



TEST SYSTEMS
PROGRAMMABLE ATTENUATORS
MANUALLY VARIABLE ATTENUATORS
FIXED ATTENUATORS
TERMINATIONS
RF SWITCHES
POWER DIVIDERS AND COMBINERS
TEST ACCESSORIES

JFW INDUSTRIES, INC.

317-887-1340 877-887-4539 www.jfwindustries.com



About JFW Industries, Inc.

Founded in 1979 in Beech Grove, Indiana, JFW Industries Inc. is a world leader in designing and manufacturing passive RF components and application specific test systems. These components include attenuators, RF switches, and specialized test systems for use in the cellular, telecommunications, OEM test equipment, medical, automotive, defense, and automated test markets. Innovative new designs and a focus on customer requirements have allowed JFW to maintain steady growth in many key market segments.

JFW has over 120 dedicated employees, diligently working two shifts to ensure quality assembly and on-time delivery. Each one of our dedicated employees represents our over 30 year commitment to providing reliable RF solutions. Beginning with an industry renowned Customer Service Department, everyone at JFW strives for complete customer satisfaction by responding to the needs of each customer individually and providing the RF component or system that best suits that customer's application.

JFW is an ISO-9001:2008 registered company. We have over 14,000 square feet of design and manufacturing space, located in Indianapolis, Indiana (USA) with a European office located in England. We currently operate two full-time shifts and are equipped for most facets of the design, assembly, integration and testing of RF technologies.

JFW's Customer Service

Our customer service oriented attitude is reflected by both our customer service team and engineering team. We look forward to providing quality service and products to every customer.

Sales Representatives and Distributors

JFW's products and services are available on a global basis. Sales Representatives provide support across the United States. A combination of Representatives and Distributors provide worldwide sales and support in the International markets. Please contact JFW customer service or visit our web site at www.jfwindustries.com for the JFW Representative or Distributor in your area.

Product Information is Available at www.jfwindustries.com.



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JFW Factory and Sales Office Locations

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JFW's Quality Policy

“JFW is committed to anticipating and exceeding customer’s requirements and expectations through cost-competitive, quality products and services that are delivered on time and through continual improvements to our quality management system.”

JFW's Standard Terms and Conditions

JFW Industries, Inc. has standard terms of Net 30 days with approved credit.

Alternate methods of payment include MASTERCARD,
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Any other payment terms must be negotiated in advance.

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Printed September 2011

SPECIFICATIONS AND PRICING: Due to continuous product and process improvements, JFW reserves the right to change specifications, drawings and prices without notice.

Application specific designs are the cornerstone of JFW's continuous technical advances in RF components. Over three decades of designing and manufacturing custom components provides a solid and growing technology base for product development.

RF TEST SYSTEMS

This section of our catalog showcases some standard JFW test systems. At JFW Industries we understand that everyone's system requirements are unique. For this reason, we can design a system to suit your individual applications without charging you costly NRE fees. Through the integration of attenuators, switches, power dividers, and various other components, our systems are designed with the specific needs of your system in mind. JFW Test Systems also have the capability of receiving RS-232/GPIB/Ethernet commands that are formatted to meet your specific control requirements.



AVAILABLE FEATURES

- *No NRE charges for custom system designs*
- *GPIB, RS-232, TTL or Ethernet control*
- *Custom command formats*
- *Frequency ranges from DC-18 GHz*
- *50 Ohm and 75 Ohm impedance*
- *Keypad or toggles for manual control*
- *19", 23" or 24" rack sizes*
- *Bench-top designs*
- *Blocking, Non-blocking matrix configurations*
- *Latching and non-latching designs*
- *Electro-mechanical and solid state switches*
- *Electro-mechanical and solid state attenuators*
- *Power Dividers, Couplers and other RF components*
- *Various RF connector options*

AFFORDABLE CUSTOM DESIGNS ARE ALSO AVAILABLE!

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RF Test Systems

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50PA-505 SMA).

Programmable Attenuator Systems

Model Number	Impedance	# of Attenuators @ Attenuation	Frequency Range	Enclosure Type	Page
50BA-001-63	50 Ohms	One @ 0-63 x 1 dB	200-6000 MHz	Benchtop	1-3
50BA-001-95	50 Ohms	One @ 0-95 x 1 dB	200-6000 MHz	Benchtop	1-3
50BA-002-63	50 Ohms	Two @ 0-63 x 1 dB	200-6000 MHz	Benchtop	1-4
50BA-002-95	50 Ohms	Two @ 0-95 x 1 dB	200-6000 MHz	Benchtop	1-4
50PA-505	50 Ohms	Four @ 0-63 x 1 dB	200-6000 MHz	Benchtop	1-5
50PA-506	50 Ohms	Eight @ 0-63 x 1 dB	200-6000 MHz	Benchtop	1-5
50PA-512	50 Ohms	Two @ 0-63 x 1 dB	200-6000 MHz	19" Rack	1-7
50PA-513	50 Ohms	Four @ 0-63 x 1 dB	200-6000 MHz	19" Rack	1-7
50PA-514	50 Ohms	Eight @ 0-63 x 1 dB	200-6000 MHz	19" Rack	1-7
50PA-517	50 Ohms	Four @ 0-95 x 1 dB	200-6000 MHz	Benchtop	1-5
50PA-518	50 Ohms	Two @ 0-95 x 1 dB	200-6000 MHz	19" Rack	1-7
50PA-519	50 Ohms	Four @ 0-95 x 1 dB	200-6000 MHz	19" Rack	1-7
50PA-520	50 Ohms	Eight @ 0-95 x 1 dB	200-6000 MHz	19" Rack	1-7
50PA-521	50 Ohms	Eight @ 0-95 x 1 dB	200-6000 MHz	Benchtop	1-5
50PA-555	50 Ohms	Two @ 0-127 x 1 dB	700-3000 MHz	19" Rack	1-9
50PA-556	50 Ohms	Four @ 0-127 x 1 dB	700-3000 MHz	19" Rack	1-9
50PA-557	50 Ohms	Eight @ 0-127 x 1 dB	700-3000 MHz	19" Rack	1-9
50PA-628	50 Ohms	Twelve @ 0-63 x 1 dB	200-6000 MHz	Benchtop	1-5
75PA-053	75 Ohms	Two @ 0-127 x 1 dB	450-2150 MHz	19" Rack	1-9

Handover Test Systems

Model Number	Impedance	Configuration	Frequency Range	Page
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RF Switch Test Systems

Model Number	Impedance	Configuration	Frequency Range	Page
50SA-133	50 Ohms	One 1P8T RF Switch	50-2200 MHz	1-19
50SA-271	50 Ohms	Four 1P6T RF Switches	DC-18 GHz	1-18
75SA-042	75 Ohms	One 1P16T RF Switch	20-1000 MHz	1-19

Transceiver / Radio Test Systems

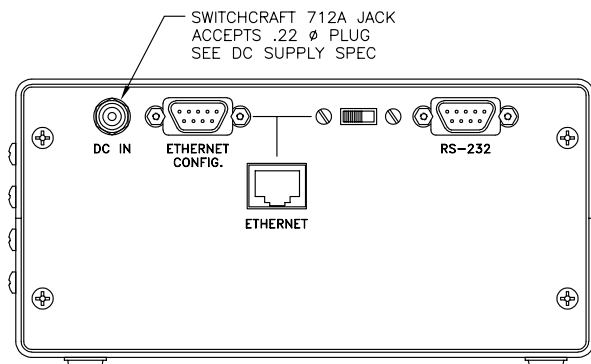
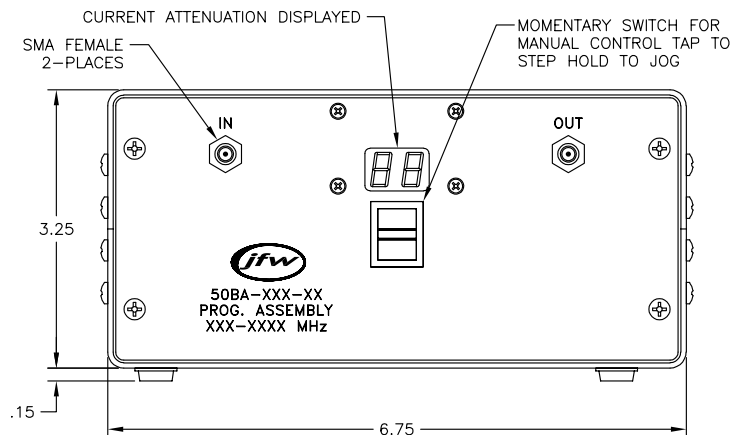
Model Number	Impedance	Configuration	Frequency Range	Page
50PMA-031	50 Ohms	6 Port with 2 RF Hubs	30-3000 MHz	1-17
50PMA-050	50 Ohms	9 Port	2000-6000 MHz	1-15

Benchtop Programmable Attenuators

Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50BA-001-63	One solid-state programmable attenuator in a mini benchtop enclosure	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50BA-001-95	One solid-state programmable attenuator in a mini benchtop enclosure	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB

Model	Insertion Loss	VSWR (maximum)	Switching Speed (typical)	RF Connectors
50BA-001-63	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50BA-001-95	8.5 dB maximum 8.0 dB typical	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female

Common Specifications				
Impedance	RF Input Power (average)	DC Supply	Control	Operating Temperature
50 Ohms	+20 dBm	+12 Vdc (100-240 VAC AC/DC transformer included)	Manual/Ethernet/RS-232	0° C to +50° C



REAR VIEW
CHASSIS DEPTH = 6.75"

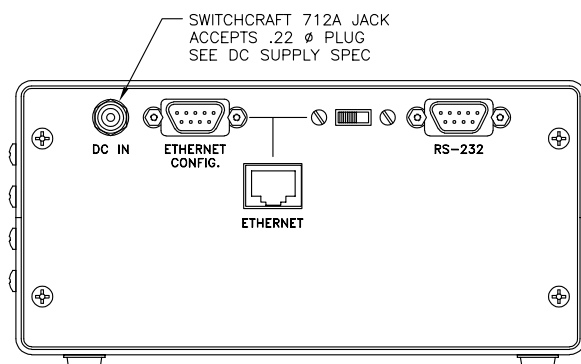
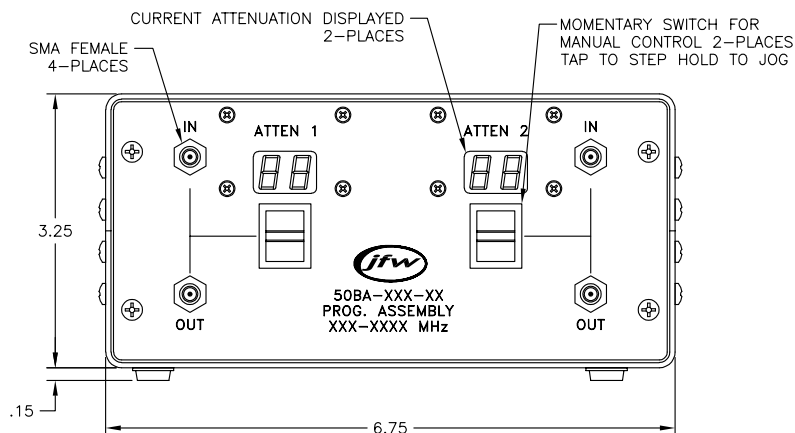
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Benchtop Programmable Attenuators

Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50BA-002-63	Two individually controlled solid-state programmable attenuators in a mini benchtop enclosure	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50BA-002-95	Two individually controlled solid-state programmable attenuators in a mini benchtop enclosure	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB

Model	Insertion Loss (maximum)	VSWR (maximum)	Switching Speed (typical)	RF Connectors
50BA-002-63	6.0 dB	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	SMA female
50BA-002-95	8.5 dB	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	SMA female

Common Specifications				
Impedance	RF Input Power (average)	DC Supply	Control	Operating Temperature
50 Ohms	+20 dBm	+12 Vdc (100-240 VAC AC/DC transformer included)	Manual/Ethernet/RS-232	0° C to +50° C



REAR VIEW
CHASSIS DEPTH = 6.75"

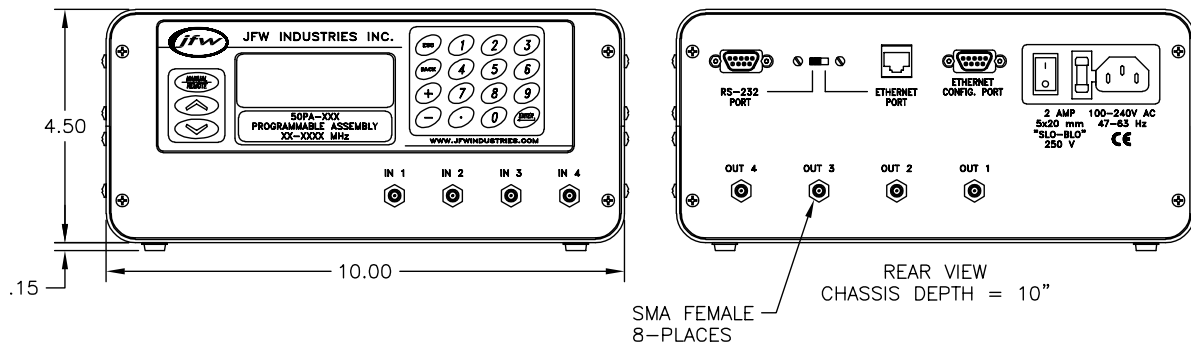
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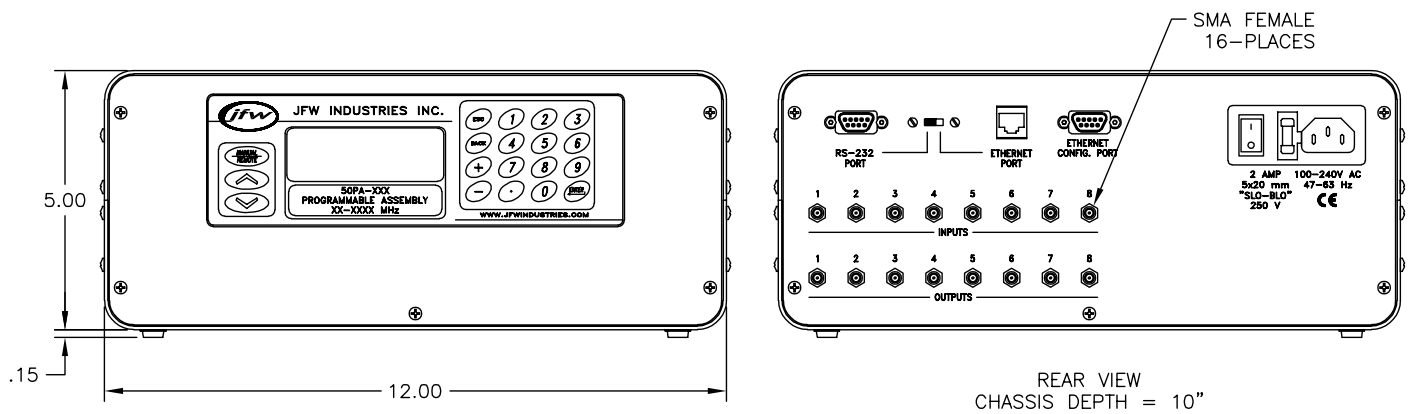
Programmable Attenuator Test Systems in Benchtop Enclosures

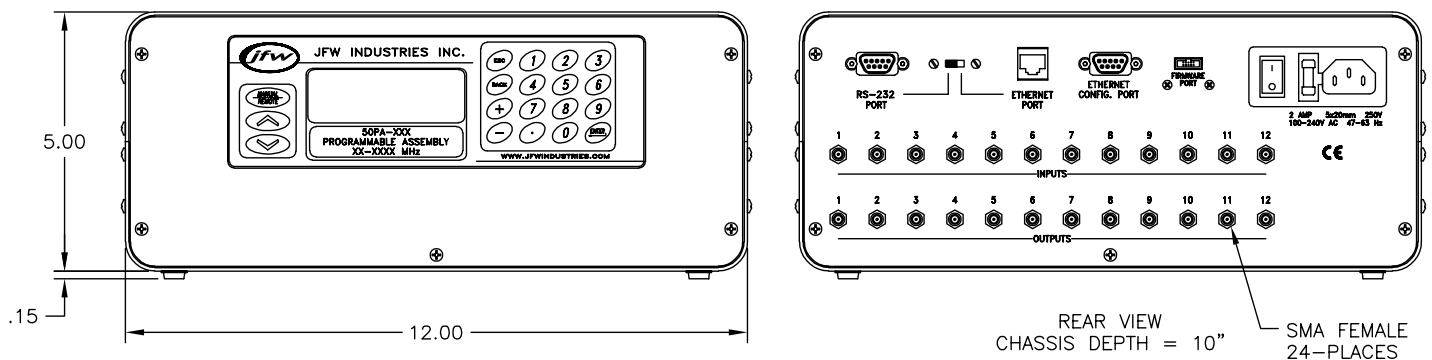
Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PA-505	Four individually controlled solid-state programmable attenuators	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50PA-506	Eight individually controlled solid-state programmable attenuators	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50PA-517	Four individually controlled solid-state programmable attenuators	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB
50PA-521	Eight individually controlled solid-state programmable attenuators	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB
50PA-628	Twelve individually controlled solid-state programmable attenuators	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB

Model	Insertion Loss	VSWR (maximum)	Switching Speed (typical)	RF Connectors
50PA-505	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-506	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	SMA female
50PA-517	8.5 dB maximum 8.0 dB typical	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-521	8.5 dB maximum 8.0 dB typical	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	SMA female
50PA-628	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	SMA female

Common Specifications				
Impedance	RF Input Power (average)	AC Supply	Control	Operating Temperature
50 Ohms	+20 dBm	100-240 VAC @ 47-63 Hz	Manual/Ethernet/RS-232	0° C to +50° C







Programmable Attenuator Test Systems in 19" Rack Enclosures

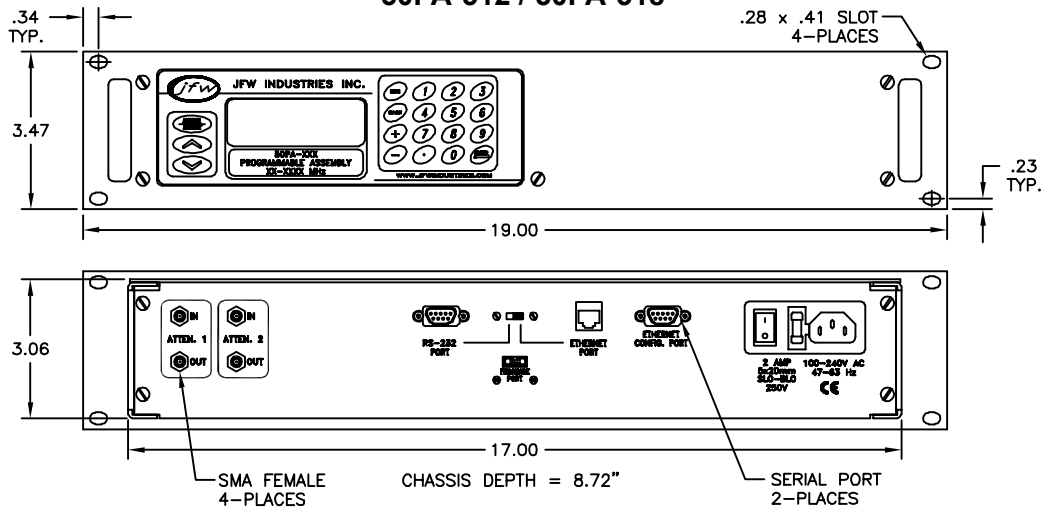
Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PA-512	Two individually controlled solid-state programmable attenuators	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50PA-513	Four individually controlled solid-state programmable attenuators	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50PA-514	Eight individually controlled solid-state programmable attenuators	200-6000 MHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB
50PA-518	Two individually controlled solid-state programmable attenuators	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB
50PA-519	Four individually controlled solid-state programmable attenuators	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB
50PA-520	Eight individually controlled solid-state programmable attenuators	200-6000 MHz	0-95 x 1 dB	± 0.50 dB 1-3 dB ± 0.75 dB 4-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB

Model	Insertion Loss	VSWR (maximum)	Switching Speed (typical)	RF Connectors
50PA-512	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-513	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-514	6.0 dB maximum 5.0 dB typical	1.8:1 200-800 MHz 1.6:1 800-6000 MHz	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-518	8.5 dB maximum 8.0 dB typical	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-519	8.5 dB maximum 8.0 dB typical	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-520	8.5 dB maximum 8.0 dB typical	2.0:1	1 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female

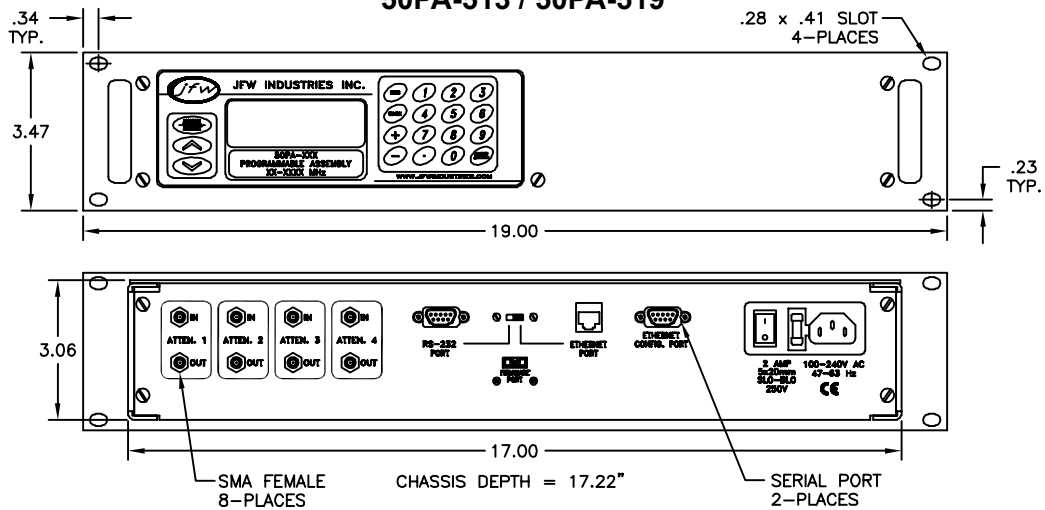
Common Specifications				
Impedance	RF Input Power (average)	AC Supply	Control	Operating Temperature
50 Ohms	+20 dBm	100-240 VAC @ 47-63 Hz	Manual/Ethernet/RS-232	0° C to +50° C

Programmable Attenuator Test Systems in 19" Rack Enclosures

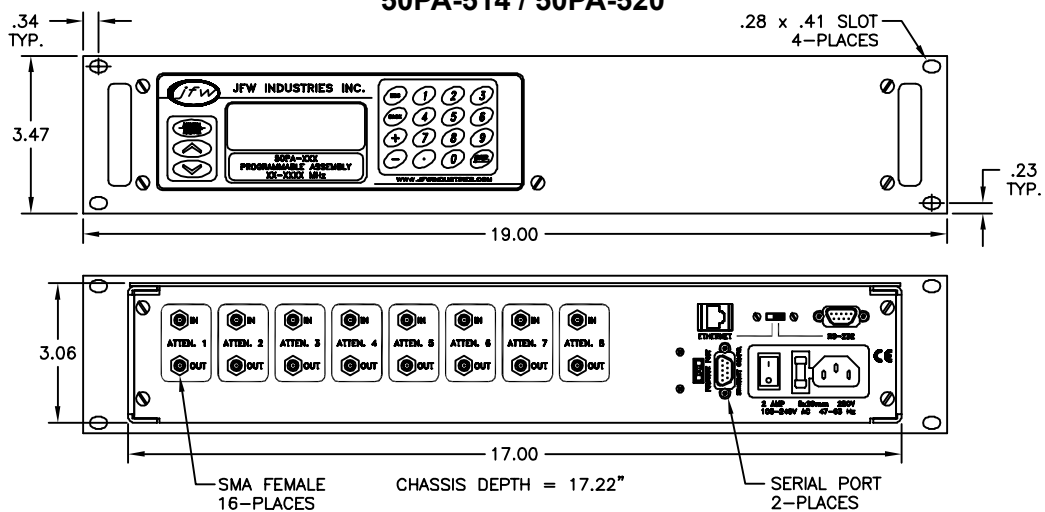
50PA-512 / 50PA-518



50PA-513 / 50PA-519



50PA-514 / 50PA-520



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Programmable Attenuator Test Systems in 19" Rack Enclosures

LTE

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Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PA-555	Two individually controlled solid-state programmable attenuators	700-3000 MHz	0-127 x 1 dB	± 0.5 dB or 2%
50PA-556	Four individually controlled solid-state programmable attenuators	700-3000 MHz	0-127 x 1 dB	± 0.5 dB or 2%
50PA-557	Eight individually controlled solid-state programmable attenuators	700-3000 MHz	0-127 x 1 dB	± 0.5 dB or 2%
75PA-053	Two individually controlled solid-state programmable attenuators	450-2150 MHz	0-127 x 1 dB	± 0.4 dB 1, 2, 4 and 8 dB ± 3% 16, 32 and 64 dB

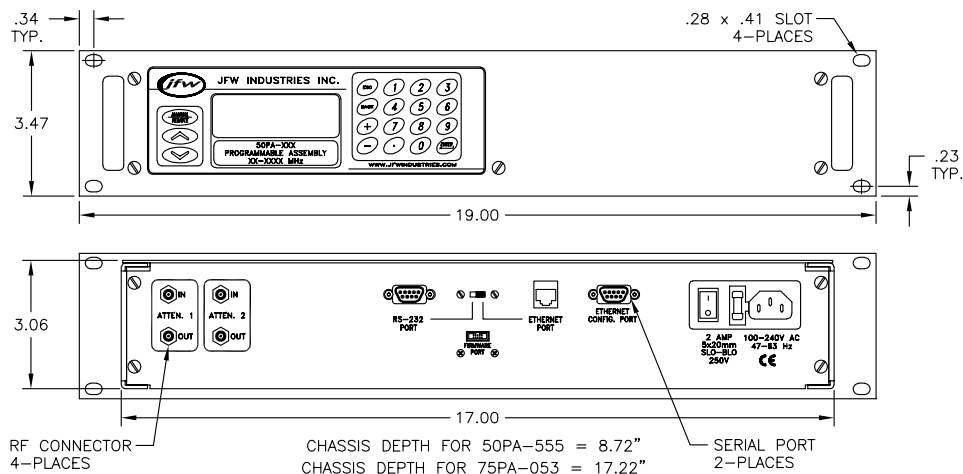
Model	Impedance	Insertion Loss (maximum)	VSWR (maximum)	Switching Speed (typical)	RF Connectors
50PA-555	50 Ohms	6.0 dB	1.6:1	5 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-556	50 Ohms	6.0 dB	1.6:1	5 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
50PA-557	50 Ohms	6.0 dB	1.6:1	5 microsecond (after command is processed) (3 milliseconds typical processing time)	N or SMA female
75PA-053	75 Ohms	4.5 dB	1.8:1	2 microseconds (after command is processed) (3 milliseconds typical processing time)	F female

Common Specifications			
RF Input Power (average)	AC Supply	Control	Operating Temperature
+20 dBm	100-240 VAC @ 47-63 Hz	Manual/Ethernet/RS-232	0° C to +50° C

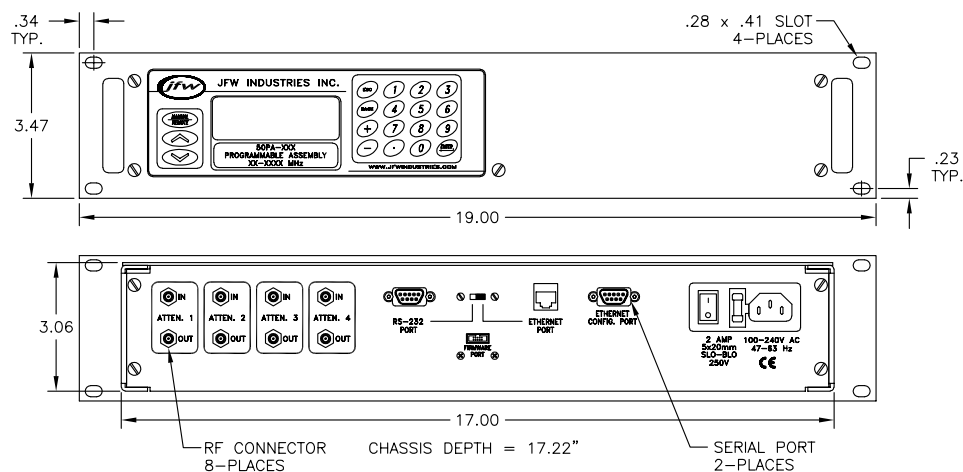
GPIB controlled models
also available.

Programmable Attenuator Test Systems in 19" Rack Enclosures

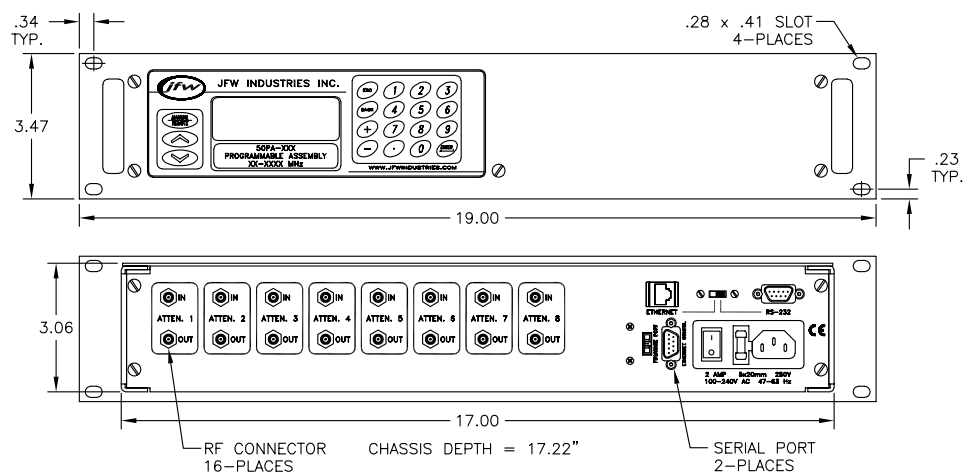
50PA-555 / 75PA-053



50PA-556



50PA-557

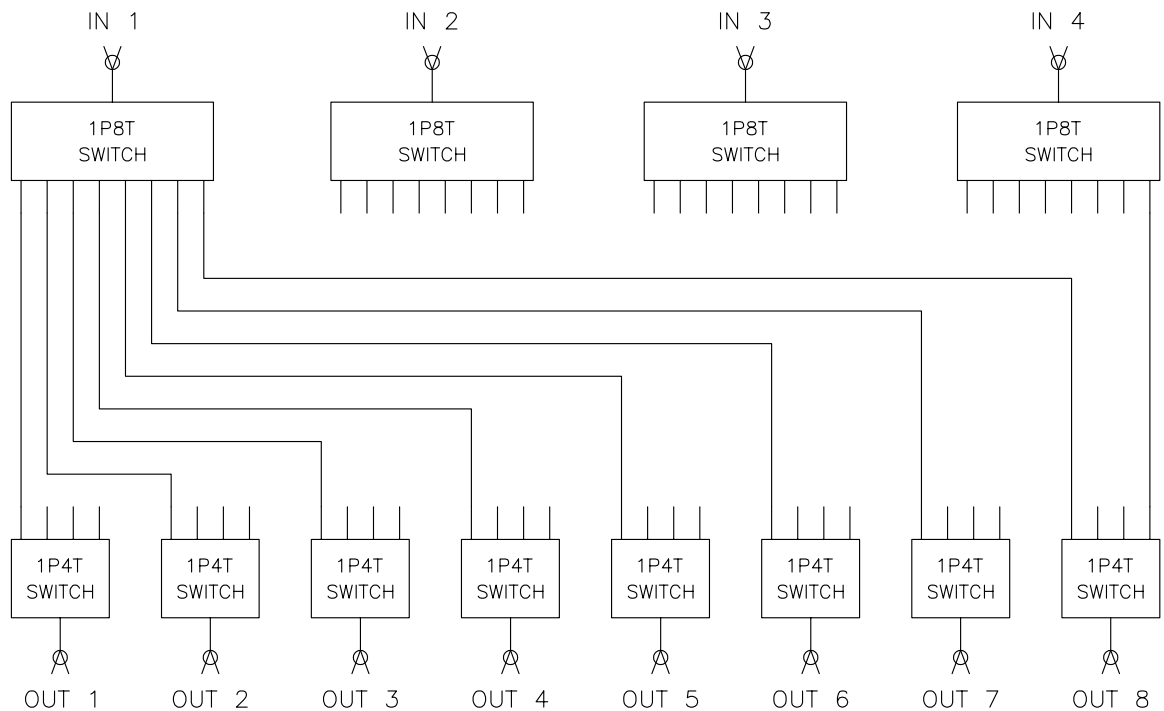
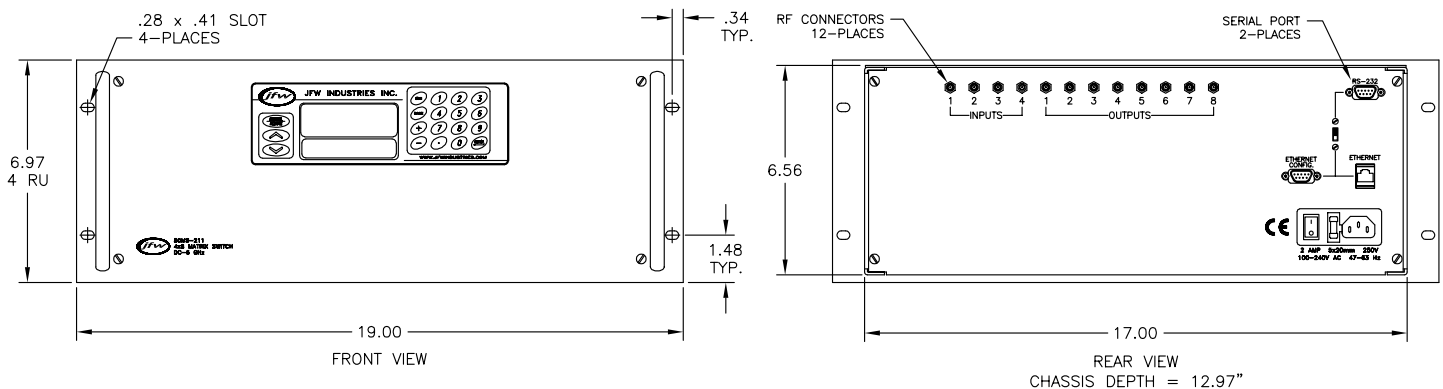


Blocking Matrix Switch

Model	Configuration	Frequency Range	Impedance	VSWR (maximum)
50MS-211	4 x 8 Blocking Matrix (all switches) (unconnected ports are reflective)	DC-6000 MHz	50 Ohms	1.5:1

Insertion Loss (maximum)	Isolation (minimum)	Input Power (average)	Control
1 dB DC-2500 MHz 2 dB 2500-6000 MHz	70 dB DC-4000 MHz 65 dB 4000-6000 MHz	1 Watt	Manual/Ethernet/RS-232

AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
100-240 VAC @ 47-63 Hz	0° C to +70° C	20 milliseconds (after command is processed) (3 milliseconds typical processing time)	SMA female



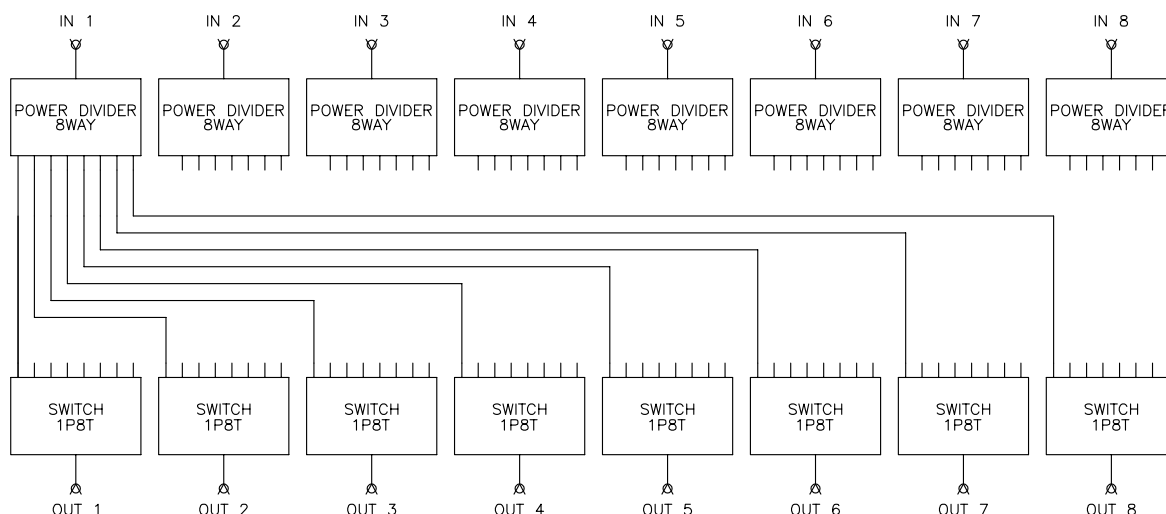
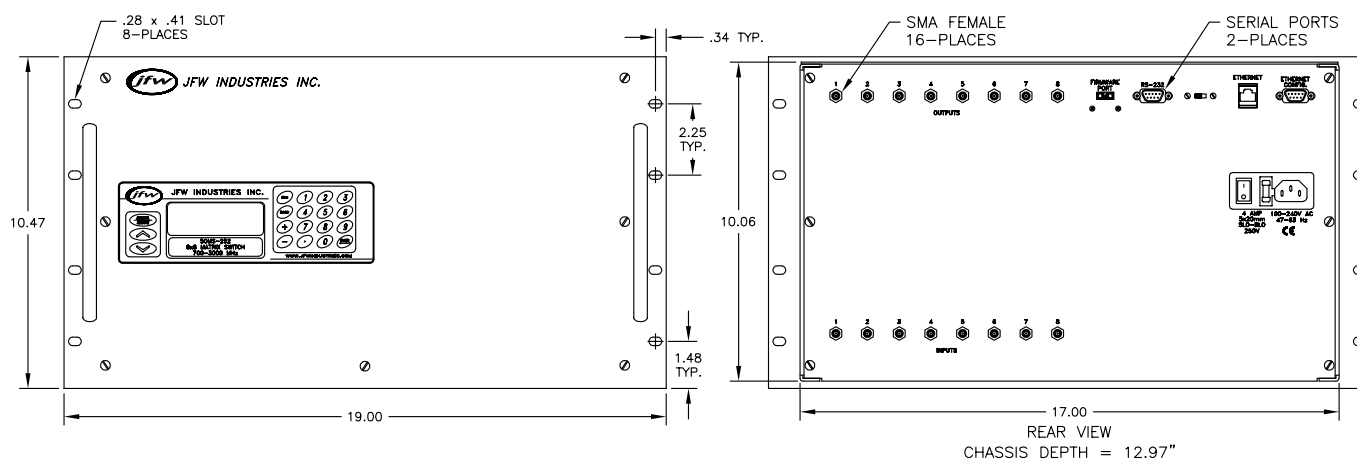
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Non-Blocking Matrix Switch

Model	Configuration	Frequency Range	Impedance	VSWR
50MS-252	8 x 8 Non-Blocking Matrix (unconnected outputs are reflective) (inputs always absorptive)	700-3000 MHz	50 Ohms	1.4:1 typical 1.6:1 maximum

Input Power (average)	Insertion Loss (typical)	Isolation (minimum)	Control
+20 dBm	11.5 dB @ 700 MHz 13.5 dB @ 3000 MHz	25 dB Output to Output (Set to same input) 60 dB Output to Output (Set to different inputs) 60 dB Input to Output 60 dB Input to Input	Manual/Ethernet/RS-232

AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
100-240 VAC @ 47-63 Hz	0° C to +70° C	20 microseconds (after command is processed) (3 milliseconds typical processing time)	SMA female

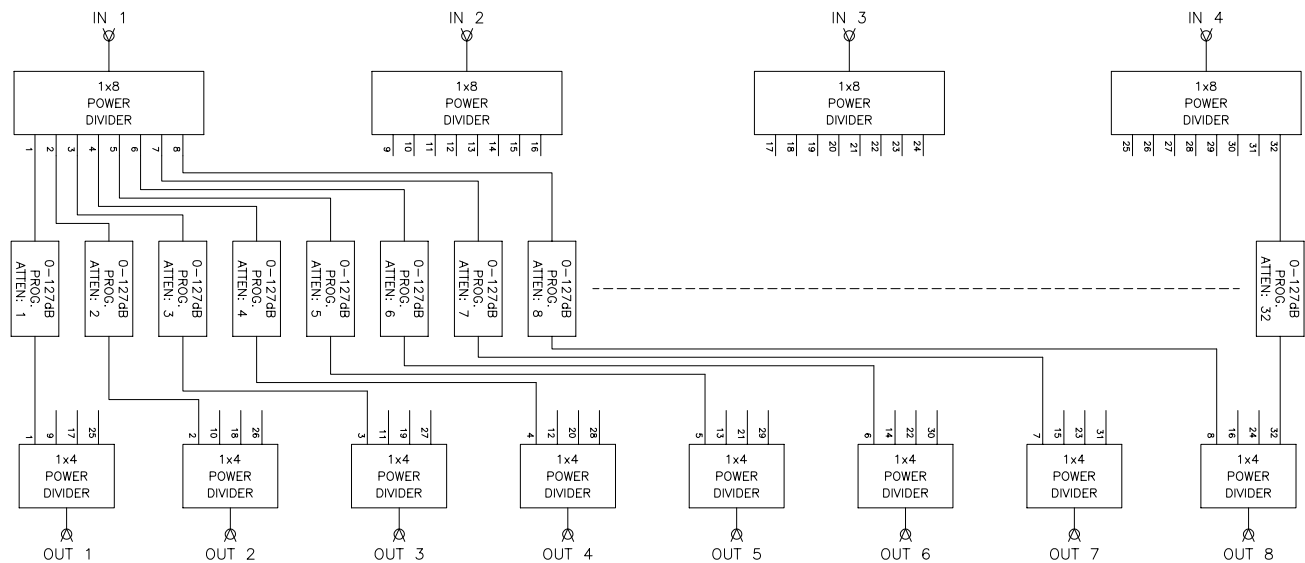
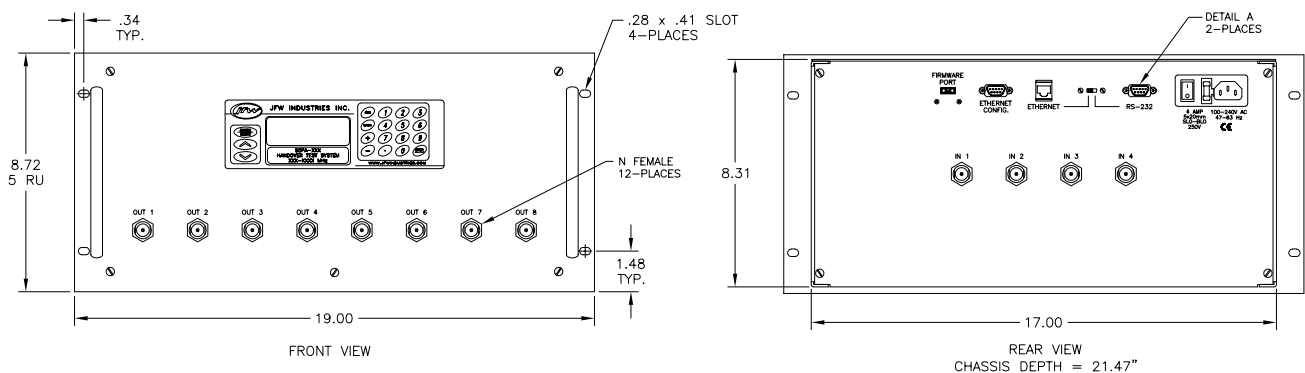


Handover Test System

Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PA-560	4 x 8 Handover System (bi-directional)	700-3000 MHz	0-127 x 1 dB	± 0.5 dB or 2% (typical) ± 0.75 dB or 2% (maximum)

Impedance	VSWR (maximum)	Insertion Loss (nominal)	Isolation (minimum)	Input Power (average)
50 Ohms	1.7:1	20 dB @ 700 MHz 23 dB @ 3000 MHz	40 dB (Input to Input) 30 dB (Output to Output)	+20 dBm

Control	AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
Manual/Ethernet/RS-232	100-240 VAC @ 47-63 Hz	0° C to +70° C	5 microseconds (after command is processed) (3 milliseconds typical processing time)	N female

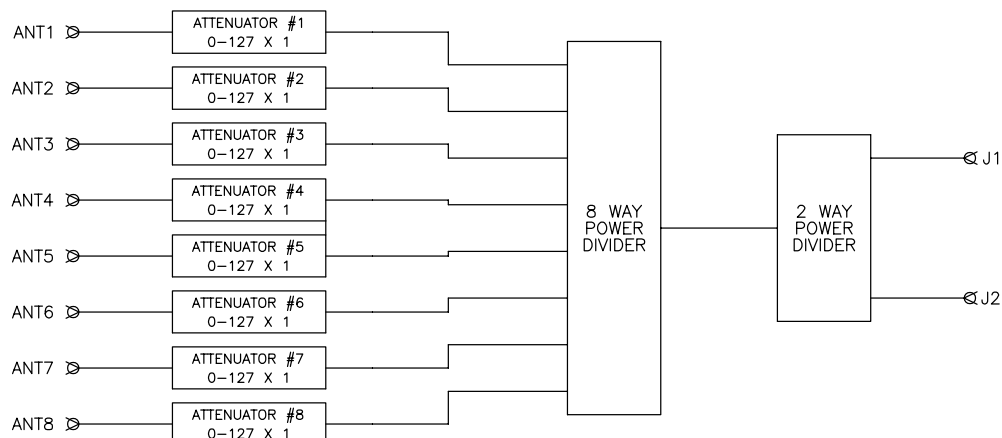
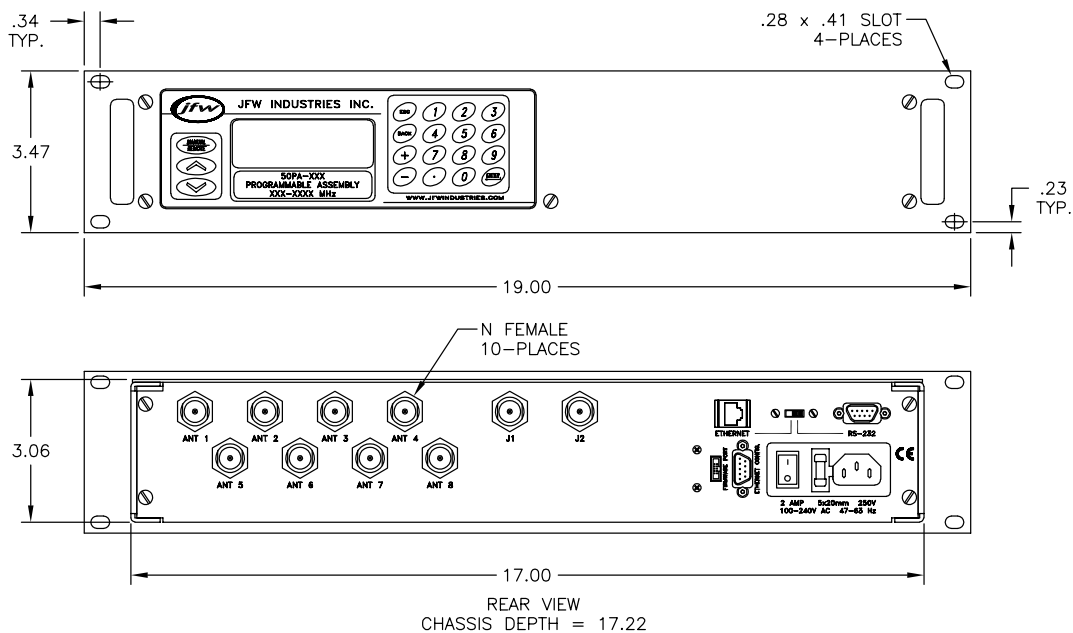


LC Handover Test System

Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PA-622	8 x 2 LC Handover System (bi-directional)	700-3000 MHz	0-127 x 1 dB	± 0.7 dB or 2% maximum ± 0.5 dB or 2% typical

Impedance	VSWR	Insertion Loss (maximum)	Isolation (minimum)	Input Power (average)
50 Ohms	1.7:1 maximum 1.5:1 typical	25 dB	30 dB from Ant # to Ant # 20 dB from J1 to J2	+20 dBm

Control	AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
Manual/Ethernet/RS-232	100-240 VAC @ 47-63 Hz	0° C to +50° C	5 microseconds (after command is processed) (3 milliseconds typical processing time)	N female

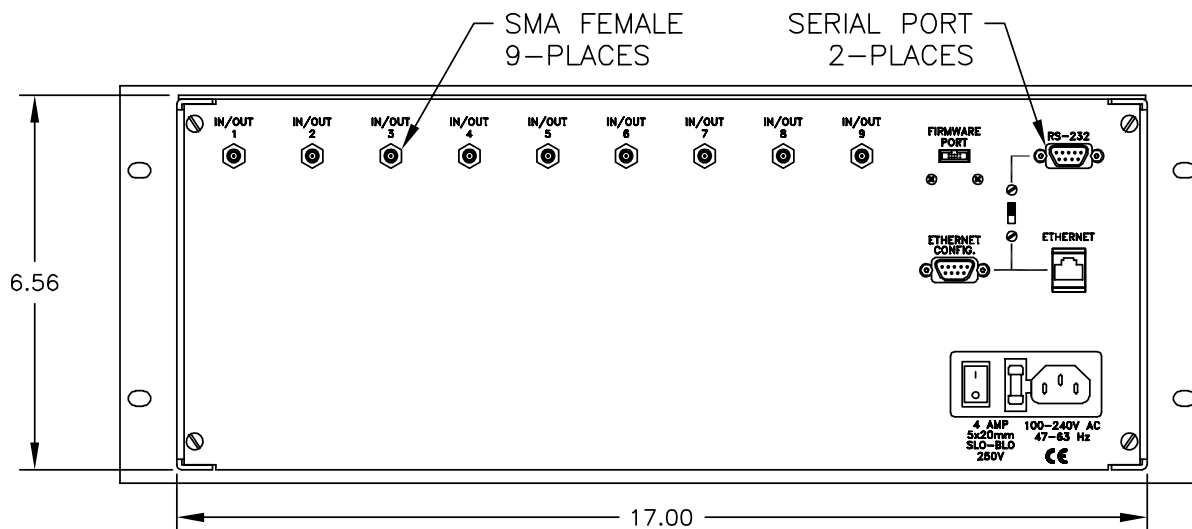
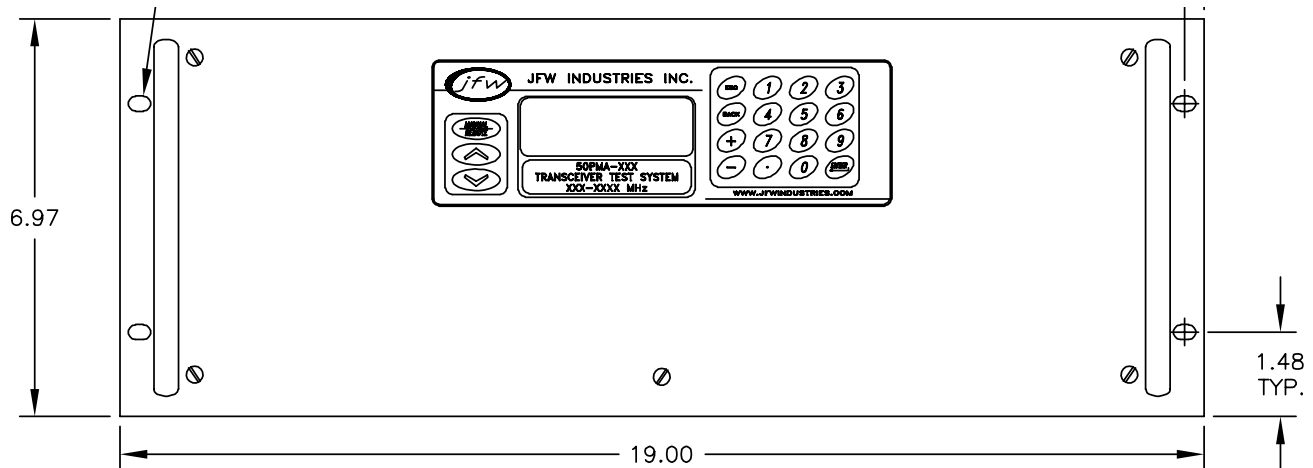


Transceiver / Radio Test System

Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PMA-050	9 Port Transceiver / Radio Tester	2-6 GHz	0-63 x 1 dB	± 0.50 dB 1-3 dB ± 1.00 dB 4-11 dB ± 1.25 dB or 4% 12-63 dB

Impedance	VSWR (maximum)	Insertion Loss	Power Divider Isolation (minimum)	Input Power (average)
50 Ohms	1.7:1	34.0 dB maximum 29.3 dB typical @ 2 GHz 31.9 dB typical @ 6 GHz	21 dB	1 Watt

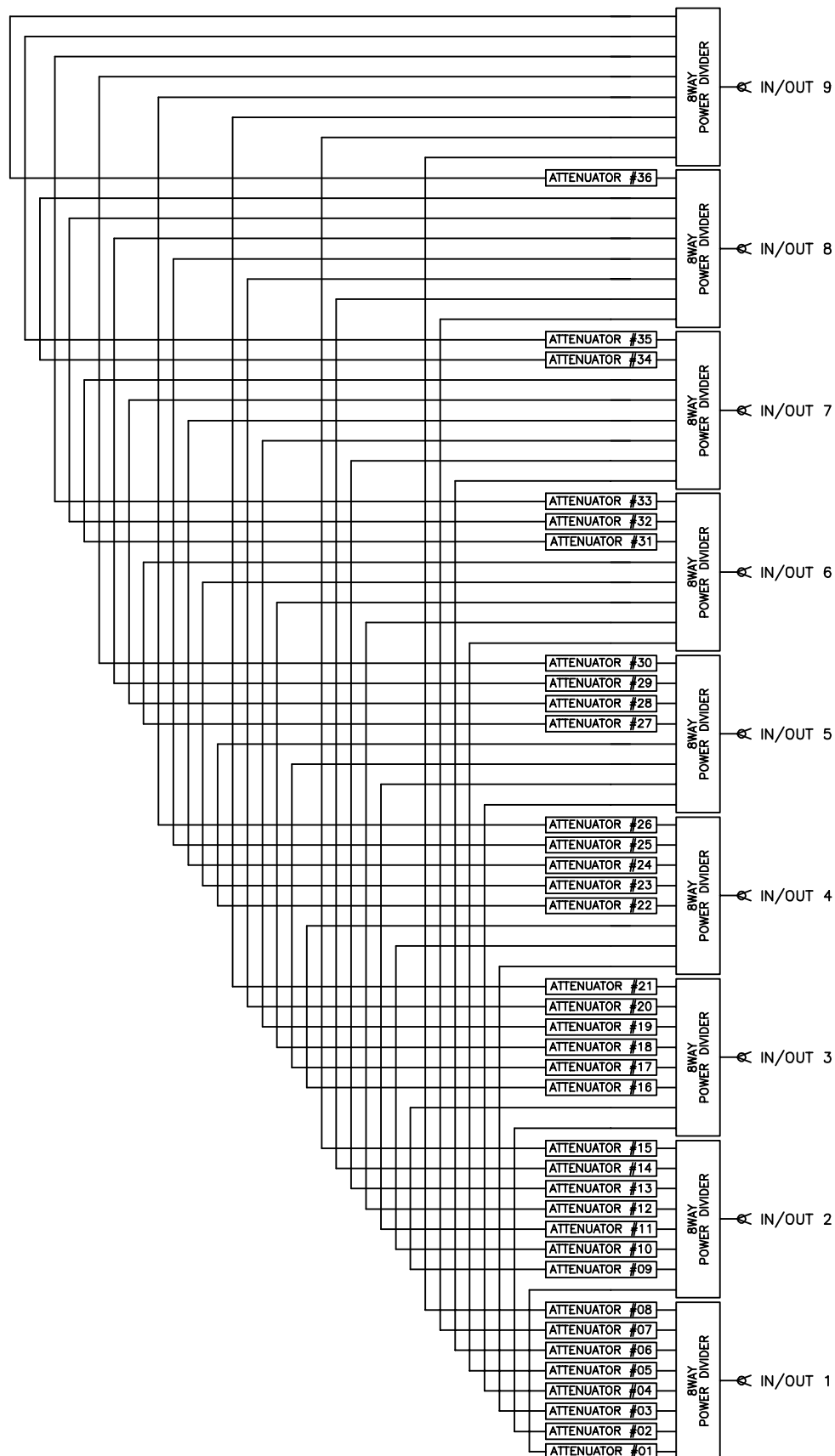
Control	AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
Manual/Ethernet/RS-232	100-240 VAC @ 47-63 Hz	0° C to +50° C	1 microsecond (after command is processed) (3 milliseconds typical processing time)	SMA female



REAR VIEW
CHASSIS DEPTH = 21.47"

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Transceiver / Radio Test System

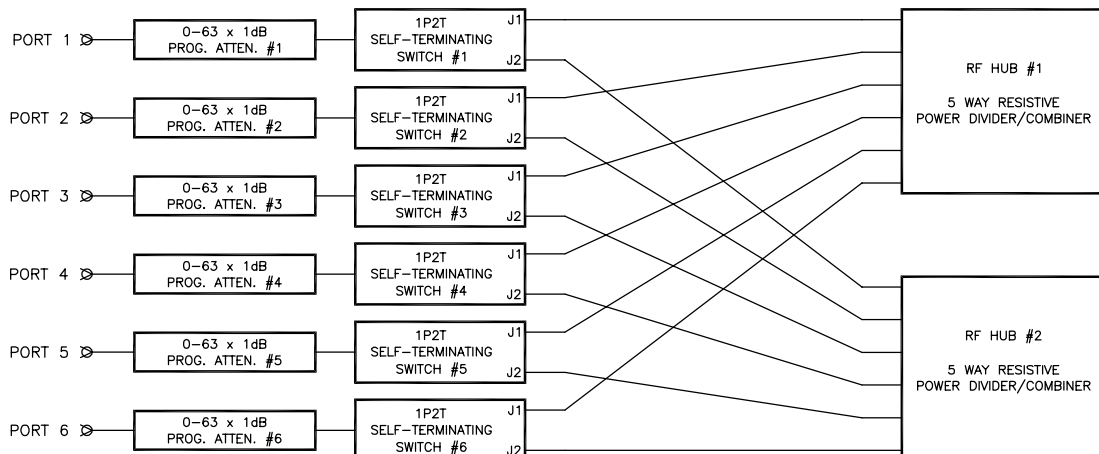
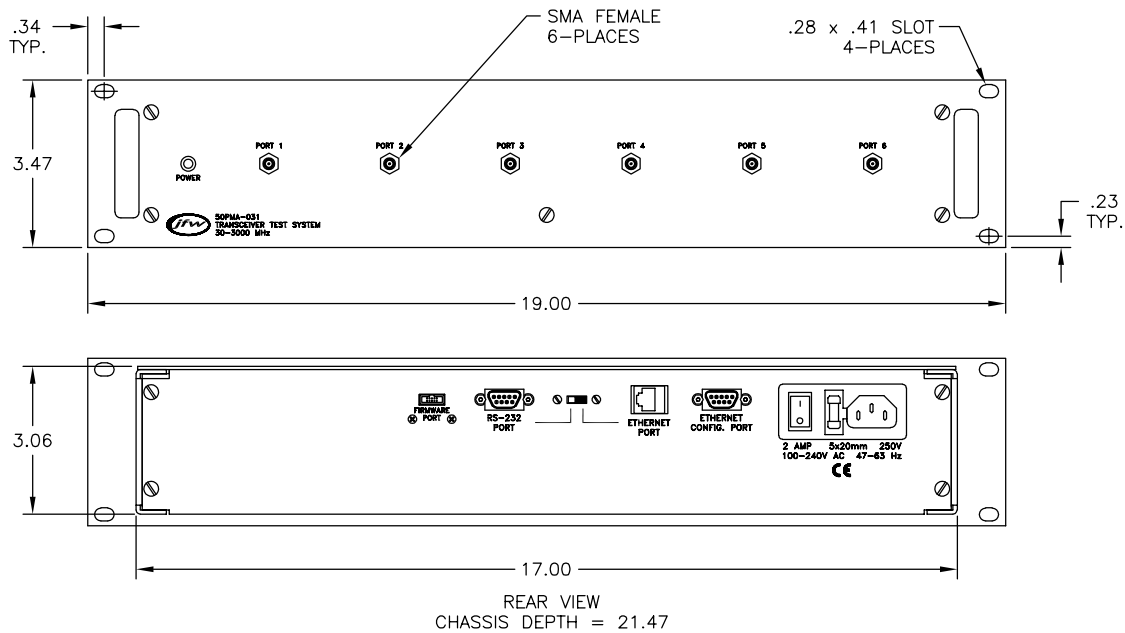


Tranceiver Test System w/ RF Hubs

Model	Configuration	Frequency Range	Attenuation Range	Attenuation Accuracy
50PMA-031	6 Port Tranceiver Test System with 2 RF Hubs	30-3000 MHz	0-63 x 1 dB	± 0.3 dB 1-7 dB ± 0.5 dB or 2% 8-63 dB

Impedance	VSWR	Insertion Loss (nominal)	Input Power (average)
50 Ohms	1.8:1 maximum 1.6:1 typical	24 dB @ 30 MHz 30 dB @ 3000 MHz	+20 dBm

Control	AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
Ethernet/RS-232	100-240 VAC @ 47-63 Hz	0° C to +70° C	2 microseconds (after command is processed) (3 milliseconds typical processing time)	SMA female

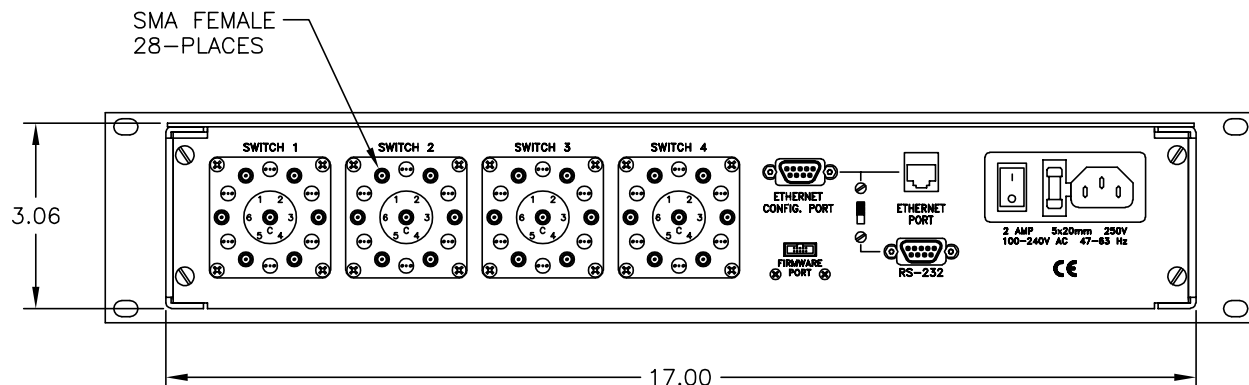
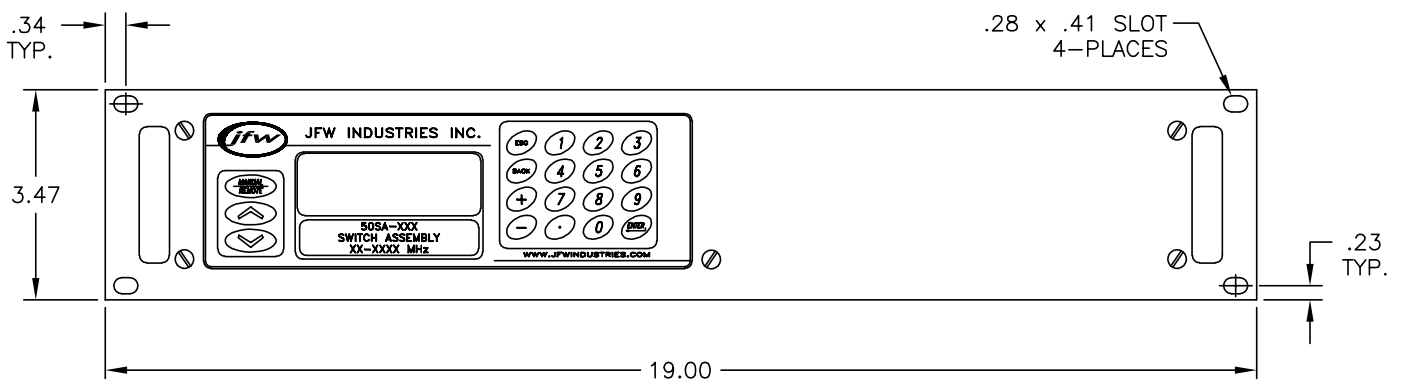


RF Switch Assembly Test System

Model	Configuration	Frequency Range	Insertion Loss (maximum)	Isolation (minimum)
50SA-271	Four Individually Controlled Self-terminating 1P6T Switches	DC-18 GHz	0.2 dB DC-4 GHz 0.3 dB 4-8 GHz 0.4 dB 8-12.4 GHz 0.5 dB 12.4-18 GHz	80 dB DC-4 GHz 75 dB 4-8 GHz 65 dB 8-12.4 GHz 60 dB 12.4-18 GHz

Impedance	VSWR (maximum)	Input Power (average - cold switched)	Control
50 Ohms	1.2:1 DC-4 GHz 1.3:1 4-8 GHz 1.4:1 8-12.4 GHz 1.5:1 12.4-18 GHz	100 Watts DC-4 GHz 90 Watts 4-8 GHz 70 Watts 8-12.4 GHz 60 Watts 12.4-18 GHz (internal terminations at 2 Watts)	Manual/Ethernet/RS-232

AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
100-240 VAC @ 47-63 Hz	0° C to +50° C	15 milliseconds (after command is processed) (3 milliseconds typical processing time)	SMA female



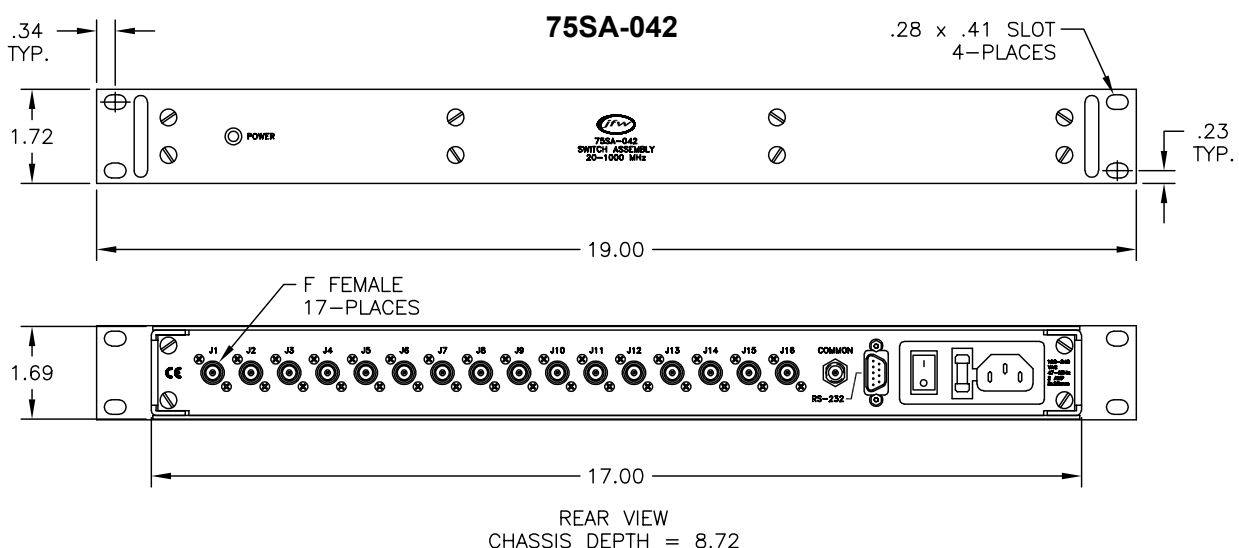
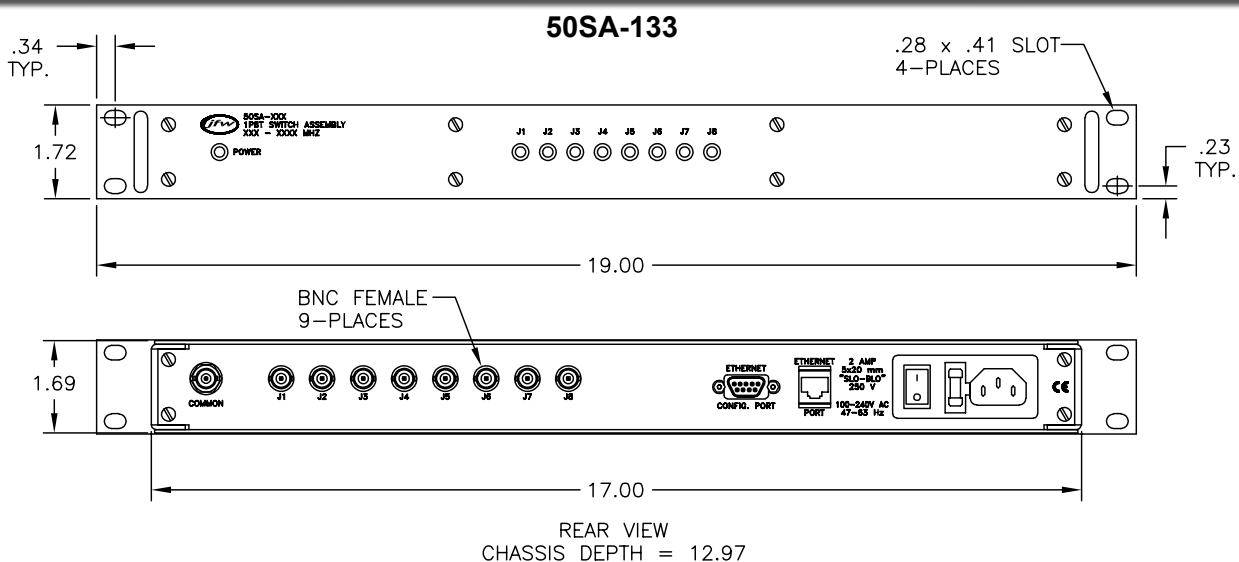
REAR VIEW
CHASSIS DEPTH = 17.22"

RF Switch Assembly Test System

Model	Configuration	Frequency Range	Insertion Loss (maximum)	Isolation (minimum)
50SA-133	One Self-terminating 1P8T Switch	50-2200 MHz	4.5 dB	50 dB
75SA-042	One Self-terminating 1P16T Switch	20-1000 MHz	2.5 dB	55 dB

Model	Impedance	VSWR (maximum)	Input Power	Control
50SA-133	50 Ohms	1.5:1	+20 dBm	Ethernet
75SA-042	75 Ohms	1.6:1	+20 dBm	RS-232

Model	AC Supply	Operating Temperature	Switching Speed (typical)	RF Connectors
50SA-133	100-240 VAC @ 47-63 Hz	0° C to +65° C	10 microseconds (after command is processed) (3 milliseconds typical processing time)	BNC or SMA female
75SA-042	100-240 VAC @ 47-63 Hz	0° C to +50° C	50 microsecond (after command is processed) (3 milliseconds typical processing time)	F female



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Programmable Attenuators

Model Number Index Sorted by Model Number

Please add connector type to the end of part number to complete model number (Example: 50P-1080 SMA).

Solid State - 50 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
50P-1080	3-1215 MHz	0-127 x 1	2-6
50P-1130	1-200 MHz	0-63.5 x 0.5	2-9
50P-1226	400-2200 MHz	0-127 x 1	2-6
50P-1501	200-3000 MHz	0-127 x 1	2-6
50P-1571	20-1000 MHz	0-63.5 x 0.5	2-9
50P-1621	20-500 MHz	0-63 x 1	2-9
50P-1767	400-3000 MHz	0-70 x 10	2-8
50P-1768	30-2500 MHz	0-55 x 5	2-8
50P-1769	800-2200 MHz	0-1.5 x 0.1	2-8
50P-1779	800-2400 MHz	0-127 x 1	2-7
50P-1782	15-2000 MHz	0-127 x 1	2-7
50P-1853	200-6000 MHz	0-63 x 1	2-4
50P-1857	200-6000 MHz	0-95 x 1	2-4
50P-1867	30-3000 MHz	0-31.75 x 0.25	2-4
50P-1891	30-3000 MHz	0-63.5 x 0.5	2-4
50P-1893	30-3000 MHz	0-63 x 1	2-4
50P-1897	30-3000 MHz	0-95 x 1	2-4
50P-1900	700-3000 MHz	0-127 x 1	2-7
Solid State - 75 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
75P-141	900-2150 MHz	0-63 x 1	2-11
75P-153	20-1000 MHz	0-63.5 x 0.5	2-11
75P-168	50-2000 MHz	0-63 x 1	2-10
75P-173	450-2150 MHz	0-127 x 1	2-10

Analog - 50 Ohm			
Model Number	Frequency Range	Attenuation Range	Page
50AP-002	10-500 MHz	0-30 dB	2-12
50AP-077	50-2200 MHz	0-20 dB	2-12
Analog - 75 Ohm			
Model Number	Frequency Range	Attenuation Range	Page
75AP-001	10-500 MHz	0-30 dB	2-12

Relay - 50 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
50P-076	DC-1000 MHz	0-127 x 1	2-13
50P-591	DC-3000 MHz	0-85 x 1	2-13
50P-766	DC-5000 MHz	0-70 x 10	2-18
50P-847	DC-5000 MHz	0-15 x 1	2-18
50P-975	DC-1000 MHz	0-63 x 1	2-15
50P-1126	DC-1000 MHz	0-31.5 x 0.5	2-15
50P-1128	DC-2000 MHz	0-63.75 x 0.25	2-13
50P-1208	DC-2500 MHz	0-15 x 1	2-14
50P-1209	DC-2500 MHz	0-15.5 x 0.5	2-14
50P-1210	DC-2500 MHz	0-31 x 1	2-14
50P-1211	DC-2500 MHz	0-31.5 x 0.5	2-14
50P-1212	DC-2500 MHz	0-63 x 1	2-14
50P-1436	DC-2500 MHz	0-127 x 1	2-17
50P-1516	DC-6000 MHz	0-70 x 10	2-18
50P-1633	DC-1000 MHz	0-64.5 x 0.1	2-16
50P-1683	DC-2500 MHz	0-70 x 10	2-15
50P-1696	DC-2500 MHz	0-63 x 1	2-17
50P-1705	DC-200 MHz	0-64.5 x 0.1	2-16
50P-1758	DC-1000 MHz	0-95 x 1	2-15
Relay - 75 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
75P-022	DC-1000 MHz	0-63 x 1	2-19
75P-033	DC-1000 MHz	0-127 x 1	2-20
75P-089	DC-500 MHz	0-63.75 x 0.25	2-20
75P-093	DC-1000 MHz	0-110 x 10	2-19
75P-157	DC-1000 MHz	0-95.5 x 0.5	2-21
75P-163	DC-1000 MHz	0-63.75 x 0.25	2-21
75P-174	DC-2150 MHz	0-63 x 1	2-22

Programmable Attenuators

Model Number Index

Sorted by Attenuation Range

Please add connector type to the end of part number to complete model number (Example: 50P-1080 SMA).

Solid State - 50 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-1.5 x 0.1	800-2200 MHz	50P-1769	2-8
0-31.75 x 0.25	30-3000 MHz	50P-1867	2-4
0-55 x 5	30-2500 MHz	50P-1768	2-8
0-63 x 1	20-500 MHz	50P-1621	2-9
0-63 x 1	200-6000 MHz	50P-1853	2-4
0-63 x 1	30-3000 MHz	50P-1893	2-4
0-63.5 x 0.5	1-200 MHz	50P-1130	2-9
0-63.5 x 0.5	20-1000 MHz	50P-1571	2-9
0-63.5 x 0.5	30-3000 MHz	50P-1891	2-4
0-70 x 10	400-3000 MHz	50P-1767	2-8
0-95 x 1	200-6000 MHz	50P-1857	2-4
0-95 x 1	30-3000 MHz	50P-1897	2-4
0-127 x 1	3-1215 MHz	50P-1080	2-6
0-127 x 1	15-2000 MHz	50P-1782	2-7
0-127 x 1	200-3000 MHz	50P-1501	2-6
0-127 x 1	400-2200 MHz	50P-1226	2-6
0-127 x 1	700-3000 MHz	50P-1900	2-7
0-127 x 1	800-2400 MHz	50P-1779	2-7
Solid State - 75 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-63 x 1	900-2150 MHz	75P-141	2-11
0-63 x 1	50-2000 MHz	75P-168	2-10
0-63.5 x 0.5	20-1000 MHz	75P-153	2-11
0-127 x 1	450-2150 MHz	75P-173	2-10

Analog - 50 Ohm			
Attenuation Range	Frequency Range	Model Number	Page
0-20 dB	50-2200 MHz	50AP-077	2-12
0-30 dB	10-500 MHz	50AP-002	2-12
Analog - 75 Ohm			
Attenuation Range	Frequency Range	Model Number	Page
0-30 dB	10-500 MHz	75AP-001	2-12

Relay - 50 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-15 x 1	DC-2500 MHz	50P-1208	2-14
0-15 x 1	DC-5000 MHz	50P-847	2-18
0-15.5 x 0.5	DC-2500 MHz	50P-1209	2-14
0-31 x 1	DC-2500 MHz	50P-1210	2-14
0-31.5 x 0.5	DC-1000 MHz	50P-1126	2-15
0-31.5 x 0.5	DC-2500 MHz	50P-1211	2-14
0-63 x 1	DC-1000 MHz	50P-975	2-15
0-63 x 1	DC-2500 MHz	50P-1212	2-14
0-63 x 1	DC-2500 MHz	50P-1696	2-17
0-63.75 x 0.25	DC-2000 MHz	50P-1128	2-13
0-64.5 x 0.1	DC-200 MHz	50P-1705	2-16
0-64.5 x 0.1	DC-1000 MHz	50P-1633	2-16
0-70 x 10	DC-5000 MHz	50P-766	2-18
0-70 x 10	DC-6000 MHz	50P-1516	2-18
0-70 x 10	DC-2500 MHz	50P-1683	2-15
0-85 x 1	DC-3000 MHz	50P-591	2-13
0-95 x 1	DC-1000 MHz	50P-1758	2-15
0-127 x 1	DC-1000 MHz	50P-076	2-13
0-127 x 1	DC-2500 MHz	50P-1436	2-17
Relay - 75 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-63 x 1	DC-1000 MHz	75P-022	2-19
0-63 x 1	DC-2150 MHz	75P-174	2-22
0-63.75 x 0.25	DC-500 MHz	75P-089	2-20
0-63.75 x 0.25	DC-1000 MHz	75P-163	2-21
0-95.5 x 0.5	DC-1000 MHz	75P-157	2-21
0-110 x 10	DC-1000 MHz	75P-093	2-19
0-127 x 1	DC-1000 MHz	75P-033	2-20

Solid State Programmable Attenuators

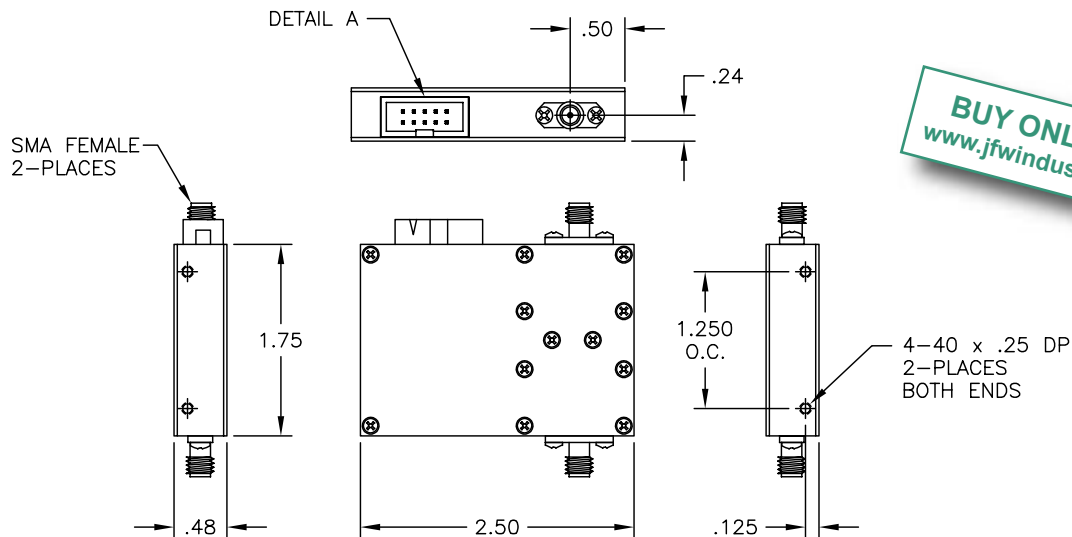
Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1853	200-6000 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.50 dB 1-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-63 dB	1.8:1 200-800 MHz 1.5:1 800-6000 MHz	5.5 dB maximum 2.6 dB typical @ 200 MHz 3.0 dB typical @ 800 MHz 3.5 dB typical @ 2000 MHz 5.0 dB typical @ 6000 MHz
50P-1857	200-6000 MHz	0-95 x 1 dB/ 1, 2, 4, 8, 16, 32 and 32 dB	± 0.50 dB 1-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 4% 12-95 dB	2.0:1	8 dB maximum 3.7 dB typical @ 200 MHz 4.0 dB typical @ 800 MHz 4.8 dB typical @ 2000 MHz 7.5 dB typical @ 6000 MHz
50P-1867	30-3000 MHz	0-31.75 x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8 and 16 dB	± 0.10 dB 0.25-3.75 dB ± 0.25 dB 4.0-7.75 dB ± 0.50 dB or 4% 8.0-31.75 dB	1.5:1	2.5 dB maximum 1.3 dB typical @ 30 MHz 2.2 dB typical @ 3000 MHz
50P-1891	30-3000 MHz	0-63.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	± 0.2 dB 0.5-7.5 dB ± 0.5 dB or 2% 8.0-63.5 dB	1.8:1 30-800 MHz 1.5:1 800-3000 MHz	4.0 dB maximum 2.5 dB typical @ 30 MHz 3.7 dB typical @ 3000 MHz
50P-1893	30-3000 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.2 dB 1-7 dB ± 0.5 dB or 2% 8-63 dB	1.8:1 30-800 MHz 1.5:1 800-3000 MHz	4.0 dB maximum 2.5 dB typical @ 30 MHz 3.7 dB typical @ 3000 MHz
50P-1897	30-3000 MHz	0-95 x 1 dB/ 1, 2, 4, 8, 16, 32 and 32 dB	± 0.50 dB 1-7 dB ± 1.00 dB 8-11 dB ± 1.25 dB or 3% 12-95 dB	2.2:1 30-800 MHz 1.6:1 800-3000 MHz	6.0 dB maximum 3.5 dB typical @ 30 MHz 4.2 dB typical @ 800 MHz 5.5 dB typical @ 3000 MHz

Model	Impedance	Switching Speed	RF Input Power	Control Logic	Operating Temperature	RF Connector	DC Supply (nominal)
50P-1853	50 Ohms	1 microsecond	+20 dBm operating +25 dBm (no damage)	(6 lines) TTL Low for Thru Path TTL High for Attenuation	-40° C to +85° C	SMA female	+5 Vdc @ 50 mA
50P-1857	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	-40° C to +85° C	SMA female	+5 Vdc @ 50 mA
50P-1867	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	-40° C to +85° C	SMA female	+5 Vdc @ 50 mA
50P-1891	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	-40° C to +85° C	SMA female	+5 Vdc @ 50 mA
50P-1893	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(6 lines) TTL Low for Thru Path TTL High for Attenuation	-40° C to +85° C	SMA female	+5 Vdc @ 50 mA
50P-1897	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	-40° C to +85° C	SMA female	+5Vdc @ 50 mA

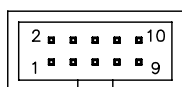
For a DC mating cable,
see page 8-11.

Solid State Programmable Attenuators

50P-1853 / 50P-1867 / 50P-1891 / 50P-1893



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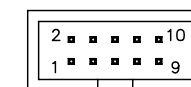
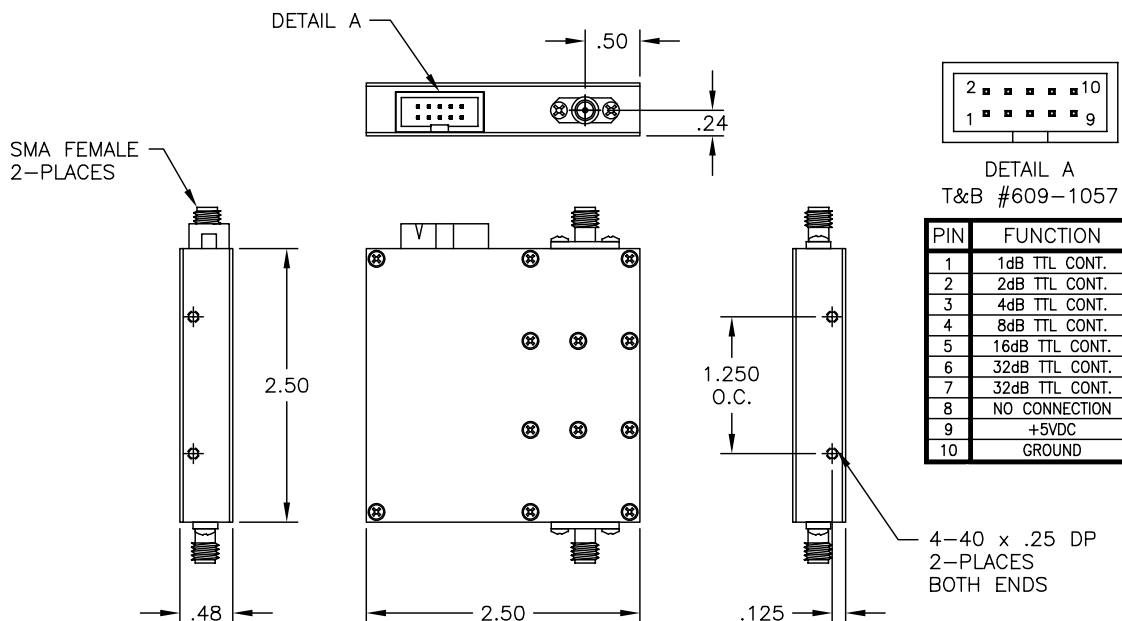
DETAIL A
T&B #609-1057

PIN	50P-1853/1893
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	32dB TTL CONT.
7	NO CONNECTION
8	NO CONNECTION
9	+5Vdc
10	GROUND

PIN	50P-1867
1	0.25dB TTL CONT.
2	0.5dB TTL CONT.
3	1dB TTL CONT.
4	2dB TTL CONT.
5	4dB TTL CONT.
6	8dB TTL CONT.
7	16dB TTL CONT.
8	NO CONNECTION
9	+5Vdc
10	GROUND

PIN	50P-1891
1	0.5dB TTL CONT.
2	1dB TTL CONT.
3	2dB TTL CONT.
4	4dB TTL CONT.
5	8dB TTL CONT.
6	16dB TTL CONT.
7	32dB TTL CONT.
8	NO CONNECTION
9	+5Vdc
10	GROUND

50P-1857 / 50P-1897



DETAIL A
T&B #609-1057

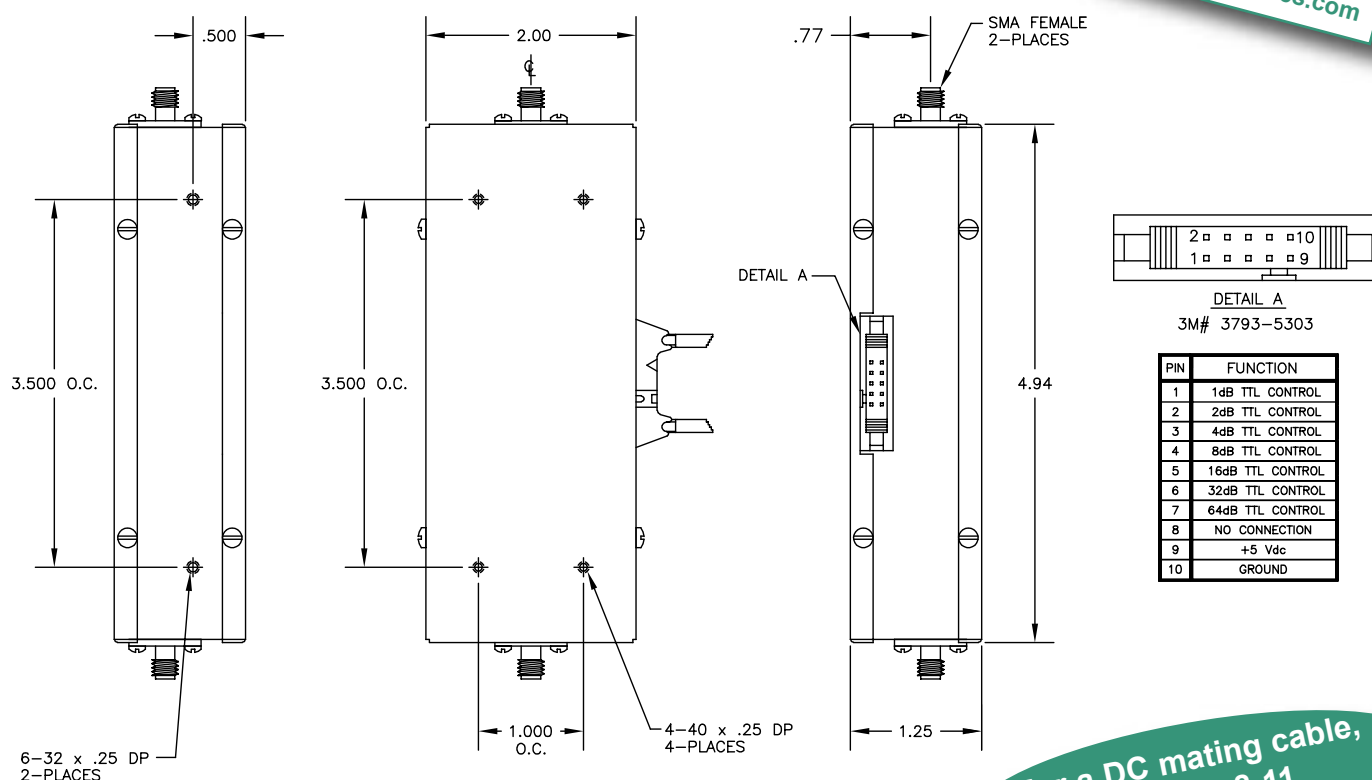
PIN	FUNCTION
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	32dB TTL CONT.
7	32dB TTL CONT.
8	NO CONNECTION
9	+5VDC
10	GROUND

Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50P-1080	3-1215 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.2 dB or 2% 3-500 MHz ± 0.4 dB or 2% 500-1215 MHz	1.4:1	4.0 dB Flatness ± 0.75 dB
50P-1226	400-2200 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.5 dB or 2%	1.5:1	4.5 dB
50P-1501	200-3000 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	1, 2, 4, 8 dB ± 0.25 dB 200-2000 MHz 1, 2, 4, 8 dB ± 0.4 dB 2000-3000 MHz 16, 32, 64 dB ± 0.5 dB or 2% 200-3000 MHz	1.5:1	3.5 dB to 1000 MHz 6.0 dB to 3000 MHz

Model	Impedance	Switching Speed (maximum)	RF Input Power	DC Supply (nominal)	Control Logic (7 lines)	Operating Temperature	RF Connectors
50P-1080	50 Ohms	5 microseconds	+10 dBm	+5 Vdc @ 300 mA	TTL low for Thru Path TTL high for attenuation	0° C to +70° C	BNC, N, SMA or TNC female
50P-1226	50 Ohms	2 microseconds	+20 dBm operating +30 dBm no damage	+5 Vdc @ 300 mA	TTL low for Thru Path TTL high for attenuation	0° C to +70° C	N, SMA or TNC female
50P-1501	50 Ohms	2 microseconds	+20 dBm operating +30 dBm no damage	+5 Vdc @ 300 mA	TTL low for Thru Path TTL high for attenuation	0° C to +70° C	N or SMA female

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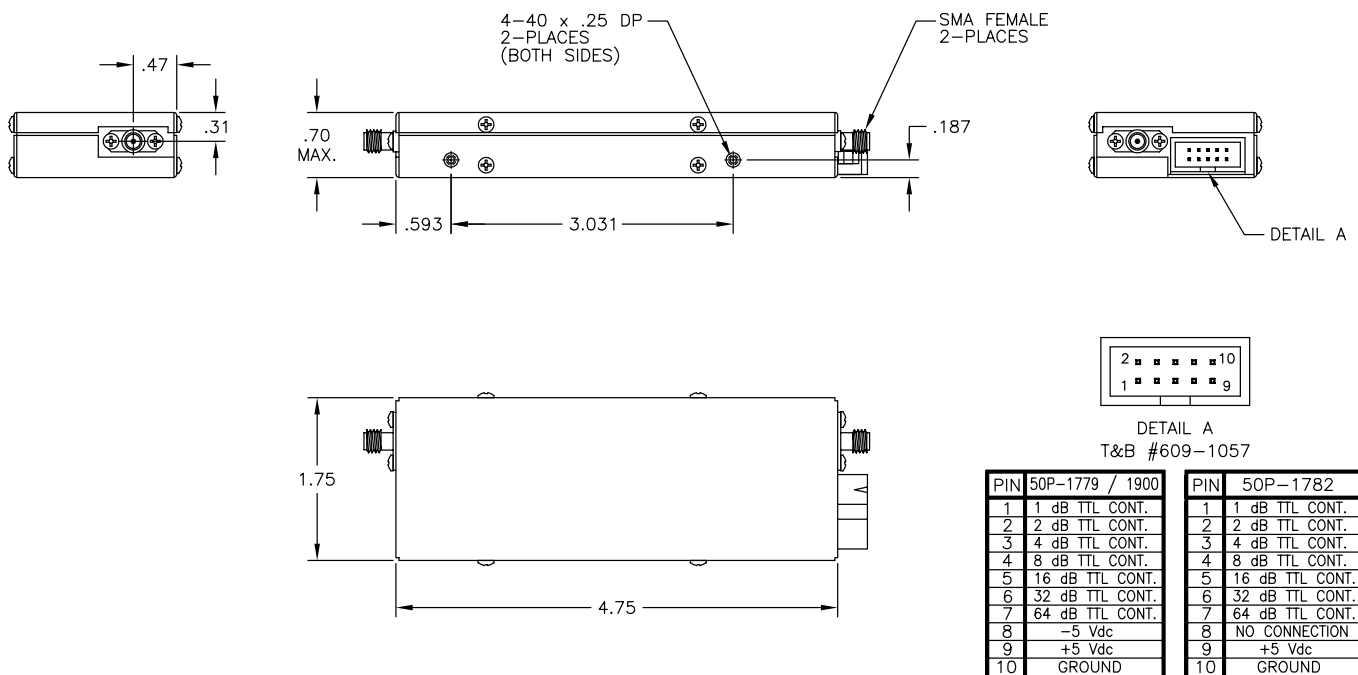


For a DC mating cable,
see page 8-11.

Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	Switching Speed
50P-1779	800-2400 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.3 dB or 2%	1.4:1	4.5 dB maximum 2.0 dB typical @ 800 MHz 4.0 dB typical @ 2400 MHz	5 microseconds
50P-1782	15-2000 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.4 dB or 2%	1.5:1	6 dB maximum 2.0 dB typical @ 15 MHz 5.5 dB typical @ 2000 MHz	10 microseconds
50P-1900	700-3000 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.5 dB or 2%	1.5:1	6.0 dB maximum 2.3 dB typical @ 700 MHz 4.8 dB typical @ 3000 MHz	5 microseconds

Model	Impedance	RF Input Power	DC Supply (nominal)	Control Logic (7 lines)	RF Connectors
50P-1779	50 Ohms	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA -5 Vdc @ 250 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female
50P-1782	50 Ohms	+10 dBm operating +30 dBm (no damage)	+5 Vdc @ 300 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female
50P-1900	50 Ohms	+20 dBm	+5 Vdc @ 155 mA -5 Vdc @ 115 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female



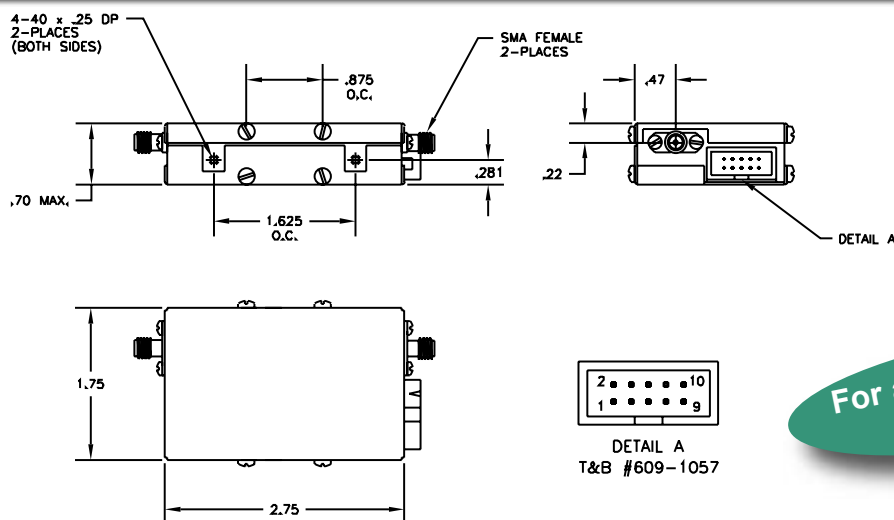
For a DC mating cable,
see page 8-11.

Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	Insertion Loss (maximum)
50P-1767	400-3000 MHz	0-70 x 10 dB/ 10, 20 and 40 dB	± 0.5 dB or 2%	2.6 dB
50P-1768	30-2500 MHz	0-55 x 5 dB/ 5, 10, 20 and 20 dB	± 0.3 dB or 1% 30-500 MHz ± 0.5 dB or 2% 500-2500 MHz	4.5 dB
50P-1769	800-2200 MHz	0-1.5 x 0.1 dB/ 0.1, 0.2, 0.4 and 0.8 dB	0.1 dB ± 0.05 dB 0.2 dB ± 0.075 dB 0.4 dB ± 0.1 dB 0.8 dB ± 0.2 dB	1.0 dB

Model	VSWR	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic
50P-1767	1.6:1 maximum 1.5:1 typical	1 microsecond	+10 dBm operating +17 dBm (1 dB compression)	+5 Vdc @ 70 mA	(3 lines) TTL Low for Thru Path TTL High for Attenuation
50P-1768	1.5:1 maximum	5 microseconds	+10 dBm operating +30 dBm (no damage)	+5 Vdc @ 70 mA	(4 lines) TTL Low for Thru Path TTL High for Attenuation
50P-1769	1.5:1 maximum	5 microseconds	+20 dBm operating +30 dBm (no damage)	+5 Vdc @ 15 mA	(4 lines) TTL Low for Thru Path TTL High for Attenuation

Common Specifications		
Impedance	Operating Temperature	RF Connector
50 Ohms	0° C to +70° C	SMA female



For a DC mating cable,
see page 8-11.

50P-1767	50P-1768	50P-1769
PIN	FUNCTION	FUNCTION
1	10dB TTL CONTROL	0.1dB TTL CONTROL
2	20dB TTL CONTROL	0.2dB TTL CONTROL
3	40dB TTL CONTROL	0.4dB TTL CONTROL
4	NO CONNECTION	0.8dB TTL CONTROL
5	NO CONNECTION	NO CONNECTION
6	NO CONNECTION	NO CONNECTION
7	NO CONNECTION	NO CONNECTION
8	NO CONNECTION	NO CONNECTION
9	+XX Vdc	+XX Vdc
10	GROUND	GROUND

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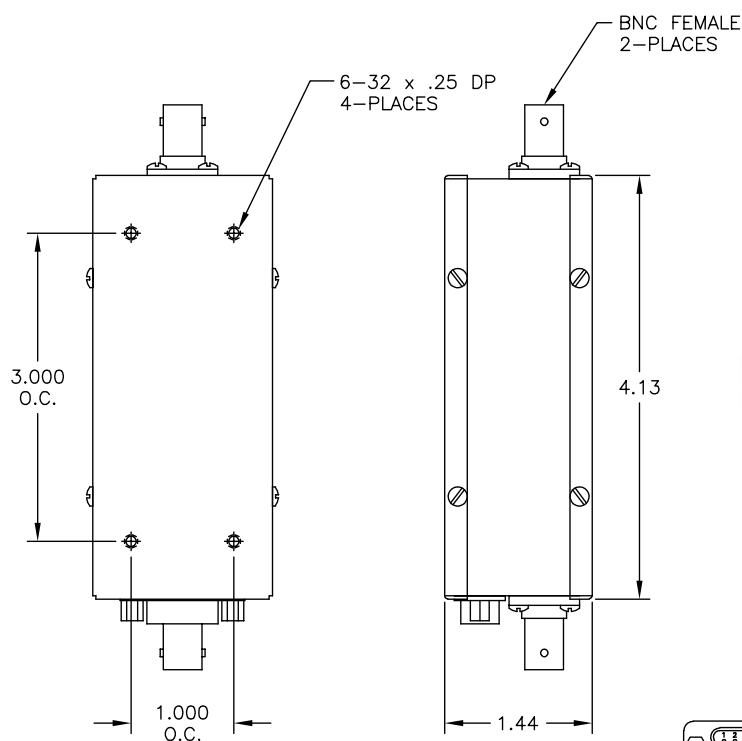
Solid State Programmable Attenuators

Phase
Constant

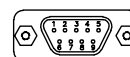
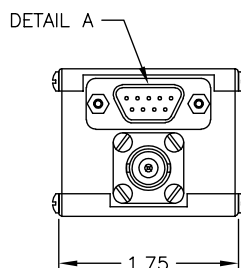
Phase
Constant

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)	RF Input Power
50P-1130	1-200 MHz	0-63.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	± 0.3 dB or 1%	1.5:1	4.0 dB	+10 dBm
50P-1571	20-1000 MHz	0-63.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	± 0.3 dB or 1% 20-300 MHz ± 0.3 dB or 2% 300-800 MHz ± 0.4 dB or 2% 800-1000 MHz	1.4:1	3.5 dB	+10 dBm
50P-1621	20-500 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.5 dB or 2%	1.5:1	3.0 dB	+10 dBm

Model	Impedance	Switching Speed	DC Supply (nominal)	Phase Shift (maximum)	Control Logic	RF Connectors
50P-1130	50 Ohms	20 microseconds	+5 Vdc @ 300 mA	± 3° @ any setting	TTL low for Thru Path TTL high for attenuation	BNC, N, SMA or TNC female
50P-1571	50 Ohms	2 microseconds	+5 Vdc @ 200 mA	N/A	TTL low for Thru Path TTL high for attenuation	BNC, N, SMA or TNC female
50P-1621	50 Ohms	2.0 microseconds maximum 1.5 microseconds typical	+5 Vdc @ 250 mA	± 5° @ any setting	TTL low for Thru Path TTL high for attenuation	BNC, N, SMA or TNC female



For a DC mating cable,
see page 8-11.



DETAIL A
DE-9P

PIN	50P-1130/1571
1	.5dB TTL CONTROL
2	1dB TTL CONTROL
3	2dB TTL CONTROL
4	4dB TTL CONTROL
5	8dB TTL CONTROL
6	16dB TTL CONTROL
7	32dB TTL CONTROL
8	GROUND
9	+5 Vdc

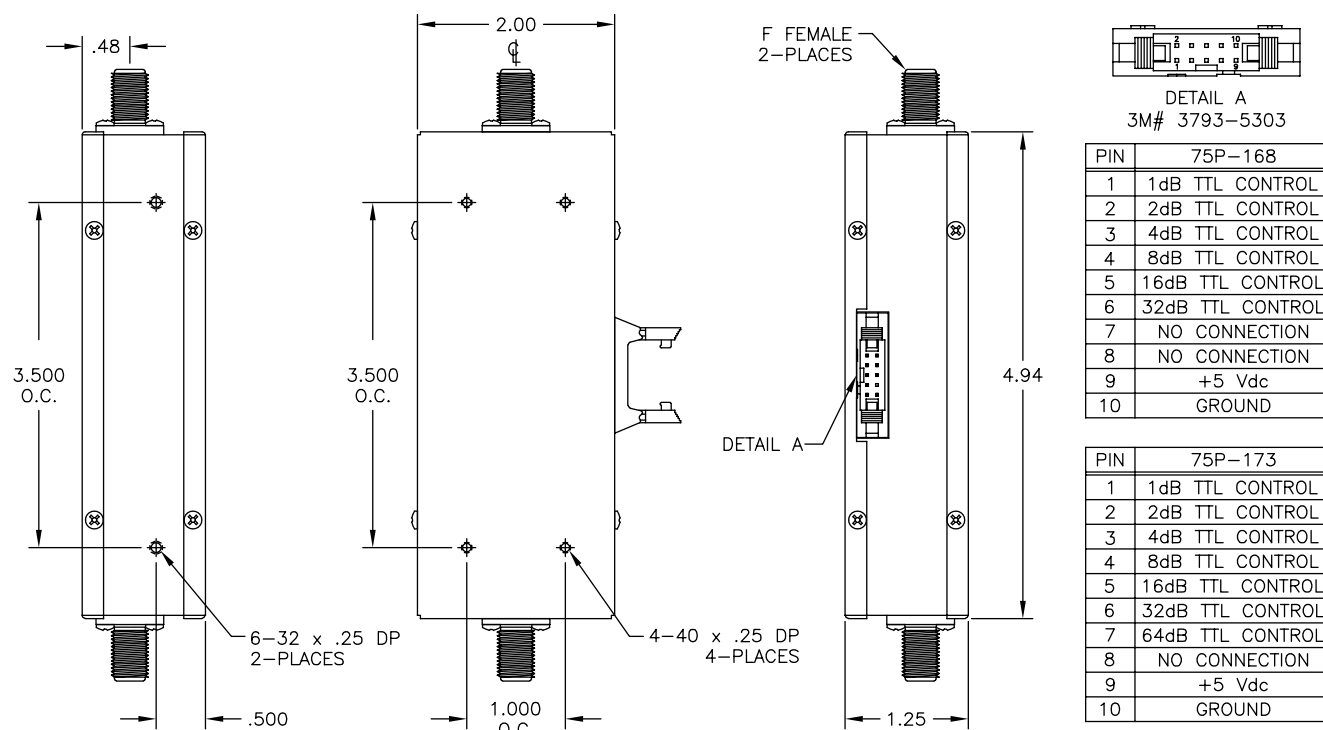
PIN	50P-1621
1	1dB TTL CONTROL
2	2dB TTL CONTROL
3	4dB TTL CONTROL
4	8dB TTL CONTROL
5	16dB TTL CONTROL
6	32dB TTL CONTROL
7	NO CONNECTION
8	GROUND
9	+5 Vdc

75 Ohm Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	RF Connectors
75P-168	50-2000 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.5 dB or 3%	1.6:1	5 dB maximum	BNC, F or N female
75P-173	450-2150 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	1, 2, 4, 8 dB ± .3 dB 16, 32, 64 dB ± 3%	1.5:1	2.5 dB maximum to 450 MHz 4.5 dB maximum to 2150 MHz	BNC, F or N female

Model	Impedance	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic	Operating Temperature
75P-168	75 Ohms	5 microseconds	+10 dBm average +15 dBm (1 dB compression)	+5 Vdc @ 250 mA	(6 Lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C
75P-173	75 Ohms	2 microseconds	+20 dBm operating +30 dBm (no damage)	+5 Vdc @ 300 mA	(7 Lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C

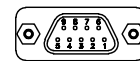
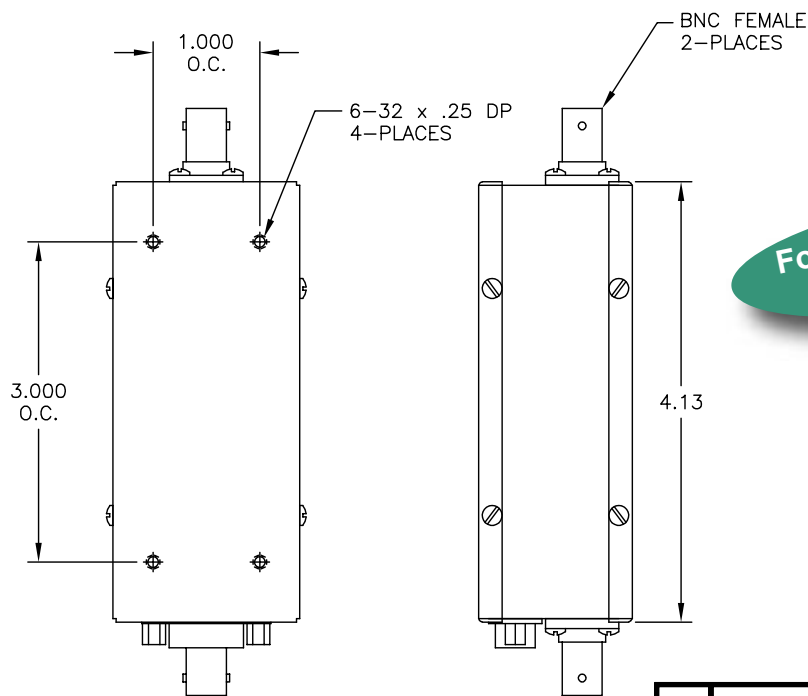
For a DC mating cable, see page 8-11.



75 Ohm Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75P-141	900-2150 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.5 dB or 3%	1.5:1	4.0 dB
75P-153	20-1000 MHz	0-63.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	± 0.3 dB or 1% 20-250 MHz ± 0.3 dB or 2% 250-1000 MHz	1.35:1 20-250 MHz 1.5:1 250-1000 MHz	4.0 dB

Model	Impedance	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic	Operating Temperature	RF Connectors
75P-141	75 Ohms	5 microseconds	+20 dBm	+5 Vdc @ 250 mA	(6 lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C	BNC, F or N female
75P-153	75 Ohms	10 microseconds	+15 dBm	+5 Vdc @ 250 mA	(7 lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C	BNC or F female



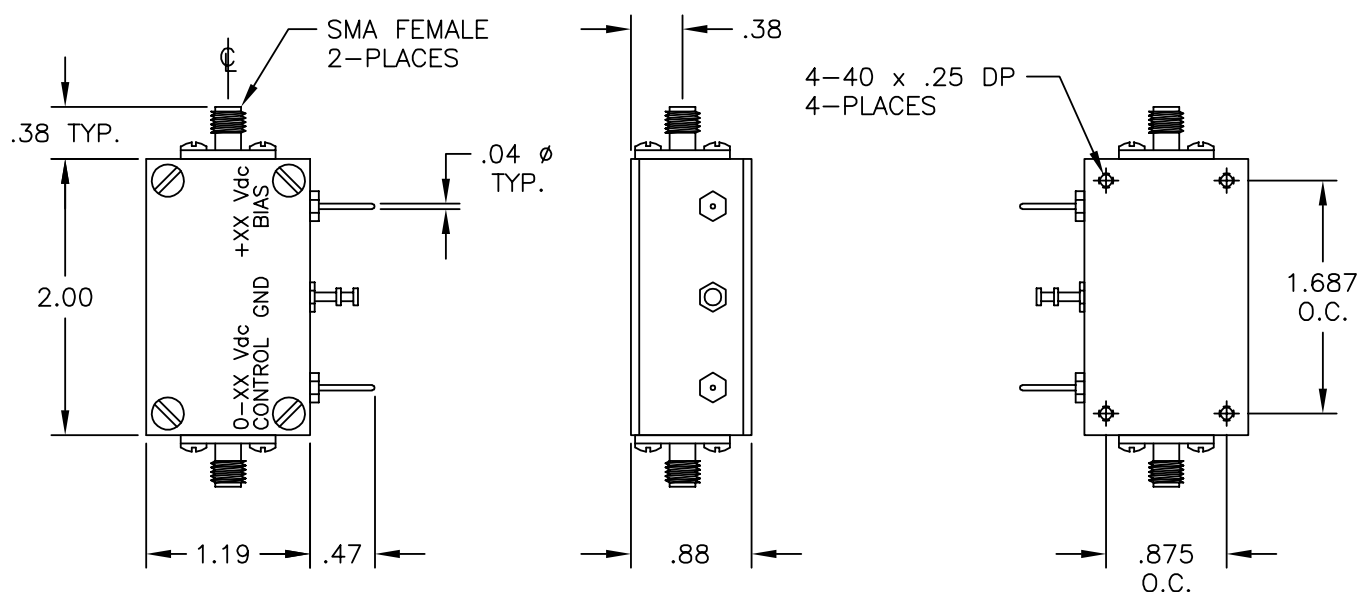
DETAIL A
DE-9P

PIN	75P-141	75P-153
1	1 dB TTL CONT.	.5 dB TTL CONT.
2	2 dB TTL CONT.	1 dB TTL CONT.
3	4 dB TTL CONT.	2 dB TTL CONT.
4	8 dB TTL CONT.	4 dB TTL CONT.
5	16 dB TTL CONT.	8 dB TTL CONT.
6	32 dB TTL CONT.	16 dB TTL CONT.
7	NO CONNECTION	32 dB TTL CONT.
8	GROUND	GROUND
9	+5 Vdc	+5 Vdc

Analog Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Accuracy	VSWR (maximum)	Insertion Loss	RF Input Power	3rd Order Intercept Point
50AP-002	10-500 MHz	0-30 dB continuously variable/ ± 0.5 dB 0-15 dB ± 0.75 dB 15-30 dB	1.4:1	2 dB maximum	+10 dBm	+30 dBm
50AP-077	50-2200 MHz	0-20 dB continuously variable/ ± 1.0 dB maximum ± 0.5 dB thru 10 dB typical	1.5:1 to 1000 MHz 1.7:1 to 2200 MHz	3 dB nominal	+10 dBm	+35 dBm
75AP-001	10-500 MHz	0-30 dB continuously variable/ ± 0.5 dB 0-15 dB ± 0.75 dB 15-30 dB	1.3:1	2 dB maximum	+10 dBm	+30 dBm

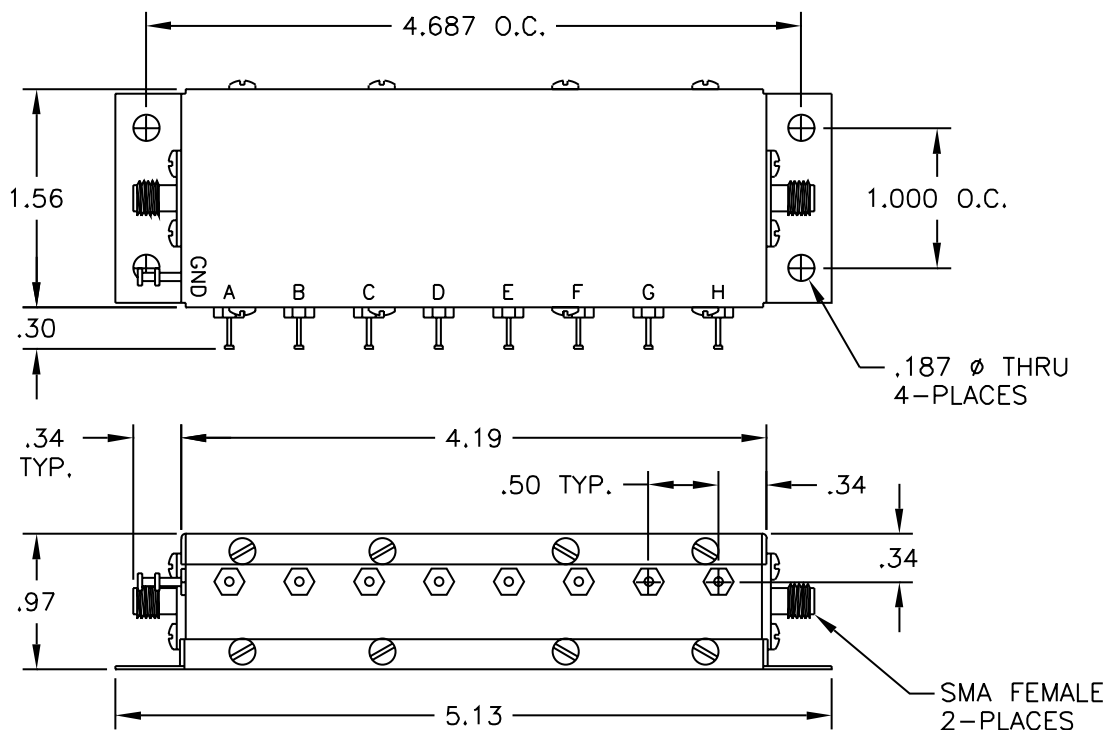
Model	Impedance	Switching Speed	Operating Temperature	DC Supply (nominal)	Control (negative slope)	RF Connectors
50AP-002	50 Ohms	50 microseconds	0° C to +70° C	+5 Vdc @ 2 mA	0 to +15 Vdc @ 40 mA (+15 Volts = insertion loss) (0 Volts = maximum attenuation)	BNC, N or SMA female
50AP-077	50 Ohms	50 microseconds	-20° C to +75° C	+5 Vdc @ 2 mA	0 to +10 Vdc @ 20 mA (+10 Volts = insertion loss) (0 Volts = maximum attenuation)	N or SMA female
75AP-001	75 Ohms	50 microseconds	0° C to +70° C	+5 Vdc @ 2 mA	0 to +15 Vdc @ 40 mA (+15 Volts = insertion loss) (0 Volts = maximum attenuation)	BNC, F or TNC female



Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)	RF Input Power
50P-076	DC-1000 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	1, 2, 4 and 8 dB ± 0.2 dB 16, 32 and 64 dB ± 0.4 dB Accumulated Error (0-31 dB) ± 0.5 dB (32-127 dB) ± 1 dB	1.4:1	3.5 dB	1 Watt average 1000 Watts peak
50P-591	DC-3000 MHz	0-85 x 1 dB/ 1, 2, 4, 8, 10, 20 and 40 dB	± 0.3 dB or 0.5% DC-500 MHz ± 0.4 dB or 1.0% 500-1000 MHz ± 0.5 dB or 1.0% 1000-2000 MHz ± 0.6 dB or 1.5% 2000-3000 MHz	1.5:1	2.5 dB DC-1000 MHz 3.5 dB 1000-2000 MHz 4.5 dB 2000-3000 MHz	1 Watt average 100 Watts peak
50P-1128	DC-2000 MHz	0-63.75 x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8, 16 and 32 dB	0.25, 0.5 dB ± 0.10 dB 1, 2, 4, 8 dB ± 0.25 dB 16, 32 dB ± 2% DC-1000 MHz 0.25, 0.5 dB ± 0.15 dB 1, 2, 4, 8 dB ± 0.30 dB 16, 32 dB ± 3% 1000-2000 MHz	1.4:1 DC-1000 MHz 1.5:1 1000-2000 MHz	3.0 dB DC-1000 MHz 3.5 dB 1000-2000 MHz	0.5 Watts average

Common Specifications				
Impedance	Switching Speed	DC Supply/Control	Operating Temperature	RF Connectors
50 Ohms	6 milliseconds	+12 Vdc @ 30 mA per relay (8 total)	-20° C to +85° C	BNC, N, SMA or TNC female



MODEL	A	B	C	D	E	F	G	H
50P-076	1	2	4	8	16	32	64	
50P-591	1	2	4	8	10	20	40	
50P-1128	.25	.5	1	2	4	8	16	32

Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1208	DC-2500 MHz	0-15 x 1 dB/ 1, 2, 4 and 8 dB	1, 2, 4 and 8 dB ± 0.2 dB or 2% DC-1000 MHz ± 0.3 dB or 3% 1000-2500 MHz	1.5:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 2.5 dB maximum @ 2500 MHz
50P-1209	DC-2500 MHz	0-15.5 x 0.5 dB/ 0.5, 1, 2, 4 and 8 dB	0.5 dB ± 0.2 dB DC-2500 MHz 1, 2, 4 and 8 dB ± 0.2 dB or 2% DC-1000 MHz ± 0.3 dB or 3% 1000-2500 MHz	1.6:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.0 dB maximum @ 2500 MHz
50P-1210	DC-2500 MHz	0-31 x 1 dB/ 1, 2, 4, 8 and 16 dB	1, 2, 4, 8 and 16 dB ± 0.2 dB or 2% DC-1000 MHz ± 0.3 dB or 3% 1000-2500 MHz	1.6:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.0 dB maximum @ 2500 MHz
50P-1211	DC-2500 MHz	0-31.5 x 0.5 dB/ 0.5, 1, 2, 4, 8 and 16 dB	0.5 dB ± 0.2 dB DC-2500 MHz 1, 2, 4, 8 and 16 dB ± 0.2 dB or 2% DC-1000 MHz ± 0.3 dB or 3% 1000-2500 MHz	1.6:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.5 dB maximum @ 2500 MHz
50P-1212	DC-2500 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	1, 2, 4, 8, 16 and 32 dB ± 0.2 dB or 2% DC-1000 MHz ± 0.3 dB or 3% 1000-2500 MHz	1.6:1	3.9 dB maximum 1.0 dB typical @ 500 MHz 1.7 dB typical @ 1000 MHz 3.5 dB typical @ 2500 MHz

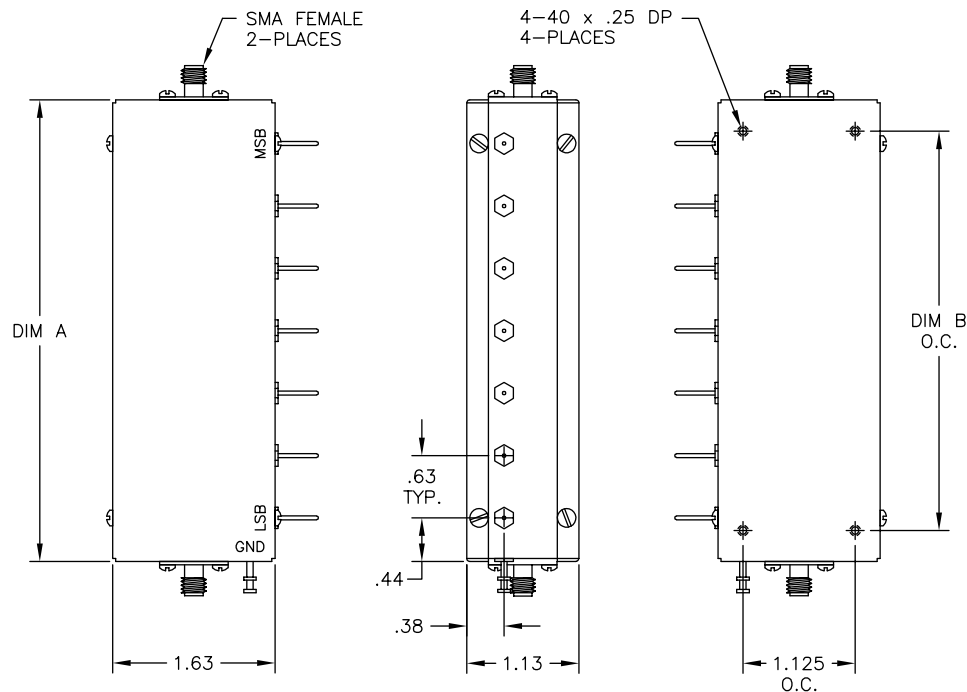
Model	Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply/Control	RF Connectors
50P-1208	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay	BNC, N, SMA or TNC female
50P-1209	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay	BNC, N, SMA or TNC female
50P-1210	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay	BNC, N, SMA or TNC female
50P-1211	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	0.5, 1, 2, 4, 8 dB +12 Vdc @ 15 mA 16 dB +12 Vdc @ 30 mA	BNC, N, SMA or TNC female
50P-1212	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	1, 2, 4, 8 dB +12 Vdc @ 15 mA 16 dB +12 Vdc @ 30 mA 32 dB +12 Vdc @ 60 mA	BNC, N, SMA or TNC female

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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-975	DC-1000 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.2 dB or 2%	1.25:1	0.8 dB @ 500 MHz 1.5 dB @ 1000 MHz
50P-1126	DC-1000 MHz	0-31.5 x 0.5 dB/ 0.5, 1, 2, 4, 8 and 16 dB	± 0.2 dB or 2%	1.25:1	0.8 dB @ 500 MHz 1.5 dB @ 1000 MHz
50P-1683	DC-2500 MHz	0-70 x 10 dB/ 10, 20, 20 and 20 dB	± 0.5 dB or 2%	1.5:1	2.5 dB maximum
50P-1758	DC-1000 MHz	0-95 x 1 dB/ 1, 2, 4, 8, 16, 32 and 32 dB	± 0.3 dB or 2%	1.5:1	2.0 dB maximum 1.4 dB typical @ 1000 MHz

Model	Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply/ Control	RF Connectors
50P-975	50 Ohms	6 milliseconds	-20° C to + 85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (6 relays total)	BNC, N, SMA or TNC female
50P-1126	50 Ohms	6 milliseconds	-20° C to + 85° C	1 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (6 relays total)	BNC, N, SMA or TNC female
50P-1683	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (4 relays total)	BNC, N, SMA or TNC female
50P-1758	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (7 relays total)	BNC, N, SMA or TNC female



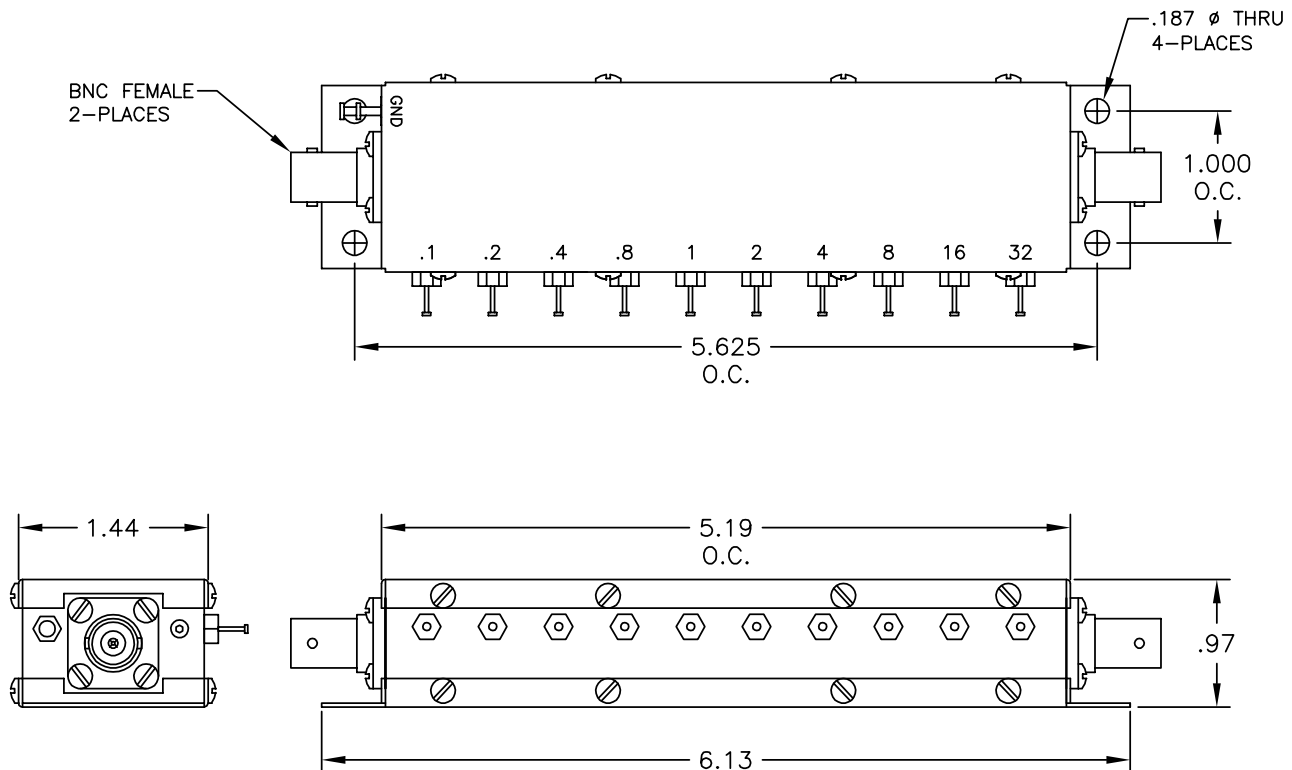
MODEL	DIM: A	DIM: B
50P-975	4.00	3.500
50P-1126	4.00	3.500
50P-1208	2.75	2.250
50P-1209	3.38	2.875
50P-1210	3.38	2.875
50P-1211	4.00	3.500
50P-1212	4.63	4.125
50P-1683	2.75	2.250
50P-1758	4.63	4.125

TTL Models Available
Upon Request

Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1633	DC-1000 MHz	0-64.5 x 0.1 dB/ 0.1, 0.2, 0.4, 0.8, 1, 2, 4, 8, 16 and 32 dB	0.1, 0.2, 0.4 and 0.8 dB $\pm$.05 dB 1, 2 dB $\pm$.07 dB 4 dB $\pm$ 0.1 dB 8 dB $\pm$ 0.15 dB 16, 32 dB $\pm$ 0.25 dB Accumulated Error $\pm$ 0.25 dB or 2%	1.4:1	4 dB nominal
50P-1705	DC-200 MHz	0-64.5 x 0.1 dB/ 0.1, 0.2, 0.4, 0.8, 1, 2, 4, 8, 16 and 32 dB	0.1, 0.2, 0.4, 0.8 dB $\pm$ 0.025 dB 1, 2, 4 dB $\pm$ 0.04 dB 8, 16, 32 dB $\pm$ 0.08 dB	1.3:1	0.75 dB maximum 0.58 dB typical @ 200 MHz

Model	Impedance	Switching Speed	RF Input Power (average)	DC Supply / Control	Operating Temperature	RF Connectors
50P-1633	50 Ohms	6 milliseconds	0.5 Watts	+12 Vdc @ 30 mA per relay (10 relays total)	-20° C to +85° C	BNC, N, SMA or TNC female
50P-1705	50 Ohms	6 milliseconds	1.0 Watt	+12 Vdc @ 15 mA per relay (10 relays total)	-20° C to +85° C	BNC, N, SMA or TNC female



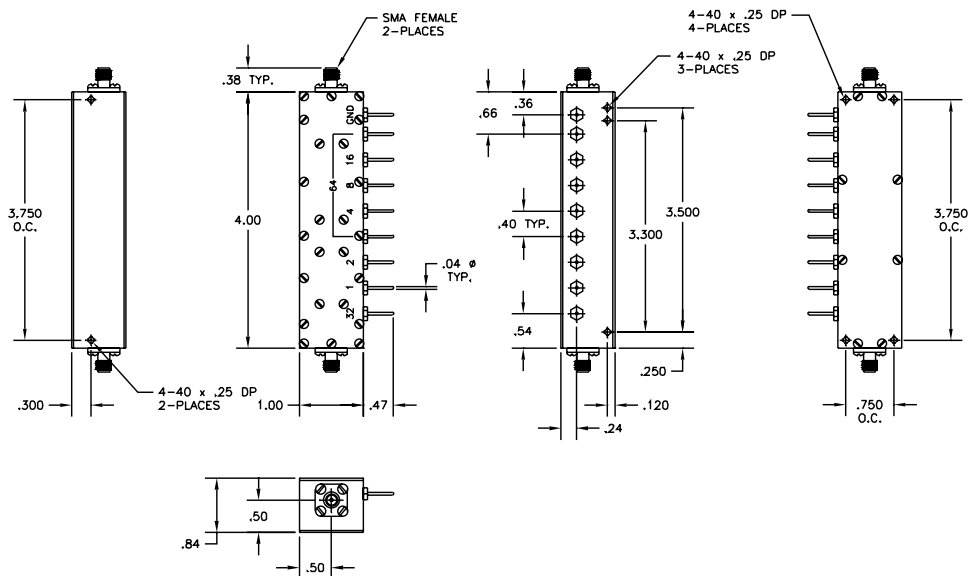
Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1436	DC-2500 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.4 dB or 2.25%	1.4:1	4.3 dB maximum 2.6 dB typical @ 1000 MHz 4.0 dB typical @ 2500 MHz
50P-1696	DC-2500 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.4 dB or 2.25%	1.4:1	3.5 dB maximum 2.9 dB typical @ 2500 MHz

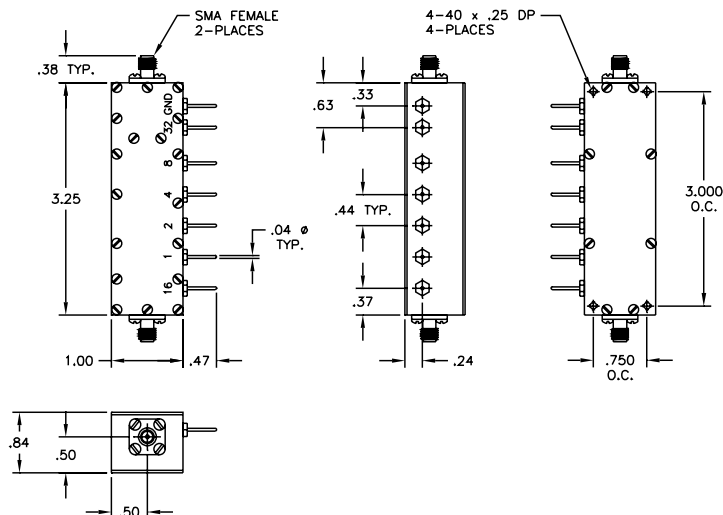
Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
50 Ohms	6 milliseconds	1 Watt average	+12 Vdc @ 30 mA per relay	-20° C to +85° C	SMA female

50P-1436



50P-1696

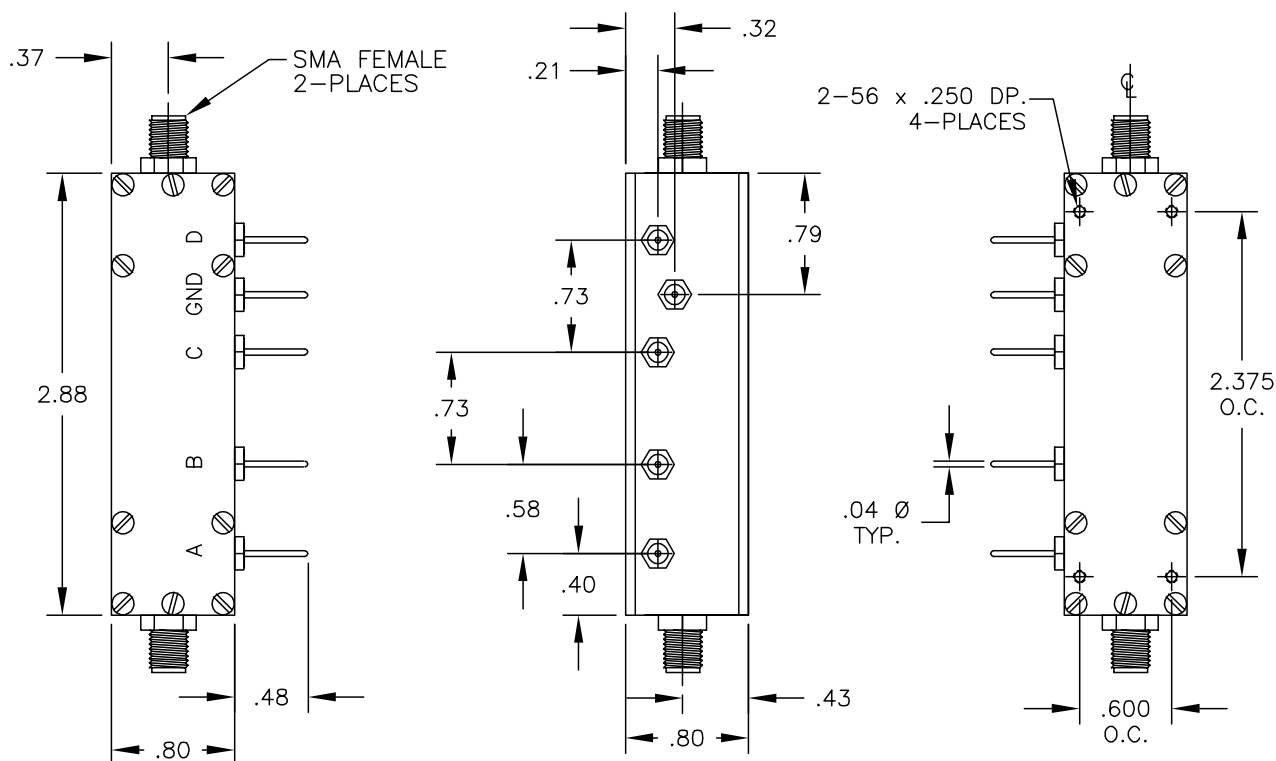


Wideband Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50P-766	DC-5000 MHz	0-70 x 10 dB/ 10, 20, 20 and 20 dB	± 0.3 dB or 1% DC-1000 MHz ± 0.5 dB or 1% 1000-3000 MHz ± 0.5 dB or 2% 3000-5000 MHz	1.3:1 DC-2000 MHz 1.5:1 2000-5000 MHz	2.5 dB DC-2000 MHz 3.5 dB 2000-5000 MHz
50P-847	DC-5000 MHz	0-15 x 1 dB/ 1, 2, 4 and 8 dB	± 0.3 dB or 3% DC-1000 MHz ± 0.5 dB or 4% 1000-3000 MHz ± 0.5 dB or 5% 3000-5000 MHz	1.3:1 DC-2000 MHz 1.5:1 2000-5000 MHz	2.5 dB DC-2000 MHz 4.0 dB 2000-5000 MHz
50P-1516	DC-6000 MHz	0-70 x 10 dB/ 10, 20, 20 and 20 dB	± 0.3 dB or 2% DC-2000 MHz ± 0.5 dB or 4% 2000-6000 MHz	1.5:1	2.5 dB DC-2000 MHz 3.5 dB 2000-6000 MHz

Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply/ Control	Operating Temperature	RF Connectors
50 Ohms	10 milliseconds	0.5 Watt average 100 Watts peak	+12 Vdc @ 30 mA per relay	-20° C to +85° C	SMA female



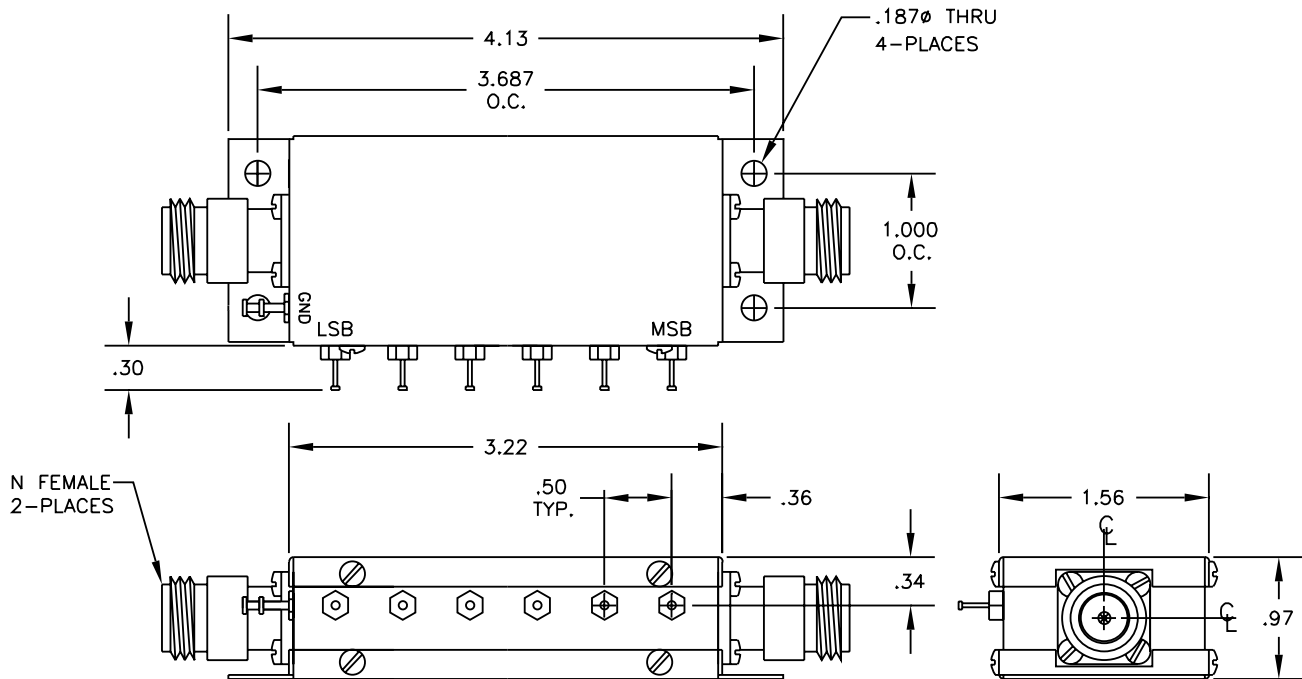
PIN	50P-847
A	1 dB CONTROL
B	2 dB CONTROL
C	4 dB CONTROL
D	8 dB CONTROL

PIN	50P-766/1516
A	10 dB CONTROL
B	20 dB CONTROL
C	20 dB CONTROL
D	20 dB CONTROL

75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75P-022	DC-1000 MHz	0-63 x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	± 0.3 dB DC-100 MHz ± 0.3 dB or 1.0% 100-500 MHz ± 0.3 dB or 1.5% 500-1000 MHz	1.4:1	2.2 dB
75P-093	DC-1000 MHz	0-110 x 10 dB/ 10, 20, 20, 20, 20 and 20 dB	± 0.3 dB DC-100 MHz ± 0.3 dB or 1% 100-500 MHz ± 0.5 dB or 1% 500-1000 MHz	1.4:1	2.2 dB

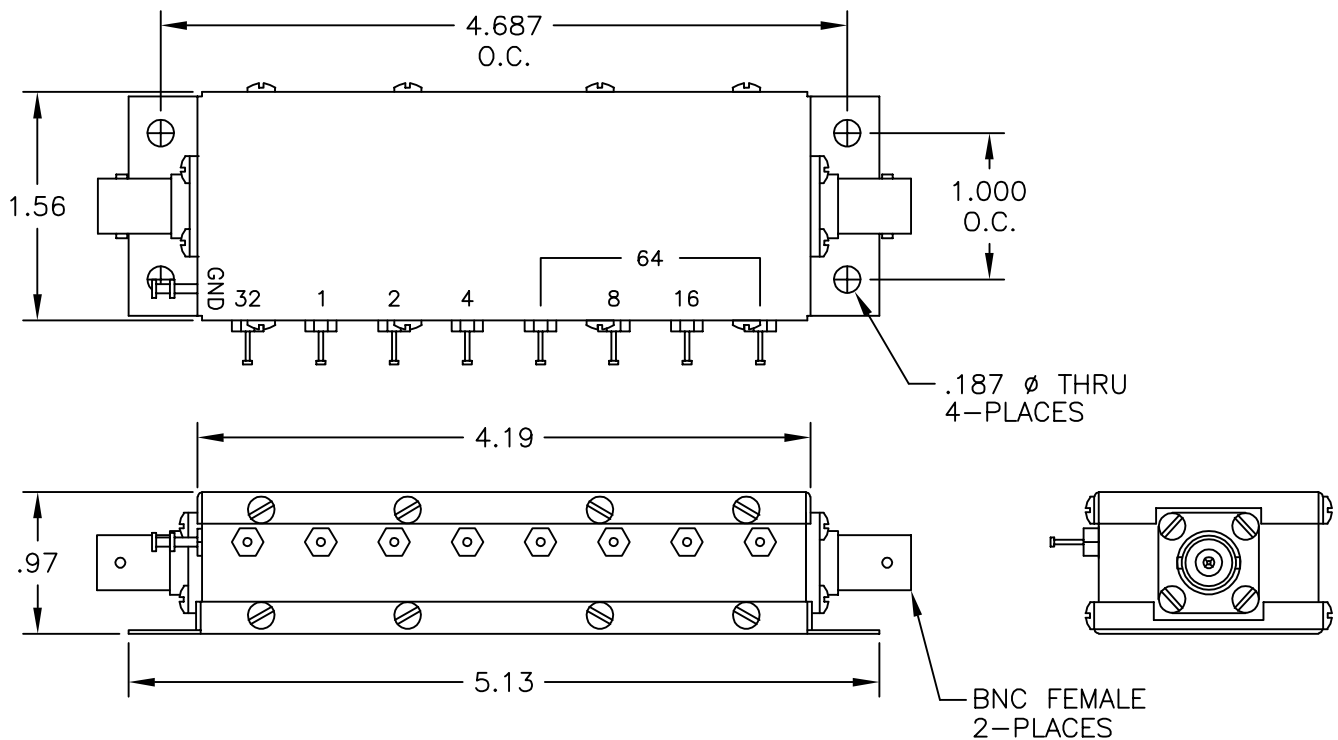
Common Specifications					
Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
75 Ohms	6 milliseconds	1 Watt average 1000 Watts peak	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, F or N female



75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (nominal)
75P-033	DC-1000 MHz	0-127 x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	± 0.5 dB DC-100 MHz ± 0.5 dB or 1% 100-500 MHz ± 0.5 dB or 2% 500-1000 MHz	1.5:1	2.5 dB
75P-089	DC-500 MHz	0-63.75 x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8, 16 and 32 dB	± 0.1 dB or 1% DC-100 MHz ± 0.2 dB or 1% 100-500 MHz	1.25:1	2.0 dB

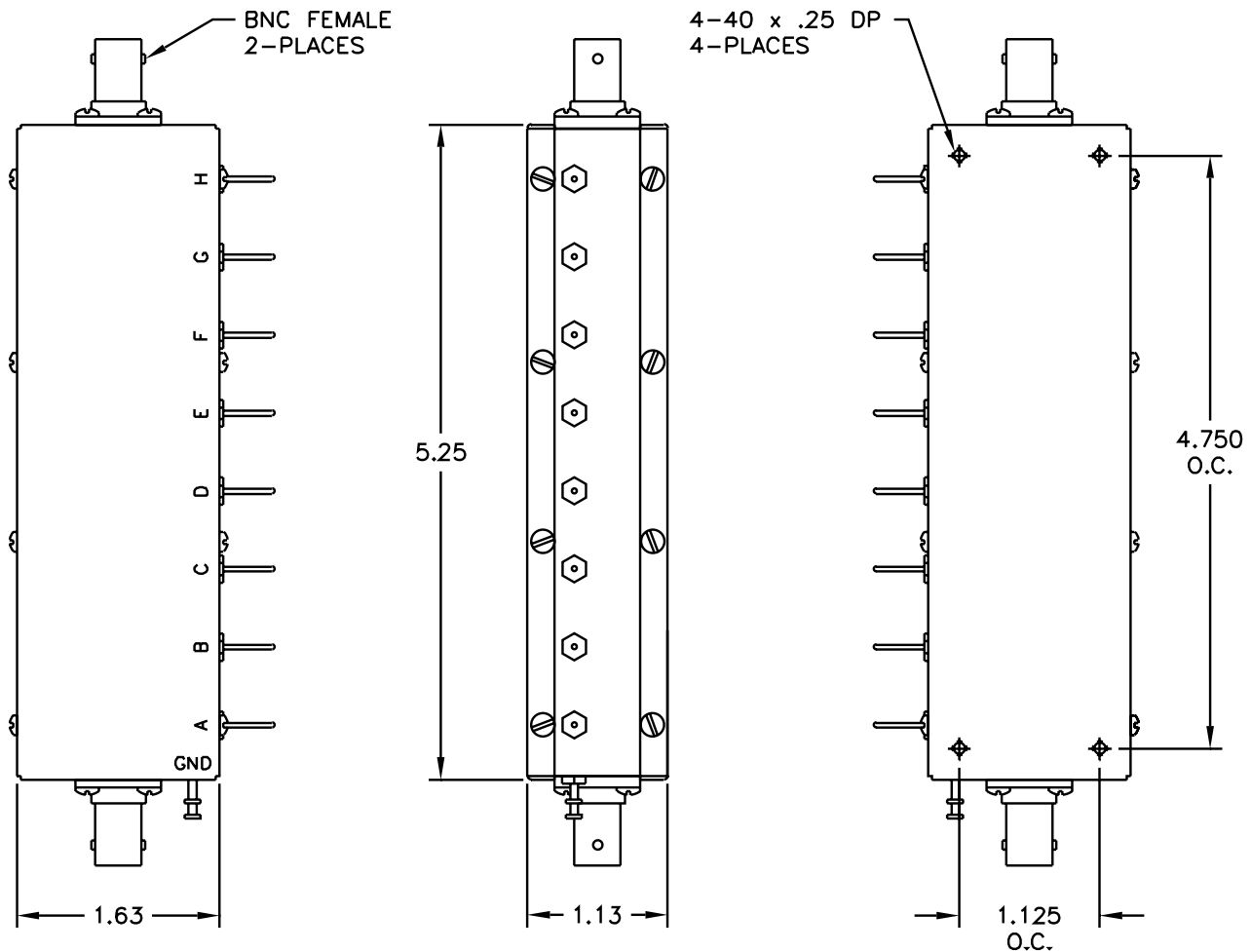
Model	Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
75P-033	75 Ohms	6 milliseconds	1 Watt average	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, F or N female
75P-089	75 Ohms	6 milliseconds	1 Watt average	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, F or N female



75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
75P-157	DC-1000 MHz	0-95.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 16, 32 and 32 dB	± 0.2 dB or 2%	1.4:1	2.5 dB maximum
75P-163	DC-1000 MHz	0-63.75 x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8, 16 and 32 dB	0.25 dB ± 0.05 dB 0.5, 1, and 2 dB ± 0.1 dB 4 and 8 dB ± 0.2 dB 16 dB ± 0.3 dB 32 dB ± 0.4 dB Accumulated Error ± 0.5 dB or 1.5%	1.4:1	2.2 dB maximum 0.75 dB typical at 500 MHz 1.50 dB typical at 1000 MHz

Common Specifications					
Impedance	Switching Speed	RF Input Power (average)	DC Supply/Control	Operating Temperature	RF Connectors
75 Ohms	6 milliseconds	0.5 Watts	+12 Vdc @ 15 mA per relay	-20° C to +85° C	BNC, F, N, or TNC female

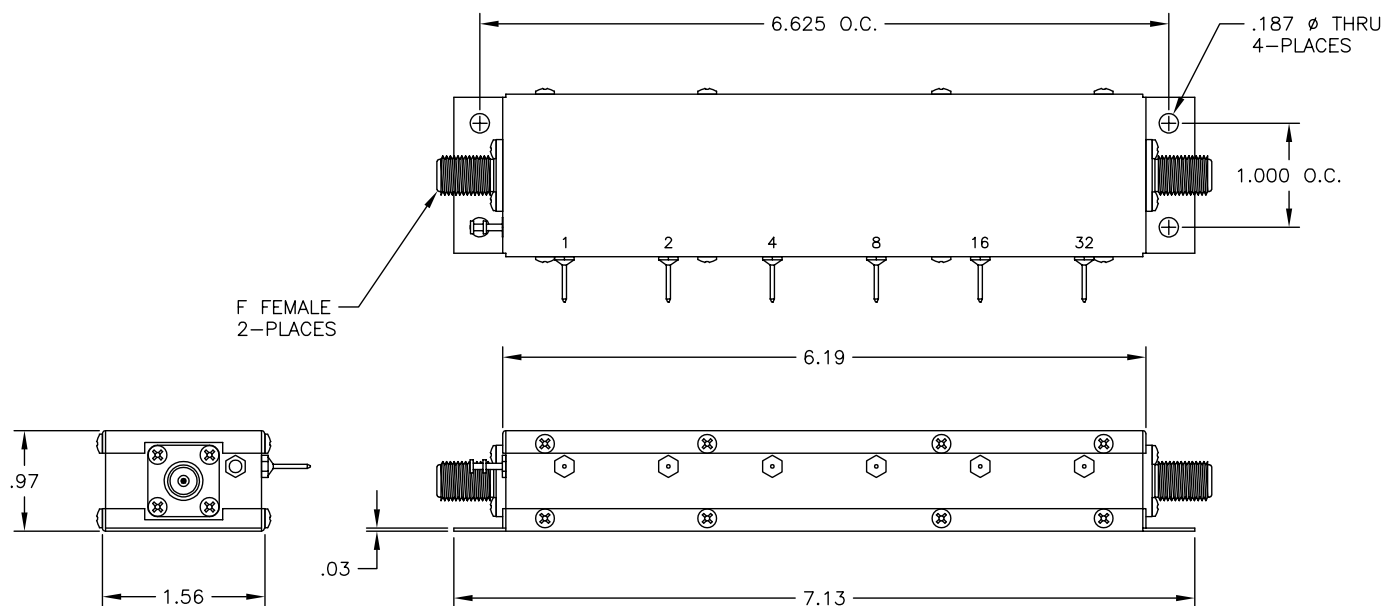


MODEL	A	B	C	D	E	F	G	H
75P-157	.5	1	2	4	8	16	32	32
75P-163	.25	.5	1	2	4	8	16	32

75 Ohm Relay Programmable Attenuator

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
75P-174	DC-2150 MHz	0-63 x 1 dB 1, 2, 4, 8, 16 and 32 dB	± 0.5 dB or 3% 1-31 dB ± 4% 32-63 dB	1.4:1	2.2 dB maximum 1.0 dB typical @ 1000 MHz 1.3 dB typical @ 1500 MHz 1.8 dB typical @ 2150 MHz

Common Specifications					
Impedance	Switching Speed	RF Input Power (average)	DC Supply/Control	Operating Temperature	RF Connectors
75 Ohms	6 milliseconds	0.5 Watts	+12 Vdc @ 34 mA per relay	-40° C to +70° C	F female



MANUALLY VARIABLE ATTENUATORS

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Manually Variable Attenuators

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50R-019 SMA).

Single Rotary Attenuators - 50 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
50R-019	DC-2200 MHz	0-10 x 1	3-3
50R-028	DC-1000 MHz	0-1 x 0.1	3-3
50R-029	DC-2200 MHz	0-70 x 10	3-4
50R-043	DC-1000 MHz	0-100 x 10	3-4
50R-124	DC-2500 MHz	0-70 x 10	3-4
50R-137	DC-2550 MHz	0-80 x 10	3-5
50R-234	DC-2550 MHz	0-100 x 10	3-5
50R-246	DC-2700 MHz	0-70 x 10	3-4
50R-248	DC-2500 MHz	0-10 x 1	3-3
50R-249	DC-2500 MHz	0-1 x 0.1	3-3
50R-310	DC-2700 MHz	0-10 x 1	3-3
50R-385	DC-3000 MHz	0-10 x 1	3-3
50R-400	DC-8 GHz	0-9 x 1	3-6
50R-401	DC-8 GHz	0-60 x 10	3-6

Single Rotary Attenuators - 75 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
75R-050	DC-2200 MHz	0-10 x 1	3-13
75R-055	DC-1000 MHz	0-70 x 10	3-14
75R-056	DC-1000 MHz	0-10 x 1	3-13
75R-057	DC-1000 MHz	0-1 x 0.1	3-13
75R-089	DC-2200 MHz	0-60 x 10	3-14

Dual Rotary Attenuators - 50 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
50DR-001	DC-1000 MHz	0-110 x 1	3-8
50DR-046	DC-2500 MHz	0-50 x 1	3-8
50DR-055	DC-2000 MHz	0-30 x 1	3-7
50DR-060	DC-2000 MHz	0-11 x 0.1	3-7
50DR-061	DC-2200 MHz	0-80 x 1	3-8
50DR-063	DC-1100 MHz	0-50 x 1	3-7
50DR-077	DC-2000 MHz	0-90 x 1	3-8
50DR-082	DC-2000 MHz	0-110 x 1	3-8
50DR-096	DC-3000 MHz	0-30 x 1	3-7
50DR-111	DC-2700 MHz	0-60 x 1	3-8
50DR-119	DC-2200 MHz	0-110 x 1	3-8

Dual Rotary Attenuators - 75 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
75DR-009	DC-1000 MHz	0-70 x 1	3-16
75DR-018	DC-1000 MHz	0-30 x 1	3-15
75DR-021	DC-2100 MHz	0-30 x 1	3-15
75DR-022	DC-1000 MHz	0-11 x 0.1	3-15

Benchtop Rotary Attenuators - 50 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
50BR-008	DC-2200 MHz	0-80 x 1	3-10
50BR-009	DC-1000 MHz	0-110 x 1	3-10
50BR-017	DC-1000 MHz	0-81 x 0.1	3-11
50BR-022	DC-1000 MHz	0-111 x 0.1	3-11
50BR-036	DC-2000 MHz	0-110 x 1	3-10
50BR-068	DC-2550 MHz	0-110 x 1	3-9
50BR-096	DC-2200 MHz	0-80 x 1	3-9
50BR-104	DC-2700 MHz	0-80 x 1	3-9
50BR-105	DC-8 GHz	0-69 x 1	3-6
50BR-112	DC-2700 MHz	0-110 x 1	3-9

Benchtop Rotary Attenuators - 75 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
75BR-014	DC-1000 MHz	0-90 x 1	3-17
75BR-023	DC-2150 MHz	0-70 x 1	3-17

Panel Mounted Rotary Attenuators - 50 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
50PM-003	DC-2500 MHz	0-50 x 1	3-12
50PM-009	DC-2200 MHz	0-80 x 1	3-12
50PM-074	DC-2700 MHz	0-60 x 1	3-12
50PM-075	DC-2500 MHz	0-50 x 1	3-12

Pushbutton Attenuators - 50 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
50B-001	DC-750 MHz	0-65 x 1	3-19
50B-035	DC-750 MHz	0-85 x 1	3-19

Pushbutton Attenuators - 75 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
75B-001	DC-500 MHz	0-65 x 1	3-19

Toggle Attenuators - 50 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
50TA-006	DC-850 MHz	0-65 x 1	3-20
50TA-007	DC-850 MHz	0-45.5 x 0.5	3-20

Toggle Attenuators - 75 Ohm

Model Number	Frequency Range	Attenuation Range (dB)	Page
75TA-006	DC-500 MHz	0-65 x 1	3-20
75TA-007	DC-500 MHz	0-45.5 x 0.5	3-20

Rocker Attenuators - 50 Ohm

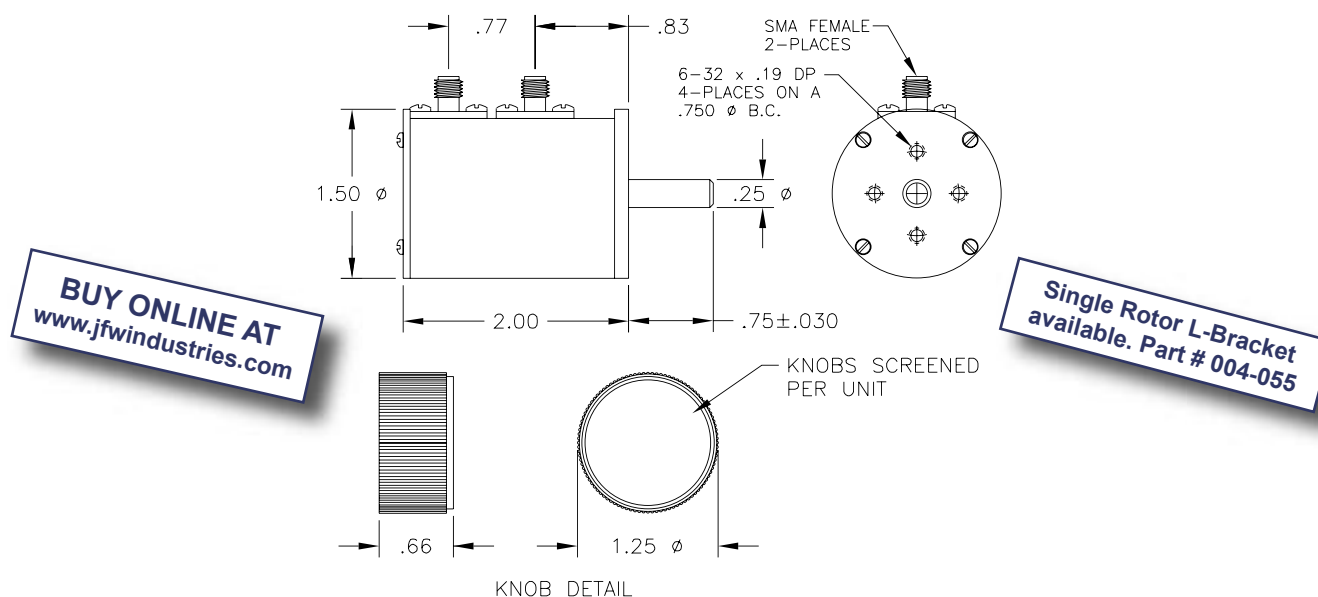
Model Number	Frequency Range	Attenuation Range (dB)	Page
50RA-003	DC-500 MHz	0-65 x 1	3-18
50RA-004	DC-1000 MHz	0-65 x 1	3-18

Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy
50R-019	DC-2200 MHz	0-10 x 1 dB	± 0.2 dB DC-1000 MHz ± 0.4 dB 1000-2200 MHz
50R-028	DC-1000 MHz	0-1 x 0.1 dB	± 0.03 dB DC-500 MHz ± 0.05 dB 500-1000 MHz
50R-248	DC-2500 MHz	0-10 x 1 dB	± 0.25 dB DC-1000 MHz ± 0.5 dB 1000-2500 MHz
50R-249	DC-2500 MHz	0-1 x 0.1 dB	± 0.05 dB
50R-310	DC-2700 MHz	0-10 x 1 dB	± 0.5 dB
50R-385	DC-3000 MHz	0-10 x 1 dB	± 0.5 dB

Model	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50R-019	1.2:1 DC-1000 MHz 1.4:1 1000-2200 MHz	0.2 dB DC-1000 MHz 0.4 dB 1000-2200 MHz	BNC, SMA or TNC female
50R-028	1.2:1	0.7 dB	BNC, SMA or TNC female
50R-248	1.2:1 DC-1000 MHz 1.5:1 1000-2500 MHz	0.25 dB DC-1000 MHz 0.5 dB 1000-2500 MHz	BNC, SMA or TNC female
50R-249	1.2:1 DC-1000 MHz 1.4:1 1000-2500 MHz	1.0 dB	BNC, SMA or TNC female
50R-310	1.2:1 DC-1000 MHz 1.3:1 1000-2700 MHz	0.5 dB	SMA female
50R-385	1.2:1 DC-1000 MHz 1.5:1 1000-3000 MHz	0.6 dB	SMA female

Common Specifications				
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C



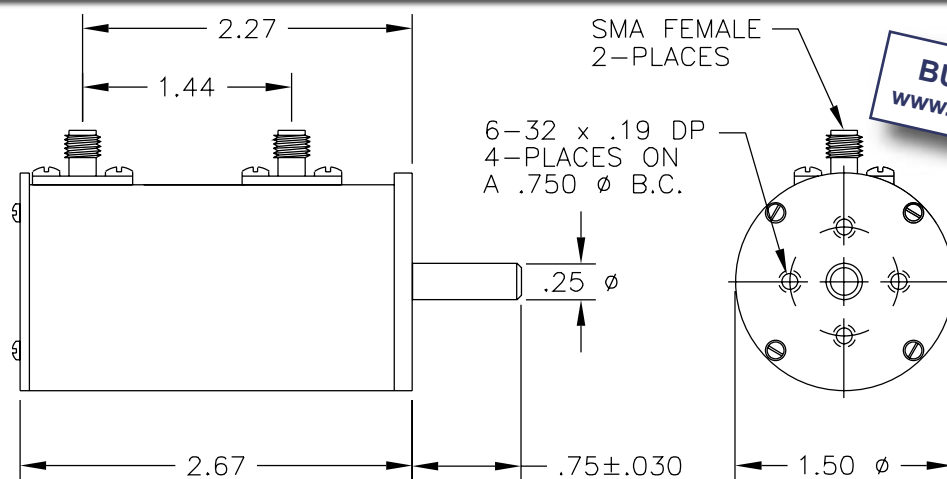
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Rotary Attenuators

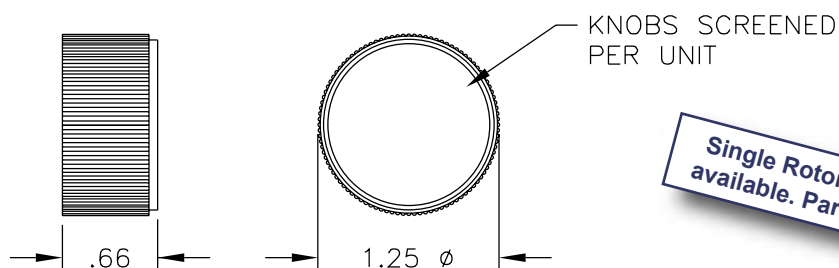
Model	Frequency Range	Attenuation Range	Attenuation Accuracy
50R-029	DC-2200 MHz	0-70 x 10 dB	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-2200 MHz
50R-043	DC-1000 MHz	0-100 x 10 dB	± 0.5 dB or 2%
50R-124	DC-2500 MHz	0-70 x 10 dB	± 0.5 dB or 2.5%
50R-246	DC-2700 MHz	0-70 x 10 dB	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-2700 MHz

Model	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50R-029	1.2:1 DC-1000 MHz 1.4:1 1000-2200 MHz	0.3 dB DC-1000 MHz 0.5 dB 1000-2200 MHz	BNC, N, SMA or TNC female
50R-043	1.2:1	0.3 dB	BNC, N, SMA or TNC female
50R-124	1.4:1	0.5 dB	BNC, N, SMA or TNC female
50R-246	1.2:1 DC-1000 MHz 1.4:1 1000-2700 MHz	0.6 dB	SMA female

Common Specifications				
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C



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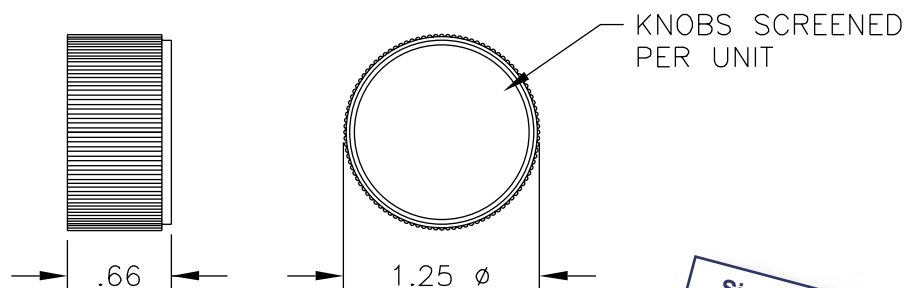
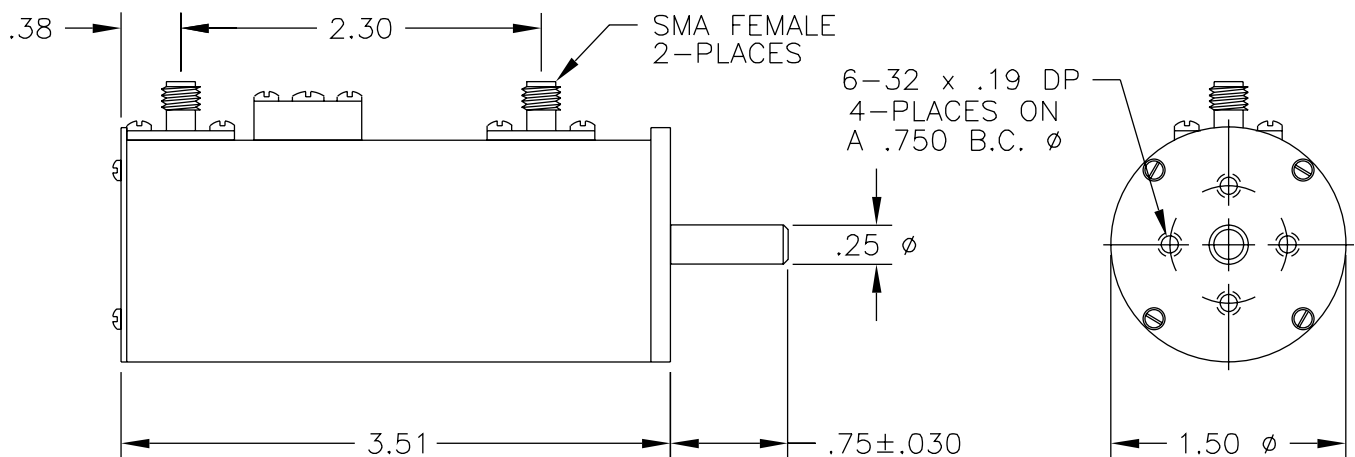
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Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50R-137	DC-2550 MHz	0-80 x 10 dB	± 0.3 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-2550 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2550 MHz	1 dB
50R-234	DC-2550 MHz	0-100 x 10 dB	± 0.3 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-1500 MHz ± 0.5 dB or 4% 1500-2550 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-1500 MHz 1.7:1 1500-2550 MHz	1 dB

Common Specifications					
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	N, SMA or TNC female



KNOB DETAIL

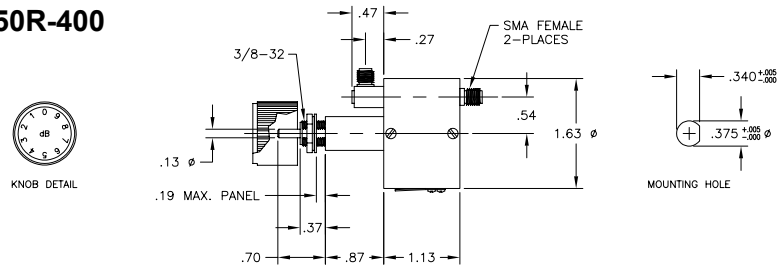
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High Frequency Rotary Attenuators

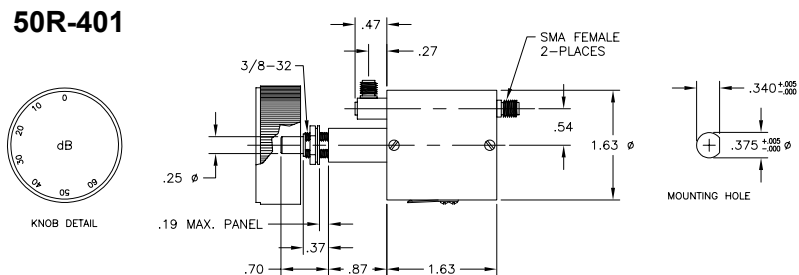
Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50R-400	DC-8 GHz	0-9 x 1 dB	± 0.3 dB DC-4 GHz ± 0.5 dB 4-8 GHz	1.3:1 DC-4 GHz 1.6:1 4-8 GHz	0.6 dB
50R-401	DC-8 GHz	0-60 x 10 dB	± 0.5 dB or 2% DC-4 GHz ± 1.0 dB or 3% 4-8 GHz	1.3:1 DC-4 GHz 1.6:1 4-8 GHz	0.7 dB
50BR-105	DC-8 GHz	0-69 x 1 dB	1 dB Steps ± 0.3 dB DC-4 GHz ± 0.5 dB 4-8 GHz 10 dB Steps ± 0.5 dB or 2% DC-4 GHz ± 1.0 dB or 3% 4-8 GHz	1.6:1 DC-4 GHz 1.9:1 4-8 GHz	1.8 dB

Model	Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
50R-400	50 Ohms	2 Watts average 200 Watts peak	Attenuation increases in clockwise direction	36° with no stop between minimum and maximum	0° C to +50° C	SMA female
50R-401	50 Ohms	2 Watts average 200 Watts peak	Attenuation increases in clockwise direction	36° with stop between minimum and maximum	0° C to +50° C	SMA female
50BR-105	50 Ohms	2 Watts average 200 Watts peak	Attenuation increases in clockwise direction	1 dB steps - 36° with no stop between minimum and maximum 10dB steps - 36° with stop between minimum and maximum	0° C to +50° C	SMA female

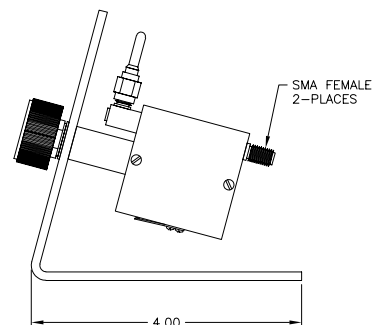
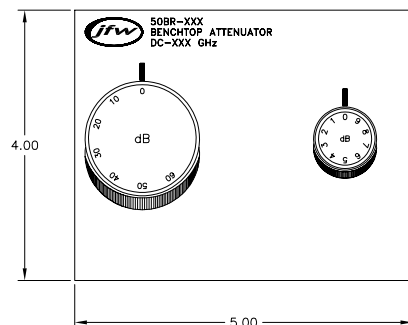
50R-400



50R-401



50BR-105



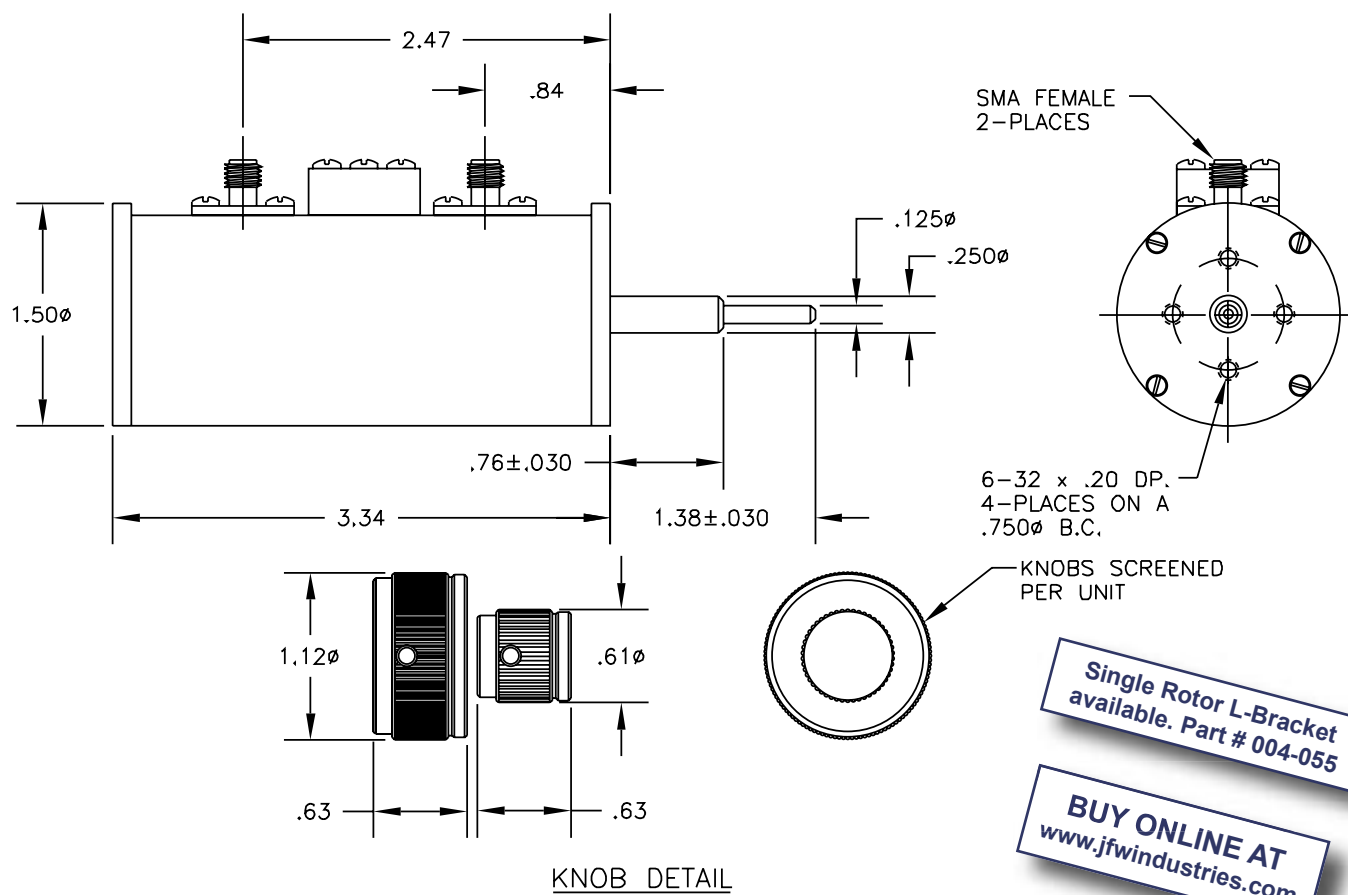
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Dual Concentric Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50DR-055	DC-2000 MHz	0-30 x 1 dB	± 0.25 dB or 2% DC-1000 MHz ± 0.4 dB or 3% 1000-2000 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2000 MHz	0.8 dB
50DR-060	DC-2000 MHz	0-11 x 0.1 dB	± 0.05 dB (0.1 dB steps) DC-1100 MHz ± 0.06 dB (0.1 dB steps) 1100-2000 MHz ± 0.2 dB (1 dB steps) DC-1100 MHz ± 0.4 dB (1 dB steps) 1100-2000 MHz	1.3:1 DC-1100 MHz 1.5:1 1100-2000 MHz	1 dB DC-1100 MHz 1.25 dB 1100-2000 MHz
50DR-063	DC-1100 MHz	0-50 x 1 dB	± 0.2 dB DC-250 MHz ± 0.5 dB 250-500 MHz ± 1.0 dB 500-1100 MHz	1.1:1 DC-250 MHz 1.2:1 250-500 MHz 1.4:1 500-1100 MHz	0.5 dB
50DR-096	DC-3000 MHz	0-30 x 1 dB	± 0.25 dB or 2% DC-1000 MHz ± 0.4 dB or 3% 1000-2000 MHz ± 0.5 dB or 4% 2000-3000 MHz	1.4:1 DC-1000 MHz 1.5:1 1000-2000 MHz 1.7:1 2000-3000 MHz	1.1 dB

Common Specifications

Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, N, SMA or TNC female



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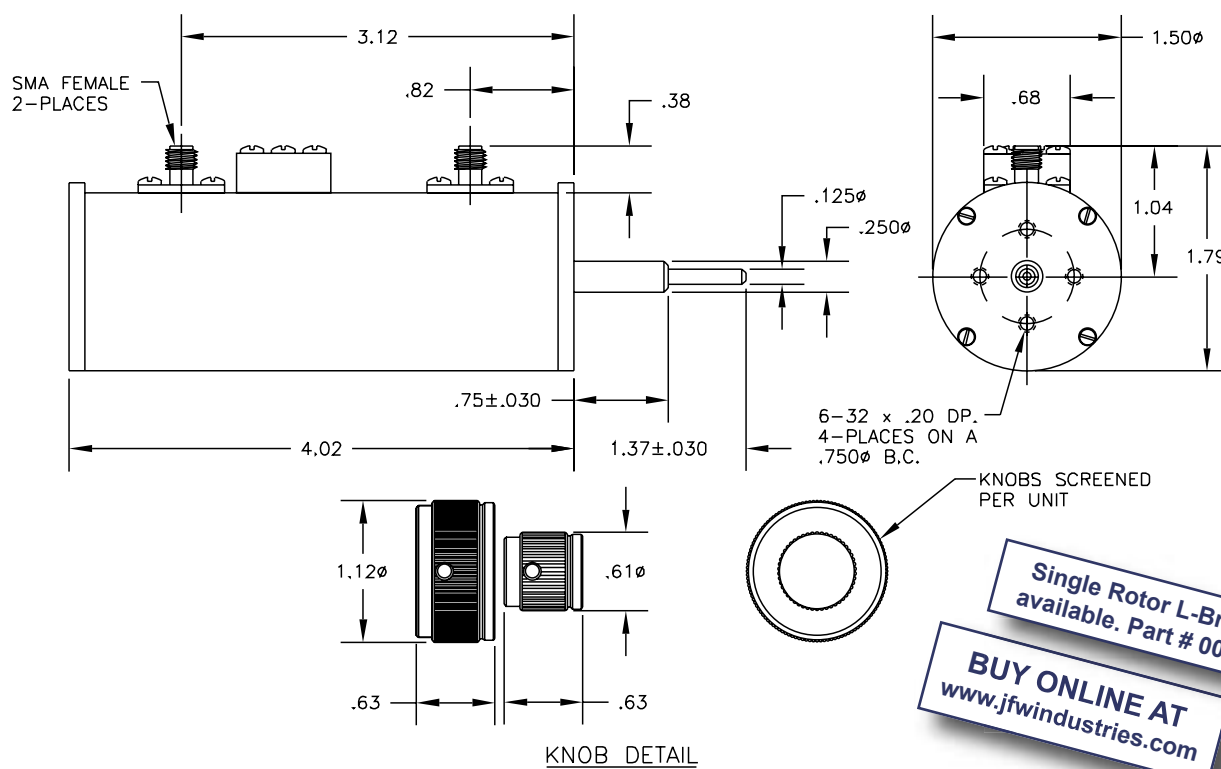
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Dual Concentric Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy (maximum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50DR-001	DC-1000 MHz	0-110 x 1 dB	± 0.2 dB or 1% DC-500 MHz ± 0.3 dB or 2% 500-1000 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz	0.5 dB	BNC, N, SMA or TNC female
50DR-046	DC-2500 MHz	0-50 x 1 dB	± 0.2 dB or 1% DC-500 MHz ± 0.3 dB or 3% 500-1000 MHz ± 0.4 dB or 3% 1000-2500 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz 1.5:1 1000-2500 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2500 MHz	BNC, N, SMA or TNC female
50DR-061	DC-2200 MHz	0-80 x 1 dB	± 0.5 dB or 3%	1.25:1 DC-1000 MHz 1.5:1 1000-2200 MHz	0.6 dB DC-1000 MHz 1.0 dB 1000-2200 MHz	BNC, N, SMA or TNC female
50DR-077	DC-2000 MHz	0-90 x 1 dB	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-2000 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz 1.5:1 1000-2000 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2000 MHz	BNC, N, SMA or TNC female
50DR-082	DC-2000 MHz	0-110 x 1 dB	± 0.5 dB or 2% DC-500 MHz ± 0.5 dB or 3% 500-2000 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz 1.5:1 1000-2000 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2000 MHz	BNC, N, SMA or TNC female
50DR-111	DC-2700 MHz	0-60 x 1 dB	± 0.5 dB or 3%	1.35:1 DC-1000 MHz 1.5:1 1000-2700 MHz	0.6 dB DC-1000 MHz 1.2 dB 1000-2700 MHz	SMA Female
50DR-119	DC-2200 MHz	0-110 x 1 dB	± 0.5 dB or 2% DC-500 MHz ± 0.5 dB or 3% 500-2000 MHz ± 0.5 dB or 4% 2000-2200 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz 1.5:1 1000-2200 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2200 MHz	BNC, N, SMA or TNC female

Common Specifications

Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C



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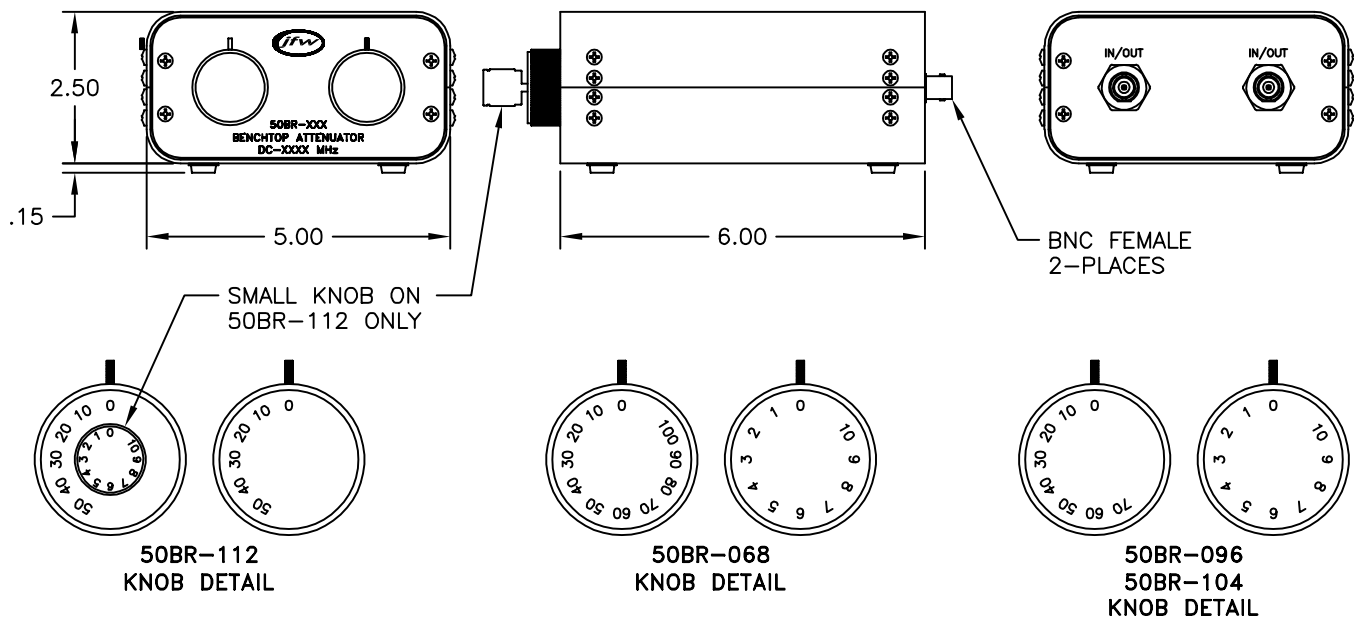
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Benchtop Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy (maximum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50BR-068	DC-2550 MHz	0-110 x 1 dB	± 0.5 dB or 2% DC-1000 MHz ± 0.5 dB or 3% 1000-1500 MHz ± 0.5 dB or 4% 1500-2550 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-1500 MHz 1.7:1 1500-2550 MHz	1.8 dB	BNC, N, SMA or TNC female
50BR-096	DC-2200 MHz	0-80 x 1 dB	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-2200 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2200 MHz	1.5 dB	BNC, N or SMA female
50BR-104	DC-2700 MHz	0-80 x 1 dB	± 0.4 dB (1 dB steps) ± 0.5 dB or 2% (10 dB steps) DC-1000 MHz ± 0.5 dB (1 dB steps) ± 0.5 dB or 3% (10 dB steps) 1000-2700 MHz	1.5:1 DC-1000 MHz 1.8:1 1000-2700 MHz	1.7 dB	SMA female
50BR-112	DC-2700 MHz	0-110 x 1 dB	± 0.5 dB (1 dB steps) ± 0.7 dB or 3% (10 dB steps)	1.5:1 DC-700 MHz 1.8:1 700-2700 MHz	2.2 dB	BNC, N, SMA or TNC female

Common Specifications				
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C



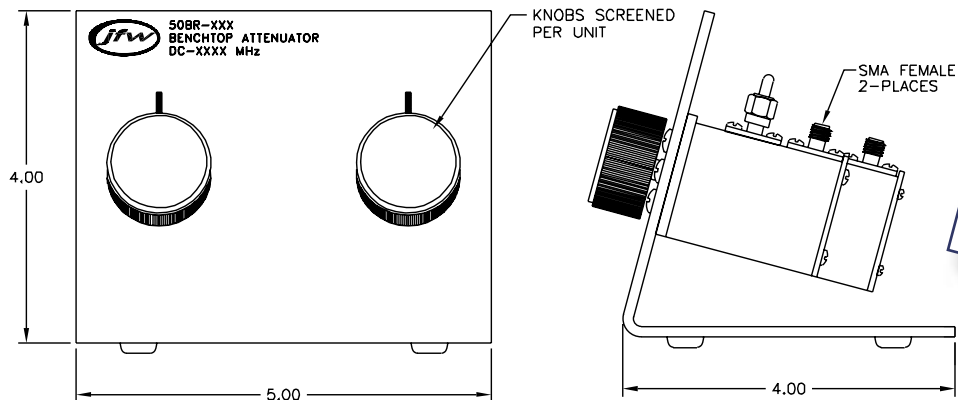
Benchtop Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50BR-008	DC-2200 MHz	0-80 x 1 dB	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-1000 MHz ± 0.5 dB or 3% 1000-2200 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2200 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2200 MHz
50BR-009	DC-1000 MHz	0-110 x 1 dB	±0.5 dB or 2%	1.3:1	1.2 dB
50BR-036	DC-2000 MHz	0-110 x 1 dB	± 0.5 dB or 2% DC-1000 MHz ± 0.5 dB or 3% 1000-1500 MHz ± 0.5 dB or 4% 1500-2000 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-1500 MHz 1.7:1 1500-2000 MHz	0.75 dB DC-1000 MHz 1.25 dB 1000-2000 MHz

Common Specifications

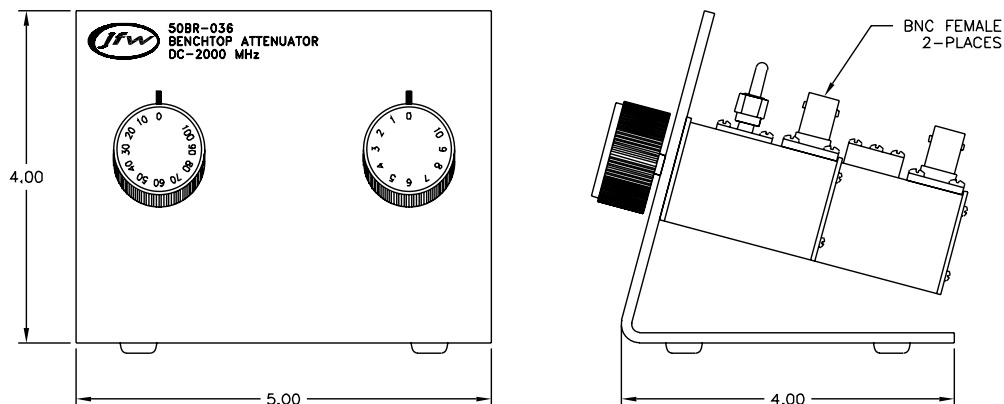
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, N, or SMA female

50BR-008 / 50BR-009



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50BR-036

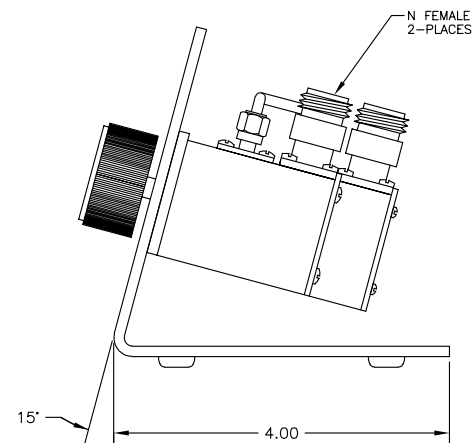
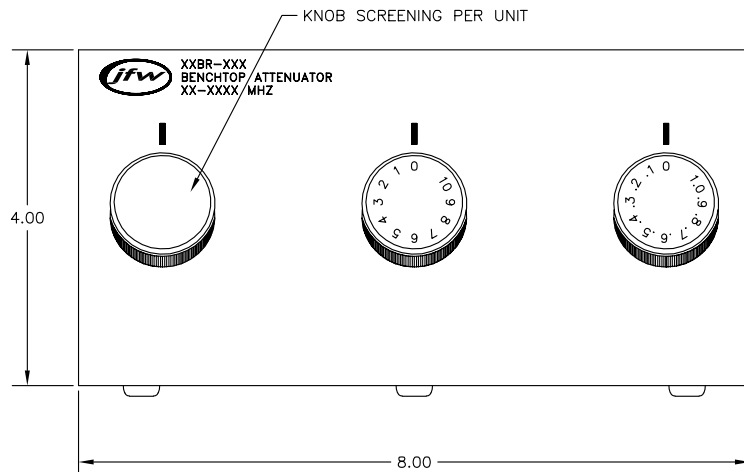


Benchtop Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50BR-017	DC-1000 MHz	0-81 x 0.1 dB	DC-500 MHz ± 0.04 dB (0-1 dB) ± 0.2 dB (1-10 dB) ± 0.5 dB (10-81 dB) 500-1000 MHz ± 0.06 dB (0-1 dB) ± 0.3 dB (1-10 dB) ± 0.8 dB (10-81 dB)	1.3:1 DC-500 MHz 1.5:1 500-1000 MHz	1.25 dB
50BR-022	DC-1000 MHz	0-111 x 0.1 dB	DC-500 MHz ± 0.04 dB (0-1 dB) ± 0.2 dB (1-10 dB) ± 0.5 dB or 1% (10-111 dB) 500-1000 MHz ± 0.06 dB (0-1 dB) ± 0.3 dB (1-10 dB) ± 0.5 dB or 2% (10-111 dB)	1.3:1 DC-500 MHz 1.5:1 500-1000 MHz	1.25 dB

Common Specifications					
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, N, SMA or TNC female

50BR-017 / 50BR-022



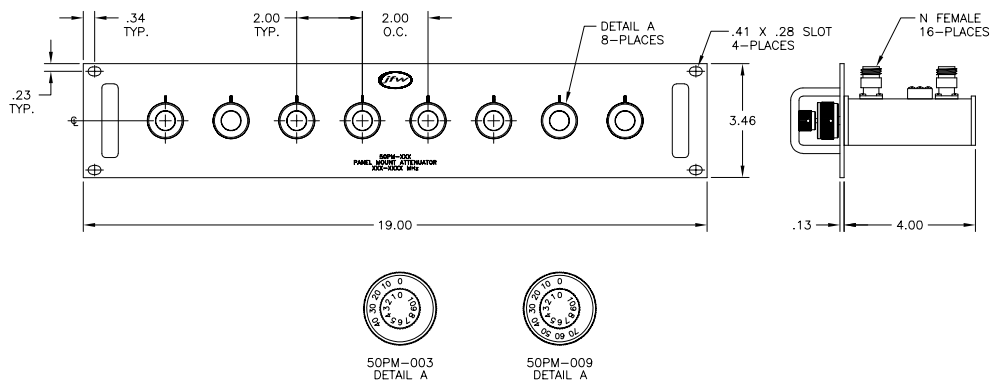
Panel Mounted Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50PM-003	DC-2500 MHz	0-50 x 1 dB Eight 50DR-046 panel mounted attenuators	± 0.2 dB or 1% DC-500 MHz ± 0.3 dB or 3% 500-1000 MHz ± 0.4 dB or 3% 1000-2500 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz 1.5:1 1000-2500 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2500 MHz
50PM-009	DC-2200 MHz	0-80 x 1 dB Eight 50DR-061 panel mounted attenuators	± 0.5 dB or 3%	1.25:1 DC-1000 MHz 1.5:1 1000-2200 MHz	0.6 dB DC-1000 MHz 1.0 dB 1000-2200 MHz
50PM-074	DC-2700 MHz	0-60 x 1 dB Four 50DR-111 panel mounted attenuators	± 0.5 dB or 3%	1.35:1 DC-1000 MHz 1.5:1 1000-2700 MHz	0.6 dB DC-1000 MHz 1.2 dB 1000-2700 MHz
50PM-075	DC-2500 MHz	0-50 x 1 dB Four 50DR-046 panel mounted attenuators	± 0.2 dB or 1% DC-500 MHz ± 0.3 dB or 3% 500-1000 MHz ± 0.4 dB or 3% 1000-2500 MHz	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz 1.5:1 1000-2500 MHz	0.5 dB DC-1000 MHz 1.0 dB 1000-2500 MHz

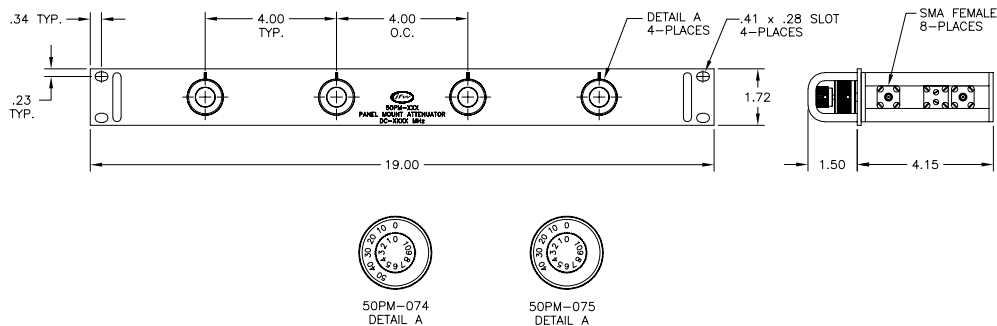
Common Specifications

Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
50 Ohms	2 Watts average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, N, SMA or TNC female

50PM-003 / 50PM-009



50PM-074 / 50PM-075

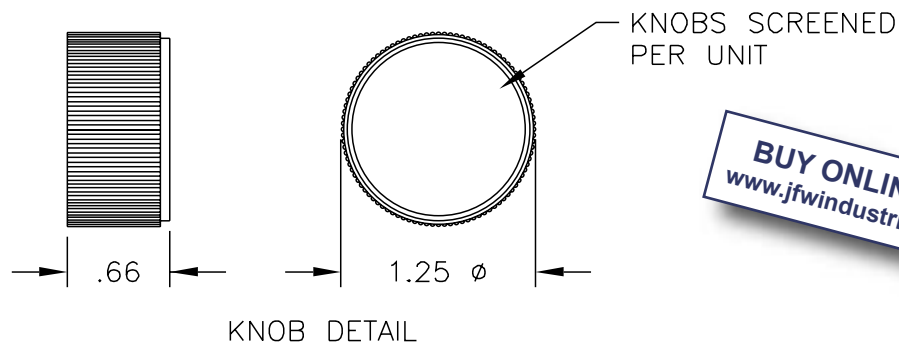
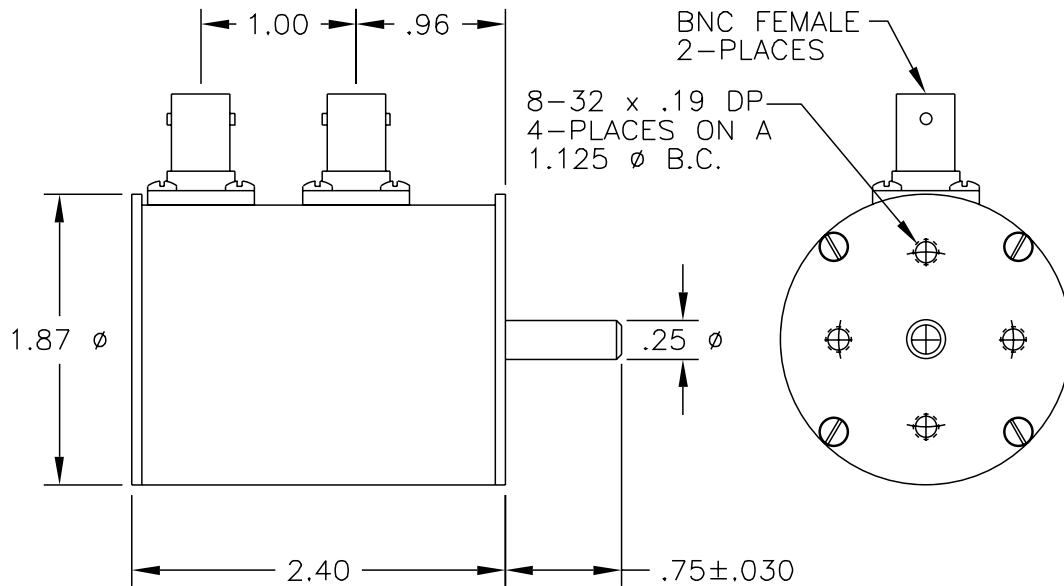


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75 Ohm Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75R-050	DC-2200 MHz	0-10 x 1 dB	± 0.1 dB DC-30 MHz ± 0.2 dB 30-500 MHz ± 0.3 dB 500-1000 MHz ± 0.4 dB 1000-2200 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2200 MHz	0.4 dB DC-1000 MHz 0.6 dB 1000-2200 MHz
75R-056	DC-1000 MHz	0-10 x 1 dB	± 0.1 dB DC-30 MHz ± 0.2 dB 30-500 MHz ± 0.3 dB 500-1000 MHz	1.3:1 DC-500 MHz 1.5:1 500-1000 MHz	0.4 dB
75R-057	DC-1000 MHz	0-1 x 0.1 dB	± 0.04 dB DC-500 MHz ± 0.08 dB 500-1000 MHz	1.3:1 DC-500 MHz 1.4:1 500-1000 MHz	0.7 dB

Common Specifications					
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
75 Ohms	1 Watt average 1000 Watts peak	Attenuation increases in c'lockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, F or N female

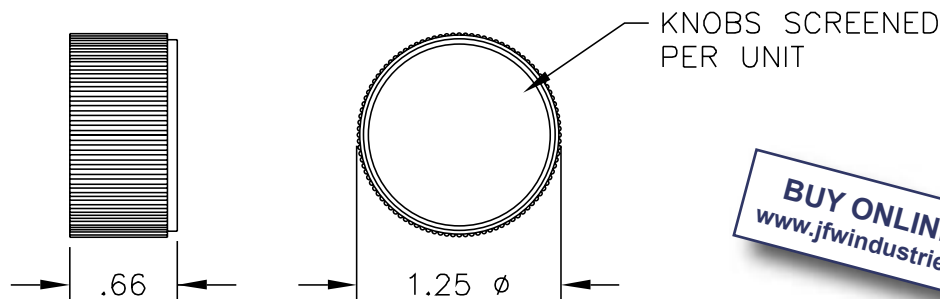
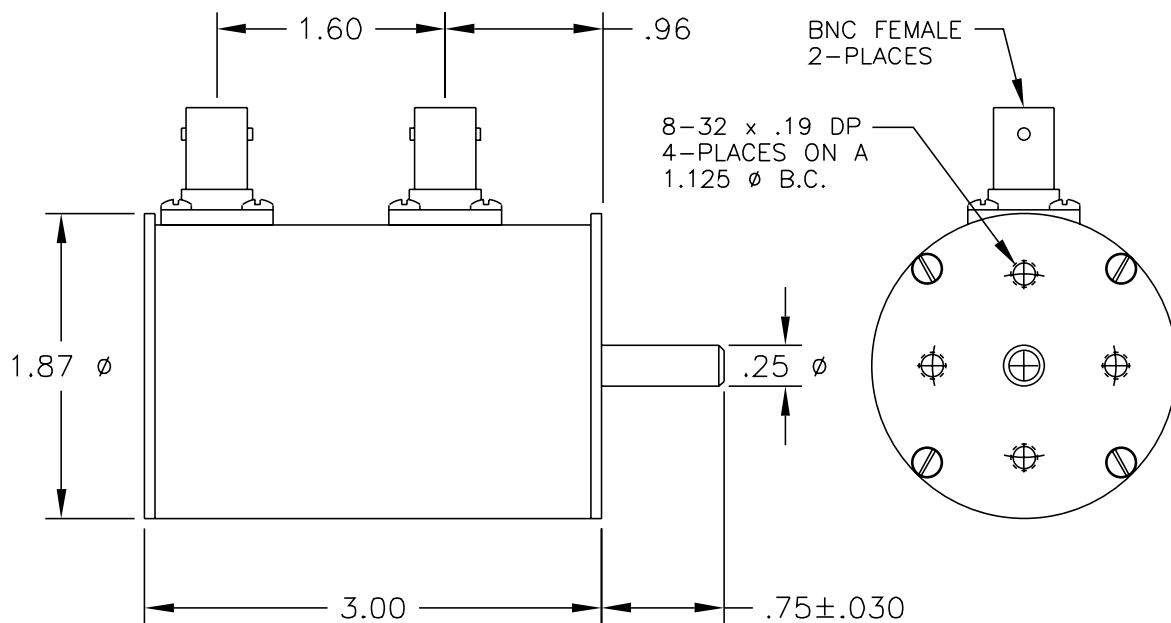


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75 Ohm Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75R-055	DC-1000 MHz	0-70 x 10 dB	± 0.75 dB DC-500 MHz ± 1.0 dB 500-1000 MHz	1.3:1 DC-500 MHz 1.5:1 500-1000 MHz	0.4 dB
75R-089	DC-2200 MHz	0-60 x 10 dB	± 0.5 dB or 2% DC-1000 MHz ± 0.5 dB or 3% 1000-2200 MHz	1.4:1 DC-1000 MHz 1.6:1 1000-2200 MHz	0.3 dB DC-1000 MHz 0.5 dB 1000-2200 MHz

Common Specifications					
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
75 Ohms	1 Watt average 1000 Watts peak	Attenuation increases in c'lockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, F or N female



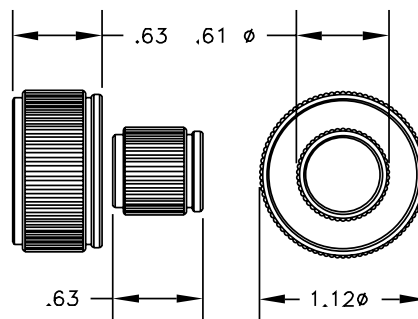
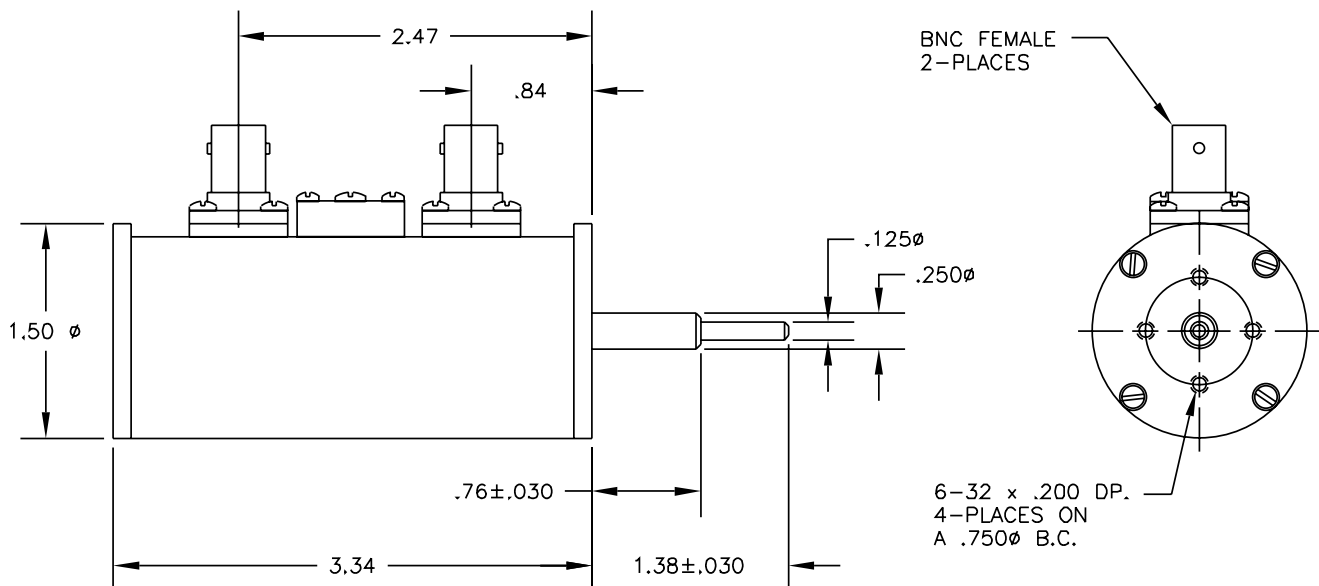
KNOB DETAIL

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75 Ohm Dual Concentric Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
75DR-018	DC-1000 MHz	0-30 x 1 dB	± 0.4 dB (0-10 dB) ± 0.5 dB (10-30 dB)	1.35:1	0.5 dB maximum
75DR-021	DC-2100 MHz	0-30 x 1 dB	DC-1000 MHz ± 0.3 dB (0-10 dB) ± 0.5 dB (10-30 dB) 1000-2100 MHz ± 0.5 dB (0-10 dB) ± 1.0 dB (10-30 dB)	1.6:1	1.00 dB maximum 0.75 dB typical @ 2100 MHz
75DR-022	DC-1000 MHz	0-11 x 0.1 dB	± 0.05 dB (0-1 dB) ± 0.30 dB (1-11 dB)	1.4:1 DC-500 MHz 1.5:1 500-1000 MHz	1.25 dB maximum 1.00 dB typical @ 1000 MHz

Common Specifications					
Impedance	RF Input Power	Standard Rotation	Indexing	RF Connectors	Operating Temperature
75 Ohms	1 Watt average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	BNC or F female	-20° C to +85° C



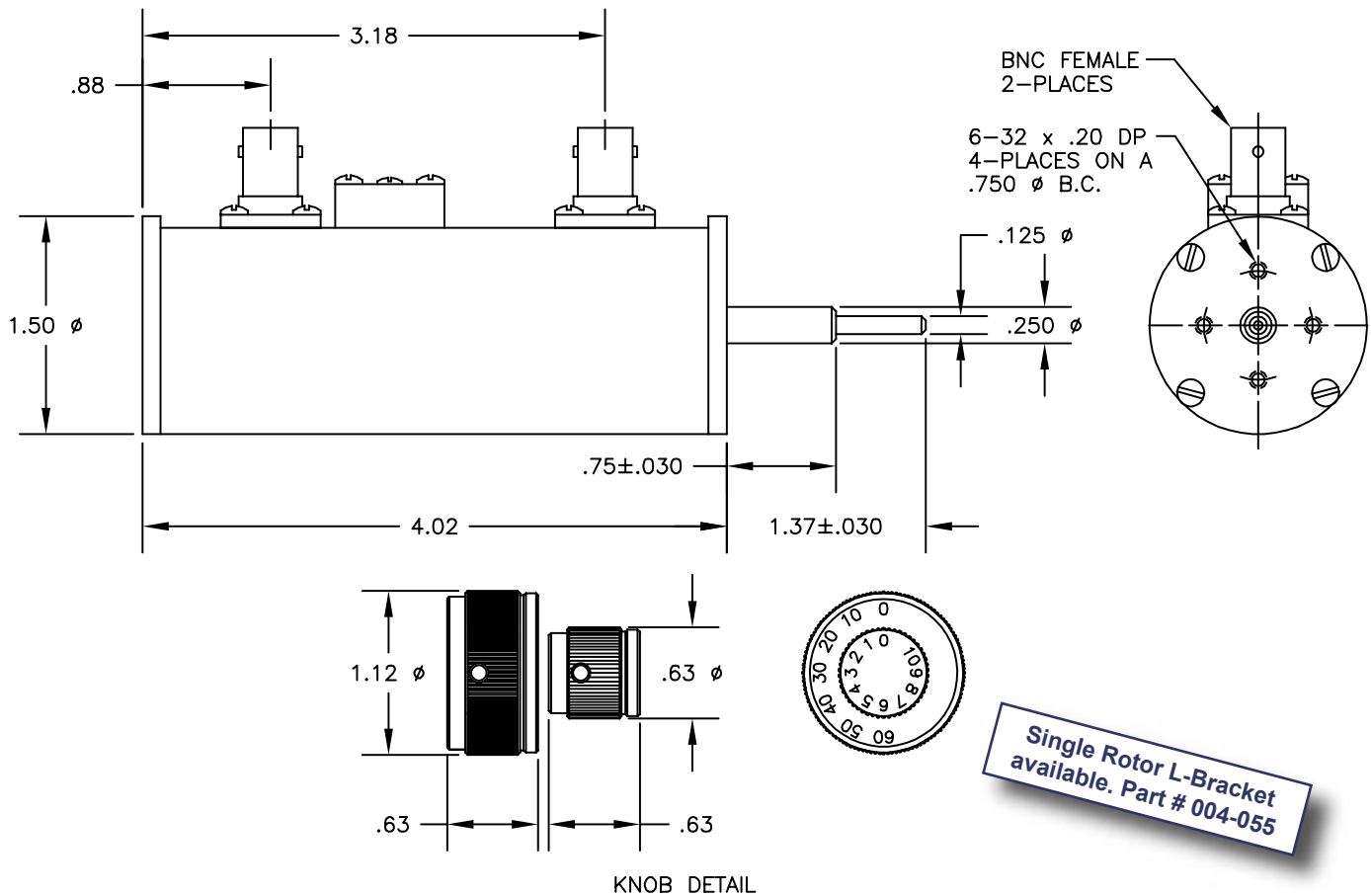
KNOB DETAIL

Single Rotor L-Bracket
available. Part # 004-055

75 Ohm Dual Concentric Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75DR-009	DC-1000 MHz	0-70 x 1 dB	± 0.5 dB or 3%	1.4:1	0.75 dB

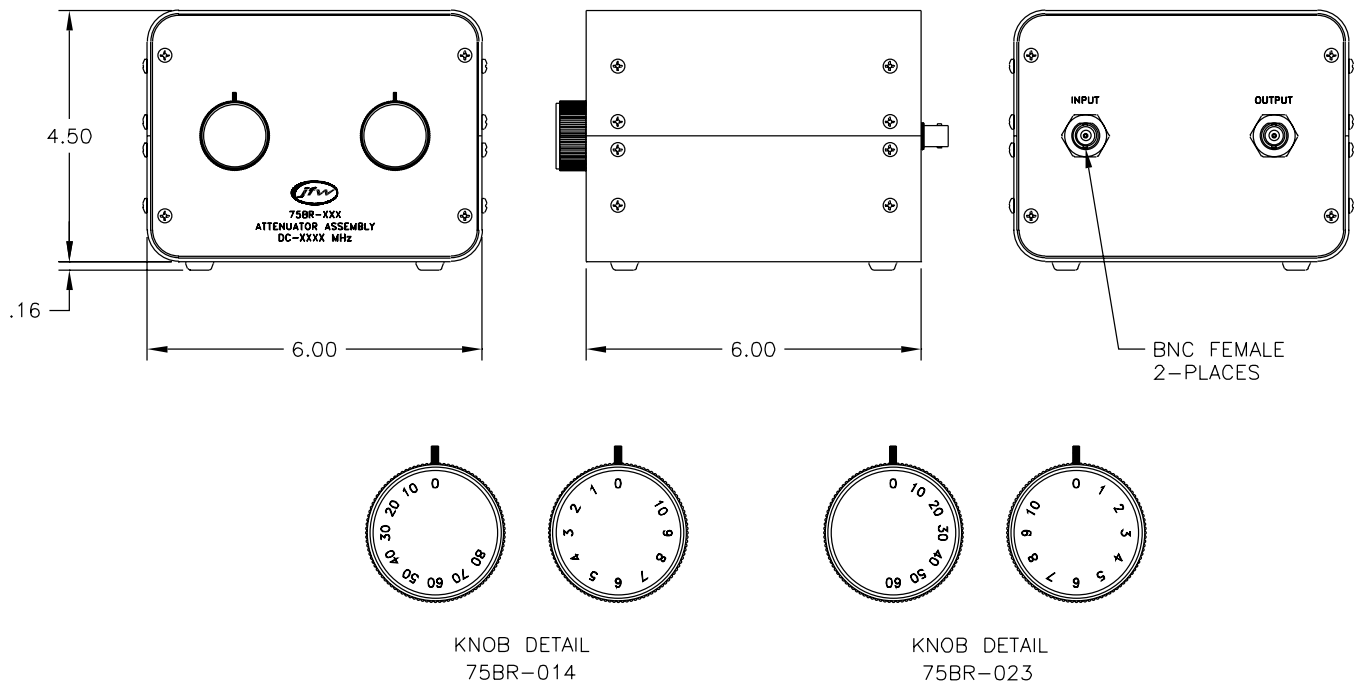
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
75 Ohms	1 Watt average 1000 Watts peak	Attenuation increases in clockwise direction	30° with stops at minimum and maximum	-20° C to +85° C	BNC, F or N female



75 Ohm Benchtop Rotary Attenuators

Model	Frequency Range	Attenuation Range	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75BR-014	DC-1000 MHz	0-90 x 1 dB	DC-500 MHz ± 0.3 dB (0-10 dB) ± 0.5 dB (10-60 dB) ± 0.8 dB (70-90 dB) 500-1000 MHz ± 0.5 dB (0-10 dB) ± 1.0 dB (10-60 dB) ± 1.5 dB (70-90 dB)	1.3:1 DC-500 MHz 1.5:1 500-1000 MHz	1.0 dB
75BR-023	DC-2150 MHz	0-70 x 1 dB	± 0.5 dB (0-10 dB) ± 0.6 dB or 3% (10-70 dB)	1.5:1 DC-1000 MHz 1.8:1 1000-2150 MHz	1.5 dB

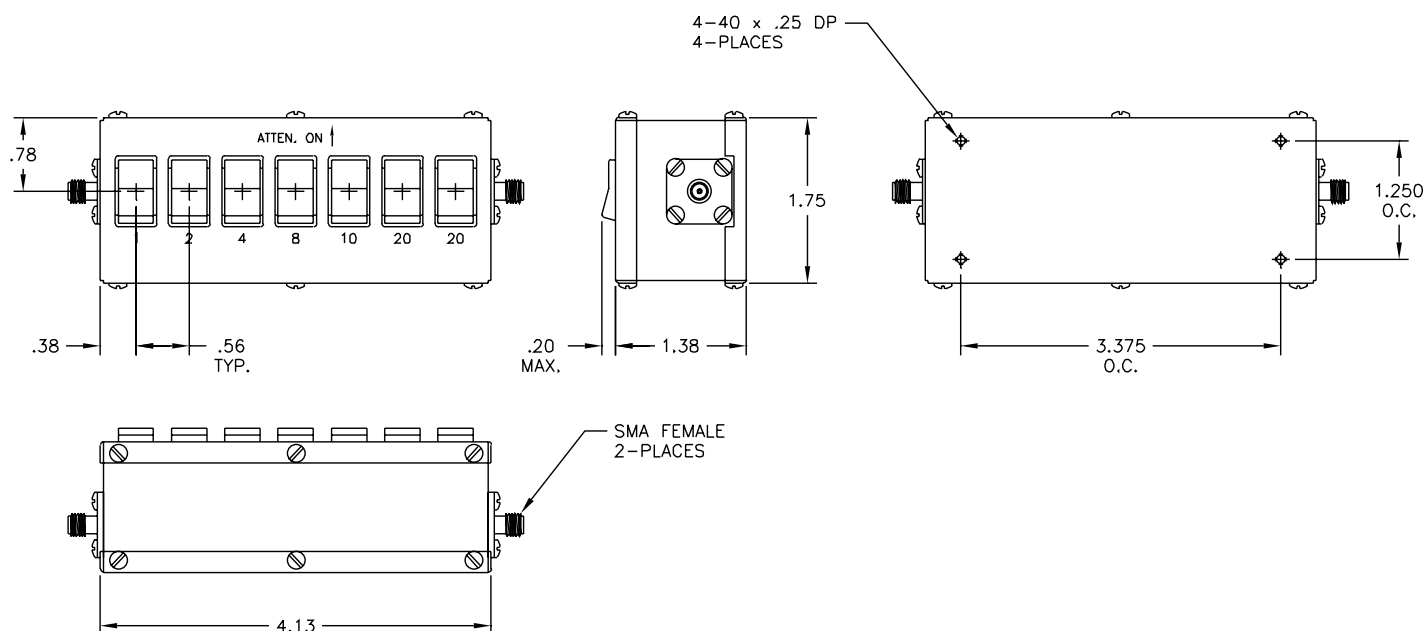
Common Specifications					
Impedance	RF Input Power	Standard Rotation	Indexing	Operating Temperature	RF Connectors
75 Ohms	1 Watt average 1000 Watts peak	See knob detail below	30° with stops at minimum and maximum	-20° C to +85° C	BNC, F or N female



Rocker Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50RA-003	DC-500 MHz	0-65 x 1 dB 1, 2, 4, 8, 10, 20, and 20 dB	± 0.4 dB	1.25:1	1.1 dB
50RA-004	DC-1000 MHz	0-65 x 1 dB 1, 2, 4, 8, 10, 20, and 20 dB	± 0.4 dB or 1%	1.3:1	1.5 dB

Model	Impedance	RF Input Power	RF Connectors
50RA-003	50 Ohms	1 Watt average @ +25° C 250 Watts peak (1 microsecond)	BNC, N, SMA or TNC female
50RA-004	50 Ohms	1 Watt average @ +25° C 250 Watts peak (1 microsecond)	BNC, N, SMA or TNC female

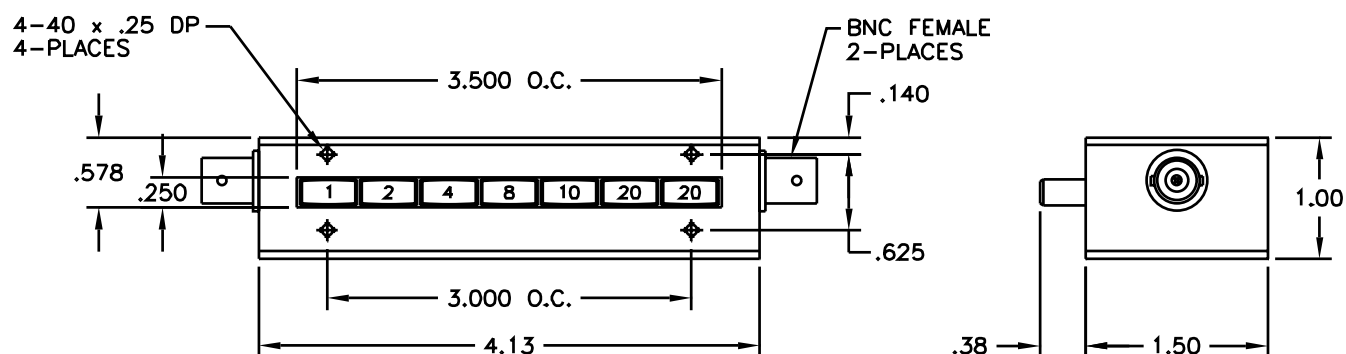


Pushbutton Attenuators

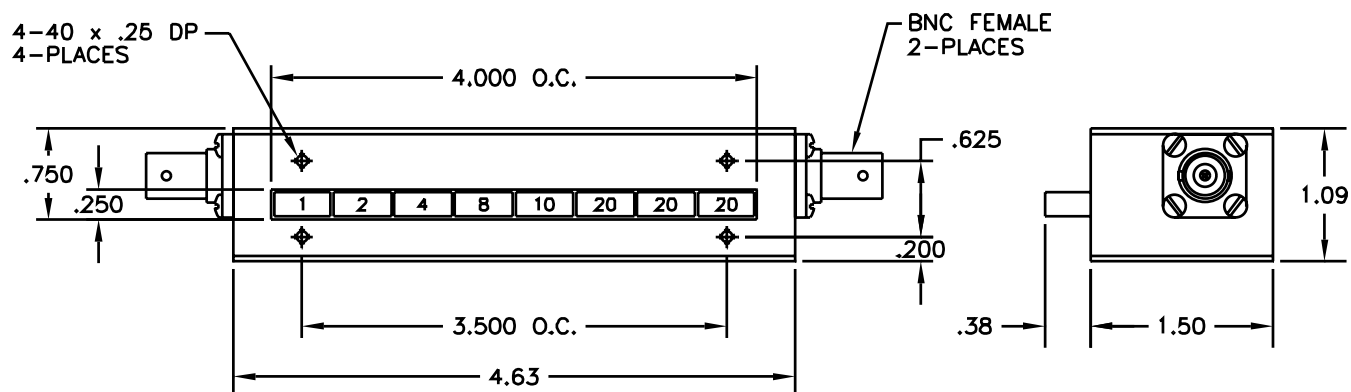
Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50B-001	DC-750 MHz	0-65 x 1 dB/ 1, 2, 4, 8, 10, 20 and 20 dB	± 0.3 dB DC-100 MHz ± 0.5 dB 100-300 MHz ± 0.8 dB 300-500 MHz ± 1.3 dB 500-750 MHz	1.1:1 DC-100 MHz 1.25:1 100-500 MHz 1.4:1 500-750 MHz	1.5 dB maximum 1.0 dB typical @ 750 MHz 0.7 dB typical @ 500 MHz
50B-035	DC-750 MHz	0-85 x 1 dB/ 1, 2, 4, 8, 10, 20, 20 and 20 dB	± 0.5 dB or 1% DC-500 MHz ± 0.5 dB or 2% 500-750 MHz	1.3:1 DC-500 MHz 1.4:1 500-750 MHz	1.0 dB nominal DC-500 MHz 1.5 dB nominal 500-750 MHz
75B-001	DC-500 MHz	0-65 x 1 dB/ 1, 2, 4, 8, 10, 20 and 20 dB	± 0.3 dB DC-100 MHz ± 0.5 dB 100-300 MHz ± 0.8 dB 300-500 MHz	1.1:1 DC-100 MHz 1.2:1 100-300 MHz 1.3:1 300-500 MHz	1.2 dB @ 500 MHz maximum

Model	Impedance	Power Rating	Operating Temperature	RF Connectors
50B-001	50 Ohms	1 Watt average (1000 Watts peak)	-20° C to +85° C	BNC female
50B-035	50 Ohms	1 Watt average (100 Watts peak)	-20° C to +85° C	BNC female
75B-001	75 Ohms	1 Watt average (1000 Watts peak)	-20° C to +85° C	BNC or F female

50B-001 / 75B-001



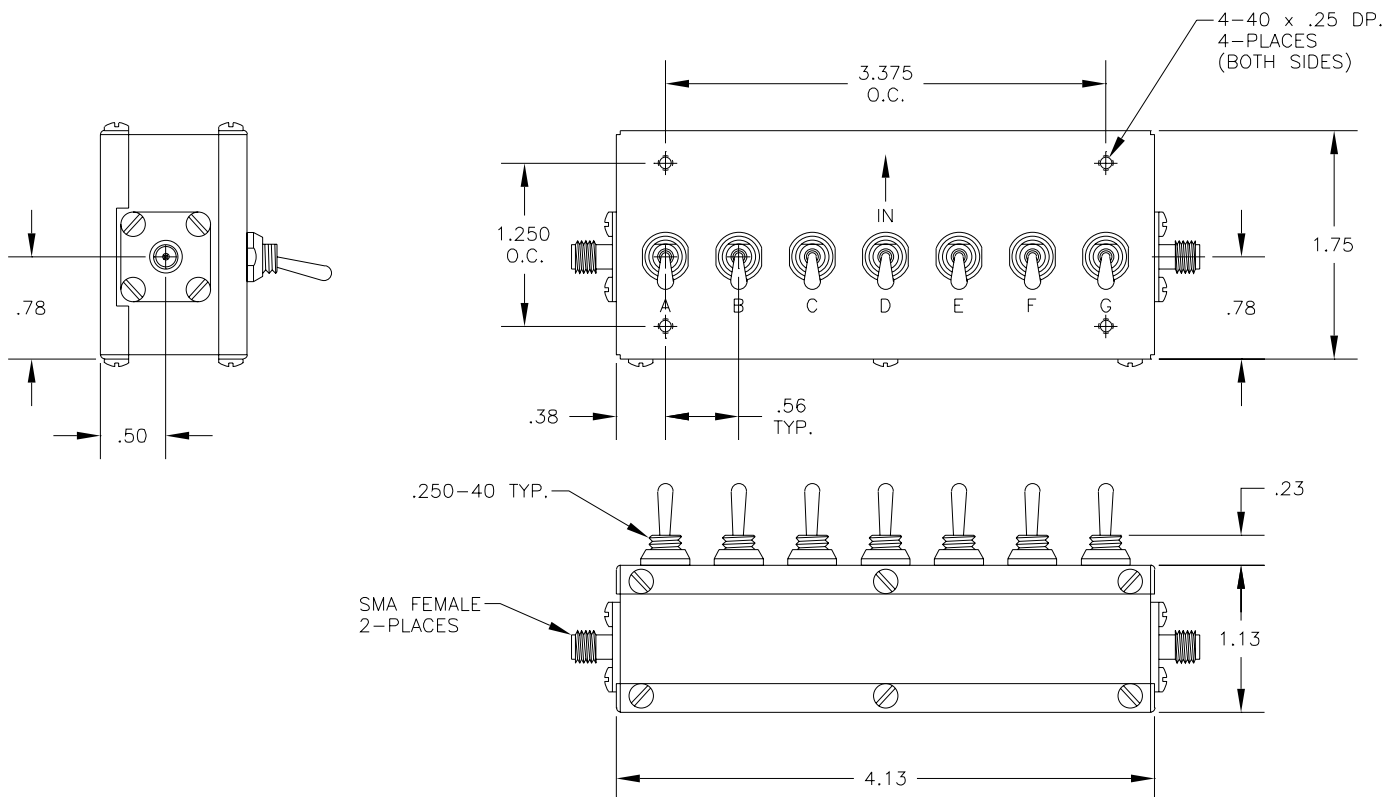
50B-035



Toggle Switch Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50TA-006	DC-850 MHz	0-65 x 1 dB/ 1, 2, 4, 8, 10, 20 and 20 dB	± 0.3 dB or 2%	1.4:1	1.5 dB
50TA-007	DC-850 MHz	0-45.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 10 and 20 dB	± 0.3 dB or 1% DC-500 MHz ± 0.3 dB or 2% 500-850 MHz	1.4:1	1.5 dB
75TA-006	DC-500 MHz	0-65 x 1 dB/ 1, 2, 4, 8, 10, 20 and 20 dB	± 0.3 dB or 2%	1.4:1	1.5 dB
75TA-007	DC-500 MHz	0-45.5 x 0.5 dB/ 0.5, 1, 2, 4, 8, 10 and 20 dB	± 0.3 dB or 1%	1.4:1	1.5 dB

Model	Impedance	Power Rating	Operating Temperature	RF Connectors
50TA-006	50 Ohms	0.5 Watt average (100 Watts peak)	-20° C to +85° C	BNC, N, SMA or TNC female
50TA-007	50 Ohms	0.5 Watt average (100 Watts peak)	-20° C to +85° C	BNC, N, SMA or TNC female
75TA-006	75 Ohms	0.5 Watt average (100 Watts peak)	-20° C to +85° C	BNC, F or N female
75TA-007	75 Ohms	0.5 Watt average (100 Watts peak)	-20° C to +85° C	BNC, F or N female



MODEL #	A	B	C	D	E	F	G
50TA-006	1	2	4	8	10	20	20
50TA-007	.5	1	2	4	8	10	20
75TA-006	1	2	4	8	10	20	20
75TA-007	.5	1	2	4	8	10	20

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Fixed Attenuators

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50F-003 SMA).

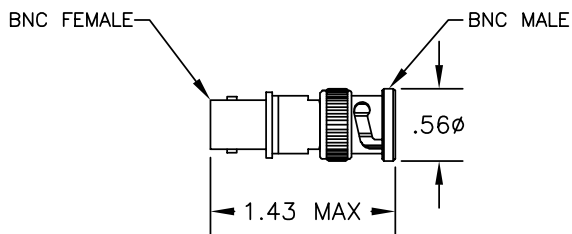
Low Power - 50 Ohm				Medium Power - 50 Ohm			
Model Number	Frequency Range	Average Power	Page	Model Number	Frequency Range	Average Power	Page
50F-XXX	DC-2200 MHz	1 Watt	4-3	50FH-XXX-5	DC-2000 MHz	5 Watts	4-12
50FFD-XXX	600-1950 MHz	DC Passing	4-8	50FH-XXX-10	DC-2000 MHz	10 Watts	4-12
50FFP-XXX	400-2500 MHz	DC Passing	4-8	50FH-XXX-30	DC-2000 MHz	30 Watts	4-14
50FP-XXX-H2	DC-2000 MHz	2 Watts	4-10	50FH-XXX-30-3	DC-3000 MHz	30 Watts	4-14
50FP-XXX-H3	DC-3000 MHz	2 Watts	4-10	50FH-XXX-50	DC-2000 MHz	50 Watts	4-14
50FP-XXX-H4	DC-4000 MHz	2 Watts	4-10	50FH-XXX-50-3	DC-3000 MHz	50 Watts	4-14
50FP-XXX-H6	DC-6000 MHz	2 Watts	4-10	50FHC-XXX-10	DC-4000 MHz	10 Watts	4-13
50HB-XX	DC-6000 MHz	2 Watts	4-6	50FHC-XXX-15	DC-4000 MHz	15 Watts	4-13
50HN-XX	DC-6000 MHz	2 Watts	4-6	50FHC-XXX-20	DC-4000 MHz	20 Watts	4-13
50HF-XXX	DC-18 GHz	2 Watts	4-7	50FHC-XXX-25	DC-4000 MHz	25 Watts	4-13
Low Power - 75 Ohm				50FHXC-XXX-40	DC-4000 MHz	40 Watts	4-13
Model Number	Frequency Range	Average Power	Page	50FHXC-XXX-50	DC-4000 MHz	50 Watts	4-13
75F-XXX	DC-1000 MHz	1 Watt	4-4	50FPE-XXX	DC-6000 MHz	5 Watts	4-11
75FFB-XXX	950-2150 MHz	DC Passing	4-8	50HF-XXX-5	DC-18 GHz	5 Watts	4-7
75FFD-XXX	450-2000 MHz	DC Passing	4-8	50HFP-XXX-10	DC-18 GHz	10 Watts	4-7
75FP-XXX-2G	DC-2000 MHz	1 Watt	4-5				
75FP-XXX-3G	DC-3000 MHz	0.5 Watts	4-5				
Fixed Attenuator Kits - 50 Ohm				High Power - 50 Ohm			
Model Number	Frequency Range	Average Power	Page	Model Number	Frequency Range	Average Power	Page
50KFA-005	DC-2200 MHz	1 Watt	4-9	50FH-XXX-100	DC-1000 MHz	100 Watts	4-15
50KFA-006	DC-2200 MHz	1 Watt	4-9	50FH-XXX-100-2	DC-2000 MHz	100 Watts	4-15
50KFA-008	DC-18 GHz	2 Watts	4-9	50FH-XXX-100-3	DC-3000 MHz	100 Watts	4-15
50KFA-014	DC-18 GHz	2 Watts	4-9	50FH-XXX-300	DC-1000 MHz	300 Watts	4-19
50KFA-074	DC-2200 MHz	1 Watt	4-9	50FH-XXX-300-2	DC-2000 MHz	300 Watts	4-19
				50FHAO-XXX-75	DC-3000 MHz	75 Watts	4-16
				50FHAO-XXX-100	DC-3000 MHz	100 Watts	4-16
				50FHAO-XXX-150	DC-3000 MHz	150 Watts	4-17
				50FHAO-XXX-200	DC-3000 MHz	200 Watts	4-18
				50FHDQ-XXX-500	DC-1000 MHz	500 Watts	4-20
				50FHDQ-XXX-500-3	DC-3000 MHz	500 Watts	4-20
				50FHIE-XXX-1000	DC-3000 MHz	1000 Watts	4-21
				50FHIQ-XXX-1000	DC-1000 MHz	1000 Watts	4-21

1 Watt Fixed Attenuators F Series

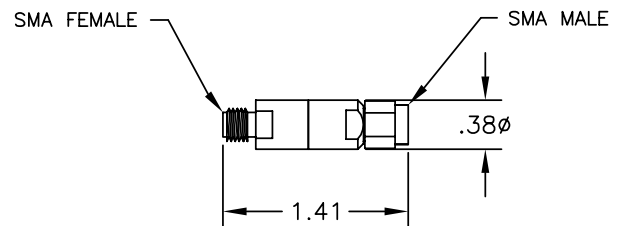
Model	Frequency Range	Attenuation Values *	Attenuation Accuracy (maximum)	VSWR (maximum)	RF Connectors
50F-XXX	DC-2200 MHz	1 thru 20 dB in any 1 dB increment	± 0.5 dB DC-1000 MHz ± 0.8 dB 1000-2200 MHz	1.2:1 DC-1000 MHz 1.4:1 1000-2200 MHz	BNC, N, SMA or TNC
50F-XXX	DC-1000 MHz	21 thru 30 dB in any 1 dB increment	± 0.5 dB or 2%	1.2:1	BNC, N, SMA or TNC
* (XXX) insert attenuation value					

Common Specifications			
Impedance	Input Power (@ +25° C)	Peak Power	Operating Temperature
50 Ohms	1 Watt	1000 Watts	-55° C to +125° C

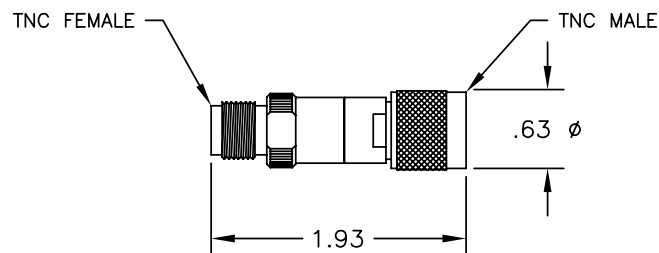
50F-XXX BNC



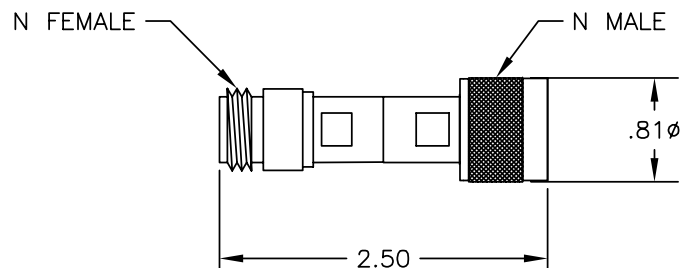
50F-XXX SMA



50F-XXX TNC



50F-XXX N



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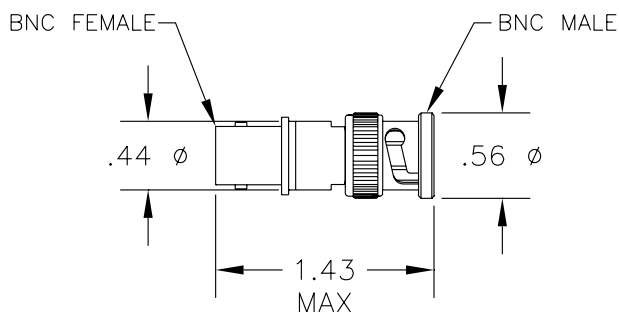
75 Ohm Fixed Attenuators F Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
75F-XXX	DC-500 MHz	1 thru 30 dB in any 1 dB increment	± 0.2 dB DC-100 MHz ± 0.4 dB 100-500 MHz	1.3:1	BNC
75F-XXX	DC-1000 MHz	1 thru 20 dB in any 1 dB increment	± 0.3 dB DC-500 MHz ± 0.5 dB 500-1000 MHz	1.2:1 @ 500 MHz 1.3:1 @ 1000 MHz	F (Screw On) or N
75F-XXX	DC-1000 MHz	1 thru 20 dB in any 1 dB increment	± 0.3 dB DC-500 MHz ± 0.5 dB 500-1000 MHz	1.15:1 @ 500 MHz 1.30:1 @ 1000 MHz	TNC

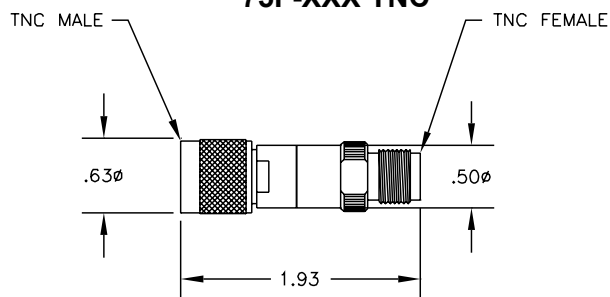
* (XXX) insert attenuation value

Common Specifications			
Impedance	Input Power (@ +25° C)	Peak Power	Operating Temperature
75 Ohms	1 Watt	1000 Watts	-55° C to +125° C

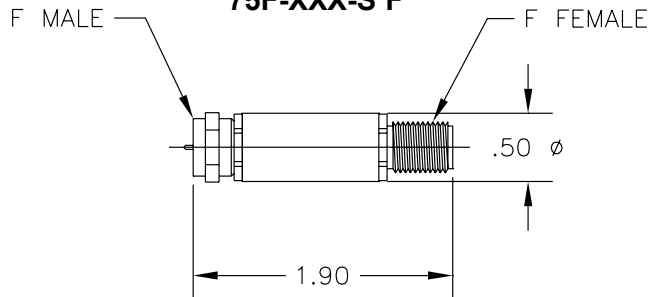
75F-XXX BNC



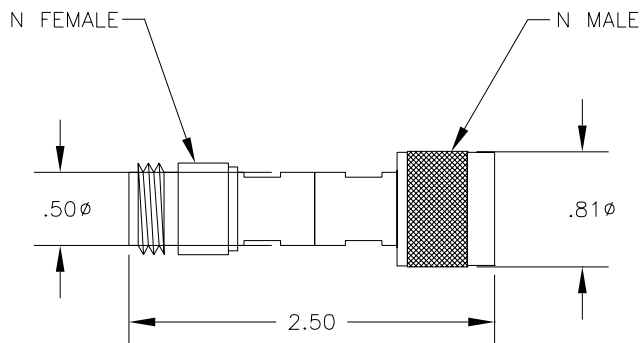
75F-XXX TNC



75F-XXX-S F



75F-XXX N



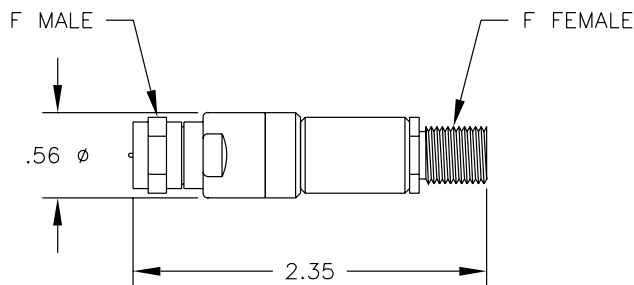
75 Ohm Fixed Attenuators FP Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
75FP-XXX-2G	DC-2000 MHz	1 thru 20 dB in any 1 dB increment	± 0.3 dB DC-1000 MHz ± 0.5 dB or 3% 1000-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	F, BNC, TNC or N
75FP-XXX-3G	DC-3000 MHz	3 thru 20 dB in any 1 dB increment	± 0.3 dB DC-1300 MHz ± 0.5 dB 1300-3000 MHz	1.12:1 DC-1300 MHz 1.3:1 1300-3000 MHz	F or N

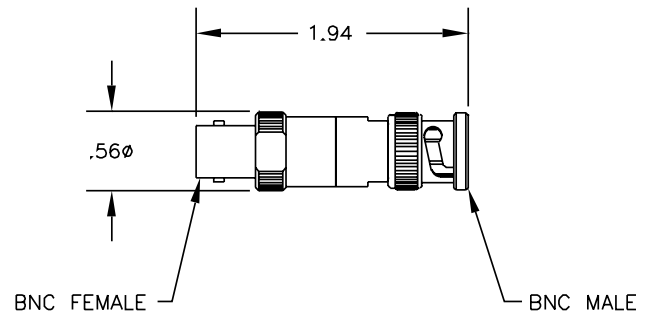
* (XXX) insert attenuation value

Model	Impedance	Input Power (@ +25° C)	Peak Power	Operating Temperature
75FP-XXX-2G	75 Ohms	1.0 Watt	1000 Watts	-55° C to +125° C
75FP-XXX-3G	75 Ohms	0.5 Watts	100 Watts	-55° C to +125° C

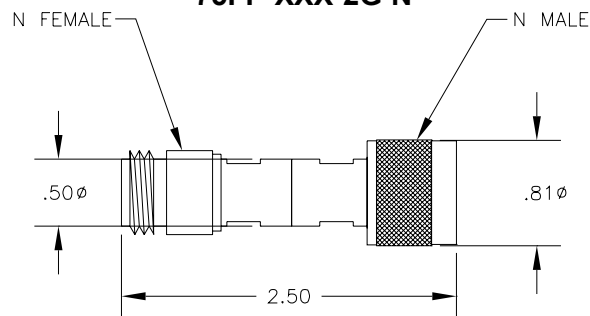
75FP-XXX-2G F



75FP-XXX-2G BNC

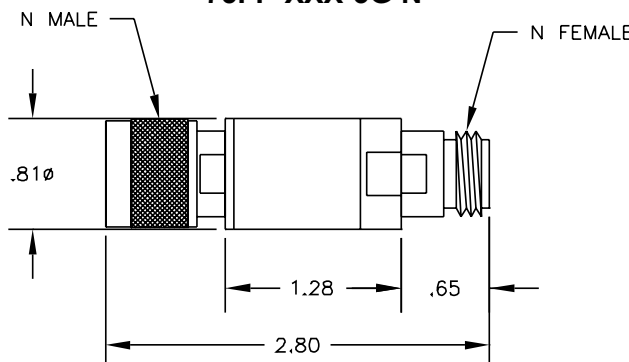


75FP-XXX-2G N

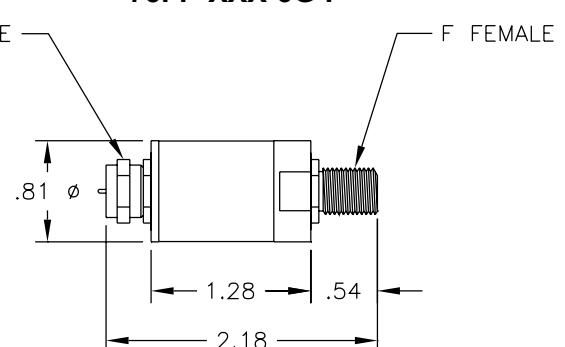


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75FP-XXX-3G N



75FP-XXX-3G F



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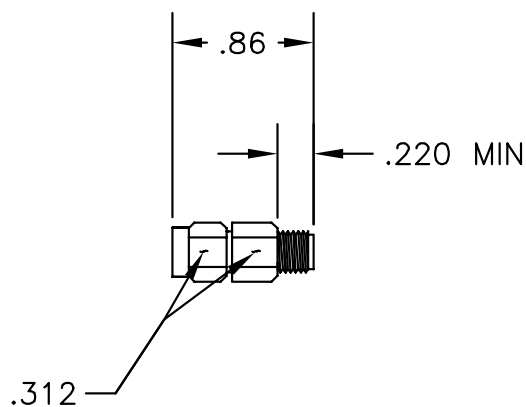
DC-6 GHz Fixed Attenuators

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy (maximum)	VSWR (maximum)	RF Connectors
50HB-XX	DC-6000 MHz	1-12, 15, 20 & 30 dB	± 0.5 dB (1-20 dB) ± 0.75 dB (30 dB)	1.15:1 DC-2.5 GHz 1.20:1 2.5-6 GHz (1-6 dB) 1.25:1 2.5-6 GHz (7-12 dB) 1.30:1 2.5-6 GHz (15, 20 dB) 1.35:1 2.5-6 GHz (30 dB)	SMA
50HN-XX	DC-6000 MHz	1, 3, 6, 10, 20 & 30 dB	± 0.30 dB (1, 3 & 6 dB) ± 0.50 dB (10 dB) ± 0.75 dB (20 dB) ± 1.00 dB (30 dB)	1.25:1	N

* (XXX) insert attenuation value

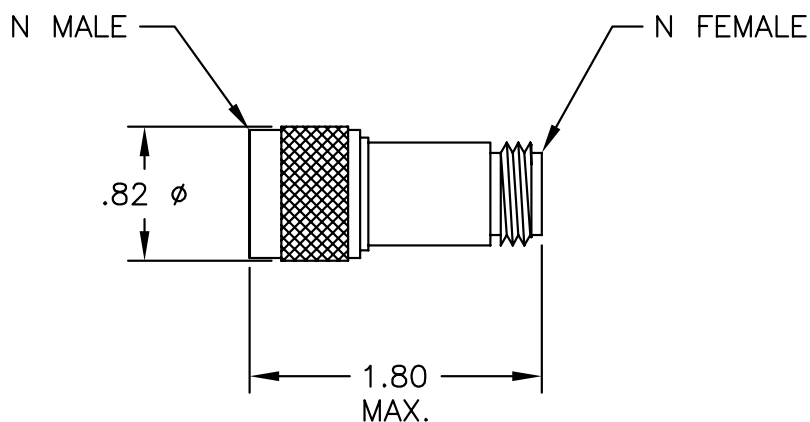
Common Specifications			
Impedance	Input Power (average)	Peak Power	Operating Temperature
50 Ohms	2 Watts @ +25° C Derate to 0.5 Watts @ +125° C	200 Watts (5 microsecond pulse, 0.1% duty cycle)	-65° C to +125° C

50HB-XX SMA



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50HN-XX N



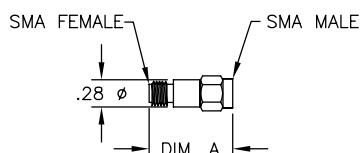
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DC-18 GHz Fixed Attenuators

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50HF-XXX	DC-18 GHz	0-10, 12, 15, 20 & 30 dB	± 0.3 dB (1-6 dB) ± 0.5 dB (7-20 dB) ± 0.75 dB (30 dB)	1.2:1 DC-4 GHz 1.25:1 4-8 GHz 1.3:1 8-12.4 GHz 1.4:1 12.4-18 GHz	N or SMA
50HF-XXX-5	DC-18 GHz	0-10, 12, 15, 20 & 30 dB	± 0.3 dB (1-6 dB) ± 0.5 dB (7-20 dB) ± 0.75 dB (30 dB)	1.2:1 DC-4 GHz 1.25:1 4-8 GHz 1.3:1 8-12.4 GHz 1.4:1 12.4-18 GHz	N or SMA
50HFP-XXX-10	DC-18 GHz	3, 6, 10, 20 & 30 dB	± 0.5 dB (3 & 6 dB) ± 0.75 dB (10 dB) ± 1.0 dB (20 dB) ± 1.25 dB (30 dB)	1.2:1 DC-4 GHz 1.3:1 4-12.4 GHz 1.4:1 12.4-15 GHz 1.45:1 15-18 GHz	N or SMA
* (XXX) insert attenuation value - Consult Factory for other dB Values					

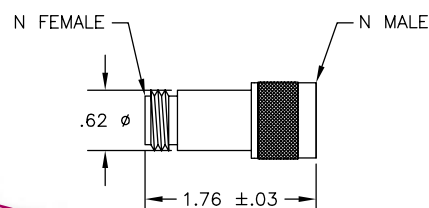
Model	Impedance	Input Power (average)	Peak Power	Operating Temperature
50HF-XXX	50 Ohms	2 Watts @ +25° C (derate to 0.5 Watts @ +125° C)	250 Watts	-65° C to +125° C
50HF-XXX-5	50 Ohms	5 Watts @ +25° C (derate to 1 Watt @ +125° C)	250 Watts	-65° C to +125° C
50HFP-XXX-10	50 Ohms	10 Watts @ +25° C (derate to 2 Watts @ +125° C)	500 Watts	-65° C to +125° C

50HF-XXX SMA



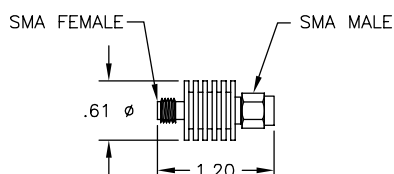
dB VALUE	DIM. A
0.5-12 dB	.86 ±.03
13-30 dB	.99 ±.03

50HF-XXX N

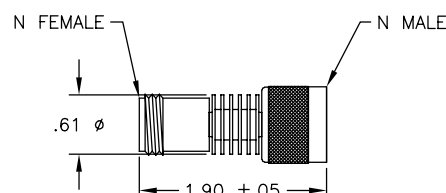


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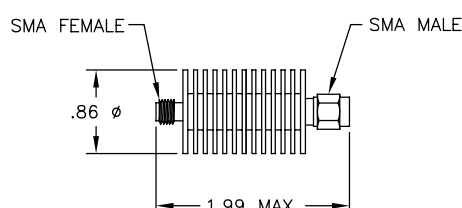
50HF-XXX-5 SMA



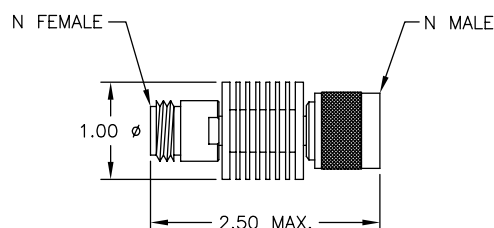
50HF-XXX-5 N



50HFP-XXX-10 SMA



50HFP-XXX-10 N



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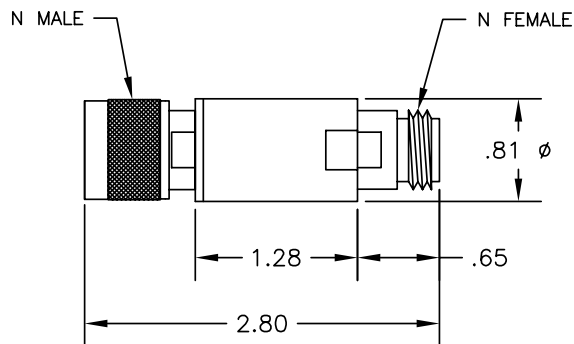
DC Passing Attenuators

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors	Input Power (@ +25° C)
50FFD-XXX	600-1950 MHz	1-30 dB	± 0.25 dB	1.3:1	BNC, N, SMA or TNC	+21 dBm
50FFP-XXX	400-2500 MHz	1-10 dB	± 0.4 dB	1.4:1	BNC, N, SMA or TNC	+21 dBm
75FFB-XXX	950-2150 MHz	3-20 dB	± 0.5 dB	1.5:1	BNC or F	1 Watt
75FFD-XXX	450-2000 MHz	3-20 dB	± 0.5 dB	1.4:1	BNC or F	1 Watt

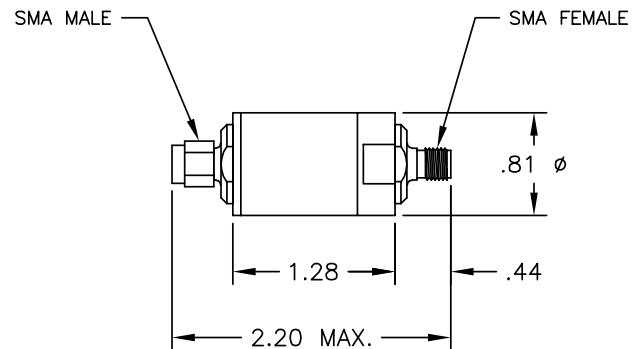
* (XXX) insert attenuation value - Consult Factory for other dB Values

Model	Impedance	Operating Temperature	Insertion Loss @ 10 MHz	DC Ratings	DC Resistance (Input to Output)
50FFD-XXX	50 Ohms	-40° C to +85° C	0.75 dB nominal @ 10 MHz	4 Amps/150 Volts	0.05 Ohms nominal
50FFP-XXX	50 Ohms	-40° C to +85° C	0.75 dB nominal @ 10 MHz	4 Amps/150 Volts	0.05 Ohms nominal
75FFB-XXX	75 Ohms	-40° C to +85° C	0.75 dB nominal @ 10 MHz	2 Amps/50 Volts	0.1 Ohms nominal
75FFD-XXX	75 Ohms	-40° C to +85° C	0.75 dB nominal @ 10 MHz	4 Amps/50 Volts	0.1 Ohms nominal

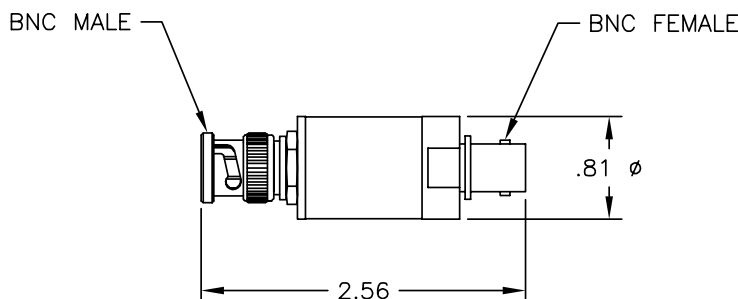
**50FFD-XXX N
50FFP-XXX N**



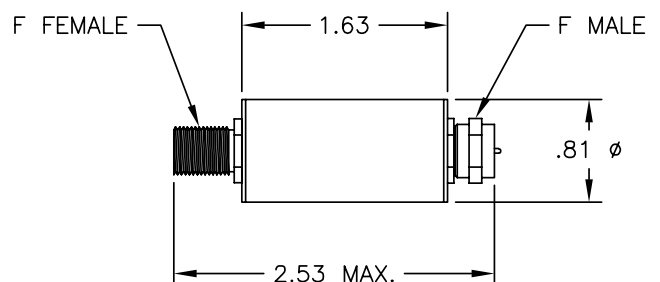
**50FFD-XXX SMA
50FFP-XXX SMA**



75FFB-XXX BNC



75FFD-XXX F



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Fixed Attenuator Kits

Model	Frequency Range	Impedance	Attenuators and Accessories	RF Connectors	Calibration Frequencies DC-18 GHz Models Only
50KFA-005	DC-2200 MHz	50 Ohms	one each: 1,2,3,6,10 and 20 dB Fixed Attenuators one each: 50 Ohm and 75 Ohm Feedthru Terminations one each: Impedance Matching Pad one each: N male to BNC female adapter one each: N female to BNC male adapter	BNC male/female	
50KFA-006	DC-2200 MHz	50 Ohms	one each: 1,2,3,6,10 and 20 dB Fixed Attenuators one each: BNC female to SMA male adapter one each: BNC male to SMA female adapter one each: N female to SMA male adapter	SMA male/female	
50KFA-008	DC-18 GHz	50 Ohms	one each: 50HF-003 N one each: 50HF-006 N one each: 50HF-010 N one each: 50HF-020 N	N male/female	DC, 4 GHz, 8 GHz, 12.4 GHz and 18 GHz
50KFA-014	DC-18 GHz	50 Ohms	one each: 50HF-003 SMA one each: 50HF-006 SMA one each: 50HF-010 SMA one each: 50HF-020 SMA	SMA male/female	DC, 4 GHz, 8 GHz, 12.4 GHz and 18 GHz
50KFA-074	DC-2200 MHz	50 Ohms	one each: 3,6,10 and 20 dB one each: male termination	BNC, N or SMA male/female	



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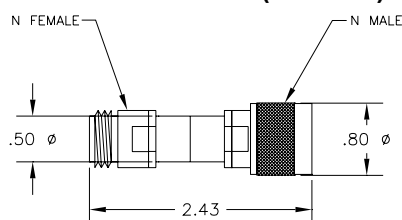
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2 Watt Fixed Attenuators FP Series

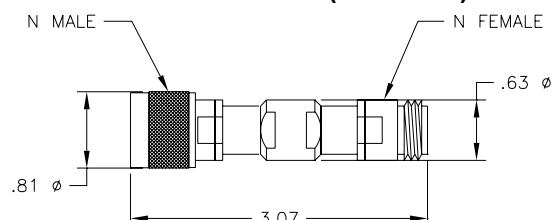
Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FP-XXX-H2	DC-2000 MHz	1 thru 30 dB in any 1 dB increment	± 0.3 dB or 2%	1.1:1 DC-500 MHz 1.3:1 500-2000 MHz	BNC, N, SMA, TNC, rev. pol TNC or 7/16
50FP-XXX-H2	DC-2000 MHz	31 thru 65 dB in any 1 dB increment	± 0.4 dB DC-500 MHz ± 0.8 dB 500-1000 MHz ± 1.0 dB 1000-2000 MHz	1.1:1 DC-500 MHz 1.3:1 500-2000 MHz	BNC, N, SMA, TNC, rev. pol TNC or 7/16
50FP-XXX-H3	DC-3000 MHz	1 thru 30 dB in any 1 dB increment	± 0.3 dB or 2%	1.3:1	BNC, N, SMA, TNC or 7/16
50FP-XXX-H4	DC-4000 MHz	1 thru 30 dB in any 1 dB increment	± 0.3 dB or 2% DC-2000 MHz ± 0.4 dB or 2% 2000-4000 MHz	1.15:1 DC-2000 MHz 1.25:1 2000-4000 MHz	BNC, N, SMA or TNC
50FP-XXX-H6	DC-6000 MHz	1 thru 20 dB in any 1 dB increment	± 0.3 dB DC-3000 MHz ± 0.4 dB 3000-4000 MHz ± 0.5 dB 4000-6000 MHz	1.15:1 DC-3000 MHz 1.30:1 3000-4000 MHz 1.35:1 4000-6000 MHz	N or SMA
* (XXX) insert attenuation value					

Common Specifications			
Impedance	Input Power (average)	Peak Power	Operating Temperature
50 Ohms	2 Watts @ +25° C (derate to 1 Watt @ +85° C)	1000 Watts	-55° C to +100° C

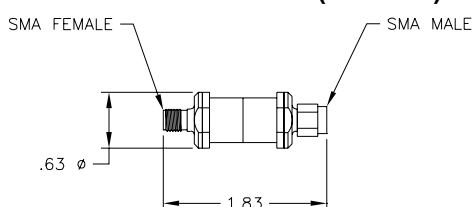
50FP-XXX-XX N (1-30 dB)



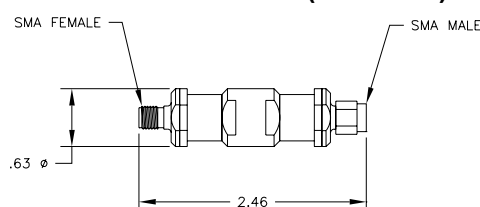
50FP-XXX-H2 N (31-65 dB)



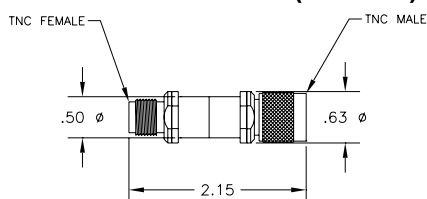
50FP-XXX-XX SMA (1-30 dB)



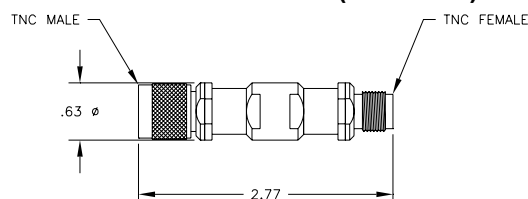
50FP-XXX-H2 SMA (31-65 dB)



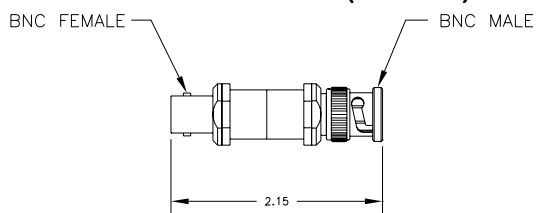
50FP-XXX-XX TNC (1-30 dB)



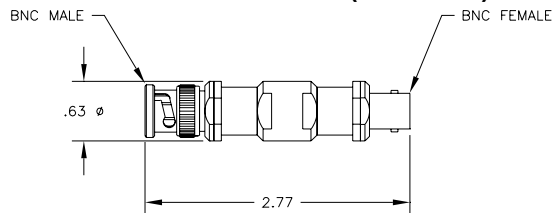
50FP-XXX-H2 TNC (31-65 dB)



50FP-XXX-XX BNC (1-30 dB)



50FP-XXX-H2 BNC (31-65 dB)



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5 Watt Fixed Attenuators FPE Series

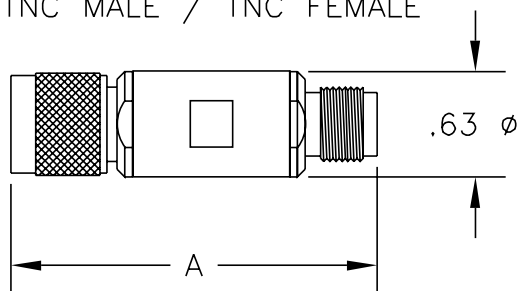
Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FPE-XXX	DC-6000 MHz	1 thru 40 dB in any 1 dB increment	± 0.30 dB DC-3000 MHz ± 0.40 dB 3000-4000 MHz ± 0.50 dB 4000-6000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-3000 MHz 1.3:1 3000-5000 MHz 1.35:1 5000-6000 MHz	N, SMA, TNC or reverse polarity TNC
50FPE-XXX	DC-4000 MHz	41 thru 60 dB in any 1 dB increment	± 0.75 dB	1.25:1	N, SMA, TNC or reverse polarity TNC
50FPE-XXX	DC-4000 MHz	1 thru 40 dB in any 1 dB increment	± 0.30 dB DC-3000 MHz ± 0.40 dB 3000-4000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-3000 MHz 1.3:1 3000-4000 MHz	BNC
* (XXX) insert attenuation value					

Common Specifications			
Impedance	Input Power (average)	Peak Power	Operating Temperature
50 Ohms	5 Watts @ +25° C (derate to 1 Watt @ +85° C)	1000 Watts	-55° C to +100° C

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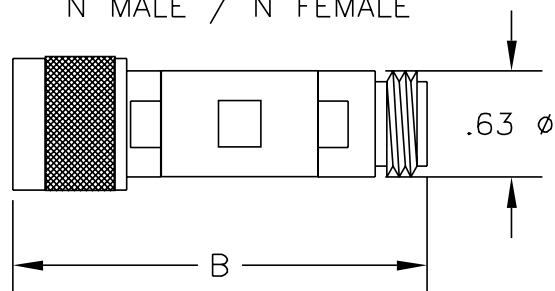
50FPE-XXX TNC

TNC MALE / TNC FEMALE



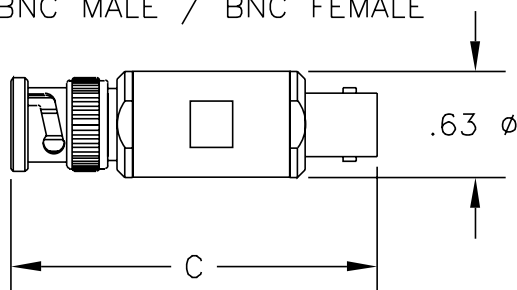
50FPE-XXX N

N MALE / N FEMALE



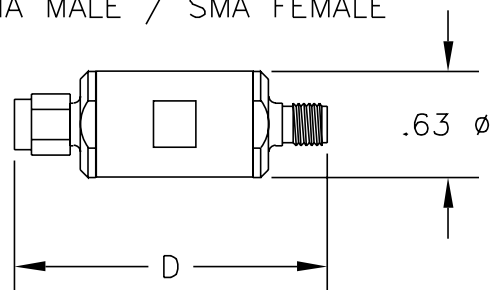
50FPE-XXX BNC

BNC MALE / BNC FEMALE



50FPE-XXX SMA

SMA MALE / SMA FEMALE



ATTENUATION	DIM: A	DIM: B	DIM: C	DIM: D
0-20 dB	2.16	2.45	2.16	1.85
21-60 dB	2.57	2.86	2.57	2.26

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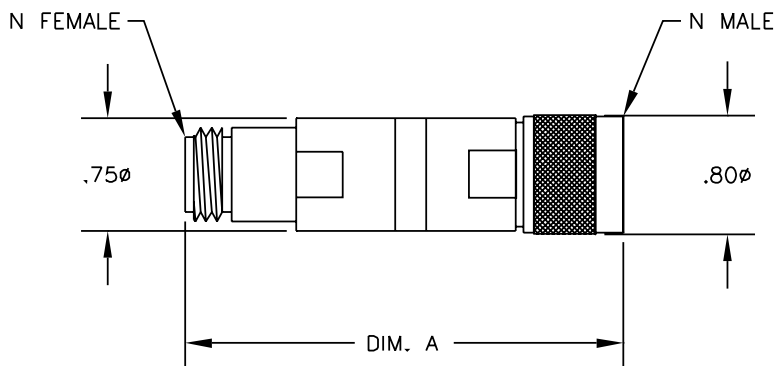
5 & 10 Watt Fixed Attenuators FH Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FH-XXX-5	DC-2000 MHz	1 thru 20 dB in any 1 dB increment	± 0.2 dB DC-500 MHz ± 0.5 dB 500-1000 MHz ± 0.8 dB 1000-2000 MHz	1.1:1 DC-500 MHz 1.2:1 500-1000 MHz 1.5:1 1000-2000 MHz	BNC, N, SMA, TNC or 7/16
50FH-XXX-5	DC-1000 MHz	21 thru 60 dB in any 1 dB increment	± 0.5 dB or 2% DC-500 MHz ± 4% 500-1000 MHz	1.2:1	BNC, N, SMA, TNC or 7/16
50FH-XXX-10	DC-2000 MHz	1 thru 20 dB in any 1 dB increment	± 0.2 dB DC-500 MHz ± 0.5 dB 500-1000 MHz ± 0.8 dB 1000-2000 MHz	1.1:1 DC-500 MHz 1.2:1 500-1000 MHz 1.5:1 1000-2000 MHz	BNC, N, SMA, TNC or 7/16

* (XXX) insert attenuation value

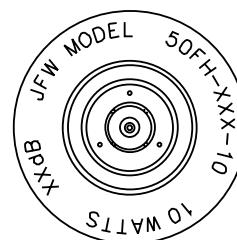
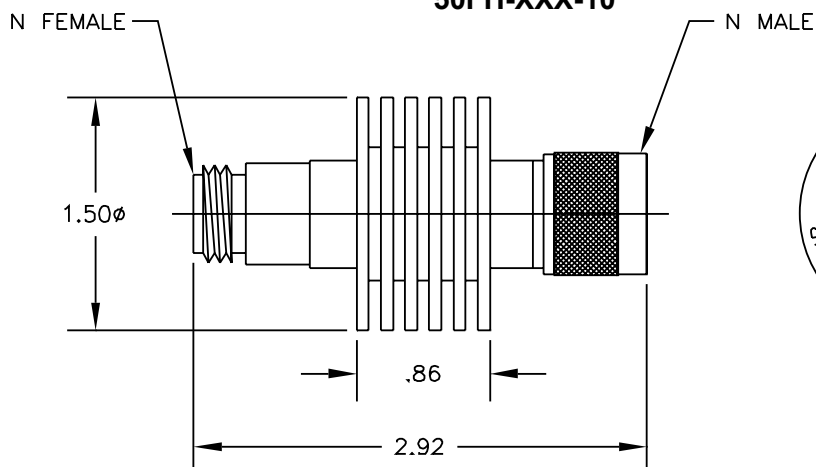
Model	Impedance	Input Power (@ +25° C)	Peak Power	Operating Temperature
50FH-XXX-5	50 Ohms	5 Watts	2000 Watts	-55° C to +100° C
50FH-XXX-10	50 Ohms	10 Watts	2000 Watts	-55° C to +100° C

50FH-XXX-5



dB VALUE	DIM. A
0-30 dB	2.92
31-60 dB	4.04

50FH-XXX-10



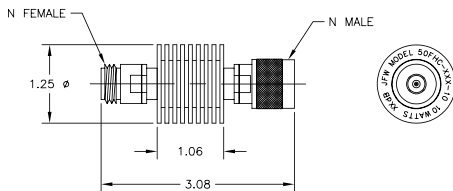
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10-50 Watt Fixed Attenuators FHC Series

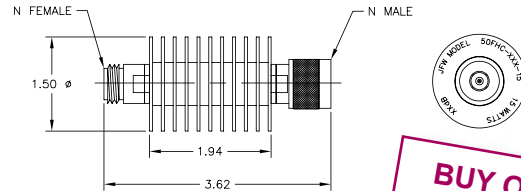
Model	Input Power (average)	Input Power Derating (average)	Impedance	RF Connectors
50FHC-XXX-10	10 Watts @ +25° C	5.0 Watts @ +70° C	50 Ohms	BNC, N, SMA, TNC or reverse polarity TNC
50FHC-XXX-15	15 Watts @ +25° C	7.5 Watts @ +70° C	50 Ohms	BNC, N, SMA, TNC, reverse polarity TNC or 7/16
50FHC-XXX-20	20 Watts @ +25° C	10.0 Watts @ +70° C	50 Ohms	BNC, N, SMA, TNC, reverse polarity TNC or 7/16
50FHC-XXX-25	25 Watts @ +25° C	12.5 Watts @ +70° C	50 Ohms	BNC, N, SMA, TNC, reverse polarity TNC or 7/16
50FHXC-XXX-40	40 Watts @ +25° C	20.0 Watts @ +70° C	50 Ohms	BNC, N, SMA, TNC, reverse polarity TNC or 7/16
50FHXC-XXX-50	50 Watts @ +25° C	25.0 Watts @ +70° C	50 Ohms	BNC, N, SMA, TNC, reverse polarity TNC or 7/16

Common Specifications					
Attenuation Values *	Frequency Range	Attenuation Accuracy	VSWR (maximum)	Peak Power	Operating Temperature
1 thru 30 dB in any 1 dB increment	DC-4000 MHz	DC-1000 MHz ± 0.25 dB 1-20 dB ± 0.5 dB 21-30 dB 1000-4000 MHz ± 0.5 dB 1-20 dB ± 0.75 dB 21-30 dB	1.15:1 DC-1000 MHz 1.35:1 1000-4000 MHz	1000 Watts	-55° C to +100° C
31 thru 60 dB in any 1 dB increment	DC-3000 MHz	± 2% DC-2000 MHz ± 3% 2000-3000 MHz	1.15:1 DC-1000 MHz 1.35:1 1000-3000 MHz	1000 Watts	-55° C to +100° C
* (XXX) insert attenuation value					

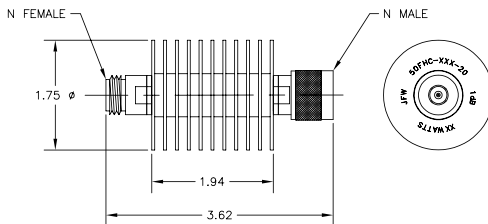
50FHC-XXX-10



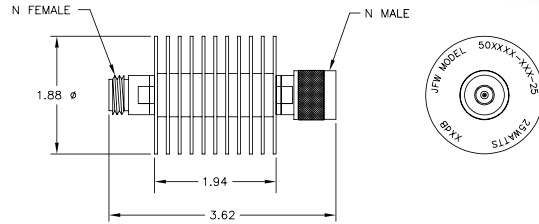
50FHC-XXX-15



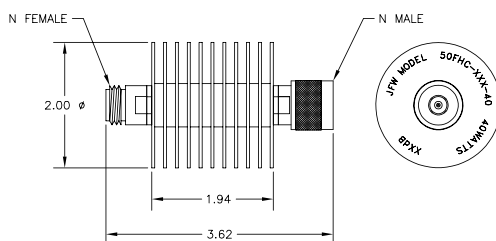
50FHC-XXX-20



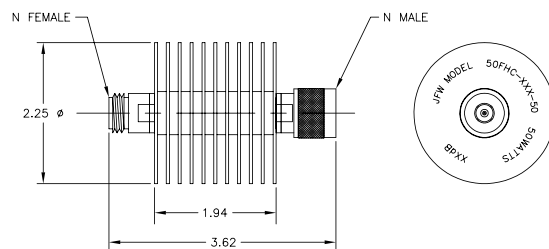
50FHC-XXX-25



50FHXC-XXX-40



50FHXC-XXX-50



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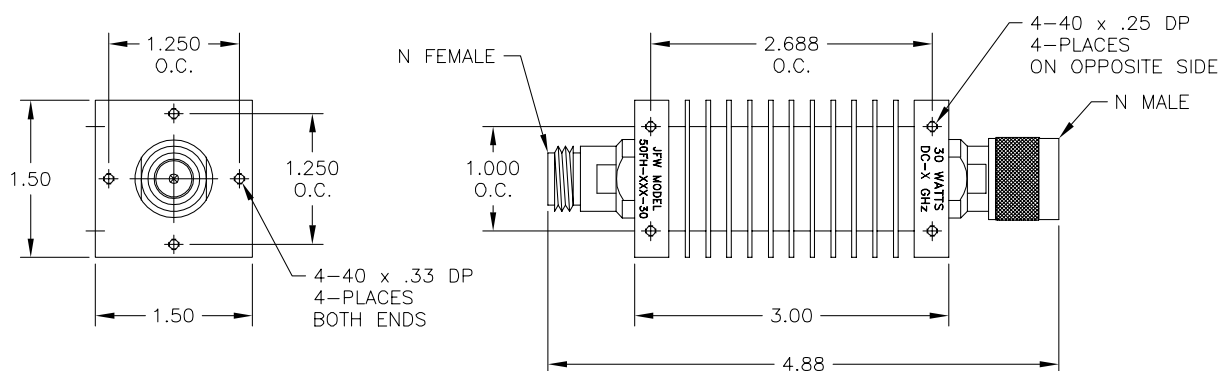
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30 & 50 Watt Fixed Attenuators FH Series

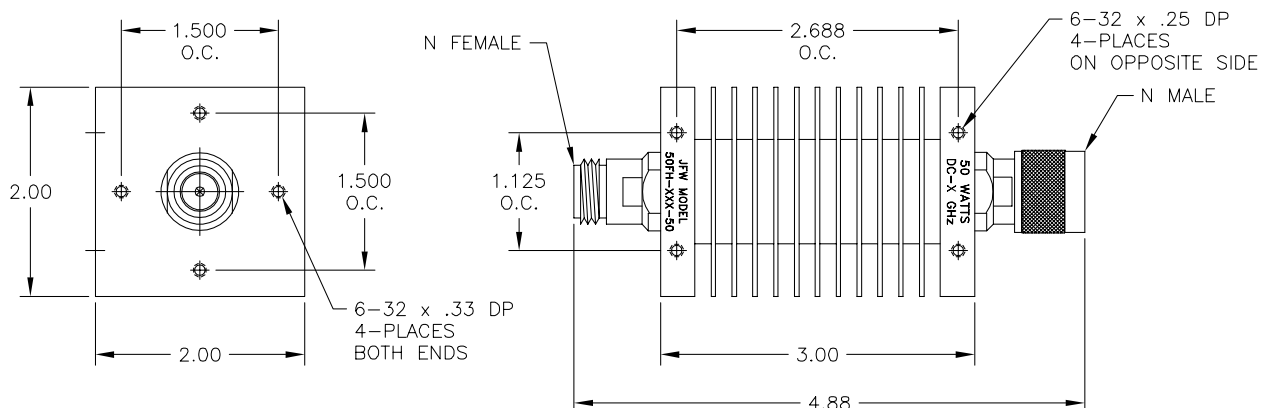
Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FH-XXX-30	DC-2000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.3:1 DC-1000 MHz 1.4:1 1000-2000 MHz	BNC, N, SMA, TNC or 7/16
50FH-XXX-30-3	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1	BNC, N, SMA, TNC or 7/16
50FH-XXX-50	DC-2000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.3:1 DC-1000 MHz 1.4:1 1000-2000 MHz	BNC, N, SMA, TNC or 7/16
50FH-XXX-50-3	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1	BNC, N, SMA, TNC or 7/16
* (XXX) insert attenuation value					

Model	Impedance	Input Power (average)	Peak Power	Operating Temperature
50FH-XXX-30 and -30-3	50 Ohms	30 Watts @ +25° C (derate to 15 Watts @ +85° C)	1000 Watts	-55° C to +100° C
50FH-XXX-50 and -50-3	50 Ohms	50 Watts @ +25° C (derate to 25 Watts @ +85° C)	1000 Watts	-55° C to +100° C

50FH-XXX-30



50FH-XXX-50

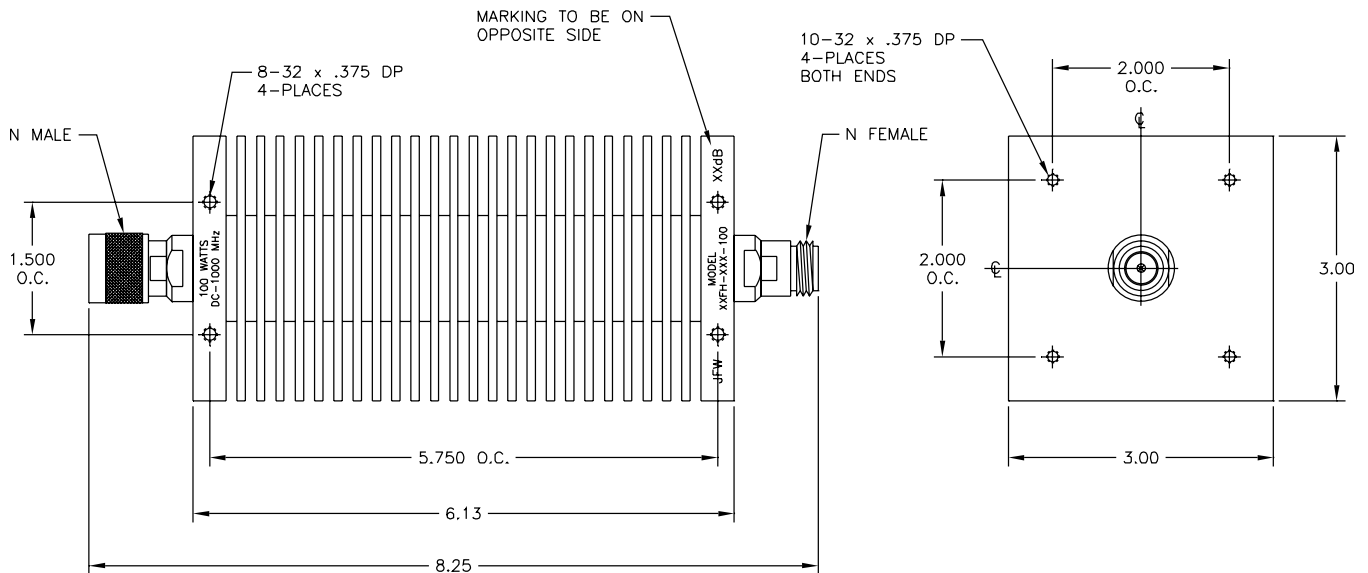


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100 Watt Fixed Attenuators FH Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FH-XXX-100	DC-1000 MHz	1 thru 50 dB in any 1 dB increment	± 0.3 dB	1.2:1	BNC, N, SMA, TNC or 7/16
50FH-XXX-100-2	DC-2000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.3:1 DC-1000 MHz 1.4:1 1000-2000 MHz	BNC, N, SMA, TNC or 7/16
50FH-XXX-100-3	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1	BNC, N, SMA, TNC or 7/16
* (XXX) insert attenuation value					

Common Specifications			
Impedance	Input Power (average)	Peak Power	Operating Temperature
50 Ohms	100 Watts @ +25° C (derate to 50 Watts @ +85° C)	1000 Watts	-55° C to +100° C



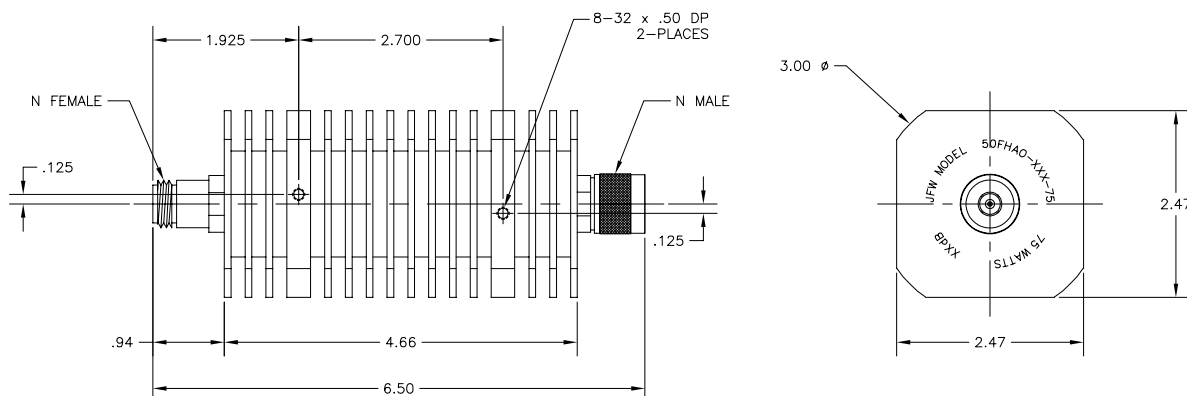
75 & 100 Watt Fixed Attenuator FHAO Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FHAO-XXX-75	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1 (1-14 dB) 1.3:1 (15-50 dB)	BNC, N, SMA, TNC or 7/16
50FHAO-XXX-100	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1 (1-14 dB) 1.3:1 (15-50 dB)	N or 7/16

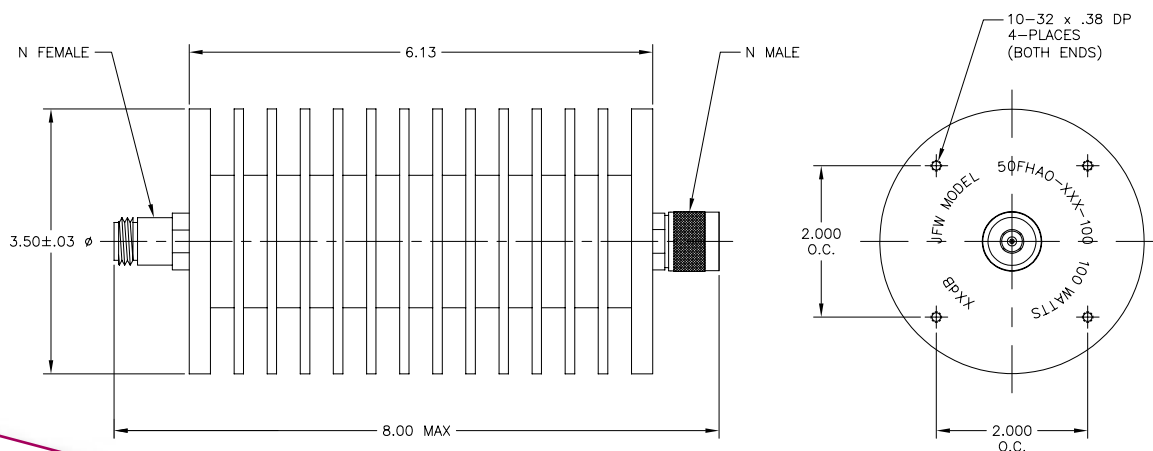
* (XXX) insert attenuation value

Model	Impedance	Input Power (average)	Peak Power	Operating Temperature
50FHAO-XXX-75	50 Ohms	75 Watts @ +25° C (derate to 37.5 Watts @ +85° C)	1000 Watts	-55° C to +100° C
50FHAO-XXX-100	50 Ohms	100 Watts @ +25° C (derate to 50 Watts @ +85° C)	1000 Watts	-55° C to +100° C

50FHAO-XXX-75



50FHAO-XXX-100



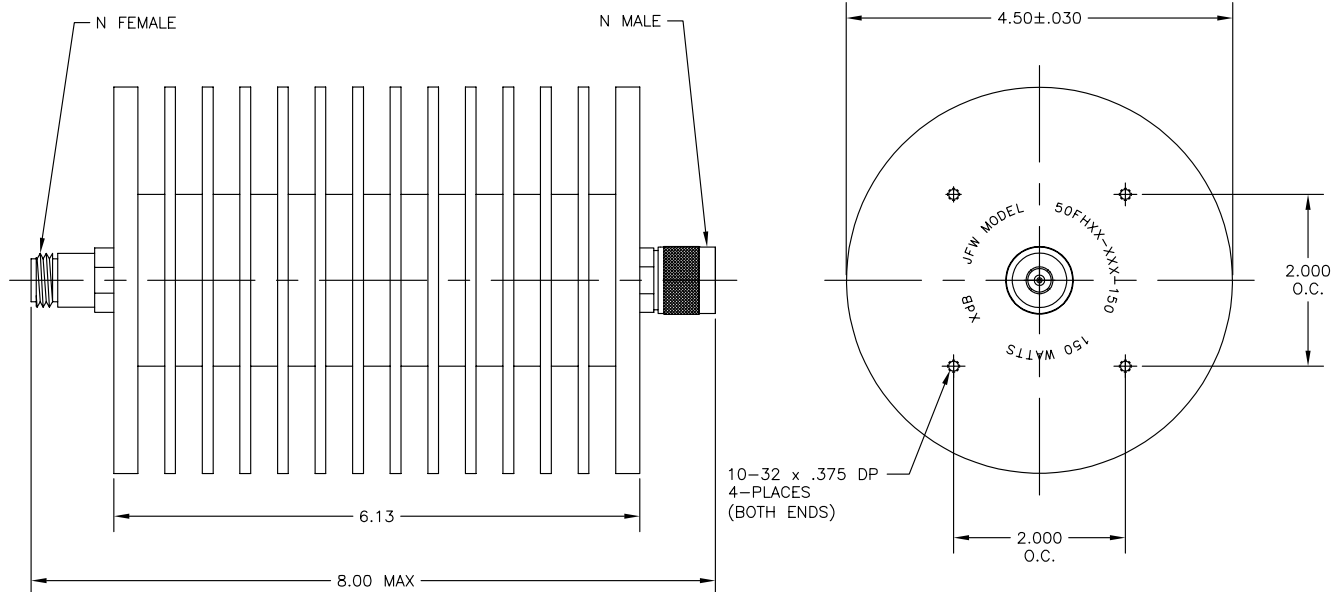
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150 Watt Fixed Attenuator FHAO Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connector
50FHAO-XXX-150	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1 (1-14 dB) 1.3:1 (15-50 dB)	N or 7/16
* (XXX) insert attenuation value					

Impedance	RF Input Power (average)	Peak Power	Operating Temperature
50 Ohms	150 Watts @ +25° C (derate to 75 Watts @ +85° C)	1000 Watts	-55° C to +100° C

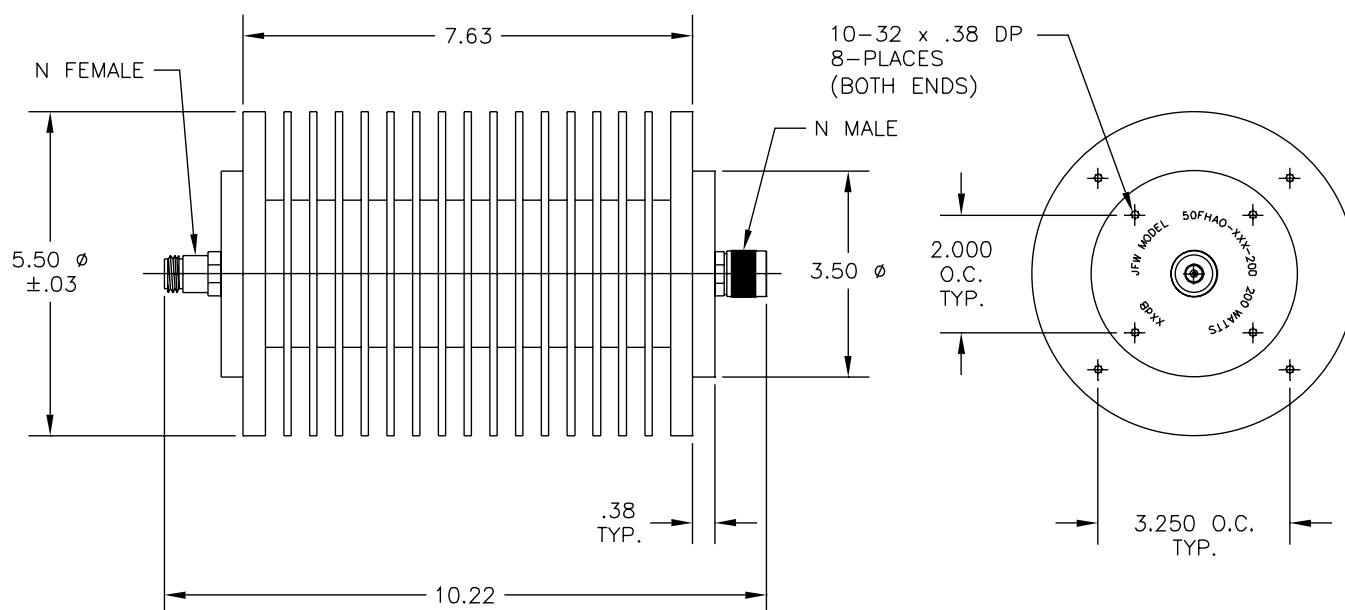


200 Watt Fixed Attenuator FHAO Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connector
50FHAO-XXX-200	DC-3000 MHz	1 thru 50 dB in any 1 dB increment	± 0.5 dB	1.4:1 (1-14 dB) 1.3:1 (15-50 dB)	N or 7/16
* (XXX) insert attenuation value					

Impedance	Input Power (average)	Peak Power	Operating Temperature
50 Ohms	200 Watts @ +25° C (derate to 100 Watts @ +85° C)	1000 Watts	-55° C to +100° C

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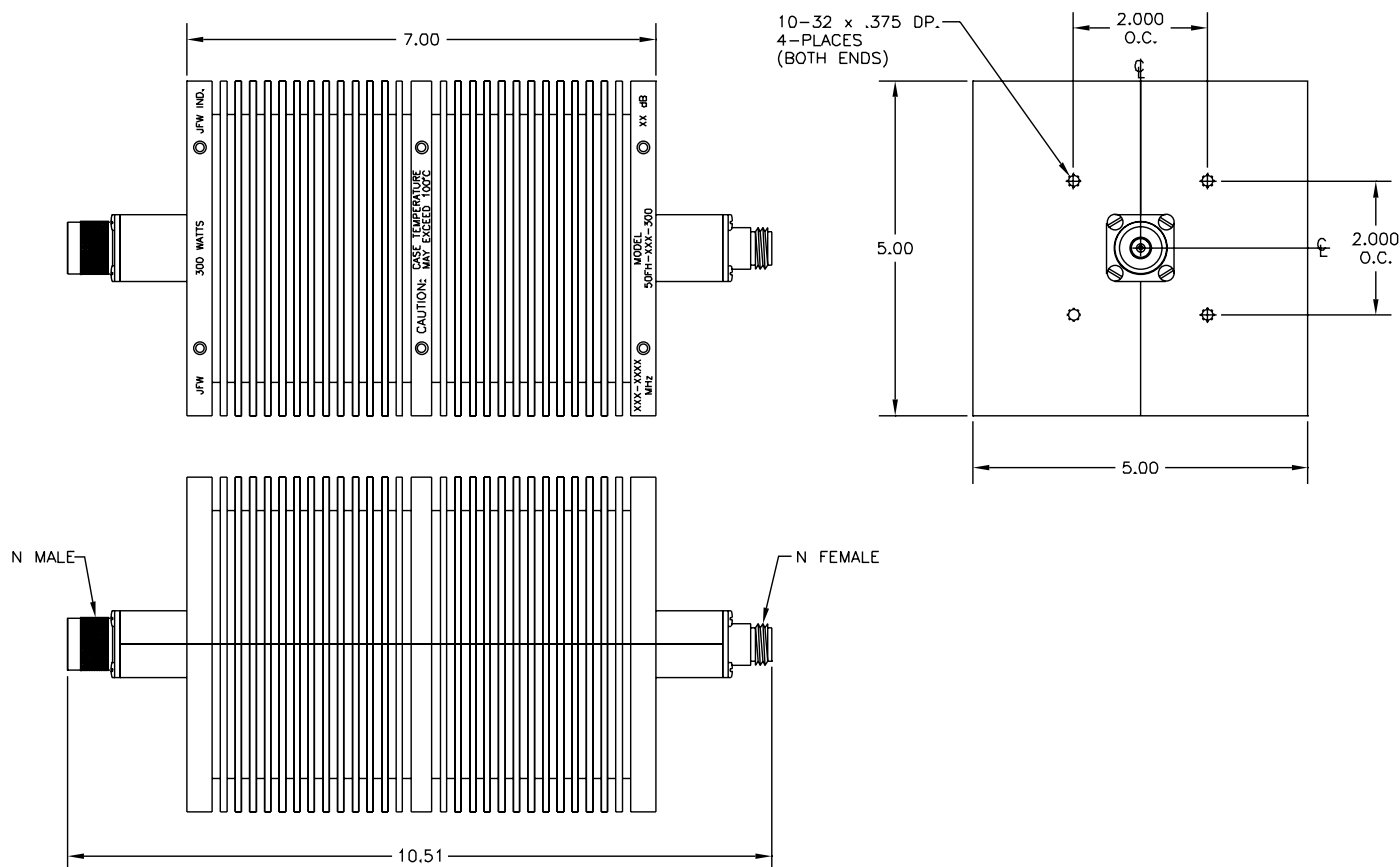
**High
Peak
Power**

300 Watt Fixed Attenuators FH Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FH-XXX-300	DC-1000 MHz	1 thru 30 dB in any 1 dB increment	± 0.5 dB or 2%	1.3:1	BNC, N, TNC or 7/16
50FH-XXX-300	DC-1000 MHz	31 thru 50 dB in any 1 dB increment	± 0.2 dB or 1% DC-250 MHz ± 0.3 dB or 2% 250-500 MHz ± 0.5 dB or 3% 500-1000 MHz	1.1:1 DC-250 MHz 1.15:1 250-500 MHz 1.25:1 500-1000 MHz	BNC, N, TNC or 7/16
50FH-XXX-300-2	DC-2000 MHz	3 thru 40 dB in any 1 dB increment	± 0.5 dB or 3%	1.4:1	N, TNC or 7/16

* (XXX) insert attenuation value

Common Specifications			
Impedance	Input Power (average)	Peak Power	Operating Temperature
50 Ohms	300 Watts @ +25° C (derate to 75 Watts @ +85° C)	2000 Watts	-55° C to +100° C

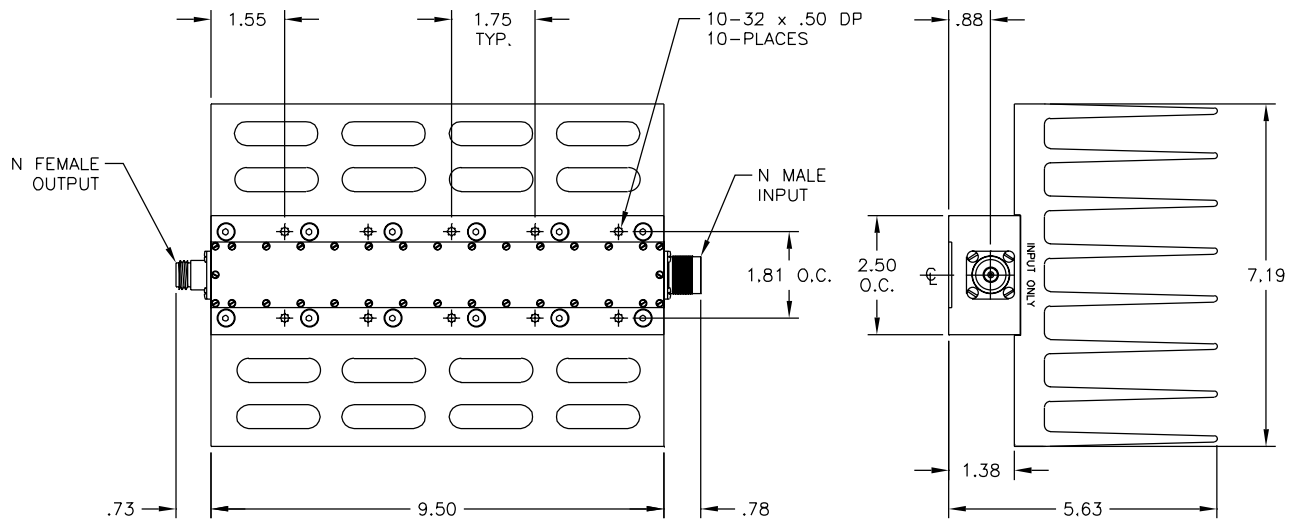


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500 Watt Fixed Attenuators FHDQ Series

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FHDQ-XXX-500	DC-1000 MHz	3 thru 40 dB in any 1 dB increment	± 0.5 dB	1.2:1	N, TNC or 7/16
50FHDQ-XXX-500-3	DC-3000 MHz	10, 20, 25, 30 or 40 dB	10 dB ± 0.5 dB 20 dB ± 0.6 dB 25 dB ± 0.7 dB 30 dB ± 0.8 dB 40 dB ± 0.8 dB	1.2:1 DC-1000 MHz 1.25:1 1000-1500 MHz 1.35:1 1500-3000 MHz	N, TNC or 7/16
* (XXX) insert attenuation value (other attenuation values available upon request)					

Common Specifications				
Impedance	Input Power (average) (uni-directional)	Reverse Power (average)	Peak Power	Operating Temperature
50 Ohms	500 Watts @ +25° C (derate to 50 Watts @ +100° C)	125 Watts @ +25° C	2500 Watts	-55° C to +100° C

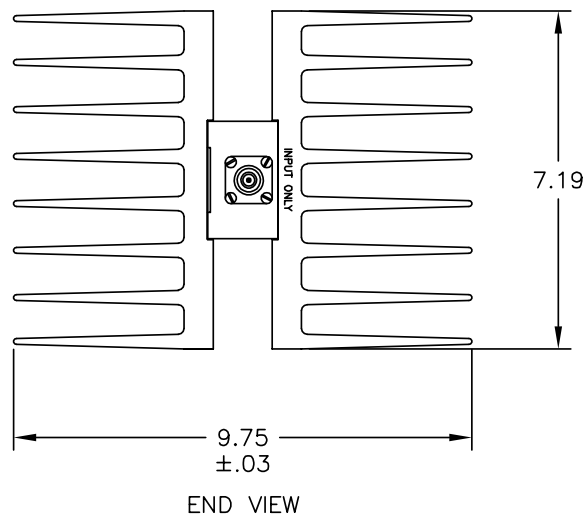
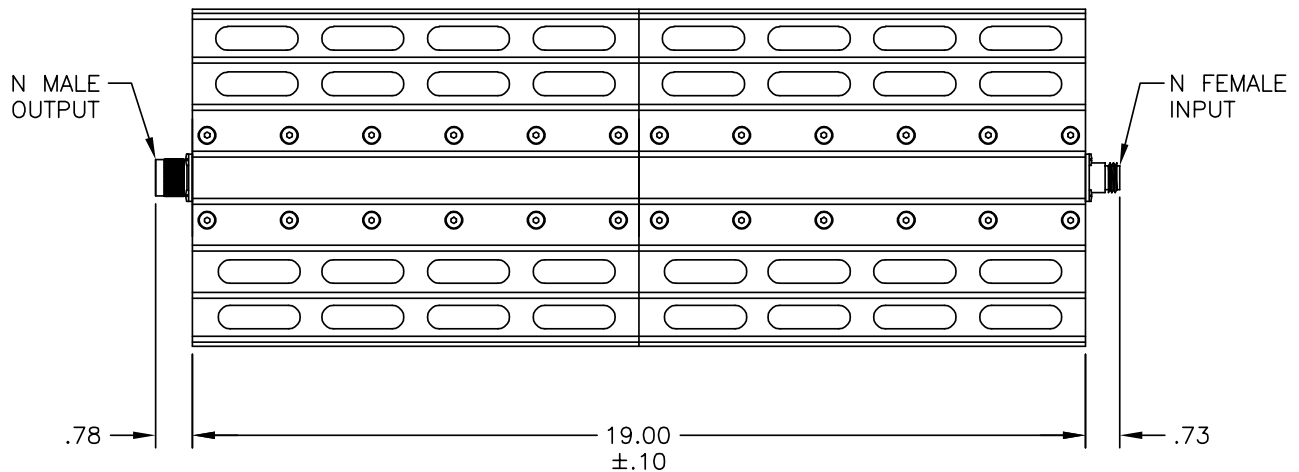


1000 Watt Fixed Attenuators

Model	Frequency Range	Attenuation Values *	Attenuation Accuracy	VSWR (maximum)	RF Connectors
50FHIE-XXX-1000	DC-3000 MHz	20, 30 and 40 dB	± 1.5 dB	1.4:1	N or 7/16
50FHIQ-XXX-1000	DC-1000 MHz	10, 20 and 30 dB	± 1.0 dB	1.3:1	N or 7/16

* (XXX) insert attenuation value
(other attenuation values available upon request)

Common Specifications				
Impedance	Input Power (average) (uni-directional)	Reverse Power (average)	Peak Power	Operating Temperature
50 Ohms	1000 Watts average @ +25° C Derated linearly to 100 Watts @ +100° C	125 Watts @ +25° C	4000 Watts	-55° C to +100° C



TERMINATIONS and MISMATCHES

JFW has a plethora of terminations with various impedance, input powers, RF connectors and mechanical configurations to choose from.

Each termination from JFW is designed and manufactured to the highest quality standards.



Available Features

- Terminations from DC-26.5 GHz
- Terminations from 1/2 Watt to 1000 Watts (CW)
- High peak power terminations (up to 20 kW pulses)
- 50 Ohm and 75 Ohm terminations (other impedance values also available upon request)
- Choose from many RF connectors (BNC, SMA, N, TNC, 7/16, F, reverse polarity and more)
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Terminations and Mismatches

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50T-455 SMA M).

Low Power - 50 Ohm			
Model Number	Frequency Range	Average Power	Page
50T-001	DC-2200 MHz	1 Watt	5-5
50T-002	DC-2200 MHz	1 Watt	5-5
50T-007	DC-8000 MHz	1 Watt	5-5
50T-008	DC-8000 MHz	1 Watt	5-5
50T-129	DC-18 GHz	1 Watt	5-4
50T-199	DC-18 GHz	2 Watts	5-4
50T-261	DC-2000 MHz	2 Watts	5-6
50T-300	DC-3000 MHz	2 Watts	5-6
50T-352	DC-6000 MHz	1 Watt	5-5
50T-363	DC-4000 MHz	2 Watts	5-6
50T-364	DC-2200 MHz	1 Watt	5-5
50T-376	DC-4000 MHz	2 Watts	5-6
50T-378	DC-2200 MHz	1 Watt	5-5
50T-455	DC-18 GHz	1 Watt	5-4
Low Power - 75 Ohm			
Model Number	Frequency Range	Average Power	Page
75T-001	DC-1000 MHz	1 Watt	5-3
75T-002	DC-1000 MHz	1 Watt	5-3
75T-018	DC-2150 MHz	1 Watt	5-3
75T-019	DC-2150 MHz	1 Watt	5-3
75T-035	DC-2150 MHz	2 Watts	5-3

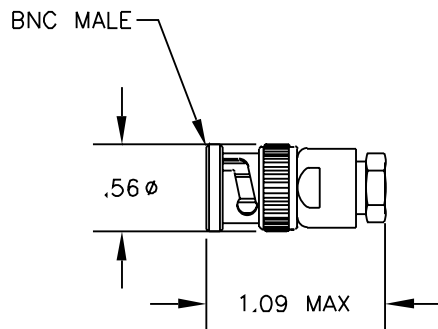
Medium Power - 50 Ohm			
Model Number	Frequency Range	Average Power	Page
50T-034-XXX	DC-1000 MHz	50 Watts	5-10
50T-128	DC-18 GHz	5 Watts	5-4
50T-191	DC-18 GHz	5 Watts	5-4
50T-358-XXX	DC-3000 MHz	20 Watts	5-8
50T-359-XXX	DC-3000 MHz	15 Watts	5-8
50T-410	DC-4000 MHz	5 Watts	5-7
50T-439-XXX	DC-3000 MHz	10 Watts	5-8
50T-440-XXX	DC-3000 MHz	25 Watts	5-8
50T-473-XXX	DC-1000 MHz	5 Watts	5-7
50T-474	DC-2000 MHz	5 Watts	5-7
50T-506	DC-3000 MHz	50 Watts	5-8
50T-507	DC-3000 MHz	40 Watts	5-8
50T-532	DC-3000 MHz	50 Watts	5-10
50T-533	DC-6000 MHz	50 Watts	5-10
50T-548	DC-3000 MHz	30 Watts	5-9
50T-549	DC-3000 MHz	75 Watts	5-11
50T-552	DC-2000 MHz	50 Watts	5-10
50T-553-XXX	DC-1000 MHz	30 Watts	5-9
50T-554	DC-2000 MHz	30 Watts	5-9

High Power - 50 Ohm			
Model Number	Frequency Range	Average Power	Page
50T-032-XXX	DC-1000 MHz	100 Watts	5-11
50T-069-XXX	DC-1000 MHz	300 Watts	5-15
50T-133-XXX	DC-1000 MHz	200 Watts	5-14
50T-242	DC-2000 MHz	100 Watts	5-11
50T-243	DC-3000 MHz	100 Watts	5-11
50T-303-XXX	DC-3000 MHz	100 Watts	5-12
50T-338-XXX	DC-3000 MHz	200 Watts	5-13
50T-350	DC-3000 MHz	150 Watts	5-12
50T-390	DC-6000 MHz	100 Watts	5-12
50T-420	DC-1000 MHz	500 Watts	5-16
50T-421	DC-3000 MHz	500 Watts	5-16
50T-495	DC-3000 MHz	1000 Watts	5-17
50T-513	DC-300 MHz	1000 Watts	5-17
50T-521	DC-1000 MHz	1000 Watts	5-17

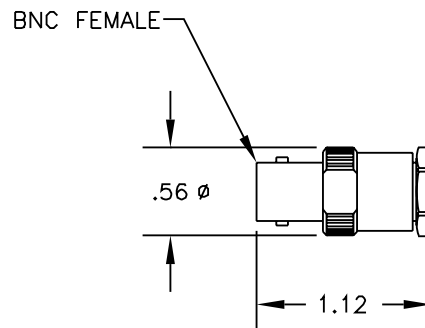
75 Ohm Terminations

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power (@ +25° C)	Peak Power	Operating Temperature	RF Connectors
75T-001	75 Ohms	DC-1000 MHz	1.1:1	1 Watt	1000 Watts	-20° C to +100° C	BNC male
75T-002	75 Ohms	DC-1000 MHz	1.1:1	1 Watt	1000 Watts	-20° C to +100° C	BNC female
75T-018	75 Ohms	DC-2150 MHz	1.1:1 DC-1000 MHz 1.15:1 1000–2150 MHz	1 Watt	1000 Watts	-55° C to +85° C	F female
75T-019	75 Ohms	DC-2150 MHz	1.1:1 DC-1000 MHz 1.15:1 1000–2150 MHz	1 Watt	1000 Watts	-55° C to +85° C	F male Thread-On with .024" diameter center conductor
75T-035	75 Ohms	DC-2150 MHz	1.15:1 DC-1000 MHz 1.25:1 1000–2150 MHz	2 Watts	1000 Watts	-20° C to +100° C	BNC or N

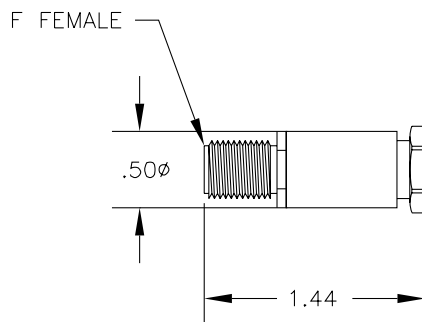
75T-001



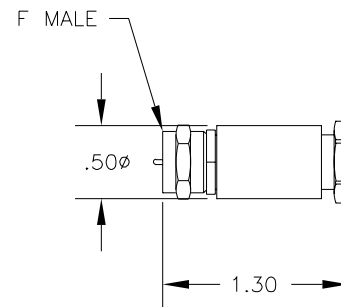
75T-002



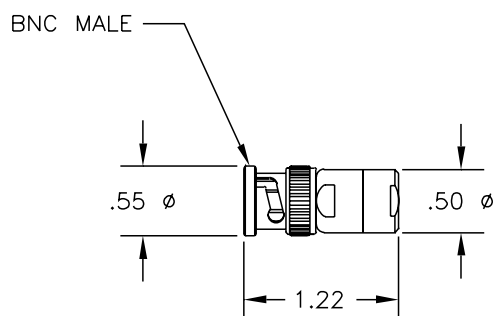
75T-018



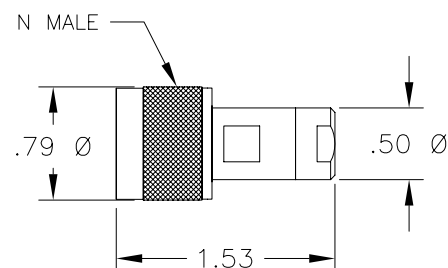
75T-019



75T-035 BNC M



75T-035 N M



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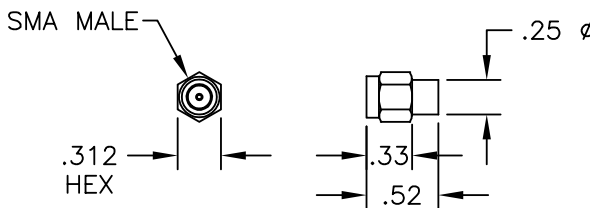
High Frequency Terminations

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power	Peak Power	Operating Temperature	RF Connectors
50T-128	50 Ohms	DC-18 GHz	1.1:1 DC-4 GHz 1.15:1 4-8 GHz 1.2:1 8-12.4 GHz 1.25:1 12.4-18 GHz	5 Watts @ +25° C derated linearly to 1 Watt @ +125° C	250 Watts (5 microseconds)	-55° C to +125° C	SMA male or female
50T-129	50 Ohms	DC-18 GHz	1.05:1 DC-4 GHz 1.15:1 4-8 GHz 1.2:1 12.4-18 GHz	1 Watt @ +25° C	1000 Watts (5 microseconds)	-65° C to +125° C	SMA female
50T-191	50 Ohms	DC-18 GHz	1.1:1 DC-4 GHz 1.15:1 4-8 GHz 1.2:1 8-12.4 GHz 1.25:1 12.4-18 GHz	5 Watts @ +25° C derated linearly to 1 Watt @ +125° C	250 Watts (5 microseconds)	-65° C to +125° C	N male or female
50T-199	50 Ohms	DC-18 GHz	1.15:1 DC-8 GHz 1.2:1 8-12.4 GHz 1.3:1 12.4-18 GHz	2 Watts @ +25° C derated linearly to 1 Watt @ +125° C	2500 Watts (5 microseconds)	-65° C to +125° C	N male
50T-455	50 Ohms	DC-18 GHz	1.05:1 DC-4 GHz 1.15:1 4-12.4 GHz 1.2:1 12.4-18 GHz	1 Watt @ +25° C	1000 Watts (5 microseconds)	-65° C to +125° C	SMA male

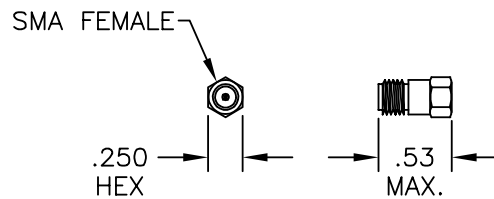
Low
Cost

Low
Cost

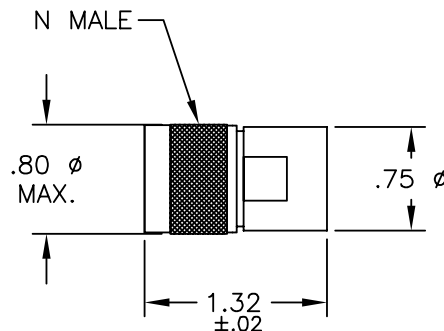
50T-455



50T-129

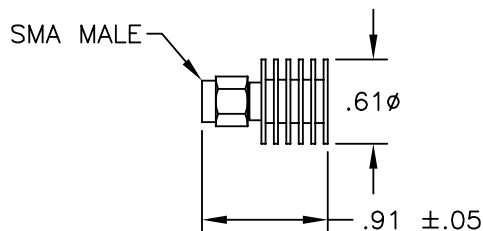


50T-199

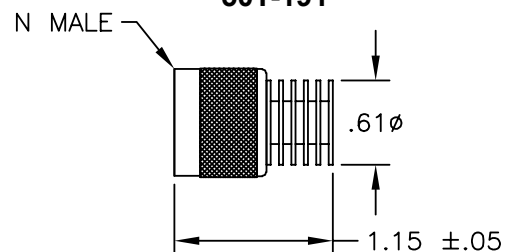


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50T-128



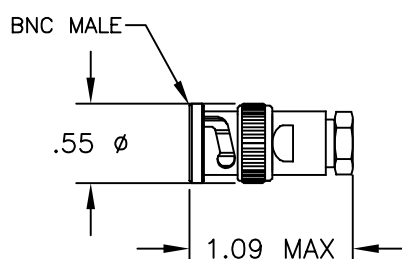
50T-191



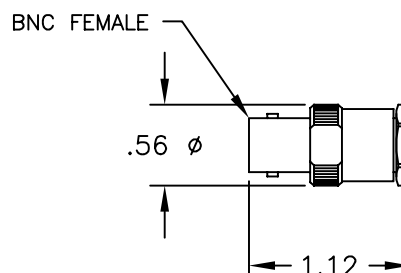
1 Watt Terminations

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power (@ +25° C)	Peak Power	Operating Temperature	RF Connectors
50T-001	50 Ohms	DC-2200 MHz	1.1:1 DC-2000 MHz 1.15:1 2000-2200 MHz	1 Watt	1000 Watts	-20° C to +100° C	BNC male
50T-002	50 Ohms	DC-2200 MHz	1.1:1 DC-2000 MHz 1.15:1 2000-2200 MHz	1 Watt	1000 Watts	-20° C to +100° C	BNC female
50T-007	50 Ohms	DC-8000 MHz	1.1:1 DC-4000 MHz 1.25:1 4000-8000 MHz	1 Watt	1000 Watts	-20° C to +100° C	N male
50T-008	50 Ohms	DC-8000 MHz	1.1:1 DC-4000 MHz 1.25:1 4000-8000 MHz	1 Watt	1000 Watts	-20° C to +100° C	N female
50T-352	50 Ohms	DC-6000 MHz	1.05:1 DC-1000 MHz 1.1:1 1000-2000 MHz 1.2:1 2000-4000 MHz 1.25:1 4000-6000 MHz	1 Watt	1000 Watts	-20° C to +100° C	N male
50T-364	50 Ohms	DC-2200 MHz	1.05:1 DC-500 MHz 1.1:1 500-1000 MHz 1.2:1 1000-2200 MHz	1 Watt	1000 Watts	-20° C to +100° C	N male
50T-378	50 Ohms	DC-2200 MHz	1.05:1 DC-500 MHz 1.1:1 500-1000 MHz 1.2:1 1000-2200 MHz	1 Watt	1000 Watts	-20° C to +100° C	N female

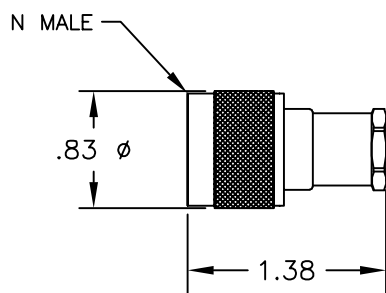
50T-001



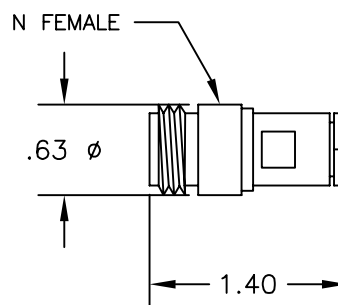
50T-002



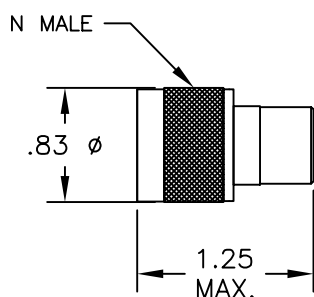
50T-007



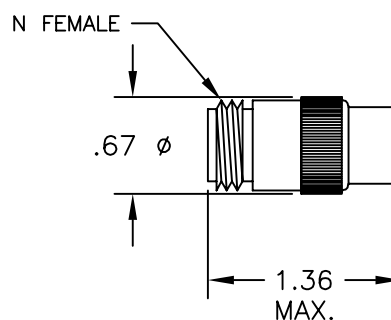
50T-008



50T-352 / 50T-364



50T-378



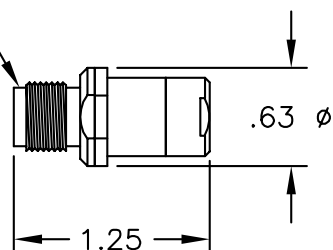
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2 Watt Terminations

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power (@ +25° C)	Peak Power	Operating Temperature	RF Connectors
50T-261	50 Ohms	DC-2000 MHz	1.1:1	2 Watts	1000 Watts	-20° C to +100° C	7/16 male or female
50T-300	50 Ohms	DC-3000 MHz	1.1:1 DC-1500 MHz 1.2:1 1500-3000 MHz	2 Watts	1000 Watts	-55° C to +125° C	TNC Reverse Polarity male or female
50T-363	50 Ohms	DC-4000 MHz	1.1:1 DC-2000 MHz 1.2:1 2000-4000 MHz	2 Watts	1000 Watts	-20° C to +100° C	7/16 male or female
50T-376	50 Ohms	DC-4000 MHz	1.1:1	2 Watts	1000 Watts	-20° C to +85° C	BNC, N SMA, TNC male or female

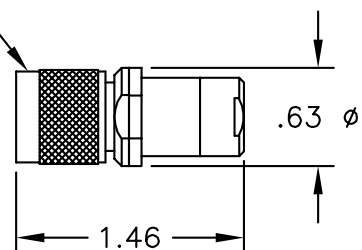
50T-300

TNC FEMALE
REVERSE POLARITY
(MALE CONTACT)



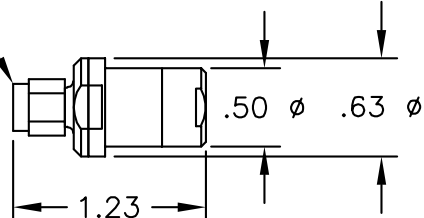
50T-300

TNC MALE
REVERSE POLARITY
(FEMALE CONTACT)

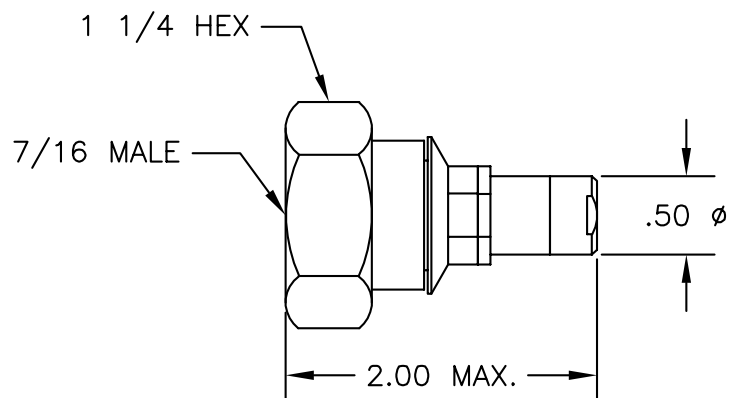


50T-376

SMA MALE

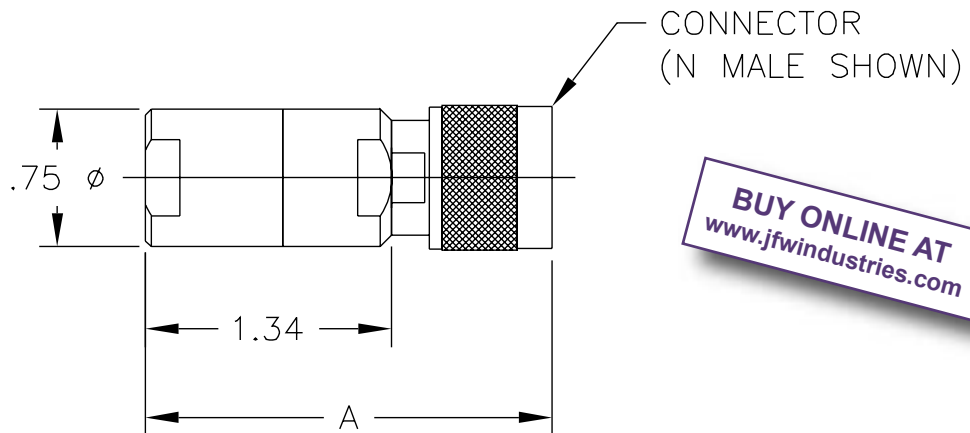


50T-261 / 50T-363



5 Watt Terminations and Mismatches

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power (@ +25° C)	Peak Power	Operating Temperature	RF Connectors
50T-473-XXX*	50 Ohms	DC-1000 MHz	1.10:1 (1.0:1) +/- 5% (all mismatch values)	5 Watts	1000 Watts	-40° C to +85° C	BNC, N, SMA, TNC or reverse polarity TNC (male or female)
50T-474	50 Ohms	DC-2000 MHz	1.10:1	5 Watts	1000 Watts	-40° C to +85° C	BNC, N, SMA, TNC or reverse polarity TNC (male or female)
50T-410	50 Ohms	DC-4000 MHz	1.15:1	5 Watts	1000 Watts	-40° C to +85° C	BNC, N, SMA, TNC or reverse polarity TNC (male or female)
*Insert VSWR required (1.0, 1.1, 1.2, 1.5, 2.0, 2.5, 3.0, 3.5, 5.0, or 6.0). Other VSWR available upon request. (Termination = 50T-473-1.0) (1.5:1 Mismatch = 50T-473-1.5) (5.0:1 Mismatch = 50T-473-5.0)							



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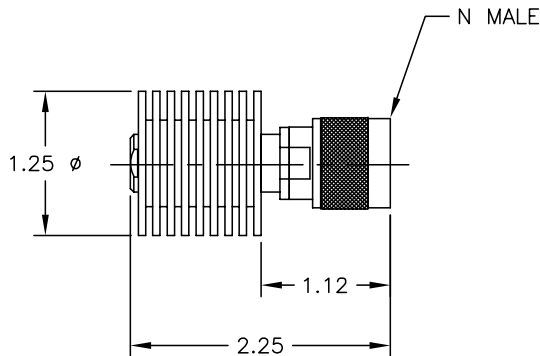
CONNECTOR	SMA M.	SMA F.	BNC M.	BNC F.	TNC M.	TNC F.	N M.	N F.
DIM: A	1.82	1.78	2.06	1.86	2.06	1.86	2.22	1.99

10-50 Watt Terminations and Mismatches

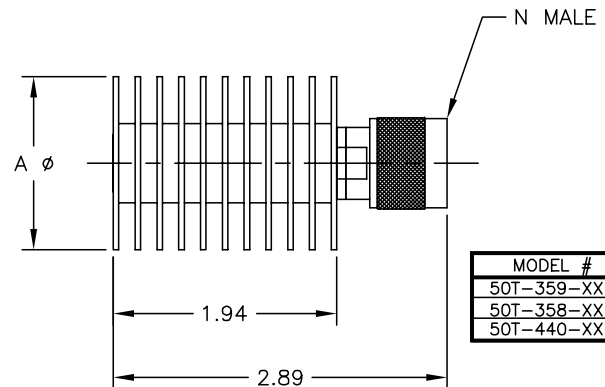
Model	Input Power (@ +25° C)	Impedance	Frequency Range	VSWR	Peak Power	Operating Temperature	RF Connectors
50T-439-XXX*	10 Watts	Referenced to 50 Ohms	DC-3 GHz	1.15:1 maximum (1.0:1) ± 10% (all mismatch values)	1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female
50T-359-XXX*	15 Watts	Referenced to 50 Ohms	DC-3 GHz	1.15:1 maximum (1.0:1) ± 10% (all mismatch values)	1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female
50T-358-XXX*	20 Watts	Referenced to 50 Ohms	DC-3 GHz	1.15:1 maximum (1.0:1) ± 10% (all mismatch values)	1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female
50T-440-XXX*	25 Watts	Referenced to 50 Ohms	DC-3 GHz	1.15:1 maximum (1.0:1) ± 10% (all mismatch values)	1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female
50T-507-XXX*	40 Watts	Referenced to 50 Ohms	DC-3 GHz	1.15:1 maximum (1.0:1) ± 10% (all mismatch values)	1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female
50T-506-XXX*	50 Watts	Referenced to 50 Ohms	DC-3 GHz	1.15:1 maximum (1.0:1) ± 10% (all mismatch values)	1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female

*Insert VSWR required (1.0:1 through 5.0:1 in any 0.1 increment). Other VSWR available upon request.
(Termination = 50T-439-1.0) (1.5:1 Mismatch = 50T-439-1.5) (5.0:1 Mismatch = 50T-439-5.0)

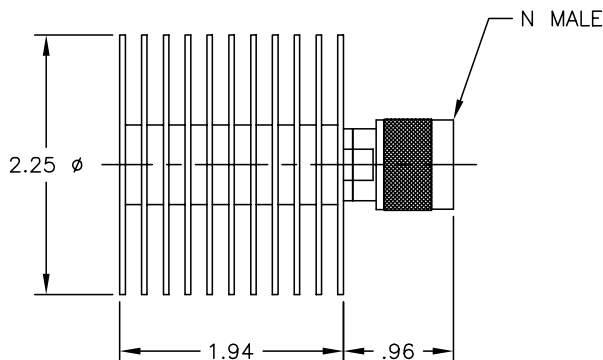
**50T-439
(10W)**



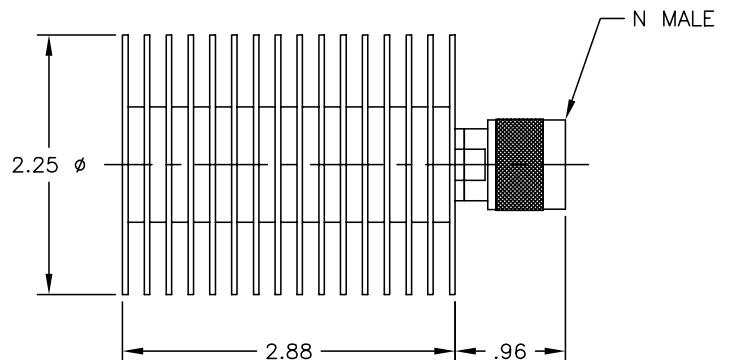
**50T-359 / 50T-358 / 50T-440
(15W) (20W) (25W)**



**50T-507
(40W)**



**50T-506
(50W)**

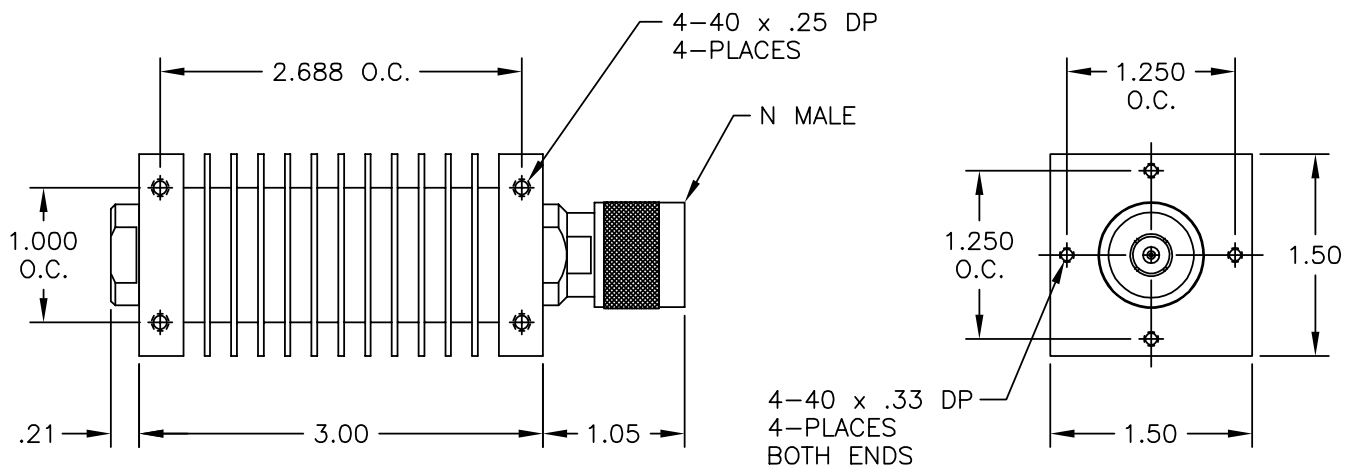


30 Watt Terminations and Mismatches

Model	Impedance	Frequency Range	VSWR (maximum)	RF Connectors
50T-553-XXX*	Referenced to 50 Ohms	DC-1000 MHz	1.10:1 (termination i.e. 1.0:1) $\pm 5\%$ (all mismatch values)	BNC, N, SMA, TNC or 7/16 male or female
50T-554	50 Ohms	DC-2000 MHz	1.1:1	BNC, N, SMA, TNC or 7/16 male or female
50T-548	50 Ohms	DC-3000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-3000 MHz	BNC, N, SMA, TNC or 7/16 male or female

*Insert VSWR required (1.0:1 through 8.0:1 in any 0.1 increment). Other VSWR available upon request.
(Termination = 50T-553-1.0) (1.5:1 Mismatch = 50T-553-1.5) (5.0:1 Mismatch = 50T-553-5.0)

Common Specifications		
Input Power (average)	Peak Power	Operating Temperature
30 Watts @ +25° C (derate to 15 Watts @ +85° C)	1000 Watts	-55° C to +100° C

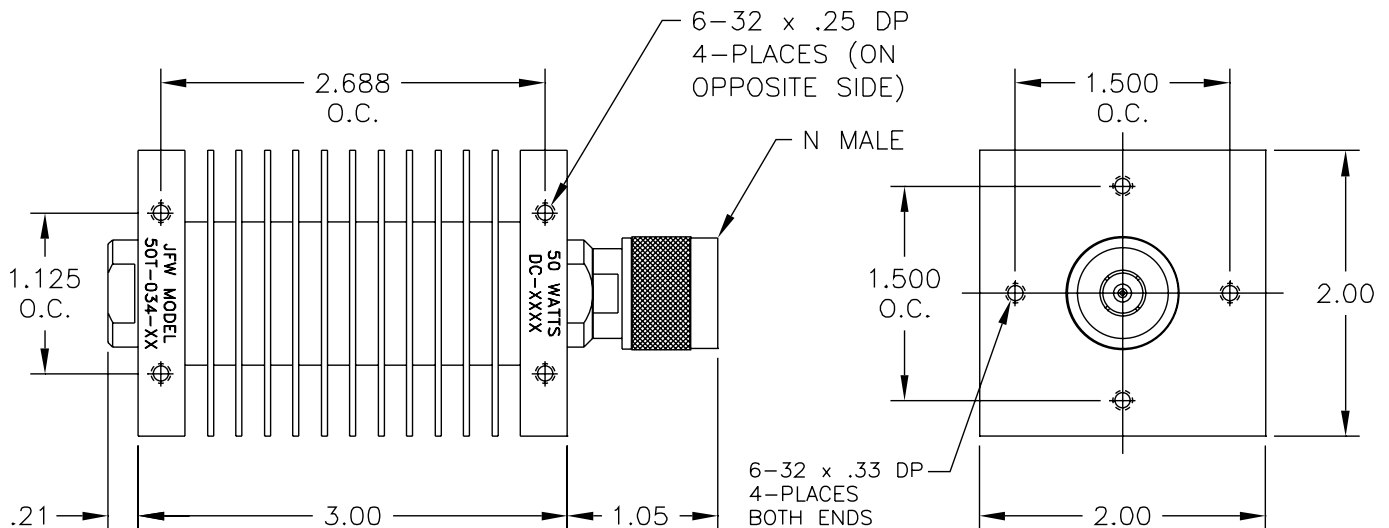


50 Watt Terminations and Mismatches

Model	Impedance	Frequency Range	VSWR (maximum)	RF Connectors
50T-034-XXX*	Referenced to 50 Ohms	DC-1000 MHz	1.10:1 (termination i.e. 1.0:1) $\pm$ 5% (all mismatch values)	BNC, N, SMA, TNC or 7/16 male or female
50T-552	50 Ohms	DC-2000 MHz	1.1:1	BNC, N, SMA, TNC or 7/16 male or female
50T-532	50 Ohms	DC-3000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-3000 MHz	N, SMA or 7/16 male or female
50T-533	50 Ohms	DC-6000 MHz	1.2:1 DC-3000 MHz 1.35:1 3000-6000 MHz	N, SMA or 7/16 male or female

*Insert VSWR required (1.0:1, 1.1:1, 1.2:1, 1.5:1, 2.0:1, 2.5:1, 3.0:1, 3.5:1, 4.0:1, 4.5:1, 5.0:1 and 8.0:1). Other VSWR available upon request.
(Termination = 50T-034-1.0) (1.5:1 Mismatch = 50T-034-1.5) (5.0:1 Mismatch = 50T-034-5.0)

Common Specifications		
Input Power (average)	Peak Power	Operating Temperature
50 Watts @ +25° C (derate to 25 Watts @ +85° C)	1000 Watts	-55° C to +100° C



75 & 100 Watt Terminations and Mismatches

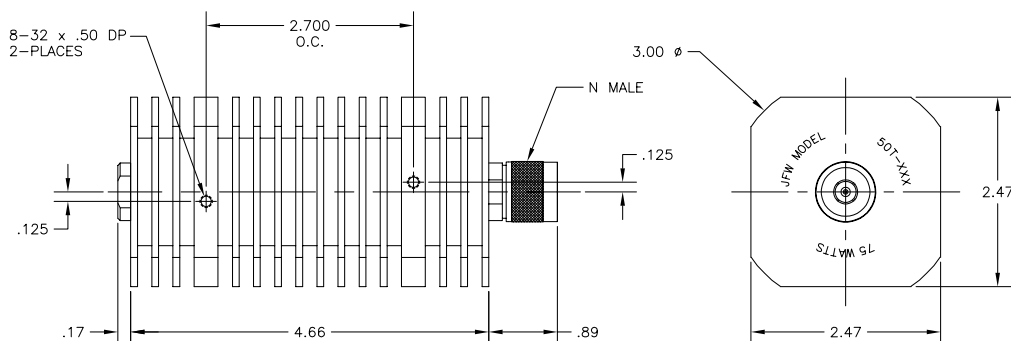
Model	Impedance	Frequency Range	VSWR (maximum)	Input Power (average)
50T-549	50 Ohms	DC-3000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-3000 MHz	75 Watts @ +25° C (derate to 37.5 Watts @ +85° C)
50T-032-XXX*	Referenced to 50 Ohms	DC-1000 MHz	1.10:1 (termination i.e. 1.0:1) ± 5% (all mismatch values)	100 Watts @ +25° C (derate to 50 Watts @ +85° C)
50T-242	50 Ohms	DC-2000 MHz	1.1:1	100 Watts @ +25° C (derate to 50 Watts @ +85° C)
50T-243	50 Ohms	DC-3000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-3000 MHz	100 Watts @ +25° C (derate to 50 Watts @ +85° C)

*Insert VSWR required (1.0:1, 1.1:1, 1.2:1, 1.5:1, 2.5:1, 3.0:1, 3.5:1, 5.0:1 or 6.0:1). Other VSWR available upon request.
(Termination = 50T-032-1.0) (1.5:1 Mismatch = 50T-032-1.5) (5.0:1 Mismatch = 50T-032-5.0)

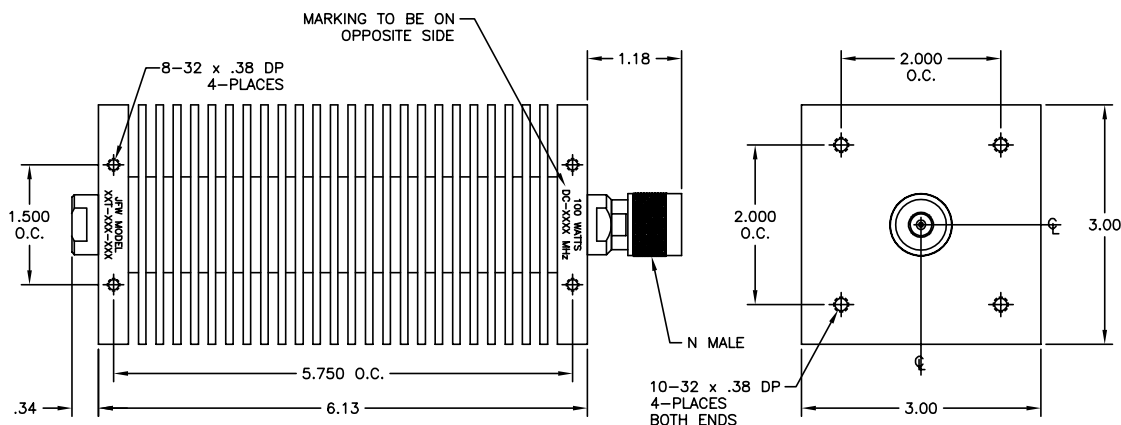
Common Specifications

Peak Power	Operating Temperature	RF Connectors
1000 Watts	-55° C to +100° C	BNC, N, SMA, TNC or 7/16 male or female

50T-549



50T-032-XXX / 50T-242 / 50T-243



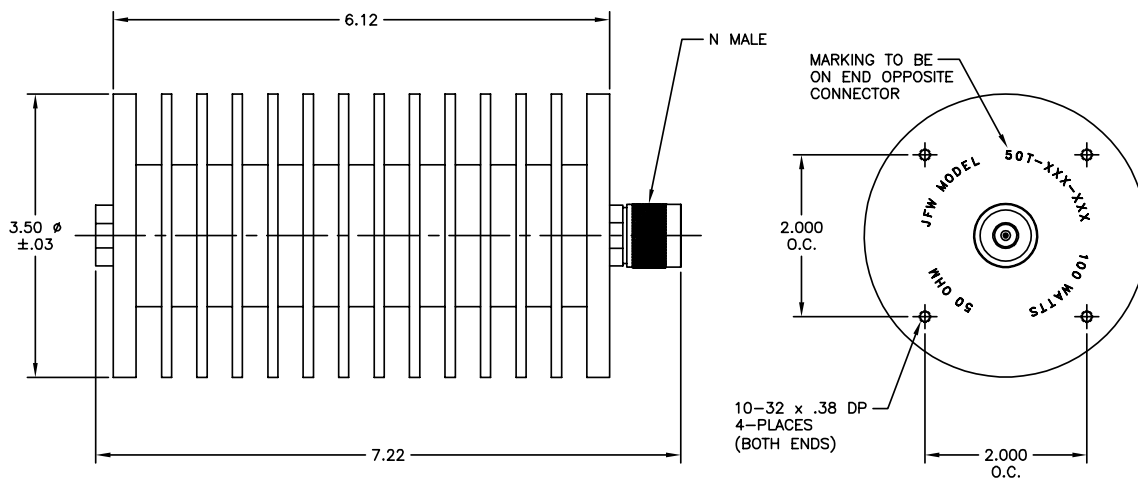
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100 & 150 Watt Terminations and Mismatches

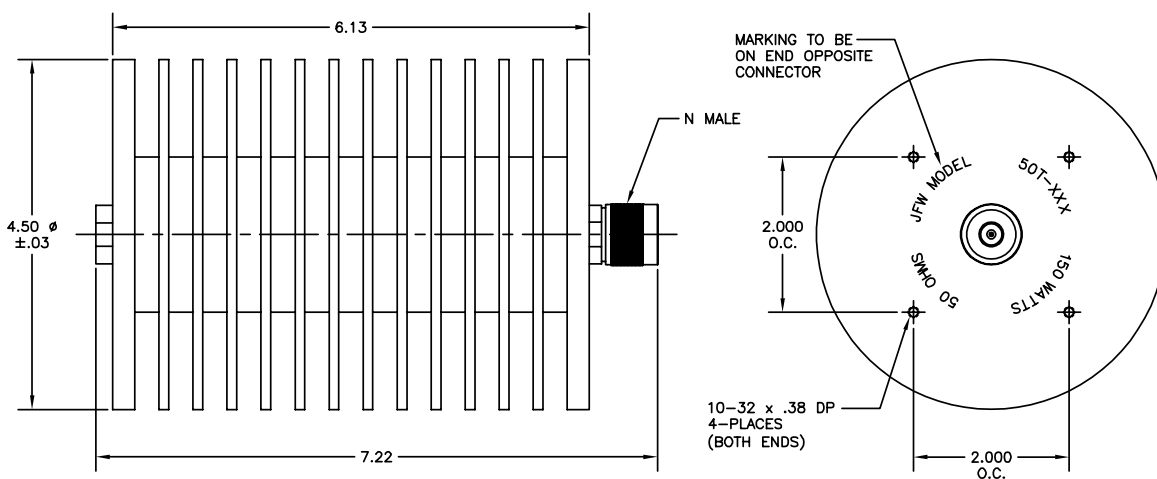
Model	Impedance	Frequency Range	VSWR (maximum)	RF Input Power	RF Connectors
50T-303-XXX*	Referenced to 50 Ohms	DC-3000 MHz (1.0:1) DC-2500 MHz (1.1:1 thru 1.2:1) DC-2000 MHz (1.3:1 thru 3.0:1) DC-1000 MHz (3.1:1 thru 10.0:1)	1.15:1 (termination i.e. 1.0:1) $\pm 5\%$ DC-1000 MHz $\pm 10\%$ 1000-2500 MHz (all mismatch values)	100 Watts average @ +25° C Derate to 50 Watts @ +85° C	BNC, N, 7/16 male or female
50T-390	50 Ohms	DC-6000 MHz	1.2:1 DC-3000 MHz 1.35:1 3000-6000 MHz	100 Watts average @ +25° C Derate to 50 Watts @ +85° C	N or 7/16 male or female
50T-350	50 Ohms	DC-3000 MHz	1.15:1	150 Watts average @ +25° C Derate to 75 Watts @ +85° C	N or 7/16 male or female

*Insert VSWR required (1.0:1, 1.2:1, 1.3:1, 1.5:1, 1.6:1, 1.7:1, 2.0:1, 2.5:1, 3.0:1, 4.0:1, 5.0:1, 10.0:1). Other VSWR available upon request.
(Termination = 50T-303-1.0) (1.5:1 Mismatch = 50T-303-1.5) (5.0:1 Mismatch = 50T-303-5.0)

50T-303-XXX / 50T-390



50T-350

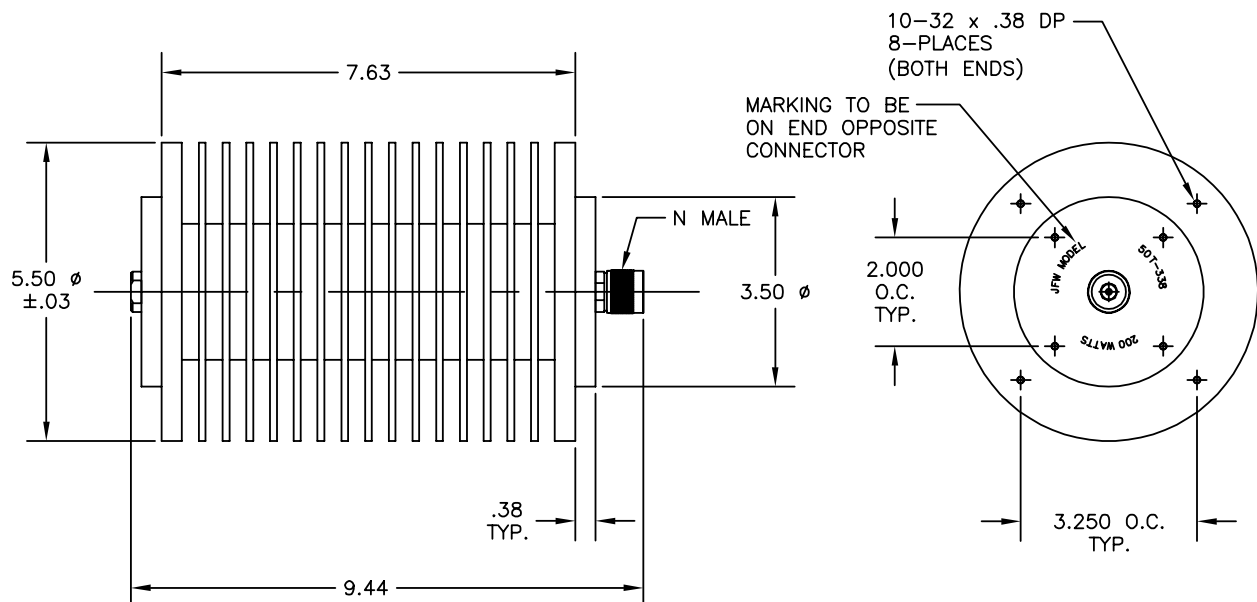


200 Watt Termination and Mismatch

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power
50T-338-XXX*	Referenced to 50 Ohms	DC-3000 MHz (1.0:1) DC-2500 MHz (1.1:1 thru 1.2:1) DC-2000 MHz (1.3:1 thru 3.0:1) DC-1000 MHz (3.1:1 thru 10.0:1)	1.15:1 (termination i.e. 1.0:1) ± 5% DC-1000 MHz ± 10% 1000-2500 MHz (all mismatch values)	200 Watts average @ +25° C Derate to 50 Watts average @ +70° C

Peak Power	Operating Temperature	RF Connectors
1000 Watts (1 microsecond pulse)	-55° C to +100° C	N or 7/16 male or female

*Insert VSWR required (1.0:1, 1.2:1, 1.3:1, 1.5:1, 1.6:1, 1.7:1, 1.8:1, 1.9:1, 2.0:1, 2.5:1, 3.0:1, 5.0:1, 10.0:1). Other VSWR available upon request.
(Termination = 50T-338-1.0) (1.5:1 Mismatch = 50T-338-1.5) (5.0:1 Mismatch = 50T-338-5.0)



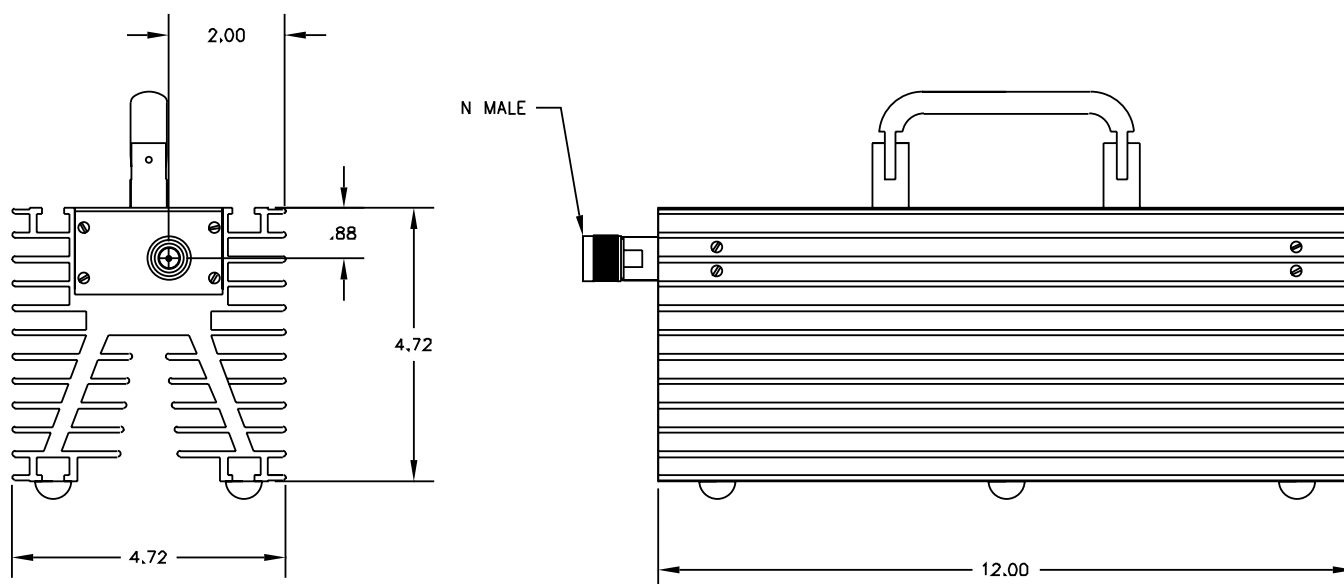
200 Watt Termination and Mismatch

High
Peak
Power

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power
50T-133-XXX*	Referenced to 50 Ohms	DC-1000 MHz (1.0:1 thru 1.5:1) DC-100 MHz (above 1.5:1)	1.1:1 (termination i.e. 1.0:1) ± 5% (all mismatch values)	200 Watts average @ +25° C Derate to 100 Watts @ +100° C

Peak Power	Operating Temperature	RF Connectors
2500 Watts (100 microseconds, 8% duty cycle)	-55° C to +100° C	BNC, N, TNC or 7/16 male or female

*Insert VSWR required (1.0:1, 1.1:1, 1.2:1, 1.5:1 or 2.0:1). Other VSWR available upon request.
(Termination = 50T-133-1.0) (1.5:1 Mismatch = 50T-133-1.5) (5.0:1 Mismatch = 50T-133-5.0)



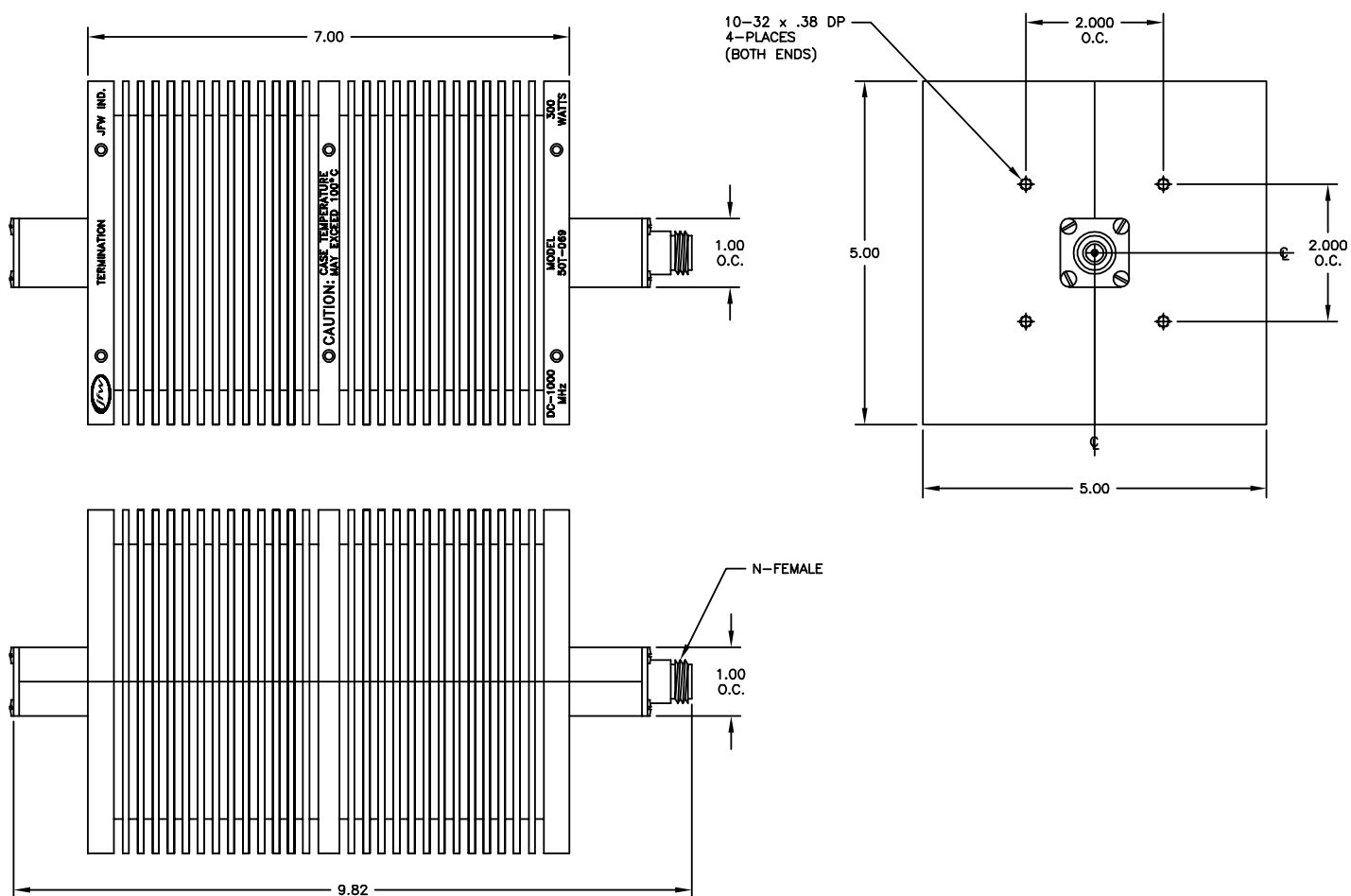
**High
Peak
Power**

300 Watt Termination and Mismatch

Model	Impedance	Frequency Range	VSWR (maximum)	Input Power
50T-069-XXX*	Referenced to 50 Ohms	DC-1000 MHz (1.0:1 thru 1.5:1) DC-500 MHz (1.6:1 thru 5.0:1)	1.10:1 (termination i.e. 1.0:1) ± 5% (1.1:1 thru 1.5:1) ± 8% (1.6:1 thru 5.0:1)	300 Watts average @ +25° C Derate to 75 Watts @ +85° C

Peak Power	Operating Temperature	RF Connectors
2500 Watts	-55° C to +100° C	BNC, N or TNC or 7/16 male or female

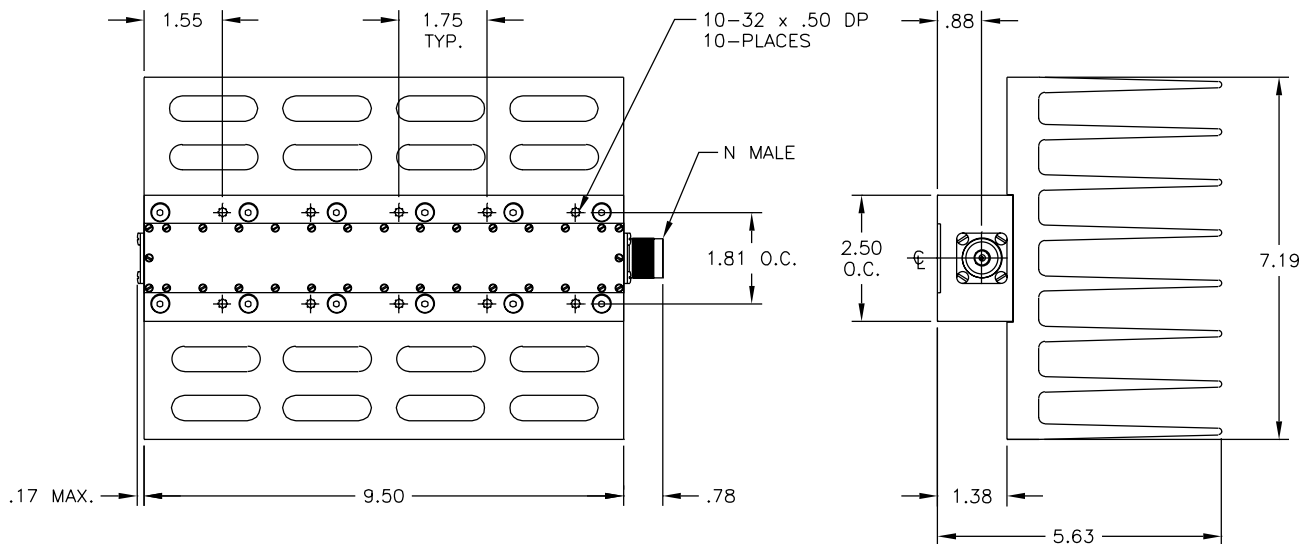
*Insert VSWR required (1.0:1 thru 5.0:1). Other VSWR available upon request.
(Termination = 50T-069-1.0) (1.5:1 Mismatch = 50T-069-1.5) (5.0:1 Mismatch = 50T-069-5.0)



500 Watt Terminations

Model	Frequency Range	VSWR (maximum)	Input Power	RF Connectors
50T-420	DC-1000 MHz	1.15:1	500 Watts average @ +25° C Derate to 50 Watts @ +100° C	N or TNC male or female
50T-421	DC-3000 MHz	1.2:1 DC-1000 MHz 1.3:1 1000-3000 MHz	500 Watts average @ +25° C Derate to 50 Watts @ +100° C	N or TNC male or female

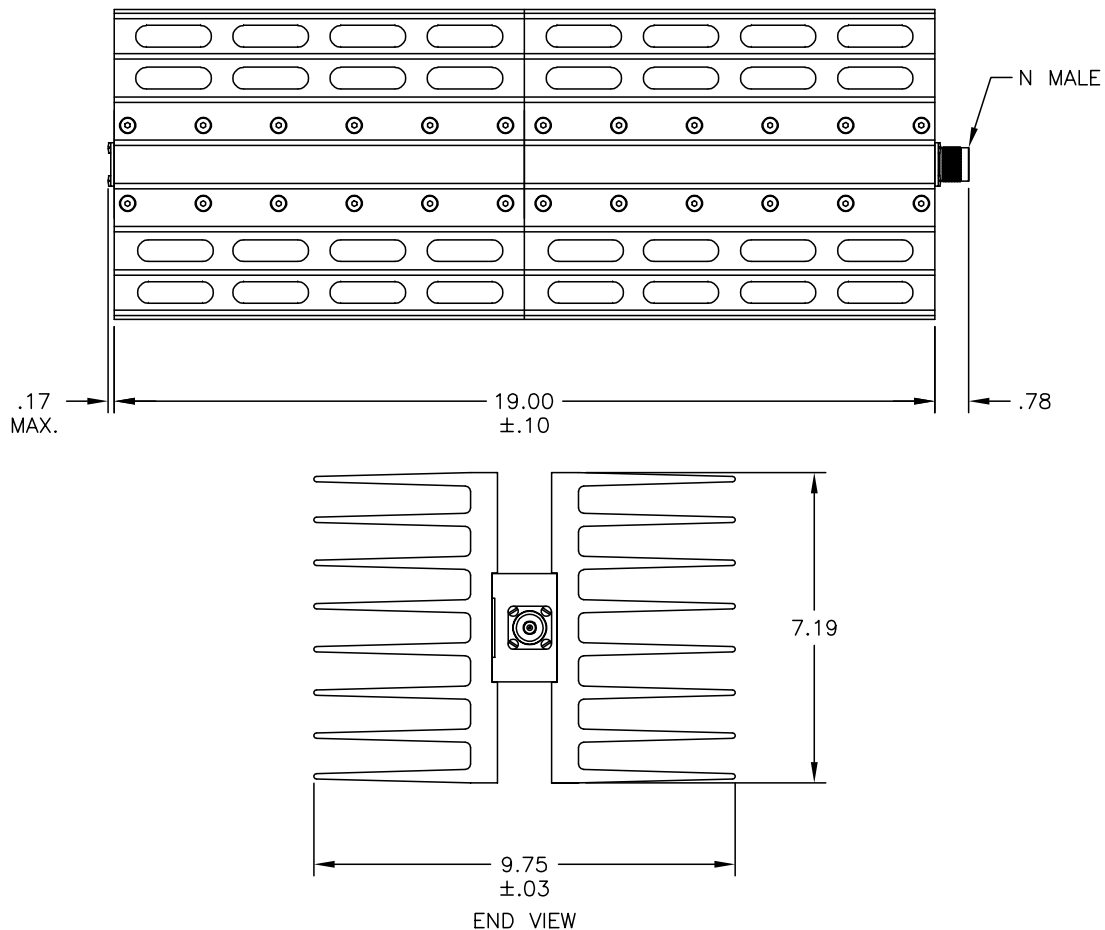
Common Specifications		
Impedance	Peak Power	Operating Temperature
50 Ohms	2000 Watts (10 millisecond pulse, 25% duty cycle)	-55° C to +100° C



1000 Watt Terminations

Model	Frequency Range	VSWR (maximum)	Input Power
50T-495	DC-3000 MHz	1.2:1 DC-500 MHz 1.3:1 500-2500 MHz 1.4:1 2500-3000 MHz	1000 Watts average @ +25° C Derated linearly to 100 Watts @ +100° C
50T-513	DC-300 MHz	1.15:1	1000 Watts average @ +25° C Derated linearly to 100 Watts @ +100° C
50T-521	DC-1000 MHz	1.2:1	1000 Watts average @ +25° C Derated linearly to 100 Watts @ +100° C

Common Specifications			
Impedance	Peak Power	Operating Temperature	RF Connectors
50 Ohms	4000 Watts	-55° C to +100° C	N or 7/16 male or female



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RF Switches

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50S-348 SMA).

Solid State - 50 Ohm			
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50S-348	5-2000 MHz	1P2T	6-4
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50S-642	5-3000 MHz	1P1T	6-4
50S-785	20-2000 MHz	1P1T	6-4
50S-847	50-2000 MHz	1P6T	6-6
50S-884	50-2000 MHz	1P4T	6-6
50S-976	750-4300 MHz	1P2T	6-4
50S-979	5-2500 MHz	1P2T	6-4
50S-1011	400-2000 MHz	1P8T	6-6
50S-1035	20-4300 MHz	1P4T	6-8
50S-1075	20-4300 MHz	1P4T	6-8
50S-1163	20-4300 MHz	1P2T	6-8
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75S-332	950-2150 MHz	1P2T	6-16
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50S-1524	100-500 MHz	1P6T	6-14
50S-1525	100-500 MHz	1P4T	6-14
50S-1559	20-1000 MHz	1P2T	6-12
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RF Switches

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Please add connector type to the end of part number to complete model number (Example: 50S-348 SMA).

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Wideband Solid State Coaxial Switches

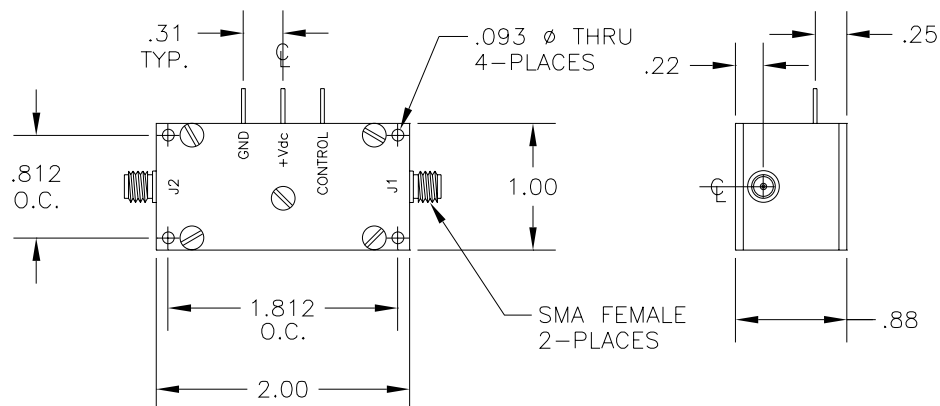
Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-642	1P1T (reflective)	5-3000 MHz	80 dB 5-500 MHz 60 dB 500-3000 MHz	1.4:1	2.0 dB	SMA female
50S-785	1P1T (reflective)	20-2000 MHz	60 dB	1.4:1	1.5 dB	SMA female
50S-1324	1P1T (absorptive)	800-2200 MHz	55 dB	1.4:1	1.5 dB	SMA female
50S-1337	1P1T (absorptive)	800-3000 MHz	50 dB	1.5:1	1.25 dB 800-1000 MHz 2.25 dB 1000-3000 MHz	SMA female
50S-348	1P2T (reflective)	5-2000 MHz	60 dB 5-1000 MHz 50 dB 1000-2000 MHz	1.4:1	1.0 dB 5-1000 MHz 1.5 dB 1000-2000 MHz	SMA female
50S-979	1P2T (absorptive)	5-2500 MHz	60 dB 5-1000 MHz 50 dB 1000-2200 MHz 45 dB 2200-2500 MHz	1.4:1	1.0 dB 5-1000 MHz 1.5 dB 1000-2200 MHz 2.0 dB 2200-2500 MHz	SMA female
50S-976	1P2T (reflective)	750-4300 MHz	50 dB 750-2000 MHz 40 dB 2000-3500 MHz 30 dB 3500-4300 MHz	1.4:1	1.5 dB	SMA female
50S-1382	1P3T (reflective)	5-2500 MHz	55 dB 5-1000 MHz 45 dB 1000-2500 MHz	1.5:1	1.0 dB 5-1000 MHz 1.5 dB 1000-2000 MHz 2.0 dB 2000-2500 MHz	SMA female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature
50S-642	50 Ohms	20 microseconds	+10 dBm 5-1500 MHz +20 dBm 1500-3000 MHz	+5 Vdc @ 100 mA	(1 line) TTL low-off (reflective) TTL high-on	0° C to +70° C
50S-785	50 Ohms	500 nanoseconds	+10 dBm	+5 Vdc @ 125 mA	(1 line) TTL low-off (reflective) TTL high-on	0° C to +70° C
50S-1324	50 Ohms	10 microseconds	+20 dBm	+5 Vdc @ 150 mA	(1 line) TTL low-off and both ports are internally terminated into 50 Ohms TTL high-on	0° C to +70° C
50S-1337	50 Ohms	500 nanoseconds	+20 dBm	+5 Vdc @ 100 mA	(1 line) TTL low-off and both ports are internally terminated into 50 Ohms TTL high-on	0° C to +70° C
50S-348	50 Ohms	5 microseconds	+5 dBm	+5 Vdc @ 150 mA	(2 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C
50S-979	50 Ohms	5 microseconds	+10 dBm	+5 Vdc @ 150 mA	(2 lines) TTL low-off ports are internally terminated into 50 Ohms TTL high-on	0° C to +70° C
50S-976	50 Ohms	5 microseconds	+10 dBm	+5 Vdc @ 150 mA	(2 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C
50S-1382	50 Ohms	20 microseconds	+5 dBm	+5 Vdc @ 150 mA	(3 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C

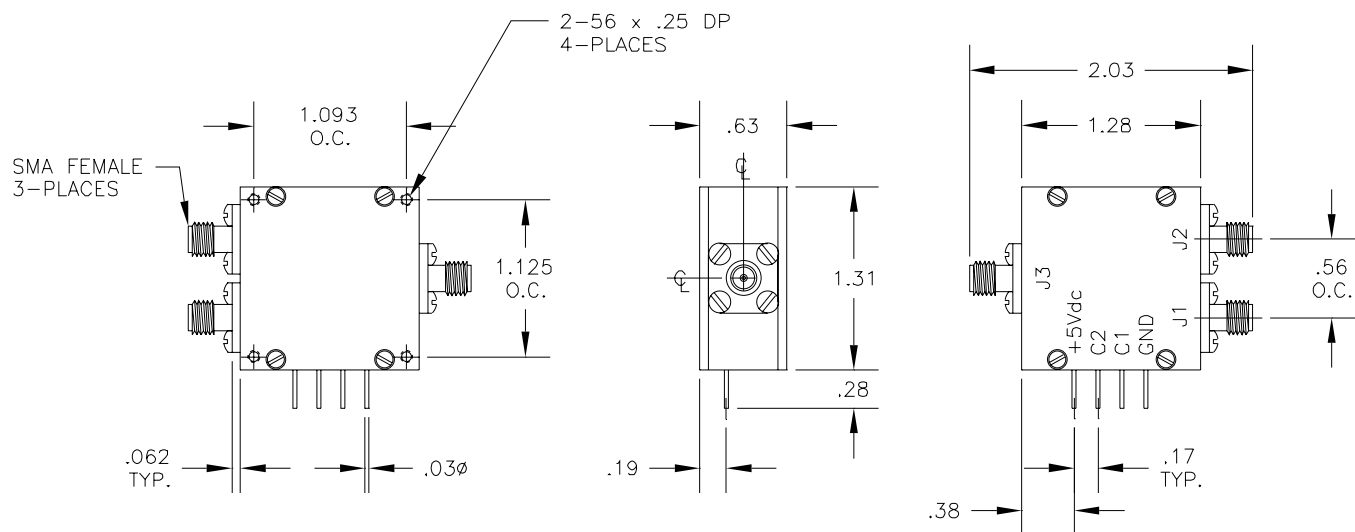
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Wideband Solid State Coaxial Switches

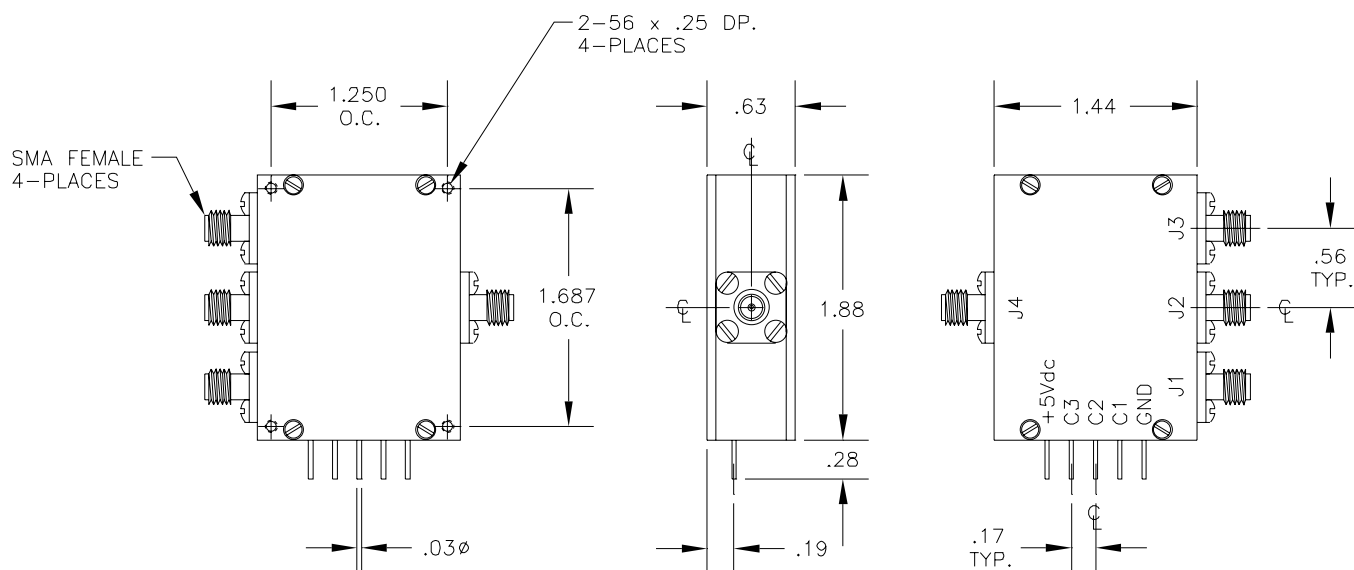
50S-642 / 50S-785 / 50S-1324 / 50S-1337



50S-348 / 50S-976 / 50S-979



50S-1382

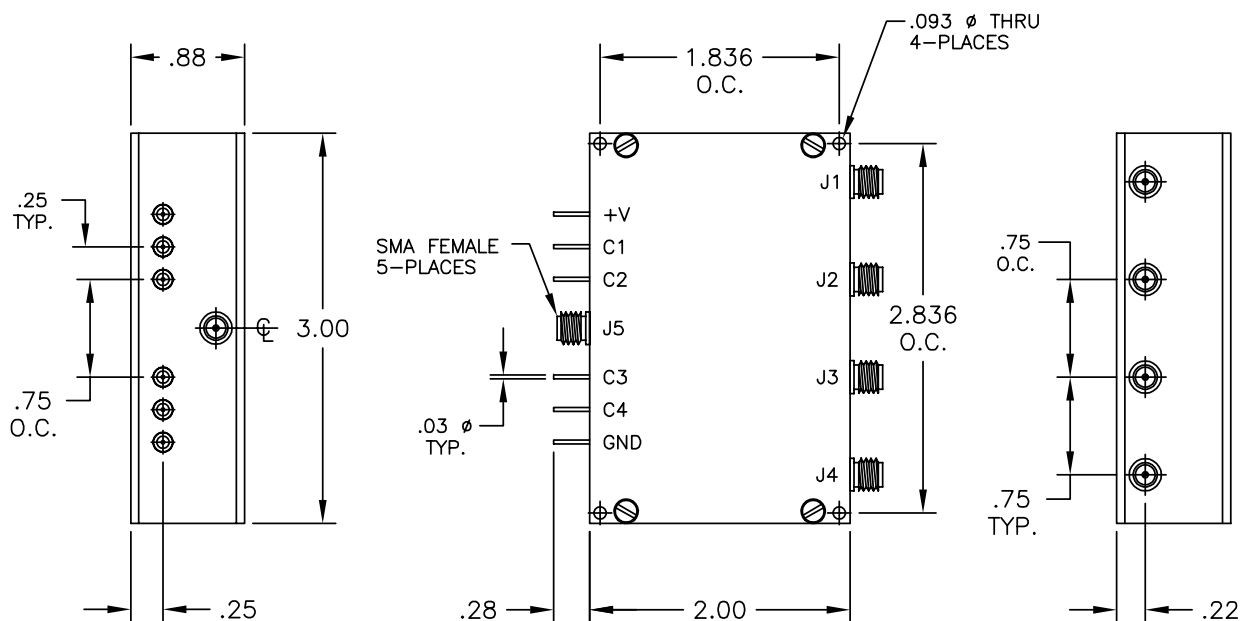


Wideband Solid State Coaxial Switch

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-884	1P4T (reflective)	50-2000 MHz	65 dB 50-1000 MHz 55 dB 1000-2000 MHz	1.4:1	1.5 dB 50-500 MHz 2.0 dB 500-1000 MHz 2.5 dB 1000-2000 MHz	SMA female
50S-847	1P6T (absorptive)	50-2000 MHz	70 dB 50-1500 MHz 55 dB 1500-2000 MHz	1.3:1 50-750 MHz 1.4:1 750-1500 MHz 1.5:1 1500-2000 MHz	1.5 dB 50-750 MHz 2.0 dB 750-1500 MHz 3.0 dB 1500-2000 MHz	SMA female
50S-381	1P8T (absorptive)	100-1250 MHz	65 dB 100-750 MHz 60 dB 750-1250 MHz	1.3:1 100-750 MHz 1.4:1 750-1250 MHz	1.5 dB 100-750 MHz 2.0 dB 750-1250 MHz	SMA female
50S-1011	1P8T (absorptive)	400-2000 MHz	65 dB 400-1000 MHz 55 dB 1000-2000 MHz	1.5:1	2.0 dB 400-1000 MHz 3.0 dB 1000-2000 MHz	SMA female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature
50S-884	50 Ohms	5 microseconds	+13 dBm	+5 Vdc @ 150 mA	(4 lines) TTL low-off (reflective) TTL high-on	-20° C to +85° C
50S-847	50 Ohms	1 microsecond	+10 dBm	+5 Vdc @ 250 mA	(3 lines) TTL per drawing Off ports are internally terminated into 50 Ohms	0° C to +70° C
50S-381	50 Ohms	1 microsecond	+10 dBm	+5 Vdc @ 150 mA	(8 lines) TTL low-off ports are internally terminated into 50 Ohms TTL high-on	0° C to +70° C
50S-1011	50 Ohms	10 microseconds	+20 dBm	+5 Vdc @ 150 mA	(8 lines) TTL low-off ports are internally terminated into 50 Ohms TTL high-on	0° C to +70° C

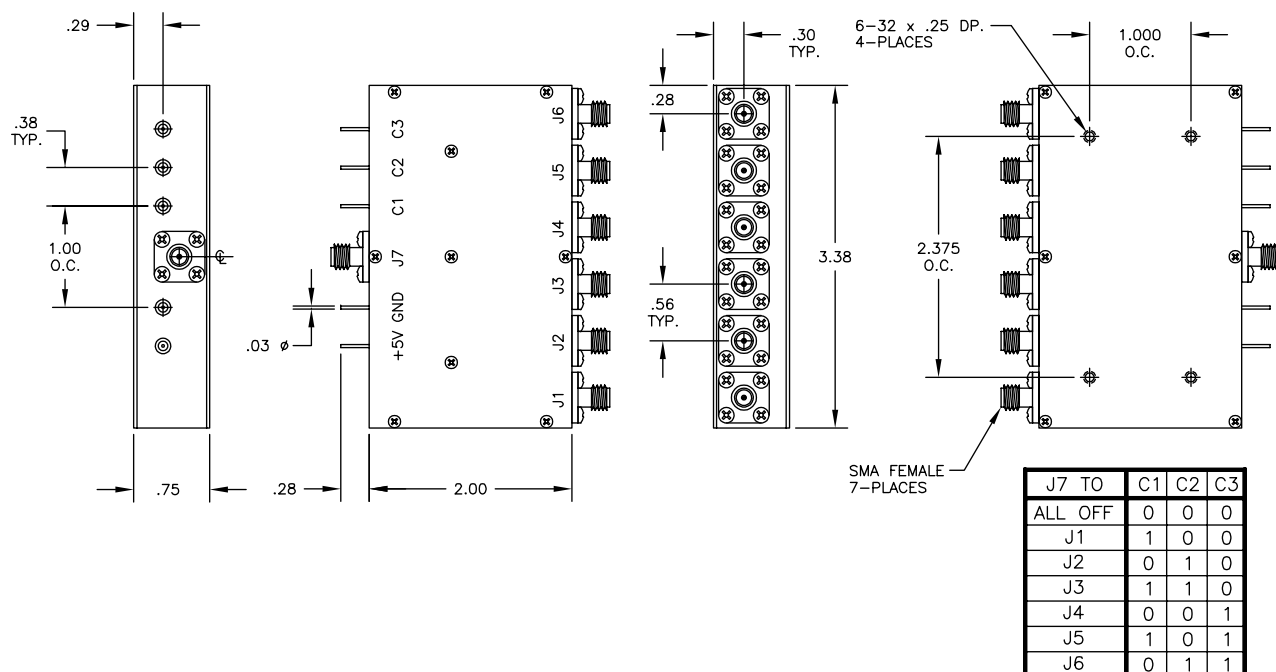
50S-884



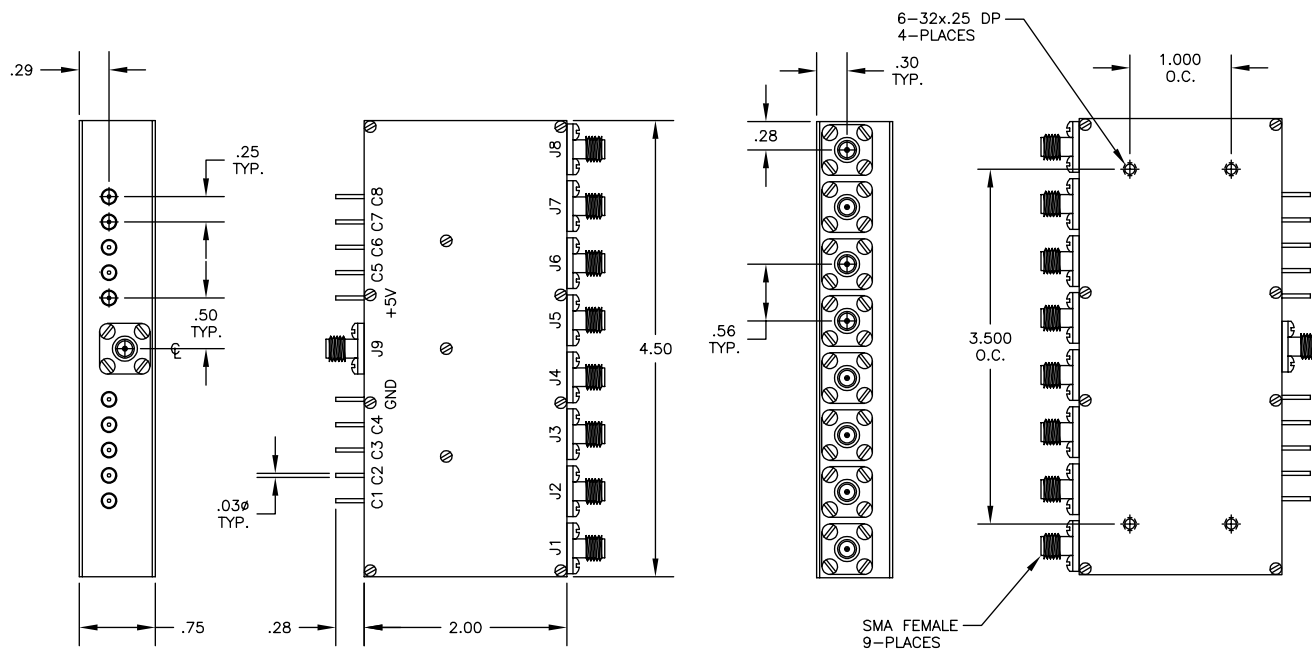
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Wideband Solid State Coaxial Switches

50S-847



50S-381 / 50S-1011



4.3 GHz Wideband Solid State Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1163	1P2T (reflective)	20-4300 MHz	80 dB 20-1000 MHz 70 dB 1000-2000 MHz 60 dB 2000-4000 MHz 55 dB 4000-4300 MHz	1.5:1	1.5 dB 20-1000 MHz 3 dB 1000-4300 MHz	SMA female
50S-1220	1P2T (absorptive)	20-4300 MHz	80 dB 20-1000 MHz 70 dB 1000-2000 MHz 60 dB 2000-4000 MHz 55 dB 4000-4300 MHz	1.5:1	1.5 dB 20-1000 MHz 3 dB 1000-4300 MHz	SMA female
50S-1035	1P4T (reflective)	20-4300 MHz	80 dB 20-1000 MHz 70 dB 1000-2000 MHz 60 dB 2000-4000 MHz 55 dB 4000-4300 MHz	1.5:1	2 dB 20-1000 MHz 4 dB 1000-4300 MHz	SMA female
50S-1075	1P4T (absorptive)	20-4300 MHz	75 dB 20-1000 MHz 65 dB 1000-2000 MHz 55 dB 2000-4300 MHz	1.5:1	2 dB 20-1000 MHz 4 dB 1000-4300 MHz	SMA female
50S-1199	1P8T (reflective)	20-4300 MHz	70 dB to 2000 MHz 50 dB to 4300 MHz	1.5:1	2 dB 20-1000 MHz 2.5 dB 1000-2000 MHz 3 dB 2000-3000 MHz 4 dB 3000-4300 MHz	SMA female
50S-1310	1P8T (absorptive)	20-4300 MHz	70 dB to 2000 MHz 50 dB to 4300 MHz	1.5:1	2.5 dB 20-1000 MHz 3 dB 1000-2000 MHz 3.5 dB 2000-3000 MHz 4.5 dB 3000-4300 MHz	SMA female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature
50S-1163	50 Ohms	20 microseconds	+20 dBm 20-100 MHz +30 dBm 100-4300 MHz	+24 Vdc @ 50 mA	(2 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C
50S-1220	50 Ohms	10 microseconds	+20 dBm 20-100 MHz +30 dBm 100-4300 MHz	+24 Vdc @ 50 mA +5 Vdc @ 50 mA	(2 lines) TTL low-off and port is internally terminated into 50 Ohms TTL high-on	0° C to +70° C
50S-1035	50 Ohms	20 microseconds	+20 dBm 20-100 MHz +30 dBm 100-4300 MHz	+24 Vdc @ 50 mA	(4 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C
50S-1075	50 Ohms	10 microseconds	+20 dBm 20-100 MHz +30 dBm 100-4300 MHz	+24 Vdc @ 150 mA +5 Vdc @ 100 mA	(4 lines) TTL low-off and port is internally terminated into 50 Ohms TTL high-on	0° C to +70° C
50S-1199	50 Ohms	20 microseconds	+20 dBm 20-100 MHz +30 dBm 100-4300 MHz	+24 Vdc @ 100 mA +5 Vdc @ 100 mA	(4 lines) TTL per drawing Off ports reflective	0° C to +70° C
50S-1310	50 Ohms	15 microseconds	+20 dBm 20-100 MHz +30 dBm 100-4300 MHz	+24 Vdc @ 200 mA +5 Vdc @ 150 mA	(4 lines) TTL per drawing Off ports are internally terminated into 50 Ohms	0° C to +70° C

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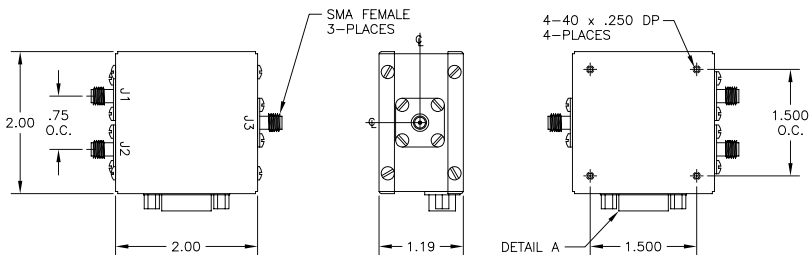
4.3 GHz Wideband Solid State Coaxial Switches

50S-1163 / 50S-1220



PIN	50S-1163
1	TTL CONT. 1
2	TTL CONT. 2
3	NO CONNECTION
4	NO CONNECTION
5	NO CONNECTION
6	NO CONNECTION
7	NO CONNECTION
8	+24Vdc
9	GND

PIN	50S-1220
1	TTL CONT. 1
2	TTL CONT. 2
3	NO CONNECTION
4	NO CONNECTION
5	NO CONNECTION
6	NO CONNECTION
7	+5 Vdc
8	+24 Vdc
9	GND



J3 TO	C1	C2
J1	1	0
J2	0	1
OFF	0	0

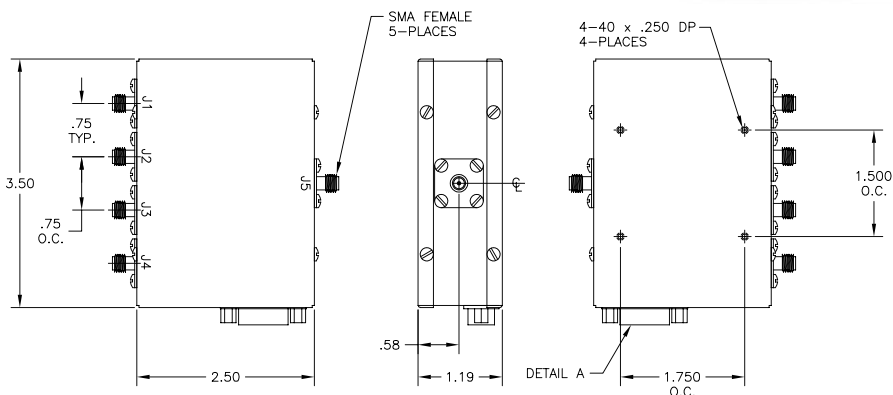
For a DC mating cable, see page 8-11.

50S-1035 / 50S-1075



PIN	50S-1035
1	TTL CONT. 1
2	TTL CONT. 2
3	TTL CONT. 3
4	TTL CONT. 4
5	NO CONNECTION
6	NO CONNECTION
7	NO CONNECTION
8	+24 Vdc
9	GROUND

PIN	50S-1075
1	TTL CONT. 1
2	TTL CONT. 2
3	TTL CONT. 3
4	TTL CONT. 4
5	NO CONNECTION
6	NO CONNECTION
7	+5 Vdc
8	+24 Vdc
9	GROUND

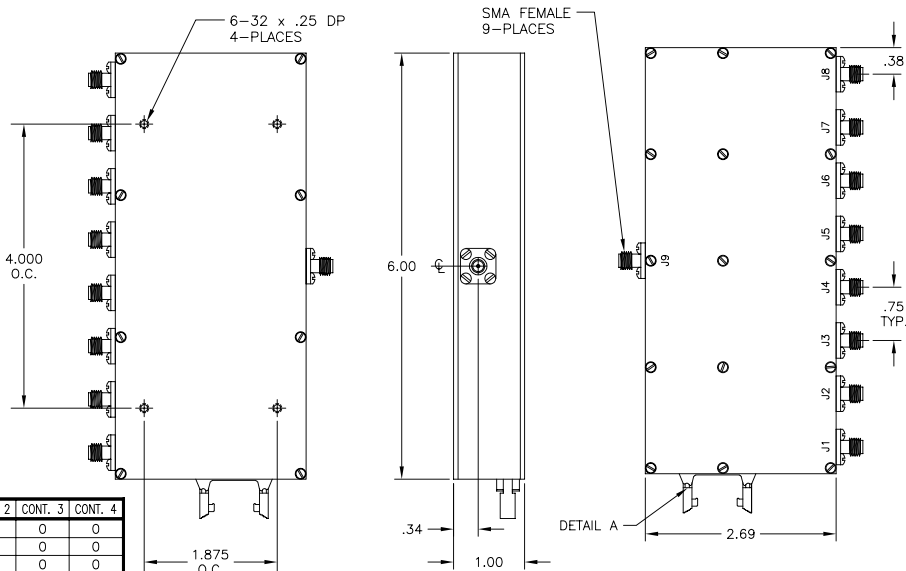


50S-1199 / 50S-1310



PIN	FUNCTION
1	CONTROL 1
2	NO CONNECTION
3	CONTROL 2
4	NO CONNECTION
5	CONTROL 3
6	+XX Vdc
7	CONTROL 4
8	+5 Vdc
9	NO CONNECTION
10	GROUND

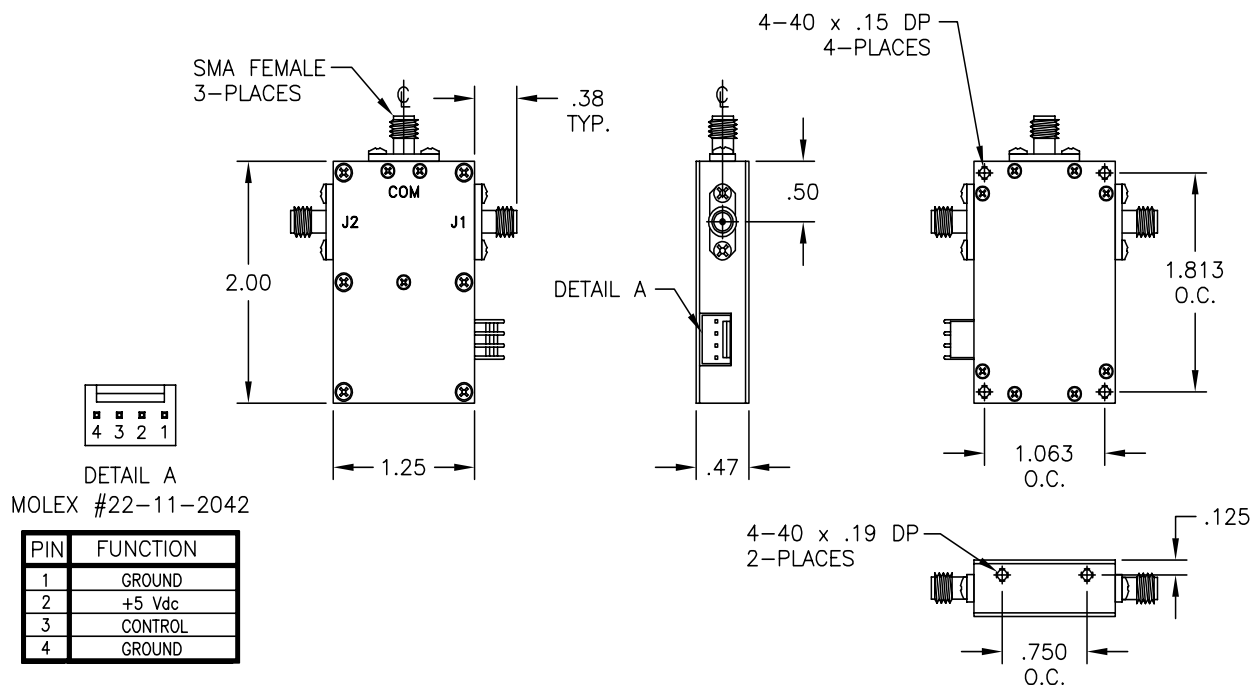
J9 TO:	CONT. 1	CONT. 2	CONT. 3	CONT. 4
NONE	0	0	0	0
J1	1	0	0	0
J2	0	1	0	0
J3	1	1	0	0
J4	0	0	1	0
J5	1	0	1	0
J6	0	1	1	0
J7	1	1	1	0
J8	0	0	0	1



6 GHz Solid State Coaxial Switch

Model	Configuration	Frequency Range	Isolation	VSWR	Insertion Loss
50S-1876	1P2T (absorptive)	20-6000 MHz	55 dB minimum 75 dB typical 20-2000 MHz 70 dB typical 2000-4000 MHz 65 dB typical 4000-6000 MHz	1.80:1 maximum 1.25:1 typical 20-2000 MHz 1.50:1 typical 2000-6000 MHz	2.50 dB maximum 1.25 dB typical 20-2000 MHz 1.75 dB typical 2000-6000 MHz

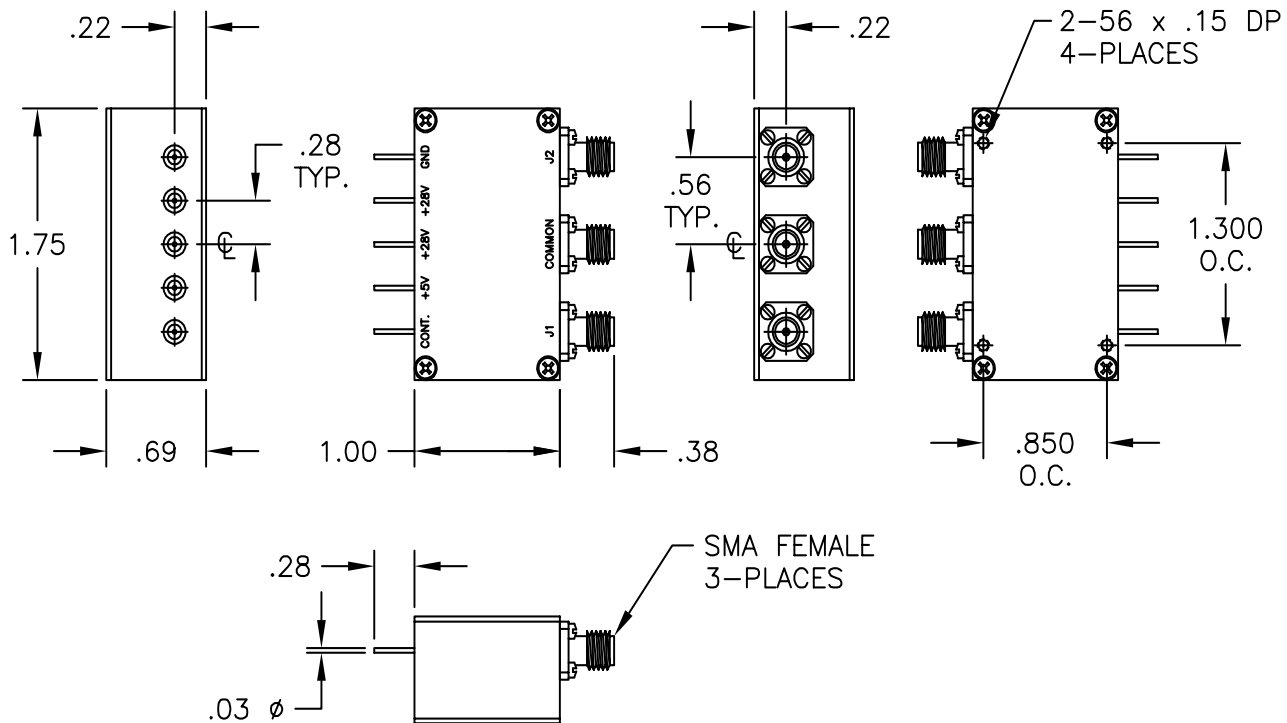
Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature	RF Connectors
50 Ohms	10 microseconds maximum 5 microseconds typical	+26 dBm (Hot switch)	+5 Vdc @ 10 mA	TTL low for COM to J1 and J2 terminated into 50 Ohms TTL high for COM to J2 and J1 terminated into 50 Ohms	-40° C to +85° C	SMA female



Medium Power Solid State Coaxial Switch

Model	Configuration	Frequency Range	Isolation	VSWR	Insertion Loss	RF Connectors
50S-1872	1P2T (reflective)	20-500 MHz	50 dB minimum 65 dB typical @ 20 MHz 55 dB typical @ 500 MHz	1.3:1 maximum 1.2:1 typical	0.6 dB maximum 0.2 dB typical @ 20 MHz 0.4 dB typical @ 500 MHz	SMA female
50S-1873	1P2T (reflective)	800-2200 MHz	45 dB minimum 55 dB typical	1.5:1 maximum 1.3:1 typical	0.9 dB maximum 0.7 dB typical	SMA female

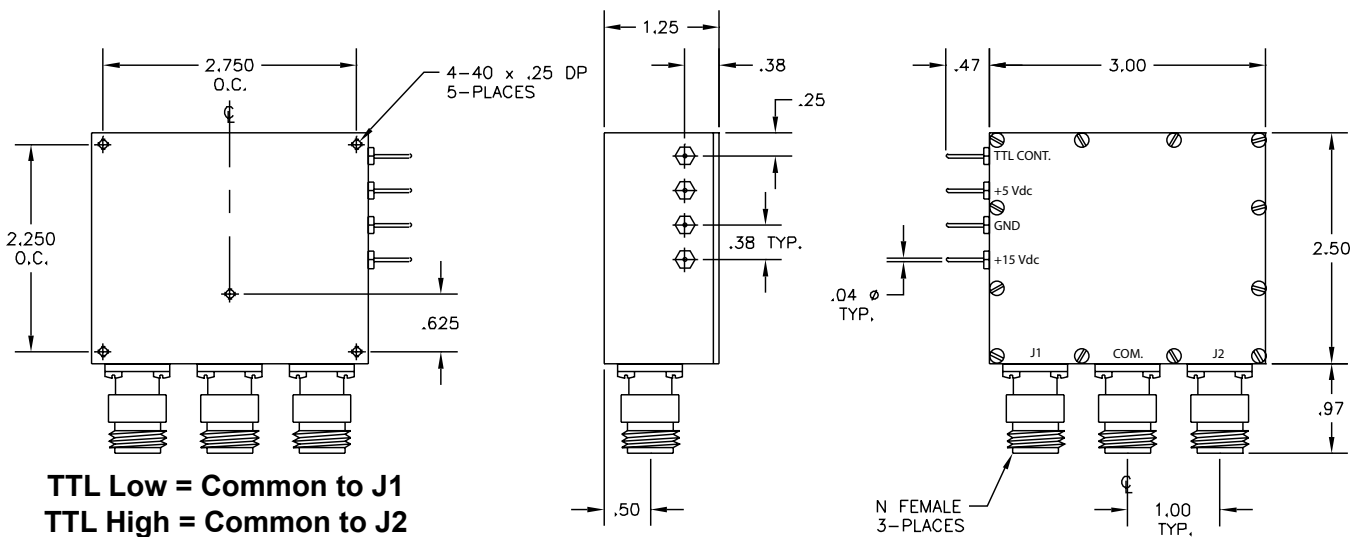
Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature
50S-1872	50 Ohms	10 microseconds maximum 6 microseconds typical	5 Watts average (Hot switch)	+28 Vdc @ 70 mA +5 Vdc @ 40 mA	(1 line) TTL low for Common to J1 TTL high for Common to J2	-20° C to +75° C
50S-1873	50 Ohms	12 microseconds maximum 10 microseconds typical	15 Watts average (Hot switch)	+28 Vdc @ 35 mA +5 Vdc @ 40 mA	(1 line) TTL low for Common to J1 TTL high for Common to J2	-20° C to +75° C



High Power 1P2T Solid State Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1268	1P2T (reflective)	100-500 MHz	55 dB	1.25:1	0.5 dB	N, SMA or TNC female
50S-1422	1P2T (reflective)	100-500 MHz	55 dB	1.25:1	0.5 dB	BNC, N, SMA or TNC female
50S-1505	1P2T (reflective)	20-2500 MHz	45 dB 20-1000 MHz 35 dB 1000-2500 MHz	1.4:1	0.7 dB 20-1000 MHz 1.0 dB 1000-2000 MHz 1.5 dB 2000-2500 MHz	N, SMA or TNC female
50S-1559	1P2T (reflective)	20-1000 MHz	50 dB 20-500 MHz 40 dB 500-1000 MHz	1.4:1	0.50 dB 20-500 MHz 0.75 dB 500-1000 MHz	BNC, N, SMA or TNC female
50S-1832	1P2T (reflective)	1000-1300 MHz	40 dB	1.3:1	0.75 dB	N female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Operating Temperature
50S-1268	50 Ohm	40 microseconds (50% TTL to 10% or 90% RF)	100 Watts average (Cold switch) 500 Watts peak (1 microsecond pulse) 100 Watts average (Hot switch)	+12 Vdc to +15 Vdc @ 250 mA + 5 Vdc @ 40 mA	-20° C to +70° C
50S-1422	50 Ohm	40 microseconds (50% TTL to 10% or 90% RF)	250 Watts average (Cold switch) 500 Watts peak (1 microsecond pulse) 100 Watts average (Hot switch)	+15 Vdc @ 250 mA +5 Vdc @ 40 mA	-20° C to +70° C
50S-1505	50 Ohm	10 microseconds (50% TTL to 10% or 90% RF)	25 Watts average (Cold switch) 200 Watts peak (1 microsecond pulse)	+15 Vdc @ 325 mA +5 Vdc @ 40 mA	-20° C to +70° C
50S-1559	50 Ohm	40 microseconds (50% TTL to 10% or 90% RF)	150 Watts average (Cold switch) 50 Watts average (Hot switch)	+15 Vdc @ 250 mA +5 Vdc @ 40 mA	-20° C to +70° C
50S-1832	50 Ohm	10 microseconds (50% TTL to 10% or 90% RF)	200 Watts average (Cold switch) 1000 Watts Peak (35 microsecond pulse)	+15 Vdc @ 250 mA +5 Vdc @ 40 mA	-20° C to +70° C

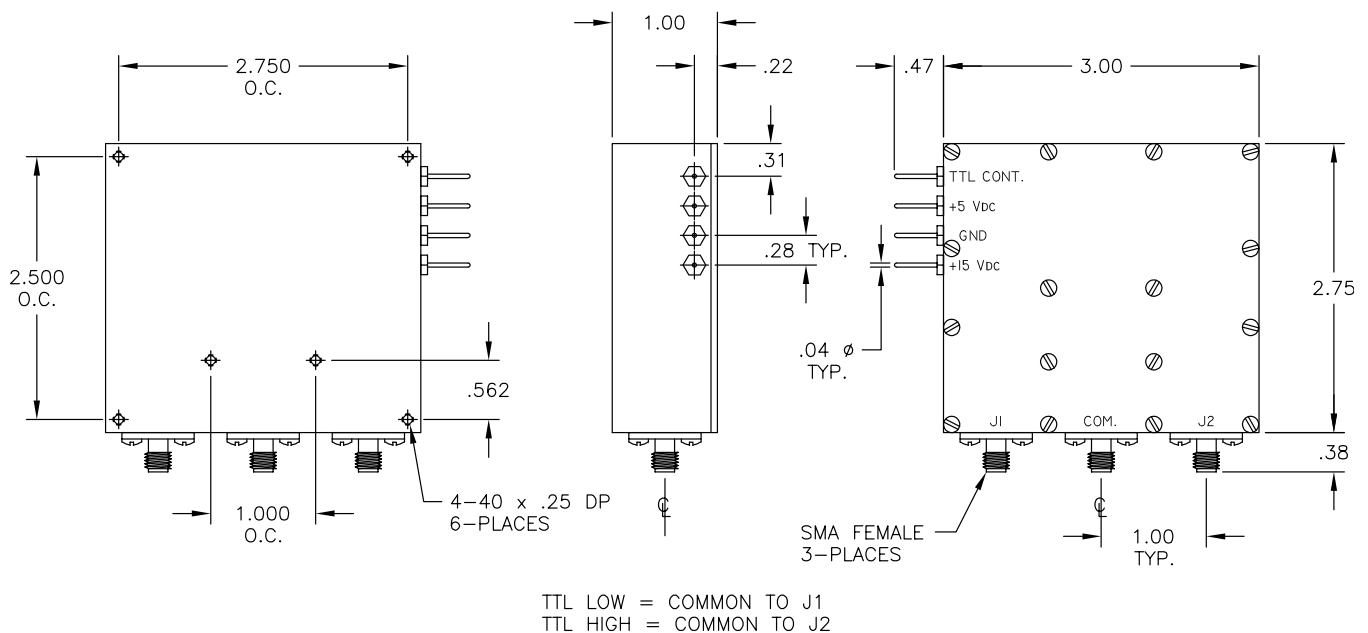


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High Power 1P2T Solid State Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1820	1P2T (reflective)	800-2700 MHz	65 dB 800-2000 MHz 60 dB 2000-2700 MHz	1.4:1	1.00 dB 800-2000 MHz 1.20 dB 2000-2700 MHz	N, SMA or TNC female
50S-1821	1P2T (reflective)	800-3000 MHz	65 dB 800-2000 MHz 55 dB 2000-3000 MHz	1.4:1	1.00 dB 800-2000 MHz 1.30 dB 2000-3000 MHz	N, SMA or TNC female
50S-1841	1P2T (reflective)	500-3000 MHz	65 dB 500-2000 MHz 55 dB 2000-3000 MHz	1.5:1	0.75 dB 500-1000 MHz 0.90 dB 1000-2000 MHz 1.25 dB 2000-3000 MHz	N, SMA or TNC female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Operating Temperature
50S-1820	50 Ohms	10 microseconds maximum 6 microseconds typical (50% TTL to 10% or 90% RF)	100 Watts average (Cold switch) 30 Watts average (Hot switch)	+15 Vdc @ 80 mA +5 Vdc @ 40 mA	-20° C to +70° C
50S-1821	50 Ohms	10 microseconds maximum 6 microseconds typical (50% TTL to 10% or 90% RF)	75 Watts average (Cold switch) 30 Watts average (Hot switch)	+15 Vdc @ 80 mA +5 Vdc @ 40 mA	-20° C to +70° C
50S-1841	50 Ohms	10 microseconds maximum 6 microseconds typical (50% TTL to 10% or 90% RF)	30 Watts average (Hot switch)	+15 Vdc @ 80 mA +5 Vdc @ 40 mA	-20° C to +70° C



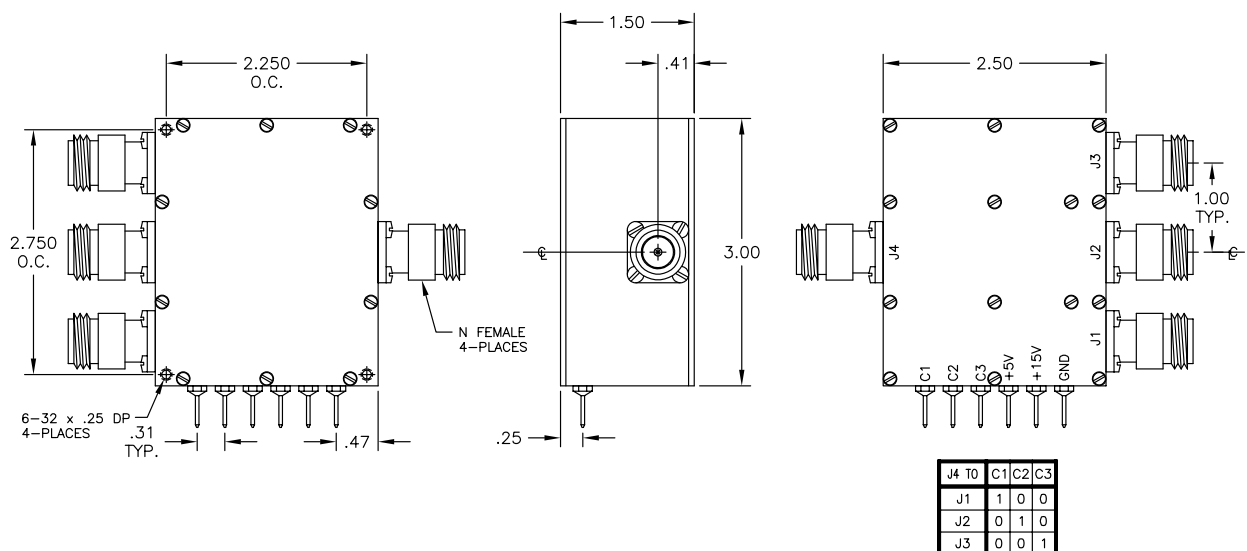
High Power Solid State Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1407	1P3T (reflective)	100-500 MHz	50 dB	1.3:1	0.5 dB	N, SMA or TNC female
50S-1525	1P4T (reflective)	100-500 MHz	50 dB	1.3:1	0.55 dB	N, SMA or TNC female
50S-1524	1P6T (reflective)	100-500 MHz	50 dB	1.3:1	0.75 dB	N, SMA or TNC female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature
50S-1407	50 Ohms	40 microseconds (50% TTL to specified isolation)	250 Watts average (Cold switch) 500 Watts peak (1 microsecond) 20 Watts average (Hot switch)	+15 Vdc @ 400 mA +5 Vdc @ 80 mA	(3 lines*) TTL (See chart)	-20° C to +70° C
50S-1525	50 Ohms	40 microseconds (50% TTL to 10% or 90% RF)	100 Watts average (Cold switch) 500 Watts peak (1 microsecond) 20 Watts average (Hot switch)	+15 Vdc @ 650 mA +5 Vdc @ 150 mA	(3 lines) TTL (See chart)	-20° C to +70° C
50S-1524	50 Ohms	40 microseconds (50% TTL to 10% or 90% RF)	100 Watts average (Cold switch) 500 Watts peak (1 microsecond) 20 Watts average (Hot switch)	+15 Vdc @ 750 mA +5 Vdc @ 150 mA	(3 lines) TTL (See chart)	-20° C to +70° C

*Only one control line can be TTL high at a time.

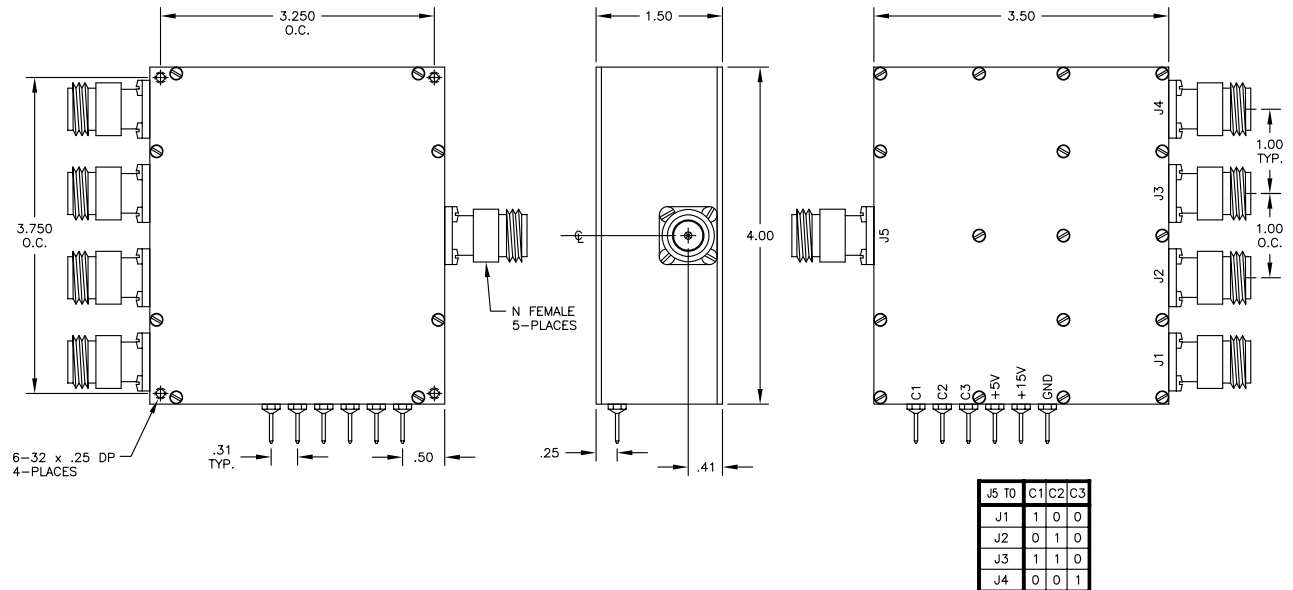
50S-1407



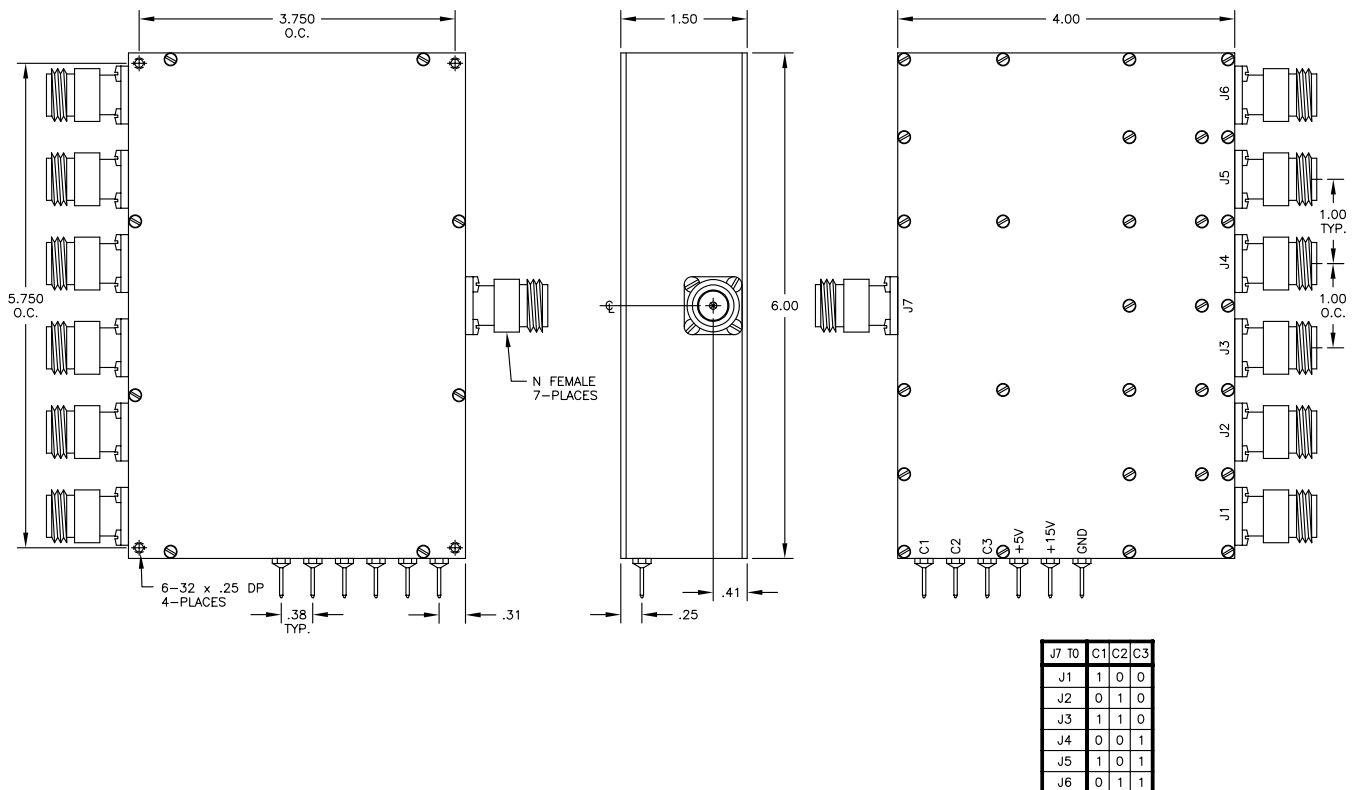
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High Power Solid State Coaxial Switches

50S-1525



50S-1524



75 Ohm Solid State Coaxial Switches

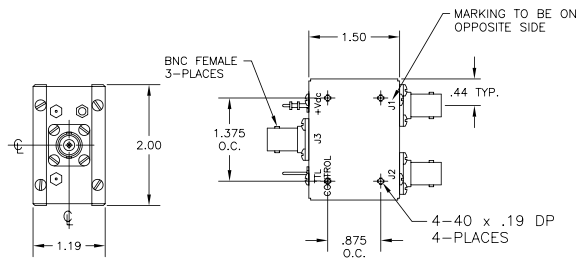
Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
75S-081	1P2T (absorptive)	5-1000 MHz	60 dB 5-500 MHz 55 dB 500-1000 MHz	1.2:1 5-300 MHz 1.3:1 300-600 MHz 1.4:1 600-1000 MHz	1.5 dB 5-500 MHz 2.5 dB 500-1000 MHz	BNC, F or N female
75S-332	1P2T (absorptive)	950-2150 MHz	70 dB	1.4:1	2.5 dB	F female
75S-225	1P4T (reflective)	5-1000 MHz	60 dB	1.2:1	2.25 dB	BNC or F female
75S-333	1P4T (absorptive)	950-2150 MHz	70 dB	1.4:1	2.5 dB	F female
75S-181	1P8T (reflective)	5-1000 MHz	70 dB 5-50 MHz 60 dB 50-500 MHz 55 dB 500-1000 MHz	1.3:1 5-500 MHz 1.4:1 500-1000 MHz	1.5 dB 5-500 MHz 2.0 dB 500-1000 MHz	BNC or F female
75S-338	1P8T (absorptive)	900-2200 MHz	65 dB	1.5:1	3.0 dB	F female
75S-264	1P16T (absorptive)	20-1000 MHz	55 dB	1.4:1	2.0 dB	BNC or F female

Model	Impedance	Switching Speed	RF Input Power	Supply Voltage	Control Logic	Operating Temperature
75S-081	75 Ohms	20 microseconds	+20 dBm (1 dB compression)	+5 Vdc @ 100 mA	(1 line) TTL low for J3 to J1 TTL high for J3 to J2 off port terminated into 75 Ohms	0° C to +70° C
75S-332	75 Ohms	10 microseconds	+30 dBm	+12 Vdc @ 150 mA	(2 lines) TTL low - off and port internally terminated into 75 Ohms TTL high - on	0° C to +70° C
75S-225	75 Ohms	10 microseconds	+20 dBm (1 dB compression)	+24 Vdc @ 50 mA	(4 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C
75S-333	75 Ohms	10 microseconds	+30 dBm	+12 Vdc @ 200 mA	(4 lines) TTL low - off and port internally terminated into 75 Ohms TTL high - on	0° C to +70° C
75S-181	75 Ohms	200 microseconds	+10 dBm	+28 Vdc @ 250 mA	(8 lines) TTL low-off (reflective) TTL high-on	0° C to +70° C
75S-338	75 Ohms	10 microseconds	+30 dBm	+12 Vdc @ 200 mA	(8 lines) TTL low - off and port internally terminated into 75 Ohms TTL high - on	0° C to +70° C
75S-264	75 Ohms	50 microseconds	+20 dBm	+5 Vdc @ 100 mA +15 Vdc @ 200 mA -15 Vdc @ 500 mA	(5 lines) TTL per drawing off ports terminated into 75 Ohms	0° C to +70° C

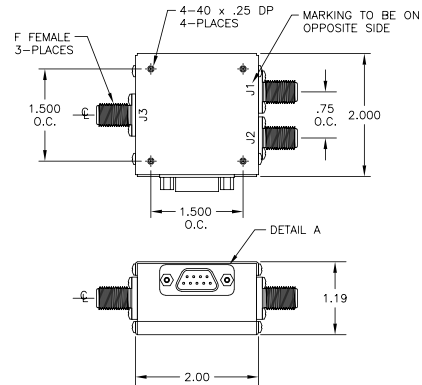
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75 Ohm Solid State Coaxial Switches

75S-081



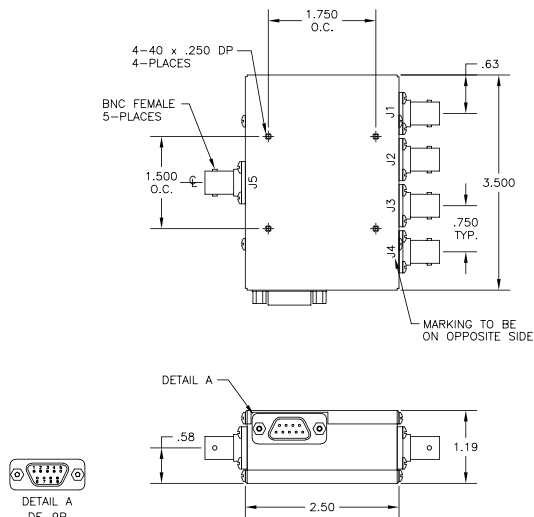
75S-332



J3 TO	C1	C2
OFF	0	0
J1	1	0
J2	0	1

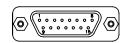
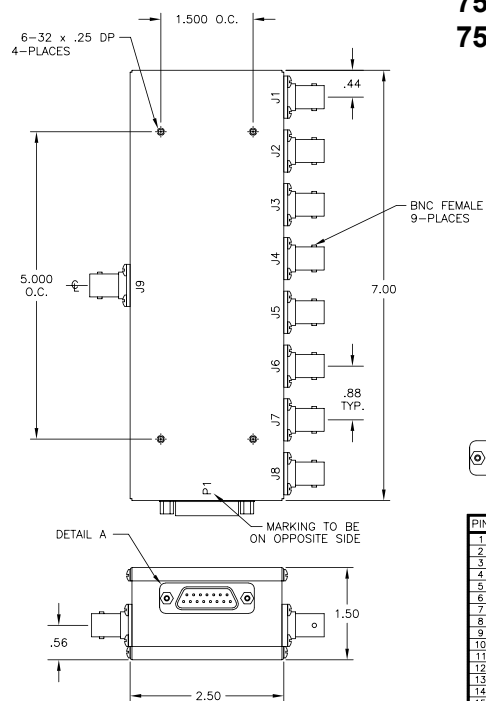
PIN	FUNCTION
1	CONTROL 1
2	CONTROL 2
3	NO CONNECTION
4	NO CONNECTION
5	NO CONNECTION
6	NO CONNECTION
7	NO CONNECTION
8	+12 Vdc
9	GROUND

**75S-225
75S-333**



PIN	FUNCTION
1	CONTROL 1
2	CONTROL 2
3	CONTROL 3
4	CONTROL 4
5	NO CONNECTION
6	NO CONNECTION
7	NO CONNECTION
8	+XX Vdc
9	GROUND

**75S-181
75S-338**

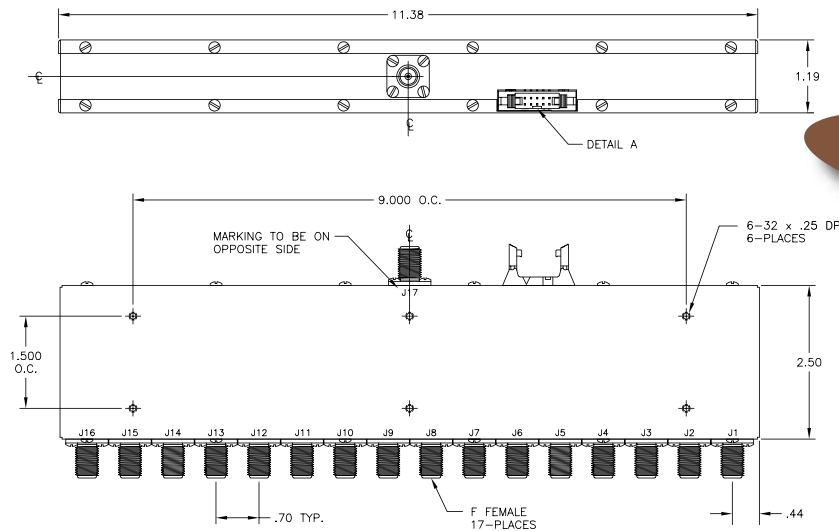


PIN	FUNCTION
1	CONTROL 1
2	CONTROL 2
3	CONTROL 3
4	CONTROL 4
5	CONTROL 5
6	CONTROL 6
7	CONTROL 7
8	CONTROL 8
9	NO CONNECTION
10	NO CONNECTION
11	NO CONNECTION
12	NO CONNECTION
13	NO CONNECTION
14	+XX Vdc
15	GROUND



PIN	FUNCTION
1	CONTROL 1
2	CONTROL 2
3	CONTROL 3
4	CONTROL 4
5	CONTROL 5
6	+5 Vdc
7	GROUND
8	+15 Vdc
9	GROUND
10	-15 Vdc

J17 TO	C1	C2	C3	C4	C5
ALL OFF	0	0	0	0	0
J1	1	0	0	0	0
J2	0	1	0	0	0
J3	1	1	0	0	0
J4	0	0	1	0	0
J5	1	0	1	0	0
J6	0	1	1	0	0
J7	1	1	1	0	0
J8	0	0	0	1	0
J9	1	0	0	1	0
J10	0	1	0	1	0
J11	1	1	0	1	0
J12	0	0	1	1	0
J13	1	0	1	1	0
J14	0	1	1	1	0
J15	1	1	1	1	0
J16	0	0	0	0	1



75S-264

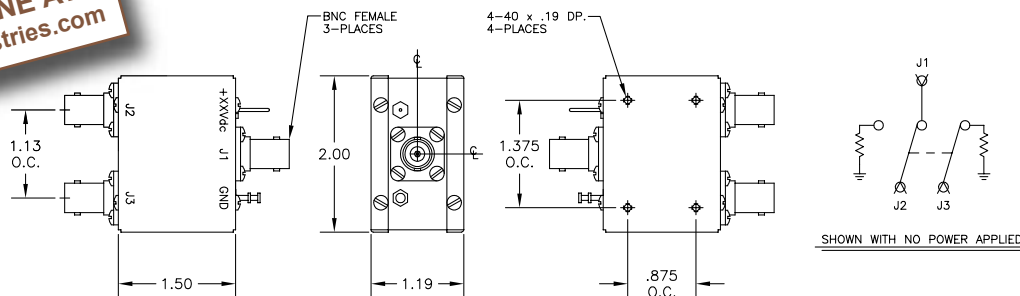
For a DC mating cable, see page 8-11.

75 Ohm Electro-mechanical Coaxial Switches

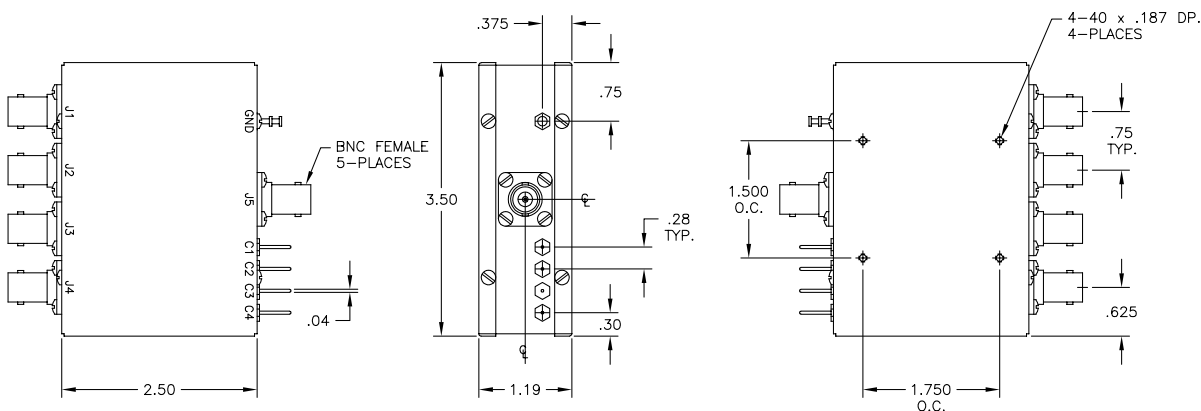
Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
75S-111	1P2T (failsafe, absorptive)	DC-2150 MHz	50 dB DC-1000 MHz 45 dB 1000-2150 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2150 MHz	0.75 dB DC-1000 MHz 1.0 dB 1000-2150 MHz	BNC or F female
75S-306	1P4T (N.O., absorptive)	DC-2150 MHz	70 dB DC-500 MHz 50 dB 500-2150 MHz	1.2:1 DC-500 MHz 1.4:1 500-2150 MHz	0.8 dB	BNC or F female
75S-221	1P8T (failsafe, absorptive)	DC-2150 MHz	60 dB DC-500 MHz 50 dB 500-2150 MHz	1.5:1	1.0 dB DC-1000 MHz 2.0 dB 1000-2150 MHz	BNC or F female
75S-303	1P16T (failsafe, absorptive)	DC-2150 MHz	70 dB DC-1000 MHz 50 dB 1000-2150 MHz	1.5:1	0.75 dB DC-1000 MHz 1.50 dB 1000-2150 MHz	BNC or F female

Model	Impedance	Switching Speed	RF Input Power	Control Voltage	Operating Temperature
75S-111	75 Ohms	10 milliseconds	+20 dBm	+12 Vdc @ 90 mA	-20° C to +85° C
75S-306	75 Ohms	10 milliseconds	+20 dBm	+12 Vdc @ 60 mA	-20° C to +85° C
75S-221	75 Ohms	10 milliseconds	+20 dBm	+12 Vdc @ 110 mA	-20° C to +85° C
75S-303	75 Ohms	10 milliseconds	+27 dBm	TTL per table	-20° C to +85° C

75S-111



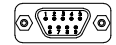
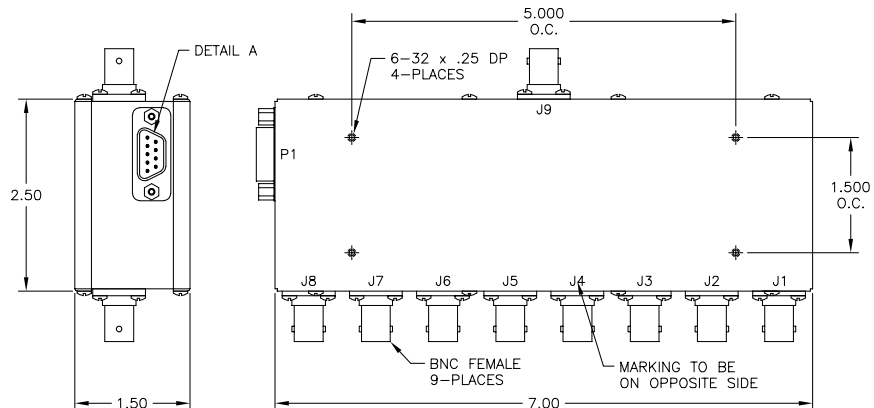
75S-306



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75 Ohm Electro-mechanical Coaxial Switches

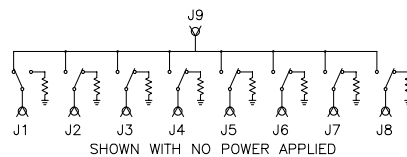
75S-221



DETAIL A
DE-9P

PIN	FUNCTION
1	GROUND
2	CONTROL 2
3	CONTROL 3
4	CONTROL 4
5	CONTROL 5
6	CONTROL 6
7	CONTROL 7
8	CONTROL 8
9	GROUND

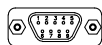
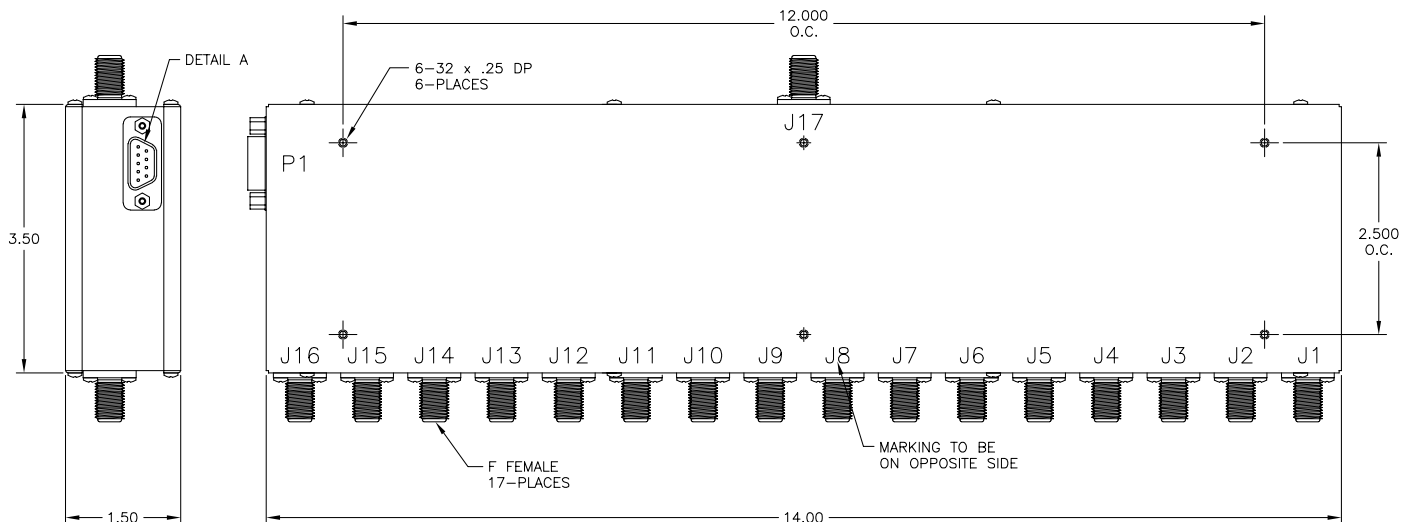
J9 TO	PIN NUMBER
J1	2
J2	3
J3	4
J4	5
J5	6
J6	7
J7	8
J8	9



NOTE: WITH NO POWER APPLIED TO DE-P CONNECTOR
COMMON IS FAILSAFE CONNECTED TO J1

For a DC mating cable,
see page 8-11.

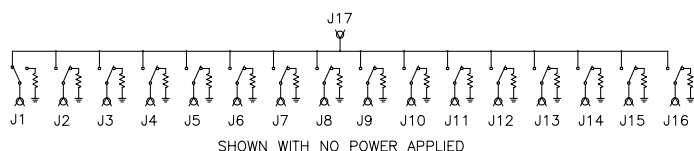
75S-303



DETAIL A
DE-9P

PIN	FUNCTION
1	CONTROL 1
2	CONTROL 2
3	CONTROL 3
4	CONTROL 4
5	NO CONNECTION
6	NO CONNECTION
7	NO CONNECTION
8	+12 Vdc
9	GROUND

J17 TO	CONT.
J1	1
J2	2
J3	3
J4	4
J5	5
J6	6
J7	7
J8	8
J9	9
J10	10
J11	11
J12	12
J13	13
J14	14
J15	15
J16	16



NOTE : WITH NO POWER APPLIED TO DE-9 CONNECTOR
COMMON IS FAILSAFE CONNECTED TO J1

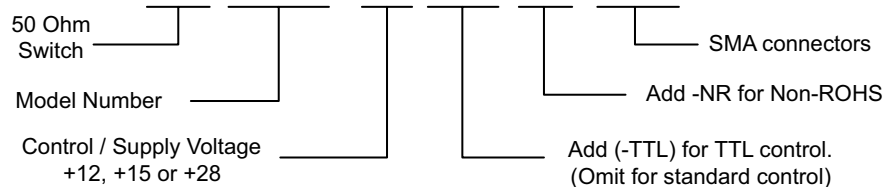
18 GHz Electro-mechanical Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1313	1P2T (failsafe, reflective)	DC-18 GHz	85 dB DC-1 GHz 80 dB 1-4 GHz 70 dB 4-8 GHz 65 dB 8-12 GHz 60 dB 12-18 GHz	1.1:1 DC-1 GHz 1.15:1 1-4 GHz 1.2:1 4-8 GHz 1.3:1 8-12 GHz 1.35:1 12-18 GHz	0.10 dB DC-1 GHz 0.15 dB 1-4 GHz 0.20 dB 4-8 GHz 0.30 dB 8-12 GHz 0.35 dB 12-18 GHz	SMA female
50S-1360	1P3T (N.O., reflective)	DC-18 GHz	70 dB DC-4 GHz 65 dB 4-8 GHz 60 dB 8-18 GHz	1.2:1 DC-4 GHz 1.3:1 4-8 GHz 1.4:1 8-12 GHz 1.5:1 12-18 GHz	0.20 dB DC-4 GHz 0.30 dB 4-8 GHz 0.40 dB 8-12 GHz 0.50 dB 12-18 GHz	SMA female
50S-1315	1P4T (N.O., reflective)	DC-18 GHz	70 dB DC-4 GHz 65 dB 4-8 GHz 60 dB 8-18 GHz	1.2:1 DC-4 GHz 1.3:1 4-8 GHz 1.4:1 8-12 GHz 1.5:1 12-18 GHz	0.20 dB DC-4 GHz 0.30 dB 4-8 GHz 0.40 dB 8-12 GHz 0.50 dB 12-18 GHz	SMA female

Model	Impedance	Switching Speed	RF Input Power (average)	Control Voltage / Supply Voltage (Non-TTL) (TTL)	Operating Temperature	Lifetime (minimum)
50S-1313	50 Ohms	15 milliseconds	See Power Table Below	+12 Vdc @ 200 mA nominal +15 Vdc @ 200 mA nominal +28 Vdc @ 100 mA nominal	-25° C to +65° C	1 million cycles
50S-1360	50 Ohms	20 milliseconds	See Power Table Below	+12 Vdc @ 325 mA nominal +15 Vdc @ 280 mA nominal +28 Vdc @ 160 mA nominal	-25° C to +65° C	1 million cycles
50S-1315	50 Ohms	20 milliseconds	See Power Table Below	+12 Vdc @ 325 mA nominal +15 Vdc @ 280 mA nominal +28 Vdc @ 160 mA nominal	-25° C to +65° C	1 million cycles

Power Table								
Frequency Range	DC-100 MHz	100-200 MHz	200-500 MHz	500-1000 MHz	1-4 GHz	4-8 GHz	8-12 GHz	12-18 GHz
Maximum Average RF Power	500 Watts	400 Watts	300 Watts	200 Watts	100 Watts	90 Watts	70 Watts	60 Watts

50S-AAAA+BB-TTL-NR SMA



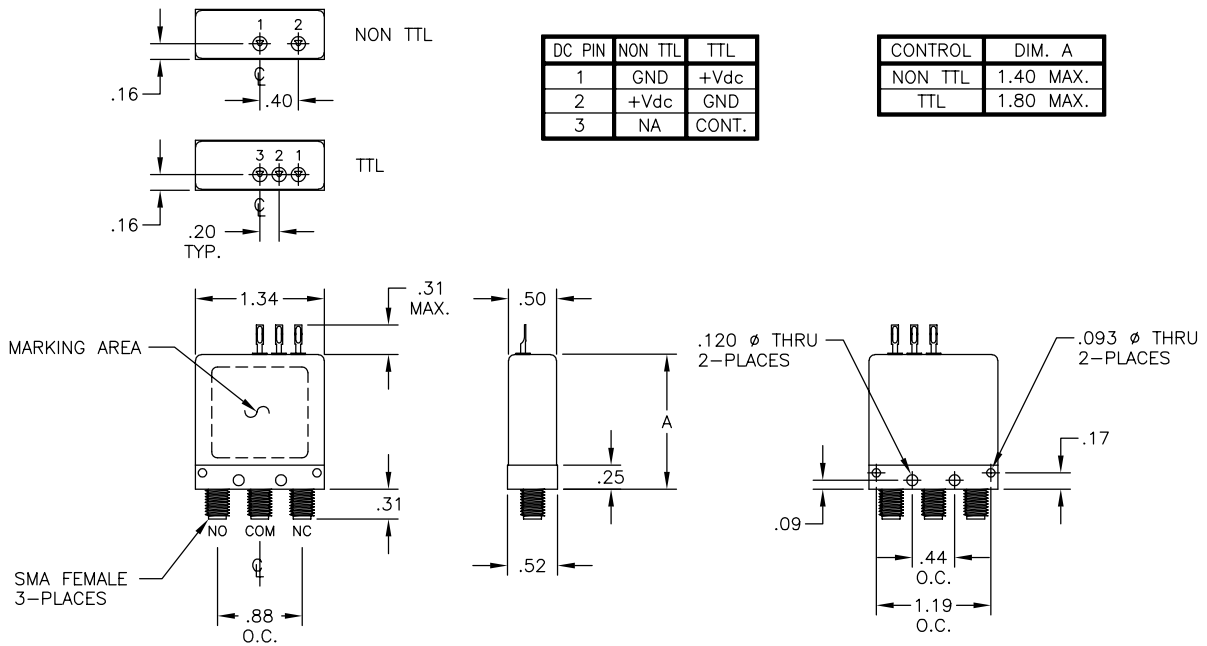
Examples: 50S-1313+12-NR SMA (1P2T / +12 Volt / Non-TTL / Non-ROHS)
 50S-1315+28-TTL SMA (1P4T / +28 Volt / TTL)

Contact factory for latching and self-terminating model numbers

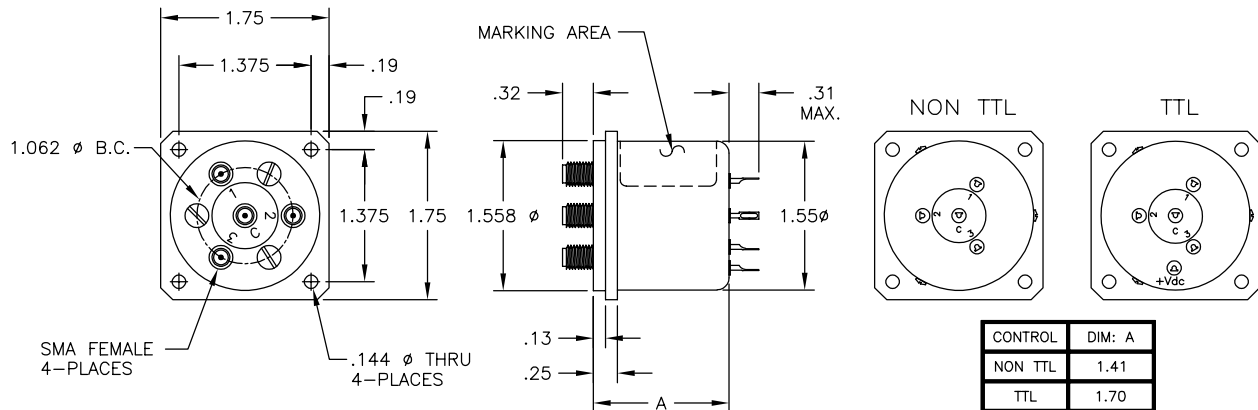
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18 GHz Electro-mechanical Coaxial Switches

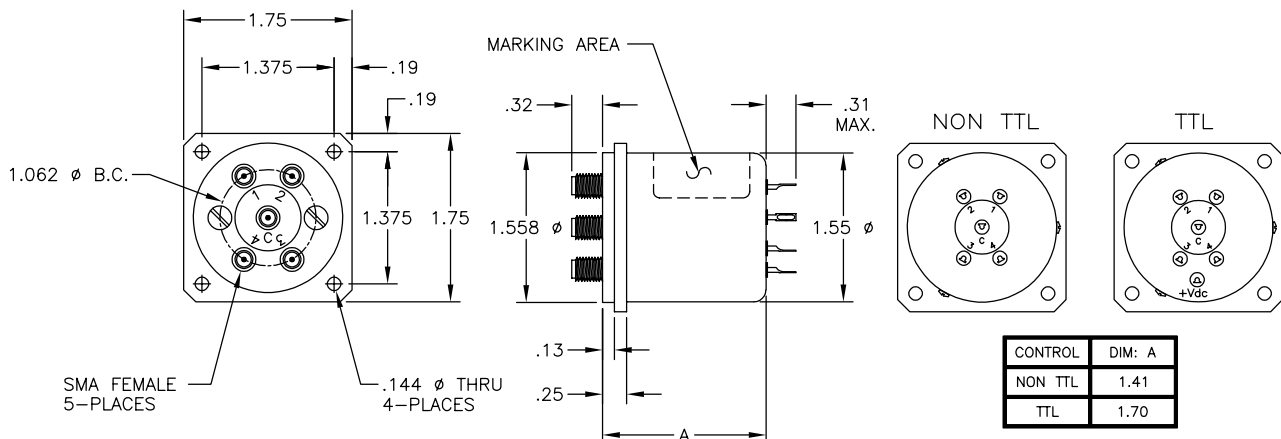
50S-1313



50S-1360



50S-1315



18 GHz Electro-mechanical Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1316	1P6T (N.O., reflective)	DC-18 GHz	70 dB DC-4 GHz 65 dB 4-8 GHz 60 dB 8-18 GHz	1.2:1 DC-4 GHz 1.3:1 4-8 GHz 1.4:1 8-12 GHz 1.5:1 12-18 GHz	0.20 dB DC-4 GHz 0.30 dB 4-8 GHz 0.40 dB 8-12 GHz 0.50 dB 12-18 GHz	SMA female
50S-1317	1P8T (N.O., reflective)	DC-18 GHz	70 dB DC-4 GHz 65 dB 4-8 GHz 60 dB 8-16 GHz 55 dB 16-18 GHz	1.25:1 DC-4 GHz 1.35:1 4-8 GHz 1.40:1 8-12 GHz 1.50:1 12-16 GHz 1.80:1 16-18 GHz	0.20 dB DC-4 GHz 0.30 dB 4-8 GHz 0.40 dB 8-12 GHz 0.50 dB 12-16 GHz 0.80 dB 16-18 GHz	SMA female

Model	Impedance	Switching Speed	RF Input Power (average)	Control Voltage / Supply Voltage (Non-TTL) (TTL)	Operating Temperature	Lifetime (minimum)
50S-1316	50 Ohms	20 milliseconds	See Power Table Below	+12 Vdc @ 325 mA nominal +15 Vdc @ 280 mA nominal +28 Vdc @ 160 mA nominal	-25° C to +65° C	1 million cycles
50S-1317	50 Ohms	15 milliseconds	See Power Table Below	+12 Vdc @ 285 mA nominal +15 Vdc @ 225 mA nominal +28 Vdc @ 120 mA nominal	-25° C to +65° C	1 million cycles

Power Table								
Frequency Range	DC-100 MHz	100-200 MHz	200-500 MHz	500-1000 MHz	1-4 GHz	4-8 GHz	8-12 GHz	12-18 GHz
Maximum Average RF Power	500 Watts	400 Watts	300 Watts	200 Watts	100 Watts	90 Watts	70 Watts	60 Watts

50S-AAAA+BB-TTL-NR SMA

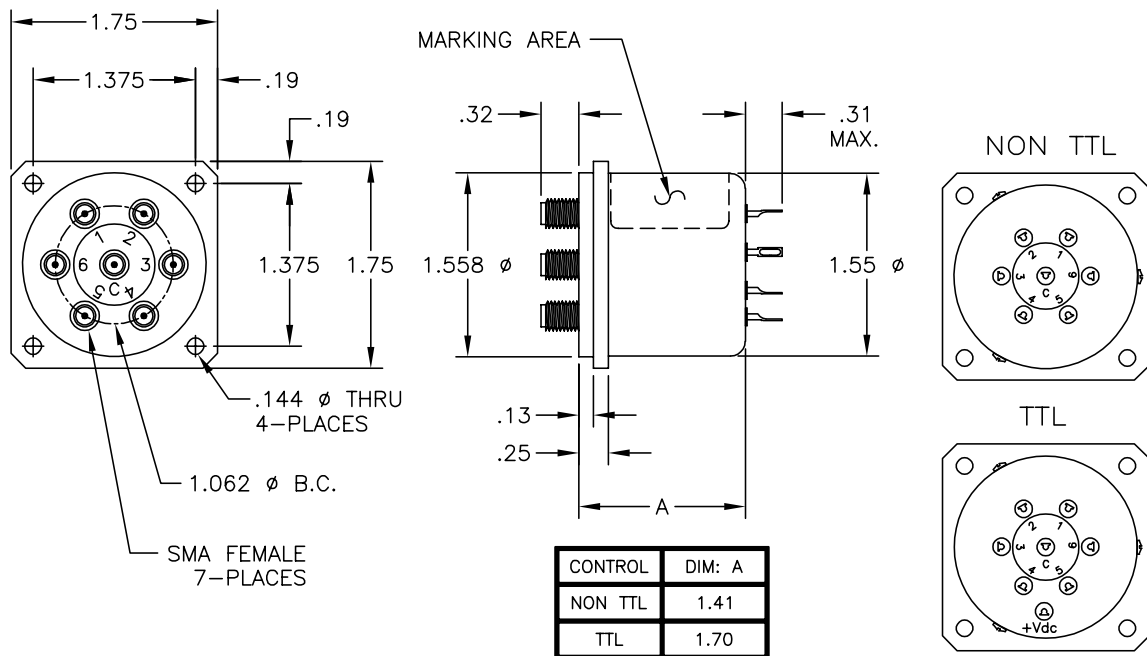
50 Ohm Switch _____ SMA connectors
 Model Number _____ Add -NR for Non-ROHS
 Control / Supply Voltage _____ Add (-TTL) for TTL control.
 +12, +15 or +28 (Omit for standard control)

Examples: 50S-1316+12-NR SMA (1P6T / +12 Volt / Non-TTL / Non-ROHS)
 50S-1317+28-TTL SMA (1P8T / +28 Volt / TTL)

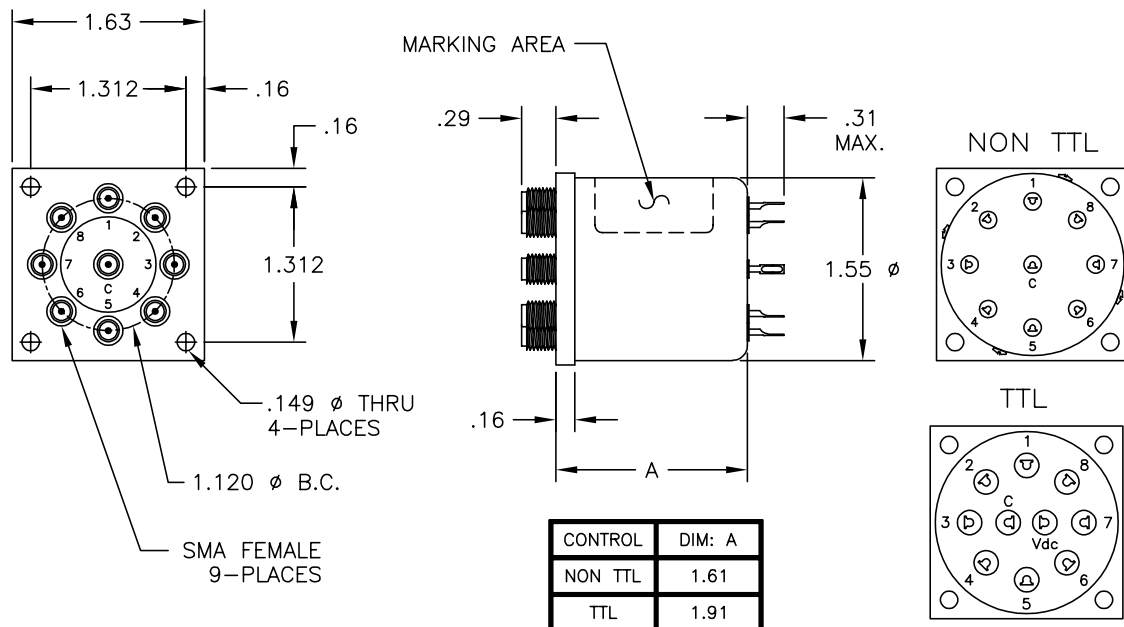
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18 GHz Electro-mechanical Coaxial Switches

50S-1316



50S-1317



18 GHz Electro-mechanical Coaxial Switches

Model	Configuration	Frequency Range	Isolation (minimum)	VSWR (maximum)	Insertion Loss (maximum)	RF Connectors
50S-1361	Transfer Switch (failsafe)	DC-18 GHz	85 dB DC-1 GHz 80 dB 1-4 GHz 70 dB 4-8 GHz 65 dB 8-12 GHz 60 dB 12-18 GHz	1.1:1 DC-1 GHz 1.2:1 1-4 GHz 1.3:1 4-8 GHz 1.4:1 8-12 GHz 1.5:1 12-18 GHz	0.10 dB DC-1 GHz 0.20 dB 1-4 GHz 0.30 dB 4-8 GHz 0.40 dB 8-12 GHz 0.50 dB 12-18 GHz	SMA female

Model	Impedance	Switching Speed	RF Input Power (average)	Control Voltage / Supply Voltage (Non-TTL) (TTL)	Operating Temperature	Lifetime (minimum)
50S-1361	50 Ohms	20 milliseconds	See Power Table Below	+12 Vdc @ 360 mA nominal +15 Vdc @ 285 mA nominal +24 Vdc @ 190 mA nominal +28 Vdc @ 150 mA nominal	-25° C to +65° C	1 million cycles

Power Table								
Frequency Range	DC-100 MHz	100-200 MHz	200-500 MHz	500-1000 MHz	1-4 GHz	4-8 GHz	8-12 GHz	12-18 GHz
Maximum Average RF Power	500 Watts	400 Watts	300 Watts	200 Watts	100 Watts	90 Watts	70 Watts	60 Watts

50S-1361+BB-TTL-NR SMA

50 Ohm
Switch

Model Number

Control / Supply Voltage
+12, +15, +24 or +28

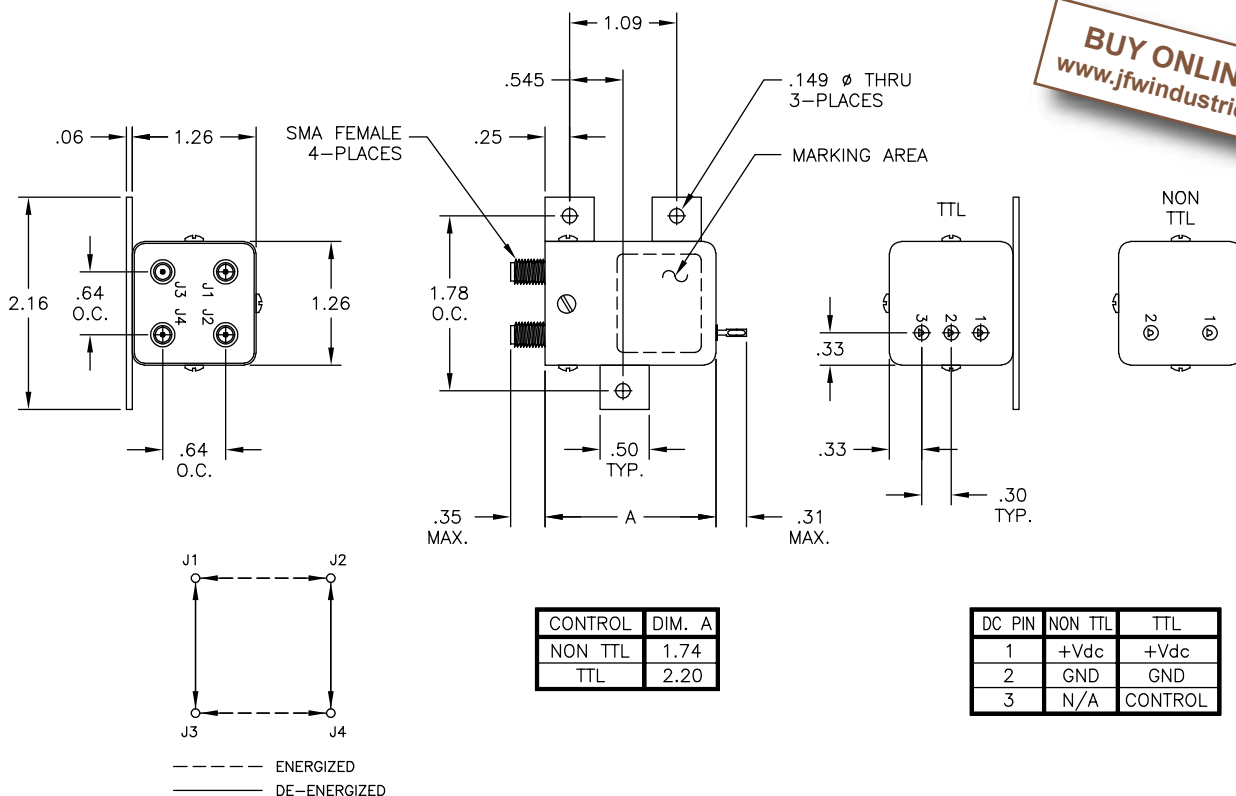
- SMA connectors

Add -NR for Non-ROHS

Add (-TTL) for TTL control.
(Omit for standard control)

Examples: 50S-1361+12-NR SMA
50S-1361+28-TTL SMA

(Transfer / +12 Volt / Non-TTL / Non-ROHS)
(Transfer / +28 Volt / TTL)



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Power Dividers/Combiners

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50PD-495 SMA).

Resistive - 50 Ohm			
Model Number	Frequency Range	Configuration	Page
50PD-016	DC-4000 MHz	2-Way	7-3
50PD-017	DC-2000 MHz	3-Way	7-3
50PD-018	DC-2000 MHz	4-Way	7-3
50PD-028	DC-1500 MHz	5-Way	7-3
50PD-133	DC-2000 MHz	2-Way	7-4
50PD-134	DC-2000 MHz	3-Way	7-4
50PD-135	DC-2000 MHz	4-Way	7-4
50PD-136	DC-2000 MHz	5-Way	7-4
50PD-292	DC-4000 MHz	3-Way	7-3
50PD-293	DC-4000 MHz	4-Way	7-3
50PD-335	DC-3000 MHz	2-Way	7-4
50PD-379	DC-4000 MHz	2-Way	7-4
50PD-432	DC-6000 MHz	2-Way	7-4
50PD-669	DC-4000 MHz	3-Way	7-4
Resistive - 75 Ohm			
Model Number	Frequency Range	Configuration	Page
75PD-045	DC-2200 MHz	2-Way	7-5
75PD-046	DC-2000 MHz	3-Way	7-5
75PD-047	DC-2000 MHz	4-Way	7-5
75PD-048	DC-2000 MHz	5-Way	7-5

Reactive - 50 Ohm			
Model Number	Frequency Range	Configuration	Page
50PD-559	800-2400 MHz	2-Way	7-8
50PD-560	800-2400 MHz	4-Way	7-8
50PD-570	800-2400 MHz	8-Way	7-8
50PD-634	2-6 GHz	2-Way	7-9
50PD-638	2-6 GHz	4-Way	7-9
50PD-647	2-6 GHz	8-Way	7-9
50PD-659	698-3000 MHz	2-Way	7-6
50PD-660	698-3000 MHz	4-Way	7-6
50PD-665	698-3000 MHz	8-Way	7-6
50PD-727	698-3000 MHz	2-Way	7-7
50PD-728	698-3000 MHz	4-Way	7-7
50PD-742	698-3000 MHz	8-Way	7-7
Reactive - 50 Ohm - High Power			
Model Number	Frequency Range	Configuration	Page
50PD-681	700-2700 MHz	2-Way	7-10
50PD-682	700-2700 MHz	4-Way	7-10
50PD-698	700-3000 MHz	2-Way	7-10
50PD-700	380-400 MHz	2-Way	7-10
50PD-756	500-2000 MHz	2-Way	7-10
Reactive - 75 Ohm			
Model Number	Frequency Range	Configuration	Page
75PD-072	800-2400 MHz	4-Way	7-12
75PD-074	800-2400 MHz	2-Way	7-12
75PD-075	950-2150 MHz	8-Way	7-12

Assembly - 50 Ohm			
Model Number	Frequency Range	Configuration	Page
50PDA-039	800-3000 MHz	12-Way	7-14
50PDA-040	800-3000 MHz	24-Way	7-14

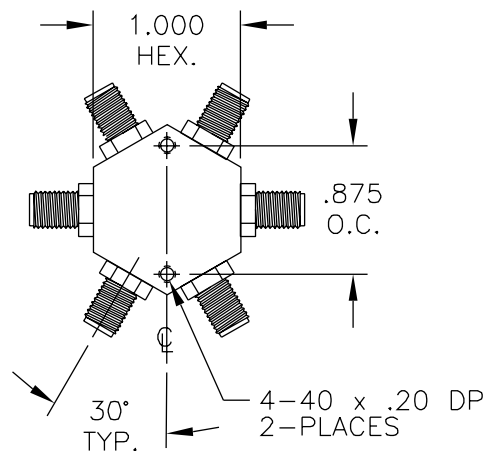
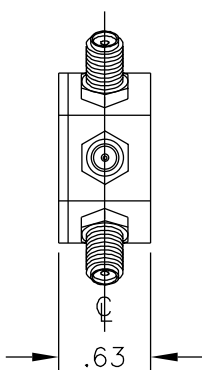
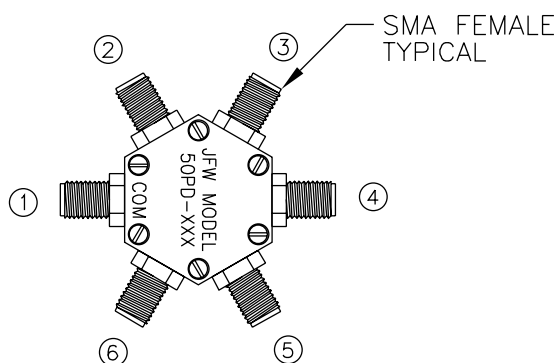
Resistive Power Dividers/Combiners

SMA - 50 Ohm

Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss	Amplitude Tracking
50PD-016	2-Way	DC-4000 MHz	1.1:1 DC-1000 MHz 1.2:1 1000-2000 MHz 1.3:1 2000-4000 MHz	6 dB $\pm$ 0.3 dB DC-2000 MHz 6 dB $\pm$ 0.5 dB 2000-4000 MHz	$\pm$ 0.1 dB DC-1000 MHz $\pm$ 0.2 dB 1000-2000 MHz $\pm$ 0.3 dB 2000-4000 MHz
50PD-017	3-Way	DC-2000 MHz	1.1:1 DC-500 MHz 1.2:1 500-2000 MHz	9.5 dB $\pm$ 0.5 dB	$\pm$ 0.1 dB DC-500 MHz $\pm$ 0.2 dB 500-1000 MHz $\pm$ 0.3 dB 1000-2000 MHz
50PD-018	4-Way	DC-2000 MHz	1.2:1	12 dB $\pm$ 0.3 dB DC-1000 MHz 12 dB $\pm$ 0.5 dB 1000-2000 MHz	$\pm$ 0.2 dB DC-1000 MHz $\pm$ 0.3 dB 1000-2000 MHz
50PD-028	5-Way	DC-1500 MHz	1.2:1	14 dB $\pm$ 0.3 dB DC-1000 MHz 14 dB $\pm$ 0.5 dB 1000-1500 MHz	$\pm$ 0.2 dB DC-1000 MHz $\pm$ 0.3 dB 1000-1500 MHz
50PD-292	3-Way	DC-4000 MHz	1.5:1	9.5 dB $\pm$ 0.5 dB	$\pm$ 0.5 dB
50PD-293	4-Way	DC-4000 MHz	1.5:1	12 dB $\pm$ 0.75 dB	$\pm$ 0.7 dB

Common Specifications

Impedance	Input Power	Peak Power	Operating Temperature	RF Connectors
50 Ohms	2 Watts average @ +25° C	100 Watts (1 microsecond)	-40° C to +85° C	SMA female



CONFIG.	COMMON PORT	IN/OUT PORTS
2 WAY	1	3,5
3 WAY	1	3,4,5
4 WAY	1	2,3,5,6
5 WAY	1	2,3,4,5,6

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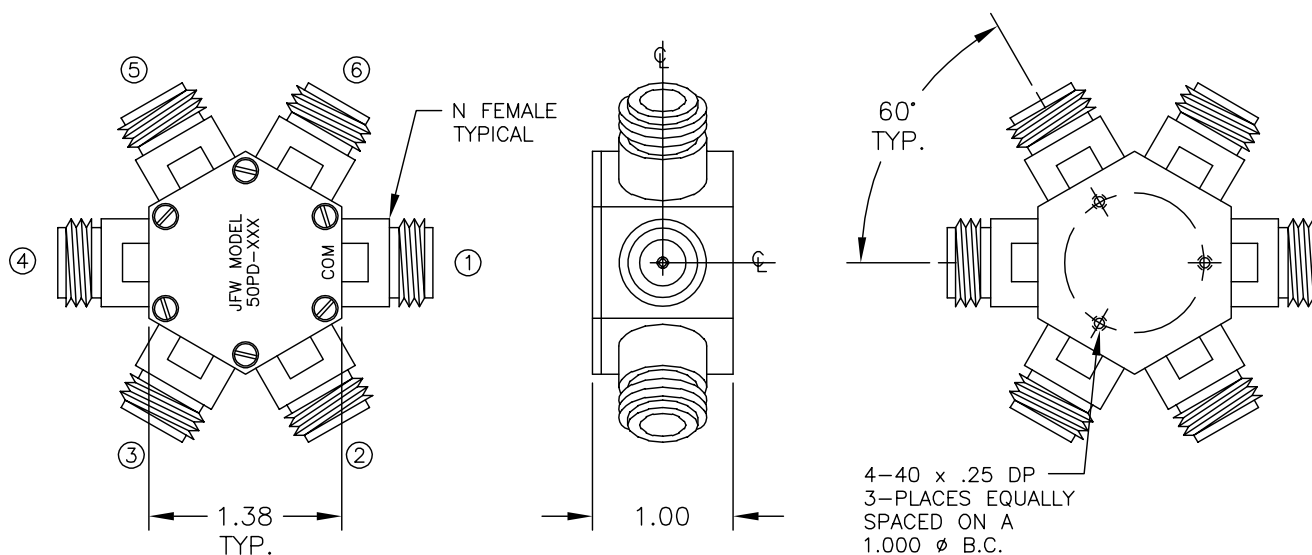
Resistive Power Dividers/Combiners

BNC & N - 50 Ohms

Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss	Input Power (average @ +25° C)	Amplitude Tracking	RF Connectors
50PD-133	2-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	6 dB ± 0.5 dB	2 Watts	± 0.3 dB	BNC or N female
50PD-134	3-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	9.5 dB ± 0.5 dB	2 Watts	± 0.4 dB	BNC or N female
50PD-135	4-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	12 dB ± 0.5 dB	2 Watts	± 0.4 dB	BNC or N female
50PD-136	5-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	14 dB ± 0.5 dB	2 Watts	± 0.4 dB	BNC or N female
50PD-335	2-Way	DC-3000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-3000 MHz	6 dB ± 0.5 dB DC-2 GHz 6 dB ± 0.75 dB 2-3 GHz	2 Watts	± 0.4 dB	BNC, N or TNC female
50PD-379	2-Way	DC-4000 MHz	1.35:1	6 dB ± 0.6 dB	2 Watts	± 0.5 dB	N female
50PD-432	2-Way	DC-6000 MHz	1.5:1	6 dB ± 0.5 dB DC-3 GHz 6 dB ± 1.0 dB 3-6 GHz	1 Watt	± 0.4 dB	N female
50PD-669	3-Way	DC-4000 MHz	1.4:1 DC-2 GHz 1.5:1 2-4 GHz	9.5 dB ± 0.5 dB DC-2 GHz 9.5 dB ± 0.6 dB 2-4 GHz	2 Watts	± 0.6 dB	N female

Common Specifications

Impedance	Peak Power	Operating Temperature
50 Ohms	100 Watts (1 microsecond)	-40° C to +85° C



CONFIG.	COMMON PORT	IN/OUT PORTS
2 WAY	1	3,5
3 WAY	1	3,4,5
4 WAY	1	2,3,5,6
5 WAY	1	2,3,4,5,6

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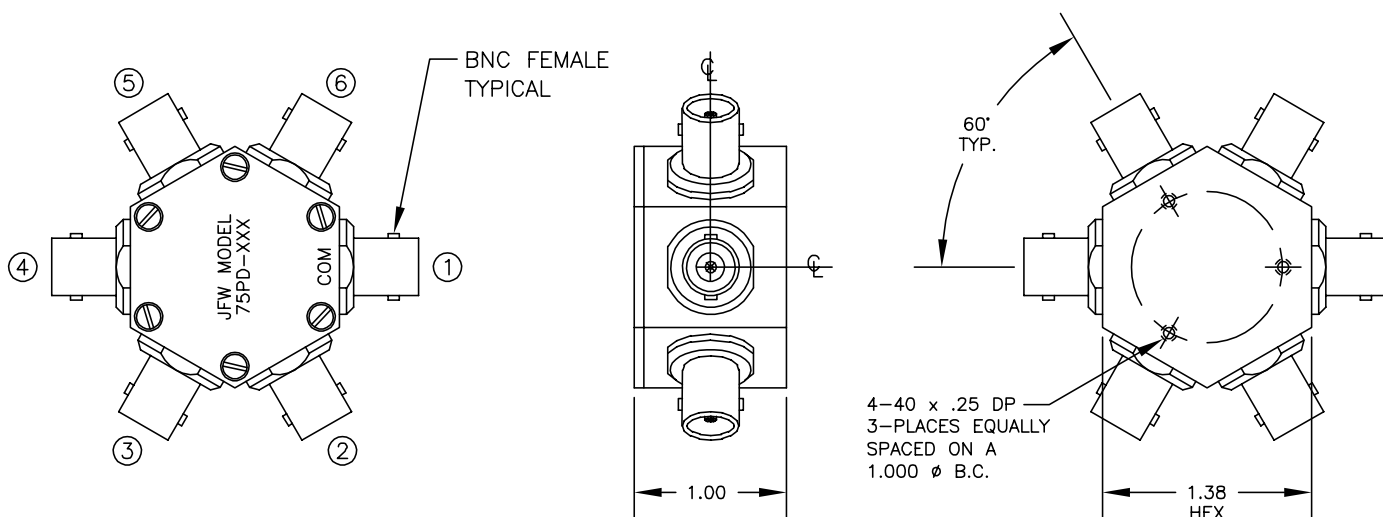
75 Ohm Resistive Power Dividers/Combiners

BNC, N, & F - 75 Ohm

Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss	Input Power (average @ 25° C)	Amplitude Tracking	RF Connectors
75PD-045	2-Way	DC-2200 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2200 MHz	6 dB $\pm$ 0.5 dB	2 Watts	$\pm$ 0.3 dB	BNC, F or N female
75PD-046	3-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	9.5 dB $\pm$ 0.5 dB	2 Watts	$\pm$ 0.4 dB	BNC, F or N female
75PD-047	4-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	12 dB $\pm$ 0.75 dB	2 Watts	$\pm$ 0.5 dB	BNC, F or N female
75PD-048	5-Way	DC-2000 MHz	1.2:1 DC-500 MHz 1.3:1 500-1000 MHz 1.4:1 1000-2000 MHz	14 dB $\pm$ 0.75 dB	2 Watts	$\pm$ 0.5 dB	BNC, F or N female

Common Specifications

Impedance	Peak Power	Operating Temperature
75 Ohms	100 Watts (1 microsecond)	-40° C to +85° C



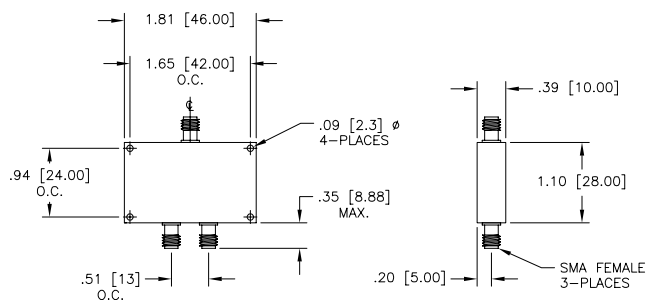
CONFIG.	COMMON PORT	IN/OUT PORTS
2 WAY	1	3,5
3 WAY	1	3,4,5
4 WAY	1	2,3,5,6
5 WAY	1	2,3,4,5,6

LTE Reactive Power Dividers / Combiners

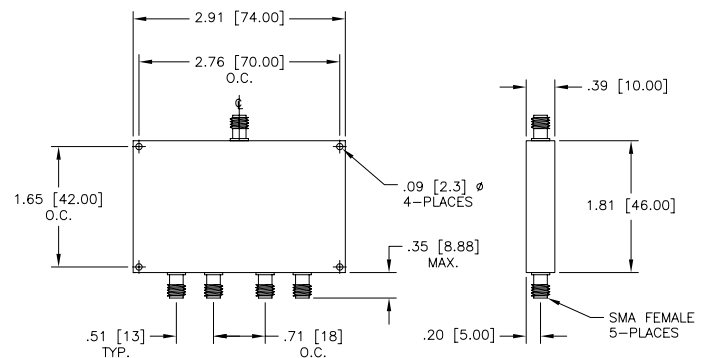
Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss (maximum)	Amplitude Tracking	Phase Tracking	Isolation (minimum)
50PD-659	2-Way	698-3000 MHz	1.4:1	0.6 dB (above 3 dB split)	± 0.5 dB	± 5°	18 dB
50PD-660	4-Way	698-3000 MHz	1.5:1	1.2 dB (above 6 dB split)	± 0.7 dB	± 8°	18 dB
50PD-665	8-Way	698-3000 MHz	1.6:1	1.5 dB (above 9 dB split)	± 0.7 dB	± 8°	18 dB

Common Specifications			
Impedance	Input Power	Operating Temperature	RF Connectors
50 Ohms	5 Watts average (divider port) 0.25 Watts average (combiner ports)	-40° C to +85° C	SMA female

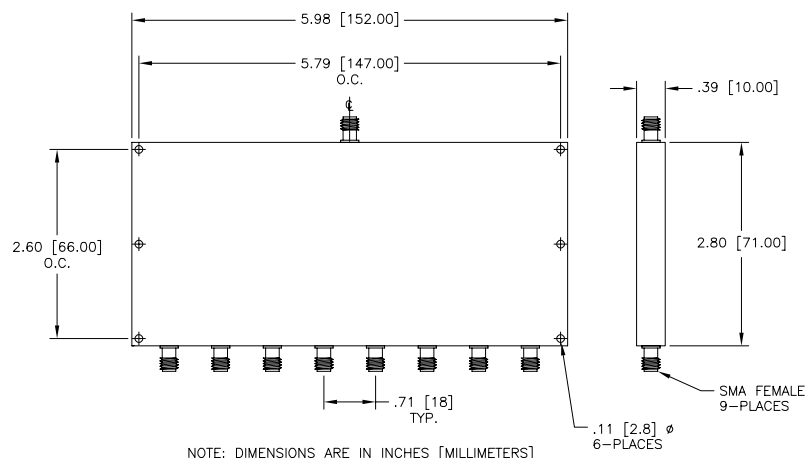
50PD-659



50PD-660



50PD-665

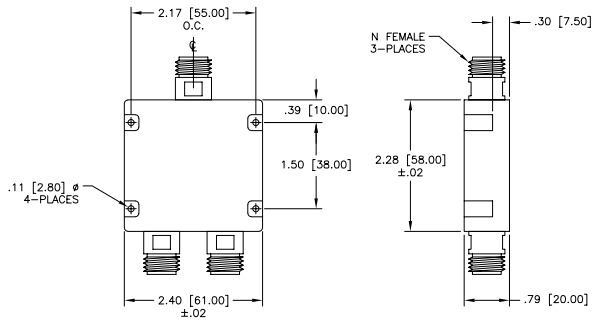


LTE Reactive Power Dividers / Combiners

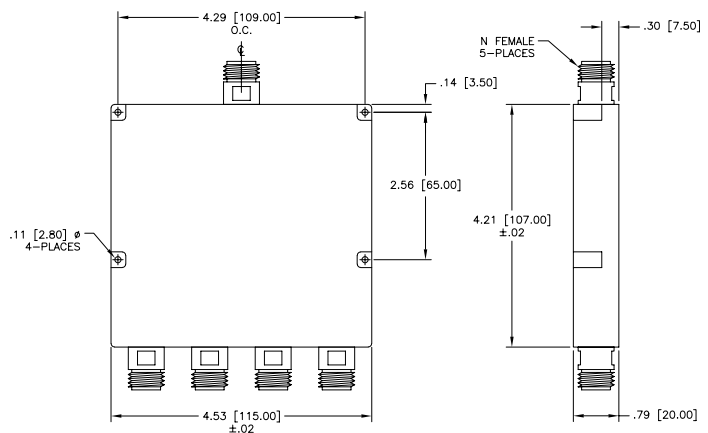
Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss (maximum)	Amplitude Tracking	Phase Tracking	Isolation (minimum)
50PD-727	2-Way	698-3000 MHz	1.4:1	0.8 dB (above 3 dB split)	± 0.5 dB	± 5°	18 dB
50PD-728	4-Way	698-3000 MHz	1.5:1	1.2 dB (above 6 dB split)	± 0.7 dB	± 8°	18 dB
50PD-742	8-Way	698-3000 MHz	1.5:1	2 dB (above 9 dB split)	± 0.5 dB	± 8° < ± 3° typical @ 3 GHz	18 dB

Common Specifications			
Impedance	Input Power	Operating Temperature	RF Connectors
50 Ohms	5 Watts average (divider port) 0.25 Watts average (combiner ports)	-40° C to +85° C	N female

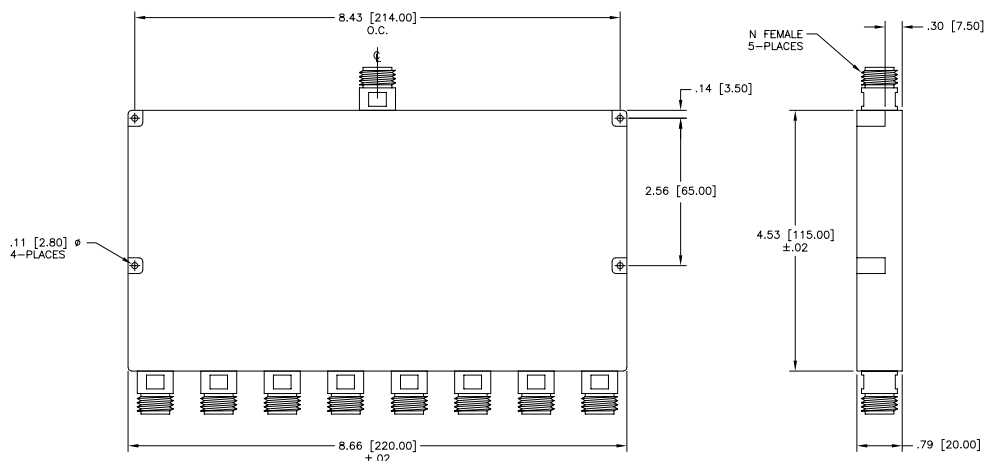
50PD-727



50PD-728



50PD-742



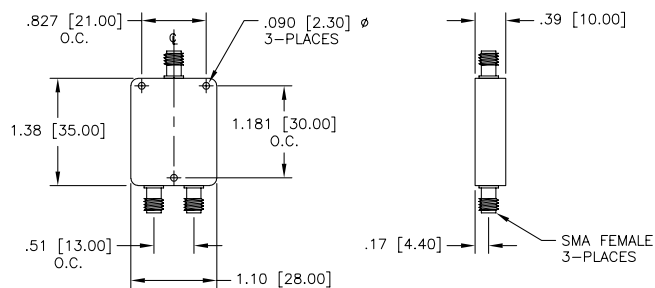
NOTE: DIMENSIONS ARE IN INCHES [MILLIMETERS]

Reactive Power Divider/Combiner

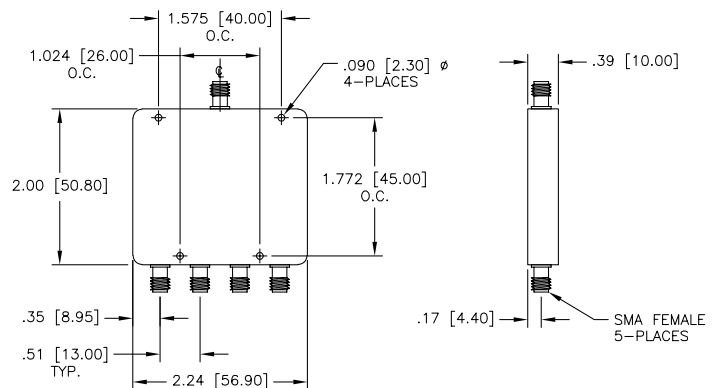
Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss (maximum)	Amplitude Tracking	Phase Tracking	Isolation (minimum)
50PD-559	2-Way	800-2400 MHz	1.4:1	0.5 dB (above 3 dB split)	± 0.3 dB	± 5°	20 dB
50PD-560	4-Way	800-2400 MHz	1.4:1	0.8 dB (above 6 dB split)	± 0.4 dB	± 6°	20 dB
50PD-570	8-Way	800-2400 MHz	1.5:1	1.2 dB (above 9 dB split)	± 0.6 dB	± 9°	20 dB

Common Specifications			
Impedance	Input Power	Operating Temperature	RF Connectors
50 Ohms	5 Watts average (divider port) 0.3 Watts average (combiner ports)	-40° C to +85° C	SMA female

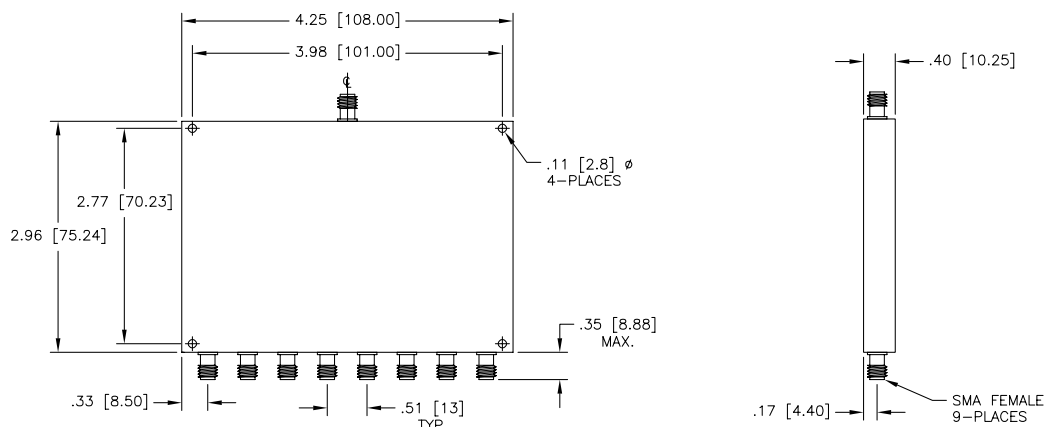
50PD-559



50PD-560



50PD-570



NOTE: DIMENSIONS ARE IN INCHES [MILLIMETERS]

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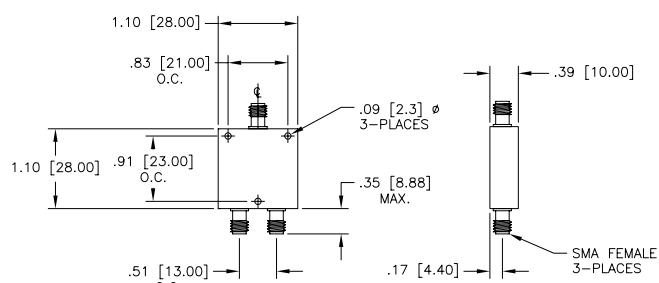
WLAN Reactive Power Dividers/Combiners

Model	Configuration	Frequency Range	VSWR	Insertion Loss	Amplitude Tracking	Phase Tracking	Isolation (minimum)
50PD-634	2-Way	2-6 GHz	1.35:1 maximum 1.2:1 typical	0.6 dB maximum 0.15 dB typical @ 2 GHz 0.30 dB typical @ 6 GHz (above 3 dB split)	± 0.35 dB	± 5°	20 dB
50PD-638	4-Way	2-6 GHz	1.45:1 maximum 1.3:1 typical	1.4 dB maximum 0.4 dB typical @ 2 GHz 0.7 dB typical @ 6 GHz (above 6 dB split)	± 0.6 dB	± 6°	18 dB
50PD-647	8-Way	2-6 GHz	1.6:1 maximum 1.4:1 typical	1.9 dB maximum 0.5 dB typical @ 2 GHz 1.1 dB typical @ 6 GHz (above 9 dB split)	± 0.8 dB	± 9°	18 dB

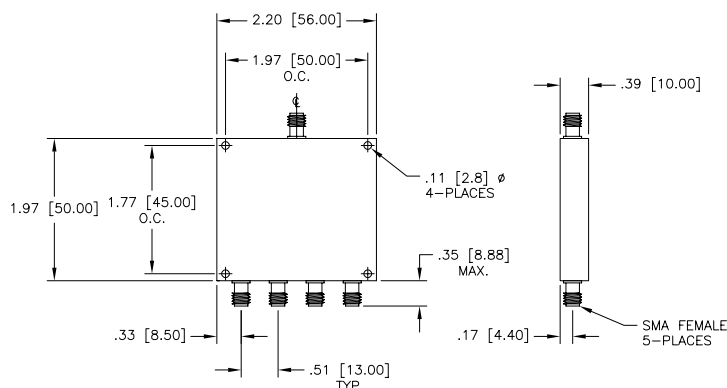
Common Specifications

Impedance	Input Power	Operating Temperature	RF Connectors
50 Ohms	5 Watts average (divider port) 0.25 Watts average (combiner ports)	-40° C to + 85° C	SMA female

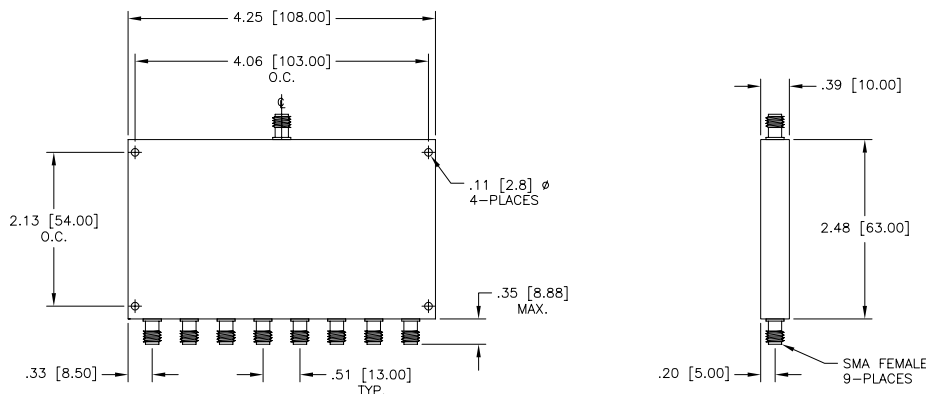
50PD-634



50PD-638



50PD-647



NOTE: DIMENSIONS ARE IN INCHES [MILLIMETERS]

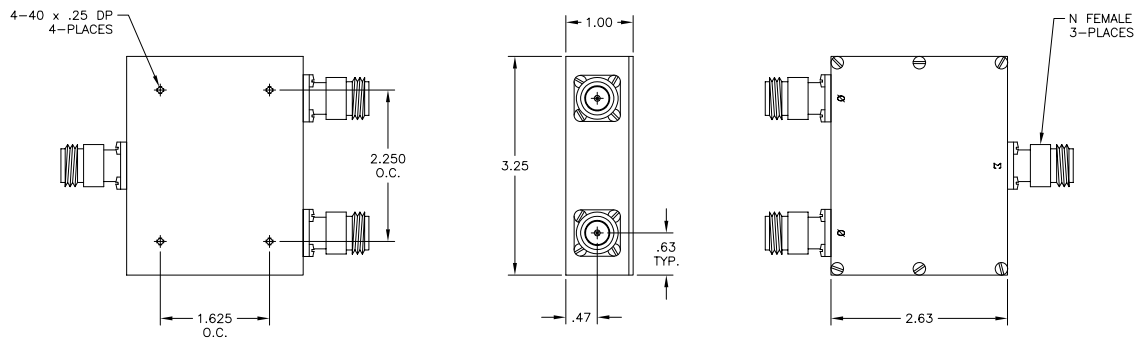
High Power Reactive Power Dividers/Combiners

Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss	Amplitude Tracking	Phase Tracking	Isolation (minimum)
50PD-681	2-Way	700-2700 MHz	1.4:1	1.2 dB maximum 0.2 dB typical @ 700 MHz 0.8 dB typical @ 2700 MHz (above 3 dB split)	± 0.4 dB	± 5°	20 dB
50PD-698	2-Way	700-3000 MHz	1.5:1	1.4 dB maximum 0.2 dB typical @ 700 MHz 1.1 dB typical @ 3000 MHz (above 3 dB split)	± 0.5 dB	± 5°	20 dB
50PD-700	2-Way	380-400 MHz	1.2:1	0.3 dB maximum 0.1 dB typical (above 3 dB split)	± 0.1 dB	± 1°	20 dB
50PD-756	2-Way	500-2000 MHz	1.4:1	0.8 dB maximum 0.5 dB typical (above 3 dB split)	± 0.4 dB	± 5°	20 dB
50PD-682	4-Way	700-2700 MHz	1.6:1	2.2 dB maximum 0.5 dB typical @ 700 MHz 1.7 dB typical @ 2700 MHz (above 6 dB split)	± 0.8 dB	± 9°	19 dB

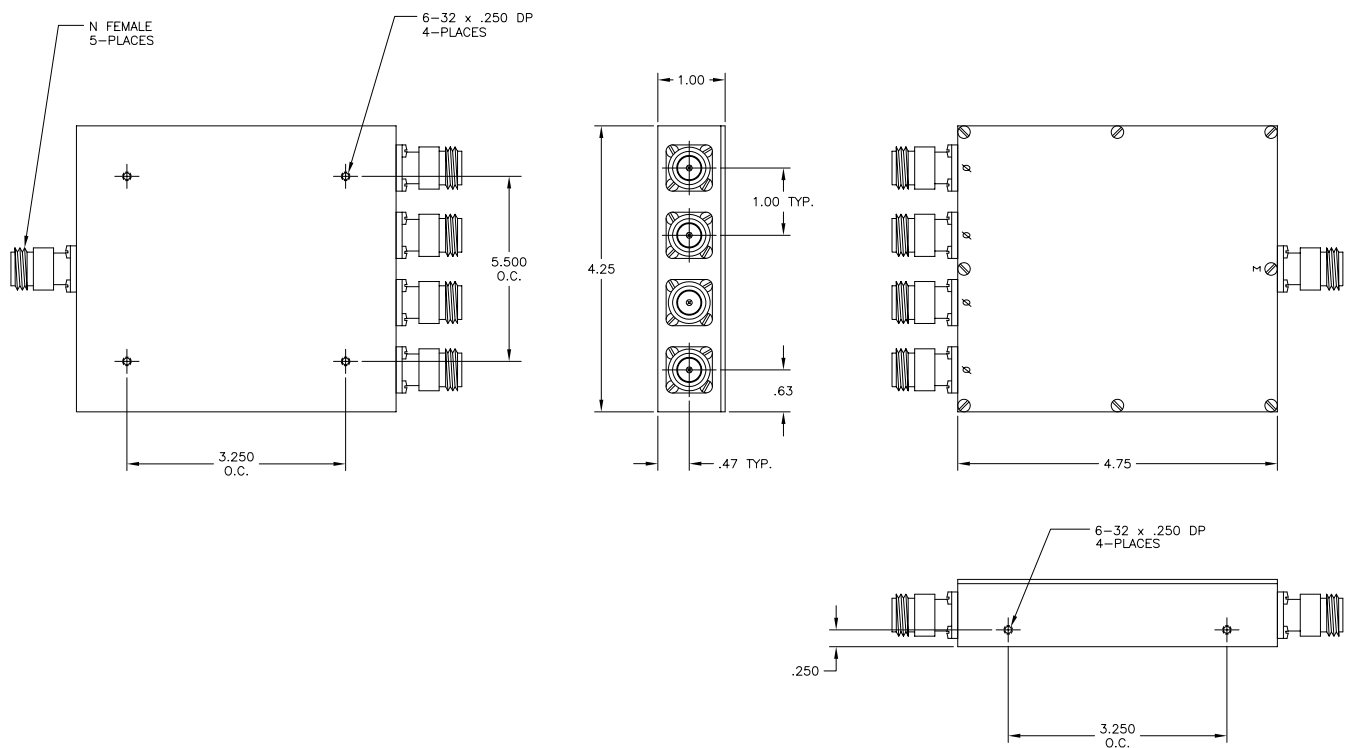
Model	Impedance	Input Power	Operating Temperature	RF Connectors
50PD-681	50 Ohms	100 Watts average (divider port) 25 Watts average (combiner ports)	-40° C to +85° C	N or SMA female
50PD-698	50 Ohms	100 Watts average (divider port) 25 Watts average (combiner ports)	-40° C to +85° C	N or SMA female
50PD-700	50 Ohms	200 Watts average (divider port) 70 Watts average (combiner ports) *See below	-40° C to +100° C	N or SMA female
50PD-756	50 Ohms	100 Watts average (divider port) 25 Watts average (combiner ports)	-40° C to +85° C	N or SMA female
50PD-682	50 Ohms	100 Watts average (divider port) 25 Watts average (combiner ports)	-40° C to +85° C	N or SMA female
*If combining two signals that are both greater than 25 Watts average, an external heatsink may be required to keep the case temperature under +100° C.				

High Power Reactive Power Dividers/Combiners

50PD-681 / 50PD-698 / 50PD-700 / 50PD-756



50PD-682

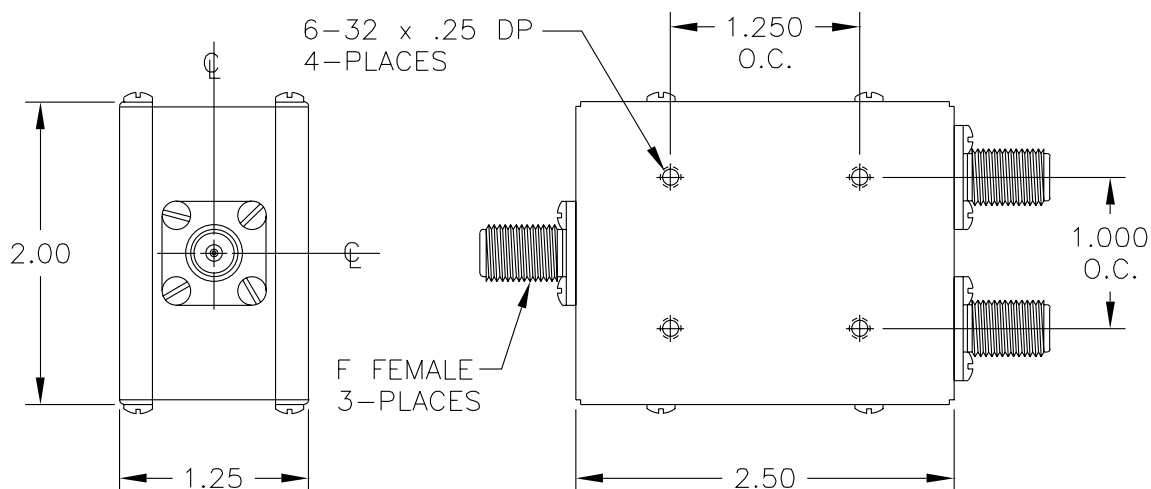


75 Ohm Reactive Power Dividers/Combiners

Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss (maximum)	Amplitude Tracking	Phase Tracking	Isolation (minimum)
75PD-074	2-Way	800-2400 MHz	1.5:1	0.75 dB (above 3 dB split)	± 0.4 dB	± 5°	20 dB
75PD-072	4-Way	800-2400 MHz	1.5:1	1.0 dB (above 6 dB split)	± 0.5 dB	± 5°	20 dB
75PD-075	8-Way	950-2150 MHz	1.5:1	1.3 dB (above 9 dB split)	± 0.6 dB	± 5°	20 dB

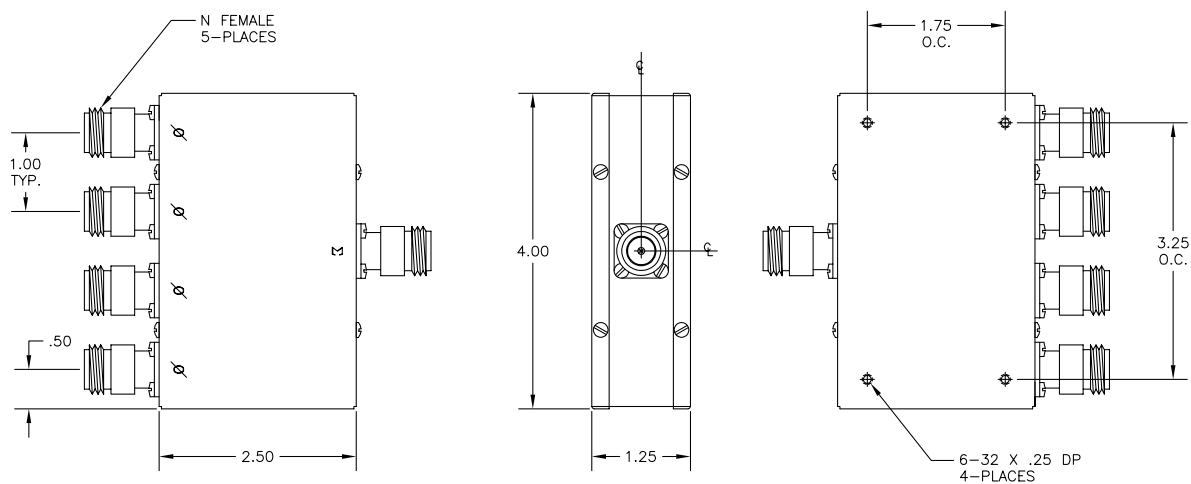
Common Specifications			
Impedance	Input Power	Operating Temperature	RF Connectors
75 Ohms	5 Watts average (divider port) 0.3 Watts average (combiner ports)	-40° C to +85° C	F or N female

75PD-074

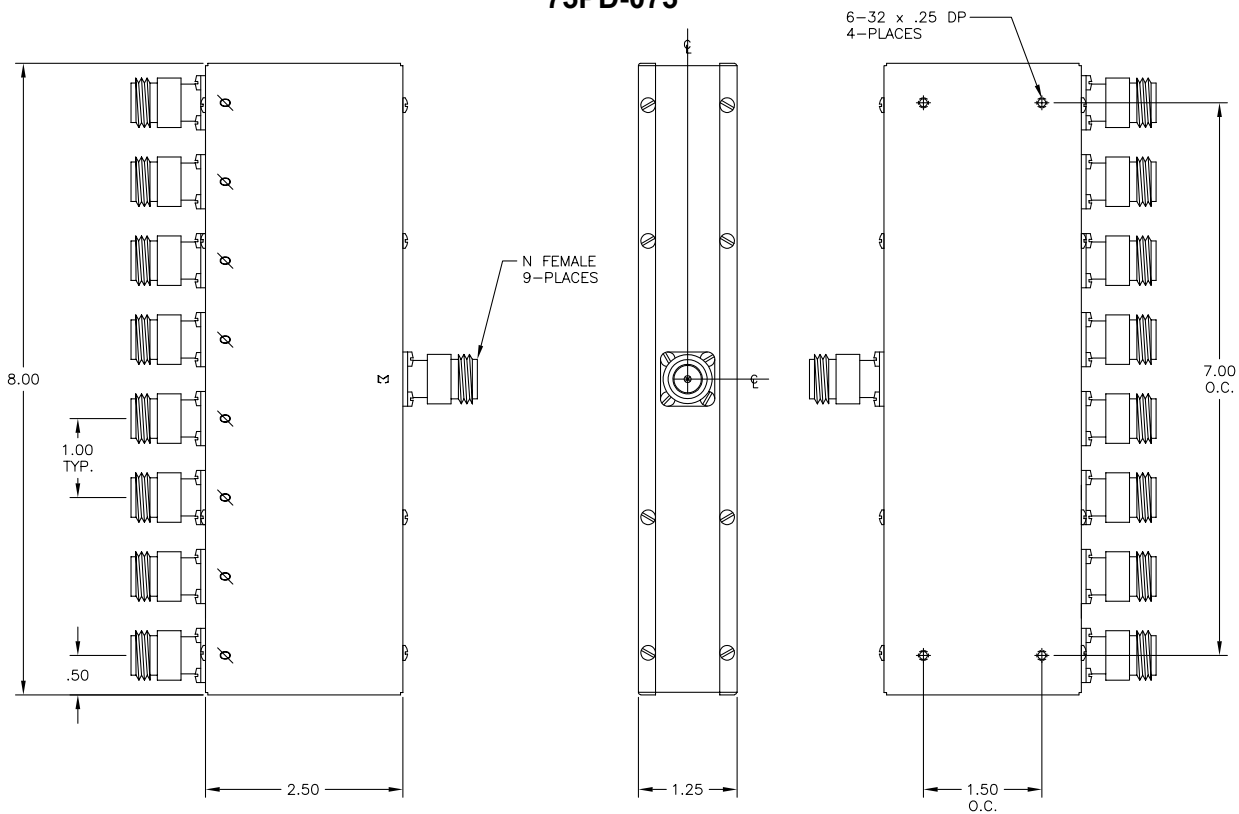


75 Ohm Reactive Power Dividers/Combiners

75PD-072



75PD-075



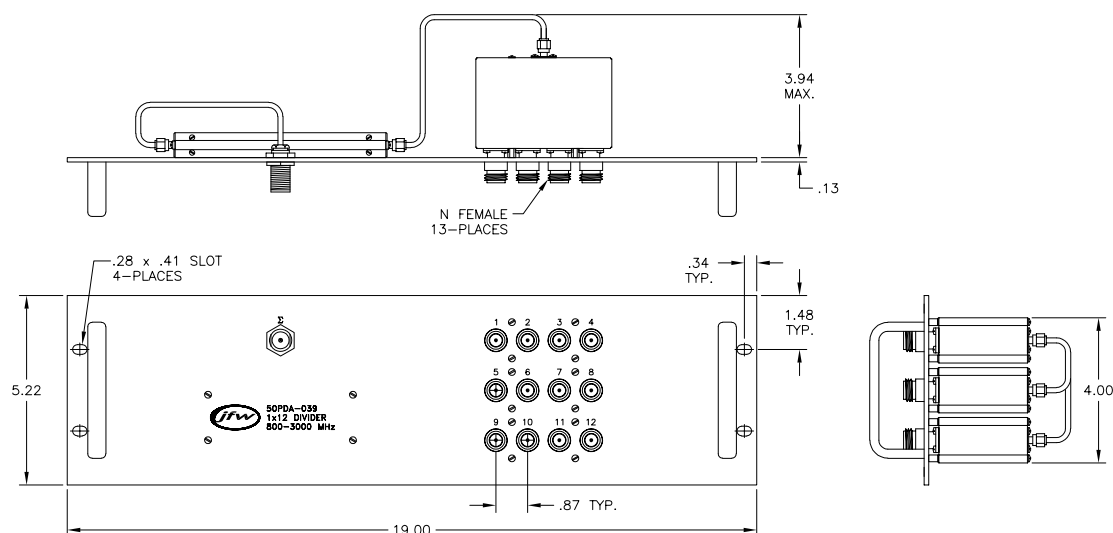
Power Dividers/Combiners Assembly

Model	Configuration	Frequency Range	VSWR (maximum)	Insertion Loss (maximum)	Amplitude Tracking	Phase Tracking	Isolation (minimum)
50PDA-039	12-Way	800-3000 MHz	1.6:1	1.75 dB (above 10.8 dB split)	± 0.75 dB	± 10°	20 dB
50PDA-040	24-Way	800-3000 MHz	1.6:1	2.3 dB (above 13.8 dB split)	± 0.9 dB	± 10°	20 dB

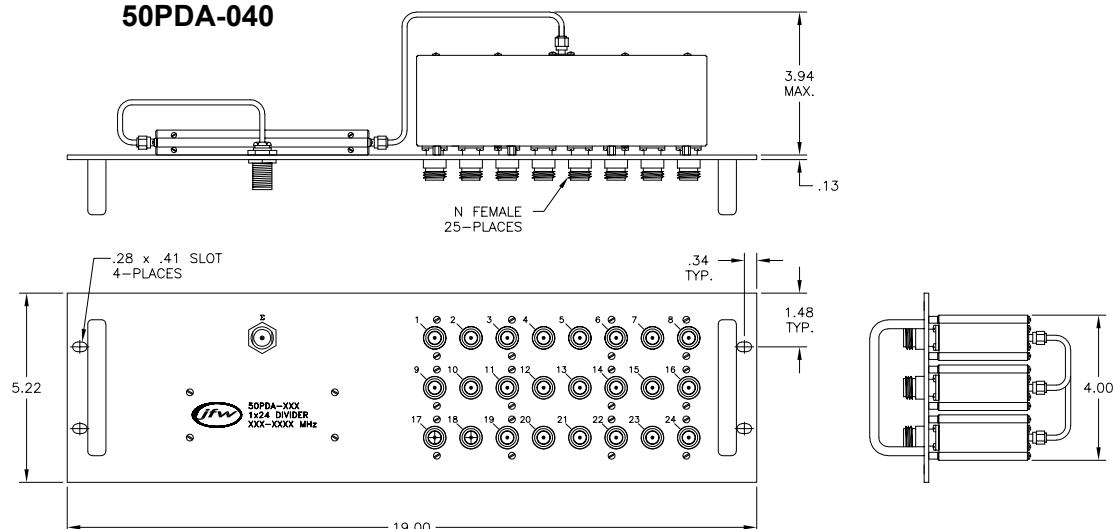
Common Specifications

Impedance	Input Power	Operating Temperature	RF Connectors
50 Ohms	5 Watts average (divider port) 0.3 Watts average (combiner ports)	-40° C to +85° C	N or SMA female

50PDA-039



50PDA-040



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Test Accessories

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50DB-009 SMA).

Bias Taps - 50 Ohm

Model Number	Frequency Range	Page
50BT-014	800-2500 MHz	8-8
50BT-017	100-1750 MHz	8-8
50BT-029	250-3000 MHz	8-8

Bias Taps - 75 Ohm

75BT-007	100-1750 MHz	8-8
75BT-013	5-2150 MHz	8-8

DC Blocks - 50 Ohm

Model Number	Frequency Range	Page
50DB-002	50 KHz - 1800 MHz	8-3
50DB-007	10 MHz - 18 GHz	8-3
50DB-009	10-4000 MHz	8-3
50DB-011	10 MHz - 18 GHz	8-3
50DB-039	200 KHz - 2000 MHz	8-3

DC Blocks - 75 Ohm

75DB-001	1-2500 MHz	8-3
75DB-013	0.1-3000 MHz	8-3

DC Cables

Model Number	Description	Page
016-168-XX	10 Pin Ribbon	8-11
016-306-XX	10 Pin Ribbon	8-11
016-330-XX	4 Pin Molex	8-11
016-551-XX	D-Subminiature 9 Pin	8-11
016-552-XX	D-Subminiature 9 Pin	8-11
016-554-XX	4 Pin Molex	8-11

RF Detectors - 50 Ohm

Model Number	Frequency Range	Page
50D-050	1-1000 MHz	8-6
50D-051	1-2000 MHz	8-6
50D-052	1-3000 MHz	8-6

RF Detectors - 75 Ohm

75D-009	1-1000 MHz	8-7
75D-010	1-2200 MHz	8-7

Feedthru Terminations - 50 Ohm

Model Number	Frequency Range	Impedance	Page
50L-001	DC-1000 MHz	50 Ohms	8-9
50L-018	DC-1000 MHz	50 Ohms	8-9

Feedthru Terminations - 75 Ohm

Model Number	Frequency Range	Impedance	Page
75L-001	DC-500 MHz	75 Ohms	8-9
75L-004	DC-1000 MHz	75 Ohms	8-9

Impedance Matching Pads

Model Number	Frequency Range	Page
57Z	DC-1000 MHz	8-4
75Z	DC-1000 MHz	8-4
57Z-2G	DC-2000 MHz	8-4
75Z-2G	DC-2000 MHz	8-4
57Z-3G	DC-3000 MHz	8-4
75Z-3G	DC-3000 MHz	8-4

Impedance Matching Transformers

Model Number	Frequency Range	Page
57ZT	0.5-600 MHz	8-5
75ZT	0.5-600 MHz	8-5
57ZT-1G	0.5-1000 MHz	8-5
75ZT-1G	0.5-1000 MHz	8-5
57ZTT-AA	800-2200 MHz	8-5
75ZTT-AA	800-2200 MHz	8-5

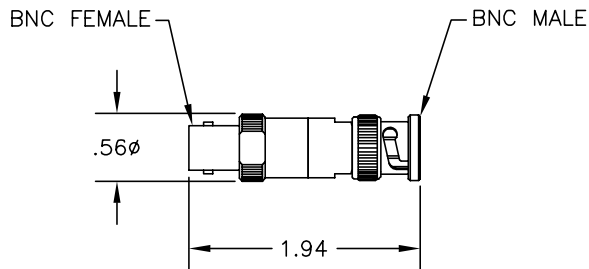
RF Fuse Holders - 50 Ohm

Model Number	Frequency Range	Impedance	Page
50RF-037	DC-1000 MHz	50 Ohms	8-10
50RF-038	DC-1000 MHz	50 Ohms	8-10

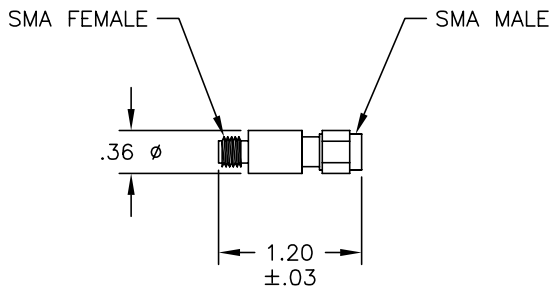
DC Blocks (Inner only)

Model	Frequency Range	Impedance	Insertion Loss (maximum)	VSWR (maximum)	Breakdown Voltage	RF Input Power (average)	RF Connector
50DB-002	50 KHz - 1800 MHz	50 Ohms	0.5 dB	1.3:1	100 Volts	2 Watts	BNC, N or TNC
50DB-007	10 MHz - 18 GHz	50 Ohms	0.5 dB	1.35:1	200 Volts	2 Watts	SMA
50DB-009	10 - 4000 MHz	50 Ohms	0.3 dB	1.3:1	50 Volts	2 Watts	BNC, N, SMA or TNC
50DB-011	10 MHz - 18 GHz	50 Ohms	0.6 dB	1.35:1	200 Volts	2 Watts	N
50DB-039	200 KHz - 2000 MHz	50 Ohms	0.4 dB	1.2:1	50 Volts	2 Watts	SMA
75DB-001	1-2500 MHz	75 Ohms	0.2 dB 1-1000 MHz 0.3 dB 1000-2500 MHz	1.1:1 1-500 MHz 1.25:1 500-1000 MHz 1.35:1 1000-2000 MHz 1.4:1 2000-2500 MHz	100 Volts	2 Watts	BNC, N or TNC
75DB-013	0.1-3000 MHz	75 Ohms	0.5 dB 0.1-2000 MHz 0.7 dB 2000-3000 MHz	1.3:1 0.1-2000 MHz 1.4:1 2000-3000 MHz	50 Volts	2 Watts	BNC, F or N

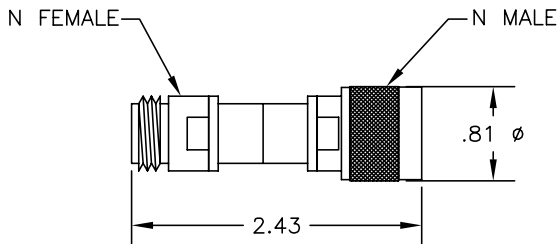
50DB-002 / 75DB-001



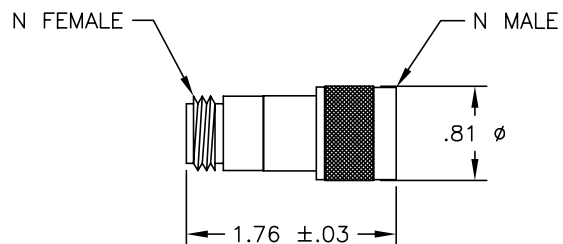
50DB-007



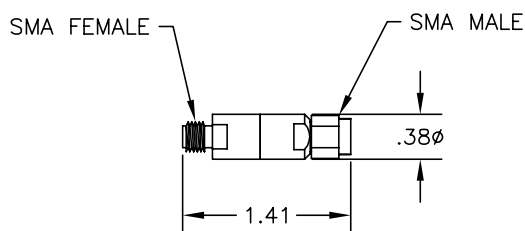
50DB-009



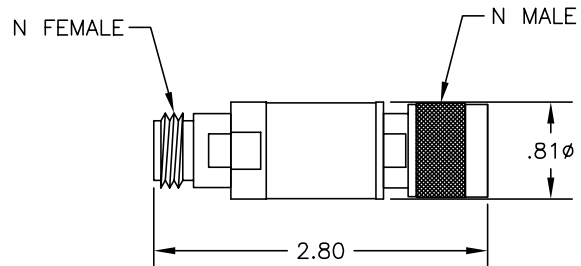
50DB-011



50DB-039



75DB-013



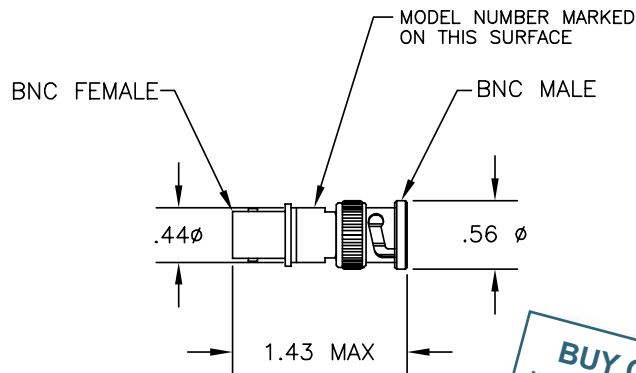
Impedance Matching Pads

Model	Frequency Range	Impedance*	Attenuation Loss	VSWR (maximum)
57Z	DC-1000 MHz	50 Ohms male 75 Ohms female	5.7 ± 0.5 dB	1.2:1
75Z	DC-1000 MHz	75 Ohms male 50 Ohms female	5.7 ± 0.5 dB	1.2:1
57Z-2G	DC-2000 MHz	50 Ohms male 75 Ohms female	5.7 ± 0.5 dB	1.2:1 DC-1000 MHz 1.3:1 1000-2000 MHz
75Z-2G	DC-2000 MHz	75 Ohms male 50 Ohms female	5.7 ± 0.5 dB	1.2:1 DC-1000 MHz 1.3:1 1000-2000 MHz
57Z-3G	DC-3000 MHz	50 Ohms male 75 Ohms female	5.7 ± 0.3 dB DC-1500 MHz 5.7 ± 0.5 dB 1500-3000 MHz	1.2:1 DC-1500 MHz 1.35:1 1500-3000 MHz
75Z-3G	DC-3000 MHz	75 Ohms male 50 Ohms female	5.7 ± 0.3 dB DC-1500 MHz 5.7 ± 0.5 dB 1500-3000 MHz	1.2:1 DC-1500 MHz 1.35:1 1500-3000 MHz

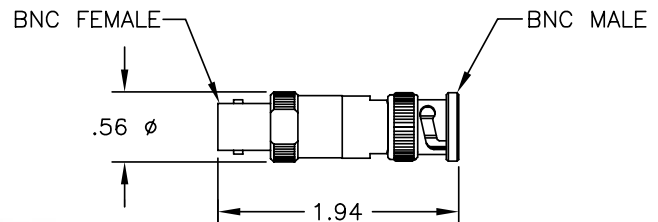
*** OTHER IMPEDANCES AVAILABLE - PLEASE CONTACT THE FACTORY**

Common Specifications			
Input Power	Operating Temperature	RF Connectors - 50 Ohm Side	RF Connectors - 75 Ohm Side
1 Watt average 1000 Watts peak	-20° C to +85° C	BNC, TNC, N or SMA	BNC, F, N or TNC

57Z / 75Z BNC

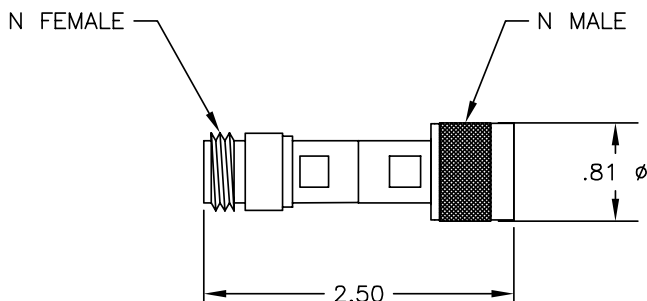


57Z-2G / 75Z-2G BNC

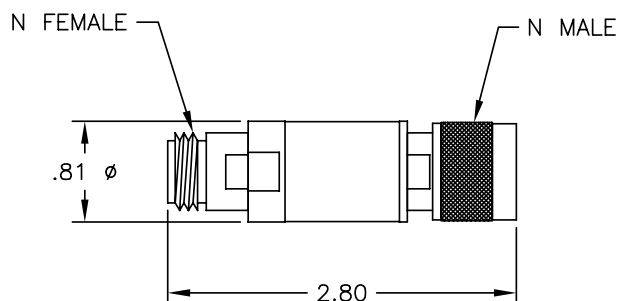


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57Z / 75Z / 57Z-2G / 75Z-2G N



57Z-3G / 75Z-3G N



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Impedance Matching Transformers

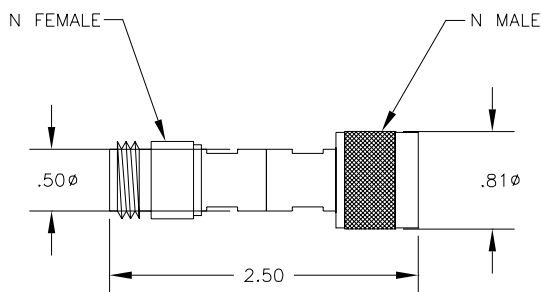
Model	Frequency Range	Impedance*	Attenuation Loss (maximum)	VSWR (maximum)	Input Power
57ZT	0.5-600 MHz	50 Ohms male 75 Ohms female	0.75 dB 0.5-300 MHz 1 dB 300-600 MHz	1.3:1 0.5-3 MHz 1.2:1 3-300 MHz 1.3:1 300-600 MHz	1 Watt average 1000 Watts peak
75ZT	0.5-600 MHz	75 Ohms male 50 Ohms female	0.75 dB 0.5-300 MHz 1 dB 300-600 MHz	1.3:1 0.5-3 MHz 1.2:1 3-300 MHz 1.3:1 300-600 MHz	1 Watt average 1000 Watts peak
57ZT-1G	0.5-1000 MHz	50 Ohms male 75 Ohms female	0.75 dB 0.5-300 MHz 1.2 dB 300-1000 MHz	1.3:1 0.5-3 MHz 1.2:1 3-300 MHz 1.3:1 300-1000 MHz	1 Watt average 1000 Watts peak
75ZT-1G	0.5-1000 MHz	75 Ohms male 50 Ohms female	0.75 dB 0.5-300 MHz 1.2 dB 300-1000 MHz	1.3:1 0.5-3 MHz 1.2:1 3-300 MHz 1.3:1 300-1000 MHz	1 Watt average 1000 Watts peak
57ZTT-AA	800-2200 MHz	50 Ohms male 75 Ohms female	0.5 dB	1.3:1	20 Watts average
75ZTT-AA	800-2200 MHz	75 Ohms male 50 Ohms female	0.5 dB	1.3:1	20 Watts average

*** OTHER IMPEDANCES AVAILABLE - PLEASE CONTACT THE FACTORY**

Common Specifications

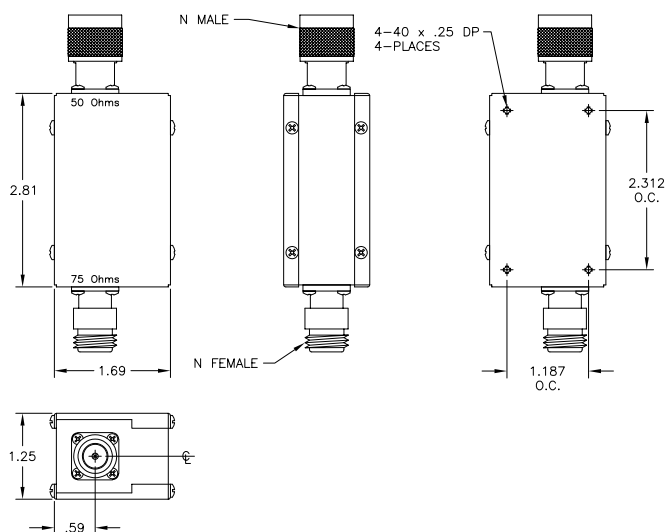
Operating Temperature	RF Connectors - 50 Ohm Side	RF Connectors - 75 Ohm Side
-20° C to +85° C	BNC, TNC, N or SMA	BNC, F, N or TNC

57ZT / 75ZT / 57ZT-1G / 75ZT-1G



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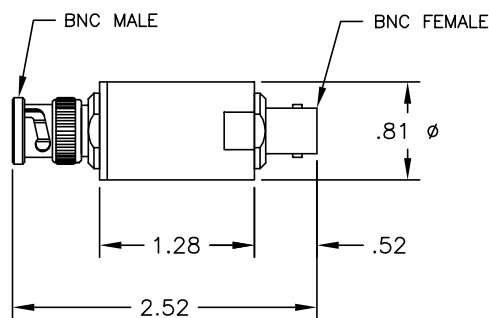
RF Detectors 50 Ohm

Model	Frequency Range	VSWR (maximum)	Flatness	RF Input Power (maximum)	Output Capacitance
50D-050	1-1000 MHz	1.2:1	± 0.2 dB	100 mW	1000 pF
50D-051	1-2000 MHz	1.2:1 1-1000 MHz 1.3:1 1000-2000 MHz	± 0.3 dB	100 mW	1000 pF
50D-052	1-3000 MHz	1.2:1 1-1000 MHz 1.3:1 1000-2000 MHz 1.4:1 2000-3000 MHz	± 0.2 dB 1-500 MHz ± 0.3 dB 500-2000 MHz ± 0.5 dB 2000-3000 MHz	100 mW	1000 pF

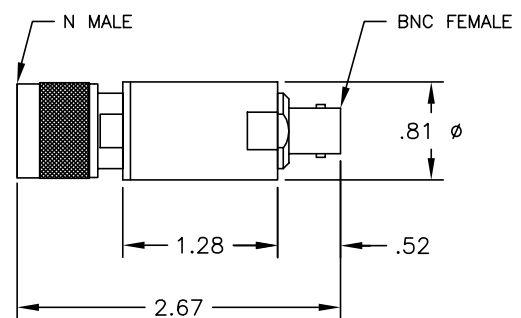
Common Specifications			
Impedance	RF Input Connector	DC Output Connector	DC Output Polarity
50 Ohms	N, BNC, TNC or SMA male or female	BNC, N, SMA or TNC female	Negative or Positive (please specify)

Note: Detector output voltage will be either positive or negative based on which polarity of detector is ordered.

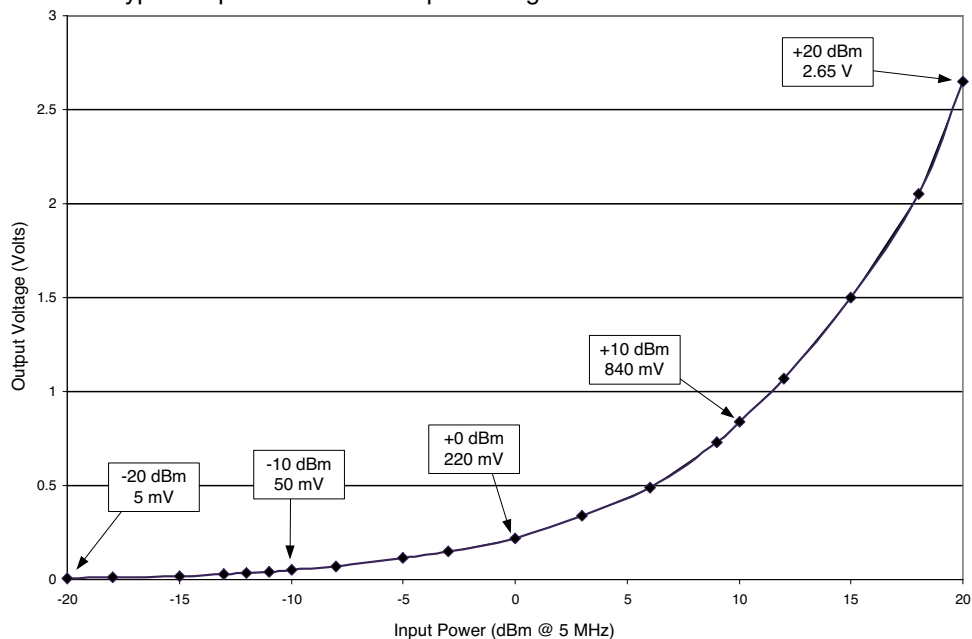
50D-050



50D-051 / 50D-052



Typical Input Power vs. Output Voltage for 50D-050/50D-051/50D-052



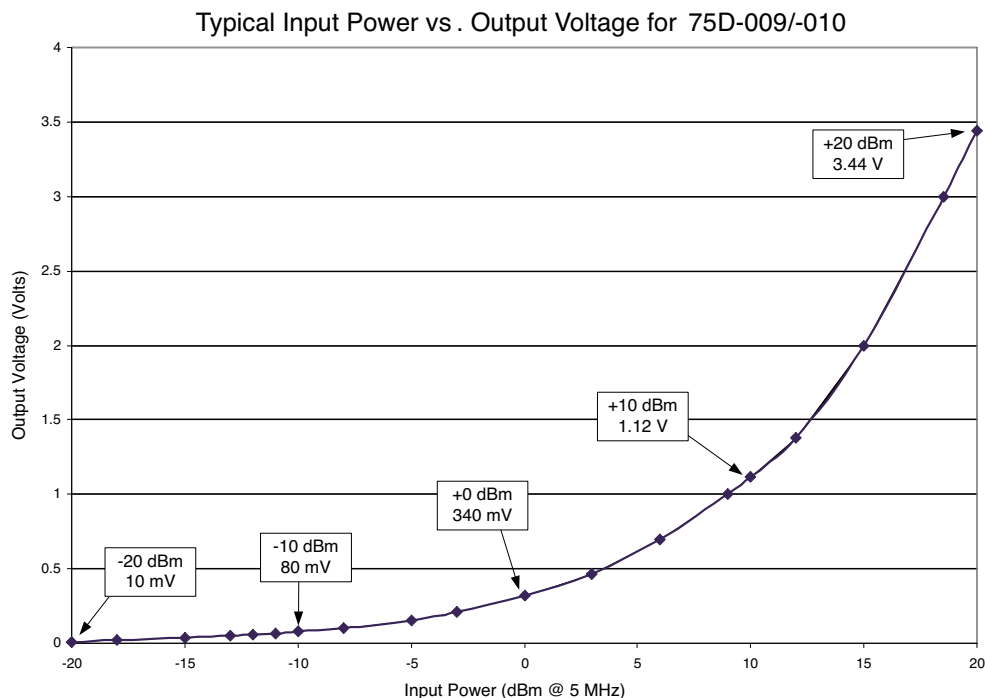
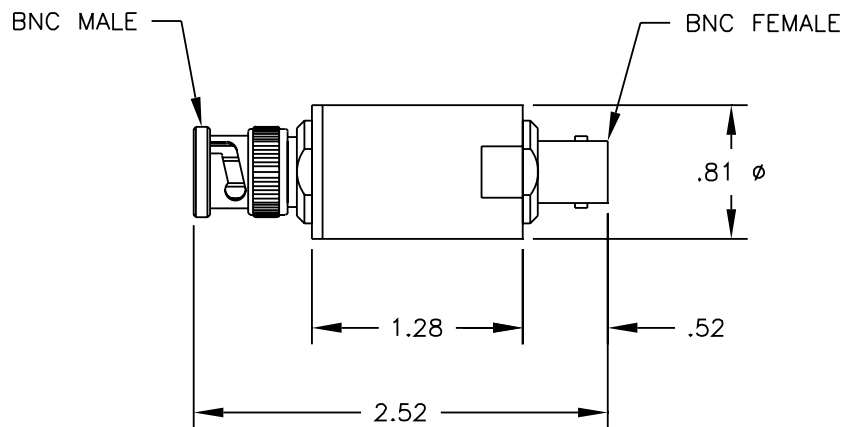
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RF Detectors 75 Ohm

Model	Frequency Range	VSWR (maximum)	Flatness	RF Input Power (maximum)	Output Capacitance (nominal)
75D-009	1-1000 MHz	1.2:1	± 0.2 dB	100 mW	1000 pF
75D-010	1-2200 MHz	1.2:1 1-1000 MHz 1.4:1 1000-2200 MHz	± 0.2 dB	100 mW	1000 pF

Common Specifications			
Impedance	RF Input Connector (75 Ohms)	DC Output Connector (50 Ohms)	DC Output Polarity
75 Ohms	BNC, N or F male or female	BNC, N, SMA or TNC female	Negative or Positive (please specify)

Note: Detector output voltage will be either positive or negative based on which polarity of detector is ordered.

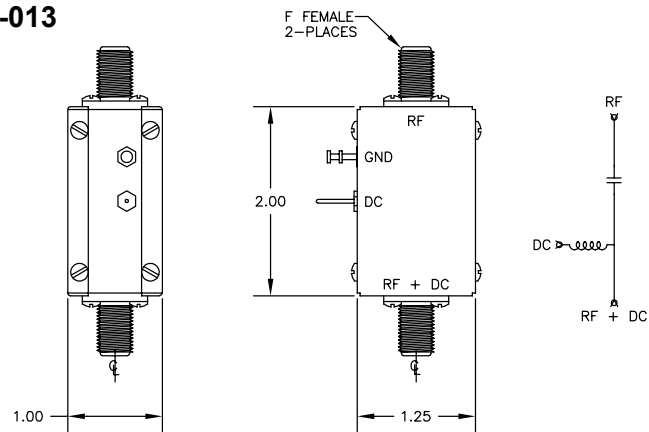


Bias Taps

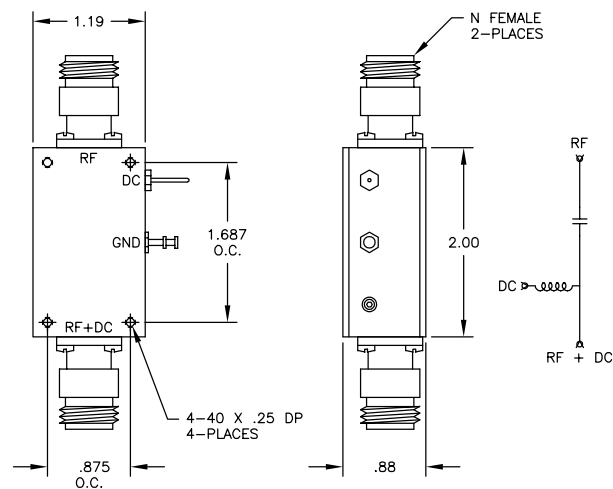
Model	Impedance	Frequency Range	VSWR (maximum)	Input Power (average)	Insertion Loss (maximum)
50BT-014	50 Ohms	800-2500 MHz	1.2:1	2 Watts	0.3 dB
50BT-017	50 Ohms	100-1750 MHz	1.4:1 100-300 MHz 1.3:1 300-1750 MHz	2 Watts	1.25 dB
50BT-029	50 Ohms	250-3000 MHz	1.5:1 250-500 MHz 1.3:1 500-3000 MHz	1 Watt	0.5 dB
75BT-007	75 Ohms	100-1750 MHz	1.4:1 100-300 MHz 1.3:1 300-1750 MHz	2 Watts	1.25 dB
75BT-013	75 Ohms	5-2150 MHz	1.25:1	1 Watt	0.4 dB

Model	RF Connectors	DC Voltage	DC Current	Operating Temperature
50BT-014	BNC, N, SMA or TNC male or female	150 Volts	5 Amps	-55° C to +85° C
50BT-017	BNC, N, SMA or TNC male or female	200 Volts	2 Amps	-55° C to +85° C
50BT-029	BNC, N or SMA male or female	100 Volts	1 Amp	-55° C to +85° C
75BT-007	F or BNC female	200 Volts	2 Amps	-55° C to +85° C
75BT-013	BNC, F, or N male or female	50 Volts	1 Amp	-55° C to +85° C

50BT-029 / 75BT-007 / 75BT-013



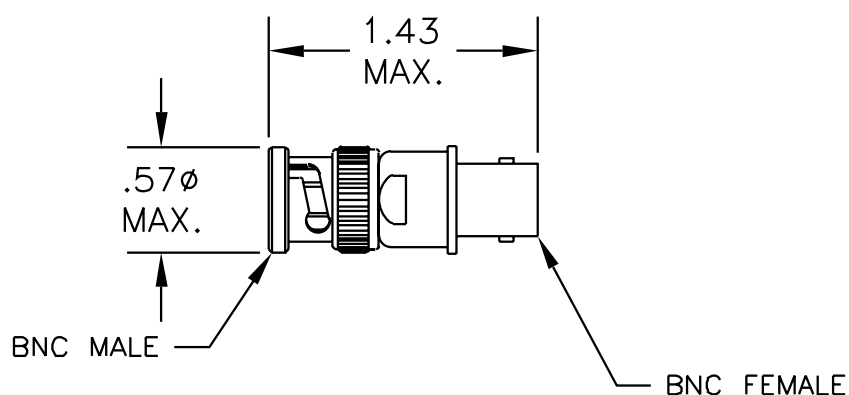
50BT-014 / 50BT-017



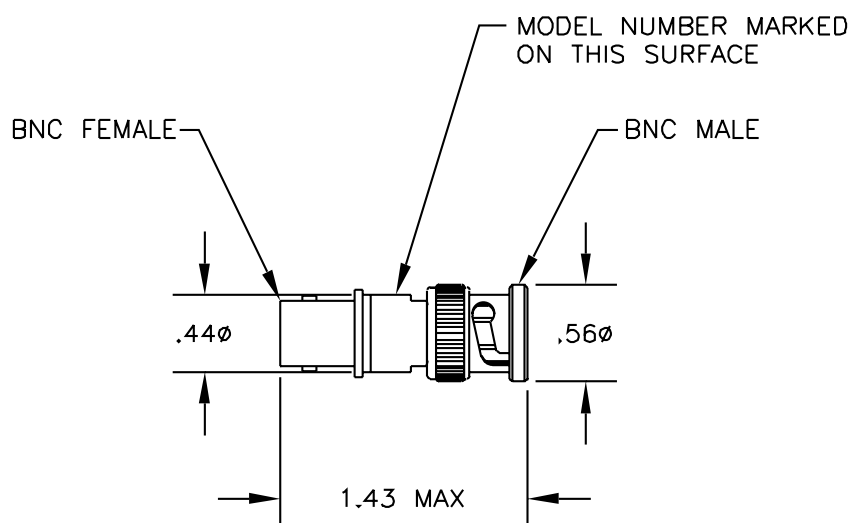
Feedthru Terminations

Model	Frequency Range	Impedance	VSWR (maximum)	RF Input Power	Operating Temperature	RF Connectors
50L-001	DC-1000 MHz	50 Ohms	1.1:1 DC-500 MHz 1.2:1 500-1000 MHz	1 Watt average 1000 Watts peak	-20° C to +100° C	BNC male / BNC female
50L-018	DC-1000 MHz	50 Ohms	1.2:1	2 Watts average 500 Watts peak	-20° C to +100° C	BNC male / BNC female
75L-001	DC-500 MHz	75 Ohms	1.2:1	1 Watt average 1000 Watts peak	-20° C to +100° C	BNC male / BNC female
75L-004	DC-1000 MHz	75 Ohms	1.2:1 DC-500 MHz 1.4:1 500-1000 MHz	1 Watt average 1000 Watts peak	-20° C to +100° C	BNC male / BNC female

50L-018 / 75L-004



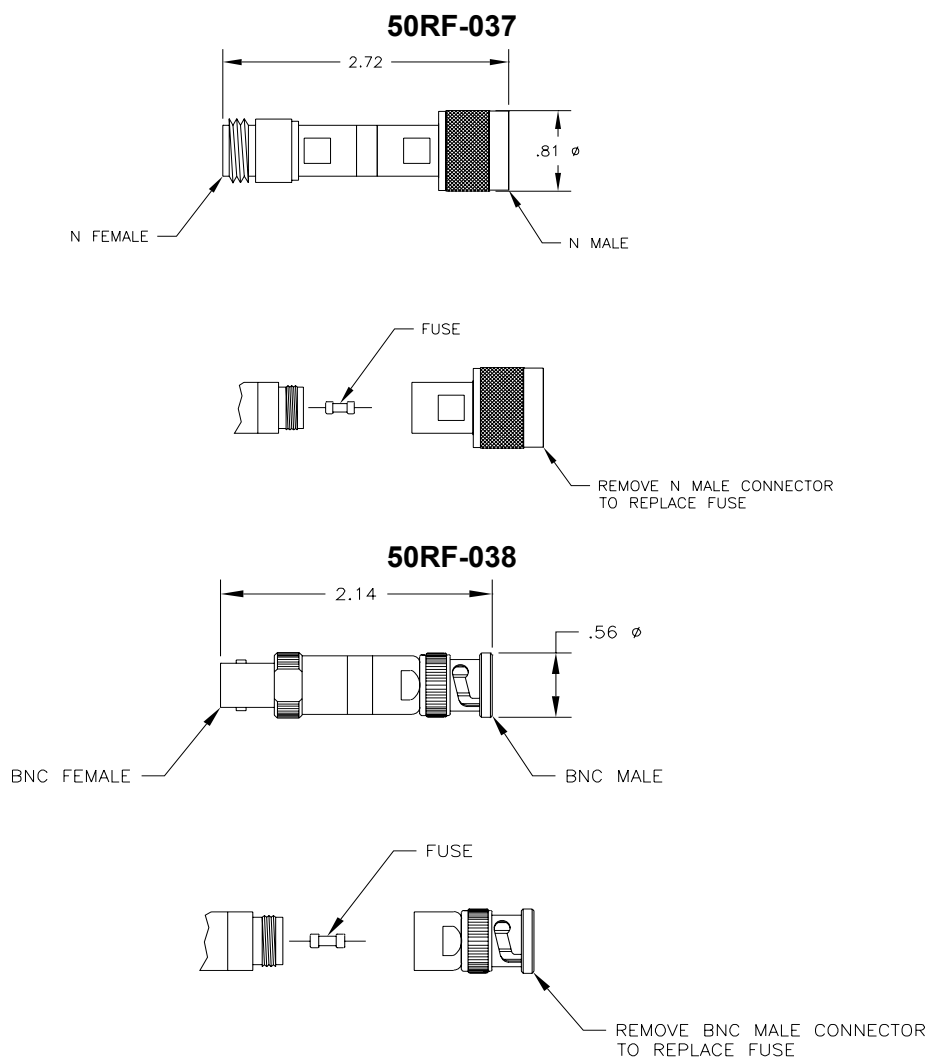
50L-001 / 75L-001



RF Fuse Holders

Model	Frequency Range	Impedance	Insertion Loss	VSWR Common to Fuse Element	Connectors
50RF-037	DC-1000 MHz	50 Ohms	with 1/16 amp fuse <2.0 dB @ 1000 MHz with 1/8 amp fuse <0.5 dB @ 1000 MHz with 1/4 amp fuse <0.3 dB @ 1000 MHz	with 1/16 amp fuse 1.5:1 DC-500 MHz 1.6:1 500-1000 MHz with 1/8 amp fuse 1.2:1 DC-500 MHz 1.4:1 500-1000 MHz with 1/4 amp fuse 1.2:1 DC-500 MHz 1.4:1 500-1000 MHz	N male / N female
50RF-038	DC-1000 MHz	50 Ohms	with 1/16 amp fuse <2.0 dB @ 1000 MHz with 1/8 amp fuse <0.5 dB @ 1000 MHz with 1/4 amp fuse <0.3 dB @ 1000 MHz	with 1/16 amp fuse 1.5:1 DC-500 MHz 1.6:1 500-1000 MHz with 1/8 amp fuse 1.2:1 DC-500 MHz 1.4:1 500-1000 MHz with 1/4 amp fuse 1.2:1 DC-500 MHz 1.4:1 500-1000 MHz	BNC male / BNC female

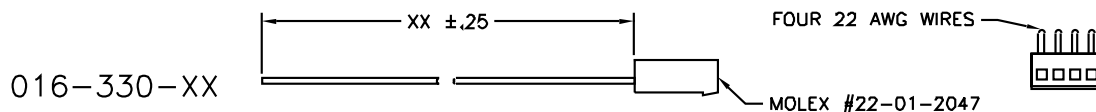
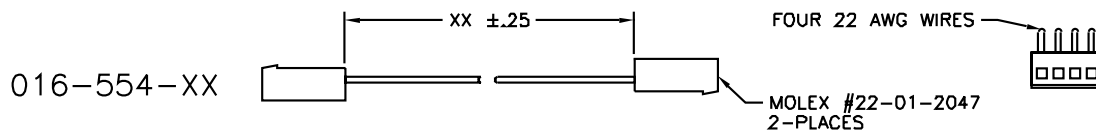
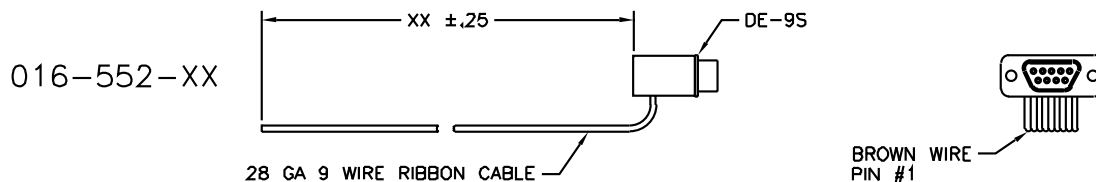
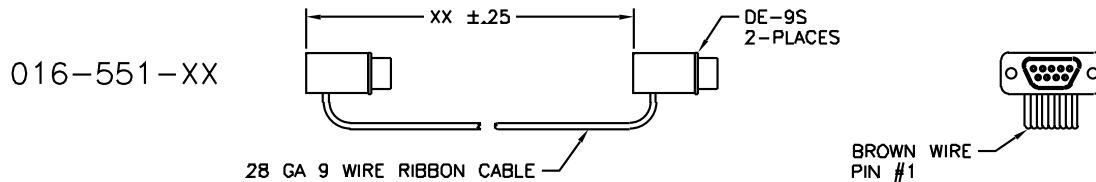
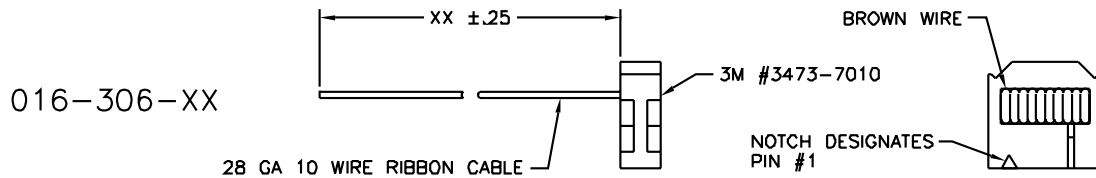
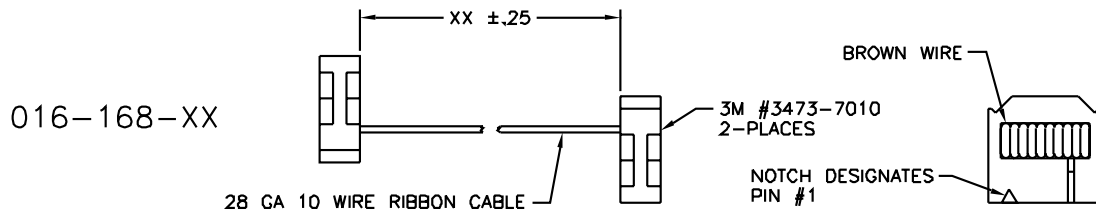
Fuse Rating	100% of rated current	200% of rated current	Fusing Level
1/16 A	4 hours minimum	1 second maximum (0.015 seconds typical)	+23 dBm (195 mW)
1/8 A	4 hours minimum	1 second maximum (0.04 seconds typical)	+29 dBm (785 mW)
1/4 A	4 hours minimum	1 second maximum (0.10 seconds typical)	+35 dBm (3.13 Watts)



DC Cable Assemblies

Model	Description	Mating Connector
016-168-XX *	10 pin ribbon cable female / female	T & B 609-1057 male and 3M #3793-5303 male
016-306-XX *	10 pin ribbon cable female / open wires	T & B 609-1057 male and 3M #3793-5303 male
016-551-XX *	D-subminiature 9 pin (DE-9S) female / female	D-subminiature 9 pin male (DE-9P)
016-552-XX *	D-subminiature 9 pin (DE-9S) female / open wires	D-subminiature 9 pin male (DE-9P)
016-554-XX *	4 pin Molex female / female	Molex #22-12-2044 male
016-330-XX *	4 pin Molex female / open wires	Molex #22-12-2044 male

* (xx) insert length in inches



Engineering Reference Guide

Effect of VSWR on Transmitted Power

VSWR	Return Loss (dB)	Trans. Loss (dB)	Volt. Refl. Coeff.	Power Trans. (%)	Power Refl. (%)
1.05	32.3	.003	.02	99.9	.1
1.10	26.4	.010	.05	99.8	.2
1.15	23.1	.021	.07	99.5	.5
1.20	20.8	.036	.09	99.2	.8
1.25	19.1	.054	.11	98.8	1.2
1.30	17.7	.075	.13	98.3	1.7
1.40	15.6	.122	.17	97.2	2.8
1.50	14.0	.177	.20	96.0	4.0
1.60	12.7	.238	.23	94.7	5.3
1.70	11.7	.302	.26	93.3	6.7
1.80	10.9	.370	.29	91.8	8.2
1.90	10.2	.440	.31	90.4	9.6
2.00	9.5	.512	.33	88.9	11.1
2.50	7.4	.881	.43	81.6	18.4
3.00	6.0	1.249	.50	75.0	25.0
3.50	5.1	1.603	.56	69.1	30.9
4.00	4.4	1.938	.60	64.0	36.0
4.50	3.9	2.255	.64	59.5	40.5
5.00	3.5	2.553	.67	55.6	44.4
5.50	3.2	2.834	.69	52.1	47.9
6.00	2.9	3.100	.71	49.0	51.0
6.50	2.7	3.351	.73	46.2	53.8
7.00	2.5	3.590	.75	43.7	56.2
7.50	2.3	3.817	.76	41.5	58.5
8.00	2.2	4.033	.78	39.5	60.5
8.50	2.1	4.240	.79	37.7	62.3
9.00	1.9	4.437	.80	36.0	64.0
9.50	1.8	4.626	.81	34.5	65.5
10.00	1.7	4.807	.82	33.1	66.9
11.00	1.6	5.149	.83	30.6	69.4
12.00	1.5	5.466	.85	28.4	71.6
13.00	1.3	5.762	.86	26.5	73.5
14.00	1.2	6.042	.87	24.9	75.1
15.00	1.2	6.301	.88	23.4	76.6
16.00	1.1	6.547	.88	22.1	77.9
17.00	1.0	6.780	.89	21.0	79.0
18.00	1.0	7.002	.89	19.9	80.1
19.00	.9	7.212	.90	19.0	81.0
20.00	.9	7.413	.90	18.1	81.9
25.00	.7	8.299	.92	14.8	85.2
30.00	.6	9.035	.94	12.5	87.5

Power Conversion Table

dBm	milliWatts	dBm	Watts
-20	0.01	25.0	0.32
-19	0.01	25.5	0.35
-18	0.02	26.0	0.40
-17	0.02	26.5	0.45
-16	0.03	27.0	0.50
-15	0.03	27.5	0.56
-14	0.04	28.0	0.63
-13	0.05	28.5	0.71
-12	0.06	29.0	0.79
-11	0.08	29.5	0.89
-10	0.10	30.0	1.00
-9	0.13	30.5	1.12
-8	0.16	31.0	1.26
-7	0.20	31.5	1.41
-6	0.25	32.0	1.58
-5	0.32	32.5	1.78
-4	0.40	33.0	2.00
-3	0.50	33.5	2.24
-2	0.63	34.0	2.51
-1	0.79	34.5	2.82
0	1.00	35.0	3.16
1	1.26	35.5	3.55
2	1.58	36.0	3.98
3	2.00	36.5	4.47
4	2.51	37.0	5.01
5	3.16	37.5	5.62
6	3.98	38.0	6.31
7	5.01	38.5	7.08
8	6.31	39.0	7.94
9	7.94	39.5	8.91
10	10.00	40.0	10.00
11	12.59	40.5	11.22
12	15.85	41.0	12.59
13	19.95	41.5	14.13
14	25.12	42.0	15.85
15	31.62	42.5	17.78
16	39.81	43.0	19.95
17	50.12	43.5	22.39
18	63.10	44.0	25.12
19	79.43	44.5	28.18
dBm	Watts	45.0	31.62
20.0	0.10	45.5	35.48
20.5	0.11	46.0	39.81
21.0	0.13	46.5	44.67
21.5	0.14	47.0	50.12
22.0	0.16	47.5	56.23
22.5	0.18	48.0	63.10
23.0	0.20	48.5	70.79
23.5	0.22	49.0	79.43
24.0	0.25	49.5	89.13
24.5	0.28	50.0	100.00

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The JFW Profile...

“JFW is committed to anticipating and exceeding customer’s requirements and expectations through cost-competitive, quality products and services that are delivered on time and through continual improvements to our quality management system.”

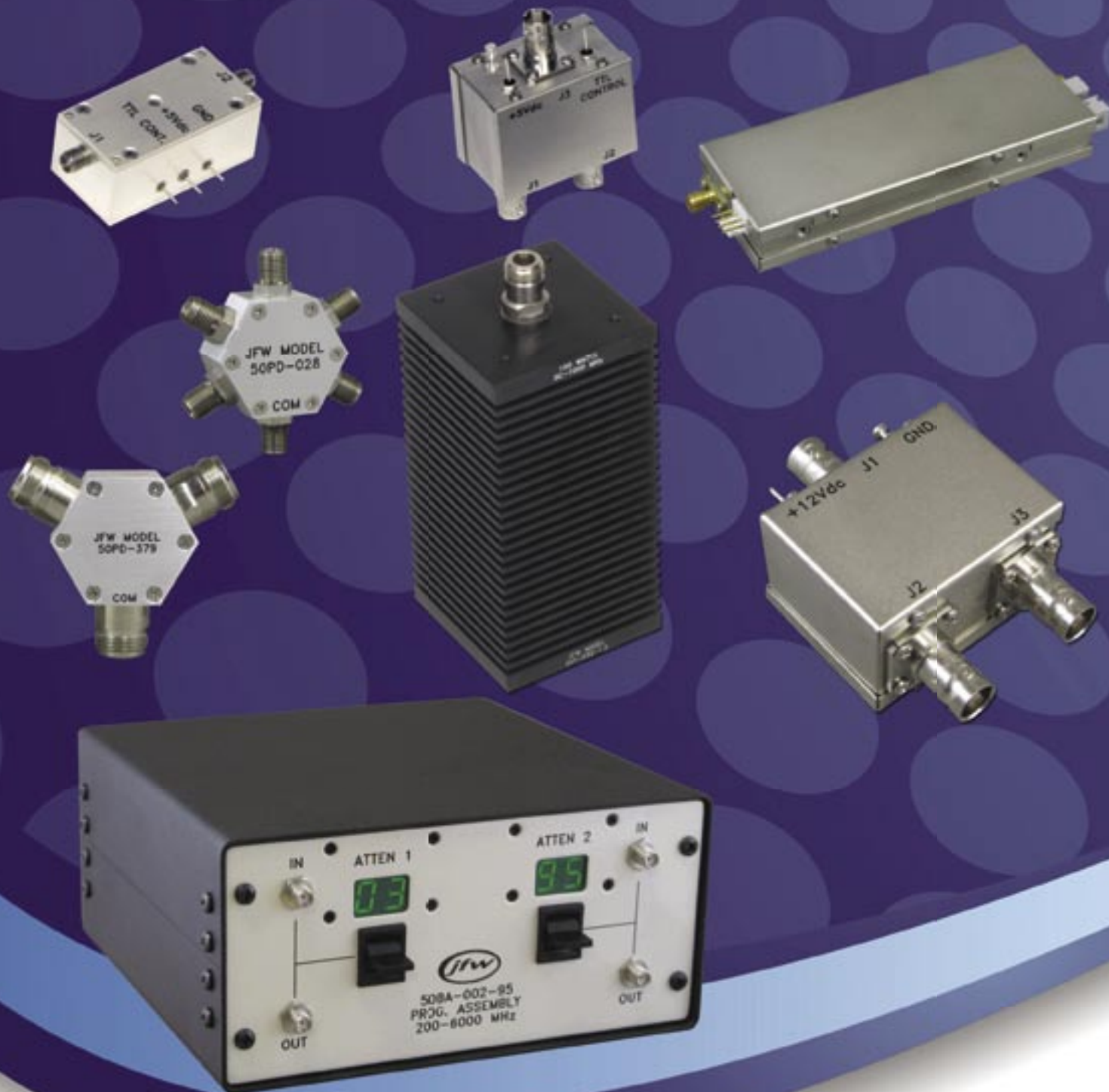
That is more than just our company’s quality policy. It’s how we do business. Now in our fourth decade, JFW Industries is a leading designer and manufacturer of innovative RF solutions that include Attenuators, Terminations, Switches, Power Dividers, Matrix Switches, and specialized RF Test Systems. Located in Indianapolis, Indiana, JFW has over 100 team members working in an ISO 9001:2008 certified environment to exceed the Quality and Service expectations of every single customer.

Our dedicated sales team, with over 75 years of combined experience in the RF and Microwave industry, makes the needs of our customers their top priority. Whether it is a quote request, special shipping requirements, or special labeling requirements our rapid response times to your requests are sure to impress.

Custom Designs...

If you can’t find a catalog model that fits your specific needs, please email your requirements to our Engineering team (jfwengr@jfwindustries.com). JFW has always been committed to designing custom RF components and custom RF test systems. This idea is core to our business operations. JFW does not charge non-recurring engineering fees (NRE’s) and our pricing for custom models is in-line with our catalog models. Each new request is assigned to one of our electrical engineers who will work with you throughout the entire design and installation process.

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