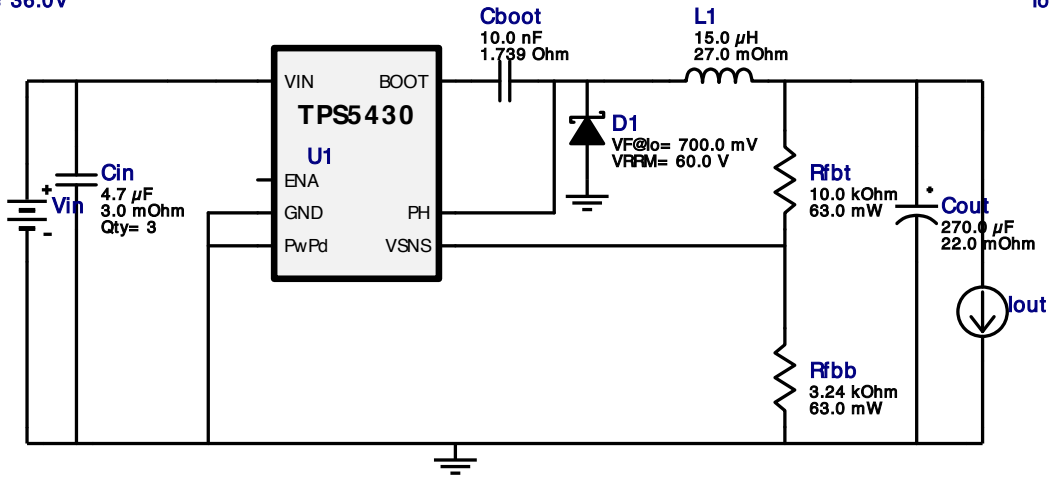


WEBENCH® Design Report

Design : 1217044/3 TPS5430DDAR
TPS5430DDAR 10.8V-36.0V to 5.00V @ 3.0A

VinMin = 10.8V
VinMax = 36.0V

Vout = 5.0V
Iout = 3.0A


Electrical BOM

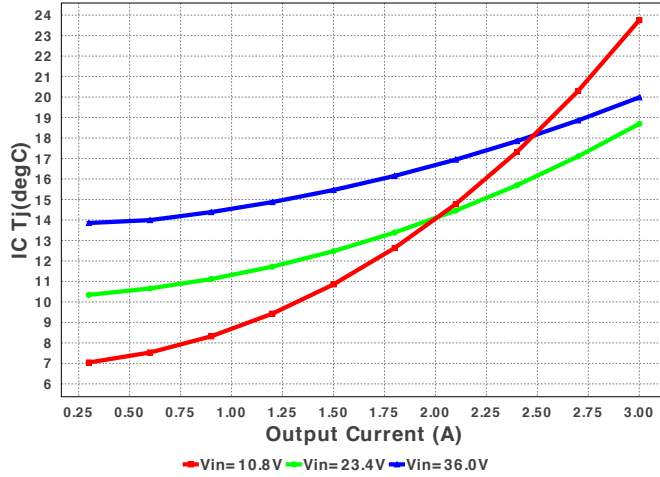
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	\$0.22	 1206 11 mm ²
3.	Cout	Panasonic	16SVPF270M Series= 1273	Cap= 270.0 uF ESR= 22.0 mOhm VDC= 16.0 V IRMS= 3.3 A	1	\$0.50	 CAPSMT_62_E7 106 mm ²
4.	D1	Diodes Inc.	B560C-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.19	 SMC 83 mm ²
5.	L1	Bourns	SRR1260-150M	L= 15.0 µH DCR= 27.0 mOhm	1	\$0.41	 SRR1260 210 mm ²
6.	Rfbb	Vishay-Dale	CRCW04023K24FKED Series= CRCW..e3	Res= 3.24 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
7.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

Item	Part Name	Manufacturer	Part Number	Reference	Qty	Price	Footprint
8.	U1	Texas Instruments	TPS5430DDAR	Switcher	1	\$1.85	

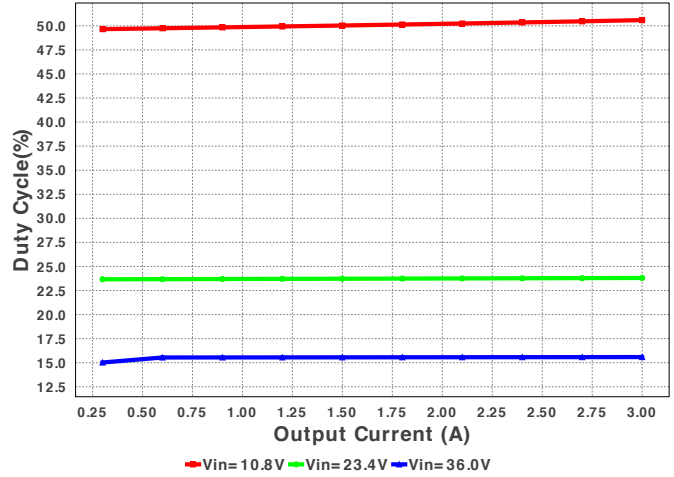


R-PDSO-G8 57 mm²

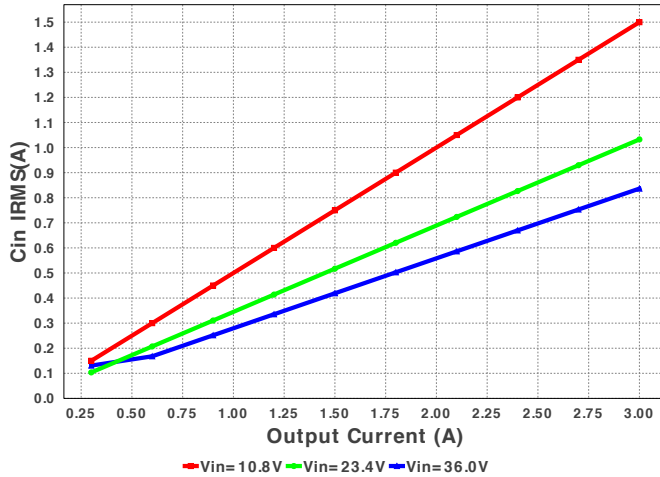
IC Tj



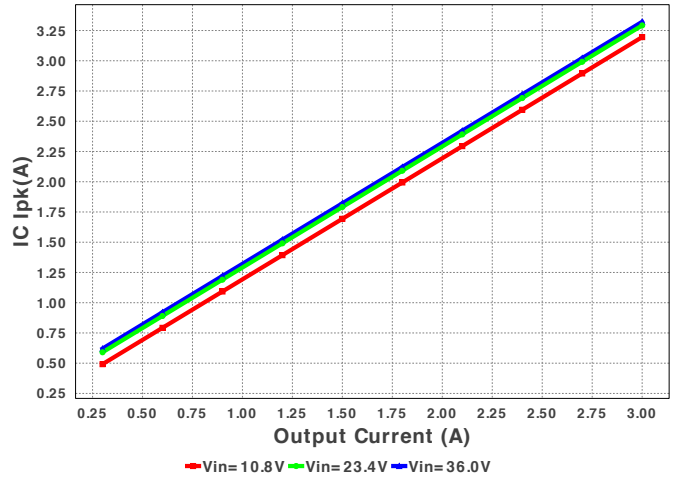
Duty Cycle



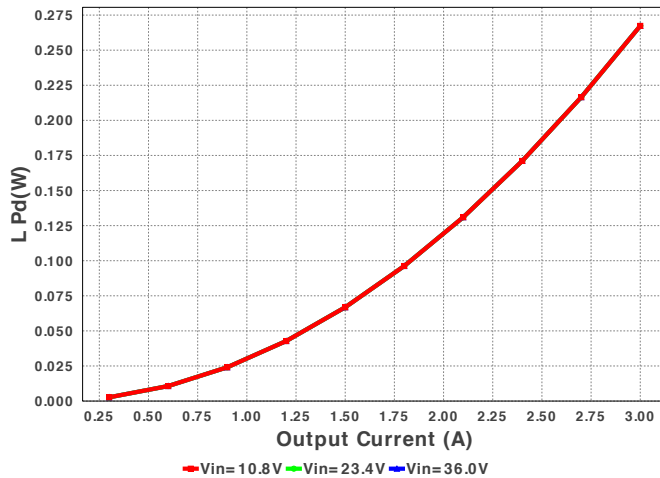
Cin IRMS



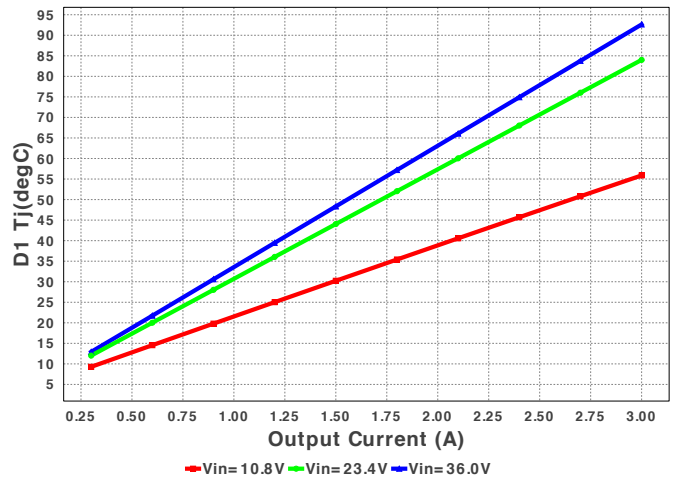
IC Ipk

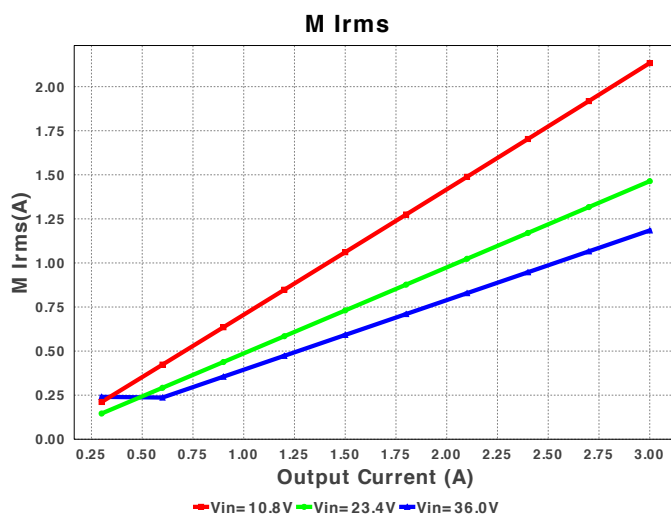
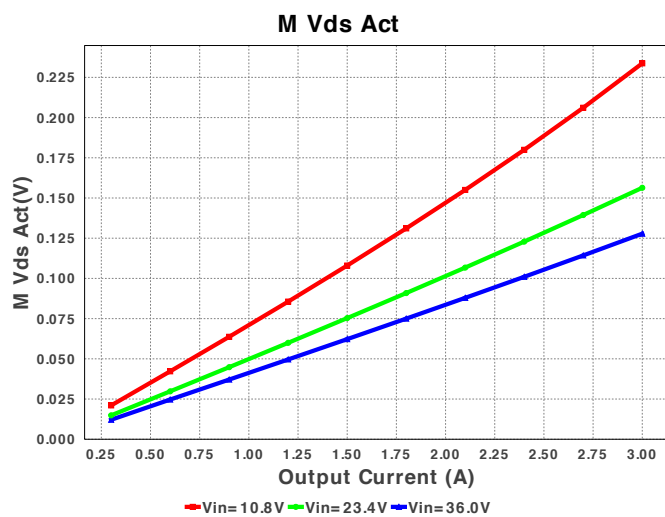
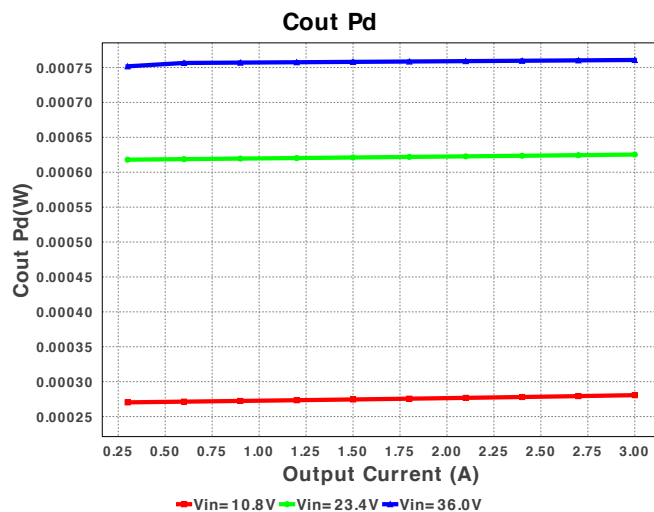
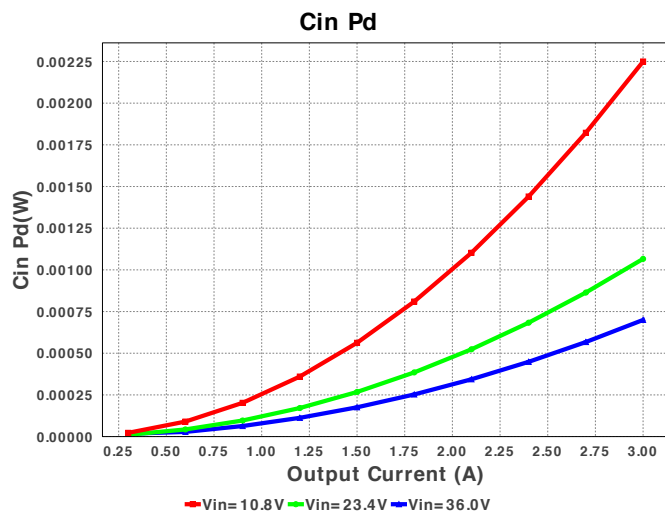
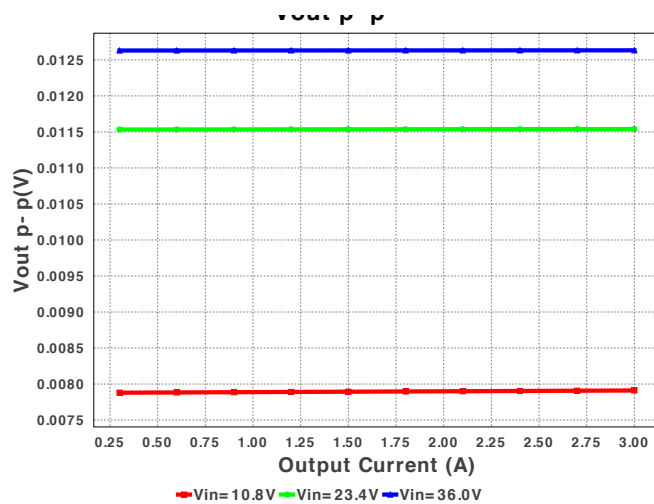
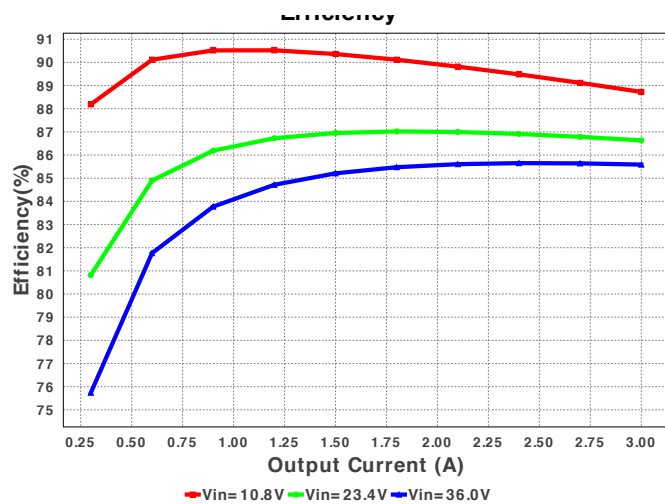


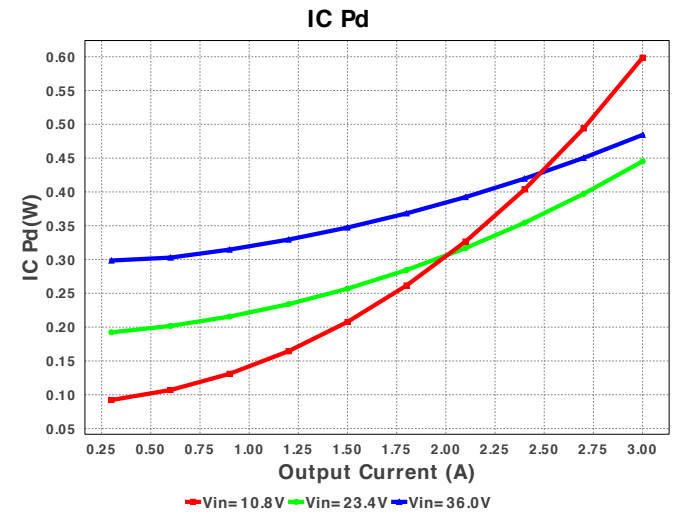
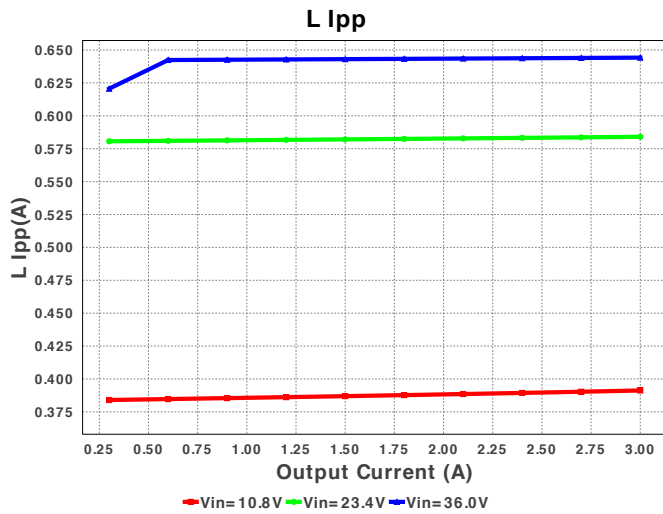
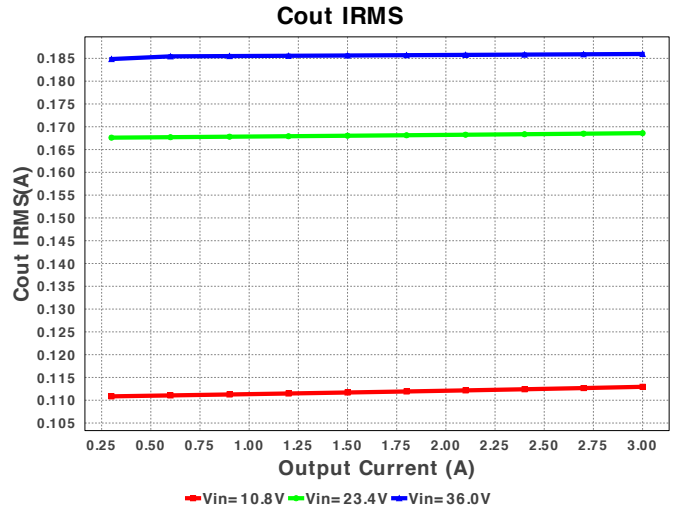
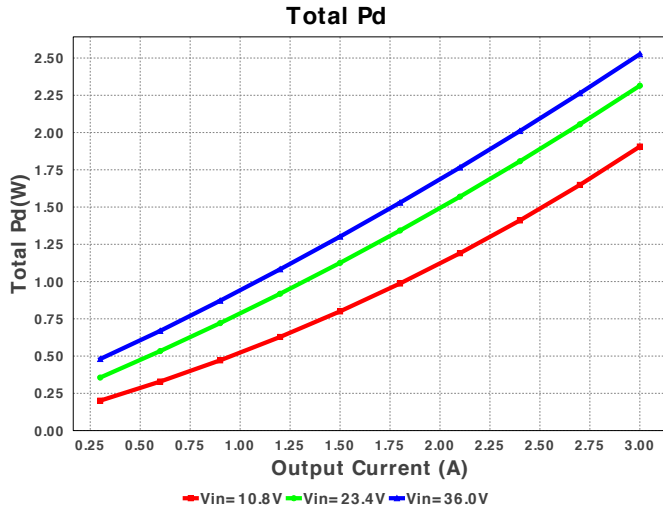
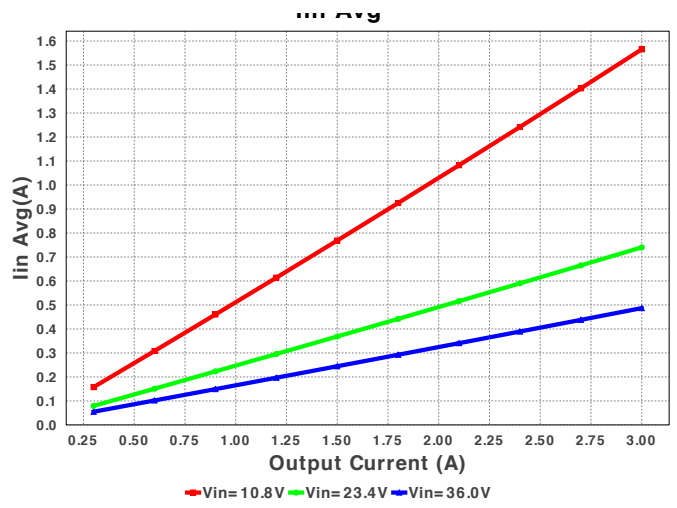
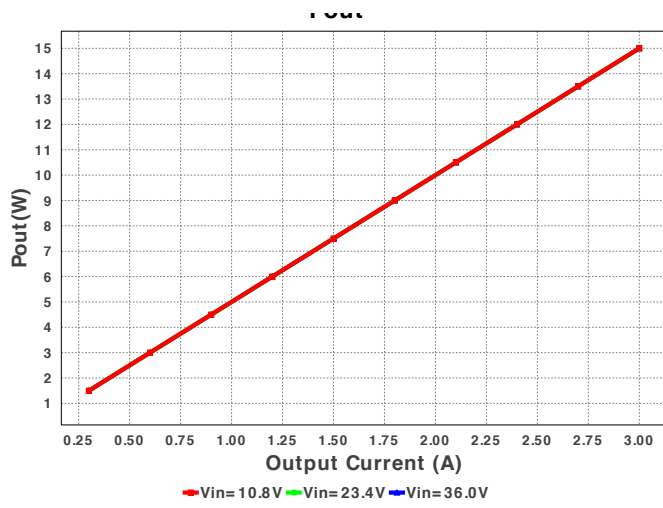
L Pd

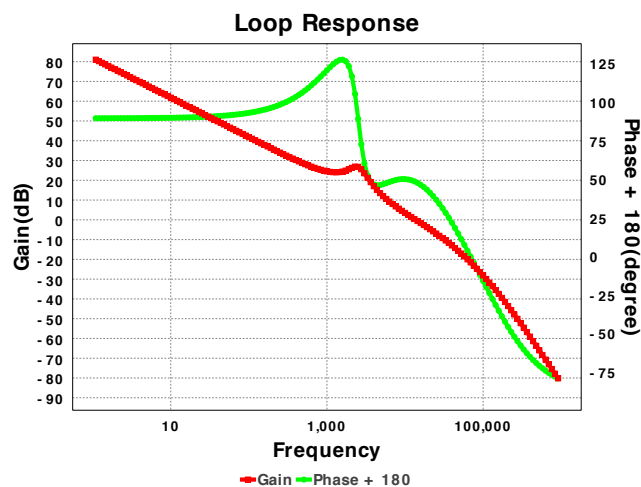
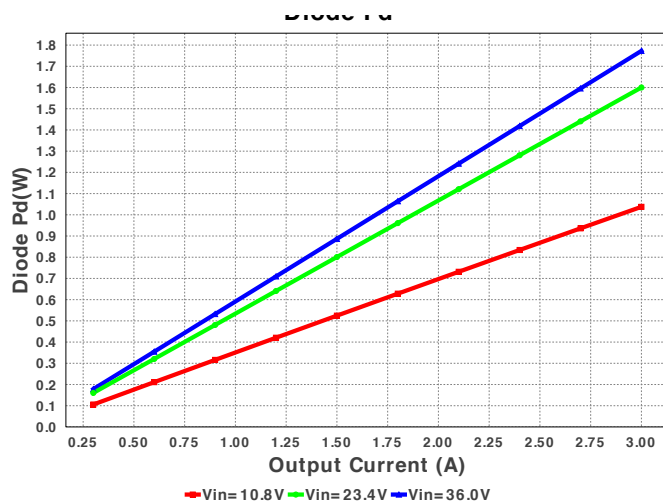


D1 Tj









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	836.443 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	185.966 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.322 A	Current	Peak switch current in IC
4.	Iin Avg	486.83 mA	Current	Average input current
5.	L Ipp	644.21 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.184 A	Current	Q Iavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	503.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	500.0 kHz	General	Switching frequency
10.	IC Tolerance	18.315 mV	General	IC Feedback Tolerance
11.	M Vds Act	127.813 mV	General	Voltage drop across the MosFET
12.	Pout	15.0 W	General	Total output power
13.	Total BOM	\$3.64	General	Total BOM Cost
14.	D1 Tj	92.635 degC	Op_Point	D1 junction temperature
15.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
16.	Cross Freq	13.701 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	15.586 %	Op_point	Duty cycle
18.	Efficiency	85.588 %	Op_point	Steady state efficiency
19.	IC Tj	19.984 degC	Op_point	IC junction temperature
20.	ICThetaJA	33.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	3.0 A	Op_point	Iout operating point
22.	Phase Marg	48.758 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	36.0 V	Op_point	Vin operating point
24.	Vout p-p	14.185 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	699.637 μW	Power	Input capacitor power dissipation
26.	Cout Pd	760.834 μW	Power	Output capacitor power dissipation
27.	Diode Pd	1.773 W	Power	Diode power dissipation
28.	IC Pd	484.376 mW	Power	IC power dissipation
29.	L Pd	267.3 mW	Power	Inductor power dissipation
30.	Total Pd	2.526 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	Iout1	3.0	Output Current #1
3.	VinMax	36.0	Maximum input voltage
4.	VinMin	10.8	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	TPS5430	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	4.0	Ambient temperature

Design Assistance

1. Feature Highlights: 3A, 500kHz Fixed Switching Frequency, Internal Compensation
2. **TPS5430** Product Folder : <http://www.ti.com/product/tps5430> : contains the data sheet and other resources.

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