

Monterey Bay Aquarium Research Institute (MBARI)

Transformer for 48-400 Converter for MOOS Program – Revised Specs

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Rev 2.2 22 June 2004

Application:

Application: Switching Power Converter in Oceanographic Instrument System
Isolation: 2500V (for safety purposes; no agency approvals required)
Input Voltage: 42-60 VDC
Output Voltage: 400 VDC
Output Current: 50 mA nominal (20 watts)
Current Limit: 400 mA (short term if necessary, e.g. 1 minute rating)
Temperature: 0 to 50 degrees C, still air
Shock/Vibration: 10 g shock, 2 g vibration 10-100 Hz, any axis
Size/Mount: Thru-Hole PWB Mount
Height above board 1.4" max
Board area 4 sq in max
Present transformer has EE625 core and horizontal PWB bobbin;
(retain if possible)

Circuit:

Topology: Half Bridge (half of V_{in} applied to primary in alternating rectangular pulses)
Transformer Freq: 25 kHz (frequency of flux cycles)
Duty Cycle: 49% max (maximum 'On' time 20 usec)
Rectification: Full Wave Bridge

Transformer:

Approximate Voltage and Current per winding
(Disregarding magnetizing current, leakage inductance, and intrawinding capacitance)

	Vpk, max	Vpk, min	Irms, max	Irms, nom
Main Primary	30 V	21 V	8.0 A	1.0 A
Primary Bias Winding	18	11.5	.01	.01
Secondary	570	400	0.40	.05
Secondary Gate Drive	--- none ---			

Priorities:

- 1) low no-load losses (e.g. core loss, distributed capacitance loss)
- 2) low nominal-load loss (e.g. copper loss)
- 3) fit existing E625 footprint
- 4) not a cost-sensitive application