Power Solutions for Today's Military

Power Systems from COTS+™ Building Blocks

HDM-BT
Boost Converter Module

- Up to 185W output
- 50 or 65VDC output
- Compliant with MIL-STD 704 A-E MIL-STD-1275 A-B
- Mu metal shield
- Rugged, meets MIL-STD-810 environments
- Fixed frequency operation
- Wide operating temperature range: −55 to +95°C
- Conduction cooled
- Withstands 100V transients
- Over-voltage protection
- Under-voltage lockout
- Load enable, output good, and shutdown features
- Line fault protection built in

Rantec's HDM-BT boost converter module is intended for avionics and vetronics applications required to meet 28V input MIL-STD-704 A-E and MIL-STD-1275 A-B. The boost module will accept and provide a regulated output voltage with an input steady state voltage range of 14VDC to the rated output voltage of the boost module. The boost module will accept transients of OVDC to 100VDC per MIL-STD-704 loci of points and MIL-STD-1275. Input transients down to 6.5VDC will still provide power conversion to the output. Input voltage transients higher than the rated output voltage of the module will be passed through to the output with no damage to the boost module.

The module can be used as the power conditioning section of a distributed power system, allowing the user to distribute a 50VDC or 65VDC buss to various point of load HDM's. Or the HDM-BT can be used as the primary input section of a centralized power supply system. In either case, the HDM-BT will eliminate the costly demand for wide input voltage range DC to DC converters and thereby simplify the system power solution.

The System Designer's Choice

Rantec Power Team Engineers Offer Technical Assistance to:
Evaluate Power System Requirements
Develop Power System Architecture
Reduce Time to Market

rantec®

Rantec Power Systems Inc.

HDM-BT
Boost Converter Module

MODEL SPECIFICS

		HDM-BT -01	HDM-BT -02
MIN	Output Voltage	48VDC	63VDC
TYP	Output Voltage	50VDC	65VDC
MAX	Output Voltage	52VDC	67VDC
TYP	Power	185W	185W
TYP	Efficiency	96%	94%
NOTE	Efficiency	Nominal line, full load See chart "Efficiency vs Load"	
MIN	Switching Frequency (Fixed)	280KHz	310KHz
TYP	Switching Frequency (Fixed)	305KHz	335KHz
MAX	Switching Frequency (Fixed)	330KHz	360KHz

APPLICATION NOTES

DOCUMENT	TITLE
HDMA-113	Boost Converter Hold-up
HDMA-114	Boost Converter Transients
HDMA-115	System Integration with the Boost Converter

Available soon at www.rantec.com

INPUT

	MIN	TYP	MAX	UNIT	COMMENTS
Voltage	14	28	50 / 65	VDC	*Min: 6.5V with reduced specs Max: steady state, model specific*
Transients	0	–	100	V	*No damage to unit. Max: passed through*
Turn-on Time		25	40	mSec	

OUTPUT

	MIN	TYP	MAX	UNIT	COMMENTS
Ripple		≤1		Vp-p	*No external capacitance required.*
Dynamic Load		≤±20		%	*25 - 75%*
Output Capacitance	0		20,000	μF	
PROTECTION					
Over-voltage		120		%	*Non-Shutdown. OVP only limits a boost converter over-voltage, not an input, over-voltage condition.*
Over-Temperature	100	105	110	°C	
REGULATION					
Line/Load		±0.5	±1.0	%	*Steady state*
Temperature Coefficient			0.02	% / °C	

GENERAL

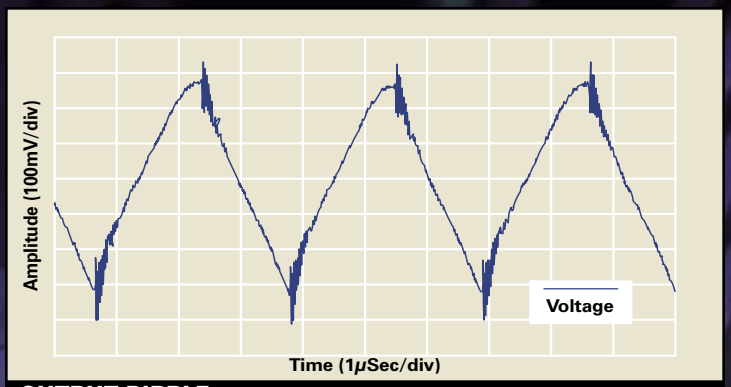
		MIN	TYP	MAX	UNIT	COMMENTS
Isolation	Input-Case	10			Mohm	*200 VDC*
	Output-Case	10				
Shutdown		Active low to inhibit boost operation (input voltage will feed through to output)				
Bias		Low power bias reference to boost return, Vbias 8.5V typical, Ibias 10mA max				
Load Enable		Active low on power up, until output voltage reaches 90% of Vout nominal, or if output exceeds 72V, otherwise "Open Drain" condition. Imax=10mA. Vmax=20V.				
Output Good		Open collector, low=OK (±10% monitor of output voltage). Vmax=20V.				

MECHANICAL

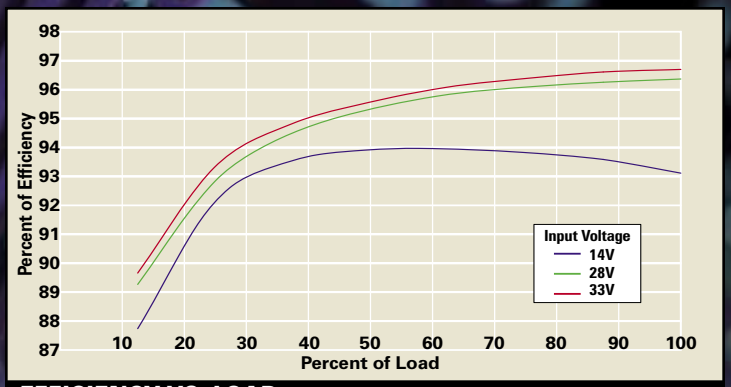
I/O Connection	Wave solderable or inserted into mating sockets
Weight	2.5 oz. max.
Construction	Mu metal electric and magnetic shielded

ENVIRONMENTAL

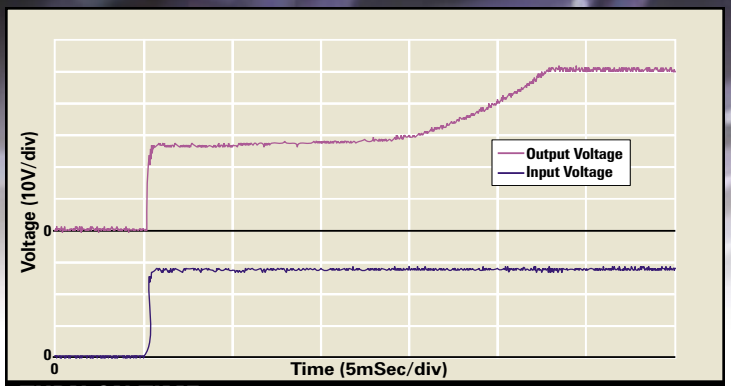
Cooling	Conductively cooled +95°C max
Operating Temperature	–55°C to +95°C, baseplate
Storage Temperature	–55°C to +125°C
Humidity	MIL-Std-810C, Meth 507.1, Proc IV (Proc I, II, or III w/optional parylene coating.)
Altitude	up to 70,000 ft
Shock	MIL-S-901C, Grade A, Type A, Class 1 High Impact Shock MIL-STD-810, Method 516, Proc. 1
Vibration	MIL-STD-810, Method 514, Proc. 1
Salt Fog	MIL-STD-810F, Method 509.4
MTBF	2,625,566 hours @ 55°C baseplate, Ground Benign per MIL-STD-217F, Note 2



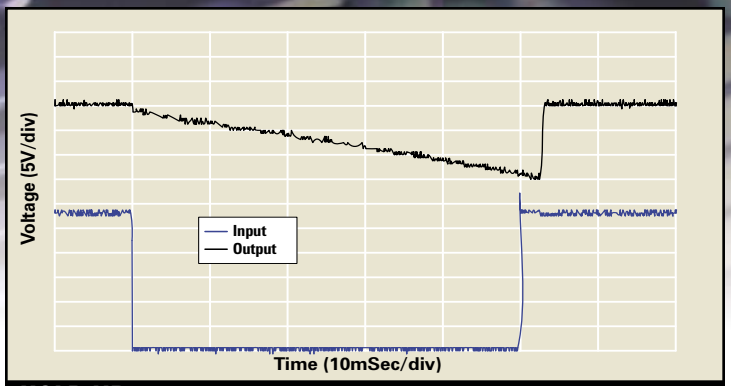
OUTPUT RIPPLE
50 Volt Output, Full Load, 25°C



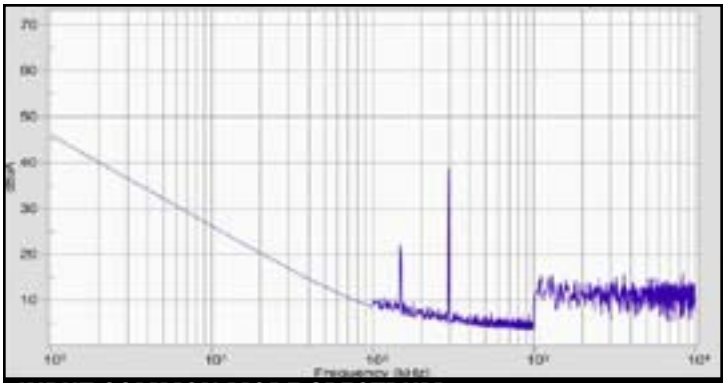
EFFICIENCY VS. LOAD
Output at 25°C



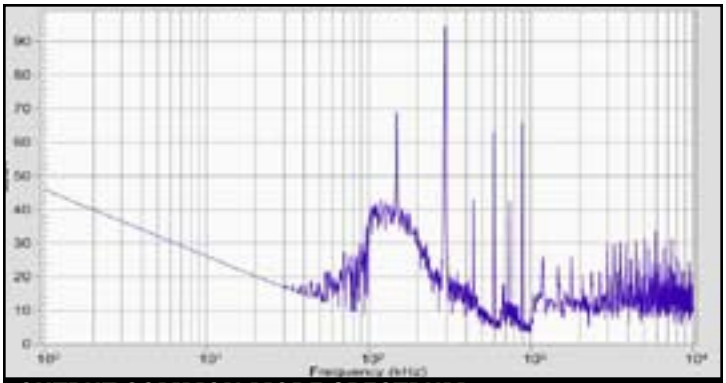
TURN ON TIME
50 Volt Output, 3.7A Load, 25°C



HOLD UP
50V Boost, 3.7A Load, 1600μf Output Cap, 25°C



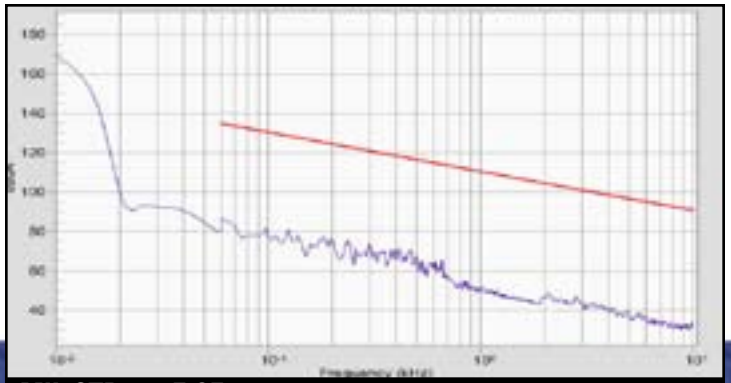
INPUT COMMON MODE SPECTRUM
50 Volt Boost, 3.7A Load (Resistive), HDF-22 EMI Filter, 2200μf Ourput Cap



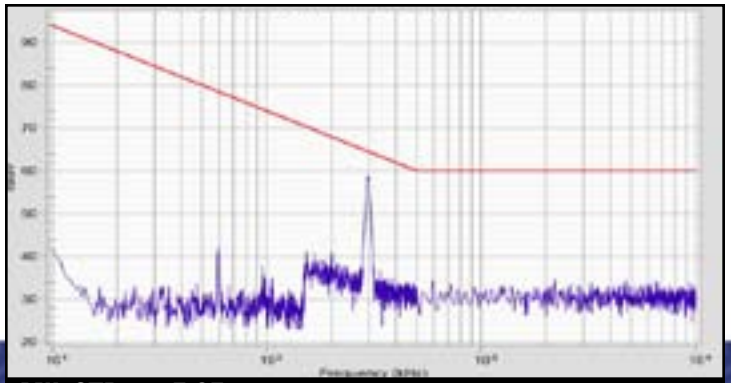
OUTPUT COMMON MODE SPECTRUM
50 Volt Boost, 3.7A Load (Resistive), HDF-22 EMI Filter, 2200μf Ourput Cap

MIL-STD-461 COMPLIANCE SOLUTION

Using Rantec's HDF-22 EMI Filter and HDM-BT Boost Converter



MIL-STD-461E CE101
50 Volt Boost, 3.7A Load (Resistive), HDF-22 EMI Filter



MIL-STD-461E CE102
50 Volt Boost, 3.7A Load (Resistive), HDF-22 EMI Filter

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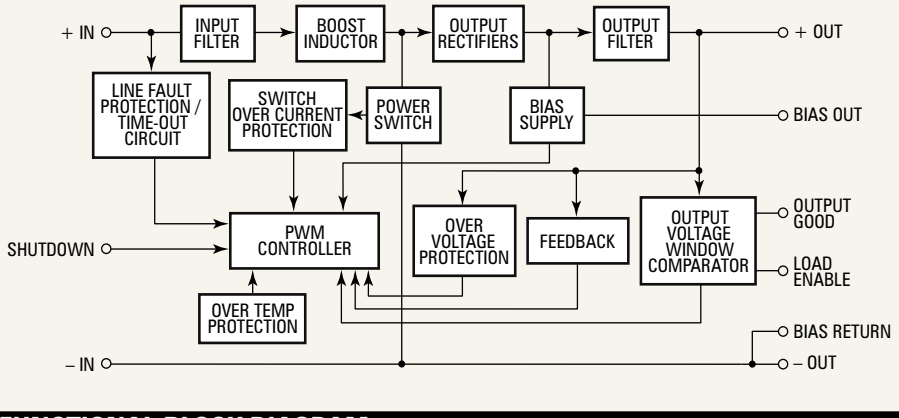
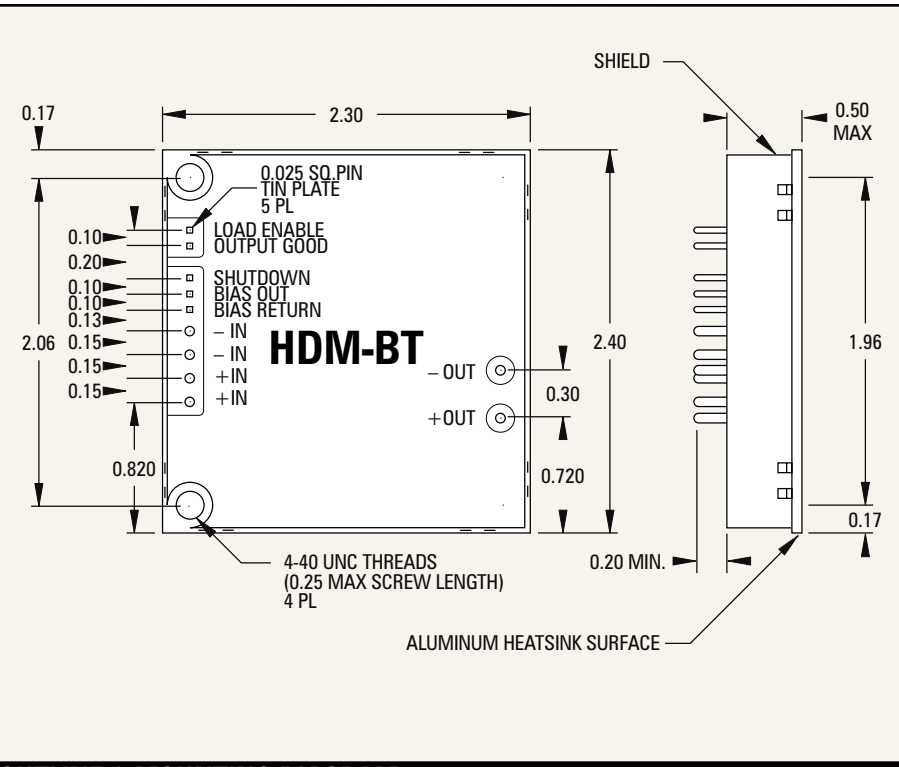
HDM ACCESSORIES

	**HDM-100** 48Vin DC-DC converters 2.1 to 24 Vout
	**HDM-HS** Heatsink
	**HDM-MB-BT** Mounting Board for Evaluation & Prototypes
	**HDF-22** EMI Filter
	**HDM-TI** Thermal Interface

Accessory data sheets available at
www.rantec.com



FUNCTIONAL BLOCK DIAGRAM



OUTLINE & MOUNTING DIAGRAM
Dimensions are for reference only

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