

250 Watt HBR Series 10:1 Encased DC/DC Converter

PRELIMINARY

CALEX



Typical unit

FEATURES

- Efficiency up to 90% @ 72Vin, 12Vout
- Ultra wide input range: 16V-160V
- Output voltage: 12V, 24V, 48V
- Vout external trim adjustment
- Output power 250W
- Package Dimension (inches):
2.39 x 2.49 x 0.55, standard half-brick size
- OVP, OCP, OTP.
- Positive or Negative Remote ON/OFF.
- Operating Baseplate Temperature range -
40°C to +100°C.
- 4242VDC input to output isolation, reinforced.
- Hold up time (10-30mS, with external C)
- UVLO Set up (resistor programmable)
- Conformally Coated PCB
- Encapsulated for harsh environment
- Meets requirements for EN50155

SAFETY FEATURES

- 4242Vdc input to output isolation
- Reinforced insulation
- UL 60950-1, 2nd Edition
- CSA-C22.2 No. 60950-1
- IEC/EN60950-1, 2nd edition
- Meets EN45545-2 Fire and Smoke
- RoHS compliant

Output Voltage (V)	Output Current (A)	Input Voltage Range (V)
12	20.8	16-160
24 In Development	10.4	16-160
48 In Development	5.2	16-160

Optimized for embedded applications on railway rolling stock environments, the HBR DC-DC Converter range offers 250W single output from a 10:1 ratio input voltage range in an industry standard half brick solution.

PRODUCT OVERVIEW

The HBR series of isolated regulated converter modules, deliver an impressive 250W single output from an ultra-wide 10:1 input voltage range, complying with the 24V to 110V input battery voltages including transient as per EN50155 (2017) standard. The industry standard half brick package offers high efficiency levels of up to 90%. The fully isolated (3000Vrms) DC-DC module accepts a wide input voltage range of 16V – 160VDC, while

maintaining a fully regulated single output. The output voltage features Overvoltage, Overcurrent, short circuit, Overtemperature and Vout overshoot protection. Other features include – adjustable Undervoltage lockout, adjustable Current limit threshold, Positive or Negative Logic enable and a Hold Up Pin to allow connection of an external capacitor.



Encapsulated Half-Brick



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PERFORMANCE SPECIFICATIONS SUMMARY AND ORDERING GUIDE [1] [2]													
Root Model [1]	Output							Input				Efficiency	Package
	V _{out} (V)	I _{out} (A, max.)	Power (W)	Ripple & Noise (mV pk-pk)		Regulation [3] (max.)		V _{in} Nom. (V)	V _{in} Range (V)	I _{in} , no load (mA)	I _{in} , full load (A)		
				Typ.	Max.	Line	Load					Typ.	Case (inches)
72WS12.250HBR	12	20.8	250	150	300	±0.2%	±0.2%	72	16-160	60	18	90%	2.39x2.49x0.55
In Development	24	10.4	250	300	450	±0.2%	±0.2%	72	16-160	80	18	90%	2.39x2.49x0.55
In Development	48	5.2	250	450	600	±0.2%	±0.2%	72	16-160	100	18	90%	2.39x2.49x0.55

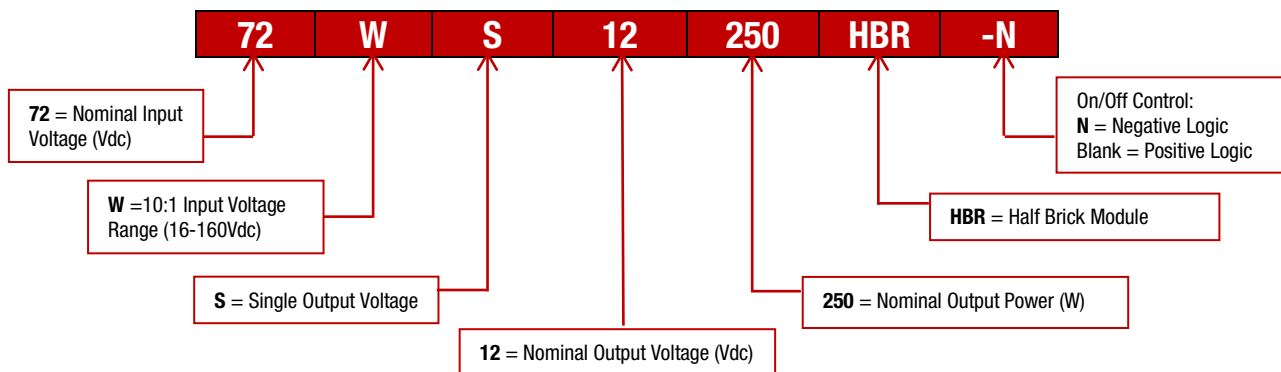
Notes:

[1] Please refer to the Part Number Structure when ordering.

[2] All specifications are at nominal line voltage and full load, +25°C unless otherwise noted. See detailed specifications. Output capacitors are 1µF ceramic multilayer in parallel with 10µF. I/O caps are necessary for our test equipment and may not be needed for your application.

[3] Regulation specifications describe output voltage deviations from a nominal/midpoint value to either extreme (50% load step).

PART NUMBER STRUCTURE

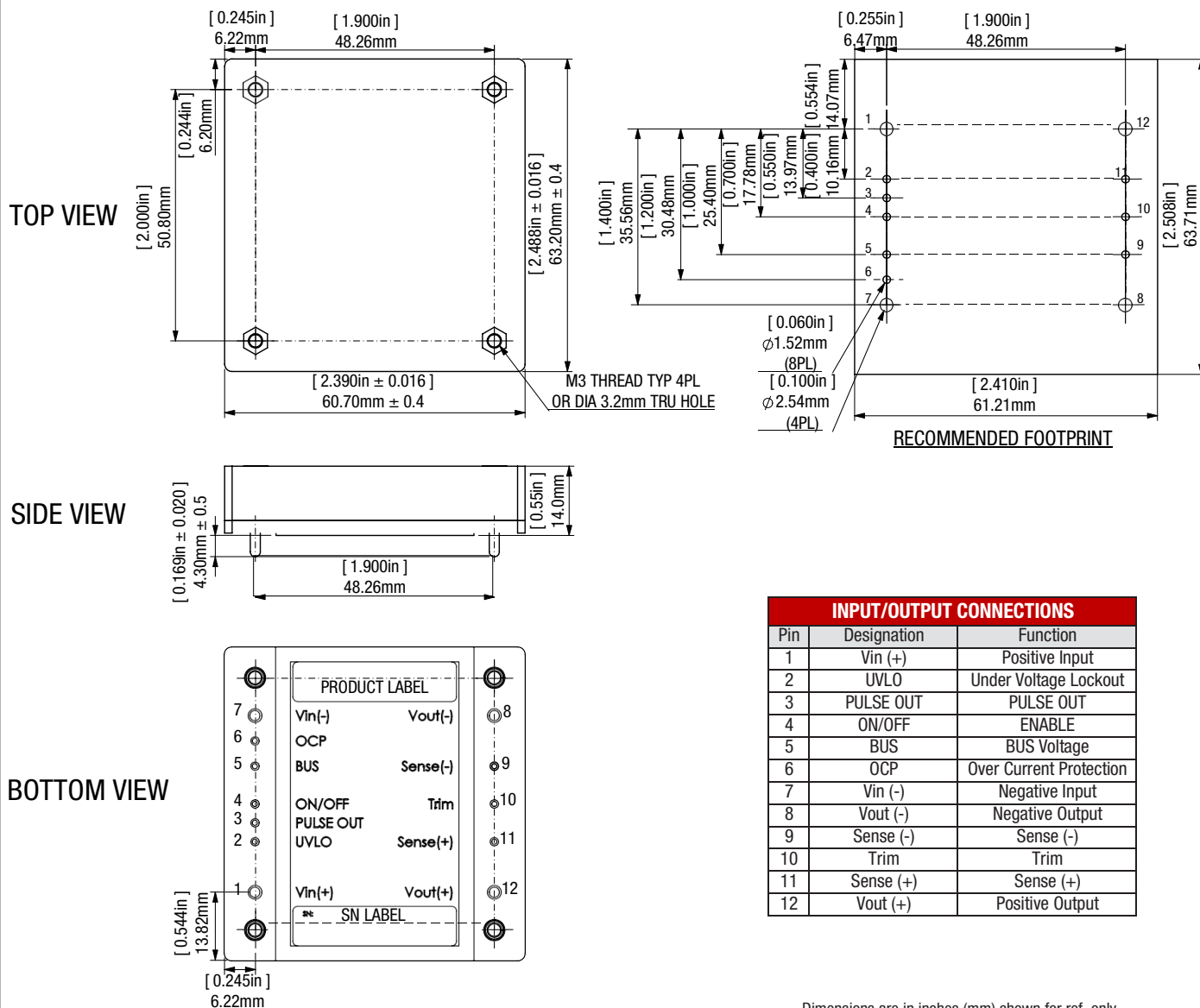


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MECHANICAL SPECIFICATIONS (STANDARD BASEPLATE OPTION)



INPUT/OUTPUT CONNECTIONS

Pin	Designation	Function
1	Vin (+)	Positive Input
2	UVLO	Under Voltage Lockout
3	PULSE OUT	PULSE OUT
4	ON/OFF	ENABLE
5	BUS	BUS Voltage
6	OCP	Over Current Protection
7	Vin (-)	Negative Input
8	Vout (-)	Negative Output
9	Sense (-)	Sense (-)
10	Trim	Trim
11	Sense (+)	Sense (+)
12	Vout (+)	Positive Output

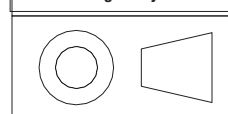
Dimensions are in inches (mm) shown for ref. only.

NOTES:

UNLESS OTHERWISE SPECIFIED:

- ALL DIMENSION ARE IN INCHES [MILLIMETER].
- ALL TOLERANCES:
 $x.xx \times in, \pm 0.02in$ ($x.xx \times mm, \pm 0.5mm$).
 $x.x \times in, \pm 0.01in$ ($x.x \times mm, \pm 0.25mm$).
- APPLIED TORQUE PER SCREW SHOULD NOT EXCEED 5.3in-lb (0.6Nm).
- PIN 2-6, 9-11: DIA 0.040in PINS: COPPER ALLOY.
PIN 1, 7, 8, 12: DIA 0.080in PINS: COPPER ALLOY.
FINISH: GOLD (5u" MIN) OVER NICKEL (100u" MIN).

Third Angle Projection



Tolerances (unless otherwise specified):

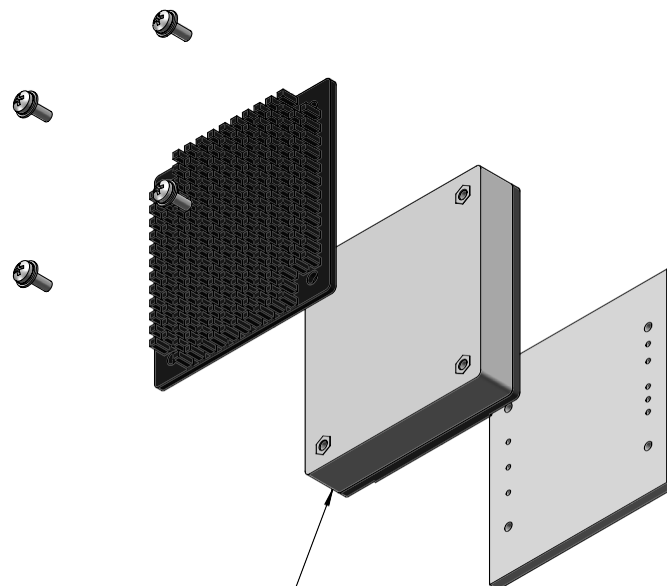
.XX ± 0.02 (0.5)
.XXX ± 0.010 (0.25)
Angles $\pm 1^\circ$

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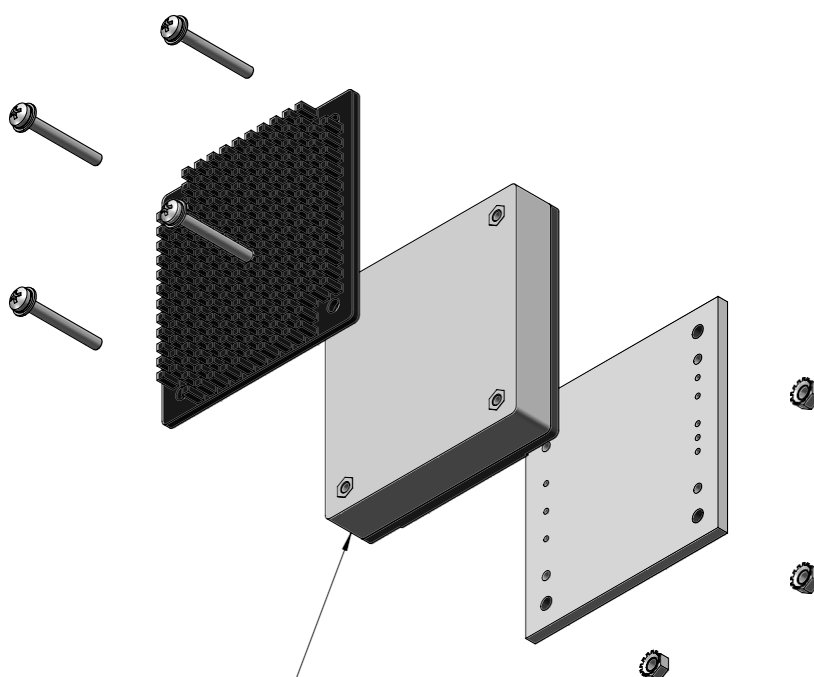
CALEX

MOUNTING BASEPLATE WITH STANDARD M3 THREADED RIVET



WITH THREADED HOLE

MOUNTING BASEPLATE WITH UNTHREADED INSERT



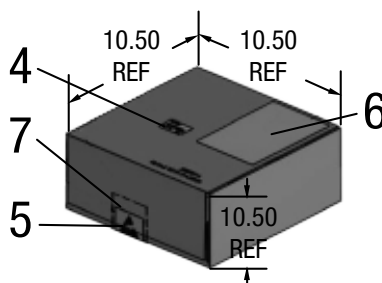
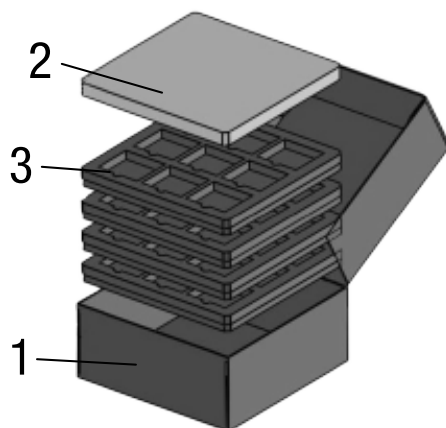
WITH THRU HOLE

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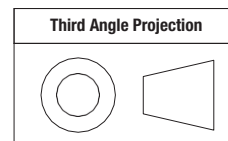
PRELIMINARY

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SHIPPING BOX, DIMENSIONS



Dimensions are in inches (mm) shown for ref. only.



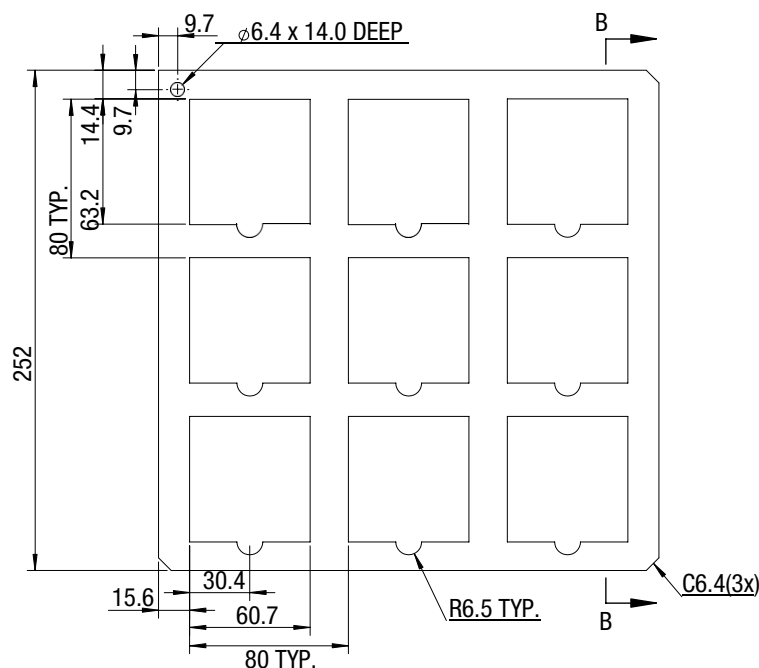
Tolerances (unless otherwise specified):
 .XX ± 0.02 (0.5)
 .XXX ± 0.010 (0.25)
 Angles ± 1°

NOTES:

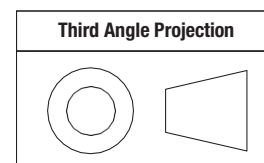
- [1] THIS DOCUMENT DEFINES THE GENERAL PACKING RULES FOR THE APPLICABLE SHIPPING KIT. (INFORMATION FOR SEALING AND MARKING IS NOT PART OF THIS DOCUMENT.)
- [2] REFER TO SHIPPING KIT BOM DETAILS.
- [3] INSERT UNITS INTO FOAM POCKETS IN TRAYS WITH PINS EMBEDDED IN FOAM
- [4] EACH FOAM TRAY CONTAINS 9 UNITS. IN FULL MPQ QUANTITIES. FOUR TRAYS EQUAL TO A TOTAL OF 36 (4x9) UNITS PER BOX.
- [5] FRONT FLAP SHALL BE SEALED WITH ESD TAPE SPECIFIED OR EQUIVALENT AFTER THE BOX IS CLOSED.
- [6] LABEL USED FOR MFR OVERPACK CARTON.
- [7] APPLY ESD LABEL OVER TAPE USED TO SEAL BOX AND APPLY IDENTIFICATION LABEL APPROX AS SHOWN

Item No.	Description	Qty
1	Carton, 10 x 10 x 4.45	1
2	Pad, ESD Foam, 9.92" SQ, 1/2" Thk	1
3	Packing Foam HBR-250W	4
4	Label, Paper, 1.0" x 1.5"	1
5	Label, ESD Warning	1
6	Label, Paper, Shipping 2" x 4"	1
7	ESD Tape, 3/4" Wide	0.33'

SHIPPING TRAY, DIMENSIONS



Dimensions are in mm shown for ref. only.



Tolerances (unless otherwise specified):
 .XX ± 0.02 (0.5)
 .XXX ± 0.010 (0.25)
 Angles ± 1°

NOTES:

- [1] ESD FOAM REQUEST.
- [2] TOLERANCE: 2
- [3] ROHS COMPLIANT.

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