



**FEATURES**

- OUTPUT CURRENT UP TO 15A
- 4:1 WIDE INPUT VOLTAGE RANGE
- HIGH EFFICIENCY UP TO 90%
- NO MINIMUM LOAD
- SOFT-START
- ADJUSTABLE OUTPUT VOLTAGE
- UNDER-VOLTAGE LOCKOUT
- INPUT REVERSE PROTECTION
- INDUSTRY STANDARD HALF-BRICK FOOTPRINT
- SIX-SIDED CONTINUOUS SHIELD
- INPUT TO OUTPUT BASIC ISULATION
- BUS TERMINAL BLOCK OPTION

**APPLICATIONS**

- Wireless Network
- Telecom/Datacom
- Industry Control System
- Distributed Power Architectures
- Semiconductor Equipment

**OPTIONS**

- Positive logic remote ON/OFF
- Pin length
- Terminal block
- Heat-sink

**DESCRIPTION**

HAE75W-SERIES DC/DC converters provide up to 75 watts of output power in an industry standard half-brick package and footprint. All models feature a wide input range, adjustable output voltage and a 15A current rating.

**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25°C otherwise noted

OUTPUT SPECIFICATIONS		
Output power		75 Watts, max
Voltage accuracy	Full load and Vin, nom	±1%
Voltage adjustability (Note 7)		+10%, -20%
Minimum load		0%
Line regulation	LL to HL at FL	See table
Load regulation	No Load to Full Load	See table
Remote sense (Note 8)		10% of Vout, nom
Ripple and noise	20MHz bandwidth	See table
Temperature coefficient		±0.02%/°C, max
Transient response recovery time	25% load step change	200µs
Over voltage protection threshold	(Hiccup) 115% ~ 130% of Vout, nom	
Over current protection threshold	110% ~ 140% of Iout Rated	
Short circuit protection	Hiccup, automatic recovery	
INPUT SPECIFICATIONS		
Input voltage range	24V nominal input 48V nominal input	9 – 36VDC 18 – 75VDC
Start-up voltage	24V nominal input 48V nominal input	8.5V, typ 17.5V, typ
Shutdown voltage	24V nominal input 48V nominal input	7.5V, typ 16V, typ
Input filter		Pi type
Input voltage variation dv/dt		5V/mS, max (Complies with ETS300 132 part 4.4)
Input surge voltage 100mS max	24V nominal input 48V nominal input	50VDC 100VDC
Input reverse protection (Note 9)		Parallel diode
Start up time	Vin, nom and constant resistive load	Power up 25mS, typ Remote ON/OFF 25mS, typ
Remote ON/OFF (Note 6)		
(Negative logic) (Standard)	DC-DC ON Short or 0V < Vr < 1.2V DC-DC OFF Open or 3V < Vr < 12V	
(Positive logic) (Option)	DC-DC ON Open or 3V < Vr < 12V DC-DC OFF Short or 0V < Vr < 1.2V	
Input current of Remote control pin	Vin(nom)	-0.5mA ~ 1mA
Remote off input current	Vin(nom)	3mA

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage	Input to Output (Basic insulation) Input (Output) to Case	2250 VDC, min 1600 VDC, min
Isolation resistance		10 <sup>9</sup> ohms, min
Isolation capacitance		2500pF, max
Switching frequency		300KHz, typ
Design meet safety standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Metal
Base material		FR4 PCB
Potting material		Silicon (UL94-V0)
Dimensions		2.40 X 2.28 X 0.50 Inches (61.0x57.9x12.7 mm)
Weight		97g (3.42oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1,010 x 10 <sup>6</sup> hrs 7.416 x 10 <sup>4</sup> hrs
ENVIRONMENTAL SPECIFICATIONS		
Operating ambient temperature (Note10)	Without Heat-sink With Heat-sink 7G-0022, 7G-0023	-40 ~ +35 (without derating) +35 ~ +84 (with derating) -40 ~ +49 (without derating) +49 ~ +88 (with derating)
Operating ambient temperature (Note10)	Without Heat-sink With Heat-sink 7G-0022, 7G-0023	-40 ~ +28 (without derating) +28 ~ +76 (with derating) -40 ~ +43 (without derating) +43 ~ +82 (with derating)
Maximum case temperature		105
Over temperature protection		115
Storage temperature range		-55 to +125
Thermal impedance (Note 11)	without Heat-sink with 0.24" Height Heat-sink with 0.45" Height Heat-sink	6.7 /watt 5.4 /watt 4.7 /watt
Thermal shock		MIL-STD-810F
Vibration		10~55Hz, 10G, 30minutes along X,Y and Z
Relative humidity		5% to 95% RH
EMC CHARACTERISTICS		
EMI (Note 12)	EN55022	Class A
ESD	EN61000-4-2	Air Contact ± 8KV ± 6KV Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A
Fast transient (Note 13)	EN61000-4-4	± 2KV Perf. Criteria A
Surge (Note 13)	EN61000-4-5	± 1KV Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A



Model Number	Input Range	Output Voltage	Output Current		Line Regulation	Load Regulation	Output (4) (5) Ripple & Noise	Input Current		Eff (4) (%)
			Min. load	Full load				No Load (3)	Full Load (2)	
HAE75-24S05W	9 – 36 VDC	5 VDC	0mA	15 A	10mV	15mV	75mVp-p	185mA	3.613 A	88
HAE75-24S12W	9 – 36 VDC	12 VDC	0mA	6.3 A	24mV	30mV	100mVp-p	185mA	3.642 A	88
HAE75-24S15W	9 – 36 VDC	15 VDC	0mA	5 A	30mV	38mV	100mVp-p	185mA	3.613 A	88
HAE75-24S24W	9 – 36 VDC	24 VDC	0mA	3.2 A	48mV	48mV	200mVp-p	85mA	3.743 A	87
HAE75-24S28W	9 – 36 VDC	28 VDC	0mA	2.7 A	56mV	56mV	200mVp-p	85mA	3.684 A	87
HAE75-24S48W	9 – 36 VDC	48 VDC	0mA	1.6 A	96mV	72mV	300mVp-p	85mA	3.743 A	87
HAE75-48S05W	18 – 75 VDC	5 VDC	0mA	15 A	10mV	15mV	75mVp-p	90mA	1.766 A	90
HAE75-48S12W	18 – 75 VDC	12 VDC	0mA	6.3 A	24mV	30mV	100mVp-p	90mA	1.800 A	89
HAE75-48S15W	18 – 75 VDC	15 VDC	0mA	5 A	30mV	38mV	100mVp-p	90mA	1.786 A	89
HAE75-48S24W	18 – 75 VDC	24 VDC	0mA	3.2 A	48mV	48mV	200mVp-p	50mA	1.871 A	87
HAE75-48S28W	18 – 75 VDC	28 VDC	0mA	2.7 A	56mV	56mV	200mVp-p	50mA	1.842 A	87
HAE75-48S48W	18 – 75 VDC	48 VDC	0mA	1.6 A	96mV	72mV	300mVp-p	50mA	1.871 A	87

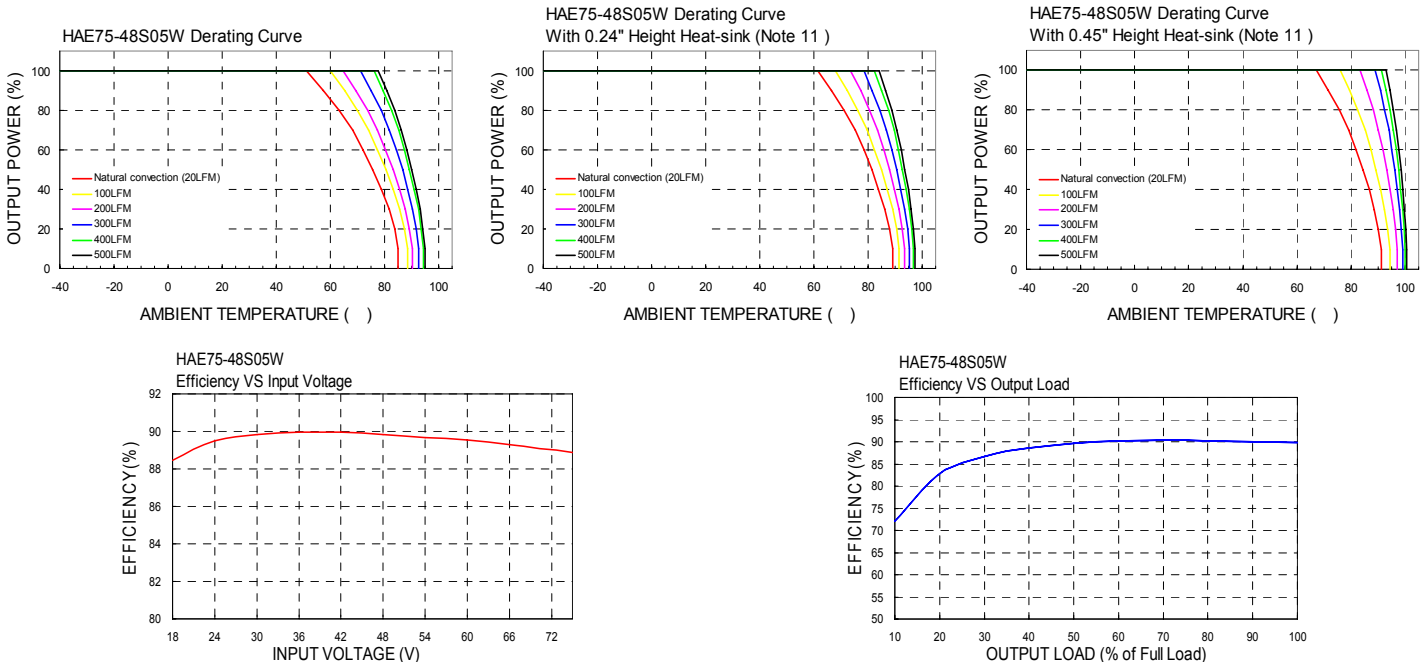
**Note**

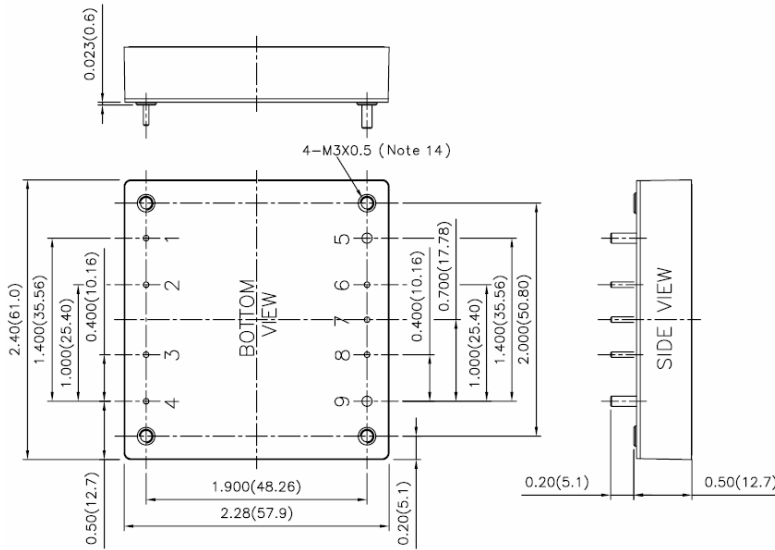
- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40 °C. MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment).
- Maximum value at nominal input voltage and full load.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- The ripple and noise of output voltage 48V is measured with a 2.2μF/100V MLCC; The ripple and noise of other output voltage is measured with a 6.8μF/50V MLCC.
- The remote ON/OFF control pin voltage is referenced to -Vin. The positive logic and pin length are optional. To order positive logic ON-OFF control add the suffix -P (Ex: HAE75-48S05W-P).
- Output voltage is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting a single resistor between TRIM and +SENSE pins for trim up or between TRIM and -SENSE pins for trim down. To calculate the value of the resistor Ru and Rd for a particular output voltage uses the following equation:

$$R_U = \left( \frac{V_{OUT}(100 + \Delta\%)}{1.225\Delta\%} - \frac{(100 + 2\Delta\%) }{\Delta\%} \right) K\Omega$$

$$R_D = \left( \frac{100}{\Delta\%} - 2 \right) K\Omega$$

- Maximum output deviation is +10% inclusive of remote sense. If remote sense is not being used, the +SENSE should be connected to its corresponding +OUTPUT and likewise the -SENSE should be connected to its corresponding -OUTPUT.
- Internal fusing is not included, so we suggest to use an input line fuse.
- Test condition with vertical direction by natural convection (20LFM).
- Heat sink is optional and P/N: 7G-0021, 7G-0022, 7G-0023, 7G-0024.
- The HAE75W series meets EN55022 Class A only with external components connected before the input pin to the converter.
- An external filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF /100V, ESR 48mΩ.
- CASE GROUNDING : When you connect the case pin and the four screw bolts to ground, the EMI could be better reduced.

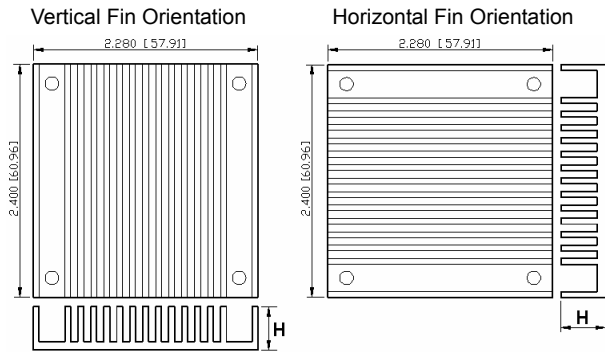
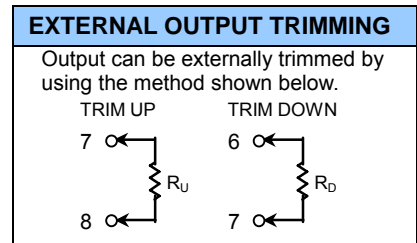




Pin 1,2,3,4,6,7,8. DIA. 0.040 (1.02mm)  
 Pin 5,9. DIA. 0.080 (2.03mm)  
 All dimensions in inches (mm)  
 Tolerance :x.xx±0.02 (x.xx±0.5)  
 x.xxx±0.01 (x.xx±0.25)  
 Pin pitch tolerance ±0.01 (0.25)  
 Pin dimension tolerance ±0.004(0.1)

PRODUCT OPTIONS TABLE	
Option	Suffix
Negative remote ON/OFF logic 0.20" pin length (standard)	-
Negative remote ON/OFF logic 0.145" pin length	-L
Negative remote ON/OFF logic 0.11" pin length	-K
Positive remote ON/OFF logic 0.20" pin length	-P
Positive remote ON/OFF logic 0.145" pin length	-S
Positive remote ON/OFF logic 0.11" pin length	-M

PIN CONNECTION		
PIN	Define	Diameter
1	- INPUT	0.04 Inches
2	CASE	0.04 Inches
3	CTRL	0.04 Inches
4	+ INPUT	0.04 Inches
5	- OUTPUT	0.08 Inches
6	- SENSE	0.04 Inches
7	TRIM	0.04 Inches
8	+ SENSE	0.04 Inches
9	+ OUTPUT	0.08 Inches



FIN ORIENTATION		P / N
Vertical	H=0.240(6.10)	7G-0023
	H=0.450(11.43)	7G-0021
Horizontal	H=0.240(6.10)	7G-0022
	H=0.450(11.43)	7G-0024

**Option : Terminal Block (Suffix-T)**

