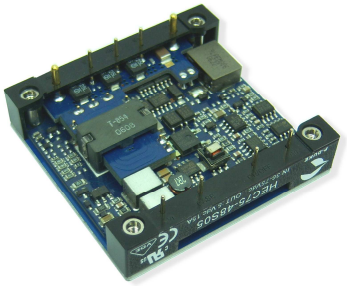
POWER MATE TECHNOLOGY CO.,LTD.

P-DUKE

HEC75-SERIES Single/Dual output

VER:10 1 / 4



FEATURES

- 75 WATTS MAXIMUM OUTPUT POWER
- SINGLE : OUTPUT CURRENT UP TO 20A
  DUAL : TOTAL OUTPUT CURRENT UP TO 15A;
  UP TO 100% LOAD IMBALANCE
- COMPACT 2.40 X 2.28 X 0.50 INCH PACKAGE
- HIGH EFFICIENCY UP TO 90%
- INPUT RANGE FROM 36VDC TO 75VDC
- FIXED SWITCHING FREQENCY (300KHz)
- HALT TESTED
- INDUSTRY STANDARD FOOTPRINT
- ADJUSTABLE OUTPUT VOLTAGE,
  INDEPENDENTLY REGULATED OUTPUTS
- INPUT TO OUTPUT ISOLATION (BASIC INSULATION)
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- SINGLE: UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- DUAL:DESIGN MEET UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

APPLICATIONS

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

OPTIONS

Remote on/off, Pin length

DESCRIPTION

HEC75-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, trimmable output voltage and a 20A current rating (15A for dual output).

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25ºC otherwise noted

OUTPUT SPECIFICATIONS		
Output power		75 Watts, max.
Voltage accuracy	Full load and nominal Vin	± 1.5%
Minimum load		0%
Voltage adjustability	Single (Note 5) Dual	+ 10% , -20% + 10% , -10%
Line regulation	LL to HL at FL	See table
Load regulation	No Load to Full Load	See table
Remote sense	Single (Note 5)	10% of Vout
Ripple and noise 20MHz bandwidth (Note 6)		100mVp-p
Temperature coefficient		±0.02% / ºC, max.
Transient response recovery time 25% load step change		200µS
Over voltage protection threshold (Non-latching Hiccup)		115% ~ 130% of Vout
Maximum total output current $I_1 + I_2$ Dual		15A
Over current protection threshold		110% ~ 140% of Iout Rated
Short circuit protection		Hiccup, automatics recovery

GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output Input to Case Output to Case		1600 VDC, min. 1000 VDC, min. 1000 VDC, min.
Isolation resistance			10^7 ohms, min.
Isolation capacitance			2500 pF, max.
Switching frequency			300 KHz, typ.
Approvals and standard (Note 7)			IEC60950-1, UL60950-1, EN60950-1
Case material			Open with Aluminum base-plate
Weight		Single Dual	63g (2.22oz) 70g (2.47oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332	Single Dual	2.000×10^5 hrs 1.300×10^5 hrs
	MIL-HDBK-217F	Single Dual	2.170×10^5 hrs 1.080×10^5 hrs

INPUT SPECIFICATIONS			
Input voltage range			36 – 75VDC
Input filter			L-C type
Input surge voltage 100mS max			100VDC
Start up time	Nominal Vin and constant resistive load	Power up Remote ON/OFF	25mS, typ. 25mS, typ.
Input reflected-ripple current			20mAp-p
Start-up voltage			34VDC
Shutdown voltage			32VDC
Remote ON/OFF (Note 8) (Negative logic) (Positive logic)		ON=Short or 0V < Vr < 1.2V, OFF=Open or 3V < Vr < 15V, ON=Open or 3V < Vr < 15V, OFF=Short or 0V < Vr < 1.2V,	I_{IN}=1mA max. I_{IN}=50µA max. I_{IN}=50µA max. I_{IN}=1mA max.
Input current of remote control pin		Nominal Vin	-0.5mA ~ 0.5mA
Remote off state input current		Nominal Vin	20mA

ENVIRONMENTAL SPECIFICATIONS	
Operating base-plate temperature range (Note 9)	-40ºC to 100ºC (with derating)
Over temperature protection	110ºC
Humidity max, Non-condensing	95%
Storage temperature range	-55ºC to 125ºC
Thermal shock	MIL-STD-810F
Vibration	MIL-STD-810F

EMC CHARACTERISTICS			
EMI (Note 10)	EN55022		Class A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 11)	EN61000-4-4	± 2KV	Perf. Criteria B
Surge (Note 11)	EN61000-4-5	± 1KV	Perf. Criteria B
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

POWER MATE TECHNOLOGY CO.,LTD.

75WATTS SINGLE/DUAL OUTPUT DC-DC CONVERTER

Model Number	Input Range	Output Voltage	Output Current		Line Regulation	Load Regulation	Input Current		Eff (4) (%)
			Min. load	Full load			No load(3)	Full load(2)	
HEC75-48S1P8	36 – 75 VDC	1.8 VDC	0mA	20 A	4 mV	6 mV	120mA	0.926 A	85
HEC75-48S2P5	36 – 75 VDC	2.5 VDC	0mA	20 A	5 mV	8 mV	90mA	1.255 A	87
HEC75-48S3P3	36 – 75 VDC	3.3 VDC	0mA	20 A	7 mV	10 mV	120mA	1.618 A	90
HEC75-48S05	36 – 75 VDC	5.0 VDC	0mA	15 A	10 mV	15 mV	130mA	1.838 A	90
HEC75-48S15	36 – 75 VDC	15 VDC	0mA	5 A	30 mV	45 mV	160mA	1.860 A	90

Model Number	Input Range	Output Voltage		Output Current		Line Regulation	Load Regulation	Eff (4) (%)
		V1	V2	I 1	I 2			
HEC75-48D3305	36 – 75 VDC	5 VDC	3.3 VDC	15 A	15 A	10/7 mV	15/10 mV	88
HEC75-48D3325	36 – 75 VDC	3.3 VDC	2.5 VDC	15 A	15 A	7/5 mV	10/8 mV	81
HEC75-48D0518	36 – 75 VDC	5 VDC	1.8 VDC	15 A	15 A	10/4 mV	15/6 mV	85
HEC75-48D3318	36 – 75 VDC	3.3 VDC	1.8 VDC	15 A	15 A	7/4 mV	10/6 mV	81

Note
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at Tc=40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Single：Typical value at nominal input voltage and full load.
   Dual：Typical value at nominal input voltage and both outputs current are 7.5A.
5. 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.
6. Measured with a 1μF M/C and a 10μF M/C(for dual outputs) or 1μF M/C and a 10μF T/C(for single outputs)
7. Dual output safety approvals pending.
8. The negative / positive logic and pin length are optional. The pin voltage is referenced to -Vin.
   Single：Please see single output product options table.
   Dual：Please see dual output product options table.
9. Heat sink is optional and P/N: 7G-0021A-F, 7G-0022A-F, 7G-0023A-F, 7G-0024A-F.
10. The HEC75 meets EN55022 class A and class B only with external components connected with the input pins of the converter.
11. An external input 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.
12. BASEPLATE GROUNDING：Base-plate should be grounded at one of the four screw bolts prior to operation.
13. The converter is provided by basic insulation.

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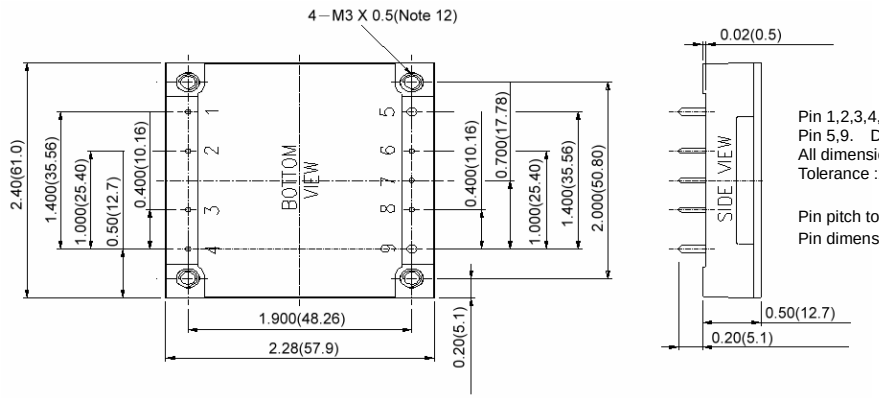
75WATTS SINGLE/DUAL OUTPUT DC-DC CONVERTER

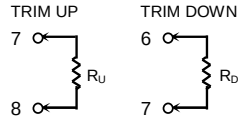
Single Output :



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.x±0.5)
x.xxx±0.01 (x.xx±0.25)
Pin pitch tolerance ±0.01 (0.25)
Pin dimension tolerance ±0.004(0.1)

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



PIN CONNECTION

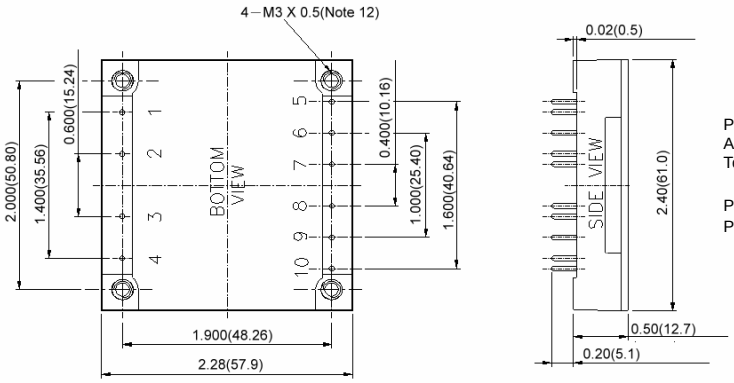
PIN	Define	Diameter
1	- INPUT	0.04 Inches
2	CASE	0.04 Inches
3	CTRL	0.04 Inches
4	+ INPUT	0.04 Inches
5	- OUTPUT	0.08 Inches
6	- SENSE	0.04 Inches
7	TRIM	0.04 Inches
8	+ SENSE	0.04 Inches
9	+ OUTPUT	0.08 Inches

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

Example：HEC75-48S3P3-P

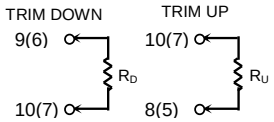
Dual Output :



Pin DIA. 0.040 (1.02mm)
All dimensions in inches (mm)
Tolerance :x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
Pin pitch tolerance ±0.01 (0.25)
Pin dimension tolerance ±0.004(0.1)

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.
( ) for V2 output trim



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	+ V2	0.04 Inches
6	-V2 (COM)	0.04 Inches
7	V2 TRIM	0.04 Inches
8	+V1	0.04 Inches
9	-V1 (COM)	0.04 Inches
10	V1 TRIM	0.04 Inches

PRODUCT OPTIONS TABLE

Option	Suffix
Positive remote ON/OFF logic, 0.20” pin length (standard)	-
Positive remote ON/OFF logic, 0.145” pin length	-L
Positive remote ON/OFF logic, 0.11” pin length	-K
Negative remote ON/OFF logic, 0.20” pin length	-N
Negative remote ON/OFF logic, 0.145” pin length	-S
Negative remote ON/OFF logic, 0.11” pin length	-M

Example：HEC75-48D3305-N

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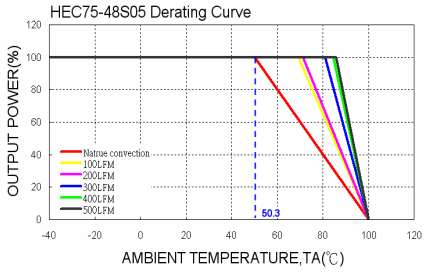
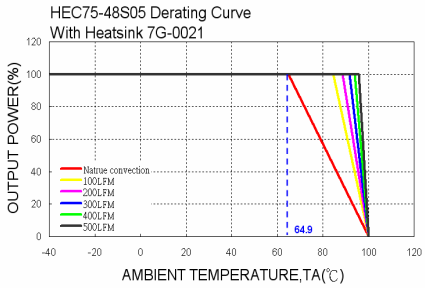
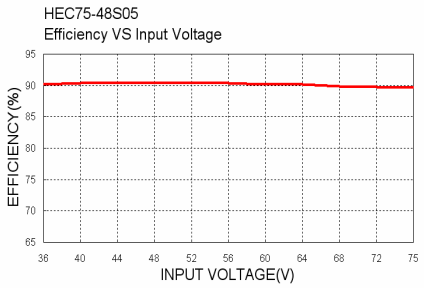
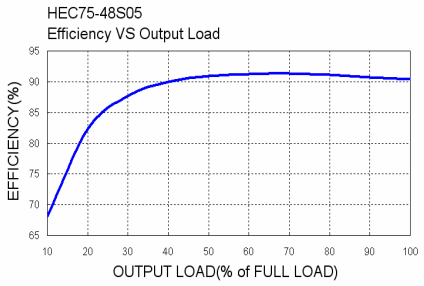
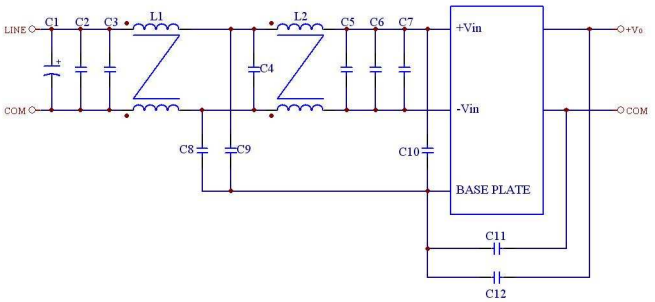
75WATTS SINGLE/DUAL OUTPUT DC-DC CONVERTER







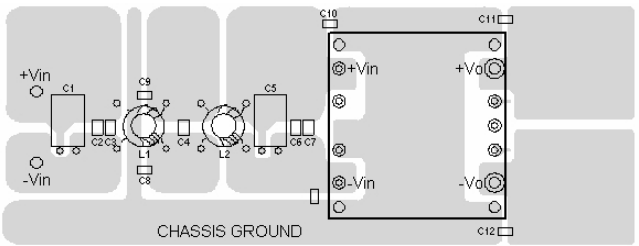




Recommended Filter for EN55022 Class B Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	C5
HEC75-xxx	220μF/100V	2.2μF /100V	2.2μF /100V	2.2μF /100V	100μF/100V
	C6	C7	C8	C9	C10
	2.2μF /100V	2.2μF /100V	1.5nF /3KV	1.5nF /3KV	1.5nF /3KV
	C11	C12	L1	L2	
	1.5nF /3KV	1.5nF /3KV	1400.4μH	304.98μH	



Recommended EN55022 Class B Filter Circuit Layout

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