POWER MATE TECHNOLOGY CO., LTD.

HEC50 SERIES

50 WATTS DC-DC CONVERTER



FEATURES

- **50 WATTS MAXIMUM OUTPUT POWER**
- **SINGLE OUTPUT UP TO 15A**
- **COMPACT 2.40 X 2.28 X 0.50 INCH PACKAGE**
- **HIGH EFFICIENCY UP TO 91%**
- **INPUT RANGE FROM 18VDC TO 36VDC AND 36VDC TO 75VDC**
- **FIXED SWITCHING FREQUENCY(300kHz)**
- **HALT TESTED**
- **INDUSTRY STANDARD FOOTPRINT**
- **ADJUSTABLE OUTPUT VOLTAGE**
- **NO MINIMUM LOAD REQUIRED**
- **UNDER-VOLTAGE LOCKOUT**
- **INPUT TO OUTPUT BASIC INSULATION:1600 VDC**
- **CE MARK MEETS 2006/95/EC, 2011/95/EC AND 2004/108/EC**
- **SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1**
- **ISO9001 CERTIFIED MANUFACTURING FACILITIES**
- **COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU**

APPLICATIONS

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

OPTIONS

Positive logic remote on/off, pin length

DESCRIPTION

HEC50 single output DC/DC converters provide up to 50 watts of output power in an industry standard half-brick package and footprint. These units are specifically designed to meet the power needs of low-voltage silicon. All models feature a wide input range, trimmable output voltage and a 15A current rating.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS		
Output power		50 Watts, max.
Voltage accuracy		± 1.5%
Minimum load		0%
Voltage adjustability (Note 5)		+ 10% , -20%
Line regulation	LL to HL at Full Load	See table
Load regulation	No load to Full load	See table
Remote sense (Note 5)		10% of Vout(nom)
Ripple and noise (Note 6)	20MHz bandwidth	100mVp-p
Temperature coefficient		±0.02% / ºC, 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		Continuous, automatics recovery

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage	Input to Output Input(Output) to Case	1600 VDC, min. 1minute 1000 VDC, min. 1minute
Isolation resistance	500VDC	10^7 ohms, min.
Isolation capacitance		2500pF, max.
Switching frequency		300kHz±10%
Design meets safety standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Open with Aluminum base-plate
Weight		50g (1.76oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1.037 x 10^6 hrs 2.560 x 10^5 hrs

INPUT SPECIFICATIONS			
Input voltage range	24VDC nominal input 48VDC nominal input		18 ~ 36VDC 36 ~ 75VDC
Input filter			L-C type
Input surge voltage	24VDC input 48VDC input		50VDC 100ms, max. 100VDC 100ms, max.
Start up time	Nominal input and constant resistive load	Power up Remote ON/OFF	25ms 25ms
Input reflected ripple current	24VDC input 48VDCinput		50mAp-p 20mAp-p
Start-up voltage	24VDC input 48VDC input		17VDC 34VDC
Shutdown voltage	24VDC input 48VDC input		15VDC 32VDC
Remote ON/OFF (Note 7)			
(Negative logic)	ON=Short or 0V < Vr < 1.2V, OFF=Open or 3V < Vr < 15V,		I_{IN}=1mA max. I_{IN}=50µA max.
(Positive logic)	ON=Open or 3V < Vr < 15V, OFF=Short or 0V < Vr < 1.2V,		I_{IN}=50µA max. I_{IN}=1mA max.
Input current of remote control pin	Nominal input		-0.5mA ~ 0.5mA
Remote off state input current	Nominal input		20mA

ENVIRONMENTAL SPECIFICATIONS	
Operating base-plate temperature range (Note 8)	-40ºC ~ +100ºC
Over temperature protection	110ºC
Humidity max, Non-condensing	95%
Storage temperature range	-55ºC ~ +125ºC
Thermal shock	MIL-STD-810F
Vibration	MIL-STD-810F

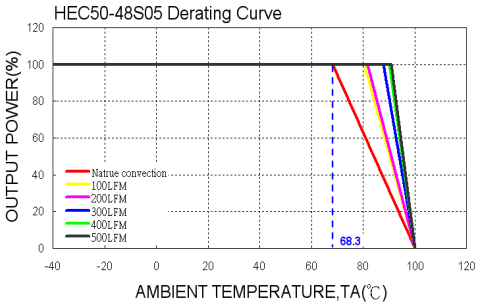
EMC CHARACTERISTICS			
EMI (Note 9)	EN55022		Class A, Class B
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 10)	EN61000-4-4	± 2kV	Perf. Criteria B
Surge (Note 10)	EN61000-4-5	± 1kV	Perf. Criteria B
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

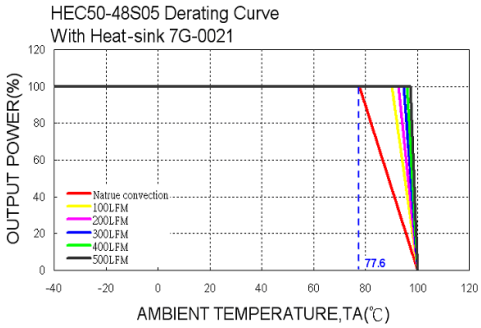
Model Number	Input Range	Output Voltage	Output Current		Line regulation	Load regulation	No load[3] Input Current	Eff [4] (%)
			Min. load	Full load				
HEC50-24S1P8	18 ~ 36 VDC	1.8 VDC	0mA	15 A	4 mV	6 mV	120mA	86
HEC50-24S2P5	18 ~ 36 VDC	2.5 VDC	0mA	15 A	5 mV	8 mV	100mA	87
HEC50-24S3P3	18 ~ 36 VDC	3.3 VDC	0mA	15 A	7 mV	10 mV	120mA	89
HEC50-24S05	18 ~ 36 VDC	5 VDC	0mA	10 A	10 mV	15 mV	120mA	90
HEC50-24S15	18 ~ 36 VDC	15 VDC	0mA	3.3 A	30 mV	45 mV	190mA	89
HEC50-48S1P8	36 ~ 75 VDC	1.8 VDC	0mA	15 A	4 mV	6 mV	80mA	87
HEC50-48S2P5	36 ~ 75 VDC	2.5 VDC	0mA	15 A	5 mV	8 mV	80mA	88
HEC50-48S3P3	36 ~ 75 VDC	3.3 VDC	0mA	15 A	7 mV	10 mV	110mA	90
HEC50-48S05	36 ~ 75 VDC	5 VDC	0mA	10 A	10 mV	15 mV	90mA	91
HEC50-48S15	36 ~ 75 VDC	15 VDC	0mA	3.3 A	30 mV	45 mV	130mA	90

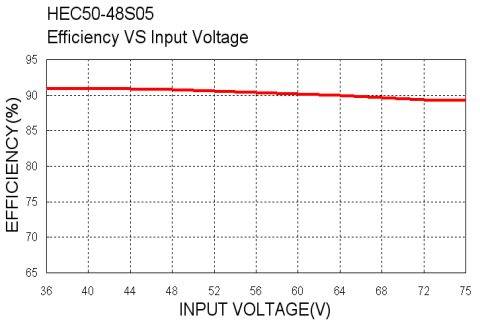
Note

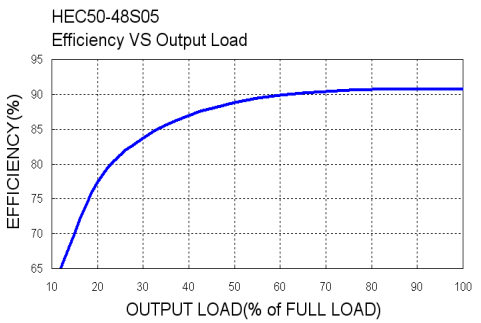
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load (Ground, Benign, controlled environment).
2. The converter is provided by basic insulation.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
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 T/C.
7. The negative/ positive logic and pin length are optional (see table). The pin voltage is referenced to –INPUT
8. Heat-sink is optional and P/N: 7G-0021A-F, 7G-0022A-F, 7G-0023A-F, 7G-0024A-F.
9. The HEC50 series standard module meets EN55022 Class A and Class B with external components.
   For more detail information, please contact with P-DUKE.
10. 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.
11. CASE GROUNDING：When connect the case pin and four screw bolts to shield plane, the EMI could be reduced.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

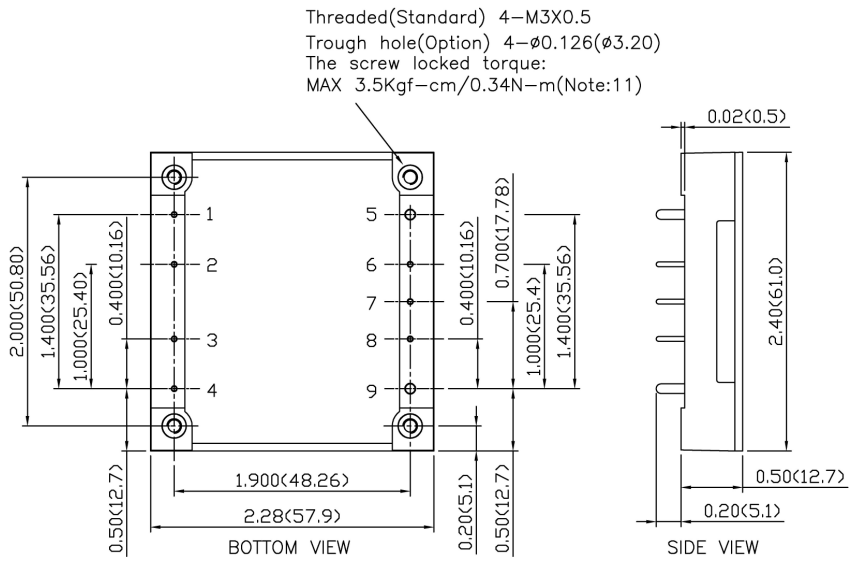








MECHANICAL DRAWING :

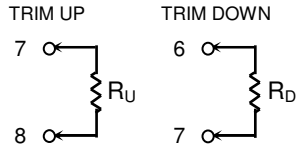


1. All dimensions in Inch (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION		
PIN	DEFINE	DIAMETER
1	-INPUT	0.040 Inch（1.02mm）
2	CASE	0.040 Inch（1.02mm）
3	CTRL	0.040 Inch（1.02mm）
4	+INPUT	0.040 Inch（1.02mm）
5	-OUTPUT	0.080 Inch（2.03mm）
6	-SENSE	0.040 Inch（1.02mm）
7	TRIM	0.040 Inch（1.02mm）
8	+SENSE	0.040 Inch（1.02mm）
9	+OUTPUT	0.080 Inch（2.03mm）

EXTERNAL OUTPUT TRIMMING

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



Remote On/Off and Pin Options	Suffix
Negative remote ON/OFF logic, 0.200” pin length (standard)	-
Negative remote ON/OFF logic, 0.145” pin length	-L
Positive remote ON/OFF logic, 0.200” pin length	-P
Positive remote ON/OFF logic, 0.145” pin length	-S

Heat-Sink and Mounting Hole Tread Options	Suffix
Without heat-sink	-
7G-0021A-F	-HS
7G-0022A-F	-HS1
7G-0023A-F	-HS2
7G-0024A-F	-HS3
Through hole (No thread)	-TH

Example：HEC50-48S3P3-PHS
* The module can’t equip heat-sink with TH option.