



Single

Dual

**APPLICATIONS**

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

**FEATURES**

- 100 WATTS MAXIMUM OUTPUT POWER
- SINGLE : OUTPUT CURRENT UP TO 25A  
DUAL : TOTAL OUTPUT POWER UP TO 100W
- COMPACT 2.40 X 2.28 X 0.50 INCH PACKAGE
- HIGH EFFICIENCY UP TO 90%
- INPUT RANGE FROM 36VDC TO 75VDC
- FIXED SWITCHING FREQUENCY(300KHZ)
- HALT TESTED
- INDUSTRY STANDARD FOOTPRINT
- ADJUSTABLE OUTPUT VOLTAGE
- 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
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

**OPTIONS**

Remote On/Off, Pin length

**DESCRIPTION**

HEC100-SERIES DC/DC converters provide up to 100 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 25A current rating.

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

| OUTPUT SPECIFICATIONS                                 |                                |                             |
|---|--------------------------------|-----------------------------|
| Output power  | Total output power             | 100 Watts, max.             |
| Voltage accuracy                                      | Full load and nominal Vin      | ± 1.5%                      |
|   | Single                         | ± 1.0%                      |
| Minimum load  | Single                         | 0%                          |
|   | Dual                           | ± 10%                       |
| Voltage adjustability                                 | Single (Note 5)                | + 10% , -20%                |
|   | Dual for Each output           | ± 10%                       |
| Line regulation                                       | LL to HL at FL                 | See table                   |
| Load regulation                                       | Single( No Load to Full Load ) | See table                   |
|   | Dual( No Load to Full Load )   | See table                   |
| Remote sense (Note 5)                                 | Single                         | 10% of Vout                 |
| Ripple and noise 20MHz bandwidth (Note 6)             |                                | 100mVp-p                    |
| Temperature coefficient                               |                                | ±0.02% / °C, max.           |
| Transient response recovery time 25% load step change |                                | 200µS                       |
| Over voltage protection Single (Hiccup) threshold     | Single                         | 115% ~ 130% of Vout         |
|   | Dual                           | 110% ~ 140% of Iout Rated   |
|   | 2.5V                           | 3.0VDC                      |
|   | 3.3V                           | 3.9VDC                      |
| Over current protection threshold                     | Single                         | 110% ~ 140% of Iout Rated   |
|   | Dual                           | 110% ~ 120% of Iout Rated   |
| Short circuit protection                              |                                | Hiccup, automatics recovery |

| GENERAL SPECIFICATIONS |                        |                                  |                             |
|------------------------|------------------------|----------------------------------|-----------------------------|
| Efficiency             |                        | See table                        |                             |
| Isolation voltage      | Input to Output        | 1600 VDC, min.                   |                             |
|                        | Input to Case          | 1000 VDC, min.                   |                             |
|                        | Output to Case         | 1000 VDC, min.                   |                             |
| Isolation resistance   | Single                 | 10 <sup>7</sup> ohms, min.       |                             |
|                        | Dual                   | 10 <sup>9</sup> ohms, min.       |                             |
| Isolation capacitance  | Single                 | 2500pF, max.                     |                             |
|                        | Dual                   | 1500pF, max.                     |                             |
| Switching frequency    |                        | 300KHz, typ.                     |                             |
| Approvals and standard | Single                 | IEC60950-1, UL60950-1, EN60950-1 |                             |
| Design meets standard  | Dual                   | IEC60950-1, UL60950-1, EN60950-1 |                             |
| Case material          | Dual                   | Non-conductive black plastic     |                             |
| Base material          |                        | Aluminum base-plate              |                             |
| Potting material       | Dual                   | Silicon (UL94-V0)                |                             |
| Weight                 | Single                 | 65g (2.29oz)                     |                             |
|                        | Dual                   | 105g (3.70oz)                    |                             |
| MTBF (Note 1)          | BELLCORE TR-NWT-000332 | Single                           | 2.000 x 10 <sup>6</sup> hrs |
|                        | MIL-HDBK-217F          | Dual                             | 1.004 x 10 <sup>6</sup> hrs |
|                        |                        | Single                           | 2.144 x 10 <sup>5</sup> hrs |
|                        |                        | Dual                             | 7.740 x 10 <sup>4</sup> hrs |

| INPUT SPECIFICATIONS                   |   |                                  |
|--|---|----------------------------------|
| Input voltage range                    |   | 36 – 75VDC                       |
| Input filter                           |   | L-C type                         |
| Input surge voltage 100mS max (Single) |   | 100VDC                           |
| Start up time                          | Nominal Vin and constant resistive load   | Single, Dual Power up 25mS, typ. |
|  | Single Remote ON/OFF                      | 25mS, typ.                       |
| JVLO Start-up voltage                  | Single                                    | 34VDC                            |
|  | Dual                                      | 35VDC                            |
| JVLO Shutdown voltage                  | Single                                    | 32VDC                            |
|  | Dual                                      | 33VDC                            |
| OVLO start-up voltage                  | Dual                                      | 76.5VDC, typ.                    |
| OVLO shutdown voltage                  | Dual                                      | 78.5VDC, typ.                    |
| Input reflected ripple current         | Single                                    | 20mA p-p                         |
| Remote ON/OFF (Note 7)                 |   |                                  |
| Single—                                |   |                                  |
| (Negative logic)                       | ON=Short or 0V < Vr < 1.2V, IIN=1mA max.  |                                  |
|  | OFF=Open or 3V < Vr < 15V, IIN=50µA max.  |                                  |
| (Positive logic)                       | ON=Open or 3V < Vr < 15V, IIN=50µA max.   |                                  |
|  | OFF=Short or 0V < Vr < 1.2V, IIN=1mA max. |                                  |
| Dual—                                  |   |                                  |
| (Positive logic)                       | ON=Open or 3V < Vr < +Vin                 |                                  |
|  | OFF=Short or Vr < 1.2V                    |                                  |
| (Negative logic)                       | ON= Short or Vr < 1.2V                    |                                  |
|  | OFF=Open or 3V < Vr < +Vin                |                                  |
| 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 8) |                     | -40°C to +100°C (with derating) |
| Over temperature protection                     | Single              | 110°C                           |
|   | Dual for base plate | 105°C                           |
| Humidity max, Non-condensing                    |                     | 95%                             |
| Storage temperature range                       |                     | -55°C to +125°C                 |
| Thermal shock                                   |                     | MIL-STD-810F                    |
| Vibration                                       |                     | MIL-STD-810F                    |

| EMC CHARACTERISTICS      |             |           |                  |
|--------------------------|-------------|-----------|------------------|
| EMI (Note 9)             | EN55022     |           | Class A          |
| 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 | Input Current          |                          | Eff <sup>(4)</sup> (%) |
|---------------|-------------|----------------|----------------|-----------|-----------------|-----------------|------------------------|--------------------------|------------------------|
|               |             |                | Min. load      | Full load |                 |                 | No load <sup>(3)</sup> | Full load <sup>(2)</sup> |                        |
| HEC100-48S1P8 | 36 – 75 VDC | 1.8 VDC        | 0mA            | 25 A      | 4 mV            | 6 mV            | 110mA                  | 1.172 A                  | 85                     |
| HEC100-48S2P5 | 36 – 75 VDC | 2.5 VDC        | 0mA            | 25 A      | 5 mV            | 8 mV            | 80mA                   | 1.588 A                  | 87                     |
| HEC100-48S3P3 | 36 – 75 VDC | 3.3 VDC        | 0mA            | 25 A      | 7 mV            | 10 mV           | 100mA                  | 2.046 A                  | 89                     |
| HEC100-48S05  | 36 – 75 VDC | 5.0 VDC        | 0mA            | 20 A      | 10 mV           | 15 mV           | 100mA                  | 2.480 A                  | 90                     |
| HEC100-48S15  | 36 – 75 VDC | 15 VDC         | 0mA            | 6.66 A    | 30 mV           | 45 mV           | 200mA                  | 2.507 A                  | 90                     |

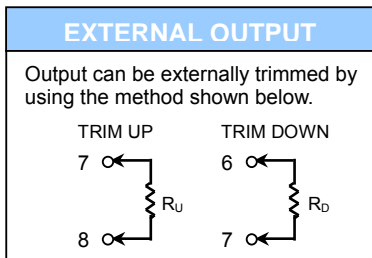
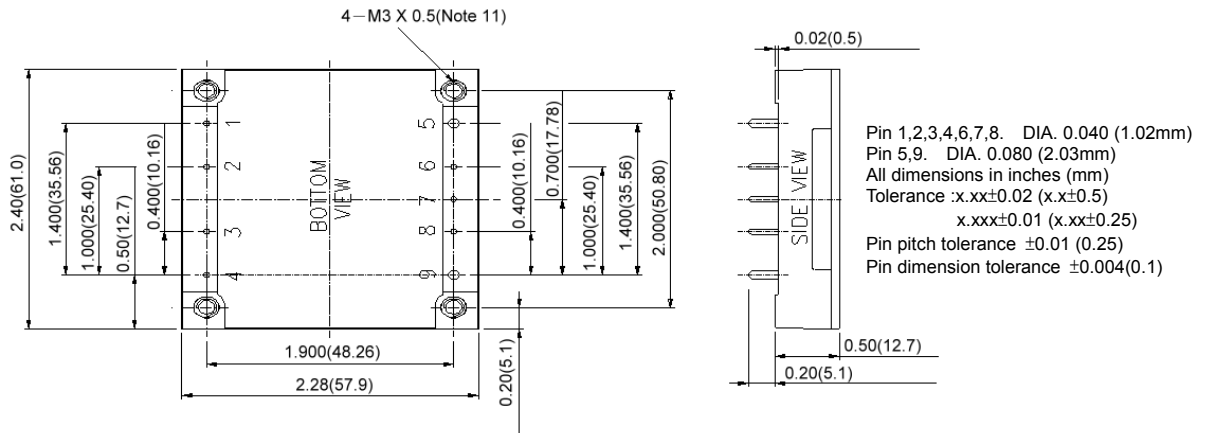
| Model Number   | Input Range | Output Voltage |         | Output Current |      | Line Regulation |        | Load Regulation |        | Input Current          |                          | Eff <sup>(4)</sup> (%) |
|----------------|-------------|----------------|---------|----------------|------|-----------------|--------|-----------------|--------|------------------------|--------------------------|------------------------|
|                |             | V1             | V2      | I 1            | I 2  | V1              | V2     | V1              | V2     | No load <sup>(3)</sup> | Full load <sup>(2)</sup> |                        |
| HEC100-48D3305 | 36 – 75 VDC | 5 VDC          | 3.3 VDC | 20 A           | 25 A | 25mV            | 16.5mV | 25mV            | 16.5mV | 200mA                  | 2.48A                    | 88                     |
| HEC100-48D2505 | 36 – 75 VDC | 5 VDC          | 2.5 VDC | 20 A           | 25 A | 25mV            | 12.5mV | 25mV            | 12.5mV | 200mA                  | 2.6A                     | 85                     |
| HEC100-48D2533 | 36 – 75 VDC | 3.3 VDC        | 2.5 VDC | 25 A           | 25 A | 16.5mV          | 12.5mV | 16.5mV          | 12.5mV | 190mA                  | 2.59A                    | 85                     |

- 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 dual efficiency test condition: HEC100-48D3305 @ 5V/12A and 3.3V/12A  
HEC100-48D2505 @ 5V/12A and 2.5V/16A  
HEC100-48D2533 @ 3.3V/18A and 2.5V/16A
  - 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.
  - Single : Measured with a 1μF M/C and a 10μF T/C.  
Dual : Measured without any external filter.
  - The negative / positive logic and pin length (DIM) 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.
  - Heat sink is optional and P/N: 7G-0021A-F, 7G-0022A-F, 7G-0023A-F, 7G-0024A-F.
  - The HEC100 meets EN55022 class A and class B only with external components connected to the input pins to the converter.
  - 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.
  - BASEPLATE GROUNDING : Base-plate should be grounded at one of four screw bolts prior to operation.
  - The converter is provided by basic insulation.





Single Output :

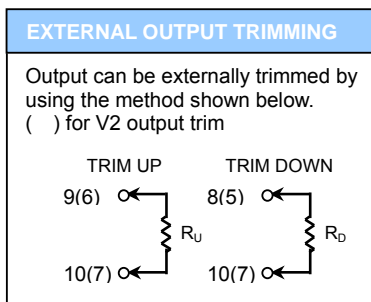
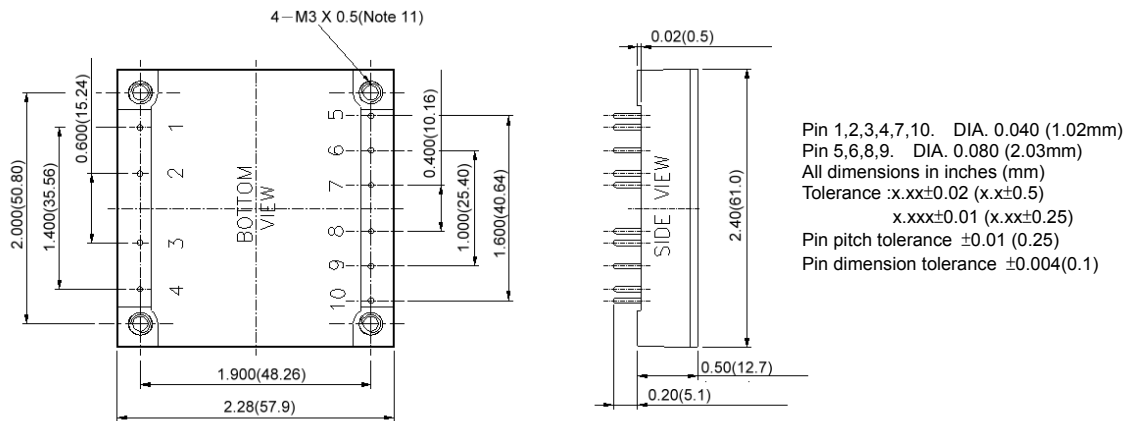


| PIN CONNECTION |          |             |
|----------------|----------|-------------|
| PIN            | Define   | Diameter    |
| 1              | - INPUT  | 0.04 Inches |
| 2              | CASE     | 0.04 Inches |
| 3              | CTRL     | 0.04 Inches |
| 4              | + INPUT  | 0.04 Inches |
| 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 : HEC100-48S3P-P

Dual Output :



| 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              | + V 2       | 0.08 Inches |
| 6              | - V 2 (COM) | 0.08 Inches |
| 7              | V2 TRIM     | 0.04 Inches |
| 8              | + V 1       | 0.08 Inches |
| 9              | - V 1 (COM) | 0.08 Inches |
| 10             | V1 TRIM     | 0.04 Inches |

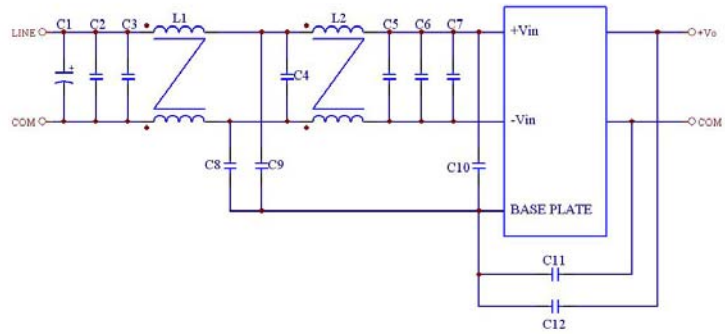
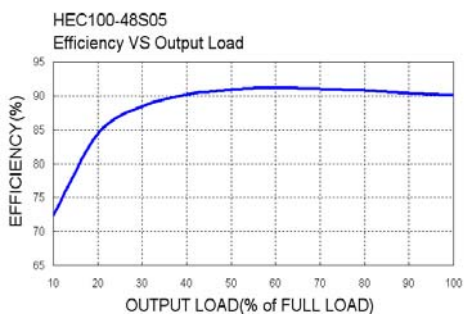
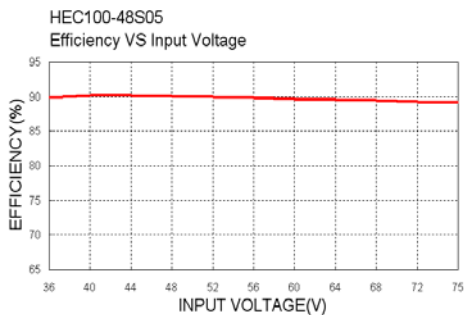
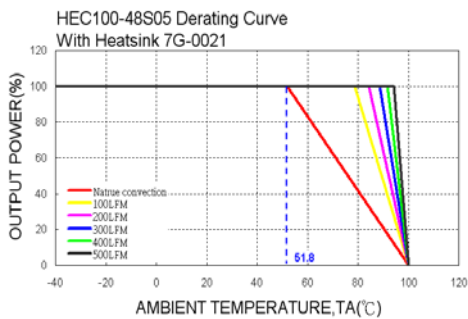
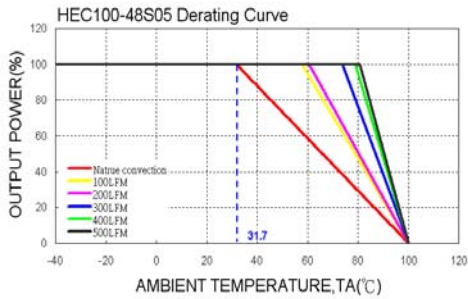
| PRODUCT OPTIONS TABLE                               |        |
|---|--------|
| Option  | Suffix |
| Positive remote ON/OFF logic, PIN 5,6,8,9 DIM 0.08" | -      |
| Positive remote ON/OFF logic, PIN 5,6,8,9 DIM 0.04" | -Y     |
| Negative remote ON/OFF logic, PIN 5,6,8,9 DIM 0.08" | -N     |
| Negative remote ON/OFF logic, PIN 5,6,8,9 DIM 0.08" | -Z     |

Example : HEC100-48D3305-N





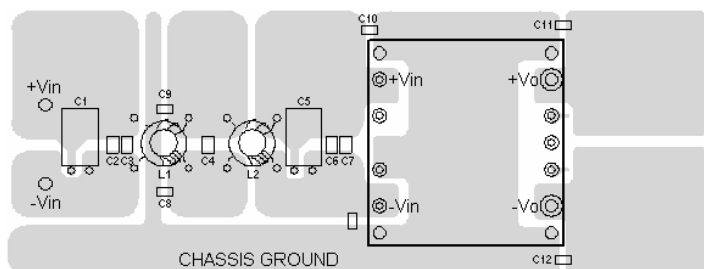
# 100WATTS SINGLE/DUAL OUTPUT DC-DC CONVERTER



### 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:

|            |             |             |             |             |            |
|------------|-------------|-------------|-------------|-------------|------------|
| HEC100-xxx | C1          | C2          | C3          | C4          | C5         |
|            | 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

