

## HPR7XXC

## 5 WATT UNREGULATED SIP DC/DC CONVERTER

### FEATURES

- ROHS COMPLIANT
- EFFICIENCY >80%
- SIP PACKAGE
- HIGH POWER DENSITY: >16 WATTS/INCH<sup>3</sup>



- LOW COST
- SINGLE AND DUAL OUTPUTS
- INTERNAL INPUT AND OUTPUT FILTERING
- SIX-SIDED SHIELDING

### DESCRIPTION

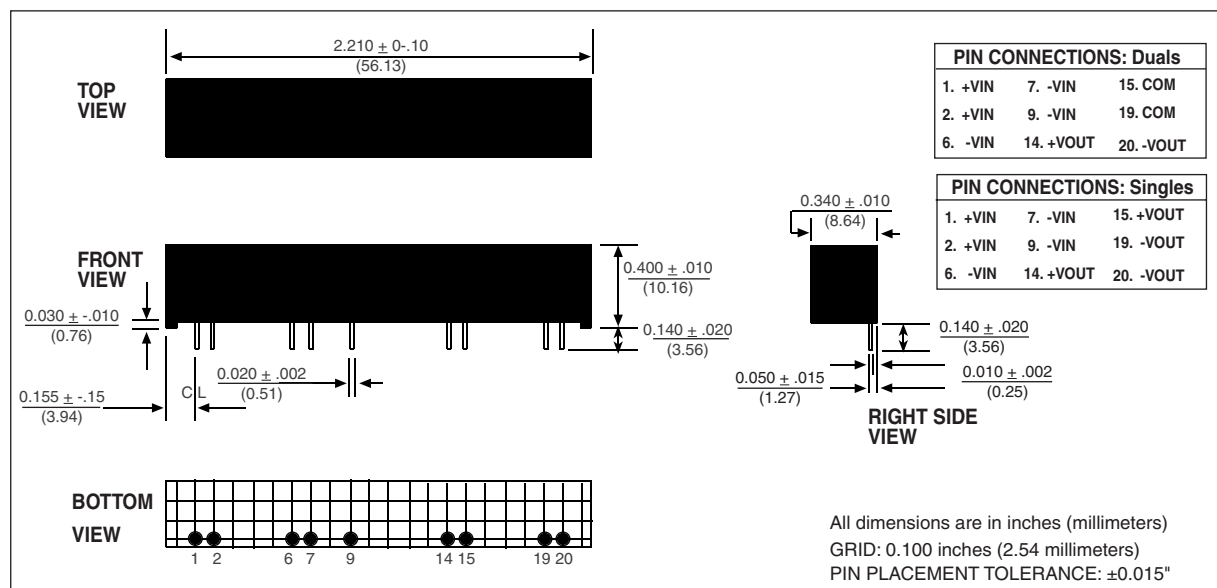
The HPR7XXC Series provides high power densities where space is critical. The small SIP package measures only 2.2" x .3" x .4" (56 x 9 x 10 mm). Designed for high density boards, the package is non-conductive, which presents advantages over painted metal enclosures.

The series includes many different voltage models (other input and output voltages are available upon request), all set in a low thermal resistance molding compound, called Iso-ThermoFlex™, which provides excellent heat dissipation of internal components. The use of surface mount devices and manufacturing processes, combined with the encapsulation process, assure the user that the product is more environmentally rugged than any other DC/DC converter of its type.

Operation down to no load will not impact the reliability of the series, although this product has a 10mA minimum load for specification purposes. It is recommended that all pins be used for current carrying capacity even though duplicate pin-outs are internally connected.

The HPR7XXC has 500VDC isolation barrier between input and output, offering the designer maximum flexibility in grounding options and polarity configurations. The outstanding MTTF, superior reliability, and low cost make it an excellent choice for any high power-density applications.

### MECHANICAL



# ELECTRICAL CHARACTERISTICS

Specifications typical at  $T_A = +25^{\circ}\text{C}$ , nominal input voltage, rated output current unless otherwise specified.

| MODEL   | NOMINAL<br>INPUT<br>VOLTAGE<br>(VDC) | RATED<br>OUTPUT<br>VOLTAGE<br>(VDC) | RATED<br>OUTPUT<br>CURRENT<br>(mA) | INPUT CURRENT   |                    | REFLECTED<br>RIPPLE<br>CURRENT<br>(mAp-p) | EFFICIENCY<br>(%) |
|---------|--------------------------------------|-------------------------------------|------------------------------------|-----------------|--------------------|-------------------------------------------|-------------------|
|         |                                      |                                     |                                    | NO LOAD<br>(mA) | RATED LOAD<br>(mA) |                                           |                   |
| HPR700C | 5                                    | 5                                   | 1000                               | 70              | 1250               | 15                                        | 80                |
| HPR703C | 5                                    | $\pm 5$                             | $\pm 500$                          | 70              | 1250               | 15                                        | 80                |
| HPR704C | 5                                    | $\pm 12$                            | $\pm 208$                          | 70              | 1190               | 15                                        | 84                |
| HPR705C | 5                                    | $\pm 15$                            | $\pm 167$                          | 70              | 1190               | 15                                        | 84                |
| HPR706C | 12                                   | 5                                   | 1000                               | 25              | 490                | 15                                        | 80                |
| HPR710C | 12                                   | $\pm 12$                            | $\pm 208$                          | 25              | 490                | 15                                        | 85                |
| HPR711C | 12                                   | $\pm 15$                            | $\pm 167$                          | 25              | 490                | 15                                        | 85                |
| HPR712C | 15                                   | 5                                   | 1000                               | 20              | 407                | 15                                        | 82                |
| HPR717C | 15                                   | $\pm 15$                            | $\pm 167$                          | 20              | 392                | 15                                        | 85                |

Note: Other input to output voltage options may be available. Please consult factory.

## COMMON SPECIFICATIONS

Specifications typical at  $T_A = +25^{\circ}\text{C}$ , nominal input voltage, rated output current unless otherwise specified.

| PARAMETER                                      | CONDITIONS                                                                                                                                          | MIN                  | TYP           | MAX                    | UNITS              |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------|------------------------|--------------------|
| <b>INPUT</b>                                   |                                                                                                                                                     |                      |               |                        |                    |
| Voltage Range                                  |                                                                                                                                                     | 4.75<br>11.4<br>14.2 | 5<br>12<br>15 | 5.25<br>12.6<br>15.8   | VDC<br>VDC<br>VDC  |
| Voltage Rise Time                              | See Application Note: "Capacitive Loading Effects on Start-Up of DC/DC Converters"                                                                  |                      |               |                        |                    |
| <b>ISOLATION</b>                               |                                                                                                                                                     |                      |               |                        |                    |
| Rated Voltage                                  |                                                                                                                                                     | 500                  |               |                        | VDC                |
| Test Voltage                                   | 60 Hz, 10 seconds                                                                                                                                   | 500                  |               |                        | Vpk                |
| Resistance                                     |                                                                                                                                                     |                      | 1             |                        | GW                 |
| Capacitance                                    |                                                                                                                                                     |                      | 55            |                        | pF                 |
| Leakage Current                                | $V_{ISO} = 240\text{VAC}$ , 60Hz                                                                                                                    |                      | 5             |                        | $\mu\text{Arms}$   |
| <b>OUTPUT</b>                                  |                                                                                                                                                     |                      |               |                        |                    |
| Rated Power                                    |                                                                                                                                                     |                      | 5             |                        | W                  |
| Voltage Setpoint Accuracy                      | Rated Load, Nominal $V_{IN}$                                                                                                                        |                      | $\pm 3$       |                        | %                  |
| Temperature Coefficient                        |                                                                                                                                                     |                      | $\pm 0.05$    |                        | %/Deg C            |
| Ripple & Noise                                 | BW = DC to 10MHz<br>BW = 10Hz to 2MHz                                                                                                               |                      | 50<br>5       |                        | mVp-p<br>mVrms     |
| Voltage                                        | $I_L = 10\text{mA}$ , $V_{OUT} = 5\text{V}$<br>$I_L = 10\text{mA}$ , $V_{OUT} = \pm 12\text{V}$<br>$I_L = 10\text{mA}$ , $V_{OUT} = \pm 15\text{V}$ |                      |               | 5.75<br>13.10<br>16.25 | VDC<br>VDC<br>VDC  |
| <b>REGULATION</b>                              |                                                                                                                                                     |                      |               |                        |                    |
| Line Regulation                                | High Line to Low Line                                                                                                                               |                      | 1.2           |                        | %/%Vin             |
| Load Regulation (5V out only)                  | Rated Load to No Load                                                                                                                               |                      | 15            |                        | %                  |
| Load Regulation (All other Models)             | Rated Load to No Load                                                                                                                               |                      | 10            |                        | %                  |
| <b>GENERAL</b>                                 |                                                                                                                                                     |                      |               |                        |                    |
| Switching Frequency                            |                                                                                                                                                     |                      | 170           |                        | kHz                |
| Package Weight                                 |                                                                                                                                                     |                      | 7             |                        | g                  |
| MTTF per MIL-HDBK-217, Rev. E<br>Ground Benign | Circuit Stress Method<br>$T_A = +25^{\circ}\text{C}$                                                                                                |                      | 2000          |                        | kHr                |
| <b>TEMPERATURE</b>                             |                                                                                                                                                     |                      |               |                        |                    |
| Specification                                  |                                                                                                                                                     | -25                  | +25           | +70                    | $^{\circ}\text{C}$ |
| Operation                                      |                                                                                                                                                     | -40                  |               | +85                    | $^{\circ}\text{C}$ |
| Storage                                        |                                                                                                                                                     | -40                  |               | +110                   | $^{\circ}\text{C}$ |

## ABSOLUTE MAXIMUM RATINGS

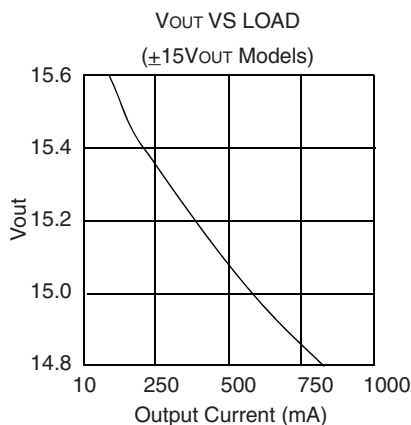
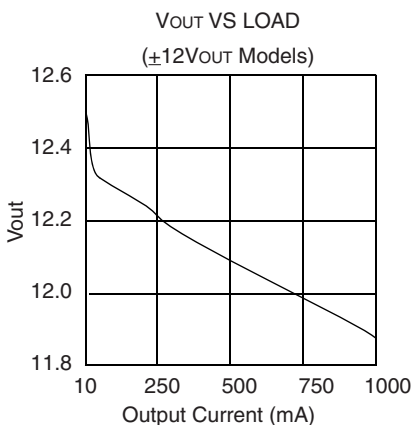
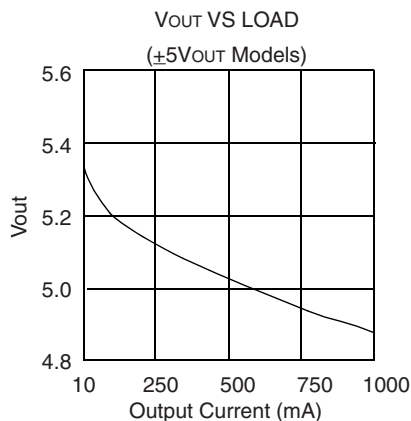
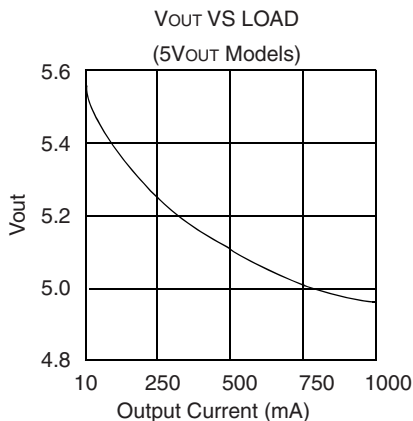
Internal Power Dissipation.....1.7W  
Short Circuit Protection.....Momentary  
Lead Temperature (soldering, 10 seconds max).....+300 $^{\circ}\text{C}$

## ORDERING INFORMATION

Device Family \_\_\_\_\_ **HPR** **7XX** **C**  
HPR indicates DC/DC converter  
Model Number \_\_\_\_\_  
RoHS Compliant \_\_\_\_\_

# TYPICAL PERFORMANCE CURVES

Specifications typical at  $T_A = +25^\circ\text{C}$ , rated input voltage, rated output current unless otherwise specified.



## THROUGH-HOLE SOLDERING INFORMATION

These devices are intended for wave soldering or manual soldering.

**They are not intended to be subject to surface mount processes under any circumstances.**

The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures within the converter will not exceed 175°C. Care should be taken to control manual soldering limits identical to that of wave soldering.

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