

HPR1XX

SERIES DC/DC CONVERTER

POWER: 0.75 Watt
OUTPUT: Single Output
SIZE: Multiple Package Styles

C&D TECHNOLOGIES
 Power Solutions
 POWER ELECTRONICS DIVISION

Product Site: www.cdpowerelectronics.com
 Corporate Site: www.cdtechno.com

PRODUCT DATA SHEET

FEATURES

- Low Cost
- Multiple Package Styles
- Internal Input and Output
- Filtering
- Non-Conductive Case
- High Output Power Density: 10 Watts/Inch³
- Extended Temperature Range: -25°C to +85°C
- Efficiencies to 79%

The HPR1XX Series uses advanced circuit design and packaging technology to deliver superior reliability and performance. A 170kHz push-pull oscillator is used in the input stage. Beat-frequency oscillation problems are reduced when using the HPR1XX Series with high frequency isolation amplifiers.

Reduced parts count and high efficiency add to the reliability of the HPR1XX Series. The high efficiency of the HPR1XX Series means less internal power dissipation, as low as 190mW. With reduced heat dissipation the HPR1XX Series can operate at higher temperatures with no degradation. In addition, the high

efficiency of the HPR1XX Series means the series is able to offer greater than 10 W/inch³ of output power density. Operation down to no load will not impact the reliability of the series, although a ≥ 1 mA minimum load is needed to realize published specifications.

The HPR1XX Series provides the user a low cost converter without sacrificing reliability. The use of surface mounted devices and advanced manufacturing technologies make it possible to offer premium performance and low cost.

Absolute Maximum Ratings

| | |
|--|-----------|
| Internal Power Dissipation | 450mW |
| Short Circuit Duration | Momentary |
| Lead Temperature (soldering, 10 seconds max) | +300°C * |

* NOTE: Refer to Reflow Profile for SMD Models.

Ordering Information

| | | | |
|-------------------------------|--|-----|-----|
| Device Family | HPR | 1XX | V/W |
| HPR Indicates DC/DC Converter | | | |
| Model Number | Selected from Table of Electrical Characteristics | | |
| Package Option | There is "no" package designator for the SIP package | | |
| V = DIP Package | | | |
| W = SMD Package | | | |

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ELECTRICAL SPECIFICATIONS

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

| MODEL | NOMINAL INPUT VOLTAGE (VDC) | RATED OUTPUT VOLTAGE (VDC) | RATED OUTPUT CURRENT (mA) | INPUT CURRENT | | REFLECTED RIPPLE CURRENT (mA _{p-p}) | EFFICIENCY (%) |
|--------|-----------------------------|----------------------------|---------------------------|---------------|-----------------|---|----------------|
| | | | | NO LOAD (mA) | RATED LOAD (mA) | | |
| HPR100 | 5 | 5 | 150 | 20 | 216 | 10 | 69 |
| HPR101 | 5 | 12 | 62 | 20 | 212 | 5 | 70 |
| HPR102 | 5 | 15 | 50 | 20 | 212 | 5 | 71 |
| HPR103 | 5 | ±5 | ±75 | 20 | 218 | 5 | 68 |
| HPR104 | 5 | ±12 | ±30 | 20 | 212 | 5 | 68 |
| HPR105 | 5 | ±15 | ±25 | 20 | 200 | 5 | 75 |
| HPR106 | 12 | 5 | 150 | 10 | 90 | 5 | 69 |
| HPR107 | 12 | 12 | 62 | 10 | 81 | 5 | 77 |
| HPR108 | 12 | 15 | 50 | 10 | 81 | 5 | 77 |
| HPR109 | 12 | ±5 | ±75 | 10 | 88 | 5 | 71 |
| HPR110 | 12 | ±12 | ±30 | 10 | 81 | 5 | 74 |
| HPR111 | 12 | ±15 | ±25 | 10 | 81 | 5 | 77 |
| HPR112 | 15 | 5 | 150 | 8 | 72 | 5 | 69 |
| HPR113 | 15 | 12 | 62 | 8 | 72 | 5 | 69 |
| HPR114 | 15 | 15 | 50 | 8 | 72 | 5 | 69 |
| HPR115 | 15 | ±5 | ±75 | 8 | 72 | 5 | 69 |
| HPR116 | 15 | ±12 | ±30 | 8 | 63 | 5 | 76 |
| HPR117 | 15 | ±15 | ±25 | 8 | 63 | 5 | 79 |
| HPR118 | 24 | 5 | 150 | 8 | 48 | 15 | 65 |
| HPR119 | 24 | 12 | 62 | 8 | 48 | 15 | 65 |
| HPR120 | 24 | 15 | 50 | 8 | 45 | 15 | 69 |
| HPR121 | 24 | ±5 | ±75 | 8 | 45 | 15 | 69 |
| HPR122 | 24 | ±12 | ±30 | 8 | 45 | 15 | 67 |
| HPR123 | 24 | ±15 | ±25 | 8 | 45 | 15 | 69 |

Note: Other input to output voltages may be available. Please contact factory.

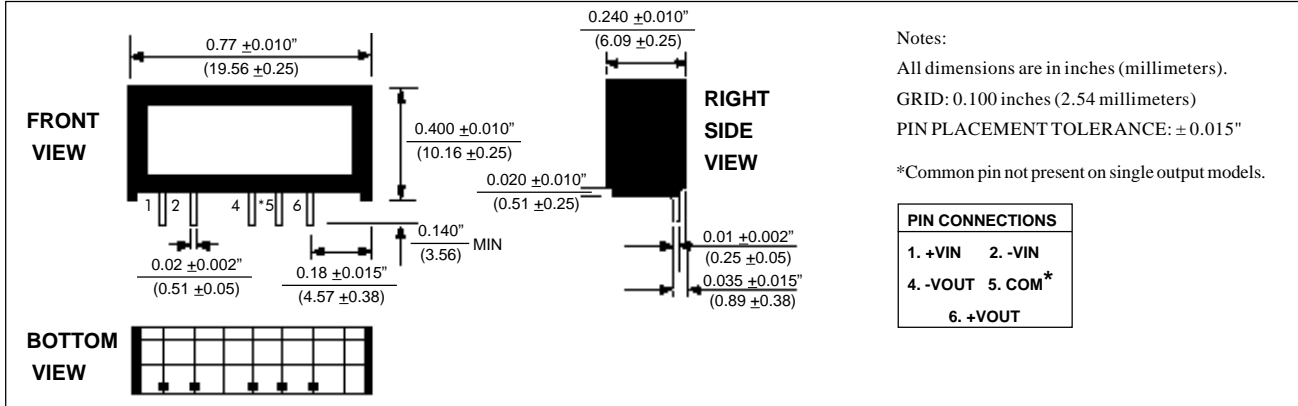
COMMON SPECIFICATIONS

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

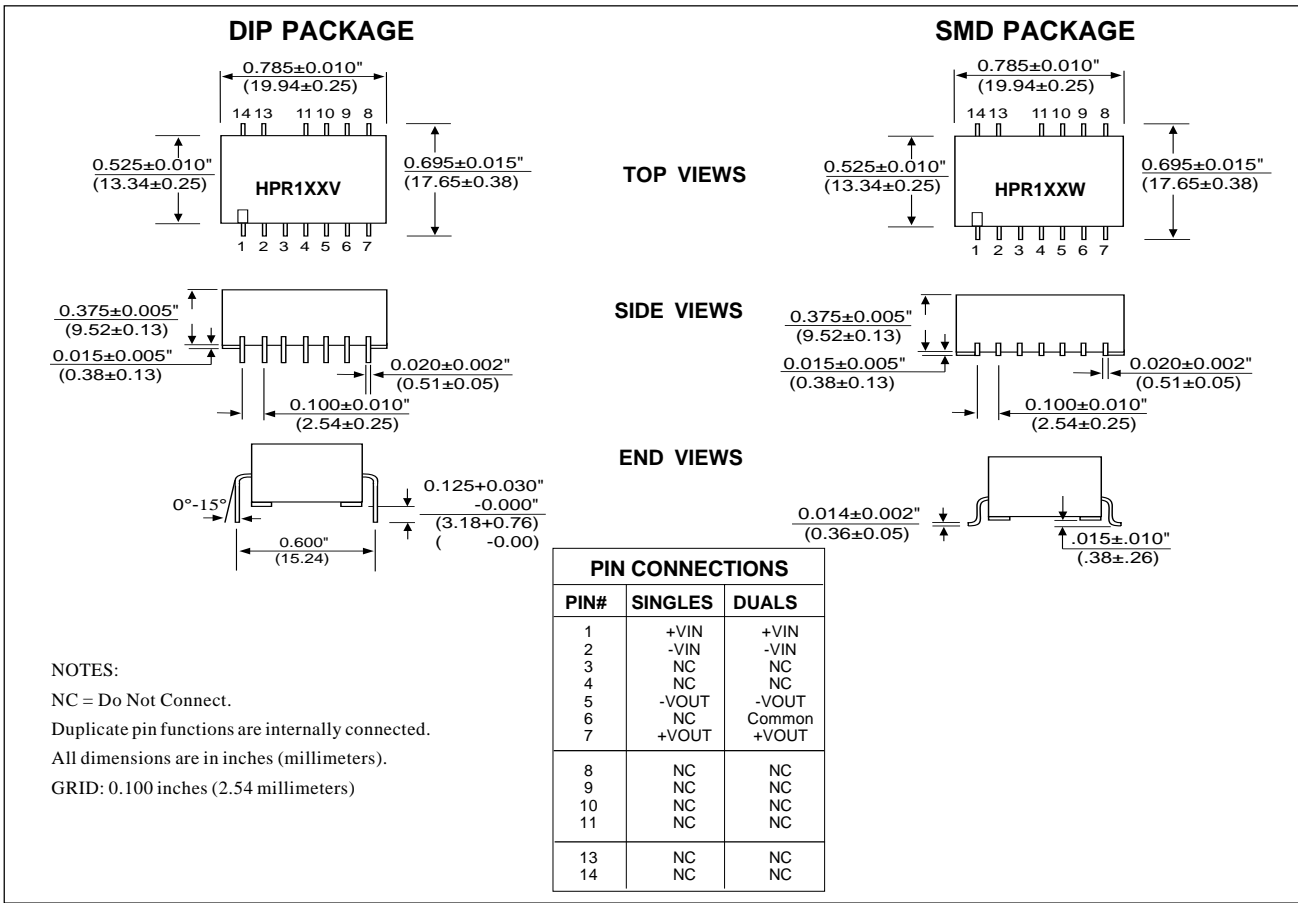
| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---|--|-----------------------------|--|-----------------------------|---|
| INPUT Voltage Range | | 4.5 10.8 13.5 21.6 | 5 12 15 24 | 5.5 13.2 16.5 26.4 | V _{DC} V _{DC} V _{DC} V _{DC} |
| Voltage Rise Time | See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters" | | | | |
| ISOLATION Rated Voltage Test Voltage Resistance Capacitance Leakage Current | 60 Hz, 10 Seconds $V_{ISO} = 240\text{VAC}, 60\text{Hz}$ | 750 750 | 10 25 2 | 100 8.5 | V _{DC} V _{rms} (1060pk) GΩ pF μArms |
| OUTPUT Rated Power Voltage Setpoint Accuracy Ripple & Noise HPR103 Voltage (Over Input Voltage Range) Temperature Coefficient | Rated Load, Nominal V_{IN} BW = DC to 10MHz BW = 10Hz to 2MHz BW = DC to 10MHz 1mA Load, $V_{OUT} = 5\text{V}$ 1mA Load, $V_{OUT} = 12\text{V}$ 1mA Load, $V_{OUT} = 15\text{V}$ | | 750 45 30 90 .01 | ±5 | mW % mV _{p-p} mV _{rms} mV _{p-p} V _{DC} V _{DC} V _{DC} %/°C |
| REGULATION Line Regulation | High Line to Low Line | | 1 | | %/V _{in} |
| GENERAL Switching Frequency Frequency Change Package Weight MTTF per MIL-HDBK-217, Rev. E* Ground Benign Fixed Ground Naval Sheltered Airborne Uninhabited Fighter | Over Line and Load Circuit Stress Method $T_A = +25^\circ\text{C}$ $T_A = +35^\circ\text{C}$ $T_A = +35^\circ\text{C}$ $T_A = +35^\circ\text{C}$ | | 170 24 2 7.9 1.9 1.2 300 | | kHz % g Mhr Mhr Mhr kHr |
| TEMPERATURE Specification Operation Storage | | -25 -40 -40 | +25 | +85 +100 +110 | °C °C °C |

*For demonstrated MTTF results reference Power Convertibles Reliability Report HPR105

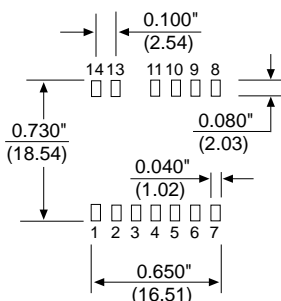
MECHANICAL "SIP" Package/Pinout



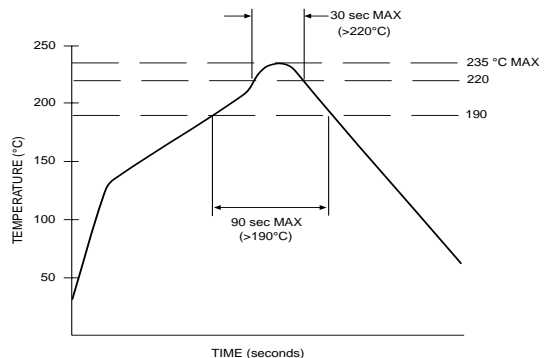
MECHANICAL Package/Pinout "V" and "W"



RECOMMENDED LAND PATTERN

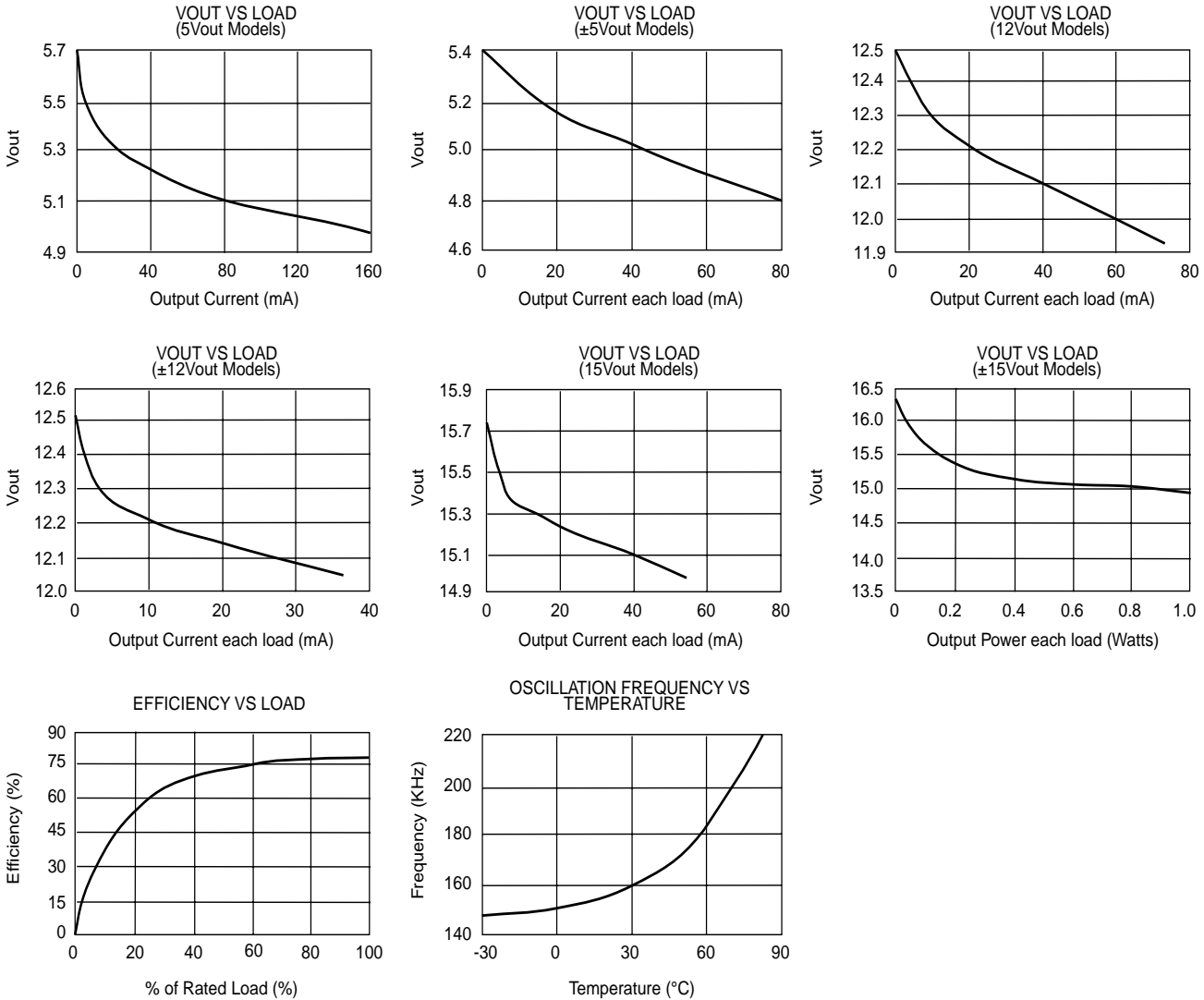


RECOMMENDED REFLOW PROFILE

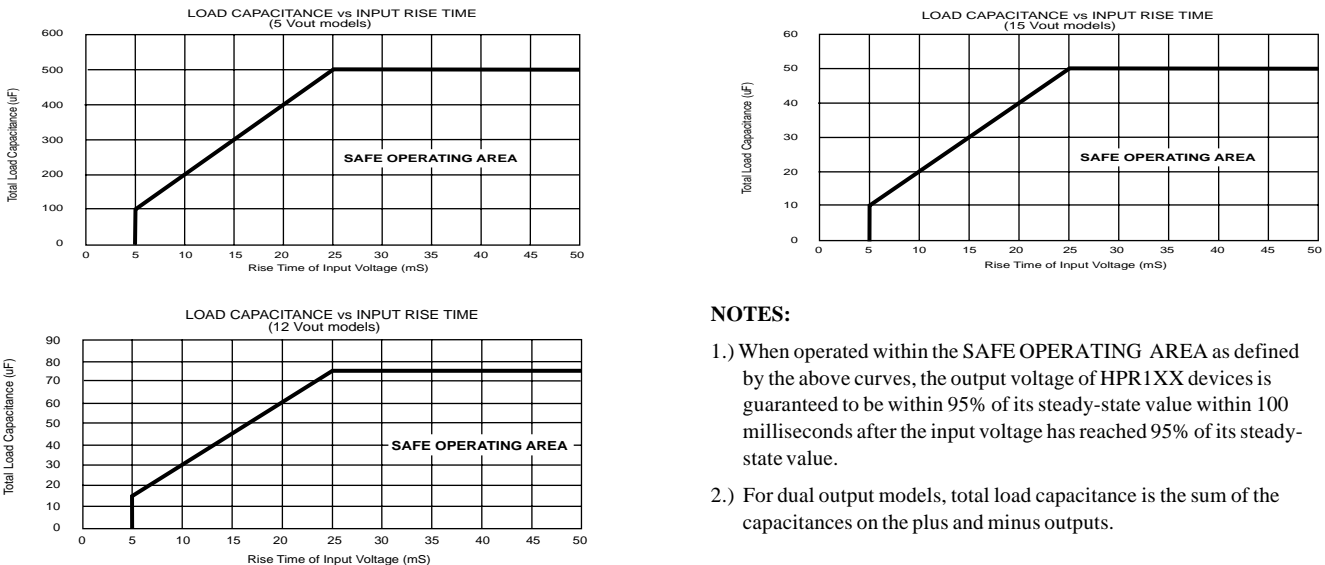


TYPICAL PERFORMANCE CURVES

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



SAFE OPERATING AREA



NOTES:

- 1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HPR1XX devices is guaranteed to be within 95% of its steady-state value within 100 milliseconds after the input voltage has reached 95% of its steady-state value.
- 2.) For dual output models, total load capacitance is the sum of the capacitances on the plus and minus outputs.