

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 $\geq 1\text{mA}$ 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

	HPR	1XX	V/W
Device Family	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 (mAp-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.

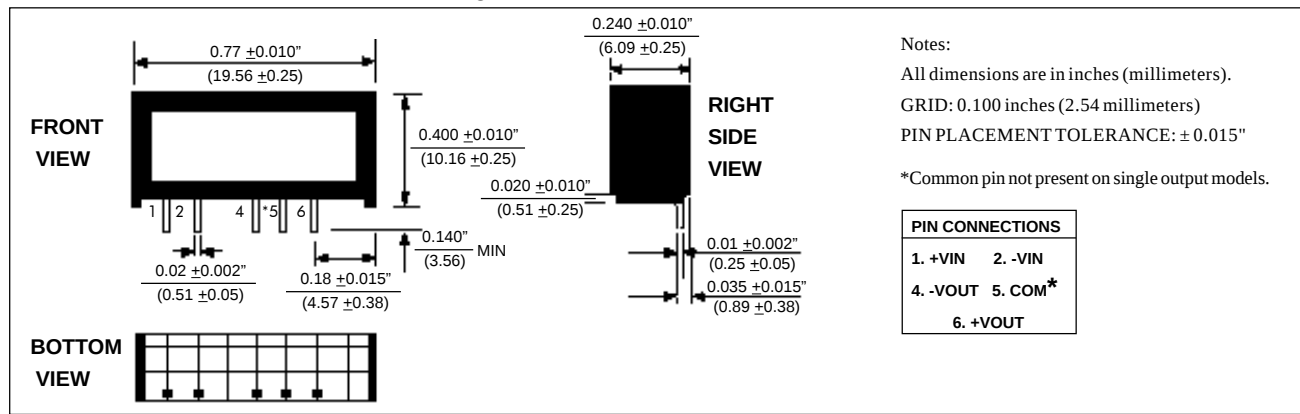
COMMON SPECIFICATIONS

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

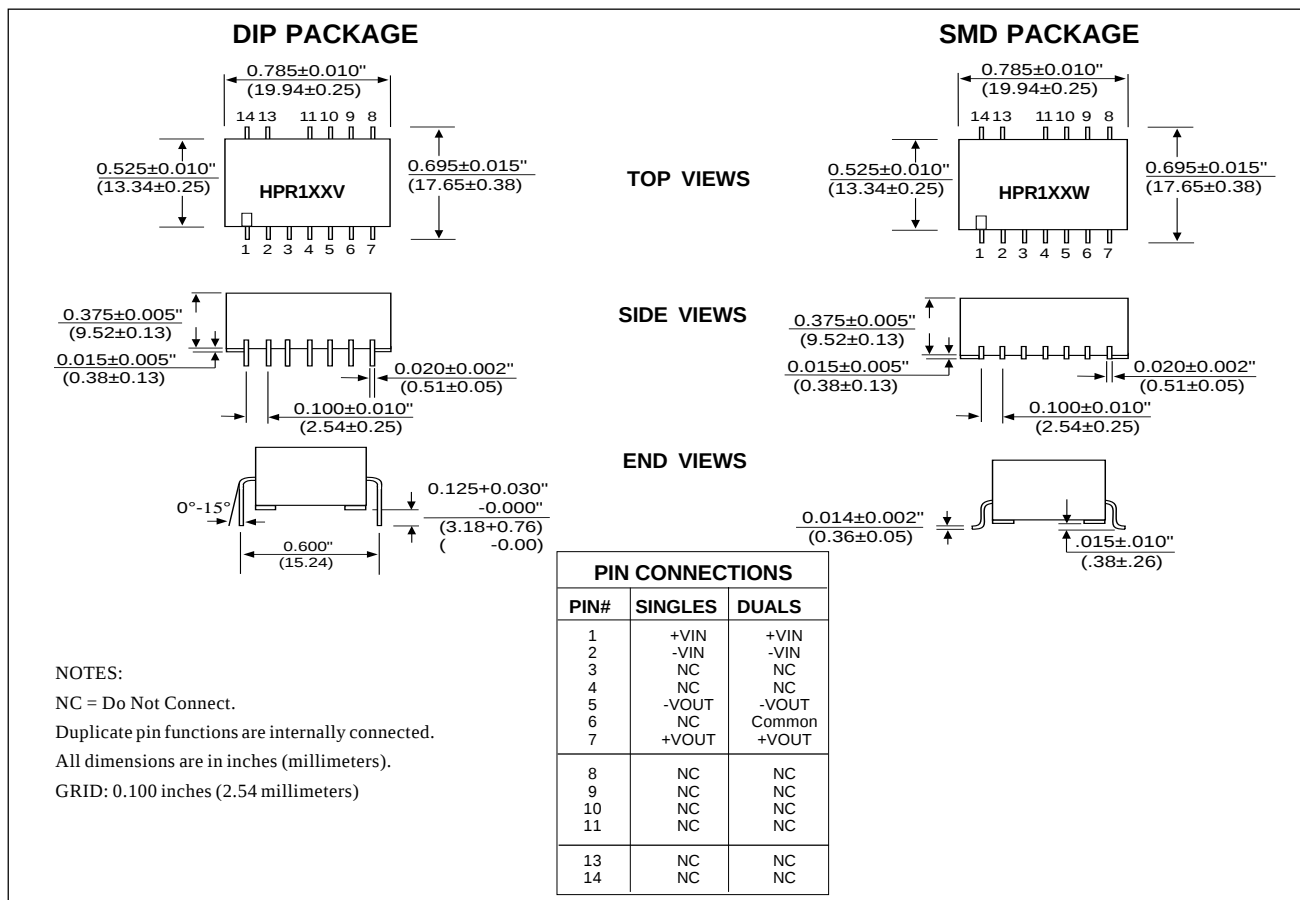
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		4.5 10.8 13.5 21.6	5 12 15 24	5.5 13.2 16.5 26.4	V_{DC} V_{DC} V_{DC} V_{DC}
Voltage Rise Time	See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"				
ISOLATION					
Rated Voltage		750			V_{DC}
Test Voltage	60 Hz, 10 Seconds	750			V_{rms} (1060pk)
Resistance			10		$G\Omega$
Capacitance			25	100	pF
Leakage Current	$V_{ISO} = 240\text{VAC}$, 60Hz		2	8.5	μArms
OUTPUT					
Rated Power			750		mW
Voltage Setpoint Accuracy				± 5	%
Ripple & Noise	Rated Load, Nominal V_{IN} BW = DC to 10MHz BW = 10Hz to 2MHz BW = DC to 10MHz		45 30 90		mVp-p mVrms mVp-p
HPR103					
Voltage (Over Input Voltage Range)	1mA Load, $V_{OUT} = 5\text{V}$ 1mA Load, $V_{OUT} = 12\text{V}$ 1mA Load, $V_{OUT} = 15\text{V}$			7 15 18	V_{DC} V_{DC} V_{DC}
Temperature Coefficient			.01		$\%/^{\circ}\text{C}$
REGULATION					
Line Regulation	High Line to Low Line		1		$\%/V_{in}$
GENERAL					
Switching Frequency			170		kHz
Frequency Change	Over Line and Load		24		%
Package Weight			2		g
MTTF per MIL-HDBK-217, Rev. E*	Circuit Stress Method				
Ground Benign	$T_A = +25^{\circ}\text{C}$		7.9		MHr
Fixed Ground	$T_A = +35^{\circ}\text{C}$		1.9		MHr
Naval Sheltered	$T_A = +35^{\circ}\text{C}$		1.2		MHr
Airborne Uninhabited Fighter	$T_A = +35^{\circ}\text{C}$		300		kHr
TEMPERATURE					
Specification		-25	+25	+85	$^{\circ}\text{C}$
Operation		-40		+100	$^{\circ}\text{C}$
Storage		-40		+110	$^{\circ}\text{C}$

*For demonstrated MTTF results reference Power Convertibles Reliability Report HPR105

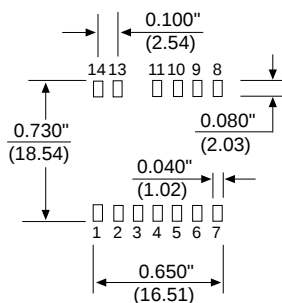
MECHANICAL "SIP" Package/Pinout



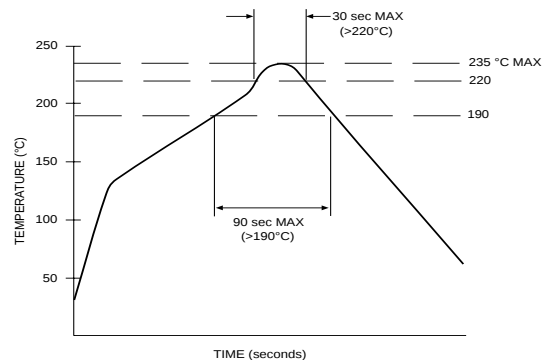
MECHANICAL Package/Pinout "V" and "W"



RECOMMENDED LAND PATTERN

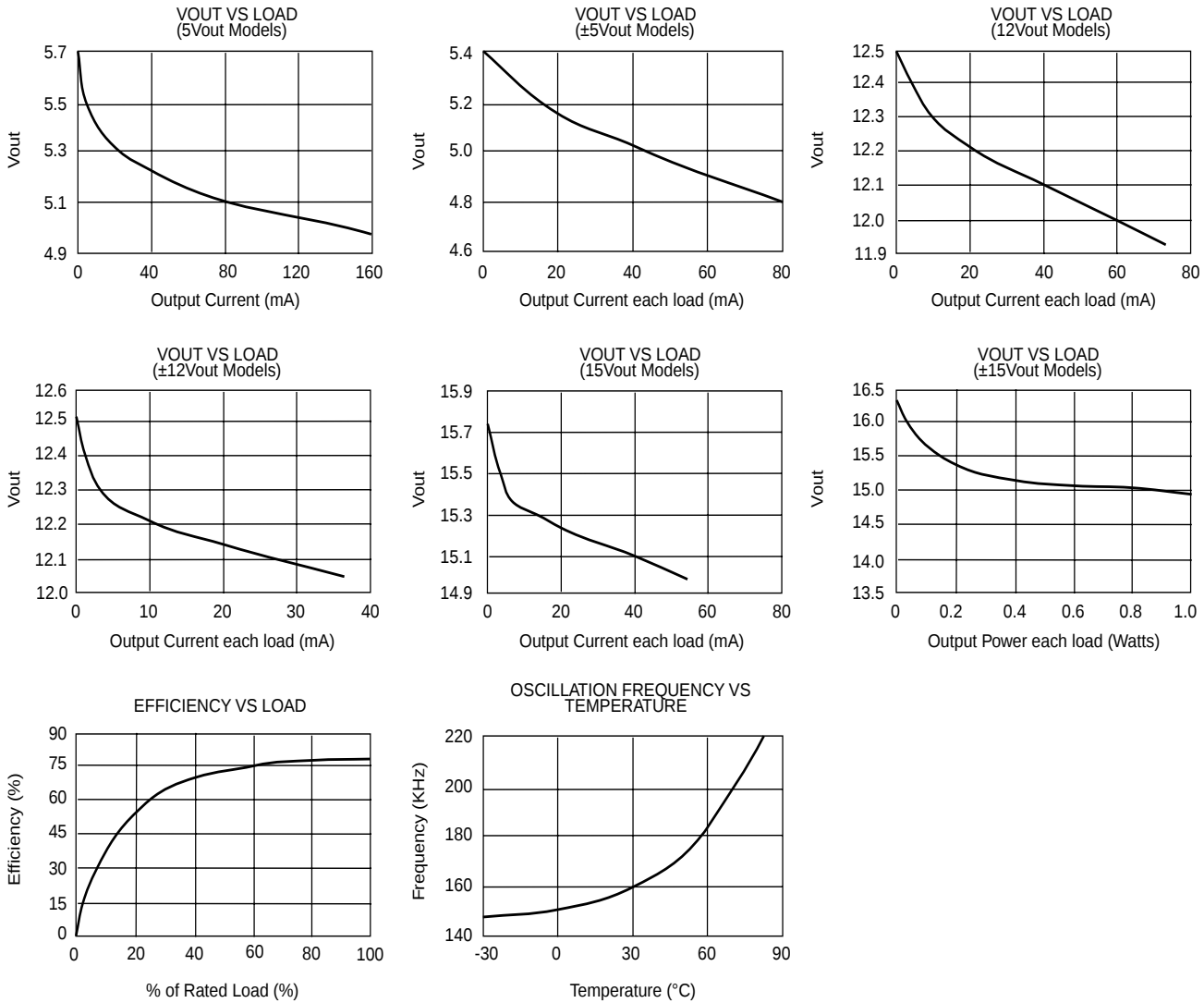


RECOMMENDED REFLOW PROFILE

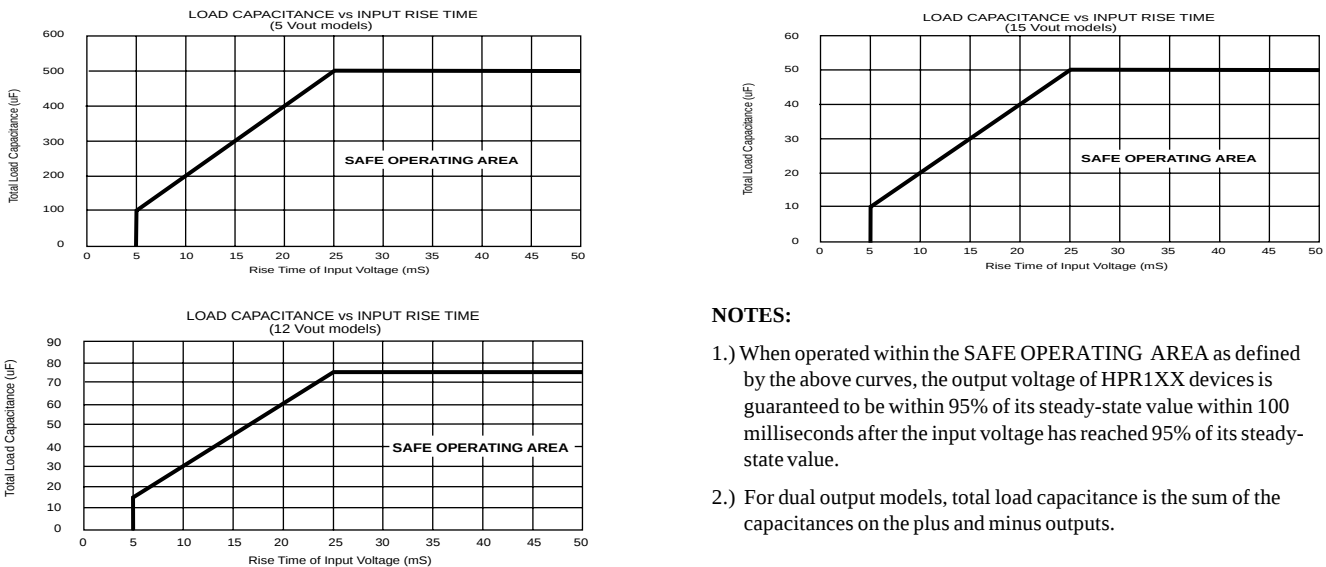


TYPICAL PERFORMANCE CURVES

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.