

HPR1XX

0.75 Watt Single Output DC/DC Converter



- 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
- Efficiency to 79%

ISO9001
CERTIFIED

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.

SPECIFICATIONS All specifications are typical at $T_A = +25^\circ\text{C}$ nominal input voltage unless otherwise specified.

PRODUCT SELECTION CHART

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	76
HPR121	24	±5	±75	8	45	15	69
HPR122	24	±12	±30	8	45	15	67
HPR123	24	±15	±25	8	45	15	69

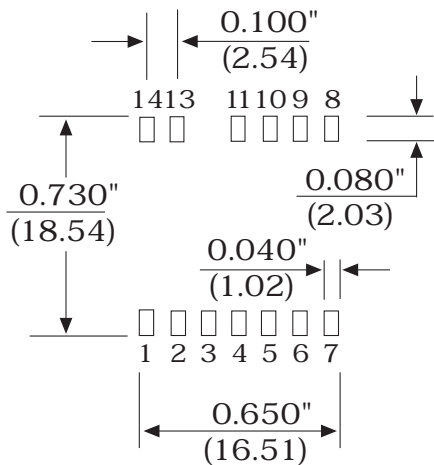
Note: Other input to output voltages may be available. Please contact factory.

SPECIFICATIONS, ALL MODELS

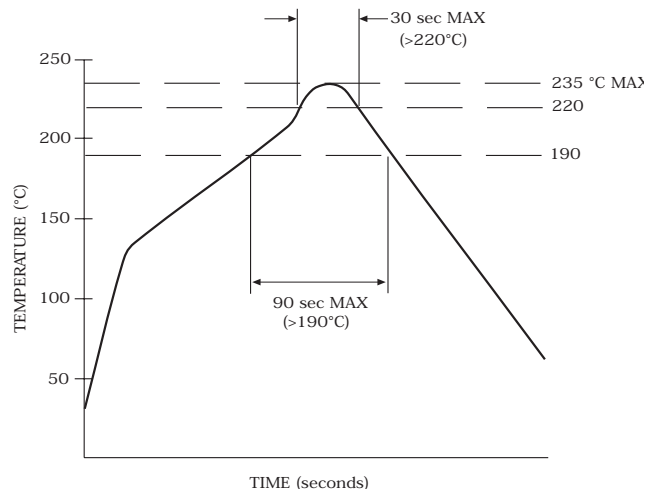
Specifications are at $T_A = +25^\circ\text{C}$ nominal input voltage unless otherwise specified.

	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
OUTPUT	INPUT					
	Voltage Range		4.5	5	5.5	VDC
			10.8	12	13.2	VDC
			13.5	15	16.5	VDC
			21.6	24	26.4	VDC
	Voltage Rise Time	See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"				
	OUTPUT					
	Rated Power			750		mW
	Voltage Setpoint Accuracy	Rated Load, Nominal V_{IN}			± 5	%
	Ripple & Noise	BW = DC to 10MHz		150		mVp-p
BW = 10Hz to 2MHz			30		mVrms	
Voltage (Over Input Voltage Range)	1mA Load, $V_{OUT} = 5V$			7	VDC	
	1mA Load, $V_{OUT} = 12V$			15	VDC	
	1mA Load, $V_{OUT} = 15V$			18	VDC	
Temperature Coefficient			.01		%/ $^\circ\text{C}$	
REGULATION						
Line Regulation	High Line to Low Line		1		%/ V_{in}	
GENERAL ISOLATION						
Rated Voltage		750			VDC	
Test Voltage	60 Hz, 10 Seconds	750			Vrms (1060pk)	
Resistance			10		GW	
Capacitance			25	100	pF	
Leakage Current	$V_{ISO} = 240\text{VAC}, 60\text{Hz}$		2	8.5	mArms	
Switching Frequency			170		kHz	
Frequency Change	Over Line and Load		24		%	
Package Weight			2		g	
MTTF per MIL-HDBK-217, Rev. F*	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	$^\circ\text{C}$	

RECOMMENDED LAND PATTERN



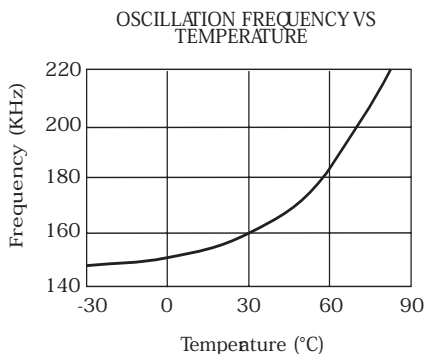
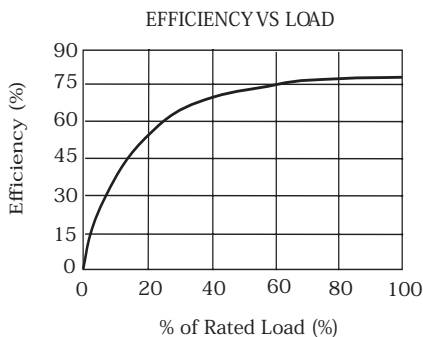
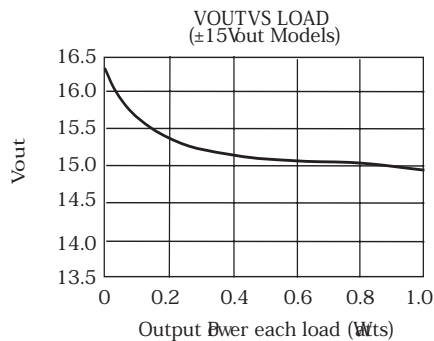
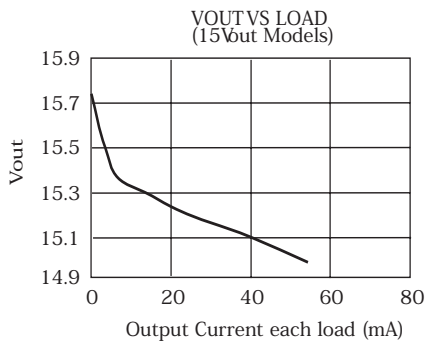
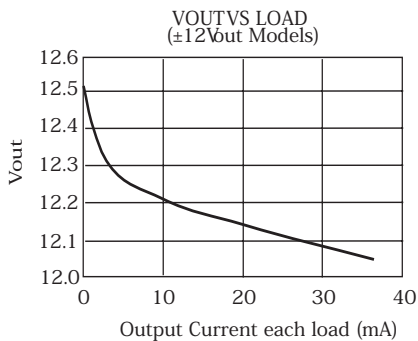
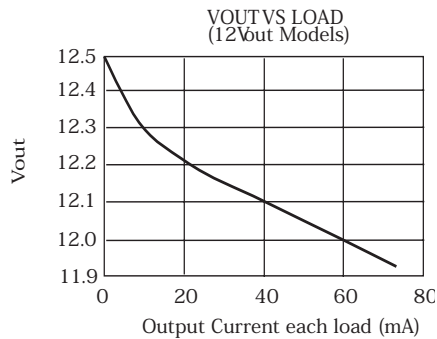
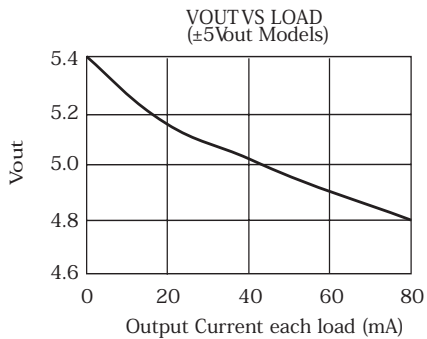
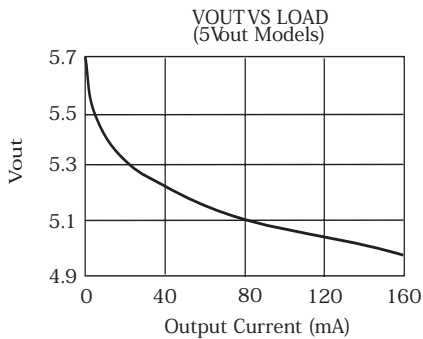
RECOMMENDED REFLOW PROFILE**



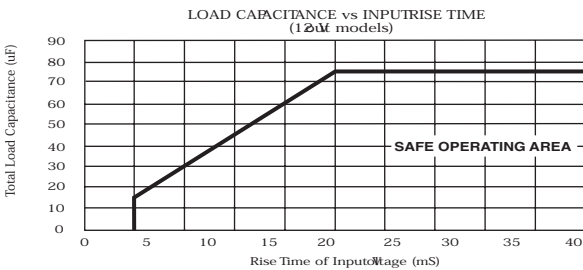
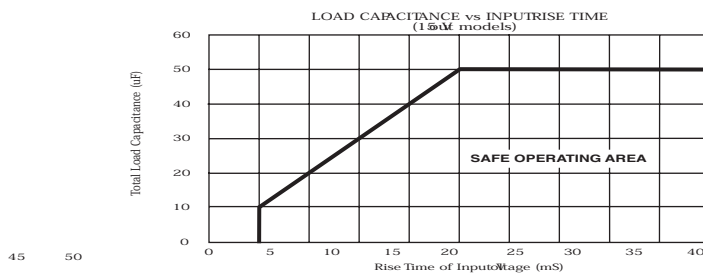
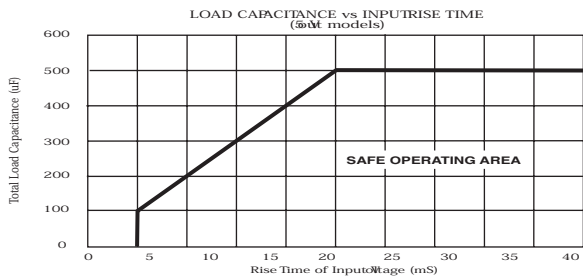
** This profile is only applicable to the surface mount package devices.

TYPICAL PERFORMANCE CURVES

Specifications are at $T_A = +25^\circ\text{C}$ nominal input voltage, nominal load, recommended external components applied, unless otherwise specified. (Refer to Application Note DCAN-9 at www.cdpoweronline.com)



SAFE OPERATING AREA

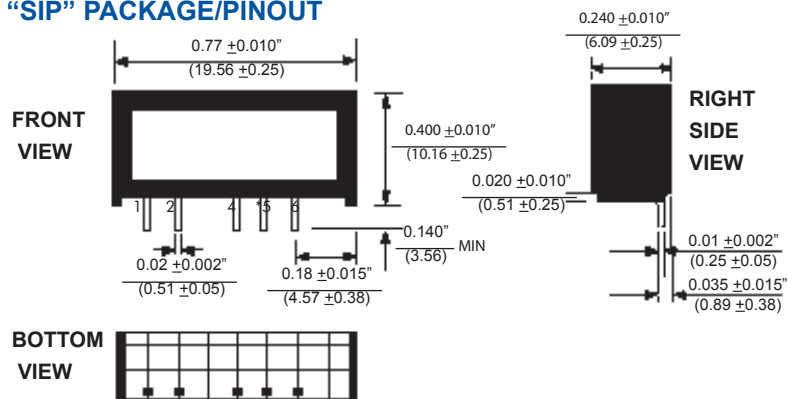


NOTES:

- 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.

MECHANICAL

“SIP” PACKAGE/PINOUT

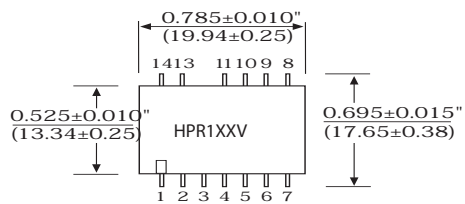


Notes:
 All dimensions are in inches (millimeters).
 GRID: 0.100 inches (2.54 millimeters)
 PIN PLACEMENT TOLERANCE: $\pm 0.015"$
 *Common pin not present on single output models.

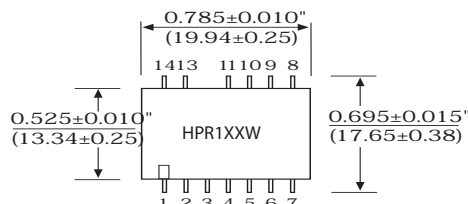
PIN CONNECTIONS	
1.	+VIN
2.	-VIN
4.	-VOUT
5.	COM*
6.	+VOUT

PACKAGE/PINOUT “V” AND “W”

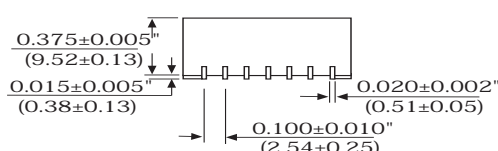
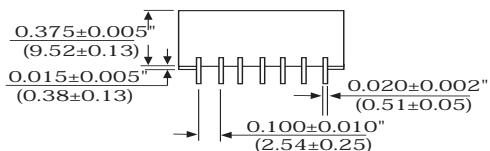
DIP PACKAGE



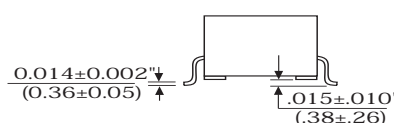
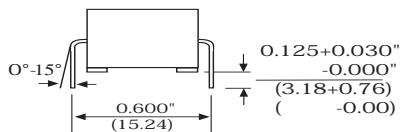
SMD PACKAGE



SIDE VIEWS



END VIEWS



PIN CONNECTIONS					
PIN#	SINGLES	DUALS	PIN#	SINGLES	DUALS
1	+VIN	+VIN	7	+VOUT	+VOUT
2	-VIN	-VIN	8	NC	NC
3	NC	NC	9	NC	NC
4	NC	NC	10	NC	NC
5	-VOUT	-VOUT	11	NC	NC
6	NC	Common	13	NC	NC
			14	NC	NC

NOTES:
 NC = Do Not Connect.
 Duplicate pin functions are internally connected.
 All dimensions are in inches (millimeters).
 GRID: 0.100 inches (2.54 millimeters)

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation..... 450mW
 ShortCircuitDuration..... 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

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