

# 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/Inch<sup>3</sup>
- Extended Temperature Range: -25°C to +85°C
- Efficiency 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/inch<sup>3</sup> of output power density. Operation down

to no load will not impact the reliability of the series, although a  $\geq 1$ 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 <sub>p-p</sub> )	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.

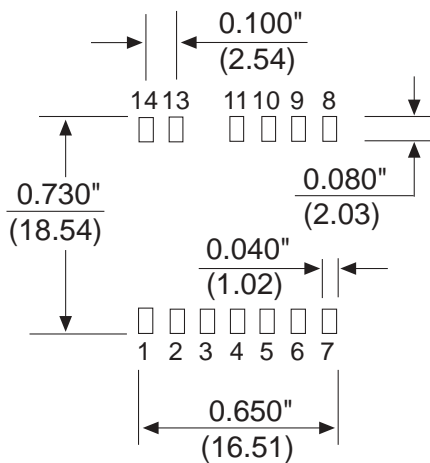
# SPECIFICATIONS, ALL MODELS

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

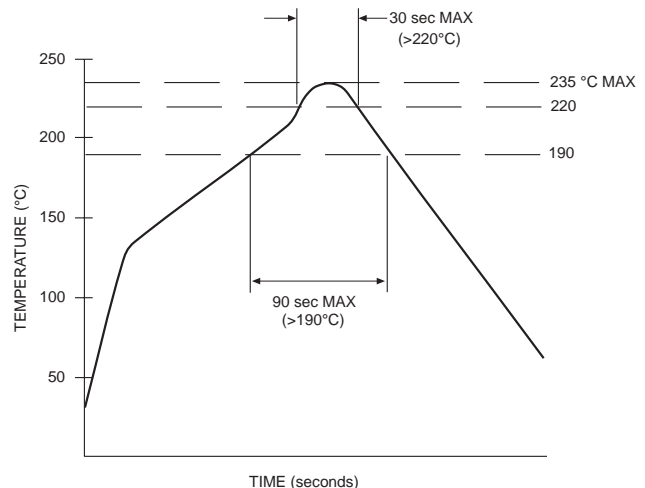
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS	
INPUT	<b>INPUT</b>						
	Voltage Range		4.5	5	5.5	VDC	
				10.8	12	13.2	VDC
				13.5	15	16.5	VDC
		21.6	24	26.4	VDC		
	Voltage Rise Time See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"						
OUTPUT	<b>OUTPUT</b>						
	Rated Power			750		mW	
	Voltage Setpoint Accuracy	Rated Load, Nominal $V_{IN}$			$\pm 5$	%	
	Ripple & Noise	BW = DC to 10MHz			45	mVp-p	
		BW = 10Hz to 2MHz			30	mVrms	
		BW = DC to 10MHz			90	mVp-p	
	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		%/ $^\circ\text{C}$	
<b>REGULATION</b>							
Line Regulation	High Line to Low Line			1	%/ $V_{in}$		
<b>GENERAL ISOLATION</b>							
Rated Voltage			750			VDC	
Test Voltage	60 Hz, 10 Seconds		750			Vrms (1060pk)	
Resistance				10		$\text{G}\Omega$	
Capacitance				25	100	pF	
Leakage Current	$V_{ISO} = 240\text{VAC}, 60\text{Hz}$			2	8.5	$\mu\text{Arms}$	
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	
<b>TEMPERATURE</b>							
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.

## RECOMMENDED LAND PATTERN

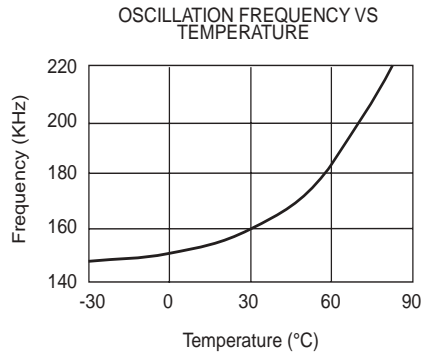
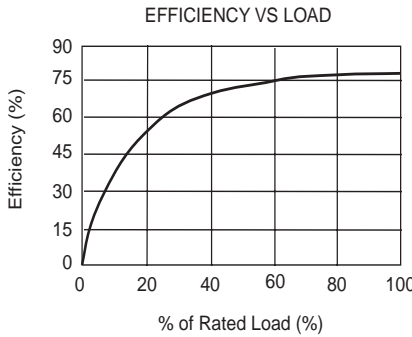
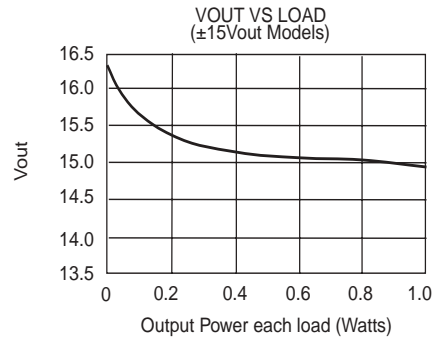
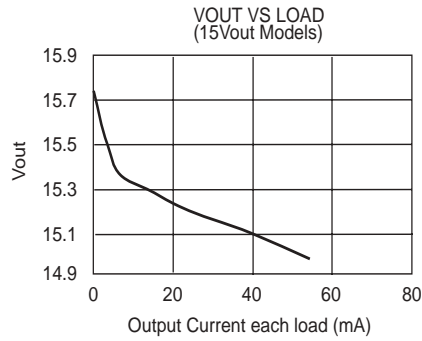
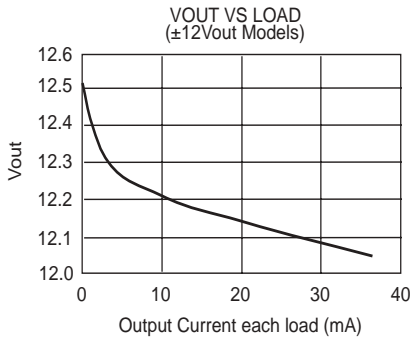
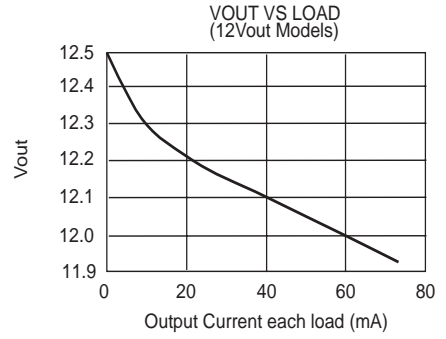
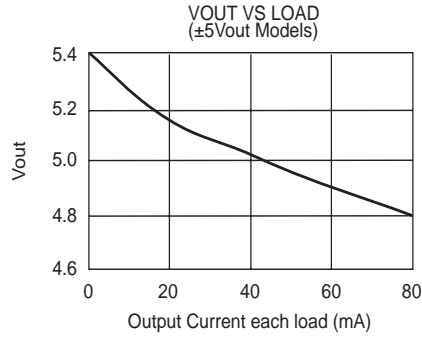
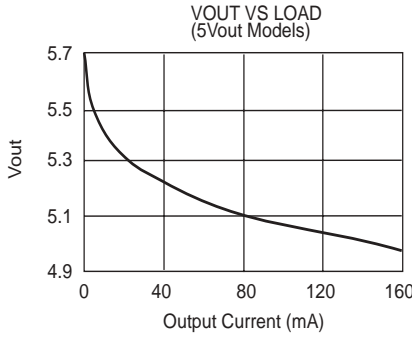


## RECOMMENDED REFLOW PROFILE

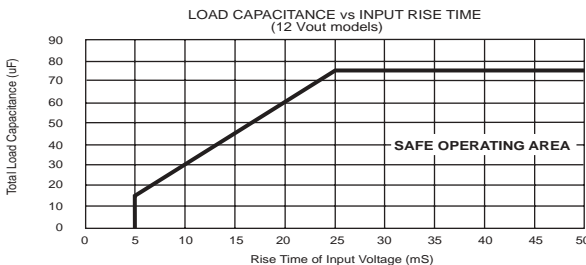
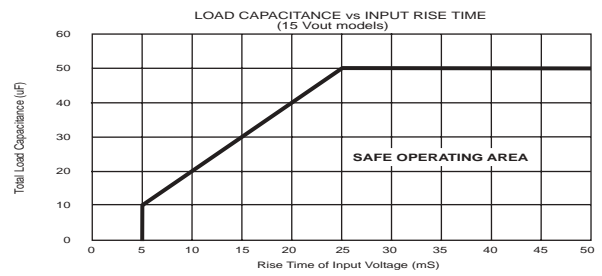
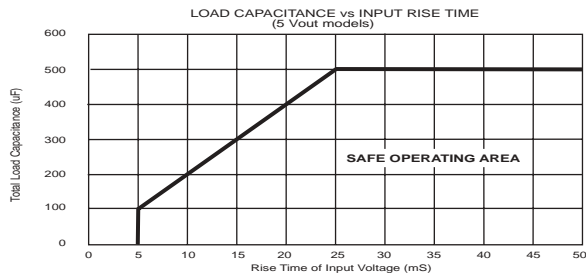


## TYPICAL PERFORMANCE CURVES

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](http://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.

