

## 3.0 WATT MINIATURE SIP DC/DC CONVERTER

### HPR2XX

#### FEATURES

- Four Channels Of Isolated Power
- High Output Power Density: > 9. 4 Watts/Inch<sup>3</sup>
- Extended Temperature Range:  
-25°C To +85°C
- High Efficiency: To 84%
- Low Cost
- High Isolation Voltage: 750V Continuous Input-to-Output and Channel-to-Channel
- Single In-line Package (SIP)
- Internal Input and Output Filtering
- Non-Conductive Case

The HPR2XX Series is designed for multiple channel applications that require small size and could benefit from a complete one-package solution. The HPR2XX Series offers four isolated channels of output power in a footprint less than the size of many singular devices. This unregulated series of DC/DC converters provides three watts of total output power. Each isolated channel can supply up to 750mW.

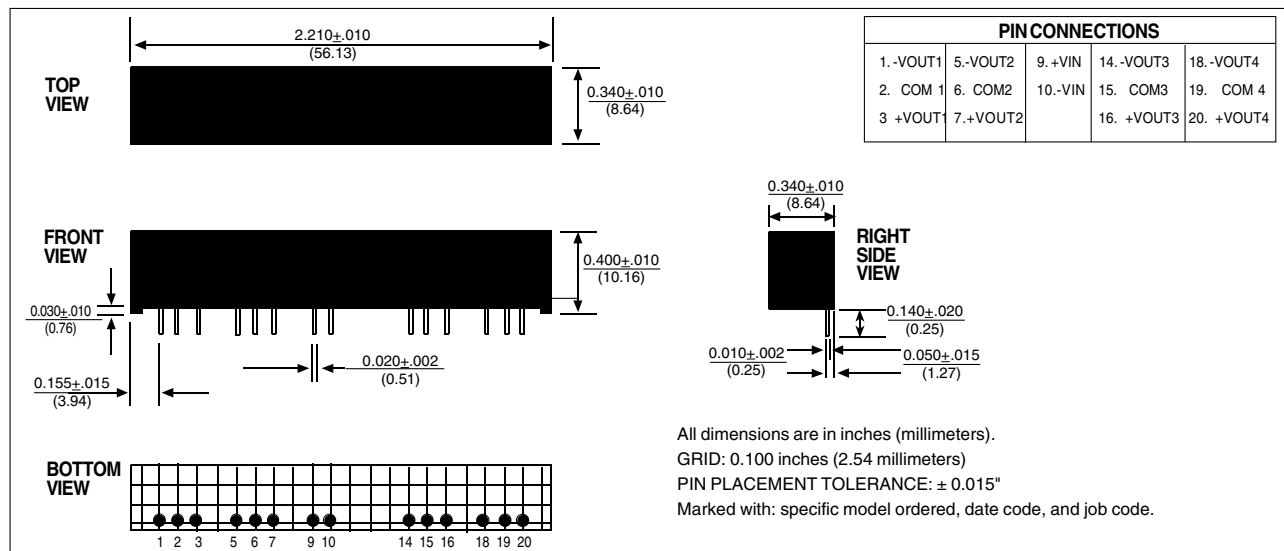
The HPR2XX Series uses advanced circuit design and packaging technology to realize superior reliability and performance. With only one switching converter on the board, the HPR2XX eliminates the possibility of separate converters creating beat

frequencies, or "aliasing" in multiple channel applications.

The high efficiency of the HPR2XX Series means less internal power dissipation than comparable solutions. With reduced heat to dissipate, the HPR2XX Series can operate at higher temperatures with no degradation in reliability. In addition, the high efficiency of the HPR2XX Series provides greater than 9 watts/inch<sup>3</sup> output power density.

The HPR2XX Series offers the user low cost without sacrificing reliability. The use of surface mounted devices and manufacturing technologies make it possible to offer premium performance and low cost.

#### MECHANICAL



Internet: <http://www.cdpowerelectronics.com>

**Power Electronics Division, United States**  
3400 E Britannia Drive, Tucson, Arizona 85706  
Phone: 800.547.2537 Fax: 520.770.9369

**Power Electronics Division, Europe**  
C&D Technologies (Power Electronics) Ltd.  
132 Shannon Industrial Estate, Shannon, Co. Clare, Ireland  
Tel: +353.61.474.133 Fax: +353.61.474.141

# 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)		
HPR203	5	$\pm 5.2$	$\pm 73$	70	820	35	74
HPR204	5	$\pm 12$	$\pm 30$	75	750	35	80
HPR205	5	$\pm 15$	$\pm 25$	75	750	35	80
HPR210	12	$\pm 12$	$\pm 30$	30	305	15	82
HPR211	12	$\pm 15$	$\pm 25$	30	300	15	84
HPR216	15	$\pm 12$	$\pm 30$	20	240	15	83
HPR217	15	$\pm 15$	$\pm 25$	20	240	20	84
HPR221	24	$\pm 5.0$	$\pm 75$	20	170	20	74
HPR223	24	$\pm 15$	$\pm 25$	20	155	20	81

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		4.5 10.8 13.5 21.6	5 12 15 24	5.5 13.2 16.5 26.4	VDC VDC VDC VDC
Voltage Rise Time				1	V/ $\mu\text{sec}$
In Rush Current	At Startup				Amps
<b>ISOLATION</b>					
Rated Voltage	Input to Output, Channel to Channel	750			VDC
Test Voltage	60 Hz, 10 seconds	750			Vpk
Resistance			10		$\text{G}\Omega$
Capacitance			30		pF
Leakage Current	$V_{\text{ISO}} = 240\text{VAC}, 60\text{Hz}$		4		$\mu\text{Arms}$
<b>OUTPUT</b>					
Total Rated Power			3		W
Rated Power Each Channel			750		mW
Voltage Setpoint Accuracy	Rated Load, Nominal $V_{\text{IN}}$			$\pm 5$	%
Ripple & Noise	BW = DC to 10MHz BW = 10Hz to 2MHz		40 7		mVp-p mVrms
Voltage	$I_L = 1\text{mA}, V_{\text{OUT}} = 5\text{V}$ $I_L = 1\text{mA}, V_{\text{OUT}} = 12\text{V}$ $I_L = 1\text{mA}, V_{\text{OUT}} = 15\text{V}$			8 17 20	VDC VDC VDC
Temperature Coefficient			.05		%/Deg C
<b>REGULATION</b>					
Line Regulation	High Line to Low Line		1		%/% $V_{\text{IN}}$
Load Regulation (5V out only)	Rated Load to 1mA Load		10		%
Load Regulation (All other Models)	Rated Load to 1mA Load		3		%
<b>GENERAL</b>					
Switching Frequency			300		kHz
Package Weight			7		g
Frequency Change	Rated Load to 1mA Load		5		%
MTTF per MIL-HDBK-217, Rev. E	High Line to Low Line		20		%
Ground Benign	Circuit Stress Method				MHr
Fixed Ground	$T_A = +25^\circ\text{C}$		1.8		MHr
Naval Sheltered	$T_A = +35^\circ\text{C}$		450		kHr
Airborne Uninhabited Fighter	$T_A = +35^\circ\text{C}$		270		kHr
	$T_A = +35^\circ\text{C}$		45		kHr
<b>TEMPERATURE</b>					
Specification		-25	+25	+85	$^\circ\text{C}$
Operation		-40		+100	$^\circ\text{C}$
Storage		-40		+110	$^\circ\text{C}$

## ABSOLUTE MAXIMUM RATINGS

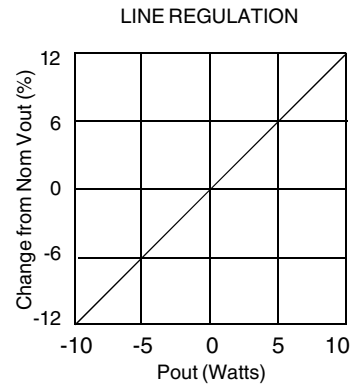
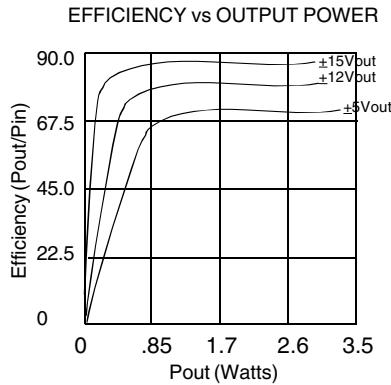
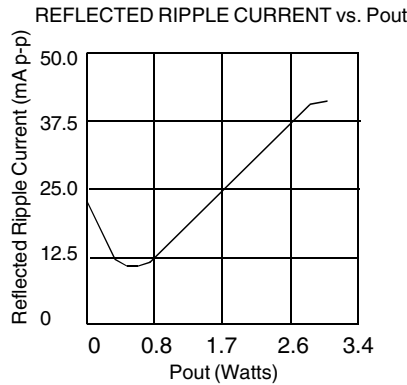
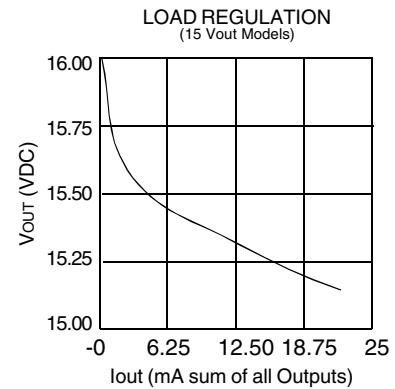
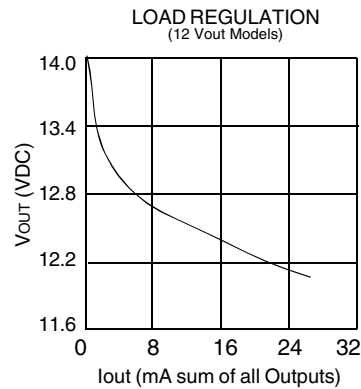
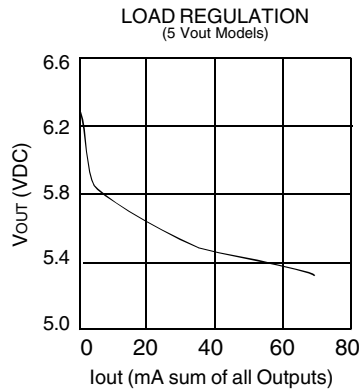
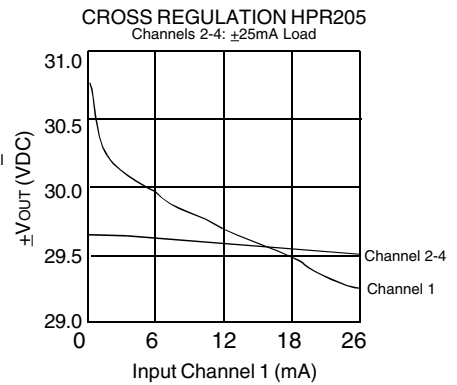
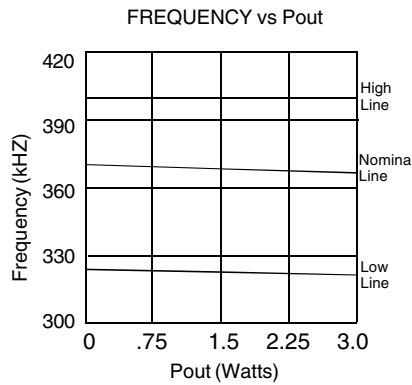
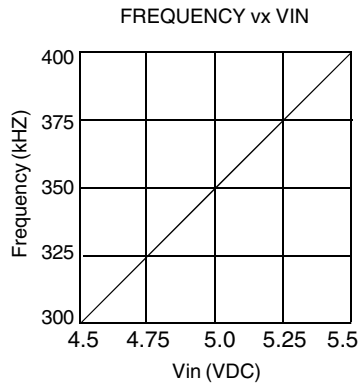
Internal Power Dissipation.....	1.2W
Short Circuit Protection.....	< 1 second
Lead Temperature (soldering, 10 seconds max).....	+300 $^\circ\text{C}$

## ORDERING INFORMATION

Device Family	HPR 2XX /H
HPR Indicates DC/DC Converter	
Model Number	Selected From Table Above
Screening Option	

# TYPICAL PERFORMANCE CURVES

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



The information provided herein is believed to be reliable; however, C&D TECHNOLOGIES assumes no responsibility for inaccuracies or omissions. C&D TECHNOLOGIES assumes no responsibility for the use of this information, and all use of such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. C&D TECHNOLOGIES does not authorize or warrant any C&D TECHNOLOGIES product for use in life support devices/systems or in aircraft control applications.