

# 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.

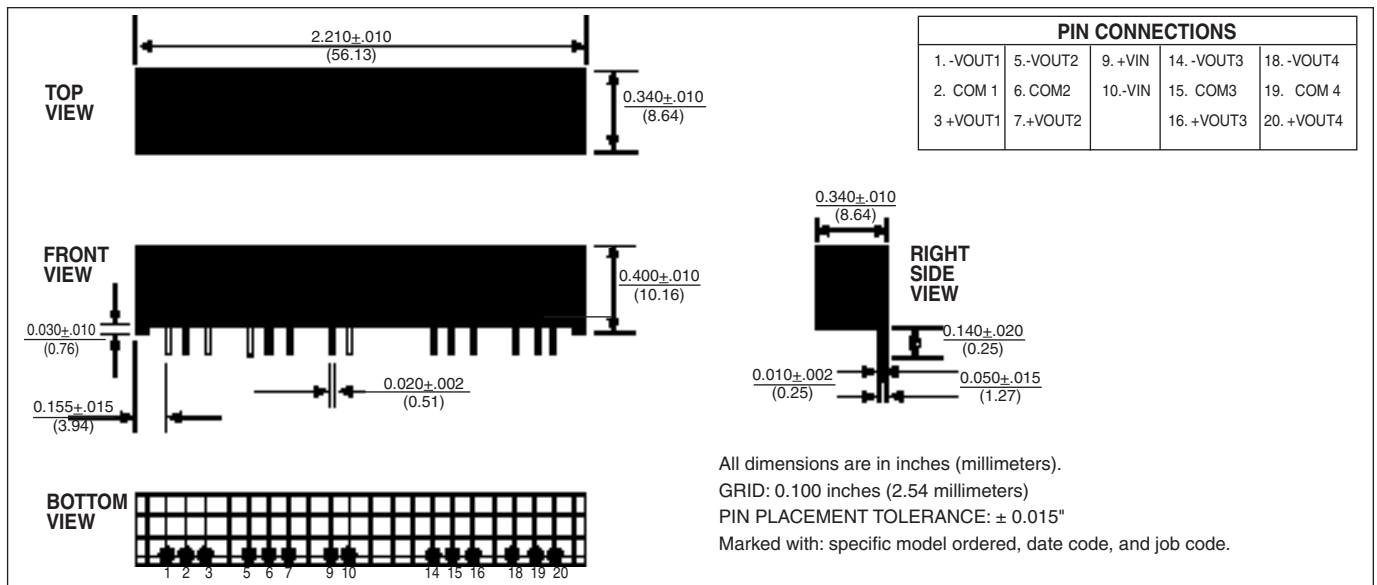
The HPR2XX Series uses advanced circuit design and packaging technology to realize superior reliability and performance. With only one switching converter on the board, the HPR2XX eliminates the possibility of separate converters creating beat frequencies,

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



# ELECTRICAL SPECIFICATIONS

EFFICIENCY MODEL	NOMINAL (VDC)	RATED INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (mA)	INPUT CURRENT		REFLECTED RATED LOAD (mA <sub>p-p</sub> )	RIPPLE CURRENT (%)
				OUTPUT CURRENT (mA)	NO LOAD (mA)		
HPR203	5	±5.2	±73	70	820	35	74
HPR204	5	±12	±30	75	750	35	80
HPR205	5	±15	±25	75	750	35	80
HPR210	12	±12	±30	30	305	15	82
HPR211	12	±15	±25	30	300	15	84
HPR216	15	±12	±30	20	240	15	83
HPR217	15	±15	±25	20	240	20	84
HPR221	24	±5.0	±75	20	170	20	74
HPR223	24	±15	±25	20	155	20	81

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Note: Other input to output voltage options may be available. Please consult factory.

## COMMON SPECIFICATIONS

Standard Input Voltage = 5V, Output Voltage = 5V, Output Current = 1mA, unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<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				1	V/ $\mu$ 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		G $\Omega$
Capacitance			30		pF
Leakage Current	$V_{ISO} = 240VAC, 60Hz$		4		$\mu$ Arms
<b>OUTPUT</b>					
Total Rated Power			3		W
Rated Power Each Channel			750		mW
Voltage Setpoint Accuracy	Rated Load, Nominal $V_{IN}$			±5	%
Ripple & Noise	BW = DC to 10MHz		40		mVp-p
	BW = 10Hz to 2MHz		7		mVrms
Voltage	$I_L = 1mA, V_{OUT} = 5V$			8	VDC
	$I_L = 1mA, V_{OUT} = 12V$			17	VDC
	$I_L = 1mA, V_{OUT} = 15V$			20	VDC
Temperature Coefficient			.05		%/Deg C
<b>REGULATION</b>					
Line Regulation	High Line to Low Line		1		%/% $V_{IN}$
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		%
	High Line to Low Line		20		%
MTTF per MIL-HDBK-217, Rev. E	Circuit Stress Method				
Ground Benign	$T_A = +25^{\circ}C$		1.8		MHr
Fixed Ground	$T_A = +35^{\circ}C$		450		kHr
Naval Sheltered	$T_A = +35^{\circ}C$		270		kHr
Airborne Uninhabited Fighter	$T_A = +35^{\circ}C$		45		kHr
<b>TEMPERATURE</b>					
Specification		-25	+25	+85	$^{\circ}C$
Operation		-40		+100	$^{\circ}C$
Storage		-40		+110	$^{\circ}C$

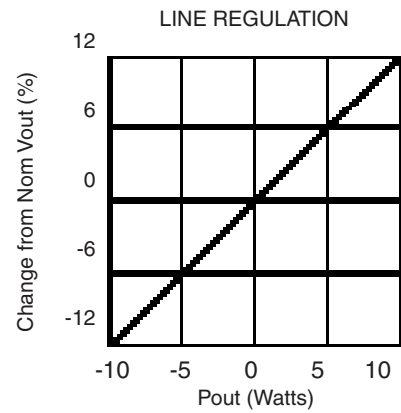
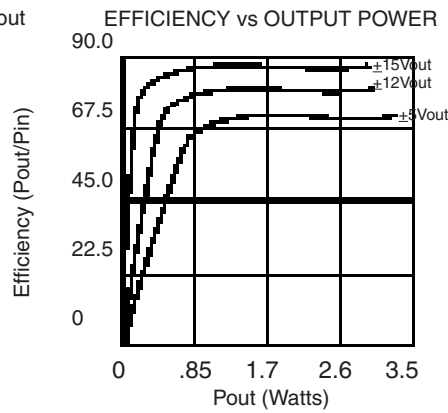
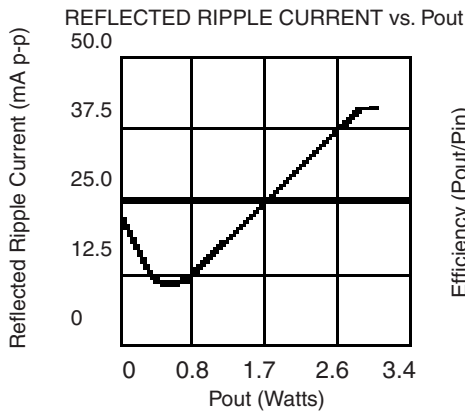
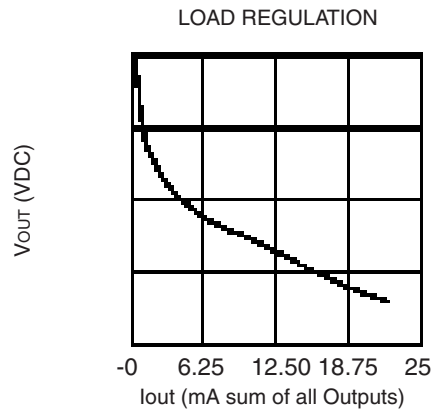
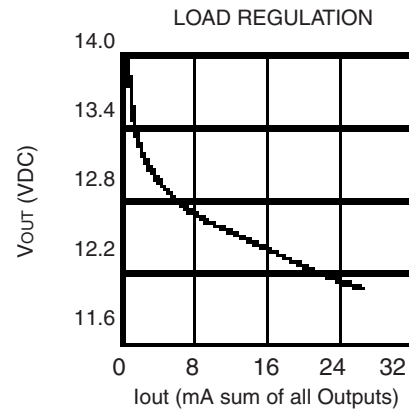
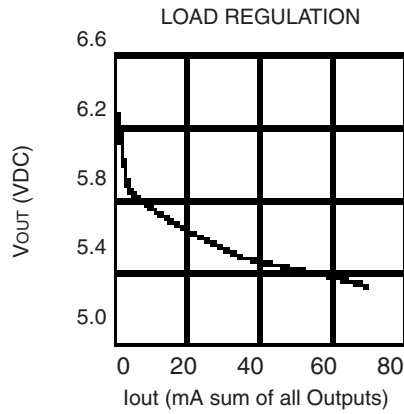
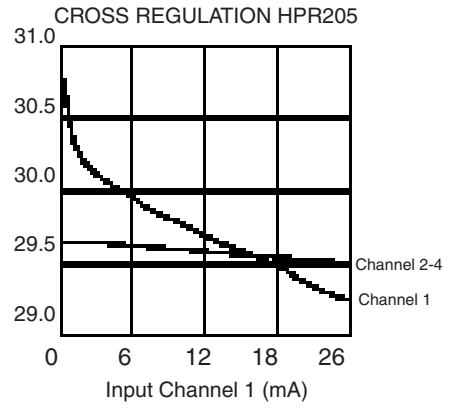
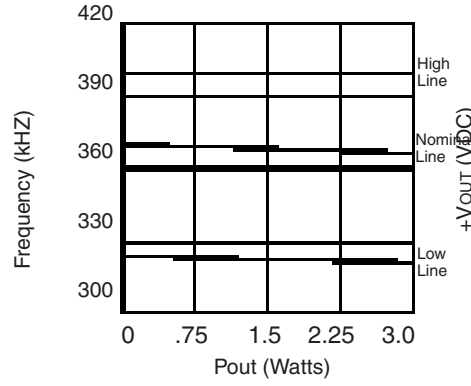
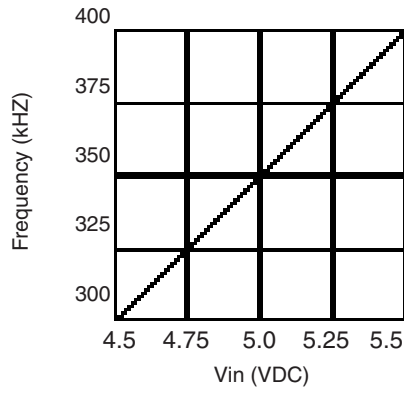
## ORDERING INFORMATION

### ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation.....1.2W  
Short Circuit Protection.....< 1 second

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

# TYPICAL PERFORMANCE CURVES



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