

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%

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.

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.

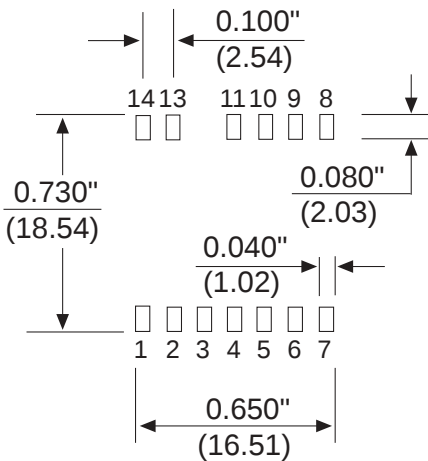
SPECIFICATIONS, ALL MODELS

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

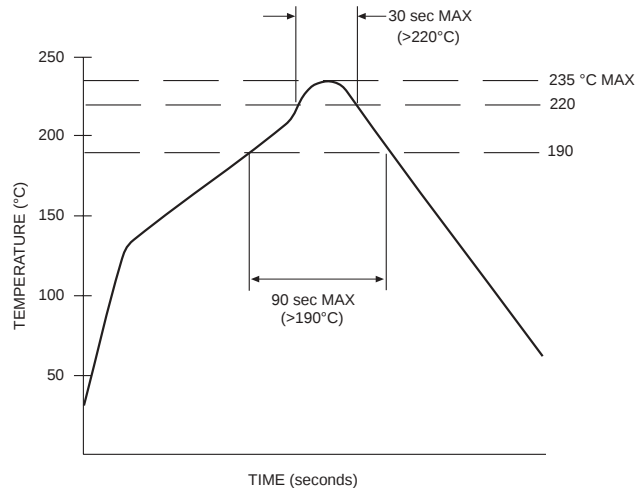
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT	INPUT					
	Voltage Range		4.5	5	5.5	VDC
			10.8	12	13.2	VDC
			13.5	15	16.5	VDC
OUTPUT			21.6	24	26.4	VDC
	Voltage Rise Time See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"					
	OUTPUT					
	Rated Power			750		mW
GENERAL	Voltage Setpoint Accuracy	Rated Load, Nominal V_{IN}			± 5	%
	Ripple & Noise	BW = DC to 10MHz		45		mVp-p
		BW = 10Hz to 2MHz		30		mVrms
	HPR103	BW = DC to 10MHz		90		mVp-p
GENERAL	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		$G\Omega$
	Capacitance			25	100	pF
	Leakage Current	$V_{ISO} = 240VAC, 60Hz$		2	8.5	μArms
	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	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.

RECOMMENDED LAND PATTERN

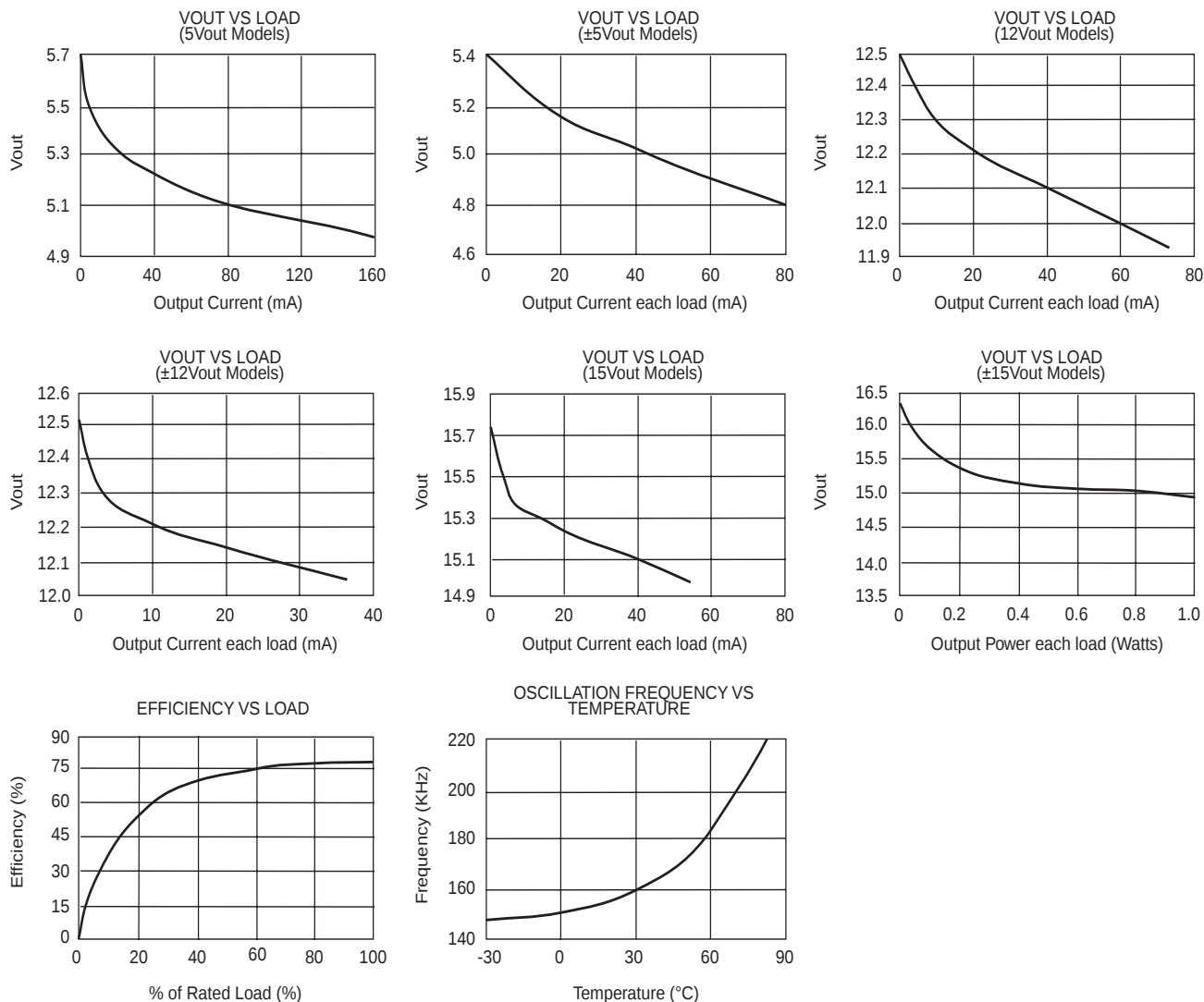


RECOMMENDED REFLOW PROFILE

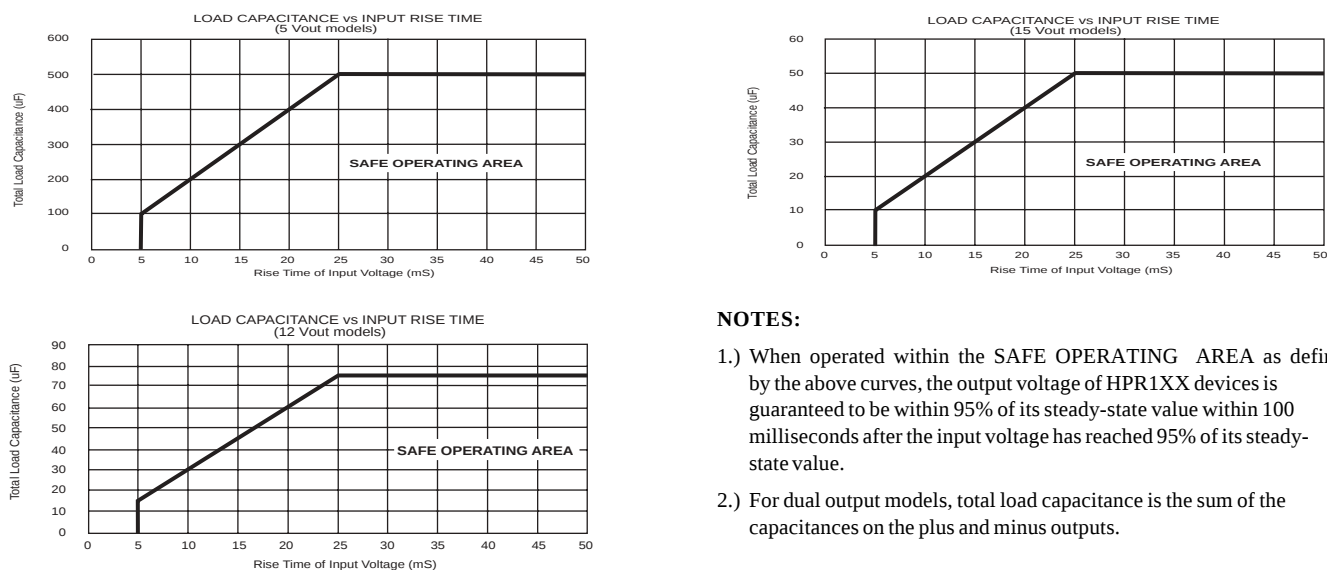


TYPICAL PERFORMANCE CURVES

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)



SAFE OPERATING AREA

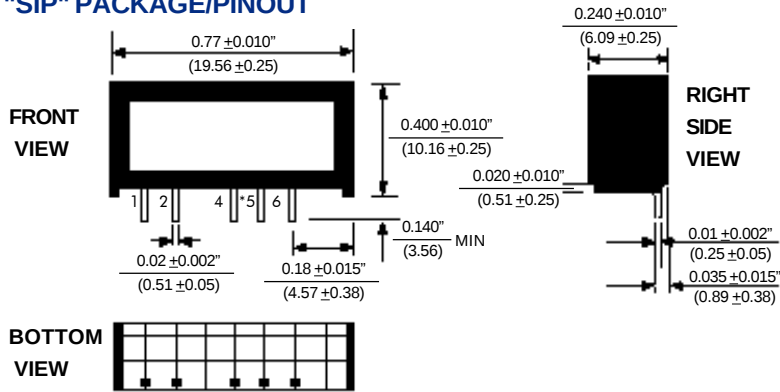


NOTES:

- 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



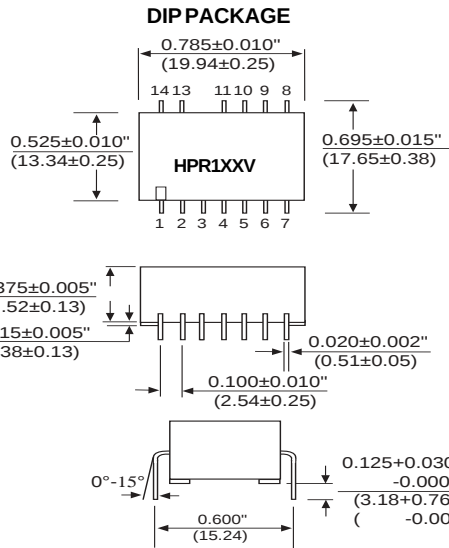
Notes:
All dimensions are in inches (millimeters).
GRID: 0.100 inches (2.54 millimeters)
PIN PLACEMENT TOLERANCE: ± 0.015

*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"



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) $+300^{\circ}\text{C}$ *

* 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
W = SMD Package

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