



HPR1XX SERIES
0.75 WATTS
UNREGULATED

DC/DC CONVERTERS

MINIATURE SIP, DIP AND SMD PACKAGES

FEATURES

- LOW COST
- SINGLE-IN-LINE PACKAGE (SIP)
- INTERNAL INPUT AND OUTPUT FILTERING
- NON-CONDUCTIVE CASE
- HIGH OUTPUT POWER DENSITY: 10 WATTS/INCH³
- EXTENDED TEMPERATURE RANGE:- 25°C to +85°C
- HIGH EFFICIENCY: to 80%

DESCRIPTION

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 1mA minimum load is needed to realize published specifications.

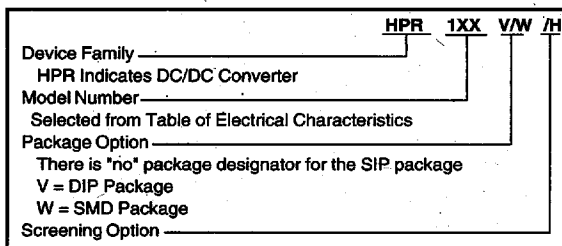
The HPR1XX Series provides the user low cost without sacrificing reliability. The use of surface mounted devices and advanced manufacturing technologies make it possible to offer premium performance and low cost.

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation.....	450mW
Short Circuit Duration.....	Momentary
Lead Temperature (soldering, 10 seconds max).....	+300°C *

* NOTE: Refer to Reflow Profile for SMD Models.

ORDERING INFORMATION



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 (%)
				MIN LOAD (mA)	RATED LOAD (mA)		
HPR100	5	5	150	20	216	10	69
HPR101	5	12	62	20	200	5	73
HPR102	5	15	50	20	199	5	75
HPR103	5	± 5	± 75	20	208	5	70
HPR104	5	± 12	± 30	20	192	5	78
HPR105	5	± 15	± 25	20	190	5	79
HPR106	12	5	150	10	90	5	69
HPR107	12	12	62	10	81	5	77
HPR108	12	15	50	10	78	5	80
HPR109	12	± 5	± 75	10	87	5	72
HPR110	12	± 12	± 30	10	78	5	80
HPR111	12	± 15	± 25	10	78	5	80
HPR112	15	5	150	8	72	5	69
HPR113	15	12	62	8	67	5	75
HPR114	15	15	50	8	63	5	80
HPR115	15	± 5	± 75	8	68	5	73
HPR116	15	± 12	± 30	8	63	5	80
HPR117	15	± 15	± 25	8	63	5	80
HPR118	24	5	150	8	44	15	70
HPR119	24	12	62	8	42	15	74
HPR120	24	15	50	8	41	15	76
HPR121	24	± 5	± 75	8	41	15	76
HPR122	24	± 12	± 30	8	40	15	78
HPR123	24	± 15	± 25	8	40	15	79

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

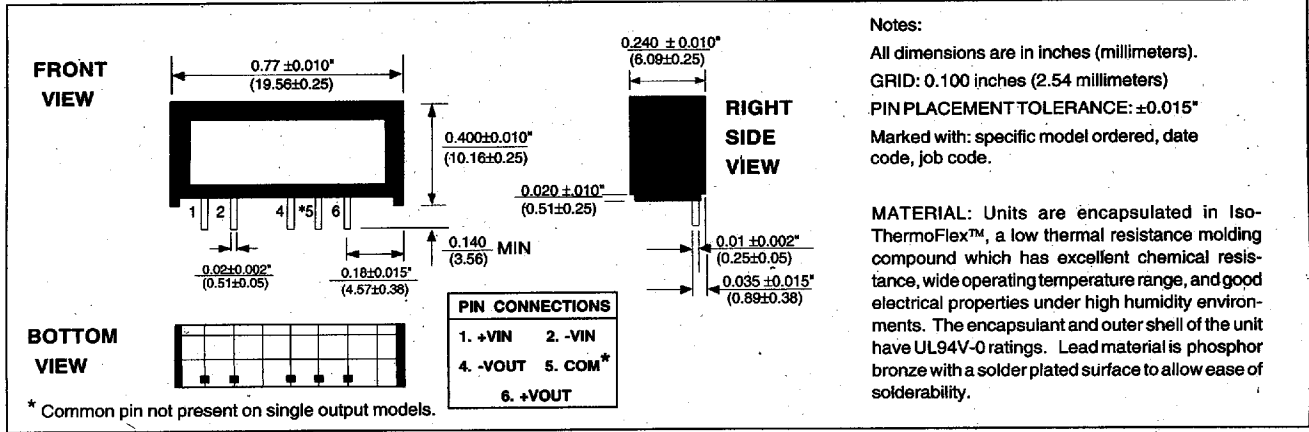
COMMON SPECIFICATIONS

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

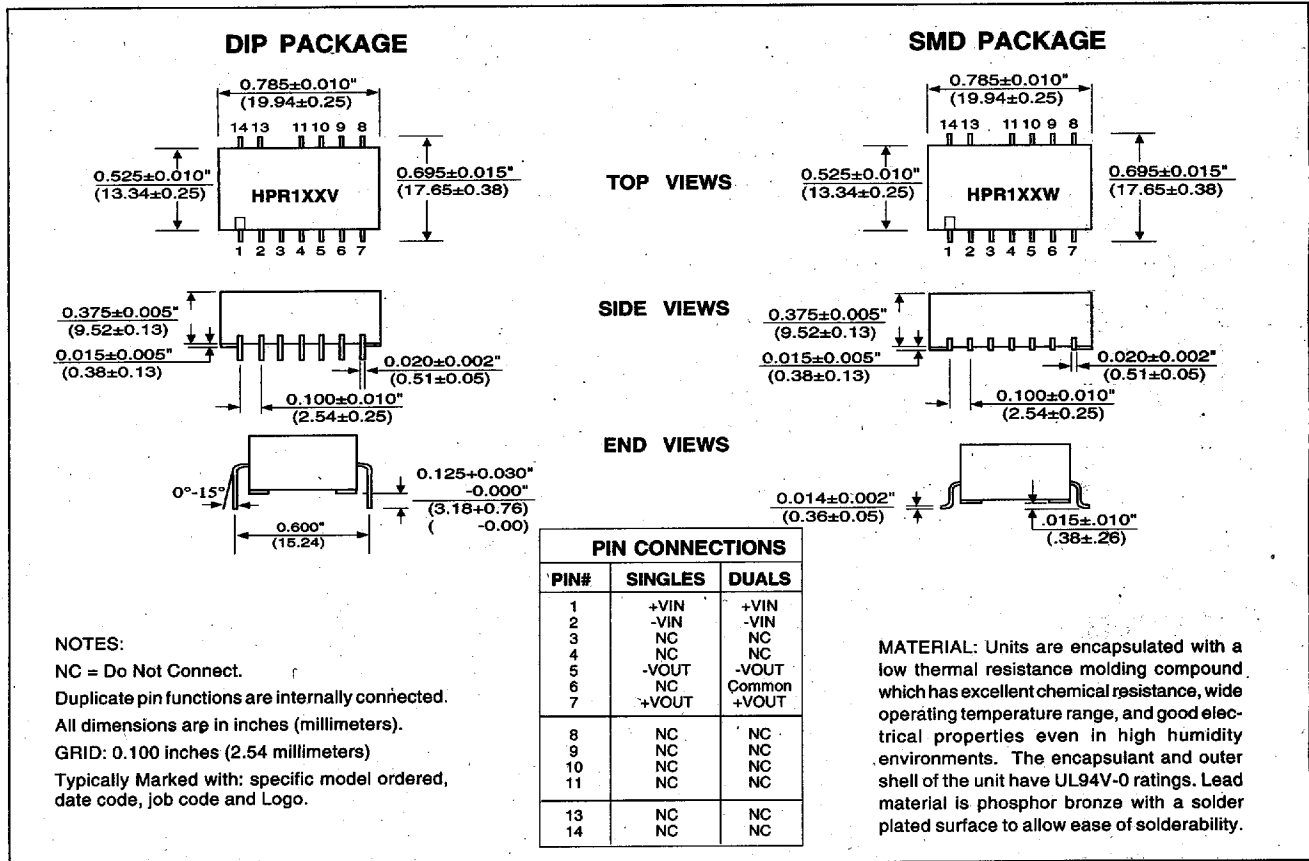
Parameter	Conditions	Min	Typ	Max	Units	
INPUT						
Voltage Range		4.5 10.8 13.5 21.6	5 12 15 24	5.5 13.2 16.5 26.4	VDC VDC VDC VDC	
Voltage Rise Time	See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"					
ISOLATION						
Rated Voltage	60 Hz, 10 Seconds	750			VDC	
Test Voltage		750			Vpk	
Resistance			10		G Ω	
Capacitance			25	100	pF	
Leakage Current	$V_{ISO} = 240\text{VAC}, 60\text{Hz}$		2	8.5	μArms	
OUTPUT						
Rated Power	Rated Load, Nominal V_{IN} BW = DC to 10MHz BW = 10Hz to 2MHz BW = DC to 10MHz		750		mW	
Voltage Setpoint Accuracy				± 5	%	
Ripple & Noise				45		mVp-p
HPR103				30		mVrms
Voltage	1mA Load, $V_{OUT} = 5\text{V}$ 1mA Load, $V_{OUT} = 12\text{V}$ 1mA Load, $V_{OUT} = 15\text{V}$			7 15 18	VDC VDC VDC	
Temperature Coefficient			.01		%/Deg C	
REGULATION						
Line Regulation	High Line to Low Line		1		%/%Vin	
Load Regulation (5V out only)	Rated Load to 1mA Load		10		%	
Load Regulation (All other Models)	Rated Load to 1mA Load		3		%	
GENERAL						
Switching Frequency	Over Line and Load		170		kHz	
Frequency Change			24		%	
Package Weight			2		g	
MTTF per MIL-HDBK-217, Rev. E	Circuit Stress Method $T_A = +25^\circ\text{C}$ $T_A = +35^\circ\text{C}$ $T_A = +35^\circ\text{C}$ $T_A = +35^\circ\text{C}$ $T_A = +35^\circ\text{C}$		7.9		MHr	
Ground Benign			1.9		MHr	
Fixed Ground			1.2		MHr	
Naval Sheltered			300		MHr	
Airborne Uninhabited Fighter					kHr	
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

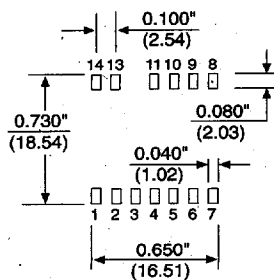
MECHANICAL "SIP" Package/Pinout



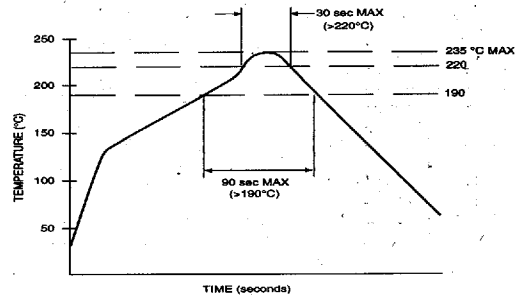
MECHANICAL Package/Pinout "V" and "W"



RECOMMENDED LAND PATTERN

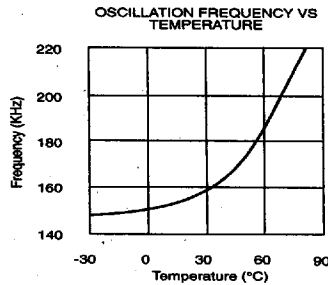
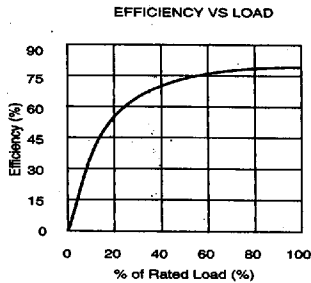
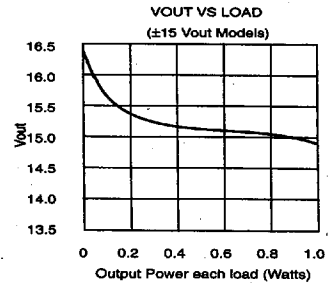
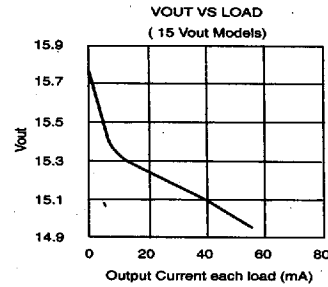
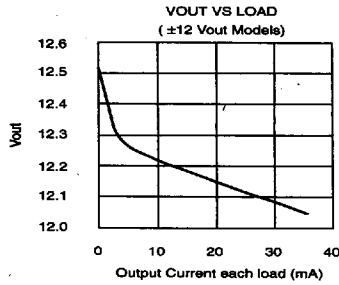
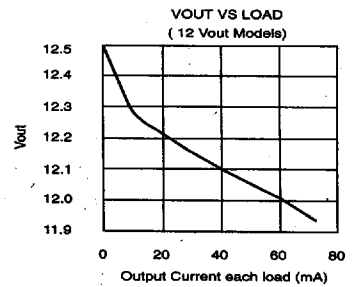
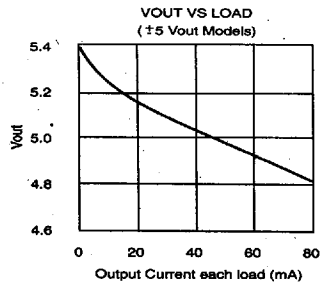
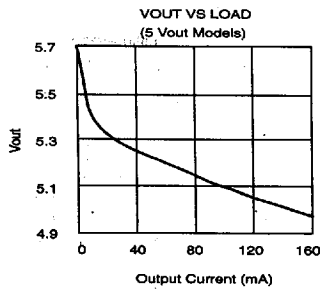


RECOMMENDED REFLOW PROFILE

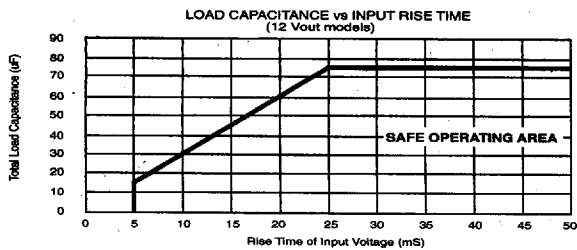
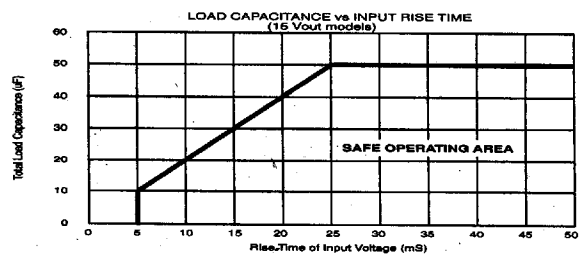
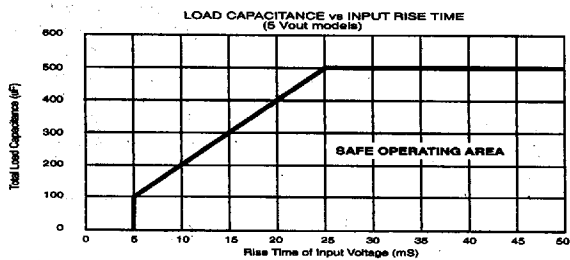


TYPICAL PERFORMANCE CURVES

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



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.