C&D TECHNOLOGIES

OBSOLETE PRODUCT
Contact Factory for Replacement Model

Product Data Sheet

1.0 WATT UNREGULATED SIP DC/DC CONVERTER

HPR10XX

FEATURES

- LOW COST
- SINGLE-IN-LINE PACKAGE (SIP)
- INTERNAL INPUT AND OUTPUT FILTERING
- NON-CONDUCTIVE CASE
- HIGH OUTPUT POWER DENSITY: 13 WATTS/INCH^3
- EXTENDED TEMPERATURE RANGE: -25°C TO +65°C
- HIGH EFFICIENCY: TO 72% TYPICAL

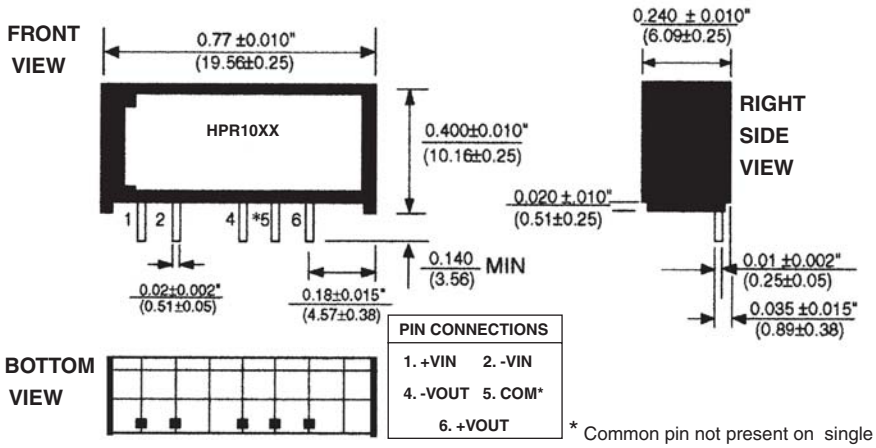
DESCRIPTION

The HPR10XX 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 HPR10XX Series with high frequency isolation amplifiers.

Reduced parts count and high efficiency add to the reliability of the HPR10XX Series. The high efficiency of the HPR10XX Series means less internal power dissipation, as low as 190mW. With reduced heat dissipation the HPR10XX Series can operate at higher temperatures with no degradation. In addition, the high efficiency of the HPR10XX Series means the series is able to offer greater than 13 W/inch^3 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 HPR10XX 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.

MECHANICAL



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.

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ELECTRICAL SPECIFICATIONS

Specifications typical at T_A = +25°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 NO LOAD (mA)	INPUT CURRENT RATED LOAD (mA)	REFLECTED RIPPLE CURRENT (mAp-p)	EFFICIENCY (%)
HPR1000	5	5	200	33	290	8	68
HPR1001	5	12	83	33	290	8	69
HPR1002	5	15	67	33	285	8	70
HPR1003	5	±5	±100	33	285	8	70
HPR1004	5	±12	±42	33	285	8	70
HPR1005	5	±15	±34	33	285	8	70
HPR1006	12	5	200	18	110	10	70
HPR1007	12	12	83	18	107	10	71
HPR1008	12	15	67	18	107	10	71
HPR1009	12	±5	±100	18	107	10	71
HPR1010	12	±12	±42	18	107	10	71
HPR1011	12	±15	±34	18	107	10	71
HPR1012	15	5	200	15	96	10	70
HPR1013	15	12	83	15	94	10	70
HPR1014	15	15	67	15	94	10	71
HPR1015							
HPR1016	15	±12	±42	15	94	10	71
HPR1017	15	±15	±34	15	94	10	71
HPR1018	24	5	200	12	60	15	71
HPR1019	24	12	83	12	60	15	71
HPR1020	24	15	67	12	58	15	72
HPR1021	24	±5	±100	12	58	15	72
HPR1022	24	±12	±42	12	58	15	72
HPR1023	24	±15	±34	12	58	15	72

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

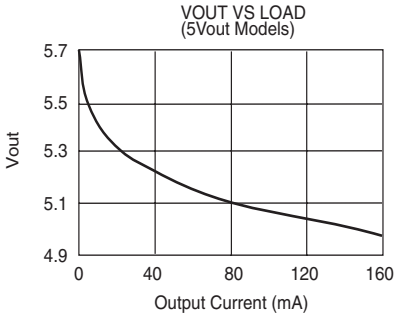
COMMON SPECIFICATIONS

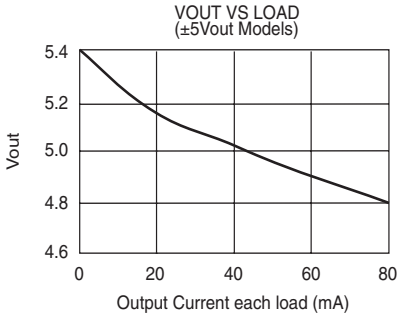
Specifications typical at T_A = +25°C, nominal input voltage, rated output current unless otherwise specified.

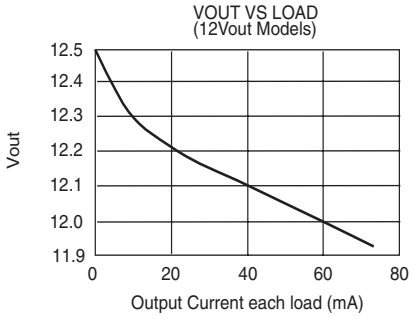
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		4.5	5	5.5	VDC
		10.8	12	13.2	VDC
		13.5	15	16.5	VDC
		21.6	24	26.4	VDC
Voltage Rise Time	See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"				
ISOLATION					
Rated Voltage		1000			VDC
Test Voltage	60 Hz, 10 Seconds	1000			Vpk
Resistance			10		GΩ
Capacitance			25	100	pF
Leakage Current	V_{ISO}= 240VAC, 60Hz		2	8.5	µArms
OUTPUT					
Rated Power			1.0		W
Voltage Setpoint Accuracy	Rated Load, Nominal V_{IN}			±5	%
Ripple & Noise	BW = DC to 10MHz			100	mVp-p
	BW =10Hz to 2MHz		30		mVrms
Voltage	1mA Load, V_{OUT} = 5V			7	VDC
	1mA Load, V_{OUT} = 12V			15	VDC
	1mA Load, V_{OUT} = 15V			18	VDC
Temperature Coefficent			.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			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°C		3.8		MHr
Fixed Ground	T_A = +35°C		1.4		MHr
Naval Sheltered	T_A = +35°C		685		kHr
Airborne Uninhabited Fighter	T_A = +35°C		211		kHr
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-20		2		
TEMPERATURE					
Specification		-25	+25	+65	°C
Storage		-50		+110	°C

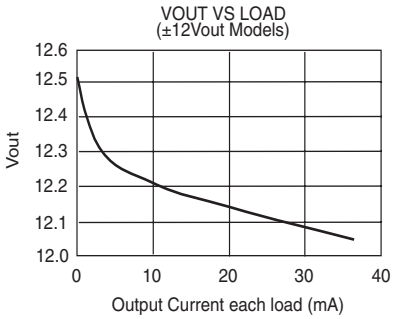
* For demonstrated MTTF results reference Reliability Report HPR105

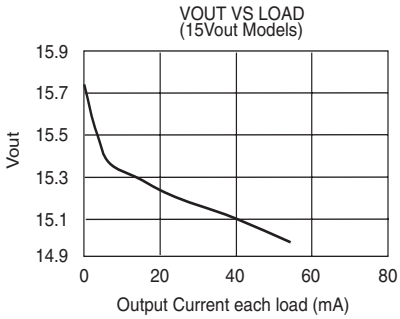
TYPICAL PERFORMANCE CURVES

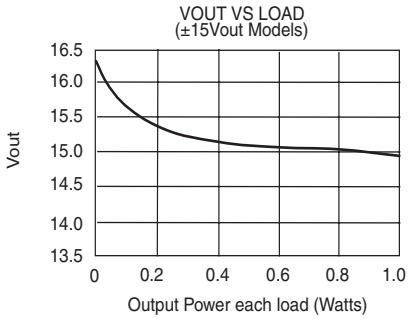


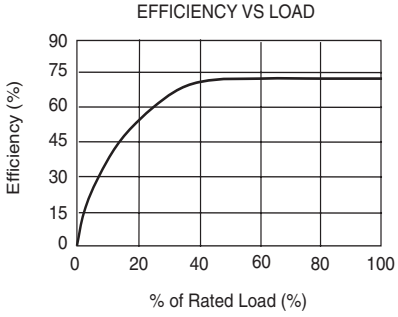


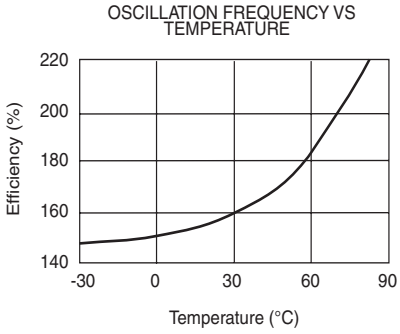




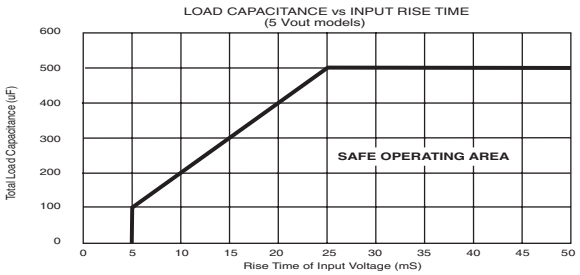


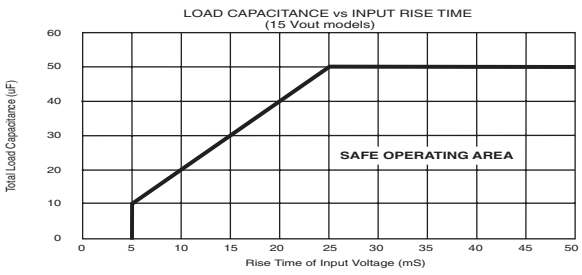


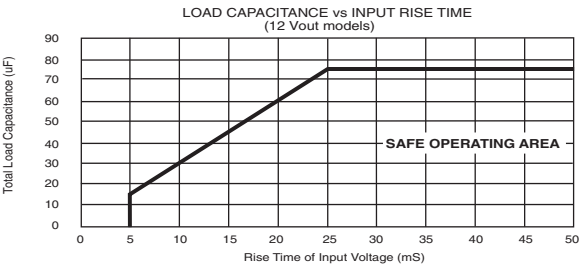




SAFE OPERATING AREA







NOTES:

1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HPR10XX 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.

ORDERING INFORMATION

HPR 10XX /H

Device Family
HPR Indicates DC/DC Converter
Model Number
Selected from Table of Electrical Characteristics
Screening Option

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation.....490mW
Short Circuit Duration.....Momentary
Lead Temperature (soldering, 10 seconds max).....+300°C

THROUGH-HOLE SOLDERING INFORMATION

These devices are intended for wave soldering or manual soldering.
They are not intended to be subject to surface mount processes under any circumstances.

The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's body will not be compromised and internal temperatures within the converter will not exceed 175°C. Care should be taken to control manual soldering limits identical to that of wave soldering.