HPR10XXC

1.0 Watt Unregulated, SIP DC/DC Converter

NOT RECOMMENDED FOR NEW DESIGNS
See page Electrical Specifications for alternatives

FEATURES

- RoHS Compliant
- 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
- Efficiency to 72% (Typical)

DESCRIPTION

The HPR10XXC 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 HPR10XXC Series with high frequency isolation amplifiers.

Reduced parts count and high efficiency add to the reliability of the HPR10XXC Series. The high efficiency of the HPR10XXC Series means less internal power dissipation, as low as 190mW. With reduced heat dissipation the HPR10XXC Series can operate at higher temperatures with no degradation. In addition, the high efficiency of the HPR10XXC 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 HPR10XXC 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.

ELECTRICAL SPECIFICATIONS

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

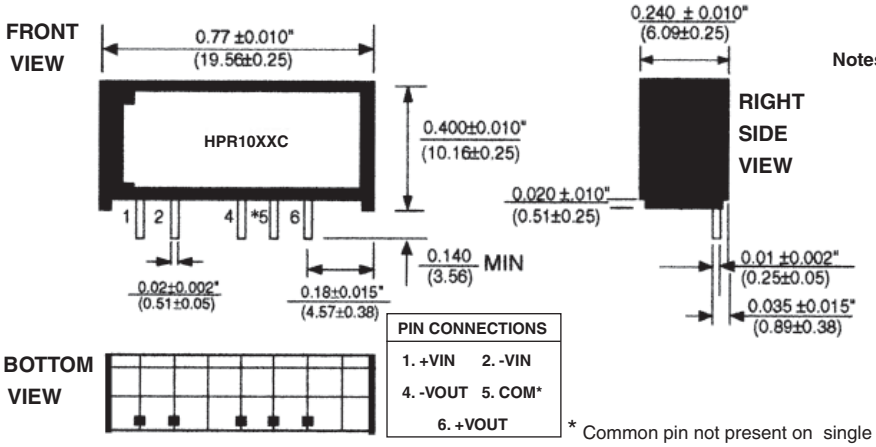
	Model	Nominal Input Voltage	Rated Output Voltage	Rated Output Current	Input Current		Reflected Ripple Current	Efficiency	Recommended Alternatives
					No Load	Rated Load			
		V_{DC}	V_{DC}	mA	mA		mAp-p	%	
NOT RECOMMENDED FOR NEW DESIGNS	HPR1000C	5	5	200	33	290	8	68	NMR100C / MER1S0505SC
	HPR1001C	5	12	83	33	290	8	69	NMR101C / MER1S0512SC
	HPR1004C	5	±12	±42	33	285	8	70	NMA0512SC / MEA1D0512SC
	HPR1005C	5	±15	±34	33	285	8	70	NMA0515SC / MEA1D0515SC
	HPR1018C	24	5	200	12	60	15	71	MER1S2405SC
	HPR1022C	24	±12	±42	12	58	15	72	MEA1D2412SC
	HPR1023C	24	±15	±34	12	58	15	72	MEA1D2415SC
OBSOLETE	HPR1002C	5	15	67	33	285	8	70	NMR102C / MER1S0515SC
	HPR1003C	5	±5	±100	33	285	8	70	NMA0505SC / MEA1D0505SC
	HPR1006C	12	5	200	18	110	10	70	NMR106C / MER1S1205SC
	HPR1007C	12	12	83	18	107	10	71	NMR107C / MER1S1212SC
	HPR1008C	12	15	67	18	107	10	71	NMR108C / MER1S1215SC
	HPR1009C	12	±5	±100	18	107	10	71	NMA1205SC / MEA1D1205SC
	HPR1010C	12	±12	±42	18	107	10	71	NMA1212SC / MEA1D1212SC
	HPR1011C	12	±15	±34	18	107	10	71	NMA1215SC / MEA1D1215SC
	HPR1012C	15	5	200	15	96	10	70	MER1S1505SC
	HPR1013C	15	12	83	15	94	10	70	MER1S1512SC
	HPR1014C	15	15	67	15	94	10	71	MER1S1515SC
	HPR1015C								MEA1D1505SC
	HPR1016C	15	±12	±42	15	94	10	71	MEA1D1512SC
	HPR1017C	15	±15	±34	15	94	10	71	MEA1D1515SC
	HPR1019C	24	12	83	12	60	15	71	MER1S2412SC
	HPR1020C	24	15	67	12	58	15	72	MER1S2415SC
	HPR1021C	24	±5	±100	12	58	15	72	MEA1D2405SC

RoHS COMPLIANT 2002/95/EC

25

For full details go to
www.murata-ps.com/rohs

MECHANICAL



Notes: All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

PIN PLACEMENT TOLERANCE: ± 0.015"

MATERIAL: Lead material is phosphor bronze; finish is 100-300 micro-inches of matte tin over a barrier layer of 5-40 micro-inches of nickel.

* Common pin not present on single output models.

COMMON SPECIFICATIONS

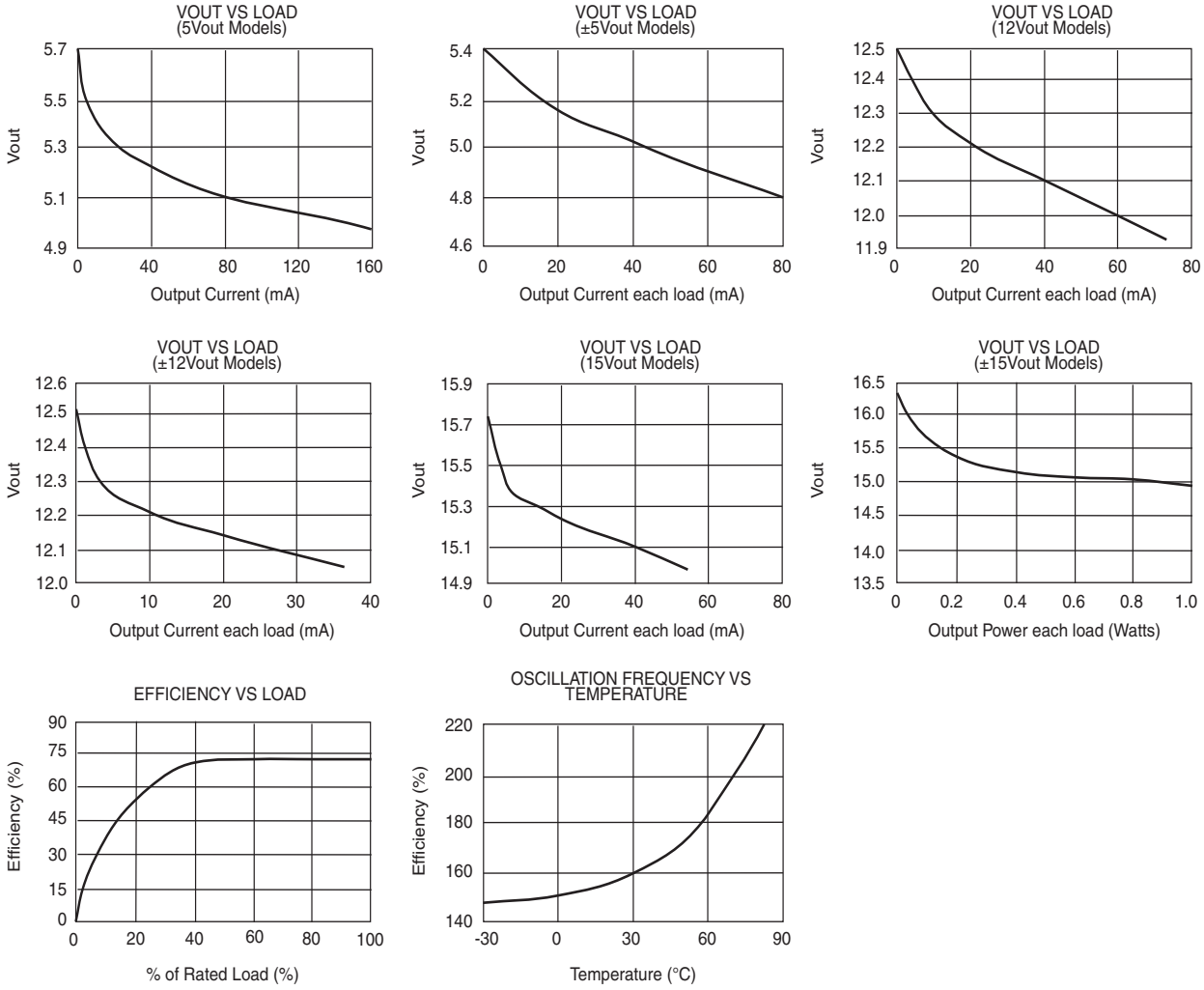
Specifications typical at T_A = +25°C, nominal input voltage, rated output current unless otherwise specified.

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	mV_{p-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
TEMPERATURE					
Specification		-25	+25	+65	°C
Storage		-50		+110	°C

* For demonstrated MTTF results reference Reliability Report HPR105

Typical Performance Curves

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

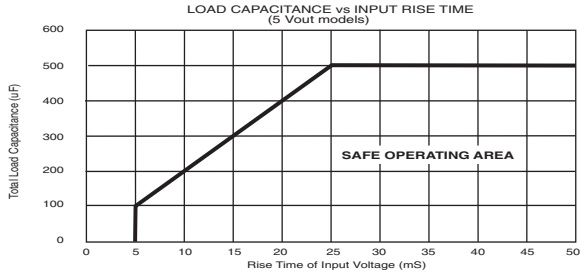


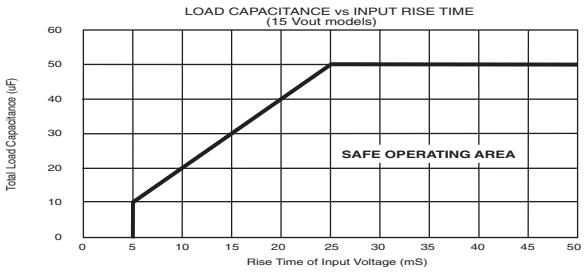
Through-Hole Soldering Information

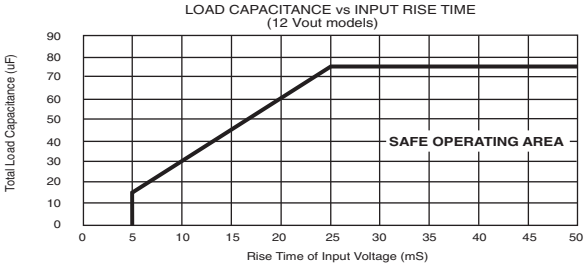
These devices are intended for wave soldering or manual soldering.
They are not intended to be subject to surface mount processes under any circumstances.

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 plastic 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.

SAFE OPERATING AREA







NOTES:

1. When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of Hpr10xxC 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 C

Device Family
HPR Indicates DC/DC Converter
Model Number
Selected from Table of Electrical Characteristics
RoHS Compliance

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation	490mW
Short Circuit Duration	Momentary

Murata Power Solutions, Inc.
11 Cabot Boulevard, Mansfield, MA 02048-1151 U.S.A.
ISO 9001 and 14001 REGISTERED