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HPR1XXC Series

0.75 Watt Single Output DC/DC Converters



FEATURES

- Low Cost
- Multiple Package Styles
- Internal Input and Output Filtering
- Non-Conductive Case

NOT RECOMMENDED FOR NEW DESIGNS

- High Output Power Density: 10 Watts/Inch³
- Extended Temperature Range: -25°C to +85°C
- Efficiency to 79%
- RoHS Compliant

The HPR1XXC Series uses advanced circuit design and packaging technology to deliver superior reliability and performance. A 70kHz push-pull oscillator is used in the input stage. Beat-frequency oscillation problems are reduced when using the HPR1XXC Series with high frequency isolation amplifiers.

Reduced parts count and high efficiency add to the reliability of the HPR1XXC Series. The high efficiency of the HPR1XXC Series means less internal power dissipation, as low as 190mW.

With reduced heat dissipation the HPR1XXC Series can operate at higher temperatures with no degradation. In addition, the high efficiency of the HPR1XXC 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 ≥ 1 mA minimum load is needed to realize published specifications.

The HPR1XXC 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.

As of September 2014, ONLY the following part numbers will be available: HPR100C; HPR102C; HPR103C; HPR104C; HPR105C; HPR106C; HPR107C; HPR110C; HPR116C; HPR117C; HPR118C; HPR120C

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	Rated Output Voltage	Rated Output Current	Input Current		Reflected Ripple Current	Efficiency	Recommended Alternatives
				No Load	Rated Load			
				mA				
HPR100C	5	5	150	20	216	10	69	NMR100C / MER1S0505SC
OBSOLETE ★ HPR101C	5	12	62	20	212	5	70	NMR101C / MER1S0512SC
HPR102C	5	15	50	20	212	5	71	NMR102C / MER1S0515SC
HPR103C	5	±5	±75	20	218	5	68	NMA0505SC / MEA1D0505SC
HPR104C	5	±12	±30	20	212	5	68	NMA0512SC / MEA1D0512SC
HPR105C	5	±15	±25	20	200	5	75	NMA0515SC / MEA1D0515SC
HPR106C	12	5	150	10	90	5	69	NMR106C / MER1S1205SC
HPR107C	12	12	62	10	81	5	77	NMR107C / MER1S1212SC
HPR110C	12	±12	±30	10	81	5	74	NMA1212SC / MEA1D1212SC
OBSOLETE ★ HPR111C	12	±15	±25	10	81	5	77	NMA1215SC / MEA1D1215SC
OBSOLETE ★ HPR112C	15	5	150	8	72	5	69	MER1S1505SC
OBSOLETE ★ HPR113C	15	12	62	8	72	5	69	MER1S1512SC
HPR116C	15	±12	±30	8	63	5	76	MEA1D1512SC
HPR117C	15	±15	±25	8	63	5	79	MEA1D1515SC
HPR118C	24	5	150	8	48	15	65	MER1S2405SC
HPR120C	24	15	50	8	45	15	76	MER1S2415SC
OBSOLETE ★ HPR122C	24	±12	±30	8	45	15	67	MEA1D2412SC
OBSOLETE ★ HPR123C	24	±15	±25	8	45	15	69	MEA1D2415SC
HPR108C	12	15	50	10	81	5	77	NMR108C / MER1S1215SC
HPR109C	12	±5	±75	10	88	5	71	NMA1205SC / MEA1D1205SC
HPR114C	15	15	50	8	72	5	69	MER1S1515SC
HPR115C	15	±5	±75	8	72	5	69	MEA1D1505SC
HPR119C	24	12	62	8	48	15	65	MER1S2412SC
HPR121C	24	±5	±75	8	45	15	69	MEA1D2405SC

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

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	
			21.6	24	26.4	VDC	
OUTPUT	Voltage Rise Time	See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"					
	OUTPUT						
	Rated Power				750	mW	
	Voltage Setpoint Accuracy	Rated Load, Nominal V_{IN}			± 5	%	
	Ripple & Noise	BW = DC to 10MHz		150	200	mVp-p	
		BW = 10Hz to 2MHz		30	40	mVrms	
	Voltage (Over Input Voltage Range)	1mA to Rated Current, $V_{OUT} = 5V$		4.75		7	VDC
		1mA to Rated Current, $V_{OUT} = 12V$		11.40		15	VDC
		1mA to Rated Current, $V_{OUT} = 15V$		14.25		18	VDC
	Temperature Coefficient			.01	.05	%/°C	
REGULATION							
Load Regulation (All other modes)	Rated Load to 1mA Load		3		%		
GENERAL	GENERAL						
	ISOLATION						
	Rated Voltage		750			VDC	
	Test Voltage	60 Hz, 10 Seconds	750			Vrms	
	Resistance		10			GΩ	
	Capacitance			25	100	pF	
	Leakage Current	$V_{ISO} = 240\text{VAC}, 60\text{Hz}$		2	8.5	μArms	
	Switching Frequency			170		kHz	
	Frequency Change	Over Line and Load		24		%	
	Package Weight				3	g	
	MTTF per MIL-HDBK-217, Rev. F*	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						
Specification		-25	+25	+85	°C		
Operation		-40		+100	°C		
Storage		-40		+110	°C		

SOLDERING INFORMATION

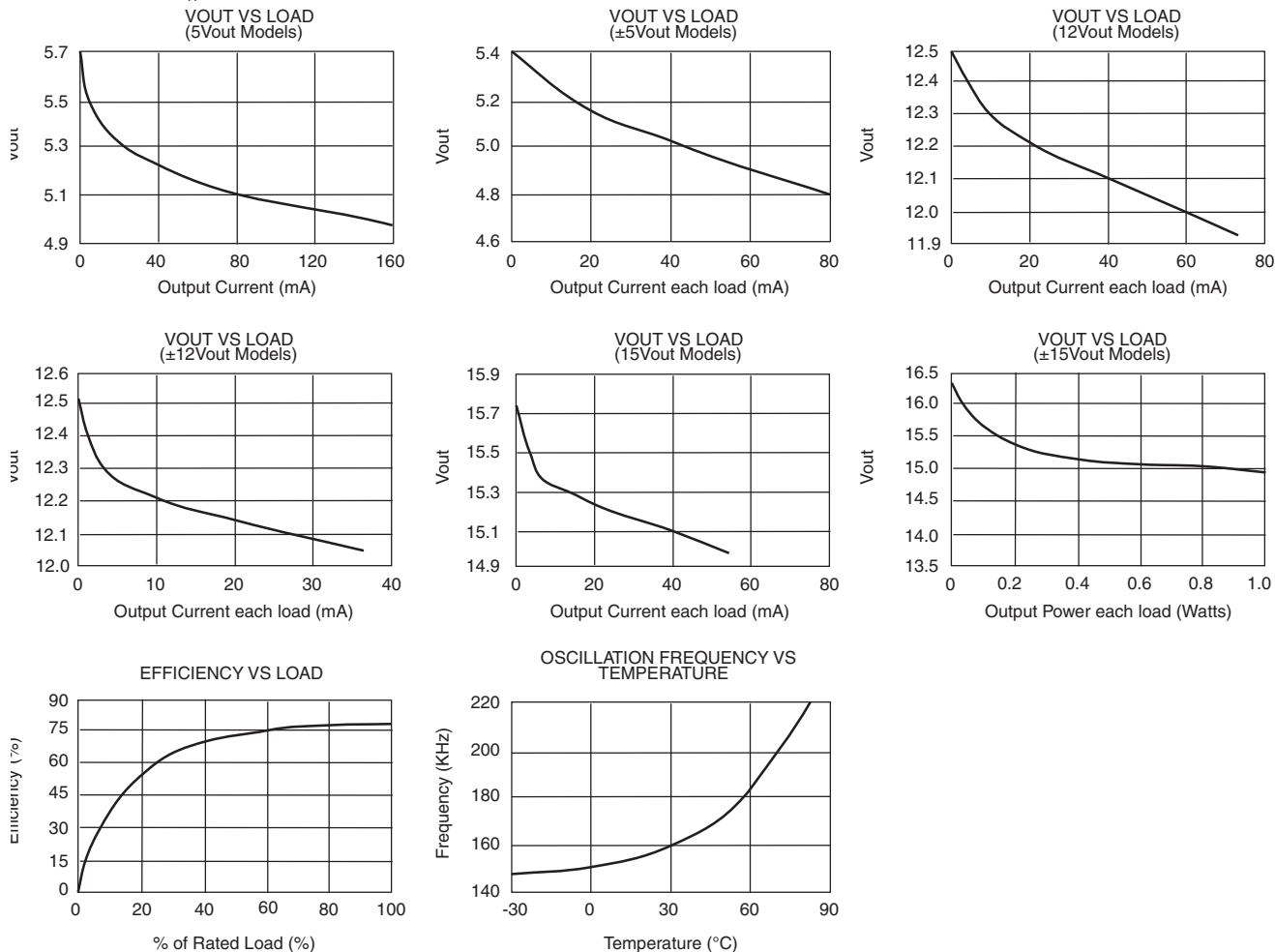
The HPR1XXC devices are intended for wave soldering or manual soldering.

They are not intended to be subject to surface mount processes under any circumstances.

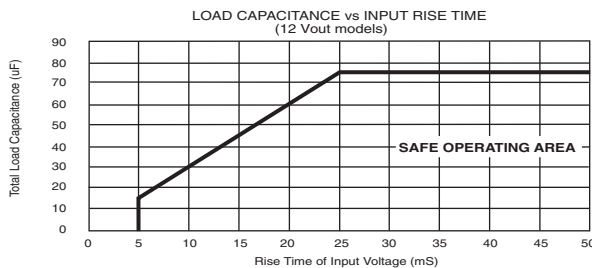
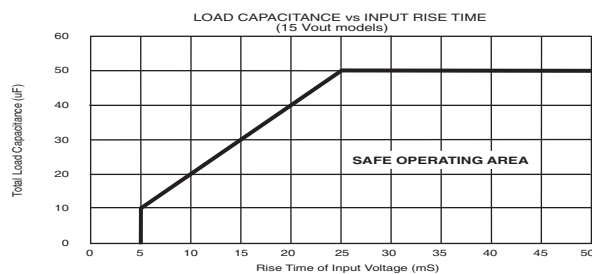
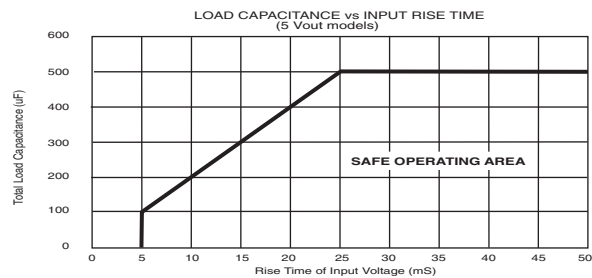
The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures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

TYPICAL PERFORMANCE CURVES

Specifications are at $T_A = +25^\circ\text{C}$ nominal input voltage and nominal load.



SAFE OPERATING AREA



NOTES:

- 1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HPR1XXC 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.

