THE DATASHEET OF

HPR103C

HPR1XXC Series

0.75 Watt Single Output DC/DC Converters

Murata Power Solutions

FEATURES

- Low Cost
- Multiple Package Styles
- Internal Input and Output Filtering
- Non-Conductive Case
- High Output Power Density: 10 Watts/Inch^3
- 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 170kHz 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 ≥1mA 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 October 2016, ONLY the following part numbers will be available: HPR100C; HPR105C; HPR107C; HPR116C; HPR117C; HPR118C

SPECIFICATIONS All specifications are typical at T_A = +25°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			
		V_{DC}	V_{DC}	mA	mA		mAp-p	%	
Available	HPR100C	5	5	150	20	216	10	69	NMR100C / MER1S0505SC
Discontinued	HPR101C	5	12	62	20	212	5	70	NMR101C / MER1S0512SC
Discontinued	HPR102C	5	15	50	20	212	5	71	NMR102C / MER1S0515SC
Discontinued	HPR103C	5	±5	±75	20	218	5	68	NMA0505SC / MEA1D0505SC
Discontinued	HPR104C	5	±12	±30	20	212	5	68	NMA0512SC / MEA1D0512SC
Available	HPR105C	5	±15	±25	20	200	5	75	NMA0515SC / MEA1D0515SC
Discontinued	HPR106C	12	5	150	10	90	5	69	NMR106C / MER1S1205SC
Available	HPR107C	12	12	62	10	81	5	77	NMR107C / MER1S1212SC
Discontinued	HPR110C	12	±12	±30	10	81	5	74	NMA1212SC / MEA1D1212SC
Discontinued	HPR111C	12	±15	±25	10	81	5	77	NMA1215SC / MEA1D1215SC
Discontinued	HPR112C	15	5	150	8	72	5	69	MER1S1505SC
Discontinued	HPR113C	15	12	62	8	72	5	69	MER1S1512SC
Available	HPR116C	15	±12	±30	8	63	5	76	MEA1D1512SC
Available	HPR117C	15	±15	±25	8	63	5	79	MEA1D1515SC
Available	HPR118C	24	5	150	8	48	15	65	MER1S2405SC
Discontinued	HPR120C	24	15	50	8	45	15	76	MER1S2415SC
Discontinued	HPR122C	24	±12	±30	8	45	15	67	MEA1D2412SC
Discontinued	HPR123C	24	±15	±25	8	45	15	69	MEA1D2415SC
Discontinued	HPR108C	12	15	50	10	81	5	77	NMR108C / MER1S1215SC
Discontinued	HPR109C	12	±5	±75	10	88	5	71	NMA1205SC / MEA1D1205SC
Discontinued	HPR114C	15	15	50	8	72	5	69	MER1S1515SC
Discontinued	HPR115C	15	±5	±75	8	72	5	69	MEA1D1505SC
Discontinued	HPR119C	24	12	62	8	48	15	65	MER1S2412SC
Discontinued	HPR121C	24	±5	±75	8	45	15	69	MEA1D2405SC

RoHS COMPLIANT

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

SPECIFICATIONS, ALL MODELS

Specifications are at T_A = +25°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
	Voltage Rise Time See Typical Performance Curves & Application Notes: "Capacitive Loading Effects on Start-Up of DC/DC Converters"					
OUTPUT	**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 Coefficent			.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}= 240VAC, 60Hz		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°C	7.9			MHr
	Fixed Ground	T_A = +35°C	1.9			MHr
	Naval Sheltered	T_A = +35°C	1.2			MHr
	Airborne Uninhabited Fighter	T_A = +35°C	300			kHr
	TEMPERATURE					
	Specification		-25	+25	+85	°C
	Operation		-40		+100	°C
	Storage		-40		+110	°C

SOLDERING INFORMATION

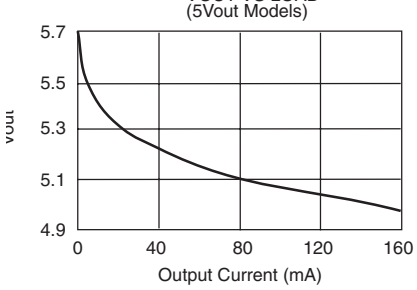
The HPR1XXC devices are intended for wave soldering or manual soldering.
They are not intended to be subject to surface mount processes under any circumstances.

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.

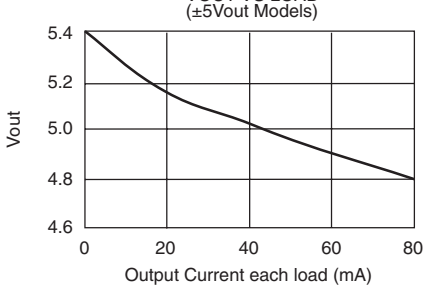
TYPICAL PERFORMANCE CURVES

Specifications are at T_A = +25°C nominal input voltage and nominal load.

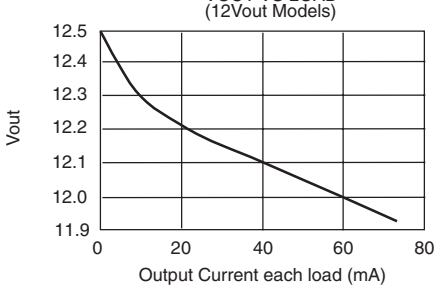
VOUT VS LOAD (5Vout Models)



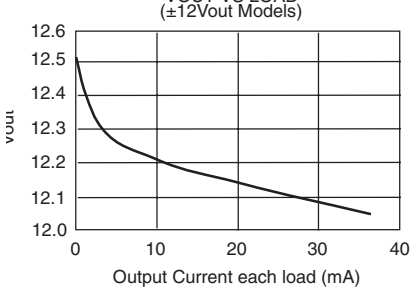
VOUT VS LOAD (±5Vout Models)



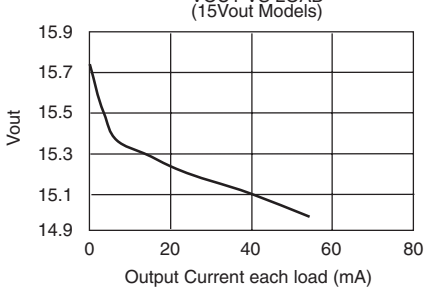
VOUT VS LOAD (12Vout Models)



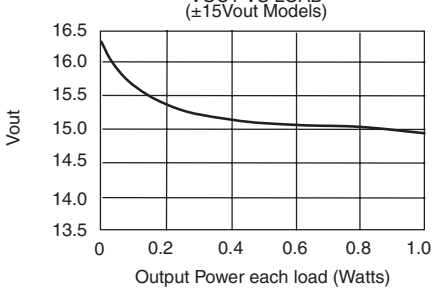
VOUT VS LOAD (±12Vout Models)



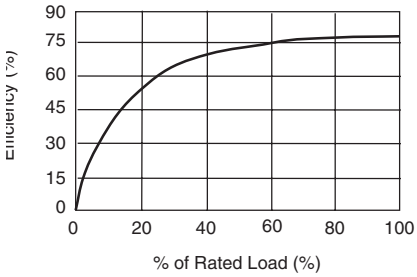
VOUT VS LOAD (15Vout Models)



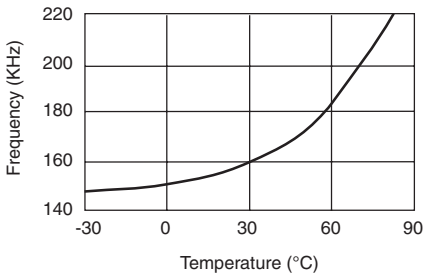
VOUT VS LOAD (±15Vout Models)



EFFICIENCY VS LOAD

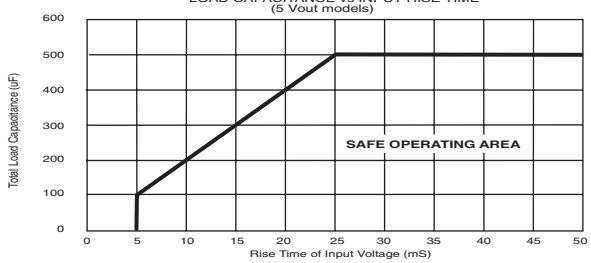


OSCILLATION FREQUENCY VS TEMPERATURE

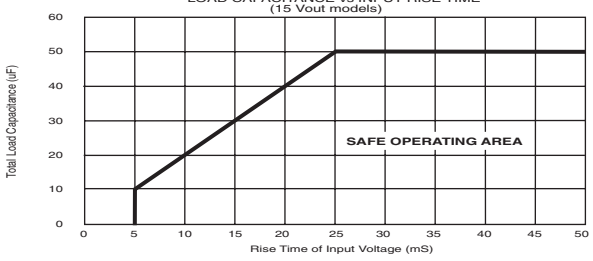


SAFE OPERATING AREA

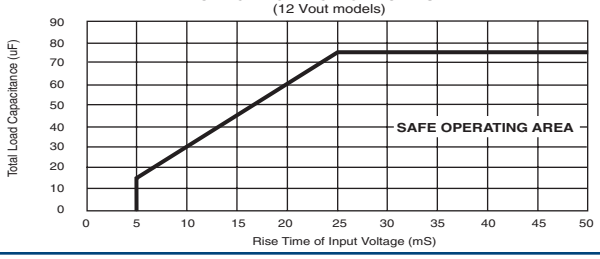
LOAD CAPACITANCE vs INPUT RISE TIME (5 Vout models)



LOAD CAPACITANCE vs INPUT RISE TIME (15 Vout models)



LOAD CAPACITANCE vs INPUT RISE TIME (12 Vout models)



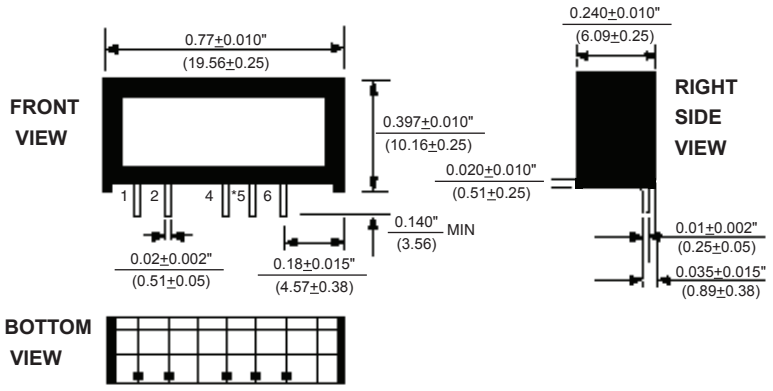
NOTES:

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.

MECHANICAL

"SIP" PACKAGE/PINOUT



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; lead finish is 100-300 microinches of matte tin over a nickel barrier layer of 5-40 microinches.

*Common pin not present on single output models.

PIN CONNECTIONS

1.	+VIN
2.	-VIN
4.	-VOUT
5.	COM*
6.	+VOUT

ABSOLUTE MAXIMUM RATINGS

Internal Power Dissipation 450mW
Short Circuit Duration..... Momentary

ORDERING INFORMATION

HPR 1XX C

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

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ISO 9001 and 14001 REGISTERED

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