Murata Power Solutions

HPR1XXVC

0.75 Watt Single Output DC/DC Converter

The HPR1XXVC 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 HPR1XXVC Series with high frequency isolation amplifiers.

Reduced parts count and high efficiency add to the reliability of the HPR1XXVC Series. The high efficiency of the HPR1XXVC Series means less internal power dissipation, as low as 190mW. With reduced heat dissipation the HPR1XXVC Series can operate at higher temperatures with no degradation. In addition, the high efficiency of the HPR1XXVC Series means the series is able to offer greater than 10 W/inch^3 of output power density. Operation down to no load will not impact the reliability of the series, although a $\geq$1mA minimum load is needed to realize published specifications.

The HPR1XXVC 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.

SPECIFICATIONS

All specifications are typical at T_A = +25°C nominal input voltage unless otherwise specified.

PRODUCT SELECTION CHART

MODEL	NOMINAL INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (VDC)	RATED OUTPUT CURRENT (mA)	INPUT CURRENT		REFLECTED RIPPLE CURRENT (mAp-p)	EFFICIENCY (%)
				NO LOAD (mA)	RATED LOAD (mA)		
HPR100VC	5	5	150	20	216	10	69
HPR101VC	5	12	62	20	212	5	70
HPR102VC	5	15	50	20	212	5	71
HPR103VC	5	±5	±75	20	218	5	68
HPR104VC	5	±12	±30	20	212	5	68
HPR105VC	5	±15	±25	20	200	5	75
HPR106VC	12	5	150	10	90	5	69
HPR107VC	12	12	62	10	81	5	77
HPR108VC	12	15	50	10	81	5	77
HPR109VC	12	±5	±75	10	88	5	71
HPR110VC	12	±12	±30	10	81	5	74
HPR111VC	12	±15	±25	10	81	5	77
HPR112VC	15	5	150	8	72	5	69
HPR113VC	15	12	62	8	72	5	69
HPR114VC	15	15	50	8	72	5	69
HPR115VC	15	±5	±75	8	72	5	69
HPR116VC	15	±12	±30	8	63	5	76
HPR117VC	15	±15	±25	8	63	5	79
HPR118VC	24	5	150	8	48	15	65
HPR119VC	24	12	62	8	48	15	65
HPR120VC	24	15	50	8	45	15	76
HPR121VC	24	±5	±75	8	45	15	69
HPR122VC	24	±12	±30	8	45	15	67
HPR123VC	24	±15	±25	8	45	15	69

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

RoHS COMPLIANT 2002/95/EC

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

ISO9001 CERTIFIED

SPECIFICATIONS, ALL MODELS

Specifications are at T_A = +25°C nominal input voltage 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"					
OUTPUT	**OUTPUT**					
OUTPUT	Rated Power				750	mW
OUTPUT	Voltage Setpoint Accuracy	Rated Load, Nominal V_{IN}			±5	%
OUTPUT	Ripple & Noise	BW = DC to 10MHz		150	200	mVp-p
OUTPUT		BW =10Hz to 2MHz		30	40	mVrms
OUTPUT	Voltage (Over Input Voltage Range)	1mA to Rated Current, V_{OUT} = 5V	4.75		7	VDC
OUTPUT		1mA to Rated Current, V_{OUT} = 12V	11.40		15	VDC
OUTPUT		1mA to Rated Current, V_{OUT} = 15V	14.25		18	VDC
OUTPUT	Temperature Coefficent			.01	.05	%/ °C
OUTPUT	**REGULATION**					
OUTPUT	Load Regulation (All other modes)	Rated Load to 1mA Load		3		%
GENERAL	**GENERAL**					
GENERAL	ISOLATION					
GENERAL	Rated Voltage		750			VDC
GENERAL	Test Voltage	60 Hz, 10 Seconds	750			Vrms
GENERAL	Resistance		10			GΩ
GENERAL	Capacitance			25	100	pF
GENERAL	Leakage Current	V_{ISO}= 240VAC, 60Hz		2	8.5	µArms
GENERAL	Switching Frequency			170		kHz
GENERAL	Frequency Change	Over Line and Load		24		%
GENERAL	Package Weight				3	g
GENERAL	MTTF per MIL-HDBK-217, Rev. F*	Circuit Stress Method				
GENERAL	Ground Benign	T_A = +25°C	7.9			MHr
GENERAL	Fixed Ground	T_A = +35°C	1.9			MHr
GENERAL	Naval Sheltered	T_A = +35°C	1.2			MHr
GENERAL	Airborne Uninhabited Fighter	T_A = +35°C	300			kHr
GENERAL	Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-20		2		
GENERAL	**TEMPERATURE**					
GENERAL	Specification		-25	+25	+85	°C
GENERAL	Operation		-40		+100	°C
GENERAL	Storage		-40		+110	°C

SOLDERING INFORMATION

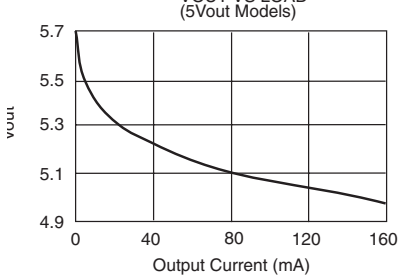
The HPR1XXVC devices are intended for wave soldering or manual soldering.
They are not intended to be subject to surface mount processes under any circumstances.

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.

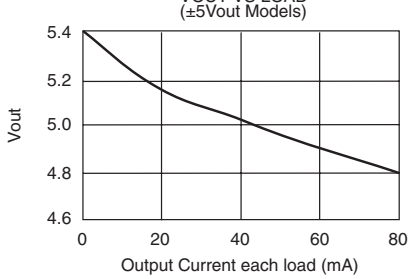
TYPICAL PERFORMANCE CURVES

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

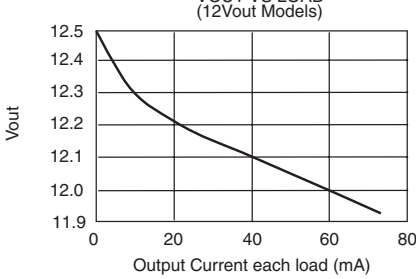
VOUT VS LOAD (5Vout Models)



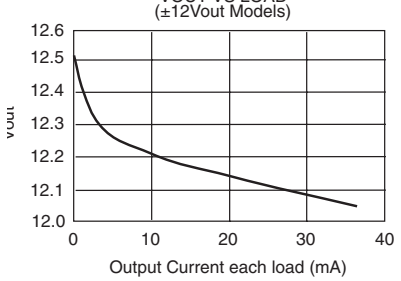
VOUT VS LOAD (±5Vout Models)



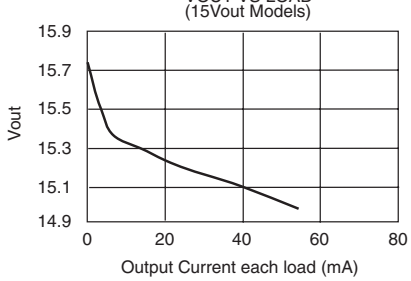
VOUT VS LOAD (12Vout Models)



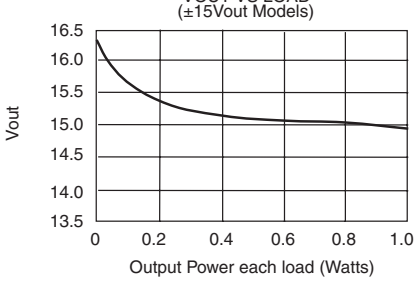
VOUT VS LOAD (±12Vout Models)



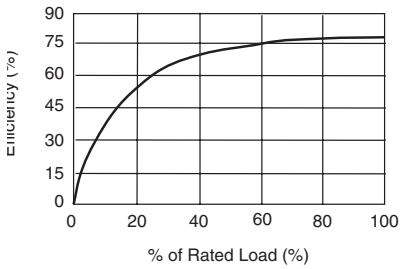
VOUT VS LOAD (15Vout Models)



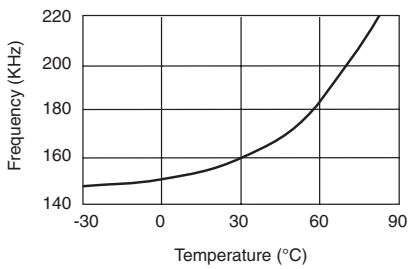
VOUT VS LOAD (±15Vout Models)



EFFICIENCY VS LOAD

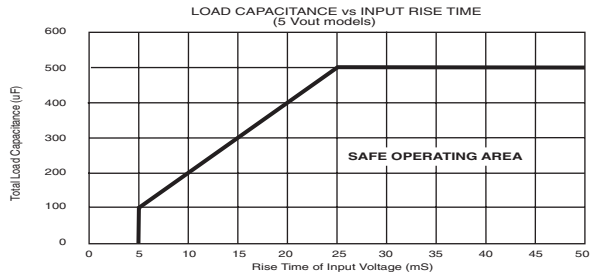


OSCILLATION FREQUENCY VS TEMPERATURE

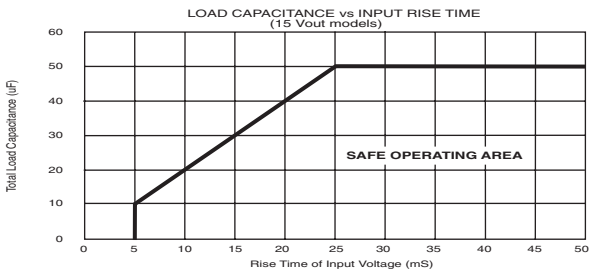


SAFE OPERATING AREA

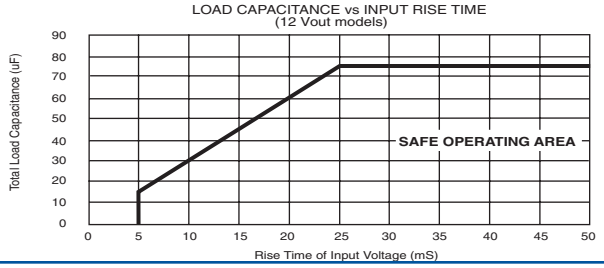
LOAD CAPACITANCE vs INPUT RISE TIME (5 Vout models)



LOAD CAPACITANCE vs INPUT RISE TIME (15 Vout models)



LOAD CAPACITANCE vs INPUT RISE TIME (12 Vout models)



NOTES:

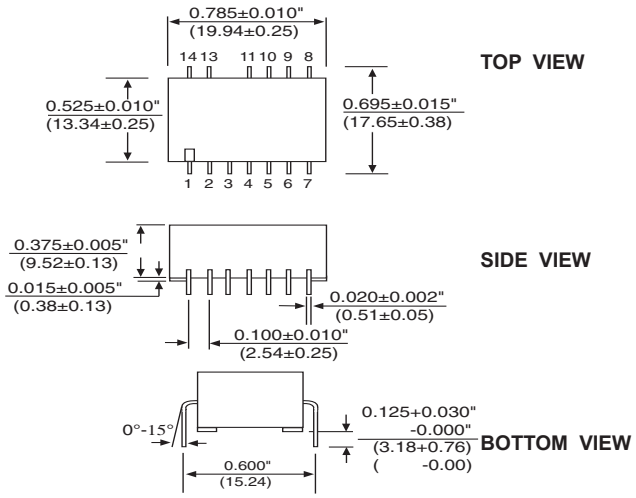
1.) When operated within the SAFE OPERATING AREA as defined by the above curves, the output voltage of HPR1XXC devices is guaranteed to be within 95% of its steady-state value within 100 milliseconds after the input voltage has reached 95% of its steady-state value.

2.) For dual output models, total load capacitance is the sum of the capacitances on the plus and minus outputs.

MECHANICAL

PACKAGE/PINOUT "V"

DIP PACKAGE



PIN CONNECTIONS					
PIN#	SINGLES	DUALS	PIN#	SINGLES	DUALS
1	+VIN	+VIN	7	+VOUT	+VOUT
2	-VIN	-VIN	8	NC	NC
3	NC	NC	9	NC	NC
4	NC	NC	10	NC	NC
5	-VOUT	-VOUT	11	NC	NC
6	NC	Common	13	NC	NC
			14	NC	NC

NOTES:

NC = Do Not Connect.

Duplicate pin functions are internally connected.

All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

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

ABSOLUTE MAXIMUM RATINGS

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

ORDERING INFORMATION

HPR 1XX V C

Device Family
HPR Indicates DC/DC Converter

Model Number
Selected from Table of Electrical Characteristics

Package Option
V = DIP Package

RoHS Compliant Version

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