

PRODUCT OVERVIEW

The HPR4XXC Series uses advanced circuit design and packaging technology to realize superior reliability and performance. A 170kHz push-pull oscillator is used in the input stage. The HPR4XXC Series reduces beat-frequency oscillation problems when used with high frequency isolation amplifiers. Reduced parts count and high efficiency add to the reliability of the HPR4XXC Series.

The high efficiency of the HPR4XXC Series means less internal power dissipation, as low as 190mW. With less heat to dissipate the HPR4XXC Series can operate at higher temperatures with no degradation of reliable operation. In addition, the high efficiency of the HPR4XXC 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 this product has a ≥ 1 mA minimum load for specifications purposes.

The HPR4XXC Series provides high isolation in a very small package. The use of surface mounted devices and manufacturing technologies makes it possible to offer premium performance and low cost.

FEATURES

- High Isolation Voltage: 3000 VPK Test
- Single-In-Line Package (SIP)
- Internal Input and Output
- Low Cost
- Non-Conductive Case
- High Output Power Density: 10 Watts/Inch³
- Extended Temperature Range: -25°C to +85°C
- High Efficiency to 79%
- RoHS Compliant

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 (VDC) | RATED OUTPUT VOLTAGE (VDC) | RATED OUTPUT CURRENT (mA) | INPUT CURRENT (mA) | | | REFLECTED RIPPLE CURRENT (mA _{p-p}) | EFFICIENCY (%) |
|--------------------|-----------------------------|--------------------------------|--------------------------------|--------------------|----------------|----------------|---|----------------|
| | | | | NO LOAD (mA) | RATED TYP | LOAD MAX | | |
| HPR400C | 5 | 5 | 150 | 20 | 216 | 235 | 10 | 69 |
| HPR401C | 5 | 12 | 62 | 20 | 212 | 235 | 5 | 70 |
| HPR402C | 5 | 15 | 50 | 20 | 212 | 235 | 5 | 71 |
| HPR403C | 5 | ± 5 | ± 75 | 20 | 218 | 245 | 5 | 68 |
| HPR404C | 5 | ± 12 | ± 30 | 20 | 212 | 235 | 5 | 68 |
| HPR405C | 5 | ± 15 | ± 25 | 20 | 220 | 220 | 5 | 75 |
| HPR406C | 12 | 5 | 150 | 10 | 90 | 100 | 5 | 69 |
| HPR407C | 12 | 12 | 62 | 10 | 81 | 90 | 5 | 77 |
| HPR408C | 12 | 15 | 50 | 10 | 81 | 90 | 5 | 77 |
| HPR409C | 12 | ± 5 | ± 75 | 10 | 88 | 98 | 5 | 71 |
| HPR410C | 12 | ± 12 | ± 30 | 10 | 81 | 90 | 5 | 74 |
| HPR411C | 12 | ± 15 | ± 25 | 10 | 81 | 90 | 5 | 77 |
| HPR412C | 15 | 5 | 150 | 8 | 72 | 80 | 5 | 69 |
| HPR413C | 15 | 12 | 62 | 8 | 72 | 80 | 5 | 69 |
| HPR414C | 15 | 15 | 50 | 8 | 72 | 80 | 5 | 69 |
| HPR415C | 15 | ± 5 | ± 75 | 8 | 72 | 80 | 5 | 69 |
| HPR416C | 15 | ± 12 | ± 30 | 8 | 63 | 70 | 5 | 76 |
| HPR417C | 15 | ± 15 | ± 25 | 8 | 63 | 66 | 5 | 79 |
| HPR418C | 24 | 5 | 150 | 8 | 48 | 53 | 15 | 65 |
| HPR419C | 24 | 12 | 62 | 8 | 48 | 53 | 15 | 65 |
| HPR420C | 24 | 15 | 50 | 8 | 45 | 50 | 15 | 69 |
| HPR421C | 24 | ± 5 | ± 75 | 8 | 45 | 50 | 15 | 69 |
| HPR422C | 24 | ± 12 | ± 30 | 8 | 45 | 50 | 15 | 67 |
| HPR423C | 24 | ± 15 | ± 25 | 8 | 45 | 50 | 15 | 69 |

Note: Other input to output voltages may be available. Please contact Murata Power Solutions.



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 |
|------------------------------------|--|------------------------------|-------|-----|---------------------|------------------|
| OUTPUT | 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 | | | | | |
| | 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 | %/ $^\circ\text{C}$ | |
| REGULATION | | | | | | |
| Load Regulation (All other modes) | Rated Load to 1mA Load | | | 3 | % | |
| GENERAL | | | | | | |
| ISOLATION | | | | | | |
| Rated Voltage | | | 1000 | | VDC | |
| Test Voltage | 60 Hz, 60 Seconds | | 3000 | | Vpk | |
| Resistance | | | 10 | | $\text{G}\Omega$ | |
| Capacitance | | | | 25 | 100 | pF |
| Leakage Current | $V_{ISO} = 240\text{VAC}, 60\text{Hz}$ | | | 2 | 7 | 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 |
| Moisture Sensitivity Level (MSL) | IPC/JEDEC J-STD-20 | | | 2 | | |
| TEMPERATURE | | | | | | |
| Specification | | | -25 | +25 | +85 | $^\circ\text{C}$ |
| Operation | | | -40 | | +100 | $^\circ\text{C}$ |
| Storage | | | -40 | | +110 | $^\circ\text{C}$ |

SOLDERING INFORMATION

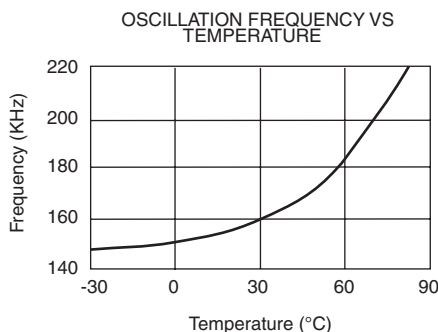
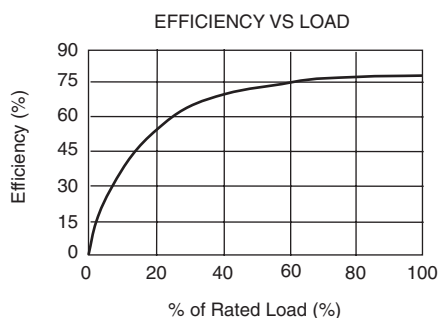
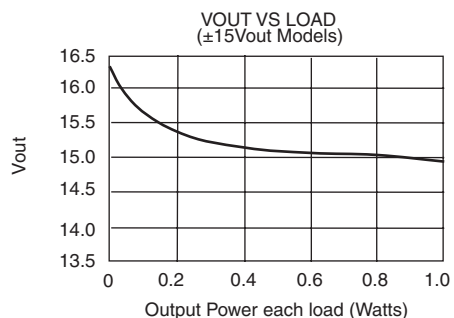
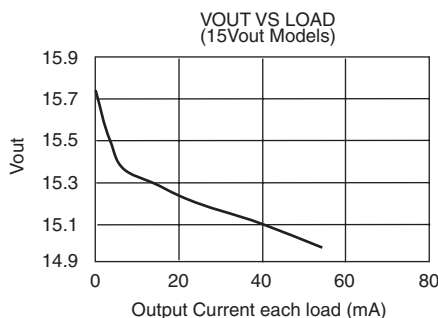
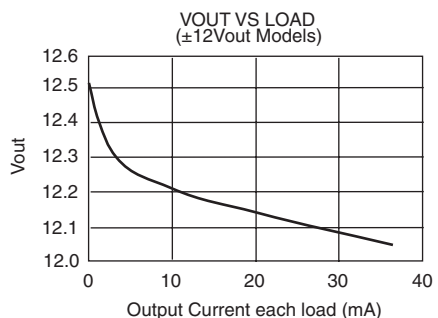
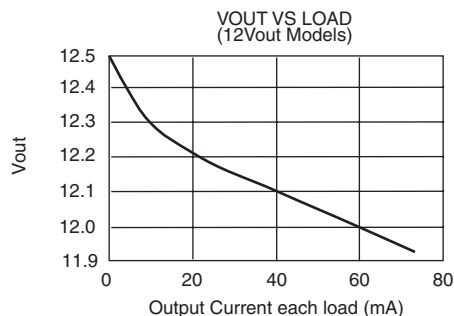
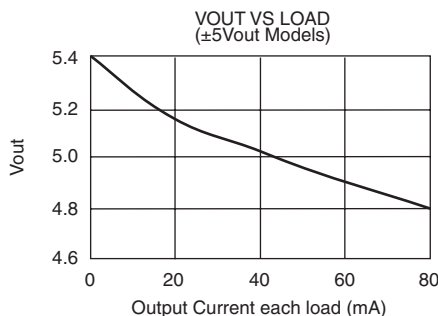
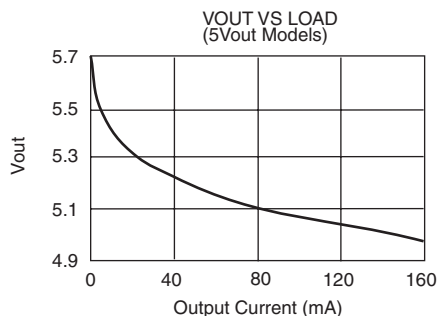
The HPR4XXC devices are intended for wave soldering or manual soldering.

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

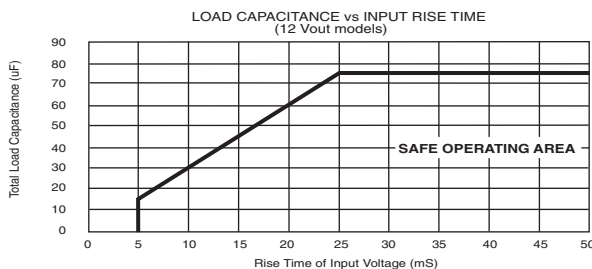
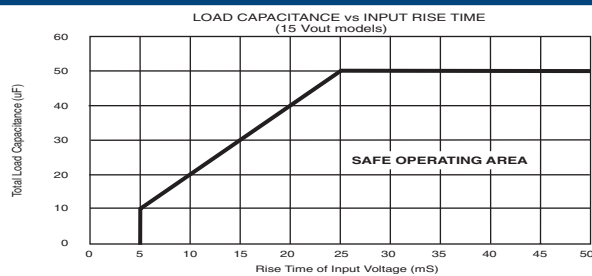
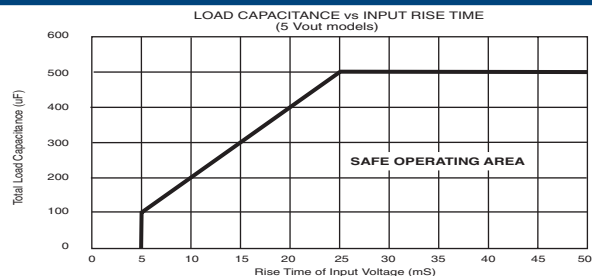
The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures 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:

- When operated within the SAFE OPERATING AREA as defined above curves, the output voltage of HPR4XXC 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.
- For dual output models, total load capacitance is the sum of the capacitances on the plus and minus outputs.

