



APPLICATIONS

- Battery-powered devices
- Portable devices
- Embedded computing
- High-current SMPS
- High-frequency SMPS
- POL converters
- FPGA

FEATURES

- Size 4.45mmx4.1mmx1.8mm
- Molded Construction
- Low Audible Noise
- Soft Saturation
- Stable Over High Temperatures
- Max Operating Temp +155°C
- RoHS/REACH-Compliant, Halogen-Free

ELECTRICAL CHARACTERISTICS

| Parameter | | | Value | Unit |
|--|------------------|------|-------|------|
| Inductance ⁽¹⁾ | L | ±20% | 5.6 | μH |
| Resistance | R_{DC} | typ | 97 | mΩ |
| Resistance _{MAX} | $R_{DC\ MAX}$ | max | 116 | mΩ |
| Rated Current ⁽²⁾ | I_R | typ | 2.45 | A |
| Saturation Current _{25°C} ⁽³⁾ | $I_{SAT\ 25°C}$ | typ | 2.6 | A |
| Saturation Current _{100°C} ⁽⁴⁾ | $I_{SAT\ 100°C}$ | typ | 2.6 | A |
| Resonance Frequency | f_r | typ | 23 | MHz |

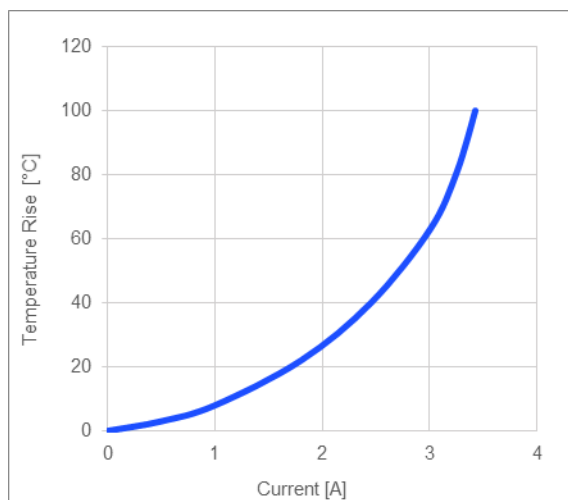
GENERAL SPECIFICATIONS

| | |
|---|---|
| ⁽¹⁾ Inductance | Measured at 100kHz, 100mA |
| ⁽²⁾ Rated Current | Rated current will cause the coil temperature rise ΔT of 40K <i>I_R measured with the inductor soldered in a single-layer PCB. Copper layer thickness 35μm Cu / PCB size 30x50mm. Temperature behavior dependent on circuit design, PCB layout, proximity to other components, and trace dimensions and thickness.</i> |
| ⁽³⁾ Saturation Current _{25°C} | Saturation current will cause L to drop from 30% at 25°C ambient temperature |
| ⁽⁴⁾ Saturation Current _{100°C} | Saturation current will cause L to drop from 30% at 100°C ambient temperature |
| Temperature Test Condition | Electrical specifications measured at 25°C, 35% RH if not given differently |
| Operating Condition | Operating temperature: -40°C to +155°C (including temp rise) Should not exceed +155°C under worst-case operation conditions |
| Storage Condition | Tape and Reel packaging: -10°C to +40°C Humidity: <50% RH |

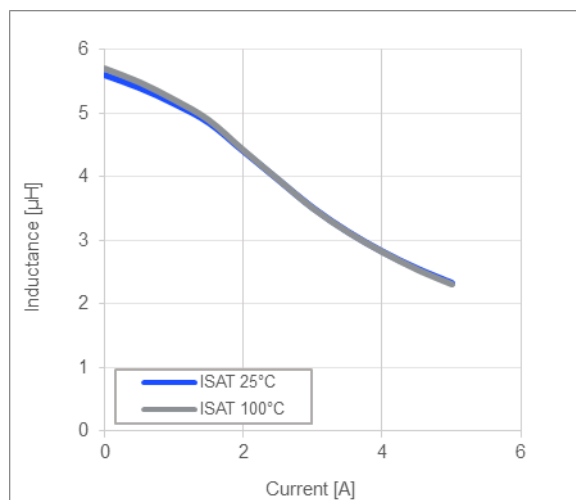
All MPS parts are lead-free, halogen-free, and adhere to the RoHS directive. For MPS green status, please visit the MPS website under Quality Assurance. "MPS", the MPS logo, and "Simple, Easy Solutions" are registered trademarks of Monolithic Power Systems, Inc. or its subsidiaries.

TYPICAL PERFORMANCE CURVES

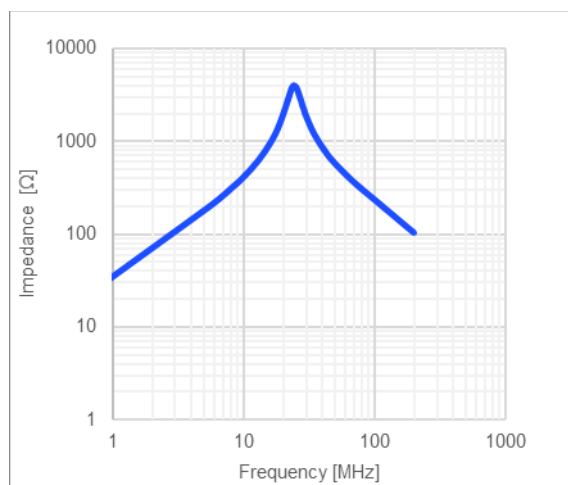
Temperature Rise vs. Current



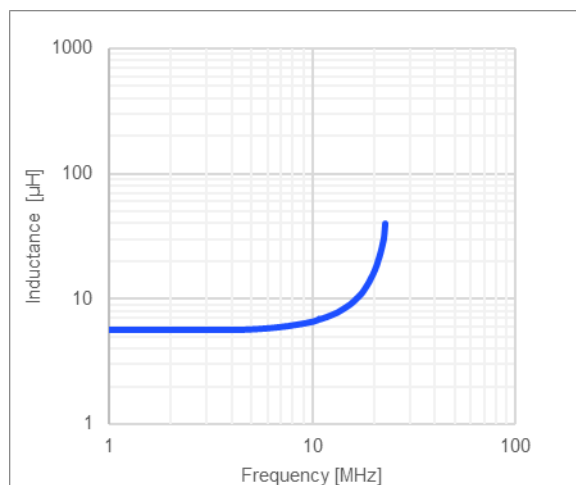
Inductance vs. Current



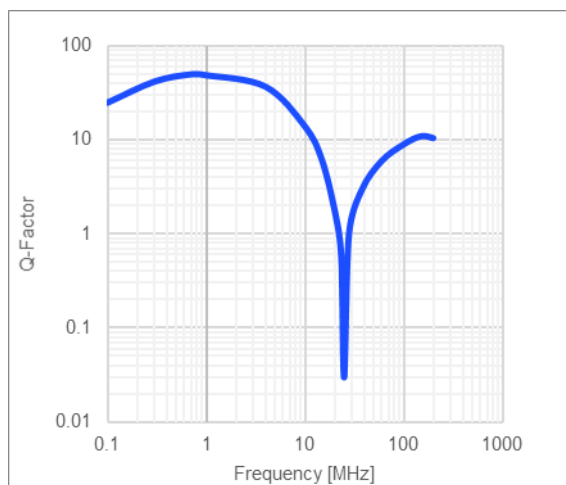
Impedance vs. Frequency



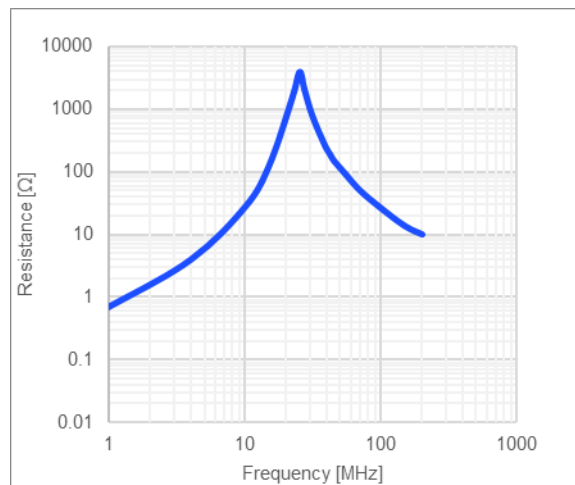
Inductance vs. Frequency



Quality Factor vs. Frequency



AC Resistance vs. Frequency



LAND PATTERN

Dimensions

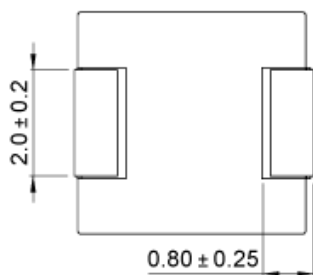
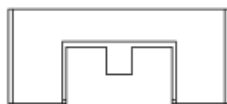
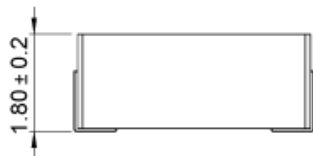
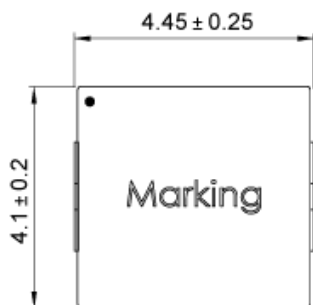
| | |
|---|---------------------------|
| A | 2.50 ref. |
| B | 2.20 ref. |
| C | 5.20 ref. (unit in mm) |



PRODUCT PACKAGE AND DIMENSIONS

Dimensions

(unit in mm)



TOP MARKING

Marking

| | |
|------------------|---------|
| Start of Winding | · (dot) |
| Inductance Code | 5R6 |

ORDERING INFORMATION

| Part Number | $L^{(1)}$ | R_{DC} | $I_R^{(2)}$ | $I_{SAT\ 25^\circ C}^{(3)}$ | $I_{SAT\ 100^\circ C}^{(4)}$ |
|----------------|-----------|----------|-------------|-----------------------------|------------------------------|
| | typ (μH) | typ (mΩ) | typ (A) | typ (A) | typ (A) |
| MPL-AY4020-5R6 | 5.6 | 97 | 2.45 | 2.6 | 2.6 |
| MPL-AY4020-6R8 | 6.8 | 129 | 2.20 | 2.4 | 2.4 |
| MPL-AY4020-8R2 | 8.2 | 136 | 2.10 | 2.1 | 2.1 |
| MPL-AY4020-100 | 10 | 163 | 1.90 | 2 | 2 |

GENERAL SPECIFICATIONS

| | |
|---|--|
| (1) Inductance | Measured at 100kHz, 100mA |
| (2) Rated Current | Rated current will cause the coil temperature rise ΔT of 40K <i>I_R measured with the inductor soldered in a single-layer PCB. Copper layer thickness 35μm Cu / PCB size 30x50mm. Temperature behavior dependent on circuit design, PCB layout, proximity to other components, and trace dimensions and thickness.</i> |
| (3) Saturation Current $_{25^\circ C}$ | Saturation current will cause L to drop from 30% at 25°C ambient temperature |
| (4) Saturation Current $_{100^\circ C}$ | Saturation current will cause L to drop from 30% at 100°C ambient temperature |
| Temperature Test Condition | Electrical specifications measured at 25°C, 35% RH if not given differently |
| Operating Condition | Operating temperature: -40°C to +155°C (including temp rise) Should not exceed +155°C under worst-case operation conditions |
| Storage Condition | Tape and Reel packaging: -10°C to +40°C Humidity: <50% RH |

NOTICE: The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third-party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Monolithic Power Systems \(MPS\):](#)

[MPL-AY4020-5R6](#)