



**THE DATASHEET OF
MPL-SE5040-1R0**





APPLICATIONS

- Battery-powered devices
- High-efficiency SMPS
- Embedded computing
- Input filters

FEATURES

- Size 4.9mmx4.9mmx4mm
- Semi-Shielded Construction
- Low DCR
- Low Stray Field
- Max Operating Temp +125°C
- RoHS/REACH-Compliant, Halogen-Free

ELECTRICAL CHARACTERISTICS

| Parameter | | | Value | Unit |
|--|------------------|------------|-------|------------|
| Inductance ⁽¹⁾ | L | $\pm 20\%$ | 1.0 | μ H |
| Resistance | R_{DC} | typ | 9.4 | m Ω |
| Resistance _{MAX} | $R_{DC\ MAX}$ | max | 11 | m Ω |
| Rated Current ⁽²⁾ | I_R | typ | 7.6 | A |
| Saturation Current _{25°C} ⁽³⁾ | $I_{SAT\ 25°C}$ | typ | 10.5 | A |
| Saturation Current _{100°C} ⁽⁴⁾ | $I_{SAT\ 100°C}$ | typ | 9 | A |
| Resonance Frequency | f_r | typ | 105 | MHz |

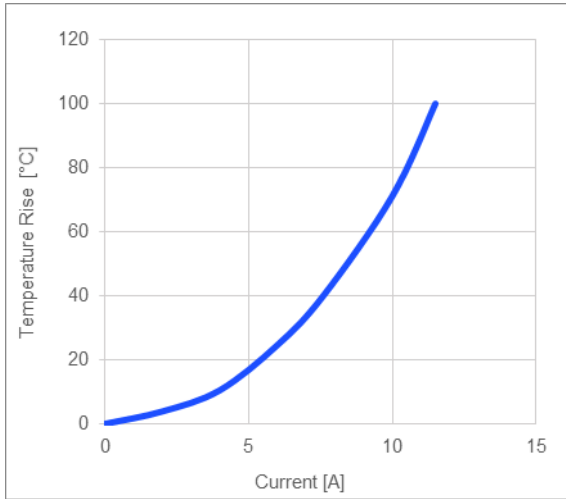
GENERAL SPECIFICATIONS

| | |
|--|---|
| (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 +125°C (including temp rise) Should not exceed +125°C under worst-case operation conditions |
| Storage Condition | Tape and Reel packaging: -10°C to +40°C Humidity: <50% RH |

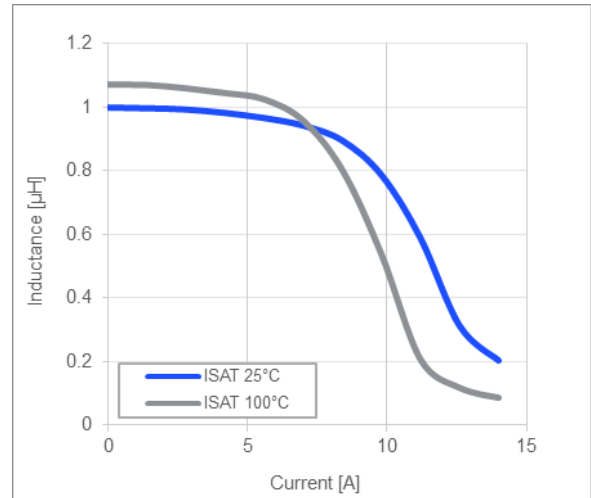
All MPS parts are lead-free, halogen-free, and adhere to the RoHS directive. For MPS green status, please visit the MPS website under Quality Assurance. "MPS", the MPS logo, and "Simple, Easy Solutions" are registered trademarks of Monolithic Power Systems, Inc. or its subsidiaries.

TYPICAL PERFORMANCE CURVES

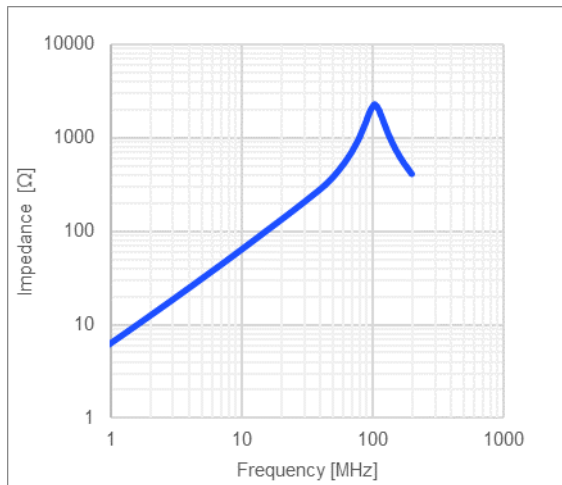
Temperature Rise vs. Current



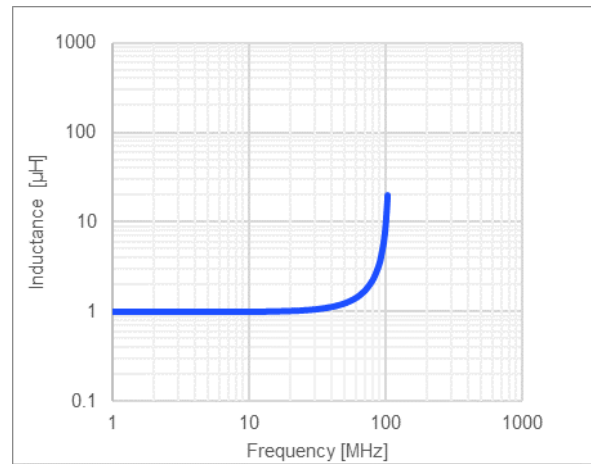
Inductance vs. Current



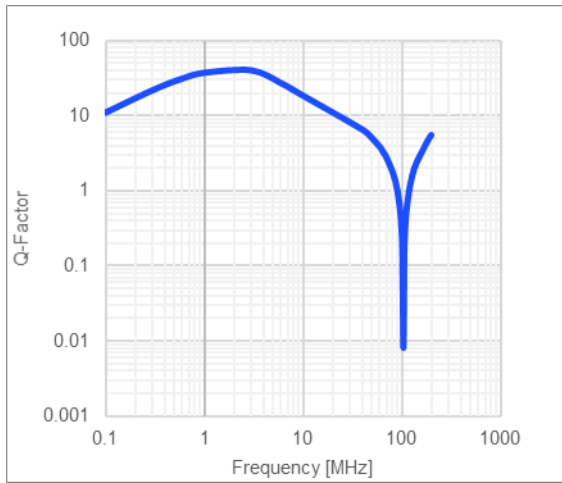
Impedance vs. Frequency



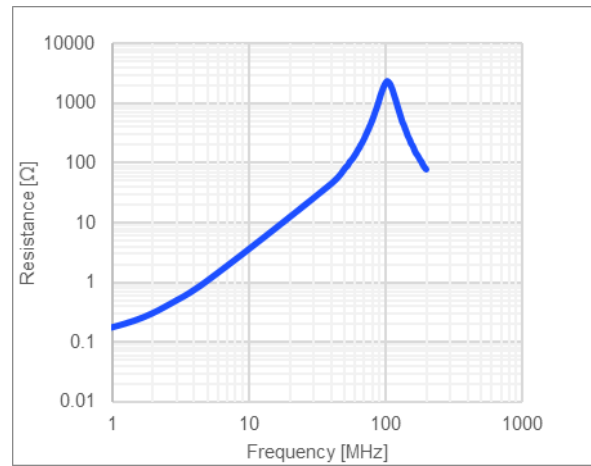
Inductance vs. Frequency



Quality Factor vs. Frequency



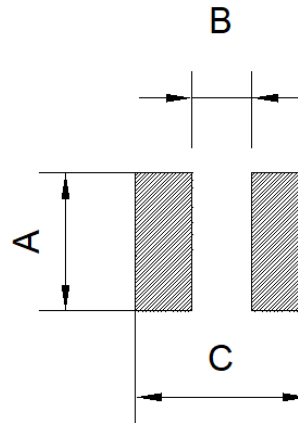
AC Resistance vs. Frequency



LAND PATTERN

| Dimensions | |
|------------|-----------|
| A | 4.0 ref. |
| B | 2.10 ref. |
| C | 5.10 ref. |

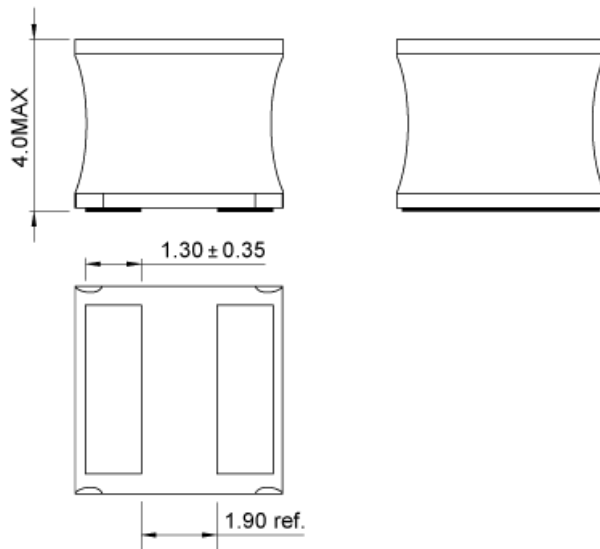
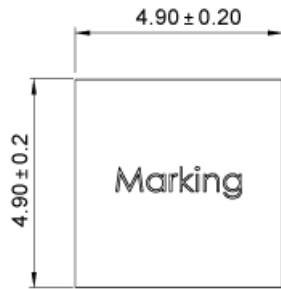
(unit in mm)



PRODUCT PACKAGE AND DIMENSIONS

| Dimensions | |
|------------|--|
|------------|--|

(unit in mm)



TOP MARKING

| Marking | |
|-----------------|-----|
| Inductance Code | 1R0 |

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-SE5040-R47 | 0.47 | 7.3 | 8.0 | 16 | 13.5 |
| MPL-SE5040-1R0 | 1.0 | 9.4 | 7.6 | 10.5 | 9 |
| MPL-SE5040-1R5 | 1.5 | 14 | 6.2 | 9.3 | 8.4 |
| MPL-SE5040-2R2 | 2.2 | 16 | 5.4 | 7.9 | 7.3 |
| MPL-SE5040-3R3 | 3.3 | 22 | 5.2 | 6.4 | 5.2 |
| MPL-SE5040-4R7 | 4.7 | 33 | 4.3 | 5 | 4.6 |
| MPL-SE5040-6R8 | 6.8 | 45 | 3.5 | 4.6 | 4 |
| MPL-SE5040-100 | 10 | 56 | 3.2 | 3.6 | 3 |
| MPL-SE5040-150 | 15 | 83 | 2.5 | 2.9 | 2.6 |
| MPL-SE5040-220 | 22 | 124 | 2.1 | 2.4 | 2.15 |

GENERAL SPECIFICATIONS
(1) Inductance

Measured at 100kHz, 100mA

(2) Rated Current

Rated current will cause the coil temperature rise ΔT of 40K
 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.

(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 +125°C (including temp rise)

Should not exceed +125°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.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View MPL-SE5040-1R0 on WIN SOURCE](#)
-  [Monolithic Power Systems Inc. Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management