# MPL-SE6040-3R3

## Semi-Shielded Inductor 3.3µH

## APPLICATIONS

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

## FEATURES

- Size 6mmx6mmx4mm
- 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) | $L$ | ±20% | 3.3 | µH |
| Resistance | $R_{DC}$ | typ | 19.5 | mΩ |
| Resistance MAX | $R_{DC\ MAX}$ | max | 24 | mΩ |
| Rated Current (2) | $I_R$ | typ | 5.6 | A |
| Saturation Current 25°C (3) | $I_{SAT\ 25°C}$ | typ | 5.6 | A |
| Saturation Current 100°C (4) | $I_{SAT\ 100°C}$ | typ | 4.9 | A |
| Resonance Frequency | $f_r$ | typ | 35 | MHz |

## GENERAL SPECIFICATIONS

| | |
|---|---|
| (1) Inductance | Measured at 100kHz, 100mA |
| (2) Rated Current | Rated current will cause the coil temperature rise ΔT of 40K<br>*$I_R$ 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°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)<br>Should not exceed +125°C under worst-case operation conditions |
| Storage Condition | Tape and Reel packaging: -10°C to +40°C<br>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.


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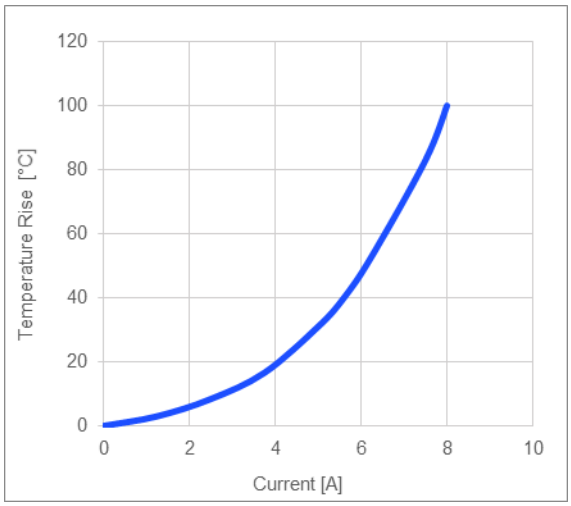
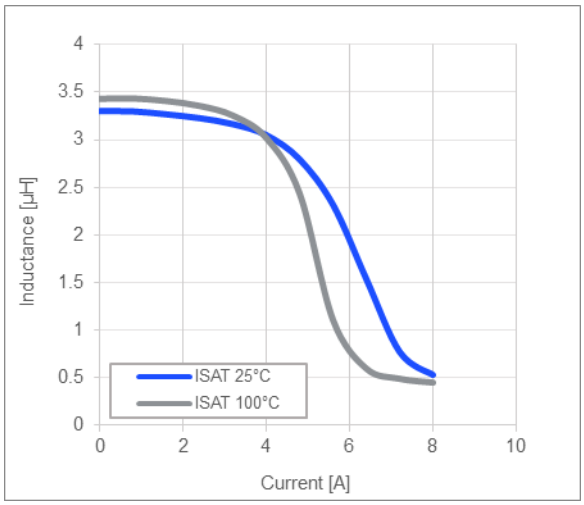
## TYPICAL PERFORMANCE CURVES

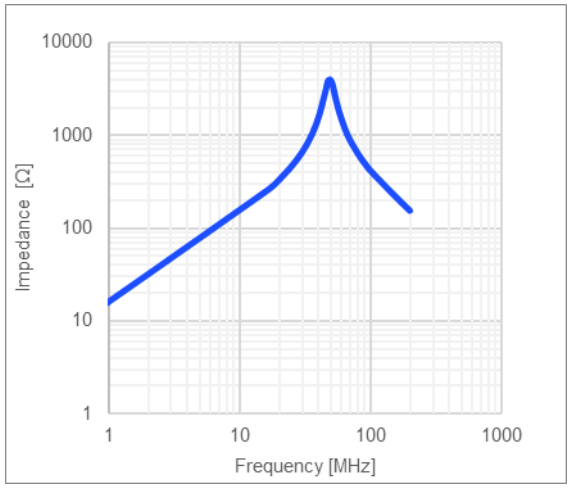
### Temperature Rise vs. Current



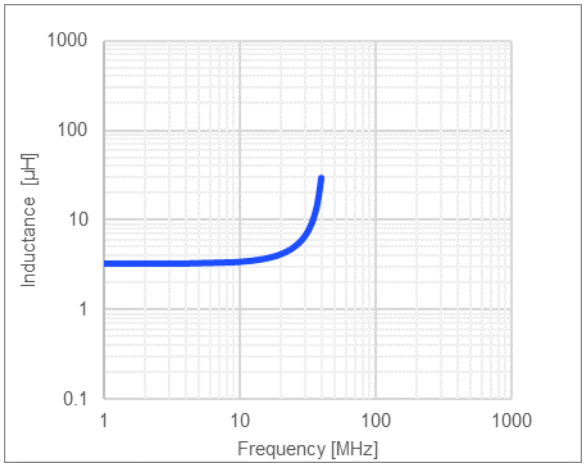

### Inductance vs. Current




### Impedance vs. Frequency




### Inductance vs. Frequency





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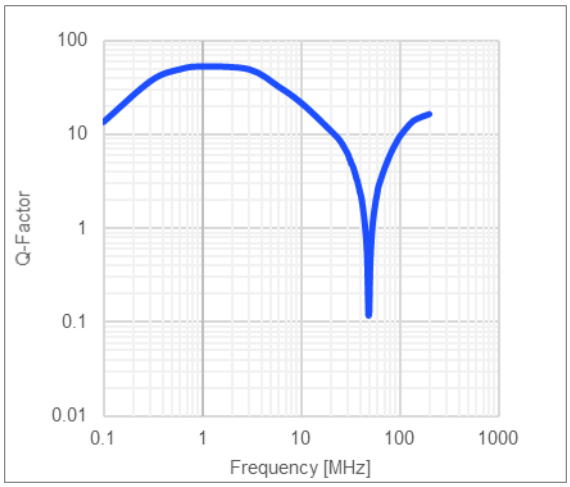
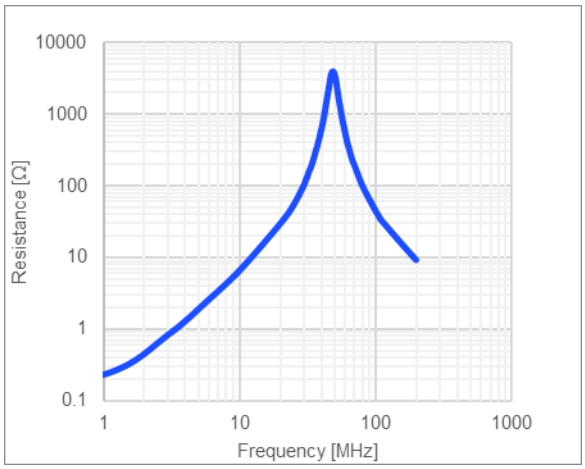
**Quality Factor vs. Frequency**




**AC Resistance vs. Frequency**





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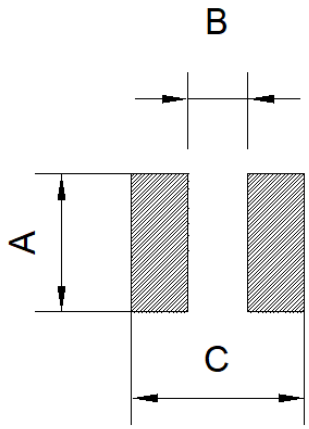
## LAND PATTERN

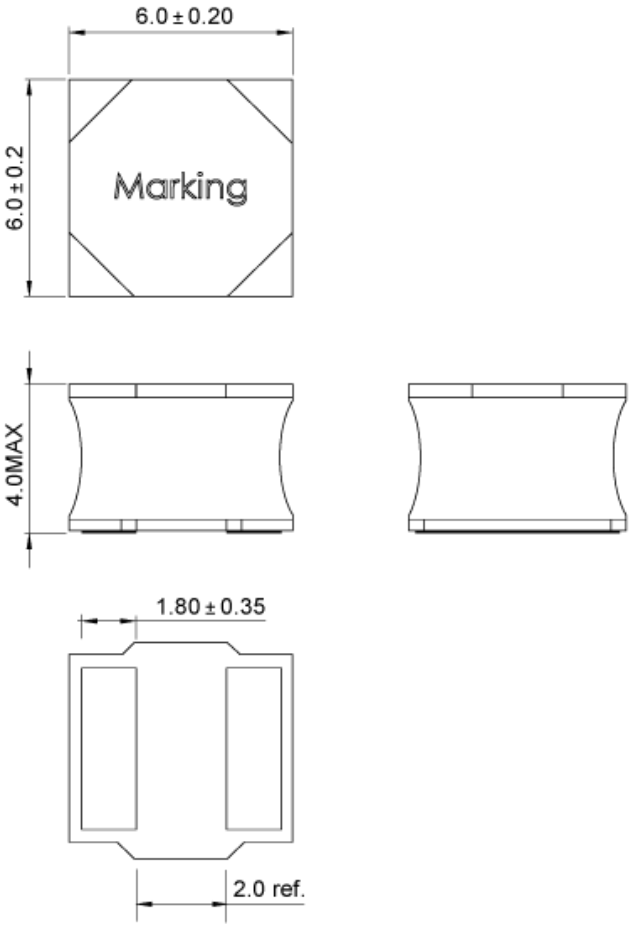
| Dimensions | |
|---|---|
| A | 4.50 ref. |
| B | 2.20 ref. |
| C | 6.50 ref. |
| | (unit in mm) |




## PRODUCT PACKAGE AND DIMENSIONS

**Dimensions**

(unit in mm)




## TOP MARKING

| Marking | |
|---|---|
| Inductance Code | 3R3 |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## ORDERING INFORMATION

| Part Number | $L$ (1) typ (µH) | $R_{DC}$ typ (mΩ) | $I_R$ (2) typ (A) | $I_{SAT\ 25°C}$ (3) typ (A) | $I_{SAT\ 100°C}$ (4) typ (A) |
|---|---|---|---|---|---|
| MPL-SE6040-1R5 | 1.5 | 11.5 | 6.8 | 8.9 | 7.8 |
| MPL-SE6040-2R2 | 2.2 | 14.5 | 6.3 | 7.2 | 6.7 |
| MPL-SE6040-3R3 | 3.3 | 19.5 | 5.6 | 5.6 | 4.9 |
| MPL-SE6040-4R7 | 4.7 | 23 | 5.2 | 5 | 4.5 |
| MPL-SE6040-6R8 | 6.8 | 33 | 4.4 | 4.1 | 3.7 |
| MPL-SE6040-8R2 | 8.2 | 39 | 4.0 | 3.6 | 3.2 |
| MPL-SE6040-100 | 10 | 41 | 3.8 | 3.4 | 2.8 |
| MPL-SE6040-150 | 15 | 70 | 2.8 | 2.7 | 2.4 |
| MPL-SE6040-220 | 22 | 97 | 2.35 | 2.25 | 2 |

## GENERAL SPECIFICATIONS

| | |
|---|---|
| (1) **Inductance** | Measured at 100kHz, 100mA |
| (2) **Rated Current** | Rated current will cause the coil temperature rise ΔT of 40K<br>*$I_R$ 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** $_{25°C}$ | 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)<br>Should not exceed +125°C under worst-case operation conditions |
| **Storage Condition** | Tape and Reel packaging: -10°C to +40°C<br>Humidity: <50% RH |

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