

Overview

The KEMET MPLCG metal composite inductors are ideal for use in DC to DC switching power supplies. The MPLCG's small size makes it ideal for applications with tight space requirements. The combination of composite core material and round wire allows these inductors to be used in applications with high switching frequencies and where efficiency is important.

Applications

- Switching DC-DC power supplies
- Notebook computers
- Tablets
- Embedded computer systems
- Servers and storage
- HDTVs

Benefits

- Metal composite powder
- Operating temperature up to +125°C
- High inductance
- Low DCR
- Low profile 3 mm maximum
- Low core loss
- Low acoustic noise



Part Number System

| MPLCG | 0530 | L | R22 |
|--------|--------------|----------|---|
| Series | Size Code | Inductor | Inductance Code μH |
| MPLCG | 0530 0630 | | R = decimal point Examples: R22 = 0.22 μH 1R0 = 1.0 μH |

Performance Characteristics

| Item | Performance Characteristics |
|---------------------------|---|
| Operating Temperature | -40°C to +125°C (including self-temperature rise) |
| Rated Inductance Range | 0.22 – 4.70 µH at 100 kHz, 1 mA |
| Inductance Tolerance | ±20% |
| Rated DC Resistance Range | 2.7 – 74.0 mΩ maximum |
| Rated Current Range | 4.5 – 14.1 A |

Table 1 – Ratings & Part Number Reference

| Part Number | Inductance (µH) at 100 kHz, 1 mA | Inductance Tolerance | DC Resistance (mΩ) Maximum | Rated Current (A) | |
|-----------------------|-------------------------------------|-------------------------|-------------------------------|--------------------------|--------------------------|
| | | | | Irms ¹ (Ref.) | Isat ² (Ref.) |
| MPLCG0530LR22 | 0.22 | ±20% | 3.7 | 14.1 | 10.2 |
| MPLCG0530LR33 | 0.33 | ±20% | 7.3 | 10.3 | 8.9 |
| MPLCG0530LR47 | 0.47 | ±20% | 8.4 | 9.5 | 8.9 |
| MPLCG0530LR68 | 0.68 | ±20% | 11.6 | 7.9 | 6.8 |
| MPLCG0530L1R0 | 1.00 | ±20% | 14.6 | 7.4 | 5.6 |
| MPLCG0530L1R5 | 1.50 | ±20% | 21.7 | 5.9 | 5.6 |
| MPLCG0530L2R2 | 2.20 | ±20% | 36.4 | 4.5 | 5.0 |
| MPLCG0530L3R3* | 3.30 | ±20% | 58.0 | 3.6 | 3.1 |
| MPLCG0530L4R7* | 4.70 | ±20% | 74.0 | 3.1 | 3.0 |
| MPLCG0630LR22* | 0.22 | ±20% | 2.7 | 21.4 | 17.9 |
| MPLCG0630LR33* | 0.33 | ±20% | 4.3 | 16.9 | 17.3 |
| MPLCG0630LR47 | 0.47 | ±20% | 5.0 | 15.8 | 15.6 |
| MPLCG0630LR68* | 0.68 | ±20% | 6.0 | 14.2 | 12.6 |
| MPLCG0630LR82* | 0.82 | ±20% | 7.0 | 13.1 | 11.8 |
| MPLCG0630L1R0 | 1.00 | ±20% | 9.0 | 11.9 | 11.3 |
| MPLCG0630L1R5 | 1.50 | ±20% | 15.0 | 9.9 | 8.3 |
| MPLCG0630L2R2 | 2.20 | ±20% | 19.0 | 8.2 | 7.8 |
| MPLCG0630L3R3 | 3.30 | ±20% | 30.0 | 6.5 | 6.3 |
| MPLCG0630L4R7 | 4.70 | ±20% | 41.0 | 5.5 | 5.4 |

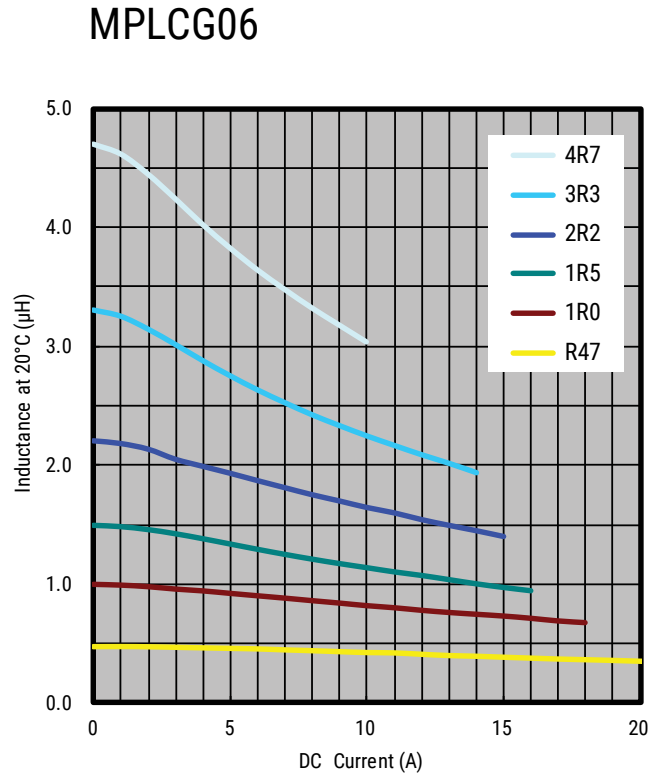
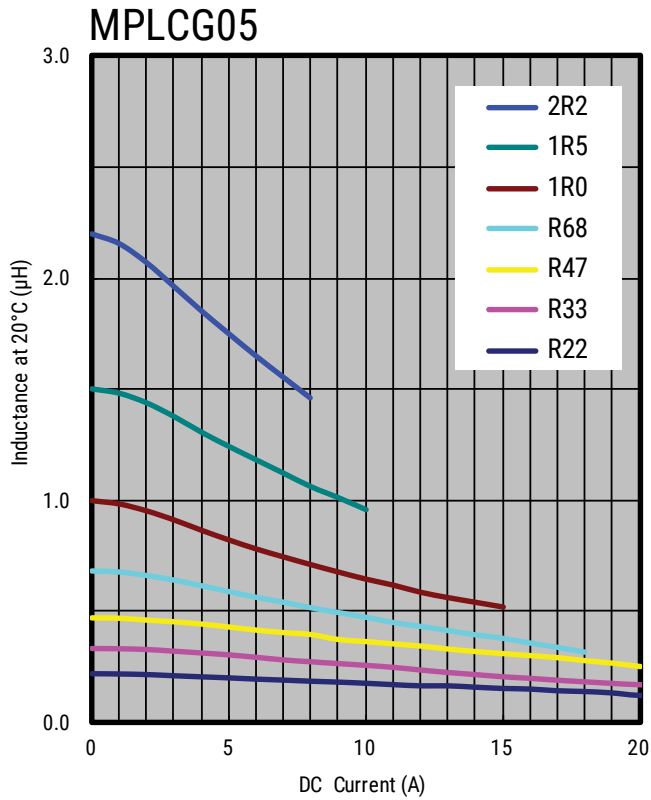
¹ T = 40 K rise at rated current

² Inductance drop 20% at rated current

All electrical characteristics data is referenced to 20°C.

* This part is not for new design.

DC-Superposed Characteristics

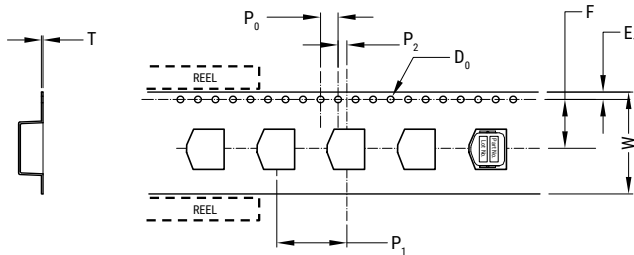


Dimensions

| Case Size | Dimensions (mm) | Land Pattern (mm) |
|-----------|-----------------|-------------------|
| MPLCG0530 | | |
| MPLCG0630 | | |

Taping Specification

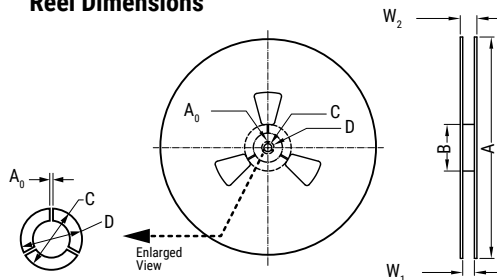
Dimensions of Indented Square Hole Plastic Tape



| Case Size | Reel Quantity | | Dimensions (mm) | | | | | | | | |
|-----------|---------------|-----------|-----------------|------|----------------|----------------|----------------|----------------|-----------------|-------|-------|
| | | | W | F | E ₁ | P ₁ | P ₂ | P ₀ | ∅D ₀ | T | |
| MPLCG0530 | 3,500 | Tolerance | ±0.3 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.05 | ±0.05 |
| | | Nominal | 12.0 | 5.5 | 1.75 | 8.0 | 2.0 | 4.0 | 1.55 | 0.4 | |
| MPLCG0630 | 2,000 | Tolerance | ±0.3 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.05 | ±0.05 |
| | | Nominal | 16.0 | 7.5 | 1.75 | 12.0 | 2.0 | 4.0 | 1.55 | 0.4 | |

Reel Specifications

Reel Dimensions



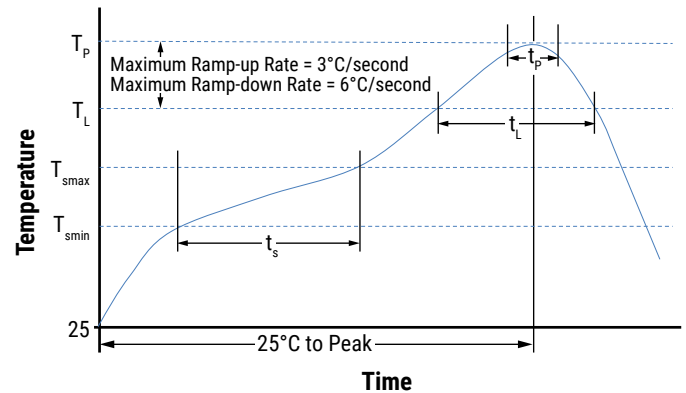
| Case Size | | Dimensions (mm) | | | | | | |
|-----------|-----------|-----------------|-------|-------|-------|----------------|----------------|----------------|
| | | A | B | C | D | A ₀ | W ₁ | W ₂ |
| MPLCG0530 | Tolerance | ±5.0 | ±10.0 | ±1.0 | ±0.8 | ±0.5 | ±1.5 | ±2.0 |
| | Nominal | ∅380 | ∅95 | ∅13.5 | ∅21.0 | 2.0 | 14.5 | 18.5 |
| MPLCG0630 | Tolerance | ±5.0 | ±10.0 | ±1.0 | ±0.8 | ±0.5 | ±1.0 | ±1.5 |
| | Nominal | ∅380 | ∅95 | ∅13.5 | ∅21.0 | 2.0 | 18.0 | 21.6 |

Soldering Process

Recommended Reflow Soldering Profile

Reference ICP/JEDEC J-STD-020E

| Profile Feature | Pb-Free Assembly |
|---|--------------------|
| Preheat/Soak | |
| Temperature Minimum (T_{smin}) | 150°C |
| Temperature Maximum (T_{smax}) | 200°C |
| Time (t_s) from T_{smin} to T_{smax} | 60 – 120 seconds |
| Ramp-up Rate (T_L to T_p) | 3°C/second maximum |
| Liquidous Temperature (T_L) | 217°C |
| Time Above Liquidous (t_L) | 60 – 150 seconds |
| Peak Temperature (T_p) | 250°C |
| Time within 5°C of Maximum Peak Temperature (t_p) | 30 seconds maximum |
| Ramp-down Rate (T_p to T_L) | 6°C/second maximum |
| Time 25°C to Peak Temperature | 8 minutes maximum |



Handling Precautions

Inductors should be stored in normal working environments. While the inductors themselves are quite robust in other environments, solderability will be degraded by exposure to high temperatures, high humidity, corrosive atmospheres, and long term storage.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity. Atmospheres should be free of chlorine and sulfur bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts. For optimized solderability, inductors' stock should be used promptly, preferably within six months of receipt.

Export Control

For customers in Japan

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

For customers outside Japan

Inductors should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destruction weapons (nuclear, chemical, biological weapons or missiles), or any other weapons.

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Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

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