

Overview

The KEMET MPCV metal composite inductors are ideal for use in DC to DC switching power supplies for automotive applications. The combination of composite core material and flat wire allows these inductors to be used in applications with high current loads and where efficiency is important.

Applications

Automotive ECU applications, such as:

- LED headlights
- Meter cluster panels
- Head-up displays (HUD)
- Electric water pumps (EWP)
- Electric oil pumps (EOP)
- Electric power steering (EPS)

Benefits

- Metal composite powder
- Operating temperature up to +155°C
- High current
- Low DCR
- Low acoustic noise
- Low magnetic flux leakage
- AEC-Q200 qualified



Part Number System

| MPCV | 1060 | L | 1R5 |
|--------|--------------|----------|--|
| Series | Size Code | Inductor | Inductance Code μH |
| MPCV | 1060 1260 | | R = decimal point Examples: R68 = 0.68 μH 1R5 = 1.50 μH |

Performance Characteristics

| Item | Performance Characteristics |
|---------------------------|---|
| Operating Temperature | -55°C to +155°C (including self-temperature rise) |
| Rated Inductance Range | 0.68 – 1.50 µH at 100 kHz, 1 mA |
| Inductance Tolerance | ±20% |
| Rated DC Resistance Range | 1.4 – 2.5 mΩ |
| DC Resistance Tolerance | ±10% |
| Rated Current Range | 22 – 32 A |

Table 1 – Ratings & Part Number Reference

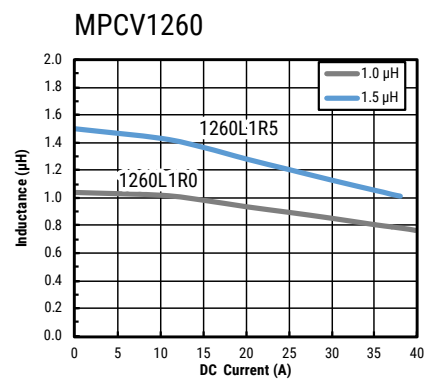
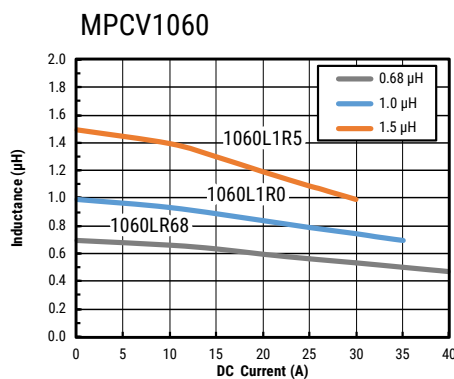
| Part Number | Inductance (µH) at 100 kHz, 1 mA | Inductance Tolerance | DC Resistance (mΩ) ±10% | Rated Current (A) | |
|--------------|-------------------------------------|-------------------------|----------------------------|--|--|
| | | | | I _{rms} ¹ (Reference) | I _{sat} ² (Reference) |
| MPCV1060LR68 | 0.68 | ±20% | 1.40 | 32 | 38 |
| MPCV1060L1R0 | 1.00 | ±20% | 1.70 | 26 | 35 |
| MPCV1060L1R5 | 1.50 | ±20% | 2.50 | 22 | 27 |
| MPCV1260L1R0 | 1.00 | ±20% | 1.50 | 32 | 42 |
| MPCV1260L1R5 | 1.50 | ±20% | 2.35 | 28 | 35 |

¹ T = 40 K rise at rated current

² Inductance drop 30% at rated current

All electrical characteristics data is referenced to 25°C.

DC-Superposed Characteristics

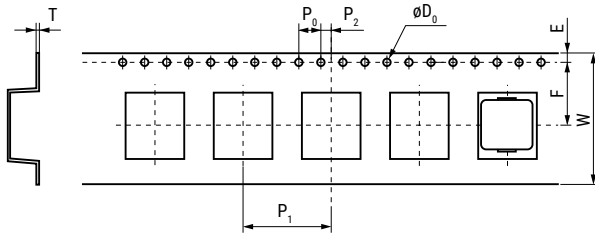


Dimensions

| Case Size | Dimensions (mm) | Land Pattern (mm) |
|-----------|--|---|
| MPCV1060 | <p>Technical drawing of MPCV1060 inductor showing top, side, and end views. Dimensions: 12.0 maximum (top width), 6.0 maximum (side width), (2.1) (end width), 10.0 ±0.3 (height), and 3.0 ±0.5 (terminal height).</p> | <p>Land pattern diagram for MPCV1060 showing a 3.6mm wide terminal with 3.3mm spacing and a 5.9mm pitch.</p> |
| MPCV1260 | <p>Technical drawing of MPCV1260 inductor showing top, side, and end views. Dimensions: 14.5 maximum (top width), 6.0 maximum (side width), (2.2) (end width), 12.5 ±0.3 (height), and 3.0 ±0.5 (terminal height).</p> | <p>Land pattern diagram for MPCV1260 showing a 3.6mm wide terminal with 3.4mm spacing and an 8.6mm pitch.</p> |

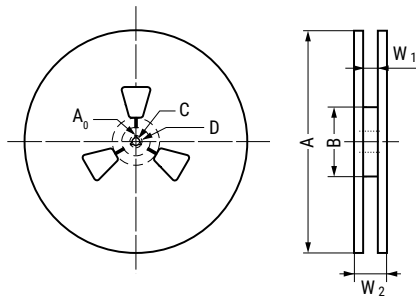
Taping Specification

Dimensions of Indented Square Hole Plastic Tape



| Case Size | Reel Quantity | | Dimensions (mm) | | | | | | | | |
|-----------|---------------|-----------|-----------------|-------|-------|----------------|----------------|----------------|-----------------|-------|-------|
| | | | W | F | E | P ₁ | P ₂ | P ₀ | øD ₀ | T | |
| MPCV1060 | 500 | Tolerance | ±0.30 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.05 | ±0.05 |
| | | Nominal | 24.00 | 11.50 | 1.75 | 24.00 | 2.00 | 4.00 | 1.55 | 0.40 | |
| MPCV1260 | 300 | Tolerance | ±0.30 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.10 | ±0.05 | ±0.05 |
| | | Nominal | 24.00 | 11.50 | 1.75 | 24.00 | 2.00 | 4.00 | 1.55 | 0.40 | |

Reel Specifications



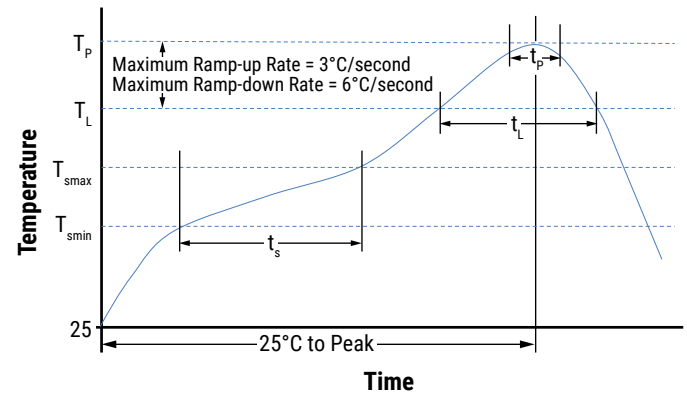
| Case Size | | Dimensions (mm) | | | | | | |
|-----------|-----------|-----------------|------|-------|-------|----------------|----------------|----------------|
| | | A | B | C | D | A ₀ | W ₁ | W ₂ |
| MPCV1060 | Tolerance | ±2.0 | ±2.0 | ±0.5 | ±0.8 | ±0.5 | | |
| | Nominal | ø380 | ø80 | ø13.0 | ø21.0 | 2.3 | 25.4 | 29.4 |
| MPCV1260 | Tolerance | ±3.0 | ±1.0 | ±0.5 | ±0.8 | ±0.5 | | |
| | Nominal | ø330 | ø100 | ø13.0 | ø21.5 | 2.6 | 25.0 | 29.0 |

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) | 245°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, exposure to high temperatures, high humidity, corrosive atmospheres, and long-term storage degrades solderability.

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-bearing and sulfur-bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts.

For optimized solderability, inductor stock should be used promptly, preferably within six months of receipt.

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