CMC 14 Common Mode Chokes Series
High Grade - Improved Temperature Stability

- Less than 20% performance variations versus temperature (-55°C/+125°C)
- Minimum impedance attenuation: 100 Ω from 100 kHz to 30 MHz
- Compact SMD package (2x4 pins)
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180°C)
- Operating/storage temperature range: -55°C to +125°C
- Approx. weight: 5 grams

**Electrical Data**

<table>
<thead>
<tr>
<th>ID Code</th>
<th>Inductance Value at 25°C (-40/+35%)</th>
<th>MAX RMS Current for ΔT = 40°C</th>
<th>MAX DC Resistance (25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMC14 M14 2WR</td>
<td>140 µH</td>
<td>7.2 A</td>
<td>2.7 mΩ</td>
</tr>
<tr>
<td>CMC14 M25 2WR</td>
<td>248 µH</td>
<td>6.4 A</td>
<td>3.5 mΩ</td>
</tr>
<tr>
<td>CMC14 M39 2WR</td>
<td>387 µH</td>
<td>5.7 A</td>
<td>4.2 mΩ</td>
</tr>
<tr>
<td>CMC14 M56 2WR</td>
<td>558 µH</td>
<td>5.4 A</td>
<td>5.0 mΩ</td>
</tr>
<tr>
<td>CMC14 M76 2WR</td>
<td>760 µH</td>
<td>4.5 A</td>
<td>7.0 mΩ</td>
</tr>
<tr>
<td>CMC14 M99 2WR</td>
<td>992 µH</td>
<td>3.8 A</td>
<td>10.0 mΩ</td>
</tr>
<tr>
<td>CMC14 M122 2WR</td>
<td>1255 µH</td>
<td>3.2 A</td>
<td>14.0 mΩ</td>
</tr>
<tr>
<td>CMC14 M152 2WR</td>
<td>1550 µH</td>
<td>2.6 A</td>
<td>20.0 mΩ</td>
</tr>
<tr>
<td>CMC14 M182 2WR</td>
<td>2232 µH</td>
<td>2.2 A</td>
<td>29.0 mΩ</td>
</tr>
</tbody>
</table>

**Typical Dimensions**

(mm, top view)

**Notes**

1. Dielectric strength test: 500V (50Hz - 1min)
2. Max power dissipation at +125°C: 400mW
3. Heat increase at Max current ≤ 25°C
4. 1:1 ratio (sector wound construction)
5. Interwinding capacitances < 15pF
6. Variation of «L» values over the working temperature range ≤ 15%
7. Admissible temp. during reflow soldering: +260°C/30 seconds

**Connections**

**PCB Layout**

(suggested)

**Marking**

- Tape and Reel: 200 units per reel of diameter 330 mm

**Unreeling**

- P1: 20
- Po: 4.0
- W: 44.0
- So: none
**CMC 17 Common Mode Chokes Series**

**High Grade - Improved Temperature Stability**

- Less than 20% performance variations versus temperature (-55 °C / +125 °C)
- Minimum impedance attenuation: 100 Ω from 100 kHz to 30 MHz
- Compact SMD package (2x4 pins)
- RMS current range: from 1.1 A to 11.7 A for 40 °C heating above 25 °C
- Materials meet UL94-V0 rating
- Thermal index according to IEC85: H (180 °C)
- Operating/storage temperature range: -55 °C to +125 °C
- Approx weight: 10 grams

### Electrical Data

<table>
<thead>
<tr>
<th>ID Code</th>
<th>Inductance Value at 25°C (-40/+35%)</th>
<th>Typical SRF</th>
<th>Max Impedance (Typical)</th>
<th>Max Attenuation (Z = 50Ω)</th>
<th>MAX RMS Current for ∆T = 40°C</th>
<th>MAX DC Resistance (25°C)</th>
<th>Typical Leakage Inductance (100kHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMC17 M45 1WR</td>
<td>0.45 mH</td>
<td>32 MHz</td>
<td>1 kΩ</td>
<td>20 dB</td>
<td>11.7 A</td>
<td>5 mΩ</td>
<td>0.5 μH</td>
</tr>
<tr>
<td>CMC17 M21 1WR</td>
<td>1.15 mH</td>
<td>15 MHz</td>
<td>1.9 kΩ</td>
<td>26 dB</td>
<td>8.3 A</td>
<td>10 mΩ</td>
<td>1.1 μH</td>
</tr>
<tr>
<td>CMC17 M26 1WR</td>
<td>2.59 mH</td>
<td>8 MHz</td>
<td>3.7 kΩ</td>
<td>32 dB</td>
<td>6 A</td>
<td>18 mΩ</td>
<td>2.3 μH</td>
</tr>
<tr>
<td>CMC17 M38 1WR</td>
<td>5.83 mH</td>
<td>1.5 MHz</td>
<td>5.3 kΩ</td>
<td>35 dB</td>
<td>4 A</td>
<td>40 mΩ</td>
<td>6.3 μH</td>
</tr>
<tr>
<td>CMC17 M12 1WR</td>
<td>13.1 mH</td>
<td>0.6 MHz</td>
<td>9.4 kΩ</td>
<td>40 dB</td>
<td>2.7 A</td>
<td>90 mΩ</td>
<td>13.4 μH</td>
</tr>
<tr>
<td>CMC17 M13 1WR</td>
<td>30.3 mH</td>
<td>0.3 MHz</td>
<td>15.8 kΩ</td>
<td>44 dB</td>
<td>1.7 A</td>
<td>220 mΩ</td>
<td>32 μH</td>
</tr>
<tr>
<td>CMC17 M16 1WR</td>
<td>69.2 mH</td>
<td>0.1 MHz</td>
<td>29 kΩ</td>
<td>49 dB</td>
<td>1.1 A</td>
<td>500 mΩ</td>
<td>70 μH</td>
</tr>
</tbody>
</table>

### Notes

1. Dielectric strength test: 500v (50Hz - 1min)
2. 1:1 ratio (sector wound construction)

### Connections

![Connections Diagram]

### PCB Layout (suggested)

![PCB Layout Diagram]

### Marking

![Marking Diagram]

- yyww: Date code
CMC 17 Common Mode Chokes Series
High Grade - Improved Temperature Stability

Impedance

Typical values at 25°C with 1 mT at 10 kHz

Attenuation

Typical values (Z=50 Ω) at 25°C with 1 mT at 10 kHz

Variation vs Temperature

Change in inductance value (<1 mT at 10 kHz)

Attenuation Measurement Circuit

CMC17 range uses very high performance materials and therefore, offers remarkable temperature stability figures compared to standard or high-perm ferrite cores.
CMC 17 Common Mode Chokes Series
High Grade - Improved Temperature Stability

Derating Curves

All thermal measurements under atmospheric conditions with component mounted on 1 dm² PCB without cooling device. All above graphs indicate maximum RMS current allowed through component v. ambient temperature for a defined ∆T. Maximum operating temperature is +125 °C.

Example:
CMC17 M45 for application with Tamb = +85 °C Max current allowed is <11 Arms with ∆T<40 °C.
If temp increase allowed in application is limited to ∆T<20 °C, current must be reduced to 8 Arms.
• The operating temperature announced in the datasheets takes into account maximum ambient temperature around the component + its self heating temperature in operation.
• Typical $T^\circ$ range is -55°C +125°C for usual embedded applications (avionics, defence, space...) in order to ensure a good ageing of the products.
• Microspire guarantees an extended lifetime in this operational $T^\circ$ range, because only high temperature class materials are used and offer sufficient safety margin: all plastic materials used are H class according to IEC85 standard (180°C during 20,000 hours) and magnetic cores show a high Curie temperature value ($T_C > 200°C$).
• Typical values for admissible current at $+25°C$ ambient for a $40°C$ nominal temperature increase are defined without any heatsink in our litterature.
• When using an appropriate cooling device, these values can be slightly increased
• The associated derating curves allow to check maximum current possible in the component versus acceptable temperature increase above ambient temperature of the application.

In this example, CMC2258K is chosen for an application at $T_{amb} = +85°C$. Max recommended RMS current is then $< 14A$ with $\Delta T < 40°C$.
If temperature increase in the application is limited to $\Delta T < 20°C$, current value must be reduced to $< 10A$.

• With the above data, it is clear that the « theoretical » maximum possible current reaches zero for $+125°C$ ambient temperature (because heating above is not recommended) !
• However, it still remains possible to load the component with current leading to operating temperature greater than $+125°C$ but in this case, extended lifetime for the product is not guaranteed any longer.
• Heating values versus current above $+125°C$ operating temperature can still be calculated upon request.