HCM1A0805V2
Automotive grade high current power inductors

Product features
- AEC-Q200 qualified
- High current carrying capacity
- Magnetically shielded, low EMI
- DC-DC converter applications up to 1 MHz
- Filtering applications up to Self Resonant Frequency (SRF) [See product specification table]
- Inductance range from 3.3 μH to 47 μH
- Current range from 2.5 A to 9.2 A
- 8.4 mm x 8.0 mm footprint surface mount package in a 5.4 mm height
- Moisture Sensitivity Level (MSL): 1
- Alloy powder core material

Applications
- Body electronics
  - Central body control module
  - Vehicle access control system
  - Headlamps, tail lamps and interior lighting and LED lighting
  - Heating ventilation and air conditioning controllers (HVAC)
  - Doors, window lift and seat control
- Advanced driver assistance systems
  - Adaptive cruise control (ACC)
  - Automatic parking control
  - Collision avoidance system/ Car black box system
- Infotainment and cluster electronics
  - Audio subsystem: head unit and trunk amp
  - Digital instrument cluster
  - In-vehicle infotainment (IVI) and navigation
  - Port power/USB HUB for front and rear passengers
- Chassis and safety electronics
  - Airbag control unit
  - Electronic stability control system (ESC)
- Engine and Powertrain Systems
  - Electric pumps, motor control and auxiliaries
  - Powertrain control module (PCU)/ Engine Control unit (ECU)
  - Transmission Control Unit (TCU)

Environmental data
- Storage temperature range (Component): -55 °C to +155 °C
- Operating temperature range: -55 °C to +155 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant
Technical Data 10902
Effective July 2019

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www.eaton.com/electronics

Part marking: 1AxxxV2, xxx=inductance value in μH, R=decimal point. If no R is present then last character equals number of zeros. xxxx=Lot code

All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ±0.3 millimeters unless stated otherwise
Pad layout tolerances are ±0.1 millimeters unless stated otherwise
DCR measured from point “a” to point “b”
Do not route traces or vias underneath the inductor
Packaging information (mm)
Drawing not to scale
Supplied in tape and reel packaging, 500 parts per 13” diameter reel

Core loss vs $B_{p-p}$

![Graphs showing core loss vs $B_{p-p}$ for different inductor models at various frequencies.](image-url)
Core loss vs $B_{p-p}$

**HCM1A0805V2-220-R**

- 50 kHz
- 100 kHz
- 300 kHz
- 500 kHz
- 700 kHz

**HCM1A0805V2-330-R**

- 50 kHz
- 100 kHz
- 300 kHz
- 500 kHz
- 700 kHz

**HCM1A0805V2-470-R**

- 50 kHz
- 100 kHz
- 300 kHz
- 500 kHz
- 700 kHz
Inductance and impedance vs. frequency

HCM1A0805V2-3R3-R

HCM1A0805V2-4R7-R

HCM1A0805V2-100-R

HCM1A0805V2-150-R

HCM1A0805V2-220-R

HCM1A0805V2-330-R
Inductance and impedance vs. frequency
Inductance and temperature rise vs. current

**HCM1A0805V2-3R3-R**

- Inductance (µH)
- Temperature rise (°C)
- Idc (A)

**HCM1A0805V2-4R7-R**

- Inductance (µH)
- Temperature rise (°C)
- Idc (A)

**HCM1A0805V2-100-R**

- Inductance (µH)
- Temperature rise (°C)
- Idc (A)

**HCM1A0805V2-150-R**

- Inductance (µH)
- Temperature rise (°C)
- Idc (A)

**HCM1A0805V2-220-R**

- Inductance (µH)
- Temperature rise (°C)
- Idc (A)

**HCM1A0805V2-330-R**

- Inductance (µH)
- Temperature rise (°C)
- Idc (A)
Inductance and temperature rise vs. current

![Graph showing inductance and temperature rise vs. current for HCM1A0805V2-470-R. The x-axis represents Idc (A) ranging from 0.0 to 4.5, and the y-axis represents OCL (µH) ranging from 0 to 50 on one side and Temperature rise (°C) ranging from 0 to 100 on the other side. The graph illustrates the relationship between inductance and temperature rise with varying current levels.]
Solder reflow profile

Table 1 - Standard SnPb solder (Tc)

<table>
<thead>
<tr>
<th>Package thickness</th>
<th>Volume &lt;350 mm³</th>
<th>Volume ≥350 mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2.5 mm</td>
<td>235 °C</td>
<td>220 °C</td>
</tr>
<tr>
<td>≥2.5 mm</td>
<td>220 °C</td>
<td>220 °C</td>
</tr>
</tbody>
</table>

Table 2 - Lead (Pb) free solder (Tc)

<table>
<thead>
<tr>
<th>Package thickness</th>
<th>Volume &lt;350 mm³</th>
<th>Volume 350 - 2000 mm³</th>
<th>Volume &gt;2000 mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.6 mm</td>
<td>260 °C</td>
<td>260 °C</td>
<td>260 °C</td>
</tr>
<tr>
<td>1.6 – 2.5 mm</td>
<td>260 °C</td>
<td>250 °C</td>
<td>245 °C</td>
</tr>
<tr>
<td>&gt;2.5 mm</td>
<td>250 °C</td>
<td>245 °C</td>
<td>245 °C</td>
</tr>
</tbody>
</table>

Reference J-STD-020

<table>
<thead>
<tr>
<th>Profile feature</th>
<th>Standard SnPb solder</th>
<th>Lead (Pb) free solder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat and soak</td>
<td>100 °C</td>
<td>150 °C</td>
</tr>
<tr>
<td>• Temperature min. (Tmin)</td>
<td>150 °C</td>
<td>200 °C</td>
</tr>
<tr>
<td>• Temperature max. (Tmax)</td>
<td>60-120 seconds</td>
<td>60-120 seconds</td>
</tr>
<tr>
<td>Average ramp up rate Tp to Tp</td>
<td>3 °C/ second max.</td>
<td>3 °C/ second max.</td>
</tr>
<tr>
<td>Liquidous temperature (Tl)</td>
<td>183 °C</td>
<td>217 °C</td>
</tr>
<tr>
<td>Time at liquidous (Tl)</td>
<td>60-150 seconds</td>
<td>60-150 seconds</td>
</tr>
<tr>
<td>Peak package body temperature (Tp)**</td>
<td>Table 1</td>
<td>Table 2</td>
</tr>
<tr>
<td>Time (Tp)** within 5 °C of the specified classification temperature (Tc)</td>
<td>20 seconds**</td>
<td>30 seconds**</td>
</tr>
<tr>
<td>Average ramp-down rate (Tp to Tmax)</td>
<td>6 °C/ second max.</td>
<td>6 °C/ second max.</td>
</tr>
<tr>
<td>Time 25 °C to peak temperature</td>
<td>6 minutes max.</td>
<td>8 minutes max.</td>
</tr>
</tbody>
</table>

* Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.
** Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum.