MPIA25-V2
Automotive grade
High current, low profile, miniature power inductors

Product features
• AEC-Q200 qualified
• High current carrying capacity in a compact standard 1008 (2520 metric) footprint
• Magnetically shielded, Low EMI
• Rugged construction
• Self resonant frequency (SRF) greater than 25 MHz
• Inductance range from 0.33 μH to 4.7 μH
• Current range from 1.2 A to 7.5 A
• 2.7 mm x 2.2 mm footprint surface mount package in 1.05 mm, 1.25 mm heights
• Moisture Sensitivity Level (MSL): 1

Applications
• Body electronics
  ▫ Central body control module
  ▫ Vehicle access control system
  ▫ Headlamps, tail lamps, interior lighting and LED lighting
  ▫ Doors, window lift and seat control
• Advanced driver assistance systems
  ▫ 77 GHz radar system
  ▫ Basic and smart surround, and rear and front view camera
  ▫ Adaptive cruise control (ACC)
  ▫ Automatic parking control
  ▫ Car black box system
• Infotainment and cluster electronics
  ▫ Active noise cancellation (ANC)
  ▫ Audio subsystem: head unit and trunk amp
  ▫ Digital instrument cluster
  ▫ In-vehicle infotainment (IVI) and navigation

Environmental data
• Storage temperature range (Component): -40 °C to +125 °C
• Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
• Solder reflow temperature: J-STD-020 (latest revision) compliant
• Halogen free, lead free, RoHS compliant
## Technical Data

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### Product Specifications

<table>
<thead>
<tr>
<th>Part Number*</th>
<th>OCL (μH) ±20%</th>
<th>I rms (A)</th>
<th>I sat (A)</th>
<th>DCR (mΩ) typical @ +20 °C</th>
<th>DCR (mΩ) maximum @ +20 °C</th>
<th>SRF (MHz) typical</th>
<th>K-factor*</th>
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</thead>
<tbody>
<tr>
<td><strong>1.0 mm height</strong></td>
<td></td>
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<tr>
<td>MPIA2510V2-R33-R</td>
<td>0.33</td>
<td>4.8</td>
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<td>25</td>
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<td>44</td>
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<td>MPIA2510V2-1R0-R</td>
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<td>52</td>
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<td>1.22</td>
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<tr>
<td>MPIA2512V2-1R0-R</td>
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<tr>
<td>MPIA2512V2-2R2-R</td>
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<tr>
<td>MPIA2512V2-3R3-R</td>
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<td>135</td>
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<td>1965</td>
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<tr>
<td>MPIA2512V2-4R7-R</td>
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<td>1.9</td>
<td>196</td>
<td>235</td>
<td>25</td>
<td>1580</td>
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</tbody>
</table>

1. Open Circuit Inductance (OCL) Test Parameters: 1.0 MHz, 0.1 Vrms, 0.0 Ads, +25 °C.  
2. I rms: DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed +125 °C under worst case operating conditions verified in the end application.  
3. I sat: Peak current for approximately 30% rolloff @ +25 °C.  
4. K-factor: Used to determine Bp-p for core loss (see graph). Bp-p = K * L * ΔI. Bp-p (Gauss), K = (K-factor from table), L = (Inductance in μH), ΔI = (Peak to peak ripple current in Amps).  
5. Part Number Definition: MPIA25xxV2-xxx-R  
   MPIA25 = Product code  
   xx = Height indicator  
   V2 = Version indicator  
   xxx = Inductance value in μH, R = decimal point, If no R is present then last character equals number of zeros  
   - R suffix = RoHS compliant

### Dimensions (mm)

#### Dimension A

| MPIA2510V2 | 1.05 maximum |
| MPIA2512V2 | 1.25 maximum |

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### Recommended Pad Layout

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### Schematic

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- No marking
- All soldering surfaces to be coplaner within 0.10 millimeters
- Tolerances are ±0.2 millimeters unless stated otherwise
- Pad layout tolerances are ±0.1 millimeters unless stated otherwise
- Do not route traces or vias underneath the inductor

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Packaging information (mm)
Supplied in tape and reel packaging, 3000 parts per 7” diameter reel

Core loss vs. Bp-p (+25 °C)

MPIA2510V2-R33-R
MPIA2510V2-R47-R

Downloaded from Arrow.com.
Core loss vs. Bp-p (+25 °C)

MPIA2510V2-68-R

MPIA2510V2-1R0-R

MPIA2510V2-1R5-R

MPIA2510V2-2R2-R

MPIA2510V2-3R3-R

MPIA2510V2-4R7-R
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Core loss vs. Bp-p (+25 °C)
Technical Data 10650
Effective July 2018

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Core loss vs. Bp-p (+25 °C)

Inductance and Q vs. Frequency
MPIA25-V2
Automotive grade
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Inductance and Q vs. Frequency

MPIA2510V2-1R5-R

MPIA2510V2-2R2-R

MPIA2510V2-3R3-R

MPIA2510V2-4R7-R

MPIA2512V2-R33-R

MPIA2512V2-R47-R
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Inductance and Q vs. Frequency

MPIA2512V2-R68-R

MPIA2512V2-1R0-R

MPIA2512V2-1R5-R

MPIA2512V2-2R2-R

MPIA2512V2-3R3-R

MPIA2512V2-4R7-R

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Inductance and temperature rise vs. Current

MPIA2510V2-R33-R

MPIA2510V2-R47-R

MPIA2510V2-R68-R

MPIA2510V2-1R0-R

MPIA2510V2-1R5-R

MPIA2510V2-2R2-R
MPIA25-V2
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Inductance and temperature rise vs. Current

MPIA2510V2-3R3-R

MPIA2510V2-4R7-R

MPIA2512V2-R33-R

MPIA2512V2-R47-R

MPIA2512V2-R68-R

MPIA2512V2-1R0-R
MPIA25-V2
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Inductance and temperature rise vs. Current
Solder reflow profile

Reference JDEC 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>• Temperature min. ($T_{\text{min}}$)</td>
<td>100 °C</td>
</tr>
<tr>
<td></td>
<td>• Temperature max. ($T_{\text{max}}$)</td>
<td>150 °C</td>
</tr>
<tr>
<td></td>
<td>• Time ($T_{\text{min}}$ to $T_{\text{max}}$)</td>
<td>60-120 Seconds</td>
</tr>
<tr>
<td>Average ramp up rate ($T_{\text{max}}$ to $T_{P}$)</td>
<td>3°C/ Second Max.</td>
<td>3 °C/ Second Max.</td>
</tr>
<tr>
<td>Liquidous temperature ($T_{L}$)</td>
<td>183 °C</td>
<td>217 °C</td>
</tr>
<tr>
<td>Time at liquidous ($T_{L}$)</td>
<td>60-150 Seconds</td>
<td>60-150 Seconds</td>
</tr>
<tr>
<td>Peak package body temperature ($T_{P}$)</td>
<td>Table 1</td>
<td>Table 2</td>
</tr>
<tr>
<td>Time ($T_{P}$)** within 5 °C of the specified classification temperature ($T_{C}$)</td>
<td>20 Seconds**</td>
<td>30 Seconds**</td>
</tr>
<tr>
<td>Average ramp-down rate ($T_{D}$ to $T_{\text{max}}$)</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 ($T_{P}$) is defined as a supplier minimum and a user maximum.
** Tolerance for time at peak profile temperature ($T_{P}$) is defined as a supplier minimum and a user maximum.

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