

# ACE1V4532

## Automotive grade common-mode chip inductor



### Product features

- AEC-Q200 qualified
- 1812 (4532 metric) package
- Impedance range from 700 ohms to 15000 ohms
- Inductance range from 11 uH to 200 uH
- Moisture sensitivity level (MSL): 1

### Applications

- Controller area network (CAN)
- Ethernet architectures
- Automotive signal line filter
- Advanced driver assistance systems (ADAS)
- Infotainment, safety cameras, sensors, xEV, Powertrain
- Engine control unit (ECU)
- Electric power steering system (EPS)
- Battery management systems (BMS)

### Environmental compliance and general specifications

- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant

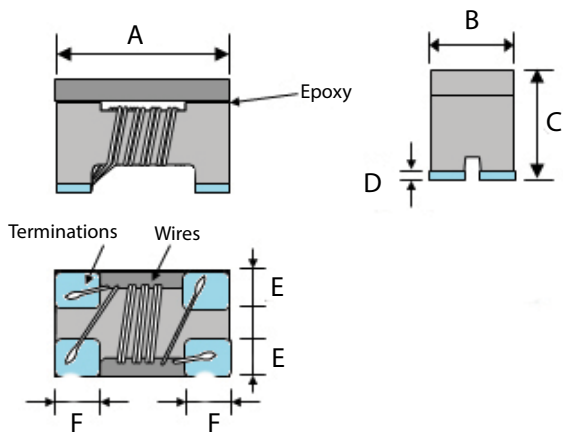


**Product specifications**

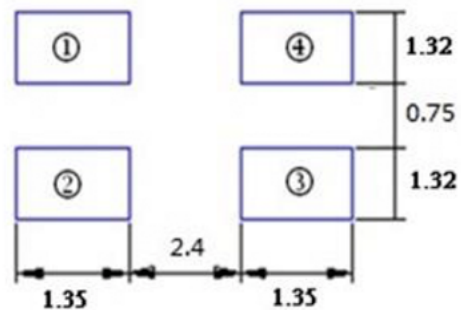
| Part number     | Common-mode impedance Z (Ω) at 10 MHz | Common-mode inductance (μH) at 100 kHz | DCR (Ω) @ +25 °C maximum | Idc (mA) maximum | Rated voltage (Vdc) typical | Insulation resistance (MΩ) minimum |
|-----------------|---------------------------------------|--|--------------------------|------------------|-----------------------------|------------------------------------|
| ACE1V4532-110-R | 300 minimum<br>700 typical            | 11 +50%/-30%                           | 0.60                     | 250              | 50                          | 10                                 |
| ACE1V4532-220-R | 500 minimum<br>1000 typical           | 22 +50%/-30%                           | 1.00                     | 200              | 50                          | 10                                 |
| ACE1V4532-510-R | 1000 minimum<br>2000 typical          | 51 +50%/-30%                           | 1.00                     | 200              | 50                          | 10                                 |
| ACE1V4532-101-R | 2000 minimum<br>5000 typical          | 100 +50%/-30%                          | 2.00                     | 150              | 50                          | 10                                 |
| ACE1V4532-201-R | 10000 minimum<br>15000 typical        | 200 +50%/-30%                          | 4.50                     | 100              | 50                          | 10                                 |

1. Part Number Definition: ACE1V4532-xxn-R  
 ACE1V4532 = Product code and size  
 xx= inductance value in uH,  
 n= multiplication factor: 10^n (i.e. 110 = 11 \* 10^0 = 11 uH)  
 -R suffix = RoHS compliant

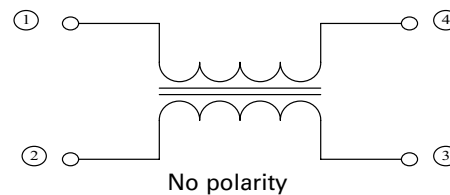
**Mechanical parameters, schematic, pad layout (mm)**



**Recommended pad layout**



**Equivalent circuit**

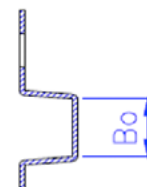
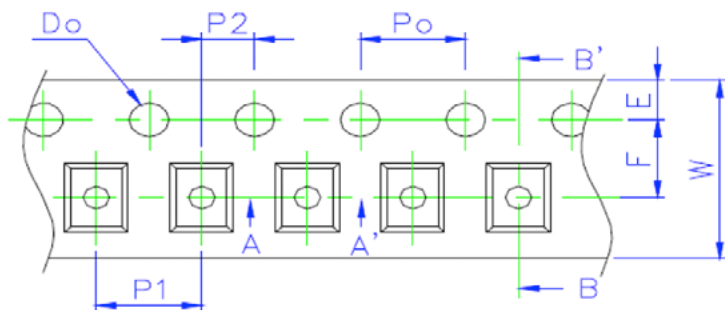


| Part Number     | A       | B        | C        | D        | E       | F       |
|-----------------|---------|----------|----------|----------|---------|---------|
| ACE1V4532-xxn-R | 4.5±0.2 | 3.2 ±0.2 | 2.8 ±0.2 | 0.2 ±0.1 | 1.2typ. | 1.0typ. |

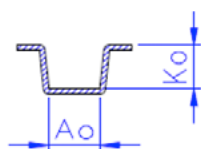
All soldering surfaces to be coplanar within 0.1 millimeters  
 Tolerances are ±0.1 millimeters unless stated otherwise  
 Pad layout dimensions are reference only  
 Traces or vias underneath the inductor is not recommended

**Packaging information (mm)**

Supplied in tape and reel packaging, 500 parts per 7" diameter reel



SEC: B-B'

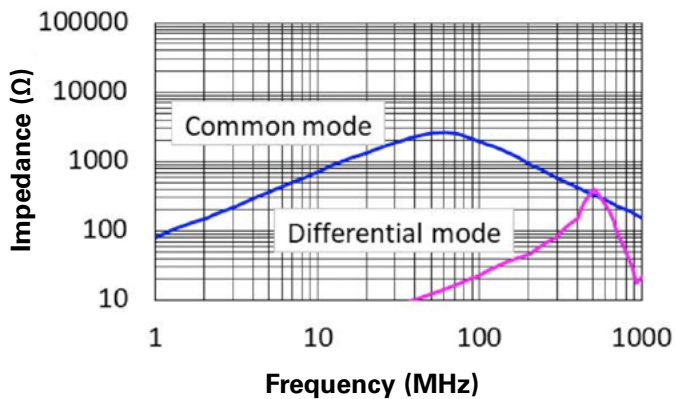


SEC: A-A'

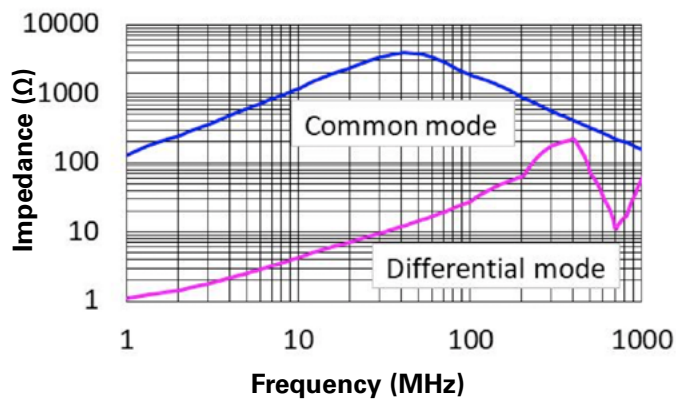
|       |                  |
|-------|------------------|
| $A_o$ | $3.45 \pm 0.10$  |
| $B_o$ | $4.90 \pm 0.10$  |
| $K_o$ | $3.05 \pm 0.10$  |
| $W$   | $12.00 \pm 0.20$ |
| $E$   | $1.75 \pm 0.10$  |
| $F$   | $5.50 \pm 0.05$  |
| $P_o$ | $4.0 \pm 0.05$   |
| $P_1$ | $8.0 \pm 0.10$   |
| $D_o$ | $1.5 + 0.1, -0$  |

Performance curves

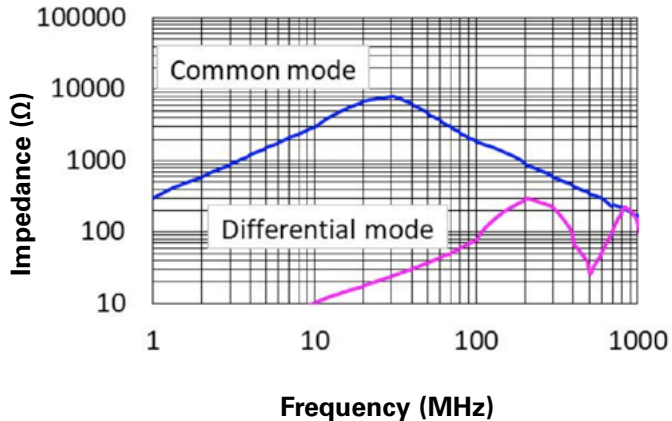
ACE1V4532-110-R



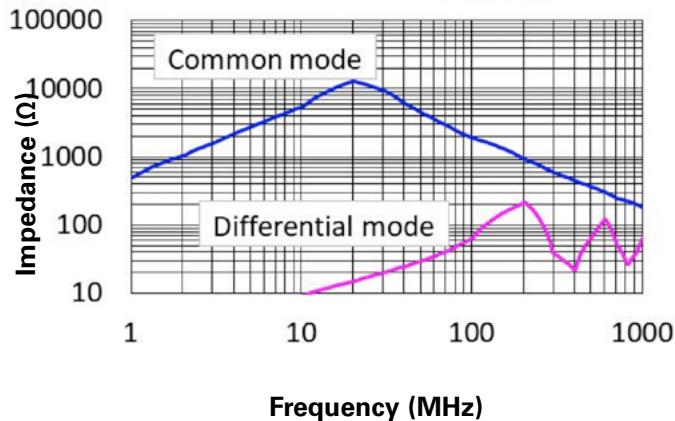
ACE1V4532-220-R



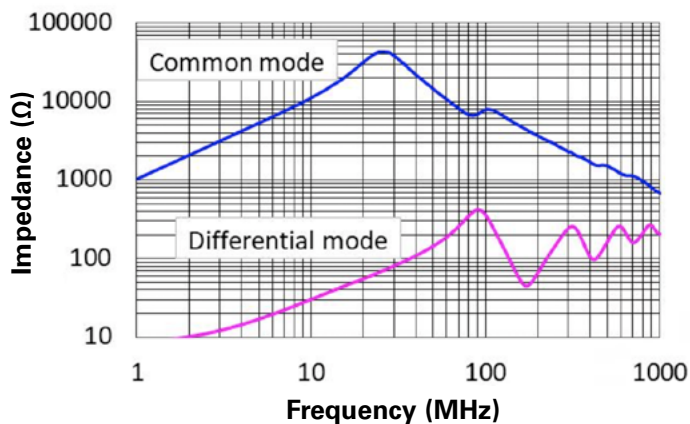
ACE1V4532-510-R



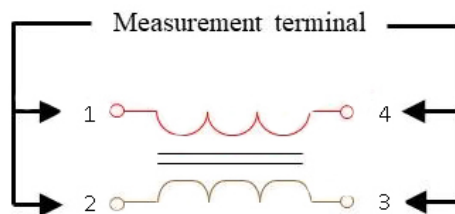
ACE1V4532-101-R



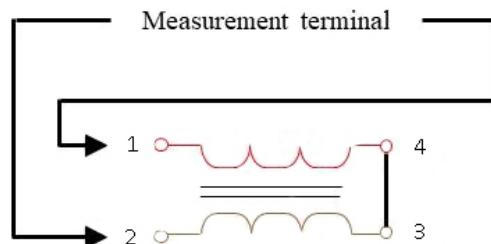
ACE1V4532-201-R



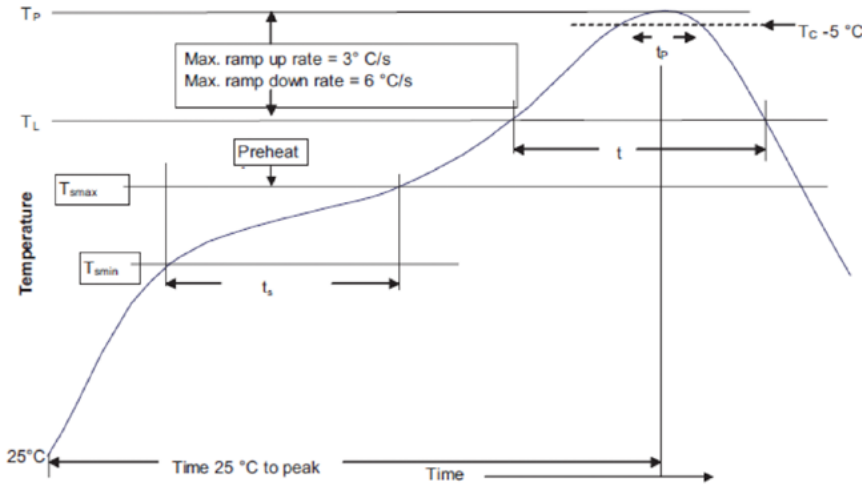
Common mode measurement method:



Differential mode measurement method:



**Solder reflow profile**



**Table 1 - Standard SnPb solder (T<sub>C</sub>)**

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5 mm           | 235 °C                      | 220 °C                      |
| ≥2.5 mm           | 220 °C                      | 220 °C                      |

**Table 2 - Lead (Pb) free solder (T<sub>C</sub>)**

| Package thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350 - 2000 | Volume mm <sup>3</sup> >2000 |
|-------------------|-----------------------------|-----------------------------------|------------------------------|
| <1.6 mm           | 260 °C                      | 260 °C                            | 260 °C                       |
| 1.6 – 2.5 mm      | 260 °C                      | 250 °C                            | 245 °C                       |
| >2.5 mm           | 250 °C                      | 245 °C                            | 245 °C                       |

**Reference J-STD-020**

| Profile feature   | Standard SnPb solder | Lead (Pb) free solder |
|---|----------------------|-----------------------|
| Preheat and soak  |                      |                       |
| • Temperature min. (T <sub>smin</sub> )   | 100 °C               | 150 °C                |
| • Temperature max. (T <sub>smax</sub> )   | 150 °C               | 200 °C                |
| • Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )                                | 60-120 seconds       | 60-120 seconds        |
| Ramp up rate T <sub>L</sub> to T <sub>P</sub>   | 3 °C/ second max.    | 3 °C/ second max.     |
| Liquidous temperature (T <sub>L</sub> )   | 183 °C               | 217 °C                |
| Time (t <sub>L</sub> ) maintained above T <sub>L</sub>  | 60-150 seconds       | 60-150 seconds        |
| Peak package body temperature (T <sub>P</sub> )*  | Table 1              | Table 2               |
| Time (t <sub>P</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> ) | 20 seconds*          | 30 seconds*           |
| Ramp-down rate (T <sub>P</sub> to T <sub>L</sub> )  | 6 °C/ second max.    | 6 °C/ second max.     |
| Time 25 °C to peak temperature  | 6 minutes max.       | 8 minutes max.        |

\* Tolerance for peak profile temperature (T<sub>P</sub>) is defined as a supplier minimum and a user maximum.

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