

# ACE1V2012

## Automotive grade common-mode chip inductor



### Product features

- AEC-Q200 qualified
- 0805 (2012 metric) package
- Impedance range from 90 ohms to 2200 ohms
- 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 +105 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant



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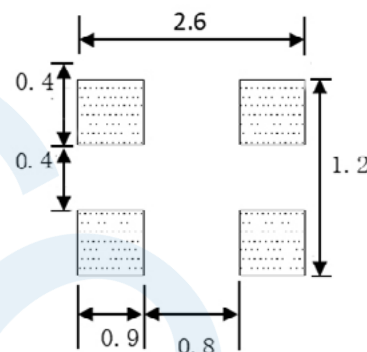
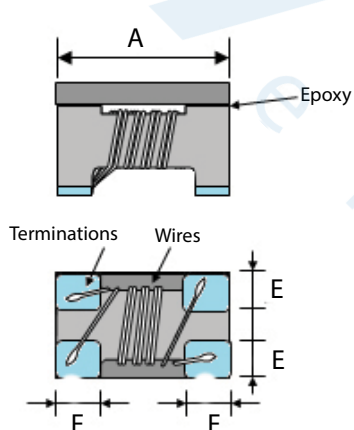
**Product specifications**

Part number	Common-mode impedance Z (Ω) at 100 MHz	DCR (Ω) @ +25 °C maximum	I <sub>dc</sub> (mA) maximum	Rated voltage (Vdc) typical	Insulation resistance (MΩ) minimum	Withstanding voltage (Vdc) typical
ACE1V2012-900-R	90 ±25%	0.3	400	50	10	125
ACE1V2012-121-R	120 ±25%	0.3	370	50	10	125
ACE1V2012-201-R	200 ±25%	0.35	330	50	10	125
ACE1V2012-361-R	360 ±25%	0.4	280	50	10	125
ACE1V2012-681-R	680 ±25%	0.8	220	50	10	125
ACE1V2012-102-R	1000 ±25%	1.5	190	50	10	125
ACE1V2012-222-R	2200 ±25%	2.0	150	50	10	125

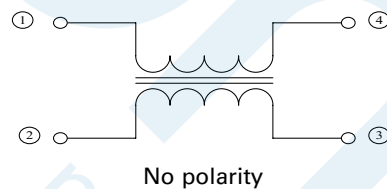
1. Part Number Definition: ACE1V2012-xxn-R  
 ACE1V2012 = Product code and size  
 xx= inductance value in ohms,  
 n= multiplication factor: 10<sup>n</sup> (i.e. 900 = 90 \* 10<sup>0</sup> = 90 ohms)  
 -R suffix = RoHS compliant

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

**Recommended pad layout**



**Equivalent circuit**

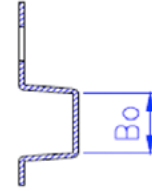
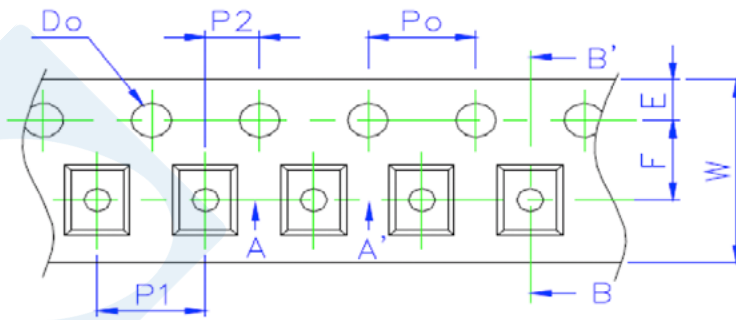


Part Number	A	B	C	D	E	F
ACE1V2012-xxn-R	2.0 ±0.2	1.2 ±0.2	1.2 ±0.2	0.2 ±0.1	0.40 typ	0.45 typ

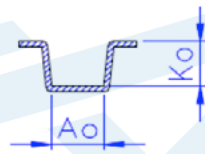
All soldering surfaces to be coplanar within 0.1 millimeters  
 Tolerances are ±0.1 millimeters unless stated otherwise  
 Pad layout dimensions are reference only  
 Traces or vias underneath the inductor is not recommended

**Packaging information (mm)**

Supplied in tape and reel packaging, 2000 parts per 7" diameter reel



SEC: B-B'

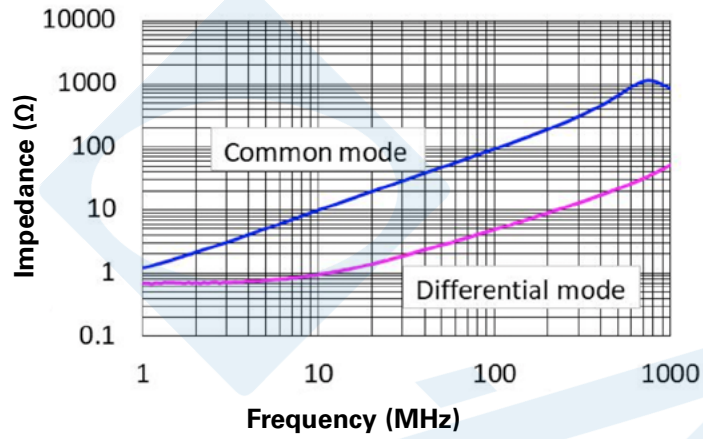


SEC: A-A'

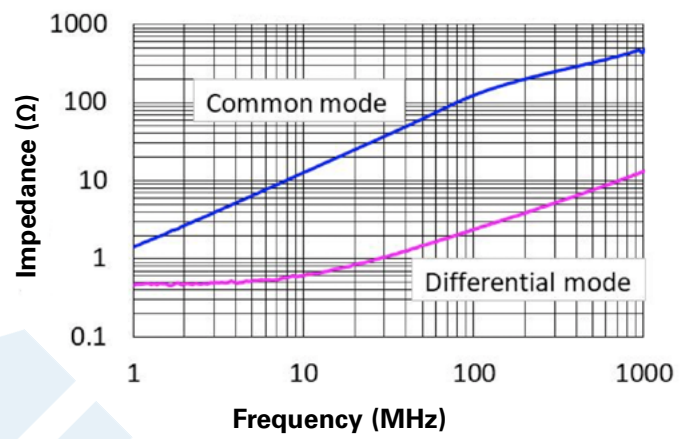
Ao	1.50±0.10
Bo	2.35±0.10
Ko	1.45±0.10
W	8.00±0.20
E	1.75±0.10
F	3.50±0.05
Po	4.0±0.05
P1	4.0±0.10
Do	1.0±0.1

Performance curves

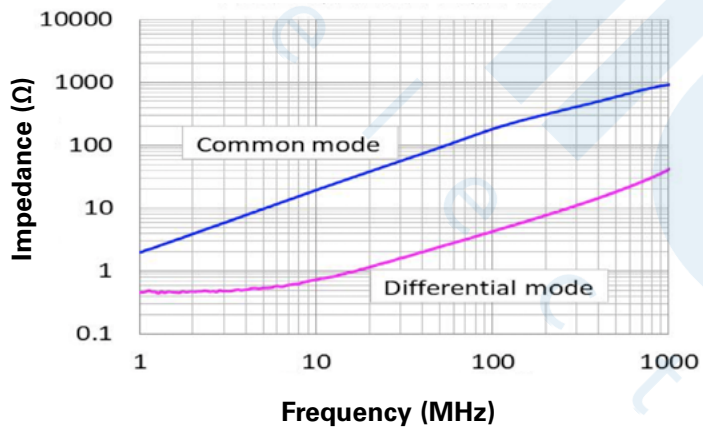
ACE1V2012-900-R



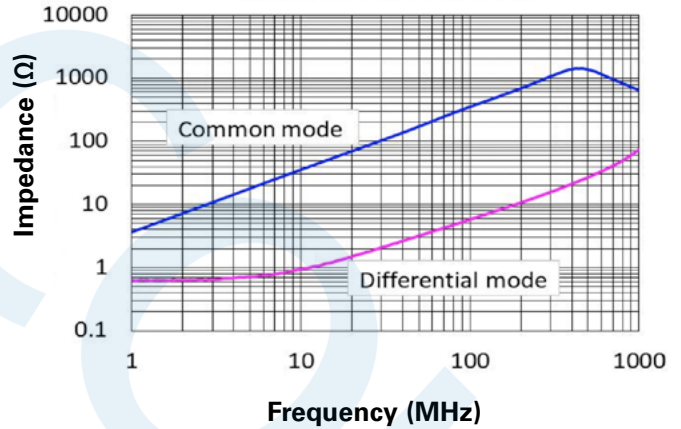
ACE1V2012-121-R



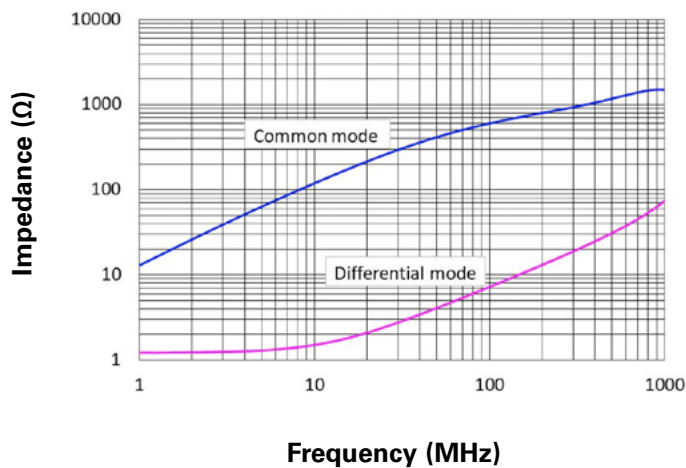
ACE1V2012-201-R



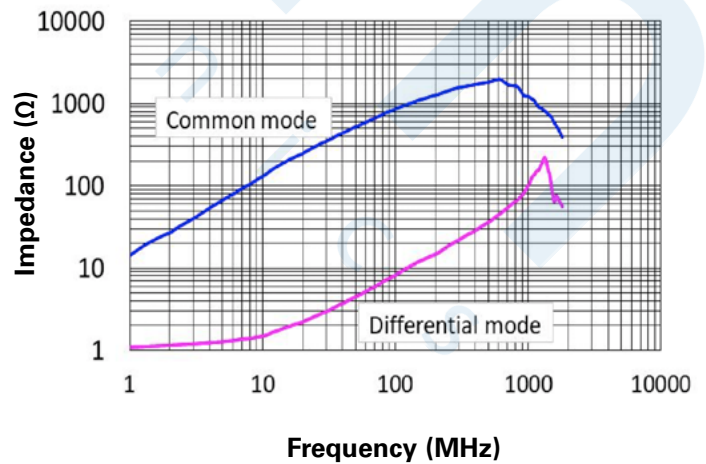
ACE1V2012-361-R



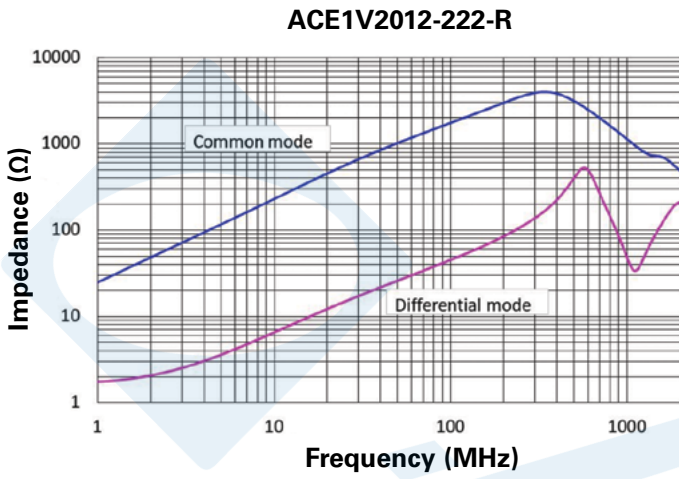
ACE1V2012-681-R



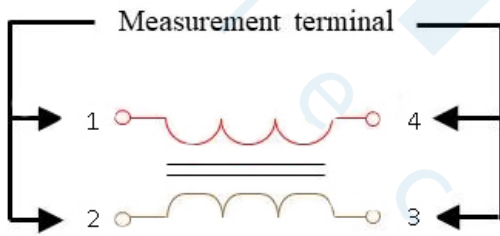
ACE1V2012-102-R



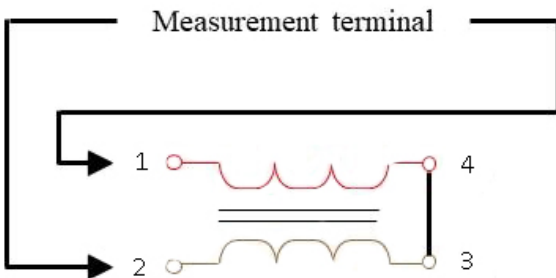
Performance curves



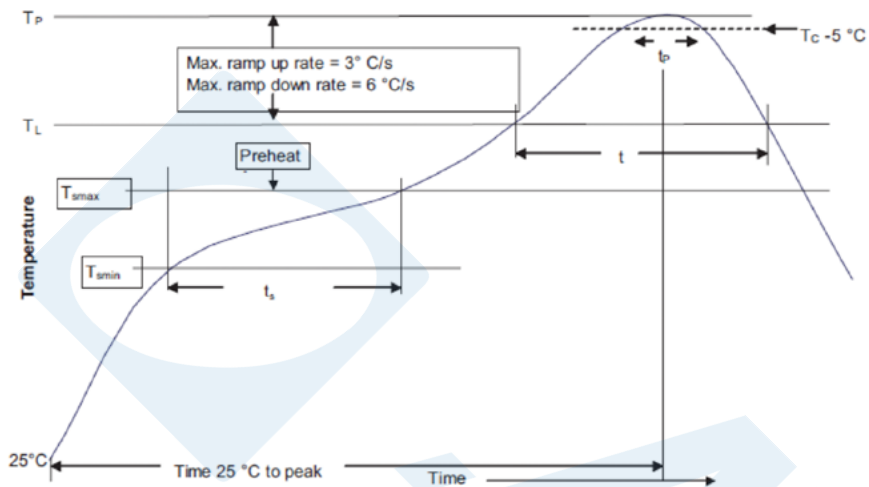
Common mode measurement method:



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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