

# ACE1V3225

## Automotive grade common-mode chip inductor



### Product features

- AEC-Q200 qualified
- 1210 (3225 metric) package
- Impedance range from 500 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

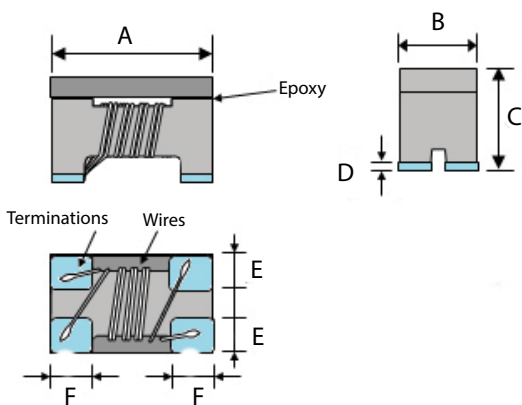


**Product specifications**

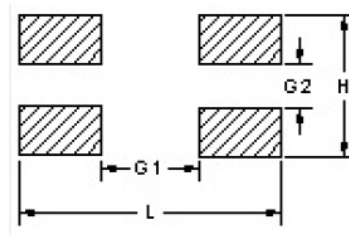
Part number	Common-mode impedance Z (Ω) at 10 MHz	Common-mode inductance (μH) at 100 kHz	DCR (Ω) @ +25 ° maximum	Idc (mA) maximum	Rated voltage (Vdc) typical	Insulation resistance (MΩ) minimum
ACE1V3225-110-R	300 minimum 500 typical	11+50%/-30%	0.40	300	80	10
ACE1V3225-220-R	500 minimum 1000 typical	22+50%/-30%	0.50	250	80	10
ACE1V3225-510-R	1000 minimum 2600 typical	51+50%/-30%	0.70	200	80	10
ACE1V3225-101-R	2200 minimum 5100 typical	100+50%/-30%	1.50	150	80	10
ACE1V3225-201-R	NA	200+30%/-20%	4.80	70	80	10

1. Part Number Definition: ACE1V3225-xxn-R  
 ACE1V3225 = 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

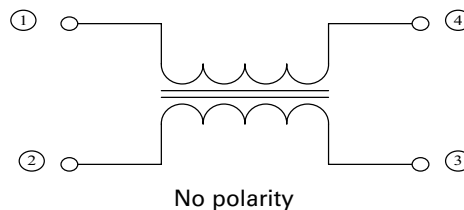
**Mechanical parameters, schematic, pad layout (mm)**



**Recommended pad layout**



**Equivalent circuit**

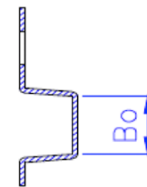
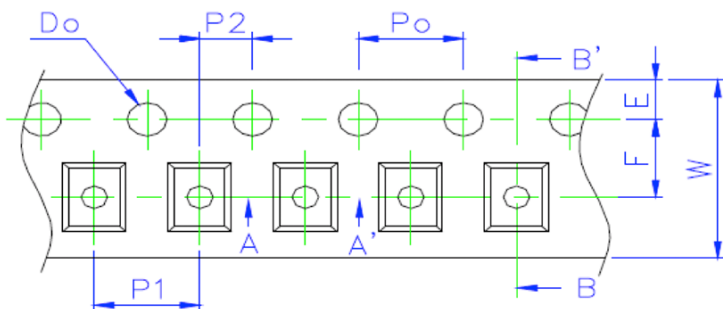


Part number	A	B	C	D	E	F	L	H	G1	G2
ACE1V3225-xxn-R	3.2±0.2	2.5±0.2	2.5 max	0.2±0.1	0.9 typ	08 typ	3.7 typ	2.55 typ	1.9 typ	0.75 typ

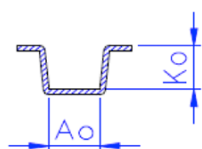
All soldering surfaces to be coplanar within 0.1 millimeters  
 Tolerances are ±0.1 millimeters unless stated otherwise  
 Pad layout dimensions are reference only  
 Traces or vias underneath the inductor is not recommended

**Packaging information (mm)**

Supplied in tape and reel packaging, 1000 parts per 7" diameter reel



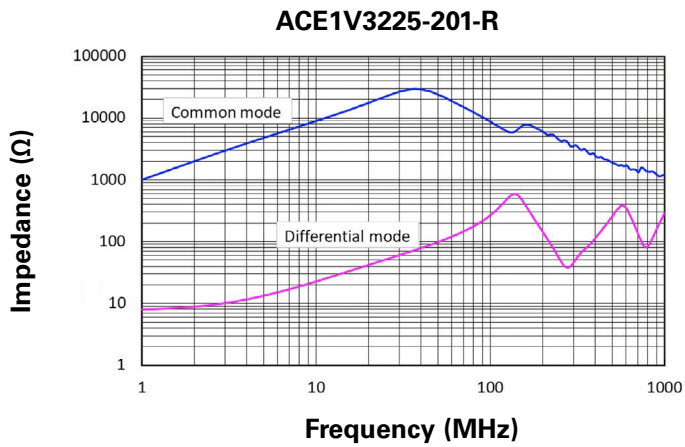
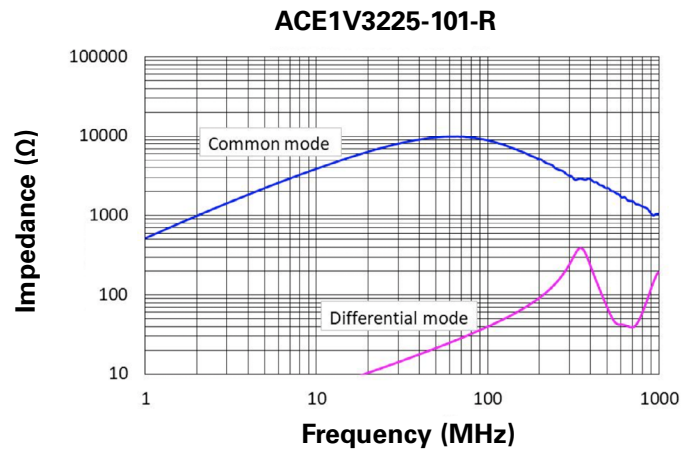
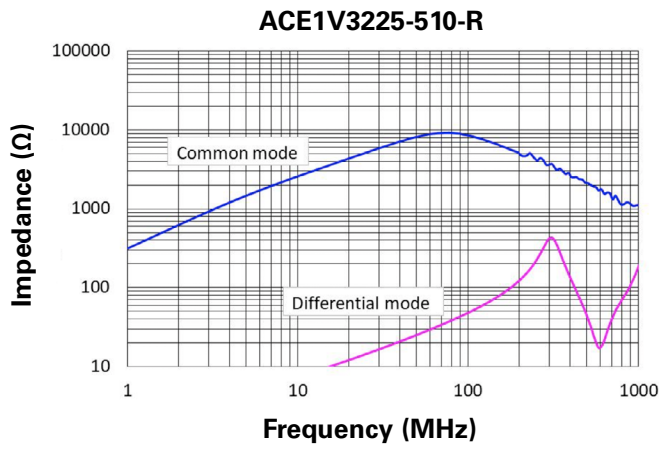
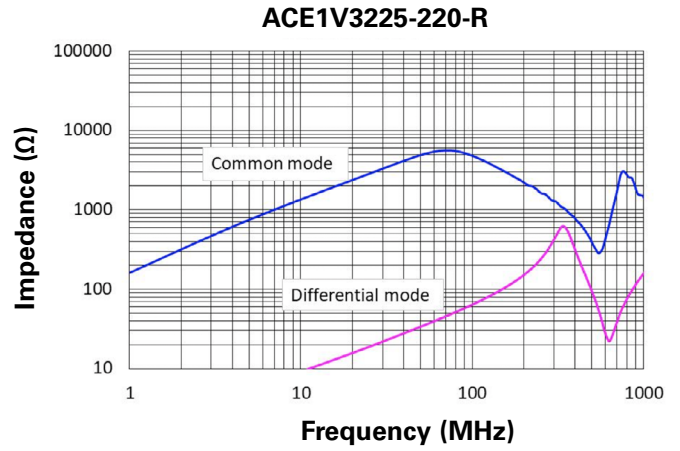
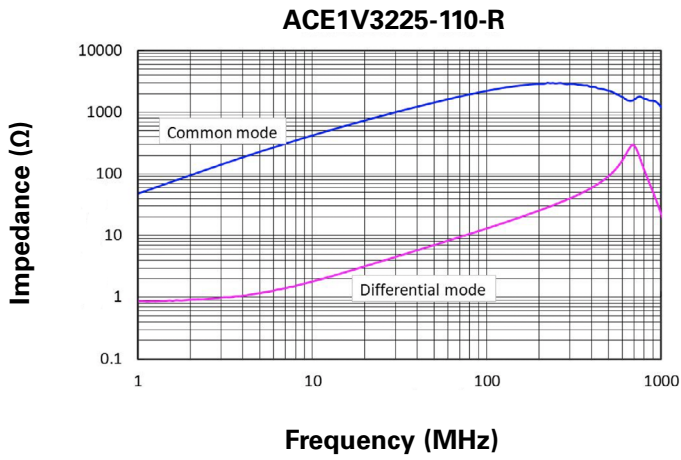
SEC: B-B'



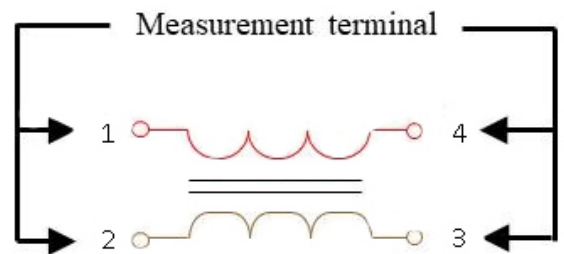
SEC: A-A'

$A_o$	$2.80 \pm 0.10$
$B_o$	$3.60 \pm 0.10$
$K_o$	$2.20 \pm 0.10$
$W$	$8.00 \pm 0.20$
$E$	$1.75 \pm 0.10$
$F$	$3.50 \pm 0.05$
$P_o$	$4.0 \pm 0.05$
$P_1$	$4.0 \pm 0.10$
$D_o$	$1.0 \pm 0.1$

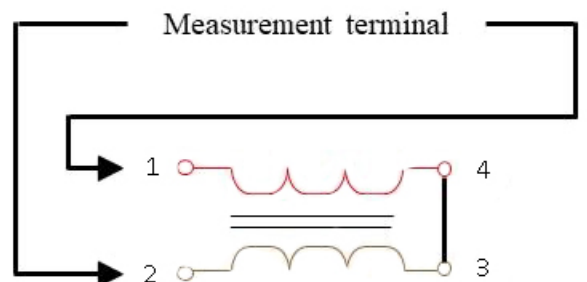
Performance curves



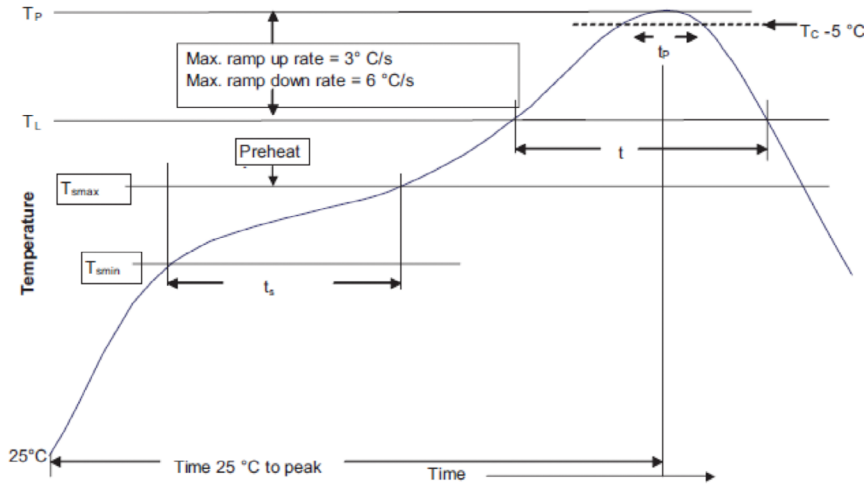
Common mode measurement method:



Differential mode measurement method:



**Solder reflow profile**



**Table 1 - Standard SnPb solder ( $T_C$ )**

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 ( $T_C$ )**

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. ( $T_{smin}$ )	100 °C	150 °C
• Temperature max. ( $T_{smax}$ )	150 °C	200 °C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	60-120 seconds
Ramp up rate $T_L$ to $T_p$	3 °C/ second max.	3 °C/ second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time ( $t_L$ ) maintained above $T_L$	60-150 seconds	60-150 seconds
Peak package body temperature ( $T_p$ )*	Table 1	Table 2
Time ( $t_p$ )* within 5 °C of the specified classification temperature ( $T_C$ )	20 seconds*	30 seconds*
Ramp-down rate ( $T_p$ to $T_L$ )	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 ( $T_p$ ) is defined as a supplier minimum and a user maximum.

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Printed in USA  
Publication No. 10985  
June 2021

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