

PCA1V3223

Automotive power-over-coax inductors for decoupling circuits



Product features

- AEC-Q200
- High reliability
- Ferrite core wire wound construction
- 1210 (3225 metric) package in 2.5 mm height
- 0.081 grams typical
- Moisture sensitivity level (MSL): 1

Applications

- ADAS camera
- SRR (Short range radar)
- LiDAR (Light detection and ranging)
- Vehicle communications
- Autonomous driving (3D mapping)
- Transmitting signal and power over single cable
- Decoupling circuits

Environmental compliance and general specifications

- Operating temperature range: -55 °C to +150 °C (ambient plus self-temperature rise)
- Storage temperature (component): -55 °C to +150 °C



Product specifications

Part number ¹	OCL ¹ (μH)	DCR (Ω) maximum @ +25 °C	SRF (MHz) minimum	I _{sat} ² (mA) typical +25 °C	I _{rms} ³ (mA) typical +85 °C	+105 °C	+125 °C
PCA1V3223-2R2-R	2.2 ± 20%	0.19	200	1,000	1,000	880	520
PCA1V3223-2R7-R	2.7 ± 20%	0.22	200	975	975	860	510
PCA1V3223-3R3-R	3.3 ± 20%	0.24	150	950	950	840	500
PCA1V3223-4R7-R	4.7 ± 20%	0.28	100	850	850	720	400
PCA1V3223-100-R	10 ± 20%	0.40	100	500	700	620	360
PCA1V3223-220-R	22 ± 20%	0.62	50	400	550	500	280
PCA1V3223-470-R	47 ± 20%	0.90	30	300	500	300	100

1. Open Circuit Inductance (OCL): Test frequency parameters: 1 MHz, 0.1 V @ 25 °C

2. I_{sat}: DC current that causes ≤ 30% inductance drop from its initial value.

3. I_{rms}: Heat rated current will cause the coil temperature rise without core loss. Ambient temperature (+85 °C/+105 °C/+125 °C): the part temperature (ambient temperature plus self-generation of heat should be under 150 °C).

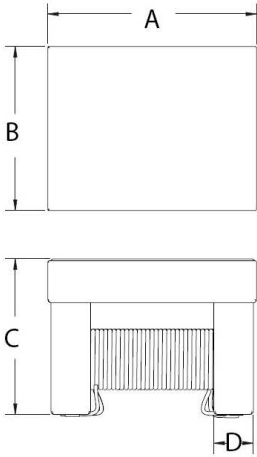
4. Part number definition: PCA1V3223-xxx-R

PCA1V3223= Product code and size

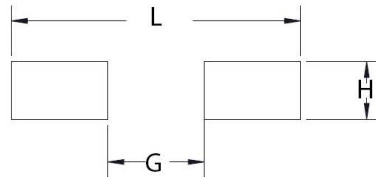
xxx= inductance value in μH, R= decimal point, if no R is present then last character equals number of zeros

-R suffix = RoHS compliant

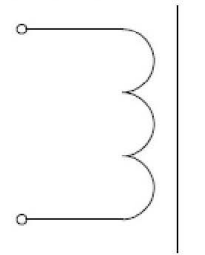
Mechanical parameters (mm)



Recommended pad layout



Schematic



Part number	A	B	C	D	L	G	H
PCA1V3223-XXX-R	3.20 ± 0.20	2.50 ± 0.20	2.30 ± 0.20	0.58 ± 0.10	3.80 ref	2.20 ref	2.80 ref

Part marking: No marking

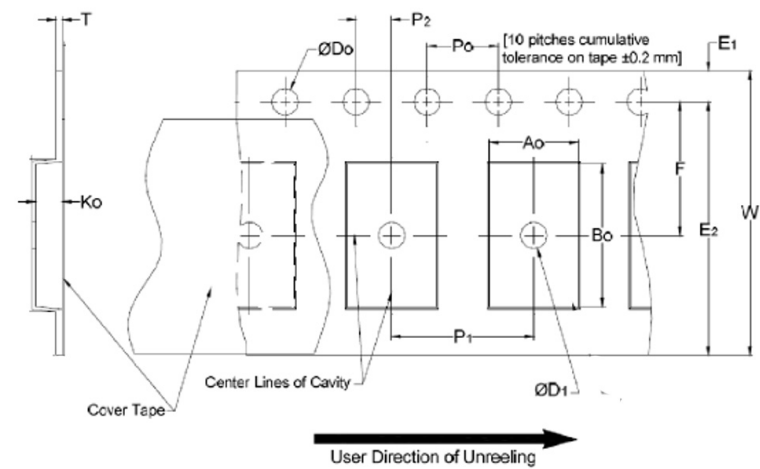
All soldering surfaces to be coplanar within 0.1 millimeters

Pad layout dimensions are reference only

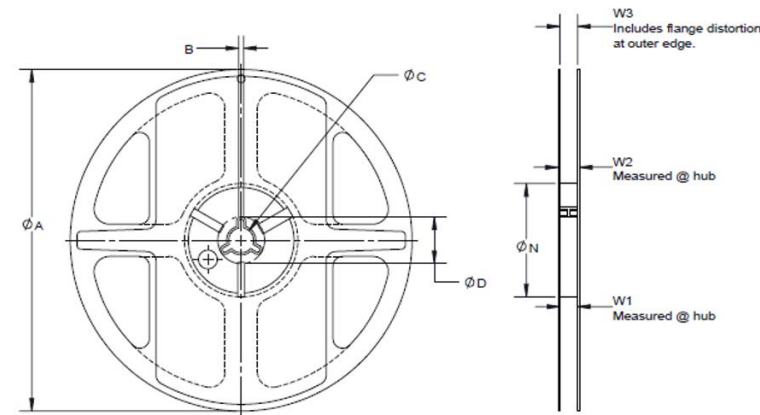
Traces or vias underneath the inductor is not recommended

Packaging information (mm)

Drawing not to scale
Supplied in tape and reel packaging, 1500 parts per 7" diameter reel (EIA-481 compliant)



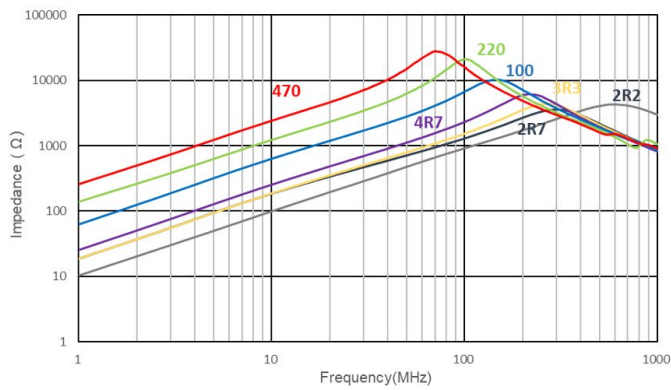
A ₀	2.7 ± 0.1
B ₀	3.5 ± 0.1
K ₀	2.75 ± 0.1
T	0.3 ± 0.05
W	8 ± 0.1
F	3.5 ± 0.05
E ₁	1.75 ± 0.1
E ₂	N/A
P ₀	4 ± 0.1
P ₁	4 ± 0.1
P ₂	2 ± 0.05
D ₀	1.5 + 0.1/-0
D ₁	1 ± 0.1



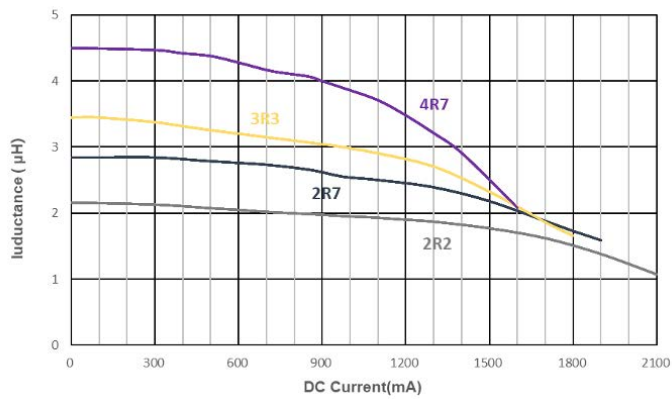
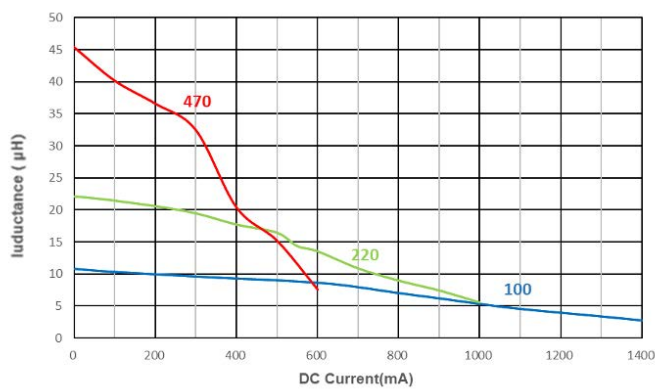
Shape & Appearance For Reference Only

Type	7" * 8
A	178 ± 2
B	2 ± 0.5
C	13.5 ± 0.5
D	21
N	60 ± 2
W ₁	9 ± 0.5
W ₂	N/A
W ₃	N/A

Impedance vs frequency



Inductance vs DC current



Solder reflow profile

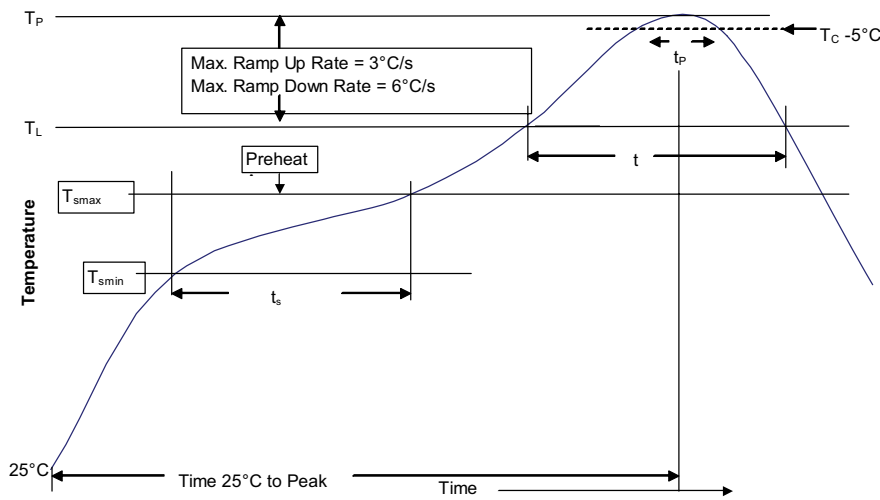


Table 1 - Standard SnPb solder (T_c)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥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 ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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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