

Power Inductor

Automotive Grade

APCP Series



Overview

Power inductors are passive electronic components used in various circuits to store energy in a magnetic field when electrical current flows through them. They are critical in filtering, energy storage, and noise suppression in power electronic systems. They are designed to handle higher currents and are optimized for minimal power loss and thermal efficiency.

Benefits

1. Automotive grade available
2. Dual winding in one ferrite core(Mn-Zn, Ni-Zn Material)
3. Good power factor(PFC) & high efficiency
4. SEPIC circuit application
5. No thermal aging

Applications

1. Automotive Systems for Lamp, Lighting
2. EMI solutions
3. Wide input voltage DC to DC converter(SEPIC)

Product Information

Series	L (mm)	W(mm)	T (mm)	Inductance (μH)
APCP	7.6	7.6	3.8	2.2 ~ 1000
	7.6	7.6	4.5	
	12.0	12.0	8.1	

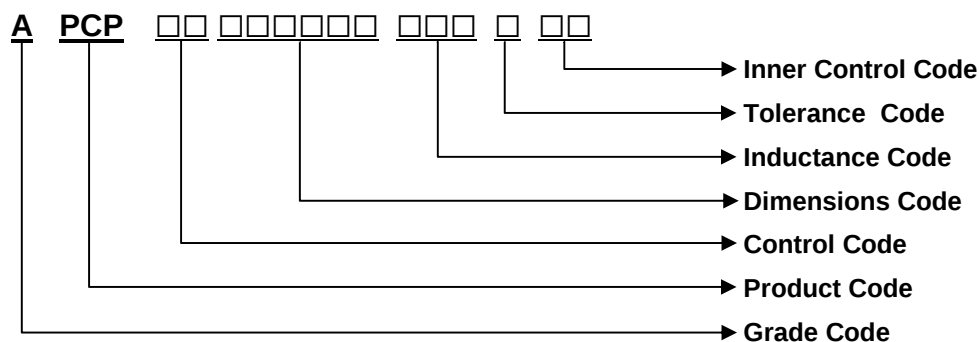


APCP00121281 Series Specification

AEC-Q200

1 Scope: This specification applies to the Pb Free high current type SMD inductors

2 Part Numbering:



3 Rating:

Operating Temperature: - 55°C ~ + 150°C (Including self temp. rise)

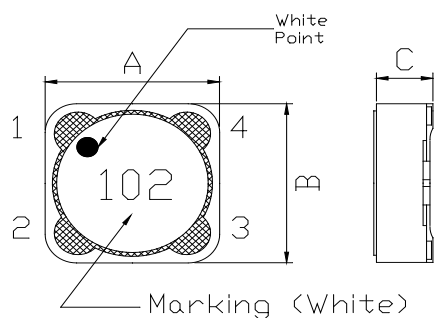
Storage Temperature: - 55°C ~ + 150°C (For after the circuit board is mounted)

Storage Temperature (on tape & reel): -20°C to +40°C; 75% RH max.

4 Standard Testing Condition:

	Unless otherwise specified	In case of doubt
Temperature	Ordinary Temperature (15 to 35°C)	20 to 30°C
Humidity	Ordinary Humidity (25 to 85% RH)	50 to 80 %RH

5 Configuration and Dimensions:



A: 12.0± 0.5	mm
B: 12.0± 0.5	mm
C: 8.1 Max.	mm
D: 5.7 Typ.	mm
E: 5.0 Typ.	mm
F: 1.6 Typ.	mm

Net Weight (grms)

SIZE CODE	Net Weight (grms)
121281	4.22(Typ.)

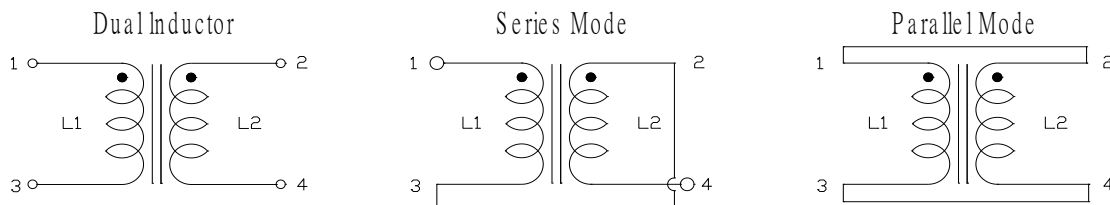
APCP00121281 Series Specification

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6 Electrical Characteristics:

Part No.	Inductance L1,2(μH)	Parallel Ratings				Series Ratings				Marking
		OCL	Resistance	Rated DC Current		OCL	Resistance	Rated DC Current		
		(μH)	RDC(Ω)Max.	Isat(A)	IrmsA)	(μH)	RDC(Ω)Max.	Isat(A)	Irms(A)	
APCP001212812R2T80	2.2	2.2±30%	9.2 m	25.50	12.50	8.8±30%	33.8 m	12.70	6.23	● 2R2
APCP001212813R3T80	3.3	3.3±30%	11.0 m	21.50	10.40	13.2±30%	40.0 m	10.80	5.23	● 3R3
APCP001212814R7T80	4.7	4.7±30%	13.5 m	16.50	8.25	18.8±30%	50.0 m	8.24	4.13	● 4R7
APCP001212816R8M80	6.8	6.8±20%	18.3 m	13.30	7.34	27.2±20%	65.6 m	6.67	3.67	● 6R8
APCP001212818R2M80	8.2	8.2±20%	19.1 m	12.20	6.32	32.8±20%	71.4 m	6.09	3.16	● 8R2
APCP00121281100M80	10	10±20%	24.1 m	11.20	6.04	40±20%	92.1 m	5.60	3.02	● 100
APCP00121281150M80	15	15±20%	33.3 m	9.66	5.03	60±20%	0.129	4.83	2.51	● 150
APCP00121281220M80	22	22±20%	50.3 m	7.57	4.00	88±20%	0.192	3.78	2.00	● 220
APCP00121281330M80	33	33±20%	66.4 m	6.22	3.23	132±20%	0.265	3.11	1.61	● 330
APCP00121281470M80	47	47±20%	89.8 m	5.28	2.95	188±20%	0.353	2.64	1.47	● 470
APCP00121281680M80	68	68±20%	0.123	4.44	2.44	272±20%	0.469	2.22	1.22	● 680
APCP00121281820M80	82	82±20%	0.153	4.06	2.09	328±20%	0.578	2.03	1.04	● 820
APCP00121281101M80	100	100±20%	0.175	3.64	1.96	400±20%	0.701	1.82	0.980	● 101
APCP00121281151M80	150	150±20%	0.261	3.01	1.59	600±20%	1.013	1.51	0.796	● 151
APCP00121281221M80	220	220±20%	0.343	2.43	1.29	880±20%	1.380	1.22	0.645	● 221
APCP00121281331M80	330	330±20%	0.540	2.01	1.04	1320±20%	2.172	1.01	0.522	● 331
APCP00121281471M80	470	470±20%	0.865	1.68	0.85	1880±20%	3.300	0.838	0.427	● 471
APCP00121281681M80	680	680±20%	1.296	1.39	0.76	2720±20%	4.888	0.697	0.380	● 681
APCP00121281821M80	820	820±20%	1.632	1.27	0.65	3280±20%	5.896	0.633	0.325	● 821
APCP00121281102M80	1000	1000±20%	1.992	1.14	0.61	4000±20%	7.202	0.571	0.307	● 102

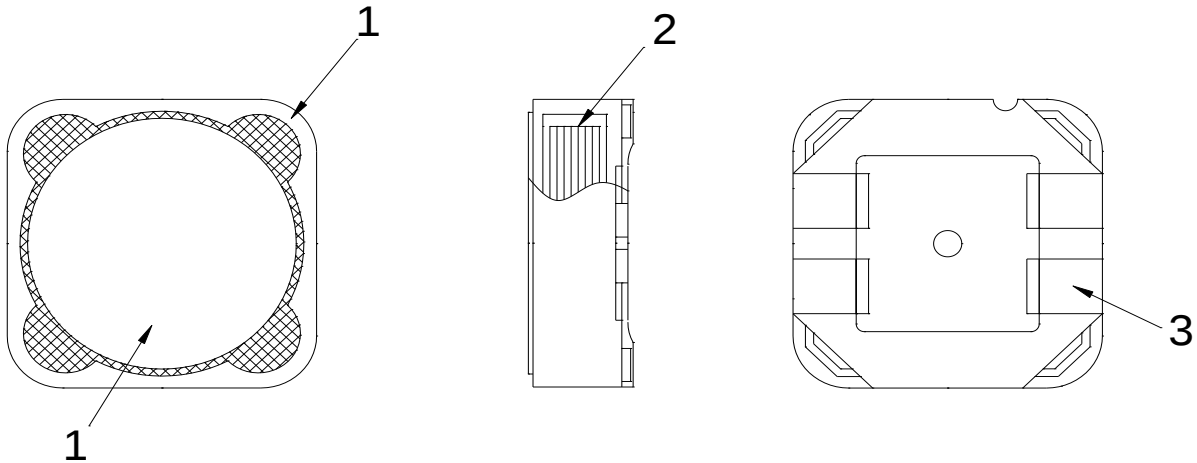
SCHEMATIC



NOTE: tolerance M = ±20% , T = ±30%

1. Test Frequency : 100kHz, 0.25V
2. Dual: L1(1-3) , L2(2-4) Parallel: (1,2-3,4) Series: (1-4) tie (2-3)
3. Isat : Based on inductance change ($\Delta L/L_0$: drop 30% Typ.) @ ambient Temperature : 25°C
4. Irms : Based on temperature rise (ΔT : 40°C Typ.)
5. Turns Ratio (1-3):(2-4) 1:1
6. Parallel RDC = $(R1 \cdot R2) / (R1 + R2)$
Series RDC = $(R1 + R2)$

6.1 Construction:



6.2 Material List:

NO.	ITEM	DESCRIPTION & TYPE
1	CORE	FERRITE
2	WIRE	MAGNET WIRE (P180)
3	TERMINAL	Ag/Cu/Ni/Sn

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ELECTRICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Temperature characteristics	$\Delta L/L_{20^{\circ}\text{C}} \leq \pm 10\%$ 0 ~ 2000 ppm/ $^{\circ}\text{C}$	The test shall be performed after the sample has stabilized in an ambient temperature of -20 to +85 $^{\circ}\text{C}$, and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L/L_{20^{\circ}\text{C}} \leq \pm 10\%$.

MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
High Temperature Exposure (Storage)	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-STD-202 Method 108 1. preconditioning : reflow 3 times. 2. 1000hrs. at rated operating temperature, part can be stored for 1000 hrs. @ 150 $^{\circ}\text{C}$. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Temperature Cycling	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to JESD22 Method JA-104 1. preconditioning : reflow 3 times. 2. 1000 cycles (-55 $^{\circ}\text{C}$ to +150 $^{\circ}\text{C}$). Measurement at 24 $\pm$ 4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time.
Biased Humidity	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-STD-202 Method 103 1. preconditioning : reflow 3 times. 2. 1000 hrs 85 $^{\circ}\text{C}$ /85%RH. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Operational Life	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-PRF-27 1. preconditioning : reflow 3 times. 2. 1000 hrs. @ 150 $^{\circ}\text{C}$. Measurement 24 $\pm$ 4 hours after test conclusion.
Physical Dimensions	Product spec	Refer to JESD22-B100 Verify physical dimensions to the applicable device detail specification.

APCP00121281 Series Specification

AEC-Q200

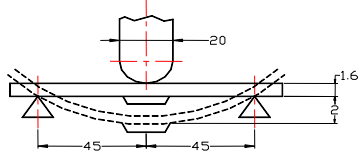
MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Resistance to Solvent	1. Marking -No constitute failure 2. No damage or degradation that has occurred due to solvent	Refer to MIL-STD-202 Method 215 Immersion 3+0.5/-0 minutes in Terpene defluxer. Brush 10 strokes (wet bristle) 2 to 3 oz. Rinse in water. Air blow dry.
Mechanical Shock	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	MIL-STD-202 Method 213 Units are non-operating. Pulse shape : Half-sine waveform Impact acceleration : 100 g's Pulse duration : 6 ms Number of shocks : 18 shocks (3 shocks for each face)
Vibration	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	MIL-STD-202 Method 204 5 g's for 20 minutes, 12 cycles each of 3 orientations. Test from 10-2000Hz.
Resistance to Soldering Heat (reflow soldering)	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Temperature profile of reflow soldering Refer to MIL-STD-202 Method 210 SMD: Condition K, time above 217°C, 60s – 150s, 3Cycles
Solderability	All terminations shall exhibit a continuous solder coating free from defects for a minimum of 95% of the critical area of any individual termination.	Refer to J-STD-002 For both Leaded & SMD. Electrical Test not required. Test Method B @ 245±5°C, dwell for 5+0/-0.5 seconds

APCP00121281 Series Specification

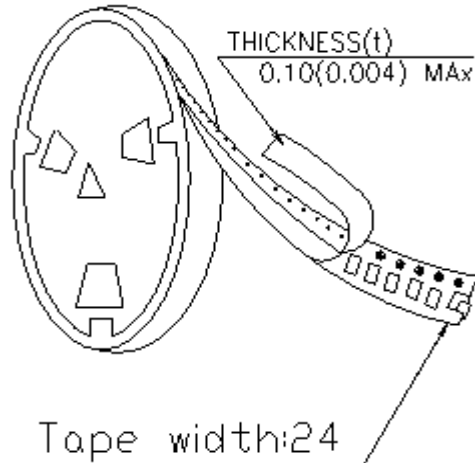
AEC-Q200

MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Board Flex	1. $\Delta L/L_0 \leq \pm 10\%$ 2. No Crack	Refer to AEC-Q200-005 Bend the board (D) X = 2mm, 60sec minimum holding time. 
Terminal Strength	1. $\Delta L/L_0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to AEC-Q200-006 Apply a 1.8Kg force to the side of a device bending tested. The force shall be applied for 60+1 seconds.
Electrical Characterization	User Specification.	Parametrically test per lot and sample size requirements. Summary to show minimum, maximum, mean and standard deviation at room, minimum and maximum operating temperatures.
ESD		Refer to AEC-Q200-002 or ISO/DIS 10605 Refer to attachment third party report
Flammability	The marking and A side have no obvious broken, and the marking are clearly	Refer to UL 94 Burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.

7 Packaging:

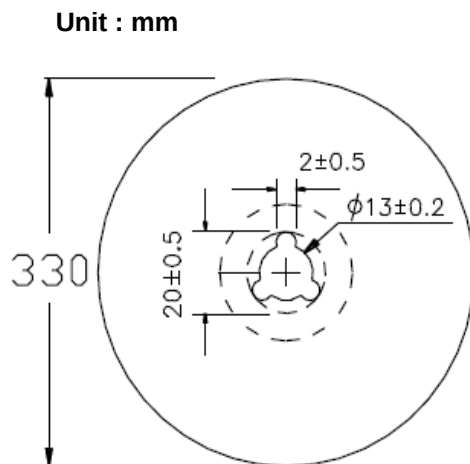
7.1 Packaging -Cover Tape



7.2 Packaging Quantity

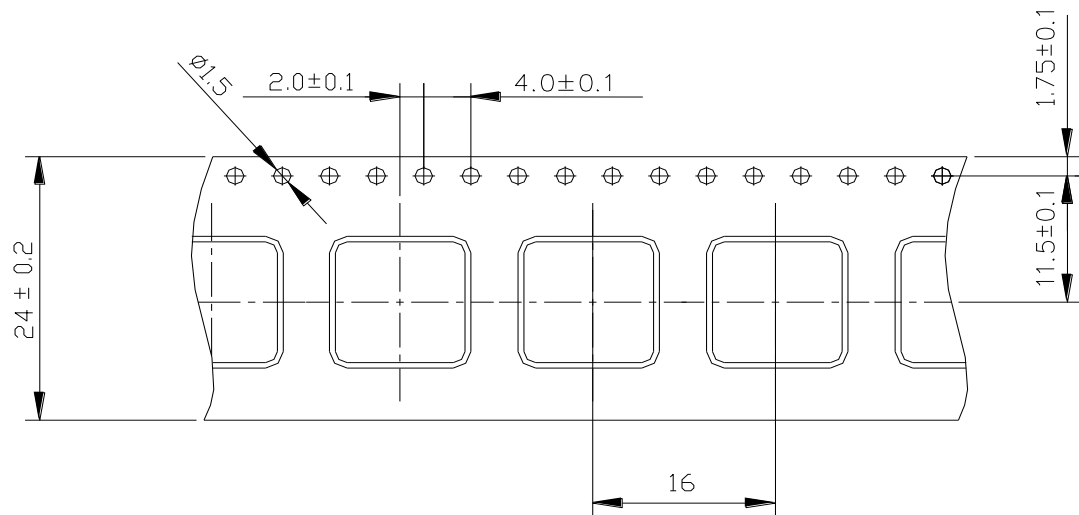
TYPE	PCS/REEL
APCP00121281	500

7.3 Reel Dimensions

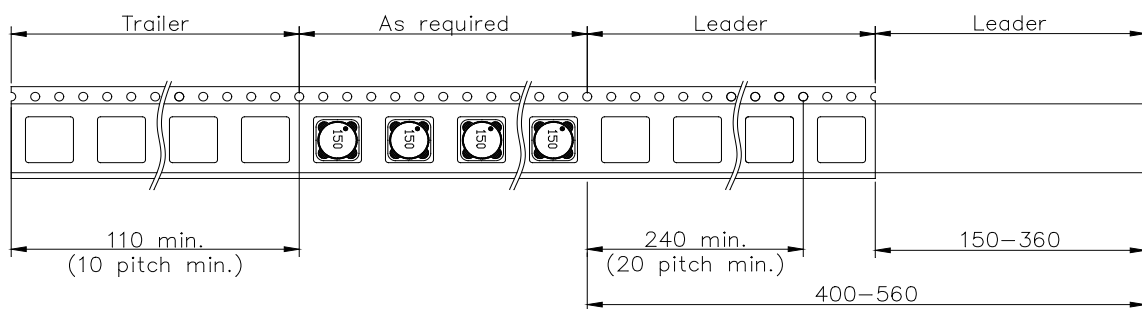
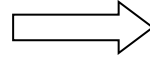


7 Packaging:

7.4 Tape Dimensions in mm

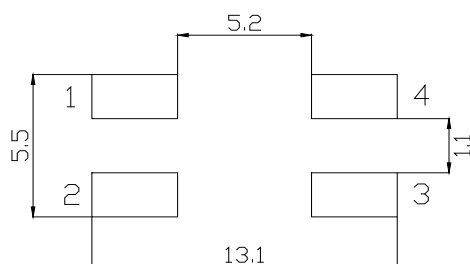


**Unreeling
Direction**



8 Recommended Land Pattern:

(STANDARD PATTERN) Unit : mm



9 Note:

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Do not knock or drop.
3. All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
4. Please keep the distance between transformer/coil and other components
(refer to the standard IEC 950)
5. The moisture sensitivity level (MSL) of products is classified as level 1.
6. Suggestion

On customer side this product series need to be fixed by the glue after IR reflow.

Please refer to below example photo:



Glue