

Power Inductor

Automotive Grade

APCF 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. High inductance 1000~ μ H
3. Ferrite SMD Shielded Type
4. No thermal aging

Applications

1. Automotive Systems for Dashboard, CCD Module
2. Media player
3. Net working
4. Lighting, LCD Panel/TV

Product Information

Series	L (mm)	W (mm)	T (mm)	Inductance (μ H)
APCF	7.0	7.0	3.2	1 ~ 1500
	7.0	7.0	4.5	
	10.0	10.0	4.5	
	12.5	12.5	6.5	
	12.5	12.5	7.5	

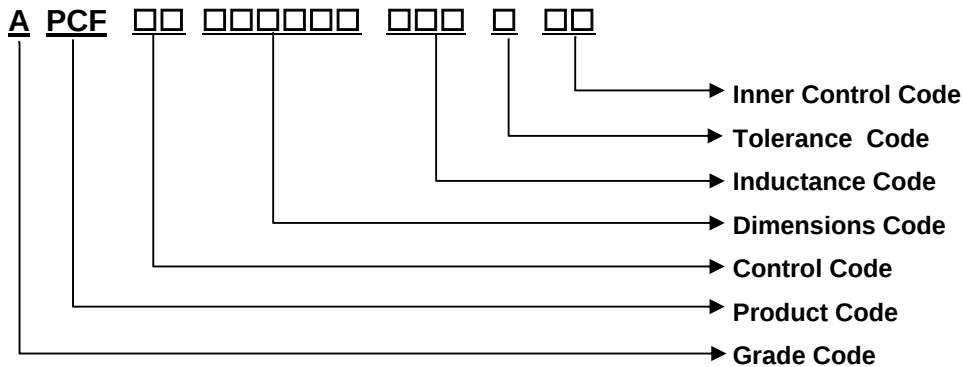


APCF00101045 Series Specification

AEC-Q200

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

2 Part Numbering:



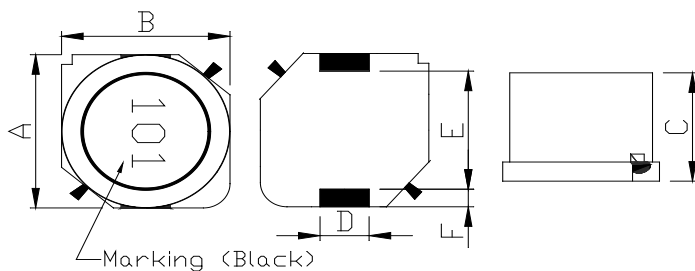
3 Rating:

Operating Temperature range: -55°C ~ +150°C (Including self temp. rise)
 Storage Temperature range: -55°C ~ +150°C (For after the circuit board is mounted)
 Storage Temperature: -20°C ~ +40°C; 75% RH max. (stored in carrier tape)

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: 10.0± 0.3 mm
 B: 10.0± 0.3 mm
 C: 4.50± 0.3 mm
 D: 3.00± 0.2 mm
 E: 6.00 Typ. mm
 F: 2.00 Typ. mm

Net Weight (grms)

SIZE CODE	Net Weight (grms)
101045	1.17 (Typ.)

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6 Electrical Characteristics:

Part No.	Inductance L(μH)	Test Freq.	Resistance RDC(Ω) ±20%	Rated DC Current		Tolerance	Marking
				Isat(A)	Irms(A)		
APCF001010451R5□Y0	1.5	100kHz/0.25V	11.8m	7.50	6.00	T	1R5
APCF001010453R3□Y0	3.3	100kHz/0.25V	16.1m	4.90	3.70	T	3R3
APCF001010454R7□Y0	4.7	100kHz/0.25V	19.8m	4.20	3.50	M,T	4R7
APCF001010455R6□Y0	5.6	100kHz/0.25V	22.0m	3.80	3.20	T	5R6
APCF00101045100□Y0	10	100kHz/0.25V	36.4m	3.00	2.50	M,T	100
APCF00101045150□Y0	15	100kHz/0.25V	47.2m	2.40	2.20	M,T	150
APCF00101045220□Y0	22	100kHz/0.25V	59.1m	2.10	1.90	M,T	220
APCF00101045330□Y0	33	100kHz/0.25V	81.5m	1.60	1.70	M,T	330
APCF00101045470□Y0	47	100kHz/0.25V	0.10	1.40	1.50	M,T	470
APCF00101045680□Y0	68	100kHz/0.25V	0.14	1.20	1.30	M,T	680
APCF00101045101□Y0	100	100kHz/0.25V	0.20	1.00	1.10	M,T	101
APCF00101045151□Y0	150	100kHz/0.25V	0.35	0.79	0.81	M,T	151
APCF00101045221□Y0	220	100kHz/0.25V	0.47	0.65	0.70	M,T	221
APCF00101045331□Y0	330	100kHz/0.25V	0.68	0.54	0.58	M,T	331
APCF00101045471□Y0	470	100kHz/0.25V	1.03	0.47	0.47	M,T	471
APCF00101045681□Y0	680	100kHz/0.25V	1.60	0.38	0.38	M,T	681
APCF00101045102□Y0	1000	100kHz/0.25V	2.80	0.32	0.29	M,T	102
APCF00101045152□Y0	1500	100kHz/0.25V	3.40	0.22	0.26	M,T	152

NOTE: tolerance M=±20%, T=±30%

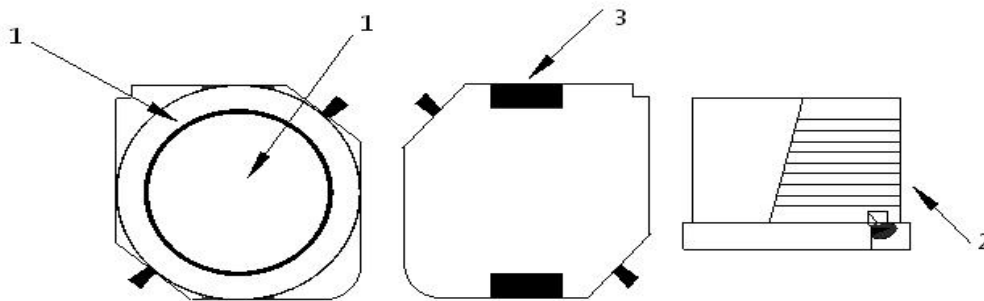
1. Isat : Based on inductance change ($\Delta L/L_0$: drop 10% Typ.) @ambient temperature 25°C

2. Irms : Based on temperature rise (ΔT : 40°C Typ.)

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6.1 Construction:



6.2 Material List:

NO.	ITEM	DESCRIPTION & TYPE
1	Core	Ferrite
2	Wire	Magnet Wire (P180)
3	Terminal	Terminal Copper

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ELECTRICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Insulation resistance	There shall be no other damage or problems.	DC 100V voltage shall be applied across this sample of top surface and the terminal. The insulation resistance shall be more than $1 \times 10^8 \Omega$.
Dielectric withstand voltage	There shall be no other damage or problems.	AC 100V voltage shall be applied for 1 minute across the top surface and the terminal of this sample
Temperature characteristics	$\Delta L/L20^\circ C \leq \pm 10\%$ 0~2000 ppm/ $^\circ C$	The test shall be performed after the sample has stabilized in an ambient temperature of -20 to +85 $^\circ C$, and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L/L20^\circ C \leq \pm 10\%$.

MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
High Temperature Exposure (Storage)	1. $\Delta L/L0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-STD-202 Method 108 1. preconditioning : reflow 3 times. 2. 1000 hrs. at rated operating temperature, part can be stored for 1000 hrs. @ 150 $^\circ C$. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Temperature Cycling	1. $\Delta L/L0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to JESD22 Method JA-104 1. preconditioning : reflow 3 times. 2. 1000 cycles (-55 $^\circ C$ to +150 $^\circ C$). 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. $\Delta L/L0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-STD-202 Method 103 1. preconditioning : reflow 3 times. 2. 1000 hrs 85 $^\circ C$ /85%RH. Unpowered. Measurement at 24 $\pm$ 4 hours after test conclusion.
Operational Life	1. $\Delta L/L0 \leq \pm 10\%$ 2. Appearance-No damage (OM)	Refer to MIL-PRF-27 1. preconditioning : reflow 3 times. 2. 1000 hrs. @ 150 $^\circ C$. 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.

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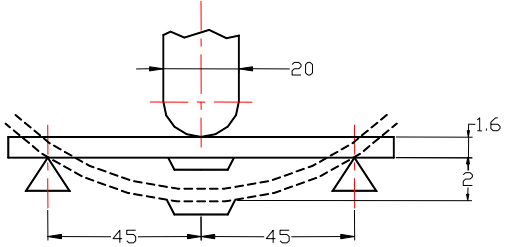
MECHANICAL

TEST ITEM	SPECIFICATION	
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 Temperature Ramp up: 3°C/sec. max. Ramp down: 6°C/sec. max. 260°C 217°C 160°C 25°C Time Preheat: 150-200°C, 60-120 sec. Liquidus: >217°C, 60-150 sec. Soldering: 260°C ± 3°C, 10 - 30 sec. 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. Magnification 30X. Conditions: SMD: a) Method B1 @ 245°C, 5+0/-0.5 s. b) Method D @ 260°C, 30+5/-0 s.

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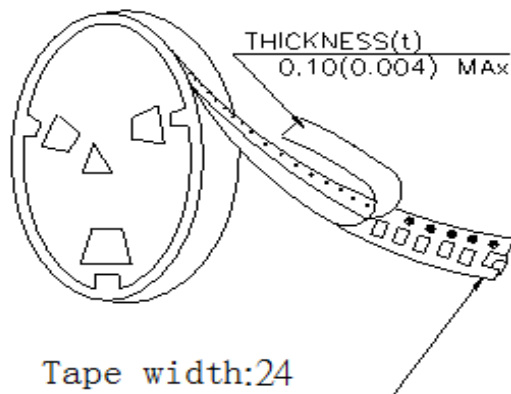
AEC-Q200

ENVIRONMENT CHARACTERISTICS

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

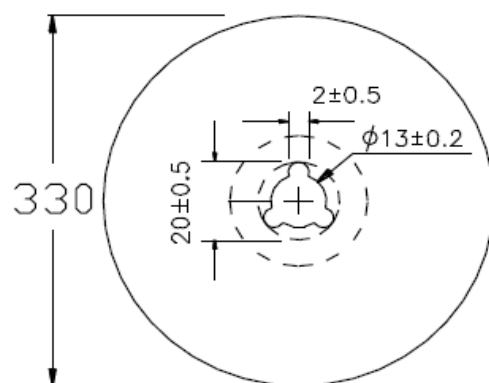


7.2 Packaging Quantity

TYPE	PCS/REEL
APCF00101045	500

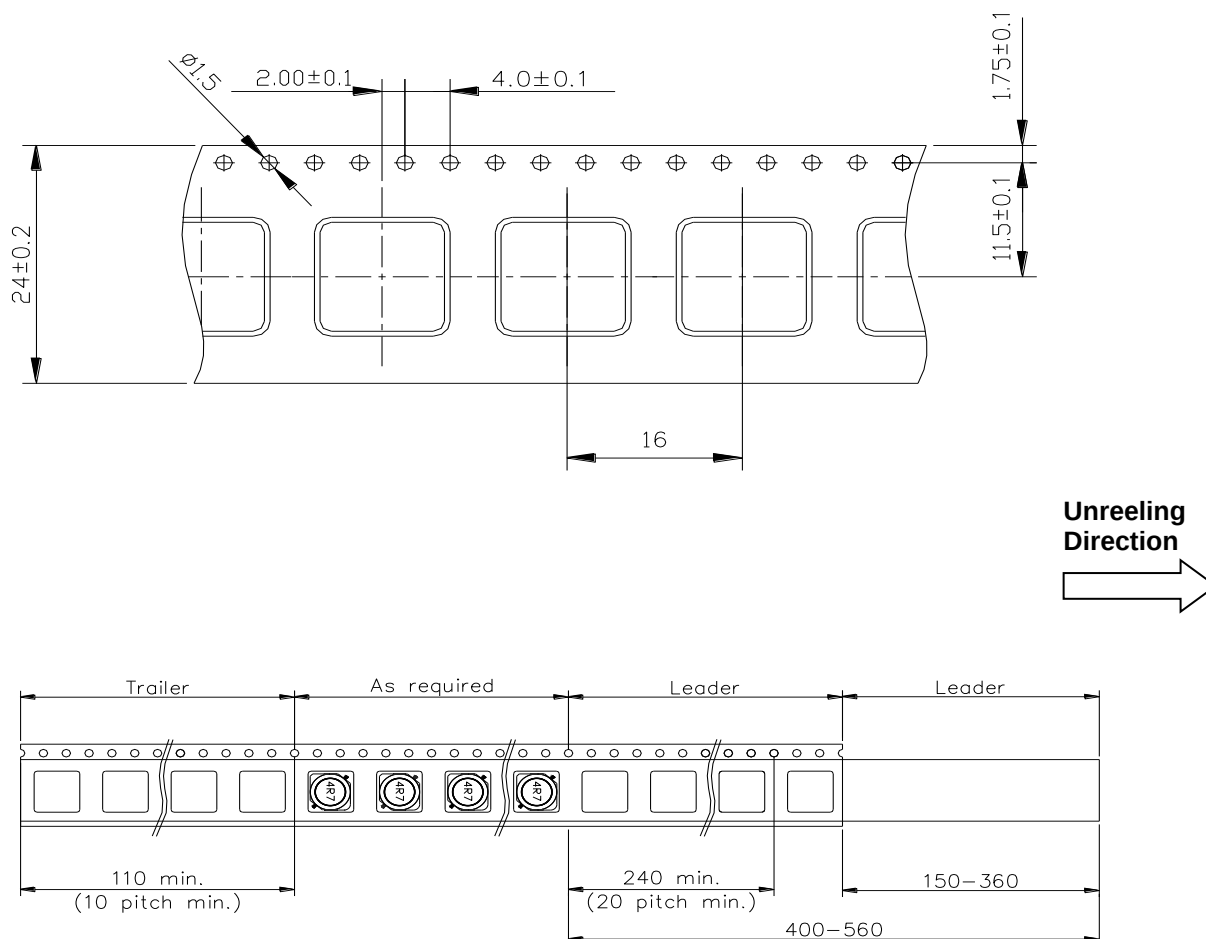
7.3 Reel Dimensions

Unit : mm



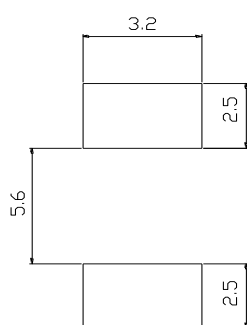
7 Packaging:

7.4 Tape Dimensions in mm



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