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Automotive Grade Radial Lead MLCCs

Feature

* Automotive grade high reliability.
* Excellent solderability and heat resistance for reflow soldering.
* Epoxy resin encapsulated for excellent moisture resistance,mechanical strength and heat resistance.

Application

* AEC-Q200

Has passed the AEC - Q200 standards set all of the experimental conditions.

Part Number

ACC4	0805	N	331	K	500	T	F1
A	B	C	D	E	F	G	H

A:

Product Type	
Code	Type
ACC4	) Class Dielectric Radial Leaded Mlcc (Automotive Grade)
ACT4	) Class Dielectric Radial Leaded Mlcc (Automotive Grade)

B:

UNIT: INCHES

x Nominal Body Size (Length x Width)	
0805	0.17x0.15
1206	0.20x0.18

C:

Temperature Characteristics			
CG(N)	C0G(NP0)	0 ± 30ppm/	-55~+125
B	X7R	± 15%	-55~+125

D

Nominal Capacitance
First two digits are significant,and the third,digit is number of zeros . For example: 104=100000pF 5R6=5.6pF

E

Tolerance					
C	D	G	J	K	M
±0.25pF	±0.5pF	±2.0%	±5.0%	±10%	±20%
C.D C 10PF C.D for C 10PF NP0:C.D.G.J.K.M, X7R:K.M.					

F

Rated Voltage
First two digits are signify cant ,and the third digit is number of zeros . For example: 500=50V,101=100V

G

Packaging Style		
Tape	P	Ammo
	T	Reel
Bulk	Blank	

H

mm Lead Space (Unit: mm)	
F1	2.54
F3	5.08

Size code, capacitance and voltage

Reliability Test Method

<table>
<tr><td>Item</td><td colspan="2">Technical Specification</td><td colspan="3">Test Method and Remarks</td></tr>
<tr><td rowspan="4">Capacitance
(C)</td><td rowspan="2">I
Class I</td><td rowspan="2">within the specified tolerance.</td><td>Capacitance</td><td>Measuring Frequency</td><td>Measuring Voltage</td></tr>
<tr><td>C≤1000pF</td><td>1MHZ±10%</td><td rowspan="2">1.0±0.2V</td></tr>
<tr><td>II
Class II</td><td rowspan="2">within the specified tolerance.</td><td>C 1000 pF</td><td>1KHZ±10%</td></tr>
<tr><td>Capacitance</td><td>Measuring Frequency</td><td>Measuring Voltage</td></tr>
<tr><td rowspan="4">Dissipation
Factor
(DF)</td><td rowspan="2">I
Class I</td><td rowspan="2">C≥50pF
DF≤0.15%
C 50pF
DF≤1.5[(150/C)+7] X10^{-4}</td><td>C≤10uF</td><td>1KHZ±10%</td><td>1.0±0.2V</td></tr>
<tr><td>Capacitance</td><td>Measuring Frequency</td><td>Measuring Voltage</td></tr>
<tr><td rowspan="2">II
Class II</td><td rowspan="2">B</td><td rowspan="2">DF ≤3.5%</td><td>≤1000pF</td><td>1MHZ±10%</td><td rowspan="2">1.0±0.2V</td></tr>
<tr><td>1000 pF</td><td>1KHZ±10%</td></tr>
<tr><td rowspan="2">Insulation
Resistance</td><td>I
Class I</td><td>C≤10nF
IR≥10000MΩ
C>10nF
R. C≥100 ΩF</td><td colspan="3" rowspan="2">:
Measuring Voltage: Rated Voltage
：60 ± 5
Duration: 60±5s
≤75%
Test Humidity: ≤75%
25 ± 3
Test Temprature: 25 ± 3
≤50mA
Test Current: ≤50mA</td></tr>
<tr><td>II
Class II</td><td>C≤25nF
IR≥4000MΩ
C>25nF
R.C≥100 ΩF</td></tr>
</table>

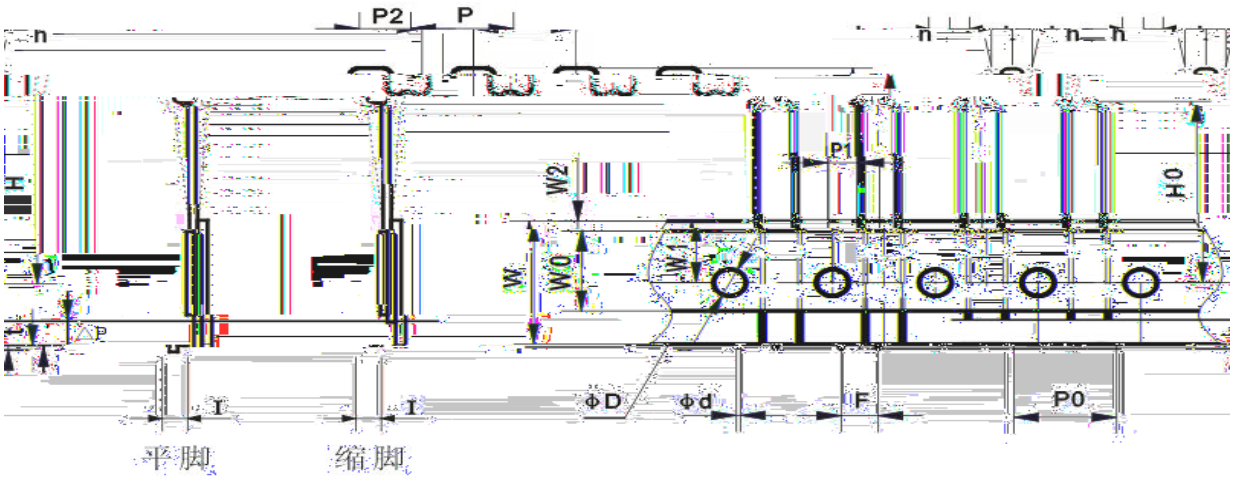
Item	Technical Specification	Test Method and Remarks
Biased Humidity	ΔC/C C0G: ≤ ±2.5% ±.25pF X7R: ≤ ±12.5%	2 Preconditioning class 2 only 140 ~150 1 24 At 140 ~150 1 hour, then keep for 24 ±1 hour at room temp. 85 ± 2 80~85%R.H. 100KΩ 1.3~1.5V 1000 Test condition 85 °C, 85% R.H. Add 100 KΩ resistor, applied Ur and 1.3 to 1.5 volts for 1,000 hours.
	DF COG Cr ≥ 30pF ≤ 0.5% Cr 30pF ≤ 1/ 400+20Cr X7R ≥ 25V : 0.035 max ≥ 16V : 0.050 max ≥ 10V : 0.075 max	
	IR COG C ≤ 10nF IR ≥ 10000MΩ C>10nF R. C ≥ 100 ΩF X7R C ≤ 25nF IR ≥ 4000MΩ C>25nF R.C ≥ 100 ΩF	
	Appearance No visible damage	
Life Test	ΔC/C C0G ≤ ±3% ±0.3pF X7R ≤ ±12.5% C0G: ≤ ±3% or ±0.3pF, whichever is larger. X7R: ≤ ±12.5%	2 1000 125 50mA 24 C0G 48 X7R Applied Voltage: 2Rated Voltage Duration: 1000h Temperature 125 Charge/ Discharge Current: 50mA max. Recovery Conditions: Room Temperature Recovery Time: 24h (C0G), or 48h (X7R)
	DF COG Cr ≥ 30pF ≤ 0.5% Cr 30pF ≤ 1/ 400+20Cr X7R ≥ 25V : 0.035 max ≥ 16V : 0.050 max ≥ 10V : 0.075	
	IR C0G C ≤ 10nF IR ≥ 10000MΩ C>10nF R. C ≥ 100 ΩF X7R C ≤ 25nF IR ≥ 4000MΩ C>25nF R.C ≥ 100 ΩF	
	Appearance: No visible damage.	

Item	Technical Specification	Test Method and Remarks
Temperature Cycle	ΔC/C: C0G ≤ ±2.5% ±2.5pF , X7R ≤ ±10% C0G: ≤ ±2.5% or ±2.5pF, whichever is larger. X7R: ≤ ±10%	2 1 24 ± 1h Preconditioning(class 2 only):up-category temperature, 1h Recovery time: 24 ± 1h Initial Measurement 1000 , 4 Cycling Times: 1000 times, 1 cycle, 4 steps: 24 ± 2h Recovery time after test: 24 ± 2h
	DF COG Cr ≥ 30pF ≤ 0.5% Cr 30pF ≤ 1/ 400+20Cr X7R: 0.050 max	
	IR COG C ≤ 10nF IR ≥ 10000MΩ C>10nF R. C ≥ 100 ΩF X7R C ≤ 25nF IR ≥ 4000MΩ C>25nF R.C ≥ 100 ΩF	
	Appearance: No visible damage.	
High Temperature Exposure	ΔC/C: C0G ≤ ±2.5% ±2.5pF , X7R ≤ ±10% C0G: ≤ ±2.5% or ±2.5pF, whichever is larger. X7R: ≤ ±10%	125 ± 2 Temperature: 125 ± 2 Voltage: without 1000 Duration: 1000h Recovery conditions: Room emperature 24 ( ) 48 ( ) Recovery Time: 24h (Class1) or 48h (Class2)
	DF COG Cr ≥ 30pF ≤ 0.15% Cr 30pF ≤ 1/ 400+20Cr X7R ≥ 25V : 0.035 max ≥ 16V : 0.050 max ≥ 10V : 0.075 max	
	IR: IR:Same to initial value.	
	Appearance:No visible damage.	

Item	Technical Specification	Test Method and Remarks
Vibration	ΔC/C: C0G ≤ ±2.5% ±2.5pF , X7R ≤ ±10% C0G: ≤ ±2.5% or ±2.5pF, whichever is larger. X7R: ≤ ±10%	
	DF	
	DF COG Cr ≥ 30pF ≤ 0.15% ≤ 1/ 400+20Cr V : 0.035 max V : 0.050 max V : 0.075 max IR:Same to initial value. Qppearance:No visible damage. y	3 3 (18) Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks) Waveform: Half-sin 6 Duration: 6 ms 100g Peak value: 100 g 12.3 ft/s Velocity change: 12.3 ft/s

Item	Technical Specification		Test Method and Remarks
Terminal Strength	Tensile Strength	No abnormality such as cut lead or looseness.	4.54N 10 ±1 Fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 4.54N, and then keeping the force for 10 ±1 sec.
	Bending Strength		2.27N 90 3 Each lead wire shall be subjected to a force of 2.27N and then be bent a angle of 90 degree then returned to initial position. Then second bend in the opposite direction shall be made, repeat 3 times.
Life Test	ΔC/C: C0G ≤ ±3% ±0.3pF X7R ≤ ±12.5% C0G ≤ ±3% or ±0.3pF, whichever is larger. X7R ≤ ±12.5%		2 1000 125 50mA 24 C0G 48 X7R Applied Voltage: 2Rated Voltage Duration: 1000h Temperature 125 Charge/ Discharge Current: 50mA max. Recovery Conditions: Room Temperature Recovery Time: 24h (C0G), or 48h (X7R)
	DF: COG: Cr ≥ 30pF ≤ 0.5% Cr 30pF ≤ 1/ 400+20Cr X7R ≥ 25V : 0.035 max ≥ 16V : 0.050 max ≥ 10V : 0.075		
	IR: C0G C ≤ 10nF IR ≥ 10000MΩ C>10nF R. C ≥ 100 ΩF C ≤ 25nF IR ≥ 4000MΩ C>25nF R.C ≥ 100 ΩF		
	Visual Appearance: No visible damage		

Packaging



Code	P	P0	P1	P2	d	h	W	W0	W1	W2	H	H0	I	D	t	P
Dim.	12.7	12.7	3.85 5.1	6.35	0.5 0	0	18.5	8 10	9	1.5	32.25	16 19.5	1.42	4.0	0	0≤P<12
Tol.	± 1.0	± 0.2	± 0.7	± 1.3	± 0.1	± 1.0	± 1.0	± 1.0	± 0.5	± 1.5	Max.	± 1.0	Ma x	± 0.2	Max	

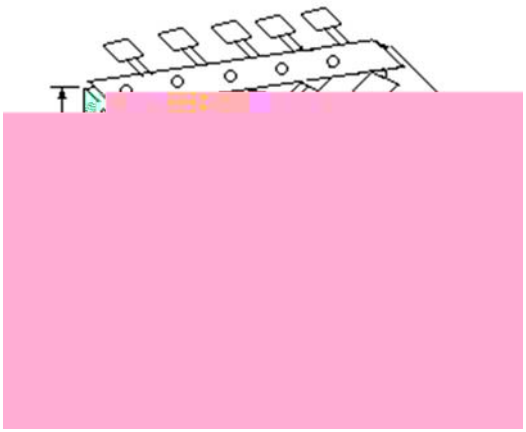
* Note

P1=3.85mm for F=5.08mm P1=5.1mm for F=2.54mm.

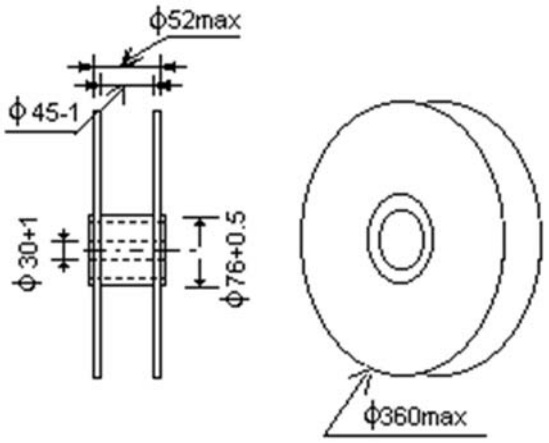
Ammo Packaging/Tape and Reel Packaging: H0 16±1mm Pin size 7mm ;

H0 19.5±1mm Pin size 7mm .

Ammo Packaging



Tape and Reel Packaging



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Packaging Quantity

Size Code	Bulk		Ammo	Tape and Reel
	pin ≤ 25mm	pin>25mm		
0805	1000pcs	500pcs	2500pcs	4000pcs
1206	1000pcs	500pcs	2500pcs	2000pcs
1209/1210	1000pcs	500pcs	2000pcs	2000pcs
1812	1000pcs	500pcs	1000pcs	1000pcs