

# SPECIFICATION FOR APPROVAL

CUSTOMER \_\_\_\_\_

PART NAME **MULTILAYER (MONO) CERAMIC CAPACITOR- Radial**

SPEC Please see Page.2 SPEC table

PART NO \_\_\_\_\_

DATE 2017-10-27

CUSTOMER APPROVE

DRAWING		
PREPARED	CHECKED	APPROVED

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## SPEC table

NO.	Spec
1	TS17R 1pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
2	TS17R 2.2pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
3	TS17R 3.3pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
4	TS17R 4.7pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
5	TS17R 5.6pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
6	TS17R 15pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
7	TS17R 18pF 500V +/-5% NPO P:5.08mm 1206 Bulk RoHS
8	TS17R 5600pF 500V +/-20% Y5V P:5.08mm 1206 Bulk RoHS

## Feature

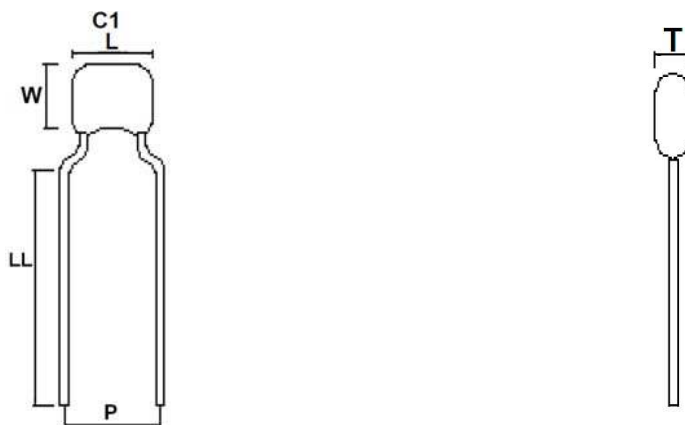
Miniature size, large capacitance, tape and reel packaging suitable for auto-placement

Epoxy resin coating creates excellent performance in humidity resistance, mechanical strength and heat resistance.

## Standard size, various lead configuration

Dielectric Type	Class I	Class II		
Dielectric Material	Temperature Compensating	X7R(B)	Z5U(E)	Y5V(Y/F)
Electrical Properties	The electrical properties is the most stable one and has little change with temperature, voltage and time	X7R material has high dielectric constant, and its capacitance is higher than class I. These capacitors are classified as having a semi-stable T.C..	Temperature characteristic is between that of X7R and Y5V. The capacitance is unstable and sensible to temperature and voltage.	Y5V material has highest dielectric constant. Its capacitance and dissipation is sensible to temperature and voltage.
Application	Used in applications where low-losses and high-stability are required, such as filters, oscillators, and timing circuits so on.	Used over a wide temperature range, such in these kinds of circuits, DC-blocking, coupling, bypassing, frequency discriminating etc.	Ideally suited for bypassing and coupling application circuits operating with low DC bias in the environment approaching to room temperature.	Used over a moderate temperature range in application where high capacitance is required.
Available capacitance range	0.5pF~0.1uF	100pF~22uF	1nF~10uF	

## Outside Dimension



TYPE		Dimension(inches)				Voltage	Available Capacitance Range	
British expression	Shape	L(max)	W(max)	T(max)	P(±0.5)	(V)	COG(NPO)	Y5V
1206	C1	5.5	4.5	4.5	5.08	500	1-18pF	5600pF

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## Reliability and Test Method for General Leaded MLCC

Item	Technical Specification		Test Method and Remarks			
Capacitance (C)	Class I	within the specified tolerance.	Capacitance	Measuring Frequency	Measuring Voltage	
			≤1000pF	1MHZ±10%	1.0±0.2V	
			>1000 pF	1KHZ±10%		
	Class II	within the specified tolerance.	The capacitance should be pretreated before measured(only for class II).			
			Measuring Frequency	Measuring Voltage		
1KHZ±10%	B: 1.0±0.2V	E/F(Y) 0.3±0.2V				
Dissipation Factor (DF)	Class I	$C_R \geq 50\text{pF}$ $DF \leq 0.15\%$ $C_R < 50\text{pF}$ $DF \leq 1.5[(150/C_R)+7] \times 10^{-4}$	Capacitance	Measuring Frequency	Measuring Voltage	
			≤1000pF	1MHZ±10%	1.0±0.2V	
			>1000 pF	1KHZ±10%		
	Class II	B	DF ≤3.5%	1KHZ±10%; Measuring Frequency: 1KH 1.0±0.2V Measuring Voltage: 1KHZ±10%		
		E Y/F	$\leq 7.5\%$ ( $C_R \leq 0.1\mu\text{F}$ ) $\leq 10.0\%$ $(1\mu\text{F} > C_R > 0.1\mu\text{F})$ $\leq 15\%$ ( $C_R \geq 1\mu\text{F}$ )	1KHZ±10% Measuring Frequency: 1KHZ±10% 0.3±0.2V Measuring Voltage: 0.3±0.2V		
Insulation Resistance	Class I	$C \leq 10\text{nF}$ $IR \geq 10000\text{M}\Omega$ $C > 10\text{nF}$ $R.C \geq 100 \Omega\text{F}$	Measuring Voltage: Rated Voltage Duration: 60±5s			
	Class II	$C \leq 25\text{nF}$ $IR \geq 4000\text{M}\Omega$ $C > 25\text{nF}$ $R.C \geq 100 \Omega\text{F}$				
Withstanding Voltage	No breakdown or damage.		Between terminals: Measuring Voltage:                      Duration: 5±1s Class I :300% Rated voltage Class II :250% Rated voltage The charge/ discharge current is less than 50mA.			
			Between terminals and body Voltage: 2.5 times rated voltage      Duration: 1~5s Small metallic ball method Small metallic balls with 1mm diameters shall be put in a vessel and the test capacitor shall be submerged except 2mm from the top of its component body and the terminals. The test voltage shall be applied between the short-circuited terminals and the metallic balls.			

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Item	Technical Specification		Test Method and Remarks			
Solder ability	Lead wire shall be at least 75% covered with a new solder coating.		The terminal of capacitor is dipping into a 25% rosin solution of ethanol and then into molten solder (Sn-2.5Ag-1Bi-0.5Cu ) of 245 ±2℃ for less than 3s. In both cases the depth of dipping is up to about 1.5~2mm from the terminal body.			
Resistance to Soldering Heat	Item	$\Delta_{C/C} \leq$	Solder temperature: 265 ±3℃ Duration: 6 (+1,0)s Immersed conditions: Inserted into the PC board (with t=1.6mm, hole=1.0mm diameter) Recovery: For class I, 4 to 24 hours of recovery under the standard condition after test. Preconditioning (Class II) : 1 hour of preconditioning at 150(-10,+0) °C, followed by 48 ±4 hours of recovery under the standard condition Recovery(Class II): 48 ±4 hours of recovery under the standard condition after test.			
	Class I	±2.5% or ±0.25pF				
	B	±10%				
	E / Y ( F)	±20%				
	No significant abnormality in appearance.					
High Temperature Loading Test	No significant abnormality in appearance.		Temperature			
	Capacitance Change: Class I: ≤ ±3% or ±0.3pF Whichever is larger. Class II: B: ≤ ±12.5% E / F(Y): ≤ ±30%		CG (N)	X7R	Y5V	Z5U
	Dissipation Factor: Class I: Not more than twice of initial value. B: ≤ 5.0% E / F(Y): ≤ 12.5% (C <sub>R</sub> ≤ 0.1uF) ≤ 15.0% (1uF > C <sub>R</sub> > 0.1uF) ≤ 17.5% (C <sub>R</sub> ≥ 1uF)		125(-0,+3)℃		85(-0,+3) °C	
	Insulation Resistance: ≥ 500MΩ or 25 Ω.F Whichever is smaller.		Applied voltage: 1.5 times rated voltage The charge/ discharge current is less than 50mA. Duration: 1000 (-0, +48) hours Recovery Time: Class I Dielectric: 24 ±2 hours Class II Dielectric: 48 ±4 hours			
	No defects or abnormalities in appearance and legible marking.		Solvent temperature: put the sample into solvent 1 Min, and then take it out and brush sample's notation area 10 times with pledget , repeat 3 times.			
Solvent Resistance	No defects or abnormalities in appearance and legible marking.		Solvent temperature: put the sample into solvent 1 Min, and then take it out and brush sample's notation area 10 times with pledget , repeat 3 times.			

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