

SPECIFICATION FOR APPROVAL

CUSTOMER _____

PART NAME Multilayer Ceramic Chip Capacitors – SMD

SPEC TS18 1uF 50V +/-10% X7R 1812 T&R RoHS

PART NO _____

DATE 2023-7-24

CUSTOMER APPROVE

DRAWING		
PREPARED	CHECKED	APPROVED

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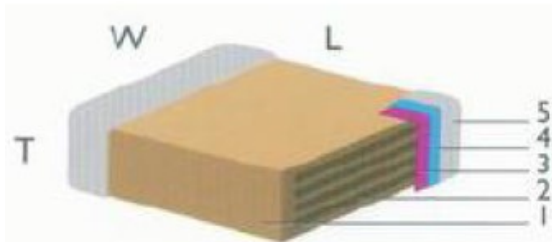
Feature

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

*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	

Drawing



Size Code and Voltage VS Capacitance

Size Code	Dimension (mm)	Voltage	Available Capacitance Range
			K7R
1812	L x W x T=4.5±0.2x3.2±0.2x3.1max mm	50V	105

Reliability and Test Method for 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 classII).		
			Measuring Frequency	Measuring Voltage	
			1KHZ±10%	B:1.0±0.2V	E/ F(Y): 0.3±0.2V
Dissipation Factor (DF)	Class I	CR≥50pF DF≤0.15% CR < 50pF DF≤1.5[(150/CR)+7] X10-4	Capacitance	Measuring Frequency	Measuring Voltage
			≤1000pF	1MHZ±10%	1.0±0.2V
			>1000 pF	1KHZ±10%	
	Class II	B	DF ≤3.5%	Measuring Frequency: 1KHZ±10% Measuring Voltage: 1.0±0.2V	
	E Y/ F	≤7.5% (CR ≤ 0.1uF) ≤10.0% (1uF > CR > 0.1uF) ≤15% (CR ≥1uF)	Measuring Frequency: 1KHZ±10% Measuring Voltage: 0.3±0.2V		
Insulation Resistance	Class I	C≤10nF IR≥10000MΩ C>10nF R.C≥100 ΩF	Measuring Voltage: Rated Voltage Duration: 60±5s		
	Class II	C≤25nF IR≥4000MΩ C>25nF R.C≥100 ΩF			

Item	Technical Specification	Test Method and Remarks
Withstanding Voltage	No breakdown or damage.	Between terminals : Measuring Voltage : Duration: 5±1s ClassI:300% Rated voltage ClassII: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 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.
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°C 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	$\Delta C/C \leq$
	Class I	$\pm 2.5\%$ or $\pm 0.25pF$
	B	$\pm 10\%$
	E / Y (F)	$\pm 20\%$
	No significant abnormality in appearance.	
High Temperature Loading Test	No significant abnormality in appearance.	Temperature
	Capacitance Change: Class I: $\leq \pm 3\%$ or $\pm 0.3pF$ Whichever is larger. Class II: B: $\leq \pm 12.5\%$ E / F(Y): $\leq \pm 30\%$	CG (N) / X7R Y5V Z5U
	Dissipation Factor: Class I : Not more than twice of initial value. Class II : B: $\leq 5.0\%$ E / F(Y): $\leq 12.5\%$ ($C_R \leq 0.1\mu F$) $\leq 15.0\%$ ($1\mu F > C_R > 0.1\mu F$) $\leq 17.5\%$ ($C_R \geq 1\mu F$)	125(-0,+3)°C 85(-0,+3) °C
	Insulation Resistance: $\geq 500M\Omega$ or $25 \Omega.F$ 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
Solvent Resistance	No defects or abnormalities in appearance and legible marking.	Solvent temperature: 23±5°C put the sample into solvent 1 Min, and then take it out and brush sample's notation area 10 times with pldget , repeat 3 times.

* Note on standard condition: " standard condition " referred to herein should be defined as follows:

5 to 35°C of temperature, 45 to 75% of relative humidity, and 86 to 106kPa of atmospheric pressure.

* When there are questions concerning measurement results:

In order to provide correlation data, the test should be conducted under a condition of 25 degrees plus/minus 1 centigrade of temperature, 48% through 52% of relative humidity and 86 through 106 kPa of atmospheric pressure.

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