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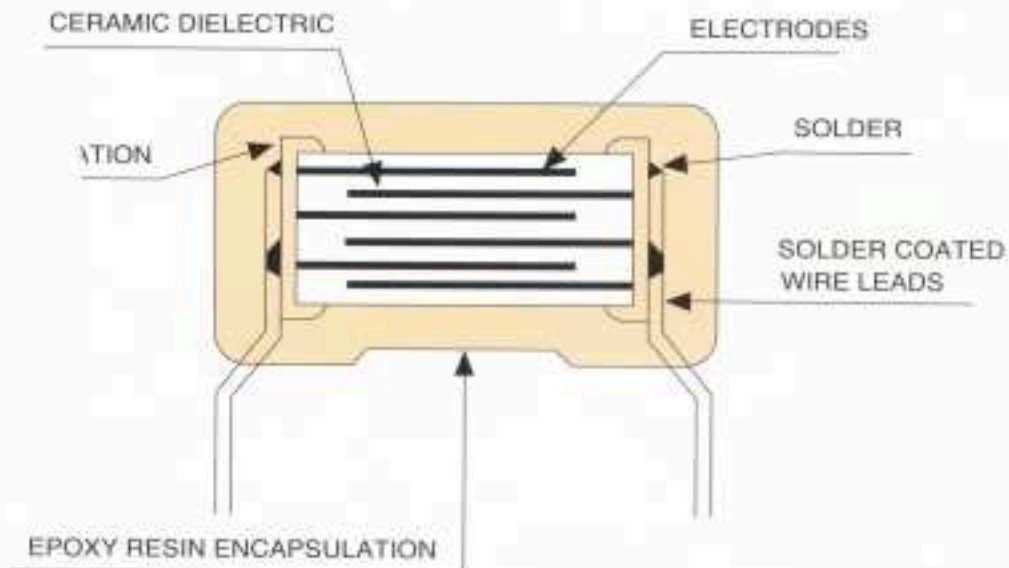
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INTRODUCTION

SHINY SPACE'S Multilayer Ceramic Capacitors is high capacitance in miniature size, high performance and high reliability, with excellent frequency characteristic and low inductance.

Our SSM series multilayer ceramic capacitors, have wide application on computer, data processing, telecommunication, industrial control and instrumentation equipment, switching power supplies etc.

All of our Multilayer Ceramic Capacitors are in Radial-Leaded and Axial-Leaded, flame retardant Epoxy Coated Type, with excellent moisture resistance and insulation, can be supplied in Bulk, Forming, Tape/Box, Tape/Reel package for Automatic Insertion in Printed Circuit Board.



■ ELECTRICAL SPECIFICATIONS

Capacitance Range: 1pF to 22uF

Capacitance Tolerance: (Standard)

NPO: F= $\pm 1\%$ B= $\pm 0.10\text{pF}$
 G= $\pm 2\%$ C= $\pm 0.25\text{pF}$
 D= $\pm 0.5\text{pF}$ (10pF and above)
 J= $\pm 5\%$ (10pF and above)
 K= $\pm 10\%$ (5.6pF and above)
 M= $\pm 20\%$ (2.7pF and above)

X7R: K= $\pm 10\%$
 M= $\pm 20\%$
 Z= +80-20%

Z5U, Y5V: M= $\pm 20\%$
 Z= +80-20%

Temperature Characteristics:

NPO: $0 \pm 30\text{ppm}^\circ\text{C}$, -55°C to $+125^\circ\text{C}$
X7R: $\pm 15\% \Delta\text{C}$, -55°C to $+125^\circ\text{C}$
Z5U: $+22\%$ to $-56\% \Delta\text{C}$, $+10^\circ\text{C}$ to 85°C
Y5V: $+22\%$ to $-82\% \Delta\text{C}$, -30°C to 85°C

Capacitance Test: @ 25°C or referred to + 25°C

NPO: 1.0 VRMS $\pm .25$ VRMS and 1kHz;
 1MHz for values below 1000pF
Z5U: 0.5 VRMS maximum and 1kHz.
X7R, Y5V: 1.0 VRMS maximum and 1kHz.

Dissipation Factor:

NPO: 0.1% maximum
X7R: For 50V and 100V : 2.5% maximum
 For 25V : 3.0% maximum
 For 16V : 3.5% maximum
 For 10V : 5% maximum
Z5U: 4% maximum
Y5V: For 50V and 100V : 5% maximum
 For 16V and 25V : 7% maximum
 For 10V : 10% maximum

Insulation Resistance:

100K megohms or 1,000 megohm-microfarads, whichever is less at 25°C

Dielectric Strength:

250% of rated voltage for 5 seconds at 50 mA maximum charging current

Life Test (1000hrs)

NPO, X7R: 200% rated voltage at $+125^\circ\text{C}$
Z5U, Y5V: 200% rated voltage at $+85^\circ\text{C}$

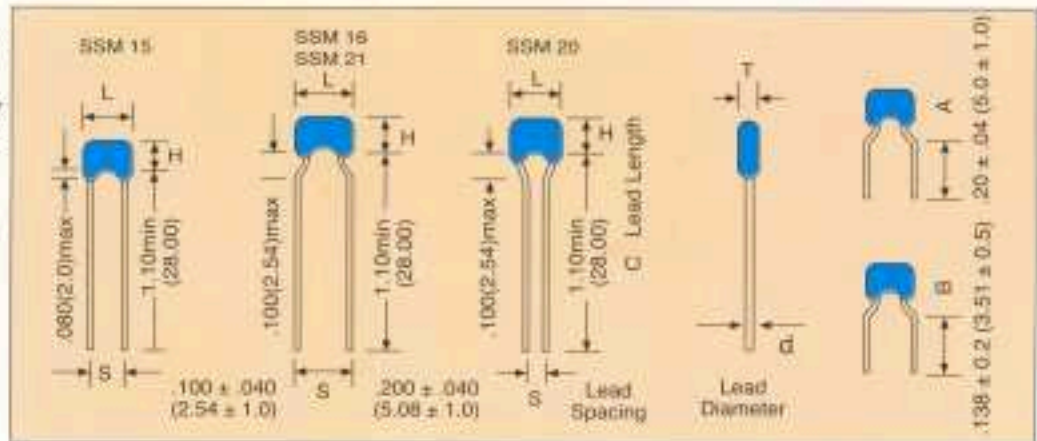
Moisture Resistance:

NPO, X7R: Ten cycles with no voltage applied
Z5U, Y5V: Ten cycles with no voltage applied

■ FEATURES

- Flame retardant epoxy.
- 10V, 16V, 25V, 50V, 100 WVDC.
- NPO, X7R and Z5U, Y5V Temperature coefficients.
- Lead Material: Solder coated, copper clad steel.
- Environmental performance to 39014 and MIL-C-20.

■ LEAD CONFIGURATION:



■ DIMENSIONS • CAPACITANCE RANGE

STYLE	DIMENSIONS					CAPACITANCE RANGE			
	L MAX.	H MAX.	T MAX.	S	d	WVDC	NPO	X7R	Z5U, Y5V
SSM 15	.160* (4.06)	.150* (3.81)	.100* (2.54)	.100* (2.54)	.020* (0.508)	25V 50V, 100V	10pF~3900pF	220pF~1.0uF	1000pF~2.2uF
SSM 16	.160* (4.06)	.150* (3.81)	.100* (2.54)	.200* (5.08)	.020* (0.508)	25V 50V, 100V	10pF~3900pF	220pF~1.0uF	1000pF~2.2uF
SSM 20	.200* (5.08)	.200* (5.08)	.125* (3.18)	.100* (2.54)	.020* (0.508)	10V, 16V, 25V 50V, 100V	2700pF~0.01uF	0.082uF~1.0uF	3.3uF~22uF
SSM 21	.200* (5.08)	.200* (5.08)	.125* (3.18)	.200* (5.08)	.020* (0.508)	10V, 16V, 25V 50V, 100V	2700pF~0.01uF	0.082uF~1.0uF	3.3uF~22uF

Dimensions in inches and (millimeters)

MULTILAYER CERAMIC CAPACITORS


NPO (COG)

STYLE		10, 15, 16		20, 21, 22	
Cap.	WVDC	50	100	50	100
		10pF	100		
12	120				
15	150				
18	180				
22	220				
27	270				
33	330				
39	390				
47	470				
56	560				
68	680				
82	820				
100	100				
120	121				
150	151				
180	181				
220	221				
270	271				
330	331				
390	391				
470	471				
560	561				
680	681				
820	821				
1000	102				
1200	122				
1500	152				
1800	182				
2200	222				
2700	272				
3300	332				
3900	392				
4700	472				
5600	562				
6800	682				
8200	822				
.01μF	103				
.012	123				
.015	153				
.018	183				
.022	223				
.027	273				
.033	333				
.039	393				
.047	473				
.056	563				
.068	683				
.082	823				

X7R

STYLE		10,	15,	16	20,	21,	22
Cap.	WVDC	25	50	100	25	50	100
		180pF	181				
220	221						
330	331						
390	391						
470	471						
560	561						
680	681						
820	821						
1000	102						
1200	122						
1500	152						
1800	182						
2200	222						
2700	272						
3300	332						
3900	392						
4700	472						
5600	562						
6800	682						
8200	822						
.01μF	103						
.012	123						
.015	153						
.018	183						
.022	223						
.027	273						
.033	333						
.039	393						
.047	473						
.056	563						
.068	683						
.082	823						
.10	104						
.12	124						
.15	154						
.18	184						
.22	224						
.27	274						
.33	334						
.39	394						
.47	474						
.56	564						
.68	684						
.82	824						
1.0	105						
1.5	155						
1.8	185						
2.2	225						

* Other capacitance values available upon special request. * Other capacitance values available upon special request.

 = Industry preferred values

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Z5U, Y5V

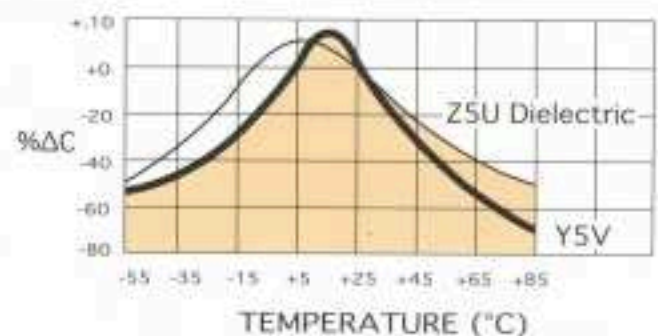
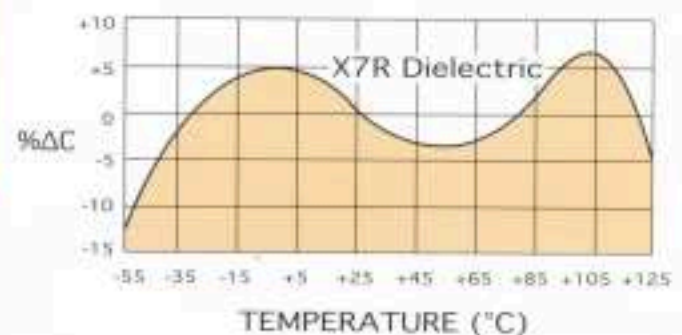
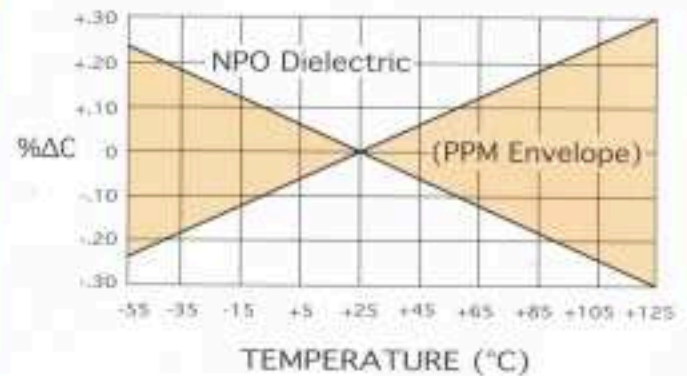
STYLE		10,	15,	16	20,	21,	22
WVDC		16	25	50	16	25	50
Cap.							
.01uF	103						
.012	123						
.015	153						
.018	183						
.022	223						
.033	333						
.039	393						
.047	473						
.056	563						
.068	683						
.082	823						
.10	104						
.12	124						
.15	154						
.18	184						
.22	224						
.33	334						
.39	394						
.47	474						
.56	564						
.68	684						
.82	824						
1.0	105						
1.2	125						
1.5	155						
1.8	185						
2.2	225						
2.7	275						
3.3	335						
3.9	395						
4.7	475						
5.1	515						
5.6	565						
6.8	685						
8.2	825						
10	106						
12	126						
15	156						
18	186						
22	226						
27	276						
33	336						
39	396						
47	476						
51	516						
56	566						
68	686						

* Other capacitance values available upon special request.

= Industry preferred values

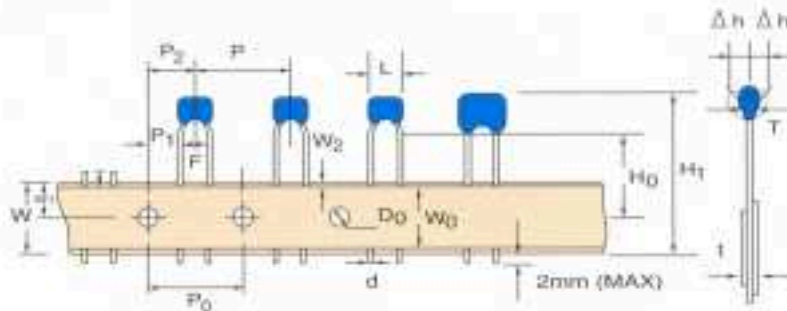
TYPICAL CHARACTERISTICS

CAPACITANCE CHANGE (ΔC) VS TEMPERATURE



RADIAL AND AXIAL TAPED TYPE PACKING METHOD

■ RADIAL TAPE TYPE

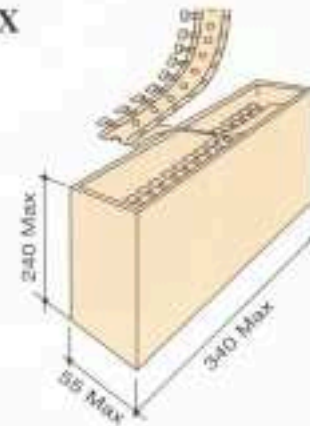


UNIT: MM

SYMBOL	DIM.	TOL.	SYMBOL	DIM.	TOL.
L	8.0 (MAX)		W0	13.0	±0.5
T	4.0 (MAX)		W1	9.0	±0.5
d	0.5	+0.06 -0.05	W2	3 (MAX)	
P	12.7	±1.0	H0	16.0	±0.5
P0	12.7	±0.2	H1	32.25 (MAX)	
P1	3.85	±0.5	D0	4.0	±0.2
P2	6.38	±1.0	t	0.7	±0.2
F	5.0	+0.8 -0.7			
Δh	0	±1.0			
W	18.0	±0.5			

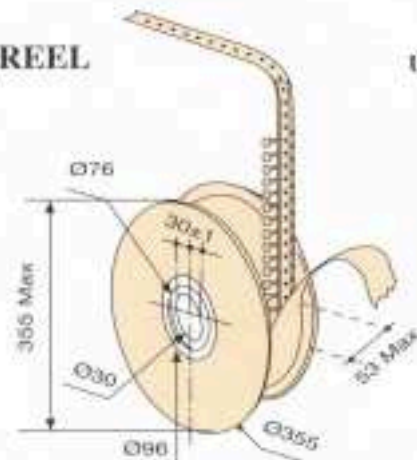
T/BOX

UNIT: MM



T/REEL

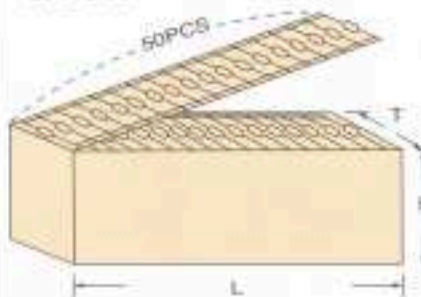
UNIT: MM



■ AXIAL TAPE TYPE

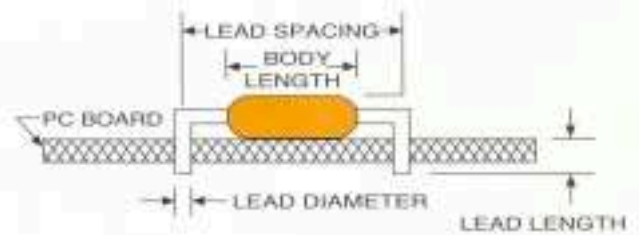
T/BOX

UNIT: MM



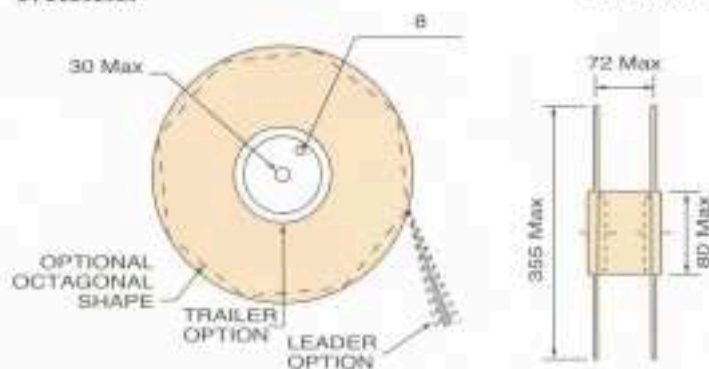
SYMBOL	TAPE INNER SPACING	
	52 mm	26 mm
L	255±5	255±5
H	105±5	54±5
T	78±2	51±2

■ AXIAL FORMED TYPE



T/REEL

UNIT: MM



■ PACKING QUANTITY

UNIT: PCS

STYLE	TAPE/REEL	AXIAL T/BOX		RADIAL T/BOX	BULK PIE/BAG
		52mm	26mm		
10	5000	5000	2000		1000
15	2500			2000	1000
16	2500			2000	1000
20	2500			2000	1000
21	2500			2000	1000
22	3000	5000	2000		1000