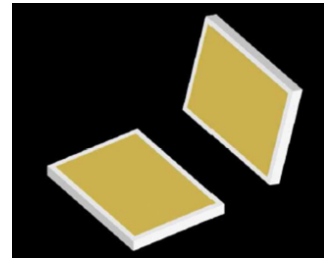


SINGLE LAYER - MICROWAVE CERAMIC CAPACITORS

Description

Ceramic capacitor
Thin film technology
Very HiQ , Low insertion loss
High Self-Resonance Frequency up to 50GHz



Applications

- Military infrastructure
- Industrial
- Telecom
- Space

Circuit applications

- Ga-As Integrated circuit's decoupling
- RF/Microwave applications
- DC block, Bypass, tuning
- Line adjustment

I. Dielectric characteristics

Description of available dielectrics for SLC.

Dielectric constant (K)	Dielectric		Temperature coefficient	Temperature range	Maximum dissipation factor (Tg δ) / frequency	Minimum Insulation Resistance	Measured Voltage @25°C
	code	class					
23	C	1	0 ± 30ppm/°C	[-55°C;+125°C]	<0.15% @ 1 MHz	>1000 GΩ	1±0.2 Vrms @ 1 MHz (all cap. value)
37	K	1					
80	N	1					
120	U	1					
160	V	1					
280	R	1	-2200 ± 500ppm/°C	<1.50% @ 1 MHz	>100 GΩ	1±0.2 Vrms @ 1 MHz (cap. Value ≤100pF) or 1±0.2 Vrms @ 1 KHz (cap. Value >100pF)	
350	L	1	-3300 ± 500ppm/°C				
600	D	2	ΔC/C = ± 10%	[+10°C;+85°C]	<2.50% @ 1 KHz	>10 GΩ	1±0.2 Vrms @ 1 MHz (cap. Value ≤100pF) or 1±0.2 Vrms @ 1 KHz (cap. Value >100pF)
1200	B	2					
2000	W	2	ΔC/C = ± 15%	[-30°C;+85°C]	<0.15% @ 1 KHz	>10 GΩ	1±0.2 Vrms @ 1 MHz (cap. Value ≤100pF) or 1±0.2 Vrms @ 1 KHz (cap. Value >100pF)
2700	X	2					
4000	T	2					
8000	Z	2	ΔC/C = +22% -56%	[-30°C;+85°C]	<4.00% @ 1 KHz	>10 GΩ	1±0.2 Vrms @ 1 MHz (cap. Value ≤100pF) or 1±0.2 Vrms @ 1 KHz (cap. Value >100pF)
12000	Y	2	ΔC/C = +22% -82%				

II. Mechanical characteristics

Version type	U (standard)	B (single border)	V (dual border)
drawings	top & bottom view	top view	top & bottom view
	side view	side view	side view

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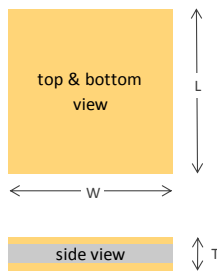
III. Terminations types

Type of metallization	Titanium-Tungsten / Gold TiW/Au	Titanium-Tungsten / Nickel / Gold TiW/Ni/Au
Termination code	T	N
Attachment connection	Wire bonding Au/Ge or Au/Si eutectic preform Silver or gold conductive epoxy Non suitable for Pb/Sn or Au/Sn soldering Good high temp. resistance : 400°C	Au/Sn eutectic preform Pb/Sn or Au/Sn soldering Moderate high temp. resistance : 325°C (*)

(*) Long term high temperature exposure may cause Ni diffusion and wire bonds issues on Au/Ge

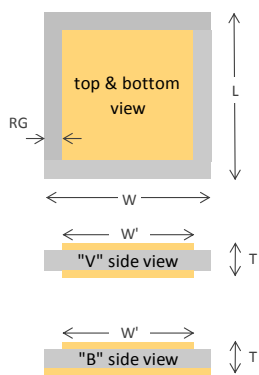
IV. Outline dimensions

U version



Parameter	Meas. Unit	Tol	Size									
			U10	U12	U15	U20	U25	U30	U35	U50	U70	U90
Width (W)	mm	+0.025 -0.076	0.25	0.30	0.38	0.51	0.64	0.76	0.89	1.27	1.78	2.29
	inch	±0.001	0.01	0.012	0.015	0.02	0.025	0.03	0.035	0.05	0.07	0.09
Length (L max)	mm	Nom.	0.30	0.38	0.51	0.64	0.76	0.89	1.02	1.52	2.03	2.54
	inch		0.012	0.015	0.02	0.025	0.03	0.035	0.04	0.06	0.08	0.10
Thickness (T)	mm	±0.050	Nominal 0.10 to 0.20									
	inch	±0.002	Nominal 0.004 to 0.008									

B & V versions



Parameter	Meas. Unit	Tolerance	Size							
			B/V10	B/V12	B/V15	B/V20	B/V25	B/V30	B/V40	B/V50
Length (L & W)	mm	±0.025	0.25	0.30	0.38	0.51	0.64	0.76	0.89	1.27
	inch	±0.001	0.01	0.012	0.015	0.02	0.025	0.03	0.035	0.05
Width nom. (W')	mm	nominal	0.17	0.2	0.28	0.41	0.51	0.66	0.91	1.12
	inch		0.007	0.008	0.011	0.016	0.02	0.026	0.036	0.044
(RG)	mm	±0.025	0.025*	0.025*	0.51	0.51	0.51	0.51	0.51	0.076
	inch	±0.001	0.001**	0.001**	0.002	0.002	0.002	0.002	0.002	0.003
Thickness (T)	mm	±0.050	Nominal 0.10 to 0.20							
	inch	±0.002	Nominal 0.004 to 0.008							

* Minimum 0.127mm

** Minimum 0.005 inch

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SINGLE LAYER - MICROWAVE CERAMIC CAPACITORS

V. Capacitance values

U version - capacitance range vs case size & dielectric type

rated voltage		U10	U12	U15	U20	U25	U30	U35	U50	U70	U90	
Cap. Value (pF)	Cap. Code	50V	50V	50V	100V	50V	100V	50V	100V	100V	100V	100V
0.1	0R1	C										
0.2	0R2	K	C									
0.3	0R3	N	K	C	K							
0.4	0R4	N	N	K	K	C	C					
0.5	0R5	U	N	K	N	C	K					
0.6	0R6	V	N	K	N	C	K	C				
0.7	0R7	V	N	N	N	K	K	C	C			
0.8	0R8	V	U	N	N	K	N	C	K			
0.9	0R9	R	V	N	U	K	N	C	K	C		
1.0	1R0	R	V	N	U	K	N	K	K	C	C	
1.1	1R1	R	V	N	V	K	N	K	K	C	K	C
1.2	1R2	R	V	N	V	N	N	K	N	C	K	C
1.3	1R3	R	V	N	V	N	N	K	N	C	K	C
1.4	1R4	L	V	U	V	N	N	K	N	K	C	C
1.5	1R5	L	V	U	V	N	N	K	N	K	C	C
1.6	1R6	L	R	U	V	N	U	K	N	K	C	C
1.7	1R7	L	R	U	V	N	U	K	N	K	C	C
1.8	1R8	L	R	U	R	N	U	N	N	K	N	C
1.9	1R9	L	R	V	R	N	U	N	N	K	N	C
2.0	2R0	D	R	V	R	N	U	N	N	K	N	C
2.1	2R1	D	L	V	R	N	V	N	N	K	N	C
2.2	2R2	D	L	V	R	U	V	N	U	K	N	C
2.4	2R4	D	L	V	R	U	V	N	U	K	N	C
2.7	2R7	D	L	R	L	U	V	N	U	N	K	C
3.0	3R0	D	L	R	L	U	V	N	U	N	K	C
3.3	3R3	D	L	R	L	V	R	N	V	U	K	C
3.6	3R6	D	D	R	L	V	R	U	V	N	U	C
3.9	3R9	B	D	R	L	V	R	U	V	N	U	C
4.3	4R3	B	D	R	D	V	R	U	V	N	N	C
4.7	4R7	B	D	L	D	R	R	U	R	N	V	C
5.1	5R1	B	D	L	D	R	R	V	R	U	V	C
5.6	5R6	B	D	L	D	R	L	V	R	U	V	C
6.2	6R2	B	D	D	D	R	L	V	R	U	V	C
6.8	6R8	B	B	D	D	R	L	R	R	V	N	C
7.5	7R5	W	B	D	D	R	D	R	L	V	R	C
8.2	8R2	W	B	D	B	L	D	R	L	V	R	C
9.1	9R1	W	B	D	B	L	D	R	L	V	R	C
10	100	X	B	D	B	L	D	R	L	R	V	C
12	120	X	W	B	B	D	D	L	D	R	L	C
15	150	T	W	B	W	D	B	L	D	R	L	C
18	180	T	W	B	W	D	B	D	D	L	D	C
20	200	T	X	W	W	D	B	D	D	L	D	C
22	220	T	X	W	X	B	B	D	B	L	D	C
27	270	Z	T	W	X	B	W	D	B	D	D	C
33	330	Z	T	X	T	B	W	B	B	D	B	C
39	390	Z	T	X	T	W	X	B	W	D	B	C
47	470	Y	Z	T	T	W	X	B	W	D	B	C
50	500	Y	Z	T	Z	W	X	B	W	B	B	C
51	510	Y	Z	T	Z	W	X	B	W	B	B	C
56	560	Y	Z	T	Z	X	T	B	X	B	W	C
68	680		Z	Z	Z	X	T	W	X	B	W	C
82	820		Y	Z	Y	T	Z	W	T	B	X	C
100	101		Y	Z	Y	T	Z	X	T	W	X	C
120	121		Y	Y	Y	T	Z	T	T	W	T	C
150	151		Y			Z	Y	T	Z	X	T	C
180	181		Y			Z	Y	T	Z	T	W	C
200	201					Z	Y	Z	Z	T	Z	C
220	221					Y	Y	Z	Z	T	Z	C
270	271					Y		Z	Y	T	Z	C
330	331					Y		Y	Y	Z	Z	C
390	391							Y		Z	Y	C
470	471							Y		Z	Y	C
560	561							Y		Z	Y	C
680	681									Y	Y	C
820	821									Y	Y	C
1000	102									Y		C
1200	122										Y	C
1500	152										Y	C
1800	182											C
2000	202											C
2500	252											C
4000	402											C

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SINGLE LAYER - MICROWAVE CERAMIC CAPACITORS










B & V versions - capacitance range vs case size & dielectric type

rated voltage		100V							
Cap. Value (pF)	Cap. Code	B/V10	B/V12	B/V15	B/V20	B/V25	B/V30	B/V40	B/V50
0.1	0R1	C	C	C					
0.2	0R2	N	K	C	C				
0.3	0R3	N	N	K	C	C			
0.4	0R4	V	N	N	K	C			
0.5	0R5	V	N	N	K	C	C		
0.6	0R6	V	V	N	K	K	C		
0.7	0R7	V	V	V	N	K	C		
0.8	0R8	R	V	V	N	K	C		
0.9	0R9	R	V	V	N	K	C	C	
1.0	1R0	R	V	V	N	K	K	C	
1.1	1R1	R	R	V	N	N	K	C	
1.2	1R2	L	R	V	N	N	K	C	
1.3	1R3	L	R	R	N	N	K	C	
1.4	1R4	L	R	R	N	N	K	C	C
1.5	1R5	L	R	R	V	N	K	C	C
1.6	1R6	D	R	R	V	N	K	K	C
1.7	1R7	D	R	R	V	N	K	K	C
1.8	1R8	D	L	R	V	N	K	K	C
1.9	1R9	D	L	L	V	N	N	K	C
2.0	2R0	D	L	L	V	N	N	K	C
2.1	2R1	D	L	L	V	N	N	K	C
2.2	2R2	D	L	L	V	V	N	K	C
2.4	2R4	D	L	L	V	V	N	K	K
2.7	2R7	D	D	L	V	V	N	K	K
3.0	3R0	B	D	D	L	V	N	K	K
3.3	3R3	B	D	D	L	V	N	N	K
3.6	3R6	B	D	D	L	V	N	N	K
3.9	3R9	B	D	D	L	V	V	N	K
4.3	4R3	B	D	D	L	R	V	N	K
4.7	4R7	B	B	D	L	R	V	N	K
5.1	5R1	B	B	D	L	R	V	N	K
5.6	5R6	B	B	B	L	R	V	N	N
6.2	6R2	W	B	B	D	R	V	V	N
6.8	6R8	W	B	B	D	R	V	V	N
7.5	7R5	W	B	B	D	L	R	V	N
8.2	8R2	W	W	B	D	L	R	V	N
9.1	9R1	W	W	B	D	D	R	V	N
10	100	X	W	W	D	D	L	V	V
12	120	X	W	W	B	D	L	R	V
15	150	T	X	W	B	D	L	R	V
18	180	T	X	X	B	D	D	R	R
20	200	T	T	X	B	B	D	L	R
22	220	Z	T	X	B	B	D	L	R
27	270	Z	T	T	W	B	D	D	L
33	330	Y	Z	T	W	B	B	D	L
39	390	Y	Z	Z	X	W	B	D	L
47	470	Y	Z	Z	X	W	B	D	D
50	500	Y	Y	Z	X	W	B	D	D
51	510	Y	Y	Z	T	X	B	D	D
56	560	Y	Y	Z	T	X	B	B	D
68	680		Y	Y	T	X	W	B	D
82	820		Y	Y	Z	T	W	B	D
100	101			Y	Z	T	X	W	B
120	121				Z	T	X	W	B
150	151				Y	Z	T	X	W
180	181				Y	Z	T	T	W
200	201				Y	Z	T	T	X
220	221				Y	Y	Z	T	X
270	271					Y	Z	T	X
330	331					Y	Y	Z	T
390	391						Y	Z	T
470	471						Y	Z	T
560	561						Y	Y	Z
680	681							Y	Z
820	821								Y
1000	102								Y
1200	122								Y

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SINGLE LAYER - MICROWAVE CERAMIC CAPACITORS

VI. How to order

101	V	20	T	680	K	T	4	W
								
Voltage code	Termination geometry	case size (see tables)	Dielectric type	capacitance code	tolerance code	Termination type	Marking	packaging
500 = 50V 101 = 100V	U = standard B = single border V = dual border		please refer to tables in specification	please refer to cap. tables in specification	A=±0.05pF B=±0.10pF C=±0.25pF D=±0.5pF F=±1% G=±2% J=±5% K=±10% M=±20%	N or T (please refer to table)	4 = standard	'Blank' = bulk package W = conductive waffle pack

Note :

Tolerances A, B, C and D apply for $C \leq 2\text{pF}$
 Tolerances B, C and D apply for $2\text{pF} < C \leq 10\text{pF}$
 Tolerances F, G, J and K apply for $C > 10\text{pF}$

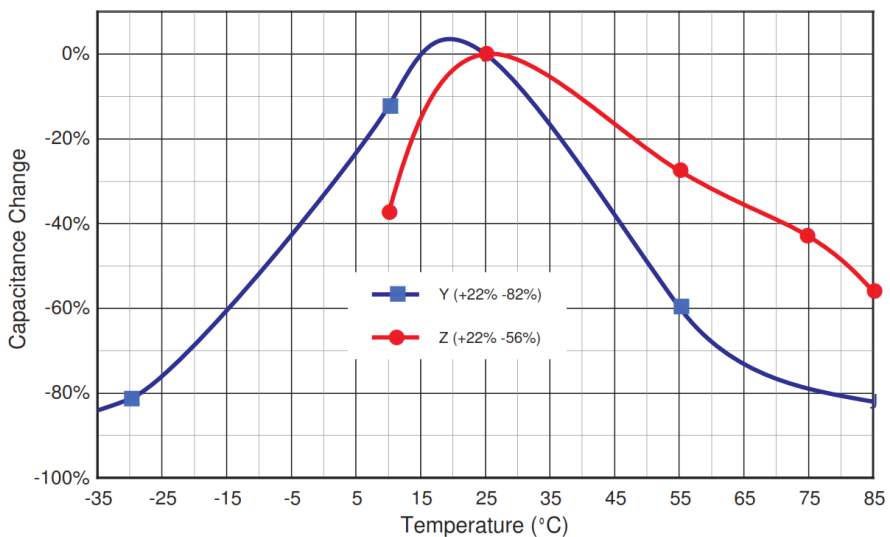
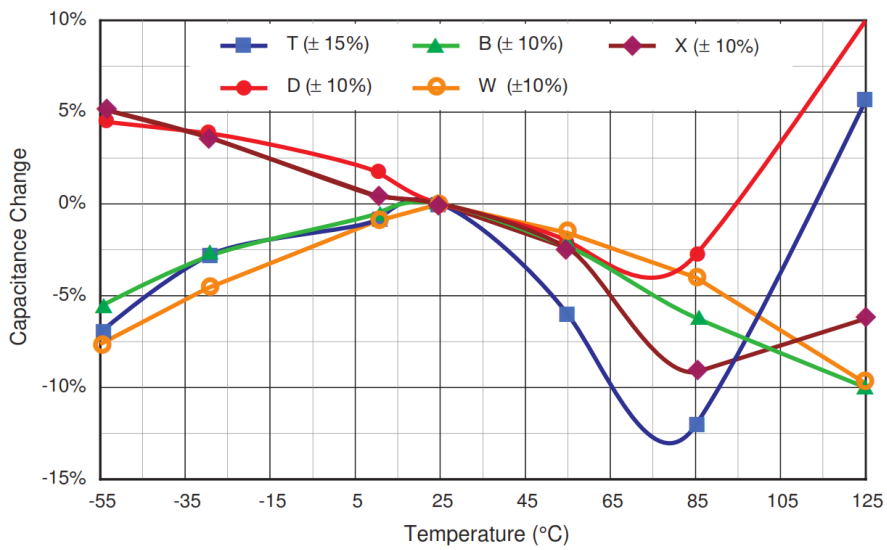
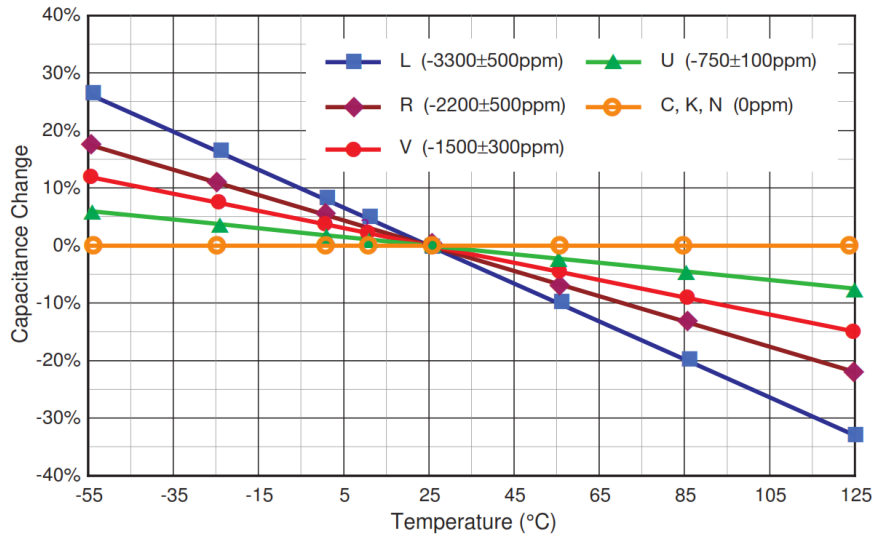
VII. Environmental Specifications

Requirements	Specifications
Bond Strength	MIL-S-883, Meth. 2011
Shear Strength	MIL-S-883, Meth. 2019
Solder Heat Resistance	MIL-S-202, Meth. 210-C, (260 ± 5°C, 5 sec.)
Solderability	MIL-S-202, Meth. 208, (245 ± 5°C, 5 sec.)
Shock	MIL-S-202, Meth. 213-I, (100g, 6 msec.)
Thermal Shock	MIL-S-202, Meth. 107, A, (-55 to +125°C)
Vibration	MIL-S-202, Meth. 204-G, (30g, 10-2000 Hz)
Burn-In/Life Test	MIL-S-202, Meth. 108, A/F
Low Voltage Humidity	Mil-C-49464, Para. 3.17
Barometric Pressure	MIL-S-202, Meth. 105, B
Immersion/Salt Spray	MIL-S-202, Meth. 104, B
Moisture Resistance	MIL-S-202, Meth. 106

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SINGLE LAYER - MICROWAVE CERAMIC CAPACITORS

VIII. SLC temperature characteristics



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