

## High Voltage Ceramic Chip Capacitors Type CFK

### △ Features

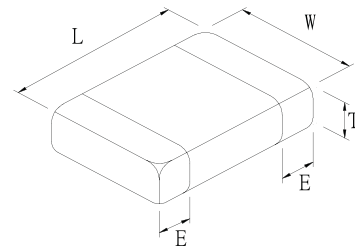
- Surface Mount
- Rated Voltage: 250 VAC, 5000VDC
- Chip Size: 1808, 1812, 2211

### △ Applications

- Suitable for wave and reflow soldering
- Use in mobile, facsimile, telephone and other telecom electronic equipment where lightning surges occur.

### △ Dimensions

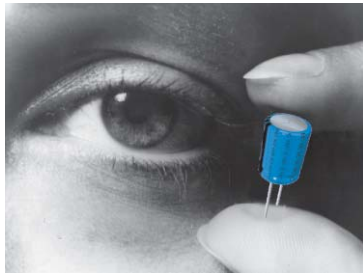
Size		1808	1812	2211
(L) Length	mm	4.60±0.30	0.30± 4.60	4.60±0.30
	(in)	(0.181±0.12)	(0.12±0.181)	(0.181±0.12)
(W) Width	mm	2.00±0.20	0.20±3.20	3.20±0.30
	(in)	(0.080±0.008)	(0.008±0.126)	(0.126±0.012)
(E) Termination	mm	0.64±0.38	0.38±0.64	0.64±0.38
	(in)	(0.025±0.015)	(0.015±0.025)	(0.025±0.015)
(T) Thickness	mm	2.20	2.70	2.70
	(in)	(0.087)	(0.106)	(0.106)



### △ Specifications

	Size	Length / Width	Volt	Capacitance
X7R	2211	L: 5.70±0.040mm (0.224±0.016) W: 2.80±0.030mm (0.110±0.012)	250	130pF-2200pF X1Y1 - TUV/UL
	1812	L: 4.60±0.030mm (0.181±0.012) W: 3.20±0.030mm (0.126±0.012)	250	150pF-1000pF X1Y2 - TUV/UL
	1808	L: 4.60±0.030mm (0.181±0.012) W: 2.00±0.020mm (0.080±0.008)	250	100pF-1000pF X1Y2 - TUV/UL
NPO	1808	L: 4.60±0.030mm (0.181±0.012) W: 2.00±0.020mm (0.080±0.008)	250	5.0pF-100pF X1Y2 - SEMKO
			250	3pF-150pF X1Y2 - TUV/UL

Surface Mount  
Capacitors

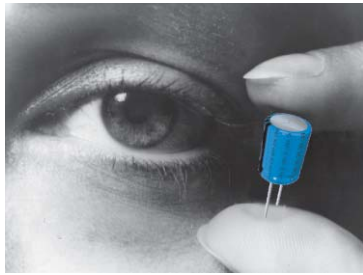


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Δ Electrical

Test	Test Conditions	Post-Test Inspection Requirements
Temperature Coefficients	Operating temp. range: -55 to +125°C	<b>Class I:</b>
		ΔC: 0±30ppm/°C
Capacitance	<b>Class I:</b>	Capacitance is within specified tolerance
	1MHz, 1Vrms	
Dissipation Factor (D.F.) and Tangent of Loss Angle (tanδ)	<b>Class II:</b>	≤ 2.5%
	1KHz, 1Vrms	
Insulation Resistance (I.R.)	<b>Class I:</b>	<b>Class I:</b>
	After 60 sec charging at 500V (DC) 25°C, 55% RH max.	≥100GΩ or ≥1000MΩ.μF Whichever is smaller
Impulse Voltage	<b>Class II:</b>	<b>Class II:</b>
	After 60 sec charging at 500V (DC) 25°C, 55% RH max.	≥10GΩ or ≥100MΩ.μF Whichever is smaller
Withstanding Voltage	Each Individual Capacitor shall be subjected to a 5.0KV(X1Y2) impulse	No breakdown or failure
	Test 1.5KV AC for 60 sec	No breakdown or failure

Surface Mount Capacitors

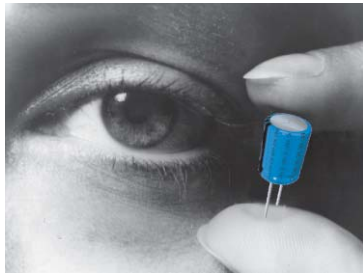


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Δ Environmental

Test	Test Conditions	Post-Test Inspection Requirements
<b>Solderability</b>	Immersed in Solder bath at $245 \pm 5^\circ\text{C}$ for $5 \pm 0.5$ sec.	No Visible Damage At least 75% of termination area should be well tinned
<b>Resistance to Soldering Heat</b>	Immersed in Solder bath at $245 \pm 5^\circ\text{C}$ for $5 \pm 0.5$ sec. Recovery: $12 \pm 1$ hr.	No Visible Damage <b>Class I:</b> $\Delta\text{C/C: } \leq \pm 2.5\%$ or $0.25\text{pF}$ whichever is larger I.R.: More than $10\text{G}\Omega$ D.F.: $\leq 2.5\%$ <b>Class II:</b> $\Delta\text{C/C: } \leq 10\%$ I.R.: More than $1\text{G}\Omega$ D.F.: $\leq 2.5\%$
<b>Endurance (Life Test)</b>	Preconditioning $1000^{+48}_0$ hr. at upper category temperature applied at: $1.25\text{U}_R$ (X1,X2) or $1.7\text{U}_R$ (Y2,Y3) Once every hour the voltage shall be increased to $1000\text{Vrms}$ for 0.1 sec. Recovery: $12 \pm 1$ hr.	No Visible Damage <b>Class I:</b> $\Delta\text{C/C: } \leq \pm 5\%$ I.R.: More than $1\text{G}\Omega$ D.F.: $\leq 0.25\%$ <b>Class II:</b> $\Delta\text{C/C: } \leq 10\%$ I.R.: $\geq 1\text{G}\Omega$ or $50\text{M}\Omega \cdot \mu\text{F}$ whichever is smaller D.F.: $\leq 2.5\%$
<b>Humidity Test (Damp heat, steady state)</b>	Preconditioning $500^{+24}_0$ hr. at $40 \pm 2^\circ\text{C}$ , 90~95% relative humidity. The capacitor with rated voltage ( $250\text{VAC}$ ) applied. Recovery: $12 \pm 1$ hr.	No Visible Damage <b>Class I:</b> $\Delta\text{C/C: } \leq \pm 5\%$ or $0.5\text{pF}$ whichever is larger I.R.: More than $10\text{G}\Omega$ D.F.: $\leq 2.5\%$ <b>Class II:</b> $\Delta\text{C/C: } \leq 10\%$ I.R.: $\geq 1\text{G}\Omega$ or $50\text{M}\Omega \cdot \mu\text{F}$ whichever is smaller D.F.: $\leq 5\%$
<b>Adhesion Strength of Termination</b>	Capacitors mounted on a substrate. A force of $5\text{N}$ applied perpendicular to the place of substrate and parallel the line joining the center of terminations for $10 \pm 1$ sec.	No Visible Damage
<b>Resistance to Flexure Stress</b>	Capacitors mounted on a substrate. The board shall then be bent by $1\text{mm}$ at a rate of $1\text{mm/sec}$ .	No Visible Damage Change in capacitance is less than 10%
<b>Active Flammability</b>	The capacitor is applied $\text{U}_R(250\text{VAC})$ . Then each sample shall be subjected to 20 discharges from a tank capacitor, charge to a voltage that, when discharged, places $\text{U}_i 2500\text{V}$ for $\text{X}_2\text{Y}_3$ , $\text{U}_i 5000\text{V}$ for $\text{X}_1\text{Y}_2$ across the capacitor under test. The interval between successive discharges shall be 5 sec.	The cheese cloth shall not burn with a flame.

Surface Mount Capacitors



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Δ Ordering

**CFK 1808 N - 100 J - 302 E D G**  
**(1) (2) (3) (4) (5) (6) (7) (8) (9)**

(1)	Series	CFK: X1Y2	
			1808
(2)	Size Code		1812
			2211
(3)	Dielectric Code	N:	COG (1BCG)
		X:	X7R (2R1)
(4)	Capacitance Code	Capacitance expressed in pF. First two digits are significant figures. The third Digit denotes number of zeros. Use R for decimal point for values less than 10pF. (eg. R47: 0.47pF)	
(5)	Tolerance Code	Code	Tolerance
		C	±0.25pF
		D	±0.5pF
		F	±1%
		G	±2%
		J	±5%
		K	±10%
		M	±20%
	Z	+80% -20%	
		Other Tolerances Available Upon Request	
(6)	Rated Voltage Code	502:	5000V
(7)	Packaging Code	TR:	Tape and Reel, Cardboard Tape
		ER:	Tape and Reel, Embossed Tape
		No Code:	Bulk
(8)	Thickness Code	Code	Tolerance (mm)
		B	0.71-0.90
		C	0.91-1.30
		D	1.31-1.50
		E	1.51-1.80
		F	1.81-2.20
	G	2.21-2.70	
(9)	Special Code	G:	Cd/Pb Free

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