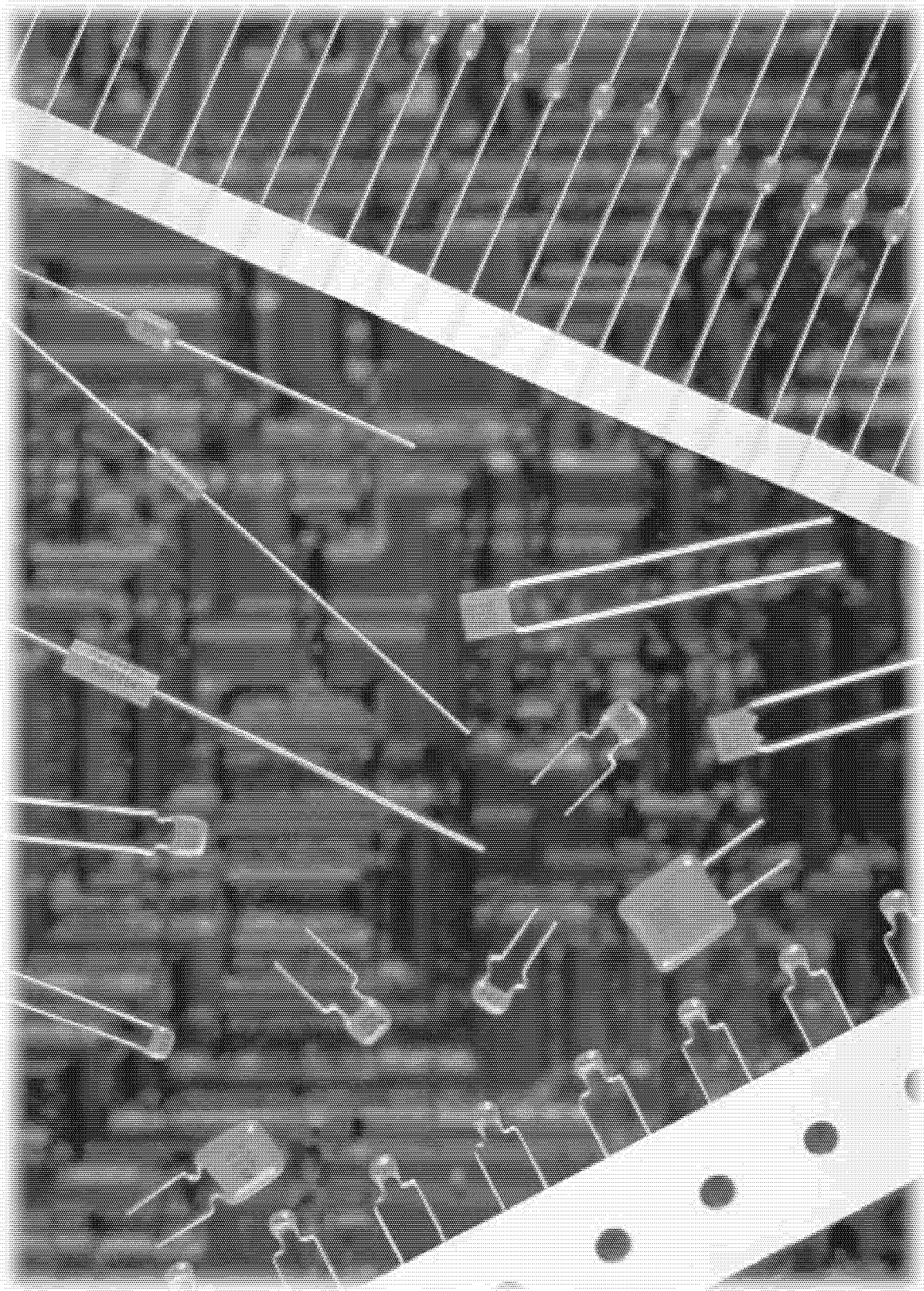


KEMET[®]

*CERAMIC
CONFORMAL
COATED & MOLDED
AXIAL & RADIAL
CAPACITORS*



CERAMIC LEADED CATALOG

Multilayer ceramic capacitors are available in a variety of physical sizes and configurations, including leaded devices and surface mounted chips. Leaded styles include molded and conformally coated parts with axial and radial leads. However, the basic capacitor element is similar for all styles. It is called a chip and consists of formulated dielectric materials which have been cast into thin layers, interspersed with metal electrodes alternately exposed on opposite

edges of the laminated structure. The entire structure is fired at high temperature to produce a monolithic block which provides high capacitance values in a small physical volume. After firing, conductive terminations are applied to opposite ends of the chip to make contact with the exposed electrodes. Termination materials and methods vary depending on the intended use.

TEMPERATURE CHARACTERISTICS

Ceramic dielectric materials can be formulated with a wide range of characteristics. The EIA standard for ceramic dielectric capacitors (RS-198) divides ceramic dielectrics into the following classes:

Class I: Temperature compensating capacitors, suitable for resonant circuit application or other applications where high Q and stability of capacitance characteristics are required. Class I capacitors have predictable temperature coefficients and are not affected by voltage, frequency or time. They are made from materials which are not ferro-electric, yielding superior stability but low volumetric efficiency. Class I capacitors are the most stable type available, but have the lowest volumetric efficiency.

Class II: Stable capacitors, suitable for bypass or coupling applications or frequency discriminating circuits where Q and stability of capacitance characteristics are not of a major importance. Class II capacitors have temperature characteristics of $\pm 15\%$ or less. They are made from materials which are ferro-electric, yielding higher volumetric efficiency but less stability. Class II capacitors are affected by temperature, voltage, frequency and time.

Class III: General purpose capacitors, suitable for by-pass coupling or other applications in which dielectric losses, high insulation resistance and stability of capacitance characteristics are of little or no importance. Class III capacitors are similar to Class II capacitors except for temperature characteristics, which are greater than $\pm 15\%$. Class III capacitors have the highest volumetric efficiency and poorest stability of any type.

KEMET leaded ceramic capacitors are offered in the three most popular temperature characteristics:

C0G: Class I, with a temperature coefficient of 0 ± 30 ppm per degree C over an operating temperature range of -55°C to $+125^\circ\text{C}$ (Also known as "NP0").

X7R: Class II, with a maximum capacitance change of $\pm 15\%$ over an operating temperature range of -55°C to $+125^\circ\text{C}$.

Z5U: Class III, with a maximum capacitance change of $+22\% - 56\%$ over an operating temperature range of $+10^\circ\text{C}$ to $+85^\circ\text{C}$.

Specified electrical limits for these three temperature characteristics are shown in Table 1.

SPECIFIED ELECTRICAL LIMITS

PARAMETER	TEMPERATURE CHARACTERISTICS		
	C0G	X7R	Z5U
Dissipation Factor: Measured at following conditions: C0G — 1 kHz and 1 vrms if capacitance > 1000 pF 1 MHz and 1 vrms if capacitance \leq 1000 pF X7R — 1 kHz and 1 vrms* Z5U — 1 kHz and 0.5 vrms	0.15%	2.5%	4.0%
Dielectric Strength: 2.5 times rated DC voltage.	Pass Subsequent IR Test		
Insulation Resistance (IR): At rated DC voltage, whichever of the two is smaller	1,000 M Ω - μ F or 100 G Ω	1,000 M Ω - μ F or 100 G Ω	1,000 M Ω - μ F or 10 G Ω
Temperature Characteristics: Range, $^\circ\text{C}$ Capacitance Change without DC voltage	-55 to 125 0 ± 30 ppm/ $^\circ\text{C}$	-55 to 125 $\pm 15\%$	+10 to 85 $+22\%, -56\%$

* 1 MHz and 1 vrms if capacitance \leq 100 pF on military product.

Table 1

GENERAL SPECIFICATIONS

Working Voltage:	Axial	Radial
C0G	50 & 100 volts	100 & 200 volts
X7R	50 & 100 volts	50, 100 & 200 volts
Z5U	50 & 100 volts	50 & 100 volts

Temperature Characteristics:

C0G	0 ± 30 PPM/°C from - 55°C to + 125°C ⁽¹⁾
X7R	± 15% from - 55°C to + 125°C
Z5U	+ 22%; - 56% from + 10°C to + 85°C

Capacitance Tolerance:

C0G	± 5%, ± 10%, ± 20%
X7R	± 10%, ± 20%
Z5U	± 20%, - 20 + 80%, - 0 + 100%

Construction:

Epoxy encapsulated - meets flame test requirements of UL Standard 94V-0.
High-temperature solder - meets EIA RS-198D, Method 302, Condition B (260°C for 10 sec.)

Lead Material:

Solder Coated Copper Clad Steel

Solderability:

EIA RS-198D, Method 302, Solder temperature - 230° ± 5°C. Dwell time in solder - 7 ± 1/2 seconds.

Terminal Strength:

EIA RS-198D, Method 303, Condition A (2.2 kg)

ELECTRICAL @ 25°C

Capacitance:

Within specified tolerance at 25°C and following test conditions.
C0G - Greater than 1000 pF with 1.0 vrms at 1 kHz.
- 1000 pF and less with 1.0 vrms at 1 MHz.
X7R - with 1.0 vrms at 1 kHz.
Z5U - with 0.5 vrms at 1 kHz.

Dissipation Factor:

At 25°C - same test conditions as capacitance.
C0G - 0.15% maximum
X7R - 2.5% maximum
Z5U - 4.0% maximum

Insulation Resistance:

EIA RS-198D, Method 104, Condition A
C0G - 100 gigohms or 1000 megohm x µF, whichever is less.
X7R - 100 gigohms or 1000 megohm x µF, whichever is less.
Z5U - 10 gigohms or 1000 megohm x µF, whichever is less.

Dielectric Withstanding Voltage:

EIA RS-198D, Method 103 (250% of rated voltage for 5 seconds, with current limited to 50mA)

ENVIRONMENTAL

Vibration:

EIA RS-198D, Method 304, Condition D (10-2000 Hz; 20g)

Shock:

EIA RS-198D, Method 305, Condition I (100g)

Life Test:

EIA RS-198D, Method 201, Condition D. Test Potential and Temperature.

C0G - 200% of rated voltage at + 125°C
X7R - 200% of rated voltage at + 125°C
Z5U - 200% of rated voltage at + 85°C

Post-Test Limits at + 25°C are:

Capacitance Change:

C0G - ± 3%, or 0.25 pF, whichever is greater.
X7R - ± 20% of initial value. ⁽²⁾
Z5U - ± 30% of initial value. ⁽²⁾

Dissipation Factor:

C0G - 0.25% maximum
X7R - 3.0% maximum
Z5U - 4.0% maximum

Insulation Resistance:

C0G - 10 gigohms or 100 megohm x µF, whichever is less.
X7R - 10 gigohms or 100 megohm x µF, whichever is less.
Z5U - 1 gigohm or 100 megohm x µF, whichever is less.

Moisture Resistance:

EIA RS-198D, Method 204, Condition A (10 cycles without applied voltage).

Post-Test Limits at + 25°C are:

Capacitance Change:

C0G - 3%, or 0.25 pF, whichever is greater.
X7R - ± 20% of initial value. ⁽²⁾
Z5U - ± 30% of initial value. ⁽²⁾

Dissipation Factor:

C0G - 0.25% maximum
X7R - 3.0% maximum
Z5U - 4.0% maximum

Insulation Resistance:

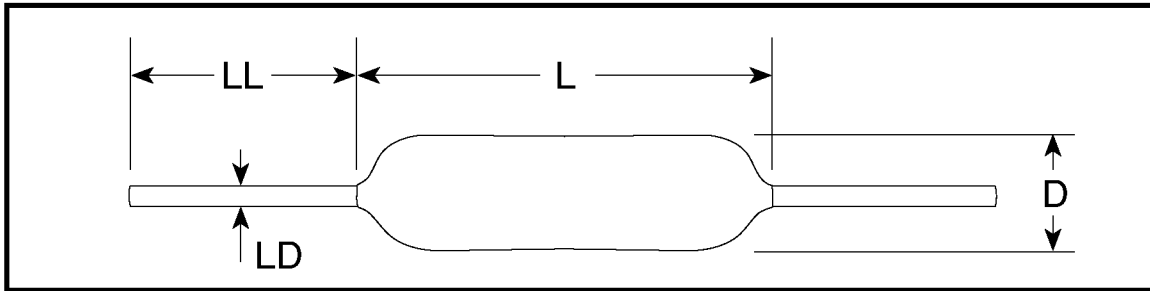
C0G - 10 gigohms or 100 megohm x µF, whichever is less.
X7R - 10 gigohms or 100 megohm x µF, whichever is less.
Z5U - 1 gigohm or 100 megohm x µF, whichever is less.

Thermal Shock:

EIA RS-198D, Method 202, Condition B (C0G & X7R: - 55°C to + 125°C; Z5U: - 55°C to + 85°C)

- (1) +53 ppm -30 ppm/°C from + 25°C to - 55°C, ± 60 ppm below 10 pF.
- (2) X7R & Z5U dielectrics exhibit aging characteristics; therefore, it is highly recommended that capacitors be deaged for 2 hours at 150°C and stabilized at room temperature for 48 hours before capacitance measurements are made.

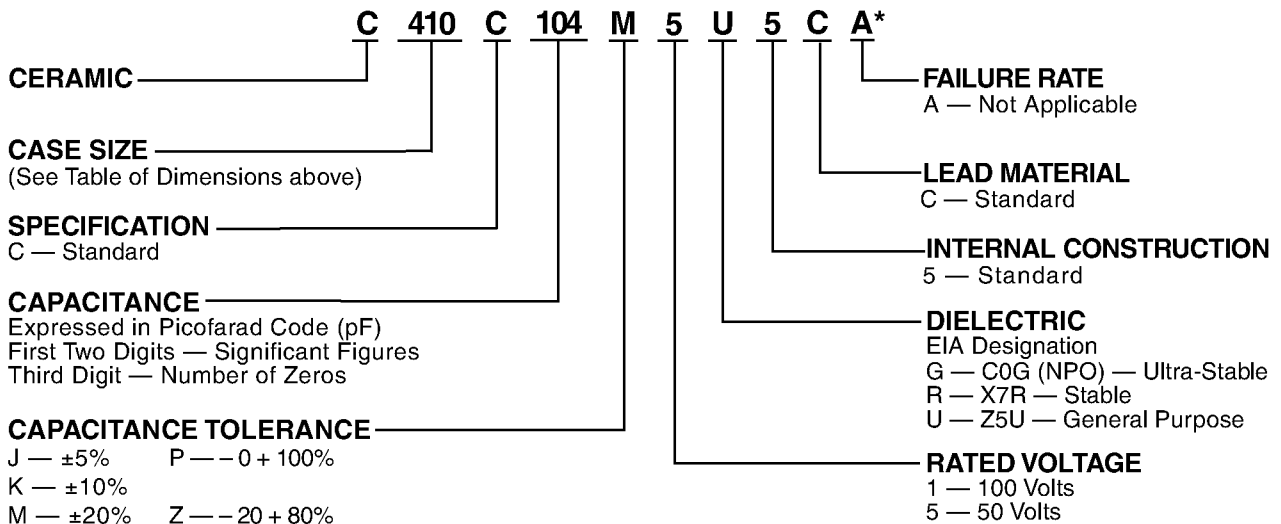
CAPACITANCE OUTLINE DRAWING



MAXIMUM DIMENSIONS—INCHES & (MILLIMETERS)

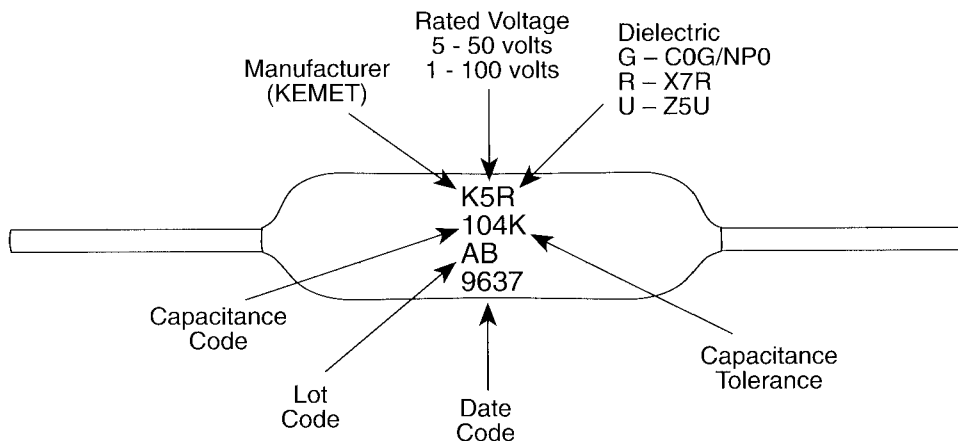
STYLE	L MAX	D MAX	LD +.001, -.003 (+.025, -.076)	LL MIN
C410	.170 (4.32)	.100 (2.54)	.020 (.51)	1.0 (25.4)
C412	.170 (4.32)	.120 (3.05)	.020 (.51)	1.0 (25.4)
C420	.260 (6.60)	.100 (2.54)	.020 (.51)	1.0 (25.4)
C430	.290 (7.37)	.150 (3.81)	.020 (.51)	1.0 (25.4)
C440	.400 (10.16)	.150 (3.81)	.020 (.51)	1.0 (25.4)

ORDERING INFORMATION



*Part Number Example: C410C104M5U5CA (14 digits — no spaces)

MARKING INFORMATION



RATINGS & PART NUMBER REFERENCE

ULTRA-STABLE
TEMPERATURE
CHARACTERISTIC — C0G/NP0

CAPACITANCE pF	KEMET PART NUMBER
100 VOLT - C0G	
10	C410C100(1)1G5CA
12	C410C120(1)1G5CA
15	C410C150(1)1G5CA
18	C410C180(1)1G5CA
22	C410C220(1)1G5CA
27	C410C270(1)1G5CA
33	C410C330(1)1G5CA
39	C410C390(1)1G5CA
47	C410C470(1)1G5CA
56	C410C560(1)1G5CA
68	C410C680(1)1G5CA
82	C410C820(1)1G5CA
100	C410C101(1)1G5CA
120	C410C121(1)1G5CA
150	C410C151(1)1G5CA
180	C410C181(1)1G5CA
220	C410C221(1)1G5CA
270	C410C271(1)1G5CA
330	C410C331(1)1G5CA
390	C410C391(1)1G5CA
470	C410C471(1)1G5CA
560	C410C561(1)1G5CA
680	C410C681(1)1G5CA
820	C410C821(1)1G5CA
1,000	C410C102(1)1G5CA
1,200	C420C122(1)1G5CA
1,500	C420C152(1)1G5CA
1,800	C420C182(1)1G5CA
2,200	C420C222(1)1G5CA
2,700	C430C272(1)1G5CA
3,300	C430C332(1)1G5CA
3,900	C430C392(1)1G5CA
4,700	C430C472(1)1G5CA
5,600	C430C562(1)1G5CA
6,800	C430C682(1)1G5CA
8,200	C430C822(1)1G5CA
10,000	C440C103(1)1G5CA
12,000	C440C123(1)1G5CA
15,000	C440C153(1)1G5CA
50 VOLT - C0G	
560	C410C561(1)5G5CA
680	C410C681(1)5G5CA
820	C410C821(1)5G5CA
1,000	C410C102(1)5G5CA
1,200	C412C122(1)5G5CA
1,500	C412C152(1)5G5CA
1,800	C412C182(1)5G5CA
2,200	C412C222(1)5G5CA
2,700	C412C272(1)5G5CA
1,200	C420C122(1)5G5CA
1,500	C420C152(1)5G5CA
1,800	C420C182(1)5G5CA
2,200	C420C222(1)5G5CA
2,700	C430C272(1)5G5CA
3,300	C430C332(1)5G5CA
3,900	C430C392(1)5G5CA
4,700	C430C472(1)5G5CA
5,600	C430C562(1)5G5CA
6,800	C430C682(1)5G5CA
8,200	C430C822(1)5G5CA
10,000	C440C103(1)5G5CA
12,000	C440C123(1)5G5CA
15,000	C440C153(1)5G5CA

(1) Insert proper letter for capacitance tolerance desired:
J = ±5%
K = ±10%
M = ±20%

SINGLE
TEMPERATURE
CHARACTERISTIC — X7R

CAPACITANCE pF	KEMET PART NUMBER
100 VOLT - X7R	
470	C410C471(1)1R5CA
560	C410C561(1)1R5CA
680	C410C681(1)1R5CA
820	C410C821(1)1R5CA
1,000	C410C102(1)1R5CA
1,200	C410C122(1)1R5CA
1,500	C410C152(1)1R5CA
1,800	C410C182(1)1R5CA
2,200	C410C222(1)1R5CA
2,700	C410C272(1)1R5CA
3,300	C410C332(1)1R5CA
3,900	C410C392(1)1R5CA
4,700	C410C472(1)1R5CA
5,600	C410C562(1)1R5CA
6,800	C410C682(1)1R5CA
8,200	C410C822(1)1R5CA
10,000	C410C103(1)1R5CA
12,000	C410C123(1)1R5CA
15,000	C412C153(1)1R5CA
18,000	C412C183(1)1R5CA
22,000	C412C223(1)1R5CA
27,000	C412C273(1)1R5CA
15,000	C420C153(1)1R5CA
18,000	C420C183(1)1R5CA
22,000	C420C223(1)1R5CA
27,000	C420C273(1)1R5CA
33,000	C420C333(1)1R5CA
39,000	C430C393(1)1R5CA
47,000	C430C473(1)1R5CA
56,000	C430C563(1)1R5CA
68,000	C430C683(1)1R5CA
82,000	C430C823(1)1R5CA
100,000	C430C104(1)1R5CA
120,000	C440C124(1)1R5CA
150,000	C440C154(1)1R5CA
50 VOLT - X7R	
8,200	C410C822(1)5R5CA
10,000	C410C103(1)5R5CA
12,000	C410C123(1)5R5CA
15,000	C410C153(1)5R5CA
18,000	C410C183(1)5R5CA
22,000	C410C223(1)5R5CA
27,000	C410C273(1)5R5CA
33,000	C410C333(1)5R5CA
39,000	C410C393(1)5R5CA
47,000	C410C473(1)5R5CA
56,000	C412C563(1)5R5CA
68,000	C412C683(1)5R5CA
82,000	C412C823(1)5R5CA
100,000	C412C104(1)5R5CA
56,000	C420C563(1)5R5CA
68,000	C420C683(1)5R5CA
82,000	C420C823(1)5R5CA
100,000	C420C104(1)5R5CA
120,000	C430C124(1)5R5CA
150,000	C430C154(1)5R5CA
180,000	C430C184(1)5R5CA
220,000	C430C224(1)5R5CA
270,000	C430C274(1)5R5CA
330,000	C440C334(1)5R5CA
390,000	C440C394(1)5R5CA
470,000	C440C474(1)5R5CA

(1) Insert proper letter for capacitance tolerance desired:
K = ±10%, M = ±20%

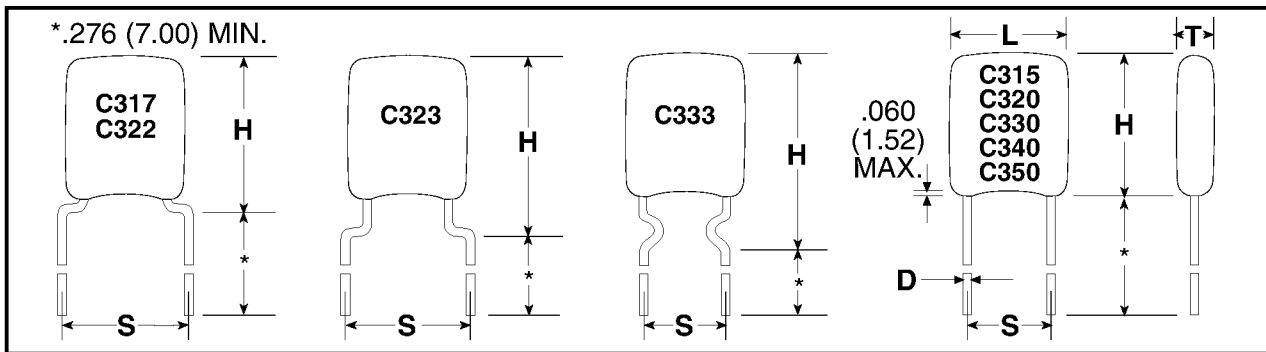
GENERAL PURPOSE
TEMPERATURE
CHARACTERISTIC — Z5U

CAPACITANCE pF	KEMET PART NUMBER
100 VOLT - Z5U	
10,000	C410C103(1)1U5CA
12,000	C410C123(1)1U5CA
15,000	C410C153(1)1U5CA
18,000	C410C183(1)1U5CA
22,000	C410C223(1)1U5CA
27,000	C420C273(1)1U5CA
33,000	C420C333(1)1U5CA
39,000	C420C393(1)1U5CA
47,000	C420C473(1)1U5CA
56,000	C430C563(1)1U5CA
68,000	C430C683(1)1U5CA
82,000	C430C823(1)1U5CA
100,000	C430C104(1)1U5CA
120,000	C430C124(1)1U5CA
150,000	C430C154(1)1U5CA
180,000	C440C184(1)1U5CA
220,000	C440C224(1)1U5CA
50 VOLT - Z5U	
27,000	C410C273(1)5U5CA
33,000	C410C333(1)5U5CA
39,000	C410C393(1)5U5CA
47,000	C410C473(1)5U5CA
56,000	C410C563(1)5U5CA
68,000	C410C683(1)5U5CA
82,000	C410C823(1)5U5CA
100,000	C410C104(1)5U5CA
120,000	C410C124(1)5U5CA
150,000	C410C154(1)5U5CA
180,000	C410C184(1)5U5CA
220,000	C410C224(1)5U5CA
270,000	C412C274(1)5U5CA
330,000	C412C334(1)5U5CA
270,000	C420C274(1)5U5CA
330,000	C420C334(1)5U5CA
390,000	C430C394(1)5U5CA
470,000	C430C474(1)5U5CA
560,000	C430C564(1)5U5CA
680,000	C430C684(1)5U5CA
820,000	C440C824(1)5U5CA
1,000,000	C440C105(1)5U5CA

(1) Insert proper letter for capacitance tolerance desired:
M = ±20%, Z = +80, -20%, P = +100, -0%

For packaging information, see pages 32 and 34.

OUTLINE DRAWINGS

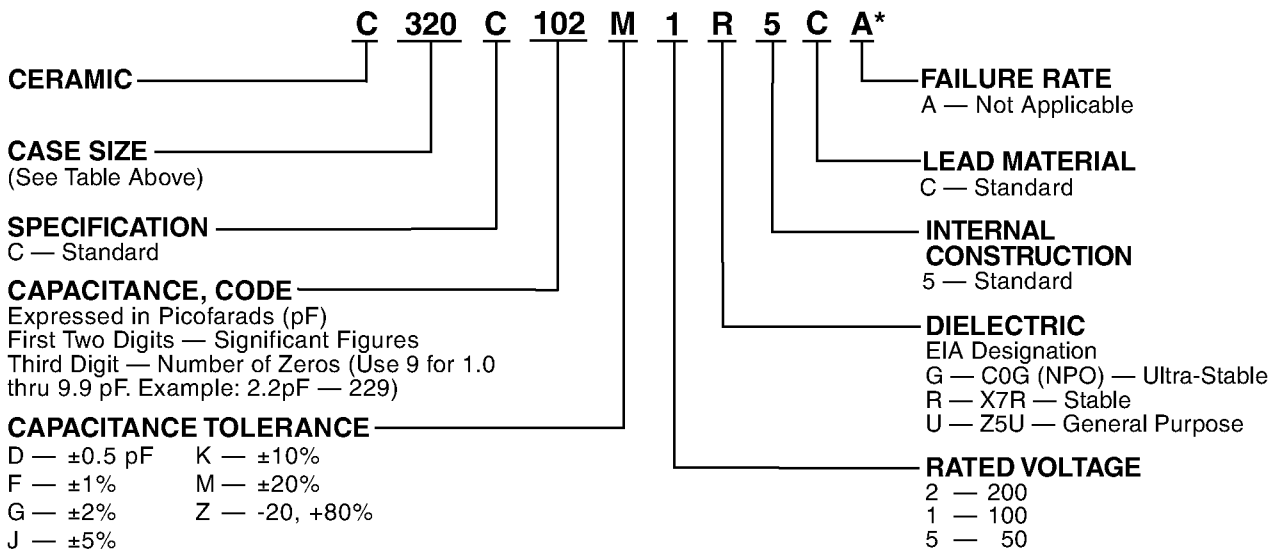


DIMENSIONS — INCHES & MILLIMETERS

CASE SIZE	L MAX.	H MAX.	T MAX.	S(1) ±.030	D +.004 - .001
C315	.150 (3.81)	.210 (5.33)	.100 (2.54)	.100 (2.54)	.020 (.51)
C317	.150 (3.81)	.230 (5.84)	.100 (2.54)	.200 (5.08)	.020 (.51)
C320	.200 (5.08)	.260 (6.60)	.125 (3.18)	.100 (2.54)	.020 (.51)
C322	.200 (5.08)	.260 (6.60)	.125 (3.18)	.200 (5.08)	.020 (.51)
C323	.200 (5.08)	.320 (8.13)	.125 (3.18)	.200 (5.08)	.020 (.51)
C330	.300 (7.62)	.360 (9.14)	.150 (3.81)	.200 (5.08)	.020 (.51)
C333	.300 (7.62)	.390 (9.91)	.150 (3.81)	.200 (5.08)	.020 (.51)
C340	.400 (10.16)	.460 (11.68)	.150 (3.81)	.200 (5.08)	.020 (.51)
C350	.500 (12.70)	.560 (14.22)	.200 (5.08)	.400 (10.16)	.025 (.64)

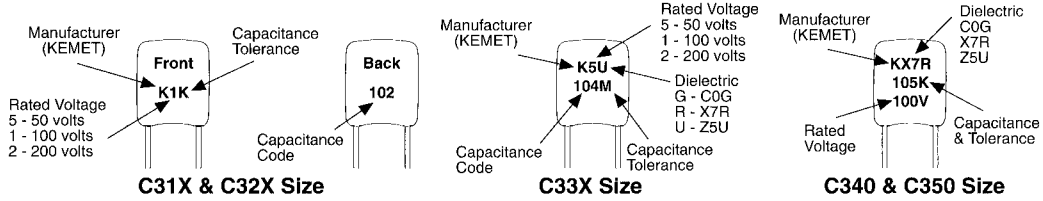
NOTE: 1 inch = 25.4 mm.
NOTE: (1) Measured at seating plane.

ORDERING INFORMATION



*Part Number Example: C320C102M1R5CA (14 digits — no spaces)

CAPACITOR MARKINGS



RATINGS & PART NUMBER REFERENCE: ULTRA-STABLE TEMPERATURE CHARACTERISTICS — COG

CAPACITANCE	KEMET PART NUMBER
200 VOLT — C31X SIZE	
1.0 pF	C31(1)C109(3)2G5CA
1.5 pF	C31(1)C159(3)2G5CA
2.2 pF	C31(1)C229(3)2G5CA
2.7 pF	C31(1)C279(3)2G5CA
3.3 pF	C31(1)C339(3)2G5CA
3.9 pF	C31(1)C399(3)2G5CA
4.7 pF	C31(1)C479(3)2G5CA
5.6 pF	C31(1)C569(3)2G5CA
6.8 pF	C31(1)C689(3)2G5CA
8.2 pF	C31(1)C829(3)2G5CA
10 pF	C31(1)C100(3)2G5CA
12 pF	C31(1)C120(3)2G5CA
15 pF	C31(1)C150(3)2G5CA
18 pF	C31(1)C180(3)2G5CA
22 pF	C31(1)C220(3)2G5CA
27 pF	C31(1)C270(3)2G5CA
33 pF	C31(1)C330(3)2G5CA
39 pF	C31(1)C390(3)2G5CA
47 pF	C31(1)C470(3)2G5CA
56 pF	C31(1)C560(3)2G5CA
68 pF	C31(1)C680(3)2G5CA
82 pF	C31(1)C820(3)2G5CA
100 pF	C31(1)C101(3)2G5CA
120 pF	C31(1)C121(3)2G5CA
150 pF	C31(1)C151(3)2G5CA
180 pF	C31(1)C181(3)2G5CA
220 pF	C31(1)C221(3)2G5CA
270 pF	C31(1)C271(3)2G5CA
330 pF	C31(1)C331(3)2G5CA
390 pF	C31(1)C391(3)2G5CA
470 pF	C31(1)C471(3)2G5CA
200 VOLT — C32X SIZE	
1.0 pF	C32(2)C109(3)2G5CA
1.5 pF	C32(2)C159(3)2G5CA
2.2 pF	C32(2)C229(3)2G5CA
2.7 pF	C32(2)C279(3)2G5CA
3.3 pF	C32(2)C339(3)2G5CA
3.9 pF	C32(2)C399(3)2G5CA
4.7 pF	C32(2)C479(3)2G5CA
5.6 pF	C32(2)C569(3)2G5CA
6.8 pF	C32(2)C689(3)2G5CA
8.2 pF	C32(2)C829(3)2G5CA
10 pF	C32(2)C100(3)2G5CA
12 pF	C32(2)C120(3)2G5CA
15 pF	C32(2)C150(3)2G5CA
18 pF	C32(2)C180(3)2G5CA
22 pF	C32(2)C220(3)2G5CA
27 pF	C32(2)C270(3)2G5CA
33 pF	C32(2)C330(3)2G5CA
39 pF	C32(2)C390(3)2G5CA

CAPACITANCE	KEMET PART NUMBER
200 VOLT — C32X SIZE (Cont'd)	
47 pF	C32(2)C470(3)2G5CA
56 pF	C32(2)C560(3)2G5CA
68 pF	C32(2)C680(3)2G5CA
82 pF	C32(2)C820(3)2G5CA
100 pF	C32(2)C101(3)2G5CA
120 pF	C32(2)C121(3)2G5CA
150 pF	C32(2)C151(3)2G5CA
180 pF	C32(2)C181(3)2G5CA
220 pF	C32(2)C221(3)2G5CA
270 pF	C32(2)C271(3)2G5CA
330 pF	C32(2)C331(3)2G5CA
390 pF	C32(2)C391(3)2G5CA
470 pF	C32(2)C471(3)2G5CA
560 pF	C32(2)C561(3)2G5CA
680 pF	C32(2)C681(3)2G5CA
820 pF	C32(2)C821(3)2G5CA
1,000 pF	C32(2)C102(3)2G5CA
1,200 pF	C32(2)C122(3)2G5CA
1,500 pF	C32(2)C152(3)2G5CA
1,800 pF	C32(2)C182(3)2G5CA
2,200 pF	C32(2)C222(3)2G5CA
2,700 pF	C32(2)C272(3)2G5CA
3,300 pF	C32(2)C332(3)2G5CA
200 VOLT — C33X SIZE	
2,700 pF	C33(4)C272(3)2G5CA
3,300 pF	C33(4)C332(3)2G5CA
3,900 pF	C33(4)C392(3)2G5CA
4,700 pF	C33(4)C472(3)2G5CA
5,600 pF	C33(4)C562(3)2G5CA
6,800 pF	C33(4)C682(3)2G5CA
8,200 pF	C33(4)C822(3)2G5CA
.01 µF	C33(4)C103(3)2G5CA
.012 µF	C33(4)C123(3)2G5CA
.015 µF	C33(4)C153(3)2G5CA
.018 µF	C33(4)C183(3)2G5CA
200 VOLT — C340 SIZE	
.018 µF	C340C183(3)2G5CA
.022 µF	C340C223(3)2G5CA
.027 µF	C340C273(3)2G5CA
.033 µF	C340C333(3)2G5CA
.039 µF	C340C393(3)2G5CA
.047 µF	C340C473(3)2G5CA
200 VOLT — C350 SIZE	
.039 µF	C350C393(3)2G5CA
.047 µF	C350C473(3)2G5CA
.056 µF	C350C563(3)2G5CA
.068 µF	C350C683(3)2G5CA

CAPACITANCE	KEMET PART NUMBER
100 VOLT — C31X SIZE	
120 pF	C31(1)C121(3)1G5CA
150 pF	C31(1)C151(3)1G5CA
180 pF	C31(1)C181(3)1G5CA
220 pF	C31(1)C221(3)1G5CA
270 pF	C31(1)C271(3)1G5CA
330 pF	C31(1)C331(3)1G5CA
390 pF	C31(1)C391(3)1G5CA
470 pF	C31(1)C471(3)1G5CA
560 pF	C31(1)C561(3)1G5CA
680 pF	C31(1)C681(3)1G5CA
820 pF	C31(1)C821(3)1G5CA
1,000 pF	C31(1)C102(3)1G5CA
100 VOLT — C32X SIZE	
680 pF	C32(2)C681(3)1G5CA
820 pF	C32(2)C821(3)1G5CA
1,000 pF	C32(2)C102(3)1G5CA
1,200 pF	C32(2)C122(3)1G5CA
1,500 pF	C32(2)C152(3)1G5CA
1,800 pF	C32(2)C182(3)1G5CA
2,200 pF	C32(2)C222(3)1G5CA
2,700 pF	C32(2)C272(3)1G5CA
3,300 pF	C32(2)C332(3)1G5CA
3,900 pF	C32(2)C392(3)1G5CA
4,700 pF	C32(2)C472(3)1G5CA
5,600 pF	C32(2)C562(3)1G5CA
6,800 pF	C32(2)C682(3)1G5CA
8,200 pF	C32(2)C822(3)1G5CA
.01 µF	C33(4)C103(3)1G5CA
.012 µF	C33(4)C123(3)1G5CA
.015 µF	C33(4)C153(3)1G5CA
.018 µF	C33(4)C183(3)1G5CA
.022 µF	C33(4)C223(3)1G5CA
.027 µF	C33(4)C273(3)1G5CA
100 VOLT — C340 SIZE	
.027 µF	C340C273(3)1G5CA
.033 µF	C340C333(3)1G5CA
.039 µF	C340C393(3)1G5CA
.047 µF	C340C473(3)1G5CA
.056 µF	C340C563(3)1G5CA
.068 µF	C340C683(3)1G5CA
100 VOLT — C350 SIZE	
.039 µF	C350C393(3)1G5CA
.047 µF	C350C473(3)1G5CA
.056 µF	C350C563(3)1G5CA
.068 µF	C350C683(3)1G5CA
.082 µF	C350C823(3)1G5CA
.1 µF	C350C104(3)1G5CA
.12 µF	C350C124(3)1G5CA

Golden Max

NOTES: (1) Case Sizes C315/C317 are identical electrically, but differ in lead spacing. See table of dimensions. Insert the appropriate symbol, "5" or "7" in the part number.
 (2) Case Sizes C320/C322/C323 are identical electrically, but differ in lead spacing. See table of dimensions. Insert the appropriate symbol, "0" or "2" or "3" in the part number.
 (3) Insert proper symbol for capacitance tolerance as follows:
 1.0 pF - 8.2 pF: D - ±5%
 10 pF - 22 pF: J - ±5%, K - ±10%
 27 pF - 47 pF: G - ±2%, J - ±5%, K - ±10%
 56 pF and up: F - ±1%, G - ±2%, J - ±5%
 (4) Case Sizes C330 and C333 are identical electrically. Insert the appropriate symbol "0" or "3" in the part number.

RATINGS & PART NUMBER REFERENCE: STABLE TEMPERATURE CHARACTERISTICS — X7R

CAPACITANCE	KEMET PART NUMBER
200 VOLT — C31X SIZE	
100 pF	C31(1)C101(3)2R5CA
120 pF	C31(1)C121(3)2R5CA
150 pF	C31(1)C151(3)2R5CA
180 pF	C31(1)C181(3)2R5CA
220 pF	C31(1)C221(3)2R5CA
270 pF	C31(1)C271(3)2R5CA
330 pF	C31(1)C331(3)2R5CA
390 pF	C31(1)C391(3)2R5CA
470 pF	C31(1)C471(3)2R5CA
560 pF	C31(1)C561(3)2R5CA
680 pF	C31(1)C681(3)2R5CA
820 pF	C31(1)C821(3)2R5CA
1,000 pF	C31(1)C102(3)2R5CA
1,200 pF	C31(1)C122(3)2R5CA
1,500 pF	C31(1)C152(3)2R5CA
1,800 pF	C31(1)C182(3)2R5CA
2,200 pF	C31(1)C222(3)2R5CA
200 VOLT — C32X SIZE	
1,000 pF	C32(2)C102(3)2R5CA
1,200 pF	C32(2)C122(3)2R5CA
1,500 pF	C32(2)C152(3)2R5CA
1,800 pF	C32(2)C182(3)2R5CA
2,200 pF	C32(2)C222(3)2R5CA
2,700 pF	C32(2)C272(3)2R5CA
3,300 pF	C32(2)C332(3)2R5CA
3,900 pF	C32(2)C392(3)2R5CA
4,700 pF	C32(2)C472(3)2R5CA
5,600 pF	C32(2)C562(3)2R5CA
6,800 pF	C32(2)C682(3)2R5CA
8,200 pF	C32(2)C822(3)2R5CA
.01 µF	C32(2)C103(3)2R5CA
.012 µF	C32(2)C123(3)2R5CA
.015 µF	C32(2)C153(3)2R5CA
.018 µF	C32(2)C183(3)2R5CA
.022 µF	C32(2)C223(3)2R5CA
200 VOLT — C33X SIZE	
.015 µF	C33(4)C153(3)2R5CA
.018 µF	C33(4)C183(3)2R5CA
.022 µF	C33(4)C223(3)2R5CA
.027 µF	C33(4)C273(3)2R5CA
.033 µF	C33(4)C333(3)2R5CA
.039 µF	C33(4)C393(3)2R5CA
.047 µF	C33(4)C473(3)2R5CA
.056 µF	C33(4)C563(3)2R5CA
.068 µF	C33(4)C683(3)2R5CA
.082 µF	C33(4)C823(3)2R5CA
.1 µF	C33(4)C104(3)2R5CA
200 VOLT — C340 SIZE	
.1 µF	C340C104(3)2R5CA
.12 µF	C340C124(3)2R5CA
.15 µF	C340C154(3)2R5CA
.18 µF	C340C184(3)2R5CA
.22 µF	C340C224(3)2R5CA
.27 µF	C340C274(3)2R5CA
200 VOLT — C350 SIZE	
.22 µF	C350C224(3)2R5CA
.27 µF	C350C274(3)2R5CA
.33 µF	C350C334(3)2R5CA
.39 µF	C350C394(3)2R5CA
.47 µF	C350C474(3)2R5CA

CAPACITANCE	KEMET PART NUMBER
100 VOLT — C31X SIZE	
820 pF	C31(1)C821(3)1R5CA
1,000 pF	C31(1)C102(3)1R5CA
1,200 pF	C31(1)C122(3)1R5CA
1,500 pF	C31(1)C152(3)1R5CA
1,800 pF	C31(1)C182(3)1R5CA
2,200 pF	C31(1)C222(3)1R5CA
2,700 pF	C31(1)C272(3)1R5CA
3,300 pF	C31(1)C332(3)1R5CA
3,900 pF	C31(1)C392(3)1R5CA
4,700 pF	C31(1)C472(3)1R5CA
5,600 pF	C31(1)C562(3)1R5CA
6,800 pF	C31(1)C682(3)1R5CA
8,200 pF	C31(1)C822(3)1R5CA
.01 µF	C31(1)C103(3)1R5CA
100 VOLT — C32X SIZE	
4,700 pF	C32(2)C472(3)1R5CA
5,600 pF	C32(2)C562(3)1R5CA
6,800 pF	C32(2)C682(3)1R5CA
8,200 pF	C32(2)C822(3)1R5CA
.01 µF	C32(2)C103(3)1R5CA
.012 µF	C32(2)C123(3)1R5CA
.015 µF	C32(2)C153(3)1R5CA
.018 µF	C32(2)C183(3)1R5CA
.022 µF	C32(2)C223(3)1R5CA
.027 µF	C32(2)C273(3)1R5CA
.033 µF	C32(2)C333(3)1R5CA
.039 µF	C32(2)C393(3)1R5CA
.047 µF	C32(2)C473(3)1R5CA
.056 µF	C32(2)C563(3)1R5CA
.068 µF	C32(2)C683(3)1R5CA
.082 µF	C32(2)C823(3)1R5CA
.1 µF	C32(2)C104(3)1R5CA
100 VOLT — C33X SIZE	
.068 µF	C33(4)C683(3)1R5CA
.082 µF	C33(4)C823(3)1R5CA
.1 µF	C33(4)C104(3)1R5CA
.12 µF	C33(4)C124(3)1R5CA
.15 µF	C33(4)C154(3)1R5CA
.18 µF	C33(4)C184(3)1R5CA
.22 µF	C33(4)C224(3)1R5CA
.27 µF	C33(4)C274(3)1R5CA
.33 µF	C33(4)C334(3)1R5CA
.39 µF	C33(4)C394(3)1R5CA
.47 µF	C33(4)C474(3)1R5CA
100 VOLT — C340 SIZE	
.47 µF	C340C474(3)1R5CA
.56 µF	C340C564(3)1R5CA
.68 µF	C340C684(3)1R5CA
.82 µF	C340C824(3)1R5CA
1.0 µF	C340C105(3)1R5CA
100 VOLT — C350 SIZE	
.68 µF	C350C684(3)1R5CA
.82 µF	C350C824(3)1R5CA
1.0 µF	C350C105(3)1R5CA
1.2 µF	C350C125(3)1R5CA

CAPACITANCE	KEMET PART NUMBER
50 VOLT — C31X SIZE	
3,300 pF	C31(1)C332(3)5R5CA
3,900 pF	C31(1)C392(3)5R5CA
4,700 pF	C31(1)C472(3)5R5CA
5,600 pF	C31(1)C562(3)5R5CA
6,800 pF	C31(1)C682(3)5R5CA
8,200 pF	C31(1)C822(3)5R5CA
.01 µF	C31(1)C103(3)5R5CA
.012 µF	C31(1)C123(3)5R5CA
.015 µF	C31(1)C153(3)5R5CA
.018 µF	C31(1)C183(3)5R5CA
.022 µF	C31(1)C223(3)5R5CA
.027 µF	C31(1)C273(3)5R5CA
.033 µF	C31(1)C333(3)5R5CA
50 VOLT — C32X SIZE	
.012 µF	C32(2)C123(3)5R5CA
.015 µF	C32(2)C153(3)5R5CA
.018 µF	C32(2)C183(3)5R5CA
.022 µF	C32(2)C223(3)5R5CA
.027 µF	C32(2)C273(3)5R5CA
.033 µF	C32(2)C333(3)5R5CA
.039 µF	C32(2)C393(3)5R5CA
.047 µF	C32(2)C473(3)5R5CA
.056 µF	C32(2)C563(3)5R5CA
.068 µF	C32(2)C683(3)5R5CA
.082 µF	C32(2)C823(3)5R5CA
.1 µF	C32(2)C104(3)5R5CA
.12 µF	C32(2)C124(3)5R5CA
.15 µF	C32(2)C154(3)5R5CA
.18 µF	C32(2)C184(3)5R5CA
.22 µF	C32(2)C224(3)5R5CA
.27 µF	C32(2)C274(3)5R5CA
50 VOLT — C33X SIZE	
.15 µF	C33(4)C154(3)5R5CA
.18 µF	C33(4)C184(3)5R5CA
.22 µF	C33(4)C224(3)5R5CA
.27 µF	C33(4)C274(3)5R5CA
.33 µF	C33(4)C334(3)5R5CA
.39 µF	C33(4)C394(3)5R5CA
.47 µF	C33(4)C474(3)5R5CA
.56 µF	C33(4)C564(3)5R5CA
.68 µF	C33(4)C684(3)5R5CA
.82 µF	C33(4)C824(3)5R5CA
1.0 µF	C33(4)C105(3)5R5CA
50 VOLT — C340 SIZE	
1.2 µF	C340C125(3)5R5CA
1.5 µF	C340C155(3)5R5CA
1.8 µF	C340C185(3)5R5CA
2.2 µF	C340C225(3)5R5CA
50 VOLT — C350 SIZE	
2.2 µF	C350C225(3)5R5CA
2.7 µF	C350C275(3)5R5CA
3.3 µF	C350C335(3)5R5CA
3.9 µF	C350C395(3)5R5CA
4.7 µF	C350C475(3)5R5CA

NOTES: (1) Case Sizes C315/C317 are identical electrically, but differ in lead spacing. See table of dimensions. Insert the appropriate symbol, "5" or "7" in the part number.
 (2) Case Sizes C320/C322/C323 are identical electrically, but differ in lead spacing. See table of dimensions. Insert the appropriate symbol, "0" or "2" or "3" in the part number.
 (3) Insert proper symbol for capacitance tolerance as follows: K - ±10%, M - ±20%
 (4) Case Sizes C330 and C333 are identical electrically. Insert the appropriate symbol "0" or "3" in the part number.

RATINGS & PART NUMBER REFERENCE
GENERAL PURPOSE TEMPERATURE CHARACTERISTIC — Z5U

CAPACITANCE	KEMET PART NUMBER
100 VOLT — C31X SIZE	
1,000 pF	C31(1)C102(3)1U5CA
1,200 pF	C31(1)C122(3)1U5CA
1,500 pF	C31(1)C152(3)1U5CA
1,800 pF	C31(1)C182(3)1U5CA
2,200 pF	C31(1)C222(3)1U5CA
2,700 pF	C31(1)C272(3)1U5CA
3,300 pF	C31(1)C332(3)1U5CA
3,900 pF	C31(1)C392(3)1U5CA
4,700 pF	C31(1)C472(3)1U5CA
5,600 pF	C31(1)C562(3)1U5CA
6,800 pF	C31(1)C682(3)1U5CA
8,200 pF	C31(1)C822(3)1U5CA
.01 μF	C31(1)C103(3)1U5CA
.012 μF	C31(1)C123(3)1U5CA
.015 μF	C31(1)C153(3)1U5CA
.018 μF	C31(1)C183(3)1U5CA
100 VOLT — C32X SIZE	
.01 μF	C32(2)C103(3)1U5CA
.012 μF	C32(2)C123(3)1U5CA
.015 μF	C32(2)C153(3)1U5CA
.018 μF	C32(2)C183(3)1U5CA
.022 μF	C32(2)C223(3)1U5CA
.027 μF	C32(2)C273(3)1U5CA
.033 μF	C32(2)C333(3)1U5CA
.039 μF	C32(2)C393(3)1U5CA
.047 μF	C32(2)C473(3)1U5CA
.056 μF	C32(2)C563(3)1U5CA
.068 μF	C32(2)C683(3)1U5CA
.082 μF	C32(2)C823(3)1U5CA
0.1 μF	C32(2)C104(3)1U5CA
.12 μF	C32(2)C124(3)1U5CA
.15 μF	C32(2)C154(3)1U5CA
100 VOLT — C33X SIZE	
0.1 μF	C33(4)C104(3)1U5CA
.12 μF	C33(4)C124(3)1U5CA
.15 μF	C33(4)C154(3)1U5CA
.18 μF	C33(4)C184(3)1U5CA
.22 μF	C33(4)C224(3)1U5CA
.27 μF	C33(4)C274(3)1U5CA
.33 μF	C33(4)C334(3)1U5CA
.39 μF	C33(4)C394(3)1U5CA
.47 μF	C33(4)C474(3)1U5CA
100 VOLT — C340 SIZE	
.47 μF	C340C474(3)1U5CA
.56 μF	C340C564(3)1U5CA
.68 μF	C340C684(3)1U5CA
.82 μF	C340C824(3)1U5CA
1.0 μF	C340C105(3)1U5CA
1.2 μF	C340C125(3)1U5CA
1.5 μF	C340C155(3)1U5CA
100 VOLT — C350 SIZE	
1.0 μF	C350C105(3)1U5CA
1.2 μF	C350C125(3)1U5CA
1.5 μF	C350C155(3)1U5CA
1.8 μF	C350C185(3)1U5CA
2.2 μF	C350C225(3)1U5CA

CAPACITANCE	KEMET PART NUMBER
50 VOLT — C31X SIZE	
4,700 pF	C31(1)C472(3)5U5CA
5,600 pF	C31(1)C562(3)5U5CA
6,800 pF	C31(1)C682(3)5U5CA
8,200 pF	C31(1)C822(3)5U5CA
.01 μF	C31(1)C103(3)5U5CA
.012 μF	C31(1)C123(3)5U5CA
.015 μF	C31(1)C153(3)5U5CA
.018 μF	C31(1)C183(3)5U5CA
.022 μF	C31(1)C223(3)5U5CA
.027 μF	C31(1)C273(3)5U5CA
.033 μF	C31(1)C333(3)5U5CA
.039 μF	C31(1)C393(3)5U5CA
.047 μF	C31(1)C473(3)5U5CA
.056 μF	C31(1)C563(3)5U5CA
.068 μF	C31(1)C683(3)5U5CA
.082 μF	C31(1)C823(3)5U5CA
0.1 μF	C31(1)C104(3)5U5CA
50 VOLT — C32X SIZE	
.027 μF	C32(2)C273(3)5U5CA
.033 μF	C32(2)C333(3)5U5CA
.039 μF	C32(2)C393(3)5U5CA
.047 μF	C32(2)C473(3)5U5CA
.056 μF	C32(2)C563(3)5U5CA
.068 μF	C32(2)C683(3)5U5CA
.082 μF	C32(2)C823(3)5U5CA
0.1 μF	C32(2)C104(3)5U5CA
.12 μF	C32(2)C124(3)5U5CA
.15 μF	C32(2)C154(3)5U5CA
.18 μF	C32(2)C184(3)5U5CA
.22 μF	C32(2)C224(3)5U5CA
.27 μF	C32(2)C274(3)5U5CA
.33 μF	C32(2)C334(3)5U5CA
.39 μF	C32(2)C394(3)5U5CA
.47 μF	C32(2)C474(3)5U5CA
.56 μF	C32(2)C564(3)5U5CA
50 VOLT — C33X SIZE	
.27 μF	C33(4)C274(3)5U5CA
.33 μF	C33(4)C334(3)5U5CA
.39 μF	C33(4)C394(3)5U5CA
.47 μF	C33(4)C474(3)5U5CA
.56 μF	C33(4)C564(3)5U5CA
.68 μF	C33(4)C684(3)5U5CA
.82 μF	C33(4)C824(3)5U5CA
1.0 μF	C33(4)C105(3)5U5CA
1.2 μF	C33(4)C125(3)5U5CA
1.5 μF	C33(4)C155(3)5U5CA
1.8 μF	C33(4)C185(3)5U5CA
2.2 μF	C33(4)C225(3)5U5CA
50 VOLT — C340 SIZE	
2.2 μF	C340C225(3)5U5CA
2.7 μF	C340C275(3)5U5CA
3.3 μF	C340C335(3)5U5CA
3.9 μF	C340C395(3)5U5CA
4.7 μF	C340C475(3)5U5CA
50 VOLT — C350 SIZE	
3.9 μF	C350C395(3)5U5CA
4.7 μF	C350C475(3)5U5CA
5.6 μF	C350C565(3)5U5CA
6.8 μF	C350C685(3)5U5CA

- NOTES:** (1) Case Sizes C315/C317 are identical electrically, but differ in lead spacing. See table of dimensions. Insert the appropriate symbol, "5" or "7" in the part number.
 (2) Case Sizes C320/C322/C323 are identical electrically, but differ in lead spacing. See table of dimensions. Insert the appropriate symbol, "0" or "2" or "3" in the part number.
 (3) Insert proper symbol for capacitance tolerance as follows:
 M – ±20%
 Z – +80%, -20%
 P – +100%, -0%
 (4) Case Sizes C330 and C333 are identical electrically. Insert the appropriate symbol "0" or "3" in the part number.

OPTIONAL CONFIGURATIONS BY LEAD SPACING

The preferred lead wire configurations are shown on page 8. However, additional configurations are available. All available options, including those on page 8, are shown below grouped by lead spacing.

Lead Spacing .100" ± .030	C 3 1 5	C 3 1 6	C 3 2 0	C 3 2 4	C 3 2 6	
Lead Spacing .200" ± .030	C 3 1 7	C 3 1 8	C 3 2 2	C 3 2 3		
Lead Spacing .200" ± .030	C 3 2 5	C 3 2 7	C 3 2 8			
Lead Spacing .200" ± .030	C 3 3 0	C 3 3 3	C 3 3 5	C 3 3 6	C 3 4 0	C 3 4 6
Lead Spacing .250" ± .030	C 3 2 1	C 3 3 1	Lead Spacing .400" ± .030		C 3 5 0	C 3 5 6

GENERAL

Working Voltage:

C0G – 50, 100 & 200 Volts
X7R – 50, 100 & 200 Volts

Temperature Characteristics:

C0G – 0 ±30 PPM/°C from -55°C to +125°C
X7R – ±15% from -55°C to +125°C

Capacitance Tolerance:

C0G – ±0.5 pF, ±1%, ±2%, ±5%, ±10%, ±20%
(±0.5 pF is tightest available tolerance)
X7R – ±10%, ±20%, -0 +100%, -20% +80%

Construction:

Monolithic block of ceramic dielectric with interdigitated internal electrodes, encapsulated in a molded case, and having axial or radial leads. Meets flame test requirements of UL Standard 94V-0.

Terminal Strength:

EIA-RS-198D Method 303 Condition A (2.2 kg)

ELECTRICAL

Capacitance:

Within specified tolerance when measured with 1 volt rms at 1 kHz (1000 pF or less at 1 MHz for C0G).

Dissipation Factor:

25°C at 1 kHz (1000 pF or less at 1 MHz for C0G).
C0G – .15% maximum
X7R – 2.5% maximum

Insulation Resistance:

After 2 minutes electrification at 25°C and rated voltage
C0G – 100K megohms or 1000 megohm - μF, whichever is less.
X7R – 100K megohms or 1000 megohm - μF, whichever is less.

Dielectric Withstanding Voltage:

250% of rated voltage for 5 seconds with current limited to 50 mA at 25°C.

Life Test:

2000 hours at 200% of rated voltage at 125°C. Post-Test limits at 25°C are:

Capacitance Change:

C0G – less than 3% or 0.25 pF, whichever is higher
X7R – ±20% of initial value

Dissipation Factor:

C0G – .25% maximum
X7R – 3.0% maximum

Insulation Resistance:

C0G – 10K megohms or 100 megohm - μF, whichever is less
X7R – 10K megohms or 100 megohm - μF, whichever is less

Dielectric Withstanding Voltage:

250% of rated voltage for 5 seconds with current limited to 50 mA.

ENVIRONMENTAL

Moisture Resistance:

MIL-STD-202, Method 106, or EIA-RS-198D, Method 204, Condition A, except 20 cycles.

Insulation Resistance:

C0G – 10K megohms or 100 megohm - μF, whichever is less
X7R – 10K megohms or 100 megohm - μF, whichever is less

Dielectric Withstanding Voltage:

250% of rated voltage for 5 seconds with current limited to 50 mA.

Immersion Cycling:

MIL-STD-202, Method 104, Condition B. Post-Test limits at 25°C are:

Insulation Resistance:

C0G – 10K megohms or 100 megohm - μF, whichever is less
X7R – 10K megohms or 100 megohm - μF, whichever is less

Solderability:

MIL-STD-202, Method 208, Sn62 solder, 245°C for 5 ±1/2 seconds.

Resistance to Soldering Heat:

MIL-STD-202, Method 210, Condition B (260°C, 10 secs). Depth of immersion – to a minimum of .050" from the capacitor body.