

High Capacitance **SAMPLE KIT**

Product-ID: HC-Kemet





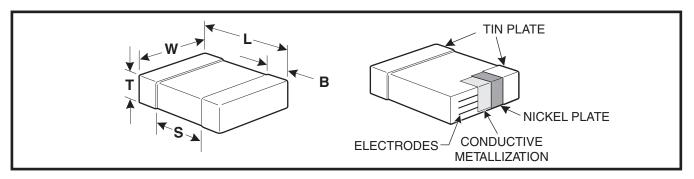
FEATURES

- C0G (NP0), X7R, X5R, Z5U and Y5V Dielectrics
- 10, 16, 25, 50, 100 and 200 Volts
- Standard End Metalization: Tin-plate over nickel
- Available Capacitance Tolerances: ±0.10 pF; ±0.25 pF; ±0.5 pF; ±1%; ±2%; ±5%; ±10%; ±20%; and +80%-20%
- Tape and reel packaging per EIA481-1. (See page 92 for specific tape and reel information.) Bulk Cassette packaging (0402, 0603, 0805 only) per IEC60286-6 and EIAJ 7201.

7 - 4V

RoHS Compliant

CAPACITOR OUTLINE DRAWINGS



DIMENSIONS—MILLIMETERS AND (INCHES)

EIA SIZE CODE	METRIC SIZE CODE	L - LENGTH	W - WIDTH	T THICKNESS	B - BANDWIDTH	S SEPARATION minimum	MOUNTING TECHNIQUE
0201*	0603	0.6 (.024) ± .03 (.001)	$0.3 \pm (.012) \pm .03 (.001)$		0.15 (.006) ± .05 (.002)	N/A	Solder Reflow
0402*	1005	1.0 (.04) ± .05 (.002)	0.5 (.02) ± .05 (.002)		0.20 (.008)40 (.016)	0.3 (.012)	Solder Reliow
0603	1608	1.6 (.063) ± .15 (.006)	0.8 (.032) ± .15 (.006)		0.35 (.014) ± .15 (.006)	0.7 (.028)	0.11
0805*	2012	2.0 (.079) ± .20 (.008)	1.25 (.049) ± .20 (.008)		0.50 (.02) ± .25 (.010)	0.75 (.030)	Solder Wave + or
1206*	3216	3.2 (.126) ± .20 (.008)	1.6 (.063) ± .20 (.008)	See page 78	0.50 (.02) ± .25 (.010)	N/A	Solder Reflow
1210*	3225	3.2 (.126) ± .20 (.008)	2.5 (.098) ± .20 (.008)	for thickness	0.50 (.02) ± .25 (.010)	N/A	
1808	4520	4.5 (.177) ± .30 (.012)	2.0 (.079) ± .20 (.008)	dimensions.	0.60 (.024) ± .35 (.014)	N/A	
1812	4532	4.5 (.177) ± .30 (.012)	3.2 (.126) ± .30 (.012)	,	0.60 (.024) ± .35 (.014)	N/A	
1825*	4564	4.5 (.177) ± .30 (.012)	6.4 (.252) ± .40 (.016)		0.60 (.024) ± .35 (.014)	N/A	Solder Reflow
2220	5650	5.6 (.220) ± .40 (.016)	5.0 (.197) ± .40 (.016)		0.60 (.024) ± .35 (.014)	N/A	
2225	5664	5.6 (.220) ± .40 (.016)	6.3 (.248) ± .40 (.016)		0.60 (.024) ± .35 (.014)	N/A	

^{*} Note: Indicates EIA Preferred Case Sizes (Tightened tolerances apply for 0402, 0603, and 0805 packaged in bulk bassette, see page 96.)

CAPACITOR ORDERING INFORMATION (Standard Chips - For Military see page 87) C 0805 C 103 K 5 R **CERAMIC** -**END METALLIZATION** SIZE CODE C-Standard (Tin-plated nickel barrier) **SPECIFICATION FAILURE RATE LEVEL** C - Standard CAPACITANCE CODE -A- Not Applicable Expressed in Picofarads (pF) First two digits represent significant figures. **TEMPERATURE CHARACTERISTIC** Designated by Capacitance Third digit specifies number of zeros. (Use 9 Change Over Temperature Range for 1.0 through 9.9pF. Use 8 for 0.5 through 0.99pF) G - C0G (NP0) (±30 PPM/°C) (Example: 2.2pF = 229 or 0.50 pF = 508) $R - X7R (\pm 15\%) (-55^{\circ}C + 125^{\circ}C)$ CAPACITANCE TOLERANCE $P-X5R (\pm 15\%) (-55^{\circ}C + 85^{\circ}C)$ $B - \pm 0.10 pF$ $J - \pm 5\%$ $U - Z5U (+22\%, -56\%) (+10^{\circ}C + 85^{\circ}C)$ $C - \pm 0.25 pF$ $K - \pm 10\%$ V – Y5V (+22%, -82%) (-30°C + 85°C) $D - \pm 0.5pF$ $M - \pm 20\%$ **VOLTAGE** 1 - 100V 3 - 25V $F - \pm 1\%$ P - (GMV) - special order only 2 - 200V 4 - 16V $G-\pm2\%$ Z - +80%. -20%5 - 50V 8 - 10V 6 - 35V 9 - 6.3V * Part Number Example: C0805C103K5RAC (14 digits - no spaces)

⁺ For extended value 1210 case size - solder reflow only



CERAMIC CHIP/STANDARD

X5R CAPACITANCE RANGE

Сар	Сар	Сар	02	201		C04	02*			C06	03*			С	0805*				C	1206	*				C12	10*		
pF	Code	Tol.	6.3V	16V	4V	6.3V	10V	16V	6.3V	10V	16V	25V	4V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	35V	50V
10,000	103	K,M		AA~																								
12,000	123	K,M				BB	BB	BB																				
15,000	153	K,M				BB	BB	BB																				
18,000	183	K,M				BB	BB	BB																				
22,000 27,000	223 273	K,M K,M				BB BB	BB BB	BB BB																				
33,000	333	K,M				BB	BB	BB																				
39,000	393	K,M				BB	BB	BB																				
47,000	473	K,M				BB	BB	BB																				
56,000	563	K,M				BB	BB	BB																				
68,000	683	K,M				BB	BB	BB																				
82,000	823	K,M				BB	BB	BB																				
100,000	104	K,M	AA~			BB	BB	BB																				
120,000	124	K,M																										
150,000 180,000	154 184	K,M K.M																										
220,000	224	K,M				BB																						
270,000	274	K,M				DD			CC	CC	СС										EB							
330,000	334	K,M							CC	CC	CC										EB							
390,000	394	K,M							CC	CC	CC										EB							
470,000	474	K,M							CC	CC	CC						DC				EC							
560,000	564	K,M							CC	CC	CC						DD				ED							
680,000	684	K,M							CC	CC	CC						DE				EE							
820,000	824	K,M				DD	DD		CC	CC	CC	00		БО.	D0	D0	DF DG				EF ED				ELL.	- LI.		FH+
1,000,000 1,200,000	105 125	K,M K.M				BB	BB		CC	CC	CC	CD		DG DD	DG DD	DG DD	DG				EC				FH+ FD+	FH+ FD+		гп+
1,500,000	155	K.M												DC	DC	DC		EC	EC	EC	EC				FD+	FD+		
1,800,000	185	K,M												DD	DD	DD		EC	EC	EC	ĒČ				FD+	FD+		
2,200,000	225	K,M				BB°			CC+	CC+	CC+			DD	DK	DD		EE	EE	EE	EE				FG+	FG+		
2,700,000	275	K,M																EF	EF	EF	EF				FG+	FG+		
3,300,000	335	K,M			BB°				CC+°					DF	DF	DH		EH	EH	EH	EH		FG+	FG+	FG+	FG+		
4,700,000	475	K,M			BB°				CC+	CC+				DH	DH	DH	DG	EH	EH	EH	EH	EH°	FG+	FG+	_	FG+		
5,600,000	565	K,M																ED	ED	EII			FG+	FG+	FG+	FG+		
6,800,000 8,200,000	685 825	K,M K,M																ED ED	ED ED	EH			FG+ FG+	FG+	FG+	FG+		
10,000,000	106	K,M							CD°+					DK+	DK+	DK+		EH	EH	EH	EH+		FT+	FT+	FO+	FH+	FT°+	
12,000,000	126	K,M							OD T					DAT	DICT	DATE							FD+	FD+	FG+			
15,000,000	156	K,M															l						FG+	FG+	FL+			
18,000,000	186	K,M															l						FG+	FG+	FH+			
22,000,000	226	K,M												DH+°				EH+	EH+°				FH+	FH+	FJ+			
27,000,000	276	K,M																										
33,000,000	336	K,M																										
39,000,000	396	K,M											D 10 .	DK°.				EU°.	⊏⊔∘.				EO°.	EO.	EO°.			
47,000,000 100,000,000	476 107	K,M K.M											DJ-+	DK°+				EH°+	EH°+				FQ°+	rQ+°	FQ°+			
100,000,000	107	rx,ivl																CH +					TQ +					

NOTE: For non-standard capacitance values or voltages, contact your local KEMET sales representative.

° Available M ±20% tolerance only

Improved product with higher ratings and tighter capacitance tolerance product may be substituted within the same size (length, width, and thickness) at KEMET's option. Reels with such substitutions will be marked with the improved KEMET part numbers.

Z5U CAPACITANCE RANGE

(KEMET's Z5U also meets Y5V Characteristics)

Сар	Сар	Сар	C0	C0805* C1206* C1210*		C1	812*	C18	B25*	C2	225			
pF	Code	Tol.	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V
6,800	682	M,Z	DC	DC										
8,200	822	M,Z	DC	DC										
10,000	103	M,Z	DC	DC	EB	EB								
12,000	123	M,Z	DC		EB	EB								
15,000	153	M,Z	DC		EB	EB								
18,000	183	M,Z	DC		EB	EB								
22,000	223	M,Z	DC DC		EB	EB								
27,000	273 333	M,Z	DC		EB EB	EB EB								
33,000 39.000	393	M,Z M.Z	DD		EB	EC						ı		
47,000	473	M,Z	DD		EB	EC	FB	FB						
56.000	563	M,Z	DD		EB	EB	FB	FB						
68,000	683	M,Z	DD		EB	EB	FB	FB						
82,000	823	M,Z	DD		EB	EB	FB	FC	GB	GB				
100,000	104	M,Z	DD		EB	EB	FB	FD	GB	GB				
120,000	124	M,Z			EC		FB	FD	GB	GB				
150,000	154	M,Z			EC		FC	FD	GB	GB				
180,000	184	M,Z			EC		FC		GB		НВ	НВ		
220,000	224	M,Z			EC		FC		GB		НВ	НВ		
270,000	274	M,Z					FC		GB		HB	НВ		
330,000	334	M,Z					FD		GB		HB	HB	KB	KC
390,000	394	M,Z					FD		GB		HB	HD	KB	KC
470,000	474	M,Z					FD		GB		HB		KB	KC
560,000	564	M,Z					FD		GC		HB		KB	
680,000	684	M,Z					FD		GC		HB		KB	
820,000	824	M,Z					FF		GE		HB		KB	l
1,000,000	105	M,Z					FH		GE		HB		KB	l
1,200,000	125	M,Z									HB		KB	l
1,500,000	155	M,Z									HB		KC	l
1,800,000	185	M,Z									HB		KD KD	
2,200,000	225	M,Z									НВ		KD	
2,700,000	275	M,Z											KD	

NOTE: For non-standard capacitance values or voltages, contact your local KEMET sales representative. 50 Volt Ceramic Chips can be used for 63 volt applications.

* EIA preferred chip sizes

See page 78 for Thickness Code Reference Chart.



Thickness Code Reference Chart Packaging Quantity Based on Finished Chip Thickness Specifications

Thickness	Chip	Chip Thickness	Qty per Reel	Qty per Reel	Qty per Reel	Qty per Reel	Qty per Bulk
Code	Size	Range (mm)	7" Plastic	13" Plastic	7" Paper	13" Paper	Cassette
AA	0201	0.30 ± 0.03	N/A	N/A	15,000	N/A	N/A
BB CB	0402 0603	0.50 ± 0.05 0.80 ± 0.07	N/A N/A	N/A N/A	10,000 4,000	50,000 10,000	50,000 15,000
CC	0603	0.80 ± 0.07	N/A	N/A	4,000	10,000	N/A
CD	0603	0.80 ± 0.15	N/A	N/A	4,000	10,000	N/A
DB	0805	0.60 ± 0.10	N/A	N/A	4,000	10,000	10,000
DC	0805	0.78 ± 0.10	N/A	N/A	4,000	10,000	N/A
DD	0805	0.90 ± 0.10	N/A	N/A	4,000	10,000	N/A
DE DF	0805 0805	1.00 ± 0.10 1.10 ± 0.10	2,500 2,500	10,000 10,000	N/A N/A	N/A N/A	N/A N/A
DG	0805	1.25 ± 0.15	2,500	10,000	N/A	N/A	N/A
DH	0805	1.25 ± 0.20	2,500	10,000	N/A	N/A	N/A
DJ	0805	1.25 ± 0.20	3,000	N/A	N/A	N/A	N/A
DK	0805	1.25 ± 0.15	3,000	N/A	N/A	N/A	N/A
DL EB	0805	0.95 ± 0.10	4,000 4,000	10,000	N/A 4,000	N/A	N/A N/A
EC	1206 1206	0.78 ± 0.10 0.90 ± 0.10	4,000	10,000 10,000	4,000 N/A	10,000 N/A	N/A N/A
ED	1206	1.00 ± 0.10	2,500	10,000	N/A	N/A	N/A
EE	1206	1.10 ± 0.10	2,500	10,000	N/A	N/A	N/A
EF	1206	1.20 ± 0.15	2,500	10,000	N/A	N/A	N/A
EG	1206	1.60 ± 0.15	2,000	8,000	N/A	N/A	N/A
EH EJ	1206 1206	1.60 ± 0.20 1.70 ± 0.20	2,000 2,000	8,000 8,000	N/A N/A	N/A N/A	N/A N/A
EK	1206	0.80 ± 0.10	2,000	8,000	N/A	N/A	N/A
EL	1206	1.15 ± 0.15	2,000	8,000	N/A	N/A	N/A
EM	1206	1.25 ± 0.15	2,500	10,000	N/A	N/A	N/A
EN	1206	0.95 ± 0.10	4,000	10,000	N/A	N/A	N/A
FB FC	1210 1210	0.78 ± 0.10 0.90 ± 0.10	4,000 4,000	10,000 10.000	N/A N/A	N/A N/A	N/A N/A
FD	1210	0.95 ± 0.10	4,000	10,000	N/A	N/A	N/A
FE	1210	1.00 ± 0.10	2,500	10,000	N/A	N/A	N/A
FF	1210	1.10 ± 0.10	2,500	10,000	N/A	N/A	N/A
FG	1210	1.25 ± 0.15	2,500	10,000	N/A	N/A	N/A
FH FJ	1210	1.55 ± 0.15	2,000	8,000	N/A N/A	N/A N/A	N/A N/A
FK	1210 1210	1.85 ± 0.20 2.10 ± 0.20	2,000 2,000	8,000 8,000	N/A	N/A N/A	N/A N/A
FL	1210	1.40 ± 0.15	2,000	8,000	N/A	N/A	N/A
FM	1210	1.70 ± 0.20	2,000	8,000	N/A	N/A	N/A
FN	1210	1.85 ± 0.20	2,000	8,000	N/A	N/A	N/A
FO FP	1210 1210	1.50 ± 0.20	2,000 2,000	8,000 8,000	N/A N/A	N/A N/A	N/A N/A
FQ	1210	1.60 ± 0.20 2.50 ± 0.22	1,500	N/A	N/A	N/A N/A	N/A N/A
FR	1210	2.25 ± 0.20	2,000	8,000	N/A	N/A	N/A
FS	1210	2.50 ± 0.20	1,000	4,000	N/A	N/A	N/A
FT	1210	1.90 ± 0.20	1,500	4,000	N/A	N/A	N/A
LD GB	1808 1812	0.90 ± 0.10 1.00 ± 0.10	4,000 1,000	10,000 4,000	N/A N/A	N/A N/A	N/A N/A
GC	1812	1.10 ± 0.10	1,000	4,000	N/A	N/A	N/A
GD	1812	1.25 ± 0.15	1,000	4,000	N/A	N/A	N/A
GE	1812	1.30 ± 0.10	1,000	4,000	N/A	N/A	N/A
GF CC	1812	1.50 ± 0.10	1,000	4,000	N/A	N/A	N/A
GG GH	1812 1812	1.55 ± 0.10 1.40 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
GJ	1812	1.70 ± 0.15	1,000	4,000	N/A	N/A	N/A
GK	1812	1.60 ± 0.20	1,000	4,000	N/A	N/A	N/A
GL	1812	1.90 ± 0.20	1,000	4,000	N/A	N/A	N/A
GM GN	1812 1812	2.00 ± 0.20	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
GO	1812	1.70 ± 0.20 2.50 ± 0.20	500	4,000 N/A	N/A N/A	N/A N/A	N/A N/A
HB	1825	1.10 ± 0.15	1,000	4,000	N/A	N/A	N/A
HC	1825	1.15 ± 0.15	1,000	4,000	N/A	N/A	N/A
HD	1825	1.30 ± 0.15	1,000	4,000	N/A	N/A	N/A
HE HF	1825 1825	1.40 ± 0.15 1.50 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
JB	2220	1.00 ± 0.15	1,000	4,000	N/A	N/A N/A	N/A
JC	2220	1.10 ± 0.15	1,000	4,000	N/A	N/A	N/A
JD	2220	1.30 ± 0.15	1,000	4,000	N/A	N/A	N/A
JE IE	2220	1.40 ± 0.15	1,000	4,000	N/A	N/A	N/A
JF JG	2220 2220	1.50 ± 0.15 1.70 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
JH	2220	1.80 ± 0.15	1,000	4,000	N/A	N/A	N/A
JO	2220	2.40 ± 0.15	500	2,000	N/A	N/A	N/A
KB	2225	1.00 ± 0.15	1,000	4,000	N/A	N/A	N/A
KC KD	2225 2225	1.10 ± 0.15 1.30 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
KE KE	2225	1.40 ± 0.15	1,000	4,000	N/A N/A	N/A N/A	N/A N/A
1.1		1.10 ± 0.10	1,000	1,000	13/73	13/73	14/7

This chart refers to ceramic chip thickness codes on pages 73 - 76.

Note: TU suffix represents tape and reel packaging of unmarked components.

Note: TM suffix represents tape and reel packaging of marked components.

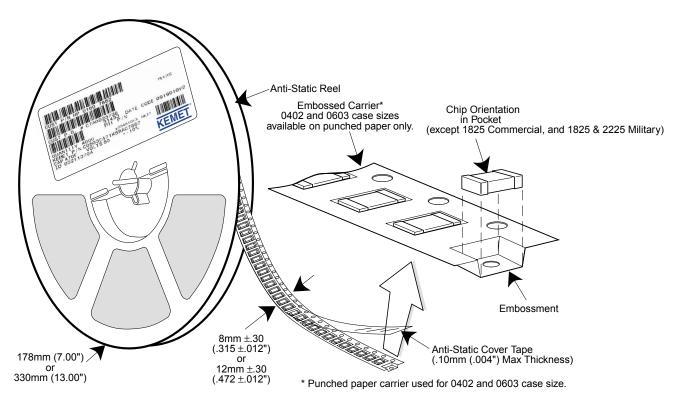
Cases sizes \leq 1210 are 8mm tape with 4mm pitch and Case Sizes >1210 are 12mm tape and 8mm pitch.

Packaging Information



Tape & Reel Packaging

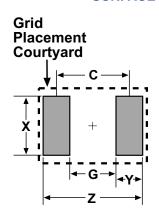
KEMET offers Multilayer Ceramic Chip Capacitors packaged in 8mm and 12mm plastic tape on 7" and 13" reels in accordance with EIA standard 481-1: Taping of surface mount components for automatic handling. This packaging system is compatible with all tape fed automatic pick and place systems. See page 78 for details on reeling quantities for commercial chips and page 87 for MIL-PRF-55681 chips.



Case Sizes ≤ 1210 are 8 mm tape with 4 mm pitch. Case Sizes >1210 are 12 mm tape with 8 mm pitch.

Note: TU suffix represents tape and reel packaging of unmarked components. TM suffix represents tape and reel packaging of marked components.

SURFACE MOUNT LAND DIMENSIONS - CERAMIC CHIP CAPACITORS - MM



		Ref	low So	lder		Wave Solder					
Dimension	Z	G	Х	Y(ref)	C(ref)	Z	G	Х	Y(ref)	Smin	
0402	2.14	0.28	0.74	0.93	1.21		Not I	Recomme	nded		
0603	2.78	0.68	1.08	1.05	1.73	3.18	0.68	0.80	1.25	1.93	
0805	3.30	0.70	1.60	1.30	2.00	3.70	0.70	1.10	1.50	2.20	
1206	4.50	1.50	2.00	1.50	3.00	4.90	1.50	1.40	1.70	3.20	
1210	4.50	1.50	2.90	1.50	3.00	4.90	1.50	2.00	1.70	3.20	
1812	5.90	2.30	3.70	1.80	4.10				•		
1825	5.90	2.30	6.90	1.80	4.10						
2220	7.00	3.30	5.50	1.85	5.15	Not Recommended					
2225	7.00	3.30	6.80	1.85	5.15						

Calculation Formula

Z = Lmin + 2Jt + Tt G = Smax - 2Jh - ThX = Wmin + 2Js + Ts

Tt, Th, Ts = Combined tolerances



Packaging Information

Performance Notes

1. Cover Tape Break Force: 1.0 Kg Minimum.

2. Cover Tape Peel Strength: The total peel strength of the cover tape from the carrier tape shall be:

Tape Width Peel Strength

8 mm 0.1 Newton to 1.0 Newton (10g to 100g) 12 mm 0.1 Newton to 1.3 Newton (10g to 130g)

The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300 ± 10 mm/minute.

- 3. Reel Sizes: Molded tantalum capacitors are available on either 180 mm (7") reels (standard) or 330 mm (13") reels (with C-7280). Note that 13" reels are preferred.
- **4. Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA-556.

Embossed Carrier Tape Configuration: Figure 1

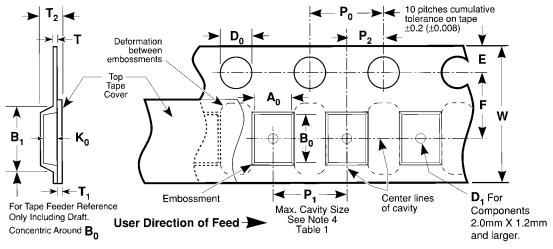


Table 1 — EMBOSSED TAPE DIMENSIONS (Metric will govern)

Constant Dimensions — Millimeters (Inches)													
Tape Size	$\mathbf{D}_{\scriptscriptstyle{0}}$		E	P_{o}	P_{2}	T Max	T₁ Max						
8 mm and	1.5 +0.10 -0		±0.10	4.0 ±0.10	2.0 ±0.05 0.600		0.100						
12 mm	(0.059 +0.004, -	١, ١	±0.004)	(0.157 ±0.004)	(0.079 ±0.002)	(0.024)	(0.004)						
·		V	ariable l	Dimensions —	Millimeters (Ir	ches)							
Tape Size	Pitch	B₁ Max.	D₁ Min.	F	P ₁	R Min.	T ₂ Max	W	A ₀ B ₀ K ₀				
		Note 1	Note 2			Note 3			Note 4				
8 mm	Single (4 mm)	4.4	1.0	3.5 ±0.05	4.0 ±0.10	25.0	2.5	8.0 ±0.30					
	,	(0.173)	(0.039)	(0.138 ±0.002)	(0.157 ±0.004)	(0.984)	(0.098)	(.315 ±0.012)					
12 mm	Double (8 mm)	8.2 (0.323)	1.5 (0.059)	5.5 ±0.05 (0.217 ±0.002)	8.0 ±0.10 (0.315 ±0.004)	30.0 (1.181)	4.6 (0.181)	12.0 ±0.30 (0.472 ±0.012)					

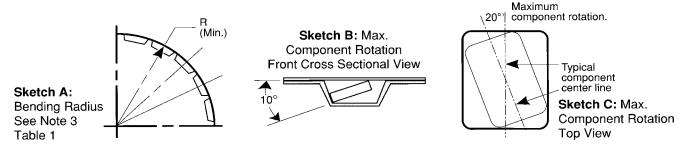
NOTES

- 1. B1 dimension is a reference dimension for tape feeder clearance only.
- 2. The embossment hole location shall be measured from the sprocket hole controlling the location of the embossment. Dimensions of embossment location and hole location shall be applied independent of each other.
- 3. Tape with components shall pass around radius "R" without damage (see sketch A). The minimum trailer length (Fig. 2) may require additional length to provide R min. for 12 mm embossed tape for reels with hub diameters approaching N min. (Table 2)
- 4. The cavity defined by A₀, B₀, and K₀ shall be configured to surround the part with sufficient clearance such that the chip does not protrude beyond the sealing plane of the cover tape, the chip can be removed from the cavity in a vertical direction without mechanical restriction, rotation of the chip is limited to 20 degrees maximum in all 3 planes, and lateral movement of the chip is restricted to 0.5 mm maximum in the pocket (not applicable to vertical clearance.)

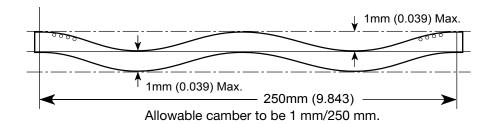


Packaging Information

Embossed Carrier Tape Configuration (cont.)



Sketch D: Tape Camber (Top View)



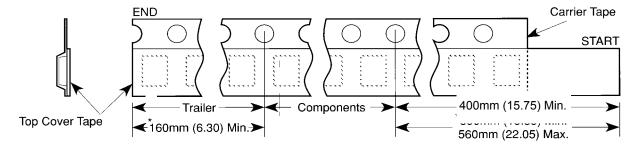


Figure 2: Tape Leader & Trailer Dimensions (Metric Dimensions Will Govern)

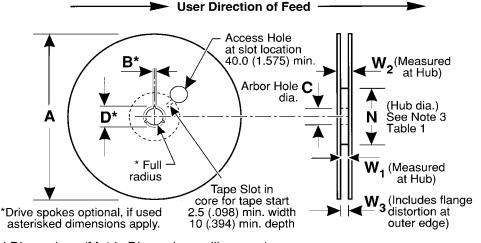


Figure 3: Reel Dimensions (Metric Dimensions will govern)

Table 2 – REEL DIMENSIONS (Metric will govern)

					(90.0,		
Tape Size	A Max	B* Min	С	D* Min	N Min	W ₁	W ₂ Max	W ₃
8 mm	330.0 (12.992)	1.5 (0.059)	13.0 ± 0.20 (0.512 ± 0.008)	20.2 (0.795)	50.0 (1.969) See Note 3	8.4 +1.5, -0.0 (0.331 +0.059, -0.0)	14.4 (0.567)	7.9 Min (0.311) 10.9 Max (0.429)
12 mm	330.0 (12.992)	1.5 (0.059)	13.0 ± 0.20 (0.512 ± 0.008)	20.2 (0.795)	Table 1	12.4 +2.0, -0.0 (0.488 +0.078, -0.0)	18.4 (0.724)	11.9 Min (0.469) 15.4 Max (0.606)



Packaging Information

Punched Carrier (Paper Tape) Configuration (Ceramic Chips Only):

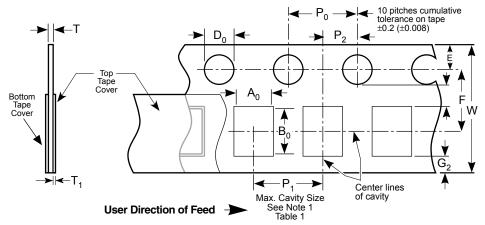


Table 1: 8 & 12mm Punched Tape (Metric Dimensions Will Govern)

Constant Dimensions - Millimeters (Inches)

Tape Size	D ₀	E	P ₀	P ₂	Т1	G ₁	G ₂	R Min.
8mm and 12mm	1.5 +0.10, -0.0 (.059 +0.004, -0.0)		4.0 ± 0.10 $(.157 \pm 0.004)$	2.0 ± 0.05 $(.079 \pm 0.002)$	(.004)			See Note 2

Table 1: 8 & 12mm Punched Tape (Metric Dimensions Will Govern)

Variable Dimensions - Millimeters (Inches)

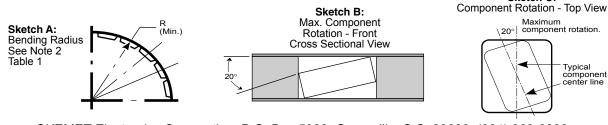
Tape Size	P ₁	F	W	A ₀ B ₀	Т
8mm 1/2 Pitch	$\begin{array}{c} 2.0 \pm 0.10 \\ (.079 \pm .004) \\ \text{See Requirements} \\ \text{Section 3.3 (d)} \end{array}$	3.5 ± 0.05 $(.138 \pm .002)$	8.0 ± 0.3 (.315 ± 0.012)	See Note 1 Table 1	1.1mm (.043) Max. for Paper Base Tape and 1.6mm (.063) Max. for Non-
8mm	4.0 ± 0.10 (0.157 ± .004)				Paper Base Compositions.
12mm	4.0 ± 0.10 (0.157 ± .004)	5.5 ± 0.05	12.0 ± 0.3		See Note 3.
12mm Double Pitch	8.0 ± 0.10 (0.315 ± .004)	(.217 ± .002)	(.472 ± .012)		

Note

1. A_0 , B_0 and T determined by the maximum dimensions to the ends of the terminals extending from the body and/or the body dimensions of the component. The clearance between the ends of the terminals or body of the component to the sides and depth of the cavity (A_0 , B_0 and T) must be within 0.05mm (.002) minimum and 0.50mm (.020) maximum. The clearance allowed must also prevent rotation of the component within the cavity of not more than 20 degrees (see sketches A and B).

Sketch C:

- 2. Tape with components shall pass around radius "R" without damage.
- 3. KEMET nominal thicknesses are: 0402 = 0.6mm and all others 0.95mm minimum.

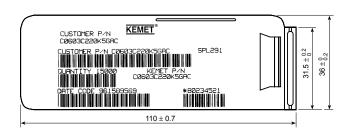


Packaging Information



Bulk Cassette Packaging (Ceramic Chips only) (Meets Dimensional Requirements IEC-286-6 and EIAJ 7201)

 $2.0 \pm \frac{0}{0}$. $3.0 \pm \frac{0.2}{0}$



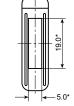


Table 2 – Capacitance Values Available In Bulk Cassette Packaging

			•	•
Case Size	Dielectric	Voltage	Min. Cap Value	Max. Cap Value
0402	All	All	All	All
0603	All	All	All	All
0805	C0G	200 100 50	109 109 109	181 331 102
	X7R	200 100 50 25 16	221 221 221 221 221 221	392 103 273 104 104
	Y5V	25 16	104 104	224 224

Table 1 – Capacitor Dimensions for Bulk Cassette Packaging – Millimeters

Metric Size Code	EIA Size Code	Length L	Width W	Thickness T	Bandwidth B	Minimum Separation S	Number of Pcs/Cassette
1005 1608 2012	0402 0603 0805	1.6 ± 0.07	$\begin{array}{c} 0.5 \pm 0.05 \\ 0.8 \pm 0.07 \\ 1.25 \pm 0.10 \end{array}$	0.5 ± .05 0.8 ± .07 0.6 ± .10	0.2 to 0.4 0.2 to 0.5 0.5 to 0.75	0.3 0.7 0.75	50,000 15,000 10,000

Terminations: KEMET nickel barrier layer with a tin overplate.

CAPACITOR MARKING TABLE (Marking Optional - Not Available for 0402 Size or Y5V Dielectric)

Numeral			Capa	citance	(pF) Fo	or Various	Numeral Id	lentifiers	
Alpha Character	9	0	1	2	3	4	5	6	7
Α	0.10	1.0	10	100	1000	10,000	100,000	1,000,000	10,000,000
В	0.11	1.1	11	110	1100	11,000	110,000	1,100,000	11,000,000
С	0.12	1.2	12	120	1200	12,000	120,000	1,200,000	12,000,000
D	0.13	1.3	13	130	1300	13,000	130,000	1,300,000	13,000,000
E	0.15	1.5	15	150	1500	15,000	150,000	1,500,000	15,000,000
F	0.16	1.6	16	160	1600	16,000	160,000	1,600,000	16,000,000
G	0.18	1.8	18	180	1800	18,000	180,000	1,800,000	18,000,000
Н	0.20	2.0	20	200	2000	20,000	200,000	2,000,000	20,000,000
J	0.22	2.2	22	220	2200	22,000	220,000	2,200,000	22,000,000
K	0.24	2.4	24	240	2400	24,000	240,000	2,400,000	24,000,000
L	0.27	2.7	27	270	2700	27,000	270,000	2,700,000	27,000,000
M	0.30	3.0	30	300	3000	30,000	300,000	3,000,000	30,000,000
N	0.33	3.3	33	330	3300	33,000	330,000	3,300,000	33,000,000
Р	0.36	3.6	36	360	3600	36,000	360,000	3,600,000	36,000,000
Q	0.39	3.9	39	390	3900	39,000	390,000	3,900,000	39,000,000
R	0.43	4.3	43	430	4300	43,000	430,000	4,300,000	43,000,000
S	0.47	4.7	47	470	4700	47,000	470,000	4,700,000	47,000,000
Т	0.51	5.1	51	510	5100	51,000	510,000	5,100,000	51,000,000
U	0.56	5.6	56	560	5600	56,000	560,000	5,600,000	56,000,000
V	0.62	6.2	62	620	6200	62,000	620,000	6,200,000	62,000,000
W	0.68	6.8	68	680	6800	68,000	680,000	6,800,000	68,000,000
X	0.75	7.5	75	750	7500	75,000	750,000	7,500,000	75,000,000
Υ	0.82	8.2	82	820	8200	82,000	820,000	8,200,000	82,000,000
Z	0.91	9.1	91	910	9100	91,000	910,000	9,100,000	91,000,000
а	0.25	2.5	25	250	2500	25,000	250,000	2,500,000	25,000,000
b	0.35	3.5	35	350	3500	35,000	350,000	3,500,000	35,000,000
d	0.40	4.0	40	400	4000	40,000	400,000	4,000,000	40,000,000
е	0.45	4.5	45	450	4500	45,000	450,000	4,500,000	45,000,000
f	0.50	5.0	50	500	5000	50,000	500,000	5,000,000	50,000,000
m	0.60	6.0	60	600	6000	60,000	600,000	6,000,000	60,000,000
n	0.70	7.0	70	700	7000	70,000	700,000	7,000,000	70,000,000
t	0.80	8.0	80	800	8000	80,000	800,000	8,000,000	80,000,000
У	0.90	9.0	90	900	9000	90,000	900,000	9,000,000	90,000,000

Laser marking is available as an extra-cost option for most KEMET ceramic chips. Such marking is two sided, and includes a \overline{K} to identify KEMET, followed by two characters (per EIA-198 - see table below) to identify the capacitance value. Note that marking is not available for size 0402 nor for any Y5V chip. In addition, the 0603 marking option is limited to the \overline{K} only.



Example shown is 1,000 pF capacitor.



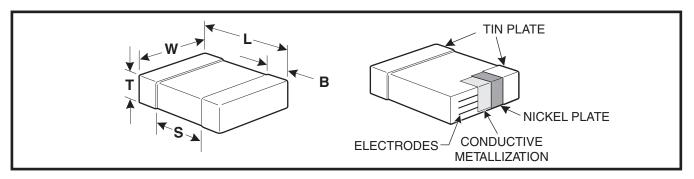
FEATURES

- C0G (NP0), X7R, X5R, Z5U and Y5V Dielectrics
- 10, 16, 25, 50, 100 and 200 Volts
- Standard End Metalization: Tin-plate over nickel
- Available Capacitance Tolerances: ±0.10 pF; ±0.25 pF; ±0.5 pF; ±1%; ±2%; ±5%; ±10%; ±20%; and +80%-20%
- Tape and reel packaging per EIA481-1. (See page 92 for specific tape and reel information.) Bulk Cassette packaging (0402, 0603, 0805 only) per IEC60286-6 and EIAJ 7201.

7 - 4V

RoHS Compliant

CAPACITOR OUTLINE DRAWINGS



DIMENSIONS—MILLIMETERS AND (INCHES)

EIA SIZE CODE	METRIC SIZE CODE	L - LENGTH	W - WIDTH	T THICKNESS	B - BANDWIDTH	S SEPARATION minimum	MOUNTING TECHNIQUE
0201*	0603	0.6 (.024) ± .03 (.001)	$0.3 \pm (.012) \pm .03 (.001)$		0.15 (.006) ± .05 (.002)	N/A	Solder Reflow
0402*	1005	1.0 (.04) ± .05 (.002)	0.5 (.02) ± .05 (.002)		0.20 (.008)40 (.016)	0.3 (.012)	Solder Reliow
0603	1608	1.6 (.063) ± .15 (.006)	0.8 (.032) ± .15 (.006)		0.35 (.014) ± .15 (.006)	0.7 (.028)	0.11
0805*	2012	2.0 (.079) ± .20 (.008)	1.25 (.049) ± .20 (.008)		0.50 (.02) ± .25 (.010)	0.75 (.030)	Solder Wave + or
1206*	3216	3.2 (.126) ± .20 (.008)	1.6 (.063) ± .20 (.008)	See page 78	0.50 (.02) ± .25 (.010)	N/A	Solder Reflow
1210*	3225	3.2 (.126) ± .20 (.008)	2.5 (.098) ± .20 (.008)	for thickness	0.50 (.02) ± .25 (.010)	N/A	
1808	4520	4.5 (.177) ± .30 (.012)	2.0 (.079) ± .20 (.008)	dimensions.	0.60 (.024) ± .35 (.014)	N/A	
1812	4532	4.5 (.177) ± .30 (.012)	3.2 (.126) ± .30 (.012)	,	0.60 (.024) ± .35 (.014)	N/A	
1825*	4564	4.5 (.177) ± .30 (.012)	6.4 (.252) ± .40 (.016)		0.60 (.024) ± .35 (.014)	N/A	Solder Reflow
2220	5650	5.6 (.220) ± .40 (.016)	5.0 (.197) ± .40 (.016)		0.60 (.024) ± .35 (.014)	N/A	
2225	5664	5.6 (.220) ± .40 (.016)	6.3 (.248) ± .40 (.016)		0.60 (.024) ± .35 (.014)	N/A	

^{*} Note: Indicates EIA Preferred Case Sizes (Tightened tolerances apply for 0402, 0603, and 0805 packaged in bulk bassette, see page 96.)

CAPACITOR ORDERING INFORMATION (Standard Chips - For Military see page 87) C 0805 C 103 K 5 R **CERAMIC** -**END METALLIZATION** SIZE CODE C-Standard (Tin-plated nickel barrier) **SPECIFICATION FAILURE RATE LEVEL** C - Standard CAPACITANCE CODE -A- Not Applicable Expressed in Picofarads (pF) First two digits represent significant figures. **TEMPERATURE CHARACTERISTIC** Designated by Capacitance Third digit specifies number of zeros. (Use 9 Change Over Temperature Range for 1.0 through 9.9pF. Use 8 for 0.5 through 0.99pF) G - C0G (NP0) (±30 PPM/°C) (Example: 2.2pF = 229 or 0.50 pF = 508) $R - X7R (\pm 15\%) (-55^{\circ}C + 125^{\circ}C)$ CAPACITANCE TOLERANCE $P-X5R (\pm 15\%) (-55^{\circ}C + 85^{\circ}C)$ $B - \pm 0.10 pF$ $J - \pm 5\%$ $U - Z5U (+22\%, -56\%) (+10^{\circ}C + 85^{\circ}C)$ $C - \pm 0.25 pF$ $K - \pm 10\%$ V – Y5V (+22%, -82%) (-30°C + 85°C) $D - \pm 0.5pF$ $M - \pm 20\%$ **VOLTAGE** 1 - 100V 3 - 25V $F - \pm 1\%$ P - (GMV) - special order only 2 - 200V 4 - 16V $G-\pm2\%$ Z - +80%. -20%5 - 50V 8 - 10V 6 - 35V 9 - 6.3V * Part Number Example: C0805C103K5RAC (14 digits - no spaces)

⁺ For extended value 1210 case size - solder reflow only



CERAMIC CHIP/STANDARD

COG CAPACITANCE RANGE - 1210, 1812, 1825, 2220, 2225

Cap Cap	/ 50V	C222	200V
0.52.4 508.249 D	300	1000	2300
2.7-9.1 279-919 D KM FB			
100-130 100-130 10 JJKM FB			
27.0-510 270-510 270-510 D, GJJKM FB			
56.0-82.0 560-82.0 F.G.J.K.M. FB			
910-3600 910-361 F.G.J.KM FB			
300.0 391 F.G.J.K.M. FB			
430.0 431 F,G,J,KM FB FB FB FB FB FB GB GB GB GB FB			
470.0 471 F.G.J.K.M FB FB FB FB FB FB GB GB GB GB FB			
560.0 561 F,G,J,KM FB FB FB FB FB GB GB GB			
620.0 621 F,G,J,KM FB FB FB FB FB FB GB GB GB FB			
B80.0 G81			
750.0 751 F.G.J.K.M. FB FB B FB FB FB GB GB GB GB FB			
820.0 821 F.G.J.K.M. FB			
910.0 911 F,G.J.K.M FB FB FB FB FB FB GB GB GB GB FB			
1.100.0 112 F.G.J.K.M FB			
1,200.0 122 F,G,J,KM FB FB FB FB FB FB GB GB GB GB GB 1,300.0 132 F,G,J,KM FB			I
1,300.0 132 F.G.J.K.M FB FB FB FB FB FC FB FB GB GB GB FB			1
1,500.0 152 F,G,J,KM, FB FB FB FB FB FB GB GB GB GB GB 1,500.0 152 F,G,J,KM, FB			
1,600.0 162 F,G,J,KM FB FB FB FB FB FB FE BB FB			
1800.0 182 F.G.J.K.M FB FB FB FB FB FE GB GB GB GB GB 2,000.0 202 F.G.J.K.M FB FB FB FB FC FE GB GB GB GB 2,200.0 222 F.G.J.K.M FB FB FB FB FC FG GB GB GB			
2,200.0 222 F,G,J,K,M FB FB FB FC FG GB GB GB			
2,400.0 242 F,G,J,K,M FB FB FB FB FC FC FC			
2,700.0 272 F,G,J,K,M FB FB FB FB FC FC GB GB GB 3,000.0 302 F,G,J,K,M FB FB FB FB FC FC FF			
3,000.0 332 F.G.J.K.M FB FB FB FB FF FF FF GB GB GB			
3,600.0 362 F.G.J.K.M FB FB FB FF FF			
3,900.0 392 F.G.J.K.M FB FB FB FF FF GB GB GB HB HB HB			
4,300.0 432 F.G.J.K.M FB FB FB FB FF FF FF			
4,700.0 472 F,G,J,K,M FF FF FF FF FG FG GB GB GD HB HB HB 5,100.0 512 F,G,J,K,M FB FB FB FB FG FG	KB	KB	KB
5,100.0 512 F,G,J,K,M FB FB FB FB FG FG FG 5,600.0 562 F,G,J,K,M FB FB FB FB FB FG FG GB GB GH HB HB HB	KB	КВ	КВ
6.200.0 622 F.G.J.K.M FB FB FB FB FG			
6,800.0 682 F,G,J,K,M FB FB FB FB FG GB GJ HB HB HB JB JB	KB	KB	KB
7,500.0 752 F,G,J,K,M FC FC FC FC FC FC	1	l	
8,200.0 822 F,G,J,K,M FC FC FC FC FC GB GH HB HB HB JB JB	KB	KB	KB
9,100.0 912 F,G,J,K,M FE	кв	кв	кв
12,000.0 123 F,G,J,K,M FG FG FG FG FB GB GG HB HB HE JB JB	KB	KB	KB
15,000.0 153 F.G.J.K.M FG FG FG FG FB GB GB HB HB JB JB	KB	KB	KE
18,000.0 183 F,G,J,K,M FB FB FB FB FB GB GB HB HE JB JB	KB	KB	
22,000.0 223 F,G,J,K,M FB FB FB FB FB GB GB HB HE JB JB	KB	KB	1
27,000.0 273 F.G.J.K.M FB FB FB FB FB GB GB HB HF JB JB	KB	KE	1
33,000.0 333 F.G.J.K.M FB FB FB FB FB GB GB JB JB JB 47,000.0 473 F.G.J.K.M FB FB FB FB FE GB GB JB JB JB	KB	1	
47,000.0 473 F.G.J.K.M FB FB FB FB FF GB GB JB JB JB	1	1	
68,000.0 683 F.G.J.K.M FB FB FB FC FG GB GB JB JB			
82,000.0 823 F,G,J,K,M FC FC FC FF FH GB GB JB JB			
100,000.0 104 F,G,J,K,M FE FE FE FG FM+ GB GD JB JB			
120,000.0 124 F,G,J,K,M FG FG FG FH GB GH JB JB			
150,000.0 154 F,G,J,K,M FH FH FH FM+ GD GN JB JB 220,000.0 224 F,G,J,K,M FK+ FK+ FK+ GK JB JD			
270,000.0 274 F,G.J.K.M FR4 FR4 FR4 B	1	1	
330,000.0 334 F.G.J.K.M JD JH	1	1	1
470,000.0 474 F,G,J,K,M JG	1	1	
560,000.0 564 F,G,J,K,M			

X7R CAPACITANCE RANGE - 0402, 0603, 0805, 1206

Cap	Сар				C0402						C0603							C0805							C1206			
рF	Code	Cap Tol	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	100V	200V	6.3V	10V	16V	25V	50V	100V	200V	6.3V	10V	16V	25V	50V	100V	200V
150 180	151 181	J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	СВ	DC																			
220		J, K, M	BB	BB	BB	BB	BB	CB	DC																			
270 330		J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	CB CB	CB CB	CB	CB CB	CB CB	CB CB	DC DC													
390	391	J, K, M J, K, M	BB	BB	BB	BB	BB	CB	CB	CB	CB CB	CB	CB	CB	DC													
470		J, K, M	BB	BB	BB	BB	BB	CB	DC																			
560 680	561 681	J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	DC DC																			
820	821	J, K, M	BB	BB	BB	BB	BB	CB	DC																			
1,000 1,200		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	DC DC	EB EB																		
1,500	152	J, K, M	BB	BB	BB	BB	BB	CB	СВ	CB	CB	CB	CB	CB	DC	EB												
1,800 2,200		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	DC DC	EB EB																		
2,700	272	J, K, M	BB	BB	BB	BB	BB	CB	DC	EB																		
3,300 3,900		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	DC DC	EB EB																		
4,700	472	J, K, M	BB	BB	BB	BB	BB	CB	CB	CB	СВ	CB	CB	CB	DC	EB												
5,600 6,800		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	DC DC	EB EB																		
8,200		J, K, M	BB	BB	BB	BB	BB	CB	СВ	CB	СВ	СВ	CB	СВ	DC	EB												
10,000 12,000		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB BB	CB CB	CB CB	CB CB	CB CB	CB CB	CB CB	СВ	DC DC	EB EB												
15,000	153	J, K, M	BB	BB	BB	BB	BB	CB	CB	CB	CB	CB	CB		DC	DC	DC	DC	DC	DD	DC	EB						
18,000		J, K, M	BB	BB	BB	BB	BB	CB	CB	CB	CB	CB	CB		DC	DC	DC	DC	DC	DD	DC	EB						
22,000 27,000		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB	BB	CB CB	CB CB	CB CB	CB CB	CB CB	CB CB		DC DC	DC DC	DC DC	DC DC	DC DC	DD DD	DC DE	EB EB						
33,000	333	J, K, M	BB	BB	BB	BB		CB	CB	CB	CB	CB	CB		DC	DC	DC	DC DC	DC	DD	DE	EB						
39,000 47,000		J, K, M J, K, M	BB BB	BB BB	BB BB	BB BB		CB CB	CB CB	CB	CB	CB CB	CB CB		DC DC	DC DC	DC DC	DC	DC DC	DD DE	DE DG	EB EB	EB EB	EB EB	EB EB	EB EB	EC EC	EB ED
56,000	563	J, K, M	BB	BB	BB			CB	CB	CB	СВ	СВ			DD	DD	DD	DD	DD	DE	DG	EB	EB	EB	EB	EB	EB	ED
68,000 82,000		J, K, M J, K, M	BB BB	BB BB	BB BB			CB CB	CB CB	CB CB	CB CB	CB CB			DD DD	DD DD	DD DD	DD DD	DD DD	DE DE		EB EB	EB EB	EB EB	EB EB	EB EB	EB EB	ED ED
100,000	104	J, K, M	BB	BB	BB			СВ	СВ	CB	СВ	СВ			DD	DD	DD	DD	DD	DE		EB	EB	EB	EB	EB	EB	EM
120,000 150,000	124 154	J, K, M J, K, M						CB CB	CB CB	CB CB		CB CD			DC DC	DC DC	DC DC	DC DC	DD DD	DG		EC EC	EC EC	EC EC	EC EC	EC EC	EC EC	EM EG
180,000		J, K, M						CB	CB	CB					DC	DC	DC	DC	DD			EC	EC	EC	EC	EC	EC	
220,000 270,000	224 274	J, K, M J, K, M						CB CB	CB CB	CB CB	CD				DC DD	DC DD	DC DD	DC DD	DD	DG		EC EB	EC EB	EC EB	EC EB	EC EC	EC EM	
330,000		J, K, M						CB	CB	CB					DD	DD	DD	DD	DD			EB	EB	EB	EB	EC	EG	
390,000 470,000		J, K, M J, K, M						CB CB	CB CB	CB CB					DG DD	DG DD	DG DD	DG DD	DE DE			EB EC	EB EC	EB EC	EB EC	EC EC	EG EG	
560,000	564	J, K, M													DD	DD	DD	DG	DH			ED	ED	ED	ED	EC		
680,000 820,000	684 824	J, K, M J. K. M													DD DD	DD DD	DD DD	DG DG	DH			EE	EE EF	EE EF	EE EF	ED ED		
1,000,000	105	J, K, M						CC*	CC*	CC*					DD	DD	DD	DG				EF	EF	EF	EG	ED		
1,200,000 1,500,000	125 155	J, K, M J, K, M		l											DE DG	DE DG	DE DG			l	l	ED EF	ED EF	ED EF	EG EG	EH		
1,800,000	185	J, K, M													DG	DG	DG					EF	EF	EF		EH		
2,200,000 2,700,000		J, K, M J, K, M													DG	DG	DG					ED EN	ED EN	ED EN	EF	EH		
3,300,000	335	J, K, M																				ED	ED	ED	EH			
3,900,000 4,700,000		J, K, M J, K, M																				EF+	EF+	EF+	EH+			
5,600,000	565	J, K, M																				EH+	EH+	EH+	C/1+			
6,800,000	685	J, K, M		l																l	l	EH+	EH+	EH+				
8,200,000 10,000,000	825 106	J, K, M J, K, M		l																l	l	EH+	EH+	EH+				

^{*} Capacitance K or M. ontact KEMET Sales Rep for J tolerance availability. +_Reflow Only.

NOTE: For non-standard capacitance values or voltages, contact your local KEMET sales representative.

CERAMIC CHIP/STANDARD



X7R CAPACITANCE RANGE - 1210, 1808, 1812, 1825, 2220, 2225

Сар	Сар					C1210					C1808			C1	812			C1825			C2	220			C2225	
pF	Code	Cap Tol.	6.3V	10V	16V	25V	50V	100V	200V	50V	100V	200V	25V	50V	100V	200V	50V	100V	200V	25V	50V	100V	200V	50V	100V	200V
2,200	222	J,K,M	FB	FB	FB	FB	FB	FB	FB	-		2001				200.	-		2001		-		2001			2001
2,700	272	J,K,M	FB	FB	FB	FB	FB	FB	FB																	
3,300		J,K,M	FB	FB	FB	FB	FB	FB	FB																	
3,900	392	J,K,M	FB	FB	FB	FB	FB	FB	FB																	
4,700		J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD														
5,600	562	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD														
6,800	682	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD	GB	GB	GB	GB										
8,200	822	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD	GB	GB	GB	GB										
10,000	103	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD	GB	GB	GB	GB										
12,000	123	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD	GB	GB	GB	GB										
15,000	153	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD	GB	GB	GB	GB										
18,000	183	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD	LD	GB	GB	GB	GB										
22,000	223	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD		GB	GB	GB	GB	HB	HB	HB							
27,000	273	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD		GB	GB	GB	GB	НВ	НВ	НВ							
33,000	333	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD		GB	GB	GB	GB	НВ	НВ	НВ							
39,000	393	J,K,M	FB	FB	FB	FB	FB	FB	FB	LD	LD		GB	GB	GB	GB	НВ	НВ	НВ							
47,000	473	J,K,M	FB	FB	FB	FB	FB	FB	FC	LD	LD		GB	GB	GB	GB	HB	НВ	НВ					KC	KC	KC
56,000	563	J,K,M	FB	FB	FB	FB	FB	FB	FC	LD	LD		GB	GB	GB	GB	HB	HB	HB					KC	KC	KC
68,000	683	J,K,M	FB	FB	FB	FB	FB	FB	FC	LD			GB	GB	GB	GB	НВ	НВ	НВ					KC	KC	KC
82,000	823	J,K,M	FB	FB	FB	FB	FB	FC	FF	LD			GB	GB	GB	GB	HB	HB	HB				JC	KC	KC	KC
100,000	104	J,K,M	FB	FB	FB	FB	FB	FD	FG	LD			GB	GB	GB	GB	HB	HB	HB				JC	KC	KC	KC
120,000	124	J,K,M	FB	FB	FB	FB	FB	FD		LD			GB	GB	GB	GB	HB	HB	HB				JC	KC	KC	KC
150,000	154	J,K,M	FC	FC	FC	FC	FC	FD		LD			GB	GB	GB	GE	HB	HB	HB				JC	KC	KC	KC
180,000	184	J,K,M	FC	FC	FC	FC	FC	FD		LD			GB	GB	GB	GF	HB	HB	HB				JC	KC	KC	KC
220,000	224	J,K,M	FC	FC	FC	FC	FC	FD					GB	GB	GB	GG	HB	HB	HB				JC	KC	KC	KC
270,000	274	J,K,M	FC	FC	FC	FC	FC	FD					GB	GB	GG	GG	HB	HB	HB	JC	JC	JC	JC	KB	KC	KC
330,000	334	J,K,M	FD	FD	FD	FD	FD	FD					GB	GB	GG	GG	HB	HB	HB	JC	JC	JC	JC	KB	KC	KC
390,000	394	J,K,M	FD	FD	FD	FD	FD						GB	GB	GG	GG	HB	HB	HD	JC	JC	JC	JC	KB	KC	KC
470,000	474	J,K,M	FD	FD	FD	FD	FD	FD					GB	GB	GG	GJ	HB	HB	HD	JC	JC	JC	JC	KB	KC	KD
560,000	564	J,K,M	FD	FD	FD	FD	FD						GC	GC	GG		HB	HD	HD	JC	JC	JC	JD	KB	KC	KD
680,000	684	J,K,M	FD	FD	FD	FD	FD						GC	GC	GG		HB	HD	HD	JC	JC	JD	JD	KB	KC	KD
820,000	824	J,K,M	FF	FF	FF	FF	FF						GE	GE	GG		HB		HF	JC	JC	JF	JF	KB	KC	KE
1,000,000	105	J,K,M	FH	FH	FH	FH	FH	FM					GE	GE	GG		HB		HF	JC	JC	JF	JF	KB	KD	KE
1,200,000	125	J,K,M	FH	FH	FH	FH	FG										HB			JC	JC			KB		KE
1,500,000	155	J,K,M	FH	FH	FH	FH	FG										HC			JC	JC			KC		
1,800,000	185	J,K,M	FH	FH	FH	FH	FG										HD			JD	JD			KD		
2,200,000	225	J,K,M	FJ	FJ	FJ	FJ	FG	FT*							GO°		HF			JF	JF			KD		
2,700,000	275	J,K,M	FE	FE	FE																					
3,300,000		J,K,M	FF	FF	FF	FM	FM																			
3,900,000	395	J,K,M	FG	FG	FG																					
4,700,000	475	J,K,M	FC+	FC+	FC+	FG+	FS+						GK*	GK*												
5,600,000		J,K,M	FF+	FF+	FF+																					
6,800,000	685	J,K,M	FG+	FG+	FG+	FM+																				
8,200,000	825	J,K,M	FH+	FH+	FH+																					
10,000,000	106	J,K,M	FH+	FH+	FH+	FS+							GK*							JF	JO					
12,000,000	126	J,K,M																								
15,000,000	156	J,K,M																			JO					
18,000,000	186	J,K,M																								
22,000,000	226	J,K,M	FS+	FS+																JO						
47,000,000	476	M	FS+																							

^{*} Capacitance tolerance K or M. Contact your local KEMET Sales Rep for J tolerance availability. + Reflow Only NOTE: For non-standard capacitance values or voltages, contact your local KEMET sales representative.

50 Volt Ceramic Chips can be used for 63 volt applications.

Improved product with higher ratings and tighter capacitance tolerance product may be substituted within the same size (length, width, and thickness) at KEMET's option. Reels with such substitutions will be marked with the improved KEMET part numbers.

Y5V CAPACITANCE RANGE

Сар	Cap Cap C0402*		*		C06	03*			C	0805	*			(1206	*			(C1210	*			
pF	Code	Tol.	6.3V	10V	16V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V
22,000	223	Z	BB	BB	BB	CB	CB	CB	CB					DC					EB					
27,000	273	Z	BB	BB	BB	CB	CB	CB	CB					DC					EB					
33,000	333	Z	BB	BB	BB	CB	CB	CB	CB					DC					EB					
39,000	393	Z	BB	BB	BB	CB	CB	CB	CB					DD					EB					
47,000	473	Z	BB	BB	BB	CB	CB	CB	CB					DD					EB					
56,000	563	Z	BB	BB	BB	CB	CB	CB	CB					DD					EB					
68,000	683	Z	BB	BB	BB	CB	CB	CB	CB					DD					EB					
82,000	823	Z	BB	BB	BB	CB	CB	CB	CB					DD					EB					
100,000	104	Z	BB	BB	BB	CB	CB	CB	CB					DD					EB					
120,000	124	Z				CC	CC	CC	CC	DC	DC	DC	DC											
150,000	154	Z				CC	CC	CC	CC	DC	DC	DC	DC											
180,000	184	Z				CC	CC	CC	CC	DC	DC	DC	DC											
220,000	224	Z	BB			CC	CC	CC	CC	DC	DC	DC	DC	DD	EC	EC	EC	EC		FD	FD	FD	FD	FD
270,000	274	Z				CC	CC	CC	CC	DC	DC	DC	DC		EB	EB	EB	EB		FD	FD	FD	FD	FD
330,000	334	Z				CC	CC	CC	CC	DC	DC	DC	DC		EB	EB	EB	EB		FD	FD	FD	FD	FD
390,000	394	Z				CC	CC	CC		DC	DC	DC	DC		EB	EB	EB	EB		FD	FD	FD	FD	FD
470,000 560,000	474 564	Z Z	BB			CC	CC	CC		DC DD	DC DD	DC DD	DC DD		EC EB	EC EB	EC EB	EC EB		FD FD	FD FD	FD FD	FD FD	FD FD
680,000	684	Z				CC	CC			DE	DE	DE	DE		EB	EB	EB	EB		FD	FD	FD	FD	FD
820,000	824	Ž				čč	CC			DG	DĞ	ĎĞ	DĞ		ĒВ	ĒΒ	ĒΒ	ĒΒ		FF	FF	FF	FF	FF
1,000,000	105	Z	BB			CC	CC			DĞ	DĞ	DG	DĞ		EG	EG	EG	EG		FH	FH	FH	FH	FH
1,200,000	125	Z								DC	DC	DC			EC	EC	EC			FD	FD	FD		
1,500,000 1,800,000	155 185	Z Z								DC DD	DC DD	DC DD			EC	EC	EC			FD FD	FD FD	FD FD		
2,200,000	225	Z								DD	DD	DD			ĒĔ	ΕĔ	EE			FD	FD	FD		
3,300,000	335	Z								DE	DE	DH			EF	EF	EF			FE	FE	FE		
4,700,000	475	Z								DH	DH	DH			ΕM	EM	EM			FG	FG	FG		
5,600,000	565	Z								DH	DH				ΕJ	ΕÌ	EJ			FG	FĞ	FĞ		
6,800,000 10,000,000	685 106	Z								DH	DH				EJ EJ	EJ EJ				FH FH	FH FH	FH		
15.000.000	156	Ž								ווט	ווט				LJ	LJ				FH	FH	FH		
22.000.000	226	Z													EH					FT	FT	FM		

NOTE: For non-standard capacitance values or voltages, contact your local KEMET sales representative. 50 Volt Ceramic Chips can be used for 63 volt applications.

* EIA preferred chip sizes

⁺ Reflow only



Thickness Code Reference Chart Packaging Quantity Based on Finished Chip Thickness Specifications

Thickness	Chip	Chip Thickness	Qty per Reel	Qty per Reel	Qty per Reel	Qty per Reel	Qty per Bulk
Code	Size	Range (mm)	7" Plastic	13" Plastic	7" Paper	13" Paper	Cassette
AA	0201	0.30 ± 0.03	N/A	N/A	15,000	N/A	N/A
BB CB	0402 0603	0.50 ± 0.05 0.80 ± 0.07	N/A N/A	N/A N/A	10,000 4,000	50,000 10,000	50,000 15,000
CC	0603	0.80 ± 0.07	N/A	N/A	4,000	10,000	N/A
CD	0603	0.80 ± 0.15	N/A	N/A	4,000	10,000	N/A
DB	0805	0.60 ± 0.10	N/A	N/A	4,000	10,000	10,000
DC	0805	0.78 ± 0.10	N/A	N/A	4,000	10,000	N/A
DD	0805	0.90 ± 0.10	N/A	N/A	4,000	10,000	N/A
DE DF	0805 0805	1.00 ± 0.10 1.10 ± 0.10	2,500 2,500	10,000 10,000	N/A N/A	N/A N/A	N/A N/A
DG	0805	1.25 ± 0.15	2,500	10,000	N/A	N/A	N/A
DH	0805	1.25 ± 0.20	2,500	10,000	N/A	N/A	N/A
DJ	0805	1.25 ± 0.20	3,000	N/A	N/A	N/A	N/A
DK	0805	1.25 ± 0.15	3,000	N/A	N/A	N/A	N/A
DL EB	0805	0.95 ± 0.10	4,000 4,000	10,000	N/A 4,000	N/A	N/A N/A
EC	1206 1206	0.78 ± 0.10 0.90 ± 0.10	4,000	10,000 10,000	4,000 N/A	10,000 N/A	N/A N/A
ED	1206	1.00 ± 0.10	2,500	10,000	N/A	N/A	N/A
EE	1206	1.10 ± 0.10	2,500	10,000	N/A	N/A	N/A
EF	1206	1.20 ± 0.15	2,500	10,000	N/A	N/A	N/A
EG	1206	1.60 ± 0.15	2,000	8,000	N/A	N/A	N/A
EH EJ	1206 1206	1.60 ± 0.20 1.70 ± 0.20	2,000 2,000	8,000 8,000	N/A N/A	N/A N/A	N/A N/A
EK	1206	0.80 ± 0.10	2,000	8,000	N/A	N/A	N/A
EL	1206	1.15 ± 0.15	2,000	8,000	N/A	N/A	N/A
EM	1206	1.25 ± 0.15	2,500	10,000	N/A	N/A	N/A
EN	1206	0.95 ± 0.10	4,000	10,000	N/A	N/A	N/A
FB FC	1210 1210	0.78 ± 0.10 0.90 ± 0.10	4,000 4,000	10,000 10.000	N/A N/A	N/A N/A	N/A N/A
FD	1210	0.95 ± 0.10	4,000	10,000	N/A	N/A	N/A
FE	1210	1.00 ± 0.10	2,500	10,000	N/A	N/A	N/A
FF	1210	1.10 ± 0.10	2,500	10,000	N/A	N/A	N/A
FG	1210	1.25 ± 0.15	2,500	10,000	N/A	N/A	N/A
FH FJ	1210	1.55 ± 0.15	2,000	8,000	N/A N/A	N/A N/A	N/A N/A
FK	1210 1210	1.85 ± 0.20 2.10 ± 0.20	2,000 2,000	8,000 8,000	N/A	N/A N/A	N/A N/A
FL	1210	1.40 ± 0.15	2,000	8,000	N/A	N/A	N/A
FM	1210	1.70 ± 0.20	2,000	8,000	N/A	N/A	N/A
FN	1210	1.85 ± 0.20	2,000	8,000	N/A	N/A	N/A
FO FP	1210 1210	1.50 ± 0.20	2,000 2,000	8,000 8,000	N/A N/A	N/A N/A	N/A N/A
FQ	1210	1.60 ± 0.20 2.50 ± 0.22	1,500	N/A	N/A	N/A N/A	N/A N/A
FR	1210	2.25 ± 0.20	2,000	8,000	N/A	N/A	N/A
FS	1210	2.50 ± 0.20	1,000	4,000	N/A	N/A	N/A
FT	1210	1.90 ± 0.20	1,500	4,000	N/A	N/A	N/A
LD GB	1808 1812	0.90 ± 0.10 1.00 ± 0.10	4,000 1,000	10,000 4,000	N/A N/A	N/A N/A	N/A N/A
GC	1812	1.10 ± 0.10	1,000	4,000	N/A	N/A	N/A
GD	1812	1.25 ± 0.15	1,000	4,000	N/A	N/A	N/A
GE	1812	1.30 ± 0.10	1,000	4,000	N/A	N/A	N/A
GF CC	1812	1.50 ± 0.10	1,000	4,000	N/A	N/A	N/A
GG GH	1812 1812	1.55 ± 0.10 1.40 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
GJ	1812	1.70 ± 0.15	1,000	4,000	N/A	N/A	N/A
GK	1812	1.60 ± 0.20	1,000	4,000	N/A	N/A	N/A
GL	1812	1.90 ± 0.20	1,000	4,000	N/A	N/A	N/A
GM GN	1812 1812	2.00 ± 0.20	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
GO	1812	1.70 ± 0.20 2.50 ± 0.20	500	4,000 N/A	N/A N/A	N/A N/A	N/A N/A
HB	1825	1.10 ± 0.15	1,000	4,000	N/A	N/A	N/A
HC	1825	1.15 ± 0.15	1,000	4,000	N/A	N/A	N/A
HD	1825	1.30 ± 0.15	1,000	4,000	N/A	N/A	N/A
HE HF	1825 1825	1.40 ± 0.15 1.50 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
JB	2220	1.00 ± 0.15	1,000	4,000	N/A	N/A N/A	N/A
JC	2220	1.10 ± 0.15	1,000	4,000	N/A	N/A	N/A
JD	2220	1.30 ± 0.15	1,000	4,000	N/A	N/A	N/A
JE IE	2220	1.40 ± 0.15	1,000	4,000	N/A	N/A	N/A
JF JG	2220 2220	1.50 ± 0.15 1.70 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
JH	2220	1.80 ± 0.15	1,000	4,000	N/A	N/A	N/A
JO	2220	2.40 ± 0.15	500	2,000	N/A	N/A	N/A
KB	2225	1.00 ± 0.15	1,000	4,000	N/A	N/A	N/A
KC KD	2225 2225	1.10 ± 0.15 1.30 ± 0.15	1,000 1,000	4,000 4,000	N/A N/A	N/A N/A	N/A N/A
KE KE	2225	1.40 ± 0.15	1,000	4,000	N/A N/A	N/A N/A	N/A N/A
1.1		1.10 ± 0.10	1,000	1,000	13/73	13/73	14/7

This chart refers to ceramic chip thickness codes on pages 73 - 76.

Note: TU suffix represents tape and reel packaging of unmarked components.

Note: TM suffix represents tape and reel packaging of marked components.

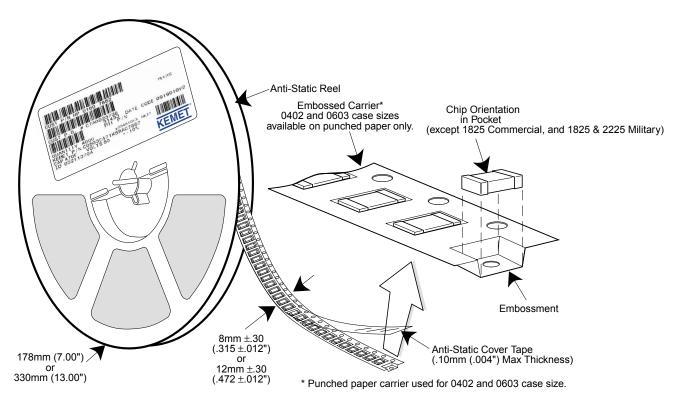
Cases sizes \leq 1210 are 8mm tape with 4mm pitch and Case Sizes >1210 are 12mm tape and 8mm pitch.

Packaging Information



Tape & Reel Packaging

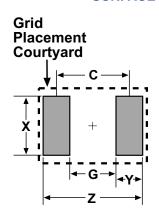
KEMET offers Multilayer Ceramic Chip Capacitors packaged in 8mm and 12mm plastic tape on 7" and 13" reels in accordance with EIA standard 481-1: Taping of surface mount components for automatic handling. This packaging system is compatible with all tape fed automatic pick and place systems. See page 78 for details on reeling quantities for commercial chips and page 87 for MIL-PRF-55681 chips.



Case Sizes ≤ 1210 are 8 mm tape with 4 mm pitch. Case Sizes >1210 are 12 mm tape with 8 mm pitch.

Note: TU suffix represents tape and reel packaging of unmarked components. TM suffix represents tape and reel packaging of marked components.

SURFACE MOUNT LAND DIMENSIONS - CERAMIC CHIP CAPACITORS - MM



		Ref	low So	lder			W	ave Sc	older			
Dimension	Z	G	Х	Y(ref)	C(ref)	Z	G	Х	Y(ref)	Smin		
0402	2.14	0.28	0.74	0.93	1.21		Not I	Recomme	nded			
0603	2.78	0.68	1.08	1.05	1.73	3.18	0.68	0.80	1.25	1.93		
0805	3.30	0.70	1.60	1.30	2.00	3.70	0.70	1.10	1.50	2.20		
1206	4.50	1.50	2.00	1.50	3.00	4.90	1.50	1.40	1.70	3.20		
1210	4.50	1.50	2.90	1.50	3.00	4.90	1.50	2.00	1.70	3.20		
1812	5.90	2.30	3.70	1.80	4.10				•			
1825	5.90	2.30	6.90	1.80	4.10							
2220	7.00	3.30	5.50	1.85	5.15	Not Recommended						
2225	7.00	3.30	6.80	1.85	5.15							

Calculation Formula

Z = Lmin + 2Jt + Tt G = Smax - 2Jh - ThX = Wmin + 2Js + Ts

Tt, Th, Ts = Combined tolerances



Packaging Information

Performance Notes

1. Cover Tape Break Force: 1.0 Kg Minimum.

2. Cover Tape Peel Strength: The total peel strength of the cover tape from the carrier tape shall be:

Tape Width Peel Strength

8 mm 0.1 Newton to 1.0 Newton (10g to 100g) 12 mm 0.1 Newton to 1.3 Newton (10g to 130g)

The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300 ± 10 mm/minute.

- 3. Reel Sizes: Molded tantalum capacitors are available on either 180 mm (7") reels (standard) or 330 mm (13") reels (with C-7280). Note that 13" reels are preferred.
- **4. Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA-556.

Embossed Carrier Tape Configuration: Figure 1

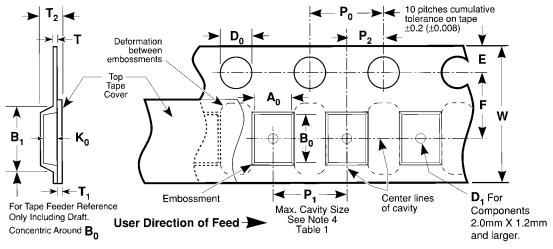


Table 1 — EMBOSSED TAPE DIMENSIONS (Metric will govern)

		С	onstant	Dimensions —	- Millimeters (li	nches)						
Tape Size	$\mathbf{D}_{\scriptscriptstyle{0}}$		E	P_{o}	P_{2}	T Max	T₁ Max					
8 mm and	1.5 +0.10 -0		±0.10	4.0 ±0.10	2.0 ±0.05	0.600	0.100					
12 mm	(0.059 +0.004, -	١, ١	±0.004)	(0.157 ±0.004)	(0.079 ±0.002)	(0.024)	(0.004)					
Variable Dimensions — Millimeters (Inches)												
Tape Size	Pitch	B₁ Max.	D₁ Min.	F	P ₁	R Min.	T ₂ Max	W	A ₀ B ₀ K ₀			
		Note 1	Note 2			Note 3			Note 4			
8 mm	Single (4 mm)	4.4	1.0	3.5 ±0.05	4.0 ±0.10	25.0	2.5	8.0 ±0.30				
	,	(0.173)	(0.039)	(0.138 ±0.002)	(0.157 ±0.004)	(0.984)	(0.098)	(.315 ±0.012)				
12 mm	Double (8 mm)	8.2 (0.323)	1.5 (0.059)	5.5 ±0.05 (0.217 ±0.002)	8.0 ±0.10 (0.315 ±0.004)	30.0 (1.181)	4.6 (0.181)	12.0 ±0.30 (0.472 ±0.012)				

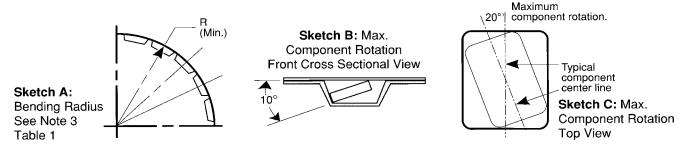
NOTES

- 1. B1 dimension is a reference dimension for tape feeder clearance only.
- 2. The embossment hole location shall be measured from the sprocket hole controlling the location of the embossment. Dimensions of embossment location and hole location shall be applied independent of each other.
- 3. Tape with components shall pass around radius "R" without damage (see sketch A). The minimum trailer length (Fig. 2) may require additional length to provide R min. for 12 mm embossed tape for reels with hub diameters approaching N min. (Table 2)
- 4. The cavity defined by A₀, B₀, and K₀ shall be configured to surround the part with sufficient clearance such that the chip does not protrude beyond the sealing plane of the cover tape, the chip can be removed from the cavity in a vertical direction without mechanical restriction, rotation of the chip is limited to 20 degrees maximum in all 3 planes, and lateral movement of the chip is restricted to 0.5 mm maximum in the pocket (not applicable to vertical clearance.)

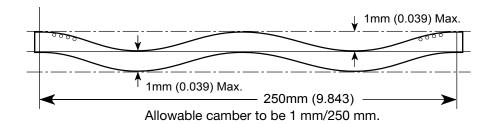


Packaging Information

Embossed Carrier Tape Configuration (cont.)



Sketch D: Tape Camber (Top View)



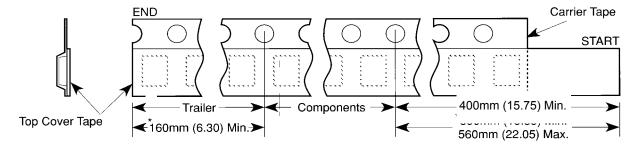


Figure 2: Tape Leader & Trailer Dimensions (Metric Dimensions Will Govern)

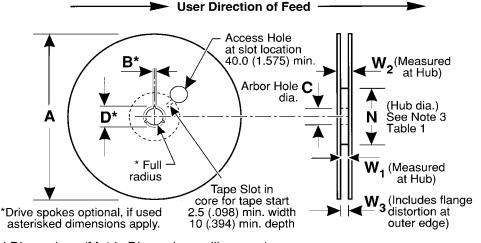


Figure 3: Reel Dimensions (Metric Dimensions will govern)

Table 2 – REEL DIMENSIONS (Metric will govern)

					(90.0,		
Tape Size	A Max	B* Min	С	D* Min	N Min	W ₁	W ₂ Max	W ₃
8 mm	330.0 (12.992)	1.5 (0.059)	13.0 ± 0.20 (0.512 ± 0.008)	20.2 (0.795)	50.0 (1.969) See Note 3	8.4 +1.5, -0.0 (0.331 +0.059, -0.0)	14.4 (0.567)	7.9 Min (0.311) 10.9 Max (0.429)
12 mm	330.0 (12.992)	1.5 (0.059)	13.0 ± 0.20 (0.512 ± 0.008)	20.2 (0.795)	Table 1	12.4 +2.0, -0.0 (0.488 +0.078, -0.0)	18.4 (0.724)	11.9 Min (0.469) 15.4 Max (0.606)



Packaging Information

Punched Carrier (Paper Tape) Configuration (Ceramic Chips Only):

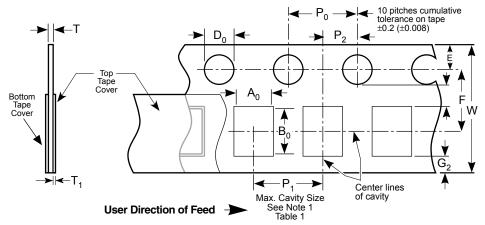


Table 1: 8 & 12mm Punched Tape (Metric Dimensions Will Govern)

Constant Dimensions - Millimeters (Inches)

Tape Size	D ₀	E	P ₀	P ₂	Т1	G ₁	G ₂	R Min.
8mm and 12mm	1.5 +0.10, -0.0 (.059 +0.004, -0.0)		4.0 ± 0.10 $(.157 \pm 0.004)$	2.0 ± 0.05 $(.079 \pm 0.002)$	(.004)			See Note 2

Table 1: 8 & 12mm Punched Tape (Metric Dimensions Will Govern)

Variable Dimensions - Millimeters (Inches)

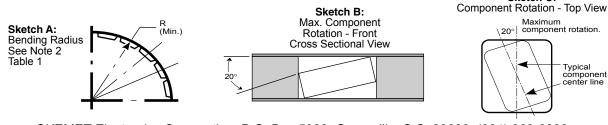
Tape Size	P ₁	F	W	A ₀ B ₀	Т
8mm 1/2 Pitch	$\begin{array}{c} 2.0 \pm 0.10 \\ (.079 \pm .004) \\ \text{See Requirements} \\ \text{Section 3.3 (d)} \end{array}$	3.5 ± 0.05 $(.138 \pm .002)$	8.0 ± 0.3 (.315 ± 0.012)	See Note 1 Table 1	1.1mm (.043) Max. for Paper Base Tape and 1.6mm (.063) Max. for Non-
8mm	4.0 ± 0.10 (0.157 ± .004)				Paper Base Compositions.
12mm	4.0 ± 0.10 (0.157 ± .004)	5.5 ± 0.05	12.0 ± 0.3		See Note 3.
12mm Double Pitch	8.0 ± 0.10 (0.315 ± .004)	(.217 ± .002)	(.472 ± .012)		

Note

1. A_0 , B_0 and T determined by the maximum dimensions to the ends of the terminals extending from the body and/or the body dimensions of the component. The clearance between the ends of the terminals or body of the component to the sides and depth of the cavity (A_0 , B_0 and T) must be within 0.05mm (.002) minimum and 0.50mm (.020) maximum. The clearance allowed must also prevent rotation of the component within the cavity of not more than 20 degrees (see sketches A and B).

Sketch C:

- 2. Tape with components shall pass around radius "R" without damage.
- 3. KEMET nominal thicknesses are: 0402 = 0.6mm and all others 0.95mm minimum.

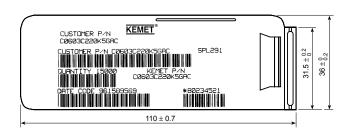


Packaging Information



Bulk Cassette Packaging (Ceramic Chips only) (Meets Dimensional Requirements IEC-286-6 and EIAJ 7201)

 $2.0 \pm \frac{0}{0}$. $3.0 \pm \frac{0.2}{0}$



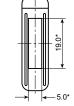


Table 2 – Capacitance Values Available In Bulk Cassette Packaging

			•	•
Case Size	Dielectric	Voltage	Min. Cap Value	Max. Cap Value
0402	All	All	All	All
0603	All	All	All	All
0805	C0G	200 100 50	109 109 109	181 331 102
	X7R	200 100 50 25 16	221 221 221 221 221 221	392 103 273 104 104
	Y5V	25 16	104 104	224 224

Table 1 – Capacitor Dimensions for Bulk Cassette Packaging – Millimeters

Metric Size Code	EIA Size Code	Length L	Width W	Thickness T	Bandwidth B	Minimum Separation S	Number of Pcs/Cassette
1005 1608 2012	0402 0603 0805	1.6 ± 0.07	$\begin{array}{c} 0.5 \pm 0.05 \\ 0.8 \pm 0.07 \\ 1.25 \pm 0.10 \end{array}$	0.5 ± .05 0.8 ± .07 0.6 ± .10	0.2 to 0.4 0.2 to 0.5 0.5 to 0.75	0.3 0.7 0.75	50,000 15,000 10,000

Terminations: KEMET nickel barrier layer with a tin overplate.

CAPACITOR MARKING TABLE (Marking Optional - Not Available for 0402 Size or Y5V Dielectric)

101 0102 0120 01 101 2101001110,									
Numeral Capacitance (pF) For Various Numeral Identifiers									
Alpha Character	9	0	1	2	3	4	5	6	7
Α	0.10	1.0	10	100	1000	10,000	100,000	1,000,000	10,000,000
В	0.11	1.1	11	110	1100	11,000	110,000	1,100,000	11,000,000
С	0.12	1.2	12	120	1200	12,000	120,000	1,200,000	12,000,000
D	0.13	1.3	13	130	1300	13,000	130,000	1,300,000	13,000,000
E	0.15	1.5	15	150	1500	15,000	150,000	1,500,000	15,000,000
F	0.16	1.6	16	160	1600	16,000	160,000	1,600,000	16,000,000
G	0.18	1.8	18	180	1800	18,000	180,000	1,800,000	18,000,000
Н	0.20	2.0	20	200	2000	20,000	200,000	2,000,000	20,000,000
J	0.22	2.2	22	220	2200	22,000	220,000	2,200,000	22,000,000
K	0.24	2.4	24	240	2400	24,000	240,000	2,400,000	24,000,000
L	0.27	2.7	27	270	2700	27,000	270,000	2,700,000	27,000,000
M	0.30	3.0	30	300	3000	30,000	300,000	3,000,000	30,000,000
N	0.33	3.3	33	330	3300	33,000	330,000	3,300,000	33,000,000
Р	0.36	3.6	36	360	3600	36,000	360,000	3,600,000	36,000,000
Q	0.39	3.9	39	390	3900	39,000	390,000	3,900,000	39,000,000
R	0.43	4.3	43	430	4300	43,000	430,000	4,300,000	43,000,000
S	0.47	4.7	47	470	4700	47,000	470,000	4,700,000	47,000,000
Т	0.51	5.1	51	510	5100	51,000	510,000	5,100,000	51,000,000
U	0.56	5.6	56	560	5600	56,000	560,000	5,600,000	56,000,000
V	0.62	6.2	62	620	6200	62,000	620,000	6,200,000	62,000,000
W	0.68	6.8	68	680	6800	68,000	680,000	6,800,000	68,000,000
X	0.75	7.5	75	750	7500	75,000	750,000	7,500,000	75,000,000
Υ	0.82	8.2	82	820	8200	82,000	820,000	8,200,000	82,000,000
Z	0.91	9.1	91	910	9100	91,000	910,000	9,100,000	91,000,000
а	0.25	2.5	25	250	2500	25,000	250,000	2,500,000	25,000,000
b	0.35	3.5	35	350	3500	35,000	350,000	3,500,000	35,000,000
d	0.40	4.0	40	400	4000	40,000	400,000	4,000,000	40,000,000
е	0.45	4.5	45	450	4500	45,000	450,000	4,500,000	45,000,000
f	0.50	5.0	50	500	5000	50,000	500,000	5,000,000	50,000,000
m	0.60	6.0	60	600	6000	60,000	600,000	6,000,000	60,000,000
n	0.70	7.0	70	700	7000	70,000	700,000	7,000,000	70,000,000
t	0.80	8.0	80	800	8000	80,000	800,000	8,000,000	80,000,000
У	0.90	9.0	90	900	9000	90,000	900,000	9,000,000	90,000,000

Laser marking is available as an extra-cost option for most KEMET ceramic chips. Such marking is two sided, and includes a \overline{K} to identify KEMET, followed by two characters (per EIA-198 - see table below) to identify the capacitance value. Note that marking is not available for size 0402 nor for any Y5V chip. In addition, the 0603 marking option is limited to the \overline{K} only.



Example shown is 1,000 pF capacitor.

CE HIGH CAPACITANCE

No.	Ordercode	Casesize	Volt	Сар.	Tol.	Dielec.
1	C0402C335M7PAC	0402	4V	3.3uF	±20%	X5R
2	C0402C475M7PAC	0402	4V	4.7uF	±20%	X5R
3	C0805C476M7PAC	0805	4V	47uF	±20%	X5R
4	C0402C225M9PAC	0402	6.3V	2.2uF	±20%	X5R
5	C0603C106M9PAC	0603	6.3V	10uF	±20%	X5R
6	C1206C476M9PAC	1206	6.3V	47uF	±20%	X5R
7	C1210C107M9PAC	1210	6.3V	100uF	±20%	X5R
8	C1206C226M8PAC	1206	10V	22uF	±20%	X5R
9	C2220C226K4RAC	2220	16V	22uF	±10%	X7R
10	C1210C476M4PAC	1210	16V	47uF	±20%	X5R
11	C1206C475M5PAC	1206	50V	4.7uF	±20%	X5R
12	C1825C225K5RAC	1825	50V	2.2uF	±10%	X7R
13	C1210C225M1RAC	1210	100V	2.2uF	±20%	X7R