

## Data Sheet

**Customer:**

**Product:** Multilayer Ceramic Chip Capacitor

**Sizes.:** 0201/0402/0603/0805/1206/1210/1808/1812

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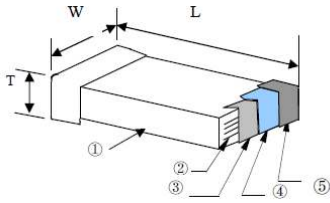
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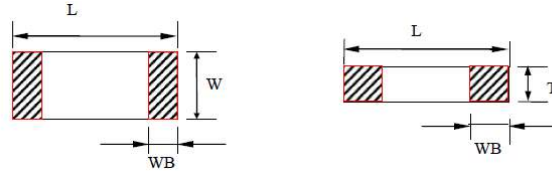
**Multilayer Ceramic Chip Capacitor  
Multilayer Ceramic Chip Capacitor**

**Construction**



①	Ceramic Dielectric	④	Nickel Layer:
②	Inner Electrodes	⑤	Tin Layer
③	Substrate Electrodes		

**Dimensions**



Capacitance  $\leq$  50V

Unit: mm

Type	Size (Inch)	Dielectric	L	W	T/Symbol	WB	
01	0201	All	0.60±0.03	0.30±0.03	0.30±0.03	C	0.15±0.05
			0.60±0.05	0.30±0.05	0.30±0.05	D	
02	0402	Y5V	1.00±0.05	0.50±0.05	0.50±0.05	E	0.25±0.05
			1.00±0.15	0.50±0.10	0.50±0.10	K	
		Except Y5V	1.00±0.05	0.50±0.05	0.50±0.05	E	
			1.00±0.15	0.50±0.15	0.50±0.15	F	
03	0603	All	1.00±0.20	0.50±0.20	0.50±0.20	N	
			1.60±0.10	0.80±0.10	0.80±0.10	H	0.35±0.20
05	0805	All	1.60±0.20	0.80±0.20	0.80±0.20	B	
			Y5V	0.70±0.10	1.25±0.20	0.70±0.10	G
0.80±0.10	1.25±0.20	0.80±0.10		H			
1.25±0.20	1.25±0.20	1.25±0.20		J			
0.80±0.20	1.25±0.20	0.80±0.20		B			
06	1206	All	3.20±0.30	1.60±0.30	1.25±0.20	J	0.60±0.30
					0.80±0.20	B	
					1.60±0.30	L	
					0.80±0.20	B	
					1.00±0.20	I	
					1.25±0.20	J	
10	1210	All	3.20±0.30	2.50±0.30	1.60±0.30	L	0.60±0.30
					1.25±0.20	J	
					2	R	
					2.5	O	
08	1808	All	4.50±0.40	2.00±0.20	1.60±0.30	L	0.60±0.30
12	1812	All	4.50±0.40	3.20±0.30	1.25±0.20	J	0.60±0.30
					1.60±0.30	L	
					2.5	O	

**Multilayer Ceramic Chip Capacitor**

Capacitance > 50V

Type	Size (Inch)	L	W	T/Symbol		WB
02	0402	1.00±0.05	0.50±0.05	0.50±0.05	E	0.25±0.05
03	0603	1.60±0.10	0.80±0.10	0.80±0.10	H	0.35±0.20
05	0805	2.00±0.20	1.25±0.20	0.80±0.20	B	0.50±0.20
				1.00±0.20	I	
				1.25±0.20	J	
06	1206	3.20±0.30	1.60±0.30	0.80±0.20	B	0.60±0.30
				1.00±0.20	I	
				1.25±0.20	J	
				1.60±0.30	L	
10	1210	3.20±0.30	2.50±0.30	1.25±0.20	J	0.60±0.30
				1.60±0.30	L	
08	1808	4.50±0.40	2.00±0.20	1.25±0.20	J	0.60±0.30
				1.60±0.30	L	
12	1812	4.50±0.40	3.20±0.30	1.25±0.20	J	0.60±0.30
				1.60±0.30	L	
				2	R	

**Part Numbering**

MCF	03	J	T	N	250	3R9
Product Type	Dimensions (L×W)	Capacitance Tolerance	Packaging	Dielectric	Voltage (VDCW)	Capacitance
	01: 0201 02: 0402 03: 0603 05: 0805 06: 1206 10: 1210 08: 1808 12: 1812	A: ±0.05pF (Cap≤10pF) B: ±0.1pF (Cap≤10pF) C: ±0.25pF (Cap≤10pF) D: ±0.5pF (Cap≤10pF) F: ±1% G: ±2% J: ±5% K: ±10% M: ±20% Z: +80/-20%	T: Taping Reel	N: NPO (COG) B: X7R F: Y5V X: X5R	4V0: 4V 6V3: 6.3V 250: 25V 500: 50V 101: 100V 102: 1000V 202: 2000V 302: 3000V	3R9: 3.9pF 150: 15pF 181: 180pF 225: 2.2μF 106: 10μF

**Temperature Coefficient /Characteristics**

Dielectric	Reference Temperature Point	Temperature Coefficient	Operation Temperature Range
NOP(COG)	20℃	0±30ppm/℃	-55~125℃
X7R	20℃	±15%	-55~125℃
X5R	20℃	±15%	-55~85℃
Y5V	20℃	-80%~+30%	-25~85℃

Note : Nominal temperature coefficient and allowed tolerance of class I are decided by the changing of the capacitance between 20℃ and 85℃ . Nominal temperature coefficient of class II are decided by the temperature of 20℃ .

**Measurement method of dielectric withstanding Voltage for High Voltage MLCC**

Rated Voltage Range	Measuring Method
100V ≤ Vr < 500V	Force 200% Rated Voltage for 5 second. Max.Current should not exceed 50mA
500V ≤ Vr ≤ 1000V	Force 150% Rated Voltage for 5 second. Max.Current should not exceed 50mA
1000V < Vr ≤ 2000V	Force 120% Rated Voltage for 5 second. Max.Current should not exceed 50mA
2000V < Vr ≤ 5000V	Force 120% Rated Voltage for 5 second. Max.Current should not exceed 10mA

**【MCF Series】**



**Multilayer Ceramic Chip Capacitor**

**■General Capacitance & Voltage**

Capacitance & Voltage (NPO 6.3V~100V)

Dielectric		NPO																								
EIA	Size	0402						0603					0805				1206		1210		1808		1812			
Code	VDCW	6.3V	10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	
0R1	0.1pF				E	E	E			H	H	H				B	B		B							
0R2	0.2				E	E	E			H	H	H				B	B		B							
0R3	0.3				E	E	E			H	H	H				B	B	B	B							
0R4	0.4				E	E	E			H	H	H				B	B	B	B							
0R5	0.5				E	E	E			H	H	H				B	B	B	B							
0R6	0.6				E	E	E			H	H	H				B	B	B	B							
0R7	0.7				E	E	E			H	H	H				B	B	B	B							
0R8	0.8				E	E	E			H	H	H				B	B	B	B							
0R9	0.9				E	E	E			H	H	H				B	B	B	B							
1R0	1.0				E	E	E			H	H	H				B	B	B	B			J				
1R2	1.2				E	E	E			H	H	H				B	B	B	B			J				
1R5	1.5				E	E	E			H	H	H				B	B	B	B			J				
1R8	1.8				E	E	E			H	H	H				B	B	B	B			J				
2R0	2.0				E	E	E			H	H	H				B	B	B	B			J		L		
2R2	2.2				E	E	E			H	H	H				B	B	B	B			J		L		
2R7	2.7				E	E	E			H	H	H				B	B	B	B			J		L		
3R0	3.0				E	E	E			H	H	H				B	B	B	B			J		L		J
3R3	3.3				E	E	E			H	H	H				B	B	B	B			J		L		J
3R9	3.9				E	E	E			H	H	H				B	B	B	B			J		L		J
4R7	4.7				E	E	E			H	H	H				B	B	B	B			J		L		J
5R0	5.0				E	E	E			H	H	H				B	B	B	B			J		L		J
5R6	5.6				E	E	E			H	H	H				B	B	B	B			J		L		J
6R8	6.8				E	E	E			H	H	H				B	B	B	B			J		L		J
8R2	8.2				E	E	E			H	H	H				B	B	B	B			J		L		J
9R0	9.0				E	E	E			H	H	H				B	B	B	B			J		L		J
100	10pF				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
120	12				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
150	15				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
180	18				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
200	20				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
220	22				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
270	27				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
300	30				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
330	33				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
390	39				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
470	47				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
560	56				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
680	68				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
750	75				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
820	82				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
101	100pF				E	E	E			H	H	H				B	B	B	B	J	J	L	L	J	J	J
121	120				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
151	150				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
181	180				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
201	200				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
221	220				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
271	270				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
301	300				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
331	330				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
361	360				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
391	390				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
471	470				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
561	560				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
681	680				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
751	750				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
821	820				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
102	1000pF				E	E				H	H	H				B	B	B	B	J	J	L	L	J	J	J
122	1200		E	E	E					H	H					B	B	B	B	J	J	L	L	J	J	J
152	1500		E	E						H	H					B	B	B	B	J	J	L	L	J	J	J
182	1800		E	E						H	H					B	B	B	B	J	J	L	L	J	J	J
202	2000		E	E						H	H					B	B	B	B	J	J	L	L	J	J	J
222	2200		E	E						H	H					B	B	B	B	J	J	L	L	J	J	J
272	2700		E	E						H	H					B	B	B	B	J	J	L	L	J	J	J
332	3300	E								H	H					B	B	B	B	J	J	L	L	J	J	J
392	3900	E								H	H					B	B	B	B	J	J	L	L	J	J	J
472	4700	E								H	H					B	B	B	B	J	J	L	L	J	J	J
562	5600									H	H					B	B	B	B	J	J	L	L	J	J	J
682	6800									H	H					B	B	B	B	J	J	L	L	J	J	J
822	8200							H								B	B	B	B	J	J	L	L	J	J	J
103	0.01uF							H					J	J	J	J		L		J	J	L	L	J	J	J
123	0.012							H					J	J	J	J		L		J	J	L	L	J	J	J
153	0.015							H					J	J	J	J		L		J	J	L	L	J	J	J
183	0.018							H					J	J	J	J		L		J	J	L	L	J	J	J
223	0.022							H					J	J	J	J		L		J	J	L	L	J	J	J
273	0.027												J	J	J	J		L		J	J	L	L	J	J	J
333	0.033												J	J				L		J	J	L	L	J	J	J
473	0.047												J					L		J	J	L	L	J	J	J
563	0.056												J					L		J	J	L	L	J	J	J
683	0.068												J					L		J	J	L	L	J	J	J
823	0.083												J					L		J	J	L	L	J	J	J
104	0.100												J					L		J	J	L	L	J	J	J

■The letter in cell is expressed the symbol of product thickness

Capacitance & Voltage (X7R 6.3V~100V)

Dielectric		X7R																		
EIA	Size	0402						0603						0805						
Code	VDCW	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	
101	100pF	E	E	E	E	E							H							B
121	120	E	E	E	E	E							H							B
151	150	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
181	180	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
201	200	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
221	220	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
241	240	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
271	270	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
301	300	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
331	330	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
361	360	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
391	390	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
471	470	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
501	500	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
511	510	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
561	560	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
621	620	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
681	680	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
751	750	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
821	820	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
102	1000pF	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
122	1200	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
152	1500	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
182	1800	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
202	2000	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
222	2200	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
242	2400	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
272	2700	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
302	3000	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
332	3300	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
362	3600	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
392	3900	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
472	4700	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
502	5000	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
512	5100	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
562	5600	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
682	6800	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
822	8200	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
103	0.01μF	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
123	0.012	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
153	0.015	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
183	0.018	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
203	0.020	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
223	0.022	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
273	0.027	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
303	0.030	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
333	0.033	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
393	0.039	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
473	0.047	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
513	0.051	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
563	0.056	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	B
683	0.068	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
823	0.082	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
104	0.10μF	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
124	0.12	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
154	0.15	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
184	0.18	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
224	0.22	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
274	0.27	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
334	0.33	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
394	0.39	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
474	0.47	E	E	E	E	E	E	H	H	H	H	H	H	B	B	B	B	B	B	J
564	0.56							H	H	H	H	H	H	J	J	J	J	J	J	J
684	0.68							H	H	H	H	H	H	J	J	J	J	J	J	J
824	0.82							H	H	H	H	H	H	J	J	J	J	J	J	J
105	1.0μF							H	H	H	H	H	H	J	J	J	J	J	J	J
155	1.5							H	H	H	H	H	H	J	J	J	J	J	J	J
225	2.2							H	H	H	H	H	H	J	J	J	J	J	J	J
335	3.3							H	H	H	H	H	H	J	J	J	J	J	J	J
475	4.7							H	H	H	H	H	H	J	J	J	J	J	J	J
685	6.8													J	J	J	J	J	J	J
106	10μF													J	J	J	J	J	J	J

■The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (X7R 6.3V~100V)

Dielectric		X7R																						
EIA	Size	1206						1210						1808						1812				
Code	VDCW	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	16V	25V	50V	100V	
R47	0.47 pF																				L	L	L	
151	150						B						J								L	L	L	
181	180						B						J								L	L	L	
201	200	B	B	B	B	B	B						J								L	L	L	
221	220	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	
271	270	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
331	330	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
391	390	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
471	470	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
561	560	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
681	680	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
751	750	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
821	820	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
102	1000pF	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L
122	1200	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
152	1500	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
182	1800	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
202	2000	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
222	2200	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
272	2700	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
332	3300	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
392	3900	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
472	4700	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O	O	O	L
562	5600	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O			L
682	6800	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	O			L
822	8200	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
103	0.01μF	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
123	0.012	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
153	0.015	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
183	0.018	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
203	0.020	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
223	0.022	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
273	0.027	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
333	0.033	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
393	0.039	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
473	0.047	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
563	0.056	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
683	0.068	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
823	0.082	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
104	0.10μF	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
124	0.12	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
154	0.15	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
184	0.18	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
224	0.22	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
274	0.27	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
334	0.33	B	B	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L				L
394	0.39							J	J	J	J	J	J	L	L	L	L	L	L	L				L
474	0.47	J	J	J	J	J	L	J	J	J	J	J	J	L	L	L	L	L	L	L				L
564	0.56	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L				L
684	0.68	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L				R
824	0.82	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L				R
105	1.0μF	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L				R
125	1.2	J	J	J	J	J		L	L	L	L	L	L	L	L	L	L	L	L	L				R
155	1.5	J	J	J	J	J		L	L	L	L	L	L	L	L	L	L	L	L	L				R
225	2.2	L	L	L	L	L		L	L	L	L	L	L	L	L	L	L	L	L	L				R
335	3.3	L	L	L	L	L		L	L	L	L	L	L	L	L	L	L	L	L	L				
475	4.7	L	L	L	L	L		L	L	L	L	L	L	L	L	L	L	L	L	L				
685	6.8	L	L	L	L	L		L	L	L	L	L												
106	10	L	L	L	L	L		L	L	L	L	L												
226	22	L	L	L	L			L	L	L	L													
476	47							L	L															

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**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (X5R 4V~50V)

Dielectric		X5R																	
EIA	Size	0402						0603						0805					
Code	VDCW	4V	6.3V	10V	16V	25V	50V	4V	6.3V	10V	16V	25V	50V	4V	6.3V	10V	16V	25V	50V
473	0.047μF						E												
563	0.056						E												
683	0.068						E												
823	0.082						E												
104	0.10μF	E	E	E	E	E	E												
124	0.12	E	E	E	E	E	E												
154	0.15	E	E	E	E	E	E												
184	0.18	E	E	E	E	E	E												
224	0.22	E	E	E	E	E	E												
334	0.33	E	E	E	E	E	E												
474	0.47	E	E	E	E	E	E	H	H	H	H	H	H						
564	0.56	E	E	E	E	E	E	H	H	H	H	H	H						
684	0.68	E	E	E	E	E	E	H	H	H	H	H	H						
105	1.0μF	F	F	F	F	F	F	H	H	H	H	H	H	J	J	J	J	J	J
155	1.5	F	F	F	F	F		H	H	H	H	H	H	J	J	J	J	J	J
225	2.2	F	F	F	F	F		H	H	H	H	H	H	J	J	J	J	J	J
335	3.3	F	F	F	F			H	H	H	H	H		J	J	J	J	J	J
475	4.7	F	F	F	F			H	H	H	H	H		J	J	J	J	J	J
685	6.8	F	F	F				H	H	H	H	H		J	J	J	J	J	
106	10μF	N	N	N				B	B	B	B	B		J	J	J	J	J	
156	15	N	N					B	B	B				J	J	J	J	J	
226	22	N	N					B	B	B				J	J	J	J	J	
476	47							B	B					J	J	J			

Dielectric		X5R																				
EIA	Size	1206						1210						1808				1812				
Code	VDCW	4V	6.3V	10V	16V	25V	50V	4V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	6.3V	10V	16V	25V	
104	0.1μF	B																				
155	1.5	B																				
225	2.2	L	L	L	L	L	L															
335	3.3	L	L	L	L	L	L															
475	4.7	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				O	O
685	6.8	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				O	O
106	10μF	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	O	O	O	O	
126	12	L	L	L	L	L		O	O	O	O	O		L	L	L		O	O	O		
156	15	L	L	L	L	L		O	O	O	O	O		L	L	L		O	O	O		
226	22	L	L	L	L	L		O	O	O	O	O		L	L	L		O	O	O		
336	33	L	L	L	L			O	O	O	O	O		L	L			O	O			
476	47	L	L	L	L			O	O	O	O	O		L	L			O	O			
686	68	L	L					O	O	O	O			L				O				
107	100μF	L	L					O	O	O	O			L				O				
337	330							O	O													

■The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (Y5V 6.3V~100V)

Dielectric		Y5V																							
EIA	Size	0402					0603					0805					1206								
Code	VDCW	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	6.3V	10V	16V	25V	50V	100V	
102	1000pF	E	E	E	E	E	H	H	H	H	H		H	H	H	H	H							B	
122	1200	E	E	E	E	E	H	H	H	H	H		H	H	H	H	H							B	
152	1500	E	E	E	E	E	H	H	H	H	H		H	H	H	H	H							B	
182	1800	E	E	E	E	E	H	H	H	H	H		H	H	H	H	H							B	
222	2200	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
272	2700	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
332	3300	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
392	3900	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
472	4700	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
562	5600	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
682	6800	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
822	8200	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H							B	
103	0.010μF	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	
123	0.012	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	
153	0.015	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
183	0.018	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
203	0.020	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
223	0.022	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
273	0.027	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
333	0.033	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
393	0.039	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
473	0.047	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
563	0.056	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
683	0.068	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
823	0.082	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
104	0.10μF	E	E	E	E	E	H	H	H	H	H	H	H	H	H	H	H	B						B	B
124	0.12	E	E	E	E		H	H	H	H	H		H	H	H	H	H							B	B
154	0.15	E	E	E	E		H	H	H	H	H		H	H	H	H	H							B	B
184	0.18	E	E	E	E		H	H	H	H	H		H	H	H	H	H							B	B
224	0.22	E	E	E	E		H	H	H	H	H		H	H	H	H	H							B	B
274	0.27	E	E				H	H	H	H	H		H	H	H	H	H							B	B
334	0.33	K	K				H	H	H	H	H		H	H	H	H	H							B	B
394	0.39	K	K				H	H	H	H	H		H	H	H	H	H							B	B
474	0.47	K	K				H	H	H	H	H		H	H	H	H	H							B	B
564	0.56	K	K				H	H	H	H	H		H	H	H	H	H							B	
684	0.68	K	K				H	H	H	H	H		H	H	H	H	H							B	
824	0.82	K	K				H	H	H	H	H		H	H	H	H	H							B	
105	1.0μF	K	K				H	H	H	H	H		H	H	H	H	H							B	
125	1.2						H	H	H	H			H	H	H	H	H							B	
135	1.3						H	H	H	H			H	H	H	H	H							B	
155	1.5						H	H	H	H			H	H	H	H	H							B	
225	2.2						H	H	H	H			H	H	H	H	H							B	
275	2.7						H	H					H	H	H	H								B	
335	3.3						H	H					H	H	H	H								B	B
475	4.7						H	H					H	H	H	H								B	B
685	6.8						H	H					H	H	H									B	
106	10μF						B	B					H	H	H									B	
226	22												H	H					L	L	L				
336	33																		L						
476	47																		L						

■The letter in cell is expressed the symbol of product thickness



**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (Y5V 6.3V~100V)

Dielectric		Y5V													
EIA	Size	1210						1808	1812						
Code	VDCW	6.3V	10V	16V	25V	50V	100V	100V	6.3V	10V	16V	25V	50V	100V	
102	1000pF														
122	1200														
152	1500														
182	1800														
222	2200														
272	2700														
332	3300														
392	3900														
472	4700					J									
562	5600					J									
682	6800					J									
822	8200					J									
103	0.010μF					J			L	L	L	L	L		
123	0.012					J			L	L	L	L	L		
153	0.015					J	J		L	L	L	L	L		
183	0.018					J	J		L	L	L	L	L		
203	0.020					J	J		L	L	L	L	L		
223	0.022					J	J		L	L	L	L	L		
273	0.027					J	J		L	L	L	L	L		
333	0.033					J	J		L	L	L	L	L		
393	0.039					J	J		L	L	L	L	L		
473	0.047					J	J		L	L	L	L	L		
563	0.056					J	J		L	L	L	L	L		
683	0.068					J	J		L	L	L	L	L		
823	0.082					J	J		L	L	L	L	L		
104	0.10μF					J	J		L	L	L	L	L		
124	0.12					J	J		L	L	L	L	L		
154	0.15					J	J	J	L	L	L	L	L	L	
184	0.18					J	J	J	L	L	L	L	L	L	
224	0.22					J	J	J	L	L	L	L	L	L	
274	0.27					J	J	J	L	L	L	L	L	L	
334	0.33					J	J	J	L	L	L	L	L	L	
394	0.39					J	J	J	L	L	L	L	L	L	
474	0.47					J	J	J	L	L	L	L	L	L	
564	0.56					J	J	J	L	L	L	L	L	L	
684	0.68					J	J	J	L	L	L	L	L	L	
824	0.82					J	J	J	L	L	L	L	L	L	
105	1.0μF					J	J	J	L	L	L	L	L	L	
125	1.2					J			L	L	L	L	L	L	
135	1.3					J			L	L	L	L	L	L	
155	1.5					J			L	L	L	L	L	L	
225	2.2					J			L	L	L	L	L	L	
275	2.7					J			L	L	L	L	L	L	
335	3.3					J			L	L	L	L	L	L	
475	4.7					J			L	L	L	L	L	L	
685	6.8				J				L	L	L	L	L	L	
106	10μF	R	R	R	J				L	L	L	L	L	L	
226	22	R	R	R					L	L	L				
336	33	R	R						L	L					
476	47	R	R						L	L					
107	100	R							L	L					

■The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

**■ Middle and High Voltage**

Capacitance & Voltage (NPO 200V~2KV)

Dielectric		NPO																					
EIA	Size	0603		0805			1206				1210				1808				1812				
Code	VDCW	200V	250V	200V 250V	500V 630V	1000V	200V 250V	500V 630V	1000V	2000V	200V 250V	500V 630V	1000V	2000V	200V 250V	500V 630V	1000V	2000V	200V 250V	500V 630V	1000V	2000V	
0R1	0.1pF	H	H	B	B	J	B	B	I	I													
0R5	0.5	H	H	B	B	J	B	B	I	I													
0R6	0.6	H	H	B	B	J	B	B	I	I													
0R7	0.7	H	H	B	B	J	B	B	I	I													
0R8	0.8	H	H	B	B	J	B	B	I	I													
0R9	0.9	H	H	B	B	J	B	B	I	I													
1R0	1.0	H	H	B	B	J	B	B	I	I	J	J	J	J									
1R2	1.2	H	H	B	B	J	B	B	I	I	J	J	J	J									
1R5	1.5	H	H	B	B	J	B	B	I	I	J	J	J	J									
1R8	1.8	H	H	B	B	J	B	B	I	I	J	J	J	J									
2R0	2.0	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L					
2R2	2.2	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L					
2R7	2.7	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L					
3R0	3.0	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
3R3	3.3	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
3R9	3.9	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
4R7	4.7	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
5R0	5.0	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
5R6	5.6	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
6R8	6.8	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
8R2	8.2	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
100	10pF	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
110	11	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
120	12	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
150	15	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
180	18	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
220	22	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
270	27	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
300	30	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
330	33	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
390	39	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
470	47	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
560	56	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
680	68	H	H	B	B	J	B	B	I	I	J	J	J	J	L	L	L	L	J	J	L	L	
820	82	H	H	B	B	J	B	B	I	I	L	J	J	J	L	L	L	L	J	J	L	L	
101	100pF	H	H	B	B	J	B	B	I	I	L	J	J	J	L	L	L	L	J	J	L	L	
121	120	H	H	B	B		B	B	I	I	L	J	J	J	L	L	L	L	J	J	L	L	
151	150	H	H	B	B		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
181	180	H	H	B	B		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
221	220	H	H	B	B		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
271	270	H	H	B	B		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
301	300	H	H	B	B		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
331	330	H	H	B	B		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
391	390	H	H	B			B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
471	470	H	H	B	J		B	B	I	I	J	L	J	J	L	L	L	L	J	J	L	L	
561	560			B	J		B	B	J	J	J	J	J	J	L	L	L	L	J	J	L	L	
681	680			B			B	B	J	J	J	J	J	J	L	L	L	L	J	J	L	L	
751	750			B			B	B	J	J	J	J	J	L	L	L	L	J	J	L	L		
821	820			B			B	B	J	J	J	J	J	L	L	L	L	J	J	L	L		
102	1000pF			B			B	B	J	J	J	J	J	L	L	L	L	J	J	L	L		
122	1200			J			B	B	J	J	J	L	L	L	L	L	L	J	J	L	L		
152	1500			J			B	B	J		J	L	L	L	L	L	L	J	L				
182	1800						B				J	L			L	L		J	L				
202	2000						J				J	L			L	L		J	L				
222	2200						J				J	L			L	L		J	L				
272	2700						J				J	L			L	L		J	L				
332	3300										J				L	L		J	L				
392	3900														L			J	L				
472	4700																	J	L				
562	5600																	J					
682	6800																	J					

■ The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (NPO 3KV~5KV)

Dielectric		NPO					
EIA	Size	1808			1812		
Code	VDCW	3000V	4000V	5000V	3000V	4000V	5000V
0R1	0.1pF						
0R5	0.5						
0R6	0.6						
0R7	0.7						
0R8	0.8						
0R9	0.9						
1R0	1.0						
1R2	1.2						
1R5	1.5						
1R8	1.8						
2R0	2.0	L	L	L			
2R2	2.2	L	L	L			
2R7	2.7	L	L	L			
3R0	3.0	L	L	L	L	L	L
3R3	3.3	L	L	L	L	L	L
3R9	3.9	L	L	L	L	L	L
4R7	4.7	L	L	L	L	L	L
5R0	5.0	L	L	L	L	L	L
5R6	5.6	L	L	L	L	L	L
6R8	6.8	L	L	L	L	L	L
8R2	8.2	L	L	L	L	L	L
100	10pF	L	L	L	L	L	L
110	11	L	L	L	L	L	L
120	12	L	L	L	L	L	L
150	15	L	L	L	L	L	L
180	18	L	L	L	L	L	L
220	22	L	L	L	L	L	L
270	27	L	L	L	L	L	L
330	33	L	L	L	L	L	L
390	39	L			L	L	L
470	47	L			L	L	L
560	56	L			L	L	L
680	68	L			L	L	L
820	82	L			L	L	
101	100pF	L			L	L	
121	120	L			L	L	
151	150	L			L	L	
181	180	L			L	L	
221	220	L			L	L	
271	270	L			L		
301	300	L			L		
331	330	L			L		
391	390				L		
471	470				L		
561	560				L		
681	680						
751	750						
821	820						
102	1000pF						
122	1200						
152	1500						
182	1800						
222	2200						
272	2700						
332	3300						
392	3900						
472	4700						
562	5600						
682	6800						

■The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (X7R 200V~4KV)

Dielectric		X7R																							
EIA	Size	0603			0805			1206				1210				1808				1812					
Code	VDCW	200V 250V	200V 250V	500V 630V	200V 250V	500V 630V	1000V	2000V	200V 250V	500V 630V	1000V	2000V	200V 250V	500V 630V	1000V	2000V	3000V	4000V	200V 250V	500V 630V	1000V	2000V	3000V	4000V	
101	100pF		B																						
121	120		B																						
151	150	H	B	B	B	B	B	J	J	J	J	J				L	L	L	L						
181	180	H	B	B	B	B	B	J	J	J	J	J				L	L	L	L						
221	220	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L						
271	270	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
331	330	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
391	390	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
471	470	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
561	560	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
681	680	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
751	750	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
821	820	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
102	1000pF	H	B	B	B	B	B	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
112	1100	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
122	1200	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
152	1500	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
182	1800	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
222	2200	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
272	2700	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
332	3300	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
392	3900	H	B	B	B	B	J	J	J	J	J	J	L	L	L	L	L	L	L	L	L	L	L	L	L
472	4700	H	B	B	B	J	J		J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
562	5600	H	B	B	B	J	J		J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
682	6800	H	B	J	B	J	J		J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
822	8200	H	B	J	B	J	J		J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
103	0.010μF	H	B	J	B	J	J		J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
123	0.012		B		B	J	J		J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
153	0.015		B		B	J			J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
183	0.018		B		B	J			J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
220	0.020		J		B	J			J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
223	0.022		J		B	J			J	J	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
273	0.027				B	J			J	J			L	L					L	L	L				
333	0.033				J	J			J	J			L	L					L	L	L				
393	0.039				J				J	J			L	L					L	L	L				
473	0.047				J				J	J			L	L					L	L	L				
563	0.056				J				J	J			L	L					L	L	R				
683	0.068				J				J	L			L	L					L	L					
823	0.082				J				J	L			L						L	L					
104	0.10μF				J				J	L			L						L	L					
124	0.12				J				J				L						L	R					
154	0.15				J				J				L						L	R					
184	0.18				L				L				L						L	R					
224	0.22				L				L				L						L	R					
274	0.27																								
334	0.33																				R				
394	0.39																				R				
474	0.47																				R				
564	0.56																				R				
105	1.0μF																				R				

■ The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

Capacitance & Voltage (Y5V 200V~250V)

Dielectric		Y5V									
EIA	Size	0805		1206		1210		1808		1812	
Code	VDCW	200V	250V	200V	250V	200V	250V	200V	250V	200V	250V
103	0.010μF	B	B	B	B			J	J		
123	0.012	B	B	B	B			J	J		
153	0.015	B	B	B	B	J	J	J	J		
183	0.018	B	B	B	B	J	J	J	J		
223	0.022	B	B	B	B	J	J	J	J		
273	0.027	B	B	B	B	J	J	J	J		
333	0.033	B	B	B	B	J	J	J	J		
393	0.039	B	B	B	B	J	J	J	J		
473	0.047	B	B	B	B	J	J	J	J		
563	0.056			B	B	J	J	J	J		
683	0.068			B	B	J	J	J	J		
823	0.082			B	B	J	J	J	J		
104	0.10μF			B	B	J	J	J	J	L	L
154	0.15			B	B	J	J	J	J	L	L
224	0.22			B	B	J	J	J	J	L	L
334	0.33					J	J	J	J	L	L
394	0.39					J	J	J	J	L	L
474	0.47					J	J	J	J	L	L

■The letter in cell is expressed the symbol of product thickness

**Ultra-small 0201 Capacitors**

Capacitance & Voltage

EIA	Size	0201	
		NPO	
Code	VDCW	25V	50V
0R1	0.1pF	C	C
0R2	0.2	C	C
0R3	0.3	C	C
0R4	0.4	C	C
0R5	0.5	C	C
0R6	0.6	C	C
0R7	0.7	C	C
0R8	0.8	C	C
0R9	0.9	C	C
1R0	1.0	C	C
1R1	1.1	C	C
1R2	1.2	C	C
1R3	1.3	C	C
1R4	1.4	C	C
1R5	1.5	C	C
1R6	1.6	C	C
1R7	1.7	C	C
1R8	1.8	C	C
2R0	2.0	C	C
2R2	2.2	C	C
2R4	2.4	C	C
2R5	2.5	C	C
2R7	2.7	C	C
3R0	3.0	C	C
3R3	3.3	C	C
3R6	3.6	C	C
3R7	3.7	C	C
3R9	3.9	C	C
4R0	4.0	C	C
4R3	4.3	C	C
4R7	4.7	C	C
5R0	5.0	C	C
5R1	5.1	C	C
5R6	5.6	C	C
6R0	6.0	C	C
6R2	6.2	C	C
6R5	6.5	C	C
6R8	6.8	C	C
7R0	7.0	C	C
7R5	7.5	C	C
8R0	8.0	C	C
8R2	8.2	C	C
9R0	9.0	C	C
9R1	9.1	C	C
9R5	9.5	C	C

EIA	Size	0201										
		Dielectric		X7R				X5R				
		Code	VDCW	10V	16V	25V	50V	4V	6.3V	10V	16V	25V
101	100pF	C	C	C	C							
121	120	C	C	C	C							
151	150	C	C	C	C							
181	180	C	C	C	C							
201	200	C	C	C	C							
221	220	C	C	C	C							
271	270	C	C	C	C							
331	330	C	C	C	C							
391	390	C	C	C	C							
471	470	C	C	C	C							
561	560	C	C	C	C							
681	680	C	C	C	C							
821	820	C	C	C	C							
102	1000pF	C	C	C	C							
122	1200	C	C	C	C							
152	1500	C	C	C	C							
182	1800	C	C	C	C							
222	2200	C	C	C	C							
272	2700	C	C	C	C							
332	3300	C	C	C	C							
392	3900	C	C	C	C							
472	4700	C	C	C	C							C
562	5600	C	C	C	C							C
682	6800	C	C	C	C							C
822	8200	C	C	C	C							C
103	0.010μF	C	C	C								C
153	0.015	C	C			C	C	C	C	C	C	
183	0.018	C	C			C	C	C	C	C	C	
223	0.022	C	C			C	C	C	C	C	C	
273	0.027					C	C	C	C	C	C	
333	0.033					C	C	C	C	C	C	
393	0.039					C	C	C	C	C	C	
473	0.047					C	C	C	C	C	C	
563	0.056					C	C	C	C	C	C	
683	0.068					C	C	C	C	C	C	
823	0.082					C	C	C	C	C	C	
104	0.100μF					C	C	C	C	C	C	
124	0.120					C	C	C	C	C	C	
154	0.150					C	C	C	C	C	C	
224	0.220					D	D	D	D			
334	0.330					D	D	D				
474	0.470					D	D	D				
684	0.680					D	D	D				
105	1.0μF					D	D	D				
225	2.2					D	D	D				

■The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**Capacitance & Voltage

EIA	Size	0201	
Dielectric		NPO	
Code	VDCW	25V	50V
100	10pF	C	C
110	11	C	C
120	12	C	C
130	13	C	C
140	14	C	C
150	15	C	C
160	16	C	C
180	18	C	C
200	20	C	C
220	22	C	C
240	24	C	C
270	27	C	C
300	30	C	C
330	33	C	C
360	36	C	C
390	39	C	C
430	43	C	C
470	47	C	C
510	51	C	C
560	56	C	C
620	62	C	C
680	68	C	C
750	75	C	C
820	82	C	C
101	100pF	C	C
221	220	C	C
102	1000pF	C	

■ The letter in cell is expressed the symbol of product thickness

Capacitance & Voltage

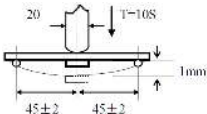
EIA	Size	0201	
Dielectric		Y5V	
Code	VDCW	6.3V	16V
103	0.010μF	C	C
123	0.012	C	
153	0.015	C	
183	0.018	C	
203	0.020	C	
223	0.022	C	
273	0.027	C	
333	0.033	C	
393	0.039	C	
473	0.047	C	
563	0.056	C	
683	0.068	C	
823	0.082	C	
104	0.10μF	C	

■ The letter in cell is expressed the symbol of product thickness

**Multilayer Ceramic Chip Capacitor**

**Environmental Characteristics**

Item	Requirement							Test Method			
Capacitance	Should be within the specified tolerance							NPO: (Class I) Cap≤ 1000pF 1.0±0.2Vrms, 1MHz±10% Cap>1000pF 1.0±0.2Vrms, 1KHz±10% X7R, X5R, Y5V: (Class II) Test Temperature:25°C±3°C Cap≤ 10uF 1.0±0.2Vrms, 1KHz±10% Cap>10uF 0.5±0.1Vrms, 120Hz±24 Hz			
(DF, tanδ) Dissipation Factor	NPO (Class I )	DF							Capacitance	Measuring Frequency	Measuring Voltage
		≤0.56%							Cr < 5 pF	1MHz±10%	1.0±0.2Vrms
		1.5[(150/Cr)+7]×10 <sup>-4</sup>							5pF≤Cr<50 pF		
		≤0.15%							50pF≤Cr≤1000 pF		
		≤0.15%							> 1000 pF	1KHz±10%	
	X7R, X5R, Y5V: (Class II)	Voltage	DF	0201	0402	0603	0805	≥1206	Cap≤ 10uF 1.0±0.2Vrms, 1KHz±10% Cap>10uF 0.5±0.1Vrms, 120Hz±24Hz		
		50V	≤ 250	≤ 3.3nF	≤ 10nF	≤ 100 nF	≤ 330 nF	≤ 680 nF			
			≤ 350	≤ 10nF	-	-	-	≤ 1μF			
			≤ 500	-	-	-	≤ 680 nF	-			
			≤ 1000	-	≤ 1μF	≤ 2.2μF	≤ 4.7μF	≤ 10μF			
		25V	≤ 250	≤ 3.3nF	≤ 10nF	≤ 150nF	≤ 330nF	≤ 680 nF			
			≤ 350	≤ 10nF	≤ 100nF	≤ 330nF	-	≤ 2.2μF			
			≤ 500	-	-	-	≤ 1μF	-			
			≤ 750	-	-	-	≤ 2.2μF	≤ 4.7μF			
		16V	≤ 250	≤ 3.3nF	≤ 10nF	≤ 150nF	≤ 330nF	≤ 680 nF			
			≤ 350	≤ 15nF	≤ 100nF	≤ 330nF	-	≤ 2.2μF			
			≤ 500	≤ 47nF	≤ 220nF	≤ 680nF	≤ 2.2μF	-			
			≤ 750	-	-	-	≤ 4.7μF	≤ 4.7μF			
			≤ 1000	≤ 100nF	≤ 4.7μF	≤ 10μF	≤ 22μF	≤ 47μF			
		10V	≤ 250	≤ 3.3 nF	≤ 10nF	≤ 150nF	≤ 330nF	≤ 680 nF			
≤ 350			≤ 15nF	≤ 100nF	≤ 330nF	-	≤ 2.2μF				
≤ 500			≤ 47nF	-	≤ 680nF	≤ 2.2μF	-				
≤ 750			-	≤ 1μF	≤ 2.2μF	≤ 4.7μF	≤ 10μF				
≤ 1000			≤ 2.2μF	≤ 10μF	≤ 22μF	≤ 47μF	≤ 100μF				
≤ 6.3V		≤ 250	≤ 3.3nF	-	≤ 150nF	-	≤ 680nF				
	≤ 350	≤ 15nF	≤ 100nF	≤ 330nF	-	≤ 2.2μF					
	≤ 500	≤ 47nF	≤ 220nF	≤ 680nF	-	-					
	≤ 750	-	≤ 1μF	-	10μF~22μF	≤ 10μF					
	≤ 1000	≤ 4.7μF	≤ 22μF	≤ 47μF	≤ 47μF	≤ 100μF					

Item	Requirement				Test Method														
Dielectric Withstanding Voltage(DWV)	No breakdown or damage.				Measuring Voltage: Class I :300% Rated voltage Class II :250% Rated voltage Duration: 1 ~ 5s Charge/ Discharge Current: 50mA max. (This method excludes high-voltage MLCC)														
Solderability	At least 95% of the terminal electrode is covered by new solder. Visual Appearance: No visible damage.				Preheating conditions:80 to 120°C ; 10~30s.														
					Solder Temperature: 235±5°C (Sn/Pb:63/37) Duration: 2±0.5s	Solder Temperature: 245±5°C (Lead-free) Duration: 2±0.5s													
Resistance to Flexure of Substrate (Bending Strength)	Appearance: No visible damage $\Delta C/C: \leq \pm 10\%$				Test Board: Al <sub>2</sub> O <sub>3</sub> or PCB Warp: 1mm Speed: 1 mm/sec. Unit: mm The measurement should be made with the board in the bending position. 														
Insulation Resistance	NPO (Class I)	C≤10 nF, Ri≥50000MΩ C > 10 nF, Ri• C <sub>R</sub> ≥500S			Measuring Voltage: Rated Voltage ( Max 500V ) Duration: 60±5s Test Humidity: ≤75% Test Temperature: 25°C ±3°C Test Current: ≤50mA														
	X7R, X5R: (Class II)	C≤25 nF, Ri≥10000MΩ C > 25 nF, Ri• C <sub>R</sub> > 100S																	
	Y5V (Class II)	C≤25 nF, Ri≥4000MΩ C > 25 nF, Ri• C <sub>R</sub> > 100S																	
Resistance to Soldering Heat	Item	NPO	X7R / X5R	Y5V	Preheating conditions: 100 to 200°C ; 10±2min. Solder Temperature: 265±5°C Duration: 10±1s Clean the capacitor with solvent and examine it with a 10X(min.) microscope. Recovery Time: 24±2h Recovery condition: Room temperature														
	$\Delta C/C$	≤±0.5% or ±0.5pF whichever is larger	-5~+10%	-10~+20%															
	DF	Same to initial value																	
	IR	Same to initial value																	
		Appearance : No visible damage. At least 95% of the terminal electrode is covered by new solder.																	
Termination Adhesion	No visible damage				Applied Force: 5N Duration: 10±1S														
Temperature Cycle	NPO: $\Delta C/C: \leq \pm 1\%$ or $\pm 1pF$ , whichever is larger. X7R/X5R: $\Delta C/C: \leq \pm 10\%$ Y5V: $\Delta C/C: \leq \pm 20\%$				Preheating conditions: up-category temperature, 1h Recovery time: 24±1h Initial Measurement Cycling Times: 5 times, 1 cycle, 4 steps:														
					<table border="1"> <thead> <tr> <th>Step</th> <th>Temp.(°C)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Low- category temp NPO/X7R/X5R : -55 Y5V: -25</td> <td>30</td> </tr> <tr> <td>2</td> <td>Normal temp. (+20)</td> <td>2-3</td> </tr> <tr> <td>3</td> <td>Up- category temp NPO/X7R/ : +125 X5R /Y5V: +85</td> <td>30</td> </tr> <tr> <td>4</td> <td>Normal temp. (+20)</td> <td>2-3</td> </tr> </tbody> </table>	Step	Temp.(°C)	Time (min)	1	Low- category temp NPO/X7R/X5R : -55 Y5V: -25	30	2	Normal temp. (+20)	2-3	3	Up- category temp NPO/X7R/ : +125 X5R /Y5V: +85	30	4	Normal temp. (+20)
Step	Temp.(°C)	Time (min)																	
1	Low- category temp NPO/X7R/X5R : -55 Y5V: -25	30																	
2	Normal temp. (+20)	2-3																	
3	Up- category temp NPO/X7R/ : +125 X5R /Y5V: +85	30																	
4	Normal temp. (+20)	2-3																	
					Recovery time after test: 24±2h														



**Multilayer Ceramic Chip Capacitor**

Item	Requirement	Test Method																		
Humidity Load	NPO: $\Delta C/C : \pm 7.5\%$ or $\pm 0.75pF$ , whichever is larger. X7R/X5R: $\Delta C/C : \leq \pm 12.5\%$ Y5V: $\Delta C/C : \leq \pm 30\%$ DF: Not more than twice of initial value. IR: NPO: $Ri \geq 5000M\Omega$ 或 $Ri \cdot CR \geq 50S$ whichever is smaller X7R/X5R: $Ri \geq 1000M\Omega$ 或 $Ri \cdot CR \geq 10S$ whichever is smaller. Y5V: $Ri \geq 400M\Omega$ 或 $Ri \cdot CR \geq 10S$ whichever is smaller. Appearance: No visible damage	Temperature : $40 \pm 2^\circ C$ Humidity : 90~95%RH Voltage: Rated Voltage Duration : 500h Recovery conditions : Room temperature Recovery Time : 24h (Class1) or 48h (Class2)																		
Life Test	NPO: $\Delta C/C : \leq \pm 2\%$ or $\pm 1pF$ , whichever is larger. X7R/X5R $\Delta C/C \leq \pm 20\%$ Y5V: $\Delta C/C \leq \pm 30\%$ DF: Not more than twice of initial value. IR: NPO: $Ri \geq 4000M\Omega$ 或 $Ri \cdot CR \geq 40S$ whichever is smaller X7R/X5R/Y5V: $Ri \geq 2000M\Omega$ 或 $Ri \cdot CR \geq 50S$ whichever is smaller. Visual Appearance: No visible damage	Low-Voltage ( $\leq 100V$ ) Applied Voltage: $2 \cdot Ur$ , except the table 1 Duration: 1000h Temperature : $125^\circ C$ ( NPO, X7R ) $85^\circ C$ ( X5R, Y5V ) Charge/ Discharge Current: 50mA max. Recovery Conditions: Room Temperature Recovery Time: 24h (Class 1), or 48h (Class2) <table border="1" data-bbox="1077 806 1524 1019"> <thead> <tr> <th colspan="4">Table 1</th> </tr> <tr> <th>Capacitance</th> <th>Test Voltage</th> <th>Capacitance</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>0201 <math>\geq</math> 47nF</td> <td rowspan="4">1.5Ur</td> <td>0805 <math>\geq</math> 1uF</td> <td rowspan="4">1.5 Ur</td> </tr> <tr> <td>0402 <math>\geq</math> 330nF</td> <td>1206 <math>\geq</math> 10uF</td> </tr> <tr> <td>0603 <math>\geq</math></td> <td>1210 <math>\geq</math></td> </tr> <tr> <td>470nF</td> <td>10uF</td> </tr> </tbody> </table>	Table 1				Capacitance	Test Voltage	Capacitance	Test Voltage	0201 $\geq$ 47nF	1.5Ur	0805 $\geq$ 1uF	1.5 Ur	0402 $\geq$ 330nF	1206 $\geq$ 10uF	0603 $\geq$	1210 $\geq$	470nF	10uF
Table 1																				
Capacitance	Test Voltage	Capacitance	Test Voltage																	
0201 $\geq$ 47nF	1.5Ur	0805 $\geq$ 1uF	1.5 Ur																	
0402 $\geq$ 330nF		1206 $\geq$ 10uF																		
0603 $\geq$		1210 $\geq$																		
470nF		10uF																		
Middle & high voltage Life Test	NPO: $\Delta C/C : \leq \pm 2\%$ or $\pm 1pF$ , whichever is larger. X7R/X5R $\Delta C/C \leq \pm 20\%$ Y5V: $\Delta C/C \leq \pm 30\%$ DF: Not more than twice of initial value. IR: NPO: $Ri \geq 4000M\Omega$ 或 $Ri \cdot CR \geq 40S$ whichever is smaller X7R/X5R/Y5V: $Ri \geq 2000M\Omega$ 或 $Ri \cdot CR \geq 50S$ whichever is smaller. Visual Appearance: No visible damage	Applied Voltage: $100V \leq \text{Rated Voltage} \leq 200V$ : 1.5 Multiple $200V < \text{Rated Voltage} \leq 500V$ : 1.3 Multiple $500V < \text{Rated Voltage}$ : 1.2 Multiple Duration: 1000h Charge/ Discharge Current: 50mA max. Temperature : $125^\circ C$ ( NPO X7R ); $85^\circ C$ ( X5R, Y5V ) Recovery Conditions: Room Temperature Recovery Time: 24h (Class 1), or 48h (Class2)																		

■ Pretreatment ( only for class 2 capacitor) is a method to treat the capacitor before measurement. First, place the capacitor in the up-category temperature or other specified higher temperature environment for 1 hour. Then recovery the capacitor at standard pressure conditions for 24±1 hours.

■ Storage Temperature: 5 ~ 40°C; Relative Humidity 20 ~70 %RH

**Multilayer Ceramic Chip Capacitor**

**■Packaging**

Packaging Quantity

Unit: mm

Type	Dielectric	Voltage	Capacitance	Thickness / Symbol		Packaging (7" Reel)	
						Paper tape	Plastic tape
0201	NPO	25V	0R1-102	0.30±0.03	C	15K	-
		50V	0R1-221	0.30±0.03	C	15K	-
0402	NPO	6.3V	332-472	0.50±0.05	E	10K	-
		10V / 16V	122-272	0.50±0.05	E	10K	-
		25V	0R1-122	0.50±0.05	E	10K	-
		50V	0R1-102	0.50±0.05	E	10K	-
		100V	0R1-101	0.50±0.05	E	10K	-
0603	NPO	10V	123-223	0.80±0.10	H	4K	-
		16V	822-103	0.80±0.10	H	4K	-
		25V / 50V	0R1-682	0.80±0.10	H	4K	-
		100V	0R1-102	0.80±0.10	H	4K	-
		200V / 250V	0R1-471	0.80±0.10	H	4K	-
0805	NPO	10V	103-104	1.25±0.20	J	-	3K
		16V	103-333	1.25±0.20	J	-	3K
		25V	103-273	1.25±0.20	J	-	3K
		50V	0R1-822	0.80±0.20	B	4K	-
			103-223	1.25±0.20	J	-	3K
		100V	0R1-332	0.80±0.20	B	4K	-
		200V / 250V	0R1-102	0.80±0.20	B	4K	-
			122-152	1.25±0.20	J	-	3K
		500V / 630V	0R1-331	0.80±0.20	B	4K	-
			471-561	1.25±0.20	J	-	3K
1KV	0R1-101	1.25±0.20	J	-	3K		
1206	NPO	50V	0R3-822	0.80±0.20	B	4K	-
			103-104	1.60±0.30	L	-	2K
		100V	0R1-332	0.80±0.20	B	4K	-
			0R1-182	0.80±0.20	B	4K	-
		200V / 250V	202-272	1.25±0.20	J	-	3K
			0R1-100	0.80±0.20	B	4K	-
			110-471	1.00±0.20	I	-	3K
		500V / 630V	561-152	1.25±0.20	J	-	3K
			0R1-121	1.00±0.20	I	-	3K
		1KV	151-102	1.25±0.20	J	-	3K
			0R1-390	1.00±0.20	I	-	3K
			470-680	1.25±0.20	J	-	3K
			820-271	1.60±0.30	L	-	2K
1210	NPO	50V	100-104	1.25±0.20	J	-	2K
		100V	1R0-682	1.25±0.20	J	-	2K
		200V / 250V	1R0-332	1.25±0.20	J	-	2K
			1R0-122	1.25±0.20	J	-	2K
		500V / 630V	152-222	1.60±0.30	L	-	2K
			1R0-681	1.25±0.20	J	-	2K
		1KV	821-122	1.60±0.30	L	-	2K
			1R0-271	1.25±0.20	J	-	2K
		2KV	301-471	1.60±0.30	L	-	2K

**Multilayer Ceramic Chip Capacitor**

Packaging Quantity

Unit: mm

Type	Dielectric	Voltage	Capacitance	Thickness / Symbol		Packaging (7" Reel)	
						Paper tape	Plastic tape
1808	NPO	50V	100-104	1.60±0.30	L	-	2K
		100V	2R0-472	1.60±0.30	L	-	2K
		200V / 250V	2R0-392	1.60±0.30	L	-	2K
		500V / 630V	2R0-272	1.60±0.30	L	-	2K
		1KV	2R0-102	1.60±0.30	L	-	2K
		2KV	2R0-471	1.60±0.30	L	-	2K
		3KV	2R0-331	1.60±0.30	L	-	2K
		4KV	2R0-330	1.60±0.30	L	-	2K
1812	NPO	50V	100-104	1.25±0.20	J	-	1K
		100V	3R0-103	1.25±0.20	J	-	1K
		200V / 250V	3R0-682	1.25±0.20	J	-	1K
		500V / 630V	3R0-102	1.25±0.20	J	-	1K
			122-472	1.60±0.30	L	-	1K
		1KV	3R0-122	1.60±0.30	L	-	1K
		2KV	3R0-102	1.60±0.30	L	-	1K
		3KV	3R0-561	1.60±0.30	L	-	1K
		4KV	3R0-221	1.60±0.30	L	-	1K
		5KV	3R0-680	1.60±0.30	L	-	1K

Packaging Quantity

Unit: mm

Type	Dielectric	Voltage	Capacitance	Thickness / Symbol		Packaging (7" Reel)	
						Paper tape	Plastic tape
0201	X7R	10V / 16V	101-223	0.30±0.03	C	15K	-
		25V	101-103	0.30±0.03	C	15K	-
		50V	101-102	0.30±0.03	C	15K	-
0402	X7R	6.3V / 10V	101-474	0.50±0.05	E	10K	-
		16V / 25V	101-224	0.50±0.05	E	10K	-
		50V	101-104	0.50±0.05	E	10K	-
		100V	151-472	0.50±0.05	E	10K	-
0603	X7R	6.3V	151-475	0.80±0.10	H	4K	-
		10V / 16V	151-225	0.80±0.10	H	4K	-
		25V / 50V	151-105	0.80±0.10	H	4K	-
		100V	101-104	0.80±0.10	H	4K	-
		200V / 250V	151-103	0.80±0.10	H	4K	-
0805	X7R	6.3V / 10V / 16V	151-474	0.80±0.20	B	4K	-
			564-106	1.25±0.20	J	-	3K
		25V	151-474	0.80±0.20	B	4K	-
			564-475	1.25±0.20	J	-	3K
		50V	151-474	0.80±0.20	B	4K	-
			564-225	1.25±0.20	J	-	3K
		100V	101-563	0.80±0.20	B	4K	-
			683-105	1.25±0.20	J	-	3K
		200V / 250V	101-183	0.80±0.20	B	4K	-
			220-223	1.25±0.20	J	-	3K
500V / 630V	151-562	0.80±0.20	B	4K	-		
	682-103	1.25±0.20	J	-	3K		
1206	X7R	6.3V / 10V / 16V / 25V	201-334	0.80±0.20	B	4K	-
			474-155	1.25±0.20	J	-	3K
			225-226	1.60±0.30	L	-	2K
		50V	201-334	0.80±0.20	B	4K	-
			474-155	1.25±0.20	J	-	3K
			225-106	1.60±0.30	L	-	2K

**Multilayer Ceramic Chip Capacitor**

Packaging Quantity

Unit: mm

Type	Dielectric	Voltage	Capacitance	Thickness / Symbol		Packaging (7" Reel)	
						Paper tape	Plastic tape
1206	X7R	100V	151-563	0.80±0.20	B	4K	-
			683-334	1.25±0.20	J	-	3K
			474-105	1.60±0.30	L	-	2K
		200V / 250V	151-273	0.80±0.20	B	4K	-
			333-154	1.25±0.20	J	-	3K
			184-224	1.60±0.30	L	-	2K
		500V / 630V	151-272	0.80±0.20	B	4K	-
			332-333	1.25±0.20	J	-	3K
		1KV	151-102	0.80±0.20	B	4K	-
			112-123	1.25±0.20	J	-	3K
2KV	151-272	1.25±0.20	J	-	3K		
1210	X7R	6.3V / 10V	221-474	1.25±0.20	J	-	2K
			564-476	1.60±0.30	L	-	2K
		16V / 25V	221-474	1.25±0.20	J	-	2K
			564-226	1.60±0.30	L	-	2K
		50V	221-474	1.25±0.20	J	-	2K
			564-106	1.60±0.30	L	-	2K
		100V	151-224	1.25±0.20	J	-	2K
			334-475	1.60±0.30	L	-	2K
		200V / 250V	151-154	1.25±0.20	J	-	2K
			184-224	1.60±0.30	L	-	2K
		500V / 630V	151-563	1.25±0.20	J	-	2K
			683-104	1.60±0.30	L	-	2K
		1KV	151-392	1.25±0.20	J	-	2K
			472-223	1.60±0.30	L	-	2K
		2KV	151-272	1.25±0.20	J	-	2K
			332-103	1.60±0.30	L	-	2K
1808	X7R	6.3V / 10V / 16V / 25V / 50V	221-475	1.60±0.30	L	-	2K
		100V	221-225	1.60±0.30	L	-	2K
		200V / 250V	221-224	1.60±0.30	L	-	2K
		500V / 630V	221-683	1.60±0.30	L	-	2K
		1KV	151-223	1.60±0.30	L	-	2K
		2KV	151-103	1.60±0.30	L	-	2K
		3KV	151-472	1.60±0.30	L	-	2K
		4KV	151-222	1.60±0.30	L	-	2K
1812	X7R	16V	R47-102	1.60±0.30	L	-	1K
			122-682	2.5	O	-	0.5K
		25V / 50V	R47-102	1.60±0.30	L	-	1K
			122-472	2.5	O	-	0.5K
		100V	271-564	1.60±0.30	L	-	1K
			684-225	2	R	-	0.5K
		200V / 250V	271-224	1.60±0.30	L	-	1K
			334-105	2	R	-	0.5K
		500V / 630V	271-104	1.60±0.30	L	-	1K
			124-224	2	R	-	0.5K
		1K	271-473	1.60±0.30	L	-	1K
			563	2	R	-	0.5K
		2K	271-123	1.60±0.30	L	-	1K
		3K	271-472	1.60±0.30	L	-	1K
4K	271-332	1.60±0.30	L	-	1K		

**Multilayer Ceramic Chip Capacitor**

Packaging Quantity

Unit: mm

Type	Dielectric	Voltage	Capacitance	Thickness / Symbol		Packaging (7" Reel)	
						Paper tape	Plastic tape
0201	X5R	4V / 6.3V / 10V	153-154	0.30±0.03	C	15K	-
			224-225	0.30±0.05	D	15K	-
		16V	153-154	0.30±0.03	C	15K	-
			224	0.30±0.05	D	15K	-
			25V	153-104	0.30±0.03	C	15K
50V	472-103	0.30±0.03	C	15K	-		
0402	X5R	4V / 6.3V	104-684	0.50±0.05	E	10K	-
			105-685	0.50±0.15	F	10K	-
			106-226	0.50±0.20	N	10K	-
		10V	104-684	0.50±0.05	E	10K	-
			105-685	0.50±0.15	F	10K	-
			106	0.50±0.20	N	10K	-
		16V	104-684	0.50±0.05	E	10K	-
			105-475	0.50±0.15	F	10K	-
		25V	104-684	0.50±0.05	E	10K	-
			105-225	0.50±0.15	F	10K	-
		50V	473-684	0.50±0.05	E	10K	-
			105	0.50±0.15	F	10K	-
0603	X5R	4V / 6.3V	474-685	0.80±0.10	H	4K	-
			106-476	0.80±0.20	B	4K	-
		10V	474-685	0.80±0.10	H	4K	-
			106-226	0.80±0.20	B	4K	-
		16V / 25V	474-685	0.80±0.10	H	4K	-
			106	0.80±0.20	B	4K	-
50V	474-225	0.80±0.10	H	4K	-		
0805	X5R	4V / 6.3V / 10V	105-476	1.25±0.20	J	-	3K
		16V / 25V	105-226	1.25±0.20	J	-	3K
		50V	105-475	1.25±0.20	J	-	3K
1206	X5R	4V	104-155	0.80±0.20	B	4K	-
			225-107	1.60±0.30	L	-	2K
		6.3V	225-107	1.60±0.30	L	-	2K
		10V / 16V	225-476	1.60±0.30	L	-	2K
		25V	225-226	1.60±0.30	L	-	2K
50V	225-106	1.60±0.30	L	-	2K		
1210	X5R	4V / 6.3V	475-106	1.60±0.30	L	-	2K
			126-337	2.5	O	-	1K
		10V / 16V	475-106	1.60±0.30	L	-	2K
			126-107	25	O	-	1K
		25V	475-106	1.60±0.30	L	-	2K
50V	126-476	25	O	-	1K		
1808	X5R	6.3V	475-107	1.60±0.30	L	-	2K
		10V	475-476	1.60±0.30	L	-	2K
		16V	475-226	1.60±0.30	L	-	2K
		25V	475-106	1.60±0.30	L	-	2K
1812	X5R	6.3V	106-107	2.5	O	-	0.5K
		10V	106-476	2.5	O	-	0.5K
		16V	475-226	2.5	O	-	0.5K
		25V	475-106	2.5	O	-	0.5K

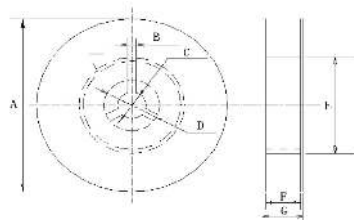
**Multilayer Ceramic Chip Capacitor**

Packaging Quantity

Unit: mm

Type	Dielectric	Voltage	Capacitance	Thickness / Symbol		Packaging (7" Reel)	
						Paper tape	Plastic tape
0201	Y5V	6.3V	103-104	0.30±0.03	C	15K	-
		16V	103	0.30±0.03	C	15K	-
0402	Y5V	6.3V / 10V	102-274	0.50±0.05	E	10K	-
			334-105	0.50±0.10	K	10K	-
		16V / 25V	102-224	0.50±0.05	E	10K	-
		50V	102-104	0.50±0.05	E	10K	-
0603	Y5V	6.3V / 10V	102-685	0.80±0.10	H	4K	-
			106	0.80±0.20	B	4K	-
		16V / 25V	102-225	0.80±0.10	H	4K	-
		50V	102-105	0.80±0.10	H	4K	-
0805	Y5V	100V	222-104	0.80±0.10	H	4K	-
		6.3V / 10V	102-226	0.80±0.10	H	4K	-
		16V	102-106	0.80±0.10	H	4K	-
		25V	102-475	0.80±0.10	H	4K	-
		50V	102-225	0.80±0.10	H	4K	-
1206	Y5V	100V	103-104	0.80±0.20	B	4K	-
		200V / 250V	103-473	0.80±0.20	B	4K	-
		6.3V	226-476	1.60±0.30	L	-	2K
		10V / 16V	226	1.60±0.30	L	-	2K
		25V	475-106	0.80±0.20	B	4K	-
		50V	102-475	0.80±0.20	B	4K	-
1210	Y5V	100V	153-474	0.80±0.20	B	4K	-
		200V / 250V	103-224	0.80±0.20	B	4K	-
		6.3V	106-107	2	R	-	1K
		10V	106-476	2	R	-	1K
		16V	106-226	2	R	-	1K
		25V	685-106	1.25±0.20	J	-	2K
		50V	472-475	1.25±0.20	J	-	2K
1808	Y5V	100V	153-105	1.25±0.20	J	-	2K
		200V / 250V	153-474	1.25±0.20	J	-	2K
1812	Y5V	100V	154-105	1.25±0.20	J	-	2K
		200V / 250V	103-394	1.25±0.20	J	-	2K
		6.3V / 10V	103-107	1.60±0.30	L	-	1K
		16V	103-226	1.60±0.30	L	-	1K
		25V / 50V	103-106	1.60±0.30	L	-	1K
100V	154-225	1.60±0.30	L	-	1K		
200V / 250V	104-474	1.60±0.30	L	-	1K		

Tape and Reel

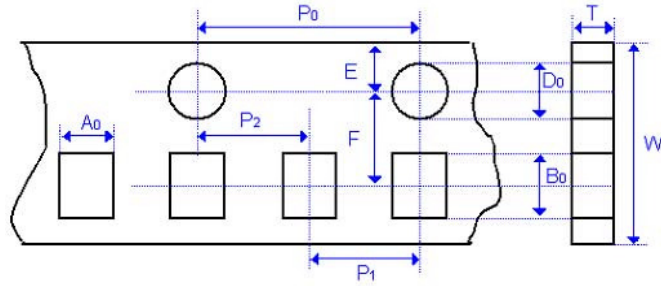


Unit: mm

Type	A	B	C	D	E	F	G
0603	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
0805	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1206	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1210	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1808	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max
1812	178±2.0(7")	3.0	13.0±0.5	21.0±0.8	50 or more	10.0±1.5	12 max

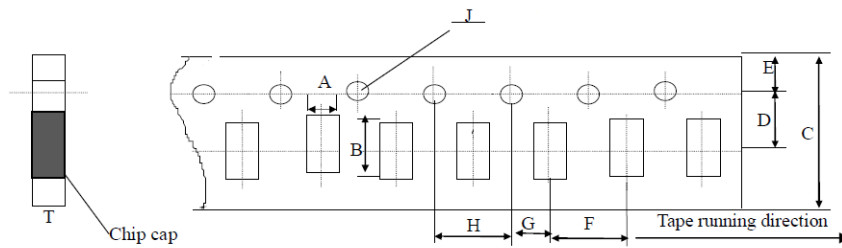
**Multilayer Ceramic Chip Capacitor**

Paper Tape Size Specification



Unit: mm

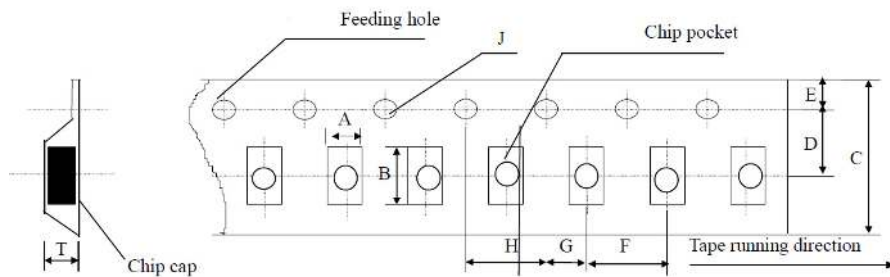
Type	A0	B0	T	W	P0	P1	P2	D0	E	F
0201	0.37±0.10	0.67±0.10	0.80 Below	8.00±0.10	4.00±0.10	2.00±0.05	2.00±0.05	1.5-0/+0.10	1.75±0.10	3.50±0.05
0402	0.65±0.10	1.15±0.10	0.80 Below	8.00±0.10	4.00±0.10	2.00±0.05	2.00±0.05	1.5-0/+0.10	1.75±0.10	3.50±0.05



Unit: mm

Type	A	B	C	D	E	F	G	H	J	T
0603	1.10±0.10	1.90±0.10	8.00±0.10	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.5-0/+0.10	1.10 Max
0805	1.45±0.15	2.30±0.15	8.00±0.15	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.5-0/+0.10	1.10 Max
1206	1.80±0.20	3.40±0.20	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.5-0/+0.10	1.10 Max

Plastic Tape Size Specification



Unit: mm

Type	A	B	C	D	E	F	G	H	J	T
0805	1.55±0.20	2.35±0.20	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.50-0/+0.10	1.50 Max
1206	1.95±0.20	3.60±0.20	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.10	4.00±0.10	1.50-0/+0.10	1.85 Max
1210	2.70±0.10	3.42±0.10	8.00±0.10	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.55-0/+0.10	3.20 Max
1808	2.20±0.10	4.95±0.10	12.00±0.10	5.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50-0/+0.10	3.00 Max
1812	3.66±0.10	4.95±0.10	12.00±0.10	5.50±0.05	1.75±0.10	8.00±0.10	2.00±0.05	4.00±0.10	1.55-0/+0.10	4.00 Max

**Multilayer Ceramic Chip Capacitor**

**Recommended Soldering Method**

Type	Dielectric	Capacitance	Soldering Method
0201	NPO	/	R
	X7R/X5R	/	R
	Y5V	/	R
0402	NPO	/	R
	X7R/X5R	/	R
	Y5V	/	R
0603	NPO	/	R/W
	X7R/X5R	$C \geq 1\mu\text{F}$	R
		$C < 1\mu\text{F}$	R/W
	Y5V	$C \geq 1\mu\text{F}$	R
$C < 1\mu\text{F}$		R/W	
0805	NPO	/	R/W
	X7R/X5R	$C \geq 4.7\mu\text{F}$	R
		$C < 4.7\mu\text{F}$	R/W
	Y5V	$C \geq 1\mu\text{F}$	R
$C < 1\mu\text{F}$		R/W	
1206	NPO	/	R/W
	X7R/X5R	$C \geq 10\mu\text{F}$	R
		$C < 10\mu\text{F}$	R/W
	Y5V	$C \geq 10\mu\text{F}$	R
$C < 10\mu\text{F}$		R/W	
$\geq 1210$	NPO	/	R
	X7R/X5R	/	R
	Y5V	/	R

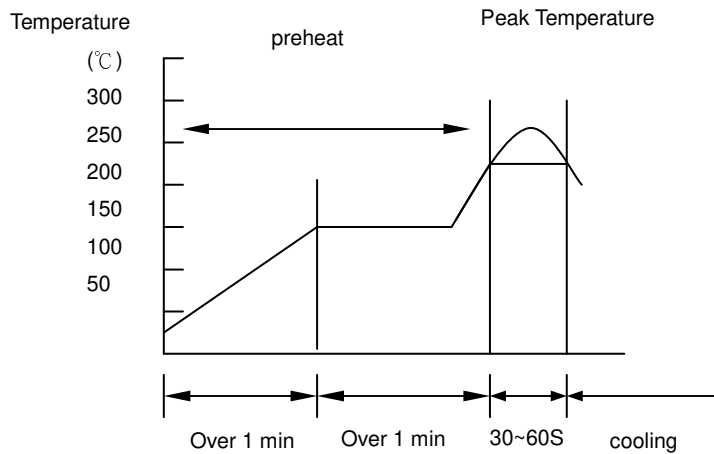
Soldering method : R - Reflow Soldering  
W - Wave Soldering



**Multilayer Ceramic Chip Capacitor**

**■The temperature profile for soldering**

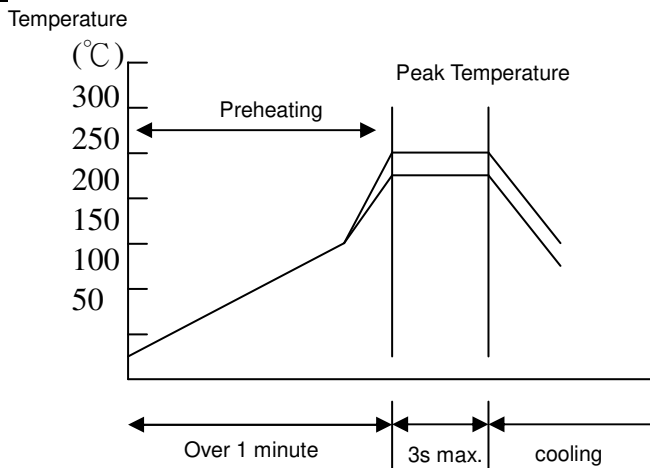
**Re-flow soldering**



	Pb-Sn soldering	Lead-free soldering
Peak temperature	230°C ~ 250°C	240°C ~ 260°C

While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as:  $T \leq 150^{\circ}\text{C}$ .

**Wave soldering**



	Pb-Sn soldering	Lead-free soldering
Peak temperature	230°C ~ 260°C	240°C ~ 270°C

While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as:  $T \leq 150^{\circ}\text{C}$ .