

Microwave Capacitors

HOW TO ORDER

MW	15	N	100	G	500	L	T
Series	Size	Dielectric	Capacitance	Tolerance	Rated voltage	Termination	Packaging
MW=Microwave	15=0402 (1005) 18=0603 (1608)	N=NPO (CO)	Two significant digits followed by no. of zeros. And R is in place of decimal point. eg.: R47=0.47pF OR5=0.5pF 1R0=1.0pF 100=10x10 ⁰ =10pF	A=±0.05pF B=±0.1pF C=±0.25pF F=±1% G=±2% J=±5%	Two significant digits followed by no. of zeros. And R is in place of decimal point. 500=50 VDC	L=Ag/Ni/Sn	B=Bulk C=Bulk cassette T=7" reeled G=13" reeled

PACKAGING DIMENSION AND QUANTITY

Size	Thickness (mm)/Symbol	Paper tape		
		7" reel	13" reel	
0402	0.50±0.05	N	10K	20K
0603	0.80±0.07	S	4K	10K

Unit: pieces

ELECTRICAL CHARACTERISTICS

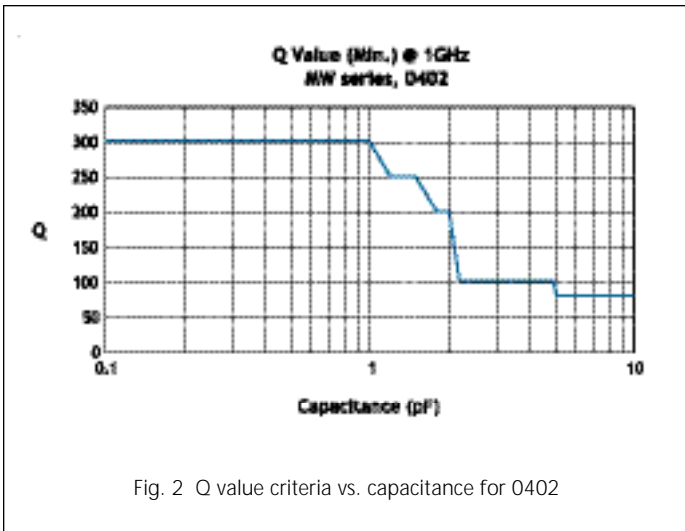


Fig. 2 Q value criteria vs. capacitance for 0402

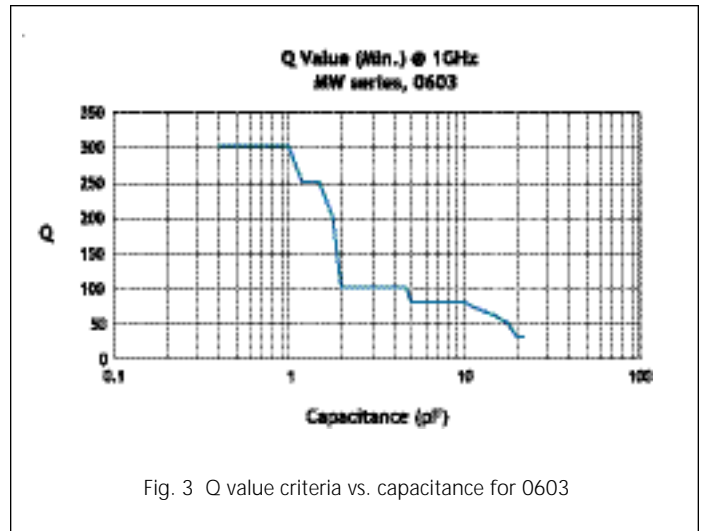


Fig. 3 Q value criteria vs. capacitance for 0603

Microwave Capacitors

■ CAPACITANCE RANGE

Dielectric		NPO	
Size		0402	0603
Rated Voltage (VDC)		50	50
Capacitance	0.1pF (0R1)	N	
	0.2pF (0R2)	N	
	0.3pF (0R3)	N	
	0.4pF (0R4)	N	S
	0.5pF (0R5)	N	S
	0.6pF (0R6)	N	S
	0.7pF (0R7)	N	S
	0.8pF (0R8)	N	S
	0.9pF (0R9)	N	S
	1.0pF (1R0)	N	S
	1.2pF (1R2)	N	S
	1.5pF (1R5)	N	S
	1.8pF (1R8)	N	S
	2.0pF (2R0)	N	S
	2.2pF (2R2)	N	S
	2.7pF (2R7)	N	S
	3.0pF (3R0)	N	S
	3.3pF (3R3)	N	S
	3.9pF (3R9)	N	S
	4.0pF (4R0)	N	S
	4.7pF (4R7)	N	S
	5.0pF (5R0)	N	S
5.6pF (5R6)	N	S	
6.0pF (6R0)	N	S	
6.8pF (6R8)	N	S	
7.0pF (7R0)	N	S	
8.0pF (8R0)	N	S	
8.2pF (8R2)	N	S	
9.0pF (9R0)	N	S	
10pF (100)	N	S	
12pF (120)			S
15pF (150)			S
18pF (180)			S
22pF (220)			S

1. The letter in cell is expressed the symbol of product thickness.

2. For more information about products with special capacitance or other data, please contact WTC local representative.

Appendix I : Reliability Test Conditions and Requirements

NO.	Item	Test Condition	Requirements																																																																
1.	Visual and Mechanical	---	<ul style="list-style-type: none"> * No remarkable defect. * Dimensions to confirm to individual specification sheet. 																																																																
2.	Capacitance	Class I : NPO Cap 1000pF 1.0±0.2Vrms, 1MHz±10%	<ul style="list-style-type: none"> * Shall not exceed the limits given in the detailed spec. <p>NPO: Cap 30pF, Q 1000; Cap<30pF, Q 400+20C X7R, X5R:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>2.5%</td> <td>3.0%</td> <td>All 0201:0603 0.047µF;0805 0.18µF; 1206 0.47µF</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">3.5%</td> <td>5.0%</td> <td>0805 1µF, 1210 10µF</td> </tr> <tr> <td>7.0%</td> <td>0603 0.33µF;TT series & Cap 1µF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">3.5%</td> <td>5.0%</td> <td>0402 0.033µF;0603 0.15µF; 0805 0.68µF;1206 2.2µF</td> </tr> <tr> <td>10%</td> <td>TT series & Cap 1µF</td> </tr> <tr> <td>10V</td> <td>5.0%</td> <td>10.0%</td> <td>TT series & Cap 1µF;0805 10µF</td> </tr> <tr> <td>6.3V</td> <td>10.0%</td> <td>15.0%</td> <td>0805 22µF;1210 100µF</td> </tr> </tbody> </table> <p>Y5V:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>5.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td rowspan="2">35V</td> <td rowspan="2">7.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td>---</td> <td>---</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">5.0%</td> <td>7.0%</td> <td>0603 0.1µF; 0805 0.33µF; 1206 1µF; 1210 4.7µF</td> </tr> <tr> <td>9.0%</td> <td>0402 0.068µF</td> </tr> <tr> <td>16V (C<1.0µF)</td> <td>7.0%</td> <td>9.0%</td> <td>0402 0.068µF; 0603 0.68µF</td> </tr> <tr> <td>16V (C 1.0µF)</td> <td>9.0%</td> <td>12.5%</td> <td>0805 4.7µF;1206 10µF;1210 22µF</td> </tr> <tr> <td>10V</td> <td>12.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>6.3V</td> <td>20.0%</td> <td>---</td> <td>---</td> </tr> </tbody> </table>	Rated vol.	D.F.	Exception of D.F.		50V	2.5%	3.0%	All 0201:0603 0.047µF;0805 0.18µF; 1206 0.47µF	25V	3.5%	5.0%	0805 1µF, 1210 10µF	7.0%	0603 0.33µF;TT series & Cap 1µF	16V	3.5%	5.0%	0402 0.033µF;0603 0.15µF; 0805 0.68µF;1206 2.2µF	10%	TT series & Cap 1µF	10V	5.0%	10.0%	TT series & Cap 1µF;0805 10µF	6.3V	10.0%	15.0%	0805 22µF;1210 100µF	Rated vol.	D.F.	Exception of D.F.		50V	5.0%	---	---	35V	7.0%	---	---	---	---	25V	5.0%	7.0%	0603 0.1µF; 0805 0.33µF; 1206 1µF; 1210 4.7µF	9.0%	0402 0.068µF	16V (C<1.0µF)	7.0%	9.0%	0402 0.068µF; 0603 0.68µF	16V (C 1.0µF)	9.0%	12.5%	0805 4.7µF;1206 10µF;1210 22µF	10V	12.5%	---	---	6.3V	20.0%	---	---
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3.	Q/ D.F. (Dissipation Factor)	Class II : X7R, X5R, Y5V Cap 10µF, 1.0±0.2Vrms, 1KHz±10% Cap>10µF, 0.5±0.2Vrms, 120Hz±20%																																																																	
4a.	Dielectric Strength	<ul style="list-style-type: none"> * To apply voltage (50V) 250%. * Duration : 1 to 5 sec. * Charge & discharge current less than 50mA. <table border="1"> <thead> <tr> <th>To apply voltage :</th> <th></th> </tr> </thead> <tbody> <tr> <td>100V</td> <td>3 times V DC</td> </tr> <tr> <td>200V ~ 300V</td> <td>2 times V DC</td> </tr> <tr> <td>500V ~ 999V</td> <td>1.5 times V DC</td> </tr> <tr> <td>1000V ~ 3000V</td> <td>1.2 times V DC</td> </tr> </tbody> </table> <ul style="list-style-type: none"> * Cut-off, set at 10mA * TEST= 15 sec. * RAMP=0 	To apply voltage :		100V	3 times V DC	200V ~ 300V	2 times V DC	500V ~ 999V	1.5 times V DC	1000V ~ 3000V	1.2 times V DC	<ul style="list-style-type: none"> * No evidence of damage or flash over during test. 																																																						
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4b.	Dielectric Strength (for X1/Y2 & X2/Y3)	<ul style="list-style-type: none"> * To apply 1500 VAC voltage. * Duration: 60 sec. 	<ul style="list-style-type: none"> * No evidence of damage or flash over during test. 																																																																
5.	Insulation Resistance	To apply rated voltage for max. 120 sec.	10G or RxC 500 -F whichever is smaller.																																																																
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7.	Adhesive Strength of Termination	<ul style="list-style-type: none"> * Pressurizing force: 0201: 2N 0402 & 0603: 5N >0603: 10N * Test time: 10±1 sec. 	<ul style="list-style-type: none"> * No remarkable damage or removal of the terminations. 																																																																
8.	Vibration Resistance	<ul style="list-style-type: none"> * Vibration frequency: 10~55 Hz/min. * Total amplitude: 1.5mm * Test time: 6 hrs. (Two hrs each in three mutually perpendicular directions.) 	<ul style="list-style-type: none"> * No remarkable damage. * Cap change and Q/D.F.: To meet initial spec. 																																																																

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9.	Solderability	<ul style="list-style-type: none"> * Solder temperature: 235±5°C * Dipping time: 2±0.5 sec. 	95% min. coverage of all metalized area.																																																										
10.	Bending Test	<ul style="list-style-type: none"> * The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm per second until the deflection becomes 1 mm and then the pressure shall be maintained for 5±1 sec. * Measurement to be made after keeping at room temp. for 24±2 hrs. 	<ul style="list-style-type: none"> * No remarkable damage. * Cap change: NPO: within ±5.0% or ±0.5pF whichever is larger. X7R, X5R: within ±12.5% Y5V: within ±30% (This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.)																																																										
11.	Resistance to Soldering Heat	<ul style="list-style-type: none"> * Solder temperature: 270±5°C * Dipping time: 10±1 sec * Preheating: 120 to 150°C for 1 minute before immerse the capacitor in an eutectic solder. * Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 48±4 hrs at room temp. * Measurement to be made after keeping at room temp. for 24±2 hrs. (Class I) or 48±4 hrs. (Class II). 	<ul style="list-style-type: none"> * No remarkable damage. * Cap change: NPO: within ±2.5% or ±0.25pF whichever is larger. X7R, X5R: within ±7.5% Y5V: within ±20% * Q/D.F., I.R. and dielectric strength: To meet initial requirements. * 25% max. leaching on each edge. 																																																										
12.	Temperature Cycle	<ul style="list-style-type: none"> * Conduct the five cycles according to the temperatures and time. <table border="1"> <thead> <tr> <th>Step</th> <th>Temp. (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. operating temp. +0/-3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>2-3</td> </tr> <tr> <td>3</td> <td>Max. operating temp. +3/-0</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>2-3</td> </tr> </tbody> </table> <ul style="list-style-type: none"> * Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 48±4 hrs at room temp. * Measurement to be made after keeping at room temp. for 24±2 hrs. (Class I) or 48±4 hrs. (Class II). 	Step	Temp. (°C)	Time (min.)	1	Min. operating temp. +0/-3	30±3	2	Room temp.	2-3	3	Max. operating temp. +3/-0	30±3	4	Room temp.	2-3	<ul style="list-style-type: none"> * No remarkable damage. * Cap change: NPO: within ±2.5% or ±0.25pF whichever is larger. X7R, X5R: within ±7.5% Y5V: within ±20% * Q/D.F., I.R. and dielectric strength: To meet initial requirements. 																																											
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13.	Humidity (Steady State)	<ul style="list-style-type: none"> * Test temp.: 40±2°C * Humidity: 90~95% RH * Test time: 500+24/-0hrs. * Measurement to be made after keeping at room temp. for 24±2 hrs. (Class I) or 48±4 hrs. (Class II). 	<ul style="list-style-type: none"> * No remarkable damage. * Cap change: NPO: within ±5.0% or ±0.5pF whichever is larger. X7R, X5R: 10V, within ±12.5% 6.3V, within ±25% Y5V: within ±30% * Q/D.F. value: NPO: Cap 30pF, Q 350; 10pF Cap<30pF, Q 275+2.5C Cap<10pF; Q 200+10C X7R, X5R: <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>3.0%</td> <td>6.0%</td> <td>0603 0.047µF; 0805 0.18µF; 1206 0.47µF</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">5.0%</td> <td>10.0%</td> <td>0805 1µF; 1210 10µF</td> </tr> <tr> <td>14.0%</td> <td>0603 0.33µF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">5.0%</td> <td>10.0%</td> <td>0402 0.033µF; 0603 0.15µF; 0805 0.68µF; 1206 2.2µF</td> </tr> <tr> <td>15.0%</td> <td>0402 0.056µF; 0603 0.33µF; 0805 2.2µF; 1206 2.2µF, TT series & Cap 1µF</td> </tr> <tr> <td>6.3V</td> <td>15.0%</td> <td>30.0%</td> <td>0805 10µF; 1210 100µF</td> </tr> </tbody> </table> <p>Y5V:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>7.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>35V</td> <td>10.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">7.5%</td> <td>10.0%</td> <td>0603 0.1µF; 0805 0.33µF; 1206 1µF; 1210 4.7µF</td> </tr> <tr> <td>12.5%</td> <td>0402 0.068µF</td> </tr> <tr> <td>16V (C<1.0µF)</td> <td>10.0%</td> <td>12.5%</td> <td>0402 0.068µF; 0603 0.68µF</td> </tr> <tr> <td>16V (C 1.0µF)</td> <td>12.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>10V</td> <td>15.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td>6.3V</td> <td>30.0%</td> <td>---</td> <td>---</td> </tr> </tbody> </table> <ul style="list-style-type: none"> * I.R.: 10V 1G or 50 -F whichever is smaller. 6.3V, 10 -F 	Rated vol.	D.F.	Exception of D.F.		50V	3.0%	6.0%	0603 0.047µF; 0805 0.18µF; 1206 0.47µF	25V	5.0%	10.0%	0805 1µF; 1210 10µF	14.0%	0603 0.33µF	16V	5.0%	10.0%	0402 0.033µF; 0603 0.15µF; 0805 0.68µF; 1206 2.2µF	15.0%	0402 0.056µF; 0603 0.33µF; 0805 2.2µF; 1206 2.2µF, TT series & Cap 1µF	6.3V	15.0%	30.0%	0805 10µF; 1210 100µF	Rated vol.	D.F.	Exception of D.F.		50V	7.5%	---	---	35V	10.0%	---	---	25V	7.5%	10.0%	0603 0.1µF; 0805 0.33µF; 1206 1µF; 1210 4.7µF	12.5%	0402 0.068µF	16V (C<1.0µF)	10.0%	12.5%	0402 0.068µF; 0603 0.68µF	16V (C 1.0µF)	12.5%	---	---	10V	15.0%	---	---	6.3V	30.0%	---	---
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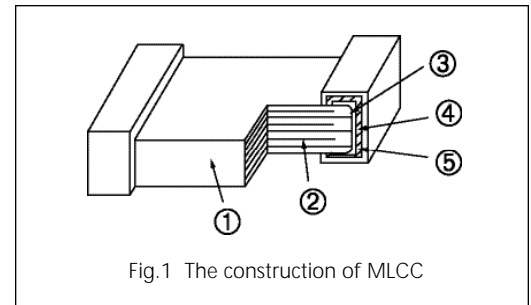
Appendix I : Reliability Test Conditions and Requirements

NO.	Item	Test Condition	Requirements																																																									
14.	Humidity Load (Damp Heat)	<ul style="list-style-type: none"> * Test temp.: 40±2°C * Humidity: 90~95%RH * Test time: 500+24/-0 hrs. * To apply voltage: rated voltage (Max. 500V) * Measurement to be made after keeping at room temp. for 24±2 hrs. (Class I) or 48±4 hrs. (Class II). 	<ul style="list-style-type: none"> * No remarkable damage. * Cap change: NPO: within ±7.5% or ±0.75pF whichever is larger. X7R, X5R: 10V, within ±12.5% 6.3V, with ±25% Y5V: 10V, within ±30% 6.3V, within +30 to -40% * Q/D.F. value: NPO: Cap 30pF, Q 200; Cap<30pF, Q 100+10/3C X7R, X5R: <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>3.0%</td> <td>6.0%</td> <td>0603 0.047μF; 0805 0.18μF; 1206 0.47μF</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">5.0%</td> <td>10.0%</td> <td>0805 1μF, 1210 10μF</td> </tr> <tr> <td>14.0%</td> <td>0603 0.33μF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">5.0%</td> <td rowspan="2">10.0%</td> <td>0402 0.033μF; 0603 0.15μF; 0805 0.68μF; 1206 2.2μF</td> </tr> <tr> <td>0402 0.056μF; 0603 0.33μF; 0805 2.2μF; 1206 2.2μF, TT series & Cap 1μF</td> </tr> <tr> <td>6.3V</td> <td>15.0%</td> <td>30.0%</td> <td>0805 10μF; 1210 100μF</td> </tr> </tbody> </table> <p>Y5V:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>7.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>35V</td> <td>10.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">7.5%</td> <td>10.0%</td> <td>0603 0.1μF; 0805 0.33μF; 1206 1μF; 1210 4.7μF</td> </tr> <tr> <td>12.5%</td> <td>0402 0.068μF</td> </tr> <tr> <td>16V (C<1.0μF)</td> <td>10.0%</td> <td>12.5%</td> <td>0402 0.068μF; 0603 0.68μF</td> </tr> <tr> <td>16V (C 1.0μF)</td> <td>12.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>10V</td> <td>15.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td>6.3V</td> <td>30.0%</td> <td>---</td> <td>---</td> </tr> </tbody> </table> <ul style="list-style-type: none"> * I.R.: 10V, 500M or 25 -F whichever is smaller. 6.3V, 5 -F 	Rated vol.	D.F.	Exception of D.F.		50V	3.0%	6.0%	0603 0.047μF; 0805 0.18μF; 1206 0.47μF	25V	5.0%	10.0%	0805 1μF, 1210 10μF	14.0%	0603 0.33μF	16V	5.0%	10.0%	0402 0.033μF; 0603 0.15μF; 0805 0.68μF; 1206 2.2μF	0402 0.056μF; 0603 0.33μF; 0805 2.2μF; 1206 2.2μF, TT series & Cap 1μF	6.3V	15.0%	30.0%	0805 10μF; 1210 100μF	Rated vol.	D.F.	Exception of D.F.		50V	7.5%	---	---	35V	10.0%	---	---	25V	7.5%	10.0%	0603 0.1μF; 0805 0.33μF; 1206 1μF; 1210 4.7μF	12.5%	0402 0.068μF	16V (C<1.0μF)	10.0%	12.5%	0402 0.068μF; 0603 0.68μF	16V (C 1.0μF)	12.5%	---	---	10V	15.0%	---	---	6.3V	30.0%	---	---
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15.	High Temperature Load (Endurance)	<ul style="list-style-type: none"> * Test temp.: NPO, X7R: 125±3°C X5R, Y5V: 85±3°C * To apply voltage: (1) 6.3V or C 10μF (for X7R, X5R): 150% of rated voltage. (2) 6.3V<V<500V and C<10μF (for X7R, X5R): 200% of rated voltage. (3) 500V: 150% of rated voltage. (4) V 630V: 120% of rated voltage. (Max. 3600V) * Test time: 1000+24/-0 hrs. * Measurement to be made after keeping at room temp. for 24±2 hrs. (Class I) or 48±4 hrs. (Class II). 	<ul style="list-style-type: none"> * No remarkable damage. * Cap change: NPO: within ±3.0% or ±0.3pF whichever is larger. X7R, X5R: 10V, within ±12.5% 6.3V, with ±25% Y5V: 10V, within ±30% 6.3V, within +30 to -40% * Q/D.F. value: NPO: Cap 30pF, Q 350 10pF Cap<30pF, Q 275+2.5C Cap<10pF, Q 200+10C X7R, X5R: <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>3.0%</td> <td>6.0%</td> <td>0603 0.047μF; 0805 0.18μF, 1206 0.47μF</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">5.0%</td> <td>10.0%</td> <td>0805 1μF, 1210 10μF</td> </tr> <tr> <td>14.0%</td> <td>0603 0.33μF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">5.0%</td> <td rowspan="2">10.0%</td> <td>0402 0.033μF; 0603 0.15μF; 0805 0.68μF; 1206 2.2μF</td> </tr> <tr> <td>0402 0.056μF; 0603 0.33μF; 0805 2.2μF; 1206 2.2μF TT series & Cap 1μF</td> </tr> <tr> <td>6.3V</td> <td>15.0%</td> <td>30.0%</td> <td>0805 10μF; 1210 100μF</td> </tr> </tbody> </table> <p>Y5V:</p> <table border="1"> <thead> <tr> <th>Rated vol.</th> <th>D.F.</th> <th colspan="2">Exception of D.F.</th> </tr> </thead> <tbody> <tr> <td>50V</td> <td>7.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>35V</td> <td>10.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">7.5%</td> <td>10.0%</td> <td>0603 0.1μF; 0805 0.33μF; 1206 1μF; 1210 4.7μF</td> </tr> <tr> <td>12.5%</td> <td>0402 0.068μF</td> </tr> <tr> <td>16V (C<1.0μF)</td> <td>10.0%</td> <td>12.5%</td> <td>0402 0.068μF; 0603 0.68μF</td> </tr> <tr> <td>16V (C 1.0μF)</td> <td>12.5%</td> <td>---</td> <td>---</td> </tr> <tr> <td>10V</td> <td>15.0%</td> <td>---</td> <td>---</td> </tr> <tr> <td>6.3V</td> <td>30.0%</td> <td>---</td> <td>---</td> </tr> </tbody> </table> <ul style="list-style-type: none"> * I.R.: 10V, 1G or 50 -F whichever is smaller. 6.3V, 10 -F 	Rated vol.	D.F.	Exception of D.F.		50V	3.0%	6.0%	0603 0.047μF; 0805 0.18μF, 1206 0.47μF	25V	5.0%	10.0%	0805 1μF, 1210 10μF	14.0%	0603 0.33μF	16V	5.0%	10.0%	0402 0.033μF; 0603 0.15μF; 0805 0.68μF; 1206 2.2μF	0402 0.056μF; 0603 0.33μF; 0805 2.2μF; 1206 2.2μF TT series & Cap 1μF	6.3V	15.0%	30.0%	0805 10μF; 1210 100μF	Rated vol.	D.F.	Exception of D.F.		50V	7.5%	---	---	35V	10.0%	---	---	25V	7.5%	10.0%	0603 0.1μF; 0805 0.33μF; 1206 1μF; 1210 4.7μF	12.5%	0402 0.068μF	16V (C<1.0μF)	10.0%	12.5%	0402 0.068μF; 0603 0.68μF	16V (C 1.0μF)	12.5%	---	---	10V	15.0%	---	---	6.3V	30.0%	---	---
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Appendix II : General Information

Construction

No.	Name	NP0/X7R	X7R/X5R/Y5V
①	Ceramic material	BaTiO ₃ based	
②	Inner electrode	AgPd alloy	Ni
③	Termination	Inner layer	Ag
④		Middle layer	Ni
⑤		Outer layer	Sn (Matt)



Storage and handling conditions

- (1) To store products at 5 to 40°C ambient temperature and 20 to 70% related humidity conditions.
- (2) The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

Cautions:

- Don't store products in a corrosive environment such as sulfide, chloride gas, or acid. It may cause oxidization of electrode, which easily be resulted in poor soldering.
- To store products on the shelf and avoid exposure to moisture.
- Don't expose products to excessive shock, vibration, direct sunlight and so on.

Recommended soldering conditions

The lead-free termination MLCCs are not only to be used on SMT against lead-free solder paste, but also suitable against lead-containing solder paste. If the optimized solder joint is requested, increasing soldering time, temperature and concentration of N₂ within oven are recommended.

