SPECIFICATIONS
of
MULTILAYER CHIP CAPACITOR

NP0, X7R, Y5V
10V ~ 3000V
0402 (1005) ~ 1812 (4532)
0.5pF ~ 22μF

Version 2002NOV

WALSIN TECHNOLOGY CORPORATION
YANG-MEI PLANT:
566-1, KAO-SHI ROAD, 5 LIN, YANG-MEI, TAO-YUAN, TAIWAN, R.O.C
TEL:886-3-4758711 FAX:886-3-4755197

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MLCC PART NUMBER CODES
HOW TO ORDER

0603 **N** **101** **J** **500** **L** **T**

SIZE CODE
See catalogue for chip sizes
Code is L*W
0603(in inches)
=.06"*.03"
=1.6mm*0.8mm
=1608(in metric)

DIELECTRIC
N=COG(NPO)
B=X7R
F=Y5V

CAPACITANCE
(Picofarads)
Two significant digits followed by no.of zeros
101=100pF
102=1000pF
152=1500pF
103=10000pF

CAPACITANCE TOLERANCE(EIA CODE)

B = +/- 0.1 pF
C = +/- 0.25 pF
D = +/- 0.50 pF
F = +/- 1.0 %
G = +/- 2.0 %
J = +/- 5.0 %
K = +/- 10 %
M = +/- 20 %
Z = -20% / +80 %
B,C = for Cap <= 5 pF
D = for 5pF < Cap < 10 pF
NPO : B,C, D,F,G, J, K,
X7R : J,K, M
Y5V : M, Z

PACKING CODE
T= Reeled
B= Bulk

TERMINATION
N=Ag/Ni/SnPb
B=Cu/Ni/SnPb
L=Ag/Ni/Sn
C=Cu/Ni/Sn

VOLTAGE(VDCW)
Two significant digits followed by no.of zeros
100=10V
160=16V
250=25V
500=50V
101=100V
102=1000V
202=2000V
302=3000V

For values below 10 pF, use "R" in place of decimal point, e.g., 4.7pF=4R7

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NPO SERIAL PRODUCTS SPECIFICATIONS

Above product satisfies the requirements as follow：

NO.	Test Items	Test Condition	Requirements
1.	Visual &Mechanical		• No remarkable defect. • Dimensions to conform to individual specification sheet.
2.	Capacitance	≤1000pF 1.0±0.2Vrms，1MHz±10% >1000pF 1.0±0.2Vrms，1KHz±10%	• Shall not exceed the limits given in the detailed spec.
3.	Q Value	≤1000pF 1.0±0.2Vrms，1MHz±10% >1000pF 1.0±0.2Vrms，1KHz±10%	• More than 30pF: Q≥1000 • Less than 30pF: Q≥400+20C
4.	Dielectric strength	• To apply voltage(<50V)：250% of rated voltage for 1~5 sec. • Charge & discharge current less than 50mA.	No evidence of damage or flash over during test.
		100V 200V ~ 300V 500V ~ 999V 1000 ~ 3000V Cut-off, set at 10mA TEST= 15 RAMP=0	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
5.	Insulation resistance	To apply rated voltage for max. 120sec.	10GΩ MIN. or 500Ω-F MIN. , whichever is smaller.
		Rated Voltage: 100V ~ 500V To apply rated voltage	> 10GΩ
		Rated Voltage: >500V To apply 500V*60sec	> 10GΩ
6.	Temperature coefficient	With no electrical load -55 ~ 125°C at 25°C	Within ±30ppm/°C
7.	Bending test	• 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. (Appendix 1) • Measurement to be made after keeping at room temp. for 24±2 hours	• No remarkable damage. • Cap change : ±5.0% MAX. or ±0.5pF MAX. , whichever is larger. This capacitance change means the change of Capacitance under specified flexure of substrate from the capacitance measured before the test.
8.	Solderability	• Solder temperature :230±5°C • Dipping time : 2±0.5 sec • Solder : SN63A	90% MIN. coverage of all metalized area.
9.	Resistance to soldering heat	• Solder temperature : 260±5°C • Dipping time : 10±1 sec • Solder : SN63A • Measurement to be made after keeping at room temp. for 24 ±2 hours.	• No remarkable damage. • Cap change : ±2.5% MAX. or ±0.25pF MAX. , whichever is larger. • Q & I.R. & Dielectric strength : To meet initial requirements. • 25% max. Leaching on each edge.

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NO.	Test Items	Test Condition	Requirements
10.	Temperature cycle	• Test temp. : -55°C ~ 125°C • Test step : 1) -55°C -3/+0 °C 30±3 min. 2) room temp. 2~3 min. 3)125°C +3/-0 °C 30±2min. 4) room temp. 2~3 min. • Conduct the five cycles according to the temperatures and time. • Measurement to be made after keeping at room temp. for 24±2 hours.	• No remarkable damage. • Cap change : ±2.5% MAX. or ±0.25pF MAX. , whichever is larger. • Q & I.R. & Dielectric strength : To meet initial requirements.
11	Humidity (Damp Heat) steady state	• Test temp. : 40±2°C • Humidity : 90~95%RH • Test time : 1000+24/-0hrs. • Measurement to be made after keeping at room temp. for 24 ±2 hrs.	• No remarkable damage. • Cap change : ±5.0% MAX. or ±0.5pF MAX. , whichever is larger. • Q value : More than 30pF Q≥350 10pF≤C<30pF Q≥275+2.5C Less than 10pF Q≥200+10C • I.R. : 1GΩ MIN. or 50Ω-F MIN., whichever is smaller.
12.	Humidity (Damp Heat) Load	• Test temp. : 40±2°C • Humidity : 90~95%RH • Test time : 1000+24/-0hrs. • To apply voltage : • rated voltage (Max. 500V) • Measurement to be made after keeping at room temp. for 24 ±2 hours.	• No remarkable damage. • Cap change : ±7.5%MAX. or ±0.75pF MAX. , whichever is larger. • Q value : More than 30pF Q≥200 C< 30pF Q≥100+10/3C • I.R. : 500MΩ MIN. or 25Ω-F MIN. , whichever is smaller.
13.	Adhesive strength of termination	• Pressurizing force : 1kg (10N) • Test time : 10 ±1 sec (Appendix 2)	• No remarkable damage or removal of the terminations.
14.	Vibration Resistance	• Vibration frequency : 10~55 Hz/min. • Total amplitude : 1.5mm • Test time : 6 hrs.(Two hours each in three mutually perpendicular directions.)	• No remarkable damage. • Cap change & Q : To meet initial requirements.
15.	High Temperature Load (Endurance)	• Test temp. : 125±3°C • To apply voltage : V<500V : 200% of rated voltage. V≥500V, <1000V : 150% of rated voltage. V≥1000V : 120% of rated voltage.(Max.3600V) • Test time : 1000+24/-0 hrs. • Measurement to be made after keeping at room temp. for 24 ±2 hours.	• No remarkable damage. • Cap change : ±3.0% MAX. or ±0.3pF MAX. , whichever is larger. • Q value : More than 30pF Q≥350 10pF≤C<30pF Q≥275+2.5C Less than 10pF Q≥200+10C • I.R. : 1GΩ MIN. or 50Ω-F MIN., whichever is smaller.

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X7R SERIAL PRODUCTS SPECIFICATIONS

Above product satisfies the requirements as follow

NO.	Test Items	Test Condition	Requirements
1.	Visual &Mechanical		• No remarkable defect. • Dimensions to conform to individual specification sheet.
2.	Capacitance	1.0±0.2Vrms，1KHz±10%	• Shall not exceed the limits given in the detailed spec.
3.	Dissipation factor	1.0±0.2Vrms，1KHz±10%	• ≤2.5% Rated voltage : ≥50V • ≤3.5% Rated voltage : 25V, 16V • ≤5.0% Rated g voltage : 10V
4.	Dielectric strength	• To apply voltage(<50V) : 250% of rated voltage for 1~5 sec. • Charge & discharge current less than 50mA	No evidence of damage or flash over during test.
		100V 200V ~ 300V 500V ~ 999V 1000V ~ 3000V Cut off, set at 10mA TEST=15 RAMP=0	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
5.	Insulation resistance	To apply rated voltage for max. 120sec.	10GΩ MIN. or 500Ω-F MIN. , whichever is smaller.
		Rated Voltage: 100V ~ 500V To apply rated voltage	> 10GΩ
		Rated Voltage: > 500V To apply 500V*60sec	>10GΩ
6.	Temperature coefficient	With no electrical load -55 ~ 125°C at 25°C	Within ±15%.
7.	Bending test	• 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 sec. Appendix 1) • Measurement to be made after keeping at room temp. for 24±2 hours	• No remarkable damage. • Cap change : ≤±12.5%. This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.
8.	Solderability	• Solder temperature : 230±5°C • Dipping time : 2±0.5 sec • Solder : SN63A	90% MIN. coverage of all metalized area.
9.	Resistance to soldering heat	• Solder temperature : 260±5°C • Dipping time : 10±1 sec • Solder : SN63A • Measurement to be made after keeping at room temp. for 48±4 hours.	• No remarkable damage. • Cap change : ＜±7.5% • DF value & I.R : To meet initial standard value. • Dielectric Strength : no defect. • 25% max. Leaching on each edge.

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NO.	Test Items	Test Condition	Requirements
10.	Temperature cycle	• Test temp. : -55°C ~ 125°C • Test step : 1) -55°C -3/+0 °C 30±3 min. 2) room temp. 2~3 min. 3) 125°C +3/-0 °C 30±2 min. 4) room temp. 2~3min. • Conduct the five cycles according to the temperatures and time. • Measurement to be made after keeping at room temp. for 48 ±4 hours.	• No remarkable damage. • Cap change : <±7.5% • D.F value & I.R. : To meet initial standard value.
11	Humidity (Damp Heat) steady state	• Test temp. : 40±2°C • Humidity : 90~95% RH • Test time : 1000+24/-0 hrs. • Measurement to be made after keeping at room temp. for 48±4 hrs.	• No remarkable damage. • Cap change : <±12.5% • DF value : ≤3.0% Rated voltage : 50V ≤5.0% Rated voltage : 25V, 16V ≤7.5% Rated voltage : 10V • I.R. : 1GΩ MIN. or 50Ω-F MIN., whichever is smaller.
12.	Humidity (Damp Heat) Load	• Test temp. : 40±2°C • Humidity : 90~95% RH • Test time : 1000+24/-0 hrs. • To apply rated voltage (Max. 500V) • Measurement to be made after keeping at room temp. for 48±2 hours.	• No remarkable damage. • Cap change : <±12.5% • DF value : ≤3.0% Rated voltage : 50V ≤5.0% Rated voltage : 25V, 16V ≤7.5% Rated voltage : 10V • I.R. : 500MΩ MIN. or 25Ω-F MIN., whichever is smaller.
13.	Adhesive strength of termination	Pressurizing force : 1kg (10N) Test time : 10±1 sec (Appendix 2)	No remarkable damage or removal of the terminations.
14.	Vibration Resistance	• Vibration frequency : 10~55 Hz/min. • Total amplitude : 1.5mm • Test time : 6 hrs.(Two hours each in three mutually perpendicular directions.)	• No remarkable damage. • Cap change & DF : To meet initial requirements.
15.	High Temperature Load (Endurance)	• Test temp. : 125±3°C • To apply voltage : V<500V : 200% of rated voltage. V≥500V, <1000V : 150% of rated voltage. V≥1000V : 120% of rated voltage.(Max.3600V) • Test time : 1000+24/-0 hrs. • Measurement to be made after keeping at room temp. for 48±4 hours.	• No remarkable damage. • Cap change : <±12.5% • DF value : ≤3.0% Rated voltage : 50V ≤5.0% Rated voltage : 25V, 16V ≤7.5% Rated voltage : 10V • I.R. : 1GΩ MIN. or 50Ω-F MIN., whichever is smaller.

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Y5V SERIAL PRODUCTS SPECIFICATIONS

Above product satisfies the requirements as follow :

NO.	Test Items	Test Condition	Requirements
1.	Visual &Mechanical		• No remarkable defect. • Dimensions to conform to individual specification sheet.
2.	Capacitance	C≤22μF, 1.0±0.2Vrms, 1KHz±10% C > 22μF, 0.5±0.1Vrms, 120Hz±10Hz, 25°C	• Shall not exceed the limits given in the detailed spec.
3.	Dissipation factor	C≤22μF, 1.0±0.2Vrms, 1KHz±10% C > 22μF, 0.5±0.1Vrms, 120Hz±10Hz, 25°C	• DF≤5.0% (≥50V) • DF≤5.0% (25V) [Except 0603≥0.1μF, 0805≥0.33μF, 1206≥1μF, DF≤7%] • DF≤7.0% (C<1.0μF, 16V) [Except 0402≥0.068μF; DF≥9%] • DF≥9.0% (C≥1.0μF, 16V) • DF≥12.5% (10V)
4.	Dielectric strength	• To apply voltage(<50V) : 250% of rated voltage for 1~5 sec. • Charge & discharge current less than 50mA.	No evidence of damage or flash over during test.
		100V 200V ~ 300V 500V ~ 999V 1000V ~ 3000V Cut off, set at 10mA TEST=15 RAMP=0	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
5.	Insulation resistance	To apply rated voltage for max. 120sec.	10GΩMIN. or 500Ω-F MIN ,whichever is smaller.
		Rated Voltage: 100V ~ 500V To apply rated voltage	>10GΩ
		Rated Voltage: >500V To apply 500*60sec	>10GΩ
6.	Temperature coefficient	With no electrical load -25°C ~ 85°C at 20°C	Within +30% / -80%
7.	Bending test	• 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 sec. (Appendix 1) • Measurement to be made after keeping at room temp. for 48±4hours	• No remarkable damage. • Cap change : ≤±30% This capacitance change means the change of Capacitance under specified flexure of substrate from the capacitance measured before the test.
8.	Solderability	• Solder temperature : 230±5°C • Dipping time : 2±0.5 sec • Solder : SN63A	90%MIN. coverage of all metalized area.

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NO.	Test Items	Test Condition	Requirements
9.	Resistance to soldering heat	• Solder temperature : 260±5°C • Dipping time : 10±1 sec • Solder : SN63A • Measurement to be made after keeping at room temp. for 48±4 hours.	• No remarkable damage. • Cap change : <±20% • D.F value & I.R. : To meet initial standard value. • Dielectric strength : no defect. • 25% max. leaching on each edge.
10.	Temperature cycle	• Test temp. : -55°C ~ 125°C • Test step : 1) -55°C -3/+0 °C 30±3 min. 2) room temp. 2~3 min. 3) 125°C +3/-0 °C 30±2 min. 4) room temp. 2~3min. • Conduct the five cycles according to the temperatures and time. • Measurement to be made after keeping at room temp. for 48 ±4 hours.	• No remarkable damage. • Cap change : <±20% • D.F value & I.R. : To meet initial standard value.
11	Humidity (Damp Heat) Steady State	• Test temp. : 40±2°C • Humidity : 90~95% RH • Test time : 1000+24/-0 hrs. • Measurement to be made after keeping at room temp. for 48±4 hrs.	• No remarkable damage. • Cap change : <±30% • DF value : ≤7.5% Rated voltage: ≥50V ≤7.5% Rated voltage:25V [Except 0603≥0.068μF; 0805≥0.33μF, 1206≥1μF, DF≤10%] DF≤10.0% (C<1.0μF, 16V) [Except 0402≥0.1μF, DF≦12.5%] DF≤12.5% (C≥1.0μF, 16V) DF≤15% (10V) • I.R. : 1GΩ MIN or 50Ω-F MIN ,whichever is smaller
12.	Humidity (Damp Heat) Load	• Test temp. : 40±2°C • Humidity : 90~95% RH • Test time : 1000+24/-0 hrs. • To apply voltage : rated voltage (Max. 500V) • Measurement to be made after keeping at room temp. for 48±4 hrs.	• No remarkable damage. • Cap change : <±30% • DF value : ≤7.5% Rated voltage: ≥50V ≤7.5% Rated voltage:25V [Except 0603≥0.1μF; 0805≥0.33μF, 1206≥1μF, DF≤10%] DF≤10.0% (C<1.0μF、16V) [Except 0402≥0.068μF, DF≤12.5%] DF≤12.5% (C≥1.0μF、16V) DF≤15% (10V) • I.R. : 500MΩ MIN. or 25Ω-F MIN.,whichever is smaller.
13.	Adhesive strength of termination	• Pressurizing force : 1kg (10N) • Test time:10±1sec (Appendix2)	No remarkable damage or removal of the terminations.

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NO.	Test Items	Test Condition	Requirements
14	Vibration Resistance	• Vibration frequency : 10~55 Hz/min. • Total amplitude : 1.5mm • Test time : 6 hrs.(Two hours each in three mutually perpendicular directions.)	• No remarkable damage. • Cap change & DF : To meet initial requirements
15.	High Temperature Load (Endurance)	• Test temp. : 85±3°C • To apply voltage : V<500V : 200% of rated voltage. V≥500V, <1000V : 150% of rated voltage. V≥1000V : 120% of rated voltage.(Max.3600V) • Test time : 1000+24/-0 hrs. • Measurement to be made after keeping at room temp. for 48±4 hours.	• No remarkable damage. • Cap change : <±30% • DF value : ≤7.5% Rated voltage: ≥50V ≤7.5% Rated voltage:25V [Except 0603≥0.1μF; 0805≥0.33μF, 1206≥1μF, DF≤10%] DF≤10.0% (C<1.0μF、16V) [Except 0402≥0.068μF, DF≤12.5%] DF≤12.5% (C≥1.0μF, 16V) DF≤15% (10V) • I.R. : 1GΩ MIN. or 50Ω-F MIN., whichever is smaller.

TOLERANCE AND CAPACITANCE

Capacitance & Tolerance	NPO	X7R	Y5V
1R0=1.0pF 100=10pF 101=100pF 102=1000pF=1nF 103=10000pF=10nF 104=100nF 105=1000nF=1μF 106=10000nF=10 μF	0R5—104	101—105	103—226
B: ±0.1pF (Cap ≤ 5pF) C: ±0.25pF (Cap ≤ 5pF) D: ±0.5pF (5pF < Cap < 10pF) F: ±1% G: ±2% J: ±5% K: ±10% M: ±20% Z : -20% / +80%	B, C, D, F, G, J, K	J, K, M	M, Z

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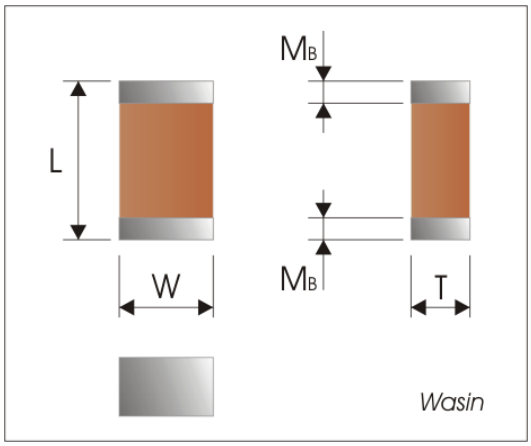
LENGTH, WIDTH, AND MB

Unit: inch(mm)



size	0402	0603	0805	1206	1210	1808	1812
Length	0.040±0.0002 (1.00±0.05)	0.063±0.004 (1.60±0.10)	0.080±0.006 (2.00±0.15)	0.125±0.006 (3.20±0.15)	0.125±0.012 (3.20±0.30)	0.180±0.015 (4.50±0.40)	0.180±0.012 (4.50±0.30)
Width	0.020±0.002 (0.50±0.05)	0.030±0.003 (0.80±0.07)	0.050±0.004 (1.25±0.1)	0.063±0.006 (1.60±0.15) 0.063±0.008 (1.60±0.2) <<Note>>	0.100±0.008 (2.50±0.20)	0.081±0.010 (2.03±0.25)	0.125±0.012 (3.20±0.30)
MB	0.010+0.002/-0.004 (0.25+0.05/-0.10)	0.015±0.006 (0.40±0.15)	0.020±0.008 (0.50±0.20)	0.025±0.008 (0.60±0.20)	0.030±0.010 (0.75±0.25)	0.030±0.010 (0.75±0.25)	0.030±0.010 (0.75±0.25)

Note : Width 1.60±0.2mm is applied to thickness G(=1.6±0.2mm), and width 1.60±0.15mm is applied to the others.

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CAPACITANCE AND VOLTAGE (NPO)

DIELECTRIC		NPO																									
SIZE	EIA CAP	0402				0603				0805				1206				1210				1812			
VDCW	CODE	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V
0.5pF	0R5	N	N	N	N	S	S	S	S	A	A	A	A												
1	1R0	N	N	N	N	S	S	S	S	A	A	A	A												
1.2	1R2	N	N	N	N	S	S	S	S	A	A	A	A												
1.5	1R5	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
1.8	1R8	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
2.2	2R2	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
2.7	2R7	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
3.3	3R3	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
3.9	3R9	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
4.7	4R7	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
5.6	5R6	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
6.8	6R8	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
8.2	8R2	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
10pF	100	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
12	120	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
15	150	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
18	180	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
22	220	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
27	270	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
33	330	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
39	390	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
47	470	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
56	560	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
68	680	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
82	820	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
100pF	101	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
120	121	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
150	151	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
180	181	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
220	221	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
270	271	N	N			S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
330	331	N	N			S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C				
390	391	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
470	471	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
560	561					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
680	681					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
820	821					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C				
1000pF	102					S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
1200	122					S	S			B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
1500	152					S	S			B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
1800	182					S	S			B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
2200	222					S	S			B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
2700	272					S	S			D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
3300	332					S	S			D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
3900	392									D	D	D	D	B	B	B	B	C	C	C	C	D	D	D	D
4700	472									D	D	D		B	B	B	B	C	C	C	C	D	D	D	D
5600	562									D	D			B	B	B	B	C	C	C	C	D	D	D	D
6800	682									D	D			C	C	C	C	C	C	C	C	D	D	D	D
8200	822									D	D			C	C	C	C	C	C	C	C	D	D	D	D
0.01μF	103									D	D			D	D	D	D	C	C	C	C	D	D	D	D
0.012	123									D	D			D	D			C	C	D	D	D	D	D	D
0.015	153													D	D			C	C	D	D	D	D	D	D
0.018	183													D	D			C	C			D	D	D	D
0.022	223													D	D			C	C			D	D	D	D
0.027	273													D	D			C	C			D	D	D	D
0.033	333													D	D			C	C			D	D	D	D
0.039	393													G	G			C	C			D	D		
0.047	473																	D	D			D	D		
0.056	563																	D	D			D	D		
0.068	683																					D	D		
0.082	823																					D	D		
0.1μF	104																					D	D		

(1)OTHER SIZE , CAPACITANCE , VOLTAGE , AND 13" REEL ARE AVAILABLE UPON CUSTOMER'S REQUEST.

TAPE AND REEL: Size Unit : inch(mm)

SIZE	0402(1005)	0603(1608)	0805(2012)	1206(3216)	1210(3225)	1808(4520)	1812(4532)
A=0.6+/-0.1mm	—	—	PAPER 4Kp/REEL	—	—	—	—
B=0.8+/-0.1mm	—	—	PAPER 4Kp/REEL	PAPER 4Kp/REEL	—	—	—
C=0.95+/-0.1mm	—	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	—	—
D=1.25±0.1mm	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 2Kp/REEL	PLASTIC 1Kp/REEL
G=1.60+/-0.2mm	—	—	—	PLASTIC 2Kp/REEL	—	—	—
S=0.8±0.07mm	—	PAPER 4Kp/REEL	—	—	—	—	—
N=0.50±0.05mm	PAPER 10Kp/REEL	—	—	—	—	—	—
K=2.00±0.2mm	—	—	—	—	—	PLASTIC 1Kp/REEL	PLASTIC 1Kp/REEL
M=2.5±0.30mm	—	—	—	—	—	—	—

WALSIN TECHNOLOGY CORPORATION
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566-1, KAO-SHI ROAD, 5 LIN, YANG-MEI, TAO-YUAN, TAIWAN, R.O.C
TEL:886-3-4758711 FAX:886-3-4755197

CAPACITANCE AND VOLTAGE (Hi-Voltage NPO)

DIELECTRIC		NPO																									
SIZE	EIA CAP	0603	0805				1206						1210						1808			1812						
VDCW	CODE	100	100	200	250	500	100	200	250	500	1000	2000	100	200	250	500	1000	2000	1000	2000	3000	100	200	250	500	1000	2000	3000
0.5pF	0R5	S	A	A	A	A																						
1	1R0	S	A	A	A	A																						
1.2	1R2	S	A	A	A	A																						
1.5	1R5	S	A	A	A	A	B	B	B	B	B	B																
1.8	1R8	S	A	A	A	A	B	B	B	B	B	B																
2.2	2R2	S	A	A	A	A	B	B	B	B	B	B																
2.7	2R7	S	A	A	A	A	B	B	B	B	B	B																
3.3	3R3	S	A	A	A	A	B	B	B	B	B	B																
3.9	3R9	S	A	A	A	A	B	B	B	B	B	B																
4.7	4R7	S	A	A	A	A	B	B	B	B	B	B																
5.6	5R6	S	A	A	A	A	B	B	B	B	B	B																
6.8	6R8	S	A	A	A	A	B	B	B	B	B	B																
8.2	8R2	S	A	A	A	A	B	B	B	B	B	B																
10pF	100	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
12	120	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
15	150	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
18	180	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
22	220	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
27	270	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
33	330	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
39	390	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
47	470	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D
56	560	S	A	A	A	A	B	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D
68	680	S	A	A	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D
82	820	S	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D
100pF	101	S	A	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D
120	121	S	A	A	A	D	B	B	B	B	B	D	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D
150	151	S	A	B	B	D	B	B	B	B	C	D	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D
180	181	S	A	B	B	D	B	B	B	B	C	G	C	C	C	C	C	D	D	D	K	D	D	D	D	D	D	D
220	221	S	A	D	D	D	B	B	B	B	D	G	C	C	C	C	C	D	D	D	K	D	D	D	D	D	D	D
270	271	S	A	D	D	D	B	B	B	C	D		C	C	C	C	C		D	D	K	D	D	D	D	D	D	K
330	331	S	A	D	D	D	B	B	B	C			C	C	C	C	D		D	D		D	D	D	D	D	D	K
390	391	S	B	D	D	D	B	B	B	C			C	C	C	C	D		D	K		D	D	D	D	D	D	K
470	471	S	B	D			B	C	C	C			C	C	C	C	D		D	K		D	D	D	D	D	D	K
560	561	S	B	D			B	C	C	C			C	C	C	C			K	K		D	D	D	D	D	D	
680	681		B	D			B	C	C	C			C	C	C	C			K	K		D	D	D	D	D	K	
820	821		B	D			B	C	D	D			C	C	C	C			K			D	D	D	D	D	K	
1000pF	102		B				B	C					C	C	C	C			K			D	D	D	D	K	K	
1200	122		B				B	C					C	D	D	D						D	D	D	D	K		
1500	152		B				B	C					C	D	D	D						D	D	D	D	K		
1800	182		B				B	D					C	D	D	D						D	D	D	D			
2200	222		B				B	D					C	D	D							D	D	D	D			
2700	272		D				B						C	D	D							D	D	D	D			
3300	332		D				B						C	D								D	D	D	D			
3900	392		D				B						C	D								D	D					
4700	472						B						C									D	D					
5600	562						B						C									D	D					
6800	682						C						C									D	D					
8200	822						C						C									D						
0.01μF	103												C									D						
0.012	123												D									D						
0.015	153												D									D						
0.018	183																					D						
0.022	223																					D						
0.027	273																					D						
0.033μF	333																					D						

(1)OTHER SIZE , CAPACITANCE , VOLTAGE , AND 13" REEL ARE AVAILABLE UPON CUSTOMER'S REQUEST.

TAPE AND REEL: Size Unit : inch(mm)

SIZE	0402(1005)	0603(1608)	0805(2012)	1206(3216)	1210(3225)	1808(4520)	1812(4532)
A=0.6+/-0.1mm	—	—	PAPER 4Kp/REEL	—	—	—	—
B=0.8+/-0.1mm	—	—	PAPER 4Kp/REEL	PAPER 4Kp/REEL	—	—	—
C=0.95+/-0.1mm	—	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	—	—
D=1.25±0.1mm	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 2Kp/REEL	PLASTIC 1Kp/REEL
G=1.60+/-0.2mm	—	—	—	PLASTIC 2Kp/REEL	—	—	—
S=0.8±0.07mm	—	PAPER 4Kp/REEL	—	—	—	—	—
N=0.50±0.05mm	PAPER 10Kp/REEL	—	—	—	—	—	—
K=2.00±0.2mm	—	—	—	—	—	PLASTIC 1Kp/REEL	PLASTIC 1Kp/REEL
M=2.5±0.30mm	—	—	—	—	—	—	—

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TEL:886-3-4758711 FAX:886-3-4755197

CAPACITANCE AND VOLTAGE (X7R BME)

DIELECTRIC		X7R																							
SIZE	EIA CAP	0402				0603				0805				1206				1210				1812			
VDCW	CODE	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V
100pF	101	N	N	N	N	S	S	S	S	B	B	B	B												
120	121	N	N	N	N	S	S	S	S	B	B	B	B												
150	151	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
180	181	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
220	221	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
270	271	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
330	331	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
390	391	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
470	471	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
560	561	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
680	681	N	N	N	N	S	S	S	S	B	B	B	B	B^	B^	B^	B^								
820	821	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B								
1000pF	102	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
1200	122	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
1500	152	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
1800	182	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
2200	222	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
2700	272	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
3300	332	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
3900	392	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
4700	472	N	N	N	N	S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
5600	562	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
6800	682	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C^	C^	C^	C^	D^	D^	D^	D^
8200	822	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.01μF	103	N	N	N		S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.012	123	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.015	153	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.018	183	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.022	223	N	N			S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.027	273	N				S	S	S	S	B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.033	333	N				S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.039	393	N				S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.047	473	N				S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.056	563					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.068	683					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D^	D^	D^	D^
0.082	823					S	S			B	B	B	D	B	B	B	B	C	C	C	C	D	D	D	D
0.1μF	104					S	S			B	B	B	D	B	B	B	B	C	C	C	C	D	D	D	D
0.12	124					S				B	B	B	D	B	B	B	B	C	C	C	C	D	D	D	D
0.15	154					S				D	D	D	D	C	C	C	C	C	C	C	C	D	D	D	D
0.18	184					S				D	D	D		C	C	C	C	C	C	C	C	D	D	D	D
0.22	224					S				D	D	D		C	C	C	C	C	C	C	C	D	D	D	D
0.27	274									D	D	D		C	C	C		C	C	C	C	D	D	D	D
0.33	334									D	D	D		C	C	C		C	C	C	D	D	D	D	D
0.39	394									D	D			C	C			C	C	C	D	D	D	D	D
0.47	474									D	D			D	D			C	C	C		D	D	D	D
0.56	564									D	D			D	D							D	D	D	D
0.68	684									D				D	D							D	D	D	K
0.82	824									D				D	D							D	D	D	K
1μF	105									D				D	D							D	D	D	K

(1)OTHER SIZE , CAPACITANCE , VOLTAGE , AND 13" REEL ARE AVAILABLE UPON CUSTOMER'S REQUEST.

(2)[^] : the said items are made by NME(Noble Metal Electrode).

TAPE AND REEL: Size Unit : inch(mm)

SIZE	0402(1005)	0603(1608)	0805(2012)	1206(3216)	1210(3225)	1808(4520)	1812(4532)
A=0.6+/-0.1mm	—	—	PAPER 4Kp/REEL	—	—	—	—
B=0.8+/-0.1mm	—	—	PAPER 4Kp/REEL	PAPER 4Kp/REEL	—	—	—
C=0.95+/-0.1mm	—	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	—	—
D=1.25±0.1mm	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 2Kp/REEL	PLASTIC 1Kp/REEL
G=1.60+/-0.2mm	—	—	—	PLASTIC 2Kp/REEL	—	—	—
S=0.8±0.07mm	—	PAPER 4Kp/REEL	—	—	—	—	—
N=0.50±0.05mm	PAPER 10Kp/REEL	—	—	—	—	—	—
K=2.00±0.2mm	—	—	—	—	—	PLASTIC 1Kp/REEL	PLASTIC 1Kp/REEL
M=2.5±0.30mm	—	—	—	—	—	—	—

WALSIN TECHNOLOGY CORPORATION
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566-1, KAO-SHI ROAD, 5 LIN, YANG-MEI, TAO-YUAN, TAIWAN, R.O.C
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CAPACITANCE AND VOLTAGE (Hi-Voltage X7R BME)

DIELECTRIC		X7R																								
SIZE	EIA CAP	0603	0805				1206							1210					1808			1812					
VDCW	CODE	100	100	200	250	500	100	200	250	500	1000	1500	2000	100	200	250	500	1000	1000	1500	2000	100	200	250	500	1000	2000
100pF	101	S	B	B^	B^	B^																					
120	121	S	B	B^	B^	B^																					
150	151	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	B^						D^	D^	D^						
180	181	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	B^						D^	D^	D^						
220	221	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	B^						D^	D^	D^						
270	271	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	B^						D^	D^	D^					D^	D^
330	331	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	B^						D^	D^	D^					D^	D^
390	391	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	C^						D^	D^	D^					D^	D^
470	471	S	B	B^	B^	B^	B^	B^	B^	B^	B^	B^	C^						D^	D^	D^					D^	D^
560	561	S	B	B^	B^	B^	B^	B^	B^	B^	B^	C^	C^						D^	D^	D^					D^	D^
680	681	S	B	B^	B^	B^	B^	B^	B^	B^	B^	C^	C^						D^	D^	D^					D^	D^
820	821	S	B	B^	B^	B^	B	B^	B^	B^	B^	G^	G^						D^	D^	D^					D^	D^
1000pF	102	S	B	B^	B^	B^	B	B^	B^	B^	B^	G^	G^	C^	C^	C^	C^	C^	D^	D^	K^	D^	D^	D^	D^	D^	D^
1200	122	S	B	B^	B^	B^	B	B^	B^	B^	B^	G^		C^	C^	C^	C^	C^	D^	D^	K^	D^	D^	D^	D^	D^	D^
1500	152	S	B	B^	B^	B^	B	B^	B^	B^	C^	G^		C^	C^	C^	C^	C^	D^	D^	K^	D^	D^	D^	D^	D^	D^
1800	182	S	B	B^	B^	B^	B	B^	B^	B^	C^	G^		C^	C^	C^	C^	C^	D^	D^	K^	D^	D^	D^	D^	D^	D^
2200	222	S	B	B^	B^	B^	B	B^	B^	B^	D^	G^		C^	C^	C^	C^	C^	D^	D^	K^	D^	D^	D^	D^	D^	D^
2700	272	S	B	B^	B^	B^	B	B^	B^	B^	G^			C^	C^	C^	C^	C^	D^	D^		D^	D^	D^	D^	D^	D^
3300	332	S	B	B^	B^		B	B^	B^	B^	G^			C^	C^	C^	C^	D^	D^	K^		D^	D^	D^	D^	D^	K^
3900	392	S	B	B^	B^		B	B^	B^	B^	G^			C^	C^	C^	C^		D^			D^	D^	D^	D^	D^	K^
4700	472	S	B	B^	B^		B	B^	B^	B^				C^	C^	C^	C^		D^			D^	D^	D^	D^	D^	K^
5600	562	S	B	D^	D^		B	B^	B^	B^				C^	C^	C^	C^		K^			D^	D^	D^	D^	D^	
6800	682	S	B	D^	D^		B	B^	B^	B^				C^	C^	C^	C^		K^			D^	D^	D^	D^	D^	
8200	822	S	B	D^	D^		B	B^	B^	C^				C	C^	C^	C^		K^			D^	D^	D^	D^	D^	
0.01μF	103	S	B	D^	D^		B	B^	B^	C^				C	C^	C^	C^		K^			D^	D^	D^	D^	D^	
0.012	123		B				B	B^	B^					C	C^	C^	C^					D^	D^	D^	D^	K^	
0.015	153		B				B	C^	C^					C	C^	C^	C^					D^	D^	D^	D^	K^	
0.018	183		B				B	C^	C^					C	C^	C^	C^					D^	D^	D^	D^		
0.022	223		B				B	C^	C^					C	C^	C^	D^					D^	D^	D^	D^		
0.027	273		D				B	C^	C^					C	C^	C^						D^	D^	D^	D^		
0.033	333		D				B	G^	G^					C	C^	C^						D^	D^	D^	D^		
0.039	393						B	G^	G^					C	C^	C^						D^	D^	D^	D^		
0.047	473						B	G^	G^					C	D^	D^						D^	D^	D^	D^		
0.056	563						B							C	D^	D^						D^	D^	D^	K^		
0.068	683						B							C								D^	D^	D^	K^		
0.082	823						D							C								D	D^	D^	K^		
0.1μF	104						D							C								D	D^	D^	K^		
0.12	124													C								D	D^	D^			
0.15	154													D								D	K^	K^			
0.18	184													D								D	K^	K^			
0.22	224													D								D	K^	K^			
0.27	274																					D					
0.33	334																					D					
0.39	394																					D					
0.47	474																					K					
0.56	564																					K					
0.68	684																					K					
0.82	824																										
1μF	105																										

(1)OTHER SIZE , CAPACITANCE , VOLTAGE , AND 13" REEL ARE AVAILABLE UPON CUSTOMER'S REQUEST.

(2)[^] : the said items are made by NME(Noble Metal Electrode).

TAPE AND REEL: Size Unit : inch(mm)

SIZE	0402(1005)	0603(1608)	0805(2012)	1206(3216)	1210(3225)	1808(4520)	1812(4532)
A=0.6+/-0.1mm	—	—	PAPER 4Kp/REEL	—	—	—	—
B=0.8+/-0.1mm	—	—	PAPER 4Kp/REEL	PAPER 4Kp/REEL	—	—	—
C=0.95+/-0.1mm	—	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	—	—
D=1.25±0.1mm	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 2Kp/REEL	PLASTIC 1Kp/REEL
G=1.60+/-0.2mm	—	—	—	PLASTIC 2Kp/REEL	—	—	—
S=0.8±0.07mm	—	PAPER 4Kp/REEL	—	—	—	—	—
N=0.50±0.05mm	PAPER 10Kp/REEL	—	—	—	—	—	—
K=2.00±0.2mm	—	—	—	—	—	PLASTIC 1Kp/REEL	PLASTIC 1Kp/REEL
M=2.5±0.30mm	—	—	—	—	—	—	—

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CAPACITANCE AND VOLTAGE (Y5V BME)

DIELECTRIC		Y5V																							
SIZE	EIA CAP	0402				0603				0805				1206				1210				1812			
VDCW	CODE	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V	10V	16V	25V	50V
1000pF	102																								
1200	122																								
1500	152																								
1800	182																								
2200	222																								
2700	272																								
3300	332																								
3900	392																								
4700	472																								
5600	562																								
6800	682																								
8200	822																								
0.01μF	103	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.012	123	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.015	153	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.018	183	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.022	223	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.027	273	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.033	333	N	N	N	N	S	S	S	S	A	A	A	A	B	B	B	B								
0.039	393	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
0.047	473	N	N	N		S	S	S	S	A	A	A	A	B	B	B	B								
0.056	563	N	N			S	S	S	S	A	A	A	A	B	B	B	B								
0.068	683	N	N			S	S	S	S	A	A	A	A	B	B	B	B								
0.082	823	N	N			S	S	S	S	A	A	A	A	B	B	B	B								
0.1μF	104	N	N			S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D
0.15	154	N				S	S	S	S	A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D
0.22	224	N				S	S	S		A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D
0.33	334					S	S	S		B	B	B	B	B	B	B	B	C	C	C	C	D	D	D	D
0.47	474					S	S			B	B	B		B	B	B	B	C	C	C	C	D	D	D	D
0.68	684					S				B	B	D		B	B	B	B	C	C	C	C	D	D	D	D
1μF	105					S				B	B	D		C	C	C	C	C	C	C	C	D	D	D	D
1.5	155									D	D			C	C	C		C	C	C		D	D	D	D
2.2	225									D	D			C	C	C		C	C	C		D	D	D	D
3.3	335									D				D	D	D		C	C	C		D	D	D	D
4.7	475									D				D	D			C	C	D		D	D	D	D
6.8	685													D				C	C			D	D	D	D
10μF	106													D				D	D			D	D	D	
22μF	226																	D							

(1)OTHER SIZE , CAPACITANCE , VOLTAGE , AND 13" REEL ARE AVAILABLE UPON CUSTOMER'S REQUEST.

TAPE AND REEL: Size Unit : inch(mm)

SIZE	0402(1005)	0603(1608)	0805(2012)	1206(3216)	1210(3225)	1808(4520)	1812(4532)
A=0.6+/-0.1mm	—	—	PAPER 4Kp/REEL	—	—	—	—
B=0.8+/-0.1mm	—	—	PAPER 4Kp/REEL	PAPER 4Kp/REEL	—	—	—
C=0.95+/-0.1mm	—	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	—	—
D=1.25±0.1mm	—	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 2Kp/REEL	PLASTIC 1Kp/REEL
G=1.60+/-0.2mm	—	—	—	PLASTIC 2Kp/REEL	—	—	—
S=0.8±0.07mm	—	PAPER 4Kp/REEL	—	—	—	—	—
N=0.50±0.05mm	PAPER 10Kp/REEL	—	—	—	—	—	—
K=2.00±0.2mm	—	—	—	—	—	PLASTIC 1Kp/REEL	PLASTIC 1Kp/REEL
M=2.5±0.30mm	—	—	—	—	—	—	—

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CAPACITANCE AND VOLTAGE (Hi-Voltage Y5V BME)

DIELECTRIC		Y5V											
SIZE	EIA CAP	0805			1206			1210			1812		
VDCW	CODE	100	200	250	100	200	250	100	200	250	100	200	250
0.01 μF	103	B	B	B	B	B	B	C	C	C	D	D	D
0.015	153	B	B	B	B	B	B	C	C	C	D	D	D
0.022	223	B	B	B	B	B	B	C	C	C	D	D	D
0.033	333	B	B	B	B	B	B	C	C	C	D	D	D
0.047	473	B	B	B	B	B	B	C	C	C	D	D	D
0.068	683	B	B	B	B	B	B	C	C	C	D	D	D
0.1 μF	104	B			B	B	B	C	C	C	D	D	D
0.15	154				C	C	C	C	C	C	D	D	D
0.22	224				C			C			D	D	D
0.33	334							C			D	D	D
0.47	474										D	D	D
0.68	684										D	D	D
1 μF	105										D		

(1)OTHER SIZE , CAPACITANCE , VOLTAGE , AND 13" REEL ARE AVAILABLE UPON CUSTOMER'S REQUEST.

TAPE AND REEL: **Size Unit : inch(mm)**

SIZE	0805(2012)	1206(3216)	1210(3225)	1812(4532)
A=0.6+/-0.1mm	PAPER 4Kp/REEL	—	—	—
B=0.8+/-0.1mm	PAPER 4Kp/REEL	PAPER 4Kp/REEL	—	—
C=0.95+/-0.1mm	—	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	—
D=1.25±0.1mm	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 3Kp/REEL	PLASTIC 1Kp/REEL
G=1.60+/-0.2mm	—	PLASTIC 2Kp/REEL	—	—
S=0.8±0.07mm	—	—	—	—
N=0.50±0.05mm	—	—	—	—
K=2.00±0.2mm	—	—	—	PLASTIC 1Kp/REEL
M=2.5±0.30mm	—	—	—	—

*** NEW PRODUCTS PROMOTION ***

(1). X5R Series,

X5R 0402 56nF- 100nF /10V

(2). Multi-layer C-array Series,

NPO 0603*4(8P4C) 10pF- 470pF /50V
X7R 0603*4(8P4C) 100pF- 100nF /16V
X7R 0603*4(8P4C) 100pF- 10nF /50V,25V
Y5V 0603*4(8P4C) 10nF- 100nF /50V,25V

(3). Low Inductance Capacitor (LIC) Series,

X5R 0306 100nF- 220nF /10V
X7R 0612 10nF- 100nF /50V

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PACKING ON TAPE AND REEL

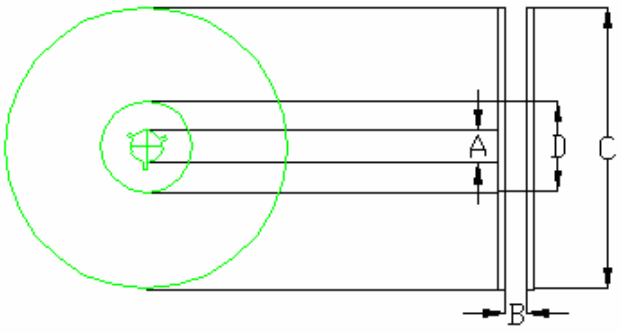
Unit per reel **Unit : mm**

chip size	Paper tape width(reel)	Paper tape thickness	Paper tape unit/reel	Plastic tape width(reel)	Plastic tape thickness	Plastic tape unit/reel
0402	8 mm (7")	N	10Kp/Reel			
	8mm(13")	N	50Kp/Reel			
0603	8 mm (7")	S	4Kp/Reel			
	8mm(10")	S	10Kp/Reel			
	8mm(13")	S	15Kp/Reel			
0805	8 mm (7")	A、B	4Kp/Reel	8 mm (7")	C、D	3Kp/Reel
	8mm(10")	A、B	10Kp/Reel	8mm(10")	C、D	5Kp/Reel
	8mm(13")	A、B	15Kp/Reel	8mm(13")	C、D	10Kp/Reel
1206	8 mm (7")	A、B	4Kp/Reel	8 mm (7")	C、D	3Kp/Reel
	8mm(10")	A、B	10Kp/Reel	8mm(10")	C、D	5Kp/Reel
	8mm(13")	A、B	15Kp/Reel	8mm(13")	C、D	10Kp/Reel
				8 mm (7")	F、G	2Kp/Reel
				8 mm (7")	K	1Kp/Reel
1210				8 mm (7")	C、D	3Kp/Reel
				8 mm (7")	F	1Kp/Reel
1808				12mm (7")	C、G	2Kp/Reel
				12mm (7")	K	1Kp/Reel
1812				12mm (7")	D	1Kp/Reel

* chip thickness :

N=0.50±0.05
A=0.60±0.10
B=0.80±0.10
C=0.95±0.10
D=1.25±0.10
S=0.80 ±0.07
G=1.60± 0.20
K=2.00± 0.20
M=2.5± 0.30

Reel size label	chip size 0402	0603	0805	1206	1210	1808	1812
A	13.0±1.0	13.0±1.0	13.0±1.0	13.0±1.0	13.0±1.0	13.0±1.0	13.0±1.0
B	9.0±1.0	9.0±1.0	9.0±1.0	9.0±1.0	9.0±1.0	13.5±1.0	13.5±1.0
C	178.0±1.0 (7")	178.0±1.0 (7")	178.0±1.0 (7")	178.0±1.0 (7")	178.0±1.0 (7")	178.0±1.0 (7")	178.0±1.0 (7")
		250.0±1.0 (10")	250.0±1.0 (10")	250.0±1.0 (10")			
	330.0±1.0 (13")	330.0±1.0 (13")	330.0±1.0 (13")	330.0±1.0 (13")			
D	60.5±1.0 (7")	60.5±1.0 (7")	60.5±1.0 (7")	60.5±1.0 (7")	60.5±1.0 (7")	80.0±1.0 (7")	80.0±1.0 (7")
		62.5±1.0 (10")	62.5±1.0 (10")	62.5±1.0 (10")			
	100.0±1.0 (13")	100.0±1.0 (13")	100.0±1.0 (13")	100.0±1.0 (13")			



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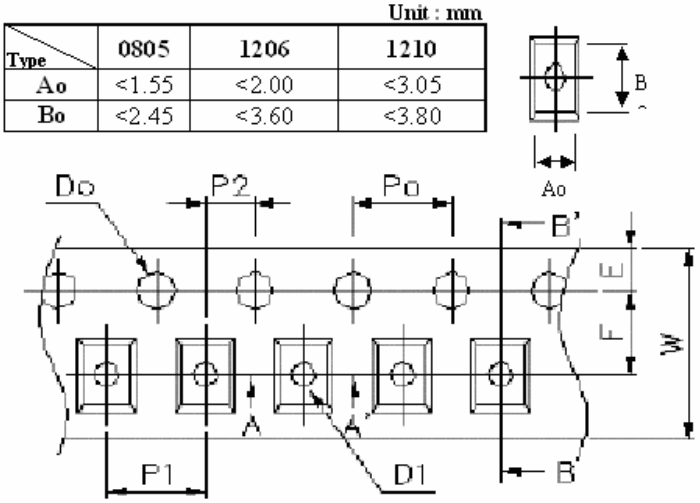
PACKING ON TAPE AND REEL

Tape Size Contrastive Table

A. Plastic tape size specification

Unit : mm

Type	0805	1206	1210
Ao	<1.55	<2.00	<3.05
Bo	<2.45	<3.60	<3.80

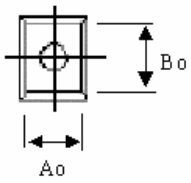


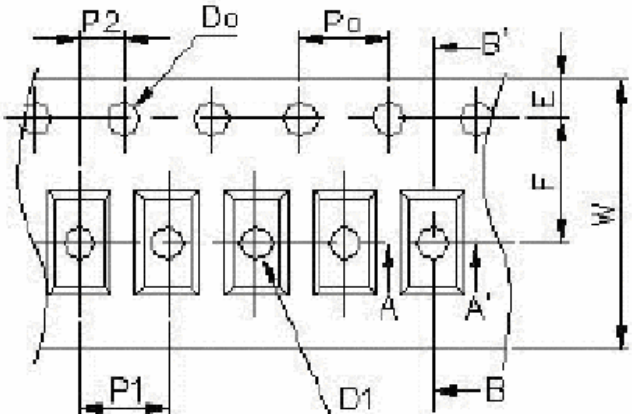
Item	Specification	Tol. (+/-)
W	**8.00**	±0.20
E	**1.75**	±0.10
F	**3.50**	±0.05
D0	**1.50**	+0.10, -0
D1	**1.00**	±0.10
P0	**4.00**	±0.05
P1	**4.00**	±0.10
P2	**2.00**	±0.05
P0 x 10	**40.00**	±0.20

B. Plastic tape size specification

Unit : mm

Type	1808
Ao	<2.30
Bo	<5.00





Item	Specification	Tol. (+/-)
W	**12.00**	±0.20
E	**1.75**	±0.10
F	**5.50**	±0.05
D0	**1.50**	+0.10, -0
D1	**1.50**	±0.10
P0	**4.00**	±0.05
P1	**4.00**	±0.10
P2	**2.00**	±0.05
P0 x 10	**40.00**	±0.20

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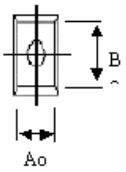
PACKING ON TAPE AND REEL

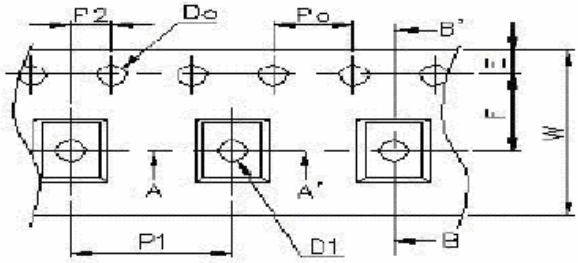
Tape Size Contrastive Table

C. Plastic tape size specification

Unit : mm

Type	1812
Ao	<3.80
Bo	<5.35

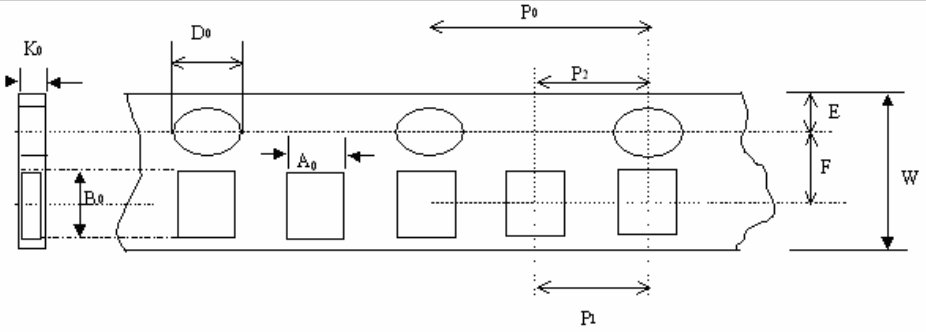




Item	Specification	Tol. (+/-)
W	**12.00**	±0.20
E	**1.75**	±0.10
F	**5.50**	±0.05
D0	**1.50**	+0.10, -0
D1	**1.50**	±0.10
P0	**4.00**	±0.05
P1	**8.00**	±0.10
P2	**2.00**	±0.05
P0 x 10	**40.00**	±0.20

D. Paper tape size specification

SYMBOL	PRODUCT SIZE CODE								UNIT
	0402		0603		0805		1206		
	SIZE	TOL	SIZE	TOL	SIZE	TOL	SIZE	TOL	
A_0	0.62	±0.05	1.02	±0.05	1.50	±0.10	2.00	±0.15	mm
B_0	1.12	±0.05	1.82	±0.05	2.30	±0.10	3.50	±0.15	mm
K_0	0.60	±0.05	0.95	±0.05	0.95/0.75	±0.05	0.95	±0.05	mm
W	8.00	±0.10	8.00	±0.10	8.00	±0.10	8.00	±0.10	mm
D_0	1.55	±0.05	1.55	±0.05	1.55	±0.05	1.55	±0.05	mm
E	1.75	±0.10	1.75	±0.10	1.75	±0.10	1.75	±0.10	mm
F	3.50	±0.05	3.50	±0.05	3.50	±0.05	3.50	±0.05	mm
P_0	4.00	±0.10	4.00	±0.10	4.00	±0.10	4.00	±0.10	mm
P_1	2.00	±0.05	4.00	±0.10	4.00	±0.10	4.00	±0.10	mm
P_2	2.00	±0.05	2.00	±0.05	2.00	±0.05	2.00	±0.05	mm



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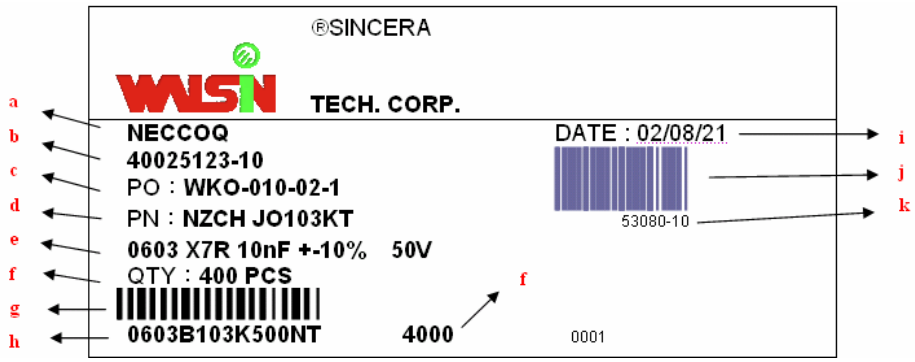
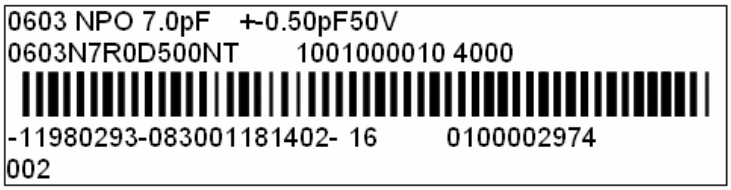
DESCRIPTION OF THE STANDARD SHIPPING LABEL



a. Customer name
b. WALSIN order serial number and item number
c. Customer P/O
d. Customer P/N
e. Description of specifications
f. Quantity
g. Quantity and WALSIN P/N or customer P/N in bar code
h. Material serial number of WALSIN
i. Shipping date
j. Order bar code including serial number and item numberSerial number of the label

Information of caution/precaution handling of chip : 1. No bumping & pressurizing when carry. 2. Keep out of water.

Walsin Standard Label (MLCC) :



- **1st Column : 0603 NPO 7.0pF +-0.50pF50V** **<<Content: product description>>**

  (1). 0603: Size (2). NPO : Dielectric (3). 7.0pF : Capacitance (4) +/-0.50pF: Tolerance

- **2nd Column : 0603N7R0D500NT 1001000010 4000** **<<Content: Part number + batch number of taping +quantity per reel(pcs)>>**

  (1). 0603N7R0D500NT: Part number

  (2). 1001000010: Batch number of taping (2.1) 000010: random number

  (3). 4000: quantity per reel (unit: pieces)

- **3rd Column: Bar code** **<<Content:The reading is same as 2nd column>>**

  0603N7R0D500NT 1001000010 4 (Quantity unit: Kpcs)

- **4th Column: -11980293-083001181402- 16 0100002974 002**

  (1). - : Tap
  (2). 11980293 : Employee number
  (3). 083001 : Mouth , Date, Year (The date of printing)
  (4). 181402 : Hour, minute, second (Printing Time)
  (5). 16 : Copies of label(with same batch number)
  (6). 0100002974 : Batch number of bulk
  (7). 002 : Series of copies

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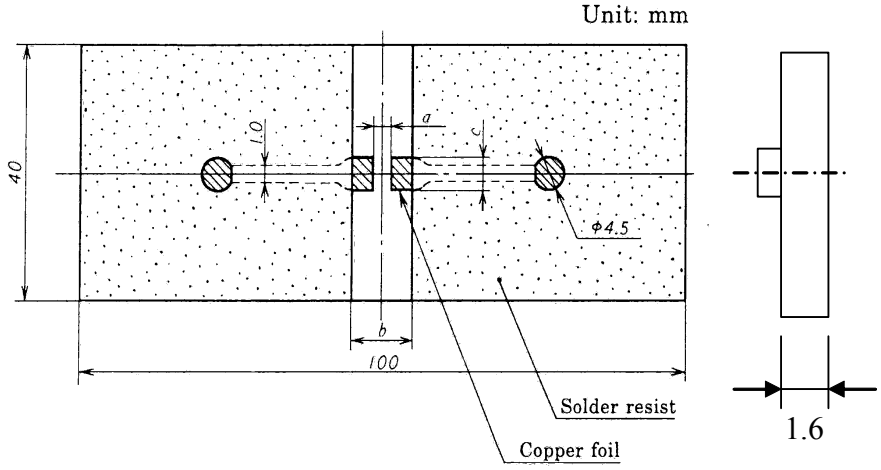
Appendix 1 Bending test

1. Testing Substrate:

The testing substrate shall the testing substrate A given in Fig.1, the substrate shall be that of class GE4 specified in JIS C6484 or at least the equivalent, the thickness shall be 1.6mm and thickness of copper foil be 0.035mm.

Fig. 1. Testing printed wiring board A
(for use in test for resistance of board to bending)



External Size of Capacitor		Dimensions of Pattern (Unit : mm)			
Symbol	W*L	a	b	c	d
0402	0.5*1.0	0.4	1.5	0.5	1.0
0603	0.8*1.6	1.0	3.0	1.2	1.0
0805	1.25*2.0	1.2	4.0	1.65	1.0
1206	1.6*3.2	2.2	5.0	2.0	1.0
1210	2.5*3.2	2.2	5.0	2.9	1.0
1812	3.2*4.5	3.5	7.0	3.7	1.0

2. Testing Method:

2.1 The capacitor shall be soldered to testing substrate A.

2.2 The substrate shall be so placed with it's surface on which capacitor is mounted downwards that the center of capacitor coincides with the center of supports as illustrated in Fig2.

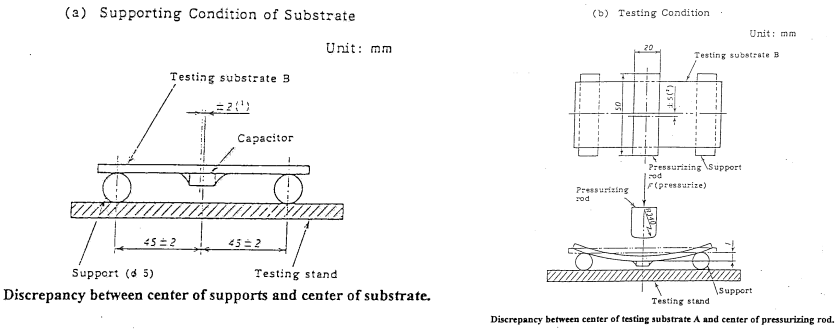


Fig.2 Flexural test of substrate

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Appendix 2 Adhesive strength of termination

1. Testing Substrate:

The testing substrate shall be the testing substrate A illustrated in Fig.1.

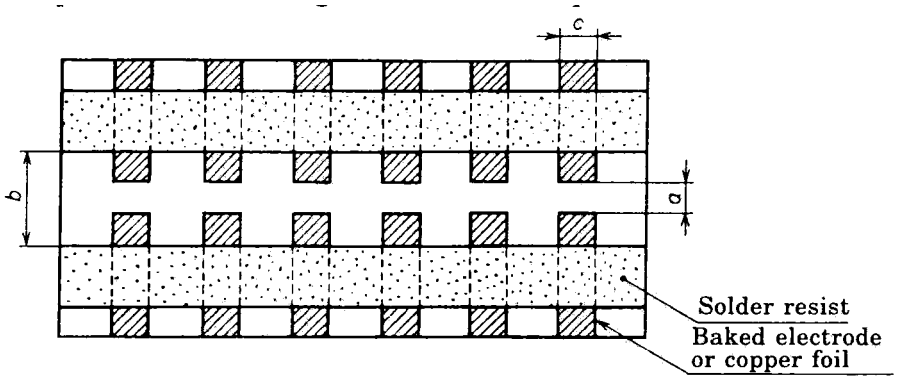

Fig.1 Testing substrate A

External Size of Capacitor		Dimensions of Pattern Unit : mm		
Symbol	W*L	a	b	c
0402	0.5*1.0	0.4	1.5	0.5
0603	0.8*1.6	1.0	3.0	1.2
0805	1.25*2.0	1.2	4.0	1.65
1206	1.6*3.2	2.2	5.0	2.0
1210	2.5*3.2	2.2	5.0	2.9
1812	3.2*4.5	3.5	7.0	3.7

Remark : Material of substrate shall be alumina or glass fabric base epoxy resin.

Alumina : purity 95% or more, thickness 0.6mm or more.

Glass fabric base epoxy resin : Class GE4 specified in JIS C6484 or the equivalent.

Thickness 1.6mm and copper foil thickness 0.035mm.

2. Testing Method:

The pressurizing force shall be gradually applied to the center side surface of capacitor in the capacitor in the direction horizontal and parallel to the testing substrate as shown in Fig.2.

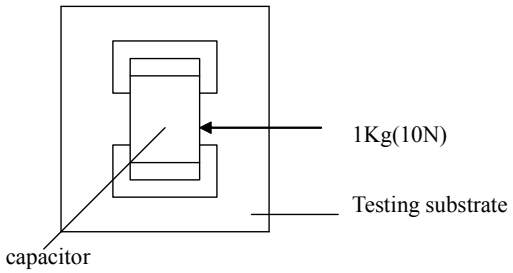

Fig.2 Direction of Pressurizing

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