

FEATURES

- X1Y2/X2Y3 class, size 1808~2220, COG(NPO)/X7R, 250V_{AC}
- High reliability and stability.
- Small size and high capacitance.
- Safety standard approval by UL60384-14.
- HALOGEN compliant

APPLICATION

- Modem, Facsimile, Telephone
- Other electronic equipment for lighting or surge protection and isolation.

PART NUMBER SYSTEM





[X1/Y2, X2/Y3]

MSK/MSH Series

MERITEK capacitors are designed for surge or lightning immunity in moderm facsimile and other equipments.The capacitors of series MSK are class X1/Y2 compliant respectively. The green type capacitors in MSK and MSH series are manufactured by using environmentally friendly materials without lead or cadmium. The terminations are composed of plated nickel and pure tin to feature the superior leaching resistance during soldering



SPECIFICATIONS

C0G(NPO)		X	(7R
1808		1808, 1	812, 2211
	250V _{AC}		0V _{AC}
X1/Y2 Class	3pF ~ 270pF	X1/Y2 Class	130pF ~ 2200pF
X2/Y3 Class	3pF ~ 1000pF	X2/Y3 Class	150pF ~ 5600pF
Cap≤5pF: B (±	0.1pF), C (±0.25pF)		
5pF <cap<10p< td=""><td>F: C (±0.25pF), D (±0.5pF)</td><td colspan="2">K (±10%), M (±20%)</td></cap<10p<>	F: C (±0.25pF), D (±0.5pF)	K (±10%), M (±20%)	
Cap≥10pF: F (±1%), G (±2%), J (±5%),K (±10%)		
Cap<30pF: D.I	F≤1/(400+20C)	-	<2.5%
Cap≥30pF: D.F	= ≤0.10%	<u> </u>	
≥100GΩ or R•0	C≥1000	≥10GΩ or R-C≥500Ω-F whichever	
whichever is smaller		is smaller	
	-55 to +125°C		
±30ppm / °C		±	15%
	(Cu or Ag) / Ni / Sn (lead-fre	e termination)	
	X1/Y2 Class X2/Y3 Class Cap≤5pF: B (± 5pF <cap<10p Cap≥10pF: F (Cap<30pF: D.I ≥100GΩ or R-0 whichever is si</cap<10p 	$\begin{tabular}{ c c c c c c } \hline COG(NPO) & 1808 & 250V_{AC} & 250V_{AC} & 250V_{AC} & 270pF & 270pF & 22/Y3 Class & 3pF ~ 270pF & 22/Y3 Class & 3pF ~ 1000pF & Cap<5pF: B (±0.1pF), C (±0.25pF) & 5pF10pF: F (±1%), G (±2%), J (±5%), K (±10%) & Cap<30pF: D.F\leq1/(400+20C) & Cap>30pF: D.F\leq0.10\% & 2100G\Omega \ or R-C\geq1000 & whichever is smaller & -55 \ to +125^{\circ}C & \\ & & & & & & & & & & & & & & & & & $	$\begin{tabular}{ c c c c c c } \hline COG(NPO) & & & & & & & & & & & & & & & & & & &$

* C0G(NPO): Apply 1.0±0.2Vrms, 1.0MHz±10%, at 25°C ambient temperature X7R: Apply 1.0±0.2Vrms, 1.0kHz±10%, at 25°C ambient temperature

MERITEK



DIMENSIONS



Size inch(mm)	BL	BW	BH		LW			
			1.25±0.1	С				
1909/4520)	46+03	2 0+0 2	1.40±0.15	D	0.26			
1000(4520)	4.0±0.3	2.0±0.2	1.60±0.20	Е				
			2.00±0.20	F				
	4.6±0.3	3.2±0.3	1.25±0.10	С	0.26			
4940(4520)			1.60±0.20	Е				
1012(4332)			2.00±0.20	F				
			2.50±0.30	G				
	E 7 · 0 4	28.02	1.60±0.20	Е	0.20			
2211/5728)			2.00±0.20	F				
2211(3728) 5.7±0		2.0±0.3	2.50±0.30	G	0.30			
			2.80±0.30	Н				
All dimension is	All dimension is mm							

CAPACITANCE RANGE

Class		X1/Y2(MSK series)		X2/Y3(MSH series)			
Rated Voltage			-		250V _{AC}		
	Dielectric	Dielectric COG(NPO) X7R		C0G(NPO)	X7R		
	Certificated	UL	UL	UL	UL	UL	UL
	Size	1808	1812	2211	1808	1808	1812
	Impulse	5kV	5k	V		2.5kV	
	3.0pF (3R0)	D			D		
	3.3pF (3R3)	D			D		
	4.0pF (4R0)	D			D		
	4.7pF (4R7)	D			D		
	5.0pF (5R0)	D			D		
	5.6pF (5R6)	D			D		
	6.8pF (6R8)	D			D		
	8.2pF (8R2)	D			D		
	10pF (100)	D			D		
	12pF (120)	D			D		
	15pF (150)	D			D		
	18pF (180)	D			D		
	22pF (220)	D			D		
	27pF (270)	D			D		
	33pF (330)	D			D		
	39pF (390)	E			E		
	47pF (470)	E			E		
	56pF (560)	E			E		
ce	68pF (680)	E			E		
tan	82pF (820)	E			E		
cit	100pF (101)	F			F		
edi	120pF (121)	F			F		
ပီ	130pF (131)	F		E	F		
	150pF (151)	F	E	E	F	E	
	160pF (161)	F	E	E	F	E	
	180pF (181)	F	E	E	F	E	
	220pF (221)	F	E	E	F	E	
	270pF (271)	F	E	E	F	E	E
	330pF (331)		E	E	F	E	E
	390pF (391)		E	E	F	E	E
	470pF (471)		E	F	F	E	E
	560pF (561)		E	F	F	E	E
	680pF (681)		F	F	F	E	E
	720pF (721)		F	F	F	E	E
	820pF (821)		F	F	F	E	E
	1,000pF (102)		G	G	F	F	E
	1,200pF (122)			G		F	E
	1,500pF (152)			G		F	F
	1,800pF (182)			G		F	F
	2,200pF (222)			G		F	G
	2,700pF (272)						G



	3,300pF (332)			G
	3,900pF (392)			G
	2,700pF (272)			G
	4,700pF (472)			G
	5 600pE (562)			G

RELIABILITY

No.	Item	Standard Method	Test Condition	Requirements
1.	Visual examination and Dimensions	IEC 60384-1 4.1		 * No remarkable defect. * Dimensions to confirm to individual specification sheet.
2.	Capacitance	IEC 60384-1 4.2.2	Class I (C0G/NPO): 1.0 ± 0.2 Vrms, 1MHz±10% For C _R ≤100pF 1KHz±10% For C _R > 100pF	 Capacitance is within specified tolerance C_R means rated capacitance for conform to the E6 series of preferred values given in IEC 60063.
3.	D.F. (Dissipation Factor) Tangent of loos angle	IEC 60384-1 4.2.3	Class II (X7R): 1.0±0.2Vrms, 1KHz±10%	Class I (C0G/NPO): Cap≥30pF, D.F≤0.1%; Cap<30pF, D.F≤1/(400+20C) Class II (X7R): ≤2.5%
4.	Temperature Coefficient	IEC 60384-21/22 4.6	With no electrical load.T.C.Operating TempC0G(NPO)-55~125°C at 25°CX7R-55~125°C at 25°C	T.C.Capacitance C angeCOG(NPO)Within ±30ppm/°CX7RWithin ±15%
5.	Insulation Resistance	IEC 60384-21/22 4.5.3	* To apply voltage at $500V_{DC}$ for 60 sec. * The charge current shall not exceed 0.05A.	Class I (NP0): ≥ 100 G Ω or RxC ≥ 1000 Ω -F whichever issmaller.Class II (X7R): ≥ 10 G Ω or RxC ≥ 500 Ω -F whichever is smaller.
6.	Voltage proof (Dielectric Strength)	IEC 60384-14 4.2.1	* To apply voltage: X Capacitor: $1075V_{DC}$ (4.3U _R) Y Capacitor: $1500V_{AC}$ * Duration: 60 sec. * The charge current shall not exceed 0.05A.	 * No evidence of damage or flashover during test. * The voltage shall be raised from the near zero to the test voltage a rate not exceeding 150V(r.m.s.)/sec.
7.	Solderability	IEC 60384-21/22 4.10	* Solder temperature: 245±5°C * Dipping time: 2±0.2 sec.	75% min. coverage of all metalized area.
8.	Resistance to Soldering Heat	IEC 60384-14 4.4 IEC 60384-21/22 4.9	 * Solder temperature: 260±5°C * Dipping time: 10±1 sec * Preheating: 120 to 150°C for 1 minute before immerse the capacitor in a 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) and 48± 4 hrs (Class II) 	 * No visible damage. * Cap change: NP0: within ±2.5% or ±0.25pF whichever is larger. I.R: More than 1GΩ X7R: within ±10% I.R: More than 1GΩ
9.	Humidity (Damp Heat) Steady State	IEC 60384-14 4.12	 * Test temp.: 40±2°C * Humidity: 90~95% RH * Test time: 500+24/-0hrs. * Applied Voltage:250V_{AC} * Measurement to be made after keeping at room temp. for 24±2 hrs (Class I) and 48± 4 hrs (Class II) 	 * No remarkable damage. * Cap change: NP0 within ±5% or ±0.5pF whichever is larger X7R within ±15% * D.F Value: NP0 ≤ 0.25% X7R: ≤5.0% * I.R. ≥1GΩ * Dielectric strength satisfies the specified initial value



MSK/MSH Series (X1/Y2, X2/Y3)

 10. Endurance IEC 'Impulse Voltage: 'Appearance : And the involution capacitor shall be subjected to a VD Appearance : Comparison of the involution capacitor shall be subjected to a VD Appearance : Comparison of the involution capacitor shall be subjected to a VD Appearance : Comparison of the involution capacitor shall be subjected to a VD Appearance : Comparison of the involution capacitor shall be subjected to a VD Appearance : Comparison of the involution capacitor is the involution capa	No.	Item	Standard Method	Test Condition	Requirements
 b.039-114 b.039-114 c.141 b.1507 (p112 calculate shall be subjected to a 1y by a 6.0xy (p12 calculate shall be increased to 10700 ps before endurance test (p1700 ps before endurance testest (p1700 ps be	10.	Endurance	IEC	* Impulse Voltage:	* Appearance :
 11. Resistance IEC - Volume sample: 12.6 for the longe of capacitance must be substrate for Y and the terminations. 12. Rebustness IEC - value is a distribution to the substrate. A force of Substrate for the capacitance must be have a distribution to the substrate. The longe and the terminations. 12. Rebustness IEC - value is a distribution to the substrate. A force of Substrate for the capacitance for the terminations. 13. Passive IEC - value is a substrate for the capacitor. Table is a substrate. The longe and the terminations. 14. Resistence IEC - value is a substrate. The longe and the terminations. 15. Resistence IEC - value is a substrate. The longe and the terminations. 16. Resistence IEC - value is a substrate. The longe and the terminations. 17. Resistence IEC - value is a substrate. A force of SN of the terminations. 18. Resistence IEC - value is a substrate. A force of SN of the terminations. 19. Resistence IEC - value is a substrate. A force of SN of the terminations. 10. remarkable damage or removal of the terminations. 11. Resistence IEC - value is a substrate. A force of SN of the terminations. 12. Rebustness IEC - value is a substrate. A force of SN of the terminations. 13. Passive IEC - value is a substrate. The capacitance must be fore the test.) 14. Active IEC - value is a substrate. A force of SN of the terminations. 15. Instrate IEC - value is a substrate form the capacitance that a form the capacitance that a substrate form the second of the terminations. 14. Kettre IEC - value is a substrate form the second of the terminations. 15. Instrate IEC - value is a substrate form the isone of the termination of the termination. 16. Instrate a substrate form the second of the termination. 17. Resistence IEC - value is a substrate form the capacit			60384-14	Each individual capacitor shall be subjected to a Vp	No mechanical damage.
 Here applied is endurance test. Artivetina 20%, Unit and U			4.14	(X1Y2 Class Impulse 6kV) impulse for three times	NP0 within ±5% or ±0.5pF whichever is larger
Additional pulse test 107/000s before endurance test D.F. Value: NPS 5.0.29% XTR: 5.0% 11. Resistance to Fiscure (Albertine Status) EC 12. Rebistance to Fiscure (Albertine Status) EC 13. Resistance to Fiscure (Albertine Status) EC 14. Resistance to Fiscure (Albertine Status) Capacitor: 1.204c (12.5.V _k) Y capacito				before applied to endurance test.	X7R within $\pm 20\%$
In Proceeding of the second				Additional pulse test 10/700µs before endurance test	* D.F Value:
 Test Temp: 125:37C * Applied Voltage: * Capacitors mounted on a substrate. * No remarkable damage. * No remarkable damage. * Capacitors mounted on a substrate. * No remarkable damage. * Capacitors mounted on a substrate. A force of SN (This capacitance change ments to change of capacitance measured before the test.) * Capacitors mounted on a substrate. * Capacitors mounted on a substrate. A force of SN (This capacitance inter of terminations of EC 00384-112 * Capacitors mounted on a substrate. A force of SN (This capacitance inter of terminations of EC 00384-114 * Capacitors mounted on a substrate. * Capacitors mounted on a substrate. * Capacitor inter of terminations of EC 00384-114 * Voltage: * Voltage: * Voltage: * Voltage: * Voltage: * Voltage: * The capacitors applied the ine force of substrate and terminations of terminations of termination for the capacitor in the sample state state in the sample state in the sample state in the sample				for Y3 class (IEC60950)	NP0 ≤ 0.25%
 1. Resistance IEC of planue in the made after keeping at room item, for 24a2 this (2632 Viz.) reparator: 1.7204; (312.5Viz.) reparator: 1.70442 (425 Viz.) reparator: 1.704442 (425 Viz.) reparator: 1.704444 (425 Viz.) reparator: 1.70444 (425 Viz.) reparator: 1.7044 (425 Viz.) reparator: 1.7044 (42				*Test Temp.: 125±3°C	X7R: ≤5.0%
 X. expactor: 1,5 Up (12:5Up) (3 capacitor: 1,5 Up (12:5Up)) Once every hour the voltage shall be increased to 100 Wms for 0.1 soc. Measurement to be made after keeping at room temp. for 24.2 Nrs (Class 1) and 44.24 hts (Class 1) No remarkable damage. Cap change of essible in 1mm with a rate of 1mm/sec. Substrate BC Capacitor: 1,5 Up (12:5Up) Capacitors mounted on a substrate. The board shall be bent 1mm with a rate of 1mm/sec. Substrate Capacitors from the capacitance under specified flexure of substrate flexure				* Applied Voltage:	 I.R. 21GΩ * Dielectric strength satisfies the specified initial value
11. Resistance In Figure 4.13 Figure 4.13 <td< th=""><th></th><th></th><th></th><th>X capacitor: $1.25U_R$ (312.5V_{AC})</th><th>Dielectric strength satisfies the specified initial value</th></td<>				X capacitor: $1.25U_R$ (312.5V _{AC})	Dielectric strength satisfies the specified initial value
11. Resistance bolicoversion IEC 100/Wms for 0.1 sec. • Measurement to be made after keeping at room term, for 242 km (Class I) • No remarkable damage. • Cap change is less than 196. • Cap c				Y capacitor: 1.70U _R (425V _{AC})	
1000/vms for 0.1 sec. • Measurement to be made after keeping at room temp. for 24±2 thm (Cless I) and 48±4 hms (Cless II) 11. Resistance EC • Capacitors mounted on a substrate. The board shall • No remarkable damage. • Cap change is less than 10%. (This capacitance change means the change of capacitance under spacified flexure of substrate from the capacitance under spacified flexure of substrate flexure of substrate from the capacitance under spacified flexure of substrate from the capacitance under spacified flexure of substrate from the capacitance under spacified flexure of substrate flexure of the terminations. of termination 60384-14 • Capacitor flexure of terminations for 10:1 sec. • No remarkable damage or removal of the terminations. of termination 18 Flam exposure time: 5 sec Max. • Capacitor didn't burn at all • Capacitor didn't burn at all				Once every hour the voltage shall be increased to	
11. Resistance or Fixure of Substrate EC 4.8 - Capacitors mounted on a substrate. The board shall be bent imm with a rate of imm/sec. - Cap change is less than 10%. (This capacitance thange of capacitance under spacefiled flexure of substrate No remarkable damage. - Cap change is less than 10%. (This capacitance thange of capacitance under spacefiled flexure of substrate from the capacitance in the capacitance that applied perpendicular to the place of substrate. A force of SN of software of substrate No remarkable damage. - Cap change is less than 10%. (This capacitance that is considered in the capacitance under spacefiled flexure of substrate from the capacitance measured before the test.) 12. Robustness of software in the capacitors mounted on a substrate. A force of SN of software is substrate - No remarkable damage or removal of the terminations. 13. Passive Femmability 0.0384-121/22 - Capacitors mounted on a substrate. A force of SN appled perpendicular to the place of substrate is capacitance for the capacitance into capacitor. - No remarkable damage or removal of the terminations. 14. Passive Femmability 0.0384-121/22 - Volume sample: 21.56 mm ³ + Flam exposure time: 5 soc Max. + Capacitor didn't burn at all + Flam exposure time: 5 soc Max. + Capacitor didn't burn with a flame. sample shall be subjected to 20 discharges from a tank capacitor. Charge to a volume test. The integes between successive discharges shall be 5 sec. + Number of impulse : 24 max. - There shall be no permanent breakdown or flashover.				1000Vrms for 0.1 sec.	
11. Resistance IEC * Capacitors mounted on a substrate. The board shall * Io remarkable damage. 12. Robustness 4.8 20 Image: The capacitors mounted on a substrate. The board shall * Io remarkable damage. 12. Robustness IEC 60384-21/22 * Capacitors mounted on a substrate. A force of SN * No remarkable damage or removal of the terminations. 12. Robustness IEC 60384-21/22 * Capacitors mounted on a substrate. A force of SN * No remarkable damage or removal of the terminations. 13. Passive IEC consult * Capacitors amplie 21.56 mm ³ * Capacitor didn't burn at all 14. Active IEC * Volume sample: 21.56 mm ³ * Capacitor didn't burn at all 14. Active IEC * The capacitors applied UR (250V _{4C}). Then each sample shall be subjected to 20 discharges from a tark capacitor, charge to a volume test. The induce test. The ind				temp for 24+2 brs (Class I) and 48+4 brs (Class II)	
to Flexure of Substrate 60384-21/22 4.8 be bent timm with a rate of timmsec. * Cap change is less than 10%. 12. Robustness of reminations IEC 4.15 * Capacitors mounted on a substrate. A force of 5N applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10t1 sec. * No remarkable damage or removal of the terminations. 13. Passive Flammability Adhesive Athene IEC 60384-21/22 * Capacitors mounted on a substrate. A force of 5N applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10t1 sec. * No remarkable damage or removal of the terminations. 13. Passive Flammability Bioscient Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Adhesive Athene Adhesive Athene Adhesive Athene Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhesive Adhes	11.	Resistance	IEC	* Capacitors mounted on a substrate. The board shall	* No remarkable damage.
Substrate 4.8 Substrate 4.8 12. Robustness formation IEC formation Capacitors mounted on a substrate. A force of 5N fermination * No remarkable damage or removal of the terminations. 12. Robustness formation IEC formation * Capacitors mounted on a substrate. A force of 5N fermination * No remarkable damage or removal of the terminations. 13. Passive Flammability IEC formation * Unume sample: 21.56 mm ³ remaination * Capacitors mounted on a substrate. A force of 5N termination * Capacitors mounted on a substrate. A force of 5N termination * No remarkable damage or removal of the terminations. 13. Passive Flammability IEC 60384-14 +17 IEC 60384-14 +13 * Volume sample: 21.56 mm ³ remembility : C. IEC 60384-14 +13 * Interespective flammability : C. IEC 60384-14 +13 * The chaese cloth shall not burn with a flame. 14. Active Flammability FCC Raset in capacitor, charge to a voltage that, when discharge flapse up soport for X2Y3, U 5000v for X1Y2 across the capacitor under test. The interval between succession flapse up soport for X2Y3, U 500v for X1Y2 across the capacitor under test. The interval between succession flapse up soport for X2Y3, U 500v for X1Y2 across the capacitor under test. The interval between succession flapse up soport for X2Y3, U 500v for X1Y2 across the capacitor under test. The interval between succession flapse up soport for X2Y3, U 500v for X1Y2 across the capacitor under test. The interval between succession flapse up soport for XY3, U 500v for X1Y2 across the capacitor under test. The interval b		to Flexure of	60384-21/22	be bent 1mm with a rate of 1mm/sec.	* Cap change is less than 10%.
12. Robustness of eminations IEC 60384-21/22 (Athesive Strength of 13. Passive IEC 60384-11 (Capacitor smounted on a substrate. A force of applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. No remarkable damage or removal of the terminations. 13. Passive Flammability IEC 60384-14 (Capacitor) * Volume sample: 21.56 mm ³ • Flammability: C. Capacitor: applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. * Capacitor didn't burn at all 13. Passive Flammability IEC 60384-14 4.13 * Volume sample: 21.56 mm ³ • Flame exposure time: 5 sec Max. 4.38 * Capacitors applied Us (250V ₄). Then each sample shall be subjected to 20 discharges for a tank capacitor, charge to a voltage that, when discharged, plase U 2200V for X2*3, U 500VV for X1*2 across the capacitor more rest. The interval between successive discharges shall be 5 sec. * The cheese cloth shall not burn with a flame. 15. Impulse IEC 60384-14 * X1 : 4.0K, X2 : 2.5KV. * There shall be no permanent breakdown or flashover. 15. Impulse IEC 60384-14 * X1 : 4.0K, X2 : 2.5KV. * There shall be no permanent breakdown or flashover.		Substrate	4.8	20	(This capacitance change means the change of capacitance
12. Robustness of (Athesive Strength of Fermination) iC apacitors mounted on a substrate. A force of SN apriled being bring the center of substrate and parallel the line joining the center of substrate and parallel the line joining the center of terminations for 10:11 sec. * No remarkable damage or removal of the terminations. 13. Passive Flammability IEC 60384-21/22 * Volume sample: 21:56 mm ³ - Eage action. * Our mean and the substrate and parallel the line joining the center of terminations for 10:11 sec. * Capacitors 10:11 sec. 13. Passive Flammability IEC 60384-21/22 * Volume sample: 21:56 mm ³ - Eage action. * Capacitors applied UK (250V _{AC}). Then each sample shall be subjected U2 of scharges from a tank capacitor, marge to a voltage that, when discharge (plase U1: 2500V for X2X) at 10:500V for X1: 4 avol. X2: 2.5KV. * The cheese cloth shall not burn with a flame. 15. Impulse Voltage IEC 60384-14 4.13 * X1: 4 avol. X2: 2.5KV. * X1: 2.0KV, Y2: 2.5KV. * There shall be no permanent breakdown or flashover.					under specified flexure of substrate from the capacitance
12. Robustness of sof (Adhesive At 15 (Adhesive Bremination) IEC 15. Impulse ICC 15. Impulse IEC 15. Impulse • Capacitors mounted on a substrate. A force of applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:11 sec. • No remarkable damage or removal of the terminations. 12. Robustness of terminations IEC 4.15 4.15 (Adhesive IEC 6034-11 4.17 IEC 6038-11 4.38 • Capacitors mounted on a substrate. A force of applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:11 sec. • No remarkable damage or removal of the terminations. 13. Passive Flammability 6038-14 4.17 IEC 6038-14 • Volume sample: 21:56 mm ³ • Category of flammability : C. • Capacitor didn't burn at all • Category of flammability : C. 14. Active Flammability 6038-144 4.13 • The capacitors applied UR (250V _{AC}). Then each sample shall be subjected to 20 discharges from a tank capacitor, charge to a voltage that, when discharged plase UI : 2500V for X273, UI stoory for X1'12 across the capacitor under test. The interval between successive discharges shall be 5 sec. • There shall be no permanent breakdown or flashover.				R = 230	measured before the test.)
12. Robustness of sof (Athesive Strength of Termination) IEC 4.15 • Capacitors mounted on a substrate. A force of 5N compendicular to the place of substrate and parallel the line joining the center of terminations for 10.11 sec. • No remarkable damage or removal of the terminations. 13. Passive Flammability IEC 60384-14 4.13 • Volume sample: 21.65 mm ³ + Strength of 4.13 • Volume sample: 21.65 mm ³ + Strength of 4.13 • Volume sample: 21.65 mm ³ + State spoure time: 5 sec Max. • Category of flammability : C. • Capacitor didn't burn at all 13. Passive Flammability IEC 60384-1 4.38 • Volume sample: 21.65 mm ³ + Time exposure time: 5 sec Max. • Category of flammability : C. • Capacitor didn't burn at all 14. Active Flammability IEC 60384-11 4.18 • The capacitors applied Ux (250V _{xc}). Then each sample shall be subjected to 20 discharges from a thic capacitor, charge to a voltage that, when discharged plase UI 2500V for X273, UI 5000V for X172 across the capacitor under test. The interval between successive discharges shall be 5 sec. • There shall be no permanent breakdown or flashover. 15. Impulse Voltage IEC 60384-14 4.13 • X1 : 4.0KV, X2 : 2.5KV. • Y2 : 5.0KV, Y3 : None. • Number of impulse : 24 max. • There shall be no permanent breakdown or flashover.				50	
12. Robustness of sof (Adhesive Strength of Terminations) EC (30342-21/22) (4.13) * Capacitors mounted on a substrate. A force of substrate and parallel the line joining the center of terminations for 10:11 sec. * No remarkable damage or removal of the terminations. 13. Passive Flammability EC (3034-14) * Olume sample: 21.56 mm ³ * Capacitor. * Capacitor didn't burn at all 14. Active Flammability EC (3034-14) * Volume sample: 21.56 mm ³ * Category of flammability : C. * Capacitor didn't burn at all 14. Active Flammability * The capacitor sapplied Us (250V _{AC}). Then each sample shall be subjected to 20 discharges from a tank capacitor. Use Source time: 5 sec. * The cheese cloth shall not burn with a flame. 15. Impulse Voltage EC 60384-14 4.13 * X1 : 4.0KV, X2 : 2.5KV, * Y2 : 5.0KV, Y3 : None. * There shall be no permanent breakdown or flashover.					
12. Robustness of (Adhesive Strength of Termination) IEC (0384-21/22 (A15) Capacitors mounted on a substrate. A force of (0384-21/22) No remarkable damage or removal of the terminations. applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. No remarkable damage or removal of the terminations. applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. No remarkable damage or removal of the terminations. applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. No remarkable damage or removal of the terminations. applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. No remarkable damage or removal of the terminations. applied to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. 13. Passive Flammability E00384-14 4.17 4.18 IEC 60384-14 4.18 * Volume sample: 21.56 mm ³ + Flame exposure time: 5 sec Max. * Flame exposure time: 5 sec Max. * Capacitor didn't burn at all * Capacitor didn't burn at all 14. Active Flammability Voltage IEC 60384-21/22 4.18 * The capacitor charges to a voltage that, when discharged, plase UI 2500V for X270, UI 5000V for X1Y2 across the capacitor discharges shall be 5 sec. * Number of impulse : 24 max. * There shall be no permanent breakdown or flashover.					
12. Robustness of Atts IEC 60384-21/22 4.15 * Capacitors mounted on a substrate. A force of 5N applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10:1 sec. * No remarkable damage or removal of the terminations. 13. Passive Flammability IEC 60384-1 4.13 * Outme sample: 21.56 mm ³ Flame exposure time: 5 sec Max. * Capacitor didn't burn at all 14. Active Flammability IEC 60384-14 4.18 * Volume sample: 21.56 mm ³ Flame exposure time: 5 sec Max. * Capacitor didn't burn at all 14. Active Flammability IEC 60384-14 4.18 * The capacitor sapplied Uk (250V _{xc}). Then each sample shall be subjected to 20 discharges from a tank capacitor, charge to a voltage that, when discharged, plase UL 2500/ for X2Y, 01 5000/ for X1Y2 across the capacitor up to the interval between successive discharges shall be 5 sec. * The reshall be no permanent breakdown or flashover. 15. Impulse IEC 60384.14 *XI : 4.0K, X2 : 2.5KV. * There shall be no permanent breakdown or flashover.				1mm	
12. Robustness of (Adnesiv Econositions 4.15 (Adnesiv) IEC 60384-21/22 terminations 115 (Adnesiv) • Capacitors mounted on a substrate. A force of parallel the line joining the center of terminations for 10° sec. • No remarkable damage or removal of the terminations. 12. Robustness of (Adnesiv) IEC 60384-21/22 terminations 115 • Capacitors mounted on a substrate. A force of IEC 60384-1 4.13 • No remarkable damage or removal of the terminations. 13. Passive Flammability EC 60384-14 4.17 IEC 60384-14 4.38 • Volume sample: 21.56 mm ³ • Flame exposure time: 5 sec Max. • Flame exposure time: 5 sec Max. • Category of flammability : C. Category of flammability : C. Starged, plase UI 2500V _k o). Then each sample shall be subjected to 20 discharges from a 4.18 • Capacitor didn't burn at all • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The cheese cloth shall not burn with a flame. • The shall be no permanent breakdown or flashover. • Voltage • Voltage 15. Impulse Voltage IEC • X1 : 4.0KV, X2 : 2.5KV. • Number of impulse : 24 max. • There shall be no permanent breakdown or flashover.					
12. Robustness of of (Adhesive Strength, 21/22 IEC (60384-21/22 (Adhesive (At 5)) (Adhesive Strength, 21/3) • Capacitors mounted on a substrate. A force of 5N aparallel the line joining the center of substrate and parallel the line joining the center of terminations for 10±1 sec. • No remarkable damage or removal of the terminations. 12. Robustness (Adhesive Termination) 4.15 (Adhesive A1.13 • Capacitor to the place of substrate and parallel the line joining the center of terminations for 10±1 sec. • No remarkable damage or removal of the terminations. 13. Passive Flammability E0 60384-14 4.17 IEC 60384-14 4.18 • Volume sample: 21.56 mm ³ • Flammability : C. IEC 60384-14 4.18 • Volume sample: 21.56 mm ³ • Flammability : C. IEC 60384-21/22 • The capacitors spelled UR (250V _{AC}). Then each sample shall be subjected to 20 discharges from a tank capacitor, charget to a voltage that, when discharged, plase U 2500V for X2Y3, Ui 5000V for XY1 2 across the capacitor under test. The interval between successive discharges shall be 5 sec. * X1 : 4.0KV, X2 : 2.5KV. * Number of impulse : 24 max. • There shall be no permanent breakdown or flashover.					
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 12. Robustness of 60384-21/22 terminations. * Capacitors mounted on a substrate. A force of SN were substrate. A force of SN emarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations. * No remarkable damage or removal of the terminations					
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Flammability60384-21/22 4.18sample shall be subjected to 20 discharges from a tank capacitor, charge to a voltage that, when discharged, plase Ui 2500V for X2Y3, Ui 5000V for X1Y2 across the capacitor under test. The interval between successive discharges shall be 5 sec.15.Impulse VoltageIEC 60384-14 4.13* X1 : 4.0kV, X2 : 2.5kV. * Y2 : 5.0kV, Y3 : None. * Number of impulse : 24 max.*There shall be no permanent breakdown or flashover.	14.	Active	IEC	* The capacitors applied UR (250V _{AC}). Then each	* The cheese cloth shall not burn with a flame.
4.18 tank capacitor, charge to a voltage that, when discharged, plase Ui 2500V for X2Y3, Ui 5000V for X1Y2 across the capacitor under test. The interval between successive discharges shall be 5 sec. 15. Impulse Voltage IIEC * X1 : 4.0kV, X2 : 2.5kV. * Y2 : 5.0kV, Y3 : None. * Number of impulse : 24 max.		Flammability	60384-21/22	sample shall be subjected to 20 discharges from a	
15. Impulse IEC * X1 : 4.0kV, X2 : 2.5kV. * Voltage 60384-14 * Y2 : 5.0kV, Y3 : None. * There shall be no permanent breakdown or flashover. * Number of impulse : 24 max. * Number of impulse : 24 max. * There shall be no permanent breakdown or flashover.			4.18	tank capacitor, charge to a voltage that, when	
Impulse IEC * X1 : 4.0kV, X2 : 2.5kV. *There shall be no permanent breakdown or flashover. Voltage 60384-14 * Y2 : 5.0kV, Y3 : None. *There shall be no permanent breakdown or flashover.				X1Y2 across the capacitor under test. The interval	
15. Impulse Voltage IEC * X1 : 4.0kV, X2 : 2.5kV. *There shall be no permanent breakdown or flashover. 4.13 * Y2 : 5.0kV, Y3 : None. * Number of impulse : 24 max. *There shall be no permanent breakdown or flashover.				between successive discharges shall be 5 sec.	
Voltage 60384-14 * Y2 : 5.0kV, Y3 : None. 4.13 * Number of impulse : 24 max.	15.	Impulse	IEC	* X1 : 4.0kV, X2 : 2.5kV.	*There shall be no permanent breakdown or flashover.
4.13 Number or impulse : 24 max.		Voltage	60384-14	* Y2 : 5.0kV, Y3 : None.	
			4.13	Number of Impulse : 24 max.	



REFLOW PROFILES



Chip Size	ΔΤ
1808, 1812, 2211, 2220	50°C

Soldering	Solder Temp.(T _c)	Soldering Time (t _p)
Reflow	235 – 260°C	< 15 sec.

Note : For example , $T_{\rm c}$ is 260°C and time tp is 15sec.

for user : The peak temperature must not exceed 260°C. The time above 255°C must not exceed 15 seconds.

Cooling

After soldering, cool the chips and the substrate gradually to room temperature. Natural cooling in air is recommended to minimize stress in the solder joint. A cooling rate not exceeding 4°C per second should be used when forced cooling is necessary.

Cleaning

All fux residues must be removed by using suitable electronic-grade vapor-cleaning solvents to eliminate contamination that could cause electrolytic surface corrosion. Good results can be obtained by using ultrasonic cleaning of the solvent. The choice of the proper system is depends upon many factors such as component mix, flux, and solder paste and assembly method. The ability of the cleaning system to remove flux residues and contamination from under the chips is very important.