



Type SA Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose

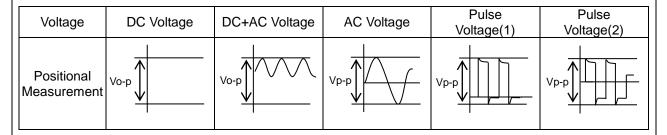
Product specifications in this catalog are as of Jun. 2019, and are subject to change or obsolescence without notice.

Please consult the approval sheet before ordering. Please read rating and Cautions first.

⚠ CAUTION

1. OPERATING VOLTAGE

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p which contains DC bias within the rated voltage range. When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rated voltage containing these irregular voltage.



2. OPERATING TEMPERATURE AND SELF-GENERATED HEAT

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself.

When the capacitor is used in a high-frequency current, pulse current or the like, it may have the self-generated heat due to dielectric-loss. Applied voltage should be the load such as self-generated heat is within 20 °C on the condition of atmosphere temperature 25 °C. When measuring, use a thermocouple of small thermal capacity-K of ϕ 0.1mm and be in the condition where capacitor is not affected by radiant heat of other components and wind of surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability.(Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

3. TEST CONDITION FOR WITHSTANDING VOLTAGE

(1) TEST EQUIPMENT

Test equipment for AC withstanding voltage should be used with the performance of the wave similar to 50/60 Hz sine wave.

If the distorted sine wave or over load exceeding the specified voltage value is applied, the defective may be caused.

(2) VOLTAGE APPLIED METHOD

When the withstanding voltage is applied, capacitor's lead or terminal should be firmly connected to the out-put of the withstanding voltage test equipment, and then the voltage should be raised from near zero to the test voltage.

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, test voltage should be applied with the *zero cross. At the end of the test time, the test voltage should be reduced to near zero, and then capacitor's lead or terminal should be taken off the out-put of the withstanding voltage test equipment.

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, the surge voltage may arise, and therefore, the defective may be caused.

*ZERO CROSS is the point where voltage sine wave pass 0V.

- See the right figure -

voltage sine wave

4. FAIL-SAFE

When capacitor would be broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure would follow an electric shock, fire or fume.

5. VIBRATION AND IMPACT

Do not expose a capacitor or its leads to excessive shock or vibration during use.

6. SOLDERING

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

When soldering capacitor with a soldering iron, it should be performed in following conditions.

Temperature of iron-tip: 400 °C max. Soldering iron wattage: 50W max. Soldering time: 3.5s max.

7. BONDING, RESIN MOLDING AND COATING

In case of bonding, molding or coating this product, verify that these processes do not affect the quality of capacitor by testing the performance of the bonded, molded or coated product in the intended equipment.

In case of the amount of applications, dryness / hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc.) are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit.

The variation in thickness of adhesive, molding resin or coating may cause a outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

8. TREATMENT AFTER BONDING, RESIN MOLDING AND COATING

When the outer coating is hot (over 100 °C) after soldering, it becomes soft and fragile. So please be careful not to give it mechanical stress.

Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used.

9. OPERATING AND STORAGE ENVIRONMENT

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture. Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed -10 to 40 °C and 15 to 85%.

Use capacitors within 6 months after delivered. Check the solderability after 6 months or more.

10. LIMITATION OF APPLICATIONS

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- 1. Aircraft equipment
- 2. Aerospace equipment
- 3. Undersea equipment
- 4. Power plant control equipment
- 5. Medical equipment
- 6. Transportation equipment (vehicles, trains, ships, etc.)
- 7. Traffic signal equipment
- 8. Disaster prevention / crime prevention equipment
- 9. Data-processing equipment exerting influence on public
- Application of similar complexity and/or reliability requirements to the applications listed in the above.

NOTICE

1. CLEANING (ULTRASONIC CLEANING)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min maximum. Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

2. CAPACITANCE CHANGE OF CAPACITORS

· Class 1 capacitors

Capacitance might change a little depending on a surrounding temperature or an applied voltage. Please contact us if you use for the strict time constant circuit.

· Class 2 and 3 capacitors

Class 2 and 3 capacitors like temperature characteristic B, E and F have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor leaves for a long time. Moreover, capacitance might change greatly depending on a surrounding temperature or an applied voltage. So, it is not likely to be able to use for the time constant circuit.

Please contact us if you need a detail information.

3. PERFORMANCE CHECK BY EQUIPMENT

Before using a capacitor, check that there is no problem in the equipment's performance and the specifications.

Generally speaking, CLASS 2 ceramic capacitors have voltage dependence characteristics and temperature dependence characteristics in capacitance. So, the capacitance value may change depending on the operating condition in a equipment. Therefore, be sure to confirm the apparatus performance of receiving influence in a capacitance value change of a capacitor, such as leakage current and noise suppression characteristic.

Moreover, check the surge-proof ability of a capacitor in the equipment, if needed, because the surge voltage may exceed specific value by the inductance of the circuit.

⚠ NOTE

- 1.Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
- 2. You are requested not to use our product deviating from this specification.

EGD08E

1. Application

This specification is applied to Safety Standard Certified Lead Type Disc Ceramic Capacitors Type SA used for General Electric equipment.

Type SA is Safety Standard Certified capacitors of Class X1,Y2.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids.

Approval standard and certified number

	Standard number *Certified number		AC Rated volt. V(r.m.s.)
UL/cUL	UL60384-14	E37921	
ENEC	EN60384-14	40042990	X1:300
(VDE)	EIN00304-14	40042990	Y2:300
CQC	IEC60384-14	CQC15001137840	

^{*}Above Certified number may be changed on account of the revision of standards and the renewal of certification.

2. Rating

2-1. Operating temperature range -40 ~ +125°C

2-2. Rated Voltage X1:AC300V(r.m.s.) Y2:AC300V(r.m.s.)

2-3. Part number configuration

ex.) <u>DE2</u>	B3	SA	471	K	A3	B	X02F
Product	Temperature	Type	Capacitance	Capacitance	Lead	Packing	Individual
code	characteristic	name		tolerance	code	style code	specification

Product code

DE2 denotes class X1,Y2.

•Temperature characteristic

Code	Temperature characteristic
1X	SL
B3	В
E3	E

Please confirm detailed specification on [Specification and test methods].

• Type name

This denotes safety certified type name Type SA.

• Capacitance

The first two digits denote significant figures; the last digit denotes the multiplier of 10 in pF. ex.) In case of 471.

$$47 \times 10^1 = 470 pF$$

• Capacitance tolerance

Please refer to [Part number list].

• Lead code

Code	Lead style
A*	Vertical crimp long type
J*	Vertical crimp short type
N*	Vertical crimp taping type

^{*} Please refer to [Part number list].

• Packing style code

Code	Packing type			
В	Bulk type			
Α	Ammo pack taping type			

• Individual specification

In case part number cannot be identified without 'individual specification', it is added at the end of part number.

ond or part name on								
Code	Specification							
	 Rated voltage: X1:AC300V(r.m.s.) Y2:AC300V(r.m.s.) Halogen Free (Br ≤ 900ppm, Cl ≤ 900ppm) 							
X02F	Br + Cl ≤ 1500ppm CP wire							
	 Dielectric strength between lead wires: AC2600V(r.m.s.) 							

Note) Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name(SA) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.

3. Marking

Type name : SA

Nominal capacitance : Actual value(under 100pF)
3 digit system(100pF and over)

Capacitance tolerance : Code Class code and Rated voltage mark : **X1 300~**

Y2 300~

Manufacturing year : Letter code(The last digit of A.D. year.)

Manufacturing month : Code

Company name code : (Made in Thailand)

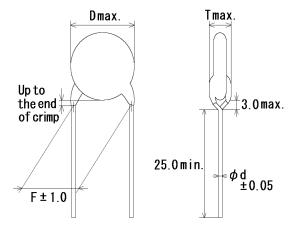
(Example)

SA 471K X1 300~ Y2 300~ 5D (M15

ETSA03C

4. Part number list

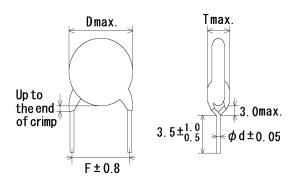
·Vertical crimp long type (Lead code:A*)



Note) The mark '*' of lead code differ from lead spacing(F) and lead diameter(d).
Please see the following list about details.

T.C. Cap. (pF) Cap. tol. Customer Part Number Murata Part Number D T F d code (pp.) code (pp.) SL 10 ±10% DE21XSA100KA3BX02F 7.0 4.0 7.5 0.6 A3 2.0 SL 15 ±10% DE21XSA150KA3BX02F 6.0 5.0 7.5 0.6 A3 5.0 SL 22 ±10% DE21XSA220KA3BX02F 6.0 4.0 7.5 0.6 A3 5.0 SL 33 ±10% DE21XSA330KA3BX02F 7.0 4.0 7.5 0.6 A3 2.0 SL 47 ±10% DE21XSA470KA3BX02F 7.0 4.0 7.5 0.6 A3 2.0 SL 68 ±10% DE21XSA680KA3BX02F 7.0 4.0 7.5 0.6 A3 2.0 B 100 ±10% DE2B3SA151KA3BX02F 6.0 4.0 7.5 0.6 A3 5.0 B 330 ±10%<										UIIIL .	111111
D T F d Code (p SL 10 ±10% DE21XSA100KA3BX02F 7.0 4.0 7.5 0.6 A3 2.5	тс	Сар.	Сар. Сар.	Customer Part Number	Murata Part Number		nensi	Lead	Pack qty.		
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	Е	3300	±20%		DE2E3SA332MA3BX02F	9.0	4.0	7.5	0.6	A3	250
F 40000 L000	Е	4700	±20%		DE2E3SA472MA3BX02F	10.0	5.0	7.5	0.6	A3	250
E 10000 $\pm 20\%$ DE2E3SA103WA3BX02F 15.0 5.0 7.5 0.6 A3 10	Е	10000	$\pm 20\%$		DE2E3SA103MA3BX02F	15.0	5.0	7.5	0.6	А3	100

·Vertical crimp short type
(Lead code:J*)

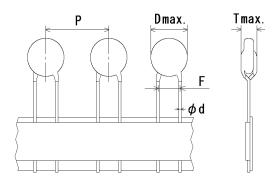


Note) The mark '*' of lead code differ from lead spacing(F) and lead diameter(d).
Please see the following list about details.

Unit · mm

									Unit :	mm
T.C.	Сар.	p. Cap.	Customer Part Number	Murata Part Number	Dimension (mm)				Lead	Pack
1.0.	(pF)	tol.	Customer Fait Number	Widiata Fait Number	D	Т	F	d	code	qty. (pcs)
SL	10	\pm 10%		DE21XSA100KJ3BX02F	7.0	4.0	7.5	0.6	J3	500
SL	15	$\pm 10\%$		DE21XSA150KJ3BX02F	6.0	5.0	7.5	0.6	J3	500
SL	22	$\pm 10\%$		DE21XSA220KJ3BX02F	6.0	4.0	7.5	0.6	J3	500
SL	33	±10%		DE21XSA330KJ3BX02F	7.0	4.0	7.5	0.6	J3	500
SL	47	±10%		DE21XSA470KJ3BX02F	7.0	4.0	7.5	0.6	J3	500
SL	68	±10%		DE21XSA680KJ3BX02F	8.0	4.0	7.5	0.6	J3	500
В	100	±10%		DE2B3SA101KJ3BX02F	6.0	4.0	7.5	0.6	J3	500
В	150	±10%		DE2B3SA151KJ3BX02F	6.0	4.0	7.5	0.6	J3	500
В	220	±10%		DE2B3SA221KJ3BX02F	6.0	5.0	7.5	0.6	J3	500
В	330	±10%		DE2B3SA331KJ3BX02F	6.0	4.0	7.5	0.6	J3	500
В	470	±10%		DE2B3SA471KJ3BX02F	7.0	4.0	7.5	0.6	J3	500
В	680	±10%		DE2B3SA681KJ3BX02F	7.0	4.0	7.5	0.6	J3	500
Е	1000	±20%		DE2E3SA102MJ3BX02F	6.0	4.0	7.5	0.6	J3	500
Е	1500	±20%		DE2E3SA152MJ3BX02F	7.0	4.0	7.5	0.6	J3	500
Е	2200	±20%		DE2E3SA222MJ3BX02F	8.0	4.0	7.5	0.6	J3	500
Е	3300	±20%		DE2E3SA332MJ3BX02F	9.0	4.0	7.5	0.6	J3	500
E	4700	±20%		DE2E3SA472MJ3BX02F	10.0	5.0	7.5	0.6	J3	500
Е	10000	±20%		DE2E3SA103MJ3BX02F	15.0	5.0	7.5	0.6	J3	200

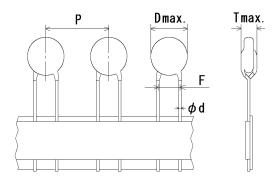
Vartical crimp taping type (Lead code:N*)



Note) The mark '*' of lead code differ from lead spacing(F), lead diameter(d) and pitch of component(P). Please see the following list or taping specification about details.

	Offit : Hilli										
T.C.	Сар.	Сар.	Cap. tol. Customer Part Number Murata Part Number		Dimension (mm)					Lead	Pack
1.0.	(pF)	tol.			D	Т	F	d	Р	code	qty. (pcs)
SL	10	±10%		DE21XSA100KN3AX02F	7.0	4.0	7.5	0.6	15.0	N3	1000
SL	15	±10%		DE21XSA150KN3AX02F	6.0	5.0	7.5	0.6	15.0	N3	1000
SL	22	±10%		DE21XSA220KN3AX02F	6.0	4.0	7.5	0.6	15.0	N3	1000
SL	33	±10%		DE21XSA330KN3AX02F	7.0	4.0	7.5	0.6	15.0	N3	1000
SL	47	±10%		DE21XSA470KN3AX02F	7.0	4.0	7.5	0.6	15.0	N3	1000
SL	68	±10%		DE21XSA680KN3AX02F	8.0	4.0	7.5	0.6	15.0	N3	1000
В	100	±10%		DE2B3SA101KN3AX02F	6.0	4.0	7.5	0.6	15.0	N3	1000
В	150	±10%		DE2B3SA151KN3AX02F	6.0	4.0	7.5	0.6	15.0	N3	1000
В	220	±10%		DE2B3SA221KN3AX02F	6.0	5.0	7.5	0.6	15.0	N3	1000
В	330	±10%		DE2B3SA331KN3AX02F	6.0	4.0	7.5	0.6	15.0	N3	1000
В	470	±10%		DE2B3SA471KN3AX02F	7.0	4.0	7.5	0.6	15.0	N3	1000
В	680	±10%		DE2B3SA681KN3AX02F	7.0	4.0	7.5	0.6	15.0	N3	1000
Е	1000	±20%		DE2E3SA102MN3AX02F	6.0	4.0	7.5	0.6	15.0	N3	1000
Е	1500	±20%		DE2E3SA152MN3AX02F	7.0	4.0	7.5	0.6	15.0	N3	1000
Е	2200	±20%		DE2E3SA222MN3AX02F	8.0	4.0	7.5	0.6	15.0	N3	1000
Е	3300	±20%		DE2E3SA332MN3AX02F	9.0	4.0	7.5	0.6	15.0	N3	1000
Е	4700	±20%		DE2E3SA472MN3AX02F	10.0	5.0	7.5	0.6	15.0	N3	1000

Vartical crimp taping type (Lead code:N*)



Note) The mark '*' of lead code differ from lead spacing(F), lead diameter(d) and pitch of component(P). Please see the following list or taping specification about details.

тс	Сар.	Сар.	Customer Part Number	Murata Part Number		Dimension (mm)						Lead	Pack
1.0.	(pF)	tol.	Customer Fait Number	ividiata Fait Numbei	D	Т	F	d	Р	COOE .	qty. (pcs)		
Е	10000	±20%		DE2E3SA103MN7AX02F	15.0	5.0	7.5	0.6	30.0	N7	400		

			1,1,1	eterence oi	···y						
	ecification and test		I 0	-:(: +:				Т	t method		
No. 1	Appearance and o		No marked de form and dime	cification fect on appeara ensions. o [Part number li		The capacitor should be inspected by naked eyes for visible evidence of defect. Dimensions should be measured with slide calipers.				•	
2	Marking		To be easily le	gible.		The capacitor should be inspected by naked eyes					
3	Dielectric strength	Between lead wires No failure.			AC26 the le	600V(r.m. ead wires	s.) <50/60 for 60 s.	ot be dama OHz> is ap	plied bet	ween	
		Body insulation	No failure.			First, the terminals of the capacitor should be connected together. Then, a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm			About About To A mm About Abou		
4	Insulation Resista	ince (I.R.)	10000MΩ min			with E The v	DC500±5 oltage sh gh a resis	0V within nould be a stor of 1M		charging. the capac	itor
5	Capacitance		Within specified tolerance.		1±0.1	kHz and	AC1±0.2	be meası V(r.m.s.) n	nax		
6	Dissipation Factor (D.F.)		2.5% max.						hould be r and AC1±0		
7	Temperature characteristic		Char. SL: +350 to -1000 pm/°C (Temp. range: +20 to +85°C) Char. B: Within ±10 % Char. E: Within +20/-55% (Temp. range: -25 to +85°C)			The capacitance measurement should be made at each step specified in Table.				made at	
				Step Temp.(°C)		1 2 3 4 5 20±2 -25±2 20±2 85±2 20±2					
8	Active flammabilit	у	The cheese-cl fire.	oth should not b	e on	least chees 20 dis discha maint	ene but resections one but resection. Scharges show that aimed for the section of	the capacity of the capacity of the interest ould be 5 capacity of the interest ould be 5 capacity of the interest ould be 5 capacity of the interest of the interest output of the interest of the interest output of the interest o	0A	blete layerd be subject to should discharge ct. Sho	rs of ected to ssive be e.c. ut

			Reference only	
No.	Item		Specification	Test method
9	Robustness of terminations	Tensile	Lead wire should not cut off. Capacitor should not be broken.	Fix the body of capacitor, apply a tensile weight gradually to each lead wire in the radial direction of
				capacitor up to 10N and keep it for 10±1 s.
		Bending		With the termination in its normal position, the
				capacitor is held by its body in such a manner that
				the axis of the termination is vertical; a mass applying a force of 5N is then suspended from the
				end of the termination.
				The body of the capacitor is then inclined,
				within a period of 2 to 3 s, through an angle of
				about 90° in the vertical plane and then
				returned to its initial position over the same period
				of time; this operation constitutes one bend.
				One bend immediately followed by a second bend in the opposite direction.
10	Vibration	Appearance	No marked defect.	The capacitor should be firmly soldered to the
	resistance	Capacitance	Within the specified tolerance.	supporting lead wire and vibration which is 10 to
		D.F.	2.5% max.	55Hz in the vibration frequency range,1.5mm in
				total amplitude, and about 1min in the rate of
				vibration change from 10Hz to 55Hz and back to
				10Hz is applied for a total of 6 h; 2 h each in
11	Solderability of lead	<u></u>	Lead wire should be soldered with	3 mutually perpendicular directions. The lead wire of a capacitor should be dipped into
''	Joid Grability of lead		uniformly coated on the axial	a ethanol solution of 25wt% rosin and then into
			direction over 3/4 of the	molten solder for 2±0.5 s. In both cases the depth
			circumferential direction.	of dipping is up to about 1.5 to 2.0mm from the
				root of lead wires.
				Temp. of solder:
				245±5°C Lead Free Solder (Sn-3Ag-0.5Cu)
12	Soldering effect	Appearance	No marked defect.	Solder temperature: 350±10°C or 260±5°C
	(Non-preheat)	Capacitance change	Within ±10%	Immersion time : 3.5±0.5 s
		I.R.	1000MΩ min.	(In case of 260±5°C: 10±1 s) The depth of immersion is up to about
		Dielectric	Per item 3	1.5 to 2.0mm from the root of lead wires.
		strength	T OF ROLL O	
		3		Thermal Capacitor
				1.5
				10 2.0mm
				Molten
				solder
				Pre-treatment : Capacitor should be stored at
				125±2°C for 1 h, and apply the
				AC2000V(r.m.s.) 60s then placed
				at *1room condition for 24±2 h
				before initial measurements.
				(Do not apply to Char. SL) Post-treatment: Capacitor should be stored for 1
				to 2 h at *1 room condition.
13	Soldering effect	Appearance	No marked defect.	First the capacitor should be stored at 120+0/-5°C
	(On-preheat)	Capacitance	Within ±10%	for 60+0/-5 s.
		change		Then, as in figure, the lead wires should be immersed solder of 260+0/-5°C up to 1.5 to 2.0mm
		I.R.	1000M Ω min.	from the root of terminal for 7.5+0/-1 s.
		Dielectric	Per item 3	nom the root of terminal for 7.5±0/-1 5.
		strength		Thermal
				insulating
				1.5 to 2.0mm
				Molten
				solder
				Pre-treatment : Capacitor should be stored at
				125±2°C for 1 h, and apply the
				AC2000V(r.m.s.) 60s then placed
				at *1room condition for 24±2 h
				before initial measurements.
				(Do not apply to Char. SL) Post-treatment: Capacitor should be stored for 1 to
				2 h at *1 room condition.
*1 "ro	om condition" Tempe	rature: 15 to 35°	C, Relative humidity: 45 to 75%, Atmo	
1			,,	•

			Reference only	
No.	Item	า	Specification	Test method
14	Flame test		The capacitor flame discontinue as follows. Cycle Time 1 to 4 30 s max. 5 60 s max.	The capacitor should be subjected to applied flame for 15 s. and then removed for 15 s until 5 cycle.
15	Passive flammabili	ty	The burning time should not be exceeded the time 30 s. The tissue paper should not ignite.	The capacitor under test should be held in the flame in the position which best promotes burning. Time of exposure to flame is for 30 s. Length of flame: 12±1mm Gas burner: Length 35mm min. Inside Dia. 0.5±0.1mm Outside Dia. 0.9mm max. Gas: Butane gas Purity 95% min. Gas burner About 8mm Flame 200±5mm About 10mm thick board
16	Humidity (Under steady state)	Appearance Capacitance change D.F. I.R. Dielectric strength	No marked defect. Char. SL: Within $\pm 5\%$ Char. B: Within $\pm 10\%$ Char. E: Within $\pm 15\%$ Char. SL: 2.5% max. Char. B, E: 5.0% max. 3000M Ω min. Per item 3	Set the capacitor for 500±12 h at 40±2°C in 90 to 95% relative humidity. Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for 1 to 2 h at *1 room condition.
17	Humidity loading	Appearance Capacitance change D.F. I.R. Dielectric strength	No marked defect. Char. SL: Within ±5% Char. B: Within ±10% Char. E: Within ±15% Char. SL: 2.5% max. Char. B, E: 5.0% max. 3000MΩ min. Per item 3 C. Relative humidity: 45 to 75%. Atmo-	Apply AC300V(r.m.s.) for 500±12 h at 40±2°C in 90 to 95% relative humidity. Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for 1 to 2 h at *1room condition.

^{*1 &}quot;room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Life Appearance No marked defect. Each individual capacitor should be subjected to a 5KV impulses for three times. Then the capacitors are applied to life test.	18 Life App Cap cha I.R. Die stree 19 Temperature and immersion cycle Cap cha C	Capacitance change I.R. Dielectric	No marked defect. Within ±20% 3000MΩ min.	The for The of 1 Thr to a of r volt	ch indivisik v impu applied 100 (%) 50 30 17 e capacit a period e air in the 125+2/-0 roughout a AC510) mains freatage is in the tage is in	tage dual capacitor lses for three to life test. T2 ors are placed of 1000 h. le oven is mai °C, and relatithe test, the c /(r.m.s.)<50/6	Front time (T1) Time to half-va t d in a circul ntained at a ve humidity capacitors a	ating air oven a temperature r of 50% max.			
Capacitance change Step Temperature and immersion cycle	Temperature and immersion cycle Temperature and immersion cycle D.F. I.R. Die	Capacitance change I.R. Dielectric	Within $\pm 20\%$ 3000M Ω min.	The for The of 1 Thr to a of r volt	ch indivisik v impu applied 100 (%) 50 30 17 e capacit a period e air in the 125+2/-0 roughout a AC510) mains freatage is in the tage is in	dual capacitor lses for three to life test. T2 ors are placed of 1000 h. lee oven is mai °C, and relatithe test, the c /(r.m.s.)<50/6	Front time (T1) Time to half-va t d in a circul ntained at a ve humidity capacitors a	ating air oven a temperature r of 50% max.			
LR. 3000MΩ min.	19 Temperature and immersion cycle Cap cha	change I.R. Dielectric	3000MΩ min.	The for The of 1 Thr to a of r volt	ikV impu applied 100 (%) 50 30 1 T e capacit a period e air in the 125+2/-0 roughout a AC510' mains free tage is in	Ises for three to life test. T2 ors are placed of 1000 h. the oven is mai °C, and relatified the test, the color.	Front time (T1) Time to half-va t d in a circul ntained at a ve humidity capacitors a	ating air oven a temperature r of 50% max.			
Dielectric strength Per item 3 Per item 4 Per item 6 Per item 7 Per item 6 Per item 6 Per item 7 Per item 7 Per item 6 Per item 7 Per item 8 Per item 8 Per item 8 Per item 9 Per it	19 Temperature and immersion cycle Cacha D.F. I.R. Die	Dielectric		The for The of 1 Thr to a of r volt	100 (%) 100 (%	ors are placed of 1000 h. le oven is mai °C, and relatithe test, the ct/(r.m.s.)<50/6	Time to half-va	ating air oven a temperature of 50% max.			
strength Strength	19 Temperature and immersion cycle Carcha D.F. I.R. Die		Per item 3	for The of 1 Thr to a of r volt	e capaciti a period e air in the 125+2/-0 roughout a AC510' mains fre tage is in	ors are placed of 1000 h. lee oven is mai °C, and relatifithe test, the ct/(r.m.s.)<50/6	Time to half-va	ating air oven a temperature of 50% max.			
The capacitors are placed in a circulating air oven for a period of 1000 h. The air in the oven is maintained at a temperature of 125±2-20 °C, and relative humidity of 50% max. Throughout the test, the capacitors are subjected to a AC5100V(r.m.s.) 60% follows alternating voltage of mains frequency, except that once each hout working is increased to AC1000V(r.m.s.) 60% then placed at "100m condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60% then placed at 100m condition for 24±2 h before initial measurements. Capacitance Char. SL : Within ±5% change c	19 Temperature and immersion cycle Cacha D.F.	strength		for The of 1 Thr to a of r volt	e capaciti a period e air in the 125+2/-0 roughout a AC510' mains fre tage is in	ors are placed of 1000 h. lee oven is mai °C, and relatifithe test, the ct/(r.m.s.)<50/6	Time to half-va	ating air oven a temperature of 50% max.			
The capacitors are placed in a circulating air oven for a period of 1000 h. The air in the oven is maintained at a temperature of 125+2/-0 °C, and relative humbidity of 50% max. Throughout the test, the capacitors are subjected to a AC510V(r.m.s.) c50/60Hz> alternating voltage of mains frequency, expet that once each hour the voltage is increased to AC100V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at 1° inoom condition for 24±2 h before initial measurements. (Dara B: Within ±10% Char. B: Within ±5% change Char. B: Within ±20% Char. B: Within ±2	immersion cycle Cap cha			for The of 1 Thr to a of r volt	e capacit a period e air in th 125+2/-0 roughout a AC510' mains fre tage is in	ors are placed of 1000 h. is even is main °C, and relating the test, the cot/(r.m.s.)<50/6	t in a circul ntained at a ve humidity capacitors a	ating air oven a temperature v of 50% max.			
The capacitors are placed in a circulating air oven for a period of 1000 h. The air in the oven is maintained at a temperature of 125+27-0 °C, and relative humidity of 50% max. Throughout the test, the capacitors are subjected to a AC510V(r.m.s)-5060Hz-b alternating voltage of mains frequency, except that once each hour the voltage is increased to AC1000V(r.m.s) flost hen placed at "155±2" for 1 h, and apply the AC2000V(r.m.s) flost hen placed at "155±2" for 1 h, and apply the AC2000V(r.m.s) flost hen placed at "155±2" for 1 h, and apply the AC2000V(r.m.s) flost hen placed at "155±2" for 1 h, and apply the AC2000V(r.m.s) flost hen placed at "155±3" flost hen placed	immersion cycle Cap cha			for The of 1 Thr to a of r volt	e capacit a period e air in th 125+2/-0 roughout a AC510 mains fre tage is in	ors are placed of 1000 h. is even is main °C, and relating the test, the cot/(r.m.s.)<50/6	d in a circul ntained at a ve humidity capacitors a	a temperature of 50% max.			
The capacitors are placed in a circulating air oven for a period of 1000 h. The air in the oven is maintained at a temperature of 125±2/2 °C, and relative humidity of 50% max. Throughout the test, the capacitors are subjected to a AC\$10V(r.m.s.) 6000Hz> alternating voltage of mains frequency, except that once each hour the voltage is increased AC\$100V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 608 sthen placed at "froom condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for 24±2 h at *iroom condition. The capacitor should be stored for 24±2 h at *iroom condition. The capacitor should be stored for 24±2 h at *iroom condition. The capacitor should be stored for 24±2 h at *iroom condition. The capacitor should be stored for 24±2 h at *iroom condition. The capacitor should be stored to 5 temperature cycles, then consecutively to 2 immersion cycles. **Char. B. : Within ±5% char. B. : 25% max. Char. B. E. : 5.0% max. I.R. 3000M02 min. Dielectric strength **Per item 3** **LR** **Step** Temperature(°C)** Time Immersion water 1 +65+5/-0 15 min water 2 0+3 15 min water	immersion cycle Cap cha			for The of 1 Thr to a of r volt	e capacit a period e air in th 125+2/-0 roughout a AC510 mains fre tage is in	ors are placed of 1000 h. e oven is maing of control of the test, the test of the test, the test of the test, the test of the tes	ntained at a ve humidity capacitors a	a temperature of 50% max.			
The capacitors are placed in a circulating air oven for a period of 1000 h. The air in the oven is maintained at a temperature of 125±2/0 °C, and relative humidity of 50% max. Throughout the text capacitors are subjected to a AC\$10V(r.m.s.) <50/60Hz> alternating voltage of mains frequency, except that once each hour the voltage is increased AC\$100V(r.m.s.) for 0.1 s. Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°1com condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored of 24±2 h at 1°1com condition for 24±2 h before initial measurements. (Char. SL : Within ±5% Char. B. : Within ±10% Char. B. : Within ±20% D.F. Char. SL : Within ±20% D.F. Char. SL : 2.5% max. Char. B. E. 5.0% max. I.R. 3000MΩ min. Dielectric strength Per item 3 I.R. 3000MΩ min. Dielectric strength Per item 3 The capacitor should be stored at 125±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at 1°25±2°C for 1 h, and apply the AC\$2000V(r.m.s.) 60s then placed at	immersion cycle Carcha D.F I.R. Die			for The of 1 Thr to a of r volt	a period e air in th 125+2/-0 roughout a AC510 mains fre tage is in	ors are placed of 1000 h. le oven is mai °C, and relatithe test, the cov(r.m.s.)<50/6	ntained at a ve humidity capacitors a	a temperature of 50% max.			
for a period of 1000 h. The air in the oven is maintained at a temperature of 125+2/-0 °C, and relative humidity of 50% max. Throughout the test, the capacitors are subjected to a AC510V(r.m.s.) < a bidding is increased to AC1000V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125+2°C for 1 h, and apply the AC2000V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125+2°C for 1 h, and apply the AC2000V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125+2°C for 1 h, and apply the AC2000V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored for 24±2 h at 1°room condition for 24±2 h at 1°room condition for 24±2 h at 1°room condition. 19 Temperature and immersion cycle Capacitance Char. St. : Within ±5% Char. B: Within ±5% Char. B: Within ±5% Char. B: Within ±20% Value of 1 h and 2000 (value of 1 h and 2000 value of 1 h and 2000 (value of 1 h and 2000 value of 1 h and 2000 vit. Salt water Cycle imital measurements. (Do not apply to Char. St.) Post-treatment: Capacitor should be stored for 1 h and 2000 vit. Salt water Cycle imital measurements. (Do not apply to Char. St.) Post-treatment: Capacitor should be stored for 1 h and 2000 vit. Salt water Cycle imital measurements. (Do not apply to Char. St.) Post-treatment: Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Salt water Capacitor should be stored for 1 h and 2000 vit. Sal	immersion cycle Carcha D.F I.R. Die			for The of 1 Thr to a of r volt	a period e air in th 125+2/-0 roughout a AC510 mains fre tage is in	of 1000 h. se oven is mai °C, and relati the test, the o V(r.m.s.)<50/6	ntained at a ve humidity capacitors a	a temperature of 50% max.			
The air in the oven is maintained at a temperature of 125+2/-0 °C, and relative humidity of 50% max. Throughout the test, the capacitors are subjected to a AC510V(r.m.s.) sG00(boftz- alternating voltage of mains frequency, except that none each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 s. Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at 1*room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored for Capacitance Char. SL : Within ±5% Char. E : Within ±20% Char. E : Within ±20% Char. SL : 2.5% max. I.R. 3000MΩ min. Per item 3 I.R. 3000MΩ min. Per item 3 Fer item 3 Fer item 3 The air in the oven is maintained at a temperature of 1 s. and policy of an acceptance of mains frequency, except that none acceptance of mains frequency, except that none acceptance of the voltage is increased to AC1000V(r.m.s.) 60s then placed at 1*room condition for 24±2 h defined to the voltage is increased to AC1000V(r.m.s.) 60s then placed at 1*room condition for 24±2 h defined to the voltage is increased to AC2000V(r.m.s.) 60s then placed at 1*room condition. The capacitor should be subjected to 5 temperature cycles. The capacitor should be subjected to 5 temperature cycles. Step Temperature(°C) Time Immersion cycles. Step Temperature(°C) Time Immersion cycles. Step Temperature(°C) Time Immersion cycles. Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at 1*room condition for 24±2 h defined to the voltage at 1*room condition for 24±2 h defined to the voltage at 1*room condition for 24±2 h defined to the voltage at 1*room condition for 24±2 h defined to the voltage at 1*room condition.	immersion cycle Cap cha			The of 1 Thr to a of r	e air in the second of the sec	e oven is mai °C, and relation the test, the condition of the test, the condition of the test of the t	ve humidity capacitors a	of 50% max.			
Throughout the test, the capacitors are subjected to a AC510V _L m.s.) + 50% flotDez alternating voltage of mains frequency, except that once each hour the voltage is increased to AC1000V _L m.s.) for 0.1 s. Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V _L m.s.) flost then placed at 1*room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored for 24±2 h at 1*room condition. Throughout the test, the capacitors are subjected to a AC5000V _L m.s.) flost then placed at 1*105±2°C for 1 h, and apply the AC2000V _L m.s.) flost then placed at 1*room condition. The capacitor should be stored to 24±2 h at 1*room condition. The capacitor should be subjected to 5 temperature cycles, then consecutively to 2 immersion cycles. Char. SL : Within ±10% Char. SL : 25% max. Char. B, E : 5.0% max. I.R. 3000MΩ min. Dielectric strength Per item 3 Throughout the test, the capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V _L m.s.) for 0.1 s. Throughout the test, the voltage of mains frequency, except that once each hour the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the test, the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the test, the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the test, the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the test, the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the test, the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the voltage is increased to AC1000V _L m.s.) for 0.1 s. Throughout the voltage is increased to AC1000V _L m.s.) for 0.1 s. The capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V _L m.s.) for 0.1 s. The capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V _L m.s.) for 0.1 s. The capacitor should be subjected to 5 temperature cycle. Throughout the vo	immersion cycle Carcha D.F I.R. Die			Thr to a of r volt	oughout AC510 mains fre tage is in	the test, the σ (r.m.s.)<50/6	apacitors a				
to a AČS10V(r.m.s.) x50/60Hz> alternating voltage of mains frequency, except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at "10om condition for 24±2 h before initial measurements. (D not apply to Char. St.) Post-treatment: Capacitor should be stored for 24±2 h at "10om condition for 24±2 h at "10om condition. The capacitor should be subjected to 5 temperature cycles. Char. B. : Within ±10% Char. B. : Within	immersion cycle Cap cha			to a of n volt	a AC510\ mains fre tage is in	/(r.m.s.)<50/6		are subjected			
19 Temperature and immersion cycle Appearance Capacitance change Char. B. Within ±10% Char. E. Within ±20% Char. B. Stopmax.	immersion cycle Carcha D.F I.R. Die			of n	nains fre tage is in		unz> aileii				
Voltage is increased to AC1000V(r.m.s.) for 0.1 s. Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for 24±2 h at *1room condition for 24±2 h at *1	immersion cycle Carcha D.F I.R. Die			volt	tage is in	of mains frequency, except that once each hour the					
Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at "froom condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored at "15±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at "150m condition. The Capacitor should be stored for 24±2 h at "froom condition or 24±2 h at "froom condition or 24±2 h at "froom condition. The capacitor should be subjected to 5 temperature cycles. (Char. B. : Within ±5% change Char. B. : Within ±20% Char. B. : Within ±20% Char. B. : Within ±20% Char. B. E. : 5.5% max. Char. B. E. : 5.5% max. I.R.	immersion cycle Carcha D.F I.R. Die				voltage is increased to AC1000V(r.r						
AC2000V(r.m.s.) 60s their placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored for 24±2 h at *1room condition. Appearance No marked defect. (Char. SL : Within ±5% change Char. SL : Within ±10% Char. E : Within ±20% D.F. Char. SL : 2.5% max. (Char. SL : 5.5% max. 1.R. 3000MΩ min. Dielectric strength Dielectric strength Appearance Char. SL : 2.5% max. (Char. SL : 2.5% max. 1.R. 3000MΩ min. Dielectric strength Per item 3 Appearance Char. SL : 2.5% max. (Char. SL : 2.5% max. 1.R. 3000MΩ min. The capacitor should be subjected to 5 temperature cycles, then consecutively to 2 immersion cycles. **Temperature cycles** Step Temperature(°C) Time 1 mersion water 1 +65+5/-0 15 min 2 water 2 0±3 15 min 3 salt water Cycle time: 2 cycles Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at **Troom condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored for	immersion cycle Carcha D.F I.R. Die										
Temperature and immersion cycle Appearance Appearance Char. St. Within ±5% char. B. Within ±20%	immersion cycle Carcha D.F I.R. Die			1							
Defore initial measurements. (Do not apply to Char. SL)	immersion cycle Carcha D.F I.R. Die										
Temperature and immersion cycle Appearance No marked defect. Capacitance change Char. St. Within ±5% Char. B. Within ±20% Char. B. S. 1.0% max. Char. B. 1.0% ma	immersion cycle Cap cha										
Post-treatment : Capacitor should be stored for 24±2 h at *1*room condition. Post-treatment : Capacitor should be stored for 24±2 h at *1*room condition. The capacitor should be subjected to 5 temperature cycles.	immersion cycle Cap cha										
Temperature and immersion cycle Appearance Char. SL : Within ±5% Char. B : Within ±20% Char. B : Within ±20% Char. B : S. 5. 6 max.	immersion cycle Cap cha			Pos	st-treatm	ent :Capacito	r should be	stored for			
Capacitance change Char. SL : Within ±5% Char. B : Within ±10% Char. E : Within ±10% Char. E : Within ±20% D.F. Char. SL : 2.5% max. Char. B, E : 5.0% max. I.R. 3000MΩ min. Dielectric strength Per item 3 Step Temperature(°C) Time 1	immersion cycle Cap cha										
change Char. B : Within ±20% D.F. Char. SL : 2.5% max. Char. B, E : 5.0% max. Step Temperature (°C) Time I.R. 3000MΩ min. 2 Room temp. 3 min Dielectric strength Per item 3 1 -40+0/-3 30 min Cycle time:5 cycles 2 Room temp. 3 min Cycle time:5 cycles 2 Immersion cycle> Step Temperature(°C) Time Immersion water 1 +65+5/-0 15 min water Salt water 2 0±3 15 min water Cycle time:2 cycles Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored for	D.F										
Char. E : Within ±20% D.F. Char. SL : 2.5% max. Char. B, E : 5.0% max. I.R. 3000MΩ min. Dielectric strength Per item 3 Step Temperature(°C) Time 1	D.F I.R. Die			Cyc	ies, ther	consecutively	y to 2 imme	ersion cycles.			
D.F. Char. SL : 2.5% max. Char. B, E : 5.0% max. I.R. 3000MΩ min. Dielectric strength Per item 3 Step Temperature(°C) Time 1	I.R. Die	onango		<te< td=""><td>emperatu</td><td>re cycle></td><td></td><td></td></te<>	emperatu	re cycle>					
Char. B, E : 5.0% max. 1	Die	D.F.			Sten	Temperat	uro(°C)	Time			
1.R. 3000MΩ min. 2 Room temp. 3 min 3 +125+3/-0 30 min 4 Room temp. 3 min Cycle time:5 cycles	Die		Char. B, E : 5.0% max.								
strength 4 Room temp. 3 min Cycle time:5 cycles Step Temperature(°C) Time Immersion water 1		I.R.	3000MΩ min.								
Cycle time:5 cycles Step Temperature(°C) Time Immersion water 1	stre		Per item 3			+125+	-3/-0				
Step Temperature(°C) Time Immersion water 1 +65+5/-0 15 min Clean water 2 0±3 15 min Salt water Cycle time:2 cycles Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for		strength		L	4	Room t					
Step Temperature(°C) Time Immersion water 1 +65+5/-0 15 min Clean water 2 0±3 15 min Salt water Cycle time:2 cycles Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for							Cycle tir	ne:5 cycles			
Step Temperature(°C) Time water				<in< td=""><td>nmersion</td><td>cycle></td><td></td><td></td></in<>	nmersion	cycle>					
1 +65+5/-0 15 min Clean water 2 0±3 15 min Salt water Cycle time:2 cycles Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for				Ste	ep Ten	nperature(°C)	Time				
Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *¹room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for											
2 0±3 15 min Salt water Cycle time:2 cycles Pre-treatment : Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment : Capacitor should be stored for					1 •	+65+5/-0	15 min				
Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for					,	0+3	15 min				
Pre-treatment: Capacitor should be stored at 125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for					2	U±S	_				
125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *¹room condition for 24±2 h before initial measurements. (Do not apply to Char. SL) Post-treatment: Capacitor should be stored for							Cycle tir	ne:2 cycles			
Eizen at 100m obliation.					125±2°C for 1 h, and apply the AC2000V(r.m.s.) 60s then placed at *1room condition for 24±2 h before initial measurements. (Do not apply to Char. SL)						

6.Packing specification

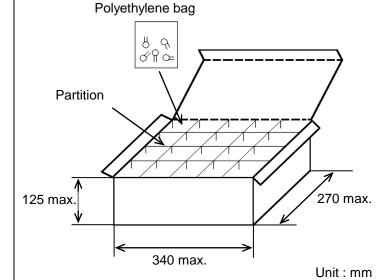
•Bulk type (Packing style code : B)

*1 *2
The number of packing = Packing quantity × n

The size of packing case and packing way

*1 : Please refer to [Part number list].

*2 : Standard n = 20 (bag)



Note)

The outer package and the number of outer packing be changed by the order getting amount.

- •Ammo pack taping type (Packing style code : A)
 - · The tape with capacitors is packed zigzag into a case.
 - · When body of the capacitor is piled on other body under it.
- The size of packing case and packing way

 Position of label

 Position of label

 Capacitor

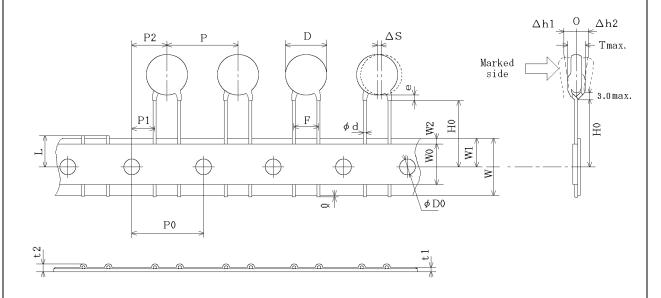
 Hold down tape

 Hold down tape upper

7. Taping specification

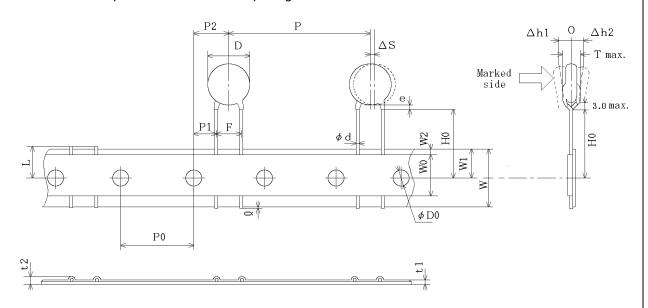
7-1. Dimension of capacitors on tape

Vertical crimp taping type < Lead code : N3 > Pitch of component 15.0mm / Lead spacing 7.5mm



	1	Offit . IIIIII
Code	Dimensions	Remarks
Р	15.0±2.0	
P0	15.0±0.3	
F	7.5±1.0	
P2	7.5±1.5	
P1	3.75±1.0	Deviation of progress direction
D	Please refer to [Part number list].	
ΔS	0±2.0	They include deviation by lead bend .
W	18.0±0.5	
W1	9.0±0.5	Deviation of tape width direction
ПО	10.0 \ 2.0	
по	16.0± ₀	
Q	+0.5~-1.0	
φ D 0	4.0±0.1	
φd	0.60±0.05	
t1	0.6±0.3	
t2	1.5 max.	They include hold down tape thickness.
∆h1	0.0	
∆h2		
L	11.0± _{1.0}	
W0	11.5 min.	
W2	1.5±1.5	
е	Up to the end of	crimp
Т	Please refer to [Part number list].	
	P P0 F P2 P1 D ΔS W W1 H0 Q φD0 φd t1 t2 Δh1 Δh2 L W0 W2 e	P 15.0±2.0 P0 15.0±0.3 F 7.5±1.0 P2 7.5±1.5 P1 3.75±1.0 D Please refer to [ΔS 0±2.0 W 18.0±0.5 W1 9.0±0.5 H0 18.0± $^{2.0}$ 0 $^$

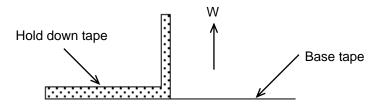
Vertical crimp taping type < Lead code : N7 > Pitch of component 30.0mm /Lead spacing 7.5mm



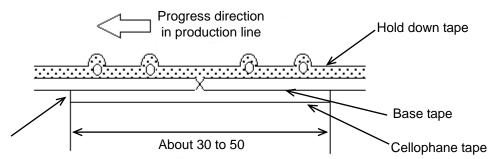
Item		Dimensions	Remarks
Pitch of component	Р	30.0±2.0	
Pitch of sprocket hole	P0	15.0±0.3	
Lead spacing		7.5±1.0	
Length from hole center to component center	P2	7.5±1.5	
Length from hole center to lead	P1	3.75±1.0	Deviation of progress direction
Body diameter		Please refer to [Part number list].
Deviation along tape, left or right	ΔS	0±2.0	They include deviation by lead bend.
Carrier tape width	W	18.0±0.5	
Position of sprocket hole	W1	9.0±0.5	Deviation of tape width direction
Lead distance between reference and bottom planes	H0	18.0± ₀ ^{2.0}	
Protrusion length	Q	+0.5~-1.0	
Diameter of sprocket hole	φ D 0	4.0±0.1	
Lead diameter	φd	0.60±0.05	
Total tape thickness	t1	0.6±0.3	The continuous hard above to a shiple of
Total thickness, tape and lead wire	t2	1.5 max.	They include hold down tape thickness.
Deviation across tape, front	∆h1	2.0	
Deviation across tape, rear		2.0 max.	
Portion to cut in case of defect	L	11.0± ⁰ _{1.0}	
Hold down tape width	W0	11.5 min.	
Hold down tape position	W2	1.5±1.5	
Coating extension on lead	е	Up to the end of	crimp
Body thickness	Т	Please refer to [Part number list].

7-2. Splicing way of tape

1) Adhesive force of tape is over 3N at test condition as below.



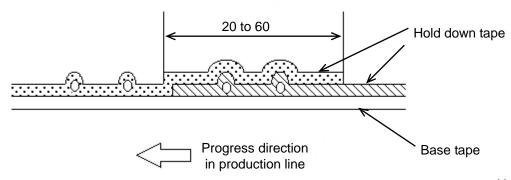
- 2) Splicing of tape
 - a) When base tape is spliced
 - •Base tape should be spliced by cellophane tape. (Total tape thickness should be less than 1.05mm.)



No lifting for the direction of progressing

Unit: mm

- b) When hold down tape is spliced
 - •Hold down tape should be spliced with overlapping. (Total tape thickness should be less than 1.05mm.)



- c) When both tape are spliced
 - •Base tape and hold down tape should be spliced with splicing tape.
- 3) Missing components
 - •There should be no consecutive missing of more than three components.
 - •The number of missing components should be not more than 0.5% of total components that should be present in a Ammo pack.

EU RoHS and Halogen Free

This products of the following crresponds to EU RoHS and Halogen Free

(1) RoHS

EU RoHs 2011/65/EC compliance

maximum concentration values tolerated by weight in homogeneous materials

- •1000 ppm maximum Lead
- •1000 ppm maximum Mercury
- •100 ppm maximum Cadmium
- •1000 ppm maximum Hexavalent chromium
- •1000 ppm maximum Polybrominated biphenyls (PBB)
- •1000 ppm maximum Polybrominated diphenyl ethers (PBDE)

(2) Halogen-Free

The International Electrochemical Commission's (IEC) Definition of Halogen-Free (IEC 61249-2-21) compliance

- •900 ppm maximum chlorine
- •900 ppm maximum bromine
- •1500 ppm maximum total chlorine and bromine