

S P E C I F I C A T I O N O F

ALUMINUM ELECTROLYTIC CAPACITORS

UBT series
(Pb free-RoHS complied)

		sheet 1 of 23	APPROVED	J.Kobayashi Jan. 09. 2016		
DWG. No.		H160108h10	CHECKED	K.Yasukawa Jan. 09. 2016		
REV. LET.			DESIGNED	K.Kominami Jan. 09. 2016		
LET.	REVISIONS		DATE	DR.	CK.	AP.

1. SCOPE

This specification covers "UBT series" miniature single-ended aluminum electrolytic capacitors.

2. APPLICABLE SPECIFICATION

Japanese Industrial Standard JIS C 5101-4:1998 Characteristics W and JIS C 5101-1 :1998 except as specified in this specification.

3. OPERATING TEMPERATURE RANGE

Operating temperature range is the range of ambient temperature at which the capacitor can be operated continuously at rated voltage.
 $-40 \sim +125^{\circ}\text{C}$ (10~250V) , $-25 \sim +125^{\circ}\text{C}$ (350~450V)

4. CHARACTERISTICS

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows :

Ambient temperature : 5 to 35°C

Relative humidity : 45 to 85%RH

Air pressure : 86kPa to 106kPa

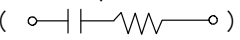
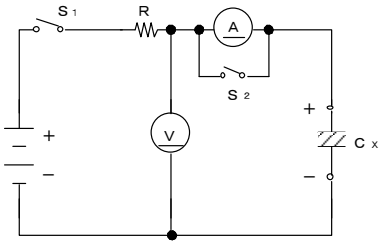
If there may be doubt on the results, measurements shall be made within the following limits,

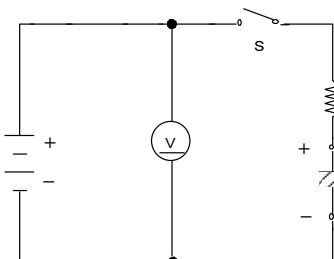
Ambient temperature : $20 \pm 2^{\circ}\text{C}$

Relative humidity : 60 to 70%RH

Air pressure : 86kPa to 106kPa

4.1 ELECTRICAL CHARACTERISTICS

No.	Item	Test method	Performance
4.1.1	RATED VOLTAGE		DC 10~450 V
4.1.2	CAPACITANCE	Measuring frequency 120Hz $\pm 20\%$ Measuring circuit : Series equivalent circuit () Measuring voltage : 0.5Vrms or less +1.5 to 2.0 VDC	1~4700 μF Capacitance tolerance: $\pm 20\%$
4.1.3	Tan δ	Measuring frequency, measuring circuit and measuring voltage are the same those for capacitance.	Not more than the value given in table 1.
4.1.4	LEAKAGE CURRENT	The rated voltage shall be applied across the capacitor and its protective resistor which shall be $1000 \pm 100 \Omega$. The leakage current shall then be measured after an electrification period of 1 min. Measurement circuit  R : Protective resistor ($1000 \pm 100 \Omega$) Ⓐ : DC ammeter Ⓥ : DC voltmeter S ₁ : switch S ₂ : Protective switch for an ammeter C _x : Test Capacitor	A: Voltage 10~100V After 1 min; not more than I=0.03CV or 4(μA) whichever is greater. B: Voltage 160~450V After 1 min; not more than CV ≤ 1000 : I=0.1CV+40 μA not more than CV>1000: I=0.04CV+100 μA I : Leakage current(μA) C : Capacitance(μF) V : Rated voltage(V)

No.	Item	Test method			Performance
4. 1. 5	TEMPERATURE CHARACTERISTIC	Step	Temperature	Time	Step 2 : Impedance ratio Ratio to the value at step 1 shall be not more than the value given Table-1. Step 4 : Variation of capacitance Within $\pm 20\%$ of the value at Step 1.
		1	$20 \pm 2^{\circ}\text{C}$	-----	
		2	$-25, -40 \pm 2^{\circ}\text{C}$	2h.	
		3	$20 \pm 2^{\circ}\text{C}$	15min.	
		4	$125 \pm 2^{\circ}\text{C}$	2h.	
		Step 1 : Capacitance and impedance shall be measured. ($ Z $ 20°C $120\text{Hz} \pm 20\%$) Step 2 : After the capacitor being stored for 2 hours, Impedance shall be made at thermal stability. ($ Z $ $-25, -40^{\circ}\text{C}$ $120\text{Hz} \pm 20\%$) Step 4 : After the capacitor being stored for 2 hours, capacitance shall be measured. The measurement shall be made at thermal stability.			
4. 1. 6	SURGE TEST	Voltage application : 1000 times of charging for 30 ± 5 sec., with a period of 6 ± 0.5 min.. Test temperature : $15^{\circ}\text{C} \sim 35^{\circ}\text{C}$ And the capacitor shall be stored under standard atmospheric conditions to obtain thermal stability, after which measurements shall be made.			Capacitance Not less than 80% of the value before test. Dissipation factor Not more than 200% of the specified value in Table 1. Leakage current To satisfy No. 4. 1. 4.
		Test circuit  R : Protective series resistor (1000Ω) ⓧ : DC voltmeter S : Switch Cx : Test capacitor Note : This requirement is applicable only to instantaneous overvoltage which may be applied to the terminals of capacitor, therefore, not applicable to such overvoltages as often applied.			
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4.2 MECHANICAL PERFORMANCE																
No.	Item	Test method		Performance												
4.2.1	TERMINAL STRENGTH	Tensile strength of termination: A static load of ※1 N shall be applied to the terminal in the axial direction and acting in a direction away from the body for 10 sec.. <table><tr><td>dia.of wireφ</td><td>0.6</td><td>0.8</td></tr><tr><td>※1 Tensileforce N</td><td>10</td><td>10</td></tr></table> Bending strength of termination: Hang the specified dead weight of ※2 N, then bent the body through 90° , return to the original position. Next bend it in opposite direction through 90° with the same speed, again return to the original position. Carry out this operation in about 5 sec. <table><tr><td>dia.of wireφ</td><td>0.6</td><td>0.8</td></tr><tr><td>※2 Bendingforce N</td><td>5</td><td>5</td></tr></table>		dia.of wireφ	0.6	0.8	※1 Tensileforce N	10	10	dia.of wireφ	0.6	0.8	※2 Bendingforce N	5	5	When the capacitance is measured, there shall be no intermittent contacts, or open or short-circuiting. There shall be no such mechanical damage.
dia.of wireφ	0.6	0.8														
※1 Tensileforce N	10	10														
dia.of wireφ	0.6	0.8														
※2 Bendingforce N	5	5														
4.2.2	RESISTANCE TO VIBRATION	To comply with JIS C 5101-1 4.17 Direction and duration of vibration: 3 orthogonal directions mutually each for 2h. Total 6h.		When the capacitance is measured, there shall be no intermittent contacts, or open or short-circuiting. There shall be no such mechanical damage.												
4.2.3	SOLDERABILITY	To comply with JIS C 5101-1 4.15 Temperature or solder : 235±5℃ Dipping time : 2±0.5sec. This specification shall be met after the capacitors are stored under standard atmospheric conditions for 6 months.		At least 3/4 of circumferential surface of the dipping portion of termination shall be covered with new solder.												
4.3 ENDURANCE PERFORMANCE																
No.	Item	Test method		Performance												
4.3.1	RESISTANCE TO SOLDERING HEAT	Solder bath method Solder temperature : 260±5℃ Immersion time : 10±1 sec. Printed wiring board : 1.6mm Soldering iron method Bit temperature : 350±10℃ Application time of soldering iron : 3~4 sec. For other procedures then those specified, refer to JIS C 5101-1 4.14. Test Method 1 (Solder bath at 260℃) and Method 2 (Soldering iron at 350℃)		Variation of capacitance : Within ±10% of the value before test. Tan δ : To satisfy Table 1 Leakage current : To satisfy No.4.1.4 Appearance : No remarkable abnormality.												
4.3.2	RESISTANCE TO DAMP HEAT (STEADY STATE)	To comply with JIS C 5101-1 4.22 Test temperature : 40±2℃ Test time : 240±8h Relative humidity : 90~95%RH After complection of test, the capacitor shall be subjected to standard atmospheric conditions for 1 to 2 hours, after which measurements shall be made.		Variation of capacitance : Within ±15% of the value before test. Tan δ : To satisfy Table 1 Leakage current : To satisfy No.4.1.4 Appearance : No remarkable abnormality.												
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No.	Item	Test method	Performance										
4. 3. 3	ENDURANCE	To comply with JIS C 5101-1 4. 23 Applied voltage D.C. bios with rated ripple current through protective resistance of 1000Ω, so that its peak voltage shall not exceed the rated D.C. voltage. The capacitors shall be removed from the test chamber and stabilized at room temperature for 2 h. . Test temperature 125 ±2°C Test time : V≤50V φD=8 : 2000⁺⁷²₋₀ h φD=10 : 5000⁺⁷²₋₀ h φD≥12.5 : 10000⁺⁷²₋₀ h 63V ~100V φD=8 : 2000⁺⁷²₋₀ h φD=10 : 3000⁺⁷²₋₀ h φD≥12.5 : 5000⁺⁷²₋₀ h V≥160V : 2000⁺⁷²₋₀ h	Variation of capacitance : Within ※A of the value before test. Tanδ : Not more than ※B of the specified value in Table 1. Leakage current : To satisfy No. 4. 1. 4 Appearance : No remarkable abnormality. ※A : ±30% (V≤100V) ±20% (V≥160V) ※B : 300% (V≤100V) 200% (V≥160V)										
4. 3. 4	SHELF LIFE TEST	The capacitors are then stored with no voltage applied at a temperature of 125 ±2°C for 1000⁺⁴⁸₋₀ h Following this period the capacitors shall be removed from the test chamber and be allowed to stabilized at room temperature. Next they shall be connected to a series limiting resistor with D.C. rated voltage applied for 30 min. after which the capacitors shall be discharged.	Variation of capacitance : Within ※A of the value before test. Tanδ : Not more than ※B of the specified value in Table 1. Leakage current : To satisfy No. 4. 1. 4 Appearance : No remarkable abnormality.										
4. 3. 5	PRESSURE RELIEF VENT TEST	A. C. Application Test The capacitor shall be subjected to an A. C. voltage(50 or 60Hz) with r.m.s.value equal to 0.7 times the rated D.C. voltage through a series resistor. The series resistor as follows. <table><tr><td>Cap. (μF)</td><td>R(Ω)</td></tr><tr><td>C≤10</td><td>100</td></tr><tr><td>10<C≤100</td><td>10</td></tr><tr><td>100<C≤1000</td><td>1</td></tr><tr><td>1000<C</td><td>0.1</td></tr></table> D. C. Application Test The capacitor Shall be subjected to a reverse D.C. voltage equal to the rated D.C. voltage. The current flowing through the capacitor shall be limited to 1A. Note : The test is terminated if the vent device is not actuated when 30min. has elapsed from the start of the test conducted under the conditions.	Cap. (μF)	R(Ω)	C≤10	100	10<C≤100	10	100<C≤1000	1	1000<C	0.1	The vent device is actuated under the test conditions, thereby preventing terminals,metal pieces, etc, of the capacitor from scattering due to burst, the case from separating from the seal packing, or the capacitor from producing flame.
Cap. (μF)	R(Ω)												
C≤10	100												
10<C≤100	10												
100<C≤1000	1												
1000<C	0.1												
SPECIFICATION													
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Table - 1 Electrical Characteristics

Rated voltage (V)	Surge voltage (V)	Tan δ ※4	Impedance ratio at 120Hz	
			$\frac{[Z]-25^{\circ}\text{C}}{[Z]+20^{\circ}\text{C}}$	$\frac{[Z]-40^{\circ}\text{C}}{[Z]+20^{\circ}\text{C}}$
10	13	0.20	3	4
16	20	0.16	2	4
25	32	0.14	2	4
35	44	0.12	2	4
50	63	0.10	2	4
63	79	0.10	2	4
80	100	0.08	2	4
100	125	0.08	2	4
160	200	0.20	3	6
200	250	0.20	3	6
250	300	0.20	3	6
350	400	0.24	6	—
400	450	0.24	6	—
450	500	0.24	6	—

※4 For capacitance of more than 1000 μF , add 0.02 for every increase of 1000 μF .

5. MARKING

5.1 The following items shall be marked indelibly on the capacitor.

- (1) Manufacture's name(abbreviated manufacture's name permitted)or trade mark.
- (2) Month and year of production or cord(including Lot No.).
- (3) Rated voltage
- (4) Capacitance
- (5) Polarity of the terminals
- (6) Capacitance tolerance code : (M)
- (7) Maximum operating temperature : 125°C
- (8) Series identification : BT

<MARKING>

nichicon

220 μF 10V



BT (M)

125°C

Lot No.

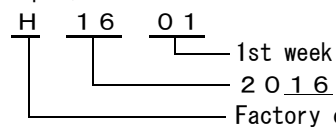
5.2 Marking color

Sleeve color : Blue

Print color : White

5.3 Date Code

<Example>



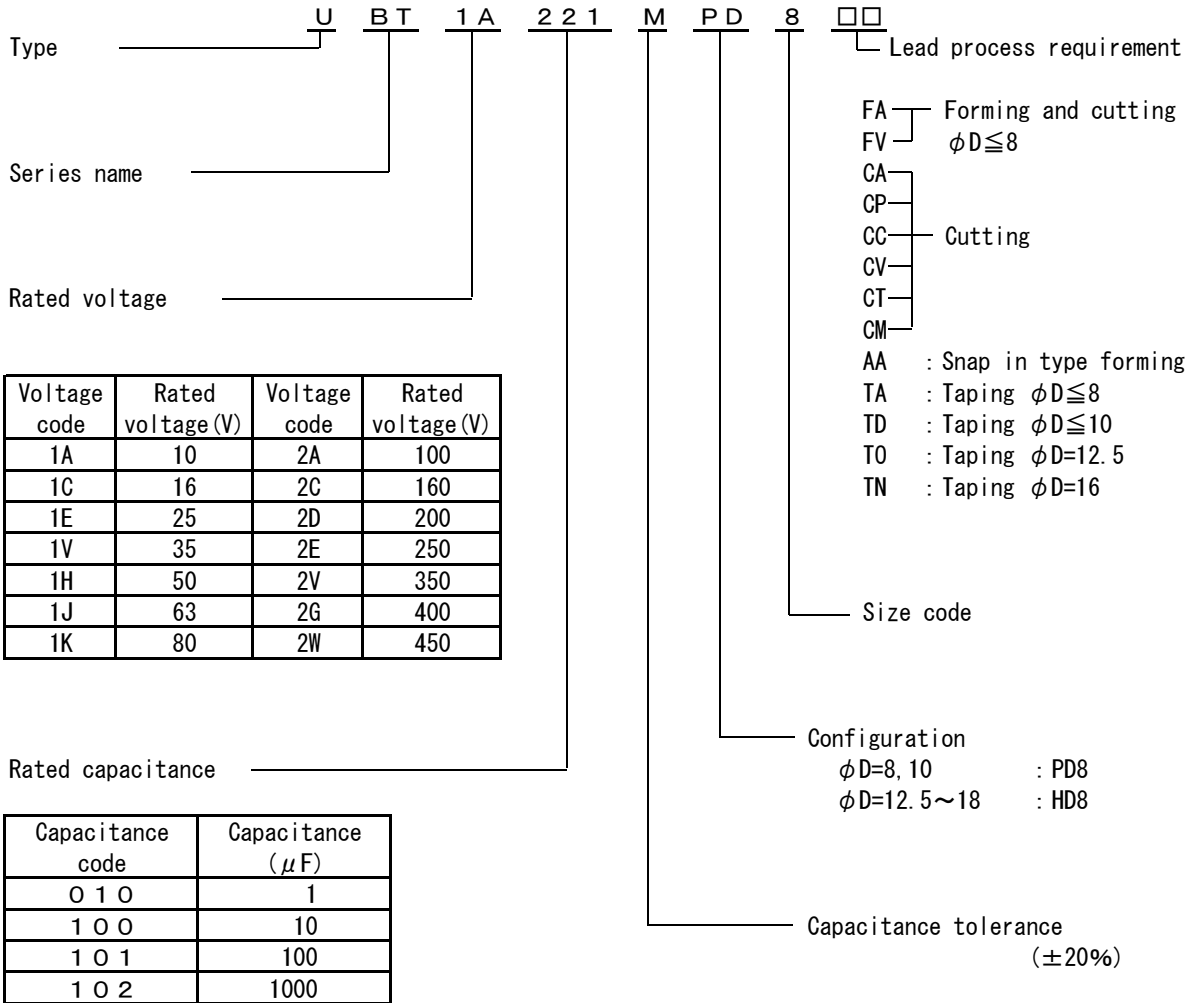
H:NICHICON (OHNO) CORPORATION

N:NICHICON (IWATE) CORPORATION

B:NICHICON (MALAYSIA) SDN. BHD.

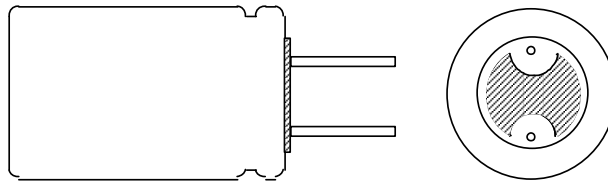
C:NICHICON ELECTRONICS (WUXI) CO., LTD.

6. TYPE NUMBERING SYSTEM

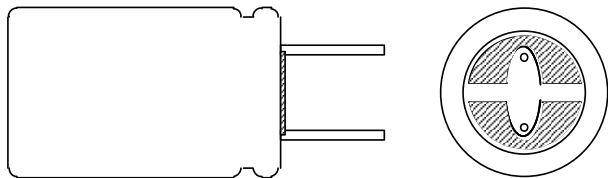


“GAS ESCAPE” END SEAL TYPE

FORM A



FORM B

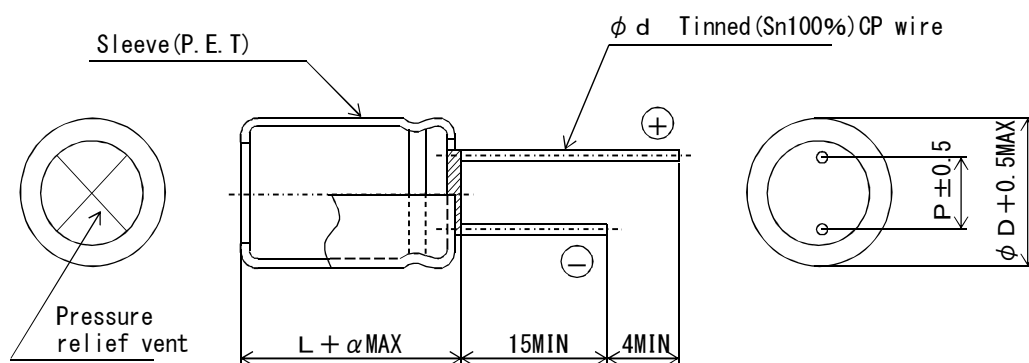


・ SCOPE

FORM	ϕ D
A	$\phi 8$ 、 $\phi 10$
B	$\phi 12.5 \sim \phi 18$

7. SHAPE AND DIMENSIONS

A : LONG LEAD



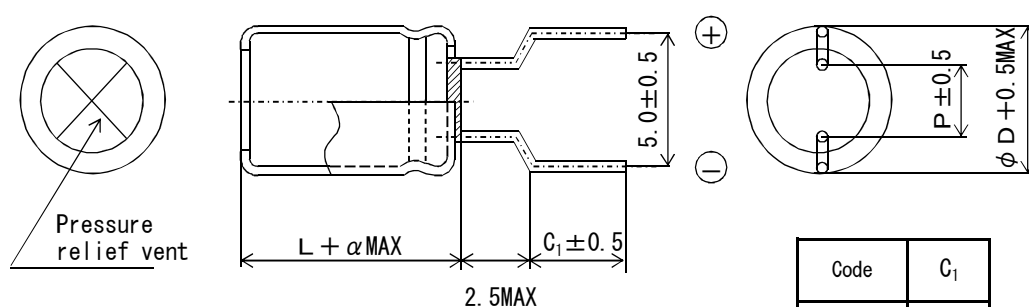
(mm)					
ϕD	8	10	12.5	16	18
P	3.5	5.0	5.0	7.5	7.5
ϕd	0.6	0.6	*0.6	0.8	0.8

α	$L < 20 : 1.5$
	$L \geq 20 : 2.0$

* : In case $L > 25$ for the $\phi 12.5$ dia. unit, lead dia. $\phi d = 0.8$

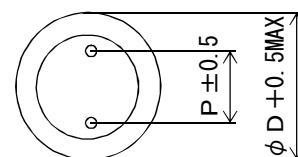
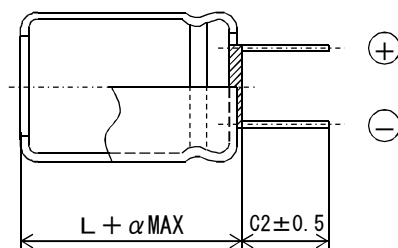
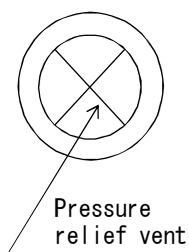
B : FORMING CUT LEAD (Formed lead code : FA, FV)

$\phi D = 8$



Code	C_1
FA	5.0
FV	3.5

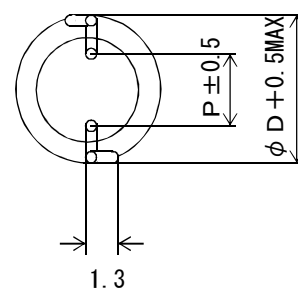
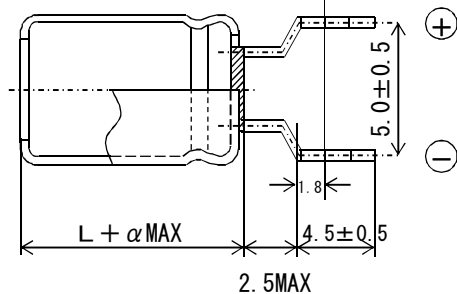
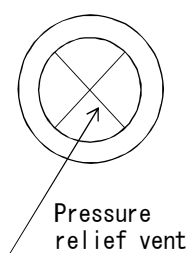
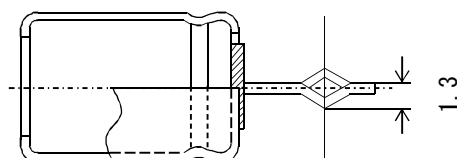
C : STRAIGHT CUT TYPE LEAD (Formed lead code : CA, CP, CC, CV, CT, CM)



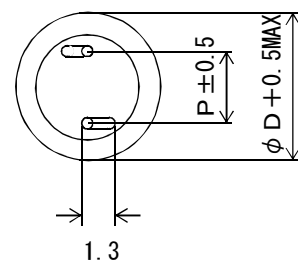
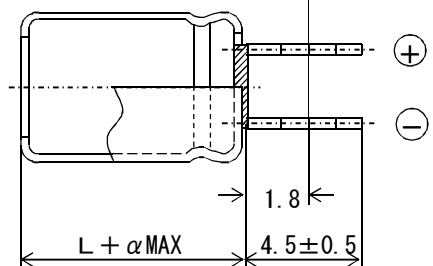
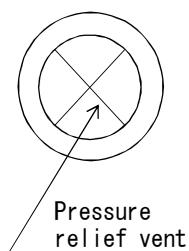
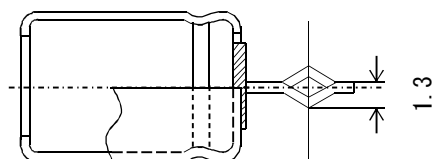
Code	C_2	Code	C_2
C A	5.0	C V	3.5
C P	4.5	C T	3.2
C C	4.0	C M	3.0

D : SNAP-IN TYPE LEAD (Formed lead code : AA)

$\phi D \leq 8$



$\phi D \geq 10$



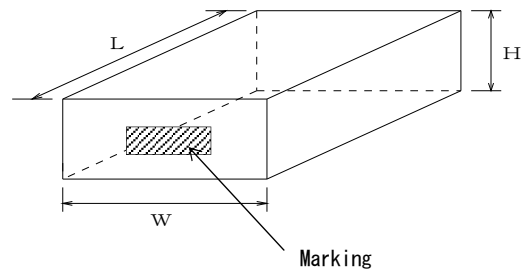
• Packing

(1)Quantity in box(sacks)

Size ϕ D $\times$ L (mm)	Long lead			Formed lead		
	sacks	Inside box	Outside box	sacks	Inside box	Outside box
$\phi 8 \times 11.5$	200	3000	12000	200	4000	16000
$\phi 10 \times 12.5$	200	2000	8000	200	2800	11200
$\phi 10 \times 16$	200	1800	7200	200	2000	8000
$\phi 10 \times 20$	200	1400	5600	200	1600	6400
$\phi 10 \times 25$	200	1200	4800	200	1600	6400
$\phi 12.5 \times 20$	100	1000	4000	—	1330	5320
$\phi 12.5 \times 25$	100	800	3200	—	1000	4000
$\phi 12.5 \times 31.5$	100	600	2400	—	650	2600
$\phi 16 \times 20$	50	600	2400	—	840	3360
$\phi 16 \times 25$	50	400	1600	—	630	2520
$\phi 16 \times 31.5$	50	300	1200	—	630	2520
$\phi 18 \times 31.5$	50	300	1200	—	450	1800
$\phi 18 \times 35.5$	50	250	1000	—	300	1200

(2)Package dimensions

ϕ D		L	W	H
$\phi 8 \sim \phi 18$	Inside box	255	210	130
	Outside box	437	265	278



(3)Marking of inside box

Inside box shall be marked.

- 1)Rated voltage
- 2)Type No. (When requested)
- 3)Quantity
- 4)Produced lot number
- 5)Identification corresponding to environment.

(4)Weight

($g \pm 15\%$)

SIZE	WEIGHT	SIZE	WEIGHT
$\phi 8 \times 11.5$	1.19	$\phi 16 \times 20$	5.92
$\phi 10 \times 12.5$	1.49	$\phi 16 \times 25$	7.38
$\phi 10 \times 16$	1.77	$\phi 16 \times 31.5$	8.43
$\phi 10 \times 20$	2.34	$\phi 18 \times 31.5$	13.30
$\phi 10 \times 25$	3.07	$\phi 18 \times 35.5$	14.30
$\phi 12.5 \times 20$	3.43		
$\phi 12.5 \times 25$	4.56		
$\phi 12.5 \times 31.5$	6.01		

8. Application

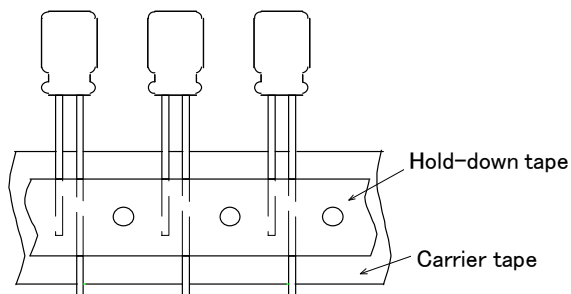
This specification applied to the singleended lead aluminum electrolytic capacitors for $\phi 8 \sim 16$ case diameter.

9. Taping method

9.1 Leads of capacitor shall be fixed between on the hold-down tape and carrier tape as shown Fig-1.

All capacitors shall be orientated in one direction such that the positive lead comes right side of the capacitor when seeing from hold-down tape up.

Fig-1



9.2 leader length and trailer length shall be 3 feeding hold unless otherwise requested.

9.3 There shall be no three successive missing product on tape.

9.4 Joint of carrier tape

For joint of carrier tape, two carrier tape shall be joined together by winding adhesive tape around carrier tape.

Divergence of feed hold center shall not be exceed 1 mm at 20 feed holes length.

Fig-2

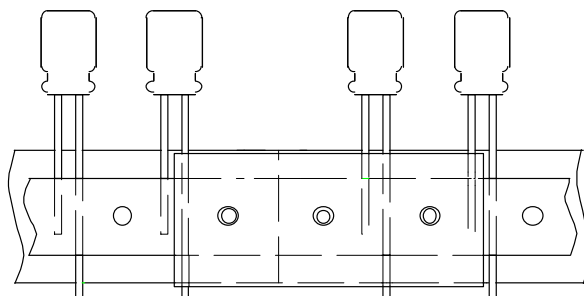
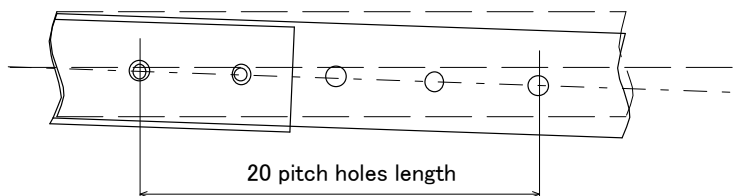
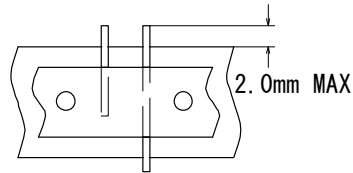


Fig-3



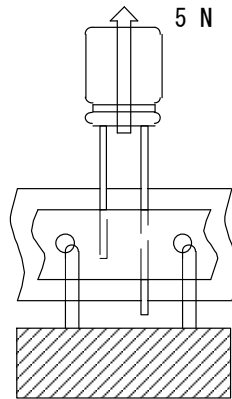
- 9.5 When leads are snipped to remove a capacitor, lead protrusion above the carrier tape shall be 2mm MAX.

Fig-4



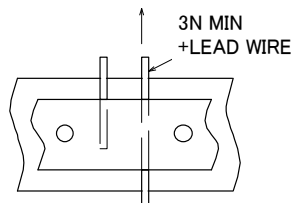
- 9.6 Pull strength
Capacitors shall be withstand 5N pull test without being removed from tape.

Fig-5



- 9.7 Lead pull strength
Lead pull strength after taped shall be 3N min (+ lead only).
+ lead shall be pulled vertically as show Fig-6 until the lead is completely removed from the tape by using pull tester.

Fig-6

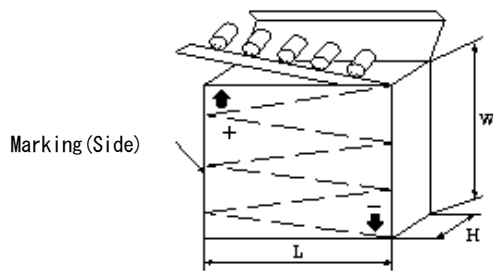


10 Packing

10.1 Taped capacitors are packed into carton case in zigzag each folding will have following units.

Diameter	Quantity
$\phi 8$	25
$\phi 10$	24
$\phi 12.5$	20
$\phi 16$	10

10.2 Package dimensions



ϕD		L	W	H
$\phi 8$	11.5L	332	229	49
$\phi 10$	12.5L	330	195	48
	16L	330	195	53
	20L	330	195	57
	25L	327	195	61
$\phi 12.5$	20L	315	284	58
	25L	325	280	62
$\phi 16$	20L	305	220	58
	25L	305	220	61

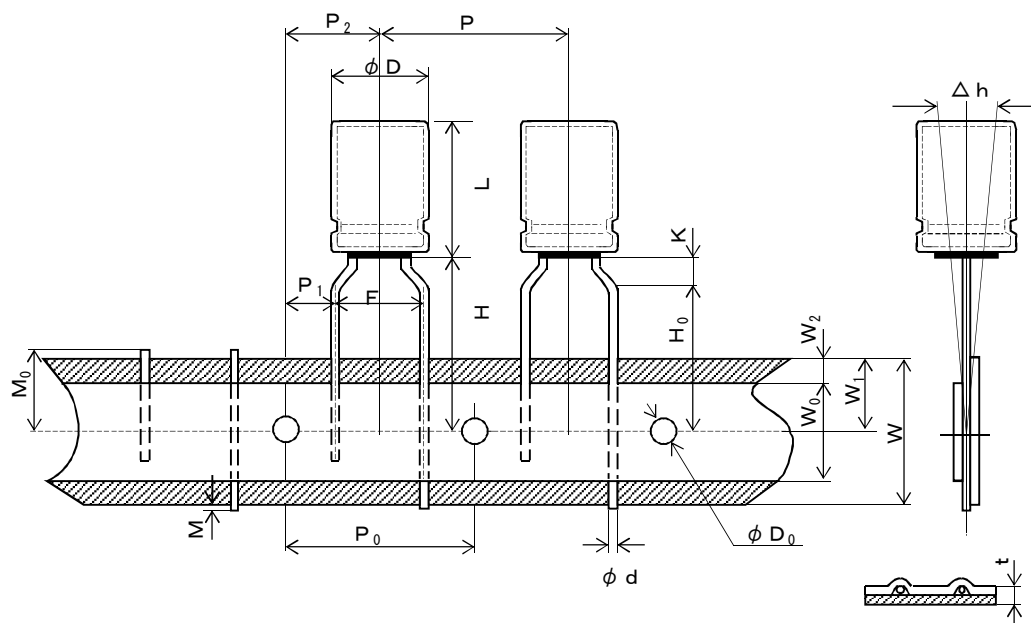
10.3 Marking(Each box shall be marked)

- 1) Polarity
As shown on 10.2, +/- polar is marked on on the correspoiding side surface.
- 2) Rated voltage
- 3) Type No. (When requested)
- 4) Quantity
- 5) Produced lot number
- 6) Polaliti is marked on cover as +/-.

10.4 Quantity in box

ϕD		Inside box	Outside box
$\phi 8$	11.5L, 15L	1000	10000
$\phi 10$	12.5L	500	5000
	16L, 20L, 25L	500	4000
$\phi 12.5$		500	2500
$\phi 16$		250	1000

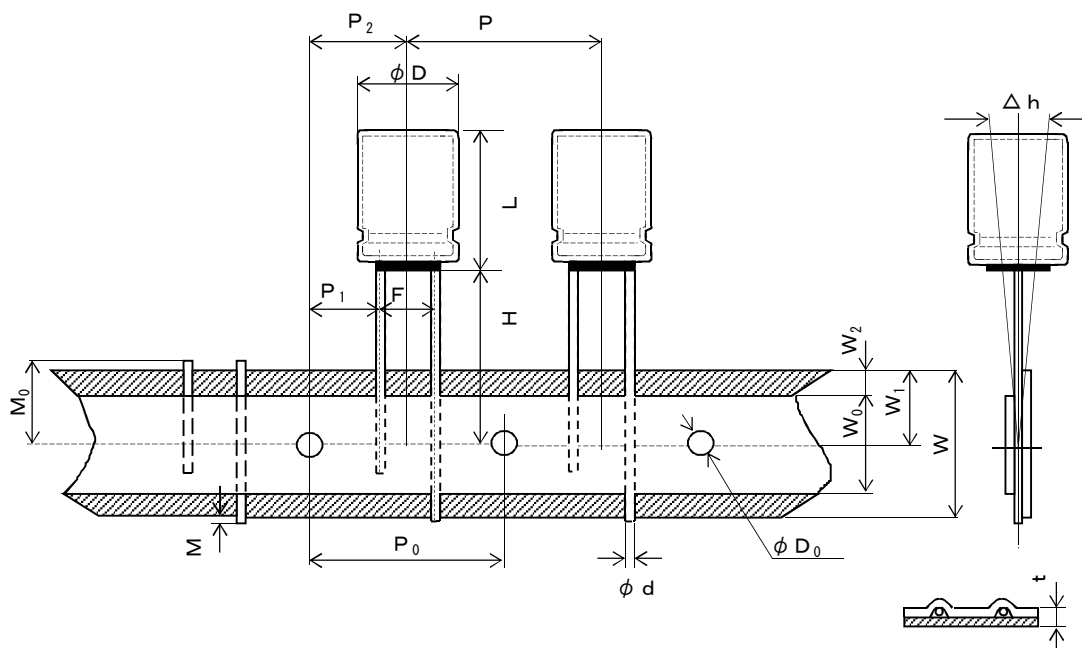
Taping Configuration(Taping code:TA)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	8	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.6	± 0.05	
Pitch of component	P	12.7	± 1.0	
Feed hole pitch	P ₀	12.7	± 0.2	
Hole center to lead	P ₁	3.85	± 0.5	
Feed hole center to component center	P ₂	6.35	± 1.0	
Lead to lead distance	F	5.0	+0.8 -0.2	Measured at below clinch.
Clinch height	K	4.0	MAX	
Component alignment .F-R	Δh	0	± 1.0	Center of body.
Tape width	W	18.0	± 0.5	
Hold-down tape width	W ₀	7.0	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W ₁	9.0	± 0.5	
Hold-down tape position	W ₂	1.5	MAX	
Height of component from tape center	H	20.0	+0.75 -0.5	
Lead-wire clinch height	H ₀	16.0	± 0.5	
Lead-wire protrusion	M	1.0	MAX	
Feed hole diameter	ϕD_0	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M ₀	11.0	MAX	

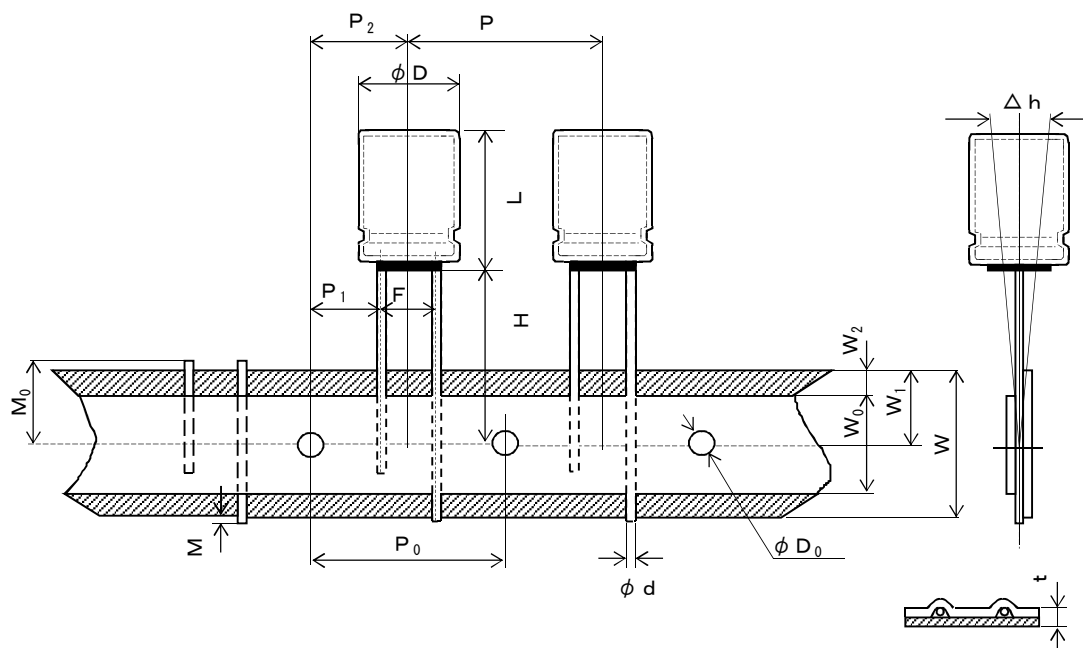
Taping Configuration(Taping code:TD)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	8	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.6	± 0.05	
Pitch of component	P	12.7	± 1.0	
Feed hole pitch	P ₀	12.7	± 0.2	
Hole center to lead	P ₁	4.6	± 0.5	
Feed hole center to component center	P ₂	6.35	± 1.0	
Lead to lead distance	F	3.5	+0.8 -0.2	
Component alignment .F-R	Δh	0	± 1.0	Center of body.
Tape width	W	18.0	± 0.5	
Hold-down tape width	W ₀	7.0	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W ₁	9.0	± 0.5	
Hold-down tape position	W ₂	1.5	MAX	
Height of component from tape center	H	18.5	+0.75 -0.5	
Lead-wire protrusion	M	1.0	MAX	
Feed hole diameter	ϕD_0	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M ₀	11.0	MAX	

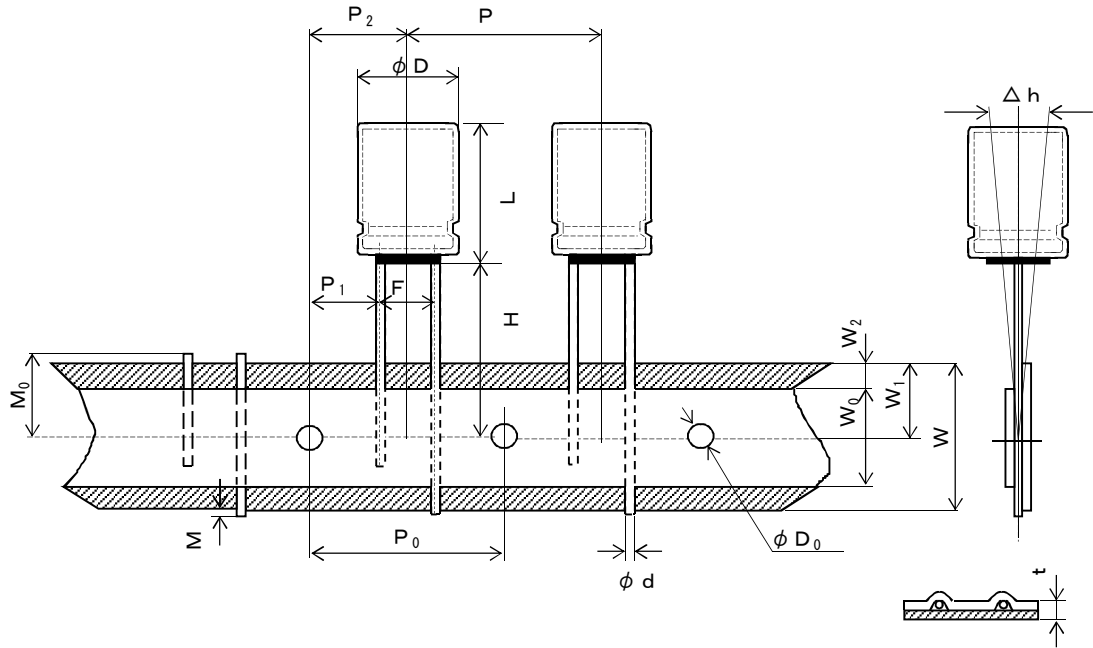
Taping Configuration(Taping code:TD)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	10	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.6	± 0.05	
Pitch of component	P	12.7	± 1.0	
Feed hole pitch	P ₀	12.7	± 0.2	
Hole center to lead	P ₁	3.85	± 0.5	
Feed hole center to component center	P ₂	6.35	± 1.0	
Lead to lead distance	F	5.0	+0.8 -0.2	
Component alignment F-R	Δh	0	± 1.0	Center of body.
Tape width	W	18.0	± 0.5	
Hold-down tape width	W ₀	7.0	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W ₁	9.0	± 0.5	
Hold-down tape position	W ₂	1.5	MAX	
Height of component from tape center	H	18.5	+0.75 -0.5	
Lead-wire protrusion	M	1.0	MAX	
Feed hole diameter	ϕD_0	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M ₀	11.0	MAX	

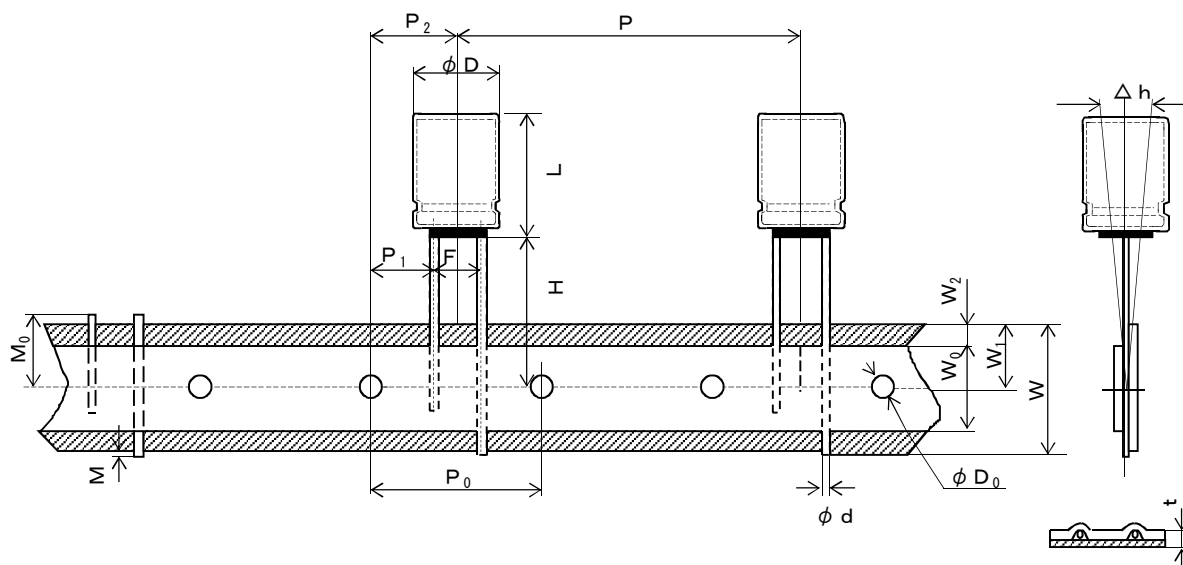
Taping Configuration(Taping code:T0)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	12.5	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.6	± 0.05	
Pitch of component	P	15.0	± 1.0	
Feed hole pitch	P ₀	15.0	± 0.2	
Hole center to lead	P ₁	5.0	± 0.5	
Feed hole center to component center	P ₂	7.5	± 1.0	
Lead to lead distance	F	5.0	+0.8 -0.2	
Component alignment F-R	Δh	0	± 1.0	Center of body.
Tape width	W	18.0	± 0.5	
Hold-down tape width	W ₀	12.5	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W ₁	9.0	± 0.5	
Hold-down tape position	W ₂	1.5	MAX	
Height of component from tape center	H	18.5	+0.75 -0.5	
Lead-wire protrusion	M	1.0	MAX	
Feed hole diameter	ϕD_0	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M ₀	11.0	MAX	

Taping Configuration (Taping code: TN)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	16	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.8	± 0.05	
Pitch of component	P	30.0	± 1.0	
Feed hole pitch	P ₀	15.0	± 0.2	
Hole center to lead	P ₁	3.75	± 0.5	
Feed hole center to component center	P ₂	7.5	± 1.0	
Lead to lead distance	F	7.5	± 0.8	
Component alignment F-R	Δh	0	± 1.0	Center of body.
Tape width	W	18.0	± 0.5	
Hold-down tape width	W ₀	12.5	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W ₁	9.0	± 0.5	
Hold-down tape position	W ₂	1.5	MAX	
Height of component from tape center	H	18.5	+0.75 -0.5	
Lead-wire protrusion	M	1.0	MAX	
Feed hole diameter	ϕD_0	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M ₀	11.0	MAX	

■ Standard ratings

V	10 (1A)			16 (1C)			25 (1E)		
Cap. (μ F)	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz
100				8 × 11.5	0.32	340	8 × 11.5	0.13	500
220	8 × 11.5	0.26	340	10 × 12.5	0.15	620	10 × 12.5	0.10	680
330	10 × 12.5	0.15	620	10 × 12.5	0.10	680	10 × 16	0.075	945
470	10 × 12.5	0.10	680	10 × 16	0.075	945	10 × 20	0.057	1100
1000	10 × 20	0.057	1100	12.5 × 20	0.042	1490	12.5 × 25	0.033	1750
2200	12.5 × 25	0.033	1750	16 × 25	0.024	2300	16 × 31.5	0.020	2710
3300	16 × 25	0.024	2300	16 × 31.5	0.020	2710	18 × 31.5	0.017	3310
4700	16 × 31.5	0.020	2710	18 × 31.5	0.018	3270			

V	35 (1V)			50 (1H)		
Cap. (μ F)	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz
1				8 × 11.5	2.00	35
2.2				8 × 11.5	1.80	50
3.3				8 × 11.5	1.50	60
4.7				8 × 11.5	1.15	85
10				8 × 11.5	0.75	180
22				8 × 11.5	0.50	250
33				8 × 11.5	0.45	300
47				8 × 11.5	0.35	440
100	10 × 12.5	0.15	620	10 × 12.5	0.18	555
220	10 × 16	0.094	790	10 × 20	0.098	930
330	10 × 20	0.075	950	12.5 × 20	0.070	1330
470	12.5 × 20	0.058	1330	12.5 × 25	0.055	1650
1000	16 × 25	0.031	2010	16 × 31.5	0.031	2430
2200	18 × 35.5	0.025	2790			

V	63 (1J)			80 (1K)			100 (2A)		
Cap. (μ F)	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz	Case size Φ D×L (mm)	Impedance (Ω MAX) 20°C / 100kHz	Rated ripple (mA _{RMS}) 125°C / 10kHz~100kHz
4.7							8 × 11.5	2.00	130
10							8 × 11.5	1.50	150
22	8 × 11.5	2.00	130	8 × 11.5	1.50	150	10 × 12.5	0.80	480
33	8 × 11.5	1.50	150	10 × 12.5	0.80	480	10 × 12.5	0.80	480
47	10 × 12.5	0.59	530	10 × 12.5	0.80	480	10 × 16	0.55	630
100	10 × 16	0.41	690	10 × 20	0.39	790	12.5 × 20	0.25	990
220	12.5 × 20	0.16	1050	12.5 × 25	0.18	1240	16 × 25	0.11	1500
330	12.5 × 25	0.12	1290	12.5 × 31.5	0.16	1390	16 × 31.5	0.079	1790
470	12.5 × 31.5	0.097	1460	16 × 25	0.11	1500			

・ Frequency coefficient of allowable ripple current

Cap. (μ F)	Frequency	120Hz	300Hz	1kHz	10kHz~
1000 > CV		0.50	0.64	0.83	1.00
1000 ≤ CV		0.67	0.79	0.91	1.00

■ Standard ratings

V	160 (2C)		200 (2D)		250 (2E)	
Cap. (μ F)	Case size Φ D×L (mm)	Rated ripple (mA _{rms}) 125°C / 120Hz	Case size Φ D×L (mm)	Rated ripple (mA _{rms}) 125°C / 120Hz	Case size Φ D×L (mm)	Rated ripple (mA _{rms}) 125°C / 120Hz
10			10 × 20	78	10 × 20	78
22	10 × 20	115	10 × 25	126	12.5 × 20	128
33	10 × 25	154	12.5 × 20	157	12.5 × 25	171
47	12.5 × 20	187	12.5 × 25	204	16 × 25	225
68	12.5 × 25	245	16 × 20	250	16 × 31.5	292
100	16 × 25	329	16 × 25	329		
150	16 × 31.5	434				

V	350 (2V)		400 (2G)		450 (2W)	
Cap. (μ F)	Case size Φ D×L (mm)	Rated ripple (mA _{rms}) 125°C / 120Hz	Case size Φ D×L (mm)	Rated ripple (mA _{rms}) 125°C / 120Hz	Case size Φ D×L (mm)	Rated ripple (mA _{rms}) 125°C / 120Hz
4.7	10 × 20	53	10 × 20	53	10 × 25	58
10	10 × 25	85	10 × 25	86	12.5 × 20	86
22	12.5 × 25	139	12.5 × 31.5	142	16 × 25	154
33	16 × 25	189	16 × 25	189	16 × 31.5	203
47	16 × 31.5	243	16 × 31.5	243		

・ Frequency coefficient of allowable ripple current

Cap. (μ F)	Frequency	50Hz	120Hz	300Hz	1kHz	10kHz	100kHz
4.7~33		0.75	1.00	1.25	1.50	1.75	1.80
47~150		0.80	1.00	1.15	1.30	1.40	1.50

11. Resistance to cleaning agent

(1) Applicable cleaning agents

Pine Alpha ST-100S, Clean Through 750H/750L/710M, Sanelek b-12, Aqua Cleaner 210SEP, Techno Care FRW14~17, Iso-propyl Alcohol

(2) Cleaning condition

Total cleaning time shall be within 5 minutes by immersion, ultrasonic or other method. (Temperature of the cleaning agent shall be 60°C or lower)

12. APPLICATION NOTICE

- (1) Application of reverse voltage would lead the short-circuited circuitry and may further result in an explosion if the unit is kept energized.
- (2) Do not apply any overvoltage exceeding the rated voltage (surge voltage for short period) to the capacitor.
- (3) Do not use for a circuit where abrupt discharges are repeated frequently.
- (4) Do not allow any higher ripple currents than rated to flow through a capacitor.
- (5) Whenever you use a capacitor that has been long stored, make sure to gradually increase the voltage to the rated value.
- (6) The characteristics of capacitor will be adversely affected if leads are dipped in solder too long or if the solder temperature is too high.
- (7) Be careful not to subject the lead wires of capacitors to excessive force.

13. OTHERS

• The Relevant Export Regulation Laws:

In case that there is a certain danger of the products conflicting with the use and activity for the developments of weapons of mass destruction, the procedures based upon the relevant export regulation laws are absolutely needed.

• Ozone Depletion Substance

Ozone depletion substances are not used in our production process and at our suppliers.

• Brominated Flame Retardants

The restricted brominated flame retardants are not used.

• RoHS Directive target substance (lead, cadmium, mercury, hexavalent chrome, PBB, PBDE) are not used.

• Estimated life

Please use the estimated life, which is calculated at various temperature conditions etc, as reference value.

• Production factory

NICHICON (OHNO) CORPORATION
NICHICON (IWATE) CORPORATION
NICHICON (MALAYSIA) SDN. BHD.
NICHICON ELECTRONICS (WUXI) CO., LTD.

SPECIFICATION		DWG. No.	H160108h10	sheet	21
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Material of Aluminum Electrolytic Capacitors

U B T series

No.	I T E M	M A T E R I A L S
①	Anode foil	High-purity Aluminum foil
②	Cathode foil	High-purity Aluminum foil
③	Separator	10V~100V : Non wood fiber 160V~450V : Wood fiber
④	Lead wire	Tinned (Sn:100%) CP wire
⑤	Aluminum lead tab	Aluminum
⑥	Rubber end seal	synthetic rubber
⑦	Aluminum case	Aluminum
⑧	Sleeve	Polyester (PET)
⑨	Tape or binder	Tape : Polypropylene Binder : Poval
⑩	Paste	10V~100V : γ -buthyrolactone and organic acid 160~450V : Ethylene glycol and organic acid

Structure for Aluminum Electrolytic Capacitor.

