

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

ALUMINUM ELECTROLYTIC CAPACITORS

UHW series
(Pb free • RoHS complied)

		sheet 1 of 25	APPROVED	J.Kobayashi Jan. 30. 2018		
DWG. No.		H180127h4	CHECKED	M.Murayama Jan. 30. 2018		
REV. LET.			DESIGENED	K.Kominami Jan. 30. 2018		
LET.	REVISIONS		DATE	DR.	CK.	AP.

1. SCOPE

This specification covers "UHW 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~+105°C

4. CHARACTERISTICS

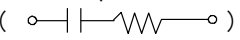
Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows :

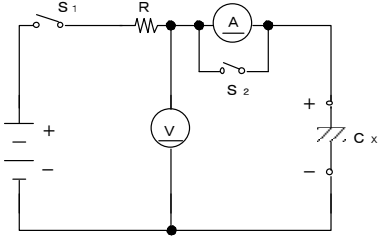
Ambient temperature : 5 to 35°C
Relative humidity : 45 to 85%RH
Air pressure : 86kPa to 106kPa

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

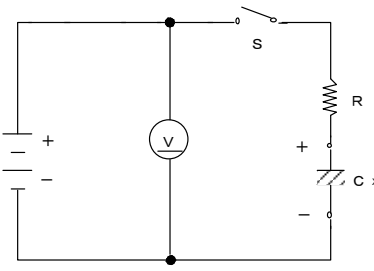
Ambient temperature : 20±2°C
Relative humidity : 60 to 70%RH
Air pressure : 86kPa to 106kPa

4.1 ELECTRICAL CHARACTERISTICS

No.	Item	Test method	Performance
4.1.1	RATED VOLTAGE		DC 6.3~100 V
4.1.2	CAPACITANCE	Measuring frequency 120Hz ±20 % Measuring circuit : Series equivalent circuit () Measuring voltage : 0.5Vrms or less +1.5 to 2.0 VDC	8.2~15000 μF Capacitance tolerance: ±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.

No.	Item	Test method	Performance															
4. 1. 4	LEAKAGE CURRENT	The rated voltage shall be applied across the capacitor and its protective resistor which shall be $1000\pm100\Omega$.The leakage current shall then be measured after an electrification period of 2 min. Measurement circuit  R : Protective resistor($1000\pm100\Omega$) Ⓐ : DC ammeter Ⓥ : DC voltmeter S₁ : switch S₂ : Protective switch for an ammeter C_x : Test Capacitor	After 2 min; I=0.01CV I : Leakage current (μA) C : Capacitance (μF) V : Rated voltage (V)															
4. 1. 6	TEMPERATURE CHARACTERISTIC	<table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>20±2℃</td><td>-----</td></tr><tr><td>2</td><td>-25, -40⁺⁰₋₃ ℃</td><td>2h.</td></tr><tr><td>3</td><td>20±2℃</td><td>15min.</td></tr><tr><td>4</td><td>105⁺³₋₀ ℃</td><td>2h.</td></tr></table> Step 1 : Capacitance and impedance shall be measured. (Z 20℃ 120Hz±20%) Step 2 : After the capacitor being stored for 2 hours, Impedance shall be made at thermal stability. (Z -25, -40℃ 120Hz±20%) Step 4 : After the capacitor being stored for 2 hours, capacitance shall be measured. The measurement shall be made at thermal stability.	Step	Temperature	Time	1	20±2℃	-----	2	-25, -40 ⁺⁰ ₋₃ ℃	2h.	3	20±2℃	15min.	4	105 ⁺³ ₋₀ ℃	2h.	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 ±20% of the value at Step 1.
Step	Temperature	Time																
1	20±2℃	-----																
2	-25, -40 ⁺⁰ ₋₃ ℃	2h.																
3	20±2℃	15min.																
4	105 ⁺³ ₋₀ ℃	2h.																

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No.	Item	Test method	Performance
4.1.7	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. Test circuit  R : Protective series resistor (1000 Ω) $\textcircled{V}$: DC voltmeter S : Switch C_x : 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.	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.

4.2 MECHANICAL PERFORMANCE

No.	Item	Test method	Performance																
4.2.1	TERMINAL STRENGTH	Tensile strength of termination: A static load of $\times 1$ N shall be applied to the terminal in the axial direction and acting in a direction away from the body for 10 sec.. $\times 1$ <table border="1"> <tr> <td>ϕ d dia. of wire ϕ</td><td>0.5</td><td>0.6</td><td>0.8</td></tr> <tr> <td>Tensile force N</td><td>5</td><td>10</td><td>10</td></tr> </table> Bending strength of termination: Hang the specified dead weight of $\times 2$ 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. $\times 2$ <table border="1"> <tr> <td>ϕ d dia. of wire ϕ</td><td>0.5</td><td>0.6</td><td>0.8</td></tr> <tr> <td>Bending force N</td><td>2.5</td><td>5</td><td>5</td></tr> </table>	ϕ d dia. of wire ϕ	0.5	0.6	0.8	Tensile force N	5	10	10	ϕ d dia. of wire ϕ	0.5	0.6	0.8	Bending force N	2.5	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.
ϕ d dia. of wire ϕ	0.5	0.6	0.8																
Tensile force N	5	10	10																
ϕ d dia. of wire ϕ	0.5	0.6	0.8																
Bending force N	2.5	5	5																

No.	Item	Test method	Performance
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 : $235\pm5^{\circ}\text{C}$ Dipping time : $2\pm0.5\text{sec.}$ 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 : $260\pm5^{\circ}\text{C}$ Immersion time : $10\pm1\text{ sec.}$ Printed wiring board : 1.6mm Soldering iron method Bit temperature : $350\pm10^{\circ}\text{C}$ Application time of soldering iron : $3\sim5\text{ sec.}$ For other procedures then those specified, refer to JIS C 5101-1 4.14. Test Method 1 (Solder bath at 260°C) and Method 2 (Soldering iron at 350°C)	Variation of capacitance : Within $\pm10\%$ 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 : $40\pm2^{\circ}\text{C}$ Test time : $240\pm8\text{h}$ 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 $\pm15\%$ of the value before test. Tan δ : To satisfy Table 1 Leakage current : To satisfy No. 4.1.4 Appearance : No remarkable abnormality.

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 : 105 ±2℃ Test time ※3 (6. 3V) <table><tr><td>φ D ≤6. 3</td><td>:</td><td>6000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×11. 5L</td><td>:</td><td>8000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×15L</td><td>:</td><td>9000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×20L</td><td>:</td><td></td><td></td><td></td></tr><tr><td>φ D ≥10</td><td>:</td><td>10000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>(10~50V)</td><td></td><td></td><td></td><td></td></tr><tr><td>φ D ≤6. 3</td><td>:</td><td>7000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×11. 5L</td><td>:</td><td>9000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×15L</td><td>:</td><td>10000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×20L</td><td>:</td><td></td><td></td><td></td></tr><tr><td>φ D ≥10</td><td>:</td><td>10000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>(63~100V)</td><td></td><td></td><td></td><td></td></tr><tr><td>φ D ≤6. 3</td><td>:</td><td>8000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×11. 5L</td><td>:</td><td>10000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×15L</td><td>:</td><td>11000</td><td>⁺⁷²₋₀</td><td>h</td></tr><tr><td>φ 8×20L</td><td>:</td><td></td><td></td><td></td></tr><tr><td>φ D ≥10</td><td>:</td><td>12000</td><td>⁺⁷²₋₀</td><td>h</td></tr></table>	φ D ≤6. 3	:	6000	⁺⁷² ₋₀	h	φ 8×11. 5L	:	8000	⁺⁷² ₋₀	h	φ 8×15L	:	9000	⁺⁷² ₋₀	h	φ 8×20L	:				φ D ≥10	:	10000	⁺⁷² ₋₀	h	(10~50V)					φ D ≤6. 3	:	7000	⁺⁷² ₋₀	h	φ 8×11. 5L	:	9000	⁺⁷² ₋₀	h	φ 8×15L	:	10000	⁺⁷² ₋₀	h	φ 8×20L	:				φ D ≥10	:	10000	⁺⁷² ₋₀	h	(63~100V)					φ D ≤6. 3	:	8000	⁺⁷² ₋₀	h	φ 8×11. 5L	:	10000	⁺⁷² ₋₀	h	φ 8×15L	:	11000	⁺⁷² ₋₀	h	φ 8×20L	:				φ D ≥10	:	12000	⁺⁷² ₋₀	h	Variation of capacitance : Within ※3 of the value before test. Tan δ : Not more than 200% of the specified value in Table 1. Leakage current : To satisfy No. 4. 1. 4 Appearance : No remarkable abnormality. ※3 6. 3V, 10V : ±30% 16V~100V : ±25%
φ D ≤6. 3	:	6000	⁺⁷² ₋₀	h																																																																																				
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4. 3. 4	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, there by 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.																																																																											
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C≤10	100																																																																																							
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1000<C	0. 1																																																																																							
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Table - 1 Electrical Characteristics

Rated voltage (V)	Surge voltage (V)	Tan δ ※4	Impedance ratio at 120Hz		
			$\phi D \leq 6.3$ $\frac{ Z _{-40^{\circ}\text{C}}}{ Z _{+20^{\circ}\text{C}}}$	$\phi D \geq 8$ $\frac{ Z _{-40^{\circ}\text{C}}}{ Z _{+20^{\circ}\text{C}}}$	$\frac{ Z _{-25^{\circ}\text{C}}}{ Z _{+20^{\circ}\text{C}}}$
6.3	8	0.21	5	3	2
10	13	0.18	5	3	2
16	20	0.15	4	3	2
25	32	0.13	4	3	2
35	44	0.11	4	3	2
50	63	0.10	4	3	2
63	79	0.09	3	3	2
80	100	0.09	3	3	2
100	125	0.08	3	3	2

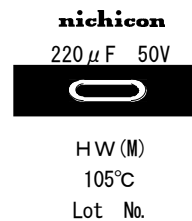
※4 For capacitance of more than 1000 μ F, add 0.02 for every increase of 1000 μ F.

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. : nichicon
- (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 : 105°C
- (8) Series identification : HW

<MARKING>

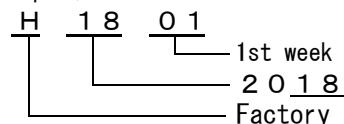


5.2 Marking color

Sleeve color : Black
Print color : White

5.3 Lot No.

<Example>



H:NICHICON (OHNO) CORPORATION
N:NICHICON (IWATE) CORPORATION
B:NICHICON (MALAYSIA) SDN. BHD.
C:NICHICON ELECTRONICS (WUXI) CO., LTD.

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6. TYPE NUMBERING SYSTEM

Type U HW 1 C 2 2 2 M HD □ □□

Series name

Rated voltage

Voltage code	Rated Voltage (V)	Voltage code	Rated Voltage (V)
0J	6.3	1H	50
1A	10	1J	63
1C	16	1K	80
1E	25	2A	100
1V	35		

Rated capacitance

Capacitance code	Capacitance (μF)
8 R 2	8.2
1 0 0	10
1 0 1	100
1 0 2	1000

Lead process requirement

CA Cutting

CP

CC

CV

CT

CM

AA : Snap in type forming

TD : Taping $\phi D \leq 10$

T0 : Taping $\phi D = 12.5$

TN : Taping $\phi D = 16, 18$

Size code ※5

Configuration

$\phi D = 5$: DD

$\phi D = 6.3$: ED

$\phi D = 10$: PD

$\phi D = 12.5 \sim 18$: HD

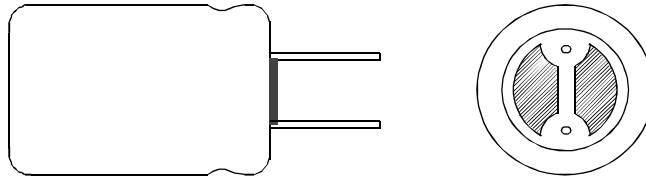
Capacitance tolerance (±20%)

※5

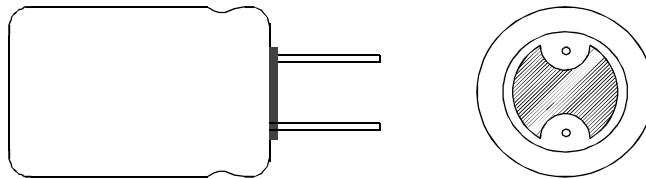
Please refer to size table in sheet 18 to 22.
For small dia. type put '1' when lead process is required
otherwise leave this digit blank.

・ "GAS ESCAPE" END SEAL TYPE

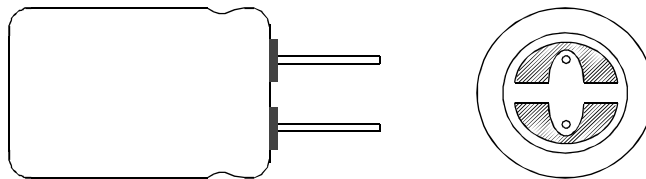
FORM A



FORM B



FORM C

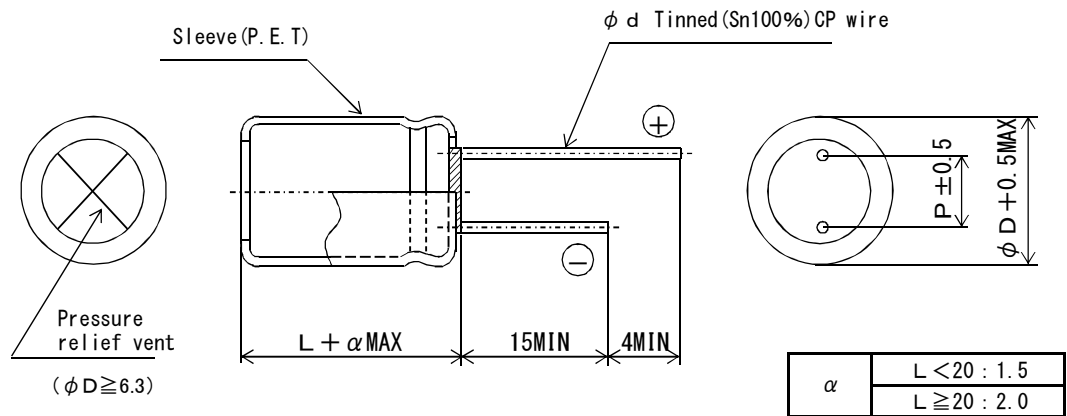


・ SCOPE

FORM	ϕ D
A	ϕ 5、 ϕ 6.3
B	ϕ 8、 ϕ 10
C	ϕ 12.5~ ϕ 18

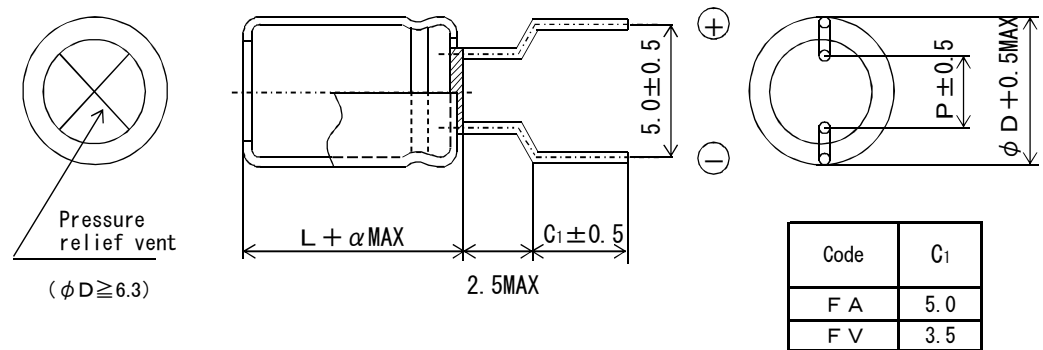
7. SHAPE AND DIMEN: SHAPE AND DIMENSIONS

A : LONG LEAD



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

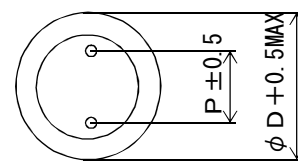
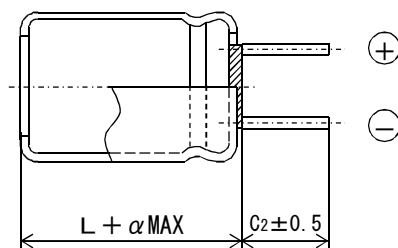
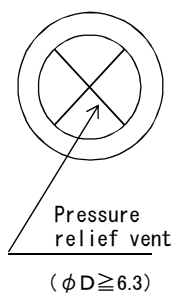
$\phi D \leq 8$



	(mm)						
ϕD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ϕd	0.5	0.5	0.6	0.6	*0.6	0.8	0.8

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

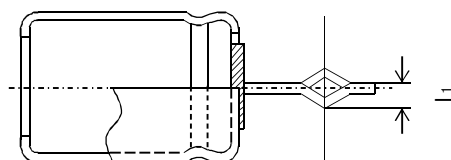
C : STRAIGHT CUT TYPE LEAD (Formed lead code : CA, CP, CC, CV, CT, CM)



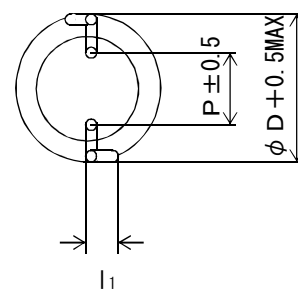
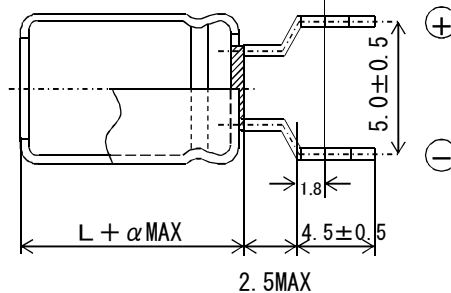
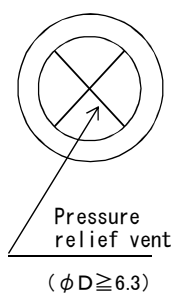
Code	C ₂	Code	C ₂
C A	5.0	C V	3.5
C P	4.5	C T	3.2
C C	4.0	C M	3.0

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

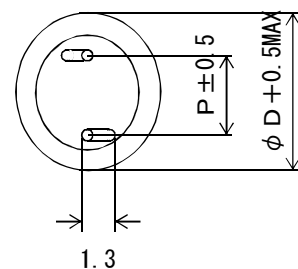
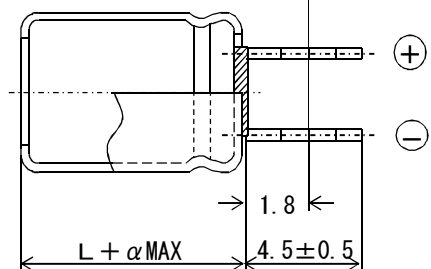
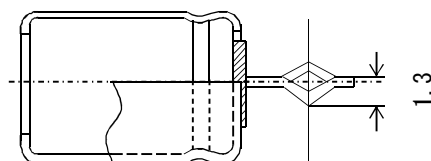
$\phi D \leq 8$



ϕD	5	6.3	8
P	2.0	2.5	3.5
l ₁	1.1	1.1	1.3



$\phi D \geq 10$



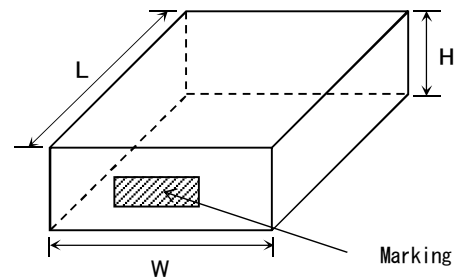
• Packing

(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
$\phi 5 \times 11$	200	6000	24000	200	8000	32000
$\phi 6.3 \times 11$	200	4000	16000	200	7000	28000
$\phi 8 \times 11.5$	200	3000	12000	200	4000	16000
$\phi 8 \times 15$	200	2000	8000	200	3600	14400
$\phi 8 \times 20$	200	2000	8000	200	2200	8800
$\phi 10 \times 12.5$	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
$\phi 10 \times 31.5$	200	1000	4000	200	1200	4800
$\phi 12.5 \times 15$	100	1200	4800	100	1400	5600
$\phi 12.5 \times 20$	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
$\phi 12.5 \times 35.5$	100	500	2000	—	650	2600
$\phi 12.5 \times 40$	100	400	1600	—	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
$\phi 16 \times 35.5$	50	300	1200	—	400	1600
$\phi 16 \times 40$	50	300	1200	—	400	1600
$\phi 18 \times 20$	50	400	1600	—	600	2400
$\phi 18 \times 25$	50	300	1200	—	450	1800
$\phi 18 \times 31.5$	50	300	1200	—	450	1800
$\phi 18 \times 35.5$	50	250	1000	—	300	1200
$\phi 18 \times 40$	50	200	800	—	300	1200

(2) Package dimensions

ϕ D		L	W	H
$\phi 5 \sim \phi 18$	Inside box	255	210	130
	Outside box	440	268	282



(3)Marking

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±15%)

SIZE	WEIGHT	SIZE	WEIGHT	SIZE	WEIGHT
$\phi 5 \times 11$	0.44	$\phi 12.5 \times 15$	2.96	$\phi 16 \times 40$	12.30
$\phi 6.3 \times 11$	0.59	$\phi 12.5 \times 20$	3.43	$\phi 18 \times 20$	7.71
$\phi 8 \times 11.5$	1.19	$\phi 12.5 \times 25$	4.56	$\phi 18 \times 25$	10.20
$\phi 8 \times 15$	1.36	$\phi 12.5 \times 31.5$	6.01	$\phi 18 \times 31.5$	13.30
$\phi 8 \times 20$	1.66	$\phi 12.5 \times 35.5$	7.06	$\phi 18 \times 35.5$	14.30
$\phi 10 \times 12.5$	1.49	$\phi 12.5 \times 40$	7.57	$\phi 18 \times 40$	16.40
$\phi 10 \times 16$	1.77	$\phi 16 \times 20$	5.92		
$\phi 10 \times 20$	2.34	$\phi 16 \times 25$	7.38		
$\phi 10 \times 25$	3.07	$\phi 16 \times 31.5$	8.43		
$\phi 10 \times 31.5$	3.21	$\phi 16 \times 35.5$	11.00		

8. Application

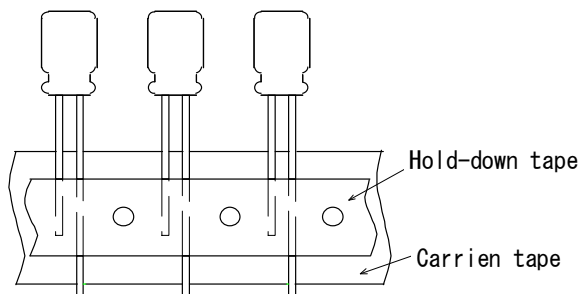
This specification applied to the singleended lead aluminum electrolytic capacitors for $\phi 5 \sim 18$ case diameter.

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

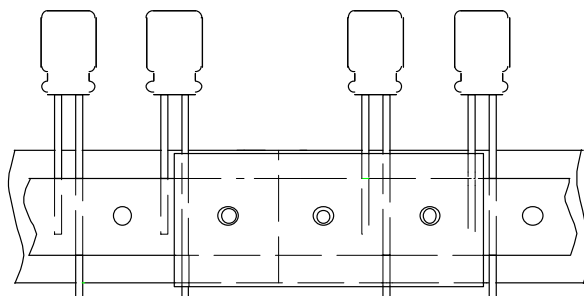
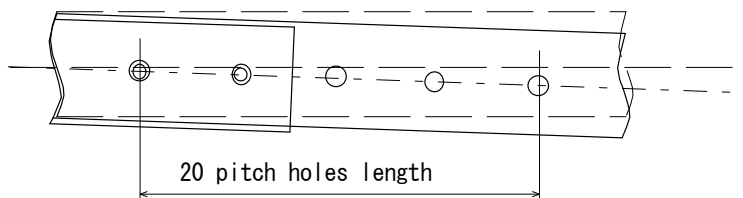
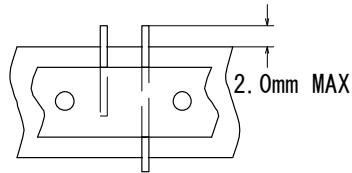


Fig-3



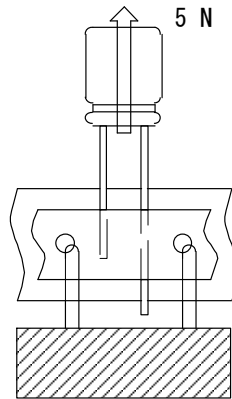
- 9.5 When leads are snipped to remove a capacitor, lead protrusion above the carrier tape shall be 2mm MAX.

Fig-4



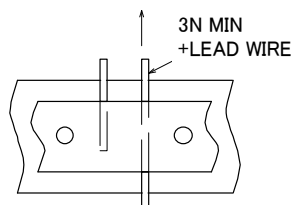
- 9.6 Pull strength
Capacitors shall be withstand 5N pull test without being removed from tape.

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

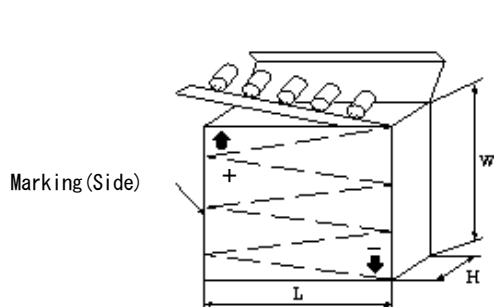


10. Packing

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

Diameter	Quantity
$\phi 5$, $\phi 6.3$, $\phi 8$	25
$\phi 10$	24
$\phi 12.5$	20
$\phi 16$, $\phi 18$	10

10.2 Package dimensions



(mm)			
ϕD	L	W	H
$\phi 5$	332	229	49
$\phi 6.3$	330	275	49
$\phi 8$	11.5L	332	229
	15L		49
	20L	330	229
$\phi 10$	12.5L	330	195
	16L	330	195
	20L	330	195
	25L	327	195
			61
$\phi 12.5$	15L	313	280
	20L	315	284
	25L	325	280
			62
$\phi 16$	20L	305	220
	25L	305	220
$\phi 18$	20L	315	284
	25L	315	280

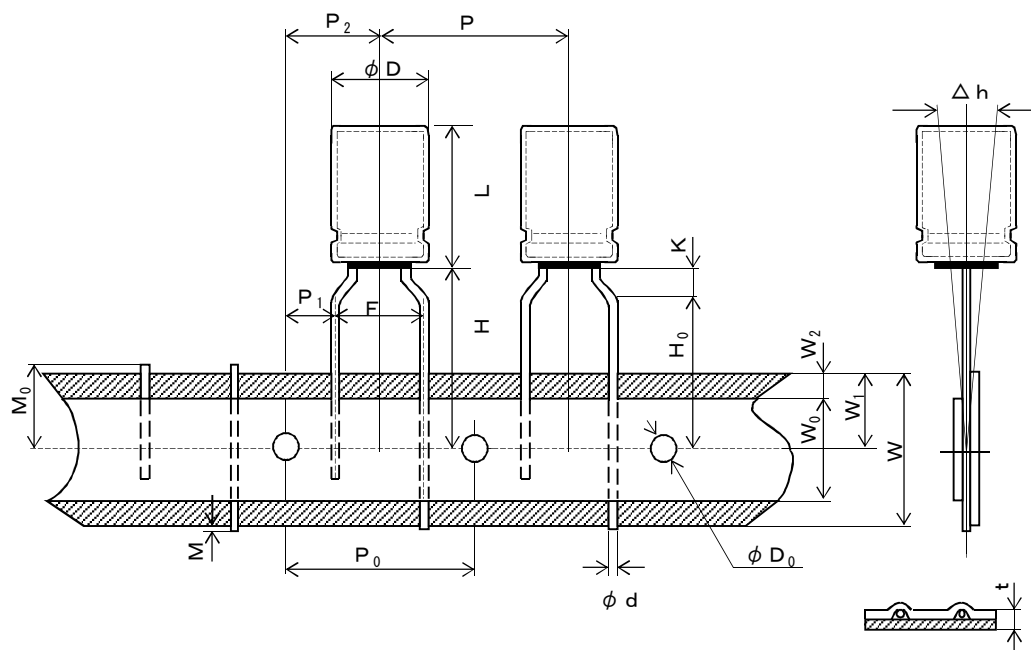
10.3 Marking (Each box shall be marked)

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

10.4 Quantity in box

ϕD	Inside box	Outside box
$\phi 5$, $\phi 6.3$	2000	20000
$\phi 8$	11.5L, 15L	1000
	20L	8000
$\phi 10$	12.5L	500
	16L, 20L, 25L	500
$\phi 12.5$	500	2500
$\phi 16$	250	1000
$\phi 18$	250	1250

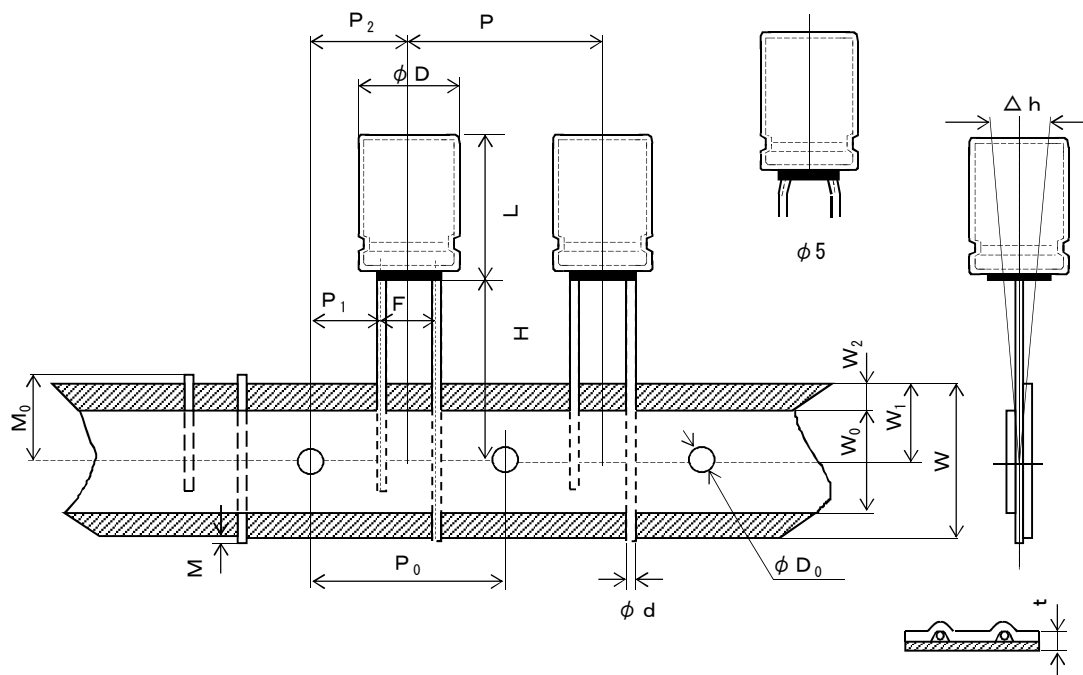
Taping Configuration (Taping code: TA)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	5, 6, 3, 8	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.5	± 0.05	$\phi 8 : 0.6$
Pitch of component	P	12.7	± 1.0	
Feed hole pitch	P0	12.7	± 0.2	
Hole center to lead	P1	3.85	± 0.5	
Feed hole center to component center	P2	6.35	± 1.0	
Lead to lead distance	F	5.0	+0.8 -0.2	Measured at below clinch.
Clinch height	K	2.5	MAX	$\phi 8 : 4.0$ MAX.
Component alignment .F-R	Δh	0	± 1.0	Center of body.
Tape width	W	18.0	± 0.5	
Hold-down tape width	W0	7.0	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W1	9.0	± 0.5	
Hold-down tape position	W2	1.5	MAX	
Height of component from tape center	H	18.5	+0.75 -0.5	$\phi 8 : 20.0$
Lead-wire clinch height	H0	16.0	± 0.5	
Lead-wire protrusion	M	1.0	MAX	
Feed hole diameter	$\phi D0$	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of clipped lead	M0	11.0	MAX	

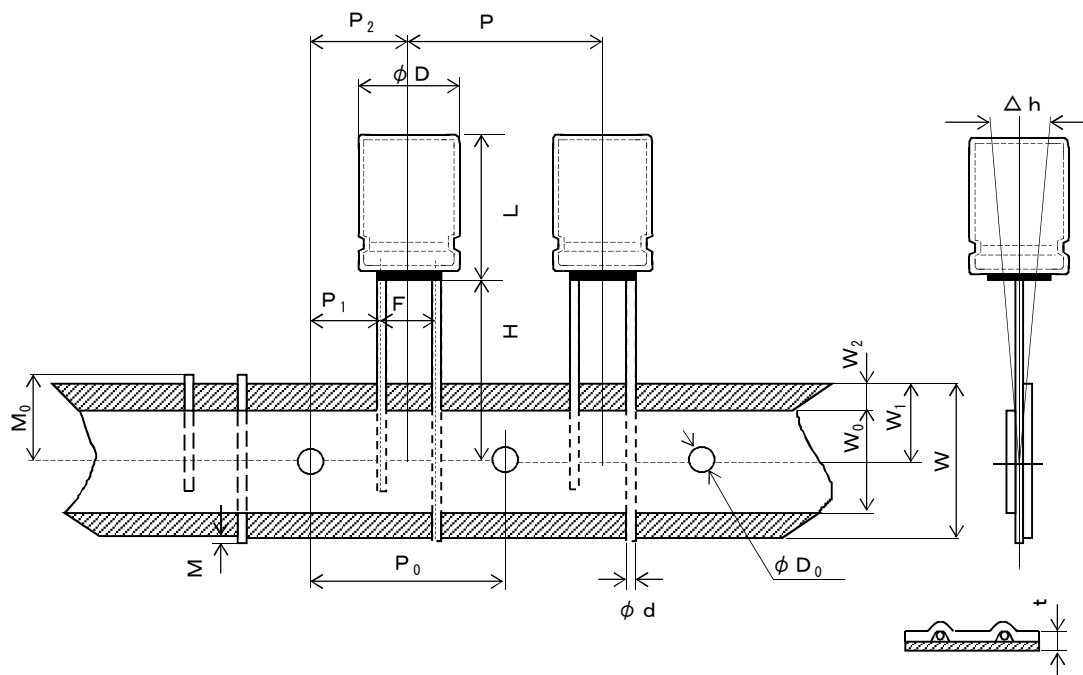
Taping Configuration (Taping code: TD)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	5, 6.3	+0.5MAX	
Body height	L	L	—	To comply with series specification.
Lead-wire diameter	ϕd	0.5	± 0.05	
Pitch of component	P	12.7	± 1.0	
Feed hole pitch	P0	12.7	± 0.2	
Hole center to lead	P1	5.1	± 0.5	
Feed hole center to component center	P2	6.35	± 1.0	
Lead to lead distance	F	2.5	+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	W0	7.0	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W1	9.0	± 0.5	
Hold-down tape position	W2	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	$\phi D0$	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M0	11.0	MAX	

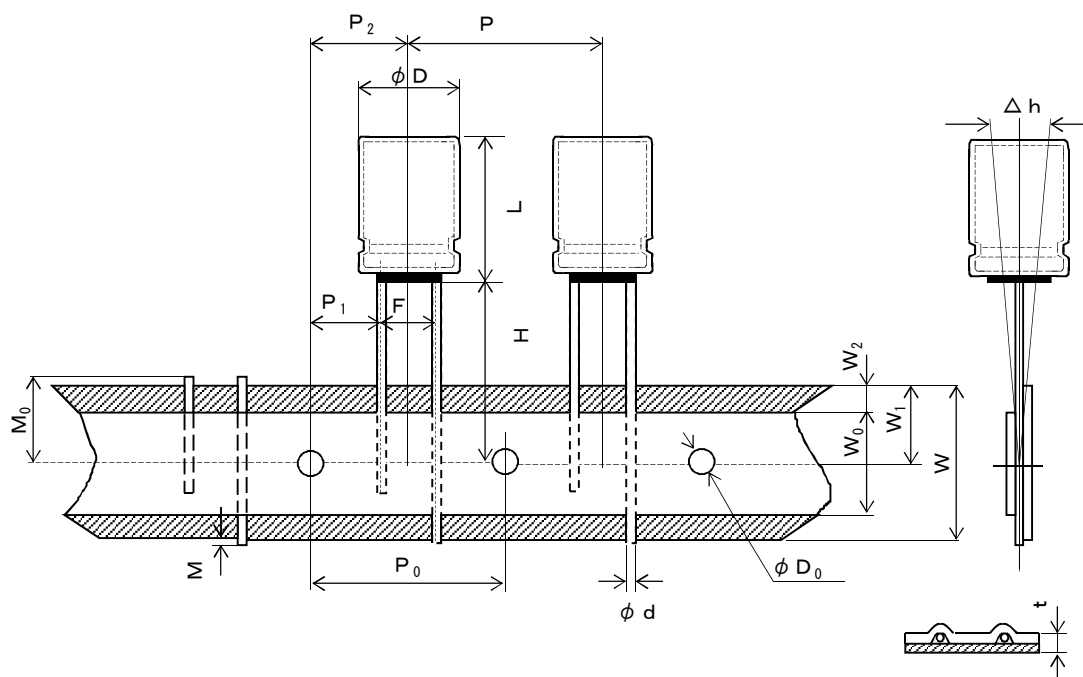
Taping Configuration (Taping code: TD)



(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	P0	12.7	± 0.2	
Hole center to lead	P1	4.6	± 0.5	
Feed hole center to component center	P2	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	W0	7.0	MIN	The hold down tape shall not protrude beyond the carrier tape.
Hole position	W1	9.0	± 0.5	
Hold-down tape position	W2	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	$\phi D0$	4.0	± 0.2	
Total tape thickness	t	0.6	± 0.2	
Length of snapped lead	M0	11.0	MAX	

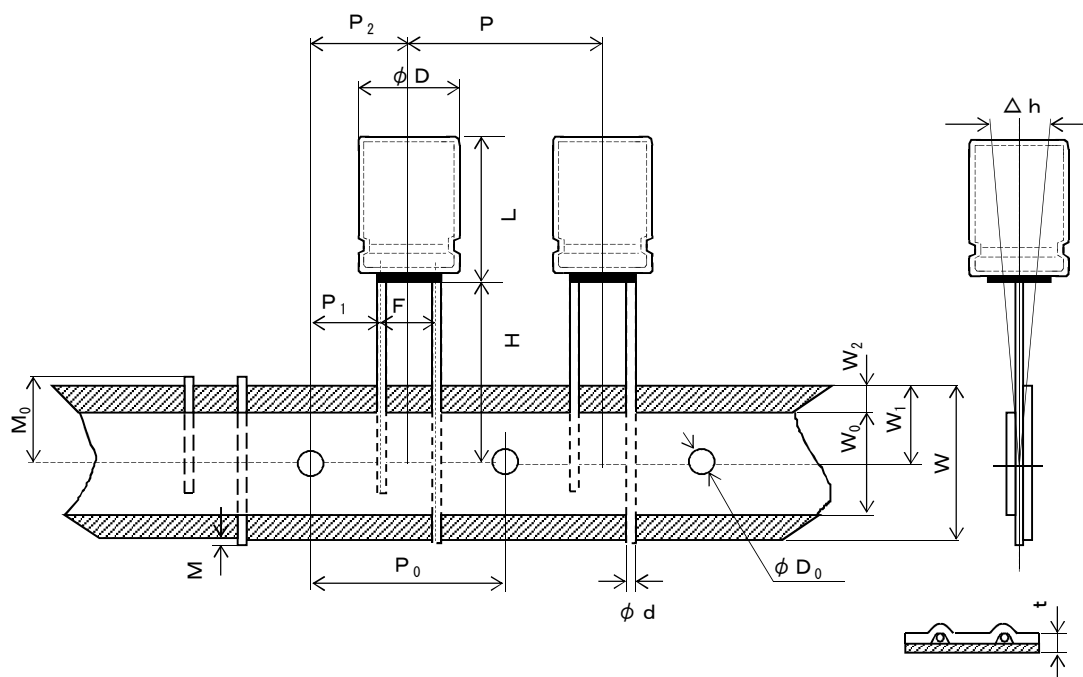
Taping Configuration (Taping code: TD)



(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	

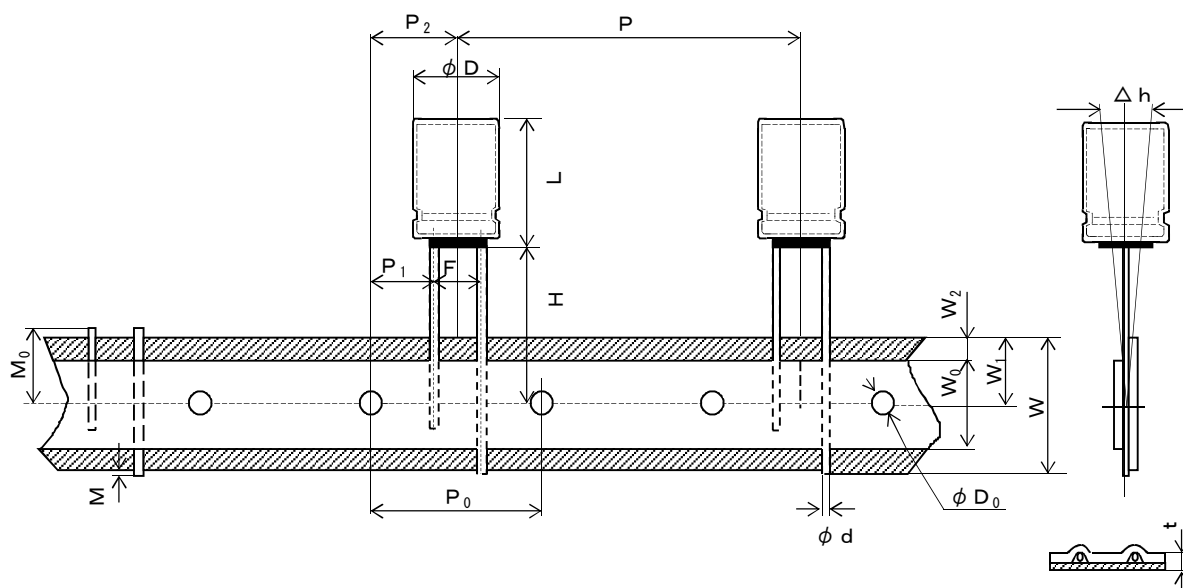
Taping Configuration (Taping code: T0)



(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, 18	+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	

11. STANDARD RATINGS

Rated voltage (V)	6.3(0J)					10(1A)				
Capacitance (μ F)	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C
	Φ D	L	20°C	-10°C		Φ D	L	20°C	-10°C	
150						5	11	0.47	1.5	450
220	5	11	0.47	1.50	450					
330						6.3	11	0.20	0.66	700
470	6.3	11	0.20	0.66	700					
560						8	11.5	0.10	0.36	1200
820	8	11.5	0.10	0.36	1200	8	15	0.054	0.17	1600
1000	8	15	0.054	0.17	1600	10	12.5	0.048	0.15	1700
1200	10	12.5	0.048	0.15	1700	▲8	20	0.038	0.120	1960
						10	16	0.030	0.090	2000
1500	8	20	0.038	0.120	1960	10	16	0.030	0.090	2000
1800	10	16	0.030	0.090	2000	10	20	0.020	0.060	2500
2200	10	20	0.020	0.060	2500	10	25	0.017	0.051	2900
2700	10	20	0.020	0.060	2500	12.5	20	0.017	0.051	2600
3300	10	25	0.017	0.051	2900	12.5	20	0.017	0.051	2600
3900	12.5	20	0.017	0.051	2600	12.5	25	0.015	0.045	3200
4700	12.5	25	0.015	0.045	3200	12.5	31.5	0.012	0.036	3795
						▲16	20	0.015	0.045	3575
5600	12.5	31.5	0.012	0.036	3795	12.5	35.5	0.011	0.033	4120
	▲12.5	25	0.015	0.045	3200	▲16	25	0.013	0.039	3810
6800	12.5	31.5	0.011	0.033	3795	16	25	0.013	0.039	3810
	▲16	20	0.015	0.045	3575					
8200	16	25	0.013	0.039	3810	16	31.5	0.011	0.033	4000
10000	16	25	0.013	0.039	3810	16	31.5	0.011	0.033	4000
12000	16	31.5	0.011	0.033	4000	16	35.5	0.010	0.030	4200
15000	16	35.5	0.010	0.030	4200					

In this case, 6 will be put at 12th digit of type numbering system, "▲"

Rated voltage (V)	16(1C)					25(1E)				
Capacitance (μ F)	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C
	Φ D	L	20°C	-10°C		Φ D	L	20°C	-10°C	
68						5	11	0.47	1.50	450
120	5	11	0.47	1.50	450					
150						6.3	11	0.20	0.66	700
180						6.3	11	0.20	0.66	700
270	6.3	11	0.20	0.66	700					
330						8	11.5	0.10	0.36	1200
390						8	15	0.054	0.17	1600
470	8	11.5	0.10	0.36	1200	10	12.5	0.048	0.15	1700
560	8	15	0.054	0.17	1600	8	20	0.038	0.12	1960
680	10	12.5	0.048	0.15	1700	10	16	0.030	0.090	2000
820	▲8	20	0.038	0.12	1960	10	20	0.020	0.060	2500
	10	16	0.030	0.090	2000	▲10	16	0.030	0.090	2000
1000	▲8	20	0.038	0.12	1960	10	20	0.020	0.060	2500
	10	16	0.030	0.090	2000					
1200	10	20	0.020	0.060	2500	10	25	0.017	0.051	2900
	▲10	16	0.030	0.090	2000					
1500	10	20	0.020	0.060	2500	12.5	20	0.017	0.051	2600
1800	10	25	0.017	0.051	2900	12.5	25	0.015	0.045	3200
2200	12.5	20	0.017	0.051	2600	12.5	25	0.015	0.045	3200
						▲16	20	0.015	0.045	3575
2700	12.5	25	0.015	0.045	3200	12.5	31.5	0.012	0.036	3795
						▲16	20	0.015	0.045	3576
3300	12.5	25	0.015	0.045	3200	12.5	35.5	0.011	0.033	4120
	▲16	20	0.015	0.045	3575	▲16	25	0.013	0.039	3810
3900	12.5	31.5	0.012	0.036	3795	16	25	0.013	0.039	3810
	▲16	20	0.015	0.045	3575					
4700	12.5	35.5	0.011	0.033	4120	16	31.5	0.011	0.033	4000
	▲16	25	0.013	0.039	3810					
5600	16	25	0.013	0.039	3810	16	35.5	0.010	0.030	4200
6800	16	31.5	0.011	0.033	4000					
8200	16	35.5	0.010	0.030	4200					

In this case, 6 will be put at 12th digit of type numbering system, "▲"

Rated voltage (V)	35(1V)					50(1H)				
Capacitance (μ F)	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C
	Φ D	L	20°C	-10°C		Φ D	L	20°C	-10°C	
27						5	11	0.47	1.50	450
47	5	11	0.47	1.50	450					
56						6.3	11	0.20	0.66	700
100	6.3	11	0.20	0.66	700	8	11.5	0.10	0.36	1200
120						8	11.5	0.10	0.36	1200
150						8	15	0.054	0.17	1600
180	8	11.5	0.10	0.36	1200	10	12.5	0.048	0.15	1700
220	8	15	0.054	0.17	1600	▲10	12.5	0.048	0.15	1700
						10	16	0.042	0.126	1650
270	8	15	0.054	0.17	1600	▲8	20	0.038	0.12	1960
	▲10	12.5	0.048	0.15	1700	10	20	0.030	0.090	2060
330	10	12.5	0.048	0.15	1700	10	20	0.030	0.090	2060
390	▲8	20	0.038	0.12	1960	10	25	0.028	0.084	2420
	10	16	0.030	0.090	2000	▲10	20	0.030	0.090	2060
470	10	16	0.030	0.090	2000	10	25	0.028	0.084	2420
						▲12.5	20	0.027	0.081	2300
560	10	20	0.020	0.060	2500	12.5	20	0.027	0.081	2300
680	10	25	0.017	0.051	2900	12.5	25	0.023	0.069	2800
	▲10	20	0.020	0.060	2500					
820	10	25	0.017	0.051	2900	12.5	25	0.023	0.069	2800
	▲12.5	20	0.017	0.051	2600	▲16	20	0.023	0.069	3070
1000	12.5	20	0.017	0.051	2600	12.5	31.5	0.020	0.060	3500
						▲16	25	0.021	0.063	3270
1200	12.5	25	0.015	0.045	3200	16	25	0.021	0.063	3270
1500	16	20	0.015	0.045	3575	12.5	35.5	0.019	0.057	3810
						▲16	25	0.021	0.063	3270
1800	12.5	31.5	0.012	0.036	3795	16	31.5	0.019	0.057	3430
	▲16	25	0.013	0.039	3810					
2200	12.5	35.5	0.011	0.033	4120	16	31.5	0.019	0.057	3430
	▲16	25	0.013	0.039	3810					
2700						16	35.5	0.018	0.054	3600
3300	16	31.5	0.011	0.033	4000					
3900	16	35.5	0.010	0.030	4200					

In this case, 6 will be put at 12th digit of type numbering system, "▲"

Rated voltage (V)	63(1J)					80(1K)				
Capacitance (μ F)	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C
	Φ D	L	20°C	-10°C		Φ D	L	20°C	-10°C	
12						5	11	1.20	5.40	310
18	5	11	1.20	5.40	310					
27						6.3	11	0.46	2.10	500
39	6.3	11	0.46	2.10	500					
47	6.3	11	0.46	2.10	500	8	11.5	0.29	1.30	950
68	8	11.5	0.29	1.30	950	8	15	0.20	0.90	1230
82	8	11.5	0.29	1.30	950	10	12.5	0.17	0.66	1280
100	8	15	0.20	0.90	1230	8	20	0.16	0.66	1580
120	8	15	0.20	0.90	1230	10	16	0.115	0.47	1040
	▲10	12.5	0.17	0.66	1280					
150	8	20	0.16	0.66	1580					
	▲10	12.5	0.17	0.66	1280					
180	▲8	20	0.16	0.66	1580	10	20	0.088	0.34	1430
	10	16	0.115	0.47	1200	▲12.5	15	0.115	0.47	1430
220						10	25	0.072	0.28	1620
270	10	20	0.088	0.34	1570	10	31.5	0.063	0.18	1750
						▲12.5	20	0.065	0.18	1750
330	10	25	0.072	0.28	1990					
390	10	31.5	0.063	0.18	2050	12.5	25	0.049	0.14	2210
	▲12.5	20	0.065	0.18	1990					
470						12.5	31.5	0.044	0.13	2400
						▲16	20	0.050	0.15	1950
560	12.5	25	0.049	0.14	2460	12.5	35.5	0.038	0.11	2600
						▲18	20	0.047	0.14	2270
680	12.5	31.5	0.044	0.13	2760	12.5	40	0.033	0.095	2860
	▲16	20	0.050	0.15	2380	▲16	25	0.040	0.12	2430
820	12.5	35.5	0.038	0.11	3040	16	31.5	0.033	0.095	2640
	▲18	20	0.047	0.14	2460	▲18	25	0.038	0.11	2500
1000	12.5	40	0.033	0.095	3100	16	35.5	0.030	0.086	2860
	▲16	25	0.040	0.12	2890					
1200	16	31.5	0.025	0.072	2930	16	40	0.028	0.081	3510
	▲18	25	0.038	0.11	2930	▲18	31.5	0.031	0.090	2860
1500	16	35.5	0.023	0.066	3100	18	35.5	0.028	0.081	3510
	▲18	31.5	0.024	0.069	3100					
1800	16	40	0.021	0.060	3510	18	40	0.027	0.076	3860
	▲18	35.5	0.022	0.063	3510					
2200	18	40	0.020	0.057	3860					

In this case, 6 will be put at 12th digit of type numbering system, "▲"

Rated voltage (V)	100(2A)				
Capacitance (μ F)	Size (mm)		Impedance (Ω MAX.) 100kHz		Allowable ripple (mArms) 100kHz 105°C
	Φ D	L	20°C	-10°C	
8.2	5	11	1.20	5.40	310
18	6.3	11	0.46	2.10	500
33	8	11.5	0.29	1.30	950
47	8	15	0.20	0.90	1230
56	10	12.5	0.17	0.66	1280
68	8	20	0.16	0.66	1580
82	10	16	0.115	0.47	1040
100	10	20	0.088	0.34	1430
	▲12.5	15	0.115	0.47	1430
120	10	25	0.072	0.28	1620
180	12.5	20	0.065	0.18	1750
220	12.5	25	0.049	0.14	2210
270	12.5	31.5	0.044	0.13	2400
	▲16	20	0.050	0.15	1950
390	12.5	35.5	0.038	0.11	2600
	▲16	25	0.040	0.12	2430
	●18	20	0.047	0.014	2270
470	12.5	40	0.033	0.095	2860
	▲18	25	0.038	0.11	2500
560	16	31.5	0.033	0.095	2640
680	16	35.5	0.030	0.086	2860
	▲18	31.5	0.031	0.090	2860
820	16	40	0.028	0.081	3510
	▲18	35.5	0.028	0.081	3510
1000	18	40	0.027	0.076	3860

In this case, 6 will be put at 12th digit of type numbering system, "▲"

In this case, 3 will be put at 12th digit of type numbering system, "※"

• Frequency coefficient of allowable ripple current

Cap (μF) \ Freq.	120Hz	1kHz	10kHz	100kHz ~
8.2~33	0.40	0.70	0.90	1.00
39~180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
4700~15000	0.85	0.95	0.98	1.00

• Temperature coefficient of allowable ripple current

Temperature	~85°C	105°C
Coefficient	1.70	1.00

12. 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)

13. 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 frequency.
- (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.

14. 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, sexivalent 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.

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Material of Aluminum Electrolytic Capacitors
UHW Series

No.	ITEM	MATERIALS
①	Anode foil	High-purity Aluminum foil
②	Cathode foil	High-purity Aluminum foil
③	Separator	Non wood fiber
④	Lead wire	Tinned (Sn100%) 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	Electrolyte	Ethylene glycol and organic acid

Structure for Alminum Electrolytic Capacitor

