

TO : HOLYSTONE

No. NE-6766

SPECIFICATION OF

ALUMINUM ELECTROLYTIC CAPACITORS

BW series
(Pb free - RoHS compliance)

	sheet 1 of 22	APPROVED	m. Tada Jan. 07. 2009		
DWG. No.	H090107h6	CHECKED	Jan. 07. 2009		
REV. LET.		DESIGNED	Jan. 07. 2009		
LET.	REVISIONS	DATE	DR.	CK.	AP.

1. SCOPE

This specification covers "BW 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.
-55~+135°C

4. CHARACTERISTICS

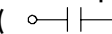
Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows:

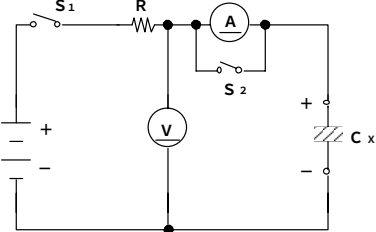
Ambient temperature: 5 to 35°C
Relative humidity : 45 to 85%
Air pressure : 86kPa to 106kPa

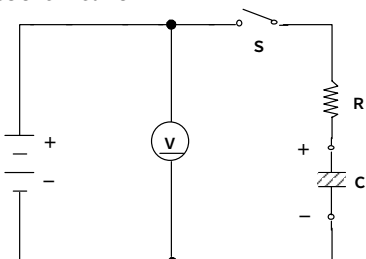
If there may be doubt on the results, measurements shall be made within the following limits,

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

4.1 ELECTRICAL CHARACTERISTICS

Nº	Item	Test method	Performance
4.1.1	RATED VOLTAGE		DC 10~100 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	1~4700 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 1 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 1 min; not more than $I=0.03CV$ or $4(\mu A)$ whichever is greater. I : Leakage current(μA) C : Capacitance(μF) V : Rated voltage(V)															
4.1.5	TEMPERATURE CHARACTERISTIC	<table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>$20\pm2^{\circ}C$</td><td>-----</td></tr><tr><td>2</td><td>$-25,-40_{-3}^{0}^{\circ}C$</td><td>2h.</td></tr><tr><td>3</td><td>$20\pm2^{\circ}C$</td><td>15min.</td></tr><tr><td>4</td><td>$135_{0}^{+3}^{\circ}C$</td><td>2h.</td></tr></table> Step 1 : Capacitance and impedance shall be measured. (Z $20^{\circ}C$ $120Hz\pm20\%$) Step 2 : After the capacitor being stored for 2 hours, Impedance shall be made at thermal stability. (Z $-25,-40^{\circ}C$ $120Hz\pm20\%$) 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	$20\pm2^{\circ}C$	-----	2	$-25,-40_{-3}^{0}^{\circ}C$	2h.	3	$20\pm2^{\circ}C$	15min.	4	$135_{0}^{+3}^{\circ}C$	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 $\pm20\%$ of the value at Step 1.
Step	Temperature	Time																
1	$20\pm2^{\circ}C$	-----																
2	$-25,-40_{-3}^{0}^{\circ}C$	2h.																
3	$20\pm2^{\circ}C$	15min.																
4	$135_{0}^{+3}^{\circ}C$	2h.																
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Nº	Item	Test method	Performance												
4.1.6	SURGE TEST	Voltage application : 1000 times of charging for 30 ± 5 sec., with a period of 6 ± 0.5min.. Test temperature : $15^{\circ}\text{C}\sim35^{\circ}\text{C}$ 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 ⓧ : DC voltmeter S : Switch Cx : Test capacitor Note : This requirement is applicable only to instantaneous over voltage which may be applied to the terminals of capacitor, therefore, not applicable to such over voltages 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 ※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 Tensileforce 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 Tensileforce 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 Tensileforce 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 : $235\pm5^{\circ}\text{C}$ 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 circum- ferential surface of the dipping portion of termination shall be covered with new solder.												
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4.3 ENDURANCE PERFORMANCE

Nº	Item	Test method	Performance
4.3.1	RESISTANCE TO SOLDERING HEAT	Solder bath method Solder temperature : $260 \pm 5^{\circ}\text{C}$ Immersion time : 10 ± 1 sec. Printed wiring board : 1.6mm Soldering iron method Bit temperature : $350 \pm 10^{\circ}\text{C}$ Application time of soldering iron : $3 \frac{1}{4}$ 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 $\pm 10\%$ 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 : $40 \pm 2^{\circ}\text{C}$ Test time : 240 ± 8h Relative humidity : 90~95% 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 $\pm 15\%$ of the value before test. Tan δ : To satisfy Table 1 Leakage current : To satisfy No.4.1.4 Appearance : No remarkable abnormality.
4.3.3	LIFE TEST	To comply with JIS C 5101-1 4.23 Applied voltage D.C. bias 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 $135 \pm 2^{\circ}\text{C}$ Test time ※3 $\Phi D=8$: $1000 \frac{+48}{-0}$ h $\Phi D=10$: $2000 \frac{+72}{-0}$ h $\Phi D \geq 12.5$: $3000 \frac{+72}{-0}$ h	Variation of capacitance : Within $\pm 30\%$ of the value before test. Tan δ : Not more than 300% of the specified value in Table 1. Leakage current : To satisfy No.4.1.4 Appearance : No remarkable abnormality.

Nº	Item	Test method	Performance										
4.3.4	SHELF LIFE TEST	The capacitors are then stored with no voltage applied at a temperature of $135 \pm 2^{\circ}\text{C}$ for 1000 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 $\pm 30\%$ of the value before test. Tan δ : Not more than 300% 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>$C \leq 10$</td><td>100</td></tr><tr><td>$10 < C \leq 100$</td><td>10</td></tr><tr><td>$100 < C \leq 1000$</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.	Cap. (μF)	R (Ω)	$C \leq 10$	100	$10 < C \leq 100$	10	$100 < C \leq 1000$	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)												
$C \leq 10$	100												
$10 < C \leq 100$	10												
$100 < C \leq 1000$	1												
$1000 < C$	0.1												
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.													

Table - 1 Electrical Characteristics

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

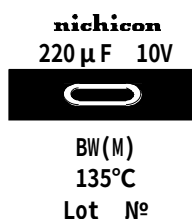
※4 For capacitance of more than 1000 μF , add 0.02 for every increase of 1000 μF .

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. : nichicon
- (2) Month and year of production or cord(including Lot N°)
- (3) Rated voltage
- (4) Capacitance
- (5) Polarity of the terminals
- (6) Capacitance tolerance code : (M)
- (7) Maximum operating temperature : 135°C
- (8) Series identification : BW

<MARKING>

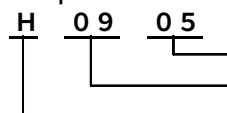


5.2 Marking color

Sleeve color : Blue
Print color : White

5.3 Lot N°

<Example>



5th week
2 0 0 9
Factory code
H:NICHICON (OHNO) CORPORATION
N:NICHICON (IWATE) CORPORATION
B:NICHICON (MALAYSIA) SDN.BHD.
C:NICHICON ELECTRONICS (WUXI) CO.,LTD.

6. TYPE NUMBERING SYSTEM

Type U BW 1 A 2 2 1 M P D 1 ☐ ☐

Series name

Rated voltage

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

Rated Capacitance

Capacitance code	Capacitance (μF)
0 1 0	1
1 0 0	10
1 0 1	100
1 0 2	1000

Lead process requirement

FA Forming and cutting
FV $\Phi D=8$

CA
CP
CC Cutting
CV
CT
CM

AA : Snap in type forming

TA : Taping $\Phi D=8$

TD : Taping $\Phi D \leq 10$

TO : Taping $\Phi D=12.5$

TN : Taping $\Phi D=16$

Configuration

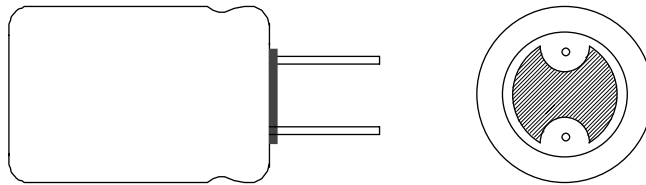
$\Phi D=8,10$: PD

$\Phi D=12.5 \sim 16$: HD

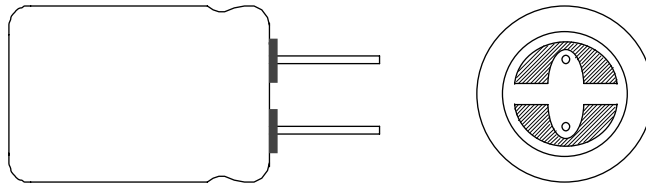
Capacitance tolerance
($\pm 20\%$)

"GAS ESCAPE" END SEAL TYPE

FORM A



FORM B

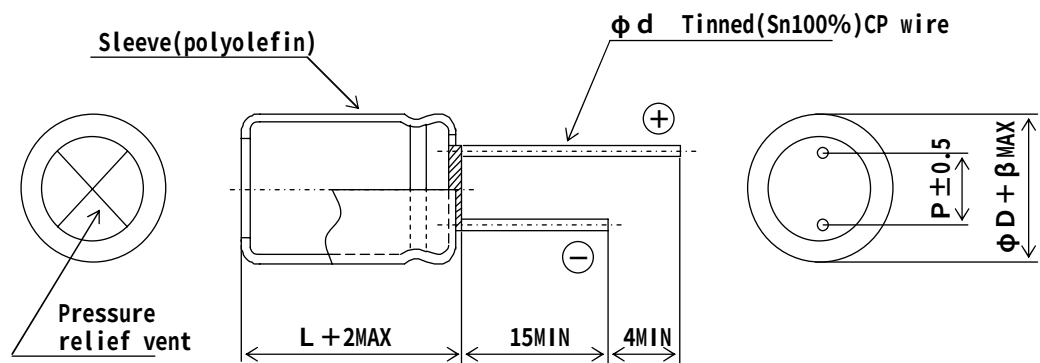


• SCOPE

FORM	ϕ D
A	$\phi 8$ 、 $\phi 10$
B	$\phi 12.5$ 、 $\phi 16$

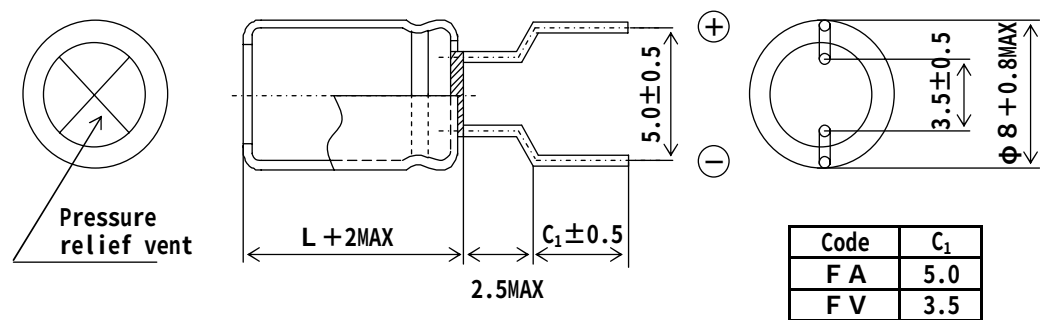
7. SHAPE AND DIMENSIONS

A : LONG LEAD



B : FORMING

$\Phi D = 8$

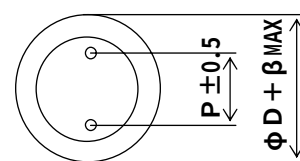
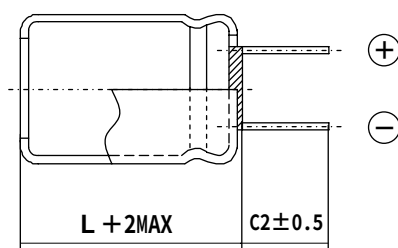
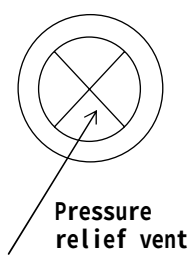


Code	C ₁
F A	5.0
F V	3.5

	(mm)			
ΦD	8	10	12.5	16
β	0.8	0.8	1.0	1.0
P	3.5	5.0	5.0	7.5
Φd	0.6	0.6	*0.6	0.8

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

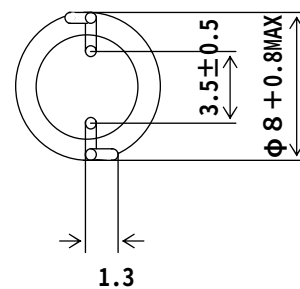
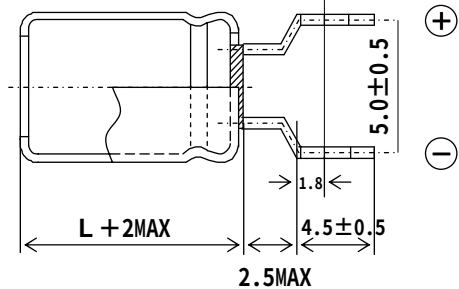
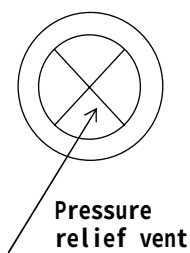
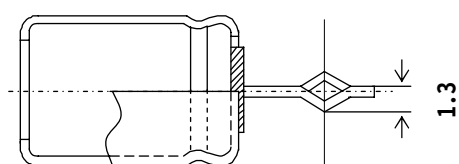
C : STRAIGHT CUT TYPE LEAD (Formed lead code : CA, CP, CC, CV, CT, CM)



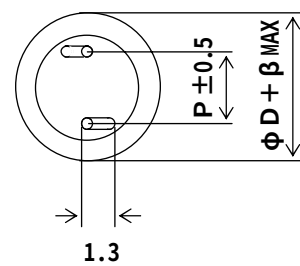
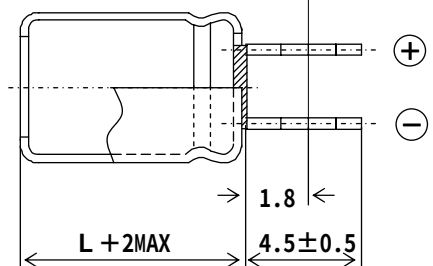
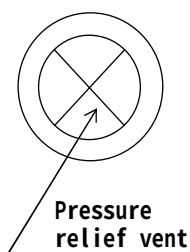
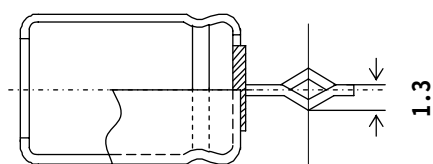
Code	C ₂	Code	C ₂
CA	5.0	CV	3.5
CP	4.5	CT	3.2
CC	4.0	CM	3.0

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

$\phi D = 8$



$\phi D \geq 10$



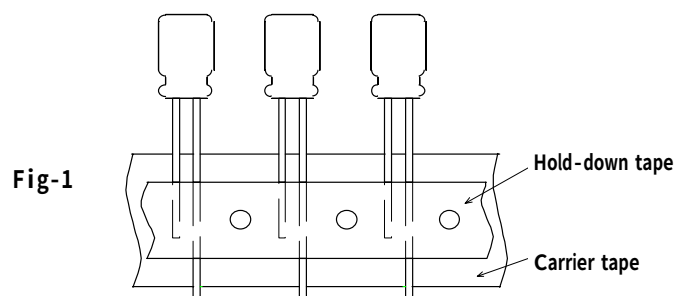
8. Application

This specification applied to the single-ended 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.



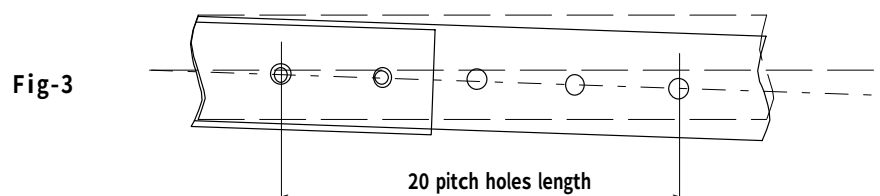
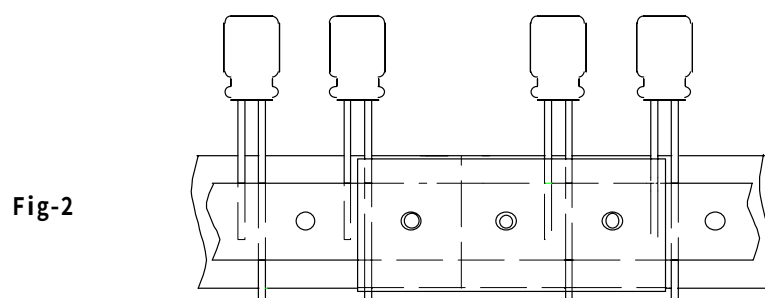
9.2 leader length and trailer length shall be 3 feeding hold unless otherwise requested.

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

9.4 Joint of carrier tape

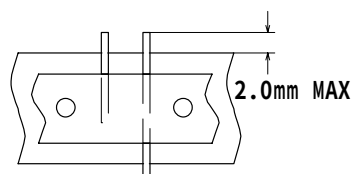
For joint of carrier tape, two carrier tape shall be joined together by winding adhesive tape around carrier tape.

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



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

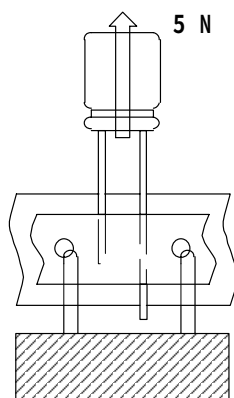
Fig-4



9.6 Pull strength

Capacitors shall be withstand 5N pull test without being removed from tape.

Fig-5

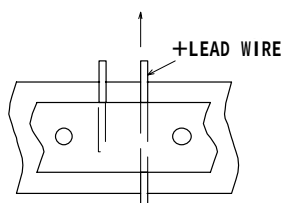


9.7 Lead pull strength

Lead pull strength after taped shall be listed in the table below (+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



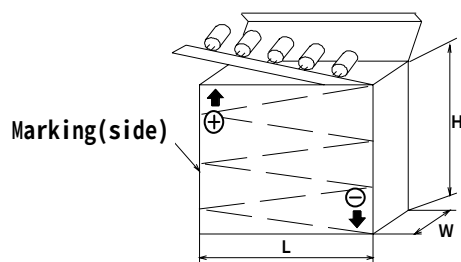
Case dia.	Lead dia.	Pull strength
$\phi 8, \phi 10, \phi 12.5$	0.6	3N MIN
$\phi 16$	0.8	3N MIN

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 MAX.	H MAX.	W MAX.
$\phi 8$		340	260	54
$\phi 10$	12.5L	340	200	54
	16L			
	20L	340	200	62
$\phi 12.5$	20L	330	290	65
	25L			
$\phi 16$	25L	320	230	65

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

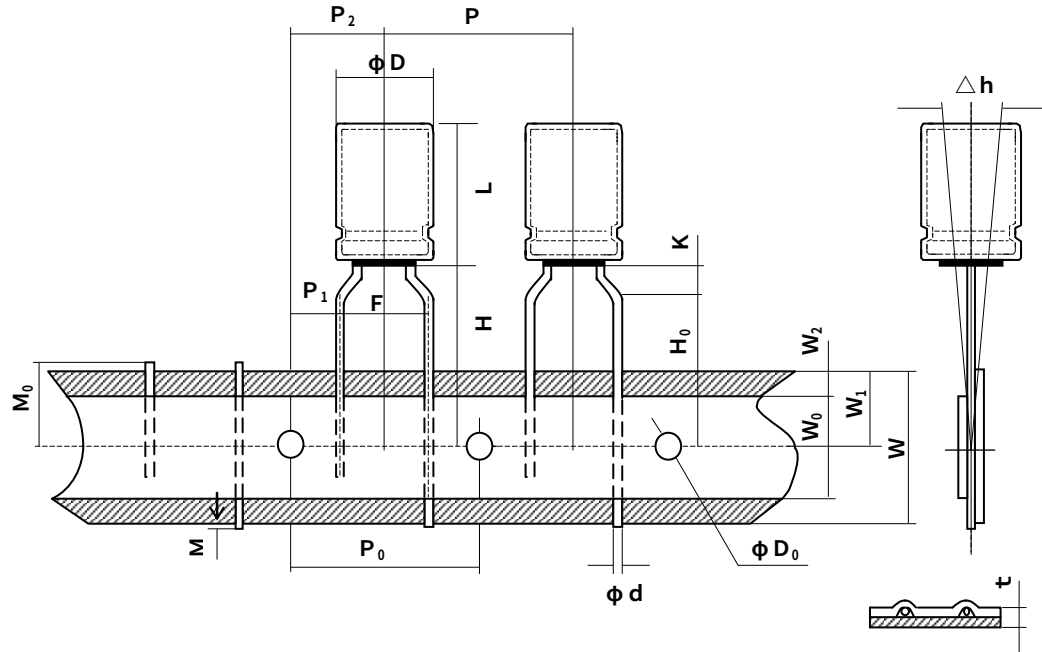
5) Produced lot number

6) Polarity is marked on cover as +/-.

10.4 Quantity in box

Case diameter	Quantity in box(pcs)
$\phi 8$	1000
$\phi 10, \phi 12.5$	500
$\phi 16$	250

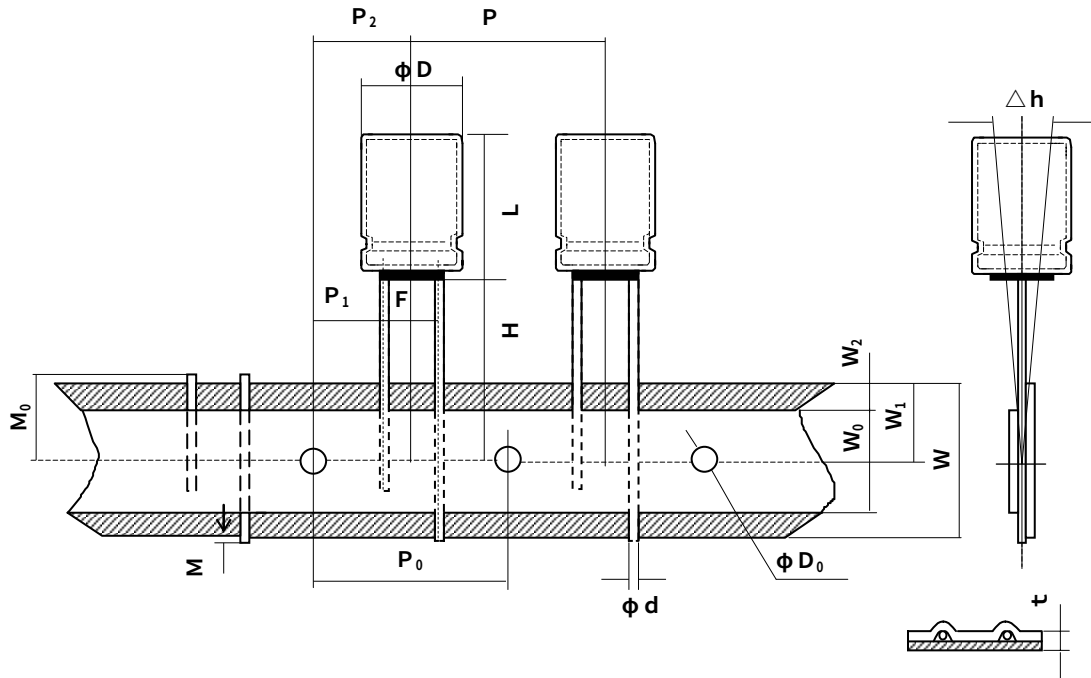
Taping Configuration(Taping code:TA)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	8	+0.8MAX	
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	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	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	20	+0.75 -0.5	
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 snapped lead	M0	11.0	MAX	

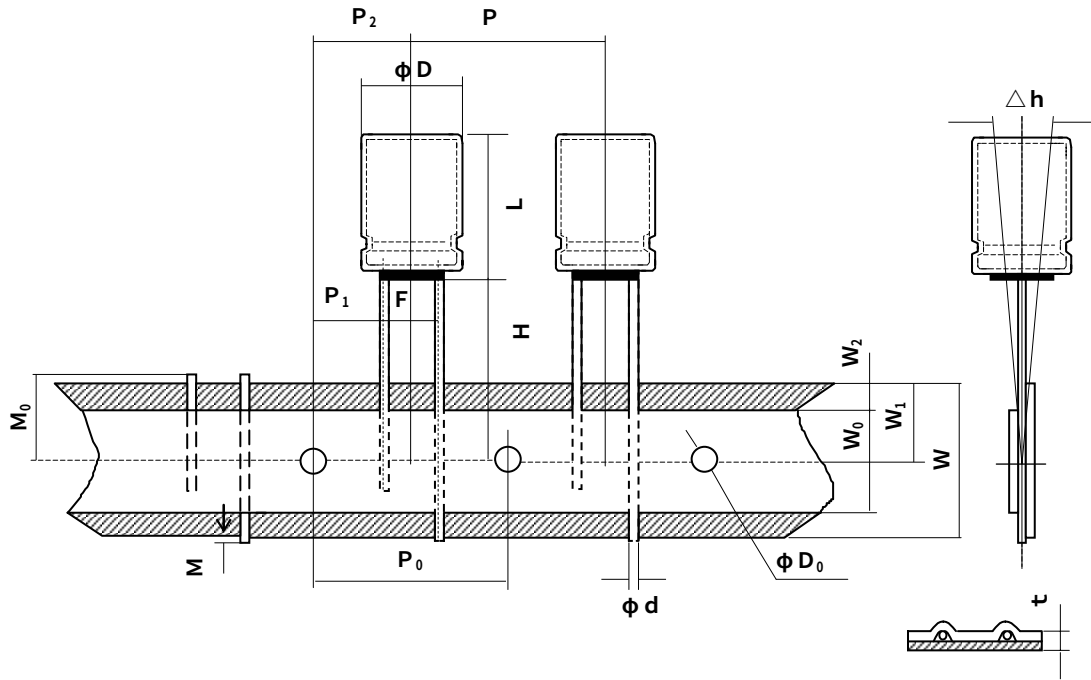
Taping Configuration(Taping code:TD)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	8	+0.8MAX	
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	

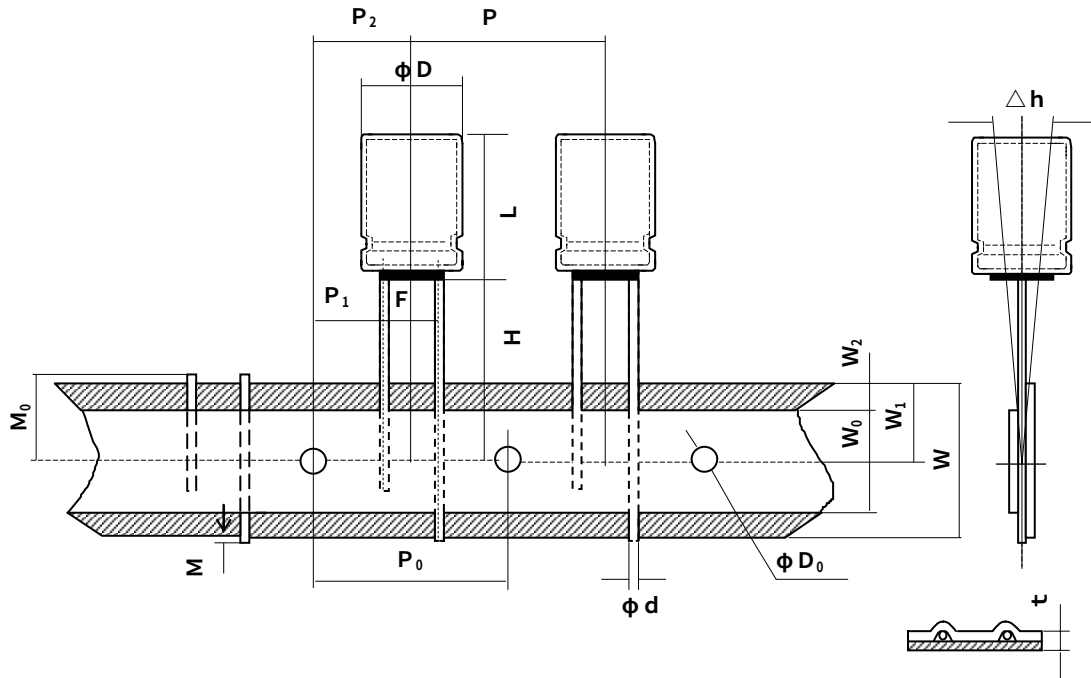
Taping Configuration(Taping code:TD)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	10	+0.8MAX	
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	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	
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 snipped lead	M0	11.0	MAX	

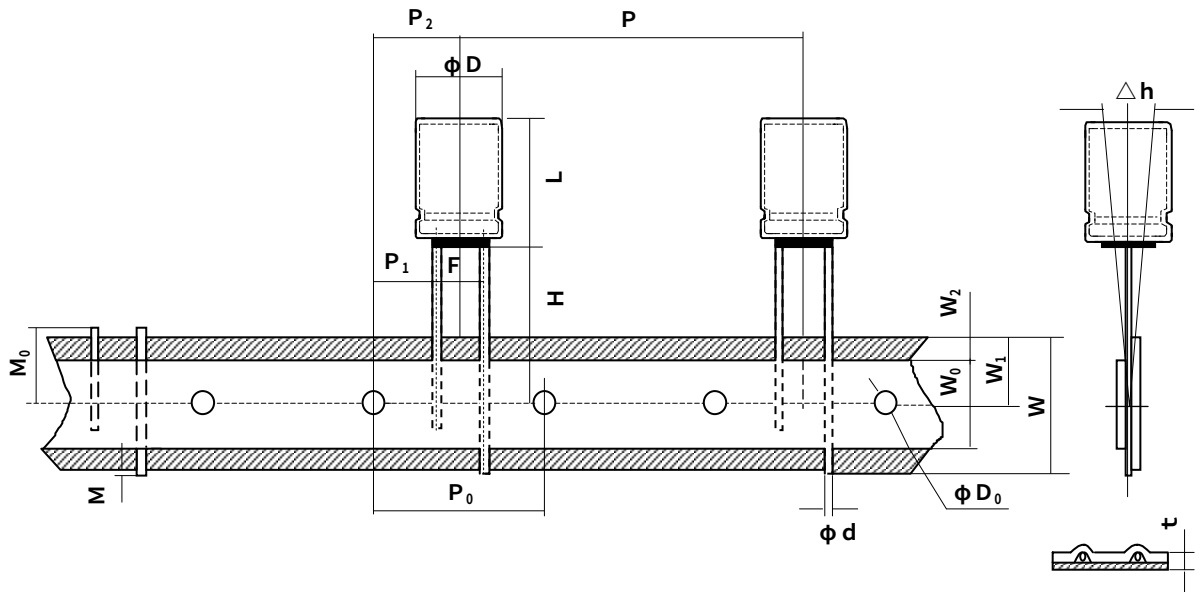
Taping Configuration(Taping code:T0)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ΦD	12.5	+1.0MAX	
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	P0	15.0	±0.2	
Hole center to lead	P1	5.0	±0.5	
Feed hole center to component center	P2	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	W0	12.5	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	ΦD0	4.0	±0.2	
Total tape thickness	t	0.6	±0.2	
Length of snipped lead	M0	11.0	MAX	

Taping Configuration(Taping code:TN)



(mm)

Item	Symbol	Value	Tolerance	Remarks
Body diameter	ϕD	16	+1.0MAX	
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	P0	15.0	± 0.2	
Hole center to lead	P1	3.75	± 0.5	
Feed hole center to component center	P2	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	W0	12.5	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	

■Standard ratings

V	10(1A)			16(1C)			25(1E)			35(1V)		
Item	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz
Cap. (μF)												
1												
2.2												
3.3												
4.7												
10												
22												
33												
47												
100				8 × 11.5	0.32	340	8 × 11.5	0.13	500	10 × 12.5	0.15	620
220	8 × 11.5	0.26	340	10 × 12.5	0.15	620	10 × 12.5	0.10	680	10 × 16	0.094	790
330	10 × 12.5	0.15	620	10 × 12.5	0.10	680	10 × 16	0.075	945	10 × 20	0.075	950
470	10 × 12.5	0.10	680	10 × 16	0.075	945	10 × 20	0.057	1100	12.5 × 20	0.058	1330
1000	10 × 20	0.057	1100	12.5 × 20	0.042	1490	12.5 × 25	0.033	1750	16 × 25	0.031	2010
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						
4700	16 × 31.5	0.020	2710									

V	50(1H)			63(1J)			80(1K)			100(2A)		
Item	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz	Case size ΦD×L (mm)	Impedance (Ω)MAX. 20°C/ 100kHz	Rated ripple (mArms) 135°C/ 100kHz
Cap. (μF)												
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							8 × 11.5	2.00	130
10	8 × 11.5	0.75	180							8 × 11.5	1.50	150
22	8 × 11.5	0.50	250	8 × 11.5	2.00	130	8 × 11.5	1.50	150	10 × 12.5	0.80	480
33	8 × 11.5	0.45	300	8 × 11.5	1.50	150	10 × 12.5	0.80	480	10 × 12.5	0.80	480
47	8 × 11.5	0.35	440	10 × 12.5	0.59	530	10 × 12.5	0.80	480	10 × 16	0.55	630
100	10 × 12.5	0.18	555	10 × 16	0.41	690	10 × 20	0.39	790	12.5 × 20	0.25	990
220	10 × 20	0.098	930	12.5 × 20	0.16	1050	12.5 × 25	0.18	1240	16 × 25	0.11	1500
330	12.5 × 20	0.07	1330	12.5 × 25	0.12	1290	12.5 × 31.5	0.16	1390	16 × 31.5	0.079	1790
470	12.5 × 25	0.055	1650	12.5 × 31.5	0.097	1460	16 × 25	0.11	1500			
1000	16 × 31.5	0.031	2430	16 × 31.5	0.055	1900						

• Frequency coefficient of allowable ripple current

V	CV	Freq	120Hz	300Hz	1kHz	10kHz~
10~100	1000>CV		0.50	0.64	0.83	1.00
	1000≤CV		0.67	0.79	0.91	1.00

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.(Temperture of the cleaning agent shall be 60°C or lower)

After cleaning,capacitors should be driend using hot air for minimum of 10 minutes along with the PC board. Hot air temperature should be below the maximum operating temperature of the capacitor.

Insufficient dries dry after water rinse may cause appearance problems , sleeve shrink, bottom-plate bulge and such.

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 use for a circuit where abrupt discharges are repeated frequency.

(3)Do not apply any voltage exceeding the rated voltage (or surge voltage when in short time).

(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,sexivalent chrome, PBB,PBDE)are not used.

SPECIFICATION		DWG. №	H090107h6	sheet	20
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Material of Aluminum Electrolytic Capacitors

BW 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	Manila paper
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	Polyolefin
⑨	Tape or binder	Tape : Polypropylene Binder : Poval
⑩	Paste	γ -butyrolactone and organic acid

Structure for Alminum Electrolytic Capacitor

