SPECIFICATION SHEET

SMD CAPACITORS ALUMINUM ELECTROLYTIC FZ SERIES

SPECIFICATION SHEET NO.	S0228- FZ476M050HEJTA	
ORIGINAL MFG/PART NO	Aillen Capacitors/CAE476M1HHFZEG7TRC	
NEXTGEN PART CODE	FZ476M050HEJTA	Indicate This Code For RFQ/Order
DATE	Feb. 28, 2025	
REVISION	A2	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	SMD Capacitors Aluminum Electrolytic (CAE), FZ series, 2 pads Wide Temperature and Low Impedance type Capacitance: 47µF, Tolerance ±20%, Voltage 50V Case size: ØD6.30*L7.70mm, Impedance (mΩ/20℃,100KHz): 0.68Ω Max. Ripple Current (mA r.m.s/@+105℃, 100KHz): 185mA Max. Lifetime @105°C: 3000 Hours Operating Temp. Range -55°C ~+105°C Package in Tape/Reel, 1000pcs/Reel REACH/RoHS/RoHS III Compliant & Halogen Free	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER		
MEMO		

VENDOR APPROVE
Issued/Checked/Approved   
Date: Feb. 28, 2025

CUSTOMER APPROVE
Date:

MAIN FEATURE



Image shown is a representation only. Exact specifications should be obtained from the product dimension.

- Aluminum Electrolytic Capacitors Foil Type, Radial, Can – SMD
- Wide Temperature And Low Impedance Type
- High Stability And Reliability and Designed Capacitors Quality Meets IEC60384
- Operating Temperature Range: -55~+105℃
- Available For High Density Surface Mounting
- Rated Voltage Range from 6.3V to 100V
- Offer Quality Alternatives Parts For Major Brand KEMET/CHEMI-CON/NICHICON/ RUBYCON and more
- Moisture Sensitivity Level (MSL) 1 (Unlimited)
- REACH/RoHS/RoHS III Compliant & Halogen Free

MAIN APPLICATION

- High-density Patch Assembly Electronic Circuit: Power Supply, Lighting, etc
- Industrial Equipment: Routers, Switches, Measuring Instruments, etc.
- Consumption Type Equipment: Amplifying Circuit Of Intelligent Loudspeaker, Smoothing Circuit, LED Lamp, etc.

ELECTRICAL CHARACTERISTICS

- See Page 8 ~Pag3 9 For Different Part Number.
- All Products Parameters are Subject To NextGen Components' Final Confirmation.

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code FZ476M050HEJTA For RFQ/Order.

PART CODE GUIDE

RFQ
Request For Quotation

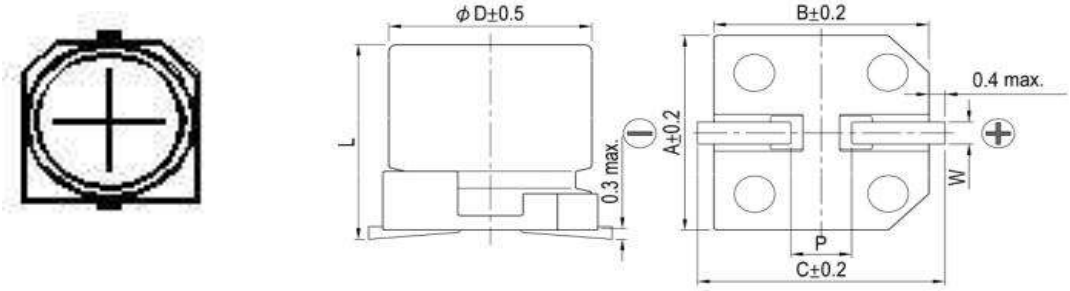
CODE	NAME	KEY SPECIFICATION OPTION
FZ	Product Index	Capacitors Aluminum Electrolytic, V-Chip Type, Original Series Number CDFZ
476	Rated Capacitance	475: 4.7μF; 106: 10μF; 156: 15μF; 226: 22μF; 276: 27μF; 336: 33μF 476: 47μF; 566: 56μF; 686: 68μF; 107: 100μF; 157: 150μF; 227: 220μF 337: 330μF; 477: 470μF; 687: 680μF; 108: 1000μF; 158: 1500μF 228: 2200μF; 338: 3300μF
M	Capacitance Tolerance	M: ±20%; V: -10% ~ +20%
050	Rated Voltage	6V3: 6.3V; 010: 10V; 016:16V; 025: 25V; 035: 35V; 050: 50V; 063: 63V 080: 80V; 100: 100V
H	Environmental Requirements	R: RoHS III Complaint; H: RoHS III Complaint & Halogen Free
E	Case Diameter	B: ØD3.0mm; C: ØD4.0mm; D: ØD5.0mm; E: ØD6.3mm; F: ØD8.0mm; G: ØD10.0mm; K: ØD16mm; L: ØD18mm; P: ØD12.5mm
J	Case Length	H: L5.7mm; I: L6.5mm; J: L7.7mm; K: L10.5mm; L: L11.5mm; M: L12.5mm; N: L13.5mm
T	Package	T: Tape and Reel
A	Internal Control Code	Letter A~Z, a~z or digits (0~9)
XX	Suffix	Blank: N/A XX: Letter A~Z, a~z or digits (0~9) for Special/Custom Parameters

DIMENSION (Unit: mm)

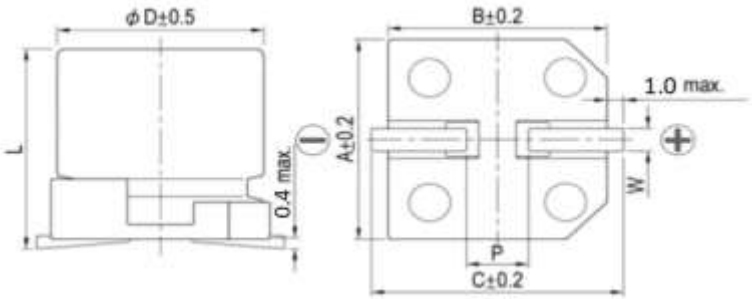
Ø4 ~ Ø6.3 Non explosion proof valve,

Ø8 ~ Ø10 Explosion proof valve

Ø4~Ø10



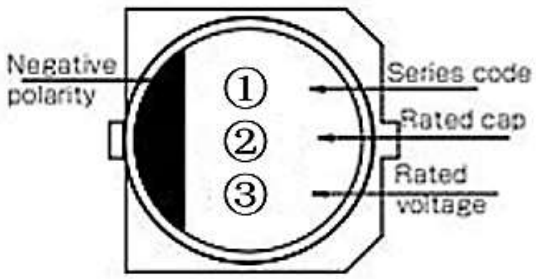
Ø12.5~Ø18



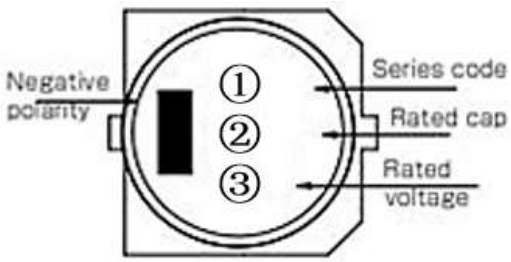
Size	Ø4	Ø5	Ø6.3	Ø6.3	Ø8	Ø8	Ø10	Ø10	Ø12.5
Case L	5.7	5.7	5.7	7.7	6.5	10.5	10.5	13.5	13.5
Tolerance @ L	-0.3/+0.5	-0.3/+0.5	-0.3/+0.5	-0.3/+0.5	-0.3/+0.5	±0.5	±0.5	±0.5	±0.5
A	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0
C	5.1	6.0	7.2	7.2	9.2	9.2	11.2	11.2	14.0
P	1.0±0.2	1.5±0.2	2.1±0.2	2.1±0.2	3.1±0.2	3.1±0.2	4.5±0.2	4.5±0.2	4.4±0.2
W	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.8~1.1	0.7~1.2	0.7~1.3	0.7~1.3	1.1~1.4

MARKING – FOR DIFFERENT GUIDE

DØ ≤10mm

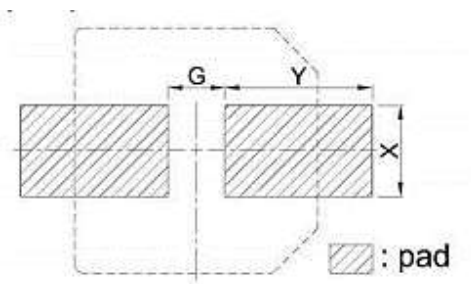


DØ ≥2.5mm



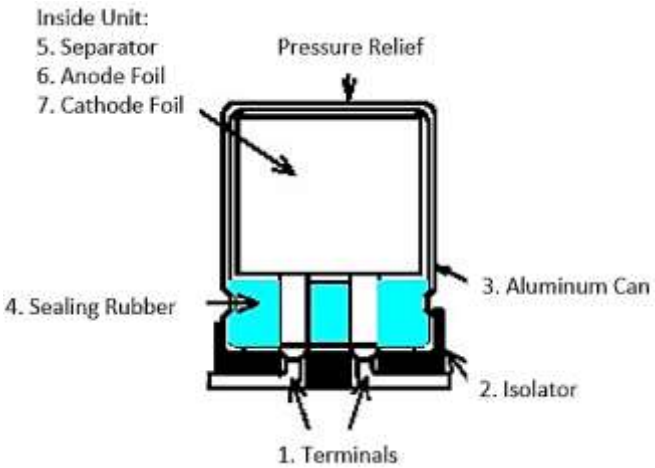
SYMBOL	NAME
①	Series Code
②	Rated Capacitance
③	Rated Voltage

RECOMMENDED LAND PATTERN (Unit: mm)



DIAMETER SIZE	X	Y	G
DØ4	1.6	2.6	1.0
DØ5	1.6	3.0	1.4
DØ6.3	1.6	3.5	1.9
DØ8	2.5	3.5	3.0
DØ10	2.5	4.0	4.0
DØ12.5	3.2	6.0	4.0

CONSTRUCTION – FOR REFERENCE ONLY



NO.	PARTS	MATERIAL
1	Terminal	Tinned Copper – Clad Steel Wire (Pb Free)
2	Isolator	Thermo-plastic resin
3	Aluminum Can	Aluminum
4	Sealing Rubber	Synthetic rubber
5	Separator	Manila hemp
6	Anode Foil	High purity aluminum foil
7	Cathode Foil	Aluminum foil

GENERAL ELECTRICAL CHARACTERISTICS – FOR DIFFERENT PART CODE

PARAMETER	UNITS	VALUE
Operating Junction Temperature Range	°C	-55 ~ +105
Storage Temperature Range	°C	-55 ~ +150

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

FREQUENCY F(Hz)		100≤F < 1K	1K≤F < 10K	10K≤F < 100K	100K≤F
Coefficient C(μF)	C≤33	0.35	0.70	0.90	1.00
	33 < C≤150	0.45	0.85	0.92	1.00
	150 < C	0.60	0.85	0.95	1.00

TEMPERATURE COEFFICIENT

AMBIENT TEMPERATURE (℃)	105	85	≤70
Coefficient	1	1.5	2

ELECTRICAL CHARACTERISTICS - Ta = 25℃, FOR DIFFERENT PART CODE

NEXTGEN PART CODE	RATE VOL.	CAPACITOR VALUE	MAX. LEAKAGE CURRENT	MAX. IMPEDANCE @20 °C 100KHZ	MAX. RIPPLE CURRENT @ 105°C 100KHZ	LOAD LIFE	CASE SIZE ØD X L
	V	µF	µA	Ω	mA r.m.s	Hours	mm
FZ477M6V3HFKTA	6.3	470	29.61	0.17	450	5000	8x10.5
FZ477M6V3HFKTB	6.3	470	29.61	0.16	600	5000	8x10.5
FZ108M010HGKTA	10	1000	100	0.09	850	5000	10x10.5
FZ108M010HGKTB	10	1000	100	0.08	850	5000	10x10.5
FZ477M016HFKTA	16	470	75.2	0.17	450	5000	8x10.5
FZ337M025HGKTA	25	330	82.5	0.09	670	5000	10x10.2
FZ337M025HFKTA	25	330	82.5	0.17	450	5000	8x10.5
FZ337M025HFKTB	25	330	82.5	0.16	600	5000	8x10.5
FZ477M025HGKTA	25	470	117.5	0.09	670	5000	10x10.5
FZ477M025HGKTB	25	470	117.5	0.09	850	5000	10x10.5
FZ108M025HPNTA	25	1000	250	0.07	820	5000	12.5x13.5
FZ108M025HPNTB	25	1000	250	0.06	1100	5000	12.5x13.5
FZ226M035HDHTA	35	22	7.7	0.8	150	2000	5x5.7
FZ226M035HEHTA	35	22	7.7	0.8	150	2000	6.3x5.7
FZ226M035HEHTB	35	22	7.7	0.44	230	2000	6.3x5.7
FZ476M035HFITA	35	47	16.45	0.44	230	3000	8x6.5
FZ105M050HCHTA	50	1	3.0	2.9	60	2000	4x5.7
FZ106M050HEHTA	50	10	5	0.88	165	2000	6.3x5.7
FZ106M050HDHTB	50	10	5	1.52	85	2000	5x5.7
FZ107M050HFKTA	50	100	50	0.34	360	5000	8x10.5

ELECTRICAL CHARACTERISTICS - Ta = 25℃, FOR DIFFERENT PART CODE

NEXTGEN PART CODE	RATE VOL.	CAPACITOR VALUE	MAX. LEAKAGE CURRENT	MAX. IMPEDANCE @20 °C 100KHZ	MAX. RIPPLE CURRENT @ 105°C 100KHZ	LOAD LIFE	CASE SIZE ØD X L
	V	µF	µA	Ω	mA r.m.s	Hours	mm
FZ476M050HEJTA	50	47	23.5	0.68	185	3000	6.3x7.7
FZ476M050HEJTB	50	47	23.5	0.68	195	3000	6.3x7.7
FZ476M050HFITA	50	47	23.5	0.68	185	3000	8x6.5
FZ476M050HFITB	50	47	23.5	0.68	195	3000	8x6.5
FZ227M050HGKTA	50	220	110	0.18	670	5000	10x10.5
FZ337M050HPNTA	50	330	165	0.12	900	5000	12.5x13.5
FZ475M063HDHTA	63	4.7	3.0	2.9	60	2000	5x5.7
FZ476M063HFKTA	63	47	29.61	0.65	250	5000	8x10.5

Remark

1) Specification are subject to change without notice should a safety or technical concern arise regarding the product, please be sure to contact our sales offices.

2) The sizes in the above table are all standard specifications. If you need custom parameters , please contact us.

CHARACTERISTICS

Standard Atmospheric Conditions

The standard range of atmospheric conditions for making measurements/test as follows:

Ambient temperature: 15˚C to 35˚C

Relative humidity: 45% to 85%

Air Pressure: 86kPa to 106kPa

If there is any doubt about the results, measurement shall be made within the following conditions:

Ambient temperature: 20˚C ± 2˚C

Relative humidity: 60% to 70%

Air Pressure: 86kPa to 106kPa

As to the detailed information, please refer to following Table

Operating Temperature Range

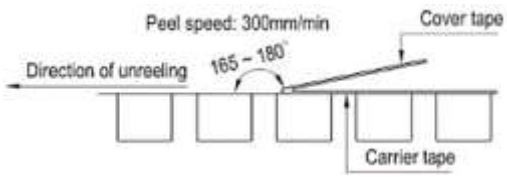
The ambient temperature range at which the capacitor can be operated continuously at rated voltage is

-55˚C to 105˚C.

As to the detailed information, please refer to the mentioned table next pages.

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Nominal Capacitance
(Tolerance)</td><td><Condition>
Measuring Frequency : 120Hz±12Hz
Measuring Voltage : Not more than 0.5V
Measuring Temperature : 20±2℃
<Criteria>
Shall be within the specified capacitance tolerance</td></tr>
<tr><td>Leakage Current</td><td><Condition>
After DC Voltage is applied to capacitors through the series protective resistor (1kΩ±10Ω) so that terminal voltage may reach the reacted use voltage. The leakage current when measured in 2 minutes shall not exceed the values of the following equation.
<Criteria>
I (μA) ≤ 0.01 CV or 3 (μA), Whichever is greater
I: Leakage Current (μA)
C: Capacitance (μF)
V: Rated Working Voltage (V)</td></tr>
<tr><td>tan δ</td><td><Condition>
See Normal Capacitance, for measuring frequency, voltage and temperature.
<Criteria>
The tangent of the loss angle (tan δ) of the capacitors shall refer to the following table.
Measurements shall be made under the same conditions as those given for the measurement of the capacitance.

<table>
<tr><td>W.V.</td><td>Cap.(μF)</td><td>6.3</td><td>10</td><td>16</td><td>25</td></tr>
<tr><td rowspan="4">tan δ</td><td>＜1000</td><td>0.26</td><td>0.22</td><td>0.20</td><td>0.18</td></tr>
<tr><td>1000</td><td>0.28</td><td>0.24</td><td>0.22</td><td>0.20</td></tr>
<tr><td>1500</td><td>0.28</td><td>0.27</td><td>/</td><td>/</td></tr>
<tr><td>2200</td><td>0.34</td><td>0.29</td><td>/</td><td>/</td></tr>
</table>
<table>
<tr><td>W.V.</td><td>Cap.(μF)</td><td>35</td><td>50</td><td>100</td></tr>
<tr><td rowspan="3">tan δ</td><td>＜330</td><td>0.14</td><td>0.12</td><td>0.14</td></tr>
<tr><td>330</td><td>0.16</td><td>0.12</td><td>0.18</td></tr>
<tr><td>470</td><td>0.18</td><td>0.14</td><td>0.18</td></tr>
</table>
Remark: Refer to this document for tan δ of other voltages.</td></tr>
</table>

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Rated voltage
(WV)
Surge voltage
(SV)</td><td>
<table>
<tr><td>W.V.
(V.DC)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td></tr>
<tr><td>S.V.
(V.DC.)</td><td>7.2</td><td>11.5</td><td>18.4</td><td>28.8</td><td>40.2</td><td>57.5</td><td>72.5</td><td>92</td><td>115</td></tr>
</table>
</td></tr>
<tr><td>Temperature
Characteristic IEC-
60384-4 4.12</td><td>
<Condition>.
<table>
<tr><th>Step.</th><th>Testing Temperature(℃)</th><th>Time</th></tr>
<tr><td>1</td><td>20±2</td><td>Time to reach thermal equilibrium</td></tr>
<tr><td>2</td><td>-55(-25) ±3</td><td>Time to reach thermal equilibrium</td></tr>
<tr><td>3</td><td>20±2</td><td>Time to reach thermal equilibrium</td></tr>
<tr><td>4.</td><td>105±2</td><td>Time to reach thermal equilibrium</td></tr>
<tr><td>5</td><td>20±2</td><td>Time to reach thermal equilibrium</td></tr>
</table>
<Criteria>
a) At +105℃, capacitance shall be within ±20% of their origin at +20℃, measured capacitance, tan δ shall be within limit of 4.3. The leakage current value at +105℃ shall not more than 8 times the specified value.
b) At step 5, tan δ shall be within the limit of 4.3. The leakage current value shall not more than the specified value.
c) At-55℃ (-25℃), impedance (Z) ratio shall not exceed the value of the following table.
<table>
<tr><td>Rated Voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr>
<tr><td>Z-25℃/Z+20℃ (120Hz)</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>2</td><td>2</td></tr>
<tr><td>Z-55℃/Z+20℃ (120Hz)</td><td>4</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr>
</table>
d) Capacitance tan δ and impedance shall be measured at 120Hz
</td></tr>
<tr><td>Sealing Tape
Reel Strength</td><td>
<Condition>
Peel angle: 165 to 180℃ referred to the surface on which the tape is glued.
Peel speed: 300mm per minutes
The peel strength must be 0.1 ~ 0.7N under these conditions.


</td></tr>
</table>

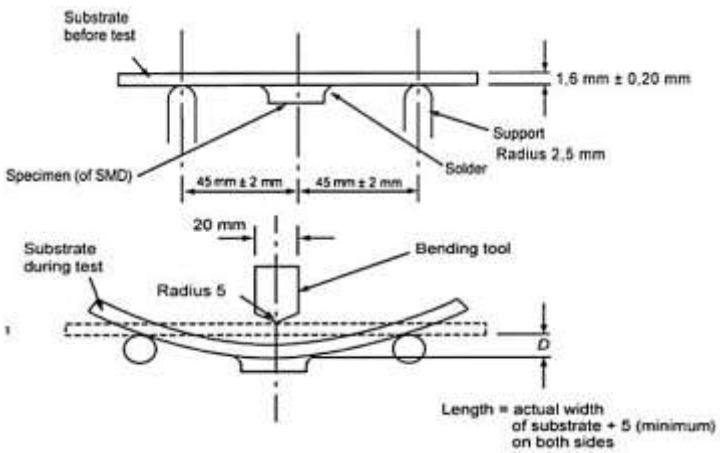
<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Load Life Test
IEC-60384- 4 4.13</td><td>
<Condition>
The capacitor is stored at a temperature of 105° C ±2 with rated voltage applied continuously for 2000Hrs for Ø D x L≤6.3x5.7mm;3000 Hrs for 6.3x7.7L & 8x6.5L & 10x7.7L;5000 Hrs for Ø D ≥ 8mm. Then the product should be tested after 16 hours recovering time at atmospheric conditions. The result should meet the following table:
<Criteria> The characteristic shall meet the following requirements.
<table>
<tr><td>Capacitance Change</td><td>±30% of initial measured value.</td></tr>
<tr><td>tan δ</td><td>300% or less of the specified value</td></tr>
<tr><td>Leakage current</td><td>Not more than the specified value.</td></tr>
<tr><td>Appearance</td><td>No leakage of electrolyte or swelling of the case.
All markings shall be legible</td></tr>
<tr><td>Inner construction</td><td>No corrosion of tab terminals or electrodes</td></tr>
</table>
Remarks: Prior to the measurement of the leakage current, the D.C. rated voltage shall be applied across the capacitor and its protective resistance (1kΩ) for 30 mines after which it shall be discharged.
</td></tr>
<tr><td>Shelf Life Test
IEC-60384- 4 4.17</td><td>
<Condition>
The capacitors are then stored with no voltage applied at a temperature of 105 ±2℃ for 1000+48/0 hours. Following this period the capacitors shall be removed from the test chamber and be allowed to stabilized at room temperature for 4~8 hours. Next they shall be connected to a series limiting resistor(1k±100Ω) with D.C. rated voltage applied for 30min. After which the capacitors shall be discharged, and then, tested the characteristics.
<Criteria> The characteristic shall meet the following requirements.
<table>
<tr><td>Capacitance Change</td><td>±30% of initial measured value.</td></tr>
<tr><td>tan δ</td><td>300% or less of the specified value</td></tr>
<tr><td>Leakage current</td><td>Not more than 200% of the specified value</td></tr>
<tr><td>Appearance</td><td>No leakage of electrolyte or swelling of the case.
All markings shall be legible</td></tr>
<tr><td>Inner construction</td><td>No corrosion of tab terminals or electrodes</td></tr>
</table>
Remark:
If the capacitors are stored more than 1 year, the leakage current may increase.
Please apply voltage through about 1 KΩ resistor, if necessary.
</td></tr>
</table>

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Surge Test
IEC-60384- 4 4.9</td><td>
<Condition>
Test temperature:15~35℃
Series resistor: R= $\frac{100\pm50}{C}$
R： protective resistor (KΩ)
C： nominal capacitance (μF) Test voltage: Surge voltage item 4.4
No. of cycles: 1000cycles Each cycles lasts for 6±0.5min
“ON” for 30±5 s “OFF” for 5±0.5min.
<table>
<tr><td>Leakage current</td><td>Not more than the specified value</td></tr>
<tr><td>Capacitance Change</td><td>Within±15% of initial value.</td></tr>
<tr><td>tan δ</td><td>Not more than the specified value.</td></tr>
<tr><td>Appearance</td><td>There shall be no leakage of electrolyte.</td></tr>
</table>
Attention: This test simulates over voltage at abnormal situation, and not be hypothesizing that over voltage is always applied.
</td></tr>
<tr><td>Vibration Test
IEC-60384- 4 4.8</td><td>
<Condition>
Fix it at the point 4 mm or less from body. For ones of 12.5 mm or more in diameter or 25 mm or Capacitance; Direction and during of vibration:3 orthogonal directions mutually each for 2 hours(total of 6 hours)
Vibration frequency range : 10Hz ~ 55Hz
Peak to peak amplitude : 1.5mm
Sweep rate : 10Hz ~ 55Hz ~ 10Hz in about 1 minute
<Criteria>
The characteristic shall meet the following requirements.
<table>
<tr><td>Leakage current</td><td>Not more than the specified value</td></tr>
<tr><td>Capacitance Change</td><td>Within±10% of initial value.</td></tr>
<tr><td>tan δ</td><td>Not more than the specified value.</td></tr>
<tr><td>Appearance</td><td>There shall be no leakage of electrolyte.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Solderability
Test IEC-60384-4
4.6</td><td><Condition>
The capacitor shall be tested under the following conditions:
Soldering temperature: 245℃±3℃
Dipping depth: 2mm
Dipping speed: 25±2.5mm/s
Dipping time: 3±0.5s
<Criteria>
<table><tr><td>Coating quality</td><td>A minimum of 95% of the surface being immersed</td></tr></table></td></tr>
<tr><td>Resistance to
solder heat
test</td><td><Condition>
After reflow soldering (item 4.18)
The capacitor shall be left at room temperature for before measurement.
<Criteria>
The characteristic shall meet the following requirements.
<table><tr><td>Leakage current</td><td>Not more than the specified value</td></tr><tr><td>Capacitance Change</td><td>Within±10% of initial value.</td></tr><tr><td>tan δ</td><td>Not more than the specified value.</td></tr><tr><td>Appearance</td><td>There shall be no leakage of electrolyte.</td></tr></table></td></tr>
<tr><td>Damp heat test
IEC60384-4
4.12</td><td><Condition>
Humidity Test:
According to IEC60384-4 No.4.12 methods, capacitor shall
be exposed for 1000±8 hours in an atmosphere of 90~95%R H .at
60±3℃, the characteristic change shall meet the following requirement.

<Criteria>
<table><tr><td>Leakage current</td><td>Not more than the specified value</td></tr><tr><td>Capacitance Change</td><td>Within±20% of initial value.</td></tr><tr><td>tan δ</td><td>Not more than 120% of the specified value</td></tr><tr><td>Appearance</td><td>There shall be no leakage of electrolyte.</td></tr></table></td></tr>
</table>

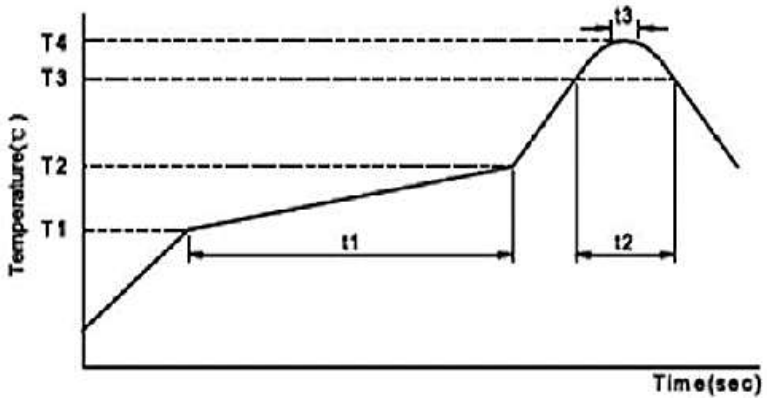
<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Change Of Temperature Test IEC-60384-4 4.7</td><td>
<Condition>
Temperature cycle: According to IEC60384-4 No.4.7 methods, capacitor shall be placed in an oven, the condition according as below
<table>
<tr><th>No.</th><th>Temperature</th><th>Time</th></tr>
<tr><td>1</td><td>+25℃</td><td>≤3 Minutes</td></tr>
<tr><td>2</td><td>-55℃</td><td>30±2 Minutes</td></tr>
<tr><td>3</td><td>+25℃</td><td>≤3 Minutes</td></tr>
<tr><td>4</td><td>+105℃</td><td>30±2 Minutes</td></tr>
<tr><td>5</td><td>+25℃</td><td>≤3 Minutes</td></tr>
<tr><td colspan="3">1 to 5 = 1 cycle, Total 5 cycles</td></tr>
</table>
and then the capacitor shall be subjected to standard atmospheric conditions for 4 hours, after which measurements shall be made.
<Criteria>
The characteristic shall meet the following requirements.
<table>
<tr><td>Capacitance Change</td><td>Within ±10% of initial value.</td></tr>
<tr><td>tan δ</td><td>Not more than the specified value.</td></tr>
<tr><td>Leakage current</td><td>Not more than the specified value.</td></tr>
<tr><td>Appearance</td><td>No broken and undamaged.</td></tr>
</table>
</td></tr>
<tr><td>Low Temperature Test</td><td>
<Condition>
Capacitors are placed at -55 ± 3℃ for 96 ± 4 hours. And then the capacitor shall be subjected to standard atmospheric conditions for 4 hours, after which measurements shall be made.
<Criteria>
<table>
<tr><td>Leakage current</td><td>Not more than the specified value</td></tr>
<tr><td>Capacitance Change</td><td>Within±10% of initial value.</td></tr>
<tr><td>tan δ</td><td>Not more than the specified value.</td></tr>
<tr><td>Appearance</td><td>No broken and undamaged</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Vent Test
IEC-60384-4 4.16</td><td><Condition>
The following test only apply to those products with vent products at diameter ≥ Ø8 with vent.
D.C. test
The capacitor is connected with its polarity reversed to a DC power source. Then a current selected from following table is applied.
<table><tr><td>Diameter (mm)</td><td>DC Current (A)</td></tr><tr><td>22.4 or less</td><td>1</td></tr></table>
<Criteria>
No emission of gas after 30 minutes of the voltage application also meets the specification. The vent shall operate with no dangerous conditions such as flames or dispersion of pieces of the capacitor and/or case.</td></tr>
<tr><td>Mechanical Characteristics Test</td><td><Condition>
Bending Test: Apply pressure in the direction of the arrow at a rate of about 0.5 mm/s until bent width reaches 2 mm and hold for 60s. The board shall be the test board “B” as specified in JIS C 0051: 2002. If the land area differs, it shall be specified clearly in the next item.


<Criteria>
Without mechanical damage such as breaks. Electrical characteristics shall be satisfied. If there are electrodes on both surfaces, above requirements shall be satisfied on whichever surface it may be fixated on.</td></tr>
</table>

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Reflow Soldering

Temperature Profile</td><td>
<table>
<tr><td>Welding Method</td><td>Reflow Soldering</td><td>Soldering Iron</td><td>Wave Soldering</td></tr>
<tr><td>The feasibility of</td><td>Feasible</td><td>Feasible</td><td>Is not workable</td></tr>
</table>

Conditions for the use of lead-free reflow soldering.


1) Methods the following
Reflow soldering: please follow the temperature condition during welding. If high temperature is used, please measure and inform the capacitor temperature and reflow soldering condition. The product size is larger and its rising temperature is slower. It is not necessary to adjust the temperature of the reflow solder in accordance with the size of the product. For example, the products of 4 and 10 will be installed in the PCB over tin furnace.
2) Precautions for soldering tin: Related factors of reflow soldering temperature:
Product size: The product size is larger and its temperature rises slowly.
Product installation position: The temperature of PCB center is lower than that of PCB
3) Reflow soldering
If possible, avoid reflow soldering twice.
If repeated reflux is unavoidable, measure and inform the first and second reflux temperature, and the time of reflow soldering
4) Please do not 3 times of reflow soldering
Please follow the following conditions when soldering tin soldering:
Soldering iron maximum temperature：350±5℃;
Welding time：3+1/-0S
</td></tr>
</table>

<table>
<tr><th>ITEM</th><th>PERFORMANCE</th></tr>
<tr><td>Reflow Soldering

Temperature Profile</td><td>
Test Method And Peak Temperature Permissible Range
<table>
<tr><td colspan="2">Products category</td><td colspan="8">SMD aluminum electrolytic capacitor</td></tr>
<tr><td colspan="2">voltage（V）</td><td>4~50</td><td colspan="2">4~50</td><td>≥63</td><td colspan="2">4~100</td><td>≥160</td></tr>
<tr><td colspan="2">Product size</td><td>Φ4~6.3×4.5 L</td><td colspan="2">Φ4~6.3</td><td>Φ4~6.3</td><td colspan="2">Φ8~18</td><td>≥Φ12.5</td></tr>
<tr><td rowspan="2">Preheating</td><td>TEM（T_1~T_2，℃）</td><td colspan="8">150~180</td></tr>
<tr><td>Time（t_1）Max. S</td><td>120</td><td colspan="7">180</td></tr>
<tr><td rowspan="2">The duration of the</td><td>TEM（T_3，℃）</td><td>230</td><td>217</td><td>230</td><td>217</td><td>217</td><td>230</td><td>217</td></tr>
<tr><td>Time（t_2）Max. S</td><td>30</td><td>90</td><td>60</td><td>60</td><td>60</td><td>40</td><td>60</td></tr>
<tr><td rowspan="2">The highest temperature</td><td>TEM（T_4，℃）</td><td>250</td><td colspan="2">260</td><td>250</td><td colspan="2">250</td><td>240</td></tr>
<tr><td>Time（t_3）Max. S</td><td colspan="7">5</td></tr>
<tr><td colspan="2">Return the number</td><td>1</td><td colspan="7">≤2</td></tr>
</table>

Please contact us if the conditions of use are higher than those listed above.
When performing second reflow soldering, please make sure the temperature of capacitor has cooled to 5 ~ 35 ℃.
If the reflow condition is based on IPC/JEDEC(J-STD-020), please contact us.

OP-CAP Precautions:

Reflow soldering will reduce the rated electrostatic capacity of the product, and it should be confirmed whether reflow soldering condition meets the specification of recommended reflow soldering.
Although the actual reflow condition change is still based on the reflow soldering method, please note that the highest temperature and the electrode terminal at the bottom of the aluminum shell must not exceed the maximum temperature.
OP-APproductsduringtheprocessofreflowheatingtemperatureshouldincrease to more than 200 ℃
If the reflow condition temperature or duration is greater than the above table, the OP-CAP product will be damaged. The electrostatic capacity of the product is reduced by about 50%, the leakage current is large (up to m A), and the outside of the capacitor is damaged.

Recommended Land Size (see page 5)
</td></tr>
</table>

TAPE (Unit: mm), Applicable standard JIS C0806 and IEC 60286.

Fig. 1 (Ø4 ~ Ø10)

Fig. 1-1

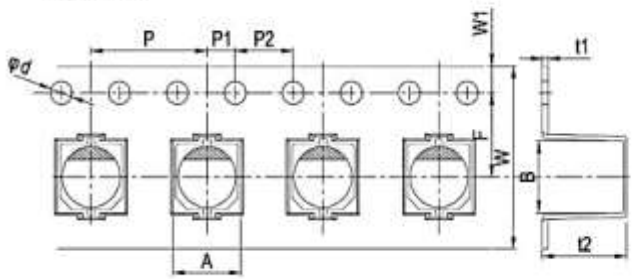
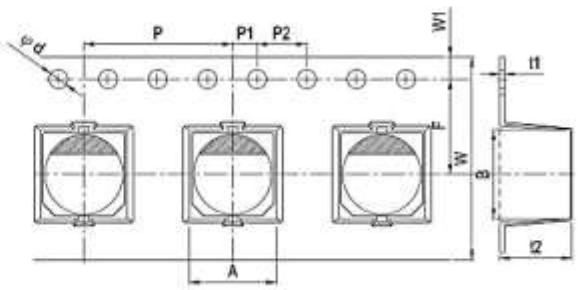


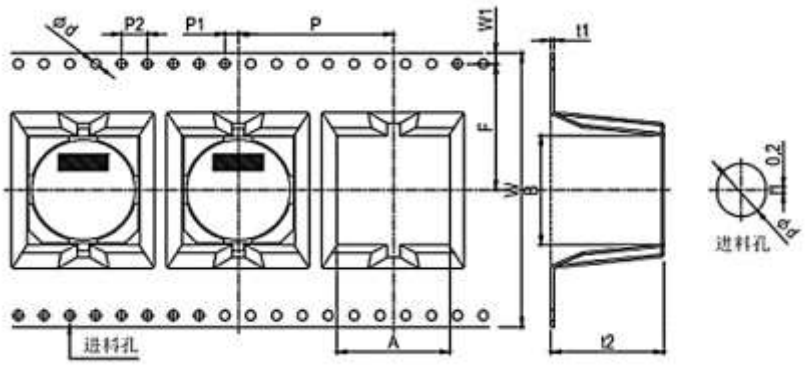
Fig. 1-2



SIZE	W	P	F	A0	B0	t2	Ød	P1	P2	t1	W1	APPLICABLE
Ø4*5.7	12	8	5.5	4.7	4.7	5.8	1.5	2	4	0.4	1.75	Fig.1-1
Ø5*5.7	12	12	5.5	6.0	6.0	5.8	1.5	2	4	0.4	1.75	Fig.1-2
Ø6.3*5.7	16	12	7.5	7.0	7.0	5.8	1.5	2	4	0.4	1.75	Fig.1-2
Ø6.3*7.7	16	12	7.5	7.0	7.0	8.3	1.5	2	4	0.4	1.75	Fig.1-2
Ø6.3*10.2	16	12	7.5	7.0	7.0	11.0	1.5	2	4	0.4	1.75	Fig.1-2
Ø8*6.5	16	12	7.5	8.7	8.7	6.8	1.5	2	4	0.4	1.75	Fig.1-2
Ø8*10.5	24	16	11.5	8.7	8.7	11.0	1.5	2	4	0.4	1.75	Fig.1-2
Ø8*12.5	24	16	11.5	8.7	8.7	13.0	1.5	2	4	0.4	1.75	Fig.1-2
Ø10*10.5	24	16	11.5	10.7	10.7	11.0	1.5	2	4	0.4	1.75	Fig.1-2
Ø10*12.5	24	16	11.5	10.7	10.7	13.0	1.5	2	4	0.4	1.75	Fig.1-2
Ø10*13.5	24	16	11.5	10.7	10.7	13.0	1.5	2	4	0.4	1.75	Fig.1-2

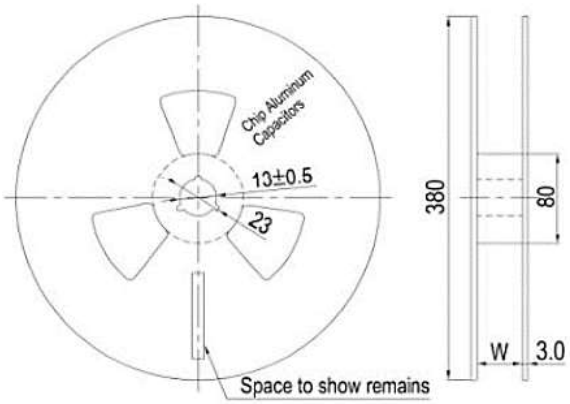
TAPE (Unit: mm), Applicable standard JIS C0806 and IEC 60286.

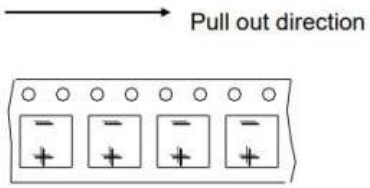
Fig. 1-3 (Ø12.5 ~ Ø18)



SIZE	W	P	F	A	B	t2	Ød	P1	P2	t1	W1	APPLICABLE
Ø12.5*13.5	32	24	14.2	13.4	13.4	14.5	1.5	2	4	0.5	1.75	Fig.1-3
Ø12.5*16	32	24	14.2	13.4	13.4	17	1.5	2	4	0.5	1.75	Fig.1-3
Ø16*16.5	44	28	20.2	17.5	17.5	17.5	1.5	2	4	0.5	1.75	Fig.1-3
Ø16*21.5	44	28	20.2	17.5	17.5	22.5	1.5	2	4	0.5	1.75	Fig.1-3
Ø18*16.5	44	32	20.2	19.5	19.5	17.5	1.5	2	4	0.5	1.75	Fig.1-3

REEL (Unit: mm), Applicable standard JIS C0806 and IEC 60286.

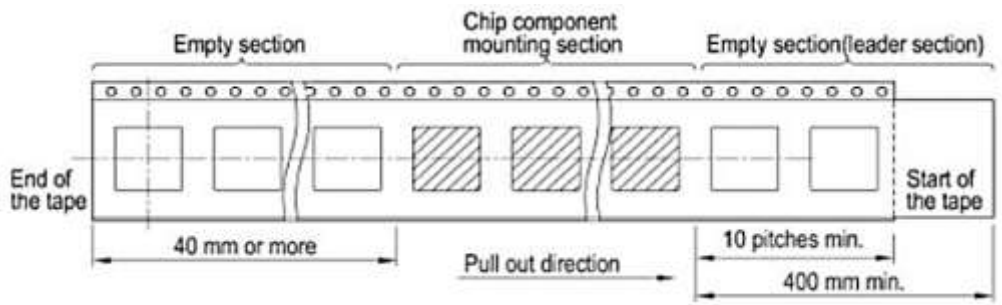




CASE SIZE	Ø4	Ø5	Ø6.3	Ø8x6.5	Ø8x10.2 (10.5)	Ø10	Ø12.5
W (mm)	14	14	18	18	26	26	34
Qty/Reel (pcs)	2000	1000	1000	500	500	500	500

PACKING METHOD

- Polarity: Anode on the opposite side of the feed hole
- The leader length of the tape shall not be less than 400mm including 10 or more embossed sections in which no parts are contained.
- The winding core is provided with an over 40mm long empty section



APPLICATION GUIDELINE

CIRCUIT DESIGN

1) Please make sure the environmental and mounting conditions to which the capacitor will be exposed are within the conditions specified in catalogue.

2) Operating temperature and applied ripple shall be within specification.

3) Appropriate capacitors which comply with the life requirement of the products should be selected when designing the circuit.

4) Aluminum electrolytic capacitors are polar. Make sure that no reverse voltage or AC voltage is applied to the capacitors. Please use bi-polar capacitors for a circuit that can possibly see reversed polarity.

Note: Even bi-polar capacitors cannot be used for AC voltage application.

5) Do not use aluminum electrolytic capacitors in a circuit that requires rapid and very frequent charge/ discharge. In this type of circuit, it is necessary to use a special design capacitor with extended life characteristics.

6) Do not apply excess voltage.

(1) Please pay attention to that the peak voltage, which is DC voltage overlapped by ripple current, will not exceed the rated voltage.

(2) In the case where more than 2 aluminum electrolytic capacitors are used in series, please make sure that applied voltage will be lower than rated voltage and the voltage will be applied to each capacitor equally by using a balancing resistor in parallel with the capacitor.

7) Aluminum electrolytic capacitors shall not be used under the following environmental conditions:

(1) (a) Capacitors will be exposed to water (including condensation), brine or oil. (b) Ambient conditions that include toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, ammonium, etc. (c) Ambient conditions that expose the capacitor to ozone, ultraviolet ray and radiation.

(2) Severe vibration and physical shock conditions that exceed specification.

Vibration test condition: 10-55-10Hz

Vibration frequency range : 10~55~10hz

Sweep rate : 10~55~10Hz/minute

Sweep method : logarithmic

Amplitude or acceleration : 1.5mm (max. Acceleration is 10G)

Direction of vibration : X, Y, Z direction

Testing time: 2 hours per each direction

Shock is not applicable normally.

If a particular condition is required, please contact our sales team.

8) The main chemical solution of the electrolyte and the separator paper used in the capacitors are combustible. The electrolyte is conductive. When it comes in contact with the PC board, there is a possibility of pattern corrosion or short circuit between the circuit pattern, which could result in smoking or catching fire. Do not locate any circuit pattern beneath the capacitor end seal.

9) Do not design a circuit board that the heat generating components are placed near the aluminum electrolytic capacitor or on the reverse side of PC board, if that just under the capacitor.

10) Electrical characteristics may vary depending on changes in temperature and frequency. Please consider this variation when you design circuits.

11) When you install more than 2 capacitors in parallel, please consider the balance of current flowing into the capacitors.

12) While mounting capacitors on double-side PC board, the capacitors should be away from those unnecessary base plate holes and connection holes.

MOUNTING

1) Once a capacitor has been assembled in the set and power applied, do not attempt to re-use the capacitor in other circuits or application.

2) Leakage current of the capacitors that have been stored for more than 2 years may increase. When leakage current has increased, please perform a voltage treatment using a 1kΩ resistor.

3) Please confirm specifications and polarity before installing capacitors on the PC board.

4) Do not drop capacitors on the floor, nor use a capacitor that was dropped.

5) Do not deform the capacitor during installation.

6) Please pay attention to the mechanical shock to the capacitor by suction nozzle of the automatic insertion machine or automatic mounter, or by product checker, or by centering mechanism.

REFLOW SOLDERING

1) Please follow “Reflow Soldering Conditions” when use the part.

2) When an infrared heater is used, please pay attention to the extent of heating since the absorption rate of infrared will vary due to difference in the color and size of the capacitor.

3) Do not tilt lay down or twist the capacitor body after the capacitor are soldered to the PC board.

4) Do not carry the PC board by grasping the soldered capacitor.

5) Please do not allow anything to touch the capacitor after soldering. If PC boards are stored in stack, please make sure the PC board or other components away from the capacitor.

6) The capacitors shall not be effected by any radiated heat from the soldered PC board or other components after soldering.

7) Cleaning:

(a) Do not clean capacitors with halogenated cleaning agent. However, if it is necessary to clean with halogenated cleaning agent, please contact our sales team.

(b) Recommended cleaning method

Applicable : Any type, any ratings

Cleaning conditions: Total cleaning time shall be within 2 minutes by immersion, ultrasonic or other methods. Temperature of the cleaning agents shall be 40℃ or below. After cleaning, capacitors should be dried by using hot air for the minimum 10 minutes along with the PC board mounted. Hot air temperature should be within the maximum operating temperature of the capacitor. Insufficient dryness after water rinse may cause appearance problems, such as bottom-plate bulge and etc.;

Avoid using ozone destructive substances as cleaning agents for protecting global environment.

IN THE EQUIPMENT

1) Do not directly touch terminal by hand.

2) Do not link positive terminal and negative terminal by conductor, nor spill conductible liquid such as alkaline or acidic solution on or near the capacitor.

3) Please make sure that the ambient conditions where the set is installed are free from spilling water or oil, direct sunlight, ultraviolet rays, radiation, poisonous gases, vibration or mechanical shock.

MAINTENANCE AND INSPECTION

Please periodically inspect the aluminum capacitors that are installed in industrial equipment. The following items should be checked:

Appearance: remarkable abnormality such as pressure relief vent opening, electrolyte leaking, etc.

Electrical characteristics: capacitance, dielectric loss tangent, leakage current and etc., which are specified in catalogue or alternate product specification.

IN AN EMERGENCY

1) If you see smoke due to operation of safety vent, please turn off the main switch or pull out the plug from the outlet.

2) If you breathe the gas or ingest the electrolyte, please wash out your mouth and throat with water immediately.

3) If your skin is exposed to the electrolyte, please wash it away using soap and water.

STORAGE

1) Do not keep capacitor in high temperature and high humidity atmosphere. Storage conditions should be:

Temperature: 5℃~ 35℃ Humidity : lower than 75% Place : Indoor

2) Avoid ambient conditions where capacitors are covered with water, brine or oil.

3) A storage products for longer than 12 months is not recommended. Within other effects, the terminals may suffer degradation, resulting in bad solderability. All products shall be used within the period of 12 months based on the day of shipment

DISPOSAL

Please take either of the following methods in disposing capacitors.

1) Incinerate them after crushing capacitors or making a hole on the capacitor body.

2) If incineration is not applicable, hand them over to a waste disposal agent and have them buried in landfills.

IMPORTANT NOTES AND DISCLAIMER

1. ROHS COMPLIANCE: The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.

2. REACH COMPLIANCE: REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.

3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. NextGen Component, Inc (*NextGen*) reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

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