



**SAMXON BRAND ALUMINUM ELECTROLYTIC CAPACITORS**

**PRODUCT SPECIFICATION**

規格書

<b>CUSTOMER :</b> (客戶) :	<b>DATE :</b> (日期) : 2019-7-4
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CATEGORY (品名)	: ALUMINUM ELECTROLYTIC CAPACITORS
DESCRIPTION (型号)	: VS1 10V100 $\mu$ F ( $\phi$ 5x5.4)
VERSION (版本)	: 01
Customer P/N	:
SUPPLIER	:

SUPPLIER	
PREPARED (拟定)	CHECKED (审核)
赵安平	刘渭清

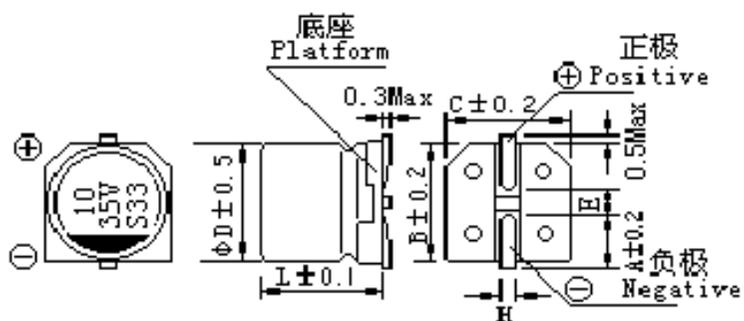
CUSTOMER	
APPROVAL (批准)	SIGNATURE (签名)



**Table 1 Product Dimensions and Characteristics**

Unit: mm

(Φ4 ~ Φ6.3)



Size	5X5.4
A±0.2	2.1
B±0.2	5.3
C±0.2	5.3
E	1.3
L±0.2	5.4
H	0.5~0.9

No.	SAMXON Part No.	WV (Vdc)	Cap. (μF)	Cap. tolerance	Temp. range(°C)	tanδ (120Hz, 20°C)	Leakage Current (μA,2min)	Max Ripple Current at 85°C 120Hz (mA rms)	Load lifetime (Hrs)	Dimension (mm)
										D×L
1	VS1107M1AD54TRS0	10	100	-20%~+20%	-40~85	0.22	10	41	2000	5X5.4

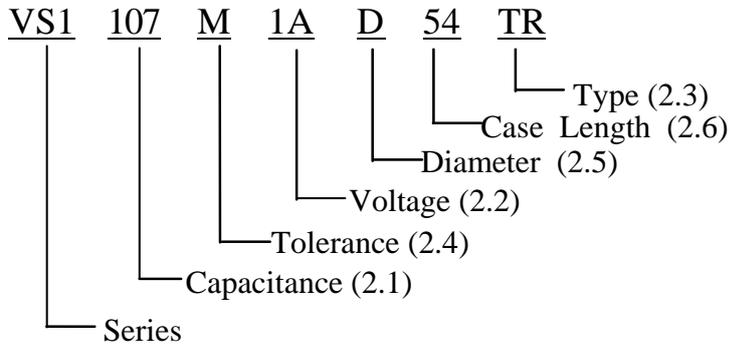
**C O N T E N T S**

	<b>Sheet</b>
1. Application	4
2. Part Number System	4
3. Construction	5
4. Characteristics	5~10
4.1 Rated voltage & Surge voltage	
4.2 Capacitance (Tolerance)	
4.3 Leakage current	
4.4 $\tan\delta$	
4.5 Temperature characteristic	
4.6 Load life test	
4.7 Shelf life test	
4.8 Surge test	
4.9 Vibration	
4.10 Solderability test	
4.11 Resistance to solder heat	
4.12 Damp heat test	
4.13 Adhesion test	
4.14 Reflow soldering temperature profile	
4.15 Maximum permissible (ripple current)	
5. Taping	11
6. Packing style	12

## 1. Application

This specification applies to polar Aluminum electrolytic capacitor (foil type) used in electronic equipment. Designed capacitor's quality meets IEC60384.

## 2. Part Number System



### 2.1 Capacitance code

<b>Code</b>	<b>107</b>
Capacitance ( $\mu$ F)	100

### 2.2 Rated voltage code

<b>Code</b>	<b>1A</b>
Voltage (W.V.)	10

### 2.3 Type

<b>Code</b>	<b>TR</b>
Reference	Embossed Taping.

### 2.4 Capacitance tolerance

"M" stands for -20% ~ +20%

### 2.5 Diameter

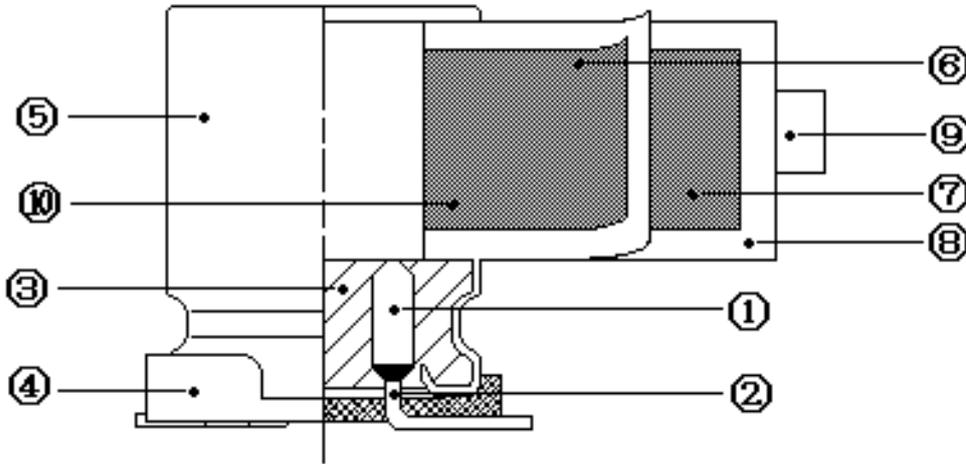
<b>Code</b>	<b>D</b>
Diameter	5

### 2.6 Case length

54=5.4mm

### 3. Constructions

#### 3-1 Inside Construction



#### 3-2 Construction parts

No.	Parts	Materials	No.	Parts	Materials
1	Lead line	Aluminum 99.93%	6	Anode foil	Formed aluminum 99.99%
2	Terminal	Tinned copper-ply wire (Lead Free) (*2)	7	Cathode foil	Etched aluminum 98%
3	Sealing pad	I.I.R.	8	Separator	Pulp
4	Base plate	P.P.A	9	Adhesive tape	Poly propylene film
5	Case	Aluminum 98%+ PET coating	10	Electrolyte	GBL & EG

### 4. Characteristics

#### Standard atmospheric conditions

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

#### Operating temperature range

The ambient temperature range at which the capacitor can be operated continuously at rated voltage  
 See table 1 temperature range.

As to the detailed information, please refer to table 2.

MAN YUE ELECTRONICS COMPANY LIMITED	ELECTROLYTIC CAPACITOR SPECIFICATION VSI SERIES	<b>SAMXON</b>

Table 2

ITEM		PERFORMANCE																		
4.1	Rated voltage (WV)  Surge voltage (SV)	<table border="1"> <tr> <td>WV (V.DC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>100</td> </tr> <tr> <td>SV (V.DC)</td> <td>8</td> <td>13</td> <td>20</td> <td>32</td> <td>44</td> <td>63</td> <td>125</td> </tr> </table>	WV (V.DC)	6.3	10	16	25	35	50	100	SV (V.DC)	8	13	20	32	44	63	125		
WV (V.DC)	6.3	10	16	25	35	50	100													
SV (V.DC)	8	13	20	32	44	63	125													
4.2	Nominal capacitance (Tolerance)	<p>&lt;Condition&gt;            Measuring Frequency : 120Hz ± 12Hz            Measuring Voltage : Not more than 0.5Vrms            Measuring Temperature : 20 ± 2°C</p> <p>&lt;Criteria&gt;            Shall be within the specified capacitance tolerance.</p>																		
4.3	Leakage current	<p>&lt;Condition&gt;            Connecting the capacitor with a protective resistor (1kΩ ± 10Ω) in series for 2 minutes, and then, measure Leakage Current.</p> <p>&lt;Criteria&gt;            Refer to Table 1</p>																		
4.4	tanδ	<p>&lt;Condition&gt;            See 4.2, Norm Capacitance, for measuring frequency, voltage and temperature.</p> <p>&lt;Criteria&gt;            Refer to Table 1</p>																		
4.5	Temperature characteristics	<p>&lt;Condition&gt;</p> <table border="1"> <thead> <tr> <th>STEP</th> <th>Testing Temperature(°C)</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20 ± 2</td> <td>Time to reach thermal equilibrium</td> </tr> <tr> <td>2</td> <td>-55(-40) (-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>85 ± 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> </tbody> </table> <p>Capacitance, DF, and impedance shall be measured at 120Hz.</p> <p>&lt;Criteria&gt;</p> <ol style="list-style-type: none"> <li>At +85°C, capacitance shall be within ± 25% of their origin at +20°C, measured capacitance, dissipation factor shall be within limit of 4.4. The leakage current value at +85°C shall not more than 10 times the Specified value.</li> <li>At step 5, capacitance shall be within ± 10% of their original +20°C, measured capacitance, dissipation factor shall be within the limit of 4.4. The leakage current value shall not more than the specified value</li> </ol>	STEP	Testing Temperature(°C)	Time	1	20 ± 2	Time to reach thermal equilibrium	2	-55(-40) (-25) ± 3	Time to reach thermal equilibrium	3	20 ± 2	Time to reach thermal equilibrium	4	85 ± 2	Time to reach thermal equilibrium	5	20 ± 2	Time to reach thermal equilibrium
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4.5

Temperature  
characteristics

c. At-40°C (-25°C), impedance (z) ratio shall not exceed the value of the following table.

Working Voltage (V)	6.3	10	16	25	35	50
Z-25°C/Z+20°C	8	8	4	4	3	3

4.6

Load  
life  
test

**<Condition>**

According to IEC60384-4No.4.13 methods, The capacitor is stored at a temperature of 85 °C ±2 with DC bias voltage plus the rated ripple current for Table 1. (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) 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.

Leakage current	Value in 4.3 shall be satisfied
Capacitance Change	Within ±20% of initial value.
tanδ	Not more than 200% of the specified value.
Appearance	There shall be no leakage of electrolyte.

4.7

Shelf  
life  
test

**<Condition>**

The capacitors are then stored with no voltage applied at a temperature of 85 ±2°C for 1000+48/0 hours. Following this period the capacitors shall be removed from the test chamber and be allowed to stabilize 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.

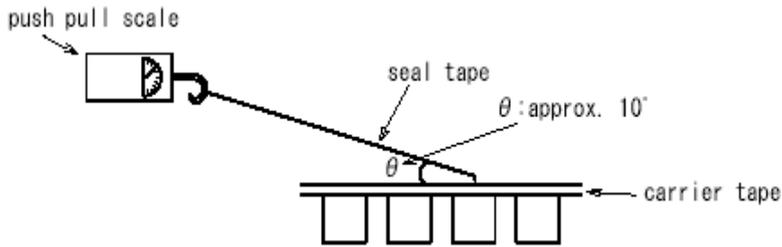
**<Criteria>**

The characteristic shall meet the following requirements.

Leakage current	Value in 4.3 shall be satisfied
Capacitance Change	Within ±20% of initial value.
tanδ	Not more than 200% of the specified value.
Appearance	There shall be no leakage of electrolyte.

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.

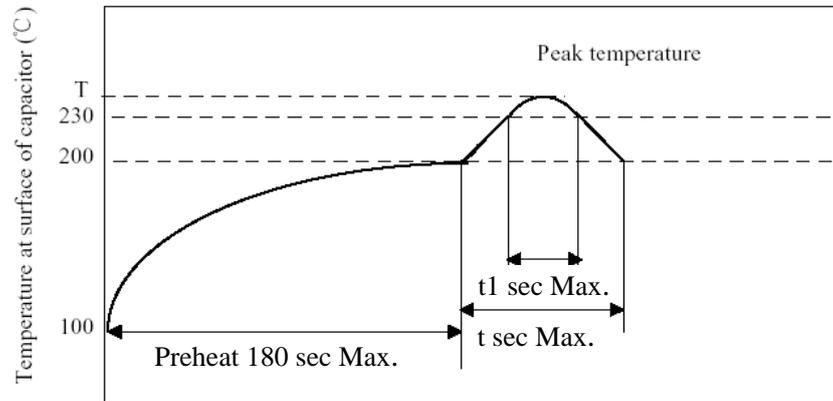
4.8	Surge test	<p><b>&lt;Condition&gt;</b>  Applied a surge voltage to the capacitor connected with a <math>(100 \pm 50)/C_R</math> (k<math>\Omega</math>) resistor. The capacitor shall be submitted to 1000 cycles, each consisting of charge of <math>30 \pm 5</math>s, followed discharge of 5 min 30s.  The test temperature shall be 15~35°C.  <math>C_R</math> :Nominal Capacitance (<math>\mu</math> F)</p> <p><b>&lt;Criteria&gt;</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Leakage current</td> <td>Not more than the specified value.</td> </tr> <tr> <td>Capacitance Change</td> <td>Within <math>\pm 15\%</math> of initial value.</td> </tr> <tr> <td><math>\tan\delta</math></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> <p>Attention:  This test simulates over voltage at abnormal situation only. It is not applicable to such over voltage as often applied.</p>	Leakage current	Not more than the specified value.	Capacitance Change	Within $\pm 15\%$ of initial value.	$\tan\delta$	Not more than the specified value.	Appearance	There shall be no leakage of electrolyte.
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$\tan\delta$	Not more than the specified value.									
Appearance	There shall be no leakage of electrolyte.									
4.9	Vibration test	<p><b>&lt;Condition&gt;</b>  The following conditions shall be applied for 2 hours in each 3 mutually perpendicular directions.  Vibration frequency range : 10Hz ~ 55Hz  Peak to peak amplitude : 1.5mm  Sweep rate : 10Hz ~ 55Hz ~ 10Hz in about 1 minute  Mounting method:  The capacitor with diameter greater than 12.5mm or longer than 25mm must be fixed in place with a bracket.</p> <p><b>&lt;Criteria&gt;</b>  After the test, the following items shall be tested:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Inner construction</td> <td>No intermittent contacts, open or short circuiting. No damage of tab terminals or electrodes.</td> </tr> <tr> <td>Appearance</td> <td>No mechanical damage in terminal. No leakage of electrolyte or swelling of the case. The markings shall be legible.</td> </tr> </table>	Inner construction	No intermittent contacts, open or short circuiting. No damage of tab terminals or electrodes.	Appearance	No mechanical damage in terminal. No leakage of electrolyte or swelling of the case. The markings shall be legible.				
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4.10	Solderability test	<p><b>&lt;Condition&gt;</b>  The capacitor shall be tested under the following conditions:  Soldering temperature : <math>245 \pm 3^\circ\text{C}</math>  Dipping depth : 2mm  Dipping speed : <math>25 \pm 2.5</math>mm/s  Dipping time : <math>3 \pm 0.5</math>s</p> <p><b>&lt;Criteria&gt;</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Coating quality</td> <td>A minimum of 95% of the surface being immersed</td> </tr> </table>	Coating quality	A minimum of 95% of the surface being immersed						
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4.11	Resistance to solder heat test	<p><b>&lt;Condition&gt;</b>            Terminals of the capacitor shall be immersed into solder bath at <math>260 \pm 5^{\circ}\text{C}</math> for <math>10 \pm 1</math> seconds or <math>400 \pm 10^{\circ}\text{C}</math> for <math>3_{-0}^{+1}</math> seconds to 1.5~2.0mm from the body of capacitor .            Then the capacitor shall be left under the normal temperature and normal humidity for 1~2 hours before measurement.</p> <p><b>&lt;Criteria&gt;</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Leakage current</td> <td>Not more than the specified value.</td> </tr> <tr> <td>Capacitance Change</td> <td>Within <math>\pm 10\%</math> of initial value.</td> </tr> <tr> <td><math>\tan\delta</math></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>	Leakage current	Not more than the specified value.	Capacitance Change	Within $\pm 10\%$ of initial value.	$\tan\delta$	Not more than the specified value.	Appearance	There shall be no leakage of electrolyte.
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$\tan\delta$	Not more than the specified value.									
Appearance	There shall be no leakage of electrolyte.									
4.12	Damp heat test	<p><b>&lt;Condition&gt;</b>            Humidity Test:            According to IEC60384-4 No.4.12 methods, capacitor shall be exposed for <math>500 \pm 8</math> hours in an atmosphere of 90~95% R H .at <math>40 \pm 2^{\circ}\text{C}</math> , the characteristic change shall meet the following requirement.</p> <p><b>&lt;Criteria&gt;</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Leakage current</td> <td>Not more than the specified value.</td> </tr> <tr> <td>Capacitance Change</td> <td>Within <math>\pm 20\%</math> of initial value.</td> </tr> <tr> <td>Dissipation Factor</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>	Leakage current	Not more than the specified value.	Capacitance Change	Within $\pm 20\%$ of initial value.	Dissipation Factor	Not more than 120% of the specified value.	Appearance	There shall be no leakage of electrolyte.
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Appearance	There shall be no leakage of electrolyte.									
4.13	Adhesion test	<p>Reasonable pulling strength :0.1~0.7N            Pulling speed: 300mm/min</p> 								
4.14	Reflow soldering temperature profile	<p>After the capacitor is subjected to the specified reflow soldering , (see temperature profile below ) it shall meet the condition stated in the page 10, item 4.11.</p> <p><b>&lt;Reflow soldering condition &gt;</b>            The temperature shall be measured with thermal couple. which shall be placed and fixed on the top of capacitor body.</p> <p>Maximum Permissible Reflow Soldering Temperature Profile            We recommend soldering shall done according to following maximum permissible reflow soldering temperature reflow soldering temperature profile.</p>								

4.14

Reflow  
soldering  
temperatur  
e profile

Reflow soldering  
(This is a method to heat parts and the substrate by hot air or infrared furnace.)



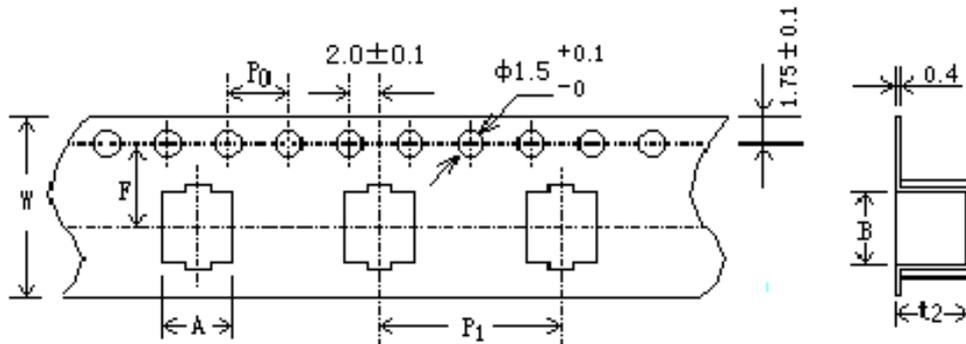
- 1) Temperature at surface of capacitor shall not exceed T(°C).
- 2) Period that temperature at surface of capacitor becomes more than 200°C and 230°C shall not exceed t and t1 seconds, respectively.
- 3) Preheat shall be made at 100°C~200°C and for maximum 180 seconds.

Size	T(°C)	t(sec)	t1(sec)
Φ 4~6.3	255	100	50
Φ 8	245	100	40
Φ 10~16	245	100	40

**5. Taping**

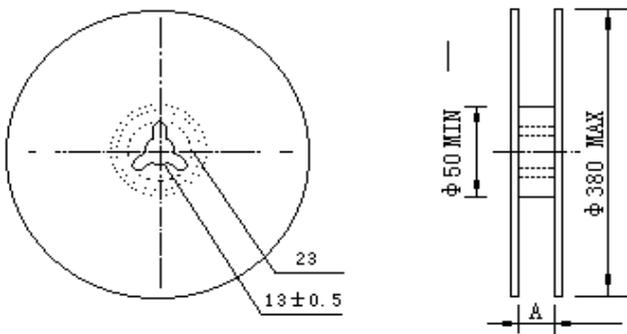
[Unit: mm]

a) Carrier Tape



$\varphi D \times L$	$W \pm 0.3$	$A \pm 0.2$	$B \pm 0.2$	$F \pm 0.1$	$P_0 \pm 0.1$	$P_1 \pm 0.1$	$t_2 \pm 0.2$
$\varphi 5 \times 5.4$	12.0	6.0	6.0	5.5	4.0	12.0	5.8

b) Reel



$\varphi D$	5	10	12.5
A	14	26	34

## 6. Packing Style

- (1). Carrier tape shall be reeled inside. (seal tape shall be outside)
- (2). End of the tape shall be inside to the reel physically as shown in the below figure and leader part of seal tape shall not be attached.

