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东莞市科尼盛电子有限公司
DONGGUAN KNSCHA ELECTRONICS CO., LTD.

规格承认书
Specification for approval

客户名称: (Customer Name)	
产品名称: (Product Name)	**贴片铝电解电容器** SMD Aluminum Electrolytic Capacitor
客户料号: (Customer part number)	
科尼盛料号: (KNSCHA number)	FZ220UF25V**90RV0110**
型号规格: (Specifications)	**SMD E/C 220UF/25V 8*10.5mm FZ** SMD E/C 220UF/25V 8*10.5mm FZ

制 造 (Manufacture)		
Approval		
拟 制 (Fiction)	审 核 (Chief)	核 准 (Approval)
刘淑芬	刘军军	徐贵南

客 户 (Customer)		
Approval		
检 验 (Inspect)	审 核 (Chief)	核 准 (Approval)

东莞市科尼盛电子有限公司

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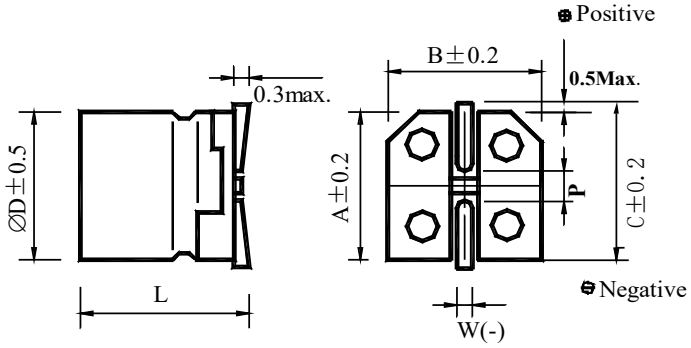
variation required description

Ver	Before change	After change	Date	Handler
A0	First recognition		2022/03/17	
A1				
A2				

Product Dimensions



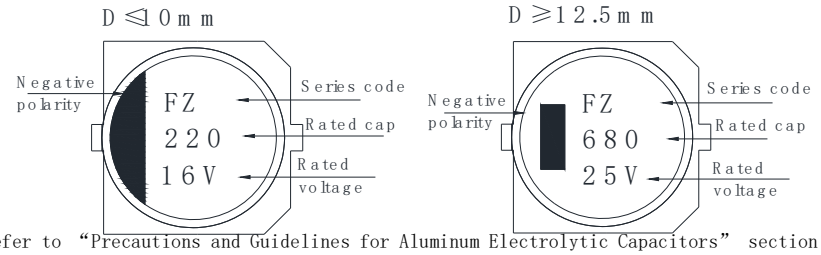
Unit: mm

Φ	8
L	10.5±0.5
A	8.3
B	8.3
C	9.2
W	0.7~1.2
P	3.1±0.2

Items	Performance
Category Temperature Range	-55℃~105℃
Rated Voltage V_R	25V
Capacitance C_R	220μF (120Hz, 20℃)
Capacitance Tolerance	± 20 % (120Hz, 20℃)
Surge Voltage V_S	28.8V_{DC}
Leakage Current (20℃)	I_{LEAK} ≤ 55 μA After 2 minutes
Tan δ	≤ 0.16 (120Hz, 20℃)
Impedance max.	≤ 0.17 Ω (100KHz, 20℃)
Ripple Current ($I_{AC,R}$ / rms)	450 mA (100KHz, 105℃)
Low Temperature Characteristics at 120 Hz	Impedance ratio: $Z_{(-25℃)}$ / $Z_{(+20℃)}$ = 2; $Z_{(-55℃)}$ / $Z_{(+20℃)}$ = 3
Ripple Current (A) and Frequency Multipliers	Frequency (Hz): 50,60 / 120 / 1K / 10k up; Multiplier: 0.60 / 0.70 / 0.80 / 1.00
Endurance and Shelf Life Test	Items: Endurance — Test Time: 5,000 Hrs at 105℃; V_R — Cap. Change: Within ±30 % of initial value — Tan δ: Less than 300% of specified value — Leakage Current: Within specified value; Shelf Life Test — Test Time: 1,000 Hrs at 105℃ — Cap. Change: Within ±30 % of initial value — Tan δ: Less than 300% of specified value — Leakage Current: Within specified value
Standards	JIS C 5101-1, -18, IEC 60384-4
Remarks	RoHS Compliance, Halogen-free

Marking: Each capacitor shall be marked with the following information.

Marking color: Black



Please refer to "Precautions and Guidelines for Aluminum Electrolytic Capacitors" section in KNSCHA's catalog for further details.

Diagram of Dimensions

Product Code Guide - SMD Type

1. Carrier Tape

Fig. 1-1 Carrier tape ΦD≤10

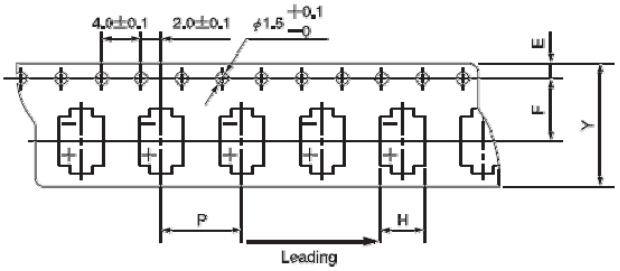
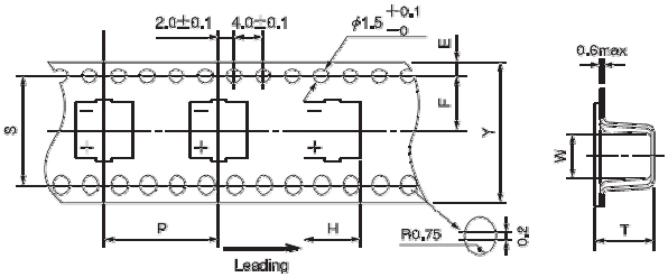


Fig. 1-2 Carrier tape ΦD≥12.5



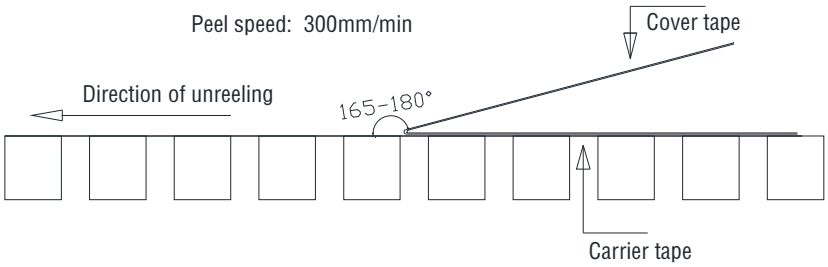
Unit:mm

Size(φD×L)	Y±0.3	H±0.2	W±0.2	P±0.1	E±0.1	F±0.1	T±0.2	S±0.1	Fig.No.
φ4×5.4	12.0	5.0	5.0	8.0	1.75	5.5	6.0	—	1-1
φ4×5.8	12.0	5.0	5.0	8.0	1.75	5.5	6.5	—	1-1
φ4×7.0	12.0	5.0	5.0	8.0	1.75	5.5	7.5	—	1-1
φ5×5.4	12.0	6.0	6.0	12.0	1.75	5.5	6.0	—	1-1
φ5×5.8	12.0	6.0	6.0	12.0	1.75	5.5	6.5	—	1-1
φ5×7.0	12.0	6.0	6.0	12.0	1.75	5.5	7.5	—	1-1
φ6.3×5.4	16.0	8.7	8.7	12.0	1.75	7.5	6.0	—	1-1
φ6.3×5.8	16.0	8.7	8.7	12.0	1.75	7.5	6.5	—	1-1
φ6.3×7.7	16.0	8.7	8.7	12.0	1.75	7.5	8.2	—	1-1
φ6.3×7.9	16.0	8.7	8.7	12.0	1.75	7.5	8.5	—	1-1
φ8×6.5	16.0	8.7	8.7	12.0	1.75	7.5	7.2	—	1-1
φ8×10.5	24.0	8.7	8.7	16.0	1.75	11.5	11.5	—	1-1
φ8×11.5	24.0	8.7	8.7	16.0	1.75	11.5	12.0	—	1-1
φ8×12.5	24.0	8.7	8.7	16.0	1.75	11.5	13.5	—	1-1
φ8×13.5	24.0	8.7	8.7	16.0	1.75	11.5	14.5	—	1-1
φ10×7.7	24.0	10.7	10.7	16.0	1.75	11.5	8.5	—	1-1
φ10×10.5	24.0	10.7	10.7	16.0	1.75	11.5	11.5	—	1-1
φ10×11.5	24.0	10.7	10.7	16.0	1.75	11.5	12.5	—	1-1
φ10×12.5	24.0	10.7	10.7	16.0	1.75	11.5	13.5	—	1-1
φ10×13.5	24.0	10.7	10.7	16.0	1.75	11.5	14.5	—	1-1
φ12.5×13.5	32.0	13.9	13.9	24.0	1.75	14.2	14.5	28.5	1-2
φ12.5×16.0	32.0	13.9	13.9	24.0	1.75	14.2	16.5	28.5	1-2
φ16×16.5	44.0	17.5	17.5	28.0	1.75	20.2	17.5	40.5	1-2
φ16×21.5	44.0	17.5	17.5	28.0	1.75	20.2	22.5	40.5	1-2
φ18×16.5	44.0	19.5	19.5	32.0	1.75	20.2	17.5	40.5	1-2
φ18×21.5	44.0	19.5	19.5	32.0	1.75	20.2	22.5	40.5	1-2

4.1 Peel angle: 165 to 180℃refered to the surface on which the tape is glued.

4.2 Peel speed: 300mm per minutes

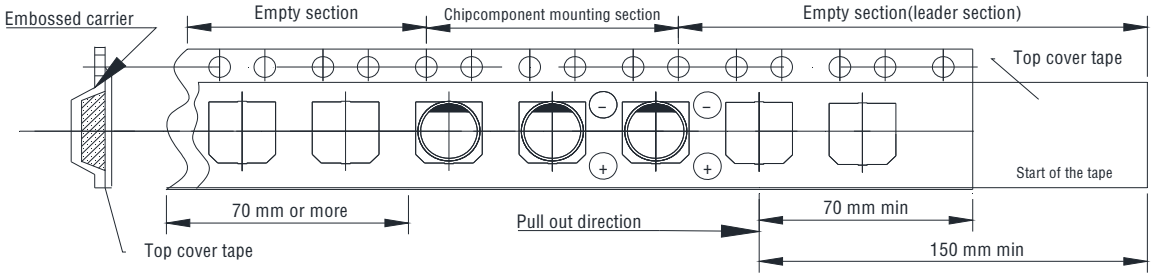
4.3 The peel strength must be 0.1 ~ 0.7N under these conditions.



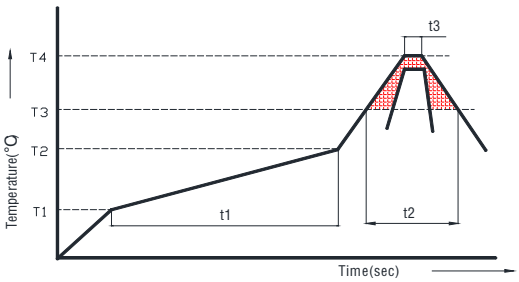
5. Packing Method

5.1 The leader length of the tape shall not be less than 150 mm including 10 or more embossed sections inwhich no parts are contained.

5.2 the core has an empty section with a length less than 60mm, and the perforation carrier is only suitable for Φ D ≤ 5mm.



Endurance characteristic:

<table>
<tr><td>8</td><td>Solderability Test</td><td>After the lead wire fully immersed in the solder for 3 ± 0.5 secs at a temperature of 245 ± 5℃, the solder the solder coating must be more than 95%. .
Dipping speed: 25±2.5mm/s
Dipping time: 3±0.5s</td><td>Capacitance change</td><td>Within ± 10% of initial value</td></tr>
<tr><td></td><td></td><td></td><td>Tan δ</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td></td><td>Leakage Current</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td></td><td>Physical</td><td>No broken and undamaged</td></tr>
<tr><td rowspan="4">9</td><td rowspan="4">Solder Heat-Resistance Test</td><td rowspan="4">1.IR Reflow
 
</td><td>Capacitance change</td><td>Within ± 10% of initial value</td></tr>
<tr><td>Tan δ</td><td>Within specified value</td></tr>
<tr><td>Leakage Current</td><td>Within specified value</td></tr>
<tr><td>Physical</td><td>No broken and undamaged</td></tr>
</table>

Rated voltage (V)		4-50		63 up	4-100		160 up
Case size (φ)		4-6.3		4-6.3	8-18		8-18
Preheat	Temp.(T1~T2,℃)	150-180					
	Time (t1)(Max,secs)	100					
Duration	Temp.(T3,℃)	217	230	217	217	230	217
	Time (t2)(Max,secs)	90	40	60	60	40	40
Peak	Temp.(T4,℃)	260		250	250		245
	Time (t3,secs)	5					
Reflow cycles		2 or less					

2.Solder iron method:
Bit temperature: 350 ± 5℃
Application time of soldering Iron: 3 +1/-0 sec
※Please contact our representative if your condition is higher.
※Please ensure that the capacitor became cold enough tothe room temperature (5℃ ~ 35℃) before the second reflow.
※Consult with us when performing reflow profile in IPC /JEDEC (J-STD-020)

10	Venting Test	1.pplicable to the capacitors with case size is 8×10 mm and larger. 2.Test condition: (1) AC test: The capacitor shall be connected across an applying 50 or 60 Hz AC which is 0.7 times ofrated voltage or 250Vrms AC whichever is the lower. (2) DC test: Applying inverse DC rated voltage with current to the capacitor. Where case diameter: φD ≦ 12.5 mm: 2 A DC max. φD＞12.5 mm: 10 A DC max. Note: (1) When the pressure relief vent operated, the capacitor shall avoid any danger of fire or explosion ofcapacitor element (terminal and metal foil etc.) or cover. (2) When the pressure relief device does not open with the voltage applied over 30 minutes, the test isconsidered to be passed.

No.	Item	Conditions

Leakage current flows through a capacitor when DC voltage is applied across it. Leakage current varies with changes in ambient temperature and applied DC voltage level and its time of application. Overvoltage situation, presence of moisture, and thermal stresses, especially occurring during the soldering process can enhance leakage current. Initial leakage current is usually higher and does not decrease until voltage is applied for a certain period of time. It is recommended to keep initial leakage current within specified levels.

(6)Charge and Discharge

Regular electrolytic capacitors are not suitable for rapid charging/discharging circuits. Such usage may either cause reduction in overall capacitance or damage due to overheating. Leon provides special assistance for selecting appropriate capacitors for rapid charging/discharging circuits.

(7)Surge Voltage

The Surge voltage rating is referred as the maximum DC overvoltage that may be applied to an electrolytic capacitor for a short time interval of 30 seconds at infrequent at infrequent time intervals not exceeding 5.5minutes with a limiting resistance of 1kΩ. Unless otherwise described on the catalogue or product specifications, please do not apply a voltage exceeding the capacitor's voltage rating. The rated surge voltages corresponding to rated voltages of electrolytic capacitors are presented as follows:

Rated Voltage(V)	4	6.3	10	16	25	35	50	63	80	100
Surge Voltage(V)	4.6	7.3	11.5	18.4	28.8	40.3	57.5	72.5	92	115
Rated Voltage(V)	160	200	250	315	350	400	420	450	500	525
Surge Voltage(V)	176	220	275	347	385	440	462	495	550	578

(8)Surge Voltage

The capacitor shall NOT be exposed to:

(a)Fluids including water, saltwater spray, oil, fumes, highly humid or condensed climates, etc.

(b)Ambient conditions containing hazardous gases/fumes like hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or bromine gas, ammonia, tec.

(c)Exposed to ozone, ultraviolet rays and radiation.

(d)Severe vibrations or physical shocks that exceeds the specifications mentioned in this catalogue.

(9)Circuit Design Consideration

(a)Please ensure whether application, operating and mounting conditions satisfy the conditions specified in the catalog before installation of a capacitor. Please consult KNSCHA, if any of the conditions are beyond the conditions specified in the catalog.

(b)Heat-generating components or heat sinks should not be placed closer to Aluminum electrolytic capacitors on the PCB to avoid their premature failure. A cooling system is recommended to improve their reliable working.

(c)Electrical characteristics and performance of aluminum electrolytic capacitors are affected by variation of applied voltage, ripple current, ripple frequency and operating temperature. Therefore, these parameters shall not exceed specified values in the catalog.

(d)Aluminum capacitors may be connected in the parallel fashion for increasing total capacitance and/or for achieving higher ripple current capability. But, such design may cause unequal current flow through each of the capacitors due to differences in their impedances.

(e)When two or more capacitors are connected in series, voltage across each capacitor may differ and fall below the applied voltage. A resistor should be placed across each capacitor so as to match applied voltage with voltage across a capacitor.

(f)Please consult KNSCHA while selecting a capacitor for high- frequency switching circuit or a circuit that undergoes rapid charging/ discharging.

(g)Standard outer sleeve of the capacitor is not a perfect electrical insulator therefore is unsuitable for the applications that requires perfect electrical insulation. Please consult KNSCHA, if your application requires perfect electrical insulation.

(h)Tilting or twisting capacitor body is not recommended once it is soldered to the PCB.

2.Caution for Assembling Capacitors

(1)Mounting

(a)Aluminum electrolytic capacitors are not recommended to reuse in other circuits once they are mounted and powered in a circuit.

(b)Aluminum electrolytic capacitors may hold static charge between its anode and cathode, which is recommended to be discharged through a 1kΩ resistor before re-use.

(c)A long storage of capacitors may result into its insulation deterioration. This can lead to a high leakage current when voltage is applied that may damage the capacitor. Capacitors following a long storage period must undergo voltage treatment/re-forming.

Capacitors are charged by applying rated DC voltage through a resistor of 1kΩ in series at least for an hour. It is recommended to increase applied voltage gradually using a voltage regulator unit once capacitors are assembled on the board. The charging should be followed by discharging through a 1KΩ resistor.

(d)Please check capacitor rated voltage before mounting.

(e)Please check capacitor polarity before mounting.

(f)Please don't drop capacitor on the floor / hard object.

(g)Please don't deform the capacitor during installation.

(h)Please confirm whether the lead spacing of the capacitors match with its pad spacing / footprint on PCB prior to installation.

(i)Please avoid excessive mechanical shocks to capacitor during the auto-insertion process, inspection or centering operations.

(4)Capacitors shall not be exposed to ozone, ultraviolet rays or radiation.

5.Estimation of life time

$$L_r = L_0 \times 2^{\frac{T_{0max} - T_{r\,max}}{10}}$$

L_r : Estimated lifetime (hours)

L_0: Base lifetime specified at maximum operating temperature with applied the DC voltage and the ripple current (hours)

$T_{0\,max}$: The core temperature that rated ripple current applied at maximum operating temperature.

$T_{r\,max}$: The core temperature that applied actual ripple current at ambient temperature.

6.Maintenance Inspection

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

7.Environmental Consideration

KNSCHA already have received ISO 14000 certificate. Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr+6), PBB, PBDE, DEHP, BBP, DBP and DIBP have never been using in capacitor. If you need "Halogen-free" products, please consult with us.

For further details, please refer to the following industrial standards:

IEC 60384-4- Fixed capacitors for use in electronic equipment - Part 4: Sectional specification - Aluminum electrolytic capacitors with solid (MnO_2) and non-solid electrolyte (Established in January 1995, Revised in March 2007)

EIAJ RCR-2367B- Guideline of notabilia for fixed aluminum electrolytic capacitors for use in electronic equipment [Technical Standardization Committee on Passive Components (Established in March 1995, Revised in March 2002)].

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