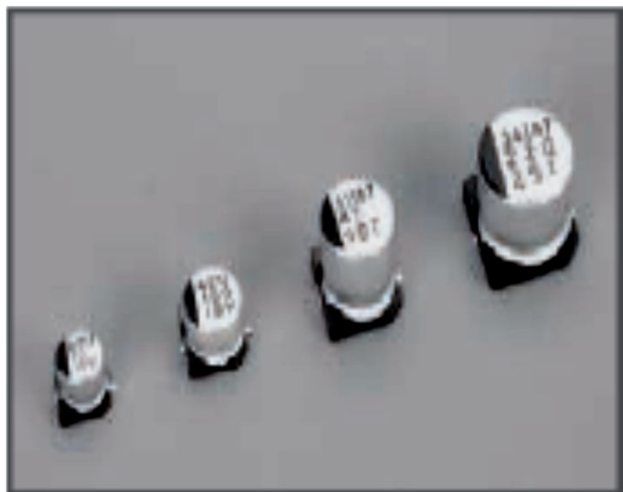


DATE: 2022.09.15
 SPEC. NO SICE-SP-R027

To: MARITEX

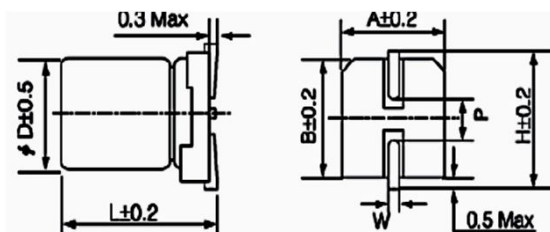
SPECIFICATION

FOR SMD AL. ELECTROLYTIC CAPACITORS (CZ SERIES)



CZ#1V221MISVTR
(LxDxA=10.2x8x9)

Please return us one copy your signed specification after you approved of it



DAEWOO ELECTRONIC EQUIPMENT VIETNAM CO., LTD

SUPPLIER'S DAEWOO

CUSTOMER'S MARITEX

Maker	Checker	Approval

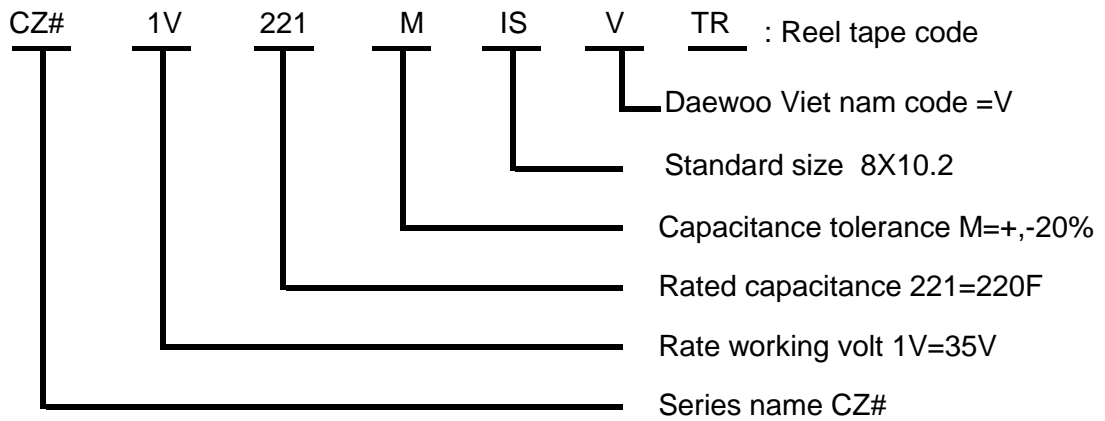


Maker	Checker	Approval

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We hand in this specification in order to be approved of SMD electrolytic capacitor(CZ Series)
that our company is going to deliver your company.

1. Composition Type: CZ#1V221MISVTR"8x10.2"



2. Operating temperature range:

6.3~50WV: -55°C to +105°C (-67°F to +221°F)

3. Electrical characteristic:

3.1 Capacitance.

The capacitance is measured at a frequency of 120Hz at a temperature of 20°C ± 2°C (68°F ± 3.6°F) with a maximum of 0.5 Vrms applied.

Capacitance tolerance	-20% ~ +20% (M)
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3.2 Leakage current (L.C)

6.3~50V	$I \leq 0.01CV$ or $3\mu A$ (2Min)
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I = DC Leakage current (μA)

C = Nominal capacitance (μF)

V = Rated Voltage (WV.DC)

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3.3 Tangent of Loss Angle (Tanδ)

The tangent of the loss angle when measured at a frequency of 120Hz at a temperature of (20°C ± 2°C) (68°F ± 3.6°F) shall be less than the values indicated below:

Tanδ (max., at 20°C,120Hz)	6.3V	10V	25V	35V
	0.24	0.20	0.14	0.12

When capacitance is over 1000µF, Tanδ shall be added 0.02 to the listed value with increase of every each 1000µF.

4. Test.

4.1 Damp heat

The capacitor shall be stored at a temperature of 40 ± 2°C and relative humidity of 90% to 95% for 240 ± 8hours. And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2 hours, after which measurements shall be made.

Capacitance change Max	Within ± 20% of the initial value.
Dissipation factor	Within value specified above.
Leakage current	Within value specified above.

4.2 Load life

After applying rated working voltage for 2000 hours at +105°C and then being stabilized at +20°C, capacitors shall meet following limits.

Capacitance change	Within ± 20% of the initial measured value.
Dissipation factor	≤ 200% of the initial specified value
Leakage current	≤ The initial specified value.

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4.3 Shelf life

The capacitor shall be stored at $105^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 1000^{0-48} hours during which time no voltage shall be applied. And then capacitor shall be subjected to standard atmospheric condition for 1 to 2 hours, after measurements shall be made Prior to the measurement, voltage conditioning may be made.

Capacitance change Max	Within $\pm 20\%$ of the initial measured value.
Dissipation factor	$\leq 150\%$ of the initial specified value
Leakage current	\leq The initial specified value.

4.4 Impedance ratio at low temperature

When capacitor are stored at the temperature of $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ respectively the ratio of impedance measured at each test temperature with the frequency of 120 Hz shall be less than value.

W.V (V)	6.3	10	25	35
Z- 25°C /Z 20°C	3	2	2	2
Z- 40°C /Z 20°C	4	4	3	3

4.5 Resistance to soldering heat

For other procedures than those specified below soldering iron method.

+ Temperature: $260 \pm 5^{\circ}\text{C}$

+ Application time of soldering iron: 10 sec

Capacitance change Max	Within $\pm 20\%$ of the initial value.
Dissipation factor	Within values specified above
Leakage current	Within values specified above



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5. Recommended cleaning solvents

Methanol, isopropanol, isobutanol, ethanol, petroleum ether, propanol and or commercial detergents.

Halogenated hydrocarbon cleaning agents such as freon (MF, TF, TMC or TC) trichloroethylene, trichloroethane, or methylchloride are not recommended as they may damage the capacitor.

6. Marking

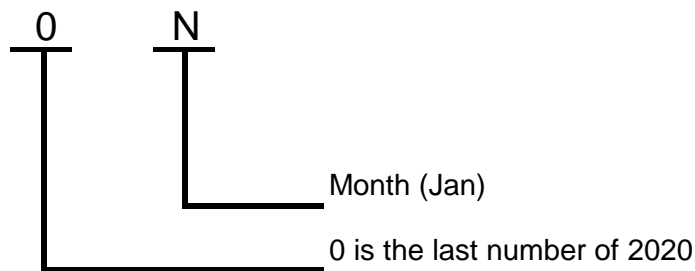
The following items shall be marked indelibly and legibly on the spoci-fled location.

- 1). Brand: DAEWOO
- 2). Series Designation: CZ#
- 3). Rated Voltage (DC): 35V
- 4). Capacitance (μF): 220μF
- 5). Capacitance Tolerance: (M): ±20%
- 6). Maximum Operating Temperature: 105°C
- 7). Lot No: 0N
- 8). Sleeve Colour: Maroon

7. Lot Number

The lot number regulates the following formula. But 1, 0, I are exception

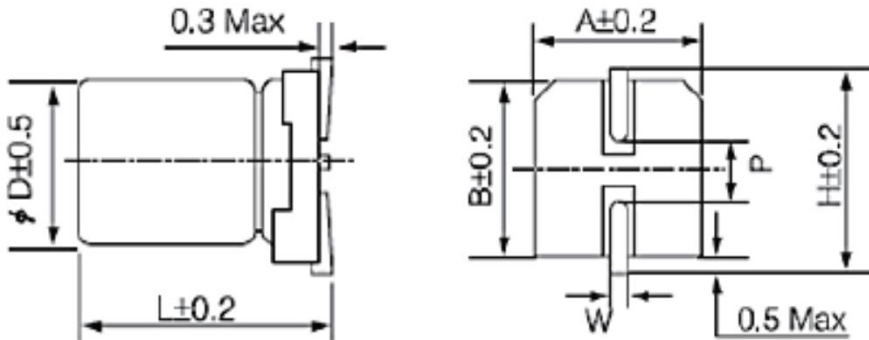
Ex: Jan 2020



MONTH	1	2	3	4	5	6	7	8	9	10	11	12
YEAR												
2020	N	P	Q	R	S	T	U	V	W	X	Y	Z
2029												

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8. CASE SIZE AND DIMENSION



* Standard lead style:

Unit = mm

Size code	ϕD	L	A	B	P	H	W
35V/220uF	8.0	10	8.3	8.3	3.1	9.0	0.8~1.1

9. RIPPLE CURRENT COEFFICIENT

* Frequency

Cap(μF) \ Freq(Hz)	50	120	400	1K	10K	50 ~ 100K
220	0.8	1.0	1.11	1.17	1.25	1.28

* Temperature

Temperature	$\leq 70^{\circ}C$	$85^{\circ}C$	$105^{\circ}C$
Factor	1.95	1.65	1.0

10. DIMENSION & PERMISSIBLE RIPPLE CURRENT [mA(rms) at $105^{\circ}C$, 100KHz]

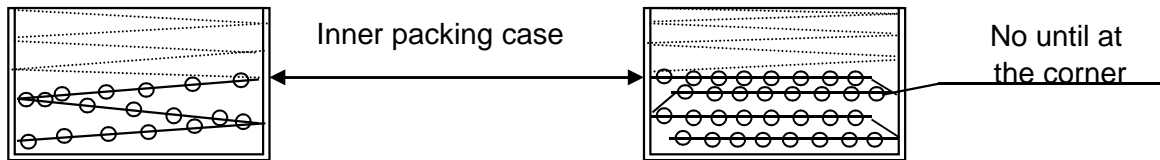
WV (V)	CAP (μF)	SIZE	RIPPLE CURRENT
35	220	10.2 x 80 x 9	220

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11. Packing method

11.1 Taped products shall be packed in a cardboard box like zigzag.

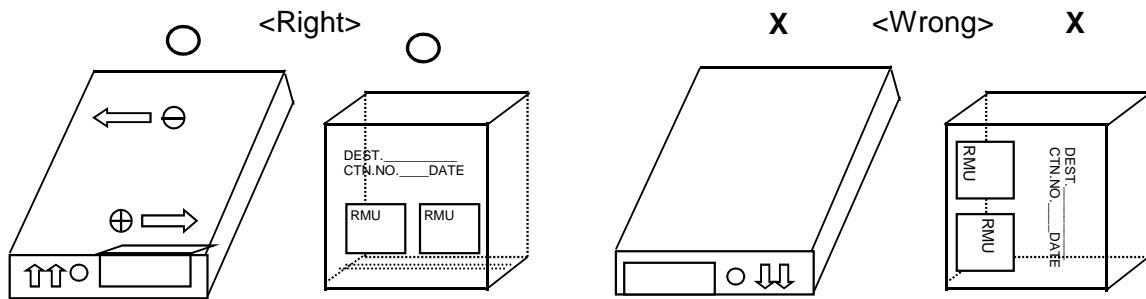
There shall be a single part number in a inner carton.



11.2 Polarity identifications on a cardboard box shall match the polarity of products.

11.3 Inner carton box shall be handled as follows.

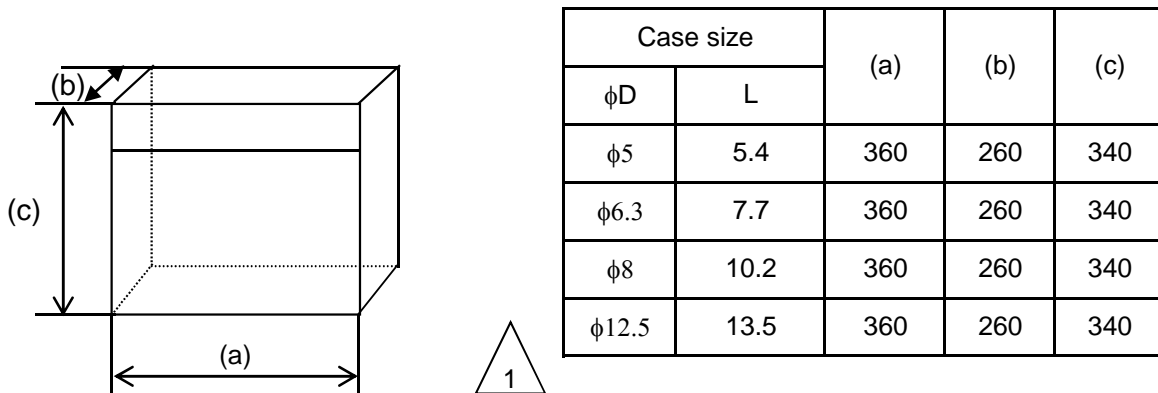
- * No more than 10 inner carton boxes shall be piled.
- * In case of putting the boxes lengthways, the indication of porarity shall face up.
- * The products shall be handled with care.



11.4 The inner cartons shall be packed in a cardboard box for transportation.

Various part number can be packed in a outer carton.

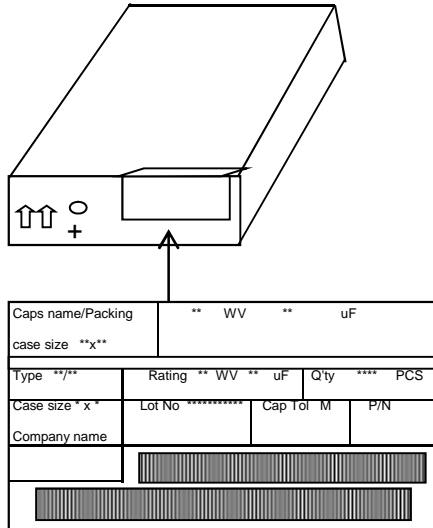
11.5 Shape & dimensions of inner carton shall be as follows.



* Note: The dimensions listed above may be changed without notice. The carton shall be suitable for the auto-insert machines after change.

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* Inner box packing standard

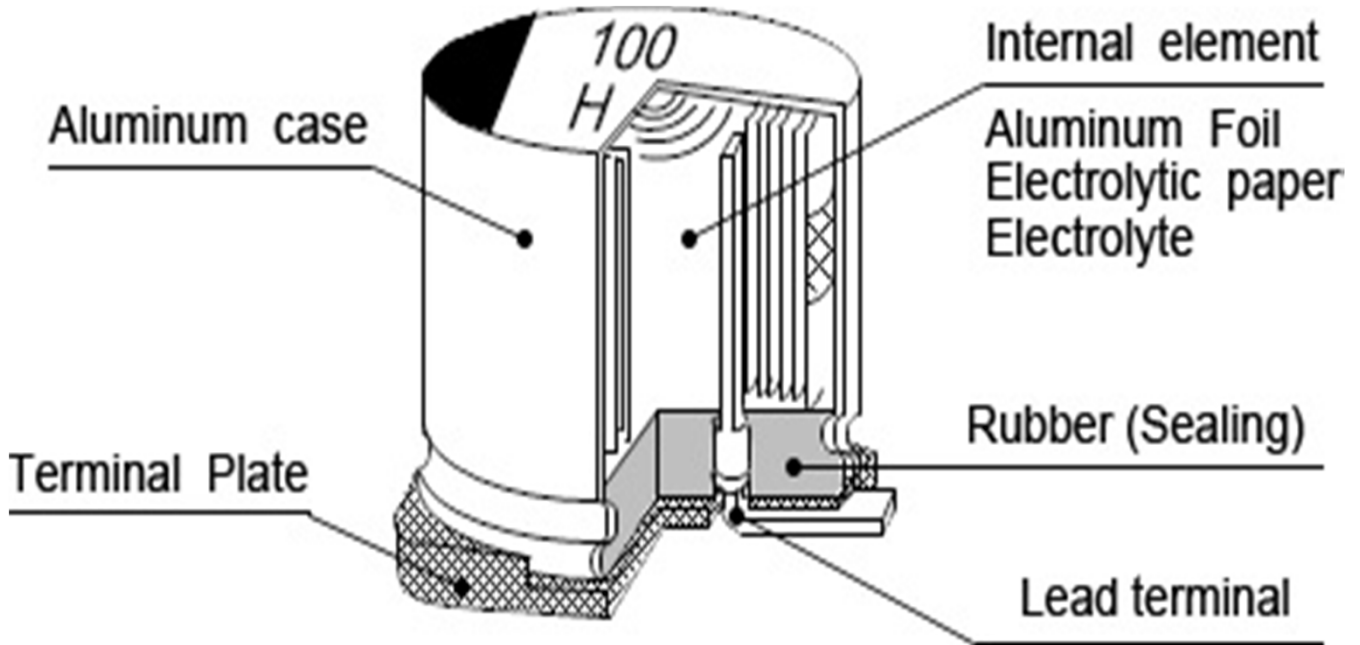


11.6 Packing quantity

Product diameter [mm]	Inner carton quantity min. Packing quantity [Pcs]	Outer carton quantity [Pcs]
φ4	2000	20000
φ5	1000	10000
φ6.3	1000	10000
φ8	500	4000
φ12.5	250	2000

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12.CONSTRUCTION RADIAL TYPE CAPACITORS.



No	Raw Materials			Contents(ppm=mg/kg)						ICP Data
	Part Name	Vendor	Material	cd	pb	Hg	Cr6+	PBB	PBDE	
1	FOIL(+)	KDK,HEC	Aluminium	0	0	0	0	0	0	#1
2	FOIL(-)	ELE-CON	Aluminium	0	0	0	0	0	0	#2
3	Elec Paper	SPO,NKK	Pulp	0	0	0	0	0	0	#3
4	Electrolyte	CAPCHEM	MEG	0	0	0	0	0	0	#4
5	Adhesive Tape	Tapex	Polypropylene	0	0	0	0	0	0	#5
6	Lead wire	Kohoku	Al,Fe+Sn	0	0	0	0	0	0	#6
7	Sealing Rubber	Foldwin,Yufeng	Rubber	0	0	0	0	0	0	#7
8	Case	DN-Tech,Hanam	Aluminium	0	0	0	0	0	0	#8
9	Terminal Plate	Moo Deung	PET	0	0	0	0	0	0	#9
10	Ink	Moo Deung	INK	0	0	0	0	0	0	#10
TOL				0	0	0	0	0	0	
SAMSUNG Eco-Partner Standard				5	100	800	800	100	100	



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RAW MATERIAL SUPPLIERS LIST					
Items	Company name	Country	Contents	Using of CE	Remark
Anode Foil	- KDK	- JAPAN	* Low and high gain Anode Foil	* All series of CE	* Forming(+)
	- HEC	- CHINA	* High voltage (160Fv up) Foil		
Cathode Foil	- ELE-CON	- CHINA	* Cathode Foil (20, 40, 50 μ m)	* All series of CE	* Etching(-) * PURITY : 98.4%
Lead wire	- Kohoku	- CHINA	* Lead-wire welding and press	* 04 type only	* Sn 100% coated
Case	- DN-Tech,Hanam	- CHINA	- 04 ~ 18 Al-case press	* All series of CE	
Terminal Plate	- MOODEUNG	- KOREA	* PET tube	* 04, Snap-in all	
Paper	- NKK	- JAPAN	* 100% from NKK		
	- SPO	- GERMANY	* 100% from NKK		
Sealing Rubber	- Foldwin	- CHINA	* Normal and butyl Rubber	* All series of CE	
	- Yufeng	CHINA	* Normal and butyl Rubber		
Electrolyte	- CAPCHEM	- CHINA	* Adipic Acid, Boric Acid	* All series CE	
Adhesive	- TAPEX	- KOREA	* Element winding film	* 04, Snap-in all	

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CONFIRMATION AND ACTION PLAN TABLE

No	Banned Substances and total abolish	PART OR RAW MATERIAL MANUFACTURER		ACTION PLAN TO ELIMINATE IF STILL USING
		NOT USE	USE	
1	Cadmium and cadmium compounds	X		
2	PBB and PBDE	X		
3	Chlorinated paraffins (chlorine flame retarding materials/plasticizers)	X		
4	Polychlorinated biphenyl (PCB) category	X		
5	Polychlorinated naphthalene category	X		
6	Organic tin compounds(Tributyl tin category/Triphenyl tin category)	X		
7	Asbestos	X		
8	Azo compounds	X		
9	Lead and its compounds	X		
10	Mercury and its inorganic compounds	X		
11	Hexavalent chromium compounds	X		
12	Polyvinylchloride (PVC)	X		
13	Organic bromine compound except PBB and PBDE	X		
14	Manufacturing Process : Ozone Depleting Substances	X		
15	Manufacturing Process : Chlorined organic solvent	X		