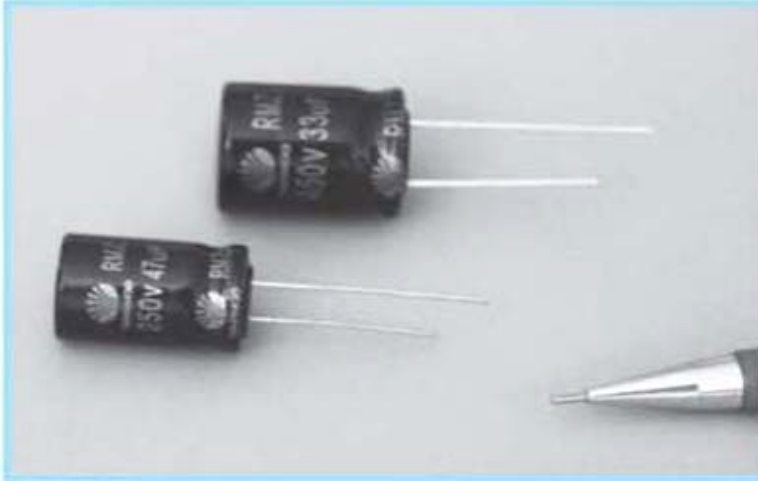


DATE: 2015.01.10
SPEC: SICE-SP-R038

To: PHP

SPECIFICATION

FOR AL. ELECTROLYTIC CAPACITORS (RMZ SERIES)



=> RMZ2G3R3MIAVTS

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

DAEWOO ELECTRONIC EQUIPMENT VIETNAM CO., LTD

SUPPLIER'S DAEWOO

Maker	Checker	Approval



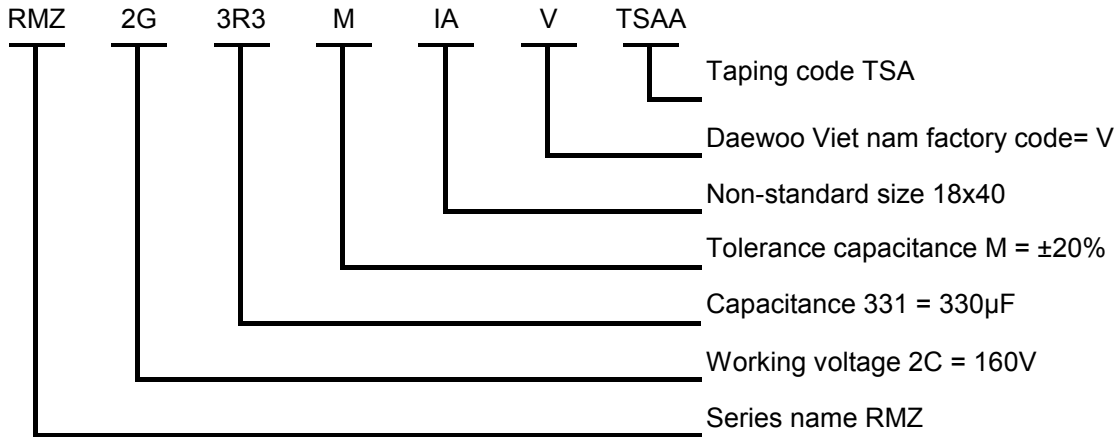
CUSTOMER'S PHP

Maker	Checker	Approval

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

1. Composition Type: RMZ2C331MIAVTSAA "10x12.5"



2. Operating temperature range:

400WV: -25°C to +105°C (-13°F to +211°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)

I	≤ 0.03CV + 15µA (5min) whichever is greater
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I = DC Leakage current (µA)
C = Nominal capacitance (µF)
V = Rated Voltage (WV.DC)

3.3 Surge Voltage:

Condition: Referring to JIS-C-5101-1(1998), 1000 Cycles of a charge period 30±5s, followed by a discharge period of 5.5±0.5min.

Test temperature : 15oC ~ 35oC

Rated voltage ≤ 315V : Surge voltage shall be 1.15 times the rated voltage

Rated voltage > 315V : Surge voltage shall be 1.10 times the rated voltage

and capacitor shall be stored under standard atmospheric conditions to obtain thermal stability, after which measurement shall be made. In criterial capacitance change within ±15% of initial valus.

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3.4 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)	W.V (V)	400
	Tanδ	0.15

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 01 to 02 hours, after which measurements shall be made.

Capacitance change Max	Within ± 10% 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 10000 hours at +105°C and then being stabilized at +20°C capacitors shall meet following limits.

Capacitance change	Within ± 10% of the initial measured value.
Dissipation factor	≤ 200% of the initial specified value.
Leakage current	≤ The initial specified value.

4.3 Shelf life

After storage for 1000 hours at +105°C with no voltage applied and then being stabilized at +20°C capacitors shall meet following limits.

Capacitance change Max	Within ± 10% of the initial measured value.
Dissipation factor	≤ 200% of initial specified value.
Leakage current	≤ 200% of initial specified value.

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4.4 Temperature cycle:

Condition: Referring to JIS-C-5101-1(1998) the capacitors shall be subjected in turn to the procedure specified below:

Step	Temperature	Time(Min)	Cycle
1	Rated low working temperature(-25+3oC)	30±3	1 to 4=1cycle Total 10 cycle
2	Normal temperature 25±2oC	3	
3	Rated high working temperature(+105+2oC)	30±3	
4	Normal temperature 25±2oC	3	

Critical:

Capacitance change Max	Within ± 5% of the initial value.
Dissipation factor	Not more than specified value
Leakage current	Not more than specified value
Appearance	No leakage and undamaged

4.5 Impedance ratio at low temperature

When capacitor are stored at the temperature of -40°C ± 3°C and 20°C± 2°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)	400
Z-25°C/Z20°C	3
Z-40°C/Z20°C	6

4.6 Resistance to soldering heat

For other procedures than those specified below soldering iron method.

+ Temperature: 260 ± 5°C

+ Application time of soldering iron: 10 sec

Capacitance change Max	Within ± 10% 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, isobutanaol, 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

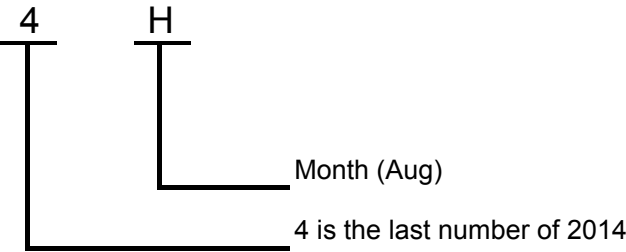
The following items shall be marked indelibly and legibly on the spoci-fled location.

- 1). Brand: 
- 2). Series Designation: RMZ
- 3). Rated Voltage (DC): 400V
- 4). Capacitance (μF): 3.3μF
- 5). Capacitance Tolerance(M): ±20%
- 6). Maximum Operating Temperature
- 7). Lot No : 4H
- 8). Sleeve Colour: BLACK

7. Lot Number

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

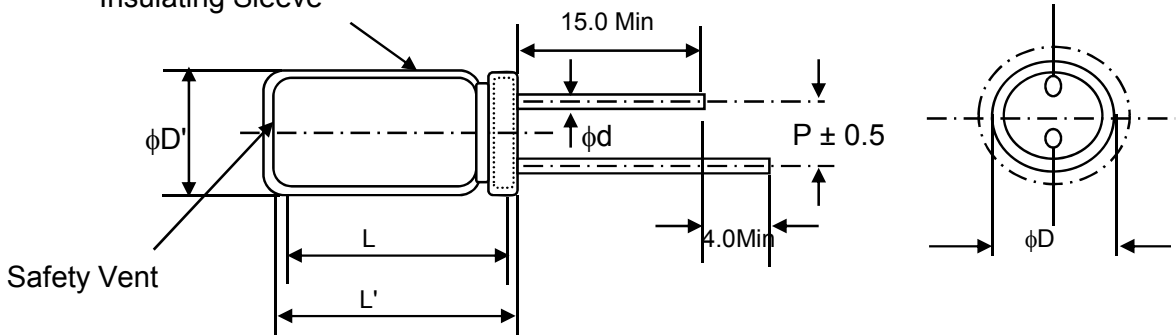
Ex: AUG 2014



MONTH	1	2	3	4	5	6	7	8	9	10	11	12
YEAR	A	B	C	D	E	F	G	H	J	K	L	M

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8. CASE SIZE AND DIMENSION
Insulating Sleeve



* Standard lead style:

ϕD	18.0
P	7.5
ϕd	0.8

$$D' = [D + 0.5] \text{Max}$$

$$L' = [L + 1.5] \text{Max}$$

9. RIPPLE CURRENT COEFFICIENT

* Frequency

Frequency (Hz)	120	400	1K	10K	100K
3.3	1.0	1.62	1.91	2.50	2.94

* Temperature

Temperature	$\leq 70^{\circ}\text{C}$	85°C	105°C
Factor	1.65	1.37	1.0

10. DIMENSION & PERMISSIBLE RIPPLE CURRENT [mA(rms) at 105°C , 100KHz]

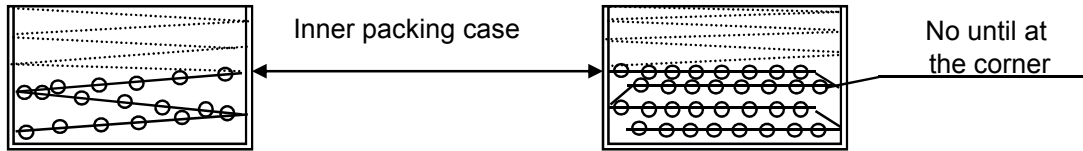
WV (V)	CAP (μF)	SIZE	Z(Ω)	RIPPLE
400	3.3	10 x 12.5	3.5	300

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11. Packing methode

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

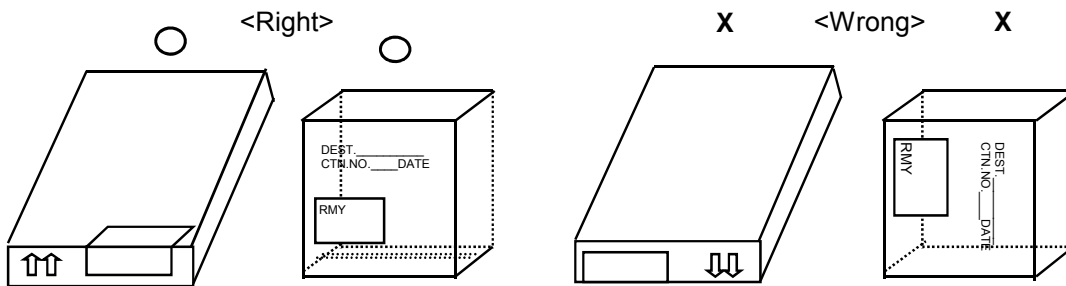
There shall be a single part number in a inner carton.



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

11.3 Inner carton box shall be handled as follows.

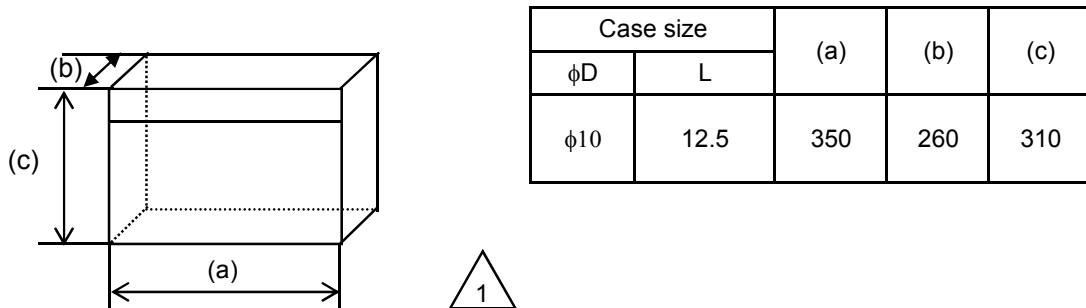
- * No more than 10 inner carton boxes shall be piled.
- * In case of putting the boxes lengthways, the indication of porarity shall face up.
- * The products shall be handled with care.



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

Various part number can be packed in a outer carton.

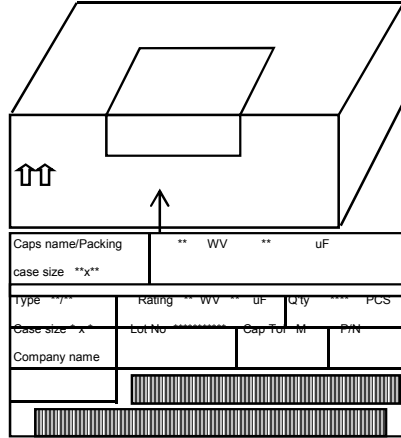
11.5 Shape & dimensions of inner carton shall be as follows.



* 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 standard quantity:

Product diameter [mm]	Inner carton quantity min. Packing quantity [Pcs]	Outer carton quantity [Pcs]
φ10	500	2500

11.7 Vibration test:

Condition: Referring to JIS-C-5101-1(1998) method, used test frequency from 10-55-10Hz (approximately 1 minute), 3 directions of X.Y. Z each 2 hours, Performance of part shall not have changed or breakage. Direction and duration of vibration: 3 orthogonal directions multuallity each for 2h, Total 5h.

Critical:

Capacitance change Max	Within ± 5% of the initial value.
Dissipation factor	Not more than specified value
Leakage current	Not more than specified value
Appearance	No leakage and undamaged

11.8 Terminal Strength test::

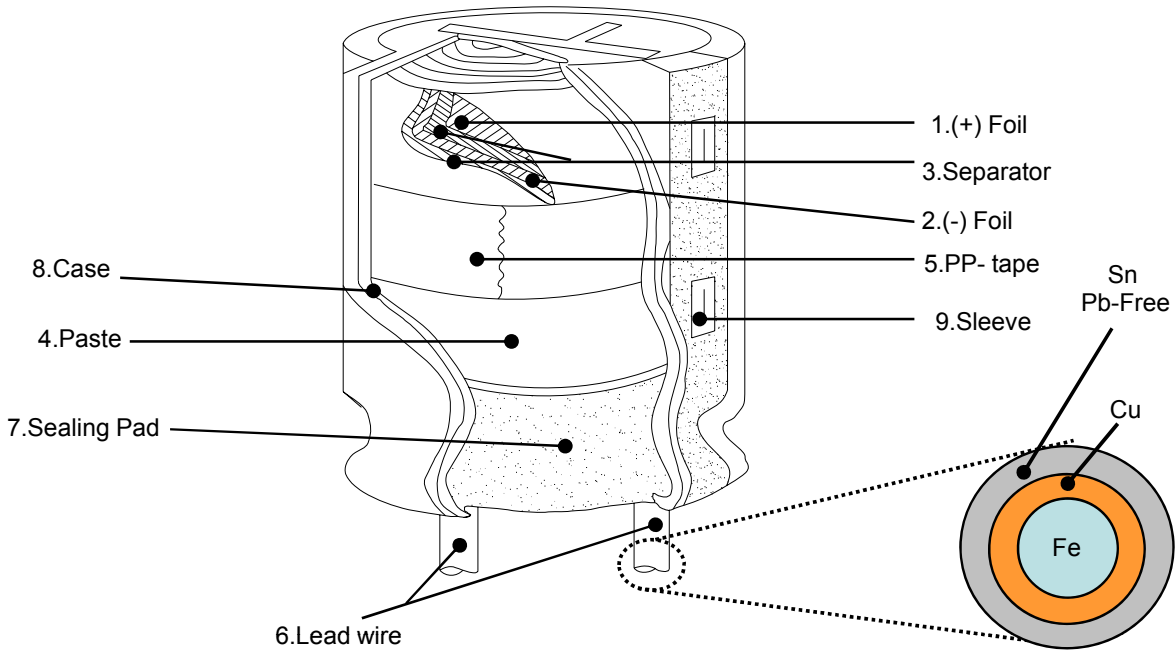
Conditions: A force shall be gradually applied to the terminal in the direction of the axits of the terminal up to the specified pull force 10N and retained for 10±1 seconds

Diameter of terminal(mm)	Pull force(N)
$0.3 \leq d \leq 0.5$	10
$0.5 \leq d \leq 0.8$	10
$0.8 \leq d \leq 1.25$	20
$1.25 \leq d$	40

Critical: There shall be no such mechanical damage as terminal damage etc.

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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(+)	HAIXING, HFCC	Aluminium	0	0	0	0	0	0	#1
2	FOIL(-)	ELE-CON	Aluminium	0	0	0	0	0	0	#2
3	Paper	KAN	Pulp	0	0	0	0	0	0	#3
4	PASTE	CAPCHEM	MEG	0	0	0	0	0	0	#4
5	Adhesive Tape	TAPEX	Polypropylene	0	0	0	0	0	0	#5
6	Lead wire	LITON	Al,Fe+Sn	0	0	0	0	0	0	#6
7	Rubber	LIEN-EKI	Rubber	0	0	0	0	0	0	#7
8	Case	OAKLEY	Aluminium	0	0	0	0	0	0	#8
9	Sleeve	MOODEUNG	PVC	0	0	0	0	0	0	#9
10	Sleeve Ink	MOODEUNG	INK	0	0	0	0	0	0	#10
11	Box Packing	TRUONG HUNG	Kraft	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	- HFCC	- CHINA	* Low and high gain Anode Foil	* All series of CE	* Forming(+)
	- HAIXING	- 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	- LISHENG	- CHINA	* Lead-wire welding and press	* 04 type only	* Sn 100% coated
Case	- OAKLEY	- CHINA	- 04 ~ 18 Al-case press	* All series of CE	
Sleeve	- MOODEUNG	- KOREA	* PVC tube	* 04, Snap-in all	
Paper	- KAN	- CHINA	* 100% from CHINA	* All series of CE	
Rubber	- LIEN-EKI	- CHINA	* Normal and butyl Rubber	* All series of CE	
Paste	- CAPCHEM	- CHINA	* Adipic Acid, Boric Acid	* All series CE	
Adhesive Tapex	- 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(Tributhyl 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	Polyethylene terephthalate (PET)		X	
13	Organic bromine compound except PBB and PBDE	X		
14	Manufacturing Process : Ozone Depleting Substances	X		
15	Manufacturing Process : Chlorined organic solvent	X		

