

Messrs. Shenzhen Onstone Technology Co.,Ltd.

Metallized Polyester Film Capacitors

REFERENCE SPECIFICATION SHEET

弊社製品番号 Rubycon Part No.	630MMG224J
弊社仕様書図番 Drawing No.	SPB0872B
発行日 Issued Date	2020年3月31日 31-Mar-20

RoHS2 ((EU)2015/863) 対応品 RoHS2 ((EU)2015/863) Compliance Part
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RUBYCON CORPORATION
RUBYCON ELECTRONICS INC.
TECHNICAL DIVISION
FILM TECHNOLOGY GROUP

Approval	Design
Y. Matsuda	M. Sakamoto

1. Scope

This Standard specifies the rating, performance, dimension, etc. of metallized plastic film capacitors (characteristic N) for electronic equipment, which mainly employ metallized polyester film for capacitors of JIS C 2319.

2. Reference standards

This specification conforms to following standards.

JIS C 5101-1:1998

JIS C 5101-2:1998

3. Factory

Factory	Address	Country of origin
RUBYCON ELECTRONICS INC.	2932, Moto-Ojima, Matsukawa-Machi, Shimoina-Gun, Nagano Pref, 399-3303, JAPAN	JAPAN

4. Type Designation

The type designation shall be composed as shown in the following arrangement.

630	MMG	224	J
Rated voltage	Series	Nominal capacitance	Tolerance
630 · 630VDC		224 · 0.22 μ F	J · \pm 5%

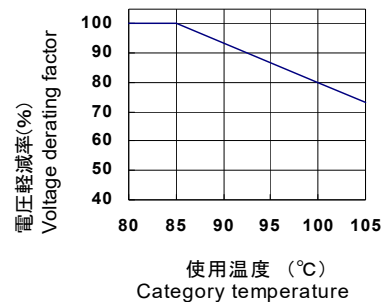
5. Specifications

Category Temperature Range	-40°C~+105°C(+85°C) ※
Rated Voltage	630VDC
Capacitance Tolerance	\pm 5% (J)
tan δ	0.01 max at 1kHz
Voltage Proof	Rated Voltage \times 160% 60s
Insulation Resistance	15,000M Ω min

※ Derate the voltage as shown in the table "6. Rated voltage derating by category temperature" when using the capacitor beyond +85°C.

6. Rated voltage derating by category temperature

Use of the capacitors at high temperature shortens the capacitor life due to thermal deterioration. Please derate the operating voltage in conformance with the graph.



7. Structure

Display the following item in the main body of the capacitor.

- Nominal capacitance: It is marked by symbol "224".
- Tolerance on capacitance: It is marked by symbol "J".
- Rated voltage: It is marked by symbol "2J".
- Manufacturer's abbreviation: It is marked with the symbol of "R".
- Series symbol: "G" means distinction symbol of series.
- Lot number of Production: It is marked by three figures.

Remark: The marking ink shall be black.

[Example of marking]

224J2J
R G001

[ロット構成 / Lot composition]

001

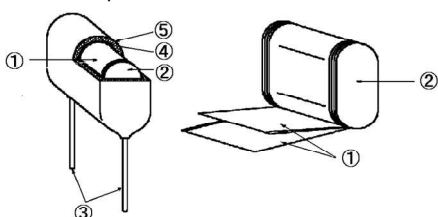
製造週 / weekly code (01-53)

西暦末尾 / The end number of Anno Domini

8. Marking on product

Cut model product

Construction element



No.	Items	Materials
①	Dielectric	Metallized polyester film
②	Metal Spray	Tin Alloy
③	Lead Wire	Annealed copper wire (1) Plating element: Sn+3Cu (2) The plating thickness: 12 \pm 2 μ m
④	Under Coat Resin	Resin of ultraviolet hardening type
⑤	Over Coat Resin	Epoxy resin (Powder)(Green) UL94V-0 approval

9. Performance

The test and measurement, unless otherwise specified, shall be carried out under the Standard conditions of normal temperature (temperature of 15 to 35 °C), normal humidity (relative humidity of 25 to 85%).

The capacitors shall satisfy the performance of the following table.

() means number of JIS C 5101-1

Item	Performance	Testing method (JIS C 5101-1)
1. Appearance	The lead wire shall be coated with solder completely. When tested with naked eye, there shall be no abnormality such as remarkable flaw or pin-hole on the appearance.	(4.4) The test on appearance shall be carried out by visual check.
2. Marking		
Marking	On the capacitor, the information shall be marked clearly by indelible way.	(4.4) The test on appearance shall be carried out by visual check.
Resistance to solvent	No remarkable abnormality on appearance, marking to be legible.	(4.31) The reagent shall be liquid of Isopropyl alcohol. The test sample of capacitor shall be completely immersed into the reagent for 30 ± 5 sec. At the temperature of 20 to 25 °C in a stand still state and taken out of the liquid. Then the appearance shall be examined.
3. Withstand voltage		
Between terminals	No abnormality. However, instant breakdown may appear.	(4.6) Apply 160% of the rated voltage for 1 min. The charging and discharging current shall not exceed 1A.
Between terminal and exterior cladding	No abnormality.	(4.6) Apply 200% of rated voltage for 1 to 5 sec.
4. Insulation resistance		
Between terminals	15,000MΩ min	(4.5) After applying 100 ± 15V for 60 ± 5sec and measure
Between terminal and exterior cladding	30,000MΩ min	
5. Capacitance	Within specified tolerances.	(4.7) Measuring frequency: 1 kHz ± 20%. Measuring voltage: 5Vrms and under.
6. Tan δ	0.01 max	(4.8) Measuring frequency: 1 kHz ± 20%. Measuring voltage: 5Vrms and under.
7. Strength of termination		
Tensile strength	No abnormality such as break or looseness of termination.	(4.13.1) The body of test sample of capacitor shall be fixed. Unless otherwise specified, the appropriate tensile force of 10N shall be gradually applied up to the specified value in the leading-out direction of termination, and it shall be maintained for 10 ± 1sec. (4.13.2) The test sample of capacitor shall be held in such a way that the regular lead-out axis of lead wire termination becomes vertical. Unless otherwise specified, the tensile force of 5N shall be applied from the end of termination. After the body is bent through 90 degrees, it shall be returned to the original position. This operation shall be conducted in 2 to 3 sec. Next the body of specimen shall be reversely bent through 90 degrees at the same rate and again returned to the original position.
Bending strength		
8. Vibration proof	No electrical short circuit or disconnection of no less than 0.5 ms shall appear in the element. Stable connecting condition of the element. No abnormality of the appearance after test.	(4.17) The range of vibration frequency shall be from 10 to 55 Hz, the peak to peak amplitude 1.5 mm, the rate of change in vibration frequency so selected that the frequency should increase from 10 to 55 Hz and return again to 10 Hz in approx. 1 min, and such vibration cycle shall be repeated. The test shall be conducted for 2 hrs in each direction of any given three directions perpendicular to each other, 6 hrs in total.

SPB0872B	Metallized Polyester Film Capacitors		630MMG	3 / 5
Item	Performance	Testing method (JIS C 5101-1)		
9. Resistance to soldering heat				
Appearance	No remarkable abnormality.	(4.14) ※ Not possible for Reflow Soldering. [Soldering bath method] Temperature of solder shall be $260 \pm 5^{\circ}\text{C}$. Dipping time shall be $10 \pm 1\text{sec}$. (Preheating: 120°C , 90 sec.) Immersion depth shall be up to 1.5 to 2.0 mm from the roots of the terminations. [Thickness of the heat shield board (Print board):1.6mm] [Soldering iron method] Temperature of iron shall be $350 \pm 10^{\circ}\text{C}$, applied duration within 3 sec as 1 time. Soldering iron point diameter: within 3mm. As for test condition of voltage proof, 160% of rated voltage shall be applied for 1 min.		
Withstand voltage proof (between terminals)	No abnormality.			
Insulation Resistance	15,000M Ω min			
tan δ	0.01 max			
Variation rate of capacitance	Within $\pm 2\%$ of the value before test.			
10. Solderability				
At least 95% of the circumferential surface dipped into solder shall be covered with new solder.		(4.15) Concentration of Rosin: 10% Temperature of Solder: $245 \pm 5^{\circ}\text{C}$. Immersion Time: $2 \pm 0.5\text{ sec}$. The terminations shall be immersed in the flux for 5 to 10 sec. at normal temperature. The depth of immersion shall be up to 1.5 to 2mm away from the root of the terminations by using a heat shielding plate. The operation of immersing and pulling out shall be continued at a rate of $25 \pm 2.5\text{ mm per sec}$. • Solder: Sn / 3.0Ag / 0.5Cu • Flux: Rosin: 10%		
11. Low temperature resistance				
Appearance	No remarkable abnormality.	(4.29) Test temperature shall be $-40 \pm 2^{\circ}\text{C}$. Test keep time shall be 500+24/0 hrs. After test, it shall be left in normal condition for 1 hr or more, and the performance is measured.		
Insulation resistance (between terminals)	15,000M Ω min			
Tan δ	0.01 max			
Variation rate of capacitance	Within $\pm 3\%$ of the value before test.			
12. Heat resistance				
Appearance	No remarkable abnormality.	(4.29) Test temperature shall be $+105 \pm 2^{\circ}\text{C}$. Test keep time shall be 500+24/0 hrs. After test, it shall be left in normal condition for 1 hr or more, and the performance is measured.		
Insulation resistance (between terminals)	15,000M Ω min			
Tan δ	0.01 max			
Variation rate of capacitance	Within $\pm 3\%$ of the value before test.			
13. Moisture resistance (steady)				
Appearance	No remarkable abnormality.	(4.22) The relative humidity shall be 90 to 95%. Test temperature shall be $40 \pm 2^{\circ}\text{C}$, and the test duration shall be 500+24/0 hrs. After test, it shall be left in normal condition for 16 hrs, and the performance is measured. As for test condition of voltage proof, 130% of rated voltage shall be applied for 1 min.		
Withstand voltage (between terminals)	No abnormality.			
Insulation resistance	4,500M Ω min			
tan δ	0.01 max			
Variation rate of capacitance	Within $\pm 5\%$ of the value before test.			
14. Load for moisture resistance				
Appearance	No remarkable abnormality.	(4.22) The relative humidity shall be 90 to 95 %. Test temperature shall be $40 \pm 2^{\circ}\text{C}$, and the test duration shall be 500+24/0 hrs, and apply the rated voltage. The application shall be made through serial resistor of 20 to 1000 Ω per 1V. After test, it shall be left in normal condition for 16 hrs, and the performance is measured. As for test condition of voltage proof, 130% of rated voltage shall be applied for 1 min.		
Withstand voltage (between terminals)	No abnormality.			
Insulation resistance	4,500M Ω min			
tan δ	0.01 max			
Variation rate of capacitance	Within $\pm 10\%$ of the value before test.			
15. Load for higher temperature				
Appearance	No remarkable abnormality.	(4.23) DC voltage of 125% of rated voltage shall be applied to the capacitor for 1000+48/0 hrs through serial resistor of 20 to 1000 Ω per 1V at the test temperature of $85 \pm 2^{\circ}\text{C}$.		
Insulation resistance	7,500M Ω min			
tan δ	0.01 max			
Variation rate of capacitance	Within $\pm 8\%$ of the value before test.			
RUBYCON ELECTRONICS INC.				

Item

Performance

Testing method (JIS C 5101-1)

16. Heat cycle

Appearance	No remarkable abnormality.	(4.16) Leaving the samples in $-40 \pm 3^{\circ}\text{C}$, 30 ± 3 min, 3 min in normal condition, $105 \pm 2^{\circ}\text{C}$, 30 ± 3 min and 3 min in normal condition. This operation shall be counted as 1 cycle, the test shall be conducted 100cycles. After test, it shall be left in normal condition for 1 hr or more, and the performance is measured.
Insulation resistance	7,500M Ω min	
tan δ	0.01 max	
Variation rate of capacitance	Within ± 5 % of the value before test.	

17. Charge and discharge

Variation rate of capacitance	Within $\pm 5\%$ of the value before test.	(4.27) Apply the pulse current I_{o-p} (A) calculated from multiply du/dt (V/s) below and C (μF), 60Hz, 10000 times.					
tan δ	0.01 max						
Insulation resistance	7,500M Ω min						
<table border="1"> <thead> <tr> <th>Rated voltage</th> <th>Lead pitch (mm)</th> </tr> </thead> <tbody> <tr> <td>630V</td> <td>10.0</td> </tr> <tr> <td></td> <td>192</td> </tr> </tbody> </table>			Rated voltage	Lead pitch (mm)	630V	10.0	
Rated voltage	Lead pitch (mm)						
630V	10.0						
	192						

18. Cleaning resistance

After cleaning, No deterioration of performance of characteristic, appearance, size, environment resistance, life etc.

(Cleaning solvents)
 PANALPHA ST-100S Cleaning temp. : 40°C
 PANALPHA ST-100SX

(Cleaning method and condition)
 1. Ultrasonic cleaning : 1 min.
 [Ultrasonic power: 28kHz, 500W, Bath capacity... 38 liter.]
 2. Immersion cleaning : 1 min.
 3. Steam cleaning : 1 min.

10. Conditions for using

- Permissible current by frequency / Permissible voltage by frequency: Please refer to the attached graph.
- Rated voltage
Rated voltage is the maximum peak voltage (sum of DC and peak voltage) and no more than the value specified in detail specification which may be applied to a capacitor continuously at its maximum rated temperature.

11. Cautions for proper use information

- Self temperature rise of the capacitor shall be within 15°C .
- The direct sunlight may change the color of exterior.
- Please don't clean by acetone.

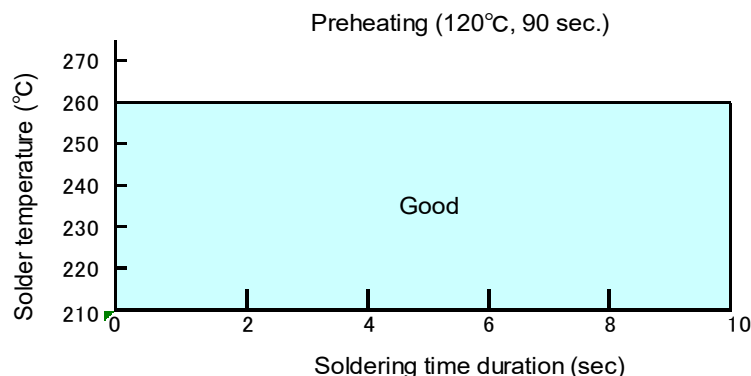
12. Storage Condition

- A storage needs to be kept indoors at less than 30°C and relative humidity of under 75% without any sudden temperature changes, direct sunlights and corrosive gas around.
- Storage time limit is within 1 year from shipped date.

13. Soldering Operation

When the state of the high temperature continues for a long time, it is likely to become defective of a short, defective of resistance pressure, and defective of exterior crack, etc. for the deterioration of the film.

Please note the following thing when you do the soldering work.



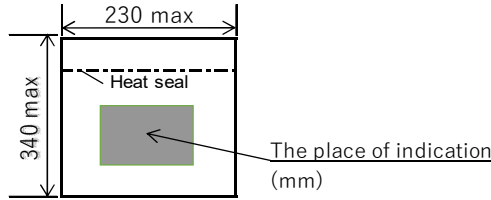
When using soldering iron, temperature of iron shall be 350°C , applied duration within 3sec as 1time.
 Soldering iron point diameter: within 3 mm.

14. Packaging specification

14-1. Marking position on the box and Inner bag, Carton box dimension

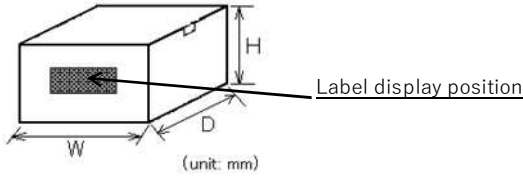
(1) Packaging of bag: The plastic bag shall be marked with the following items or slip which indicates items.

①	Product Name
②	Lot No.
③	Quantity
④	Company name
⑤	Country of Origin
⑥	Bagging Date



(2) Quantity and size

Inner carton (Cardboard)



Carton box dimensions
W × D × H (max)
235 × 270 × 160

(3) Packaging of carton: The barcode label of inner carton shall be marked with below items.

[Label design of packaging box]

a) (P)	g) LFC	h) RoHS Compliance	m)
b)	i) D:200101 S : Y00Q5 F : S-600 I : 000	j)	
c) (Q) 1,000 PCS		k) M N 0 0 0 1	
d)		l) RUBYCON CORPORATION	
e) 630 MMG 224 J			
f) (630 MMG 224 J- -)			

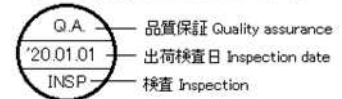
工程印字の構成

About Lot number of Production (8 digits)

M N 0001

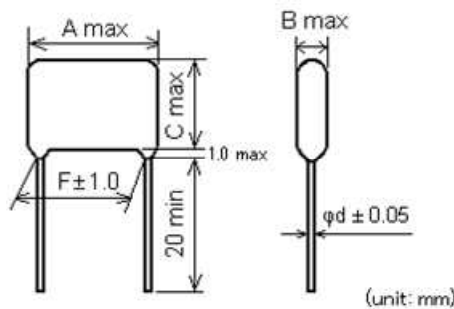
- 追番 / Continuously number
- 製造月 / Manufacturing month symbol
- 固定 / Fixation

[QA印の内容 content of Q.A. stamp]



a) Your Part No.	h) RoHS Compliance
b) Barcode of Your Part No.	i) management item
c) Quantity	j) Barcode of management item
d) Barcode of Quantity	k) Lot number of Production
e) Rubycon Part No.	l) Company name
f) Rubycon Part No.	m) Inspection stamp
g) Lead Free Compliance	

15. Dimensions / Packaging Quantity

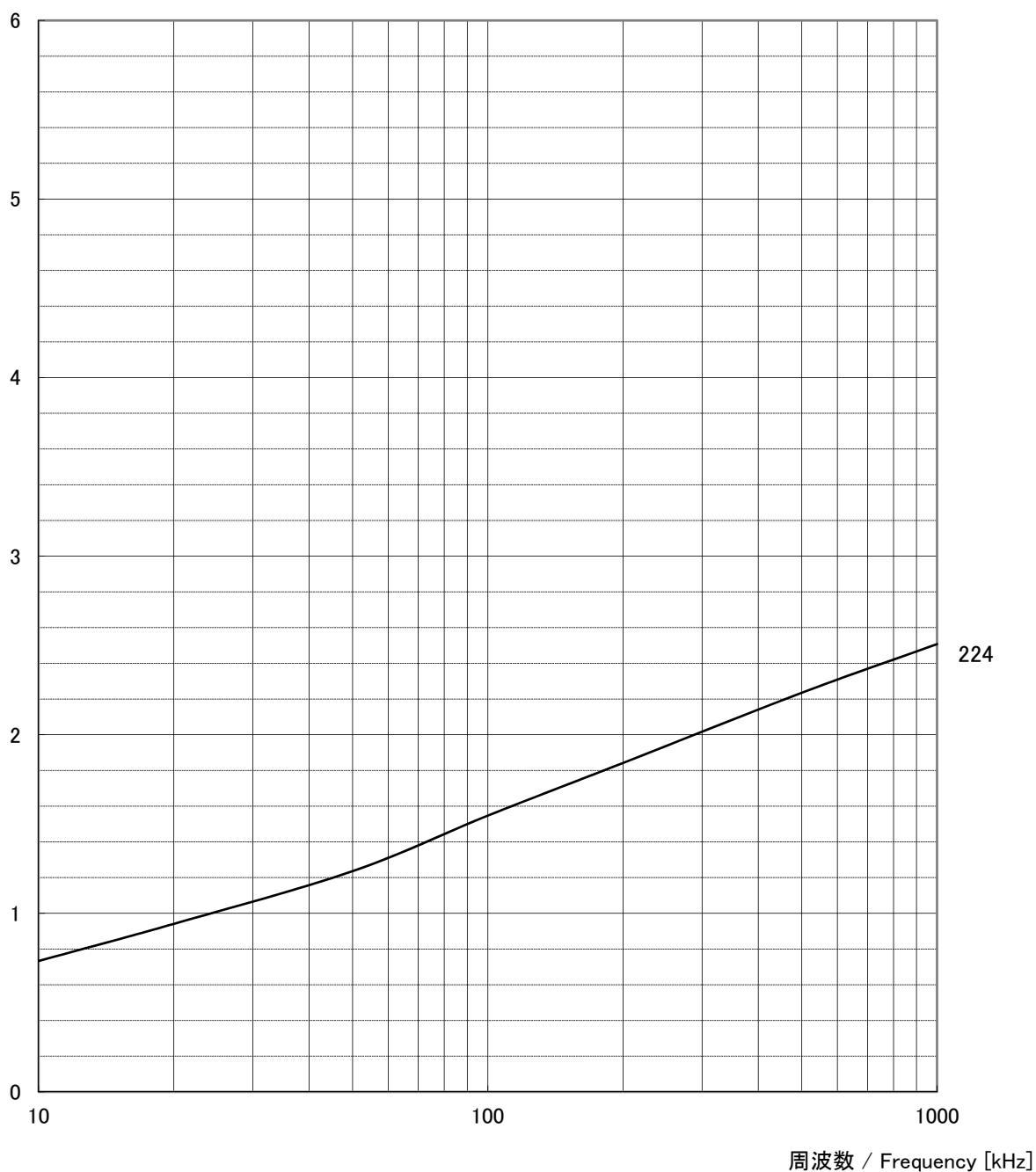


Part No.	Rated Voltage	Cap (μF)	Size (mm)					Packaging Quantity (pcs)	
			A	B	C	F	d	Bag	Carton
630MMG224J	630DC	0.22	13.0	10.5	16.5	10.0	0.6	100	1,000

周波数に対する許容電流
PERMISSIBLE CURRENT FOR FREQUENCY

630MMG224
定格電圧: DC630V / 250Vrms (at 60Hz) 使用温度範囲: -40 ~ +85°C (105°C) (コンデンサ壁面)
Rated voltage : DC630V / 250Vrms (at 60Hz Sin wave) Category temp. range : -40 to +85°C (105°C) (Capacitor surface)

許容電流値 / Permissible current [Arms]



周波数に対する許容電圧
PERMISSIBLE VOLTAGE FOR FREQUENCY

630MMG224
定格電圧: DC630V / 250Vrms (at 60Hz) 使用温度範囲: -40 ~ +85°C (105°C) (コンデンサ壁面)
Rated voltage : DC630V / 250Vrms (at 60Hz Sin wave) Category temp. range : -40 to +85°C (105°C) (Capacitor surface)

注意事項 DCバイアス分を含む場合、直流電圧と交流電圧の和の尖頭値を直流定格電圧以下にして下さい。
 更に、交流電圧は下記グラフの値を超えないようにご使用下さい。

Notice Where DC bias voltage is included, DC rated voltage minus DC bias voltage becomes the permissible AC voltage.
 Please use it at the AC voltage value within the range shown in the graph below.

許容電圧値 / Permissible voltage [Vrms]

