

# 承认书 DATA SHEET

Customer name:		
BERYL SERIES:	RC	TYPE: RADIAL
DESCRIPTION:	470uF/25V Φ8	3*14
Apply date :	2021-03-11	

BERYL			CUSTOMER	
P/N:RC025M471LO8*14TH-2A	1Et	P/N:		
PREPARED	APPROVAL	PREPARED	CHECKED	APPROVAL
董桂茹	邹小云			

After approved, please sign back 1 Approval Sheet before order. If not, we will treat it as tacitly acknowledged and accepted our relative standard and technical index.

# Zhao Qing Beryl Electronic Technology Co., Ltd.

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# Revise record

NO.	Date	Revise reason	Revise content	Prepared
01	2020.12.14	First issue	First issue	杨静
02	2021.03.11		增加测试页	董桂茹

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### 1, Application

This specification applies to Aluminum electrolytic capacitor (foil type) used in electronic equipment. Designed capacitor's quality meets IEC 60384.

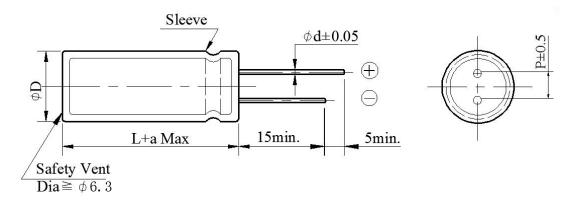
# 2. Table of specification and characteristics

Series	Cap(uF) 120Hz/20°C	WV(V) Size (		Size (mm)		_		-		_		Life(hours)
	120112/20		D	L			1 ofer unce					
RC	470	25	8	14	-40~+1	.05	$\pm 20\%$	2000				
	(%)(MAX) 0Hz/20°C	Lc(μA)(I 2min/2					RC (mArms) MAX)105°C /100KHz	Surge voltage(V)				
	€14	€117	7.5	≤0.	≤0.13		≤630	29				

Other: /

#### 3. Product Dimensions

Type

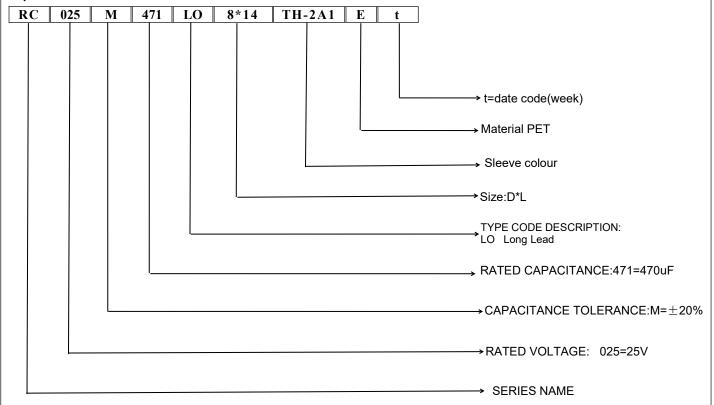


ФD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Фd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8
α	(L< 2	$0) \pm 1.5$	(L≥20) ± 2	2.0			

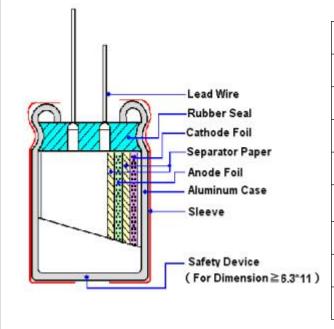
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### 4. Part Number



### 5, Construction

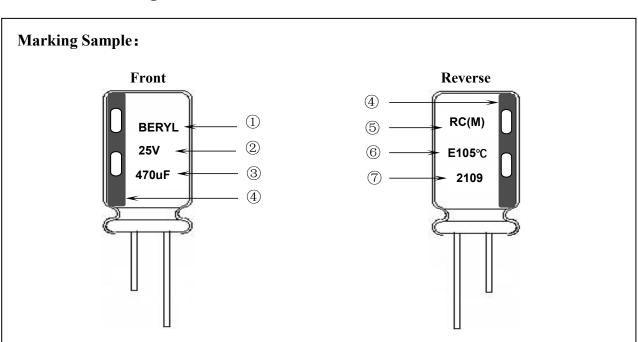


Material name	Composition	Supplier name
Lead	Al and (Fe+Cu+Sn)	NM、JX
Rubber	EPT / IIR	LHX、LA、TH、LM2
Case	Aluminum	OX、YJ、HL、LY2
Paper	Wood / Fibrous plant materials	KE、DF
Anode foil	$Al + Al_2O_3$	HY1、HY2、HF、HY3、 LD、FQ
Cathode foil	Aluminum	GY、LY1
Electrolyte	Glycol + Water +Ammonium salt	XZB、LM1、JZ2、FS
Sleeve PET		YL, CY

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### 6, Product Marking



#### **Marking Details:**

Capacitor shall be marked the following items:

- 1) Trademark (BERYL)
- 2) working voltage(25V)
- 3) Nominal capacitance(470uF)
- 4) Cathode marked
- 5) Series symbol & Nominal capacitance tolerance (M: -20% ~ +20%)
- 6) Sleeve material(E: PET)

Maximum operating temperature(105°C)

7) Date code (2109)

21: Manufactured year 2021

Code	20	21	22	23	24	25	26	27	
Year	2020	2021	2022	2023	2024	2025	2026	2027	

09: Manufactured week (01, 02, 03, 04.....51, 52)

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#### 7. Characteristics

#### **Standard atmospheric conditions**

Unless other specified, the standard range of atmospheric conditions for making measurements and tests is 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 :  $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 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 is  $(6.3\sim450WV)$  -40°C to +105°C.

#### **Table**

	ITEM	PERFORMANCE
1	Nominal capacitance (Tolerance)	<condition> Measuring Frequency: 120Hz±12Hz Measuring Voltage: Not more than 0.5Vrms +1.5~2.0V.DC Measuring Temperature: 20±2°C <criteria> Shall be within the specified capacitance tolerance.</criteria></condition>
2	Leakage current	<ul> <li>Condition&gt; Connecting the capacitor with a protective resistor (1kΩ±10Ω) in series for 2 minutes, and then, measure leakage current.</li> <li>Criteria&gt; I: Leakage current (μA) I (μA) ≤0.01CVor 3 (μA) whichever is greater, measurement circuit refer to right drawing.</li> <li>C: Capacitance (μF)</li> <li>V: Rated DC working voltage (V)</li> </ul>
3	Dissipation factor	<b>Condition&gt;</b> Nominal capacitance, for measuring frequency, voltage and temperature. <b>Criteria&gt;</b> Must be within the parameters (See page 3)

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	ITEM			PERFORMA	NCE		
4	Impedance	<b>Condition&gt;</b> Measuring frequency:100kHz; Measuring temperature:20±2°C Measuring point: 2mm max. from the surface of a sealing rubber on the lead wire. <b>Criteria&gt;</b> (20°C) Must be within the parameters (See page 3)					
5	Load life test	Condition> According to IEC60384 Maximum operating tercurrent for Rated life + exceed the rated working recovering time at atm  Criteria> The characteristic shall Leakage current Capacitance Change Dissipation Factor Appearance	mperature ±2 48/0hours. (** ng voltage) Tospheric condes  meet the foll  Not more  Not more	°C with DC bi The sum of DC Then the produ ditions. The re owing require re than the spe 20% of initial e than 200% of	as voltage plucand ripple poor should be to sult should mements.  cified value.  value.	s the rated ri eak voltage s ested after 16 eet the follow value.	pple hall not hours
6	Shelf life test	Appearance   There shall be no leakage of electrolyte.				s shall be removed	
7	Maximum permissible (ripple current, temperature coefficient)	Condition> The maximum permissible applied at maximum operation Table-3 The combined value of I voltage and shall not reverse Frequency Multipliers:  Freq (Hz) Cap. (μF) 470  Temperature Coefficients  Temperature (°C) Factor	D.C voltage a verse voltage.  120  0.60	and the peak A  1k  0.80			

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# **ALUMINUM ELECTROLYTIC CAPACITORS**

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	ITEM				PER	FORMAN	CE				
8	Terminal strength	Fixed the consecution of the con	ength of terminapacitor, application, application, application, application, and then better of lead with mm and less 1.6~0.8 mm	lied for th of to lied for ent it for	erminals. ce to bent or 90° to it  Tensile (1)  10 (	the termin s original perforce N (o.51) (1.02)	al (1~4 mm position with Bending 2.5	from the first 12~3 force N (0.25) (0.51)	he rubber) seconds.	for 90°	within
9	Temperatur e characterist ics	Criteria> <ul> <li>a. At +105</li> <li>Dissipat</li> <li>The leak</li> <li>b. In step 5</li> <li>Dissipat</li> <li>The leak</li> </ul>	(-40  2  10  2  ce, DF, and in the compact of the c	0±2 0±2 0±2 05±2 0±2 mpedan ce measure measure measure in all not (Z) rati 10	sured at +; ithin the l d shall no red at +20 ithin the l	Time to re Time to re Time to re Time to re e measured 20°C shall mit of Iten t more than °C shall be mit of Iten n the specie	be within ±10 times of within ±10 times of 7.3 fied value.	al equilial equilial equilial equilial equilial equilial equilial equilial equilial equiliance of the specific equiliance of the specific equiliance of the specific equilibrium equilibri	ibrium ibrium ibrium ibrium its original ecified valus original v	ie. alue.	
10	Surge test	series for 30±: 1000 times. The before measure CR: Nomina <criteria> Leakage cu Capacitance Dissipation Appearance  Attention: This test sin</criteria>	hen the capac rement al Capacitance arrent e Change	very 5: itors sh e (μF)  Not With Not The:	±0.5 minu all be left more than in ±15% more than re shall be	tes at 15~3 under norr the specif of initial value the specif no leakage	5°C.Proced nal humidit ied value. ied value. ied value. e of electrol	ure sha y for 1- yte.	ell be repeat	eed	



	ITEM		PERFORMA	NCE		
		<condition> Temperature cycle: According to IEC60384-4 N according as below:</condition>	o.4.7 methods, capacito	r shall be placed in an oven	, the condition	
	Change of temperature test	Те	mperature	Time		
		(1) +20°C		3 Minutes		
		(2) Rated low tempera	ture (- 40°C) (-25°C)	30±2 Minutes		
11		(3) Rated high tempera	ature (+105°C)	30±2 Minutes		
		(1) to (3) =1 cycle, tota	al 5 cycle			
		<a href="Criteria">Criteria&gt; The characteristic shall meet</a>	the following requirem	ent		
		Leakage current	Not more than the s			
		Dissipation Factor	Not more than the s	specified value.		
		Appearance	There shall be no le	There shall be no leakage of electrolyte.		
12	Damp heat test	Condition> Humidity test: According to IEC60384-4 N be exposed for 500±8 hours 40±2°C, the characteristic ch  Criteria> Leakage current  Capacitance Change  Dissipation Factor  Appearance	in an atmosphere of 90- nange shall meet the foll  Not more than the spe  Within ±10% of initia	ecified value.  of the specified value.		
13	Solderabilit y test	Dipping speed : 2	45 ±5°C mm 5±2.5mm/s =0.5 <b>s</b> Less than 3s	oditions:  % of the surface being		

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	ITEM	PERFORMANCE
		Condition> The following conditions shall be applied for 2 hours in each 3 mutually perpendicular directions. Vibration frequency range: 10Hz ~ 55Hz each 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.
14	4 Vibration test	4mm or less Within 30°
		<criteria> To be soldered</criteria>
		After the test, the following items shall be tested:    No intermittent contacts, open or short circuiting.
		No damage of tab terminals or electrodes.  No mechanical damage in terminal. No leakage of electrolyte or swelling of the case. The markings shall be legible.
	Resistance	<b>Condition&gt;</b> Terminals of the capacitor shall be immersed into solder bath at 260±5°Cfor10±1seconds or400±10°Cfor3 <sup>-0</sup> seconds to 1.5~2.0 mm from the body of capacitor. Then the capacitor shall be left under the normal temperature and normal humidity for 1~2 hours before measurement. <b>Criteria&gt;</b>
15	to solder heat	Leakage current Not more than the specified value.
	test	Capacitance Change Within ±5% of initial value.
		Dissipation Factor Not more than the specified value.
		Appearance There shall be no leakage of electrolyte.
16	Vent test	Condition> The following test only apply to those products with vent products at diameter ≥∅6.3 with vent. D.C. test The capacitor is connected with its polarity reversed to a DC power source. Then a current selected from Table 2 is applied.  Current (A)
		22.4 or less 1 <criteria> The vent shall operate with no dangerous conditions such as flames or dispersion of pieces of the capacitor and/or case.</criteria>

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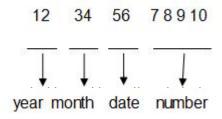


### 8. Packing Information

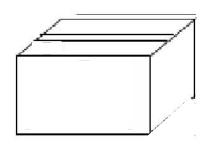
Packing Label Marked (the following items shall be marked on the label) (Inside box or bag)

(1)Clint order number (2)Client part number (3)Beryl part number (4)Capacitance (5)Voltage (6)Dimension (7)Packaging quantity (8)Capacitance tolerance (9) QC Marking (10) Lot number (11) Series

#### LOT Number:



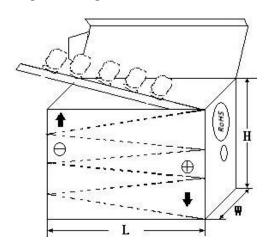
#### 1) Bulk Packing:



#### 3) Outer box



#### 2) Taped Packing:



#### 4) Outer box label:

BERYL	Zhao Qin	g Beryl Ele Ltd.	ctronic	Technology Co.,
C.S.R:				- 110 115
C.S.R P/O:			ROHS HE	
C.S.R P/N	:0			
S.P.R P/N:				QC
SPEC:				
QTY:	PCS	TOL:	%	
L/N:		S.P.R:		8

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#### 9. Prohibition to Use Environment- related Substances

We are hereby to certify the followings:

Our company hereby warrants and guarantees that all or part of products, including, but not limited to, the peripherals, accessories or package, delivered to your company (including your subsidiaries and affiliated companies) directly or indirectly by our company are free from any of the substances listed below.

The latest version of <Substances Prohibited as per RoHS or <Sony-SS-00259>

	·			
	Cadmium and cadmium compounds			
Accord with	Lead and lead compounds			
heavy metal	Mercury and mercury compounds			
	Hexavalent chromium compounds			
	Polychlorinated biphenyls (PCB)			
Organia ablarin	Polychlorinated naphthalenes (PCN)			
Organic chlorin compounds	Polychlorinated terphenyls (PCT)			
	Chlorinated paraffins (CP)			
	Other chlorinated organic compounds			
Organic	Polybrominated biphenyls (PBB)			
bromine	Polybrominated diphenylethers (PBDE)			
compounds	Other brominated organic compounds			
Tributyltin compo	Tributyltin compounds			
Triphenyltin compounds				
Asbestos				
Specific azo compounds				
Formaldehyde				
Polyvinyl chloride (PVC) and PVC blends				
F、Cl、Br、I				
REACH				

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# Test Report

Series	RC	_ Spec.	470uF/25V	Size(mm)	8*14
Cap tolerance	±20%	Work _ temperature	105°C	Color of Tube	Dark green
Test date	2021-03-02	Test humidity	36%	Test temperature	23.2°C

Items	Cap (μF)	D.F (%)	L.C (μA)	ESR (Ω)	Appearance
NO.	376~564 (120Hz)	≤14 (120Hz)	≤117.5 (2min)	≤0.13 (100KHz)	ОК
1	441.0	4.75	9	0.0700	OK
2	465.7	4.81	8	0.0677	OK
3	441.5	4.90	10	0.0674	ОК
4	461.0	5.09	11	0.0670	OK
5	462.7	5.17	9	0.0684	OK
6	467.4	5.17	11	0.0681	OK
7	441.0	5.67	11	0.0674	OK
8	451.0	4.70	10	0.0681	OK
9	461.7	4.70	10	0.0680	OK
10	451.0	4.90	10	0.0694	OK
Opinion			,	•	

Approve: 杨静Audit: 董桂茹Test: 赵凯群

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NEVH1.0M250AB NEVH3.3M250BB NEVH3.3M450CC KME50VB100M-8X11.5 SG220M1CSA-0407 ES5107M016AE1DA

ESMG160ETD102MJ16S ESX472M16B 227RZS050M 476CKH100MSA 477RZS050M B41793A9108Q1 UVX1V101KPA1FA

UVX1V222MHA1CA KME25VB100M-6.3X11 VTL100S10 VTL470S10 VTL470S16A 511D336M250EK5D 052687X ECE-A1CF471

NRE-S560M16V6.3X7TBSTF RGA221M1CTA-0611G ERZA630VHN182UP54N UPL1A331MPH NEV1000M6.3DE NEV100M16CB

NEV100M50DD-BULK NEV2200M16FF NEV220M50EE NEV2.2M50AA NEV330M63EF NEV4700M35HI NEV4.7M100BA

NEV47M16BA NEV47M50CB-BULK NEVH1.0M350AB