

# 规格书 SPECIFICATION SHEET

Customer name:			
BERYL SERIES:	RF	TYPE:	RADIAL
DESCRIPTION:	1000uF/16V	Ф10*16	
Apply date :	2022-04-13		

BERYL			CUSTOME	2
P/N:RF016M102LO10*16TA-1A	A1Et	P/N:		
PREPARED CHECKED	APPROVAL	PREPARED	CHECKED	APPROVAL
董桂茹工程部	张业维			

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	2022.04.13	First issue	First issue	董桂茹

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1650

18

# 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

≤160

Series	Cap(uF) 120Hz/20°C	WV(V)	Size	(mm)	Temperature (°C)		-		-		-		-				-		Capacitance Tolerance	Life(hours) @105(°C)
	120112/20 C		D	L			( )		1 of crance	(a)103( C)										
RF	1000	16	10	16	-40~+10	05	±20%	5000												
` ′	)(MAX) v/20°C	LC(µA)(N 2min/20	· · · · · · · · · · · · · · · · · · ·		2)(MAX) Hz/25°C	RC (mA rms) (MAX)105°C/100KHz		Surge voltage(V)												

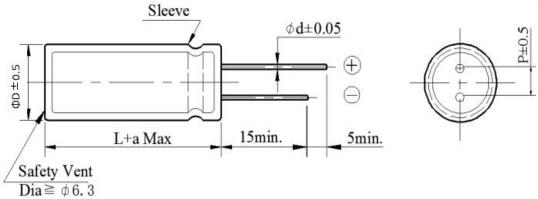
≤0.08

Other: /

#### 3. Product Dimensions

Type

≤16

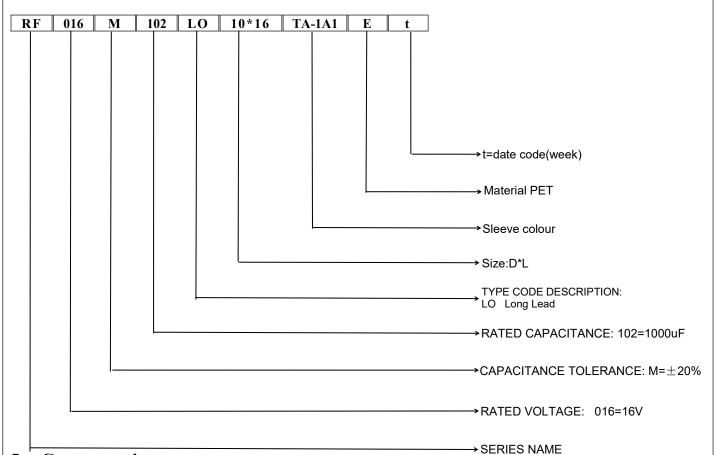


ФD	5	6.3	8	10	13	16	18	22
P	2	2.5	3.5	5	5	7.5	7.5	10
Фd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8	0.8
а			(L< 20)	± 1.5	(L≥2	$0) \pm 2.0$	_	

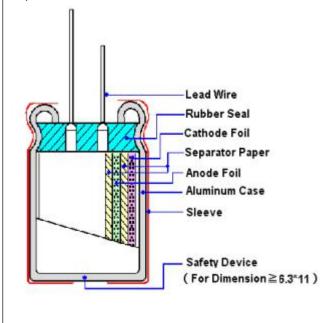
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#### 4. Part Number



# 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

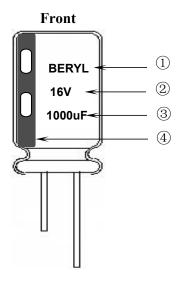
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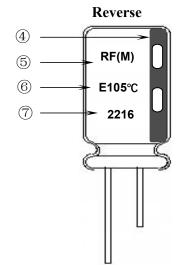
# **BERYL** 绿宝石

### **ALUMINUM ELECTROLYTIC CAPACITORS**

# 6. Product Marking

# Marking Sample:





#### **Marking Details:**

Capacitor shall be marked the following items:

- 1) Trademark (BERYL)
- 2) working voltage(16V)
- 3) Nominal capacitance(1000uF)
- 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 (2216)

22: Manufactured year 2022

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

16: Manufactured week (01, 02, 03, 04......52, 53)

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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  $(6.3\sim100\text{WV})$  -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	Condition>     Connecting the capacitor with a protective resistor (1kΩ±10Ω) in series for 2 minutes, and then, measure leakage current. Criteria>     I: Leakage current (μA)     I (μA) ≤0.01CVor 3 (μA) whichever is greater, measurement circuit refer to right drawing.     C: Capacitance (μF)     V: Rated DC working voltage (V)
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		1	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 ter current for Rated life +4 exceed the rated workir recovering time at atmost Criteria> The characteristic shall Leakage current Capacitance Change Dissipation Factor Appearance	mperature ±2' 48/0hours. (7 ng voltage) Tospheric cond meet the foll Not more Within ± Not more	C with DC be The sum of DC hen the productions. The recovering requires than the special than 200% of the sum	ias voltage pluct and ripple pluct should be to esult should mements.	us the rated rigeak voltage sleested after 16 eet the follow	pple nall not hours		
6	Shelf life test	<condition> The capacitors are then stemperature±2°C for from the test chambed leakage current  <criteria> The characteristic shall maked the characteristi</criteria></condition>	neet the follow Not more t Within ±25	ours. Following wed to stabilize wing requirements and 200% of the following than 200% of the following the follow	ng this period, zed at room te nents.	the capacitor emperature for value.	s shall be removed		
7	Maximum permissible (ripple current, temperature coefficient)	Condition> The maximum permissib applied at maximum ope Table-3 The combined value of I voltage and shall not rev Frequency Multipliers:  Freq (Hz)  Cap. (μF)  1000  Temperature Coefficient:  Temperature (°C)  Factor	D.C voltage a erse voltage.  120  0.60	nd the peak A  1k  0.87					

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	ITEM				PER	FORMAN	NCE			
8	Terminal strength	Tensile strength of terminals Fixed the capacitor, applied force to the terminal in lead out direction for 30+5-0 seconds. Bending strength of terminals.  Fixed the capacitor, applied force to bent the terminal (1~4 mm from the rubber) for 9 2~3 seconds, and then bent it for 90° to its original position within 2~3 seconds.    Diameter of lead wire						er) for 90° within		
9	Temperature characteristics	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 ir  °C, capacitance ion factor shat age current manager in factor shat age current shat age curren	0±2 -25±3 0±2 05±2 0±2 mpedance ce measured measured measured ll be with	e shall b red at +; nin the li shall no d at +20 nin the li nore tha shall not	Time to rather t	be within = n 7.3 n 10 times e within ±1 n 7.3 fied value.	al equilit al equilit al equilit al equilit al equilit =25% of of its spe 0% of its	brium brium brium brium its origin	alue. I value.
10	Surge test	series for 30± 1000 times. To before measure CR: Nomina <criteria> Leakage cu Capacitance Dissipation Appearance  Attention: This test sin</criteria>	hen the capaci rement al Capacitance arrent e Change a Factor	very 5±0 itors shal e (μF)  Not m Within Not m There	ore than a ±15% ore than shall be	ttes at 15~3 under nor	ried value. ried value. ried value. ried value. ried value.	dure shal ty for 1-2	l be repe 2 hours	/

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	ITEM		PERFORMAN	NCE
		<condition> Temperature cycle: According to IEC60384-4 No according as below:</condition>	o.4.7 methods, capacito	r shall be placed in an oven, the condition
		Ter	mperature	Time
		(1) +20°C		3 Minutes
	Change of	(2) Rated low temperat	ure (- 40°C) (-25°C)	30±2 Minutes
11	temperature test	(3) Rated high tempera	ture (+105°C)	30±2 Minutes
		(1) to $(3) = 1$ cycle, tota	l 5 cycle	
		Criteria> The characteristic shall meet  Leakage current	the following requirement Not more than the s	
		Dissipation Factor	Not more than the s	specified value.
		Appearance	There shall be no le	akage of electrolyte.
12	Damp heat test	Condition> Humidity test: According to IEC60384-4 No be exposed for 500±8 hours if 40±2°C, the characteristic check Criteria>  Leakage current  Capacitance Change  Dissipation Factor  Appearance	n an atmosphere of 90~ ange shall meet the following that the special within ±10% of initial shall be shall meet the special within ±10% of initial shall be	295%R H .at owing requirement. ecified value. al value. of the specified value.
13	Solderability test	Dipping depth : 2r Dipping speed : 25	5.5 ±5°C mm 5±2.5mm/s 0.5 <b>s</b> Less than 3s	of the surface being

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	ITEM	PERFORMANCE						
14	Vibration test	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 must be fixed in place with a bracket. Within 30° After the test, the following items shall be tested:						
		Inner construction  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 to	<b>Condition&gt;</b> Terminals of the capacitor shall be immersed into solder bath at 260±5°Cfor10±1sect or400±10°Cfor3 -0 seconds to 1.5~2.0 mm from the body of capacitor. Then the capa shall be left under the normal temperature and normal humidity for 1~2 hours before measurement. <b>Criteria&gt;</b>	citor					
15	solder heat test							
		Capacitance Change Within ±5% of initial value.  Dissipation Factor Not more than the specified value.						
		Appearance There shall be no leakage of electrolyte.						
		Condition> The following test only apply to those products with vent products at diameter ≥∅6.3 vent. D.C. test	3 with					
16	Vent test	The capacitor is connected with its polarity reversed to a DC power source. Then a selected from Table 2 is applied. <table 2=""></table>	current					
		Diameter (mm) DC Current (A)  22.4 or less 1						
	22.4 or less   1   Criteria>  The vent shall operate with no dangerous conditions such as flames or dispersion of the capacitor and/or case.							

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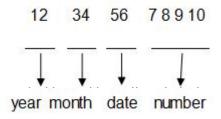


# 8. Packing Information

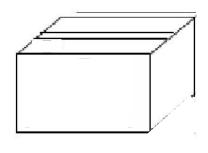
Packing Label Marked (the following items shall be marked on the label) (Inside box or bag)

(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:



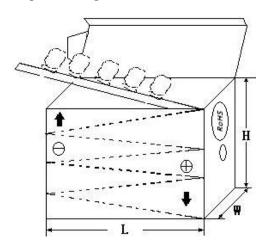
#### 1) Bulk Packing:



#### 3) Outer box



#### 2) Taped Packing:



#### 4) Outer box label:

C.S.R:				- 110 115
C.S.R P/O:				ROHS HE
C.S.R P/N:				
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>

	1 Substances 1 formatica as per Rolls of Solly-55-00257			
	Cadmium and cadmium compounds			
Accord with	Lead and lead compounds			
heavy metal	Mercury and mercury compounds			
	Hexavalent chromium compounds			
Organic chlorin compounds	Polychlorinated biphenyls (PCB)			
	Polychlorinated naphthalenes (PCN)			
	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	ounds			
Triphenyltin compounds				
Asbestos				
Specific azo comp	pounds			
Formaldehyde				
Polyvinyl chloride	e (PVC) and PVC blends			
F、Cl、Br、I				
REACH				

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NEV4700M50HB NEV.47M100AA NEVH1.0M250AB NEVH3.3M250BB NEVH3.3M450CC KM4700/16 KME50VB100M-8X11.5

SG220M1CSA-0407 ES5107M016AE1DA ESMG160ETD102MJ16S ESX472M16B 227RZS050M 476CKH100MSA 477RZS050M

UVX1V101KPA1FA UVX1V222MHA1CA KME25VB100M-6.3X11 VTL100S10 VTL470S10 VTL470S16A 511D336M250EK5D

052687X ECE-A1CF471 NRE-S560M16V6.3X7TBSTF RGA221M1CTA-0611G ERZA630VHN182UP54N UPL1A331MPH

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NEV2.2M50AA NEV330M63EF NEV4700M35HI NEV4.7M100BA