

规格书 SPECIFICATION SHEET

Customer name:			
BERYL SERIES:	RC	TYPE:	RADIAL
DESCRIPTION:	47uF/450V	Ф16*26	
Apply date :	2022-04-11		

BERYL			CUSTOMER	1
P/N:RC450M470LO16*26TH-2A	P/N:			
PREPARED	APPROVAL	PREPARED	CHECKED	APPROVAL
董桂茹 廖梅君				
2020019588				

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.

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Sheet No.: 20220411 Page : 1/12



Revise record

NO.	Date	Revise reason	Revise content	Prepared
01	2022.04.11	First issue	First issue	董桂茹

Sheet No.: 20220411 Page : 2 / 12



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

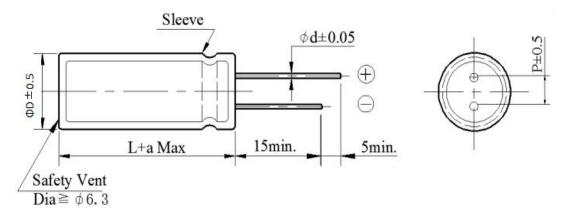
Series	Cap(uF) 120Hz/20°C	WV(V)	Size(mm)		Size(mm)		Temperature	Capacitance	Life(hours)
	120HZ/20°C		D	L	(°C)	Tolerance	@105(℃)		
RC	47	450	16	26	-40~ +105	±20%	5000		

DF (%)(MAX) 120Hz/20°C	LC(μA)(MAX) 2min/20°C	ESR(Ω)(MAX) 100KHz/25°C	RC (mA rms) (MAX)105°C/100KHz	Surge voltage(V)
≤20	≤433	<u>-</u>	1120	495

Other: /

3. Product Dimensions

Type

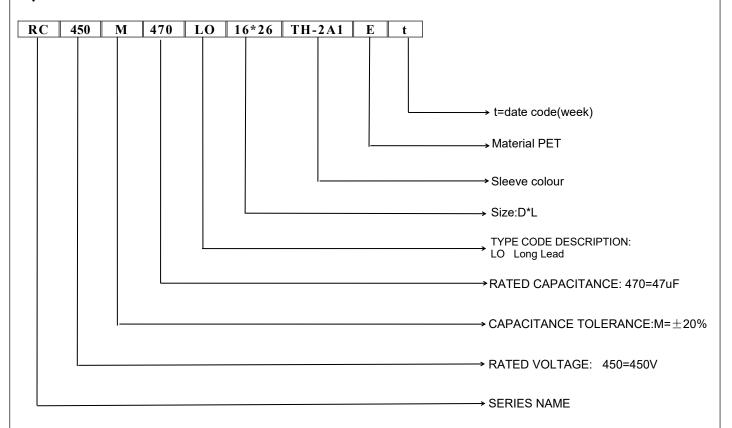


ФЪ	5	6.3	8	10	13	16	18	22
P	2	2.5	3.5	5	5	7.5	7.5	10
Фd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8	0.8
a			(L< 20) ± 1.5	(L≥20	$(1)) \pm 2.0$		

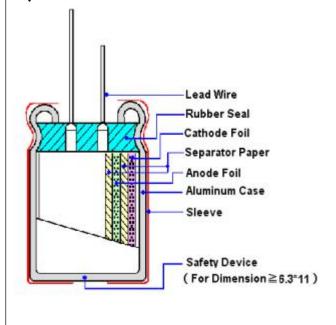
Sheet No.: 20220411 Page: 3 / 12



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		

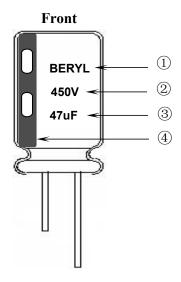
Sheet No.: 20220411 Page: 4/12

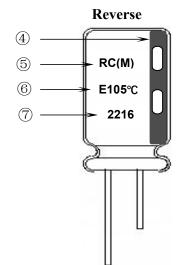
BERYL 绿宝石

ALUMINUM ELECTROLYTIC CAPACITORS

6. Product Marking

Marking Sample:





Marking Details:

Capacitor shall be marked the following items:

- 1) Trademark (BERYL)
- 2) working voltage(450V)
- 3) Nominal capacitance(47uF)
- 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	19	20	21	22	23	24	25	26	
Year	2019	2020	2021	2022	2023	2024	2025	2026	

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

Sheet No.: 20220411 Page: 5 / 12



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	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) ≤0.02CV +10 (μA), measurement circuit refer to right drawing. C: Capacitance (μF) V: Rated DC working voltage (V)
3	Dissipation factor	<condition> Nominal capacitance, for measuring frequency, voltage and temperature. <criteria> Must be within the parameters (See page 3)</criteria></condition>

Sheet No.: 20220411 Page: 6 / 12



	PERFORMANCE							
4 Impedance	Condition> Measuring frequency:100kHz; Measuring temperature:20±2°C Measuring point: 2mm max. from the surface of a sealing rubber on the lead wire. Criteria> (20°C) Must be within the parameters (See page 3)							
Load S life test	Condition> According to IEC60384 Maximum operating territory current for Rated life +4 exceed the rated working recovering time at atmost covering time at atmost criteria> The characteristic shall Leakage current Capacitance Change Dissipation Factor Appearance	nperature ±2. 18/0hours. (ng voltage) ospheric cor meet the fol Not mo Within : Not mo	2°C with DC (The sum of Then the pro- nditions. The llowing require than the s ±20% of initing than 200%	bias voltage DC and ripple duct should b result should irements.	plus the rated e peak voltage e tested after meet the foll e.	l ripple e shall not 16 hours		
Shelf 6 life test	Condition> The capacitors are then stored with no voltage applied at a temperature of Maximum operatemperature±2°C for1000+48/0 hours. Following this period, the capacitors shall be remore from the test chamber and be allowed to stabilized at room temperature for16 hours. mean leakage current Criteria> The characteristic shall meet the following requirements. Leakage current Not more than 200% of the specified value. Capacitance Change Within ±20% of initial value. Dissipation Factor Not more than 200% of the specified value. Appearance There shall be no leakage of electrolyte.							
Maximum permissible (ripple current, temperature coefficient)	Condition> The maximum permissible ripple current is the maximum A.C current at 100kHz and applied at maximum operating temperature Table-3 The combined value of D.C voltage and the peak A.C voltage shall not exceed the ravoltage and shall not reverse voltage. Frequency Multipliers: Freq (Hz) Cap. (μF) 120 1k 10k 50~100k 10c 10c 10c 10c 10c 10c 10c							

Sheet No.: 20220411 Page: 7/12



	ITEM				PF	RFORM	ANCE	2				
8	Terminal strength	Condition> Tensile strength of terminals Fixed the capacitor, applied force to the terminal in lead out direc seconds. Bending strength of terminals. Fixed the capacitor, applied force to bent the terminal (1~4 mm fre seconds, and then bent it for 90° to its original position within 2~3 Diameter of lead wire Tensile force N (kgf) 0.5mm and less 5 (0.51) 2.5 (0.50) Criteria> No noticeable changes shall be found, no breakage or looseness and the capacitor, applied force to bent the terminal (1~4 mm fre seconds, and then bent it for 90° to its original position within 2~3 Diameter of lead wire 10 (1.02) 5 (0.50) Criteria> No noticeable changes shall be found, no breakage or looseness and the capacitor, applied force to bent the terminal in lead out direct seconds. Tensile force N (kgf) 10 (1.02) 5 (0.50) Criteria> No noticeable changes shall be found, no breakage or looseness and the capacitor. Tensile force N (kgf) 10 (1.02) 10 (1.02) 10 (1.02) 11 (1.02) 12 (1.02) 13 (1.02) 14 (1.02) 15 (1.02) 16 (1.02) 17 (1.02) 18 (1.02)			From th -3 secon Force N (0.25) 0.51)	e rubbo onds.	er) for 90°	within 2~3				
9	Temperature characteristics	a. At +105 Dissipat The leak b. In step 5 Dissipat The leak	Time Time Time									
10	Surge test	series for 30± 1000 times. To before measure CR: Nomina <criteria> Leakage cu Capacitance Dissipation Appearance Attention: This test si</criteria>	<condition> Applied a surge voltage to the capacitor connected with a (100 ±50)/CR (kΩ) resistor in series for 30±5 seconds in every 5±0.5 minutes at 15~35°C.Procedure shall be repeated 1000 times. Then the capacitors shall be left under normal humidity for 1-2 hours before measurement CR: Nominal Capacitance (μF) <criteria> Leakage current Not more than the specified value. Capacitance Change Within ±15% of initial value. Dissipation Factor Not more than the specified value. Appearance There shall be no leakage of electrolyte.</criteria></condition>									

Sheet No.: 20220411 Page: 8 / 12



	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				
			mperature	Time				
		(1) +20°C		3 Minutes				
	Change of	(2) Rated low temperat	ture (-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, total	ıl 5 cycle					
		Criteria> The characteristic shall meet Leakage current	the following requirem Not more than the s					
		Dissipation Factor	Not more than the s	specified value.				
		Appearance	There shall be no le	eakage of electrolyte.				
12	Damp heat test	Humidity test: According to IEC60384-4 No be exposed for 500±8 hours	According to IEC60384-4 No.4.12 methods, capacitor shall be exposed for 500±8 hours in an atmosphere of 90~95%R H .at 40±2°C, the characteristic change shall meet the following requirement. Criteria> Leakage current Not more than the specified value. Capacitance Change Within ±10% of initial value. Dissipation Factor Not more than 120% of the specified value.					
13	Solderability test	Condition> The capacitor shall be tested under the following conditions: Soldering temperature : 245 ±5°C Dipping depth : 2mm Dipping speed : 25±2.5mm/s Dipping time : 3±0.5s Criteria> Soldering wetting time Less than 3s Coating quality A minimum of 95% of the surface being immersed						

Sheet No.: 20220411 Page: 9 / 12



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 25mm must be fixed in place with a bracket. Within 30°				
		Critaria> To be soldered				
		Criteria> To be soldered 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.				
		Appearance No mechanical damage in terminal. No leakage of electrolyte or swelling of the case. The markings shall be legible.				
	Resistance to solder heat test	Condition> Terminals of the capacitor shall be immersed into solder bath at 260±5°Cfor10±1seconds or400±10°Cfor3 ⁻⁰ 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. Criteria>				
15		Leakage current Not more than the specified value.				
		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	Condition> The following test only apply to those products with vent products at diameter ≥Ø6.3 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. Table 2>				
10	test	Diameter (mm) DC 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>				

Sheet No.: 20220411 Page: 10 / 12

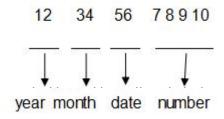


8. Packing Information

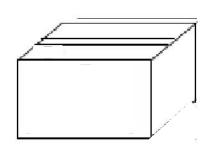
Packing Label Marked (the following items shall be marked on the label) (Inside box or bag)

(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:



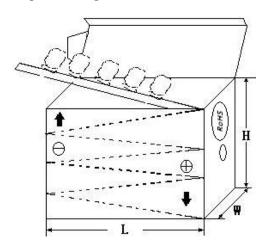
1) Bulk Packing:



3) Outer box



2) Taped Packing:



4) Outer box label:

C.S.R:		277.7979		
C.S.R P/O:	66 92	ROHS HF		
C.S.R P/N:	27			
S.P.R P/N:		QC		
SPEC:				
QTY:	PCS	TOL:	%	
L/N:		S.P.R:		

Sheet No.: 20220411 Page: 11 / 12



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

Sheet No.: 20220411 Page: 12 / 12

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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