

规格书 SPECIFICATION SHEET

Customer name:			
BERYL SERIES:	RC	TYPE:	RADIAL
DESCRIPTION:	10uF/400V	Ф10*13	
Apply date :	2022-04-12		

BERYL		CUSTOMER				
P/N:RC400M100LO10*13TH-2	A1Et	P/N:				
PREPARED CHECKED	APPROVAL	PREPARED	CHECKED	APPROVAL		
董桂茹、工程部廖梅君	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.

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Sheet No.: 20220412 Page : 1/12



Revise record

NO.	Date	Revise reason	Revise content	Prepared
01	2022.04.12	First issue	First issue	董桂茹

Sheet No.: 20220412 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

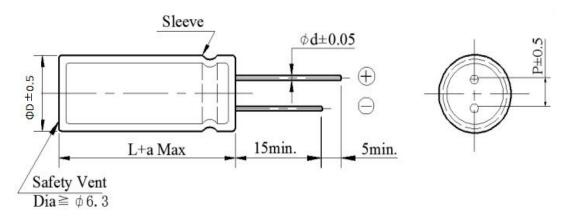
Series	Cap(uF) 120Hz/20°C	WV(V)	Size(mm)		Temperature	Capacitance	Life(hours)	
	120HZ/20°C	, ,	D	L	(°C)	Tolerance	@105(°C)	
RC	10	400	10	13	-40~ +105	±20%	5000	

DF (%)(MAX)	LC(μA)(MAX)	ESR(Ω)(MAX)	RC (mA rms)	Surge voltage(V)
120Hz/20°C	2min/20°C	100KHz/25°C	(MAX)105°C/100KHz	
≤20	≤90	-	285	440

Other: /

3. Product Dimensions

Type

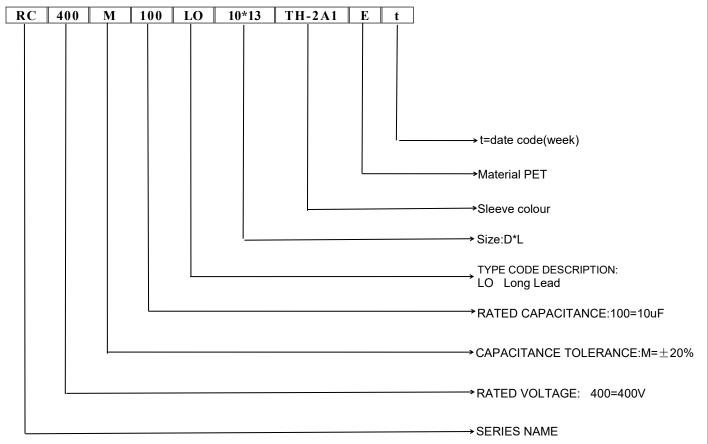


ΦD	5	6.3	8	10	13	16	18	22
P	2	2.5	3.5	5	5	7.5	7.5	10
Фd	0.5	0.5	0.5/0.6	0.6	0.6	0.8	0.8	0.8
а			$(L < 20) \pm 1.5$		(L≥20) ± 2.0			

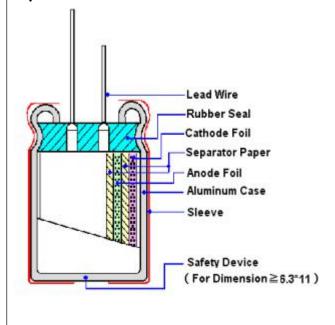
Sheet No.: 20220412 Page : 3 / 12



4. Part Number



5. Construction



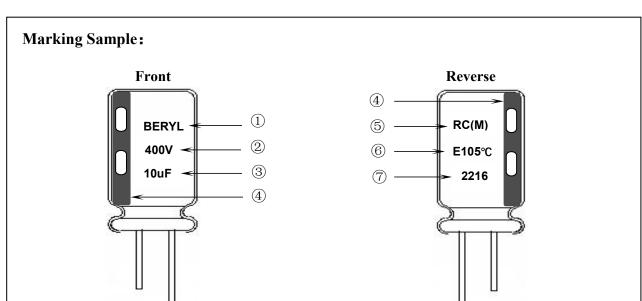
Material name	Composition	Supplier name
Lead	Al and (Fe+Cu+Sn)	NM、JX
Rubber	EPT / IIR	LHX、LA、TH、LM2
Case	Aluminum	OX、YJ、HL、LY2
Paper	Wood / Fibrous plant materials	KE、DF
Anode foil	$Al + Al_2O_3$	HY1、HY2、HF、HY3、 LD、FQ
Cathode foil	Aluminum	GY、LY1
Electrolyte	Glycol + Water +Ammonium salt	XZB、LM1、JZ2、FS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

Sheet No.: 20220412 Page: 4/12

BERYL 绿宝石

ALUMINUM ELECTROLYTIC CAPACITORS

6. Product Marking



Marking Details:

Capacitor shall be marked the following items:

- 1) Trademark (BERYL)
- 2) working voltage(400V)
- 3) Nominal capacitance(10uF)
- 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.: 20220412 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 $(6.3\sim450\mathrm{WV})$ -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.
2	Leakage current	$ \begin{array}{l} \textbf{} \\ \textbf{Connecting the capacitor with a protective resistor } (1k\Omega\pm10\Omega) \text{ in series for} \\ \textbf{2 minutes, and then, measure leakage current.} \\ \textbf{} \\ \textbf{I: Leakage current } (\mu A) \\ \textbf{I } (\mu A) \leqslant 0.02\text{CV} + 10(\mu A) \text{ ,} \\ \textbf{measurement circuit refer to right drawing.} \\ \textbf{C: Capacitance } (\mu F) \\ \textbf{V: Rated DC working voltage } (V) \\ \end{array} $
3	Dissipation factor	Condition> Nominal capacitance, for measuring frequency, voltage and temperature. Criteria> Must be within the parameters (See page 3)

Sheet No.: 20220412 Page: 6 / 12



	ITEM				P	ERF	ORMAN	CE		
4	Impedance	Measu Criteria	ring frequency: ring point: 2mn	n max. fr	om the	e surf	face of a s		er on the lead	wire.
5	Load life test	Maxim curren excee recove <criteria: appe<="" capa="" ch="" dissi="" leak="" th="" the=""><th colspan="8">According to IEC60384-4No. 4.13 methods, the capacitor is stored at a temperature of Maximum operating temperature ±2°C with DC bias voltage plus the rated ripple current for Rated life +48/0hours. (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) Then the product should be tested after 16 hours recovering time at atmospheric conditions. The result should meet the following table: **Criteria** The characteristic shall meet the following requirements. Leakage current Not more than 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.</th></criteria:>	According to IEC60384-4No. 4.13 methods, the capacitor is stored at a temperature of Maximum operating temperature ±2°C with DC bias voltage plus the rated ripple current for Rated life +48/0hours. (The sum of DC and ripple peak voltage shall not exceed the rated working voltage) Then the product should be tested after 16 hours recovering time at atmospheric conditions. The result should meet the following table: **Criteria** The characteristic shall meet the following requirements. Leakage current Not more than 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.							
6	Shelf life test	The cap tem fron leak <criteria: capaci="" char="" dissipa<="" leakag="" th="" the=""><th colspan="8">Condition> The capacitors are then stored with no voltage applied at a temperature of Maximum operating temperature±2°C for1000+48/0 hours. Following this period, the capacitors shall be removed from the test chamber and be allowed to stabilized at room temperature for16 hours. measure 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.</th></criteria:>	Condition> The capacitors are then stored with no voltage applied at a temperature of Maximum operating temperature±2°C for1000+48/0 hours. Following this period, the capacitors shall be removed from the test chamber and be allowed to stabilized at room temperature for16 hours. measure 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.							
7	Maximum permissible (ripple current, temperature coefficient)	The marapplied Table-3 The cor voltage Frequenc	Appearance There shall be no leakage of electrolyte. Condition> The maximum permissible ripple current is the maximum A.C current at 100kHz applied at maximum operating temperature Table-3 The combined value of D.C voltage and the peak A.C voltage shall not exceed th voltage and shall not reverse voltage. Freq (Hz) 120 1k 10k 100k Cap. (μF) 10 0.42 0.70 0.90 1.00 Temperature Coefficient: Temperature (°C) 60 85 95 105 Factor 2.23 1.73 1.41 1.00							

Sheet No.: 20220412 Page: 7 / 12



	ITEM					PER	FORM <i>A</i>	NCE				
8	Terminal strength	seconds. E Fixed the c 2~3 second Diame 0.5 Criteria>	d force to the terminal in lead out direction for 30+5-0 of terminals. d force to bent the terminal (1~4 mm from the rubber) for 90° with the force of the force					· 90° within				
9	Temperature characteristics	a. At +105 Dissipat The leak b. In step 5 Dissipat The leak c. At -40°(Voltage (V)	Condition> STEP Testing temperature (°C) Time 1 20±2 Time to reach thermal equilibrium 2 -40-25±3 Time to reach thermal equilibrium 3 20±2 Time to reach thermal equilibrium 4 105±2 Time to reach thermal equilibrium 5 20±2 Time to reach thermal equilibrium 6 20±2 Time to reach thermal equilibrium 7 20±2 Time to reach thermal equilibrium 8 20±2 Time to reach thermal equilibrium 9 20±2 Time to reach thermal equilibrium 10 20±2 Time to reach thermal equilibrium 10 20±2 Time to reach thermal equilibrium 10 25 35 50 63~160 200~400 450 10 200~400 450 10 200~400 450 10 200~400 450 200~400 450									
10	Surge test	series for 30±; 1000 times. The before measur CR: Nomina Criteria> Leakage cut Capacitance Dissipation Appearance Attention:	Applied a surge voltage to the capacitor connected with a (100 ± 50) /CR (k Ω) resistoreries 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 (μ F) **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. **Attention*: This test simulates over voltage at abnormal situation only. It is not applicable to such									

Sheet No.: 20220412 Page: 8 / 12



	ITEM	PERFORMANCE								
		<condition> Temperature cycle: According to IEC60384-4 N according as below:</condition>	Temperature cycle: According to IEC60384-4 No.4.7 methods, capacitor shall be placed in an oven,							
		Te	mperature	Time						
		(1) +20°C		3 Minutes						
	Change of	(2) Rated low tempera	ture (-40°C)(-25°C)	30±2 Minutes						
11	temperature test	(3) Rated high tempera	nture (+105°C)	30±2 Minutes						
		(1) to $(3) = 1$ cycle, total	al 5 cycle							
		Criteria> The characteristic shall meet Leakage current	the following requirem Not more than the							
		Dissipation Factor	Not more than the	specified value.						
		Appearance	There shall be no le	eakage of electrolyte.						
12	Damp heat test	According to IEC60384-4 N be exposed for 500±8 hours	Leakage currentNot more than the specified value.Capacitance ChangeWithin $\pm 10\%$ of initial value.Dissipation FactorNot more than 120% of the specified value.							
13	Solderability test	Soldering temperature : 24 Dipping depth : 25 Dipping speed : 2 Dipping time : 3± <criteria></criteria>	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							

Sheet No.: 20220412 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.: 20220412 Page: 10 / 12

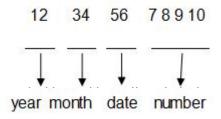


8. Packing Information

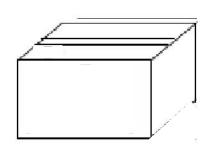
Packing Label Marked (the following items shall be marked on the label) (Inside box or bag)

(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:



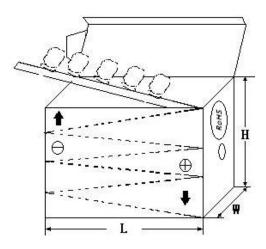
1) Bulk Packing:



3) Outer box



2) Taped Packing:



4) Outer box label:

C.S.R:		277.7979		
C.S.R P/O:	66 67	ROHS HE		
C.S.R P/N:	27			
S.P.R P/N:		QC		
SPEC:				
QTY:	PCS	TOL:	%	
L/N:		S.P.R:		

Sheet No.: 20220412 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>

Accord with Cadmium and cadmium compounds Lead and lead compounds							
Accord with Lead and lead compounds							
heavy metal Mercury and mercury compounds	Mercury and mercury compounds						
Hexavalent chromium compounds							
Polychlorinated biphenyls (PCB)							
Polychlorinated naphthalenes (PCN)							
Organic chlorin Polychlorinated terphenyls (PCT)							
compounds Chlorinated paraffins (CP)							
Other chlorinated organic compounds							
Organic Polybrominated biphenyls (PBB)	Polybrominated biphenyls (PBB)						
bromine Polybrominated diphenylethers (PBDE)	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.: 20220412 Page: 12 / 12

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

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NEV2.2M50AA NEV330M63EF NEV4700M35HI NEV4.7M100BA