

**NO.: RD20220919002**

**TO: Ozdisan**

**APPROVAL SHEET No. : B-7629C**

**Series No. : KRM**

**Specification No.:**

**Halogen-Free RoHS2.0**

**APPROVAL SHEET  
FOR AL. ELECTROLYTIC CAPACITORS**

No.	(Customer No.)	(Koshin Part No.)	Description	ΦD x L
1		PKRM-035V221MG125-T/A5.0	35V220μF	10X12.5

**APPROVED BY:**

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PLEASE SIGN RETURN US ONE COPY OF THE APPROVAL SHEET

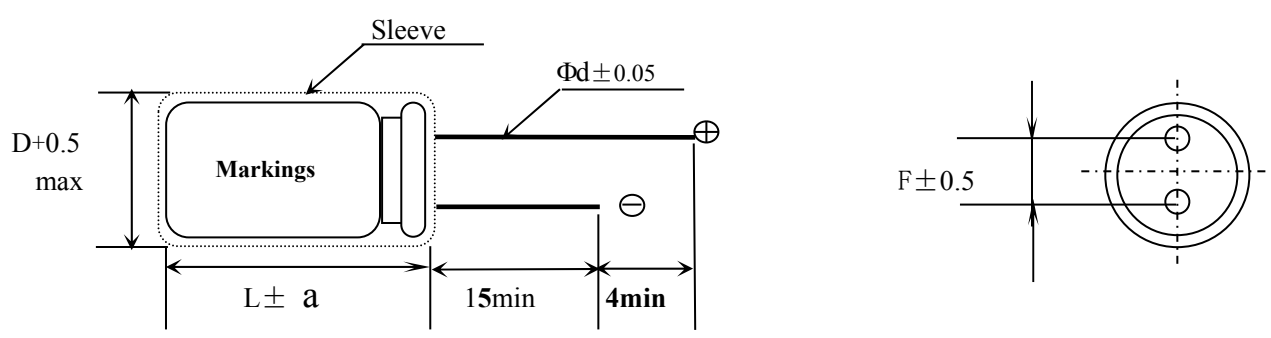
DESIGNED BY:TANGJINGLING CHECKED BY:JUANGYUANYUAN APPROVED BY: HAUNGXUEHUI  
DATE: 2022-9-19

**KOSHIN**

**DJS-DS-0013**



Standard Size map:



ΦD	5	6.3	8	10	12.5	16	18	22	25
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0
Φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8/1.0	1.0
a	1.5		1.5 for L16max 2.0 for L20min						

Coefficient of Frequency for Ripple Current

Rated voltage (v)	Frequency (Hz)	50•60	120	1K	10K	100K
	Capacitance(μF)					
6.3 to 100	CAP ≤ 10	0.80	1.00	1.30	1.65	1.70
	10 < CAP ≤ 100	0.80	1.00	1.23	1.48	1.53
	100 < CAP ≤ 1000	0.80	1.00	1.16	1.35	1.38
	1000 < CAP	0.80	1.00	1.11	1.25	1.28
160 to 500	0.47 to 330	0.80	1.00	1.30	1.40	1.60

Coefficient of Temperature for Ripple Current

Rated voltage (V)	Temperature (°C)	70 or less	85	105
6.3 to 100		2.00	1.70	1.00
160 to 500		1.80	1.40	1.00



## Series KRM Capacitor

1. Our part No. : For example

<u>PKRM</u>	<u>035V</u>	<u>221</u>	<u>M</u>	<u>G125</u>
Se rise code	rated voltage	capacitance	tolerance	case size symbol
PKRM	35V	220 $\mu$ F	$\pm 20\%$	$\Phi 10 \times 12.5$

2. Your part No.:

3. Marking:

Include company's brand "Koshin", series code, rated voltage, capacitance, rated temperature range, polarity and tolerance of capacitance.

4. Specifications:

4.1 Temperature range : -55~+105°C

4.2 Electrical characteristics

4.2.1 Capacitance tolerance :  $\pm 20\%$

4.2.2 Tangent of loss angle ( $\tan \delta$ ) :

Rated voltage(V)	6.3	10	16	25	35	50	63	100	160-500
$\tan \delta$ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15

Note: 0.02 is added to each 1000  $\mu$  F increase over 1000  $\mu$  F

4.2.3 Leakage current ( $\mu$  A) :

Rated voltage (V)	6.3-500
Leakage Current ( $\mu$ A)	Less than 0.01CV or 3 whichever is large (after 1 minutes)

Note: I : Leakage current ( $\mu$  A) , C : Capacitance ( $\mu$  F) , V : Rated DC working voltage (V)



NO	ITEM	TEST METHOD	SPECIFICATION
2.6	Surge test	Rated surge voltage shall be applied (switch on)for 30±5 second and then shall be applied (switch off) with discharge for 5.5min at room temperature. This cycle shall be repeated for 1000 cycles. Duration of one cycle is 6±0.5 minutes	<p>Capacitance change: within ±15% of the initial specified value.</p> <p>Dissipation factor: Less than specified value.</p> <p>Leakage current: Within initial specified value.</p>

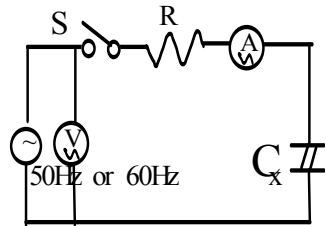
3.Mechanical characteristics :

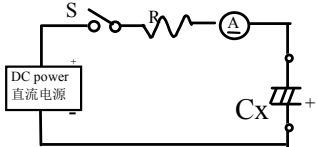
NO	ITEM 项目	TEST METHOD	SPECIFICATION																
3.1	Lead strength	<p>(A)Tensile strength :</p> <p>wire lead terminal :</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">d(mm)</td> <td style="padding: 2px;">≤0.5</td> <td style="padding: 2px;">0.5&lt;d≤0.8</td> <td style="padding: 2px;">0.8&lt;d≤1.25</td> </tr> <tr> <td style="padding: 2px;">load(kg)</td> <td style="padding: 2px;">0.5</td> <td style="padding: 2px;">1.0</td> <td style="padding: 2px;">2.0</td> </tr> </table> <p>The capacitor shall withstand the constant tensile force specified between the body and each lead for 10seconds without damage either mechanical or electrical.</p> <p>(B) Bending strength :</p> <p>wire lead terminal :</p> <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">d(mm)</td> <td style="padding: 2px;">≤0.5</td> <td style="padding: 2px;">0.5&lt;d≤0.8</td> <td style="padding: 2px;">0.8&lt;d≤1.25</td> </tr> <tr> <td style="padding: 2px;">load(kg)</td> <td style="padding: 2px;">0.5</td> <td style="padding: 2px;">0.5</td> <td style="padding: 2px;">1.0</td> </tr> </table> <p>with the capacitor in a vertical position apply the load specified axially to each lead. The capacitor shall be rotated slowly from the vertical to the horizontal position, back to the vertical position. The 90° in the opposite direction and back the original position. Performance of capacitor shall not have change and leads shall be undamaged.</p>	d(mm)	≤0.5	0.5<d≤0.8	0.8<d≤1.25	load(kg)	0.5	1.0	2.0	d(mm)	≤0.5	0.5<d≤0.8	0.8<d≤1.25	load(kg)	0.5	0.5	1.0	<p>When the capacitance is measured, there shall be no intermittent contacts, or open-or short-circuiting.</p> <p>There shall be no such mechanical damage as terminal damage etc.</p>
d(mm)	≤0.5	0.5<d≤0.8	0.8<d≤1.25																
load(kg)	0.5	1.0	2.0																
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NO.	ITEM	TEST METHOD	SPECIFICATION
3.2	Vibration resistance	The frequency of the vibration shall vary uniformly within the range 10 to 55 Hz with the amplitude of 0.75mm, completing the cycle in the interval of one minute. The capacitor shall be securely mounted by its leads with hold the body of capacitor. The capacitor shall be vibrated in three mutually perpendicular directions for a period of 2 hours in each direction.	Appearance : no abnormal.  Capacitance change: within $\pm 5\%$ of initial measured value.
3.3	Solder ability	The leads are dipped in the solder bath of Sn at $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $2 \pm 0.5$ seconds. The dipping depth should be set at 1.5~2.0 mm.	The solder alloy shall cover the 95% or more of dipped lead's area.

4. Reliability :

NO	ITEM	TEST METHOD	SPECIFICATION
4.1	Soldering heat resistance	The leads immerse in the solder bath of Sn at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $10 \pm 1$ seconds until a distance of 1.5~2.0mm from the case.	No visible damage or leakage of electrolyte.  Capacitance change: Within $\pm 5\%$ of the initial measured value  Tan $\delta$ : Less than specified value.  Leakage current: Less than specified value
4.2	Damp head ( steady state)	Subject the capacitor to $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90% to 95% relative humidity for 504 hours.	Capacitance change: Within $\pm 20\%$ of the initial measured value Tan $\delta$ : Less than 1.2 specified value.  Leakage current: Less than specified value Impedance: Less than 1.2 specified value.

NO.	ITEM	TEST METHOD	SPECIFICATION														
4.3	Load life	After 2000 hours continuous application of max allowable ripple current and DC rated voltage at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ , Measurements shall be performed after 16 hours exposed at room temperature.	Capacitance change: Within $\pm 20\%$ of the initial value. Tan $\delta$ :less than 200% specified value  Leakage current: Less than initial specified value.  Appearance :no Abnormal														
4.4	Shelf life	After storage for 1000 hours at $105\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ without voltage application ,Measurements shall be performed after exposed for 16 hrs at room temperature after application of Testing	Capacitance change: Within $\pm 10\%$ of the initial value.  Tan $\delta$ :less than specified value  Leakage current: Less than specified value.  Appearance :no Abnormal														
4.5	Storage at low temperature	The capacitor shall be stored at temperature of $-55\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ for 16 hours, during which time be subjected to standard atmospheric conditions for 16 hours or more. After which measurements shall be made.	Capacitance change: Within $\pm 10\%$ of the initial value.  Tan $\delta$ :less than specified value  Leakage current: Less than specified value.  Appearance :no Abnormal														
4.6	Pressure relief	AC test Applied voltage: AC voltage not exceeding 0.7 times of the rated direct voltage or 250V AC whichever is the lower.  Frequency : 50Hz or 60Hz. Series resistor :refer to the table below  s* Resistance is equivalent to a half impedance by test frequency.	AC test circuit   <table border="1" data-bbox="406 1624 1149 2004"> <thead> <tr> <th>Capacitance(C) 容量</th> <th>Series resistor</th> </tr> </thead> <tbody> <tr> <td><math>C &lt; 1\mu\text{F}</math></td> <td>1000 <math>\Omega</math></td> </tr> <tr> <td><math>1\mu\text{F} &lt; C \leq 10\mu\text{F}</math></td> <td>100 <math>\Omega</math></td> </tr> <tr> <td><math>10\mu\text{F} &lt; C \leq 100\mu\text{F}</math></td> <td>10 <math>\Omega</math></td> </tr> <tr> <td><math>100\mu\text{F} &lt; C \leq 1000\mu\text{F}</math></td> <td>1 <math>\Omega</math></td> </tr> <tr> <td><math>1000\mu\text{F} &lt; C \leq 10000\mu\text{F}</math></td> <td>0.1 <math>\Omega</math></td> </tr> <tr> <td><math>10000\mu\text{F} &lt; C</math></td> <td>*</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li><math>\ominus</math> : AC power</li> <li>S : Switch</li> <li><math>\text{V}</math> : AC voltage meter</li> <li><math>\text{A}</math> : AC current meter</li> <li>R : protection resistor</li> <li><math>C_x</math> : testing capacitor</li> </ul>	Capacitance(C) 容量	Series resistor	$C < 1\mu\text{F}$	1000 $\Omega$	$1\mu\text{F} < C \leq 10\mu\text{F}$	100 $\Omega$	$10\mu\text{F} < C \leq 100\mu\text{F}$	10 $\Omega$	$100\mu\text{F} < C \leq 1000\mu\text{F}$	1 $\Omega$	$1000\mu\text{F} < C \leq 10000\mu\text{F}$	0.1 $\Omega$	$10000\mu\text{F} < C$	*
Capacitance(C) 容量	Series resistor																
$C < 1\mu\text{F}$	1000 $\Omega$																
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$10\mu\text{F} < C \leq 100\mu\text{F}$	10 $\Omega$																
$100\mu\text{F} < C \leq 1000\mu\text{F}$	1 $\Omega$																
$1000\mu\text{F} < C \leq 10000\mu\text{F}$	0.1 $\Omega$																
$10000\mu\text{F} < C$	*																

NO.	ITEM	TEST METHOD	SPECIFICATION
4.6	Pressure relief	<p>DC test Send the following electricity while applying the inverse voltage.</p> <p>Where case size  <math>D \leq 22.4\text{mm}</math>: 1 A D.C.fixed  <math>D &gt; 22.4\text{mm}</math>: 10 A D.C.fixed</p> <p>Note 1. When the pressure relief device does not open even 30 minutes after commencement of test, the test may be ended.</p>	<p>DC test circuit</p>  <p>S : Switch  Ⓐ : DC current meter  Cx: testing capacitor</p> <p>The pressure relief device shall open in such a way as to avoid any damage of fire or explosion of capacitor elements (terminal and metal foil etc.) or cover.</p>
4.7	Temp cycle	<p>LSL temperature(°C):-55 ± 3 time(H): 0.5H/timeX5 times  USL temperature(°C):105 ± 2 time(H): 0.5H/timeX5 times  Judgement: CAP: <math>\Delta C/C \leq \pm 10\%</math>, Appearance no Abnormal.  No electrolyte leakage。</p>	
4.8	Thermal shock	<p>dry heat temperature (°C): 105 ± 2 time(H): 16  moist heat temperature(°C): 55 time(H): 24/  cold temperature(°C): -55 ± 2 time(H): 2/  moist heat temperature(°C): 55 time(H): 24 :  Judgement: CAP, <math>\Delta C/C \leq \pm 10\%</math>, Tan <math>\delta</math> :Less than 1.2 specified value, Leakage current: Less than specified value. Appearance no Abnormal. No electrolyte leakage。</p>	

**5. Marking**

Marking on capacitors include:

Koshin trade-mark

Koshin  
Working voltage

Normal capacitance

Tolerance

Polarity

Operating temperature range

**Sleeving pipe basic: Black PET**

**Printing color: White**

**Required space above the valve (mm): 2.0mm**





Detergent needing attention

Hydrogen carbide liquid and halogen liquid can cause Aluminum Electrolytic Capacitor to corrode. Some of Safe and Unsafe detergent are as follows

<b>Safe</b>	<b>Unsafe</b>
Dimethylbenzene	1,1,2-trichloroethane
Ethanol	1,2,2- trichloroethane
Butanol	Tetrachloroethylene
Methanol	Chloroform(colorless volatilizable liquid)
Propanol	Dichloromethane
Detergent	Trichloroethylene

Taping size  $\Phi 10$

TP5.0mm pitch tape packing

Taping code number: T/A5.0

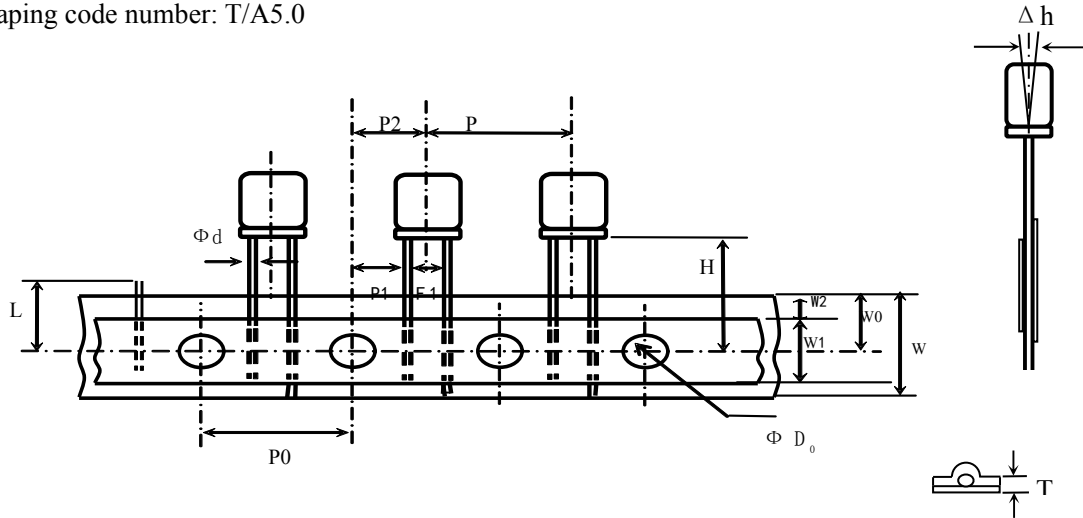


Table of dimensions

Item	Symbol	Dimension	Tolerance	Reference
Lead-wire diameter	$\Phi d$	0.6	$\pm 0.05$	
Distance between centers of leads	F1	5.0	$\pm 0.5$	
Height of component form tape center	H	18.5	+0.75 -0.5	
Component spacing	P	12.7	$\pm 1.0$	
Perforation pitch	P0	12.7	$\pm 0.3$	
Hole center to lead distance	P1	3.85	$\pm 0.7$	
Hole center to component center	P2	6.35	$\pm 1.0$	
Carrier tape width	W	18.0	$\pm 0.5$	
Hole down tape width	W0	9.0	$\pm 0.5$	
Feed hole position	W1	10.0	$\pm 0.5$	
Hole down tape width	W2	0.5-1.5	-----	
Diameter of sprocket holes	$\Phi D0$	4.0	$\pm 0.2$	
Body inclination forward or backward	$\Delta h$	0	$\pm 1.0$	
Tape base thickness	t0	0.38	$\pm 0.05$	
Total thickness of the combined carrier tape and hold down tape	T	0.7	$\pm 0.2$	
Cut off position of defectives	L	11.0	or less	

## Aluminum Electrolytic Capacitor Specification

Series	PKRM	35 V 220μF	Part No.	PKRM-035V221MG125-T/A5.0
Customer No.			Case size	ΦD10 X L12.5
Specification	Items		Standard	
	Operating temperature range		- 55 ~ + 105 °C	
	Capacitance tolerance		±20% ( 20°C , 120Hz )	
	Dissipation factor (MAX)		( Less than ) 12% ( 20°C , 120Hz )	
	Leakage current (MAX)		( Less than ) 77μA ( 20°C 35 V 1 min )	
	Impedance (MAX)		/	
	Ripple current (MAX)		300mArms ( 120Hz , 105°C )	
	Load life		2000hrs	
Outline	Sleeving pipe basic		Black PET	
	Marking color		White	
	( Dimensions )			
	Copper clad steel wire(tinned)			
	<p style="text-align: right;">[Remarks:Taping space:5.0±0.5]</p> <p style="text-align: right;">(unit):mm</p>			
Recorder	(The first edition) :2022-9-19			
Wrote by: Tangjingling		Checked by: Jiangyuanyuan		Approved by: Huangxuehui