

### Datasheet

ENGLISH

### 470µF 50 V dc, Through Hole Aluminium Electrolytic Capacitor

RS Stock number 711-1475



### **Specifications:**

Item		Performance Characteristics												
Operating Temperature Range(℃)	-4	0+10	)5℃	6.3 1	to 10	0VD	С	-2	5+1(	)5℃	160	to 45	50VD	C
Capacitance Tolerance (%)							±20	%						
Rated Voltage Range(v)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	23	20	16	14	12	10	10	10	15	15	16	20	20	20
Dissipation Factor(tan $\delta$ %)max.	]	For Capacitance > 1000uF, add 2% per another 1000uF (+20°C, at 120Hz)										F		
Leakage Current (LC.) (µA/after 1 min.)max.	whichover is greater measured With reted working w													
Life Test: Load Life Test:		\C/(						0%	of th	e ini	tial v	alue		
After 2000 Hrs at 105°C	Т	'an δ			≦	200%	6 of 1	the in	itial	spec	ified	valu	ie	
Shelf Life Test: After <mark>1000</mark> Hrs at 105℃	C LC. $\leq$ The initial specified value													
Detail specifications	Conform to IEC 60384-4													
Spec. & RIPPLE CUR	Spec. & RIPPLE CURRENT:													

uF	WV	SIZE(DxL)	Maximum Ripple Current
470	50	10X20	600mA,rms,120Hz at 105°C



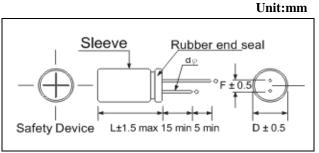
#### Low Temperature Characteristics (120Hz) Impedance Ratio max.

						63	100	160	200	250	350	400	450
Z-25°C/Z+20°C 4	3	2	2	2	2	2	2	3	3	3	5	6	15
Z-40°C/Z+20°C 8	6	4	4	3	3	3	3	-	-	-	-	-	-

#### Multiplier for Ripple Current VS, Frequency

C	AP(uF) \ Hz	60 (50)	120	500	1K	10K up
	CAP≦100	0.70	1	1.30	1.40	1.50
Multiplier	10 <cap≦1000< td=""><td>075</td><td>1</td><td>1.20</td><td>1.30</td><td>1.35</td></cap≦1000<>	075	1	1.20	1.30	1.35
	1000 < CAP	0.80	1	1.10	1.12	1.15

**D**'



D	5	6.3	8	10	13	16	18	22	25
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	10
dΦ	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8	1.0



### CONTENTS OF QUALITY ASSURANCE

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#### ASSURANCE METHOD CONTENTS

#### SCOPE Performance

Unless otherwise specified, the capacitors shall be measured at +15°C to +35°C , 45to75%RH. However, if any Doubt arises on the judgment, the measurement conditions shall be +20 $\pm$ 1°C, 60to70%RH the test Conditions shall comply with IEC-60384-4.

1. Capacitance(CAP.)

Measuring frequency	:120Hz±20%
Measuring voltage	:0.5V rms. +1.5 to 2.0V dc
Measuring circuit	:Series equivalent circuit.

Criteria: Shall be within the specified capacitance tolerance.

#### 2.Dissipation Factor (tan $\delta$ )

Measuring frequency	:120Hz±20%
Measuring voltage	:0.5V rms. +1.5 to 2.0V dc
Measuring circuit	:Series equivalent circuit.

Criteria: Shall not exceed the specified in the table of Ratings.

3. Leakage Current (L.C.)

DC leakage current shall be measure with rate voltage, which is applied through a resistor of 1,000±10Ω connected in series with the capacitors, at the end of a specified period after the capacitors reached the rated voltage across the terminals. Criteria: Shall not exceed the specified in the table of Ratings.

#### 4. Surge Voltage

- 4.1 The surge DC rating is the maximum voltage to which the capacitor should be subjected under any conditions. This includes transients and peak ripple at the highest line voltage.
- 4.2 Capacitors, connected in series with 1000 ohm resistors, shall withstand the surge test voltage applied at the rated of 1/2 minute on, 4 1/2 minutes off, for 1000 successive test cycles at 20°C (see the following table)

#### PERFORMANCE CHARACTERISTICS(continued)

Rated	l Voltage (WV)	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Surge	voltage (SV)	10	13	20	32	44	63	79	125	200	250	300	400	450	500
Criteria:	ange		:=	≦±1	.5% o	of in	itia	l val	ue						
	<b>Dissipation Factor</b>					within specified value:									
	Leakage Current					:within specified value									
Physical				:	no bi	oker	n and	und	amage	ed					



### **Endurance characteristic**

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NO.	Item	Condition		Specification
5	High temperature	1. Capacitors shall be placed in oven with application of ripple current	Capacitance change	Within $\pm 20\%$ of the initial value
	load life test	and rate voltage for 2000±12hrs at 105℃	TAN δ	Less then 200% of specified value
		2. The capacitors should be use within specified permissible ripple current	Leakage Current	Within specified value
		<ul> <li>in each standard products table(the sum of DC working voltage and AC peak voltage shall be equal to the rated DC working voltage</li> <li>3. The specified maximum permissible ripple current in defined at 105°C and 120 Hz</li> <li>4. Then the capacitor shall be subjected to standard atmospheric conditions for 16 hours, after witch measurements shall be made.</li> </ul>	Physical	no broken and undamaged
6.	High temperature	After 1000hrs test at 105°C without rated working voltage.	Capacitance change	Within ±20% of the initial value
	shelf life test	And then the capacitor shall be subjected to standard atmospheric	ΤΑΝ δ	Less then 200% of specified value
		conditions for 16 hours, after witch measurements shall be made.	Leakage Current	Within specified value
			Physical	no broken and undamaged
7.	Rotational temperature test	Capacitor is place in a oven whose temperature follow specific regulation	Capacitance change	Within ±10% of the initial value
		to change. The specific regulations is "+25°C (1 hr) → +105°C (2 hrs) →	ΤΑΝ δ	Within specified value
		+25°C (0.5 hr) → -40°C (2 hrs) → +25°C (0.5 hr)", and it called a	Leakage Current	Within specified value
		cycle. The test totals 10 cycles. And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours, after witch measurements shall be made.	Physical	no broken and undamaged
8.	Humidity test	Capacitors shall be exposed for 500± 8hrs in an atmosphere of 90~95%R.H	Capacitance change	Within ±10% of the initial value
		at 40°C. And then the capacitor shall be subjected to standard atmospheric	ΤΑΝ δ	Less then 120% of specified value
		conditions for 16 hours, after witch measurements shall be made.	Leakage Current	Within specified value
			Physical	no broken and undamaged



9.	Low	Capacitor are place at -40 $\pm$ 3°C for 72 $\pm$	Capacitance	Within $\pm 10\%$ of the initial
	temperature	4hrs.And then the capacitor shall be	change	value
	test	subjected to standard atmospheric conditions for 16 hours, after witch	ΤΑΝ δ	Within specified value
		measurements shall be made.	Leakage	Within specified value
			Current	
			Physical	no broken and undamaged
10.	Vibration	1. Fix it at the point 4mm or less form	Capacitance	Within ±10% of the initial
	test	body. For ones of 12.5mm or 25mm	change	value
		or more length, use separate fixture. 2. Direction and during of vibration:3	ΤΑΝδ	Within specified value
		orthogonal direction each for 2hrs	Leakage	Within specified value
		total 6hrs.	Current	
		3. Mutually frequency:	Physical	no broken and undamaged
		10 to55Hz reciprocation for 1 min. 4.Total amplitude:1.5mm		
11.	Reflow test	1. IR Reflow	Capacitance	Within ±10% of the initial
11.	Kenow test		change	value
		TEMP 13	TAN δ	Within specified value
				,, spooniou (unuo
			Leakage	Within specified value
		T2	Current	
			Physical	no broken and undamaged
		Preheat Temp (T1~T2) 100~150℃		
		Time (t1) max 40 sec		
		Duration Temp(T3) 260°C		
		Time (t2) max         10 sec           D         Trans (T4)         27.827		
		Peck         Temp(T4)         270°C           Time (t3) max         5 sec		
		Reflow     Twice or less		
		cycle		
		2. Solder bath method:		
		Solder temperature:260±3℃ Immersion time:5+1/-0 sec		
		Thickness of heat shunt		
		(Printed wiring board):1.6mm		
		(		
		3. Soldering iron method:		
		Bit temperature: $350 \pm 10^{\circ}$		
		Application time of soldering		
		Iron:3+1/-0 sec		
0		ved Products, gives you professional qualit	v parts across all	products satagarias. Our rang



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12.	Solderability		d wire fully immersed in the		temperature of
	test	$245\pm2^{\circ}$ C, the	solder coating must be mo	ore then 95%	
13.	Mechanical		about lead tabs strength.		
		2. Tension tes			ft and finite of
			tabs shall not be broken or a rertically and pressing the follo		
		for $10\pm1$ s		owing weight on the lead	labs of capacitor
			Lead tabs diameter(mm)	Weight(Kg)	
			$\leq 0.5$	0.5	-
			0.6~0.8	1.0	-
			>0.8	2.5	-
		3. Bending tes	L	2.0	
			acitor is held in vertical position	on. Attach a weight to the	lead tabs, slowly
			citor 90° to a same way in the		
		-	lead tabs shall not be broken (		
		r J J			
					_
			Lead tabs diameter(mm)	Weight(Kg)	
			≦0.5	0.5	
			0.6~0.8	1.0	
			>0.8	2.5	
					•
14.	Safety vent		ly a reverse voltage with curr		
			en the pressure relief vent ope		
			generation or expulsion of a p ie vent does not operate with t		
			isidered to be passed.	the voltage applied for 50	minutes, the test is
15.	Standards		cteristic W of IEC-60384-4,18		
10.	Standarus	Satisfies Chara	eteristic ** 011EC-00504-4,10		
1					



## **CODE CONSTRUCTION**

### ENGLISH

	LHK	<u> </u>	71	M	[ 50	V (	$\mathbf{V}$	10	20			
	<u>Series</u>		<u>icitance</u>				<u>eve</u>	<u>Dia.</u>	Length	<u>Forr</u>		
	(1)		(2)	(3)	(4)	(:	5)	(6)	(7)	3)	8)	
(1) Series:												
LGK	I	MK	LSM	LEK	LPS	Ll	KP	LNP	LLK	LBI	<b>D</b>	
(2) Ca	(2) Capacitance (uF):											
$\mu$ F	0.1	1		10	1	00	1	1000	10000		1.5	
Code	0R1	01	0	100	1	01		102	103	1	R5	
$\mu$ F	0.22	2.		22	2	20		2200	22000		15	
Code			2	220		21		222	223		50	
$\mu$ F	0.33	3.		33		30		3300	33000		50	
Code	R33	<u>3</u> F		330		31		332	333		51	
$\mu$ F	0.47	4.		47		70		4700	47000		500	
Code	R47	4F	(/	470	4	71		472	473		52	
	erance	•	1									
Code		K or		M								
Toleran			.0%	±2	0%							
(4) Wo	(4) Working Voltage (V):											
6.3		0		16		25		35		50		63
100		60	2	00	2	50		350		400		450
<u>(5) Sle</u>	eve:											
Code	V	E										
Sleeve	PVC	PE										
<u>(6)</u> Dia	ameter	(mm	l):									
4	5		6		8		10		13	16		18
22	25		30		35		51		64	77	1	90
(7) Le	ength (	mm):										
5	7	9	1	1	12	14	4	16	2	0	21	25
26	31	33	3		40	42		45	5		53	65
75	75 83 96				115	12	1	130	14	10	144	157
(8) Fo	rming	(opti	onal)	•								
	+ pitch (m			h (mm)	Kir	hk +	pitch (n	nm)				
	TB2			C3.3				K5				
	TB2.5			<u>C3.5</u>								
	`TB3.5			<u>C5</u>								
	TB5			C7								

RS, Professionally Approved Products, gives you professional quality parts across all products categories. Our range has



## LABEL

Electrolyti	c Capacitor
470	uF
50	V
500	pcs
105°C	RoHS
TAIWAN	COMPLIANT
	470 50 <u>500</u>

# Lot No : <u>8 070313</u>-<u>000314</u>

# DATE LOT NO.