

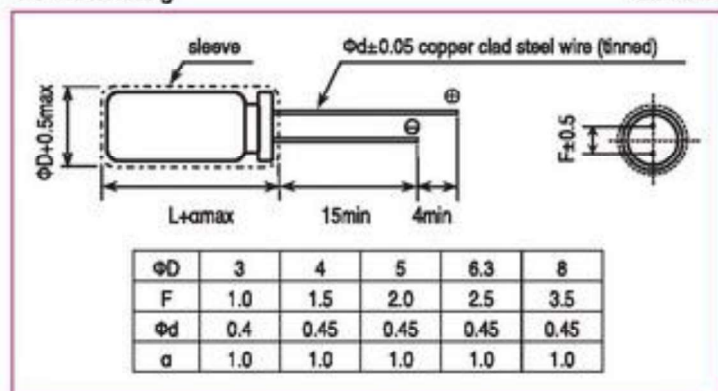
KC3 Miniature Aluminum Electrolytic Capacitors

5mm L, Standard Capacitors, Series KC3.

Diameters from $\Phi 3$ to $\Phi 8$ mm and a height of 5mm

Outline Drawing

Unit: mm



Photo



Marking color: white print on black sleeve

Specifications

No.	Item	Performance									
1	Temperature range (°C)	-40 to +85									
2	Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Rated Capacitance (μF); V: Rated voltage (V) 20°C									
3	Capacitance tolerance (%)	±20 (20°C,120Hz)									
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	20°C,120Hz	
		Tan δ (max)	0.35	0.24	0.20	0.16	0.14	0.12	0.10		
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	120Hz	
		Impedance ratio (max)	Z _(-25°C) /Z _(+20°C)	7	4	3	2	2	2		2
			Z _(-40°C) /Z _(+20°C)	15	8	6	4	4	3		3
6	Endurance (85°C) (Applied ripple current)	Test time	1000hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
7	Shelf life (85°C)	Test time	500hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
8	Applicable standards	JIS-C-5102 and JIS-C-5141									

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	1K	10K ~ 100K
Rated voltage (V)				
4 to 16	0.80	1.00	1.10	1.20
25 to 35	0.80	1.00	1.50	1.70
50	0.80	1.00	1.80	1.90

Coefficient of Temperature for Ripple Current

Temperature (°C)	45	50	70	85
Coefficient	1.80	1.50	1.30	1.00

KC3 Miniature Aluminum Electrolytic Capacitors

Dimension: Φ D $\times$ L(mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

VDC Contents μ F	4V		6.3V		10V		16V		25V		35V		50V	
	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA
0.1													4X5(3X5)	1(1)
0.22													4X5(3X5)	2(2)
0.33													4X5(3X5)	3(2.8)
0.47													4X5(3X5)	5(4)
1													4X5(3X5)	8.7(7)
2.2											4X5(3X5)	8.7(7)	4X5	10
3.3									4X5(3X5)	11(10)	4X5	12	4X5	13
4.7							4X5(3X5)	14(11)	4X5	14	4X5	17	5X5	20
10					4X5(3X5)	17(13)	4X5	23	5X5	27	5X5	27	6.3X5	31
22			4X5	22	5X5	30	4X5	35	6.3X5	42	6.3X5	46	6.3X5	46
33	4X5	27	4X5	34	5X5	41	5X5	49	6.3X5	52	6.3X5	52	8X5	66
47	4X5	34	5X5	37	6.3X5	50	6.3X5	58	6.3X5	58	8X5	72		
100	5X5	55	6.3X5	62	6.3X5	70	8X5	99	8X5	99				
220	6.3X5	74	8X5	104	8X5	120								
330	8X5	142	8X5	145										

Ultra-miniature Type

K3S Miniature Aluminum Electrolytic Capacitors

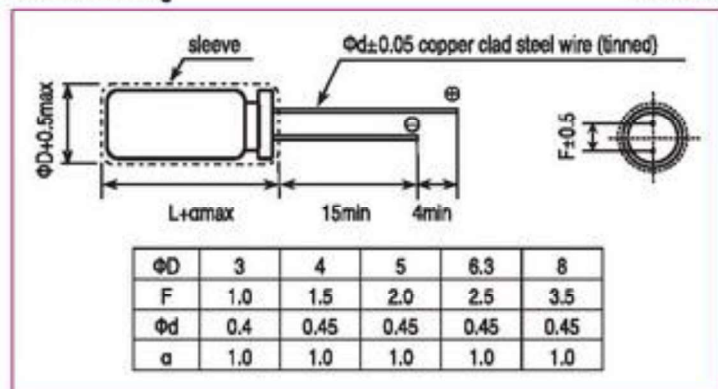
5mm L, 105°C Use Capacitors, Series K3S.

Diameters from $\Phi 3$ to $\Phi 8$ mm and a height of 5mm

Guaranteed 1000 hours at 105°C

Outline Drawing

Unit: mm



Photo

RoHS



Marking color: black print on yellow sleeve

Specifications

No.	Item	Performance									
1	Temperature range (°C)	-55 to +105									
2	Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Rated Capacitance(μF); V: Rated voltage(V) 20°C									
3	Capacitance tolerance (%)	±20 (20°C, 120Hz)									
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	20°C, 120Hz	
		Tan δ (max)	0.35	0.28	0.24	0.20	0.14	0.12	0.10		
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	120Hz	
		Impedance ratio (max)	$Z_{(-25^{\circ}\text{C})}/Z_{(+20^{\circ}\text{C})}$	7	4	3	2	2	2		2
			$Z_{(-40^{\circ}\text{C})}/Z_{(+20^{\circ}\text{C})}$	15	8	6	4	4	3		3
6	Endurance (105°C) (Applied ripple current)	Test time	1000hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
7	Shelf life (105°C)	Test time	500hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
8	Applicable standards	JIS-C-5102 and JIS-C-5141									

Coefficient of Frequency for Ripple Current

Rated voltage (v)	50* 60	120	1K	10K* 100K
4 to 16	0.80	1.00	1.15	1.25
25 to 35	0.80	1.00	1.25	1.41
50	0.80	1.00	1.35	1.50

Coefficient of Temperature for Ripple Current

Temperature	60	85	105
Coefficient	1.90	1.40	1.00

K3S Miniature Aluminum Electrolytic Capacitors

Dimension: Φ D $\times$ L(mm)

Ripple Current: mA/rms at 120Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC μ F	4V		6.3V		10V		16V		25V		35V		50V	
	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA
0.1													4X5(3X5)	1.0
0.22													4X5(3X5)	2.6
0.33													4X5(3X5)	3.2
0.47													4X5(3X5)	3.8
1													4X5(3X5)	6.2
2.2									3X5	7.5	4X5	8.7	4X5	10
3.3									4X5	11	4X5	12	4X5	13
4.7					4X5	13	4X5	14	4X5	15	4X5	17	5X5	20
10			4X5	18	4X5	14	4X5	23	5X5	27	5X5	27	6.3X5	31
22	4X5	20	4X5	21	5X5	27	5X5	30	6.3X5	42	6.3X5	46	6.3X5	46
33	4X5(5X5)	27	5X5	30	5X5	34	6.3X5	40	6.3X5	52	6.3X5	52	8X5	55
47	4X5(5X5)	34	5X5	36	6.3X5	43	6.3X5	48	6.3X5	58	8X5	68		
100	5X5(6.3X5)	50	6.3X5	56	6.3X5	70	8X5	80	8X5	85				
220	6.3X5	74	8X5	80	8X5	95								

Ultra-miniature Type

K3N Miniature Aluminum Electrolytic Capacitors

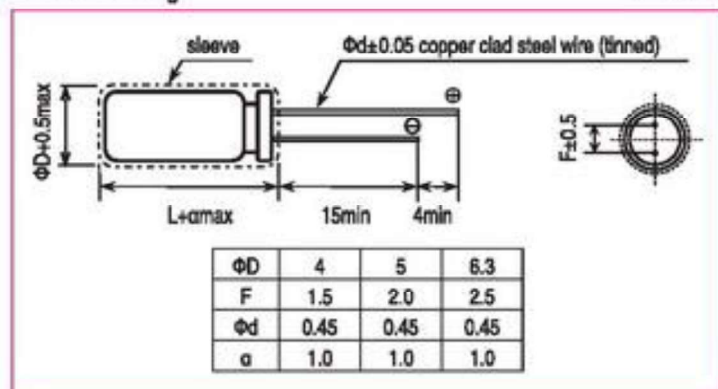
5mm L, Non-polar Miniature Capacitors, Series K3N.

Diameters from $\Phi 4$ to $\Phi 6.3$ mm and a height of 5mm

Guaranteed 1000 hours at 85°C

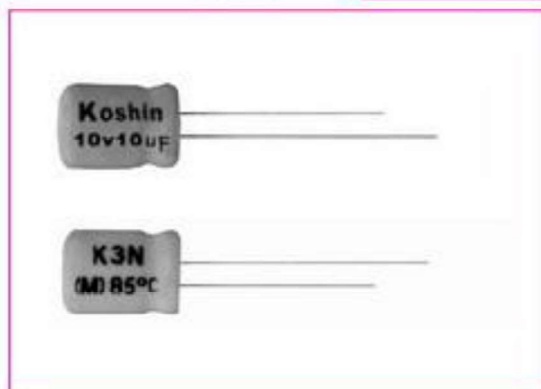
Outline: Drawing

Unit: mm



Photo

RoHS



Making color: black print on red sleeve

Specifications

No.	Item	Performance									
1	Temperature range (°C)	-40 to +85									
2	Leakage current (μ A)	Less than 0.03CV or 5 whichever is larger (after five minutes) C: Rated Capacitance(μ F); V: Rated voltage(V) 20°C									
3	Capacitance tolerance (%)	±20 (20°C, 120Hz)									
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)		4	6.3	10	16	25	35	50	20°C, 120Hz
		Tan δ (max)		0.35	0.24	0.20	0.16	0.16	0.14	0.12	
5	Stability at Low Temperature	Rated voltage (V)		4	6.3	10	16	25	35	50	120Hz
		Impedance ratio (max)	Z _(-25℃) /Z _(+20℃)	7	4	3	2	2	2	2	
			Z _(-40℃) /Z _(+20℃)	15	8	6	4	4	3	3	
6	Endurance (85°C) (Applied ripple current)	Test time			1000hours (with the polarity inverted every 250 hrs)						
		Leakage current			The initial specified value or less						
		Percentage of capacitance change			Within ±20% of initial value						
		Tangent of the loss angle			200% or less of the initial specified value						
7	Shelf life (85°C)	Test time			500hours						
		Leakage current			The initial specified value or less						
		Percentage of capacitance change			Within ±20% of initial value						
		Tangent of the loss angle			200% or less of the initial specified value						
8	Applicable standards	JIS-C-5102 and JIS-C- 5141									

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 - 60	120	1K	10K - 100K
Rated voltage (v)				
4 to 50	0.80	1.00	1.30	1.45

Coefficient of Temperature for Ripple Current

Temperature(°C)	50 or less	60	70	85
Coefficient	1.80	1.70	1.60	1.00

K3N Miniature Aluminum Electrolytic Capacitors

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

μ F	V.DC Contents	4V		6.3V		10V		16V		25V		35V		50V	
		Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA
0.1														4X5	1.9
0.22														4X5	2.9
0.33														4X5	3.5
0.47														4X5	4.2
1												4X5	5.5	4X5	6.1
2.2										4X5	8	4X5	9.1	5X5	10
3.3								4X5	9	4X5	10	5X5	12	5X5	13
4.7						4X5	11	4X5	12	5X5	14	5X5	15	6.3X5	16
10		4X5	19	4X5	15	5X5	19	5X5	21	6.3X5	22	6.3X5	24		
22		5X5	23	5X5	26	6.3X5	31	6.3X5	33						
33		6.3X5	30	6.3X5	36	6.3X5	38								
47		6.3X5	36	6.3X5	41										

Ultra-miniature Type

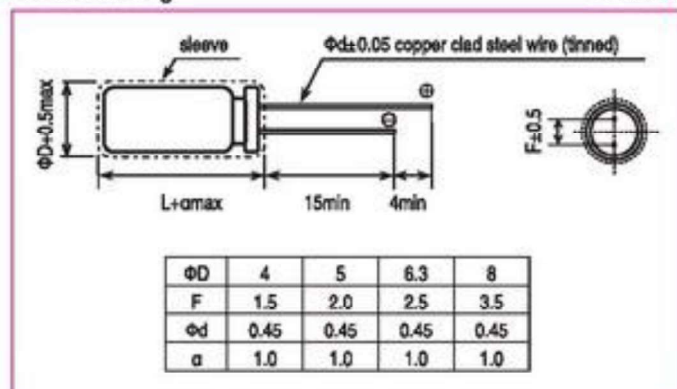
KCL Miniature Aluminum Electrolytic Capacitors

5mm L, Standard Capacitors, Low Leakage current, 85℃, Series KCL.

Diameters from $\Phi 4$ to $\Phi 8$ and a height of 5mm

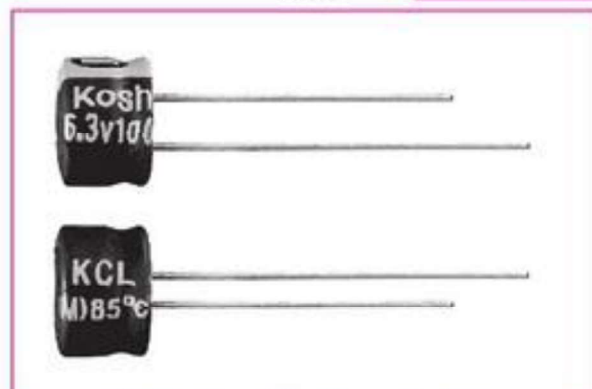
Outline Drawing

Unit: mm



Photo

RoHS



Marking color: white print on purple sleeve

Specifications

No.	Item	Performance									
1	Temperature range (°C)	-40 to +85									
2	Leakage current (μ A)	Less than 0.002CV or 0.4 whichever is larger (after two minutes) C: Rated Capacitance (μ F); V: Rated voltage (V) 20°C									
3	Capacitance tolerance (%)	±20 (20°C,120Hz)									
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	20°C,120Hz	
		Tan δ (max)	0.35	0.24	0.20	0.16	0.14	0.12	0.10		
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	120Hz	
		Impedance ratio (max)	Z _{(-25℃)/Z_(+20℃)}	7	4	3	2	2	2		2
		Z _{(-40℃)/Z_(+20℃)}	15	8	6	4	4	3	3		
6	Endurance (85°C) (Applied ripple current)	Test time	1000hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
7	Shelf life (85°C)	Test time	500hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
8	Applicable standards	JIS-C-5102 and JIS-C-5141									

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	1K	10K~
Capacitance (μF)				
CAP ≤ 47	0.80	1.00	1.30	1.50
47 < CAP	0.80	1.00	1.15	1.20

Coefficient of Temperature for Ripple Current

Temperature (℃)	45	50	70	85
Coefficient	1.80	1.50	1.30	1.00

KCL Miniature Aluminum Electrolytic Capacitors

Dimension: $\Phi \times D \times L$ (mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents μF	4V		6.3V		10V		16V		25V		35V		50V	
	$\Phi \times D \times L$	mA	$\Phi \times D \times L$	mA	$\Phi \times D \times L$	mA	$\Phi \times D \times L$	mA	$\Phi \times D \times L$	mA	$\Phi \times D \times L$	mA	$\Phi \times D \times L$	mA
0.1													4X5	1.0
0.22													4X5	2.0
0.33													4X5	2.8
0.47													4X5	4.0
1													4X5	8.4
2.2													4X5	13
3.3													5X5	17
4.7									4X5	16	4X5	18	5X5	20
10							4X5	25	5X5	27	5X5	29	6.3X5	33
22			4X5	28	4X5	32	5X5	37	6.3X5	42	6.3X5	46	8X5	60
33	5X5	28	5X5	37	5X5	41	6.3X5	49	6.3X5	52				
47	5X5	33	5X5	45	6.3X5	52	6.3X5	58						
100	6.3X5	56	6.3X5	70										

Ultra-miniature Type

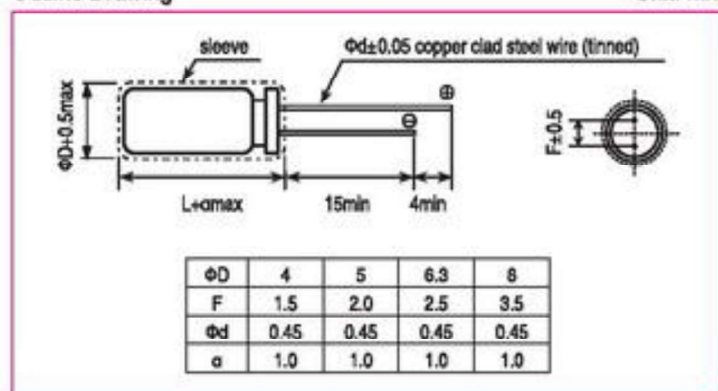
KR2 Miniature Aluminum Electrolytic Capacitors

7mm L, Miniature Capacitors, Series KR2 .

Conventional KR2 is further reduced in size
Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm
Guaranteed 1000 hours at 85°C

Outline Drawing

Unit: mm



Photo

RoHS



Marking color: black print on blue sleeve

Specifications

No.	Item	Performance										
1	Temperature range (°C)	-40 to +85										
2	Leakage current (μ A)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Rated Capacitance(μ F); V: Rated voltage(V) 20℃										
3	Capacitance tolerance (%)	±20 (20℃,120Hz)										
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	63	100	20℃,120Hz
		Tan δ (max)	0.35	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	63	100	120Hz
		Impedance ratio (max)	6	4	3	2	2	2	2	2	2	
		$Z_{(-25^{\circ}C)}/Z_{(+20^{\circ}C)}$	16	10	8	6	3	3	3	3	3	
6	Endurance (85℃) (Applied ripple current)	Test time	1000hours									
		Leakage current	The initial specified value or less									
		Percentage of capacitance change	Within ±20% of initial value									
		Tangent of the loss angle	200% or less of the initial specified value									
7	Shelf life (85℃)	Test time	500hours									
		Leakage current	The initial specified value or less									
		Percentage of capacitance change	Within ±20% of initial value									
		Tangent of the loss angle	200% or less of the initial specified value									
8	Applicable standards	JIS-C-5102 and JIS-C-5141										

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	1K	10K ~ 100K
Rated voltage (V)				
4 to 16	0.80	1.00	1.10	1.20
25 to 35	0.80	1.00	1.50	1.70
50 to 100	0.80	1.00	1.60	1.90

Coefficient of Temperature for Ripple Current

Temperature (°C)	70 or less	85
Coefficient	1.35	1.00

KR2 Miniature Aluminum Electrolytic Capacitors

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents μ F	4V		6.3V		10V		16V		25V	
	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA
0.1									4X7	2
0.22									4X7	3
0.33									4X7	4.4
0.47									4X7	7.9
1									4X7	11
2.2									4X7	17
3.3									4X7	20
4.7									4X7	22
10							4X7	28	4X7	30
22			4X7	33	4X7	35	5X7*	42	5X7*	50
33	4X7	33	4X7	40	4X7	43	5X7	55	6.3X7	58
47	4X7	38	4X7	42	5X7*	58	6.3X7*	68	6.3X7	71
100	5X7	61	6.3X7*	78	6.3X7	90	6.3X7	92	8X7	125
220	6.3X7	95	6.3X7	120	8X7	140	8X7	146		
330	8X7	154	8X7	160	8X7	165				
470	8X7	160								

Ultra-miniature Type

V.DC Contents μ F	35V		50V		63V		100V	
	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA
0.1			4X7	2	4X7	2		
0.22			4X7	3	4X7	3		
0.33			4X7	4	4X7	4.4		
0.47			4X7	5	4X7	7.9		
1			4X7	10	4X7	11	4X7	12
2.2			4X7	15	4X7	17	5X7	20
3.3			4X7	18	4X7	21	6.3X7	30
4.7	4X7	22	5X7*	26	5X7	26	6.3X7	35
10	5X7*	33	6.3X7*	38	6.3X7	40		
22	6.3X7	55	6.3X7	59	8X7	70		
33	8X7*	71	8X7*	76				
47	8X7	83	8X7	88				

Note: Case size in mark of "*" is available to product down size.

KRJ Miniature Aluminum Electrolytic Capacitors

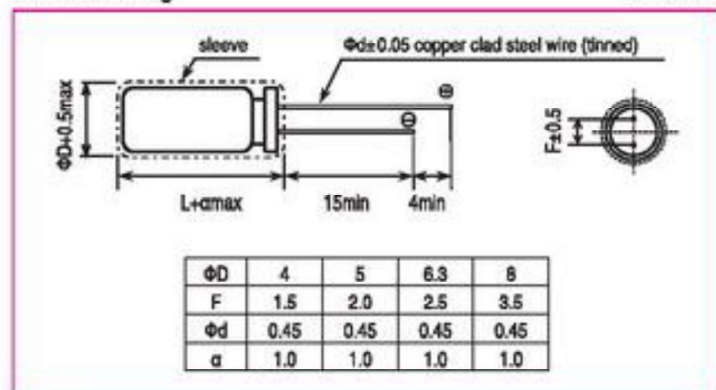
7mm L, 105°C Miniature Capacitors, Series KRJ.

Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm

Guaranteed 1000 hours at 105°C

Outline Drawing

Unit: mm



Photo

RoHS



Marking color: black print on yellow sleeve

Specifications

No.	Item	Performance									
1	Temperature range (°C)	-55 to +105									
2	Leakage current (μ A)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Rated Capacitance(μ F); V: Rated voltage(V) 20℃									
3	Capacitance tolerance (%)	±20 (20℃,120Hz)									
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	63	20℃,120Hz
		Tan δ (max)	0.35	0.22	0.19	0.16	0.14	0.12	0.10	0.09	
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	63	120Hz
		Impedance ratio $Z_{(-25℃)}/Z_{(+20℃)}$	7	4	3	2	2	2	2	2	
		Impedance ratio (max) $Z_{(-40℃)}/Z_{(+20℃)}$	15	8	6	4	4	3	3	3	
6	Endurance (105℃) (Applied ripple current)	Test time	1000hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
7	Max.Storage temp (105℃)	Test time	500hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
8	Applicable standards	JIS-C-5102 and JIS-C-5141									

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	1K	10K ~ 100K
Rated voltage (v)				
4 to 16	0.95	1.00	1.28	1.39
25 to 35	0.76	1.00	1.27	1.59
50 to 63	0.90	1.00	1.40	2.00

Coefficient of Temperature for Ripple Current

Temperature(°C)	70 or less	85	105
Coefficient	2.10	1.80	1.00

KRJ Miniature Aluminum Electrolytic Capacitors

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC μ F	4V		6.3V		10V		16V		25V		35V		50V		63V	
	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA
0.1													4X7	2	4X7	2
0.22													4X7	3	4X7	3
0.33													4X7	4	4X7	4.4
0.47													4X7	5	4X7	7.9
1													4X7	10	4X7	11
2.2													4X7	15	4X7	17
3.3													4X7	18	4X7	21
4.7											4X7	22	5X7*	23	5X7	26
10							4X7	25	4X7	26	5X7*	30	6.3X7*	34	6.3X7	40
22			4X7	31	4X7	32	5X7*	39	5X7*	41	6.3X7	47	6.3X7	53	8X7	70
33	4X7	32	4X7	32	4X7	35	5X7	43	6.3X7	53	8X7*	71	8X7	76		
47	4X7	38	4X7	38	5X7*	47	6.3X7*	59	6.3X7	65	8X7	83	8X7	85		
100	5X7	61	6.3X7*	75	6.3X7	80	6.3X7	90	8X7	125						
220	6.3X7	90	6.3X7	99	8X7	140	8X7	146								
330	8X7	156	8X7	156												

Note: Case size in mark of *** is available to product down size.

Ultra-miniature Type

KRN Miniature Aluminum Electrolytic Capacitors

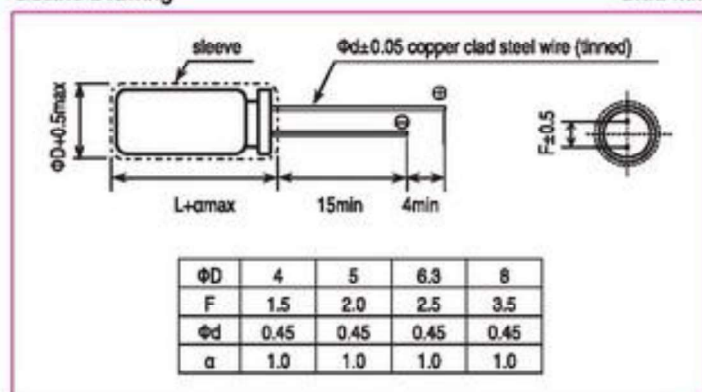
7mm L, Non-polar Microminiature Capacitors, Series KRN.

Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm

Guaranteed 1000 hours at 85°C

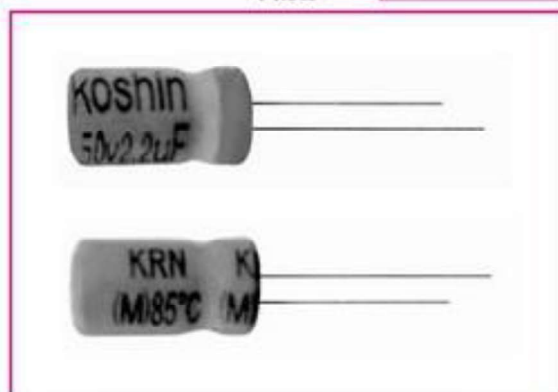
Outline Drawing

Unit: mm



Photo

RoHS



Marking color: black print on red sleeve

Specifications

No.	Item	Performance											
1	Temperature range (°C)	-40 to +85											
2	Leakage current (μ A)	Less than 0.03CV or 3 whichever is larger(after five minutes) C: Rated Capacitance(μ F); V: Rated voltage(V) 20℃											
3	Capacitance tolerance (%)	±20 (20℃,120Hz)											
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)		4	6.3	10	16	25	35	50	63	20℃,120Hz	
		Tan δ (max)		0.35	0.24	0.20	0.16	0.15	0.14	0.12	0.09		
5	Low temperature characteristics	Rated voltage(V)		4	6.3	10	16	25	35	50	63	120Hz	
		Impedance ratio (max)	Z _{(-25℃)/Z_(+20℃)}		7	4	3	2	2	2	2		2
			Z _{(-40℃)/Z_(+20℃)}		15	8	6	4	4	3	3		3
6	Endurance (85℃) (Applied ripple current)	Test time		1000hours (with the polarity inverted every 250 hrs)									
		Leakage current		The initial specified value or less									
		Percentage of capacitance change		Within ±20% of initial value									
		Tangent of the loss angle		200% or less of the initial specified value									
7	Shelf life (85℃)	Test time		500hours									
		Leakage current		The initial specified value or less									
		Percentage of capacitance change		Within ±20% of initial value									
		Tangent of the loss angle		200% or less of the initial specified value									
8	Applicable standards	JIS-C-5102 and JIS-C-5141											

Coefficient of Frequency for Ripple Current

Rated voltage (v)	Frequency (Hz)	50 ~ 60	120	1K	10K ~ 100K
4 to 16		0.80	1.00	1.10	1.20
25 to 35		0.80	1.00	1.50	1.70
50 to 63		0.80	1.00	1.60	1.90

Coefficient of Temperature for Ripple Current

Temperature(°C)	45	60	70	85
Coefficient	1.80	1.50	1.30	1.00

KRN Miniature Aluminum Electrolytic Capacitors

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC μ F	4V		6.3V		10V		16V		25V		35V		50V		63V	
	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA
0.1													4X7	2.1	4X7	2.6
0.22													4X7	4.5	4X7	5.0
0.33													4X7	5.6	4X7	6.1
0.47													4X7	6.6	4X7	7.3
1													4X7	9.7	4X7	10
2.2											4X7	13	4X7	14	5X7	16
3.3									4X7	15	5X7	16	5X7	18	6.3X7	20
4.7							4X7	18	5X7	18	5X7	20	6.3X7	22	8X7	24
10					4X7	23	5X7	27	6.3X7	28	8X7	30				
22			5X7	40	5X7	40	6.3X7	45	8X7	52						
33	5X7	40	5X7	40	6.3X7	45	8X7	52								
47	6.3X7	45	6.3X7	49	8X7	55										
100	8X7	66														

Ultra-miniature Type

KLS Miniature Aluminum Electrolytic Capacitors

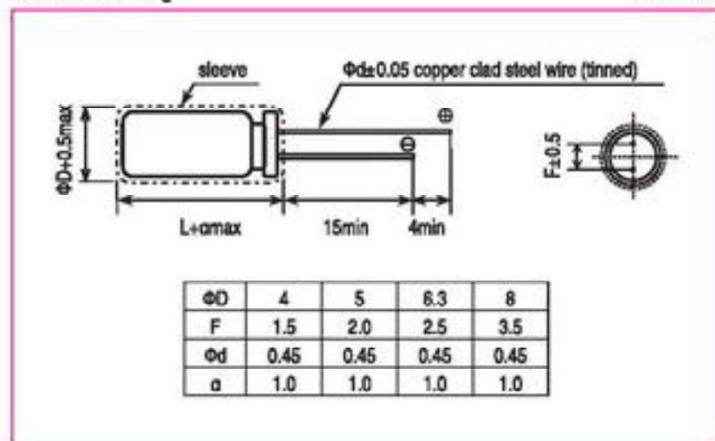
7mm L, 85°C Low Leakage Current Miniature Capacitors, Series KLS.

Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm

Guaranteed 1000 hours at 85°C

Outline Drawing

Unit: mm



Photo

RoHS



Marking color: black print on orange sleeve

Specifications

No.	Item	Performance									
1	Temperature range(°C)	-40 to + 85									
2	Leakage current (μ A)	Less than 0.002CV or 0.3 whichever is larger (after two minutes) C: Capacitance(μ F); V: Rated voltage(V) 20℃									
3	Capacitance tolerance (%)	±20 (20℃,120Hz)									
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	63	20℃,120Hz
		Tan δ (max)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.09	
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	63	120Hz
		Impedance ratio $Z_{(-25℃)}/Z_{(+20℃)}$	6	4	3	3	2	2	2	2	
		Impedance ratio (max) $Z_{(-40℃)}/Z_{(+20℃)}$	12	8	6	4	4	3	3	3	
6	Endurance (85℃) (Applied ripple current)	Test time	1000 hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
7	Shelf life (85℃)	Test time	500hours								
		Leakage current	The initial specified value or less								
		Percentage of capacitance change	Within ±20% of initial value								
		Tangent of the loss angle	200% or less of the initial specified value								
8	Applicable standards	JIS-C-5102 and JIS-C-5141									

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	1K	10K	100K
Capacitance (μF)					
CAP ≤ 47	0.70	1.00	1.20	1.30	1.45
CAP > 47	0.80	1.00	1.10	1.15	1.20

Coefficient of Temperature for Ripple Current

Temperature(°C)	45	60	70	85
Coefficient	1.80	1.50	1.30	1.00

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents μ F	4V		6.3V		10V		16V		25V		35V		50V		63V	
	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA
0.1													4X7	3	4X7	3
0.22													4X7	5	4X7	5
0.33													4X7	6	4X7	6
0.47													4X7	7	4X7	7
1													4X7	10	4X7	10
2.2													4X7	16	5X7	19
3.3											4X7	18	4X7	20	6.3X7	29
4.7									4X7	19	5X7	21	5X7	24	6.3X7	36
10							4X7	27	5X7	29	6.3X7	36	6.3X7	40		
22					4X7	36	4X7	40	6.3X7	47	6.3X7	53				
33	4X7	33	4X7	41	5X7	44	5X7	55	6.3X7	63	8X7	71				
47	4X7	39	5X7	49	6.3X7	54	6.3X7	62	8X7	74						
100	6.3X7	59	6.3X7*	75	8X7	90	8X7	110								

Ultra-miniature Type

KZL Miniature Aluminum Electrolytic Capacitors

7mm L, 105°C Low Leakage Current Miniature Capacitors, Series KZL

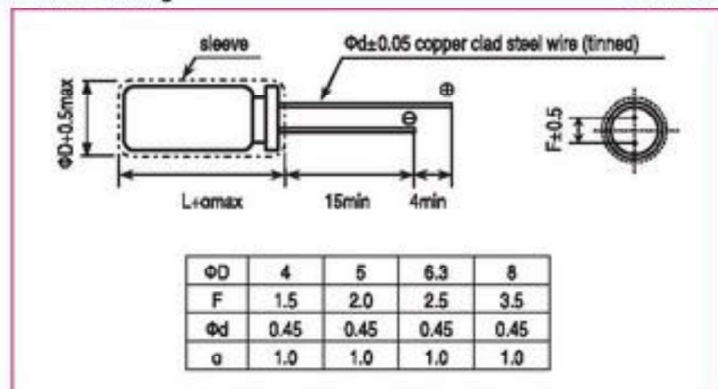
Diameters from $\Phi 4$ to $\Phi 8$ mm and a height of 7mm

Guaranteed 1000 hours at 105°C

RoHS

Outline Drawing

Unit: mm



Photo



Marking color: black print on orange sleeve

Specifications

No.	Item	Performance										
1	Temperature range (°C)	-40 to + 105										
2	Leakage current (μ A)	Less than 0.002CV or 0.3 whichever is larger (after two minutes) C: Capacitance(μ F); V: Rated voltage(V) 20℃										
3	Capacitance tolerance (%)	±20 (20℃,120Hz)										
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)		4	6.3	10	16	25	35	50	63	20℃,120Hz
		Tan δ (max)		0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.09	
5	Low temperature characteristics	Rated voltage (V)		4	6.3	10	16	25	35	50	63	120Hz
		Impedance ratio (max)	Z _(-25℃) /Z _(+20℃)		6	4	3	3	2	2	2	
			Z _(-40℃) /Z _(+20℃)		12	10	6	6	4	4	4	
6	Endurance (105℃) (Applied ripple current)	Test time			1000 hours							
		Leakage current			The initial specified value or less							
		Percentage of capacitance change			Within ±20% of initial value							
		Tangent of the loss angle			200% or less of the initial specified value							
7	Shelf life (105℃)	Test time			500hours							
		Leakage current			The initial specified value or less							
		Percentage of capacitance change			Within ±20% of initial value							
		Tangent of the loss angle			200% or less of the initial specified value							
8	Applicable standards	JIS-C-5102 and JIS-C-5141										

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	1K	10K	100K
Capacitance (μF)					
CAP ≤ 47	0.70	1.00	1.20	1.30	1.45
CAP > 47	0.80	1.00	1.10	1.15	1.20

Coefficient of Temperature for Ripple Current

Temperature(°C)	70 or less	85	105
Coefficient	2.10	1.80	1.00

KZL Miniature Aluminum Electrolytic Capacitors

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC μ F	4V		6.3V		10V		16V		25V		35V		50V		63V	
	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA
0.1													4X7	3	4X7	3
0.22													4X7	5	4X7	5
0.33													4X7	6	4X7	6
0.47													4X7	7	4X7	7
1													4X7	10	4X7	10
2.2													4X7	16	5X7	19
3.3											4X7	18	4X7	20	6.3X7	29
4.7									4X7	19	5X7	21	6.3X7	24	6.3X7	36
10							4X7	27	5X7	29	6.3X7	32	8X7	40		
22					4X7	36	4X7	40	6.3X7	44	6.3X7	49				
33	4X7	33	4X7	41	5X7	44	5X7	50	6.3X7	55	8X7	67				
47	4X7	39	5X7	49	6.3X7	54	6.3X7	62	8X7	74						
100	6.3X7	59	6.3X7	75	8X7	90										

Ultra-miniature Type

KSH Miniature Aluminum Electrolytic Capacitors

7mm L, 105°C High-Reliability, Low Impedance Capacitors, Series KSH.

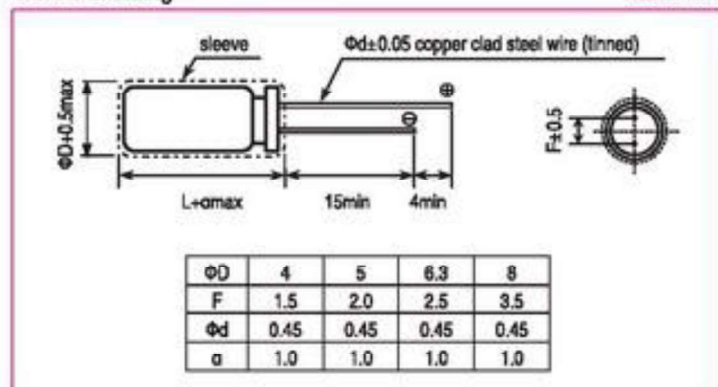
Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm

Guaranteed 1000 hours at 105°C

RoHS

Outline Drawing

Unit: mm



Photo



Marking color: White print on deep green sleeve

Specifications

No.	Item	Performance							
1	Temperature range (°C)	-40 to +105							
2	Leakage current (μ A)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Capacitance (μ F);V: Rated voltage (V) 20°C							
3	Capacitance tolerance (%)	±20 (20°C 120Hz)							
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	6.3	10	16	25	35	20°C,120Hz	
		Tan δ (max)	0.18	0.16	0.14	0.12	0.12		
5	Low temperature characteristics	Rated voltage (V)	6.3	10	16	25	35	120Hz	
		Impedance ratio (max)	Z _{(-25℃)/Z_(+20℃)}	2	2	2	2		2
			Z _{(-40℃)/Z_(+20℃)}	3	3	3	3		3
6	Endurance (105°C) (Applied ripple current)	Test time	1000hours						
		Leakage current	The initial specified value or less						
		Percentage of capacitance change	Within ±20% of initial value						
		Tangent of the loss angle	200% or less of the initial specified value						
7	Shelf life (105°C)	Test time	500hours						
		Leakage current	The initial specified value or less						
		Percentage of capacitance change	Within of initial value						
		Tangent of the loss angle	200% or less of the initial specified value						
8	Applicable standards	JIS-C-5102 and JIS-C-5141							

Coefficient of Frequency for Ripple Current

Capacitance (μF)	Frequency (Hz)	120	1K	10K	100K
CAP ≤ 47		0.50	0.76	0.87	1.00
47 < CAP ≤ 220		0.70	0.85	0.90	1.00

Coefficient of Temperature for Ripple Current

Temperature (°C)	60	70	85	105
Coefficient	1.80	1.50	1.30	1.00

KSH Miniature Aluminum Electrolytic Capacitors

Dimension: $\Phi \times D \times L$ (mm)

Ripple Current: mA/rms at 100KHz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents μF	6.3V			10V			16V		
	$\Phi \times D \times L$	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms, 105°C)	$\Phi \times D \times L$	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms, 105°C)	$\Phi \times D \times L$	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms, 105°C)
6.8							4X7	3.30	70
10							4X7	3.30	70
15							4X7	3.30	70
22				4X7	3.30	70	5X7	1.70	110
33	5X7	1.70	110	5X7	1.70	110	6.3X7	0.80	160
47	5X7	1.70	110	6.3X7	0.80	160	6.3X7	0.80	160
68	6.3X7	0.80	160	6.3X7	0.80	160	8X7	0.50	200
100	6.3X7	0.80	160	8X7	0.50	200	8X7	0.50	200
150	8X7	0.50	200	8X7	0.50	200			
220	8X7	0.50	200						

V.DC Contents μF	25V			35V		
	$\Phi \times D \times L$	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms, 105°C)	$\Phi \times D \times L$	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms, 105°C)
6.8				4X7	3.30	70
10	4X7	3.30	70	5X7	1.70	110
15	5X7	1.70	110	6.3X7	0.80	160
22	5X7	1.70	110	6.3X7	0.80	160
33	6.3X7	0.80	160	8X7	0.50	200
47	8X7	0.50	160			
68	8X7	0.50	200			

Ultra-miniature Type

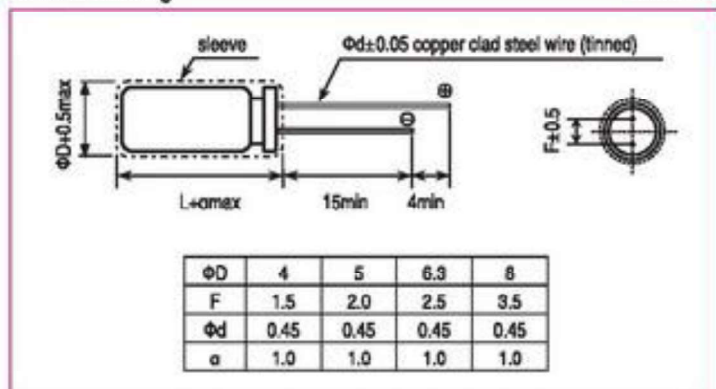
KSJ Miniature Aluminum Electrolytic Capacitors

7mm L, 85°C, Long Life, Series KSJ.

Conventional KSJ is further reduced in size
Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm
Guaranteed 2000 hours at 85°C

Outline Drawing

Unit: mm



Photo

RoHS



Marking color: white print on gray sleeve

Specifications

No.	Item	Performance										
1	Temperature range (°C)	-40 to +85										
2	Leakage current (μ A)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Rated Capacitance(μ F); V: Rated voltage(V) 20°C										
3	Capacitance tolerance (%)	±20 (20°C,120Hz)										
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	4	6.3	10	16	25	35	50	63	20°C,120Hz	
		Tan δ (max)	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.09		
5	Low temperature characteristics	Rated voltage (V)	4	6.3	10	16	25	35	50	63	120Hz	
		Impedance ratio (max)	$Z_{(-25^{\circ}\text{C})}/Z_{(+20^{\circ}\text{C})}$	7	4	3	2	2	2	2		2
		$Z_{(-40^{\circ}\text{C})}/Z_{(+20^{\circ}\text{C})}$	15	8	6	4	4	3	3	3		
6	Endurance (85°C) (Applied ripple current)	Test time	2000hours									
		Leakage current	The initial specified value or less									
		Percentage of capacitance change	Within ±20% of initial value									
		Tangent of the loss angle	200% or less of the initial specified value									
7	Shelf life (85°C)	Test time	1000hours									
		Leakage current	The initial specified value or less									
		Percentage of capacitance change	Within ±20% of initial value									
		Tangent of the loss angle	200% or less of the initial specified value									
8	Applicable standards	JIS-C-5102 and JIS-C-5141										

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 ~ 60	120	400	1K	50K ~ 100K
CAP ≤ 10	0.80	1.00	1.30	1.45	1.70
10 < CAP ≤ 100	0.80	1.00	1.23	1.36	1.53
100 < CAP	0.80	1.00	1.16	1.25	1.38

Coefficient of Temperature for Ripple Current

Temperature (°C)	45 or less	60	70	85
Coefficient	1.80	1.50	1.35	1.00

Dimension: Φ D $\times$ L(mm)

Ripple Current: mA/rms at 120Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

μ F	V.DC Contents	4V		6.3V		10V		16V		25V	
		Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA
4.7										4X7	17
10								4X7	30	4X7	30
										5X7	33
22		4X7	23	4X7	31	4X7	35	4X7	37	5X7	45
								5X7	42	6.3X7	48
33		4X7	26	4X7	32	4X7	40	4X7	45	5X7	52
				5X7	35	5X7	45	5X7	50	6.3X7	60
47		4X7	35	4X7	40	4X7	47	5X7	61	6.3X7	68
				5X7	47	5X7	51	6.3X7	67	8X7	72
68		5X7	55	5X7	55	5X7	60	6.3X7	72	6.3X7	75
						6.3X7	68				
100		5X7	58	5X7	65	5X7	80	6.3X7	95	8X7	115
				6.3X7	75	6.3X7	90	8X7	105		
220		6.3X7	65	6.3X7	90	6.3X7	105				
				8X7	120	8X7	150				
330		6.3X7	90	8X7	120						
470		8X7	120								

μ F	V.DC Contents	35V		50V		63V	
		Φ D $\times$ L	mA	Φ D $\times$ L	mA	Φ D $\times$ L	mA
0.1				4X7	1.5	4X7	1.5
0.22				4X7	2.5	4X7	2.5
0.33				4X7	3.5	4X7	3.5
0.47				4X7	5	4X7	6
1				4X7	10	4X7	12
2.2				4X7	19	4X7	19
3.3				4X7	24	4X7	25
4.7		4X7	22	4X7	27	5X7	29
				5X7	29	6.3X7	33
10		4X7	30	5X7	35	6.3X7	40
		5X7	35	6.3X7	38		
22		5X7	50	6.3X7	60	8X7	65
		6.3X7	58	8X7	63		
33		6.3X7	54	8X7	78		
		8X7	68				
47		8X7	80				
68		8X7	85				

KLJ Miniature Aluminum Electrolytic Capacitors

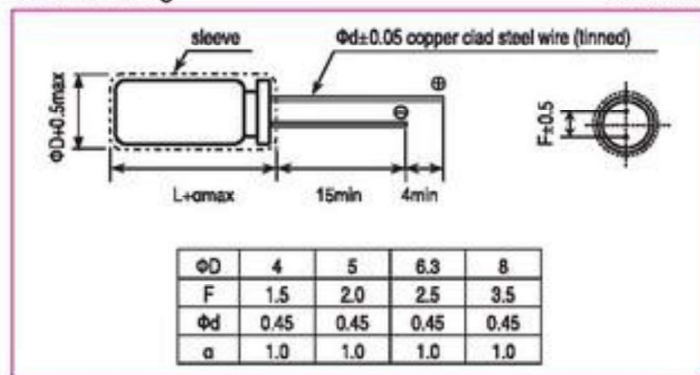
7mm L, 105°C Miniature Capacitors, Long Life, Series KLJ.

Diameter from $\Phi 4$ to $\Phi 8$ and height of 7mm

Guaranteed 2000 hours at 105°C

Outline Drawing

Unit: mm



Photo



Marking color: black print on purple sleeve

Specifications

No.	Item	Performance								
1	Temperature range (°C)	-40 to +105								
2	Leakage current (μ A)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Rated Capacitance(μ F); V: Rated voltage(V) 20℃								
3	Capacitance tolerance (%)	±20% (20℃,120Hz)								
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	6.3	10	16	25	35	50	63	20℃,120Hz
		Tan δ (max)	0.24	0.20	0.16	0.14	0.12	0.10	0.09	
5	Low temperature characteristics	Rated voltage (V)	6.3	10	16	25	35	50	63	120Hz
		Impedance ratio (max)	$Z_{(-25^{\circ}\text{C})}/Z_{(+20^{\circ}\text{C})}$	4	3	2	2	2	2	
		$Z_{(-40^{\circ}\text{C})}/Z_{(+20^{\circ}\text{C})}$	8	6	4	4	3	3	3	
6	Endurance (105℃) (Applied ripple current)	Test time	2000hours							
		Leakage current	The initial specified value or less							
		Percentage of capacitance change	Within ±20% of initial value							
		Tangent of the loss angle	200% or less of the initial specified value							
7	Max Storage temp (105℃)	Test time	1000hours							
		Leakage current	The initial specified value or less							
		Percentage of capacitance change	Within ±20% of initial value							
		Tangent of the loss angle	200% or less of the initial specified value							
8	Applicable standards	JIS-C-5102 and JIS-C-5141								

Coefficient of Frequency for Ripple Current

Frequency (Hz)	50 - 60	120	1K	10K	50K-100K
Capacitance (μF)					
CAP ≤ 100	0.80	1.00	1.45	1.65	1.70
100 < CAP ≤ 220	0.80	1.00	1.36	1.48	1.53

Coefficient of Temperature for Ripple Current

Temperature (°C)	45	60	70	85	105
Coefficient	2.10	1.90	1.65	1.40	1.00

Dimension: Φ DXL(mm)

Ripple Current: mA/rms at 120Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents μ F	6.3V		10V		16V		25V		35V		50V		63V	
	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA	Φ D×L	mA
0.1											4X7	1.5	4X7	1.5
0.22											4X7	2.5	4X7	2.5
0.33											4X7	3.5	4X7	3.5
0.47											4X7	5	4X7	6
1											4X7	10	4X7	12
2.2											4X7	20	4X7	20
3.3											4X7	26	5X7	28
4.7							4X7	17			4X7	27	5X7	29
											5X7	29	6.3X7	33
10					4X7	28	4X7	28	5X7	35	6.3X7	38	6.3X7	40
							5X7	33						
22	4X7	28	4X7	32	4X7	35	5X7	43						
					5X7	42	6.3X7	45	6.3X7	50	8X7	63	8X7	65
33	4X7	32	5X7	48	5X7	50	6.3X7	62	6.3X7	60	8X7	78		
	5X7	35							8X7	68				
47	5X7	47	5X7	51	6.3X7	67	8X7	75	8X7	80				
68	5X7	50	6.3X7	68	6.3X7	70	8X7	80	8X7	85				
					8X7	78								
100	6.3X7	75	6.3X7	80	8X7	110	8X7	115						
			8X7	95										
220	8X7	92	8X7	130										