

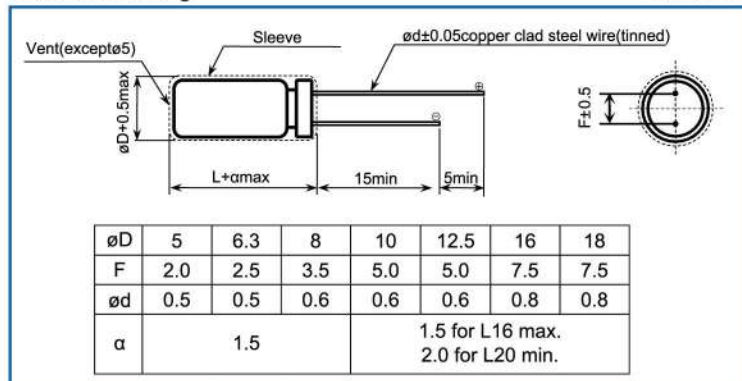
### 105°C Non-polar High Temperature Miniature Capacitors, Series KZB.

Guaranteed 2000 hours at 105°C

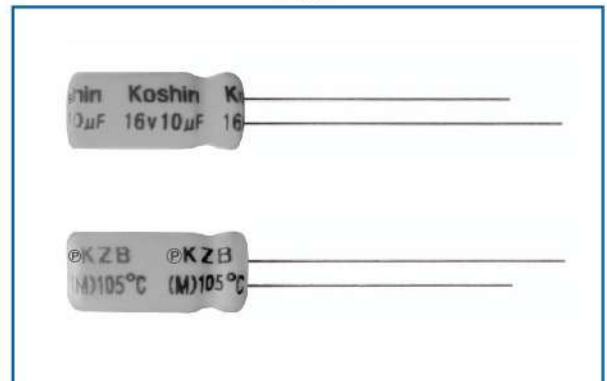
RoHS

#### Outline Drawing

Unit: mm



#### Photo



Making color: black print on red sleeve

#### Specifications

No.	Item	Performance											
1	Temperature range(°C)	-40 to +105											
2	Leakage current (µA)	Less than 0.03CV or 3 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)	6.3	10	16	25	35	50	63	100	160-250	20°C	
		Tan δ (max)	0.25	0.25	0.20	0.15	0.15	0.13	0.10	0.09	0.15	120Hz	
0.02 is added to each 1000µF increase over 1000µF.													
5	Low temperature characteristics	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160-200	250	120Hz
		Impedance ratio(max)	Z <sub>(-25°C)/Z<sub>(+20°C)</sub></sub>	4	3	3	2	2	2	2	2	2	
			Z <sub>(-40°C)/Z<sub>(+20°C)</sub></sub>	8	6	6	4	4	3	3	3	4	6
6	Endurance (105°C) (Applied ripple current)	Test time	2000hours (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 (105°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-5101-4(IEC60384)											

#### Coefficient of Frequency for Ripple Current

Capacitance ( µ F)	Frequency (Hz)	50 - 60	120	1K	10K - 100K
CAP ≤ 10		0.80	1.00	1.30	1.70
10 < CAP ≤ 100		0.80	1.00	1.23	1.53
100 < CAP ≤ 1000		0.80	1.00	1.16	1.38
1000 < CAP		0.80	1.00	1.11	1.28

#### 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:  $\Phi$ DXL(mm)  
Ripple Current: mA/rms at 120Hz, 105°C

### DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents $\mu$ F	6.3V		10V		16V		25V		35V		50V		63V		100V	
	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA
0.1											5X11	4	5X11	5	5X11	5
0.22											5X11	5	5X11	6	5X11	6
0.33											5X11	6	5X11	6	5X11	7
0.47											5X11	7	5X11	8	5X11	8
1											5X11	10	5X11	11	5X11	12
2.2											5X11	15	5X11	16	6.3X11	20
3.3											5X11	18	5X11	20	6.3X11	25
4.7									5X11	21	5X11	22	6.3X11	24	6.3X11	30
10					5X11	27	5X11	27	5X11	30	6.3X11	37	6.3X11	40	8X11.5	50
22	5X11	34	5X11	34	5X11	40	6.3X11	46	6.3X11.5	51	8X11.5	63	8X11.5	68	10X16	97
33	5X11	45	5X11	45	5X11	49	6.3X11	56	8X11.5	72	8X11.5	77	10X12.5	98	10X20	140
47	5X11	54	5X11	54	6.3X11	67	6.3X11	67	8X11.5	86	10X12.5	105	10X16	130	12.5X20	170
100	6.3X11	90	6.3X11	90	8X11.5	110	8X11.5	110	10X16	160	10X20	190	12.5X20	225	16X25	300
220	8X11.5	150	8X11.5	150	10X12.5	195	10X16	215	12.5X20	290	12.5X25	340	16X25	405	16X35.5	510
330	8X11.5	185	10X16	240	10X16	265	12.5X20	320	12.5X20	350	16X25	460	16X31.5	535		
470	10X12.5	260	10X16	290	10X20	345	12.5X25	380	12.5X25	465	16X31.5	590	18X35.5	680		
1000	10X20	460	12.5X20	510	12.5X25	605	16X25	670	16X31.5	805						
2200	12.5X25	820	16X25	940	16X31.5	1070	18X35.5	1140								

V.DC Contents $\mu$ F	160V		200V		250V	
	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA
0.47	5X11	8	6.3X11	9	6.3X11	10
1	6.3X11	11	8X11.5	12	8X11.5	13
2.2	8X11.5	18	8X11.5	22	10X12.5	26
3.3	8X11.5	26	10X12.5	30	10X16	37
4.7	10X12.5	31	10X16	37	10X20	50
10	10X16	60	10X20	66	10X20	79
22	12.5X20	117	12.5X20	117	12.5X25	138
33	12.5X20	143	12.5X25	158	16X25	169
47	16X25	188				



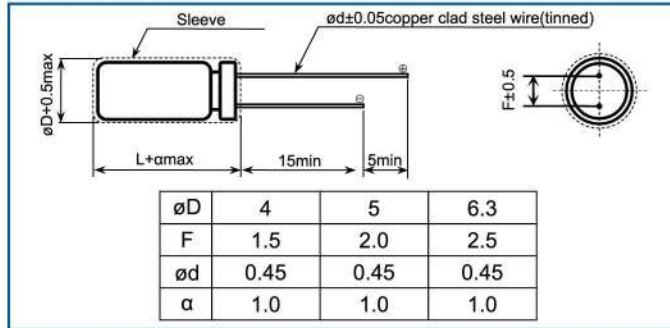
### 5mm L, Non-polar Miniature Capacitors, Series K3N.

Diameters from  $\Phi 4\text{mm}$  to  $\Phi 6.3\text{mm}$  and a height of 5mm  
Guaranteed 1000 hours at 85°C

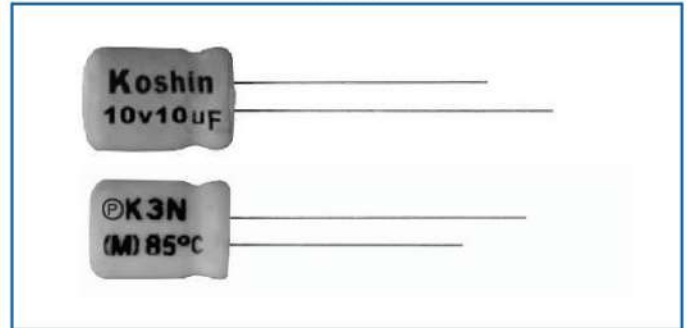
RoHS

Outline Drawing

Unit: mm



Photo



Making color: black print on red sleeve

### Specifications

No.	Item	Performance								
1	Temperature range(°C)	-40 to +85								
2	Leakage current (µA)	Less than 0.03CV or 5 whichever is larger (after five 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	0.16	0.14	0.12	
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	
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-5101-4(IEC60384)								

### Coefficient of Frequency for Ripple Current

Frequency (Hz)	Rated voltage (V)			
	50-60	120	1K	10K-100K
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



### DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:  $\Phi$ DXL(mm)  
Ripple Current: mA/rms at 120Hz, 85°C

V.DC Contents $\mu$ F	4V		6.3V		10V		16V		25V		35V		50V	
	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ D×L	mA	$\Phi$ D×L	mA	$\Phi$ DXL	mA	$\Phi$ DXL	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										



### Standard Bi-polar High Temperature Capacitors, Series KBP.

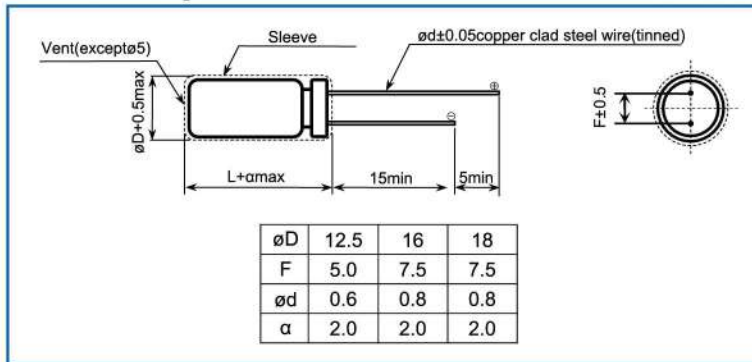
Guaranteed 2000 hours at 105°C

Suitable For Horizontal Deflection Current Correction of TV Sets

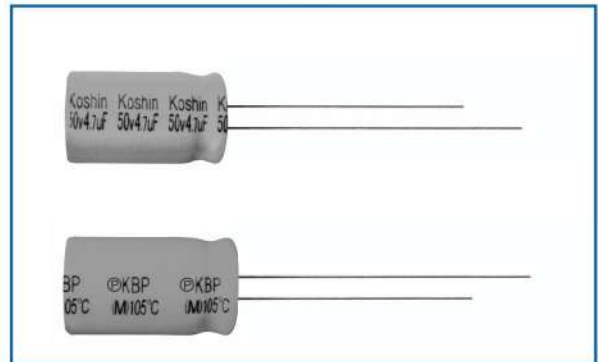
RoHS

Outline Drawing

Unit: mm



Photo



Making color: black print on red sleeve

### Specifications

No.	Item	Performance					
1	Temperature range(°C)	-40 to +105					
2	Leakage current (µA)	Less than 100 (after two minutes) C: Rated Capacitance(µF); V: Rated voltage(V) 20°C					
3	Capacitance tolerance (%)	±10 (20°C,120Hz)					
4	Tangent of the loss angle (Tan δ)	Rated voltage (V)	25	50	63	20°C, 120Hz	
		Tanδ(max)	0.05	0.05	0.05		
5	Low temperature characteristics	Rated voltage (V)	25	50	63	120Hz	
		Impedance ratio(max)	Z <sub>(-25°C)/Z<sub>(+20°C)</sub></sub>	2	2		2
			Z <sub>(-40°C)/Z<sub>(+20°C)</sub></sub>	4	4		4
6	Endurance (105°C) (Applied ripple current)	Test time	2000hours (with the polarity inverted every 250 hrs)				
		Leakage current	The initial specified value or less				
		Percentage of capacitance change	Within ± 15% of initial value				
		Tangent of the loss angle	200% or less of the initial specified value				
7	Shelf life (105°C)	Test time	1000hours				
		Leakage current	The initial specified value or less				
		Percentage of capacitance change	Within ± 15% of initial value				
		Tangent of the loss angle	200% or less of the initial specified value				
8	Applicable standards	JIS-C-5101-4(IEC60384)					

### Coefficient of Temperature for Ripple Current

Temperature(°C)	45	60	70	85	95	105
Coefficient	2.10	1.90	1.65	1.40	1.25	1.00



Dimension:  $\Phi$ DXL(mm)  
Ripple Current(A<sub>p-p</sub>) 15.75KHz, at 105°C

### DIMENSION & PERMISSIBLE RIPPLE CURRENT

V.DC Contents $\mu$ F	25V		50V		63V	
	$\Phi$ DXL	A <sub>p-p</sub>	$\Phi$ DXL	A <sub>p-p</sub>	$\Phi$ DXL	A <sub>p-p</sub>
2.2	12.5X25	3.4	12.5X25	3.4	12.5X25	3.4
3.3	16X25	4.1	16X25	4.1	16X25	4.1
4.7	16X31.5	4.5	16X31.5	4.5	16X31.5	4.5
6.8	16X35.5	4.6	16X35.5	4.6	16X35.5	4.6
10	18X35.5	4.9	18X35.5	4.9	18X35.5	4.9
12	18X40	5.0	18X40	5.0	18X40	5.0
15	18X40	5.4	18X40	5.4	18X40	5.4



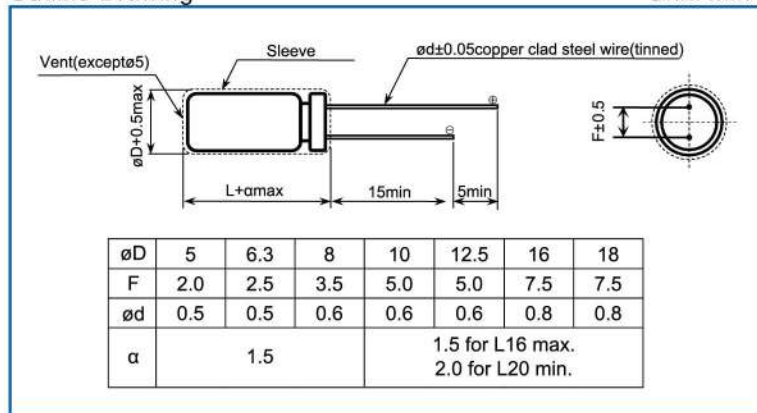
### 85°C Non-polar Miniature Capacitors, Series KRB.

Guaranteed 2000 hours at 85°C

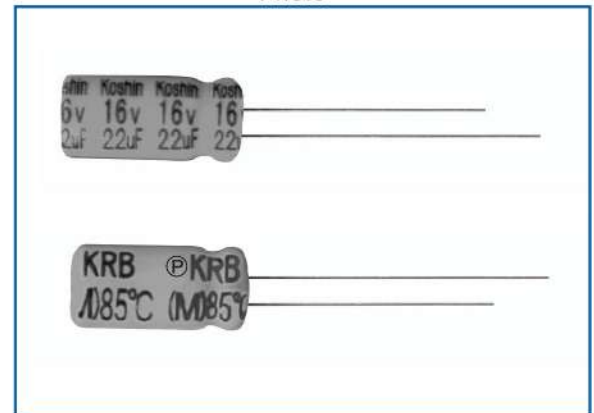
RoHS

#### Outline Drawing

Unit: mm



#### Photo



Marking color: black print on red sleeve

### Specifications

No.	Item	Performance										
1	Temperature range(°C)	40 to +85										
2	Leakage current (µA)	Less than 0.03CV or 3 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)	6.3	10	16	25	35	50	63	100	160-250	20°C 120Hz
		Tanδ (max)	0.25	0.25	0.20	0.15	0.15	0.13	0.10	0.09	0.15	
		0.02 is added to each 1000uF increase over 1000uF.										
5	Low temperature characteristics	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160-250	120Hz
		Impedance ratio(max)	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	
		0.5 for -25°C, 1 for -40°C are added to each 1000uF increase over 1000uF.										
6	Endurance (85°C) (Applied ripple current)	Test time	2000hours (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	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-5101-4(IEC60384)										

#### Coefficient of Frequency for Ripple Current

Capacitance (µ F)	Frequency (Hz)			
	50 · 60	120	1K	10K · 100K
CAP ≤ 10	0.80	1.00	1.30	1.70
10 < CAP ≤ 100	0.80	1.00	1.23	1.53
100 < CAP ≤ 1000	0.80	1.00	1.16	1.38
1000 < CAP	0.80	1.00	1.11	1.28

#### Coefficient of Temperature for Ripple Current

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



Dimension:  $\Phi$ DXL(mm)  
Ripple Current: mA/rms at 120Hz, 85°C

### DIMENSION & PERMISSIBLE RIPPLE CURRENT

$\mu$ F	6.3V		10V		16V		25V		35V		50V		63V		100V	
	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA
0.1											5X11	4	5X11	5	5X11	5
0.22											5X11	7	5X11	8	5X11	8
0.33											5X11	8	5X11	10	5X11	10
0.47											5X11	10	5X11	12	5X11	12
1											5X11	15	5X11	18	6.3X11	23
2.2											5X11	23	5X11	25	6.3X11	26
3.3											5X11	28	5X11	31	6.3X11	32
4.7											5X11	33	6.3X11	37	8X11.5	44
10					5X11	40	5X11	42	6.3X11	46	8X11.5	55	8X11.5	61	8X11.5	66
22	5X11	50	5X11	56	5X11	59	6.3X11	63	8X11.5	76	8X11.5	82	10X12.5	108	10X16	118
33	5X11	62	5X11	69	6.3X11	73	6.3X11	78	8X11.5	94	8X11.5	104	10X16	137	10X20	152
47	5X11	74	6.3X11	83	6.3X11	88	8X11.5	105	8X11.5	115	10X16	150	10X20	172	12.5X20	193
100	6.3X11	108	8X11.5	137	8X11.5	149	10X12.5	182	10X16	202	10X20	229	12.5X20	267	16X25	315
220	8X11.5	181	10X12.5	242	10X16	265	10X16	294	12.5X20	335	12.5X25	378	16X25	443	16X35.5	498
330	8X11.5	236	10X16	308	10X20	340	12.5X20	384	12.5X25	429	16X25	496	16X31.5	653		
470	10X16	329	10X20	385	12.5X20	432	12.5X25	479	16X25	548	16X31.5	614	18X35.5	787		
1000	10X20	502	12.5X20	598	12.5X25	659	16X31.5	775	16X35.5	852	18X40	1048				
2200	12.5X25	829	16X25	992	16X35.5	1114	18X40	1347								

$\mu$ F	160V		200V		250V	
	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA
0.47	5X11	10	6.3X11	10	6.3X11	12
1	6.3X11	14	8X11.5	16	8X11.5	16
2.2	8X11.5	23	8X11.5	28	10X12.5	32
3.3	8X11.5	33	10X12.5	33	10X16	46
4.7	10X12.5	39	10X16	46	10X20	62
10	10X16	75	10X20	83	10X20	99
22	12.5X20	146	12.5X20	146	12.5X25	172
33	12.5X20	179	12.5X25	197	16X25	211
47	12.5X25	235				



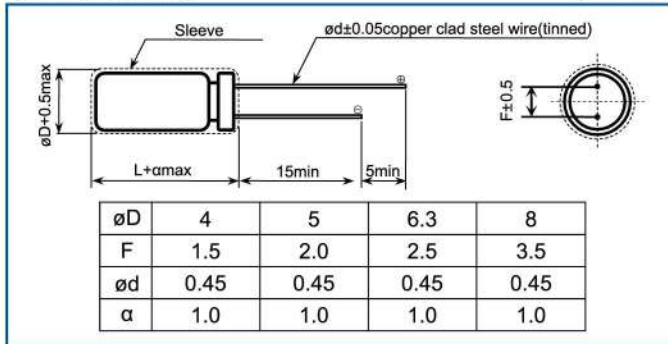
### 7mm L, Non-polar Microminiature Capacitors, Series KRN.

Diameter from  $\Phi 4$  to  $\Phi 8$  and height of 7mm  
Guaranteed 1000 hours at 85°C

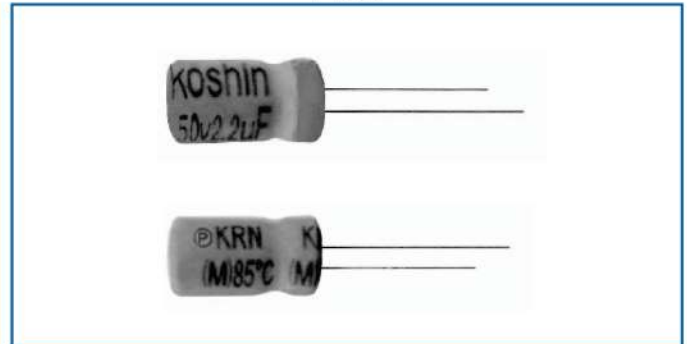
RoHS

Outline Drawing

Unit: mm



Photo



Marking color: black print on red sleeve

### Specifications

No.	Item	Performance									
1	Temperature range(°C)	-40 to +85									
2	Leakage current (μA)	Less than 0.03CV or 3 whichever is larger(after five 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	63	20°C, 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 <sub>(-25°C)/Z<sub>(+20°C)</sub></sub>	7	4	3	2	2	2	2	
6	Endurance (85°C) (Applied ripple current)	Test time	1000hours (with the polarity inverted every 250hours)								
		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-5101-4(IEC60384)									

### 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



### DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:  $\Phi$ DXL(mm)  
Ripple Current: mA/rms at 120Hz, 85°C

V.DC $\mu$ F Contents	4V		6.3V		10V		16V		25V		35V		50V		63V	
	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	mA	$\Phi$ DXL	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														

