Koshin

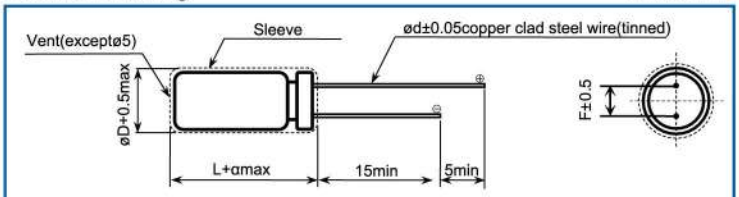
KZF Miniature Aluminum Electrolytic Capacitors

105℃ Use, Very Low Impedance ,Long Life Capacitors, Series KZF.

Very Low Impedance, High Ripple Current
Long Life 2000–8000hours, 105℃
Suitable for High Frequency Switching Power Supply
RoHS Compliance

RoHS

Outline Drawing — Unit: mm



øD	5	6.3	8	10	12.5	16
F	2.0	2.5	3.5	5.0	5.0	7.5
ød	0.5	0.5	0.6	0.6	0.6	0.8
α	1.5			1.5 for L16 max. 2.0 for L20 min.		

Photo

Marking color: White print on purple sleeve

Specifications

No.	Item	Performance									
1	Temperature range(℃)	-40 to +105(6.3V~100V)									
2	Leakage current (μA)	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	100	20℃
		Tanδ(max)	0.22	0.19	0.16	0.14	0.12	0.12	0.09	0.08	120Hz
		0.02 is added to every 1000 μ F increase over 1000 μ F									
5	Low temperature characteristics	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz
		Impedance ratio(max) $Z_{(-25℃)}/Z_{(+20℃)}$	4	3	3	2	2	2	2	2	
		Impedance ratio(max) $Z_{(-40℃)}/Z_{(+20℃)}$	8	6	4	3	3	3	3	3	
6	Endurance (105℃) (Applied ripple current)	Size(Φ)			5	6	8	10	12.5	16	18
		Test time			2000	2000	3000	5000	7000	8000	8000
		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	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

Frequence(Hz) Cap	50 • 60	120	1K	10K	100K
0.22-0.33	0.45	0.55	0.75	0.90	1.00
39-330	0.60	0.70	0.85	0.95	1.00
390-1000	0.65	0.75	0.90	0.98	1.00
1200-18000	0.75	0.80	0.95	1.00	1.00

Coefficient of Temperature for Ripple Current

Temperature(℃)	45	60	85	95	105
Coefficient	2.41	2.20	1.70	1.25	1.00

Koshin

KZF Miniature Aluminum Electrolytic Capacitors

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents / μF	6.3V			10V			16V		
	DXL	Impedance Ω/100KHz 20℃	Ripple Current (mA/rms,105℃)	DXL	Impedance Ω/100KHz 20℃	Ripple Current (mA/rms,105℃)	DXL	Impedance Ω/100KHz 20℃	Ripple Current (mA/rms,105℃)
47							5X11	0.570	160
100				5X11	0.570	180	6.3X11	0.300	280
150	5X11	0.530	180	5X11	0.450	250			
220				6.3X11	0.240	320	6.3X15	0.180	355
330	6.3X11	0.220	360	6.3X15	0.200	360	8X11.5	0.130	650
470	6.3X15	0.180	380	8X11.5	0.150	650	8X16	0.093	750
							10X12.5	0.095	760
560							8X20	0.085	830
680	8X11.5	0.120	650	8X16	0.095	830	8X20	0.080	980
				10X12.5	0.095	850	10X16	0.070	1180
820	10X12.5	0.095	870						
1000	8X16	0.095	840	8X20	0.085	980	10X20	0.055	1290
				10X16	0.072	1180			
1200	8X20	0.090	1050	10X20	0.055	1400	10X25	0.049	1390
	10X16	0.070	1250						
1500	10X20	0.053	1400	10X25	0.048	1640	10X30	0.038	1820
							12.5X20	0.040	1800
1800	12.5X16	0.050	1450	10X30	0.038	1860			
2200	10X25	0.045	1645	10X30	0.036	1870	12.5X25	0.034	2060
				12.5X20	0.036	1850			
2700	10X30	0.040	1880				12.5X30	0.028	2470
							16X22	0.032	2290
3300	12.5X20	0.039	1750	12.5X25	0.032	2080	12.5X35	0.026	2720
3900	12.5X25	0.033	2130	12.5X30	0.026	2590	12.5X40	0.021	3190
							16X25	0.023	2610
							18X20	0.032	2460
4700	12.5X30	0.028	2440	12.5X35	0.023	2730	16X31.5	0.022	3250
							18X25	0.024	2950
5600	12.5X35	0.025	2620	12.5X40	0.020	2960	16X35.5	0.020	3360
	16X20	0.028	2260	16X25	0.022	2780	18X31.5	0.020	3520
6800	12.5X40	0.022	3310	16X31.5	0.020	3420	16X40	0.017	3880
	16X25	0.025	2910	18X25	0.022	3130			
8200	16X31.5	0.020	3430	16X35.5	0.019	3280	18X35	0.016	4010
				18X31.5	0.019	3540			
10000	16X35.5	0.017	3590	16X40	0.017	3810	18X40	0.015	4160
	18X25	0.020	3130	18X35.5	0.017	3860			

ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 89
e-mail : comp@es-france.com
Site Web : www.es-france.com

Koshin

KZF Miniature Aluminum Electrolytic Capacitors

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents μF	25V			35V			50V		
	DXL	Impedance Ω/100KHz 20℃	Ripple Current (mA/rms,105℃)	DXL	Impedance Ω/100KHz 20℃	Ripple Current (mA/rms,105℃)	DXL	Impedance Ω/100KHz 20℃	Ripple Current (mA/rms,105℃)
22							5X11	0.800	185
33				5X11	0.570	180			
47	5X11	0.570	180				6.3X11	0.570	260
56				6.3X11	0.300	320	6.3X11	0.350	300
100	6.3X11	0.350	300	6.3X15	0.220	420	8X11.5	0.250	475
150	6.3X15	0.250	400	8X11.5	0.150	620	10X12.5	0.150	650
220	8X11.5	0.150	580	8X16	0.100	750	10X16	0.090	700
				10X12.5	0.100	760			
270				8X20	0.090	870	10X20	0.084	950
330	8X16	0.100	750	10X16	0.072	1070	10X25	0.070	1250
	10X12.5	0.100	760						
470	8X20	0.080	960	10X20	0.054	1350	10X30	0.054	1640
	10X16	0.070	1090	12.5X16	0.060	1340	12.5X20	0.058	1550
560				10X25	0.048	1520	12.5X25	0.048	1870
680	10X20	0.055	1340	10X30	0.041	1760	12.5X30	0.040	2110
				12.5X20	0.042	1600			
820	10X25	0.047	1490				12.5X35	0.035	2360
1000	10X30	0.040	1790	12.5X25	0.033	2020	12.5X40	0.030	2630
	12.5X20	0.040	1680				16X25	0.035	2580
1200				12.5X30	0.028	2420	16X31.5	0.027	2860
				16X20	0.032	2310	18X25	0.030	2660
1500	12.5X25	0.033	2020	12.5X35	0.026	2650	16X35.5	0.025	3030
1800	12.5X30	0.027	2450	12.5X40	0.020	3060	16X40	0.022	3480
	16X20	0.032	2340	16X25	0.026	2810	18X31.5	0.025	3480
				18X20	0.031	2700			
2200	12.5X35	0.027	2605	16X31.5	0.022	3330	18X35.5	0.022	3600
	18X20	0.030	2580	18X25	0.024	3100			
2700	12.5X40	0.022	3180	16X35.5	0.021	3430	18X40	0.020	3720
	16X25	0.030	2800	18X31.5	0.022	3480			
3300	16X31.5	0.023	3250	16X40	0.019	3730			
	18X25	0.024	3020	18X35.5	0.020	3820			
3900	16X35.5	0.020	3490	18X40	0.017	4060			
	18X31.5	0.021	3650						
4700	16X40	0.018	3920						
	18X35.5	0.019	4110						
5600	18X35.5	0.017	4250						

Koshin

KZF Miniature Aluminum Electrolytic Capacitors

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents / μF	63V			100V		
	ΦDXL	Impedance Ω/100KHz 20˚C	Ripple Current (mA/rms,105˚C)	ΦDXL	Impedance Ω/100KHz 20˚C	Ripple Current (mA/rms,105˚C)
5.6				5X11	2.000	90
12	5X11	1.800	140	6.3X11	1.300	120
18				6.3X15	0.700	200
22	6.3X11	1.000	240	8X12	0.600	240
27				10X13	0.520	320
33				8X16	0.400	310
				10X16	0.380	440
39	6.3X15	0.600	330	8X20	0.320	420
56				10X20	0.310	550
68	8X12	0.340	400	10X25	0.240	720
100	8X16	0.260	530	10X30	0.200	880
	10X12.5	0.255	540	12.5X20	0.200	820
120	10X16	0.210	610	12.5X25	0.160	960
150	8X20	0.220	680			
180	10X20	0.150	850	12.5X30	0.120	1180
				16X20	0.160	1160
220	10X25	0.135	1030	12.5X35	0.092	1360
				16X25	0.088	1340
270				12.5X40	0.070	1560
				18X20	0.095	1340
330	10X30	0.095	1280	16X31.5	0.066	1660
	12.5X20	0.090	1260	18X25	0.075	1620
390	12.5X25	0.075	1480	16X35.5	0.060	1880
				18X31.5	0.065	1780
470	12.5X30	0.060	1670	16X40	0.048	2020
	16X20	0.063	1620			
560				18X35.5	0.055	1900
680	12.5X35	0.050	1860	18X40	0.045	1980
	16X25	0.060	1820			
820	12.5X40	0.046	2160			
	16X31.5	0.046	2230			
	18X25	0.046	2230			
1000	16X35.5	0.040	2460			
1200	16X40	0.035	2650			
	18X31.5	0.033	2720			
1500	18X35.5	0.032	2850			
1800	18X40	0.028	3020			

Koshin

KZH Miniature Aluminum Electrolytic Capacitors

105℃Use, Ultra Low Impedance Capacitors, Series KZH.

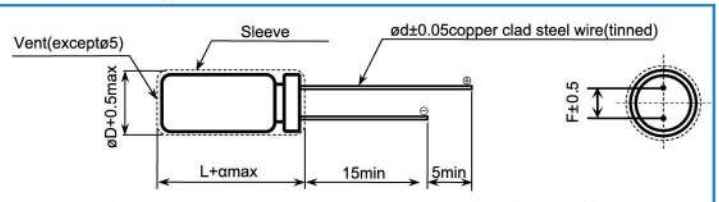
Suitable for Application of Mother Board

Guaranteed 2000 hours at 105℃

RoHS

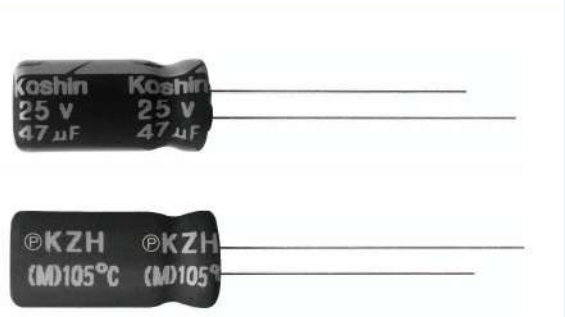
Outline Drawing

Unit: mm



øD	5	6.3	8	10	12.5	16
F	2.0	2.5	3.5	5.0	5.0	7.5
ød	0.5	0.5	0.6	0.6	0.6	0.8
α	1.5			1.5 for L16 max. 2.0 for L20 min.		

Photo



Marking color: White print on deep green sleeve

Specifications

No.	Item	Performance							
1	Temperature range(℃)	-40 to +105							
2	Leakage current (μA)	less than 0.01CV or 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)		6.3	10	16	25	35	50	20℃ 120Hz
		Tan δ (max)		0.22	0.19	0.16	0.14	0.12	0.10	
		0.02 is added to every 1000 μ F increase over 1000 μ F								
5	Low temperature characteristics	Rated voltage (V)		6.3	10	16	25	35	50	120Hz
		Impedance ratio(max)	$Z_{(-25℃)}/Z_{(+20℃)}$	2	2	2	2	2	2	
			$Z_{(-40℃)}/Z_{(+20℃)}$	3	3	3	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	Shelf life (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-5101-4(IEC60384)							

Coefficient of Frequency for Ripple Current

Frequency (Hz) / Capacitance (μ F)	50 • 60	120	1K	10K	100K
CAP≤100	0.60	0.70	0.85	0.95	1.00
100<CAP≤1000	0.65	0.75	0.90	0.98	1.00
1000<CAP	0.75	0.80	0.95	0.98	1.00

Coefficient of Temperature for Ripple Current

Temperature(℃)	70	85	105
Coefficient	1.78	1.40	1.00

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Item / ΦDXL	6.3V					10V					16V				
	μF	Impedance (Ω ,Max/100KHz)		Ripple Current (mA/rms,105℃)		μF	Impedance (Ω ,Max/100KHz)		Ripple Current (mA/rms,105℃)		μF	Impedance (Ω ,Max/100KHz)		Ripple Current (mA/rms,105℃)	
		20℃	-10℃	120Hz	100KHz		20℃	-10℃	120Hz	100KHz		20℃	-10℃	120Hz	100KHz
5X11	150	0.30	1.00	175	250	100	0.30	1.00	175	250	56	0.30	1.00	175	250
6.3X11	330	0.13	0.41	284	405	220	0.13	0.41	284	405	120	0.13	0.41	284	405
8X11.5	560	0.07	0.22	570	760	470	0.07	0.22	570	760	330	0.07	0.22	532	760
8X15	820	0.056	0.17	746	995	680	0.056	0.17	746	995	470	0.056	0.17	746	995
8X20	1200	0.041	0.13	1000	1250	1000	0.041	0.13	938	1250	680	0.041	0.13	938	1250
10X12.5	1000	0.053	0.16	773	1030	680	0.053	0.16	773	1030	470	0.053	0.16	773	1030
10X16	1200	0.038	0.12	1144	1430	1000	0.038	0.12	1144	1430	680	0.038	0.12	1073	1430
10X20	1500	0.023	0.069	1456	1820	1200	0.023	0.069	1456	1820	1000	0.023	0.069	1365	1820
10X25	2200	0.022	0.066	1720	2150	1500	0.022	0.066	1720	2150	1200	0.022	0.066	1720	2150
12.5X20	3300	0.021	0.053	1888	2360	2200	0.021	0.053	1888	2360	1500	0.021	0.053	1888	2360
12.5X25	3900	0.018	0.045	2216	2770	3300	0.018	0.045	2216	2770	2200	0.018	0.045	2216	2770
12.5X30	4700	0.016	0.041	2632	3290	3900	0.016	0.041	2632	3290	2700	0.016	0.041	2632	3290
12.5X35	5600	0.015	0.039	2720	3400	4700	0.015	0.039	2720	3400	3300	0.015	0.039	2720	3400
16X25	6800	0.016	0.043	2768	3460	5600	0.016	0.043	2768	3460	3900	0.016	0.043	2768	3460

V.DC / Item / ΦDXL	25V					35V					50V				
	μF	Impedance (Ω ,Max/100KHz)		Ripple Current (mA/rms,105℃)		μF	Impedance (Ω ,Max/100KHz)		Ripple Current (mA/rms,105℃)		μF	Impedance (Ω ,Max/100KHz)		Ripple Current (mA/rms,105℃)	
		20℃	-10℃	120Hz	100KHz		20℃	-10℃	120Hz	100KHz		20℃	-10℃	120Hz	100KHz
5X11	47	0.30	1.00	175	250	33	0.30	1.00	138	250	22	0.34	1.18	131	238
6.3X11	100	0.13	0.41	284	405	56	0.13	0.41	284	405	56	0.14	0.50	270	385
8X11.5	220	0.07	0.22	532	760	150	0.07	0.22	532	760	100	0.074	0.22	507	724
8X15	330	0.056	0.17	697	995	220	0.056	0.17	697	995	120	0.061	0.18	665	950
8X20	470	0.041	0.13	938	1250	270	0.041	0.13	875	1250	180	0.046	0.14	833	1190
10X12.5	330	0.053	0.16	721	1030	220	0.053	0.16	721	1030	150	0.061	0.18	685	979
10X16	470	0.038	0.12	1073	1430	330	0.038	0.12	1001	1430	220	0.042	0.12	959	1370
10X20	680	0.023	0.069	1365	1820	470	0.023	0.069	1365	1820	270	0.030	0.09	1106	1580
10X25	820	0.022	0.066	1613	2150	560	0.022	0.066	1613	2150	330	0.028	0.085	1309	1870
12.5X20	1000	0.021	0.053	1770	2360	680	0.021	0.053	1770	2360	470	0.027	0.068	1538	2050
12.5X25	1500	0.018	0.045	2216	2770	1000	0.018	0.045	2078	2770	560	0.023	0.059	1808	2410
12.5X30	1800	0.016	0.041	2632	3290	1200	0.016	0.041	2632	3290	680	0.021	0.052	2145	2860
12.5X35	2200	0.015	0.039	2720	3400	1500	0.015	0.039	2720	3400	820	0.019	0.051	2220	2960
16X25	2700	0.016	0.043	2768	3460	1800	0.016	0.043	2768	3460	1000	0.021	0.056	2258	3010

Koshin

KJH Miniature Aluminum Electrolytic Capacitors

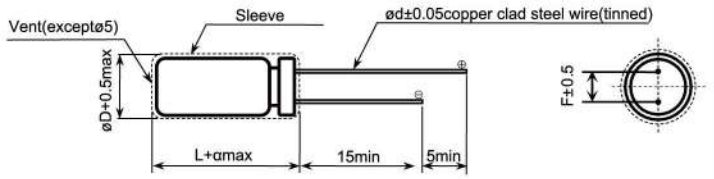
105℃ Use, High–Reliability, Low Impedance Capacitors, Series KJH.

The capacitor of this Series achieves high reliability under the environmental Loading prevailing in a piece of equipment on which it is mounted
Guarantees 5000 hours at 105℃ (Φ5 to 6.3: 2000hours; Φ8 to 10: 3000 hours)

RoHS

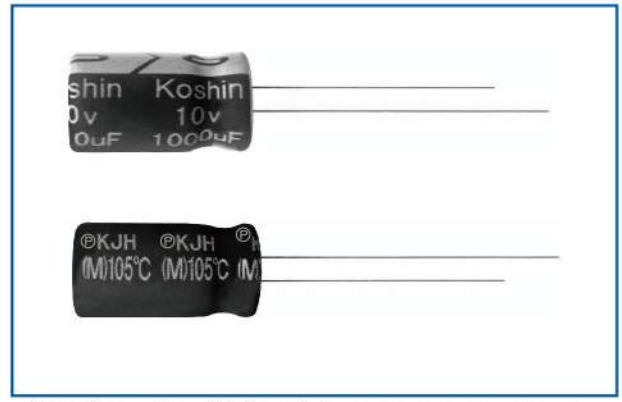
Outline Drawing

Unit: mm



øD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
α	1.5			1.5 for L16 max. 2.0 for L20 min.			

Photo



Marking color: White print on deep green sleeve

Specifications

No.	Item	Performance									
1	Temperature range(℃)	-55 to +105									
2	Leakage current (μA)	Less than 0.01CV or 3 whichever is larger(after two minutes) 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	100	20℃
		Tanδ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07	120Hz
		0.02 is added to every 1000 μ F increase over 1000 μ F									
5	Low temperature characteristics	Rated voltage (V)	6.3	10	16	25	35	50	63	100	120Hz
		Impedance ratio(max) $Z_{(-25℃)}/Z_{(+20℃)}$	2	2	2	2	2	2	2	2	
		Impedance ratio(max) $Z_{(-40℃)}/Z_{(+20℃)}$	3	3	3	3	3	3	3	3	
6	Endurance (105℃) (Applied ripple current)	Test time	5000hours (Φ5 to 6.3: 2000hours; Φ8 to 10: 3000 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	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								
8	Applicable standards	JIS–C–5101–4(IEC60384)									

Coefficient of Frequency for Ripple Current

Frequency (Hz) / Capacitance (μF)	120	1K	10K	100K
CAP≤4.7	0.40	0.68	0.78	1.00
4.7<CAP≤47	0.50	0.76	0.87	1.00
47<CAP≤220	0.70	0.85	0.90	1.00
220<CAP≤1000	0.80	0.93	0.98	1.00
1000<CAP	0.90	0.95	1.00	1.00

Coefficient of Temperature for Ripple Current

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

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Item / μF	6.3V				10V			
	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)
		20°C	-10°C	100KHz		20°C	-10°C	100KHz
47					5X11	2.10	5.50	111
56					5X11	1.90	4.80	121
68					5X11	1.30	3.90	154
100	5X11	1.30	3.90	154	6.3X11	0.60	1.80	260
220	6.3X11	0.60	1.80	260	8X11.5	0.33	0.99	400
330	8X11.5	0.33	0.88	400	8X11.5	0.33	0.99	400
390	8X11.5	0.33	0.88	400	10X12.5	0.27	0.75	510
470	10X12.5	0.25	0.75	510	10X12.5	0.25	0.75	510
560	10X12.5	0.25	0.75	510	10X16	0.19	0.57	635
680	10X16	0.19	0.57	635	10X16	0.19	0.57	635
1000	10X20	0.14	0.42	860	10X20	0.14	0.37	860
1200	10X20	0.14	0.42	860	10X25	0.12	0.30	1030
2200	12.5X20	0.085	0.26	1250	12.5X25	0.070	0.21	1355
3300	12.5X25	0.070	0.21	1355	12.5X25	0.070	0.21	1355
4700	16X25	0.060	0.18	1770	16X31.5	0.048	0.14	2030

V.DC / Item / μF	16V				25V			
	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)
		20°C	-10°C	100KHz		20°C	-10°C	100KHz
33	5X11	1.30	3.90	154	5X11	1.30	3.90	154
39	5X11	1.30	3.90	154	6.3X11	0.60	1.80	260
47	6.3X11	0.60	1.80	260	6.3X11	0.60	1.80	260
56	6.3X11	0.60	1.80	260	6.3X11	0.60	1.80	260
68	6.3X11	0.60	1.80	260	6.3X11	0.60	1.80	260
100	6.3X11	0.60	1.80	260	8X11.5	0.33	0.99	400
220	8X11.5	0.33	0.99	400	10X12.5	0.25	0.75	510
330	10X12.5	0.25	0.75	510	10X16	0.19	0.57	635
390	10X16	0.19	0.57	635	10X20	0.14	0.42	635
470	10X16	0.19	0.57	635	10X20	0.14	0.42	635
560	10X20	0.14	0.42	860	10X25	0.12	0.30	1030
680	10X20	0.14	0.42	860	12.5X20	0.085	0.26	1250
1000	12.5X20	0.085	0.26	1250	12.5X25	0.070	0.23	1355
1200	12.5X20	0.085	0.26	1250	12.5X25	0.070	0.21	1355
2200	12.5X25	0.070	0.21	1355	16X25	0.060	0.18	1770
3300	16X31.5	0.048	0.14	2030	16X35.5	0.044	0.13	2295
4700	16X35.5	0.044	0.13	2295	18X40	0.037	0.10	2740

Koshin

KJH Miniature Aluminum Electrolytic Capacitors

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Item / μF	35V				50V			
	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)
		20°C	-10°C	100KHz		20°C	-10°C	100KHz
1					5X11	4.00	15.0	78
2.2					5X11	4.00	12.0	88
3.3					5X11	3.50	11.0	94
4.7					5X11	3.00	9.00	100
6.8					5X11	3.00	9.00	100
10					5X11	2.00	6.00	124
22	5X11	1.30	3.90	154	6.3X11	0.60	1.80	260
33	6.3X11	0.60	1.80	260	6.3X11	0.60	1.80	260
39	6.3X11	0.60	1.80	260	6.3X11	0.60	1.80	260
47	6.3X11	0.60	1.80	260	8X11.5	0.33	0.99	400
56	6.3X11	0.60	1.80	260	8X11.5	0.33	0.99	400
68	6.3X11	0.60	1.80	260	8X11.5	0.33	0.99	400
100	8X11.5	0.33	0.99	400	10X16	0.19	0.57	635
220	10X16	0.19	0.57	635	10X25	0.12	0.30	1030
330	10X20	0.12	0.42	860	12.5X20	0.085	0.26	1250
390	10X25	0.12	0.30	1030	12.5X25	0.070	0.21	1355
470	12.5X20	0.085	0.26	1250	12.5X25	0.070	0.21	1355
560	12.5X20	0.085	0.26	1250	12.5X25	0.070	0.21	1355
680	12.5X25	0.070	0.21	1355	16X25	0.060	0.18	1770
1000	12.5X25	0.070	0.21	1355	16X25	0.060	0.18	1770
1200	12.5X25	0.070	0.21	1355	16X31.5	0.048	0.14	2030
2200	16X35.5	0.044	0.13	2295	18X40	0.037	0.10	2740
3300	18X40	0.037	0.10	2740				

V.DC / Item / μF	63V				100V			
	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)
		20°C	-10°C	100KHz		20°C	-10°C	100KHz
1					5X11	7.00	25.0	66
2.2					5X11	6.00	21.0	72
3.3					5X11	5.00	18.0	78
4.7					6.3X11	1.20	4.20	180
6.8					6.3X11	1.20	4.20	180
10	6.3X11	1.20	4.20	180	8X11.5	0.56	2.00	305
22	6.3X11	1.20	4.20	180	8X11.5	0.56	2.00	308
33	8X11.5	0.56	2.00	305	10X12.5	0.50	1.80	380
39	8X11.5	0.56	2.00	305	10X16	0.32	1.10	500
47	8X11.5	0.56	2.00	305	10X20	0.27	0.95	620

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Item / μF	63V				100V			
	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)	ΦDXL	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms,105°C)
		20°C	-10°C	100KHz		20°C	-10°C	100KHz
56	10X12.5	0.50	1.80	380	10X20	0.27	0.95	620
68	10X12.5	0.50	1.80	380	10X25	0.21	0.63	760
100	10X20	0.27	0.95	620	12.5X20	0.16	0.56	890
220	12.5X20	0.094	0.24	820	16X25	0.090	0.32	1440
330	12.5X25	0.073	0.21	1100	16X31.5	0.060	0.17	1790
390	12.5X25	0.073	0.21	1100	16X35.5	0.056	0.14	2065
470	16X25	0.060	0.18	1770				
560	16X31.5	0.048	0.14	2030				
680	16X31.5	0.048	0.14	2030				
1000	18X35.5	0.041	0.11	2240				

Koshin

KLH Miniature Aluminum Electrolytic Capacitors

105℃ Use, High-Reliability, Low Impedance Capacitors, Series KLH.

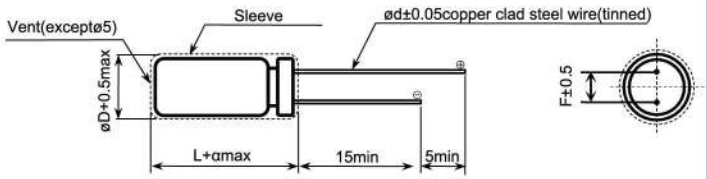
The capacitor of this Series achieves high reliability under the environmental loading prevailing in a piece of equipment on which it is mounted

Guarantees 5000 hours at 105℃ (Φ5 to 6.3: 2000hours; Φ8: 3000 hours)

RoHS

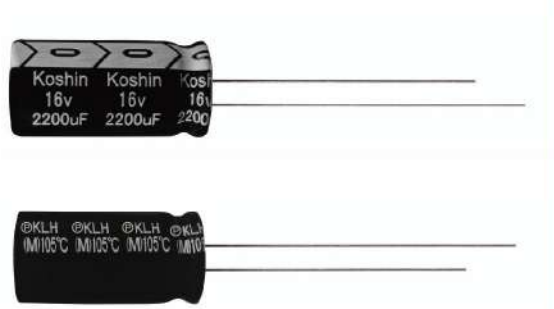
Outline Drawing

Unit: mm



øD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
α	1.5			1.5 for L16 max. 2.0 for L20 min.			

Photo



Marking color: White print on deep green sleeve

Specifications

No.	Item	Performance													
1	Temperature range(℃)	-40 to +105(6.3V~100V)									-25 to +105 (160V~500V)				
2	Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after two minutes)									Less than 0.03CV whichever is large (after two minutes)				
		C: Rated Capacitance (μ F). V: Rated voltage (V) 20℃													
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	200-250	350-400	450-500	20˚C
		Tanδ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.15	0.15	0.15	120Hz
		0.02 is added to every 1000 μ F increase over 1000 μ F													
5	Low temperature characteristics	Rated voltage (V)		6.3	10	16	25	35	50	63	100	160	200-250	350-400	450-500	120Hz
		Impedance ratio(max)	$Z_{(-25°C)}/Z_{(+20°C)}$	4	3	3	2	2	2	2	2	2	2	5	6	
			$Z_{(-40°C)}/Z_{(+20°C)}$	8	6	4	4	4	3	3	3	3	6	6	-	
6	Endurance (105℃) (Applied ripple current)	Test time		Φ5 toΦ6.3: 2000hours, Φ8: 3000 hours, D≥Φ10:5000hours												
		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		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

Frequency (Hz) / Capacitance (μ F)	50 • 60	120	1K	10K	100K
CAP≤10	0.47	0.59	0.85	0.97	1.00
10<CAP≤100	0.52	0.65	0.89	0.97	1.00
100<CAP≤1000	0.58	0.72	0.90	0.98	1.00
1000<CAP	0.63	0.78	0.91	0.98	1.00

Coefficient of Temperature for Ripple Current

Temperature(℃)	45	60	85	95	105
Coefficient	2.10	1.90	1.65	1.25	1.00

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents / μF	6.3V			10V			16V		
	DXL	Impedance Ω/100KHz 20°C	Ripple Current (mA/rms,105°C)	DXL	Impedance Ω/100KHz 20°C	Ripple Current (mA/rms,105°C)	DXL	Impedance Ω/100KHz 20°C	Ripple Current (mA/rms,105°C)
10							5X11	4.000	37
22				5X11	2.700	56	5X11	2.000	70
33				5X11	2.200	58	5X11	1.260	130
47				5X11	1.200	120	5X11	0.520	190
100	5X11	1.100	185	5X11	0.480	170	6.3X11	0.310	260
220	6.3X11	0.700	300	6.3X11	0.280	330	8X11.5	0.210	455
330	8X11.5	0.390	390	8X11.5	0.150	445	8X11.5	0.120	550
470	8X11.5	0.350	415	8X11.5	0.115	555	8X11.5	0.095	580
1000	10X12.5	0.300	700	10X16	0.072	1010	10X16	0.050	1180
2200				10X20	0.052	1450	10X25	0.050	1750
	10X20	0.060	1400	12.5X25	0.041	1690	12.5X20	0.035	1950
3300	12.5X20	0.050	1425	12.5X25	0.029	1980	12.5X25	0.028	2340
4700	12.5X25	0.025	1950	12.5X30	0.031	2100	16X25	0.024	2650

V.DC / Contents / μF	25V			35V			50V		
	DXL	Impedance Ω/100KHz 20°C	Ripple Current (mA/rms,105°C)	DXL	Impedance Ω/100KHz 20°C	Ripple Current (mA/rms,105°C)	DXL	Impedance Ω/100KHz 20°C	Ripple Current (mA/rms,105°C)
0.47							5X11	6.300	15
1							5X11	4.000	25
2.2							5X11	2.800	33
3.3							5X11	2.400	45
4.7							5X11	2.400	58
10	5X11	2.100	56	5X11	2.800	70	5X11	1.800	100
22	5X11	1.800	120	5X11	1.500	130	5X11	1.000	135
33	5X11	1.200	150	5X11	1.300	175	6.3X11	0.800	230
47	5X11	0.500	220	6.3X11	0.800	250	6.3X11	0.500	285
100	6.3X11	0.280	300	8X11.5	0.190	380	8X11.5	0.180	475
220	8X11.5	0.125	550	10X12.5	0.098	720	10X16	0.080	900
330	10X12.5	0.082	720	10X16	0.065	995	10X20	0.068	1050
470	10X16	0.065	1040	10X20	0.050	1150	12.5X20	0.055	1490
1000	12.5X20	0.039	1530	12.5X25	0.031	1950	16X25	0.036	2130
2200	16X25	0.028	2405	16X31.5	0.025	2650	18X35.5	0.025	2900
3300	16X31.5	0.020	3050						
4700	16X35.5	0.017	3490						

Koshin

KLH Miniature Aluminum Electrolytic Capacitors

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents / μF	63V			100V		
	DXL	Impedance Ω /100KHz 20˚C	Ripple Current (mA/rms,105˚C)	DXL	Impedance Ω /100KHz 20˚C	Ripple Current (mA/rms,105˚C)
0.47	5X11	6.300	16	5X11	20.00	20
1	5X11	4.000	27	5X11	9.500	30
2.2	5X11	2.800	38	5X11	6.500	42
3.3	5X11	2.400	48	5X11	4.500	55
4.7	5X11	2.400	62	5X11	2.400	72
10	5X11	1.900	105	6.3X11	2.400	130
22	6.3X11	0.850	245	8X11.5	1.800	220
33	6.3X11	0.610	265	10X12.5	0.680	320
47	8X11.5	0.560	351	10X16	0.460	420
100	10X16	0.240	610	10X20	0.370	560
220	10X20	0.110	1020	12.5X25	0.180	880
330	12.5X20	0.070	1160	16X31.5	0.100	1440
470	12.5X25	0.050	2000	16X25	0.090	1790
1000	16X35.5	0.032	2450	18X40	0.076	2500

V.DC / Contents / μF	160V			200V			250V		
	DXL	Impedance Ω /100KHz 20˚C	Ripple Current (mA/rms,105˚C)	DXL	Impedance Ω /100KHz 20˚C	Ripple Current (mA/rms,105˚C)	DXL	Impedance Ω /100KHz 20˚C	Ripple Current (mA/rms,105˚C)
0.47	6.3X11	9.950	35	6.3X11	9.155	35	6.3X11	8.950	30
1	6.3X11	8.050	50	6.3X11	7.850	50	6.3X11	6.750	50
2.2	6.3X11	5.815	75	6.3X11	5.320	75	6.3X11	5.100	85
3.3	8X11.5	4.570	110	8X11.5	4.510	130	8X11.5	4.180	120
4.7	8X11.5	4.360	130	8X11.5	4.220	155	8X11.5	3.580	165
6.8	10X16	3.61	160	8X11.5	3.250	170	8X11.5	2.750	180
10	10X16	3.050	250	8X11.5	2.750	250	10X12.5	2.160	220
22	10X16	1.870	300	10X16	1.585	320	10X16	1.375	340
33	10X16	1.215	380	10X20	1.050	440	10X20	0.960	460
47	10X20	1.020	600	12.5X20	0.525	500	12.5X20	0.455	550
68	12.5X20	0.560	660	12.5X25	0.415	660	12.5X25	0.390	730
100	12.5X25	0.510	850	16X25	0.200	850	16X25	0.285	990
150	16X25	0.275	1210	16X25	0.185	1210	16X31.5	0.240	1300
220	16X31.5	0.200	1470	16X31.5	0.150	1630	18X31.5	0.215	1730
330	16X35.5	0.175	2000						

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents / μF	350V			400V			450V		
	DXL	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms,105°C)	DXL	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms,105°C)	DXL	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms,105°C)
0.47	6.3X11	8.82	36	6.3X11	33	26	6.3X11	34	28
1	6.3X11	7.90	50	6.3X11	16.5	36	6.3X11	18	38
2.2	6.3X11	6.35	75	6.3X11	13	65			
	8X11.5	4.025	85	8X11.5	13	76	8X11.5	14	80
3.3	8X11.5	3.85	100	8X11.5	12	86	8X11.5	9.680	130
	10X12.5	3.580	120						
4.7	8X11.5	3.12	130	8X11.5	4.980	130			
	10X12.5	2.950	150				10X12.5	5.075	190
6.8	10X12.5	2.43	170	10X12.5	7.5	160	10X16	4.750	200
10	10X16	1.455	190	10X16	3.350	183	10X20	4.580	277
22	12.5X20	1.320	310	12.5X20	2.875	314	12.5X20	2.835	510
33	12.5X25	0.860	420	12.5X25	1.280	422	16X25	2.420	620
47	16X25	0.625	560	16X25	0.925	560	16X25	1.670	790
68	16X31.5	0.580	750	16X31.5	0.850	750	18X31.5	0.852	990
100	16X31.5	0.530	1010	18X31.5	0.575	1010	18X35.5	0.740	1050

V.DC / Contents / μF	500V		
	DXL	Impedance Ω /100KHz 20°C	Ripple Current (mA/rms,105°C)
2.2	8X11.5	10.0	85
3.3	10X12.5	8.00	140
4.7	10X16	6.00	180
10	10X20	4.00	190
22	12.5X25	3.50	310
33	16X25	3.00	420
47	18X31.5	2.50	560

Koshin

KSH Miniature Aluminum Electrolytic Capacitors

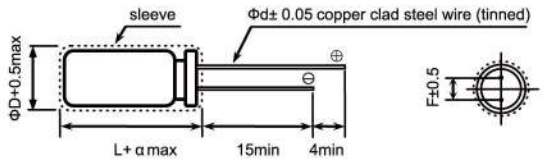
7mm L,105℃ High-Reliability, Low Impedance Capacitors, Series KSH.

Diameter from Φ4 to Φ8 and height of 7mm

Guaranteed 1000~2000 hours at 105℃

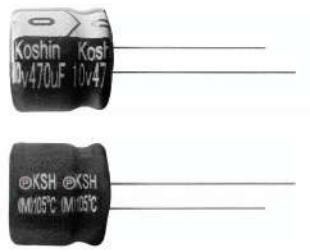
RoHS

Outline Drawing Unit: mm



ΦD	4	5	6.3	8
F	1.5	2.0	2.5	3.5
Φd	0.45	0.45	0.45	0.45
α	1.0	1.0	1.0	1.0

Photo



Marking color: White print on deep green sleeve

Specifications

No.	Item	Performance						
1	Temperature range(℃)	-40 to +105						
2	Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after two minutes) C: Capacitance (μF);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	20℃,120Hz
		Tanδ(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℃) (Applied ripple current)	Test time		1000~2000 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 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) / Capacitance (μF)	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(℃)	60	70	85	105
Coefficient	1.80	1.50	1.30	1.00

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension:ΦDXL(mm)
Ripple Current: mA/rms at 100KHz,105℃

V.DC / Contents / μF	6.3V			10V			16V		
	ΦDXL	Impedance Ω/100KHz 20˚C	Ripple Current (mA/rms,105˚C)	ΦDXL	Impedance Ω/100KHz 20˚C	Ripple Current (mA/rms,105˚C)	ΦDXL	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		
	ΦDXL	Impedance Ω/100KHz 20˚C	Ripple Current (mA/rms,105˚C)	ΦDXL	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			