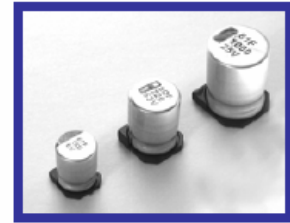


FZ Long Life with Extra Lower Impedance 长寿命极低阻抗品

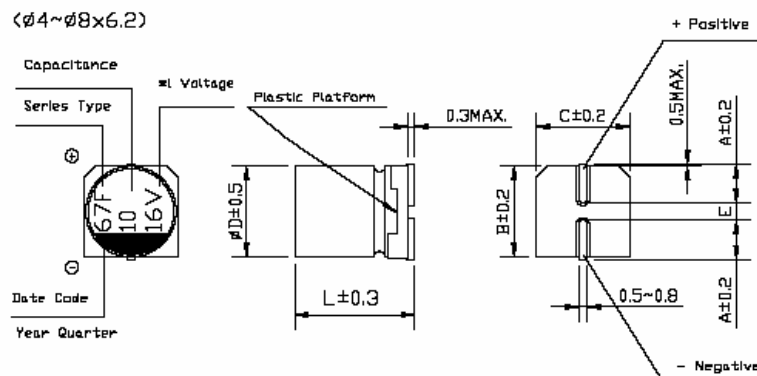
- Extra low impedance with temperature range -55°C to +105°C and load life of 2000~5000 hours.
- Impedance 5~25% less than KZ series.
- Lead-free reflow soldering is available subject to customers' request.



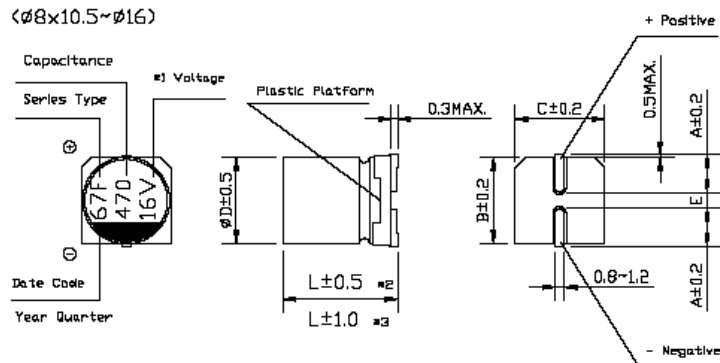
◆ Specifications 特性

Items 项目	Performance Characteristics 主要特性																																							
Operating Temperature Range 使用温度范围	-55~+105°C																																							
Voltage Range 额定工作电压范围	6.3~100V																																							
Capacitance Range 静电容量范围	3.3~4700 μF																																							
Capacitance Tolerance 静电容量允许偏差	±20% at 120 Hz, 20°C																																							
Leakage Current 漏电流	For φ4~φ10, after 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3(μA), whichever is greater. For φ12.5~φ16, after 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4(μA), whichever is greater. φ4~φ10: 施加额定工作电压 2 分钟, LC≤0.01CV 或 3(μA), 取较大值; φ12.5~φ16: 施加额定工作电压 1 分钟, LC≤0.03CV 或 4(μA), 取较大值。																																							
Tan δ 损耗角正切	Measurement frequency 测试频率: 120Hz, Temperature 温度: 20°C <table border="1"> <thead> <tr> <th>Rated voltage (V.DC) 额定工作电压</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Tan δ 损耗角正切(max)</td> <td>φ4~φ10</td> <td>0.26</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> <td>0.07</td> </tr> <tr> <td></td> <td>φ12.5~φ16</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.10</td> <td>0.08</td> <td>0.07</td> </tr> </tbody> </table>	Rated voltage (V.DC) 额定工作电压	6.3	10	16	25	35	50	63	80	100	Tan δ 损耗角正切(max)	φ4~φ10	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.07		φ12.5~φ16	0.26	0.22	0.18	0.16	0.14	0.10	0.08	0.07									
Rated voltage (V.DC) 额定工作电压	6.3	10	16	25	35	50	63	80	100																															
Tan δ 损耗角正切(max)	φ4~φ10	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.07																															
	φ12.5~φ16	0.26	0.22	0.18	0.16	0.14	0.10	0.08	0.07																															
Stability at Low Temperature 低温特性	Measurement frequency 测试频率: 120Hz <table border="1"> <thead> <tr> <th>Rated voltage (V.DC) 额定工作电压</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Impedance ratio 阻抗比</td> <td>Z(-25°C)/Z(20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> <tr> <td>ZT/Z20 (max)</td> <td>Z(-55°C)/Z(20°C)</td> <td>4</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated voltage (V.DC) 额定工作电压	6.3	10	16	25	35	50	63	80	100	Impedance ratio 阻抗比	Z(-25°C)/Z(20°C)	2	2	2	2	2	2	2	2	Z(-40°C)/Z(20°C)	3	3	3	3	3	3	3	3	ZT/Z20 (max)	Z(-55°C)/Z(20°C)	4	4	4	3	3	3	3	3
Rated voltage (V.DC) 额定工作电压	6.3	10	16	25	35	50	63	80	100																															
Impedance ratio 阻抗比	Z(-25°C)/Z(20°C)	2	2	2	2	2	2	2	2																															
	Z(-40°C)/Z(20°C)	3	3	3	3	3	3	3	3																															
	ZT/Z20 (max)	Z(-55°C)/Z(20°C)	4	4	4	3	3	3	3	3																														
Load Life 高温负荷特性	After 5000 hours' (2000 hours' for φ4~φ6.3 and φ8×6.2, 3000 hours' for φ8×10.5~φ10×13.5) application of rated voltage at 105°C, capacitors meet the characteristics requirements listed at right. 在 105°C 环境中施加额定工作电压 5000 小时 (φ4~φ6.3 和 φ8×6.2 为 2000 小时, φ8×10.5~φ10×13.5 为 3000 小时) 后, 电容器的特性符合右表的要求。 <table border="1"> <tbody> <tr> <td>Capacitance Change 静电容量变化率</td> <td>Within ±30% of the initial value 初始值的±30%以内</td> </tr> <tr> <td>Tan δ 损耗角正切</td> <td>200% or less of the initial specified value 不大于规范值的 200%</td> </tr> <tr> <td>Leakage Current 漏电流</td> <td>Initial specified value or less 不大于规范值</td> </tr> </tbody> </table>	Capacitance Change 静电容量变化率	Within ±30% of the initial value 初始值的±30%以内	Tan δ 损耗角正切	200% or less of the initial specified value 不大于规范值的 200%	Leakage Current 漏电流	Initial specified value or less 不大于规范值																																	
Capacitance Change 静电容量变化率	Within ±30% of the initial value 初始值的±30%以内																																							
Tan δ 损耗角正切	200% or less of the initial specified value 不大于规范值的 200%																																							
Leakage Current 漏电流	Initial specified value or less 不大于规范值																																							
Shelf Life 高温储存特性	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 105°C 环境中无负荷放置 1000 小时后, 电容器的特性符合高温负荷特性中所列的规定值。																																							
Resistance to Soldering Heat 耐焊接热特性	After reflow soldering and restored at room temperature, they meet the characteristics requirements listed at right. 经过回流焊并冷却至室温后, 电容器的特性符合右表的要求。 <table border="1"> <tbody> <tr> <td>Capacitance Change 静电容量变化率</td> <td>Within ±10% of the initial value 初始值的±10%以内</td> </tr> <tr> <td>Tan δ 损耗角正切</td> <td>Initial specified value or less 不大于规范值</td> </tr> <tr> <td>Leakage Current 漏电流</td> <td>Initial specified value or less 不大于规范值</td> </tr> </tbody> </table>	Capacitance Change 静电容量变化率	Within ±10% of the initial value 初始值的±10%以内	Tan δ 损耗角正切	Initial specified value or less 不大于规范值	Leakage Current 漏电流	Initial specified value or less 不大于规范值																																	
Capacitance Change 静电容量变化率	Within ±10% of the initial value 初始值的±10%以内																																							
Tan δ 损耗角正切	Initial specified value or less 不大于规范值																																							
Leakage Current 漏电流	Initial specified value or less 不大于规范值																																							
Applicable Standards 适用标准	JIS C-5141 and JIS C-5102																																							

◆ Dimensions & Marking 尺寸及印字



FZ Series



*1 Voltage mark [6V] represents 6.3V for $\phi 4 \sim \phi 10$; *2 $[L \pm 0.5]$ is applicable to $\phi 8 \times 10.5 \sim \phi 10$; *3 $[L \pm 1.0]$ is applicable to $\phi 12.5 \sim \phi 16$.
 Re: Date code and series type — 1st digit for Year, 2nd digit for Quarter, 4 quarter codes in one year are 1, 4, 7, 0; 3rd character for Series; FZ Series = F.

	(mm)										
DxL	$\phi 4 \times 5.8$	$\phi 5 \times 5.8$	$\phi 6.3 \times 5.8$	$\phi 6.3 \times 7.7$	$\phi 8 \times 6.2$	$\phi 8 \times 10.5$	$\phi 10 \times 10.5$	$\phi 10 \times 13.5$	$\phi 12.5 \times 13.5$	$\phi 12.5 \times 16$	$\phi 16 \times 16.5$
A	1.8	2.1	2.4	2.4	3.3	2.9	3.2	3.2	4.7	4.7	5.5
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
E ± 0.2	1.0	1.3	2.2	2.2	2.2	3.1	4.4	4.4	4.4	4.4	6.7
L	5.8	5.8	5.8	7.7	6.2	10.5	10.5	13.5	13.5	16.0	16.5

◆ Standard size & Maximum permissible ripple current & Impedance 规格壳号及最大允许纹波电流及阻抗值

WV 电压		6.3			10			16		
容量 Cap. (μF)		0J			1A			1C		
10	100							4x5.8	1.35	90
15	150							4x5.8	1.35	90
22	220	4x5.8	1.35	90	4x5.8	1.35	90	5x5.8 (4x5.8)	0.70 (1.35)	160 (90)
33	330	5x5.8 (4x5.8)	0.70 (1.35)	160 (90)	5x5.8 (4x5.8)	0.70 (1.35)	160 (90)	6.3x5.8 (5x5.8)	0.36 (0.70)	240 (160)
47	470	5x5.8 (4x5.8)	0.70 (1.35)	160 (90)	6.3x5.8 (5x5.8)	0.36 (0.70)	240 (160)	6.3x5.8 (5x5.8)	0.36 (0.70)	240 (160)
56	560	5x5.8	0.70	160	6.3x5.8	0.36	240	6.3x5.8	0.36	240
68	680	6.3x5.8 (5x5.8)	0.36 (0.70)	240 (160)	6.3x5.8	0.36	240	6.3x7.7 (6.3x5.8)	0.26 (0.36)	300 (240)
100	101	6.3x5.8 (5x5.8)	0.36 (0.70)	240 (160)	6.3x7.7 (6.3x5.8)	0.26 (0.36)	300 (240)	6.3x7.7 (6.3x5.8)	0.26 (0.36)	300 (240)
150	151	6.3x5.8	0.36	240	6.3x7.7	0.26	300	6.3x7.7	0.26	300
220	221	6.3x7.7 (6.3x5.8) (8x6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3x7.7 (8x6.2)	0.26 (0.26)	300 (300)	8x10.5 (6.3x7.7)	0.16 (0.26)	600 (300)
330	331	6.3x7.7 (8x6.2)	0.26	300	10x10.5 (8x10.5)	0.08 (0.16)	850 (600)	10x10.5 (8x10.5)	0.08 (0.16)	850 (600)
470	471	8x10.5	0.16	600	10x10.5 (8x10.5)	0.08 (0.16)	850 (600)	10x10.5 (8x10.5)	0.08 (0.16)	850 (600)
680	681	10x10.5 (8x10.5)	0.08 (0.16)	850 (600)	10x10.5	0.08	850	10x13.5 (10x10.5)	0.07 (0.08)	950 (850)
1000	102	10x10.5 (8x10.5)	0.08 (0.16)	850 (600)	10x13.5 (10x10.5)	0.07 (0.08)	950 (850)	16x16.5 (12.5x16) (12.5x13.5)	0.05 (0.055) (0.06)	1450 (1200) (1100)
1500	152	10x13.5 (10x10.5)	0.07 (0.08)	950 (850)	12.5x13.5	0.06	1100	16x16.5	0.05	1450
2200	222	12.5x13.5	0.06	1100	12.5x16	0.055	1200			
3300	332	12.5x16	0.055	1200	16x16.5	0.05	1450	Case Size	Impedance	Ripple Current
4700	472	16x16.5	0.05	1450						

Maximum Impedance (Ω) at 20°C 100kHz, Ripple Current (mA rms) at 105°C 100kHz

◆ **Standard size & Maximum permissible ripple current & Impedance** 规格壳号及最大允许纹波电流及阻抗值

WV 电压 容量 Cap. (μF)		25			35			50		
		1E			1V			1H		
4.7	4R7				4×5.8	1.35	90	5×5.8 (4×5.8)	1.52 (2.9)	85 (60)
10	100	4×5.8	1.35	90	5×5.8 (4×5.8)	0.70 (1.35)	160 (90)	6.3×5.8 (5×5.8)	0.88 (1.52)	165 (85)
15	150	5×5.8	0.70	160	5×5.8	0.70	160	6.3×5.8	0.88	165
22	220	6.3×5.8 (5×5.8)	0.36 (0.70)	240 (160)	6.3×5.8 (5×5.8)	0.36 (0.70)	240 (160)	6.3×7.7 (6.3×5.8) (8×6.2)	0.68 (0.88) (0.68)	195 (165) (195)
33	330	6.3×5.8 (5×5.8)	0.36 (0.70)	240 (160)	6.3×5.8 (8×6.2)	0.36 (0.26)	240 (300)	6.3×7.7 (8×6.2)	0.68	195
47	470	6.3×7.7 (6.3×5.8) (8×6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3×7.7 (6.3×5.8) (8×6.2)	0.26 (0.36) (0.26)	300 (240) (300)	6.3×7.7 (8×6.2)	0.68	195
56	560	6.3×7.7 (6.3×5.8)	0.26 (0.36)	300 (240)	6.3×7.7	0.26	300	8×10.5	0.34	350
68	680	6.3×7.7	0.26	300	6.3×7.7	0.26	300	8×10.5	0.34	350
100	101	6.3×7.7 (8×6.2)	0.26	300	8×10.5	0.16	600	10×10.5 (8×10.5)	0.18 (0.34)	670 (350)
150	151	8×10.5 (6.3×7.7)	0.16 (0.26)	600 (300)	10×10.5 (8×10.5)	0.08 (0.16)	850 (600)	10×10.5	0.18	670
220	221	8×10.5	0.16	600	10×10.5 (8×10.5)	0.08 (0.16)	850 (600)	10×13.5 (10×10.5)	0.14 (0.18)	780 (670)
330	331	10×10.5 (8×10.5)	0.08 (0.16)	850 (600)	10×10.5	0.08	850	12.5×13.5	0.12	900
470	471	10×13.5 (10×10.5)	0.07 (0.08)	950 (850)	12.5×13.5 (10×13.5)	0.06 (0.07)	1100 (950)	16×16.5 (12.5×16)	0.08 (0.10)	1250 (1050)
680	681	12.5×13.5	0.06	1100	12.5×16	0.055	1200			
1000	102	16×16.5 (12.5×16)	0.05 (0.055)	1450 (1200)	16×16.5	0.05	1450	Case Size	Impedance	Ripple Current
1500	152	16×16.5	0.05	1450						

Maximum Impedance (Ω) at 20°C 100kHz, Ripple Current (mA rms) at 105°C 100kHz

◆ **Standard size & Maximum permissible ripple current & Impedance** 规格壳号及最大允许纹波电流及阻抗值

WV 电压 容量 Cap. (μF)		63			80			100		
		1J			1K			2A		
3.3	3R3				5×5.8	5.0	25			
4.7	4R7	5×5.8	3.0	50	6.3×5.8	3.0	40			
10	100	6.3×7.7 (6.3×5.8)	1.2 (1.5)	120 (80)	6.3×7.7 (8×6.2)	2.4	60	8×10.5	1.3	130
22	220	8×10.5 (6.3×7.7) (8×6.2)	0.65 (1.2) (1.2)	250 (120) (120)	8×10.5	1.3	130	10×10.5 (8×10.5)	0.7 (1.3)	200 (130)
33	330	8×10.5	0.65	250	8×10.5	1.3	130	10×10.5	0.7	200
47	470	8×10.5	0.65	250	10×10.5	0.7	200	12.5×13.5 (10×13.5)	0.32 (0.60)	500 (250)
68	680	12.5×13.5 (8×10.5)	0.16 (0.65)	800 (250)	12.5×13.5	0.32	500	12.5×13.5	0.32	500
100	101	12.5×13.5 (10×10.5)	0.16 (0.35)	800 (400)	12.5×13.5	0.32	500	16×16.5 (12.5×16)	0.17 (0.26)	795 (550)
150	151	12.5×13.5 (10×13.5)	0.16 (0.25)	800 (650)	12.5×13.5	0.32	500			
220	221	12.5×13.5 (10×13.5)	0.16 (0.25)	800 (650)	12.5×16	0.26	550	Case Size	Impedance	Ripple Current
330	331	16×16.5	0.082	1400	16×16.5	0.17	795			

Maximum Impedance (Ω) at 20°C 100kHz, Ripple Current (mA rms) at 105°C 100kHz

FZ Series

◆ **Frequency Correction Factor of Rated Ripple Current** 纹波电流频率补偿系数

Frequency Capacitance (μ F)		50Hz	120Hz	300Hz	1kHz	10kHz~
		$\Phi 4 \sim \Phi 10$	4.7~68	0.35	0.50	0.64
100~1500	0.40		0.55	0.70	0.85	1.00
$\Phi 12.5 \sim \Phi 16$	~68	0.40	0.55	0.70	0.85	1.00
	100~680	0.45	0.65	0.80	0.90	1.00
	1000~4700	0.65	0.85	0.95	1.00	1.00