



CONDUCTIVE POLYMER HYBRID ALUMINUM ELECTROLYTIC CAPACITORS

FRA Series

- Wide Temperature range
- High Ripple Current
- $-55^{\circ}\text{C} \sim +135^{\circ}\text{C}$
- Endurance 135°C , 2000~4,000hrs
- AEC-Q200 compliant : Please contact us for more details, test data, information.

FPA

High Temp

FRA



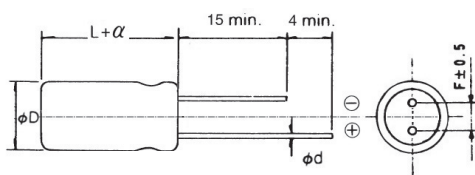
SPECIFICATIONS

Item	Characteristics													
Category temperature range	-55 to +135℃													
Rated voltage range	16 to 63Vdc													
Surge voltage	Rated Voltage(WV)	16	25	35	50	63								
	Surge Voltage(SV)	18,4	29,0	40,0	57,5	72,5								
Capacitance tolerance	±20% (M) (at 20℃, 120Hz)													
Tangent of loss angle	Shall not exceed the value in Ratings of FRA series, (at 20℃, 120Hz)													
Leakage Current ※ 1	Shall not exceed the value in Ratings of FRA series. (at 20℃, 2minutes)													
ESR	Shall not exceed the value in Ratings of FRA series, (at 20℃, 100kHz)													
Impedance Ratio (Characteristics at low temp.)	Impedance	Ratio												
	Z(-25℃) / Z(+20℃)	< 1.5												
	Z(-55℃) / Z(+20℃)	< 2.0 (at 100kHz)												
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 125℃ or 135℃ Capacitance change ≤ ±30% of the initial value Tanδ ≤ ±200% of the initial specified value ESR ≤ ±200% of the initial specified value Leakage current ≤ The initial specified value					<table><tr><th>CASE CODE</th><th>Time(hrs)</th></tr><tr><td>F61</td><td rowspan="2">2,000</td></tr><tr><td>F80</td></tr><tr><td>H10</td><td rowspan="2">4,000</td></tr><tr><td>J10</td></tr></table>	CASE CODE	Time(hrs)	F61	2,000	F80	H10	4,000	J10
	CASE CODE	Time(hrs)												
F61	2,000													
F80														
H10	4,000													
J10														
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 135℃ without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24hours and not more than 48 hours and not more than 48 hours before the measurements. Capacitance change ≤ ±30% of the initial value Tanδ ≤ ±200% of the initial specified value ESR ≤ ±200% of the initial specified value Leakage current ≤ The initial specified value													
Bias Humidity	The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjecting them to the DC rated voltage at 85℃, 85% RH for 2000hours Capacitance change ≤ ±30% of the initial value Tanδ ≤ ±200% of the initial specified value ESR ≤ ±200% of the initial specified value Leakage current ≤ The initial specified value													

※ 1, if any doubt arises, measure the leakage current after following voltage treatment.
(Voltage treatment : Applying rated voltage for 120minutes at 135°C)

DIMENSIONS

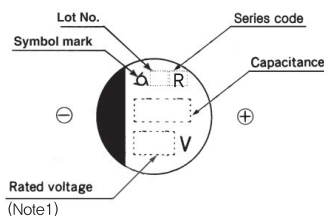
Coating Case Type



UNIT(mm)

$\phi D(+0,5\text{max.})$	6,3	6,3	8	10
L	6	8	10	10
α	0,5			
$\phi d(\pm 0,05)$	0,45	0,5	0,6	0,6
$F(\pm 0,5)$	2,5	2,5	3,5	5

MARKING



RATED RIPPLE CURRENT MULTIPLIES

Frequency(Hz)	120	1K	5K	10K	20K	30K	100K ~500K
Capacitance(μF)							
~ 10	0,03	0,30	0,50	0,60	0,70	0,75	1,00
15 ~ 33	0,07	0,30	0,50	0,60	0,70	0,75	1,00
39 ~ 150	0,10	0,40	0,60	0,70	0,80	0,80	1,00
220 ~ 560	0,13	0,45	0,65	0,75	0,85	0,85	1,00

RATINGS OF FRA Series

Case Code	Rated Voltage (V)	Rated Capacitance (μF)	ESR(mΩ) (at 100kHz)	Rated Ripple Current (mA rms at 100kHz)		Tangent of loss angle	Leakage Current (μA)
				125°C	135°C		
6.3X6	16	82	45	1,700	950	0.16	13
	25	56	50	1,400	900	0.14	14
	35	47	60	1,400	900	0.12	16
6.3X8	16	150	27	2,500	1,450	0.16	24
	25	100	30	2,100	1,400	0.14	25
	35	68	35	2,100	1,400	0.12	24
8X10	16	270	20	3,050	1,700	0.16	43
	25	220	22	2,900	1,600	0.14	55
	35	150	22	2,900	1,600	0.12	53
	50	33	30	2,400	1,250	0.10	17
	50	47	30	2,400	1,250	0.10	24
	50	68	30	2,400	1,250	0.10	34
	63	22	40	2,100	1,100	0.08	14
	63	33	40	2,100	1,100	0.08	21
	63	47	40	2,100	1,100	0.08	30
	63	68	30	2,100	1,100	0.08	30
10X10	16	470	18	3,400	2,100	0.16	75
	25	330	20	3,300	2,000	0.14	83
	35	270	20	3,300	2,000	0.12	95
	50	56	25	2,900	1,600	0.10	28
	50	100	25	2,900	1,600	0.10	50
	50	120	25	2,900	1,600	0.10	60
	63	33	30	2,600	1,400	0.08	21
	63	56	30	2,600	1,400	0.08	35
	63	82	30	2,600	1,400	0.08	52
	63	100	30	2,600	1,400	0.08	52