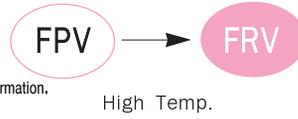




CONDUCTIVE POLYMER HYBRID ALUMINUM ELECTROLYTIC CAPACITORS

FRV Series

- Hybrid electrolyte.
- High Ripple Current.
- -55°C ~ +135°C.
- Endurance 135°C, 2,000hrs ~ 4,000hrs
- AEC-Q200 compliant : Please contact us for more details, test data, information.

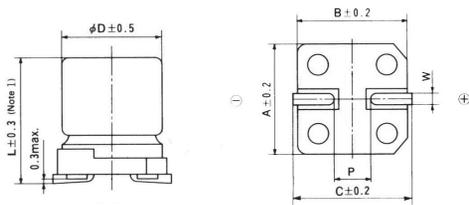


SPECIFICATIONS

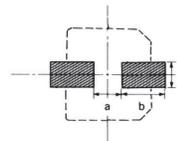
Item	Characteristics																			
Category temperature range	-55 to +135°C																			
Rated voltage range	16 to 63V _{DC}																			
Surge voltage	<table border="1"> <tr> <td>Rated Voltage(WV)</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Surge Voltage(SV)</td> <td>18.4</td> <td>29.0</td> <td>40.0</td> <td>57.5</td> <td>72.5</td> </tr> </table>	Rated Voltage(WV)	16	25	35	50	63	Surge Voltage(SV)	18.4	29.0	40.0	57.5	72.5							
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Capacitance tolerance	±20%(M) (at 20°C, 120Hz)																			
Tangent of loss angle	Shall not exceed the value in Ratings of FRV series. (at 20°C, 120Hz)																			
Leakage Current * 1	Shall not exceed the value in Ratings of FRV series. (at 20°C, 2 minutes)																			
ESR	Shall not exceed the value in Ratings of FRV series. (at 20°C, 100kHz)																			
Impedance Ratio (Characteristics at low temp.)	<table border="1"> <tr> <td>Impedance</td> <td>Ratio</td> </tr> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>< 1.5</td> </tr> <tr> <td>Z(-55°C)/Z(+20°C)</td> <td>< 2.0</td> </tr> </table>	Impedance	Ratio	Z(-25°C)/Z(+20°C)	< 1.5	Z(-55°C)/Z(+20°C)	< 2.0													
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	(at 100kHz)																			
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 125°C or 135°C.																			
	<table border="1"> <tr> <td>Capacitance change</td> <td>≤ ±30% of the initial value</td> <td>Case Code</td> <td>Time(Hrs)</td> </tr> <tr> <td>Tan δ</td> <td>≤ ±200% of the initial specified value</td> <td>F61</td> <td>2,000</td> </tr> <tr> <td>ESR</td> <td>≤ ±200% of the initial specified value</td> <td>F80</td> <td></td> </tr> <tr> <td>Leakage current</td> <td>≤ The initial specified value</td> <td>H10</td> <td>4,000</td> </tr> <tr> <td></td> <td></td> <td>J10</td> <td></td> </tr> </table>	Capacitance change	≤ ±30% of the initial value	Case Code	Time(Hrs)	Tan δ	≤ ±200% of the initial specified value	F61	2,000	ESR	≤ ±200% of the initial specified value	F80		Leakage current	≤ The initial specified value	H10	4,000			J10
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Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 135°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.																			
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Bias Humidity	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 85°C, 85% RH for 2,000 hours.																			
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- * 1. If any doubt arises, measure the leakage current after following voltage treatment. (Voltage treatment : Applying rated voltage for 120minutes at 135°C)
- * 2. Reflow Conditions : Refer to 46 page

DIMENSIONS



Recommended solder land on PC board



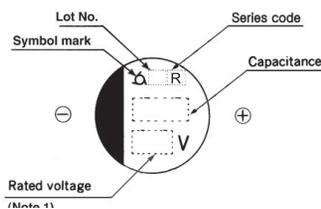
■ : Solder land on PC board

Note 1 : L ± 0.7 for 10 × 10 (J10)

Unit(mm)

Case code	φ D	L	A	B	C	W	P	a	b	c
F61	6.3	5.8	6.6	6.6	7.2	0.5-0.8	1.9	1.9	3.5	1.6
F80	6.3	7.7	6.6	6.6	7.2	0.5-0.8	1.9	1.9	3.5	1.6
H10	8.0	10.0	8.3	8.3	9.0	0.7-1.1	3.1	3.1	4.2	2.2
J10	10.0	10.0	10.3	10.3	11.0	0.7-1.1	4.5	4.5	4.4	2.2

MARKING



RATED RIPPLE CURRENT MULTIPLIERS

Cap.(μF)	120	1k	5k	10k	20k	30k	100k ~ 500k
~ 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 FRV Series

Case Code	Rated Voltage (V)	Rated Capacitance (μF)	ESR(mΩ) (at 100kHz)	Rated Ripple Current (mArms at 100kHz)		Tangent of loss angle	Leakage Current (μA)
				125°C	135°C		
F61	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
F80	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
H10	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
J10	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

Conductive Polymer Hybrid