Surface Mount Type

Series: **FP** Type: **V**

FP High temperature Lead-Free reflow (suffix:A✻)



■ Features

- Low ESR (30 % to 50 % less than FK series)
- Endurance: 2000 h at 105 °C
- Vibration-proof product is available upon request. (ϕ8 mm and larger)
- AEC-Q200 qualified*
- RoHS directive compliant

■ Specifications

Category Temp. Range	−55 °C to +105 °C							
Rated W.V. Range	6.3 V.DC to 50 V.DC							
Nominal Cap. Range	10 µF to 1800 µF							
Capacitance Tolerance	±20 % (120 Hz/+20 °C)							
DC Leakage Current	I ≦ 0.01 CV or 3 (µA) After 2 minutes (whichever is greater)							
tan δ	Please see the attached standard products list							
Characteristics at Low Temperature	W.V. (V)	6.3	10	16	25	35	50	(Impedance ratio at 120 Hz)
	Z(−25 °C)/Z(+20 °C)	2	2	2	2	2	2	
	Z(−40°C)/Z(+20 °C)	3	3	3	3	3	3	
	Z(−55°C)/Z(+20 °C)	4	4	4	3	3	3	
Endurance	After applying rated working voltage at +105 °C ±2 °C for 2000 hours the capacitors shall meet the limits specified below. Post-test requirement at +20 °C							
	Capacitance change	±30 % of initial measured value						
	tan δ	≦ 200 % of initial specified value						
	DC leakege current	≦ initial specified value						
Shelf Life	After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)							
Resistance to Soldering Heat	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.							
	Capacitance change	±10 % of initial measured value						
	tan δ	≦ initial specified value						
	DC leakage current	≦ initial specified value						

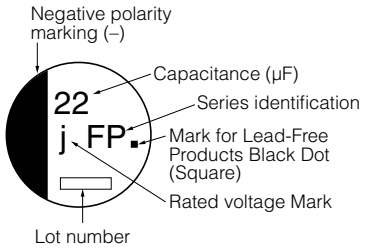
■ Frequency correction factor for ripple current

Cap (µF)	Frequency (Hz)			
	120	1 k	10 k	100 k to
10 to 470	0.65	0.85	0.95	1.00
560 to 1800	0.75	0.90	0.95	1.00

■ Marking

Example:6.3 V 22 µF

Marking color: BLACK

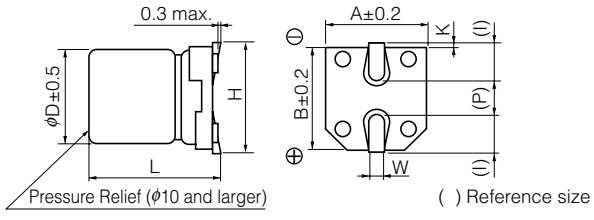


Rated Voltage Mark

j	6.3 V	E	25 V
A	10 V	V	35 V
C	16 V	H	50 V

■ Dimensions in mm(not to scale)

(Unit : mm)



Size code	D	L	A, B	H	I	W	P	K
B	4.0	5.8±0.30	4.3	5.5 max.	1.8	0.65±0.1	1.0	$0.35^{+0.15}_{-0.20}$
C	5.0	5.8±0.30	5.3	6.5 max.	2.2	0.65±0.1	1.5	$0.35^{+0.15}_{-0.20}$
D	6.3	5.8±0.30	6.6	7.8 max.	2.6	0.65±0.1	1.8	$0.35^{+0.15}_{-0.20}$
D8	6.3	7.7±0.30	6.6	7.8 max.	2.6	0.65±0.1	1.8	$0.35^{+0.15}_{-0.20}$
E	8.0	6.2±0.30	8.3	9.5 max.	3.4	0.65±0.1	2.2	$0.35^{+0.15}_{-0.20}$
F	8.0	10.2±0.30	8.3	10.0 max.	3.4	0.90±0.2	3.1	0.70±0.20
G	10.0	10.2±0.30	10.3	12.0 max.	3.5	0.90±0.2	4.6	0.70±0.20

✻ This product qualify for AEC-Q200, but it has some deviations.

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01 Mar. 2014

■ Standard Products

Endurance : 105 °C 2000 h

W.V.	Cap. (±20 %)	Case size			Specification			Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty
		Dia.	Length	✻Size Code	Ripple Current (100 kHz) (+105 °C)	E.S.R. (100 kHz) (+20 °C)	tan δ (120 Hz) (+20 °C)			Taping
(V)	(μF)	(mm)	(mm)		(mA r.m.s.)	(Ω)				(pcs)
6.3	22	4	5.8	B	160	0.85	0.26	EEEFP0J220AR	(5)	2000
	47	4	5.8	(B)	160	0.85	0.26	EEEFPJ470UAR	(5)	2000
		5	5.8	C	240	0.36	0.26	EEEFP0J470AR	(5)	1000
	100	5	5.8	(C)	240	0.36	0.26	EEEFPJ101UAR	(5)	1000
		6.3	5.8	D	300	0.26	0.26	EEEFP0J101AP	(5)	1000
	220	6.3	5.8	D	300	0.26	0.26	EEEFP0J221AP	(5)	1000
	330	6.3	7.7	D8	600	0.16	0.26	EEEFPJ331XAP	(5)	900
		8	6.2	E	500	0.18	0.26	EEEFP0J331AP	(6)	1000
	470	8	10.2	F	850	0.08	0.26	EEEFP0J471AP	(6)	500
	1000	8	10.2	F	850	0.08	0.26	EEEFP0J102AP	(6)	500
	1500	10	10.2	G	1190	0.06	0.26	EEEFP0J152AP	(6)	500
	1800	10	10.2	(G)	850	0.08	0.26	EEEFPJ182UAP	(6)	500
10	22	4	5.8	B	160	0.85	0.19	EEEFP1A220AR	(5)	2000
	33	4	5.8	(B)	160	0.85	0.19	EEEFPA330UAR	(5)	2000
		5	5.8	C	240	0.36	0.19	EEEFP1A330AR	(5)	1000
	150	6.3	5.8	D	300	0.26	0.19	EEEFP1A151AP	(5)	1000
	220	6.3	7.7	D8	600	0.16	0.19	EEEFPA221XAP	(5)	900
		8	6.2	E	500	0.18	0.19	EEEFP1A221AP	(6)	1000
	330	8	10.2	F	850	0.08	0.19	EEEFP1A331AP	(6)	500
	470	8	10.2	F	850	0.08	0.19	EEEFP1A471AP	(6)	500
	680	8	10.2	F	850	0.08	0.19	EEEFP1A681AP	(6)	500
	1000	10	10.2	G	1190	0.06	0.19	EEEFP1A102AP	(6)	500
	1200	10	10.2	(G)	850	0.08	0.19	EEEFPA122UAP	(6)	500
16	10	4	5.8	B	160	0.85	0.16	EEEFP1C100AR	(5)	2000
	22	4	5.8	(B)	160	0.85	0.16	EEEFPC220UAR	(5)	2000
		5	5.8	C	240	0.36	0.16	EEEFP1C220AR	(5)	1000
	47	5	5.8	(C)	240	0.36	0.16	EEEFPC470UAR	(5)	1000
		6.3	5.8	D	300	0.26	0.16	EEEFP1C470AP	(5)	1000
	68	6.3	5.8	D	300	0.26	0.16	EEEFP1C680AP	(5)	1000
	100	6.3	5.8	D	300	0.26	0.16	EEEFP1C101AP	(5)	1000
		6.3	7.7	D8	600	0.16	0.16	EEEFPC101XAP	(5)	900
	150	6.3	7.7	D8	600	0.16	0.16	EEEFPC151XAP	(5)	900
	220	6.3	7.7	D8	600	0.16	0.16	EEEFPC221XAP	(5)	900
		8	6.2	E	500	0.18	0.16	EEEFP1C221AP	(6)	1000
	330	8	10.2	F	850	0.08	0.16	EEEFP1C331AP	(6)	500
	470	8	10.2	F	850	0.08	0.16	EEEFP1C471AP	(6)	500
	680	10	10.2	G	1190	0.06	0.16	EEEFP1C681AP	(6)	500
	820	10	10.2	(G)	850	0.08	0.16	EEEFPC821UAP	(6)	500
25	10	4	5.8	B	160	0.85	0.14	EEEFP1E100AR	(5)	2000
	22	5	5.8	C	240	0.36	0.14	EEEFP1E220AR	(5)	1000
	33	5	5.8	(C)	240	0.36	0.14	EEEFPE330UAR	(5)	1000
		6.3	5.8	D	300	0.26	0.14	EEEFP1E330AP	(5)	1000
	47	6.3	5.8	D	300	0.26	0.14	EEEFP1E470AP	(5)	1000
	68	6.3	5.8	D	300	0.26	0.14	EEEFP1E680AP	(5)	1000
	100	6.3	7.7	D8	600	0.16	0.14	EEEFPE101XAP	(5)	900
		8	6.2	E	500	0.18	0.14	EEEFP1E101AP	(6)	1000
	150	8	10.2	F	850	0.08	0.14	EEEFP1E151AP	(6)	500
	220	8	10.2	F	850	0.08	0.14	EEEFP1E221AP	(6)	500
	330	8	10.2	F	850	0.08	0.14	EEEFP1E331AP	(6)	500
	470	10	10.2	G	1190	0.06	0.14	EEEFP1E471AP	(6)	500
	560	10	10.2	(G)	850	0.08	0.14	EEEFPE561UAP	(6)	500

✻ Size code( ):Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V

· Please refer to the page of “Reflow Profile” and “The Taping Dimensions”.

· When requesting vibration-proof product, please put the last “V” instead to “P”

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■ Standard Products

Endurance : 105 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size Dia. (mm)	Length (mm)	✻Size Code	Specification Ripple Current (100 kHz) (+105 °C) (mA r.m.s.)	E.S.R. (100 kHz) (+20 °C) (Ω)	tan δ (120 Hz) (+20 °C)	Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
35	10	4	5.8	(B)	160	0.85	0.12	EEEFPV100UAR	(5)	2000
	22	5	5.8	C	240	0.36	0.12	EEEFP1V220AR	(5)	1000
	33	6.3	5.8	D	300	0.26	0.12	EEEFP1V330AP	(5)	1000
	47	6.3	5.8	D	300	0.26	0.12	EEEFP1V470AP	(5)	1000
	68	6.3	7.7	D8	600	0.16	0.12	EEEFPV680XAP	(5)	900
	100	6.3	7.7	D8	600	0.16	0.12	EEEFPV101XAP	(5)	900
		8	10.2	F	850	0.08	0.12	EEEFP1V101AP	(6)	500
	150	8	10.2	F	850	0.08	0.12	EEEFP1V151AP	(6)	500
	220	8	10.2	F	850	0.08	0.12	EEEFP1V221AP	(6)	500
	330	10	10.2	G	1190	0.06	0.12	EEEFP1V331AP	(6)	500
	390	10	10.2	(G)	850	0.08	0.12	EEEFPV391UAP	(6)	500
50	100	8	10.2	F	670	0.18	0.10	EEEFP1H101AP	(6)	500
	220	10	10.2	G	900	0.12	0.10	EEEFP1H221AP	(6)	500

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If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V
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