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

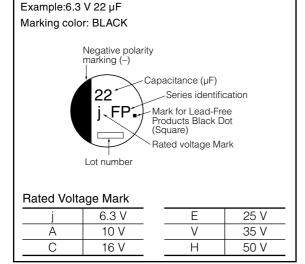
■ Specifications

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											
	W.V. (V)	6.3	10	16	25	35	50		ratio at 120 Hz)			
Characteristics	Z(-25 °C)/Z(+20 °C)	2	2	2	2	2	2	(Impodance ratio				
at Low Temperature	Z(-40°C)/Z(+20 °C)	3	3	3	3	3	3	(impedance ratio				
	Z(-55°C)/Z(+20 °C)	4	4	4	3	3	3					
	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											
Endurance	Capacitance change											
	tan δ											
	DC leakege current											
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)											
	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.											
Resistance to	Capacitance change											
Soldering Heat	tan δ											
	DC leakage current	current ≤ initial specified value										

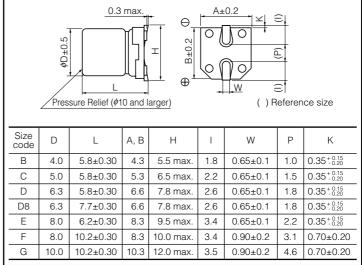
■ Frequency correction factor for ripple current

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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



■ Dimensions in mm(not to scale)



 $\boldsymbol{\ast}$ This product qualify for AEC-Q200, but it has some deviations.

(Unit: mm)

Endurance : 105 °C 2000 h

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■ Standard Products

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			Case size	;	S	pecification	on			Min. Packaging Q'ty
W.V.	Cap. (±20 %)	Dia.	Length	* Size Code			tan δ (120 Hz)	Part No. (RoHS:compliant)	Reflow	Taping
(V)	(µF)	(mm)	(mm)		(+105 °C) (mA r.m.s.)	(+20 °C) (Ω)	(+20 °C)			(pcs)
	22	4	5.8	В	160	0.85	0.26	EEEFP0J220AR	(5)	2000
		4	5.8	(B)	160	0.85	0.26	EEEFPJ470UAR	(5)	2000
	47	5	5.8	C	240	0.36	0.26	EEEFP0J470AR	(5)	1000
		5	5.8	(C)	240	0.36	0.26	EEEFPJ101UAR	(5)	1000
	100	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
6.3		6.3	7.7	D8	600	0.16	0.26	EEEFPJ331XAP	(5)	900
	330	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
-	22	4	5.8	B	160	0.85	0.19	EEEFP1A220AR	(5)	2000
		4	5.8	(B)	160	0.85	0.19	EEEFPA330UAR	(5)	2000
	33	5	5.8	C	240	0.36	0.19	EEEFP1A330AR	(5)	1000
	150	6.3	5.8	D	300	0.36	0.19	EEEFP1A151AP	(5)	1000
	150	6.3	7.7	D8	600	0.20	0.19	EEEFPA221XAP	(5)	900
10	220	8	6.2	E	500	0.18	0.19	EEEFP1A221AP	(6)	1000
10	330	8	10.2	F	850	0.18	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
	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
16		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
	10	4	5.8	В	160	0.85	0.14	EEEFP1E100AR	(5)	2000
25	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"

Endurance: 105 °C 2000 h

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■ Standard Products

W.V.	Cap. (±20 %)	Case size			S	pecificatio	n			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)	Part No. (RoHS:compliant)	Reflow	Taping
(V)	(µF)	(mm)	(mm)		(mA r.m.s.)	(Ω)				(pcs)
	10	4	5.8	(B)	160	0.85	0.12	EEEFPV100UAR	(5)	2000
35	22	5	5.8	С	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

^{*} 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"