Surface Mount Type **SP-Cap**

Series: **FD, CD, CX, UD, UE**

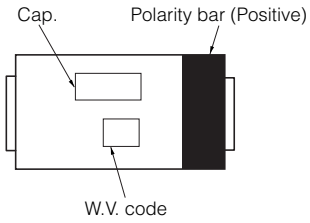
■ Features

- Low ESR
- Excellent Noise-absorbent Characteristics
- RoHS directive compliant

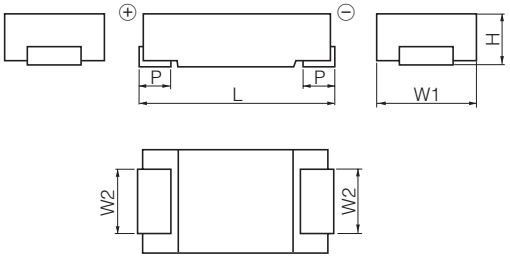
■ Specifications

Series & Size Code	FD	CD	CX	UD	UE
Category Temp. Range	−40 °C to +105 °C				
Rated W.V.Range	2 V.DC to 12.5 V.DC	2 V.DC to 16 V.DC	2 V.DC to 6.3 V.DC	2 V.DC to 8 V.DC	2 V.DC to 8 V.DC
Nominal Cap.Range	15 µF to 68 µF	2.2 µF to 220 µF	100 µF to 470 µF	68 µF to 470 µF	100 µF to 560 µF
Capacitance Tolerance	±20 %				
DC Leakage Current	Reflow 240 °C : I ≦ 0.06 CV 2minutes (2 V.DC to 4 V.DC) I ≦ 0.04 CV or 3 µA 2 minutes (6.3 V.DC to 16 V.DC) (Whichever is greater) Reflow 260 °C : I ≦ 0.1 CV 2 minutes				
tan δ	≦ 0.06 (120 Hz/+20 °C)			≦0.10 (120 Hz/+20 °C)	
Surge Voltage	Rated Working Voltage × 1.25 (15 °C to 35 °C)				
Endurance	After applying rated working voltage for 1000 hours at 105 °C±2 °C, and then being stabilized at +20 °C, capacitor shall meet the following limits.				
	Capacitance change	±10% of initial measured value			
	tan δ	≦ Initial specified value			
	DC leakage current	≦ Initial specified value			
Moisture resistance	After storing for 500 hours at 60 °C, 90 %				
	Capacitance change of initial measurd value	2, 2.5 V.DC	4 V.DC	6.3 V.DC	8 V.DC to 16 V.DC
		+70, −20 %	+60, −20 %	+50, −20 %	+40, −20 %
	tan δ	≦ 200 % of initial specified value			
	DC leakage current	≦ Initial specified value			

■ Marking



■ Dimensions in mm(not to scale)



(mm)

Series & Size Code	L±0.2	W1±0.2	W2±0.1	H	P±0.3
FD	7.3	4.3	2.4	1.1±0.1	1.3
CD	7.3	4.3	2.4	1.8±0.1	1.3
CX	7.3	4.3	2.4	1.9±0.2	1.3
UD	7.3	4.3	2.4	2.8±0.2	1.3
UE	7.3	4.3	2.4	4.2±0.1	1.3

02 Dec. 2008

NEW

■ Standard Products

Series & Size Code	Rated W.V. (V.DC)	Capacitance (±20 %) (μF)	Case Size L (mm)	Case Size W (mm)	Case Size H (mm)	Specification *1 Ripple current (Ar.m.s.)	Specification ESR*2 (Ω)	Part number *3 Reflow condition : 240 °C	Part number *3 Reflow condition : 260 °C [Proposal]	Min. Packaging Q'ty (pcs)
FD	2	68	7.3	4.3	1.1	2.0	0.028	EEFFD0D680R	—	3500
	2.5	56	7.3	4.3	1.1	2.0	0.028	EEFFD0E560R	—	3500
	4	39	7.3	4.3	1.1	2.0	0.028	EEFFD0G390R	—	3500
		47	7.3	4.3	1.1	2.0	0.028	EEFFD0G470R	—	3500
	6.3	33	7.3	4.3	1.1	2.0	0.028	EEFFD0J330R	—	3500
	8	22	7.3	4.3	1.1	2.0	0.028	EEFFD0K220R	—	3500
	12.5	15	7.3	4.3	1.1	1.4	0.040	EEFFD1B150R	—	3500
CD	2	100	7.3	4.3	1.8	2.5	0.018	EEFCD0D101R	EEFCD0D101ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0D101XR	EEFCD0D101XE	3500
		120	7.3	4.3	1.8	2.5	0.018	EEFCD0D121R	EEFCD0D121ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0D121XR	EEFCD0D121XE	3500
		150	7.3	4.3	1.8	2.5	0.018	EEFCD0D151R	EEFCD0D151ER	3500
		180	7.3	4.3	1.8	2.5	0.018	EEFCD0D181R	EEFCD0D181ER	3500
		220	7.3	4.3	1.8	2.5	0.018	EEFCD0D221R	EEFCD0D221ER	3500
	2.5	82	7.3	4.3	1.8	2.5	0.018	EEFCD0E820R	EEFCD0E820ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0E820XR	EEFCD0E820XE	3500
		100	7.3	4.3	1.8	2.5	0.018	EEFCD0E101R	EEFCD0E101ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0E101XR	EEFCD0E101XE	3500
		120	7.3	4.3	1.8	2.5	0.018	EEFCD0E121R	EEFCD0E121ER	3500
		150	7.3	4.3	1.8	2.5	0.018	EEFCD0E151R	EEFCD0E151ER	3500
	4	56	7.3	4.3	1.8	2.5	0.018	EEFCD0G560R	EEFCD0G560ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0G560XR	EEFCD0G560XE	3500
		68	7.3	4.3	1.8	2.5	0.018	EEFCD0G680R	EEFCD0G680ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0G680XR	EEFCD0G680XE	3500
		82	7.3	4.3	1.8	2.5	0.018	EEFCD0G820R	EEFCD0G820ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0G820XR	EEFCD0G820XE	3500
		100	7.3	4.3	1.8	2.5	0.018	EEFCD0G101R	EEFCD0G101ER	3500
	6.3	10	7.3	4.3	1.8	1.4	0.055	EEFCD0J100R	EEFCD0J100ER	3500
		22	7.3	4.3	1.8	1.6	0.040	EEFCD0J220R	EEFCD0J220ER	3500
		33	7.3	4.3	1.8	2.0	0.028	EEFCD0J330R	EEFCD0J330ER	3500
		47	7.3	4.3	1.8	2.5	0.018	EEFCD0J470R	EEFCD0J470ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0J470XR	EEFCD0J470XE	3500
		68	7.3	4.3	1.8	2.5	0.018	EEFCD0J680R	EEFCD0J680ER	3500
			7.3	4.3	1.8	2.7	0.015	EEFCD0J680XR	EEFCD0J680XE	3500
	8	8.2	7.3	4.3	1.8	1.4	0.055	EEFCD0K8R2R	EEFCD0K8R2ER	3500
		15	7.3	4.3	1.8	1.6	0.040	EEFCD0K150R	EEFCD0K150ER	3500
		22	7.3	4.3	1.8	1.8	0.028	EEFCD0K220R	EEFCD0K220ER	3500
		33	7.3	4.3	1.8	2.5	0.018	EEFCD0K330R	EEFCD0K330ER	3500
		47	7.3	4.3	1.8	1.8	0.025	EEFCD0K470R	EEFCD0K470ER	3500
	10	22	7.3	4.3	1.8	1.6	0.030	—	EEFCD1A220ER	3500
		33	7.3	4.3	1.8	1.8	0.025	—	EEFCD1A330ER	3500
		39	7.3	4.3	1.8	1.8	0.025	—	EEFCD1A390ER	3500
	12.5	4.7	7.3	4.3	1.8	1.0	0.080	EEFCD1B4R7R	—	3500
		10	7.3	4.3	1.8	1.0	0.060	EEFCD1B100R	—	3500
		15	7.3	4.3	1.8	1.3	0.050	EEFCD1B150R	—	3500
		22	7.3	4.3	1.8	1.6	0.030	EEFCD1B220R	—	3500
	16	2.2	7.3	4.3	1.8	1.0	0.110	EEFCD1C2R2R	—	3500
		4.7	7.3	4.3	1.8	1.0	0.080	EEFCD1C4R7R	—	3500
		6.8	7.3	4.3	1.8	1.0	0.070	EEFCD1C6R8R	—	3500
		8.2	7.3	4.3	1.8	1.3	0.045	EEFCD1C8R2R	—	3500
CX	2	220	7.3	4.3	1.9	2.7	0.015	—	EEFCX0D221R	3500
		270	7.3	4.3	1.9	3.0	0.012	—	EEFCX0D271XR	3500
		330	7.3	4.3	1.9	2.7	0.015	—	EEFCX0D331R	3500
			7.3	4.3	1.9	3.0	0.012	—	EEFCX0D331XR	3500
		390	7.3	4.3	1.9	2.7	0.015	—	EEFCX0D391R	3500
		470	7.3	4.3	1.9	2.7	0.015	—	EEFCX0D471R	3500
	2.5	220	7.3	4.3	1.9	2.7	0.015	—	EEFCX0E221R	3500
		330	7.3	4.3	1.9	2.7	0.015	—	EEFCX0E331R	3500
		390	7.3	4.3	1.9	2.7	0.015	—	EEFCX0E391R	3500
	4	150	7.3	4.3	1.9	2.7	0.015	—	EEFCX0G151R	3500
		180	7.3	4.3	1.9	2.7	0.015	—	EEFCX0G181R	3500
			7.3	4.3	1.9	3.0	0.012	—	EEFCX0G181XR	3500
		220	7.3	4.3	1.9	2.7	0.015	—	EEFCX0G221R	3500
			7.3	4.3	1.9	3.0	0.012	—	EEFCX0G221XR	3500
	6.3	100	7.3	4.3	1.9	2.7	0.015	—	EEFCX0J101R	3500
		120	7.3	4.3	1.9	2.7	0.015	—	EEFCX0J121R	3500
		150	7.3	4.3	1.9	2.7	0.015	—	EEFCX0J151R	3500
			7.3	4.3	1.9	3.0	0.012	—	EEFCX0J151XR	3500

*1: Ripple current (100 kHz/ +20 to +105 °C), *2: ESR (100 kHz/+20 °C)

*3: Please confirm EE23 in detail of the Mouting Specifications.

■ Standard Products

Series & Size Code	Rated W.V. (V.DC)	Capacitance (±20 %) (μF)	Case Size L (mm)	Case Size W (mm)	Case Size H (mm)	Specification ✻1 Ripple current (Ar.m.s.)	Specification ✻2 ESR (Ω)	Part number ✻3 Reflow condition : 240 °C	Part number ✻3 Reflow condition : 260 °C [Proposal]	Min. Packaging Q'ty (pcs)
UD	2	330	7.3	4.3	2.8	3.0	0.015	EEFUD0D331R✻4	EEFUD0D331ER✻4	2000
			7.3	4.3	2.8	3.3	0.012	EEFUD0D331XR✻4	EEFUD0D331XE✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0D331LR✻4	EEFUD0D331LE✻4	2000
		390	7.3	4.3	2.8	3.0	0.015	EEFUD0D391R✻4	EEFUD0D391ER✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0D391LR✻4	EEFUD0D391LE✻4	2000
		470	7.3	4.3	2.8	3.4	0.009	EEFUD0D471LR✻4	EEFUD0D471LE✻4	2000
	2.5	220	7.3	4.3	2.8	3.0	0.015	EEFUD0E221R✻4	EEFUD0E221ER✻4	2000
			7.3	4.3	2.8	3.3	0.012	EEFUD0E221XR✻4	EEFUD0E221XE✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0E221LR✻4	EEFUD0E221LE✻4	2000
		270	7.3	4.3	2.8	3.0	0.015	EEFUD0E271R✻4	EEFUD0E271ER✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0E271LR✻4	EEFUD0E271LE✻4	2000
	4	120	7.3	4.3	2.8	3.0	0.015	EEFUD0G121R✻4	EEFUD0G121ER✻4	2000
			7.3	4.3	2.8	3.4	0.012	EEFUD0G121XR✻4	EEFUD0G121XE✻4	2000
		150	7.3	4.3	2.8	3.0	0.015	EEFUD0G151R✻4	EEFUD0G151ER✻4	2000
			7.3	4.3	2.8	3.3	0.012	EEFUD0G151XR✻4	EEFUD0G151XE✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0G151LR✻4	EEFUD0G151LE✻4	2000
		180	7.3	4.3	2.8	2.5	0.018	EEFUD0G181R✻4	EEFUD0G181ER✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0G181LR✻4	EEFUD0G181LE✻4	2000
	6.3	100	7.3	4.3	2.8	3.0	0.015	EEFUD0J101R✻4	EEFUD0J101ER✻4	2000
			7.3	4.3	2.8	3.3	0.012	EEFUD0J101XR✻4	EEFUD0J101XE✻4	2000
		120	7.3	4.3	2.8	3.0	0.015	EEFUD0J121R✻4	EEFUD0J121ER✻4	2000
			7.3	4.3	2.8	3.3	0.012	EEFUD0J121XR✻4	EEFUD0J121XE✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0J121LR✻4	—	2000
		150	7.3	4.3	2.8	2.5	0.018	EEFUD0J151R✻4	EEFUD0J151ER✻4	2000
			7.3	4.3	2.8	3.4	0.009	EEFUD0J151LR✻4	—	2000
	8	68	7.3	4.3	2.8	3.0	0.015	EEFUD0K680R	EEFUD0K680ER	2000
		100	7.3	4.3	2.8	2.5	0.018	EEFUD0K101R	EEFUD0K101ER	2000
UE	2	270	7.3	4.3	4.2	3.3	0.012	EEFUE0D271R✻4	EEFUE0D271ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0D271XR✻4	EEFUE0D271XE✻4	2000
		330	7.3	4.3	4.2	3.3	0.012	EEFUE0D331R✻4	EEFUE0D331ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0D331XR✻4	EEFUE0D331XE✻4	2000
		390	7.3	4.3	4.2	3.3	0.012	EEFUE0D391R✻4	EEFUE0D391ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0D391XR✻4	EEFUE0D391XE✻4	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0D391LR✻4	EEFUE0D391LE✻4	2000
		470	7.3	4.3	4.2	3.3	0.012	EEFUE0D471R✻4	EEFUE0D471ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0D471XR✻4	EEFUE0D471XE✻4	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0D471LR✻4	EEFUE0D471LE✻4	2000
		560	7.3	4.3	4.2	3.3	0.012	EEFUE0D561R	EEFUE0D561ER	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0D561LR	EEFUE0D561LE	2000
	2.5	220	7.3	4.3	4.2	3.3	0.012	EEFUE0E221R✻4	EEFUE0E221ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0E221XR✻4	EEFUE0E221XE✻4	2000
		270	7.3	4.3	4.2	3.3	0.012	EEFUE0E271R✻4	EEFUE0E271ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0E271XR✻4	EEFUE0E271XE✻4	2000
		330	7.3	4.3	4.2	3.3	0.012	EEFUE0E331R✻4	EEFUE0E331ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0E331XR✻4	EEFUE0E331XE✻4	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0E331LR✻4	EEFUE0E331LE✻4	2000
		390	7.3	4.3	4.2	3.3	0.012	EEFUE0E391R✻4	EEFUE0E391ER✻4	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0E391LR✻4	EEFUE0E391LE✻4	2000
		470	7.3	4.3	4.2	3.3	0.012	EEFUE0E471R	EEFUE0E471ER	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0E471LR	EEFUE0E471LE	2000
	4	180	7.3	4.3	4.2	3.3	0.012	EEFUE0G181R✻4	EEFUE0G181ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0G181XR✻4	EEFUE0G181XE✻4	2000
		220	7.3	4.3	4.2	3.3	0.012	EEFUE0G221R✻4	EEFUE0G221ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0G221XR✻4	EEFUE0G221XE✻4	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0G221LR✻4	EEFUE0G221LE✻4	2000
		270	7.3	4.3	4.2	3.3	0.012	EEFUE0G271R	EEFUE0G271ER	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0G271LR	EEFUE0G271LE	2000
		330	7.3	4.3	4.2	3.3	0.012	EEFUE0G331R	EEFUE0G331ER	2000
	6.3	150	7.3	4.3	4.2	3.3	0.012	EEFUE0J151R✻4	EEFUE0J151ER✻4	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0J151XR✻4	EEFUE0J151XE✻4	2000
		180	7.3	4.3	4.2	3.3	0.012	EEFUE0J181R	EEFUE0J181ER	2000
			7.3	4.3	4.2	3.5	0.010	EEFUE0J181XR	EEFUE0J181XE	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0J181LR	—	2000
		220	7.3	4.3	4.2	3.0	0.015	EEFUE0J221R	EEFUE0J221ER	2000
			7.3	4.3	4.2	3.7	0.007	EEFUE0J221LR	—	2000
	8	100	7.3	4.3	4.2	3.3	0.012	EEFUE0K101R✻4	EEFUE0K101ER✻4	2000
		150	7.3	4.3	4.2	3.0	0.015	EEFUE0K151R	EEFUE0K151ER	2000

✻1: Ripple current (100 kHz/ +20 to +105 °C), ✻2: ESR (100 kHz/+20 °C)
✻3: Please confirm EE23 in detail of the Mouting Specifications.
✻4: Please use proposal part number of EE12, 13 when examining it.