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## Surface Mount Type **SP-Cap**

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

**Old series**



**[Our Requests]**

Since this series is old, we don't recommend you to adopt it but CX & SX series for your new design.

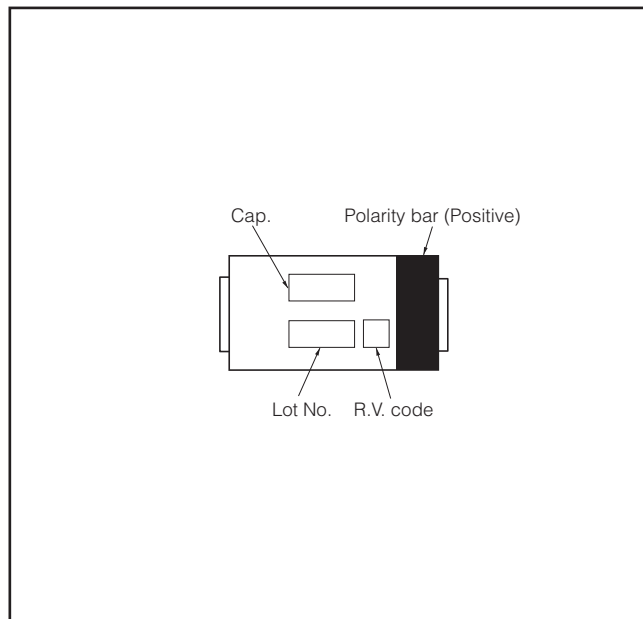
**■ Features**

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

**■ Specifications**

Series & Size Code	FD	CD	UD	UE	
Category Temp. Range	-40 °C to +105 °C				
Rated Voltage Range	2 V.DC to 12.5 V.DC	2 V.DC to 16 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	68 μF to 470 μF	100 μF to 560 μF	
Capacitance Tolerance	±20 %				
DC Leakage Current	Reflow 240 °C : I ≤ 0.06 CV (μA) 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 (μA) 2 minutes				
tan δ	≤ 0.06 (120 Hz/+20 °C)		≤ 0.10 (120 Hz/+20 °C)		
Surge Voltage	Rated Voltage × 1.25 (15 °C to 35 °C)				
Endurance	After applying rated 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)**

(Unit : 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
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

\* Externals of figure are the reference.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

### Standard Products

Reflow \*3 <260 °C>

Series & Size Code	Rated Voltage (V.DC)	Capacitance (±20%) (μF)	Case Size			Specification		Part number	Reflow		Min. Packaging Qty (pcs)	
			L (mm)	W (mm)	H (mm)	*1 Ripple current (Ar.m.s.)	*2 ESR (mΩ max.)		*4 240 °C	260 °C		
FD	2	68	7.3	4.3	1.1	2.0	28	EEFFD0D680R	○	—	3500	
	2.5	56	7.3	4.3	1.1	2.0	28	EEFFD0E560R	○	—	3500	
	4	39	7.3	4.3	1.1	2.0	28	EEFFD0G390R	○	—	3500	
		47	7.3	4.3	1.1	2.0	28	EEFFD0G470R	○	—	3500	
	6.3	33	7.3	4.3	1.1	2.0	28	EEFFD0J330R	○	—	3500	
	8	22	7.3	4.3	1.1	2.0	28	EEFFD0K220R	○	—	3500	
	12.5	15	7.3	4.3	1.1	1.4	40	EEFFD1B150R	○	—	3500	
CD	2	100	7.3	4.3	1.8	2.5	18	EEFCD0D101ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0D101XE	—	○	3500	
		120	7.3	4.3	1.8	2.5	18	EEFCD0D121ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0D121XE	—	○	3500	
			150	7.3	4.3	1.8	2.5	18	EEFCD0D151ER	—	○	3500
			180	7.3	4.3	1.8	2.5	18	EEFCD0D181ER	—	○	3500
	2.5	82	7.3	4.3	1.8	2.5	18	EEFCD0E820ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0E820XE	—	○	3500	
		100	7.3	4.3	1.8	2.5	18	EEFCD0E101ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0E101XE	—	○	3500	
			120	7.3	4.3	1.8	2.5	18	EEFCD0E121ER	—	○	3500
			150	7.3	4.3	1.8	2.5	18	EEFCD0E151ER	—	○	3500
	4	56	7.3	4.3	1.8	2.5	18	EEFCD0G560ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0G560XE	—	○	3500	
		68	7.3	4.3	1.8	2.5	18	EEFCD0G680ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0G680XE	—	○	3500	
			82	7.3	4.3	1.8	2.5	18	EEFCD0G820ER	—	○	3500
			7.3	4.3	1.8	2.7	15	EEFCD0G820XE	—	○	3500	
	6.3	100	7.3	4.3	1.8	2.5	18	EEFCD0G101ER	—	○	3500	
			10	7.3	4.3	1.8	1.4	55	EEFCD0J100ER	—	○	3500
		22	7.3	4.3	1.8	1.6	40	EEFCD0J220ER	—	○	3500	
			33	7.3	4.3	1.8	2.0	28	EEFCD0J330ER	—	○	3500
			47	7.3	4.3	1.8	2.5	18	EEFCD0J470ER	—	○	3500
				7.3	4.3	1.8	2.7	15	EEFCD0J470XE	—	○	3500
		68	7.3	4.3	1.8	2.5	18	EEFCD0J680ER	—	○	3500	
			7.3	4.3	1.8	2.7	15	EEFCD0J680XE	—	○	3500	
		8	8.2	7.3	4.3	1.8	1.4	55	EEFCD0K8R2ER	—	○	3500
			15	7.3	4.3	1.8	1.6	40	EEFCD0K150ER	—	○	3500
			22	7.3	4.3	1.8	2.0	28	EEFCD0K220ER	—	○	3500
			33	7.3	4.3	1.8	2.5	18	EEFCD0K330ER	—	○	3500
	47		7.3	4.3	1.8	1.8	25	EEFCD0K470ER	—	○	3500	
	10	22	7.3	4.3	1.8	1.6	30	EEFCD1A220ER	—	○	3500	
		33	7.3	4.3	1.8	1.8	25	EEFCD1A330ER	—	○	3500	
		39	7.3	4.3	1.8	1.8	25	EEFCD1A390ER	—	○	3500	
	12.5	4.7	7.3	4.3	1.8	1.0	80	EEFCD1B4R7R	○	—	3500	
		10	7.3	4.3	1.8	1.0	60	EEFCD1B100R	○	—	3500	
		15	7.3	4.3	1.8	1.3	50	EEFCD1B150R	○	—	3500	
		22	7.3	4.3	1.8	1.6	30	EEFCD1B220R	○	—	3500	
	16	2.2	7.3	4.3	1.8	1.0	110	EEFCD1C2R2R	○	—	3500	
		4.7	7.3	4.3	1.8	1.0	80	EEFCD1C4R7R	○	—	3500	
		6.8	7.3	4.3	1.8	1.0	70	EEFCD1C6R8R	○	—	3500	
		8.2	7.3	4.3	1.8	1.3	45	EEFCD1C8R2R	○	—	3500	
	UD	2	330	7.3	4.3	2.8	3.0	15	EEFUD0D331ER	—	○	2000
				7.3	4.3	2.8	3.3	12	EEFUD0D331XE	—	○	2000
				7.3	4.3	2.8	3.4	9	EEFUD0D331LE	—	○	2000
			390	7.3	4.3	2.8	3.0	15	EEFUD0D391ER	—	○	2000
				7.3	4.3	2.8	3.4	9	EEFUD0D391LE	—	○	2000
				470	7.3	4.3	2.8	3.4	9	EEFUD0D471LE	—	○
2.5		220	7.3	4.3	2.8	3.0	15	EEFUD0E221ER	—	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0E221XE	—	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0E221LE	—	○	2000	
		270	7.3	4.3	2.8	3.0	15	EEFUD0E271ER	—	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0E271LE	—	○	2000	

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

\*3: Please refer to the page of "Mounting Specifications".

\*4: Please contact Panasonic for details of allowable 240 °C reflow condition.

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### Standard Products

Reflow \*3 <260 °C>

Series & Size Code	Rated Voltage (V.DC)	Capacitance (±20 %) (μF)	Case Size			Specification		Part number	Reflow		Min. Packaging Qty (pcs)	
			L (mm)	W (mm)	H (mm)	*1 Ripple current (Ar.m.s.)	*2 ESR (mΩ max.)		*4 240 °C	260 °C		
UD	4	120	7.3	4.3	2.8	3.0	15	EEFUD0G121ER	—	○	2000	
			7.3	4.3	2.8	3.4	12	EEFUD0G121XE	—	○	2000	
		150	7.3	4.3	2.8	3.0	15	EEFUD0G151ER	—	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0G151XE	—	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0G151LE	—	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0G151LR	○	—	2000	
	180	7.3	4.3	2.8	2.5	18	EEFUD0G181ER	—	○	2000		
		7.3	4.3	2.8	3.4	9	EEFUD0G181LE	—	○	2000		
	6.3	100	7.3	4.3	2.8	3.0	15	EEFUD0J101ER	—	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0J101XE	—	○	2000	
		120	7.3	4.3	2.8	3.0	15	EEFUD0J121ER	—	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0J121XE	—	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0J121LR	○	—	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0J121LR	○	—	2000	
		150	7.3	4.3	2.8	2.5	18	EEFUD0J151ER	—	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0J151LR	○	—	2000	
8	68	7.3	4.3	2.8	3.0	15	EEFUD0K680ER	—	○	2000		
	100	7.3	4.3	2.8	2.5	18	EEFUD0K101ER	—	○	2000		
UE	2	270	7.3	4.3	4.2	3.3	12	EEFUE0D271ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0D271XE	—	○	2000	
		330	7.3	4.3	4.2	3.3	12	EEFUE0D331ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0D331XE	—	○	2000	
		390	7.3	4.3	4.2	3.3	12	EEFUE0D391ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0D391XE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0D391LE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0D391LR	○	—	2000	
		470	7.3	4.3	4.2	3.3	12	EEFUE0D471ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0D471XE	—	○	2000	
		560	7.3	4.3	4.2	3.7	7	EEFUE0D561ER	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0D561LE	—	○	2000	
	2.5	220	7.3	4.3	4.2	3.3	12	EEFUE0E221ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0E221XE	—	○	2000	
		270	7.3	4.3	4.2	3.3	12	EEFUE0E271ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0E271XE	—	○	2000	
		330	7.3	4.3	4.2	3.3	12	EEFUE0E331ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0E331XE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E331LE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E331LR	○	—	2000	
		390	7.3	4.3	4.2	3.3	12	EEFUE0E391ER	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E391LE	—	○	2000	
		470	7.3	4.3	4.2	3.3	12	EEFUE0E471ER	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E471LE	—	○	2000	
	4	180	7.3	4.3	4.2	3.3	12	EEFUE0G181ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0G181XE	—	○	2000	
		220	7.3	4.3	4.2	3.3	12	EEFUE0G221ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0G221XE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0G221LE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0G221LR	○	—	2000	
		270	7.3	4.3	4.2	3.3	12	EEFUE0G271ER	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0G271LE	—	○	2000	
		330	7.3	4.3	4.2	3.3	12	EEFUE0G331ER	—	○	2000	
			7.3	4.3	4.2	3.3	12	EEFUE0G331ER	—	○	2000	
		6.3	150	7.3	4.3	4.2	3.3	12	EEFUE0J151ER	—	○	2000
				7.3	4.3	4.2	3.5	10	EEFUE0J151XE	—	○	2000
	180		7.3	4.3	4.2	3.3	12	EEFUE0J181ER	—	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0J181XE	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0J181LR	○	—	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0J181LR	○	—	2000	
	220		7.3	4.3	4.2	3.0	15	EEFUE0J221ER	—	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0J221LR	○	—	2000	
	8	100	7.3	4.3	4.2	3.3	12	EEFUE0K101ER	—	○	2000	
		150	7.3	4.3	4.2	3.0	15	EEFUE0K151ER	—	○	2000	

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

\*3: Please refer to the page of "Mounting Specifications".

\*4: Please contact Panasonic for details of allowable 240 °C reflow condition.