

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

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



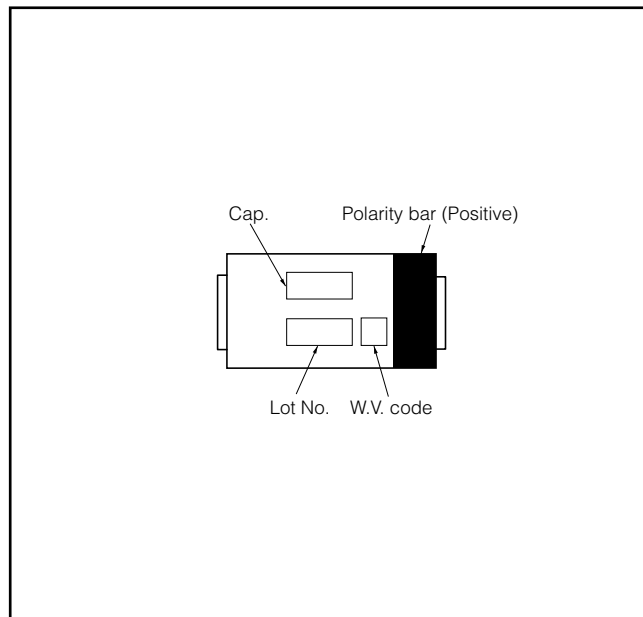
### ■ Features

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

### ■ Specifications

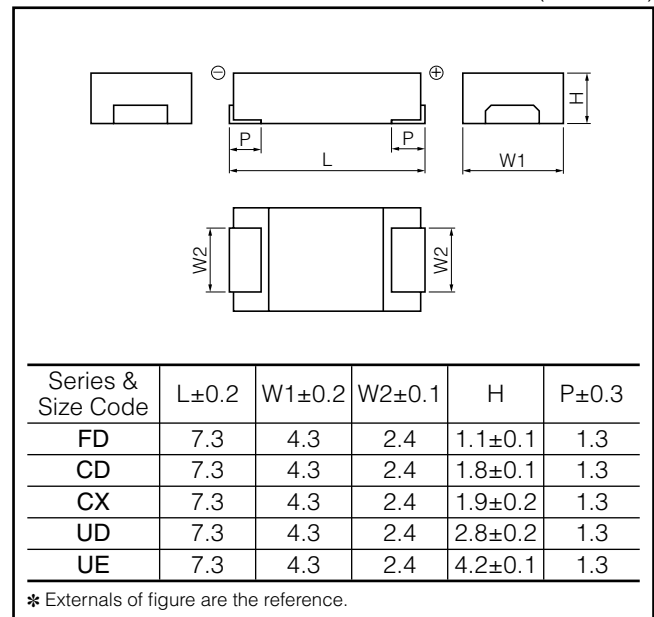
Series & Size Code	FD	CD	CX	UD	UE
Category Temp. Range	-40 °C to +105 °C				
Rated W.V.Range	2 V.DC to 12.5 V.DC	2 V.DC to 16 V.DC	2 V.DC to 6.3 V.DC	2 V.DC to 8 V.DC	2 V.DC to 8 V.DC
Nominal Cap.Range	15 μF to 68 μF	2.2 μF to 220 μF	100 μF to 560 μF	68 μF to 470 μF	100 μF to 560 μF
Capacitance Tolerance	±20 %				
DC Leakage Current	Reflow 240 °C : $I \leq 0.06 CV (\mu A) 2 \text{ minutes (2 V.DC to 4 V.DC)}$ $I \leq 0.04 CV \text{ or } 3 (\mu A) 2 \text{ minutes (6.3 V.DC to 16 V.DC)}$ (Whichever is greater)  Reflow 260 °C : $I \leq 0.1 CV (\mu A) 2 \text{ minutes}$				
tan δ	$\leq 0.06 (120 \text{ Hz}/+20 \text{ }^\circ\text{C})$			$\leq 0.10 (120 \text{ Hz}/+20 \text{ }^\circ\text{C})$	
Surge Voltage	Rated Working Voltage $\times 1.25 (15 \text{ }^\circ\text{C to } 35 \text{ }^\circ\text{C})$				
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	$\leq$ Initial specified value			
	DC leakage current	$\leq$ Initial specified value			
Moisture resistance	After storing for 500 hours at 60 °C, 90 %				
	Capacitance change of initial measured 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	$\leq 200 \%$ of initial specified value			
	DC leakage current	$\leq$ Initial specified value			

### ■ Marking



### ■ Dimensions in mm(not to scale)

(Unit : mm)



### Standard Products

○ : available, — : not available

Series & Size Code	Rated W.V. (V.DC)	Capacitance (±20%) (μF)	Case Size			Specification		Part number	Reflow condition		Min. Packaging Qty (pcs)			
			L (mm)	W (mm)	H (mm)	*1 Ripple current (Ar.m.s.)	*2 ESR (mΩ max.)		240 °C *3	260 °C *3				
FD	2	68	7.3	4.3	1.1	2.0	28	EEFFD0D680R *5	○	—	3500			
	2.5	56	7.3	4.3	1.1	2.0	28	EEFFD0E560R *5	○	—	3500			
	4	39	7.3	4.3	1.1	2.0	28	EEFFD0G390R *5	○	—	3500			
		47	7.3	4.3	1.1	2.0	28	EEFFD0G470R *5	○	—	3500			
	6.3	33	7.3	4.3	1.1	2.0	28	EEFFD0J330R *5	○	—	3500			
	8	22	7.3	4.3	1.1	2.0	28	EEFFD0K220R *5	○	—	3500			
CD	2	100	7.3	4.3	1.8	2.5	18	EEFCD0D101ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0D101XE	*4	○	3500			
		120	7.3	4.3	1.8	2.5	18	EEFCD0D121ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0D121XE	*4	○	3500			
			150	7.3	4.3	1.8	2.5	18	EEFCD0D151ER	*4	○	3500		
			180	7.3	4.3	1.8	2.5	18	EEFCD0D181ER	*4	○	3500		
	2.5	82	7.3	4.3	1.8	2.5	18	EEFCD0E820ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0E820XE	*4	○	3500			
		100	7.3	4.3	1.8	2.5	18	EEFCD0E101ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0E101XE	*4	○	3500			
			120	7.3	4.3	1.8	2.5	18	EEFCD0E121ER	*4	○	3500		
			150	7.3	4.3	1.8	2.5	18	EEFCD0E151ER	*4	○	3500		
	4	56	7.3	4.3	1.8	2.5	18	EEFCD0G560ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0G560XE	*4	○	3500			
		68	7.3	4.3	1.8	2.5	18	EEFCD0G680ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0G680XE	*4	○	3500			
			82	7.3	4.3	1.8	2.5	18	EEFCD0G820ER	*4	○	3500		
			7.3	4.3	1.8	2.7	15	EEFCD0G820XE	*4	○	3500			
	6.3	10	7.3	4.3	1.8	1.4	55	EEFCD0J100ER	*4	○	3500			
			7.3	4.3	1.8	1.6	40	EEFCD0J220ER	*4	○	3500			
		33	7.3	4.3	1.8	2.0	28	EEFCD0J330ER	*4	○	3500			
			7.3	4.3	1.8	2.5	18	EEFCD0J470ER	*4	○	3500			
			7.3	4.3	1.8	2.7	15	EEFCD0J470XE	*4	○	3500			
			7.3	4.3	1.8	2.5	18	EEFCD0J680ER	*4	○	3500			
	8	8.2	7.3	4.3	1.8	1.4	55	EEFCD0K8R2ER	*4	○	3500			
			7.3	4.3	1.8	1.6	40	EEFCD0K150ER	*4	○	3500			
		22	7.3	4.3	1.8	2.0	28	EEFCD0K220ER	*4	○	3500			
			7.3	4.3	1.8	2.5	18	EEFCD0K330ER	*4	○	3500			
			7.3	4.3	1.8	1.8	25	EEFCD0K470ER	*4	○	3500			
			7.3	4.3	1.8	1.6	30	EEFCD1A220ER	—	○	3500			
	10	33	7.3	4.3	1.8	1.8	25	EEFCD1A330ER	—	○	3500			
			7.3	4.3	1.8	1.8	25	EEFCD1A390ER	—	○	3500			
		4.7	7.3	4.3	1.8	1.0	80	EEFCD1B4R7R *5	○	—	3500			
			7.3	4.3	1.8	1.0	60	EEFCD1B100R *5	○	—	3500			
			7.3	4.3	1.8	1.3	50	EEFCD1B150R *5	○	—	3500			
			7.3	4.3	1.8	1.6	30	EEFCD1B220R *5	○	—	3500			
	16	2.2	7.3	4.3	1.8	1.0	110	EEFCD1C2R2R *5	○	—	3500			
			7.3	4.3	1.8	1.0	80	EEFCD1C4R7R *5	○	—	3500			
		6.8	7.3	4.3	1.8	1.0	70	EEFCD1C6R8R *5	○	—	3500			
			7.3	4.3	1.8	1.3	45	EEFCD1C8R2R *5	○	—	3500			
			CX	2	220	7.3	4.3	1.9	2.7	15	EEFCX0D221R	—	○	3500
					270	7.3	4.3	1.9	3.0	12	EEFCX0D271XR	—	○	3500
	330	7.3		4.3	1.9	2.7	15	EEFCX0D331R	—	○	3500			
		7.3		4.3	1.9	3.0	12	EEFCX0D331XR	—	○	3500			
		390		7.3	4.3	1.9	2.7	15	EEFCX0D391R	—	○	3500		
		470		7.3	4.3	1.9	2.7	15	EEFCX0D471R	—	○	3500		
		560	7.3	4.3	1.9	2.7	15	EEFCX0D561R	—	○	3500			
	2.5	220	7.3	4.3	1.9	2.7	15	EEFCX0E221R	—	○	3500			
7.3			4.3	1.9	2.7	15	EEFCX0E331R	—	○	3500				
390		7.3	4.3	1.9	2.7	15	EEFCX0E391R	—	○	3500				
		7.3	4.3	1.9	2.7	15	EEFCX0E471R	—	○	3500				
		7.3	4.3	1.9	2.7	15	EEFCX0G151R	—	○	3500				
4	180	7.3	4.3	1.9	2.7	15	EEFCX0G181R	—	○	3500				
		7.3	4.3	1.9	3.0	12	EEFCX0G181XR	—	○	3500				
	220	7.3	4.3	1.9	2.7	15	EEFCX0G221R	—	○	3500				
		7.3	4.3	1.9	3.0	12	EEFCX0G221XR	—	○	3500				
		270	7.3	4.3	1.9	2.7	15	EEFCX0G271R	—	○	3500			
6.3	100	7.3	4.3	1.9	2.7	15	EEFCX0J101R	—	○	3500				
		7.3	4.3	1.9	2.7	15	EEFCX0J121R	—	○	3500				
	150	7.3	4.3	1.9	2.7	15	EEFCX0J151R	—	○	3500				
		7.3	4.3	1.9	3.0	12	EEFCX0J151XR	—	○	3500				
		180	7.3	4.3	1.9	2.7	15	EEFCX0J181R	—	○	3500			

\*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 use high temperature Lead-Free reflow (260 °C) for new design.

\*5: In the case of new design please contact us.

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

○ : available, — : not available

Series & Size Code	Rated W.V. (V.DC)	Capacitance (±20 %) (μF)	Case Size			Specification		Part number	Reflow condition		Min. Packaging Qty (pcs)	
			L (mm)	W (mm)	H (mm)	*1 Ripple current (Ar.m.s.)	*2 ESR (mΩ max.)		240 °C *3	260 °C *3		
UD	2	330	7.3	4.3	2.8	3.0	15	EEFUD0D331ER *5	*4	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0D331XE *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0D331LE *5	*4	○	2000	
		390	7.3	4.3	2.8	3.0	15	EEFUD0D391ER *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0D391LE *5	*4	○	2000	
	470	7.3	4.3	2.8	3.4	9	EEFUD0D471LE *5	*4	○	2000		
	2.5	220	7.3	4.3	2.8	3.0	15	EEFUD0E221ER *5	*4	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0E221XE *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0E221LE *5	*4	○	2000	
		270	7.3	4.3	2.8	3.0	15	EEFUD0E271ER *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0E271LE *5	*4	○	2000	
			7.3	4.3	2.8	3.0	15	EEFUD0G121ER *5	*4	○	2000	
	4	120	7.3	4.3	2.8	3.4	12	EEFUD0G121XE *5	*4	○	2000	
			7.3	4.3	2.8	3.0	15	EEFUD0G151ER *5	*4	○	2000	
		150	7.3	4.3	2.8	3.3	12	EEFUD0G151XE *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0G151LE *5	*4	○	2000	
		180	7.3	4.3	2.8	2.5	18	EEFUD0G181ER *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0G181LE *5	*4	○	2000	
	6.3	100	7.3	4.3	2.8	3.0	15	EEFUD0J101ER *5	*4	○	2000	
			7.3	4.3	2.8	3.3	12	EEFUD0J101XE *5	*4	○	2000	
			7.3	4.3	2.8	3.0	15	EEFUD0J121ER *5	*4	○	2000	
		120	7.3	4.3	2.8	3.3	12	EEFUD0J121XE *5	*4	○	2000	
			7.3	4.3	2.8	3.4	9	EEFUD0J121LR *5	○	—	2000	
			7.3	4.3	2.8	2.5	18	EEFUD0J151ER *5	*4	○	2000	
	150	7.3	4.3	2.8	3.4	9	EEFUD0J151LR *5	○	—	2000		
		68	7.3	4.3	2.8	3.0	15	EEFUD0K680ER	*4	○	2000	
		100	7.3	4.3	2.8	2.5	18	EEFUD0K101ER	*4	○	2000	
	UE	2	270	7.3	4.3	4.2	3.3	12	EEFUE0D271ER *5	*4	○	2000
				7.3	4.3	4.2	3.5	10	EEFUE0D271XE *5	*4	○	2000
			330	7.3	4.3	4.2	3.3	12	EEFUE0D331ER *5	*4	○	2000
7.3				4.3	4.2	3.5	10	EEFUE0D331XE *5	*4	○	2000	
390			7.3	4.3	4.2	3.3	12	EEFUE0D391ER *5	*4	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0D391XE *5	*4	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0D391LE *5	*4	○	2000	
470			7.3	4.3	4.2	3.3	12	EEFUE0D471ER *5	*4	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0D471XE *5	*4	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0D471LE *5	*4	○	2000	
560			7.3	4.3	4.2	3.3	12	EEFUE0D561ER *5	*4	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0D561LE *5	*4	○	2000	
2.5			220	7.3	4.3	4.2	3.3	12	EEFUE0E221ER *5	*4	○	2000
				7.3	4.3	4.2	3.5	10	EEFUE0E221XE *5	*4	○	2000
			270	7.3	4.3	4.2	3.3	12	EEFUE0E271ER *5	*4	○	2000
		7.3		4.3	4.2	3.5	10	EEFUE0E271XE *5	*4	○	2000	
		7.3		4.3	4.2	3.7	7	EEFUE0E271LE *5	*4	○	2000	
		330	7.3	4.3	4.2	3.3	12	EEFUE0E331ER *5	*4	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0E331XE *5	*4	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E331LE *5	*4	○	2000	
		390	7.3	4.3	4.2	3.3	12	EEFUE0E391ER *5	*4	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E391LE *5	*4	○	2000	
		470	7.3	4.3	4.2	3.3	12	EEFUE0E471ER *5	*4	○	2000	
			7.3	4.3	4.2	3.7	7	EEFUE0E471LE *5	*4	○	2000	
4		180	7.3	4.3	4.2	3.3	12	EEFUE0G181ER *5	*4	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0G181XE *5	*4	○	2000	
		220	7.3	4.3	4.2	3.3	12	EEFUE0G221ER *5	*4	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0G221XE *5	*4	○	2000	
		270	7.3	4.3	4.2	3.7	7	EEFUE0G221LE *5	*4	○	2000	
			7.3	4.3	4.2	3.3	12	EEFUE0G271ER *5	*4	○	2000	
		330	7.3	4.3	4.2	3.7	7	EEFUE0G271LE *5	*4	○	2000	
			7.3	4.3	4.2	3.3	12	EEFUE0G331ER	*4	○	2000	
		6.3	150	7.3	4.3	4.2	3.3	12	EEFUE0J151ER *5	*4	○	2000
				7.3	4.3	4.2	3.5	10	EEFUE0J151XE *5	*4	○	2000
180			7.3	4.3	4.2	3.3	12	EEFUE0J181ER *5	*4	○	2000	
			7.3	4.3	4.2	3.5	10	EEFUE0J181XE *5	*4	○	2000	
220			7.3	4.3	4.2	3.7	7	EEFUE0J181LR *5	○	—	2000	
			7.3	4.3	4.2	3.0	15	EEFUE0J221ER	*4	○	2000	
8		100	7.3	4.3	4.2	3.7	7	EEFUE0J221LR *5	○	—	2000	
			7.3	4.3	4.2	3.3	12	EEFUE0K101ER *5	*4	○	2000	
150		7.3	4.3	4.2	3.0	15	EEFUE0K151ER	*4	○	2000		

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

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