

SPECIFICATION



SAMWHA CAPACITOR CO.,LTD
PT SAMCON

JL. RAYA SUBANG CIKUMPAY
CAMPAKA-PURWAKARTA
JAWA BARAT - INDONESIA

SPECIFICATION

ITEM : DISC CERAMIC CAPACITOR (EK Series)

PT. SAMCON		
Written	Checked	Approved
		
Irman Sudirman	Apang Djafar S.	Kim Jae Min
TME		

2025.10.16



SAMWHA CAPACITOR Co., Ltd
(Manufacturer : PT. SAMCON)

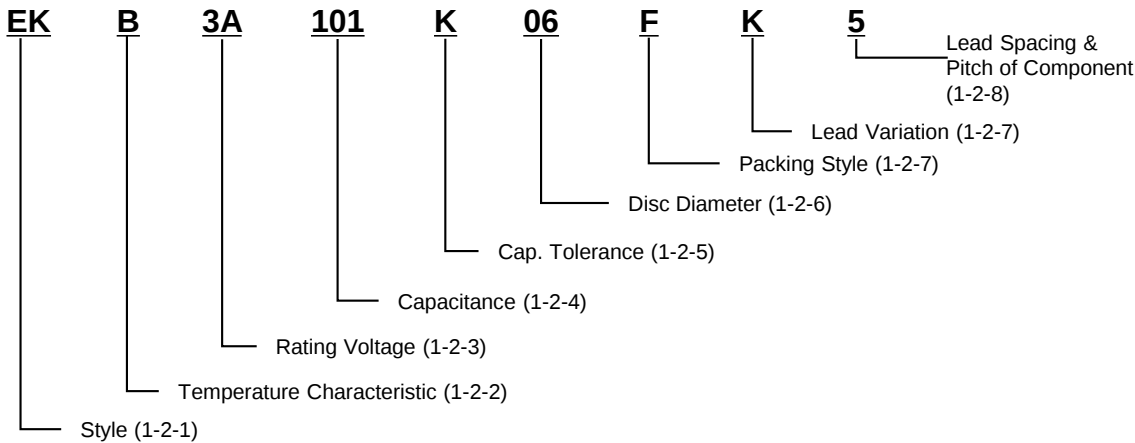
Record of Revision					SW-D02-01B	
					2/16	
P/N		SAMWHA SPEC	P/N		SAMWHA SPEC	
-		EKB3A101K06FK5	-		EKB3F101K08FF7	
		EKB3A102K08FK5			EKB3F102K10FF7	
		EKB3A221K06FK5			EKB3F221K08FF7	
		EKB3A222K10FK5			EKB3F331K08FF7	
		EKB3A471K06FK5			EKB3F471K08FF7	
		EKB3A472K14FF7			EKB3J101K08FF1	
		EKB3D101K06FK5			EKB3J102K12FF1	
		EKB3D102K08FK5			EKB3J221K08FF1	
		EKB3D221K06FK5			EKB3J331K08FF1	
		EKB3D222K12FK5			EKB3J471K08FF1	
		EKB3D471K06FK5				
		EKB3D472K16FF8				
		No			Reason	Contents
1	RoHS Free	1) P.5/16 7. Solder Heat Resistance 2) P.7/16 15. The regulation of environmental pollution materials		05.11.10		
2	Material Change	Material wire from Cu wire (Sn-Cu) to Cp wire (Sn-Cu-Fe)		08.01.01		
3	Add Soldering Profile	Flow Soldering & Iron Soldering		10.11.15		
4	Drawing & Dimension of Taping Style	Hold Down Tape Width (Wo)		12.05.01		

Reform 2009. FEB.	Ceramic Capacitor (EK Series)	No	SW-D02-01B
		Page	3/16

1. Scope.

This specification relates temperature compensating, high dielectric constant disc type fixed ceramic capacitor, intended for use in equipment for telecommunication and in electronic devices.

1-1. Type Designation



1-2. Specification

1-2-1. Style

EK : High dielectric constant fixed ceramic capacitor
Epoxy coated ceramic capacitor

1-2-2. Temperature coefficient and Temperature characteristics

EIA Code	SAMWHA Symbol	Temp. Range	Change Rate
Y5P	B	- 25°C ~ + 85°C	+ 10% ~ - 10%
Y5U	E	- 25°C ~ + 85°C	+ 22% ~ - 56%
Y5V	F	- 25°C ~ + 85°C	+ 22% ~ - 82%

* Operating temperature range guaranteed up to 125 degrees.

1-2-3. Rating Voltage

3A : 1kV, 3D : 2kV, 3F : 3.15kV, 3J : 6.3kV

1-2-4. Capacitance

The nominal capacitance value in pF is expressed by three digit number.

The first two digits represent significant figures and the last digit is the number of zero to follow.

EX. 100pF – 101

*) Note : Pre-treatment : max operating temp ± 2°C heating and maintain 1hr, and release 24 ± 2hr at room condition, using LCR meter.

1-2-5. Cap. Tolerance

Symbol	C	D	J	K	M	P	Z
Cap. Tol	$\pm 0.25 \text{ pF}$	$\pm 0.5 \text{ pF}$	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$	+ 100 ~ - 0%	+ 80 ~ - 20%

1-2-6. Disc Diameter

Unit : mm

Code	06	07	08	10	11	12	14	15	16	18	20
Dia (Φ mm)	6.3	7.0	8.0	10.0	11.0	12.5	14.0	15.0	16.0	18.0	20.0

1-2-7. Packing Style and Lead Variation (see page 9/16~14/16)

Packing Style		Lead Variation	
F	Taping Type Flat Pack	K	In-kink Type
		F	Out-Forming Type
		S	Straight Type
		R	Parallel Type
B	Bulk	K	Forming Long Type
		S/N	Straight Long/Short Type
		Q	Straight Middle Type
		W/L	Forming Short Type

1-2-8. Lead Spacing and Pitch of Component [mm] (see page 9/16~14/16)

5 : F=5.0, P=12.7 (Bulk & Taping)

1 : F=10.0, P=25.4 (Bulk & Taping)

7 : F=7.5, P=15.0 (Bulk & Taping)

2 : F=10.0, P=30.0 (Taping)

8 : F=7.5, P=30.0 (Taping)

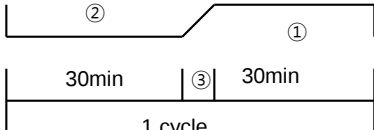
3 : F=10.0, P=30.0 (Taping)

9 : F=7.5, P=25.40 (Taping)

2. Requirements and method of test and environmental substance

NO	ITEM		Rated value	Testing method / application												
			EK Series													
1	Operating Temperature Range		- 25℃ ~ + 85℃													
2	Capacitance		Within the specified range		- Temperature : 20℃ - Frequency: 1 ± 0.1 KHz - Measured voltage : 1 ± 0.1Vrms											
3	Dissipation Factor (tan δ)		B,E:2.5% Max F : 5.0% Max													
4	Insulation resistance	Between terminals	More than 10000MΩ		- Applied Voltage : 500 V - Charge Time : 60 ± 5 sec											
5	Withstand Voltage	Between terminals	No remarkable abnormality is recognized		- Testing Voltage <table><tr><td>R.V</td><td>1~2kV</td><td>3kV</td><td>4kV~</td></tr><tr><td>W.V</td><td>R.V*2</td><td>R.V*1.75</td><td>R.V*1.5</td></tr></table>				R.V	1~2kV	3kV	4kV~	W.V	R.V*2	R.V*1.75	R.V*1.5
		R.V	1~2kV	3kV	4kV~											
		W.V	R.V*2	R.V*1.75	R.V*1.5											
Between exterior terminals	No remarkable abnormality is recognized	For 1 to 5 sec. The discharge current, however was 50mA or less.														
					-The smaller voltage of the rated voltage × 250% or 1.3 kV DC was applied for 1 to 5 sec											
6	Capacitance Temperature Characteristics		See 1-2-2		- Based on Items 2.2.12 of EIA RS-198-C											
7	Solder Heat Resistance	External view	No remarkable abnormality is recognized		- Soldering temperature: 260 -0,+5℃ - Immersion : 5 sec Pre-treatment : Capacitor should be stored at 85±2℃ for 1hr., then placed at room condition for 24±2hrs., before initial measurement. Post-treatment : Capacitor should be stored for 4 to 24 hrs. at room condition											
		Rate change for capacitance	B:Within±5% E:Within±15% F:Within±20%													
8	Solder ability		The lead wire is soldered more than 3/4 of it in the circumferential direction and to the immersed part continuously in the axial direction		- Soldering temp : 230 ± 5℃ - Immersion time : 2 ± 0.5 sec											

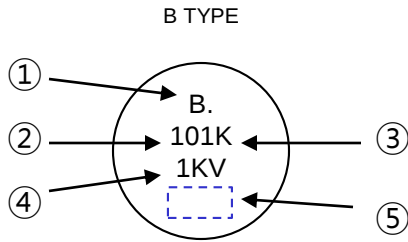
No.	ITEM		Rated Value	Testing method/application (EIA-STD, RS-198-C)																				
			EK Series																					
9.	Soldering Profile	Flow Soldering	<table><tr><th>Item Temp.(°C)</th><th>Pre-heating</th><th>Soldering</th><th>Cooling</th></tr><tr><td>260</td><td></td><td>260 +0, -5</td><td></td></tr><tr><td>200</td><td></td><td></td><td></td></tr><tr><td>160</td><td></td><td></td><td></td></tr><tr><td>100</td><td></td><td></td><td></td></tr></table> 60sec. min 5sec. max 60sec. min When soldering this product to a Pcb / Pwb, do not exceed the solder heat resistance specification of capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.	Item Temp.(°C)	Pre-heating	Soldering	Cooling	260		260 +0, -5		200				160				100				
		Item Temp.(°C)	Pre-heating	Soldering	Cooling																			
260		260 +0, -5																						
200																								
160																								
100																								
		Iron Soldering	When soldering capacitor with a soldering capacitor iron, it should be performed in following conditions. Temperature of iron-tip : 400°C max. Soldering iron wattage : 50W max. Soldering time : 3.5 sec. max. Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used																					
10.	Humidity Resistance Test	External View	No remarkable abnormality is recognized	- Temperature : 40 ± 2°C - Humidity : 90 ~ 95% RH - Testing time : 500 +24,-0 hours																				
		Rated change for capacitance	B: Within ± 10% E: Within ± 20% F: Within ± 30%	Pre-treatment : Capacitor should be stored at 85±2°C for 1hr., then placed at room condition for 24±2hrs., before initial measurement.																				
		Dissipation Factor (tan δ)	B, E : 5%Max F : 7.5%Max	Post-treatment : Capacitor should be stored for 1 to 2 hrs. at room condition																				
		Insulation Resistance	More than 1000MΩ																					
11.	Humidity Resistance Load Test	External View	Rated value is the same humidity resistance test	- Temperature : 40 ± 2°C - Humidity : 90 ~ 95% RH - Testing time : 500 +24,-0 hours - Applied voltage : Rated voltage - The discharge current shall be 50mA or less																				
		Rated change for capacitance																						
		Dissipation Factor (tan δ)	B, E : 5%Max F : 7.5%Max	Pre-treatment : Capacitor should be stored at 85±2°C for 1hr., then placed at room condition for 24±2hrs., before initial measurement.																				
		Insulation Resistance	More than 500MΩ	Post-treatment : Capacitor should be stored at 85±2°C for 1hr., then placed at room condition for 24±2 hrs.																				

No.	ITEM		Rated Value	Testing method/application (EIA-STD, RS-198-C)															
			EK Series																
12.	High Temperature Load	External View	No remarkable abnormality is recognized	- Temperature : $85 \pm 2^{\circ}\text{C}$ - Testing Time : 1000 +48,-0 hours - Applied voltage : Rated Voltage $\times$ 150% - The discharge current shall be 50mA or less Pre-treatment : Capacitor should be stored at $85\pm2^{\circ}\text{C}$ for 1hr., then placed at room condition for 24$\pm$2hrs., before initial measurement. Post-treatment : Capacitor should be stored at $85\pm2^{\circ}\text{C}$ for 1hr., then placed at room condition for 24$\pm$2 hrs.															
		Rated change for capacitance	B: Within $\pm 10\%$ E: Within $\pm 20\%$ F: Within $\pm 30\%$																
		Dissipation Factor (tan δ)	B, E : 5% Max F : 7.5% Max																
		Insulation Resistance	More than 1000M Ω																
13.	Temperature Cycling Test	Appearance	No. visible damage	Temperature cycle should be measured in the following test. Cycle time : 5 cycle Pre-treatment : Capacitor should be stored at max operating temp(①). for 1hr., placing at room condition for 24$\pm$2hrs. Post treatment : Capacitor should be stored for 24$\pm$2hrs at room. ※②:min. operating temperature ③:2 to 5minutes  Table II : Temperature Cycle <table><thead><tr><th>Step</th><th>Temperature ($^{\circ}\text{C}$)</th><th>Time (min)</th></tr></thead><tbody><tr><td>1</td><td>X ; +0/-3</td><td>30</td></tr><tr><td>2</td><td>Room temp.</td><td>3</td></tr><tr><td>3</td><td>Y; +3/-0</td><td>30</td></tr><tr><td>4</td><td>Room temp.</td><td>3</td></tr></tbody></table> Note : X = minimum operating temp Y = maximum operating temp Based on temp characteristics	Step	Temperature ($^{\circ}\text{C}$)	Time (min)	1	X ; +0/-3	30	2	Room temp.	3	3	Y; +3/-0	30	4	Room temp.	3
		Step	Temperature ($^{\circ}\text{C}$)		Time (min)														
		1	X ; +0/-3		30														
		2	Room temp.		3														
3	Y; +3/-0	30																	
4	Room temp.	3																	
Cap. Change	B : Within $\pm 10\%$ E : Within $\pm 20\%$ F : Within $\pm 20\%$																		
Dissipation Factor (tan δ)	B : 5% max E : 5% max F : 7.5% max																		
Insulation Resistance	1000M Ω min																		
14.	Preservation (keeping)		When Solderability is considered, capacitors are recommended to be used in 12 months	1). Temperature : $30^{\circ}\text{C} \pm 10^{\circ}\text{C}$ 2). Relative Humidity : 55% $\pm$ 25															
15.	The Regulation of Environmental Pollution Materials.		*Never use materials mentioned below based on International RoHS Standard. *Pb, Hg, Cr⁺⁶, PBB, PBDE, Cd, Phthalate (DEHP, DBP, BBP & DIBP)																

3. Marking

Followings are marked on the capacitor body

3-1. High Dielectric capacitor (Style : EK)



No.	EXAM.	ITEM	REMARK
1	B.	Temp. characteristic	
2	101	Capacitance	
3	K	Cap. tolerance	04~05Φ: Omitted
4	1KV	Rated voltage	
5	SWC	Manufacturer ' s code	10Φ>: Omitted, 10~20Φ : SWC

4. Enclosure

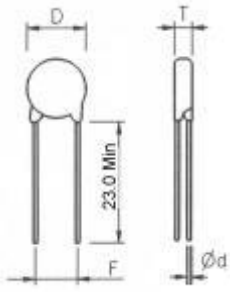
Units are coated with epoxy compound and cured

Rating Voltage	1kV ~
Material	Epoxy Resin

5. Style and Dimension

5-1). Bulk (1 ~ 2 KV)

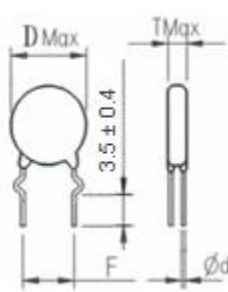
BS Type



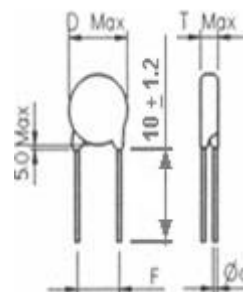
BK Type



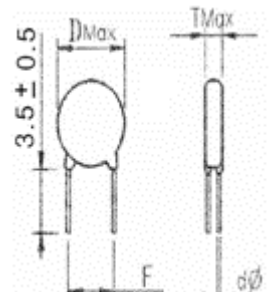
BW Type



BQ Type



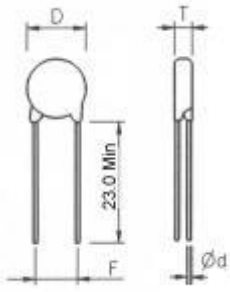
BN Type



Style	EK			Dimensions(mm)			
	Y5P (B)	Y5U (E)	Y5V (F)	D max	T max	F±1.0	d(φ) ± 0.05
1 KV DC	100-680	1000	1000,2200	6.3	5.0	5.0	0.50
	820-1500	-	4700	8.0		5.0 7.5 10.0	0.50 0.60
	1800,2200	2200	10000	10.0			
	2700	4700	-	12.5			
	3300,3900,4700	-	-	14.0		7.5 10.0	0.60
	5600,6800	10000	22000	16.0			
	8200,10000	-	-	18.0			
2 KV DC	100 – 560	-	1000, 2200	6.3	5.0	5.0 7.5	0.50 0.60
	680 – 1000	2200	-	8.0			
	-	4700	-	10.5			
	1200, 1500	-	4700	10.0		10.0 7.5 5.0	0.60 0.50
	1800,2200,2700	-	10000	12.5			
	3300,3900	-	-	14.0			
	4700	10000	-	16.0			
	5600	-	-	18.0			
	6800-10000	-	-	20.0			

5-2). Bulk (3KV ~)

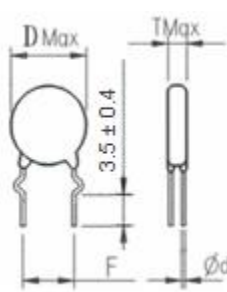
BS Type



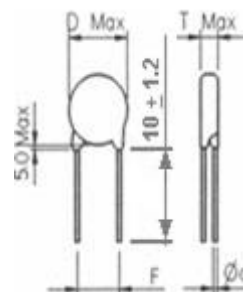
BK Type



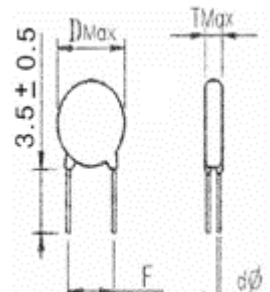
BW Type



BQ Type



BN Type

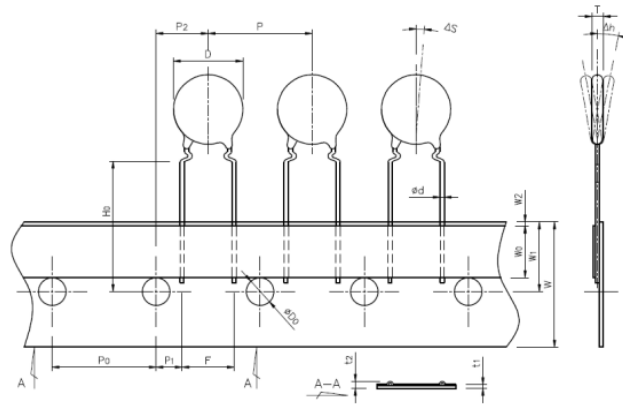


Style	EK			Dimensions(mm)			
	Y5P (B)	Y5U (E)	Y5V (F)	D max	T max	F±1.0	d(φ) ± 0.05
3.15 ~ KV DC	100-560	1000	-	8.0	7.0	7.5 10.0	0.60
	680,1000	1500	-	10.0			
	-	2200	4700	12.5			
	-	-	6800	13.0			
	1200,1500	3300, 4700	10000	14.0			
	1800-2200	-	-	15.0			
	2700	-	-	16.0			
	3300	-	-	18.0			

Style	EK			Dimensions(mm)			
	Y5P (B)	Y5U (E)	Y5V (F)	D max	T max	F±1.0	d(φ) ± 0.05
6.3 KV DC	100, 120, 150, 180, 220, 330, 470	1000	1000	8.0	7.0	7.5 10.0	0.60
	-	1500	-	9.0			
	680	-	-	10.0			
	1000	2200	2200,4700	12.5			
	-	3300	-	14.0			
	-	3900,4700	-	15.5			
	-	-	10000	20.0			

2). Taping – FK5

FK5

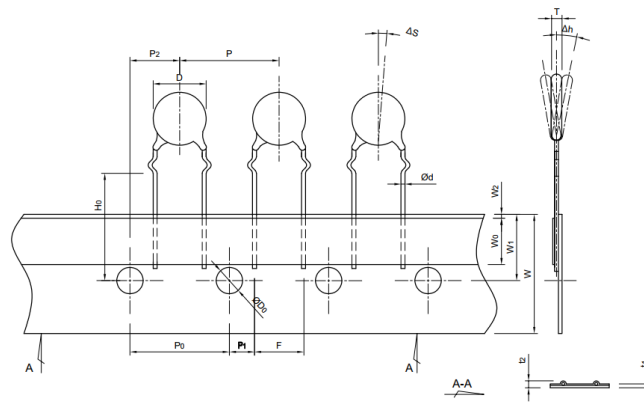


[Unit : mm]

ITEM	SYMBOL	TAPING SPECIFICATION	NOTE
		FK5	
Body Diameter	D	12.5 Max	
Body Thickness	T	5.0 Max	
Lead Diameter	Φd	0.50 ± 0.05	
Pitch of Sprocket Hole	P_0	12.7 ± 0.3	Accumulative.pitch error : $\pm 1\text{mm}/20\text{pitch}$
Pitch of Component	P	12.7 ± 1.0	
Lead Length from Hole Center to Lead	P_1	3.85 ± 0.7	
Lead Length from Hole Center to Component Center	P_2	6.35 ± 1.3	
Lead Spacing	F	$5.0 + 0.8$ $- 0.2$	
Deviation Along Tape	ΔS	0 ± 1.0	
Deviation Across Tape	Δh	0 ± 2.0	
Carrier Tape Width	W	$18.0 + 1.0$ $- 0.5$	
Hold Down Tape Width	W_0	6.0 Min	
Position of Sprocket Hole	W_1	9.0 ± 0.5	
Hold Down Tape Position	W_2	3.0 Max	
Diameter of Sprocket Hole	ΦD_0	4.0 ± 0.2	
Lead-Wire Clinch Height	H_0	16.0 ± 0.5	
Total Tape Thickness	t_1	0.7 ± 0.2	
Total Thickness, Tape and Lead Wire	t_2	1.5 Max	

2). Taping – FF7

FF7

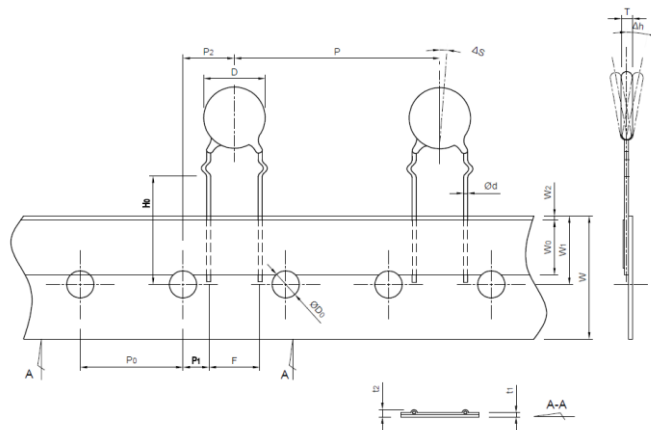


[Unit : mm]

ITEM	SYMBOL	TAPING SPECIFICATION	NOTE
		FF7	
Body Diameter	D	14.0 Max	
Body Thickness	T	7.0 Max	
Lead Diameter	Φd	0.60 ± 0.05	
Pitch of Sprocket Hole	Po	15.0 ± 0.3	
Pitch of Component	P	15.0 ± 1.0	
Lead Length from Hole Center to Lead	P1	3.75 ± 1.0	
Lead Length from Hole Center to Component Center	P2	7.5 ± 1.5	
Lead Spacing	F	7.5 ± 1.0	
Deviation Along Tape.Left or Right	△S	0 ± 1.0	
Deviation Across Tape	△h	0 ± 2.0	
Carrier Tape Width	W	18.0 +1.0 - 0.5	
Hold Down Tape Width/Masking Tape Width	Wo	8.0 min	
Position of Sprocket Hole	W1	9.0 ± 0.5	
Hold Down Tape Position	W2	3.0 Max	
Lead-Wire Clinch Height	Ho	16.0 ± 0.5	
Height of Component Hole	H	20.0 +1.5 - 1.0	
Diameter of Sprocket Hole	ΦDo	4.0 ± 0.2	
Total Tape Thickness	t1	0.7 ± 0.2	
Total Thickness, Tape and Lead Wire	t2	1.7 Max	

2). Taping – FF8

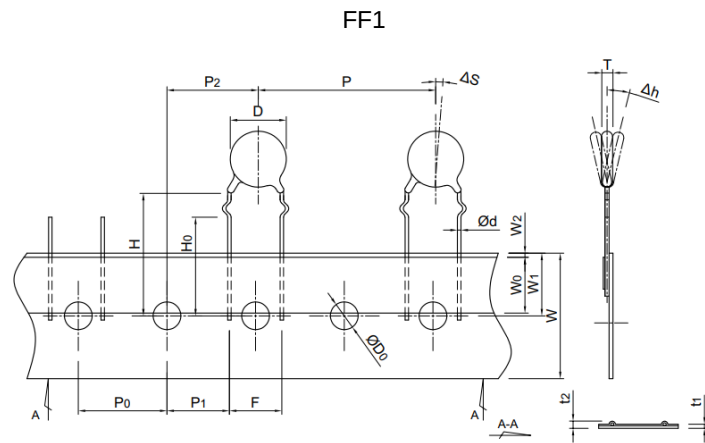
FF8



[Unit : mm]

ITEM	SYMBOL	TAPING SPECIFICATION	NOTE
		FF8	
Body Diameter	D	16.0 Max	
Body Thickness	T	5.0 Max	
Lead Diameter	Φd	0.60 ± 0.05	
Pitch of Sprocket Hole	P_0	15.0 ± 0.3	
Pitch of Component	P	30.0 ± 1.0	
Lead Length from Hole Center to Lead	P_1	3.75 ± 1.0	
Lead Length from Hole Center to Component Center	P_2	7.5 ± 1.5	
Lead Spacing	F	7.5 ± 1.0	
Deviation Along Tape.Left or Right	ΔS	0 ± 1.0	
Deviation Across Tape	Δh	0 ± 2.0	
Carrier Tape Width	W	$18.0 + 1.0$ $- 0.5$	
Hold Down Tape Width/Masking Tape Width	W_0	8.0 Min	
Position of Sprocket Hole	W_1	9.0 ± 0.5	
Hold Down Tape Position	W_2	3.0 Max	
Lead-Wire Clinch Height	H_0	16.0 ± 0.5	
Height of Component Hole	H	$20.0 + 1.5$ $- 1.0$	
Diameter of Sprocket Hole	ΦD_0	4.0 ± 0.2	
Total Tape Thickness	t_1	0.7 ± 0.2	
Total Thickness, Tape and Lead Wire	t_2	1.7 Max	

2). Taping – FF1



[Unit : mm]

ITEM	SYMBOL	TAPING SPECIFICATION	NOTE
		FF1	
Body Diameter	D	12.0 Max	
Body Thickness	T	7.0 Max	
Lead Diameter	dΦ	0.60 ± 0.05	
Pitch of Sprocket Hole	P0	12.7 ± 0.3	
Pitch of Component	P	25.4 ± 1.0	
Lead Length from Hole Center to Lead	P1	7.7 ± 1.0	
Lead Length from Hole Center to Component Center	P2	12.7 ± 1.5	
Lead Spacing	F	10.0 ± 1.0	
Deviation Along Tape, Left or Right	△S	0 ± 1.0	
Deviation Across Tape	△h	0 ± 2.0	
Carrier Tape Width	W	18.0 + 1.0 - 0.5	
Hold Down Tape Width/Masking Tape Width	W0	8.0 Min	
Position of Sprocket Hole	W1	9.0 ± 0.5	
Hold Down Tape Position	W2	3.0 Max	
Lead-Wire Clinch Height	H0	16.0 ± 0.5	
Height of Component from Hole Center	H	20.0 + 1.5 - 1.0	
Diameter of Sprocket Hole	ΦDo	4.0 ± 0.2	
Total Tape Thickness	t ₁	0.7 ± 0.2	
Total Thickness, Tape and Lead Wire	t ₂	1.7 Max	

PACKING SPECIFICATION

1) Bulk

TYPE		PACKING QUANTITY [pcs]					
DIVISION	L/W DIVISION [mm]	DIAMETER [Φ]	INNER BOX			OUT BOX	
			VINIL PAPERBAG		IBB 140	OBB 150	OBB 300
1 ~ 2 KV	Long	~ 8	F: 5.0	500 +2, -0	7,500	-	30,000
			F: 7.5,10.0	500 +2, -0	4,000	-	16,000
		9 ~ 10	F: 5.0	500 +2, -0	5,000	-	20,000
			F: 7.5,10.0	500 +2, -0	4,000	-	16,000
		11 ~12	500 +2, -0		4,000	-	16,000
		13 ~16	500 +2, -0		2,500	-	10,000
		17 ~ 20	400 +1, -0		2,000	-	8,000
	Short	~ 8	1,000 +3, -0		10,000	20,000	-
		9 ~ 10	F: 5.0	1,000 +3, -0	10,000	20,000	-
			F: 7.5,10.0	500 +2, -0	10,000	20,000	-
		11 ~ 16	500 +2, -0		5,000	10,000	-
		17 ~ 20	500 +2, -0		4,000	8,000	-
3 ~ 6 KV	Long	~ 7	500 +2, -0		5,000	-	20,000
		8 ~ 11			4,000	-	16,000
		12 ~ 14			3,000	6,000	-
		15 ~ 16			2,500	5,000	-
		17 ~ 20	200 +1, -0		2,000	4,000	-
	Short	~ 9	500 +2, -0		10,000	20,000	-
		10 ~ 11	500 +2, -0		7,500	15,000	-
		12 ~ 14	500 +2, -0		5,000	10,000	-
		15 ~ 16	500 +2, -0		4,000	8,000	-
		17 ~ 20	200 +1, -0		2,000	4,000	-

PACKING SPECIFICATION

2) Taping

DIVISION	F [mm]	TYPE	PITCH	DIAMETER [Φ]		VOLTAGE [V]	BOX H [mm]	PACKING QUANTITY [pcs]	
								IBR	OBR
~2 KV	5.0	FK5, FF5, FR5	12.7	10.0 ~ 12.0		500V ↓	52	2,000 +5, -0	10,000
				ALL		KV	52	2,000 +5, -0	10,000
	7.5	FF7, FR7	15.0	14.0↓	~10	KV	52	1,500 +5, -0	7,500
								12~	1,300 +5, -0
		FF8	30.0	15.0↑					700 +5, -0
		FF9	25.4	ALL				700 +5, -0	3,500
	10.0	FF1, FF2	ALL		-	52	700 +5, -0	3,500	
		FF3	30	ALL		-	52	600 +5, -0	3,000
3 KV~	7.5	FF7, FR7	15.0	14.0↓		KV	52	1,000 +5, -0	5,000
		FF8	30.0	15.0↑				600 +5, -0	3,000
		FF9	25.4	ALL				600 +5, -0	3,000
	10.0	FF1, FR1	25.4	ALL				600 +5, -0	3,000
		FF2	30.0					500 +5, -0	2,000

• ETC

EKB3F471K08FF5 = 1,500 +5, -0 (IN), 7,500(OUT)

3) PACKING BOX DIMENSIONS

PACKING STYLE		CATEGORY	L × W × H [mm]
BULK	IBB (Inner Box Bulk)	IBB 140	250 × 235 × 130
	OBB (Out Box Bulk)	OBB 150 (IBB 140 × 2)	485 × 265 × 145
TAPING	INNER BOX	IBR 52	325 × 280 × 55
	OUT BOX	OBR 52 (IBR 52 × 5)	340 × 310 × 290

4) STACKING BOX (Maximum)

PACKING STYLE	INBOX	OUTBOX
BULK	6	6
TAPING	10	6

■ MATERIAL LIST

NO	Material Name	Substance	Hazardous Substance Existences						Remarks
			Pb	Hg	Cr	Cr ⁺⁶	PBB	PBDE	
1	Dielectric Powder	BaTiO ₃	X	X	X	X	X	X	
2	Ag Paste	Ag	X	X	X	X	X	X	
3	Solder	Sn,Ag,Cu	X	X	X	X	X	X	
4	Epoxy resin	Epoxy	X	X	X	X	X	X	
5	Lead wire	Cu, Sn, Fe	X	X	X	X	X	X	Plating thickness : Min 3 μm. (material : tin)

Label Type

Bulk Style

BULK TYPE		
PLASTIC	INBOX	OUTBOX
		

Taping Style

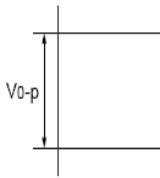
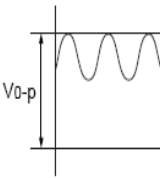
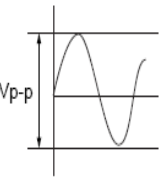
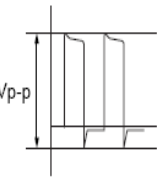
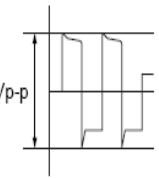
TAPING TYPE		
PLASTIC	INBOX	OUTBOX
		

■ Notices:

► Caution

1. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the V_{p-p} value of the applied voltage or the V_{0-p} that contains DC bias within the rated voltage range. When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rate voltage containing these irregular resonance.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage (1)	Pulse Voltage (2)
Positional Measurement					

2. Operating Temperature And Self-Generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high frequency current, pulse current or the like, it may have self-generated heat due to dielectric loss. Applied voltage should be the load such as self-generated heat is within 20°C on the condition of atmosphere temperature 25°C. When measuring, use a thermocouple of small thermal capacity-K of $\varnothing 0.1\text{mm}$ and be in the condition where capacitor is not affected by radiant heat of other components and wind of surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

► Notice (Capacitance change of capacitors)

For some of the capacitors, capacitance value may change considerably in the temperature range, or by applied DC voltage. and capacitor has aging characteristics (capacitance decreases by keeping as it is)