

Ceramic Capacitors (Safety Regulations) For Surface Mounting Types

Discontinued

Type HC (Sub-Class Y1)

Type FC (Sub-Class Y2)

Type BC (Sub-Class Y2)



■ Features

- Resin molded SMD type for flow/reflow soldering (HC) and reflow soldering (FC,BC)
- High reliability
- Safety requirement approved by UL, SEMKO, NEMKO, FIMKO, DEMKO and KTL* * KTL: only Type FC

■ Recommended Application

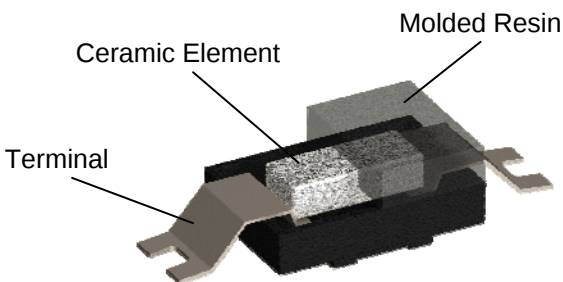
- Interference suppressors circuit and Isolation circuit of IT equipment such as MODEM.
- Interference suppressors circuit of small power supply machinery such as DC-DC converters and power modules.
- Interference suppressors circuit of AC primary side for general electronic equipment.

■ Explanation of Part Numbers

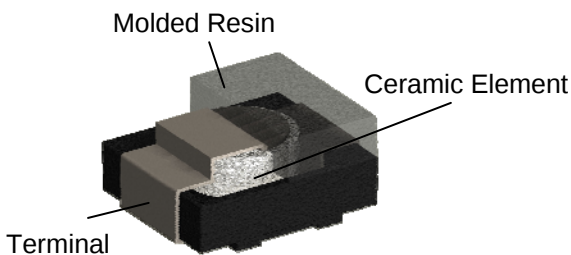
1		2		3		4		5		6		7		8		9		10		11		12					
E		C		K		T		H		C		1		0		1		K		B							
Product Code				Packaging Style				Type				Nominal Capacitance				Cap. Tolerance				Temp. Char.				Suffix			
Code		Class		Code		Style		Code		Type		(Ex.)		Capacitance		Code		Tol.		Code		Temp. Char.					
ECC		Class1		T		Taped type		HC		Type HC		050		5 pF		C		±0.25 pF		G		SL					
ECK		Class2						FC		Type FC		100		10 pF		D		±0.5 pF		B		B					
								BC		Type BC		470		47 pF		F		±1 pF		E		E					
												101		100 pF		J		±5 %		F		F					
												221		220 pF		K		±10 %									
												471		470 pF		M		±20 %									
												102		1000 pF													

■ Construction

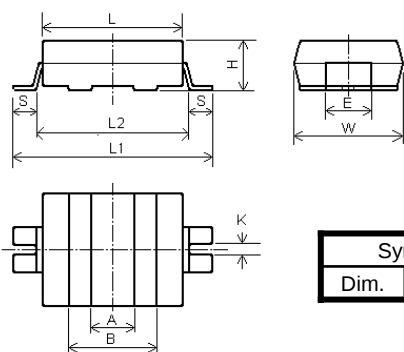
- Type HC



- Type FC,BC



■ Dimensions in mm (not to scale) 【Type HC:Y1】

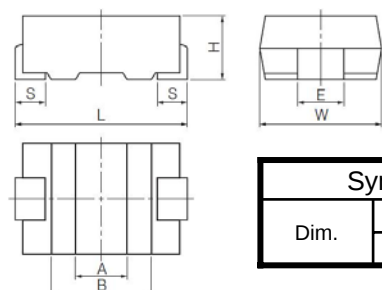


Symbol	L	W	H	S	E	A	B	L1	L2
Dim. Type HC	6.8±0.3	4.5±0.2	2.5 max	1.0±0.50	2.5±0.2	(1.7)	(3.1)	12.0±0.5	8.0 min

■ Specifications 【Type HC:Y1】

Characteristics	Temp. Char. B/Y5P		
Operating Temperature Range	-25 to 125 °C		
Rated Voltage	250 VAC		
Dielectric Withstanding Voltage	4000 VAC for 1 minute		
Capacitance	Within the specified tolerance, when measured at 1kHz±20%, 1 to 5 Vrms. and 20 °C		
Q or Dissipation Factor (tan δ)	tan δ < 0.025 at 1 kHz±20 %, 1 to 5 Vrms. and 20 °C		
Insulation Resistance	10000 MΩ min. at 500 VDC and 1 minute electrification		
Temperature Characteristics	Char.	Max. Cap. Change	Temp. Range
	B/Y5P	±10%	-25 ~ 85 °C

■ Dimensions in mm (not to scale) 【Type BC,FC:Y2】



Symbol	L	W	H	S	E	A	B
Dim. Type	Type FC	5.7±0.5	4.5±0.3	2.3 max	0.85±0.30	2.5±0.2	(1.7) (3.1)
	Type BC	7.1±0.5	6.3±0.3	2.5±0.3	1.45±0.30	2.5±0.2	(2.0) (3.7)

■ Specifications 【Type BC,FC:Y2】

Characteristics	Temp. Char. SL/GP	Temp. Char. B/Y5P, E/Y5U, F/Y5V		
Operating Temperature Range	-25 to 100 °C			
Rated Voltage	250 VAC			
Dielectric Withstanding Voltage	1500 VAC for 1 minute			
Capacitance	Within the specified tolerance, when measured at 1 MHz±20 %, 1 to 5 Vrms. and 20 °C		Within the specified tolerance, when measured at 1 kHz±20 %, 1 to 5 Vrms. and 20 °C	
Q or Dissipation Factor (tan δ)	30 pF or under Q > 200+10 C (C:Cap.pF) over 30 pF Q > 500 at 1 MHz±20 %, 1 to 5 Vrms. and 20 °C		tan δ < 0.025 at 1 kHz±20 %, 1 to 5 Vrms. and 20 °C	
Insulation Resistance	10000 MΩ min. at 500 VDC and 1 minute electrification			
Temperature Characteristics	Temperature Coefficient:+350 to -1000 ppm/ °C over the temperature range 20 to 85 °C	Char.	Max. Cap. Change	Temp. Range
		B/Y5P	±10%	-25 ~ 85 °C
		E/Y5U	+20,-55%	
		F/Y5V	+30,-80%	

■ Related Standards and Certificate Number

Certification Body	Related Standard	Certificate Number			Sub-Class	Rated Voltage	Dielectric Withstanding Voltage	Operating Temperature Range
		Type HC	Type FC	Type BC				
UL(USA)	UL60384-14	E62674	E62674	E62674	HC:Y1 BC/FC:Y2	250 VAC	HC: 4000 VAC BC/FC: 1500 VAC	HC: -25 ~ 125°C BC/FC: -25 ~ 100°C
	CAN/CSA –E60384-14	-----	-----	E62674	Y2		1500 VAC	
SEMKO(Sweden)	EN60384-14 2005	1025027	806189	1025267	HC:Y1 BC/FC:Y2		HC: 4000 VAC BC/FC: 1500 VAC	
FIMKO(Finland)		FI 26683	FI 16588A1 FI 17348A2	FI 26770				
DEMKO(Denmark)		D-00043	310914-01 310698-01	Issuing certification now				
NEMKO(Norway)		P11213874	P01100665 P01101830	P11214054				
KTL(Korea)	K60384-14	-----	SU03013-3001	-----				

■ Ratings and Characteristics

Type Name	Part Number	Capacitance (pF)	Cap. Tolerance	Temp. Char	Dimensions in mm
Type HC	ECKTHC101KB	100	±10 %	B/Y5P	6.8L × 4.5W × 2.5H
	ECKTHC221KB	220			
	ECKTHC471KB	470			
	ECKTHC101MB	100	±20 %		
	ECKTHC221MB	220			
	ECKTHC471MB	470			
Type FC	ECCTFC100DG	10	±0.5 pF	SL/GP	5.7L × 4.5W × 2.3H
	ECCTFC150JG	15	±5 %		
	ECCTFC220JG	22			
	ECCTFC330JG	33			
	ECKTFC470KB	47	±10 %	B/Y5P	
	ECKTFC101KB	100			
	ECKTFC151KB	150			
	ECKTFC221KB	220			
	ECKTFC331KB	330			
	ECKTFC471KB	470			
	ECKTFC102ME	1000	±20 %	E/Y5U	
	ECKTFC152MF	1500		F/Y5V	
	ECKTFC222MF	2200			
	Type BC	ECCTBC100DG	10	±0.5 pF	
ECCTBC150JG		15	±5 %		
ECCTBC220JG		22			
ECCTBC330JG		33			
ECCTBC470JG		47			
ECCTBC680JG		68			
ECKTBC101KB		100	±10 %	B/Y5P	
ECKTBC151KB		150			
ECKTBC221KB		220			
ECKTBC331KB		330			
ECKTBC471KB		470			
ECKTBC681KB		680			
ECKTBC102ME		1000	±20 %	E/Y5U	
ECKTBC152ME		1500			
ECKTBC222ME		2200			

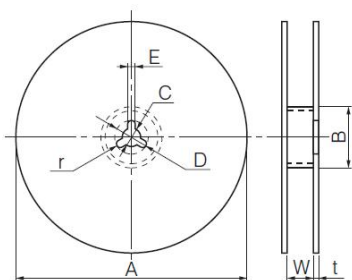
Notes * Other capacitance values are available by special order.

■ Packaging Methods (Taping)

● Minimum Quantity/Packing Unit

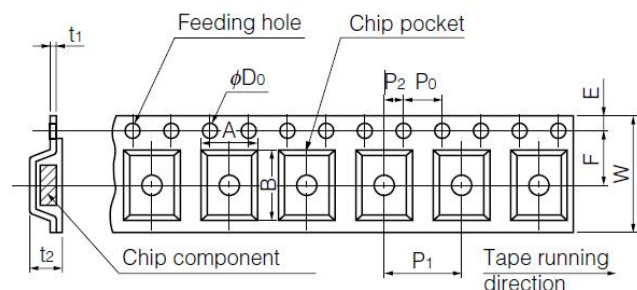
Type	Packaging style	Part Number		Minimum Packing Quantity	Packing Quantity in Carton	Carton Dimensions in mm (LWH)
Type HC	Embossed Carrier Taping	EC□□THC□□□□□	100~470pF	3000 pcs./reel	6000 pcs	350 × 350 × 62
Type FC	Embossed Carrier Taping	EC□□TFC□□□□□	10 to 2200pF	3000 pcs./reel	9000 pcs.	350 × 350 × 62
Type BC	Embossed Carrier Taping	EC□□TBC□□□□□	10 to 2200pF	2000 pcs./reel	6000 pcs.	350 × 350 × 62

● Reel



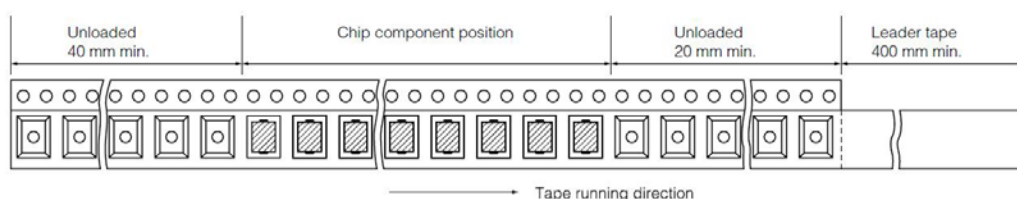
Symbol		A	B	C	D	E	W	t	r
Dim. (mm)	Type HC	330 ±5	60 min	13.0 ±0.5	21.0 ±1.0	2.0 ±0.5	25.5 ±1.5	2.0 ±0.5	R1.0
	Type FC						13.5 ±1.5		
	Type BC						13.5 ±1.5		

● Embossed carrier taping



Symbol		A	B	W	F	E	P ₁	P ₂	P ₀	φD ₀	t ₁	t ₂
Dim. (mm)	Type HC	4.8	12.3 ±0.2	24.0 ±0.3	11.5 ±0.1	1.75 ±0.10	8.0 ±0.1	2.00 ±0.05	4.1 ±0.1	1.5 +0.1 -0	0.3 ±0.1	2.8 ±0.3
	Type FC	±0.2	6.0 ±0.2	12.0 ±0.3	5.5 ±0.1							±0.3
	Type BC	6.5 ±0.2	7.5 ±0.2	±0.3	±0.1							3.2 ±0.3

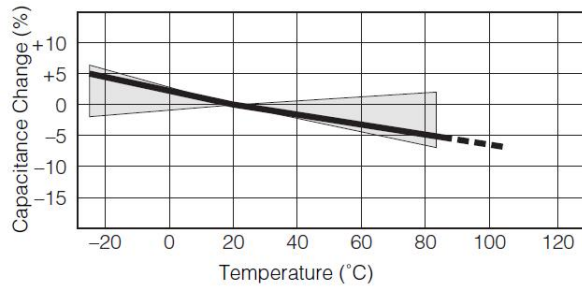
● Leader Part and Taped End



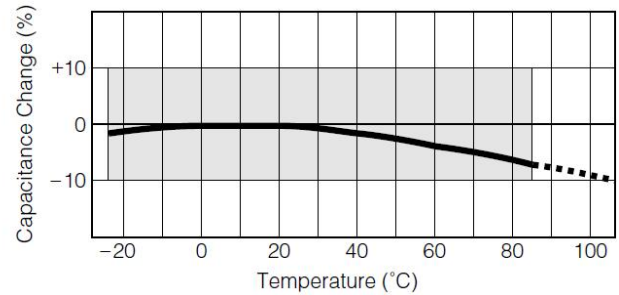
■ Typical Characteristics

● Temperature Characteristics

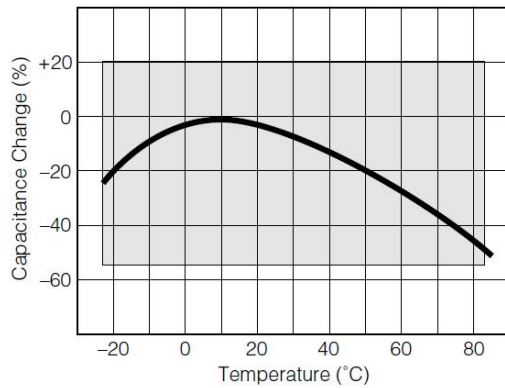
Char. SL/GP
(Temp.Coeff.:+350 to -1000 ppm/°C)



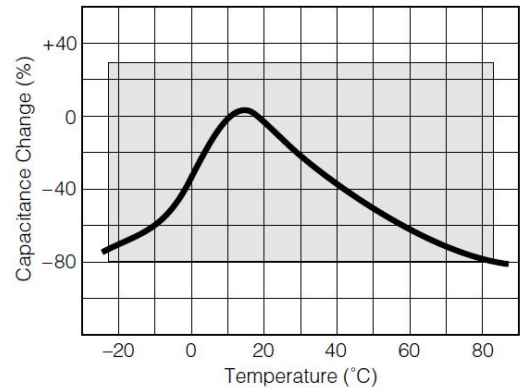
Char. B/Y5P
Temp.Range:-25 to 85 °C
Max.Cap.Change:±10 %



Char. E/Y5U (Temp.Range:-25 to 85 °C
max.Cap.Change:+20, -55 %)

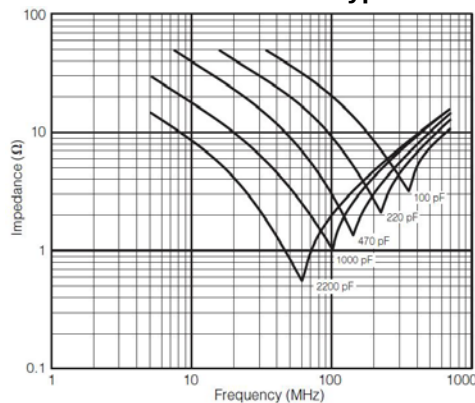


Char. F/Y5V (Temp. Range :-25 to 85 °C
max.Cap.Change:+30, -80 %)

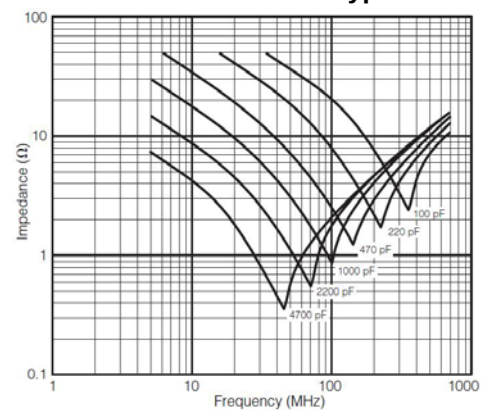


● Impedance vs. Frequency Characteristics

Type FC

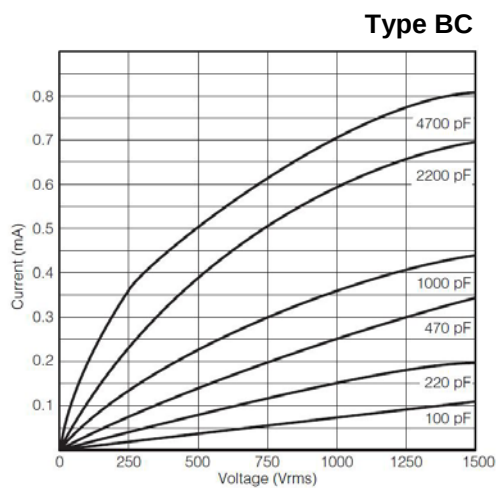
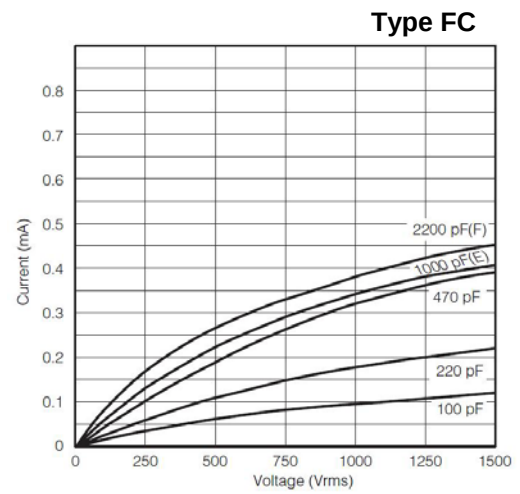
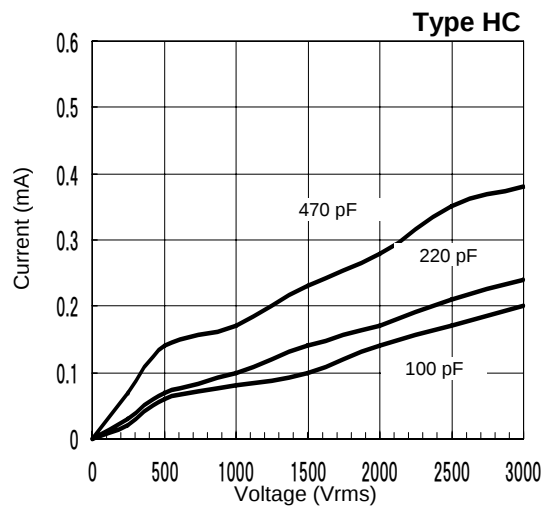


Type BC



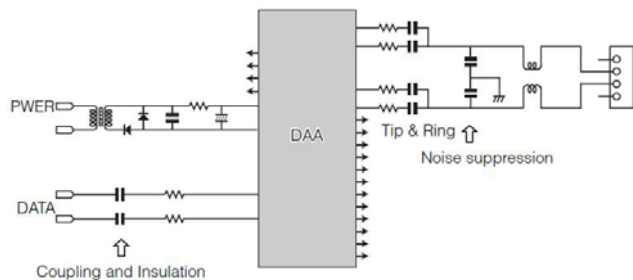
Typical Characteristics

Current vs. Voltage (Leakage Current Characteristics)

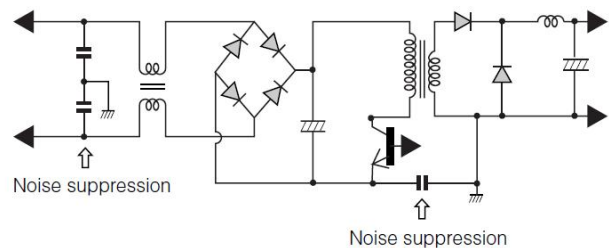


Application Examples

MODEM



Primary circuit of Switching Power Supply



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Panasonic:

[ECC-TBC100DG](#) [ECC-TBC150JG](#) [ECC-TBC220JG](#) [ECC-TBC330JG](#) [ECC-TBC470JG](#) [ECC-TBC680JG](#) [ECC-TFC050DG](#) [ECC-TFC100DG](#) [ECC-TFC150JG](#) [ECC-TFC220JG](#) [ECC-TFC330JG](#) [ECK-TBC101KB](#) [ECK-TBC102ME](#) [ECK-TBC152ME](#) [ECK-TBC222ME](#) [ECK-TBC332MF](#) [ECK-TBC471KB](#) [ECK-TBC681KB](#) [ECK-TFC101KB](#) [ECK-TFC102ME](#) [ECK-TFC151KB](#) [ECK-TFC152MF](#) [ECK-TFC221KB](#) [ECK-TFC331KB](#) [ECK-TFC470KB](#) [ECK-TFC471KB](#) [ECK-TFC680KB](#) [ECK-TFC222MF](#) [ECK-THC101KB](#) [ECK-THC101MB](#) [ECK-THC221KB](#) [ECK-THC221MB](#) [ECK-THC471KB](#) [ECK-THC471MB](#) [ECK-TFC102KB](#)