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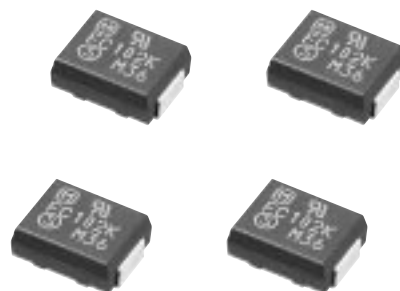
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Panasonic

Ceramic Capacitors (Safety Regulation SMD)

Ceramic Capacitors (safety Regulations) For Surface Mountings Types BC and FC



Features

- Resin molded SMD type for reflow soldering
- High reliability through disc capacitor element molded construction
- Safety requirement approved by UL, SEMKO, NEMKO, FIMKO, DEMKO and KTL (for Type FC)
- Addition new smaller type (Type FC 5.7 × 4.5mm)

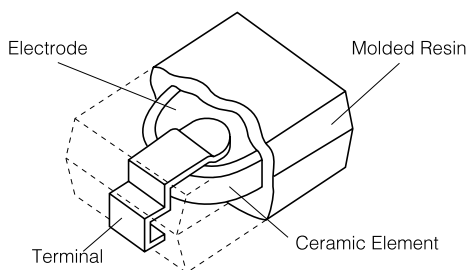
Recommended Application

- IT equipment as analog MODEM, XDSL MODEM
- AC primary circuit of AC adapter, Charger, DC-DC converter, On-board type power modul Etc.

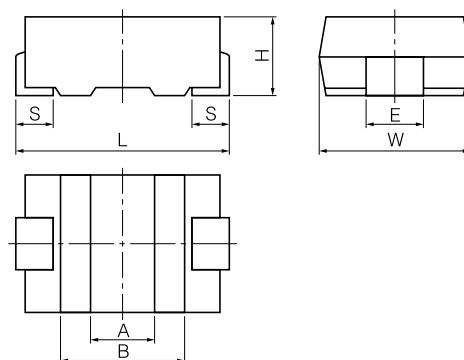
Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12	(Examples)
E	C	K	T	B	C	1	0	2	M	E		
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	S	Bulk	BC	Type BC	050	5 pF	C	±0.25 pF	G	SL/GP	
ECK	Class2	T	Taped type	FC	Type FC	100	10 pF	D	±0.5 pF	B	B/Y5P	
						470	47 pF	F	±1 pF	E	E/Y5U	
						101	100 pF	J	±5 %	F	F/Y5V	
						221	220 pF	K	±10 %			
						102	1000 pF	M	±20 %			

Construction



Dimensions in mm (not to scale)



Unit: (mm)

Symbol	L	W	H	S	E	A	B
Dim 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)
(mm) Type FC	5.7±0.5	4.5±0.3	2.3max	0.85±0.30	2.5±0.2	(1.7)	(3.1)

Precaution for Handling

See Page 93 to 95

Packaging Informations

See Page 96 to 97

Panasonic

Ceramic Capacitors (Safety Regulation SMD)

Specifications

Characteristics	Temp. Char. SL/GP	Temp. Char. B/Y5P, E/Y5U, F/Y5V
Operating Temperature Range	-25 to 100 °C (-25 to 85 °C for UL approved)	
Rated Voltage	250 VAC	
Dielectric Withstanding Voltage	1500 VAC for 1 min	
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 M Ω 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 to 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 BC	Type FC				
UL (USA)	UL1414*	E62674	—	—	250 VAC	1500 VAC	-25 to 85 °C
	UL1414 6th Ed.	—	E62674	Y2		2000 VAC	
	CSA C22.2 No.1*	E62674	—	—		1500 VAC	
SEMKO (Sweden)	EN132 400:1994 Sub-class Y2 (IEC 60384-14 2nd.Ed.)	0026049/01	0101074/01 0126276/01	Y2	250 VAC	1500 VAC	-25 to 100 °C
FIMKO (Finland)		—	FI 16588 FI 17348				
DEMKO (Denmark)		—	310914-01 310698-01				
NEMKO (Norway)		—	P01101830 P01100665				
KTL (Korea)		K60384-14 (IEC60384-14 2nd Ed.)	—				

Note : * is for Line-by-pass capacitors. Certification Number sometimes changes with the change of the approval contents so on. KTL mark is indicated on the label.

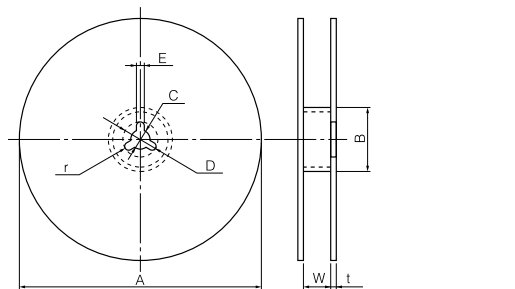
Packaging Specifications

Standard Packing Quantity

Embossed taping: 2000 pcs./reel for Type BC

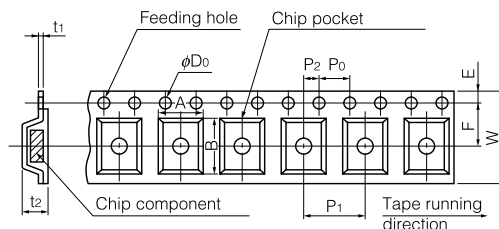
3000 pcs./reel for Type FC

Reel



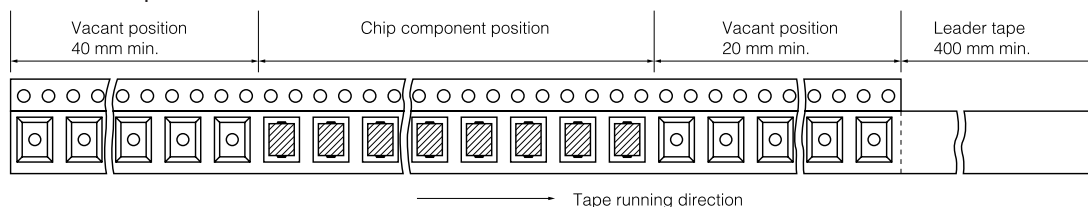
Symbol	A	B	C	D	E	W	t	r
Dim. (mm)	330±5	60 min.	13.0±0.5	21.0±1.0	2.0±0.5	13.5±1.5	2.0±0.5	R1.0

Embossed taping



Symbol	A	B	W	F	E	P ₁	P ₂	P ₀	φD ₀	t ₁	t ₂
Dim. (mm)	Type BC	6.5 ±0.2	7.5 ±0.2	12.0 ±0.3	5.5 ±0.1	1.75 ±0.10	8.0 ±0.1	2.00 ±0.05	4.0 ±0.1	1.5 ±0.1	3.2 ±0.3
	Type FC	4.8 ±0.2	6.0 ±0.2	—	—	—	—	—	—	0	2.8 ±0.3

Leader Part and Taped End



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Ceramic Capacitors (Safety Regulation SMD)

Rating and Characteristics

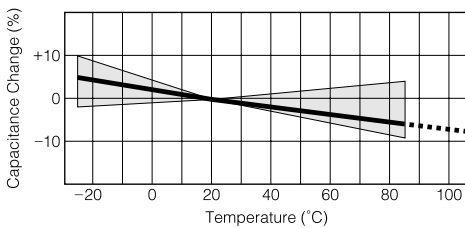
Type Name	Part Number	Capacitance (pF)	Cap. Tolerance	Temp. Char	Dimensions in mm
Type BC	ECCTBC100DG	10	±0.5 pF	SL/GP	7.1L×6.3W×2.5H
	ECCTBC150JG	15	±5 %	SL/GP	
	ECCTBC220JG	22	±5 %	SL/GP	
	ECCTBC330JG	33	±5 %	SL/GP	
	ECCTBC470JG	47	±5 %	SL/GP	
	ECCTBC680JG	68	±5 %	SL/GP	
	ECKTBC101KB	100	±10 %	B/Y5P	
	ECKTBC151KB	150	±10 %	B/Y5P	
	ECKTBC221KB	220	±10 %	B/Y5P	
	ECKTBC331KB	330	±10 %	B/Y5P	
	ECKTBC471KB	470	±10 %	B/Y5P	
	ECKTBC681KB	680	±10 %	B/Y5P	
	ECKTBC102ME	1000	±20 %	E/Y5U	
	ECKTBC152ME	1500	±20 %	E/Y5U	
	ECKTBC222ME	2200	±20 %	E/Y5U	
Type FC	ECKTBC332MF	3300	±20 %	F/Y5V	5.7L×4.5W×2.3H
	ECKTBC472MF	4700	±20 %	F/Y5V	
	ECCTFC050DG	5	±0.5 pF	SL/GP	
	ECCTFC100DG	10	±0.5 pF	SL/GP	
	ECCTFC150JG	15	±5 %	SL/GP	
	ECCTFC220JG	22	±5 %	SL/GP	
	ECCTFC330JG	33	±5 %	SL/GP	
	ECKTFC470KB	47	±10 %	B/Y5P	
	ECKTFC680KB	68	±10 %	B/Y5P	
	ECKTFC101KB	100	±10 %	B/Y5P	
	ECKTFC151KB	150	±10 %	B/Y5P	
	ECKTFC221KB	220	±10 %	B/Y5P	
	ECKTFC331KB	330	±10 %	B/Y5P	
	ECKTFC471KB	470	±10 %	B/Y5P	
	ECKTFC681KB	680	±10 %	B/Y5P	
ECKTFC821KB	820	±10 %	B/Y5P		
ECKTFC102KB	1000	±10 %	B/Y5P		
ECKTFC102ME	1000	±20 %	E/Y5U		
ECKTFC152KB	1500	±10 %	B/Y5P		
ECKTFC152MF	1500	±20 %	F/Y5V		
ECKTFC222KB	2200	±10 %	B/Y5P		
ECKTFC222MF	2200	±20 %	F/Y5V		

Notes *: Other capacitance values are available by special order.

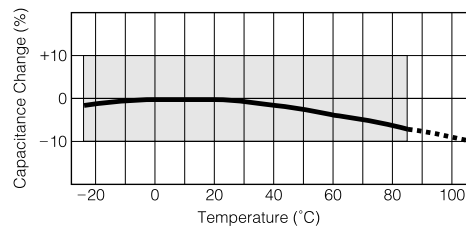
Typical Characteristics

Temperature Characteristics

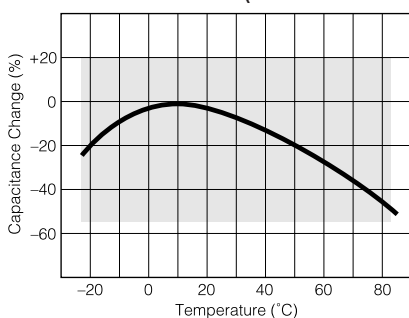
Char. SL/GP
(Temp.Coeff.: +350 to -1000 ppm/°C)



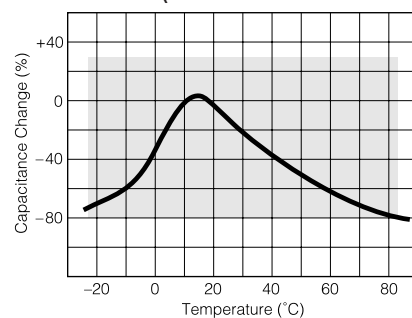
Char. B/Y5P
Temp.Range:-25 to 85 °C
Max.Cap.Change:± 10 %



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



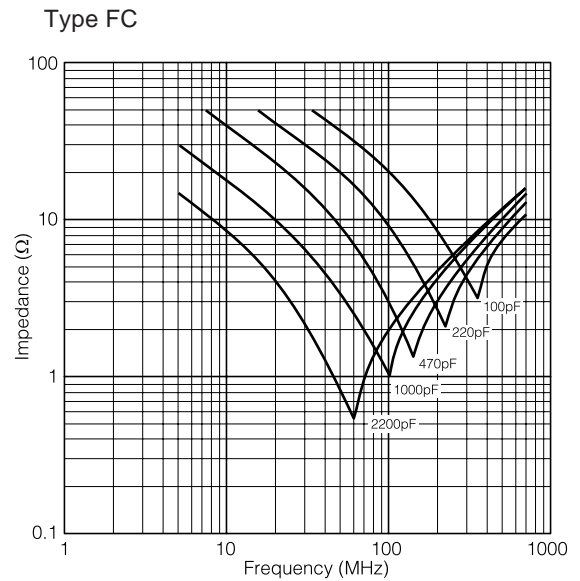
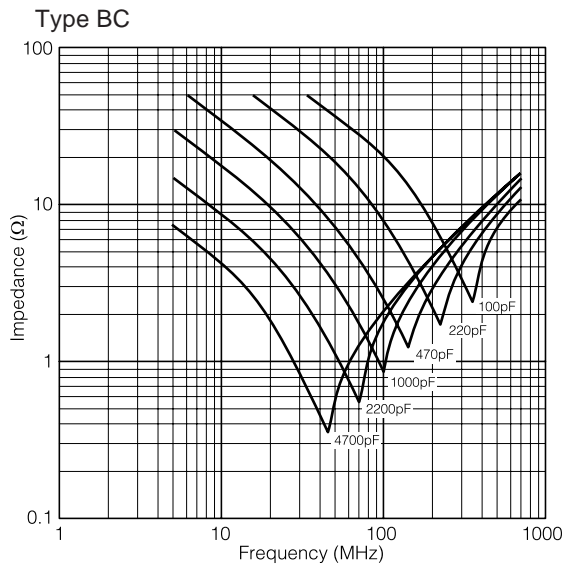
Char. F/Y5V (Temp.Range:-25 to 85 °C
max.Cap.Change:+30, -80 %)



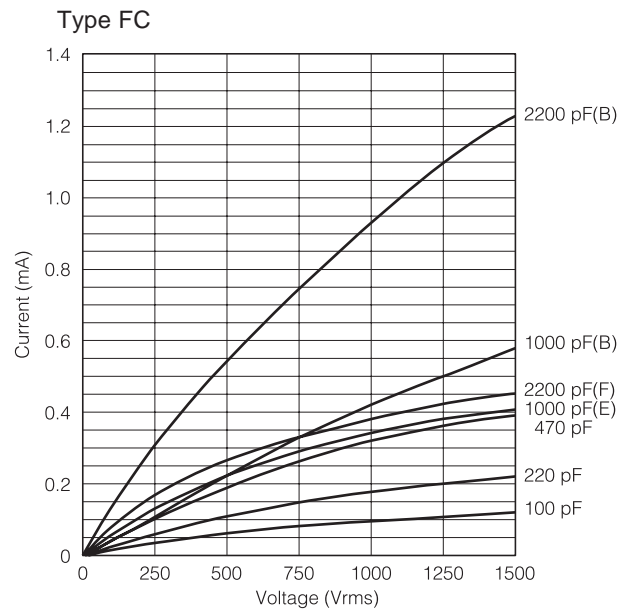
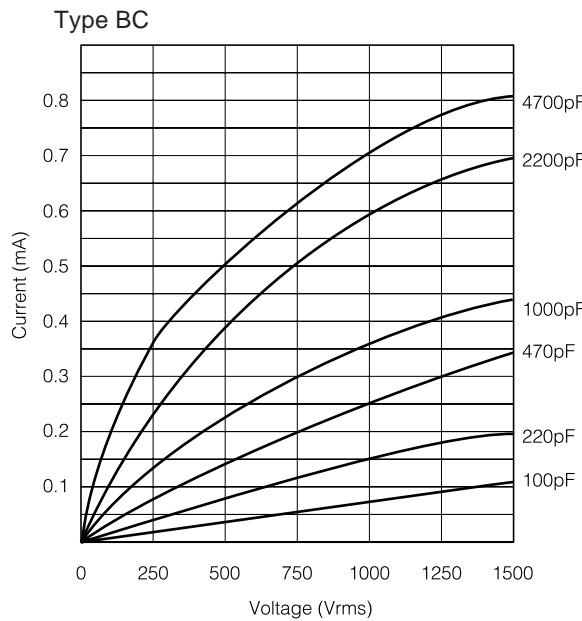
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● Impedance vs. Frequency Characteristics

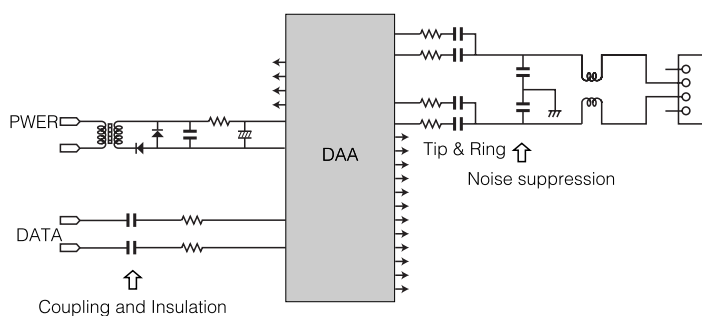


● Current vs. Voltage (Leakage Current Characteristics)



■ Application Examples

● MODEM



● Primary circuit of Switching Power Supply

