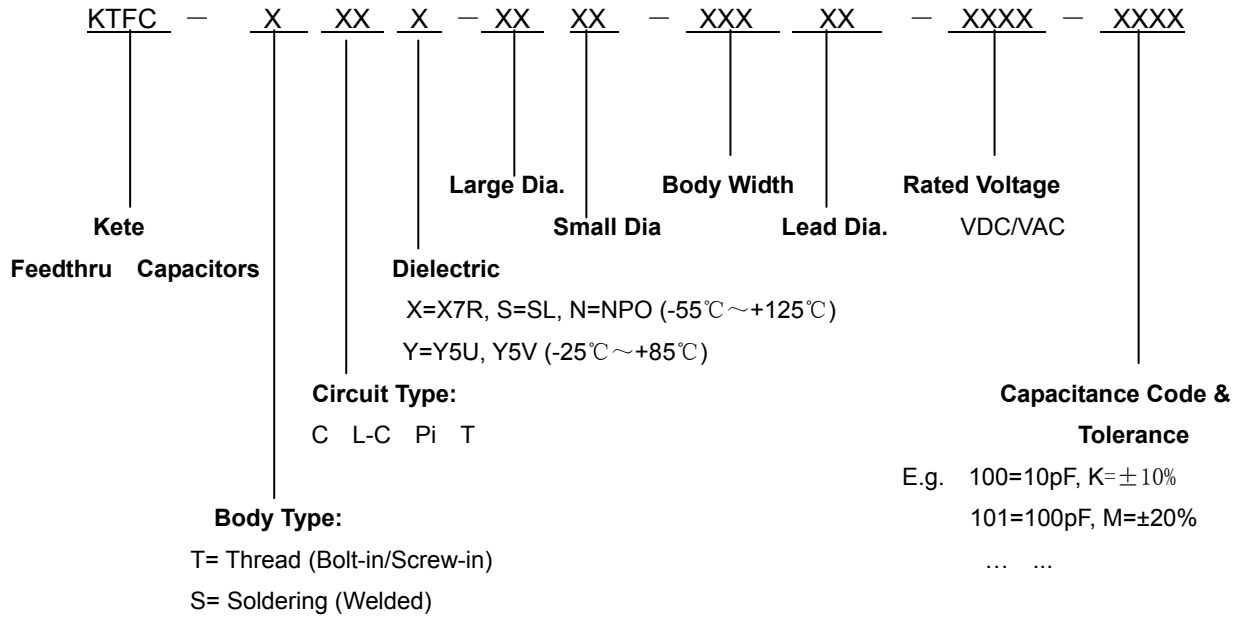
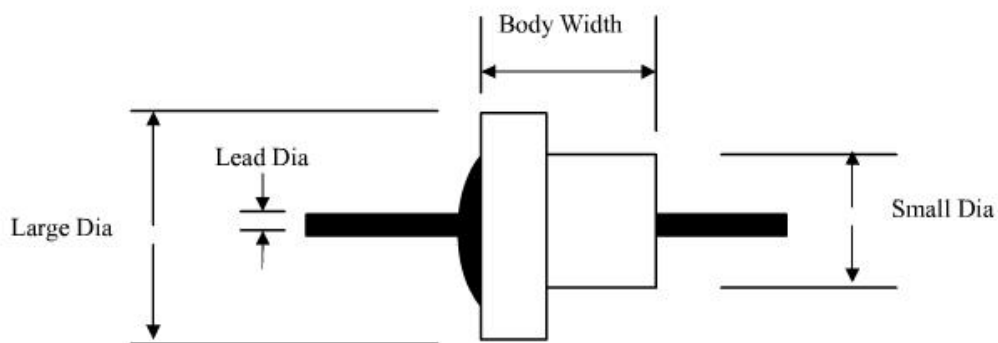


HOW TO ORDER:



Example: Thread C Circuit X7R 5040 8208 100DC 1000pF, +80%, -20%
would have the part number KTFC-TCX5040-8208- 100DC-102Z

Example :



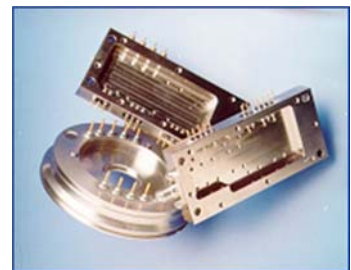
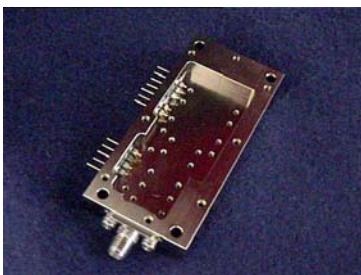
What's EMI/RFI Filters (Feedthrough Capacitors) and its application?

Electromagnetic Interference (EMI) filters, also known as Radio Frequency Interference (RFI) filters, basically are passive electronic devices that are used to suppress conducted interference that is found on a signal or power line. EMI is unacceptable electromagnetic emission, natural or man-made, which results in the degradation or malfunction of electronic or electrical equipment. RFI is detrimental electrical energy in the frequency range, which is for the specific transmitted radio frequency. Major sources of EMI and RFI include microprocessor, switching power supply, AC motor, and electrical power cord (which basically act as an antenna).

As mentioned previously, an EMI/RFI filter is a passive electronics device (comprised of multiple components) for suppressing conducted interference found on any signal or power line. An EMI/RFI filter will suppress the interference created by other equipment and the interference of the module or system itself, with the desired result being improvement to the immunity from EMI/RFI signals in the surrounding setting. EMI filters can be found both in plastic as well as metal housings, in stand alone, desktop or module configurations.

An EMI filter works by presenting a significantly higher resistance to higher frequency content. In other words, the low pass design of the EMI/RFI filter (the combination of shunting capacitors and series inductors) results in the restriction/impeding of the flow of high frequency signals, effectively shorting it to ground. The final result of the EMI filter is that it reduces and attenuates the unwanted signal strength, thereby having a minimal effect on other components or devices. EMI Filters are gauged by specifications including insertion loss, voltage rating and current rating. In addition, there are numerous approval authorities and specifications, including UL, CSA, VDE and military specification.

The feedthrough capacitors are widely used on the applications of telecommunications, lab equipment, radio control, military or space electronic modules, AM radio equipment and energy management systems etc.



Electrical Configuration:

A general overview of the various filter configurations as follows. You can choose the proper filter according to your application, key to achieving the best overall performance in your system.

C Filter

It's the most common circuit type of EMI Filter. It's a three terminal feedthrough capacitor, used to attenuate high frequency signals.

L-C Filter

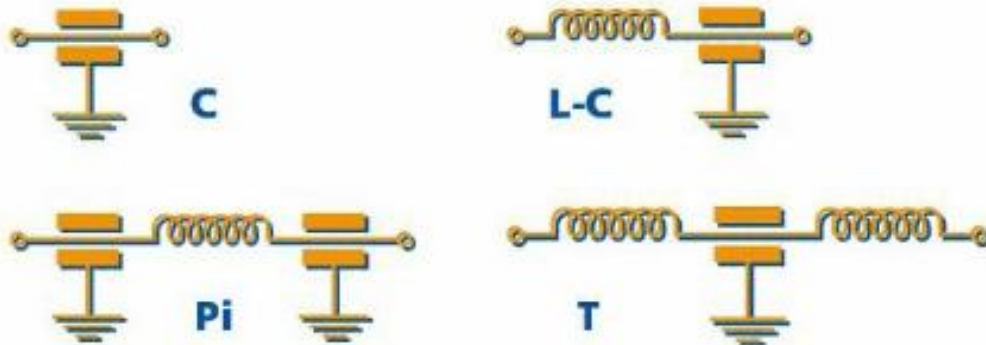
It consists of one inductive element and one capacitor. It is most commonly used in circuits with a low impedance source and high impedance load (or vice versa).

Pi Filter

It consists of two capacitors and one inductive element. This filter presents a low impedance to both the source and load in a circuit. It provides better high frequency attenuation than the "C" and "LC" filters.

T Filter

It consists of two inductive elements and one capacitor. This filter presents a high impedance to both the source and load of the circuit. It has similar filter performance to the "Pi" filter, and can be used in switching applications.



EMI Filter/Feedthrough Capacitor Installation Notes

Bolt-in EMI Filter (Feedthrough Capacitor):

All EMI Filters are supplied complete with mounting hardware if you request. Maximum recommend mounting torque must be applied to the nut only and observed as outlined in the table below. Exceeding recommended mounting torque may result in damage of the capacitor within the filter.

Avoid bending or flexing terminals at the same point of exit from the glass or epoxy seal to preserve the integrity of seal and /or ceramic capacitors.

M3	M4	M5	M6	M7
6kgf.cm	7kgf.com	8kgf.cm	9kgf.cm	10kgf.cm

Solder-in EMI Filter (Feedthrough Capacitor):

When soldering these devices in place, care should be taken to minimize thermal shock to the capacitors. DO NOT plunge the filters directly into a solder pot without preheating. If preheating the filter in a solder pot, DO NOT put filter directly into cleaning solution, without allowing it to cool down first.

A controlled temperature profile not exceed 3°C (6°F) per second is recommended when soldering filters. Although EMI/RFI Filters can withstand temperature extremes, rapid heat-up or cool-down can crack the internal ceramic capacitor. Preheating of the filter prior to soldering should be performed wherever possible at 250/330 °F (120/150°C).

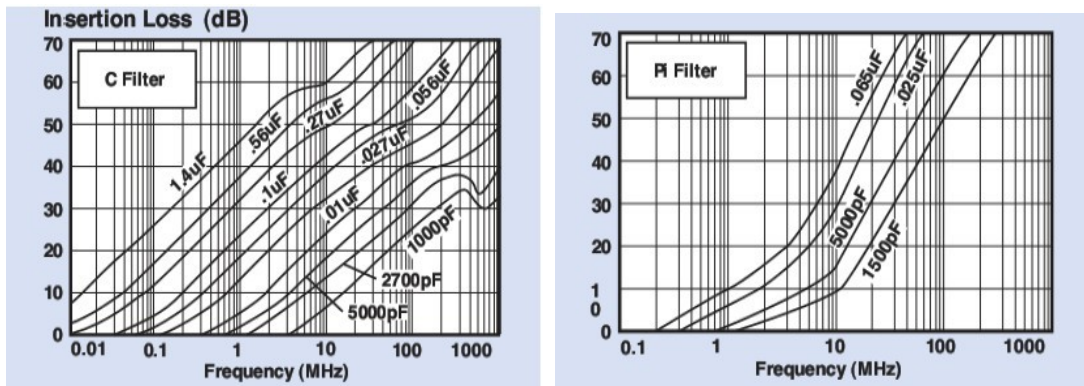
When soldering to terminal of the filter, a heat sink should be always be used properly to the capacitor body of the filter : 60-40 type solder is recommended for filter installation into chassis as well as soldering to terminals. When soldering to terminals using as iron, use a temperature controlled soldering iron (15-20Watts) with tip temperature of 550°F (300°C) maximum. The dwell on the solder iron joint should be less than 5 seconds.

If a filter style without an eyelet is being soldered into a chassis, iron processes should be avoided and the recommended solder alloy is 60-38-2.

Machine/oven soldering should be at 385-415°F(195-210°C) using a dwell and cycle time fast enough to reflow the solder and ramped to maintain less than 6 °F(3°C) per second of rise change.

When iron soldering to filter body, preheat component a 250-300°F(120-150°C), solder iron is recommended to be set at 500-550°F (260-290 °C). The dwell on the solder joint should be less than 5 seconds. The time is dependent on the heat sinking provided by the chassis, so a longer preheat maybe required.

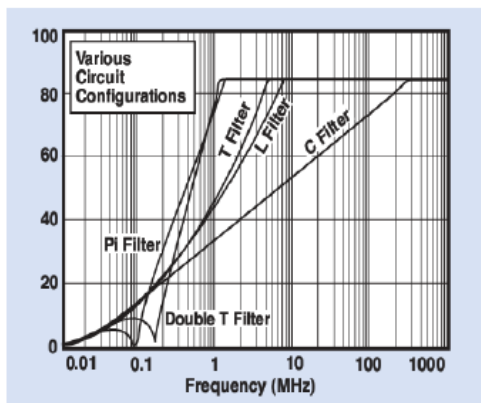
Insertion Loss Measurement:



Insertion Loss (IL) is a measure of the effectiveness of a filter : it is defined as the ratio of the voltage (E1) across the circuit load without the filter and the voltage (E2) across the load with the filter. Since insertion loss is dependent on the source and load impedance in which the filter is to be used, the measurement of IL are defined for a matched 50Ω system. The insertion loss is measure in decibels(dB) and defined as follows:

$$IL(dB) = 20 \log [E1/E2]$$

Circuit Impedance VS. Insertion Loss :



In practical circuit applications the source and load impedances may be quite different from 50Ω.If these impedance are known, our engineers can provide information on the expected insertion loss or an estimate can be made using the following formula: $IL(dB)=20 \log[1+ZsZ1/Zt(Zs+Z1)]$ Where

Zs= Source impedance in Ohms

Z1=Load impedance in Ohms

Zt=Transfer impedance in 50 Ohms system

Insertion Loss Table:

Circuit Type	Cap.	(Min.) No Load Insertion Loss(dB) @25 °C Per MIL-STD-220							
		0.01MHz	0.1MHz	1MHz	10MHz	100MHz	300MHz	1GHz	10GHz
C	10pF	-	-	-	-	-	3	6	20
	100 pF	-	-	-	-	3	10	20	28
	470 pF	-	-	-	3	15	18	35	40
	1000 pF	-	-	-	6	25	30	36	45
	2000 pF	-	-	-	8	26	32	44	51
	3300 pF	-	-	-	13	28	34	43	52
	4700 pF	-	-	5	15	30	38	47	52
	6800 pF	-	-	7	17	33	40	50	55
	0.01µF	-	-	10	21	35	45	52	60
	0.047µF	-	3	18	35	45	50	60	60
	0.1µF	-	5	20	40	70	70	60	60
	0.2µF	3	7	24	42	50	55	65	68
	0.47µF	5	15	32	40	80	80	70	68
	1µF	10	25	40	50	80	80	70	68
	1.5µF	16	25	33	44	60	80	70	68
Pi	100*2	-	-	-	-	7	18	29	32
	470*2	-	-	-	5	35	55	70	70
	1000*2	-	-	-	12	50	60	70	70
	3300*2	-	-	2	18	70	75	80	80
	6800*2	-	-	5	21	70	75	80	80
	0.1µF*2	-	10	25	65	90	90	90	80
	0.47µF *2	6	22	30	70	90	90	90	80
	1µF*2	15	30	50	70	90	90	90	80
	1.5µF*2	20	40	80	90	90	90	90	80
L-C and T	100 pF	-	-	-	-	9	19	27	34
	470 pF	-	-	-	2	21	28	38	45
	1000 pF	-	-	-	7	26	30	42	49
	2000 pF	-	-	-	12	27	34	44	50
	3300 pF	-	-	-	14	30	36	45	52
	4700 pF	-	-	3	15	30	38	45	55
	6800 pF	-	-	3	18	35	40	50	60
	0.1µF	-	10	25	65	90	90	90	80
	0.47µF	6	22	30	70	90	90	90	80
	1µF	15	30	50	70	90	90	90	80
	4.7µF	20	40	80	90	90	90	90	80

Note: The insertion loss values shown in this catalog are measured in accordance with MIL-STD-220 in a 50 Ω balance system. If your circuit is not a balance 50 Ω system, the insertion loss values you obtain will be different from those listed in this catalog.

Glossary of Commonly Used Terms

1. Capacitance:

Capacitance, expressed in "FARADS", is the capability of two or more parallel conductive plates to store electrical energy in an electrostatic field between them. Capacitance is dependent on the properties of the dielectric material and the geometry of the capacitor. (See table below)

2. Dissipation Factor (DF):

Dissipation Factor is defined as the ratio of energy dissipated to energy stored in a dielectric. It is frequency sensitive and must be specified at a specific frequency.

3. Dielectric Withstand Voltage(DWV):

The peak voltage that a component is designed to withstand, without damage for short periods of time.

4. Insertion Loss (IL):

The loss in load power due to the insertion of a component or device at some point in a transmission system.

5. Insulation Resistance (I.R.):

I.R. is the DC resistance between the terminal and ground of the a capacitor. It is generally measured at the rated voltage of the capacitor, and must be specified in terms of voltage, temperature, time and relative humidity.

6. Hermetic:

Permanently sealed by glass fusion, soldering, or other means, to prevent the transmission of air, moisture vapor, or other gases.

pF (pico Farads)	nF (nano Farads)	μF(Micro Farads)
1	0.001	0.000001
1,000	1.0	0.001
10,000	10.0	0.01
100,000	100.0	0.1
1,000,000	1000.0	1.0
Example: 10,000pF =10.0nF =0.01μF		

Soldering Mount (Welded) Series EMI Filter

Example:

Part Number: KTFC-SCX3822-5008-100VDC-102Z

Product Specifications:

Capacitance: 1000pF

Tolerance: Z (-20%, +80%)

Rated Voltage: 100VDC

Rated Current: 7A

Insulation Resistance: $\geq 3000M\Omega$ @100VDC

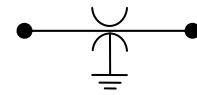
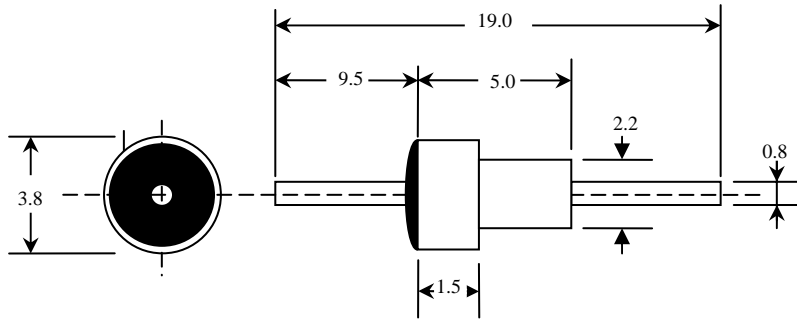
Dissipation Factor: $< 3\%$

Dielectric: X7R

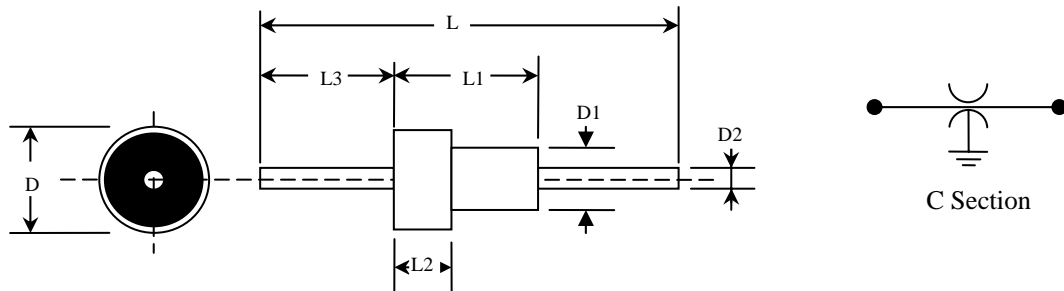
Dielectric Withstand Voltage (DWV): 200VDC (One minute no short circuit, no failure.)

Operating Temp: $-55^{\circ}C \sim +125^{\circ}C$

Soldering Temp: $\leq 300^{\circ}C$ (3 Sec)



Soldering Mount (Welded) Series Standard EMI Filter



General Specifications:

Capacitance Range: 10pF-3000pF

Tolerance: Z (-20%, +80%), other tolerances available

Rated Voltage: 50VDC-400VDC

Rated Current: 7A -10A

Soldering Temp.: $\leq 300^{\circ}\text{C}$ (3 Sec)

Dielectric & Operating Temp.: X7R(-55 $^{\circ}\text{C}$ ~+125 $^{\circ}\text{C}$), NPO(-55 $^{\circ}\text{C}$ ~+125 $^{\circ}\text{C}$), SL(-55 $^{\circ}\text{C}$ ~+125 $^{\circ}\text{C}$), Y5P(-25 $^{\circ}\text{C}$ ~+85 $^{\circ}\text{C}$),

Y5V(-25 $^{\circ}\text{C}$ ~+85 $^{\circ}\text{C}$), Y5U(-25 $^{\circ}\text{C}$ ~+85 $^{\circ}\text{C}$)

Kete Part Number	Dielectric Code	Dimension (mm)							Cap (pF)	Tol.	WVDC	DC (A)
		D	D1	L1	D2	L	L2	L3				
KTFC-SCX1915-3508-100VDC-102Z	X7R	1.9	1.5	3.5	0.8	8.7	1.0	3	1000	Z	100	7
KTFC-SCX1915-3508-100VDC-102Z	X7R	1.9	1.5	3.5	0.8	22	1.0	10	1000	Z	100	7
KTFC-SCX1915-3508-100VDC-102P	X7R	1.9	1.5	3.5	0.8	28.3	1.0	10	1000	P	100	7
KTFC-SCN1915-3507-100VDC-100Z	NPO	1.9	1.5	3.5	0.7	24	1.0	20	10	Z	100	7
KTFC-SCX2416-4508-50VDC-102Z	X7R	2.4	1.6	4.5	0.8	30.3	1.5	9	1000	Z	50	7
KTFC-SCX2416-4508-100VDC-152Z	X7R	2.4	1.6	4.5	0.8	30.3	1.5	9	1500	Z	100	7
KTFC-SCS2416-4508-100VDC-101M	SL	2.4	1.6	4.5	0.8	30.3	1.5	9	100	M	100	7
KTFC-SCY2416-4508-100VDC-561Z	Y5P	2.4	1.6	4.5	0.8	30.3	1.5	9	560	Z	100	7
KTFC-SCY2416-4508-100VDC-222Z	Y5U	2.4	1.6	4.5	0.8	30.3	1.5	9	2200	Z	100	7
KTFC-SCY2416-4508-100VDC-332Z	Y5V	2.4	1.6	4.5	0.8	30.3	1.5	9	3300	Z	50	7
KTFC-SCN2416-4508-50VDC-150Z	NPO	2.4	1.6	4.5	0.8	30.3	1.5	9	15	Z	50	7
KTFC-SCX2618-4008-100VDC-102Z	X7R	2.6	1.8	4.0	0.8	30.3	1.0	9.5	1000	Z	100	7
KTFC-SCX2618-4008-100VDC-102Z	X7R	2.6	1.8	4.0	0.8	22	1.0	10	1000	Z	100	7
KTFC-SCY2618-4008-100VDC-471Z	Y5P	2.6	1.8	4.0	0.8	6	1.0	1	470	Z	100	7
KTFC-SCY2618-4008-100VDC-471Z	Y5P	2.6	1.8	4.0	0.8	30.3	1.0	9.5	470	Z	100	7
KTFC-SCY2618-4008-100VDC-222Z	Y5U	2.6	1.8	4.0	0.8	22	1.0	10	2200	Z	100	7
KTFC-SCY2618-4008-100VDC-332Z	Y5U	2.6	1.8	4.0	0.8	22	1.0	10	3300	Z	100	7
KTFC-SCN2618-4008-100VDC-100Z	NPO	2.6	1.8	4.0	0.8	22	1.0	10	10	Z	100	7
KTFC-SCS2618-4008-50VDC-800Z	SL	2.6	1.8	4.0	0.8	30.3	1.0	9.5	80	Z	50	7
KTFC-SCS2618-4008-100VDC-470P	SL	2.6	1.8	4.0	0.8	30.3	1.0	9.5	47	P	100	7
KTFC-SCX3822-5008-100VDC-102Z	X7R	3.8	2.2	5.0	0.8	19	1.5	9.5	1000	Z	100	7
KTFC-SCX3822-5008-100VDC-102Z	X7R	3.8	2.2	5.0	0.8	22	1.5	9.5	1000	Z	100	7

Kete Part Number	Dielectric	Dimension (mm)							Cap (pF)	Tol.	WVDC	DC (A)
		D	D1	L1	D2	L	L2	L3				
KTFC-SCX3822-5008-100VDC-102Z	X7R	3.8	2.2	5.0	0.8	30.3	1.5	9.5	1000	Z	100	7
KTFC-SCX3822-5008-100VDC-102Z	X7R	3.8	2.2	5.0	0.8	57	1.5	9.5	1000	Z	100	7
KTFC-SCS3822-5008-100VDC-800Z	SL	3.8	2.2	5.0	0.8	19	1.5	9.5	80	Z	100	7
KTFC-SCY3822-5008-100VDC-471Z	Y5P	3.8	2.2	5.0	0.8	19	1.5	9.5	470	Z	100	7
KTFC-SCY3822-5008-50VDC-202Z	Y5U	3.8	2.2	5.0	0.8	30.3	1.5	9.5	2000	Z	50	7
KTFC-SCY3822-5008-100VDC-332Z	Y5V	3.8	2.2	5.0	0.8	19	1.5	9.5	3300	Z	100	7
KTFC-SCN3822-5008-100VDC-100Z	NPO	3.8	2.2	5.0	0.8	19	1.5	9.5	10	Z	100	7
KTFC-SCX4224-3510-100VDC-102Z	X7R	4.2	2.4	3.5	1.0	28.3	1.0	13	1000	Z	100	10
KTFC-SCS4224-3510-100VDC-101Z	SL	4.2	2.4	3.5	1.0	28.3	1.0	13	100	Z	100	10
KTFC-SCY4224-3510-100VDC-471Z	Y5P	4.2	2.4	3.5	1.0	28.3	1.0	13	470	Z	100	10
KTFC-SCY4224-3510-100VDC-222Z	Y5U	4.2	2.4	3.5	1.0	28.3	1.0	13	2200	Z	100	10
KTFC-SCY4224-3510-100VDC-332Z	Y5V	4.2	2.4	3.5	1.0	28.3	1.0	13	3300	Z	100	10
KTFC-SCN4224-3510-100VDC-100Z	NPO	4.2	2.4	3.5	1.0	28.3	1.0	13	10	Z	100	10
KTFC-SCX4330-2710-100VDC-102Z	X7R	4.3	3.0	2.7	1.0	28.3	1.2	13	1000	Z	100	10
KTFC-SCX4532-6007-400VDC-102Z	X7R	4.5	3.2	6.0	0.7	24	2.5	10	1000	Z	400	6
KTFC-SCX4532-6007-100VDC-102Z	X7R	4.5	3.2	6.0	0.7	24	2.5	10	1000	Z	100	6
KTFC-SCX4532-6007-100VAC-102Z	X7R	4.5	3.2	6.0	0.7	24	2.5	10	1000	Z	100	6
KTFC-SCX4532-6010-100VAC-102Z	X7R	4.5	3.2	6.0	1.0	28.3	2.1	12	1000	Z	100	10
KTFC-SCX4532-6010-220VAC-102Z	X7R	4.5	3.2	6.0	1.0	28.3	2.1	12	1000	Z	220	10
KTFC-SCX4722-3208-100VDC-102Z	X7R	4.7	2.2	3.2	0.8	22	1.0	12	1000	Z	100	7
KTFC-SCY4722-3208-100VDC-332Z	Y5V	4.7	2.2	3.2	0.8	22	1.0	12	3300	Z	100	7
KTFC-SCY4722-4010-100VDC-222Z	Y5V	4.7	2.2	4.0	1.0	28.3	1.5	13	2200	Z	100	10
KTFC-SCY4737-6515-100VAC-102Z	X7R	4.7	3.7	6.5	1.5	35	2.5	12	1000	Z	100	20
KTFC-SCX5122-5008-50VDC-202Z	X7R	5.1	2.2	5.0	0.8	28.3	1.5	12.5	2000	Z	50	7
KTFC-SCX5122-5010-50VDC-202Z	X7R	5.1	2.2	5.0	1.0	28.3	1.5	12.5	2000	Z	50	10
KTFC-SCX5122-6508-200VDC-332Z	X7R	5.1	2.2	6.5	0.8	28.3	2.5	11.5	3300	Z	200	7
KTFC-SCX5124-6010-100VDC-332Z	X7R	5.1	2.4	6.0	1.0	28.3	1.5	12.5	3300	Z	100	10

Note: 1) Epoxy seal on both ends. 2) AC are available according to request. 3) Material and Finish: Copper body, copper leads, nickel plating standard.

Variations are available. 4) We can design and manufacture according to customer's request.



Example for Datasheet

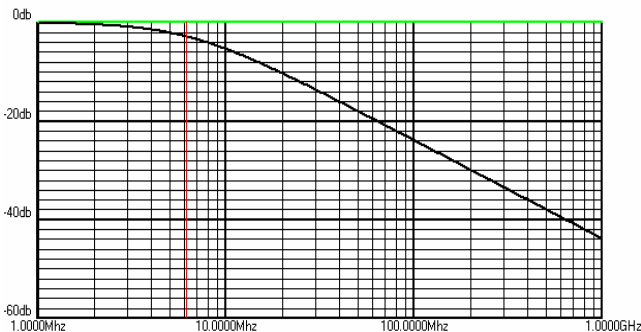
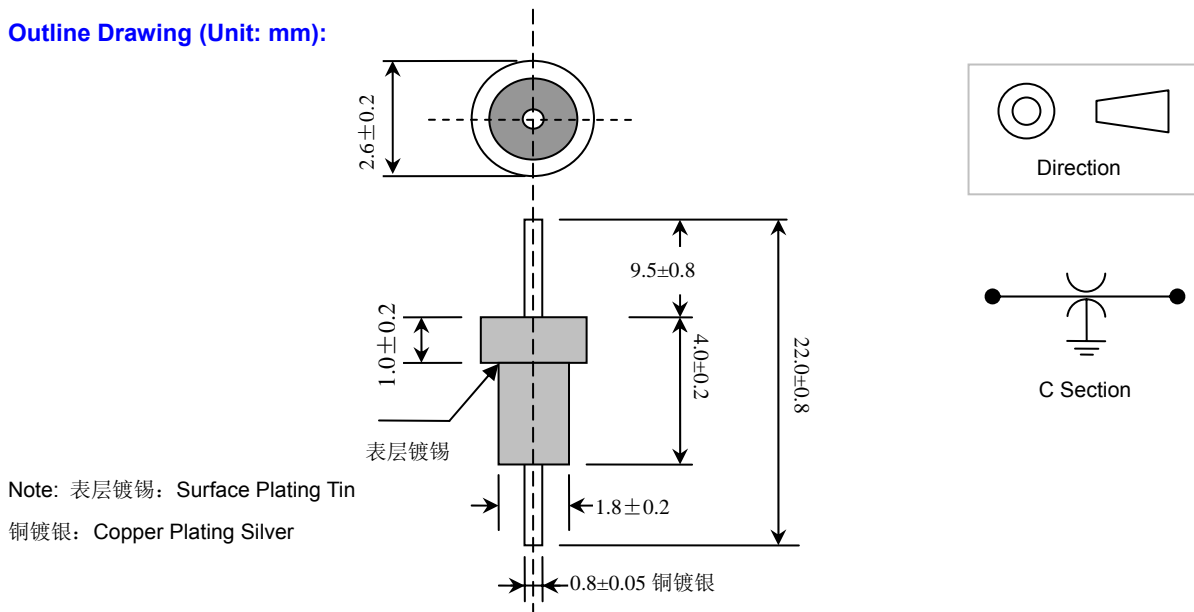
Solder-in Feed-thru Capacitor

Part Number: KTFC-SCX2618-4008-100VDC-102Z

Product Specifications:

Capacitance: 1000pF	Tolerance: Z (-20%, +80%)
Rated Voltage: 100VDC	Rated Current: 7A
Insulation Resistance: $\geq 3000M\Omega$ @100VDC	
Dissipation Factor: $< 3\%$	Dielectric: X7R
Dielectric Withstand Voltage (DWV): 300VDC (One minute no short circuit, no failure.)	
Operating Temp: $-55^{\circ}C \sim +125^{\circ}C$	Soldering Temp: $\leq 300^{\circ}C$ (3 Sec)

Outline Drawing (Unit: mm):



Caution:

1. The welding use the electric iron by constant temperature. Don't use furnace welding and solder dip methods.
2. Please don't hit the capacitor body with hard object or install capacitor by excessive way.
3. If you long place capacitors above 125 degrees higher than the environment could cause damage the capacitor.

Solder-in Feed-thru Capacitor

Part Number: **KTFC-SCX2416-4508-50VDC-102Z**

Electronical Specifications:

Capacitance: 1000pF

Tolerance: Z (-20%, +80%)

Rated Voltage: 50VDC

Rated Current: 7A

Insulation Resistance: $\geq 3000\text{M}\Omega$ @100VDC

Dissipation Factor: $< 3\%$

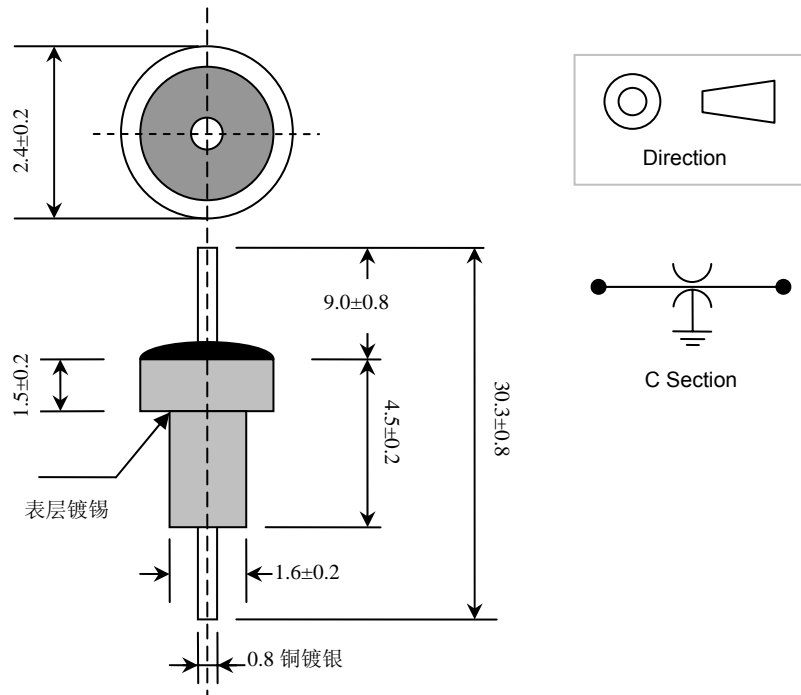
Dielectric: X7R

Dielectric Withstand Voltage (DWV): 150VDC (One minute no short circuit, no failure.)

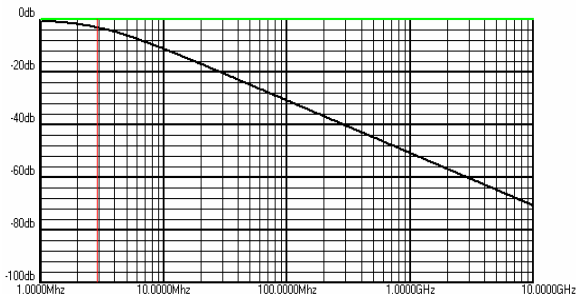
Operating Temp: -55°C + 125°C

Soldering Temp: $\leq 300^{\circ}\text{C}$ (3 Sec)

Outline Drawing (Unit: mm):



Note: 表层镀锡: Surface Plating Tin
铜镀银: Copper Plating Silver



Caution:

1. The welding use the electric iron by constant temperature. Don't use furnace welding and solder dip methods.
2. Please don't hit the capacitor body with hard object or install capacitor by excessive way.
3. If you long place capacitors above 125 degrees higher than the environment could cause damage the capacitor.