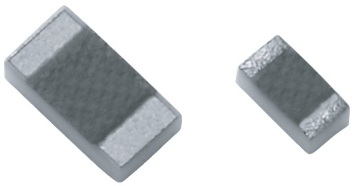
High Frequency (up to 20 GHz) Resistor, Thin Film Surface Mount Chip



FC series chip resistors are designed with low internal reactance. They function as almost pure resistors on a very high range of frequencies. The specialized laser edge trimming allows for precision tolerances to 0.1 %.

FEATURES

- Small standard size 0402 case size
- Edge trimmed block resistors
- Alumina substrate high purity (99.6 %)
- Ohmic range (10 Ω to 1000 Ω)
- Small internal reactance (< 10 mΩ)
- Low TCR (down to ± 25 ppm/°C)
- Epoxy bondable termination available
- Compliant to RoHS Directive 2002/95/EC

Pb-free Available
RoHS* COMPLIANT
GREEN (5-2008)** Available

APPLICATIONS

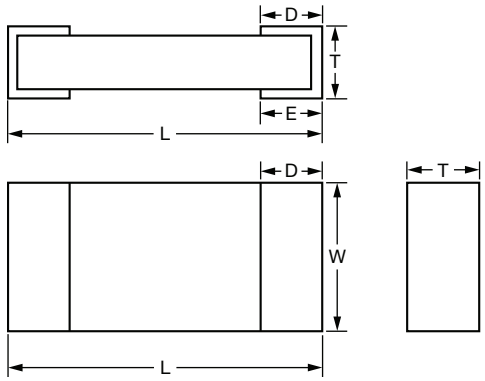
- Low noise amplifiers
- Attenuation
- Line termination

STANDARD ELECTRICAL SPECIFICATIONS		
TEST	**SPECIFICATIONS**	**CONDITIONS**
Material	Passivated nichrome	-
Resistance Range	10 Ω to 1000 Ω	Case size dependent
TCR: Absolute	± 25 ppm/°C (standard) (≥ 50 Ω) to ± 100 ppm/°C	- 55 °C to + 125 °C
Tolerance: Absolute	± 0.1 % to ± 5.0 %	+ 25 °C
Stability: Absolute	Δ*R* ± 0.02 %	2000 h at 70 °C
Stability: Ratio	-	-
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	30 V to 75 V	-
Operating Temperature Range	- 55 °C to + 125 °C	-
Storage Temperature Range	- 55 °C to + 150 °C	-
Noise	< - 35 dB	-
Shelf Life Stability: Absolute	Δ*R* ± 0.01 %	1 year at + 25 °C

COMPONENT RATINGS			
CASE SIZE	**POWER RATING (mW)**	**WORKING VOLTAGE (V)**	**RESISTANCE RANGE (Ω)**
0402	50	30	16 to 1000
0505	125	37	20 to 1000
0603	125	50	10 to 1000
0805	200	50	10 to 1000
1005	250	75	10 to 1000
1206	330	75	10 to 1000

* Pb containing terminations are not RoHS compliant, exemptions may apply
** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

DIMENSIONS in inches (millimeters)



CASE SIZE	LENGTH	WIDTH W (± 0.005)	THICKNESS TYPICAL	TOP PAD D (± 0.005)	BOTTOM PAD E (± 0.005)
0402	0.042 ± 0.008 (1.067 ± 0.203)	0.022 (0.559)	0.015 (0.381)	0.010 (0.254)	0.010 (0.254)
0505	0.055 ± 0.006 (1.397 ± 0.152)	0.050 (1.270)	0.015 (0.381)	0.010 (0.254)	0.015 (0.381)
0603	0.064 ± 0.006 (1.626 ± 0.152)	0.032 (0.813)	0.015 (0.381)	0.012 (0.305)	0.015 (0.381)
0805	0.080 ± 0.006 (2.032 ± 0.152)	0.050 (1.270)	0.015 (0.381)	0.016 ± 0.008 (0.406 ± 0.203)	0.015 (0.381)
1005	0.105 ± 0.008 (2.667 ± 0.203)	0.050 (1.270)	0.015 (0.381)	0.015 (0.381)	0.015 (0.381)
1206	0.126 ± 0.008 (3.200 ± 0.203)	0.063 (1.600)	0.015 (0.381)	0.020 + 0.005/- 0.010 (0.508 + 0.127/- 0.254)	

MECHANICAL SPECIFICATIONS

Resistive Element	Passivated nichrome
Substrate Material	Alumina
Terminations	Pre-soldered or gold
Lead (Pb)-free Option	96.5 % Sn, 3.0 % Ag, 0.5 % Cu
Tin/Lead Option	Sn63
Lead (Pb)-free Finish and Tin/Lead	Hot solder dip

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: FC1206E1001BBTS

F	C	1	2	0	6	E	1	0	0	1	B		B		T	S
F	C	1	2	0	6	K	1	0	0	0	B	T	B	S	T	S

GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION (1, 2 or 3 digits)	PACKAGING
FC	**0402** **0505** **0603** **0805** **1005** **1206**	**E** = 25 ppm/°C **H** = 50 ppm/°C **K** = 100 ppm/°C	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point. Example: 10R0 = 10 Ω 1000 = 100 Ω 1001 = 1 kΩ	**B** = 0.1 % **D** = 0.5 % **F** = 1 % **G** = 2 % **J** = 5 %	**T** = Top sided Au (gold) term Au over Ni epoxy bondable RoHS compliant - e4 **B** = Wraparound Sn/Pb solder 63 % Sn/37 % Pb w/nickel barrier **G** = Wraparound Au over Ni (gold) termination epoxy bondable RoHS compliant - e4 **TB** = Top sided Sn/Pb solder 63 % Sn/37 % Pb w/nickel barrier **TBS** = Top sided lead (Pb)-free solder w/nickel barrier RoHS compliant - e1 **S** = Wraparound lead (Pb)-free solder 96.5 % Sn/3.0 % Ag/0.5 %Cu RoHS compliant - e1	**BS** = BULK 100 min., 1 mult **WS** = WAFFLE 100 min., 1 mult TAPE AND REEL **T0** = 100 min., 100 mult **T1** = 1000 min., 1000 mult (1) **T3** = 300 min., 300 mult **T5** = 500 min., 500 mult **TF** = Full reel **TS** = 100 min., 1 mult

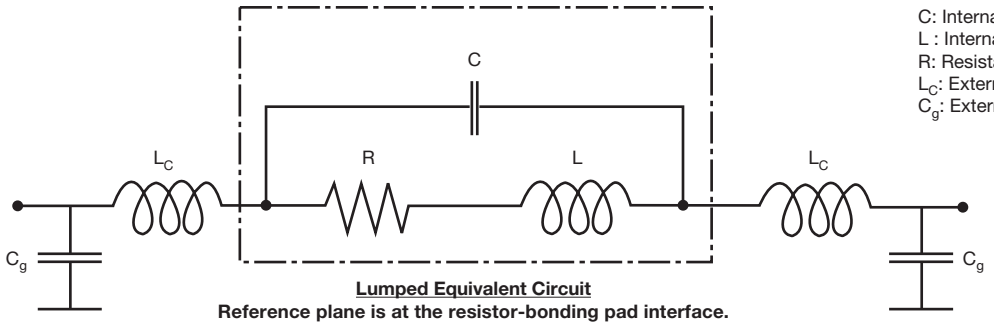
Historical Part Number example: FC1206E1001BBT (for reference purposes only)

FC	1206	E	1001	B	B	T
SERIES	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION	PACKAGING

Note

(1) Preferred packaging code

TYPICAL HIGH FREQUENCY PERFORMANCE ELECTRICAL MODEL AND TESTING

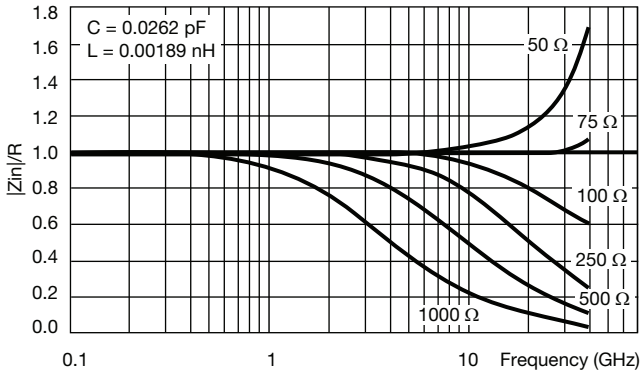


Lumped Equivalent Circuit
Reference plane is at the resistor-bonding pad interface.

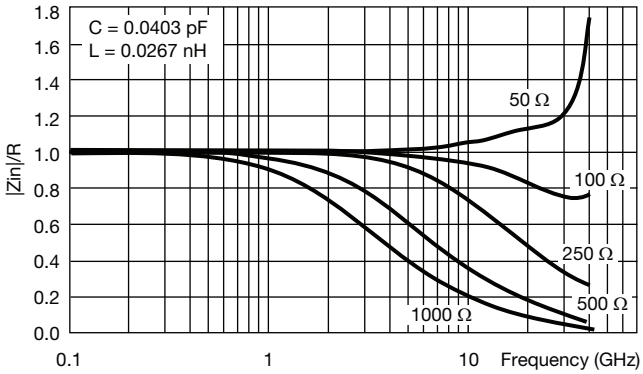
The lumped circuit above was used to model the data at the bonding pad-resistor reference plane. High frequency testing was performed by Modelithics, Inc. on parts mounted to quartz test boards. Quartz test boards were chosen to minimize the contribution of the board effects at high frequencies. Future testing will be performed on various industry standard board types. Vishay in partnership with Modelithics, Inc. will develop substrate scalable models for the FC series resistors. These models will be available for industry standard design software packages and will allow the designer to accurately model their wireless and microwave printed boards.

INTERNAL IMPEDANCE

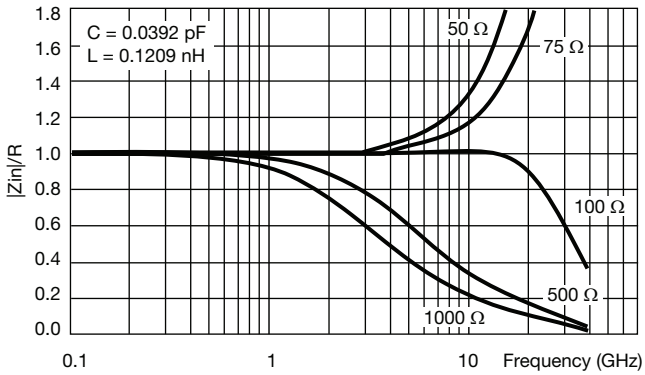
0402 Flip chip



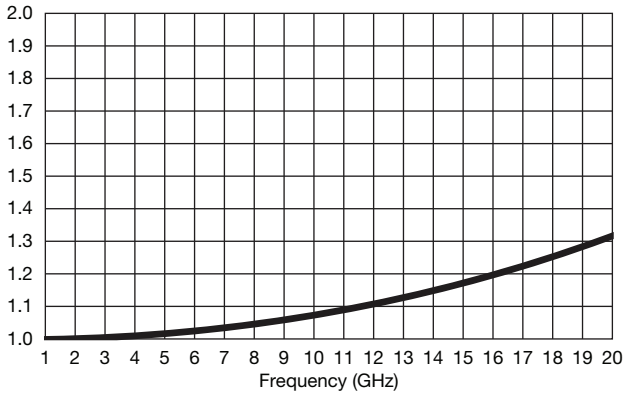
0603 Flip chip



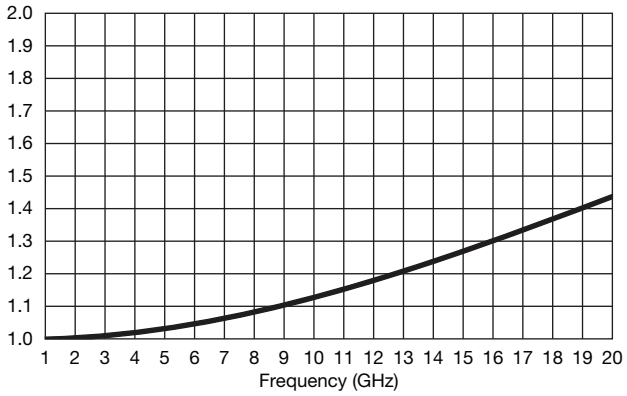
0402 Wraparound



VSWR FC Series 0402 size 50 Ω



VSWR FC Series 0402 size 100 Ω



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