

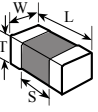
## Broadband Ceramic Capacitors

### Product Features

Series	Typical operating frequency range	Insertion Loss	Plated Material	Packaging Type
(.010" × .005")01005BB104MW4R0	16KHz(-3dB) to >67GHz	<1dB,typical		40K pcs/reel, lower quantities in cut tape
(.020" × .010")0201BB104KW160	16KHz(-3dB) to >40GHz	<1dB,typical	Au/Sn (RoHS)	15K pcs/reel, lower quantities in cut tape
(.020" × .010")0201BB103KW250	16KHz(-3dB) to >32GHz	<1dB,typical		
(.040" × .020")0402BB103KW500	16KHz(-3dB) to 40GHz	<1dB,typical	Au/Sn (RoHS)	10K pcs/reel, lower quantities in cut tape
(.040" × .020")0402BB104KW500	16KHz(-3dB) to 50GHz	<1.2dB,typical		
(.080" × .050")0805BB103KW101	16KHz(-3dB) to 3GHz	<0.25dB,typical	Ni/Sn(RoHS)	

### Mechanical Dimensions

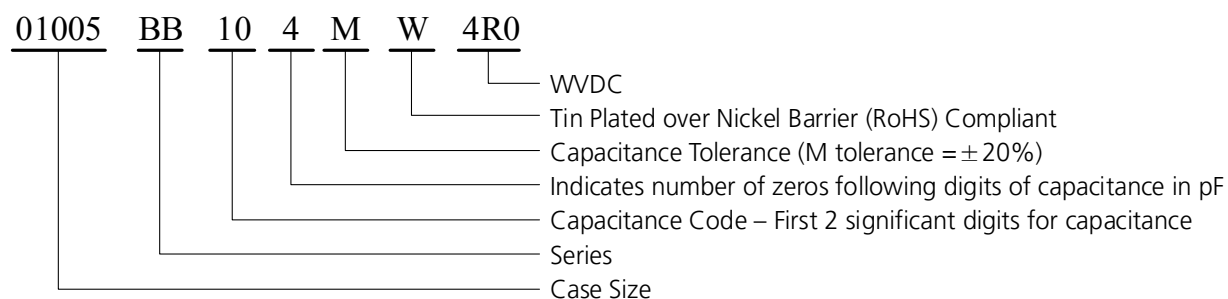
unit:inch(millimeter)

Outlines	Code	Capacitor Dimensions			
		Length (L)	Width (W)	Thick. (T)	(S)
	01005	.016 ± .001 (0.40 ± 0.03)	.008 ± .001 (0.20 ± 0.03)	.008 ± .001 (0.20 ± 0.03)	.005(0.13)min
	0201	.023 ± .001 (0.58 ± 0.03)	.012 ± .001 (0.30 ± 0.03)	.0118(0.30)max	.0078(0.20)min
	0402	.040 ± .004 (1.016 ± 0.102)	.020 ± .004 (0.508 ± 0.102)	.024(0.61)max	.016(0.406)min
	0805	.080 ± .006 (2.03 ± 0.15)	.050 ± .006 (1.27 ± 0.15)	.040(1.02)max	.044(1.12)min

### Electrical Specifications

Item	Series					
Rated Voltage	01005BB104 MW4R0	0201BB104 KW160	0201BB103 KW250	0402BB103 KW500	0402BB104 KW500	0805BB103 KW101
	4WVDC	16WVDC	25WVDC	50WVDC	50WVDC	100WVDC
Capacitance	100nF	100nF	10nF	10nF	100nF	10nF
Operating Temperature Range.	-55°C to +85°C      -55°C to +125°C					
Insulation Resistance (IR)	10 <sup>11</sup> Ω min. @ +25°C @ rated WVDC					
Dielectric Withstanding Voltage (DWV)	250% of rated voltage for 5 seconds.					
Temperature Coefficient (TC)	± 15%					

### Part Numbering



### Introduction

There are a number of circuits that require coupling RF signals or bypassing them to ground while blocking DC over extraordinarily large RF bandwidths. The applications for which they are intended typically require small, surface-mountable (SMT) units with low insertion losses, reflections, and impedances across RF frequencies extending from the tens of KHz to the tens of GHz. and temperatures typically ranging from -55 to +85°C. This note focuses on a particular implementation of these devices -- multilayer ceramic capacitors (MLCCs)- and how to obtain the best performance when they're used on various substrates.

Broadband capacitors are used in the "signal integrity" market -- optoelectronics/high-speed data; ROSA/TOSA (Transmit/Receive optical subassemblies); SONET (Synchronous Optical Networks); broadband test equipment - as well as in broadband microwave and millimeter wave amplifiers (MMICs, GaN transistors) and oscillators. The basic requirement in the former is to produce an output waveform that closely replicates an input waveform, typically a train of digital pulses, as shown in Fig.1.

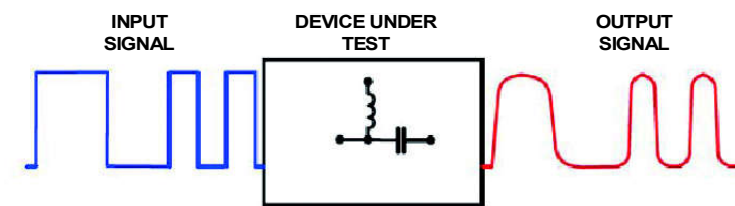
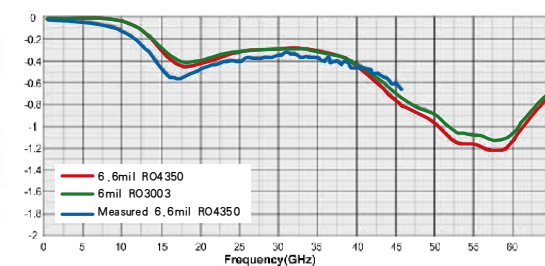


Fig.1"Signal Integrity"- output replication of input

While RF and microwave devices are typically measured in the frequency domain, digital systems are usually characterized in the time domain, and so it is necessary to make a connection between the two (Fig.2).

#### FREQUENCY DOMAIN

- Insertion loss
- Reflection



#### TIME DOMAIN

- Rise and fall times
- Eye opening
- Jitter

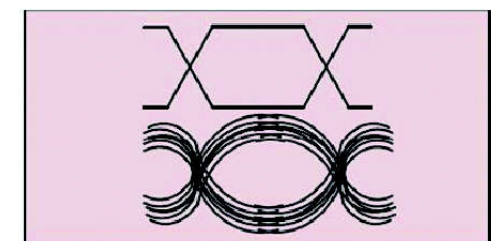


Fig.2 Frequency domain and time domain parameters

