

## Overview

KEMET Z-PWZ Power Line High Impedance Ferrite Chip Beads are ideal for use in circuit designs that require high impedances and large currents to suppress radiated noise on power lines.

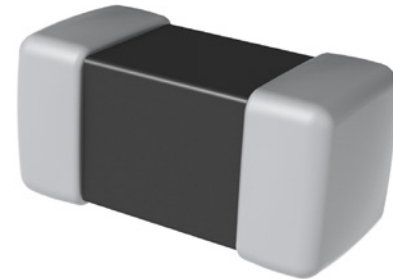
The chip size of this ferrite beads provide waveform correction of digital signals and high frequency noise suppression in various types of digital mobile equipments that require low power consumption.

## Applications

- PC, tablet, peripherals
- Differential transmission line on USB
- Optical storage, HDD
- RF circuits
- Digital still camera
- Network security
- Switching regulators

## Benefits

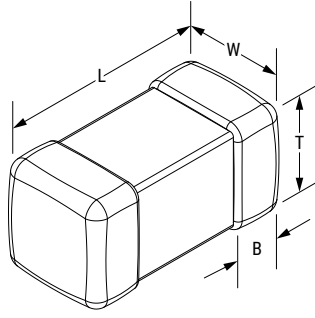
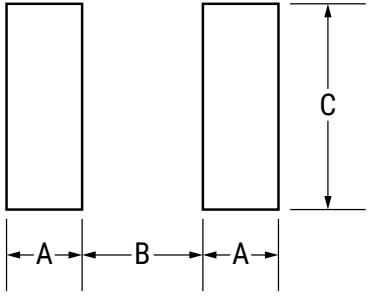
- High impedance
- Large withstand current
- High reliability and resistance to high energy
- Low stray capacitance due to wire wound structure
- Two materials available to choose from
- Impedance value from 32 – 2,000  $\Omega$
- Rated current range from 0.5 – 4 A
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$



## Part Number System

Z	0603	C	101	B	PWZ	T
Ferrite Bead	EIA Case Size (L" x W")	Specification	Impedance Value ( $\Omega$ ) at 100 MHz	Material	Series	Packaging
	0603 (1608 in mm) 0805 (2012 in mm) 0806 (2016 in mm) 1206 (3216 in mm) 1210 (3225 in mm) 1806 (4516 in mm) 1810 (4525 in mm) 1812 (4532 in mm)	C = Commercial	The first two digits represent the impedance value. The third digit indicates the number of zeros to be added.  Examples: 800 = 80 $\Omega$ 101 = 100 $\Omega$ 202 = 2000 $\Omega$	B = MHz range applications G = GHz range applications	PWZ = Power Line High Impedance Ferrite Chip Beads	T = Tape & Reel

## Dimensions – Millimeters (Inches)

Dimensions - Millimeters (Inches)						Land Pattern - Millimeters		
								
EIA Size Code	Metric Size Code	L Length	W Width	T Thickness	B Bandwidth	A	B	C
0603	1608	1.60 (0.063) ±0.1 (0.004)	0.80 (0.031) ±0.1 (0.004)	0.80 (0.031) ±0.1 (0.004)	0.30 (0.012) ±0.15 (0.006)	1.0	1.0	1.0
0805	2012	2.00 (0.079) ±0.20 (0.008)	1.25 (0.049) ±0.20 (0.008)	0.85 (0.033) ±0.2 (0.008)	0.50 (0.020) ±0.30 (0.012)	1.4	1.2	1.65
0806	2016	2.00 (0.079) ±0.20 (0.008)	1.60 (0.063) ±0.20 (0.008)	1.60 (0.063) ±0.20 (0.008)	0.50 (0.020) ±0.30 (0.012)	1.4	1.2	2.0
1206	3216	3.20 (0.126) ±0.30 (0.012)	1.60 (0.063) ±0.20 (0.008)	1.60 (0.063) ±0.20 (0.008)	0.50 (0.020) ±0.30 (0.012)	1.4	2.2	2.0
1210	3225	3.20 (0.126) ±0.30 (0.012)	2.50 (0.098) ±0.30 (0.012)	2.50 (0.098) ±0.30 (0.012)	0.50 (0.020) ±0.30 (0.012)	1.4	2.2	2.9
1806	4516	4.50 (0.177) ±0.30 (0.012)	1.60 (0.063) ±0.20 (0.008)	1.60 (0.063) ±0.20 (0.008)	0.50 (0.020) ±0.30 (0.012)	1.75	3.5	2.0
1810	4525	4.50 (0.177) ±0.40 (0.016)	2.50 (0.098) ±0.30 (0.012)	2.50 (0.098) ±0.30 (0.012)	0.90 (0.035) ±0.60 (0.024)	1.75	3.5	2.9
1812	4532	4.50 (0.177) ±0.40 (0.016)	3.20 (0.126) ±0.30 (0.012)	3.20 (0.126) ±0.30 (0.012)	0.90 (0.035) ±0.60 (0.024)	1.75	3.5	3.7

## Performance Characteristics

Item	Performance Characteristics
Impedance Range at 100 MHz	30 – 2,000 $\Omega$
Impedance Tolerance at 100 MHz	$\pm 25\%$ and $\pm 30\%$
Impedance Range at 1 GHz	75 – 1,800 $\Omega$
Impedance Tolerance at 1 GHz	$\pm 40\%$
Rated Current Range	0.5 – 4 A maximum
Rated DC Resistance Range	0.02 – 0.45 $\Omega$ maximum
Operating Temperature Range	-40°C to +125°C (includes self temperature rise)

## Environmental Compliance

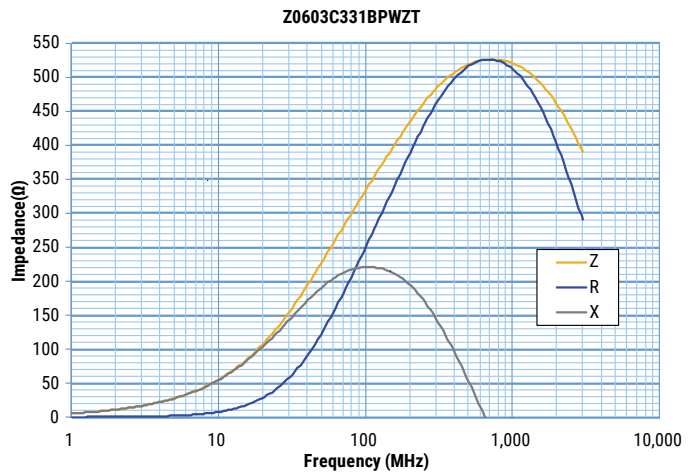
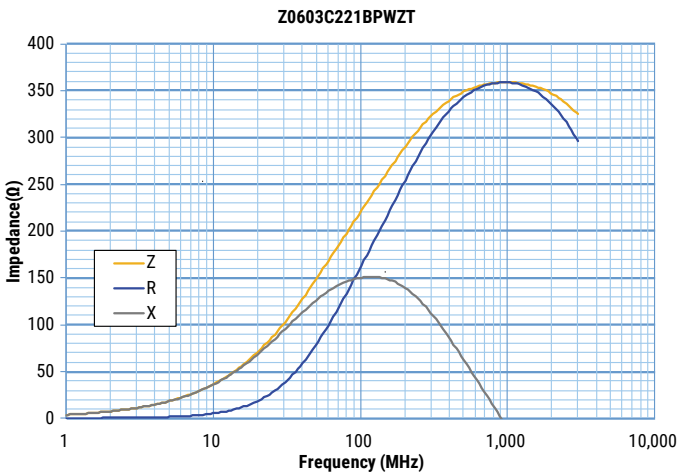
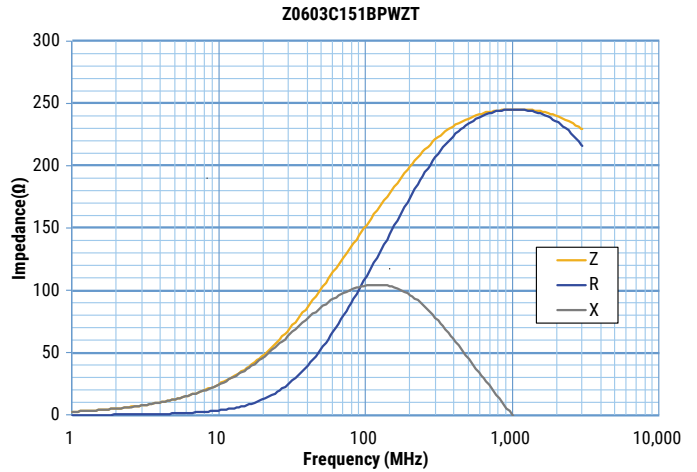
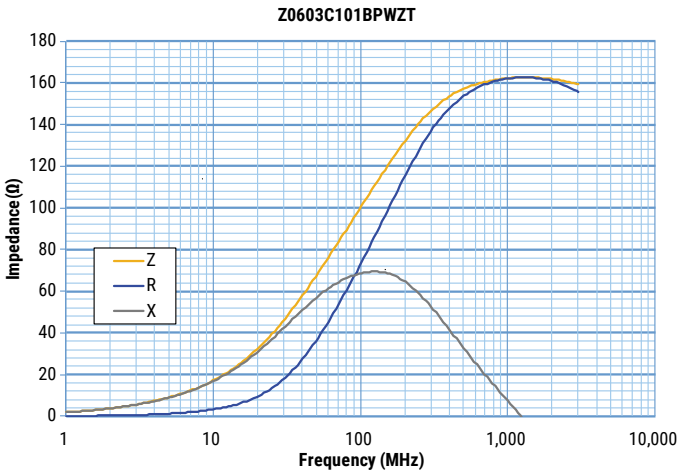
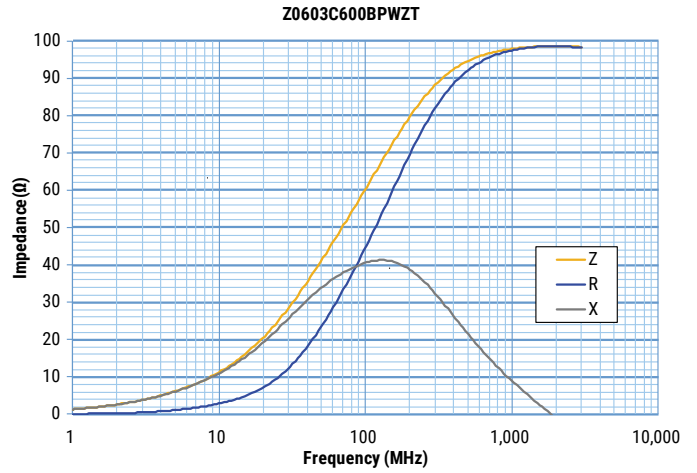
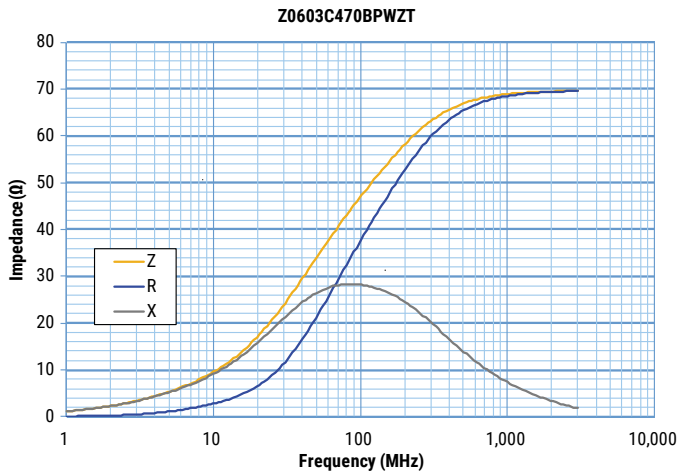
All KEMET Ferrite Beads are RoHS and REACH Compliant.



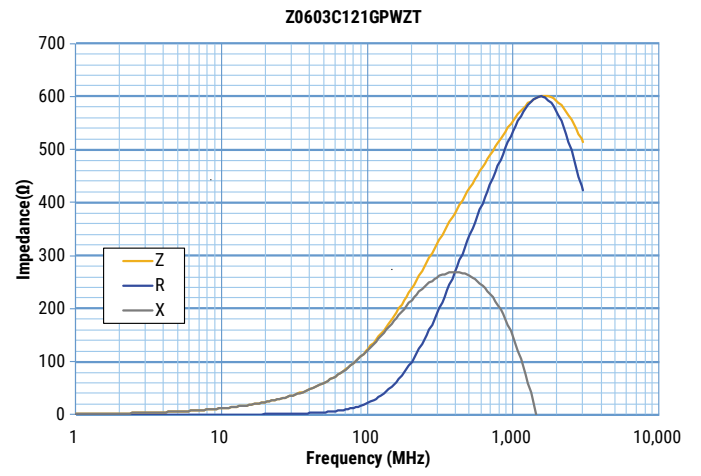
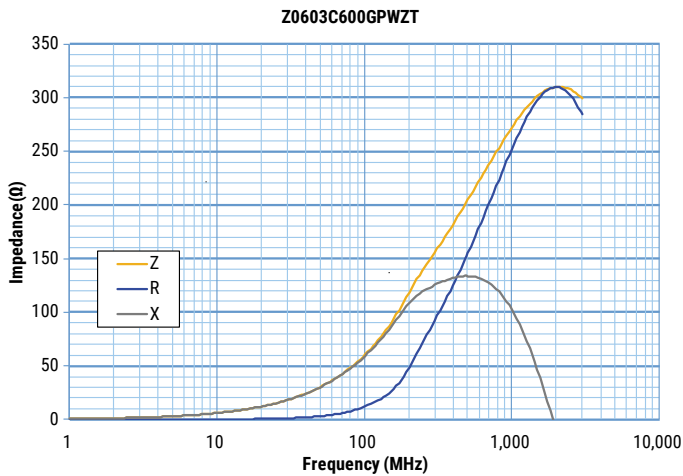
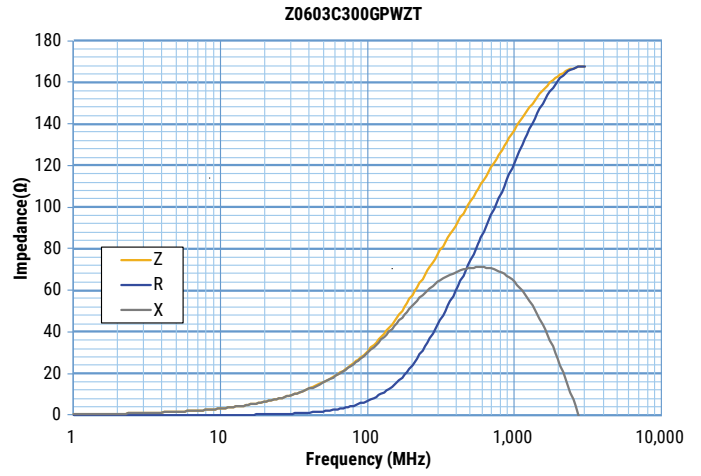
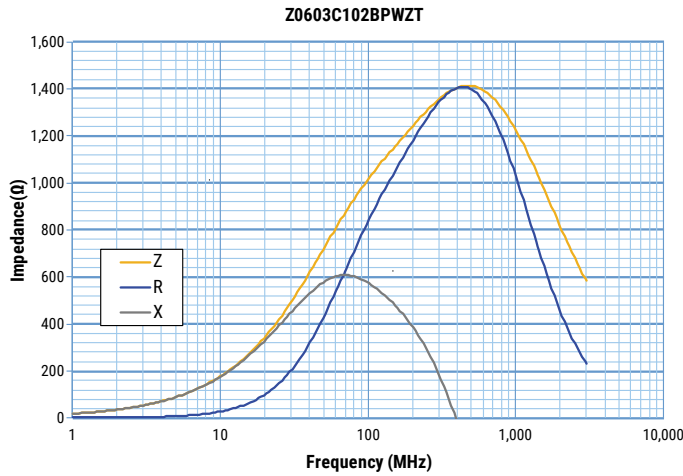
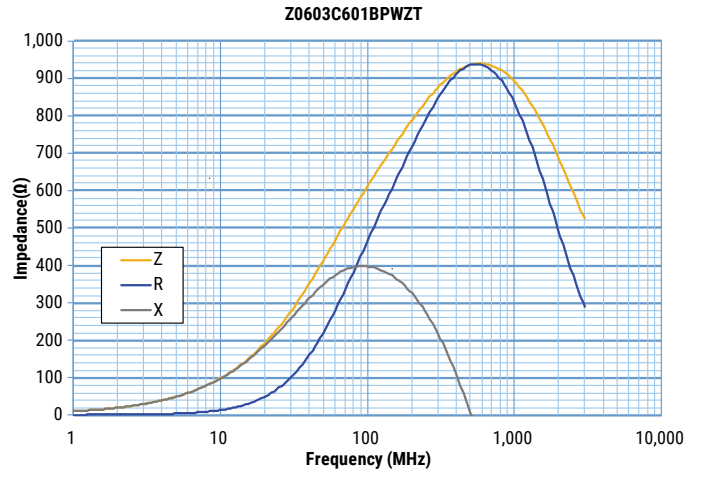
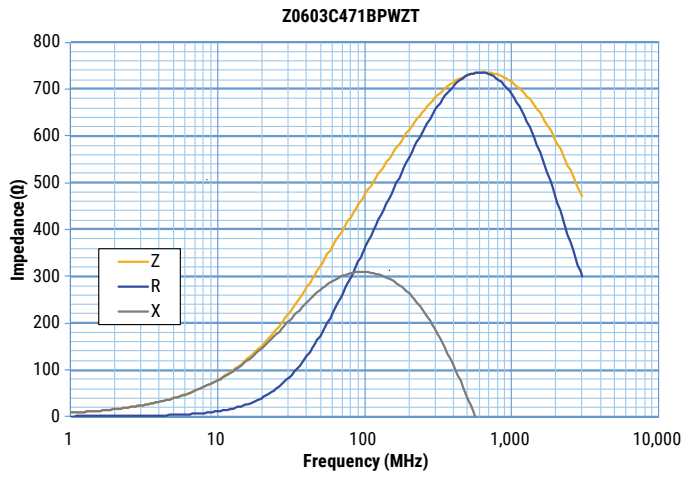
Table 1 – Ratings &amp; Part Number Reference

Part Number	Impedance ( $\Omega$ ) at 100 MHz	Impedance Tolerance	Impedance ( $\Omega$ ) at 1 GHz	Impedance Tolerance	Rated Current (A) Maximum	DC Resistance ( $\Omega$ ) Maximum
Z0603C470BPWZT	47	$\pm 25\%$	75	$\pm 40\%$	3.5	0.020
Z0603C600BPWZT	60	$\pm 25\%$	100	$\pm 40\%$	3.0	0.025
Z0603C101BPWZT	100	$\pm 25\%$	170	$\pm 40\%$	2.5	0.035
Z0603C151BPWZT	150	$\pm 25\%$	270	$\pm 40\%$	2.1	0.050
Z0603C221BPWZT	220	$\pm 25\%$	370	$\pm 40\%$	1.8	0.070
Z0603C331BPWZT	330	$\pm 25\%$	520	$\pm 40\%$	1.2	0.130
Z0603C471BPWZT	470	$\pm 25\%$	750	$\pm 40\%$	1.0	0.150
Z0603C601BPWZT	600	$\pm 25\%$	900	$\pm 40\%$	0.9	0.170
Z0603C102BPWZT	1,000	$\pm 25\%$	1,200	$\pm 40\%$	0.6	0.350
Z0603C300GPWZT	30	$\pm 25\%$	120	$\pm 40\%$	2.6	0.028
Z0603C600GPWZT	60	$\pm 25\%$	220	$\pm 40\%$	2.1	0.045
Z0603C121GPWZT	120	$\pm 25\%$	540	$\pm 40\%$	1.2	0.130
Z0603C221GPWZT	220	$\pm 25\%$	950	$\pm 40\%$	0.9	0.170
Z0603C331GPWZT	330	$\pm 25\%$	1,200	$\pm 40\%$	0.8	0.210
Z0603C471GPWZT	470	$\pm 25\%$	1,500	$\pm 40\%$	0.6	0.350
Z0603C601GPWZT	600	$\pm 25\%$	1,800	$\pm 40\%$	0.5	0.450
Z0805C800BPWZT	80	$\pm 25\%$	-	-	2.7	0.025
Z0805C121BPWZT	120	$\pm 25\%$	-	-	2.5	0.032
Z0805C221BPWZT	220	$\pm 25\%$	-	-	2.0	0.060
Z0805C331BPWZT	330	$\pm 25\%$	-	-	1.8	0.080
Z0806C251BPWZT	250	$\pm 30\%$	-	-	2.0	0.050
Z1206C501BPWZT	500	$\pm 30\%$	-	-	2.0	0.070
Z1210C601BPWZT	600	$\pm 30\%$	-	-	3.0	0.042
Z1210C102BPWZT	1,000	$\pm 30\%$	-	-	2.0	0.100
Z1210C202BPWZT	2,000	$\pm 30\%$	-	-	1.2	0.130
Z1806C851BPWZT	850	$\pm 30\%$	-	-	1.5	0.100
Z1810C102BPWZT	1,000	$\pm 30\%$	-	-	3.0	0.060
Z1810C162BPWZT	1,600	$\pm 30\%$	-	-	2.0	0.130
Z1812C681BPWZT	680	$\pm 25\%$	-	-	4.0	0.028
Z1812C132BPWZT	1,300	$\pm 25\%$	-	-	3.0	0.060
Z1812C202BPWZT	2,000	$\pm 25\%$	-	-	1.3	0.130
Part Number	Impedance ( $\Omega$ ) at 100 MHz	Impedance Tolerance	Impedance ( $\Omega$ ) at 1 GHz	Impedance Tolerance	Rated Current	DC Resistance

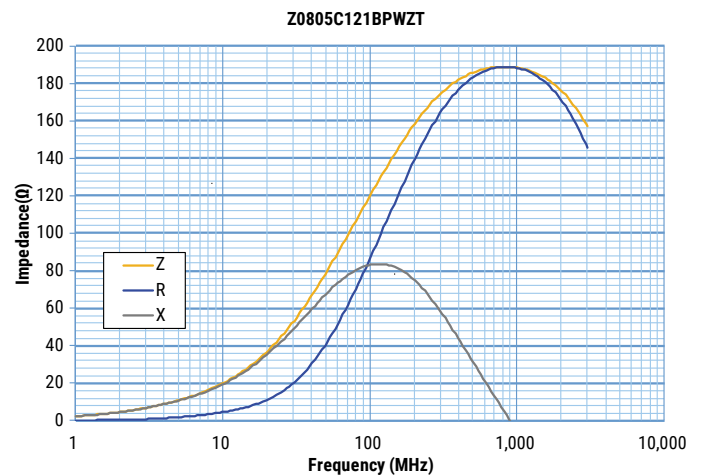
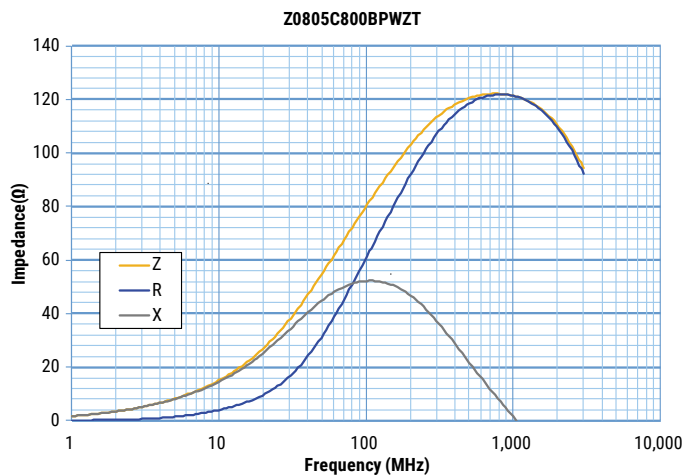
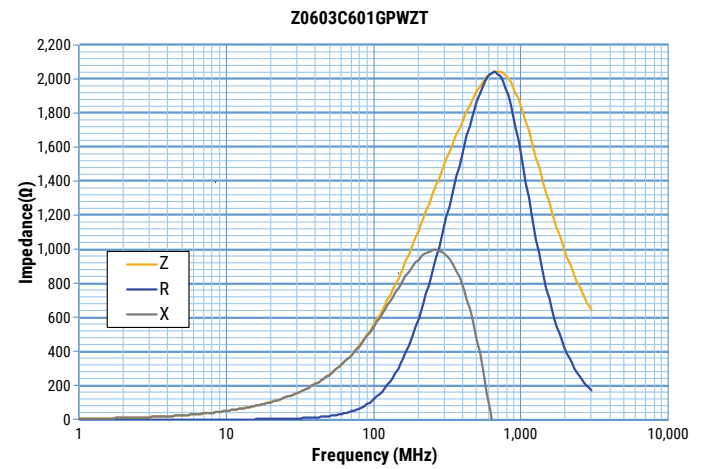
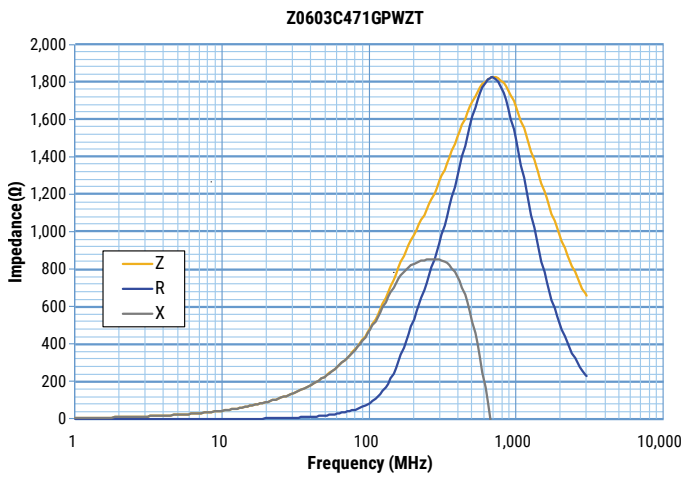
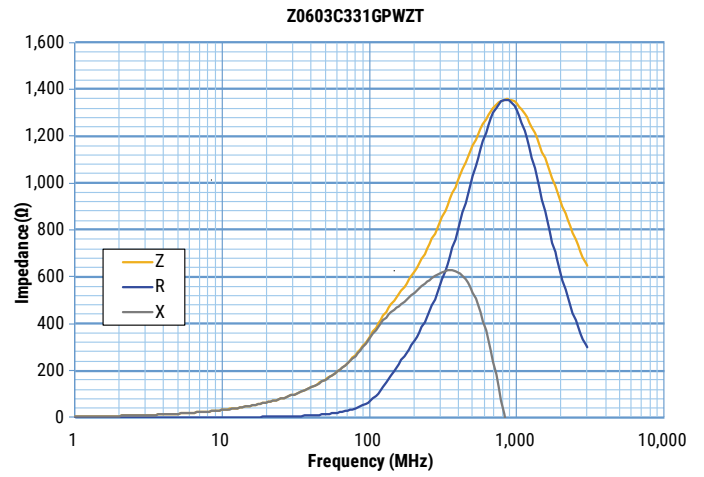
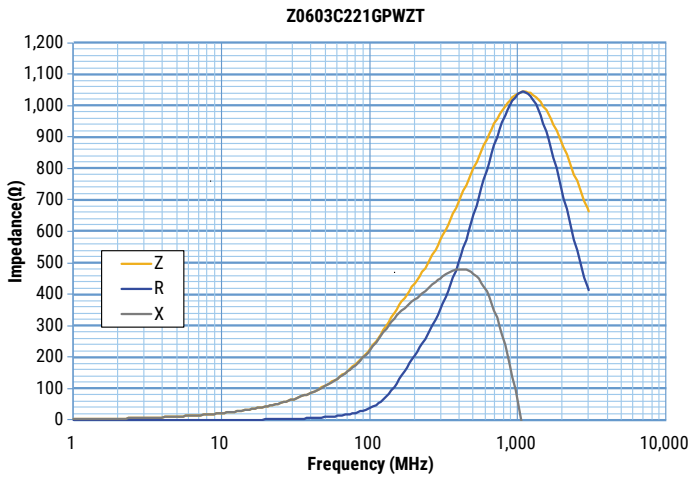
## Frequency Characteristics



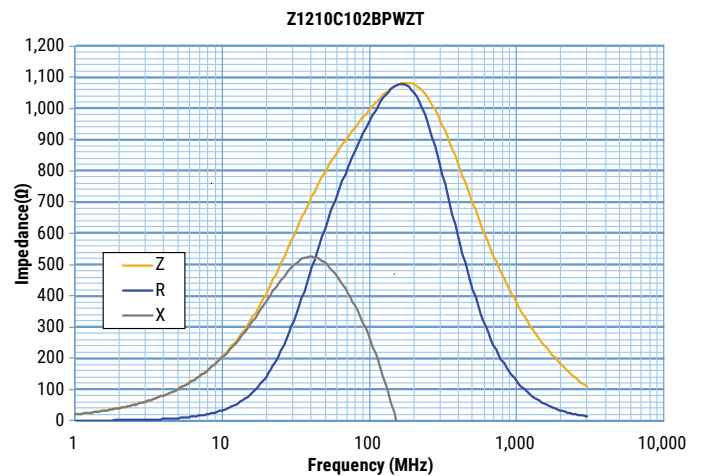
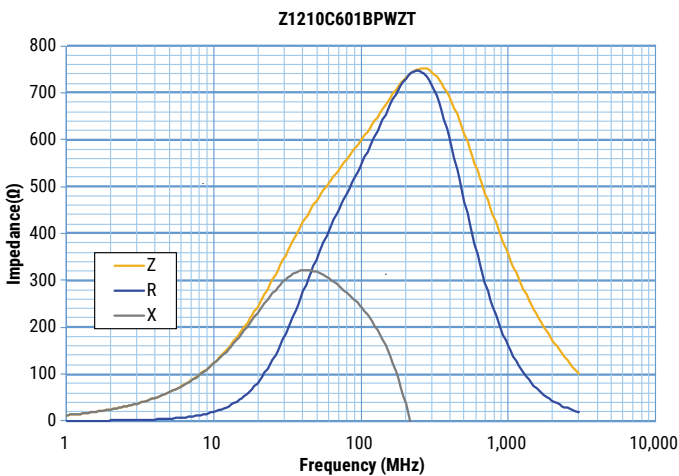
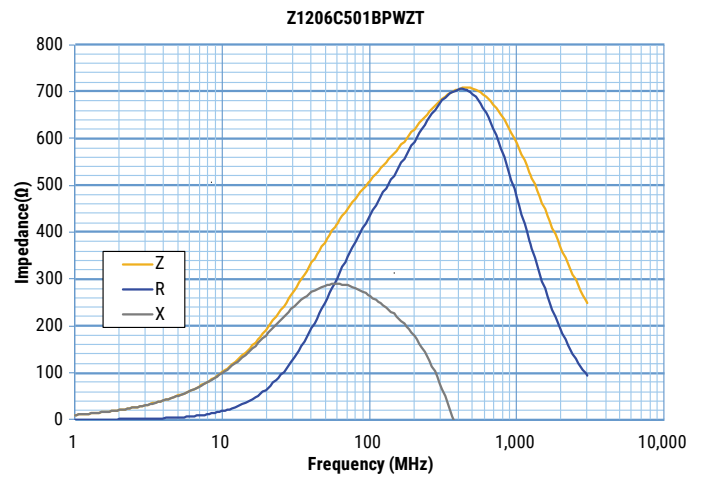
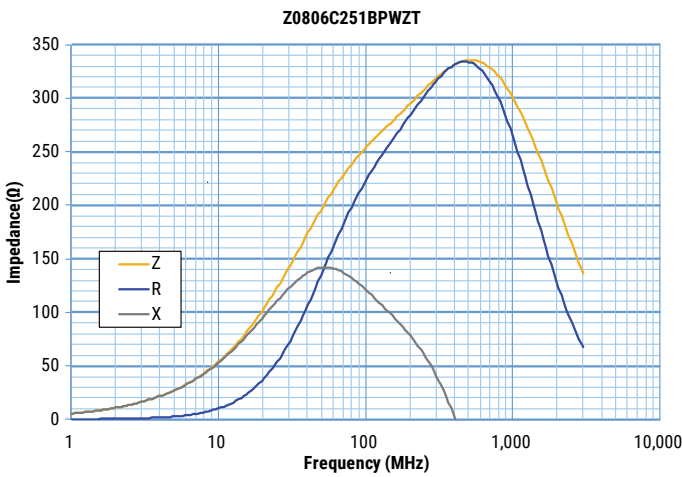
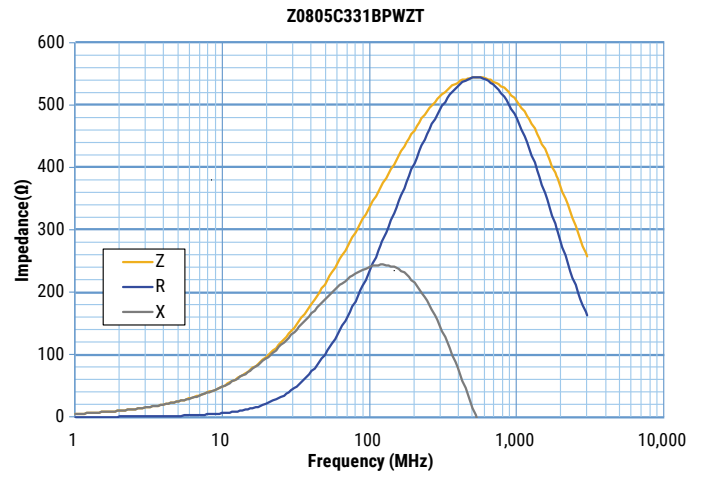
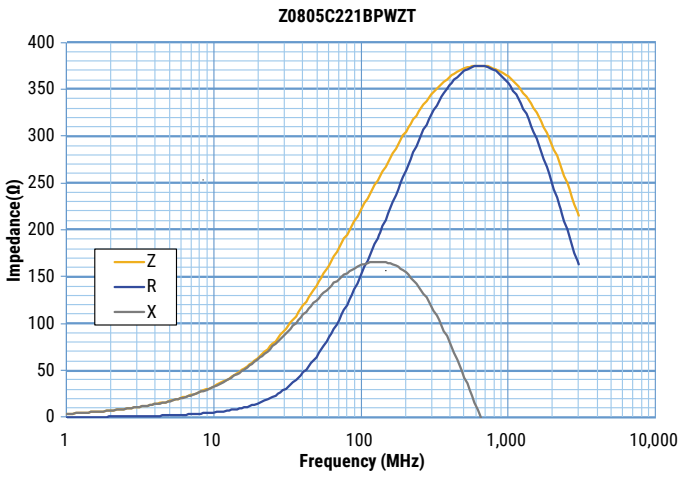
## Frequency Characteristics cont.



## Frequency Characteristics cont.

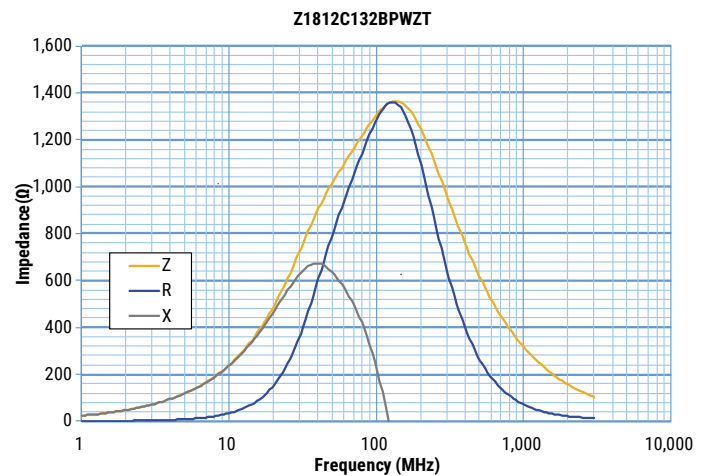
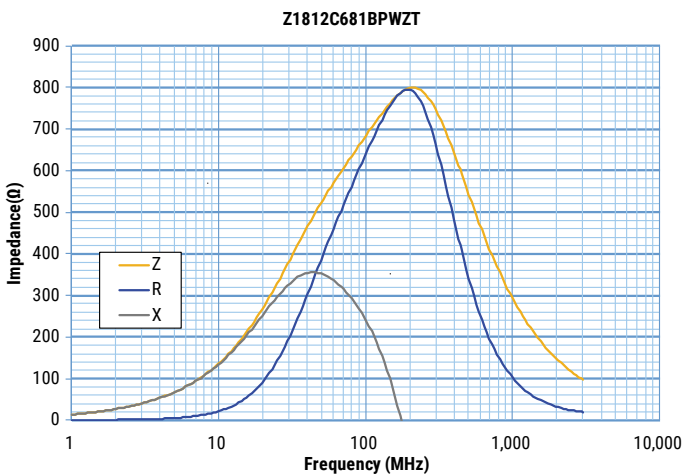
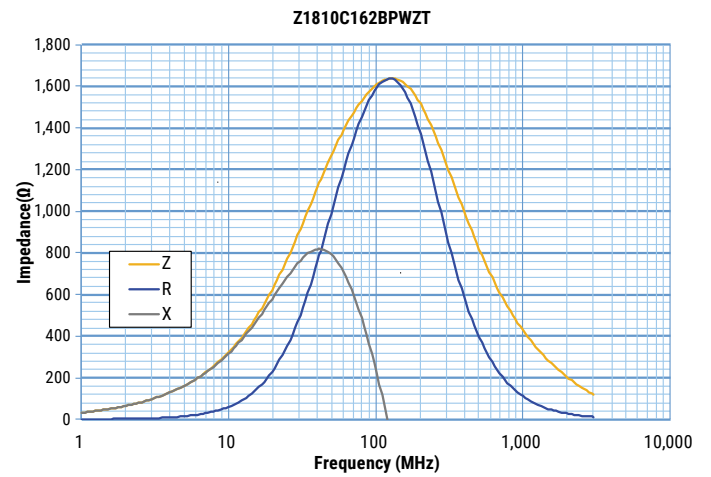
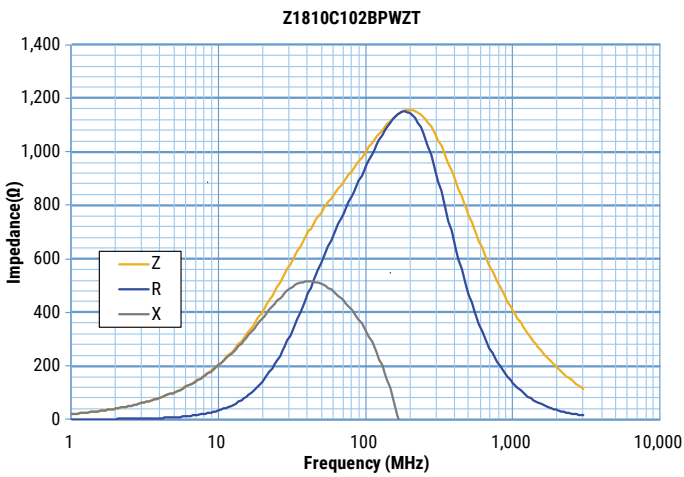
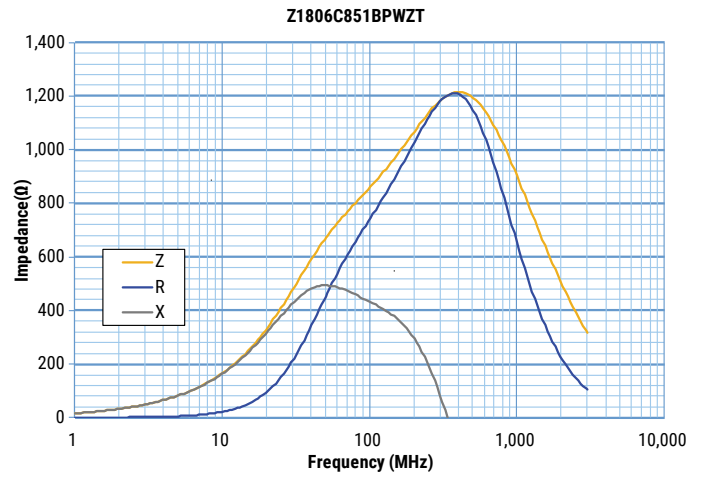
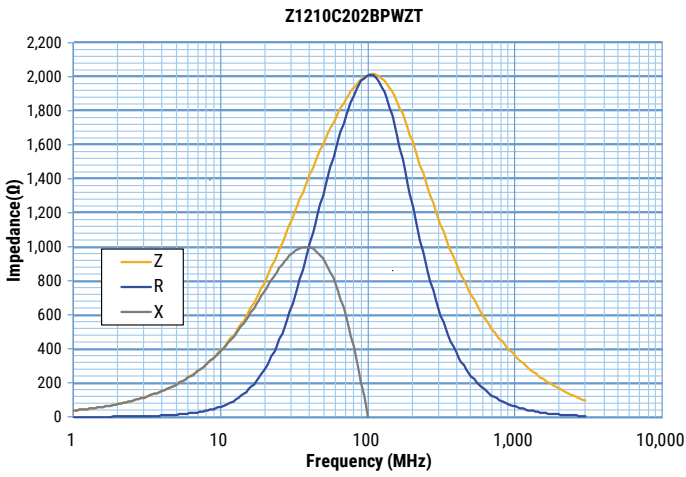


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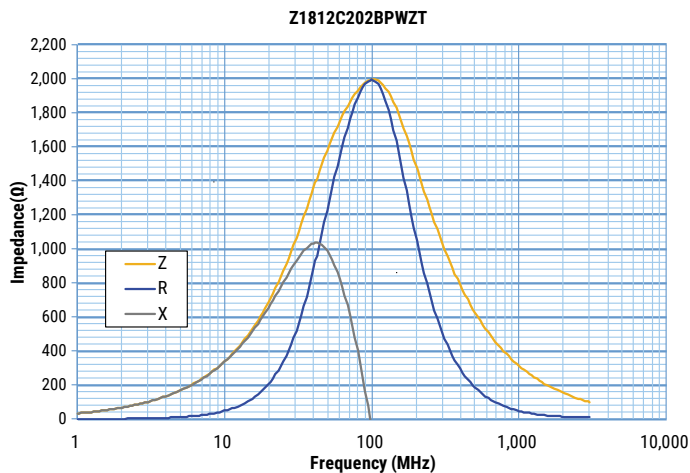




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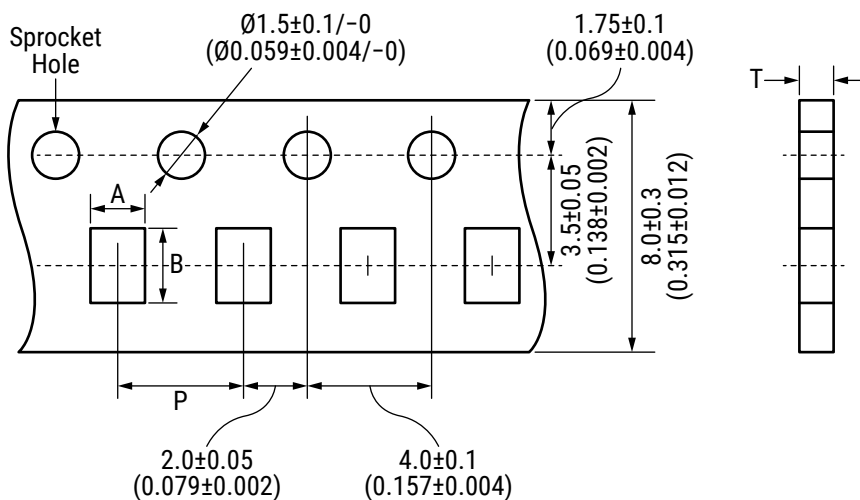


## Frequency Characteristics cont.



## Taping Specifications - Millimeters (Inches)

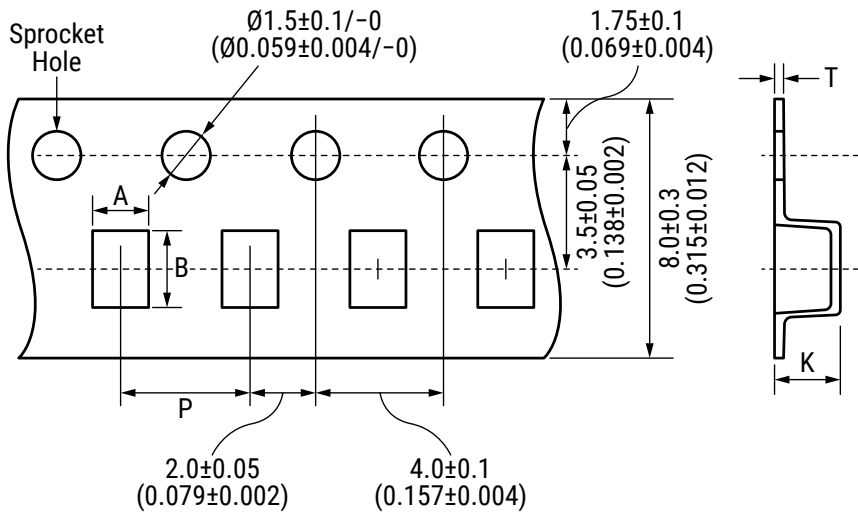
### 0603, 0805 Paper Tape 8mm Width



EIA Case Size	Metric Case Size	Height	Reel Quantity		Cavity		Pitch	Thickness
					A	B	P	T
0603	1608	0.8	4,000	Nominal	1.0	1.8	4.0	1.1
				Tolerance	±0.2	±0.2	±0.2	Maximum
0805	2012	0.85	4,000	Nominal	1.5	2.3	4.0	1.1
				Tolerance	±0.2	±0.2	±0.2	Maximum

## Taping Specifications - Millimeters (Inches) cont.

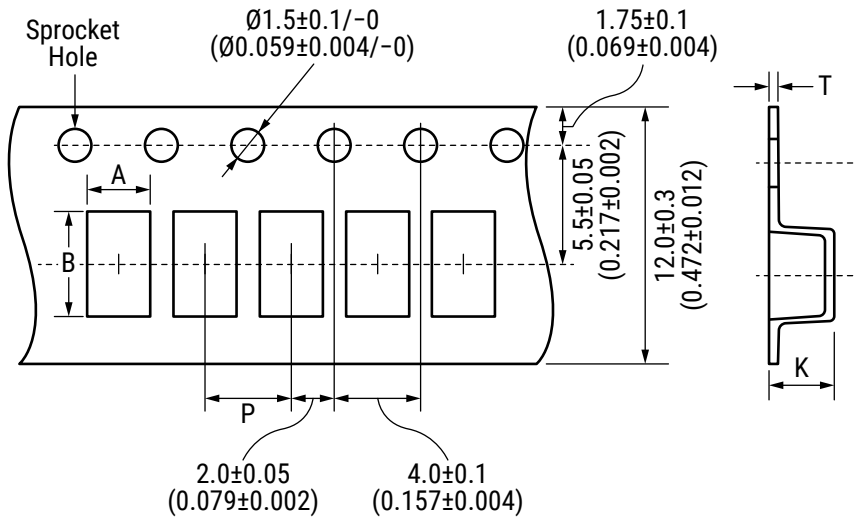
### 0806, 1206, 1210 Embossed (Plastic) Tape 8mm Width



EIA Case Size	Metric Case Size	Height	Reel Quantity		Cavity		Pitch	Thickness	
					A	B	P	T	K
0806	2016	1.6	2,000	Nominal	1.8	2.2	4.0	0.6	2.6
				Tolerance	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	Maximum	Maximum
1206	3216	1.6	2,000	Nominal	1.9	3.5	4.0	0.6	2.6
				Tolerance	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	Maximum	Maximum
1210	3225	2.5	1,000	Nominal	2.8	3.5	4.0	0.6	4.0
				Tolerance	$\pm 0.1$	$\pm 0.1$	$\pm 0.1$	Maximum	Maximum

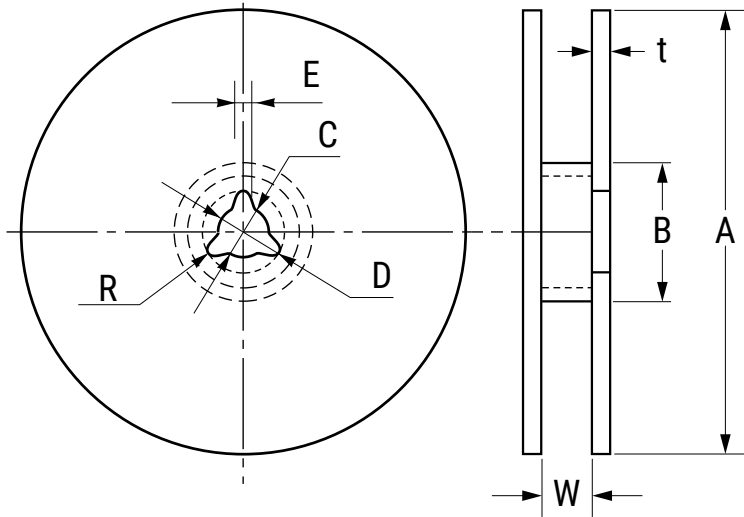
## Taping Specifications - Millimeters (Inches) cont.

### 1806, 1810, 1812 Embossed (Plastic) Tape 12 mm Width



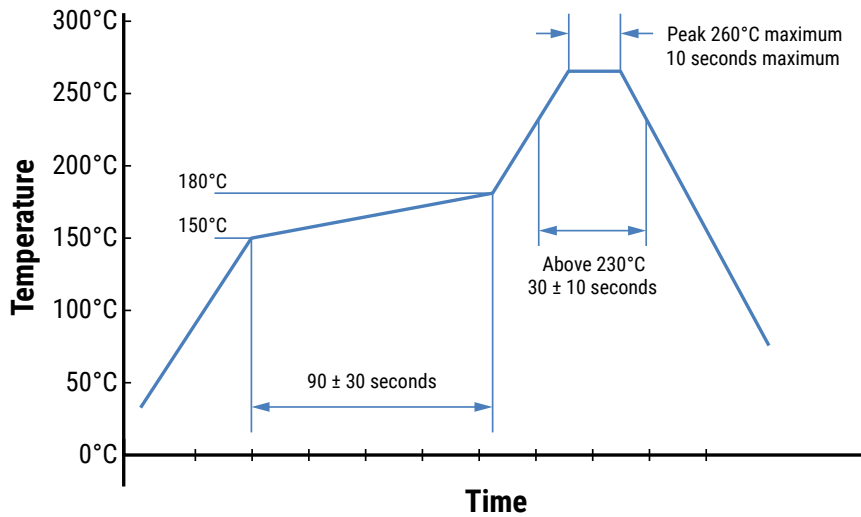
EIA Case Size	Metric Case Size	Height	Reel Quantity		Cavity		Pitch	Thickness	
					A	B	P	T	K
1806	4516	1.6	2,000	Nominal	1.9	4.9	4.0	0.6	2.6
				Tolerance	±0.2	±0.2	±0.2	Maximum	Maximum
1810	4525	2.5	1,000	Nominal	2.9	4.9	4.0	0.6	4.0
				Tolerance	±0.2	±0.2	±0.2	Maximum	Maximum
1812	4532	3.2	2,000	Nominal	3.6	4.9	8.0	0.6	4.0
				Tolerance	±0.2	±0.2	±0.2	Maximum	Maximum

## Reel Specifications - Millimeters



EIA Case Size		Dimensions - Millimeters							
		A	B	C	D	E	R	t	W
0603 0805 0806 1206 1210	Nominal	∅180.0	∅60.0	∅13.0	∅21.0	2.0	1.0	2.5	10.0
	Tolerance	+0, -3	+1, -0	±0.5	±0.8	±0.5		Maximum	±1.5
1806 1810	Nominal	∅180.0	∅60.0	∅13.0	∅21.0	2.0	1.0	2.5	14.0
	Tolerance	+0, -3	+1, -0	±0.5	±0.8	±0.5		Maximum	±1.5
1812	Nominal	∅330.0	∅100.0	∅13.0	∅21.0	2.0	1.0	3.0	14.0
	Tolerance	±0.2	±0.1	±0.5	±0.8	±0.5		Maximum	±2.0

## Recommended Reflow Soldering Profile



## Handling Precautions

Ferrite chip beads should be stored in normal working environments. While these beads themselves are quite robust in other environments, exposure to high temperatures, high humidity, corrosive atmospheres, and long-term storage degrades solderability.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity. Atmospheres should be free of chlorine-bearing and sulfur-bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts.

For optimized solderability, ferrite chip beads stock should be used promptly, preferably within six months of receipt.

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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

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[CZB2AGTTD102P](#) [NCB0402P301TR005F](#) [NCB0603R152TR030F](#) [NCB0805A121TR050F](#) [NCB3312K900TR500F](#) [NCB-H0805A221TR300F](#) [NCB-H1806E181TR300F](#) [NCB0402P300TR030F](#) [NCB0402P700TR050F](#) [NCB0805A102TR040F](#)  
[NCB1806E151TR020F](#) [NCB-H0603R121TR300F](#) [NCB-H0805A220TR600F](#) [NCB-H0805A390TR400F](#) [CIM21J252NE](#) [CZB2BFTTE121P](#)  
[EMI0805R-220](#) [74279250](#) [7427924](#) [CZB1JGTTD202P](#) [ABUPDE160808121Y00](#)