



BROADBAND COMPONENTS

- **DC to 67 GHz**
- **Capacitors**
- **Resistors**
- **Inductors**
- **SLC**



Broadband Capacitors

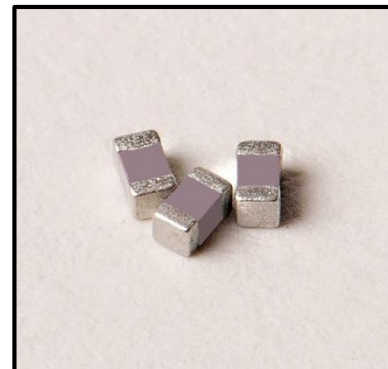




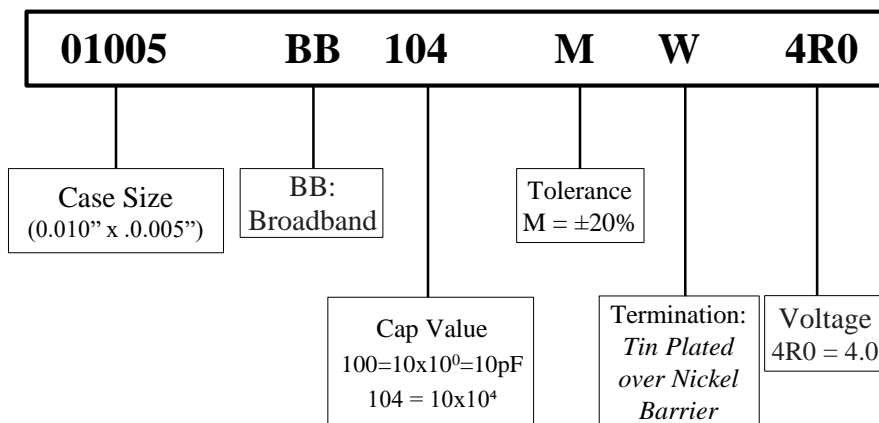
01005BB104MW4R0
(0.010" x 0.005")

≠ **Product Features**

• Typical Operating Frequency Range	16 kHz (-3dB point) to > 67 GHz
• Insertion Loss	< 1dB, typical
• Tape & Reel	40K pcs/reel; Lower quantities available in cut tape
• Capacitance	100nF, nom.
• Operating Temperature Range	-55°C to +85°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +85°C)
• Rated Voltage	4 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

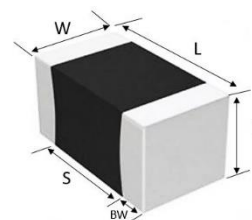


≠ **Part Numbering**



≠ **Capacitor Dimensions**

Length	Width	Thickness	Gap
L	W	T	S
0.016 in ± 0.001 (0.40mm ± 0.02mm)	0.008 in ± 0.001 (0.20mm ± 0.02mm)	0.008 in ± 0.001 (0.20mm ± 0.02mm)	0.005 in min (0.13mm min)



≠ Performance Curves



≠ Test Conditions



Typical responses for sample placed across a 0.127mm (5.0 mil) gap between 0.29mm (11.3 mil) wide, 0.21mm (8.3 mil) long mounting pads on 4-mil Rogers RO4350B.

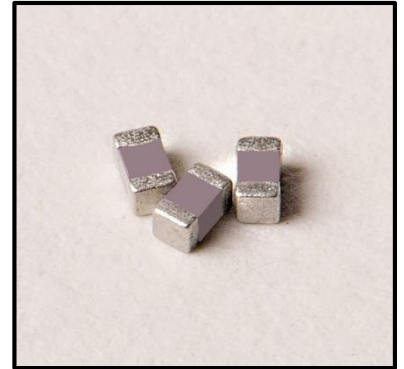
Measured and modeled data are de-embedded to the mounting pad edges using TRL calibration procedures.



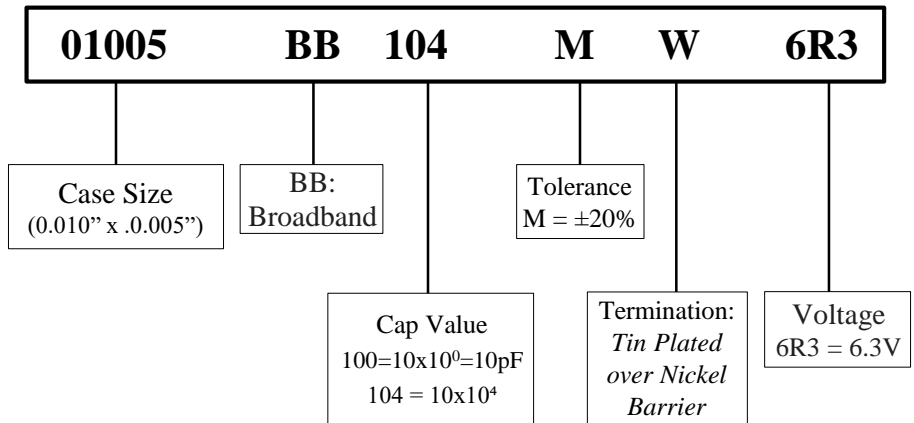
01005BB104MW6R3
(0.010" x 0.005")

Product Features

• Typical Operating Frequency Range	16 kHz (-3dB point) to > 67 GHz
• Insertion Loss	< 1dB, typical
• Tape & Reel	40K pcs/reel; Lower quantities available in cut tape
• Capacitance	100nF, nom.
• Operating Temperature Range	-55°C to +85°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +85°C)
• Rated Voltage	6.3 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 ¹¹ Ωmin @ +25°C @ rated WVDC

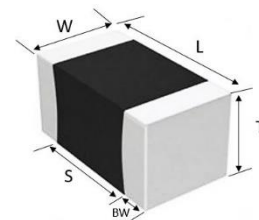


Part Numbering

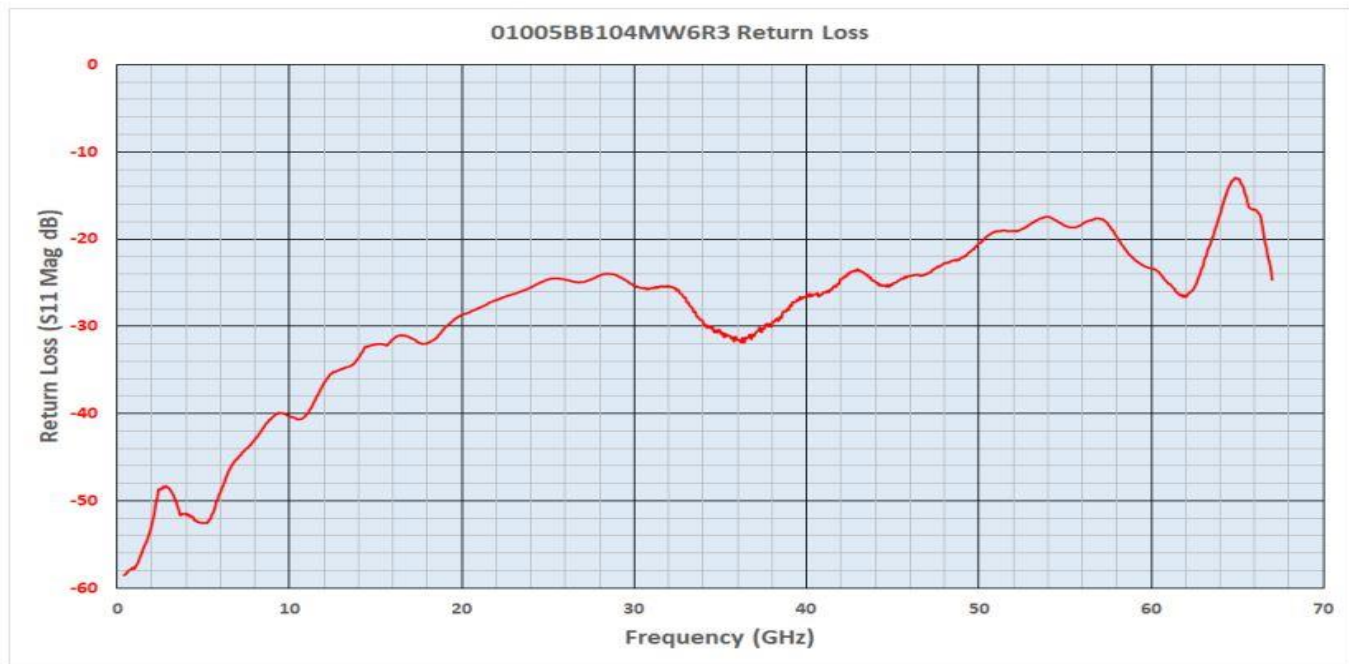
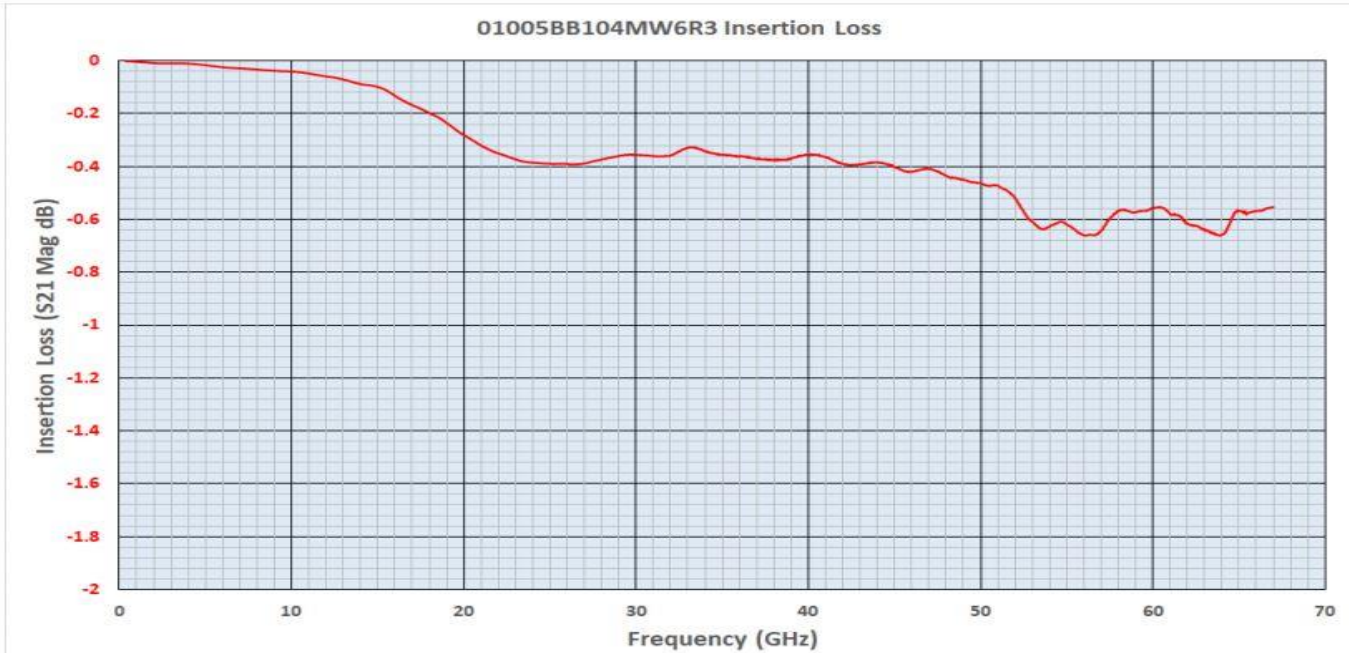


Capacitor Dimensions

Length	Width	Thickness	Gap
L	W	T	S
0.016 in ± 0.001 (0.40mm ± 0.02mm)	0.008 in ± 0.001 (0.20mm ± 0.02mm)	0.008 in ± 0.001 (0.20mm ± 0.02mm)	0.005 in min (0.13mm min)



≡ Performance Curves



≡ Test Conditions

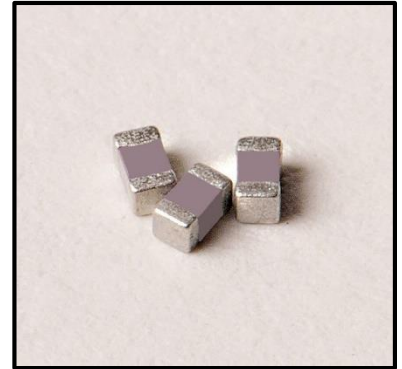


Typical responses for sample placed across a 0.127mm (5.0 mil) gap between 0.290mm (11.4 mil) wide, 0.216mm (8.5 mil) long mounting pads on 4-mil Rogers RO4350B. 50-Ohm Trace Width on substrate is 0.203mm (8mil).

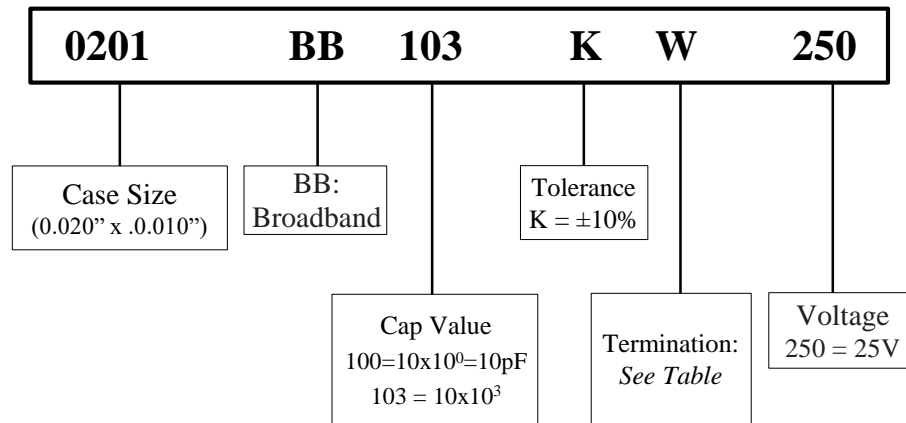
Measured and modeled data are de-embedded to the mounting pad edges using TRL calibration procedures.

≡ Product Features

• Typical Operating Frequency Range	160 kHz (-3dB point) to > 32 GHz
• Insertion Loss	< 1dB, typical
• Tape & Reel	15K pcs/reel; Lower quantities available in cut tape
• Capacitance	10nF
• Operating Temperature Range	-55°C to +125°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +125°C)
• Rated Voltage	25 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

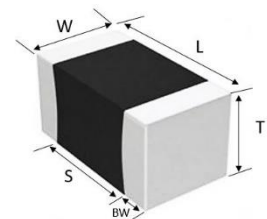


≡ Part Numbering




≡ Capacitor Dimensions

Length	Width	Thickness	Gap
L	W	T	S
0.023 in. ± 0.002 (0.58mm ± 0.06mm)	0.012 in. ± 0.002 (0.30mm ± 0.06mm)	0.013 in. Typ. (0.33mm)	0.008 in. Typ. (0.20 min)



≡ Terminations

W	G	L
 Tin Plated over Nickel Barrier (RoHS Compliant)	Gold Epoxy Mount Only	Tin/Lead (90%Sn/10%Pb)

≡ Performance Curves



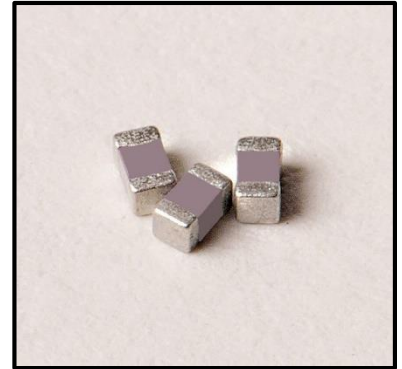
≡ Test Conditions

Typical responses for sample placed across a 3-mil gap in a 13-mil-wide trace on 6.6mil Rogers RO4350.

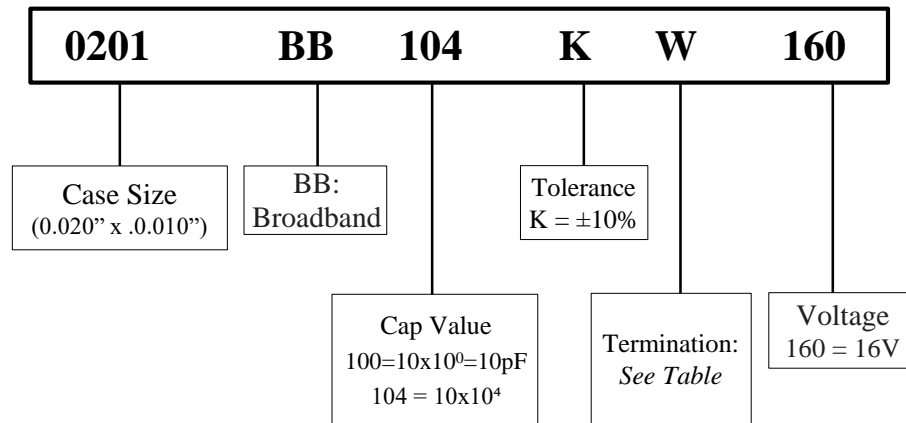
Measured and modeled data are de-embedded to the mounting pad edges using TRL calibration procedures.

≡ Product Features

• Typical Operating Frequency Range	16 kHz (-3dB point) to > 40 GHz
• Insertion Loss	< 1dB, typical
• Tape & Reel	15K pcs/reel; Lower quantities available in cut tape
• Capacitance	100nF
• Operating Temperature Range	-55°C to +125°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +125°C)
• Rated Voltage	16 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

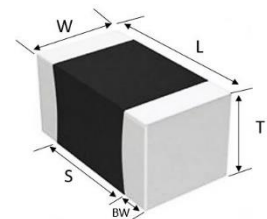


≡ Part Numbering




≡ Capacitor Dimensions

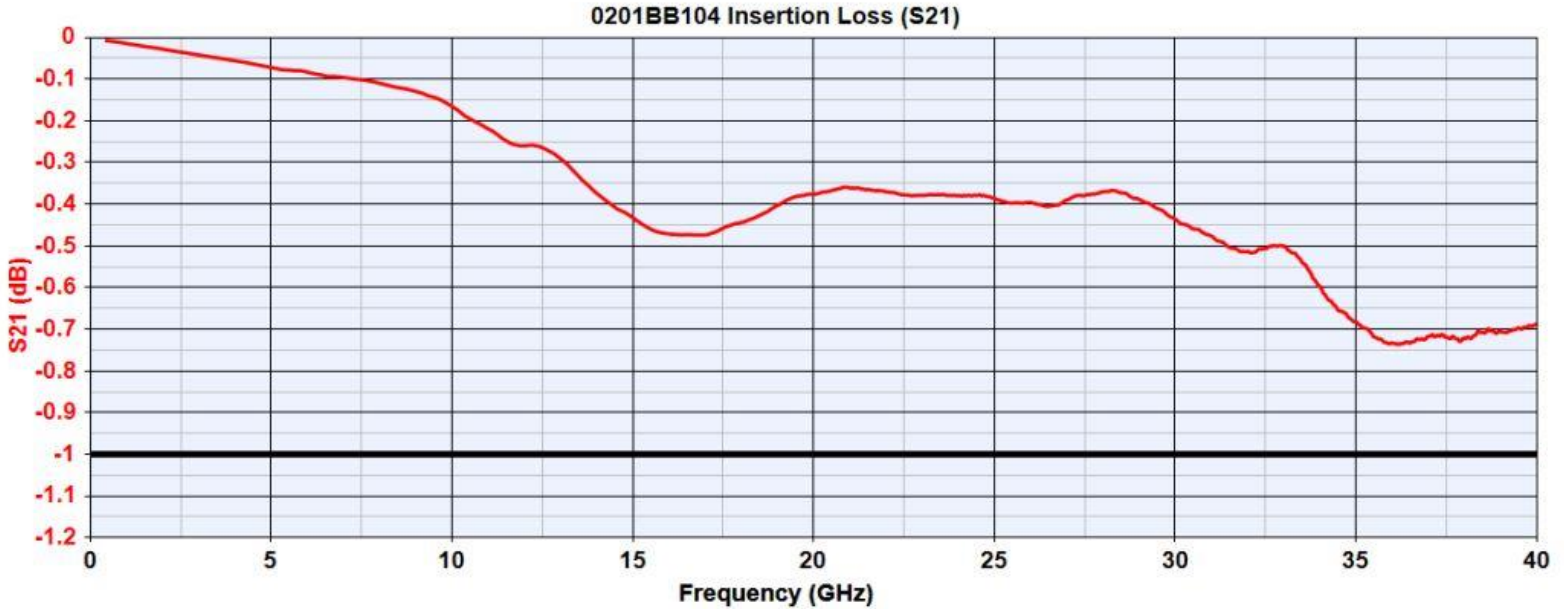
Length	Width	Thickness	Gap
L	W	T	S
0.023 in. ± 0.002 (0.58mm ± 0.06mm)	0.012 in. ± 0.002 (0.30mm ± 0.06mm)	0.013 in. Typ. (0.33mm)	0.008 in. Typ. (0.20 min)



≡ Terminations

W	G	L
 Tin Plated over Nickel Barrier (RoHS Compliant)	Gold Epoxy Mount Only	Tin/Lead (90%Sn/10%Pb)

⚡ Performance Curves



⚡ Test Conditions

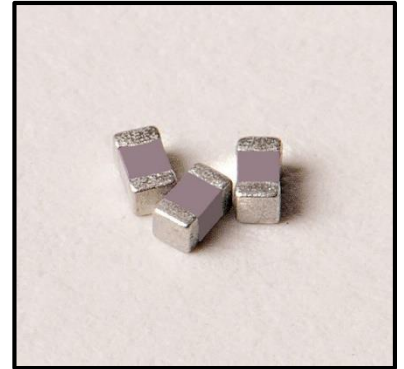


Typical responses for sample placed across a 5-mil gap in a 13.8-mil-wide trace on 6.6mil Rogers RO4350.

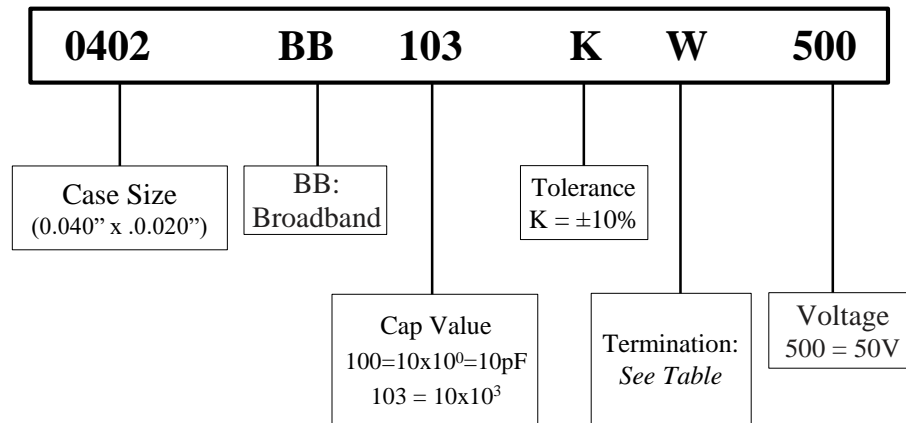
Measured and modeled data are de-embedded to the mounting pad edges using TRL calibration procedures.

≡ Product Features

• Typical Operating Frequency Range	160 kHz (-3dB point) to > 40 GHz
• Insertion Loss	< 1dB, typical
• Tape & Reel	10K pcs/reel; Lower quantities available in cut tape
• Capacitance	10nF
• Operating Temperature Range	-55°C to +125°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +125°C)
• Rated Voltage	50 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

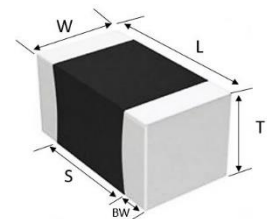


≡ Part Numbering




≡ Capacitor Dimensions

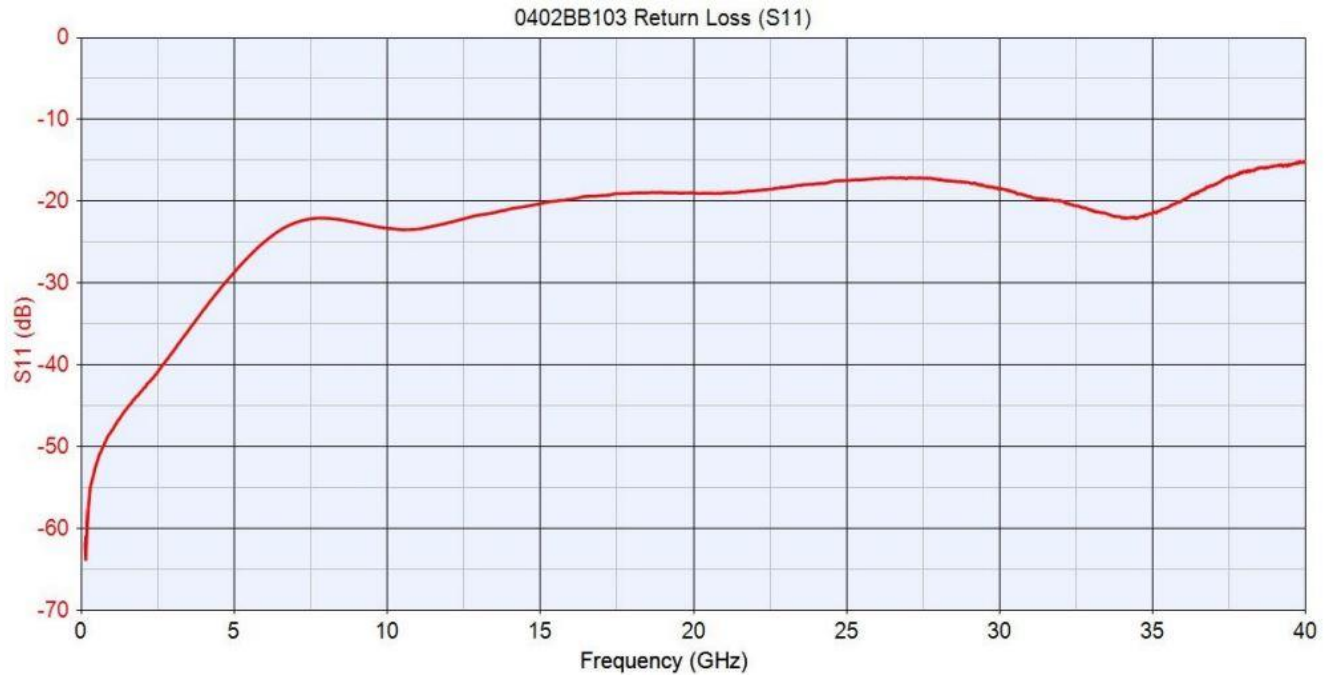
Length	Width	Thickness	Gap
L	W	T	S
0.040 in. ± 0.004 (1.016mm ± 0.102mm)	0.020 in. ± 0.004 (0.508mm ± 0.102mm)	0.024 in. MAX (0.610mm MAX)	0.016 in. MIN (0.406 min MIN)



≡ Terminations

W	G	L
 Tin Plated over Nickel Barrier (RoHS Compliant)	Gold Epoxy Mount Only	Tin/Lead (90%Sn/10%Pb)

≠ Performance Curves



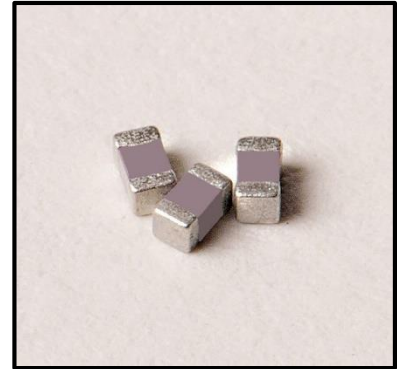
≠ Test Conditions

Typical responses for sample placed across a 10-mil thick Rogers RO4350B microstrip board, sample spanning a 15.5-mil gap in a 21-mil-wide center trace, pad length 12.3 mils.

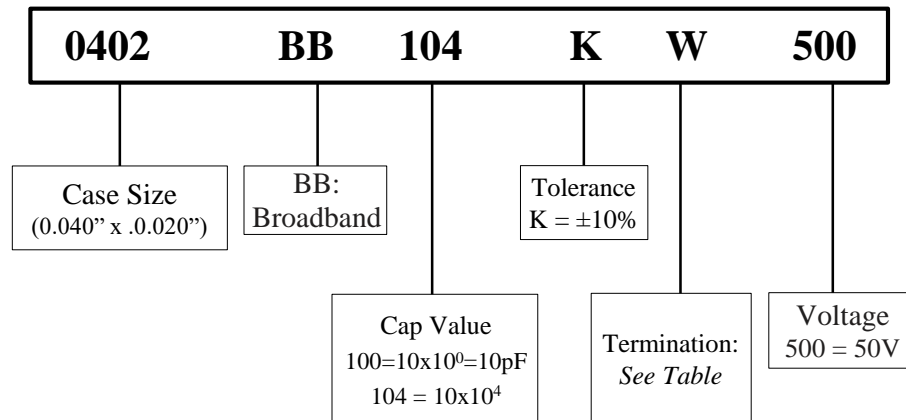
All measurements made using TRL de-embedding procedures.

≡ Product Features

• Typical Operating Frequency Range	16 kHz (-3dB point) to > 50 GHz
• Insertion Loss	< 1.2dB, typical
• Tape & Reel	10K pcs/reel; Lower quantities available in cut tape
• Capacitance	100nF
• Operating Temperature Range	-55°C to +125°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +125°C)
• Rated Voltage	50 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

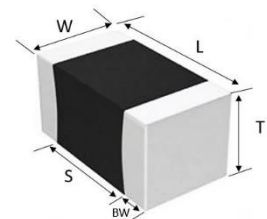


≡ Part Numbering




≡ Capacitor Dimensions

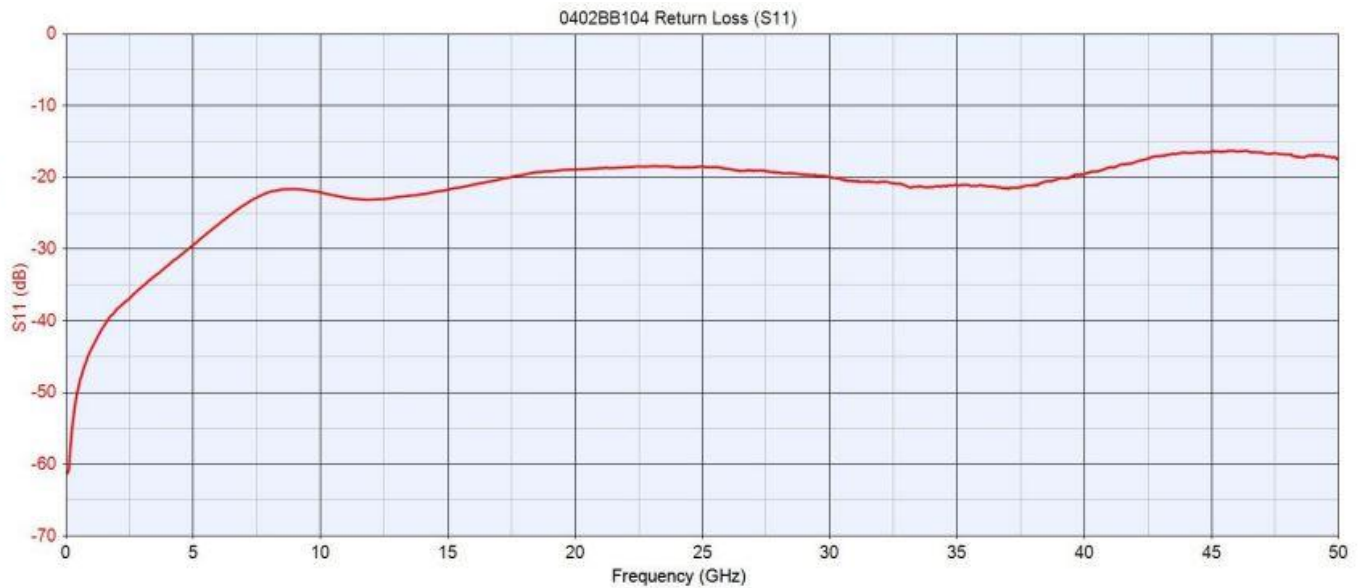
Length	Width	Thickness	Gap
L	W	T	S
0.040 in. ± 0.004 (1.016mm ± 0.102mm)	0.020 in. ± 0.004 (0.508mm ± 0.102mm)	0.024 in. MAX (0.610mm MAX)	0.016 in. MIN (0.406 min MIN)



≡ Terminations

W	G	L
 Tin Plated over Nickel Barrier (RoHS Compliant)	Gold Epoxy Mount Only	Tin/Lead (90%Sn/10%Pb)

≠ Performance Curves



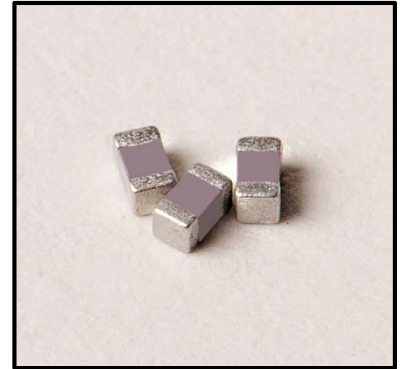
≠ Test Conditions

Typical responses for sample placed across a 15.5 mil gap in a 21-mil-wide trace on 10-mil Rogers RO4350B.

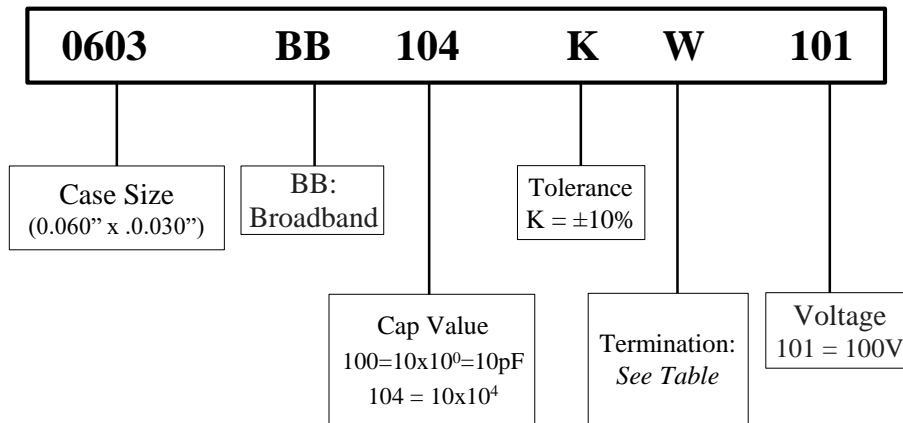
Measurements de-embedded to sample edge using TRL calibration procedures.

≠ Product Features

• Typical Operating Frequency Range	16 kHz (-3dB point) to > 20 GHz
• Insertion Loss	< 1.2dB, typical
• Tape & Reel	10K pcs/reel; Lower quantities available in cut tape
• Capacitance	100nF
• Operating Temperature Range	-55°C to +125°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +125°C)
• Rated Voltage	100 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

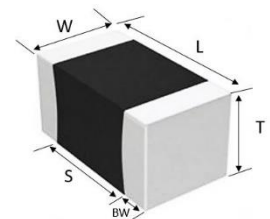


≠ Part Numbering




≠ Capacitor Dimensions

Length	Width	Thickness	Gap
L	W	T	S
0.060 in. ± 0.006 (1.52mm ± 0.15mm)	0.030 in. ± 0.006 (0.76mm ± 0.15mm)	0.035 in. MAX (0.890 mm MAX)	0.020 in. MIN (0.510 min MIN)



≠ Terminations

W	G	L
 Tin Plated over Nickel Barrier (RoHS Compliant)	Gold Epoxy Mount Only	Tin/Lead (90%Sn/10%Pb)

⊕ Performance Curves



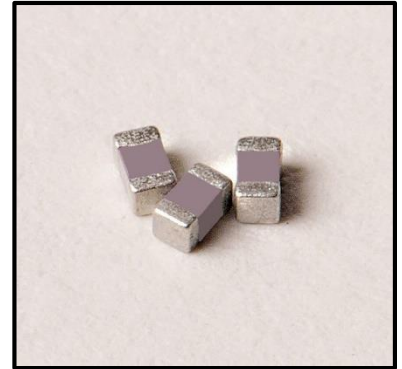
⊕ Test Conditions

Typical response for sample placed across a 36 mil gap, 29 mil wide, 13.3 mil Rogers 4350B

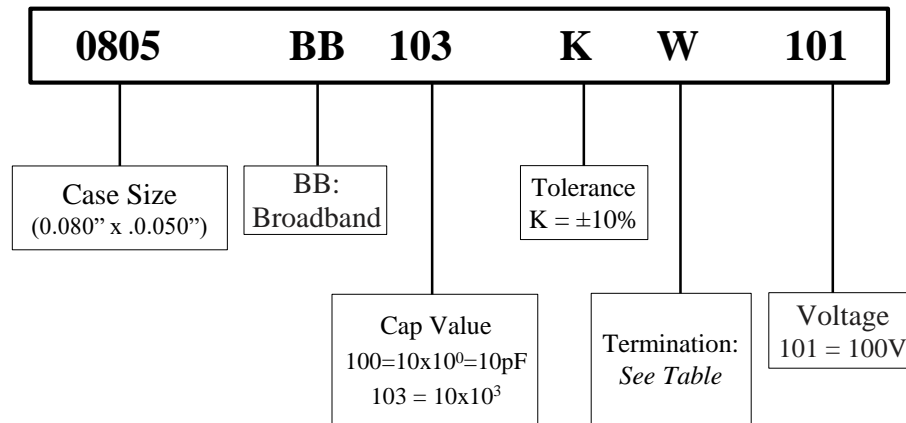
Measurements are de-embedded to sample edge using TRL calibration procedures.

≡ Product Features

• Typical Operating Frequency Range	160 kHz (-3dB point) to > 3 GHz
• Insertion Loss	< 0.25dB, typical
• Tape & Reel	4K pcs/reel; Lower quantities available in cut tape
• Capacitance	10nF
• Operating Temperature Range	-55°C to +125°C
• Temperature Coefficient of Capacitance (TCC)	(±15%, -55°C to +125°C)
• Rated Voltage	100 WVDC
• Dielectric Withstanding Voltage (DWV)	250% of rated WVDC for 5 seconds
• Insulation Resistance	10 \wedge 11 Ω min @ +25°C @ rated WVDC

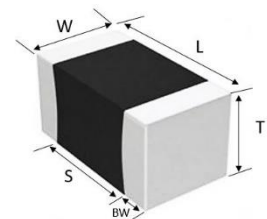


≡ Part Numbering




≡ Capacitor Dimensions

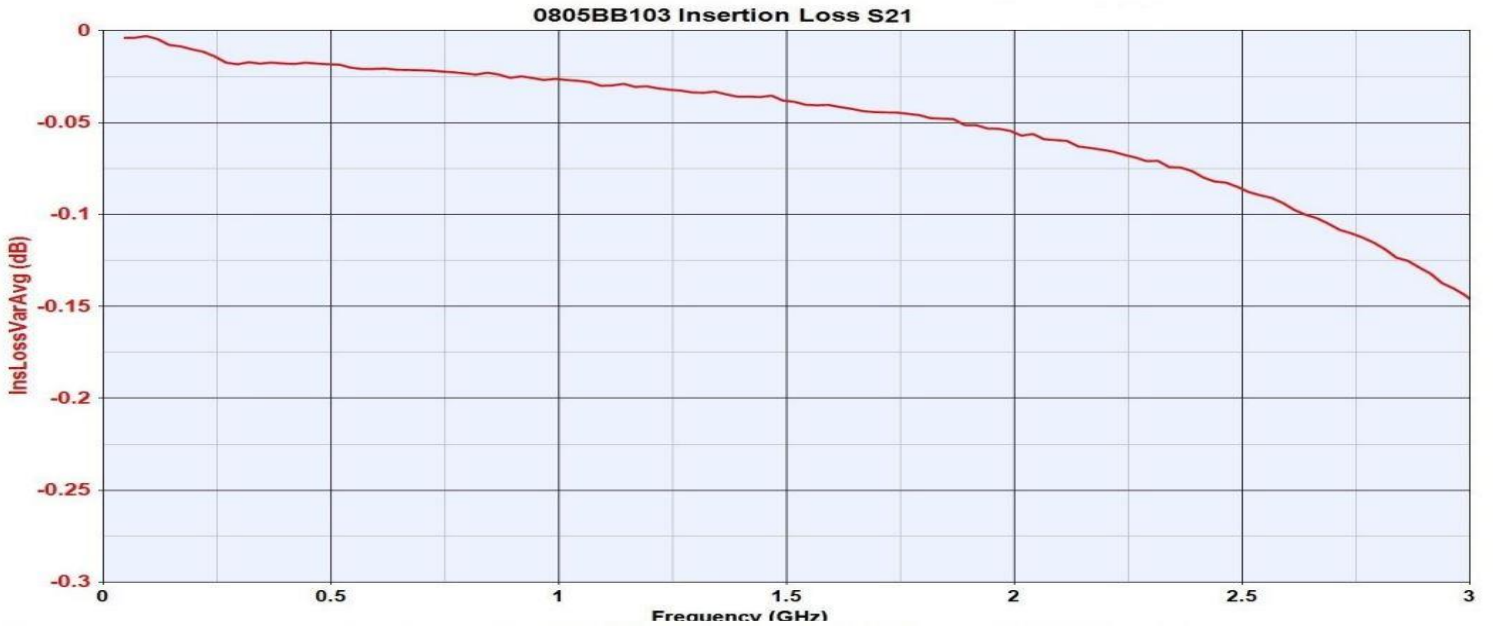
Length	Width	Thickness	Gap
L	W	T	S
0.080 in. ± 0.006 (2.03mm ± 0.15mm)	0.050 in. ± 0.006 (1.27mm ± 0.15mm)	0.040 in. MAX (1.02mm MAX)	0.044 in. MIN (1.12 min MIN)



≡ Terminations

W	G	L
 Tin Plated over Nickel Barrier (RoHS Compliant)	Gold Epoxy Mount Only	Tin/Lead (90%Sn/10%Pb)

⊕ Performance Curves



⊕ Test Conditions

Typical responses for a horizontally oriented sample (electrodes parallel to plane of substrate) placed across a 25.5-mil gap in a 42.5-mil-wide trace on 20-mil Rogers 4003C.

Measurements are de-embedded to sample edge using TRL calibration procedures.

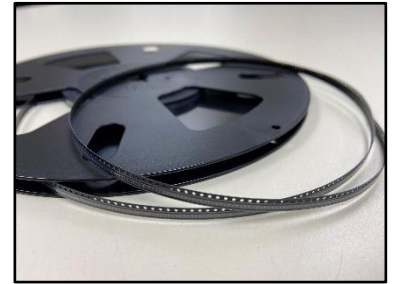


Broadband Capacitors - Tape & Reel Specifications

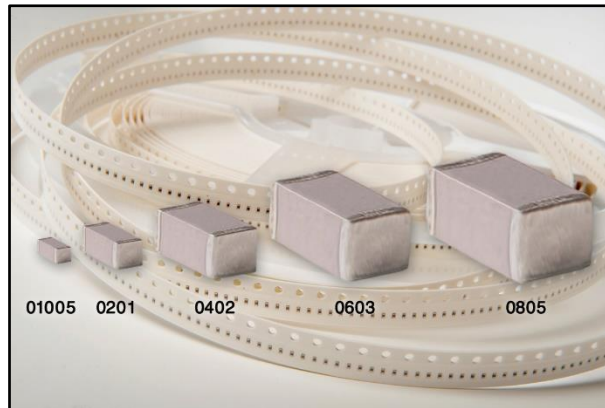
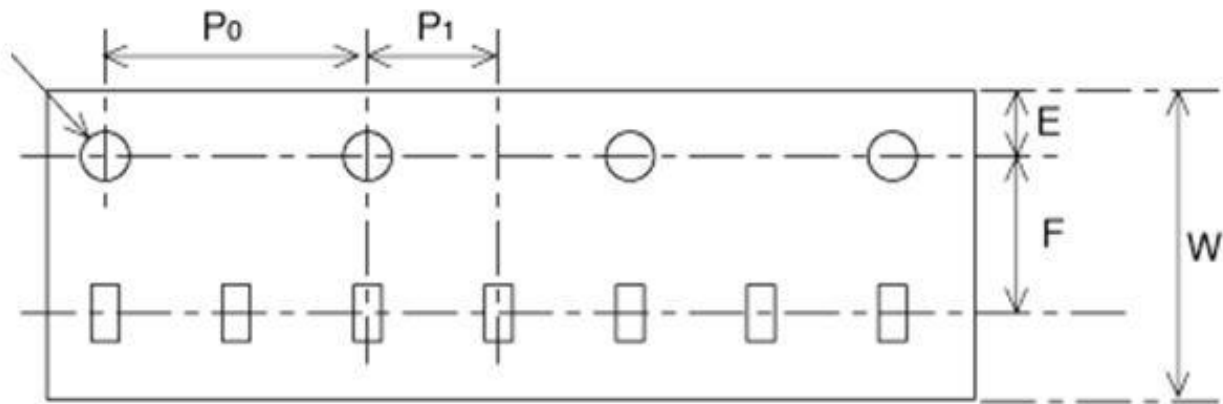




≠ **01005BB Broadband Tape & Reel Specifications**



Case Size	W	P0	P1	E	F	Type	Tape Material	Tape Size	Quantity per Reel
01005BB	4.0	2.0	1.0	0.9	1.8	W4P1 Embossed Taping	Plastic	4mm	40,000

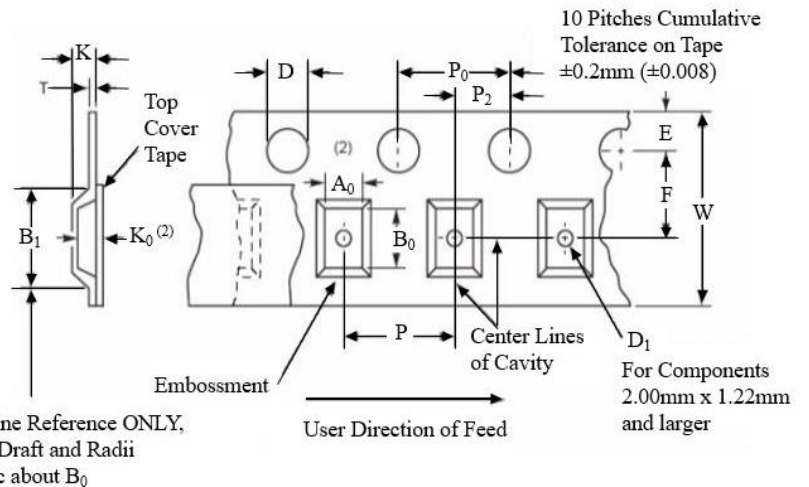


≠ 0201BB – 0805BB Broadband Tape & Reel Specifications



Case Size	Tape Material	Tape Size	Quantity per Reel
0201BB	Paper	8mm	15,000
0402BB	Paper	8mm	10,000
0603BB	Paper	8mm	4,000
0805BB	Paper	8mm	2,000- 4,000

B_1 Max	0.165 (4.20mm)
D_1 Min	0.039 (1.00mm)
F	0.138 ± 0.002 (3.50 ± 0.050 mm)
K Max	0.094 (2.40mm)
P_2	0.079 ± 0.002 (2.00 ± 0.050 mm)
R Min	0.984 (25mm)
W	0.315 ± 0.012 (8.00 ± 0.30 mm)
D	$0.059 + 0.004, -0.00$ ($1.5 + 0.10, -0.00$ mm)
E	0.069 ± 0.004 (1.75 ± 0.10 mm)
P_0	0.157 ± 0.004 (4.00 ± 0.10 mm)
t Max	0.016 (0.400mm)



A_0 B_0 K_0

- Determined by component size. Typical clearance between the cavity and the component is:
.05 (.002) min to .50 (.020) max for 8mm tape
- The component cannot rotate more than 20° within the determined cavity.



Broadband Resistors





Broadband Resistors

R35-1209BB50R00FxxQC

Product Features

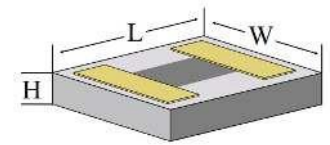
Case Size	Std. Resistance
1209	50Ω

Mechanical Dimensions

L = 0.012" ± 0.001" (0.305mm ± 0.051mm)
 W = 0.009" ± 0.001" (0.229mm ± 0.051mm)
 H = 0.005" ± 0.001" (0.127mm ± 0.025mm)



Style: 1 Recessed Pad

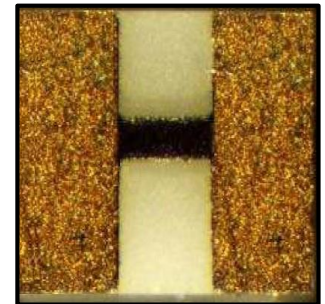


1% standard tolerance (other tolerances available)

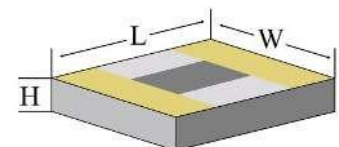
Specifications

Operating Frequency	DC to 67 GHz
Operating Temperature Range	-55°C to +150°C
Resistive Material	Tantalum Nitride (TaN)
Temperature Coefficient	±150 ppm/°C standard
Resistance Tolerance	±1% standard
Substrate	Alumina (Al ₂ O ₃) other substrates available
Metallization	A = Tantalum/Palladium/Gold (TaN/Pd/Au) R = Titanium/Platinum/Gold (Ti/Pt/Au)
Power Derating <i>See Chart at Right</i>	Full power up to 70°C Derated linearly to zero power at 150°C

*All PPI Thin Film parts are Non-Magnetic

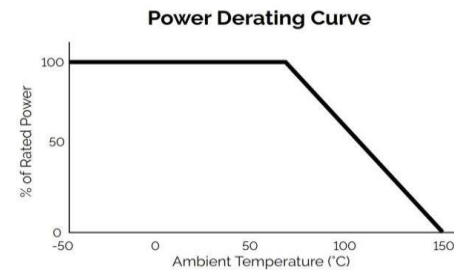
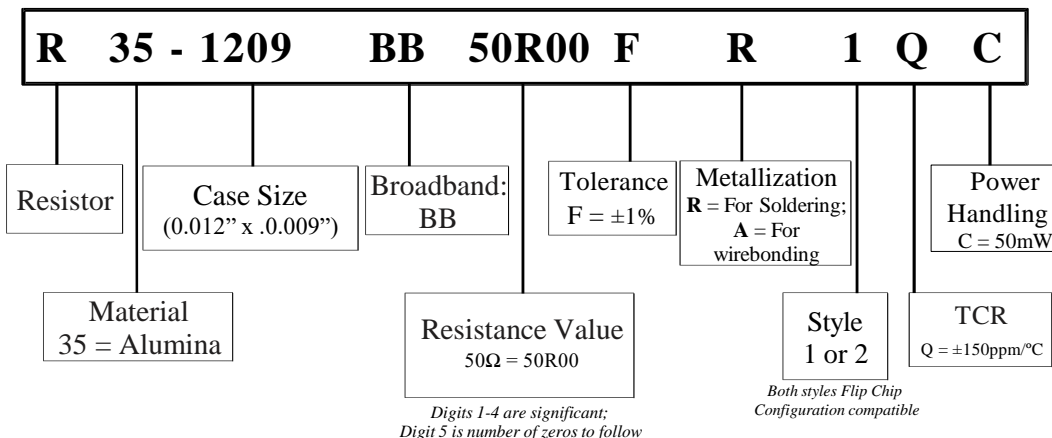


Style: 2 Full Pad



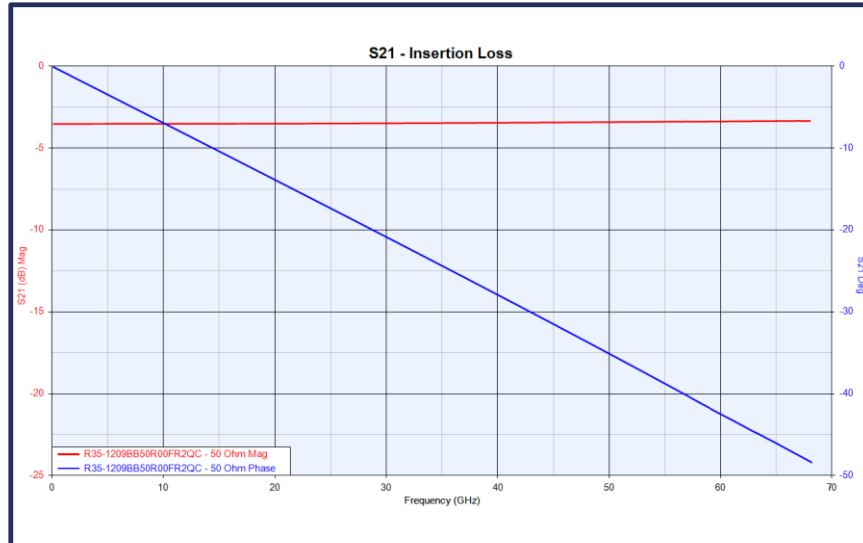
1% tolerance only

Part Numbering

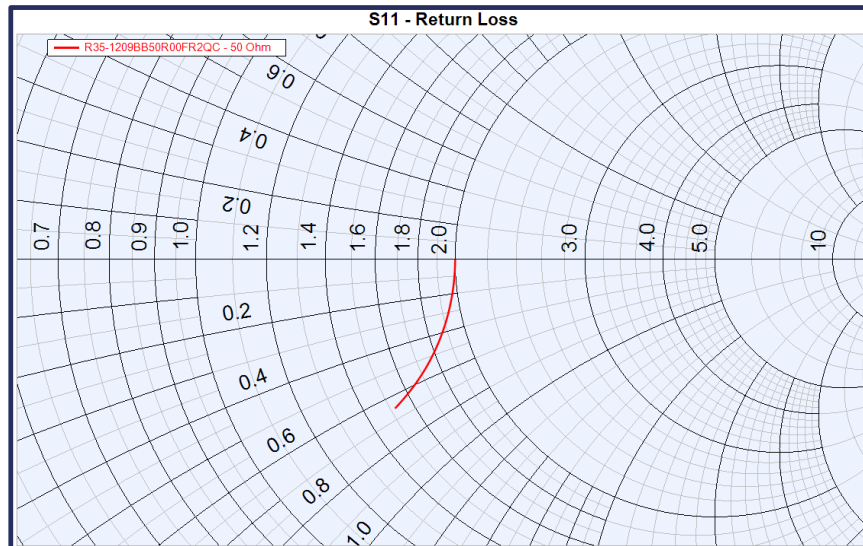


Performance Curves - Insertion and Return Loss Charts

12 x 09 50 Ω Insertion Loss



12 x 09 50 Ω Return Loss



Simulated Test Conditions / Pad Dimensions / Dielectric

Modelithics calculated data for 50 Ohm and 100 Ohm resistors from 0.1 to 67.0 GHz on 4 mil Rogers 4350B, Dielectric constant = 4.15. The pad dimensions used to develop the datasheet plots were: Length = 4.0 (0.102), Width = 10.0 (0.254), Gap = 5.0 (0.127). Units in mil (mm). Reference planes were at the pad edges.

Packaging

Parts are delivered in Waffle Packs.
Contact PPI for additional packaging options.



Broadband Resistors

R35-1209BB100R0FxxQC

Product Features

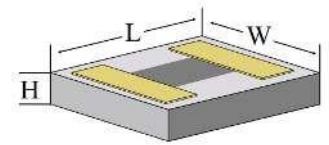
Case Size	Std. Resistance
1209	100Ω

Mechanical Dimensions

L = 0.012" ± 0.001" (0.305mm ± 0.051mm)
 W = 0.009" ± 0.001" (0.229mm ± 0.051mm)
 H = 0.005" ± 0.001" (0.127mm ± 0.025mm)



Style: 1 Recessed Pad

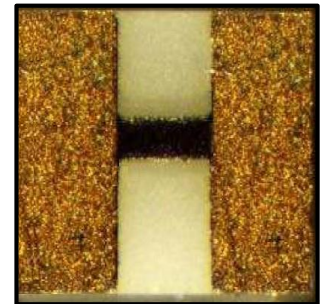


1% standard tolerance (other tolerances available)

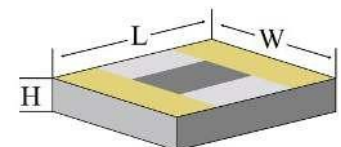
Specifications

Operating Frequency	DC to 67 GHz
Operating Temperature Range	-55°C to +150°C
Resistive Material	Tantalum Nitride (TaN)
Temperature Coefficient	±150 ppm/°C standard
Resistance Tolerance	±1% standard
Substrate	Alumina (Al ₂ O ₃) other substrates available
Metallization	A = Tantalum/Palladium/Gold (TaN/Pd/Au) R = Titanium/Platinum/Gold (Ti/Pt/Au)
Power Derating <i>See Chart at Right</i>	Full power up to 70°C Derated linearly to zero power at 150°C

*All PPI Thin Film parts are Non-Magnetic

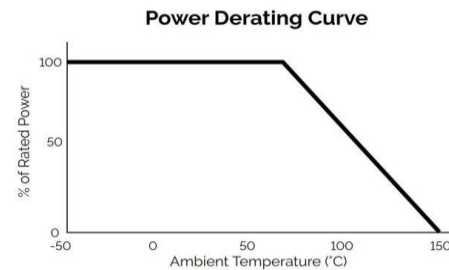
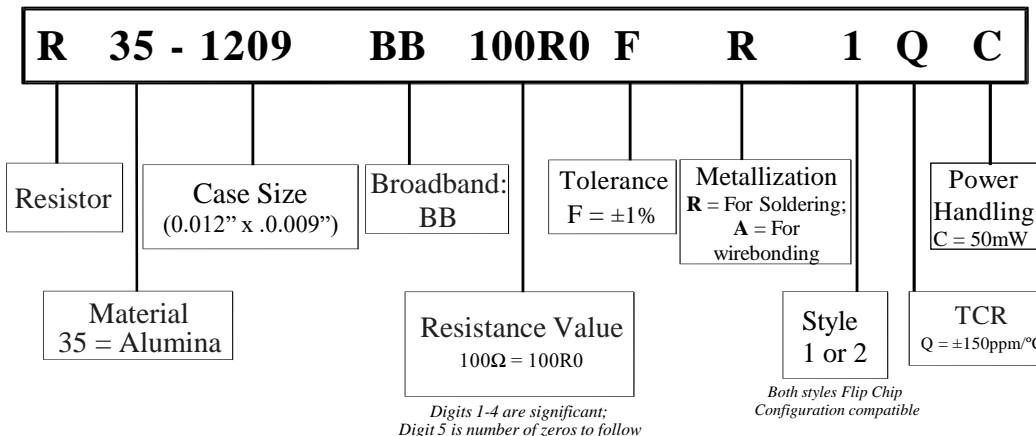


Style: 2 Full Pad



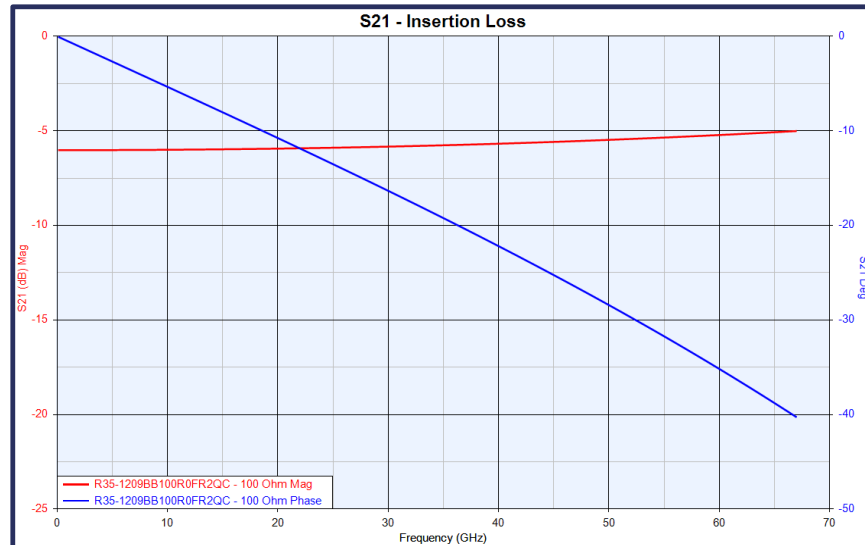
1% tolerance only

Part Numbering

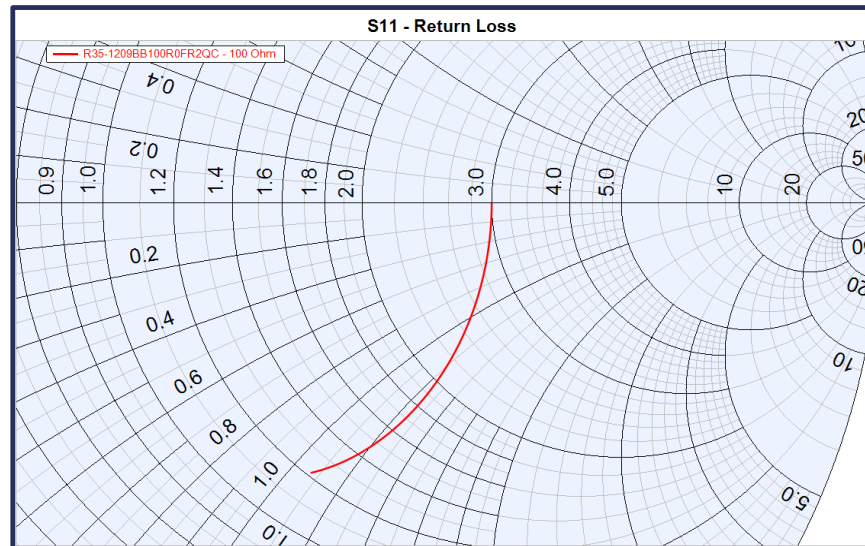


Performance Curves - Insertion and Return Loss Charts

12 x 09 100 Ω Insertion Loss



12 x 09 100 Ω Return Loss



Simulated Test Conditions / Pad Dimensions / Dielectric

Modelithics calculated data for 50 Ohm and 100 Ohm resistors from 0.1 to 67.0 GHz on 4 mil Rogers 4350B, Dielectric constant = 4.15. The pad dimensions used to develop the datasheet plots were: Length = 4.0 (0.102), Width = 10.0 (0.254), Gap = 5.0 (0.127). Units in mil (mm). Reference planes were at the pad edges.

Packaging

Parts are delivered in Waffle Packs.
Contact PPI for additional packaging options.

Product Features

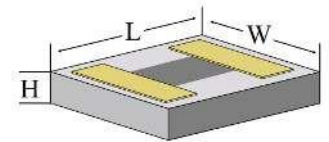
Case Size	Std. Resistance
2010	50Ω

Mechanical Dimensions

L = 0.020" ± 0.002" (0.508mm ± 0.051mm)
 W = 0.010" ± 0.001" (0.254mm ± 0.051mm)
 H = 0.010" ± 0.001" (0.254mm ± 0.025mm)



Style: 1 Recessed Pad

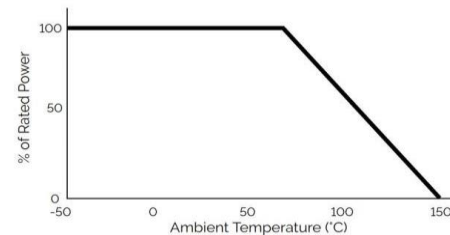


1% standard tolerance (other tolerances available)

Specifications

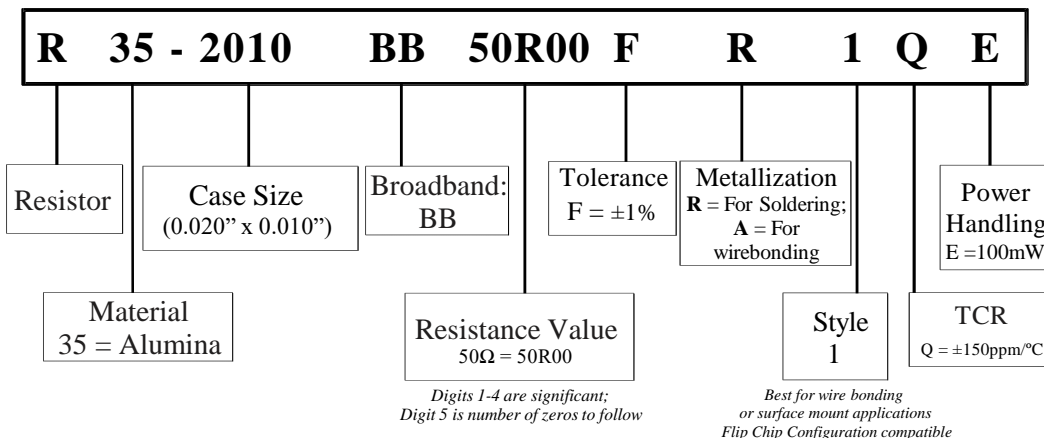
Operating Frequency	DC to 67 GHz
Operating Temperature Range	-55°C to +150°C
Resistive Material	Tantalum Nitride (TaN)
Temperature Coefficient	±150 ppm/°C standard
Resistance Tolerance	±1% standard
Substrate	Alumina (Al ₂ O ₃) other substrates available
Metallization	A = Tantalum/Palladium/Gold (TaN/Pd/Au) R = Titanium/Platinum/Gold (Ti/Pt/Au)
Power Derating <i>See Chart at Right</i>	Full power up to 70°C Derated linearly to zero power at 150°C

Power Derating Curve

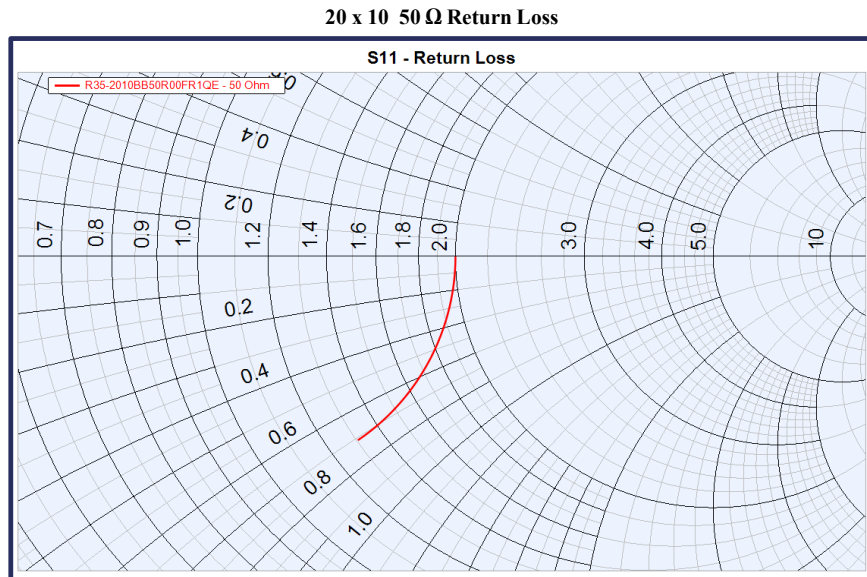
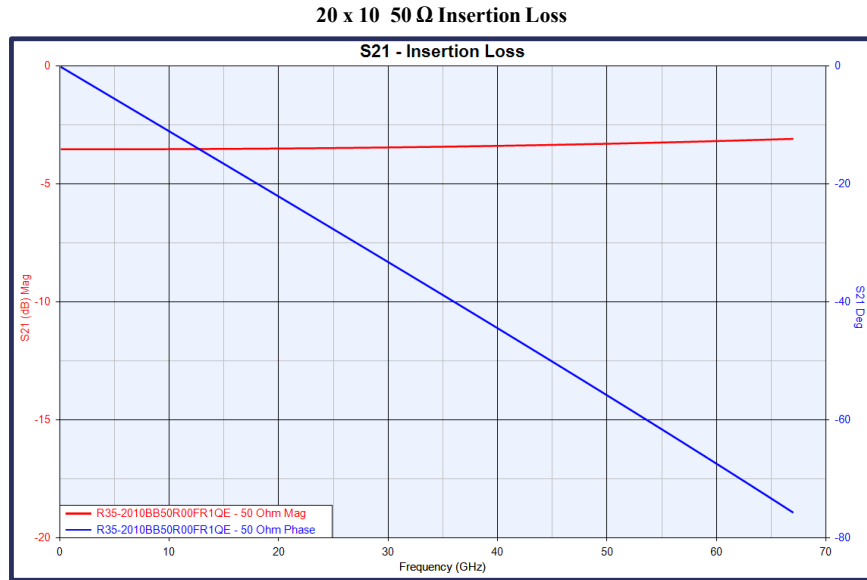


*All PPI Thin Film parts are Non-Magnetic

Part Numbering



Performance Curves - Insertion and Return Loss Charts



Simulated Test Conditions / Pad Dimensions / Dielectric

Modelithics calculated data for 50 Ohm and 100 Ohm resistors from 0.1 to 67.0 GHz on 4 mil Rogers 4350B, Dielectric constant = 4.15. The pad dimensions used to develop the datasheet plots were: Length = 4.0 (0.102), Width = 10.0 (0.254), Gap = 13.0 (0.330). Units in mil (mm). Reference planes were at the pad edges.

Packaging

Parts are available in Waffle Packs and Tape & Reel. Contact PPI for additional packaging options.

Product Features

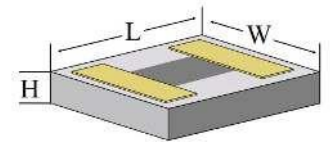
Case Size	Std. Resistance
2010	100Ω

Mechanical Dimensions

L = 0.020" ± 0.002" (0.508mm ± 0.051mm)
 W = 0.010" ± 0.001" (0.254mm ± 0.051mm)
 H = 0.010" ± 0.001" (0.254mm ± 0.025mm)



Style: 1 Recessed Pad

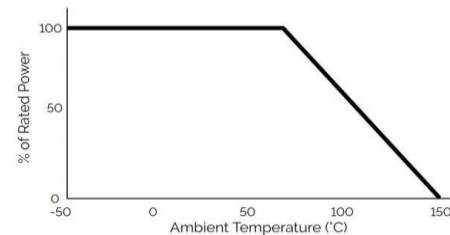


1% standard tolerance (other tolerances available)

Specifications

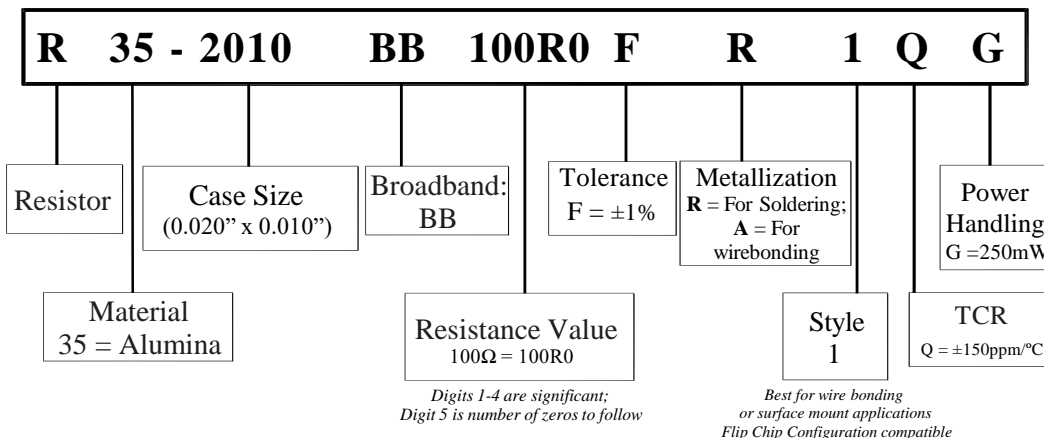
Operating Frequency	DC to 67 GHz
Operating Temperature Range	-55°C to +150°C
Resistive Material	Tantalum Nitride (TaN)
Temperature Coefficient	±150 ppm/°C standard
Resistance Tolerance	±1% standard
Substrate	Alumina (Al ₂ O ₃) other substrates available
Metallization	A = Tantalum/Palladium/Gold (TaN/Pd/Au) R = Titanium/Platinum/Gold (Ti/Pt/Au)
Power Derating <i>See Chart at Right</i>	Full power up to 70°C Derated linearly to zero power at 150°C

Power Derating Curve



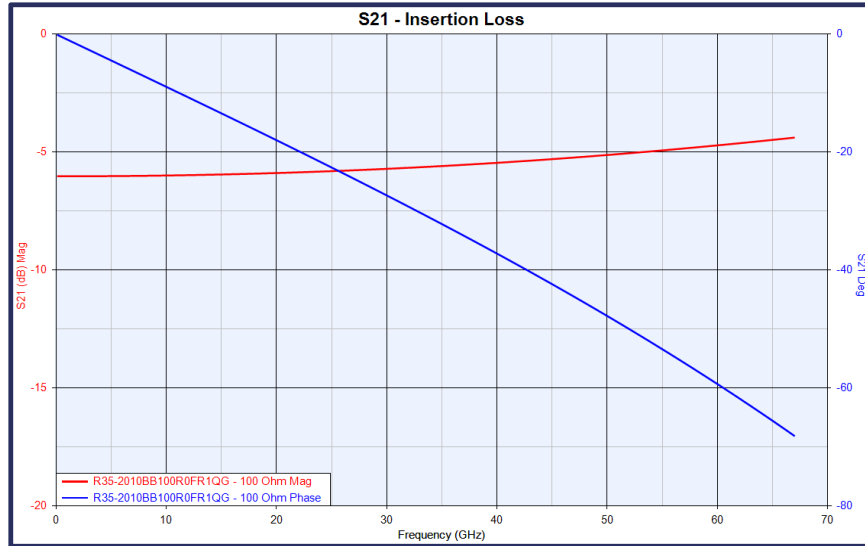
*All PPI Thin Film parts are Non-Magnetic

Part Numbering

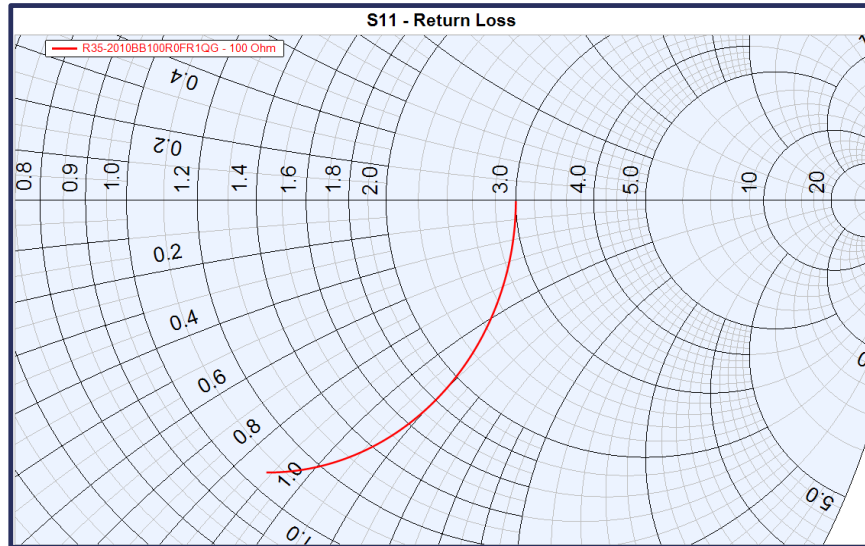


Performance Curves - Insertion and Return Loss Charts

20 x 10 100 Ω Insertion Loss



20 x 10 100 Ω Return Loss



Simulated Test Conditions / Pad Dimensions / Dielectric

Modelithics calculated data for 50 Ohm and 100 Ohm resistors from 0.1 to 67.0 GHz on 4 mil Rogers 4350B, Dielectric constant = 4.15. The pad dimensions used to develop the datasheet plots were: Length = 4.0 (0.102), Width = 10.0 (0.254), Gap = 13.0 (0.330). Units in mil (mm). Reference planes were at the pad edges.

Packaging

Parts are available in Waffle Packs and Tape & Reel. Contact PPI for additional packaging options.



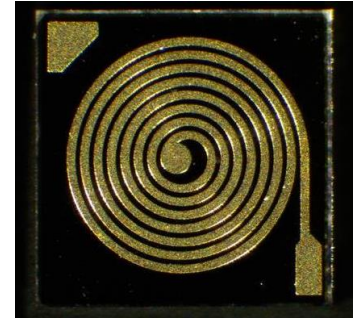
Thin Film Spiral Inductors





Spiral Inductors

PPI Spiral Inductors consist of a thin film gold spiral patterned on a substrate for use in a wide variety of uses, including storing electrical energy in the form of magnetic energy, in frequencies from DC to RF.



50x50 Spiral Inductor

An optional polyimide coating over the coil is available for increased resistance to scratches or shorts. Non-conductive epoxy is recommended as a mounting method, backside metallization is also available. A second corner pad is provided for easy wire-bonding from the center pad for edge-contact mounting.

Product Features

- High Thermal Conductivity
- Low Thermal Resistance
- Low Capacitance
- Less Resistive & Capacitive losses
- RoHS Compliant
- EIA case sizes
- More efficient thermal management

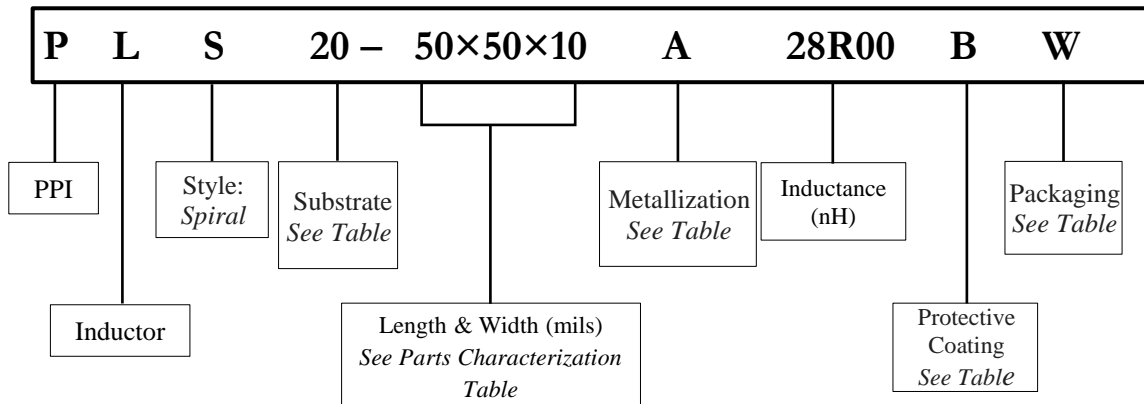
Applications

- Microwave Circuit Resonant elements
- Electrical Power & Electronic Devices

Functional Applications

- Choking, Blocking, Attenuating, or filtering/smoothing high frequency noise
- Storing & transferring energy in power converters
- Creates tuned oscillators or LC “tank” circuits
- Impedance matching

Part Numbering

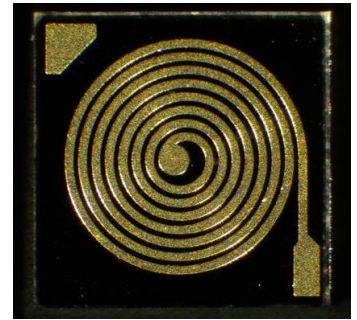


Other inductance values, DC resistance values, substrates, geometries, metallizations, and custom inductors are available.



Parts Characterizations

Case Size (Mils)	Inductances	# of Turns	DC Resistance	Q (@ 200MHz)	Q (@ 500MHz)
25 x 25	1.2 nH	1.5	0.6Ω	3	7
25 x 25	2.0 nH	2.0	0.9Ω	3	8
25 x 25	3.0 nH	2.5	1.2Ω	4	9
30 x 30	4.4 nH	3.0	1.5Ω	4	10
30 x 30	6.0 nH	3.5	1.9Ω	4	11
30 x 30	7.9 nH	4.0	2.3Ω	4	11
40 x 40	10 nH	4.5	2.7Ω	5	12
40 x 40	13 nH	5.0	3.2Ω	5	12
40 x 40	16 nH	5.5	3.7Ω	5	13
40 x 40	19 nH	6.0	4.2Ω	6	13
40 x 40	23 nH	6.5	4.7Ω	6	14
50 x 50	28 nH	7.0	5.3Ω	7	14



50x50 Spiral Inductor



Substrates

Code	Substrate
20	Quartz
35	99.6% Alumina (Al ₂ O ₃)



Metallizations

Metallization		Code	Note
Top Side	Bottom Side		
Ta/Pd/Au	—	A	Wirebondable
Ta/Pd/Au	Ta/Pd/Au	D	Wirebond or Epoxy

Other metallizations available. Please contact PPI.



Inductance Codes

Inductance (nH)
Digits 1-4 are significant figures
The "R" is used as a decimal point.
e.g. 28R0 = 28nH, 1R50 = 1.5nH

Inductance values are computed in free air, using a magnetic permeability for free air of $\mu = 4.0 \times 10^{-7}$. DC resistance is based on a gold metallization.



Protective Coating

Code	Polyimide Coating
B	Without Coating
P	With Polyimide Coating



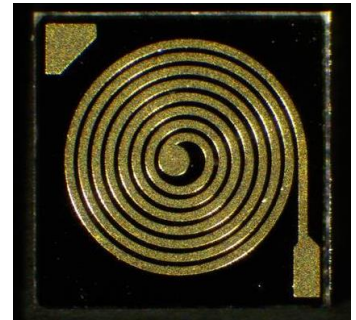
Packaging

Code	Style
W	Waffle Pack (Standard)
G	Gel Pack

All parts are supplied in waffle packs. Other packaging may be available. Contact PPI for additional packaging options.

General Properties

Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Operating Frequency	DC to 500 MHz
Insulation Resistance	10 ¹² Ω · min at 25°C



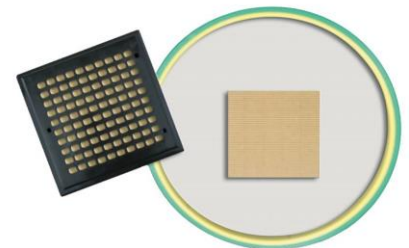
50x50 Spiral Inductor

Testing

Testing Performed	Specification / Standard
Visual Inspection	MIL-PRF-55342 MIL-STD-883
Mechanical Inspection	MIL-PRF-55342
DC Resistance	MIL-PRF-55342 MIL-STD-202
High Temperature Exposure	MIL-PRF-55342
Thermal Shock	MIL-PRF-55342 MIL-STD-202
Resistance to Bonding Exposure	MIL-PRF-55342
Wire Bonding Integrity	MIL-PRF-55342
Life Test	MIL-PRF-55342 MIL-STD-202

Performance Specifications

Additional sizes and custom inductors available. Please contact sales@passiveplus.com.



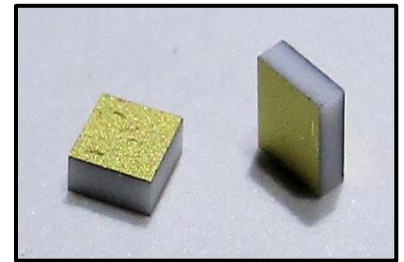


Single Layer Capacitors



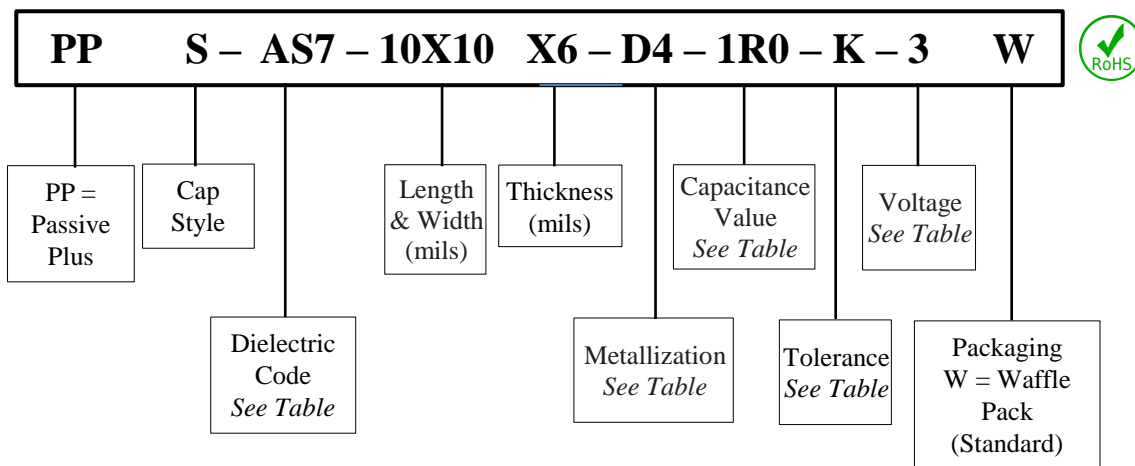
≠ Product Features

PPI offers Standard Edge to Edge SLC with tight tolerances to the required size, shape and value. Thicknesses of up to 25+ mils are available utilizing temperature-stable low-loss materials and special terminations to improve the all solder process. Chip size, shape and electrical properties may be determined from the dielectric material.



- Capacitance: 0.04 to 10,000pF
- Square or rectangle, length or width .005” and up

≠ Part Numbering



≠ Substrates

Substrates can be supplied as follows:

- **Bare**
- **Metallized:**
 - Gold over Platinum, Palladium, or Nickel
 - Silver over Platinum
 - Custom schemes and patterns to Customer specifications

Thickness Range 3 mils +

Length and Width Up to 4" depending on material

≠ Standard Electrode Metallizations

Gold (D4) This metallization consists of a minimum of 70 micro-inches of Gold over Platinum or Nickel which is ideal for all wirebonding methodologies.

Silver (S7) This metallization consists of 20 micro-inches of Silver over Platinum which is ideal for all solder applications whenever the use of Gold is unacceptable.



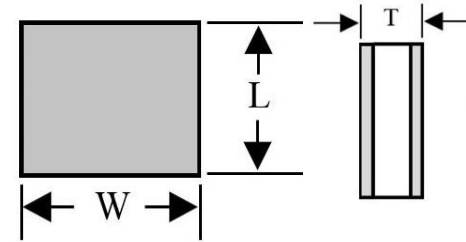
≠ Metallization Codes

Code	Description
D4	Ti/Pt/Au Titanium/Platinum/Gold (70 μin Gold)
S7	Ti/Pt/Ag Titanium/Platinum/Silver (20 μin Silver)
K2	Ta/Pd/Au Tantalum/Palladium/Gold (75 μin Gold)
L3	Ta/Pd/Au Tantalum/Palladium/Gold (100 μin Gold)

Contact PPI for available metallizations.

≠ Capacitance Codes

Value	Code
<10pF	1R0 = 1.0pF
>10pF	101 = 100pF



≠ Capacitance Tolerance & Dimensional Tolerances Codes

Class I Dielectrics: AS1 - KS2			
Tolerance	Code	Tolerance	Code
± .50pF	D	± 20%	M
± .25pF	C	± 15%	L
± .10pF	B	± 10%	K
± .05pF	A	± 5%	J
± .01pF	P	± 3%	H
		± 2%	G

Material	L or W Dimension	Tolerance
AS1 - ZS1	< 20 mils	±15%
	≥ 20 mils	±10%

Class II Dielectrics: MS1 - ZS4			
Tolerance	Code	Tolerance	Code
-10% thru +40%	Y	± 20%	M
-20% thru +80%	Z	± 15%	L
0% thru +100%	V	± 10%	K
Guaranteed Min. Value	GMV	± 5%	J

Material	L or W Dimension	Tolerance
ZS4 - ZS6	≤ 15 mils	± 2 mils
	> 15 mils; ≤ 30 mils	± 3 mils
	> 30 mils	± 5 mils

≠ Rated Voltage Codes

Code	Voltage	Dielectric Thickness
2	50V	4 mils
3	100V	6 mils

≠ Packaging

PPI SLCs are available in Waffle Packs (Standard).
Other packaging options may be available.
Please contact PPI.

**≠ Dielectric Materials – Class I**

Dielectrics below consist of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects and high insulation and dielectric breakdown.

Type	IR Min @ 25°C	Temperature Coefficient (-25 to 125°C)	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
AS1	10 ¹²	Negligible	0.0001	3.8	Quartz
AS2	10 ¹²	Negligible	0.0001	3.9	Si
AS3	10 ¹²	Negligible	0.0001	6.6	BeO
AS6	10 ¹²	P120 ± 25ppm	0.0001	8.7	AlN
AS7	10 ¹²	P180 ± 50ppm	0.0006	9.6	Alumina 96
AS8	10 ¹²	P180 ± 50ppm	0.0006	9.8	Alumina 99.6
BS2	10 ¹²	NP0 ± 30ppm	0.0001	12.6	Titanate
CS1	10 ¹²	0 ± 30ppm	0.001	20	Titanate
ES1	10 ¹²	0 ± 30ppm	0.002	40	Titanate
FS1	10 ¹²	0 ± 30ppm	0.005	50	Titanate
IS1	10 ¹⁵	0 ± 30ppm	0.005	84	Titanate
KS3	10 ⁶	N1500 ± 500ppm	0.0025	160	Titanate

**± Dielectric Materials – Class II**

Dielectrics below are characterized by high dielectric constants, increased losses and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where a small chip is necessary. Used as a bypass capacitor, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	IR (MEG-OHMs) 100VDC @ 25°C	Temperature Coefficient (-55 to 125°C)	Dissipation Factor (@ 1 MHz)	Aging (%) HR/Decade	Dielectric Constant (K)
MS1	10 ⁵	5 to -10	0.010	2.0	300
PS1	10 ⁴	± 10%	0.025	3.0	700
SS3	10 ⁵	3 to -10	0.015	3.5	2,200
US1	10 ⁵	0 to -35	0.020	3.0	4,000
US3	10 ⁵	3.0	0.025	3.0	5,000
RS2	10 ⁴	± 10%	0.025	3.0	1250
ZS1	10 ⁵	0 to -80	0.025	3.0	11,000
ZS4	<i>Contact PPI</i>	15 to -15	0.035	3.0	25,000
ZS6	<i>Contact PPI</i>	15 to -15	0.035	3.0	35,000
US3	10 ⁵	± 15%	0.030	3.0	4500



≠ Capacitance, Case Size & Dielectric Availability - Class I Dielectrics

Cap (pF)	Size mils (mm)																	
	10x10		12x12		15x15		20x20		25x25		30x30		35x35		40x40		50x50	
	(.254 x .254)		(.305 x .305)		(.381 x .381)		(.508 x .508)		(.635 x .635)		(.762 x .762)		(.889 x .889)		(1.016 x 1.016)		(1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
0.04	AS7	5	AS7	6	AS7	10												
0.06	AS7	4	AS7	5	AS7	8	AS2	5	AS2	10								
0.08	ES1	10	AS7	4	AS7	6	AS7	10	AS2	7	AS2	9						
0.1	ES1	8	ES1	11	AS7	5	AS7	9	AS2	5	AS2	7	AS2	10				
0.2	ES1	5	ES1	7	ES1	10	AS7	4	AS7	7	AS7	10	AS2	5	AS2	7	AS2	10
0.3	IS1	6	ES1	4	ES1	6	ES1	11	AS7	4	AS7	7	AS7	9	AS2	5	AS2	7
0.4	IS1	5	IS1	7	ES1	5	ES1	9	ES1	15	AS7	5	AS7	7	AS7	9	AS2	5
0.5	IS1	4	IS1	5	ES1	4	ES1	7	ES1	11	AS7	5	AS7	5	AS7	7	AS2	4
0.6	KS2	6	IS1	5	IS1	7	ES1	6	ES1	10	ES1	15	AS7	4	AS7	6	AS7	9
0.8	MS1	8	KS2	6	IS1	5	ES1	5	ES1	7	ES1	10	ES1	15	AS7	4	AS7	7
1.0	MS1	7	KS2	5	IS1	4	IS1	7	ES1	6	ES1	8	ES1	10	AS7	4	AS7	5
1.2	MS1	6	KS2	4	IS1	4	IS1	6	ES1	5	ES1	7	ES1	9	AS7	3	AS7	5
1.5	MS1	5	MS1	7	KS2	5	IS1	5	ES1	4	ES1	6	ES1	7	ES1	10	AS7	4
1.8	MS1	4	MS1	5	KS2	4	IS1	4	IS1	6	ES1	5	ES1	6	ES1	8	ES1	11
2.0	MS1	4	MS1	5	KS2	4	KS2	7	IS1	6	ES1	4	ES1	5	ES1	7	ES1	11
2.2	RS1	4	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7	ES1	5	ES1	7	ES1	10
2.7	RS1	8	MS1	4	MS1	6	KS2	5	IS1	4	IS1	6	ES1	4	ES1	5	ES1	8
3.3	RS1	7	RS1	10	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7	ES1	4	ES1	7
3.9	RS1	6	RS1	9	MS1	4	MS1	7	KS2	5	IS1	4	IS1	6	IS1	8	ES1	6
4.7	RS1	5	RS1	7	RS1	11	MS1	6	KS2	4	KS2	6	IS1	5	IS1	6	ES1	5
5.6	RS1	4	RS1	6	RS1	10	MS1	5	MS1	7	KS2	5	IS1	4	IS1	5	ES1	4
6.8	RS1	4	RS1	5	RS1	8	MS1	4	MS1	6	KS2	5	KS2	6	IS1	4	IS1	7
8.2	SS3	6	RS1	4	RS1	7	MS1	4	MS1	5	KS2	4	KS2	5	KS2	7	KS2	10
10	SS3	5	RS1	4	RS1	5	RS1	9	MS1	4	MS1	6	KS2	4	KS2	5	KS2	8
12	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	5	MS1	7	KS2	4	KS2	7
15	US1	6	SS3	5	RS1	4	RS1	6	RS1	10	MS1	4	MS1	6	MS1	7	KS2	6
18	US1	5	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	4	MS1	6	KS2	5
20	US1	5	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	4	MS1	5	KS2	4
22	US1	4	US1	6	SS3	5	RS1	4	RS1	7	RS1	9	MS1	4	MS1	5	KS2	4

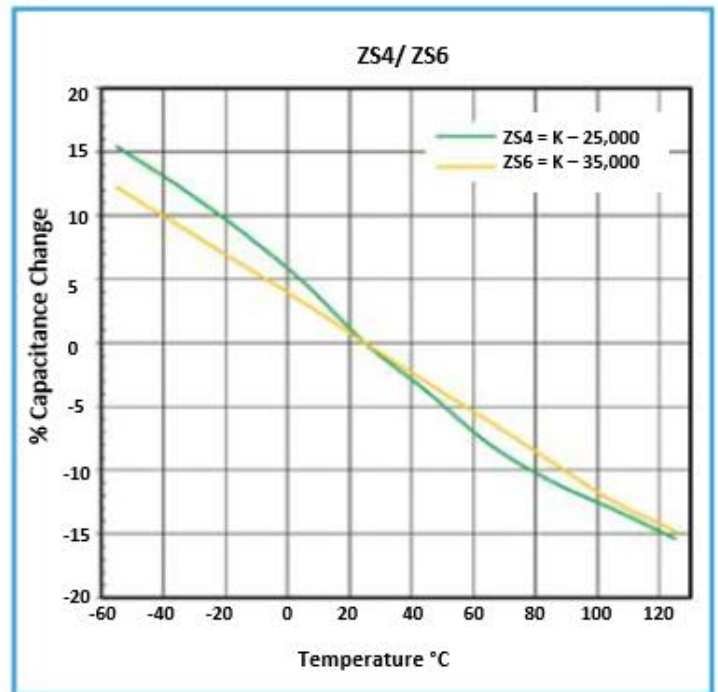
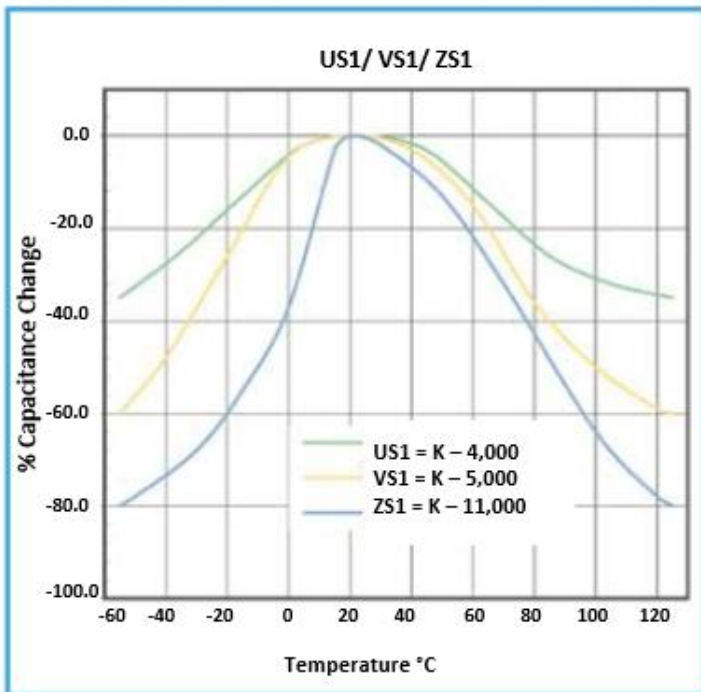
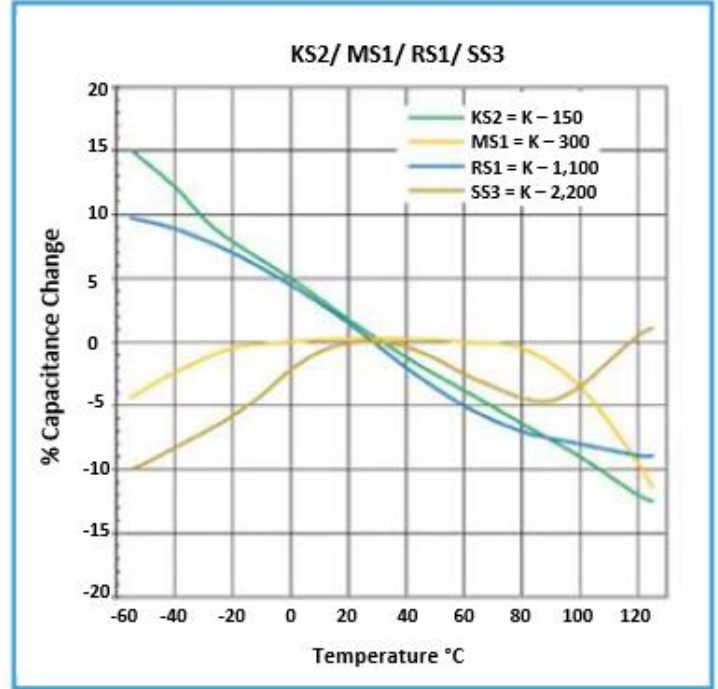
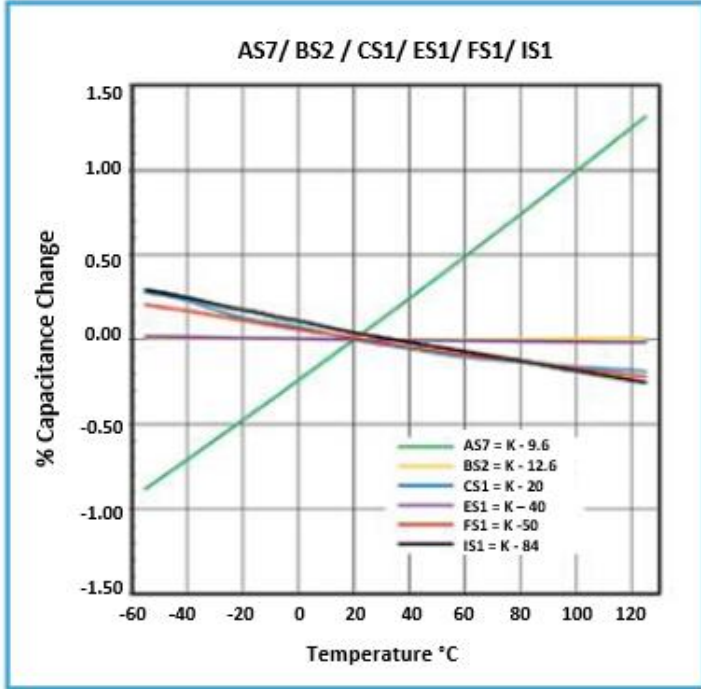
Shaded cells indicate Class II Dielectrics



± Capacitance, Case Size & Dielectric Availability – Class II Dielectrics

Cap (pF)	Size mils (mm)																	
	10x10 (.254 x .254)		12x12 (.305 x .305)		15x15 (.381 x .381)		20x20 (.508 x .508)		25x25 (.635 x .635)		30x30 (.762 x .762)		35x35 (.889 x .889)		40x40 (1.016 x 1.016)		50x50 (1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
27	US1	4	US1	5	SS3	4	RS1	4	RS1	6	RS1	8	MS1	3	MS1	4	MS1	6
33	VS1	4	US1	4	US1	6	SS3	6	RS1	5	RS1	6	RS1	11	MS1	4	MS1	5
39	ZS1	6	US1	4	US1	5	SS3	5	RS1	4	RS1	5	RS1	7	RS1	10	MS1	4
47	ZS1	5	ZS1	7	US1	5	SS3	4	SS3	6	RS1	5	RS1	6	RS1	8	MS1	4
56	ZS1	4	ZS1	6	VS1	5	US1	7	SS3	5	RS1	4	RS1	5	RS1	7	RS1	10
68	ZS1	4	ZS1	5	VS1	4	US1	6	SS3	5	SS3	6	RS1	4	RS1	6	RS1	9
82	ZS4	7	ZS1	4	ZS1	7	VS1	6	SS3	4	SS3	5	SS3	7	SS3	10	RS1	7
100	ZS4	6	ZS4	8	ZS1	6	VS1	5	US1	6	SS3	5	SS3	6	SS3	8	RS1	6
120	ZS4	5	ZS4	7	ZS1	5	ZS1	8	VS1	6	SS3	4	SS3	5	SS3	7	RS1	5
150	ZS4	4	ZS4	5	ZS1	4	ZS1	7	VS1	5	VS1	7	SS3	4	SS3	5	RS1	4
180	ZS6	4	ZS4	5	ZS4	7	ZS1	6	VS1	4	VS1	6	VS1	8	US1	8	SS3	7
200	ZS6	4	ZS4	4	ZS4	6	ZS1	5	ZS1	8	VS1	5	VS1	7	US1	7	SS3	6
220	ZS6	4	ZS6	5	ZS4	6	ZS1	4	ZS1	7	VS1	5	VS1	6	US1	6	SS3	6
270			ZS6	4	ZS4	5	ZS4	8	ZS1	6	VS1	4	VS1	5	US1	5	SS3	5
330					ZS4	4	ZS4	7	ZS1	5	ZS1	7	VS1	4	US1	4	US1	7
390					ZS6	4	ZS4	6	ZS1	4	ZS1	6	ZS1	7	ZS1	10	US1	6
470					ZS6	4	ZS4	5	ZS4	7	ZS1	5	ZS1	6	ZS1	8	US1	5
560							ZS4	4	ZS4	6	ZS1	4	ZS1	5	ZS1	7	US1	4
680							ZS6	5	ZS4	5	ZS4	8	ZS1	5	ZS1	6	VS1	4
820							ZS6	4	ZS6	6	ZS4	6	ZS1	4	ZS1	5	ZS1	7
1000									ZS6	5	ZS4	5	ZS4	7	ZS1	4	ZS1	6
1200									ZS6	4	ZS4	4	ZS4	6	ZS4	7	ZS1	5
1500											ZS6	5	ZS4	5	ZS4	6	ZS1	4
1800											ZS6	4	ZS6	6	ZS4	5	ZS4	8
2200													ZS6	5	ZS4	4	ZS4	6
2700													ZS6	4	ZS6	5	ZS4	5
3300																	ZS6	6

⊕ Typical Temperature Characteristics



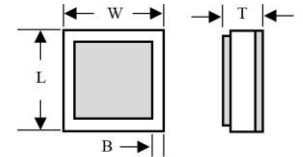


≠ Product Features

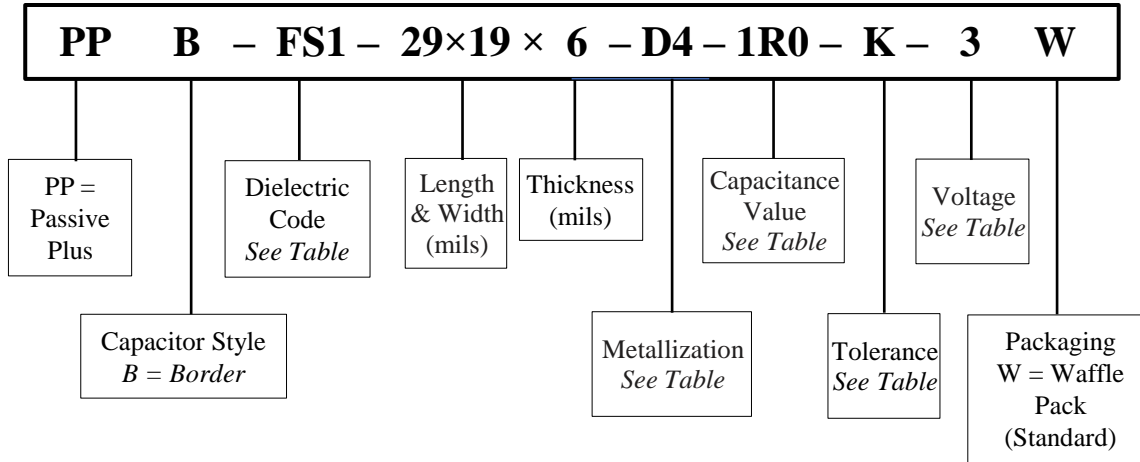
Border Caps have the topside electrode withdrawn from the edges in order to increase the distance between electrodes and dramatically decrease the possibilities of shorting when epoxy die-mounting. This style is also widely used for optical recognition-based assembly.



Increased margin sizes and special terminations are available for high power LC filter applications. Border Caps can be customized to any sized square or rectangle. Contact PPI for more information.



≠ Part Numbering



≠ Thicknesses (mils)

Length & Width	L or W Tolerance	Margin Nominal	Thickness
≤ .010	± .002	0.001	± .0015
.011 - .029	± .002	0.002	
≥ .030	± .003	0.002	

All dimensions given are inches

≠ Metallization Codes

Code	Description
D4	Ti/Pt/Au Titanium/Platinum/Gold (70 μin Gold)
S7	Ti/Pt/Ag Titanium/Platinum/Silver (20 μin Silver)
K2	Ta/Pd/Au Tantalum/Palladium/Gold (75 μin Gold)
L3	Ta/Pd/Au Tantalum/Palladium/Gold (100 μin Gold)

Contact PPI for available metallizations.



⚡ Substrates

Substrates can be supplied as follows:

- **Bare**
- **Metallized:**
 - Gold over Platinum, Palladium, or Nickel
 - Silver over Platinum
 - Custom schemes and patterns to Customer specifications

Thickness Range 3 mils +

Length and Width Up to 4” depending on material

⚡ Standard Electrode Metallizations

Gold (D4) This metallization consists of a minimum of 70 micro-inches of Gold over Platinum or Nickel which is ideal for all wirebonding methodologies.

Silver (S7) This metallization consists of 20 micro-inches of Silver over Platinum which is ideal for all solder applications whenever the use of Gold is unacceptable.

⚡ Capacitance Tolerance Codes

Class I Dielectrics: AS1 - KS2			
Tolerance	Code	Tolerance	Code
± .50pF	D	± 20%	M
± .25pF	C	± 15%	L
± .10pF	B	± 10%	K
± .05pF	A	± 5%	J
± .01pF	P	± 3%	H
		± 2%	G

Class II Dielectrics: MS1 – ZS6			
Tolerance	Code	Tolerance	Code
-10% thru +40%	Y	± 20%	M
-20% thru +80%	Z	± 15%	L
0% thru +100%	V	± 10%	K
Guaranteed Min. Value	GMV	± 5%	J

⚡ Capacitance Codes

Value	Code
<10pF	1R0 = 1.0pF
>10pF	101 = 100pF

⚡ Rated Voltage Codes

Code	Voltage	Dielectric Thickness
2	50V	4 mils
3	100V	6 mils

⚡ Packaging

PPI SLCs are available in Waffle Packs (Standard). Other packaging options may be available. Please contact PPI.

≠ Dielectric Materials – Class I

Dielectrics below consist of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects and high insulation and dielectric breakdown.

Type	IR Min @ 25°C	Temperature Coefficient (-25 to 125°C)	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
AS1	10 ¹²	Negligible	0.0001	3.8	Quartz
AS2	10 ¹²	Negligible	0.0001	3.9	Si
AS3	10 ¹²	Negligible	0.0001	6.6	BeO
AS6	10 ¹²	P120 ± 25ppm	0.0001	8.7	AlN
AS7	10 ¹²	P180 ± 50ppm	0.0006	9.6	Alumina 96
AS8	10 ¹²	P180 ± 50ppm	0.0006	9.8	Alumina 99.6
BS2	10 ¹²	NP0 ± 30ppm	0.0001	12.6	Titanate
CS1	10 ¹²	0 ± 30ppm	0.001	20	Titanate
ES1	10 ¹²	0 ± 30ppm	0.002	40	Titanate
FS1	10 ¹²	0 ± 30ppm	0.005	50	Titanate
IS1	10 ¹⁵	0 ± 30ppm	0.005	84	Titanate
KS3	10 ⁶	N1500 ± 500ppm	0.0025	160	Titanate

**± Dielectric Materials – Class II**

Dielectrics below are characterized by high dielectric constants, increased losses and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where a small chip is necessary. Used as a bypass capacitor, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	IR (MEG-OHMs) 100VDC @ 25°C	Temperature Coefficient (-55 to 125°C)	Dissipation Factor (@ 1 MHz)	Aging (%) HR/Decade	Dielectric Constant (K)
MS1	10 ⁵	5 to -10	0.010	2.0	300
PS1	10 ⁴	± 10%	0.025	3.0	700
SS3	10 ⁵	3 to -10	0.015	3.5	2,200
US1	10 ⁵	0 to -35	0.020	3.0	4,000
US3	10 ⁵	3.0	0.025	3.0	5,000
RS2	10 ⁴	± 10%	0.025	3.0	1250
ZS1	10 ⁵	0 to -80	0.025	3.0	11,000
ZS4	<i>Contact PPI</i>	15 to -15	0.035	3.0	25,000
ZS6	<i>Contact PPI</i>	15 to -15	0.035	3.0	35,000
US3	10 ⁵	± 15%	0.030	3.0	4500



± Capacitance, Case Size & Dielectric Availability - Class I Dielectrics

Cap (pF)	Size mils (mm)																	
	10x10 (.254 x .254)		12x12 (.305 x .305)		15x15 (.381 x .381)		20x20 (.508 x .508)		25x25 (.635 x .635)		30x30 (.762 x .762)		35x35 (.889 x .889)		40x40 (1.016 x 1.016)		50x50 (1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
0.04	AS7	4	AS7	4	AS7	5	AS1	5							Class I Dielectrics			
0.06	ES1	10	AS7	4	AS7	6	AS1	5	AS1	8	AS1	10						
0.08	ES1	7	ES1	10	AS7	5	AS7	10	AS1	6	AS1	8	AS1	11				
0.1	ES1	6	ES1	9	AS7	4	AS7	7	AS1	5	AS1	7	AS1	10				
0.2	IS1	4	ES1	4	ES1	5	AS7	4	AS7	5	AS7	7	AS1	4	AS1	5	AS1	10
0.3	KS2	6	IS1	5	ES1	4	ES1	8	AS7	4	AS7	5	AS7	7	AS1	4	AS1	6
0.4	KS2	4	IS1	4	IS1	6	ES1	6	ES1	10	AS7	4	AS7	5	AS7	7	AS1	5
0.5	MS1	5	KS2	4	IS1	5	ES1	4	ES1	7	ES1	10	AS7	4	AS7	6	AS7	10
0.6	MS1	5	KS2	5	IS1	4	ES1	4	ES1	6	ES1	10	AS7	4	AS7	5	AS7	7
0.8	MS1	5	MS1	5	KS2	5	IS1	6	ES1	5	ES1	7	ES1	10	AS7	4	AS7	6
1.0	MS1	4	MS1	5	KS2	4	IS1	5	ES1	4	ES1	6	ES1	8	ES1	10	AS7	5
1.2	RS1	6	MS1	5	MS1	7	IS1	4	IS1	7	ES1	5	ES1	7	ES1	10	AS7	4
1.5	RS1	7	MS1	4	MS1	6	KS2	6	IS1	6	IS1	8	ES1	6	ES1	7	ES1	15
1.8	RS1	6	MS1	4	MS1	5	KS2	5	IS1	5	IS1	7	ES1	5	ES1	7	ES1	10
2.0	RS1	6	RS1	8	MS1	4	KS2	5	IS1	5	IS1	6	ES1	4	ES1	6	ES1	10
2.2	RS1	5	RS1	7	MS1	4	MS1	7	KS2	7	IS1	6	ES1	4	ES1	5	ES1	10
2.7	RS1	5	RS1	6	MS1	4	MS1	6	KS2	6	IS1	6	IS1	8	ES1	5	ES1	8
3.3	SS3	6	RS1	6	RS1	8	MS1	5	KS2	5	IS1	4	IS1	6	IS1	7	ES1	6
3.9	SS3	5	RS1	5	RS1	7	MS1	4	KS2	4	KS2	6	IS1	5	IS1	6	ES1	5
4.7	SS3	5	RS1	5	RS1	7	MS1	4	MS1	6	KS2	5	IS1	4	IS1	5	IS1	8
5.6	SS3	5	SS3	6	RS1	5	MS1	4	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7
6.8	US1	5	SS3	6	RS1	5	RS1	8	MS1	5	MS1	7	KS2	5	KS2	7	IS1	6
8.2	US1	4	SS3	5	RS1	4	RS1	7	MS1	4	MS1	6	KS2	4	KS2	5	IS1	5
10	US1	5	SS3	4	SS3	6	RS1	6	MS1	4	MS1	5	MS1	6	KS2	5	IS1	4
12	US1	5	US1	6	SS3	5	RS1	5	RS1	8	MS1	4	MS1	6	KS2	4	KS2	6
15	US1	4	US1	5	SS3	5	RS1	5	RS1	7	MS1	4	MS1	5	MS1	6	KS2	5
18	VS1	4	VS1	6	US1	7	SS3	7	RS1	5	RS1	9	MS1	4	MS1	5	KS2	4
20	ZS1	5	VS1	5	US1	6	SS3	6	RS1	5	RS1	8	MS1	4	MS1	5	KS2	4

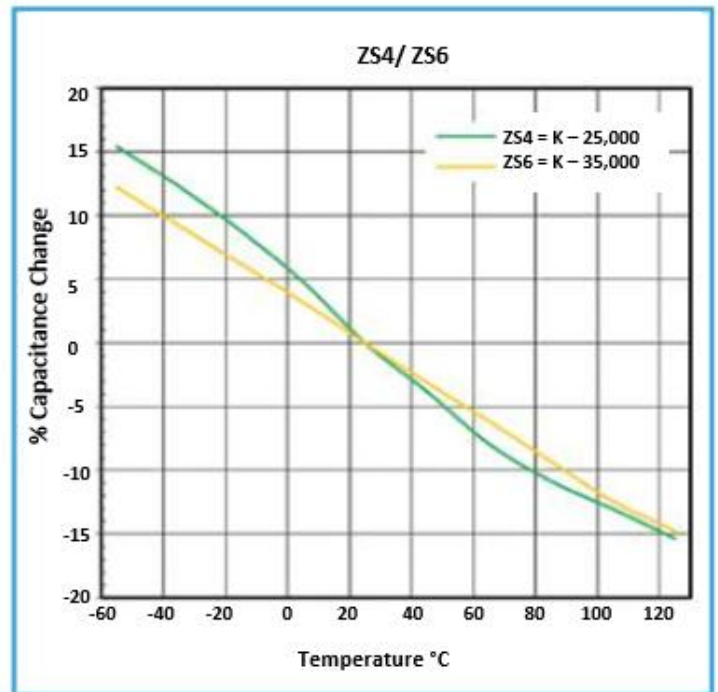
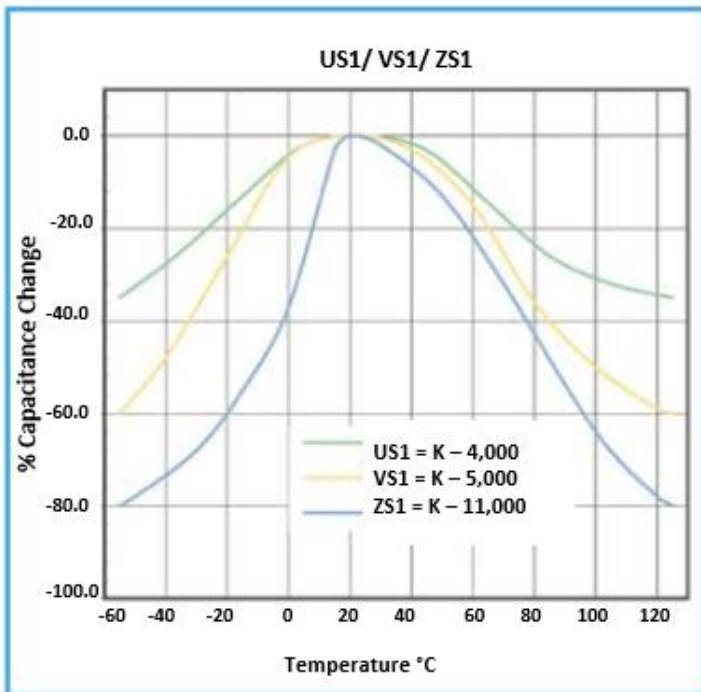
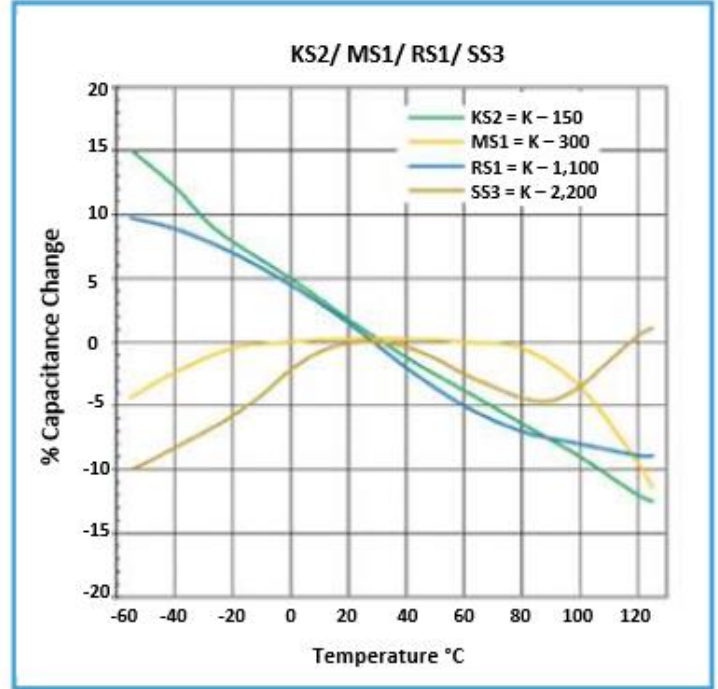
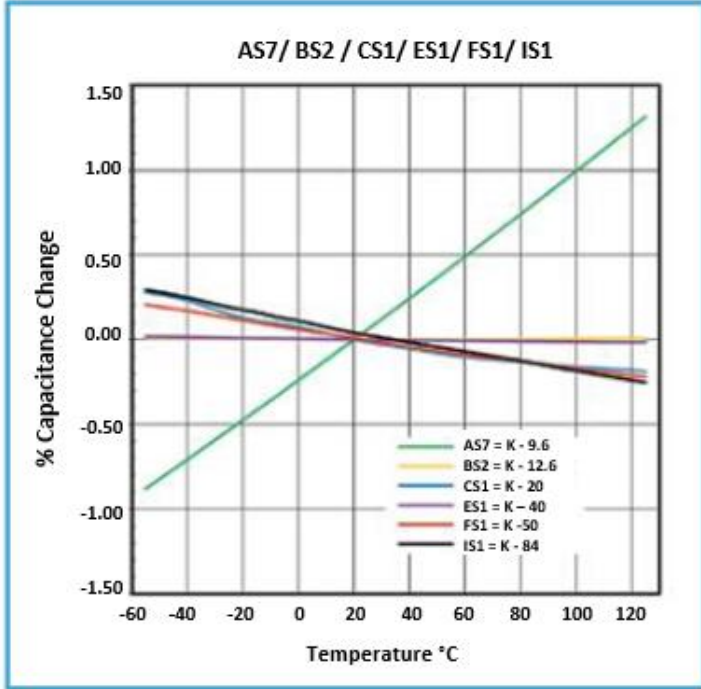
Shaded cells indicate Class II Dielectrics



± Capacitance, Case Size & Dielectric Availability – Class II Dielectrics

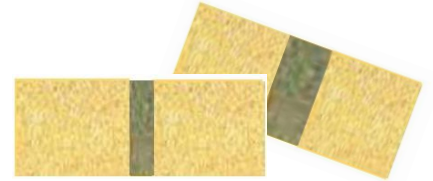
Cap (pF)	Size mils (mm)																	
	10x10		12x12		15x15		20x20		25x25		30x30		35x35		40x40		50x50	
	(.254 x .254)		(.305 x .305)		(.381 x .381)		(.508 x .508)		(.635 x .635)		(.762 x .762)		(.889 x .889)		(1.016 x 1.016)		(1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
22	ZS1	7	VS1	4	US1	5	SS3	6	RS1	5	RS1	7	RS1	10	MS1	4	MS1	6
27	ZS1	6	VS1	4	VS1	5	SS3	5	RS1	4	RS1	6	RS1	8	MS1	4	MS1	5
33	ZS1	5	ZS1	6	VS1	4	SS3	4	SS3	6	RS1	5	RS1	7	RS1	9	MS1	5
39	ZS1	4	ZS1	5	VS1	4	US1	6	SS3	6	RS1	4	RS1	6	RS1	8	MS1	4
47	ZS4	8	ZS1	5	ZS1	6	US1	5	SS3	5	SS3	7	RS1	5	RS1	7	RS1	11
56	ZS4	6	ZS1	4	ZS1	5	VS1	5	SS3	4	SS3	6	RS1	4	RS1	6	RS1	9
68	ZS4	5	ZS4	8	ZS1	5	VS1	4	US1	6	SS3	5	RS1	4	RS1	5	RS1	7
82	ZS6	6	ZS4	6	ZS1	4	VS1	4	US1	5	SS3	4	SS3	6	RS1	4	RS1	6
100	ZS6	5	ZS4	6	ZS1	4	ZS1	6	VS1	5	US1	6	SS3	5	SS3	7	RS1	5
120			ZS4	5	ZS4	6	ZS1	5	VS1	4	VS1	6	SS3	4	SS3	5	RS1	4
150			ZS4	6	ZS4	6	ZS1	4	ZS1	7	VS1	5	VS1	7	SS3	4	SS3	7
180			ZS6	5	ZS4	5	ZS1	4	ZS1	6	VS1	4	VS1	6	SS3	4	SS3	6
200					ZS6	5	ZS1	4	ZS1	6	VS1	4	VS1	5	US1	6	SS3	5
220					ZS6	5	ZS4	8	ZS1	5	VS1	4	VS1	5	US1	5	SS3	5
270					ZS6	5	ZS4	6	ZS1	4	ZS1	7	VS1	4	VS1	6	SS3	4
330							ZS4	5	ZS1	4	ZS1	5	ZS1	7	VS1	5	US1	6
390							ZS4	5	ZS4	6	ZS1	5	ZS1	6	VS1	4	US1	5
470							ZS4	4	ZS4	6	ZS1	4	ZS1	5	ZS1	7	VS1	5
560							ZS6	5	ZS6	6	ZS1	4	ZS1	5	ZS1	6	VS1	4
680									ZS6	6	ZS4	6	ZS1	4	ZS1	5	ZS1	8
820									ZS6	5	ZS4	5	ZS4	8	ZS1	4	ZS1	7
1000											ZS6	6	ZS4	6	ZS4	8	ZS1	6
1200											ZS6	5	ZS4	5	ZS4	7	ZS1	5
1500													ZS6	6	ZS4	5	ZS1	4
1800													ZS6	5	ZS6	6	ZS4	7
2200															ZS6	5	ZS4	6
2700															ZS6	5	ZS4	5
3300																	ZS6	5

⊕ Typical Temperature Characteristics



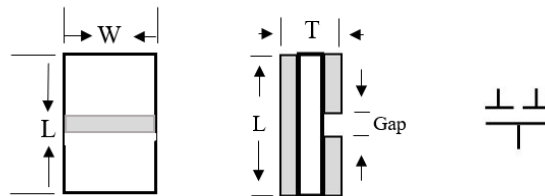
≠ Product Features

A single full electrode is provided on one side of the capacitor and split electrodes on the other side. This is a three-terminal capacitor which can be used as a two capacitor with a common electrode or as serially connected capacitors so that connections may be made on one side of the chip only (surface mount). This design is often used in microstrip coupling to eliminate lead inductance and raise the self resonant frequency.



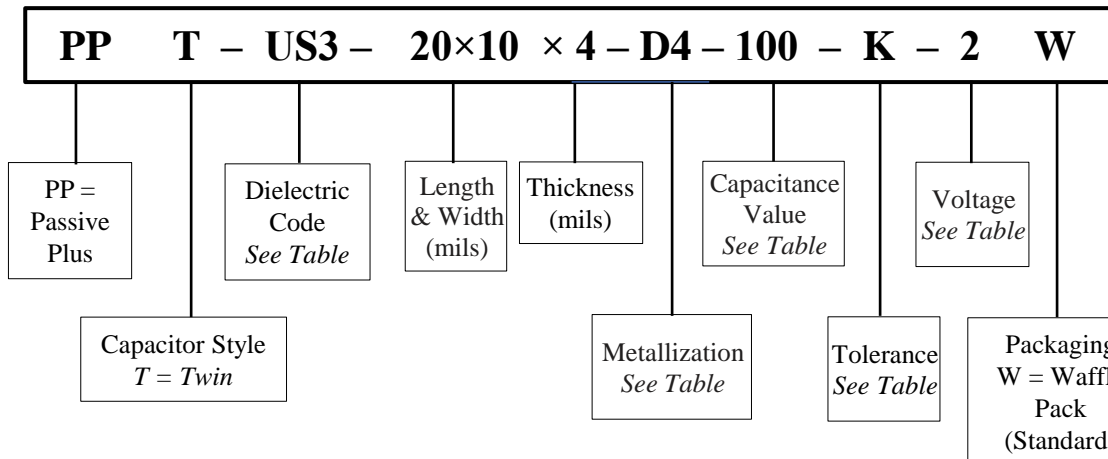
≠ Product Characteristics

- Capacitance: 0.06 picofarads and up
- Chip shape: Twin pads with gap
- Gap widths: 5, 10, 15, 20 mil or custom



Standard dimensional tolerance for length and width is $\pm 15\%$ up to 20 mils. For dimensions greater than 20 mils, standard tolerance is $\pm 10\%$. In cases where dimension cannot be exceeded, insert “M” to signify a maximum dimension. The thickness tolerance is ± 1.5 mils.

≠ Part Numbering





⚡ Substrates

Substrates can be supplied as follows:

- **Bare**
- **Metallized:**
 - Gold over Platinum, Palladium, or Nickel
 - Silver over Platinum
 - Custom schemes and patterns to Customer specifications

Thickness Range 3 mils +

⚡ Standard Electrode Metallizations

Gold (D4) This metallization consists of a minimum of 70 micro-inches of Gold over Platinum or Nickel which is ideal for all wirebonding methodologies.

Silver (S7) This metallization consists of 20 micro-inches of Silver over Platinum which is ideal for all solder applications whenever the use of Gold is unacceptable.

⚡ Capacitance Tolerance Codes

Class I Dielectrics: AS1 - KS2

Tolerance	Code
± 20%	M
± 15%	L
± 10%	K
± 5%	J

Class II Dielectrics: MS1 – ZS6

Tolerance	Code	Tolerance	Code
-10% thru +40%	Y	± 20%	M
-20% thru +80%	Z	± 15%	L
0% thru +100%	V	± 10%	K
Guaranteed Min. Value	GMV		

⚡ Metallization Codes

Code	Description
D4	Ti/Pt/Au Titanium/Platinum/Gold (70 μin Gold)
S7	Ti/Pt/Ag Titanium/Platinum/Silver (20 μin Silver)
K2	Ta/Pd/Au Tantalum/Palladium/Gold (75 μin Gold)
L3	Ta/Pd/Au Tantalum/Palladium/Gold (100 μin Gold)

Contact PPI for available metallizations.

⚡ Capacitance Codes

Value	Code
<10pF	1R0 = 1.0pF
>10pF	101 = 100pF

⚡ Rated Voltage Codes

Code	Voltage	Dielectric Thickness
2	50V	4 mils
3	100V	6 mils

⚡ Packaging

PPI SLCs are available in Waffle Packs (Standard). Other packaging options may be available. Please contact PPI.

Twin Caps are available in a wide range of size configurations, dielectric and termination materials to fit your application. Please contact PPI for designs not listed in this catalog.

≠ Dielectric Materials – Class I

Dielectrics below consist of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects and high insulation and dielectric breakdown.

Type	IR Min @ 25°C	Temperature Coefficient (-25 to 125°C)	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
AS1	10 ¹²	Negligible	0.0001	3.8	Quartz
AS2	10 ¹²	Negligible	0.0001	3.9	Si
AS3	10 ¹²	Negligible	0.0001	6.6	BeO
AS6	10 ¹²	P120 ± 25ppm	0.0001	8.7	AlN
AS7	10 ¹²	P180 ± 50ppm	0.0006	9.6	Alumina 96
AS8	10 ¹²	P180 ± 50ppm	0.0006	9.8	Alumina 99.6
BS2	10 ¹²	NP0 ± 30ppm	0.0001	12.6	Titanate
CS1	10 ¹²	0 ± 30ppm	0.001	20	Titanate
ES1	10 ¹²	0 ± 30ppm	0.002	40	Titanate
FS1	10 ¹²	0 ± 30ppm	0.005	50	Titanate
IS1	10 ¹⁵	0 ± 30ppm	0.005	84	Titanate
KS3	10 ⁶	N1500 ± 500ppm	0.0025	160	Titanate

± Dielectric Materials – Class II

Dielectrics below are characterized by high dielectric constants, increased losses and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where a small chip is necessary. Used as a bypass capacitor, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	IR (MEG-OHMs) 100VDC @ 25°C	Temperature Coefficient (-55 to 125°C)	Dissipation Factor (@ 1 MHz)	Aging (%) HR/Decade	Dielectric Constant (K)
MS1	10 ⁵	5 to -10	0.010	2.0	300
PS1	10 ⁴	± 10%	0.025	3.0	700
SS3	10 ⁵	3 to -10	0.015	3.5	2,200
US1	10 ⁵	0 to -35	0.020	3.0	4,000
US3	10 ⁵	3.0	0.025	3.0	5,000
RS2	10 ⁴	± 10%	0.025	3.0	1250
ZS1	10 ⁵	0 to -80	0.025	3.0	11,000
ZS4	Contact PPI	15 to -15	0.035	3.0	25,000
ZS6	Contact PPI	15 to -15	0.035	3.0	35,000
US3	10 ⁵	± 15%	0.030	3.0	4500



± Capacitance, Case Size & Dielectric Availability

Capacitance (pF)	Case Size							
	Mils (mm)							
	20x10 (.508 x .254)		40x20 (1.016 x .508)		60x30 (1.524 x .762)		80x40 (2.032 x 1.016)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
	Class I Dielectrics							
0.06	ES1	6	AS7	6	AS1	6	AS1	8
0.08	ES1	4	AS7	4	AS1	4	AS1	7
0.1	IS1	7	ES1	15	AS7	8	AS1	5
0.2	KS3	6	ES1	7	AS7	4	AS7	7
0.3	MS1	8	ES1	5	ES1	10	AS7	4
0.4	MS1	6	IS1	7	ES1	8	ES1	15
0.5	MS1	5	IS1	6	ES1	7	ES1	10
0.6	MS1	4	IS1	5	ES1	6	ES1	9
0.8	PS1	11	KS3	6	IS1	4	ES1	7
1	PS1	9	KS3	5	IS1	7	ES1	6
1.2	PS1	7	KS3	4	IS1	6	ES1	5
1.5	PS1	6	MS1	7	IS1	5	IS1	8
1.8	PS1	5	MS1	6	IS1	4	IS1	6
2	PS1	4	MS1	5	IS1	4	IS1	6
2.2	PS1	4	MS1	5	KS3	6	IS1	5
2.7	SS3	7	MS1	4	KS3	5	IS1	4
3.3	SS3	6	PS1	11	KS3	4	KS3	6
3.9	SS3	5	PS1	9	MS1	7	KS3	5
4.7	SS3	4	PS1	8	MS1	5	KS3	4
5.6	US1	6	PS1	6	MS1	5	MS1	7
6.8	US1	5	PS1	5	MS1	4	MS1	6
8.2	US3	5	PS1	4	PS1	11	MS1	5
10	US3	4	SS3	7	PS1	9	MS1	4
12	ZS1	8	SS3	6	PS1	7	PS1	11

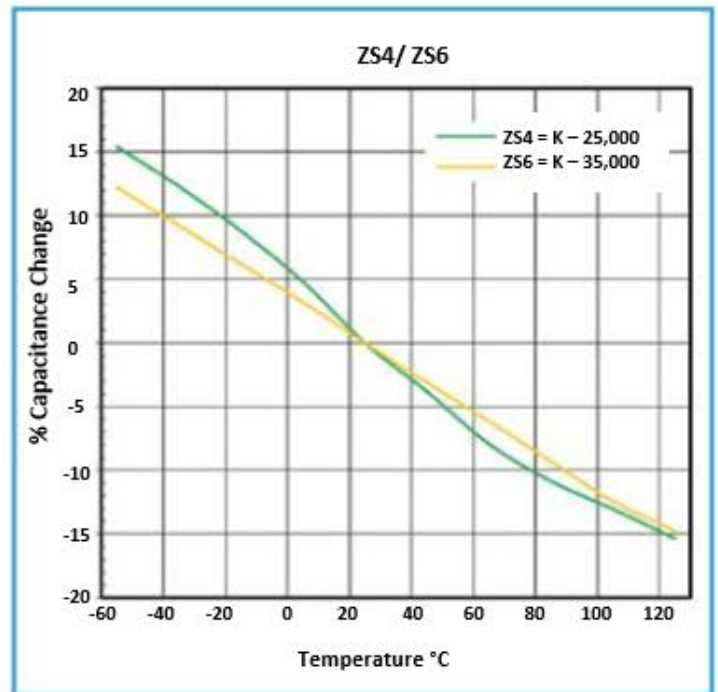
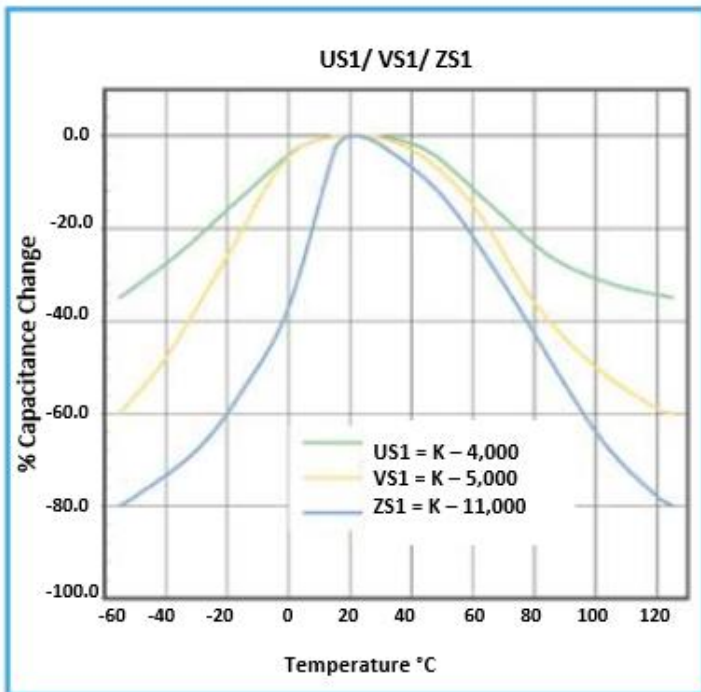
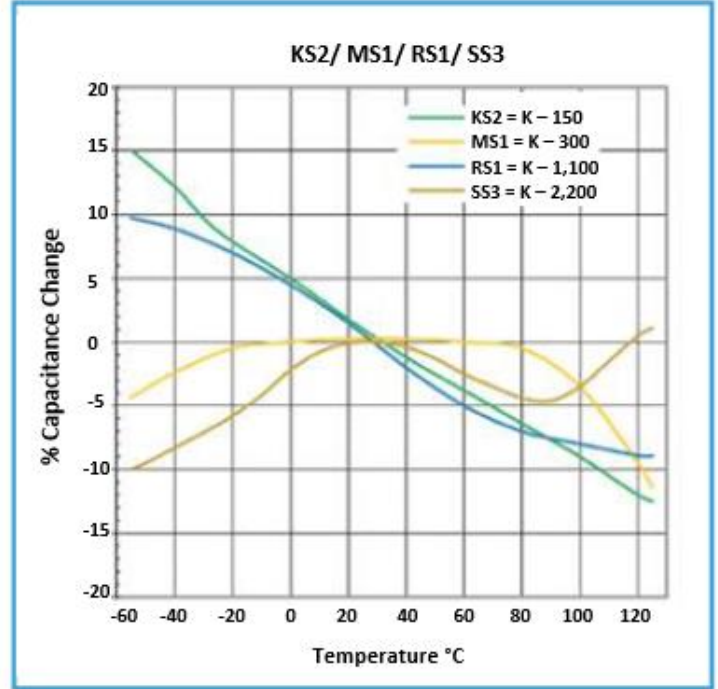
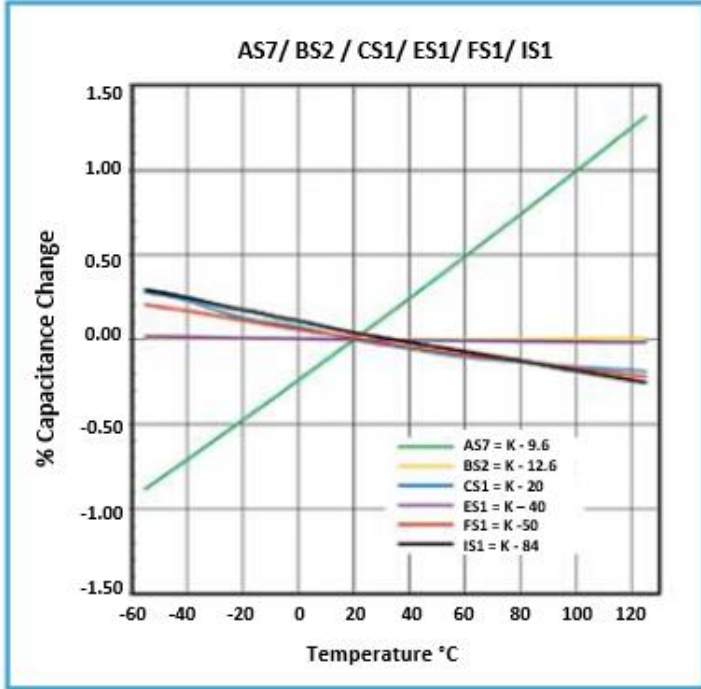
Capacitance, Case Size & Dielectric Availability chart continues on the next page.



≠ Capacitance, Case Size & Dielectric Availability - continued

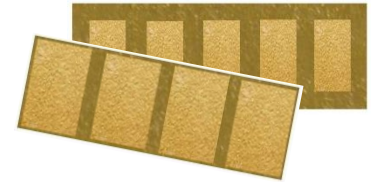
15	ZS1	6	SS3	5	PS1	6	PS1	9
18	ZS1	5	SS3	4	PS1	5	PS1	8
20	ZS1	5	US1	7	PS1	4	PS1	7
22	ZS1	4	US1	6	PS1	4	PS1	6
27	ZS4	8	US1	5	SS3	7	PS1	5
33	ZS4	6	US3	5	SS3	6	SS3	9
39	ZS4	5	US3	4	SS3	5	SS3	8
47	US3	6	ZS1	8	SS3	4	SS3	6
56	US3	5	ZS1	7	US1	6	SS3	5
68	US3	4	ZS1	5	US1	5	US1	8
82			ZS1	4	US3	5	US3	8
100			ZS4	8	US3	4	US3	7
120			ZS4	7	ZS1	8	US3	6
150			ZS4	5	ZS1	6	US3	5
180			ZS4	5	ZS1	5	ZS1	8
200			ZS6	6	ZS1	5	ZS1	7
220			ZS6	5	ZS4	9	ZS1	7
270			ZS6	4	ZS4	8	ZS1	6
330					ZS4	6	ZS1	5
390					ZS4	5	ZS4	9
470					ZS6	6	ZS4	7
560					ZS6	5	ZS4	6
680					ZS6	4	ZS4	5
820							ZS6	6
1000							ZS6	5
1200							ZS6	4
Class II Dielectrics								

⊕ Typical Temperature Characteristics



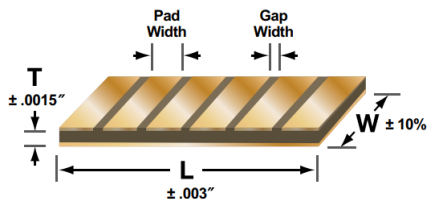
≠ Product Features

Array Caps are used where arrays of capacitors are needed, usually for decoupling or bypass of GaAs integrated circuits. Standard arrays can contain up to 10 capacitors starting at 0.04pF. Typical overall dimensions range start at 20x10 mils. Array Caps can be fully customized to meet Customer's application requirements.

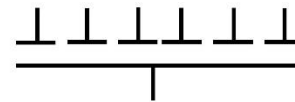


Array Caps are available with (B) or without borders (A) surrounding the edges to help prevent epoxy shorts and aid optical recognition systems.

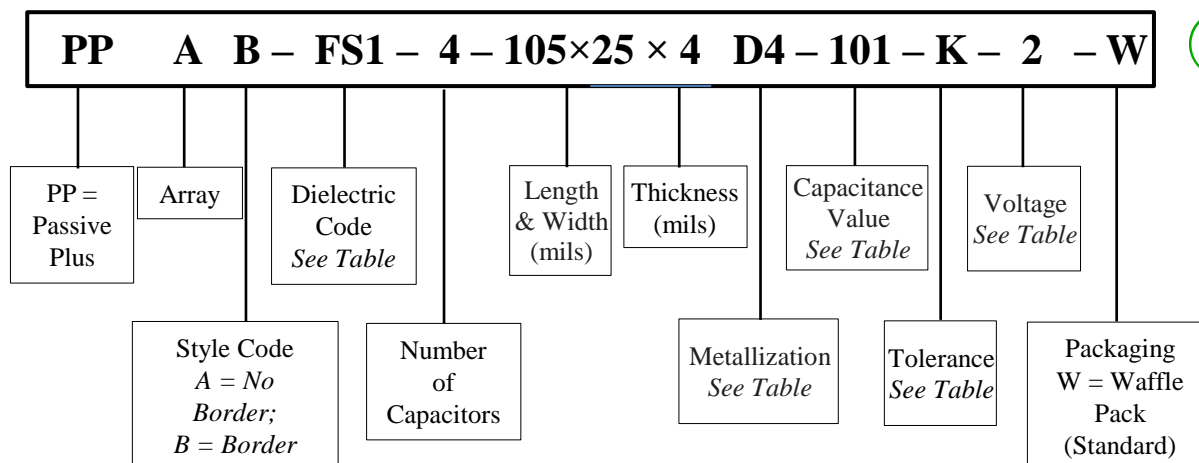
≠ Dimensions and Electrode Configuration



Standard border is 2 mils and the gap is between 4 – 6 mils depending on the capacitance required.



≠ Part Numbering





≠ Substrates

Substrates can be supplied as follows:

- **Bare**
- **Metallized:**
 - Gold over Platinum, Palladium, or Nickel
 - Silver over Platinum
 - Custom schemes and patterns to Customer specifications

Thickness Range 3 mils +

≠ Standard Electrode Metallizations

Gold (D4) This metallization consists of a minimum of 70 micro-inches of Gold over Platinum or Nickel which is ideal for all wirebonding methodologies.

Silver (S7) This metallization consists of 20 micro-inches of Silver over Platinum which is ideal for all solder applications whenever the use of Gold is unacceptable.

≠ Metallization Codes

Code	Description
D4	Ti/Pt/Au Titanium/Platinum/Gold (70 µin Gold)
S7	Ti/Pt/Ag Titanium/Platinum/Silver (20 µin Silver)
K2	Ta/Pd/Au Tantalum/Palladium/Gold (75 µin Gold)
L3	Ta/Pd/Au Tantalum/Palladium/Gold (100 µin Gold)

Contact PPI for available metallizations.

≠ Capacitance Tolerance Codes

Class I Dielectrics: AS1 - KS2	
Tolerance	Code
± 20%	M
± 15%	L
± 10%	K

Class II Dielectrics: MS1 - ZS4			
Tolerance	Code	Tolerance	Code
-10% thru +40%	Y	± 20%	M
-20% thru +80%	Z	± 15%	L
0% thru +100%	V	± 10%	K
Guaranteed Min. Value	GMV		

≠ Capacitance Codes

Value	Code
<10pF	1R0 = 1.0pF
>10pF	101 = 100pF

≠ Rated Voltage Codes

Code	Voltage	Dielectric Thickness
2	50V	4 mils
3	100V	6 mils

≠ Packaging

PPI SLCs are available in Waffle Packs (Standard). Other packaging options may be available. Please contact PPI.

≠ Dielectric Materials – Class I

Dielectrics below consist of material exhibiting very low losses, extremely low or closely controlled temperature coefficients, negligible voltage and frequency coefficients, negligible aging effects and high insulation and dielectric breakdown.

Type	IR Min @ 25°C	Temperature Coefficient (-25 to 125°C)	Dissipation Factor (@ 10GHz)	Dielectric Constant (K)	Material
AS1	10 ¹²	Negligible	0.0001	3.8	Quartz
AS2	10 ¹²	Negligible	0.0001	3.9	Si
AS3	10 ¹²	Negligible	0.0001	6.6	BeO
AS6	10 ¹²	P120 ± 25ppm	0.0001	8.7	AlN
AS7	10 ¹²	P180 ± 50ppm	0.0006	9.6	Alumina 96
AS8	10 ¹²	P180 ± 50ppm	0.0006	9.8	Alumina 99.6
BS2	10 ¹²	NP0 ± 30ppm	0.0001	12.6	Titanate
CS1	10 ¹²	0 ± 30ppm	0.001	20	Titanate
ES1	10 ¹²	0 ± 30ppm	0.002	40	Titanate
FS1	10 ¹²	0 ± 30ppm	0.005	50	Titanate
IS1	10 ¹⁵	0 ± 30ppm	0.005	84	Titanate
KS3	10 ⁶	N1500 ± 500ppm	0.0025	160	Titanate

± Dielectric Materials – Class II

Dielectrics below are characterized by high dielectric constants, increased losses and higher temperature coefficients. These properties are inherent with this class of material but the high dielectric constants permit the use of smaller size to achieve low series inductance and meet dimensional requirements. Capacitors made with these materials are often used for coupling of microstrip line circuits where a small chip is necessary. Used as a bypass capacitor, the small size provides low series inductance and dielectric losses are typically of little concern.

Type	IR (MEG-OHMs) 100VDC @ 25°C	Temperature Coefficient (-55 to 125°C)	Dissipation Factor (@ 1 MHz)	Aging (%) HR/Decade	Dielectric Constant (K)
MS1	10 ⁵	5 to -10	0.010	2.0	300
PS1	10 ⁴	± 10%	0.025	3.0	700
SS3	10 ⁵	3 to -10	0.015	3.5	2,200
US1	10 ⁵	0 to -35	0.020	3.0	4,000
US3	10 ⁵	3.0	0.025	3.0	5,000
RS2	10 ⁴	± 10%	0.025	3.0	1250
ZS1	10 ⁵	0 to -80	0.025	3.0	11,000
ZS4	<i>Contact PPI</i>	15 to -15	0.035	3.0	25,000
ZS6	<i>Contact PPI</i>	15 to -15	0.035	3.0	35,000
US3	10 ⁵	± 15%	0.030	3.0	4500



± Capacitance, Case Size & Dielectric Availability - Class I Dielectrics

Cap (pF)	Size mils (mm)																	
	10x10		12x12		15x15		20x20		25x25		30x30		35x35		40x40		50x50	
	(.254 x .254)		(.305 x .305)		(.381 x .381)		(.508 x .508)		(.635 x .635)		(.762 x .762)		(.889 x .889)		(1.016 x 1.016)		(1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
0.04	AS7	5	AS7	6	AS7	10												
0.06	AS7	4	AS7	5	AS7	8	AS2	5	AS2	10								
0.08	ES1	10	AS7	4	AS7	6	AS7	10	AS2	7	AS2	9						
0.1	ES1	8	ES1	11	AS7	5	AS7	9	AS2	5	AS2	7	AS2	10				
0.2	ES1	5	ES1	7	ES1	10	AS7	4	AS7	7	AS7	10	AS2	5	AS2	7	AS2	10
0.3	IS1	6	ES1	4	ES1	6	ES1	11	AS7	4	AS7	7	AS7	9	AS2	5	AS2	7
0.4	IS1	5	IS1	7	ES1	5	ES1	9	ES1	15	AS7	5	AS7	7	AS7	9	AS2	5
0.5	IS1	4	IS1	5	ES1	4	ES1	7	ES1	11	AS7	5	AS7	5	AS7	7	AS2	4
0.6	KS2	6	IS1	5	IS1	7	ES1	6	ES1	10	ES1	15	AS7	4	AS7	6	AS7	9
0.8	MS1	8	KS2	6	IS1	5	ES1	5	ES1	7	ES1	10	ES1	15	AS7	4	AS7	7
1.0	MS1	7	KS2	5	IS1	4	IS1	7	ES1	6	ES1	8	ES1	10	AS7	4	AS7	5
1.2	MS1	6	KS2	4	IS1	4	IS1	6	ES1	5	ES1	7	ES1	9	AS7	3	AS7	5
1.5	MS1	5	MS1	7	KS2	5	IS1	5	ES1	4	ES1	6	ES1	7	ES1	10	AS7	4
1.8	MS1	4	MS1	5	KS2	4	IS1	4	IS1	6	ES1	5	ES1	6	ES1	8	ES1	11
2.0	MS1	4	MS1	5	KS2	4	KS2	7	IS1	6	ES1	4	ES1	5	ES1	7	ES1	11
2.2	RS1	4	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7	ES1	5	ES1	7	ES1	10
2.7	RS1	8	MS1	4	MS1	6	KS2	5	IS1	4	IS1	6	ES1	4	ES1	5	ES1	8
3.3	RS1	7	RS1	10	MS1	5	KS2	4	KS2	6	IS1	5	IS1	7	ES1	4	ES1	7
3.9	RS1	6	RS1	9	MS1	4	MS1	7	KS2	5	IS1	4	IS1	6	IS1	8	ES1	6
4.7	RS1	5	RS1	7	RS1	11	MS1	6	KS2	4	KS2	6	IS1	5	IS1	6	ES1	5
5.6	RS1	4	RS1	6	RS1	10	MS1	5	MS1	7	KS2	5	IS1	4	IS1	5	ES1	4
6.8	RS1	4	RS1	5	RS1	8	MS1	4	MS1	6	KS2	5	KS2	6	IS1	4	IS1	7
8.2	SS3	6	RS1	4	RS1	7	MS1	4	MS1	5	KS2	4	KS2	5	KS2	7	KS2	10
10	SS3	5	RS1	4	RS1	5	RS1	9	MS1	4	MS1	6	KS2	4	KS2	5	KS2	8
12	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	5	MS1	7	KS2	4	KS2	7
15	US1	6	SS3	5	RS1	4	RS1	6	RS1	10	MS1	4	MS1	6	MS1	7	KS2	6
18	US1	5	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	4	MS1	6	KS2	5
20	US1	5	SS3	4	SS3	6	RS1	5	RS1	8	RS1	11	MS1	4	MS1	5	KS2	4
22	US1	4	US1	6	SS3	5	RS1	4	RS1	7	RS1	9	MS1	4	MS1	5	KS2	4

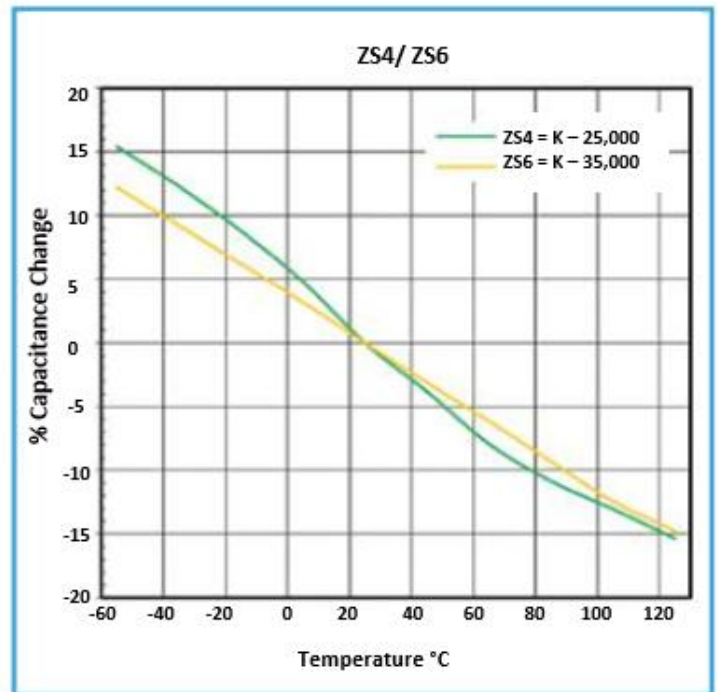
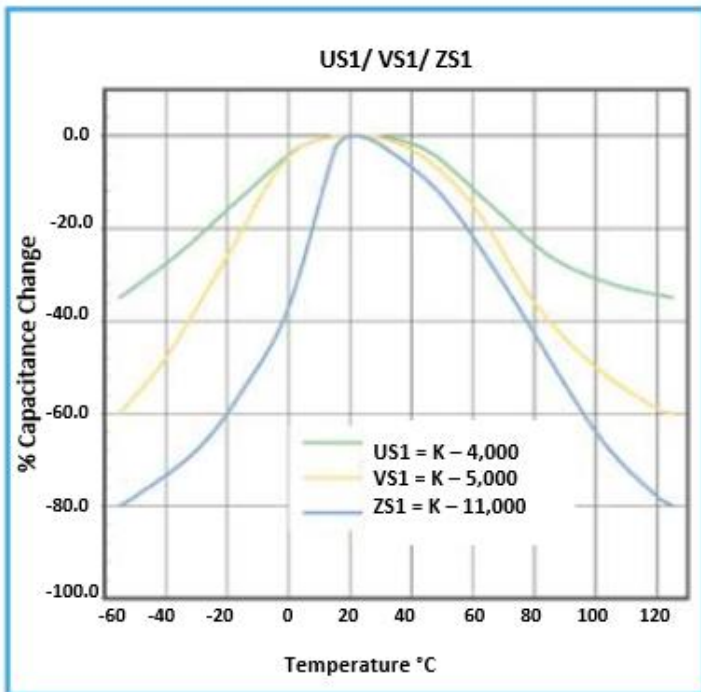
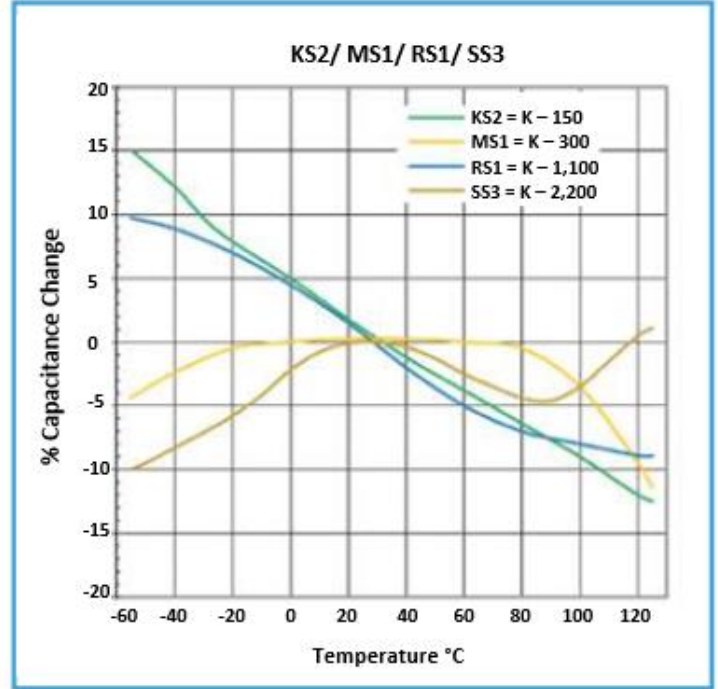
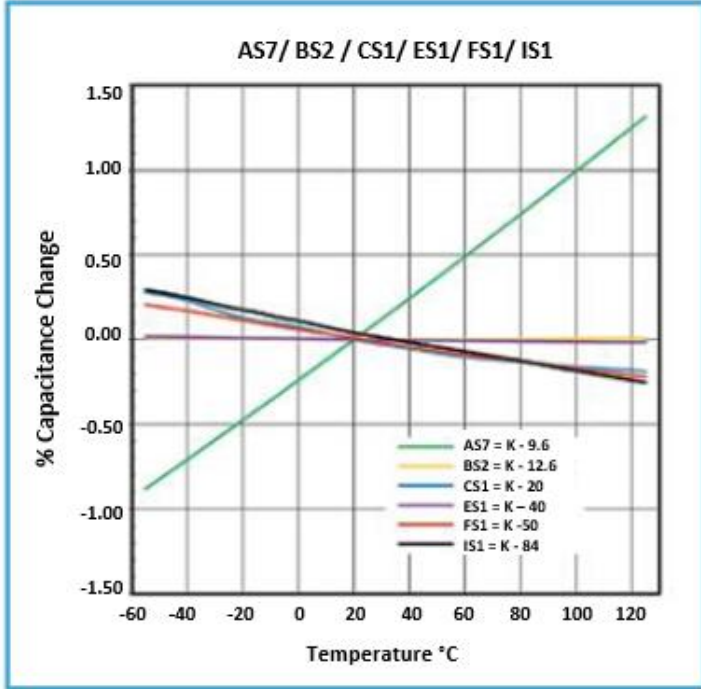
Shaded cells indicate Class II Dielectrics

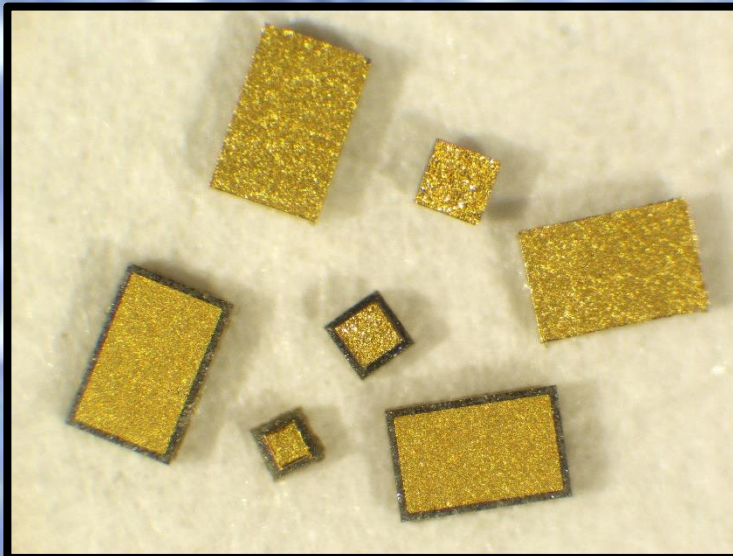
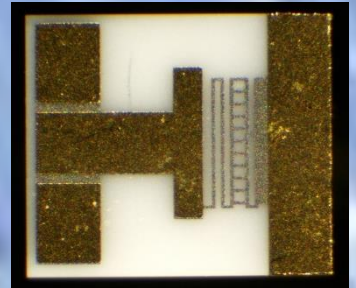
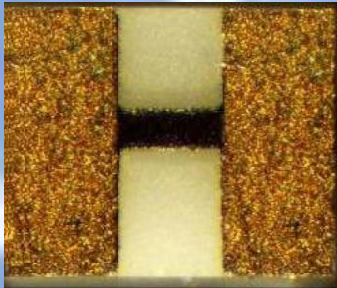
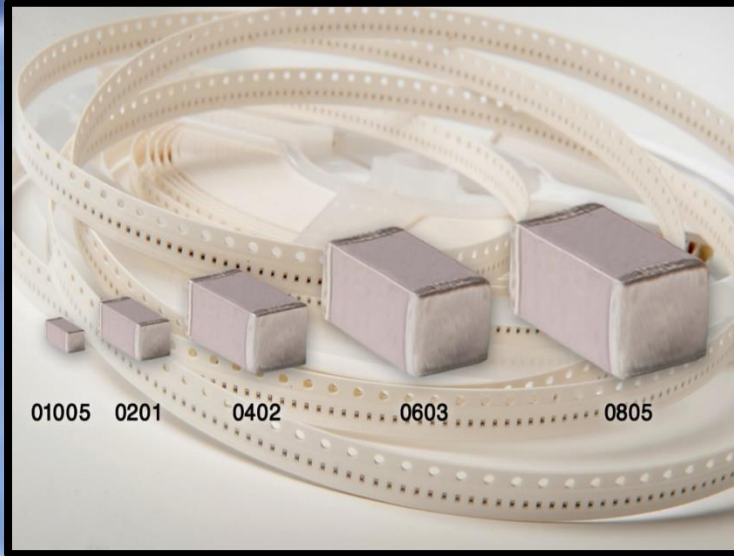


± Capacitance, Case Size & Dielectric Availability – Class II Dielectrics

Cap (pF)	Size mils (mm)																	
	10x10 (.254 x .254)		12x12 (.305 x .305)		15x15 (.381 x .381)		20x20 (.508 x .508)		25x25 (.635 x .635)		30x30 (.762 x .762)		35x35 (.889 x .889)		40x40 (1.016 x 1.016)		50x50 (1.270 x 1.270)	
	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness	Dielectric	Thickness
27	US1	4	US1	5	SS3	4	RS1	4	RS1	6	RS1	8	MS1	3	MS1	4	MS1	6
33	VS1	4	US1	4	US1	6	SS3	6	RS1	5	RS1	6	RS1	11	MS1	4	MS1	5
39	ZS1	6	US1	4	US1	5	SS3	5	RS1	4	RS1	5	RS1	7	RS1	10	MS1	4
47	ZS1	5	ZS1	7	US1	5	SS3	4	SS3	6	RS1	5	RS1	6	RS1	8	MS1	4
56	ZS1	4	ZS1	6	VS1	5	US1	7	SS3	5	RS1	4	RS1	5	RS1	7	RS1	10
68	ZS1	4	ZS1	5	VS1	4	US1	6	SS3	5	SS3	6	RS1	4	RS1	6	RS1	9
82	ZS4	7	ZS1	4	ZS1	7	VS1	6	SS3	4	SS3	5	SS3	7	SS3	10	RS1	7
100	ZS4	6	ZS4	8	ZS1	6	VS1	5	US1	6	SS3	5	SS3	6	SS3	8	RS1	6
120	ZS4	5	ZS4	7	ZS1	5	ZS1	8	VS1	6	SS3	4	SS3	5	SS3	7	RS1	5
150	ZS4	4	ZS4	5	ZS1	4	ZS1	7	VS1	5	VS1	7	SS3	4	SS3	5	RS1	4
180	ZS6	4	ZS4	5	ZS4	7	ZS1	6	VS1	4	VS1	6	VS1	8	US1	8	SS3	7
200	ZS6	4	ZS4	4	ZS4	6	ZS1	5	ZS1	8	VS1	5	VS1	7	US1	7	SS3	6
220	ZS6	4	ZS6	5	ZS4	6	ZS1	4	ZS1	7	VS1	5	VS1	6	US1	6	SS3	6
270			ZS6	4	ZS4	5	ZS4	8	ZS1	6	VS1	4	VS1	5	US1	5	SS3	5
330					ZS4	4	ZS4	7	ZS1	5	ZS1	7	VS1	4	US1	4	US1	7
390					ZS6	4	ZS4	6	ZS1	4	ZS1	6	ZS1	7	ZS1	10	US1	6
470					ZS6	4	ZS4	5	ZS4	7	ZS1	5	ZS1	6	ZS1	8	US1	5
560							ZS4	4	ZS4	6	ZS1	4	ZS1	5	ZS1	7	US1	4
680							ZS6	5	ZS4	5	ZS4	8	ZS1	5	ZS1	6	VS1	4
820							ZS6	4	ZS6	6	ZS4	6	ZS1	4	ZS1	5	ZS1	7
1000									ZS6	5	ZS4	5	ZS4	7	ZS1	4	ZS1	6
1200									ZS6	4	ZS4	4	ZS4	6	ZS4	7	ZS1	5
1500											ZS6	5	ZS4	5	ZS4	6	ZS1	4
1800											ZS6	4	ZS6	6	ZS4	5	ZS4	8
2200													ZS6	5	ZS4	4	ZS4	6
2700													ZS6	4	ZS6	5	ZS4	5
3300																	ZS6	6

⊕ Typical Temperature Characteristics





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RF & Microwave Components

Headquarters: New York, USA

