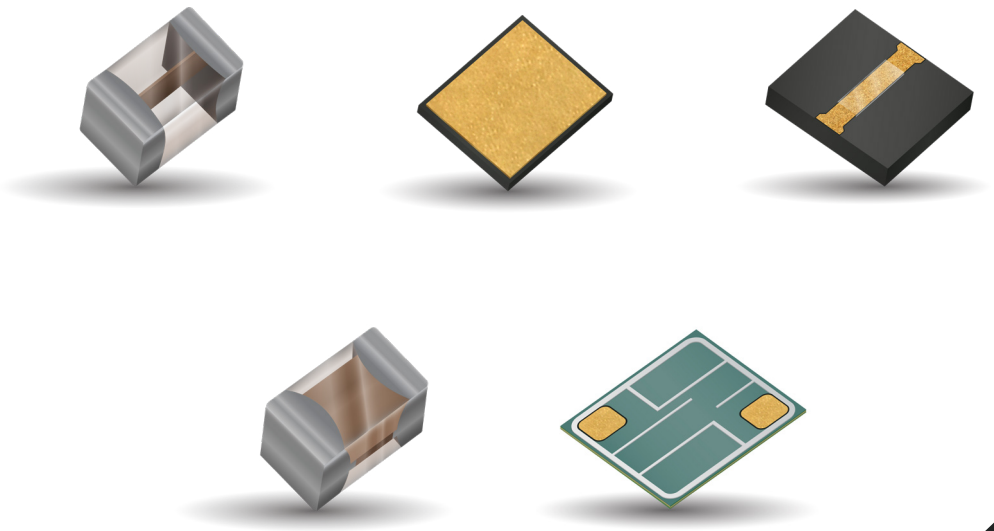
AVX®

A KYOCERA GROUP COMPANY

Passive Micro Components



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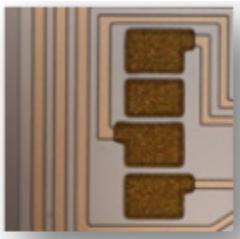
Passive Micro Components

Table of Contents

PROCES S CAPABILITIES ELECTRONIC MATERIALS

Passive Element	Resistors		Capacitors			Inductors
Material	TaN	SiCr	SiON	SiO2	BCB	CU
Sheet Resistance or Specific Capacitance	10-100 Ω/sq	700-1400 Ω/sq	100 pf/mm^2	35 pf/mm^2	25 pf/mm^2	N/A
Typical Ranges	0.47-1MΩ	47-30MΩ	1-500pF	1-500pF	1-50pF	0.5-20nH
Breakdown Conditions	> 350°C	> 400°C	≤ 600 (V/µm)	≤ 1000 (V/µm)	≤ 300 (V/µm)	NA
Minimum Tolerance	± 0.1%	± 0.1%	> 0.5% trimmed; ± 4% untrimmed	> 0.5% trimmed; ± 4% untrimmed	± 10% untrimmed	±5%
Performance NOTE TCR in ppm/°C	TCR -150 to -100 (Custom low TCR available)	TCR Tunable to ±25 (±250 Typical)	K 6.1; TCC 60	K 4.0; TCC 30	K 2.7; TCC 42	Q≤80

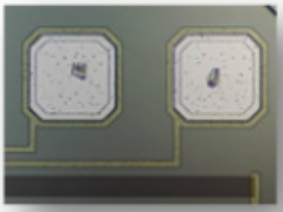
AU WIRE-BOND



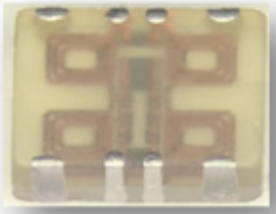
SURFACE MOUNT (SINGLE I/O PAIR)

BALL GRID ARRAY

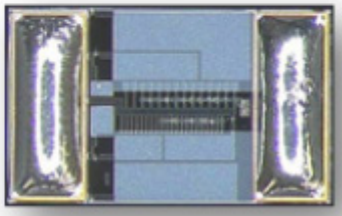
AI WIRE-BOND



SURFACE MOUNT (STRIPED, MULTIPLE I/OS



LAND GRID ARRAY



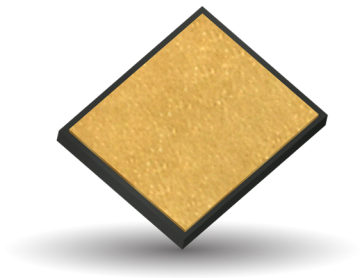
Substrate	Thickness	Comment
P-Si Boron doped	4-25 mil	15 Ω-cm
N++ Si Arsenic Doped	4-25 mil	0.002 Ω-cm
Glass	4-25 mil	10^{13} Ω-cm
Aluminum Nitride	10-60 mil	Lapped or Polished
Alumina	4-50 mil	Lapped or Polished
Fused Silica	4-25 mil	10^{14} Ω-cm

Material	Thickness	Comment
Al	150-40kÂ	Also with 4% Cu or 1% Si
Au	500-20kÂ	
Au (plated)	0.5-20µm	Electro And Electro-less
Cr	150-5kÂ	600Â Typical
Cu	2k-25kÂ	
Cu (plated)	0.5-100µm	
Ni (V)	500-10kÂ	
Pd	500-5kÂ	
Pt	1k-4kÂ	2500Â Typical
TaN	300-1.5kÂ	
Ti	500-5kÂ	600Â Typical
TiW	300-2kÂ	500Â Typical

MS Series

MOS (Metal Oxide Semiconductor) Capacitors

MIS (Metal Insulator Smiconductor) Capacitors



GENERAL DESCRIPTION

For applications in RF, microwave, and GHz ranges, AVX now offers MOS and MIS Capacitors. MOS Capacitors are Single Layer Capacitors (SLCs) that use silicon dioxide to produce small, high Q, temperature stable, high breakdown voltage, low leakage capacitors. To ease assembly, AVX offers a wide range of termination styles for epoxy or solder die attach and subsequent Gold or Aluminum wire thermosonic and ultrasonic bonding. Custom applications and designs are welcome. Please contact your local representative.

FEATURES

- Small Size: .010 to .070 inches square
- Capacitance Range: 1.0 to 1000pF
- High Q
- DC to 20GHz operation

APPLICATIONS

- Hybrid circuits
- Bias Networks
- Test and Measurement Equipment
- Aerospace
- TOSA and ROSA applications

HOW TO ORDER

MS 20 3 S 100 M AUSA W

Series Code
Metal on Silicon

Case Size
Square Size in mils 10, 20, 30, 40, 50, 60, 70
OS = Special Order*
*Please supply design

Working Voltage
2 = 200 WVDC
1 = 100 WVDC
5 = 50 WVDC
3 = 25 WVDC
* with not to see the size, cap range, wVDC table

Dielectric Code
S = SiO_2
I = SiON

Capacitance
EIA Cap Code in pF
First two digits = significant figures or "R" for decimal place.
Third digit = number of zeros or after "R" significant figures.

Capacitance Tolerance
F = 1% K = 10%
G = 2% M = 20%
J = 5%

Termination Code
Top layers:
Au = gold
Al = aluminum
OS = a custom pad (such as copper)
Bottom layers:
NA = bare silicon (no back side metal)
SA = gold on bare silicon
CA = chrome-gold
OS = (custom back)

Packaging Code
W = waffle pack
T = Tested whole wafer
D = Tested wafer diced on film frame

MIL TEST METHODS

Standard Test Method	MIL Reference	MIL Section
Bond Strength	MIL-STD-883	2011.7
Shear Strength	MIL-STD-883	2019
Thermal Shock	MIL-STD-202	107
Life	MIL-STD-202	108
Load Humidity (THB)	MIL-STD-202	103 @rated VDC

TYPICAL ELECTRICAL SPECIFICATIONS

Material	MOS(SiO_2)
pF/mm² Typical	85 @ 50V rated
TCC	±30 ppm/°C
Rated Voltage	≤200
Peak Voltage at +25°C	1.5 x Rated
DF	≤0.1%
Operating Temp. Range	-55°C to 125°C

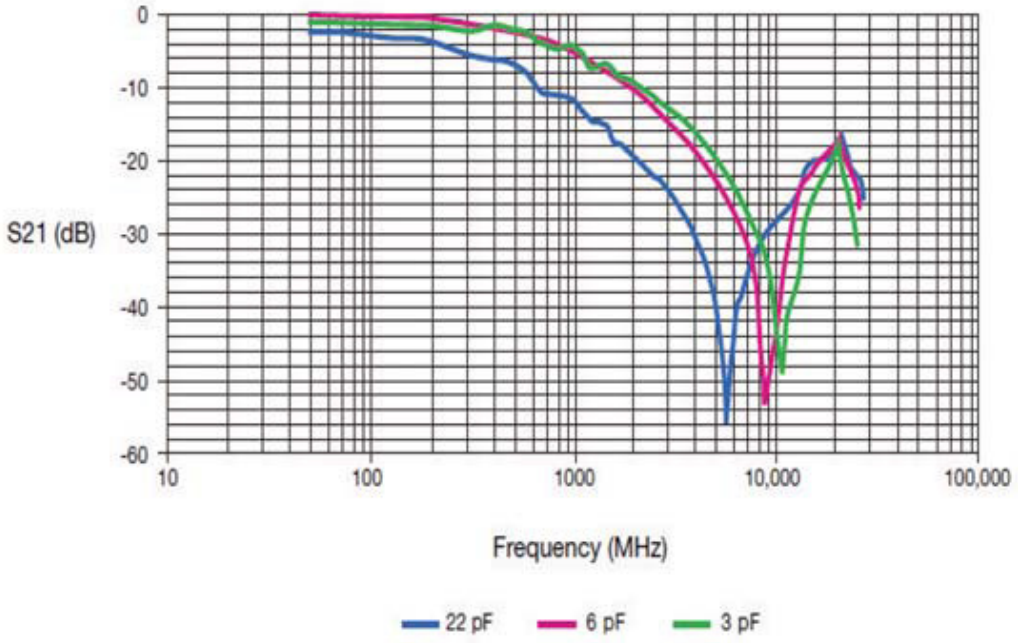
SIZE, CAPACITANCE RANGE, WVDC

Chip Area mil² (mm²)	Typical Case Size (Square) mil (mm)	Breakdown Voltage (V)	MOS		MIS	
			Min Value pF	Max Value pF	Min Value pF	Max Value pF
100 (0.064516)	10 (0.254)	200		1	1	2
100 (0.064516)	10 (0.254)	100	2	3	3	5
100 (0.064516)	10 (0.254)	50	4	6	6	9
100 (0.064516)	10 (0.254)	25	7	12	10	19
400 (0.258064)	20 (0.508)	200	1	9	1	14
400 (0.258064)	20 (0.508)	100	10	19	15	29
400 (0.258064)	20 (0.508)	50	20	38	30	58
400 (0.258064)	20 (0.508)	25	39	75	59	115
900 (0.580644)	30 (0.762)	200	1	24	1	35
900 (0.580644)	30 (0.762)	100	25	49	36	70
900 (0.580644)	30 (0.762)	50	50	95	71	145
900 (0.580644)	30 (0.762)	25	96	190	146	290
1600 (1.032256)	40 (1.016)	200	1	45	1	65
1600 (1.032256)	40 (1.016)	100	46	90	66	135
1600 (1.032256)	40 (1.016)	50	91	185	136	275
1600 (1.032256)	40 (1.016)	25	186	370	276	550
2500 (1.6129)	50 (1.27)	200	1	75	1	112
2500 (1.6129)	50 (1.27)	100	76	150	113	225
2500 (1.6129)	50 (1.27)	50	151	300	226	450
2500 (1.6129)	50 (1.27)	25	301	600	451	900
3600 (2.322576)	60 (1.524)	200	1	110	1	165
3600 (2.322576)	60 (1.524)	100	111	220	166	330
3600 (2.322576)	60 (1.524)	50	221	440	331	660
3600 (2.322576)	60 (1.524)	25	441	880	661	1320
4900 (3.161284)	70 (1.778)	200	1	150	1	225
4900 (3.161284)	70 (1.778)	100	151	300	226	450
4900 (3.161284)	70 (1.778)	50	301	600	451	900
4900 (3.161284)	70 (1.778)	25	601	1200	901	1800

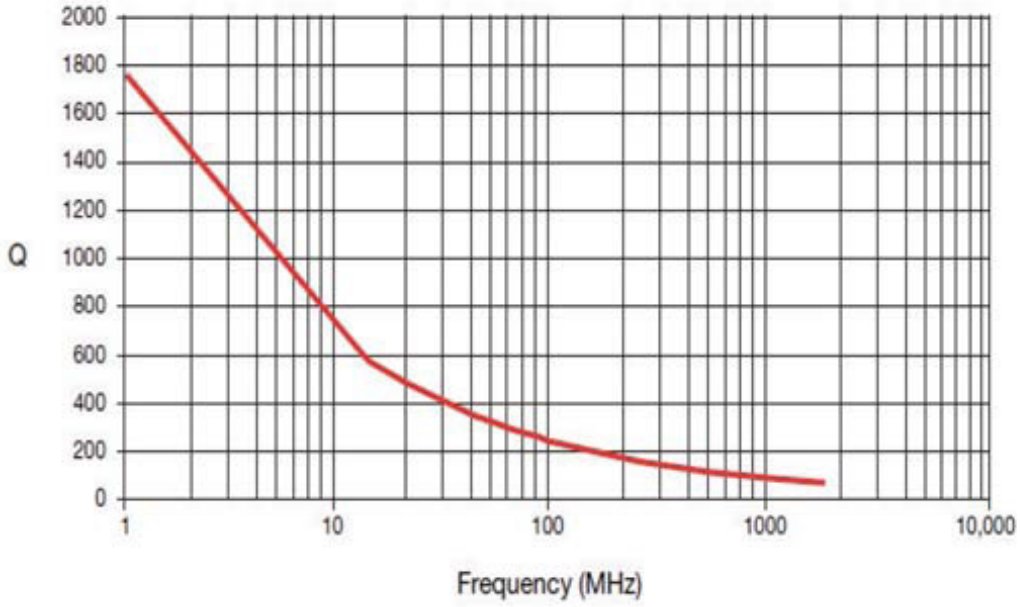
*Size tolerance ± 1 mil (0.025 mm)
Thickness range 5 to 10 mils (0.127 to 0.250 mm)

S21 AND Q VERSUS FREQUENCY

Typical MOS Caps: 50MHz-25GHz
Au/TaN bond pad, Cr/Au back side

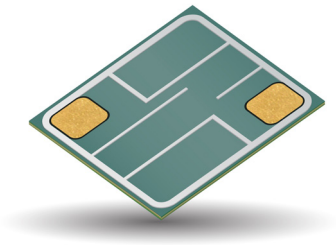


22pF Q vs. Frequency



Thin Film WBR (Wire Bond Resistor)

Top Contact



GENERAL DESCRIPTION

Top Contact Precision wire bondable resistors are ultra-stable with high reliability. Resistors are laser trimmed to tight tolerance. Customizable value and unique marking of that value. This device is built in 0202 chip outline and is ideal for but not limited to hybrid circuit applications.

These are designed specifically for applications that require thermo-compression, epoxy or ultra-sonic attachment.

BENEFITS

- Top Contact/ Bottom Isolated
- Ultra High Stability
- High Reliability
- Extremely Tight Tolerance
- Unique Value Marking
- 250 mW Power Rating
- Small package size

APPLICATIONS

- Medical Implantable
- Military / Defense
- Hybrid Designs
- Multi-Chip Module (MCM)
- Test & Measurement Instrumentation
- High-Rel Microelectronics
- RF / Microwave communications

HOW TO ORDER

WBR — **Series Code**
WBR = Wire Bond Resistor

0202 — **Case Size**
0202 = 0202
0S0S = Special Request Please supply Design or contact factory

S — **Material**
S = Silicon
G = Glass
C = Custom

C — **TCR (ppm/°C)**
A = ±25
B = ±50
C = ±100 (standard)
D = ±150
S = Special Request supply design or contact factory

1R051 — **Resistance**
Example Values
1R500=1.5 ohm
1R051=10.5ohm
1R052=105ohm
1R053=1,050ohm
2R553=2,550ohm
1R054=10,500ohm
1R007=10Megohm

F — **Tolerance**
D = 0.5%
F = 1%
G = 2%
J = 5%
S = Special Request supply design or contact factory

G — **Termination Code**
G = Bondable Gold
A = Aluminum

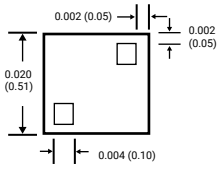
W — **Packaging**
W = Waffle Pack

MECHANICAL DIMENSIONS

Inches (mm)

Size	Length (L)	Width(W)	Minimum Bond Area
0202	0.020 ± 0.003 (0.51 ± 0.076)	0.020 ± 0.003 (0.51 ± 0.076)	0.0038 ± 0.0038 (0.09 x 0.09)

Other sizes available upon request



GENERAL CHARACTERISTICS

Resistance Range	1.0 Ohm - 10.0 Mohm
Resistance Tolerance	± 1%, ± 2% ± 0.1%, ± 0.5%,
Termination Type	Gold, Aluminum
Backing	Bare (Lapped) Substrate
Operating Temperature	-55°C ± 125°C
Insulation Resistance	10^6MOhm

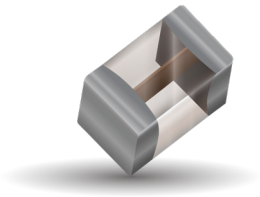
Custom values up to 10meg Ohm available upon request

ENVIRONMENTAL TESTS

Test	Limits	Specification
Life Test/ Stability	±0.25% Max Δ R/R	MIL-STD-202 MTD 108, 1000hrs, 125°C,50mW
Thermal Shock	±0.25% Max Δ R/R	MIL-STD-202 MTD 107
High Temperature Exposure	±0.25% Max Δ R/R	100 Hrs @ 150°C
Moisture Resistance	±0.25% Max Δ R/R	MIL-STD-202 MTD 106
Wire Bond Test	4 Gram Min (1.25 Mil Wire)	MIL –PRF-55342
Short Time Overload	±0.25% Max Δ R/R	MIL –PRF-55342

HVR Series

High Value Resistors



GENERAL DESCRIPTION

The HR Series is the next generation of surface mount High Value Resistors. This product was designed with our proprietary Glass Sandwich FLEXITERM® Technology. The FLEXITERM® is a surface mountable automotive and medically qualified termination that adds an extra margin against damage due to flexture during installation. The HR Series has been designed with high quality selected materials that yield excellent performance in a small size. Resistor is designed to be embedded in glass sandwich to avoid environmental conditions. This product is ideal for use in applications requiring surface mountable small outline EIA resistors.

FEATURES

- EIA 0201 & 0402 Size
- Power Rating: 125 mW
- Low Current Consumption
- High Voltage
- Operating Temperature -40°C to +125°C

APPLICATIONS

- Multi Chip Module (MCM)
- Bias Networks
- Test and Measurement Equipment
- Aerospace
- Medical
- Automotive

HOW TO ORDER

HR02 — **Size**
HR02 = 0402
HR01 = 0201

A — **TCR**
A = ±100 ppm/°C
B = ±50 ppm/°C*
C = ±250 ppm/°C
D = ±25 ppm/°C*
E = ±200 ppm/°C
*Non-standard TCR values per special request

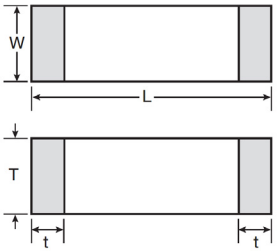
5R1 — **Resistance (Ohms)**
1R1 = 1.1 Ω
100 = 10 Ω
101 = 100 Ω
102 = 1,000 Ω
103 = 10,000 Ω
104 = 100,000 Ω
105 = 1,000,000 Ω
106 = 10,000,000 Ω

D — **Tolerance**
E = +/-0.5%*
F = 1%
G = 2%
J = 5%
*Non-standard tolerance values per special request

Z — **Termination**
7 = Nickel Gold*
Z = Nickel Tin
*Non-standard termination per special request

TR — **Packaging**
TR = Tape & Reel
W = Waffle Pack

MECHANICAL DIMENSIONS mm (inches)

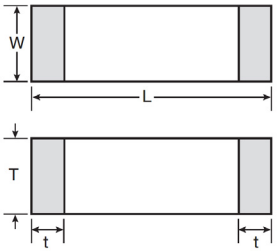


Length (L)	1.00±0.10 (0.039±0.004)
Width (W)	0.50±0.10 (0.020±0.004)
Thickness (T)	0.50±0.10 (0.020±0.004)
Terminal (t)	0.25±0.15 (0.010±0.006)

0402 SPECIFICATIONS

Resistor	Detail
Outline	EIA 0402
Package	Glass wafer sandwich
Maximum Voltage	1 KV
Resistance Value Range	From 200 Ohms to 30 MOhms
Termination	FLEXITERM® (Ag/Epoxy), plated
Power Rating	125 mW
Operating Temperature Range	-40°C to +125°C
Tolerances	0.5%, 1%, 2%, 5%

MECHANICAL DIMENSIONS mm (inches)



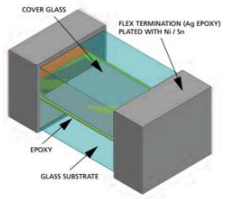
Length (L)	0.60±0.050 (0.024±0.010)
Width (W)	0.325±0.050 (0.024±0.010)
Thickness (T)	0.325±0.050 (0.020±0.004)
Terminal (t)	0.150±0.050 (0.006±0.010)

0201 SPECIFICATIONS

Resistor	Detail
Outline	EIA 0201
Package	Glass wafer sandwich
Maximum Voltage	1 KV
Resistance Value Range	From 200 Ohms to 5 MOhms
Termination	FLEXITERM® (Ag/Epoxy), plated
Power Rating	125 mW
Operating Temperature Range	-40°C to +125°C
Tolerances	0.5%, 1%, 2%, 5%

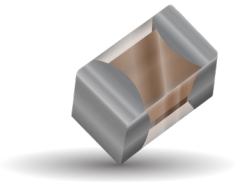
RESISTOR MATERIAL (SiCr) PROPERTIES

Sheet Resistance (Ohms per Square)	TCR ppm/°C
300 to 1300	±25, ±50, ±100, ±250



UBR Series

Ultra-Broadband Resistors



GENERAL DESCRIPTION

AVX Passive Micro Component group is pleased to introduce the UBR Series of next generation of surface mount Ultra-Broadband Resistors. This product was designed utilizing our proprietary Glass Sandwich Flexiterm® Technology, (GSFT). The Flexiterm® is a surface mountable automotive qualified termination that adds an extra margin against damage due to flexture during installation.

The UBR Series has been designed with high quality selected materials that yield excellent performance. This product is ideal for use in Optical Transceiver Modules or any application requiring excellent ultra-broadband performance. The use of glass sandwich technology and precision laser triming reduces parasitic noise up to 20 GHz.

FEATURES

- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
- Operating Temperature: -40°C to +125°C
- 100% Laser Trimming for Tight Tolerances
- RoHS Compliant

APPLICATIONS

- Optical Transceiver Modules
- Broadband Receiver
- TOSA / ROSA
- Wideband Test Equipment
- Low Noise Amplifier
- MMIC Amplifiers
- Mixers
- Directional Couplers
- Ultra-Broadband Splitters and Combiners

MARKETS

- Opto-electronics
- Automotive
- Telecom
- Broadband Jamming for EW
- Satellite Communication

HOW TO ORDER

UBR
Series Code
UBR = Ultra-Broadband Resistor

0402
Case Size
0402 = 0402
0201 = 0201

A
TCR (ppm/°C)
A = ±250
B = ±100
C = ±50*
D = ±25*
E = Special Request
Please supply design or contact factory
*Non-standard TCR values per special request

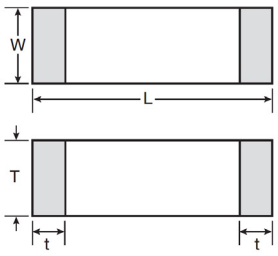
500
Resistance
First 2 Significants for Resistance R for decimal point

E
Tolerance
E = +/-0.5%*
F = ± 1%
G = ± 2%
S = Special Request
Please supply design or contact factory
*Non-standard tolerance values per special request

Z
Termination Type
Z = Flexiterm® (Ag/Epoxy) NiSn plated
7 = Gold Termination*
*Non-standard termination per special request

TR
Packaging
TR = 7" reel

MECHANICAL DIMENSIONS mm (inches)

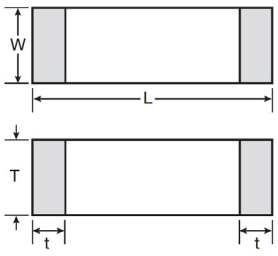


Length (L)	1.00±0.10 (0.039±0.004)
Width (W)	0.50±0.10 (0.020±0.004)
Thickness (T)	0.50±0.10 (0.020±0.004)
Terminal (t)	0.25±0.15 (0.010±0.006)

0402 SPECIFICATIONS

Resistor	Detail
Outline	EIA 0402
Package	Glass wafer sandwich
Maximum Voltage	1 KV
Resistance Value Range	From 16.6 Ohms to 200 Ohms
Termination	FLEXITERM® (Ag/Epoxy), plated
Power Rating	125 mW
Operating Temperature Range	-40°C to +125°C
Tolerances	0.5%, 1%, 2%, 5%

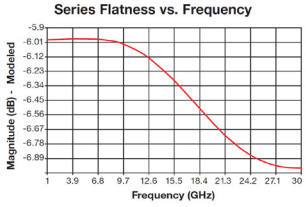
MECHANICAL DIMENSIONS mm (inches)



Length (L)	0.60±0.050 (0.024±0.010)
Width (W)	0.325±0.050 (0.024±0.010)
Thickness (T)	0.325±0.050 (0.020±0.004)
Terminal (t)	0.150±0.050 (0.006±0.010)

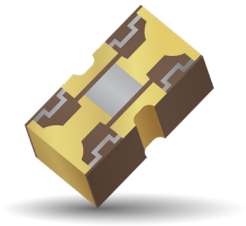
0201 SPECIFICATIONS

Resistor	Detail
Outline	EIA 0201
Package	Glass wafer sandwich
Maximum Voltage	1 KV
Resistance Value Range	From 16.6 Ohms to 200 Ohms
Termination	FLEXITERM® (Ag/Epoxy), plated
Power Rating	125 mW
Operating Temperature Range	-40°C to +125°C
Tolerances	0.5%, 1%, 2%, 5%



AF Series

Attenuator



GENERAL DESCRIPTION

AVX's new PMC SMT Attenuator Series (AF) is manufactured with the highest quality materials for reliable and repeatable performance. These devices are constructed with Aluminum Nitride (AIN) and are available in a standard EIA 0603 case size. The AF Series exhibits excellent performance characteristics for the most demanding PMC applications

The AF series provides virtually flat loss over a broad frequency spectrum. Thin film metalization provides for very stable characteristics over temperature and time. Its balanced PI design provides even current distribution and accurate attenuation characteristics from DC to 20 GHz. It is designed to meet a wide range of RF and microwave large and small signal level applications. The AF is ideal for impedance matching, input padding, signal level runing, and many other critical PMC applications. The AF is rated highest power in class and is suitable for microstrip and CPW applications.

The non-magnetic termination is available providing a range of attachment options such as eutectic diebonding, conductive epoxies, and soldering. The AF is fully compatible with high speed automated pick-and-place processing.

Note: Consult Factory for other attenuation values, termination style and case sizes.

HOW TO ORDER

AF	0603	T	03	E	CA	T	D
Product Designation	**Case Size**	**Power Rating:**	**Attenuation:**	**Configuration**	**Termination:**	**Packaging**	**Quantity**
		T = 1 W (0 to 6 dB) C = 3/4 W (7 to 10 dB)	0 to 10 dB	E = All Terminations wrappedand patterned ground plane	CA = Non-Mag Gold	T = Tape & Reel: 7" Reel, 1000 pcs. C = Cap Pack, 100 pcs. S = Snippet	D = 1000 B = 500 7 = 100 3 = 25

The above part number refers to an AF 0603 Case Size with an attenuation of 3dB, 1W Power Rating, wrapped and patterned ground plane configuration with Non-Mag Gold Termination and tape and reel packaging, 1000 pcs.

FEATURES

- Thin Film Design
- Power Rating Up to 1 Watt
- Frequency Response +/-0.5dB
- Characterized to 20 GHz
- CPW and Microstrip Applications
- EIA 0603 SMT
- Highest Power in Class
- AIN construction
- Balanced Pi design
- Non-Magnetic
- RoHs compliant

APPLICATIONS

- Telecommunications
- Satelite Communications
- Cellular Base Stations
- Microwave Radio
- ISM
- RF/Microwave Power
- Military/Aerospace
- Test and Measurement
- Impedance Matching
- Input Padding
- Signal Level Tuning
- Signal Conditioning

ELECTRICAL AND MECHANICAL SPECIFICATIONS

NOMINAL IMPEDANCE: 50 Ohms

FREQUENCY RANGE: DC to 20 GHz

VALUES AVAILABLE: 0 to 10 dB (1 dB increments)

INPUT POWER CW:
1:W: 0 to 6 dB
0.75W: 7 to 10 dB

VSMR: 1.25:1 typical

FREQUENCY RESPONSE (dB):
D.C. to 10 GHz:±0.50 dB
>10GHz: ±dB

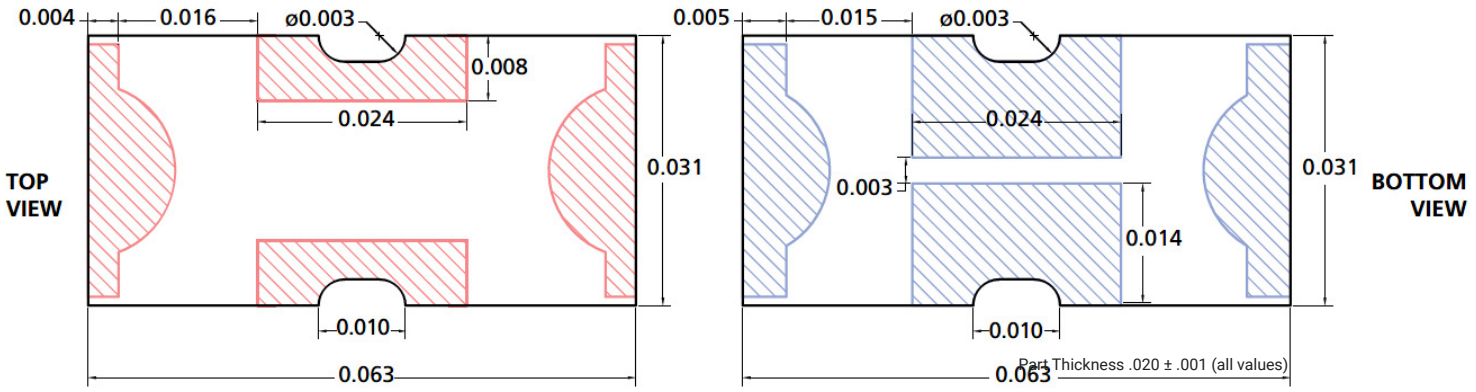
SUBSTRATE MATERIALS: AIN (1 to 10 dB)
Al_2O_3 (0 dB)

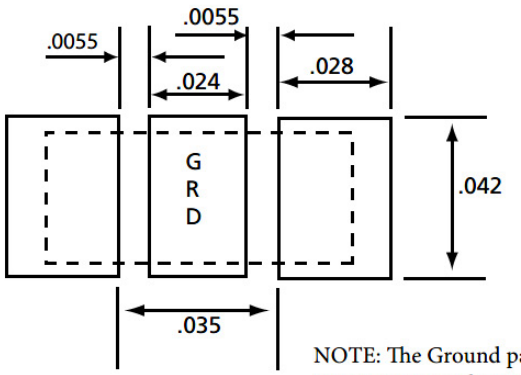
RESISTORS: Tantalum Nitride
TERMINAL: Thin FIlm metalstack, Au

ENVIRONMENTAL SPECIFICATIONS

OPERATING TEMPERATURE: -55°C to + 150°C
100% inspection Per MIL-STD-883

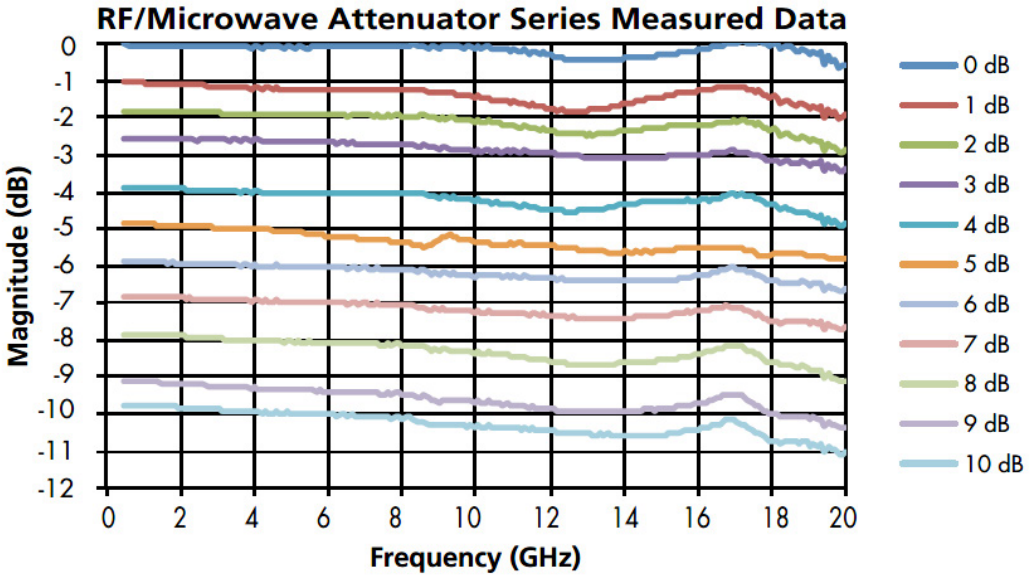
MECHANICAL CONFIGURATION





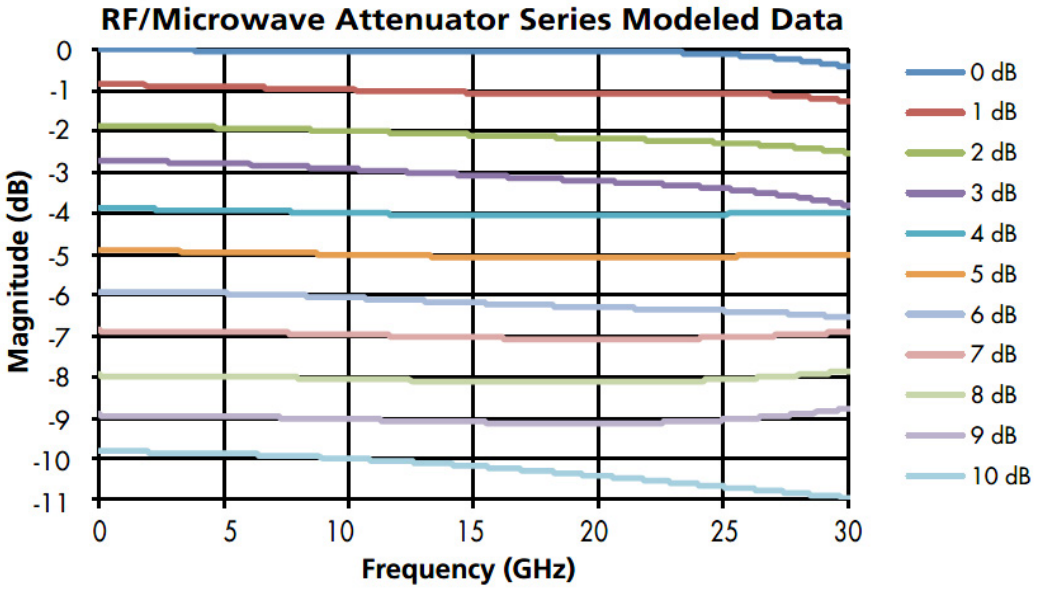
NOTE: The Ground pad is also used to remove heat from the component. Provisions must be made to connect to heat sink.

Dimensions are in inches



RF/Microwave Attenuator Test Conduction Description

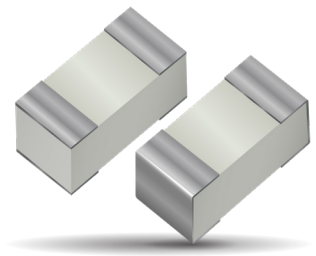
All testing performed on 13.3-mil-thick Rogers RO4350 microstrip board, with the UUT subtending a 44 mil gap in 30 mil-wide center trace (nominal 50-ohm characteristic impedance). Measurements were made using a four-receiver architecture. Measurements have been de-embedded to the edges of the UUT using a standard TRL calibration procedure.



RF/Microwave Attenuator Modeled Data Description

Models were simulated using Ansoft HFSS version 14 in a perfect 50 ohm environment with ideal ports placed at the edge of the pads to ground. The boundary condition was set to be a radiating boundary in air.

Q Bridge Thermal Conductor



GENERAL DESCRIPTION

A\/X's new Q-Bridge Thermal Conductor is manufactured with the highest quality materials for reliable and repeatable performance providing a cost effective thermal management solution. These devices are constructed with Aluminum Nitride (AlN) or Beryllium Oxide (BeO) and are available in standard EIA form factors.

Q-Bridge provides the designer with the ability to manage thermal conditions by directing heat to a thermal ground plane, heat sink or any other specific thermal point of interest. The inherently low capacitance makes this device virtually transparent at RF/microwave frequencies. This device has the added benefit of offering additional layers of protection to adjacent components from hot spot thermal loads.

Q-Bridge provides the benefit of increased overall circuit reliability. A\/X's Q-Bridge is manufactured using one-piece construction, providing a RoHS compliant SMT package that is fully compatible with high speed automated pick-andplace processing. It is available in 0302, 0402, 0603 and 0805 EIA case sizes. Custom configurations are also available

APPLICATIONS

- High Thermal Conductivity
- Low Thermal Resistance
- Low Capacitance
- Increases Circuit Reliability
- RoHS Compliant
- More efficient thermal management

FEATURES

- GaN Power Amplifiers
- High RF Power Amplifiers
- Filters
- Synthesizers
- Industrial Computers
- Switch Mode Power Supplies
- Pin & Laser Diodes

FUNCTIONAL APPLICATIONS

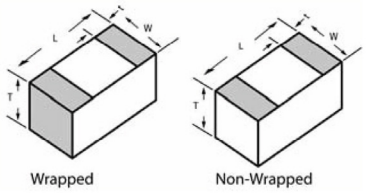
- Between active device and adjacent ground planes
- Specific contact pad to case
- Contact pad to contact pad
- Direct component contact to via pad or trace
- Edges fully metalized

HOW TO ORDER

QB	03	A	25	W	H	T
Q-Bridge	Case Size OS = 0302 02 = 0402 03 = 0603 05 = 0805	Substrate A = AIN B = BeO	Thickness (mils)	Style W = Edge Wrap E = No Wrap	Termination Y = Silver Platinum, non-magnetic Termination S = Silver over Magnetic Termination L = 60Sn/40Pb solder plating Consult factory for other termination options e.g., tin plate and solder plate	Packaging T = 1000pcs., 7" reel T\500 = 500pcs., 7" reel C = Matrix Tray

RoHS COMPLIANT

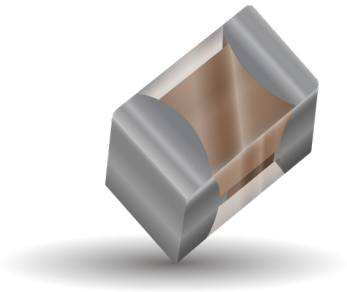
Size (EIA)	Length (L)	Width (W)	Standard Thickness (T, mils)		Termination (t)
			T1	T2	
0302	0.77 ± 0.051 (0.030 ± 0.002)	0.51 ± 0.051 (0.020 ± 0.002)	20	15	0.25 ± 0.051 (0.010 ± 0.002)
0402	1.02 ± 0.051 (0.040 ± 0.002)	0.51 ± 0.051 (0.020 ± 0.002)	20	15	0.25 ± 0.051 (0.010 ± 0.002)
0603	0.52 ± 0.051 (0.060 ± 0.002)	0.76 ± 0.051 (0.030 ± 0.002)	25	20	0.38 ± 0.051 (0.015 ± 0.002)
0805	2.03 ± 0.051 (0.080 ±.002)	1.27 ± 0.051 (0.050 ± 0.002)	40	25	0.51 ± 0.051 (0.020 ± 0.002)



AlN Case Size	Thermal Resistance (°C/W)		Thermal Conductivity (mW/°C)		Capacitance Value (pF)*	
	Thickness T1	Thickness T2	Thickness T1	Thickness T2	Thickness T1	Thickness T2
0302	19	24	53	41	0.08	0.07
0402	25	32	40	30	0.06	0.05
0603	20	25	50	40	0.08	0.06
0805	10	16	100	60	0.13	0.08

BeO Case Size	Thermal Resistance (°C/W)		Thermal Conductivity (mW/°C)		Capacitance Value (pF)*	
	Thickness T1	Thickness T2	Thickness T1	Thickness T2	Thickness T1	Thickness T2
0302	12	15	81	63	0.07	0.06
0402	16	21	61	46	0.05	0.04
0603	13	16	76	61	0.06	0.05
0805	7	11	153	92	0.10	0.07

RC Equalizer Network



GENERAL DESCRIPTION

These ruggedly constructed, ultraminiature (EIA 0402, 1005 metric) equalizers combine high-performance tantalum nitride (TaN) resistive elements and silicon/oxygen/nitrogen (SiON) capacitive elements with AVX's proprietary, automotive-qualified, glass-sandwich FLEXITERM® surface-mount technology, which provides an extra measure of protection against flexure damage during installation. The new GEQ Series equalizers are also manufactured with 100% laser trimming to achieve tight tolerances and offer a low 0.5mm profile, a 125mW power rating, resistance values spanning 10–50Ω, and capacitance values extending from 1–50pF.

Rated for a wide range of operating temperatures (-55ºC to +125ºC) and compliant with RoHS, ideal applications for the series extend across the optoelectronic, telecommunications, broadband, military, electronic warfare, space, test, and instrumentation markets and include optical transceiver modules, broadband receivers, and transmission and receiver optical subassemblies (TOSA and ROSA).

FEATURES

- EIA 0402 Case Size
- Resistance Range: 10 to 50 Ω typ.
- Capacitance Range: 1 to 50 pF typ.
- Parallel Configurations
- Power Rating: 125 mW
- Operating Temperature: -55°C to +125°C
- Laser Trimmed Resistors
- RoHS Compliant

APPLICATIONS

- Optical Transceiver Modules
- Broadband Receiver
- TOSA / ROSA

MARKETS

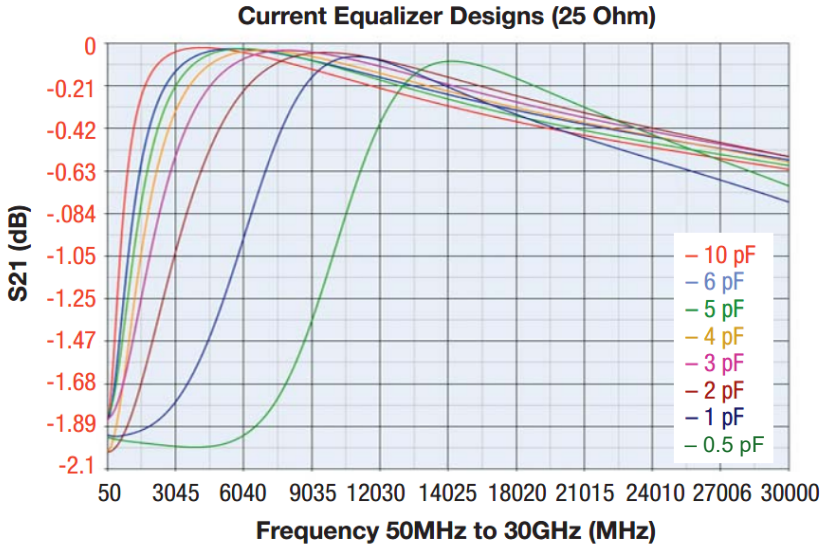
- Opto-electronics
- Telecom
- Broadband Jamming for EW
- Military
- Instrumentation and Test

*For other RC Combinations and EIA Sizes contact factory

HOW TO ORDER

GEQ	25R0	F	05R0	J	T	TR
AVX Series	**Resistance Value (Ω)**	**Resistance Tolerance**	**Capacitance Value (pF)**	**Capacitance Tolerance**	**Terminations**	**Packaging**
0402	3 significant digits R = decimal point	F = 1%	3 significant digits R= decimal point	J* = 5% K* = 10% M* =20% *Minimum tolerance = +/- 0.1pF	T = NiSn Plated	TR = Tape & Reel

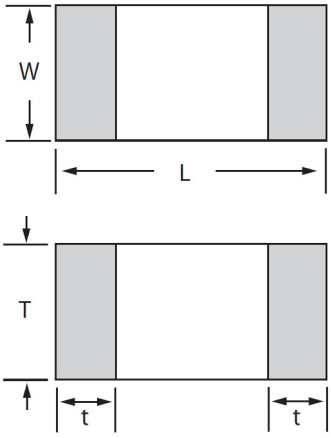
RoHS COMPLIANT



SPECIFICATIONS

Package Size: EIA 0402
Design: Glass wafer sandwich
Termination: NiSn plated
Power Rating: 125 mW
Operating Temperature Range: -55°C to +125°C
Tolerance: Resistor: 1-5%, Capacitor: 5-20%
Resistance Range: 10 to 50 Ω (typical)
Capacitance Range: 1 to 50 pF (typical)

DIMENSIONS



Size (EIA)	Length (L)	Width (W)	Thickness (T)	Termination (t)
0402	1.02 ± 0.051 (0.040 ± 0.002)	0.51 ± 0.051 (0.020 ± 0.002)	.020 ±.004 (0.50 ±0.10)	0.25 ± 0.051 (0.010 ± 0.002)

RESISTOR MATERIAL

Thin Film Resistors	TaN
Typical Sheet Resistivity (ohm/sq)	10 to 100
TCR (ppm/°C, -25 to 125°C)	-100 to -150
Stability (Change after 1000 hours @ 125°C)	1.0%

CAPACITOR MATERIAL

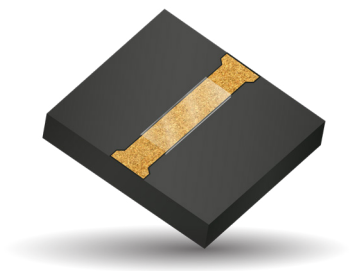
Material	SiON
pF/mm Typical	50 to 100
BDV (v/µm)	600
DF	≤0.1%
TCC (ppm/°C, -25 to 125°C)	±60

ENVIRONMENTAL TESTS

Reliability Test	Criteria
Life Test	1000 Hrs. @ 125°C @ 50 mW
85/85 Temp./ Humidity Breakdown	1080 Hrs. @ 50 mW
Thermal Cycle	100 cycles @ -40 to 125°C
Termination Strength	200 g for 50 seconds (Dage Tester)x

Transmission Line MIM Capacitor

(Metal-Insulator-Metal)



GENERAL DESCRIPTION

AVX Thin Film Technologies is pleased to introduce a novel MIM (Metal-Insulator-Metal) capacitor using a transmission line wire bond pad structure with backside ground.

The TL MIM can be supplied on quartz, alumina, glass and other substrates to minimize losses. Copper traces are used for optimal conductivity. Front and backside gold metalization make this device suitable epoxy, gold wire bond/ribbon bond attachments.

BENEFITS

- HFSS Design Unique for every device
- Gold Wirebondable
- Copper Conductor Design for improved Circuit Conductivity
- Designs Optimized for RF/Performance
- ROHS Compliant

APPLICATIONS

- DC Blocking at UHF
- High Frequency Link
- RF Microwave applications

SUBSTRATE MATERIALS

- Alumina (Al_2O_3)
- Quartz

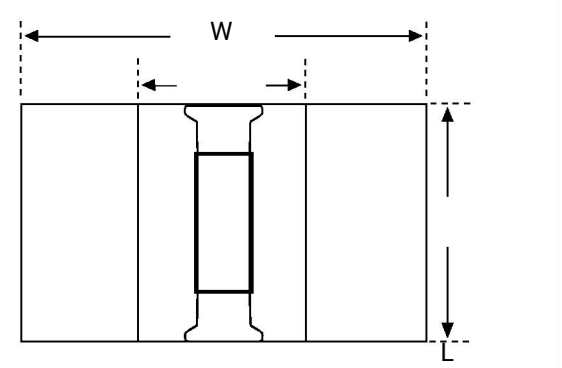
CAPACITOR MATERIALS

Rated Voltage	Specific Capacitance	Dissipation Factor	TCC (ppm/°C)
<100	50 - 100 * pf/mm2	<0.1%	±60

*Actual maximum capacitance values depend on transmission line dimensions

MECHANICAL DIMENSIONS

Based on Transmission Line Design Request



Length is determined by transmission line

TEST METHODS

Specification		Limit
MIL-STD-883-2011.10	BOND STRENGTH	> 3 gm min. w/0.001" Au Wire
MIL-STD-883-2019.10	SHEAR STRENGTH	Size Dependent See Procedure
MIL-STD-202-108	LIFE	1000 hrs @ 125°C

Transmission Line MIM Capacitor

(Metal-Insulator-Metal)

GENERAL CHARACTERISTICS

CHARACTERISTIC	DESIGN DEPENDENT
Capacitor Range	0.3 - 15 pF (typical)
Tolerance	± 20%
Backing	Gold Metalization
Termination Type	Gold Wire Bond

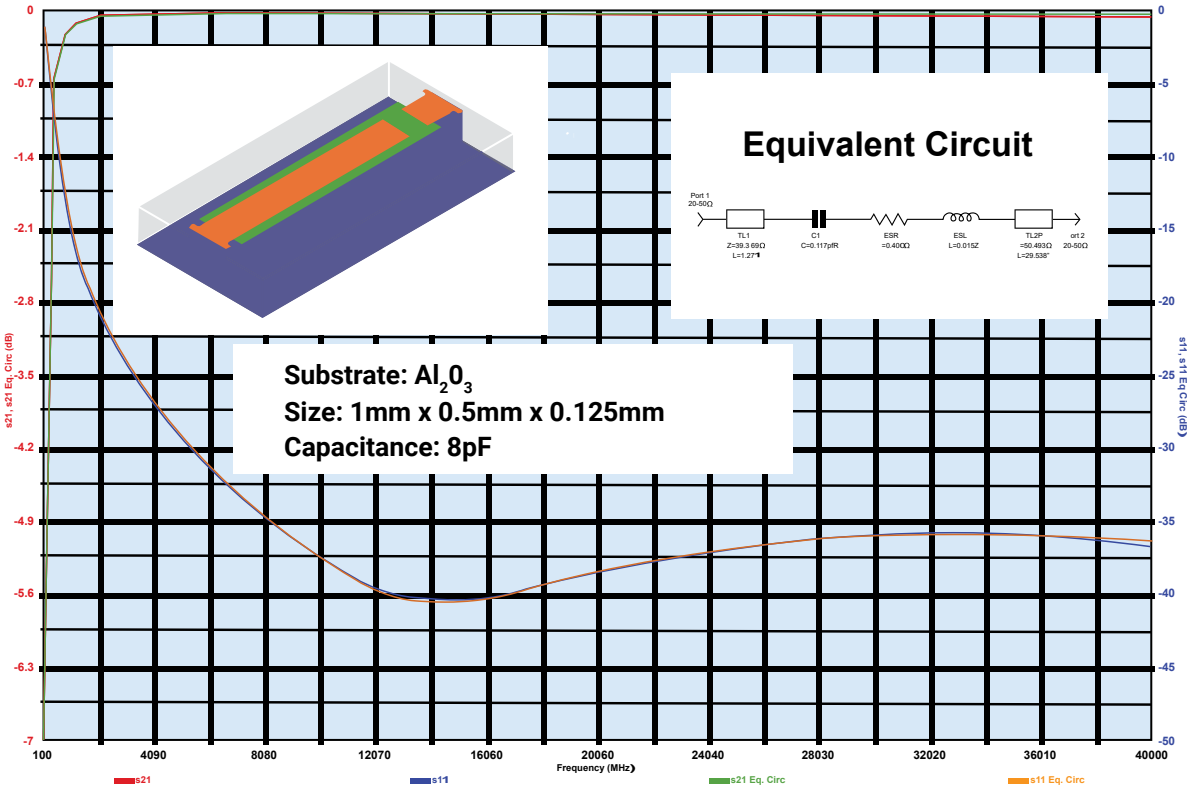
AVAILABLE PART NUMBERS

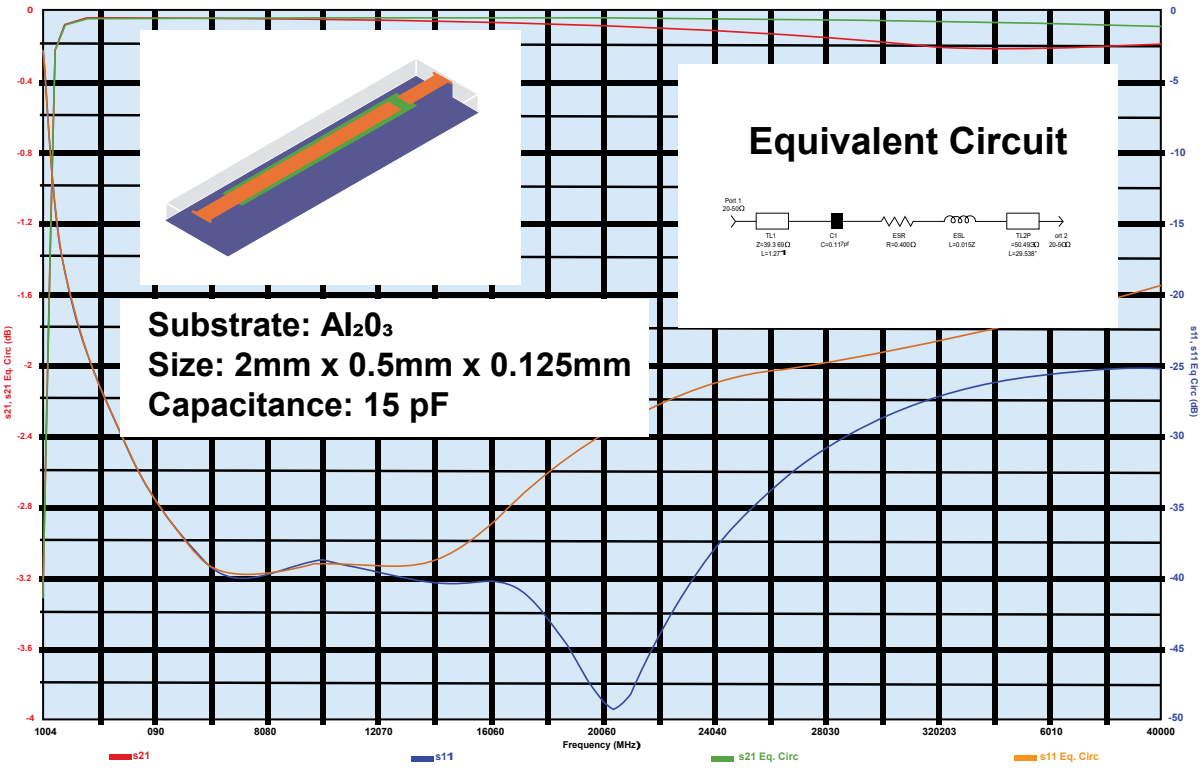
Part Number	Substrate	Length (mils)	Width (mils)	Thickness (mils)	Cap Value (pF)
MV0304CA150MABW	Alumina	30	40	10	15
MV0402CA150MAAW	Alumina	40	20	5	15
MV0802CA150MAAW	Alumina	80	20	5	15
MV0804CA1R0MABW	Alumina	80	40	10	1
MV0804CA150MABW	Alumina	80	40	10	15
MV3204CA150MABW	Alumina	120	40	10	15
MV0404CA150MABW	Alumina	40	40	10	15
MV0505CA150MQAW	Quartz	50	50	5	15

HOW TO ORDER

MV	04	02	C	A	150	M	A	A	W
Series Code	**Substrate Length**	**Substrate Width**	**Working Voltage**	**Standard Impedance**	**Capacitance**	**Capacitance Tolerance**	**Substrate**	**Substrate Thickness (mils)**	**Packaging**
MV = TL MIM	in tens of mils	in tens of mils	C = 100 WVDC	A = 50Ω X = Other Contact Factory	capacitance code in pF First two digits = significant figures or R for decimal place. Third digit - number of zero or after "R" significant figures.	M = ± 20%	A = Alumina Q = Quartz G = Glass X = Other	A = 5 mils B = 10 mils C = 15 mils X = Contact Factory	W = anti-static waffle pack T = tested, undiced D = Tested and diced on tape

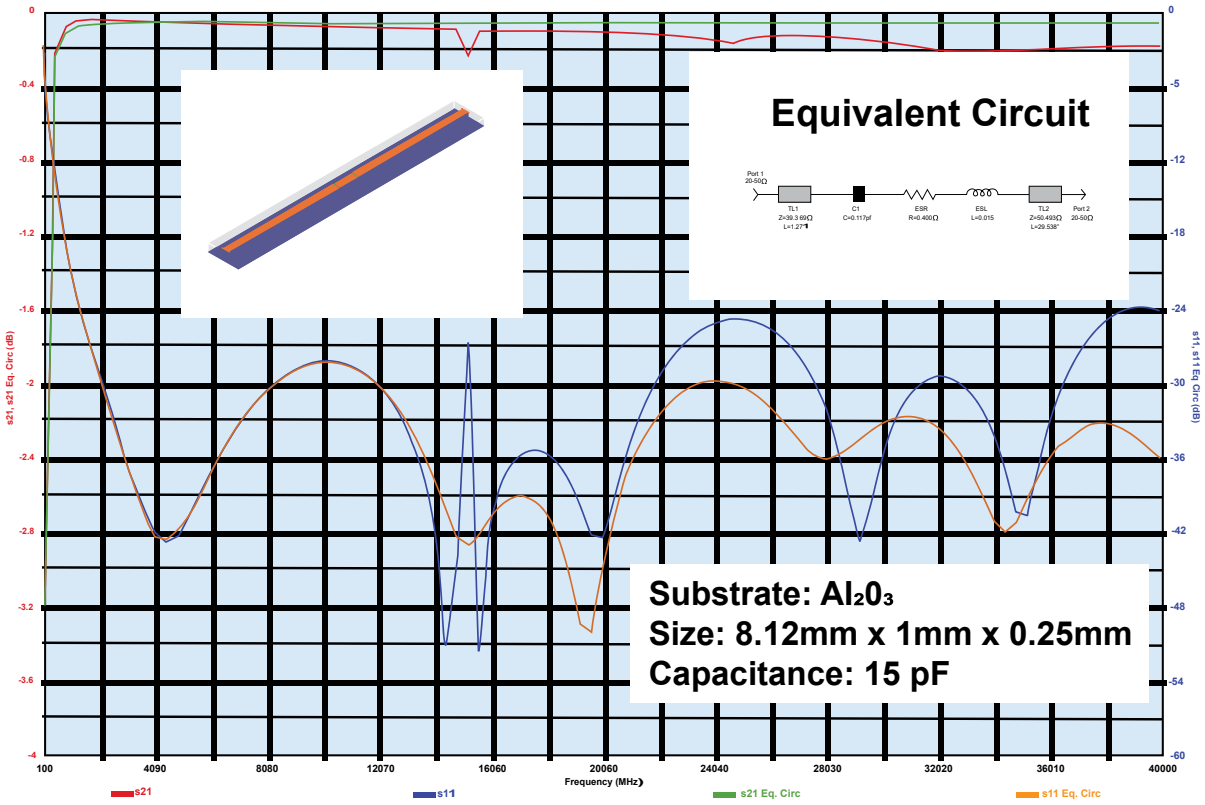
Transmission Line MIM Capacitor
(Metal-Insulator-Metal)





Transmission Line MIM Capacitor

(Metal-Insulator-Metal)



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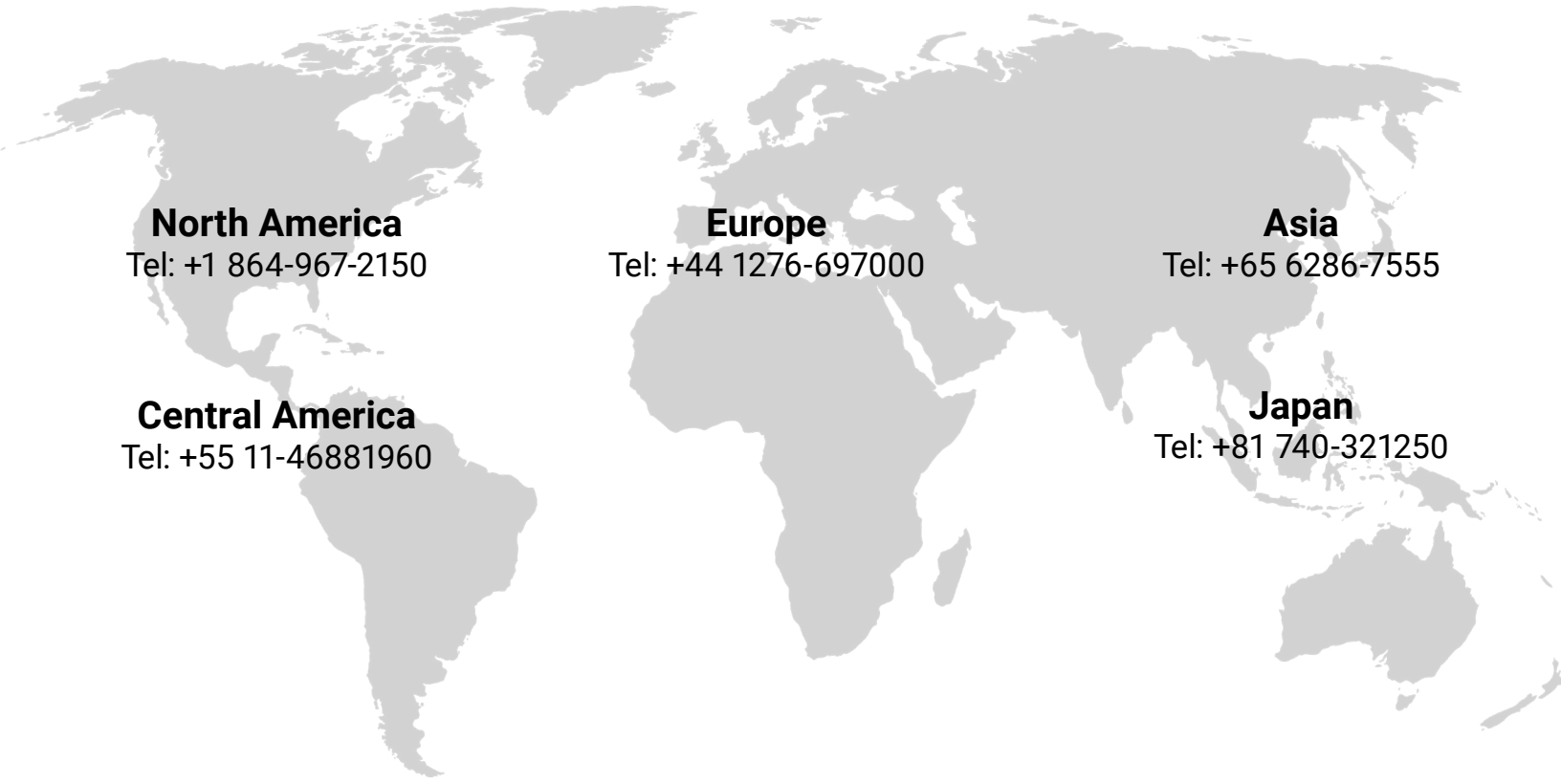

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