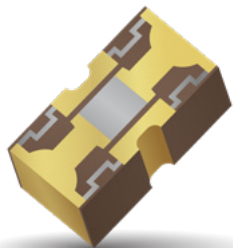


# Thin Film RF Solutions - Attenuator

## AT Series - 0603



### GENERAL DESCRIPTION

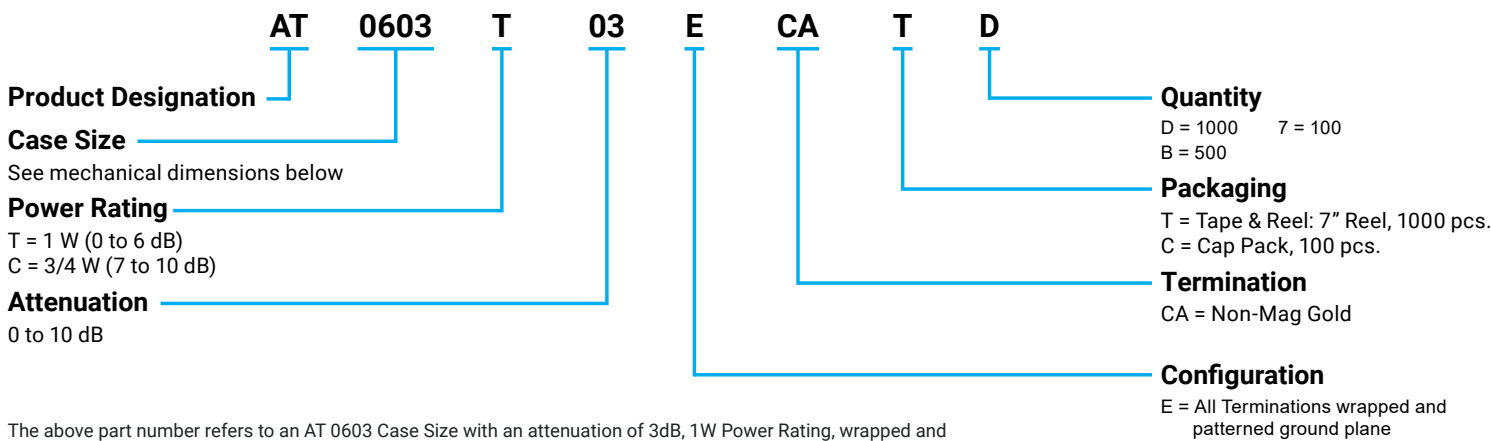
KYOCERA AVX's new PMC SMT Attenuator Series (AT) is manufactured with the highest quality materials for reliable and repeatable performance. These devices are constructed with Aluminum Nitride (AlN) and are available in a standard EIA 0603 case size. The AT Series exhibits excellent performance characteristics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

The AT 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 AT is ideal for impedance matching, input padding, signal level tuning, and many other critical PMC applications. The AT is rated highest power in class and is suitable for microstrip and CPW applications.

The non-magnetic termination is available to provide bonding with conductive epoxies. The AT 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



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

### FEATURES

- Thin Film Design
- Power Rating Up to 1 Watt
- Frequency Response  $\pm 0.5$ dB
- Characterized to 20 GHz
- CPW and Microstrip Applications
- EIA 0603 SMT
- Highest Power in Class
- AlN construction
- Balanced Pi design
- Non-Magnetic Versions Available
- RoHs compliant

### APPLICATIONS

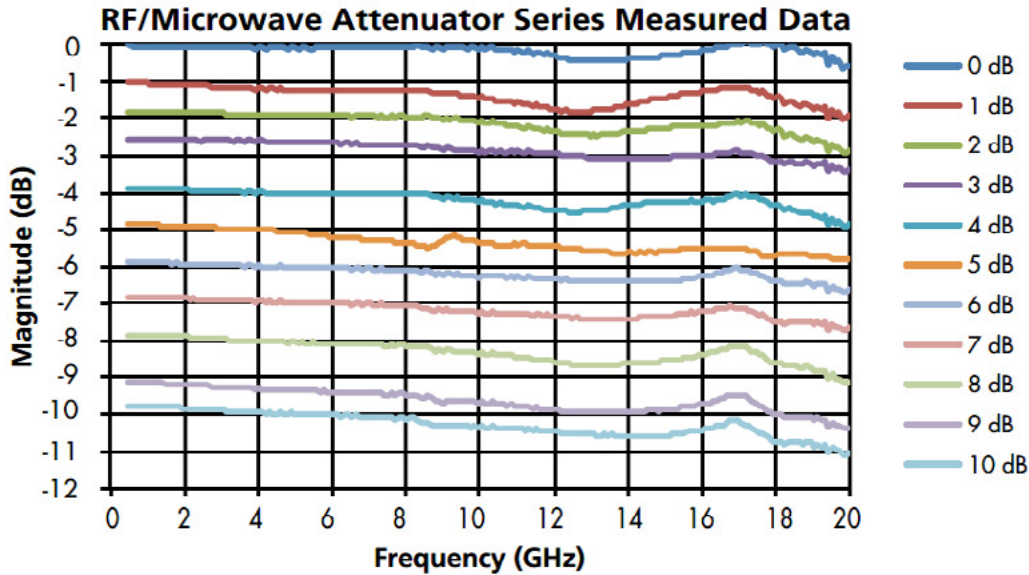
- Telecommunications
- Satellite Communications
- Cellular Base Stations
- Microwave Radio
- ISM
- RF/Microwave Power
- Military/Aerospace
- Test and Measurement
- Impedance Matching
- Input Padding
- Signal Level Tuning
- Signal Conditioning
- MRI

### AVAILABLE ATTENUATOR VALUES

Part Number	dB	Impedance	Frequency Range	Power	Case Size
AT0603T00ECATD	0	50	DC - 20 Ghz	1	0603
AT0603T01ECATD	1	50	DC - 20 Ghz	1	0603
AT0603T02ECATD	2	50	DC - 20 Ghz	1	0603
AT0603T03ECATD	3	50	DC - 20 Ghz	1	0603
AT0603T04ECATD	4	50	DC - 20 Ghz	1	0603
AT0603T05ECATD	5	50	DC - 20 Ghz	1	0603
AT0603T06ECATD	6	50	DC - 20 Ghz	1	0603
AT0603C07ECATD	7	50	DC - 20 Ghz	0.75	0603
AT0603C08ECATD	8	50	DC - 20 Ghz	0.75	0603
AT0603C09ECATD	9	50	DC - 20 Ghz	0.75	0603
AT0603C10ECATD	10	50	DC - 20 Ghz	0.75	0603

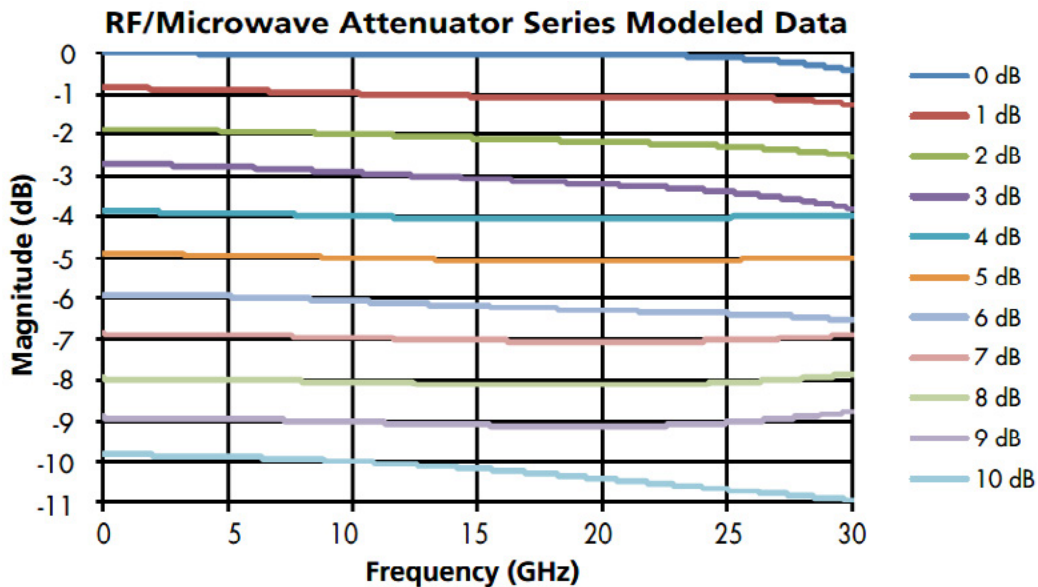
Click on part number to see full specifications





### RF/MICROWAVE ATTENUATOR TEST CONDITION 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.

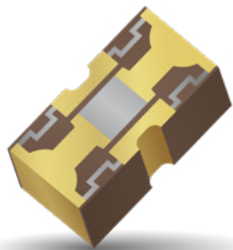


### RF/MICROWAVE ATTENUATOR MODELED DATA DESCRIPTION

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.

# Thin Film RF Solutions - Attenuator

## AT0603T00ECATD - 0dB

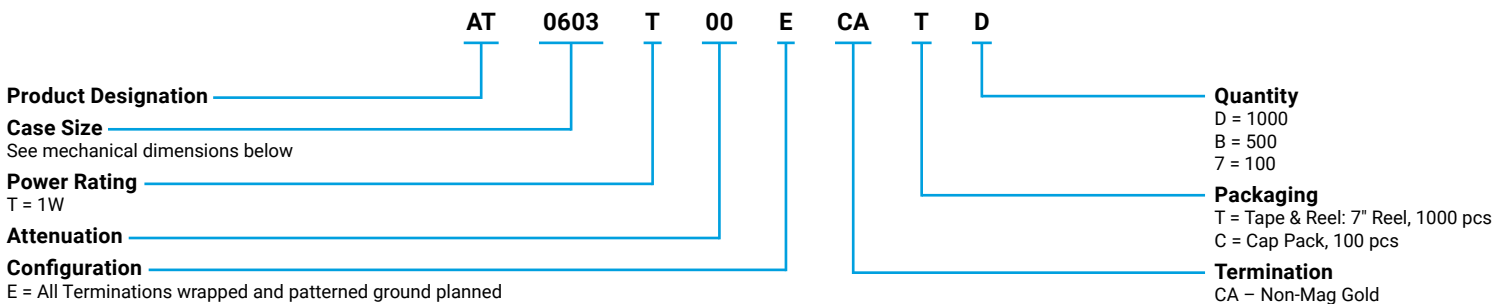


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

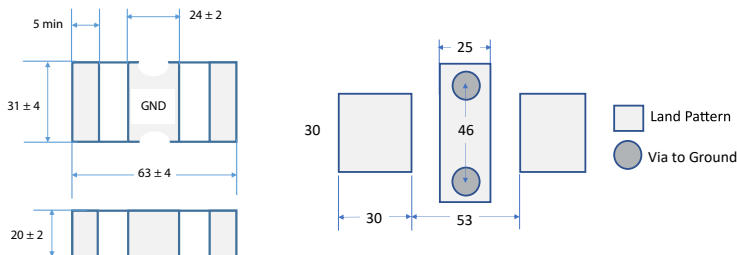
[Click here to go back to main table](#)

### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View

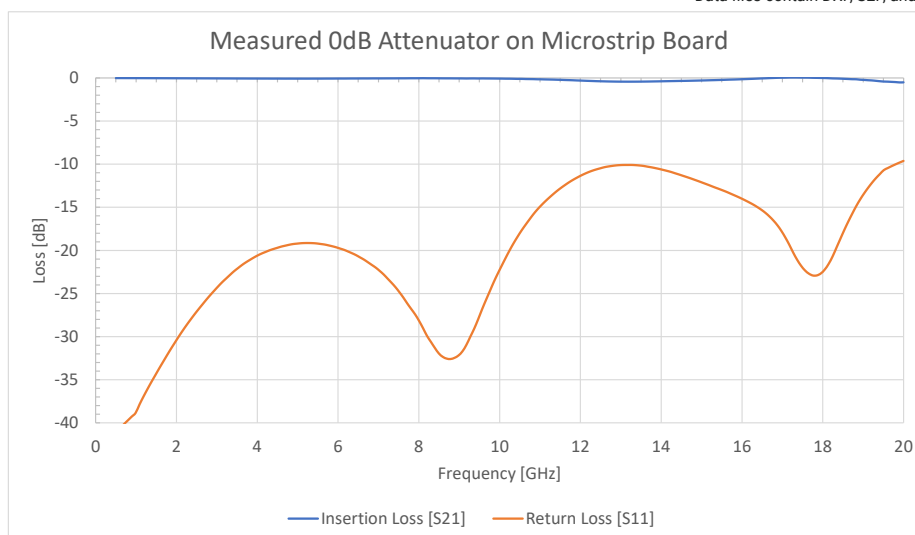


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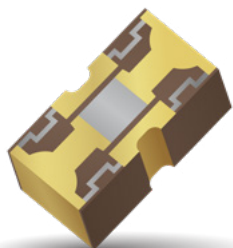
\*Data files contain DXF, S2P, and HFSS files



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.

# Thin Film RF Solutions - Attenuator

## AT0603T01ECATD - 1dB

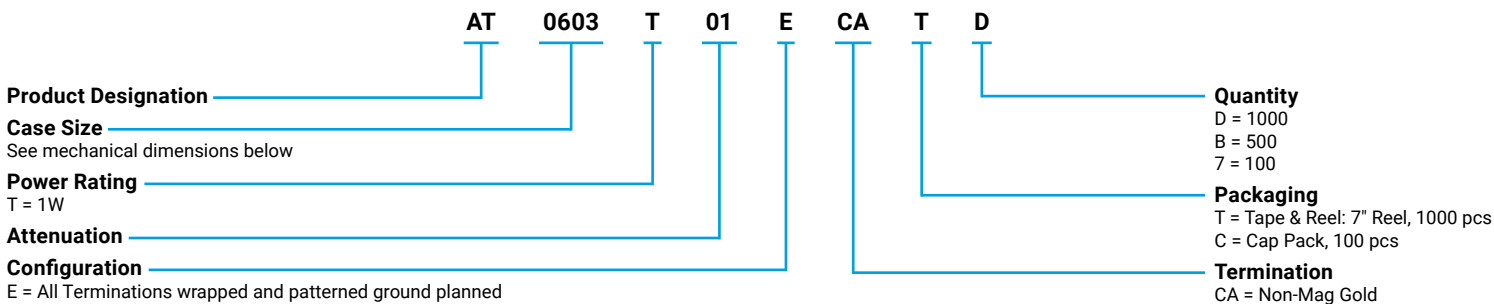


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

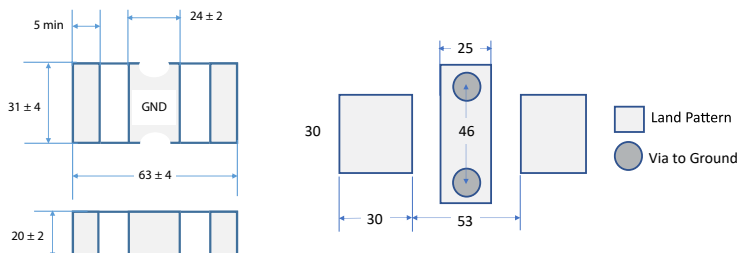
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View

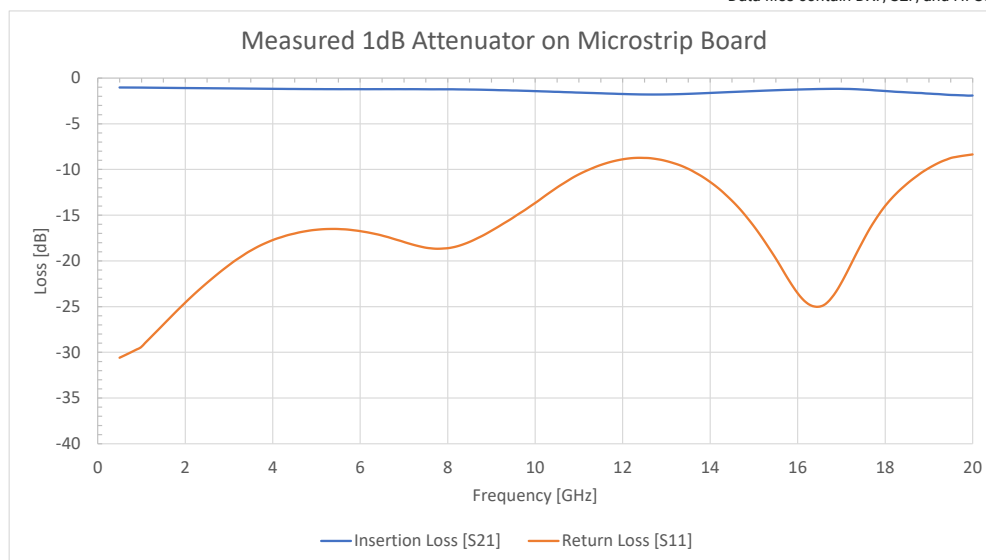


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\*Data files contain DXF, S2P, and HFSS files



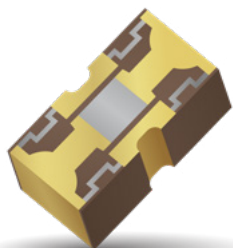
All testing performed on 13.3-mil-thick Rogers RO4350 microstrip board, with the UUT subtending a 44 mil gap in 30 mil-wide center trace (nominal 50-ohm characteristic impedance). Measurements were made using a four-receiver architecture. Measurements have been de-embedded to the edges of the UUT using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



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# Thin Film RF Solutions - Attenuator

## AT0603T02ECATD - 2dB

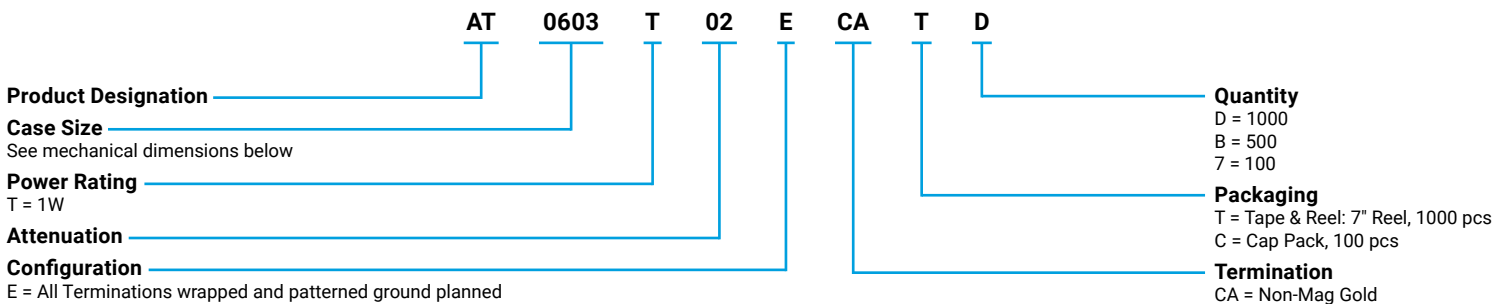


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

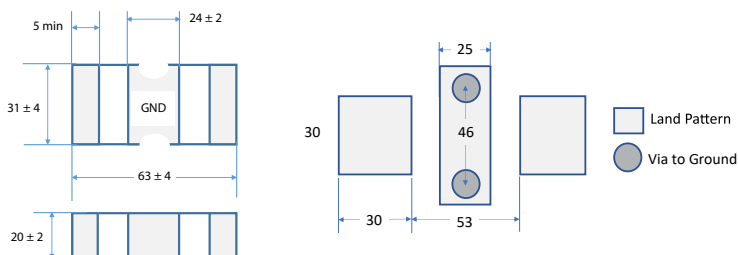
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View

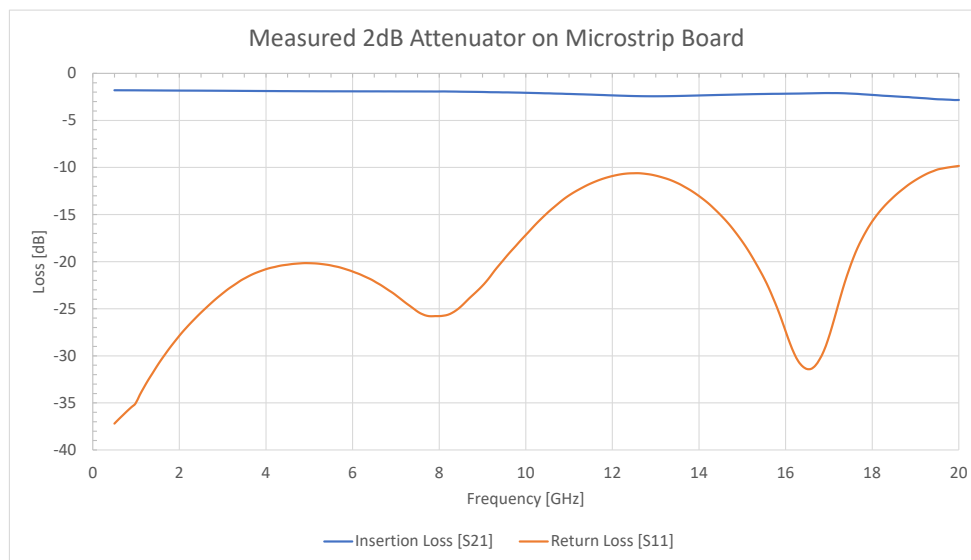


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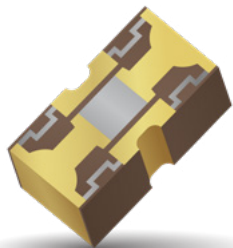
\*Data files contain DXF, S2P, and HFSS files



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.

# Thin Film RF Solutions - Attenuator

## AT0603T03ECATD - 3dB

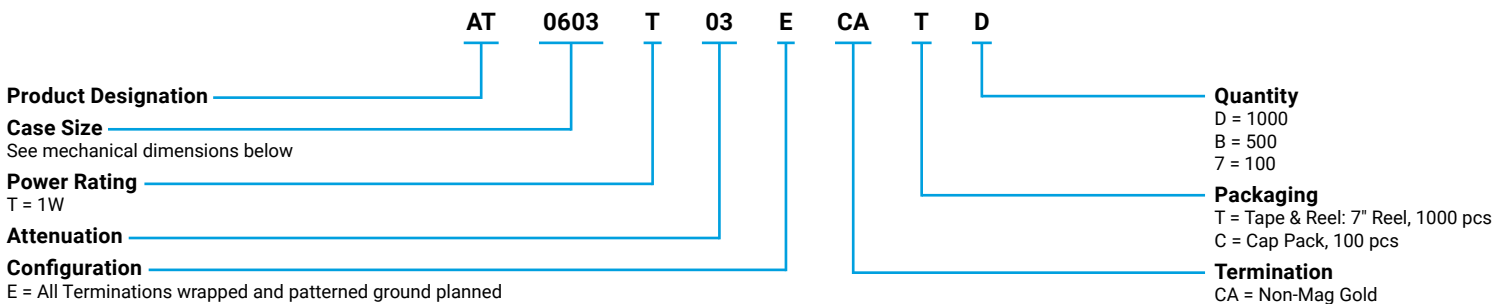


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

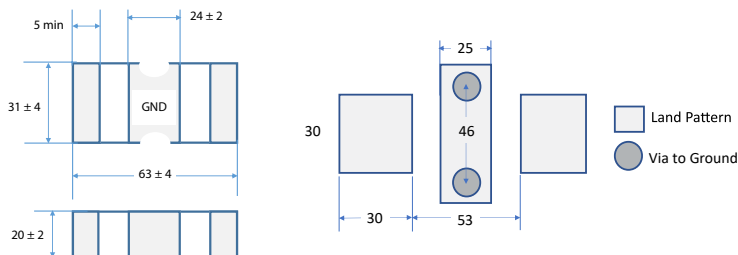
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View

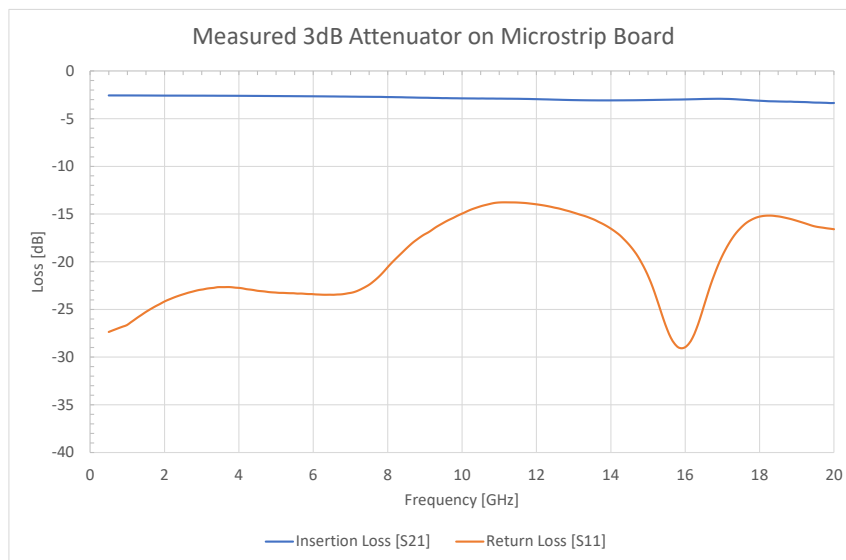


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\*Data files contain DXF, S2P, and HFSS files



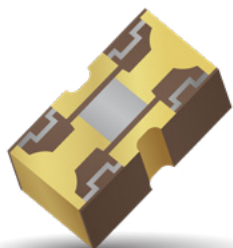
All testing performed on 13.3-mil-thick Rogers RO4350 microstrip board, with the UUT subtending a 44 mil gap in 30 mil-wide center trace (nominal 50-ohm characteristic impedance). Measurements were made using a four-receiver architecture. Measurements have been de-embedded to the edges of the UUT using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



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# Thin Film RF Solutions - Attenuator

## AT0603T04ECATD - 4dB

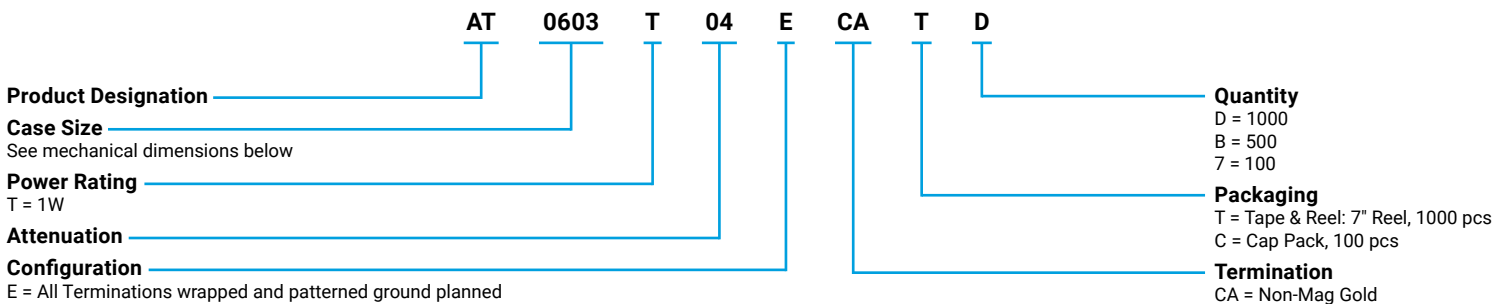


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to +150°C	<b>Inspection:</b>	100% Per MIL-STD-883

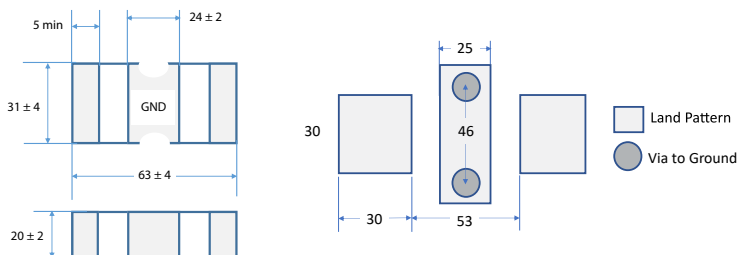
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT

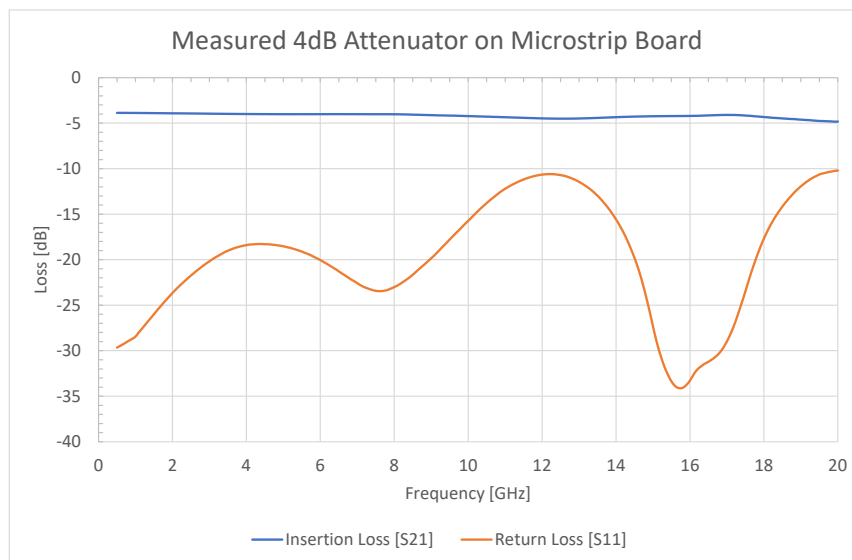


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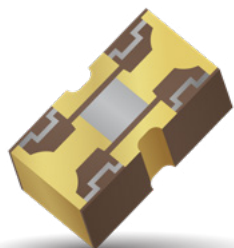
\*Data files contain DXF, S2P, and HFSS files



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.

# Thin Film RF Solutions - Attenuator

## AT0603T05ECATD - 5dB

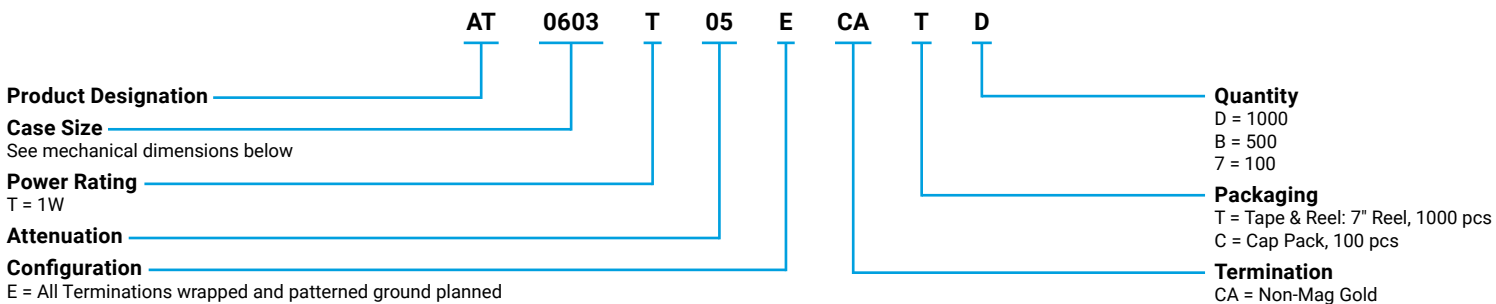


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

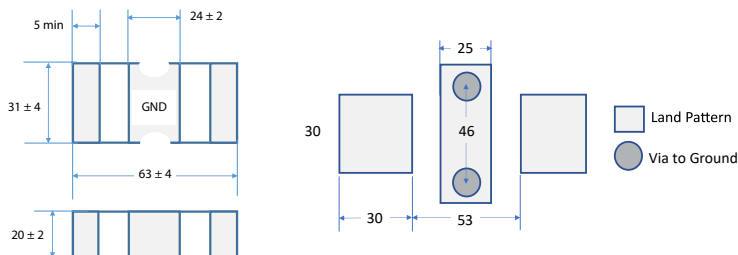
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT



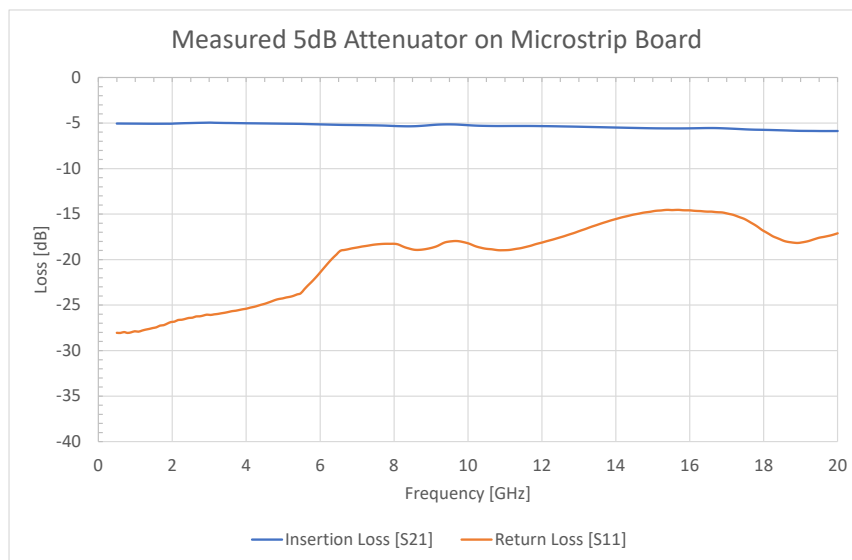
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COMPLIANT

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\*Data files contain DXF, S2P, and HFSS files



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.



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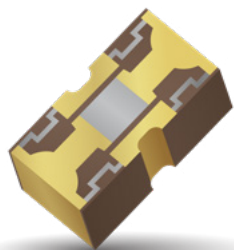
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- SPECIALTY THIN FILM PRODUCTS -



# Thin Film RF Solutions - Attenuator

## AT0603T06ECATD - 6dB

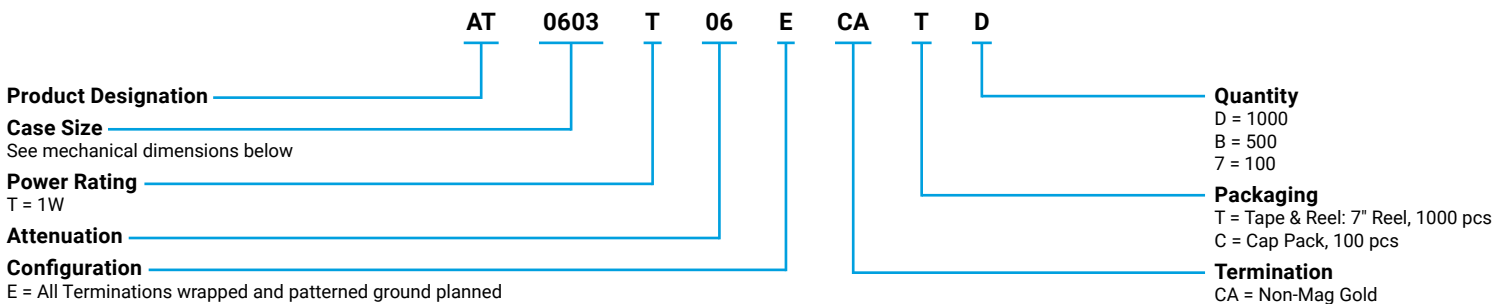


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	1W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

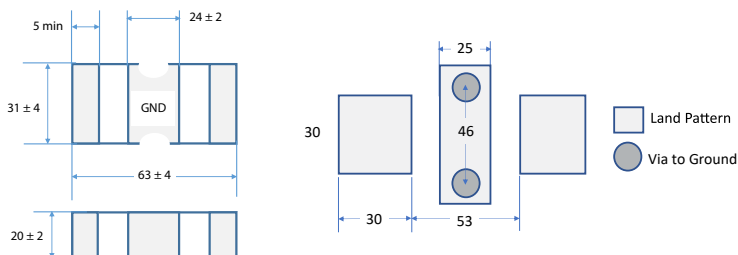
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View

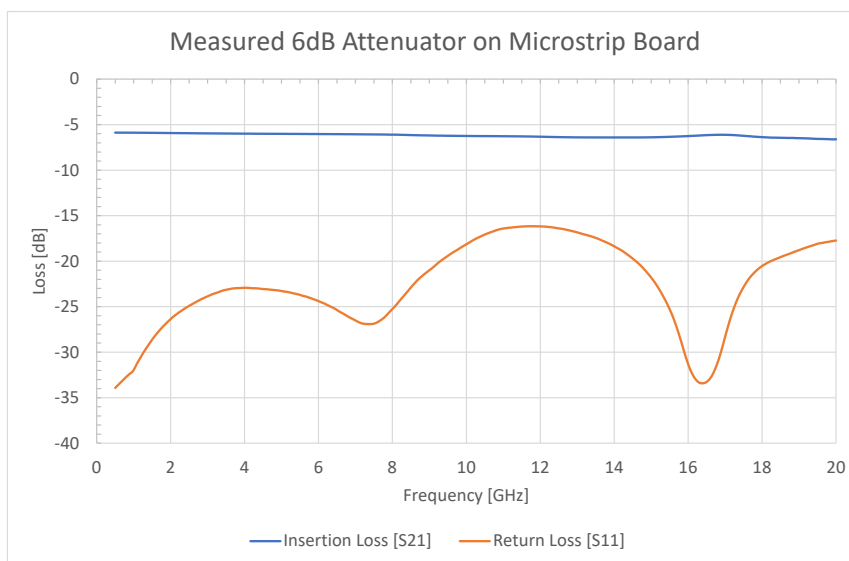


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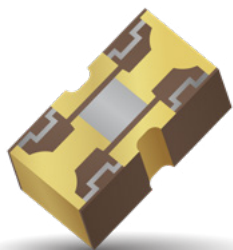
\*Data files contain DXF, S2P, and HFSS files



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.

# Thin Film RF Solutions - Attenuator

## AT0603C07ECATD - 7dB

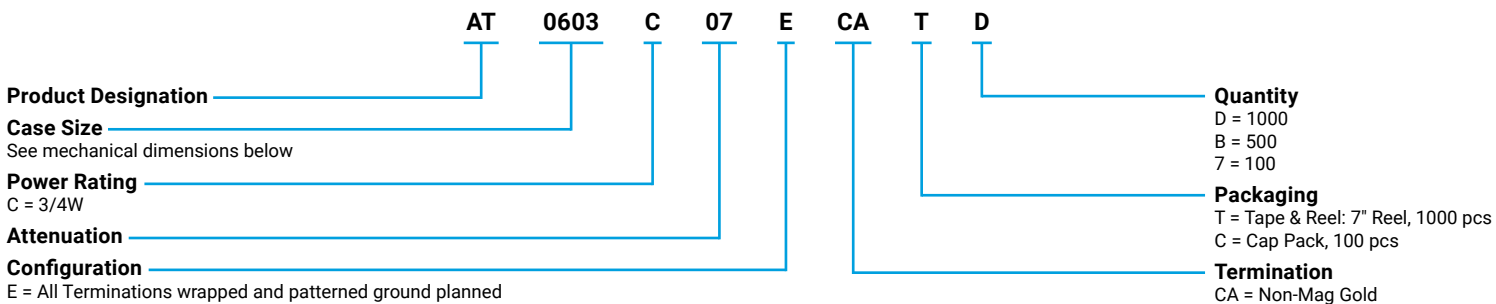


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	3/4W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to +150°C	<b>Inspection:</b>	100% Per MIL-STD-883

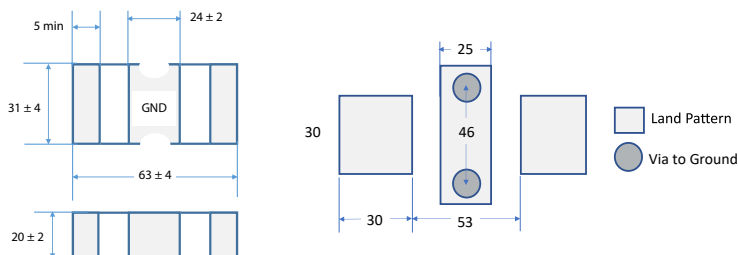
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT

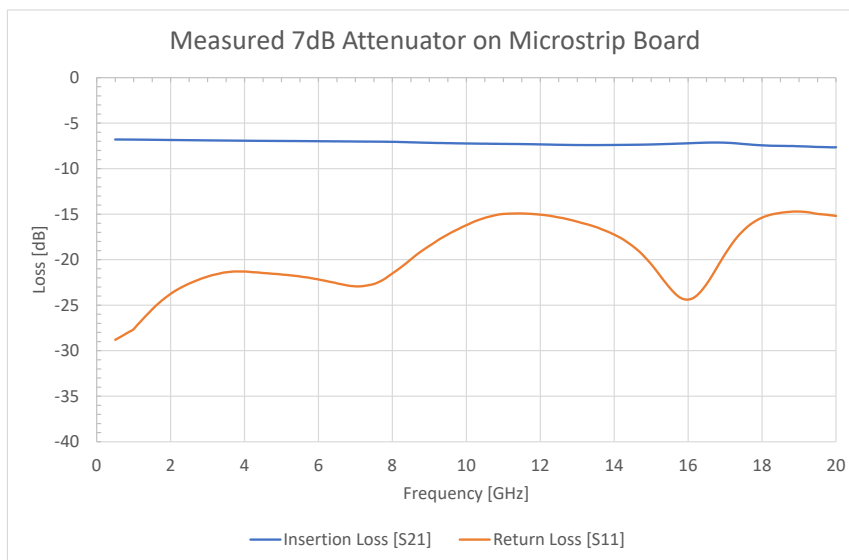


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\*Data files contain DXF, S2P, and HFSS files



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.



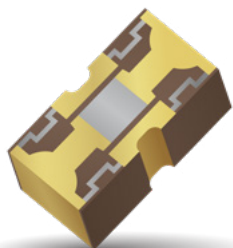
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– SPECIALTY THIN FILM PRODUCTS –

# Thin Film RF Solutions - Attenuator

## AT0603C08ECATD - 8dB

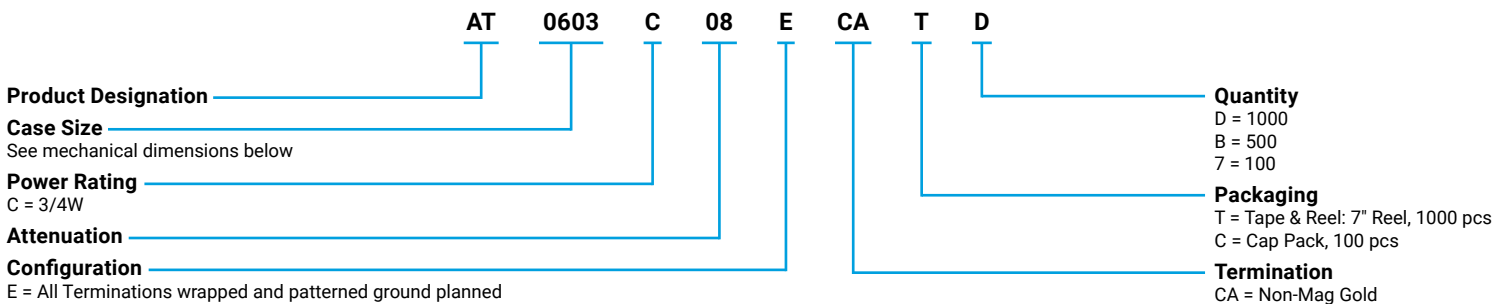


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	3/4W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

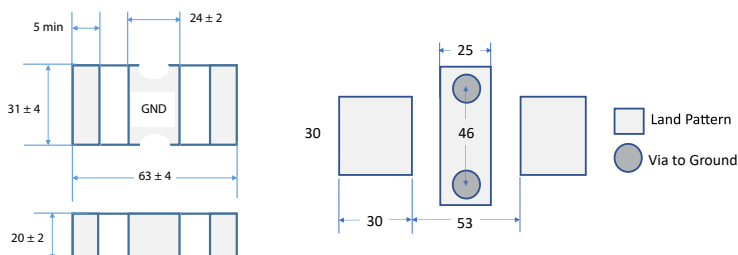
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View

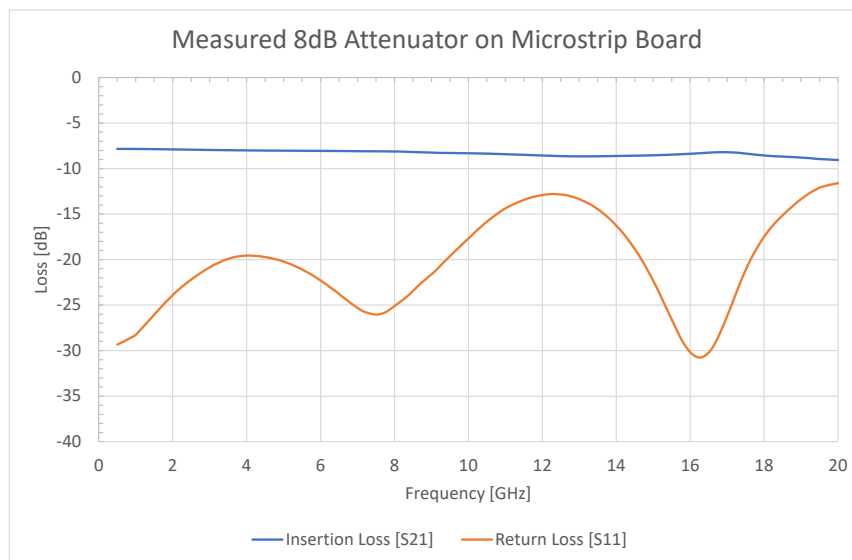


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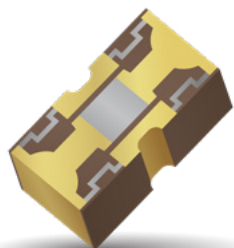
\*Data files contain DXF, S2P, and HFSS files



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.

# Thin Film RF Solutions - Attenuator

## AT0603C09ECATD - 9dB

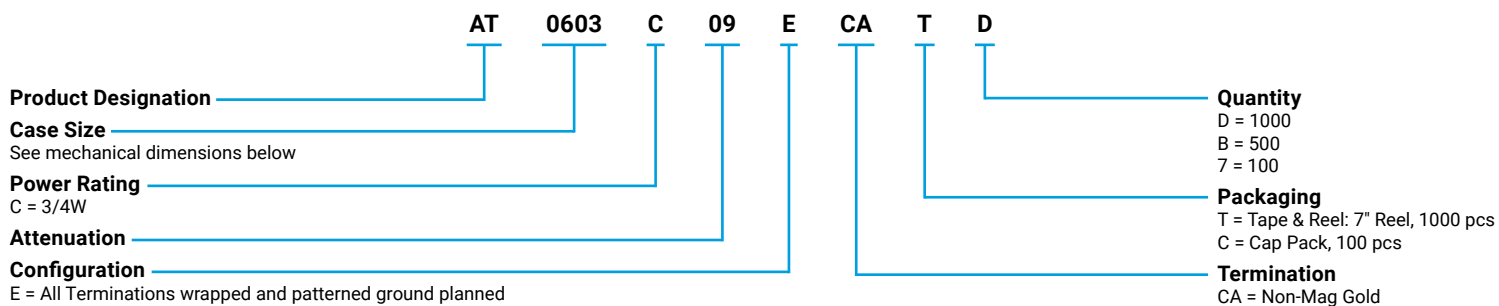


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	3/4W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to + 150°C	<b>Inspection:</b>	100% Per MIL-STD-883

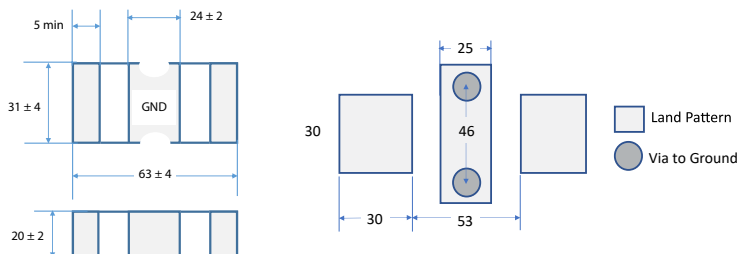
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT

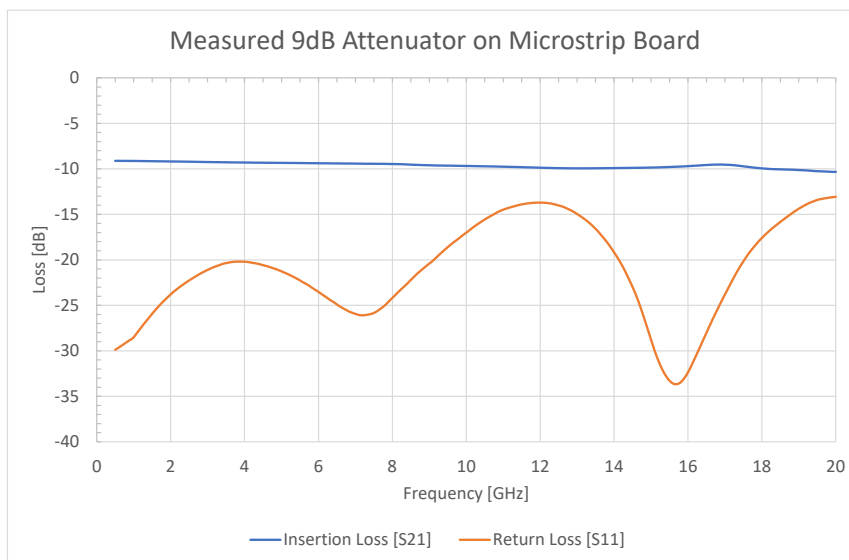


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\*Data files contain DXF, S2P, and HFSS files



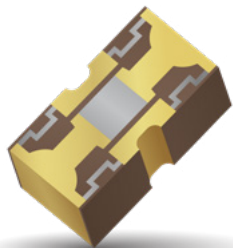
All testing performed on 13.3-mil-thick Rogers RO4350 microstrip board, with the UUT subtending a 44 mil gap in 30 mil-wide center trace (nominal 50-ohm characteristic impedance). Measurements were made using a four-receiver architecture. Measurements have been de-embedded to the edges of the UUT using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



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# Thin Film RF Solutions - Attenuator

## AT0603C10ECATD - 10dB

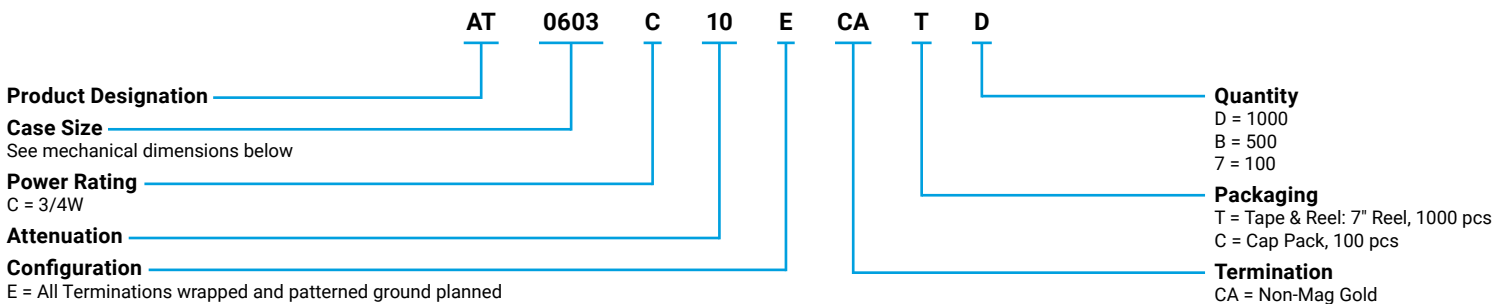


### QUALIFICATION TEST SUMMARY

<b>Input Power CW:</b>	3/4W	<b>Tolerance (dB):</b>	D.C. to 10 GHz:±0.50 dB >10GHz: ±dB
<b>Frequency Range:</b>	DC to 20 GHz	<b>Resistors:</b>	Tantalum Nitride
<b>VSMR:</b>	1.25:1 Typical	<b>Terminal:</b>	Thin Film Metalstack, Au
<b>Nominal Impedance:</b>	50 Ohms	<b>Substrate Material:</b>	AlN
<b>Operating Temperature:</b>	-55°C to +150°C	<b>Inspection:</b>	100% Per MIL-STD-883

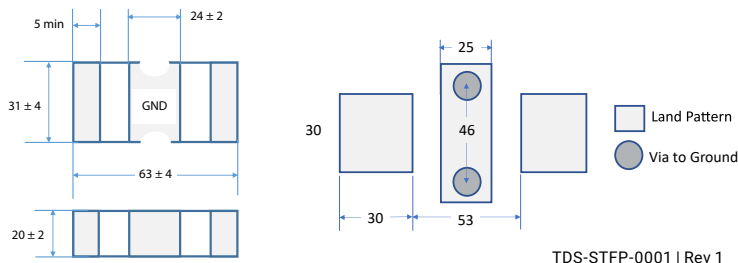
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### HOW TO ORDER



### MECHANICAL DIMENSIONS

Dimensions are in mils, Bottom View



LEAD-FREE  
LEAD-FREE COMPATIBLE  
COMPONENT

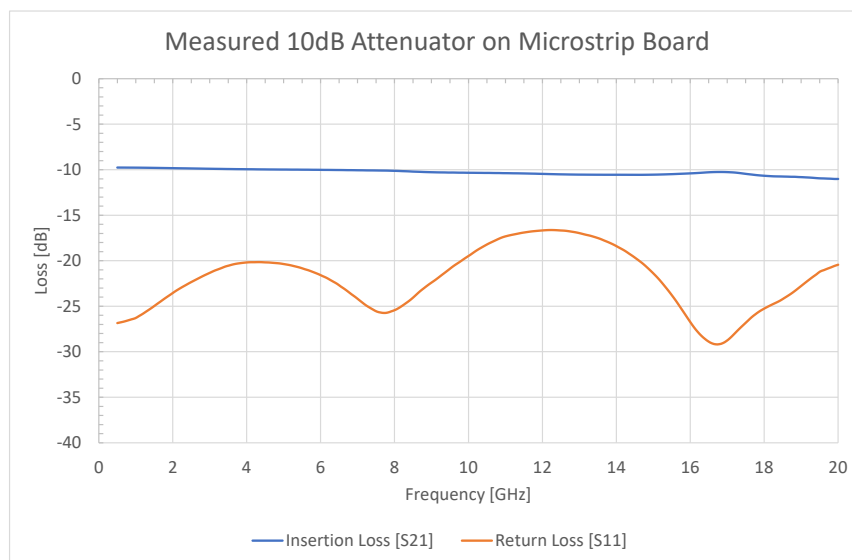


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\*Data files contain DXF, S2P, and HFSS files



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.