Introduction To BBTLine's Surface Mount RF Power Dividers

There are endless RF Power Dividers/Splitters to choose from on the market.

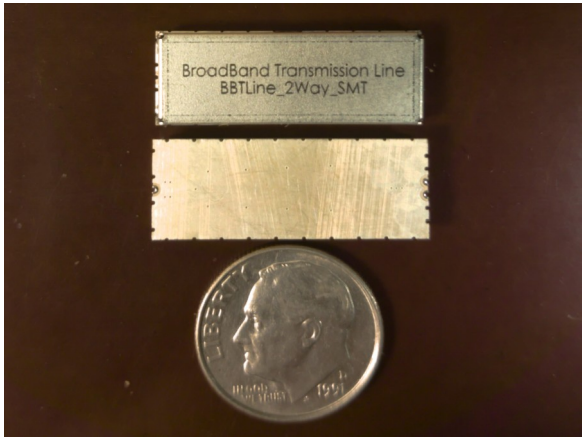
However, once the search criteria is narrowed down to: **BroadBand**, **Surface Mount**, and **High RF Power Rating -** the number of choices drops considerably.

BBTLine (Broadband Transmission Line, LLC) introduces a line of Surface Mount RF Power Dividers/Splitters to address this market deficiency.

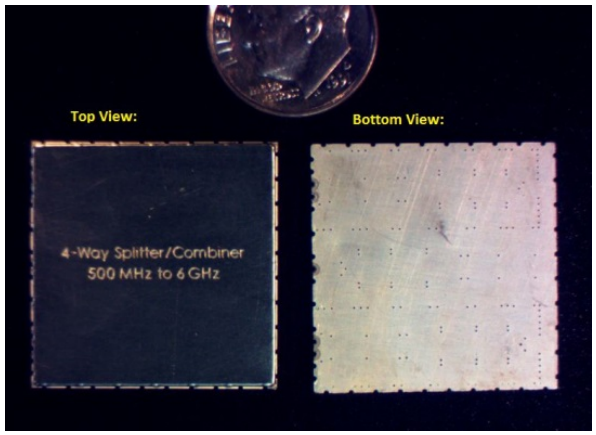
These are not Wilkinson-style RF Splitters. These are Unique/Patented Splitters which have the following RF Characteristics: Low Insertion Loss, Higher RF Power-Handling, Excellent Return Loss And Amplitude/Phase Balance, High Isolation.

BBTLine's Splitters offer the RF Design Engineer an **Engineering Alternative** to using more bulky, heavy and costly RF Power Dividers (with associated expensive connectors and cable assemblies).

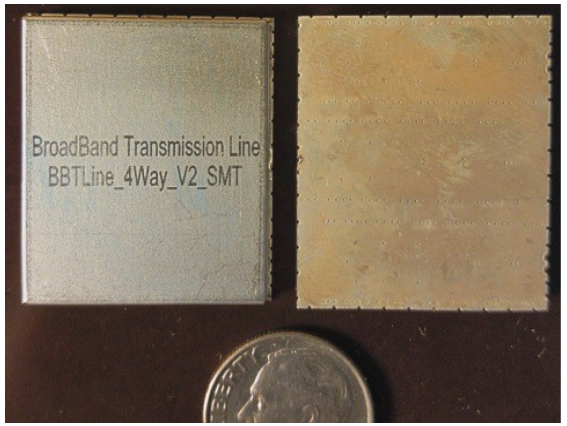
2-Way RF Splitter:



4-Way Version 1 RF Splitter:

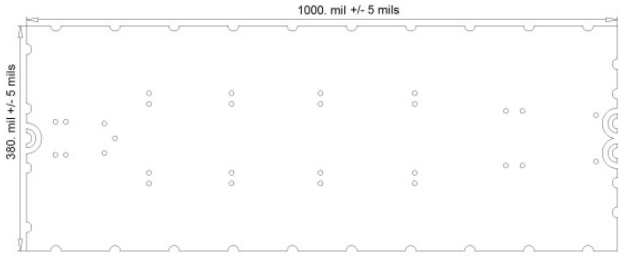


4-Way Version 2 RF Splitter:

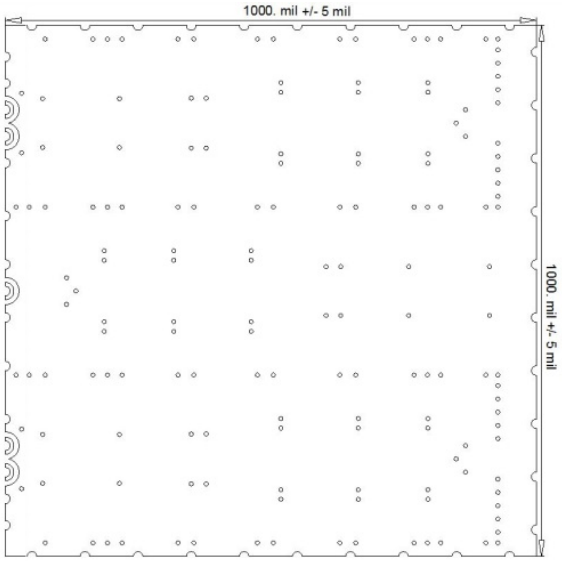


The 4-Way **Version 1** has all five ports on one side of the device, 4-Way **Version 2** has the common port on the opposite side of the other four ports.

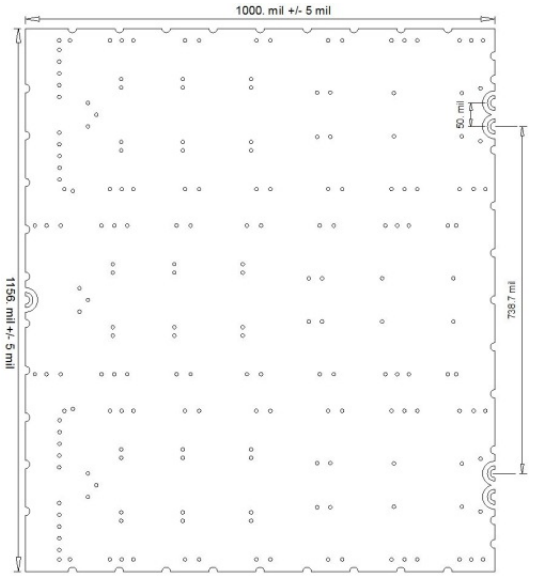
2-Way PCB FootPrint:



4-Way Version 1 PCB FootPrint:

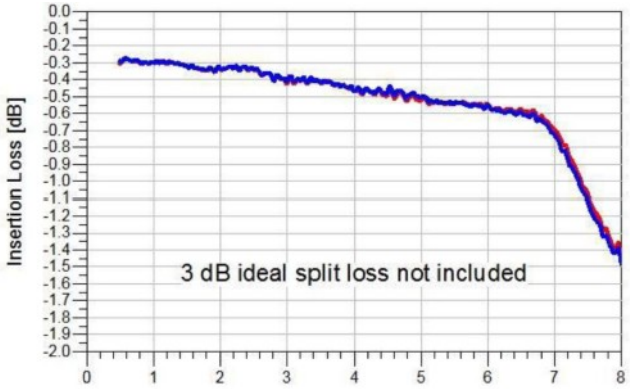


4-Way Version 2 PCB FootPrint:

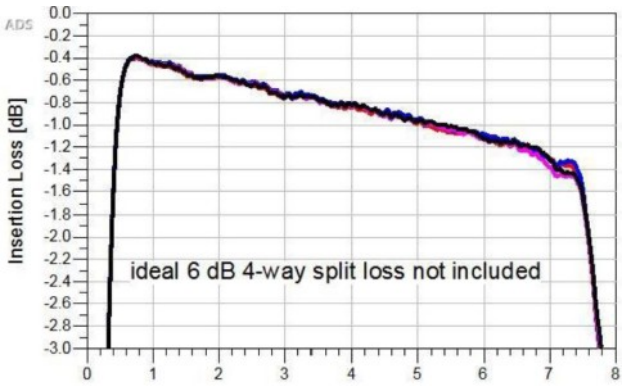


Typical Insertion Loss:

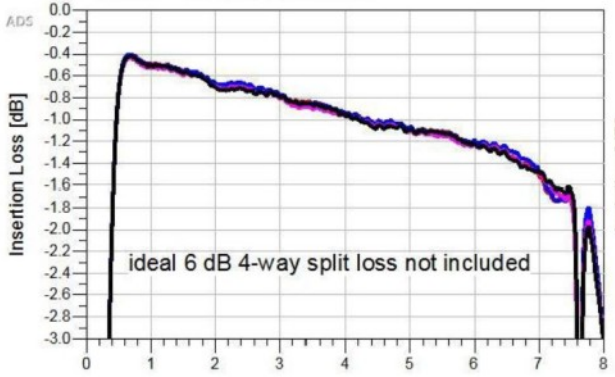
2-Way:



4-Way Version 1:

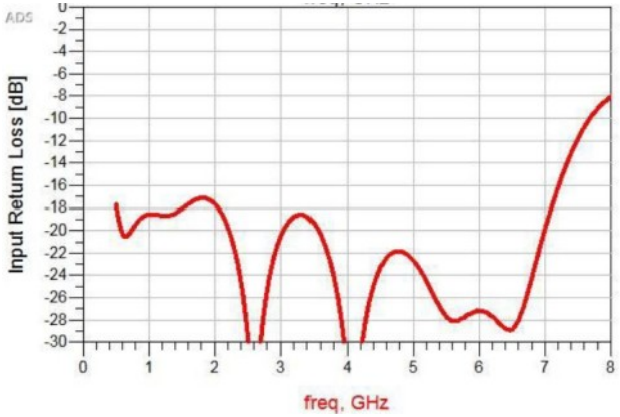


4-Way Version 2:

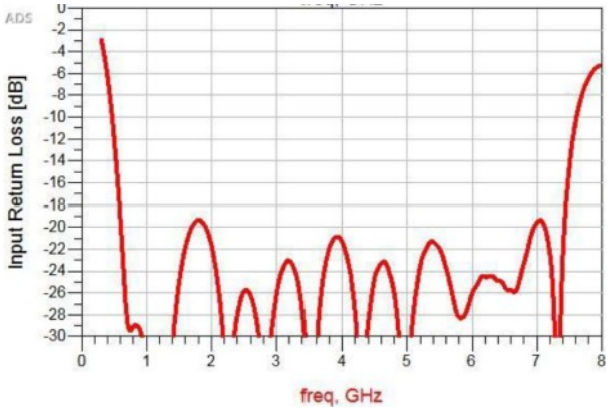


Typical Input Return Loss:

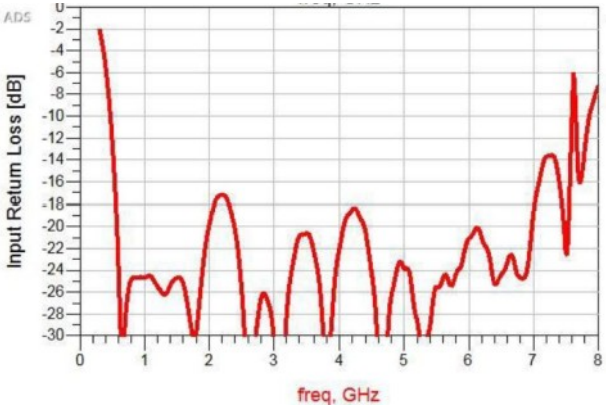
2-Way:



4-Way Version 1:

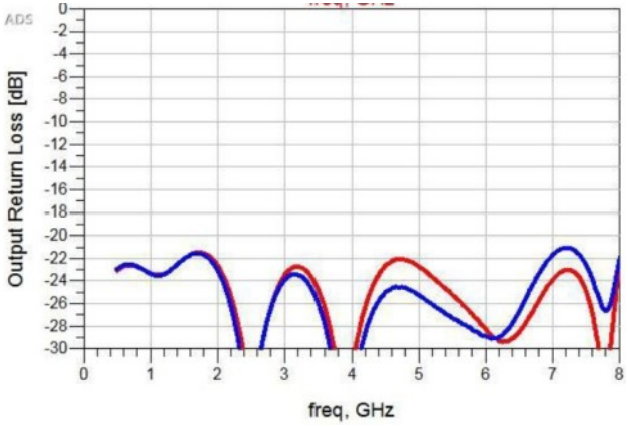


4-Way Version 2:

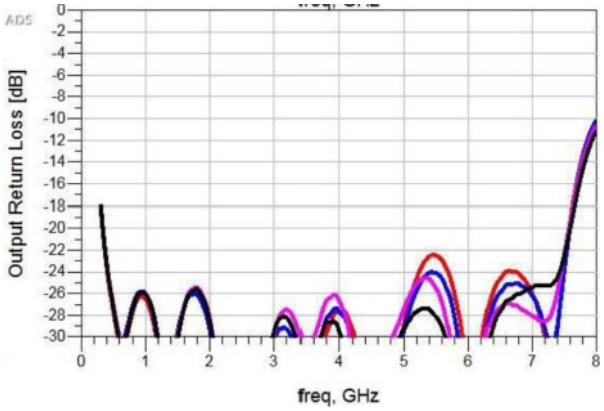


Typical Output Return Loss:

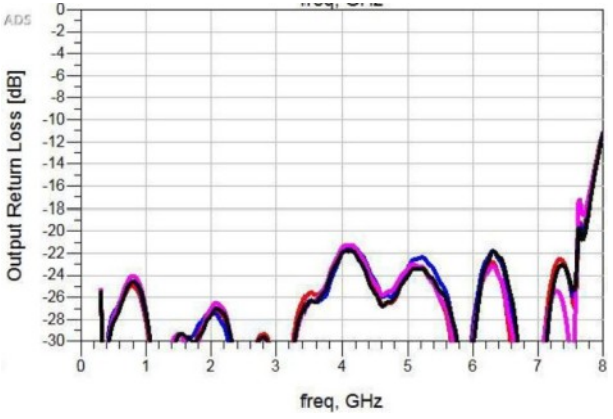
2-Way:



4-Way Version 1:

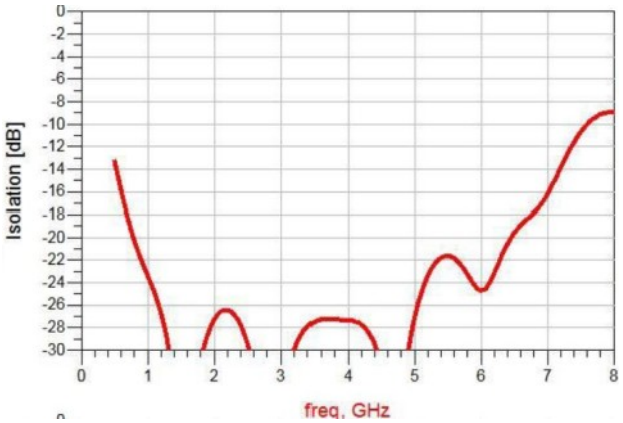


4-Way Version 2:

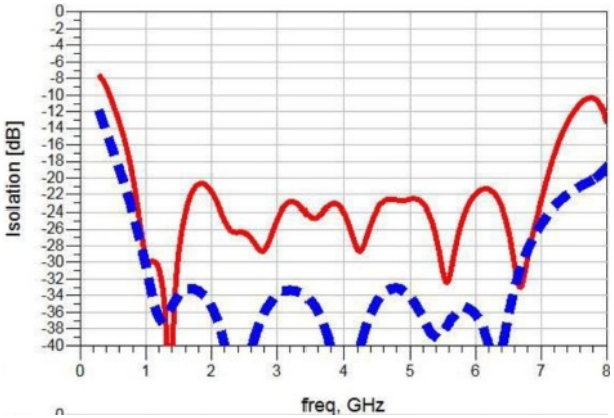


Typical Isolation (red is near-port isolation, blue-dashed is far-port isolation):

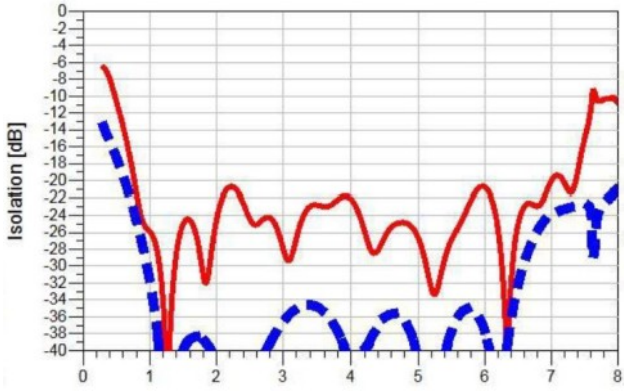
2-Way:



4-Way Version 1:

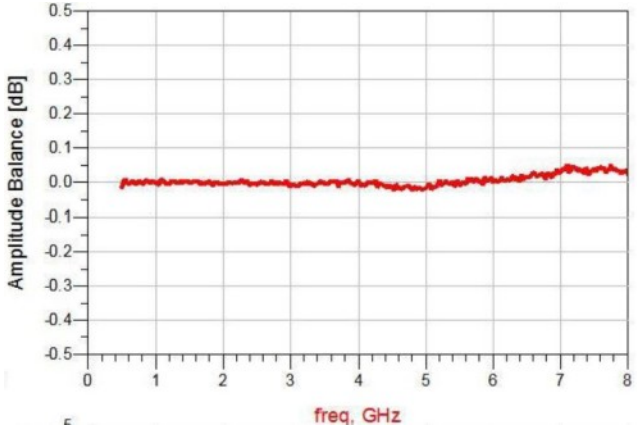


4-Way Version 2:

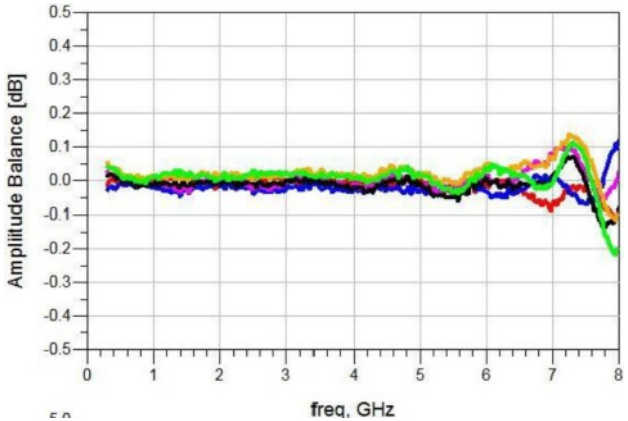


Typical Amplitude Balance:

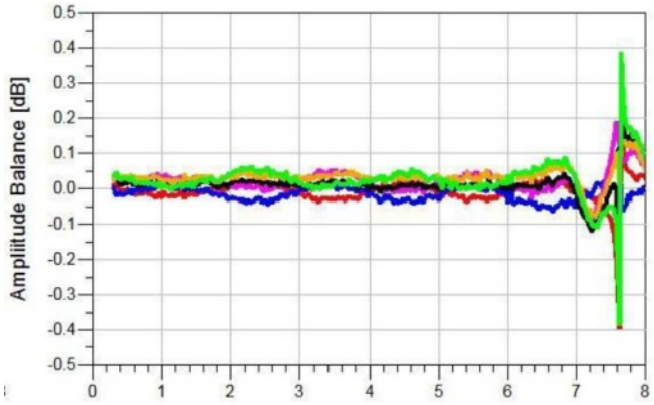
2-Way:



4-Way Version 1:

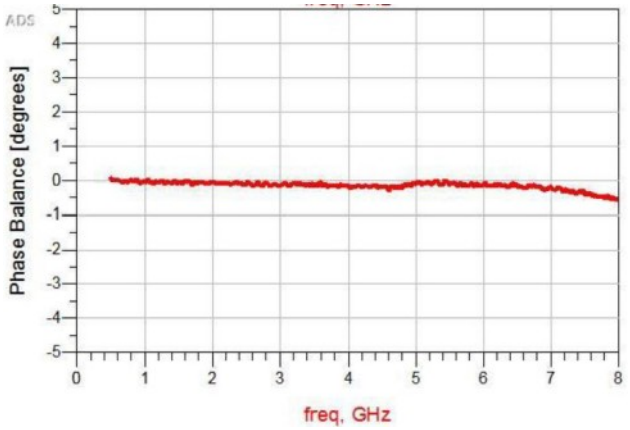


4-Way Version 2:

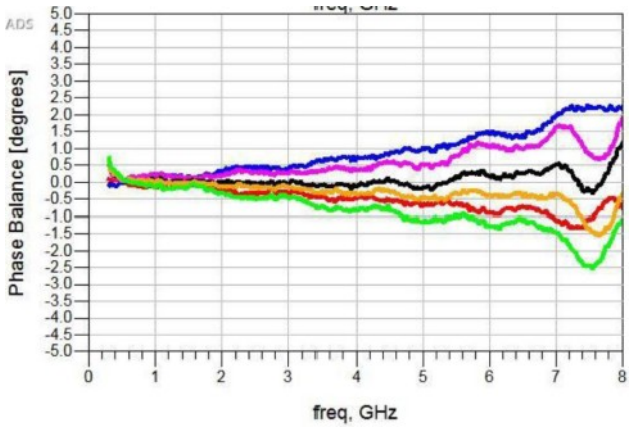


Typical Phase Balance:

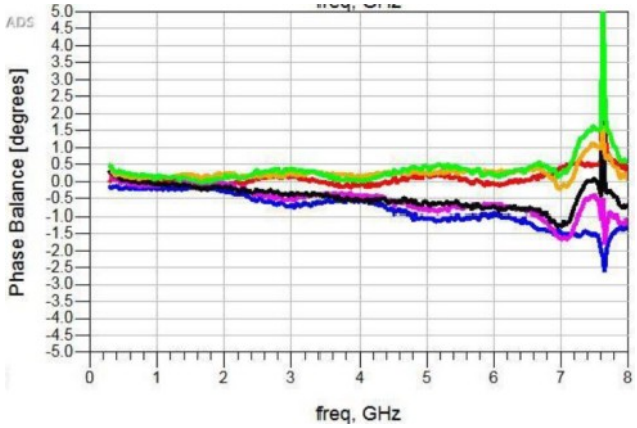
2-Way:



4-Way Version 1:



4-Way Version 2:



Typical RF Specifications:

2-Way:

Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 7
Insertion Loss @ 6 GHz [dB]	< 0.7
Isolation [dB] (0.5 to < 0.8 GHz)	> 12
Isolation [dB] (0.8 to 6.4 GHz)	> 20
Isolation [dB] (> 6.4 to 7 GHz)	> 14
Input (Common Port) Return Loss [dB]	< -17
Output Return Loss [dB]	< -18
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [Watts], In-Phase signals	> 20*
Maximum Power as Combiner [mWatts], Anti-Phase signals	= 50 **
Phase Unbalance to 6 GHz [degrees]	+/- 1.0
Amplitude Unbalance to 6 GHz [dB]	+/- 0.1
Operating Temperature Range [degrees C]	-55 to 125
Mass [grams]	< 1.1

* 20 watts is a test setup limitation **NOT** a device limitation (CW frequency of 3.55 GHz)
** internal 0201 isolation resistor limitation when combining perfectly Anti-Phase signals

4-Way Version 1:

Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 7
Insertion Loss @ 6 GHz [dB]	< 1.3
Near Port Isolation [dB] (0.5 to < 0.9 GHz)	> 11
Near Port Isolation [dB] (0.9 to 6.9 GHz)	> 20
Far Port Isolation [dB] (0.5 to < 1 GHz)	> 16
Far Port Isolation [dB] (1 to 6.6 GHz)	> 28
Input (Common Port) Return Loss (0.6 to 7 GHz) [dB]	< -17
Output Return Loss [dB]	< -18
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [Watts], In-Phase Signals	> 20*
Maximum Power as Combiner [mWatts], Anti-Phase Signals	= 50 **
Phase Unbalance to 6 GHz [degrees]	+/- 2.5
Amplitude Unbalance to 6 GHz [dB]	+/- 0.15
Operating Temperature Range [degrees C]	-55 to 125
Mass [grams]	< 2.6

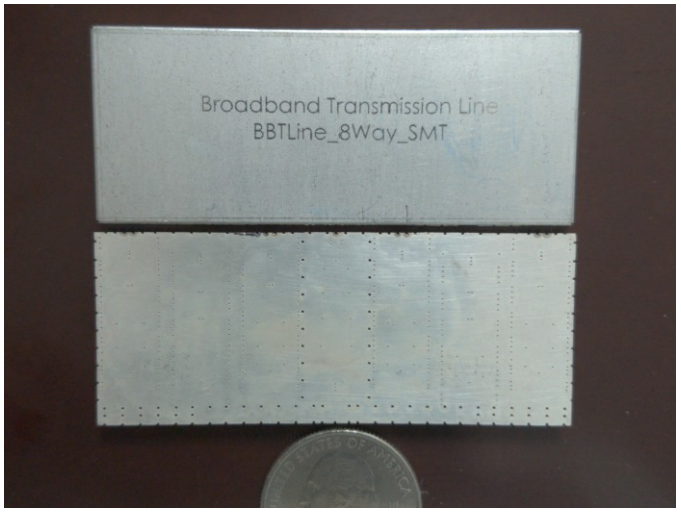
* 20 watts is a test setup limitation **NOT** a device limitation (CW frequency of 3.55 GHz)
** internal 0201 isolation resistor limitation when combining perfectly anti-phase signals

4-Way Version 2:

Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 7
Insertion Loss @ 6 GHz [dB]	< 1.4
Near Port Isolation [dB] (0.5 to < 0.8 GHz)	> 10
Near Port Isolation [dB] (0.8 to 7 GHz)	> 19
Far Port Isolation [dB] (0.5 to < 0.8 GHz)	> 16
Far Port Isolation [dB] (0.8 to 7 GHz)	> 24
Input (Common Port) Return Loss [dB] (0.5 to < 0.6 GHz)	< -12
Input (Common Port) Return Loss [dB] (0.6 to 7 GHz)	< -16
Output Return Loss [dB]	< -19
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [mWatts], In-Phase Signals	> 20*
Maximum Power as Combiner [mWatts], Anti-Phase Signals	= 50 **
Phase Unbalance to 6 GHz [degrees]	+/- 2.5
Amplitude Unbalance to 6 GHz [dB]	+/- 0.15
Operating Temperature Range [degrees C]	-55 to 125
Mass [grams]	< 2.6

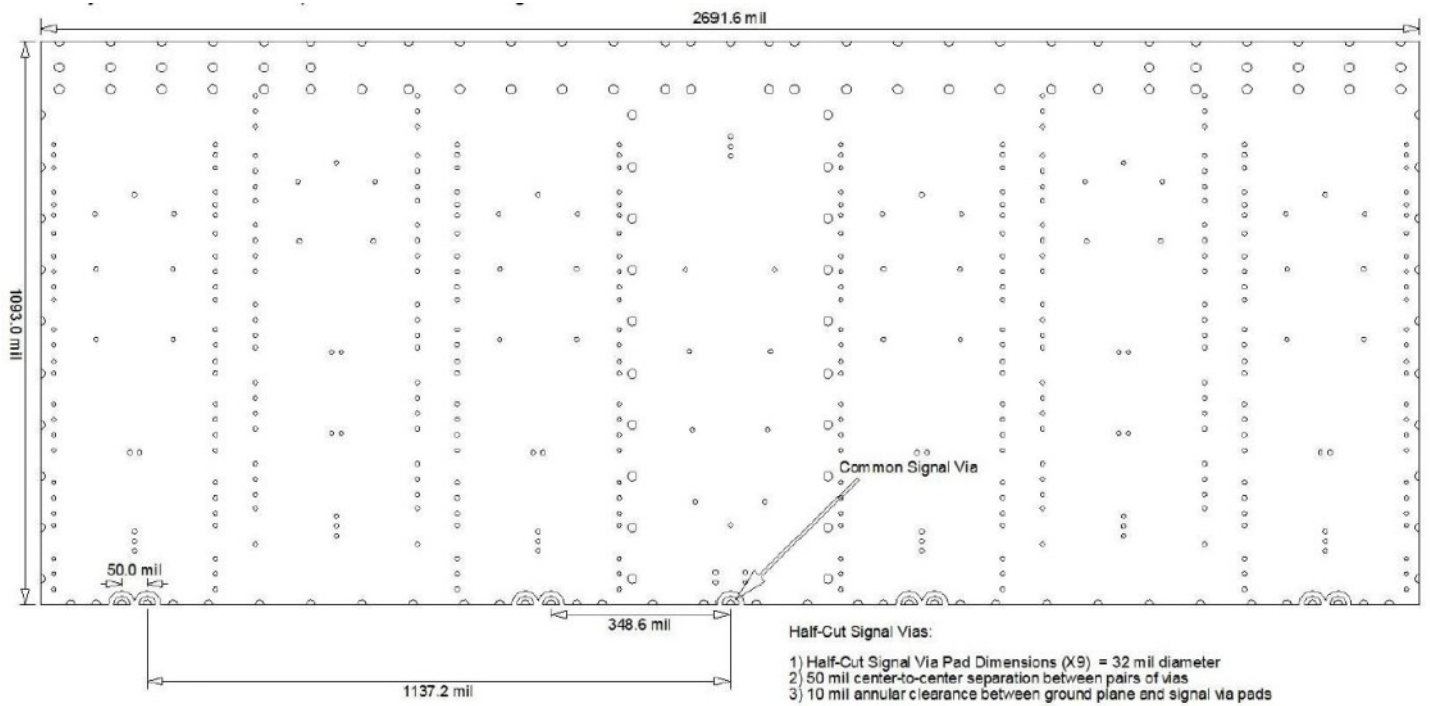
* 20 watts is a test setup limitation **NOT** a device limitation (CW frequency of 3.55 GHz)
** internal 0201 isolation resistor limitation when combining perfectly anti-phase signals

8-Way Version 1 Surface Mount RF Splitter:

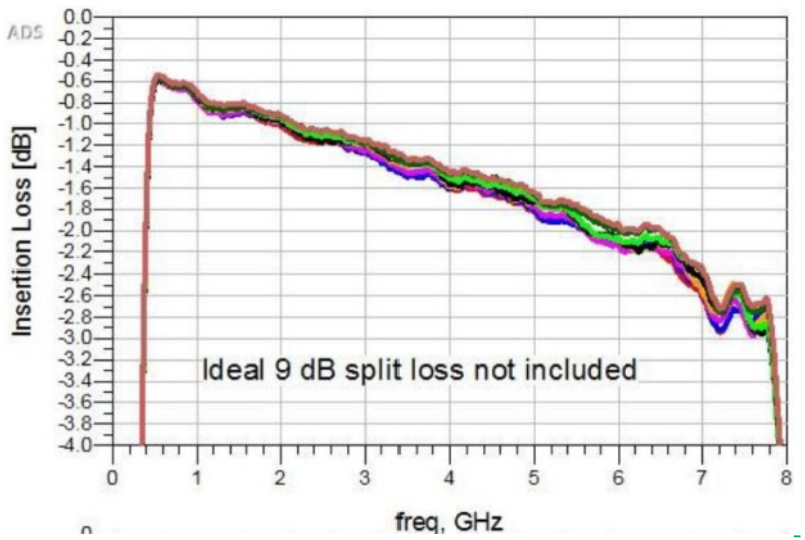


Version 1 has all nine ports on one side of the Splitter

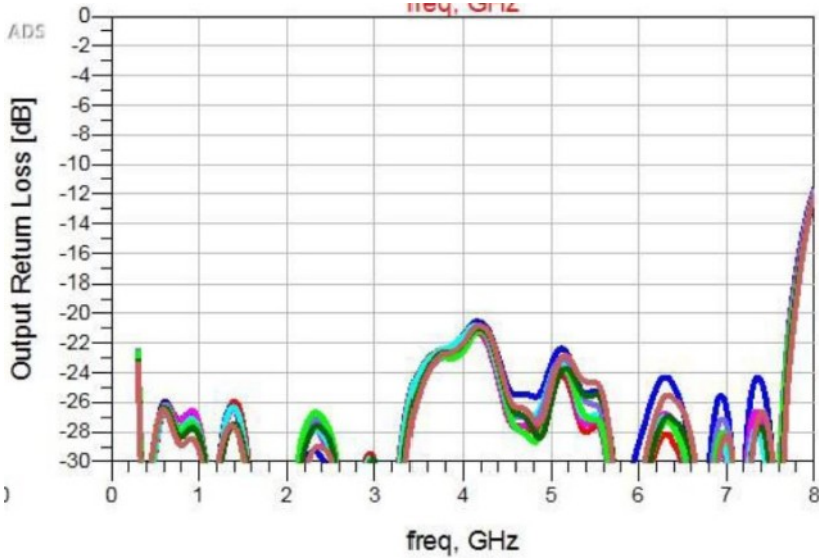
8-Way Version 1 PCB FootPrint:



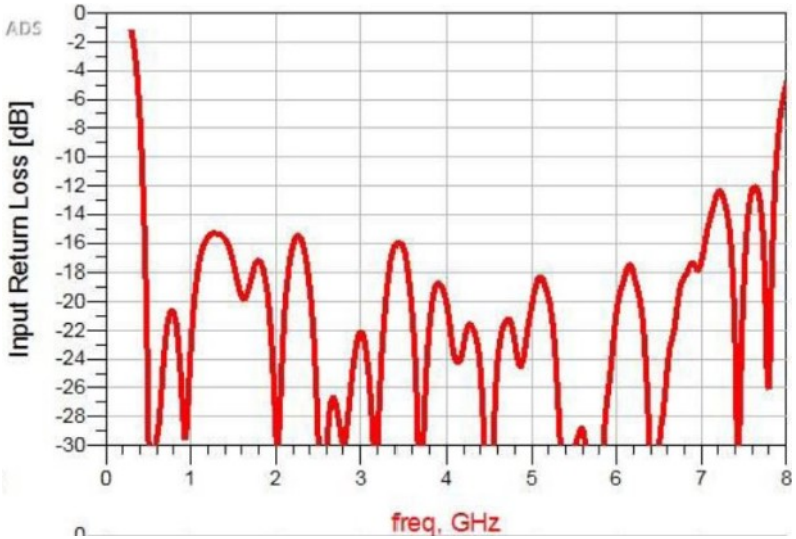
Typical Insertion Loss, 8-Way Version 1:



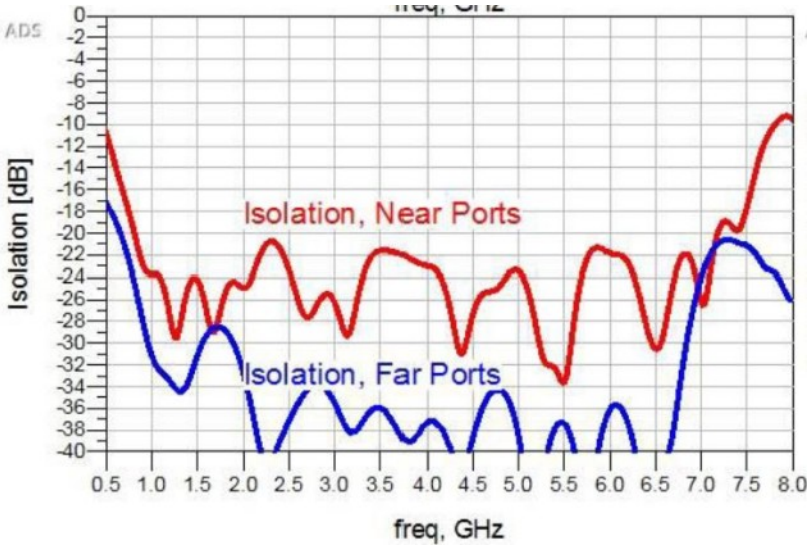
Typical Output Return Loss, 8-Way Version 1:



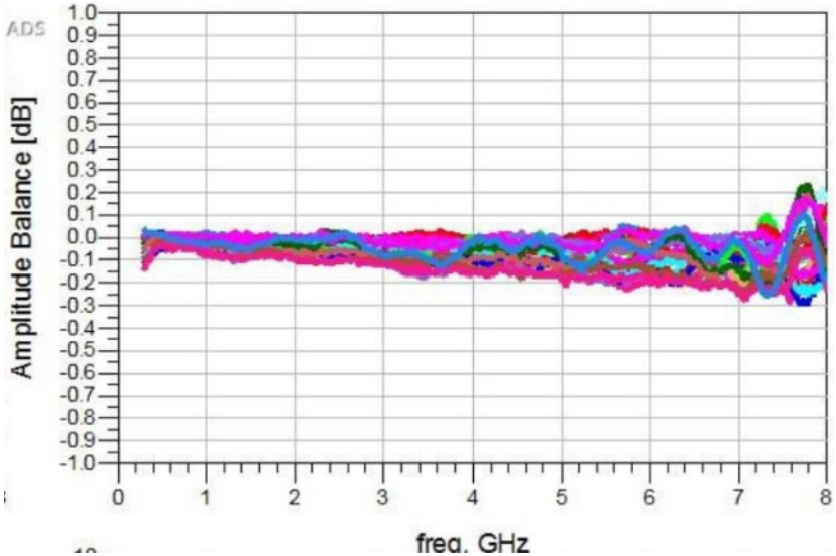
Typical Input Return Loss, 8-Way Version 1:



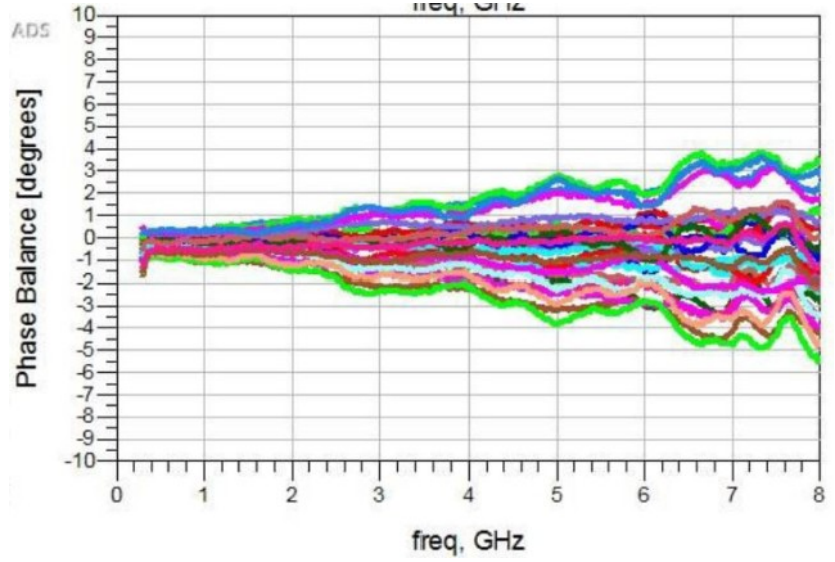
Typical Isolation, 8-Way Version 1 RF Splitter:



Typical Amplitude Balance, 8-Way Version 1 RF Splitter:



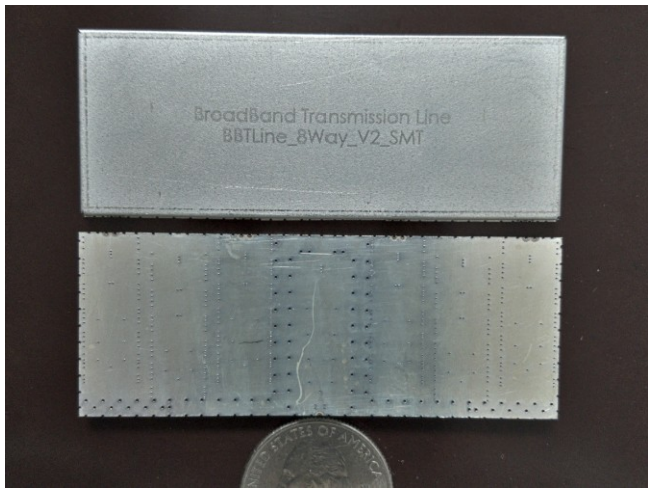
Typical Phase Balance, 8-Way Version 1 RF Splitter:



Typical RF Specifications, 8-Way Splitter Version 1:

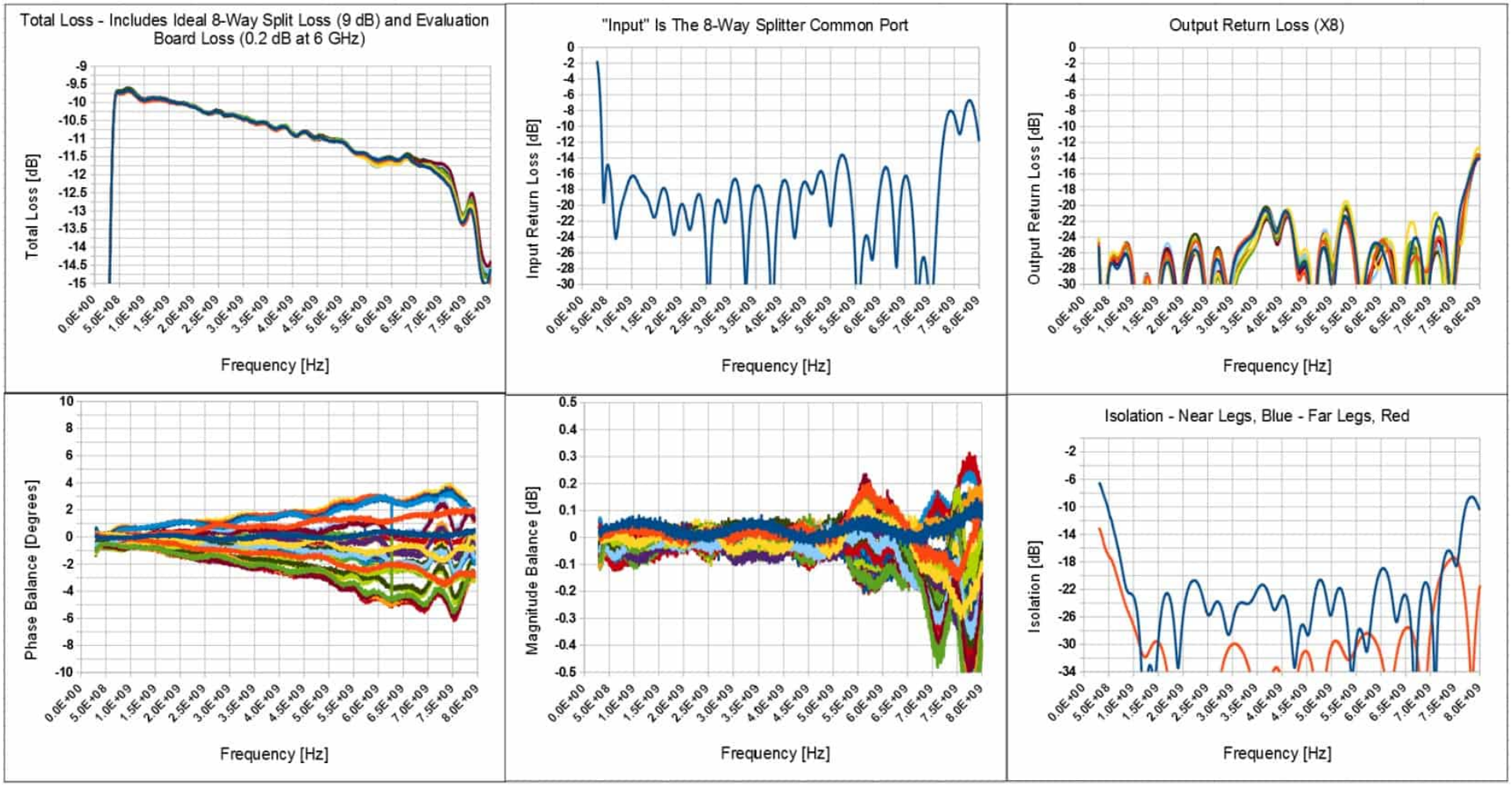
Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 7
Insertion Loss [dB] (@ 6 GHz)	< 2.6
Near Port Isolation [dB] (0.8 to 7 GHz)	> 20
Near Port Isolation [dB] (0.5 to < 0.8 GHz)	> 10
Far Port Isolation [dB] (0.875 to 6.9 GHz)	> 26
Far Port Isolation [dB] (0.5 to < 0.875 GHz)	> 16
Input (Common Port) Return Loss [dB]	< -14
Output Return Loss [dB] (1 to 6 GHz)	< -18
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [mWatts], Anti-Phase Signals	= 50 **
Maximum Power as Combiner [Watts], In-Phase Signals	> 20*
Phase Unbalance [degrees @ 6 GHz]	+/- 7
Amplitude Unbalance [dB @ 6 GHz]	+/- 0.4
* 20 watts is NOT a device limitation but a test setup limitation	
** internal 0201 isolation resistor limitation when combining perfectly anti-phase signals	
Operating Temperature Range: -55 to 125 degrees C	
Mass: < 6 grams	

8-Way Version 2 Surface Mount RF Splitter - Datasheet Pending



Version 2 has the common port on opposite side of the other eight ports

8-Way Version 2 - Preliminary Data:



Evaluation Boards:

Evaluation Boards are available for all surface mount devices from BBTLine.

SMP Connector Versions:

For the 2-Way and 4-Way Devices, Splitter Versions with SMP Connectors are also Available.

For Evaluation Boards, please purchase on-line, or, for loaner Evaluation Boards which are free of charge, submit the form at https://bbt-line.com/contact-us-evaluation-boards/

You can also contact BBTLine by phone or email:

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email - mark.derbyshire@bbt-line.com