



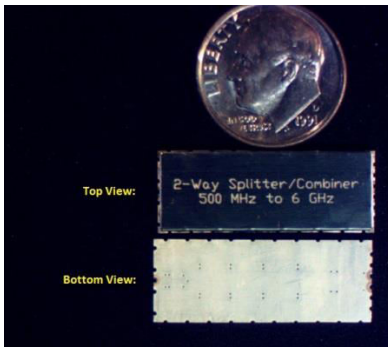
## Introduction

Although there are endless RF power splitters/combiners to choose from on the market, once you start narrowing the search criteria down to 1) BroadBand, 2) Surface Mount, and 3) Higher RF Power Rating characteristics, the number of choices is reduced considerably.

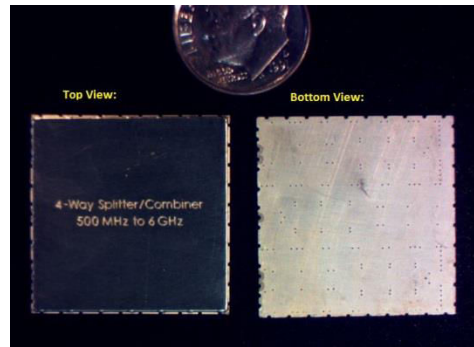
BBTLine (BroadBand Transmission Line, LLC) introduces a new line of surface-mount splitters/combiners to address this market deficiency.

These are not Wilkinson-style RF splitters, but a unique patented design which allows for more compact devices while maintaining low insertion loss (higher RF power handling... > 20 watts as a splitter), excellent return loss and excellent amplitude/phase balance:

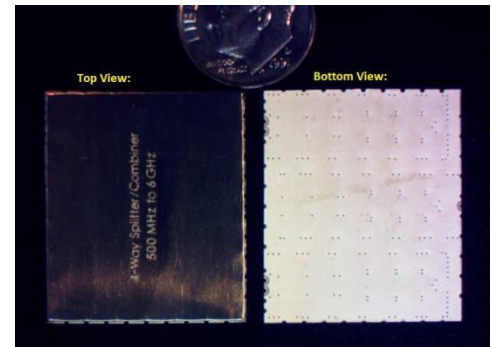
### 2-Way:



### 4-Way Version 1:

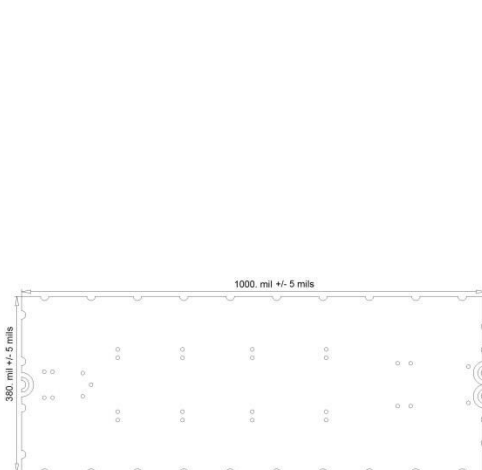


### 4-Way Version 2:

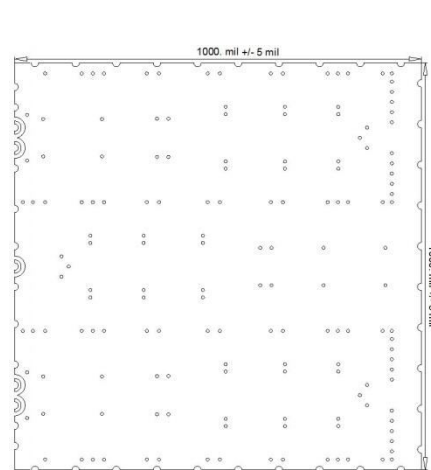


The 4-Way "Version 1" has all ports on one side of the device, "Version 2" has the common port on one side and the other ports on the opposite side of the device.

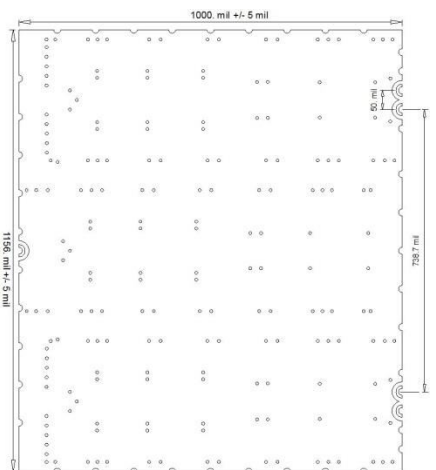
### 2-Way FootPrint:



### 4-Way Version 1 FootPrint:

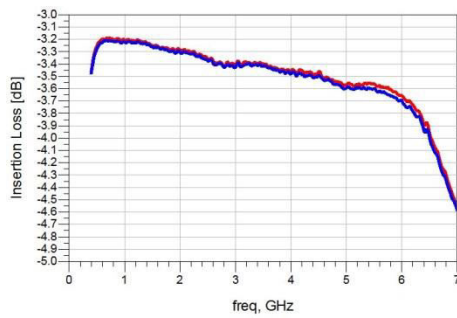


### 4-Way Version 2 FootPrint:

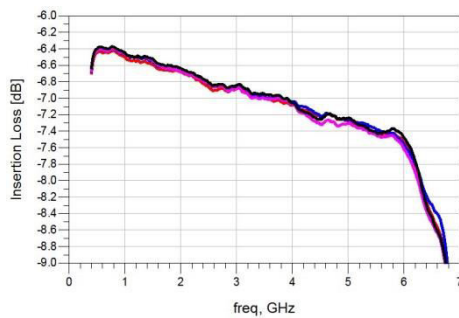


## Insertion Loss:

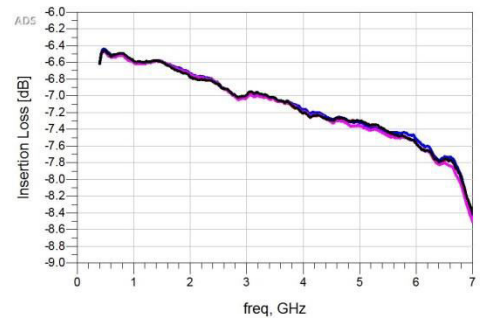
### 2-Way:



### 4-Way Version 1:



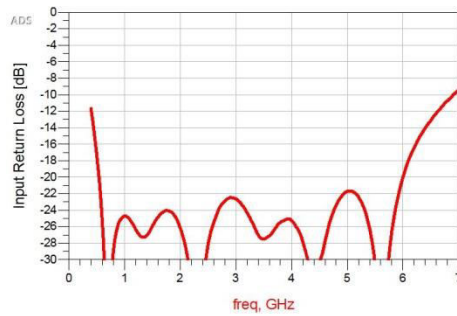
### 4-Way Version 2:



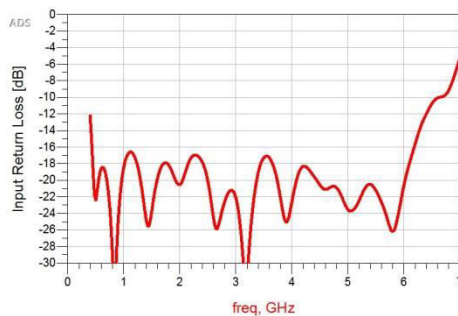
**Note:** all measurements shown above include test board traces and connectors. Expect 0.15 dB less loss (at 6 GHz) than what is shown in plots.

## Input Return Loss:

### 2-Way:



### 4-Way Version 1:

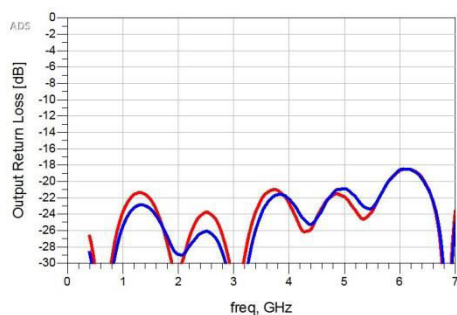


### 4-Way Version 2:

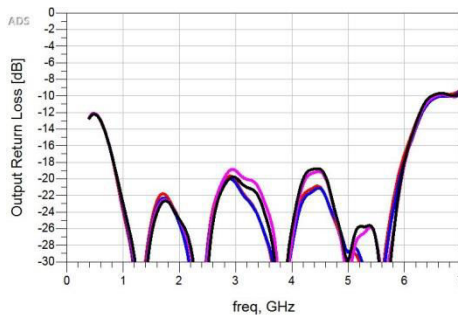


## Output Return Loss:

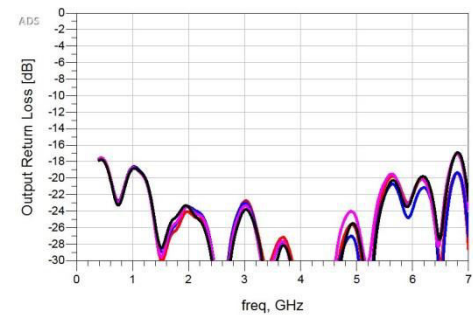
### 2-Way:



### 4-Way Version 1:

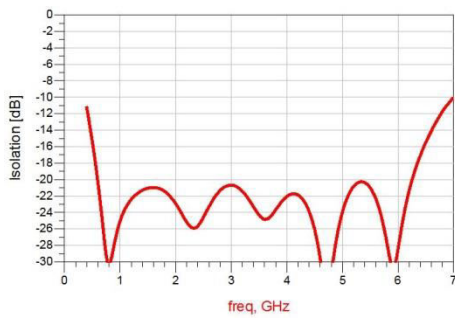


### 4-Way Version 2:

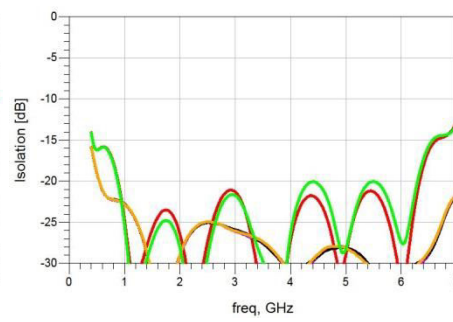


## Isolation:

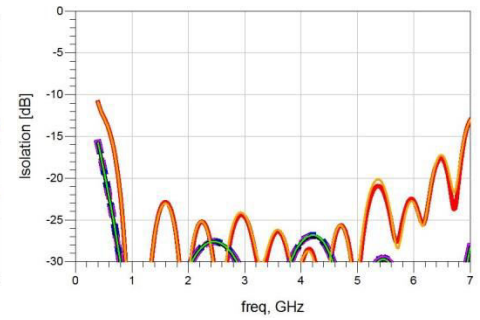
### 2-Way:



### 4-Way Version 1:

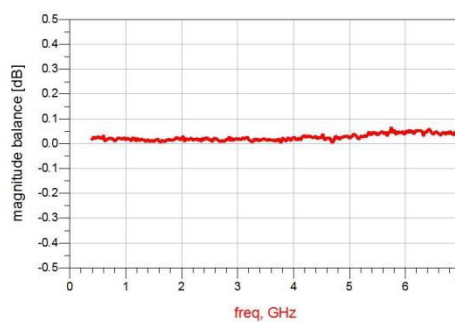


### 4-Way Version 2:

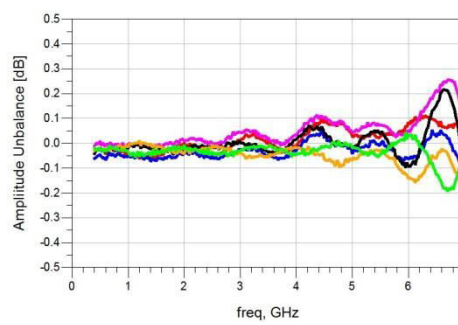


## Amplitude Balance:

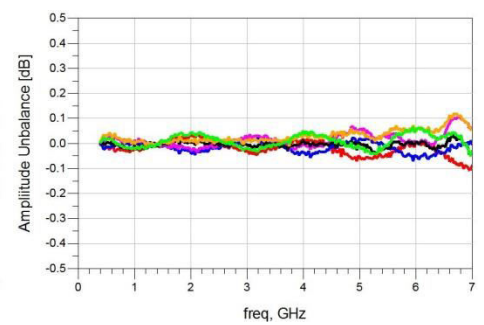
### 2-Way:



### 4-Way Version 1:

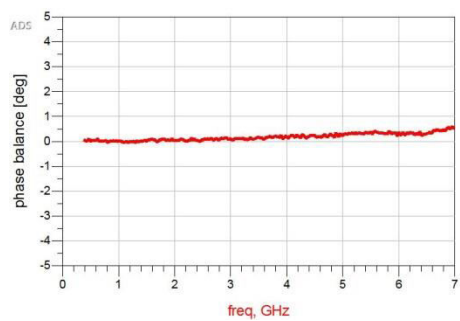


### 4-Way Version 2:

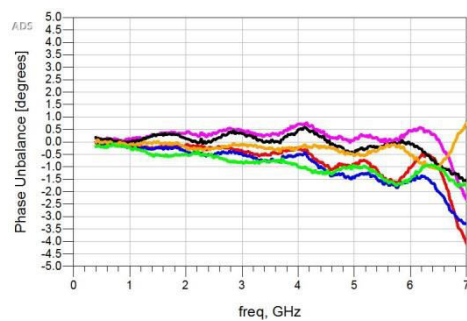


## Phase Balance:

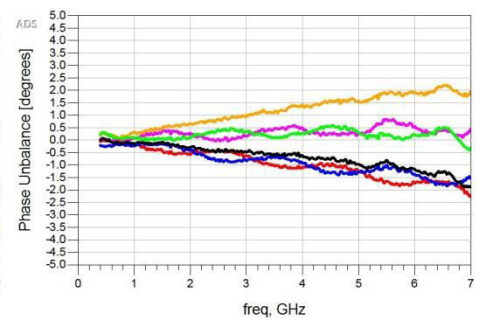
### 2-Way:



### 4-Way Version 1:



### 4-Way Version 2:



## Specifications:

### 2-Way:

Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 6
Insertion Loss [dB]	< 0.7
Isolation [dB] (0.7 to 6 GHz)	> 19
Isolation [dB] (0.5 to < 0.7 GHz)	> 15
Input (Common Port) Return Loss [dB]	< -17
Output Return Loss [dB]	< -18
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [mWatts]	< 50 **
Phase Unbalance [degrees]	+/- 1.0
Amplitude Unbalance [dB]	+/- 0.1

\* maximum test setup capability at CW frequency of 3.55 GHz

\*\* 0201 isolation resistor limitation when combining perfectly anti-phase signals

### 4-Way Version 1:

Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 6
Insertion Loss [dB]	< 1.6
Near Port Isolation [dB] (1 to 6 GHz)	> 18
Near Port Isolation [dB] (0.5 to < 1 GHz)	> 15
Far Port Isolation [dB] (1 to 6 GHz)	> 22
Far Port Isolation [dB] (0.5 to < 1 GHz)	> 17
Input (Common Port) Return Loss [dB]	< -14
Output Return Loss [dB]	< -14
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [mWatts]	< 50 **
Phase Unbalance [degrees]	+/- 2.5
Amplitude Unbalance [dB]	+/- 0.15

\* maximum test setup power capability at CW frequency of 3.55 GHz

\*\* 0201 isolation resistor limitation when combining perfectly anti-phase signals

### 4-Way Version 2:

Specifications (at Room Temperature):	
Frequency Range [GHz]	0.5 to 6
Insertion Loss [dB]	< 1.6
Near Port Isolation [dB] (1 to 6 GHz)	> 19
Near Port Isolation [dB] (0.5 to < 1 GHz)	> 13
Far Port Isolation [dB] (1 to 6 GHz)	> 22
Far Port Isolation [dB] (0.5 to < 1 GHz)	> 20
Input (Common Port) Return Loss [dB] (0.5 to 1.4 GHz)	< -12
Input (Common Port) Return Loss [dB] (1.5 to 6 GHz)	< -15
Output Return Loss [dB] (1 to 6 GHz)	< -15
Output Return Loss [dB] (0.5 to < 1 GHz)	< -13
Maximum Power as Splitter [Watts]	> 20*
Maximum Power as Combiner [mWatts]	< 50 **
Phase Unbalance [degrees]	+/- 2.5
Amplitude Unbalance [dB]	+/- 0.15

\* maximum test setup power capability at CW frequency of 3.55 GHz

\*\* internal 0201 isolation resistor limitation when combining perfectly anti-phase signals

## Evaluation Boards:

Evaluation boards are available for these devices.

Please contact BBTLine, LLC at 425-273-3712 or [bbtline@gmail.com](mailto:bbtline@gmail.com).

<http://www.bbt-line.com/>