

# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers



### GENERAL DESCRIPTION RFAP TECHNOLOGY

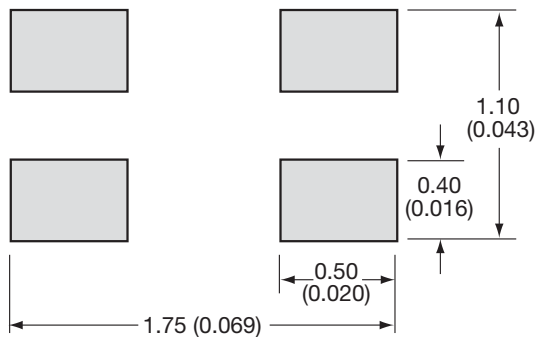
The DB0603N 3dB 90° Coupler is based on thin-film multilayer technology. The technology provides a miniature part with excellent high frequency performance and rugged construction for reliable automatic assembly.

The RFAP LGA 3dB 90° Coupler will be offered in a variety of frequency bands compatible with various types of high frequency wireless systems.

### APPLICATIONS

- Balanced Amplifiers and Signal Distribution in Wireless Communications

### Recommended Pad Layout Dimensions mm (inches)



### FEATURES

- Miniature 0603 size
- Low I. Loss
- High Isolation
- Surface Mountable
- RoHS Compliant
- Supplied on T&R

### LAND GRID ARRAY ADVANTAGES:

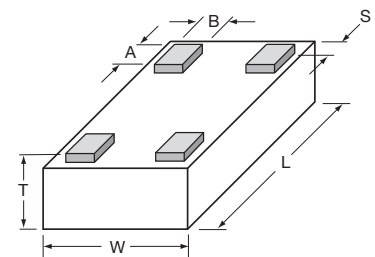
- Inherent Low Profile
- Self Alignment during Reflow
- Excellent Solderability
- Low Parasitics
- Better Heat Dissipation

### DIMENSIONS:

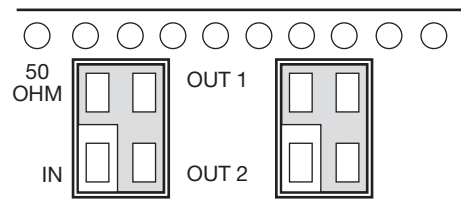
millimeters (inches)

L	1.60±0.10 (0.063±0.004)
W	0.84±0.10 (0.033±0.004)
T	0.60±0.10 (0.024±0.004)
A	0.25±0.05 (0.010±0.002)
B	0.20±0.05 (0.008±0.002)
S	0.05±0.05 (0.002±0.002)

### Bottom View



### ORIENTATION IN TAPE



### ELECTRICAL PARAMETERS

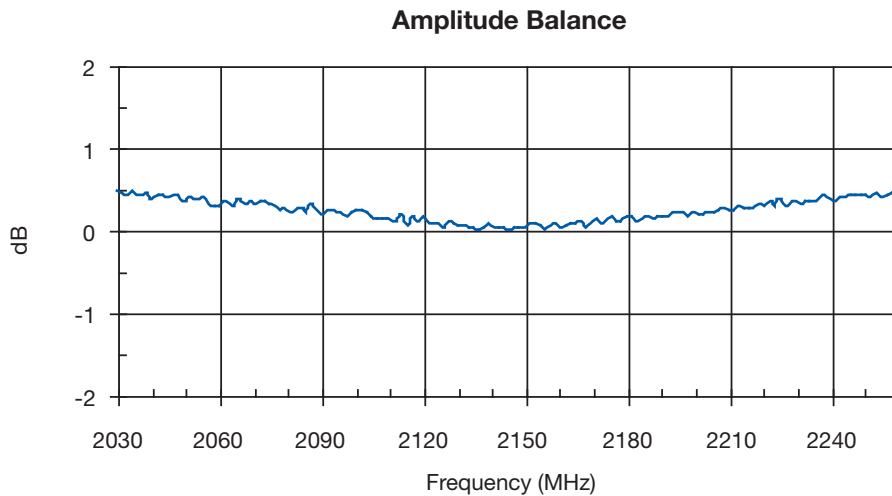
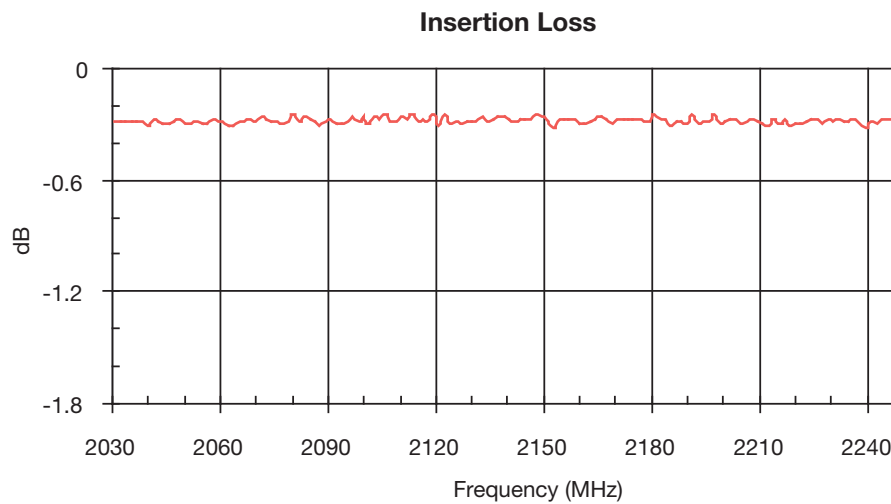
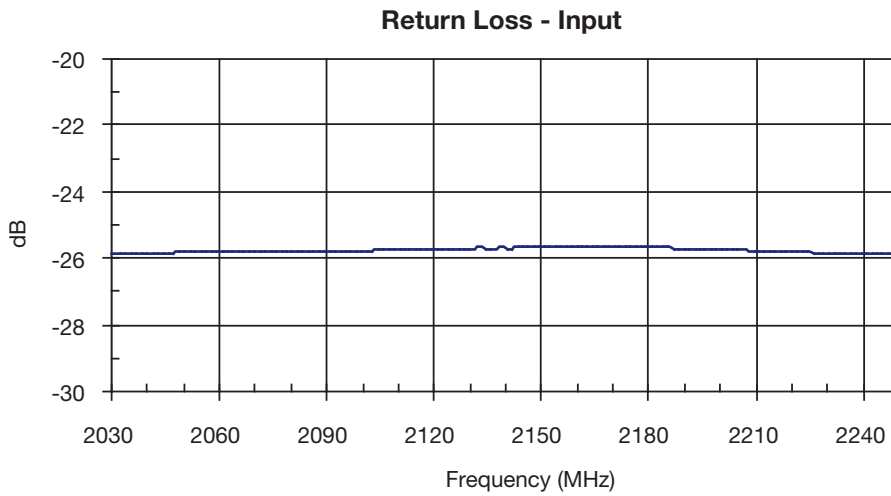
Part Number	Frequency MHz		Port Impedance Ω	Return Loss [dB]		Isolation [dB]		Insertion Loss [dB]		Amplitude Balance [dB]		Phase Balance (Relative to 90°) Deg		Power Handling Watts
	Min.	Max.		Typ.	Min.	Typ.	Min.	Typ.	Typ.	Max.	Typ.	Max.	Typ.	
DB0603N2140ANTR	2040	2240	50	15	26	15	23	0.30	0.40	0.50	0.80	2	3	3
DB0603N2400ANTR	2300	2500	50	12	17	15	23	0.25	0.35	0.30	0.80	2	3	3
DB0603N3000ANTR	2850	3150	50	12	15	15	26	0.20	0.30	0.30	0.80	2	3	3
DB0603N3500ANTR	3300	3700	50	12	15	15	26	0.20	0.30	0.30	0.80	2	3	3

# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers



2040MHz to 2240MHz DB0603N2140ANTR



3



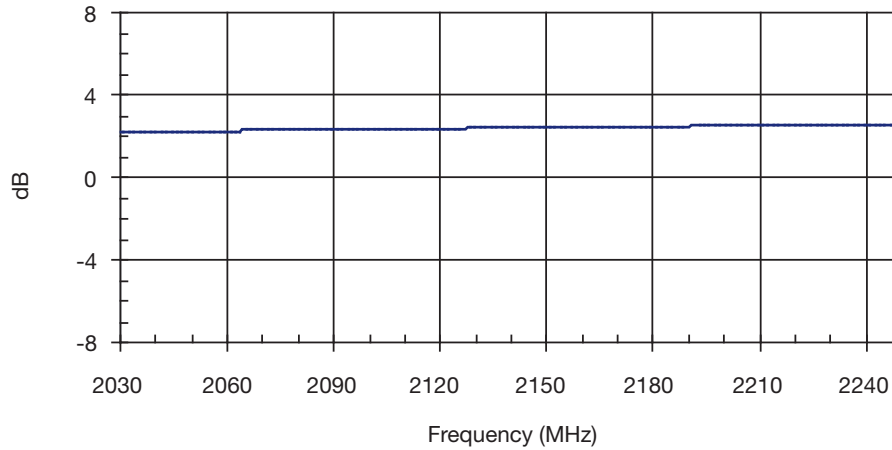
# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers

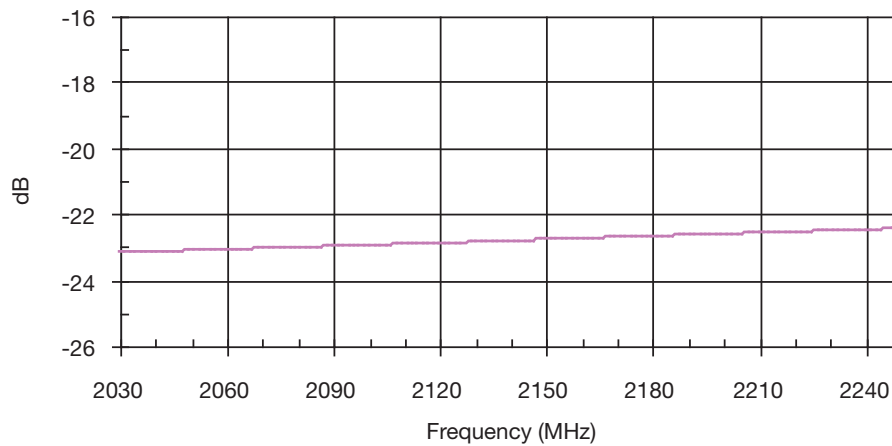


2040MHz to 2240MHz DB0603N2140ANTR

Phase Balance



Isolation



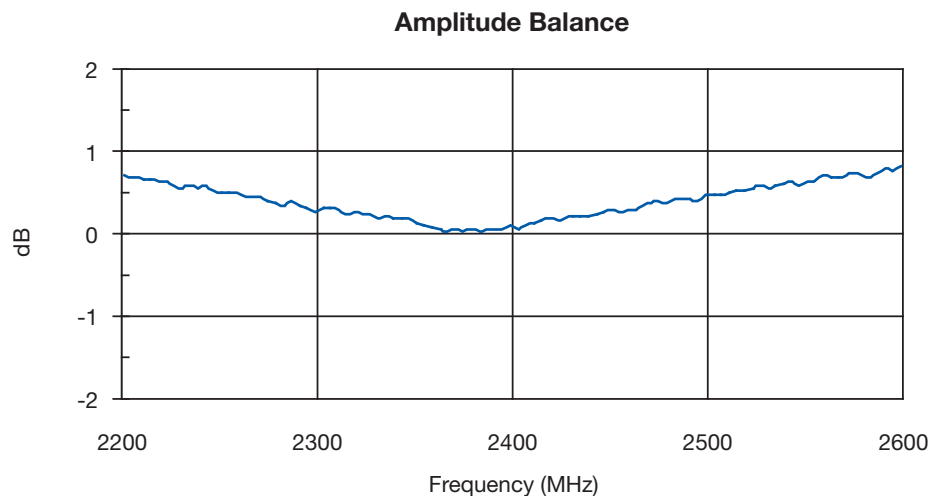
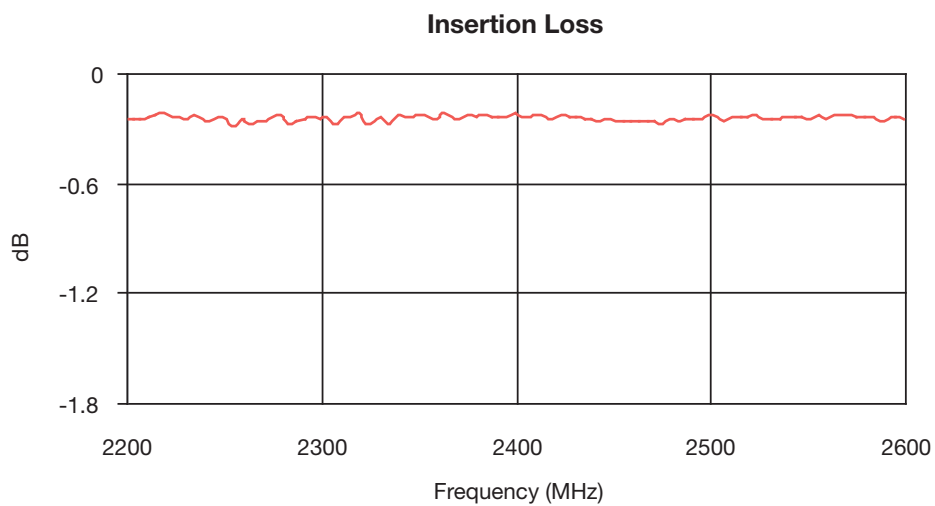
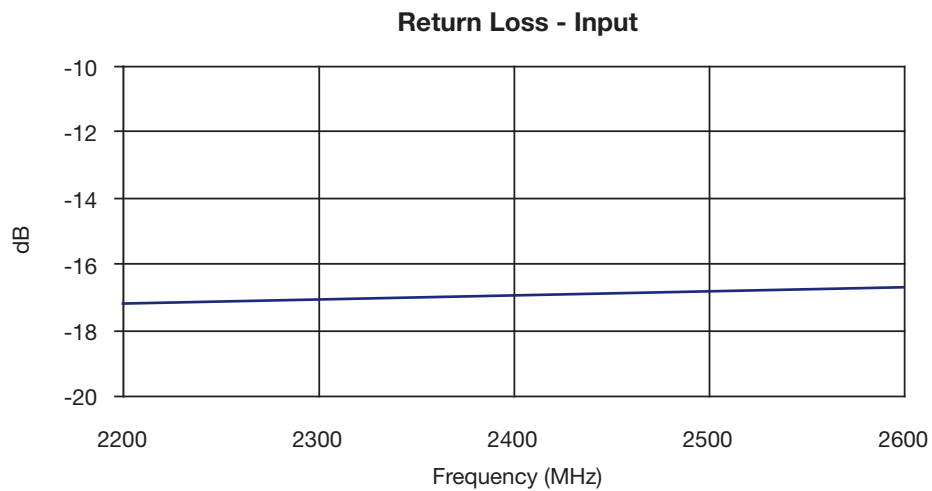
3

# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers



2200MHz to 2600MHz DB0603N2400ANTR



3



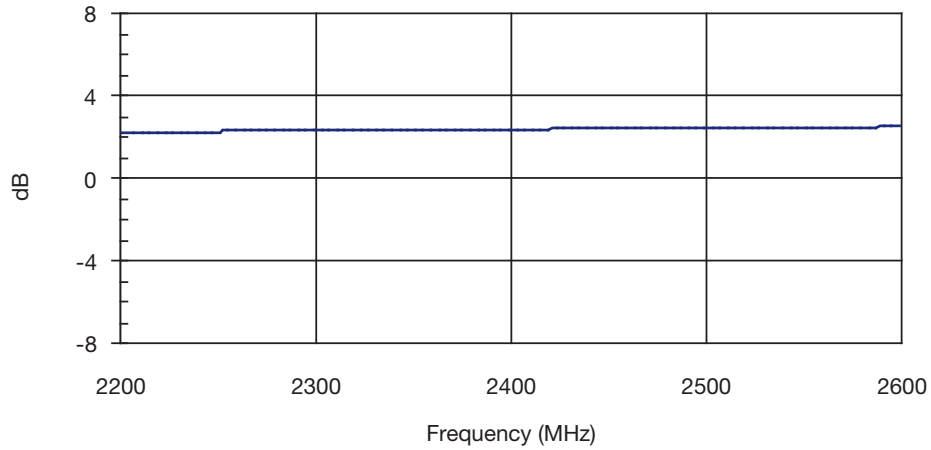
# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers

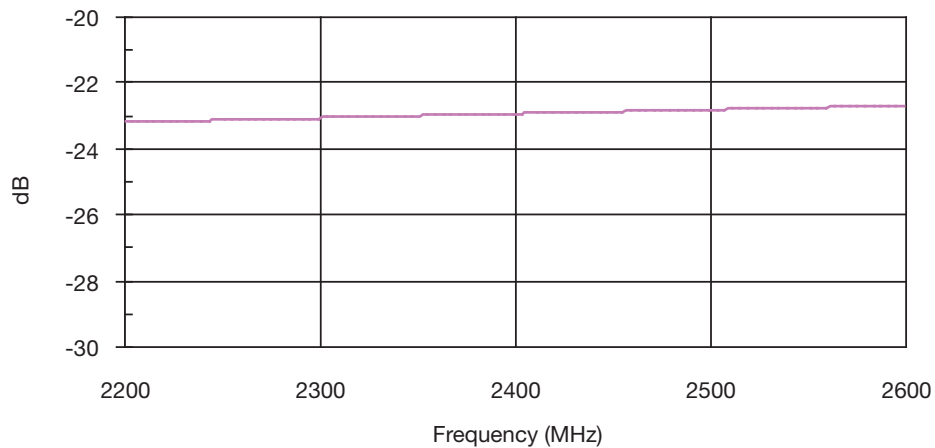


2200MHz to 2600MHz DB0603N2400ANTR

Phase Balance



Isolation



3

# Thin-Film Directional Couplers

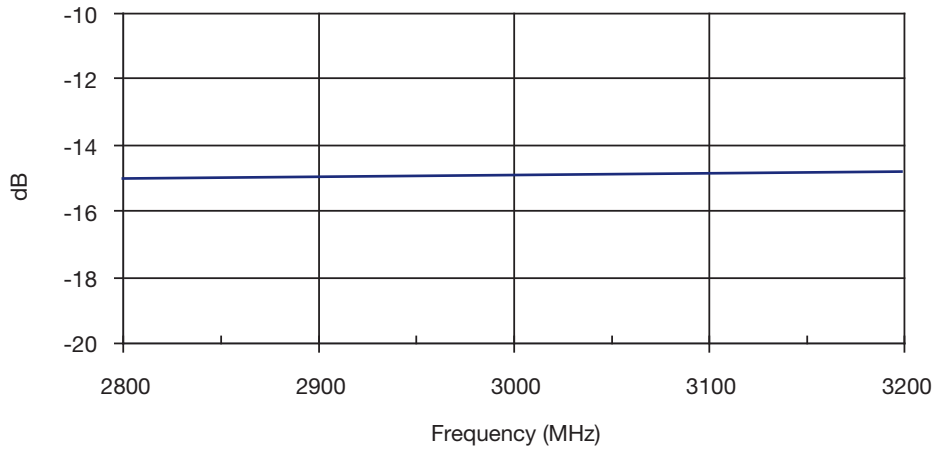
## DB0603N 3dB 90° Couplers



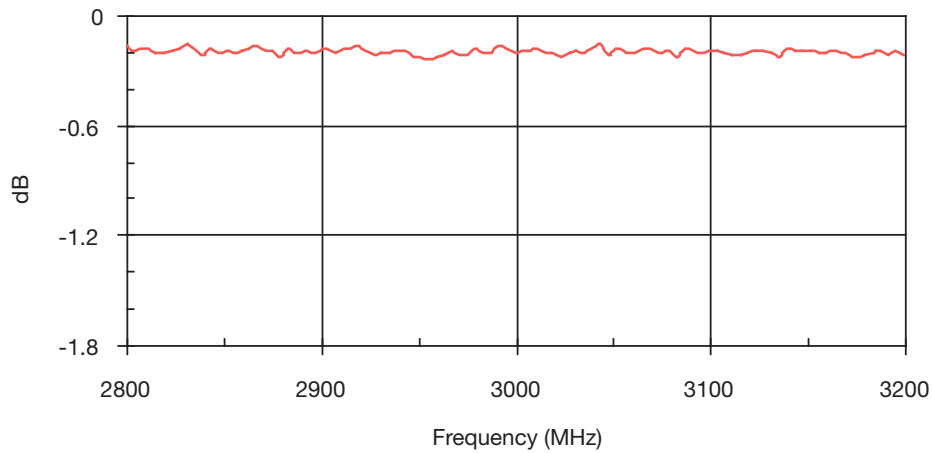
2850MHz to 3150MHz DB0603N3000ANTR

3

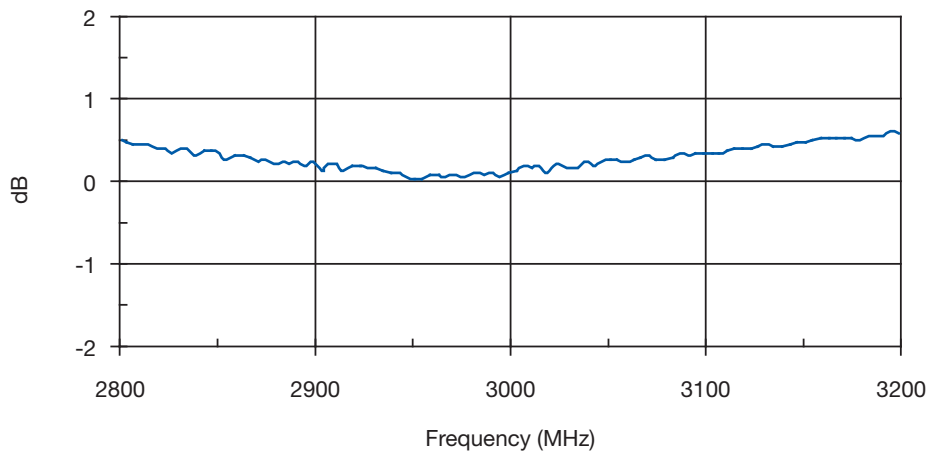
Return Loss - Input



Insertion Loss



Amplitude Balance



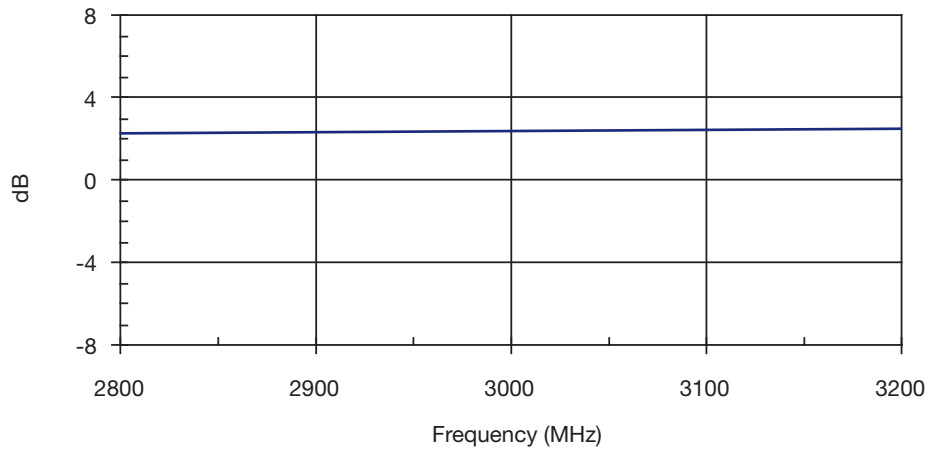
# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers

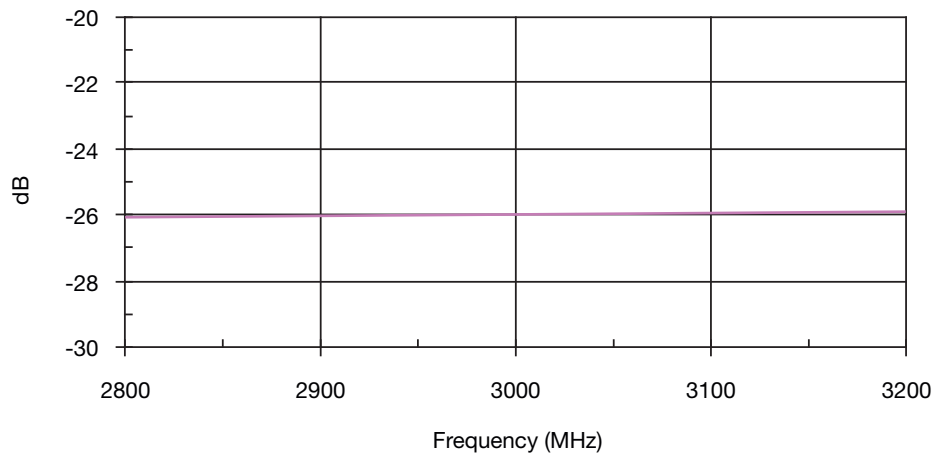


2850MHz to 3150MHz DB0603N3000ANTR

Phase Balance



Isolation



3

# Thin-Film Directional Couplers

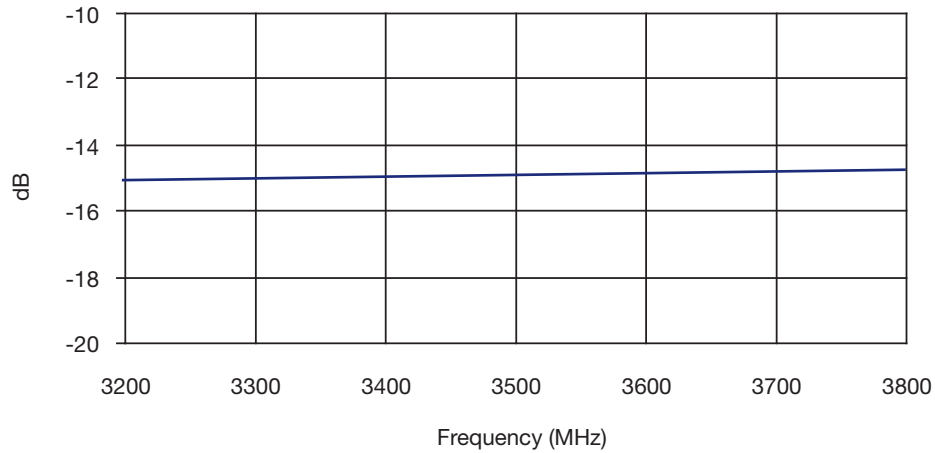
## DB0603N 3dB 90° Couplers



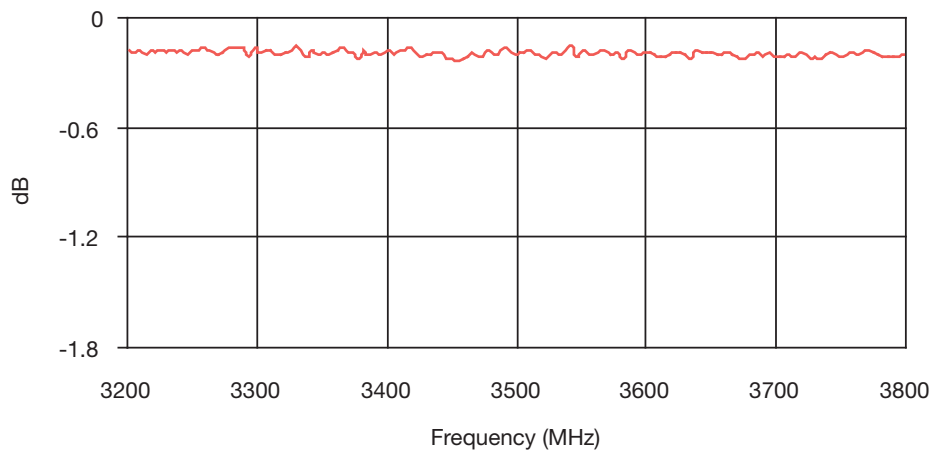
3200MHz to 3800MHz DB0603N3500ANTR

3

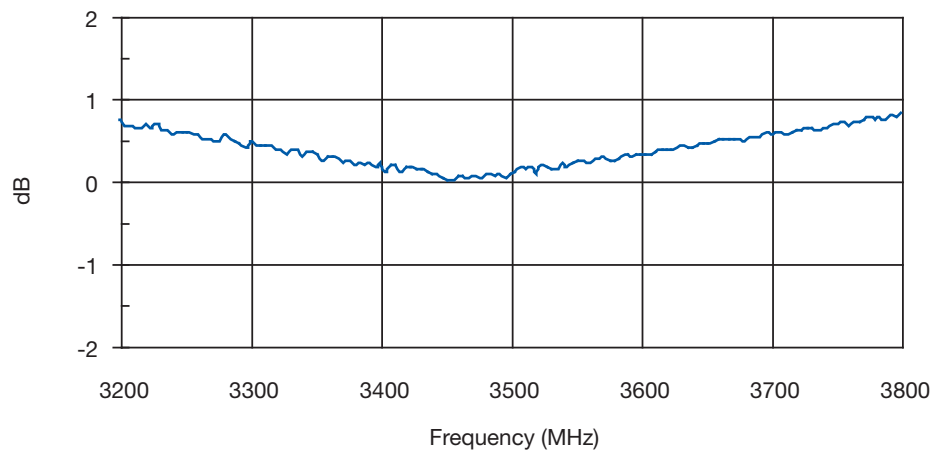
Return Loss - Input



Insertion Loss



Amplitude Balance





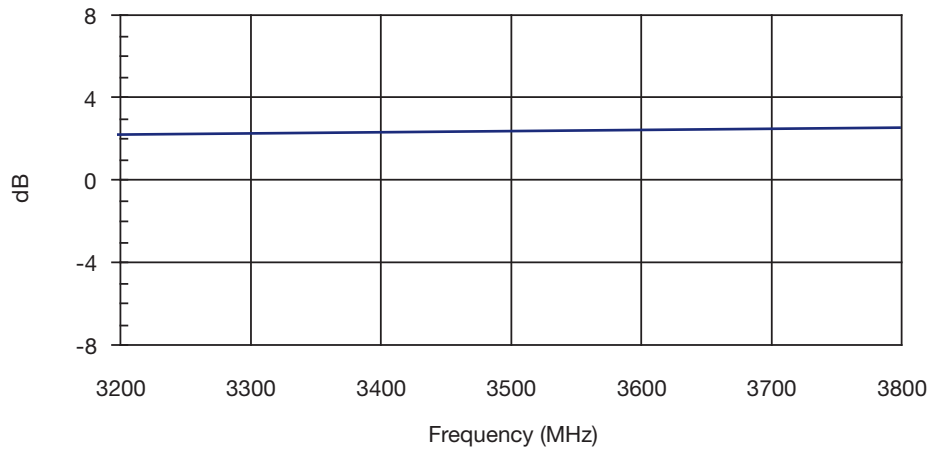
# Thin-Film Directional Couplers

## DB0603N 3dB 90° Couplers

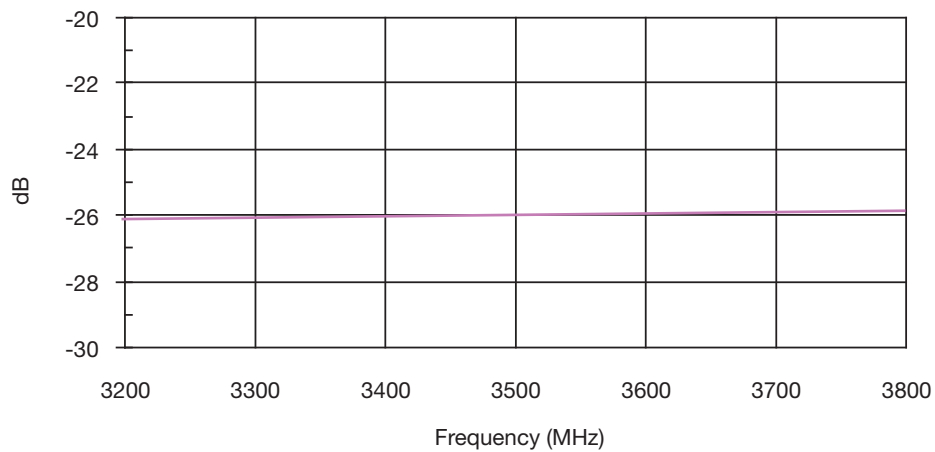


3200MHz to 3800MHz DB0603N3500ANTR

Phase Balance



Isolation



3

## DB0805 3dB 90° Test Jigs

### GENERAL DESCRIPTION

These jigs are designed for testing the DB0805 3dB 90° Couplers using a Vector Network Analyzer.

They consist of a dielectric substrate, having 50Ω microstrips as conducting lines and a bottom ground plane located at a distance of 0.254mm from the microstrips.

The substrate used is Neltec's NH9338ST0254C1BC.

The connectors are SMA type (female), 'Johnson Components Inc.' Product P/N: 142-0701-841.

Both a measurement jig and a calibration jig are provided.

The calibration jig is designed for a full 2-port calibration, and consists of an open line, short line and through line. LOAD calibration can be done by a 50Ω SMA termination.

### MEASUREMENT PROCEDURE

When measuring a component, it can be either soldered or pressed using a non-metallic stick until all four ports touch the appropriate pads. Set the VNA to the relevant frequency band. Connect the VNA using a 10dB attenuator on the jig

terminal connected to port 2. Follow the VNA's instruction manual and use the [calibration jig](#) to perform a full 2-port calibration in the required bandwidths.

3

#### Place the coupler on the [measurement jig](#) as follows:

Input (Coupler) → Connector 1 (Jig)      Output 1 (Coupler) → Connector 3 (Jig)  
 50Ω (Coupler) → Connector 2 (Jig)      Output 2 (Coupler) → Connector 4 (Jig)

#### To measure [R. Loss](#) and [I. Loss 1](#) connect:

Connector 1 (Jig) → Port 1 (VNA)      Connector 3 (Jig) → Port 2 (VNA)  
 Connector 2 (Jig) → 50Ω      Connector 4 (Jig) → 50Ω

#### To measure [R. Loss](#) and [I. Loss 2](#) connect:

Connector 1 (Jig) → Port 1 (VNA)      Connector 3 (Jig) → 50Ω  
 Connector 2 (Jig) → 50Ω      Connector 4 (Jig) → Port 2 (VNA)

#### To measure [Isolation](#) connect:

Connector 1 (Jig) → 50Ω      Connector 3 (Jig) → Port 1 (VNA)  
 Connector 2 (Jig) → 50Ω      Connector 4 (Jig) → Port 2 (VNA)

