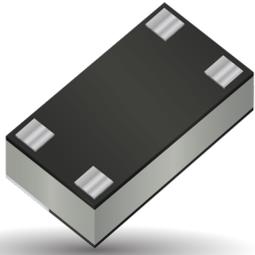


# Thin-Film RF/Microwave Directional Couplers

## DB0402 3dB 90° Coupler

### General Information



#### ITF TECHNOLOGY

The ITF 3dB LGA 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 ITF Coupler is offered in a variety frequency bands compatible with various types of high frequency wireless systems.

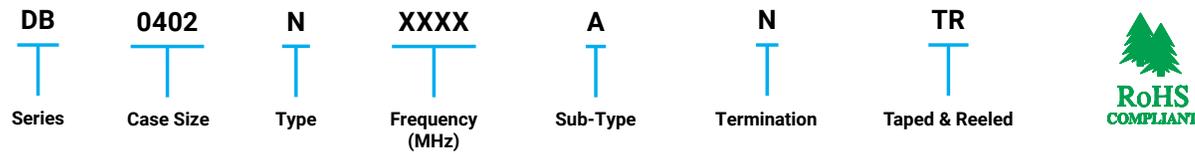
#### APPLICATIONS

- 4G LTE
- 5G LTE
- Base Stations
- Automotive
- Industrial
- Mobile communications
- Satellite TV receivers
- GPS
- Vehicle location systems
- Wireless LAN's

#### FEATURES

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

#### HOW TO ORDER



#### QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C, I<sub>R</sub>, 4 hours

#### TERMINATION

Nickel/Lead Free solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

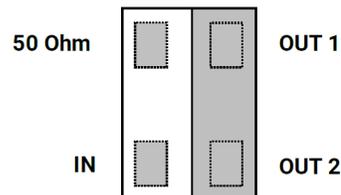
#### OPERATING TEMPERATURE

-40°C to +85°C

#### POWER HANDLING

1W (Continuous)

#### TERMINALS (TOP VIEW)

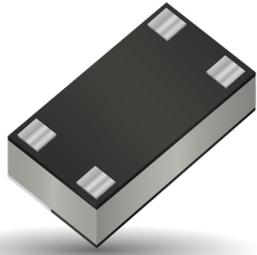


\* 50 Ohm external resistor must be placed between 50 Ohm terminal and GND plane

# Thin-Film RF/Microwave Directional Couplers

## DB0402 3dB 90° Coupler

### DB0402N3200ANTR



#### ITF TECHNOLOGY

The ITF 3dB LGA 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 ITF Coupler is offered in a variety frequency bands compatible with various types of high frequency wireless systems.

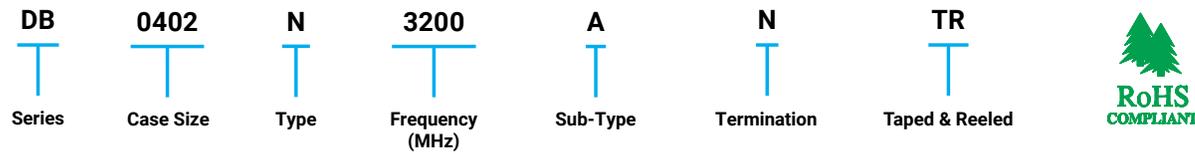
#### APPLICATIONS

- 4G LTE
- 5G LTE
- Base Stations
- Automotive
- Industrial

#### FEATURES

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

#### HOW TO ORDER



#### QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C,  $I_R$ , 4 hours

#### TERMINATION

Nickel/Lead Free solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

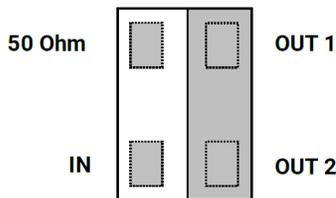
#### OPERATING TEMPERATURE

-40°C to +85°C

#### POWER HANDLING

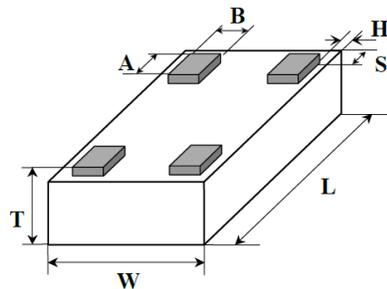
1W

#### TERMINALS (TOP VIEW)



\* 50 Ohm external resistor must be placed between 50 Ohm terminal and GND plane

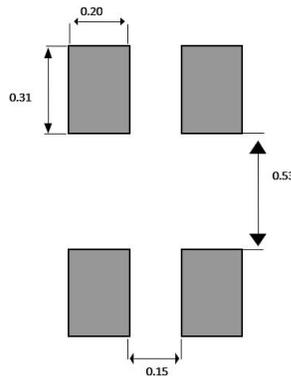
#### DIMENSIONS (BOTTOM VIEW)



mm (inches)

L	1.0±0.05 (0.040±0.002)
W	0.58±0.04 (0.023±0.002)
T	0.35±0.05 (0.014±0.002)
A	0.20±0.05 (0.008±0.002)
B	0.18±0.05 (0.007±0.002)
S	0.05±0.05 (0.002±0.002)

#### RECOMMENDED PAD LAYOUT (MM)



# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

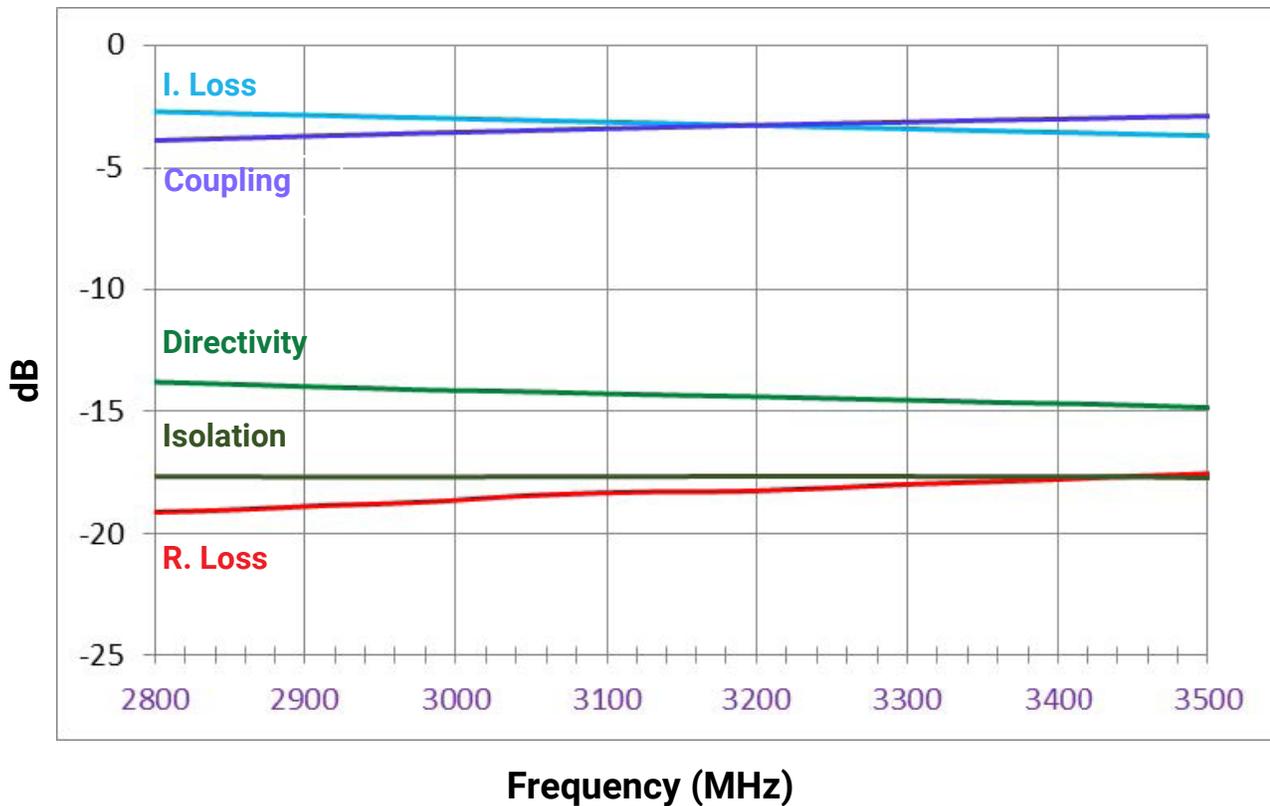
DB0402N3200ANTR



## ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Unit
Frequency	3000	3200	3400	MHz
Impedance	50			Ohm
Return Loss		-15		dB
Isolation	-15			dB
Insertion Loss		-0.5	-0.8	dB
Amplitude Balance		0.6	1.2	dB
Phase Balance (relative to 90°)		2	5	Degrees
Power Handling			1	Watts

## TYPICAL ELECTRICAL PERFORMANCE



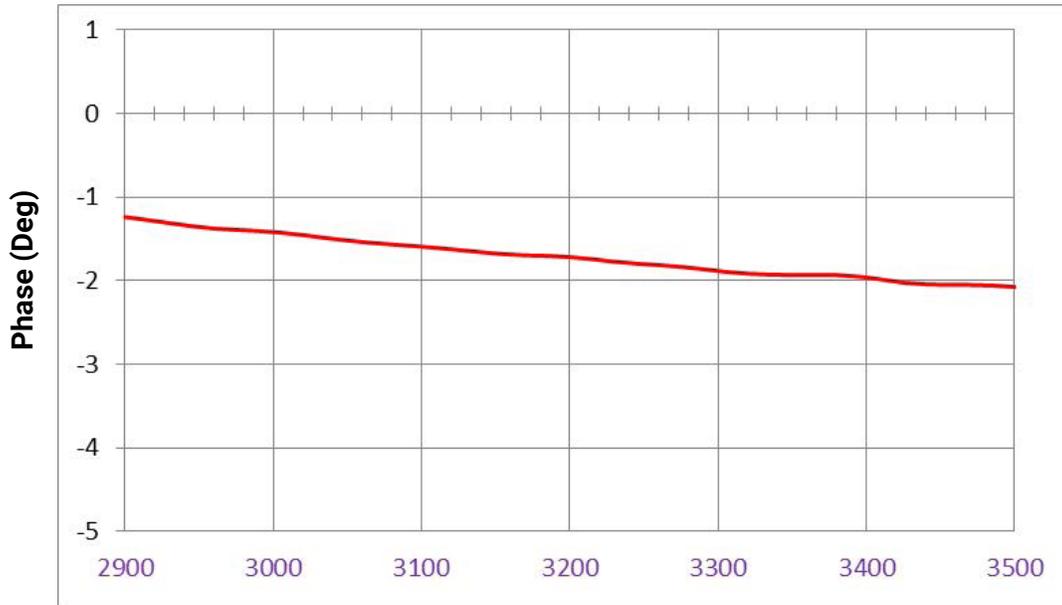
# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

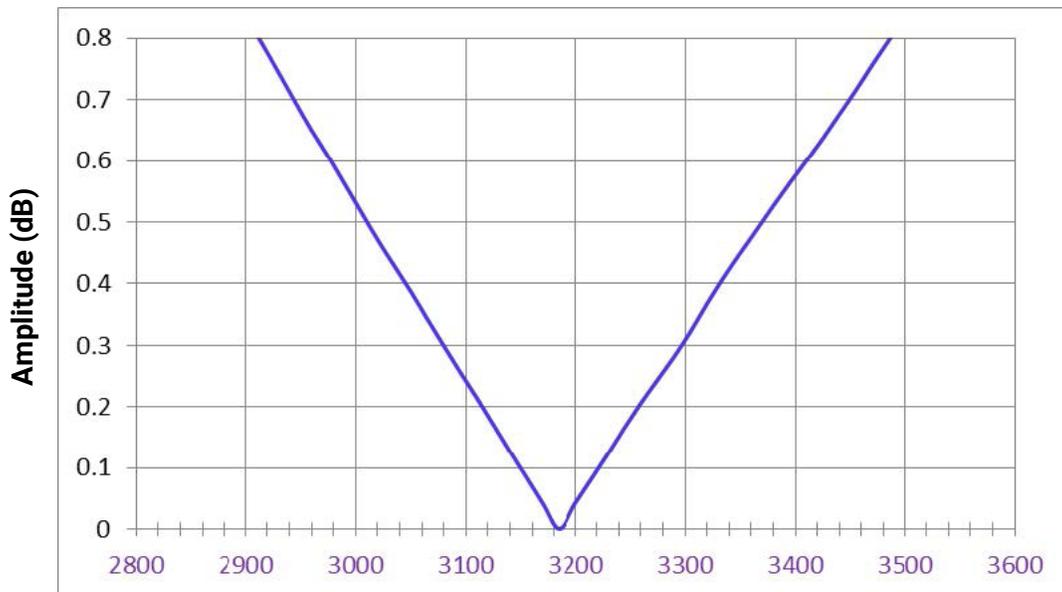
DB0402N3200ANTR



## PHASE BALANCE



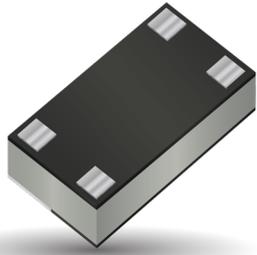
## AMPLITUDE BALANCE



# Thin-Film RF/Microwave Directional Couplers

## DB0402 3dB 90° Coupler

### DB0402N3500ANTR



#### ITF TECHNOLOGY

The ITF 3dB LGA 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 ITF Coupler is offered in a variety frequency bands compatible with various types of high frequency wireless systems.

#### APPLICATIONS

- Base Stations
- Mobile communications
- Satellite TV receivers
- GPS
- Vehicle location systems
- Wireless LAN's

#### FEATURES

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

#### HOW TO ORDER

<b>DB</b>	<b>0402</b>	<b>N</b>	<b>3500</b>	<b>A</b>	<b>N</b>	<b>TR</b>	
Series	Case Size	Type	Frequency (MHz)	Sub-Type	Termination	Taped & Reeled	

#### QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C, I<sub>R</sub>, 4 hours

#### TERMINATION

Nickel/Lead Free solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

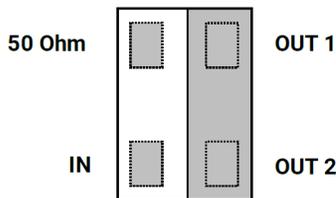
#### OPERATING TEMPERATURE

-40°C to +85°C

#### POWER HANDLING

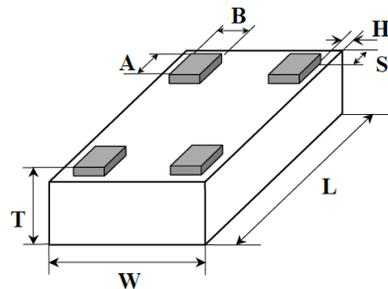
1W

#### TERMINALS (TOP VIEW)



\* 50 Ohm external resistor must be placed between 50 Ohm terminal and GND plane

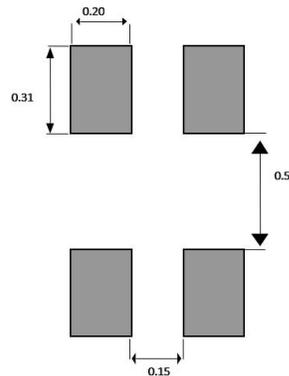
#### DIMENSIONS (BOTTOM VIEW)



mm (inches)

L	1.0±0.05 (0.040±0.002)
W	0.58±0.04 (0.023±0.002)
T	0.35±0.05 (0.014±0.002)
A	0.20±0.05 (0.008±0.002)
B	0.18±0.05 (0.007±0.002)
S	0.05±0.05 (0.002±0.002)

#### RECOMMENDED PAD LAYOUT (MM)



# Thin-Film RF/Microwave Directional Couplers

## DB0402 3dB 90° Coupler

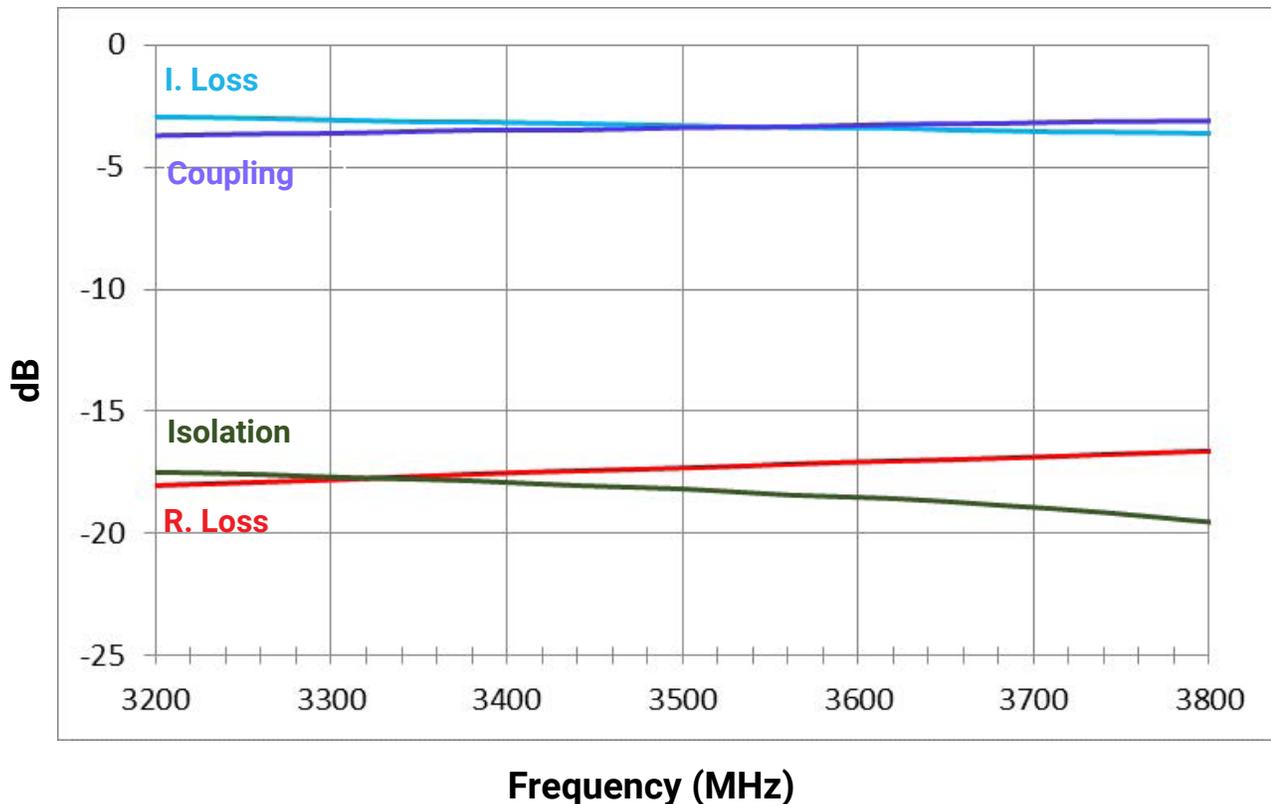
### DB0402N3500ANTR



#### ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Unit
Frequency	3300	3500	3700	MHz
Impedance	50			Ohm
Return Loss	15			dB
Isolation	15			dB
Insertion Loss		-0.5	-0.8	dB
Amplitude Balance		0.6	1.2	dB
Phase Balance (relative to 90°)		2	5	Degrees
Power Handling			1	Watts

#### TYPICAL ELECTRICAL PERFORMANCE



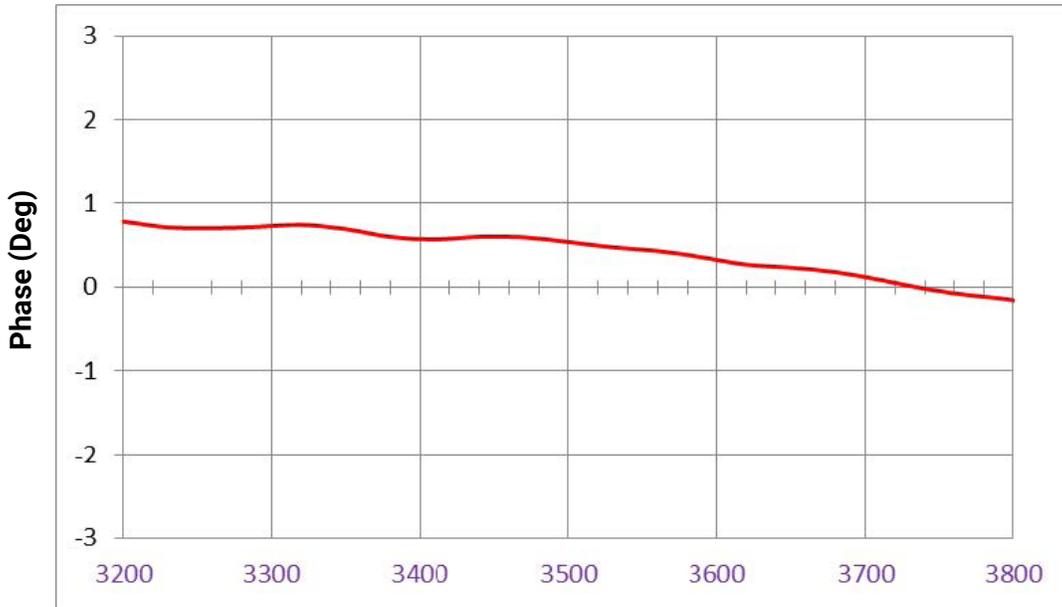
# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

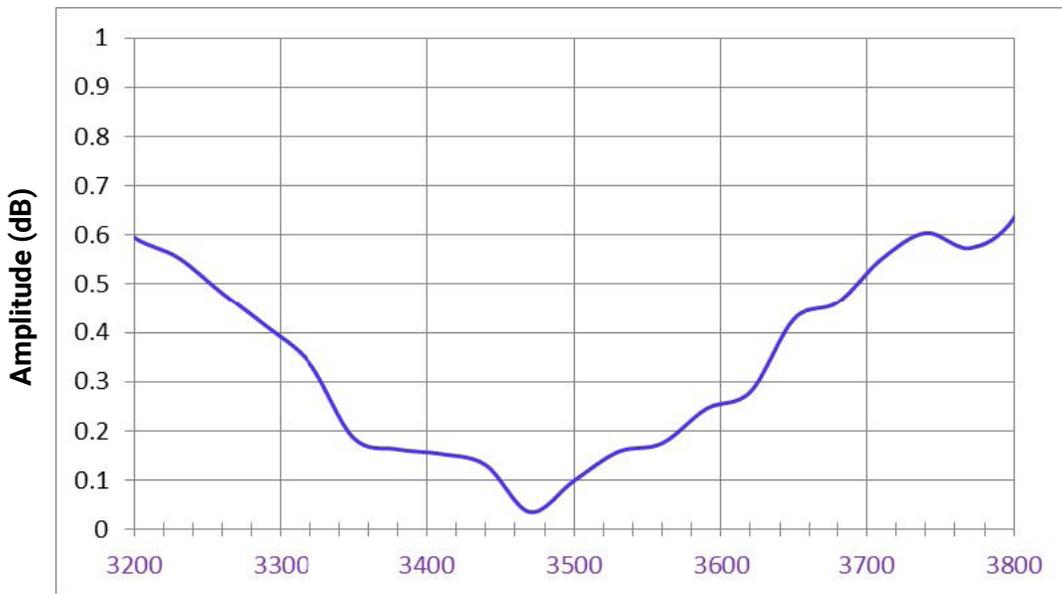
DB0402N3500ANTR



## PHASE BALANCE



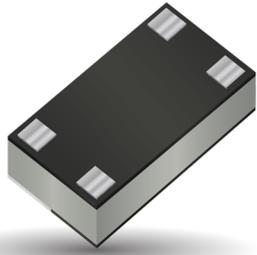
## AMPLITUDE BALANCE



# Thin-Film RF/Microwave Directional Couplers

## DB0402 3dB 90° Coupler

### DB0402N3700ANTR



#### ITF TECHNOLOGY

The ITF 3dB LGA 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 ITF Coupler is offered in a variety frequency bands compatible with various types of high frequency wireless systems.

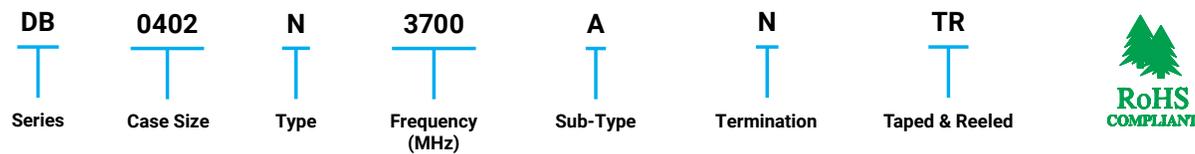
#### APPLICATIONS

- 4G LTE
- 5G LTE
- Base Stations
- Automotive
- Industrial

#### FEATURES

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

#### HOW TO ORDER



#### QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C,  $I_R$ , 4 hours

#### TERMINATION

Nickel/Lead Free solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

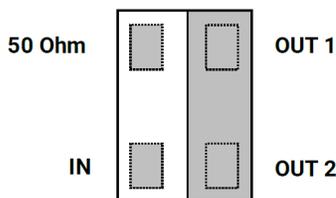
#### OPERATING TEMPERATURE

-40°C to +85°C

#### POWER HANDLING

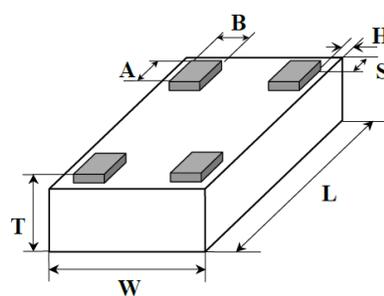
1W

#### TERMINALS (TOP VIEW)



\* 50 Ohm external resistor must be placed between 50 Ohm terminal and GND plane

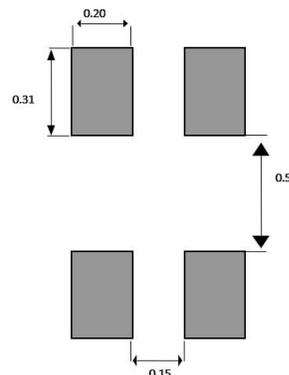
#### DIMENSIONS (BOTTOM VIEW)



mm (inches)

L	1.0±0.05 (0.040±0.002)
W	0.58±0.04 (0.023±0.002)
T	0.35±0.05 (0.014±0.002)
A	0.20±0.05 (0.008±0.002)
B	0.18±0.05 (0.007±0.002)
S	0.05±0.05 (0.002±0.002)

#### RECOMMENDED PAD LAYOUT (MM)



# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

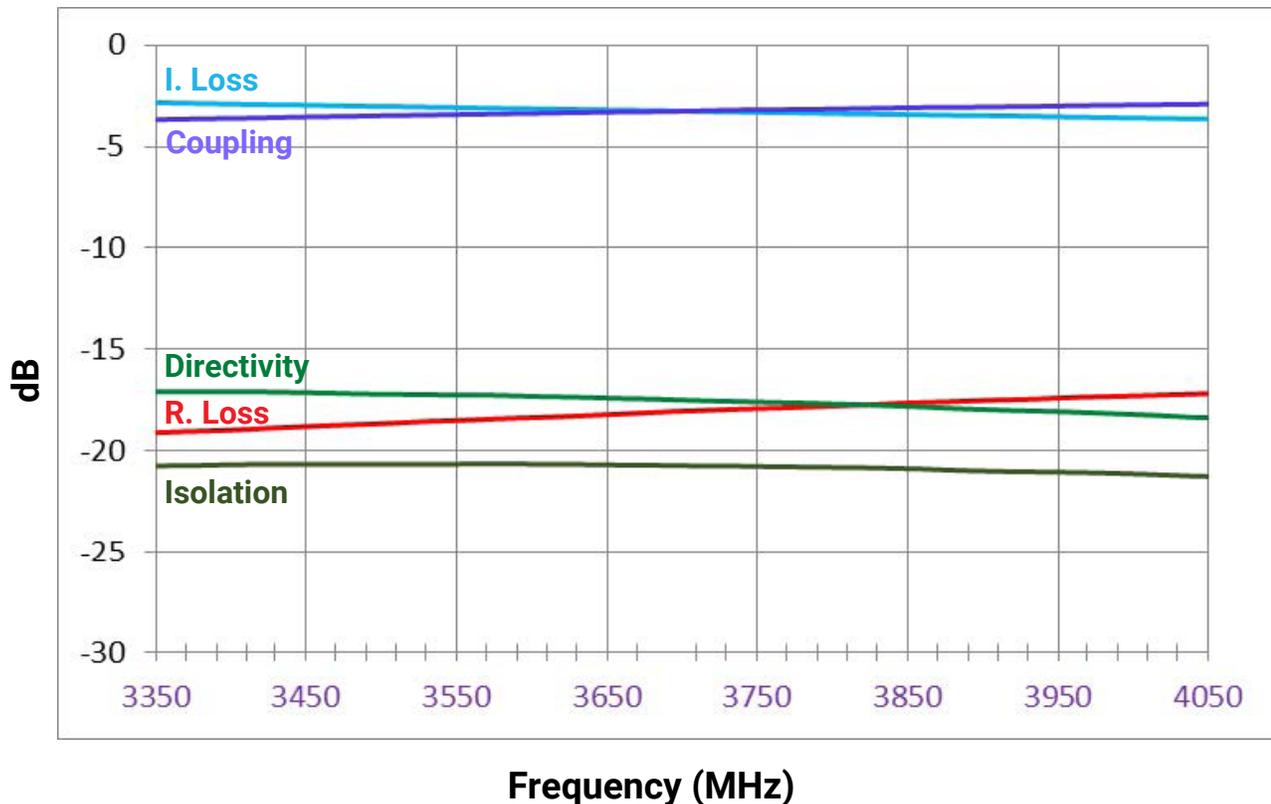
DB0402N3700ANTR



## ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Unit
Frequency	3400	3700	4000	MHz
Impedance	50			Ohm
Return Loss		-15		dB
Isolation	20			dB
Insertion Loss		-0.5	-0.8	dB
Amplitude Balance		0.6	1.2	dB
Phase Balance (relative to 90°)		2	5	Degrees
Power Handling			1	Watts

## TYPICAL ELECTRICAL PERFORMANCE



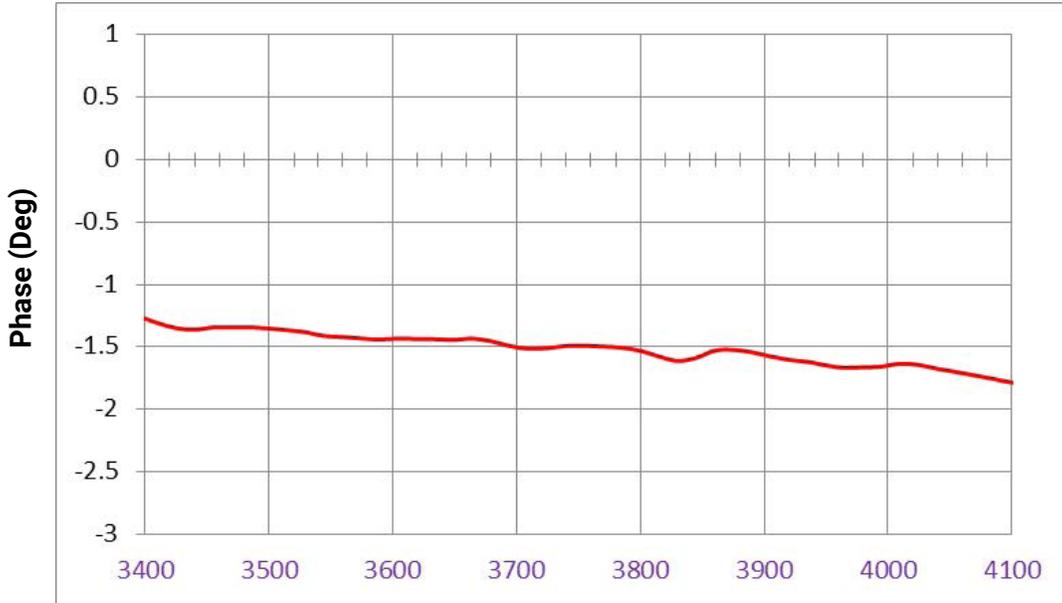
# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

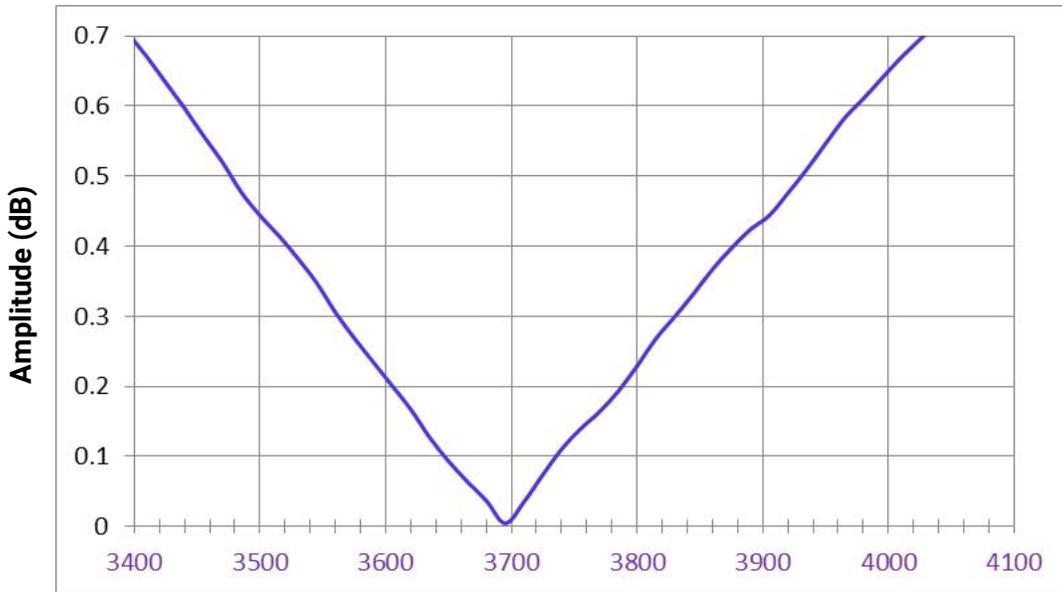
DB0402N3700ANTR



## PHASE BALANCE



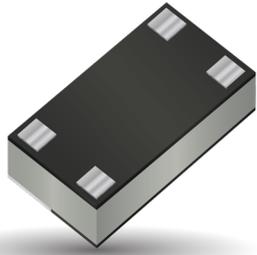
## AMPLITUDE BALANCE



# Thin-Film RF/Microwave Directional Couplers

## DB0402 3dB 90° Coupler

### DB0402N3800ANTR



#### ITF TECHNOLOGY

The ITF 3dB LGA 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 ITF Coupler is offered in a variety frequency bands compatible with various types of high frequency wireless systems.

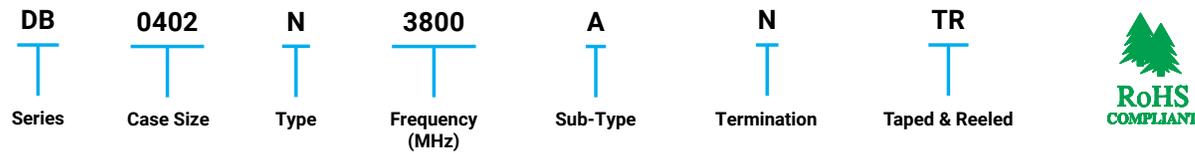
#### APPLICATIONS

- 4G LTE
- 5G LTE
- Base Stations
- Automotive
- Industrial

#### FEATURES

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

#### HOW TO ORDER



#### QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics. Each production lot is evaluated on a sample basis for:

- Static Humidity: 85°C, 85% RH, 160 hours
- Endurance: 125°C,  $I_R$ , 4 hours

#### TERMINATION

Nickel/Lead Free solder coating compatible with automatic soldering technologies: reflow, wave soldering, vapor phase and manual.

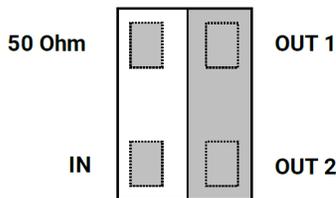
#### OPERATING TEMPERATURE

-40°C to +85°C

#### POWER HANDLING

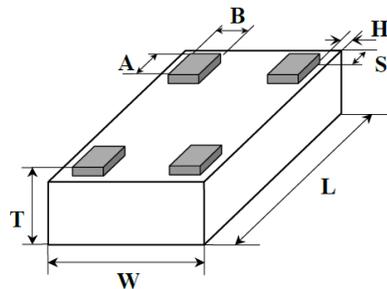
1W

#### TERMINALS (TOP VIEW)



\* 50 Ohm external resistor must be placed between 50 Ohm terminal and GND plane

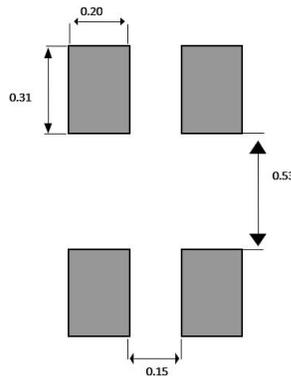
#### DIMENSIONS (BOTTOM VIEW)



mm (inches)

L	1.0±0.05 (0.040±0.002)
W	0.58±0.04 (0.023±0.002)
T	0.35±0.05 (0.014±0.002)
A	0.20±0.05 (0.008±0.002)
B	0.18±0.05 (0.007±0.002)
S	0.05±0.05 (0.002±0.002)

#### RECOMMENDED PAD LAYOUT (MM)



# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

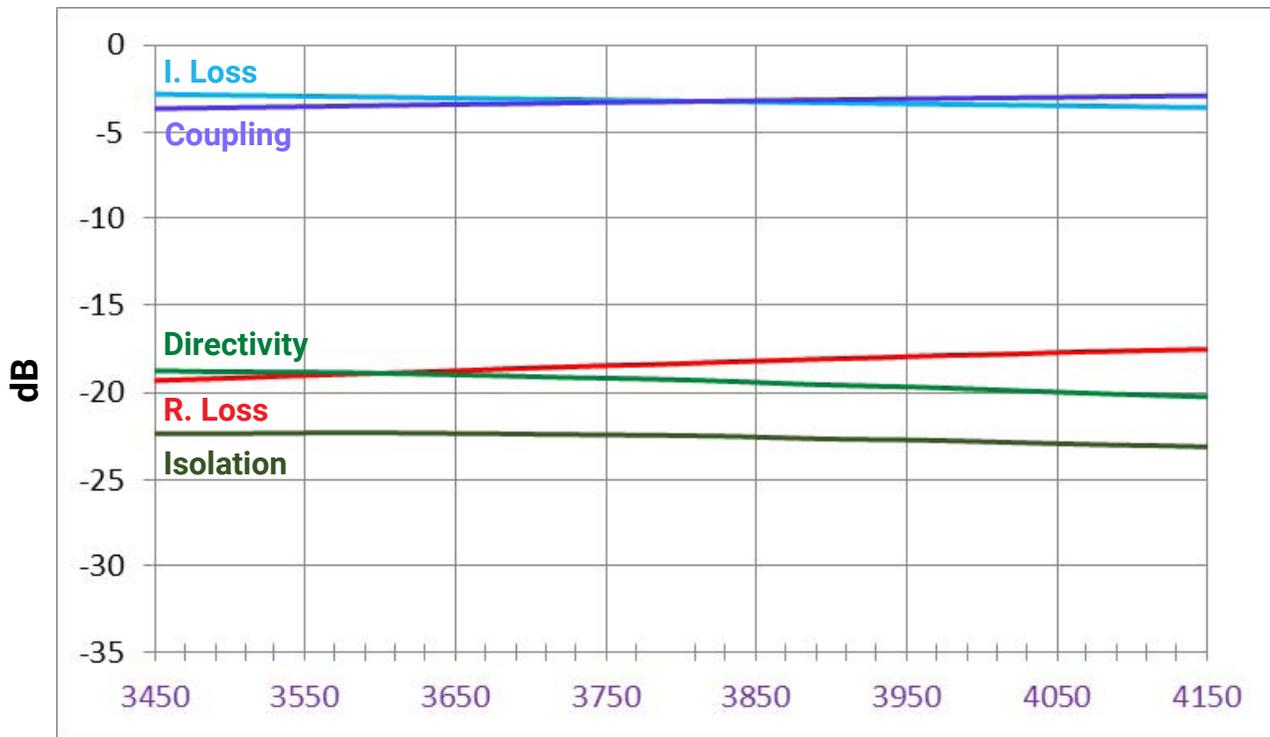
DB0402N3800ANTR



## ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Unit
Frequency	3500	3800	4100	MHz
Impedance	50			Ohm
Return Loss		-15		dB
Isolation	20			dB
Insertion Loss		-0.5	-0.8	dB
Amplitude Balance		0.6	1.2	dB
Phase Balance (relative to 90°)		2	5	Degrees
Power Handling			1	Watts

## TYPICAL ELECTRICAL PERFORMANCE



Frequency (MHz)

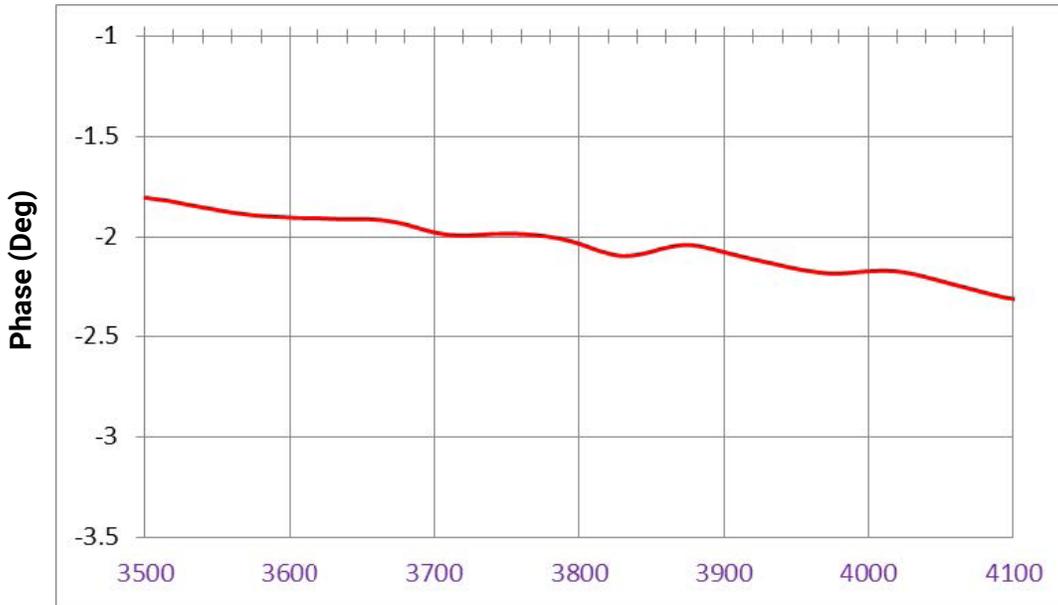
# Thin-Film RF/Microwave Directional Couplers

DB0402 3dB 90° Coupler

DB0402N3800ANTR



## PHASE BALANCE



## AMPLITUDE BALANCE

