Directional Coupler

SDC2010

首飞电子 | SHOUFEI ELECTRONICS

Product Overview

Our high-power broadband couplers available in surface-mounted and embedded formats—enable efficient power synthesis, signal distribution, and acquisition in microwave amplifier systems.

Widely applied in phased array radar, microwave transceivers, satellite communications, and radio equipment, these couplers combine high reliability with flexible customization.

Designed to match international standards in performance, pin layout, and package size, they support seamless drop-in replacement for global systems.

Key Features

- Wide frequency range: 20–1000 MHz
- Supports DCS and PCS systems
- Low insertion loss and high directivity for optimal performance
- Excellent repeatability and low VSWR for consistent signal quality
- CTE-matched for compatibility with FR4, G-10, RF-35, RO4350B, and polyimide substrates
- Immersion gold finish protects against oxidation and scratches
- RoHS compliant for eco-friendly design
- Available in convenient tape & reel packaging

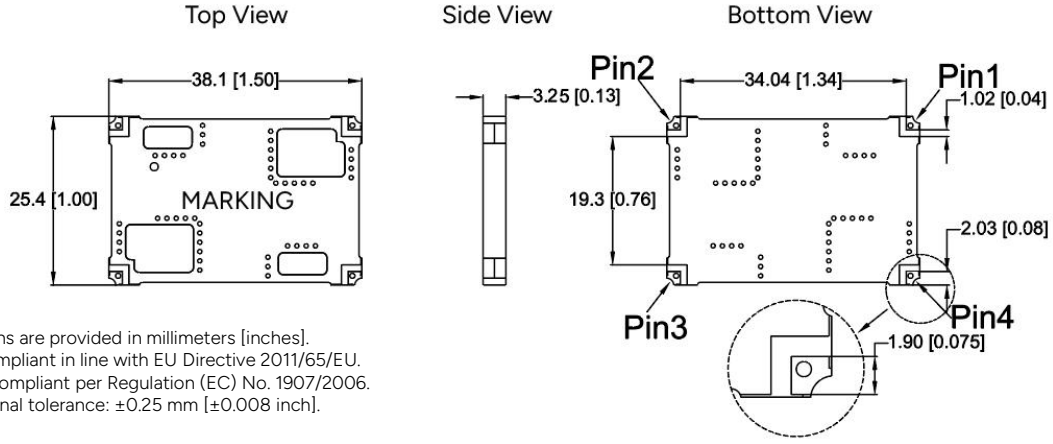
Electrical Specifications

Frequency Range	Forward Coupled	Directivity	Return Loss	Insertion Loss	Power	Operating Temp.
MHz	*dB*	*dB Min*	*dB Min*	*dB Max*	*Avg. CW, W*	*°C*
20-1000	50±1	14	20	0.3	300	-55 to +85

Note:

1. All performance data is based on measurements using a designated demo board.
2. Reported insertion loss values exclude the loss from the through-board path.

Outline Drawing

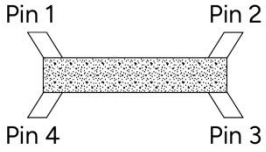


Note:

1. Dimensions are provided in millimeters [inches].
2. RoHS compliant in line with EU Directive 2011/65/EU.
3. REACH compliant per Regulation (EC) No. 1907/2006.
4. Dimensional tolerance: ±0.25 mm [±0.008 inch].

Pin Configuration

An orientation marker clearly identifies Pin 1 on the directional coupler. Once Port 1 is established, the corresponding ports can be determined automatically. Refer to the following chart for detailed mapping.



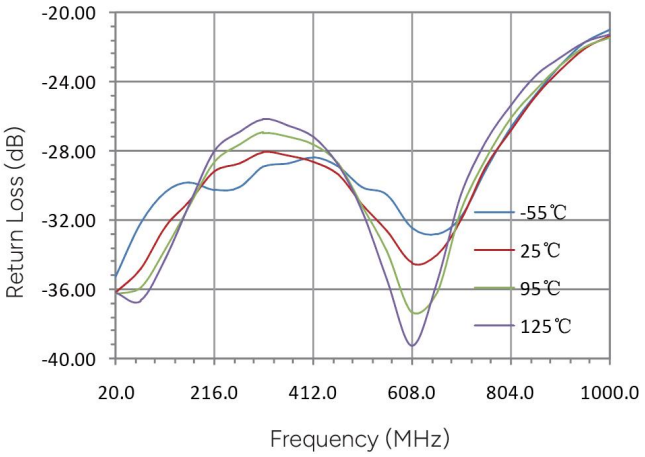
Pin 1	Pin 2	Pin 3	Pin 4
Input	Reflected Coupled	Transmission	Forward Coupled
Transmission	Forward Coupled	Input	Reflected Coupled

Typical Performance Data at 25°C

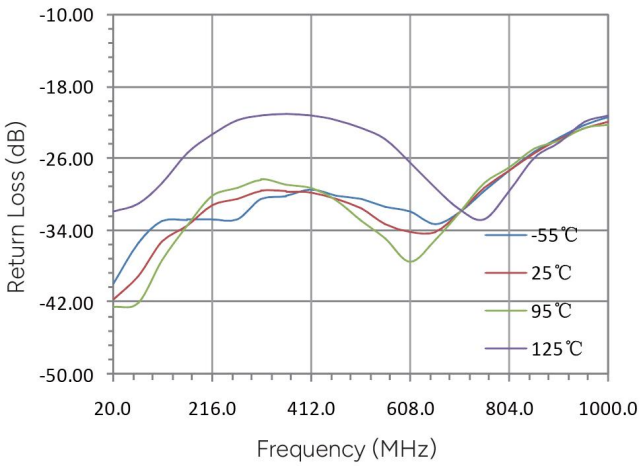
Frequency (MHz)	Forward Coupled (dB)	Transmission (dB)	Insertion Loss (dB)	Reflected Coupled (dB)	Return Loss (dB) S11	Return Loss (dB) S33
20.0	-49.87	-0.01	-0.01	-92.51	-36.15	-41.65
69.0	-49.76	-0.01	-0.01	-89.53	-34.78	-39.06
118.0	-50.14	0.00	0.00	-90.04	-32.34	-35.30
167.0	-50.42	-0.01	-0.01	-88.52	-30.95	-33.44
216.0	-50.31	-0.02	-0.02	-91.18	-29.22	-31.14
265.0	-50.37	-0.05	-0.04	-100.17	-28.74	-30.42
314.0	-50.27	-0.05	-0.05	-98.13	-28.06	-29.60
363.0	-50.05	-0.07	-0.07	-92.75	-28.31	-29.65
412.0	-49.74	-0.08	-0.08	-87.24	-28.63	-29.73
461.0	-49.62	-0.10	-0.10	-83.20	-29.38	-30.55
510.0	-49.57	-0.14	-0.14	-79.96	-31.05	-31.63
559.0	-49.29	-0.13	-0.13	-77.28	-32.61	-33.30
608.0	-49.28	-0.13	-0.13	-75.35	-34.46	-34.16
657.0	-49.04	-0.15	-0.15	-73.82	-33.96	-34.19
706.0	-49.18	-0.20	-0.20	-71.69	-32.00	-31.96
755.0	-49.17	-0.20	-0.20	-69.65	-28.87	-29.35
804.0	-49.45	-0.21	-0.20	-71.69	-26.82	-27.30
853.0	-49.95	-0.23	-0.23	-70.11	-24.80	-25.44
902.0	-50.30	-0.21	-0.21	-65.97	-23.38	-23.85
951.0	-50.82	-0.22	-0.22	-66.83	-22.07	-22.69
1000.0	-50.53	-0.20	-0.20	-66.44	-21.38	-21.87

Typical Performance

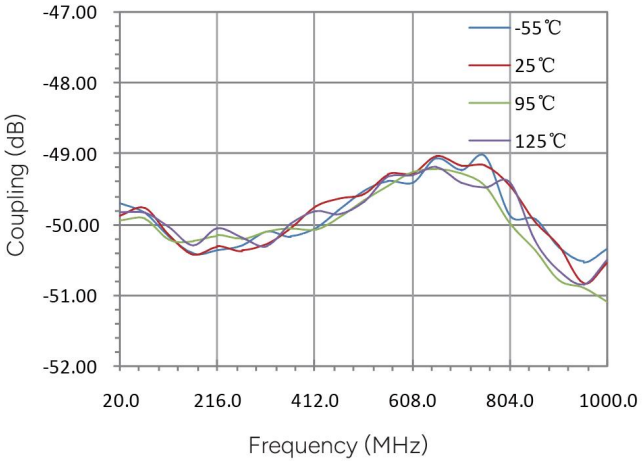
Return Loss (Port 1)



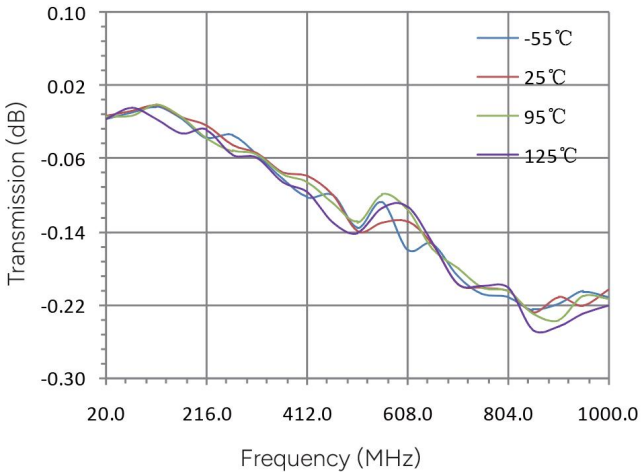
Return Loss (Port 3)



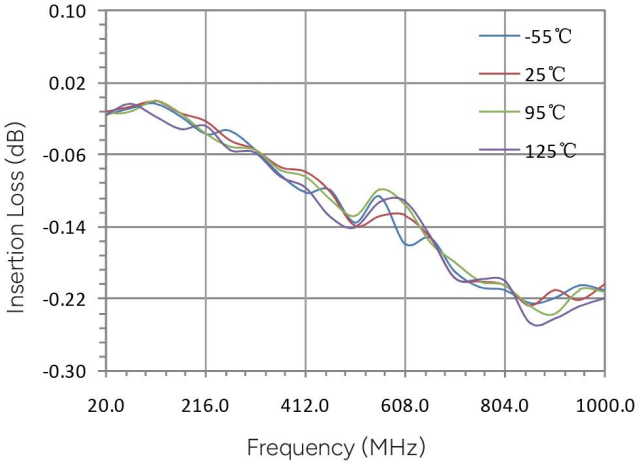
Forward Coupled (Port 1 feeding)



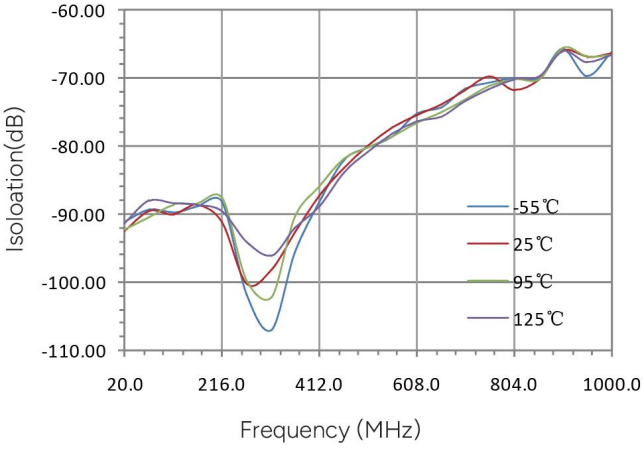
Transmission (Port 1 feeding)



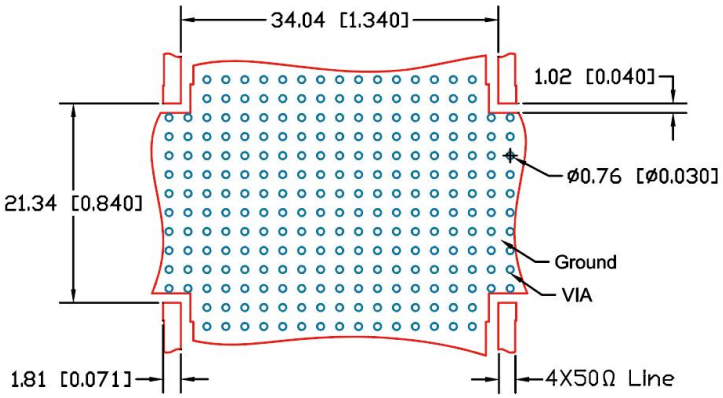
Insertion Loss (Port 1 feeding)



Reflected Coupled (Port 1 feeding)



Recommended PCB Layout



Notes:

1. The 50Ω trace width shown is derived from using RO4003 laminate with a dielectric thickness of 0.81 mm and 1 oz copper.
2. The PCB's bottom layer consists of an uninterrupted ground plane.
3. Dimensions are listed in millimeters [inches].

Reflow Profile