

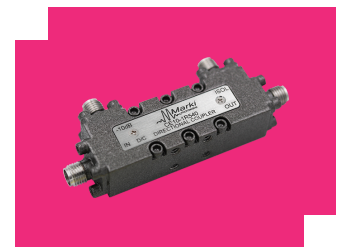
CE10-1R540

Elite 1.5-40 GHz Directional Coupler

DEVICE OVERVIEW

General Description

The CE10-1R540 is a next generation broadband 1.5GHz to 40GHz, 10dB directional coupler from the Marki Elite Series. Conductive paint is applied to all Elite Series products to reduce EMI/RFI leakage and susceptibility. The CE10-1R540 offers the best directivity, return loss, and coupling accuracy available on the market. Available as both a three port directional coupler and a four port bidirectional coupler, the CE10-1R540 is an exceptional choice for broadband return loss measurements, power leveling, and signal monitoring applications. Sophisticated neural network design techniques combined with deep circuit knowledge and triplate stripline construction allow the Marki Elite Series of Couplers to provide superior performance to all other directional couplers available.



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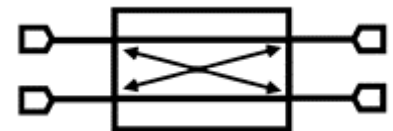
Features

- Broadband Performance
- Excellent Coupling Flatness
- High Directivity
- Low VSWR
- Conductive paint minimizes RF leakage

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Packing Size	Green Status	Product Lifecycle	Export Classification
CE10-1R540	Elite 1.5-40 GHz Directional Coupler	-	-	RoHS	Released	EAR99
<u>CE10-1R540T</u>	Elite 1.5-40 GHz Directional Coupler	-	-	RoHS	Released	EAR99

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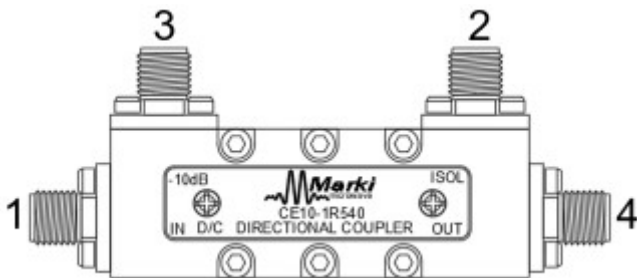
Revision History

Revision Code	Revision Date	Comment
-	2021-12-01	Datasheet Initial Release
A	2022-04-01	Terminated Option Added, Operating and Storage Temperatures Updated

Port Configuration and Functions

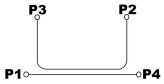
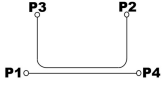
Port Diagram

A side view of the CE10-1R540 package outline drawing is shown below. The CE10-1R540 has input and output ports given in Port Functions. The CE10-1R540 can be used in either the forward or reverse direction corresponding to configuration A and B respectively. For configuration A, input signal into port 1, use port 3 for coupled port, port 2 for isolated port, and port 4 for output port. For configuration B, input signal into port 4, use port 2 for coupled port, port 3 for isolated port, and port 1 for output port.

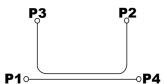


Port Functions

Configuration A

Port	Function	Description	Equivalent Circuit for Package
Port 1	Input	The input port is DC short to the output port and open to the isolated and coupled ports.	
Port 2	Isolated	The isolated port is DC short to the coupled port and open to the input and output ports.	
Port 3	Coupled	The coupled port is DC short to the isolated port and open to the input and output ports.	
Port 4	Output	The output port is DC short to the input port and open to the isolated and coupled ports.	

Configuration B

Port	Function	Description	Equivalent Circuit for Package
Port 1	Output	The input port is DC short to the output port and open to the isolated and coupled ports.	
Port 2	Coupled	The isolated port is DC short to the coupled port and open to the input and output ports.	
Port 3	Isolated	The coupled port is DC short to the isolated port and open to the input and output ports.	
Port 4	Input	The output port is DC short to the input port and open to the isolated and coupled ports.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

Parameter	Maximum Rating	Unit
RF Power Handling	20	W

Package Information

Parameter	Details	Rating
Dimensions	-	68.62 x 17.53 mm

Electrical Specifications

The electrical specifications apply for configuration A at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C.

Parameter	Port Configuration	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Mean Coupling	-	-	1.5	40	9.5	10	10.5	dB
Coupling Loss ¹	-	-	1.5	40	0.41	0.46	0.52	dB
Direct Line Insertion Loss	-	DC-40	-	-	-	0.9	1.7	dB
Amplitude Flatness ²	-	-	1.5	40	-	0.25	0.5	dB
Maximum Coupling Deviation	-	-	1.5	40	-	85	1.7	dB
Directivity	-	-	1.5	40	15	24	-	dB
IL Corrected Directivity ³	-	-	1.5	40	16	26	-	dB
Excess Insertion Loss (dB) ⁴	-	DC-40	-	-	-	0.42	1.3	dB
Impedance	-	-	-	-	-	50	-	Ω
Pass Band VSWR	-	DC-40	-	-	-	1.07	1.22	-
Pass Band Return Loss	-	-	1.5	40	20	30	-	dB

^[1] Coupling loss based on average coupling factor.

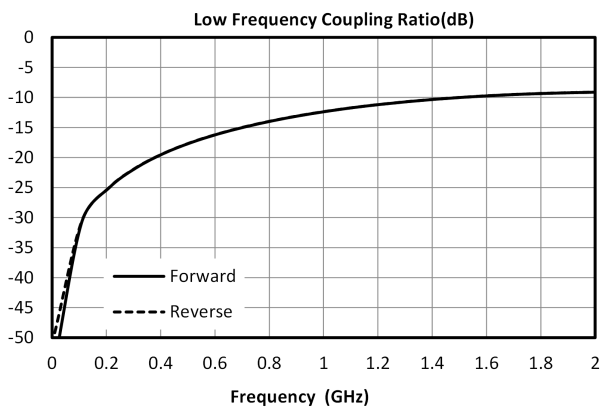
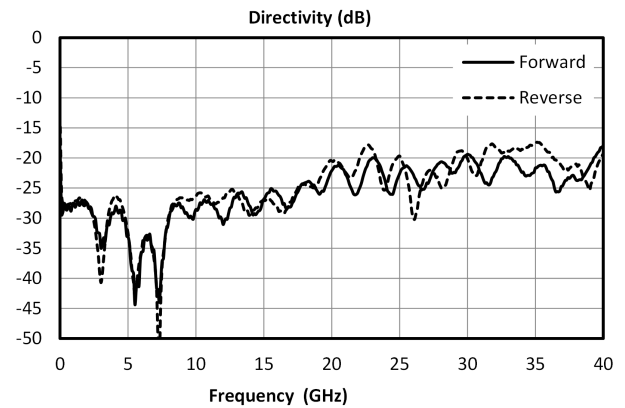
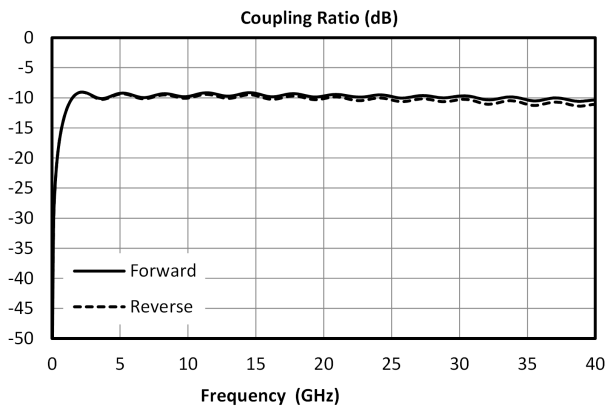
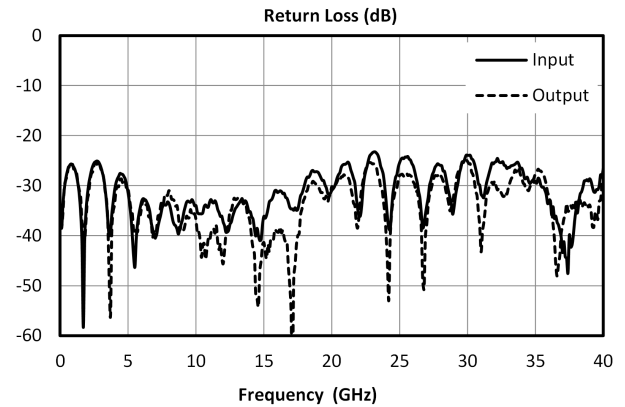
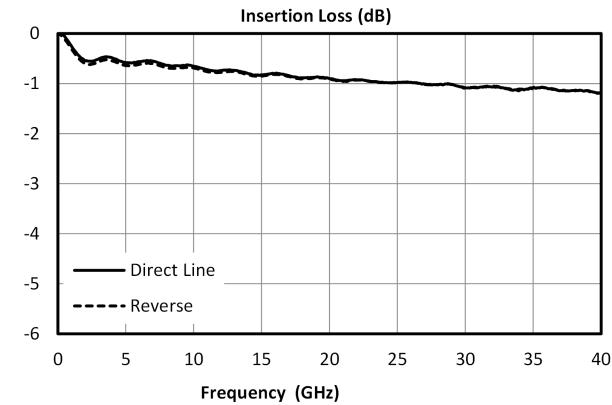
^[2] Amplitude Flatness = Median value of ABS(Measured Coupling Power – Average Coupling Factor).

^[3] IL Corrected Directivity = Directivity + Insertion Loss.

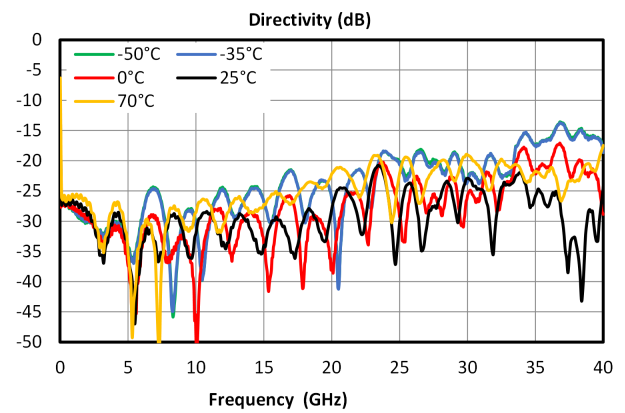
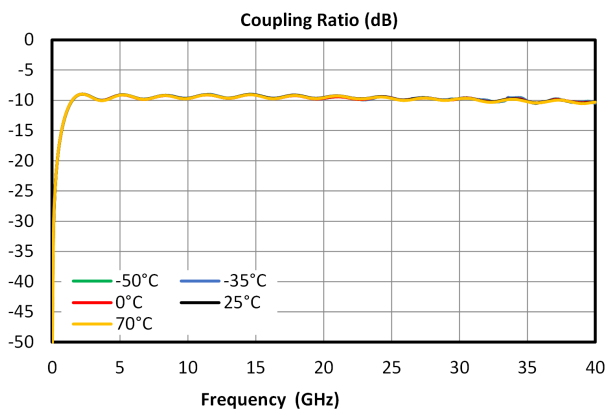
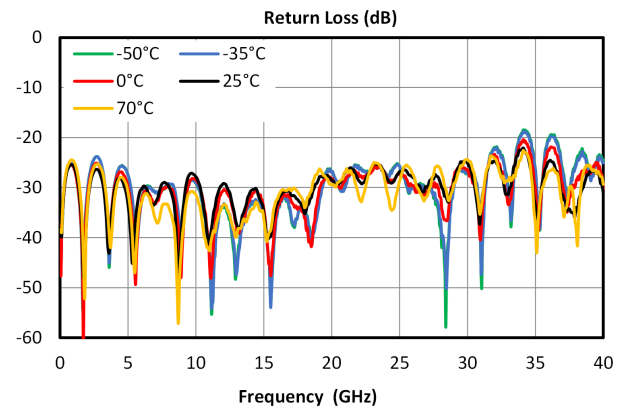
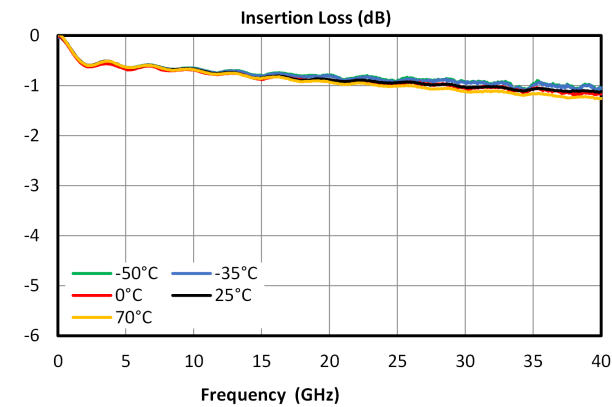
^[4] Excess Insertion Loss = (Input Port to Output Port Insertion Loss) – Coupling Loss.

Typical Performance Plots

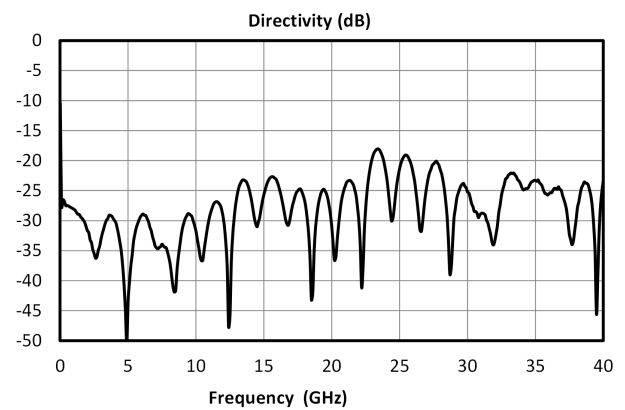
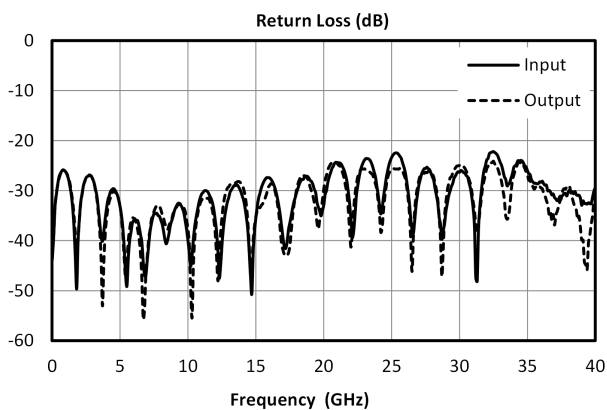
Insertion Loss, Return Loss, Coupled Port Power, and Directivity



Performance Over Temperature



Terminated Return Loss and Directivity

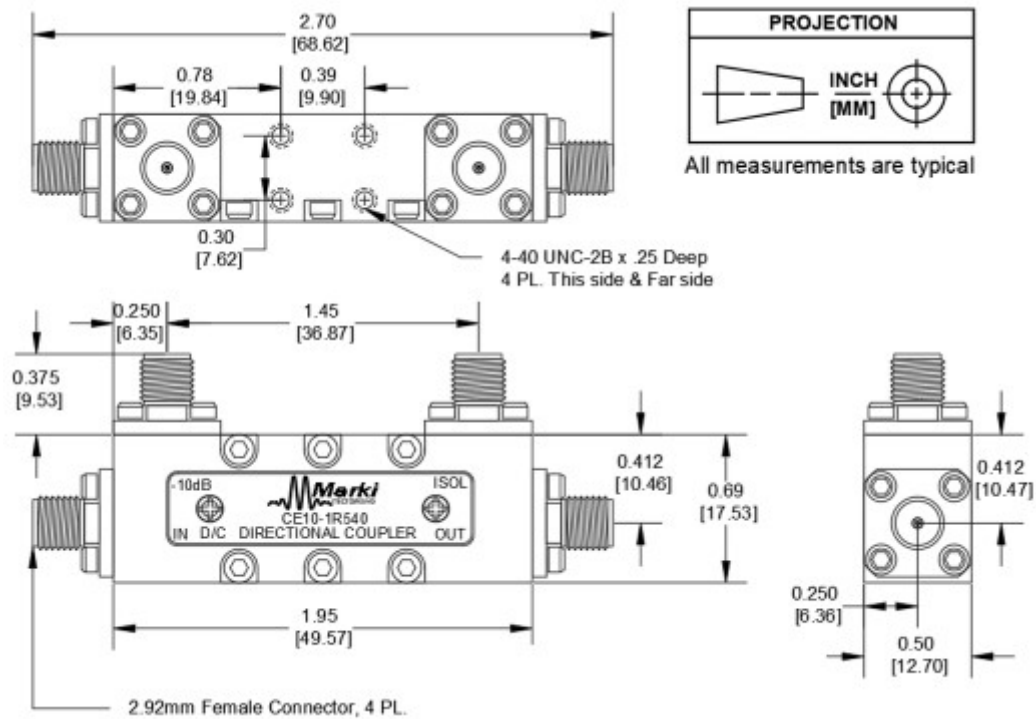


CE10-1R540

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Mechanical Data

Outline Drawing



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