SURFACE MOUNT, HIGH POWER

Bi-Directional Coupler SYDC-20-12UHP+

50Ω 1 to 150 MHz 20 dB Coupling Up to 150 Watts

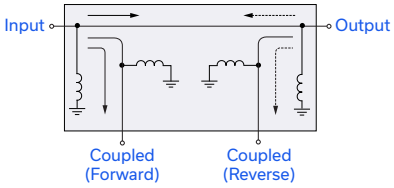
KEY FEATURES

- High Power Handling, Up to 150 Watts
- Very Low Mainline Loss, 0.20 dB Typ.
- Great Return Loss, 29 dB Typ.

Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM

BI-DIRECTIONAL COUPLER*



*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all ports to ground.

APPLICATIONS

- Military Mobile

PRODUCT OVERVIEW

Mini-Circuits' SYDC-20-12UHP+ surface mount bi-directional coupler provides exceptionally high-power handling up to 150 W and low mainline loss of 0.18 dB for applications from 1 to 150 MHz. This model features a unique heat sink design that enables reliable operation at high power without overheating, making it an ideal choice for systems where high-power capability and small size are desired. The coupler features core and wire construction mounted on an 8-lead printed laminate base with wraparound terminations for excellent solderability. This unit measures 0.690x0.433x0.028", accommodating dense circuit board layouts.

ELECTRICAL SPECIFICATIONS[1] AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		1		150	MHz
Mainline Loss (Above Theoretical Loss 0.05 dB)	10-30		0.12	0.17	dB
	5-50		0.13	0.19	
	1-150		0.20	0.29	
Nominal Coupling	1-150		20.3±1		dB
Coupling Flatness (±)	1-150		±0.16	±0.35	dB
Directivity	1-50	24	34		dB
	50-100	18	27		
	100-150	15	24		
Return Loss (Input & Output)	1-150	19	26		dB
Return Loss (CPL)	1-150	19	29		dB
Input Power[2]	10-30		150		W
	5-50		100		
	1-150		50		

1. Tested on Eval Board TB-SYDC2012UHP+.
2. The user must provide adequate means of heat removal to limit the temperature of ground under the PCB to +65°C. To ensure proper performance. At +25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 16°C/W or less when the unit is driven at maximum specified RF input power 150 W. At high ambient temperature, with the same heat sink, input power in watts must not exceed 150 W x (+65°C - Ambient) ÷ +40°C.

ABSOLUTE MAXIMUM RATINGS[3]

Operating Case Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power	Up to 150 W

3. Permanent damage may occur if any of these limits are exceeded.

REV. OR
ECO-028947
SYDC-20-12UHP+
MCL NY
260202

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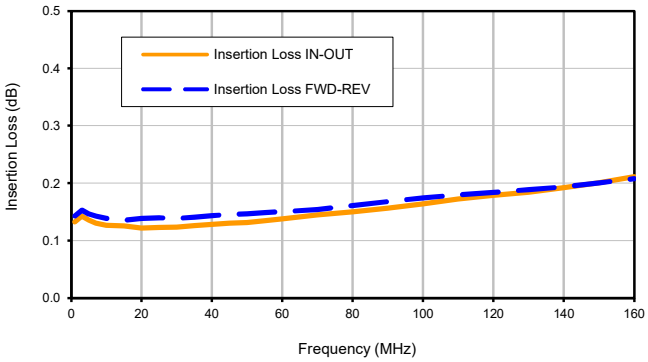
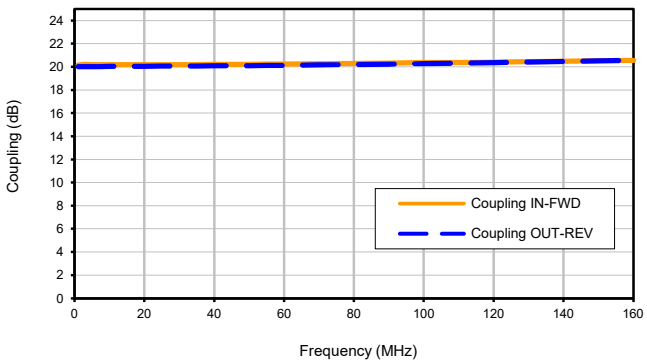
TYPICAL PERFORMANCE GRAPHS

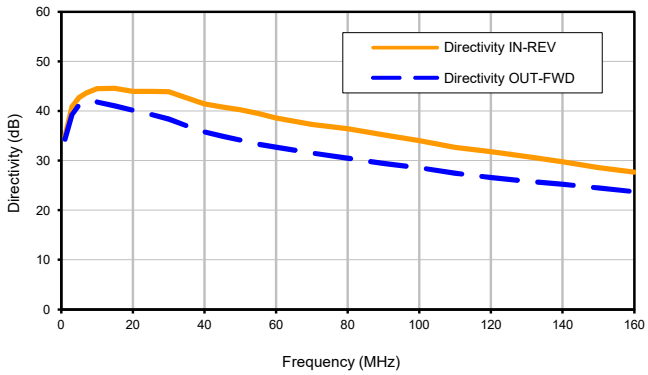
Insertion Loss



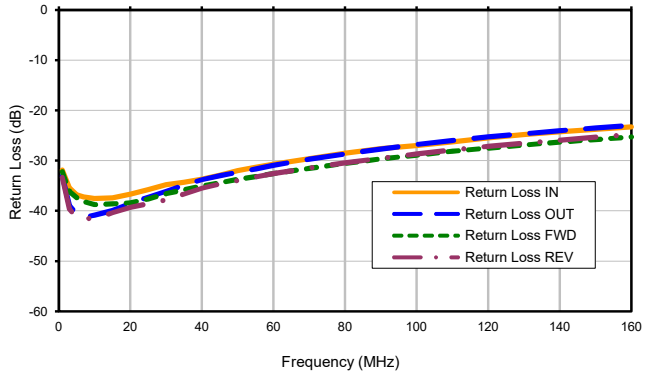
Coupling



Directivity



Return Loss



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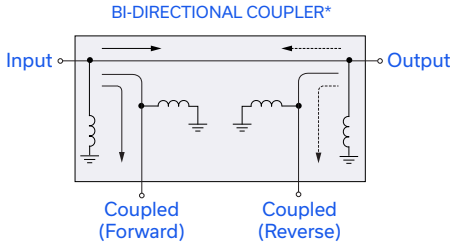

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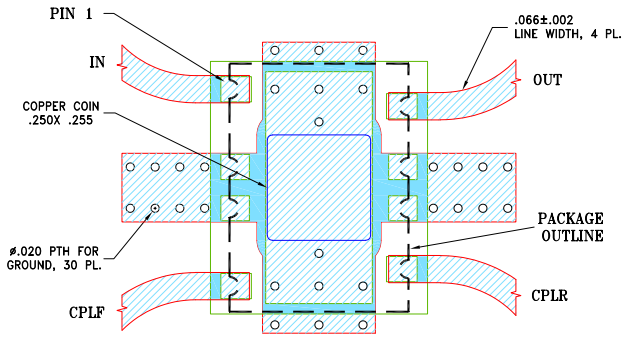
Figure 1. SYDC-20-12UHP+ Functional Diagram

PAD DESCRIPTION/CONFIGURATION

Function	Pad Number	Description
Input	1	Connects to RF Input Port
Output	8	Connects to RF Output Port
Coupled Forward	4	Connects to Coupled Forward Port
Coupled Reverse	5	Connects to Coupled Reverse Port
Ground	2,3,6,7	Connects to Ground

SUGGESTED PCB LAYOUT (PL-843)



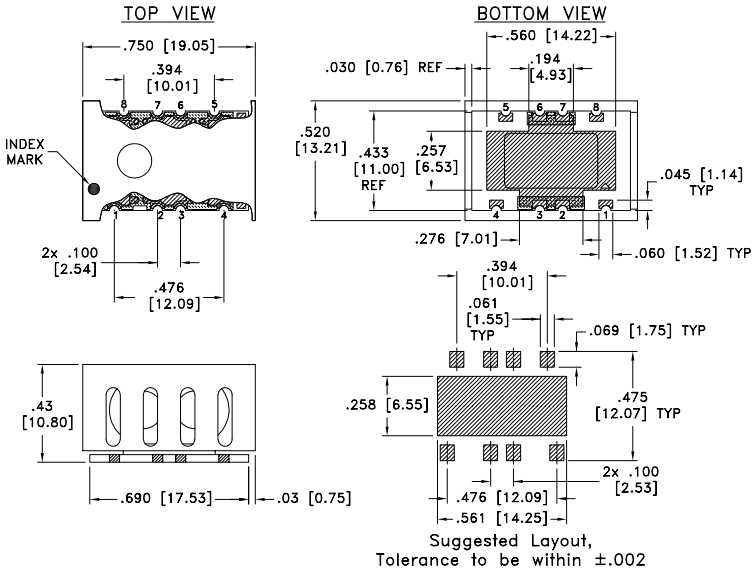
NOTES:
1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030±.002; COPPER: 1/2 OZ. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Figure 2. Suggested PCB Layout PL-843

CASE STYLE DRAWING



Weight: 2.6 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.01; 3 Pl.±.005 Inches

PRODUCT MARKING*: N/A

*Marking may contain other features or characters for internal lot control.

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (SXP Files) Data Set (.zip file) De-embedded to device pads
Case Style	PD1647-6 Lead Finish: ENIG
RoHS Status	Compliant
Tape and Reel	F115
Suggested Layout for PCB Design	PL-843
Evaluation Board	TB-SYDC2012UHP+
	Gerber File
Environmental Rating	ENV02T1

NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

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