

6dB DC Pass

# High Power Bi-Directional Coupler ZGBDC6-521-N+

50Ω Up to 60W 130 to 520 MHz

## The Big Deal

- High Power Handling: 60W
- Low Insertion Loss: 0.2 dB typ.\*



CASE STYLE: HT3025-1

## Product Overview

The Mini-Circuits ZGBDC6-521-N+ broadband high power bi-directional coupler offers excellent performance across a wide range of popular frequency bands. The ZGBDC6-521-N+ can pass up to 1A of DC current from input to output and handle up to 60W CW. The rugged construction makes this coupler ideal for use in field applications or remote monitoring sites; It is also ideal for high power lab testing.

## Key Features

Feature	Advantages
Excellent Insertion Loss , 0.2 dB Typ*	With extremely low insertion loss, this coupler is ideal for critical high power applications.
Ultra High Return Loss, 28 dB Typ	Outstanding Return loss makes this coupler ideal for sensitive power measurement and other signal distribution applications.
High Power Handling, 60W	Up to 60W CW power handling, combined with low insertion loss and excellent VSWR support operation in high power applications such as transmitters, base stations and high power device characterization.
Excellent Directivity and Coupling Flatness	Typical 28 dB directivity and $\pm 0.7$ dB of Coupling flatness provides accurate signal sampling of forward or reflected power.
Passes DC Current, 1A	Capable of passing 1A current, input to output; this coupler is suited for application using remote antenna control or other remote motorized requirements.

\*Does not include coupling loss

### 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.  
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# 6dB DC Pass High Power Bi-Directional Coupler

## ZGBDC6-521-N+

50Ω Up to 60W 130 to 520 MHz

### Maximum Ratings

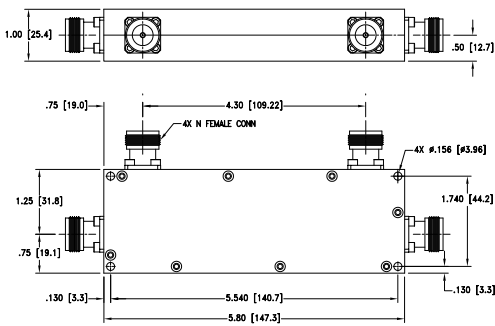
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	1A

Permanent damage may occur if any of these limits are exceeded

### Coaxial Connections

INPUT	IN
OUTPUT	OUT
COUPLED FORWARD	CPL FWD
COUPLED REVERSE	CPL REV

### Outline Drawing



Weight: 570 grams  
Dimensions are in inches [mm]

### Features

- good coupling flatness,  $\pm 0.7$  dB typ.
- high directivity, 28 dB typ.
- very good return loss, 28 dB typ.
- high power, up to 60W
- DC current pass through input to output

### Applications

- lab use
- defense
- VHF and UHF



Generic photo used for illustration purposes only

CASE STYLE: HT3025-1

Connectors	Model
N-Type	ZGBDC6-521-N+

### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

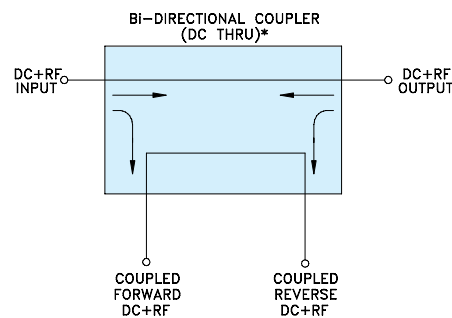
### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Operating Frequency		130		520	MHz
Coupling	130-520	—	6 $\pm$ 1.0	—	dB
Coupling Flatness ( $\pm$ )	130-520	—	$\pm 0.7$	$\pm 1.0$	dB
Mainline Loss <sup>1</sup>	130-520	—	0.2	0.6	dB
Directivity	130-520	18	28	—	dB
Return Loss (In & Out)	130-520	17.6	28	—	dB
Return Loss (Coupling)	130-520	17.6	29	—	dB
Input Power <sup>2</sup>	130-520	—	—	60	W

1. Does not include coupling loss.

2. At 25°C with no DC current. Derate linearly to 5W at 100°C.

### Electrical Schematic



\* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

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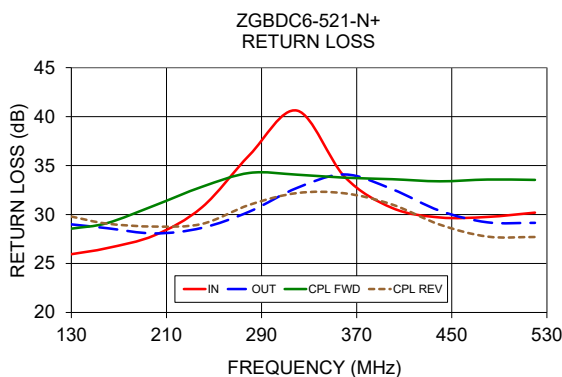
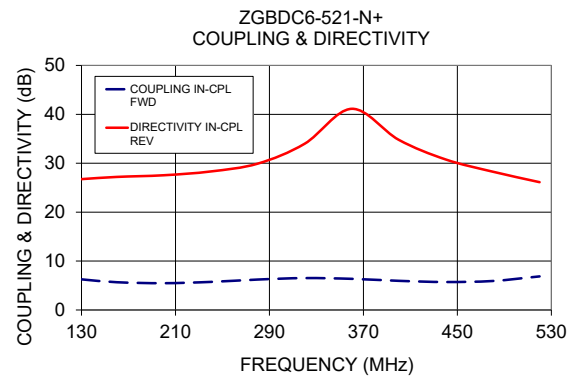
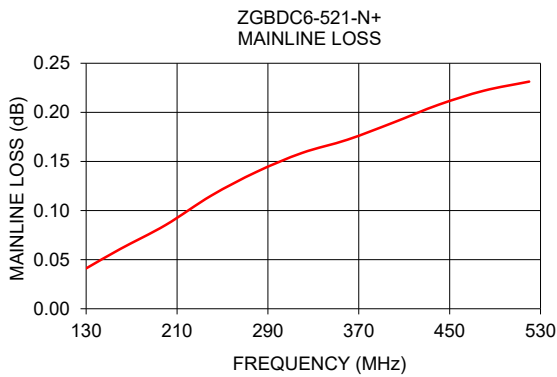
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ECO-006657  
ZGBDC6-521-N+  
CM/RS/CP  
210302  
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## Typical Performance Data

Frequency (MHz)	Mainline Loss <sup>1</sup> (dB) In-Out	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
		In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
130	0.04	6.25	6.21	29.75	26.75	25.95	28.99	28.55	29.79
160	0.06	5.66	5.65	30.02	27.20	26.57	28.60	29.12	29.07
200	0.09	5.47	5.49	30.51	27.54	27.88	28.07	30.92	28.77
240	0.12	5.73	5.79	30.76	28.32	30.75	28.64	32.84	29.04
280	0.14	6.21	6.33	30.87	29.91	36.10	30.31	34.25	31.00
320	0.16	6.51	6.68	30.63	33.99	40.61	32.72	34.07	32.19
360	0.17	6.36	6.53	29.83	41.13	33.84	34.09	33.76	32.16
400	0.19	5.95	6.09	28.91	34.80	30.66	32.58	33.60	31.01
440	0.21	5.71	5.82	28.06	30.77	29.70	30.38	33.39	28.96
480	0.22	5.92	6.02	27.52	28.28	29.75	29.20	33.57	27.74
520	0.23	6.86	6.95	26.36	26.12	30.19	29.15	33.53	27.70

1. Does not include coupling loss.



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# Bi-Directional Coupler

# ZGBDC6-521-N+

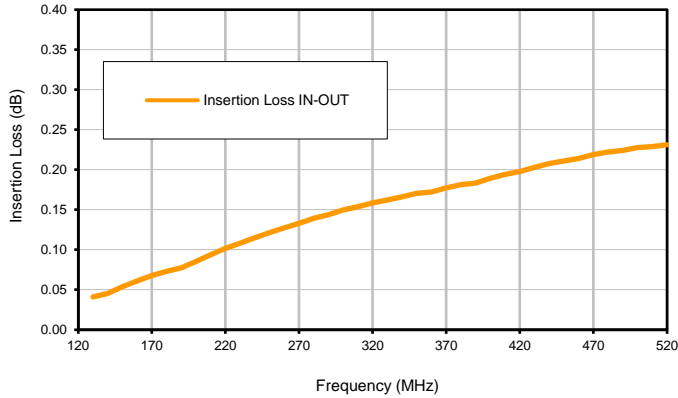
## Typical Performance Data

FREQ. (MHz)	INSERTION LOSS <sup>(1)</sup>	COUPLING		DIRECTIVITY		RETURN LOSS			
	(dB)	(dB)		(dB)		(dB)			
	IN-OUT	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
130	0.04	6.25	6.21	26.75	29.75	25.95	28.99	28.55	29.79
140	0.05	6.00	5.97	26.83	29.81	26.03	28.87	28.65	29.56
150	0.05	5.81	5.79	27.01	29.92	26.28	28.74	28.85	29.27
160	0.06	5.66	5.65	27.20	30.02	26.57	28.60	29.12	29.07
170	0.07	5.56	5.55	27.34	30.10	26.85	28.41	29.49	28.98
180	0.07	5.50	5.50	27.45	30.31	27.15	28.25	29.93	28.91
190	0.08	5.47	5.47	27.41	30.42	27.42	28.11	30.42	28.82
200	0.09	5.47	5.49	27.54	30.51	27.88	28.07	30.92	28.77
210	0.09	5.50	5.53	27.62	30.62	28.41	28.07	31.39	28.75
220	0.10	5.55	5.59	27.80	30.69	29.05	28.16	31.88	28.77
230	0.11	5.63	5.68	27.99	30.75	29.78	28.35	32.40	28.83
240	0.12	5.73	5.79	28.32	30.76	30.75	28.64	32.84	29.04
250	0.12	5.84	5.92	28.51	30.77	31.75	29.00	33.19	29.36
260	0.13	5.97	6.05	28.89	30.84	33.04	29.39	33.61	29.83
270	0.13	6.09	6.19	29.31	30.86	34.39	29.79	34.03	30.39
280	0.14	6.21	6.33	29.91	30.87	36.10	30.31	34.25	31.00
290	0.14	6.32	6.45	30.57	30.91	37.95	30.83	34.33	31.53
300	0.15	6.41	6.56	31.42	30.89	39.89	31.38	34.32	31.89
310	0.15	6.48	6.63	32.46	30.79	41.08	32.05	34.28	32.15
320	0.16	6.51	6.68	33.99	30.63	40.61	32.72	34.07	32.19
330	0.16	6.52	6.69	35.71	30.47	38.74	33.30	33.95	32.21
340	0.17	6.49	6.67	37.86	30.20	36.94	33.71	33.87	32.20
350	0.17	6.44	6.61	40.26	30.04	35.18	34.11	33.78	32.19
360	0.17	6.36	6.53	41.13	29.83	33.84	34.09	33.76	32.16
370	0.18	6.26	6.43	40.16	29.58	32.75	33.88	33.73	32.04
380	0.18	6.16	6.31	38.12	29.42	31.87	33.47	33.74	31.81
390	0.18	6.05	6.20	36.28	29.21	31.19	33.12	33.70	31.47
400	0.19	5.95	6.09	34.80	28.91	30.66	32.58	33.60	31.01
410	0.19	5.86	5.99	33.60	28.64	30.24	32.07	33.57	30.44
420	0.20	5.79	5.91	32.51	28.44	29.97	31.44	33.47	29.92
430	0.20	5.74	5.86	31.64	28.25	29.78	30.91	33.45	29.38
440	0.21	5.71	5.82	30.77	28.06	29.70	30.38	33.39	28.96
450	0.21	5.71	5.82	30.08	27.96	29.67	29.97	33.42	28.55
460	0.21	5.74	5.84	29.47	27.83	29.70	29.61	33.39	28.22
470	0.22	5.81	5.91	28.86	27.69	29.73	29.34	33.46	27.97
480	0.22	5.92	6.02	28.28	27.52	29.75	29.20	33.57	27.74
490	0.22	6.07	6.17	27.76	27.31	29.91	29.07	33.48	27.60
500	0.23	6.27	6.37	27.26	27.08	29.98	29.03	33.55	27.52
510	0.23	6.53	6.63	26.69	26.78	30.08	29.05	33.53	27.54
520	0.23	6.86	6.95	26.12	26.36	30.19	29.15	33.53	27.70

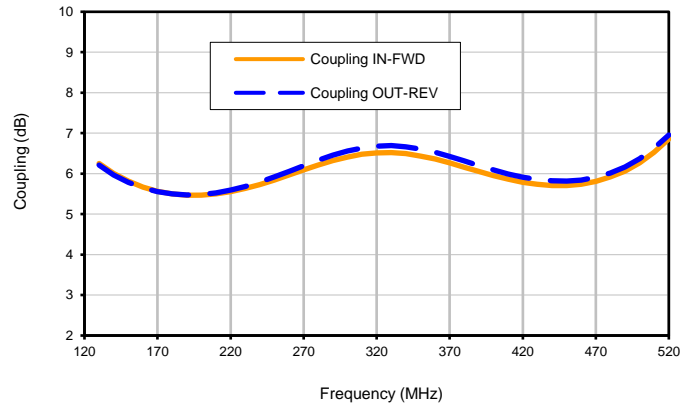
<sup>(1)</sup> Does not include coupling loss

## Typical Performance Curves

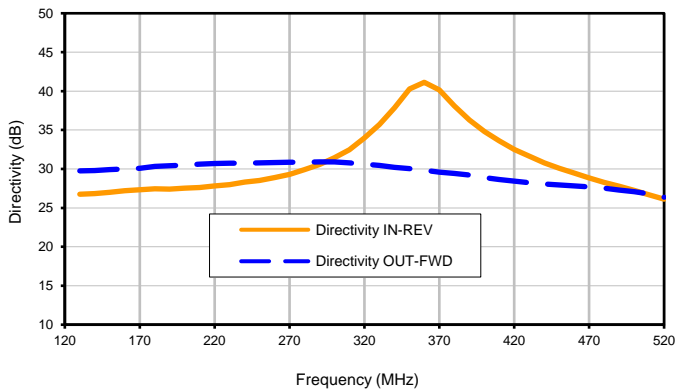
### Insertion Loss



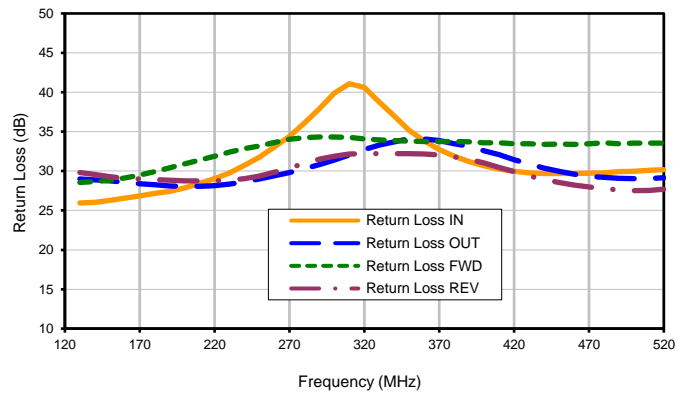
### Coupling



### Directivity



### Return Loss

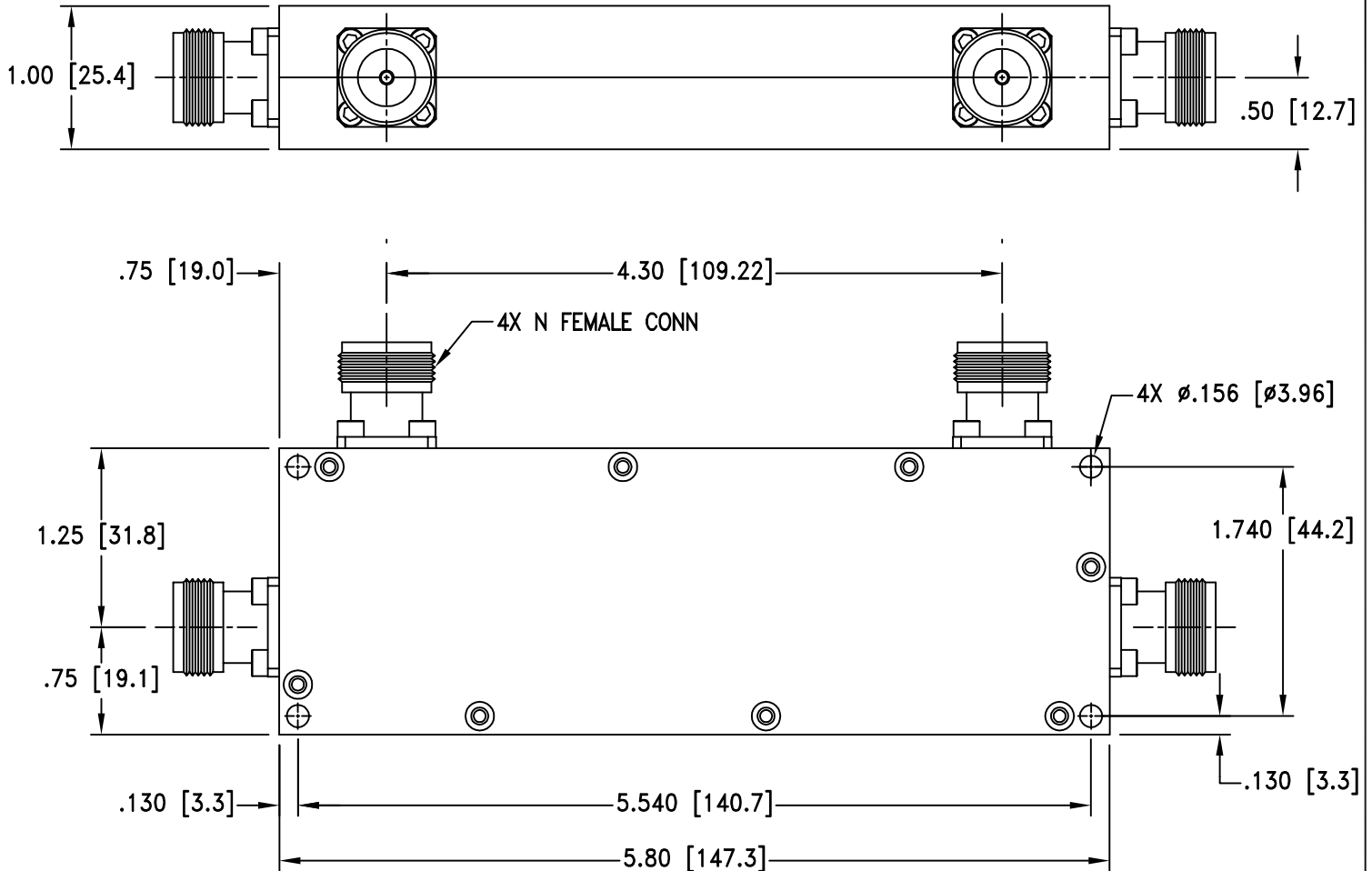


# Case Style

# HT

## Outline Dimensions

### HT3025-1



Weight: 570 grams;

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

#### Notes:

1. Case material: Aluminum Alloy 6061
2. Case Finish: Clear Alodine

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RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to +85 °C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C