Coaxial

Bi-Directional Coupler ZFBDC16-63HP+

50Ω Up to 75W 700 to 6000 MHz

The Big Deal

- Wideband, 700 to 6000 MHz
- High power handling, up to 75W
- Low mainline loss, 0.55 dB
- High directivity, 25 dB
- Excellent return loss, 20 dB typ.

CASE STYLE: JD1252

Product Overview

Mini-Circuits' ZFBDC16-63HP+ is a coaxial high-power, wideband bi-directional coupler supporting applications from 700 to 6000 MHz. This model is capable of handling up to 75W RF input power and provides high directivity, low mainline loss, and excellent return loss. The coupler comes housed in a rugged aluminum alloy case (2.00 x 2.00 x 0.88") with your choice of SMA or N-Type connectors.

Key Features

Feature	Advantages
Wideband, 700 to 6000 MHz	One device supports a broad range of applications.
Very high input power handling: • 75W, 700 to 2700 MHz • 50W, 2700 to 3500 MHz • 40W, 3500 to 6000 MHz	Produces nearly equal output signals, ideal for parallel path / multichannel systems.
Low mainline loss, 0.55 dB typ.	Provides excellent through-path signal power transmission.
Good directivity, 25 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Good return loss, 20 dB typ.	Well-matched for 50Ω systems with minimal signal reflection.

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

Coaxial
Bi-Directional Coupler

ZFBDC16-63HP+

50Ω Up to 75W 700 to 6000 MHz

Generic photo used for illustration purposes only
SMA version shown
CASE STYLE: JD1252

Connectors	Model
N-Type	ZFBDC16-63HP-N+
SMA	ZFBDC16-63HP-S+

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

Maximum Ratings

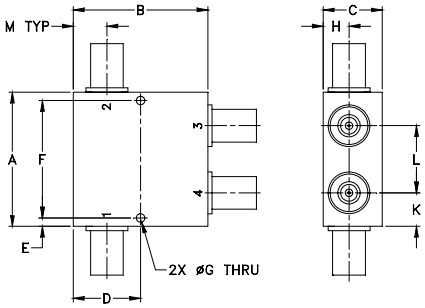
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C

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

Coaxial Connections

INPUT	1
OUTPUT	2
COUPLED (forward)	4
COUPLED (reverse)	3

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
2.00	2.00	.88	1.000	0.13	1.750	0.125
50.80	50.80	22.35	25.40	3.30	44.45	3.18

H	J	K	L	M	wt
0.38	--	0.50	1.00	0.50	grams
9.65	--	12.70	25.40	12.70	250.0

Features

- excellent mainline loss, 0.55 dB typ.
- excellent directivity, 25 dB typ.
- high power, up to 75W
- rugged shielded case

Applications

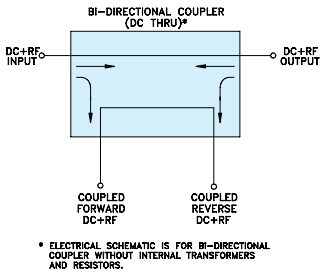
- power leveling & monitoring
- military mobile
- cellular
- WiMax
- PCN
- GSM
- WIFI

Electrical Specifications at 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		700		6000	
Mainline Loss[1]	700 - 3500	—	0.4	0.7	dB
	3500 - 6000	—	0.6	0.9	
Coupling	700 - 1000	—	26.6±1.8	—	dB
	1000 - 1700	—	23±2.4	—	
	1700 - 2000	—	20.5±1	—	
	2000 - 2700	—	19±1.4	—	
	2700 - 3500	—	17.5±1	—	
	3500 - 6000	—	16.5±0.8	—	
Coupling Flatness(±)	1700 - 2000	—	0.6	0.9	dB
	2700 - 3500	—	0.6	1.0	
	3500 - 6000	—	0.5	0.9	
Directivity	700 - 2000	20	25	—	dB
	2000 - 3500	18	23	—	
	3500 - 4200	15	22	—	
	4200 - 6000	11	18	—	
Return Loss (Input)	700 - 3500	19	25	—	dB
	3500 - 6000	14	20	—	
Return Loss (Output)	700 - 3500	19	25	—	dB
	3500 - 6000	14	20	—	
Return Loss (Coupling)	700 - 3500	17	25	—	dB
	3500 - 6000	12	18	—	
Input Power	700 - 2700	—	—	75	W
	2700 - 3500	—	—	50	
	3500 - 6000	—	—	40	

1. Mainline loss includes theoretical power loss at coupled

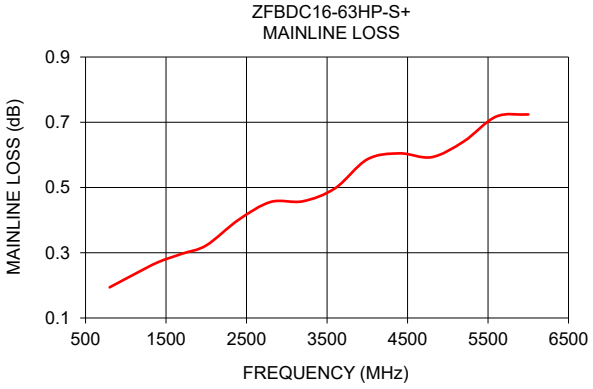
Electrical Schematic

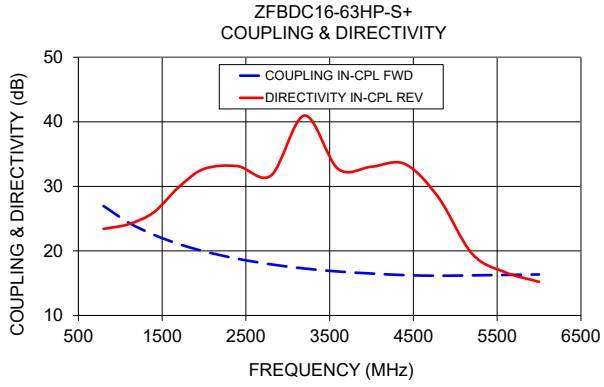


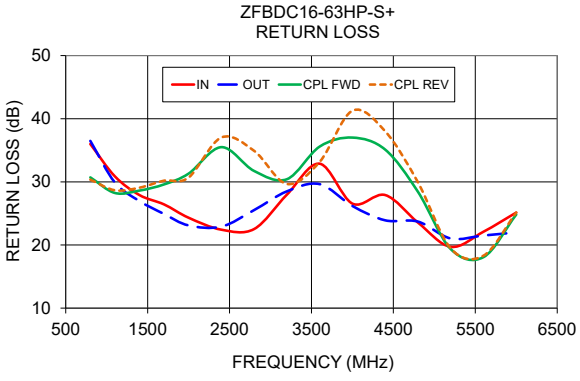
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
700.0	0.18	28.06	28.07	23.61	23.37	39.26	41.15	30.78	31.66
800.0	0.19	26.96	26.97	23.89	23.41	35.99	36.49	30.71	30.35
1100.0	0.23	24.37	24.39	24.76	24.14	30.87	29.89	28.24	28.67
1400.0	0.27	22.50	22.52	27.32	25.98	27.91	26.97	28.62	29.08
1700.0	0.30	21.07	21.10	31.35	29.90	26.43	24.92	29.60	30.19
2000.0	0.32	19.93	19.98	32.08	32.71	24.32	23.10	31.31	30.68
2400.0	0.40	18.78	18.83	30.36	33.13	22.42	22.91	35.50	37.03
2700.0	0.46	17.92	17.96	30.79	31.68	22.53	25.53	31.72	34.91
3200.0	0.46	17.27	17.30	25.75	40.97	27.98	28.50	30.42	29.66
3600.0	0.50	16.81	16.82	25.61	32.71	32.88	29.64	35.58	33.16
4000.0	0.59	16.50	16.48	28.21	33.04	26.55	26.18	37.01	41.27
4400.0	0.60	16.25	16.25	24.15	33.46	27.91	23.91	35.11	38.00
4700.0	0.59	16.16	16.14	27.38	28.26	23.55	23.71	28.43	29.92
5200.0	0.64	16.22	16.17	21.83	19.57	19.71	21.03	19.36	19.46
5600.0	0.72	16.28	16.22	17.64	16.67	22.10	21.50	18.08	18.31
6000.0	0.72	16.35	16.32	17.58	15.21	25.13	21.99	24.82	25.14







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

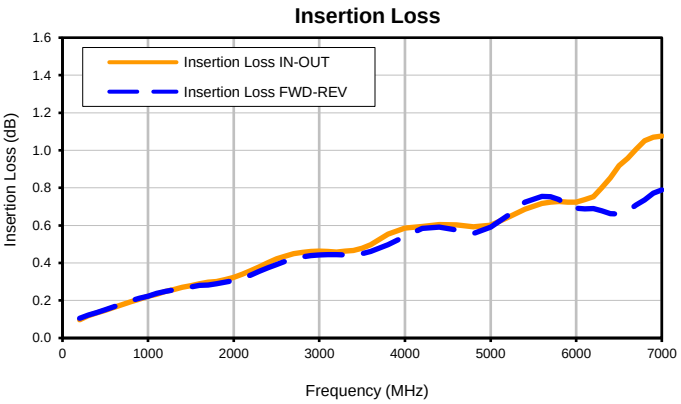
Bi-Directional Coupler ZFBDC16-63HP+

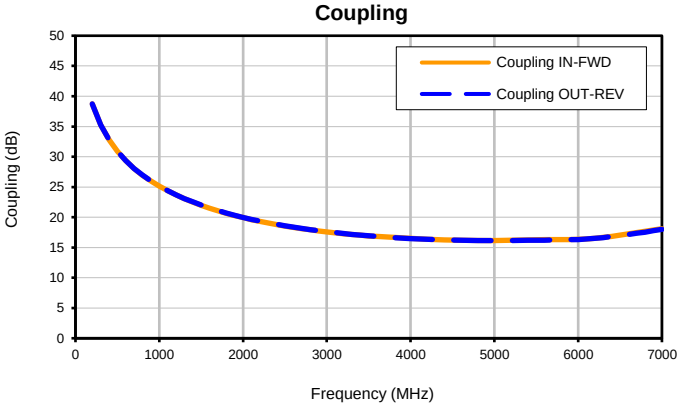
Typical Performance Data

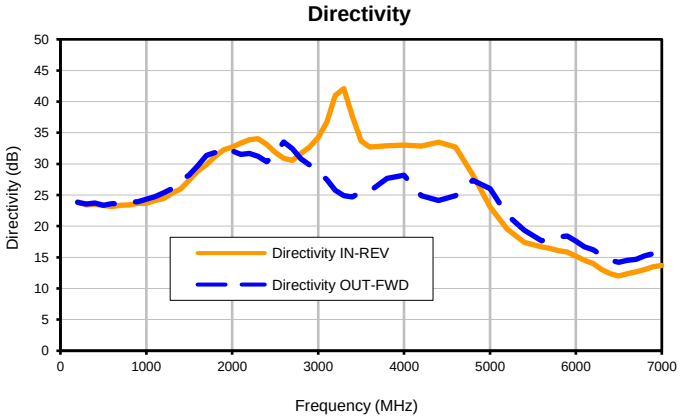
FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
200	0.10	0.11	38.74	38.73	23.91	23.82	42.59	42.04	49.15	45.40
300	0.12	0.12	35.24	35.26	23.42	23.54	43.08	40.92	40.08	42.21
400	0.13	0.14	32.79	32.79	23.53	23.72	43.58	43.03	39.83	37.67
500	0.15	0.15	30.89	30.90	23.31	23.38	53.26	46.98	34.52	35.40
600	0.16	0.17	29.35	29.36	23.16	23.64	47.93	51.70	34.09	33.33
700	0.18	0.18	28.06	28.07	23.37	23.61	39.26	41.15	30.71	31.61
800	0.19	0.20	26.96	26.97	23.41	23.89	35.99	36.49	30.71	30.35
900	0.21	0.21	25.99	26.00	23.68	23.94	33.31	33.42	28.80	29.37
1000	0.22	0.22	25.13	25.15	23.64	24.35	31.80	31.50	28.96	28.78
1100	0.23	0.24	24.37	24.39	24.14	24.76	30.87	29.89	28.24	28.67
1200	0.25	0.25	23.68	23.71	24.42	25.35	29.68	28.90	28.74	28.83
1300	0.26	0.26	23.07	23.08	25.29	26.04	29.16	27.78	28.08	28.80
1400	0.27	0.27	22.50	22.52	25.98	27.32	27.91	26.97	28.62	29.08
1500	0.28	0.27	21.98	22.00	27.42	28.22	27.66	26.21	28.54	29.17
1600	0.29	0.28	21.50	21.53	28.84	29.72	26.99	25.51	29.18	29.44
1700	0.30	0.28	21.07	21.10	29.90	31.35	26.43	24.92	29.60	30.19
1800	0.30	0.29	20.66	20.70	31.19	31.83	25.86	24.37	29.92	30.15
1900	0.31	0.30	20.28	20.32	32.27	31.27	24.94	23.68	30.05	30.20
2000	0.32	0.31	19.93	19.98	32.71	32.08	24.32	23.10	31.31	30.68
2100	0.34	0.32	19.61	19.65	33.31	31.52	23.81	22.64	32.50	32.26
2200	0.36	0.34	19.31	19.36	33.91	31.68	23.47	22.64	35.20	35.12
2300	0.38	0.36	19.04	19.08	34.04	31.20	23.06	22.81	35.12	37.31
2400	0.40	0.37	18.78	18.83	33.13	30.36	22.42	22.91	35.50	37.03
2500	0.42	0.39	18.55	18.58	31.85	31.69	21.93	23.04	35.15	42.27
2600	0.44	0.41	18.32	18.36	30.89	33.52	21.91	23.55	33.59	46.95
2700	0.45	0.42	18.11	18.16	30.54	32.47	21.79	24.49	33.43	39.28
2800	0.46	0.43	17.92	17.96	31.68	30.79	22.53	25.53	31.72	34.91
2900	0.46	0.44	17.74	17.78	32.72	29.85	23.16	26.74	32.13	34.15
3000	0.46	0.44	17.57	17.61	34.23	28.77	24.30	27.50	32.10	33.38
3100	0.46	0.44	17.42	17.45	36.70	27.48	25.84	27.79	31.47	30.81
3200	0.46	0.44	17.27	17.30	40.97	25.75	27.98	28.50	30.42	29.66
3300	0.46	0.44	17.14	17.16	42.10	24.90	31.11	28.81	31.24	30.41
3400	0.47	0.45	17.02	17.04	37.60	24.69	33.95	29.17	32.12	31.34
3500	0.48	0.45	16.91	16.93	33.66	25.59	34.71	29.84	34.92	32.55
3600	0.50	0.46	16.81	16.82	32.71	25.61	32.88	29.64	35.58	33.16
3800	0.55	0.50	16.66	16.64	32.89	27.69	29.29	28.65	38.06	36.78
4000	0.59	0.54	16.50	16.48	33.04	28.21	26.55	26.18	37.01	41.27
4200	0.59	0.58	16.35	16.36	32.86	24.89	26.85	24.96	33.67	35.99
4400	0.60	0.59	16.25	16.25	33.46	24.15	27.91	23.91	35.11	38.00
4600	0.60	0.58	16.19	16.19	32.69	24.90	25.69	23.17	33.60	38.04
4800	0.59	0.56	16.16	16.14	28.26	27.38	23.55	23.71	28.43	29.92
5000	0.60	0.59	16.17	16.14	23.11	26.04	21.14	22.38	22.60	22.39
5200	0.64	0.65	16.22	16.17	19.57	21.83	19.71	21.03	19.36	19.46
5400	0.69	0.72	16.26	16.20	17.39	19.36	20.26	20.63	18.13	18.13
5600	0.72	0.75	16.28	16.22	16.67	17.64	22.10	21.50	18.08	18.31
5700	0.72	0.75	16.29	16.23	16.41	18.16	24.58	22.78	18.57	19.12
5800	0.73	0.74	16.29	16.26	16.08	18.28	31.36	23.40	19.98	20.08
5900	0.72	0.69	16.31	16.28	15.83	18.44	38.51	23.96	23.32	22.84
6000	0.72	0.69	16.35	16.32	15.21	17.58	25.13	21.99	24.82	25.14
6100	0.74	0.69	16.42	16.40	14.54	16.67	20.45	19.04	28.25	29.21
6200	0.75	0.69	16.54	16.50	14.03	16.24	17.74	17.22	32.71	44.66
6300	0.80	0.68	16.68	16.65	13.03	15.33	15.12	15.14	31.48	33.49
6400	0.85	0.66	16.85	16.82	12.35	14.51	13.63	13.77	26.29	27.02
6500	0.92	0.66	17.05	17.01	12.01	14.20	12.70	13.01	23.62	23.97
6600	0.96	0.68	17.24	17.18	12.34	14.50	12.36	12.61	22.16	22.45
6700	1.01	0.71	17.46	17.35	12.69	14.69	12.04	12.21	20.32	21.04
6800	1.05	0.74	17.67	17.54	13.04	15.26	11.74	12.09	19.71	20.26
6900	1.07	0.77	17.88	17.78	13.47	15.59	12.09	12.23	19.24	20.04
7000	1.08	0.79	18.10	18.02	13.71	15.48	12.48	12.29	18.66	18.94

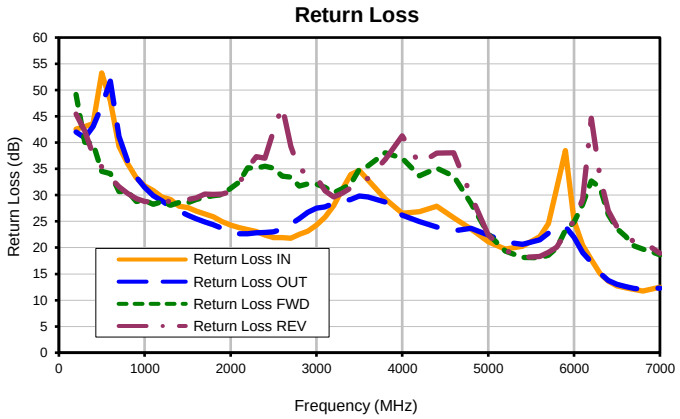
Bi-Directional Coupler ZFBDC16-63HP+

Typical Performance Curves





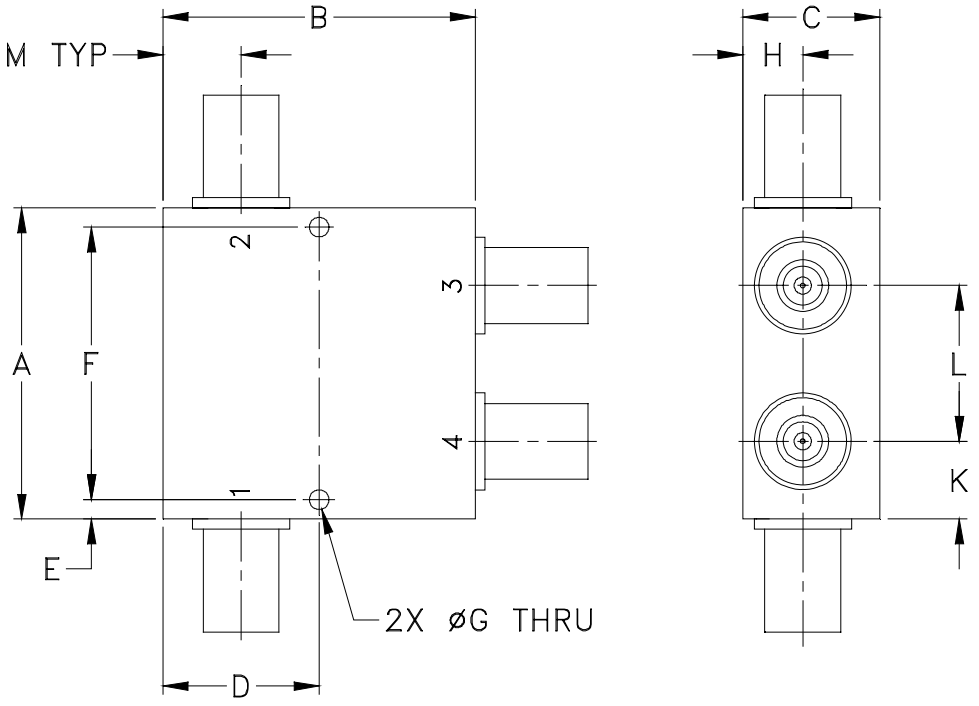




Case Style JD

JD1252

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT, GRAM
JD1252	2.00 (50.80)	2.00 (50.80)	0.88 (22.35)	1.000 (25.40)	0.13 (3.18)	1.750 (44.45)	0.125 (3.18)	0.38 (9.65)	-- --	0.50 (12.70)	1.00 (25.40)	0.50 (12.70)	250.00

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

This document and its contents are the property of Mini-Circuits

Mini-Circuits

Environmental Specifications ENV28

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 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I

This document and its contents are the property of Mini-Circuits.