X2 Frequency Multiplier

50Ω Output 10 to 1000 MHz

FD-2+

Generic photo used for illustration purposes only

CASE STYLE: FF55

Connectors	Model
BNC	FD-2+

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Input Power*	200mW

* Input is at Male BNC
Permanent damage may occur if any of these limits are exceeded.

Features

- wideband, 10 to 1000 MHz
- low conversion loss, 13.5 dB typ.
- rugged shielded case

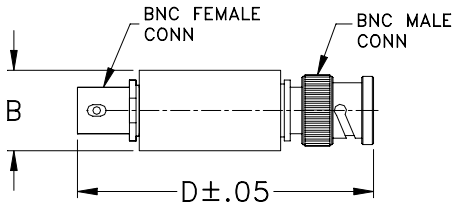
Applications

- synthesizers
- local oscillators

+RoHS Compliant

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

Outline Drawing



Outline Dimensions (inch/mm)

B	D	wt
.57	2.59	grams
14.47	65.79	40.0

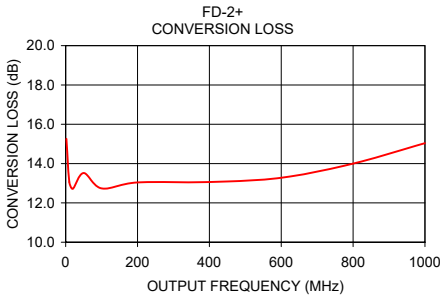
Electrical Specifications

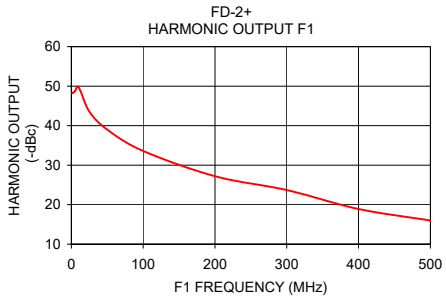
MULTIPLICATION FACTOR	FREQUENCY (MHz) F1 Input	FREQUENCY (MHz) F2 Output	INPUT POWER (dBm) Min.	INPUT POWER (dBm) Max.	CONVERSION LOSS (dB) Typ.	CONVERSION LOSS (dB) Max.	*HARMONIC OUTPUT (dBc) F1 Typ.	F1 Min.	F3 Typ.	F3 Min.	F4 Typ.	F4 Min.
2	5-100	10-200	1	15	13.0	16.0	40	30	50	40	16	12
	100-300	200-600	1	15	13.5	15.5	25	20	40	30	16	12
	300-500	600-1000	1	15	14.0	16.5	20	15	30	25	16	12

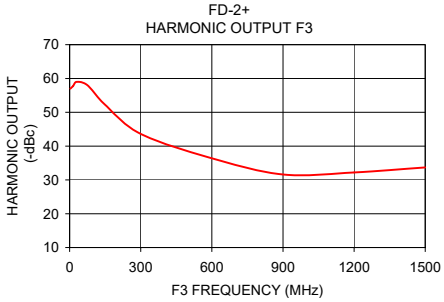
* Harmonics of input frequency below the power level of F2

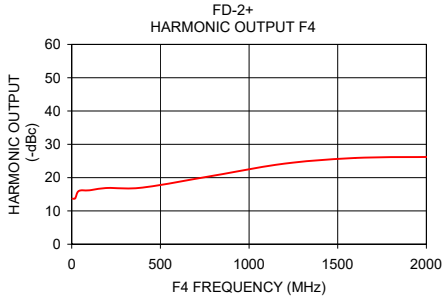
Typical Performance Data

Input Frequency (MHz)	Conversion Loss (dB) F2	Harmonic Output (-dBc) F1	F3	F4
1.00	15.26	48.20	57.00	13.70
5.00	13.06	48.70	57.80	13.80
10.00	12.72	49.80	59.00	16.00
25.00	13.52	43.60	58.00	16.20
50.00	12.74	39.00	52.20	16.90
100.00	13.04	33.60	43.60	17.00
200.00	13.06	27.20	36.40	20.60
300.00	13.28	23.70	31.60	24.20
400.00	14.00	18.90	32.20	25.90
500.00	15.04	16.00	33.70	26.20









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

Frequency Multiplier (Doubler) FD-2+

Typical Performance Data

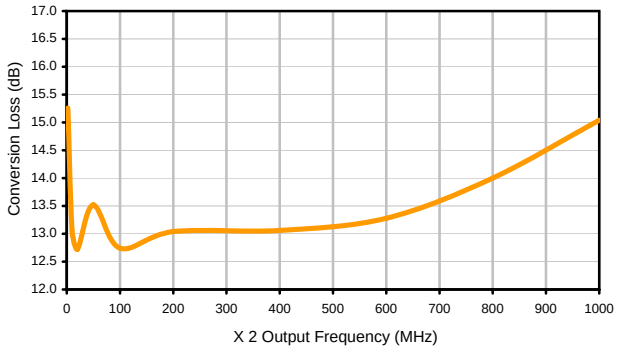
FREQUENCY (MHz)				CONVERSION LOSS (dB)	HARMONIC OUTPUT* (-dBc)		
X 1 OUTPUT	X 2 OUTPUT	X 3 OUTPUT	X 4 OUTPUT	X 2 OUTPUT	X 1 OUTPUT	X 3 OUTPUT	X 4 OUTPUT
1	2	3	4	15.26	48.20	57.00	13.70
5	10	15	20	13.06	48.70	57.80	13.80
10	20	30	40	12.72	49.80	59.00	16.00
25	50	75	100	13.52	43.60	58.00	16.20
50	100	150	200	12.74	39.00	52.20	16.90
100	200	300	400	13.04	33.60	43.60	17.00
200	400	600	800	13.06	27.20	36.40	20.60
300	600	900	1200	13.28	23.70	31.60	24.20
400	800	1200	1600	14.00	18.90	32.20	25.90
500	1000	1500	2000	15.04	16.00	33.70	26.20

*Harmonic Output below power level of X 2 Output .

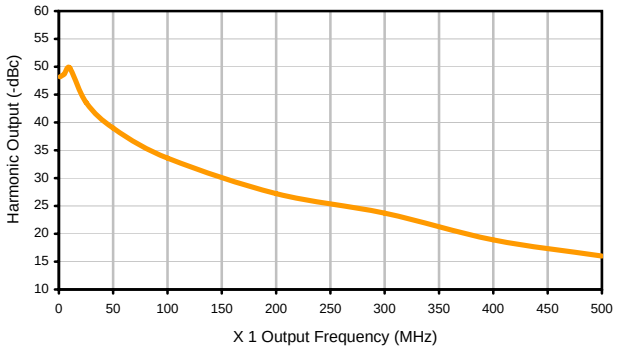
Frequency Multiplier (Doubler) FD-2+

Typical Performance Curves

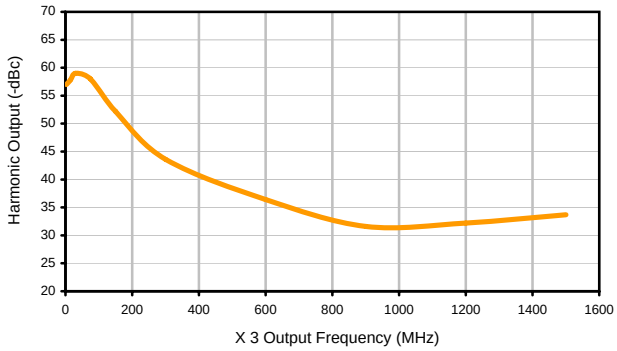
Conversion Loss X 2 Output



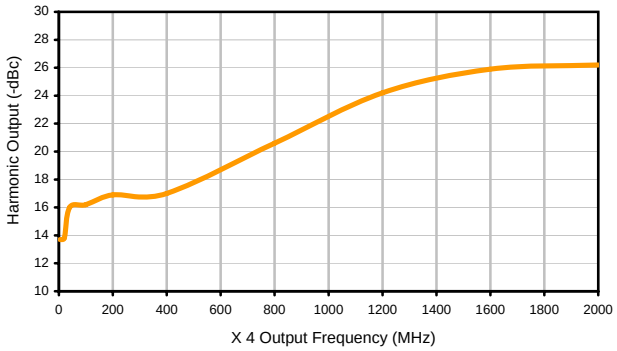
Harmonic X 1 Output



Harmonic X 3 Output



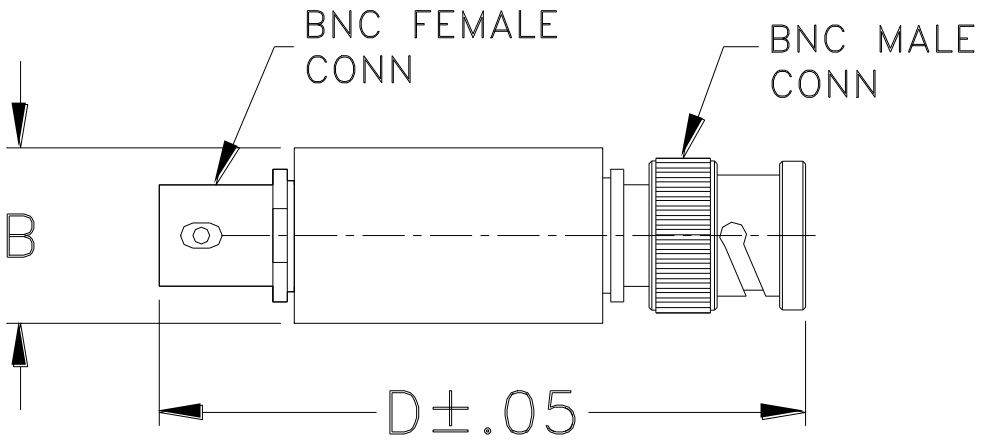
Harmonic X 4 Output



Case Style FF

FF55

Outline Dimensions



CASE #.	A	B	C	D	E	WT GRAMS
FF55	-- --	.57 (14.47)	-- --	2.59 (65.79)	-- --	40.0

Dimensions are in inches (mm). Tolerances: 2Pl. +.03/-.04; 3Pl. ± .015

Note:

1. Case material: Stainless steel.

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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

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