

2209HTFF

2000 Triple-Band Ku-Band PLL LNB (0.9 dB)

Frequency: F: 10.70 - 11.80 GHz | 10.95 - 12.10 GHz |
11.70 - 12.75 GHz

L.O. Stability: +/- 25 kHz

Output Connector: F: 75 Ohm



REACH



KEY SPECIFICATIONS

Band	Ku-Band
Input Frequency Band 1	10.70 - 11.80 GHz
Input Frequency Band 2	10.95 - 12.10 GHz
Input Frequency Band 3	11.70 - 12.75 GHz
LO Frequency 1	9.75 GHz
LO Frequency 2	10.00 GHz
LO Frequency 3	10.75 GHz
LO Stability	±25 kHz
LO Type	PLL
Noise Figure Max	1.0 dB
Noise Figure Typ	0.9 dB
Number Of Onboard Los	Triple-Band
Output Frequency Band 1	950 - 2050 MHz
Output Frequency Band 2	950 - 2100 MHz
Output Frequency Band 3	950 - 2000 MHz
Tone Frequency	22 kHz ± 4 kHz

RF SPECIFICATIONS

Control Signal 1	13V / No Tone
Control Signal 2	13V / 22kHz Tone
Control Signal 3	18V / No Tone
Conversion Gain Max	65 dB
Conversion Gain Min	55 dB

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Conversion Gain Typ	60 dB
Gain Flatness (over Full Band)	≤ 6 dB p-p
Input VSWR	2.3 : 1 max.
Output P1db	+ 5 dBm min.
Output VSWR	2.2 : 1 max.
Phase Noise 0.1khz Offset Max	-65 dBc/Hz
Phase Noise 1khz Offset Max	-75 dBc/Hz
Phase Noise 10khz Offset Max	-80 dBc/Hz
Phase Noise 100khz Offset Max	-93 dBc/Hz

ELECTRICAL SPECIFICATIONS

Current Consumption	350 mA max
Power Requirements	+12 to +24V DC

INTERFACE SPECIFICATIONS

IF Connector	F-Connector
RF Input Connector	WR-75 waveguide grooved

ENVIRONMENTAL SPECIFICATIONS

Humidity	0 - 95%
IP Rating	IP 66
Temperature Operational	-40°C to +70°C
Temperature Storage	-50 to +80°C

PHYSICAL SPECIFICATIONS

Product Height	1.70 in
Product Length	4.46 in
Product Weight	0.255 kg
Product Width	1.72 in

LOGISTICS SPECIFICATIONS

HS Code	Country of Origin	Ex Works	ECCN Number	Unit Package
	Made in Canada	Richmond, BC, Canada	EAR99	135 x 68 x 48 mm 0.335 kg

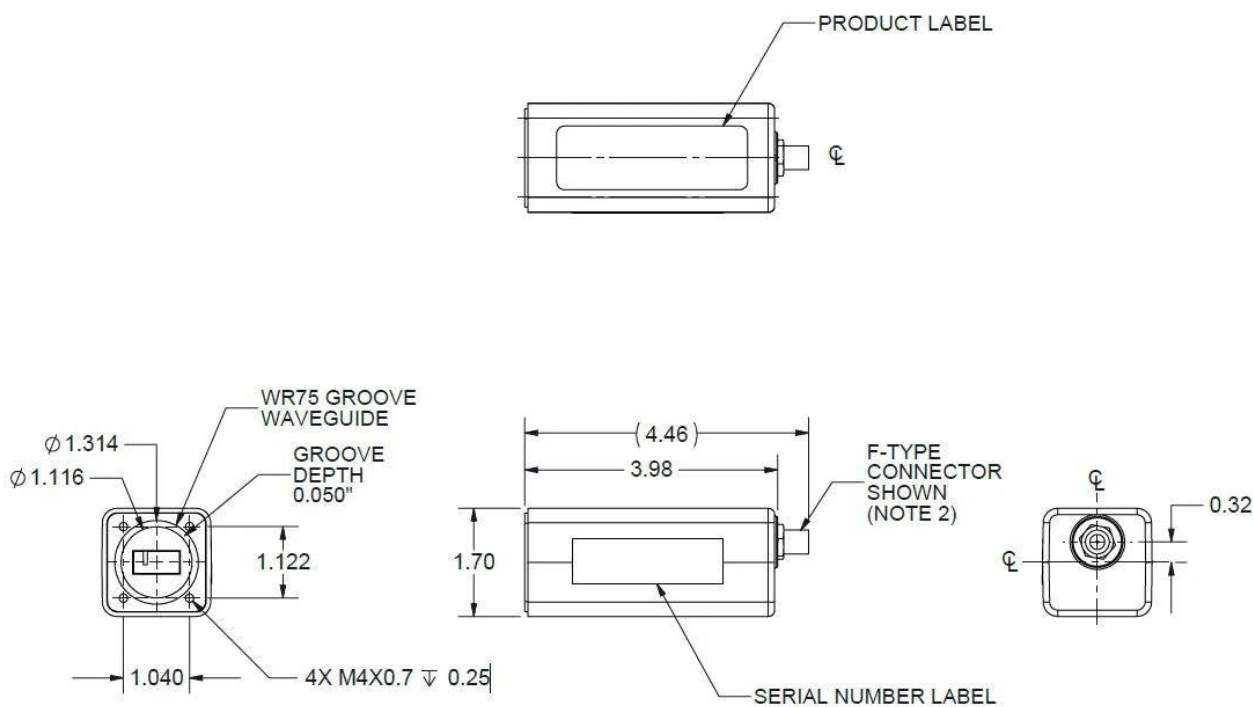
HOW TO ORDER



2108HSAF

LNB SERIES #	CONNECTOR	F: 75 Ohm N: 50 Ohm
	FREQUENCY	A / B / C / D / E / F / G (Please see next page for frequency bands)
	BAND	S: Single-Band D: Dual-Band T: Triple-Band U: Quad-Band
	REFERENCE	H: Internal Reference X: External Reference
	NOISE FIGURE	7: 0.7 dB 8: 0.8 dB 9: 0.9 dB
	L.O STABILITY	0: External Reference 1: ± 10 kHz 2: ± 25 kHz

MECHANICAL DIAGRAMS





FREQUENCY BANDS

Single Band				Dual Band						
Band	RF freq (GHz)	L.O freq (GHz)	Output freq	Band	RF freq (GHz)	L.O freq (GHz)	Output freq	Voltage/Tone		
A	11.7 - 12.20	10.75	950 - 1450 MHz	A	Band 1	10.95 - 11.70	10	950 - 1700 MHz		
B	12.25 - 12.75	11.3	950 - 1450 MHz		Band 2	11.70 - 12.75	10.75	950 - 2000 MHz		
C	10.95 - 11.70	10	950 - 1700 MHz	B	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz		
D	10.70-11.80	9.75	950 - 2050 MHz		Band 2	11.70 - 12.75	10.75	950 - 2000 MHz		
Triple Band				C	Band 1	10.95 - 11.70	10	950 - 1700 MHz		
Band	RF freq (GHz)	L.O freq (GHz)	Output freq		Voltage/Tone	Band 2	11.70 - 12.20	10.75	950 - 1450 MHz	
A	Band 1	10.95 - 11.70	10	950 - 1700 MHz	13 V	D	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz
	Band 2	11.70 - 12.20	10.75	950 - 1450 MHz	13 V / 22 kHz		Band 2	11.70 - 12.25	10.75	950 - 2000 MHz
B	Band 3	12.20 - 12.75	11.25	950 - 1500 MHz	18 V	E	Band 1	10.95 - 11.70	10	950 - 1700 MHz
	Band 1	10.95 - 11.70	10	950 - 1700 MHz	13 V		Band 2	11.70 - 12.25	10.75	950 - 1500 MHz
C	Band 2	11.70 - 12.25	10.75	950 - 1500 MHz	13 V / 22 kHz	F	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.70 - 11.70	9.75	950 - 1950 MHz
D	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	G	Band 2	11.70 - 12.20	10.75	950 - 1450 MHz
	Band 2	11.70 - 12.20	10.75	950 - 1450 MHz	13 V / 22 kHz		Band 3	12.20 - 12.75	11.25	950 - 1500 MHz
E	Band 3	12.20 - 12.75	11.25	950 - 1500 MHz	18 V	H	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 2	11.70 - 12.25	10.75	950 - 1500 MHz
F	Band 2	11.70 - 12.25	10.75	950-1500 MHz	13 V / 22 kHz	I	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950-1450 MHz	18 V		Band 1	10.70 - 10.95	9.75	950 - 1200 MHz
G	Band 1	10.95 - 11.70	10	950 - 1700 MHz	13 V	J	Band 2	10.95 - 11.70	10	950 - 1700 MHz
	Band 2	11.55 - 12.25	10.6	950 - 1650 MHz	13 V / 22 kHz		Band 3	11.70 - 12.25	10.75	950 - 1500 MHz
H	Band 3	12.20 - 12.70	11.25	950 - 1450 MHz	18 V	K	Band 4	12.25 - 12.75	11.3	950 - 1450 MHz
	Band 1	10.70 - 11.80	9.75	950 - 2050 MHz	13 V		Band 1	10.70 - 11.20	9.75	950 - 1450 MHz
I	Band 2	10.95 - 12.10	10	950 - 2100 MHz	13 V / 22 kHz	L	Band 2	11.20 - 11.70	10.25	950 - 1450 MHz
	Band 3	11.70 - 12.75	10.75	950 - 2000 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
J	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	M	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
K	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	N	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
L	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	O	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
M	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	P	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
N	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	Q	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
O	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	R	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
P	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	S	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
Q	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	T	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
R	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	U	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
S	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	V	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
T	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	W	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
U	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	X	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
V	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	Y	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
W	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	Z	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
X	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AA	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
Y	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AB	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
Z	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AC	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AA	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AD	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AB	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AE	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AC	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AF	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AD	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AG	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AE	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AH	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AF	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AI	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AG	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AJ	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AH	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AK	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AI	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AL	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AJ	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AM	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AK	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AN	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AL	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AO	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AM	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AP	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AN	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AQ	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AO	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AR	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AP	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AS	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AQ	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AT	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AR	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AU	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AS	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AV	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AT	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AW	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AU	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V	AX	Band 2	11.45 - 11.95	10.5	950 - 1450 MHz
	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V		Band 3	11.70 - 12.20	10.75	950 - 1450 MHz
AV	Band 2	11.70 - 12.70	10.75	950 - 1950 MHz	13 V / 22 kHz	AY	Band 4	12.20 - 12.75	11.25	950 - 1500 MHz
	Band 3	12.25 - 12.75	11.3	950 - 1450 MHz	18 V		Band 1	10.95 - 11.45	10	950 - 1450 MHz
AW	Band 1	10.70 - 11.70	9.75	950 - 1950 MHz	13 V	AZ	Band 2	11.45 - 11.95		