Coaxial

Low Noise Amplifier

ZKL-33ULN-S+

50Ω 0.4 to 3.0 GHz

CASE STYLE: BY493

The Big Deal

- Ultra Low Noise Figure, 0.36 dB typ. at 0.9 GHz
- High Dynamic Range
- Small connectorized package

Product Overview

The ZKL-33ULN-S+ (RoHS compliant) uses Mini-Circuits' E-PHEMT technology to offer very high gain with a combination of ultra low noise figure over a broad frequency range and high OIP3. Housed in a rugged shielded package with class 3A ESD rating and internal voltage regulator, this amplifier supports a wide variety of applications requiring moderate power output, low distortion and 50 ohm matched input/output ports.

Key Features

Feature	Advantages
Ultra Low Noise Figure, 0.36 dB at 0.9 GHz	Outstanding world class noise figure performance.
High OIP3 vs. DC power consumption +36 dBm typical at 0.9 GHz	Combination of Low Noise and High OIP3 make this model ideal for use in a Low Noise Receiver Front End (RFE)
Small Size, 1.38" x 1.5"	The small size and construction enable the ZKL-33ULN-S+ to be used in extremely compact connectorized applications.

Coaxial

Low Noise Amplifier

ZKL-33ULN-S+

50Ω 0.4 to 3.0 GHz

Features

- Low Noise Figure, 0.36 dB typ. at 0.9 GHz
- High OIP3, +36 dBm at 0.9 GHz typ.
- High Pout, P1dB, +18 dBm typ. at 0.9 GHz typ.
- High Gain, 35.0 dB at 0.9 GHz typ.

Applications

- Base station infrastructure
- Portable Wireless
- LTE
- GPS
- GSM
- Airborne radar

Generic photo used for illustration purposes only

CASE STYLE: BY493

Connectors	Model
SMA	ZKL-33ULN-S+

+RoHS Compliant

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

Electrical Specifications at 25°C and 5.0 V unless noted

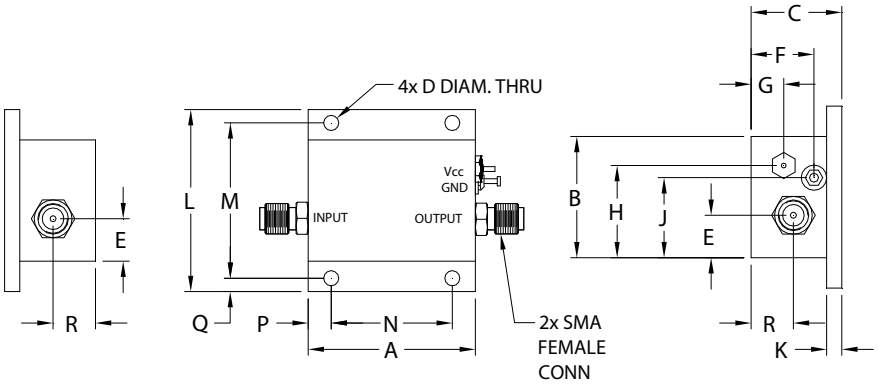
Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.4		3.0	GHz
Noise Figure	0.4		0.29	0.70	dB
	0.9		0.36		
	1.5		0.50		
	2.0		0.68		
	3.0		1.44		
Gain	0.4	33	47	37	dB
	0.9		35		
	1.5		27		
	2.0		22		
	3.0		15		
Output Power @ 1 dB compression	0.4	17	18.0		dBm
	0.9		18.0		
	1.5		18.0		
	2.0		18.0		
	3.0		13.5		
Output IP3	0.4	34	34		dBm
	0.9		36		
	1.5		37		
	2.0		38		
	3.0		36		
Input VSWR	0.4		1.28		:1
	0.9		1.25		
	1.5		1.41		
	2.0		1.33		
	3.0		1.34		
Output VSWR	0.4		1.65		:1
	0.9		1.29		
	1.5		1.12		
	2.0		1.05		
	3.0		1.25		
Active Directivity (Isolation-Gain)	0.4-3.0		8		dB
DC Supply Voltage		—	5.0	—	V
Supply Current		—	100	150	mA

Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C Case
Storage Temperature	-55°C to 100°C
DC Voltage	5.5 V
Input RF Power (no damage)	-10 dBm
Power Consumption	0.75 W

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

Outline Drawing



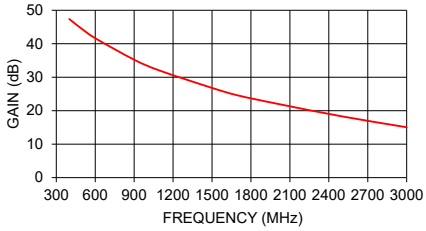
NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminal. See Application Note. AN-40-010.

Outline Dimensions (inch / mm)

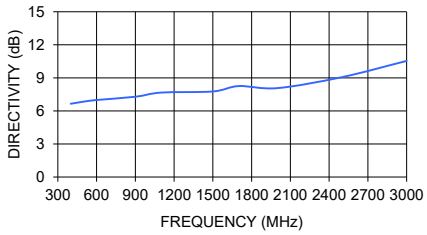
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	wt
1.38	1.00	.75	.125	.35	.52	.27	.76	.66	.125	1.50	1.281	1.000	.19	.11	.35	grams
35.05	25.40	19.05	3.18	8.89	13.21	6.86	19.30	16.76	3.18	38.10	32.54	25.40	4.83	2.79	8.89	40

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		POUT at 1dB COMPR. (dBm)	NOISE FIGURE (dB)	OUTPUT IP3 (dBm)
			IN	OUT			
400	47.4	6.7	1.28	1.65	18.5	0.3	33.9
500	44.4	6.8	1.19	1.54	18.6	0.3	34.1
600	41.6	7.0	1.17	1.46	18.7	0.3	34.7
900	35.2	7.3	1.25	1.29	18.3	0.4	36.0
1100	31.9	7.7	1.33	1.23	17.9	0.5	36.2
1500	26.8	7.8	1.41	1.12	17.9	0.5	36.8
1700	24.6	8.3	1.38	1.08	17.6	0.6	38.5
2000	22.1	8.1	1.35	1.05	18.0	0.7	37.6
2500	18.3	9.1	1.29	1.17	16.2	0.9	38.4
3000	15.0	10.5	1.34	1.25	13.4	1.4	36.1

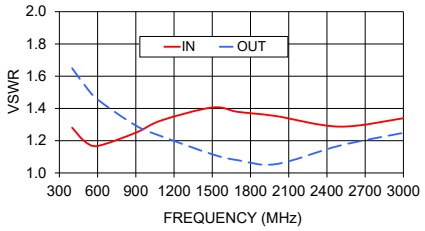
ZKL-33ULN-S+
GAIN



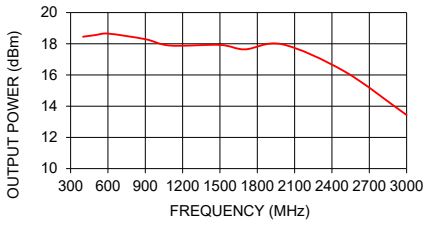
ZKL-33ULN-S+
DIRECTIVITY



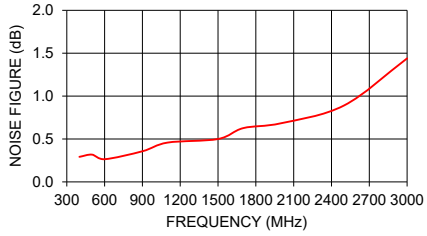
ZKL-33ULN-S+
VSWR



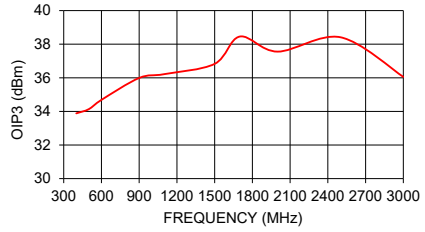
ZKL-33ULN-S+
OUTPUT POWER AT 1dB COMPRESSION



ZKL-33ULN-S+
NOISE FIGURE



ZKL-33ULN-S+
OIP3



Additional 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