Low Current, Wideband

Monolithic Amplifier

EHC-24L+

50Ω DC to 20 GHz

CASE STYLE: AF320

The Big Deal

- Super Wideband, DC to 20 GHz
- Excellent Gain Flatness(±1.1dB up to 10 GHz)
- Low Current, 19.1 mA

Product Overview

The EHC-24L+ is a low current, wideband gain block that operates up to 20 GHz fabricated using highly reliable HBT process. This Darlington pair amplifier delivers excellent gain flatness, good return loss, low current with acceptable P1dB and OIP3 across a wide bandwidth without the need of external matching network. It has highly repeatable performance from lot to lot and it is enclosed in a 4-lead ceramic package.

Key Features

Feature	Advantages
Super Wideband: DC to 20 GHz	General purpose wideband amplifier is suitable for various applications.
Low Current, 19.1mA	Low current consumption is ideal for use in amplifier chain.
Excellent gain flatness +/- 1.1dB up to 10GHz +/- 2.7dB up to 20GHz	As a desirable characteristic of a wideband amplifier, excellent gain flatness allows amplification of a signal without changing the waveform in time domain.
No external matching component required	EHC-24L+ provides typical input & output return loss of 15 dB up to 20 GHz without the need for any external matching components.

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DC-20 GHz

Product Features

- Super Wideband, DC to 20 GHz
- Low Current, 19.1mA
- Excellent Gain Flatness
  (±1.1dB up to 10 GHz)
  (±2.7dB up to 20 GHz)
- Good Input & Output Return Loss (>15 dB typ. up to 20 GHz)
- Repeatable performance (HBT Process)

Generic photo used for illustration purposes only

EHC-24L+

CASE STYLE: AF320

+RoHS Compliant

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

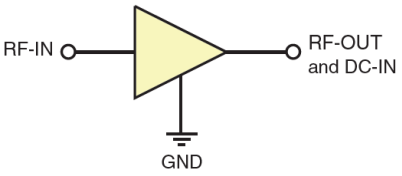
Typical Applications

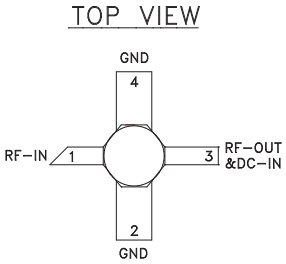
- Instrumentation
- Cable Infrastructure
- 5G

General Description

The EHC-24L+ is a low current, wideband gain block that operates up to 20 GHz fabricated using highly reliable HBT process. This Darlington pair amplifier delivers excellent gain flatness, good return loss, low current with acceptable P1dB and OIP3 across a wide bandwidth without the need of external matching network. It has highly repeatable performance from lot to lot and it is enclosed in a 4-lead ceramic package.

simplified schematic & pad description





Function	Pad Number	Description
RF-IN	1	RF input
RF-OUT & DC-IN	3	RF output and DC input
GND	2,4	Ground

Electrical Specifications at 25°C, Vs=5V, R=50Ω unless noted

Parameter	Condition (MHz)	Vs=5V[1]			Units
		Min.	Typ.	Max.	
Frequency range[5]		0.01		20	GHz
Gain	10	—	15.5	—	dB
	5000	—	14.1	—	
	8000	11.9	13.4	14.7	
	12000	—	12.8	—	
	15000	—	12.5	—	
	20000	—	10.2	—	
Input return loss	10		18		dB
	5000		14		
	8000		15		
	12000		10		
	15000		15		
	20000		11		
Output return loss	10		15		dB
	5000		14		
	8000		16		
	12000		11		
	15000		16		
	20000		11		
Reverse isolation	10000		21		dB
Output power @1dB compression	10		7.0		dBm
	5000		5.5		
	8000		6.8		
	12000		4.4		
	15000		2.6		
	20000		-0.6		
Output IP3[2]	10		19.2		dBm
	5000		17.0		
	8000		16.6		
	12000		12.8		
	15000		11.3		
	20000		9.6		
Noise figure	10		5.2		dB
	5000		5.2		
	8000		5.1		
	12000		5.3		
	15000		5.2		
	20000		5.7		
DC Supply (Vs)		4.75	5	5.25	V
Device operating current			19.1	24	mA
Device current variation vs. temperature[3]			60		µA/°C
Device current variation vs voltage[4]			0.0188		mA/mV
Thermal Resistance, junction-to-ground lead at 85°C stage temp.			349		°C/W

1. Measured on Mini-Circuits Characterization test board TB-EHC-24L+. See Characterization Test Circuit (Fig. 1)
2. Tested at Pout=-5dBm / tone.
3. (Current at 85°C — Current at -45°C)/130
4. (Current at 5.25V-current - Current at 4.75V)/1000
5. Low frequency cut-off determined by external coupling capacitors & RF choke.

Absolute Maximum Ratings[6]

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Junction Temperature	150°C
Power Dissipation	0.2W
Input Power (CW)	+22 dBm (5 minutes max.) +8 dBm (continuous)
Vs Supply voltage (Pin 3)	6V

6. Permanent damage may occur if any of these limits are exceeded.
Electrical maximum ratings are not intended for continuous normal operation.

Characterization Test Circuit

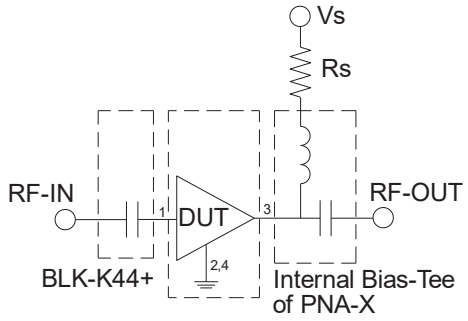


Fig 1. Characterization Circuit
Note: This block diagram is used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-EHC-24L+) Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA- X microwave network analyzer. RS=49.9 ohms, Vs = 5V
Conditions:
1. Gain and Return loss: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -5 dBm/tone at output.

Product Marking