

Dual Channel Broadband Low Noise RF Amplifier

50kHz-45GHz, 4.5 Vpp, Psat 17 dBm, Lithium Niobate Modulator Driver



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Features

- Dual 4.5V Outputs
- 0.5ps added RMS jitter
- 6ps rise / fall time
- 17dB gain to 45GHz
- 20dBm saturated output power
- 3.3W power dissipation
- Size: 1.58 x 1.85 x 0.36 inch
- Optional integrated bias tee
- Optional RF power detector

Applications

- Radar
- RoF
- Laboratory Uses
- Concept Proving
- Instrumentation

The DLNA is a broadband low-noise RF amplifier delivering up to 17 dBm output power with a 4.5 V output amplitude across a frequency range of 50 kHz to 45 GHz. It operates on +12 V DC at 180 mA and features SMA RF connectors (8.86 mm). This high-performance dual-channel amplifier is designed for 43 Gb/s optical modulator driver applications using Lithium Niobate or Electro-Absorption technologies. It offers low jitter, excellent gain, and flat group delay up to 45 GHz. The module is plug-and-play, suitable for lab use or integration into transponders. Its matched dual-driver design supports differential modulators such as dual IQ modulators and advanced modulation formats. The LNA provides low power dissipation, fast rise and fall times, and stable performance.

Note: The module must be mounted on a heat sink to prevent overheating and potential damage.

Specifications

Parameter	Min	Typical	Max	Unit
Small Signal Gain (S21)	100-26 GHz	18	21	dB
	26-40 GHz	15	19	
	40-45 GHz	15	17	
Small Signal Gain Difference (S21_A-S21_B)	100-26 GHz	0.5		dB
	26-40 GHz	0.75		
	40-45 GHz	1		
Input Match (S11)	100-26 GHz	-12	-10	dB
	26-40 GHz	-11	-8	
	40-45 GHz	-10	-8	
Output Match (S22)	100-26 GHz	-12	-10	dB
	26-40 GHz	-12	-8	
	40-45 GHz	-10	-6	
Saturated Output Power (Psat)	100-26 GHz	20		dBm
	26-40 GHz	20		
	40-45 GHz	17		
Output Vpp	4.1	4.5		V
Added RMS Jitter (43Gbps)		0.5	0.6	ps
Rise / Fall Time (43Gbps)		6	9	ps
Input Return Loss		-10		dB
RF Input Power			23	dBm
Input RF Vpp			3	V
Operation Temperature	-20	25	60	°C
Storage Temperature	-40	25	85	°C
RF Input Power (CW)			20	dBm
Power Dissipation		3.3		W
Backside Case Temperature			+75	°C



Note: Applying over the maximum RF control voltage or optical power will burn the device.
Only the protected benchtop package has warranty.

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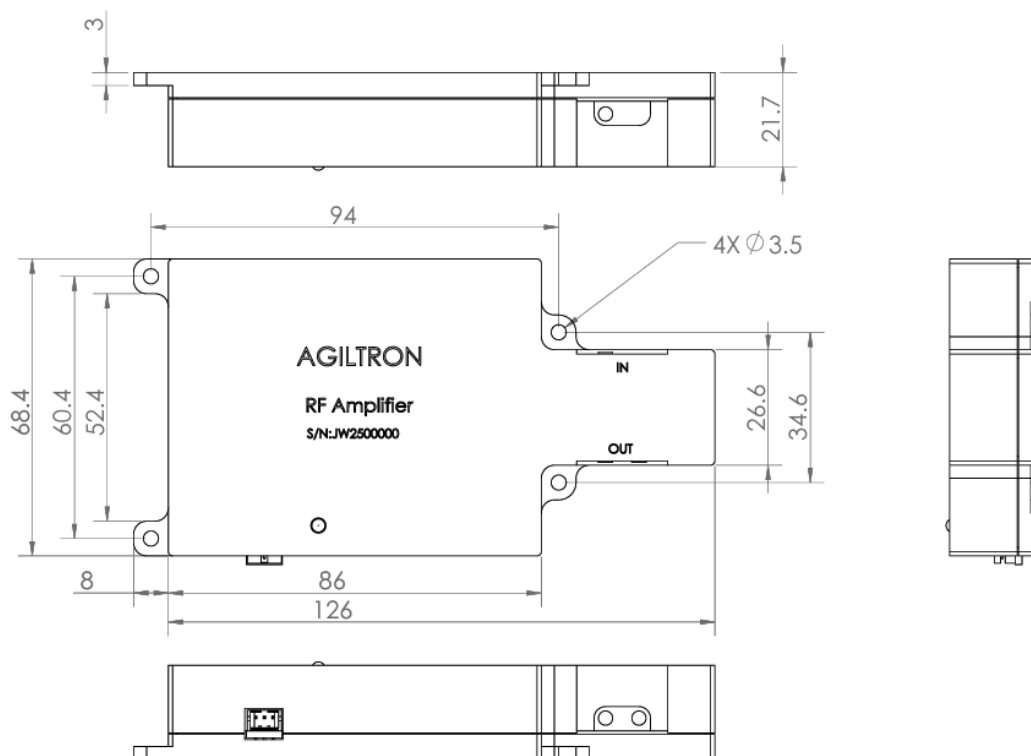
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Dimensions (inches [mm])



DC pin diameter: 0.03in [0.76mm]

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Ordering Information (Part Number)

	0005	45	20	3	17	☐
Prefix	Low Frequency	High Frequency	Gain	NF	P1dB	Module ^[1]
DLNA-	0.05MHz = 0005	45GHz = 45	20dB = 20	3dB = 3	17dBm = 17	No = 0 Yes = 1

[1]. The module is a small metal box integrated with a power supply inside.

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Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters ($<5\ \mu\text{m}$) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.

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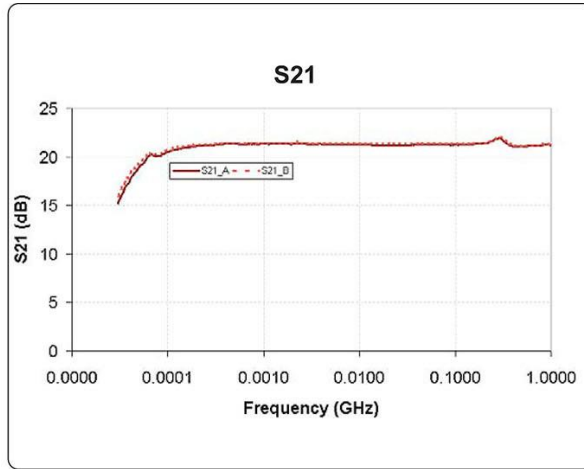
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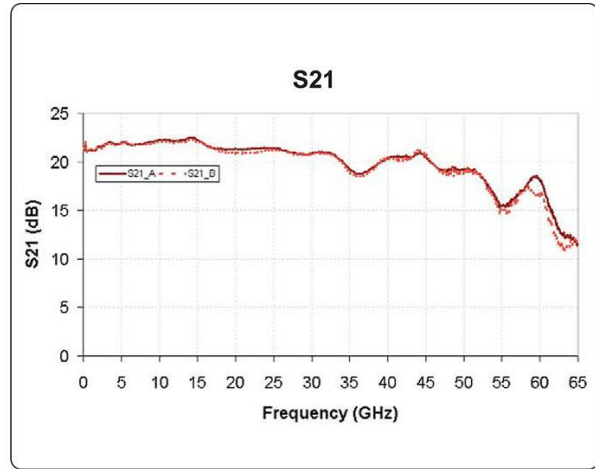


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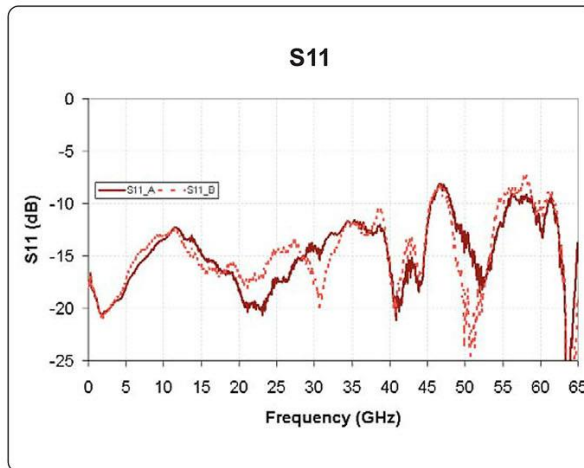
Typical Spectrum



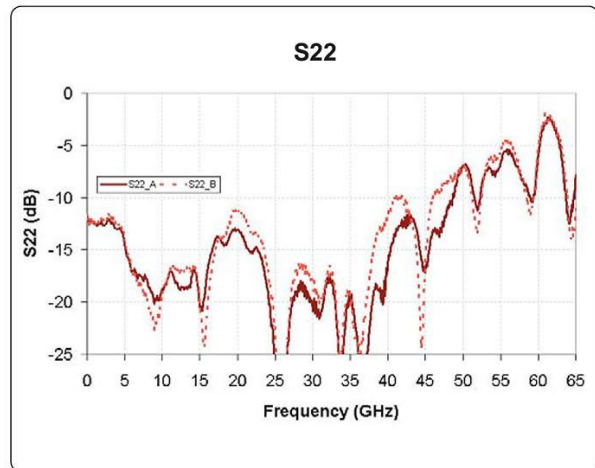
Typical module performance



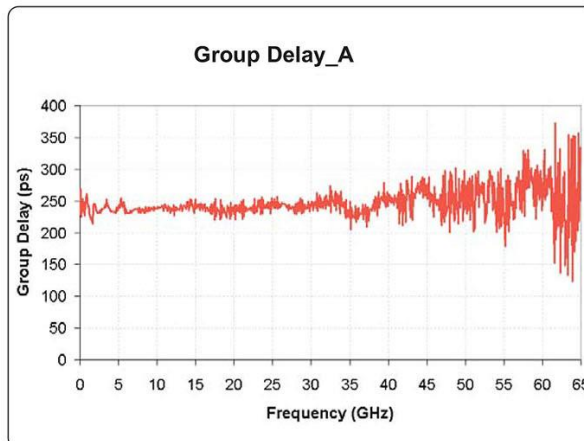
Typical module performance



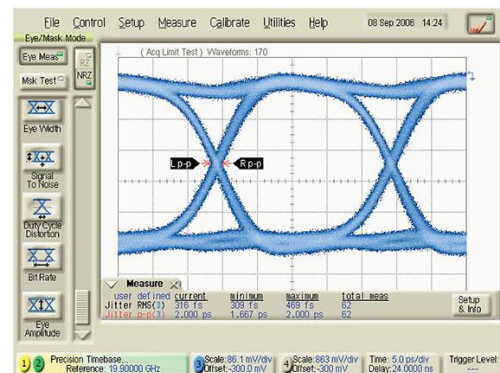
Typical module performance



Typical module performance



Typical module performance



40Gbps input signal
 - 378mV height, 442mV amplitude
 - 316fs RMS, 2.00ps p-p jitter
 - 6.56ps rise, 6.44ps fall time

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