Ultrabroadband RF Amplifier 30kHz to 45 GHz

7.5 Vp-p output, 30dB Gain

DATASHEET

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This is a high-gain, low-noise 3-stage amplifier delivering 7 Vp-p output across a broad frequency range of 30 kHz to 45 GHz. It is a general-purpose broadband driver amplifier optimized for Mach-Zehnder optical modulator applications, offering low power dissipation, high drive capability, very low added jitter, and fast rise time. The amplifier requires a 12 V DC power supply at 300 mA and features a GPPO male connector. A compatible power supply is included for user convenience.

Features

- 7.5 Vp-p (23 dBm saturated output power)
- < 8 ps rise/fall time
- < 0.5 ps added rms jitter
- 27 dB gain (to 45 GHz)
- 3.4 W Power Dissipation
- Useful gain to 65 GHz
- Small Size Package

Applications

- Mach-Zehnder optical modulator driver
- High frequency/optical communications test instrumentation
- General purpose gain block

Specifications

Parameter		Min	Typical	Max	Unit
Frequency Range		30kHz		45GHz	kHz-GHz
Signal Gain (S21)	0.01 – 26 GHz	27	30	35	dB
	26 – 45 GHz	24	27	35	
Rise/Fall Time			5	8	10	ps
Added Jitter (rms method) [1], [2]			0.2	< 0.5	< 1	ps
Input Signal			300	450	600	mV
Input Match (S11)	0.01 – 26 GHz			-12	-10	dB
	26 – 45 GHz			-10	-8	
Output Match (S22)	0.01 – 26 GHz			-12	-10	dB
	26 – 45 GHz			-10	-4	
Output Vpp				7	7.5	Vpp
Current				50	80	mA
Input Return Loss				-10		dB
Output Return Loss				-10		dB
Spec Temp				25		°C
Weight (Without Heatsink)				69		g
Power Supply				+12		V
Operating Temperature				-40 to +75		°C
Storage Temperature				-55 to +125		°C
Input Port				GPPO Male		
Output Port				GPPO Male		

Notes:

[1]. $(\text{Jitter}_{\text{added}})^2 = (\text{Jitter}_{\text{output}})^2 - (\text{Jitter}_{\text{input}})^2$

[2]. Under typical 400mV Input Amplitude.

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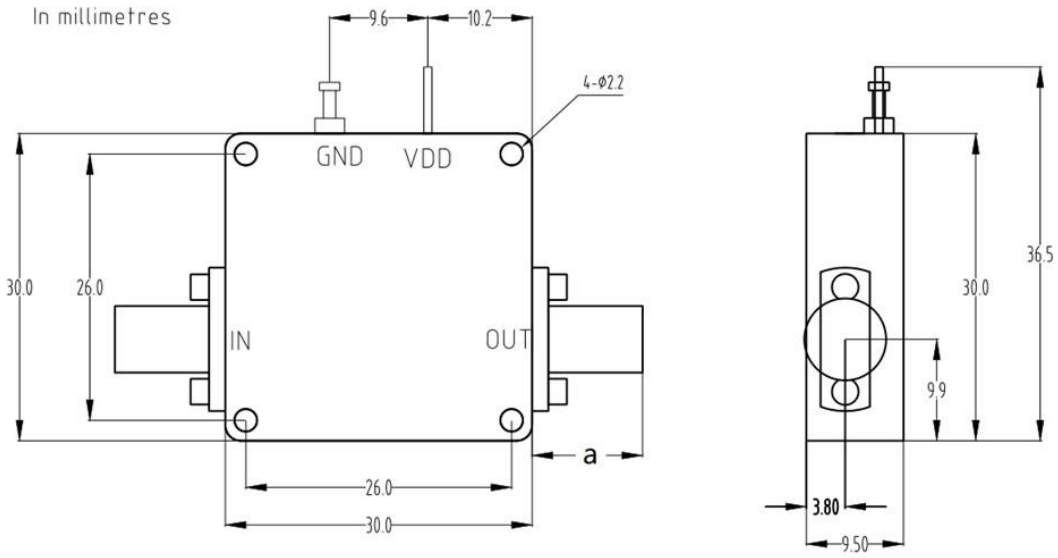
Dimensions (mm)



	<26.5GHz	<40GHz	<50GHz	<67GHz
Connector	SMA	2.92mm	2.4mm	1.85mm
Lenth of a	9.4mm	9.5mm	10.8mm	11.3mm

Note: Female Default. Contact with us for other types.

Ordering Information *

	3K	45	3	7	11	1
Prefix	**Low Frequency**	**High Frequency**	**Amplifier Stage**	**Output**		**Module***
BRFA-	30kHz = 3K	45GHz = 45	3 = 3	7V = 7		No = 1 Yes = 2

* The module is a small metal box integrated with a power supply.

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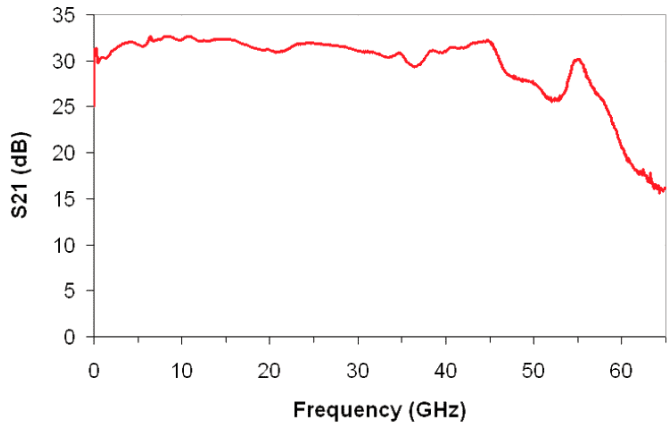
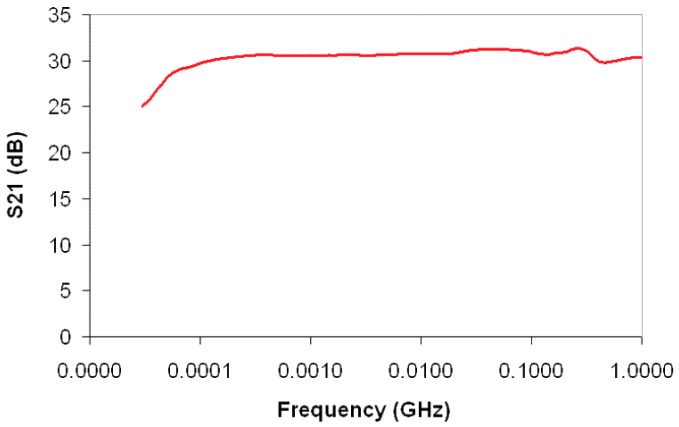
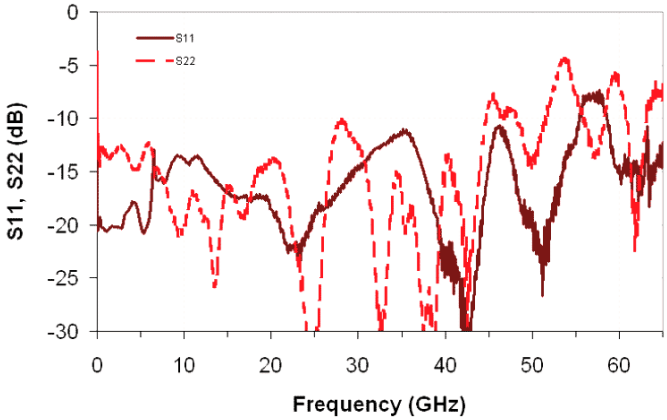
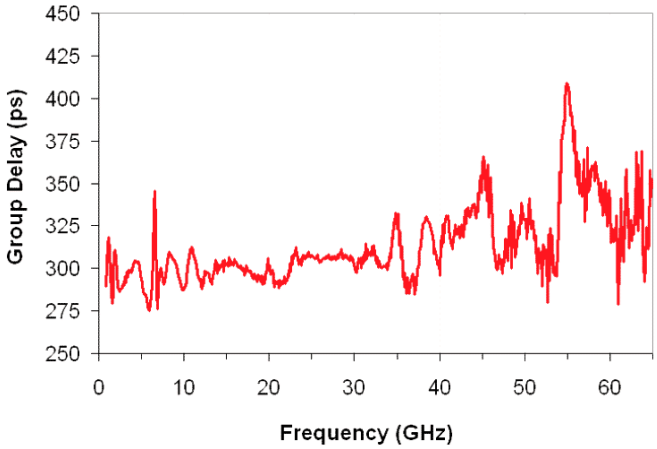
Typical Response

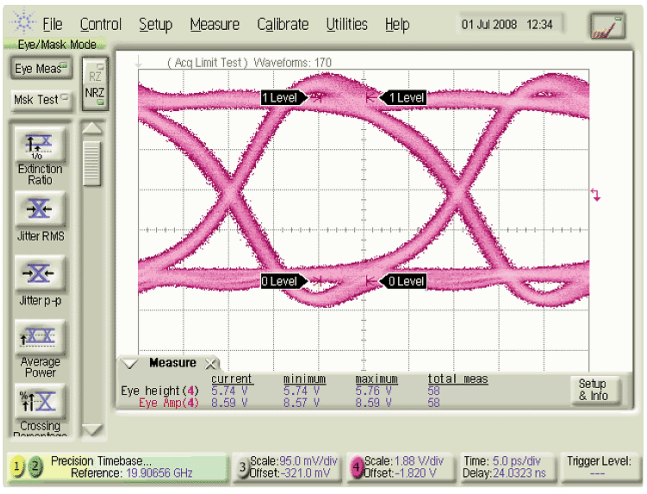




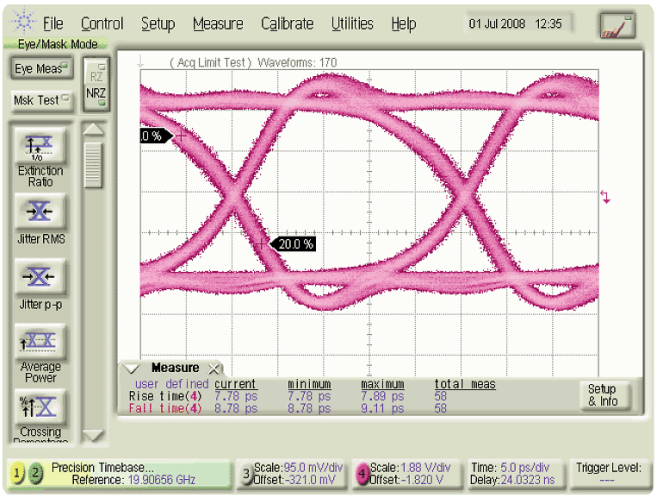




The following data has been gathered from the typical measured performance. Bias: Vd1, Vd2, Vd3 = 7V, Id1 = 85mA, Id2 = 150mA, Id3 = 240mA.



(2^{31} - 1) EYE: > 7V output (1.5V/div)



(2^{31} -1) EYE: < 10 ps Tr/Tf (5 ps/div)

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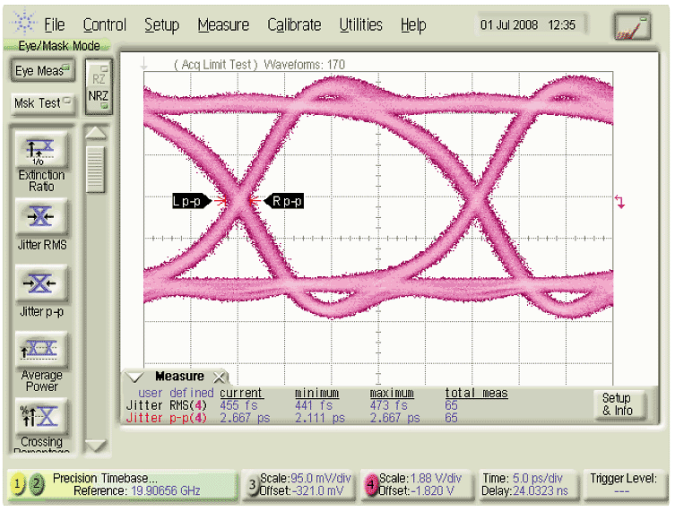
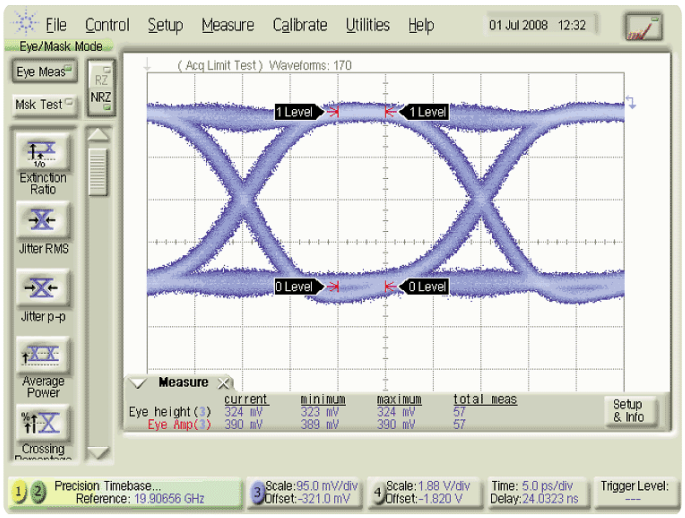


(2^{31} - 1) EYE: <500 fs added rms jitter (5 ps/div)



Input from _____ and 3dB attenuator

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 µm) 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 how handling by expanding the core side at the fiber ends.

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Caution Electrostatic Sensitivity

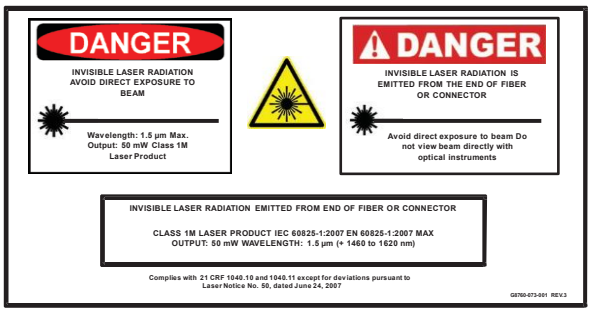
- Never touch laser diode and the module using hands
- Always use protections when handle a laser diode
- Recommend mounting the laser diode using an ionic gun and ESD finger cots

Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 µm.

Maximum power = 30 mW.



*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
*IEC is a registered trademark of the International Electrotechnical Commission.