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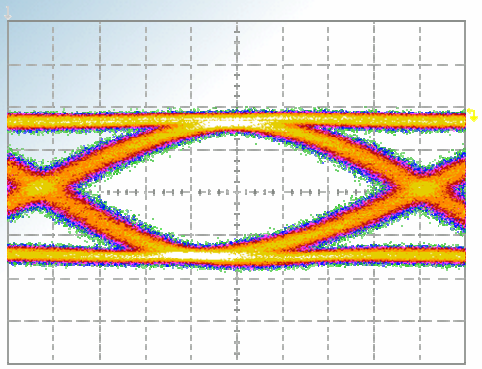
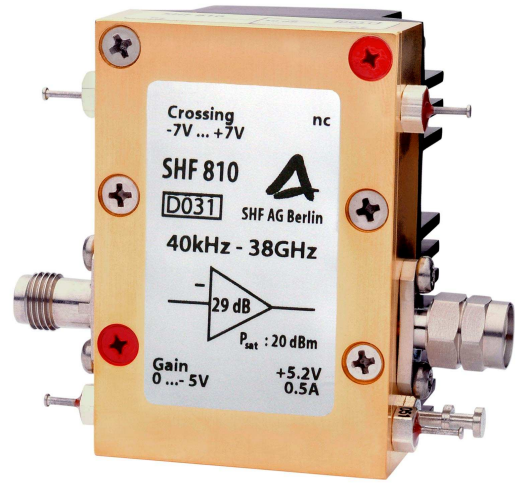


Datasheet

SHF 810

Broadband Amplifier



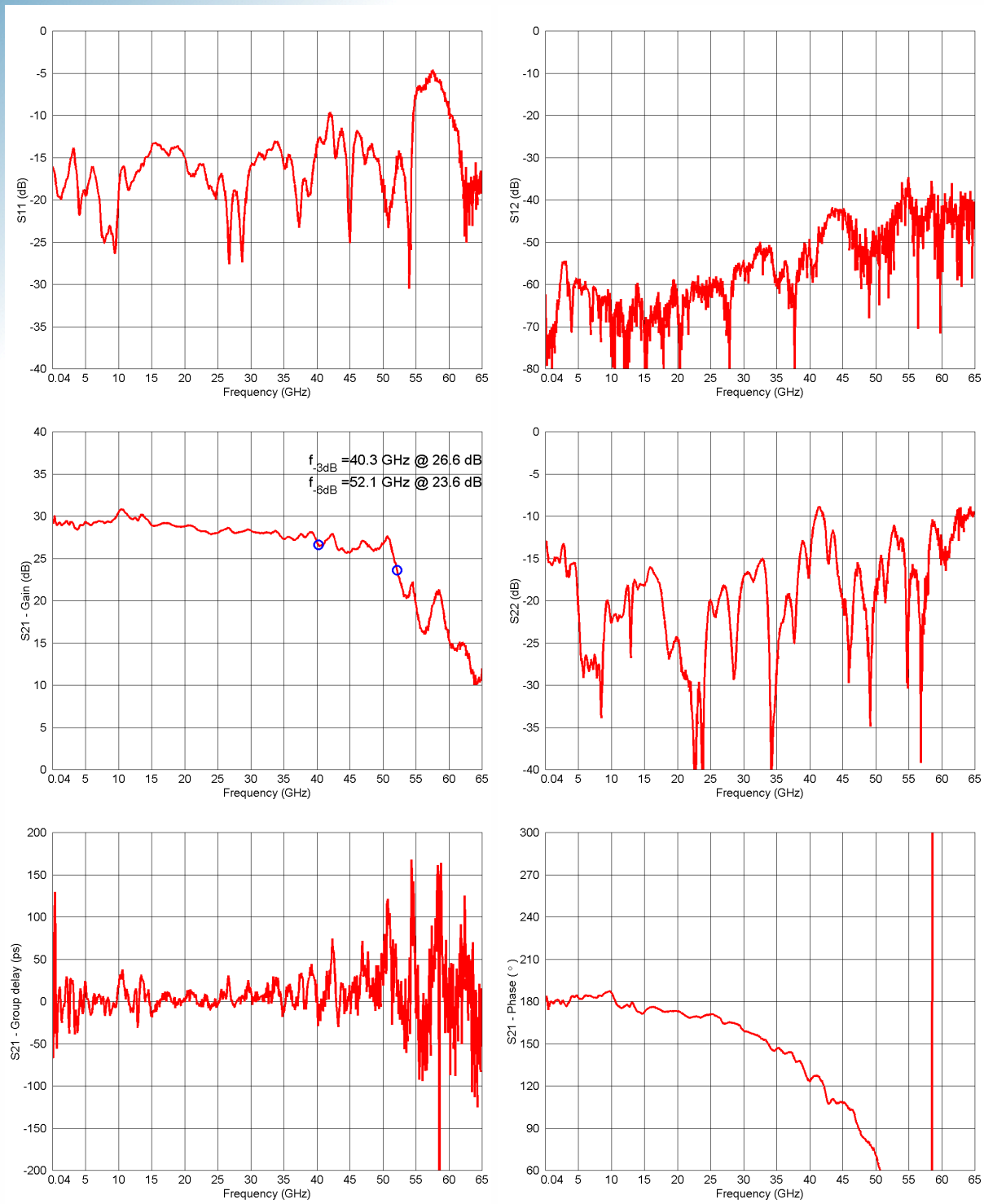
Specifications – SHF 810

(Typical Data at 35℃ case temperature (T_C), unless otherwise specified)						
Parameter	**Symbol**	**Unit**	**Min**	**Typ**	**Max**	**Conditions**
High frequency 3 dB point	f_{HIGH}	GHz	38	40		
Low frequency 3 dB point	f_{LOW}	kHz			40	
Gain	G_p	dB	28	29		inverting, AC-coupled
Output voltage adjust Voltage Current	 U_{gc} I_{gc}	 V mA	 0 0		 -5 -50	reduces gain by up to ~3 dB / reduces output voltage by 2 V
Crossing control Voltage Internal resistance		 V Ω	 -7	 500	 7	adjusts crossing point between 42…58%
Gain ripple	ΔG_p	dB		±1	±1.5	
Noise figure	N_F	dB		6		at 5 GHz
Group delay		ps		±50		>5GHz, <40GHz with 100 MHz aperture
Temperature coefficient	T_c	dB/℃		-0.05		
Output power at 1 dB compression	P_{01dB}	dBm (V)	18 (5.1) 17 (4.6)			<10 GHz <20 GHz
Output power at 2 dB compression	P_{02dB}	dBm (V)	19 (5.7) 18 (5.1)			<10 GHz <20 GHz
Output power at 3 dB compression	P_{03dB}	dBm (V)	20 (6.3) 19 (5.7)			<10 GHz <20 GHz
Jitter		fs		 550	750 600	on scope display deconvoluted in the output range between 4 and 6.5 V
Input return loss	S_{11}	dB		-15	-12 -10	<10 GHz <40 GHz
Output return loss	S_{22}	dB			-10	<40 GHz
Maximum input power		dBm			4 10	in operation without power supply
Rise time/fall time	t_r/t_f	ps			9	20%...80%
Supply voltage		V	5.2		9	0.47 A, reverse voltage protected
Power consumption		W	2.44			using 5.2 V supply voltage
Input connector						1.85 mm female (V compatible)
Output connector						1.85 mm male (V compatible)
Dimensions		mm				51x35x13.5 excluding connectors

The SHF 810 is a modulator driver which conforms to OC-768 and combines high performance with ease of use; a single power supply is all that is needed for operation. This three stage amplifier is based on special designed monolithic microwave integrated circuits (MMICs) to achieve ultra wide bandwidth and low noise performance.

A voltage regulator IC makes the amplifier insensitive to reverse voltage and line ripple.

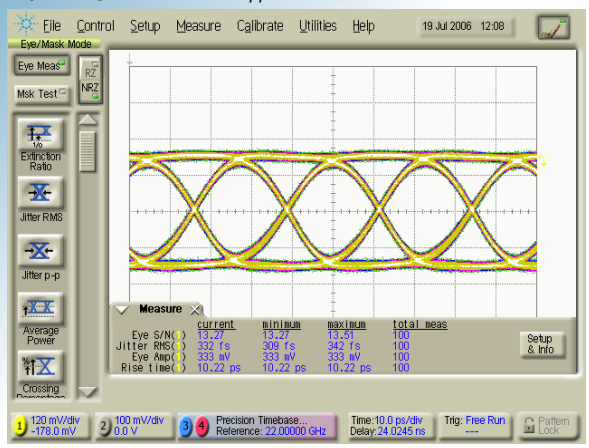
S-Parameters, group delay and phase response at maximum gain



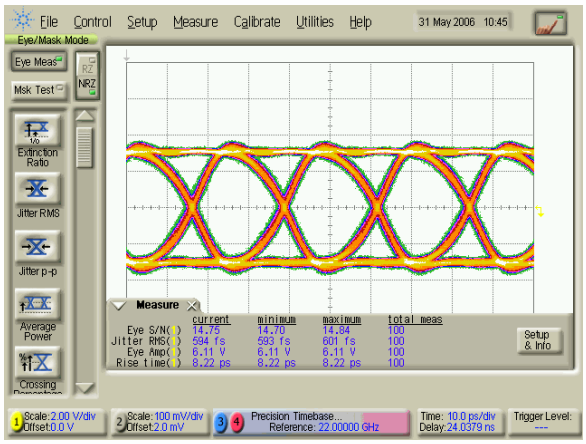
Aperture of group delay measurement: 100MHz

Eye diagram at 44 GBit/s

Input signal: ***333*** mV_{pp} , ***323*** *fs*

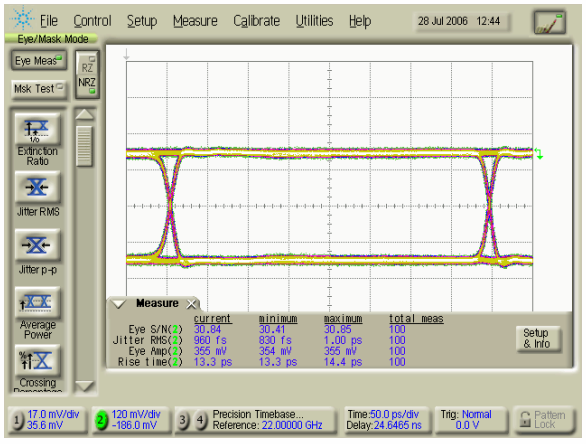


Output signal: ***6.11*** V_{pp} , ***594*** *fs*

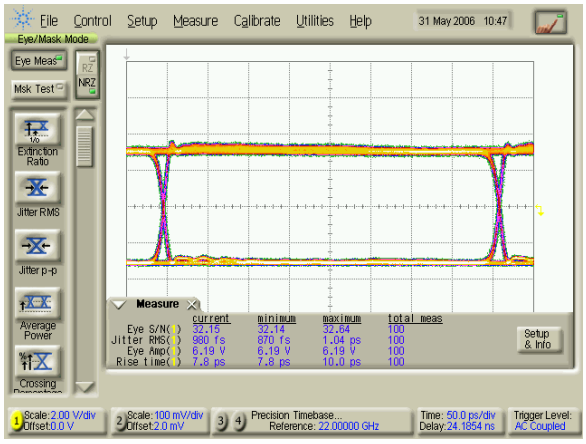


Eye diagram at 2.5 GBit/s

Input signal: ***355*** mV_{pp} , ***960*** *fs*



Ouput signal: ***6.19*** V_{pp} , ***980*** *fs*

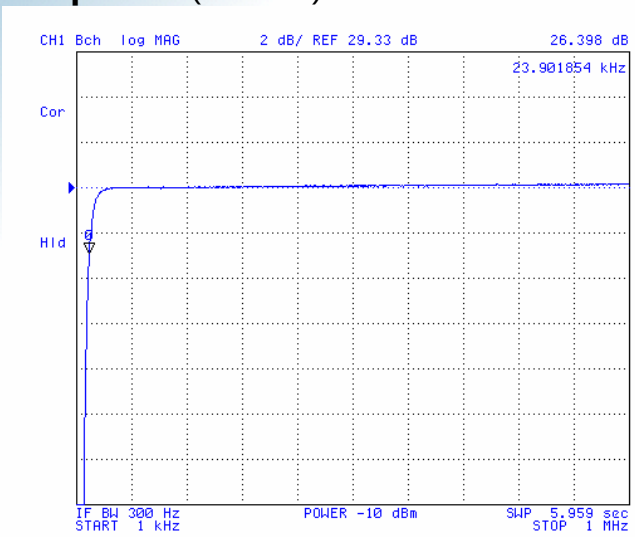


Eye diagrams measured with:
Digital Communications Analyzer
AGILENT 86100B with 86118A Sampling-Head-Module (70GHz) and 86107A Precision-Time-Base-Module.

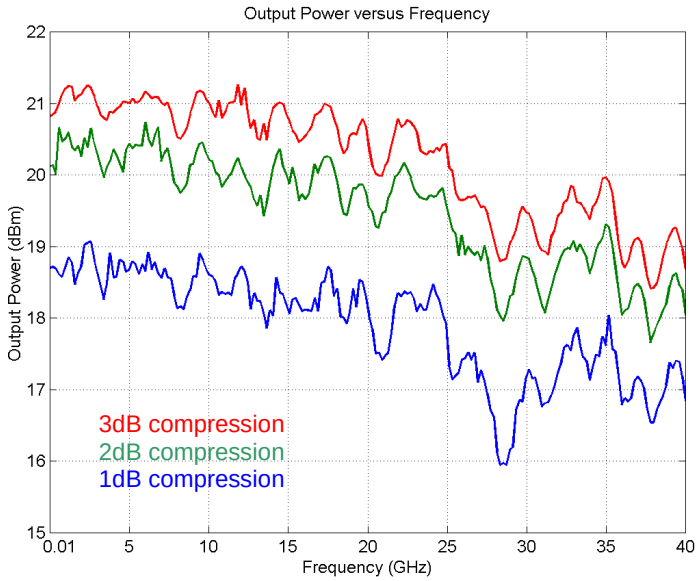
Signal source (Generator):
SHF BPG44

Measurement setup:
50cm Sucoflex 102EA + 6dB V-Gold attenuator between the generator and the SHF 810 input.
10dB + 20dB V-Gold attenuator before the sampling head input.

Low frequency response (<1 MHz)



Saturation power



Available Options

01: DC return on input
(max. ±1.75 V, max. 35 mA)

02: Built-in bias tee on input
(max. ±12 V, max. 220 mA)

03: DC return on output
(max. ±1.75 V, max. 35 mA)

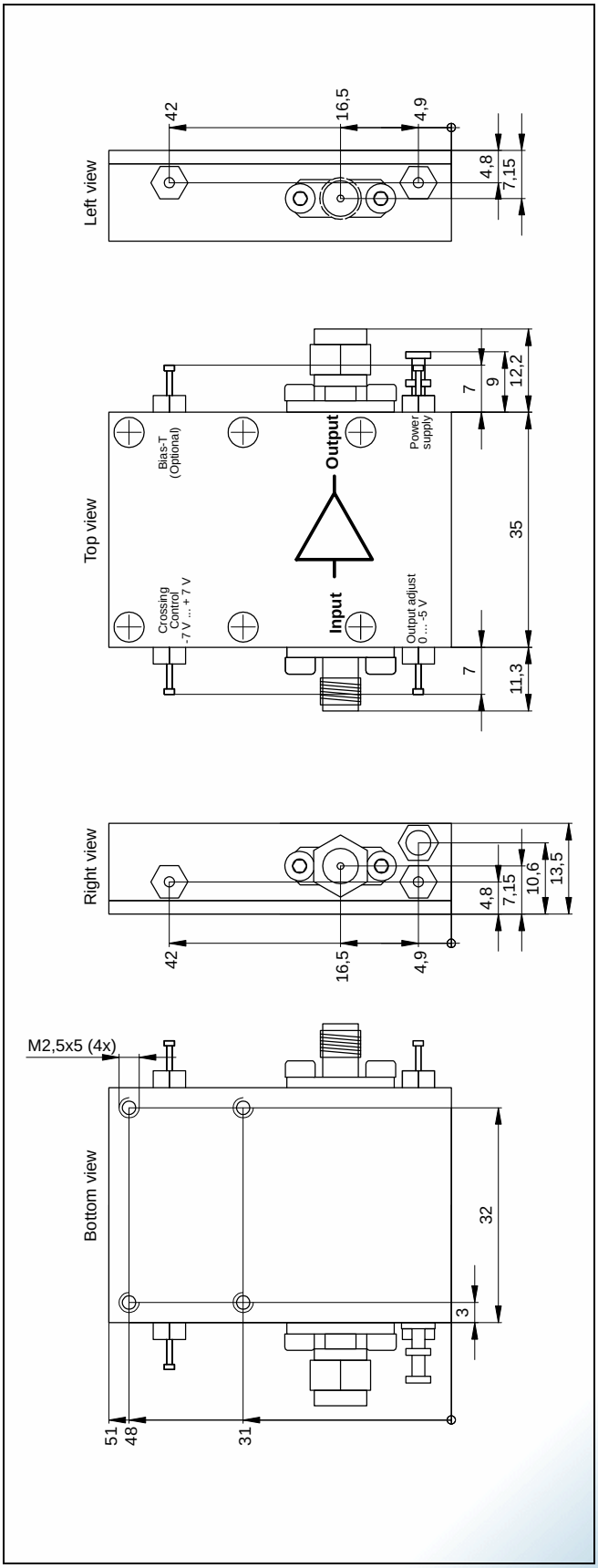
04: Built-in bias tee on output
(max. ±12 V, max. 220 mA)

MT: Special tuning available to optimize performance with E/O modulators
Positive gain slope of up to +3 dB possible

MP: Matches the phase of two amplifiers

The following options cannot be combined:
01 and 02
03 and 04
02 and 04

For other configurations please contact us.



User Instructions

ATTENTION !

Electrostatic sensitive GaAs FET amplifier

1. To prevent damage through static charge build up, cables should be always discharged before connecting them to the amplifier!
2. Attach a 50 Ohm output load **before** supplying DC power to the amplifier!
3. The supply voltage can be taken from any regular 5.2…9 V, 1 A DC power supply and can be connected to the supply feed-through filter via an ON / OFF switch.
4. The minimum supply voltage is 5.2 V. A higher one increases the power dissipation of the internal voltage stabilizer.
5. Using a 3 dB or 6 dB input attenuator will result in a 6 dB or 12 dB increase of the input return loss. For minimal degradation of amplifier rise time, these attenuators should have a bandwidth specification of greater 50 GHz (V/ 1.85mm attenuators)!
6. An input signal of about 0.33 V_{pp} equivalent to -6 dBm will produce saturated output swing of approx. 6V_{pp}.
7. Higher input voltages will drive the amplifier's output stage into saturation, leading to waveform peak clipping.
8. Saturated output voltages can only be used between 10 MHz and 40 GHz without damage while the amplifier is connected to a 50 Ohm precision load with a VSWR of less than 1.2 or better than 20 dB return loss up to 26 GHz.
9. While using a reflective load the output voltage has to be reduced to a safe operating level below 6.5 V_{pp} according to the magnitudes of the reflections.

   ATTENTION: At frequencies up to 20 GHz a capacitive load can be trans-formed to an inductive one through transmission lines! With an output stage driven into saturation this may lead to the immediate destruction of the amplifier (within a few ps)!
10. The input voltage should never be greater than 1 V_{pp} equivalent to 4 dBm input power.

    The input voltage without DC power supplied to the amplifier should never be greater than 2 V_{pp} equivalent to 10 dBm input power.
11. Hint: Pulse shape tuning of the amplifier has been performed after warm up at about 35℃ case temperature. Slightly more over and undershoot will be present at low temperature!