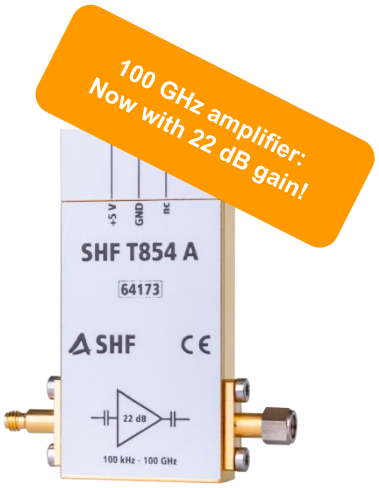
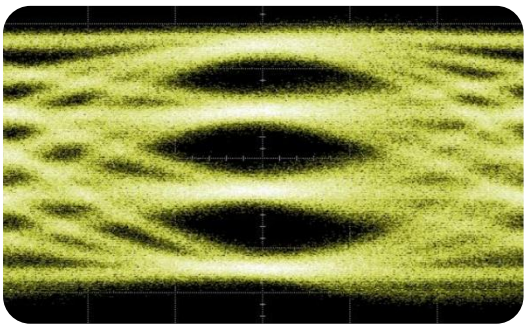
SHF Broadband Amplifiers



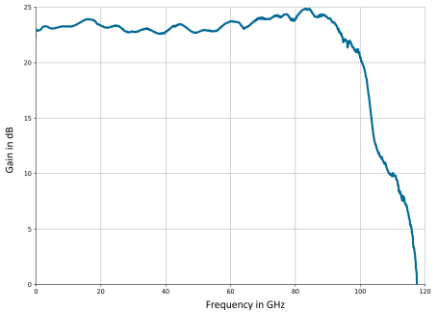
SHF has over 40 years of experience designing and producing amplifiers. All of the key MMICs are our own in-house designs. Our amplifiers' outstanding RF performance makes them well suited for a wide variety of research and development applications. These applications include optical and satellite communications, high-speed pulse experiments, data transmission, radar measurements, and quantum communication and computing.

The Fastest Amplifiers

With the new SHF T854 A we release the first two-stage amplifier with 100 GHz of bandwidth. Like its single-stage counterparts (SHF T850 C and SHF T851 A) it delivers an exceptional bandwidth, making it the ideal driver for data rates in excess of 200 Gbps. Thanks to its two-stage design, the gain is practically doubled, enabling the amplifier to boost, for example, a 200 mV PAM4 signal to 2.5 V.



2.5 V, 112 GBaud (224 Gbps) from a SHF T854 A[1]



S_{21} of a SHF T854 A

Linear Operation

In some modulation schemes, the optical modulator is driven with an electrical multi-level signal (e.g. for QAM or PAM) or with an analog signal (e.g. for OFDM). SHF amplifiers have been verified for their excellent performance with multi-level and analog signals.

Ease of Use

All operating voltages are generated internally. Therefore, only one single external power supply is needed. In addition, built-in safety features such as reverse-voltage protection and current regulators eliminate the potential risk of accidental damage.

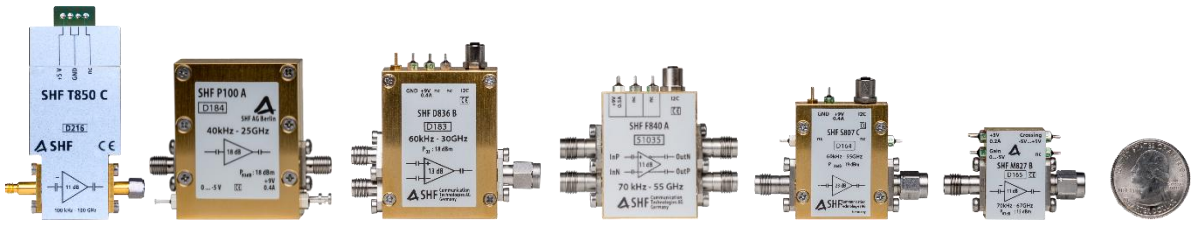
Options

Internal bias tees can be added to the input or output ports. Matched pair options are also available for applications where the DUT has to be driven differential or on multiple lines. In addition to that it is possible to mount two or four amplifiers on one common heat sink, to place the amplifiers as close as possible to the DUT (e.g. an optical modulator with two or four inputs).

[1] Measurements performed with a Keysight M8199B AWG (SSPRQ Pattern) after an “in-system” calibration.

Form Factor & Control Functions

SHF amplifiers are available in different styles as indicated by the first letter in the product code.



T-Shaped Series | P Series | Differential Input Series | Fully Differential Series | Small Series | Miniature Series

Each amplifier has a gain control function to reduce the gain continuously by up to 3 dB. The SHF *"S"*, *"D"* and *"F"* series even provide a software control to set parameters like gain, output power, bandwidth and crossing (if available for the particular amplifier type). The *"D"* series features differential input, single-ended output linear drivers with excellent common mode suppression. The SHF F840 A is SHF's fully differential amplifier.

Product Range

The table shows all the SHF amplifiers, their small signal bandwidth, and their typical gain (the number under the product code). For linear applications, the guaranteed 1 dB power compression point indicates the possible output amplitude. For binary applications, however, the higher 3 dB compression is a more appropriate value.

Bandwidth	10 dBm	11 dBm	12 dBm	13 dBm	14 dBm	15 dBm	16 dBm	18 dBm	23 dBm
100 GHz		T850 C 11 dB	T851 A 10 dB	T854 A 22 dB (NEW)					
70 GHz			M827 B | WFWM 11 dB						
66 GHz			M804 C 22 dB	M827 B 11 dB					
60 GHz				M833 B 13 dB					
55 GHz	F840 A 11 dB					S807 C 23 dB			
35 GHz				D837 C 10 dB				SHF S824 A 25 dB	
38 GHz							M834 B 15 dB		
30 GHz					D836 C 12 dB				
25 GHz				P100 A 18 dB	P115 A 25 dB			P101 A 16 dB	S126 A 29 dB
14 GHz								P101 A | ML 16 dB	

1 dB compression point