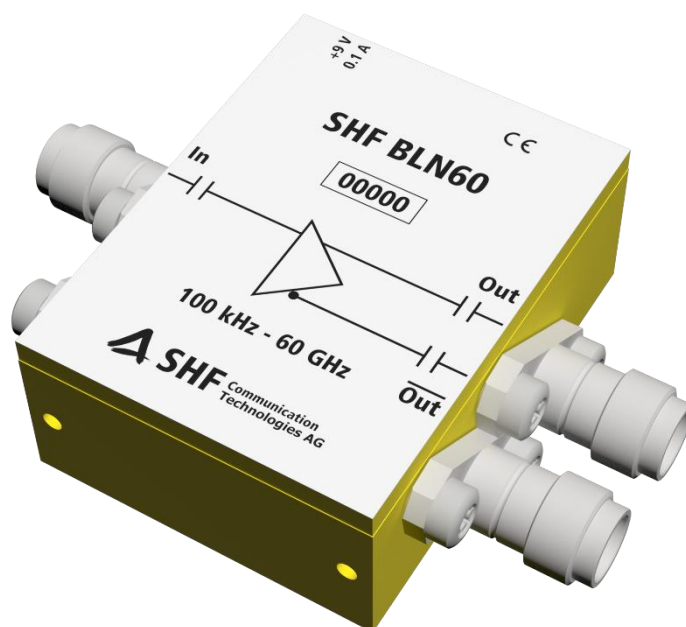


## Data Sheet

# SHF BLN60 A



## Active Balun

## Description

The SHF BLN60 A is a RoHS compliant active broadband balun. It converts a single-ended signal into a clean differential waveform for CW or broadband applications. The outstanding broadband phase and amplitude matching makes it an ideal choice for high data rate application like 128 Gbit PAM4, transition to balanced architectures (e.g., DACs or ADCs) and baseband modulation applications.

## Features

- Ultra-Broadband operation: 100 kHz ... 60 GHz

## Ease of Use

- Only one 9 V ... 14 V @ < 100 mA DC supply is needed for operation.
- Upon delivery, the active balun is ready to use. No additional software is needed.

## Options

### Low Frequency Compensation (LFC)

The Low Frequency Compensation option is offered in order to reduce the frequency response roll-off. Due to a lower loss at the lower frequencies, there is a typical roll-off of 5 dB between 100 kHz and 60 GHz. The compensation reduces the roll-off to approximately 2 dB over the frequency range, but at the same time reduces the gain by roughly 3 dB at the lower frequency range.



## Specifications

### Absolute Maximum Ratings

Parameter	Unit	Symbol	Min	Typ	Max	Comment
Input Power	dBm	$P_{in}$			3	
DC Voltage on RF-Ports	V	$V_{DC}$	-6		+6	
DC Supply Voltage	V	$V_{Supply}$	0		20	

### Electrical Characteristics (At 28°C case temperature, unless otherwise specified)

Parameter	Unit	Symbol	Min	Typ	Max	Comment
High Frequency	GHz	$f_{High}$	60			
Low Frequency	kHz	$f_{Low}$			100	
Input Power	dBm	$P_{in}$			-3	-1 dBm with LFC option
Single-ended Gain <sup>1</sup>	dB	G	-3 -4		+4 -1	$f_{in} < 50$ GHz $f_{in} \geq 50$ GHz
Single-ended Gain with LFC <sup>1</sup>	dB	$G_{LFC}$	-4 -6		1 -1	$f_{in} < 50$ GHz $f_{in} \geq 50$ GHz
P1dB Output	dBm	$P_{1db}$			1	
Phase Balance	°	PH		2.5 5	5 10	$f_{in} < 50$ GHz $f_{in} \geq 50$ GHz
Amplitude Balance	dB	A			0.3	

### Power Requirements

Parameter	Unit	Symbol	Min	Typ	Max	Comment
DC Supply Voltage	V	$V_{supply}$	9		14	Mini bushing EMI filter
DC Supply Current	I	$I_{supply}$	50		95	
Power Dissipation	mW	$P_d$			750	

<sup>1</sup> Single-ended Gain equals  $|S_{21}| = |S_{31}|$



## Specifications

### Mechanical Characteristics

Parameter	Unit	Symbol	Min	Typ	Max	Conditions
Input Connector						1.85 mm (V) female <sup>2</sup>
Output Connector P						1.85 mm (V) female <sup>2</sup>
Output Connector N						1.85 mm (V) female <sup>2</sup>
Weight	g			40		

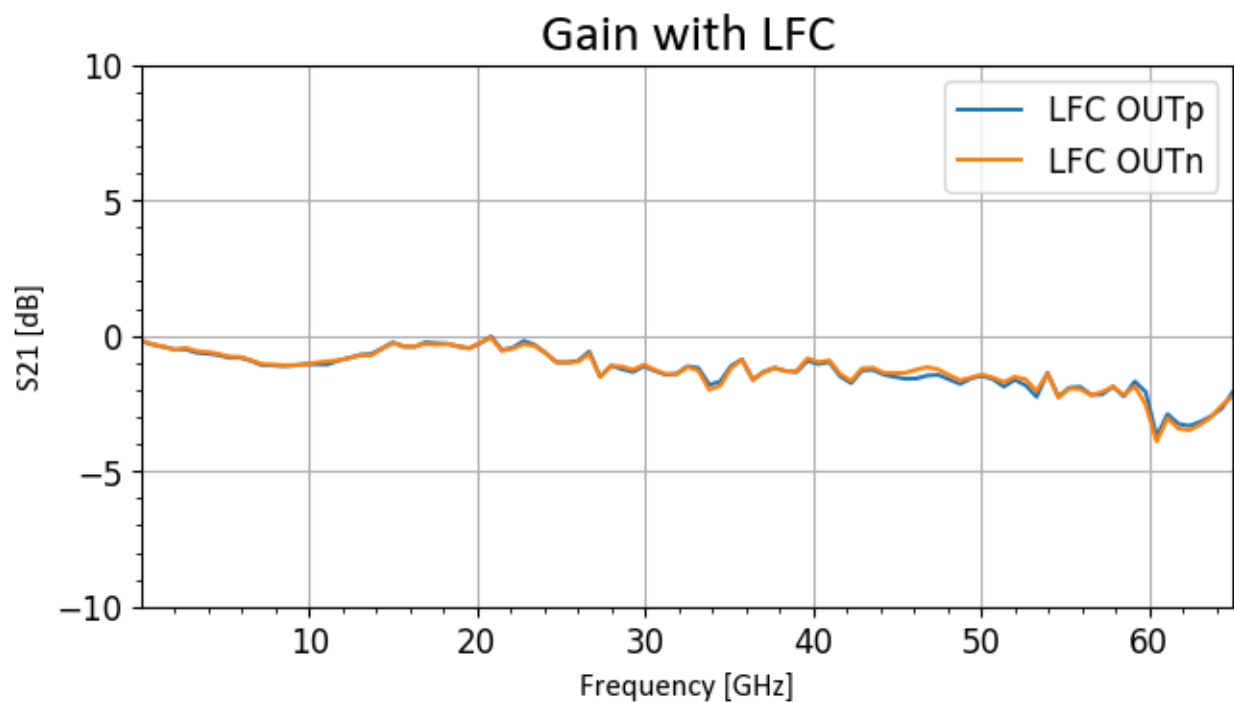
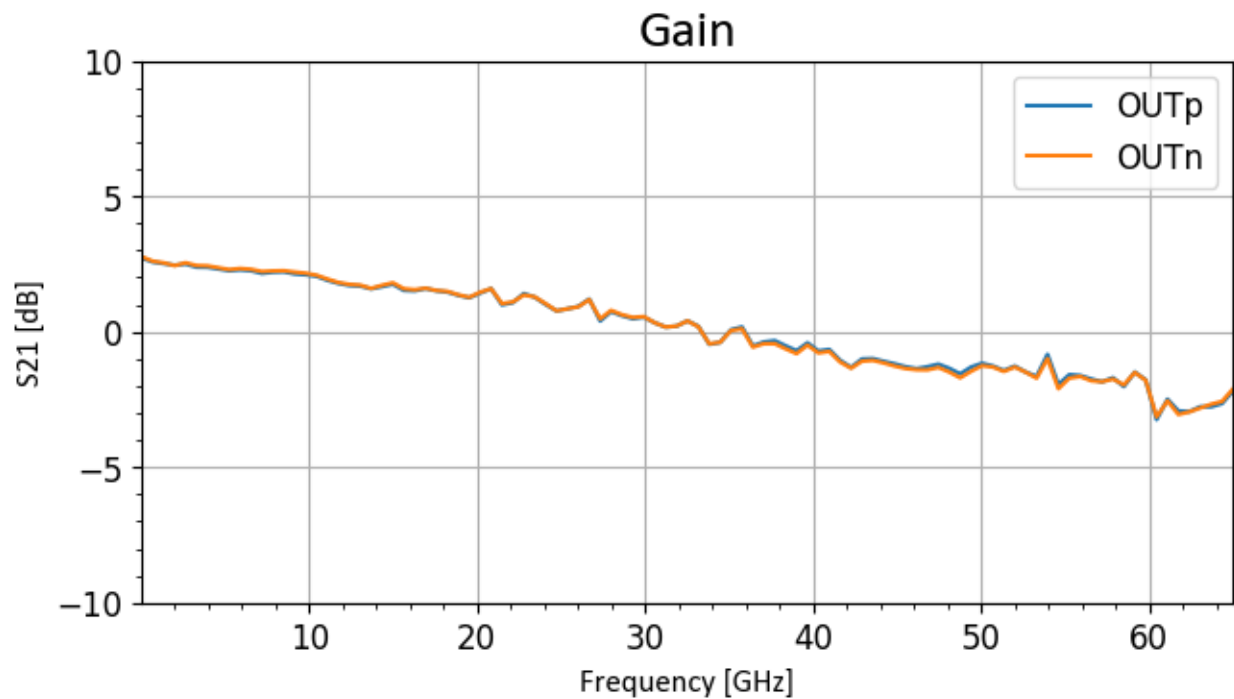
---

<sup>2</sup> Other gender configurations are available on request



## Typical Gain

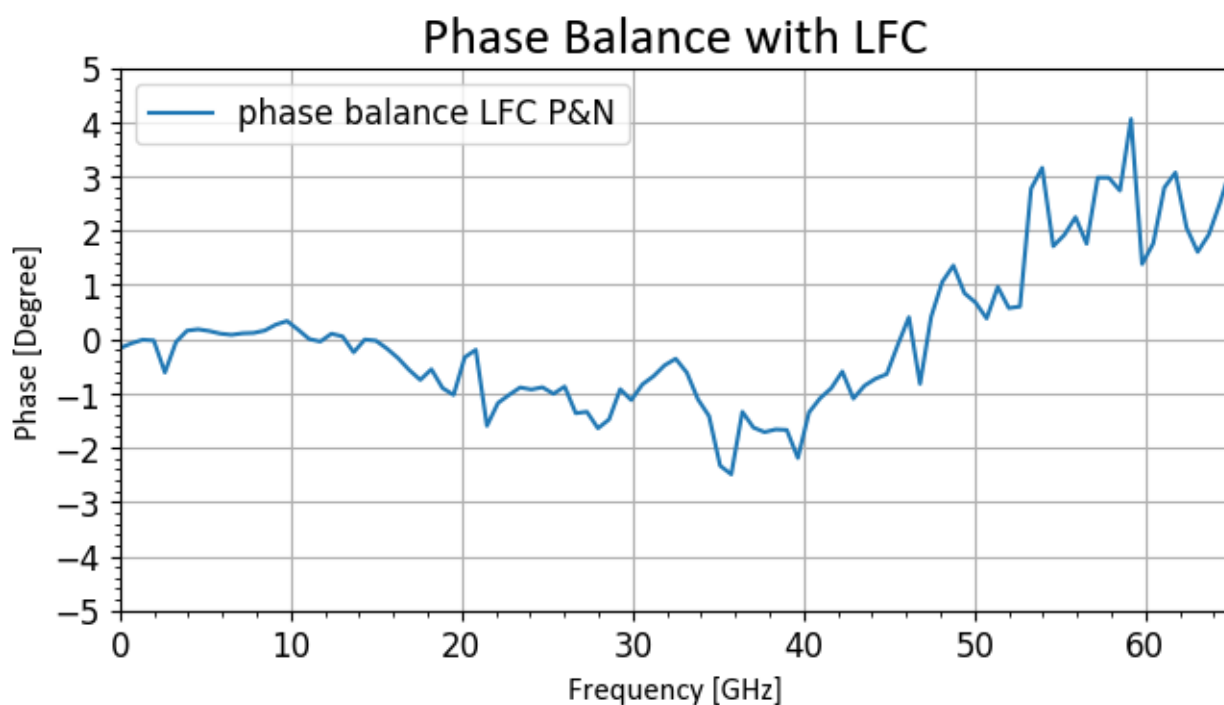
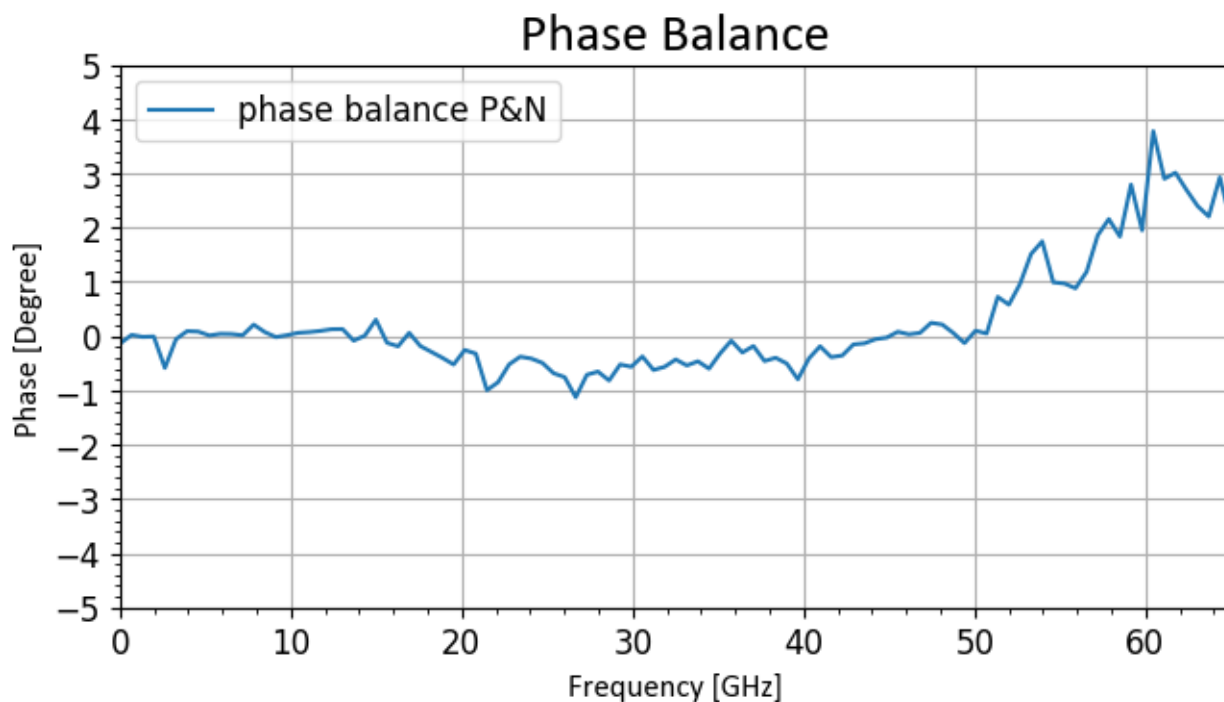
The measurement below has been performed using an Anritsu® 37397C VNA with a -10 dBm power calibration. The unused output had been terminated with 50 Ohm.



® Anritsu is a registered trademark of Anritsu Corporation

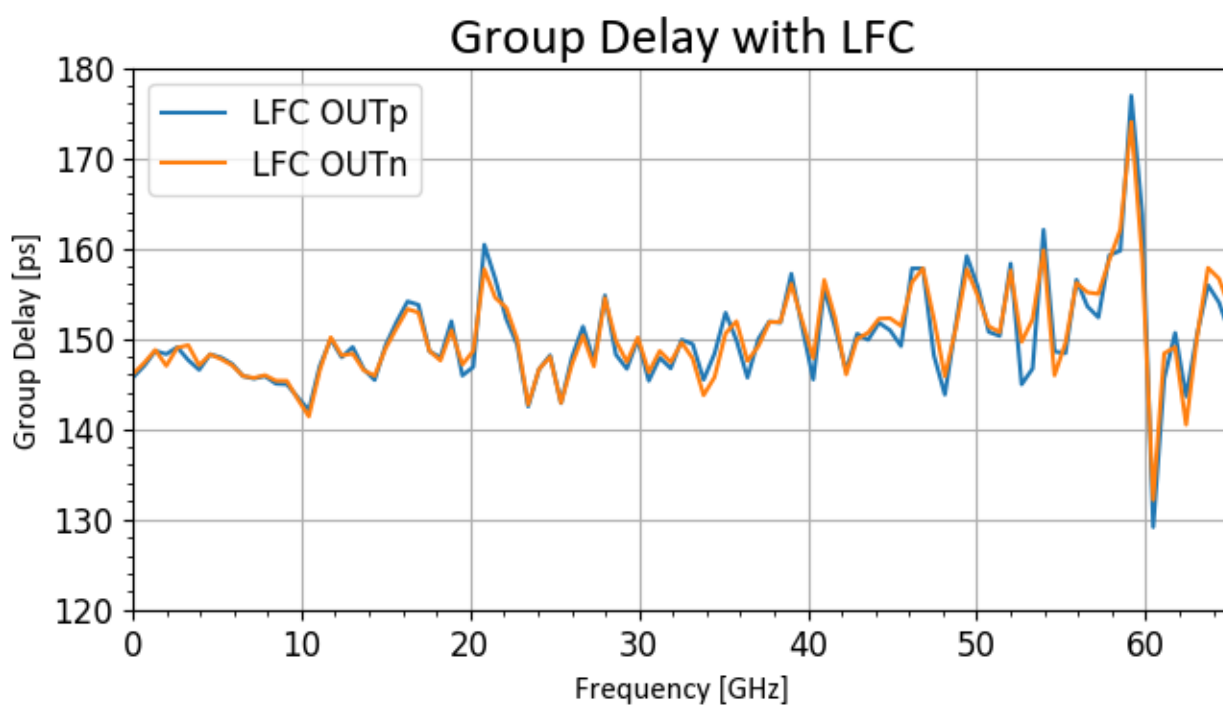
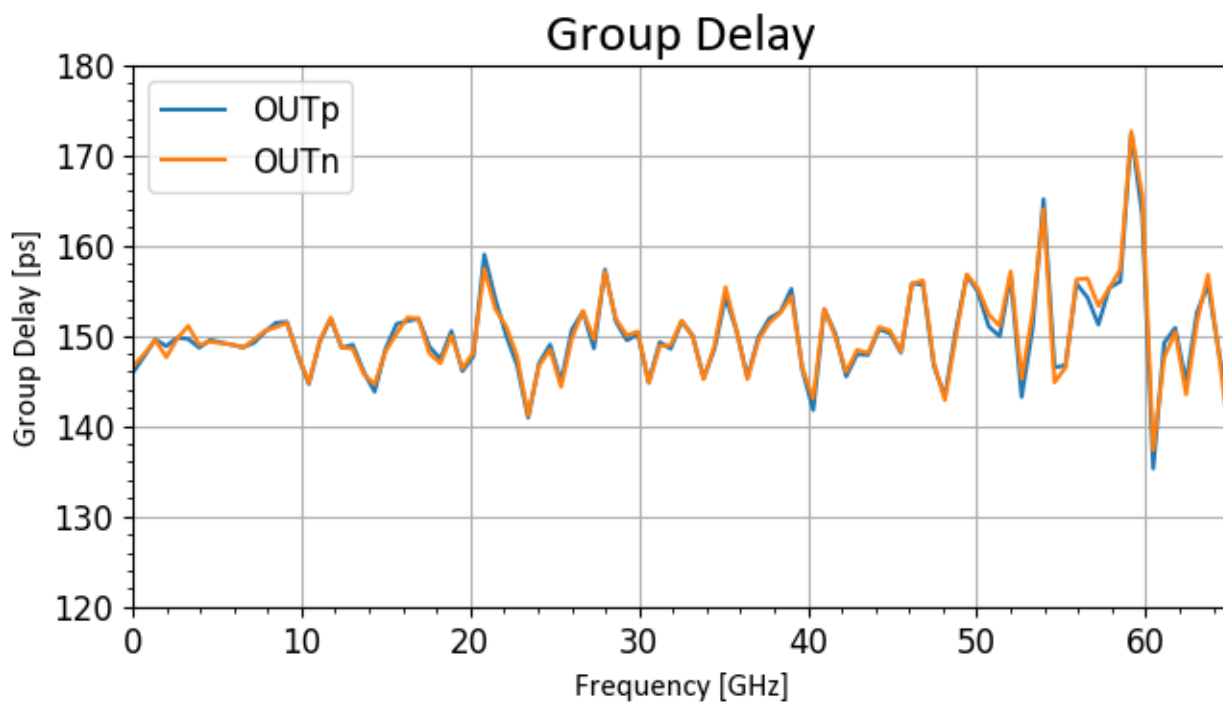


## Typical Phase Balance





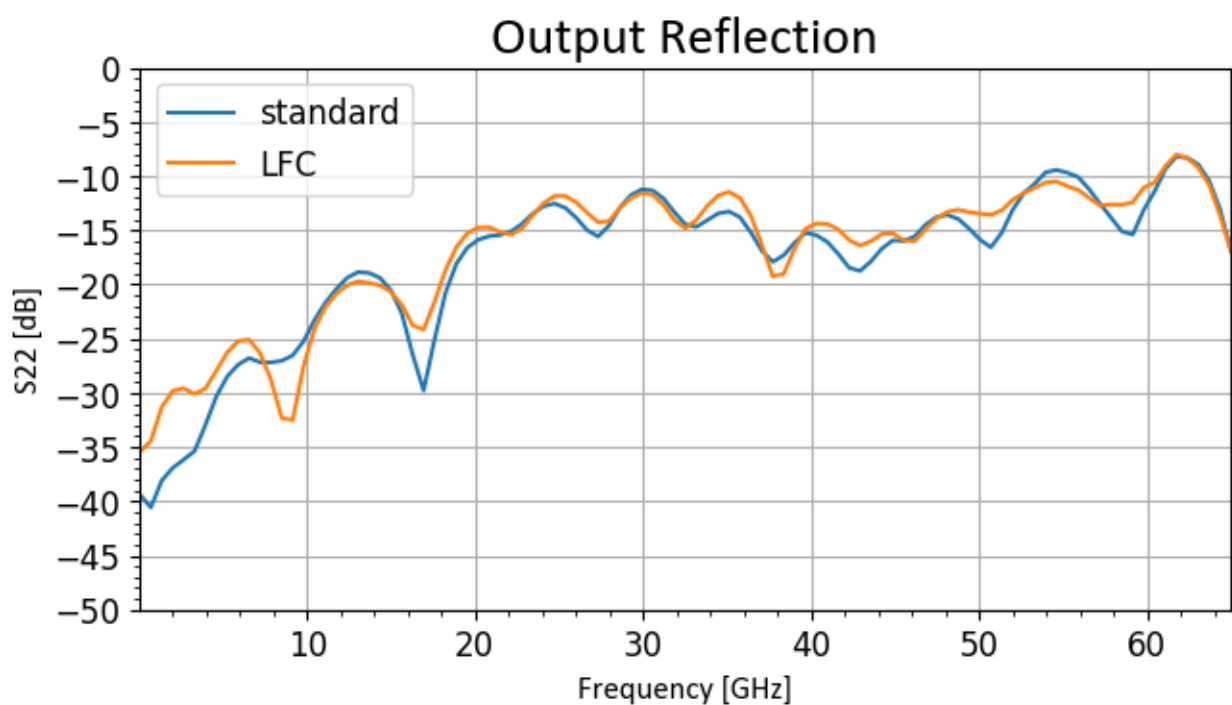
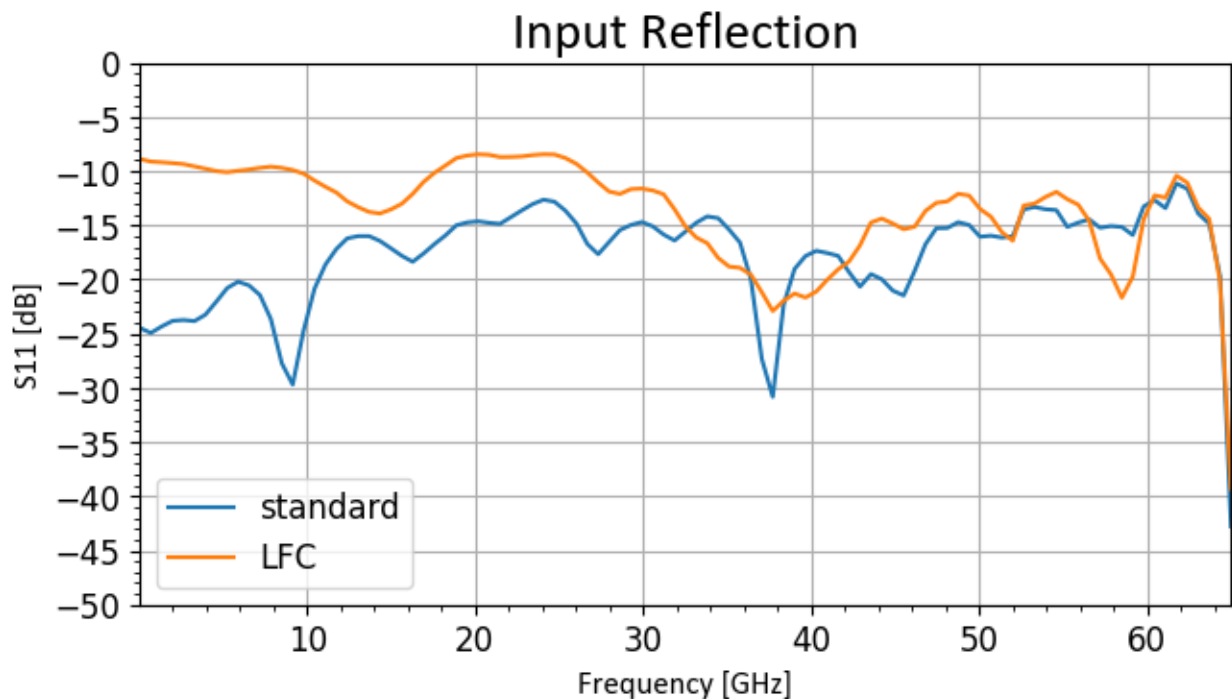
## Typical Group Delay





## Typical Reflection Coefficient

The measurement below has been performed using an Anritsu® 37397C VNA with a -10 dBm power calibration. The unused output had been terminated with 50 Ohm.



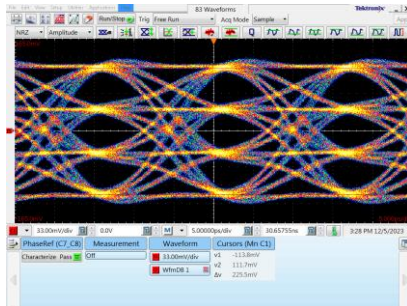
® Anritsu is a registered trademark of Anritsu Corporation



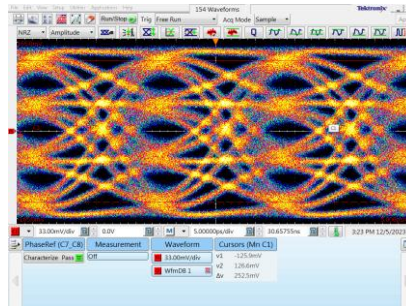


## Typical Output Eye Diagram

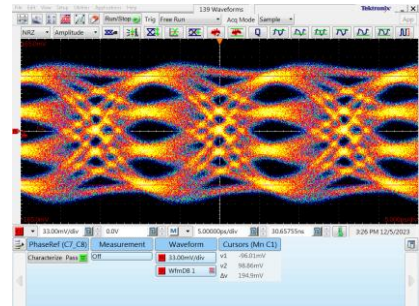
The measurements below had been performed using a BPG SHF 12105 A (PRBS 2<sup>31</sup>-1) in combination with a SHF C911 A 4 Bit DAC and a Tektronix® DSA 8300 Digital Serial Analyzer with Phase Reference (82A04B-60G) and 70 GHz Sampling Module (80E11). The output of the module had been connected directly to the DSA input. The measurement is single ended to single ended. The unused port has been terminated with 50 Ohm. The performance of each output (output and inverted output) is identical.



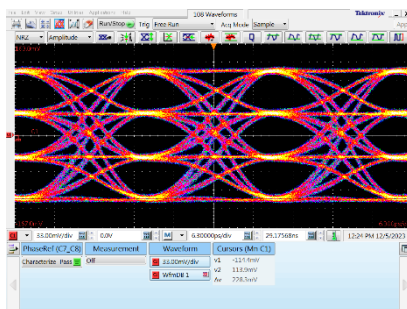
Input @ 64 GBaud



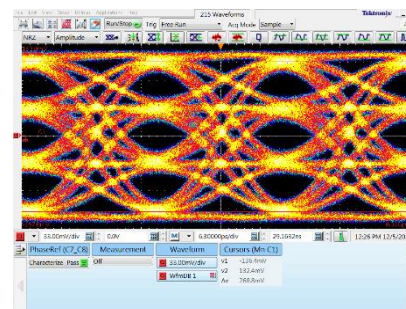
Output @ 64 GBaud



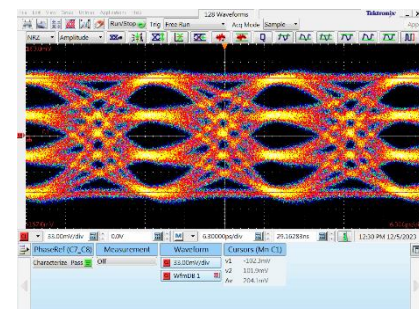
Output LFC @ 64 GBaud



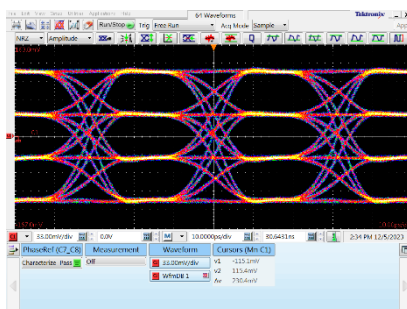
Input @ 50 GBaud



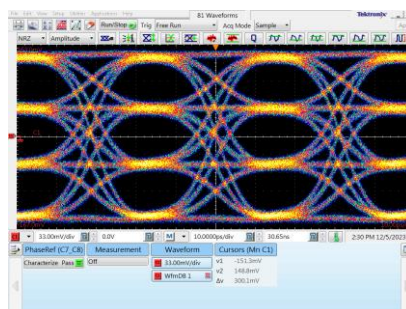
Output @ 50 GBaud



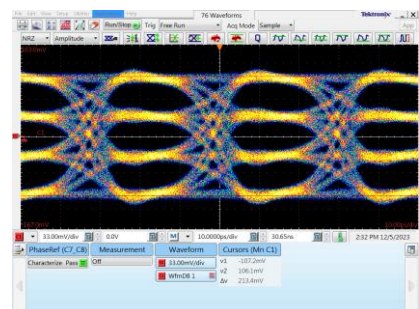
Output LFC @ 50 GBaud



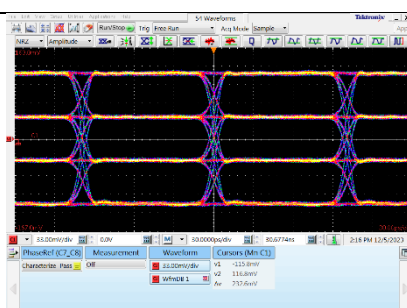
Input @ 32 GBaud



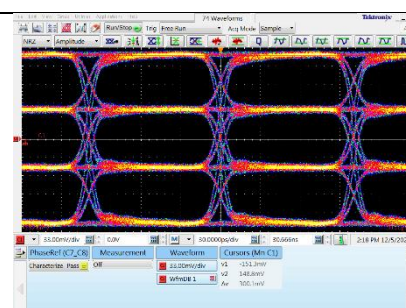
Output @ 32 GBaud



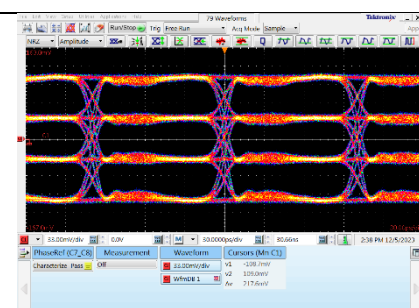
Output LFC @ 32 GBaud



Input @ 10 GBaud



Output @ 10 GBaud



Output LFC @ 10 GBaud

® Tektronix is a registered trademark of Tektronix Inc.



Technical drawings of the SHF BLN60 100 MHz - 60 GHz attenuator. The drawings include a top view, a side view, a front view, and a rear view. Dimensions are given in mm.

**Top View:** Width 28 mm, Height 37 mm. Port 1 (BNC) on the left, Port 2 (BNC) on the right. Port 3 (BNC) on the right. Port 4 (BNC) on the left. Port 5 (BNC) on the left. Dimensions: 12.4 mm (from center to Port 1), 12.4 mm (from center to Port 2), 6.3 mm (from center to Port 3), 6.3 mm (from center to Port 4), 6.3 mm (from center to Port 5).

**Side View:** Width 14.1 mm, Height 20.5 mm. Port 1 (BNC) on the left, Port 2 (BNC) on the right. Port 3 (BNC) on the right. Port 4 (BNC) on the left. Port 5 (BNC) on the left. Dimensions: 6.3 mm (from center to Port 1), 6.3 mm (from center to Port 2), 6.3 mm (from center to Port 3), 6.3 mm (from center to Port 4), 6.3 mm (from center to Port 5).

**Front View:** Width 29 mm, Height 20.5 mm. Port 1 (BNC) on the left, Port 2 (BNC) on the right. Port 3 (BNC) on the right. Port 4 (BNC) on the left. Port 5 (BNC) on the left. Dimensions: 6.3 mm (from center to Port 1), 6.3 mm (from center to Port 2), 6.3 mm (from center to Port 3), 6.3 mm (from center to Port 4), 6.3 mm (from center to Port 5).

**Rear View:** Width 28 mm, Height 37 mm. Port 1 (BNC) on the left, Port 2 (BNC) on the right. Port 3 (BNC) on the right. Port 4 (BNC) on the left. Port 5 (BNC) on the left. Dimensions: 12.4 mm (from center to Port 1), 12.4 mm (from center to Port 2), 6.3 mm (from center to Port 3), 6.3 mm (from center to Port 4), 6.3 mm (from center to Port 5).

**Port Legend:**

Port	Connector
1	1.85
2	1.85
3	1.85
4	1 mm
5	Mini B

Port	Connector	Designation
1	1.85mm (V) female	Input (In)
2	1.85mm (V) female	Output (Out)
3	1.85mm (V) female	Inverting Output ( $\overline{\text{Out}}$ )
4	1 mm Soldering Pin	GND
5	Mini Bushing EMI Filter	+9 V / 0.1 A

all dimensions in mm



**SHF Communication Technologies AG**

Wilhelm-von-Siemens-Str. 23 D | 12277 Berlin | Germany

+49 30 772 051 0

[sales@shf-communication.com](mailto:sales@shf-communication.com)

[www.shf-communication.com](http://www.shf-communication.com)