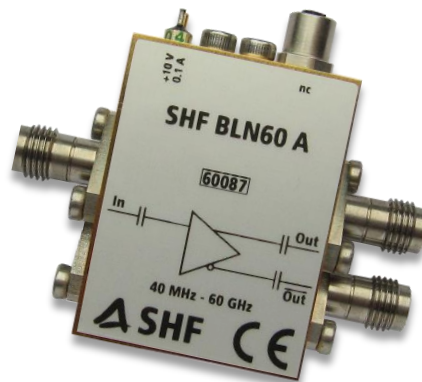


Data Sheet

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: 40 MHz... 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 40 MHz 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
Input Frequency	GHz	f_{in}	0.04		60	
Input Power	dBm	P_{in}			-3	-1 dBm with LFC option
Single-ended Gain ¹	dB	G	-2 -3		+3 -2	$f_{in} < 50$ GHz $f_{in} \geq 50$ GHz
Single-ended Gain with LFC ¹	dB	G_{LFC}	-2 -4		0 -2	$f_{in} < 50$ GHz $f_{in} \geq 50$ GHz
P1dB Output	dBm	P_{1dB}			1	
Phase Balance	°	PH	0 1		2.5 5	$f_{in} < 50$ GHz $f_{in} \geq 50$ GHz
Amplitude Balance	dB	A			0.3	
RMS Jitter	fs	J_{rms}				See ²

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	

¹Single-ended Gain equals $|S_{21}| = |S_{31}|$

²No signal degradation of jitter or duty cycle was observed for sin or square wave signals.



Mechanical Characteristics

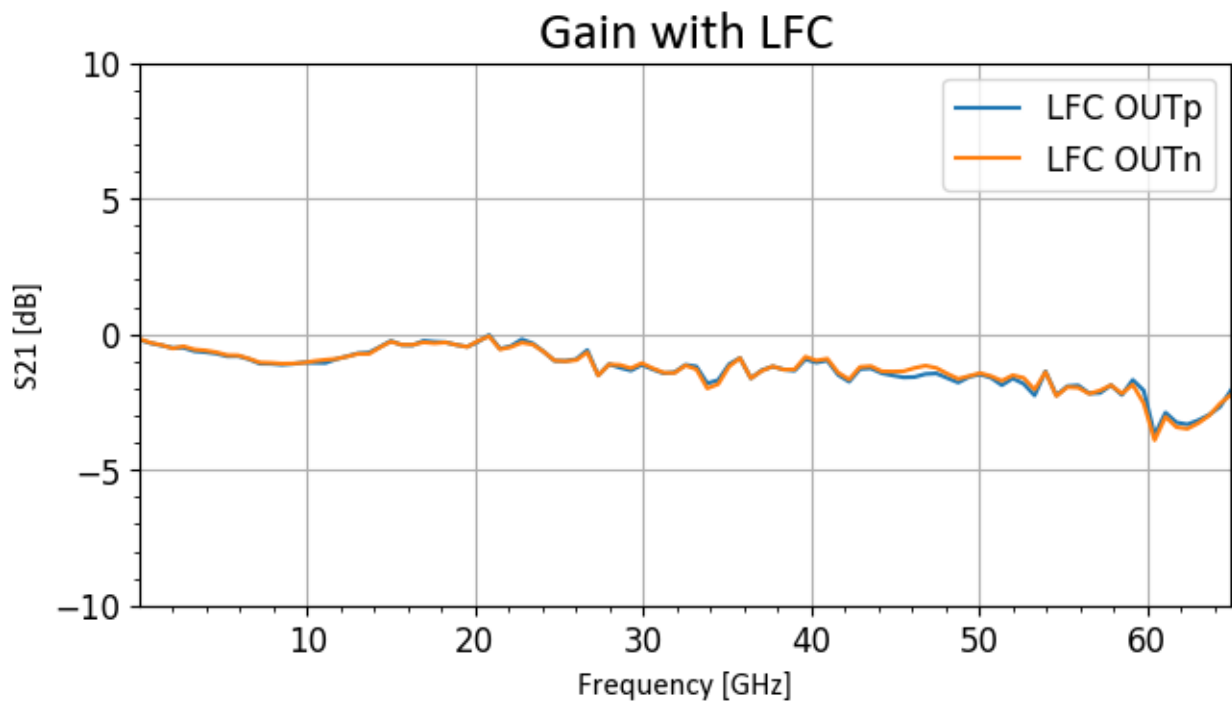
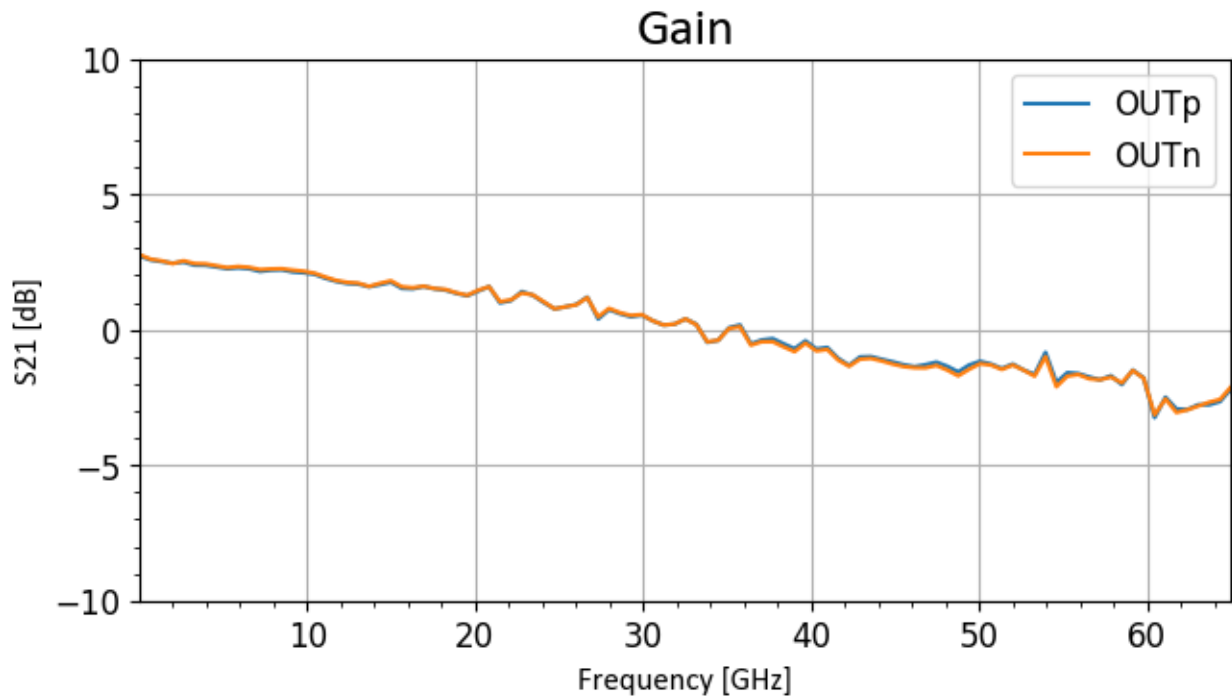
Parameter	Unit	Symbol	Min	Typ	Max	Conditions
Input Connector						1.85 mm (V) female ³
Output Connector P						1.85 mm (V) female ³
Output Connector N						1.85 mm (V) female ³
Weight	g			40		

³Other gender configurations are available on request



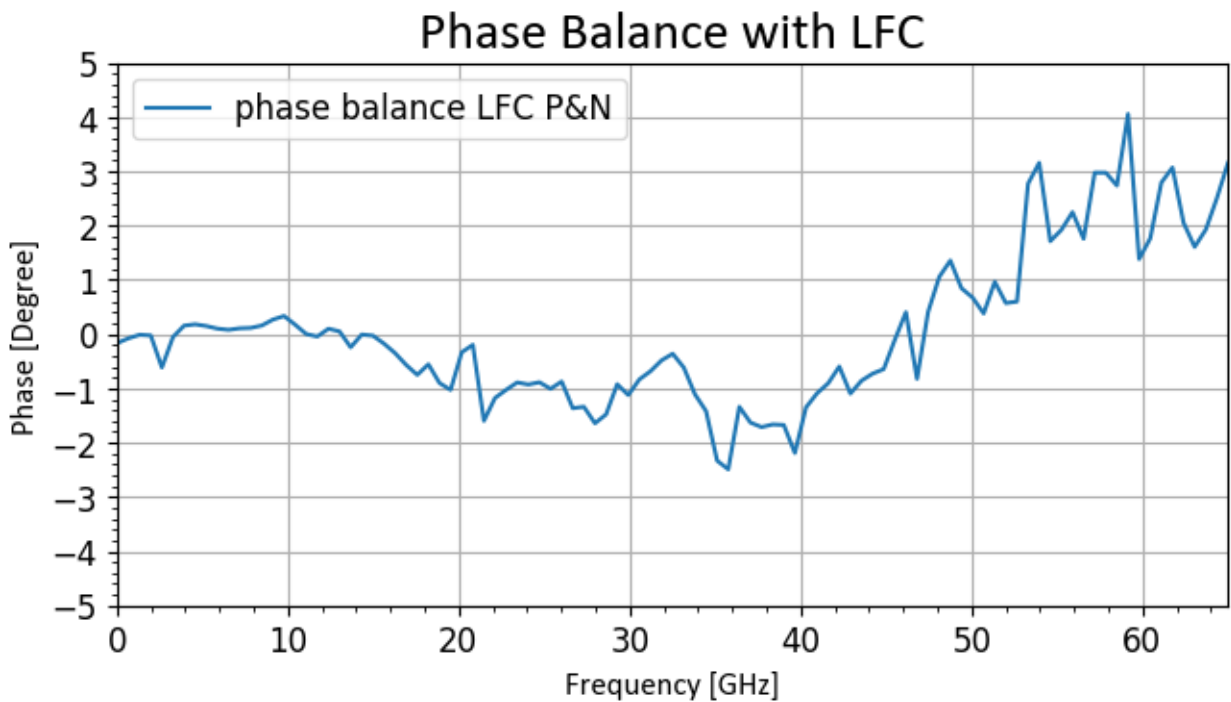
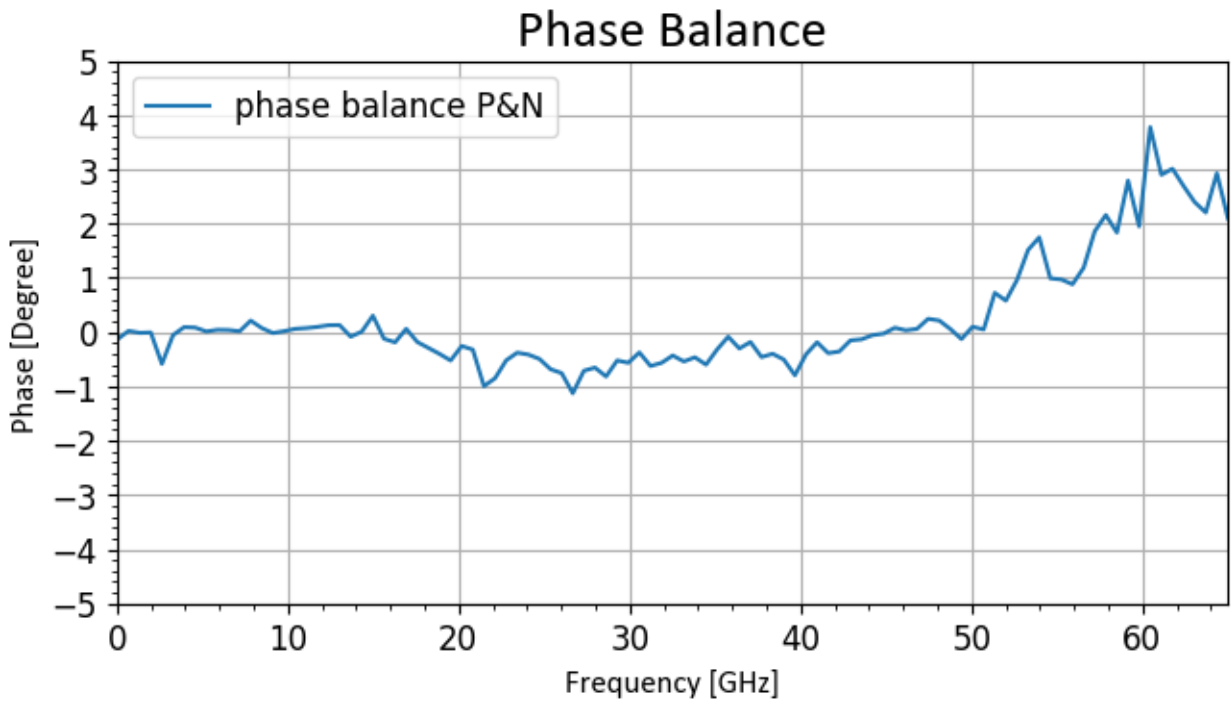
Typical Gain

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.



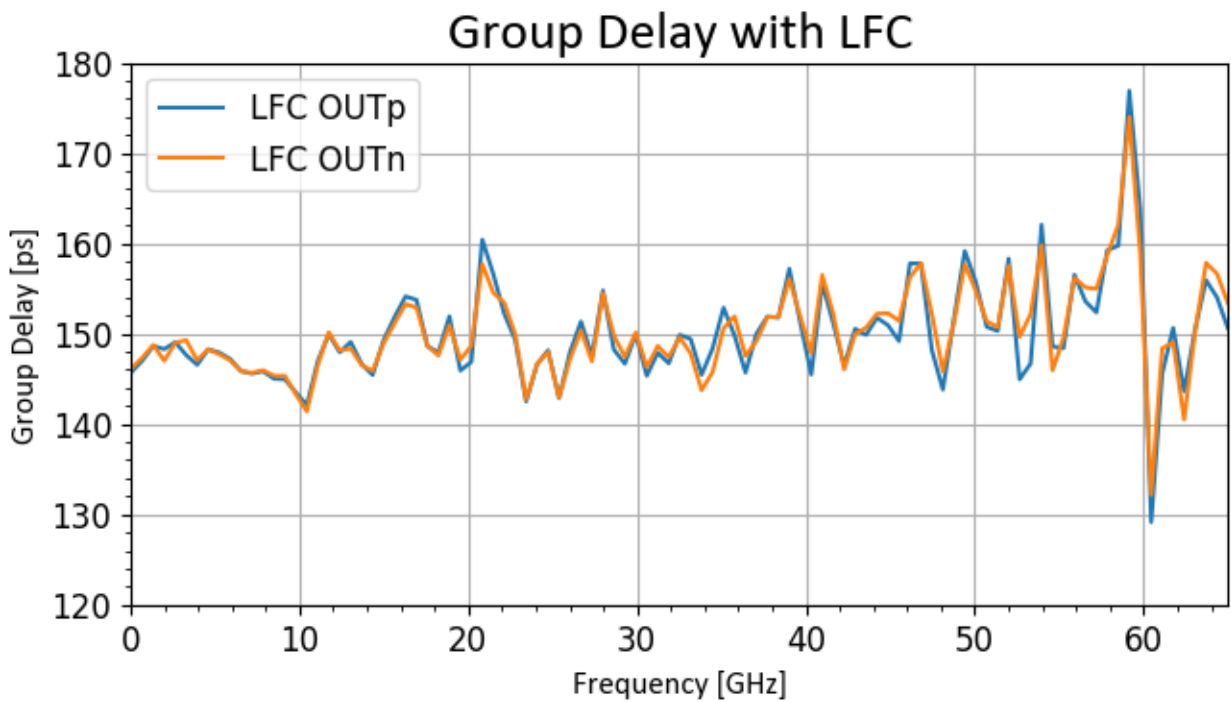
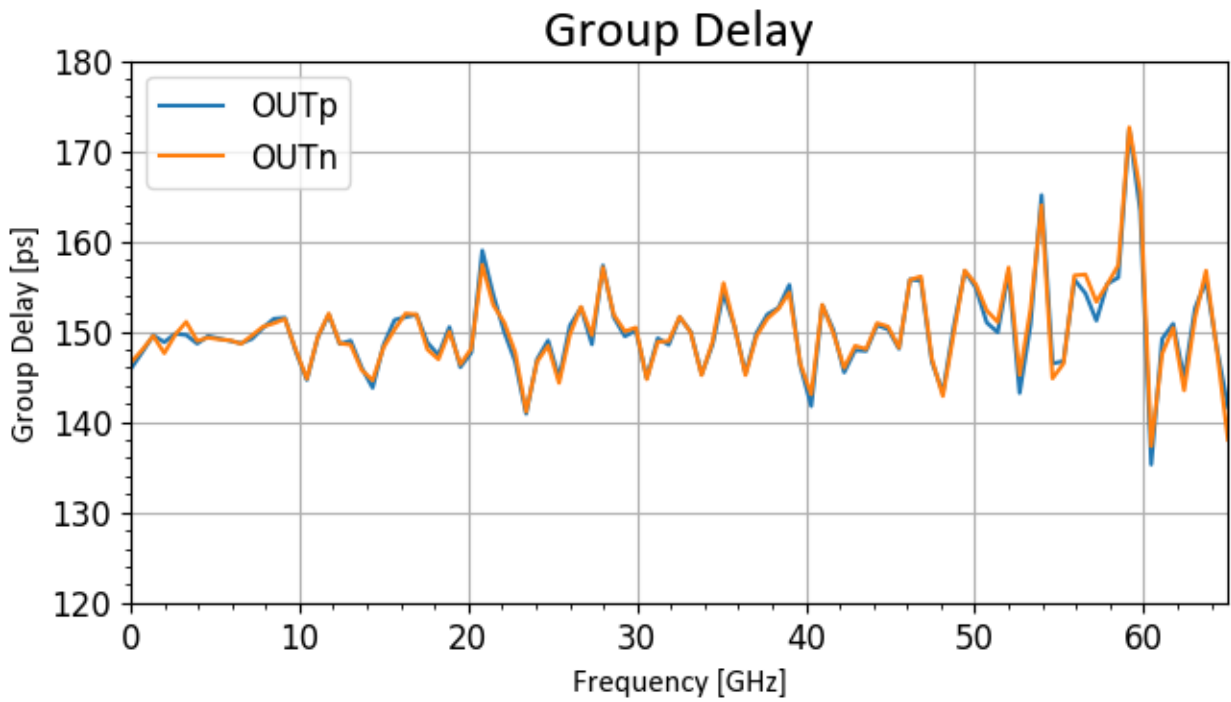


Typical Phase Balance





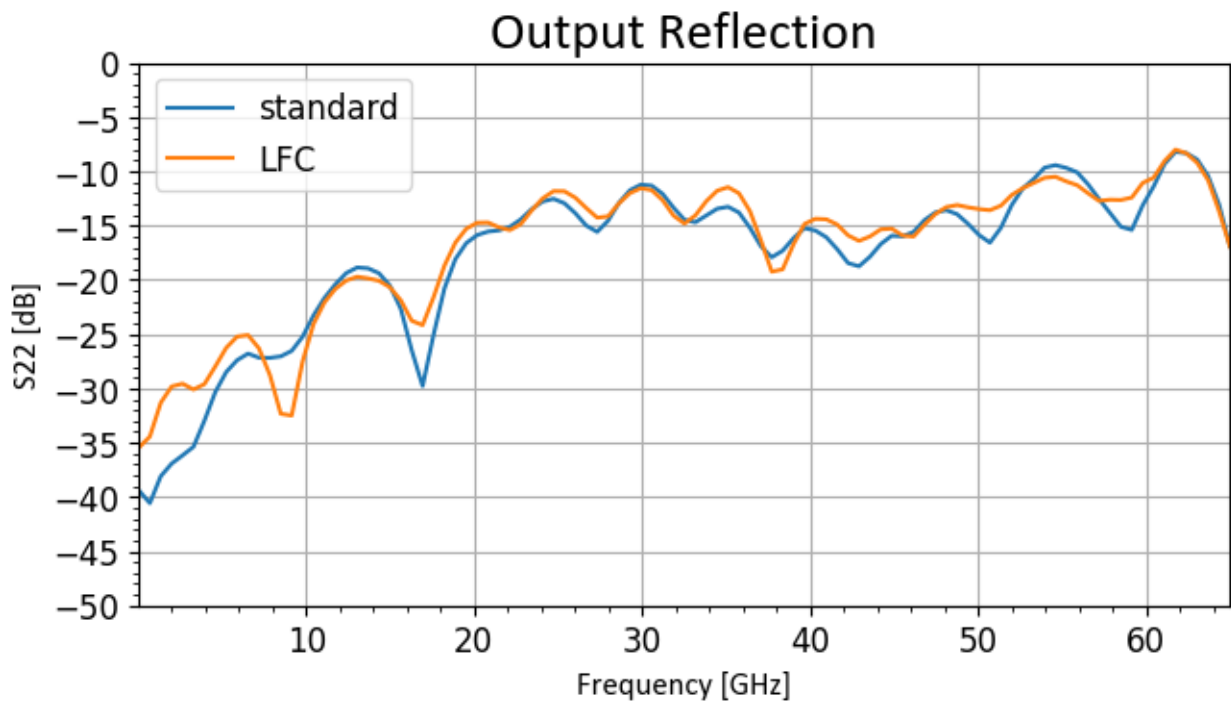
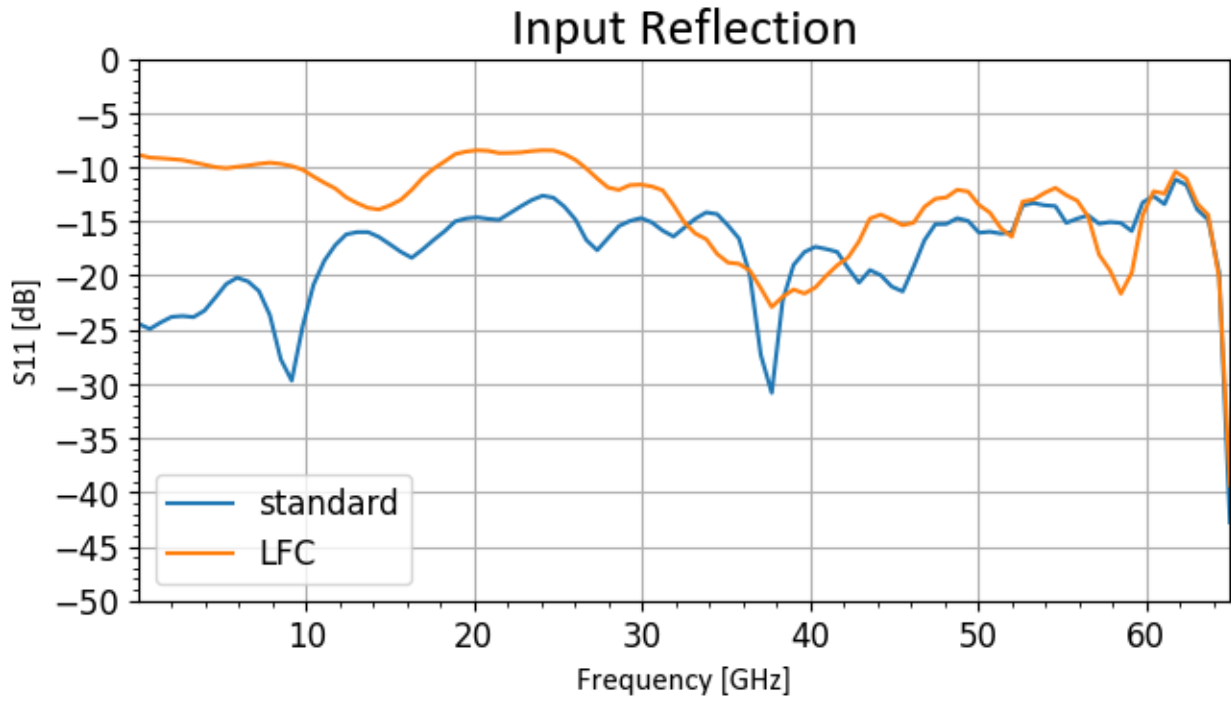
Typical Group Delay





Typical Reflection Coefficient

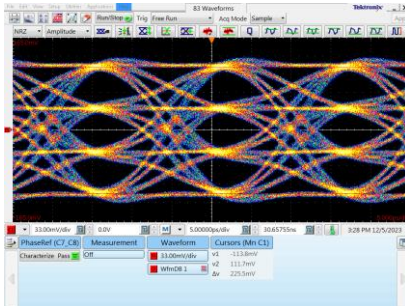
The measurement below has been performed using an Anritsu 37397C VNA with a -10 dBm power calibration. The unused output had been terminated with 50 Ohm.



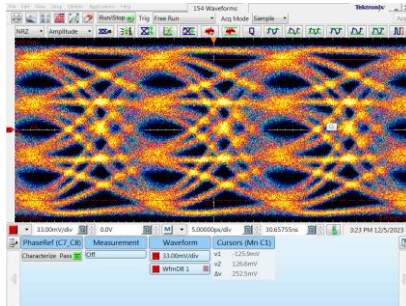


Typical Output Eye Diagram

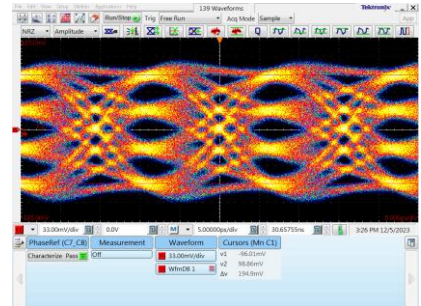
The measurements below had been performed using a BPG SHF 12105 A (PRBS 2³¹-1) in combination with a SHF C911 A 4 Bit DAC and a Tektronix DSA 8300 Digital Serial Analyzer with Phase Reference (82A04B-60G) and 70 GHz Sampling Module (80E11). The output of the module had been connected directly to the DSA input. The Measurement is single ended to single ended. The other port has been terminated with 50 Ohm. The performance of each output (output and inverted output) is identical.



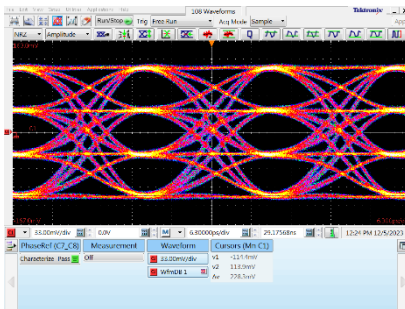
Input @ 64 GBaud



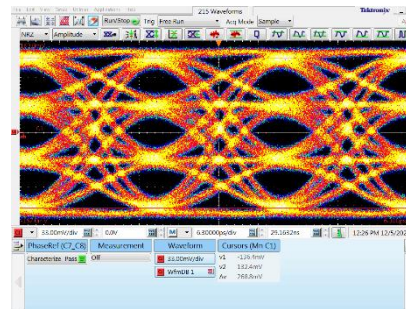
Output @ 64 GBaud



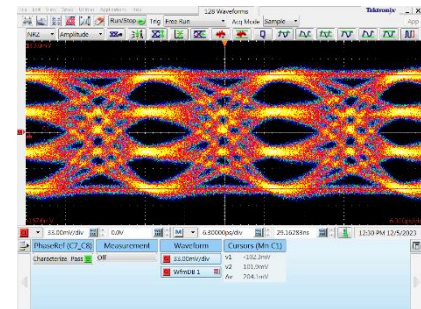
Output LFC @ 64 GBaud



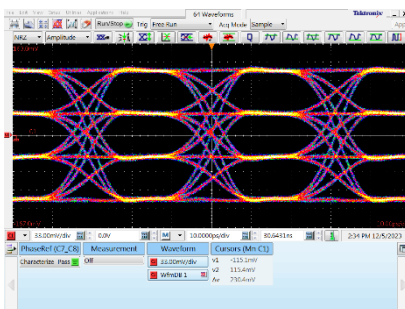
Input @ 50 GBaud



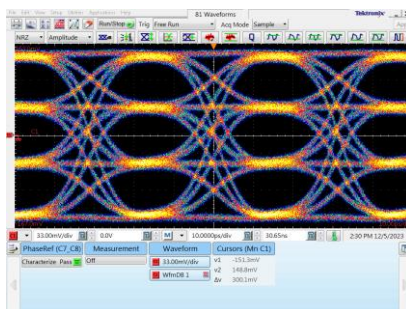
Output @ 50 GBaud



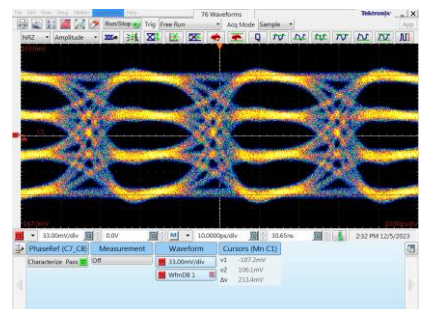
Output LFC @ 50 GBaud



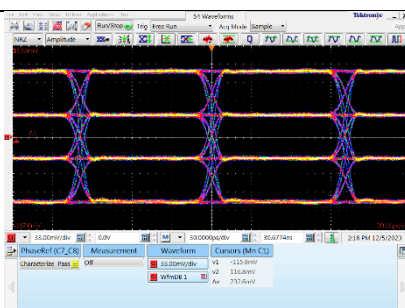
Input @ 32 GBaud



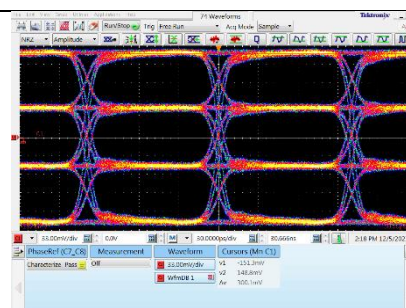
Output @ 32 GBaud



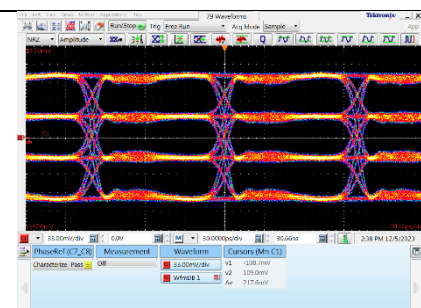
Output LFC @ 32 GBaud



Input @ 10 GBaud



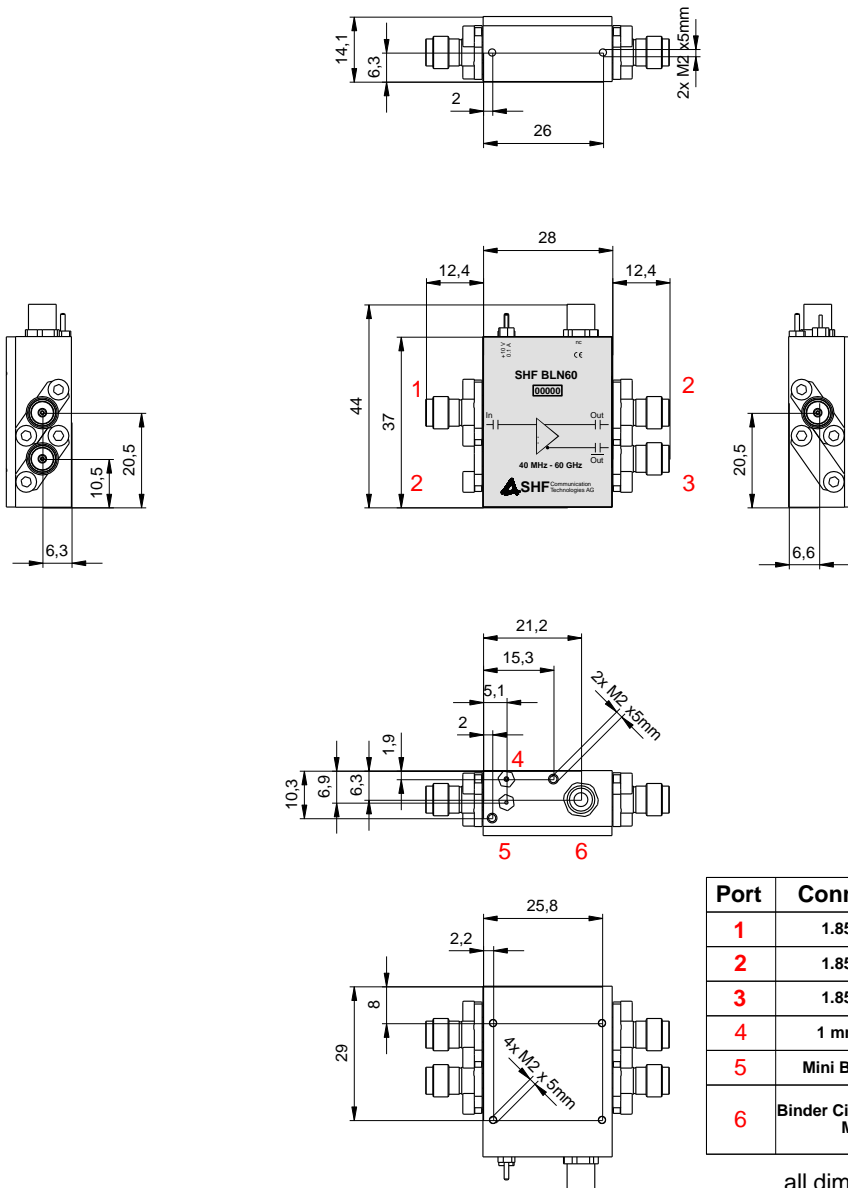
Output @ 10 GBaud



Output LFC @ 10 GBaud



Mechanical Drawing



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	+10 V / 0.1 A
6	Binder Circular Connector 3 p M5 707 series	nc

all dimensions in mm



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