

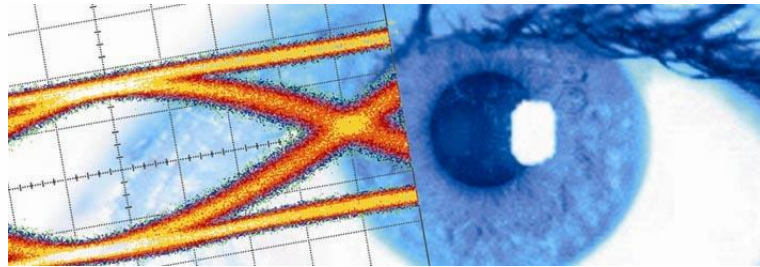


## SHF Communication Technologies AG

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# Datasheet

## SHF C603 A

### 120 Gbps

### 2:1 Multiplexer





## Description

The SHF C603 A is a 2:1 Multiplexer operating at data rates up to 120 Gbps for use in broadband test setups and telecom transmission systems. Two single ended serial data streams of up to 60 Gbps are accepted by the multiplexer and converted into one differential data signal of up to 120 Gbps. A single ended clock signal with a frequency half of the output data rate drives the SHF C603 A. All RF in- and output ports are AC-coupled and internally terminated with 50 Ohm to GND. Unused in- or output ports should be terminated with 50 Ohm.

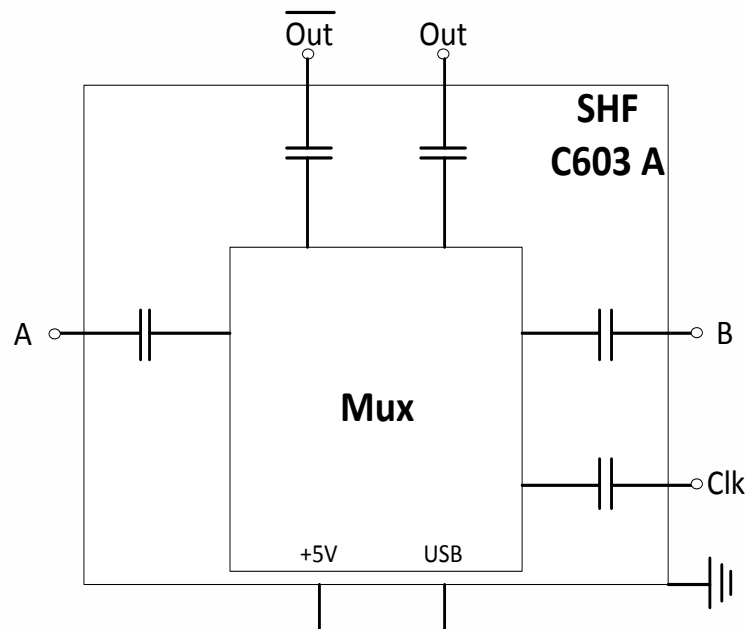
## Features

- Broadband operation up to 120 Gbps
- Differential data output, 400mV single ended output swing
- Single ended clock and data inputs
- Output Level Control
- USB interface

## Applications

- 100G, 200G and 400G system evaluation & development
- Telecom transmission
- Broadband test and measurement equipment

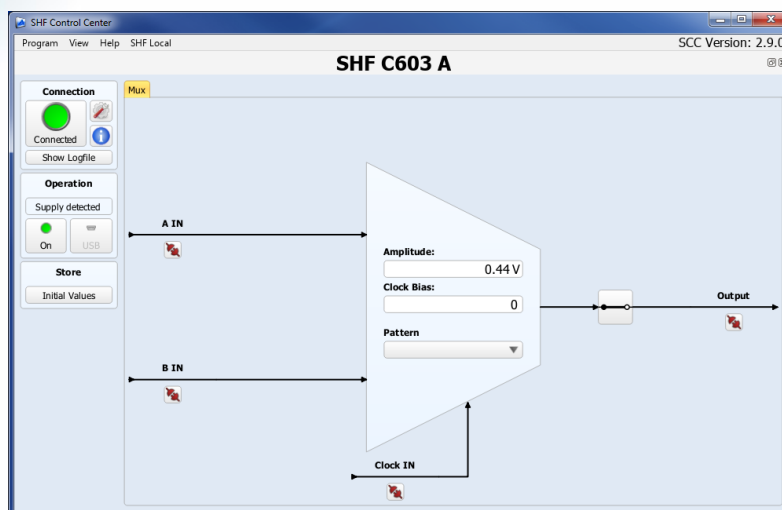
## Block Diagram





## Remote Interface & Software

The MUX is controlled by the easy to use software package SHF Control Center (SCC). The amplitude, the duty cycle and the RF output state (on/off) can be set and is displayed in the graphical user interface (GUI).



SHF Control Center (SCC)

## Absolute Maximum Ratings

Parameter	Unit	Symbol	Min.	Typ.	Max.	Comment
<b>Input Parameters</b>						
Data Input Voltage	mV	$V_{data\ in}$			900	Peak-to-Peak
Clock Input Voltage	mV	$V_{clk\ in}$			900	Peak-to-Peak
External DC Voltage on RF Input Ports	V	$V_{DCin}$	-6		+6	AC coupled input
External DC Voltage on RF Output Ports	V	$V_{DCout}$	-6		+6	AC coupled output
DC Supply Voltage	V	$V_{cc}$	0		+6	



## Specifications

Parameter	Unit	Symbol	Min.	Typ.	Max.	Comment
<b>Input Parameters</b>						
Data Input Voltage	mV	$V_{data\ in}$	300		800	
Minimum Clock Input Frequency	GHz	$f_{in,\ min}$		1	2	
Maximum Clock Input Frequency	GHz	$f_{in,\ max}$	60			
Clock Input Voltage	mV <sub>pp</sub>	$V_{clk\ in}$	400		800	
<b>Output Parameters</b>						
Minimum Output Data Rate	Gbps	$R_{out,min}$		2	4	@ 500mV <sub>pp</sub> clock input
Maximum Output Data Rate	Gbps	$R_{out,max}$	120			@ 500mV <sub>pp</sub> clock input
Maximum Output Amplitude	mV	$V_{out}$	350	400	550	single ended, adjustable up to -3dB
Rise / Fall time	ps	$t_r/t_f$		5	6	20% / 80%
Output Jitter, RMS value <sup>1</sup>	fs	$J_{rms}$		350 550	550 650	≤ 100Gbps > 100Gbps
<b>Power Requirement</b>						
Supply Voltage	V	$V_{cc}$	+5	5.2	+5.5	2.5 x 0.7 mm DC Power Jack
Supply Current	mA	$I_{cc}$		960		
Power Dissipation	W	$P_d$		4.8		@ $V_{cc} = +5V$
<b>Conditions</b>						
Case Temperature <sup>2</sup>	°C	$T_{case}$	10		45	

<sup>1</sup> Test condition: Clock Input Signal Jitter<sub>RMS</sub> < 150 fs

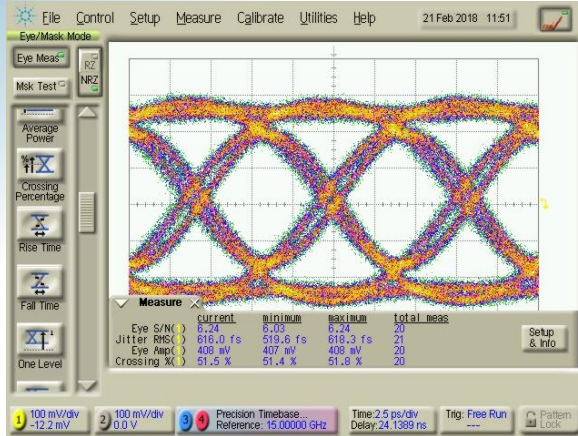
<sup>2</sup> Tr / Tf of the output data signal can be slightly decreased by applying additional cooling measures like heat sinks or cooling fans.



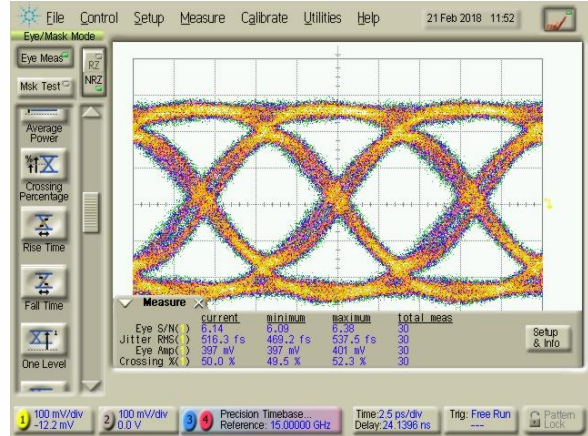


## Typical Output Eye Diagrams

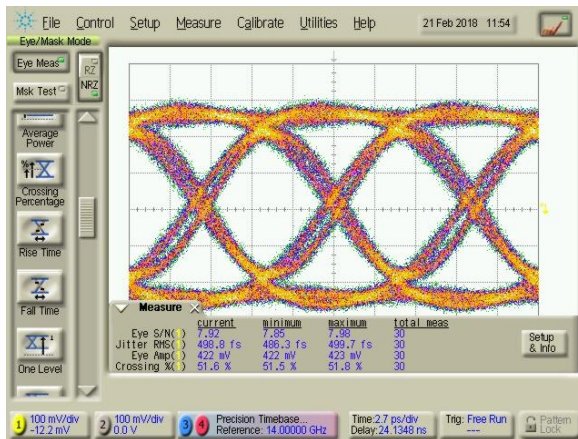
The measurements below had been performed using a SHF 12104 A Bit Pattern Generator (PRBS  $2^{31}-1$ ) and an Agilent Digital Communication Analyzer (DCA) with a Precision Timebase Module (86107A) and a 70 GHz Sampling Module (86118A). The outputs of the MUX module had been connected directly to the DCA input.



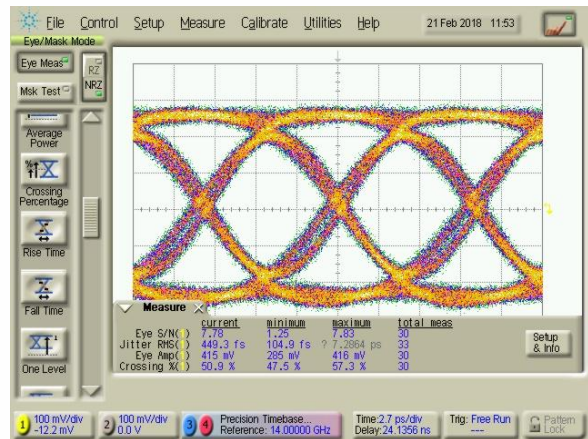
Out @ 120 Gbps



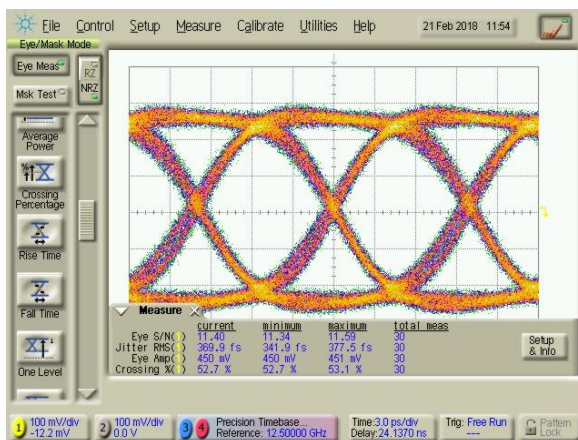
Out inv. @ 120 Gbps



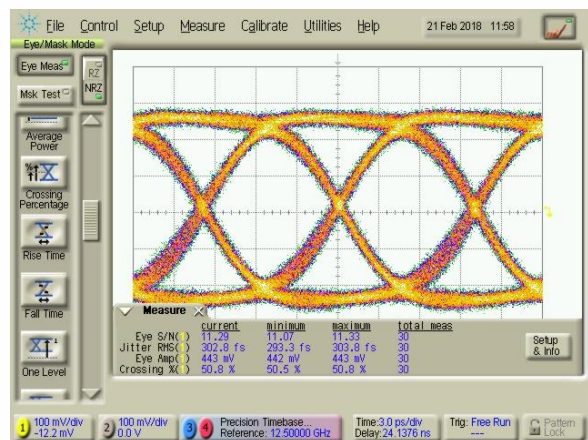
Out @ 112 Gbps



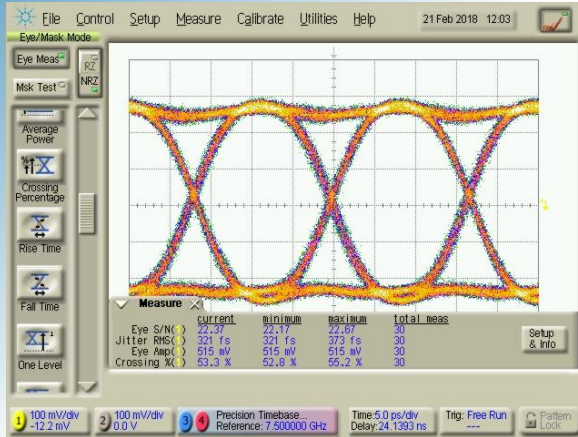
Out inv. @ 112 Gbps



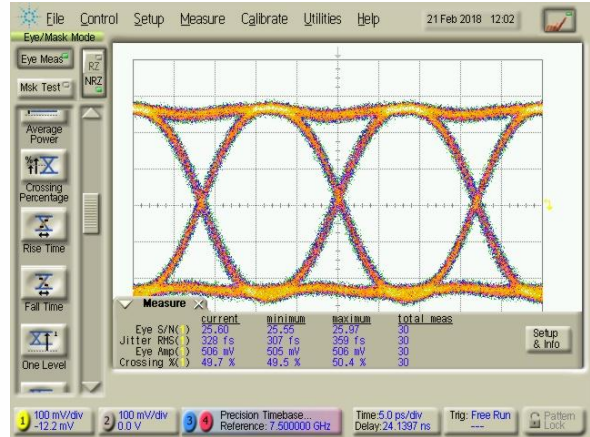
Out @ 100 Gbps



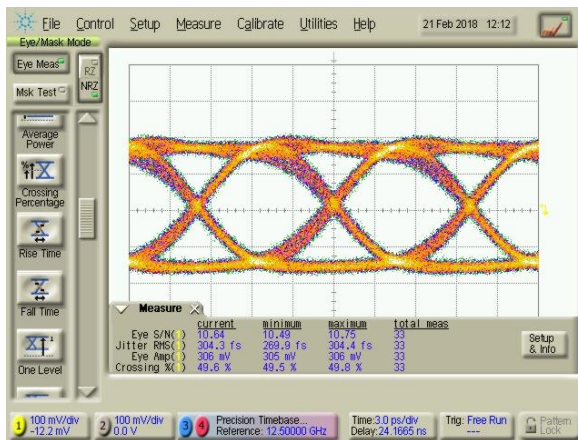
Out inv. @ 100 Gbps



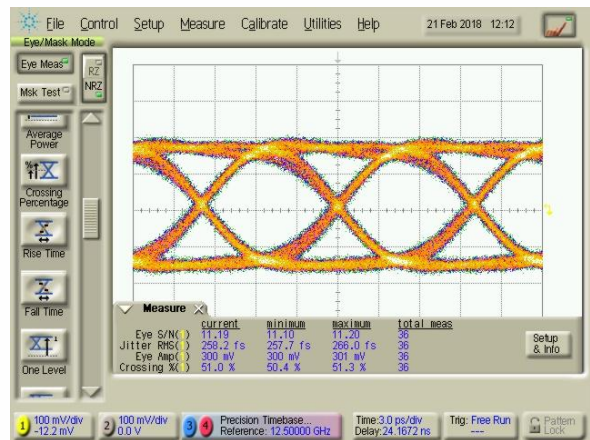
**Out @ 60 Gbps**



**Out inv. @ 60 Gbps**



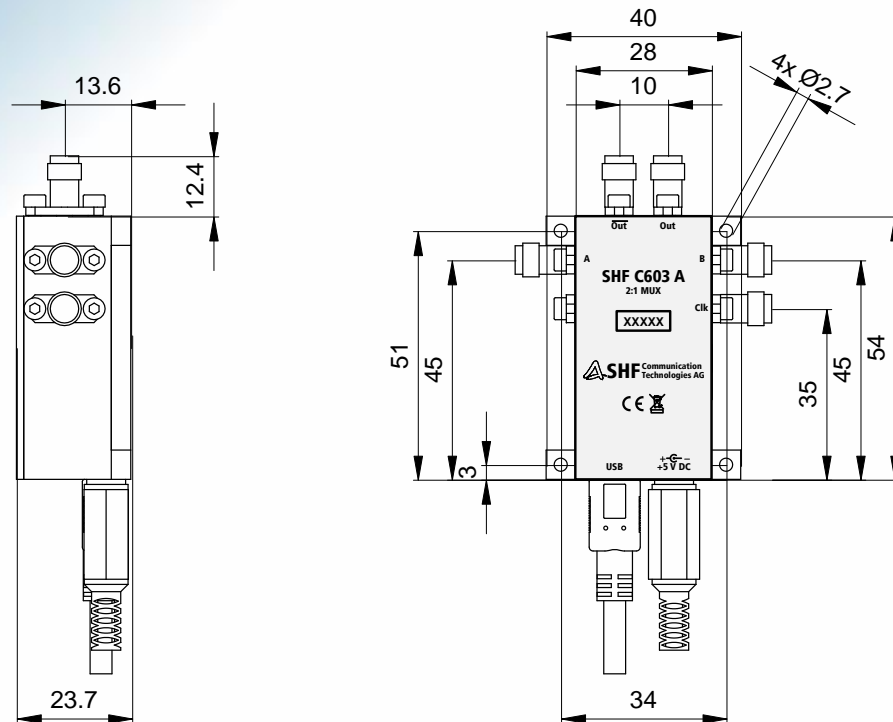
**Out @ 100 Gbps, Level = -3dB**



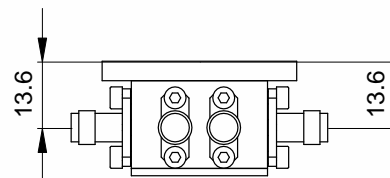
**Out! @ 100 Gbps, Level = -3dB**



## Outline Drawing – Module

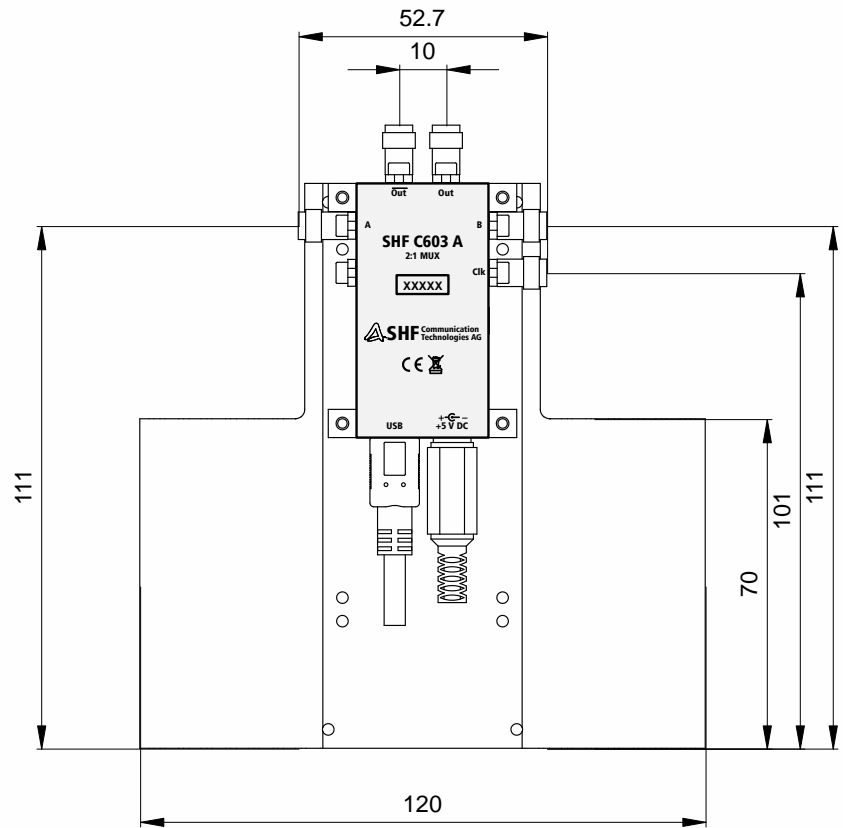
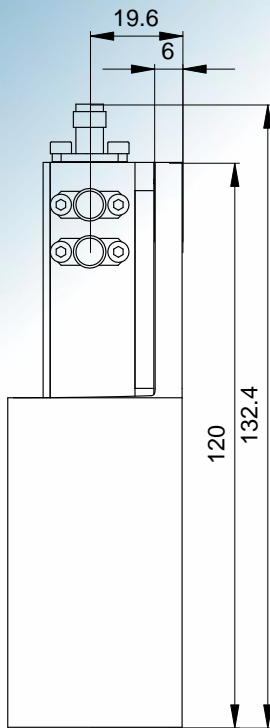


Port	Connector
Out	1.85mm (V) female
Out	1.85mm (V) female
A	1.85mm (V) female
B	1.85mm (V) female
Clk	1.85mm (V) female





## Outline Drawing – Module with Heat Sink



Port	Connector
Out	1.85mm (V) female
Out	1.85mm (V) female
A	1.85mm (V) female
B	1.85mm (V) female
Clk	1.85mm (V) female

