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Datasheet SHF C642 A 60 GHz T-Flip-Flop (TFF) 1:2 Frequency Divider



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Description

The SHF C642 A is a T-Flip-Flop (TFF) module capable of broadband operation up to 60 GHz using a sinusoidal input signal. A frequency of half the input frequency is provided at the outputs. It offers high quality output signals together with a compact size and ease of operation.

Features

- Broadband operation up to 60 GHz
- Two differential output ports with 90° phase shift between the outputs
- 700 mV_{pp} single ended output swing
- Single ended or differential operation (either In or In! or both can be used)

Applications

- 100G Ethernet development and prototyping
- OC-768 / STM-256 applications
- Telecom transmission
- Fibre Channel[®]
- Broadband test and measurement equipment

Block Diagram



Accessories1

- +5V Power Supply Desktop Adapter
- Functional earth cable → Connection to test setup ground has to be set up first before any other connection to prevent instrument damage!

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[®] Fibre Channel is a registered trademark of the Fibre Channel Industry Association

¹ Mini-USB port is only for service purposes, no USB cable will be provided



Absolute Maximum Ratings

Parameter	Unit	Symbol	Min.	Тур.	Max.	Comment
Input Parameters						
Input Voltage	mV	$V_{\text{clk}\text{in}}$			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.	Тур.	Max.	Comment
Input Parameters						
Minimum Input Frequency ²	GHz	f _{in,min}		1	2	@ 500mV input amplitude, see page 7
Maximum Input Frequency	GHz	f _{in,max}	60	62		@ 500mV input amplitude, see page 7
Input Voltage	mV	V _{in}	500 600		900 ³ 900 ³	≤ 50GHz > 50GHz Single ended, peak-to- peak, see page 7
Output Parameters						
Output Voltage	mV	V _{out}	500		900	Single ended, peak-to- peak, see page 7
Power Requirements						
Supply Voltage	V	V _{cc}	4.8	5.0	5.2	
Supply Current	mA	Icc		630	700	
Power Dissipation	mW	Pd		3150		@ V _{CC} = +5V
Conditions						
Operating Temperature	°C	Tambient	15		35	

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² Theoretical limit is DC, practical limit depends on slew rate of input signal

³ corresponds to a maximum sinusoidal input signal of +3dBm



Typical Output Waveforms

The measurements below had been performed using an Agilent 86100B DCA with Precision Time Base Module (86107A) and 70 GHz Sampling Head (86118A). The output of the TFF had been connected directly to the DCA input.



Output signal @ fout = 30 GHz



Output signal @ fout = 25 GHz



Output signal @ fout = 16 GHz



Output signal @ fout = 28 GHz



Output signal @ fout = 21.5 GHz



Output signal @ f_{out} = 14 GHz

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Output signal @ fout = 12.5 GHz



Output signal @ fout = 8 GHz



Output signal @ fout = 0.5 GHz

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Output Signal Timing

The measurements had been performed using an Agilent 86100B DCA with Precision Time Base Module (86107A) and 70 GHz Sampling Head (86118A). The output of the TFF had been connected directly to the DCA input. The screenshots shown below describe the phase relation between the 2 differential output signals with its 90° phase shift between output port 1 and output port 2.







Out1 inverted @ f_{out} = 5 GHz



Out2 @ f_{out} = 5 GHz



Out2 inverted @ fout = 5 GHz

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Input Sensitivity



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Port	Connector
In	1.85mm (V) female
In	1.85mm (V) female
Out1	2.92mm (K) female
Out1	2.92mm (K) female
Out2	2.92mm (K) female
Out2	2.92mm (K) female



Port	Connector
а	Mini-USB
b	Power
С	Functional earth (FE)

All dimensions are in mm.

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Port	Connector
In	1.85mm (V) female
In	1.85mm (V) female
Out1	2.92mm (K) female
Out1	2.92mm (K) female
Out2	2.92mm (K) female
Out2	2.92mm (K) female



All dimensions are in mm.

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