

## Features

- SMPTE 259M/292M/424M compatible
- Robust error free transmission of signals from 50Mbps to 3Gbps with up to 40km single-mode fiber
- Maximum distance of 40km under worst-case conditions and 3Gbps video pathological signals
- Supports video pathological patterns for SD-SDI, HD-SDI and 3G-SDI
- SFF package with single LC receptacle.
- Metal enclosure for lower EMI
- +3.3V single power supply.
- Laser disable pin
- Digital diagnostics and control via I<sup>2</sup>C interface, including:
  - Monitoring laser bias current, average output power, supply voltage and temperature
  - Alarm reporting when transmitter is at fault
  - Module ID polling
- Compliant ROHS and lead free

## Applications

- SMPTE 297-2006 compatible electrical-to-optical interfaces

## Descriptions

The CTF55D6-21-SDI-2X10 is a single channel optical transmitter module designed to transmit optical serial digital signals as defined in SMPTE 297-2006. The CTF55D6-21-SDI is specifically designed for robust performance in the presence of SDI pathological patterns for SMPTE 259M, SMPTE 292M and SMPTE 424M serial rates.

## Ordering Information

Part Number	Package	Temperature Range
CTF55D6-21-SDI-2X10	SFF	0°C to 70°C

**Functional Block Diagram**

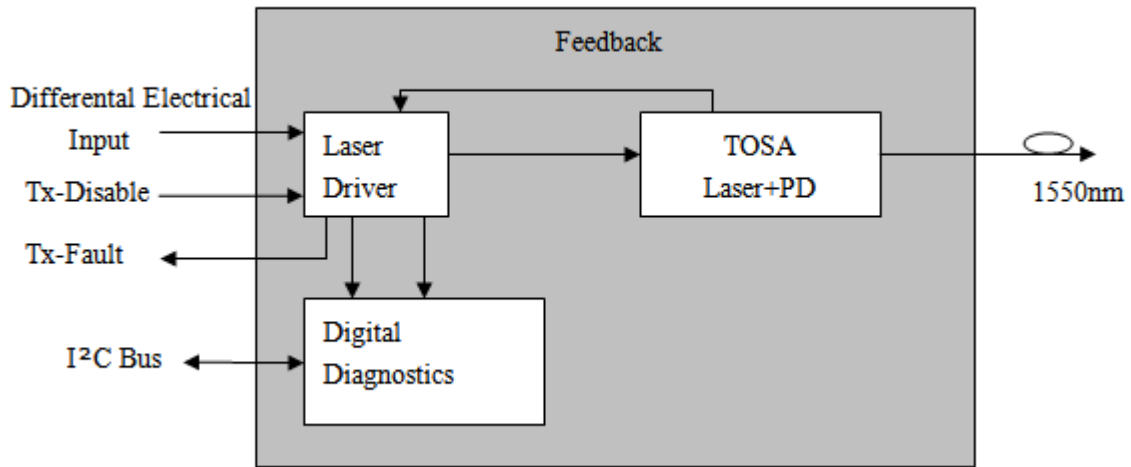
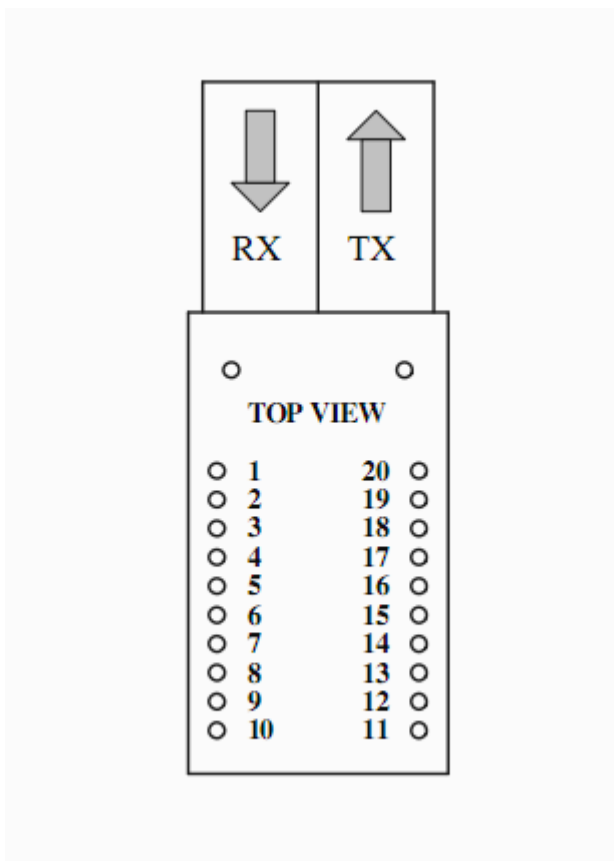


Figure 1: CTF55D6-21-SDI-2X10 Functional Block Diagram

**Pin Description**

**Pin Out Diagram**



### Pin Function Definitions

Pin#	Name	Function	Notes
		Mounting Studs/Solder Poster	Note 1
1	NC	No Connection	
2	VeeR	Receiver Signal Grounding	Note 2
3	VeeR	Receiver Signal Grounding	Note 2
4	NC	No Connection	
5	NC	No Connection	
6	VeeR	Receiver Signal Grounding	Note 2
7	VccR	Receiver Power Supply	Note 3
8	LOS	Loss of Signal Indication	Note 4
9	RD-	Receiver Data Out Bar	Note 5
10	RD+	Receiver Data Out	Note 5
11	VccT	Transmitter Power Supply	Note 3
12	VeeT	Transmitter Signal Grounding	Note 2
13	TxDis	Transmitter Disable	Note 7
14	TD+	Transmitter Data In	Note 8
15	TD-	Transmitter Data In Bar	Note 8
16	VeeT	Transmitter Signal Grounding	Note 2
17	SCL	I <sup>2</sup> C Clock	Note 6
18	SDA	I <sup>2</sup> C Data	Note 6
19	Tx-Fault	Transmitter Fault Indication	Note 9
20	NC	No Connection	

#### Note:

- The two mounting studs did not be connected to the interior of ground. They are provided for transceiver mechanical attachment to the circuit board. It is recommended that the holes in the circuit board be connected to chassis ground.**
- Directly connect these pins to the ground plane.**
- Provide +3.3V DC via the recommend Host Board power supply filter circuit. Locate the power supply filter circuit as close as possible to the VCC pin.**
- Normal optical input levels to the receiver result in logic "0" output. Low optical input levels to the receiver result in a logic "1" output.**
- These are the differential receiver outputs.**
- SCL and SDA should be pulled up with a 4.7K – 10K $\Omega$  resistor on the host board. The pull-up voltage shall be VCC.**
- LVTTTL logic level, to enable module connect to TTL logic low "0".**
- These are the differential transmitter inputs. They are DC-coupled.**
- TX-Fault is an open collector/drain output, which should be pulled up with a 4.7K–10K $\Omega$  resistor on the host board. Pull up voltage between 2.0V and VCC+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V**

## Recommended Host Board Supply Filtering

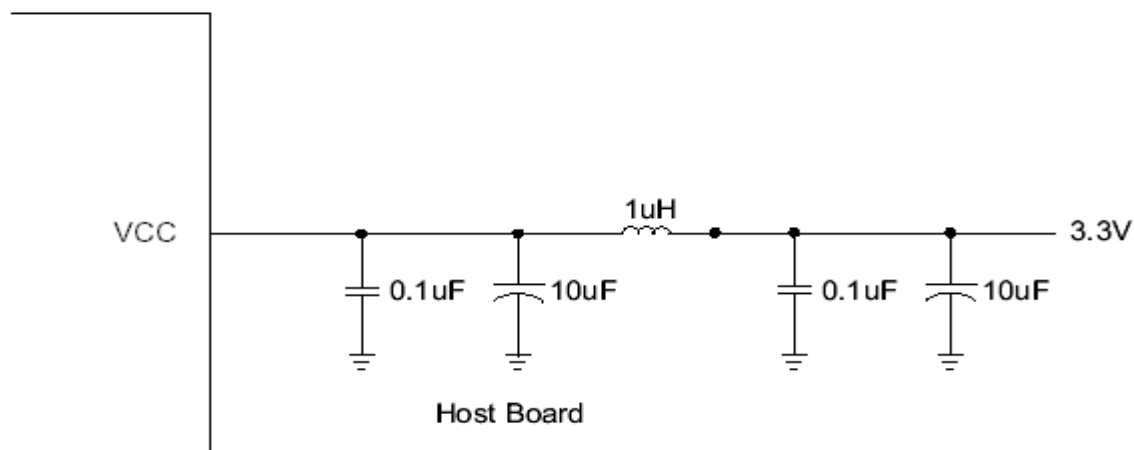


Figure 2: Recommended Host Board Supply Filtering

## Performance Specifications

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T <sub>ST</sub>	-40	+85	°C
Operating case Temperature	T <sub>case</sub>	-20	+85	°C
Input Voltage	-	GND	VCC	V
Power Supply Voltage	VCC-VEE	-0.5	+3.6	V

### Operating Environment

Parameter	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	+3.1	+3.5	V
Operating Temperature	T <sub>o</sub>	0	+70	°C

### Transmitter E-O characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Bit Rate	BR	50	-	3000	Mbps	-
Center Wavelength	$\lambda$	1540	1550	1560	nm	-
Spectral Width (RMS)	$\Delta\lambda$	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Average Optical Output Power	P <sub>o</sub>	-3	-1	+2	dBm	-
Extinction Ratio	ER	5	-	-	dB	-
Power Supply Current	ICC	-	70	180	mA	-
Transmitter Enable Voltage	VEN	0	-	0.8	-	-
Transmitter disable Voltage	VD	2.0	-	VCC	V	-
Data Inputs Voltage	VPP	300	800	1600	mV	-
		-	105	165	ps	SMPTE424M 2.97Gbps
		-	170	270	ps	SMPTE 292M 1.485Gbps

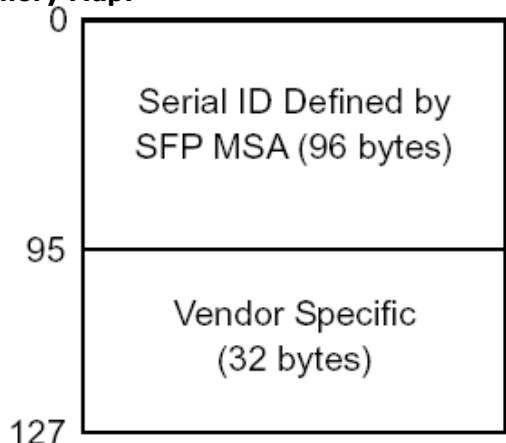
		-	300	800	ps	SMPTE 259M 270Mbps
Optical Fall Time (80%~20%)	Tf	-	120	180	Ps	SMPTE 424M 2.97Gbps
		-	170	270	Ps	SMPTE 292M 1.485Gbps
		-	300	800	ps	SMPTE 259M 270Mbps
Optical Signal Intrinsic Jitter	-	-	45	70	ps	SMPTE 424M 2.97Gbps
		-	60	100	ps	SMPTE 292M 1.485Gbps
		-	110	180	ps	SMPTE 259M 270Mbps

**EEPROM Section**

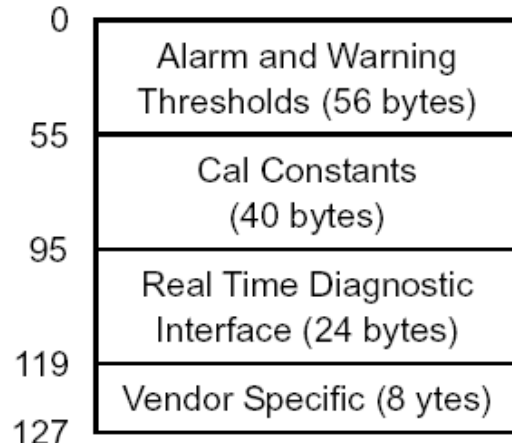
The optical transceiver contains an EEPROM. It provides access to sophisticated identification information that describes the transceiver’s capabilities, standard interfaces, manufacturer, and other information. The serial interface uses the 2-wire serial CMOS EEPROM protocol defined for the ATMEL AT24C01A/02/04 family of components. When the serial protocol is activated, the host generates the serial clock signal (SCL). The positive edge clocks data into those segments of the EEPROM that are not write protected within the SFP transceiver. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Calibration and alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented. The diagnostic data are raw A/D values and must be converted to real world units using calibration constants stored in EEPROM locations 56 – 95 at wire serial bus address A2h. The digital diagnostic memory map specific data field define as following.

**Memory Map:**



**2 wire address 1010000x (A0h)**



**2 wire address 1010001x (A2h)**

**Recommended Circuit**

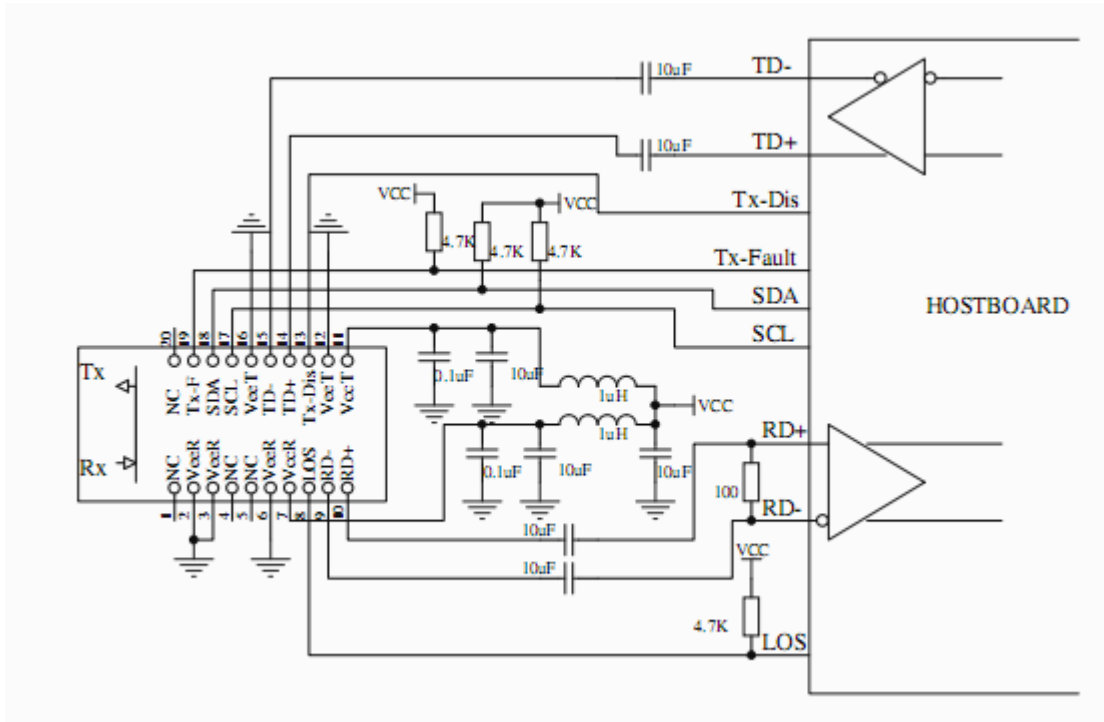
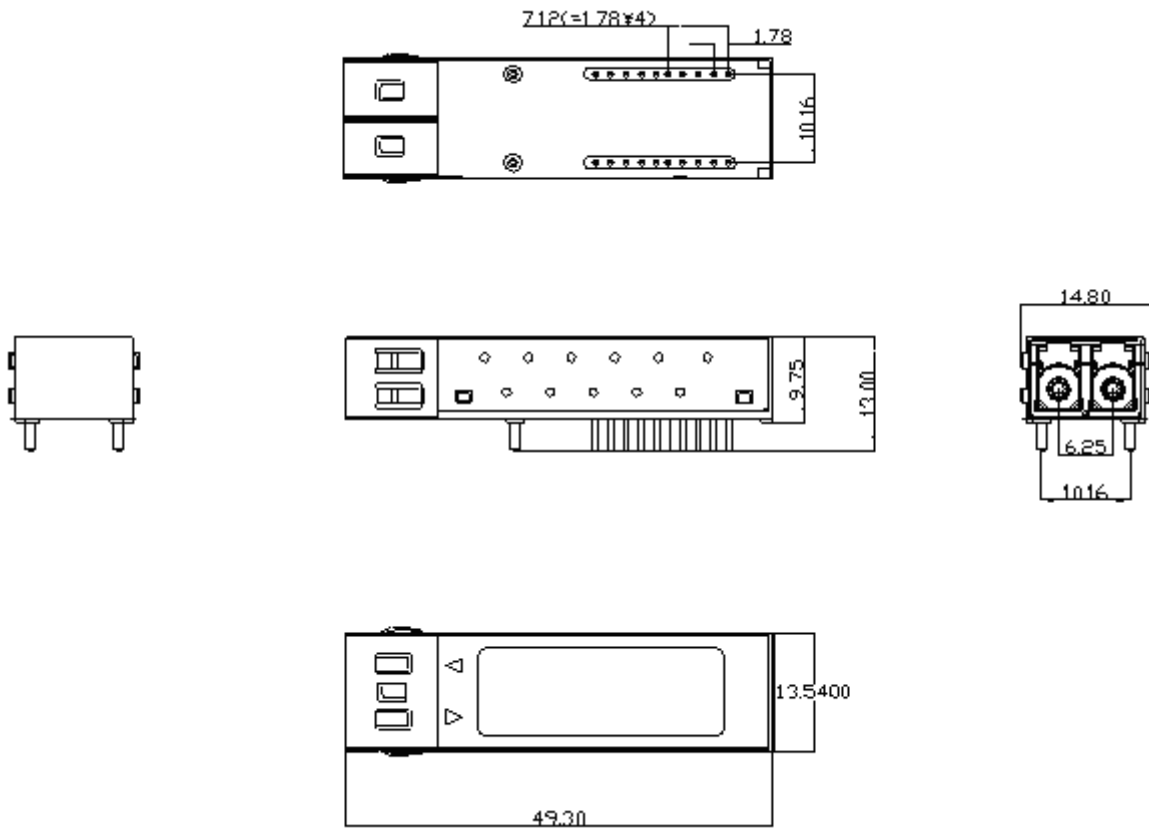


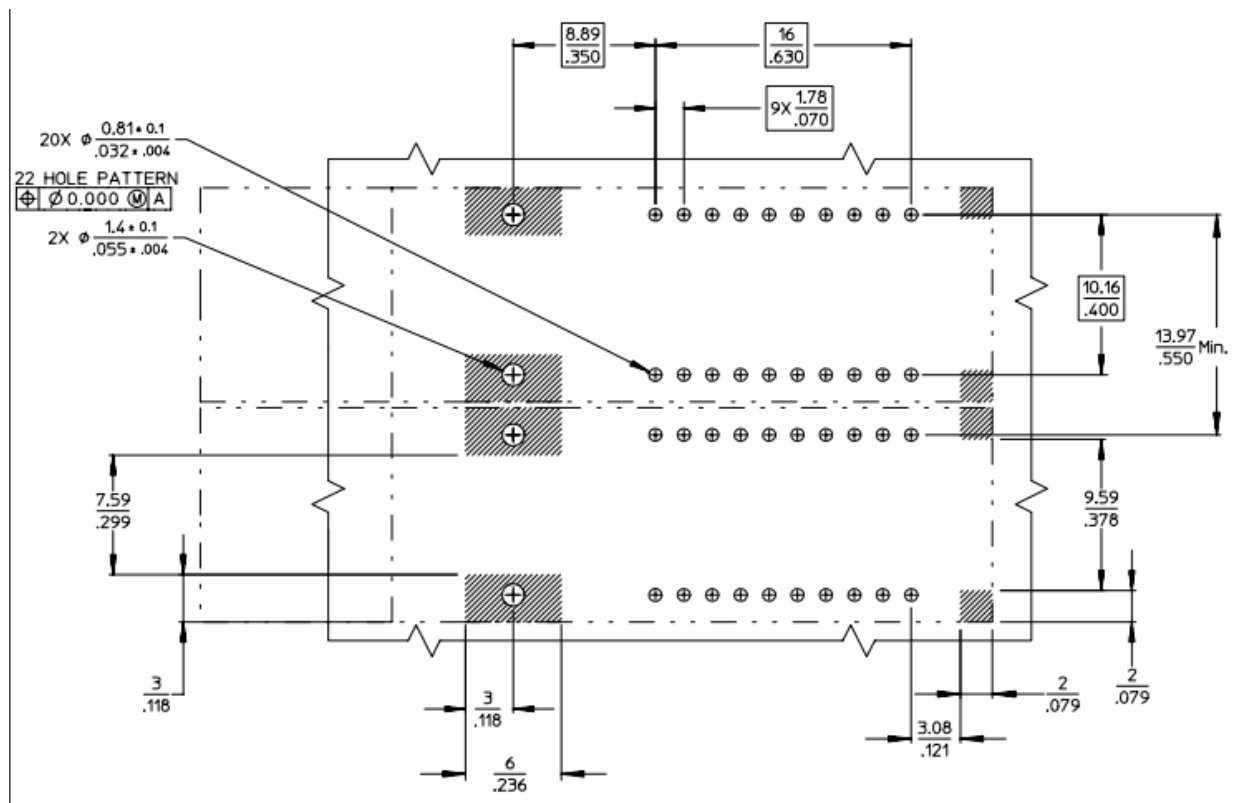
Figure 3: Recommended Circuit

**Package information**



Unit: mm

**Recommended Board Layout Hole Pattern**



1550nm Medium-power Video SFF Single Optical Transmitter



CTF55D6-21-SDI-2X10

Preliminary Data sheet

VER0.0/09-23-2016

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**For More Information**

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