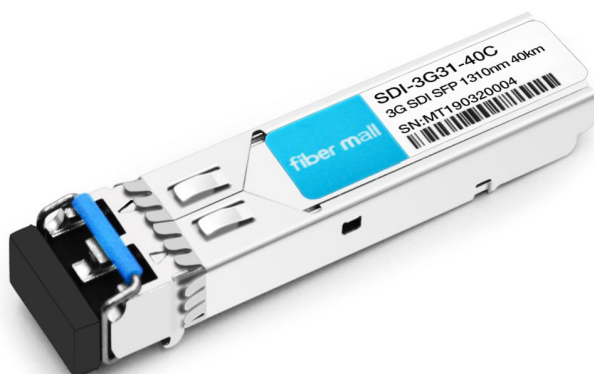


SDI-3G31-40C

3Gbps Video SFP Transceiver, Single Mode, 40km Reach



Product Features

- ❖ HD-SDI SFP Transceiver available
- ❖ SD-SDI SFP Transceiver available
- ❖ 3G-SDI SFP Transceiver available
- ❖ SMPTE 297-2006 Compatible.
- ❖ Metal enclosure for Lower EMI
- ❖ 1310nm DFB laser and PIN photodetector
- ❖ Supports video pathological patterns for SD-SDI, HD-SDI and 3G-SDI
- ❖ Compliant with SFP MSA and SFF-8472 with duplex LC receptacle

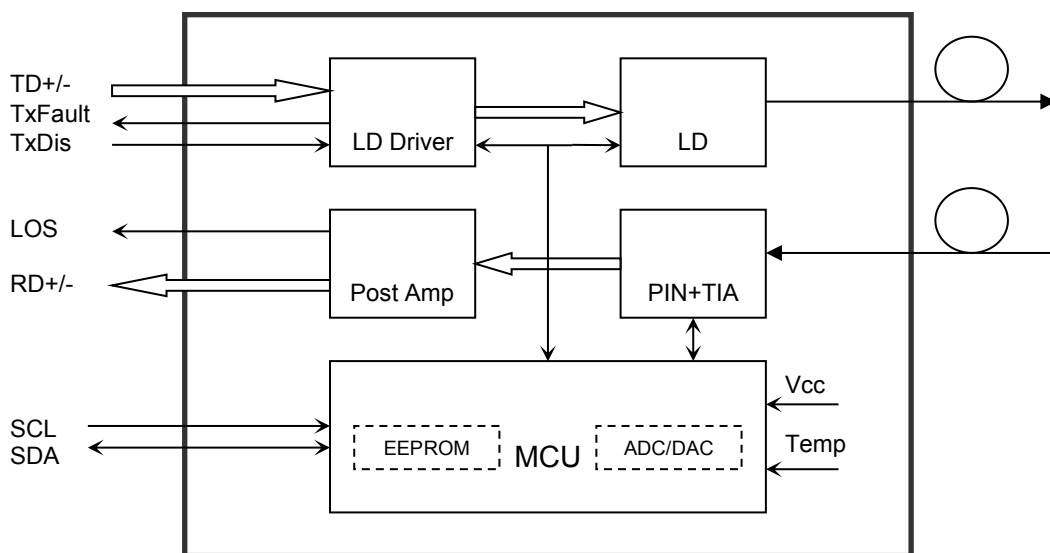
- ❖ Digital Diagnostic functions available through the I2C interface
- ❖ Compatible with RoHS
- ❖ +3.3V single power supply
- ❖ Operating case temperature:
Standard : 0 to +70°C

Applications

- ❖ SMPTE 297-2006 Compatible Electrical-to-Optical Interfaces.
- ❖ HDTV/SDTV Service Interfaces.

Description

SDI-3G31-40C is a video series transceivers are high performance, cost effective modules for duplex video transmission application over single mode fiber. The transceiver is designed to transmit/receive data rates from 50Mbps to 2.97Gbps and is specifically designed for robust performance in the presence of SDI pathological patterns for SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M serial rates. The module is fully compliant with SMPTE 297M- 2006. The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans- impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T _{ST}	-40	+85	°C
Supply Voltage	V _{CC3}	-0.5	4.5	V
Relative Humidity	RH	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate			3		Gbps
Supply Voltage	V _{CC}	+3.14	3.3	+3.47	V
Supply Current	I _{CC}			400	mA
Operating Temperature	T _{OP}	0	25	+70	°C

Optical Characteristics (Condition: Ta=T_{OP})

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Date Rate			3		Gb/s	
Optical Wavelength	λ	1260	1310	1360	nm	
Average Output Power	P _o	-2		+3	dBm	1
Optical Extinction Ratio	ER	8			dB	
Side Mode Suppression Ratio	SMSR	30	-	1	dBm	
RMS Spectral Width	$\Delta\lambda$				nm	
Receiver						
Date Rate			3		Gb/s	
Optical Wavelength	λ	1260		1580	nm	
Receiver Sensitivity (PRBS & Pathological)	SD-SDI			-25	dBm	
	HD-SDI			-23	dBm	
	3G-SDI			-22	dBm	
Receiver Overload		0			dBm	2
LOS De-Assert	LOSD			-22	dBm	
LOS Assert	LOSA				dBm	
LOS Hysteresis				4	dB	

Notes:

- 1) The optical power is launched into SMF.
- 2) Internally AC-coupled.

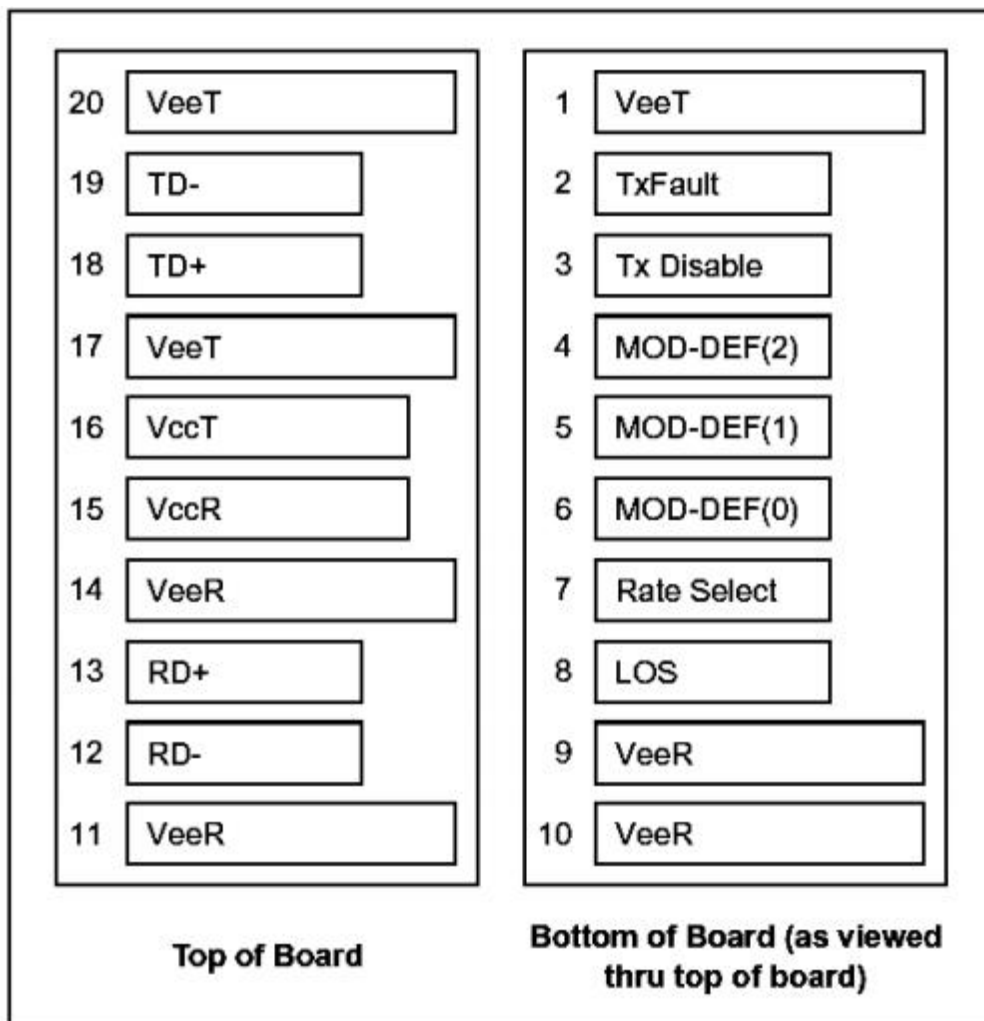
Electrical Characteristics (Condition: Ta=T_{OP})

Parameter		Symbol	Min	Typical	Max	Unit	Notes	
Transmitter								
Differential input voltage swing		VI	400		1800	mVpp	1	
Rise/Fall Time(20%~80%)		SD-SDI	Tr/Tf		270	ps	2	
		HD-SDI			270			
		3G-SDI			270			
Total Output Jitter	Rise/Fall Time (20%~80%)	SD-SDI		70	200	ps		
		HD-SDI		50	135			
		3G-SDI		70	100			
	Rise/Fall Time (20%~80%)	SD-SDI		200	300			
		HD-SDI		115				
		3G-SDI		120				
Transmit Enable Output		H	VOH	2.0		Vcc	V	
		L	VOL	0		0.8	V	
Input Differential Impedance		Zin	90	100	110	Ω		
Tx Disable		Disable		2.0		Vcc	V	
		Enable		0		0.8	V	
Tx Fault		Fault		2.0		Vcc	V	
		Normal		0		0.8	V	
Receiver								
Differential Output Voltage Swing			650	800	1000	mVpp	1	
LOS Output		Fault		2.0		Vcc	V	
		Normal		0		0.8	V	
Rx Output Rise and Fall Time		Tr/Tf	45			ps	2	
Output Differential Impedance		Zon	80	100	120	Ω		

Notes:

1. PECL input, internally AC-coupled and terminated.
2. Rise and fall times, 20% to 80%, are measured following a fourth-order Bessel-Thompson filter with a bandwidth of 0.75 x clock frequency corresponding to the serial data rate

Pin Information



Pin #	Name	Function	Notes
1	VEET	Module transmitter ground	
2	TX FAULT	Module transmitter fault	Note 1
3	TX DISABLE	Transmitter Disable; Turns off transmitter laser output	Note 2
4	MOD_DEF(2)	2 wire serial interface data input/output (SDA)	Note 3
5	MOD_DEF(1)	2 wire serial interface clock input (SCL)	Note 3
6	MOD_DEF(0)	TTL Low	Note 3
7	Rate Select	Receiver Rate Select, Not connect	
8	LOS	Receiver Loss of Signal Indication	Note 4

9	VEER	Module Receiver Ground	
10	VEER	Module Receiver Ground	
11	VEER	Module Receiver Ground	
12	RD-	Receiver inverted data out put	Note 5
13	RD+	Receiver non-inverted data out put	Note 5
14	VEER	Module receiver ground	
15	VCCR	Module receiver 3.3V supply	
16	VCCT	Module transmitter 3.3V supply	
17	VEET	Module transmitter ground	
18	TD+	Transmitter inverted data out put	Note 6
19	TD-	Transmitter non-inverted data out put	Note 6
20	VEET	Module transmitter ground	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

2) TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:

Low (0 to 0.8V): Transmitter on

(>0.8V, < 2.0V): Undefined

High (2.0 to 3.465V): Transmitter Disabled

Open: Transmitter Disabled

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.

Mod-Def 0 is grounded by the module to indicate that the module is present

Mod-Def 1 is the clock line of two wire serial interface for serial ID

Mod-Def 2 is the data line of two wire serial interface for serial ID

4) LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.

5) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.

6) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Digital Diagnostic Monitor Characteristics

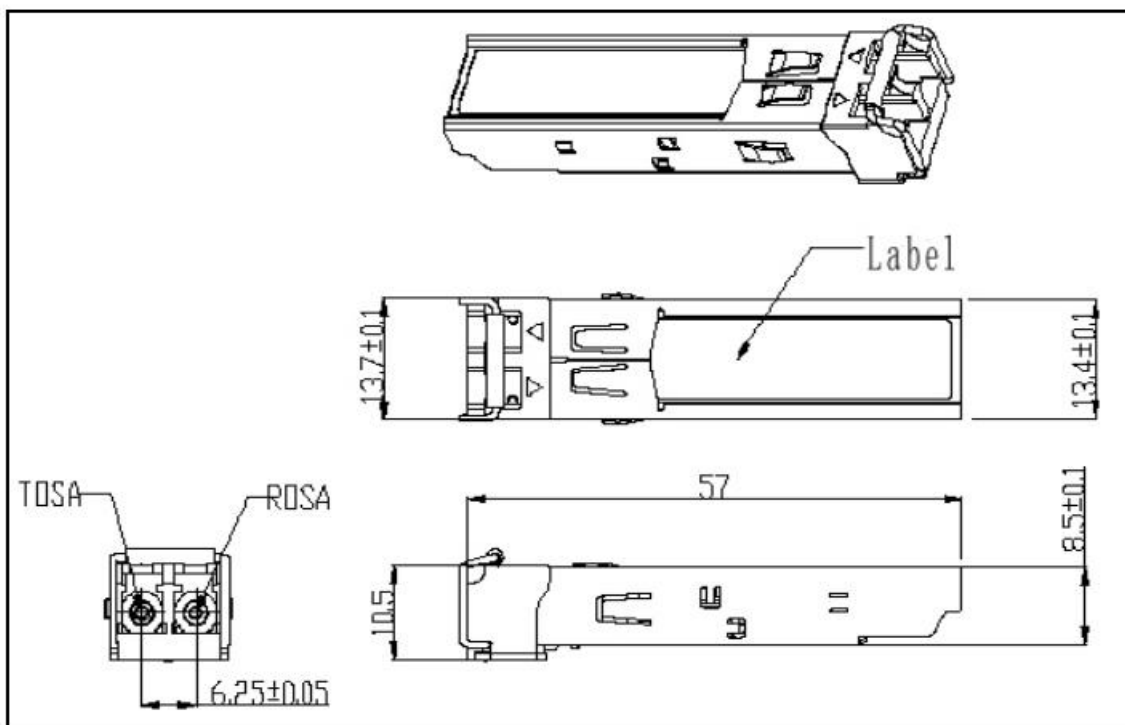
Parameter	Symbol	Min	Max	Unit
Temperature monitor absolute error	DMI_Temp	-3	3	°C
Laser power monitor absolute error	DMI_TX	-3	3	dBm
RX power monitor absolute error	DMI_RX	-3	3	dBm
Supply voltage monitor absolute error	DMI_VCC	-0.08	0.08	V
Bias current monitor	DMI_Ibias	-10%	10%	mA

Serial ID Memory Contents

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	
11	1	Encoding	NRZ (03h)
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13	1	Reserved	(0000h)
14	1	Length (SMF,km)	Link length supported for single mode fiber, units of km (14)
15	1	Length (9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length (50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length (62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length (Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: OCRECOM
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: "OB4S3414V" (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	

63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	OCRE specific date, read only

Mechanical Dimensions



Ordering Information

Part Number	Product Description
SDI-3G31-40C	1310nm, 3Gbps, 40km, LC, 0°C ~ +70°C, with DDM