OHP3G-313XCR

MSA Compliant 3Gb/s SDI Digital Video SFP Optical Transceiver Module,1310nm,3km

Features

● SMPTE 297-2006 Compatible Features

● Speed from 50 Mbps to 3Gbps

● Distance up to 3km for 3G-SDI

● Support Video Pathological Patterns for SD-SDI,HD-SDI and 3G-SDI

● 1310nm FP laser and PIN photodetector

● Hot-pluggable SFP

● SFP MSA compliant

● Digital Diagnostic functions available through the I2C interface

● Single +3.3V power supply

● Low Power Consumption

● RoHS compliant

● Operating case temperature: 0 to +70°C

Standards Reference

● INF-8074i SFP (Small Formfactor Pluggable) Transceiver

● SFF-8472 Diagnostic Monitoring Interface for Optical Transceivers

● SMPTE 259M-2008 SDTV Digital Signal/Data – Serial Digital Interface SD-SDI

● SMPTE 292M-2008 1.5 Gbps Signal / Data Serial Interface HD-SDI

● SMPTE 344M-2000 540 Mbps Serial Digital Interface

● SMPTE 424M-2006 3Gbps Signal/Data Serial Interface 3G-SDI

Applications

● SMPTE 424M (2.97Gb/s)

● SMPTE 292M (1.485Gb/s)

● SMPTE 259M (270/360Mb/s)

● High-density Video Router

● Broadcast cameras

● OC-48 and 2x Fiber Channel

● Gigabit Ethernet

Description

Optcore OHP3G-313XCR is high performance, cost effective 3G-SDI optical transceiver modules for video transmission application over single mode fiber (SMF). It provide the 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. It provide maximum transmission distance of 3km over single mode fiber at 3Gbps pathological signals. The Pin definition of OHP3G-313XCR is MSA compliant.

The OHP3G-313XCR provides extensive operational status monitoring (also called DDMI) through an I2C interface. Output optical power,bias current, supply voltage and operating temperature are monitored. If a parameter monitored is outside the pre-defined range, the alarm flag associated with the parameter will be raised.This 3G SDI video SFP module is Class I Laser products per FDA/CDRH and IEC-60825 standards.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Note
Storage Temperature	Ts	-40	85	℃	-
Power Supply Voltage	Vcc	-0.5	4	V	-
Soldering Temperature	-	-	260	℃	10 seconds on leads only
Input Voltage	Vin	GND	Vcc	V	-

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units
Power Supply Voltage	Vcc	3.1	3.3	3.5	V
Operating Temperature	Top	0	-	70	℃
Data Rate	-	-	2970	-	Mbps
Power Supply Current	Icc	-	200	300	mA

Transmitter Specifications (0°C < Top < 70°C, 3.1V < Vcc < 3.5V)

Parameter	Symbol	Min.	Typ.	Max.	Units
Optical					
Optical Transmit Power	Po	-7	-	0	dBm
Optical Center Wavelength	λ_C	1260	1310	1360	nm
Spectral Width (-20dB)	σ	-	-	4	nm
Extinction Ratio	E_R	6	-	-	dB
Optical Rise Time/Fall Time	tr/tf	-	-	135	Ps (1)
Electrical					
Differential Input Voltage	$V_{IH} - V_{IL}$	0.3	-	2.2	V
TX Disable Input Voltage–Low	$T_{DIS,L}$	0	-	-0.8	V
TX Disable Input Voltage–High	$T_{DIS,H}$	2.0	-	V_{CC}	V
TX Disable Assert Time	T_{ASSERT}	-	-	10	µs

Parameter	Symbol	Min.	Typ.	Max.	Units
TX Disable Deassert Time	$T_{DEASSERT}$	-	-	1	ms
TX Fault Output Voltage -- Low	$T_{FAULT,L}$	0	-	-0.8	V
TX Fault Output Voltage -- High	$T_{FAULT,H}$	2.0	-	V_{CC}	V

Note: 1. 20%~80%, Measured @2.97Gb/s and differential input data

Receiver Specifications (0°C < Top < 70°C, 3.1V < Vcc < 3.5V)

Parameter	Symbol	Min.	Typ.	Max.	Units
Optical					
Sensitivity for SMPTE-424M 2.97Gb/s	Sen	-	-	-18	dBm
Sensitivity for SMPTE-292M 1.485Gb/s	Sen	-	-	-19	dBm
Maximum Input Power(Saturation)	P_{MAX}	-3	-	-	dBm
Signal Detect – Asserted	P_a	-	-	-20	dBm
Signal Detect -- Deasserted	P_d	-35	-	-	dBm
Signal Detect -- Hysteresis	P_{hys}	1	-	4	dB
Wavelength of Operation	λ	1260	-	1610	nm
Electrical					
Differential Output Voltage	$V_{IL} - V_{CC}$	0.4	-	2	V
Signal Detect Output Voltage-- Low	$V_{SIL} - V_{CC}$	-	-	0.8	V
Signal Detect Output Voltage-- High	$V_{SIH} - V_{CC}$	2.0	-	-	V

Pin Assignment

Top of Board		Bottom of Board	
20	VeeT	1	VeeT
19	TD-	2	TxFault
18	TD+	3	Tx Disable
17	VeeT	4	MOD-DEF(2)
16	VccT	5	MOD-DEF(1)
15	VccR	6	MOD-DEF(0)
14	VeeR	7	Rate Select
13	RD+	8	LOS
12	RD-	9	VeeR
11	VeeR	10	VeeR
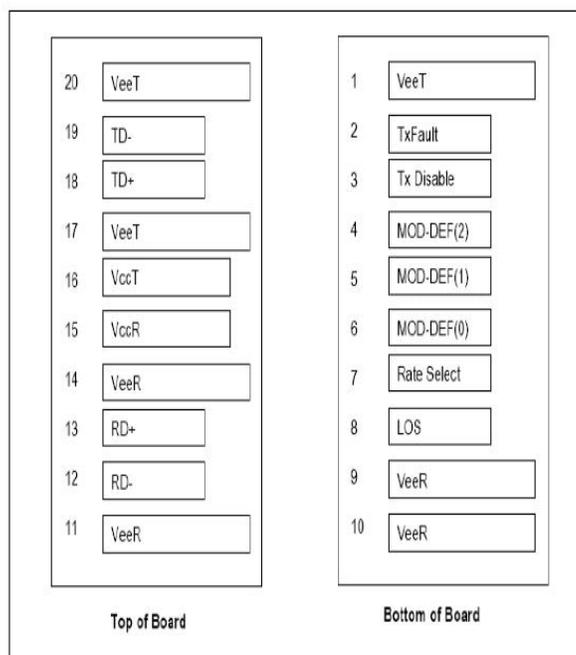
Pin Description

Pin No.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition 2	3	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	4
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	5
13	RD+	Received Data Out	3	5
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power	2	
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv Transmit Data In	3	6
20	VeeT	Transmitter Ground	1	

Notes:

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 <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 (0~0.8V): Transmitter on

(>0.8V, <2.0V): Undefined

High (2.0~3.465V): Transmitter Disabled

Open: Transmitter Disabled.

3. MOD-DEF 0,1,2 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 on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.

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

6. TD-/+: These are the differential transmitter inputs. They are AC coupled differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on host board.

EEPROM Serial ID Memory Contents (A0h)

Data Address	Size (Bytes)	Name of Field	Contents(Hex)	Description
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by serial IDonly
2	1	Connector	07	LC Connector
3-10	8	transmitter	xx	transmitter codes
11	1	Encoding	03	NRZ
12	1	BR, nominal	1E	3Gbps
13	1	Reserved	00	
14	1	Length(9um)-km	xx	transmitter distance
15	1	Length (9um)	xx	
16	1	Length (50um)	xx	
17	1	Length (62.5um)	xx	
18	1	Length (copper)	00	
19	1	Reserved	00	
20-35	16	Vendor name	4F 50 54 43 4F 52 45 20 20 20 20 20 20 20 20 20	OPTCORE (ASCⅡ)
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	part number
56-59	4	Vendor rev	xx xx xx xx	ASCⅡ
60-61	2	Wavelength	xx xx	transmitter wavelength
62	1	Reserved	00	
63	1	CC BASE	xx	Check sum of bytes 0-62
64-65	2	Options	00 1A	LOS, TX_FAULT and TX_DISABLE
66	1	BR, max	00	
67	1	BR, min	00	
68-83	16	Vendor SN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	SN：xxxxxxxxx （ASCⅡ）
84-91	8	Vendor date code		Year (2 bytes), Month (2 bytes), Day

				(2 bytes) (ASCⅡ)
92	1	Diagnostic type	68	
93	1	Enhanced option	90	
94	1	SFF-8472	xx	
95	1	CC_EXT	xx	Check sum of bytes 64 - 94
96-127	32	Vendor specific		Vendor Specific EEPROM
128-255	128	Reserved		Reserved for future use.

Digital Diagnostic Functions

As defined by the SFP+ MSA, Optcore 3G SDI video SFP transceiver module provide optional digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

Transceiver temperature

Laser bias current

Transmitted optical power

Received optical power

Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host.   The positive edge clocks data into the SFP+ transceiver into those segments of its memory map that are not write-protected.   The negative edge clocks data from the SFP+ transceiver.   The serial data signal (SDA pin) 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 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

For more detailed information including memory map definitions, please see the SFP+ MSA Specification.

Mechanical Dimensions

Unit:mm
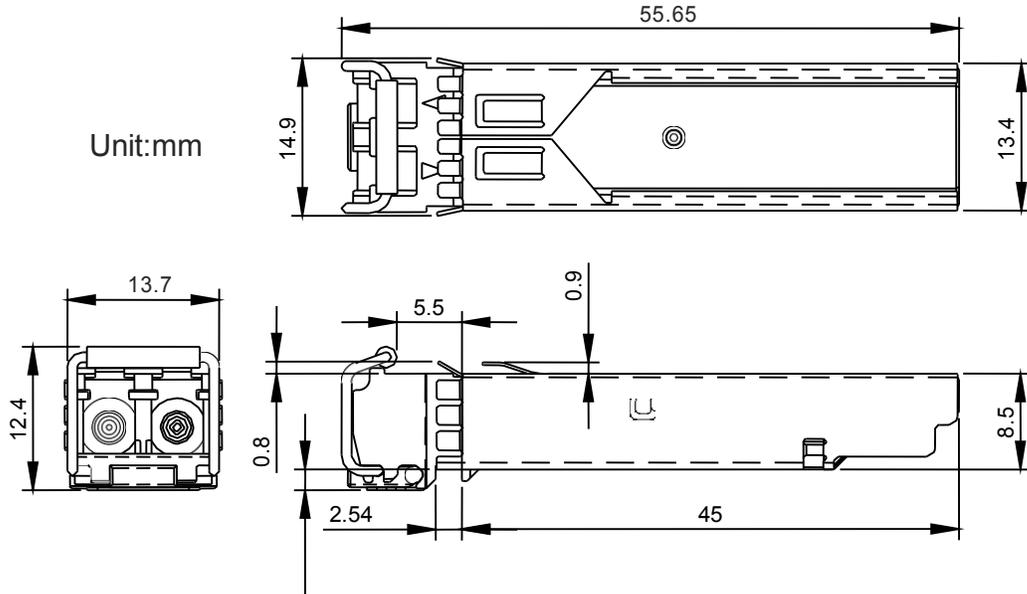
Ordering information

Part number	Description
OHP3G-313NCR	MSA 3Gb/s SDI Video SFP Transceiver,SMF,1310nm,3km,LC
OHP3G-313DCR	MSA 3Gb/s SDI Video SFP Transceiver,SMF,1310nm,3km,LC,with DDM

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

For more product information,visit us on the web at www.optcore.net