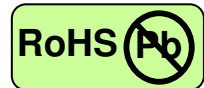


# 3 Gb/s Single Channel Optical Receiver



## SFP, LC Connector, Single Receiver for Single Mode Fiber, RoHS Compliant

Digital Diagnostics Functions



### Features

- Data Rate: 50 Mb/s to 3 Gb/s, NRZ
- Single +3.3 V Power Supply
- RoHS Compliant and Lead-free
- AC Electrical Interface
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- Supports video pathological patterns for SD-SDI, HD-SDI and 3G-SDI
- Digital Diagnostic Monitoring Interface (Received Power, Supply voltage and Operating temperature)
- LC Connector

### Applications

- SMPTE 297-2006 compatible optical-to-electrical interfaces
- High-density video routers

### Description

The CT-2500TKP-MB4L-D series from Coretek Opto Corp. are the high performance and cost-effective modules for serial optical data communication applications specified for single mode of 3 Gb/s. It operates with +3.3 V power supply. The module is intended for single mode fiber, operates at a nominal wavelength of 1260-1620 nm and complies with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP). Each module is integrated with digital diagnostics functions via an I<sup>2</sup>C serial interface.

The module is a LC connector with single channel receiver designed for robust performance in the presence of SDI pathological patterns for SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M serial rates including SD-SDI compliant link at 270 Mb/s, HD-SDI compliant link at 1.485 Gb/s and 3G-SDI compliant link at 2.97 Gb/s. It provides extensive operational status monitoring through I<sup>2</sup>C interface. For the receiver channel, input optical power, 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. The characteristics are performed in accordance with Telcordia Specification GR-468-CORE.

### EMC

Most equipment utilizing high-speed receiver will be required to meet the following requirements:

- 1) FCC in the United States
- 2) CENELEC EN55022 (CISPR 22) in Europe

To assist the customer in managing the overall equipment EMC performance, the receiver has been designed to satisfy FCC class B limits and provide good immunity to radio-frequency electromagnetic fields.

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## Product Information

Model Number	Operating Voltage & Interface	RX	
		$\lambda$ (nm)	Sens. (dBm)
CT-2500TKP-MB4L-D	3.3 V AC	1260-1620	0 to -20

## Link Distance

Transmitter	Receiver	SDI	Bit Rate	Max Link Distance	
CT-2500TJP-MB4L-D	CT-2500TKP-MB4L-D	3G-SDI	SMPTE 424M	2.97 Gb/s	10 km
		HD-SDI	SMPTE 292M	1.485 Gb/s	20 km
		SD-SDI	SMPTE 259M	270 Mb/s	30 km

## ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	T <sub>S</sub>	-40	85	°C	
Supply Voltage	V <sub>CC</sub>	-0.5	4.5	V	
Data Input Voltage	---	0	V <sub>CC</sub>	V	
Supply Current	I <sub>S</sub>		200	mA	

## OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Case Operating Temperature	T <sub>C</sub>	0		70	°C	
Supply Voltage	V <sub>CC</sub>	3.1		3.5	V	

## ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Supply Current	I <sub>CC</sub>		200	mA	
In-rush current ramp rate			50	mA/ms	
Data Output Differential Voltage	V <sub>OD</sub>	0.4	1.3	V	
LOS Output Voltage - Low	V <sub>OL</sub>	0	0.8	V	
LOS Output Voltage - High	V <sub>OH</sub>	2.0	V <sub>CC</sub>	V	
I <sup>2</sup> C CLK , I <sup>2</sup> C DATA - Low	V <sub>IL</sub>	-0.6	V <sub>CC</sub> × 0.3	V	
I <sup>2</sup> C CLK , I <sup>2</sup> C DATA - High	V <sub>IH</sub>	V <sub>CC</sub> × 0.7	V <sub>CC</sub> + 0.5	V	

# 3 Gb/s Single Channel Optical Receiver



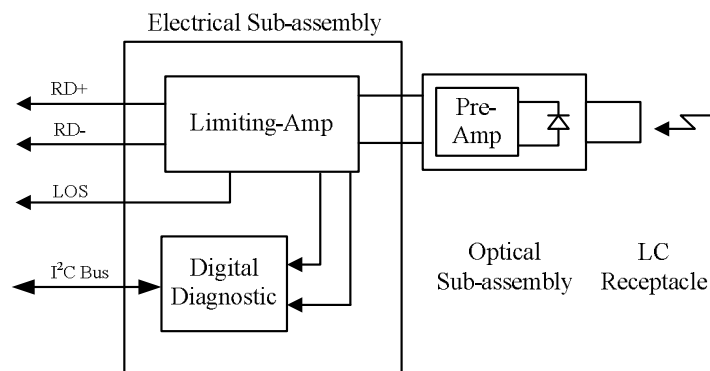
## RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	$P_{max}$	0			dBm	PRBS23, BER=1e-12
Minimum Input Optical Power	2.97 Gb/s	$P_{min}$		-18	dBm	pathological
				-20	dBm	
Minimum Input Optical Power	1.485 Gb/s	$P_{min}$		-20	dBm	pathological
				-21	dBm	
Operating Wavelength	$\lambda$	1260		1620	nm	
LOS of Signal - Asserted	$P_A$	-35			dBm	
LOS of Signal - Deasserted	$P_D$			-21	dBm	
Loss of Signal - Hysterisis	$P_D - P_A$	0.5			dB	

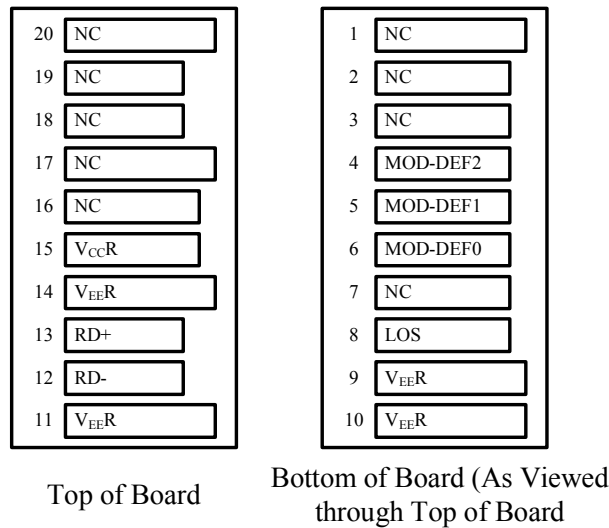
## TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Time to initialize	$t_{init}$			300	ms	
Receiver Loss of Signal Assert Time (off to on)	$t_{A,RX\_LOS}$			100	$\mu$ s	
Receiver Loss of Signal Assert Time (on to off)	$t_{D,RX\_LOS}$			100	$\mu$ s	

## BLOCK DIAGRAM OF SINGLE RECEIVER



## PIN OUT DIAGRAM OF SINGLE RECEIVER



## PIN OUT TABLE

Pin	Symbol	Functional Description
1	NC	Not Connected
2	NC	Not Connected
3	NC	Not Connected
4	MOD-DEF(2)	Module Definition 2 – Two wire serial ID interface
5	MOD-DEF(1)	Module Definition 1 – Two wire serial ID interface
6	MOD-DEF(0)	Module Definition 0 – Grounded in module
7	NC	Not Connected
8	LOS	Loss of Signal
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inverse Received Data Out
13	RD+	Received Data Out
14	VeeR	Receiver Ground
15	VccR	Receiver Power
16	NC	Not Connected
17	NC	Not Connected
18	NC	Not Connected
19	NC	Not Connected
20	NC	Not Connected

# 3 Gb/s Single Channel Optical Receiver



## EEPROM Serial ID Memory Contents

Table 1 - EEPROM Serial ID A0h Memory Contents

Addr.	Field Size (Bytes)	Name of Field	Hex	Description
00	1	Identifier	03	SFP
01	1	Ext. Identifier	04	MOD4
02	1	Connector	07	LC
03 ~ 10	8	Transceiver Codes	00 00 00 00 00 00 00 00	
11	1	Encoding	00	
12	1	BR, Nominal	19	
13	1	Reserved	00	
14	1	Length (SMF)-km	28	40 km
15	1	Length (SMF)-100m	FF	
16	1	Length (50um,OM2)	00	
17	1	Length (62.5um,OM1)	00	
18	1	Length (copper)	00	
19	1	Length (50um, OM3)	00	
20 ~ 35	16	Vendor Name	43 4F 52 45 54 45 4B 20 20 20 20 20 20 20 20 20	CORETEK
36	1	Unallocated	00	
37 ~ 39	3	OUI Code	00 00 00	
40 ~ 55	16	Vendor PN	43 54 2D 32 35 30 30 54 4B 50 2D 4D 42 34 4C 45	CT-2500TKP-MB4LE
56 ~ 59	4	Vendor Rev	30 30 30 30	0000
60 ~ 61	2	Wavelength	051E	1310 nm
62	1	Reserved	00	
63	1	CC BASE	XX	Check sum
64 ~ 65	2	Options	00 04	LOS, TX_FAULT and TX_DISABLE
66	1	BR max	00	
67	1	BR min	00	
68 ~ 83	16	Vendor SN	4B 52 xxxxxxxxxxxx	KR xxxxxxxxxxxx

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84 ~ 91	8	Date code		
92	1	Diagnostic Monitoring Type	60	
93	1	Enhanced Options	80	
94	1	SFF-8472	01	Rev 9.3 of SFF-8472 Compliance
95	1	CC BASE	XX	Check sum
96 ~ 127	32	Vendor Specific		

**Table 2- EEPROM Serial ID A2h Memory Contents**

Addr.	Field Size (Bytes)	Name of Field	Hex	Description
00 ~ 07	8	Temperature Alarm/Warning (°C)	6E 00 EC 00 64 00 F1 00	Alarm_H/L : 110/-20 Warning_H/L : 100/-15
08 ~ 15	8	Voltage Alarm/Warning (V)	8C A0 75 30 88 B8 79 18	Alarm_H/L : 3.6/3 Warning_H/L : 3.5/3.1
16 ~ 23	8	Bias Current Alarm/Warning (mA)		
24 ~ 31	8	Tx Power Alarm/Warning (dBm)		
32 ~ 39	8	Rx Power Alarm/Warning (dBm)	27 10 00 64 1F 07 00 7E	Alarm_H/L : 0/-20 Warning_H/L : -1/-19
128 ~ 143	16	Vendor Specific		

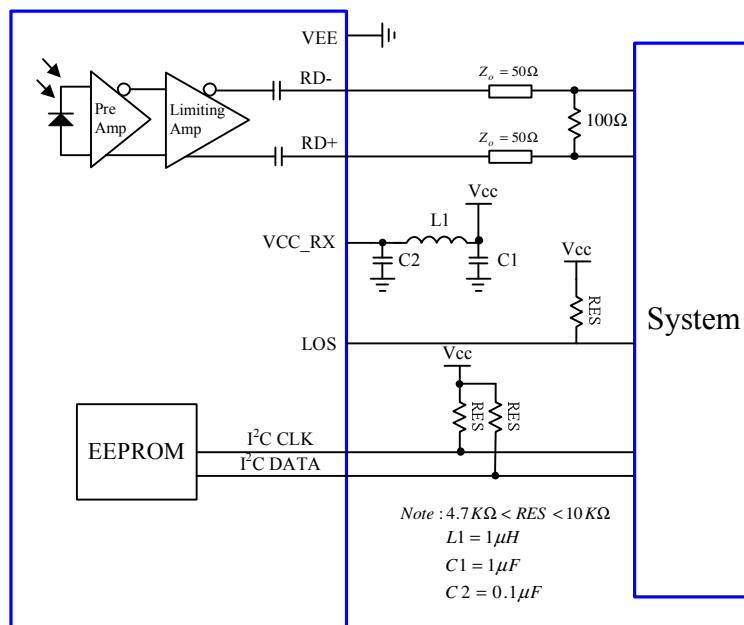
**Table 3- Monitoring Specification**

Parameter	Range	Accuracy	Calibration
Temperature	-20°C to 85°C	±3°C	Internal
Voltage	3.0 to 3.6 V	±3%	Internal
RX Power	-20 to 0 dBm	±3 dB	Internal

# 3 Gb/s Single Channel Optical Receiver

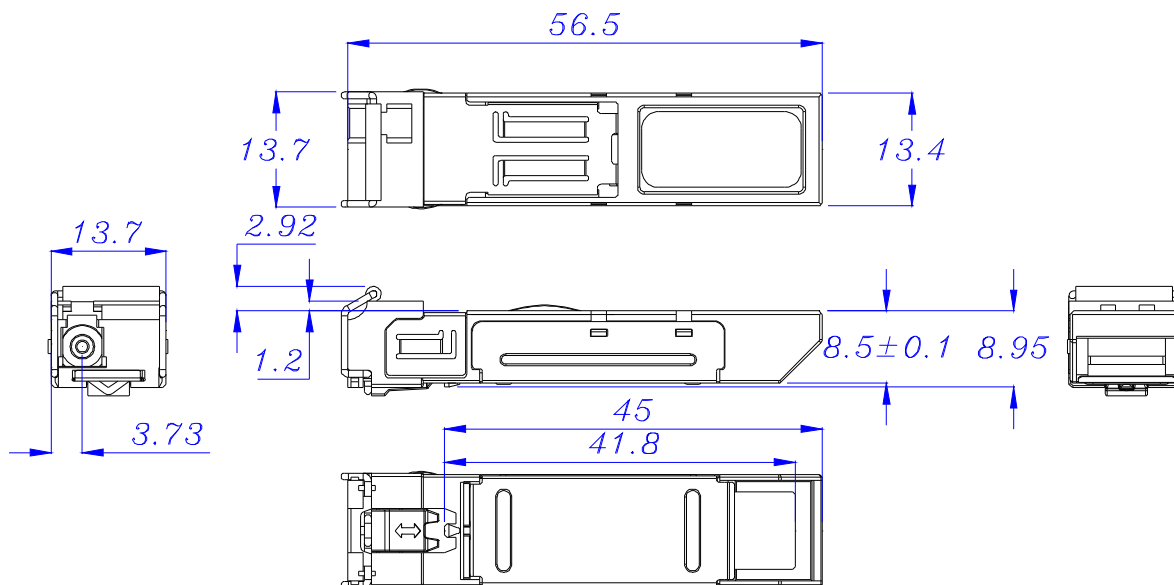


## RECOMMENDED CIRCUIT SCHEMATIC



## MECHANICAL DIMENSIONS

Units in mm



All dimensions are  $\pm 0.2\text{mm}$  unless otherwise specified.

### Claim:

CORETEK Opto Corp. reserves the right to make changes in the specification described hereinafter without prior notice.