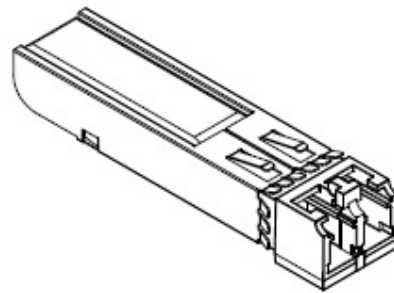


RM3-S1-4X03K-D

Product Overview

3G-SDI optical dual-fiber transceiver perfectly converts from SDI electrical signal at SMPTE 424M, SMPTE 292M, SMPTE259M and DVB-ASI to optical signal. It supports data rate 3Gbps and handles pathological patterns. The package is pluggable SFP. Paired with PALCONN 3G-SDI optical fiber transceiver, it will transmit signals with maximum distance up to 10 km, 40km or 80km over single mode fiber.

Extensive operational status can be monitored in PALCONN 3G-SDI optical fiber module. Useful function is provided for users to get status data more conveniently. PALCONN 3G-SDI Optical fiber module complies with FCC, TUV, and UL standards. It is also Pb-free and RoHS compliant.



Features

- 1-port LC for 2-way transmission in 1 SFP package
- Support SMPTE 424M, SMPTE 292M, SMPTE 259M, DVB-ASI
- Handles pathological patterns for 3G-SDI, HD-SDI and SD-SDI
- 3Gbps transmission for 10km, 40km or 80km over single mode fiber
- 10, 40, 80km link distance (indicative only) by different module.
 - RM3-S1-4103K-D: 10km
 - RM3-S1-4403K-D: 40km
 - RM3-S2-4803K-D: 80km
- Digital diagnostics function to measure temperature, supply voltage, TX bias current, TX output power, Received optical power and to show flag status
- Laser disable pin
- Pb-free and RoHS compliant
- Operating temperature: 0°C to 70°C

Laser Safety

This single mode fiber module is a Class 1 laser product. It complies with IEC 825 and FDA 21 CFR 1040.10 and 1040.11. The fiber module must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

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Transceiver Optical Interface

Parameter	Min.	Typ.	Max.	Unit
Optical Power	-8	-5	-3	dBm
Laser Wavelength	1290	1310	1330	nm
Linear Extinction Ratio	5.0	8	-	dB
Intrinsic Jitter <i>PRBS 2²³-1 test pattern</i>	2.97Gb/s	-	45	ps
	1.485Gb/s	-	45	
	270Mb/s	-	45	
Optical Signal Rise Time	2.97Gb/s	-	135	ps
	1.485Gb/s	-	270	
	270Mb/s	-	400	
Optical Signal Fall Time	2.97Gb/s	-	135	ps
	1.485Gb/s	-	270	
	270Mb/s	-	400	
Receiver Wavelength	1260	-	1620	nm
Receiver Sensitivity <i>(Measured with pathological pattern; BER < 10⁻¹²)</i>	2.97Gb/s	-16	-	dBm
	1.485Gb/s	-16	-	
	270Mb/s	-16	-	
Receiver Overload	-	-	-3	dBm
Receiver Loss of Signal Asserted	-35	-	-	dBm
Receiver Loss of Signal De-asserted	-	-	-16	dBm
Receiver Loss of Signal Hysteresis	0.5	2	-	dB

Transceiver Electrical Interface

Parameter	Min.	Typ.	Max.	Unit
Operating case temperature range	0	-	70	°C
Storage temperature range	-40	-	85	°C
Power supply voltage	3.1	3.3	3.5	V
TX_Disable – High	2	-	Vcc	V
TX_Disable – Low	Vee	-	Vee+0.8	V
Power consumption	-	200	300	mA



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DDMI: TWO-WIRE ADDRESS- A0h

Data Address	Size (Bytes)	Name of Field	Description of Field
BASE ID FIELDS			
0	1	Identifier	Type of transceiver:03h SFP
1	1	Ext. Identifier	Extended identifier of type of transceiver:04h
2	1	Connector	Code for connector type:07h LC connector
3-10	8	Transceiver	Code for electronic or optical compatibility
11	1	Encoding	Code for high speed serial encoding algorithm:03h NRZ
12	1	BR, Nominal	Nominal signalling rate, units of 100MBd:3Gbps
13	1	Rate Identifier	Type of rate select functionality
14	1	Length (SMF, km)	Link length supported for single mode fiber, units of km:10
15	1	Length (SMF)	Link length supported for single mode fiber, units of 100 m: 0
16	1	Length (50 um)	Link length supported for 50 um OM2 fiber, units of 10 m: 0
17	1	Length (62.5 um)	Link length supported for 62.5 um OM1 fiber, units of m: 0
18	1	Length (cable)	Link length supported for copper or direct attach cable, units of 10m: 0
19	1	Length (OM3)	Link length supported for 50 um OM3 fiber, units of 10 m: 0
20-35	16	Vendor Name	SFP vendor name (ASCII): OptoMedia
36	1	Transceiver	Code for electronic or optical compatibility
37-39	3	Vendor OUI	SFP vendor IEEE company ID
40-55	16	Vendor PN	Part number provided by SFP vendor (ASCII):RM3-S1-4103K-D
56-59	4	Vendor rev	Revision level for part number provided by vendor (ASCII)
60-61	2	Wavelength	Laser wavelength (Passive/Active Cable Specification Compliance):1310
62	1	Unallocated	
63	1	CC_BASE	Check code for Base ID Fields (addresses 0 to 62)
EXTENDED ID FIELDS			
64-65	2	Options	Indicates which optional transceiver signals are implemented: TX_Fault, TX_DISABLE, RX_LOS
66	1	BR, max	Upper bit rate margin, units of %:5
67	1	BR, min	Lower bit rate margin, units of %:95
68-83	16	Vendor SN	Serial number provided by vendor (ASCII)
84-91	8	Date Code	Vendor's manufacturing date code
92	1	Diagnostic Monitoring Type	Indicates which type of diagnostic monitoring is implemented (if any) in the transceiver: Digital diagnostic monitoring
93	1	Enhanced Options	Indicates which optional enhanced features are implemented (if any) in the transceiver
94	1	SFF-8472 Compliance	Indicates which revision of SFF-8472 the transceiver complies with.
95	1	CC_EXT	Check code for the Extended ID Fields (addresses 64 to 94)
VENDOR SPECIFIC ID FIELDS			
96-127	32	Vendor Specific	Vendor Specific EEPROM
128-255	128	Reserved	Reserved for SFF-8079



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DDMI: TWO-WIRE ADDRESS- A2h

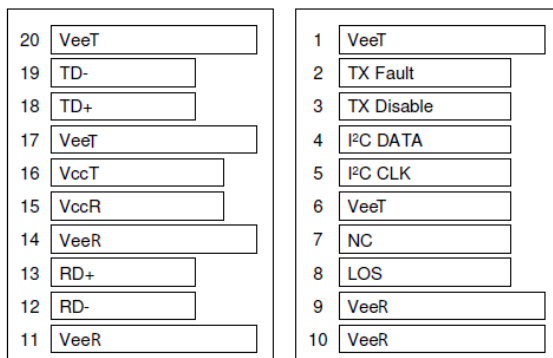
Data Address	Size (Bytes)	Name of Field	Description of Field
DIAGNOSTIC AND CONTROL/STATUS FIELDS			
00-01	2	Temp High Alarm	MSB at low address:70°C
02-03	2	Temp Low Alarm	MSB at low address:0°C
04-05	2	Temp High Warning	MSB at low address:60°C
06-07	2	Temp Low Warning	MSB at low address:10°C
08-09	2	Voltage High Alarm	MSB at low address:3.5V
10-11	2	Voltage Low Alarm	MSB at low address:3.1V
12-13	2	Voltage High Warning	MSB at low address:3.4V
14-15	2	Voltage Low Warning	MSB at low address: 3.2V
16-17	2	Bias High Alarm	MSB at low address: 85mA
18-19	2	Bias Low Alarm	MSB at low address: 0mA
20-21	2	Bias High Warning	MSB at low address: 80mA
22-23	2	Bias Low Warning	MSB at low address: 5mA
24-25	2	TX Power High Alarm	MSB at low address: 0.501mW
26-27	2	TX Power Low Alarm	MSB at low address: 0.158mW
28-29	2	TX Power High Warning	MSB at low address: 0.447mW
30-31	2	TX Power Low Warning	MSB at low address: 0.178mW
32-33	2	RX Power High Alarm	MSB at low address: 0.501mW
34-35	2	RX Power Low Alarm	MSB at low address: 0.025mW
36-37	2	RX Power High Warning	MSB at low address: 0.398mW
38-39	2	RX Power Low Warning	MSB at low address: 0.032mW
40-55	16	Unallocated	
56-91	36	EXT Cal Constants	Diagnostic calibration constants for optional External Calibration
92-94	3	Unallocated	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96	1	Temperature MSB	Internally measured module temperature
97	1	Temperature LSB	
98	1	Vcc MSB	Internally measured supply voltage in transceiver
99	1	Vcc LSB	
100	1	TX Bias MSB	Internally measured TX Bias Current
101	1	TX Bias LSB	
102	1	TX Power MSB	Measured TX output power
103	1	TX Power LSB	
104	1	RX Power MSB	Measured RX input power
105	1	RX Power LSB	
106-109	4	Unallocated	
110	1	TX Disable	Bit 7
		N/A	Bit 6
		N/A	Bit 5
		N/A	Bit 4
		N/A	Bit 3
		N/A	Bit 2
		N/A	Bit 1
		N/A	Bit 0
111	1	Reserved	Reserved for SFF-8079
112	1	Temp High Alarm Flag	Bit 7, set when internal temperature exceeds high alarm level
		Temp Low Alarm Flag	Bit 6, set when internal temperature is below low alarm level
		Vcc High Alarm Flag	Bit 5, set when internal supply voltage exceeds high alarm level
		Vcc Low Alarm Flag	Bit 4, set when internal supply voltage is below low alarm level
		TX Bias High Alarm Flag	Bit 3, set when TX Bias current exceeds high alarm level
		TX Bias Low Alarm Flag	Bit 2, set when TX Bias current is below low alarm level
		TX Power High Alarm Flag	Bit 1, set when TX output power exceeds high alarm level
		TX Power Low Alarm	Bit 0, set when TX output power is below low alarm level

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Data Address	Size (Bytes)	Name of Field	Description of Field
		Flag	
113	1	RX Power High Alarm	Bit 7, set when Received Power exceeds high alarm level
	1	RX Power Low Alarm	Bit 6, set when Received Power is below low alarm level
	1	Reserved Alarm	
	1	Reserved Alarm	
	1	Reserved Alarm	
	1	Reserved Alarm	
	1	Reserved Alarm	
	1	Reserved Alarm	
114-115	2	Unallocated	
116	1	Temp High Warning Flag	Bit 7, set when internal temperature exceeds high warning level
		Temp Low Warning Flag	Bit 6, set when internal temperature is below low warning level
		Vcc High Warning Flag	Bit 5, set when internal supply voltage exceeds high warning level
		Vcc Low Warning Flag	Bit 4, set when internal supply voltage is below low warning level
		TX Bias High Warning Flag	Bit 3, set when TX Bias current exceeds high warning level
		TX Bias Low Warning Flag	Bit 2, set when TX Bias current is below low warning level
		TX Power High Warning Flag	Bit 1, set when TX output power exceeds high warning level
		TX Power Low Warning Flag	Bit 0, set when TX output power is below low warning level
117	1	RX Power High Warning	Set when Received Power exceeds high warning level
	1	RX Power Low Warning	Set when Received Power is below low warning level
	1	Reserved Warning	
	1	Reserved Warning	
	1	Reserved Warning	
	1	Reserved Warning	
	1	Reserved Warning	
118-119	2	Ext Status/Control	Extended module control and status bytes
GENERAL USE FIELDS			
120	1	Vendor Specific	Serial data with temperature, supply voltage, TX bias current, TX output power
121-127	7	Vendor Specific	Vendor specific memory addresses
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor Specific control addresses

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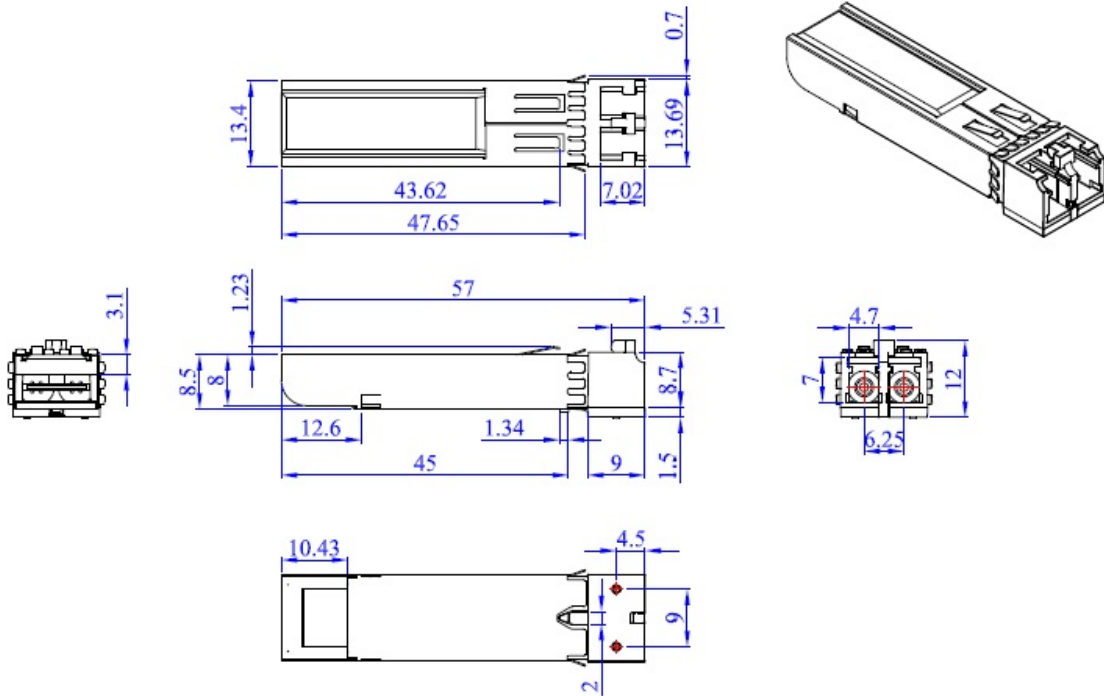
Pin Description



Pin No.	Name	Function	Notes
1	VeeT	Transmitter Ground	TX Ground
2	Tx Fault	Transmitter Fault Indication	TX Fault is an open collector/ drain output, which should be pulled up with a 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT, R+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.
3	TX Disable	Transmitter Disable	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 (>0.8, <2.0V): Undefined High (2.0- 3.465V): Transmitter Disable Open: Transmitter Disable
4	I ² C DATA	Data Line of Two Wire Serial Interface for Serial ID	I ² C Data is a bi-directional digital signal. It should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
5	I ² C CLK	Clock Line of Two Wire Serial Interface for Serial ID	I ² C clock is a digital input signal. It should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
6	VeeT	Transmitter Ground	TX Ground
7	NC	Non-connection	
8	LOS	Loss of Signal	LOS is an open collector/ drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst case receiver sensitivity. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
9	VeeR	Module Ground	RX Ground
10	VeeR	Module Ground	RX Ground
11	VeeR	Module Ground	RX Ground
12	RD-	Inv. Received Data Out	Negative differential receiver outputs (AC-coupled internally)
13	RD+	Received Data Out	Positive differential receiver outputs (AC-coupled internally)
14	VeeR	Module Ground	RX Ground
15	VccR	Receiver Power	3.3V± 5%
16	VccT	Transmitter Power	3.3V± 5%
17	VeeT	Module Ground	TX Ground
18	TD+	Transmit Data In	Positive differential transmitter inputs (AC-coupled internally)
19	TD-	Inv. Transmit Data In	Negative differential transmitter inputs (AC-coupled internally)
20	VeeT	Module Ground	TX Ground

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Mechanical Dimensions (Units in mm)



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Application Circuit

