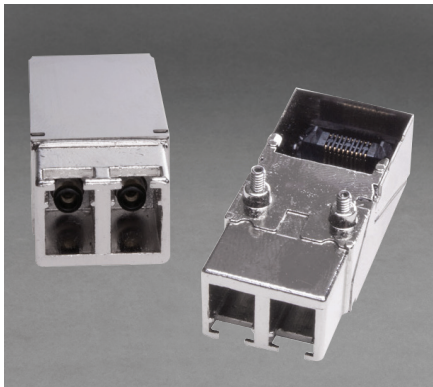




STILETTO SERIES

PCB MOUNTED OPTICAL TRANSCEIVER, 10 G BASE-SR, 10 GIGABIT ETHERNET APPLICATIONS, MULTIMODE, 850 nM



Stiletto series optical fiber transceivers consist of optoelectronic transmitter and receiver functions integrated into a pluggable Duplex LC compliant receptacle connector. The optical transmitters are 850 nM VCSEL lasers. The transmitter input lines are driven with differential CML signals applied to the transmitter (TX+ and TX-) lines. Dual loop, temperature compensated, VCSEL drivers convert the transmitter input signals to suitable VCSEL bias and modulation currents.

Outputs from the receivers consist of differential CML data signals on the receiver (RX+ and RX-) lines. An LVTTTL signal is generated on the LOS line upon receipt of an invalid incoming optical signal. The receiver data lines are squelched upon LOS assertion, preventing errant data generation when an invalid incoming optical signal is presented to the transceiver.

The electrical interface to the Stiletto optical transceivers is a Samtec SMT connector with a 20 position footprint.

STILETTO SERIES SMT / PCB MOUNTED OPTICAL TRANSCEIVER, 10 GBE, 10GBASE-SR / SFI OR sFPDP APPLICATIONS, MULTIMODE, 850 NM VCSELS

Duplex Optical Transceiver Unit
One TX and One RX Channel Operating at 10.125 Gbps

FEATURES

- Compliant with 10 Gigabit Ethernet - 10GBase-SR
- Compliant SFF-8472 digital diagnostic
- Optical fiber link distances up to 300 meters (50 / 125 μ 2,000 MHz*Km MMF - OM3)
- Maximum optical channel bit error rate less than 1×10^{-12}
- Operating temperature range from -40° to +85° C
- Nickel plated brass shell meets stringent corrosion performance requirements
- Die cast housings are strong, durable and light weight
- Duplex LC compliant optical fiber connector interface
- Threaded PCB retention features provide secure mounting in high shock and vibration environments

APPLICATIONS

Stiletto series printed circuit board mounted optical transceivers enable high speed network communications over long distances in harsh environments.

- 10 Gigabit Ethernet switches and peripheral
- sFPDP data links
- Video displays

The multimode optical fiber interface supports applications where copper cable link distance, bandwidth, weight or bulk make the use of twisted pair, twinax or quadrx copper conductors unacceptable.

ORDERING INFORMATION

Application	Part Number
Transceiver @ 10.125 Gbps	R45N-2S1K

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ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_s	-55		+100	°C
Supply Voltage	V_{CC}	-0.5		+4.5	V
TX_DIS Input Voltage	V_I	-0.5		$V_{CC} + 0.5$	V

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	T_A	-40		+85	°C
Power Supply Voltage	V_{CC}	+3.135		+3.465	V
Power Supply Noise (p-p)	N_p			200	mV
TX Differential Input Voltage (p-p)	V_D	0.25		2.2	V

ENVIRONMENTAL OPERATING CONDITIONS

Requirement	Feature	Condition	Notes
RTCA / D0-160E	ESD	HBM	2200 V
RTCA / D0-160E	Damp Heat	10 Cycles	24 Hours
EIA-455-25	Mating Durability	500 Cycles	< 0.5 dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

MATERIALS

Item	Detail	Notes
Metal Shell	Nickel Plated Brass	
Die Cast Body	Zamak 5	
Connector Pins	Brass	
Connector Pin Plating	Gold Over Nickel	
Alignment Sleeves	Composite Polymer	
Printed Circuits	Polyimide / FR-4	
PCB Conformal Coating	Type AR	
Threaded Mounting Posts	Stainless Steel	

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OPTICAL TRANSMITTERS T_A = OPERATING TEMPERATURE RANGE, $V_{CC} = 3.135\text{ V TO }3.465\text{ V}$

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER < 10^{-12})	P_O	-5.0		-1.0	dBm
Optical Output Wavelength	λ_{OUT}	840	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.45	nM
Extinction Ratio	ER	3.0	5.5		dB

OPTICAL RECEIVERS T_A = OPERATING TEMPERATURE RANGE, $V_{CC} = 3.135\text{ V TO }3.465\text{ V}$

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER < 10^{-12} , ER = 9.0)	P_I	-11.1		0.0	dBm
Optical Wavelength	λ_{IN}	840	850	860	nM

POWER SUPPLY CURRENT T_A = OPERATING TEMPERATURE RANGE, $V_{CC} = 3.135\text{ V TO }3.465\text{ V}$

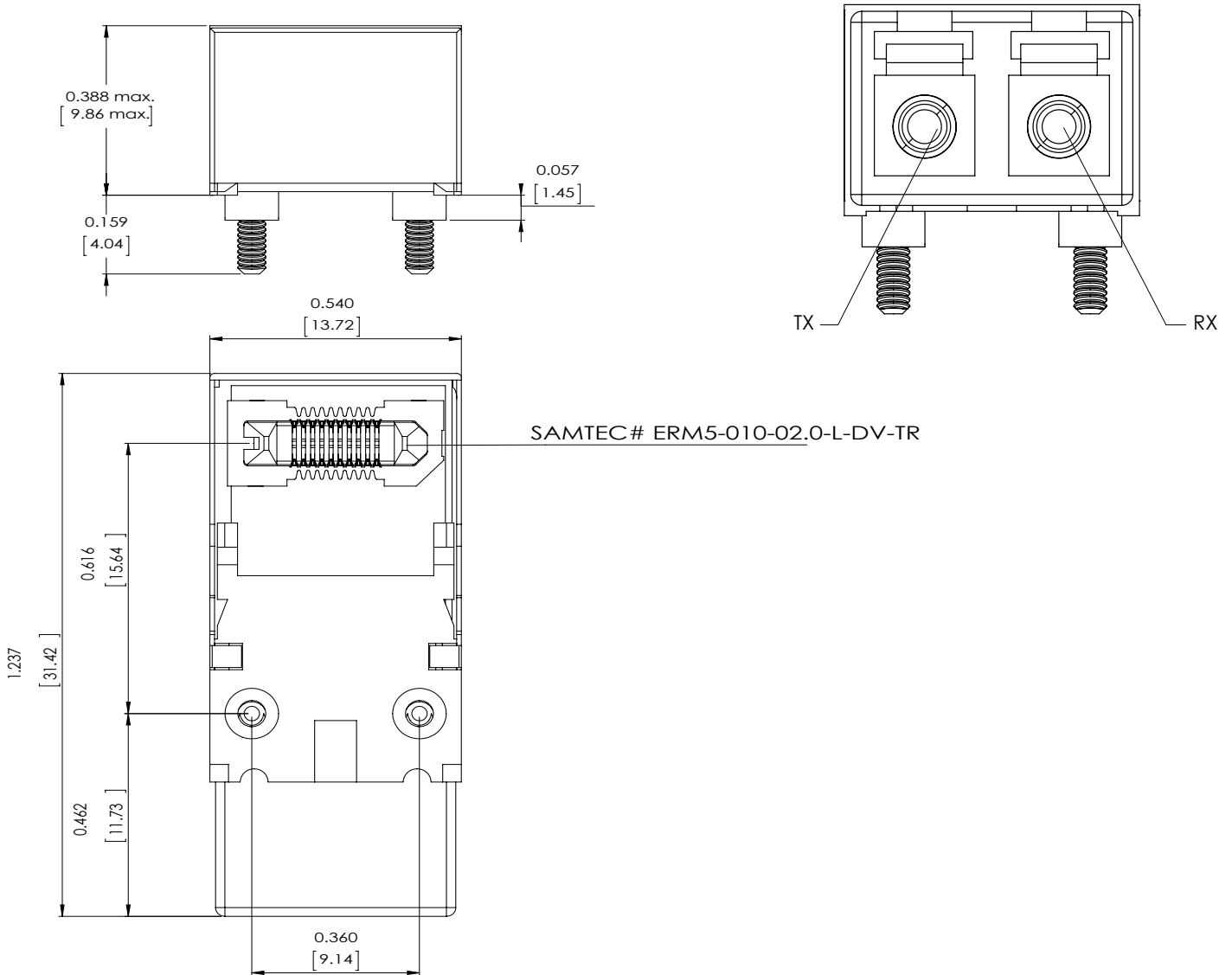
Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current Per Port	I_{OCT}		300	400	mA

OPTICAL FIBER LINK DISTANCES

Cable Type	62.5 / 125 μ 160 MHz*Km	62.5 / 125 μ 200 MHz*Km	50 / 125 μ 400 MHz*Km	50 / 125 μ 500 MHz*Km	50 / 125 μ 2,000 MHz*Km
Maximum Supported Link Distance - Meters	26	33	66	82	300

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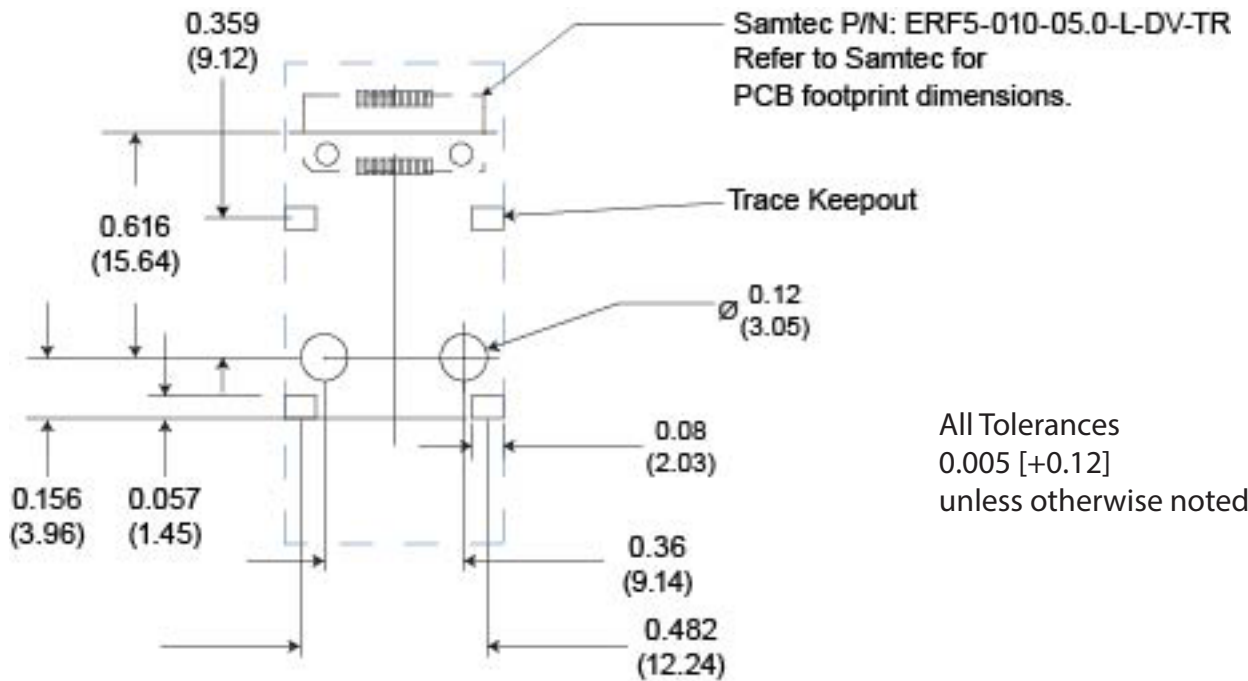
OUTLINE DRAWING



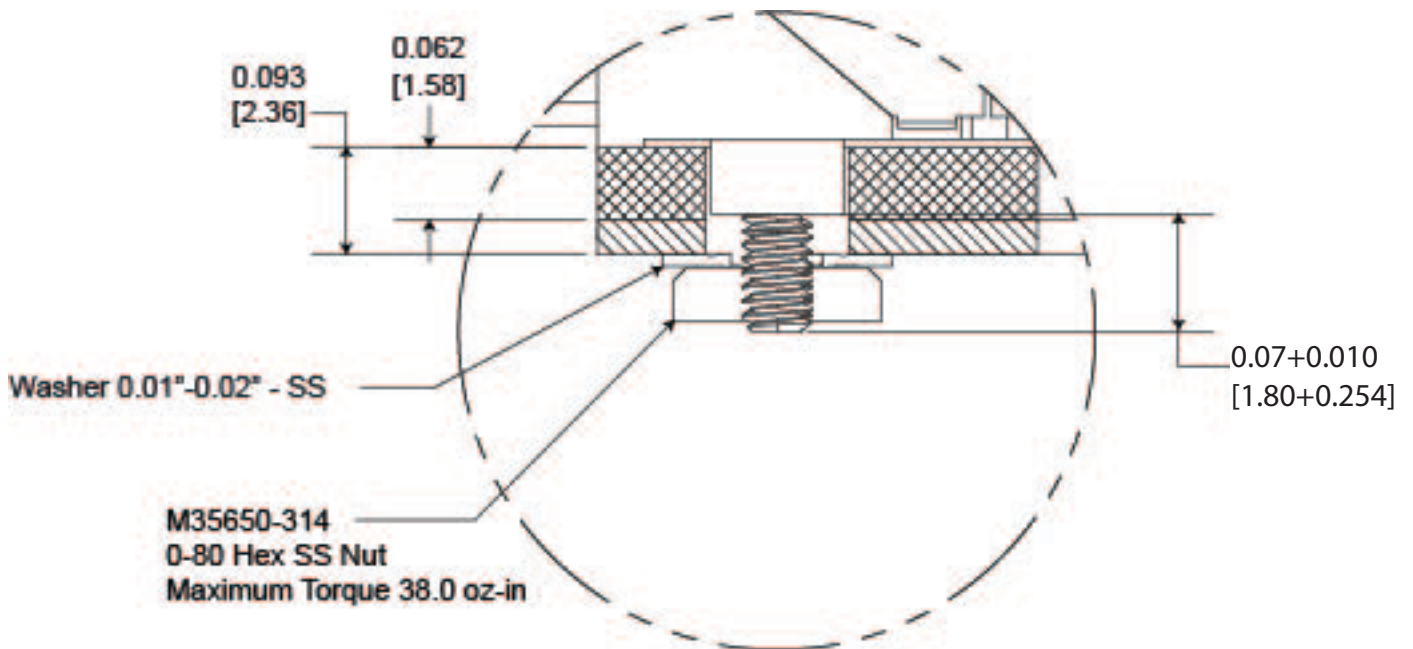
Dimensions are shown as: inches [mm]

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PRINTED CIRCUIT BOARD FOOTPRINT



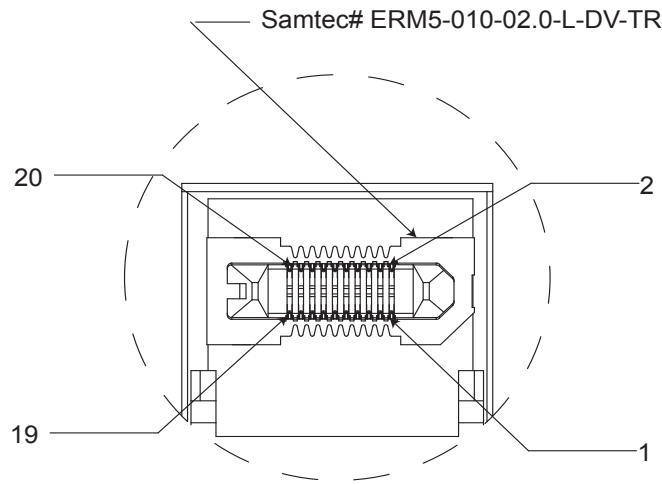
All Tolerances
0.005 [+0.12]
unless otherwise noted



Dimensions are shown as: inches (mm)

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ELECTRICAL PIN FUNCTIONS - COMPONENT BOTTOM VIEW INDICATED



FRONT VIEW OF THE J2 CONNECTOR SHOWN - MATING CABLE PLUG OPPOSITE

Pin Number	Symbol	Description	Logic Family
1	TX-	Transmitter DATA In -	CML
2	TX_Fault	Internal TX Fault Indicator - Output Satisfactory Operation: Logic "0" Output Internal Fault: Logic: "1" Output	Open Drain CMOS
3	TX+	Transmitter DATA In +	CML
4*	SDA	2 Wire Serial Interface Data	I ² C
5**	SCL	2-wire Serial Interface Clock Line	I ² C
6	GND	Ground - Isolated from Case	N/A
7	RSO	No Connection Required	N/A
8	RX_LOS	Loss of Signal - Output Satisfactory Optical Input: Logic "0" Output Unsatisfactory Optical Input: Logic "1" Output	Open Drain CMOS
9	RSEL	No Connection Required	N/A
10	GND	Ground - Isolated from Case	N/A
11	GND	Ground - Isolated from Case	N/A
12	TX_Dis	TX Disable - Input Logic 1: Disable Optical Output Logic 0: Enable Optical Output	LVTTL
13	GND	Ground - Isolated from Case	N/A
14	GND	Ground - Isolated from Case	N/A
15	VCC	Power Supply	N/A
16	VCC	Power Supply	N/A
17	RX-	Receiver DATA out -	CML
18	GND	Ground - Isolated from Case	N/A
19	RX+	Receiver DATA out +	CML
20	GND	Ground - Isolated from Case	N/A

*Pin 4 - 2 Wire Serial Interface Data line (for DDM), pins are open-collector and require pullup resistors

**Pin 5 - 2 Wire Serial Interface Clock line (for DDM), pins are open-collector and require pullup resistors

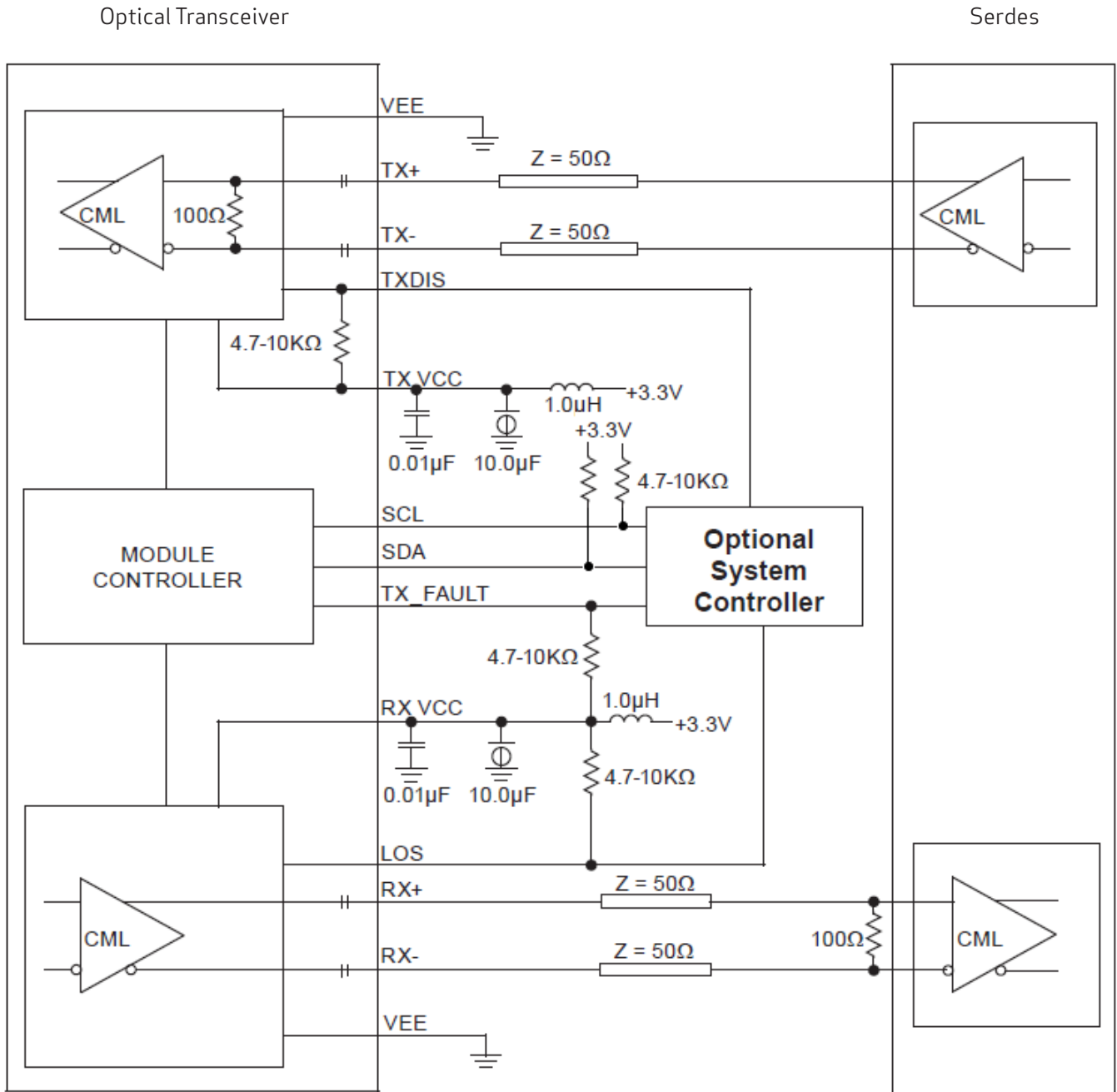
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TWO-WIRE INTERFACE ID: DATA FIELDS - ADDRESS A0H

Byte	Hex	Description	Byte	Hex	Description
0	03	Identifier (type)	37	D8	Vendor OUI
1	04	Extended Identifier (GPBIC/SFP Func defined)	38	EE	Vendor OUI
2	07	Connector (LC Fiber Optic Connector)	39	78	Vendor OUI
3	10	Transceiver (10G BASE-SR)	40	52	"R" Vendor PN ASCII Character
4	00	2-wire Serial Interface Clock Line	41	34	"4" Vendor PN ASCII Character
5	00		42	35	"5" Vendor PN ASCII Character
6	00		43	4E	"N" Vendor PN ASCII Character
7	00		44	2D	"." Vendor PN ASCII Character
8	00		45	32	"2" Vendor PN ASCII Character
9	00		46	53	"S" Vendor PN ASCII Character
10	06	Encoding (64/66B encoded data)	47	31	"1" Vendor PN ASCII Character
11	67	Signal Rate (10.3125 Gbps)	48	4B	"K" Vendor PN ASCII Character
12	00		49	20	" " Vendor PN ASCII Character
13	00		50	20	" " Vendor PN ASCII Character
14	00		51	20	" " Vendor PN ASCII Character
15	08		52	20	" " Vendor PN ASCII Character
16	03	Length 50 um OM2 (80 meters)	53	20	" " Vendor PN ASCII Character
17	00	Length 62.5 um OM1 (30 meters)	54	20	" " Vendor PN ASCII Character
18	1E		55	20	" " Vendor PN ASCII Character
19	4D	Length OM3 (300 meters)	56	01	" " Vendor REV ASCII Character
20	4F	"M" Vendor ASCII Character	57	00	" " Vendor REV ASCII Character
21	4F	"O" Vendor ASCII Character	58	00	" " Vendor REV ASCII Character
22	47	"O" Vendor ASCII Character	59	00	" " Vendor REV ASCII Character
23	20	"G" Vendor ASCII Character	60	03	Hex Byte of Laser Wavelength
24	50	" " Vendor ASCII Character	61	52	Hex Byte of Laser Wavelength
25	52	"P" Vendor ASCII Character	62		RESERVED
26	4F	"R" Vendor ASCII Character	63		Checksum or bytes 0 to 62
27	54	"O" Vendor ASCII Character	64	00	
28	4F	"T" Vendor ASCII Character	65	1A	Hardware TX_Disable, TX_Fault, RX_LOS
29	4B	"O" Vendor ASCII Character	66	00	
30	52	"C" Vendor ASCII Character	67	00	
31	41	"R" Vendor ASCII Character	68 - 83		Serial Number ASCII Characters
32	46	"A" Vendor ASCII Character	84 - 91		Manufacturer Date Code ASCII Characters
33	54	"F" Vendor ASCII Character	92	68	Diagnostic Monitoring Type
34	20	"T" Vendor ASCII Character	93	F0	Enhanced Options
35	00	" " Vendor ASCII Character	94	03	SFF-8472 Rev Compliance
36		Code for Electronic or optical compatibility	95		Checksum for bytes 64-94
			96 - 255	00	

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APPENDIX A1 PART NUMBER OPTIONS



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