10G SFP MODULE, DUAL FIBER, LC, 1270/1330 NM, 20KM

SPTLDS20

The transceiver is small form factor pluggable module for optical data communications such as 10GBASE-LR/LW defined by IEEE 802.3ae. It is with the SFP+ 20-pin connector to allow hot plug capability. The module is designed for single mode fiber and operates at a nominal wavelength of 1270nm or 1330nm; The transmitter section uses a multiple quantum well DFB, which is class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The transceiver designs are optimized for high performance and cost effective to supply customers the best solutions for telecommunication.

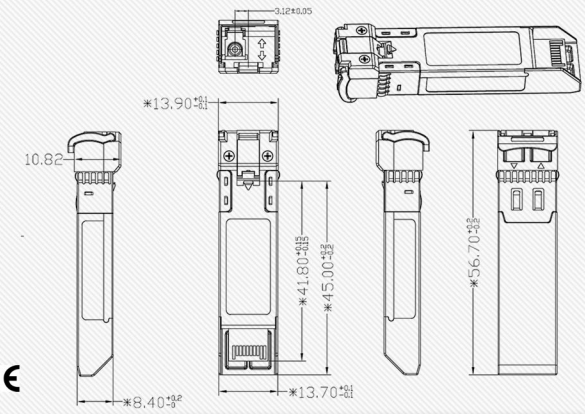
FEATURES

- Supports 9.95 to 10.3Gb/s bit rates;
- Simplex LC Connector;
- Hot pluggable SFP+ footprint;
- Applicable for 10km SMF connection;
- Low power consumption, < 1W;
- Digital Diagnostic Monitor Interface;
- Optical interface compliant to IEEE 802.3ae 10GBASE-LR;
- Electrical interface compliant to SFF-8431;
- Operating case temperature: Commerical:0 to 70 °C;

APPLICATIONS

- 10GBASE-LR at 10.3125Gbps
- 10GBASE-LW at 9.953Gbps
- Other optical link

DIMENSIONS



SPECIFICATIONS

MODEL		SPTLDS20				
PARAMETER	SYMBOL	MINIMUM	MAXIMUM	TYPICAL	UNITS	NOTE
ABSOLUTE MAXIMUM RATINGS						
Supply Voltage	Vcc	-0.5	4.0	-	V	-
Storage Temperature	Ts	-40	85	-	°C	-
Relative Humidity	RH	0	85	-	%	-
GENERAL OPERATING CHARACTERISTICS						
Data Rate	DR	9.95	10.3125	-	Gb/s	-
Supply Voltage	Vcc	3.13	3.47	3.3	V	-
Supply Current	Iccs	-	300	-	mA	-
Operating Case Temp.	Tc	0	70	-	°C	-
	Ti	-20	80	-		-
ELECTRICAL CHARACTERISTICS(TRANSMITTER)						
Differential data Input Swing	VIN, PP	180	700	-	mVpp	1
Transmit Disable Voltage	VD	Vcc-0.8	Vcc	-	V	-
Transmit Enable Voltage	VEN	Vee	Vee+0.8	-		
Input Differential Impedance	Rin	-	-	100	Ω	-
ELECTRICAL CHARACTERISTICS(RECEIVER)						
Differential Data Output Swing	Vout, PP	300	850	-	mVpp	2
Output Rise Time and Fall Time	Tr, Tf	28	-	-	Ps	3
LOS Asserted	VLOS_F	Vcc-0.8	Vcc	-	V	4
LOS De-asserted	VLOS_N	Vee	Vee+0.8	-	V	4
OPTICAL CHARACTERISTICS(TRANSMITTER)						
Operating Wavelength	λ	1260	1280	1270	nm	-
		1320	1340	1330		-
Ave. Output Power (Enabled)	PAVE	-3	+3	-	dBm	1
Side-Mode Suppression Ratio	SMSR	30	-	-	dB	-
Extinction Ratio	ER	4.5	-	-	dB	-
RMS Spectral Width	Δλ	-	1	-	nm	-
Rise/Fall Time (20%~80%)	Tr/Tf	-	50	-	ps	-
Dispersion Penalty	TDP	-	3.2	-	dB	-
Relative Intensity Noise	RIN	-	-128	-	dB/Hz	-
Output Optical Eye	Compliant with IEEE 0802.3ae					
OPTICAL CHARACTERISTICS(RECEIVER)						
Operating Wavelength	λ	1320	1340	1330	nm	-
		1260	1280	1270		-
Receiver Sensitivity(ER=4.5)	PSEN1	-	-12.6	-	dBm	2
Receiver Sensitivity(ER=6)	PSEN2	-	-14.4	-	dBm	2
Average Receive Power	PAVE	-	0.5	-	dBm	-
Receiver Reflectance	Rrx	-	-12	-	dB	-
LOS Assert	Pa	-30	-	-	dBm	-
LOS De-assert	Pd	-	-17	-	dBm	-
LOS Hysteresis	Pd-Pa	0.5	-	-	dB	

DIGITAL DIAGNOSTIC SPECIFICATIONS						
PARAMETER	SYMBOL	UNITS	MINIMUM	MAXIMUM	ACCURACY	NOTE
Transceiver Temperature	DTemp-E	°C	-5	+75	±5°C	1
Transceiver Supply Voltage	DVoltage	V	2.8	4.0	±3°C	-
Transmitter Bias Current	DBias	mA	0	127	±10%	2
Transmitter Output Power	DTx-Power	dBm	-5	+5	±2dB	-
Receiver Average Input Power	DRx-Power	dBm	-20	+1	±2dB	-

Disclaimer: Design & specifications are subject to change without prior notice.

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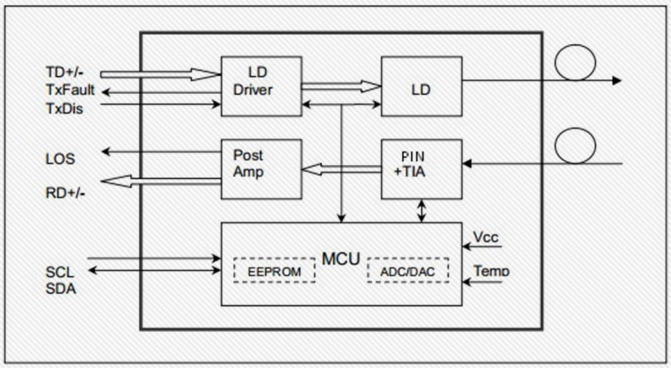
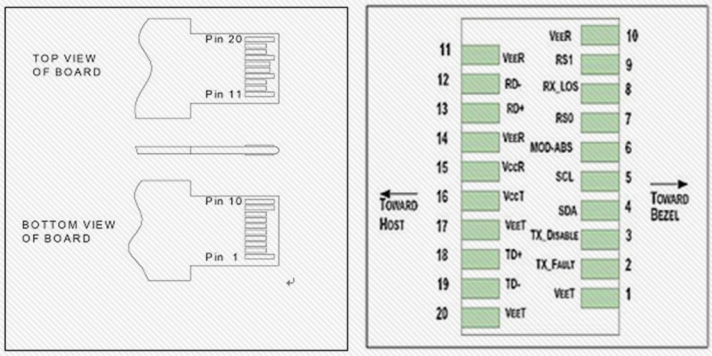
FUNCTIONAL DIAGRAM

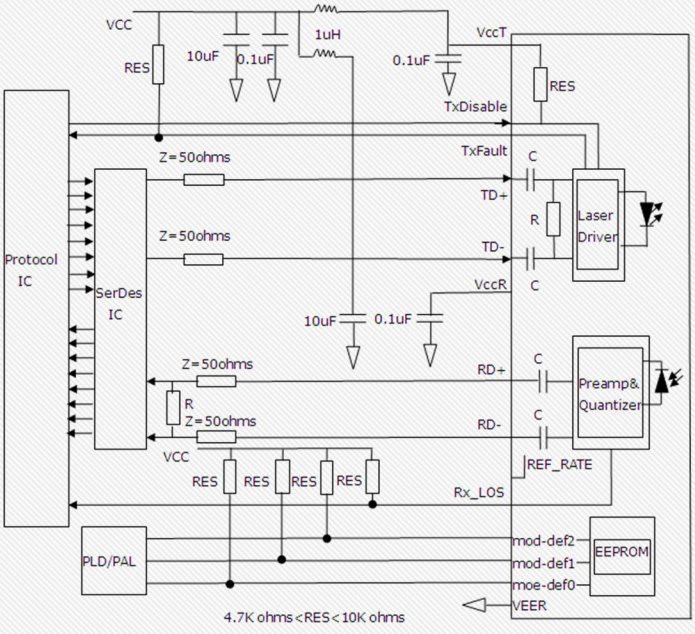


PIN DEFINTION AND FUNCTIONS



PIN	SYMBOL	NAME/DESCRIPTION
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

TYPICAL INTERFACE CIRCUIT



SERIAL INTERFACE FOR ID AND DDM

The transceiver support the 2-wire serial communication protocol as defined in the SFP+ MSA. The standard SFP+ serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information. Additionally, This SFP+ transceivers provide an enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X(A0h), so the originally monitoring interface makes use of the 8 bit address(A2h), so the originally defined serial ID memory map remains unchanged. The structure of the memory map is shown in Table1.

2 wire address 1010000X (**A0h**)	
Address	**Information**
0~95	Serial ID Defined by SFP MSA (96 bytes)
96~127	Vendor Specific (32 bytes)
128~255	Reserved,SFF8079 (128 bytes)

2 wire address 1010001X (**A2h**)	
Address	**Information**
0~55	Alarm and Warning Thresholds (56 bytes)
56~95	Calibration Constants (40 bytes)
96~119	Real Time Diagnostic Interface (24 bytes)
120~127	Vender Specific (8 bytes)
128~247	User Writable EEPROM (120 bytes)
248~255	Vender Specific (8 bytes)

WAVELENGTH	LATCH COLOR
TX 1270nm	Black
TX 1330nm	Blue

CE

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