10.3125Gbps LC Receptacle Duplex CWDM SFP+ Transceiver

Features

- 8-Wavelength CWDM Transmitter from 1470nm to 1610nm, with Step 20nm
- Standard Small Form Pluggable package with receptacle LC/UPC connector
- Compliant with SFP MSA
- SFF-8472 compliant digital diagnostic monitoring function implemented
- Internally calibrated mode
- Cooled EML Transmitter
- High sensitive APD Receiver
- Single +3.3V power supply
- Operating case temperature; 0℃ to +70℃
- Differential CML inputs and outputs
- Internally AC-Coupled electrical interface
- RoHS compliant

Description

IDS-10xxALB-C23R SFP+ transceivers are designed to meet serial optical data communications specification. The transceivers are manufactured in hot pluggable capability package with receptacle LC connector interface and made of metallized housing to obtain excellent EMI shielding.

The transmitter consists of EML in an optical subassembly (OSA).

The OSA is driven by a custom IC which converts differential CML logic signals into a laser diode drive current. The receiver includes a planar InGaAs APD mounted with a transimpedance preamplifier IC in an OSA. The OSA is mated to a custom limiting-amplifier which provides post-amplification and signal detect function (Logic 0 indicates normal operation).

The transceivers are designed to used in a single power supply (+3.3V) and an operating temperature range of 0℃ to +70℃

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Applications

- Digital Wireless Repeaters
- Digital Wireless BTS Interconnects: OBSAI and CPRI Standards
- High-speed data links.
- Other optical links

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Storage Temperature	T_{ST}	-40		+85	℃
Power Supply Voltage	V_{CC}	0		3.6	V
Operating Humidity	H_{OP}			85	% RH

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	0		70	℃
Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Power Supply Current	$I_{CC(Tx+Rx)}$			650	mA

CWDM Wavelength

Parameter	Symbol	Min	Typ	Max	Unit
S-band Short Wavelength	λ	1464.5	1471	1477.5	nm
	λ	1484.5	1491	1497.5	nm
	λ	1504.5	1511	1517.5	nm
	λ	1524.5	1531	1537.5	nm
C-band Conventional	λ	1544.5	1551	1557.5	nm
L-band Long Wavelength	λ	1564.5	1571	1577.5	nm
	λ	1584.5	1591	1597.5	nm
	λ	1604.5	1611	1617.5	nm

Transmitter Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Bit rate	B		10.3125		Gbps
Center Wavelength	λ_C	λ_C -6.5	λ_C	λ_C +6.5	nm
Output Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Average Launch Power	P_o	-0.5		5	dBm
Extinction ratio	dB	8.2			dB
Side Mode Suppression Ratio	SMSR	30			dB
Differential data input swing	$V_{IN, p-p}$	200		1000	mV
TX_Disable Input High Voltage	V_{IH}	2.4			V
TX_Disable Input Low Voltage	V_{IL}			0.8	V
TX_Fault Output High Voltage	V_{OH}	Host Vcc - 0.5		Host Vcc	V
TX_Fault Output Low Voltage	V_{OL}	0		0.4	V
Dispersion Penalty(30Km)	TDP			2.0	dB
Relative intensity noise	R_{IN}			-128	dB/Hz
Average Launch Power of Off TX	P_{o_OFF}			-30	dBm

Receiver Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Bit rate	B		10.3125		Gbps
Received Wavelength	λ_C	1260		1620	nm
Differential data output swing	$V_{OUT, p-p}$	200		800	mV
RX_LOS Output Voltage-high	V_{OH}	Host Vcc - 0.5		Host Vcc	V
RX_LOS Output Voltage-Low	V_{OL}	0		0.4	V
Average Rx Sensitivity (Note1)	P_{min}			-23.5	dBm
Maximum Input Power	P_{max}	-6			dBm
LOS De-Assert	LOS_D			-25	dBm
LOS Assert	LOS_A	-40			dBm
LOS Hysteresis	LOS_{HYS}	0.5			dB

Note 1) Sensitivity and saturation level at PRBS2^31-1, @10.3125Gbps, BER $1x10^{-12}$

PIN description

These devices can be installed in or removed from any MSA-compliant Pluggable Small Form Factor port regardless of whether the host equipment is operating or not. These devices are simply inserted, electrical-interface first, under finger-pressure. Controlled hot-plugging is ensured by 3-stage pin sequencing at the electrical interface. See the Fig. 1. As these devices are inserted, first contact is made by the housing ground shield, discharging any potentially component-damaging static electricity. Ground pins engage next and are followed by TX and RX power supplies. Finally, signal pins are connected.

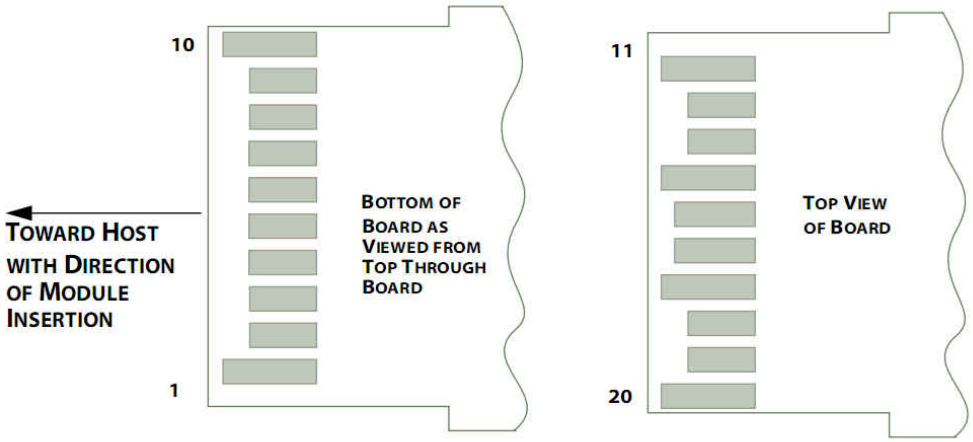

Fig. 1 SFP+ Transceiver Electrical Pad Layout

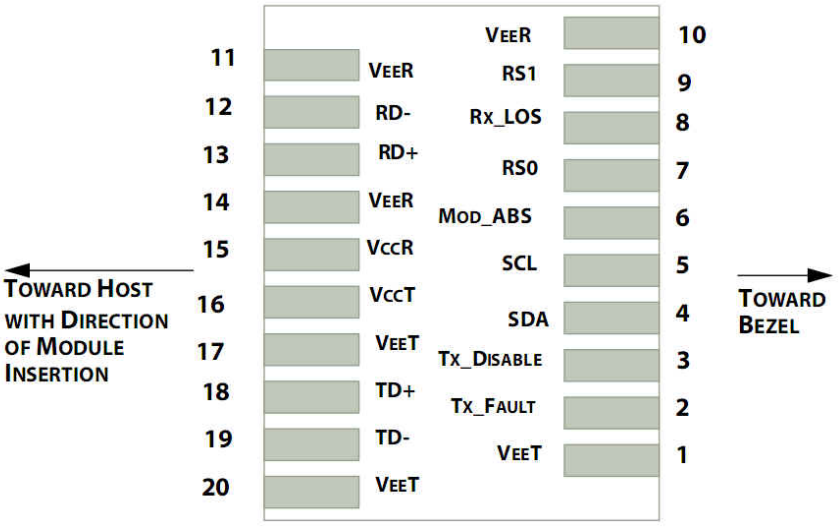

Fig. 2 Host PCB SFP+ Pin-out

PIN assignment

Pin	Name	In/Out	Logic	Description	Note
1	VeeT			Module Transmitter Ground	
2	TX_Fault		LVTTL	Module Transmitter Fault	2
3	TX_Dis	I	LVTTL	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	I/O	LVTTL	2-Wire Serial Interface Data Line	
5	SCL	I/O	LVTTL	2-Wire Serial Interface Clock	
6	Mod_ABS			Module Absent, connected to VeeT or VeeR in the module	2
7	RS0	I	LVTTL	Rate Select 0 (not functional for 10GE type)	
8	RX_LOS	O	LVTTL	Receiver Loss Of Signal Indication (In FC designated as RX_LOS and in Ethernet designated as Signal Detect)	2
9	RS1	I	LVTTL	Rate Select 1 (not functional for 10GE type)	
10	VeeR			Module Receiver Ground	1
11	VeeR			Module Receiver Ground	1
12	RD-	O	CML	Receiver Inverted Data Output	
13	RD+	O	CML	Receiver Non-Inverted Data Output	
14	VeeR			Module Receiver Ground	1
15	VccR			Module Receiver 3.3 V Supply	
16	VccT			Module Transmitter 3.3 V Supply	
17	VeeT			Module Transmitter Ground	1
18	TD+	I	CML	Transmitter Non-Inverted Data Input	
19	TD-	I	CML	Transmitter Inverted Data Input	
20	VeeT			Module Transmitter Ground	1

Note

1: Module ground pins are isolated from the module case and chassis ground within the module.

2: Shall be pulled up with 4.7k to 10k ohm to a voltage between 3.15V and 3.45V on the host board.

3: Shall be pulled up with 4.7k to 10k ohm to VccT in the module.

SFP+ Host Board Mechanical Layout [unit: mm]

A typical host board mechanical layout for attaching the SFP+ connector and cage system is shown in Fig. 3 and Fig. 4.

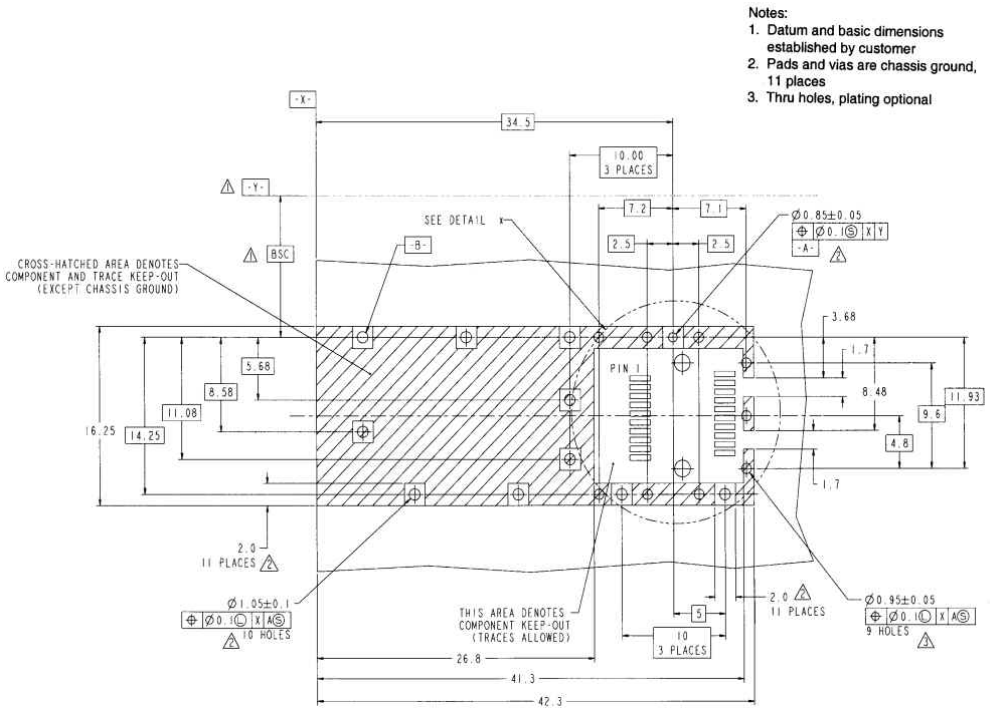

Fig. 3 Host board mechanical layout(mm)

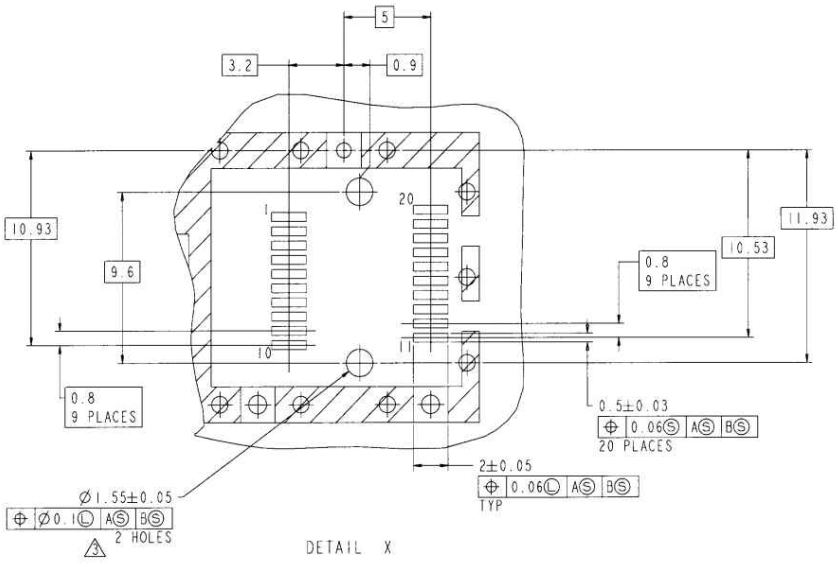

Fig. 4 Detailed host board mechanical layout(mm)

Host Board Power Supply filtering

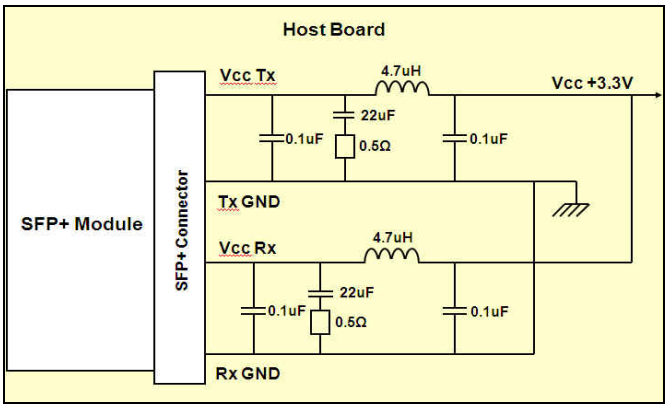

Fig. 5 Host board power supply filtering

Recommended Circuit Schematic

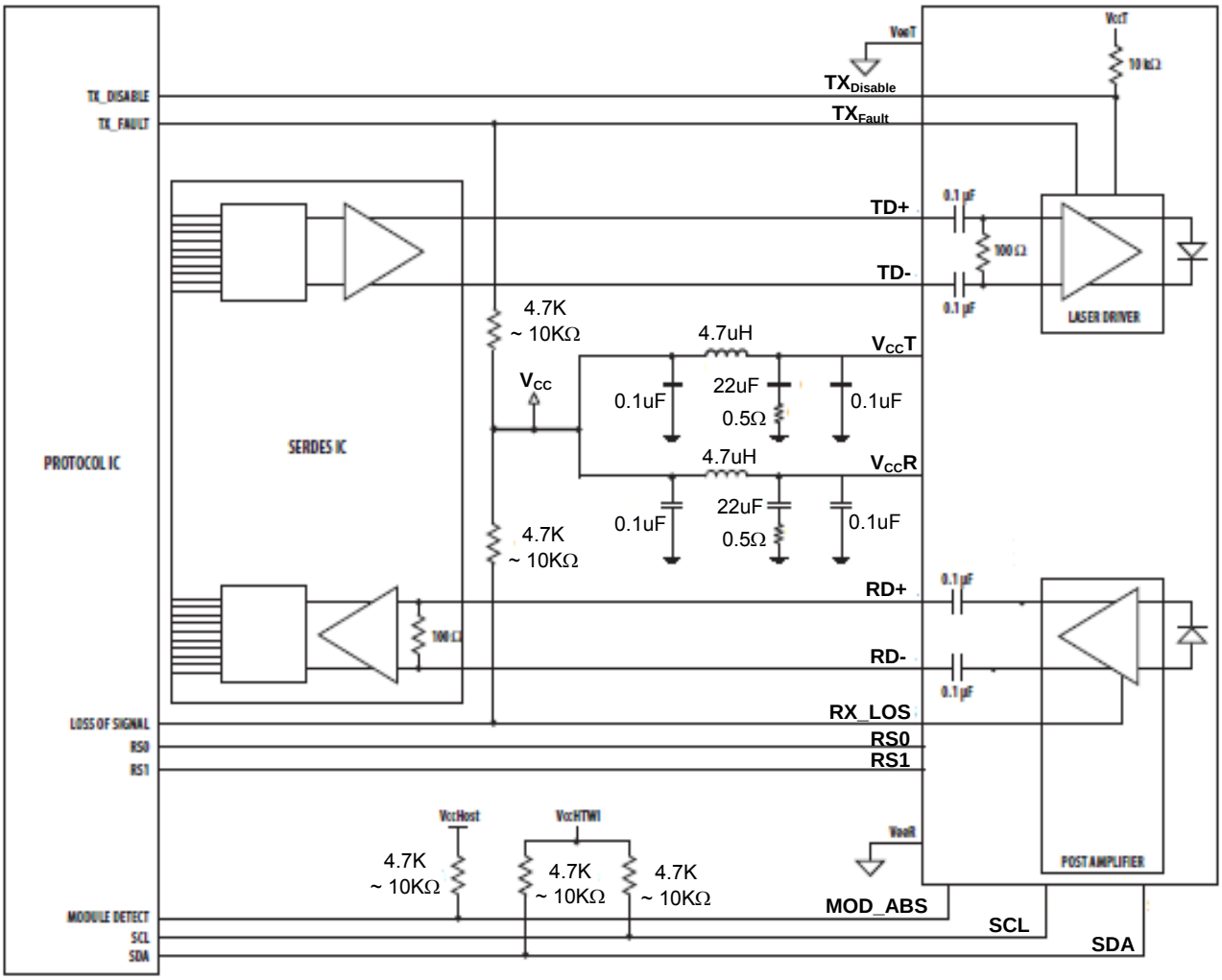

Fig. 6 SFP+ Host board Schematic Application

Digital Diagnostic Functions

The IDS-10xxALB-C23R SFP+ transceivers support the 2-wire serial communication protocol (I^2C) as defined in the SFP+ MSA. Through this serial communication, these transceivers provide access to identification information that describes their capabilities, standard interfaces, manufacturer, and other information. In addition, these SFP+ transceivers provide enhanced digital diagnostic monitoring interface, which allows real-time access to device operating conditions such as internal temperature, laser bias current, transmitted optical power, received optical power and supply voltage. It also defines a sophisticated system of alarm and warning flags.

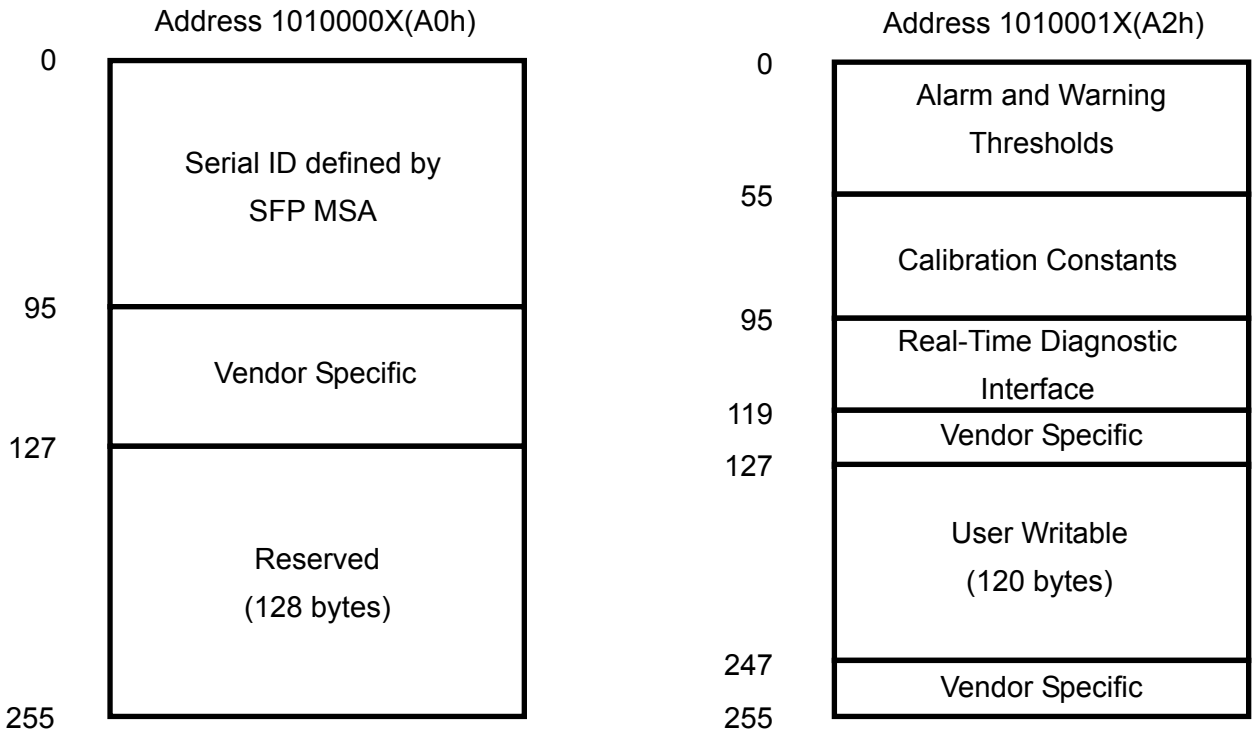

Fig. 7 Two-wire serial digital memory map

Ordering Information

For more information on this or other products and their availability, please contact e-mail at sales@intecec.com.

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No.	ITEM	Code	Description
①	Company	I	INTEC E&C
②	Form Factor	DS	Duplex SFP+
③	Data-rate	10	10Gbps
④	Tx wavelength	xx	47(1470nm) ~ 61(1610nm)
⑤	Rx wavelength	00	ALL Wavelength
⑥	Optical interface	B	LC-UPC receptacle
⑦	Temperature range	C	0℃ ~ 70℃
⑧	Link budget	23	23dB
⑨	RoHS	R	RoHS compliant

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