SFP+ 10G Duplex 850nm 200m LC Optical Transceiver

TS8511A-CN

FEATURES

- Up to 10.3125 Gbps data rate
- 850nm VCSEL Laser and PIN photo detector
- Duplex LC receptacle optical interface compliant
- Single +3.3V power supply
- Hot-pluggable
- AC coupling of LVPECL signals
- International Class1 laser safety certified
- Operating temperature range:
- Commercial: 0℃~+70℃
- RoHS Compliant
- DDMI function available with internally calibrated mode

APPLICATIONS

- 10G BASE-SR
- Fiber Channel

Standard

- Compliant with SFP+ MSA
- Compliant with SFF-8472
- Compatible with IEEE802.3ae 10GBASE-SR
- 10GFC

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Part Number	From Factor	Data Rate	Media	Distance (m)	Wavelength (nm)	Temperature (℃)
TS8511A-CN	SFP+	10G	MMF	200	850	0~70

1. ABSOLUTE MAXIMUM PARAMETERS

Exceeding the limits below may damage the active optical cable permanently.

Parameter	Symbol	Min.	Max.	Unit.
Storage temperature	TS	-40	85	℃
Power Supply Voltage	Vcc	-0.5	+4	V
Relative Humidity	RH	5	95	%

2. RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit.
Operating Case Temperature	Tc	0		70	℃
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Supply Current	Icc			300	mA
Data Rate		-	10.3125	-	Gbps
Fiber Length 50μm core MMF		-	-	200	m

3. ELECTRICAL CHARACTERISTICS

Parameter	Min.	Typ.	Max.	Unit.	Notes
Transmitter differential input voltage	180		700	mV	
Receiver differential output Voltage	300		850	mV	
Transmit Fault (TX_Fault)	2		Vcc	V	LVTTL
	0		0.8	V	LVTTL
Loss of Signal (LOS)	2		Vcc	V	LVTTL
	0		0.8	V	LVTTL
TX Disable	2		Vcc	V	LVTTL
	0		0.8	V	LVTTL

4. OPTICAL CHARACTERISTICS

(Condition: Tc= 0 to 70℃)

Optical transmitter Characteristics							
Parameter		**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Launched Power (avg.)		Pout	-6		-1	dBm	
Operating Wavelength Range		λc	840	850	860	nm	
Spectral Width (RMS)		Δλ			0.45	nm	
Extinction Ratio		ER	3			dB	1
Relative Intensity Noise		RIN			-128	dB/Hz	
Optical Rise/Fall Time		Tris/Tfall		50		PS	2
Optical Tx Output disable		Pdis			-45	dBm	
Output Eye Diagram		Complies with IEEE802.3z eye masks when filtered					
Optical receiver Characteristics							
Parameter		**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Receiver Sensitivity		S			-10	dBm	3
Wavelength Range		λc	840		860	nm	
Optical Power Input Overload		Pin-max	-3			dBm	3
LOS	Optical De-assert	Pd			-15	dBm	3
	Optical Assert	Pa	-25				
LOS hysteresis			0.5		5	dB	4

Notes:

1) For the measurements, the device was driven with10Gbps data pattern with 2^31-1 PRBS payload

2) Optical transition time is the time interval required for the rising or falling edge of an optical pulse to transition between the 20% and 80% amplitudes relative to the logical 1 and 0 levels

3) Measured with a PRBS 2^31-1 test pattern, @10Gbps, ER=4dB, BER<1E-12

4) The LOS Hysteresis minimizes 'chatter' on the output line. In principle, Hysteresis alone does not guarantee chatter-free operation

5. PIN DESCRIPTIONS

Pin	Symbol	Function/Description	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	5
2	TX_Fault	Transmitter Fault, Low: normal ; High: abnormal	6
3	TX_Disable	Transmitter Disable. High: Transmitter off; Low: Transmitter on	7
4	SDA	2-Wire Serial Interface Data Line(Same as MOD-DEF2 in INF-8074i)	8
5	SCL	2-Wire Serial Interface Data Line(Same as MOD-DEF2 in INF-8074i)	8
6	Mod_ABS	Module Absent, Connect to VeeT or VeeR in Module	9
7	RS0	Rate Select 0, optionally controls SFP+ module receiver	10
8	RX_LOS	Receiver Loss of Signal indication. High: loss of signal; Low: signal detected	11
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter	12
10	VeeR	Receiver Ground	5
11	VeeR	Receiver Ground	5
12	RD-	Receiver Inverted DATA out. AC Coupled. CML-O	13
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	13
14	VeeR	Receiver Ground	5
15	VccR	Receiver Power Supply	14
16	VccT	Transmitter Power Supply	14
17	VeeT	Transmitter Ground	5
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	15
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	15
20	VeeT	Transmitter Ground	5

Notes:

5) The module signal ground contacts.

6) This pin is an open drain/collector and should be pulled up to Vcc-host in the host with a 4.7k~10k Ohm resistor

7) This pin should be pulled up to Vcct with a 4.7k~10k Ohm resistor in modules

8) SDA&SCL(IIC) are need pull up 4.7k~10k Ohm resistor on host board

9) Mod_ABS is connected to VeeT or VeeR in the SFP+ module

10) Rate Select 0,Optionally controls SFP+ module receiver , High:RX input signaling rate > 4.25GBd and Low: RX input signaling rate≤4.25GBd

11) Module RX_Los of signal indication , need pull up 4.7k~10k Ohm resistor on host board

12) Rate Select 1,Optionally controls SFP+ module transmitter, High: Tx input signaling rate > 4.25GBd and Low : Tx input signaling rate≤4.25GBd

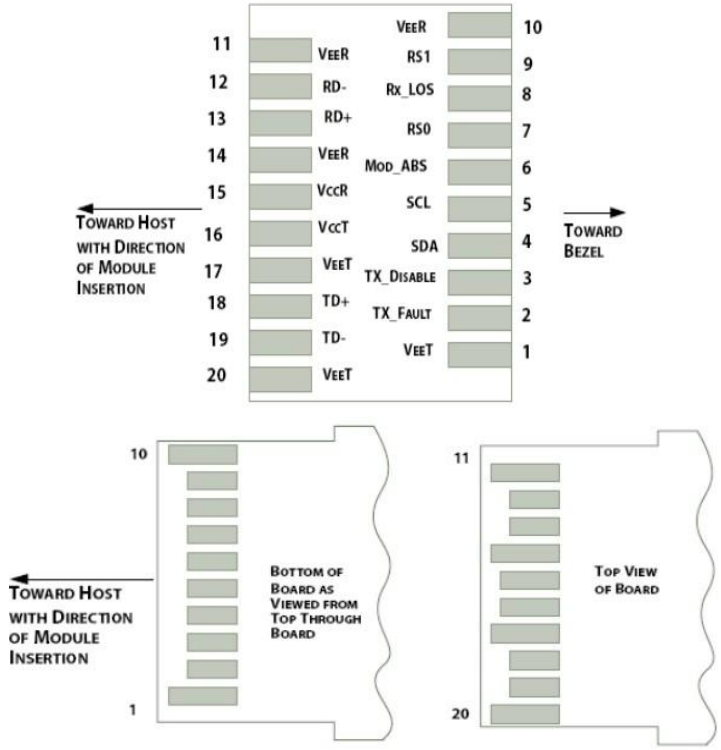
13) RD -/+: These are the differential receiver outputs. They are CML AC-coupled with 100 Ohm

terminal resistor matching internal

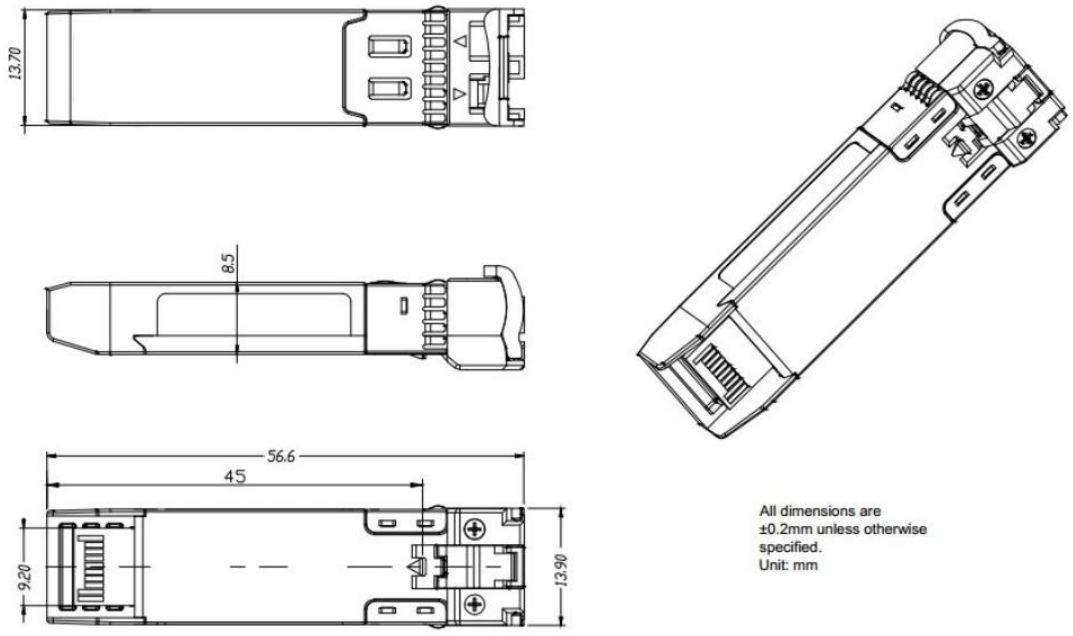
14) VccR and VccT are the receiver and transmitter power supplies

15) TD-/+: These are the differential transmitter inputs. They are CML AC-coupled with 100 Ohm terminal resistor matching internal

6. PIN DIAGRAM



7. Mechanical Design Diagram



8. Regulatory Compliance

Feature	Test	Method
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1 (>1.5kV) – Human Body Model
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1	Comply with standard
Immunity	IEC61000-4-3	Comply with standard
Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2	Compatible with Class I laser Product

9. LABEL DIAGRAM