TS-S8-1324-40Dx

25Gb/s SFP28 ER Transceivers

PRODUCT FEATURES

- Operating data rate up to 25.78Gbps
- Rate Adaptation
- Up to 40km transmission distance
- High sensitivity APD photodiode and TIA
- LC single connector
- Hot pluggable 20pin connector
- Low power consumption <1.5 W
- Single +3.3V±5% power supply
- Compliant with SFF-8472& IEEE 802.3cc
- Fully RoHS Compliant
- Operating temperature range:

  Commercial: 0°C to +70°C

  Industrial: -40°C to +85°C

Application

- 25GE BASE-ER Ethernet
- CPRI Option 10/eCPRI

Ordering information

Part Number	Product Description
TS-S8-1324-40DC	25G SFP28 ER transceiver, C-TEMP
TS-S8-1324-40DI	25G SFP28 ER transceiver, I-TEMP

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DESCRIPTION

The TS-S8-1324-40Dx Transceiver is intended for 40km reach service 25.78Gb/s 1310nm single mode high-speed communications equipment where low-cost, extraordinary performance and reliability are essential. It consumes low power, operates base on 3.3V DC power supply and is offered in the industrial temperature range. They are compliant with SFP28 MSA, SFF-8431 and SFF-8432.

The low jitter and low bit error rate optical assembly features a DML laser transmitter and APD/TIA receiver. It utilizes internal clock and data recovery (CDR) units on transmitter and the receiver chains for low jitter compliance. The differential AC coupled Tx and Rx data interfaces are CML compatible. The device is Class I laser safety compliant.

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	0	85

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Power Supply Voltage	Vcc	V	3.14	3.3	3.46
Bit Rate	BR	Gb/s		25.78	
Bit Error Ratio	BER				$5*10^{-5}$
Max Supported Link Length	L	Km			40

Electric Ports Definition

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Input Differential Impedance	R_{IN}	Ω		100		
Single-ended Data Input Swing	V_{IN}	mVp-p	90		450	
Transmit Disable Voltage	V_{DIS}	V	2		V_{CCHOST}	
Transmit Enable Voltage	V_{EN}	V	V_{EE}		V_{EE}+0.8	
Transmit Fault Assert Voltage	V_{FA}	V	2		V_{CCHOST}	
Transmit Fault De-Assert Voltage	V_{FDA}	V	V_{EE}		V_{EE}+0.4	
Receiver						
Single-ended Data Output Swing	V_{OD}	mVp-p	200		450	
LOS Fault	V_{LOSFT}	V	2		V_{CCHOST}	
LOS Normal	V_{LOSNR}	V	V_{EE}		V_{EE}+0.4	

TRANSMITTER CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Center Wavelength	λ		1260		1360	nm
Side-mode Suppression Ratio	SMSR		30			dB
Average Optical Power	P_{avg}		-2		6.0	dBm
Optical Modulation Amplitude	TxOMA		0			dBm
Transmitter and Dispersion Penalty	TDP				2.7	dB
Average Launch Power of OFF Transmitter	P_{off}				-20	dBm
Extinction Ratio	ER		4			dB
Optical Return Loss Tolerance					20	dB
Transmitter Reflectance					-26	dB

RECEIVER CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Center Wavelength	λ		1260		1360	nm
Damage Threshold			-3			dBm
Receive Power Overload					-5	dBm
Receiver Reflectance					-26	dB
Receiver Sensitivity	S	Note1			-19	dBm
LOS Assert	LOS_A		-35			dBm
LOS De-Assert	LOS_D				-21	dBm
LOS Hysteresis			0.5			dB

Note1: Measured at 25.78125Gb/s, ER>4dBm, PRBS 2^{31}-1 and BER better than or equal to 5E-5;

PIN Assignment

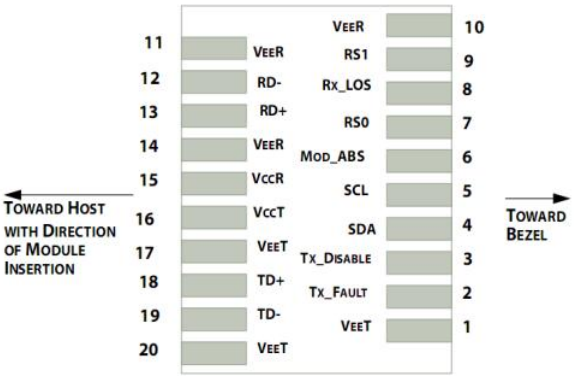

Figure 1.Pin function definitions

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Table 1: Transceiver pin descriptions

Pin Number	Symbol	Name	Description
1,17,20	VeeT	Transmitter Signal Ground	Connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Module transmitter fault output.
3	TX Disable	Transmitter Disable In (LVTTL)	Module transmitter disable control.
4	SDA	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors.
5	SCL		
6	MOD-ABS		
7	RS0	Receiver Rate Select (LVTTL) Transmitter Rate Select (LVTTL)	Rate select 0(Rx):Low=CDR Bypass ; High=CDR Select Rate select 1(Tx):Low=CDR Bypass ; High=CDR Select
9	RS1		
8	LOS	Loss of Signal Out (OC)	Receiver loss of signal.
10,11,14	VeeR	Receiver Signal Ground	Connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out (CML)	Receiver inverted data output, internally AC coupled and terminated
13	RD+	Receiver Positive DATA Out (CML)	Receiver non-inverted data output, internally AC coupled and terminated.
15	VccR	Receiver Power Supply	Receiver Power 3.3V Supply.
16	VccT	Transmitter Power Supply	Transmitter Power 3.3V Supply.
18	TD+	Transmitter Positive DATA In (CML)	Transmitter non-inverted data input, internally AC coupled and terminated.
19	TD-	Transmitter Negative DATA In (CML)	Transmitter inverted data Input, internally AC coupled and terminated.

Recommended Interface Circuit

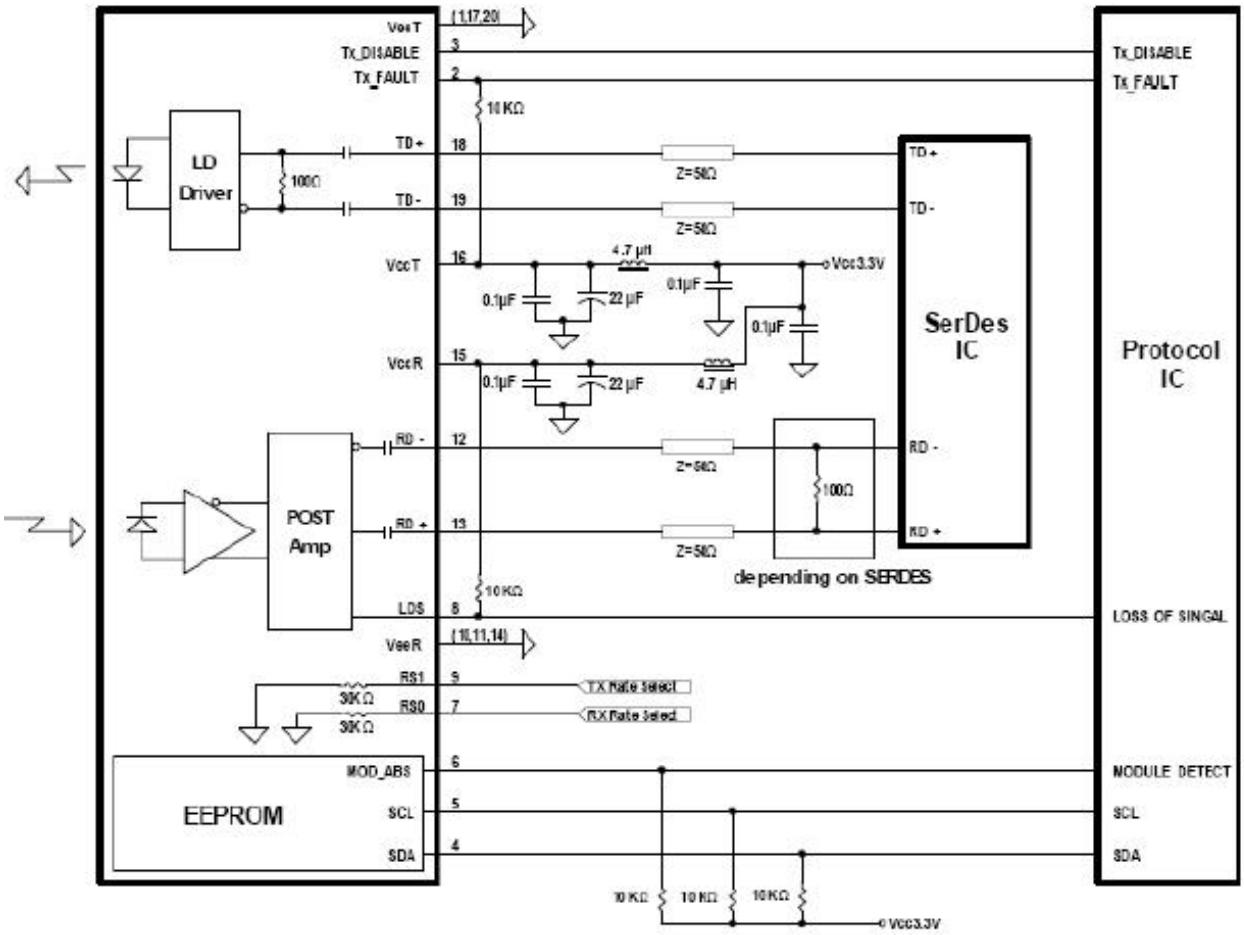

Figure 2. Typical application circuit

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Mechanical Dimensions

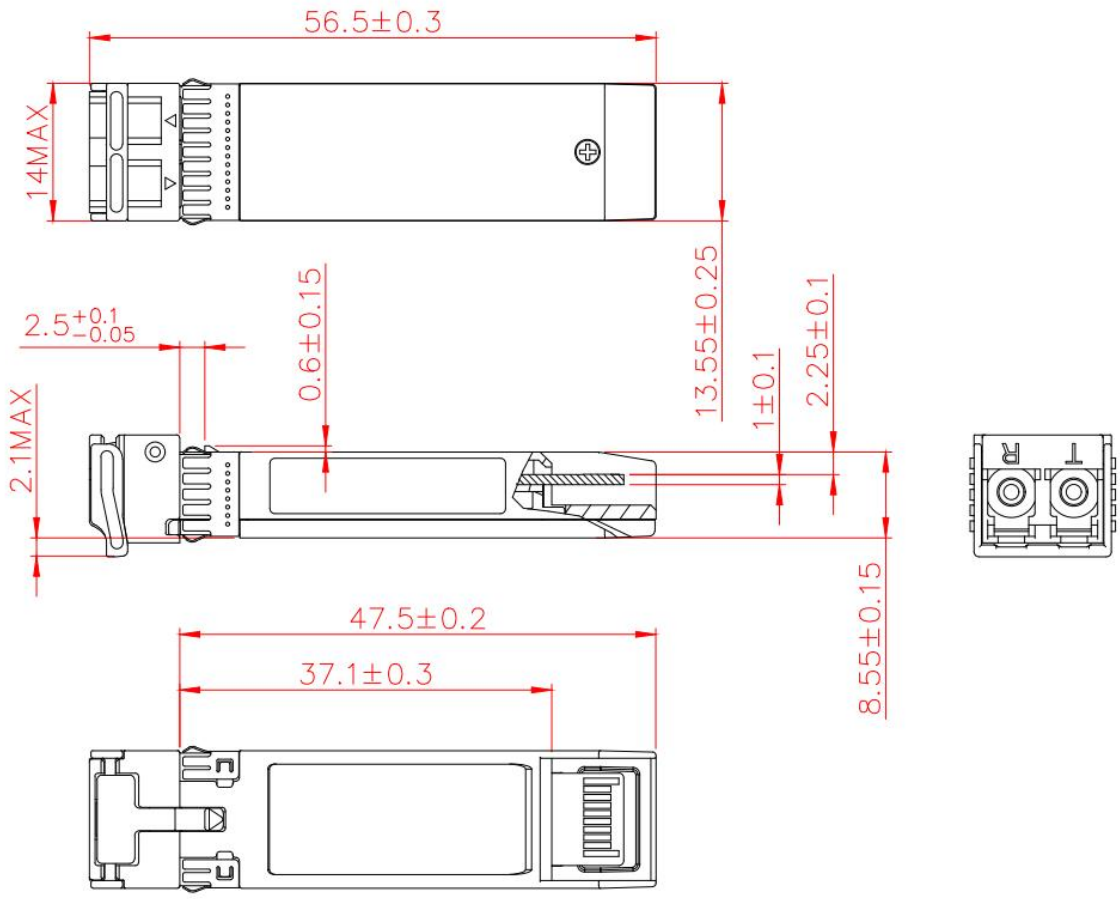

Figure 3. Module Mechanical Dimensions

Digital Diagnostics Functions

As defined by the SFF-8472, The SFP28 transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range. The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. The memories are organized as a series of 8-bit data words that can be addressed individually or

sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 0x00h to the maximum address of the memory. For more detailed information, including memory map definitions, please refer the SFF-8472 documentation.

Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB