

DataSheet

25G 1295nm /1309nm SFP28 BIDI 60km Transceiver P/N: WST-S28-BX6E-xx



Features:

- All metal housing for superior EMI performance
- Support 25GE and CPRI, data rate up to 25.78125Gbps
- Link distance up to 50km/60km single mode fiber without/with FEC in 23dB link budget
- Low DC power consumption
<1.6W for CT version, WST-S28-BX6E-xC
<1.8W for IT version, WST-S28-BX6E-xI
- High speed I/O electrical interface
- I2C interface with integrated Digital Diagnostic monitoring
- 1295nm/1309nm EML Transmitter and APD receiver
- Operating temperature range:
Commercial: 0 ~70C, WST-S28-BX6E-xC
Industrial: -40~ +85C, WST-S28-BX6E-xI
- Compliant with RoHS

Applications:

- 25G Ethernet

Santander

- Compliant with IEEE 802.3cc
- Compliant with SFF-8402
- Compliant with SFF-8419
- Complies with EU Directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	°C
Maximum Supply Voltage	VCC	0	3.6	V
Operating Relative Humidity	RH	5	95	%

Notes:

1. Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device.
2. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Notes
Case Operating Temperature	Tcase	0		+70	°C	WST-S28-BX6E-xC
		-40		+85		WST-S28-BX6E-xI
Supply Voltage	VCC	3.13		3.46	V	
Data Rate	BR		25.78125		Gbps	
Transmission Distance	TD			60	km	
Coupled fiber		Single mode fiber				9/125um SMF

Electrical Characteristics

(tested under recommended operating conditions, unless otherwise noted)

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Data Rate		BR		25.78125		Gbps	
Supply Current		Icc			480	mA	WST-S28-BX6E-xC
					540		WST-S28-BX6E-xI
Power Consumption		P			1.6	W	WST-S28-BX6E-xC
					1.8		WST-S28-BX6E-xI
Transmitter							
Differential Data Input Amplitude		VIN,P-P			900	mVpp	
Differential Impedance			90	100	110	Ω	
Tx_Disable	Normal Operation	VIL	-0.3		0.8	V	
	Laser Disable	VIH	2.0		VCC+0.3	V	
Receiver							
Differential Data Output Amplitude		VOUT,P-P			900	mVpp	
Differential Termination Mismatch (1MHZ)					10	%	
Differential Impedance			90	100	110	Ω	
Rx_LOS	Normal Operation	VoL	-0.3		0.4	V	
	Loss Signal	VoH	2		VCCHOST	V	

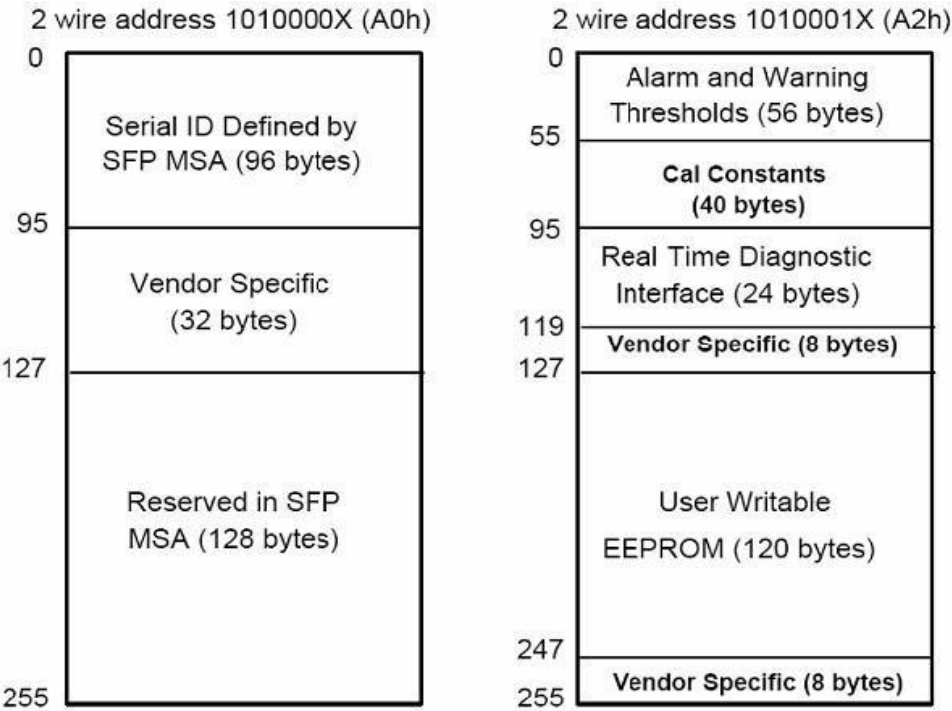
Optical Specifications

(tested under recommended operating conditions, unless otherwise noted)

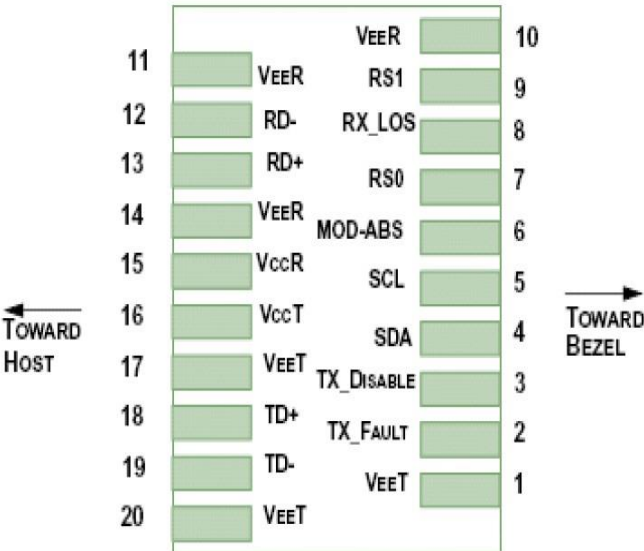
Parameter	Symbol	Min	Typ	Max	Units	Notes
Data Rate	BR		25.78125		Gbps	
Transmitter						
Wavelength	λ	1281		1297	nm	WST-S28-BX6E-Ux
		1306		1322		WST-S28-BX6E-Dx
Spectrum Bandwidth @ -20dB	$\Delta\lambda$			1	nm	
Side mode suppression ratio (SMSR)	SMSR	30			dB	
Average Output Power	POUT	1		6	dBm	
Extinction ratio	ER	4			dB	
Optical Modulation Amplitude (OMA)	POMA	2		6	dBm	
Average Output Power (Laser Off)	POFF			-30	dBm	
RIN20OMA	RIN			-130	dB/Hz	
Receiver						
Wavelength	λ	1306		1322	nm	WST-S28-BX6E-Ux
		1281		1297		WST-S28-BX6E-Dx
Receiver sensitivity (OMA)	RSEN-OMA			-19	dBm	BER @1x10 ⁻¹²
				-21		BER @5x10 ⁻⁵
Optical Power Overload	PIN (SAT)	-4			dBm	
Rx_LOS of Signal De-assert	LOSD			-21	dBm	
Rx_LOS of Signal Assert	LOSA	-35			dBm	
Rx_LOS of Signal Hysteresis	LOSH	0.5		5	dB	

EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X(A0h). Memory Contents of Serial ID are shown in



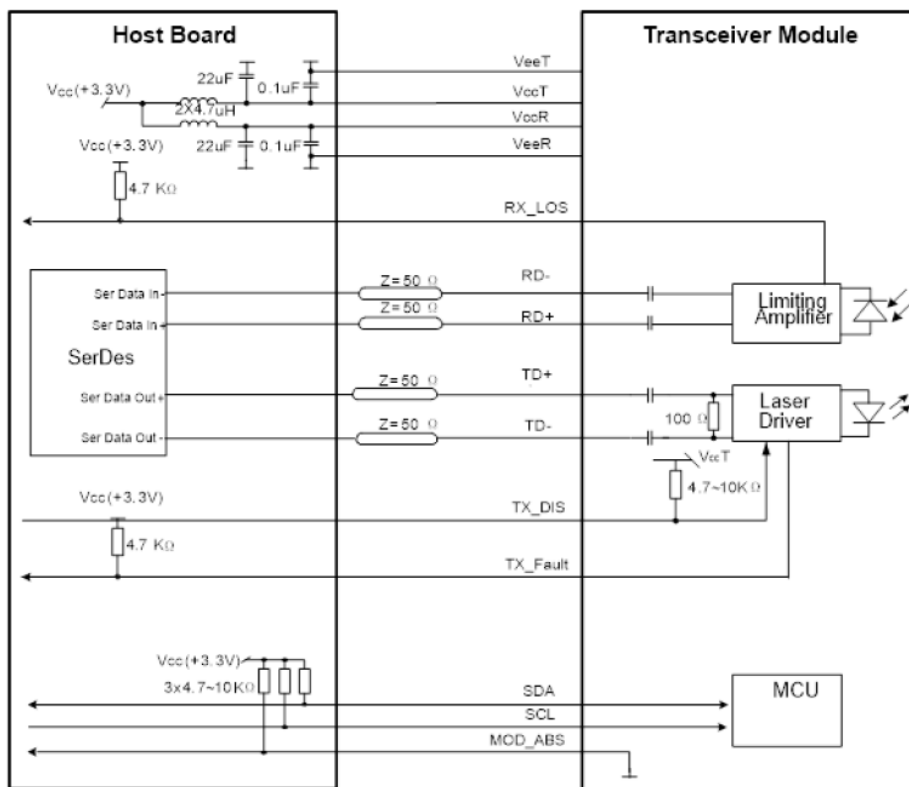
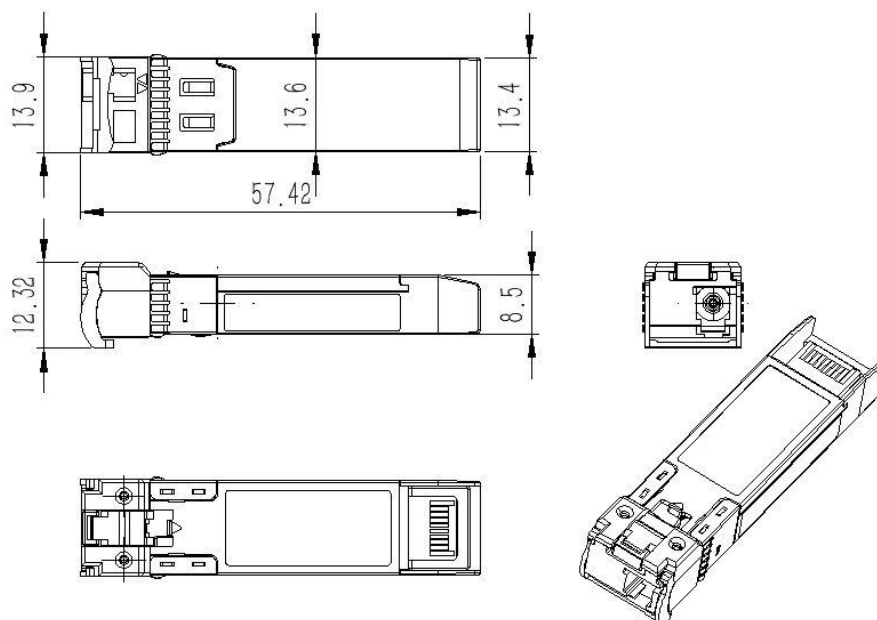
Pin Description



Pin	Symbol	Name/Description	Ref.
1	V _{EET}	Module transmitter ground	1
2	T _{FAULT}	Module transmitter fault	2
3	T _{DIS}	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD_ABS	Module Absent, connect to VeeR or VeeT in the module	4
7	RS0	Rate select0, optionally control SFP+ receiver. When high, input data rate >4.5Gb/s; when low, input data rate <=4.5Gb/s	5
8	LOS	Receiver Loss of Signal Indication	6
9	RS1	Rate select0, optionally control SFP+ transmitter. When high, input data rate >4.5Gb/s; when low, input data rate <=4.5Gb/s	1
10	V _{EER}	Module receiver ground	1
11	V _{EER}	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	V _{EER}	Module receiver ground	1
15	V _{CCR}	Module receiver 3.3V supply	
16	V _{CCT}	Module transmitter 3.3V supply	
17	V _{EET}	Module transmitter ground	1
18	TD+	Transmitter inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	V _{EET}	Module transmitter ground	1

Notes:

1. Circuit ground is internally isolated from chassis ground
2. Tx FAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on Tx DIS >2.0V or open, enabled on Tx DIS <0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Typical Application Circuit**Mechanical Dimension**

Unit: mm

Ordering Information

Part No	Specification										
	Pack age	Data rate	Laser	Optical Power (OMA)	Detector	Sensitivity (OMA) @5E-5	Temp	Reach With FEC	Other	Bail Latch color	Application code
WST-S28-BX6E-UC	SFP28	25.78125 Gbps	1295nm EML	2~6 dBm	APD	-21 dBm	0 to 70	60 km	RoHS DDM	Purple	25G Ethernet
WST-S28-BX6E-DC	SFP28	25.78125 Gbps	1309 nm EML	2~6 dBm	APD	-21 dBm	0 to 70	60 km	RoHS DDM	Yellow	25G Ethernet
WST-S28-BX6E-UI	SFP28	25.78125 Gbps	1295 nm EML	2~6 dBm	APD	-21 dBm	-40 to 85	60 km	RoHS DDM	Purple	25G Ethernet
WST-S28-BX6E-DI	SFP28	25.78125 Gbps	1309 nm EML	2~6 dBm	APD	-21 dBm	-40 to 85	60 km	RoHS DDM	Yellow	25G Ethernet

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	09-Jun-2023	New Issue	Ken Cheng	Shao Yu Lee	Wayne Liao

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