

10G EPON ONU SFP+ 1270nm / 1577nm PR30 Transceiver

P/N: WST-SFP+EPSU2-x



Applications:

- Symmetric 10GEPON PR30 ONU with 15~29dB attenuation range
- Burst Mode application
- FTTX WDM Broadband Access

Standards:

- Complies with SFP+ MSA (SFF-8431/8432)
- Complies with IEEE 802.3av
- Complies with SFF-8472 Rev 10.4
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- RoHS 2.0 Compliant

Features:

- Single fiber Bidi data links Tx10.3125Gbps / Rx10.3125Gbps application
- Single 3.3V power supply
- SFP+ package with SC/UPC Receptacle connector
- Hot-pluggable capability
- High power 1270nm DFB LD and high sensitivity 1577nm APD
- Support 20km transmission distance with SMF
- Digital diagnostic monitor interface
- CML compatible data input/output interface
- Low power dissipation
- Low EMI and excellent ESD protection
- Operating temperature range:
0 to 70 oC Operation: WST-SFP+EPSU2-C
-40 to 85 oC Operation: WST-SFP+EPSU2-I

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Power Supply Voltage	Vcc	-0.3	3.7	V	
Relative Humidity	OH	5	95	%	
Rx Damage Power	PRdmg		-9	dBm	In average power

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units / Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Operating Case Temperature	Tc	0		70	°C / WST-SFP+EPSU2-C
		-40		85	°C / WST-SFP+EPSU2-I
Power Supply Current	Icc		400	600	mA
Nominal upstream line rate (Tx)			10.3125		Gbps
Nominal downstream line rate (Rx)			10.3125		Gbps

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes
Transceiver						
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
Data Input Swing Differential	V _{IN}	200		1600	mV	Internal DC coupled
Burst Enable	V _{IH}	2.0		Vcc	V	
Burst Disable	V _{IL}	0		0.8	V	
Output Eye Mask		30%				Waveforms:2k
Receiver						
Data Output Swing Differential	V _{OUT}	300		850	mV	AC-Coupled CML
LOS High	V _{oH}	2.4		Vcc	V	LVTTTL
LOS Low	V _{oL}	0		0.4		

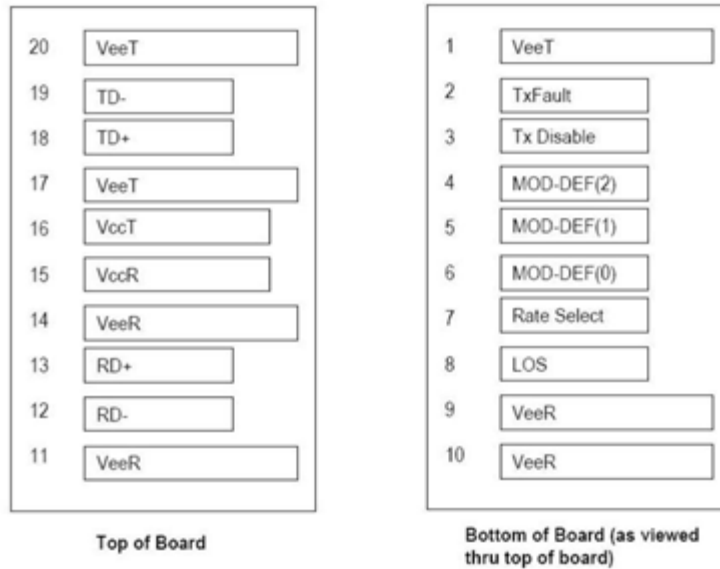
Transmitter Optical Specifications (T_{OP} = Operation Case Temperature Range, V_{CC} = 3.135 to 3.465 Volts)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Average Launch Optical Power	P_{avg}	4		9	dBm	
Extinction Ratio	ER	6			dB	
Centre Wavelength	λ_t	1260	1270	1280	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Burst on time	T_{on}			30	ns	
Burst off time	T_{off}			30	ns	
Transmitter and dispersion penalty	TDP			3	dB	
Eye Diagram	Compliant With IEEE Std 802.3av™-2009					PRBS 2 ³¹ -1 test pattern @10.3125Gbps

Receiver Optical Specifications (T_{OP} = Operation Case Temperature Range, V_{CC} = 3.135 to 3.465 Volts)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Center Wavelength	λ_r	1575	1577	1580	nm	
Receiver Sensitivity				-28.5	dBm	Measured with PRBS 2 ³¹ -1 test pattern @ 10.3125 Gbps BER $\leq 1 \times 10^{-3}$.
Receiver Overload		-10			dBm	
Receiver reflectance				-12	dB	
LOS De-Assert	LOS_A	-42			dBm	
LOS Assert	LOS_B			-29	dBm	When SD de-asserted, the data output is signal output.
LOS Hysteresis	LOS_H	0.5		6	dB	

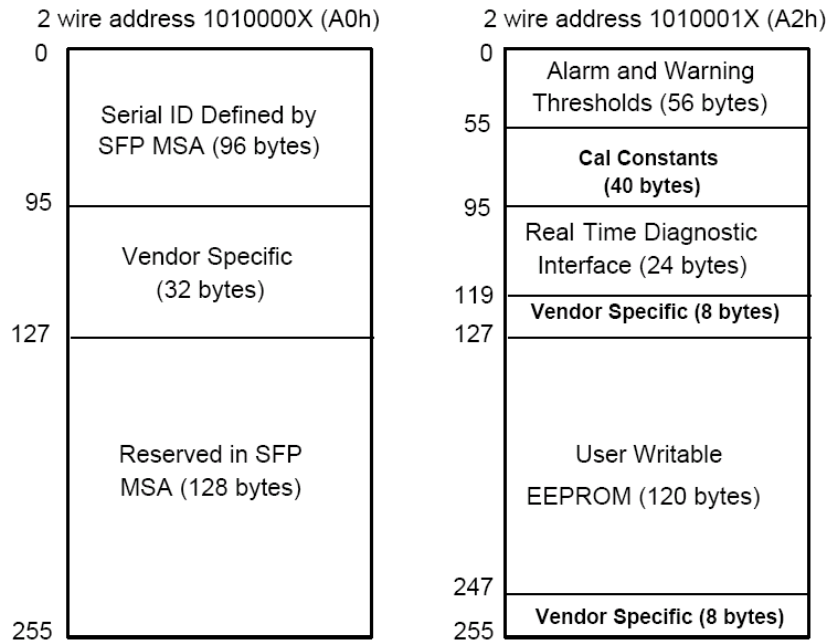
Pin Definition



Pin	Name	Description	Notes
1	VeeT	Tx Ground	
2	TX Fault	Indicate the TX fail.	Low: normal; High: abnormal
3	Burst Control	The default setting is that laser output is disable when this pin is asserted high and laser output is enabled when this pin is asserted low or laser output is disable when this pin is asserted low and laser output is enabled when this pin is asserted high. (BEN)	LVTTTL Input, Low: transmitter on, Internal pull up
4	MOD_DEF(2)	2-Wire Serial Data I/O Pin.(SDA)	
5	MOD_DEF(1)	2-Wire Serial Clock Input.(SCL)	
6	MOD_DEF(0)	Internally Grounded	
7	TX_SD	Tx Transmitter State Indication	TX_Indication Assert high when Transmitter ON. Or to the ground directly if not use.
8	Rx_LOS	Loss of Signal	Set LOS is that active high when signal is detected. (LVTTTL)
9	NC	Not Connect	
10	VeeR	Module Receiver Ground	
11	VeeR	Module Receiver Ground	
12	RD-	Inverted Received Data Out	AC-coupled
13	RD+	Non-inverted Received Data Out	AC-coupled
14	VeeR	Module Receiver Ground	
15	VCCR	Module Receiver 3.3 V Supply	
16	VCCT	Module Transmitter 3.3 V Supply	

17	VeeT	Module Transmitter Ground	
18	TD+	Non-Inverted Transmit Data in	
19	TD-	Inverted Transmit Data in	
20	VeeT	Module Transmitter Ground	

EEPROM Series ID Memory Contents (Address A0h)



Digital Diagnostic Specifications

WST-SFP+EPSU2-x transceivers support the 2-wire serial communication. The DDMI WARNING and ALARM memory positions and addresses are compliant with the SFF 8472 REV9.3 specification. The standard SFP serial ID provides access to identification information that describes the transceiver’s capabilities, standard interfaces, manufacturer, and other information. The DDMI can detect TX power, RX power, Bias current, Temperature, VCC.

Parameter	Range	Accuracy	Calibration
Temperature	-40 to 85°C	±3°C	Internal
Voltage	2.8V to 3.8V	±3%	Internal
Bias Current	0 to 130mA	±10%	Internal
TX Power	4dBm ~ 9dBm	±3dB	Internal
RX Power monitor	-9dBm ~ -29dBm	±3dB	Internal

Recommended Circuit Schematic

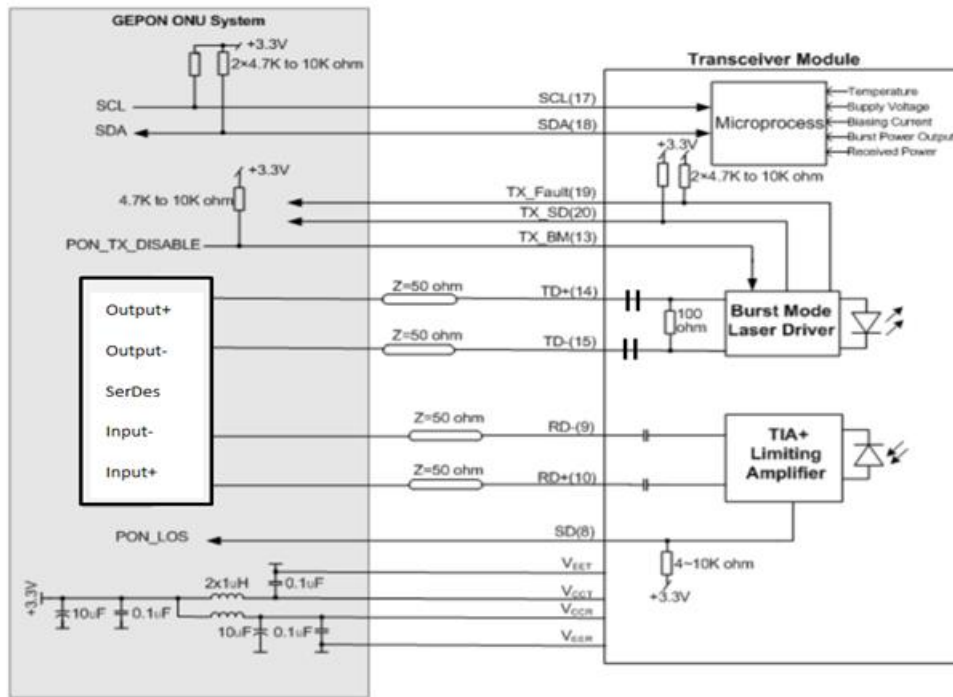
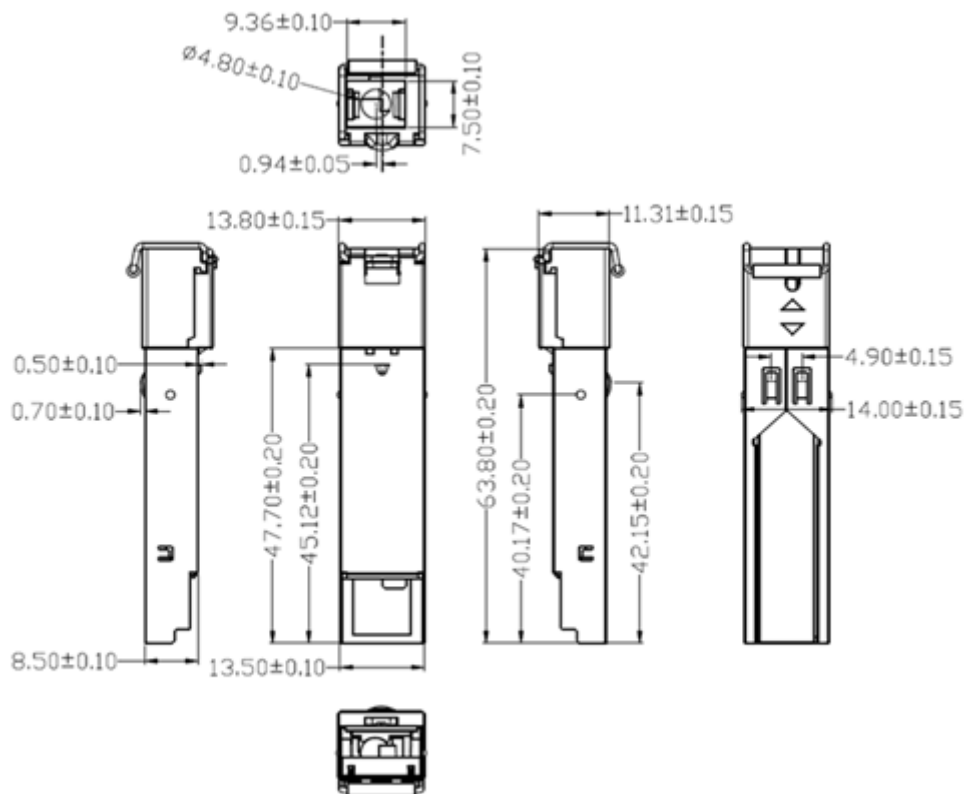


Figure 3 Typical Interface Circuit

Mechanical drawing



Unit in mm

Ordering Information

P/N	Package	Data rate	Laser	Optical Power	Detector	Max. Rx Sensitivity	Case Temp.	Distance	others	Application
WST-SFP+EPSU2-C	SFP+ SC/UPC Receptacle	10.3125 Tx / 10.3125 Rx Gbps	1270nm DFB laser	4 ~ 9 dBm	1577nm APD	-28.5 dBm	0 to 70 °C	20 km	RoHS DDM	10G EPON PR30 ONU
WST-SFP+EPSU2-I	SFP+ SC/UPC Receptacle	10.3125 Tx / 10.3125 Rx Gbps	1270nm DFB laser	4 ~ 9 dBm	1577nm APD	-28.5 dBm	-40 to 85 °C	20 km	RoHS DDM	10G EPON PR30 ONU

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	27-Oct-2023	New Issue	Joanne Ni	Ken Cheng	Wayne Liao
V1.1	01-Nov-2023	Update product picture	Joanne Ni	Ken Cheng	Wayne Liao

**Headquarters**

16F-5, No. 75, Sec. 1, Xintai 5th Rd., Xizhi Dist.,
New Taipei City 22101, Taiwan
Tel: +886-2-2698-7208
Fax: +886-2-2698-7210
Email: sales@wavesplitter.com
Website: https://wavesplitter.com/