



## Symmetric 10GEPON ONU SFP+ Transceiver *Preliminary*

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**SOEX2677-PSIGA**

### **FEATURES**

- Single fiber bi-directional data links Symmetric TX 10.3125Gbps/RX10.3125Gbps application
- -40 to 85°C operating case temperature
- 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
- CML compatible data input/output interface
- Low power dissipation
- Low EMI and excellent ESD protection
- Digital diagnostic monitor interface
- RoHS-6 compliance for SOEX2677-PSIGA

### **APPLICATIONS**

- Symmetric 10GEPON PR30 ONU with 15~29dB attenuation range

### **STANDARDS**

- Complies with SFP+ MSA (SFF-8431)
- Complies with IEEE 802.3av
- Complies with SFF-8472 Rev 10.4
- Complies with FCC 47 CFR Part 15, Class B
- Complies with FDA 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

**ABSOLUTE MAXIMUM RATING**

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Ambient Temperature	$T_{STG}$	-40	85	°C	
Operating Case Temperature	$T_c$	-40	85	°C	
Operating Humidity	OH	5	95	%	
Power Supply Voltage	$V_{CC}$	-0.5	3.6	V	

**RECOMMENDED OPERATING CONDITION**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	$T_c$	-40		+85	°C	
Power Supply Voltage	$V_{CC}$	3.13	3.3	3.47	V	
Power Supply Current	$I_{CC}$			600	mA	
Nominal upstream line rate			10.3125		Gbps	
Nominal downstream line rate			10.3125		Gbps	

**TRANSMITTER OPTICAL CHARACTERISTICS**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Average Launch Optical Power	$P_{OUT}$	4		9	dBm	EOL, Over Temperature, Launched into 9/125 $\mu$ m single mode fiber
		5		9	dBm	BOL, Room temperature, Launched into 9/125 $\mu$ m single mode fiber
Extinction Ratio	ER	6			dB	
Centre Wavelength	$\lambda$	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			1.5	dB	
Eye Diagram	Compliant With IEEE Std IEEE 802.3av					PRBS 2 <sup>31</sup> -1 test pattern @10.3125Gbit/s

**TRANSMITTER ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Input Differential Impedance	$Z_{IN}$	90	100	110	$\Omega$	
Data Input Swing Differential	$V_{IN}$	200		700	mV	
Burst_ENABLE	Burst Enable	2.0		$V_{CC}$	V	
	Burst Disable	0		0.8	V	

RECEIVER CHARACTERISTICS						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Center Wavelength	$\lambda_c$	1575		1580	nm	
Receiver Sensitivity	SENS			-28.5	dBm	EOL, Over Temperature, Measured with PRBS 2 <sup>31</sup> -1test pattern @10.3125Gbit/s, BER $\leq 1 \times 10^{-3}$ .
				-29	dBm	BOL, Room temperature, Measured with PRBS 2 <sup>31</sup> -1test pattern @10.3125Gbit/s, BER $\leq 1 \times 10^{-3}$ .
Receiver Overload		-10			dBm	
Receiver reflectance				-12	dB	
Signal-Detected De-assert		-45			dBm	
Signal-Detected Assert Level				-31.5	dBm	
LOS Hysteresis		0.5		6	dB	
Data Output Swing Differential	V <sub>OUT</sub>	300		850	mV	
LOS	High	2.4		V <sub>CC</sub>	V	
	Low	0		0.4	V	

PIN DESCRIPTION			
PIN	Name	Description	Notes
1	VeeT	Module Transmitter Ground	
2	TX Fault	Module Transmitter Fault	Low: normal; High: abnormal
3	TX BURST	Transmitter Burst Enable	TTL Input, Low: transmitter on
4	SDA	2-wire Serial Interface Data Line	Same as MOD-DEF2 in INF-8074i
5	SCL	2-wire Serial Interface Clock	Same as MOD-DEF1 in INF-8074i
6	Mod_ABS	Module Absent	Connected to VeeT or VeeR in the module
7	TX_SD	Tx Transmitter State Indication	TX_Indication Assert When Transmitter ON
8	Rx_SD	Signal Indication	High: signal detected; Low: loss of signal
9	NC	NC	
10	VeeR	Module Receiver Ground	
11	VeeR	Module Receiver Ground	
12	RD-	Inverted Received Data Out	CML, AC-coupled
13	RD+	Non-inverted Received Data Out	CML, 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	CML, AC-coupled
19	TD-	Inverted Transmit Data in	CML, AC-coupled
20	VeeT	Module Transmitter Ground	

PIN OUT DRAWING

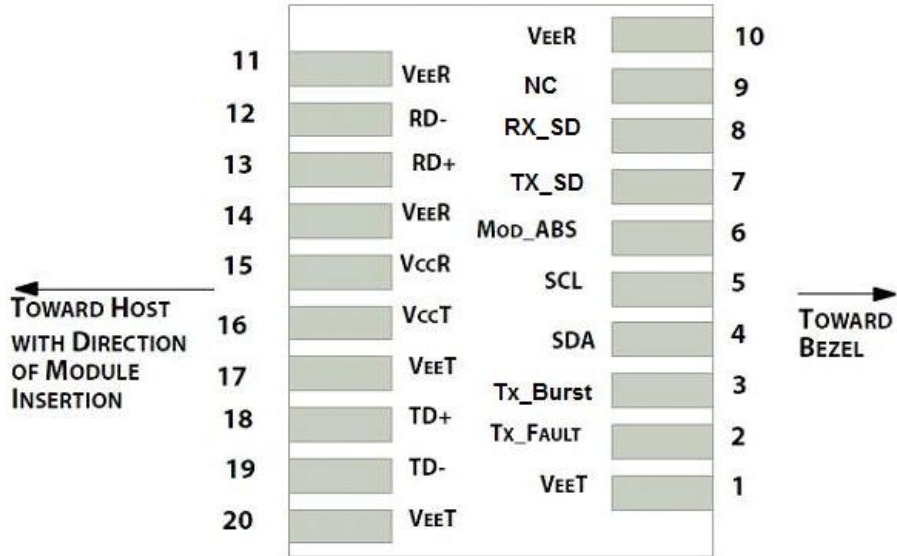


Figure 1 Pin Out Drawing

TYPICAL INTERFACE CIRCUIT

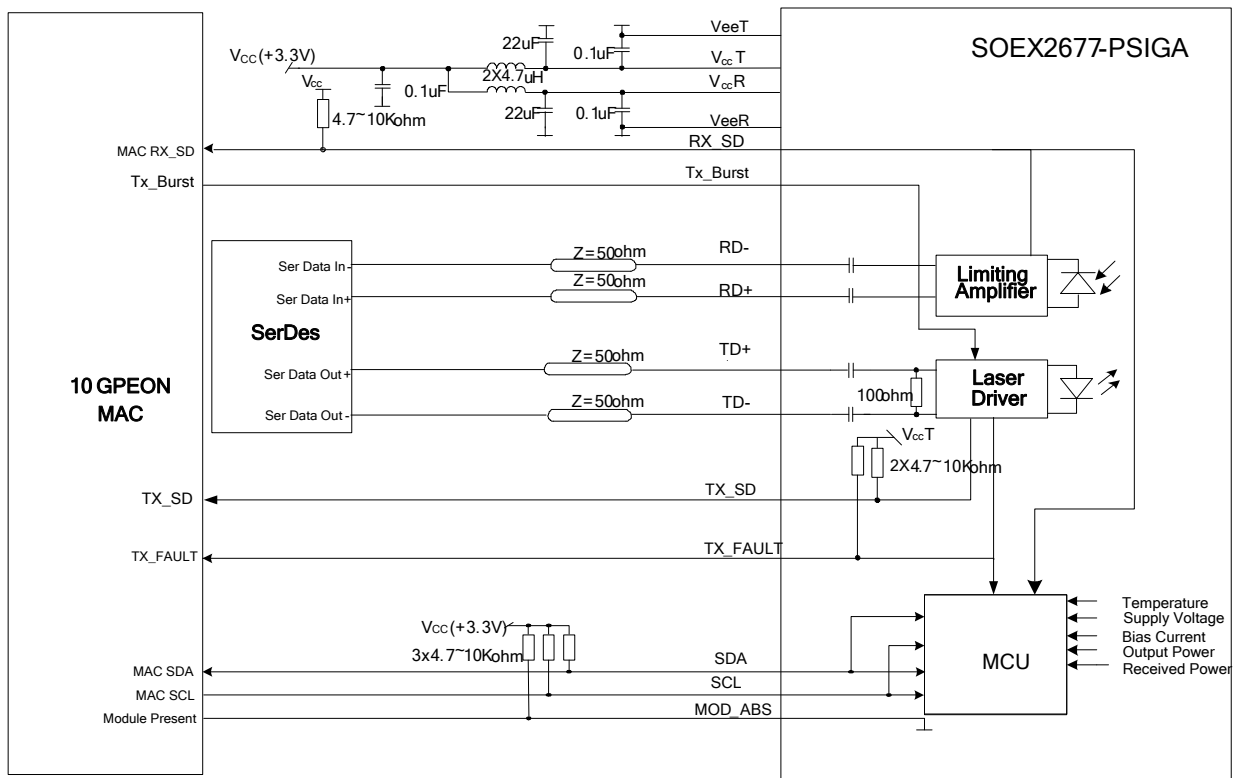


Figure 2 Typical Interface Circuit

PACKAGE OUTLINE

Unit:mm

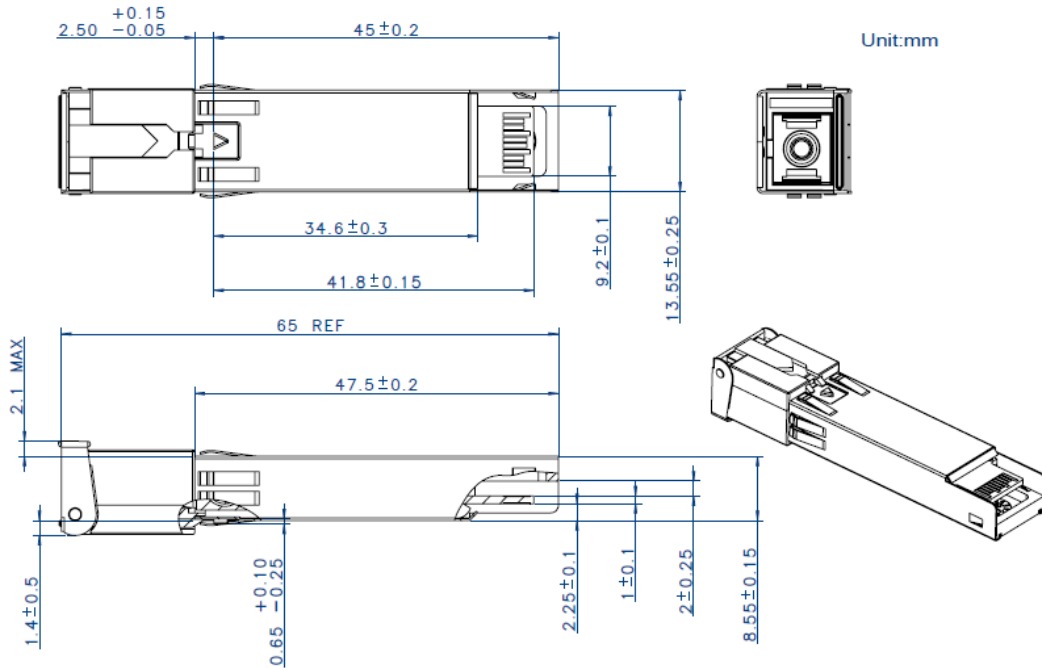


Figure 4 Package Outline

EEPROM INFORMATION

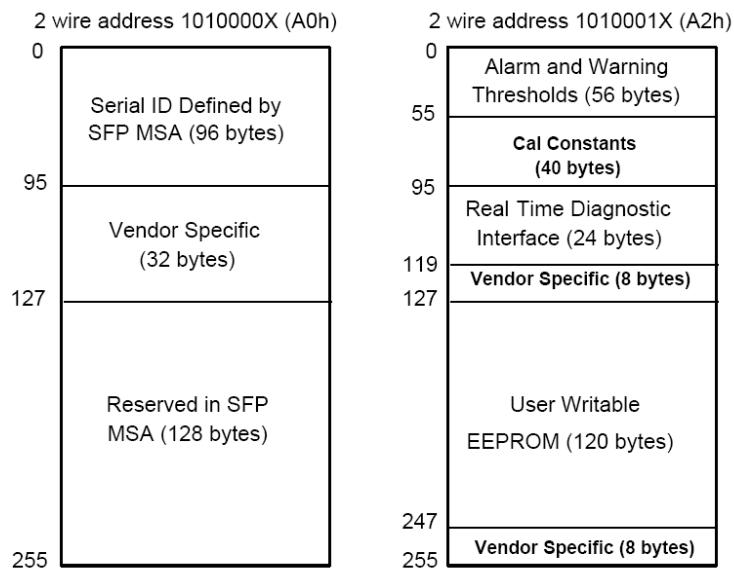


Figure 4 EEPROM Memory Map Specific Data Field Descriptions

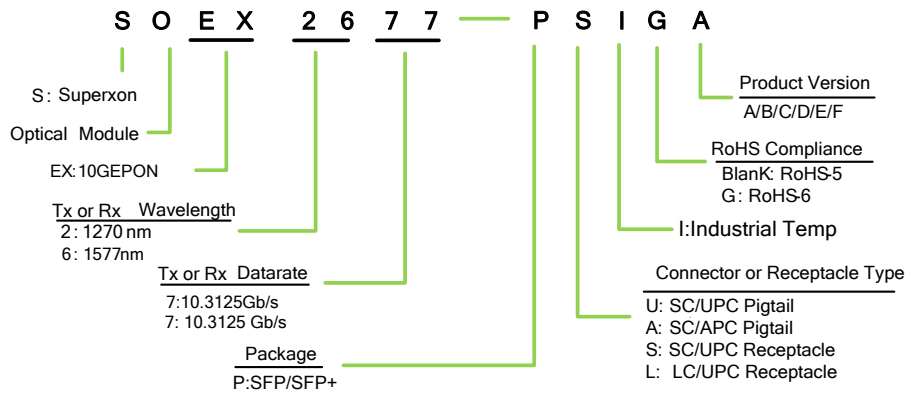
**DIGITAL DIAGNOSTIC MONITORING INTERFACE**

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

Parameter	Range	Accuracy	Calibration
Temperature	-40 to 85°C	±3°C	Internal
Voltage	3.0 to 3.6V	±3%	Internal
Bias Current	0 to 131mA	±10%	Internal
TX Power	2 to 9dBm	±3dB	Internal
RX Power monitor	-30 to -8dBm	±3dB	Internal

Note: Bias Current 4uA/LSB, TX Power 0.2uW/LSB

**ORDERING INFORMATION**



## WARNINGS

- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.
- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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