

LG-SC341G-20IMB1

SFP SC 20km GPON ONU Stick with Mac
1.244Gbps 1310nm TX / 2.488Gbps 1490nm RX

Features

- SFP transceiver with integrated PON ONU MAC and SC/UPC interface, plug-and-play supported, enabling rapid deployment via automatic discovery and configuration
- Adopts 1310nm DFB burst-mode transmitter and 1490nm TIA continuous-mode receiver
- Single 3.3V power supply
- Supports Digital Diagnostic Monitoring Interface (DDM) compliant with SFF-8472 standard
- Compliant with SFP MSA (Multi-Source Agreement) standard
- Low Electromagnetic Interference (EMI) design with excellent Electro-Static Discharge (ESD) protection performance
- Compliant with IEC-60825 Class 1 laser safety standard
- Compliant with RoHS environmental standard
- XPON Stick optical transceiver compatible with both GPON and EPON systems
- Compliant with SFP Multi-Source Agreement (MSA) SFF-8074i standard
- Compliant with ITU-T G.984.2 and its Amendment 1 standard
- Compliant with ITU-T G.988 ONU Management and Control Interface (OMCI) specification
- Compliant with IEEE 802.3AH standard
- Supports SGMII and 1000BASE-X interface protocols
- Supports application scenarios of HGU (Home Gateway Unit) and SFU (Single Family Unit)
- Operating temperature range:-40~+85°C

Application

- Passive Optical Network (PON)



Description

This product is an SFP transceiver compliant with MSA standards. It integrates not only the optical components of an ONU, but also all required complete circuits. Known as a "PON Stick", it condenses a full FTTH ONU into an SFP module slightly larger than the standard form factor. It can be directly plugged into network devices such as switches and routers, enabling data ports to adapt to various fiber environments and transmission distances on demand.

Specification

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Ambient Temperature	TSTG	-40	85	°C	
Operating Humidity	HOPR	5	95	%	
Power Supply Voltage	Vcc	-0.3	4	V	
Input Voltage		-0.3	Vcc+0.3	V	
Receiver Damaged Threshold		3		dBm	

Recommended Operating Conditioned

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power consumption	Pc		2.10	2.5	W	
Operating case Temperature	Tcase	0		70	℃	commercial
		-40		85	℃	Industrial
Operating Humidity Range	HOPR	5		95	%	
Data Rate		TX:1.244 / RX:2.488			Gbit/s	GPON MODE
		TX:1.25 / RX:1.25				EPON MODE
Data Rate Drift		-100		+100	PPM	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Central Optical Wavelength	λ_C	1290	1310	1330	nm	
Spectral Width (-20 dB)	$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio (SMSR)	SMSR	30			dB	
Average Transmit Optical Power	AOP	0.5		4	dBm	SMF
Average Off-State Burst Output Power	/			-45	dBm	
Extinction Ratio	ER	10			dB	
Optical Rise and Fall Time(20%-80%)	TR/TF			0.26	ns	PRBS 2 ²³ -1 @1244.16 Mbps
RIN ₁₅ OMA (Relative Intensity Noise, 15 dB OMA)				-115	dB/Hz	
Optical Return Loss Tolerance		-15			dB	
Transmitter Reflection				-10	dB	
Transmitter Dispersion Penalty	TDP			1	dB	20km with SMF

Optical Eye Diagram	Compliant With ITU-T G984.2					PRBS 2 ²³ -1 @1244.16 Mbps
Receiver						
Center Wavelength Range	λ_c	1480	1490	1500	nm	
Receiver Sensitivity	SEN			-28	dBm	PRBS 2 ²³ -1 @1 G~2.5 Gbps
Overload Optical Power	SAT	-8			dBm	
LOS Deassert Threshold	LOSD			-29	dBm	
LOS Assert Threshold	LOSA	-40			dBm	
Signal Detect Hysteresis	/	0.5		6	dBm	
Receiver Reflection	/			-12	dB	λ = 1490nm
WDM Filter Isolation		38			dB	λ = 1550nm
		35			dB	λ = 1650nm

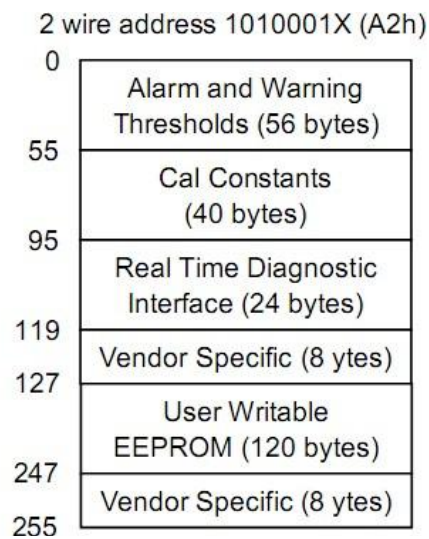
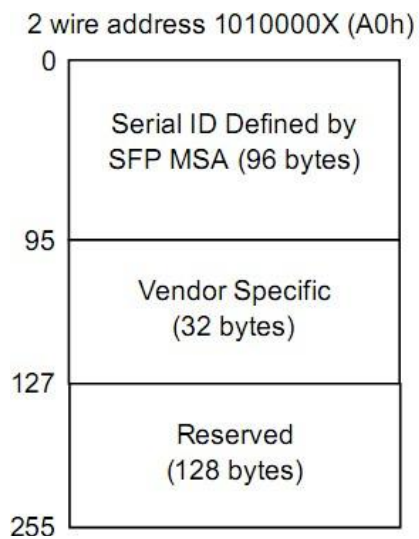
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Differential Input Swing	/	300		1800	mV	CML Input, AC Coupled
Differential Input Impedance	/	90	100	110	Ω	
Transmitter TxDisable Control Voltage – Low Level	/	0		0.8	V	
Transmitter TxDisable Control Voltage – High Level	/	2.0		VCC	V	
Transmitter Fault Alarm Voltage – Low Level	/	0		0.4	V	
Transmitter Fault Alarm Voltage – High Level	/	2.4		Vcc	V	
Receiver						
Differential Output Swing	/	300		1200	mV	CML Output, AC Coupled
Loss of Signal (LOS) – Low Level	/	0		0.4	V	
Loss of Signal (LOS) – High Level	/	2.4		VCC	V	

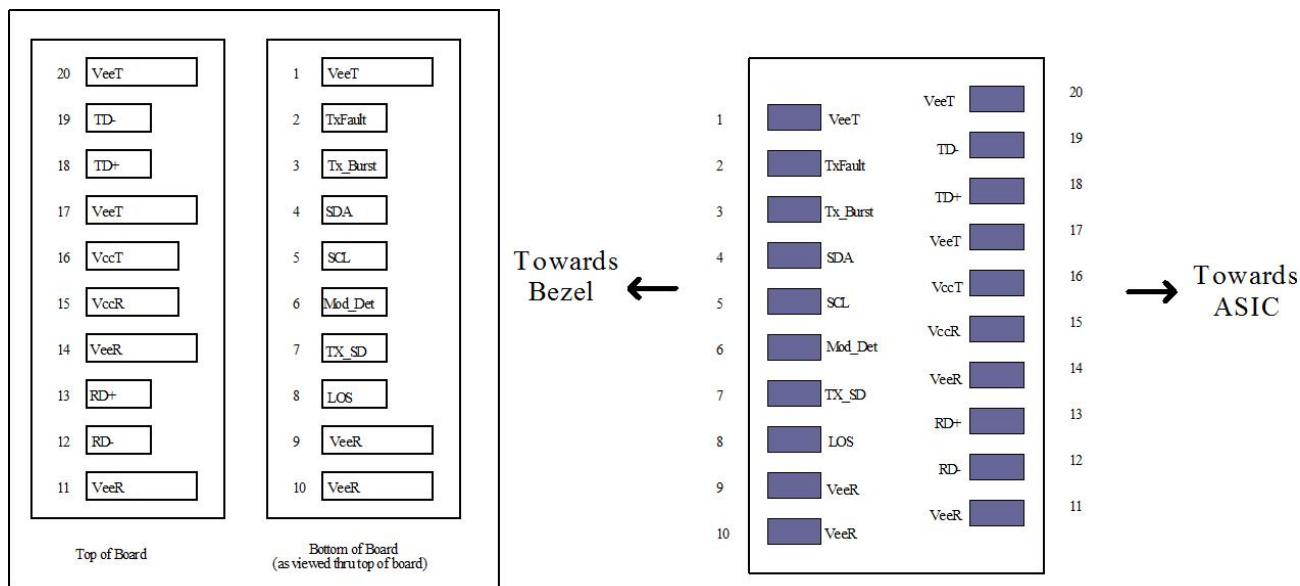
Digital Diagnostic Monitoring Information

Parameter	Range	Accuracy	Calibration
Temperature	0 to 70°C	±3°C	Internal
	-40 to 85°C	±3°C	Internal
Voltage	3.0 to 376V	±3%	Internal
Bias Current	0 to 130mA	±10%	Internal
TX Power	-10 to 8dBm	±2dB	Internal
RX Power	-30 to -8dBm	±2dB	Internal

Digital Diagnostic Memory Map



Pin Description



SFP Transceiver Electrical Pad Layout

Host Board Connector Pad Layout

Pin Num.	Name	Function	Plug seq.	Note
1	VeeT	Transmitter Ground	1	1
2	Tx Fault	Transmitter Fault indication(LVTTL)	3	2
3	Tx_Burst	Transmitter Burst control(LVTTL)	3	3
4	SDA	Module Definition 2, SDA Serial Data Signal	3	4
5	SCL	Module Definition 1, SCL Serial Clock Signal	3	4
6	MOD_Det	Module Definition 0	3	4
7	TX_SD	Transmitter signal detect(LVTTL)	3	5
8	LOS	Loss of Signal (LVTTL)	3	6
9	VeeR	Receiver Ground	1	1
10	VeeR	Receiver Ground	1	1
11	VeeR	Receiver Ground	1	1
12	RD-	Inv. Received Data Out (CML/AC coupled)	3	7
13	RD+	Received Data Out (CML/AC coupled)	3	7
14	VeeR	Receiver Ground	1	1
15	VccR	Receiver Power	2	8
16	VccT	Transmitter Power	2	8
17	VeeT	Transmitter Ground	1	1
18	TD+	Transmit Data In(LVPECL)	3	9
19	TD-	Inv. Transmit Data In(LVPECL)	3	9
20	VeeT	Transmitter Ground	1	1

Plug Seq.: Pin engagement sequence during hot plugging.

Note 1: VeeR and VeeT internally connected within the PON module.

Note 2: TX_Fault indicates the status of module with pull up resistor of 4.7~10 K Ω externally. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.4V.

Note 3: TX_Burst is an input that is used to shut down the transmitter optical output. When Tx_Burst is "L", it should pull up with 4.7~10 K Ω resistor externally; When Tx_Burst is "H", it should pull down with 4.7~10 K Ω resistor externally.

Note 4: These are the module definition pins.

SDA is serial data signal with 4.7~10 K Ω pull up resistor externally. SCL is serial clock signal with 4.7~10 K Ω pull up resistor externally.

MOD_Det is grounded internally and need 4.7~10 K Ω pull up resistor externally to indicate that the module is present.

Note 5: TX_SD function should pull up with 4.7~10 K Ω resistor externally, it monitors the state of the LD laser, when the MAC enables the module, the TX_SD goes high within a short time.

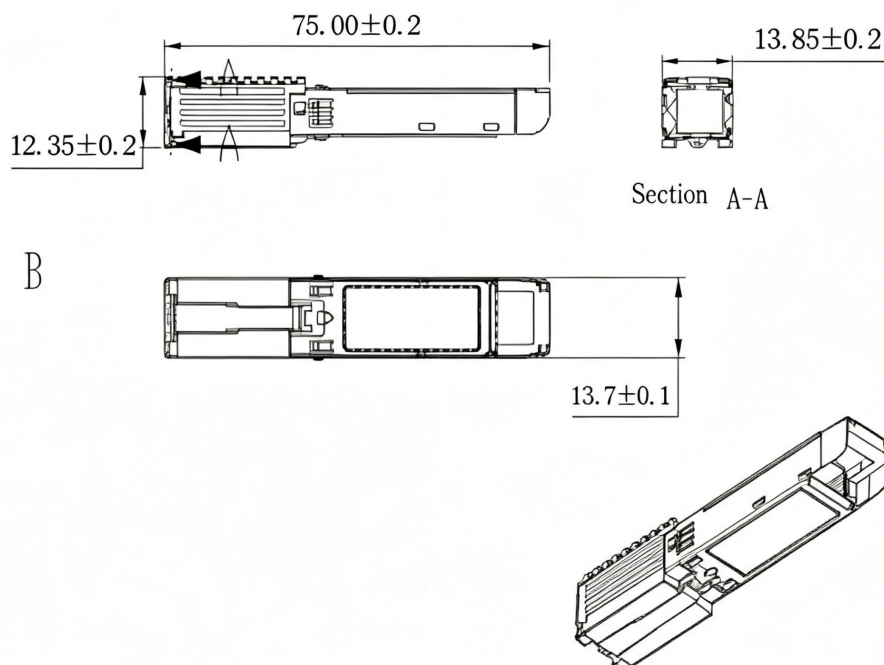
Note 6: RX_LOS indicates the status of received optical power with 4.7~10 K Ω pull up resistor internally. When high, this output indicates the received optical power is below the worst-case receiver sensitivity. Low indicates normal operation. In the low state, the output will be pulled to < 0.4V.

Note 7: RD-/+: These are the differential receiver outputs. They are AC-coupled with CML voltage level, and required 100ohm resistor to match the differential termination.

Note 8: VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V $\pm$ 5% at the SFP connector pin. Maximum supply current is 300 mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.

Note 9: TD-/+: These are the differential transmitter inputs. They are AC or DC-coupled, differential lines with 100 Ω differential termination inside the module. The AC or DC coupling is done inside the module.

Package Outline



Ordering information

Part Number	Product Description
LG-SC341G-20IMB1	GPON ONU, SC, TX1310nm/RX1490nm, TX1.25G/RX2.5G, 20km, -40~85°C, with MAC, Class B+
LG-SC432G-20IMC1	GPON OLT, SC, TX1490nm/RX1310nm, TX2.5G/RX1.25G, 20km, -40~85°C, with MAC, Class C+