
HOLS-F3420345S-xx
Optical Transceiver for GPON ONU, 20km Reach

Features

- Single fiber bi-directional data links with 1.25Gbps upstream and 2.5Gbps downstream
- Integrated with micro-optics WDM filter at 1310/1490nm
- 1310nm burst-mode transmitter with DFB laser
- 1490nm continuous-mode receiver with APD-TIA
- LVPECL/CML Differential Signal Input
- CML Differential Signal Output
- LVTTTL RX Signal Detection
- LVTTTL Burst Signal input
- Single 3.3V power supply
- Operating temperature: 0/-40 to 70/85°C
- 20km reach
- 2x10 SFF package with SC/PC receptacle
- Complies with RoHS
- Complies with IEEE 802.3ah-2004
- Complies to ITU-T G.984.5 application



Applications

- G-PON System (ONU side)
- Point to Multi-Point Link

Standard

- Compliant with SFF MSA
- Compliant with SFF-8472
- Compliant with IEEE 802.3ah
- Compliant with FCC 47 CFR Part 15, Class B+
- Compliant with FDA 21 CFR 1040.10 and 1040.11, Class I

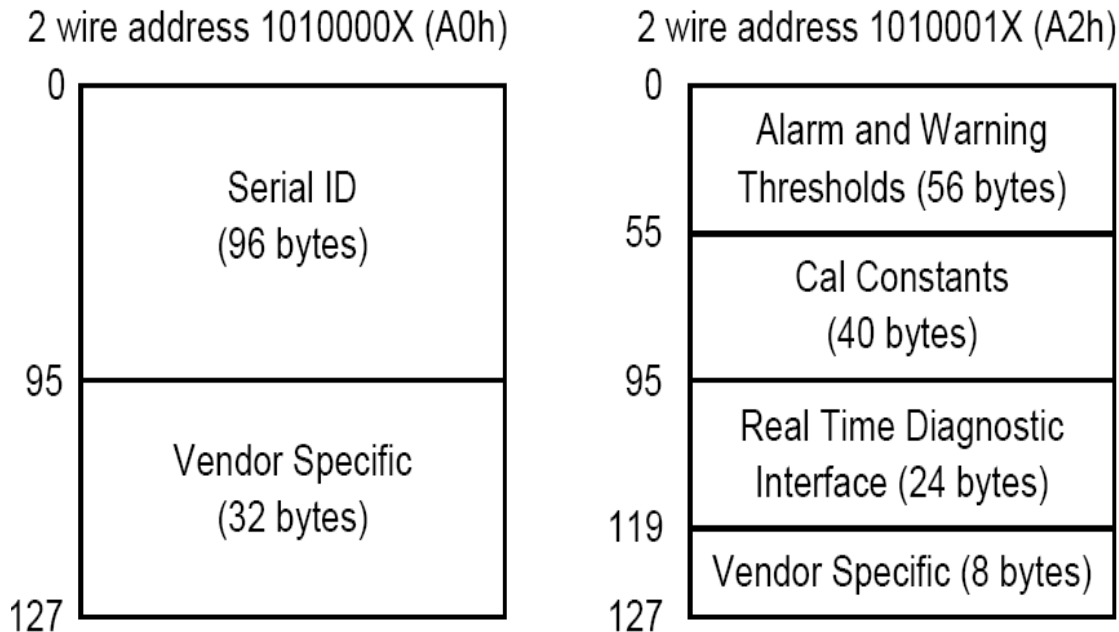
Description

The HOLS-F3420345S-xx family is specifically designed for the optical network unit (ONU) of G-PON with 1.25Gbps downstream and 2.5Gbps upstream high performance integrated duplex data transmission over single mode optical fiber. This transceiver module is compliant with ITU-T G.984.2 Class B+ and ITU-T G.984.5 application.

The HOLS-F3420345S-xx Family is designed with SFF packaging, with SC Receptacle Interface, which incorporates a nominal wavelength 1310nm DFB burst-mode (BM) transmitter and 1490nm APD-TIA continuous-mode (CM) receiver. It can achieve data transmission up to 20km on a single mode (9/125μm) optical fiber.

The module provides digital diagnostic information of its operating conditions and status, including receiver power, laser bias current, module temperature, and supply voltage. Calibration and alarm/warning threshold data are written and stored in internal memory (EEPROM).

The digital diagnostic memory map specific data field define as following.



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature Range	Ts	-40	85	°C
Relative Humidity	RH	5	85	%
Power Supply Voltage	VCC	0	4	V
Pin Input Voltage	-	GND	VCC	V
Receiver Damage Threshold	-	-	+5	dBm
Lead Solder Temperature	-	-	260/10	°C/S

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Voltage	VCC	3.13	3.3	3.47	V
Operating Case Temperature	T	0/-40	-	70/85	°C
Power consumption (TX+RX)	-	-	-	1.3	W

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Supply Current	I _{cc}	-	-	300	mA
Data Input Differential Swing	-	200	-	1600	mV
Differential Data input impedance	-	-	100	-	Ω

G984.5 Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
1310nm Tx to 1490nm Rx Crosstalk				-40	dB
1555nm Rx to 1490nm Isolation		30			dB
G.984.5 Wavelength Blocking Filter (1441 nm to 1450 nm)	WBF	7			dB
G.984.5 Wavelength Blocking Filter (1530 nm to 1539 nm)		7			dB
G.984.5 Wavelength Blocking Filter (1400 nm to 1441 nm)		22			dB
G.984.5 Wavelength Blocking Filter (1539 nm to 1625 nm)		22			dB

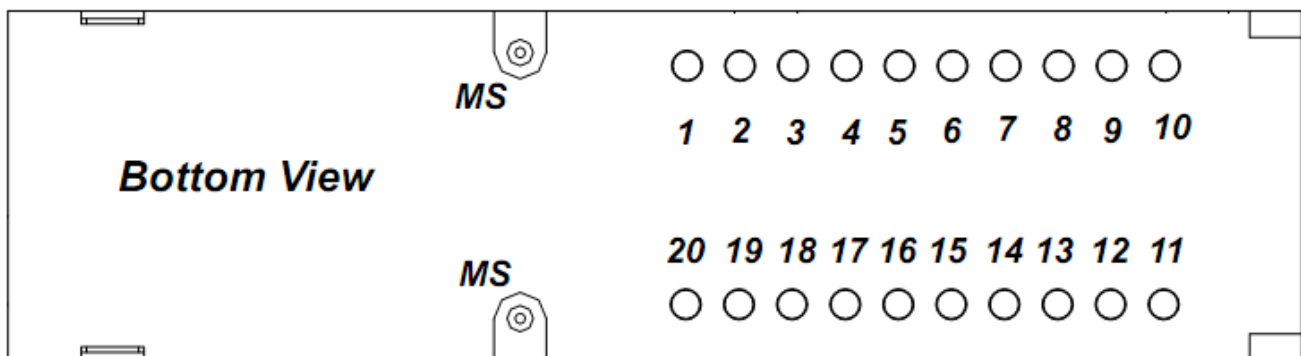
Transmitter Electro-Optical Interface

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Data Rate	D.R.	-	-	1.244	-	Gbps
Optical Output Power	Po	Coupling into a 9/125 μ m single-mode fiber	0.5	-	5	dBm
Optical Extinction Ratio	ER	Measured with PRBS 2 ²³ -1 test pattern @1.244Gbit/s.	10	-	14	dB
Output Power when TX disabled	-				-41	dBm
Center Wavelength	λ C	-	1260	1310	1360	nm
Spectral Width (RMS)	$\Delta\lambda$	-	-	-	1	nm
Side Mode Suppression Ratio	SMSR	-	30	-	-	dB
Laser On/Off Time	--	-	-	-	16	bits
Optical Rise / Fall Time	tr / tf	20% to 80% value	-	-	260	ps
Transmitter reflection	-	Measured at 1310nm	-	-	-6	dB
Relative Intensity Noise	RIN ₁₅ OMA	-	-	-	-115	dB/Hz
Burst Disable Input Voltage	VIH	-	2	-	VCC	V
Burst Enable Input Voltage	VIL	-	0	-	0.8	V
Differential Input Voltage	VIH-VIL	-	200	-	1600	mv
Optical Waveform Diagram	Compliant With IEEE 802.3ah					

Receiver Electro-Optical Interface

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Data Rate	D.R	-	-	2.488	-	Gbps
Receiver Overload	SAT	Measured with PRBS 2 ²³ -1 test pattern @2.488Gbit/s and ER=10dB, BER= 10 ⁻¹⁰	-8	-	-	dBm
Receiver Sensitivity	SEN		-	-	-28	dBm
Center Wavelength	-	-	1480	1490	1500	nm
Signal Detect- Assert	SDA	-	-	-	-29	dBm
Signal Detect- Deassert	SDD	-	-40	-	-	dBm
Signal Detect- Hysteresis	SDA-SDD	--	0.5	-	5	dB
Receiver Reflectance	-	Measured at 1490nm	-	-	-20	dB
Differential Output Voltage	-	-	400	800	1000	mVp-p
Signal-Detected Voltage - Low	-	-	0	-	0.4	V
Signal-Detected Voltage - High	-	-	2.4	-	VCC	V

Pin Descriptions



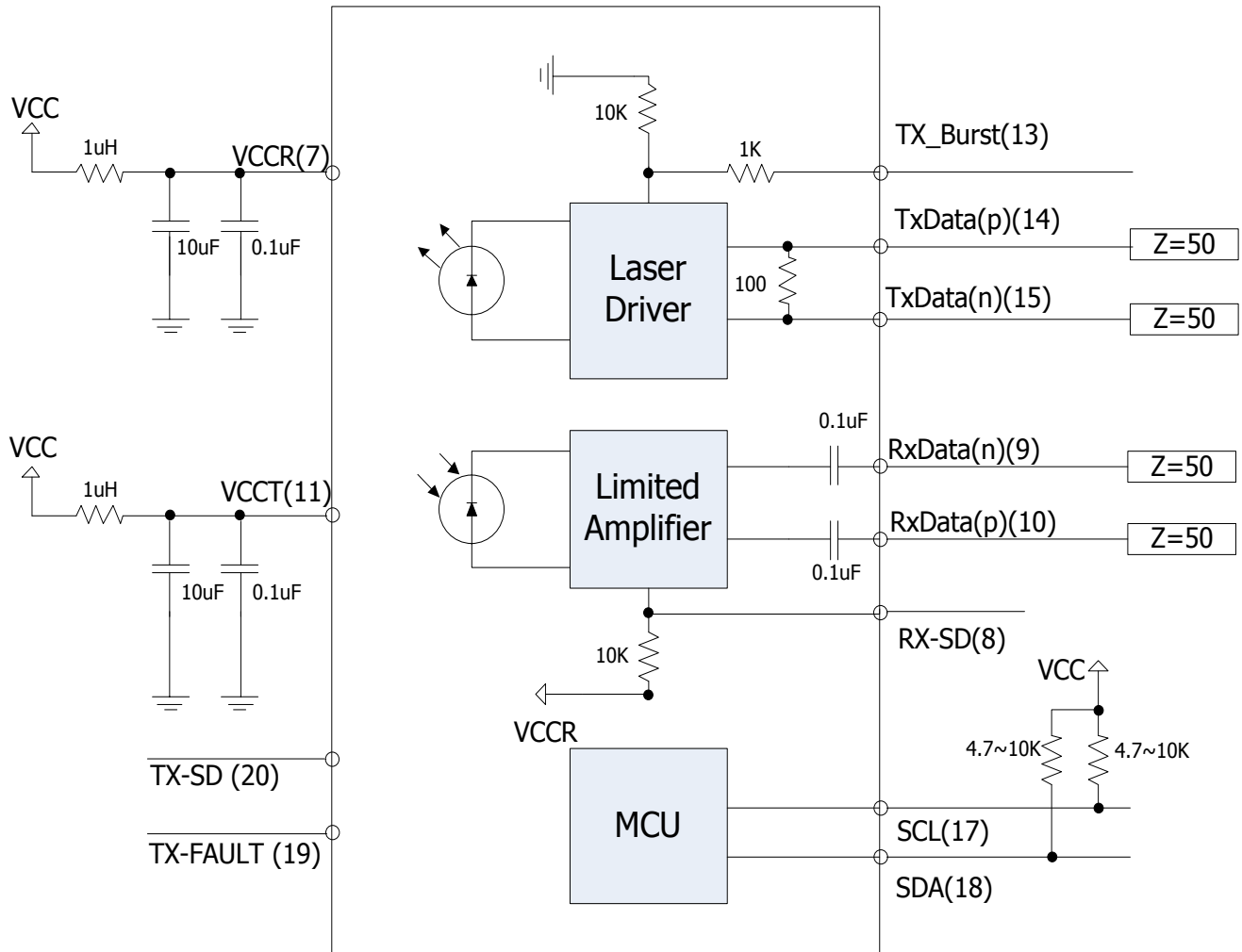
Pin	Signal Name	Description
Receiver Section		
1	NC	Not Connected
2	VeeR	Receiver Ground
3	VeeR	Receiver Ground
4	NC	Not Connected
5	NC	Not Connected
6	VeeR	Receiver Ground
7	VccR	+3.3V Receiver Power Supply
8	SD	Normal Optical Input indicated by logic "High", and No Optical Input indicated by logic "Low".
9	RD(n)	Inverted Receiver Data, CML Output (AC-Coupled internally)
10	RD(p)	Non-Inverted Receiver Data, CML Output (AC-Coupled internally)
Transmitter Section		
11	VccT	+3.3V Transmitter Power Supply
12	VeeT	Transmitter Ground
13	Burst_EN	LVTTTL input, Active high to enable laser.
14	TD(p)	Non-Inverted Transmitter Data, LVPECL Input (DC-Coupled internally)
15	TD(n)	Inverted Transmitter Data, LVPECL Input (DC-Coupled internally)
16	VeeT	Transmitter Ground
17	SCL	I2C Clock Input, LVTTTL
18	SDA	I2C Data I/O, LVTTTL
19	TX-FAULT	LVTTTL, assert when a fault condition is detected.
20	TX-SD	LVTTTL, Tx Transmitter State Indication, assert when Transmitter ON.

EEPROM serial ID memory contents (A0h)

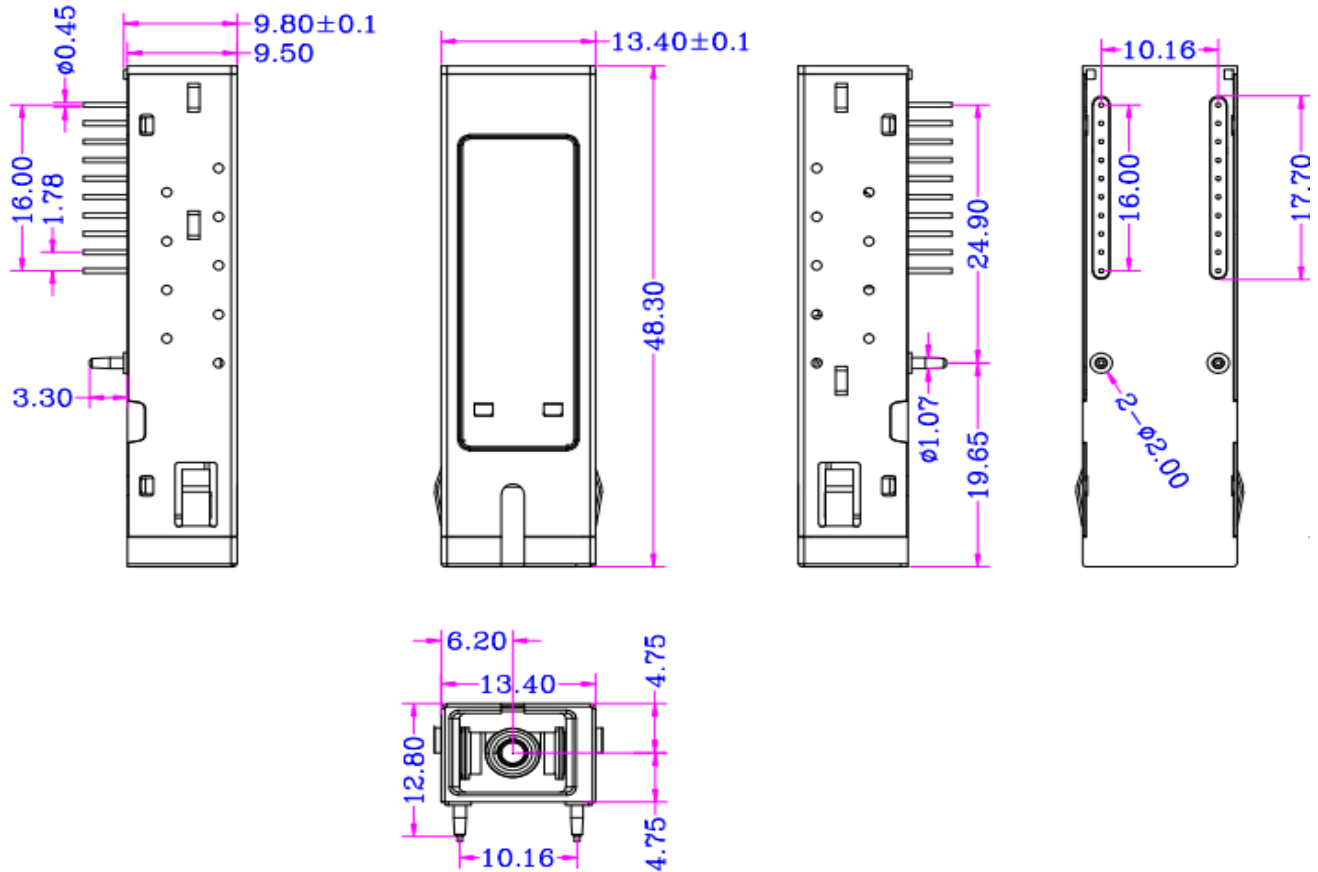
Address	Field Size	Name of Field	Hex	Description
0	1	Identifier	02	Transceiver Type
1	1	Ext. Identifier	08	Extended Identifier
2	1	Connector	01	Connector Type = SC/PC
3-10	8	Transceiver	00 00 00 00 00 00 00 00	Compatibility
11	1	Encoding	03	NRZ
12	1	BR, Nominal	0C	Nominal Bit Rate 1.244 GB/sec
13	1	Reserved	00	Reserved
14	1	Length (9um)-km	14	Link Length in Kilometers / SMF
15	1	Length (9um)	C8	Link Length in Hundreds of Meters / SMF
16	1	Length (50um)	00	50-micron MMF Link Length = N/A
17	1	Length (62.5um)	00	62.5-micron MMF Link Length = N/A
18	1	Length (Copper)	00	Copper Link Length = N/A
19	1	Reserved	00	Reserved
20-35	16	Vendor name	xxx	" HONLUS" ASCII
36	1	Reserved	00	Reserved
37-39	3	Vendor OUI	00 00 00	Vendor OUI SFP Vendor IEEE Company ID
40-55	16	Vendor PN	xxx	"HOLS-F3420345S-xx"(ASCII)
56-59	4	Vendor Rev	31 2E 30 20	"1.0" (ASC II)

Address	Field Size	Name of Field	Hex	Description
60-61	2	Wavelength	05 1E	Laser Wavelength = 1310 nm
62	1	Reserved	0	Reserved
63	1	CC_BASE	XX	Check sum of bytes 0 - 62
64-65	2	Options	00 0C	1. Rx_SD; 2. Tx_FAULT
66	1	BR, max	14	20%
67	1	BR, min	14	20%
68-83	16	Vendor SN	xxx	Programmed By factory
84-91	8	Date code	xxx	Programmed By factory
92	1	Diagnostic Monitoring Type	68	Compliant with SFF-8472 Internally Calibrated Received power measurement type-Average Power
93	1	Enhanced Options	F0	1. Alarm/warning flag implemented for all monitored quantities, 2. Soft Tx_DISABLE Monitor and Control, 3. Soft Tx_FAULT Monitor 4. Soft RX_LOS monitoring implemented
94	1	SFF-8472 Compliance	01	SFF 8472 Revision 9.3 Implemented
95	1	CC_EXT	XX	Check_Sum (64 to 94) = TBD
96-127	64	Vendor Specific	XX	Vendor Specific EEPROM

Recommend Application Circuit



Mechanical Dimensions



Ordering information

Part Number	Product Description
HOLS-F3420345S-CH	Tx1310nm, Rx1490nm, 1.25Gbps/2.5Gbps, Active high to enable laser, 20km, -40°C ~ +85°C, G.984.5, Class B+
HOLS-F3420345S-IH	Tx1310nm, Rx1490nm, 1.25Gbps/2.5Gbps, Active high to enable laser, 20km, -40°C ~ +85°C, G.984.5, Class B+
HOLS-F3420345S-CL	Tx1310nm, Rx1490nm, 1.25Gbps/2.5Gbps, Active low to enable laser, 20km, 0°C ~ +70°C, G.984.5, Class B+
HOLS-F3420345S-IL	Tx1310nm, Rx1490nm, 1.25Gbps/2.5Gbps, Active low to enable laser, 20km, -40°C ~ +85°C, G.984.5, Class B+