GO2918

SINGLE CHANNEL VIDEO OPTICAL TRANSMITTER MODULE

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GO2918 1310nm Single Channel Optical Transmitter

Features

- Supports video pathological patterns for SD-SDI, HD-SDI and 3G-SDI
- Hot-pluggable
- Laser disable pins
- User writeable EEPROM
- Digital diagnostics and control via I^2C interface including:
  - Monitoring laser bias current, average output power, supply voltage and temperature
  - Alarm reporting
  - Module ID polling
- Single +3.3V power supply
- RoHS compliant
- Telcordia GR-468 compliant
- 56.5mm x 13.4mm x 8.6mm SFP Package
- SMPTE 297-2006 compatible

Applications

- SMPTE 297-2006 compatible electrical-to-optical interfaces

Description

The GO2918 is a single channel optical transmitter module designed to transmit optical serial digital signals as defined in SMPTE 297-2006. The GO2918 is specifically designed for robust performance in the presence of SDI pathological patterns for SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M serial rates.

The GO2918 contains a 1310nm transmitter designed to provide error-free transmission of signals from 50Mbps to 3Gbps over single mode fiber (9/125). It is also hot-pluggable.

The GO2918 provides extensive operational status monitoring through an I^2C interface. Output optical power, bias current, supply voltage and operating temperature are are monitored. If a parameter monitored is outside the pre-defined range, the alarm flag associated with the parameter will be raised.

Ordering Information

Part Number	Package	Temperature Range
GO2918-31CM	SFP	T_{CASE}= 0°C to 70°C

Revision History

Version	ECR	Date	Changes and/or Modifications
0	154502	July 2010	New document.
1	155910	March 2011	Added EEPROM tables.
2	156192	April 2011	Updated EEPROM Table 4-4 Block 110 and Table 4-5.

Contents

1. Functional Block Diagram

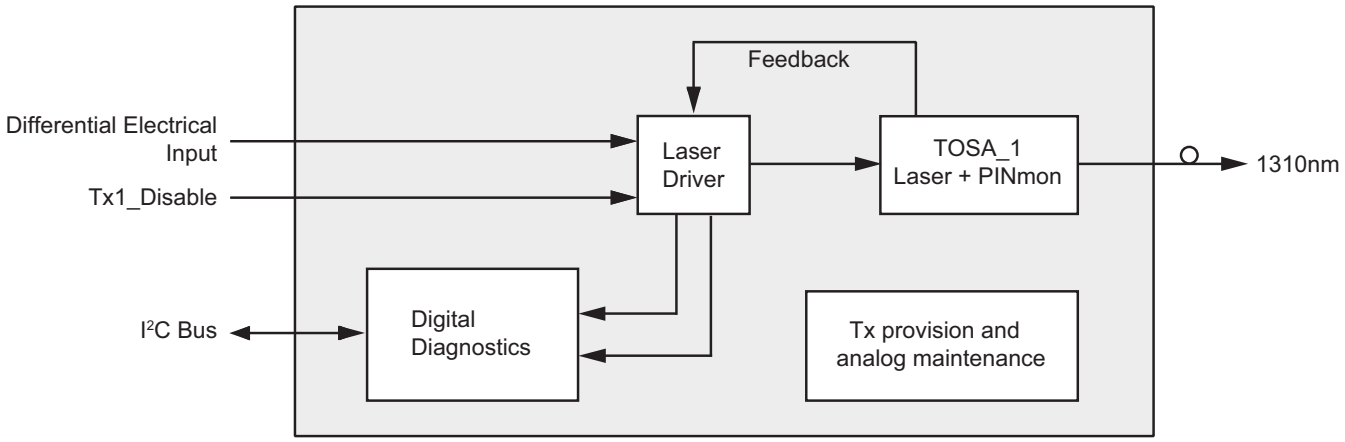

Figure 1-1: GO2918 Functional Block Diagram

2. Pin Specifications

2.1 Pin Configuration

Figure 2-1 shows the host board pad configurations for the GO2918. Figure 2-2 shows the edge connector pad configuration for the GO2918.

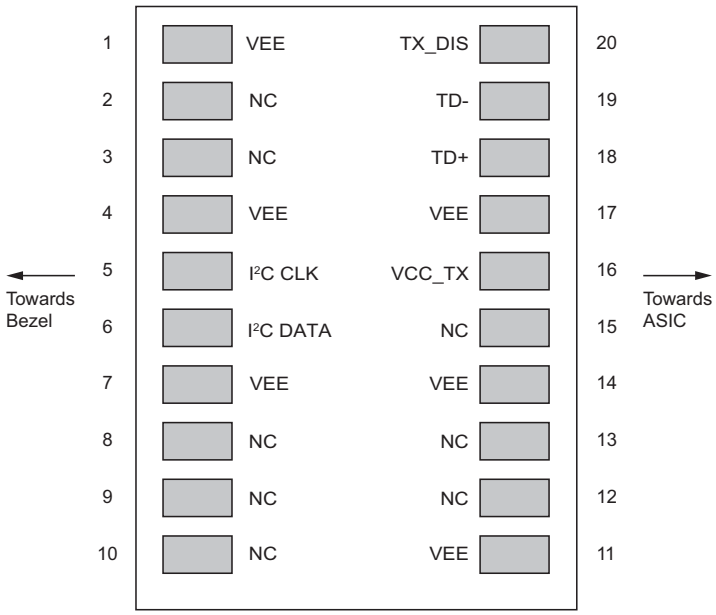

Figure 2-1: GO2918 Pin Configuration

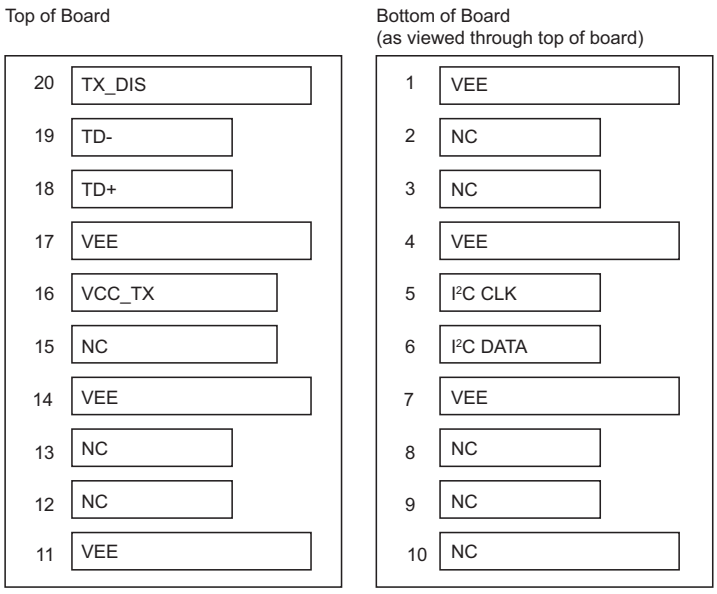

Figure 2-2: GO2918 Edge Connector Pad Configuration

2.2 Pin Descriptions

Table 2-1 lists the pin descriptions for the GO2918.

Table 2-1: Pin Descriptions

Number	Name	Type	Description
1	VEE	Ground	Ground connection
2	NC	No Connect	No Connection
3	NC	No Connect	No Connection
4	VEE	Ground	Ground connection
5	I^2C CLK	Digital (Input)	I^2C Clock
6	I^2C DATA	Digital (Bi-Directional)	I^2C Data
7	VEE	Ground	Ground connection
8	NC	No Connect	No Connection
9	NC	No Connect	No Connection
10	NC	No Connect	No Connection
11	VEE	Ground	Ground connection
12	NC	No Connect	No Connection
13	NC	No Connect	No Connection
14	VEE	Ground	Ground connection
15	NC	No Connect	No Connection
16	VCC_TX	Power	Transmitter Power Supply
17	VEE	Ground	Ground connection
18	TD+	Input	Positive Differential Input (AC-coupled internally)
19	TD-	Input	Negative Differential Input (AC-coupled internally)
20	TX_DIS	Digital (Input)	Transmitter Disable. The laser is disabled on channel 1 if TX_DIS = HIGH. Internal 4.7kΩ pull-up.

NOTES:

1. All VEE signals are connected together inside the module.

2.3 Host Board Power Supply Requirements

The host board is required to provide a regulated and filtered power supply of 3.3V +/- 5% for the GO2918 via the on board SFP connector. The host board is required to filter the VCC_TX power supply as recommended by the SFP MSA. Figure 2-3 shows the

recommended board supply filtering. When the host board is loaded with a resistive load in place of the SFP module and sourcing the maximum rated current, the peak-to-peak power supply noise measured on the SFP connector should comply to Table 2-2.

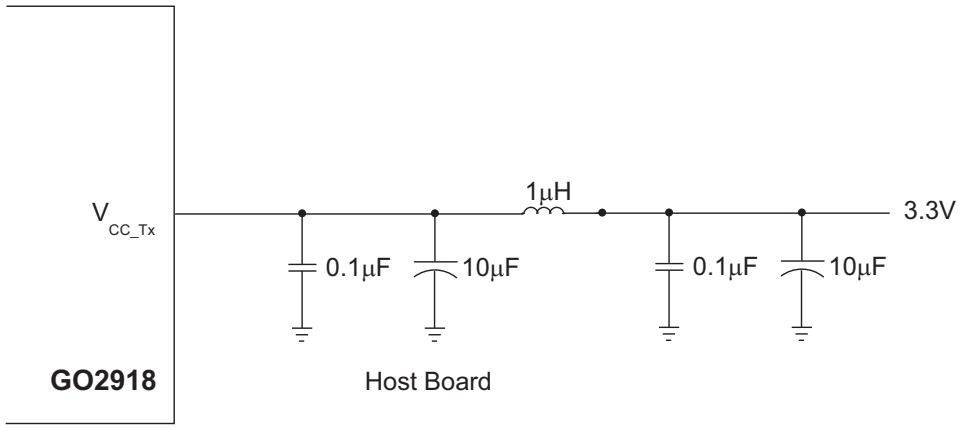

Figure 2-3: Recommended Host Board Supply Filtering

Table 2-2: Host Board Power Supply Noise Requirement at V_{CC}_Tx

Frequency (MHz)	Peak-to-Peak Noise Amplitude (%)
0.02-1	2
1-10	3

2.4 Optical Connector Requirements

An LC connector with PC/UPC polish is required the optical port.

3. Product Specifications

3.1 Absolute Maximum Ratings

Table 3-1 lists the absolute maximum ratings for the GO2918. Conditions exceeding the limits listed may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Table 3-1: Absolute Maximum Ratings

Parameter	Conditions	Value/Units
Supply Voltage	–	4V
Operating Case Temperature	–	$-20°C \leq T_{CASE} \leq 80°C$
Storage Temperature	–	$-40°C \leq T_{STG} \leq 100°C$
ESD tolerance on all pins	–	±1kV HBM
Relative Humidity (non-condensing)	–	5% - 95% RH

3.2 Optical Performance Specifications

Table 3-2 lists the optical performance specifications for the GO2918.

Table 3-2: Optical Performance Specifications

V_{CC} = 3.3V ±5%, T_C = 0°C to 70°C. Typical values are at V_{CC} = 3.3V, T_A = 25°C unless otherwise specified.

Parameter	Symbol	Condition	Min	Typ	Max	Units	Notes
Wavelength	λ	–	1280	1310	1340	nm	1
Spectral Line Width (RMS)	–	–	–	1.5	3	nm	–
Average Optical Output Power	P_{out}	–	-5	-2	0	dBm	–
Extinction Ratio	ER	–	7	–	–	dB	–

Table 3-2: Optical Performance Specifications (Continued)

V_{CC} = 3.3V ±5%, T_C = 0°C to 70°C. Typical values are at V_{CC} = 3.3V, T_A = 25°C unless otherwise specified.

Parameter	Symbol	Condition	Min	Typ	Max	Units	Notes
Optical Signal Intrinsic Jitter	–	2.97Gbps, 1.485Gbps, 270Mbps PRBS	–	30	60	ps	–
		2.97Gbps SMPTE 424M Pathological	–	45	70	ps	–
		1.485Gbps SMPTE 292M Pathological	–	60	100	ps	–
		270Mbps SMPTE 259M Pathological	–	110	180	ps	–
Optical Signal Rise Time	t_r	2.97Gbps SMPTE 424M	–	105	165	ps	–
Optical Signal Fall Time	t_f	2.97Gbps SMPTE 424M	–	120	180	ps	–
Laser Power Monitoring Accuracy	–	–	-2	–	+2	dB	–

NOTE

1. Measured at 25°C.

3.3 DC Electrical Specifications

Table 3-3 lists the DC electrical specifications for the GO2918. Figure 3-1 shows the definition of the differential signal level.

Table 3-3: DC Electrical Specifications

V_{CC} = 3.3V ±5%, T_C = 0°C to 70°C. Typical values are at V_{CC} = 3.3V, T_A = 25°C unless otherwise specified.

Parameter	Symbol	Condition	Min	Typ	Max	Units	Notes
Operating Temperature Range	T_{CASE}	–	0	–	70	°C	1
Power Supply Voltage	V_{CC}	–	3.13	3.3	3.47	V	1
Total Power Consumption	–	–	–	–	550	mW	–
Differential Input Data Amplitude	$V_{p\text{-}pDiff}$	–	0.4	–	2.4	V	2
Digital Input Low	V_{IL}	–	0		0.8	V	–
Digital Input High	V_{IH}	–	2		V_{cc}	V	–

NOTES

1. Outside the specified range, performance is not guaranteed.
2. Signals are AC coupled internally within the module and terminated to a 50Ω (single-ended) termination.

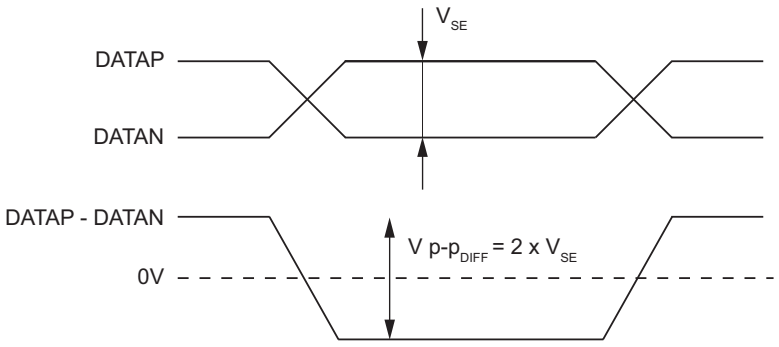

Figure 3-1: Definition of Differential Signal Level

3.4 AC Electrical Specifications

Table 3-4 lists the AC electrical specifications for the GO2918.

Table 3-4: Timing Specifications

Parameter	Symbol	Condition	Min	Max	Units
Bit Rate	BR	–	50	3000	Mbps
Time to Initialize	t_init	From power on	–	300	ms
Tx_Disable Assert Time	t_off	Time from rising edge of Tx_Disable to when the optical output falls below 10% of nominal.	–	10	µs
Tx_Disable Negate Time	t_on	Time from falling edge of Tx_Disable to when the modulated optical output rises above 90% of nominal.	–	1	ms
Serial ID Clock Rate	f_serial_clock	–	–	400	kHz

3.5 Supporting Circuit Specifications

3.5.1 In-Rush Current Control Circuit

Due to the hot-pluggable requirement, the GO2918 has built-in circuits to limit the in-rush current upon hot insertion. The specifications of the in-rush limiting circuits are summarized in Table 3-5.

Table 3-5: In-rush Current Limiting Circuits Specifications

Parameter	Value
Maximum in-rush current ramp rate	50mA/ms
Maximum in-rush current	30mA over steady state

4. Digital Diagnostics

4.1 I²C Bus Interface

The I²C interface allows reading of diagnostic information from the module. It is comprised of I²C DATA and I²C CLK pins. All address and data bytes are transmitted through the I²C DATA pin. The I²C DATA and I²C CLK pins are open-collector and they must be pulled high (4.75kΩ recommended) externally to the module. Data on the I²C DATA pin may only change during I²C CLK 'low' time periods. Data changes during I²C CLK 'high' periods will indicate either a START or STOP condition. Operations and conditions are described as follows:

START Condition

The START condition is originated by the host. A high-to-low transition of I²C DATA while I²C CLK 'high' defines a START condition that must precede any other command, see Figure 4-1.

STOP Condition

The STOP condition is originated by the host. A low-to-high transition of I²C DATA while I²C CLK 'high' defines a STOP condition, see Figure 4-1.

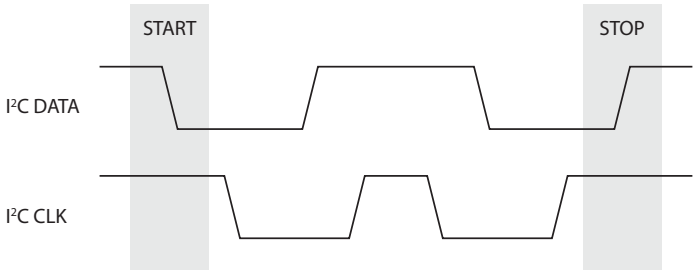

Figure 4-1: I²C START and STOP Condition

Acknowledge or ACK Condition

The acknowledge condition occurs when the I²C DATA pin is pulled 'low' during the ninth clock pulse following an address or data byte. The module originates this condition after it has received a block or data address. The host originates this condition during a sequential address read operation.

Addressing Operation

The module must receive a block address following a START condition to enable a read operation. The block address is clocked into the module MSB to LSB. There are three read operations: current address read, random read, and sequential address read.

Note that by the convention specified in the SFP MSA, 7-bit block addresses are left shifted by one bit when expressing them in hex. Block addresses for the different

memory regions are specified in Section 4.2. Block addresses A0h, A2h, and B2h would therefore be transmitted defined as binary 1010000, 1011001 and 1011001 respectively.

Current Address Read Operation

The module has an internal register that maintains the data address used during the last read operation, incremented by one. If the most recent data address was FFh, then the register resets to 00h. Once the block address is clocked in by the host with the R/W bit set 'high', the module follows with an ACK condition, and the data byte located at the current data address is serially clocked out of the module MSB to LSB. The operation is terminated when the host does not provide an ACK condition and initiates a STOP condition. See Figure 4-2.

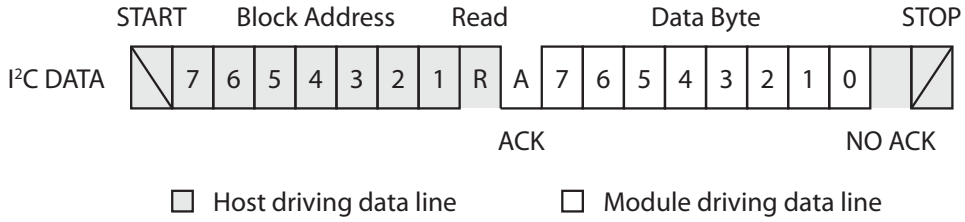

Figure 4-2: I²C Current Address Read Operation

Random Address Read Operation

A random read operation requires a dummy write sequence to load in the data address. Once the block and data addresses are clocked in by the host followed by an ACK condition provided by the module, the host must generate another START condition. The host now initiates a current address read operation by sending the block address with the R/W bit set 'high'. The module provides an ACK condition and serially clocks out the data byte. The operation is terminated when the host does not provide an ACK condition and initiates a STOP condition. See Figure 4-3.

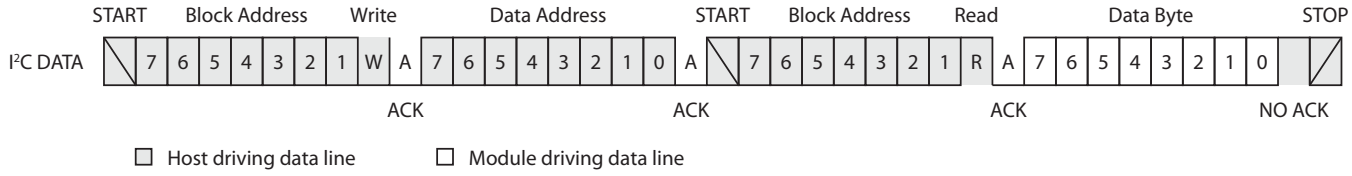

Figure 4-3: I²C Random Access Read Operation

Sequential Address Read Operation

The sequential address read operation is initiated by either a current address read or random address read operation. After the host receives the first data byte, it responds with an ACK condition. As long as the module receives the ACK condition after a data byte is read, the host can clock out additional data bytes from the module. After the data address reaches FFh, it resets to 00h. The operation is terminated when the host does not provide an ACK condition and initiates a STOP condition. See Figure 4-4.

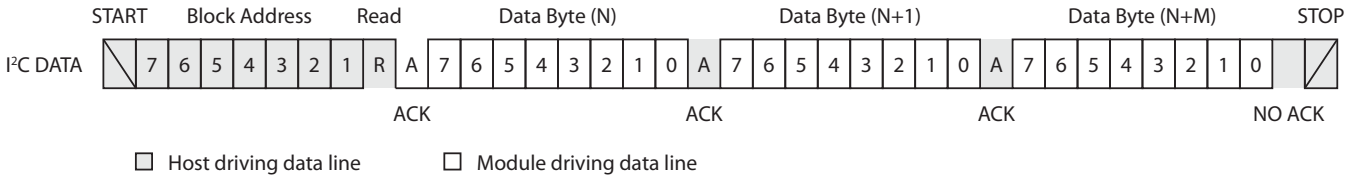

Figure 4-4: I²C Sequential Read Access Operation

4.2 Serial Interface Memory Map

Module identification and digital diagnostic monitoring information is accessible through the memory map addresses shown in this section. The items below outline the different block addresses of the module:

- Block address A0h contains serial ID information of the module.
- Block address A2h contains alarm flags, warning flags, thresholds and real-time digital diagnostic features set for the module.

The 16-bit digital diagnostic monitoring information is internally calibrated over Gennum's specified operating temperature and voltage.Alarm and warning threshold values are calibrated in the same manner and can be interpreted as defined below.

Internally measured module temperature is represented as a 16-bit signed two's complement value in increments of 1/256°C, yielding a total range of -128°C to +128°C. To calculate the temperature, treat the two's complement value as a 16-bit unsigned integer and divide it by 256. If the result is greater or equal to 128, subtract 256 from the result. See Table 4-1 for temperature conversion examples.

Table 4-1: Temperature Conversion Examples

MSB (BIN)	LSB (BIN)	Temperature (°C)
01000000	00000000	64°C
01000000	00001111	64.059°C
01011111	00000000	95°C
11110110	00000000	-10°C
11011000	00000000	-40°C

Internally measured module supply voltage is represented as a 16-bit unsigned integer with the voltage defined as the full 16-bit value with the LSB equal to 100µV, yielding a total range of 0 to +6.55V. To calculate the supply voltage, multiply the 16-bit unsigned integer by 100µV.

Internally measured laser bias current is represented as a 16-bit unsigned integer with the current defined as the full 16-bit value with the LSB equal to 2µA, yielding a total range of 0 to 131 mA. To calculate the laser bias current, multiply the 16-bit unsigned integer by 2µA.

Internally measured Tx optical power is represented as a 16-bit unsigned integer with the power defined as the full 16-bit value with the LSB equal to 0.1µW, yielding a total range of 0 to 6.5535mW (~ -40 to +8.2dBm). To calculate the Tx optical power, multiply the 16-bit unsigned integer by 0.1µW.

Table 4-2: Modules Identification Fields

Block Address: A0h

Address	Size	Name	Description and Value of the Field
0	1	Identifier	Type of serial transceiver. 83h
1	1	Ext. Identifier	Extended identifier of type of serial transceiver. 04h
2	1	Connector	Code for connector type. 07h for LC connectors.
3	1	Standards Compliance	41h, for SMPTE259M/344M/292M/424M and SMPTE 297M.
4-10	8	Transceiver Code	Code for electronic compatibility or optical compatibility. Not applicable for GO2918.
11	1	Encoding	Code for serial encoding algorithm. Value: 03H for NRZ.
12	1	BR, Nominal	Nominal bit rate, units of 100 MBits/sec, 1Eh for 3Gbps.
13	1	Reserved	Xxh
14	1	Length(9mm) - km	Link length supported for standard SMF, units of km, 1Eh (30km at HD-SDI with GO2910).
15	1	Length(9mm)	Link length supported for standard SMF, units of 100 m, 00h
16	1	Length (50mm)	Link length supported for 50/125 mm fiber, units of 10 m. 00h
17	1	Length (62.5mm)	Link length supported for 62.5/125 mm fiber, units of 10 m. 00h
18	1	Length (Copper)	Link length supported for copper, units of meters. 00h
19	1	Reserved	Xxh
20-35	16	Vendor name	SFP with OM transceiver vendor name (ASCII). G E N N U M
20	1	G	47h
21	1	E	45h
22	1	N	4Eh
23	1	N	4Eh
24	1	U	55h

Table 4-2: Modules Identification Fields (Continued)

Block Address: A0h

Address	Size	Name	Description and Value of the Field
25	1	M	4Dh
26-35	10	–	20h for each byte
36	1	Reserved	–
37-39	3	Vendor OUI	SFP with OM transceiver vendor IEEE company ID. 00 0A DF
40-55	16	Vendor PN	Part number provided by SFP with OM transceiver vendor. G O 2 9 1 8 - 3 1 C M
40	1	G	47h
41	1	O	4Fh
42	1	2	32h
43	1	9	39h
44	1	1	31h
45	1	8	38h
46	1	–	2Dh
47	1	3	33h
48	1	1	31h
49	1	C	43h
50	1	M	4Dh
51-55	5	–	20h
56-58	3	–	Reserved
59	1	Vendor Rev	Revision level for part number provided by vendor.
60	1	Wavelength	1Fh for the middle two digits of 1310.
61	1	Wavelength	1Fh for the middle two digits of 1310.
62	1	Reserved	Xxh
63	1	CC_BASE	Check code for Base ID fields. (The value of the lower 8 bits of the sum of the contents from address 0 to 62.)
64-65	2	Options	Indicates which optional SFP with OM signals are implemented.
64	1	–	00h
65	1	–	18h
66	1	BR, max	Upper bit rate margin, units of %, 5h.
67	1	BR, min	Lower bit rate margin, units of %, 5Fh.

Table 4-2: Modules Identification Fields (Continued)

Block Address: A0h

Address	Size	Name	Description and Value of the Field
68-83	16	Vendor SN	Serial number provided by vendor (ASCII)
84-85	2	Year	Manufacturing date code (ASCII).
86-87	2	Month	Manufacturing date code (ASCII).
88-89	2	Day	Manufacturing date code (ASCII).
90-91	2	Blank	–
92	1	Calibration flag	20h for calibrated average output power
93	1	–	E0h, Enhanced alarm/warning flags.
94	1	Reserved	Xxh
95	1	CC_EXT	Check code for the Extended ID fields. (The value of the lower 8 bits of the sum of the contents from address 64 to 94.)
96-255	160	Reserved	–

Table 4-3: Alarm and Warning Thresholds

Block Address: A2h

Address	Size	Name	Description and Value of the Field
0-1	2	Temp High Alarm	MSB at lower address. 78°C case temp.
2-3	2	Temp Low Alarm	MSB at lower address. -8°C case temp.
4-5	2	Temp High Warning	MSB at lower address. 73°C case temp.
6-7	2	Temp Low Warning	MSB at lower address. -3°C case temp.
8-9	2	Supply Voltage High Alarm	MSB at lower address. 3.6V
10-11	2	Supply Voltage Low Alarm	MSB at lower address. 3.0V
12-13	2	Supply Voltage High Warning	MSB at lower address. 3.47V
14-15	2	Supply Voltage Low Warning	MSB at lower address. 3.14V
16-17	2	Laser Bias High Alarm	MSB at lower address. 100mA.
18-19	2	Laser Bias Low Alarm	MSB at lower address. 5mA.

Table 4-3: Alarm and Warning Thresholds (Continued)

Block Address: A2h

Address	Size	Name	Description and Value of the Field
20-21	2	Laser Bias High Warning	MSB at lower address. 90mA.
22-23	2	Laser Bias Low Warning	MSB at lower address. 10mA
24-25	2	Tx Power High Alarm	MSB at lower address. 0dBm.
26-27	2	Tx Power Low Alarm	MSB at lower address. -7dBm.
28-29	2	Tx Power High Warning	MSB at lower address. -1dBm.
30-31	2	Tx Power Low Warning	MSB at lower address. -6dBm.
32-94	64	Reserved.	–
95	1	CC_EXT	Byte 95 contains the low order 8 bits of the check sum of byte 0 -94

Table 4-4: Alarms and Real time Diagnostic information

Block Address: A2h

Address	Size	Name	Description and Value of the Field
96	1	Temperature MSB	Internally measure module temperature (approximately equal to case temperature)
97	1	Temperature LSB	Internally measure module temperature (approximately equal to case temperature)
98	1	V_{CC} MSB	Internally measure module supply voltage
99	1	V_{CC} LSB	Internally measure module supply voltage
100	1	Laser Bias MSB	Internally measure laser bias current. 7530h corresponds to 60mA. All other readings should be scaled linearly using this factor.
101	1	Laser Bias LSB	Internally measure laser bias current. 7530h corresponds to 60mA. All other readings should be scaled linearly using this factor.
102	1	Tx Power MSB	Internally measure Tx Power.
103	1	Tx Power LSB	Internally measure Tx Power.
104-109	11	Reserved	–

Table 4-4: Alarms and Real time Diagnostic information (Continued)

Block Address: A2h

Address	Size	Name	Description and Value of the Field
110	1	Tx Disable State	Bit 7: State of TX_DIS input pin
		Tx Disable Select	Bit 6: Read/write bit that allows software disable of laser. Writing "1" disables laser.
		Reserved	Bit 5-3
		Tx Fault	Bit 2: State of TX_FAULT output
		Rx LOS	Bit 1: State of RX_LOS output
		Data_Ready	Bit 0
111	1	Conversion Update	–
		Temp Update	Bit 7 goes to high after a temperature update
		V_{CC} Update	Bit 6 goes to high after a V_{CC} update
		Mon1 Update	Bit 5 goes to high after a Tx bias current update
		Mon2 Update	Bit 4 goes to high after a Tx power update
		Mon3 Update	Bit 3 goes to high after a Tx modulation current update.
		Reserved	Bit 0 to Bit 2.
112	1	Temp High Alarm Flag	Bit 7, set when the internal temperature exceeds the high temp alarm threshold.
		Temp Low Alarm Flag	Bit 6, set when the internal temperature goes below the low temp alarm threshold.
		Supply Voltage High Alarm Flag	Bit 5, set when the internal V_{CC} exceeds the supply voltage high alarm threshold.
		Supply Voltage Low Alarm Flag	Bit 4, set when the internal V_{CC} goes below the supply voltage low alarm threshold.
		Laser Bias High Alarm Flag	Bit 3, set when the monitored laser bias current exceeds the laser bias high alarm threshold.
		Laser Bias Low Alarm Flag	Bit 2, set when monitored laser bias current goes below the laser bias low alarm threshold.
		Tx Power High Alarm Flag	Bit 1, set when the monitored Tx power exceeds the Tx power high alarm threshold.
		Tx Power Low Alarm Flag	Bit 0, set when monitored Tx power current goes below the Tx power low alarm threshold.

Table 4-4: Alarms and Real time Diagnostic information (Continued)

Block Address: A2h

Address	Size	Name	Description and Value of the Field
113	1	Mod Current High Alarm Flag	Bit 7, set when the monitored laser modulation current exceeds the laser bias high alarm threshold.
		Mod Current Low Alarm Flat	Bit 6, set when monitored laser bias current goes below the laser modulation low alarm threshold.
		Reserved	Bit 0 - 5.
114-115	2	Reserved	–
116	1	Temp High Warning Flag	Bit 7, set when the internal temperature exceeds the high temp warning threshold.
		Temp Low Warning Flag	Bit 6, set when the internal temperature goes below the low temp warning threshold.
		Supply Voltage High Warning Flag	Bit 5, set when the internal V_{CC} exceeds the supply voltage high warning threshold.
		Supply Voltage Low Warning Flag	Bit 4, set when the internal V_{CC} goes below the supply voltage low warning threshold.
		Laser Bias High Warning Flag	Bit 3, set when the monitored laser bias current exceeds the laser bias high warning threshold.
		Laser Bias Low Warning Flag	Bit 2, set when monitored laser bias current goes below the laser bias low warning threshold.
		Tx Power High Warning Flag	Bit 1, set when the monitored Tx power exceeds the Tx power high warning threshold.
		Tx Power Low Warning Flag	Bit 0, set when monitored Tx power current goes below the Tx power low warning threshold.
117	1	Mod Current High Warning Flag	Bit 7, set when the monitored laser modulation current exceeds the laser bias high alarm threshold.
		Mod Current Low Warning Flag	Bit 6, set when monitored laser bias current goes below the laser modulation low alarm threshold.
		Reserved	Bit 0 - 5
118-127	10	Reserved	–

Table 4-5: Writeable Area

Block Address: A2h

Address	Size	Name	Description and Value of the Field
128-247	120	User Writeable Area	–
248-255	8	Reserved	–

5. Application Reference Design

5.1 Typical Application Circuit

Figure 5-1 shows a typical application circuit for the GO2918.

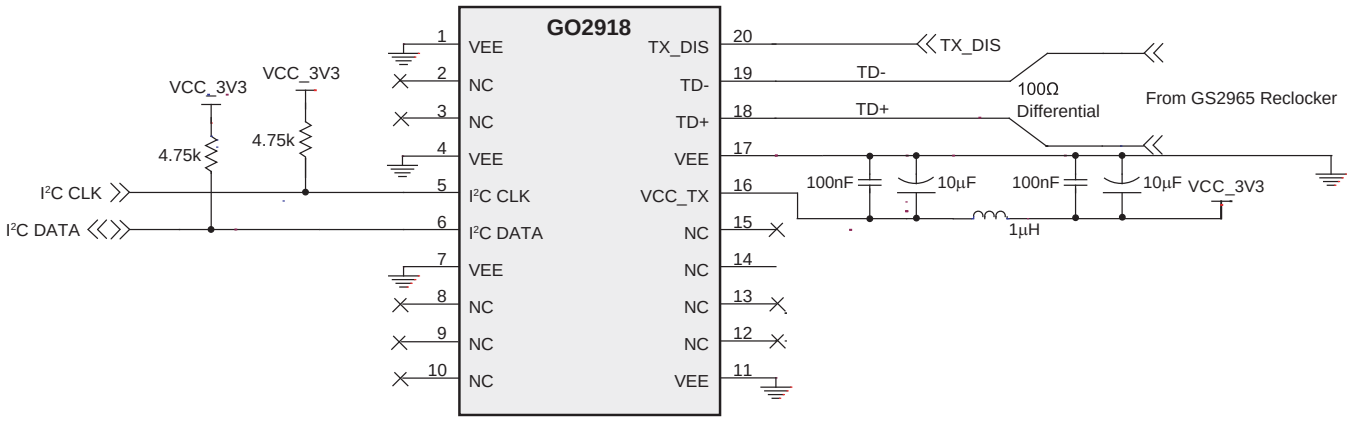

Figure 5-1: GO2918 Typical Application Circuit

6. References and Relevant Standards

Table 6-1: References and Relevant Standards

INF-8074i Rev 1.0	SFP (Small Formfactor Pluggable) Transceiver
SMPTE 259M-2008	SDTV Digital Signal/Data – Serial Digital Interface
SMPTE 292M-2008	1.5 Gbps Signal / Data Serial Interface
SMPTE 297-2006	Serial Digital Fiber Transmission System for SMPTE 259M, SMPTE 344M, SMPTE 292 and SMPTE 424M Signals
SMPTE 344M-2000	540 Mbps Serial Digital Interface
SMPTE 424M-2006	3 Gbps Signal/Data Serial Interface

7. Package Information

7.1 Package Dimensions

A common mechanical outline, as shown in Figure 7-1, is used for all SFP modules.

Since the GO2918 is a single channel device, the receptacle for channel 2 is plugged with a plastic insert.

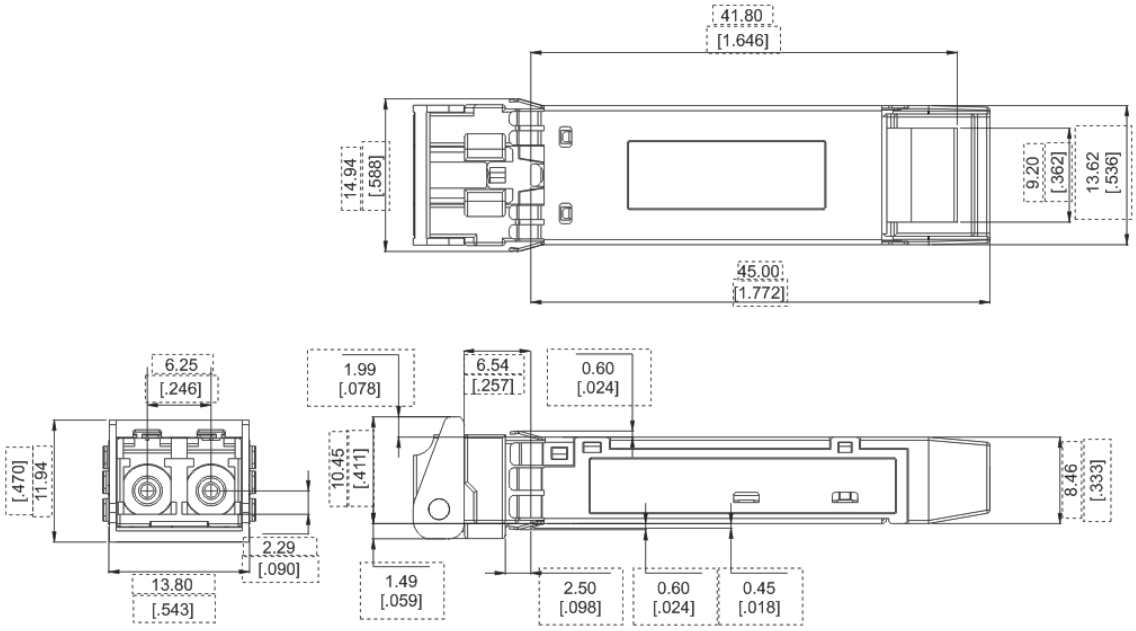

Figure 7-1: Common SFP Package Outline

7.2 PCB Layout Recommendations

Notes:
1. Datum and basic dimensions established by customer
2. Pads and vias are chassis-ground in 11 places
3. Through-holes and plating are optional

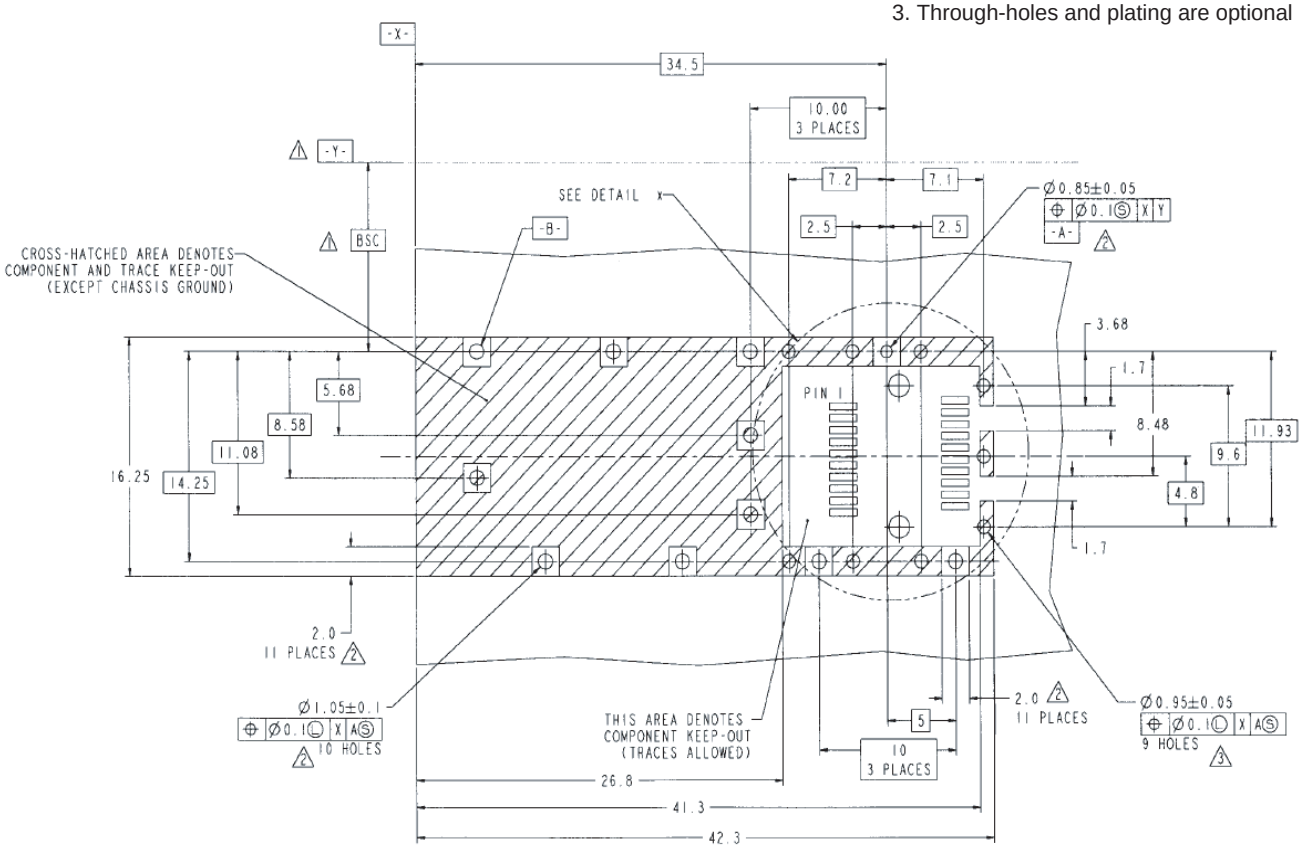

Figure 7-2: Host PCB Layout – Part 1

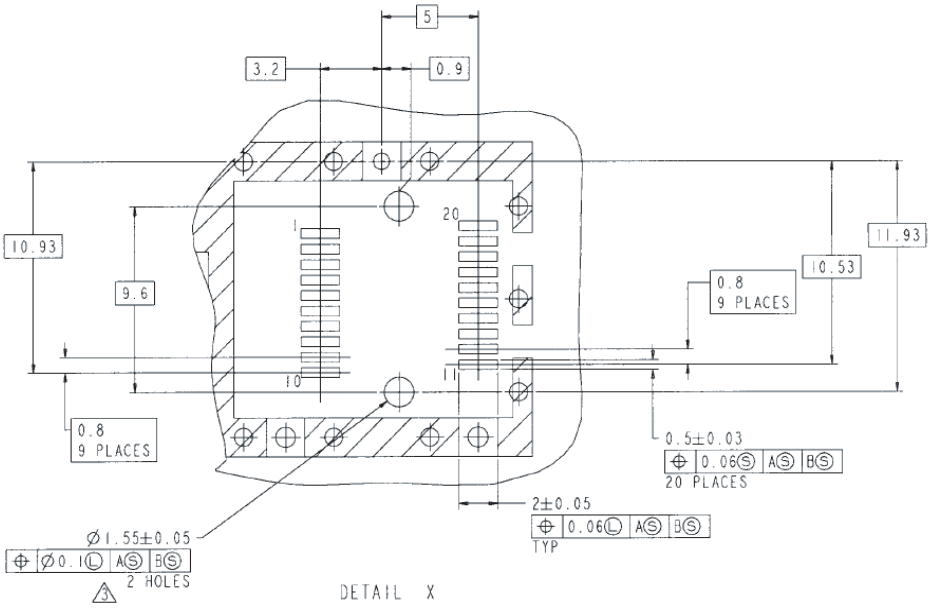

Figure 7-3: Host PCB Layout – Part 2

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