

# GP6302

## GPON SFP ONT



### Highlights

- Smallest GPON SFP ONT dimension
- Lowest power consumption GPON ONT design
- Plug-able GPON SFP ONT with SC/APC connector
- Complete GPON ONT functionality (TR-156, SP/WRR QoS, DHCP etc)
- Supporting 1PPS synchronization interface according to G.984.3/.4
- Compliant to FSAN G.984.2 specification
- ITU-T G.984.4, G.988 - GPON OMCI standard
- Support 28dB link budget, Class B+, range up to 20km
- Asymmetric Data Rate: Tx: 1244Mbps ; Rx: 2488 Mbps
- Operating case temperature options for consumer and industrial applications
  - \* GP6302 (C-temp): 0 ~ +70 °C
  - \* GP6302-I (I-temp): -40 ~ 85 °C

**GP6302** is an integrated SFP ONT, complying with the ITU-T G.984 standard for Gigabit Passive Optical Network (GPON). GP6302 provides a pluggable SFP compliant interface to upgrade existing devices for FTTx services. In addition to its high performance profile, this SFP ONT implementation assures maximum compatibility and provides remote management via OMCI channel.

### Applications

- Residential home gateway
- Network switch, router, VDSL MDU, and G.fast DPU
- Mobile backhaul

## Electrical Characteristics

Transmitter Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Differential Data Input Voltage	$V_{IN,P-P}$	300	-	1800	mVpp	
Input Differential Impedance	$Z_{IN}$	-	100	-	$\Omega$	
Tx Disable Assert Time	$T_{DIS\_A}$	-	-	10	ms	
Tx Disable De-assert Time	$T_{DIS\_D}$	-	-	1	ms	

Receiver Parameter						
Differential Output Voltage		300	-	1200	mV	
Signal Detect Output HIGH Voltage	$V_{SD\_High}$	2.4	-	-	V	
Signal Detect Output LOW Voltage	$V_{SD\_Low}$	0	-	0.8	V	
Data Output Rise and Fall Time	$T_R/T_F$	-	160	-	ps	

## Optical Characteristics

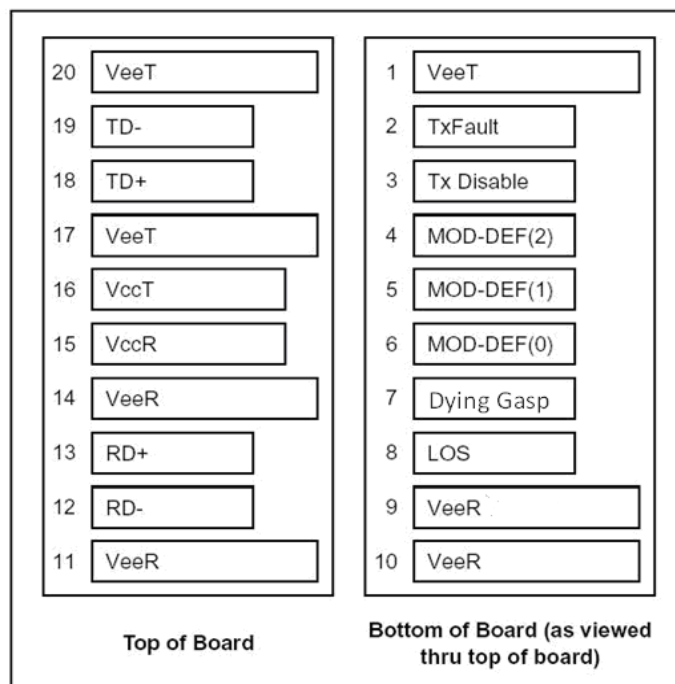
Transmitter						
Transmitter Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Range	$\lambda_C$	1290	1310	1330	nm	
Average Output Power	$P_{OUT}$	0.5	-	5	dBm	
Average Output Power (Laser Off)	$P_{OUT-OFF}$	-	-	-40	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Spectral Width (-20dB)	$\lambda_{20}$	-	-	1	nm	
Extinction Ratio	ER	10	-	-	dB	
Optical Rise and Fall Time(20%-80%)	$T_R/T_F$	-	-	250	ps	
Transmitter Output Eye	Compliant with G.984.2 Figure 3					
Receiver						
Center Wavelength Range	$\lambda_C$	1480	1490	1500	nm	
Overload		-	-	-8	dBm	
Sensitivity	$Sen$	-28	-	-	dBm	
1310nm Tx to 1490nm Rx Crosstalk		-	-	-47	dB	
1555nm Rx to 1490nm Isolation		30	-	-	dB	
(1550-1560nm) Ext to 1490 Rx Isolation		34	-	-	dB	

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## Pin Assignments



## Pin Definitions

Pin	Symbol	Logic	Name/Description	Note
1	VeeT	NA	Module Transmitter Ground	
2	Tx Fault	LVTTL-O	Transmitter fault indication	
3	TX_DISABLE	LVTTL-I	Transmitter Shut-off	
4	SDA	LVTTL-I/O	2-Wire Serial Interface Data Line (MOD-DEF2)	
5	SCL	LVTTL-I	2-Wire Serial Interface Clock (MOD-DEF1)	
6	MOD_ABS	NA	Module Absent, connected to VeeT or VeeR in the module	
7	DYING GASP	LVTTL-I	Dying Gasp message indicator (default off)	
8	LOS	LVTTL-O	Loss of Signal	
9	VeeR/1PPS	NA/1PPS	Module Receiver Ground	
10	VeeR	NA	Module Receiver Ground	
11	VeeR	NA	Module Receiver Ground	
12	RXD-	CML-O	Receiver Inverted Data Output	
13	RXD+	CML-O	Receiver Non-Inverted Data Output	
14	VeeR	NA	Module Receiver Ground	
15	VccR	NA	Module Receiver 3.3V Supply	
16	VccT	NA	Module Transmitter 3.3V Supply	
17	VeeT	NA	Module Transmitter Ground	
18	TXD+	CML-I	Transmitter Non-Inverted Data Input, CML, 100ohm differential impedance	
19	TXD-	CML-I	Transmitter Inverted Data Input, CML, 100ohm differential impedance	
20	VeeT	NA	Module Transmitter Ground	

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## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T <sub>s</sub>	-40	-	+85	°C	See P8
Supply Voltage	V <sub>CC_Rx</sub>	-0.3	-	+4.2	V	
	V <sub>CC_Tx</sub>	-0.3	-	V <sub>CC_Rx</sub> +1	V	
Operating Relative Humidity	RH	5	-	95	%	

## Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T <sub>c</sub>	-40	-	85	°C	See P8
Operating Voltage	V <sub>CC</sub>	3.14	3.30	3.46	V	
Total Tx and Rx Supply Current	I <sub>CC</sub>	-	600	-	mA	
Power Dissipation	P <sub>D</sub>	-	2	-	W	
Bit Rate(Tx)	BR	-	1244.16	-	Mbps	
Bit Rate(Rx)	BR	-	2488.32	-	Mbps	

## EEPROM (A0h)

Addr.	Field Size (Bytes)	Name of Field	Hex	Description
0	1	Identifier	03	SFP transceiver
1	1	Ext. Identifier	04	MOD4
2	1	Connector	01	SC
3-10	8	Transceiver	00 00 00 00 00 00 00 00	
11	1	Encoding	03	NRZ
12	1	BR, Nominal	0C	1.244Gbps
13	1	Reserved	00	
14	1	Length (9um)-km	14	20(km)
15	1	Length (9um)	C8	200(100m)
16	1	Length (50um)	00	Not Support MMF
17	1	Length (62.5um)	00	Not Support MMF
18	1	Length (Copper)	00	Not Support Copper
19	1	Reserved	00	
20-35	16	Vendor name	54 45 43 4F 4D 5F 43 4F 2E 2C 5F 4C 54 44 2E 00	"TECOM_CO.,_LTD."(ASCII)
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	47 50 36 33 30 32 00 00 00 00 00 00 00 00 00 00	"GP6302" (ASCII)
56-59	4	Vendor Rev	30 30 30 30	ASCII ("0 0 0 0" means 1.0 Revision)
60-61	2	Wavelength	83 95	60: A value of 0x83 is expected for 1310nm. 61: A value of 0x95 is expected for 1490nm.
62	1	Reserved	00	

63	1	CC_BASE	xx	Check sum of byte 0-62
64-65	2	Options	00 1A	64 = 0x00, reserved 65 = 0x1A, TX_DISABLE/ TX_FAULT/RX_LOS supported
66	1	BR, max	00	
67	1	BR, min	00	
68-83	16	Vendor SN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASCII
84-91	8	Date code	xx xx xx xx xx xx 20 20	Year(2 bytes),Month(2 bytes), Day(2 bytes)
92	1	Diagnostic Monitoring Type	68	Compliant with SFF-8472 V10.3 Internally Calibrated Received power measurement type -Average Power
93	1	Enhanced Options	F0	Diagnostics (Optional Alarm/warning flags) Soft TX_FAULT monitoring implemented. Soft RX_LOS monitoring implemented
94	1	SFF-8472 Compliance	05	Indicates the revision of SFF-8472 with which the transceiver complies. Value depends on module features.
95	1	CC_EXT	xx	Check sum of byte 64-94
96-255	64	Vendor Specific		

## EEPROM Memory Content (A2h)

Addr.	Field Size (Bytes)	Name of Field	Hex	Description
0	00	Temp High Alarm	64 00	100°C (I temp)
2	02	Temp Low Alarm	CE 00	-50°C (I temp)
4	04	Temp High Warning	5F 00	95°C (I temp)
6	06	Temp Low Warning	D8 00	-40°C (I temp)
8	08	Voltage High Alarm	8C A0	3.6V
10	0A	Voltage Low Alarm	75 30	3.0V
12	0C	Voltage High Warning	88 B8	3.5V
14	0E	Voltage Low Warning	79 18	3.1V
16	10	Bias High Alarm	AF C8	90mA
18	12	Bias Low Alarm	00 00	0mA
20	14	Bias High Warning	88 B8	70mA
22	16	Bias Low Warning	00 00	0mA
24	18	TX Power High Alarm	7B 86	5dBm
26	1A	TX Power Low Alarm	22 D0	-0.5dBm
28	1C	TX Power High Warning	6E 17	4.5dBm
30	1E	TX Power Low Warning	27 10	0dBm

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32	20	2	RX Power High Alarm	07 CB	-7dBm
34	22	2	RX Power Low Alarm	00 0F	-28dBm
36	24	2	RX Power High Warning	06 30	-8dBm
38	26	2	RX Power Low Warning	00 14	-27dBm
40-45	28-2D	6	MAC address	xx xx xx xx xx xx	MAC Address
46-55	2E-37	10	Reserved	00....000	Reserved
56	38	4	RX_PWR(4) Calibration	00 00 00 00	4th order RSSI calibration coefficient
60	3C	4	RX_PWR(3) Calibration	00 00 00 00	3rd order RSSI calibration coefficient
64	40	4	RX_PWR(2) Calibration	00 00 00 00	2nd order RSSI calibration coefficient
68	44	4	RX_PWR(1) Calibration	3F 80 00 00	1st order RSSI calibration coefficient
72	48	4	RX_PWR(0) Calibration	00 00 00 00	0th order RSSI calibration coefficient
76	4C	2	TX_I(Slope) Calibration	01 00	Slope for Bias calibration
78	4E	2	TX_I(Offset) Calibration	00 00	Offset for Bias calibration
80	50	2	TX_PWR(Slope) Calibration	01 00	Slope for TX Power calibration
82	52	2	TX_PWR(Offset) Calibration	00 00	Offset for TX Power calibration
84	54	2	T(Slope) Calibration	01 00	Slope for Temperature calibration
86	56	2	T(Offset) Calibration	00 00	Offset for Temperature calibration, in units of 256ths C
88	58	2	V(Slope) Calibration	01 00	Slope for VCC calibration
90	5A	2	V(Offset) Calibration	00 00	Offset for VCC calibration
92	5C	3	Reserved	00 00 00	Reserved
95	5F	1	Checksum	xx	Checksum
96	60	2	Transceiver Temperature	xx xx	Temperature in C/256
98	62	2	Supply Voltage	xx xx	Vcc
100	64	2	TX Bias Current	xx xx	BIASMON
102	66	2	TX Optical Output Power	xx xx	Back facet monitor
104	68	2	RX Optical Input Power	xx xx	RSSI
106	6A	2	Reserved	00 00	Reserved
108	6C	2	Reserved	00 00	Reserved
110	6E.7	1bit	TX_DIS State	x	Soft TX disable state
	6E.6	1bit	Soft TX Disable	x	Write bit that allows software disable laser output.
	6E.5	1bit	Reserved.	0	Reserved
	6E.4	1bit	Rate Select State	0	NOT SUPPORTED.
	6E.3	1bit	Rate Select	0	NOT SUPPORTED.
	6E.2	1bit	TX_FAULT	x	Digital state of the TX Fault Output
	6E.1	1bit	Rx LOS	x	Digital state of the Rx LOS Output
	6E.0	1bit	Data Ready Bar	x	Indicates transceiver has achieved power up and data is ready.
111	6F.7	1bit	Reserved	0	Reserved
	6F.6	1bit	Reserved	0	Reserved

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	6F.5	1bit	Reserved	0	Reserved
	6F.4	1bit	Reserved	0	Reserved
	6F.3	1bit	Reserved	0	Reserved
	6F.2	1bit	Reserved	x	Reserved
	6F.1	1bit	Reserved	0	Reserved
	6F.0	1bit	Reserved	x	Reserved
112	70.7	1bit	Temperature too high alarm	x	Temperature too high alarm
	70.6	1bit	Temperature too low alarm	x	Temperature too low alarm
	70.5	1bit	VCC too high alarm	x	VCC too high alarm
	70.4	1bit	VCC too low alarm	x	VCC too low alarm
	70.3	1bit	BIASMON too high alarm	x	BIASMON too high alarm
	70.2	1bit	BIASMON too low alarm	x	BIASMON too low alarm
	70.1	1bit	TX Power too high alarm	x	TX Power too high alarm
	70.0	1bit	TX Power too low alarm	x	TX Power too low alarm
113	71.7	1bit	RX Power too high alarm	x	RX Power too high alarm
	71.6	1bit	RX Power too low alarm	x	RX Power too low alarm
	71.5	1bit	ROGUE ONU alarm	x	ROGUE ONU alarm, "0" = no ROGUE ONU alarm, "1" = ROGUE alarm
	71.4	1bit	Reserved interrupt status bit	x	Reserved interrupt status bit
	71.3	1bit	Reserved interrupt status bit	x	Reserved interrupt status bit
	71.2	1bit	Reserved interrupt status bit	x	Reserved interrupt status bit
	71.1	1bit	Reserved interrupt status bit	x	Reserved interrupt status bit
	71.0	1bit	Reserved interrupt status bit	x	Reserved interrupt status bit
114	72	1	Reserved	00	Reserved
115	73	1	Reserved	00	Reserved
116	74.7	1bit	Temperature too high warning	x	Temperature too high warning
	74.6	1bit	Temperature too low warning	x	Temperature too low warning
	74.5	1bit	VCC too high warning	x	VCC too high warning
	74.4	1bit	VCC too low warning	x	VCC too low warning
	74.3	1bit	BIASMON too high warning	x	BIASMON too high warning
	74.2	1bit	BIASMON too low warning	x	BIASMON too low warning
	74.1	1bit	TX Power too high warning	x	TX Power too high warning
	74.0	1bit	TX Power too low warning	x	TX Power too low warning
117	75.7	1bit	RX Power too high warning	x	RX Power too high warning
	75.6	1bit	RX Power too low warning	x	RX Power too low warning
	75.5	1bit	Reserved interrupt status bit	0	Reserved interrupt status bit
	75.4	1bit	Reserved interrupt status bit	0	Reserved interrupt status bit
	75.3	1bit	Reserved interrupt status bit	0	Reserved interrupt status bit
	75.2	1bit	Reserved interrupt status bit	0	Reserved interrupt status bit
	75.1	1bit	Reserved interrupt status bit	0	Reserved interrupt status bit
	75.0	1bit	Reserved interrupt status bit	0	Reserved interrupt status bit

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118	76	1	Reserved	00	Reserved
119	77	1	Reserved	00	Reserved
120	78	8	Vendor Specific	00 00 00 00 00 00 00 00	Vendor Specific

## Digital Diagnostic Specification (A2h)

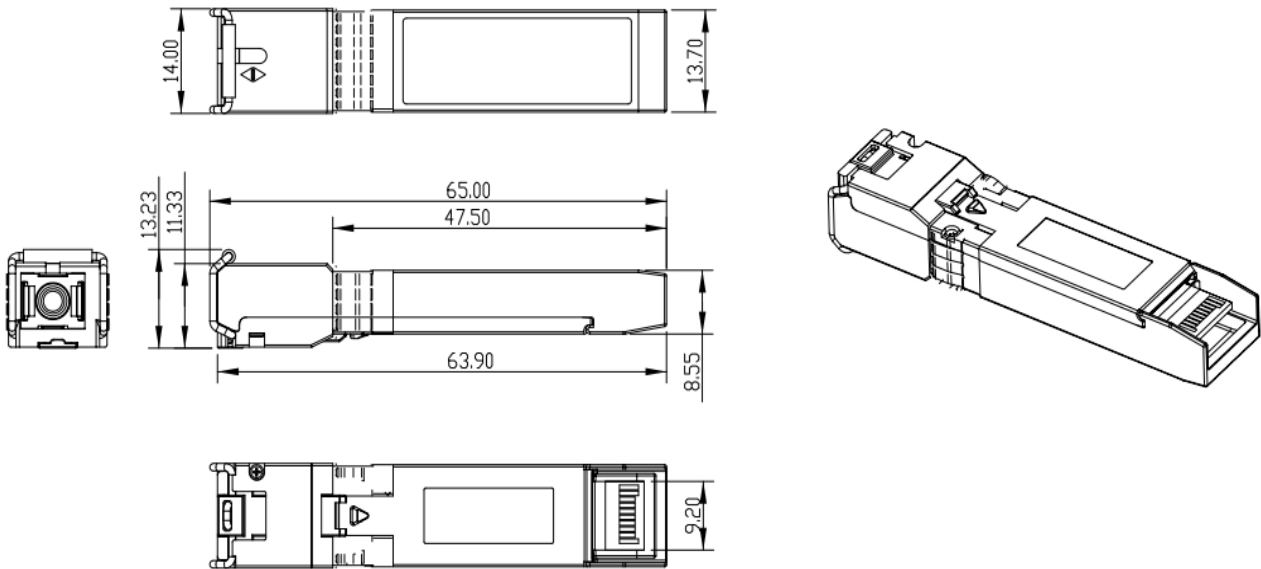
Data Address	Parameter	Range	Accuracy
96-97	Temperature	-40 to 85°C	±3°C
98-99	Vcc Voltage	0 to Vcc	±3%
100-101	Bias Current	0 to 131mA(Note)	±10%
102-103	TX Power	-10 to 8dBm	±2dB
104-105	RX Power	-34 to -8dBm	±2dB

■ Order options on operating case temperature for consumer and industrial applications

\* GP6302 (C-temp): 0 ~ +70 °C

\* GP6302-I (I-temp): -40 ~ 85 °C

## Mechanical Diagram



**Mechanical Diagram**

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