NEC

155.52 Mb/s ATM-PON OPTICAL TRANSCEIVER FOR ONU

OD-B1511-ONUB OD-B1511-ONUC

FEATURES

GENERAL

- **FULL COMPLIANCE WITH ITU-T G.983.1 CLASS B (OD-B1511-ONUB) and CLASS C (OD-B1511-ONUC) for SINGLE FIBER BI-DIRECTIONAL TRANSMISSION**
- **APPLIED to ONU(OPTICAL NETWORK UNIT) on ATM-PON SYSTEM**
- **INTEGRATED 1310/1550 nm WDM FUNCTION by EMPLOYING PLC (PLANAR LIGHTWAVE CIRCUIT)**
- **SINGLE POWER SUPPLY VOLTAGE of +3.3 V**

TRANSMITTER PART

- **155.52 Mb/s BURST-MODE TRANSMITTER OPERATING at WAVELENGTH of 1310 nm**
- **INSTANTANEOUS OPERATION FROM THE 1st BIT of BURST CELL BY FEED-FORWARD APC CIRCUIT EMPLOYING ROM**
- **LASER BIAS CURRENT CONTROL IN BURST-BY-BURST (BIAS CNT)**
- **OPTICAL OUTPUT DEGRADE DETECTION (TX ALM)**
- **SHUT DOWN FUNCTION (SHUTDOWN)**

RECEIVER PART

- **155.52 Mb/s CONTINUOUS-MODE RECEIVER OPERATING AT WAVELENGTH OF 1550 nm**
- **CLOCK AND DATA RECOVERY FUNCTION BY PLL CIRCUIT**
- **OPTICAL INPUT LOSS DETECTION (RX ALM)**

BLOCK DIAGRAM

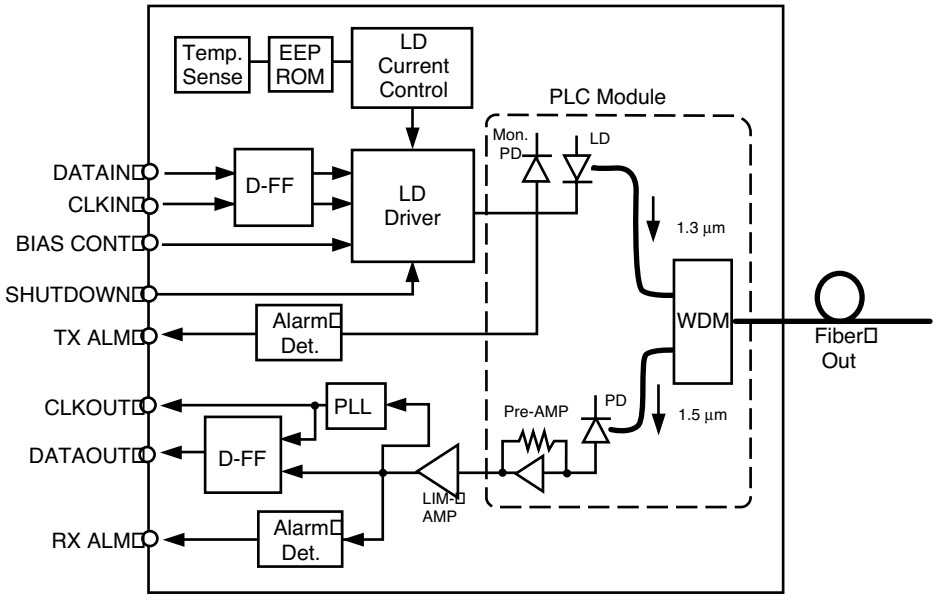


Figure 1

ABSOLUTE MAXIMUM RATINGS[1]

(TC = 25°C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	MIN	MAX
V_{CC}	Power Supply Voltage	V	-0.3	+4.0
T_{STG}	Storage Temperature	°C	-40	+85
P_f	Input Optical Power	dBm	-	0
T_{SOL}	Lead Soldering Temperature	°C/sec	-	260/10
R	Bending Radius of Pigtail Fiber	mm	30	-
	Tensile Force on Pigtail[2]	N	-	2
V_{IN}	Signal Input Voltage	V	-0.3	V_{CC}+0.3

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. = 200 gf

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX	REMARKS
T_{OP}	Ambient Temperature	°C	-40	-	+85	OD-B1511-ONUB
			-40	-	+75	OD-B1511-ONUC
HA	Ambient Humidity	%	5	-	95	
V_{CC}	Power Supply Voltage	V	+3.135	+3.300	+3.465	
I_{OP}	Power Supply Current	mA	-	-	350	Not include LVPECL termination current
	Power Supply Noise	mVpp	-	-	100	Noise frequency at 100 Hz to 1 MHz

OPTICAL INTERFACE

TRANSMITTER SECTION

ITEMS	UNIT	SPECIFICATIONS		REMARKS
		OD-B1511-ONUB	OD-B1511-ONUC	
Operating wavelength	**nm**	**1260 to 1360**		
Normal bit rate	**Mb/s**	**155.52**		
Line code	**-**	**Scrambled NRZ (burst-mode)**		
Photo diode	**-**	**FP-LD**		
Mean output power	**dBm**	**-4 to +2**	**-2 to +4**	
Optical output waveform	**-**	**Mask spec**		**Figure 2 (after passing through a 4th-order Thomson filter;fc = 0.75 x 155.52 MHz)**
Exctintion ratio	**dB**	**more than 10**		
Spectral width (RMS)	**nm**	**less than 5.8**		**under modulation condition at 2^{23}-1 pattern**
Launched optical power without input to the transmitter	**dBm**	**less than -40**	**less than -43**	
Consecutive identical digit immunity	**bit**	**more than 72**		
Tolerance to the transmitter incident light power	**dB**	**more than -15**		
Maximum reflectance	**dB**	**less than -12**		**measured at wavelength of 1.3μm**
Jitter Transfer	**-**	**Mask spec**		**Figure 3**
Jitter Tolerance	**UI_{p-p}**	**less than 0.2**		**frequency range from 0.5 kHz to 1.3 MHz**

OPTICAL INTERFACE

RECEIVER SECTION

ITEMS	UNIT	SPECIFICATIONS		REMARKS
		OD-B1511-ONUB	OD-B1511-ONUC	
Operating wavelength	nm	1480 to 1580		
Normal bit rate	Mb/s	155.52 +/-100ppm		
Line code	-	Scrambled NRZ (continuous-mode)		
Photo diode	-	PIN-PD		
Minimuim sensitivity	dBm	less than -30	less than -33	Bit error rate is 10^{-10} at 2^{23} -1 pattern
Maximum overload	dBm	more than -8	more than -11	Bit error rate is 10^{-10} at 2^{23} -1 pattern
Consecutive identical digit immunity	bit	more than 72		
Tolerance to the reflected optical power	dB	less than 10		
Maximum reflectance	dB	less than -20		measured at wavelength of 1.5μm
Jitter Transfer	-	Mask spec		Figure 3
Jitter Tolerance		Mask spec		Figure 4

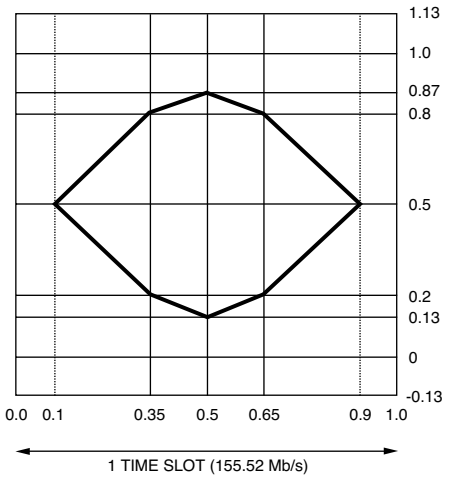


FIGURE 2. Mask of eye diagram

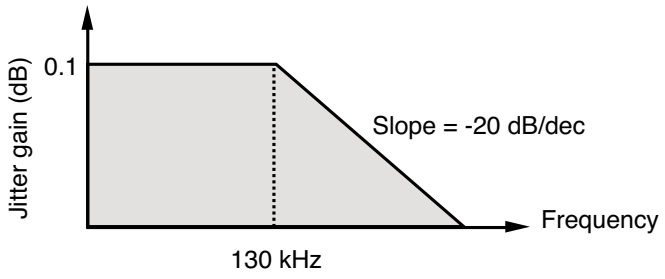


FIGURE 3. Jitter transfer mask

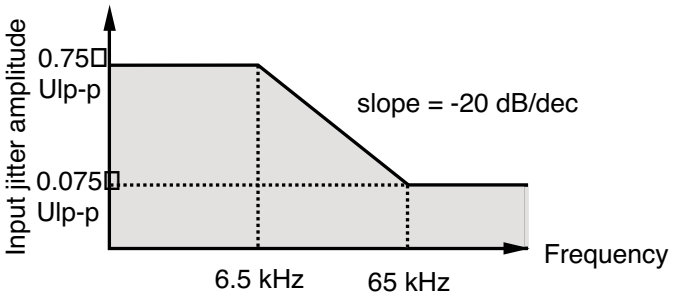
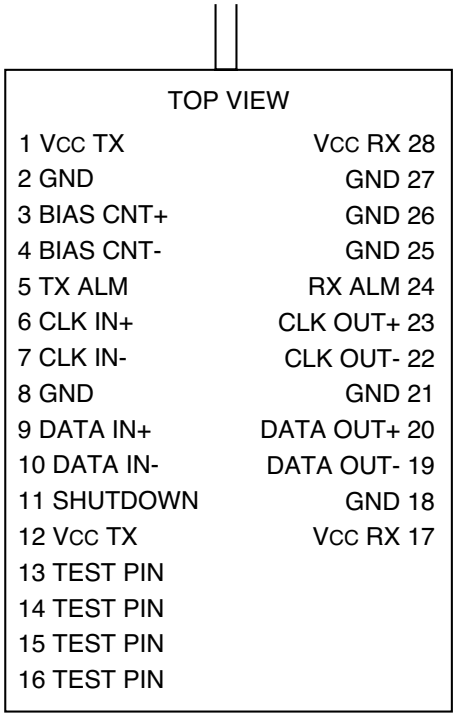


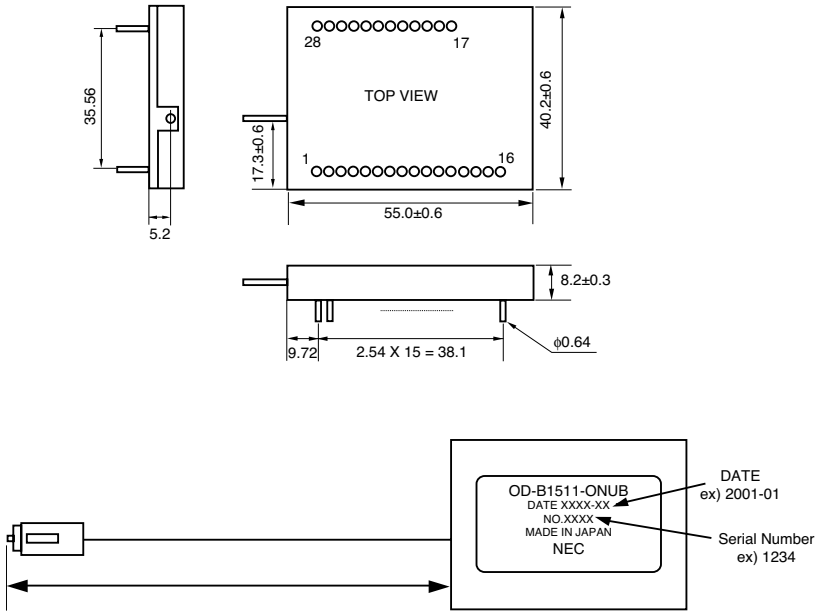
FIGURE 4. Jitter tolerance mask

PIN CONNECTIONS



	PIN NO.	INPUT/ OUTPUT	SYMBOL	DESCRIPTION
TX	1	-	VCC TX	Transmitter power supply (+3.3V)
	2	-	GND	Ground
	3	I	BIAS CNT+	Laser bias control (positive)
	4	I	BIAS CNT-	Laser bias control (negative)
	5	O	TX ALM	Optical output alarm
	6	I	CLK IN+	Clock input (positive)
	7	I	CLK IN-	Clock input (negative)
	8	-	GND	Ground
	9	I	DATA IN+	Data input (positive)
	10	I	DATA IN-	Data input (negative)
	11	I	SHUTDOWN	Optical output shut down
	12	-	VCC TX	Transmitter power supply (+3.3V)
	13	-	TEST PIN	Connect to ground
	14	-	TEST PIN	Connect to ground
	15	-	TEST PIN	Connect to ground
	16	-	TEST PIN	Connect to ground
RX	17	-	VCC RX	Receiver power supply (+3.3V)
	18	-	GND	Ground
	19	O	DATA OUT-	Data output (negative)
	20	O	DATA OUT+	Data output (positive)
	21	-	GND	Ground
	22	O	CLK OUT-	Clock output (negative)
	23	O	CLK OUT+	Clock output (positive)
	24	O	RX ALM	Optical input alarm
	25	-	GND	Ground
	26	-	GND	Ground
	27	-	GND	Ground
	28	-	VCC RX	Receiver power supply (+3.3V)

OUTLINE DIMENSIONS (Units in mm)



Note: Default pigtail fiber length (L) is 540 (+0/-40) mm.
Default optical connector is SC type.