Ether-PON ONT Transceiver Specifications

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Author *H.Ishizaki*
Project Manager *K. YUSA*

Part Number : OAT1233S-ONU-V4-A

Modification History

Rev.	Date	Originator	Comment
Rev. Draft0.2	**Nov.27, 2001**	***H. Okada***	**Table 1.2 PN Modification**
Rev. Draft0.3	**Dec.28, 2001**	***T.Tanaka***	**Addition of Figure1.1, Table1.4, Figure4.1 and 4.2**
Rev. Draft0.4	**May.7, 2002**	***T.Tanaka***	**Change Specification and Characteristics.**
Rev. Draft0.5	**May.9, 2002**	***T.Tanaka***	**Change Table3.1**
Rev. Draft0.6	**May.27, 2002**	***T.Tanaka***	**Addition of Attenuation range and Path penlty**
Rev. Draft0.7	**May.29, 2002**	***T.Tanaka***	**Addition of note sentence (Figure4.1)** **Change the Bet Error Ratio of Table1.2**
Rev. Draft0.8	**July.15, 2002**	***T.Tanaka***	**Change specification**
Rev. Draft0.9	**Sep.17, 2002**	***T.Tanaka***	**Change specification**
Rev. Draft1.0	**Dec.10, 2002**	***T.Tanaka***	**Change specification**

1.Specifications

Table 1.1 Specifications

Parameter	Unit	Specifications
Bit rate	Gbit/s	1.250
Transmission mode	–	Tx: burst, Rx: continuous
Transfer code	–	NRZ
Bi-directional transmission	–	1-fibre WDM
Transmission distance	km	less than 7 @ FP-LD
Laser diode	–	1.31um FP
Photo detector	–	PIN-PD
Attenuation range	dB	16 – 20(*)
Path penalty	dB	1
Operating temperature range	°C	0 ~ 70
Operating humidity	%	5 ~ 95
Fiber/Connector type	–	Single mode fiber (10/125nm) / PC polished SC connector
Power supply voltage	V	+3.3 +/-5%
Power consumption	W	2.0W (typ.) , 3.0W(Max.)
Dimension	mm	40 × 60 × 8.5

*: Attenuation range matches OKI's OLT module specification.

Table 1.2 Optical Characteristics (over operating temperature and lifetime)

Parameter	Unit	Specifications
Part number		OAT1233S-ONU-V4-A
Operating wavelength	nm	Tx:1270 - 1360/Rx:1480 -1580
Mask of the transmitter eye diagram		Figure1.1
Maximum reflectance of equipment, measured at transmitter wavelength	dB	-6
Mean launched power range	dBm	-1.0 ~ +3.0
Minimum extinction ratio	dB	9
Tolerance to the transmitter incident light power	dB	more than -15
Launched optical power w/o input to the transmitter	dBm	less than -43
Maximum spectral width	nm	2.5 (rms) @FP-LD
Side mode suppression ratio (@DFB-LD)	dB	-
Jitter transfer	dB	TBD
Jitter generation in 1.3kHz bandwidth	UIpp	TBD
Maximum reflectance of equipment, measured at receiver wavelength	dB	less than -20
Bit error ratio	–	less than 10^{-12}
Minimum sensitivity	dBm	-22.0
Minimum overload	dBm	-2.0
Consecutive identical digit immunity	bit	more than 72
Jitter tolerance	–	TBD
Tolerance to the reflected optical power	dB	less than 10

Table 1.3 Absolute maximum ratings

Parameter	Symbol	Conditions	Ratings	Unit
Power supply voltage	Vcc	Ta = 25°C	0 to +4.6	V
Input voltage	Vi		0 to Vcc	V
Maximum output current	Io		30	mA
Storage temperature	Tstg		-40 to +85	°C
Soldering temperature/time		Ta = 25°C	250/10	°C/sec
Maximum tension of fiber			500	g
Minimum bending radius			30	mm

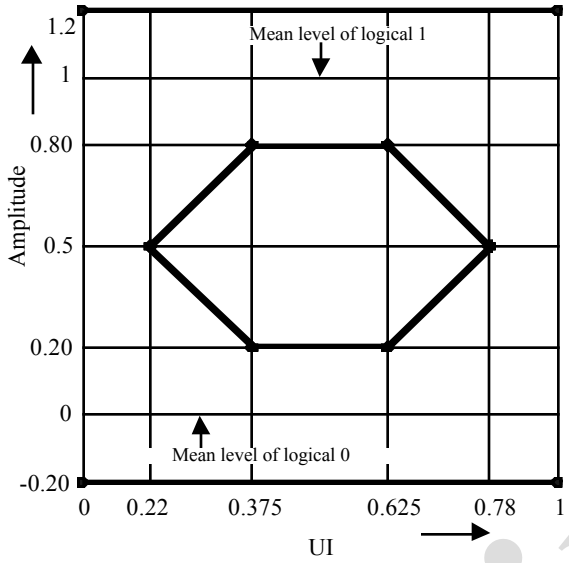


Figure1.1 Eye mask pattern for OAT1233-ONU

Table1.4 DC Characteristic

Parameter	Unit	OAT1233-ONU-Vxx-A/B		
		MIN	TYP	MAX
PECL input high voltage	V	VCC-1.17	-	VCC-0.88
PECL input low voltage		VCC-1.81	-	VCC-1.47
PECL output high voltage		VCC-1.02	-	VCC-0.88
PECL output low voltage		VCC-1.81	-	VCC-1.62
LVTTL input high voltage		2.0	-	VCC+0.3
LVTTL input low voltage		-0.3	-	0.8
LVTTL output high voltage		2.4	-	Vcc
LVTTL output low voltage		GND	-	0.4
Clock input duty	%	40	50	60
Data output rise/fall time (20 - 80 %)	ns			2.5
Clock/Data input setup & hold time	-	Figure4.1		
Pre-bias input timing	-	Figure4.2		
Required preamble pattern	-	1010101010101010		

2. Block diagram

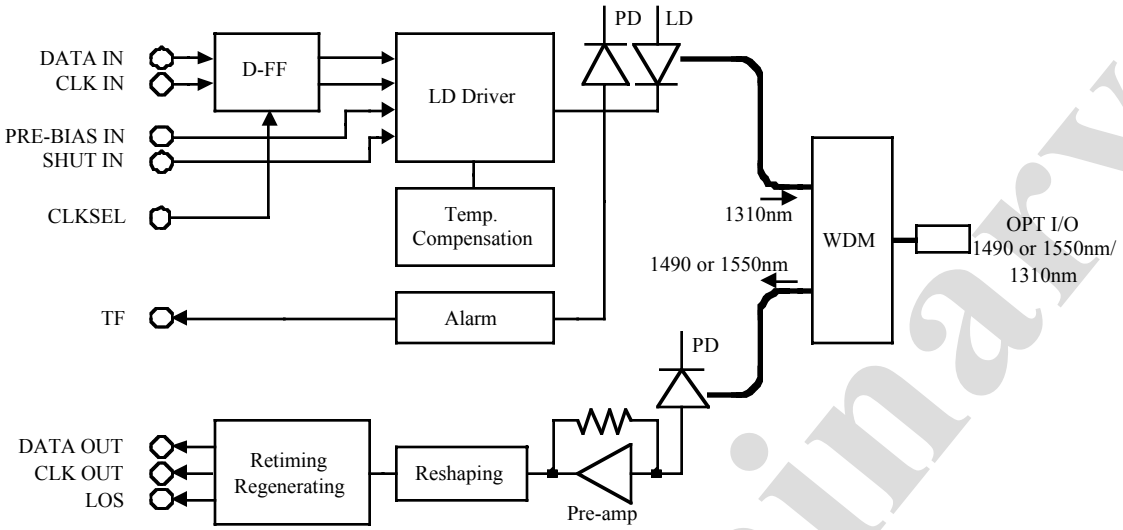


Fig. 2.1 Block diagram

3. Pin description

Table 3.1 Pin descriptions

No.	I/O	Symbol	Level	Logic	Functionality
01		SVCC			+3.3V
02		GND			Ground
03	I	SHUT	LV-TTL	P	Optical output shut down
04	O	TF	LV-TTL	P	Transmitter Failure alarm
05	I	CLKSEL	VCC or GND		Tx clock select(active GND), used if data is clocked into MOD
06	I	BIASP	LV-PECL	P	Pre-bias input (pos.)
07	I	BIASN	LV-PECL	N	Pre-bias input (neg.)
08		GND			Ground
09	I	SDATAP	LV-PECL	P	Data input (pos.)
10	I	SDATAN	LV-PECL	N	Data input (neg.)
11	I	ICLKP	LV-PECL	P	Clock input (pos.)
12	I	ICLKN	LV-PECL	N	Clock input (neg.)
13		GND			Ground
14	O	LOS	LV-TTL	P	Loss of incoming signal alarm
15		GND			Ground
16	O	RDATAN	LV-PECL	N	Data output (neg.)
17	O	RDATAP	LV-PECL	P	Data output (pos.)
18		GND			Ground
19	O	RCLKN	LV-PECL	N	Clock output (neg.)
20	O	RCLKP	LV-PECL	P	Clock output (pos.)
21		GND			Ground
22		GND			Ground
23		RVCC1			+3.3V
24		RVCC2			+3.3V

4. Timing Condition

4.1 Data/Clock input timing

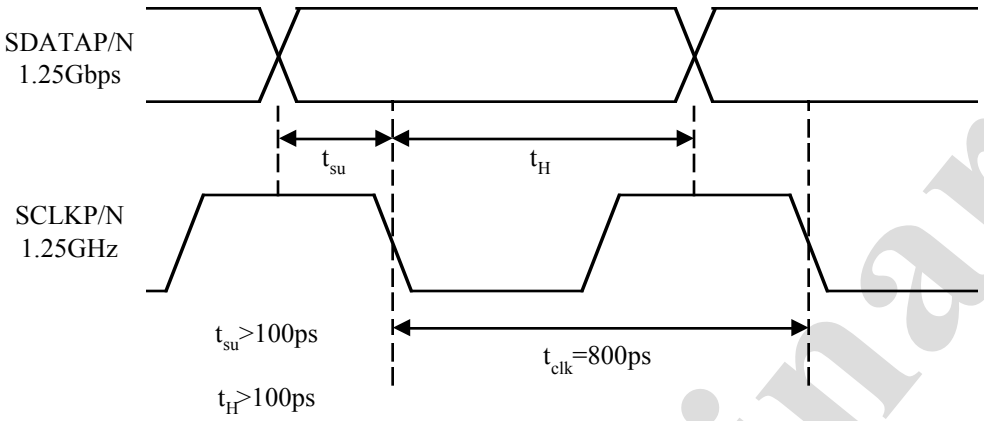
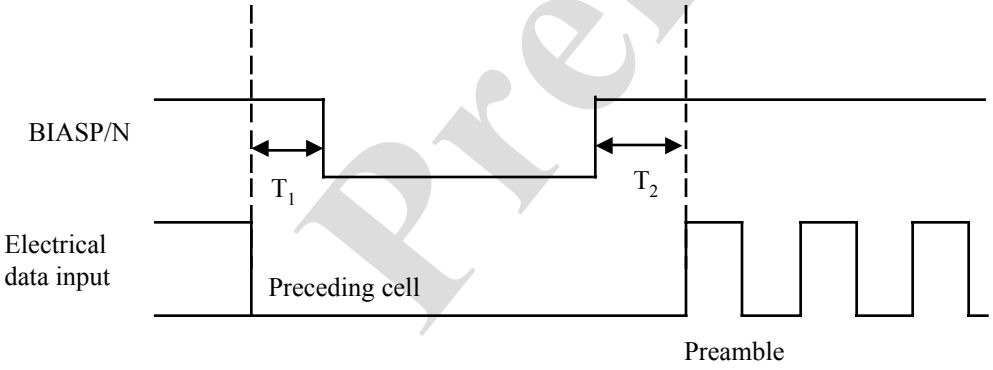


Figure4.1 Data/Clock input setup & hold time (In case of using clock)

Note: If you don't use clock, you must terminate the clock input, that is , SCLKP=1.6V, SCLKN=2.4V.

4.2 Pre-bias input timing



T_1 =0bits - 2bits@1.25Gbps

T_2 >=2bits@1.25Gbps

Figure4.2 Pre-bias input timing

5.Typical Application Circuit

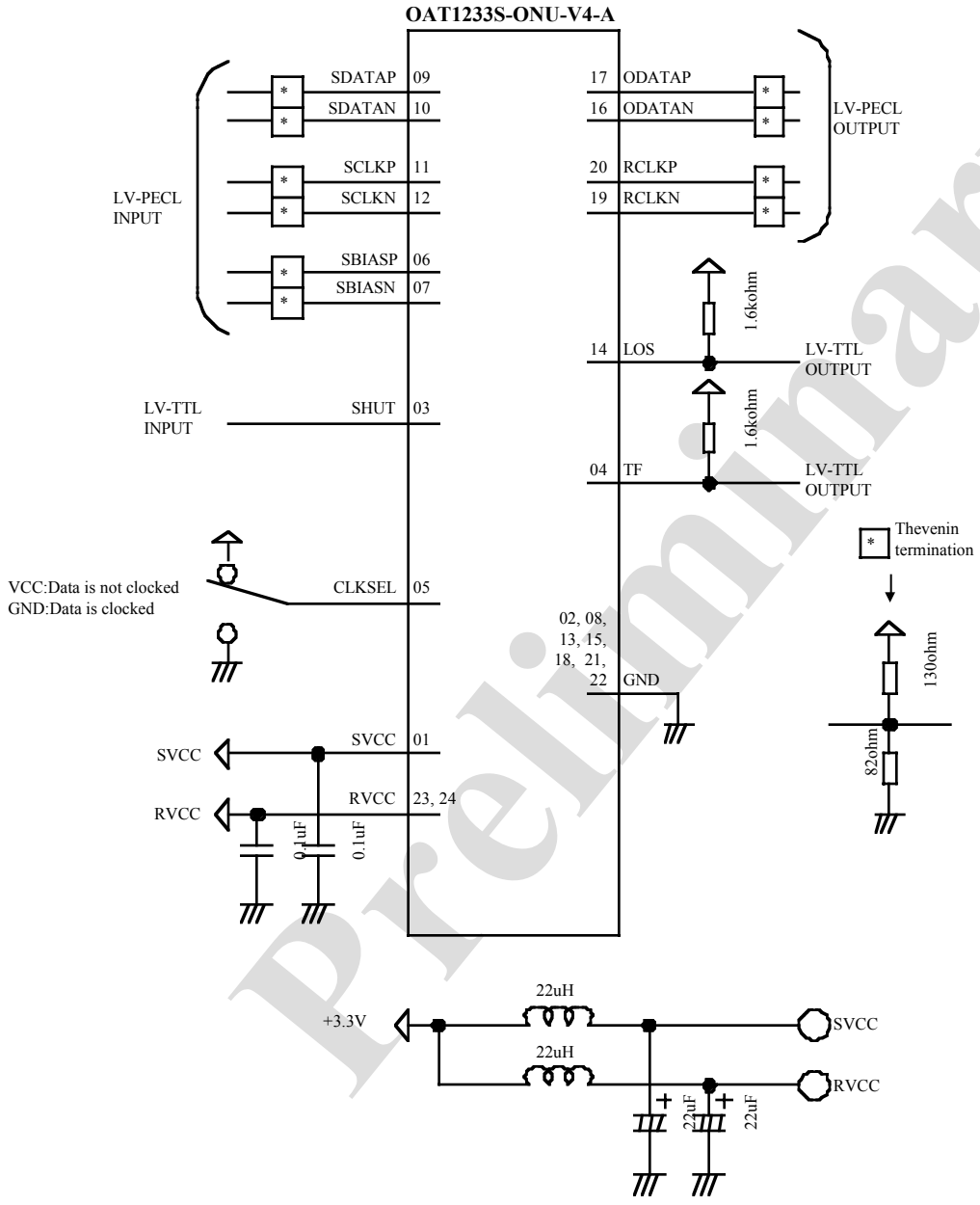


Fig5.1 Typical application circuit

6.Outline

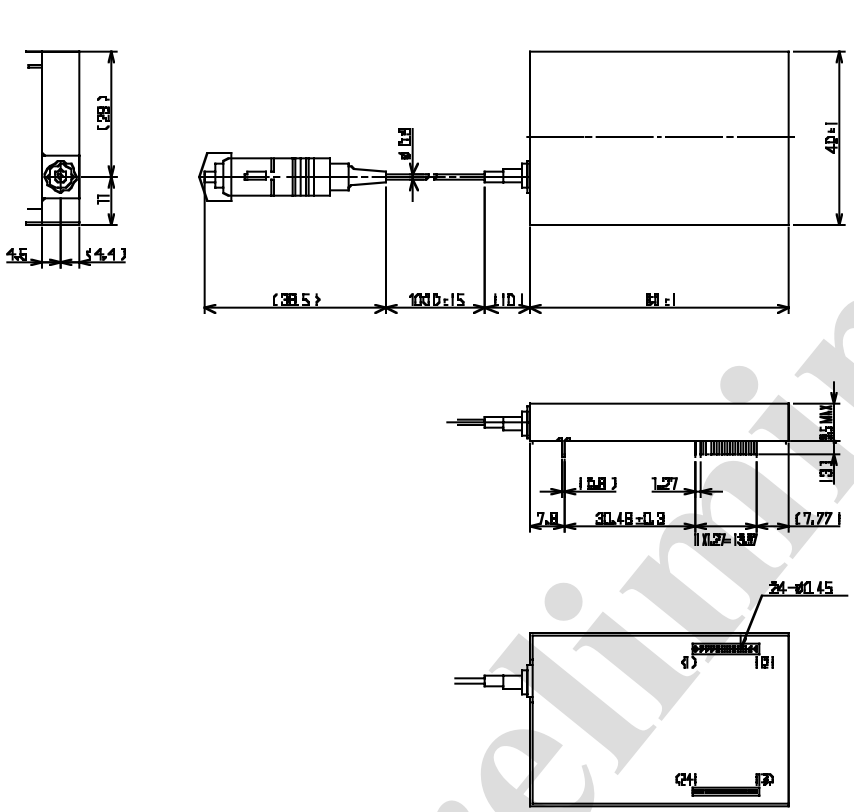


Fig 6.1 Package Outline

7. Precautions for handling

The circuits of these modules operate at very small signal. In order to avoid the degradation of the optical sensitivity due to external noise, the bottom pattern of these modules on the PCB should be ground pattern with low impedance.
Do not mount/pattern device/circuits which generate high frequency noise close to the module.

In order to operate the module stable against the power noise, install the power supply noise reduction circuits.
The impedance between the power and ground pattern of the power circuit should be as low as possible.
The elements around the module should be mounted close to the pins of the module.

If an optical power exceeding the absolute maximum ratings is fed to the module, the optical receiver may be damaged. Set the optical input power appropriately when in use of these modules.

8. Qualification and Reliability

To help ensure high product reliability and customer satisfaction, OKI is committed to an intensive quality program that starts in the design phase and proceeds through the manufacturing process.
Optical transceiver modules are qualified to OKI internal standards using MIL-STD-883 test methods and procedures and using sample techniques consistent with Telcordia requirements.
This qualification program fully meets the intent of Telcordia reliability practices GR-468-CORE.

9. Laser Safety

All version of transceiver are Class 1 Laser products FDA complies with 21 CFR 1040.10 and 1040.11 requirements.
Also, all versions are Class 1 Laser products pre IEC 825-1.