

FSAN OLT OC3 Symmetric Transceiver G983.3 Class B

OAT1523S-OLT-V2-B-10

Data Sheet

Modification History

Rev.	Date	Originator	Comment
DRAFT0.1	June 12 , 2001	H. OKADA	
DRAFT0.2	July 25 , 2001	H. OKADA	Mean launched power range, Minimum sensitivity, Power consumption
DRAFT0.3	June 10 , 2002	H. OKADA	

1. General Description

The OAT1523S-OLT-V2-B-10 is compliant with recommendation ITU-T G.983.3 Option1 class B for use in ATM-PON applications. The OAT1523S-OLT-V2-B-10 is applicable for the optical interface of the OLT function at the central office. These modules have the following functions.

(OAT1523S-OLT1-V2-B-10)

- 1-fiber bi-directional transmission using incorporated wavelength division multiplexer (WDM).
- Conversion of 155.52 Mbps electric signal to 1.49 um optical signal using laser diode (E/O conversion).
- Stabilization of optical output power and waveform with automatic power control (APC) circuit.
- Transmit failure (TF) detection.
- Detection of the abnormal increase in laser diode (TD).
- Optical signal output shut down (LS).
- Conversion of 155.52 Mbps 1.31 um optical signal to electric signal using PIN-photo diode (O/E conversion).
- Burst signal reception by automatic threshold control (ATC) circuit and burst bit synchronization technique.

The specifications are shown on the table 1.1

Table 1.1 Specifications

Parameter	Unit	Specifications
Bit rate	Mbps	155.52
Transmission mode	-	Tx: continuous, Rx: burst
Transfer code	-	NRZ
Bi-directional transmission	-	1-fibre WDM
Transmission distance	km	20
Laser diode	-	1.49um DFB-LD
Photo detector	-	PIN-PD
Operating temperature range	°C	0 ~ 70
Operating humidity	%	5 ~ 90
Fiber/Connector type	-	Single mode fiber (10/125nm) / PC polished SC connector
Power supply voltage	V	+3.3 +/-5%
Power consumption	W	1.5 (typ.) , 2.0 (max.)
Dimension	mm	40 × 60 × 8.5

2. Absolute Maximum Ratings

Stress in excess of the maximum absolute ratings can cause permanent damage to the module.

Table 2.1 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
Operating temperature	Top		0 to +70	°C
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
Maximum optical input power			0	dBm

3. Block diagram

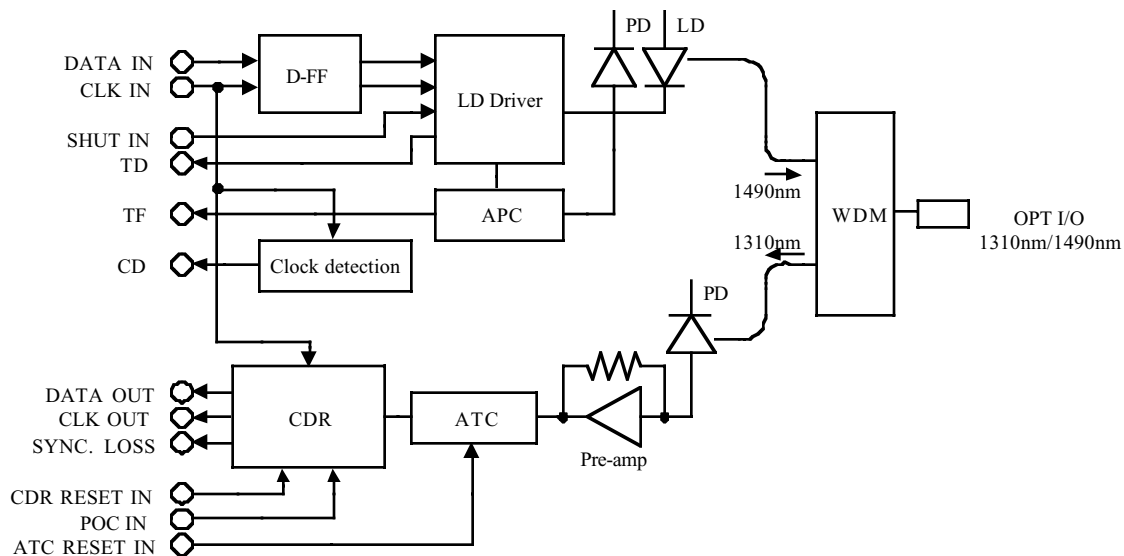


Figure 3.1 Block diagram

4. Package outline

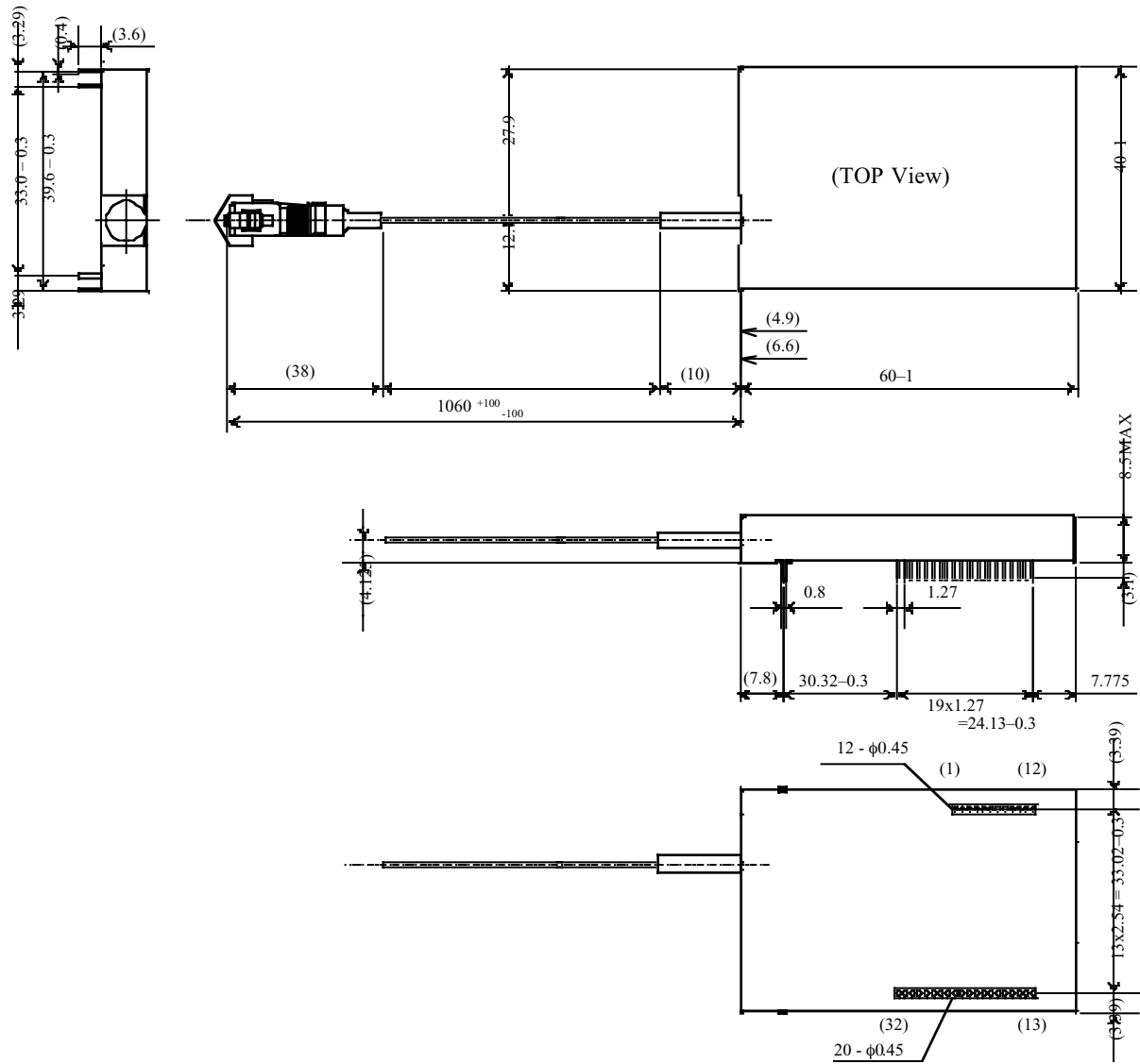


Fig 4.1 Package Outline

5. Pin description

Table 5.1 Pin descriptions

No.	I/O	Symbol	Level	Logic	Functionality
01		SVCC			Transmitter power supply (+3.3V)
02		GND			Ground
03	I	SDATAP	LVPECL	P	Data input (pos)
04	I	SDATAN	LVPECL		Data input (neg)
05	I	SCLKP	LVPECL	P	Clock input (pos)
06	I	SCLKN	LVPECL		Clock input (neg)
07		GND			Ground
08	I	SHUT	LVTTTL	P	Optical output shut down
09	O	CD	LVTTTL	P	Clock down alarm
10	O	TD	LVTTTL	P	Transmitter Degraded alarm
11	O	TF	LVTTTL	P	Transmitter Failure alarm
12		GND			Ground
13		GND			Ground
14	O	ALM	LVTTTL	P	Sync. out alarm
15		GND			Ground
16	I	POC	LVTTTL	N	Power on clear
17	I	BRSP	LVPECL	N	CDR reset (pos)
18	I	BRSN	LVPECL		CDR reset (neg)
19		GND			Ground
20	O	RCLKP	LVPECL	P	Clock output (pos)
21	O	RCLKN	LVPECL		Clock output (neg)
22		GND			Ground
23	O	RDATAP	LVPECL	P	Data output (pos)
24	O	RDATAN	LVPECL		Data output (neg)
25		GND			Ground
26		BVCC			Power supply for CDR (+3.3V)
27		GND			Ground
28		GND			Ground
29	I	RSN	LVPECL	N	ATC reset (neg)
30	I	RSP	LVPECL		ATC reset (pos)
31		GND			Ground
32		RVCC			Power supply for ATC (+3.3V)

6. Optical and electrical characteristics

Table 6.1 Optical characteristics

Parameter	Unit	
Operating wavelength	nm	Tx:1480 ~ 1500 Rx:1260 ~ 1360
Mask of the transmitter eye diagram		Figure 6.1
Maximum reflectance of equipment, measured at transmitter wavelength	dB	-
Mean launched power range	dBm	SOL: -0.5 to +2 /EOL: -1 to +2
Minimum extinction ratio	dB	10
Tolerance to the transmitter incident light power	dB	more than -15
Launched optical power w/o input to the transmitter	dBm	-
Maximum spectral width	nm	1 (@-20dB)
Side mode suppression ratio	dB	more than 30
Jitter transfer		-
Jitter generation in 1.3kHz bandwidth	UIpp	-
Maximum reflectance of equipment, measured at receiver wavelength	dB	less than -20
Bit error ratio	-	less than 10 ⁻¹⁰
Minimum sensitivity	dBm	SOL: -33.5/EOL: -33.0
Minimum overload	dBm	SOL: -7.5/EOL: -8.0
Consecutive identical digit immunity	-	more than 72
Jitter tolerance	-	-
Tolerance to the reflected optical power	dB	more than- 10

Table 6.2 Electrical characteristics

Parameter	Unit			
		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		0		0.4
Clock input duty	%	40	50	60
Clock/Data output timing		Figure 6.2		
Clock/Data output timing		Figure 6.3		
Reset input timing		Figure 6.4		
Power on clear input timing		Figure 6.5		
Tracking alarm output timing		Figure 6.6		
Required preamble pattern		10101010		

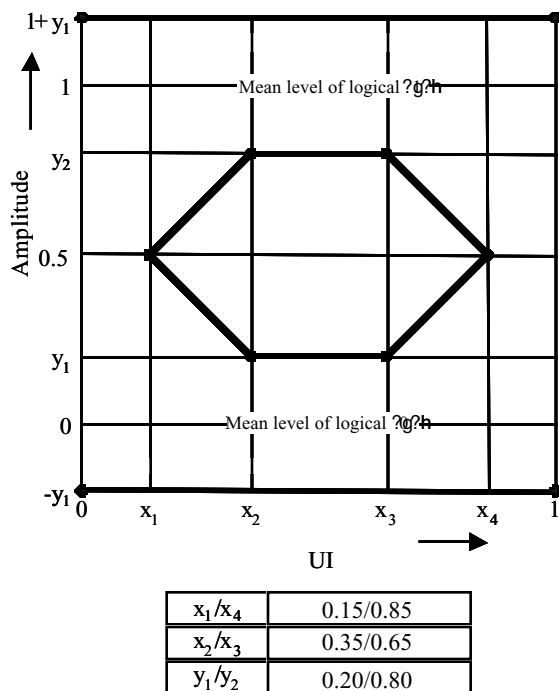
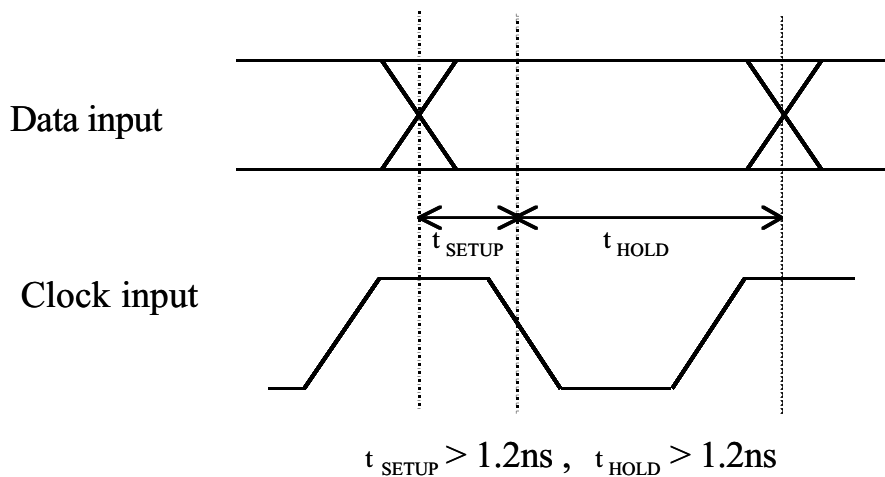
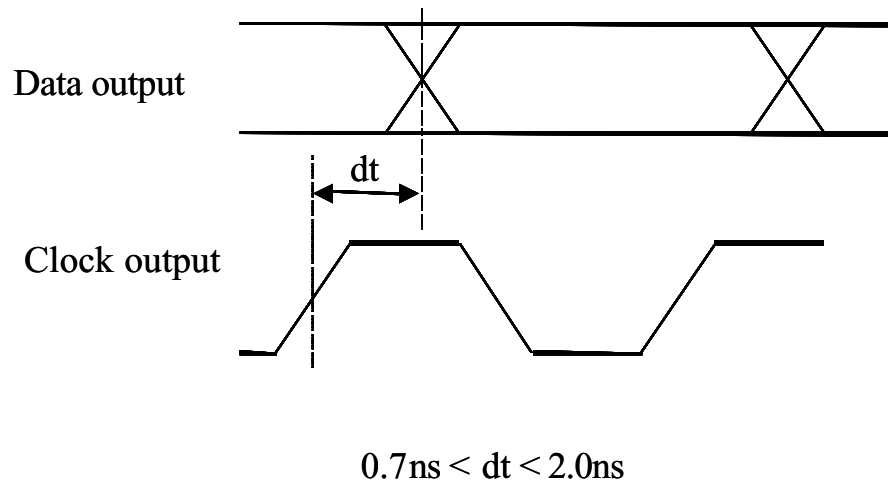


Figure 6.1 Eye pattern mask



This timing is based on the data cross point.

Figure 6.2 Clock/Data input timing



This timing is based on the data cross point.

Figure 6.3 Clock/Data output timing

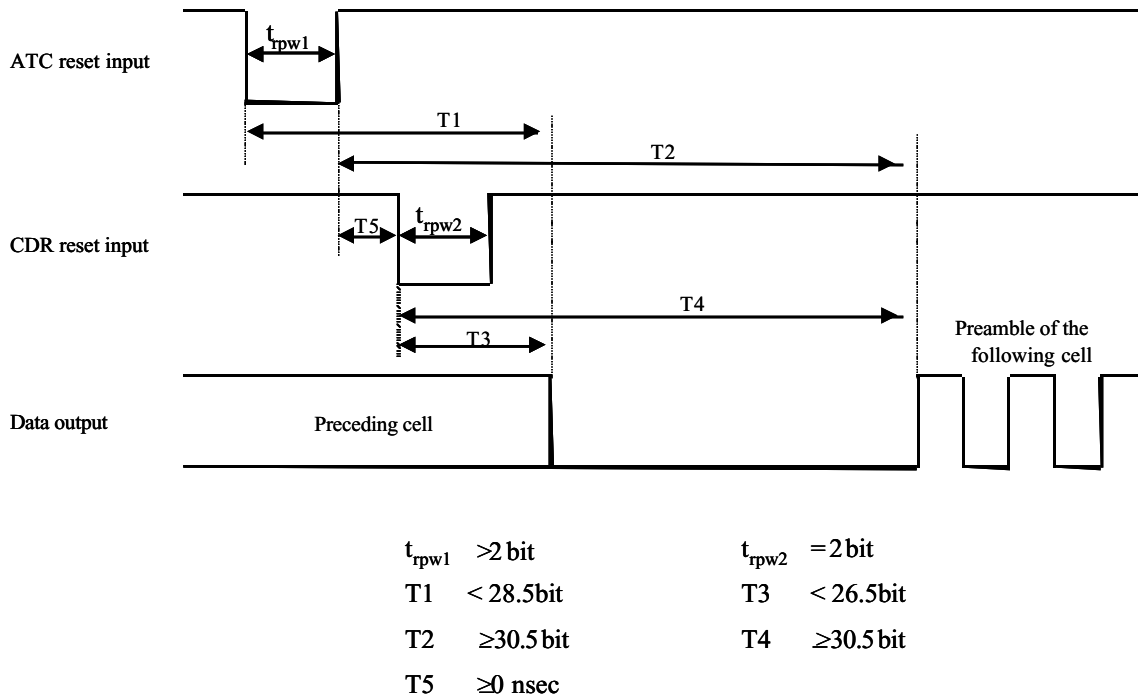


Figure 6.4 Reset input timing

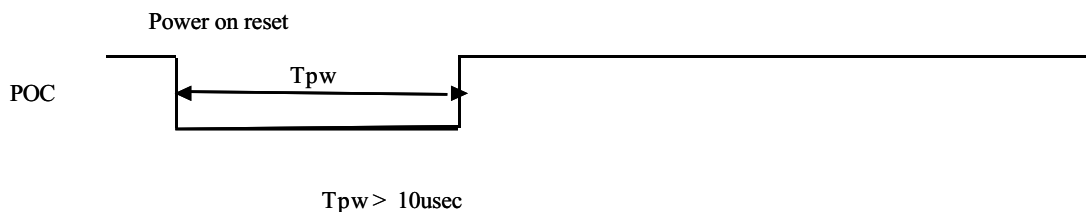
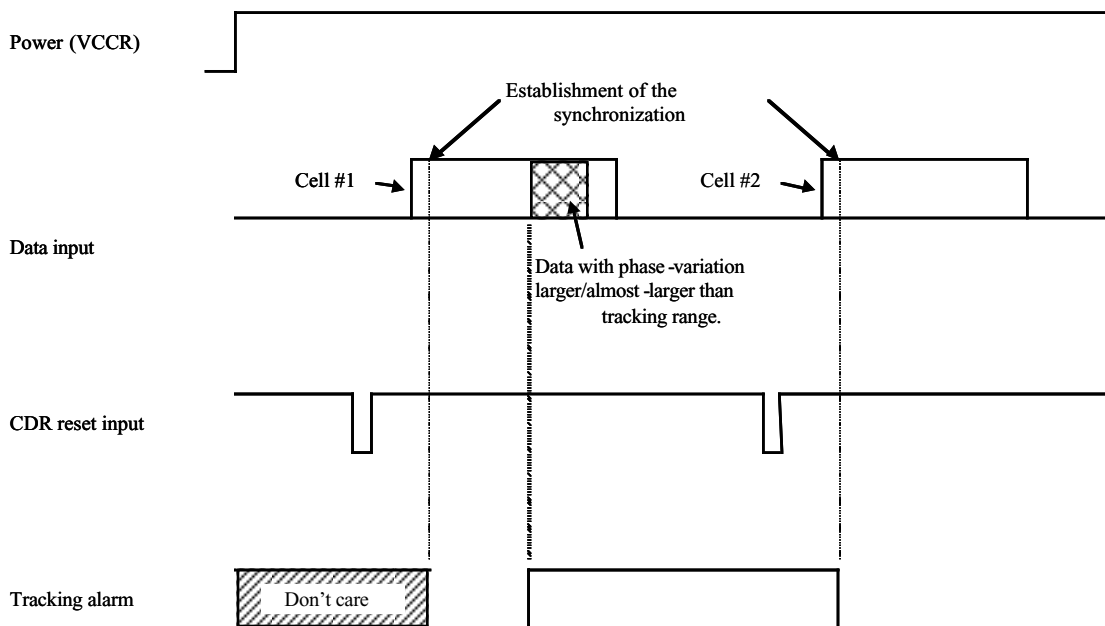
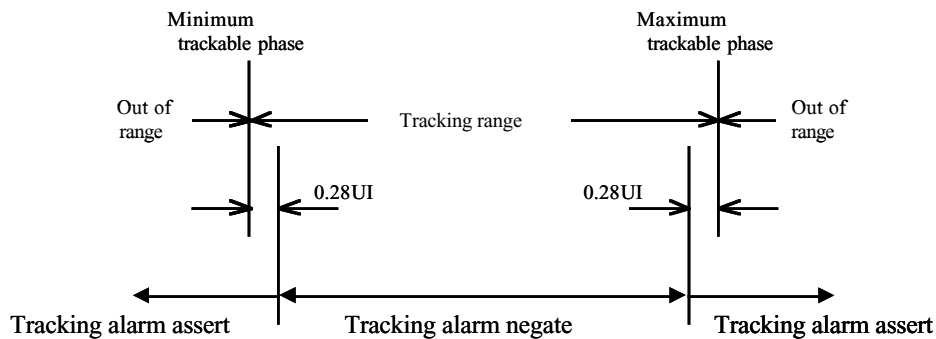


Figure 6.5 Power on clear input timing

Note: Assertion of tracking alarm does not necessarily represent recovered data error or loss of synchronization.



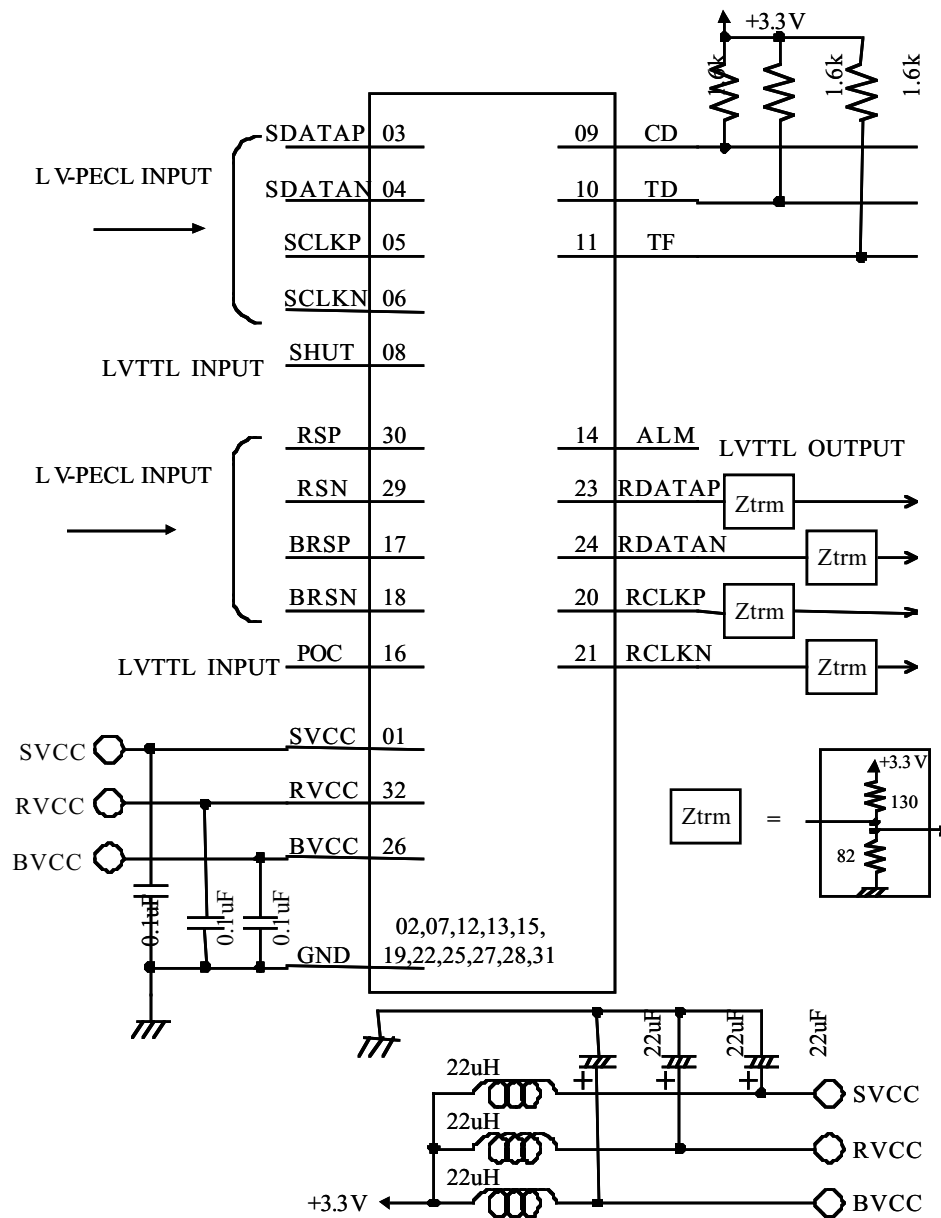
(a) Timing chart



(b) Phase condition

Figure 6.6 Sync. Out alarm reset timing

7. Recommended interface circuit



8. 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 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.

9. 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.

10. Laser Safety

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