

OAT1231T-M-05**Preliminary**

MT-RJ Transceiver at 1.25 Gbit/s

GENERAL DESCRIPTION

The OAT1231T-M-05 transceiver is a short wavelength optical transceiver intended for up to 1.25 Gbit/s applications such as Gigabit Ethernet and Fibre Channel. Reduced laser power permits Class I laser operation without an Open Fibre Control (OFC) circuit. The transceiver operate from 3.3 V DC power supply and with LVPECL logic interface. Package style is the multisourced 2 × 5 pin small form factor with integral MT-RJ connector interface. The Transceiver is provide double port densities from traditional SC 1 × 9 transceiver.

FEATURES

- Multisourced 2 × 5 pin small form factor package
- MT-RJ connector interface
- Compliant with IEEE 802.3 z/Gigabit Ethernet
- Transmission length
 - Up to 550 m with 50/125 μm MMF Cables
 - Up to 220 m with 62.5/125 μm MMF Cables
- Single 3.3 V power supply
- LVPECL logic compatible data interface
- 850 nm Vertical Cavity Surface Emitting Laser (VECSEL)
- Class I Laser eye safe
- 0°C to 70°C operating temperature range
- Transmitter disable input
- TTL signal detect output
- Wave solderable and aqueous washable

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T _S	-40	85	°C
Operating Temperature	T _A	0	70	°C
Lead Soldering Temperature	—	—	260/10	°C/s
Supply Voltage	V _{CC}	—	5	V

TRANSCEIVER OPTICAL AND ELECTRICAL CHARACTERISTICS

Transmitter Section ($T_c = 0^\circ\text{C}$ to 70°C , $V_{CC} = 3.135\text{ V}$ to 3.465 V)

Parameter	Notes	Symbol	Min.	Max.	Unit
Average Optical Output Power	50 μm MMF	P_O	-9.5	-3	dBm
Optical Wavelength		λ_C	830	860	nm
RMS Spectral Width		$\Delta\lambda$	—	0.85	nm
Extinction Ratio		E_r	9	—	dB
Relative Intensity Noise		RIN	—	-117	dB/Hz
Output Rise Time	1, 2	T_R	—	260	ps
Output Fall Time	1, 2	T_F	—	260	ps
Power Supply Current		I_{CCT}	—	60	mA
Differential Input Voltage		V_{IN}	0.7	2.2	V
Deterministic Jitter	3	DJ	—	0.10	UI
Total Jitter	3	TJ	—	0.284	UI
Transmit Disable Voltage	Disable	5	V_{ID}	$V_{CC} - 1.3$	V
	Enable	5	V_{IE}	—	0.8

Receiver Section ($T_c = 0^\circ\text{C}$ to 70°C , $V_{CC} = 3.135\text{ V}$ to 3.465 V)

Parameter	Notes	Symbol	Min	Max	Unit
Optical Input Sensitivity	6	P_{IN}	-17	-3	dBm
Optical Wavelength		λ_C	770	860	nm
Return Loss			12	—	dB
Power Supply Current		I_{CCR}	—	115	mA
Output Voltage Levels	4	V_{OL}	$V_{CC} - 1.892$	$V_{CC} - 1.548$	V
		V_{OH}	$V_{CC} - 1.051$	$V_{CC} - 0.879$	V
Signal Detect Output Voltage	High	5	V_{OA}	$V_{CC} - 0.8$	V
	Low	5	V_{OD}	—	0.4

Notes:

1. Measured from 20 to 80% point on rising and falling edge of unfiltered waveform.
2. Transmitter optical waveform characteristics are specified by an eye diagram shown in Figure 1.
The eye mask test is performed using a receiver with a fourth-order Bessel Thompson filter discussed in IEEE802.3Z.
3. Compliance point is TP1 to TP2 per IEEE802.3 z, section clause 38.6.11
 $TD = DJ + RJ$
4. LVPECL compatible interface.
5. TTL compatible interface.
6. BER of 1×10^{-12} measured with 1.25 Gbit/s 2^7-1 PRBS.

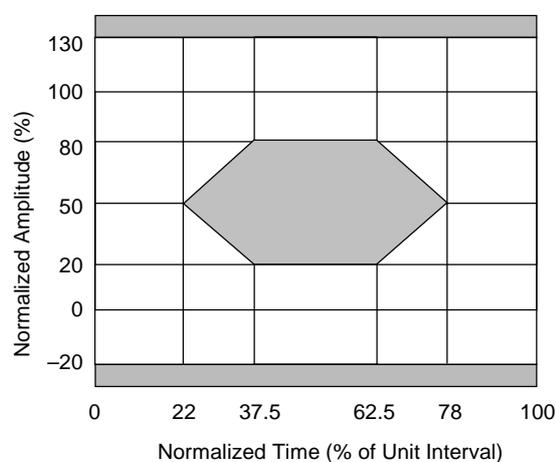


Figure 1. Transmitter Eye Diagram

APPLICATION INFORMATION

Handling precautions

OKI advises that precautions be taken to avoid electrostatic discharge (ESD) during handling, assembly, and testing of the OAT1231T-M-05. Degradation or damage can occur if proper guidelines for handling ESD sensitive devices are not followed. This could result in an inoperable device or unsafe operation.

In particular, avoid getting particulate or solvent contamination onto the optical surfaces of the laser and photo-detector assemblies. It is also strongly recommended that the MT-RJ connector receptacle be covered when not in use, using the Process Plug that is supplied with the OAT1231T-M-05 transceiver.

Regulatory information

The OKI OAT1231T-M-05 module is certified to be Class I laser product under the requirements of U. S. 21 CFR Subchapter J when used as specified by OKI. Class I products are considered to be safe. Any modification, adjustment, or use of the OAT1231T-M-05 module not specified by OKI may void the certification of the product and constitute an act of new manufacturing of a laser product under 21 CFR Subchapter J, and as such will require recertification by the new manufacturer.

Signal Detect

The Signal Detect(SD) output is positive TTL logic. This output provides a logical low output signal when the optical signal into the receiver has been interrupted or the light level has fallen below the minimum signal-detect threshold. This signal is used to get a state of receiving DATA logically, not a BET monitor.

Transmitter Disable

The Transmitter Disable(Tdis) input is a laser enable function. When Tdis is TTL logical low input or opened transmitter is normally operating. When Tdis is TTL logical high input transmitter optical output is shut down.

PIN DESCRIPTION

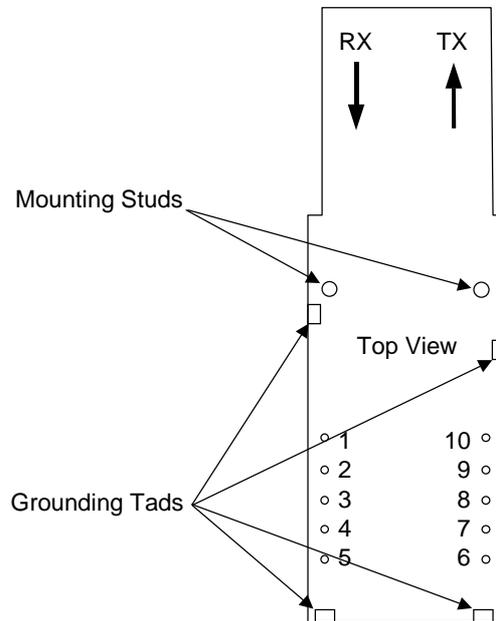


Figure 2. Pin Description

Pin	Symbol	Description
Two Mounting Studs		Two mounting studs are provided for transceiver mechanical attachment to the circuit board. They may also provide an optical connection of the transceiver to the equipment chassis ground.
Four Grounding Tabs		Four grounding tabs are provided for improvement of EMI suppression. They should be connected to signal ground.
1	V_{EER}	Receiver Signal Ground.
2	V_{CCR}	Receiver Power Supply.
3	SD	Signal Detect. Normal Operation: Logic "1" Output. Fault Condition: Logic "0" Output.
4	RD-	Received Data Out Bar. No internal terminations are provided.
5	RD+	Received Data Out. No internal terminations are provided.
6	V_{CCT}	Transmitter Power Supply.
7	V_{EET}	Transmitter Signal Ground.
8	T_{DIS}	Transmitter Disable. Normal Operation: Logic "0" Input or Open Transmit Disable: Logic "1" Input or Connect V_{CC}
9	TD+	Transmitter Data In. An internal 50 Ω termination is provided, consisting of a Thevenin termination.
10	TD-	Transmitter Data In Bar. An internal 50 Ω termination is provided, consisting of a Thevenin termination.

ELECTRICAL INTERFACE CIRCUITS

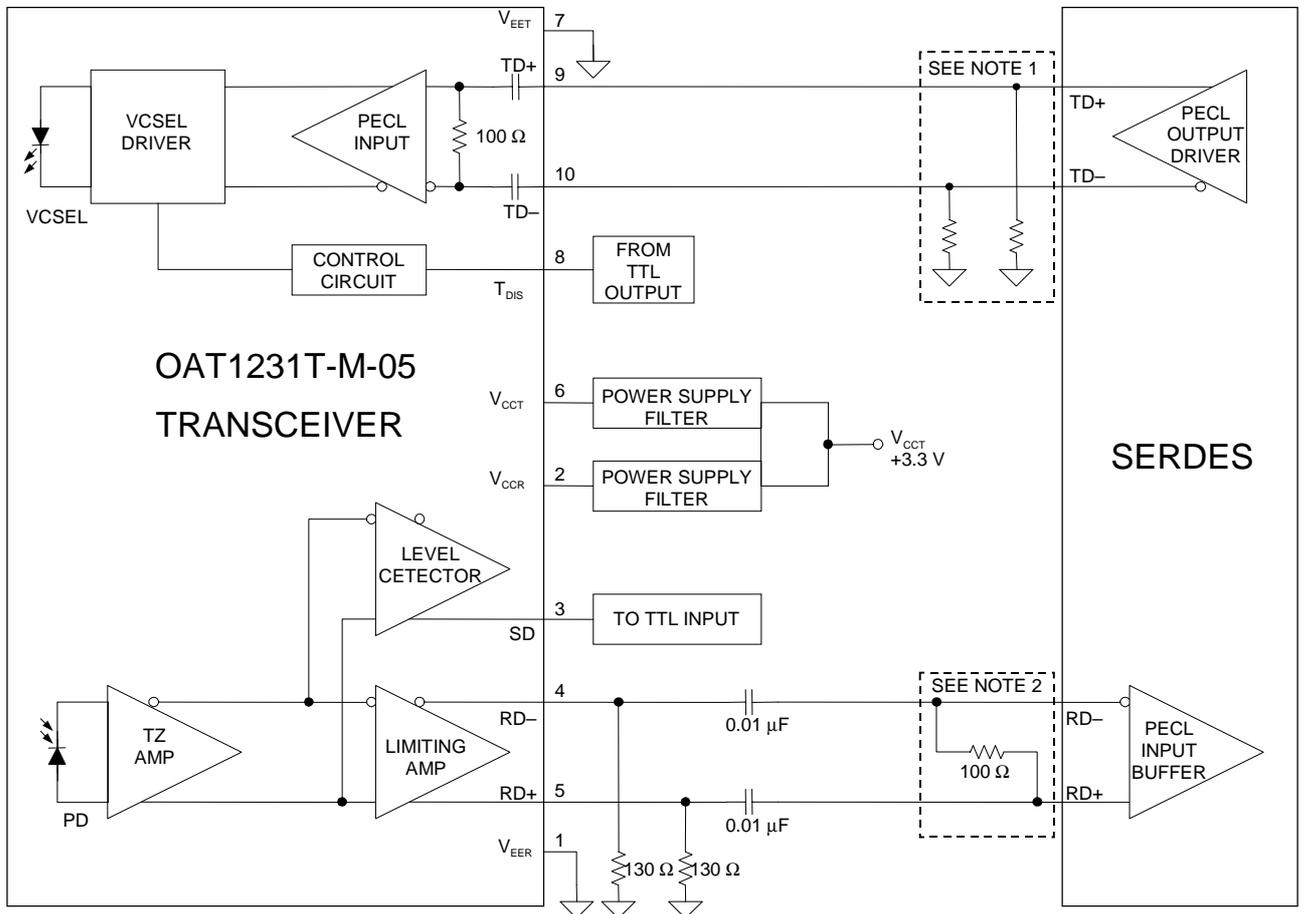
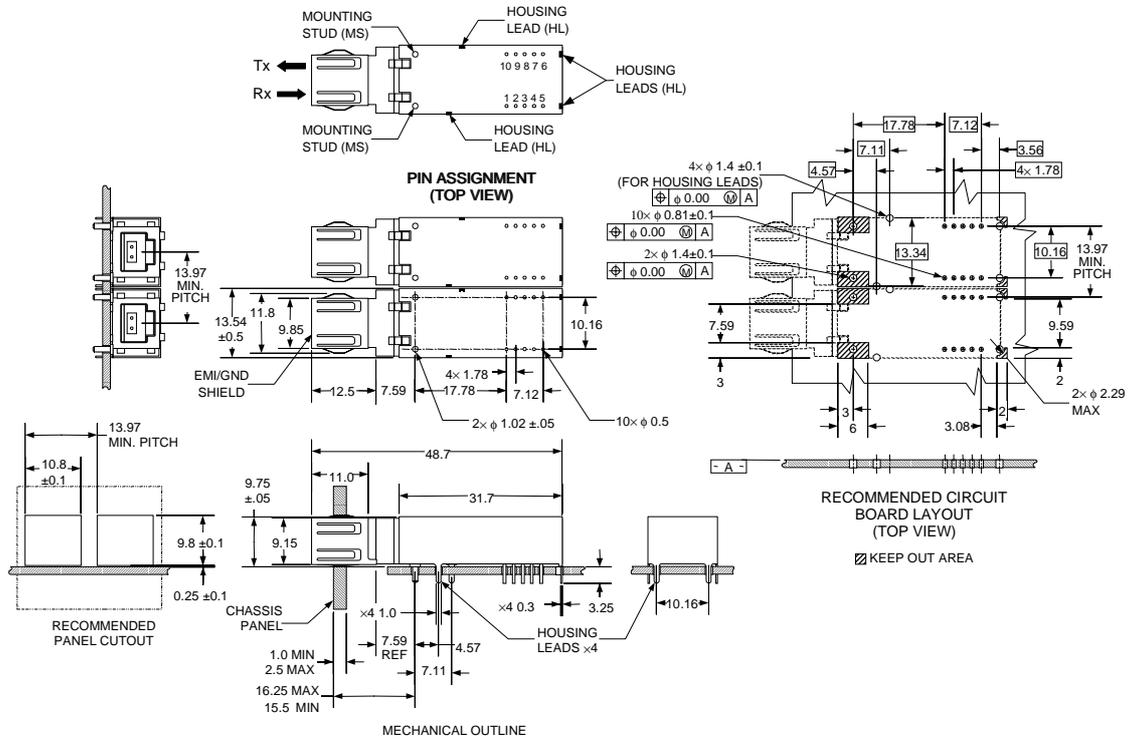


Figure 3. Example of TD+/- and RD+/- Termination

Notes:

1. Consult the serdes manufacturer for these resistor values because these values depend on the serdes chip.
2. Consult the serdes manufacturer for the termination method.

PACKAGE OUTLINE



DIMENSIONS ARE IN MILLIMETERS

Figure 5. OAT1231T-M-05 Mechanical Outline & Installation Drawing

NOTICE

1. The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.
2. The outline of action and examples for application circuits described herein have been chosen as an explanation for the standard action and performance of the product. When planning to use the product, please ensure that the external conditions are reflected in the actual circuit, assembly, and program designs.
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