

Optical Communication Devices

2.5 Gb/s Optical Transmitter Module

TOLD346S/396S-TXMS Series



APPLICATION

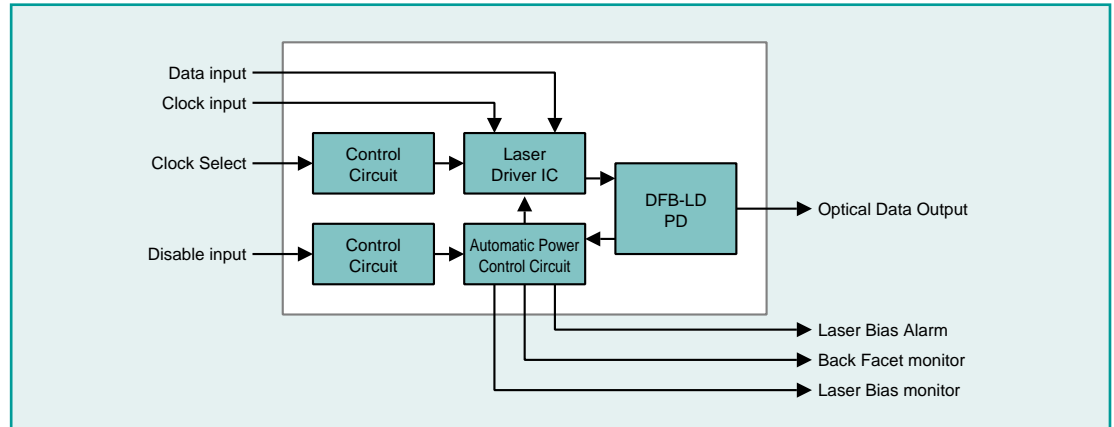
- SONET / SDH (OC-48 / STM-16) applications

FEATURES

- 1.3/1.55 μm Uncooled DFB-LD
- AC-coupled ECL/PECL data/clock input
- Clocked or non-clocked operation
- Single power supply (+5 V or -5 V)
- Automatic power control
- Transmitter disable input
- Package size: 58 (L) x 35 (W) x 8.9 (H) mm
- Tc: -10 °C to +70 °C

TOLD346S/396S-TXMS Series

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit	Note
Storage temperature	Tstg	-40 to +85	°C	
Operating case temperature	Tc	-10 to +70	°C	
Positive supply voltage	Vcc	0 to 5.5	V	(1)
Negative supply voltage	Vee	-5.7 to 0	V	(2)
Input signal voltage	Vi	2.0	V	
Soldering temperature / time	Tsol / tsol	260 / 10	°C / s	

Note: (1) When Vcc connected to +5 V, Vee must be 0 V.

(2) When Vee connected to -5 V, Vcc must be 0 V.

ELECTRICAL AND OPTICAL CHARACTERISTICS

Electrical interface and power supply

Item	Min	Typ.	Max	Unit	Note
Positive power supply voltage	4.75	5.0	5.25	V	(1)
Negative power supply voltage	-5.50	-5.20	-4.90	V	(1)
Supply current	—	—	350	mA	
Power consumption	—	1.0	2.0	W	
Power-up rate	0.2	—	50	mV/μs	(2)
Input data/clock voltage					(3)
Differential voltage (P-N)	300	800	1000	mVpp	
Per complementary rail	150	400	500	mVpp	
Setup and hold time	—	65	75	ps	(8)
Laser degrade alarm					(4)
Activated	0.0	—	0.4	V	
Deactivated	2.4	—	5.0	V	
Laser degrade alarm					
Activation Delay	—	—	200	ms	
Deactivation Delay	—	—	400	ms	
Clocked/nonclocked Select voltage					
Clocked operation	GND	—	0.8	V	
Nonclocked operation	Vcc-2.0	—	Vcc	V	
Transmitter disable voltage	Vcc-2.0	—	Vcc	V	
Transmitter enable voltage	GND	—	0.8	V	
Response time					
To disable optical output	—	—	500	ms	
To enable optical output	—	—	500	ms	
Clock and data differential skew	40	—	—	ps	(5)
Laser bias voltage	0	—	1800	mV	(6)
Back-facet monitor voltage (duty 50%)	—	500	—	mV	(7)

Notes: (1) The transmitter requires a single power supply, the other voltage must be at ground potential.

(2) The transmitter uses electrical programming potentiometers.

This value is recommended.

(3) Internally AC coupled with 50Ω termination.

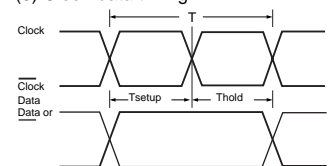
(4) Stated for Vcc = 5.0 V, Vee = 0 V. Laser degrade alarm is activated when the laser bias control circuit can no longer maintain output power through the monitor of laser bias current.

(5) This parameter is intended to specify a maximum input skew.

(6) This bias voltage is converted laser bias current with the ratio 20mV/mA.

(7) This monitor voltage is converted laser back-face monitor current.

(8) Clock-data timing.



T=402ps
Tsetup and Thold<75ps

Optical characteristics

Item	Min	Typ.	Max	Unit	Note
Wavelength					
TOLD346S-TXMS	1280	1310	1335	nm	
TOLD396S-TXMS	1500	1530	1580	nm	
Spectral width	—	0.3	1.0	nm	(1)
Side mode suppression ratio	30	—	—	dB	(2)
Wavelength temperature coefficient	—	0.1	—	nm/°C	
Average output power	-1.0	+1.0	+3.0	dBm	(3)
Output power disable	—	-50	-40	dBm	
Extinction ratio	9.0	10	—	dB	
Optical return loss	20	—	—	dB	
Jitter generation (RMS)	—	—	0.01	UIrms	
Optical mask	—	—	—	—	(4)
Maximum path penalty					
TOLD346S-TXMS	—	—	1.0	dB	@40 km distance
TOLD396S-TXMS	—	—	2.0	dB	@80 km distance

Note: (1) Measured at 20dB down from the maximum point with RMS method.

(2) Measured over a wavelength range of 1480nm to 1600nm.

(3) Measured at the connector output of the pigtail.

(4) G.957/GR-253-CORE.

DIMENSIONAL OUTLINE AND PIN ASSIGNMENT

(Unit: mm)

Top view: Overall width 990±100, main body width 58.0, distance from main body to connector 35 max.

Side view: Total length 8.9 (max), distance from front face to connector 2.5 (min), distance from front face to pin array 18±0.5, pin pitch 0.46 (0.6 max), pin diameter 2.54 (0.6 max).

Front view: Pin array width 25.4.

Bottom view: Pin array width 25.4, pin diameter 7.0 (max).

Pin Assignment

Pin	Symbol	Function
1	Vee	Negative power supply (1)
2	Back (+)	Monitoring for back facet PD current
3	Bias (+)	Monitoring for bias current
4	SDC	Shut down command (2)
5	SELC	Clock mode select (3)
6	GND	Ground
7	NUC	No user connection
8	LDA	Laser Degrade Alarm
9	NUC	No user connection
10	NUC	No user connection
11	GND	Ground
12	Vee	Negative power supply (1)
13	Vcc	Positive power supply (1)
14	NIC	No internal connection
15	GND	Ground
16	D (+)	True data input
17	GND	Ground
18	D (-)	False data input
19	GND	Ground
20	CLK (+)	True clock input
21	GND	Ground
22	CLK (-)	False clock input
23	GND	Ground
24	Vcc	Positive power supply (1)

(1) When Vcc connected to +5.0 V, Vee must be 0 V. When Vee connected to -5.2 V, Vcc must be 0 V.
(2) When left open (or low) the module is in the operating mode.
(3) When left open (or low) the module is in the clocked mode. When high, the module is in the non clocked mode.

PRECAUTIONS

- Power supply: Transient electric spike may cause a damage to the laser, the photodiode or IC chips. A surge-free power supply and a slow starter circuit should be used. To avoid causing an electrical surge, pins should not be connected or disconnected on the test fixture before turning the power off.
- The product should be grounded for obtaining the performance.
- Safety: The laser emits invisible light harmful to the human eyes. Direct viewing should be avoided.

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