TSPD-10G-TT-TODC

Features

- Integrated 10 Gbps Tunable Transmitter and Receiver with 16 Channels 6xxMbps Mux and Demux
- 170km Maximum Reach with TODC Setting
- Full C-band Coverage
- 50GHz ITU Grid Wavelength Spacing
- High Sensitivity APD Receiver
- Multi Bit Rate Support from 9.95Gbps up to 11.3Gbps
- +6dBm Output Power
- Negative Chirp MZ LiNbO3 Modulator Running NRZ Modulation
- Comply with RoHS Directive 2002/95/EC
- Comply with 300PIN Multi Source Agreement (MSA)
- Comply with I2C 300PIN MSA Interface Rev 4
- Comply with OIF SFI-4
- Comply with Telcordia Qualification
- Fits MSA size 4.5"x3.5"x0.53"

Applications

- DWDM Systems
- Metro Rings and Point to Point Networks
- Ultra Long Reach
- Non Dispersion Compensated Networks
- Sparing and Inventory
- One Time Wavelength Provisioning
- SONET/SDH and 10Gbps Ethernet with or without FEC

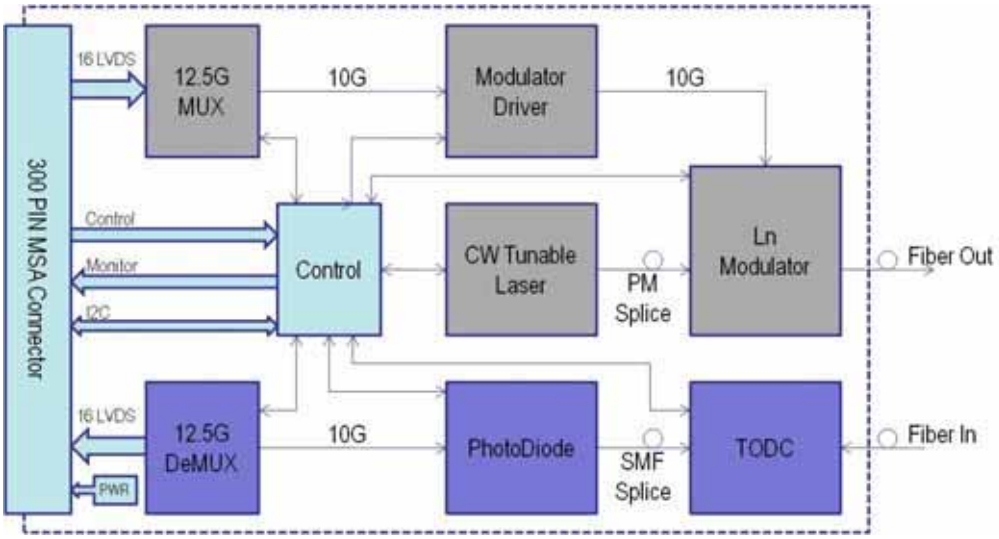

Figure 1: Transponder Block Diagram

The TSPD-10G-TT-TODC product line is a long reach or ultra long reach widely tunable transponder designed for DWDM applications. The transponder contains both a 10Gbps widely tunable transmitter and a wide band receiver. The Free-Light interface is compatible with the 300PIN MSA and the I^2C interface. The Free-Light uses a widely tunable laser to tune and cover the entire C-Band.

The TSPD-10G-TT-TODC uses a Mach Zehnder Lithium Niobate modulator to enable reliable operation across the entire C-band and over long distances. A Tunable Optical Dispersion Compensator enables the transponder receiver to tolerate up to 170km of SSMF with the negative chirp modulator integrated.

A specific I2C command enables the user to control the dispersion settings of the integrated TODC in the range of +/-2500ps/nm.

Integrated Mux and Demux are used to convert parallel electrical signals into serial signals and serial signals into parallel electrical signals respectively. The electrical interface of both transmit and receive is based on 16 differential LVDS data lines and 6xx Mbps clock. The module complies with OIF SFI-4 standard. A sensitive APD receiver converts optical to electrical signal and feeds the clock and data recovery (CDR) circuit.

50GHz ITU grid wavelength spacing is available as well as Multi Bit Rate ranging from 9.95Gbps to 11.3Gbps.

The TSPD-10G-TT-TODC allows the user to adjust the decision threshold of the receiver circuitry. The decision threshold can be set by RxDTV I^2C commands in the range of 10% to 90%.

Back to Product List

1. Specifications

1.1. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Operating Case Temperature	Tc	-5	70	ºC
Storage Case Temperature	Ts	-40	85	ºC
-5.2V Supply Voltage	VEE	-6	0.5v	V
3.3V Supply Voltage	VDD	-0.5	4	V
5.0V Supply Voltage	VCC	-0.5	5.5	V
1.8V Supply Voltage	VDD2	-0.5	2.5	V
Voltage on LVDS pin		0	Vcc	V
Static Discharge Voltage	ESD		500	V
Relative Humidity	RH		85	%
Receiver Maximum Input Power	Pin		0	dBm

1.2. Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Operating Temperature	Tcase	-5		70	°C
Power Consumption	Pmax			13	W
-5.2V Supply Voltage	Vee	-4.94	-5.2	-5.45	V
VEE Current	Iee		0.8	1.5	A
3.3V Supply Voltage	Vdd	3.13	3.3	3.47	V
VDD Current	Idd		0.92	2.5	A
5.0V Supply Voltage	Vcc	4.75	5.0	5.25	V
VCC Current	Icc		0.45	0.8	A
1.8V Supply Voltage	Vdd2	1.71	1.8	1.89	V
VDD2 Current	Idd2		0.03	0.2	A

Back to Product List

1.4. Optical Parameters

	Parameter	Symbol	Min	Typ	Max	Units
Tx	Output Power	Po	+5.5	+6	+6.5	dBm
	Modulator Extinction Ratio	ER	11	12		dB
	Shutter – output power during tuning	SHER		-45	-40	dBm
	Optical Signal to Noise Ratio	OSNR	50			dB@0.1nm
	Side Mode Suppression Ratio	SMSR	40	50		dB@0.1nm
	Tuning Range - C Band	Tλ	1528		1563	nm
	Wavelength Switching Time	tS		10	15	s
	Wavelength Accuracy*	Δft	-2.5		+ 2.5	GHz
	Power Variation Between Channels	Δ Pt	-0.5		+0.5	dBm
	Preset Chirp (Z-Cut)	α	-0.8	-0.7	-0.6	
	Jitter Generation		Compliant with GR-253 issue 3			
Rx	Input Power Sensitivity at back to back**	Si		-25	-24	dBm
	170km fiber (2900ps/nm) Sensitivity	Si170			-22	dB
	Max Receiver Overload ***	PinMax	-3	-1		dBm
	Rx Spectral Range	λin	1526		1566	nm
	Optical Return Loss	RL	27			dB
	Jitter Transfer & Tolerance		Compliant with GR-253 issue 3			

All parameters are at 10.7Gbps data rate unless otherwise stated.

* After 30 seconds

** @ BER < 10^{-12}, ER=13dB, PRBS=2^{31}-1, NRZ, OSNR>35dB, TODC optimized

*** @ BER < 10^{-12}, ER=13dB, PRBS=2^{31}-1, NRZ, OSNR>35dB, TODC optimized

Back to Product List