NEC 2.5 Gbps OPTICAL TRANSPONDER FOR OC-48 LR-1/STM-16 L-16.1 WITH 16:1 MUX AND 1:16 DEMUX INTERFACE

OD-UB092

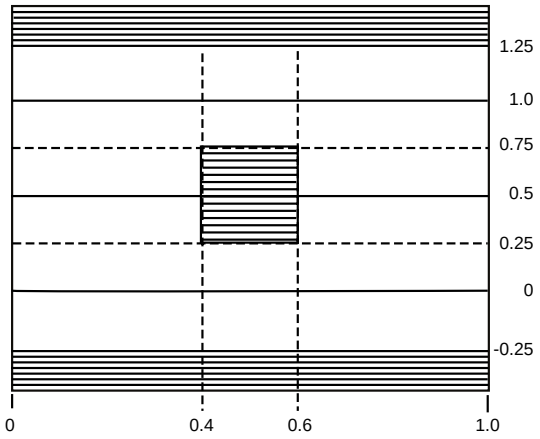
FEATURES

- **TRANSMITTER/MUX SECTION**
  - The optical transmitter is driven by a 2.5 Gbps serial data generated from 16 parallel 155.52 Mbps data inputs by a parallel to serial converter (Mux) and a 2.5 GHz clock signal synthesized by an inside PLL from the 155.52 MHz reference Clock input (REFCLK) aligned to 155.52 MHz data input clock (PICLK).
  - Uses an uncooled 1.3 μm DFP type laser.
  - Optical Characteristics satisfies OC-48 LR-1and STM-16 L-16.1 spec.
  - PLL Lock Detect Alarm (LOCKDET).
  - Laser Bias Monitor Output (LsrBias).
  - Laser Output Monitor Output (LP MON).
  - Transmitter Disable Input (TxDis)
- **RECEIVER/DEMUX SECTION**
  - The optical receiver converts 2.5 Gbps optical signal into 2.5 Gbps electrical data and extracts 2.5 GHz clock from it using an inside PLL. Optical Characteristics satisfies OC-48 LR-1 and STM-16 L-16.1 spec.
  - A Serial to parallel converter (DEMUX) converts serial 4 Gbps data signal into 16 parallel 155.52 Mbps data signals and a 155.52 MHz clock (POCLK) synchronized to these parallel outputs. Frame Search/Detection Output (FP, SEARCH).
  - Optical Input Shutdown Alarm Output (LOS).
  - Optical Receiver Photodiode Current Monitor (IPDMON).
  - Out of Frame Input (OOF).

DESCRIPTION

OD-UB092 can be used in section and photonics layers equipment of SONET/SDH protocols. This module performs parallel to serial conversion of 16 parallel 155.52 Mbps electrical signals into a single 2.5 Gbps electrical signal and then convert into a 2.5 Gbps optical signal; and vice versa a 2.5 Gbps optical signal into a 2.5 Gbps electrical signal and then performs serial to parallel conversion into 16 parallel 155.52 Mbps electrical signals. The parallel 155.52 Mbps input/output signals are differential LVPECL signals.

OPTICAL OUTPUT WAVEFORM MASK



OPTICAL CHARACTERISTICS

PARAMETERS	UNITS	SPECIFICATIONS	
		MIN	MAX
Transmitter			
Output Power	dBm	-2	+3
Output Wavelength	nm	1280	1335
Spectral Maximum, -20 dB width	nm		1
Spectral minimum side mode	dB	30	
Extinction Ratio	dB	8.2	
Wave-form		ITU-T G.957 MASK	
Laser Diode Class		IEC825-2 class 1	
Optical Output Logic		Positive Data “H” →LD On	
Receiver			
Input Wavelength	nm	1260	1580
Reflectance	dB	27	
Maximum Overload	dBm	-9	
Minimum Sensitivity	dBm	-27	
Jitter Specification		ITU-T G.958	

PIN ASSIGNMENTS

1	GND	Ground	71.	D_OUT+2	156M Data Out+	141.	D_OUT+11	156M Data Out+
2.	IPDMON	Rx PD Monitor Output	72.	D_OUT- 2	156M Data Out-	142.	D_OUT-11	156M Data Out-
3.	TxGND	Tx Ground	73.	D_OUT+0	156M Data Out+	143.	D_OUT+9	156M Data Out+
4.	D_IN +15	156M Data IN+	74.	D_OUT- 0	156M Data Out-	144.	D_OUT- 9	156M Data Out-
5.	D_IN -15	156M Data IN-	75.	RxGND	Rx Ground	145.	RxGND	Rx Ground
6.	D_IN +13	156M Data IN+	76.	NC	Open	146.	D_OUT+7	156M Data Out+
7.	D_IN -13	156M Data IN-	77.	NC	Open	147.	D_OUT-7	156M Data Out-
8.	TxGND	Tx Ground	78.	NC	Open	148.	D_OUT+5	156M Data Out+
9.	D_IN +11	156M Data IN+	79.	NC	Open	149.	D_OUT-5	156M Data Out-
10.	D_IN -11	156M Data IN-	80.	GND	Ground	150.	RxGND	Rx Ground
11.	D_IN +9	156M Data IN+	81.	GND	Ground	151.	D_OUT+3	156M Data Out+
12.	D_IN - 9	156M Data IN-	82.	RESET	Maser Reset Input	152.	D_OUT-3	156M Data Out-
13.	TxGND	Tx Ground	83.	TxGND	Tx Ground	153.	D_OUT+1	156M Data Out+
14.	D_IN +7	156M Data IN+	84.	REFCLK+	Ref. Clock IN+	154.	D_OUT-1	156M Data Out-
15.	D_IN - 7	156M Data IN-	85.	REFCLK-	Ref. Clock IN-	155.	RxGND	Rx Ground
16.	D_IN +5	156M Data IN+	86.	D_IN +14	156M Data IN+	156.	NC	Open
17.	D_IN - 5	156M Data IN-	87.	D_IN -14	156M Data IN-	157.	NC	Open
18.	TxGND	Tx Ground	88.	TxGND	Tx Ground	158.	NC	Open
19.	D_IN +3	156M Data IN+	89.	D_IN +12	156M Data IN+	159.	NC	Open
20.	D_IN -3	156M Data IN-	90.	D_IN -12	156M Data IN-	160.	GND	Ground
21.	D_IN +1	156M Data IN+	91.	D_IN +10	156M Data IN+			
22.	D_IN -1	156M Data IN-	92.	D_IN -10	156M Data IN-			
23.	TxGND	Tx Ground	93.	TxGND	Tx Ground			
24.	PICLK+	156M Clock IN+	94.	D_IN +8	156M Data IN+			
25.	PICLK-	156M Clock IN-	95.	D_IN -8	156M Data IN-			
26.	LOCKDET	Lock Detect Out	96.	D_IN +6	156M Data IN+			
27.	TxGND	Tx Ground	97.	D_IN - 6	156M Data IN-			
28.	+3.3V	+3.3V (Tx Digital)	98.	TxGND	Tx Ground			
29.	+3.3V	+3.3V (Tx Digital)	99.	D_IN +4	156M Data IN+			
30.	TxAGND	Tx Analog Ground	100.	D_IN -4	156M Data IN-			
31.	+3.3V	+3.3V (Tx Analog)	101.	D_IN +2	156M Data IN+			
32.	+3.3V	+3.3V (Tx Analog)	102.	D_IN -2	156M Data IN-			
33.	TxAGND	Tx Analog Ground	103.	TxGND	Tx Ground			
34.	LP MON	Laser Output Monitor Output	104.	D_IN +0	156M Data IN+			
35.	LsrALM	Laser Alarm Output	105.	D_IN - 0	156M Data IN-			
36.	LsrBias	Laser Bias Monitor Output	106.	TxGND	Tx Ground			
37.	NC	Open	107.	PCLK+	156M Clock Out+ (MUX)			
38.	DLOOP	System Loopback Enable Input	108.	PCLK-	156M Clock Out- (MUX)			
39.	NC	Open	109.	TxAGND	Tx Analog Ground			
40.	FP	Frame Pulse Output	110.	TxAGND	Tx Analog Ground			
41.	FRAMEEN	Frame Enable Input	111.	+3.3V	+3.3V (Tx Digital)			
42.	RxGND	Rx Ground	112.	+3.3V	+3.3V (Tx Analog)			
43.	+3.3V	+3.3V (Rx Digital)	113.	NC	Open			
44.	+3.3V	+3.3V (Rx Digital)	114.	READ	FIFO Initialization Input			
45.	NC	Open	115.	TxDis	Optical Tx Output Shutdown			
46.	RxAGND	Rx Analog Ground	116.	NC	Open			
47.	RxAGND	Rx Analog Ground	117.	PULSE	Phase Error Signal Output			
48.	+3.3V	+3.3V (Rx Analog)	118.	LLOOP	Line Loopback Enable Input			
49.	RxAGND	Rx Analog Ground	119.	LOS	Optical Input Down Alarm			
50.	RxAGND	Rx Analog Ground	120.	RxGND	Rx Ground			
51.	RxAGND	Rx Analog Ground	121.	OOF	Out Of Frame Input			
52.	NC	Open	122.	RxGND	Rx Ground			
53.	NC	Open	123.	+3.3V	+3.3V (Rx Digital)			
54.	NC	Open	124.	+3.3V	+3.3V (Rx Digital)			
55.	RxGND	Rx Ground	125.	SEARCH	A1, A2 Frame Search Output			
56.	D_OUT+14	156M Data Out+	126.	RxAGND	Rx Analog Ground			
57.	D_OUT-14	156M Data Out-	127.	RxAGND	Rx Analog Ground			
58.	D_OUT+12	156M Data Out+	128.	+3.3V	+3.3V (Rx Analog)			
59.	D_OUT-12	156M Data Out-	129.	POCLK+	156M Clockout+ (DEMUX)			
60.	RxGND	Rx Ground	130.	POCLK-	156M Clockout- (DEMUX)			
61.	D_OUT+10	156M Data Out+	131.	NC	Open			
62.	D_OUT-10	156M Data Out-	132.	NC	Open			
63.	D_OUT+8	156M Data Out+	133.	NC	Open			
64.	D_OUT- 8	156M Data Out-	134.	NC	Open			
65.	RxGND	Rx Ground	135.	RxGND	Rx Ground			
66.	D_OUT+6	156M Data Out+	136.	D_OUT+15	156M Data Out+			
67.	D_OUT-6	156M Data Out-	137.	D_OUT-15	156M Data Out-			
68.	D_OUT+4	156M Data Out+	138.	D_OUT+13	156M Data Out+			
69.	D_OUT- 4	156M Data Out-	139.	D_OUT-13	156M Data Out-			
70.	RxGND	Rx Ground	140.	RxGND	Rx Ground			

ABSOLUTE MAXIMUM RATINGS[1]

SYMBOLS	PARAMETERS	UNITS	RATINGS	
			MIN	MAX
V_{CC}	Power Supply	V	-0.3	5.0
LVPECL$_{in}$	LVPECL Input	V	0	V_{CC}
LVPECL$_{out}$	LVPECL Output Current	mA		50
P_{IN}	Optical Input Power[2]	dBm		-6
T_{STG}	Storage Temperature	°C	-40	+85
H_A	Storage Humidity (No condensed condition)	%RH	+10	+85

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Average power; optical receiver.

RECOMMENDED OPERATING CONDITIONS

SYMBOLS	PARAMETERS	UNITS	SPECIFICATIONS	
			MIN	MAX
V_{CC}	Power Supply Voltage	V	3.13	3.47
T_{OP}	Operating Temp. Range Case temp. Group No. SA01/FA01 Group No. SH01/FH01	 °C °C	 0 -40	 75 85
	Power Consumption	W		5.5

OUTLINE DIMENSIONS (Units in mm)

Product No.
OD-UB092
Group No.: SA01 : SC Connector (Case Temp.→0-75°C)
FA01 : FC Connector (Case Temp.→0-75°C)
Pigtail cord length: 1 m ± 33 cm

Group No.