



Datasheet

No.

DS10-B041

Initial Date

2010-07-29

OB

OBB2x31

Written Team

R&D Dept.

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I Preview


PN	OBB2x31
Description	SFP Bi-Di transceiver, 1.25G 1310/1550nm , 1310/1490nm 10KM SC DDMI 0~70°C +3.3V

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III Revision History

No.	Date	Items	Change Recording	Ver.	Rev.	Customer
1	2010-07-29	All	Initial registration	000	000	Standard
2						
3						
4						
5						
6						

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1. Features

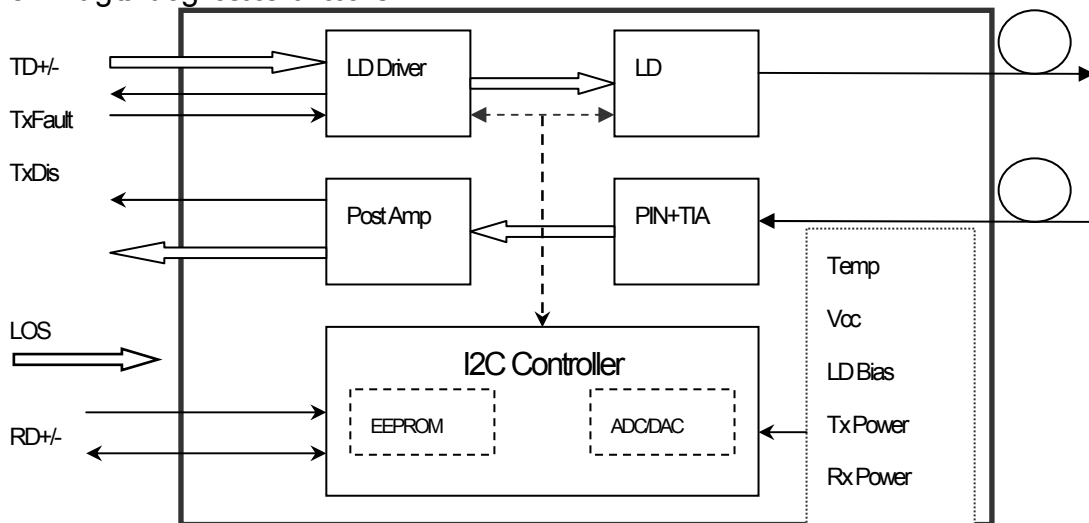
- ◆ Supports up to 1.25Gbps bit rates
- ◆ Hot-pluggable SFP footprint
- ◆ 1310PF/1550nm DFB /1490DFB laser and PIN photo detector, Up to 10km for SMF transmission
- ◆ Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- ◆ Compatible with RoHS
- ◆ Single +3.3V power supply
- ◆ Real Time Digital Diagnostic Monitoring
- ◆ Operating case temperature:
 - ◆ Standard: 0 to +70°C
 - ◆ Industrial: -40 to +85°C

2. Applications


- ◆ 1.25Gbps Optical systems
- ◆ Gigabit Ethernet
- ◆ 1.063Gbps Fiber Channel
- ◆ Other Optical links

3. Description

OBB2xx31 high performance, cost effective modules supporting data rate of 1.25Gbps and 10km transmission distance with SMF. The transceiver consists of three sections: a FP/DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement and SFF-8472 digital diagnostics functions.



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Transceiver functional diagram

4. Absolute Maximum Ratings: (TC=25°C)

Parameter	Symbol	Remarks	Min.	Max.	Unit
Storage Temperature	T _{ST}	-	-40	+85	°C
Operating Temperature	T _P	-	0	+70	°C
Input Voltage	T _{CC}	-	0	+3.6	V


5. Operating Environment:

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Industrial T _c	-40		+85	°C
Power Supply Voltage	V _{CC}	3	3.3	3.6	V
Power Supply Current	I _{CC}			300	mA
Data Rate			1.25		Gbps

6. Electrical and Optical Characteristics(Condition: Ta=TOP)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λ _c	1540	1550	1560	nm	
	λ _c	1470	1490	1510	nm	
	λ _c	1260	1310	1360	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Average Output Power	P _{out}	-9		-3	dBm	1
Extinction Ratio	ER	9.0			dB	
Data Input Swing Differential	V _{IN}	180		1200	mV	2
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
TX Disable	Disable	2.0		V _{CC}	V	
	Enable	0		0.8	V	
TX Fault	Fault	2.0		V _{CC}	V	
	Normal	0		0.8	V	
Receiver						
Centre Wavelength	λ _c	1260	1310	1360	nm	
	λ _c	1470	1490	1510	nm	
	λ _c	1530	1550	1570	nm	

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Receiver Sensitivity				-21	dBm	3
Receiver Overload		-1			dBm	3
LOS De-Assert	LOS _D			-21	dBm	
LOS Assert	LOS _A	-31			dBm	
LOS Hysteresis		0.5		4	dB	
Data Output Swing Differential	V _{out}	600	800	1000	mV	4
LOS	High	2.0		V _{cc}	V	
	Low			0.8	V	

Notes:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2⁷-1 test pattern @1250Mbps, BER ≤ 1×10⁻¹².
4. Internally AC-coupled.


7. Timing Characteristics:

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate Time	t _{on}			1	ms
Tx Disable Assert Time	t _{off}			10	μs
Time To Initialize, including Reset of Tx Fault	t _{init}			300	ms
Tx Fault Assert Time	t _{fault}			100	μs
Tx Disable To Reset	t _{reset}	10			μs
LOS Assert Time	t _{loss_on}			100	μs
LOS De-assert Time	t _{loss_off}			100	μs
Serial ID Clock Rate	f _{serial_clock}		100	400	KHz
MOD_DEF (0:2)-High	V _H	2		V _{cc}	V
MOD_DEF (0:2)-Low	V _L			0.8	V

8. Diagnostics

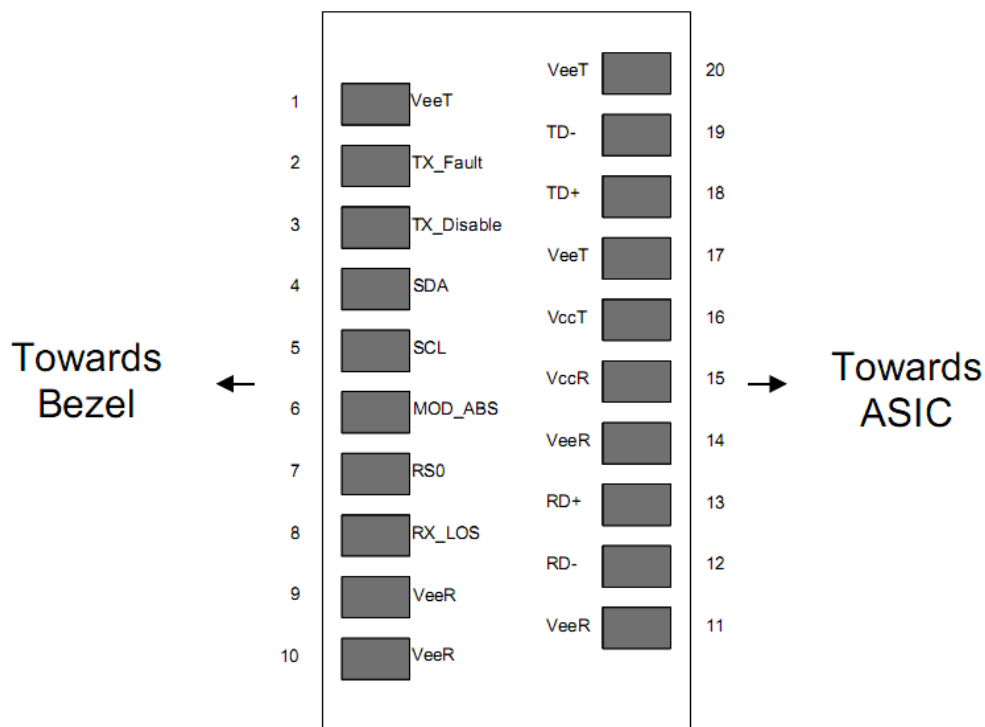
Parameter	Range	Unit	Accuracy	Calibration
Temperature	-40 to +85	°C	±3°C	Internal

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Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 100	mA	±10%	Internal
TX Power	-9 to -3	dBm	±3dB	Internal
RX Power	-21to -1	dBm	±3dB	Internal


9. Pin Assignment



10. Pin Description

Pin	Signal Name	Description	Plug Seq.	Notes
1	V _{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TXDISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	

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8	LOS	Loss of Signal	3	Note 3
9	V _{EER}	Receiver ground	1	
10	V _{EER}	Receiver ground	1	
11	V _{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V _{EER}	Receiver ground	1	
15	V _{CCR}	Receiver Power Supply	2	
16	V _{CCT}	Transmitter Power Supply	2	
17	V _{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	V _{EET}	Transmitter Ground	1	


Notes:

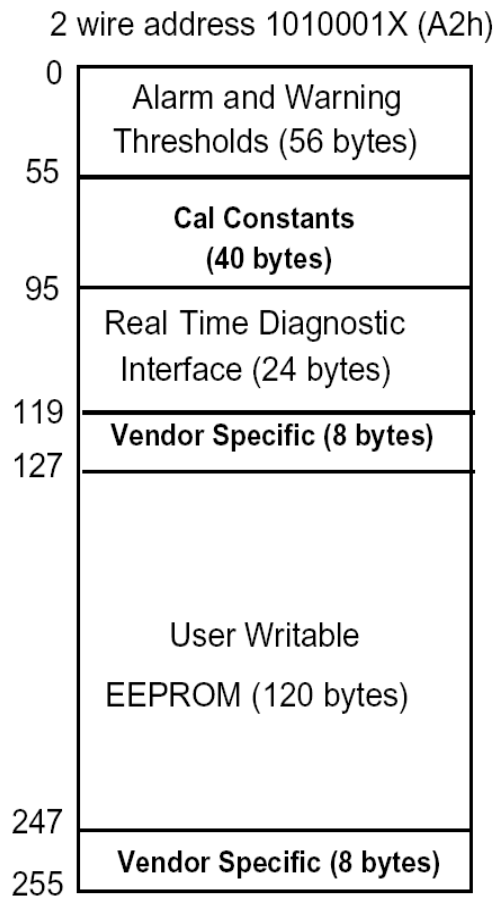
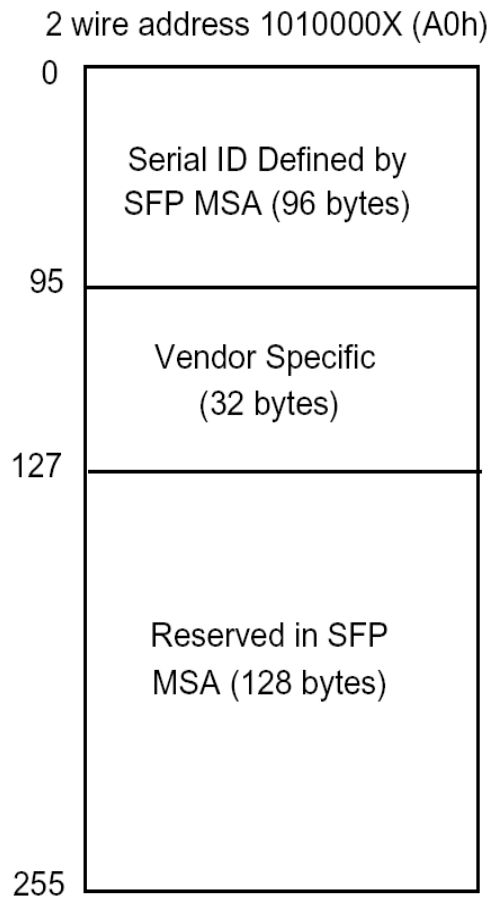
Plug Seq.: Pin engagement sequence during hot plugging.

- 1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and V_{cc}+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- 2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
- 3) LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
- 4) RD-/+ : These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- 5) TD-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

11. Digital Diagnostic Memory


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Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	OC-24 1.25G & Fiber Channel
11	1	Encoding	NRZ (03h)
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: OCRE

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36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: "OBB2xx31" (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62

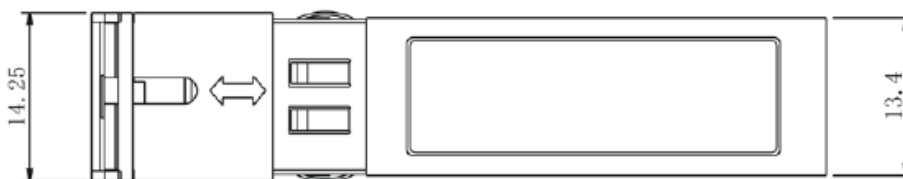
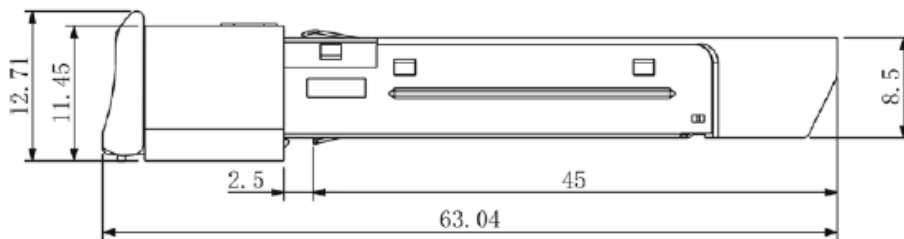
Extended ID Fields

64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	OCRE's Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)

Vendor Specific ID Fields

96-127	32	Readable	OCRE specific date, read only
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12. Mechanical Dimensions(Unit:mm)



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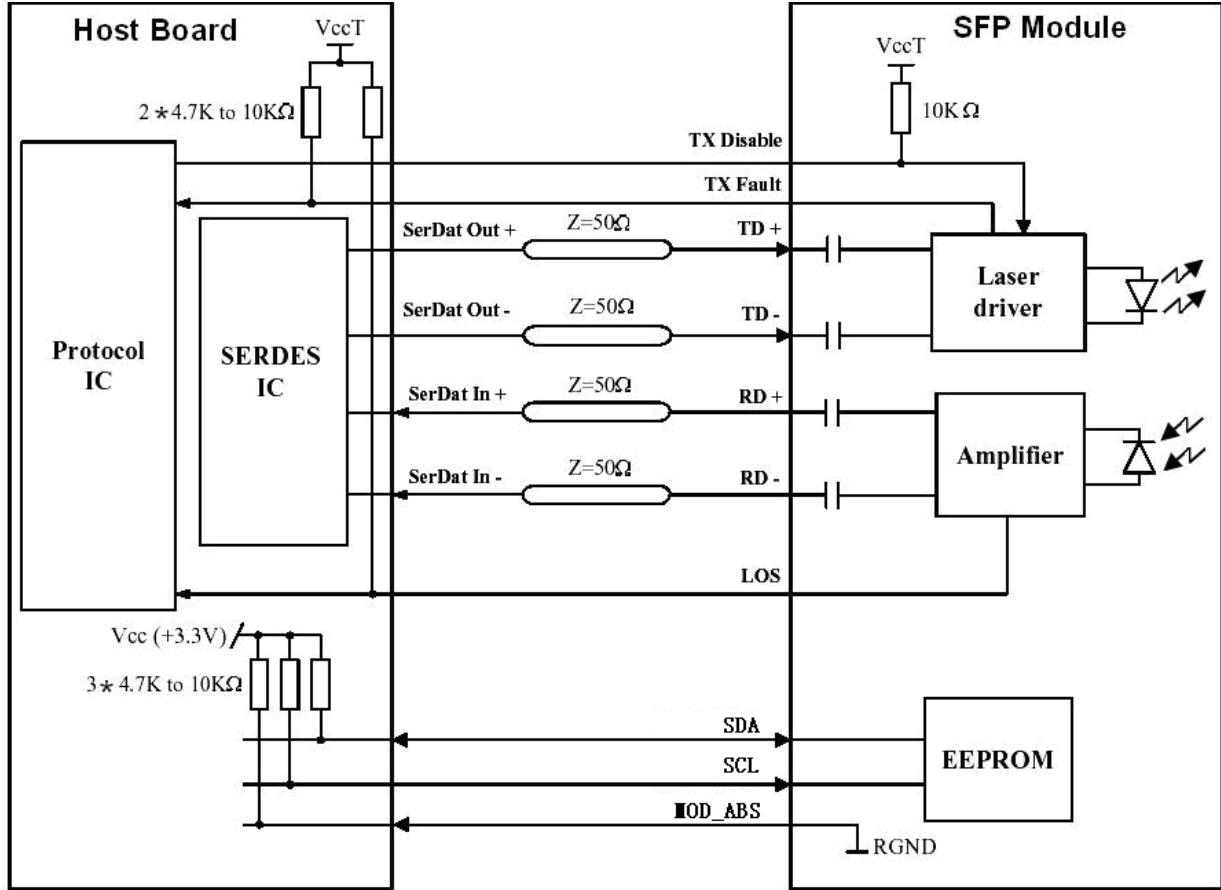
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13. Recommended Circuit



14. Model Ordering Information

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OBB23431	SFP Bi-Di transceiver, 1.25G TX1310/Rx1490nm 10KM SC DDMI 0~70°C +3.3V
OBB24331	SFP Bi-Di transceiver, 1.25G TX1490/Rx1310nm 10KM SC DDMI 0~70°C +3.3V
OBB23531	SFP Bi-Di transceiver, 1.25G TX1310/Rx1550nm 10KM SC DDMI 0~70°C +3.3V
OBB25331	SFP Bi-Di transceiver, 1.25G TX1550/Rx1310nm 10KM SC DDMI 0~70°C +3.3V
OBB23432	SFP Bi-Di transceiver, 1.25G TX1310/Rx1490nm 10KM SC DDMI -40~85°C +3.3V
OBB24332	SFP Bi-Di transceiver, 1.25G TX1490/Rx1310nm 10KM SC DDMI -40~85°C +3.3V
OBB23532	SFP Bi-Di transceiver, 1.25G TX1310/Rx1550nm 10KM SC DDMI -40~85°C +3.3V
OBB25332	SFP Bi-Di transceiver, 1.25G TX1550/Rx1310nm 10KM SC DDMI -40~85°C +3.3V

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