



Datasheet

No.

DS10-E061

Initial Date

2017-07-21

OE

OEBMCxx41

Written Team

R&D Dept.

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I Preview

PN	OEBMCxx41
Description	25G SFP28 Bi-Di 1270nm/1330nm 10KMLC DDMI 0~70 °C

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III Revision History

No.	Date	Items	Change Recording	Ver.	Rev.	Customer
1	2017-07-21	All	Initial registration	000	000	Standard
2						
3						
4						
5						
6						

 Communication Limited	Datasheet		DS10-E061 Final Rev.:2017.07.21	
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1. Features

- ◆ Supports up to 25.78Gbps bit rates
- ◆ Hot-pluggable SFP+ footprint
- ◆ DFB laser and PIN photodiode, 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: 0 to +70°C

-40 to +85°C

2. Applications

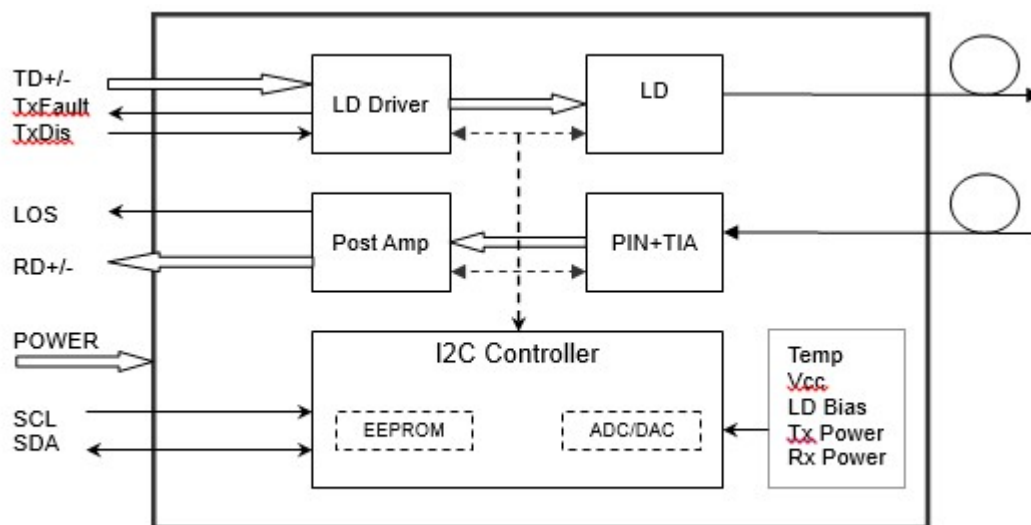
- ◆ 25GBASE-LR
- ◆ 5G Network
- ◆ Other optical links

3. Description

OEBMCxx41 is high performance, cost effective modules supporting data rate of 25.78Gbps and 10km transmission distance with SMF. The transceiver consists of three sections: a 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

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T _{ST}	-40	+85	°C
Supply Voltage	V _{CC}	-0.5	+4.5	V
Relative Humidity	RH	5	85	%

5. Operation Environment

Parameter	Symbol	Min	Typ	Max	Unit
Date Rate			25.78		Gb/s
Supply Voltage	V _{CC}	+3.14	3.3	+3.47	V
Supply Current	I _{CC}			400	mA
Operating Case Temperature	T _{OP}	0	25	+70	°C
		-40		+85	°C

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

Parameter	Symbol	Min	Type	Max	Unit	Note
Transmitter						
Date Rate			25.78		Gb/s	
Optical Wavelength	λ	1260/1320	1270/1330	1280/1340	nm	
Spectral Width (-20dB)	$\Delta \lambda$			1	nm	
Average output power	P _O	-1		6	dBm	1
Optical Extinction Ratio	ER	3.5			dB	1
Side Mode Suppression Ratio	SMSR	30			dB	
Data Input Swing Differential	V _{IN}	180		850	mV	2
Input Differential Impedance	Z _{IN}	90	100	110	Ω	

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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							
Date Rate			25.78		Gb/s		
Optical Wavelength	λ	1320/1260	1330/1270	1340/1280	nm		
Receiver Sensitivity				-14	dBm	3	
Receiver Overload				2	dBm	3	
LOS De-Assert	LOS _D			-15	dBm		
LOS Assert	LOS _A	-30			dBm		
LOS Hysteresis		0.5		4	dB		
Data Output Swing Differential	V _{out}	300		900	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 231-1 test pattern @25.78Gps, BER $\leq 5 \times 10^{-5}$.
- 4). Internally AC-coupled.

7. Timing and Electrical

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

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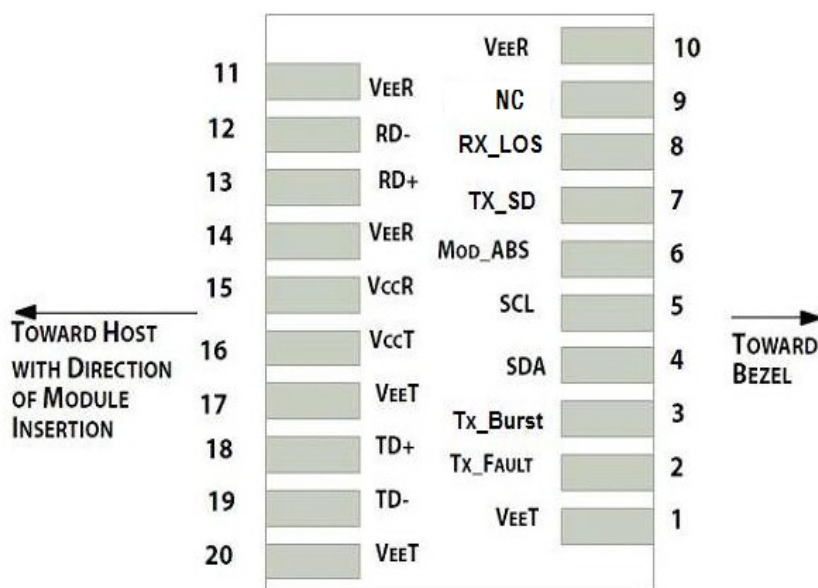
MOD_DEF (0:2)-Low	V _L			0.8	V
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8. Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal
	-40~85			
Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 100	mA	±10%	Internal
TX Power	-1 to +6	dBm	±3dB	Internal
RX Power	-14 to +2	dBm	±3dB	Internal

9. Pin Information

Diagram of Host Board Connector Block Pin Numbers and Name



Pin Function Definitions

PIN #	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	Tx Fault	Transmitter Fault Indication	3	Note 1
3	Tx Disable	Transmitter Disable	3	Note 2
4	SDL	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD-ABS	Module Absent. Grounded within the module	3	

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7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	VeeR	Receiver ground	1	
11	VeeR	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	VeeR	Receiver ground	1	
15	VccR	Receiver Power Supply	2	
16	VccT	Transmitter Power Supply	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	VeeT	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 Vcc+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.

10. Digital Diagnostic Monitor Characteristics

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)

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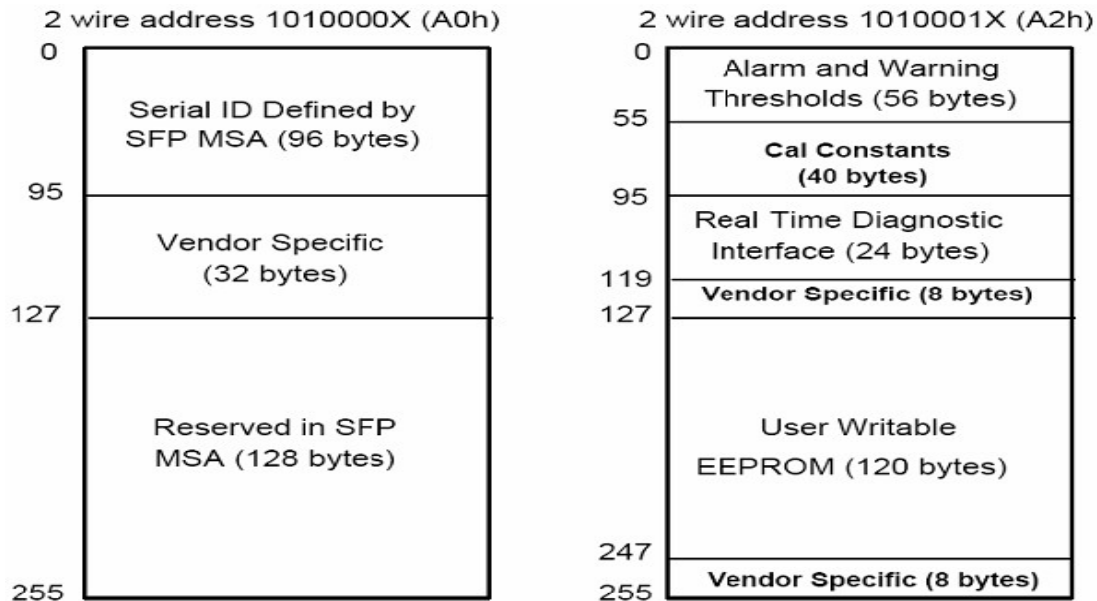


Table 2 - EEPROM Serial ID Memory Contents (A0h)

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP28)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	
11	1	Encoding	64B/66B (06h)
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps (67h)
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: OCRECOM
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: "OEBMCxx41" (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-62	3	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)

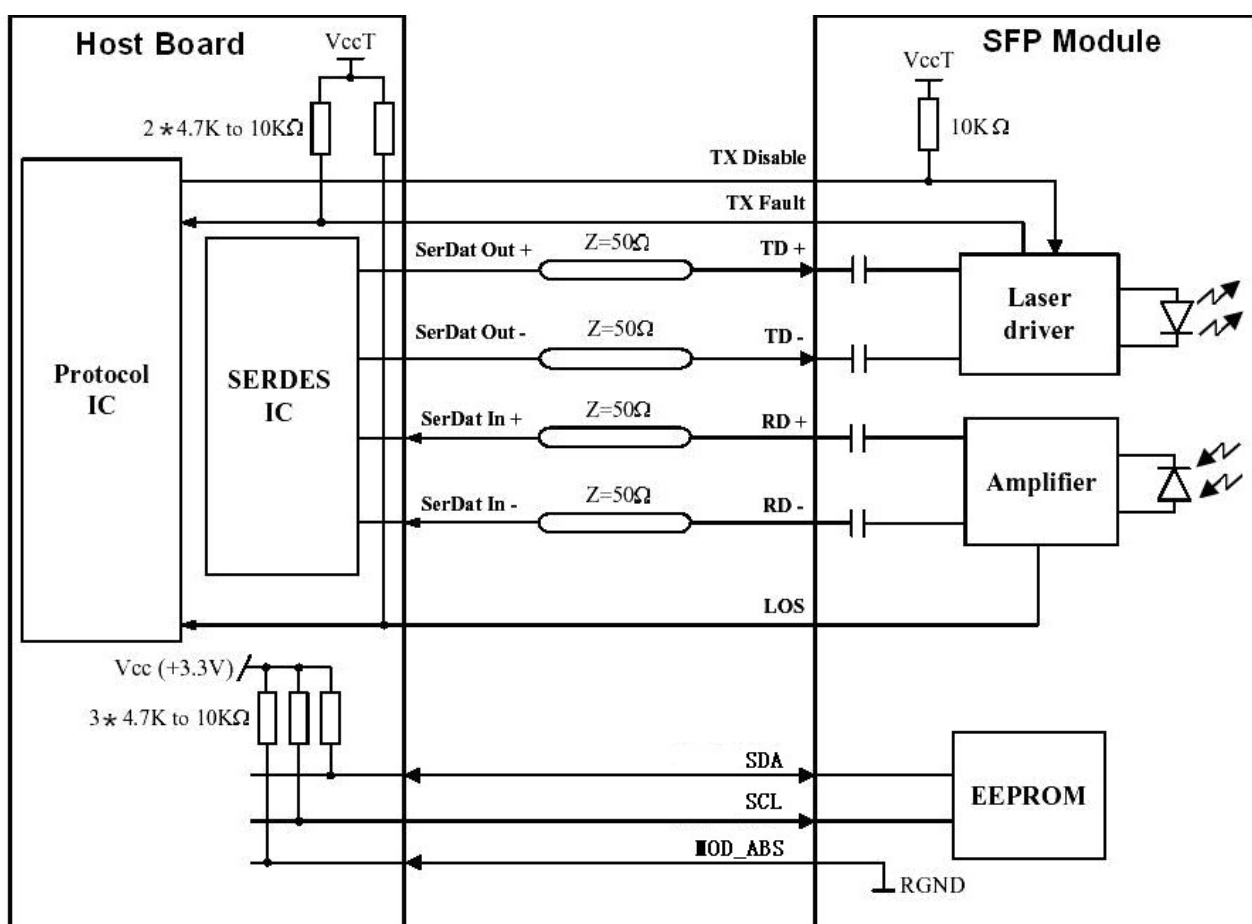
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66	1	BR, max	Upper bit rate margin, units of%
67	1	BR, min	Lower bit rate margin, units of%
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	OCRECOM's Manufacturing date code
92	1	Diagnostic type	
93	1	Enhanced option	
94	1	SFF-8472	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	OCRECOM specific date, read only
128-255	128	Reserved	Reserved for SFF-8079

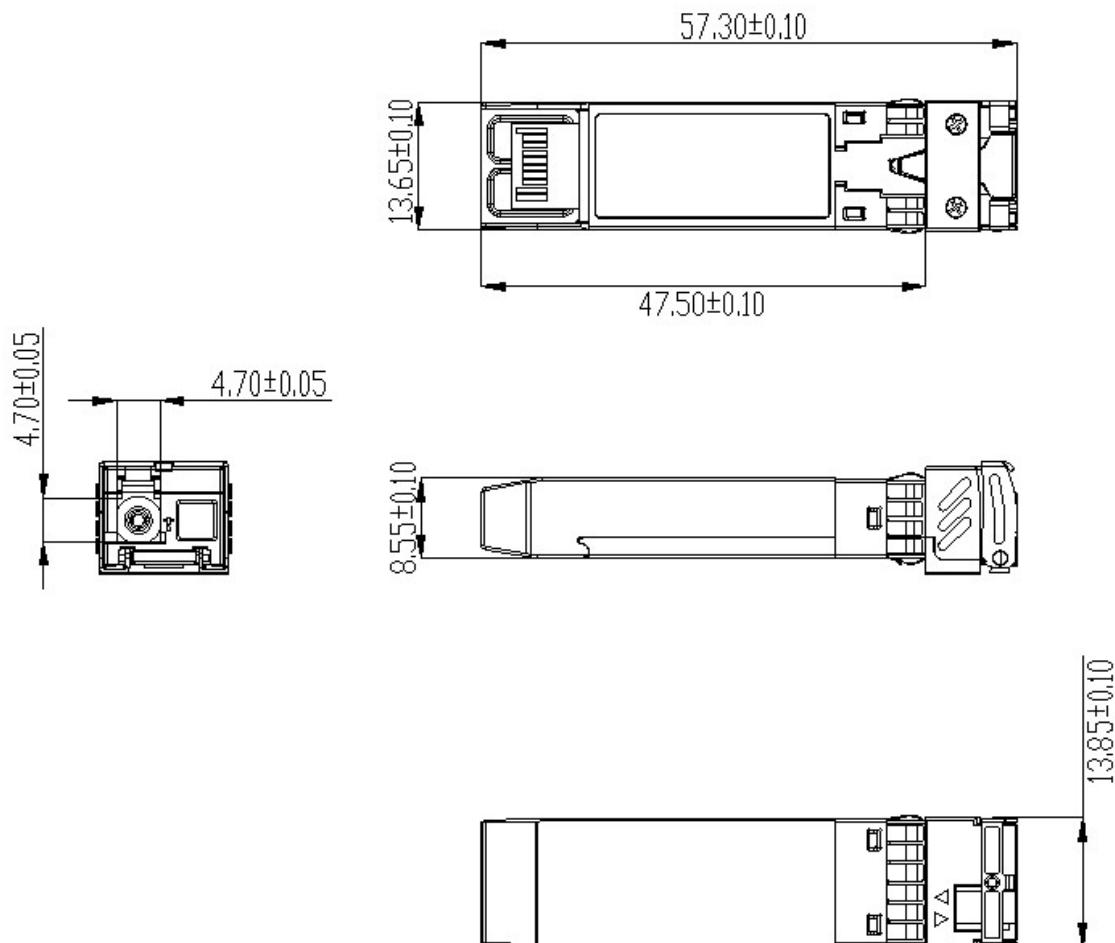
11. Recommended Circuit



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12. Mechanical Dimensions



13. Model Name information

PN	Description
OEBMC0341	25G SFP28 Bi-Di Tx1270nm/Rx1330nm 10KMLC DDMI 0~70 °C
OEBMC3041	25G SFP28 Bi-Di Tx1330nm/Rx1270nm 10KMLC DDMI 0~70 °C
OEBMC0342	25G SFP28 Bi-Di Tx1270nm/Rx1330nm 10KMLC DDMI -40~85 °C
OEBMC3042	25G SFP28 Bi-Di Tx1330nm/Rx1270nm 10KMLC DDMI -40~85 °C

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