

	Datasheet	No.	DS10-E051
		Initial Date	2017-07-21
OE	OEMS341	Written Team	R&D Dept.
			GH Zheng

I Preview

PN	OEMS341
Description	25G SFP28 SM 1310nm 10KM LC DDMI 0~70°C

II Contents

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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						

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1. Features

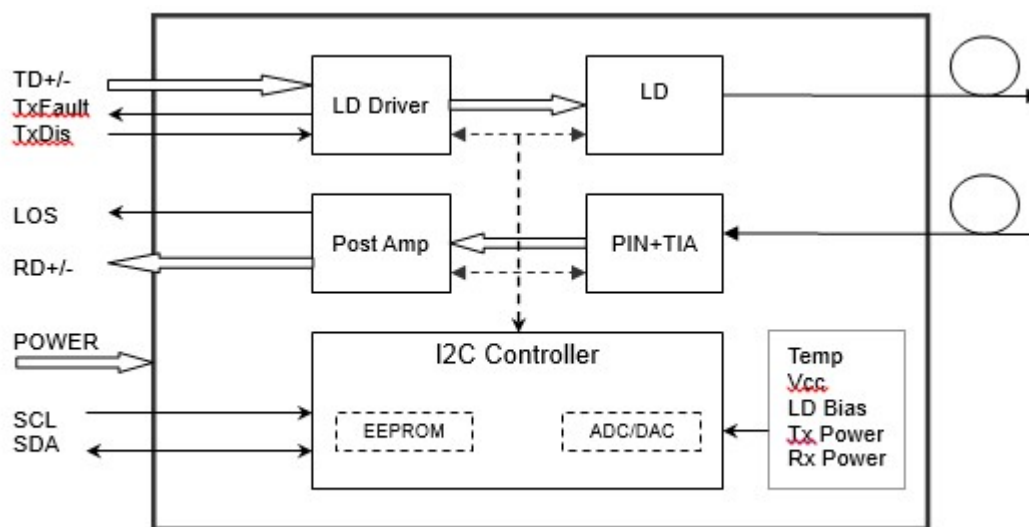
- ◆ Supports up to 25.78Gbps bit rates
- ◆ Hot-pluggable SFP+ footprint
- ◆ 1310nm DFB laser and PIN photodiode, Up to 10km for SMF transmission
- ◆ Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle
- ◆ Compatible with RoHS
- ◆ Single +3.3V power supply
- ◆ Real Time Digital Diagnostic Monitoring
- ◆ Operating case temperature: 0 to +70°C -40~85°C

2. Applications

- ◆ 25GBASE-LR
- ◆ Other optical links

3. Description

OEMS341 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.



Transceiver functional diagram

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Internal CDR's Locking Modes

Bits 110.3 and bits 118.3 control the locking modes of the internal retimer or CDR, default Value is "1".

Bit 110.3 of A2h	Bit 118.3 of A2h	RX Data Rate	TX Data Rate	Status of RX CDR	Status of TX CDR
High/1	High/1	24.33G/25.78G	24.33G/25.78G	CDR select	CDR select
High/1	Low/0	24.33G/25.78G	9.95G/10.31G	CDR select	CDR bypass
Low/0	High/1	9.95G/10.31G	24.33G/25.78G	CDR bypass	CDR select
Low/0	Low/0	9.95G/10.31G	9.95G/10.31G	CDR bypass	CDR bypass

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}			450	mA
Operating Temperature	T _{OP}	0	25	+70	°C
		-40		85	

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	1270	1310	1350	nm	
Spectral Width (-20dB)		$\Delta\lambda$			1	nm	
Average output power		P _o	-7		2	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	
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	

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Optical Wavelength	λ	1260		1600	nm	
Receiver Sensitivity				-13.3	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
MOD_DEF (0:2)-Low	V _L			0.8	V

8. Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	$\pm 3^\circ\text{C}$	Internal

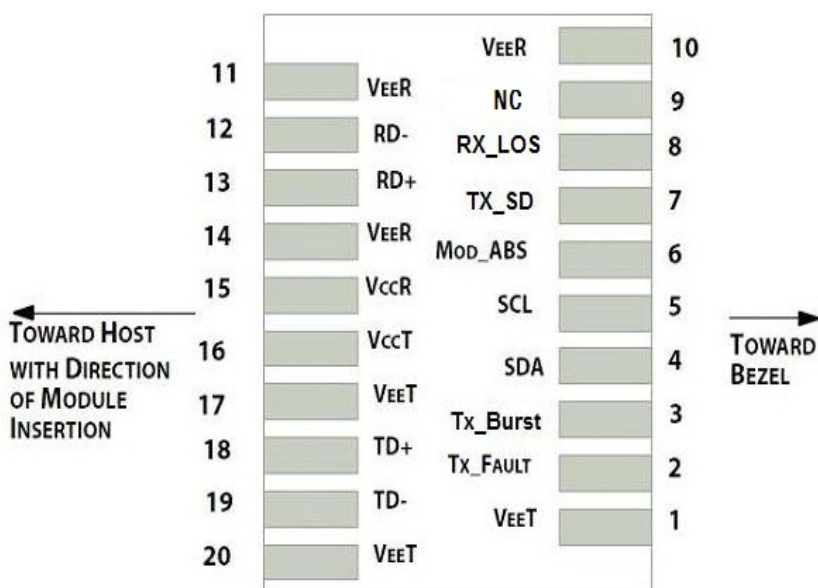
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Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 100	mA	±10%	Internal
TX Power	-7 to 2	dBm	±3dB	Internal
RX Power	-14 to +2	dBm	±3dB	Internal

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	
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	

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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)

2 wire address 1010000X (A0h)		2 wire address 1010001X (A2h)	
0	Serial ID Defined by SFP MSA (96 bytes) Vendor Specific (32 bytes) Reserved in SFP MSA (128 bytes)	0	Alarm and Warning Thresholds (56 bytes)
95		55	Cal Constants (40 bytes)
127		95	Real Time Diagnostic Interface (24 bytes)
		119	Vendor Specific (8 bytes)
		127	User Writable EEPROM (120 bytes)
255		247	Vendor Specific (8 bytes)
		255	

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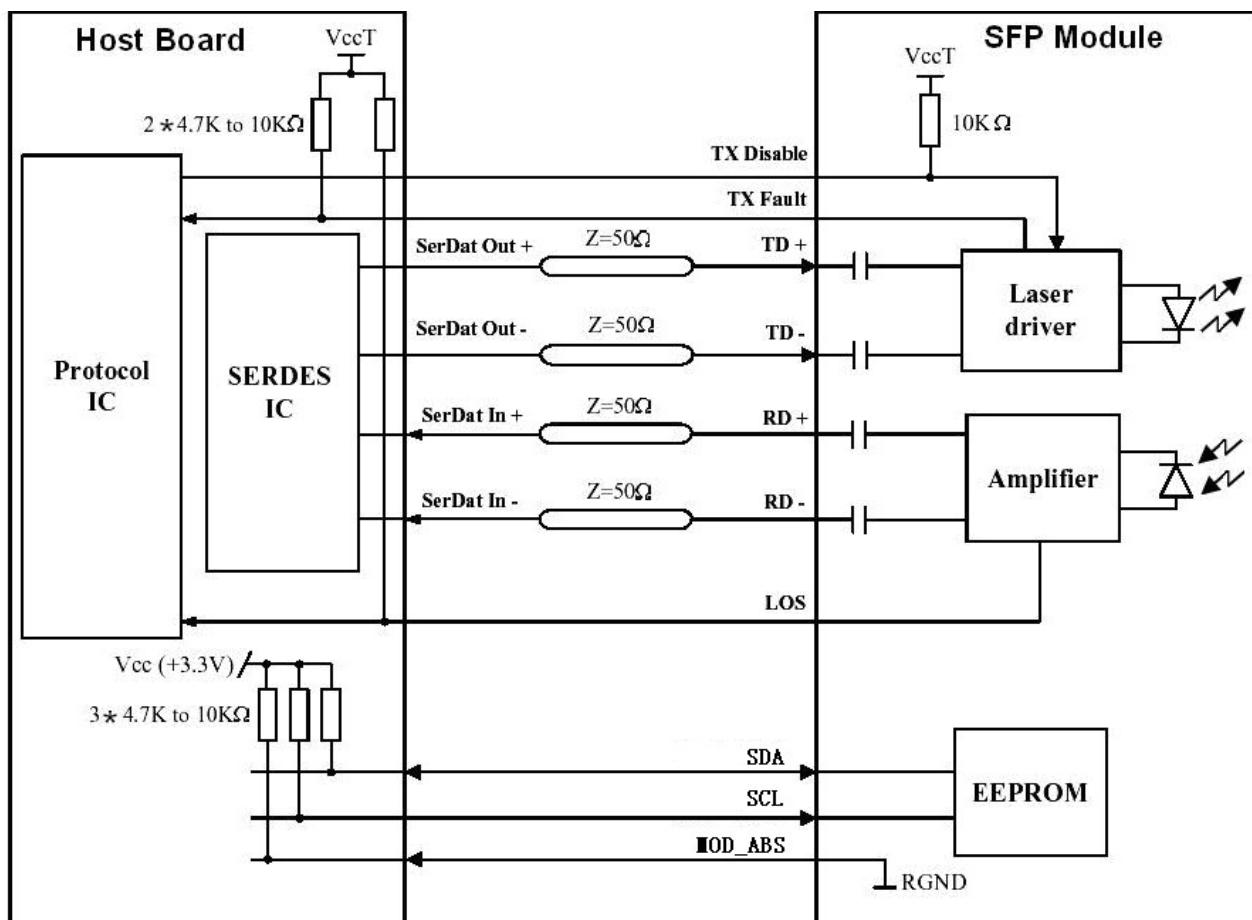
Table 2 - EEPROM Serial ID Memory Contents (A0h)

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=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	
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: "OEMS341" (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)
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 data, read only
128-255	128	Reserved	Reserved for SFF-8079

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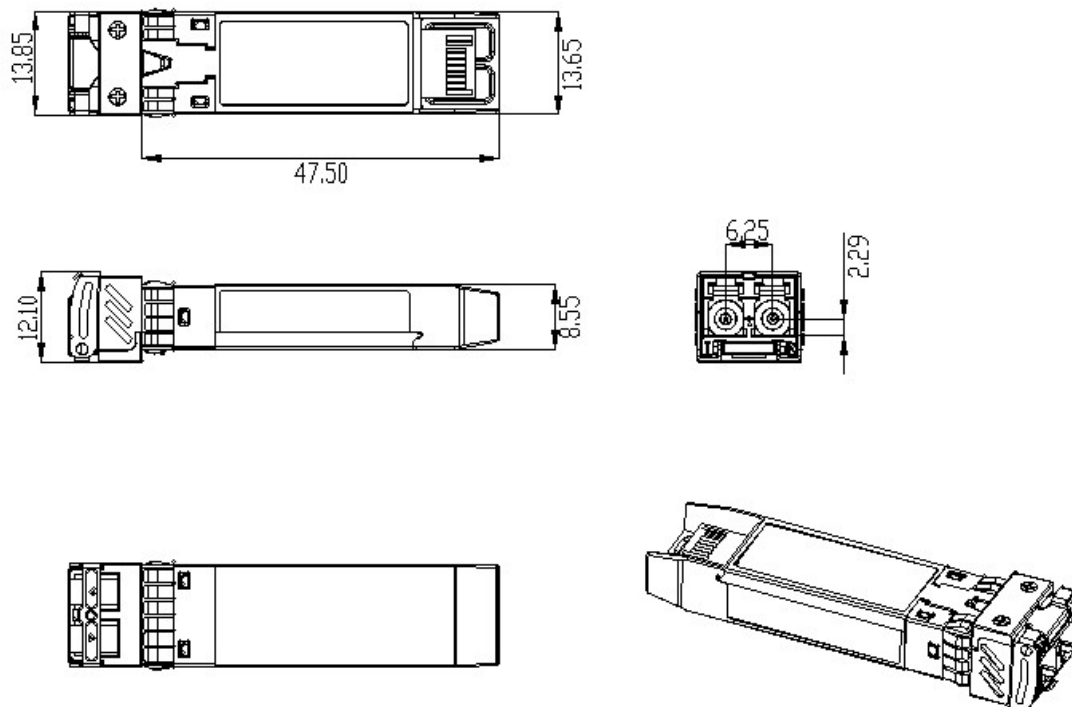
11. Recommended Circuit



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12. Mechanical Dimensions



13. Model Name information

PN	Description
OEMS341	25G SFP28 SM 1310nm 10KMLC DDMI 0~70°C
OEMS342	25G SFP28 SM 1310nm 10KMLC DDMI -40~85°C

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