	Datasheet	No.	DS10-U003
		Initial Date	2017-12-28
OU	OU8S341	Written Team	R&D Dept.
			GH Zheng

I Preview


PN	OU8S341
Description	100G QSFP28 LR4 1310nm 10KM LC DDMI 0~70 °C

II Contents

1. Features
2. Applications
3. Description
4. Absolute maximum Ratings
5. Operating Environment
6. Optical Characteristics
7. Electrical Specifications
8. Pin Descriptions
9. Diagnostic Monitoring Interface
10. Mechanical Dimensions
11. Model Ordering Information

III Revision History

No.	Date	Items	Change Recording	Ver.	Rev.	Customer
1	2017-12-28	All	Initial registration	000	000	Standard
2						
3						
4						
5						
6						

 Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	2 / 11

1. Features

- ◆ Four-channel full-duplex transceiver modules
- ◆ Up to 10km transmission of single mode fiber
- ◆ Low power consumption <4.5W
- ◆ Operating case temperature 0°C to +70°C
- ◆ 4*28Gb/s DML-based LAN-WDM transmitter
- ◆ 3.3V power supply voltage
- ◆ RoHS 6 compliant
- ◆ Hot Pluggable QSFP28 form factor
- ◆ LC connector receptacle
- ◆ Built-in digital diagnostic function

2. Applications

- ◆ 100G Ethernet
- ◆ Proprietary High Speed Interconnections
- ◆ Data center

3. Description

The OCRECOM's OU8S341 is a Four-Channel, Pluggable, dual LC, and Fiber-Optic QSFP28 Transceiver for 100G Ethernet applications. The QSFP28 full-duplex optical module offers 4 independent transmit and receive channels, each capable of 26Gbps operation for an aggregate data rate of 104Gbps 10km using single mode fiber. These modules are designed to operate over single mode fiber systems using EML laser: 1295.56nm, 1300.05nm, 1304.58nm and 1309.14nm. QSFP28 LR4 is one kind of transceiver which provides increased port density and total system cost savings. They are compliant with the QSFP28 MSA, IEEE P802.3ba.

4. Absolute Maximum Ratings


The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit	Note
Storage Temperature	TST	-40	85	degC	
Relative Humidity(non-condensing)	RH	0	85	%	
Operating Case Temperature	TOPC	0	70	degC	
Supply Voltage	VCC	-0.3	3.6	V	
Input Voltage	Vin	-0.3	Vcc+0.3	V	

5. Operating Environment

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	TOPC	0		70	degC

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 Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	3 / 11


Power Supply Voltage	VCC	3.13	3.3	3.47	V
Power Consumption		-		4.5	W
Data Rate	DR		25.78125		Gbps
Data Speed Tolerance	Δ DR	-100		+100	ppm
Link Distance with G.652	D	0		10	km

6. Optical Characteristics

All parameters are specified under the recommended operating conditions with PRBS31 data pattern unless otherwise specified.

Transmitter						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Wavelength Assignment	L0	1294.53	1295.56	1296.59	nm	
	L1	1299.02	1300.05	1301.09	nm	
	L2	1303.54	1304.58	1305.63	nm	
	L3	1308.09	1309.14	1310.19	nm	
Average Launch Power, each lane	PAVG	-4.3	-	+4.5	dBm	
Optical Modulation Amplitude (OMA)	POMA	-1.3	-	+4.5	dBm	1
Difference in Launch Power between any two lanes	Ptx,diff			5	dB	
Transmitter and Dispersion Penalty per Lane	TDP			2.2	dBm	
Rise/Fall Time	Tr/Tf	12		30	ps	
Extinction Ratio	ER	4			dB	
Transmitter Reflectance	RT			-12	dB	
EYE width		0.57			UI	
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				
Receiver						
Wavelength Assignment	L0	1294.53	1295.56	1296.59	nm	
	L1	1299.02	1300.05	1301.09	nm	
	L2	1303.54	1304.58	1305.63	nm	
	L3	1308.09	1309.14	1310.19	nm	

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 Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	4 / 11

Damage Threshold	THd	5.5					
Receiver Sensitivity in OMA, each Lane	SEN				-8.6	dBm	3
Signal Loss Assert Threshold	LOSA	-25				dBm	
Signal Loss Deassert Threshold	LOSD				-12	dBm	
LOS Hysteresis	LOSH	0.5	-		-	dB	
Optical Return Loss	ORL				-26	dBm	

Notes:

- Transmitter wavelength, RMS spectral width and power need to meet the OMA minus TDP specs to guarantee link performance.
- The eye diagram is tested with 1000 waveform.
- Sensitivity is specified at 5x10⁻⁵ BER.


7. Electrical Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Differential input impedance	Z _{in}	90	100	110	ohm
Differential Output impedance	Z _{out}	90	100	110	ohm
Differential input voltage amplitude	ΔV_{in}	900		1100	mVp-p
Differential output voltage amplitude	ΔV_{out}	200		900	mVp-p

8. Pin Descriptions

PIN	Logic	Symbol	Name/Description	Note
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTTLL-I	ModSelL	Module Select	
9	LVTTLL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	

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 CRE Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	5 / 11

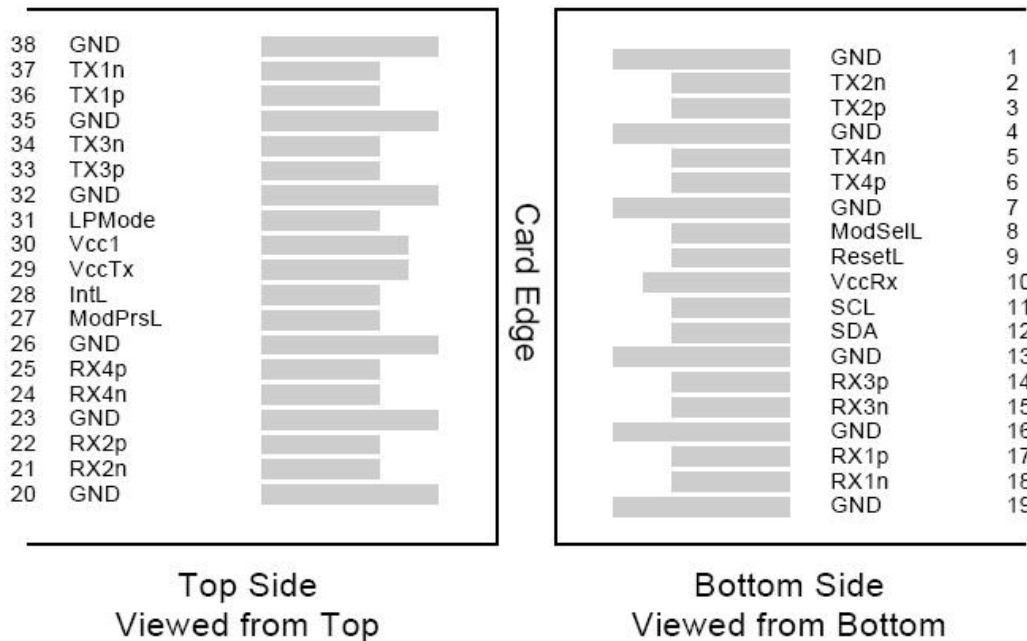
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

Notes:

1. Module circuit ground is isolated from module chassis ground within the module. GND is the symbol for signal and supply (power) common for QSFP modules.
2. The connector pins are each rated for a maximum current of 500mA.

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 CRE Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	6 / 11



ModSel Pin

The ModSel is an input pin. When held low by the host, the module responds to 2-wire serial communication commands. The ModSel allows the use of multiple QSFP modules on a single 2-wire interface bus. When the ModSel is “High”, the module will not respond to any 2-wire interface communication from the host. ModSel has an internal pull-up in the module.

ResetL Pin

Reset. LPMODE_Reset has an internal pull-up in the module. A low level on the ResetL pin for longer than the minimum pulse length (t_{Reset_init}) initiates a complete module reset, returning all user module settings to their default state. Module Reset Assert Time (t_{init}) starts on the rising edge after the low level on the ResetL pin is released. During the execution of a reset (t_{init}) the host shall disregard all status bits until the module indicates a completion of the reset interrupt. The module indicates this by posting an IntL signal with the Data_Not_Ready bit negated. Note that on power up (including hot insertion) the module will post this completion of reset interrupt without requiring a reset.

LPMODE Pin

OCRECOM’s OU8S341 QSFP28 CWDM4 operate in the low power mode (less than 1.5 W power consumption) This pin active high will decrease power consumption to less than 1W.


ModPrsL Pin

ModPrsL is pulled up to Vcc on the host board and grounded in the module. The ModPrsL is asserted “Low” when the module is inserted and deasserted “High” when the module is physically absent from the host connector.

IntL Pin

IntL is an output pin. When “Low”, it indicates a possible module operational fault or a status critical to the host system. The host identifies the source of the interrupt by using the 2-wire serial interface. The IntL pin is an open collector output and must be pulled up to Vcc on the host board.

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 Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	7 / 11

9. Diagnostic Monitoring Interface

Digital diagnostics monitoring function is available on all OCRECOM's OU8S341 QSFP28 LR4. A 2-wire serial interface provides user to contact with module. The structure of the memory is shown in the chart. The memory space is arranged into a lower, single page, address space of 128 bytes and multiple upper address space pages. This structure permits timely access to addresses in the lower page, such as Interrupt Flags and Monitors. Less time critical time entries, such as serial ID information and threshold settings, are available with the Page Select function. The interface address used is A0xh and is mainly used for time critical data like interrupt handling in order to enable a one-time-read for all data related to an interrupt situation. After an interrupt, IntL, has been asserted, the host can read out the flag field to determine the affected channel and type of flag.

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3	degC	Over operating temp
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V	Full operating range
Channel RX power monitor absolute error	DMI_RX	-3	3	dB	Per channel
Channel Bias current monitor	DMI_Ibias	-10%	10%	mA	Per channel
Channel TX power monitor absolute error	DMI_TX	-3	3	dB	Per channel

EEPROM Serial ID Memory Contents:

Data Address (Dec)	Name of Field	Description	Value(Hex)
128	Identifier	QSFP28	0E
129	Extended Identifier	3.5W max. power consumption	CC
130	Connector type	LC Connector	0C
131	Transceiver Application supported	Reserved	80
132		0	
133		0	
134		Reserved	0
135		Intermediate distance	20
136		Shortwave laser w/o OFC (SN)	10
137		Single Mode (SM)	01

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Communication Limited

Datasheet

DS10-U003
Final Rev.: 2017-12-28

Product	100G QSFP28 transceiver OU serials	Ver.	000
Part No.	OU8S341	Rev.	000
		Page	8 / 11

138		1200 Mbytes/Sec	80
139	Encoding	NRZ	03
140	BR, nominal	Nominal bit rate	67
141	Rate Select	QSFP Rate Select Version 1	0
142	Link Length(Standard SM Fiber)	2KM	2
143	Link Length(OM3)	Not supported	0
144	Link Length(OM2)	Not supported	0
145	Link Length(OM1)	Not supported	0
146	Link Length(Cooper)	Not supported	0
147	Device Tech	Uncooled transmitter device;1310nm DFB; No wavelength control; PIN detector; Transmitter not tunable	40
148	Vendor Name	OCRECOM	4F
149			43
150			52
151			45
152			43
153			4F
154			4D
155			
156			
157			
158			
159			
160			
161			
162			
163			
164	Electronic or optical interfaces for InfiniBand	4x SDR Speed(2.5Gb/s),DDR Speed(5.0Gb/s),QDR Speed(10Gb/s).	7
165	Vendor OUI	00	00
166		00	00
167		00	00
168			

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Datasheet

DS10-U003
Final Rev.: 2017-12-28

Product	100G QSFP28 transceiver OU serials	Ver.	000
Part No.	OU8S341	Rev.	000
		Page	9 / 11


169	Vendor PN		
170			
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177			
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179			
180			
181			
182			
183			
184	Vendor Rev	00	30
185			30
186	Wavelength	1310nm	66
187			58
188	Wavelength Tolerance	±50	0B
189			B8
190	Max Case Temp	Max Case Temp 70°C	46
191	Check Sum	Address 128-190	
192	Options	Rate Select, TX Disable, TX Fault, LOS, Warning indicators for: Temperature, VCC, RX power, TX Bias	0
193			0
194			0
195			DE
196	Vendor SN	Serial number provided by vendor(ASCII)	
197			
198			
199			
200			
201			
202			

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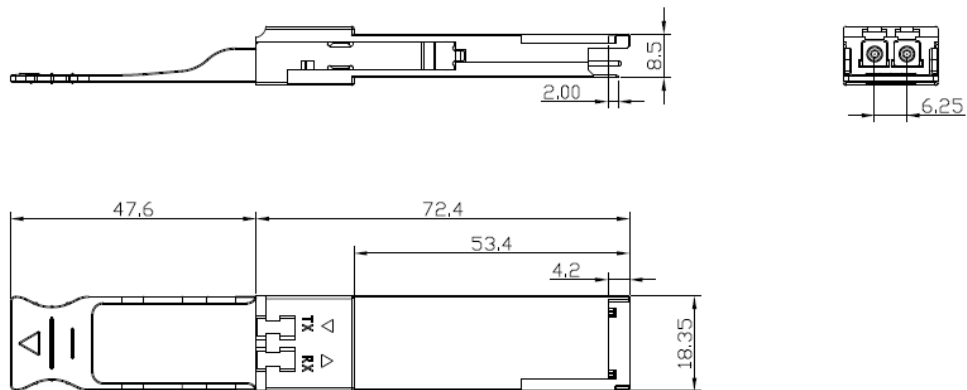
 Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	10 / 11

203			
204			
205			
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209			
210			
211			
212			
213			
214			
215	Date Code	Programmed with manufacturing date	
216			
217			
218			
219	Lot Number	Programmed with manufacturing lot	
220	Diagnostic Monitoring Type		8
221	Enhanced Options		0
222	Reserved	Reserved	Reserved
223	CC_EXT	Address 192-222	
224-255	Vendor Specific EEPROM		

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 CRE Communication Limited	Datasheet		DS10-U003 Final Rev.: 2017-12-28	
	Product	100G QSFP28 transceiver OU serials	Ver.	000
	Part No.	OU8S341	Rev.	000
			Page	11 / 11

10. Mechanical Dimensions



ESD

This transceiver is specified as ESD threshold 1KV for high speed data pins and 2KV for all others electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007)

11. Module Ordering information

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OU8S341	100G QSFP28 LR4 1310nm 10KM LC DDMI 0~70 °C

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