

# S281304025xF – SFP28 Dual Fibre

1310nm / 40km\* / 25GBASE-ER

\* As per IEEE 802.3cc-2017, links above 30km are considered engineered links and performance cannot be guaranteed

For your product safety, please read the following information carefully before any manipulation of the transceiver:



**ESD**

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



**LASER SAFETY**

This is a Class1 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).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

## 1. Overview

S281304025xF is a high-performance transceiver module for up to 25 Gigabit Ethernet data links over a single mode fibre pair. The maximum reach is 40km. The transmitter is a cooled 1310nm Distributed Feedback (DFB) laser, the receiver is an Avalanche Photodiode (APD).

This transceiver module is compliant with the Small Form-factor Pluggable (SFP+) and hot pluggable. Always contact Skylane Optics® commercial agents for compatibility with different equipment platforms.

## 2. Features

- SFP+ Multi-Source Agreement compliant (SFF-8431)
- Hot pluggable SFP+ footprint
- Serial ID functionality supported according to SFF-8472
- 25.781Gbps Serial Electrical Interface (CEI-28G-VSR)
- Dual LC Connector
- Cooled 1310nm DFB Transmitter
- APD Receiver
- Up to 40km Point-to-Point Transmission on Single Mode Fibre
- Built-in dual CDR
- Operating temperature range 0°C to 70°C or -40°C to 85°C
- Power Dissipation <1.8W
- Single +3.3V Power Supply

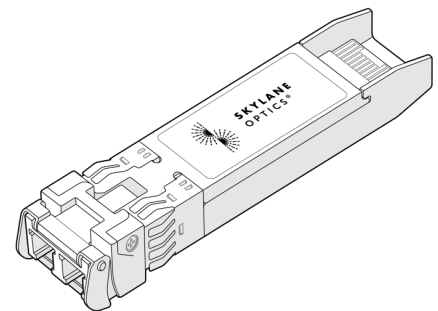


Figure 1. SFP28 Dual Fibre (non-binding illustration)

## 3. Applications

- 25x Gigabit Ethernet
- CPRI Option 10

## 4. Optical Interface

P/N	Wavelength [nm]	Protocol	Optical Output Power <sup>1</sup> [dBm]	Stressed Receiver Sensitivity <sup>2</sup> (OMA) [dBm]	Optical Receiver Overload <sup>3</sup> [dBm]	Link Length <sup>1,4</sup> [km]
<b>S281304025xF</b>	1310	25GBASE-ER	-3 to 6	≤ -16.5	-4	≤ 40

1. EOL over operating temperature range

2. Measured with 25.78Gbps, BER≤5×10<sup>-5</sup>, PRBS 2<sup>31</sup>-1

3. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers (optical loopback) before ensuring that proper optical attenuation is used

4. Cabled optical fibre as per IEEE 802.3-2012

## 5. Technical Parameters

5.1. Recommended Operating Conditions					
Parameter	Min	Typ	Max	Unit	Notes
Storage temperature	-40		85	°C	
Operating Case Temperature	0		70	°C	S2813040250F
	-40		85		S2813040252F
Relative Humidity	5		85	%	Non-Condensing
Power Supply Voltage	3.135	3.3	3.465	V	
Power Supply Current			520	mA	
Power Dissipation			1.8	W	

5.2. Transmitter Optical Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Data Rate		25.78125		Gbps	5
Average Output Power	-3		6	dBm	6, 7
Launched OMA	0		6		6, 8
Launched OMA minus TDP	-1			dBm	6
Centre Wavelength	1295		1310	nm	
Transmitter and Dispersion Penalty (TDP)			2.7	dB	
Extinction Ratio	4			dB	

5. IEEE 802.3-2012

6. Output power coupled into a 9/125 μm single mode fibre

7. Average launch power (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance

8. Even if the TDP is <1 dB, the launched OMA must exceed 0dBm

5.3. Receiver Optical Specifications					
Parameter	Min	Typ	Max	Unit	Notes
Operating Wavelength	1295		1325	nm	
Average Receive Power	-21		-4	dBm	9
Receiver Sensitivity (OMA)			-19	dBm	10
Stressed Receiver Sensitivity (OMA)			-16.5	dBm	11

9. Average receive power (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance

10. Maximum receiver sensitivity (OMA) is informative

11. Measured with 25.78Gbps, BER≤5×10<sup>-5</sup>, PRBS 2<sup>31</sup>-1

## 6. Transceiver Electrical Pad Layout

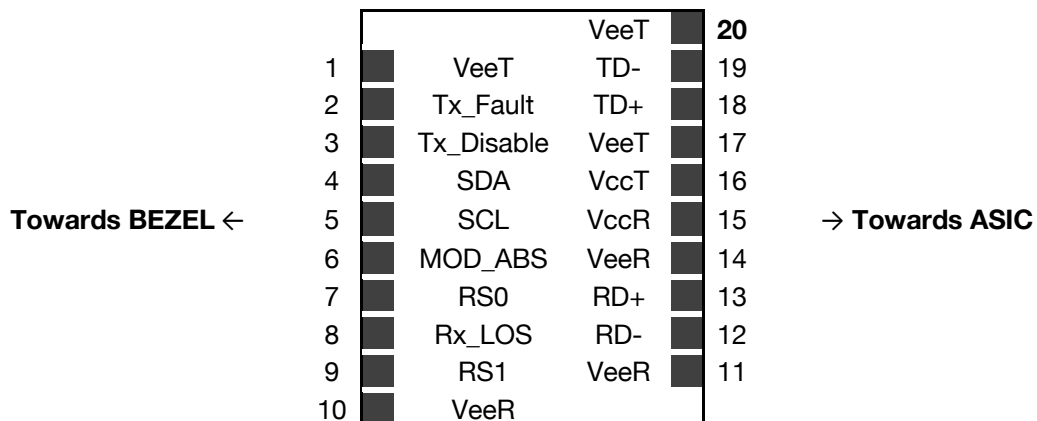


Figure 2. Transceiver Electrical Pad Layout

**7. Module Electrical Pin Definition**

Pin Number	Name	Function
1	VeeT	Module Transmitter Ground
2	Tx_Fault	Module Transmitter Fault
3	Tx_Disable	Transmitter Disable
4	SDA	2-Wire Serial Interface Data
5	SCL	2-Wire Serial Interface Clock
6	Mod_ABS	Module Absent
7	RS0	Rate Select 0
8	Rx_LOS	Receiver Loss of Signal
9	RS1	Rate Select 1
10	VeeR	Module Receiver Ground
11	VeeR	Module Receiver Ground
12	RD-	Receiver Inverted Data Output
13	RD+	Receiver Non-Inverted Data Output
14	VeeR	Module Receiver Ground
15	VccR	Module Receiver 3.3V Supply
16	VccT	Module Transmitter 3.3V Supply
17	VeeT	Module Transmitter Ground
18	TD+	Transmitter Non-Inverted Data Input
19	TD-	Transmitter Inverted Data Input
20	VeeT	Module Transmitter Ground

**8. EEPROM**

SFP+ MSA (SFF-8472)

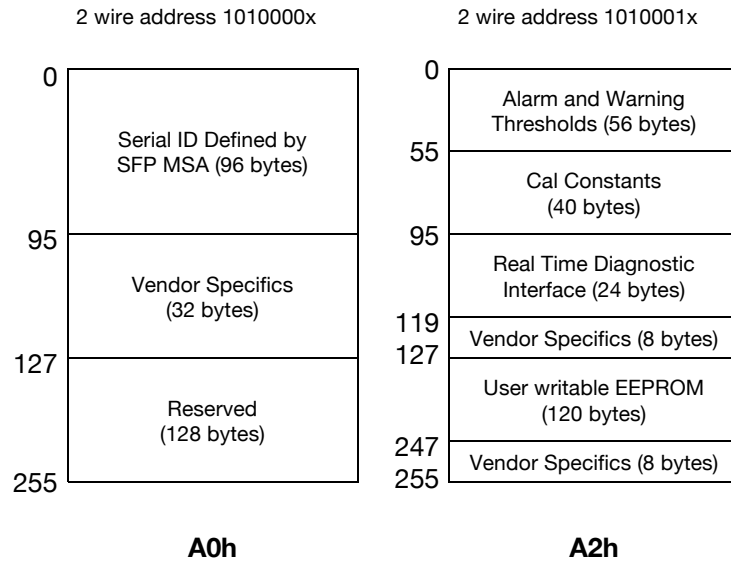


Figure 3. SFP28 Memory Map

## 9. Ordering Information

Part Number	Description
S2813040250F	SFP28 ER, 1310nm, Tx (DFB), Rx (APD), maximum distance 40km on SMF, 25x Gigabit Ethernet, dual LC connector, <b>0°C to 70°C</b> , DDM
S2813040252F	SFP28 ER, 1310nm, Tx (DFB), Rx (APD), maximum distance 40km on SMF, 25x Gigabit Ethernet, dual LC connector, <b>-40°C to 85°C</b> , DDM

## 10. Document Revision Information

Revision	Description
A	Initial release
B	Commercial temperature variant added

Skylane Optics® supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

For questions on this product please contact:  
**support@skylaneoptics.com**

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