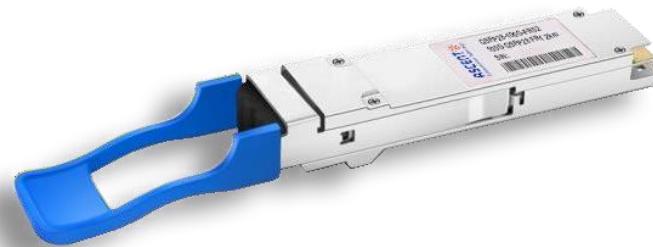


# 100G QSFP28 FR 2km Transceiver

## QSFP28 Series

- **IEEE 100GBASE-FR compliant**
- **100GE Single Protocol**
- **RS-FEC (544,514) FEC**  
**coder/decoder function**
- **Power Consumption < 3.5 W**
- **Operating case temperature:**  
**0 °C to +70 °C**
- **Single cooled 100Gb/s 1310nm EML**



Ascent's QSFP28 FR 100Gb/s transceiver is a compact, high-performance single-lambda optical module designed for 2 km transmission over single-mode fiber. Compliant with IEEE 100GBASE-FR, it delivers a reliable 100G Ethernet link in a QSFP28 form factor, making it ideal for high-density data center and enterprise network deployments.

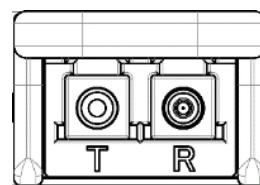
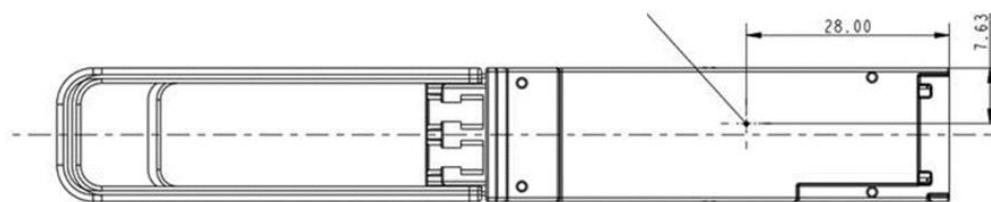
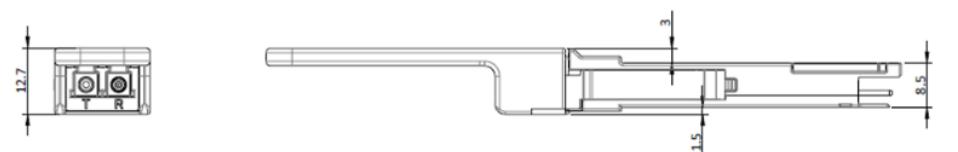
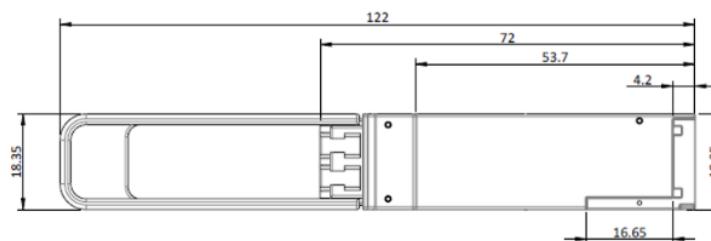
Leveraging PAM4 modulation and integrated DSP technology, the module converts four high-speed electrical lanes into a single 1310 nm optical wavelength, enabling efficient, cost-optimized short-reach connectivity. A cooled EML laser on the transmit side and a PIN photodiode receiver ensure stable signal performance and excellent link margin, while RS-FEC support enhances transmission robustness.

Designed for operational efficiency, the product offers low power consumption (<3.5 W) and supports standard digital diagnostic monitoring (DDM) for real-time performance visibility. With its proven reliability and compact footprint, it is well suited for switch-to-switch, router interconnect, and 100G data center networking applications.

## Key Features

- IEEE 100GBASE-FR compliant
- 100GE Single Protocol (103.125Gb/s)
- CAUI-4 compliant – 4 x 25.78Gb/s
- 100GAUI-4 compliant – 4 x 26.562Gb/s
- RS-FEC (544,514) FEC coder/decoder function
- Power Consumption < 3.5 W Max
- Operating case temperature: 0 °C to +70 °C
- Single cooled 100Gb/s 1310nm EML
- Single PIN PD + low-power TIA
- SFF-8636 management interface

## Outline Diagram



## Specifications

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V <sub>cc</sub>	0	+3.6	V	+3.3 V
Storage Temperature		-40	85	°C	
Optical Receiver Input		-	+5.5	dBm	Average

### Operating Environment

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V	
Supply Voltage Noise Tolerance	PSNR	-	-	66	mV	10 Hz to 10 MHz
Maximum Power Consumption		-	-	3.5	W	Target
Power Supply Current	--	-		1010.1	mA	Steady state
Operating Case Temperature T <sub>c</sub>	0	25		70	°C	

### Optical Characteristics

Parameter	Min.	Typ.	Max.	Unit	Note
-----------	------	------	------	------	------

#### Transmitter

PAM4 Signaling Rate		53.125 ± 100 ppm		GBd	
Lane Wavelengths		1304.5 to 1317.5		nm	
Side-Mode Suppression Ratio (SMSR)	30			dB	
Average Launch Power	-3.1		4	dBm	1
Outer Optical Modulation Amplitude (OMAouter) for TDECQ <1.4 dB	-0.1		4.2	dBm	
Outer Optical Modulation Amplitude (OMAouter) for 1.4 dB ≤TDECQ ≤3.4 dB	-1.5 + TDECQ			dBm	
Transmitter and Dispersion Penalty Eye Closure for PAM4 (TDECQ)			3.4	dB	
TDECQ – TECQ			2.5	dB	
Over/Under-Shoot			22	%	
Transmitter Power Excursion			2	dBm	
Average Launch Power of OFF Transmitter			-15	dBm	
Extinction Ratio	3.5			dB	
Optical Return Loss Tolerance			17.1	dB	
Transmitter Reflectance			-26	dB	2
Transmitter Transition Time			17	ps	
RIN15.5 OMA			-136	dB/Hz	

#### Receiver

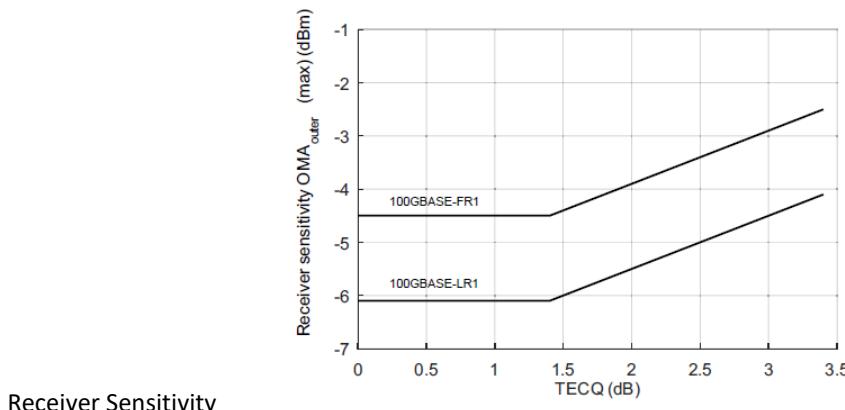
PAM4 Signaling Rate		53.125 ± 100 ppm		GBd	
Lane Wavelengths		1304.5 to 1317.5		nm	
Damage Threshold	5			dBm	3
Average Receive Power	-7.1		4	dBm	4
Receive Power (OMAouter)			4.2	dBm	
Receiver Reflectance			-26	dB	
Receiver Sensitivity (OMAouter)			-4.5, TECQ -5.9	dBm	
Stressed Receiver Sensitivity (OMAouter)			-2.5	dBm	5

Parameter	Min.	Typ.	Max.	Unit	Note
<b>Conditions of Stressed Receiver Sensitivity Test</b>					
Stressed Eye Closure for PAM4 (SECQ)	3.4		-	dB	6
SECQ – 10*Log10(Ceq)			-	dB	7

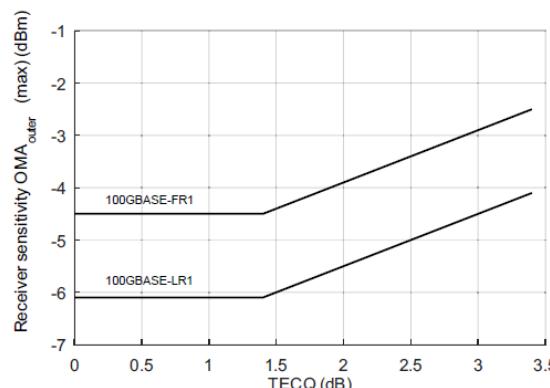
**Notes:**

1. Average launch power, each lane (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.
2. Transmitter reflectance is defined looking into the transmitter.
3. The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level.
4. Average receive power, each lane (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.
5. Measured with conformance test signal at TP3 (see 100G Lambda MSA 100G-FR - "Technical Specification, Rev. 2.0 clause 3.11) for the BER specified in IEEE Std 802.3cd clause 140.1.1.
6. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.
7. Ceq is a coefficient defined in IEEE Std 802.3-2018 clause 121.8.5.3 which accounts for reference equalizer noise enhancement.

OMA Outer



Receiver Sensitivity



## RX\_LOS Characteristics

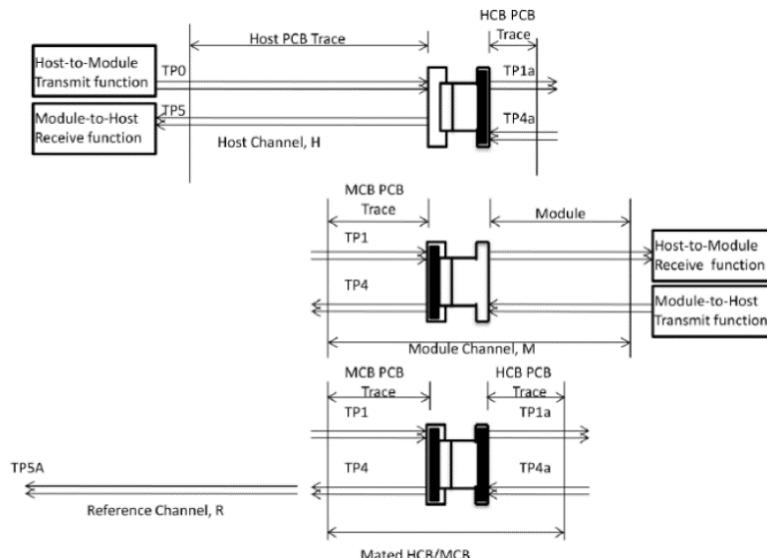
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver Loss of Signal Indicator Assert Level	RX_LOS	-30	-	-7.5	dBm	Average power
Receiver Loss of Signal Indicator De-assert Level	RX_LOS	-	-	-7	dBm	Average power

## Electrical Characteristics

Parameter	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter (Each Lane)</b>					
Differential Pk-Pk Input Voltage Tolerance	900	-	-	mV	at TP1a
Differential Termination Mismatch	-	-	10	%	at TP1
Single-Ended Input Voltage Tolerance Range	-0.4 to -3.3		-	V	at TP1a
DC Common Mode Voltage	-350	-	2850	mV	at TP1
<b>Receiver (Each Lane, at TP4)</b>					
AC Common-Mode Output Voltage (RMS)	-	-	17.5	mV	
Differential Output Voltage	-	-	900	mV	
Eye Width	0.57	-	-	UI	
Eye Height, Differential	228	-	-	mV	
Vertical Eye Closure	-	-	5.5	dB	
Differential Termination Mismatch	-	-	10	%	
Transition Time (20% to 80%)	12	-	-	ps	
DC Common Mode Boltage	-350	-	2850	mV	

**Note:** Electrical Rx output is squelched for loss of optical input signal.

## Reference Test Points



## Ordering Information

### Product Name

QSFP28-100G-FR02

### Product Description

QSFP28 Plug-in, 100GBASE-FR, Single Channel 1310nm, SMF 2km Optical Transceiver, LC, DOM

## Contact Information



### Ascent Communication Technology Ltd

#### AUSTRALIA

140 William Street, Melbourne  
Victoria 3000, AUSTRALIA  
Phone: +61-3-8691 2902

#### CHINA

Unit 1933, 600 Luban Road  
200023, Shanghai, CHINA  
Phone: +86-21-60232616

#### EUROPE

Pfarrer-Bensheimer-Strasse 7a  
55129 Mainz, GERMANY  
Phone: +49 (0) 6136 926 3246

**WEB:** [www.ascentcomtec.com](http://www.ascentcomtec.com)

#### Hong Kong SAR

Room 1210, 12th Floor, Wing Tuck Commercial Centre  
181 Wing Lok Street, Sheung Wan , Hong Kong SAR  
Phone: +852-2851 4722

#### USA

2710 Thomes Ave  
Cheyenne, WY 82001, USA  
Phone: +1 203 350 9822

#### VIETNAM

11th Floor, Hoa Binh Office Tower  
106 Hoang Quoc Viet Street, Nghia Do Ward  
Cau Giay District, Hanoi 10649, VIETNAM  
Phone: +84-24-37955917

**EMAIL:** [sales@ascentcomtec.com](mailto:sales@ascentcomtec.com)

Specifications and product availability are subject to change without notice.

Copyright © 2026 Ascent Communication Technology Limited. All rights reserved.

Ver. ACT\_QSFP28-100G-FR02\_Datasheet\_V2a\_Nov\_2020