

QSFP28 100Gb/s EZR4 Transceiver 100km



QSFP Series

- **Line rates from 103.125 Gb/s**
- **Lane bit rate 25.78 Gb/s 100GE**
- **Up to 100km transmission with KR4-FEC**
- **QSFP28 MSA package with simplex LC connector**
- **Single +3.3V power supply**
- **Maximum power consumption 6W**
- **Compliant to 802.3cu, SFF-8636&SFF-8679 standard**
- **Complies with EU Directive 2015/863/EU**

The Q28-100G-LP100 100 Gb/s QSFP28 EZR4 Transceiver is a high-capacity optical module designed for long-distance data transmission up to 100 kilometers over single-mode fiber. Supporting 100 Gbps speeds, it's ideal for telecommunications and data centers needing robust, high-speed connectivity. With its QSFP28 form factor and hot-pluggable design, the EZR4 contains 4-lane optical transmitter, 4-lane optical receiver and module management block including 2 wire serial inter-face.

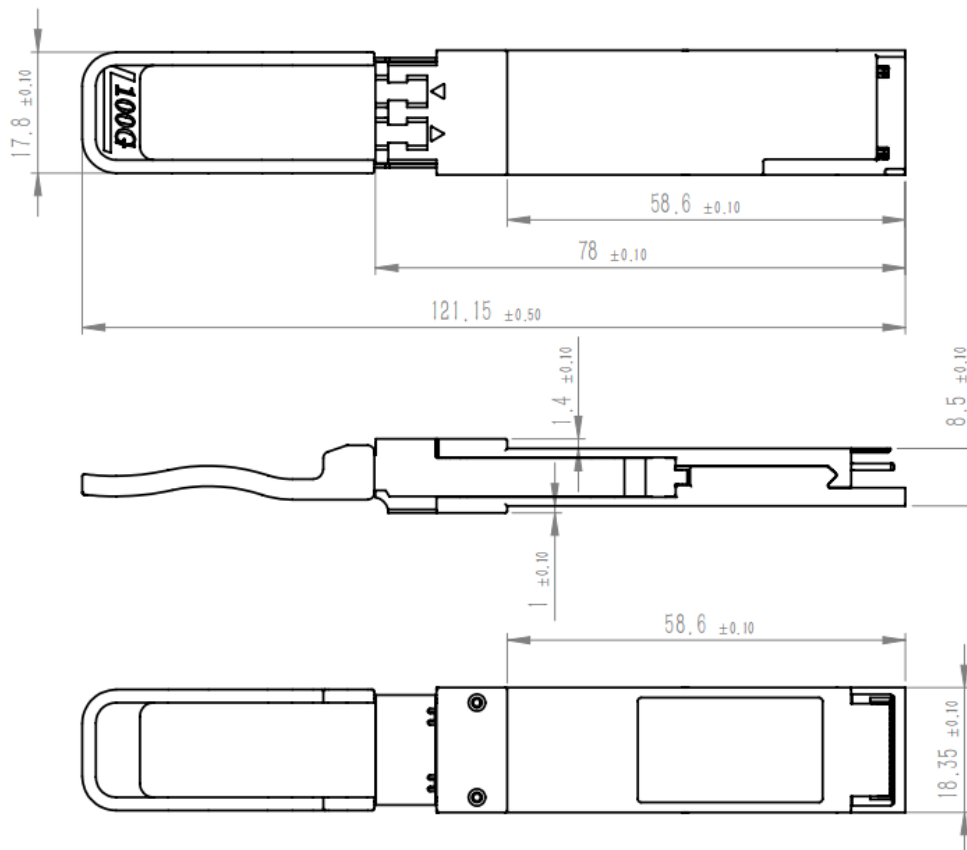
This transceiver stands out with its Extended Reach (EZR) capability, enabling reliable data transport over 100 km, making it suited for metropolitan and inter-city networks. Its advanced optical technology ensures minimal signal loss over long distances while maintaining low power consumption.

Designed for reliability, the EZR4 includes digital diagnostics monitoring (DDM), offering real-time metrics like temperature and output power for proactive management. Compliant with QSFP28 MSA standards, it ensures compatibility and performance across networks, making it a cost-effective solution for long-range, high-speed data needs.

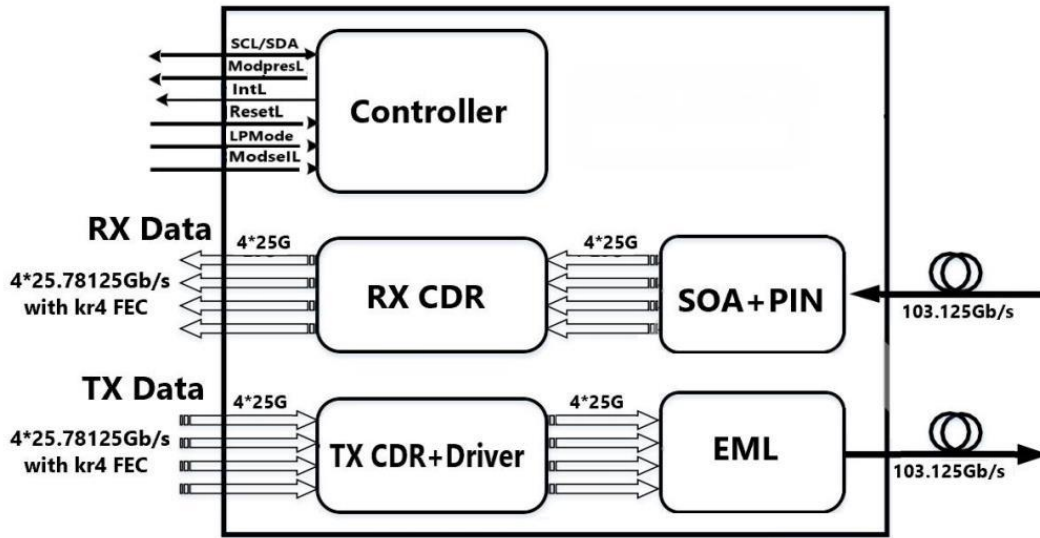
Key Features

- Support line rates from 103.125 Gb/s
- Lane bit rate 25.78 Gb/s 100GE
- Up to 100km transmission with KR4-FEC
- LAN WDM EML laser and PIN receiver with SOA
- Support Multi-Pin function with IntL/RxLOSL and LPMode/TxDIS
- High speed I/O electrical interface (CAUI-4)
- I2C interface with integrated Digital Diagnostic monitoring
- QSFP28 MSA package with duplex LC connector
- Single +3.3V power supply
- Maximum power consumption 6W
- Operating case temperature: 0 to +70 °C
- Complies with EU Directive 2015/863/EU

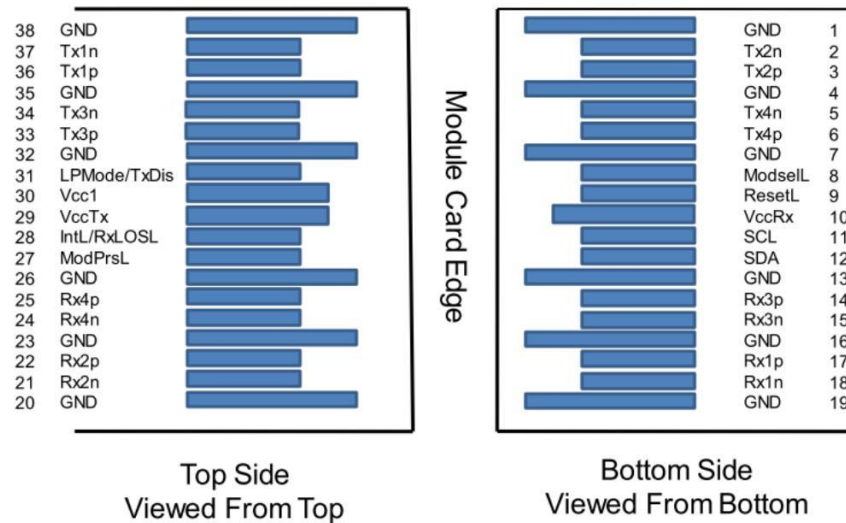
Mechanical Dimension



Transceiver Block Diagram



Pin Assignment



Pin	Logic	Symbol	Description	Plug Seq.	Note
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	
4		GND	Ground	1	1
5		Tx4n	Transmitter Inverted Data Input	3	
6		Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1
8	LVTLL-I	ModSelL	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+ 3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL/Rx_LOS	Interrupt/Rx_LOS	3	
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2

Pin	Logic	Symbol	Description	Plug Seq.	Note
31	LVTTL-I	LPMMode/TxDIS	Low Power Mode/Tx_Disable	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Output	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

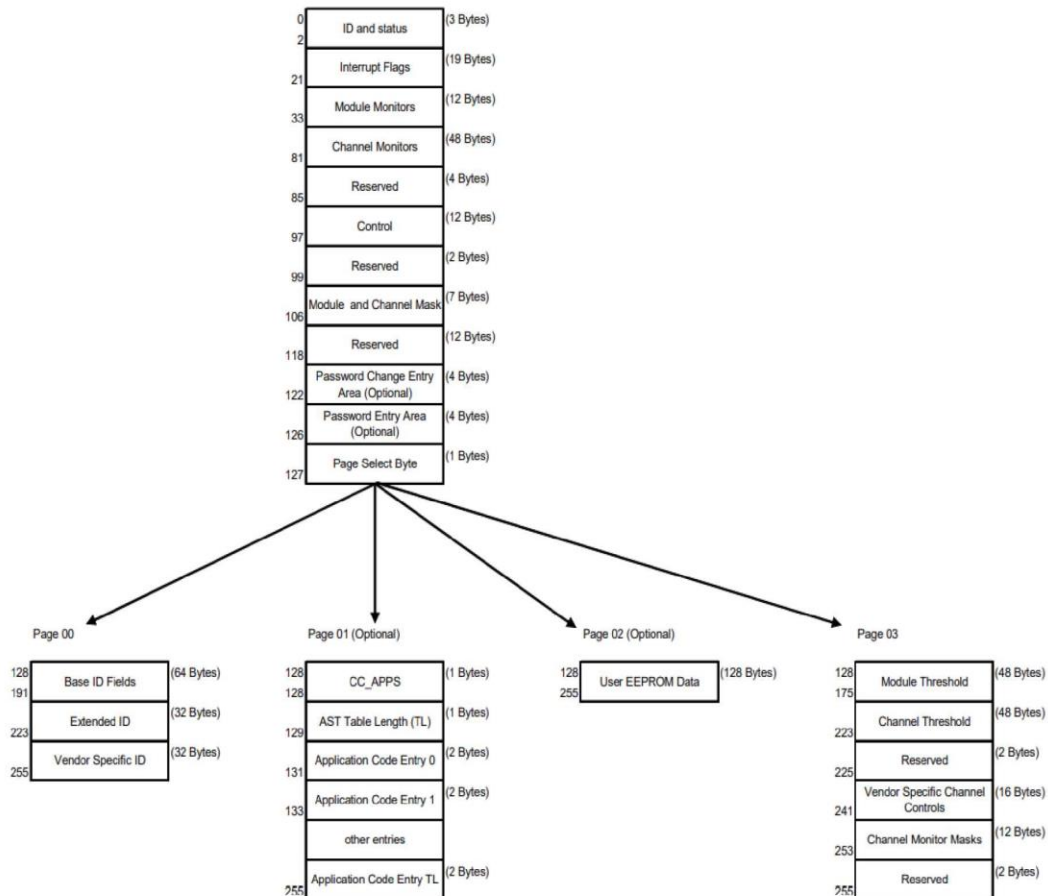
Notes:

1. GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 mod and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in MSA. The connector pins are each rated for a maximum current of 500 mA.

EEPROM Information

EEPROM memory map specific data field description is as below

2-wire serial address, 1010000x (A0h)*



Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	T _s	-40	+85	°C	
Supply Voltage	V _{cc}	-0.5	+4.0	V	
Operating Relative Humidity	RH		+85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	T _c	0		+70	°C	
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Power Supply Current	I _{cc}			1.82	A	
Maximum Power Consumption	P _D			6	W	
Aggregate Bit Rate	BR _{AVE}		103.125		Gb/s	
Lane Bit Rate	BR _{LANE}		25.78125		Gb/s	
Transmission Distance	TD			100	km	
Coupled Fiber	Single mode fiber					9/125um SMF

Optical and Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane			25.78125		Gbps	
Lane Wavelength	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	
Total Launch Power, 100GE	P _T	9		12.5	dBm	1
Average Launch Power per Lane,	P _{avg}	3		6.5	dBm	1
OMA, each Lane	P _{OMA}	4.2		7.7	dBm	1
Difference in Launch Power between Any Two Lanes(Average and OMA) between Any Two Lanes (OMA)	P _{tx,diff}			3	dB	
Average Output Power (Laser Turn off)	P _{off}			-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio, 100GE	ER	6			dB	
RIN20OMA	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Reflectance	R _T			-12	dB	
Optical Eye Mask	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}				%	2
Receiver						
Signaling Rate, each Lane			25.78125		Gbps	
Center Wavelength Lane 0	λ ₀	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ ₁	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ ₂	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ ₃	1308.09	1309.14	1310.19	nm	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Damage threshold , each Lane	Pdamage	5.5			dBm	
Average Receive Power, each Lane		-31		-6	dBm	3
Receiver Sensitivity Average, each Lane	SEN			-30	dBm	3
Los Assert	LosA	-40			dBm	
Los De-assert	LosDA			-28	dBm	

Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS 231 -1 test pattern @25.78125, Hit ratio≤5E-5.
3. Measured with a PRBS 231 -1 test pattern @25.78125 Gb/s, BER≤5E-5.

Electrical Characteristics

High-Speed Signal: Compliant to CAUI-4 (IEEE 802.3bm)

Low-Speed Signal: Compliant to SFF-8679.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter(Module Input)						
Data Rate, each Lane			25.78125		Gbps	
Differential Voltage Pk-Pk	Vpp			900	mV	1
Common Mode Voltage	Vcm	-350		2850	mV	
Transition Time	Trise/Tf all	10			ps	2
Receiver (Module Output)						
Data Rate, each Lane			25.78125		Gbps	
Common Mode Noise, RMS	Vrms			17.5	mV	
Differential Output Voltage Swing	Vout, pp			900	mV	
Eye Width	EW15	0.57			UI	
Eye Height	EH15	228			mV	
Differential Termination Resistance Mismatch				10	%	1
Transition Time	Trise/Tf all	12			ps	

Notes:

1. At 1 MHz.
2. 20% to 80%.

Digital Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to 70	°C	±3	Internal / External
Voltage	3.0 to 3.6	V	±3	Internal / External
Bias Current	30 to 100	mA	±10%	Internal / External
Tx Power	1 to 6.5	dB	±3	Internal / External
Rx Power	-29 to 4.5	dB	±3	Internal / External

Ordering Information

Product Name	Product Description
Q28-100G-LP100	QSFP28 Plug-in, compatible with QSFP-100G-eZR4 (with FEC), 100 km Optical Transceiver, Duplex LC, DOM

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