E.C.I. NETWORKS

TECHNICAL DATASHEET

100G QSFP28 BiDi LR1 Optical Transceiver

Single-lambda 100Gb/s bidirectional link over 10 km of single-mode fiber

100G ETHERNET | SIMPLEX LC · 10 KM | 1271 / 1331 NM

NOTICE

Specification and Qualification Notes

Specifications apply to the standard ECIN commercial-temperature 100G QSFP28 BiDi LR1 configuration, rated at 4.5 W maximum power consumption.

Industrial-temperature versions are retained in the ECIN ordering family but are subject to separate variant-specific validation. Host interoperability and FEC operation require qualification for the specified platform and module configuration. Confirm the actual module configuration and host requirements before deployment.

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OVERVIEW

100 Gigabit Ethernet over one optical fiber

ECIN 100G QSFP28 BiDi LR1 transceivers provide bidirectional Ethernet optical transport over one single-mode fiber. Each link requires complementary transmitter and receiver wavelengths: 1271 nm TX / 1331 nm RX at one end, and 1331 nm TX / 1271 nm RX at the other. The interface uses a simplex LC connector.

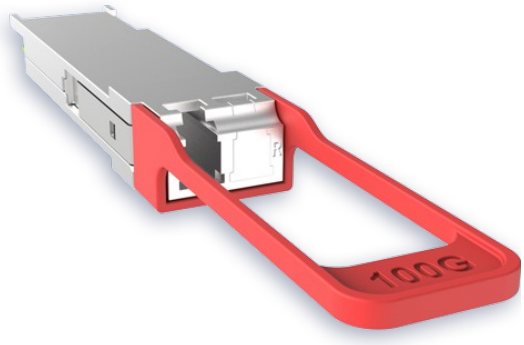
The product uses a single-lambda PAM4 optical signal and a four-lane electrical QSFP28 host interface. Digital diagnostic monitoring and module control are provided over the QSFP28 two-wire I²C management interface.

PRODUCT APPEARANCE

Transceiver mechanical views



BXU — angled product view (purple pull tab)



BXD — angled product view (red pull tab)

FEATURES

Standard commercial module

PARAMETER	SPECIFICATION
Form factor	QSFP28; MSA package
Ethernet rate	100 Gb/s class; single optical lane PAM4
Host electrical interface	4 × 25G-class lanes
Fiber and connector	Single-mode fiber (SMF), simplex LC
Maximum optical reach	10 km
Nominal TX/RX wavelengths	1271/1331 nm or complementary 1331/1271 nm
Maximum electrical power	4.5 W (standard commercial configuration)

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PARAMETER	SPECIFICATION
Supply voltage	3.3 V nominal
Case temperature	0°C to +70°C (commercial)
Management and diagnostics	I²C two-wire digital diagnostics; TX_DISABLE; RX_LOS via status and IntL

ORDERING INFORMATION

ECIN part numbers and wavelength pairing

ECIN PART NUMBER	TX / RX	TEMPERATURE
EN-QSFP28-BXU10-xx	1271 nm / 1331 nm	Commercial: 0°C to +70°C
EN-QSFP28-BXD10-xx	1331 nm / 1271 nm	Commercial: 0°C to +70°C
EN-QSFP28-BXIU10-xx	1271 nm / 1331 nm	Industrial: −40°C to +85°C*
EN-QSFP28-BXID10-xx	1331 nm / 1271 nm	Industrial: −40°C to +85°C*

Each 10 km link uses one U-direction and one D-direction module. The -xx suffix identifies OEM compatibility. *Industrial versions are ECIN family options; their electrical, optical and temperature ratings require variant-specific verification.

OPTICAL CHARACTERISTICS

Transmitter optical limits

PARAMETER	MINIMUM	MAXIMUM	UNIT
1271 nm wavelength	1264.5	1277.5	nm
1331 nm wavelength	1324.5	1337.5	nm
Average launch power	−1.4	+4.5	dBm
Transmitter OMAouter	+0.7	+4.7	dBm

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PARAMETER	MINIMUM	MAXIMUM	UNIT
TDECQ	—	3.4	dB
Extinction ratio	3.5	—	dB
Side-mode suppression ratio	30	—	dB
OFF-state optical output	—	−30	dBm

OPTICAL CHARACTERISTICS

Receiver optical limits

PARAMETER	VALUE	UNIT
Average receiver input power range	−7.7 to +4.5 (ECIN Rev. 1.0)	dBm
Receiver sensitivity (OMA)	≤ −6.1	dBm
Stressed receiver sensitivity	≤ −4.1	dBm
Receiver damage threshold	+5.5	dBm
Receiver reflectance	≤ −26	dB
LOS status	Reported via QSFP28 I²C status registers and IntL	—

> **Optical parameters and receiver thresholds must be checked against the actual supplied ECIN product configuration during qualification and acceptance testing.**

OPERATING CONDITIONS

Electrical and environmental ratings

PARAMETER	STANDARD COMMERCIAL MODULE
Nominal voltage	3.3 V

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PARAMETER	STANDARD COMMERCIAL MODULE
Supply voltage range	3.13 to 3.47 V
Maximum power consumption	4.5 W
Case operating temperature	0°C to +70°C
Storage temperature	−40°C to +85°C
Electrical interface	Four-lane QSFP28 host data interface
Connector	Simplex LC

MANAGEMENT AND CONTROL

TX_DISABLE, RX_LOS and diagnostics

FUNCTION	DESCRIPTION
TX_DISABLE	Transmitter disable supported through the QSFP28 I²C management interface; no dedicated TDIS pin is required.
RX_LOS	Receiver loss-of-signal status reported through QSFP28 I²C status registers and IntL.
LOS timing	RX_LOS status-flag assertion time: up to 100 ms.
Module monitor	I²C serial management and digital diagnostic monitoring; consult the production-specific register map for actual addresses/bit fields.
Low-speed signals	Low-speed QSFP28 interface signals include ModSelL, ResetL, LPMode, ModPrsL and IntL.

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HOST QUALIFICATION

Standards, FEC and interoperability

TOPIC	NOTES
Form factor / optical architecture	QSFP28 MSA; 100G Single Lambda MSA optical specification and IEEE 802.3cu interoperability.
Optical modulation	PAM4 single optical lane; nominal 53.125 GBd signaling.
Forward error correction	Original ECIN Rev. 1.0 references internal KP4 FEC and shutdown capability; verify implementation and host negotiation for the specific production variant.
Host electrical lanes	Four 25G-class electrical lanes.
OEM acceptance	ECIN validates OEM platform interoperability through device-specific qualification; coding alone does not establish interoperability.
Safety and compliance	Original ECIN datasheet cites RoHS and Class 1 laser; obtain production certificates where required.

APPLICATION NOTES

Pairing and deployment considerations

Deploy one BXU with one BXD, or one BXIU with one BXID, across a single-mode fiber span. Two modules with the same TX/RX direction do not form a valid BiDi pair. Validate optical loss budget, connector condition, FEC behavior, host acceptance, module temperature, and I²C control/status operation on the target platform.

Industrial-temperature part numbers are listed as available ECIN ordering variants. Their operating ratings and qualification status must be verified separately before customer commitment.

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CONTACT US

LET'S CONNECT

Contact Us

Contact ECIN for 100G BiDi optics, host interoperability and qualification support.

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