

**TECHNOLOGIE OPTIC.CA INC.****ACM7614V-11100S****100 Gigabit QSFP28 SR4 Optical Transceiver**

850 nm · MTP/MPO · up to 100 m OM4 · full DDM · Optic.ca Q28-SR4-NT-OC

The Optic.ca ACM7614V-11100S is a 100 Gigabit QSFP28 optical transceiver that delivers four independent 25.78 Gb/s lanes for an aggregate 100GBASE-SR4 link over parallel multimode fiber (MTP/MPO). Built around a four-channel 850 nm VCSEL array and a matched PIN photodetector array, it delivers reliable 100 Gb/s transport over OM3 and OM4 fiber and is designed for seamless interoperability with standards-compliant QSFP28 ports, with full validation against NETGEAR® switching platforms. Each unit is individually serialized and validated for host platform compatibility prior to shipment, factory-coded and traffic-tested, provides full SFF-8636 digital diagnostics, and is backed by the Optic.ca lifetime warranty.

Key Features

- 100GBASE-SR4 compliant per IEEE 802.3bm (Clause 95)
- Four independent full-duplex lanes; 25.78 Gb/s per lane (NRZ) for 100 Gb/s aggregate
- Four-channel 850 nm VCSEL array transmitter and PIN photodetector array
- MTP/MPO-12 parallel multimode interface
- Reach to 70 m (OM3) / 100 m (OM4)
- QSFP28 MSA-compliant; CAUI-4 (4 × 25.78 Gb/s) electrical interface
- Full SFF-8636 digital diagnostic monitoring (DDM/DOM)
- Field-programmable EEPROM for host-platform compatibility coding
- Certified compatible with NETGEAR® switching platforms
- Single +3.3 V supply; ≤ 3.5 W power consumption
- Commercial temperature range, 0 to 70 °C
- All-metal housing for superior EMI performance
- TAA compliant (Country of Origin: Taiwan); RoHS and REACH compliant; Class 1 laser

Target Applications

- 100 Gigabit Ethernet data-center fabrics
- Top-of-rack to leaf/spine aggregation
- High-performance computing and InfiniBand clusters
- Rack-to-rack and storage-area-network interconnect

Ordering Information

Part Number	Description
ACM7614V-11100S	100GBASE-SR4 QSFP28 transceiver, 850 nm, OM3/OM4 MMF, MTP/MPO-12, full DDM, pull-tab latch; NETGEAR® Certified Compatible

Standards Compliance

The ACM7614V-11100S is designed and manufactured to comply with the applicable standards listed below. These statements indicate conformance to the referenced specifications; they do not constitute third-party certification, agency listing, registration, or regulatory approval unless explicitly stated otherwise.

Standard / Program	Detail
Interface & MSA	
IEEE 802.3bm	100GBASE-SR4 PMD (Clause 95)
SFF-8665	QSFP28 4X pluggable transceiver MSA — form factor
SFF-8679	QSFP28 4X hardware and electrical specification
SFF-8636	QSFP28 management interface and digital diagnostics
Safety	
IEC/EN 60825-1:2014	Class 1 laser product
21 CFR 1040.10 and 1040.11	Complies except for deviations pursuant to Laser Notice No. 56 (May 8, 2019)
IEC/EN 62368-1	Designed to conform — AV/ICT equipment safety
Electromagnetic Compatibility	
FCC 47 CFR Part 15, Subpart B	Designed to conform to Class A limits (USA)
ICES-003	Designed to conform to Class A limits (Canada)
CISPR 32 / EN 55032	Designed to conform — emissions limits
CISPR 35 / EN 55035	Designed to conform — immunity requirements
Environmental & Trade	
EU RoHS (2011/65/EU, incl. 2015/863)	Compliant
REACH (EC 1907/2006)	Compliant
Trade Agreements Act (TAA)	Compliant — Country of Origin: Taiwan

Note: EMC and product safety for a pluggable component are determined at the host-equipment level. The module is designed to conform to the listed limits and requirements when installed in compliant host equipment.

Operating Distance

Fiber Type	Effective Modal Bandwidth	Supported Distance
OM3 multimode	2000 MHz·km	Up to 70 m
OM4 multimode	4700 MHz·km	Up to 100 m

Reach values per IEEE 802.3bm for 100GBASE-SR4 over MTP/MPO parallel multimode fiber, within the standard channel insertion-loss budget. 100GBASE-SR4 does not employ module-level FEC.

Optical Specifications

Defined over the recommended operating conditions unless otherwise noted. The parameters below are the same for each lane.

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter (per lane)						
Center wavelength	λ_C	840	850	860	nm	—
RMS spectral width	$\Delta\lambda$	—	—	0.6	nm	—
Average launch power	PAVG	-8.4	—	2.4	dBm	—
Optical modulation amplitude (OMA)	POMA	-6.4	—	3.0	dBm	1
Launch-power difference between any two lanes (OMA)	Ptx,diff	—	—	4.0	dB	—
Launch power (OMA) minus TDEC	—	-7.3	—	—	dBm	—
Transmitter and dispersion eye closure	TDEC	—	—	4.3	dB	—
Extinction ratio	ER	3.0	—	—	dB	—
Optical return-loss tolerance	TOL	—	—	12	dB	—
Average launch power OFF transmitter	Poff	—	—	-30	dBm	—
Receiver (per lane)						
Center wavelength	λ_C	840	850	860	nm	—
Damage threshold	THd	3.4	—	—	dBm	2
Average receive power		-10.3	—	2.4	dBm	—
Receiver reflectance	RR	—	—	-12	dB	—
Receive power (OMA)		—	—	3.0	dBm	—
Receiver sensitivity (OMA)	SEN	—	—	-9.2	dBm	3
Stressed receiver sensitivity (OMA)		—	—	-5.2	dBm	3
LOS assert	LOSA	-30	—	—	dBm	—
LOS deassert	LOSD		—	-12	dBm	—
LOS hysteresis	LOSH	0.5	—	—	dB	—

Encircled flux: $\geq 86\%$ at $19\ \mu\text{m}$ and $\leq 30\%$ at $4.5\ \mu\text{m}$.

Transmitter eye-mask $\{X1, X2, X3, Y1, Y2, Y3\} = \{0.30, 0.38, 0.45, 0.35, 0.41, 0.50\}$ at 5×10^{-6} hits/sample.

Note 1: Even where TDP < 0.9 dB, the OMA minimum must still exceed the value specified above.

Note 2: The receiver tolerates continuous exposure to a modulated optical input at this level on one lane without damage; correct operation is not implied at this input power.

Note 3: Measured with a conformance test signal at the receiver input for BER = 1×10^{-12} . Stressed-sensitivity test conditions: stressed eye closure 4.3 dB, J2 jitter 0.39 UI, J4 jitter 0.53 UI, aggressor-lane OMA 3 dBm, stressed-eye mask $\{0.28, 0.50, 0.50, 0.33, 0.33, 0.40\}$.

Electrical Specifications

Defined over the recommended operating conditions unless otherwise noted.

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Power consumption	—	—	—	3.5	W	—
Supply current	ICC	—	—	1060	mA	—
Power-on initialization time	—	—	—	2000	ms	1
Transmitter (per lane)						
Single-ended input voltage tolerance	—	-0.3	—	3.6	V	2
AC common-mode input voltage tolerance	—	—	—	15	mV RMS	—
Differential input voltage swing threshold (LOS)	—	—	—	50	mVpp	—
Differential input voltage swing	V _{in,pp}	180	—	1000	mVpp	—
Differential input impedance	Z _{in}	90	100	110	Ω	—
Total jitter	—	—	—	0.40	UI	—
Deterministic jitter	—	—	—	0.15	UI	—
Receiver (per lane)						
Single-ended output voltage	—	-0.3	—	4	V	—
AC common-mode output voltage	—	—	—	7.5	mV RMS	—
Differential output voltage swing	V _{out,pp}	300	—	900	mVpp	—
Differential output impedance	Z _{out}	90	100	110	Ω	—
Total jitter	—	—	—	0.3	UI	—
Deterministic jitter	—	—	—	0.15	UI	—

Note 1: Time from supply voltages reaching and remaining above the minimum recommended levels until the module is fully functional.

Note 2: Allowable range of the instantaneous single-ended input signal.

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Storage temperature	TS	-40 to +85	°C
Operating case temperature	TOP	0 to +70	°C
Power supply voltage	VCC	-0.5 to +3.6	V
Relative humidity (non-condensing)	RH	0 to 85	%
Damage threshold, each lane	THd	3.4	dBm

Operation in excess of any single absolute-maximum rating, even briefly, may cause permanent damage to the module.

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating case temperature	TOP	0	—	70	°C
Power supply voltage	VCC	3.135	3.3	3.465	V
Data rate, each lane	—	—	25.78125	28.05	Gb/s
Control input voltage, high	—	2	—	VCC	V
Control input voltage, low	—	0	—	0.8	V
Link distance, OM3	D1	—	—	70	m
Link distance, OM4	D2	—	—	100	m

Digital Diagnostic Monitoring

The module provides real-time digital diagnostic monitoring through the 2-wire serial interface, compliant with SFF-8636. Per-lane optical transmit and receive power, laser bias current, module temperature, and supply voltage are reported continuously, with alarm and warning thresholds for proactive link management.

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor, absolute error	DMI_Temp	-3	+3	°C	over operating temp.
Supply-voltage monitor, absolute error	DMI_VCC	-0.15	+0.15	V	over full range
Channel RX power monitor, absolute error	DMI_RX_Ch	-2	+2	dB	1
Channel bias-current monitor	DMI_Ibias_Ch	-10%	+10%	—	Ch1–Ch4
Channel TX power monitor, absolute error	DMI_TX_Ch	-2	+2	dB	1

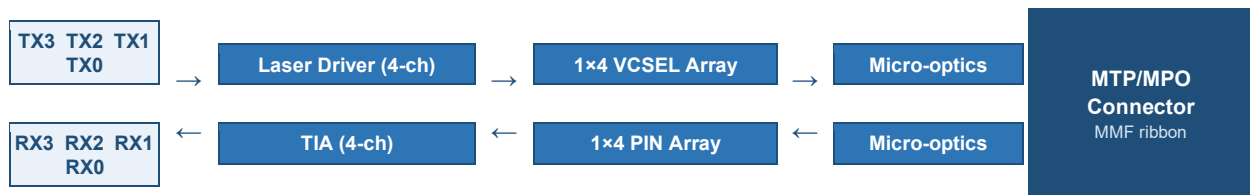
Note 1: Owing to measurement variation across multimode fibers, an additional ± 1 dB may apply, for a total accuracy of ± 3 dB.

Functional Overview

The transmitter converts four lanes of CML-level differential electrical data into parallel optical signals through a four-channel 850 nm VCSEL array driven by an integrated laser driver. The receiver converts the four parallel optical inputs back to CML-level differential electrical outputs through a PIN photodetector array followed by a four-channel transimpedance amplifier. All high-speed data lanes are differential and internally terminated.

A single +3.3 V supply powers the module. Seven low-speed control pins are provided per the QSFP28 MSA — ModSelL, SCL, SDA, ResetL, LPMode, ModPrsL, and IntL — with ModSelL allowing several modules to share one 2-wire bus, ResetL forcing a full module reset, LPMode capping power for thermally constrained hosts, ModPrsL signalling insertion, and IntL flagging fault or status conditions to the host.

Figure 1. Transceiver block diagram



Host Interface & Pin Assignment

The module mates with the host through the 38-pin MSA-compliant QSFP28 card-edge connector. Ground is common throughout the module; VccRx, Vcc1, and VccTx may be internally connected in any combination and must be applied concurrently. Each connector pin is rated for a maximum of 1000 mA. Management and diagnostics are accessed over the 2-wire serial interface.

Pin	Logic	Symbol	Name / Description
1	—	GND	Ground
2	CML-I	Tx2n	Transmitter inverted data input
3	CML-I	Tx2p	Transmitter non-inverted data input
4	—	GND	Ground
5	CML-I	Tx4n	Transmitter inverted data input
6	CML-I	Tx4p	Transmitter non-inverted data input
7	—	GND	Ground
8	LVTTL-I	ModSelL	Module select
9	LVTTL-I	ResetL	Module reset
10	—	VccRx	+3.3 V power supply, receiver
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
16	—	GND	Ground
17	CML-O	Rx1p	Receiver non-inverted data output
18	CML-O	Rx1n	Receiver inverted data output
19	—	GND	Ground

Pin	Logic	Symbol	Name / Description
20	—	GND	Ground
21	CML-O	Rx2n	Receiver inverted data output
22	CML-O	Rx2p	Receiver non-inverted data output
23	—	GND	Ground
24	CML-O	Rx4n	Receiver inverted data output
25	CML-O	Rx4p	Receiver non-inverted data output
26	—	GND	Ground
27	LVTTL-O	ModPrsL	Module present
28	LVTTL-O	IntL	Interrupt
29	—	VccTx	+3.3 V power supply, transmitter
30	—	Vcc1	+3.3 V power supply
31	LVTTL-I	LPMode	Low power mode
32	—	GND	Ground
33	CML-I	Tx3p	Transmitter non-inverted data input
34	CML-I	Tx3n	Transmitter inverted data input
35	—	GND	Ground
36	CML-I	Tx1p	Transmitter non-inverted data input
37	CML-I	Tx1n	Transmitter inverted data input
38	—	GND	Ground

Optical lane assignment at the MTP/MPO receptacle (fiber 1 at the key-up reference):

Fiber #	Lane Assignment
1	RX0
2	RX1
3	RX2
4	RX3
5–8	Not used
9	TX3
10	TX2
11	TX1
12	TX0

Handling, ESD & Laser Safety

ESD. The module withstands an electrostatic discharge of 1 kV on high-speed signal pins and 2 kV on all other electrical input pins (human-body model, MIL-STD-883 Method 3015.4 / JESD22-A114). Normal ESD precautions still apply: handle only in an ESD-protected environment and retain the module in its protective packaging until installation.

Laser safety. Class 1 laser product per IEC/EN 60825-1:2014. Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 56 (May 8, 2019). Use of controls, adjustments, or procedures other than those specified herein may result in hazardous radiation exposure.

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