

**TECHNOLOGIE OPTIC.CA INC.****ACM7624V-11100S****100 Gigabit QSFP28 PSM4 Optical Transceiver**

1310 nm · MTP/MPO (8° APC) · up to 2 km SMF · RS-FEC · full DDM · Optic.ca Q28-PSM4-NT-OC

The Optic.ca ACM7624V-11100S is a 100 Gigabit QSFP28 parallel single-mode optical transceiver that delivers four independent 25.78 Gb/s lanes for an aggregate 100G PSM4 link over parallel single-mode fiber. Built around a four-channel 1310 nm DFB array and a matched PIN photodetector array, it delivers reliable 100 Gb/s transport over G.652 single-mode fiber to 2 km with host RS-FEC, and is designed for seamless interoperability with standards-compliant QSFP28 ports. 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

- Compliant with the 100G PSM4 MSA (Rev 3.0); CAUI-4 host electrical interface per IEEE 802.3bm Annex 83E
- Four independent full-duplex lanes; 25.78 Gb/s per lane (NRZ) for 103.1 Gb/s aggregate
- Four-channel 1310 nm DFB array transmitter and PIN photodetector array
- Parallel single-mode (G.652) interface; MTP/MPO-12 with 8° angled (APC) end-face
- Reach up to 2 km with host RS-FEC (IEEE 802.3bj Clause 91)
- Full SFF-8636 digital diagnostic monitoring (DDM/DOM)
- Field-programmable EEPROM for host-platform compatibility coding
- 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
- Certified compatible with NETGEAR® switching platforms

Target Applications

- 100 Gigabit Ethernet links and data-center fabrics
- Data-center interconnect (DCI) up to 2 km over single-mode fiber
- Spine-leaf and inter-rack single-mode aggregation
- InfiniBand QDR/DDR and high-performance computing clusters

Ordering Information

Part Number	Description
ACM7624V-11100S	100G PSM4 QSFP28 transceiver, 1310 nm DFB, G.652 SMF, MTP/MPO-12 (8° APC), up to 2 km with RS-FEC, full DDM, pull-tab latch; NETGEAR® Certified Compatible

Standards Compliance

The ACM7624V-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	
100G PSM4 MSA (Rev 3.0)	Parallel single-mode 4-lane optical interface (PMD)
IEEE 802.3bm, Annex 83E	CAUI-4 4 × 25.78 Gb/s host electrical interface
IEEE 802.3bj, Clause 91	RS-FEC, RS(528,514) — required for the 2 km link
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	Wavelength	Supported Distance
G.652 single-mode	1310 nm	Up to 2 km (with RS-FEC)

The 2 km link assumes host-enabled RS-FEC per IEEE 802.3bj Clause 91 (RS(528,514)): a pre-FEC BER of 5×10^{-6} is corrected to $\leq 1 \times 10^{-12}$. A female MTP/MPO connector with an 8° angled (APC) end-face must be used to minimize reflections.

Optical Specifications

Specified over the recommended operating conditions with a PRBS31 pattern unless otherwise noted. The parameters below are the same for each lane.

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter (per lane unless noted)						
Center wavelength	λ_C	1295	1310	1325	nm	—
Side-mode suppression ratio	SMSR	30	—	—	dB	—
Total average launch power (all lanes)	PT	—	—	8.0	dBm	—
Average launch power, each lane	PAVG	-5.5	—	3.0	dBm	—
Optical modulation amplitude (OMA), each lane	POMA	-3.5	—	2.2	dBm	1
Launch-power difference between any two lanes (OMA)	Ptx,diff	—	—	5	dB	—
Launch power (OMA) minus TDP, each lane	—	-4.3	—	—	dBm	—
Transmitter and dispersion penalty, each lane	TDP	—	—	2.9	dB	—
Extinction ratio	ER	3.5	—	—	dB	—
Relative intensity noise	RIN	—	—	-128	dB/Hz	—
Optical return-loss tolerance	TOL	—	—	20	dB	—
Transmitter reflectance	RT	—	—	-12	dB	—
Average launch power OFF transmitter, each lane	Poff	—	—	-30	dBm	—
Receiver (per lane unless noted)						
Center wavelength	λ_C	1295	1310	1325	nm	—
Damage threshold, each lane	THd	4.5	—	—	dBm	2
Average receive power, each lane	—	-10.2	—	3.0	dBm	—
Receive power (OMA), each lane	—	—	—	2.2	dBm	—
Receiver sensitivity (OMA), each lane	SEN1	—	—	-9.0	dBm	BER 1×10^{-12}
Stressed receiver sensitivity (OMA)	—	—	—	-6.44	dBm	BER 1×10^{-12} ; Note 3
Receiver sensitivity (OMA), each lane	SEN2	—	—	-11.35	dBm	BER 5×10^{-5}
Stressed receiver sensitivity (OMA)	—	—	—	-8.79	dBm	BER 5×10^{-5} ; Note 3
Receiver reflectance	RR	—	—	-26	dB	—
Receive-power difference between any two lanes (OMA)	Prx,diff	—	—	5.5	dB	—
LOS assert	LOSA	-30	—	—	dBm	—
LOS deassert	LOSD	—	—	-15	dBm	—
LOS hysteresis	LOSH	0.5	—	—	dB	—

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Receiver electrical 3 dB upper cutoff, each lane	Fc	—	—	31	GHz	—

Transmitter eye-mask {X1, X2, X3, Y1, Y2, Y3} = {0.31, 0.40, 0.45, 0.34, 0.38, 0.40}.

Note 1: Even where TDP < 0.8 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: Stressed-sensitivity test conditions (test conditions, not receiver characteristics): vertical eye-closure penalty 1.9 dB, J2 jitter 0.27 UI, J4 jitter 0.39 UI, stressed-eye mask {0.24, 0.50, 0.50, 0.24, 0.24, 0.40}.

Electrical Specifications

Specified over the recommended operating conditions unless otherwise noted; test points per OIF CEI-28G-VSR.

Parameter	Test point	Min	Typ	Max	Unit	Notes
Power consumption	—	—	—	3.5	W	—
Supply current	ICC	—	—	1.06	A	—
Transmitter (per lane)						
Overload differential voltage, pk-pk	TP1a	900	—	—	mV	—
Common-mode voltage (V _{cm})	TP1	-350	—	2850	mV	1
Differential termination resistance mismatch	TP1	—	—	10	%	at 1 MHz
Differential return loss (SDD11)	TP1	—	—	—	dB	per CEI-28G-VSR Eq. 13-19
CM-to-DM / DM-to-CM conversion (SDC11, SCD11)	TP1	—	—	—	dB	per CEI-28G-VSR Eq. 13-20
Stressed input test	TP1a	—	—	—	—	per CEI-28G-VSR §13.3.11.2.1
Receiver (per lane)						
Differential voltage, pk-pk	TP4	—	—	900	mV	—
Common-mode voltage (V _{cm})	TP4	-350	—	2850	mV	1
Common-mode noise, RMS	TP4	—	—	17.5	mV	—
Differential termination resistance mismatch	TP4	—	—	10	%	at 1 MHz
Differential return loss (SDD22)	TP4	—	—	—	dB	per CEI-28G-VSR Eq. 13-19
CM-to-DM / DM-to-CM conversion (SDC22, SCD22)	TP4	—	—	—	dB	per CEI-28G-VSR Eq. 13-21
Common-mode return loss (SCC22)	TP4	—	—	-2	dB	2
Transition time, 20–80%	TP4	9.5	—	—	ps	—
Vertical eye closure (VEC)	TP4	—	—	5.5	dB	—
Eye width at 1×10^{-15} (EW15)	TP4	0.57	—	—	UI	—
Eye height at 1×10^{-15} (EH15)	TP4	228	—	—	mV	—

Note 1: V_{cm} is generated by the host; the specification includes the effects of ground-offset voltage.

Note 2: Applies from 250 MHz to 30 GHz.

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	4.5	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	—	Gb/s
Data-rate accuracy	—	-100	—	+100	ppm
Control input voltage, high	—	2	—	VCC	V
Control input voltage, low	—	0	—	0.8	V
Link distance, G.652 SMF	D	0.002	—	2	km

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	-0.1	+0.1	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

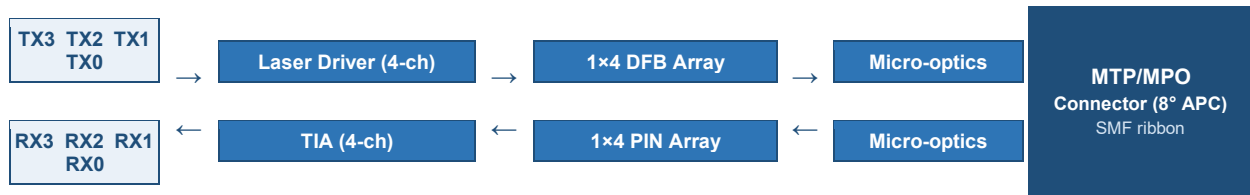
Note 1: Owing to measurement variation across single-mode fibers, an additional ± 1 dB may apply, for a total accuracy of ± 3 dB.

Functional Overview

The transmitter converts four lanes of CML-level differential electrical data into parallel optical signals through a four-channel 1310 nm DFB 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
20	—	GND	Ground
21	CML-O	Rx2n	Receiver inverted data output

Pin	Logic	Symbol	Name / Description
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	TX0
2	TX1
3	TX2
4	TX3
5–8	Not used
9	RX3
10	RX2
11	RX1
12	RX0

MPO-12 fiber-lane assignment shown per the 100G PSM4 MSA (Type-B crossover); confirm against the module mechanical drawing.

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-A). 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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