100G QSFP28 ER4 Transceiver

ET7402-ER4

Edgecore's ET7402-ER4 QSFP28 transceiver modules are designed for 100 Gigabit Ethernet over single mode fiber. They are compliant with the QSFP28 MSA, 100GBASE-ER4 Lite. Digital diagnostics functions are available via the I2C interface, as specified by the QSFP28 MSA.
The module is compliant with RoHS.

Product Features

- Compliant with QSFP28 MSA
- Compliant with 100G Ethernet ER4 Lite
- 4 cooled 25Gb/s channels LAN WDM EML TOSA
- 4 channels APD photo detector
- Single +3.3 V power supply
- Class 1 laser safety certified
- Power consumption less than 4.5 W
- Commercial operating temperature: 0°C to +70°C
- Up to 30km on SMF without FEC & 40km with FEC
- Duplex LC connector
- RoHS 6/6 compliant

Applications

- 100G Ethernet
- Data center

Ordering Information

Part Number	Data Rate	Fiber	Distance	Interface	Temp.	DDMI
ET7402-ER4	100Gbps	SMF	30 km without FEC & 40 km with FEC	Duplex LC	0~+70°C	Yes

Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power per Lane	Po	-2.9		+2.9	dBm	1
Total Launch Optical Power	Po			+8.9	dBm	1
Center Wavelength Range	L1	1294.53	1295.56	1296.59	nm	
	L2	1299.02	1300.05	1301.09	nm	
	L3	1303.54	1304.58	1305.63	nm	
	L4	1308.09	1309.14	1310.19	nm	
Extinction Ratio	EX	8.0			dB	2
Spectral Width(-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Return Loss Tolerance	ORLT			20	dB	
Pout @TX-Disable Asserted	Poff			-30	dBm	1
Eye Mask {X1, X2, X3, Y1, Y2, Y3}			{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}			

*Note 1: The optical power is launched into SMF.

*Note 2: Measured with a PRBS 2^{31}-1 test pattern @25.78125Gbps.

Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	L1	1294.53	1295.56	1296.59	nm	
	L2	1299.02	1300.05	1301.09	nm	
	L3	1303.54	1304.58	1305.63	nm	
	L4	1308.09	1309.14	1310.19	nm	
Sensitivity per Channel (OMA)	S			-16.6	dBm	1
	S			-20.5	dBm	2
Overload (each channel)	P_{OL}	-4.9			dBm	1
Damage Threshold (each channel)	P_{damage}	-3.9			dBm	
Receiver Reflectance	Rf			-26	dB	
LOS De-Assert	LOSD			-21.0	dBm	
LOS Assert	LOSA	-26.0			dBm	
LOS Hysteresis		0.5			dB	

*Note 1: Measured with PRBS 2^{31}-1 test pattern, 25.78125Gb/s, BER 1.0E-12

*Note 2: Measured with PRBS 2^{31}-1 test pattern, 25.78125Gb/s, BER 5.0E-5.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_s	-40	85	°C
Relative Humidity	RH	5	5	%
Supply Voltage	V_{cc}	-0.5	4.0	V

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_c	0	25	70	°C
Supply Voltage	V_{cc}	3.135	3.3	3.465	V
Data Rate per Channel			25.78125		Gb/s

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Module Supply Current	Icc			1350	mA	
Power Dissipation	P_D			4500	mW	

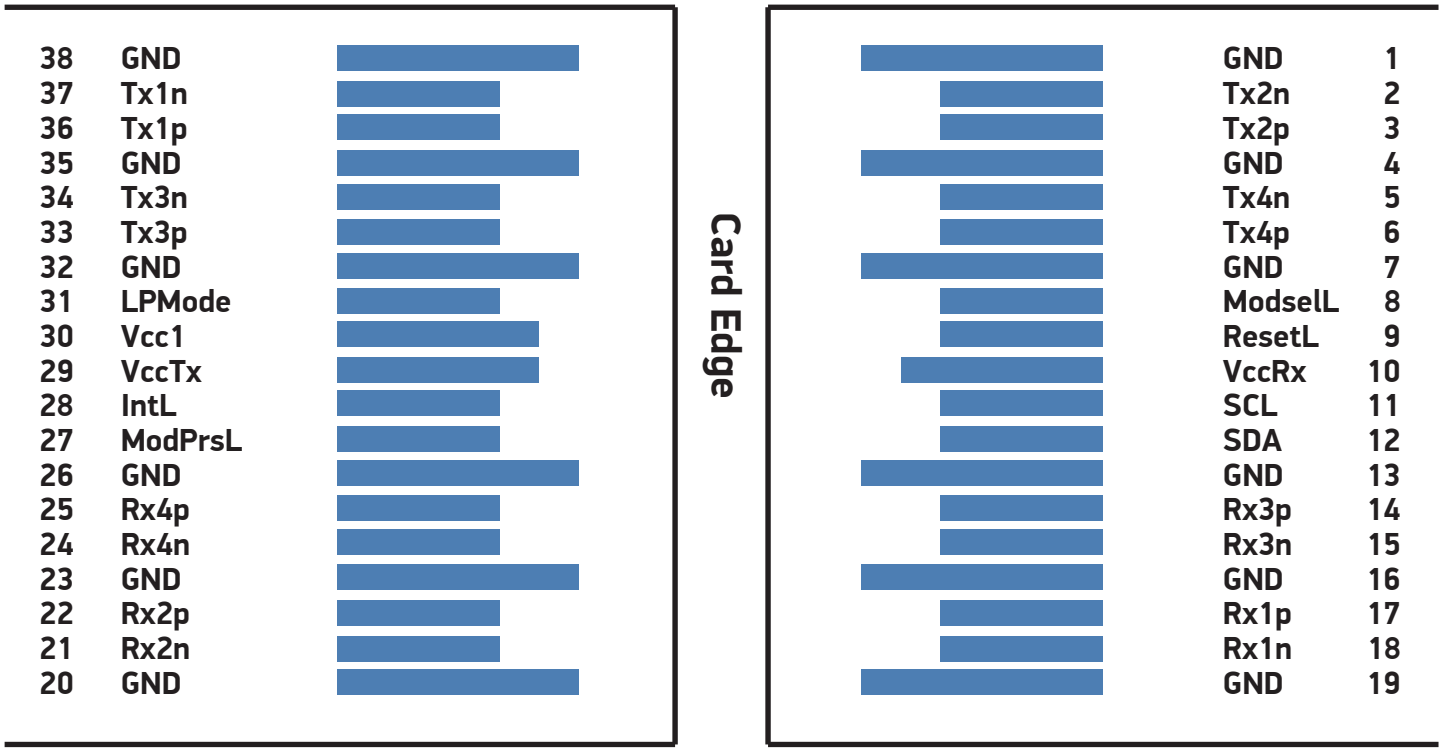
Transmitter Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Single-ended Input Voltage Tolerance		-0.3		4.0	V	
Input Differential Impedance	Z_{IN}		100	-	Ω	
Differential Data Input Swing	$V_{IN, P-P}$	190		700	mV_{P-P}	
AC Common Mode Input Voltage Tolerance		15			mV	
Differential Input Voltage Swing Threshold			50		mVpp	

Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Single-ended Output Voltage		-0.3		4.0	V	
Output Differential Impedance	Z_O	90	100	110	Ω	
Differential Data Output Swing	$V_{OUT, P-P}$	300		850	mV_{P-P}	
AC Common Mode Output Voltage				7.5	mV	

QSFP28 Transceiver Electrical Pad Layout



Transceiver Electrical Pad Layout

Pin	Name	Function/Description	Notes
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	Tx2-	Transmitter Inverted Data Input	
3	Tx2+	Transmitter Non-Inverted Data output	
4	GND	Transmitter Ground (Common with Receiver Ground)	1
5	Tx4-	Transmitter Inverted Data Input	
6	Tx4+	Transmitter Non-Inverted Data output	
7	GND	Transmitter Ground (Common with Receiver Ground)	1
8	ModSelL	Module Select	2
9	ResetL	Module Reset	2
10	VccRx	3.3 V Power Supply Receiver	
11	SCL	2-Wire serial Interface Clock	2
12	SDA	2-Wire serial Interface Data	2
13	GND	Transmitter Ground (Common with Receiver Ground)	1
14	Rx3+	Receiver Non-Inverted Data Output	
15	Rx3-	Receiver Inverted Data Output	
16	GND	Transmitter Ground (Common with Receiver Ground)	1
17	Rx1+	Receiver Non-Inverted Data Output	
18	Rx1-	Receiver Inverted Data Output	
19	GND	Transmitter Ground (Common with Receiver Ground)	1
20	GND	Transmitter Ground (Common with Receiver Ground)	1
21	Rx2-	Receiver Inverted Data Output	
22	Rx2+	Receiver Non-Inverted Data Output	
23	GND	Transmitter Ground (Common with Receiver Ground)	1
24	Rx4-	Receiver Inverted Data Output	1
25	Rx4+	Receiver Non-Inverted Data Output	
26	GND	Transmitter Ground (Common with Receiver Ground)	1
27	ModPrsl	Module Present	
28	IntL	Interrupt	2
29	VccTx	3.3 V power supply transmitter	
30	Vcc1	3.3 V power supply	
31	LPMode	Low Power Mode	2
32	GND	Transmitter Ground (Common with Receiver Ground)	1
33	Tx3+	Transmitter Non-Inverted Data Input	
34	Tx3-	Transmitter Inverted Data Output	
35	GND	Transmitter Ground (Common with Receiver Ground)	1
36	Tx1+	Transmitter Non-Inverted Data Input	
37	Tx1-	Transmitter Inverted Data Output	
38	GND	Transmitter Ground (Common with Receiver Ground)	1
*Note 1:	The module signal grounds are isolated from the module case.		
*Note 2:	This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.		

Warranty
Please check www.edge-core.com for the warranty terms in your country.

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