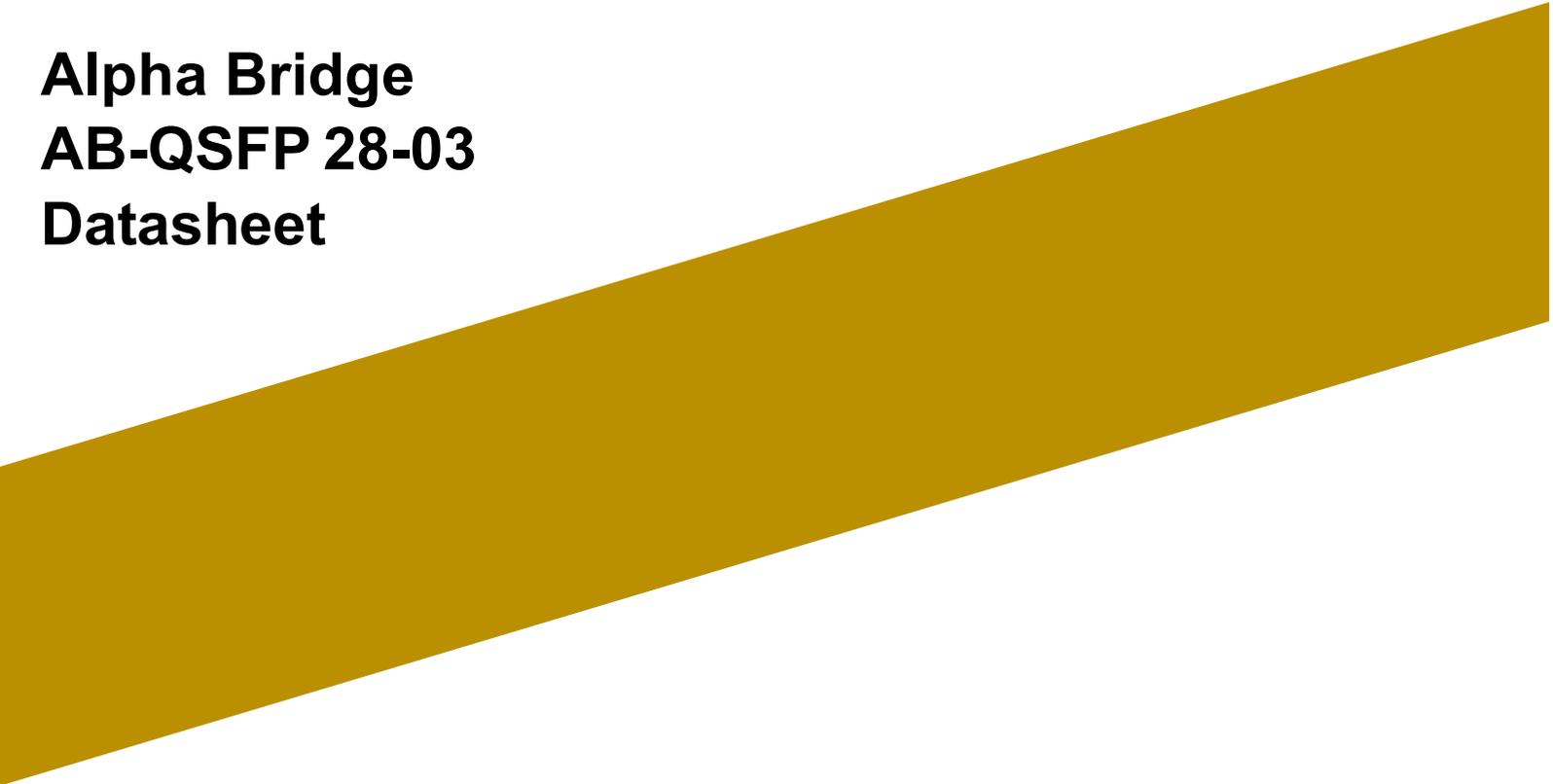# Alpha Bridge
AB-QSFP 28-03
Datasheet

Features

- Supports 103.1Gb/s aggregate bit rate
- 4x25Gb/s electrical interface
- Maximum link length of 300m on OM4 Multimode Fiber (MMF)
- Hot-pluggable QSFP28 footprint
- Single MPO 12 receptacle
- Low power Consumption
- RoHS-6 compliant and lead-free
- +3.3V single power supply
- Support Digital Diagnostic Monitor interface
- Case operating temperature Commercial: 0°C to +70°C

Applications

- 100GBASE-SR4 100G Ethernet

Compliance

- QSFP28 MSA.
- IEEE802.3bm
- SFF-8636
- RoHS

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Storage Temperature	TS	-40		85	ºC	
Storage Ambient Humidity	HA	0		85	%	
Maximum Supply Voltage	VCC	-0.5		3.6	V	
Receiver Damage Threshold		3.4			dBm	
Lead Soldering Temperature/Time	TSOLD			260/10	ºC/sec	1
Lead Soldering Temperature/Time	TSOLD			360/10	ºC/sec	2

Note: 1. Suitable for wave soldering.

2. Only for soldering by iron.

General Product Characteristics

Data Rate Specifications	Symbol	Min.	Typ.	Max.	Unit	Ref.
Bit Rate (all wavelength combined)	BR			103.1	Gb/s	1
Bit Error Ratio (pre-FEC)	BER			10-May		2
Maximum Supported Distances						
Fiber Type						
Link distance on OM3 MMF	d			70	meters	3
Link distance on OM4 MMF	d			300	meters	3

Notes:

1. Supports 100GBASE-SR4 per IEEE 802.3bm.

2. Tested with a PRBS 2^{31}-1 test pattern.

3. Requires FEC on the host to support maximum distance, per 100GBASE-SR4.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Transmitter (per lane)						
Average Output Power per lane	POUT	-6		2.4	dBm	
Extinction Ratio	ER	2			dB	
Center Wavelength	λC	840		860	nm	
RMS Spectral Width	σ			0.6	nm	
Transmitter OFF Output Power	POff			-30	dBm	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}		{0.3,0.38,0.45,0.35,0.41,0.5}				1
Receiver (per lane)						
Input Optical Wavelength	λIN	840		860	nm	
Rx Sensitivity (OMA) per lane @BER=5E-5	RSENS			-10.3	dBm	2
Input Saturation Power (Overload)	PSAT	2.4			dBm	
Receiver Reflectance	Rfl			-12	dBm	
Loss of Signal Assert	PA	-30			dBm	
Loss of Signal De-assert	PD			-12	dBm	
LOS Hysteresis	PD - PA	0.5			dB	

Note:

1. Hit Ratio 1.5x10-3 hit/sample.

2. Measured with PRBS 2^31-1 test pattern 25.78125Gbps.

Electrical Interface Characteristics

| Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	VCC1, VCCTX, VCCRX	3.15		3.45	V	
Supply Current	ICC			750	mA	
Transmitter (per Lane)						
Input different impedance	Rin	90	100	110	Ω	
Single ended input voltage tolerance	VinT	-0.3		4	V	
Single ended data input swing	Vin,pp	200		1000	mV	
Receiver (per Lane)						
Output different impedance	Rout	90	100	110	Ω	
Single ended data output swing	Vout,pp	200		1000	mV	
Single-ended output voltage	VoutR	-0.3		4	V	

Pin Diagram
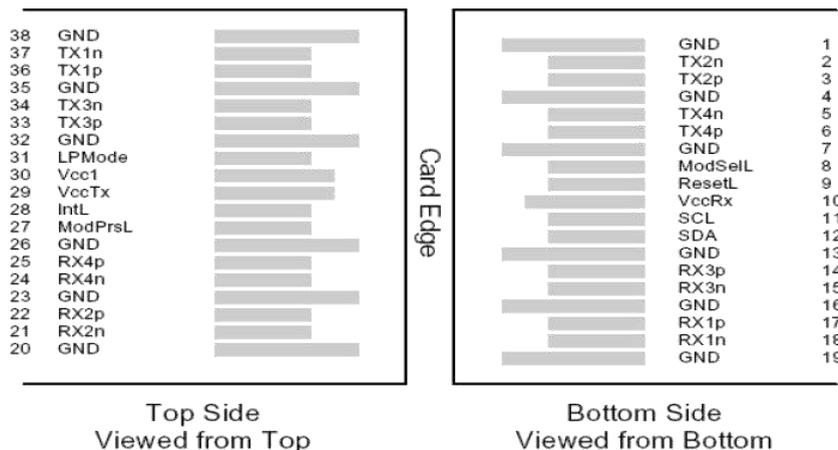
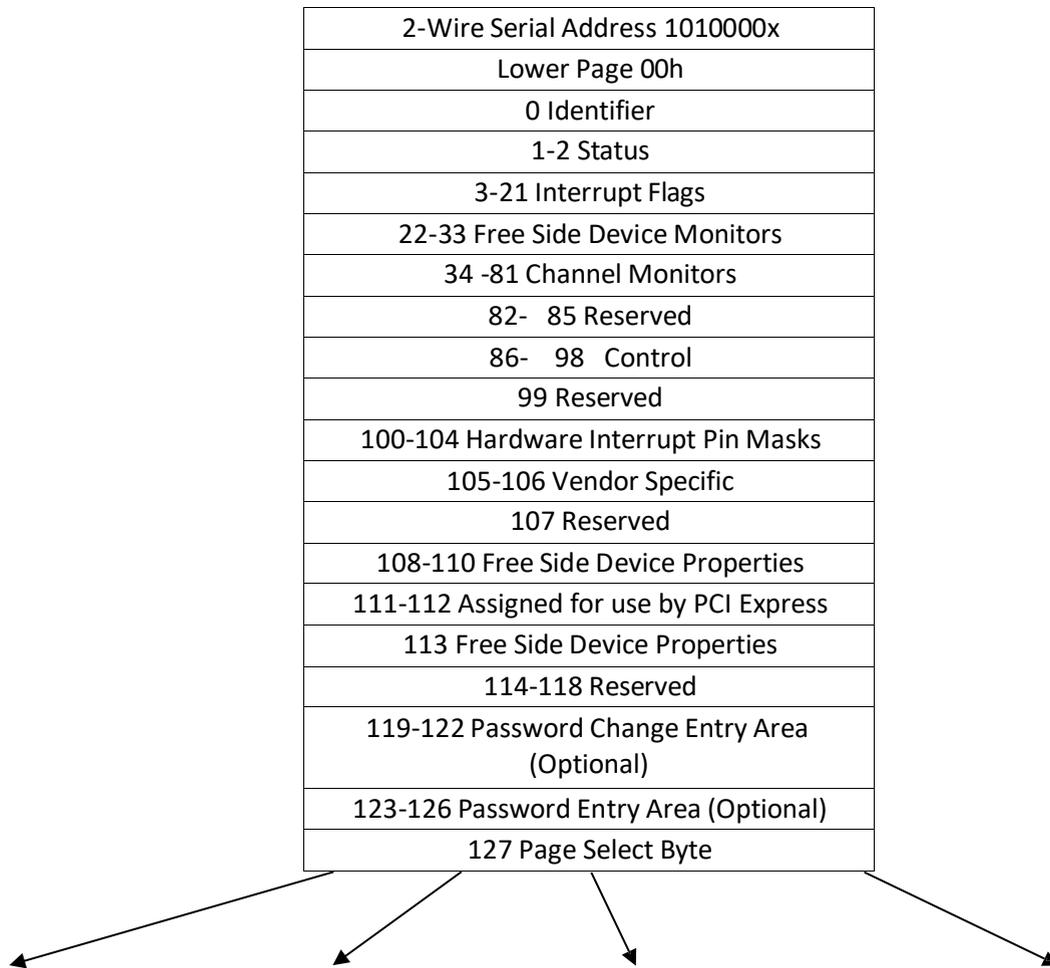**Figure 1 – QSFP28-Compliant 38-Pin Connector (Per SFF-8679)**

Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSe1L	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrSL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power Supply	
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Note:

1. Circuit ground is internally isolated from chassis ground.

Digital Diagnostic Functions

2-Wire Serial Address 1010000x
Lower Page 00h
0 Identifier
1-2 Status
3-21 Interrupt Flags
22-33 Free Side Device Monitors
34 -81 Channel Monitors
82- 85 Reserved
86-   98 Control
99 Reserved
100-104 Hardware Interrupt Pin Masks
105-106 Vendor Specific
107 Reserved
108-110 Free Side Device Properties
111-112 Assigned for use by PCI Express
113 Free Side Device Properties
114-118 Reserved
119-122 Password Change Entry Area (Optional)
123-126 Password Entry Area (Optional)
127 Page Select Byte

Upper Page 00h	Optional Page 01h	Optional Page 02h	Optional Page 03h
128 Identifier	128 CC_APPS	128-255 User EEPROM Data	128-175 Free Side Device Thresholds
129-191 Base ID Fields	129 AST Table Length (TL)		
	130-131 Application code entry 0		
	132-133 Application code entries 1		176-223 Channel Thresholds
192-223 Extended ID			224 Tx EQ & Rx Emphasis Magnitude ID
224-255 Vendor-Specific ID	134-253 other entries		225 RX output amplitude indicators
			226-241 Channel Controls
			242-251 Channel Monitor Masks
	254-255 Application Code Entry TL		252-255 Reserved

Figure 2 – Two-Wire Interface Fields

Recommended Interface Circuit

Mechanical Specifications (Unit: mm)
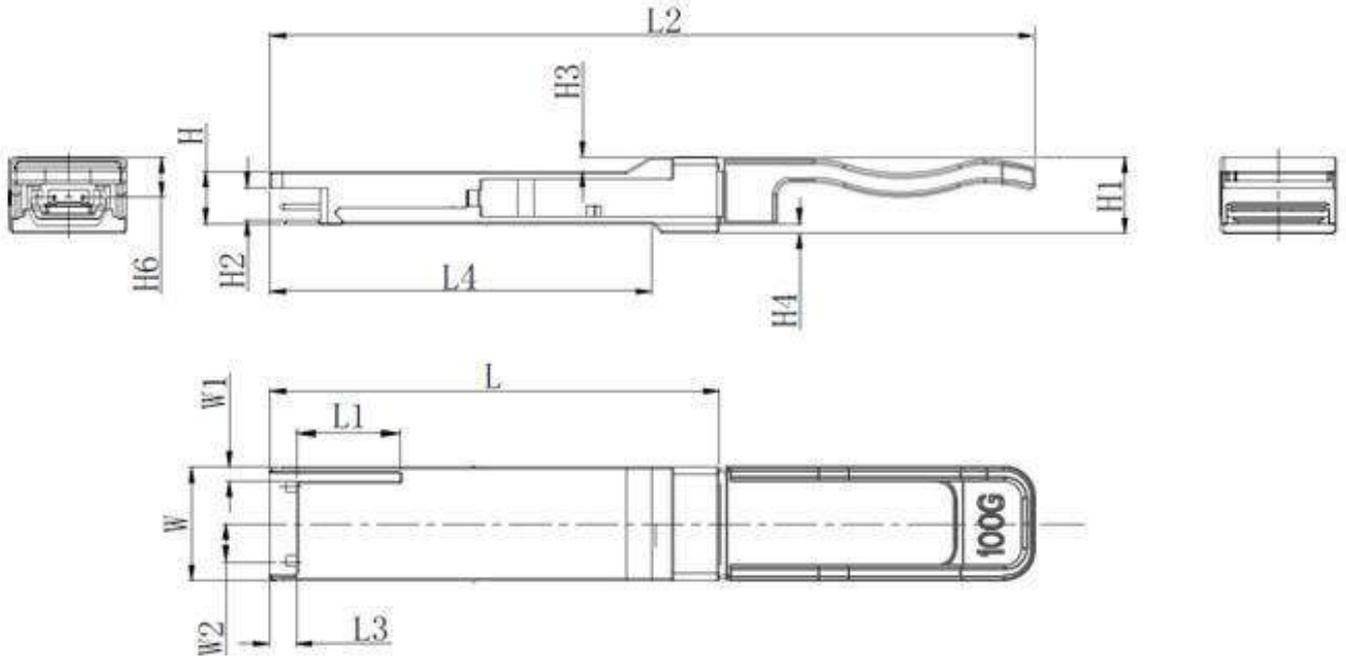
Unit mm	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
Max	72.2	–	–	4.35	61.4	18.45	–	6.2	8.6	12.4	5.35	2.5	1.6	2	–
TYPE	72	–	121	4.2	61.2	18.35	–	–	8.5	12.2	5.2	2.3	1.5	1.8	6.55
Min	68.8	16.5	–	4.05	61	18.25	2.2	5.8	8.4	12	5.05	2.1	1.3	1.6	–

Ordering information

Part Number	Description
AB-QSFP28-03	100G SR4 850nm 300m, MPO-12, 0-70℃, with DDM

Note: All information contained in this document is subject to change without notice