

400G QSFP-DD PAM4 1310nm 2km DOM Transceiver

AE-QSFPDD-DR4+

Features

- Compliant with IEEE802.3bs Standard: -400GAUI-8 Electrical Interface
- Compliant with IEEE 802.3cu Standards: -4x 100GBASE-FR1 Optical Interface
- Compliant with QSFP-DD MSA HW Rev 5.1 Type 2 Housing with MPO-12 Connector
- Compliant with QSFP-DD CMIS Rev 5.0
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Class 1 Laser

Application

- 400GBASE-DR4

Description

The AE-QSFPDD-DR4+ Module supports link lengths of up to 2km parallel SMF with MTP/MPO-12 connector. It is compliant to IEEE 802.3bs protocol and 400GAUI-8 standards. The 400 Gigabit Ethernet signal is carried over four parallel lanes by one wavelength per lane. It can be used as 4x100G breakout to QSFP28-FR-100G.

Specification

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	TOP	0	-	70	°C
Storage Temperature	TS	-40	-		°C
Supply Current	TS	-	-	3827.8	mA
Power Supply Voltage	VCC	3.13	3.3	3.46	V
Instantaneous Peak Current at Hot Plug	ICC_IP	-	-	4000	mA
Sustained peak Current at Hot Plug	ICC_SP	-	-	3300	mA
Maximum Power Dissipation	PD	-	-	9	W
Aggregate Bit Rate	ABR	-	425	-	Gb/s
Channel Data Rate	fDC	-	106.25	-	Gb/s

Signalling Rate Per Lane	SRL	-	53.125	-	GBd
Operating Distance	-	2	-	2000	m

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Transmitter					
Center Wavelength, Per Lane	λ_c	1304.5	1311	1317.5	nm
Side-mode Suppression Ratio	SMSR	30	-	-	dB
Average Launch Power, Each Lane	POUTL	-3.1	-	4	dBm
Optical Modulation Amplitude, Each Lane*1	OMA	-	-	4.2	dBm
Average Launch Power Tx_Off, Each Lane	POUT_OFF	-	-	-40	dBm
Launch power in OMAouter Minus TDECQ	-				dBm
Transmitter and Dispersion Eyeclosure for PAM4	TDECQ	-		3.4	dB
RIN17.1OMA	RIN	-	-	-136	dB/Hz
Optical Return Loss Tolerance	ORL	-	-	17.1	dB
Extinction Ratio	ER	3.5	-	-	dB
Optical Return Loss Tolerance	-	-	-	17.1	dB
Transmitter Reflectance	-	-	-	-26	dB
Receiver					
Center Wavelength, Per Lane	λ_c	1304.5	1311	1317.5	nm
Damage Threshold, Each Lane	PMAX	5.0	-	-	dBm
Receiver Sensitivity (OMA)*1	BOL	-	-	-4.2	dBm
Stressed Receiver Sensitivity in OMA*1	SRS	-	-	-2.5	dBm
Stressed Eye Closure for PAM4(SECQ), Lane Under Test	SECQ	-	3.4	-	dB
OMAouter of Each Aggressor Lane	-	-		-	dBm
Receiver Loss of Signal Indicator Assert Level	RX_LOSA	-	-		dBm
Receiver Loss of Signal Indicator Deassert Level	RX_LOSD	-	-		dBm
Hysteresis	-	0.5	-	4	dB

Notes:

Measured with conformance test signal at TP3 for the BER = 2.4x10⁻⁴.

The drawing consists of two views: TOP VIEW and BOTTOM VIEW.

TOP VIEW:

- Overall width: 18 MAX.
- Overall length: 18.38 ± 0.1.
- Feature 1: 13 MIN, 38.2 MIN, 3.10 ± 0.15, 0.5 ± 0.15, 6.50 ± 0.15 ZK.
- Feature 2: 10.06 ± 0.15, 2.2 MIN.
- Feature 3: 16.5 MIN.
- Feature 4: 58.26 REF, 48.2 MIN, 35.8 ± 0.5.
- Feature 5: 12.4 MIN, 2.00 MIN, 6.5.
- Feature 6: 2.8 MAX, 15, 0.1 F.
- Feature 7: 5.5 MIN, 0.1 F, 6.5.
- Feature 8: 29.6 ± 0.1.
- Feature 9: 40.1 MAX.
- Feature 10: 1.0 MIN.
- Feature 11: 1.6 MAX.
- Feature 12: 13.5 REF.
- Feature 13: 3.4 MAX.
- Feature 14: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 15: 1.0 MIN.
- Feature 16: 4 MIN.
- Feature 17: 6 MIN.
- Feature 18: 8.5 ± 0.1.
- Feature 19: 2 ± 0.15.
- Feature 20: 2 ± 0.15.
- Feature 21: 4 MIN.
- Feature 22: 6 MIN.
- Feature 23: 8.5 ± 0.1.
- Feature 24: 1.0 MIN.
- Feature 25: 1.6 MAX.
- Feature 26: 13.5 REF.
- Feature 27: 3.4 MAX.
- Feature 28: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 29: 1.0 MIN.
- Feature 30: 40.1 MAX.
- Feature 31: 2.8 MAX, 15, 0.1 F.
- Feature 32: 5.5 MIN, 0.1 F, 6.5.
- Feature 33: 29.6 ± 0.1.
- Feature 34: 4 MIN.
- Feature 35: 6 MIN.
- Feature 36: 8.5 ± 0.1.
- Feature 37: 2 ± 0.15.
- Feature 38: 2 ± 0.15.
- Feature 39: 1.0 MIN.
- Feature 40: 1.6 MAX.
- Feature 41: 13.5 REF.
- Feature 42: 3.4 MAX.
- Feature 43: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 44: 1.0 MIN.
- Feature 45: 40.1 MAX.
- Feature 46: 2.8 MAX, 15, 0.1 F.
- Feature 47: 5.5 MIN, 0.1 F, 6.5.
- Feature 48: 29.6 ± 0.1.
- Feature 49: 4 MIN.
- Feature 50: 6 MIN.
- Feature 51: 8.5 ± 0.1.
- Feature 52: 2 ± 0.15.
- Feature 53: 2 ± 0.15.
- Feature 54: 1.0 MIN.
- Feature 55: 1.6 MAX.
- Feature 56: 13.5 REF.
- Feature 57: 3.4 MAX.
- Feature 58: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 59: 1.0 MIN.
- Feature 60: 40.1 MAX.
- Feature 61: 2.8 MAX, 15, 0.1 F.
- Feature 62: 5.5 MIN, 0.1 F, 6.5.
- Feature 63: 29.6 ± 0.1.
- Feature 64: 4 MIN.
- Feature 65: 6 MIN.
- Feature 66: 8.5 ± 0.1.
- Feature 67: 2 ± 0.15.
- Feature 68: 2 ± 0.15.
- Feature 69: 1.0 MIN.
- Feature 70: 1.6 MAX.
- Feature 71: 13.5 REF.
- Feature 72: 3.4 MAX.
- Feature 73: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 74: 1.0 MIN.
- Feature 75: 40.1 MAX.
- Feature 76: 2.8 MAX, 15, 0.1 F.
- Feature 77: 5.5 MIN, 0.1 F, 6.5.
- Feature 78: 29.6 ± 0.1.
- Feature 79: 4 MIN.
- Feature 80: 6 MIN.
- Feature 81: 8.5 ± 0.1.
- Feature 82: 2 ± 0.15.
- Feature 83: 2 ± 0.15.
- Feature 84: 1.0 MIN.
- Feature 85: 1.6 MAX.
- Feature 86: 13.5 REF.
- Feature 87: 3.4 MAX.
- Feature 88: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 89: 1.0 MIN.
- Feature 90: 40.1 MAX.
- Feature 91: 2.8 MAX, 15, 0.1 F.
- Feature 92: 5.5 MIN, 0.1 F, 6.5.
- Feature 93: 29.6 ± 0.1.
- Feature 94: 4 MIN.
- Feature 95: 6 MIN.
- Feature 96: 8.5 ± 0.1.
- Feature 97: 2 ± 0.15.
- Feature 98: 2 ± 0.15.
- Feature 99: 1.0 MIN.
- Feature 100: 1.6 MAX.
- Feature 101: 13.5 REF.
- Feature 102: 3.4 MAX.
- Feature 103: 20 MAX TYPE 1, 35 MAX TYPE 2.
- Feature 104: 1.0 MIN.
- Feature 105: 40.1 MAX.
- Feature 106: 2.8 MAX, 15, 0.1 F.
- Feature 107: 5.5 MIN, 0.1 F, 6.5.
- Feature 108: 29.6 ± 0.1.
- Feature 109: 4 MIN.
- Feature 110: 6 MIN.
- Feature 111: 8.5 ± 0.1.
- Feature 112: 2 ± 0.15.
- Feature 113: 2 ± 0.15.
- Feature 114: 1.0 MIN.
- Feature 115: 1.6 MAX.
- Feature 116: 13.5 REF.
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- Feature 123: 29.6 ± 0.1.
- Feature 124: 4 MIN.
- Feature 125: 6 MIN.
- Feature 126: 8.5 ± 0.1.
- Feature 127: 2 ± 0.15.
- Feature 128: 2 ± 0.15.
- Feature 129: 1.0 MIN.
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- Feature 137: 5.5 MIN, 0.1 F, 6.5.
- Feature 138: 29.6 ± 0.1.
- Feature 139: 4 MIN.
- Feature 140: 6 MIN.
- Feature 141: 8.5 ± 0.1.
- Feature 142: 2 ± 0.15.
- Feature 143: 2 ± 0.15.
- Feature 144: 1.0 MIN.
- Feature 145: 1.6 MAX.
- Feature 146: 13.5 REF.
- Feature 147: 3.4 MAX.
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- Feature 149: 1.0 MIN.
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- Feature 152: 5.5 MIN, 0.1 F, 6.5.
- Feature 153: 29.6 ± 0.1.
- Feature 154: 4 MIN.
- Feature 155: 6 MIN.
- Feature 156: 8.5 ± 0.1.
- Feature 157: 2 ± 0.15.
- Feature 158: 2 ± 0.15.
- Feature 159: 1.0 MIN.
- Feature 160: 1.6 MAX.
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- Feature 164: 1.0 MIN.
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- Feature 167: 5.5 MIN, 0.1 F, 6.5.
- Feature 168: 29.6 ± 0.1.
- Feature 169: 4 MIN.
- Feature 170: 6 MIN.
- Feature 171: 8.5 ± 0.1.
- Feature 172: 2 ± 0.15.
- Feature 173: 2 ± 0.15.
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- Feature 195: 40.1 MAX.
- Feature 196: 2.8 MAX, 15, 0.1 F.
- Feature 197: 5.5 MIN, 0.1 F, 6.5.
- Feature 198: 29.6 ± 0.1.
- Feature 199: 4 MIN.
- Feature 200: 6 MIN.
- Feature 201: 8.5 ± 0.1.
- Feature 202: 2 ± 0.15.
- Feature 203: 2 ± 0.15.
- Feature

Parameter	Current Measurement	Alarms Low	Alarms High	Warnings Low	Warnings High	Unit
Temperature	5<CM<65	-5	75	0	70	°C
Voltage	3.2<CM<3.4	2.97	3.63	3.13	3.46	V
Current	6<CM<95	2	105	1	100	mA
Tx Power	-2.6<CM<3.5	-3.6	4.5	-3.1	4	dBm
Rx Power	-6.6<CM<3.5	-7.6	4.5	-7.1	4	dBm
RX_DDMI*	-40dBm	-	-	-	-	dBm

RX DDMI=-40dbm@ NO RX Optical Input.This test is implemented in IQC.

Part Number	Description
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