DWDM SFP+ CH17~CH61 80km DDM LC SMF Transceiver

P/N: AE-SFP+-D80-XX

Features

- Supports up to 11.3Gbps
- Available in all C-Band Wavelengths on the 100GHz DWDM ITU Grid
- Temperature-Stabilized DWDM EML Transmitter
- Duplex LC Connector
- Power Dissipation < 1.5W
- Dispersion tolerance from -500ps/nm to 1600ps/nm
- Hot-Pluggable SFP+ Footprint
- Compliant with SFF-8431 MSA
- Compliant with SFF-8432 MSA
- Operating Case Temperature Standard: 0°C to 70°C Extended: -20°C to 75°C

Applications

- 10GBASE-ZR/ZW
- 10G FC
- OBSAI rates 6.144 Gb/s, 3.072 Gb/s, 1.536 Gb/s, 0.768Gb/s
- CPRI rates 10.138Gb/s ,9.830 Gb/s,7.373Gb/s, 6.144 Gb/s, 4.915 Gb/s,
- 2.458 Gb/s, 1.229 Gb/s, 0.614Gb/s
- Other optical links

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	+85	°C
Supply Voltage	Vcc	-0.5	3.6	V
Operating Relative Humidity		-	95	%

II. Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Operating Case Temperature	Tc	Standard	0		+70	°C
		Extended	-20		+75	°C
Power Supply Voltage	Vcc		3.15	3.3	3.45	V
Power Supply Current	Icc (0°C to 70°C)				350	mA
	Icc (-20°C to 75°C)				522	mA
Data Rate	DR		0.6	10.3	11.3	Gbps

III. Performance Specifications – Electrical

Parameter		Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter							
CML Inputs(Differential)		Vin	250		1000	mVpp	AC coupled input*(note6)
Input Impedance (Differential)		Zin	85	100	115	ohm	Rin > 100 kohm @ DC
TX_Dis	Disable		2		Vcc+0.3	V	
	Enable		0		0.8		
TX_FAULT	Fault		2		Vcc+0.3	V	
	Normal		0		0.5		
Receiver							
CML Outputs (Differential)		Vout	350		700	mVpp	AC coupled output*(note6)
Output Impedance (Differential)		Zout	85	100	115	ohm	
RX_LOS	LOS		2		Vcc+0.3	V	
	Normal		0		0.8	V	
MOD_DEF (0:2)		VoH	2.5			V	With Serial ID
		VoL	0		0.5	V	

IV. Performance Specifications – Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate	DR	0.6	10.3	11.3	Gbps
Transmitter					
Center Wavelength Spacing			100		GHz
			0.8		nm

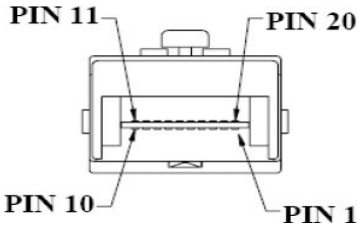
Spectral width(RMS)	Δλ		0.15	0.3	nm
Side Mode Suppression Ratio	SMSR	30			dB
Average Output Power*(note4)	Pout	1		5	dBm
Average Launch Power (Tx: OFF)	Poff			-30	dBm
Extinction Ratio	ER	6			dB
Pout@TX Disable Asserted	Pout			-45	dBm
Transmitter Dispersion Penalty@1600ps/nm	TDP			3.5	dB
Relative Intensity Noise	RIN			-128	dB/Hz
TX Jitter	TXj	Per 802.3ae requirements			
Receiver					
Receiver Sensitivity*(note5)	Pmin			-23	dBm
Receiver Overload	Pmax	-7			dBm
LOS De-Assert	LOSD			-24	dBm
LOS Assert	LOSA	-40			dBm
LOS Hysteresis		1			dB

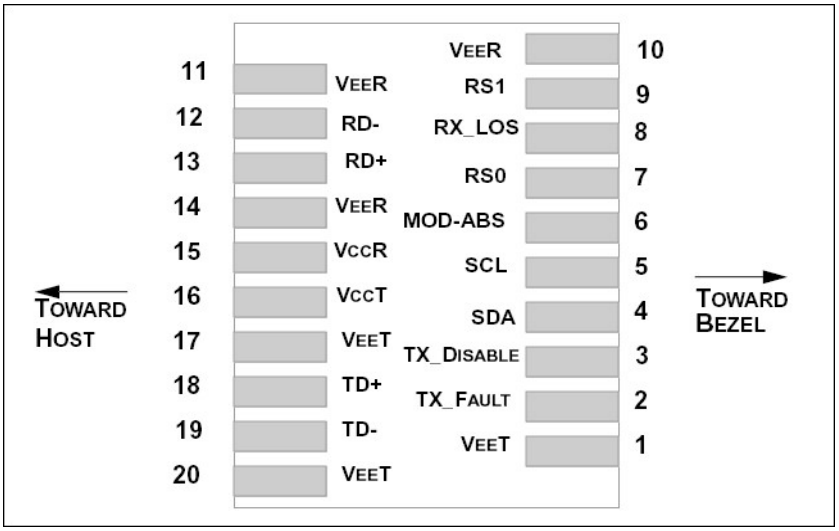
Note4: Output is coupled into a 9/125μm single-mode fiber.

Note5: Minimum average optical power measured at the BER less than 1E-12, OSNR ＞ 30dB. The measure pattern is PRBS 231-1.

Note6: CML logic, internally AC coupled.

V. SFP+ Transceiver Electrical Pad Layout





VI. Pin Function Definition

Pin Num.	Name	FUNCTION	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	Note 5
2	TX Fault	Transmitter Fault Indication	3	Note 1
3	TX Disable	Transmitter Disable	3	Note 2, Module disables on high or open
4	SDA	Module Definition 2	3	2-wire Serial Interface Data Line.
5	SCL	Module Definition 1	3	2-wire Serial Interface Clock.
6	MOD-ABS	Module Definition 0	3	Note 3
7	RS0	RX Rate Select (LVTTL).	3	No Function Implement.
8	LOS	Loss of Signal	3	Note 4
9	RS1	TX Rate Select (LVTTL).	1	No Function Implement.
10	VeeR	Receiver Ground	1	Note 5
11	VeeR	Receiver Ground	1	Note 5
12	RD-	Inv. Received Data Out	3	Note 6
13	RD+	Received Data Out	3	Note 7
14	VeeR	Receiver Ground	1	Note 5
15	VccR	Receiver Power	2	3.3 ± 5%, Note 7
16	VccT	Transmitter Power	2	3.3 ± 5%, Note 7
17	VeeT	Transmitter Ground	1	Note 5
18	TD+	Transmit Data In	3	Note 8
19	TD-	Inv. Transmit Data In	3	Note 8
20	VeeT	Transmitter Ground	1	Note 5

Notes:

1. TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

2. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 – 10 KΩ resistor. Its states are:

3. Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined

4. High (2.0 – 3.465V): Transmitter Disabled Open: Transmitter Disabled

5. Module absent, connected to VEET or VEER in the module.

6. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

7. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case

8. RD-/+: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

9. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V

10. ±5% at the SFP+ connector pin. Maximum supply current is 300mA. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP+ input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP+ transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP+ transceiver module.

11. TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

VII. C-band λc Wavelength Guide

ITU Channel Product Code	Frequency (THz)	Wavelength	ITU Channel Product Code	Frequency (THz)	Wavelength
17	191.7	1563.86	40	194.0	1545.32
18	191.8	1563.05	41	194.1	1544.53
19	191.9	1562.23	42	194.2	1543.73
20	192.0	1561.42	43	194.3	1542.94
21	192.1	1560.61	44	194.4	1542.14
22	192.2	1559.79	45	194.5	1541.35
23	192.3	1558.98	46	194.6	1540.56
24	192.4	1558.17	47	194.7	1539.77
25	192.5	1557.36	48	194.8	1538.98
26	192.6	1556.55	49	194.9	1538.19
27	192.7	1555.75	50	195.0	1537.40
28	192.8	1554.94	51	195.1	1536.61
29	192.9	1554.13	52	195.2	1535.82
30	193.0	1553.33	53	195.3	1535.04
31	193.1	1552.52	54	195.4	1534.25
32	193.2	1551.72	55	195.5	1533.47
33	193.3	1550.92	56	195.6	1532.68

34	193.4	1550.12	57	195.7	1531.90
35	193.5	1549.32	58	195.8	1531.12
36	193.6	1548.51	59	195.9	1530.33
37	193.7	1547.72	60	196.0	1529.55
38	193.8	1546.92	61	196.1	1528.77
39	193.9	1546.12			

VIII. Ordering information

Part Number	Product Description
AE-SFP+-D80-XX	SFP+, 10Gbps, SMF, 80KM, DDM, LC connector, -5℃ ~ +70℃，XX= ITU Grid 17~61