
DWDM SFP+ CH17~CH61 80km DDM LC SMF Transceiver
P/N: AE-SFP+-D80-TU

Features

- Supports 9.95Gb/s to 11.3Gb/s bit rates
- Monolithically integrated full C-band tunable transmitter and APD receiver
- 50 GHz ITU channel spacing with integrated wavelength locker
- Maximum link length of 80km
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP+ footprint
- Specifications compliant with SFF-8472 V10.3& SFF-8690 V1.4
- Compliant with SFP+ MSA with LC connector
- Power dissipation <1.6W
- Case temperature range: -5°C to 70°C

Applications

- DWDM 10GBASE-ZR/ZW 10G Ethernet
- DWDM 80KM 10G Fiber Channel
- DWDM SONET OC-192&SDH STM-64

I. DWDM-SFP+-ZR-TU Wavelength Guide Table

Channel	Wavelength (nm)	Frequency (THZ)	Channel	Wavelength (nm)	Frequency (THZ)
1	1568.36	191.15	51	1548.11	193.65
2	1567.95	191.20	52	1547.72	193.70
3	1567.54	191.25	53	1547.32	193.75
4	1567.13	191.30	54	1546.92	193.80
5	1566.72	191.35	55	1546.52	193.85
6	1566.31	191.40	56	1546.12	193.90
7	1565.90	191.45	57	1545.72	193.95
8	1565.50	191.50	58	1545.32	194.00
9	1565.09	191.55	59	1544.92	194.05
10	1564.68	191.60	60	1544.53	194.10
11	1564.27	191.65	61	1544.13	194.15
12	1563.86	191.70	62	1543.73	194.20
13	1563.45	191.75	63	1543.33	194.25
14	1563.05	191.80	64	1542.94	194.30
15	1562.64	191.85	65	1542.54	194.35
16	1562.23	191.90	66	1542.14	194.40
17	1561.83	191.95	67	1541.75	194.45
18	1561.42	192.00	68	1541.35	194.50
19	1561.01	192.05	69	1540.95	194.55
20	1560.61	192.10	70	1540.56	194.60
21	1560.20	192.15	71	1540.16	194.65
22	1559.79	192.20	72	1539.77	194.70
23	1559.39	192.25	73	1539.37	194.75
24	1558.98	192.30	74	1538.98	194.80
25	1558.58	192.35	75	1538.58	194.85
26	1558.17	192.40	76	1538.19	194.90
27	1557.77	192.45	77	1537.79	194.95
28	1557.36	192.50	78	1537.40	195.00
29	1556.96	192.55	79	1537.00	195.05
30	1556.55	192.60	80	1536.61	195.10
31	1556.15	192.65	81	1536.22	195.15
32	1555.75	192.70	82	1535.82	195.20
33	1555.34	192.75	83	1535.43	195.25
34	1554.94	192.80	84	1535.04	195.30
35	1554.54	192.85	85	1534.64	195.35
36	1554.13	192.90	86	1534.25	195.40
37	1553.73	192.95	87	1533.86	195.45
38	1553.33	193.00	88	1533.47	195.50
39	1552.93	193.05	89	1533.07	195.55
40	1552.52	193.10	90	1532.68	195.60
41	1552.12	193.15	91	1532.29	195.65
42	1551.72	193.20	92	1531.90	195.70

43	1551.32	193.25	93	1531.51	195.75
44	1550.92	193.30	94	1531.12	195.80
45	1550.52	193.35	95	1530.72	195.85
46	1550.12	193.40	96	1530.33	195.90
47	1549.72	193.45	97	1529.94	195.95
48	1549.32	193.50	98	1529.55	196.00
49	1548.91	193.55	99	1529.16	196.05
50	1548.51	193.60			

Note :

1. When a tunable module is plugged in for the first time, it will go to a default channel, DWDM-SFP+-ZR-TU default channel is 1568.36nm, compatible with channel range from 1 to 99
2. When the module is power cycled it will automatically go to the last channel selected, or when Tx_Disable asserted and then re-enabled, the module returns to the last channel selected.

II. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	°C	
Relative Humidity	RH	5	-	85	%	
Power Supply Voltage	VCC	-0.3	-	3.6	V	
Signal Input Voltage		Vcc-0.3	-	Vcc+0.3	V	

III. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note	
Case Operating Temperature	Tcase	-5	-	70	°C	Without air flow	
Power Supply Voltage	VCC	3.14	3.3	3.47	V		
Power Supply Current	ICC	-		480	mA		
Data Rate	BR		10.312 5		Gbps		
Transmission Distance	TD		-	80	km		
Coupled fiber		Single mode fiber					9/125um SMF

IV. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter						
Average Optical Power	Pout	0		5	dBm	1
Frequency stability (BOL)		f_c -1.5		f_c +1.5	GHz	2
Frequency stability (EOL)		f_c -2.5		f_c +2.5	GHz	2
Center Wavelength Spacing			50		GHz	3

Optical Extinction Ratio	ER	8.2				dB	
Side mode Suppression ratio	SMSR	35				dB	
Average Launch Power(Laser off)	Poff				-30	dBm	
Output Eye Mask	Compliant with IEEE 802.3ae						
Receiver							
Rx Sensitivity with dispersion 0 ps/nm	RSENS				-22	dBm	@9.95,10.3,10.5 Gbp, BER=10 ⁻¹²
					-27		@10.709Gbps, BER=10 ⁻⁴
					-27		@11.1Gbps, BER=10 ⁻⁴
					-26.5		@11.3Gbps, BER=10 ⁻⁴
Rx Sensitivity with dispersion -400 to +1450 ps/nm					-21		@9.95, 10.3, 10.5Gbps, BER=10 ⁻¹²
					-25		@10.709Gbps, BER=10 ⁻⁴
					-25		@11.1Gbps, BER=10 ⁻⁴
					-24		@11.3Gbps, BER=10 ⁻⁴
Input Saturation Power (Overload)	Psat	-6				dBm	
Wavelength Range	λC	1480		1580		nm	
LOS De-Assert	LOSD				-26	dBm	
LOS Assert	LOSA	-35				dBm	
LOS Hysteresis		0.5				dB	

Notes:

1. Output power is power coupled into a 9/125 mm single-mode fiber.
2. f c refer to Page 2 the Frequency row of XGXP-DWT96-80D Wavelength Guide Table, and test condition is reflect power to transmitter lower than -27dBm.
3. Corresponds to approximately 0.4 nm.

V. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			480	mA	
Transmitter						
Input differential impedance	ohm		100		Ω	1
Differential data input swing	Vin,pp	240		910	mV	
Transmit Disable Voltage	Vdis	Vcc-1.3		Vcc	V	
Transmit Enable Voltage	Ven	Vee		Vee+ 0.8	V	2
TX_FAULT Voltage-High		Vcc-1.3		Vcc	V	

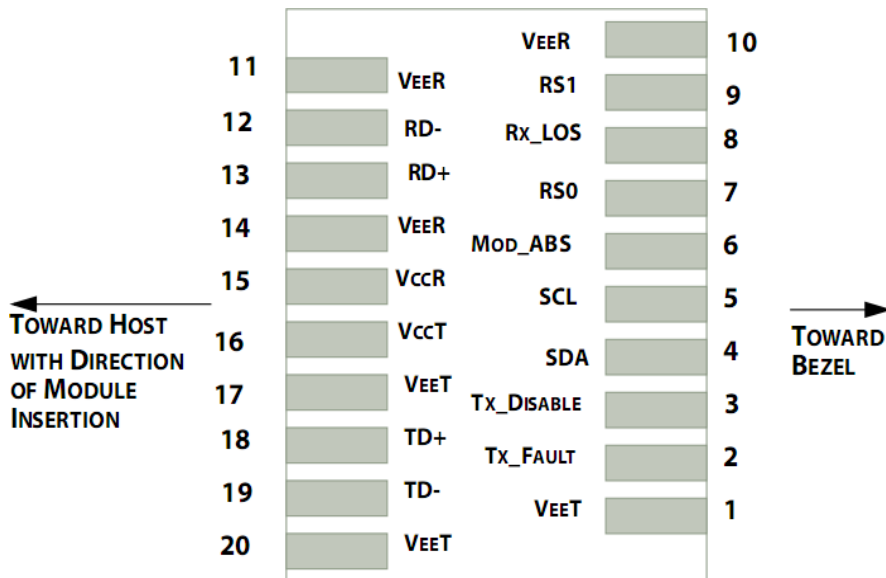
TX_FAULT Voltage-Low		Vee		Vee+ 0.8	V	
Receiver						
Differential data output swing	Vout,pp	350		800	mV	3
Data output rise time	tr	30			ps	4
Data output fall time	tf	30			ps	4
LOS Fault		Vcc-1.3		VccHOST	V	5
LOS Normal		Vee		Vee+0.8	V	5

Notes:

Connected directly to TX data input pins. AC coupled thereafter.

1. Or open circuit.
2. Into 100 ohms differential termination.
3. These are unfiltered 20-80% values
4. Loss of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

VI. Pin Descriptions



Pin out of Connector Block on Host Board

Pin	Symbol	Name/Description	NOTE
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault.	2
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	1

10	VEER	Receiver Ground (Common with Transmitter Ground)	1
11	VEER	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground (Common with Transmitter Ground)	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to $V_{cc} + 0.3V$. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

VII. Ordering information

Part Number	Product Description
AE-SFP+-D80-TU	SFP+, 10Gbps, SMF, 80KM, DDM, LC connector, -5°C ~ +70°C,