

Features

- 1550 nm ITU-T C-band 100 GHz spacing Tunable DWDM SFP+ Transceiver
- Retimed data rate 24.33-25.78 Gbit/s
- Un-retimed data rates greater than 1.2Gbit/s are also supported
- Negative chirp transmitter with ILMZ (Integrated Laser Mach Zehnder) TOSA
- APD receiver with limiting amplifier + CDR
- Power consumption: max 2.5W
- Power supply lines: 3.3 V
- Operating case temperature range: -40 to 85 °C
- SmartTune MSA is supported for self-tuning
- Remote Diagnostics and Control features are available upon request



- Compact size (57.4mm L x 13.9mm W x 11.85mm H)
- Class 1 Laser Safety

Applications

- Wireless fronthaul / Low-Layer Split
- Local area networks (LAN)
- Wide area networks (WAN)
- Ethernet switches and router applications

1. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage	VCCT	0	3.6	V	+3.3V
Supply Voltage	VCCR	0	3.6	V	+3.3V
Optical Receiver Input	PIMAX	-	5	dBm	Average
Operating Case Temperature	Tc I-Temp	-40	85	°C	
Storage Temperature	TSTR	-40	85	°C	
ESD SFI pins	ESD1	-	1	kV	HBM
ESD except for SFI pins	ESD2	-	2	kV	HBM

2. Operating Environment

Parameter	Symbol	Min	Typ.	Max	Unit	Notes
Supply Voltage	VCCT	3.135	3.300	3.465	V	+3.3V
Supply Voltage	VCCR	3.135	3.300	3.465	V	+3.3V
Operating Case Temperature	I-Temp	-40		85	°C	

3. Power Supply Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Supply Voltage	VCCT	3.135	3.300	3.465	V
	VCCR	3.135	3.300	3.465	V
Supply Current	Icc3	-	-	0.8	A
Power Consumption	PDS	-	-	2.5	W

4. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes	
Transmitter							
Chromatic Dispersion		0	-	270	ps/nm		
Operating Distance 25G		0		15	km	1	
Data Rate Retimed		24.33	25.78	Gbit/s	NRZ	2	
Data Rate Unretimed		1.2		11.3	Gbit/s		
Wavelength		1528.773		1566.314	nm	3	
Frequency range		191.40	-	196.1	THz		
Wavelength Spacing			100		GHz		
Center Frequency Deviation		-12.5		12.5	GHz		
Optical Transmit Power	Po	0		4	dBm	4	
Shuttered Output Power	-	-35	dBm				
Optical Power stability	ΔP_o	-1		1	dB	5	
Side mode suppression	SMSR	35	-	-	dB	6	
Spectral width	$\Delta\lambda$		0.3	0.5	nm	7	
Extinction ratio	ER	7.5	-	-	dB	8	
Eye mask		ITU-T G.959.1 NRZ 25G Ratio					9
Mask margin		10	-	-	%		
Tuning speed		-	-	150	ms	10	

Receiver						
Data Rate Retimed		24.33		25.78	Gbit/s	11
Data Rate Unretimed		1.2		11.3	Gbit/s	
Input Operating Wavelength		1260		1620	nm	12
Receiver Sensitivity 25G 0-270ps/nm	Prmin	-	-	-19.5	dBm	13
Maximum input power (overload) 25G	Pro	-7	-	-	dBm	
Receiver Reflectance	RL	-	-	-24	dB	
LOS assert		-35	-	-	dBm	
LOS de-assert		-	-	-23.5	dBm	
LOS Hysteresis		0.5	-	5.0	dB	
LOS assert time		-	-	100	us	
LOS de-assert time		-	-	100	us	

Notes:

1. Maximum pre-FEC bit-error ratio = 5×10^{-5}
2. NRZ
3. 100GHz grid, 48 channels
4. EOL
5. All channels, BOL
6. ± 2.5 nm, modulated
7. -20dB, modulated
8. Filtered, 25Gb/s
9. See G.959.1, Figure 7-4
10. Warmed-up, from any CH to any other CH
11. NRZ
12. Specs guaranteed between 1529.55nm to 1560.61nm
13. 25.78Gb/s, $5E-5$, OSNR>35dB

5. Module Electrical Output Characteristics at TP4

(IEEE 802.3 Table 83E-3)

Parameter	802.3	Test Point	Value	Units
Signaling rate per lane (range)		83E.3.1.1	25.78125 +/- 100 ppm	Gb/s
AC common-mode output voltage (max, RMS)		83E.3.1.2	17.5	mV
Differential output voltage (max)		83E.3.1.2	900	mV
Eye width (min)	EW8	109B.3.2.1.2	0.57	UI
Eye height, differential (min)	EH8	109B.3.2.1.2	228	mV
Vertical eye closure (max)	VEC8	109B.3.2.1.2	5	dB
Differential output return loss (min)		83E.3.1.3	Equation (83E-2)	dB

Common to differential mode conversion return		83E.3.1.3	Equation (83E-3)	dB
Differential termination mismatch (max)		83E.3.1.4	10	%
Transition time (min, 20% to 80%)		83E.3.1.5	12	ps
DC common mode voltage (min) ^a		83E.3.1.2	-350	mV
DC common mode voltage (max) ^a		83E.3.1.2	2850	mV

^aDC common mode voltage is generated by the host. Specification includes effects of ground offset voltage.

6. Module Electrical Input Characteristics at TP1/TP1a

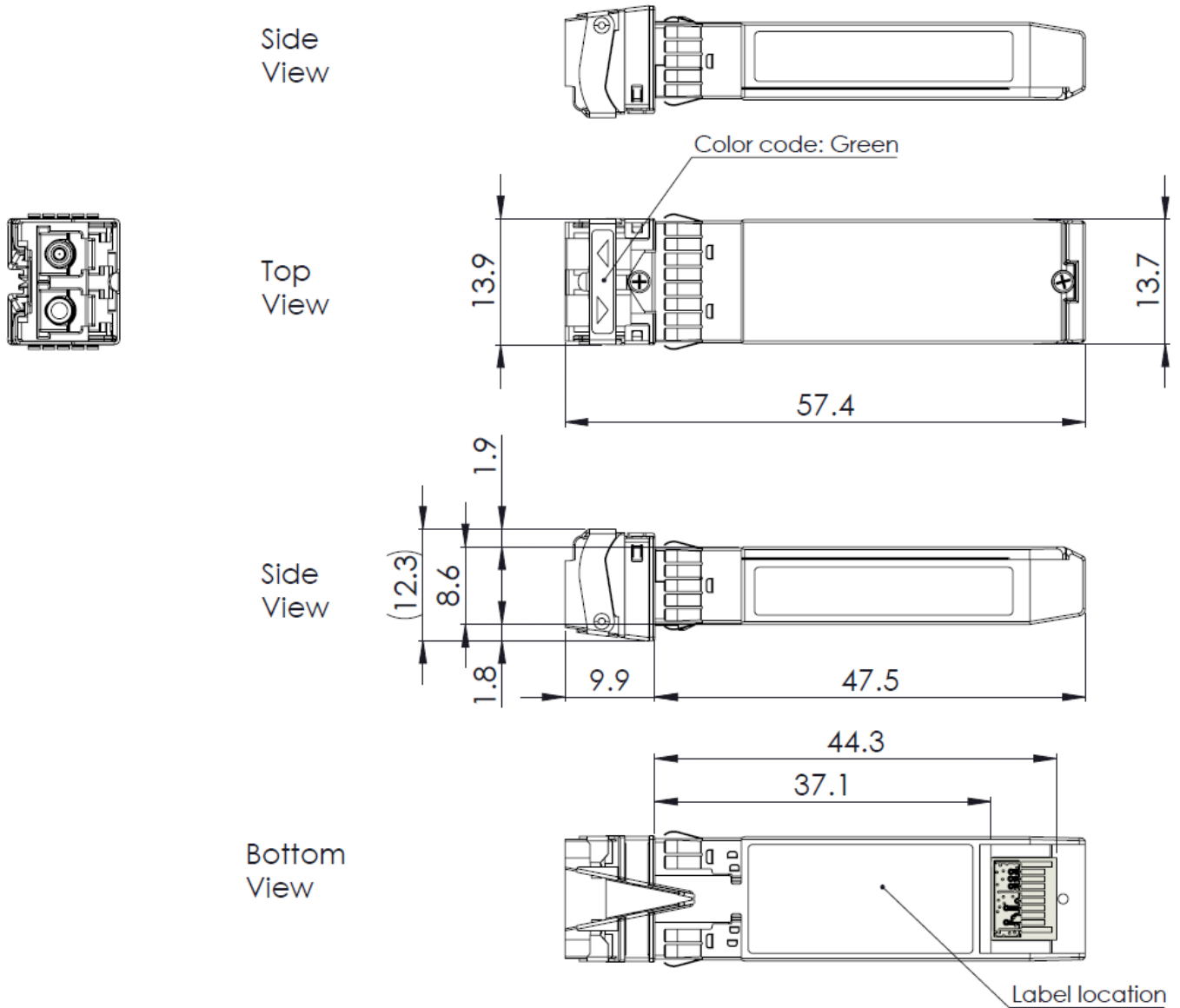
(IEEE 802.3 Table 83E-7)

Parameter	802.3	Test Point	Value	Units
Signaling rate per lane (range)	83E.3.1.1	TP1	25.78125 +/- 100 ppm	Gb/s
Differential pk-pk input voltage tolerance (min)	83E.3.1.2	TP1a	900	mV
Differential input return loss (min)	83E.3.3.1	TP1	Equation (83E-5)	dB
Differential to common-mode input return loss (min)	83E.3.3.1	TP1	Equation (83E-6)	dB
Differential termination mismatch (max)	83E.3.1.4	TP1	10	%
Module stressed input test ^a	109B.3.4.2	TP1a	See 109B.3.4.2	
Single-ended voltage tolerance range (min)	83E.3.1.2	TP1a	-0.4 to 3.3	V
DC common mode voltage (min) ^b	83E.3.1.2	TP1	-350	mV
DC common mode voltage (max) ^b	83E.3.1.2	TP1	2850	mV

^aMeets BER specified in 109B.3.4.2.

^bDC common mode voltage is generated by the host. Specification includes effects of ground offset voltage.

7. Mechanical Diagram



Note: External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

8. Ordering Information

OEM	Part Number	OEM	Part Number
MSA	AN-SFP28-TUNE-15-I	MSA OnePort	OP-SFP28-TUNE-15-I

9. Contact Information

Tel: 800.590.9535

Web: <http://www.approvednetworks.com>