

Features

- RoHS compliant
- Up to 10Gb/s data links
- Compliant with IEEE 802.3ae 10GBASE-L
- Compliant with Compact SFP MSA
- Compact SFP MSA Option 2
- Uncooled 1330nm CWDM DFB laser transmitter
- InGaAs PIN-PD receiver
- Metal package for lower EMI
- Single power supply voltage: +3.3V
- Low power dissipation
- LC duplex connector
- Operating temperature range: -40°C to 85°C



Applications

- 10G Ethernet 20km
- Compatible with CPRI line rates: 1.2288Gb/s~9.8304Gb/s

1. General Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Absolute Supply Voltage	Vcc_max	0	-	4.0	V	-
Operating Voltage	Vcc	3.135	-	3.465	V	-
Total Current	Icc	-	-	490	mA	-
Operating Case Temperature	Top	-40	-	85	°C	1
Storage Temperature	Tst	-40	-	85	°C	-

Notes: 1. Measured on top side front center of SFP+ module.

2. Electrical Specifications (Each Channel)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Data Rate	B	9.9	10.3	11.3	Gb/s	-
Differential Input Impedance	R _{in}	80	100	120	Ω	-
Differential Data Input Swing	V _{in,pp}	150	-	1000	mVp-p	-
Data Input Rise/Fall Time	tr/tf	15	-	40	ps	-
Data Dependent Input Jitter	DDJ			0.1	UI	1
Data Input Total Jitter	T _J	-	-	0.28	UI	-
Tx Disable Voltage	V _d	2.0	-	V _{cc} +0.3	V	-
Tx Enable Voltage	V _{en}	0	-	0.8	V	-
Tx Disable Assert Time	T _{off}	-	-	100	us	-
Tx Enable Assert Time	T _{on}	-	-	2	ms	-
Initialization Time	T _{start}	-	-	300	ms	-
Receiver						
Data Rate	B	9.9	10.3	11.3	Gb/s	-
Differential Output Impedance	R _{out}	80	100	120		-
Differential Data Output Swing	V _{out}	300	-	800	mVp-p	-
Data Output Rise/Fall Time	tr/tf	-	-	45	ps	2
Data Dependent Output Jitter	DDJ	-	-	0.42	UI	K28.5
Total Output Jitter	T _J			0.70	UI	2 ³¹ -1
LOS Output High Voltage	V _{losh}	2		V _{cc}		
LOS Output Low Voltage	V _{losl}	-	-	0.8	V	-
LOS Assert/Deassert Time Delay	T _{los_onoff}	-	-	100	us	

Notes:

1. K28.5 pattern @10.3Gb/s
2. 20%~80% values

3. Optical Specifications (Each Channel)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Average Optical Power	Pout	0	-	5	dBm	1
Launch Power in OMA minus TDP	-	-1.1	-	-	dBm	-
Optical Modulation Amplitude	-	-0.1	-	-	dBm	
Optical Wavelength	λ	1320	1330	1340	nm	-
Spectral Width@-20dB	$\lambda\Delta$ -20dB	-	-	0.45	nm	-
Side Mode Suppression Ratio	SMSR	30	-		dB	-
Optical power of OFF transmitter	Pout-off	-	-	-30	dBm	-
Transmitter and Dispersion Penalty	TDP	-	-	3.0	dB	-
Optical Extinction Ratio	ER	4.5	-	-	dB	-
Relative Intensity Noise	RIN12OMA	-	-	-128	dB/Hz	-
Optical Return Loss Tolerance	-	-	-	12	dB	-
Transmitter Reflectance	-	-	-	-12	dB	-
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}= {0.25, 0.40, 0.45, 0.25, 0.28, 0.40}						
Receiver						
Optical Wavelength	λ	1260	1270	1280	nm	-
Average Receiver Sensitivity	RSENS	-	-	-13.4	dBm	2
Maximum Input Power	Pol	1.5	-	-	dBm	-
Receiver Sensitivity in OMA	RSENSoma	-	-	-13.6	dBm	3
Stressed Receiver Sensitivity in OMA	-	-	-	-11.1	dBm	3
Receiver Reflectance	-	-	-	-12	dB	-
LOS Assert	LOS_A	-30	-	-	dBm	-
LOS De-assert	LOS_D	-	-	-14.4	dBm	-
LOS Hysteresis	-	1	2.5	5	dB	-

Notes

1. The maximum Tx Pout is the lesser of the Class I eye safety limit and a maximum receiver input power level of 0dBm.
2. Measured with a PRBS of $2^{31}-1$ at 1×10^{-12} BER and 4.5 dB extinction ratio at 10.3Gb/s
3. Measured with a PRBS of $2^{31}-1$ at 1×10^{-12} BER and at 10.3Gb/s"

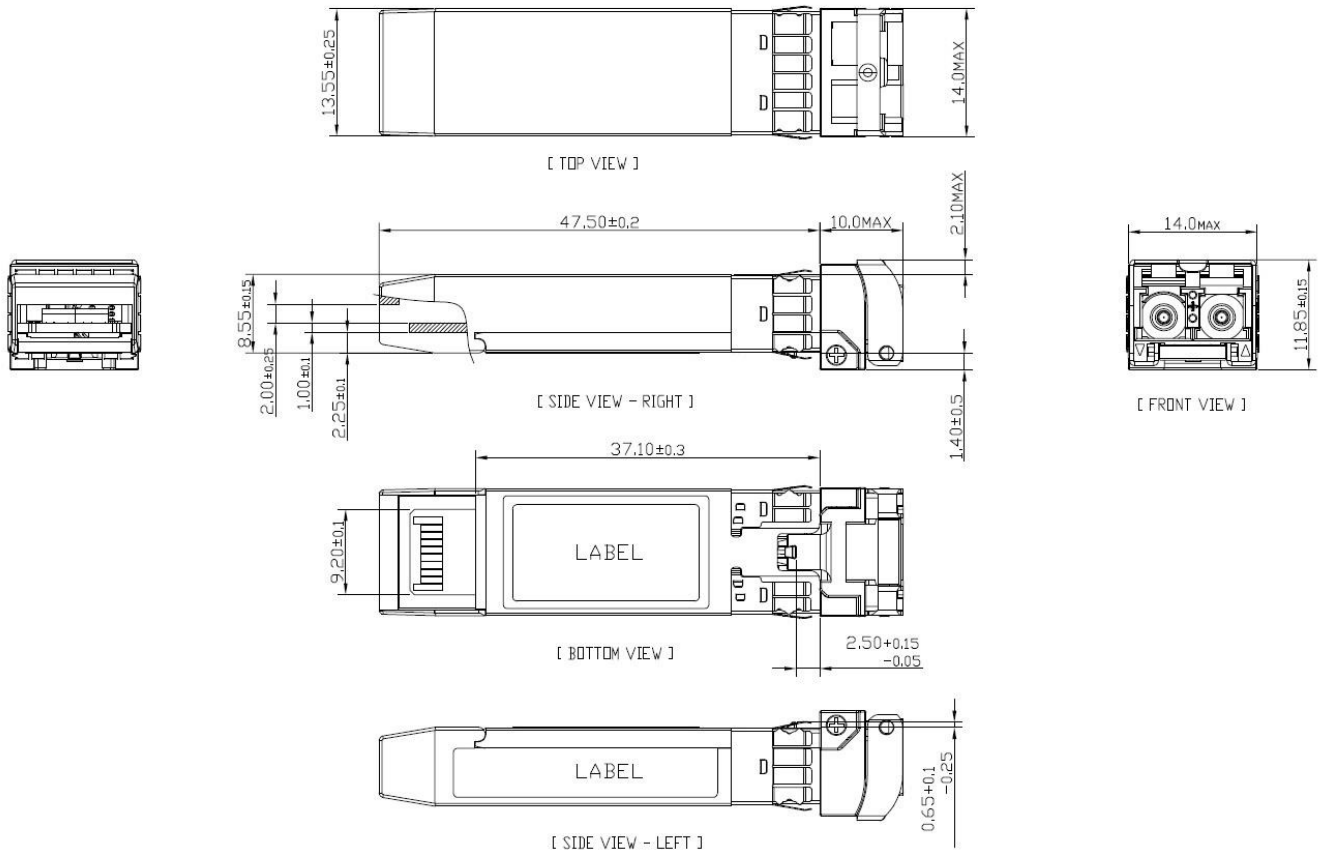
4. Link Budget Calculation

(based on the principle of IEEE 802.3ae)

Parameter	10G Base-L	Unit
Power Budget	13.44	dB
Operating Distance	20	km
Channel Insertion Loss	10.4	dB
Allocation for Penalties	3.04	dB
Additional Insertion Loss Allowed	0.0	dB

5. Mechanical Diagram

(Unit: mm)



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.

6. Ordering Information

OEM	Part Number	OEM	Part Number
MSA Generic	AN-CSFPP10G-BX32-20-I		

7. Contact Information

Tel: 800.590.9535

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