



Features:

- Operating Data Rate up to 10.31 Gbps
- 1310nm DFB-LD Transmitter, High Sensitivity APD Receiver
- Distance up to 70km
- Single 3.3V Power Supply and TTL Logic Interface
- Hot-Pluggable Duplex LC Connector Interface
- Operating Temperature:
 - Standard: 0°~+70°C
 - Industrial: -40°~+85°C
- Compliant with MSA SFP+ Specification SFF-8431
- Compliant with IEEE802.3ae 10GBASE-ZR/ZW
- RoHS compliant

Applications:

- 10GBASE-ZR at 10.31Gbps
- 10GBASE-ZW at 9.95Gbps
- 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

1. Absolute Maximum Ratings

Exceeding any one of these values may destroy the device immediately.

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

2. Recommended Operating Conditions

Parameter		Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	Commercial	Tc	0		70	°C
	Industrial	Tc	-40		85	°C
Power Supply Voltage		Vcc	3.15	3.3	3.45	V
Power Supply Current		Icc			520	mA
Surge Current		I _{surge}			+30	mA
Baud Rate		10GBASE-ZR		10.31		Gbps
		10GBASE-ZW		9.95		

3. Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
LVPECL Inputs (Differential)		V _{in}	150		1200	mV _{pp}	1
Input AC Common Mode Voltage			0		25	mV	2
Input Impedance (Differential)		Z _{in}	85	100	115	ohms	3
Differential Input S-parameter		SDD11	-	-	-10	dB	
Differential to Common Mode Conversion		SCD11	-	-	-10	dB	
TX_Disable Assert Time	t _{off}			10		us	
TX_Disable Negate Time	t _{on}	-	-	1		ms	
TX_DIS	High		2		V _{cc}	V	
	Low		0		0.8		
TX_FAULT	High		2		V _{cc} +0.3	V	4
	Low		0		0.8		5
Receiver							
CML Outputs (Differential)		V _{out}	350		700	mV _{pp}	1
Output AC Common Mode Voltage			0		15	mV	
Output Impedance(Differential)		Z _{out}	90	100	110	ohms	
Differential Output S-parameter		SD22	-	-	-10	dB	
RX_LOS	LOS	VoH	2		V _{cc} +0.3		
	Normal	VoL	0		0.8		
MOD_DEF(0.2)		VoH	2			V	6
		VoL	0		0.5		

Notes:

1. LVPECL logic, internally AC coupled
2. 2RMS
3. $3 R_{in} > 100 \text{ kohms @ DC}$
4. $I_o = 400 \mu\text{A}$, host Vcc
5. $I_o = -4.0 \text{ mA}$
6. With Serial ID

4. Optical Characteristics

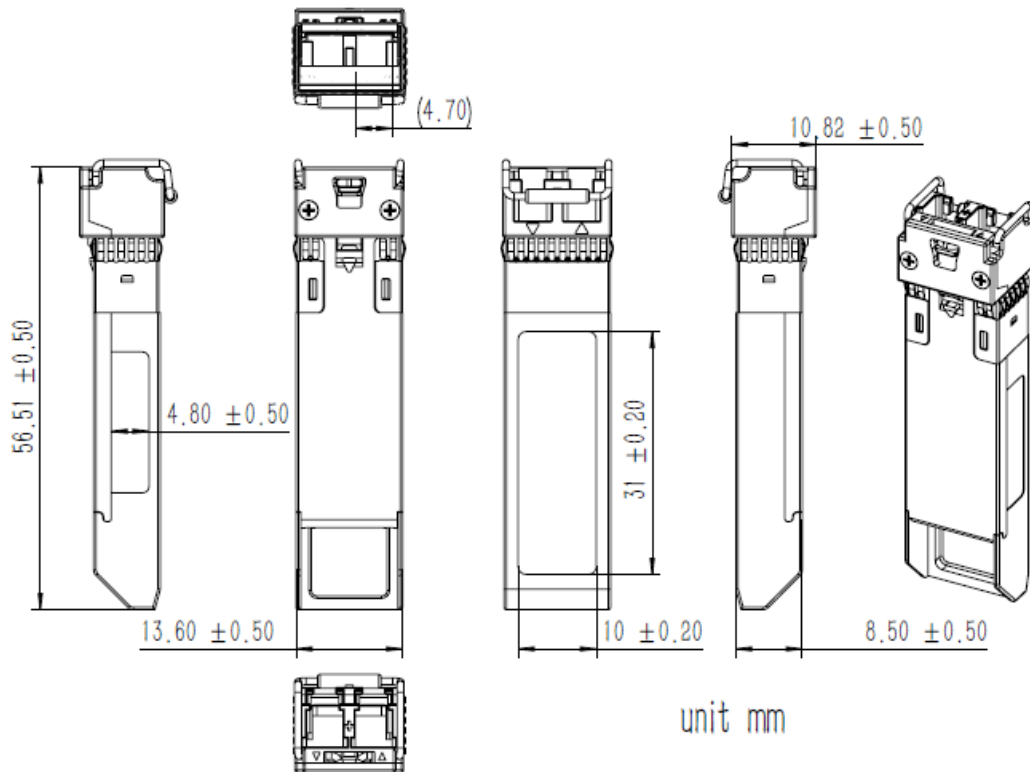
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
9 μm Core Diameter SMF	L		70		km	
Data Rate		0.6	10.31		Gbps	
Transmitter						
Center Wavelength	λ_C	1270	1310	1355	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Average Output Power	P _{out}	2		5	dBm	1
Extinction Ratio	ER	3.5			dB	
Average Power of OFF Transmitter	P _{off}			-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Transmitter Dispersion Penalty	TDP			2	dB	
Input Differential Impedance	Z _{in}	90	100	110		
TX_BISABLE time to start reset	t _{reset}	10	-	-	us	
Time to initialize, include reset of TX_FAULT	t _{init}	-	-	300	ms	
TX_FAULT from fault to assertion	t _{fault}	-	-	100	us	
Total Jitter	TJ	-	-	0.28	UI(p-p)	
Data Dependant Jitter	DDJ	-	-	0.1	UI(p-p)	
Uncorrelated Jitter	UJ	-	-	0.023	RMS	
Receiver						
Center Wavelength	λ_C	1260		1565	nm	
Receiver Sensitivity	P _{min}			-20	dBm	2
Receiver Overload	P _{max}	-8			dBm	
Return Loss	ORL			-12		
LOS De-Assert	LOSD			-22	dBm	

LOS Assert	LOSA	-34			dBm	
LOS-Hysteresis	Phys	0.5			dB	

Notes:

1. Output is coupled into a 9/125um SMF. The -4.7dBm is reference IEEE 802.3ae, the typical value is -1dBm.
2. Minimum average optical power measured at the BER less than 1E-12, back to back. The measure pattern is PRBS 231-1.

5. 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.

6. Ordering Information

OEM	Part Number	OEM	Part Number
Accedian	7SN-400-70KM-A	MSA	AN-SFP10G-LR70
Brocade	10G-SFPP-ZRL-A	OnePort	OP-SFP10G-LR70
Cisco	SFP-10G-LR70-A		

7. Contact Information

Tel: 800.590.9535

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