

Short Form Pluggables

SFP-813S-010D



SFP-Gigabit -Single Mode 10km – 1310 nm

Features

- Operating Data Rate up to 1.25Gbps
- FP Laser Transmitter and PIN-TIA Photo-Detector
- 10Km with 9/125µm SMF
- Single 3.3V Power Supply
- Hot-Pluggable SFP Footprint Duplex LC Connector Interface
- Power Dissipation <1.0W
- Industrial Operating Temperature -40°C ~ +85°C

Standards

- Compliant with SFF-8472
- Compliant with MSA SFP Specifications



Applications

- Gigabit Ethernet Switches and Routers
- Fibre Channel Switch Infrastructure
- Other Optical Links

Parameter	Symbol	Min	Typ	Max	Unit
9 µm Core Diameter SMF	L		10		km
Data rate			1.063 / 1.25		FC/Gbps
Transmitter					
Centre Wavelength	λ	1260	1310	1360	nm
Spectral Width (RMS)	$\Delta\lambda$			4	nm
Average Output Power (Note 1)	P _{out}	-9		-3	dBm
Extinction Ration	ER	9			dB
Rise / Fall Time (20%-80%)	Tr/tf			0.26	ns
Output Optical Eye (Note 2)	Compliant with IEEE 802.3				
P _{out} @TX Disable Asserted	P _{out}			-45	dBm
Receiver					
Centre Wavelength	λ_c	1260		1600	nm
Receiver Sensitivity (Note 3)	P _{min}			-21	dBm
Receiver Overload	P _{Max}	-3			dBm
LOS De-Assert	LOSD			-22	dBm
LOS Assert	LOSA	-35			dBm
LOS Hysteresis		1			dB
Note 1	Output power is power coupled into a 9/125 µm Single Mode Fibre				
Note 2	Filtered, measure with a PRBS 2 ⁷ -1 Test Pattern at 1250 Mbps				
Note 3	Minimum average optical power, measured at BER less than 1E-12 with 2 ⁷ -1 PRBS and ER -9dB				

Recommended Operating Conditions

Parameter	Symbol	Mon	Typ	Max	Unit
Operating Case Temperature	T _c	-40		+85	°C
Power Supply Voltage	V _{cc}	3.15	3.3	3.45	V
Power Supply Current	I _{cc}			300	mA
Data Rate	GBE		1.25		Gbps
	FC		1.063		

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Operating Temperature	T _s	-40°C	+85°C	°C
Maximum Supply Voltage	V _{cc}	-0.5	3.6	V
Operating Relative Humidity		5	85	%

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FACT SHEET

Parameter		Symbol	Min	Typ	Max	Unit	Notes
Transmitter							
LVPECL Inputs (Differential)		V _{in}	400		2000	mV _{pp}	AC Coupled Inputs (Note 4)
Input Impedance (Differential)		Z _{in}	85	100	115	ohms	R _{in} >100 kohms@DC
TX_Dis	Enable		2		V _{cc}	V	
	Disable		0		0.8		
TX_Fault	Fault		2		V _{cc} +0.3	V	
	Normal		0		0.5		
Receiver							
LVPECL Outputs (Differential)		V _{out}	400		2000	mV _{pp}	AC Coupled Outputs
Output Impedance (Differential)		Z _{out}	85	100	115	Ohms	
TX_Disable Assert Time		T _{off}			10	us	
RX_LOS	LOS		2		V _{cc} +0.3	V	
	Normal		0		0.8		
MOD_DEF (0.2)		VoH	2.5			V	With Serial ID
		VoL	0		0.5		
Note 4. LVPECL logic, internally AC Coupled							

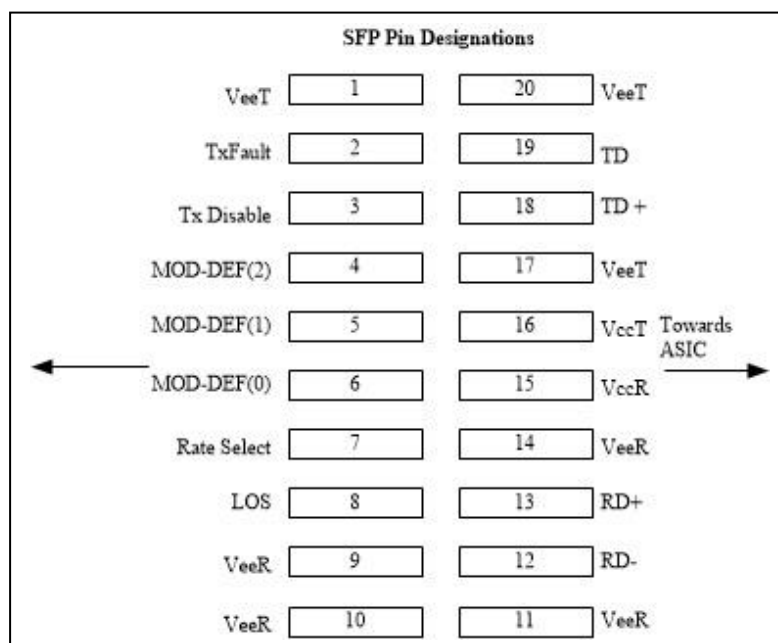
Note 4. LVPECL logic, internally AC Coupled

Digital Diagnostic Functions (DDI)

Parameter	Range	Unit	Accuracy	Calibration
Temperature	-40 to 85	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3 %	Internal/ External
Bias Current	15 to 75	mA	±10%	Internal/ External
TX Power	-9 to -3	dBm	±3 dB	Internal/ External
RX Power	-21 to -3	dBm	±3 dB	Internal/ External

NOTES

The Transceivers provide serial ID Memory contents and diagnostic information about the present operating conditions using the 2-wire serial interface (SCL, SDA) The diagnostic information with internal calibration or external calibration are all implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

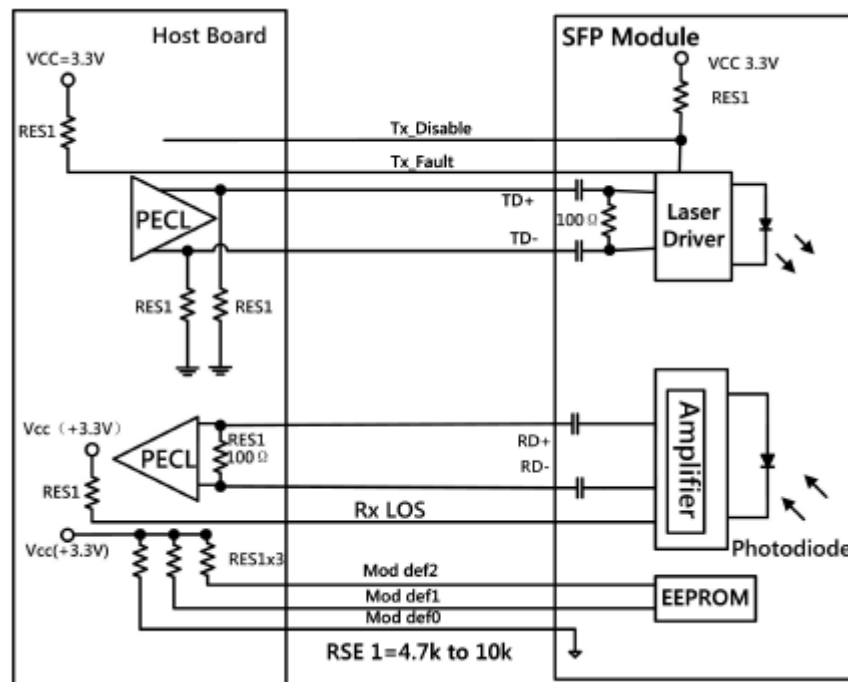


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Pin	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	5)
2	TX Fault	Transmitter Fault Indication	3	1)
3	TX Disable	Transmitter Disable	3	2) Module disables on high or open
4	MOD-DEF2	Module Definition 2	3	3) 2 wires serial ID Interface
5	MOD-DEF1	Module Definition 1	3	3) 2 wires serial ID Interface
6	MOD-DEF0	Module Definition 1	3	3) Grounded within the module
7	Rate Select	Not Connected	3	Function not available
8	LOS	Loss of Signal	3	4)
9	Veer	Receiver Ground	1	5)
10	Veer	Receiver Ground	1	5)
11	Veer	Receiver Ground	1	5)
12	RD-	Inv. Received Data Out	3	6)
13	RD+	Received Data Out	3	7)
14	VeeR	Receiver Ground	1	5)
15	VccR	Receiver Power	2	7) 3.3 $\pm$ 5%
16	VccT	Transmitter Power	2	7) 3.3 $\pm$ 5%
17	VeeT	Transmitter Ground	1	5)
18	TD+	Transmitter Data In	3	8)
19	TD-	Inv. Trans Data In	3	8)
20	VeeT	Transmitter Ground	1	5)

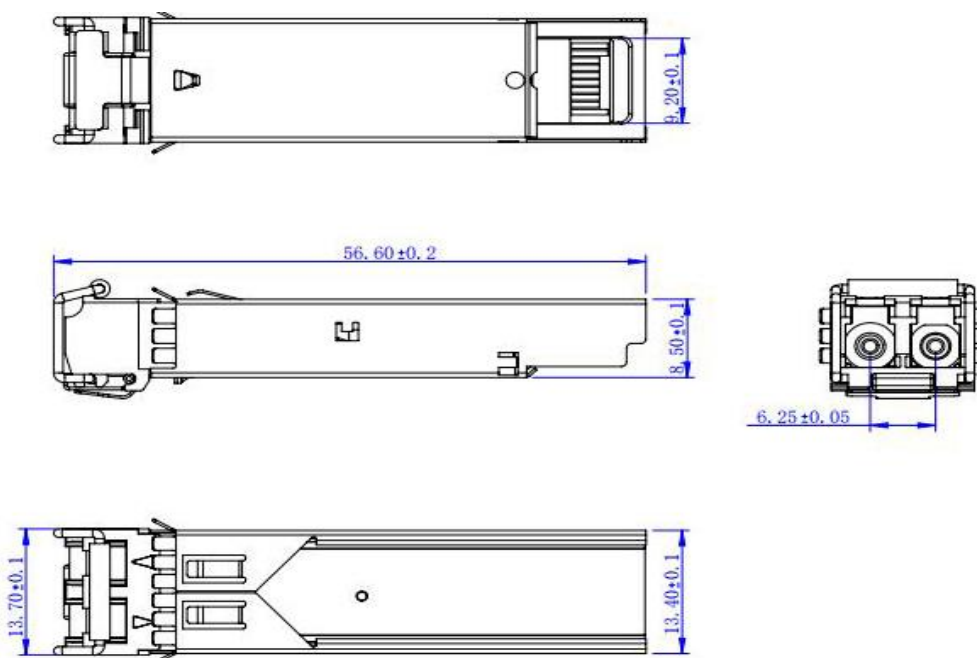
Recommended Circuit Schematic



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Mechanical Specifications



Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical pins	MIL-STD-883G Method 3015.7	Class 1C (>1000V)
Electrostatic Discharge (ESD) to the enclosure	EN 55035:2017 /A11:2020 IEC 61000-4-2	Compliant with standards
Electromagnetic Interference (EMI)	CFR47, FCC part 15 subpart B, ANSI C63.4:2014 EN 550032:2015+A11:2020 CISPR 16-2-1	Compliant with standards noise frequency range: 30Mhz to 60Ghz. Good system EMI design practice required to achieve class B margins. System margins are dependent on customers host board and chassis design
Electromagnetic Immunity	EN 55024:2010+A1:2015, IEC 61000-4-3	Compliant with standards 1KHz sine wave, 80% AM from 80Mhz to 1Ghz. No effect on transmitter/ receiver performance is detectable between these limits
RoHS 10	2011/ 65 /EU and the ammendment directive (EU) 2015 / 863	Compliant with standards
Component Recognition	EN 62368-1:2014+A11 EN 60825-1:2014 EN 60825-2:2004+A1+A2	CE No; CTB220615038E UL File; CN21EFMW001 TuV Certificate No. R50491717

Ordering Information

Part Number	Fibre	Range	Wave	Temperature
SFP-813S-010D	SM	10km	1310	-40°C to + 85°C