

Product Specification

125/155 Mb/s RoHs Compliant Pluggable SFP Transceiver

ASFPFE20S31C

Features:

- 125/155 Mb/s Data Links
- 1310nm FP laser transmitter
- Single +3.3V Power Supply
- Metal Enclosure, Excellent EMI & ESD Protection
- Operating temperature range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Hot-Pluggable SFP footprint
- RoHS Compliant and Lead-Free
- Compatible with Fast Ethernet as specified in IEEE Std
- Compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA)₁
- Duplex LC Connector
- Compliant with Bellcore TA-NWT-000983
- Eye Safety Compliant with IEC60825-1



Applications:

- Fast Ethernet
- SONET OC-3/SDH STM
- Other optical links
- Compatible with CISICO switch

Specification:

Electrical and Optical Characteristics: (T_{OP} = -40 to 85 °C, V_{CC} = 3.15 to 3.60

Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter Differential Input Volt	+/-TX_DAT	200		2400	mV p-p
Supply Current	I _{CC}		130	180	mA
Tx_Disable Input Voltage – Low	V _{IL}	0		0.8	V
Tx_Disable Input Voltage – High	V _{IH}	2.0		V _{CC}	V
Tx_Fault Output Voltage – Low	V _{OL}	0		0.8	V
Tx_Fault Output Voltage – High	V _{OH}	2.0		V _{CC}	V
Receiver Differential Output Volt	+/-RX_DAT	600		1400	mV p-p
Rx_LOS Output Voltage- Low	V _{OL}	0		0.8	V
Rx_LOS Output Voltage- High	V _{OH}	2.0		V _{CC}	V

Transmitter Section:

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate	B	-	125	-	Mb/s
Centre Wavelength	λ_c	1296	1310	1330	nm
Output Spectral Width	$\Delta \lambda$	-	-	4	nm
Average Output Power	P _o	-15	-	-8	dBm
Extinction Ratio	EXT	8.2	-	-	dB
Data Input Voltage-High	V _{IHS}	V _{CC} -1.16	-	V _{CC} -0.89	V
Data Input Voltage -Low	V _{ILS}	V _{CC} -1.82	-	V _{CC} -1.48	V
Supply Current	I _{CC}	-	90	150	mA
Output Optical Eye	Compliant with IEEE802.3Z				

Receiver Section:

Parameter	Symbol	Min.	Typical	Max.	Unit
Receive Sensitivity	P _{min}	-	-	-28	dBm
Maximum Input Power	P _{MAX}	-3	-	-	dBm
Signal Detect Threshold-De-Assert:	S _D	-	-	-30	dBm
Signal Detect Threshold-Assert	S _A	-45	-	-	dBm
Output High Voltage	V _{OH}	V _{CC} -1.03	-	V _{CC} -0.89	V
Output Low Voltage	V _{OL}	V _{CC} -1.82	-	V _{CC} -1.63	V
Operating Wavelength	λ_c	1100	-	1600	nm
Supply Current	I _{CC}	-	80	110	mA

Environmental Specifications:

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _{ST}	-40	+85	°C
Operating Temperature	T _{IP}	-40	+85	°C
Input Voltage	T _{CC}	0	+5	V

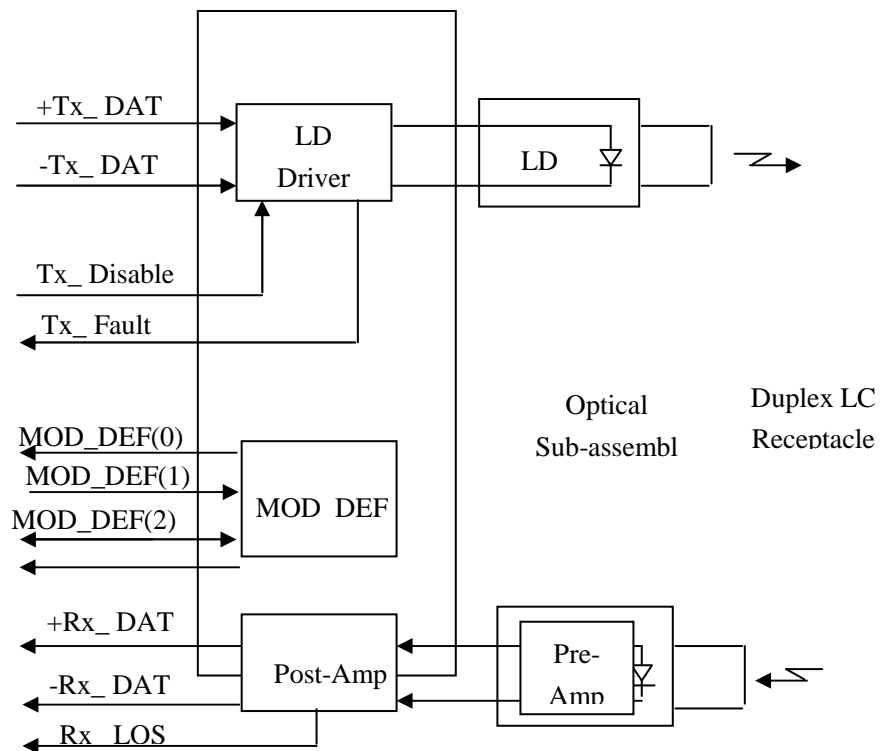
Recommended Operating Environment:

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V _{CC}	+3.0	+3.3	+3.6	V
Operating Temperature	T _{OP}	-40	-	+85	°C

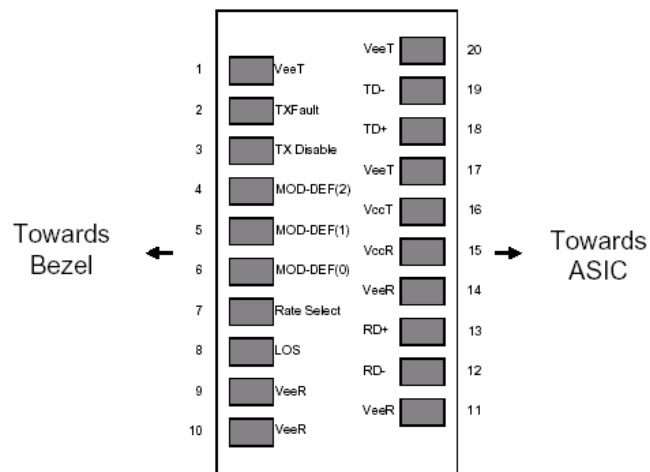
Timing Characteristics:

Parameter	Symbol	Min.	Typical	Max.	Unit
TX_DISABLE Assert Time	t _{off}		3	10	usec
TX_DISABLE Negate Time	t _{on}		0.5	1	msec
Time to initialize include reset of TX_FAULT	t _{int}		30	300	msec
TX_FAULT from fault to assertion	t _{fault}		20	100	usec
TX_DISBEL time to start reset	t _{reset}	10			usec
Receiver Loss of Signal Assert Time (off to On)	T _{A,RX_LOS}			100	usec
Receiver Loss of Signal Assert Time (on to off)	T _{d,RX_LOS}			100	usec

Block Diagram of Transceiver:



Pin Assignment



Pin out of Connector Block on Host Board

Pin Description:

Pin	Symbol	Name/Description	Ref.
1	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T _{FAULT}	Transmitter Fault. Low normal operation, High Fault indication	
3	T _{DIS}	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
10	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V _{EER}	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	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	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	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V.
MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Serial ID Memory Contents:

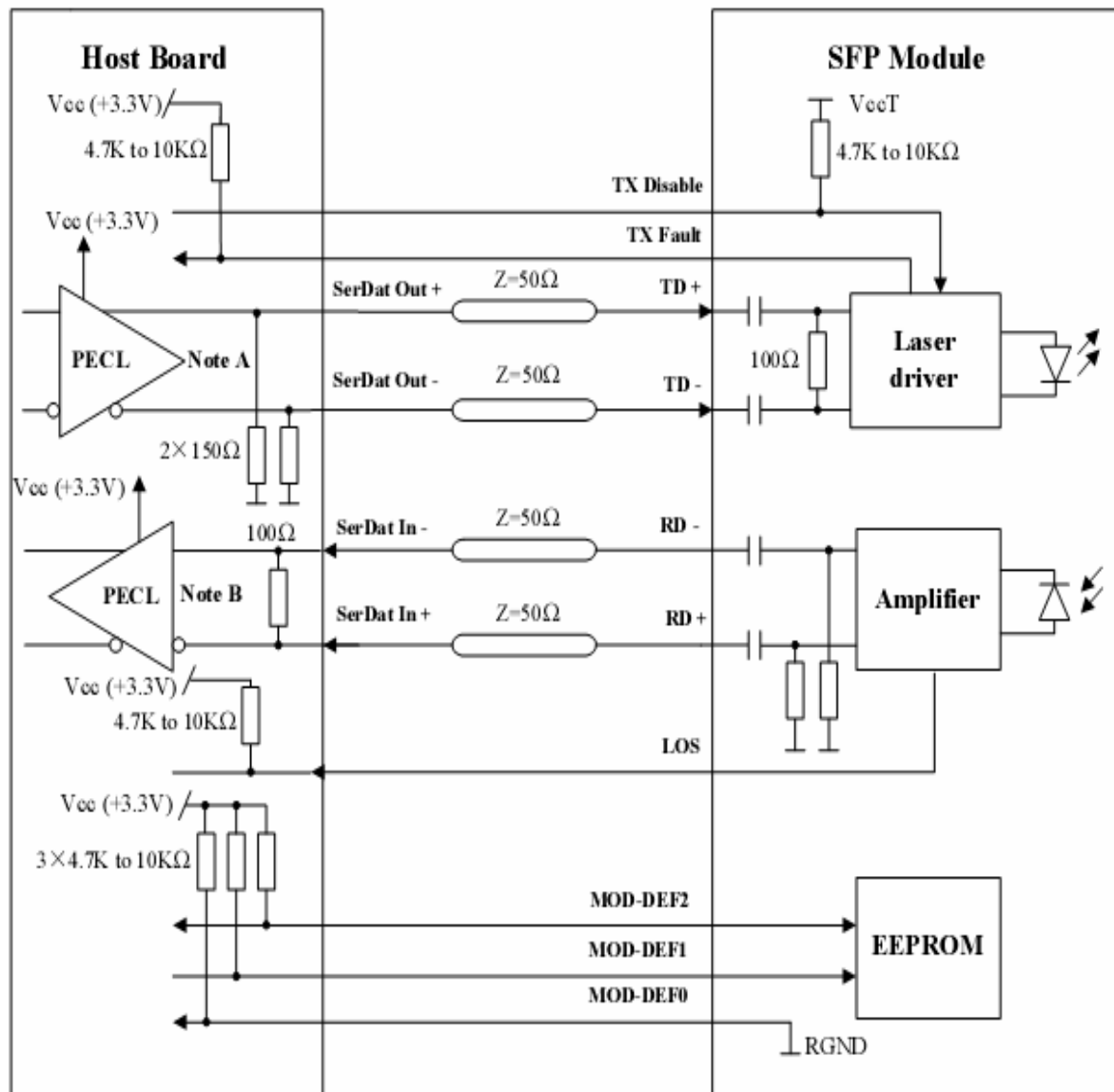
Alton Tech ASFP1G20S31C SFP transceivers support the 2-wire serial communication protocol as defined in the SFP MSA₁. It is very closely related to the E2PROM defined in the GBIC standard, with the same electrical specifications.

The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

The SFP MSA defines a 256-byte memory map in E2PROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h)

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	Gigabit Ethernet 1000Base-SX & Fiber Channel
11	1	Encoding	8B10B (01h)
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	
56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Hi-Optel's Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	specific date, read only

Recommended Circuit:



Mechanical Dimensions:

