PRODUCT DATASHEET

SFPP-10G-40km-1310

Hybriflex SFP+ Modul 10G 40km

SFP+ transceivers, according to Enhanced Small Form Factor Pluggable "SFP+ Multi-Sourcing Agreement (MSA) SFF-8431 and SFF-8472, are designed for 10G Ethernet serial optical data communication up to 10km on single mode fiber. They are compatible with IEEE Std 802.3 10G Ethernet 10GBase-LR

Features / Benefits

- Compliant with IEEE Std 802.3 10G Ethernet 10GBase-LR
- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8431 and SFF-8472
- SFP+ MSA package with duplex LC connector
- Uncooled DFB laser
- PIN receiver
- Up to 10.3125Gb/s data links
- Single +3.3V power supply
- Class 1 laser safety certified
- Operating temperature: 0 °C to 70 °C
- Up to 40km on SMF
- RoHS Compliant

Technical Features

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Storage Temperature	Ts	-40	-	85	°C	-
Relative Humidity	Rh	5	-	95	%	-
Supply Voltage	Vcc	-0.5	-	4.0	V	-

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Operating Case Temperature(Commercial)	Tc	0	25	70	°C	Measured with PRBS31 test pattern, 10.3125Gb/s, BER<10-12
Operating Case Temperature(Industrial)	Tc	-40	25	85	°C	Measured with PRBS31 test pattern, 10.3125Gb/s, BER<10-12
Supply Voltage	Vcc	3.135	3.3	3.465	V	Measured with PRBS31 test pattern, 10.3125Gb/s, BER<10-12
Data Rate	BR-	-	10.3125	-	Gb/s	Measured with PRBS31 test pattern, 10.3125Gb/s, BER<10-12

TRANSMITTER OPTICAL CHARACTERISTICS

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	Po	2	-	5	dBm	-
Center Wavelength Range	λc	1260	1310	1355	nm	-
Extinction Ratio	ER	3.5	5.5	-	dB	-
Spectral Width (RMS) at -20dB	Δλ	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Jitter	JI	-	-	0.3	UI	-
Transmitter and Dispersion Penalty	TDP	-	-	3.2	dB	-
Optical Return Loss Tolerance	ORLT	-	-	12	dB	-
Pout @TX-Disable Asserted	Poff	-	-	-30	dBm	-

RECEIVER OPTICAL CHARACTERISTICS

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λc	1260	-	1600	nm	-
Receiver Sensitivity @10.3Gb/s	-	-	-	-14.4	dBm	Measured with PRBS31 test pattern, 10.3125Gb/s, BER<10-12
Receiver Overload (Pavg)	POL	0.5	-	-	dBm	Comply with IEEE 802.3
Jitter	JI	-	-	0.3	UI	-
Receiver Reflectance	RR	-	-	-26	dB	-
LOS De-Assert	LOS-D	-	-	-16	dBm	-
LOS Assert	LOS-A	-30	-	-	dBm	-
LOS Hysteresis	LOS-H	0.5	-	-	dB	-

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Module Supply Current	Icc	-	250	360	mA	-
Power Dissipation	PD	-	-	1200	mW	-
Transmitter Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Input Differential Impedance	ZIN	-	100	-	Ω	-
Differential Data Input Swing	VIN,P-P	180	-	700	mV	-
TX_FAULT Transmitter Fault	VOH	2.0	-	Vcc	V	TX_FAULT
TX_FAULT Normal Operation	VOL	0	-	0.8	V	-
TX_DISABLE Transmitter Disable	VIH	2.0	-	Vcc	V	TX_DISABLE
TX_DISABLE Transmitter Enable	VIL	0	-	0.8	V	-
Receiver Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Output Differential Impedance	ZO	-	100	-	Ω	-
Differential Data output Swing	VOUT,P-P	300	-	850	mV	-
RX_LOS Loss of signal (LOS)	VOH	2.0	-	Vcc	V	LOS is an open collector output. Should be pulled up with 4.7KΩ on the host board
RX_LOS Normal Operation	VOL	0	-	0.8	V	-

PIN DESCRIPTION

PIN	Name	Function / Description	Notes
1	VeeT	Transmitter Ground	The module signal grounds are isolated from the module case
2	TX_Fault	Transmitter Fault (LVTTL-O) - High indicates a fault condition	This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
3	TX_Disable	Transmitter Disable (LVTTL-I) – High or open disables the transmitter	This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	This is a ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost
7	RS0	Rate Select 0 – Not used, Presents high input impedance	-
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
9	RS1	Rate Select 1 – Not used, Presents high input impedance	-
10	VeeR	Receiver Ground	The module signal grounds are isolated from the module case
11	VeeR	Receiver Ground	The module signal grounds are isolated from the module case
12	RD-	Inverse Received Data out (CML-O)	-
13	RD+	Received Data out (CML-O)	-
14	VeeR	Receiver Ground	-
15	VccR	Receiver Power - +3.3V	-
16	VccT	Transmitter Power - +3.3 V	-
17	VeeT	Transmitter Ground	The module signal grounds are isolated from the module case
18	TD+	Transmitter Data In (CML-I)	-
19	TD-	Inverse Transmitter Data In (CML-I)	-
20	VeeT	Transmitter Ground	The module signal grounds are isolated from the module case

Electrical Pad Layout