RoHS compliant
CL-SFP-E1-TDM (TDMoIP)
E1 SFP (RJ45 interface)
Datarate: 2Mbps

Description

TDM over Ethernet(IP) WAN link
Support Circuit Emulation Service over Ethernet (CESoE) transport over IP networks.
Complies IEFT RFC4533 Structure-Agnostic TDM over Packet (SAToP), Metro Ethernet Forum MEF8 IA .
Support hardware-based adaptive clock recovery, Recovered clock jitter compliant to ITU-T G.823 (E1 Jitter Control).
Jitter buffer depth to compensate up to 64 ms of Packet Delay Variation.
Use Raw Encapsulation method for PDH payload type over Ethernet packet. Payload size is configurable.
E1 interface support unframed ,or framed with or without CRC.
Hot-pluggable SFP footprint
Compact RJ-48c (RJ45) connector assembly
Fully metal enclosure, for lower EMI
RoHS compliant and lead-free
Single +3.3V power supply
100BASE-FX operation in host systems with LVPECL interface
Ambient Operating temperature: -20°C to +65°C

Applications

Web Bridge
EMUX-100 configuration ,Web browser based .
IP DSLAM
Router
Mobile/WiMax Backhaul

Ordering Information

PART NUMBER	Monitor	INPUT/OUTPUT	SIGNAL DETECT	TEMPERATURE
CL-SFP-E1-TDM	X	AC/AC	TTL	-20°C to 65 °C

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Product selection

P/N	Link Indicator on RX_LOS Pin	100BASE-X auto-negotiation enabled by default
	No	No

I. SFP to Host Connector Pin Out

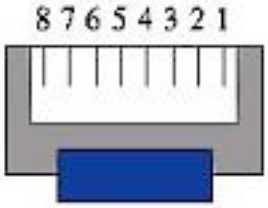
PIN	Symbol	Name/ Description	Ref.
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault. Not supported.	
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 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 connected to chassis ground
2. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
3. Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V.

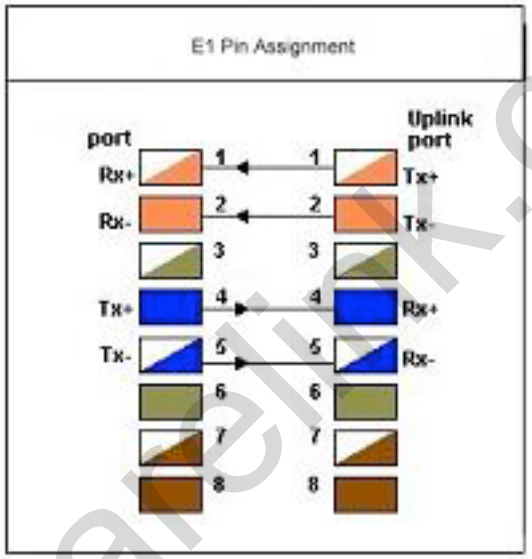
MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is an open collector output, which should be pulled up with a 4.7K - 10K Ohms resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.

Figure 1. Diagram of host board connector block pin numbers and names

E1 Interface Connector



End view



E1 RJ48C Pin Assignments

PIN	Symbol	Name/ Description	Ref.
1	RX+	Receiver differential +	
2	RX-	Receiver differential -	
3		No use	
4	TX+	Transmitter differential +	
5	TX-	Transmitter differential -	
6		No use	
7		No use	
8		No use	

II. +3.3V Volt Electrical Power Interface

Models have an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

+3.3 Volt Electrical Power Interface						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Supply Current	Is		320	375	mA	1.2W max power over full range of voltage and temperature. See caution note below
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax			4	V	
Surge Current	Isurge			30	mA	Hot plug above steady state current. See caution note below

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA

III. Low-Speed Signals

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, "Serial Communication Protocol"). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc

Low-Speed Signals, Electronic Characteristics					
Parameter	Symbol	Min	Max	unit	Notes/Conditions
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Output HIGH	VOH	host_Vcc -0.5	host_Vcc + 0.3	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector
SFP Input HIGH	VIH	2	Vcc + 0.3	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector

IV. High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

WAN Electrical Interface **E1 Interface**						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Line Frequency	fL		2.048		MHz	
Tx Output Impedance	Zout,TX		120		Ohm	
Rx Input Impedance	Zout,RX		120		Ohm	

High-Speed Electrical Interface, **Host-SFP**						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Single ended data input swing	V_{insing}	250		1200	mV	Single ended
Single ended data output swing	$V_{outsing}$	350		800	mV	Single ended
Rise/Fall Time	T_r,T_f		175		psec	20%-80%
Tx Input Impedance	Z_{in}		50		Ohm	Single ended
Rx Output Impedance	Z_{out}		50		Ohm	Single ended

V. General Specifications

General						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditios
Data Rate	BR			2.048	Mbits	
Cable Length	L			TBD		Short haul

Notes:
1. Clock tolerance is +/- 50 ppm
2. By default, the CL-SFP-E1-TDM is a full duplex device in preferred master mode
3. Automatic crossover detection is enabled. External crossover cable is not required
4. 100 BASE-FX operation with the NRZI signals across the LVPECL interface

VI. Environmental Specifications

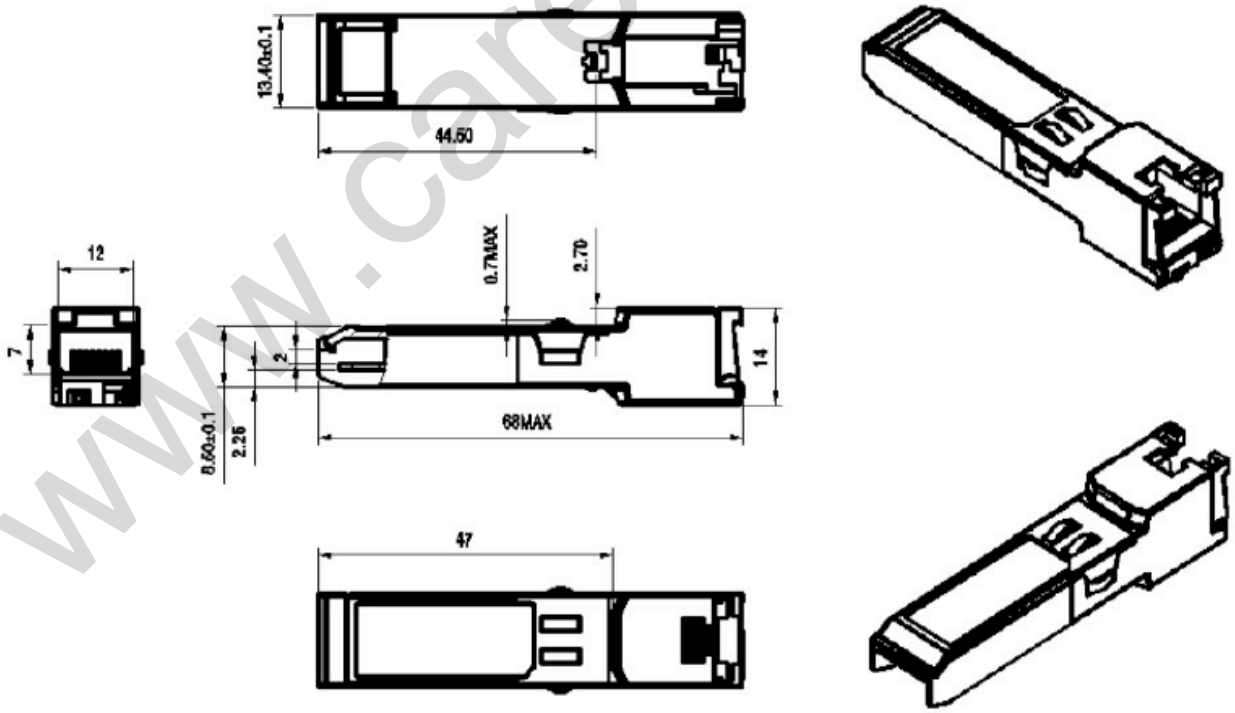
Environmental Specifications						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Operating Temperature	Top	-20		75	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

VII. Serial Communication Protocol

Not support in this module in current stage.

Serial Bus Timing Requirements						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
I ^{2}C Clock Rate		0		100.000	Hz	

VIII. Mechanical Specifications (Unit: mm)



Eye Safety Mark

The SFP series multimode transceiver is a class 1 laser product. It complies with EN 60825-1 and FDA 21 CFR 1040.10 and 1040.11. In order to meet laser safety requirements the transceiver shall be operated within the Absolute Maximum Ratings. ***Caution*** **All adjustments have been done at the factory before the shipment of the devices. No maintenance and user**	**Required Mark** **Class 1 Laser Product** **Complies with**