Smart Architecture of Espadana
Designing, Production,Customization and Consultant Service
in Network and Fiber Optic System

Technical Specification

SAE-TGMD85-03

10G 300m SFP Transceiver/Multimode

OVERVIEW

The SFP transceivers **SAE-TGMD85-03** are high performance, cost effective modules supporting data -rate of 10Gbps and 300M transmission distance with MMF.

The transmitter converts 10Gbit/s serial PECL or CML electrical data into serial optical data compliant with the 10GBASE-SR standard. An open collector compatible Transmit Disable (Tx_Dis) is provided. Logic "1" or no connection on this pin will disable the laser from transmitting. Logic "0" on this pin provides normal operation. The transmitter has an internal automatic power control loop (APC) to ensure constant optical power output across supply voltage and temperature variations. An open collector compatible Transmit Fault (TFault) is provided. TX_Fault is a module output contacts that when high, indicates that the module transmitter has detected a fault condition related to laser operation or safety. The TX_Fault output contact is an open drain/collector and shall be pulled up to the Vcc_Host in the host with a resistor in the range 4.7-10 kΩ. TX_Disable is a module input contact. When TX_Disable is asserted high or left open, the SFP+ module transmitter output shall be turned off. This contact shall be pulled up to VccT with a 4.7 kΩ to 10 kΩ resistor

SAE-TGMD85-03 made by high quality of components were rigorous screened, have superior performance in stability, environmental adaptability. The product planned in a way of better resistance and ability to corrosion and electromagnetic interference.

Feature

- Data-rate of 10Gbps operation
- 850nm VCSEL laser and PIN photo detector for 300m transmission with MMF
- Optical interface compliant to IEEE 802.3ae
- Electrical interface compliant to SFF-8431
- Hot Pluggable
- Maximum link length of 300m on 2000MHz/km MMF
- All-metal housing for superior EMI performance
- Advanced firmware allow customer system encryption information to be stored in transceiver
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Standard temperature: 0 to +70°C
- Industrial temperature: -40 to +85°C

Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Technical Specification

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	+85	°C
Supply Voltage	V cc	-0.5	+4.7	V
Operating Temperature	TOP	0	70	°C

Optical Characteristics:

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Pwr (End of Life)	POUT	-10.0		-3.0	dBm	1
Optical Wavelength	λ	830	850	860	nm	
Wavelength Temperature Dependence			0.08	0.125	nm/°C	
Spectral Width (-20dB)	σ			3.0	nm	
Optical Extinction Ratio	ER	10			dB	
Sidemode Suppression ratio	SSRmin	30			dB	
Optical Rise/Fall Time	tr/ tf		100	160	ps	
RIN	RIN			-120	dB/Hz	
Transmitter Jitter (peak to peak)				100	ps	
Receiver						
Average Rx Sensitivity @ Gigabit Ethernet	RSENS3			-24.0	dBm	2
Maximum Input Power	PMAX	-3.0			dBm	
Optical Center Wavelength	λC	770	850	860	nm	
LOS De -Assert	LOSD			-20	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis			1.0		dB	
Receiver Jitter Generation @1.25Gbps				160	ps	3

Notes:

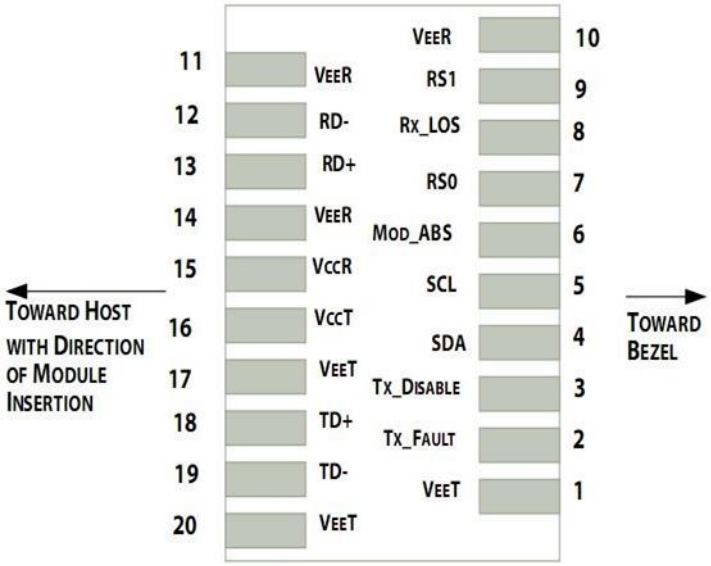
1. Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
2. with worst-case extinction ratio. Measured with a PRBS 223-1 test pattern, @1.25Gb/s, BER<10-12 3.

Jitter added by receiver (peak to peak). Measured at –18.0dBm average Rx sensitivity, PRBS 223-1 test

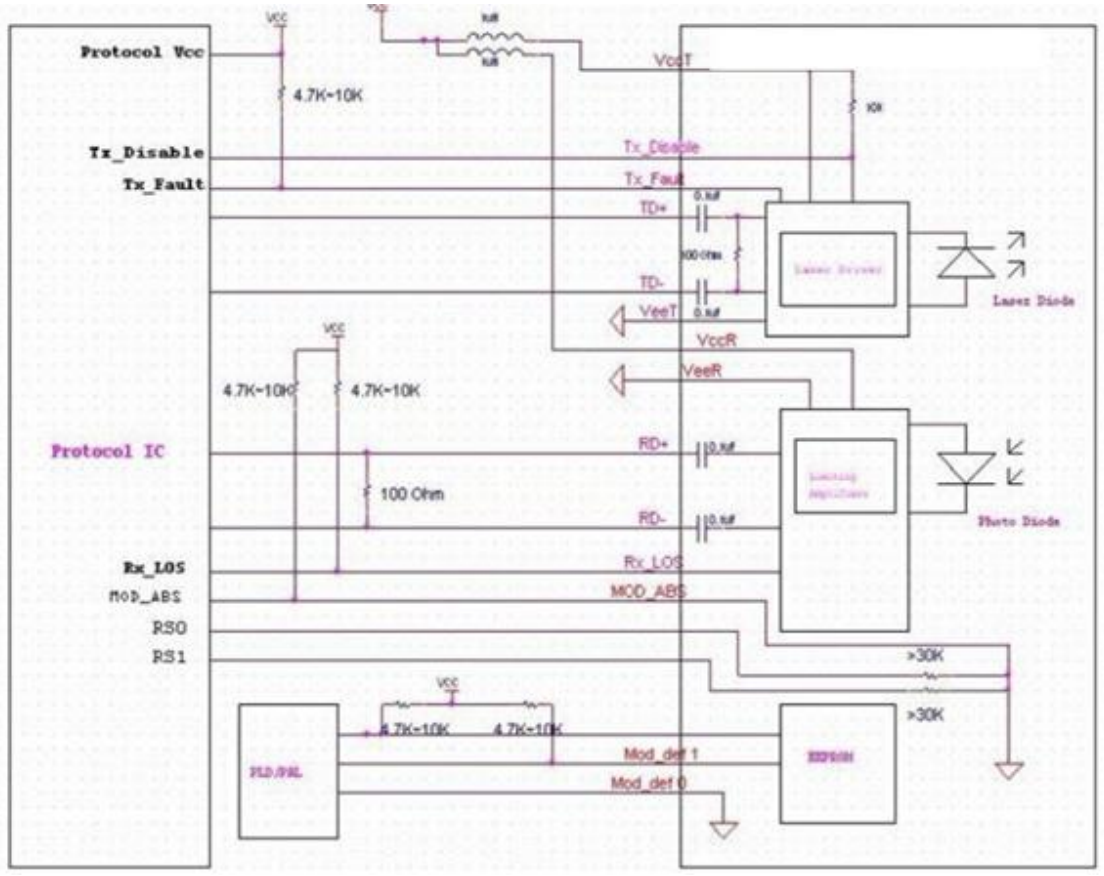
Pin Descriptions:

Pin	Symbol	Name/Description	Ref.
1	V EET	Transmitter Ground (Common with Receiver Ground)	1
2	T FAULT	Transmitter Fault.	2
3	T DIS	Transmitter Disable. Laser output disabled on high or open.	3
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	4
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	4
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	4
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	5
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



Typical Interface Circuit: (Host-Transceivers Interface Block Diagram)



Electrical Interface Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc	3.15	3.3	3.6	V	
Supply Current	Icc		185	250	mA	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Single ended data input swing	Vin,pp	250		1200	mV	
Transmit Disable Voltage	VD	Vcc–1.3		Vcc	V	
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	2
Transmit Disable Assert Time				10	us	
Receiver						
Single ended data output swing	Vout,pp	250		800	mV	3
Data output rise time	tr		100	175	ps	4
Data output fall time	tf		100	175	ps	4
LOS Fault	VLOS fault	Vcc–0.5		VccHOST	V	5

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Or open circuit.
3. Into 100 ohms differential termination.
4. 20 – 80 %
5. Loss of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
6. Receiver sensitivity is compliant with power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the recommended power supply filtering network.

Digital Diagnostic Functions

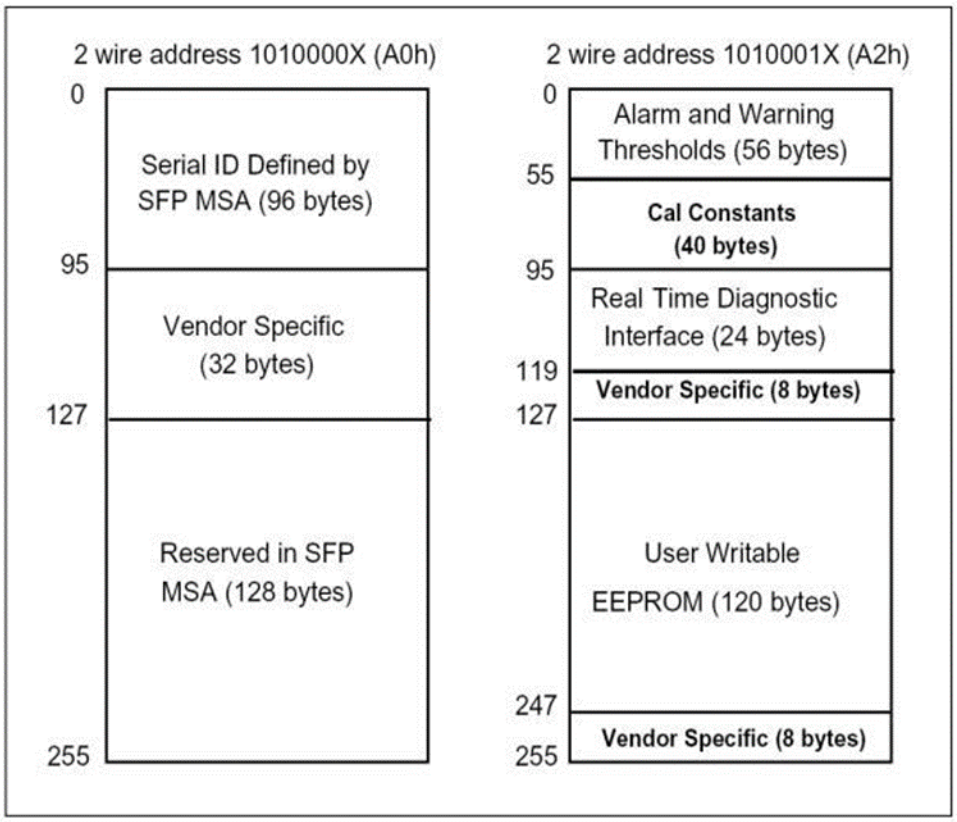
Wave Thought **SAE-TGMD85-03** transceivers support the 2-wire serial communication protocol as defined in the SFP MSA.

It is very closely related to the E2PROM defined in the GBIC standard, with the same electrical specifications.

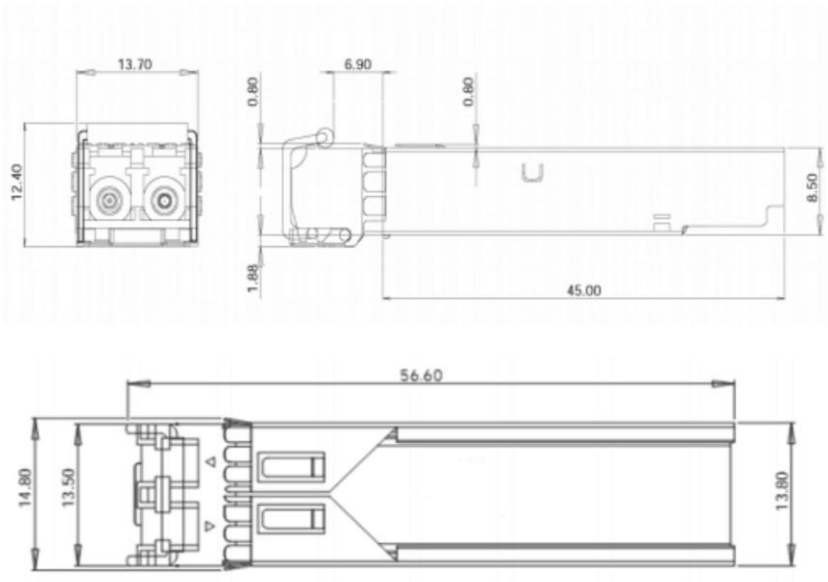
The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information. Additionally, Wave Thought SFP transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, and received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The SFP MSA defines a 256-byte memory map in E2PROM that is accessible over a 2-wire serial interface at the 8bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged. The interface is identical to, and is thus fully backward compatible with both the GBIC Specification and the SFP Multi Source Agreement.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer.



Mechanical Specifications



Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge（ESD）	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards