



SmartArchitectureofEspadana

Designing, Production, Customization and Consultant Service
in Network and Fiber Optic System



Technical Specification

SAE-TGSD31-10

10G SFP+ LR 1310nm SM 10km LC DDM





Product Description

Advanced firmware allow customer system encryption information to be stored in transceiver
Cost effective SFP+ solution, enables higher port densities and greater bandwidth
Operating case temperature: 0 to 70 °C | All-metal housing for superior EMI performance
1310nm DFB transmitter, PIN photo-detector | Applicable for 10km SMF connection
Electrical interface compliant to SFF-8431 | Applicable for 10km SMF connection
Optical interface compliant to IEEE 802.3ae 10GBASE-LR | Hot Pluggable
All-metal housing for superior EMI performance | Low power consumption
Low power consumption | RoHS6 compliant (lead free)

Full Description

SAE-TGSD31-10 is a very reliable and high performance in order to transmit 10G network data on optical cores. The SAE-TGSD31-10 1310 nm DFB 10Gigabit SFP transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 10km. The module provides differential termination and reduce differential to common mode conversion for quality signal termination and low EMI. SAE-TGSD31-10 SFP support the 2-wire serial communication protocol as defined in the SFP MSA1. The transceiver MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit 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 SFP 10km module electrical interface is compliant to SFI electrical specifications. The transmitter input and receiver output impedance is 100 Ohms differential. Data lines are internally AC coupled. The module provides differential termination and reduce differential to common mode conversion for quality signal termination and low EMI. SFI typically operates over 200 mm of improved FR4 material or up to about 150mm of standard FR4 with one connector. SAE-TGSD31-10 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.

Applications

- 10GBASE-LR at 10.3125Gbps
- Other optical links

**Standard**

Compliant with SFF-8472 SFP+ MSA.
 Compliant to SFP+ SFF-8431 and SFF-8432.
 Compliant to 802.3ae 10GBASE-LR.
 RoHS Compliant.

Absolute Maximum Ratings

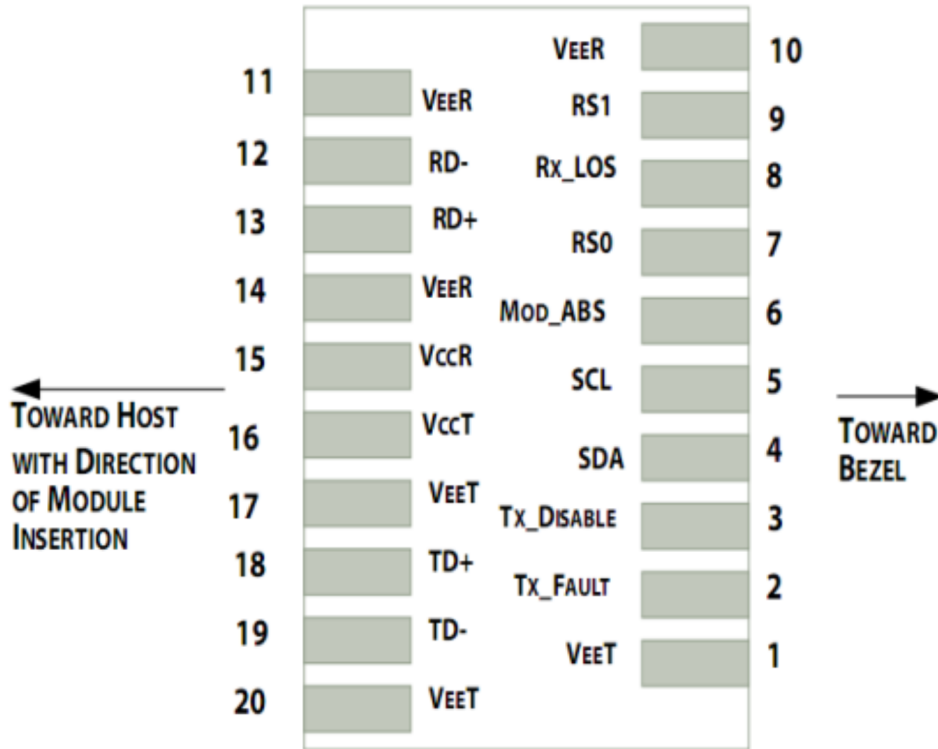
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		4.7	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TOP	-5		70	°C	

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Pwr	POUT	-6		-0.5	dBm	1
Optical Wavelength	λ	1260	1310	1355	nm	
Wavelength Temperature Dependence			0.08	0.125	nm/°C	
Spectral Width (-20dB)	σ			1	nm	
Optical Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Optical Rise/Fall Time	tr/ tf		0.1	0.26	ns	
RIN	RIN			-128	dB/Hz	
Output Eye Mask	Compliant with IEEE 0802.3ae					
Receiver						
Rx Sensitivity	RSENS			-15	dBm	2
Input Saturation Power (Overload)	Psat	-3			dBm	
Wavelength Range	λ_c	1270		1610	nm	
LOS De -Assert	LOSD			-17	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5	1.0		dB	

Notes:

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



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



Electrical Interface Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			250	mA	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Single ended data input swing	Vin,pp	180		700	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						
Differential data output swing	Vout,pp	300		850	mV	3
Data output rise time	tr	28			ps	4
Data output fall time	tf	28			ps	4
LOS Fault	VLOS fault	Vcc-1.3		VccHOST	V	5
LOS Normal	VLOS _{norm}	Vee		Vee+0.8	V	5
Power Supply Rejection	PSR	100			mVpp	6

Notes:

- 1) Connected directly to TX data input pins. AC coupled thereafter.
- 2) Or open circuit.
- 3) Into 100 ohms differential termination.
- 4) These are unfiltered 20-80% values
- 5) Loss Of Signal is LVTTTL. 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.

Mechanical Specifications

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