SFPTURKIYESSM01016GD

14.025Gb/s SFP+ Transceiver

Hot Pluggable, Duplex LC, +3.3V, 1310nm 10km DFB, Single mode

Features：

- Supports up to 14.025Gbps bit rates
- Hot-Pluggable SFP+ footprint
- 1310nm DFB-LD Transmitter
- Distance up to 10km
- Single +3.3V Power supply and TTL Logic Interface
- Duplex LC Connector Interface
- Power Dissipation < 1.2W
- Safety Certification: TUV/UL/FDA*Note1
- Compliant with MSA SFP+ Specification SFF-8431
- Compliance with Fiber Channel FC-PI-5
- Compliant with 16G/8G/4G Fiber Channel
- Single +3.3V power supply
- Real Time Digital Diagnostic Monitoring
- Operating case temperature:
  Standard: 0 to +70°C

Applications:

- 4.25/8.5/14.025G Fibre channel

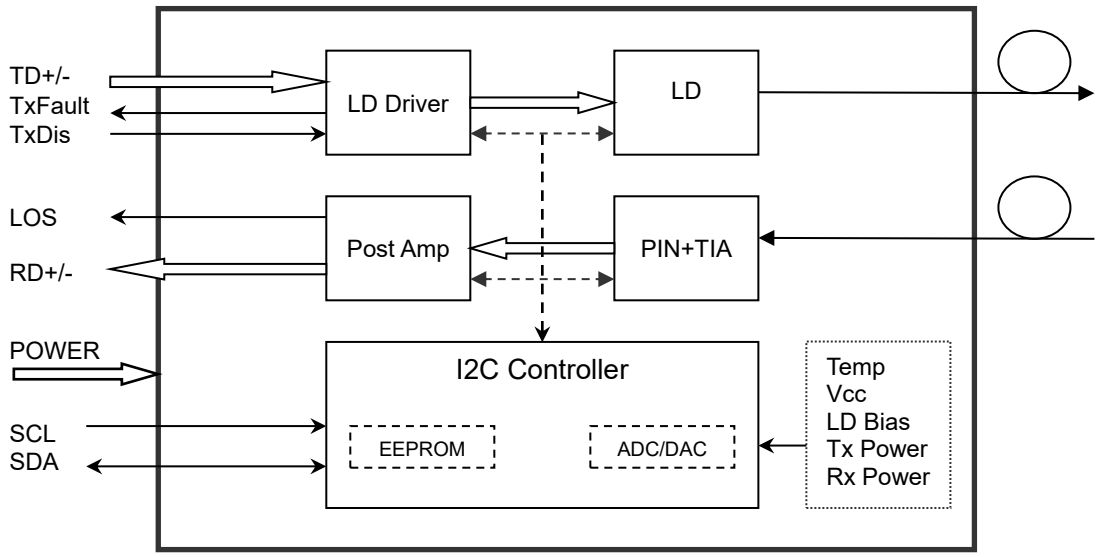
Description:

SFPTURKIYESSM01016GD transceivers are high performance, cost effective modules supporting data rate of 14.025 Gbps.

Fiber type	Data rate (Gbps)	Operating range (meters)
OM2	4.25	0.5~150
	8.5	0.5~50
	14.025	0.5~35
OM3	4.25	0.5~380
	8.5	0.5~150
	14.025	0.5~100

The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement and SFF-8472 digital diagnostics functions.



Transceiver functional diagram

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	Tc	0		+70	°C
Power Supply Voltage	Vcc	3.135	3.30	3.465	V
Power Supply Current	Icc			300	mA
Data Rate			14.025		Gbps

Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter						
Centre Wavelength	λc	1295	1310	1325	nm	
Spectral Width（RMS）	Δλ			1	nm	
Side-Mode Suppression Ratio	SMSR	30	-	-	dB	
Average Output Power	P_{out}	-5		2	dBm	1
Extinction Ratio	ER	3.5			dB	
Optical Modulation Amplitude (OMA)	Pout_OMA	-2		+2	dBm	
Average Power of OFF Transmitter	Poff			-30	dBm	
Transmitter Dispersion Penalty	TDP			4.4	dB	
Data Input Swing Differential	V_{IN}	180		950	mV	2
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
TX Disable Assert Time	t_off	-	-	10	us	
TX_DISABLE Negate Time	t_on	-	-	1	ms	
TX_BISABLE time to start reset	t_reset	10	-	-	us	
Time to initialize, include reset of TX_FAULT	t_init	-	-	300	ms	
TX_FAULT from fault to assertion	t_fault	-	-	100	us	
Receiver						
Centre Wavelength	λc	1260		1370	nm	
Receiver Sensitivity				-12	dBm	3
Receiver Overload	Pmax	2			dBm	3
Optical Return Loss	ORL			-12	dBm	
LOS De-Assert	LOS_D			-19	dBm	
LOS Assert	LOS_A	-30			dBm	

Data Output Swing Differential	V_{out}	500	700	900	mV	4
LOS	High	2.0		Vcc	V	
	Low			0.8	V	

Note:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2^{31}-1 test pattern @14025Mbps, BER ≤1×10^{-12}.
4. Internally AC-coupled.

Timing and Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit
Tx Disable Negate Time	t_on			1	ms
Tx Disable Assert Time	t_off			10	μs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	μs
Tx Disable To Reset	t_reset	10			μs
LOS Assert Time	t_loss_on			100	μs
LOS De-assert Time	t_loss_off			100	μs
Serial ID Clock Rate	f_serial_clock		100	400	KHz
MOD_DEF (0:2)-High	V_H	2		Vcc	V
MOD_DEF (0:2)-Low	V_L			0.8	V

Diagnostics

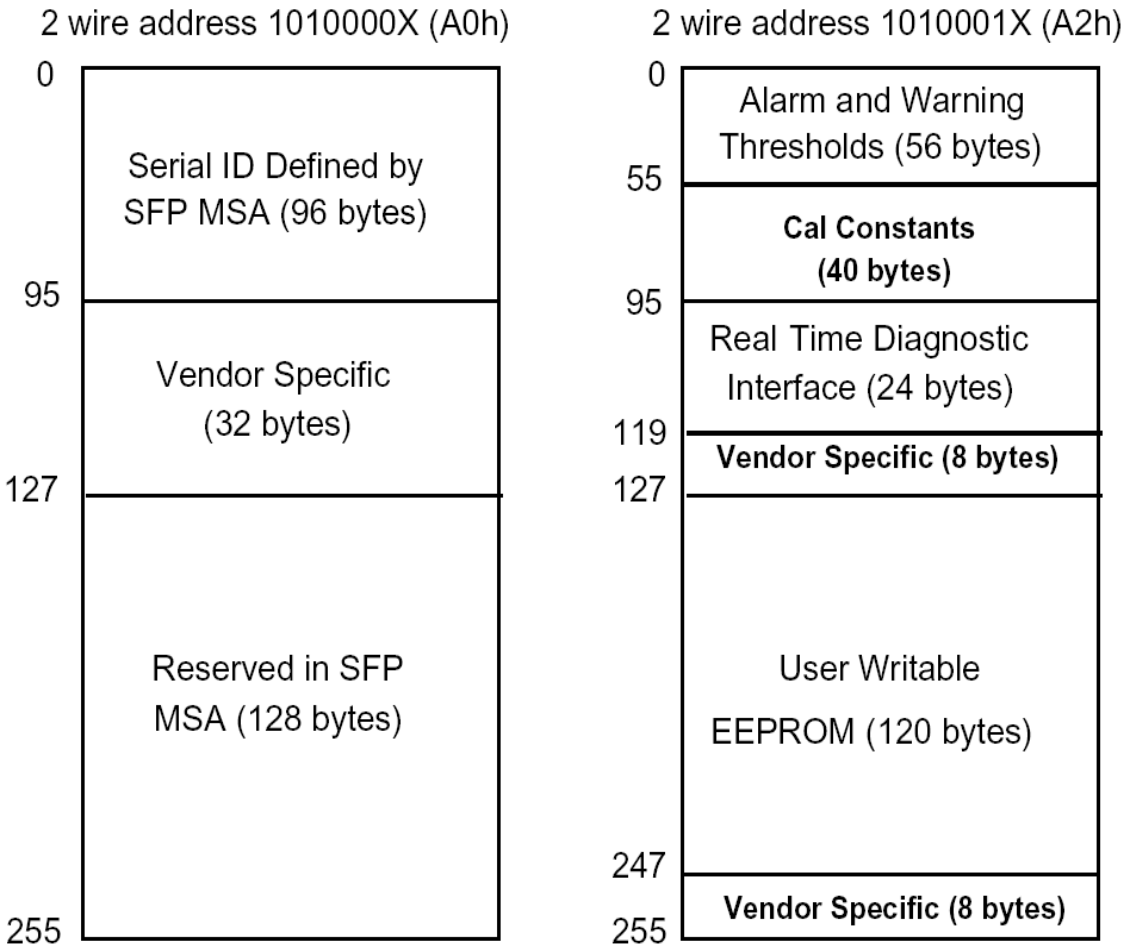
Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal
Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 15	mA	±10%	Internal
TX Power	-7.8 to -0.5	dBm	±3dB	Internal
RX Power	-16 to -1	dBm	±3dB	Internal

Digital Diagnostic Memory Map

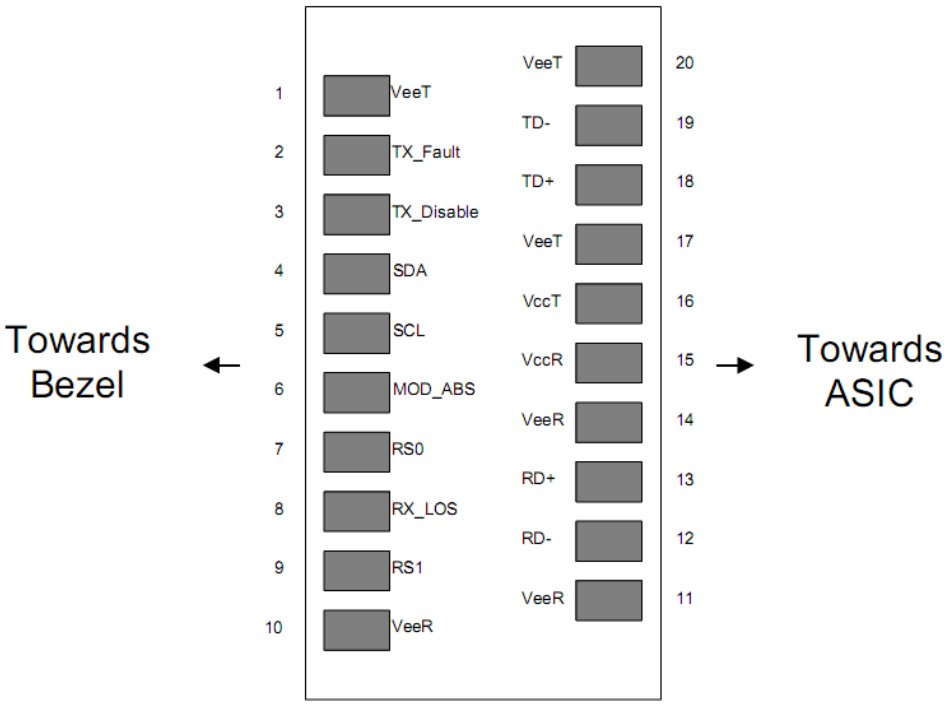
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.



Pin Descriptions



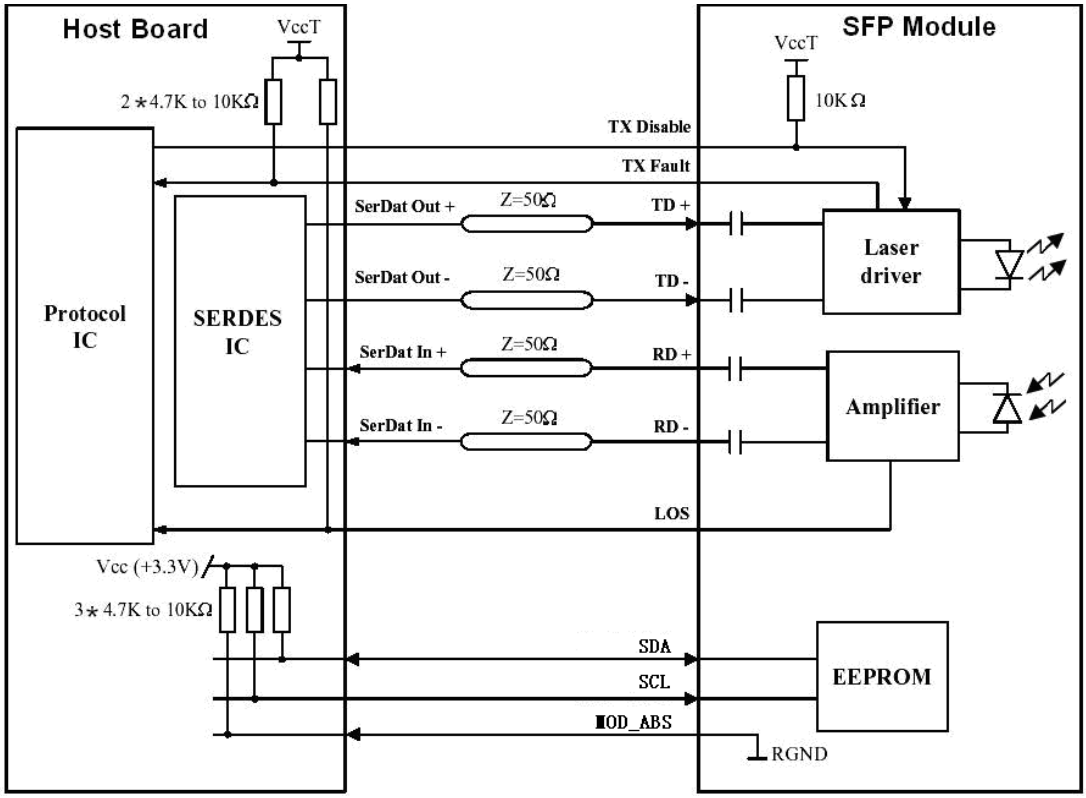
PIN	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	V_{EET}	Transmitter Ground	1	

Note:

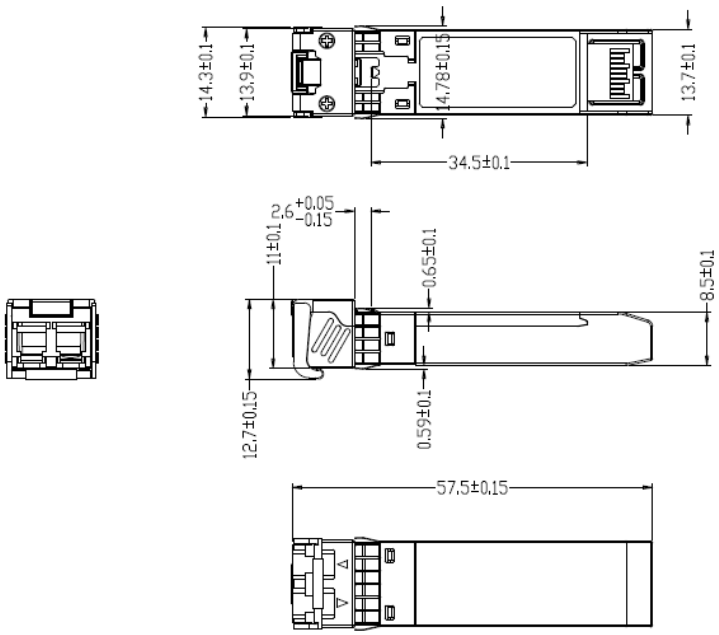
Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3) LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
4) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
5) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Interface Circuit



Mechanical Dimensions



Order Information

Table 6-Order Information

Part No.	Laser TX(nm)	Laser RX(nm)	Fiber Type	Connector
SFPTURKIYESSM01016GD	1310	1310	SMF	LC

● Notice

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