Модуль SFP28, 25G, WDM, TX/RX=1330/1270nm, 10km, Industrial, LC

Особенности:
- 1330nm DFB передатчик
- передача данных 24.33G и 25.78Gbps
- одно питание 3.3В с рассеиваемой мощностью < 1.5Вт
- до 10км по одноволоконному одномодовому волокну
- поддержка горячей замены
- соответствие спецификации на SFP28 MSA SFF-8402
- встроенный CDR (clock and data recovery) и DDMI

Области применения:
- 10GB / 25GB Ethernet
- CPRI Option 10

Part No.	Data Rate	Laser	Fiber Type	Distance	Temp.	CDR	DDMI
SFP28-WDM33-10-I	24.33G and 25.78Gbps	1330nm DFB	SMF	10km	-40℃ ~+85℃	Yes	Yes

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-45	+85	°C
Supply Voltage	V_{CC}	-0.5	4.0	V
Operating Relative Humidity	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_C	-40		85	°C
Power Supply Voltage	V_{CC}	3.135		3.465	V
Power Supply Current	I_{CC}			455	mA

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
CML Inputs (Differetial)	Vin			900	mVpp	AC coupled inputs

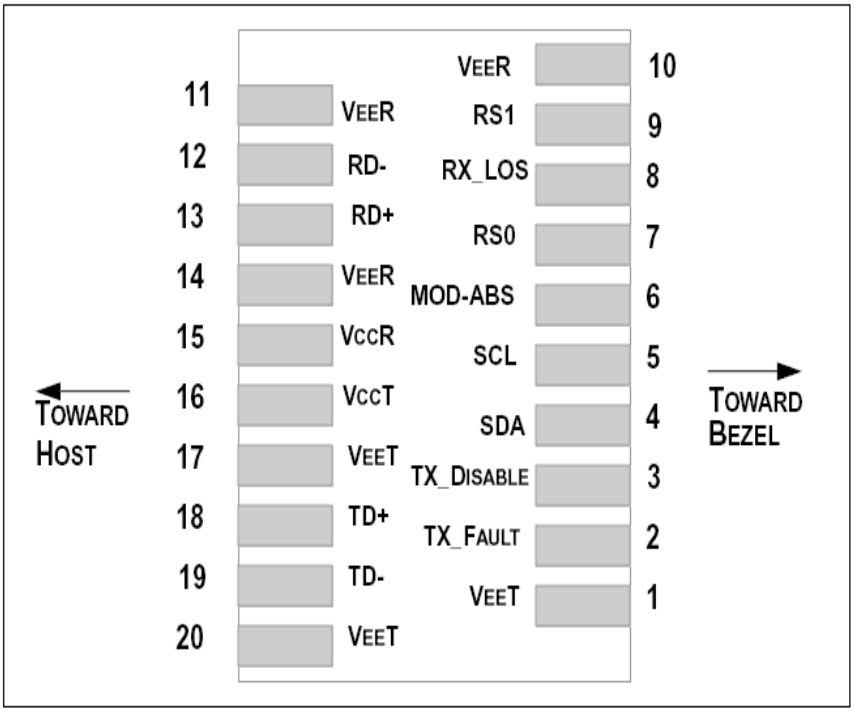
Input Impedance (Differential)	Zin		100		ohms	Connected directly to TX pins
Tx_DISABLE Input Voltage – High		2		Vcc+0.3	V	
Tx_DISABLE Input Voltage – Low		-0.3		0.8	V	
Receiver						
CML Outputs (Differetial)	Vout	300		1000	mVpp	AC coupled outputs
Rx_LOS Output Voltage – High		2.4		Vcc+0.3	V	
Rx_LOS Output Voltage – Low		-0.3		0.4	V	

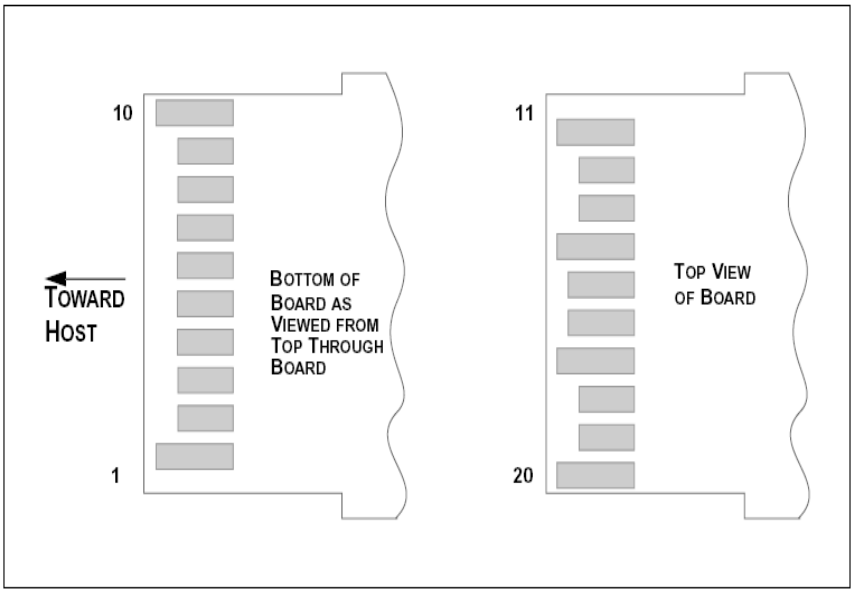
Optical and Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
9um Core Diameter SMF				10	km
Transmitter					
Centre Wavelength	λ_C	1320	1330	1340	nm
Spectral Width (-20dB)	Δλ			1	nm
Average Output Power@28.05Gb/s	P_{AVG}	-2		+4	dBm
Extinction Ratio	ER	3.5			dB
Transmitter Dispersion Penalty	TDP			2.7	dB
Side Mode Suppression Ratio	SMSR	30			Side Mode Suppression Ratio
Average Launch Power of OFF Transmitter	P_{OFF}			-30	Average Launch Power of OFF Transmitter
Receiver					
Centre Wavelength	λ_C	1260	1270	1280	nm
Unstressed Receiver Sensitivity(OMA)*Note5	Pmin			-12	dBm
Receiver Overload	Pmax	2.5			dBm
LOS De-Assert	LOS_D			-17	dBm
LOS Assert	LOS_A	-30			dBm
LOS Hysteresis		0.5			dB

Note5: Measured with data rate at 25.78Gb/s, BER less than 5E-5 and PRBS 231-1

SFP28 Transceiver Electrical Pad Layout


VEER
10
11
VEER
RS1
9
12
RD-
RX_LOS
8
13
RD+
RS0
7
14
VEER
MOD-ABS
6
15
VCCR
SCL
5
TOWARD HOST
16
VCCT
SDA
4
TOWARD BEZEL
17
VEET
TX_DISABLE
3
18
TD+
TX_FAULT
2
19
TD-
VEET
1
20
VEET


10
11
TOWARD HOST
BOTTOM OF BOARD AS VIEWED FROM TOP THROUGH BOARD
TOP VIEW OF BOARD
1
20

Pin Function Definitions

Pin Num.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Note 1
3	TX Disable	Transmitter Disable	3	Note 2, Module disables on high or open
4	SDA	Module Definition 2	3	Data line for Serial ID.
5	SCL	Module Definition 1	3	Clock line for Serial ID.
6	MOD-ABS	Module Definition 0	3	Note 3
7	RS0	RX Rate Select (LVTTL).	3	Rate Select 0, optionally controls SFP28 module receiver. This pin is pulled low to VeeT with a >30K resistor..
8	LOS	Loss of Signal	3	Note 4
9	RS1	TX Rate Select (LVTTL).	1	Rate Select 1, optionally controls SFP28 module transmitter. This pin is pulled low to VeeT with a >30K resistor.
10	VeeR	Receiver Ground	1	Note 5
11	VeeR	Receiver Ground	1	Note 5
12	RD-	Inv. Received Data Out	3	Note 6
13	RD+	Received Data Out	3	Note 6
14	VeeR	Receiver Ground	1	Note 5
15	VccR	Receiver Power	2	3.3V ± 5%, Note 7
16	VccT	Transmitter Power	2	3.3V ± 5%, Note 7
17	VeeT	Transmitter Ground	1	Note 5
18	TD+	Transmit Data In	3	Note 8
19	TD-	Inv. Transmit Data In	3	Note 8
20	VeeT	Transmitter Ground	1	Note 5

Notes:

1) TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT/R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

2) TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7K~10 K Ω resistor. Its states are:

Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined

High (2.0 – 3.465V): Transmitter Disabled Open: Transmitter Disabled

3) Module Absent, connected to VeeT or VeeR in the module.

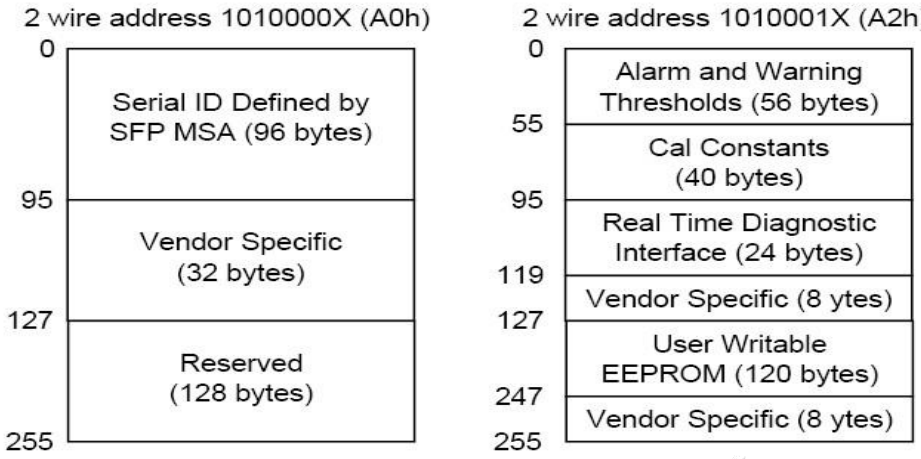
4) LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and Vcc_Host. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

5) VeeR and VeeT may be internally connected within the SFP28 module.

6) RD-/+: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 185 and 425 mV differential (92.5 –212.5 mV single ended) when properly terminated.

7) VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ±5% at the SFP+ connector pin. Maximum supply current is 340mA. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP28 input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP28 transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP28 transceiver module.

8) TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept differential swings of 90 – 800 mV (45 – 400 mV single-ended), though it is recommended that values between 90 and 800 mV differential (45 – 400 mV single-ended) be used for best EMI performance.



Mechanical Specifications