

## NS-SFP+10G-ZR80D NEWNETS 80KM SFP+ Optical Transceiver

### Features

- ◆ Compliant with SFF-8431 and IEEE802.3ae
- ◆ Data rate selectable  $\leq 4.25\text{Gbps}$  or  $9.95\text{Gbps}$  to  $11.3\text{Gbps}$  bit rates
- ◆ Cooled EML transmitter and APD receiver
- ◆ link length up to 80km
- ◆ Low Power Dissipation 1.4W Typical (Maximum:2W)
- ◆  $-5^{\circ}\text{C}$  to  $70^{\circ}\text{C}$  Operating Case Temperature
- ◆ Single 3.3V power supply
- ◆ Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- ◆ RoHS compliant and lead free



### Applications

- ◆ 10G Ethernet
- ◆ 10G Fiber Channel (with/without FEC)

### Description

- ◆ NewNets SFP+ZR Transceiver is designed for 8.5G/10G Fiber- Channel and 10GBE applications. The transceiver consists of two sections: The transmitter section incorporates a colded EML laser. And the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. NewNets SFP+ZR Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

### Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	3.8	V
Storage Temperature	Tst	-40	85	$^{\circ}\text{C}$

Relative Humidity	Rh	0	85	%
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## Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.13	3.3	3.47	V
Supply current [1]	Icc		420	610	mA
Operating Case temperature	Tca	-5	-	70	°C
Module Power Dissipation [2]	Pm	-	1.4	2	W

### Notes:

[1] Supply current is shared between VCCTX and VCCRXL. Typical Supply current test at 25°C, Max Supply current test at 60~70°C

[2] In-rush is defined as current level above steady state current requirements

## Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength	$\lambda_c$	1528		1565	nm
Optical Average Power	Po	0	-	+4	dBm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Optical Transmit Power (disabled)	PTX_DISABLE	-	-	-30	dBm
Extinction Ratio	ER	9		-	dB
RIN <sub>21</sub> OMA				-128	dB/Hz
Optical Return Loss Tolerance				21	dB
Dispersion penalty(1600ps/nm)	DP			2	dB

## Transmitter Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate	Mra	-	10.3	11.3	Gbps
Input differential impedance	Rim	-	100	-	$\Omega$
Differential data Input	VtxDIFF	120	-	850	mV
Transmit Disable Voltage	VD	2.0	-	Vcc3+0.3	V
Transmit Enable Voltage	Ven	0	-	+0.8	V
Transmit Disable Assert Time	Vn	-	-	100	us

## Receiver Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Input Operating Wavelength	$\lambda$	1110	-	1650	nm
Receiver sensitivity [1]		-	-	-24	dBm
Maximum Input Power	RX-overload	-	-	-8	dBm
Loss of Signal Asserted		-34	-	-	dBm
LOS De-Asserted		-	-	-24	dBm
LOS Hysteresis		0.5	-	-	dB

### Notes:

[1] Measured with conformance test signal for BER = 10<sup>-12</sup>. PRBS31, Data Rate=10.3Gbps.

## Receiver Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate	Mra	-	10.3	11.3	Gbps
Differential Output Swing	Vout P-P	350	-	850	mV
Rise/Fall Time	Tr / Tf	24	-	-	ps
Loss of Signal -Asserted	VOH	2	-	Vcc3+0.3-	V
Loss of Signal -Negated	VOL	0	-	+0.4	V

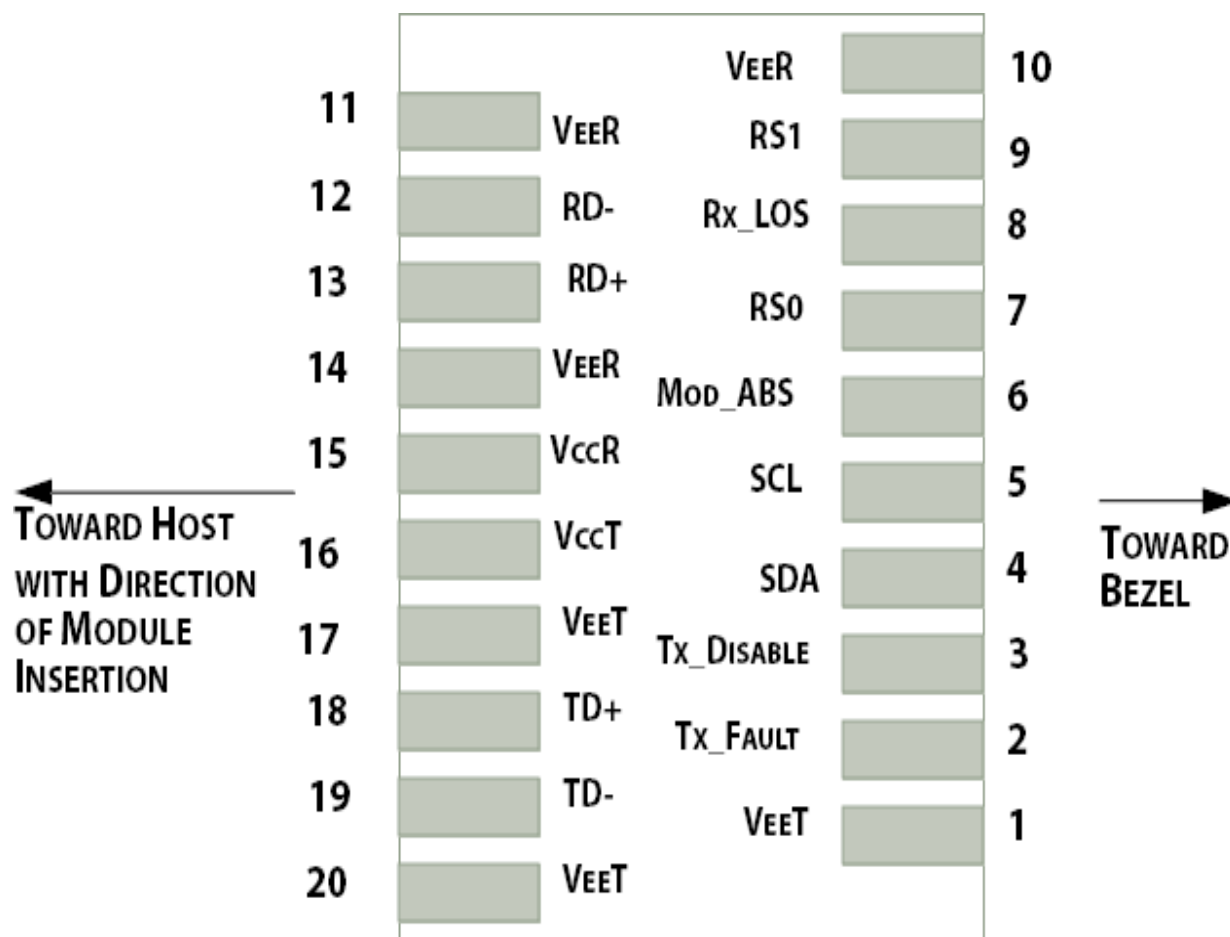


Figure1.Electrical Pin-out Details

## Pin Descriptions

Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	RS0 for Rate Select: Open or Low = Module supports $\leq 4.25$ Gbps High = Module supports 9.95 Gb/s to 10.3125 Gb/s
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	No connection required
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

### Notes:

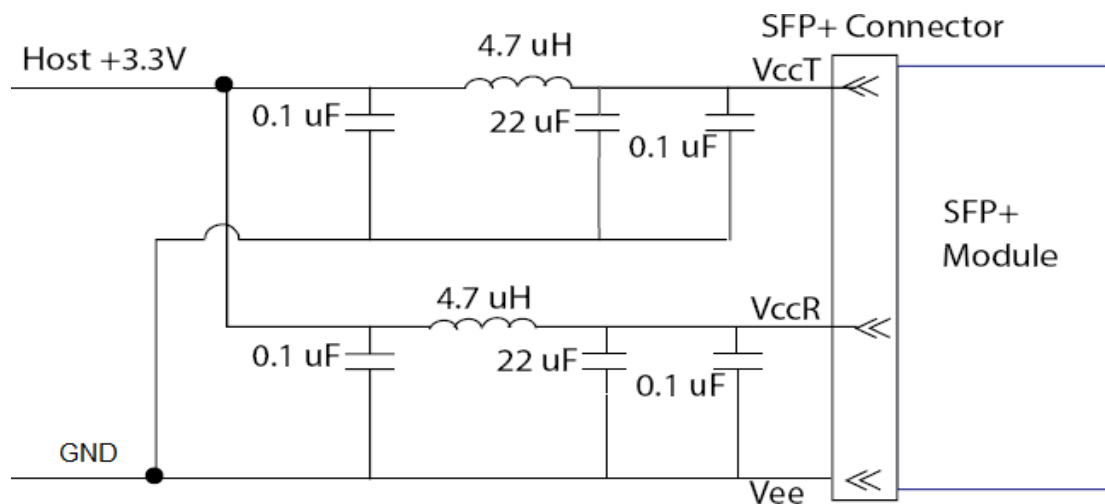
[1] Module circuit ground is isolated from module chassis ground within the module.

[2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

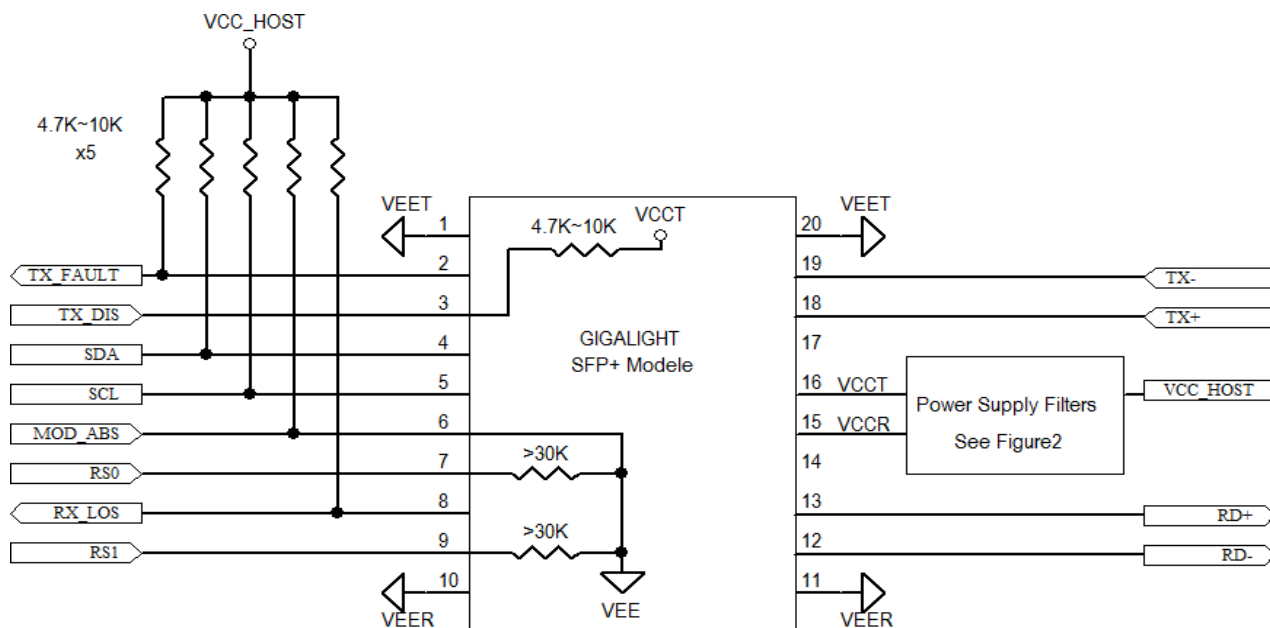
[3]Tx\_Disable is an input contact with a 4.7 k $\Omega$  to 10 k $\Omega$  pullup to VccT inside the module.

[4]Mod\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc\_Host with a resistor in the range 4.7 k $\Omega$  to 10 k $\Omega$ .Mod\_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 k $\Omega$  resistors in the module.



**Figure2. Host Board Power Supply Filters Circuit**



**Figure3. Host-Module Interface**



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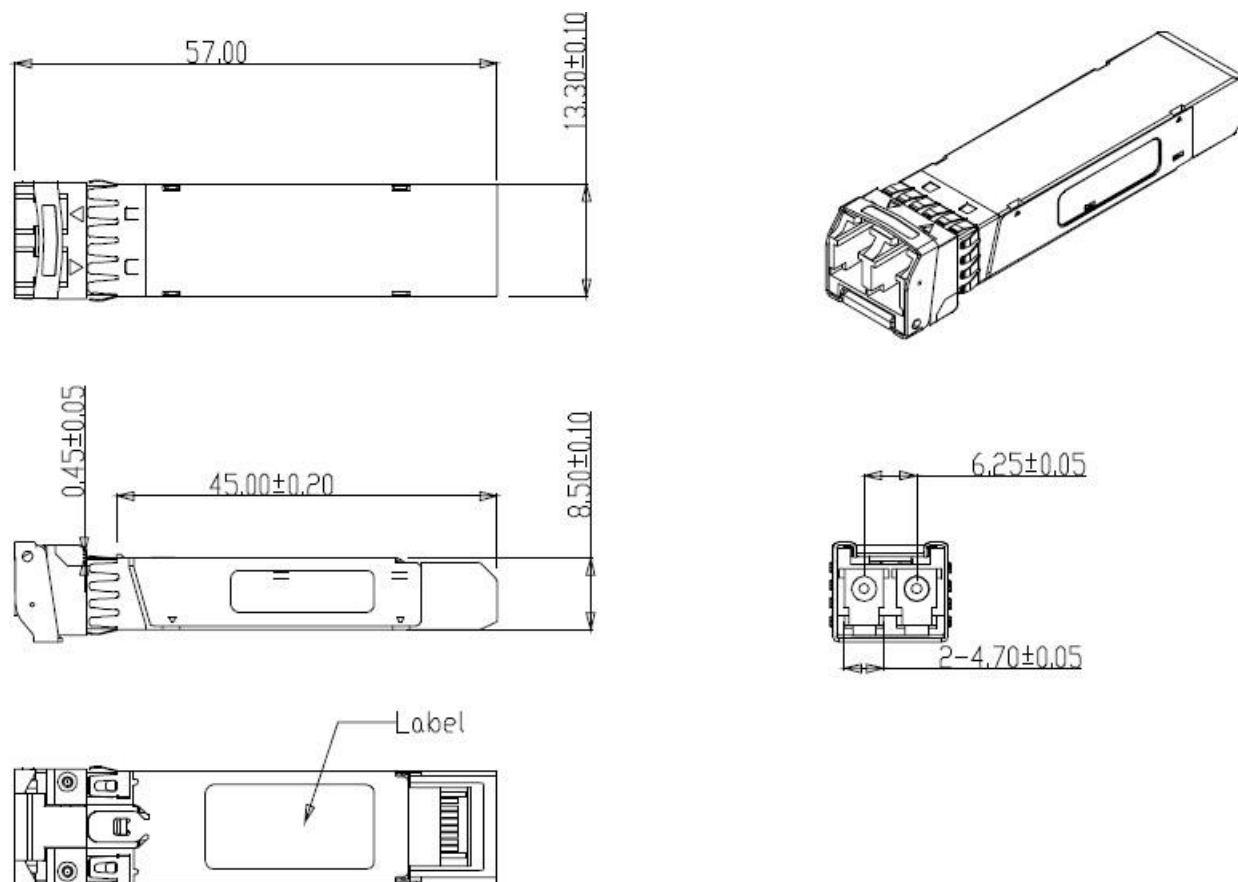


Figure4. Mechanical Specifications

## Ordering information

Part Number	Product Description
NS-SFP+10G-ZR80D	10Gbps, 1550nm SFP+ 80km, -5°C ~ +70°C