

## Description

### General

The transceiver from SANOC is the industry standard 2 x 5 package with simplex fiber optical connector for serial optical data Communications applications specify of Gigabit Ethernet IEEE802.3z / D5 and Fiber Channel. This module is designed for single-mode-fiber (SMF) with cost effective and high performance by using 1310 / 1550 nm transmitter and 1550 / 1310 nm receiver.

### Transmitter Section

The transmitter consists of a high-performance 1310 nm Fabry-Perot (FP) laser or 1550 nm MQW DFB structure laser in the optical subassembly (OSA), which is housed within a metal package. In addition, this component is also class 1 laser compliant with according to International Safety Standard IEC-825 Compliant. Complies with EN60825-1 and FDA 21 CFR 1040.10 and 1040.11

### Receiver Section

The receiver contain of an InGaAs PIN photodiode coupled to a high sensitivity transimpedance amplifier (TIA) in an OSA. This OSA combination is mated to a post amplifier IC that provides the post amplification and SD (Signal Detection) or LOS (Loss of Signal) indication circuit, which provides logic high state output when an unusable input optical signal level is detected.



2x5 SFF Bi-directional SMF Transceiver	
SC Type	SN13/1512-20ATOM(WT)

### Features

- Single + 3.3V power supply
- Differential Inputs and Outputs
- Industry Standard 2 x 5 Footprint.
- Compliant with Specification for IEEE802.3z / D5
- Compliant with Specification for Fiber Channel
- Low Power Consumption
- Class 1 Laser International Safety Standard IEC 825 Compliant. Complies with EN60825-1 and FDA 21 CFR 1040.10 and 1040.11
- Commercial Operation Temp.: 0 °C to +70 °C
- Industrial Operation Temp.: -40 °C to +85 °C
- Bi-directional Linking Distance Up to 20 km.
- RoHS Compliant

### Applications

- Bridges/Routers/intelligent hub and concentrators
- Gigabit Ethernet / Fiber Channel
- Storage Area Network

## Performance Specifications

Absolute Maximum Ratings						
Parameter	Symbol	Min	Typ	Max	Unit	
Supply Voltage	V <sub>CC</sub>	0	-	4	V	
Storage Temperature	T <sub>s</sub>	-40	-	85	°C	
Operating Temperature	Commercial	T <sub>OP-com</sub>	0	-	70	°C
	Industrial	T <sub>OP-ind</sub>	-40	-	85	°C
Lead Soldering Limits	T <sub>SOLD</sub>	-	-	260/10	°C /sec	
General Specifications						
Parameter	Symbol	Min	Typ	Max	Units	
Data Rate	B	0.80	1.25	1.50	Gbps	
Supported Link Length on 9/125µm SMF	L	20	-	-	Km	
Supply Current	I <sub>Tx+Rx</sub>	-	-	300	mA	
Power Dissipation	P <sub>Dis</sub>	-	-	1000	mW	

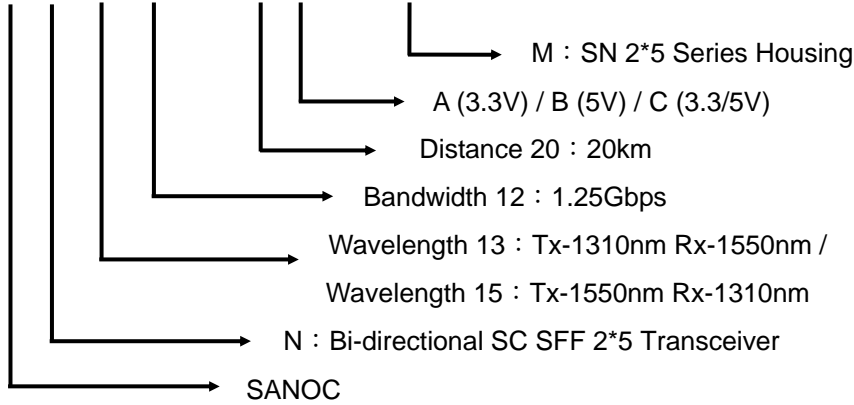
### Optical and Electrical Characteristics

Transmitter Electrical Characteristics						
Parameter		Symbol	Min	Typ	Max	Unit
Supply Voltage		V <sub>CC</sub>	3.15	3.3	3.45	V
Data Differential Input Voltage		V <sub>in, pp</sub>	400	-	2000	mV
Disable Input Voltage		V <sub>IL</sub> - V <sub>CC</sub>	-1.81	-	-1.48	V
Enable Input Voltage		V <sub>IH</sub> - V <sub>CC</sub>	-1.16	-	-0.88	V
POut@TX Disable Asserted		P <sub>OFF</sub>	-	-	-45	dBm
Transmitter Optical Characteristics						
Parameter		Symbol	Min	Typ	Max	Unit
Output Optical Power on 9μm SMF		P <sub>O</sub>	-9	-	-3	dBm
Center Wavelength	for 1312-20	λ <sub>C</sub>	1280	1310	1340	nm
	for 1512-20		1510	1550	1570	nm
Side Mode Suppression Ratio	for 1512-20	SMSR	30	-	-	dB
Spectral Width (-20dB)	for 1512-20	Δλ <sub>20dB</sub>	-	-	1	nm
Spectral Width (RMS)	for 1312-20	Δλ <sub>RMS</sub>	-	-	2	nm
Optical Rise Time (20%-80%)		t <sub>r</sub>	-	-	0.26	ns
Optical Fall Time (20%-80%)		t <sub>f</sub>	-	-	0.26	ns
Extinction Ratio		ER	8.2	-	-	dB

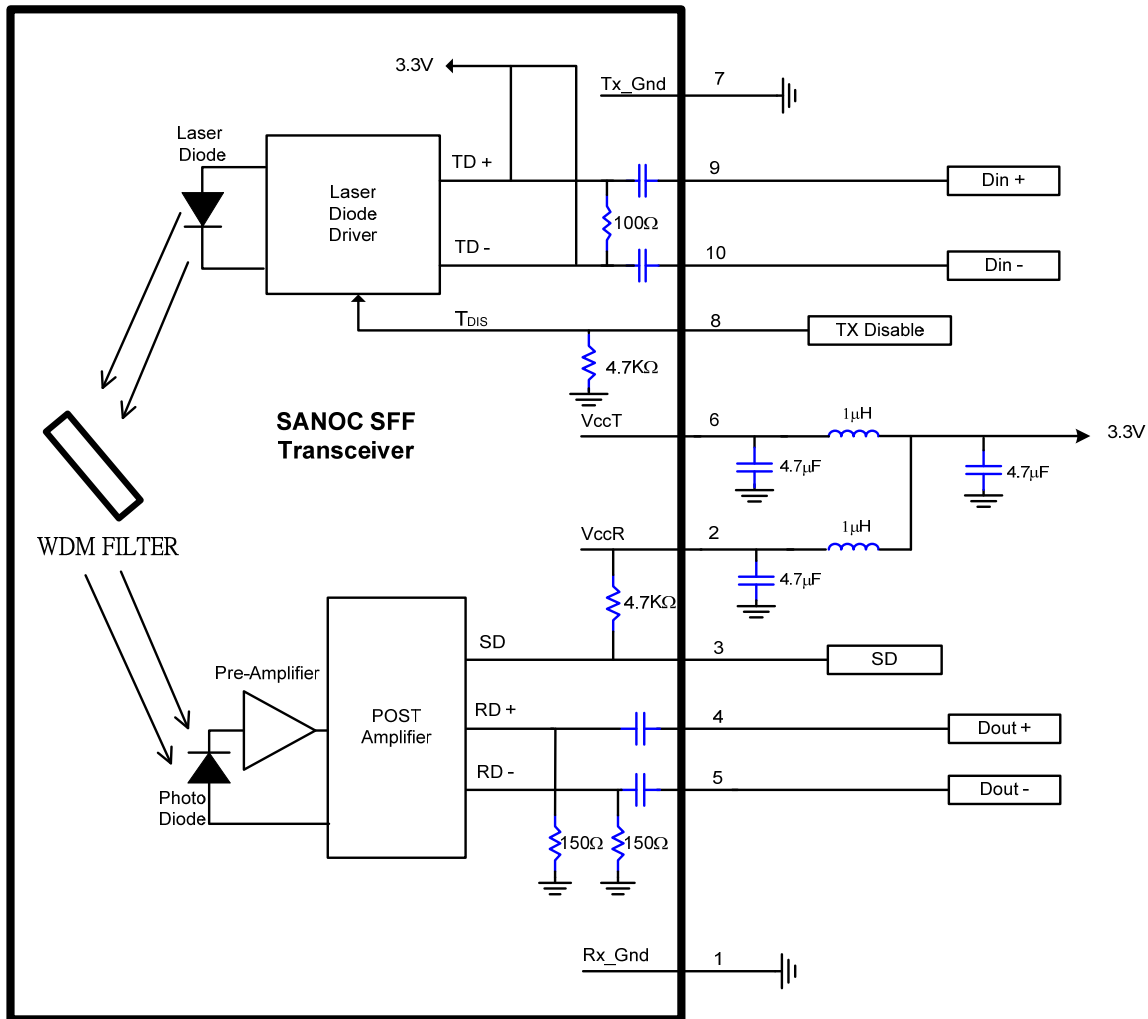
Receiver Electrical Characteristics						
Parameter		Symbol	Min	Typ	Max	Unit
Supply Voltage		V <sub>CC</sub>	3.15	3.3	3.45	V
Data Differential Output Voltage		V <sub>out, pp</sub>	500	-	1200	mV
Signal Detect Output voltage-High	for PECL	V <sub>OH</sub>	V <sub>CC</sub> -1.1	-	V <sub>CC</sub> -0.74	V
	for TTL		2.0	-	V <sub>CC</sub>	V
Signal Detect Output voltage-Low	for PECL	V <sub>OL</sub>	V <sub>CC</sub> -2.0	-	V <sub>CC</sub> -1.58	V
	for TTL		0	-	0.8	V
Data Output Rise Time (20%-80%)		t <sub>r</sub>	-	-	0.35	ns
Data Output Fall Time (20%-80%)		t <sub>f</sub>	-	-	0.35	ns
Receiver Optical Characteristics						
Parameter		Symbol	Min	Typ	Max	Unit
Maximum Receiver Power		P <sub>in</sub>	-3	-	-	dBm
Receiver Sensitivity		P <sub>S</sub>	-	-	-23	dBm
Operating Wavelength	for 1312-20	λ <sub>C</sub>	1480	-	1600	nm
	for 1512-20		1250	-	1380	nm
Optical Return Loss		P <sub>R</sub>	-	-	12	dB
Signal Detect-Asserted		P <sub>A</sub>	-	-	-23	dBm avg.
Signal Detect-Deasserted		P <sub>D</sub>	-36	-	-	dBm avg.
Signal Detect-Hysteresis		P <sub>A</sub> -P <sub>D</sub>	0.5	-	-	dB

**Ordering Information**

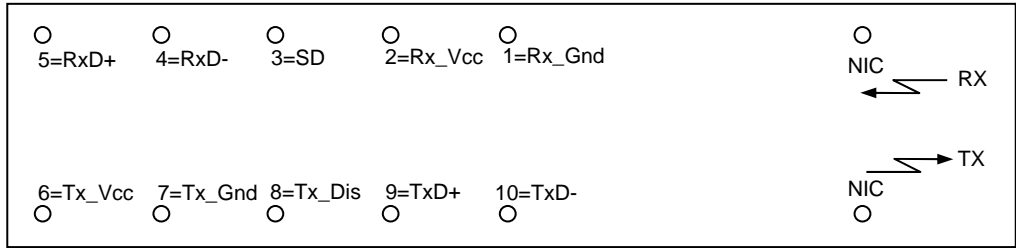
S N 13 12 – 20 A T O M(WT) → (WT) : Industrial Temp. / None : Commercial Temp.



**Recommended Circuit Schematic**



### Ping Assignment



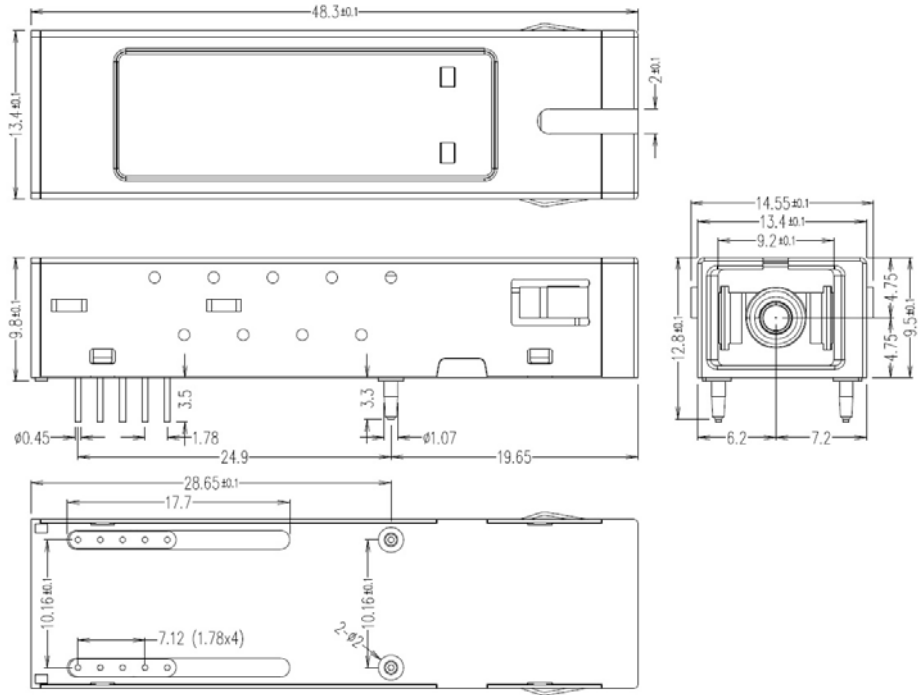
### Pinout Table

Pin	Symbol	Name/Description
1	Rx_Gnd	Receiver Signal Ground Directly connect this pin to receiver signal ground plane.
2	Rx_Vcc	Receiver Power Supply Provide (+3.3V) via the recommended receiver power supply filter.
3	SD	Signal Detect Normal optical input levels to the receiver result in a logic "1" output, Voh, asserted. Low input optical levels to the receiver result in a fault condition indicated by a logic "0" output Vol, deasserted. There are several types for output interface, PECL, CMOS and TTL.
4	RxD-	Receiver Data Out Bar RD- is used to PECL output. Terminate this high-speed differential PECL output with standard PECL techniques at the follow-on device.
5	RxD+	Receiver Data Out RD+ is used to PECL output. Terminate this high-speed differential PECL output with standard PECL techniques at the follow-on device.
6	Tx_Vcc	Transmitter Power Supply Provide (+5/+3.3V) via the recommended transmitter power supply filter.
7	Tx_Gnd	Transmitter Signal Ground Directly connect this pin to transmitter signal ground plane.
8	Tx_Dis	Transmitter Disable Connect this pin to +3.3V logic high "1" to disable module. To enable module, connect this pin to logic low "0".
9	TxD+	Transmitter Data In TxD+ is used to PECL input. Terminate this high-speed differential PECL input with standard PECL techniques at transmitter input pin.
10	TxD-	Transmitter Data In Bar TxD- is used to PECL input. Terminate this high-speed differential PECL input with standard PECL techniques at transmitter input pin.

**Package Outline Drawing**

**(1)SC Type (SN Series)**

Dimension (unit:mm)



文件名稱	SN(13.15)12-20ATOM		文件編號	09-3512201220	
版本	發行日期	撰寫者/修改者	變更內容		
V3.0	2015/8/13	潘瑋君	重新發行		
V3.3	2015/10/27	潘瑋君	加入文件履歷		
核 准	廖育聖	制 定 人	潘瑋君	制訂單位	研發部
				發行蓋章處	