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Find the *Sumitomo Electric SDT8202-TD-QN* at our website: *Click HERE*

Specification: TS-S95D002A
Date: September 20, 1995

SUMITOMO ELECTRIC INDUSTRIES

Technical Specification
for
622Mbps Plastic Molded Fiber Optic Transmitter Module
(SDT8202-T_-Q_)

❒ 155.52 Mb/s	● 622.08 Mb/s	❒ other
● Short Haul Intermediate Reach	❒ Long Haul Long Reach	❒ other
● Transmitter	❒ Receiver	❒ Transceiver
	❒ 2R / ❒ 3R	❒ 2R / ❒ 3R

SUMITOMO ELECTRIC INDUSTRIES, LTD.

SUMITOMO Electric reserves the right to make changes in the specification described hereinafter without prior notice.

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1. General

SDT8202-T--Q- is a compact and high performance digital fiber optic transmitter module ideally designed for high speed data communication systems or telecommunication transmission systems including SDH STM-4 S-1.1 and SONET OC-12 IR-1. The device also meets Bellcore TA-TSY-000253 requirement and ITU-TS G.957 recommendation.

• Application	SDH STM-4 S-1.1 / SONET OC-12 IR-1 Compliant
• Data Rate	622.08 Mbps
• Power Supply Voltage	Single +5V (or -5V
• Electrical Interface	PECL (or ECL)
• Laser Diode	1300 nm InGaAsP / InP
• Connector Interface	either FC, SC or ST pigtail
• Pin Configuration	20 pin dual in line

The features of SDT8202-T are listed below. These features provide many functions and advantages for the system SDT8201 used in.

• Features	Low Power Consumption Plastic Molded Package Uncooled Laser with Automatic Optical Power Control Circuit Optical Output Shut-down (Disable) Laser Bias Monitor Laser Rear Facet Monitor Multi-sourced Footprint

2. Block Diagram

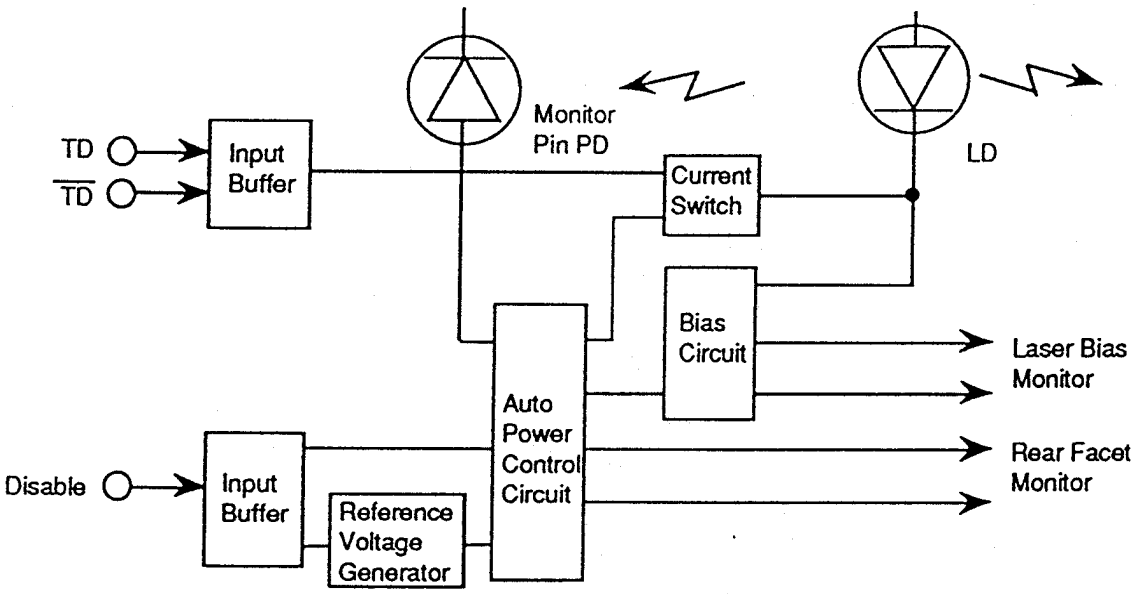
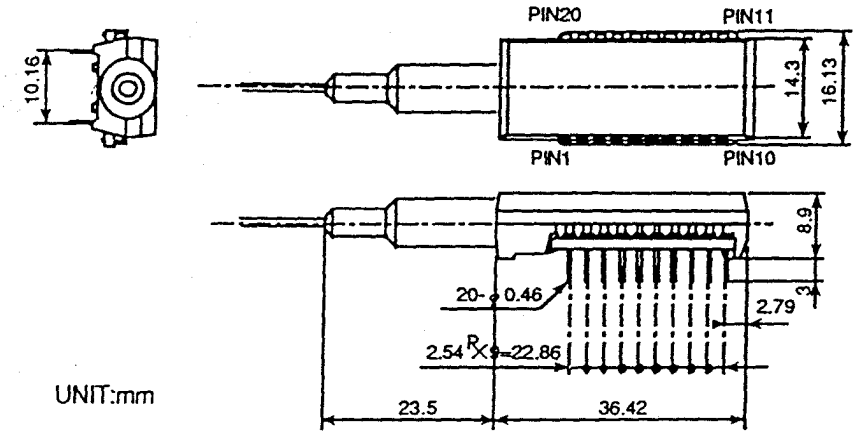


Figure 1 Block Diagram

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3. Package Dimensions.



9~10/125μm single mode fiber pigtail (typ. 60cm ±15 cm) terminated with FC-PC, SC-PC, ST-PC connector .

Figure 2 External View

4. Pin Assignment

No.	Symbol	Function
1	NC	Non Connection.
2	BM (+)	Monitoring Pin for LD Bias Current (Refer to Figure 3)
3	NC	Non Connection.
4	BM (-)	Monitoring Pin for LD Bias Current (Refer to Figure 3)
5	Vee	Power Supply (-): Vee=GND for Vcc=+5V or Vee = -5V for Vcc = GND
6	Vcc	Power Supply (+): Vcc=+5V for Vee=GND or Vcc =GND for Vee=-5V
7	Disable	LD Disable Input (Refer to 9. Relation between Disable Input Voltage and Optical Output Power)
8	Vcc	Power Supply (+): Vcc=+5V for Vee=GND or Vcc =GND for Vee=-5V
9	Vcc	Power Supply (+): Vcc=+5V for Vee=GND or Vcc =GND for Vee=-5V
10	NC	Non Connection.
11	NG	Non Connection.
12	Vcc	Power Supply (+): Vcc=+5V for Vee=GND or Vcc =GND for Vee=-5V
13	NC	Non Connection.
14	Vee	Power Supply (-): Vee=GND for Vcc=+5V or Vee = -5V for Vcc = GND
15	TD-	Negative Data Input (Refer to 6. Bectrical Interface
16	TD+	Positive Data Input (Refer to 6. Electrical Interface)
17	RFM (-)	Monitoring pin for Rear Facet Monitor Current (Refer to Figure 3
18	Vcc	Power Supply (+): Vcc=+5V for Vee=GND or Vcc =GND for Vee=-5V
19	RFM (+)	Monitoring pin for Rear Facet Monitor Current (Refer to Figure 3)
20	NC	Non Connection.

NG pins should be left open for additional functions in the future.

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5. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Case Temperature	TS	-40	85	°C	1
Operating Ambient Temperature	Ta	-40	85	°C	1
Supply Voltage	Vcc-Vee	0	7	V	2
Input Voltage	Vi	Vee	Vcc	V	3
Lead Soldering (Temperature) (Time)			260 10	°C sec.	4

Note
1. No condensation allowed
2. Vcc≥Vee, Vee = GND for Vcc = +5V or Vcc = GND for Vee = -5V.
3. TD+, TD-, and Disable
4. Measured on leads-pin at 2mm(0.079inch) off the package bottom

6. Electrical Interface

(Unless otherwise specified, Vcc-Vee = 4.75 to 5.25 V and all operating temperature shall apply.)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage		Vcc - Vee	4.75	5.00	5.25	V	
Supply Current		Idtx		60	130	mA	1, Z 3
Input Voltage	High	Vih	Vcc-1.17		Vcc-0.73	V	4,5
TD+, TD-	Low	Vil	Vcc-1.95		Vcc-1.45	V	
Transmitter Disable Voltage		Vd	Vcc-2		Vcc	V	6
Transmitter Enable Voltage		Ven	Vee+3.5		Vee+0.4	V	6
LD Bias Monitor Voltage		Vbm	0.01		0.45	V	5.7
Rear Facet Voltage		Vrfm	0.01		0.20	V	2,7

Note
1. Input bias current is not included in Supply Current.
2. 50% duty cycle data
3. 622.08Mbps
4. Vcc-Vee=5V
5. Ta=25°C
6. The transmitter is enabled as default state and requires an external voltage only to disable. (Refer to 9. Relation between Disable Input Voltage and Optical Output Power)
7. The Laser Bias and Rear Facet Monitor currents are calculated as ratios of the corresponding voltages to thier current-sensing resistors, 10 Ω and 200 Ω, respectively (See Figure 3). Upon measuring or utilizing these values, use a device whose input impedance is high enough compared with those resistors.

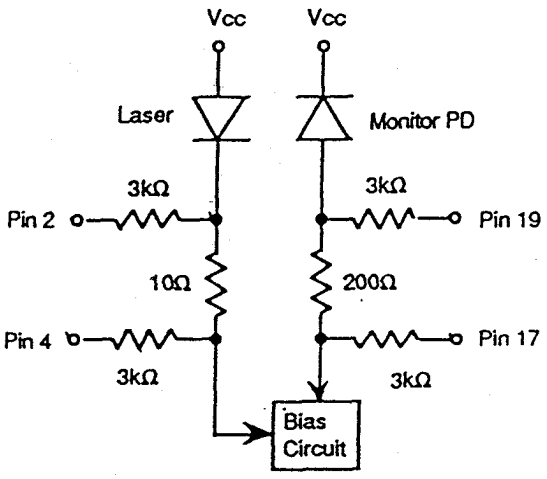


Figure 3 Monitor Circuit Schematic Diagram

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7. Optical Interface

(Unless otherwise specified, Vcc-Vee = 4.75 to 5.25 V and all operating temperature shall apply.)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Output Power	Po	-15		-8	dBm	1
Extinction Ratio	Er	8.2			dB	2
Center Wavelength	λc	1274		1356	nm	
Spectral Width (RMS)	Δλ			2.5	nm	
Eye Mask for Optical Output	Refer to figure 4					

Note

1. Measured at the bit rate of 622.08Mbps (2^{23-1}) PRBS NRZ
2. 50% duty cycle data

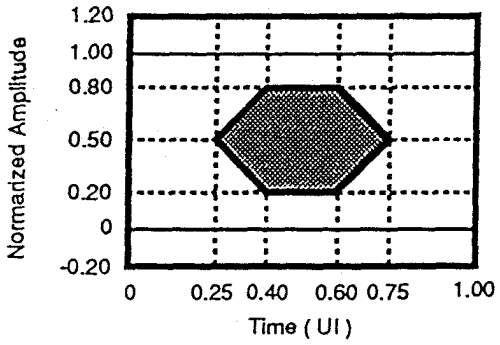


Figure 4 Eye Mask for Optical Output with Fourth Order Bessel-Thomson Filter Specified in ITU-TS G.957

8. Relation between Input Signal and Optical Output Power

Input Signal		Optical Output Power
TD+	TD-	
"H"	"L"	ON *("H")*
"L"	"H"	OFF ("L")
"H"	"H"	undefined
"L"	"L"	undefined

9. Relation between Disable Input Voltage and Optical Output Power

Disable Input Voltage [V]	Optical Output Power
"L" (Vee ~ Vee+0.4)	Enabled
"H" (Vee+3.5 ~ Vcc)	Disabled (< -45dBm)

Note

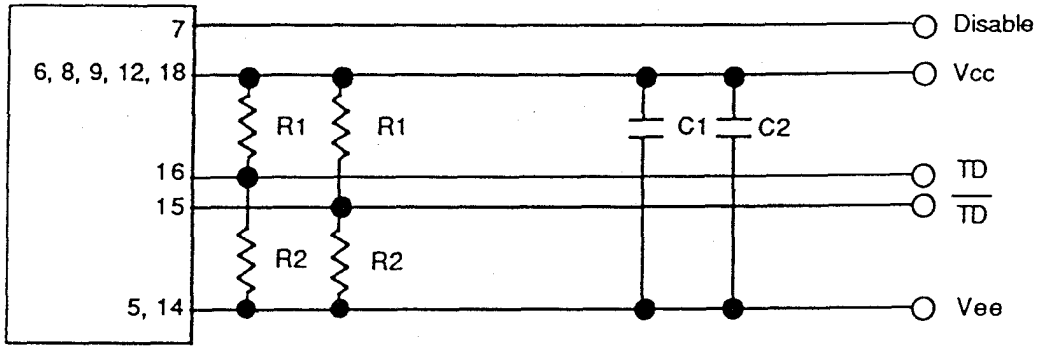
1. Enabled for no Disable input (Pin 7 opened)
2. Refer to Figure 6, If Interface condition is not suitable.

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10. Fiber Pigtail Specification

Parameter	Min.	Typ.	Max	Unit	Note
Mode Field Diameter		9.5		μm	
Cladding Diameter		125		μm	
Fiber Diameter		0.9		mm	
Optical Fiber Tensile Break Strength			9.8	N	
Bend Radius	30			mm	

11. Recommended User Interface



C1 = 0.022 μF / 25V (ceramic chip capacitor)
C2 = 1 μF / 25V (ceramic chip capacitor)
R1 = 82 Ω (≥1 / 8 W)
R2 = 130 Ω (≥1 / 8 W)

Note : 1. Terminated resistors (R1, R2) should be located as close to the module as possible.
2. 50Ω impedance lines are recommended for TD and $\overline{TD}$.
3. Please refer to Figure 3 for Pin 2, 4, 17 19.

Figure 5 Recommended User Interface

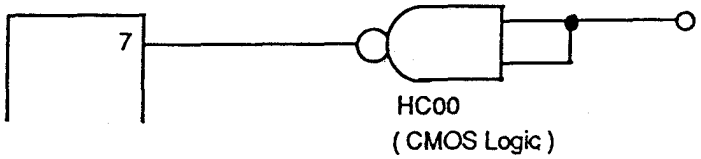


Figure 6 Example for Disable Input Logic

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12. Ordering Information

Connector type	Ordering Number	
	Ta=0~70°C	Ta=-40~85°C
FC - PC	SDT8202-TD-QN	SDT8202-TD-OW
SC - PC	SDT8202-TC-QN	SDT8202-TC-OW
ST- PC	SDT8202-TB-QN	SDT8202-TB-QW

13. Precaution

The components should be handled in the same manner as ordinary semiconductor devices to prevent the electrostatic damages. For safe keeping and carrying, the components should be packaged with ESD proof material. To assemble the components on PCB, the workbench, the soldering iron and the human body should be grounded.

To eliminate ft ripple noise to supply voltage, a ripple filter should be placed as close to the component as possible.

The signal input and output terminals should not be short-circuited to supply voltage or ground.

The accessory cap should be attached to the connector part while the optical connector is not in use, because dust on the optical interface port may let the optical power or sensitivity degrade.

The stress to the fiber pigtail may cause the damage on the performance. The fiber pigtail may snap-off by dropping the module.

Please pay special attention to the atmosphere condition of the components because the dew on the module may cause some electrical damages.

Under such a strong vibration environment as in automobile, the performance and reliability are not guaranteed.

The governmental approval is required to export this product to other countries. To dispose of these components, the appropriate procedure should be taken to prevent illegal exportation.

14. For More Information

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