



**Technical Specification
for
622Mbps Plastic Molded Fiber Optic Receiver Module**

SDT8802-R_-Q_

- | | | |
|--|--|---|
| <input type="checkbox"/> 155.52Mb/s | <input checked="" type="checkbox"/> 622.08Mb/s | <input type="checkbox"/> other _____ |
| <input checked="" type="checkbox"/> Short Haul | <input checked="" type="checkbox"/> Long Haul | <input type="checkbox"/> other _____ |
| <input checked="" type="checkbox"/> Intermediate Reach | <input checked="" type="checkbox"/> Long reach | |
| <input type="checkbox"/> Transmitter | <input checked="" type="checkbox"/> Receiver | <input type="checkbox"/> Transceiver |
| | (<input type="checkbox"/> 2R / <input checked="" type="checkbox"/> 3R) | (<input type="checkbox"/> 2R / <input type="checkbox"/> 3R) |



SUMITOMO ELECTRIC INDUSTRIES, LTD.

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

● Safety Precaution


Picture symbols

This specification uses various picture symbols to prevent possible injury to operator or other persons or damage to properties for appropriate use of the product. The symbols and definitions are as shown below. Be sure to be familiar with these symbols before reading this specification.


 Warning	Wrong operation without following this instruction may lead to human death or serious injury.
 Caution	Wrong operation without following this instruction may lead to human injury or property damage.

Example of picture symbols



 indicates prohibition of actions. Action details are explained nearby.



 indicates compulsory actions or instructions. Action details are explained near by.

1. General

SDT8802-R_-Q_ is a compact and high performance digital fiber optic receiver module ideally designed for high speed data communication systems or telecommunication transmission systems including SDH STM-4 S-4.1, S-4.2 / L-4.1, L-4.2, L-4.3 and SONET OC-12 IR-1, IR-2 / LR-1, LR-2, LR-3. The device also meets Bellcore GR-253-CORE requirement and ITU-TS G.957 / G.958 recommendation.

- Application SDH STM-4 S-4.1, S-4.2 / L-4.1, L-4.2, L-4.3
SONET OC-12 IR-1, IR-2 / LR-1, LR-2, LR-3
- Data Rate 622.08 Mbps
- Power Supply Voltage Single +5V
- Electrical Interface PECL
- Photo Diode InGaAs PIN-PD
- Connector Interface FC / SC connector
- Pin Configuration 20 Pin Dual in Line

The features of SDT8802-R_-Q_ are listed below.

- FEATURES
 - Low Power Consumption
 - Plastic Molded Package
 - Wide Dynamic Range
 - Built-in Clock Recovery
 - Signal Detect (FLAG) Function
 - Multi-sourced Footprint

2. Block Diagram

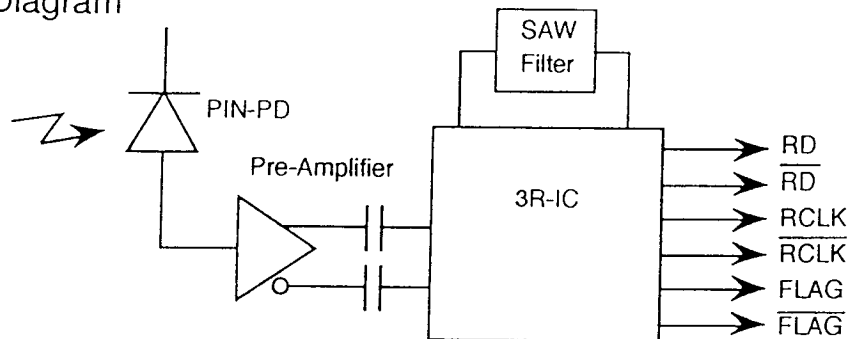


Figure 1 Block Diagram

3. Package Dimension

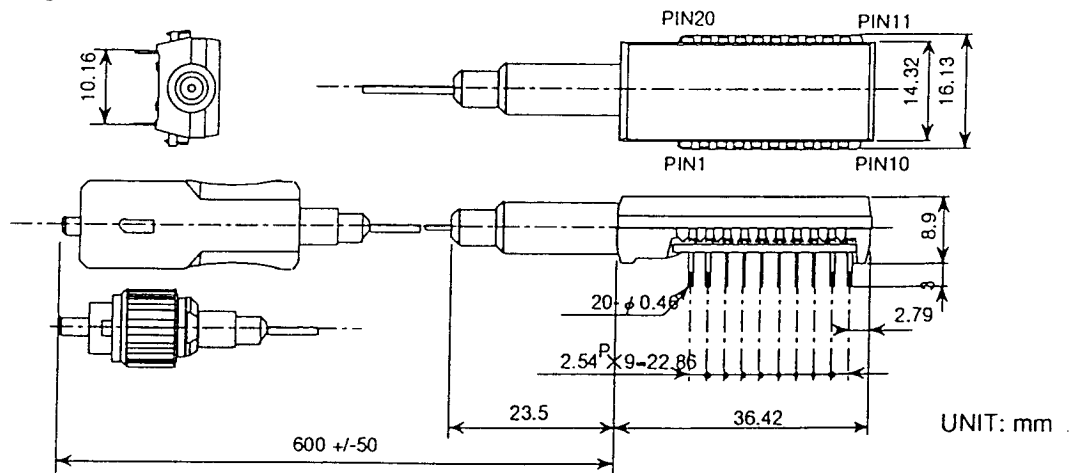


Figure 2. External View

⚠ Caution

- ⊘ Do not disassemble this product. Otherwise, failure, electrical shock overheating or fire may occur.
- ⚠ Handle the lead pin carefully. Use assisting tools or prospective aids as required. A lead pin may injure skin or human body


4. Pin Assignment


No.	Symbol	Function	No.	Symbol	Function
1	GND	Ground	11	Vcc	+5V
2	GND	Ground	12	FLAG	Differential flag output (Positive)
3	GND	Ground	13	GND	Ground
4	RCLK	Differential clock output (Positive)	14	FLAG	Differential flag output (Negative)
5	RCLK	Differential clock output (Negative)	15	GND	Ground
6	GND	Ground	16	GND	Ground
7	RD	Differential data output (Positive)	17	NC	Not connected to the internal circuit
8	GND	Ground	18	NC	Not connected to the internal circuit
9	RD	Differential data output (Negative)	19	NC	Not connected to the internal circuit
10	NC	Not connected to the internal circuit	20	NC	Not connected to the internal circuit


5. Absolute Maximum Ratings


Parameter	Symbol	Min.	Max.	Unit	Note
Storage Case Temperature	Ts	-40	85	°C	1
Operating Case Temperature	Tc	0	70	°C	1,2
		-40	85	°C	1,3
Supply Voltage	Vcc-GND	0.0	7.0	V	
Lead Soldering Temperature / Time	—	—	260/10	°C / sec	4

- Note 1. No condensation allowed
 2. For SDT8802-R*-QN (* : C or D)
 3. For SDT8802-R*-QW (* : C or D)
 4. Measured on leads-pin at 2mm(0.079inch) off the package bottom

 **Warning**

 Use the product with the rated voltage described in the specification. If the voltage exceeds the maximum rating, overheating or fire may occur.

 **Caution**

 Do not store the product in the area where temperature exceeds the maximum rating, where there is much moisture or dampness, where there is acid gas or corrosive gas, or other extreme conditions. Otherwise, failure, overheating or fire may occur.

6. Electrical Interface

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage		Vcc	4.75	5.00	5.25	V	
Supply Current		Idrx		145	200	mA	1
DATA & RCLK Output Voltage	High	Voh	Vcc-1.03		Vcc-0.88	V	2
	Low	Vol	Vcc-1.81		Vcc-1.62		
FLAG Output Voltage	High	Voh	Vcc-1.08		Vcc-0.83	V	3
	Low	Vol	Vcc-1.86		Vcc-1.57		
Clock Rise and Fall Time		Trc / Tfc			500	psec	4,5
Data Rise and Fall Time		Trd / Tfd			700	psec	4,5
Clock Sampling Point		Tcsp	600	700	800	psec	6

- Note 1. Output current is not included. 622.08 Mbps, PRBS (2²³-1)
 2. Vcc=5.0V, Tc=25°C, Output load resistance RL=50 Ω to Vcc-2V for RD, RD, RCLK and RCLK
 3. Vcc=5.0V, Tc=25°C, Output load resistance RL=510 Ω to Vee for FLAG and FLAG
 4. 20 - 80%
 5. Input capacitance and stray capacitance of measuring devices should be less than 2pF.
 6. Phase difference between rising edge of RD and falling edge of RCLK. Refer to Figure 3.

7. Optical Interface

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Bit Rate Range	—	622.08 +/-50ppm			Mbps	
Center Wavelength	—	1261		1580	nm	
Minimum Sensitivity	Pmin			-28.0	dBm	1,2
Overload	Pmax	-8.0			dBm	1,2
Clock Jitter (rms)	Tjc			16	psec	2,3,4
Clock Duty	Cduty	45	50	55	%	2,3,4
Data Jitter (rms)	Tjd			40	psec	2,3,4
Consecutive Identical Digit	CID	72	100		psec	5
FLAG Assert Level	Pa	-48.0	-33.0	-28.0	dBm	2
FLAG Deassert Level	Pd	-48.0	-35.0	-29.0	dBm	
FLAG Assert Time	Ta			100	μsec	2,3,6
FLAG Deassert Time	Td			100	μsec	

Note 1. BER = 10⁻¹⁰

2. Measured at the bit rate of 622.08 Mbps (2²³-1) PRBS NRZ

3. Optical Input Power : -28.0 ~ -8.0 dBm

4. Output load resistance for RD, \overline{RD} , RCLK and \overline{RCLK} : RL = 50Ω to Vcc - 2 V.

5. Duty 50% input signal

6. Refer to Figure 3

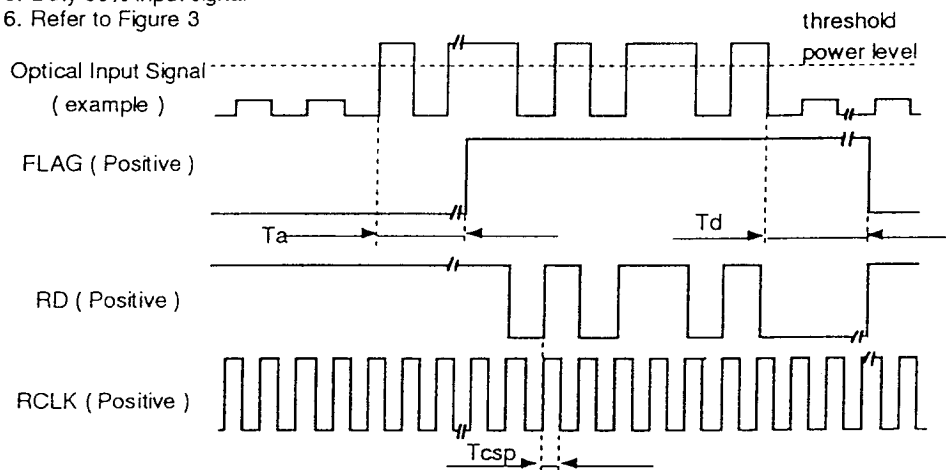


Figure 3 Timing Chart

8. Relation between Received Optical Signal and Data Output

Received Optical Signal	Data Output	
	RD	\overline{RD}
"H"	"H"	"L"
"L"	"L"	"H"

9. Fiber Pigtail Specification

Parameter	Min.	Typ.	Max.	Unit	Note
Core Diameter		62.5		μm	
Cladding Diameter		125		μm	
Outer Jacket Diameter		0.9		mm	
Optical Cord Tensile Break Strength			9.8	N	1
Bend Radius	30			mm	

Note

1. Strength between receiver body and optical fiber should be less than 9.8 N.

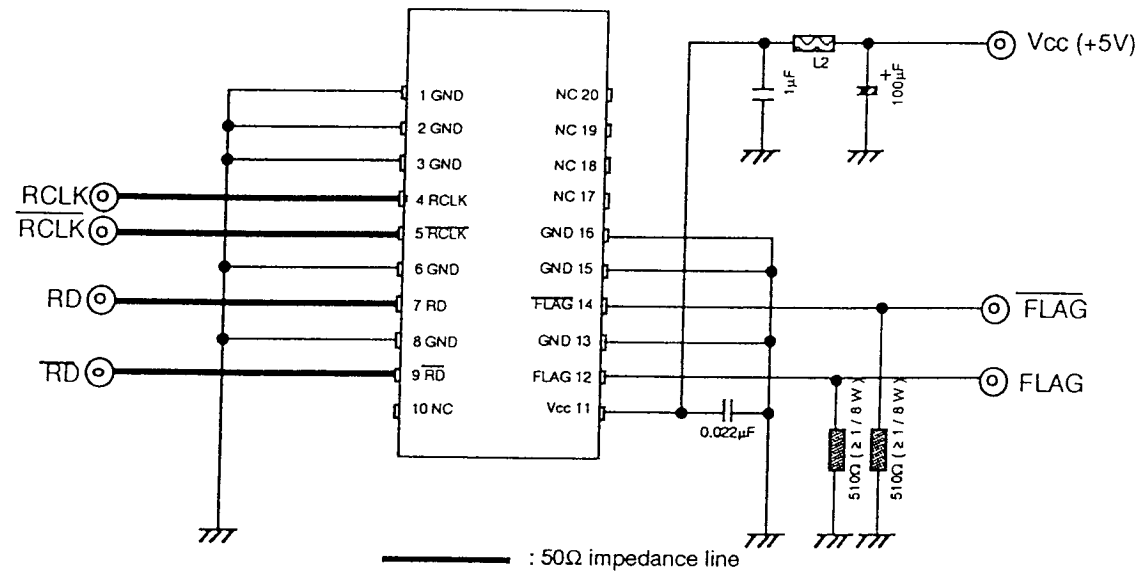
Warning

Do not put this product or components of this product into your mouth. This product contains material harmful to health.

Caution

Dispose this product or equipment including this product properly as an industrial waste according to the regulations.

10. Recommended User Interface



50Ω impedance lines are recommended for RD, RD, RCLK and RCLK.
Ripple filter should be located as close to the module as possible.

L1, L2 : Ferrite Bead ZBF253D-00 (TDK)

Example for Termination Condition

Signal outputs (RD, RD, RCLK and RCLK) are required to be terminated with resistors as shown below, because these outputs are open emitter circuits.

1)

2)

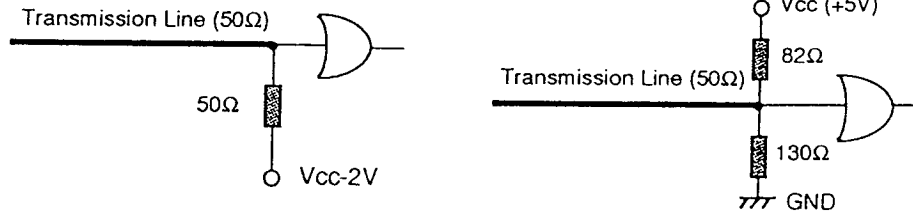


Figure 4 Recommended User Interface

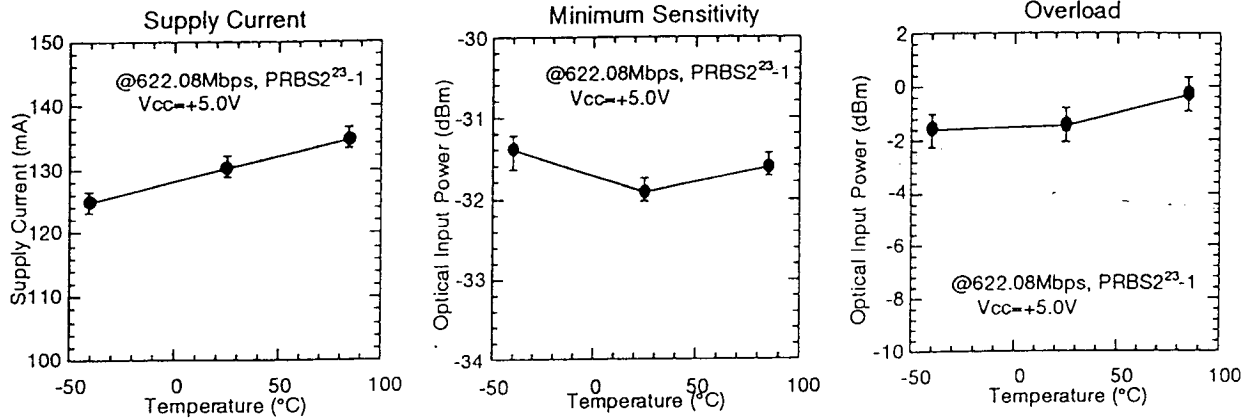
Warning

Be sure to carry out correct soldering for connection to peripheral circuits in order to prevent contact failure or short-circuit. Otherwise, a strong laser beam may cause eye injury, overheating or fire.

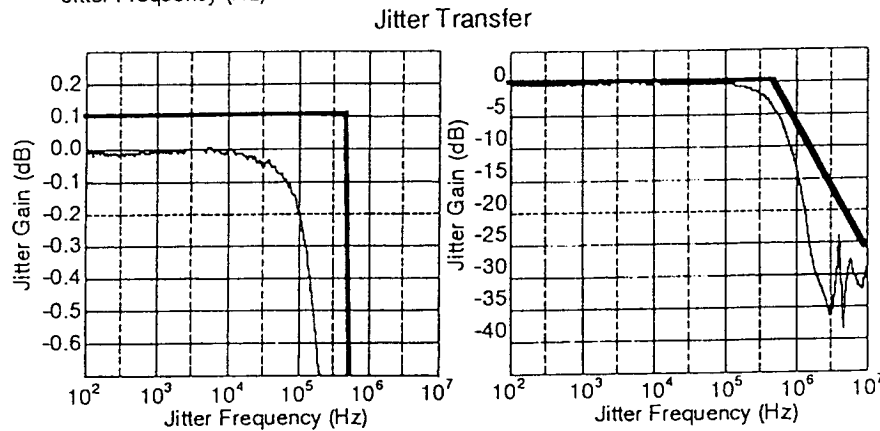
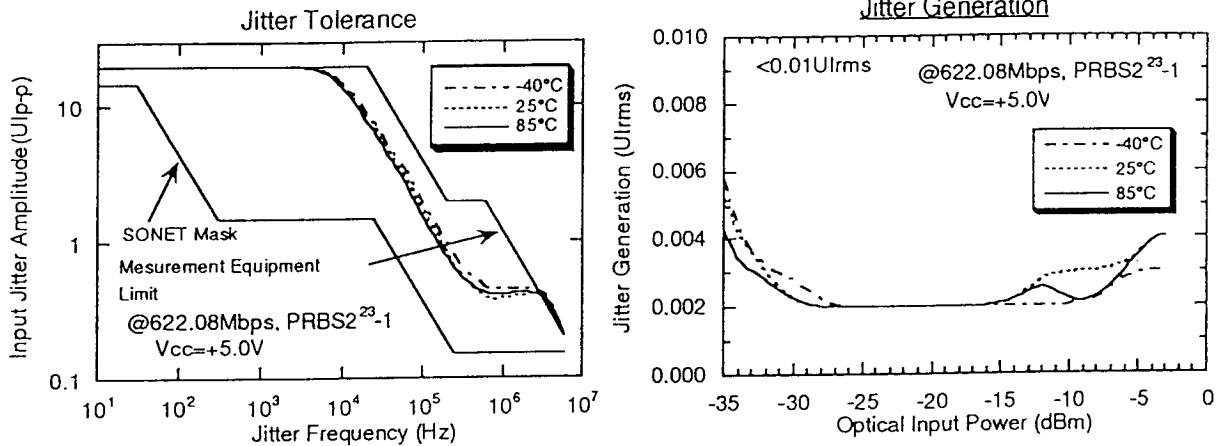
Caution

Be sure to turn the power off when you touch this product connected to the printed circuit boards. Otherwise, electric shock may occur.

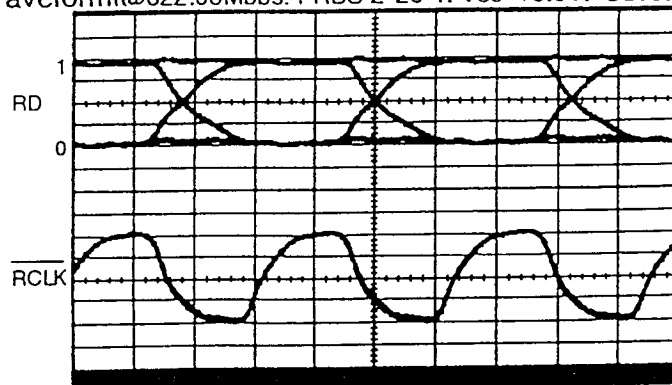
11. Typical Characteristics



* Jitter Characteristics



*Typical Output Waveform(@622.08Mbps, PRBS 2²³-1, Vcc=+5.0V, Optical Input Power=-28dBm)



Horizontal Axis : 0.5 nsec / div.
 Vertical Axis : 200 mV / div.

12. Reliability Test

Bellcore TA-NWT-000983 Issue 2, December 1993								
Heading	Test	Reference	Condition	Sampling			SEI Results	
				LTPD	SS	C	SS	F/C
Mechanical Integrity	Mechanical Shock	MIL-STD-883 Method 2002	Condition B	20%	11	0	—	—
			5 times/axis	20%	11	0	11	0
			500G, 1.0 ms 1,500G, 0.5ms	20%	11	0	—	—
	Vibration	MIL-STD-883 Method 2007	Condition A 20 G 20-2,000 Hz 4 min/cycle; 4 cycles/axis	20%	11	0	11	0
	Thermal Shock	MIL-STD-883 Method 1011	$\Delta T=100^{\circ}\text{C}$	20%	11	0	11	0
	Solderability	MIL-STD-883 Method 2003	(steam aging not required)	20%	11	0	11	0
Fiber Pull			1 Kg; 3 times; 5sec.	20%	11	0	11	0
			2 Kg; 3 times; 5sec.	20%	11	0	—	—
Endurance	Accel. Aging (High Temp.)	(R)-453 Section 5.18	+85°C; rated power	—	25	—	25	0
			>5,000hrs.	—	10	—	—	—
	High Temp. Storage	—	max. storage T (T=85°C)	20%	11	0	—	—
			>2,000	—	—	—	—	—
	Low Temp. Storage	—	min. storage T (T=-40°C)	20%	11	0	11	0
			>2,000	—	—	—	—	—
	Temperature Cycling	Section 5.20	- 40 °C to +85°C	20%	11	0	—	—
			400 times pass/fail	—	11	—	—	—
500 times for info.			20%	11	0	11	0	
Damp Heat (if using epoxy)	MIL-STD-202 M103 or IEC 68-2-3	40 °C , 95%, 56days	20%	11	0	11	0	
		or 85°C /85%RH 2,000hrs.	20%	11	0	—	—	
Cyclic Moisture Resistance	Section 5.23	—	20%	11	0	11	0	
Special Tests	Internal Moisture	MIL-STD-883 Method 1018	< 5,000 ppm water vapor	20%	11	0	11	0
	Flammability	TR357:Sec. 4.4.2.5	—	—	—	—	—	OK
	ESD Threshold	Section 5.22	—	—	6	—	6	0

13. Other Precaution

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.

This module must be handled, used and disposed of according to your company's safe working practice.

14. Ordering Information

Connector type	Operating Temperature Range	
	0~70°C	-40~85°C
FC/PC	SDT8802-RD-QN	SDT8802-RD-QW
SC	SDT8802-RC-QN	SDT8802-RC-QW

15. For More Information

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http://www.sei.co.jp/Electro-optic/eopd_home_e.html