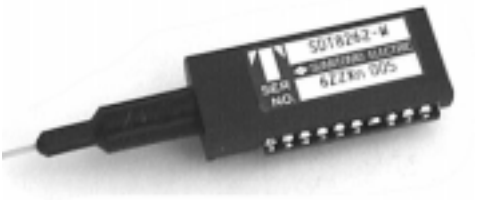


Technical Specification
for
Optical Transmitter Module

SDT8262-T_-Q_

☐ 155.52Mb/s	☑ 622.08Mb/s	☐ other _____
☐ Short Haul Intermediate Reach	☑ Long Haul Long Reach	☐ other _____
☑ Single 5.0 V	☐ Single 3.3 V	☐ other _____
☐ 1.3 µm	☑ 1.55 µm	☐ other _____
☑ Transmitter	☐ Receiver	☐ Transceiver
	(☐ 2R / ☐ 3R)	(☐ 2R / ☐ 3R)

SUMITOMO ELECTRIC

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

#Safety Precaution 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

SDT8262-T_-Q_ is a compact and high speed performance digital optical transmitter module ideally designed for versatile high speed network applications, including SDH STM-4 L-4.2, L-4.3 and SONET OC-12 LR-2, LR-3. This module also meets GR-253-CORE requirement and ITU-T G. 957 / G. 958 recommendation.

* Data Rate	622.08 Mbps, NRZ
* Duty Cycle	50%
* Power Supply Voltage	Single +5.0V (or -5.0V)
* Electrical Interface	PECL (or ECL)
* Laser Diode	1550nm DFB-LD
* Fiber Coupled Power	-3 ~ +2dBm
* Pin Configuration	20 pin Dual in Line
* Connector Interface	SC / FC Optical Connector

The features of SDT8262-T_-Q_ are listed below.

* Features
  - Low Power Consumption
  - Plastic Molded Package
  - Multi-sourced Footprint
  - Uncooled Laser with Automatic Power Control IC
  - Optical Output Shut-down (Disable)
  - Laser Bias Current Monitor / Rear Facet Monitor
  - Class 1 Laser Product (IEC 825-1 and FDA 21 CFR 1040.10 and 1040.11)

2. Block Diagram

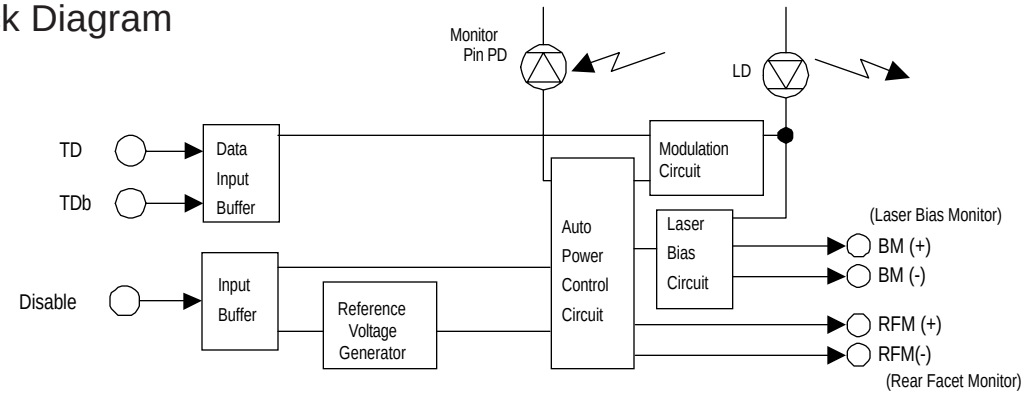


Figure 1. Block Diagram

3. Package Dimension

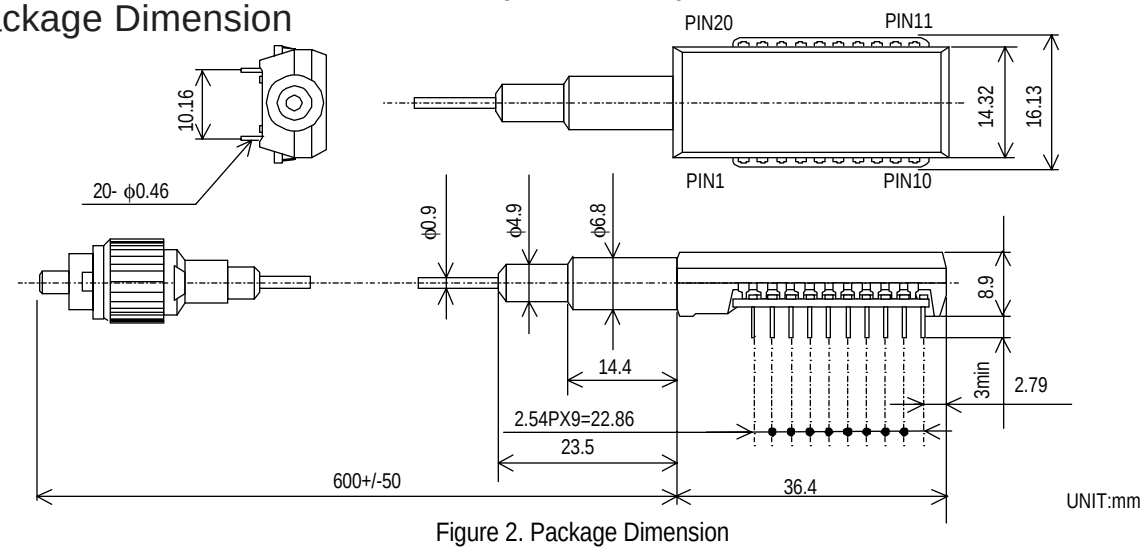


Figure 2. Package Dimension

⚠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

Function	Symbol	No.		No.	Symbol	Function
Non Connection*	NC	1		20	NC	Non Connection*
LD Bias Current Monitor (Refer to Fig. 3)	BM (+)	2		19	RFM (+)	Rear Facet Current Monitor (Refer to Fig.3)
Non Connection*	NC	3		18	Vcc	Power Supply (+)**
LD Bias Current Monitor (Refer to Fig. 3)	BM (-)	4		17	RFM (-)	Rear Facet Current Monitor (Refer to Fig.3)
Power Supply (-)**	Vee	5		16	TD	Differential Data Input (Positive)
Power Supply (+)**	Vcc	6		15	TDb	Differential Data Input (Negative)
LD Disable Input (Refer to Section 9)	Disable	7		14	Vee	Power Supply (-)**
Power Supply (+)**	Vcc	8		13	NC	Non Connection*
Power Supply (+)**	Vcc	9		12	Vcc	Power Supply (+)**
Non Connection.	NC	10		11	NC	Non Connection*

*NC pins are not connected to the internal circuit, and should be left open for additional functions in the future.
**When single +5V would be supplied, please connect Vcc to +5V and Vee to GND.
Else when single -5V would be supplied, please connect Vcc to GND and Vee to -5V.

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-Vee	0.0	7.0	V	4
Input Voltage	Vi	Vee	Vcc+0.5	V	5
Lead Soldering (Temperature)			260	°C	6
(Time)			10	sec.	

Note 1. No condensation allowed. 2. SDT8262-T_-QN 3. SDT8262-T_-QW 4. Vcc>Vee, Vcc=+5.0V, Vee=GND
5. TD, TDb, Disable 6. Measured on lead pin at 2mm (0.079in.) 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		90	200	mA	1, 2, 3
Input Voltage	High	Vih	Vcc-1.17		Vcc-0.73	V	4, 5
TD, TDb	Low	Vil	Vcc-1.95		Vcc-1.45		
Input Current	High	Iih	-10		150	µA	4, 5
TD, TDb	Low	Iil	-10		10		
Signal Input Rise / Fall Time					0.5	nsec.	6
Disable Input Voltage		Vdi	Vee+2.0		Vcc	V	7
Disable Input Current		Idi	-10		200	µA	
LD Bias Monitor Voltage		Vbm	0.01		0.50	V	5, 8
Rear Facet Monitor Voltage		Vrfm	0.01		0.20	V	5, 8

Note 1. Input bias current is not included. 2. 50% duty cycle data 3. 622.08Mbps 4. Vcc-Vee=5.0V 5. Tc=25°C 6. 20~80% 7. The transmitter is enabled as default state and requires an external voltage only to disable. (Refer to Section 9. Relation between Disable Input Voltage and Optical Output Power) 8. The Laser Bias and Rear Facet Monitor currents are calculated as ratios of the corresponding voltages to their current-sensing resistors, 10Ω and 200Ω, respectively (See Figure 3). Upon measuring or utilzing these values, please use a device whose impedance is high enough (>1MΩ) compared with those resistors.

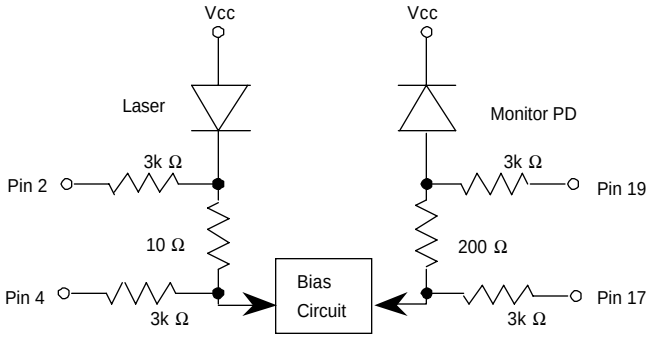


Figure 3 Monitor Circuit Schematic Diagram

⚠ Caution

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

⚠ Warning

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

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	-3.0		2.0	dBm	1
Extinction Ratio	Er	10.0			dB	1
Center Wavelength	λc	1480		1580	nm	
Spectral Width (@ -20dB)	Δλ			1.0	nm	
Side Mode Suppresion Ratio	Rs	30.0			dB	
Eye Mask for Optical Output	Refer to Figure 4					

Note 1. Measured at 622.08Mbps PRBS2^23-1, 50% duty cycle data

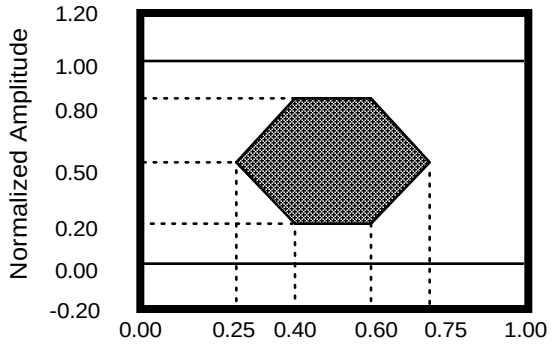


Figure 4. Optical Pulse Mask with Fourth Order Bessel-Thomson Filter Specified in ITU-T G.9

⚠ Warning

Do not look at the laser beam projection area (e.g. end of optical connector) with naked eyes or through optical equipment while the power is supplied to this product. Otherwise, your eyes may be injured.

8. Relation between Input Signal and Optical Output Signal

Relation between Input Signal and Optical Output Signal

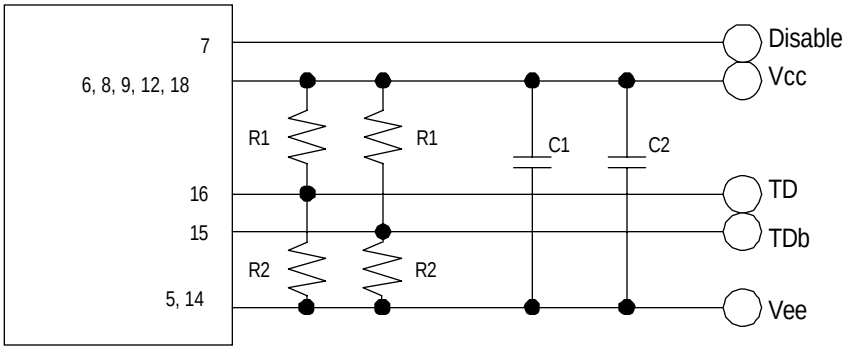
Input Signal		Optical Output Signal
TD	TDb	
High	Low	ON (High)
Low	High	OFF (Low)
High	High	Undefined
Low	Low	Undefined

Relation between Disable Input Voltage and Optical Output Power

Disable Input Voltage	Optical Output Power
"L" (Vee ~ Vee+0.4V)	Enabled
"H" (Vee+2.0 ~ Vcc)	Disabled (<-45dBm)

Note. Enabled for no Disable input (pin 7 opened)

9. Recommended User Interface



C1 = 0.022μF (Ceramic Chip Capacitor)

C2 = 1μF / 25V (Tantalum Electrolytic or Aluminum Electrolytic Capacitor)

R1 = 82Ω (≥ 1/8 W), R2 = 130Ω (≥ 1/8 W)

Note : 1. Termination resistors (R1, R2) should be located as close to the module as possible.

2. 50Ω impedance lines are recommended for TD and TDb.

3. Please refer to Figure 3 for Pin 2, 4, 17, 19.

Figure 5. Recommended User Interface

10. Fiber Pigtail Specification

Parameter	min.	Typ.	Max.	Unit	Note
Mode Field Diameter		9.5		µm	
Cladding Diameter		125		µm	
Outer Diameter		0.9		mm	
Optical Fiber Tensile Break Strength			9.8	N	1
Bend Radius	30			mm	

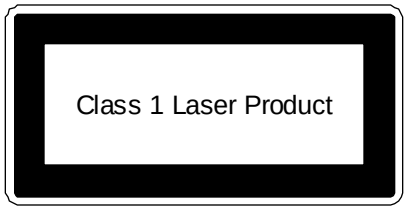
Note 1. Strength between receiver body and optical fiber should be less then 9.8 N

11. Reliability Test

Bellcore TA-NWT-000983 Issue 2, December 1993								
Heading	Test	Reference	Condition	Sampling			SEI Result	
				LTPD	SS	C	SS	F/C
Mechanical Integrity	Mechanical Shock	MIL-STD-883 Method 2002	Condition B 5 times/axis					
			500G, 1.0 ms	20%	11	0	---	---
			1,500G, 0.5ms	20%	11	0	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	ΔT=100°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	---	---
			2 Kg; 3 times; 5sec.	20%	11	0	---	---
Endurance	Accel. Aging (High Temp.)	(R)-453 Section 5.18	+85C; rated power >5,000hrs.	---	25	---	25	0
			>10,000hrs.	---	10	---	---	---
	High Temp. Storage	----------	max. storage T (T=85°C) >2,000	20%	11	0	---	---
	Low Temp. Storage	----------	min. storage T (T=-40°C) >2,000	20%	11	0	11	0
	Temperature Cycling	Section 5.20	- 40°C to +85°C					
			400 times pass/fail	20%	11	0	---	---
			500 times for info.	---	11	---	---	---
			500 times pass/fail	20%	11	0	11	0
			1000 times for info.	---	11	---	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

12. Laser Safety

This product uses a semiconductor laser system and is a laser class 1 product acc. FDA, complies with 21CFR 1040. 10 and 1040.11. Also this product is a laser class 1 product acc. IEC 825-1.



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.

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

⚠ Caution

- Be sure to turn the power off when you touch this product connected to the printed circuit boards. Otherwise, electric shock may occur.
- Dispose this product or equipment including this product properly as an industrial waste according to the regulations.

14. Ordering Information

Connector type	Operating Temperature Range	
	0 ~ 70°C	-40 ~ 85°C
FC / PC	SDT8262-TD-QN	SDT8262-TD-QW
SC	SDT8262-TC-QN	SDT8262-TC-QW

15. For More Information

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