Preliminary Technical Data (Rev. 0.3, June 8, 2000)

HITACHI

RCV5935AN

STM-16/OC-48 Optical Receiver (for L16/LR-3R)

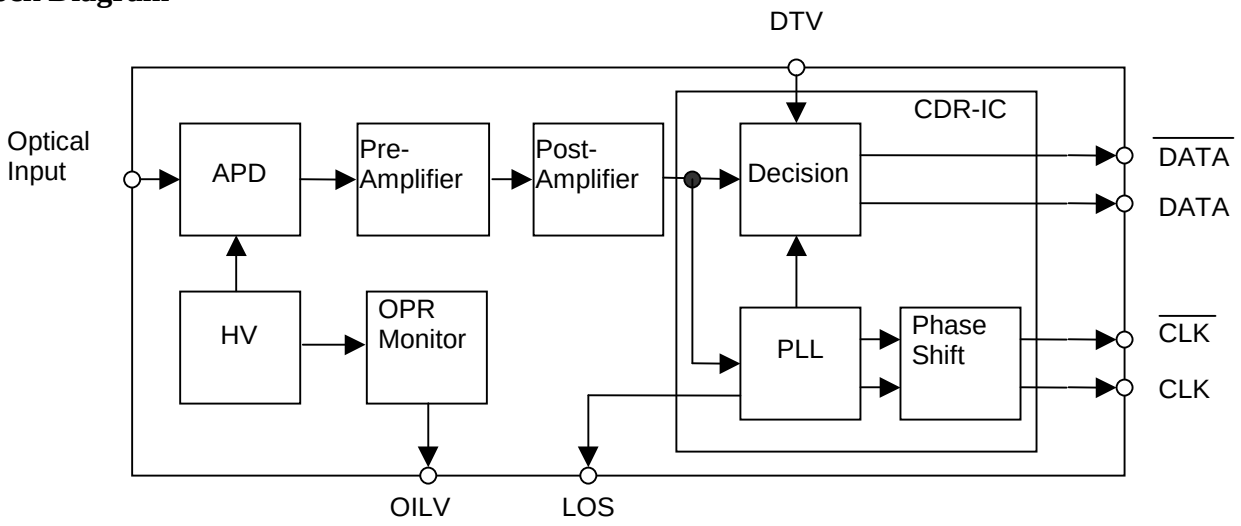
Preliminary Product Disclaimer

This preliminary data sheet is provided to assist you in the evaluation of functional samples of the products that are under development and for which a reliability test has not been completed. Until Hitachi, Ltd. releases these products for general sales, Hitachi, Ltd. reserves the right to change prices, features, functions, specifications, capabilities and release schedule.

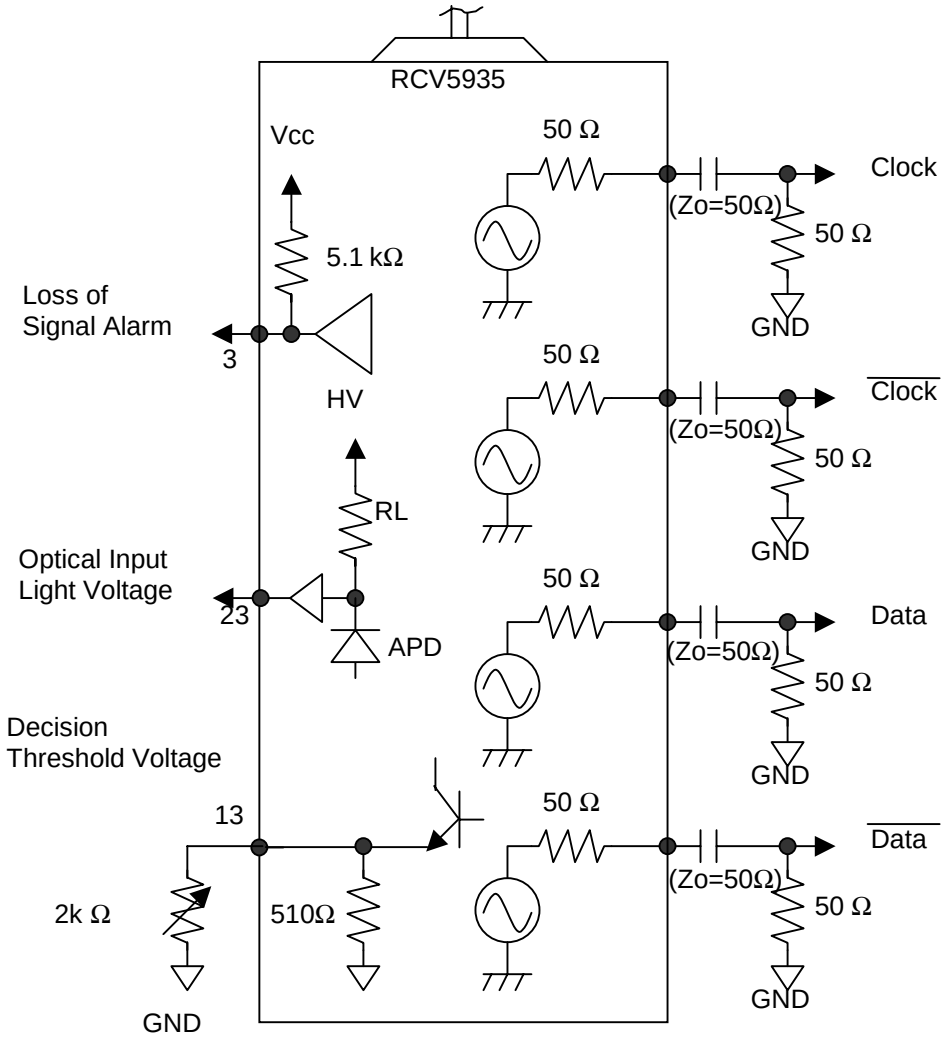
FEATURES

- **SDH/SONET compliant at STM-16/OC-48**
- **Multi-source compliant**
- **+5 V single power supply**
- **OIL (Optical Input Level) monitor and LOS (Loss of Signal) alarm available**
- **Differential Data/Clock output (AC/DC coupled)**
- **High performance in the operating case temperature range –5 to +75°C**
- **Compact size (35.6 x 59 x 8.9 mm^3)**
- **High accuracy log converted by the OIL function**

Block Diagram



Recommended Circuit



An internal version of AC Coupling Capacitor is also available.

PERFORMANCE SPECIFICATIONS

Table 1. Absolute Maximum Ratings

No.	Item	Symbol	Rated Value	Unit
1	Operating Case Temperature	Topr.	-5 to +75	°C
2	Storage Case Temperature	Tstg.	-20 to +75	°C
3	Lead Soldering Temperature	-	≤250	°C
4	Lead Soldering Time	-	≤10	s
5	DC Power Supply	Vcc	0 to 5.6	V

Table 2. Operating Environment

Electrical and optical characteristics below are defined under this operating environment, unless otherwise specified.

No.	Item	Symbol	Min.	Typ.	Max.	Unit
1	Positive Supply Voltage	Vcc	4.75	+5.00	+5.25	V
2	Total Power Consumption	Pc	-	-	3	W

Table 3. Electrical and Optical Characteristics

No.	Item			Symbol	Conditions	Min.	Typ.	Max.	Unit
1	Minimum Received Power λ=1310 nm			Pin min	10^{-10} BER, (Note 1)	-	-	-27	dBm
					10^{-10} BER at the beginning of life and at 25°C (Note 1)	-	-	-29	dBm
2	Minimum Received Power λ=1550 nm			Pin min	10^{-10} BER, (Note 1)	-	-	-29	dBm
					10^{-10} BER at the beginning of life and at 25°C (Note 1)	-	-	-31	dBm
3	Maximum Received Power			Pin max	10^{-10} BER, (Note 1)	-8	-	-	dBm
					10^{-10} BER at the beginning of life and at 25°C (Note 1)	-7.5	-	-	dBm
4	Loss of Signal Alarm	Alarm Activate/ Deactivate Level		-	Notes 1, 2 and 3	-	-	Pr, min (-3)	dBm
5		Output Voltage	Low	-	Notes 1, 2 and 3	-	-	0.44	V
6			High	-	Notes 1, 2 and 3	3.5	-	-	V
7		Activation Time		-	Notes 1, 2 and 3	-	-	95	μs
8		Deactivation Time		-	Notes 1, 2 and 3	-	-	10	ms
9	Power Consumption			-	Note 1	-	-	3	W
10	Output Rise and Fall Times			tr, tf	Note 1	-	-	150	ps
11	Clock/Data Output Voltage			-	50Ω load, Single ended AC-coupled (Note 1)	300	-	1000	mVpp
12	Clock/Data Delay			-	Notes 1 and 4	-75	-	+75	ps
13	Output Duty cycle			-	Note 1	45	-	55	%
14	Reflectance of receiver with a connector			-	Note 1	-	-	-27	dB
15	Sync Loss BER			-	Note 1	1×10^{-3}	-	-	-
16	Jitter Generation			-	Note 1	-	-	0.01	UIrms
17	Jitter Transfer			-	Note 1	GR-253/ITU-T G.958			-
18	Jitter Transfer Peaking			-	Note 1	-	-	0.1	dB
19	Jitter Tolerance			-	Note 1	GR-253/ITU-T G.958			-
20	Path penalty			PP	Note 1 (L16.2)	-	-	2	dB
21	Consecutive Identical Digit Penalty on BER=1e-10			ΔS_{CID}	Note 1	-	-	1	dB
22	Optical Input Light Voltage			OIL	Notes 1 and 5	Note 5			V
23	Decision Threshold Voltage			DTV	Notes 1 and 6	Note 6			-

Note 1. Transmit Data: NRZ at 2.488320 Gbit/s, Mark 50%, PRBS=2^{23}-1,
Power Supply Voltages: Vcc = $5.0^{\pm 0.25}$ V, Tc = -5 to 75°C
DTV pin: Open (S16.1, L16.1), Adjusted (L16.2)

Note 2.

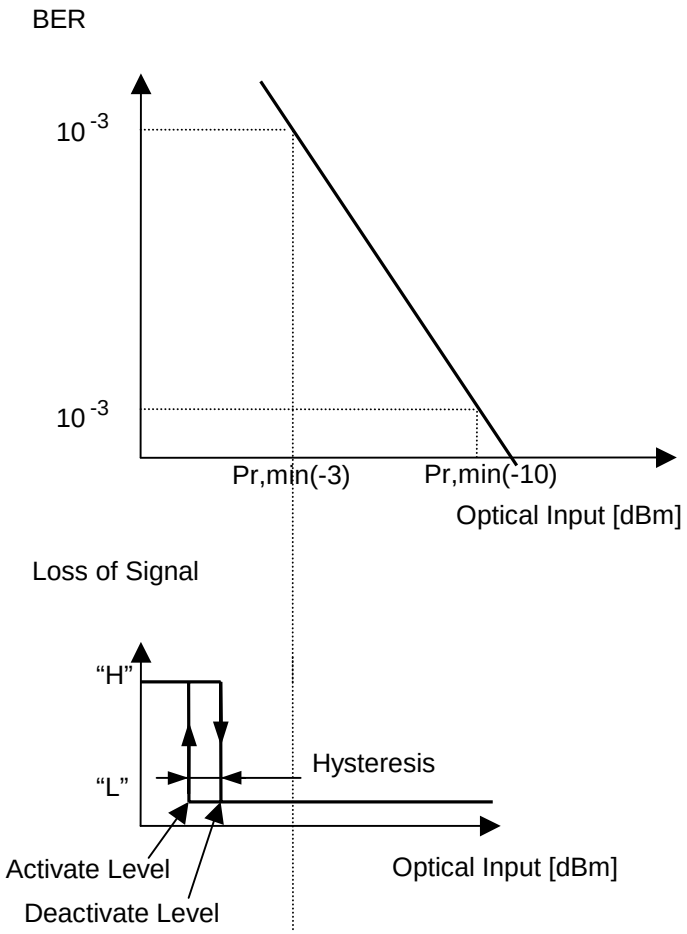


Fig. 4.1 Loss of Signal Alarm

Note 3.

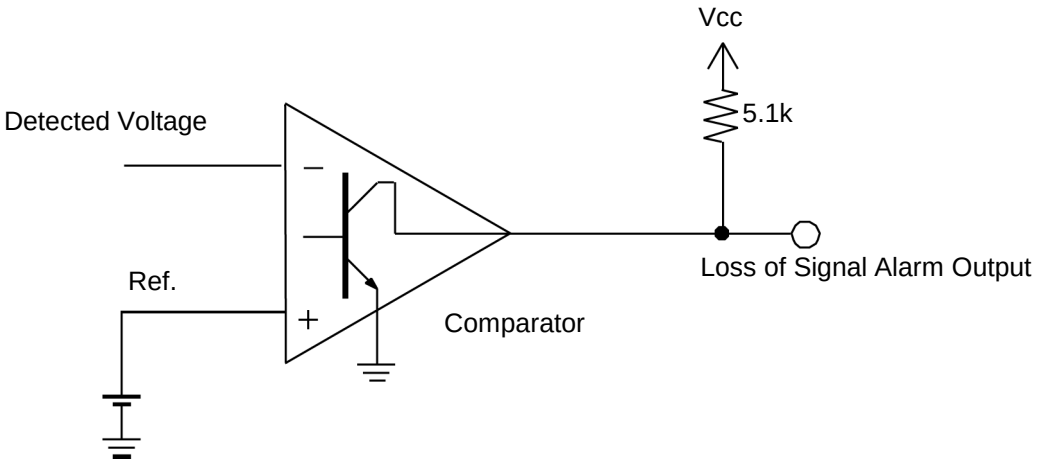


Fig. 4.2 Loss of Alarm Interface

Note 4.

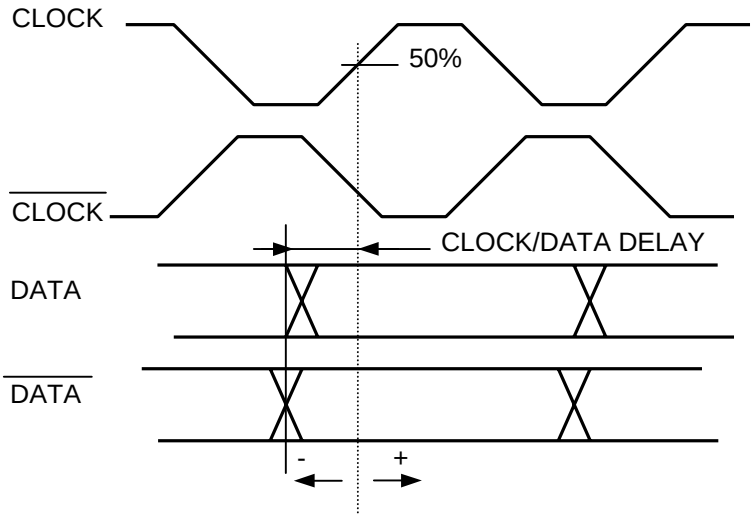


Fig. 4.3 Clock/Data Delay

Note 5.

Input Power [dBm]	-10	-15	-20	-25	-30
Voltage [V]	2.85 ±0.3	2.35 ±0.3	1.85 ±0.3	1.35 ±0.3	0.85 ±0.3

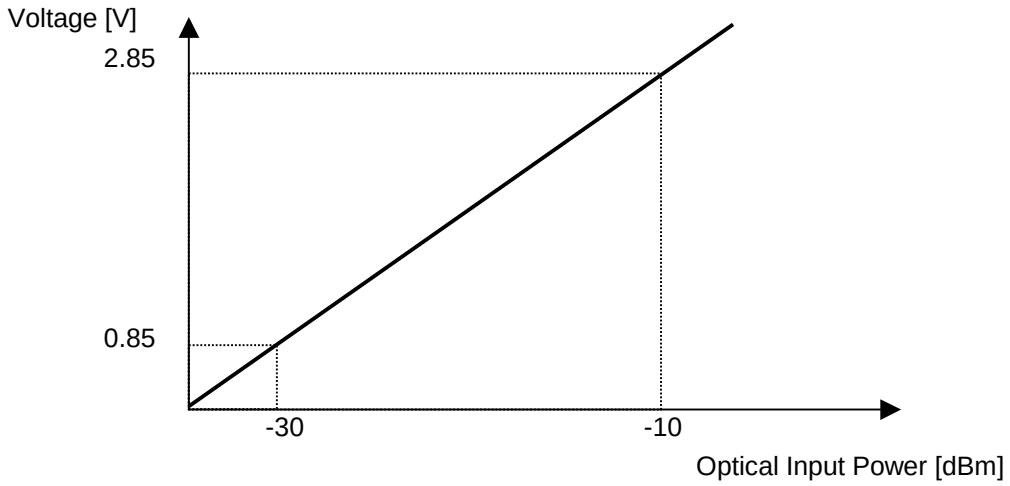


Fig. 4.4 Optical Input Light Voltage

Note 6.

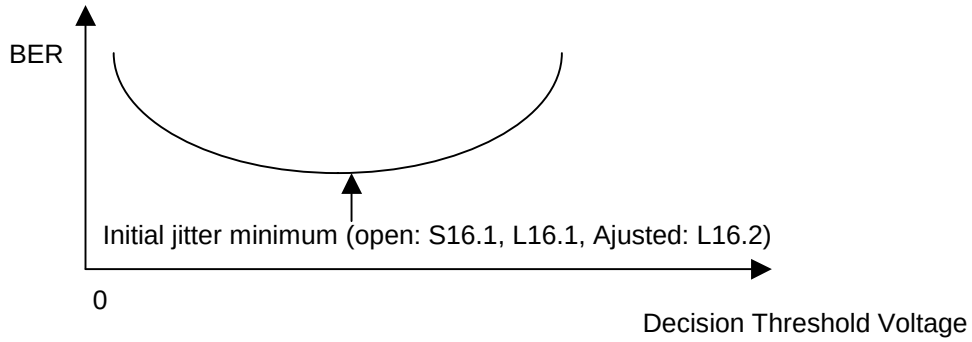


Fig. 4.5 Decision Threshold Voltage

Table 4. Pin Configuration

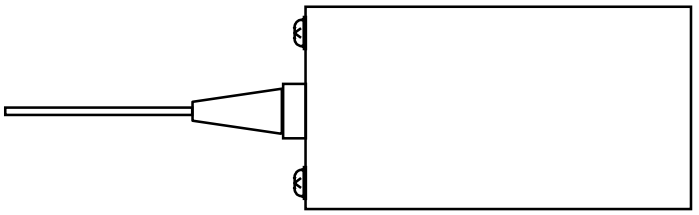
Pin #	Symbol	I/O	Logic	Description	Remarks
1	NIC			Not Internally Connected	
2	NUC			No User Connection	
3	LOS			Loss of Signal	
4	GND			Ground	
5	$\overline{\text{Cko}}$			False clock output	
6	CKo			True clock output	
7	GND			Ground	
8	Vcc			Positive power supply (+5.0 V)	
9	GND			Ground	
10	Do			True data output	
11	$\overline{\text{Do}}$			False data output	
12	GND			Ground	
13	DTV *			Decision Threshold Voltage	
14	GND			Ground	
15	GND			Ground	
16	GND			Ground	
17	GND			Ground	
18	NIC			Not Internally Connected	
19	GND			Ground	
20	GND			Ground	
21	NUC			No User Connection	
22	Vcc			Positive power supply (+5.0 V)	
23	OILV			Optical Input Light Voltage	
24	NUC			No User Connection	

* DTV should be connected to the resistor that is terminated to GND if adjustment is necessary.

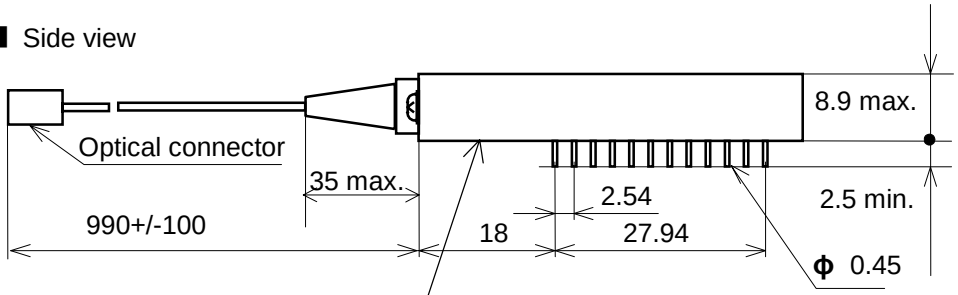
Mechanical Dimensions

Dimensions: mm
Tolerance : ±0.5 mm

■ Top view



■ Side view



■ Bottom view

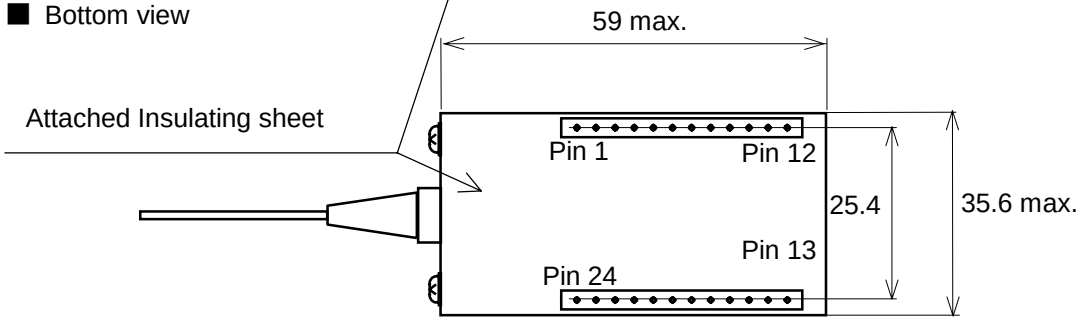


Table 5. Optical Fiber

No.	Item	Specifications	Unit
1	Type	SMF	-
2	Mode Field Diameter	9.5 ±1	μm
3	Cladding Diameter	125 ±2	μm
4	Minimum Bending Radius	30	mm
5	Outer Diameter Of Secondary Coating	0.9 ±0.1	mm

USER INFORMATION

Handling Precautions

CAUTION: Take proper electrostatic-discharge (ESD) precautions while handling these devices. These devices are sensitive to ESD.

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Revision History

Rev.	Date	Page/Line/Fig/Table	Modification	Note
0.3	June 8, 2000	-	-	