PRELIMINARY DATA SHEET

NEC

TRANSCEIVER MODULE
NL1000

3.3 V, SMALL PACKAGE IrDA COMPLIANT TRANSCEIVER MODULE
DATA RATE: 2.4 k to 115.2 kbps

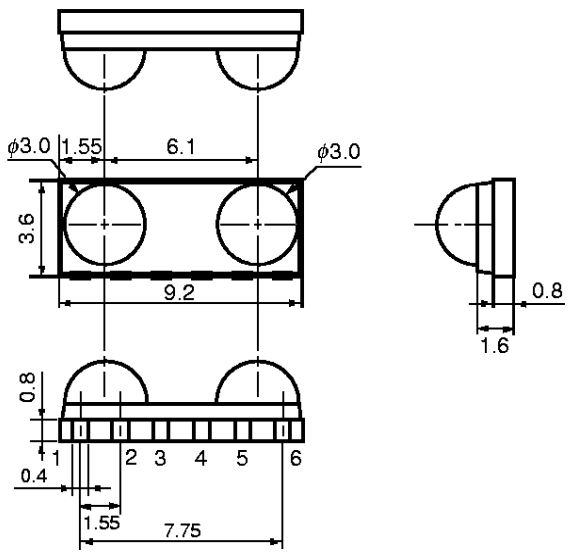
DESCRIPTION

The NL1000 is a small package transceiver module for IrDA Ver.1.0. This module incorporates an infrared Rays LED and an integrated photo detector with wide bandwidth amplifier, and it has low operating voltage and low operating current.

FEATURES

- Conform to IrDA Ver.1.0 standards
- Data rate 2.4 k to 115.2 kbps
- Supply voltage 3.3 V
- Data link distance to 1 m
- Ultra small size 3.8 × 9.6 × 4.0 (mm) (with shield case)
- Circuit current 130 μA

PACKAGE DIMENSIONS
in millimeters



PIN CONNECTIONS

Pin No.	Function
1	LEDA: LED Anode
2	TXD: Transmitter Data Input
3	RXD: Receiver Data Output
4	CX
5	V_{DD}: Supply Voltage
6	GND: Ground

The information in this document is subject to change without notice.

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The mark ★ shows major revised points.

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ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise specified)

Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	V_{DD}		−0.5 to +7.0	V
Data Input Voltage	V_{TXD}		−0.5 to V_{DD}+0.5	V
Data Output Voltage	V_{RXD}		−0.5 to V_{DD}+0.5	V
Peak LED Current	I_{FP}	PW < 1 μs, duty < 1 %	1.0	A
Repetitive Pulse LED Current	I_{RP}	PW < 100 μs, duty < 10 %	500	mA
Operating Ambient Temperature	T_A		0 to +70	°C
Storage Temperature	T_{stg}		−25 to +85	°C
Soldering Temperature (10 s)	T_{sld}		260	°C

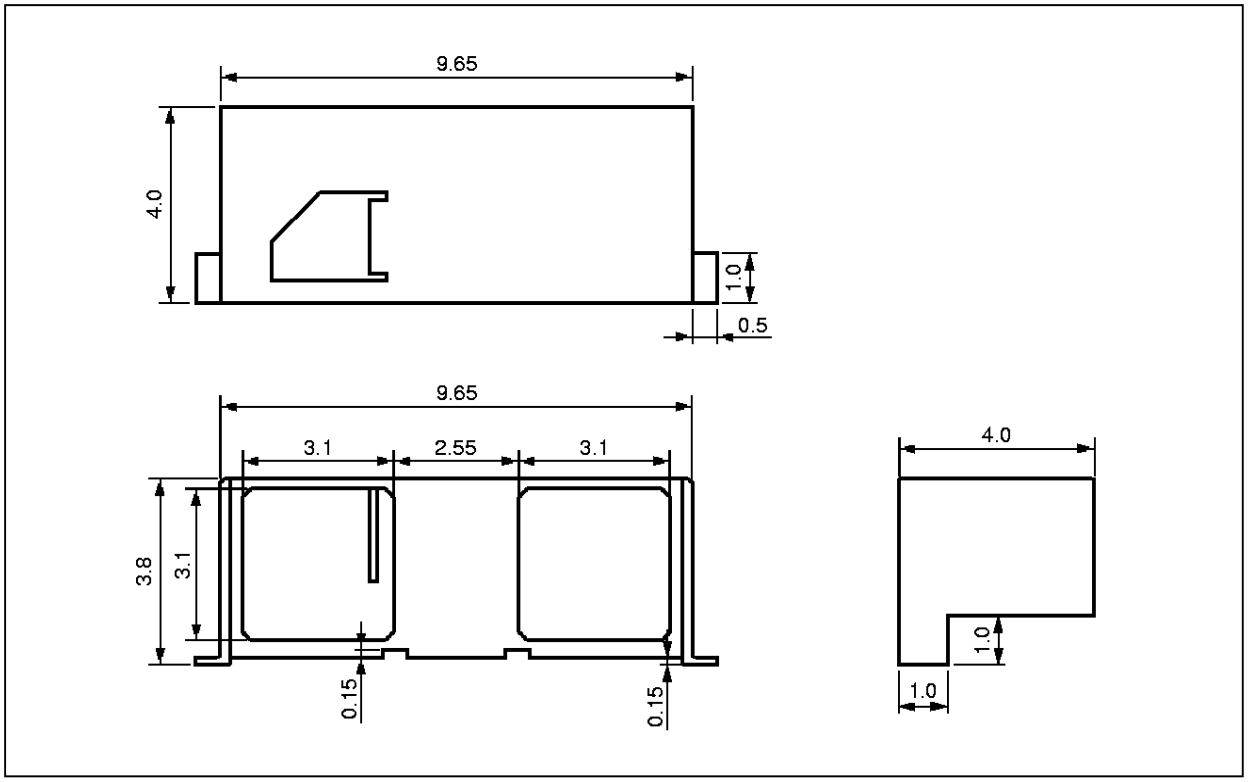
RECOMMENDED OPERATING CONDITIONS (T_A = 25 °C, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}		2.7	3.3	3.6	V
Data Input Voltage (High)	V_{IH}		2.4		3.6	V
Data Input Voltage (Low)	V_{IL}		0		0.3	V
Logic High Input Irradiance	E_{IH}	2.4 kbps to 115.2 kbps	0.0036		500	mW/cm^2
Logic Low Input Irradiance	E_{IL}				0.3	μW/cm^2
Pulse LED Current	I_{LED}			150	250	mA
Data Rate			2.4 k		115.2 k	bps

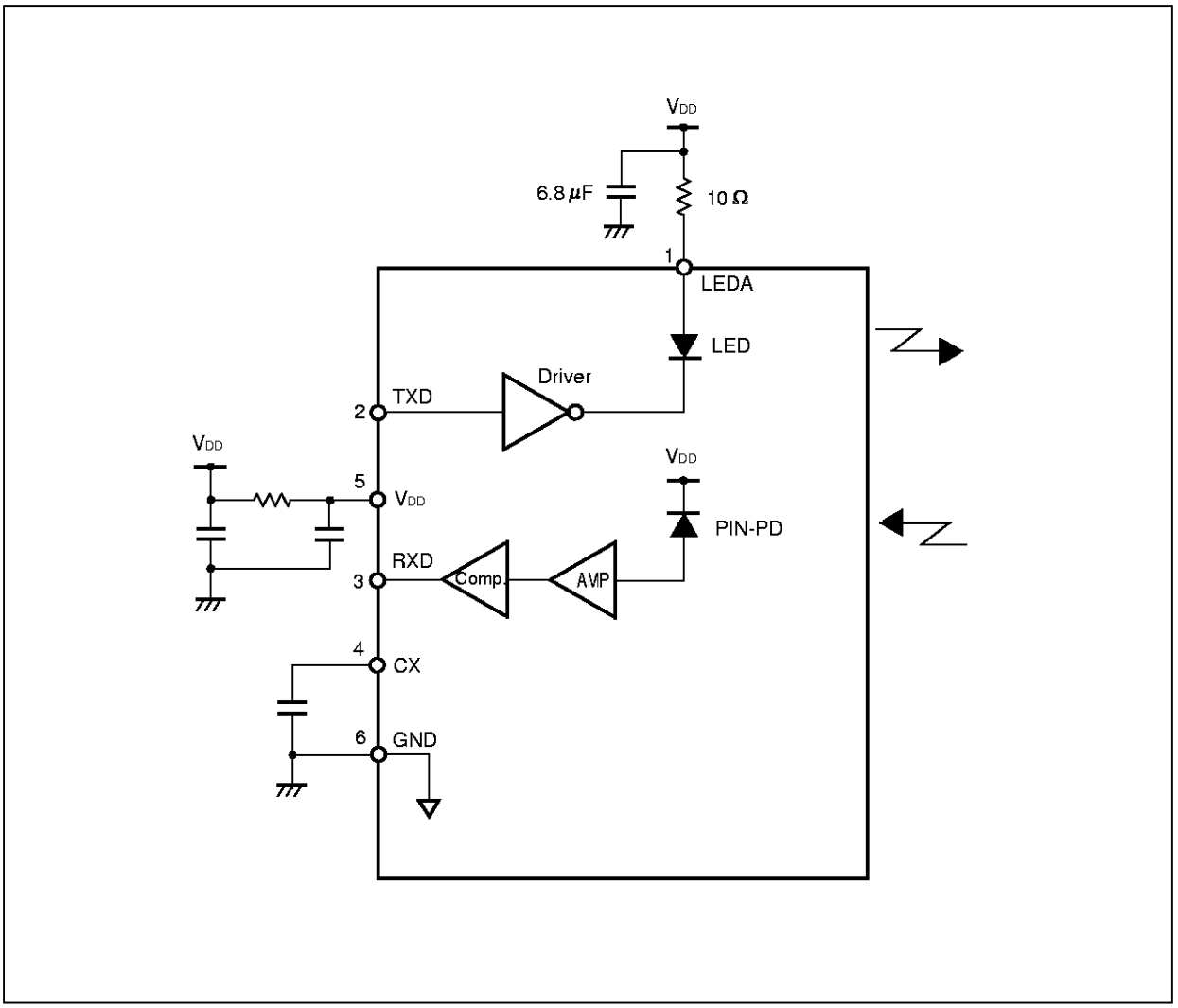
ELECTRO-OPTICAL CHARACTERISTICS (T_A = 25 °C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Transmitter	LED Peak Wavelength	λ_P	I_F = 150 mA	850	875	900	nm
	Radiant Intensity (Low)	I_{EL}				0.3	mW/sr
	Radiant Intensity (High)	I_{EH}	I_F = 150 mA	40	80	200	mW/sr
	Viewing Angle	θ	I_F = 150 mA	30		60	deg.
	LED Pulse Forward Voltage	V_{FP}	I_F = 150 mA		1.7	2.5	V
	LED Leakage Current	I_{LK}	V_{DD} = 3.3 V, GND < V_I < 0.3 V			100	μA
	Rise Time	t_r	V_I = 2.4 V, t_{pw} (TXD) = 1.63 μs,		0.4	0.6	μs
	Fall Time	t_f	f = 115.2 kHz		0.4	0.6	μs
	Pulse Width	t_{pw}		1.41	1.63	2.23	μs
Receiver	Data Output Voltage (Low)	V_{OL}			0.1	0.4	V
	Data Output Voltage (High)	V_{OH}		2.4	V_{DD}–0.1		V
	Pulse width @ 9.6 kbps			0.8		22	μs
	Pulse width @ 115.2 kbps			0.8		3	μs
	Viewing Angle	θ		30	45		deg.
	Circuit Current	I_{DD}	GND < V_I < 0.3 V		130		μA

★ **SHIELD CASE (in millimeters)**



BLOCK DIAGRAM



RECOMMENDED SOLDERING CONDITIONS

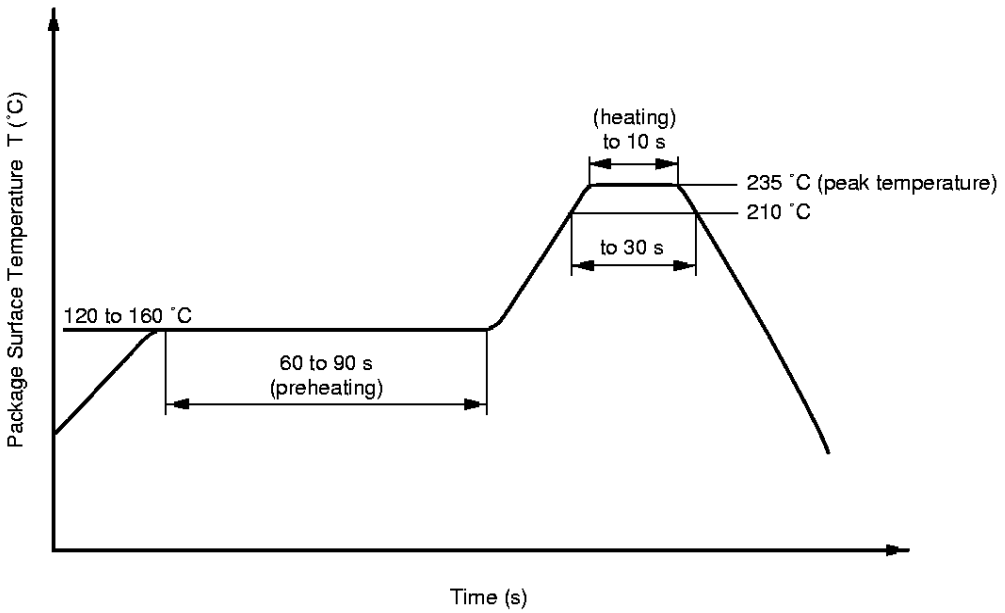
(1) Soldering by soldering iron

- Temperature 260 °C or below
- Time 10 seconds or less

(2) Infrared reflow soldering

- Peak reflow temperature 235 °C (package surface temperature)
- Time of temperature higher than 210 °C 30 seconds or less
- Number of reflows Three

Recommended Temperature Profile of Infrared Reflow



[MEMO]

CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.

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