CND0214A

Infrared Optocal Module (IrDA)

Infrared data link for cellular phones, peripheral devices

■ Features

- Compliant with IrDA Ver.1.2
- Corresponding low I/O (interface) voltage: 1.5 V
- Corresponding reflow solder (260°C)
- Ultra-small top view package (2.0 mm × 8.2 mm × 1.7 mm)

■ Type

- GaAlAs LED + IC + PIN Photodiode

■ Absolute Maximum Ratings T_a = 25°C±3°C

Parameter	Symbol	Rating	Unit
Operating supply voltage	V_{CC}	– 0.5 to +3.8	V
Output voltage	V_O	– 0.5 to +3.8	V
Input voltage	V_I	– 0.5 to +3.8	V
Shutdown input voltage	V_{SD}	– 0.5 to +3.8	V
LED operating supply voltage	V_{LEDA}	– 0.5 to +7.0	V
Pulse forward current *	I_{FP}	200	mA
Low level output current	I_{OL}	10	mA
Operating ambient temperature	T_{opr}	–20 to +70	°C
Storage temperature	T_{stg}	–30 to +85	°C

Note) *: tw ≤ 90 μs, Duty ≤ 20 %

■ Operatong Condition

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating supply voltage	V_{CC}		2.4	2.8	3.3	V
LED operating supply voltage	V_{LEDA}		2.7		4.5	V
Input / output supply voltage	V_{IO}		1.5	1.8	V_{CC}	V

■ Electrical-Optical Characteristics $V_{CC} = V_{IO}$ = 2.8 V, T_a = 25°C±3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High level supply current *1	I_{CCH}	V_{LED} = 3.6 V, V_I = 0.5 V, $V_{SD} \leq$ 0.5 V		90	120	μA
Shut down supply current *1	I_{CCSD}	V_I = 0.5 V, $V_{IO} \geq V_{SD} \geq V_{IO}$ – 0.3 (SD = High)		10	200	nA
Maximum reception distance *5	L_{max}	V_{LED} = 2.7 V to 4.5 V, $V_{SD} \leq$ 0.5 V, External components	23			cm
Data Rates	—		9.6		115.2	kbps
SD high level input voltage	V_{IHSD}		V_{IO} – 0.5		V_{IO}	V
SD low level input voltage	V_{ILSD}		0		0.5	V

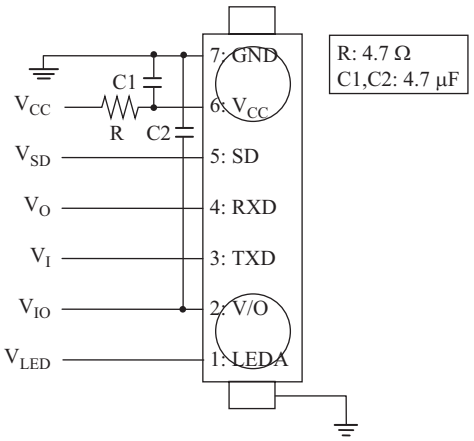
■ Electrical-Optical Characteristics (Continued) $V_{CC} = V_{IO} = 2.8$ V, $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Transmitter							
Peak emission wavelength		λ_P	I_{FP} = 60 mA, Duty 3/16	850	870	900	nm
Pulse forward current *1		I_{FP}	V_{LED} = 3.2 V, $V_{SD} \leq 0.5$ V	40	60	90	mA
Center radiant intensity *1, 2	$\theta_T = 0$	I_e	V_{LED} = 3.2 V, $V_{SD} \leq 0.5$ V	12	18		mW/sr
	$\theta_T = \pm 15$	I_{e15}	V_{LED} = 3.2 V, $V_{SD} \leq 0.5$ V	7	12		mW/sr
High level input voltage *1		V_{IH}	V_{CC} = 2.4 V to 3.3 V, $V_{SD} \leq 0.5$ V	$V_{IO} - 0.5$		V_{IO}	V
Low level input voltage *1		V_{IL}	V_{CC} = 2.4 V to 3.3 V, $V_{SD} \leq 0.5$ V	0		0.5	V
TX half-angle		θ_T		±15			°
LED optical pulse width		T_{WT}	TXD Pulse = 1.6 µs	1.41	1.6	2.2	µs
Rise time *1, 3		t_r	t_w = 1.6 µs, R_L = 50 Ω			0.2	µs
Fall time *1, 3		t_f	t_w = 1.6 µs, R_L = 50 Ω			0.2	µs
TX wake up time *8		t_{Twu}			0.3	1	µs
Receiver							
Minimum input irradiance		$E_{I\,min}$	$V_{SD} \leq 0.5$ V			5	µW/cm^2
High level output voltage *6		V_{OH}	Non signal condition I_{OH} = –200 µA, $V_{SD} \leq 0.5$ V	$V_{IO} - 0.3$		V_{IO}	V
Low level output voltage *7		V_{OL}	I_{OL} = 500 µA, $V_{SD} \leq 0.5$ V	0		0.5	V
RX half angle		θ_R		±15			°
RXD output pulse width		T_{WR}	C_L = 15 pF, 9.6 kbps to 115.2 kbps	1.0	2.3	4.2	µs
RX wake up time *9		t_{Rwu}	E_I = 8.1 µW/cm^2		200	400	µs
Receiver latency time		t_L	E_I = 8.1 µW/cm^2		100	200	µs
Rise time *4		t_r	C_L = 10 pF		50	200	ns
Fall time *4		t_f	C_L = 10 pF		50	200	ns

■ Electrical-Optical Characteristics (Continued)

Note) Measuring circuit

*1:



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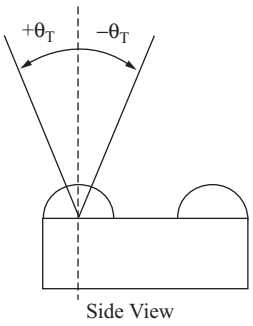

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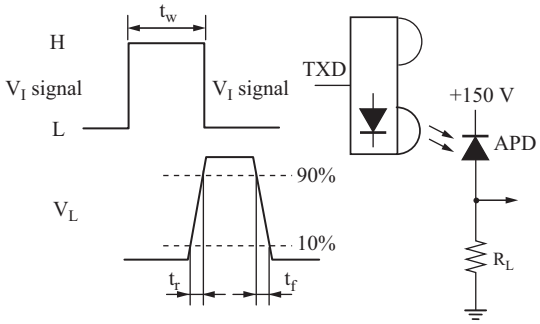

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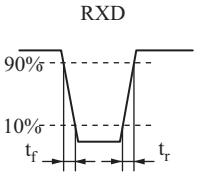

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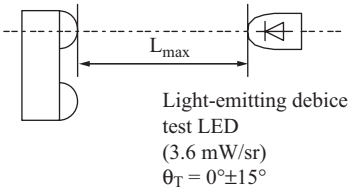

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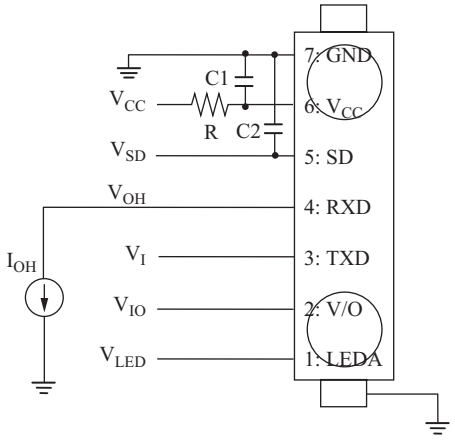

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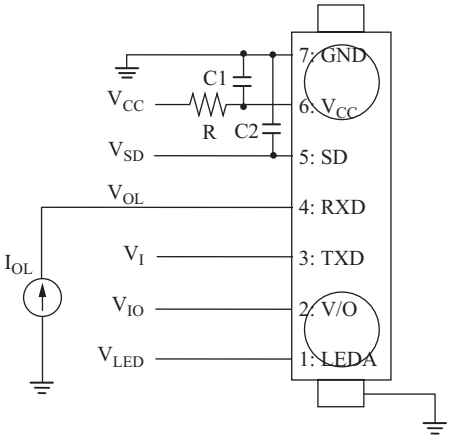
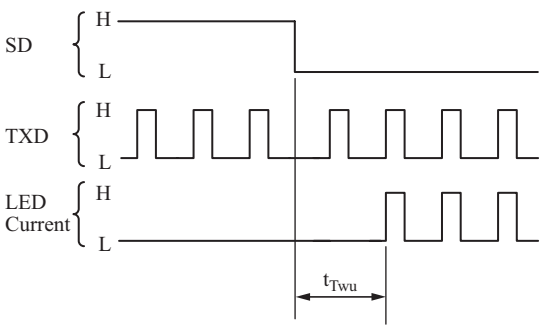


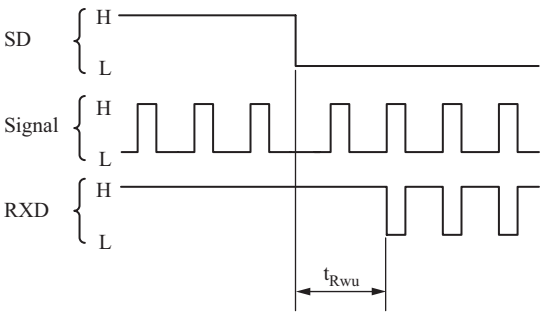
*8:

TX wake up time

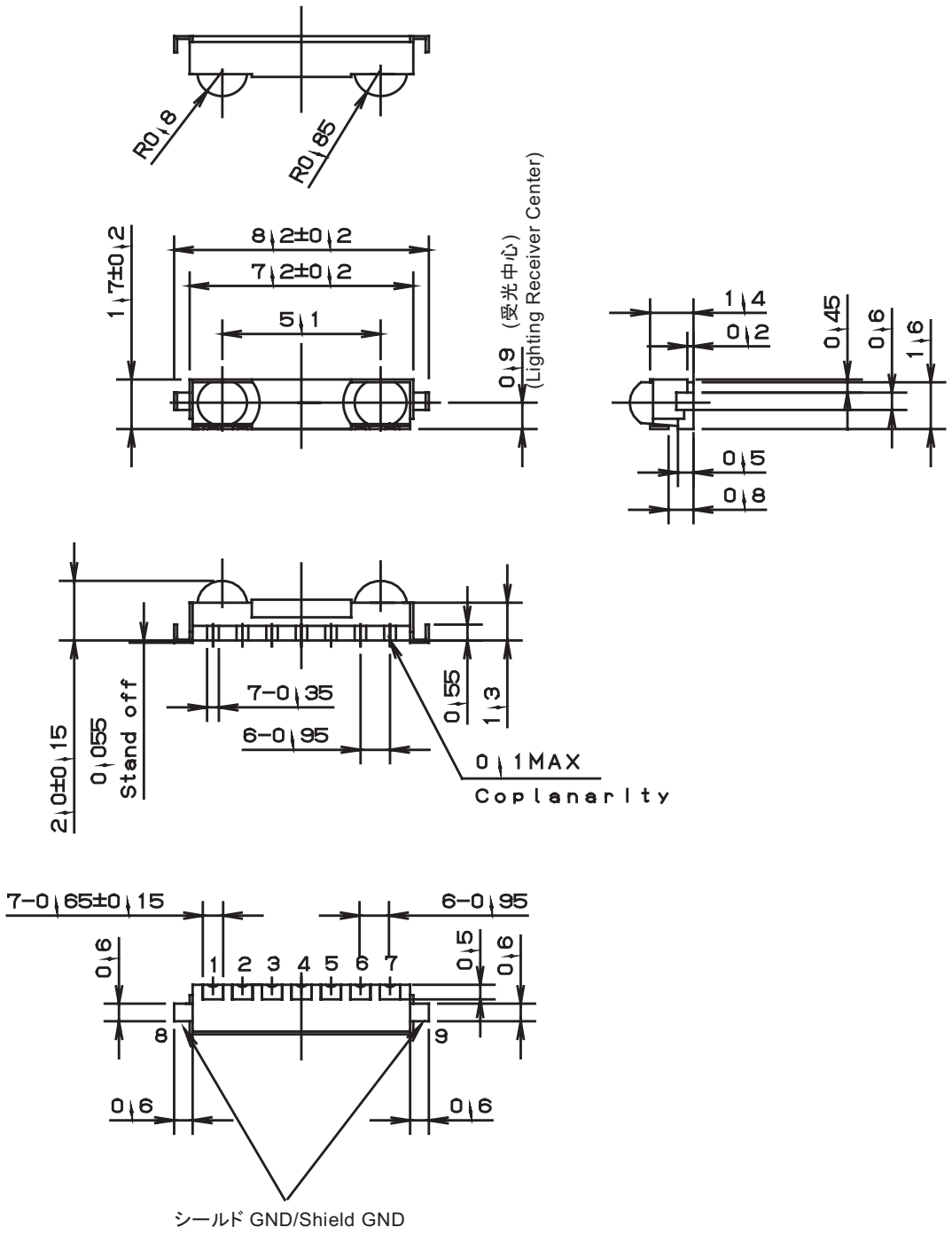


*9:

RX wake up time



■ Package (Unit: mm)



• Pin name

1. LEDA	6. V_{CC}
2. V_{IO}	7. GND
3. TXD	8. Shield GND
4. RXD	9. Shield GND
5. SD	

This product complies with the RoHS Directive (EU 2002/95/EC).

⚠Caution for Safety

⚠DANGER

■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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