

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 $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

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) *: $t_w \leq 90 \mu\text{s}$, Duty $\leq 20 \%$

■ Operating 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 $V_{CC} = V_{IO} = 2.8 \text{ V}$, $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High level supply current *1	I_{CCH}	$V_{LEDA} = 3.6 \text{ V}$, $V_I = 0.5 \text{ V}$, $V_{SD} \leq 0.5 \text{ V}$		90	120	μA
Shut down supply current *1	I_{CCSD}	$V_I = 0.5 \text{ V}$, $V_{IO} \geq V_{SD} \geq V_{IO} - 0.3$ (SD = High)		10	200	nA
Maximum reception distance *5	$L_{\max}$	$V_{LEDA} = 2.7 \text{ V}$ to 4.5 V , $V_{SD} \leq 0.5 \text{ V}$, 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

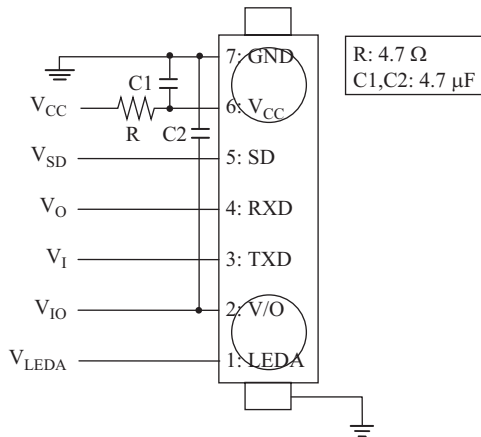
■ Electrical-Optical Characteristics (Continued) $V_{CC} = V_{IO} = 2.8 \text{ V}$, $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

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

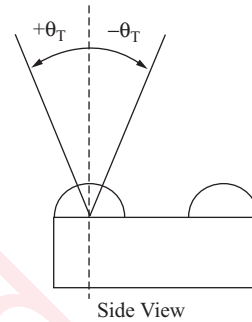
■ Electrical-Optical Characteristics (Continued)

Note) Measuring circuit

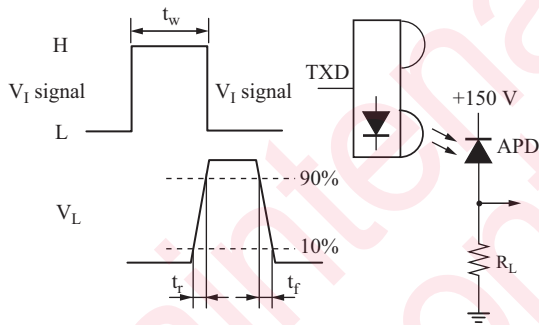
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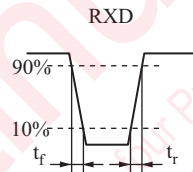
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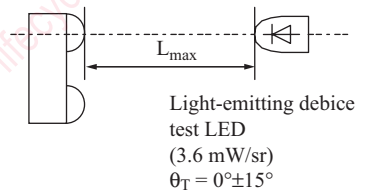
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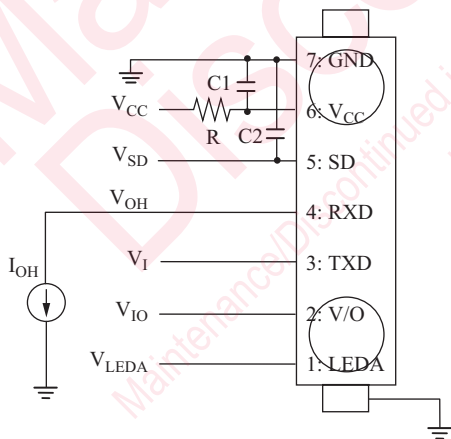
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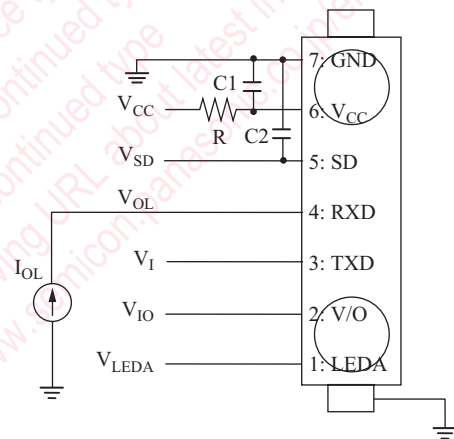
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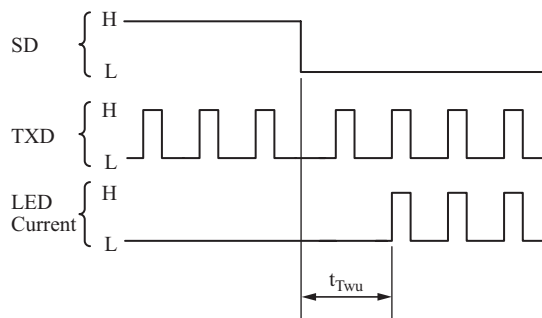


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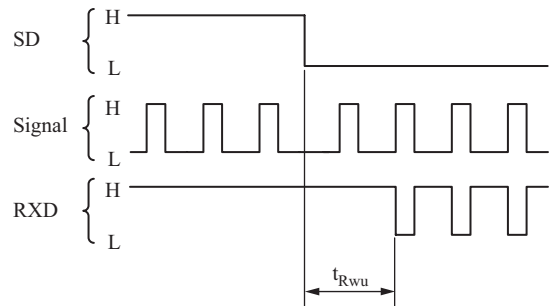
*8:

TX wake up time



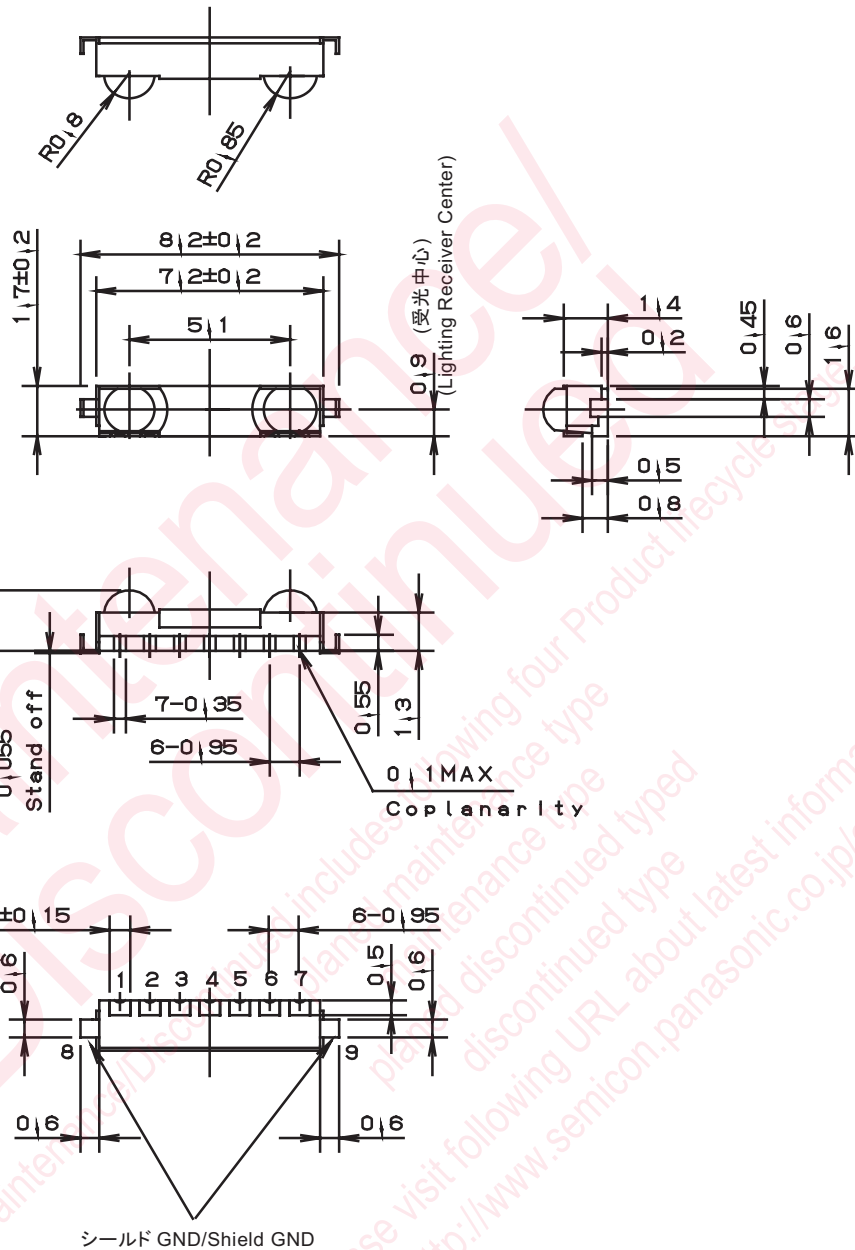
*9:

RX wake up time



■ Package (Unit: mm)

KMTLTM7K0001



• Pin name

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

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