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# 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	$\mu\text{A}$
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 $4.5 \text{ V}$ , $V_{SD} \leq 0.5 \text{ V}$ , 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

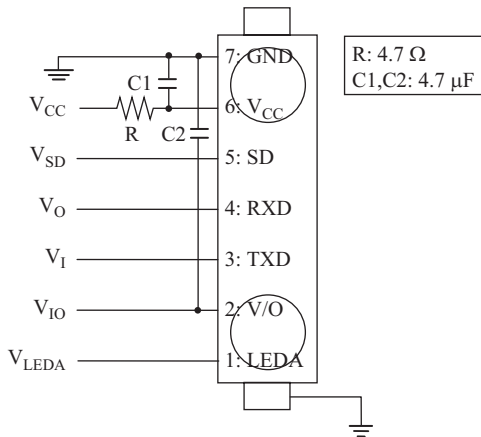
**■ Electrical-Optical Characteristics (Continued)  $V_{CC} = V_{IO} = 2.8\text{ V}$ ,  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$** 

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

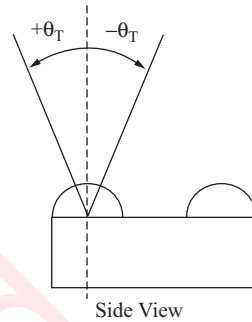
■ Electrical-Optical Characteristics (Continued)

Note) Measuring circuit

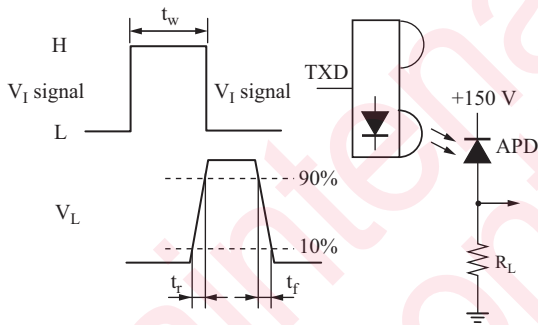
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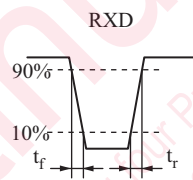
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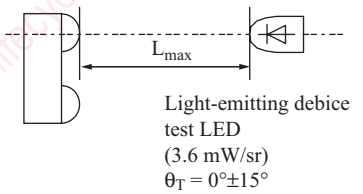
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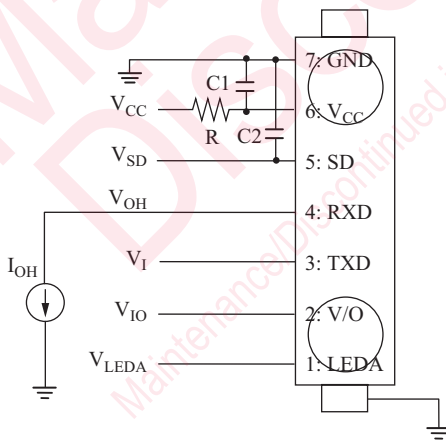
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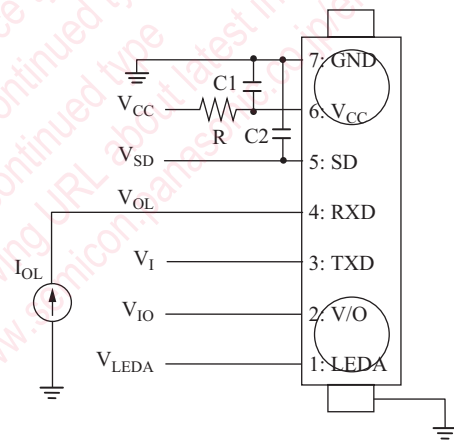
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\*6:

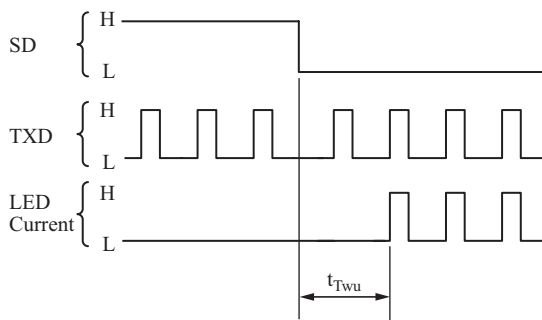


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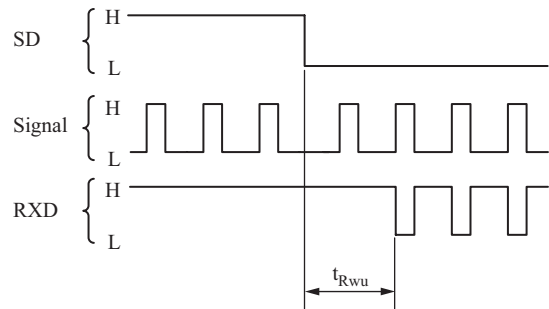
\*8:

TX wake up time



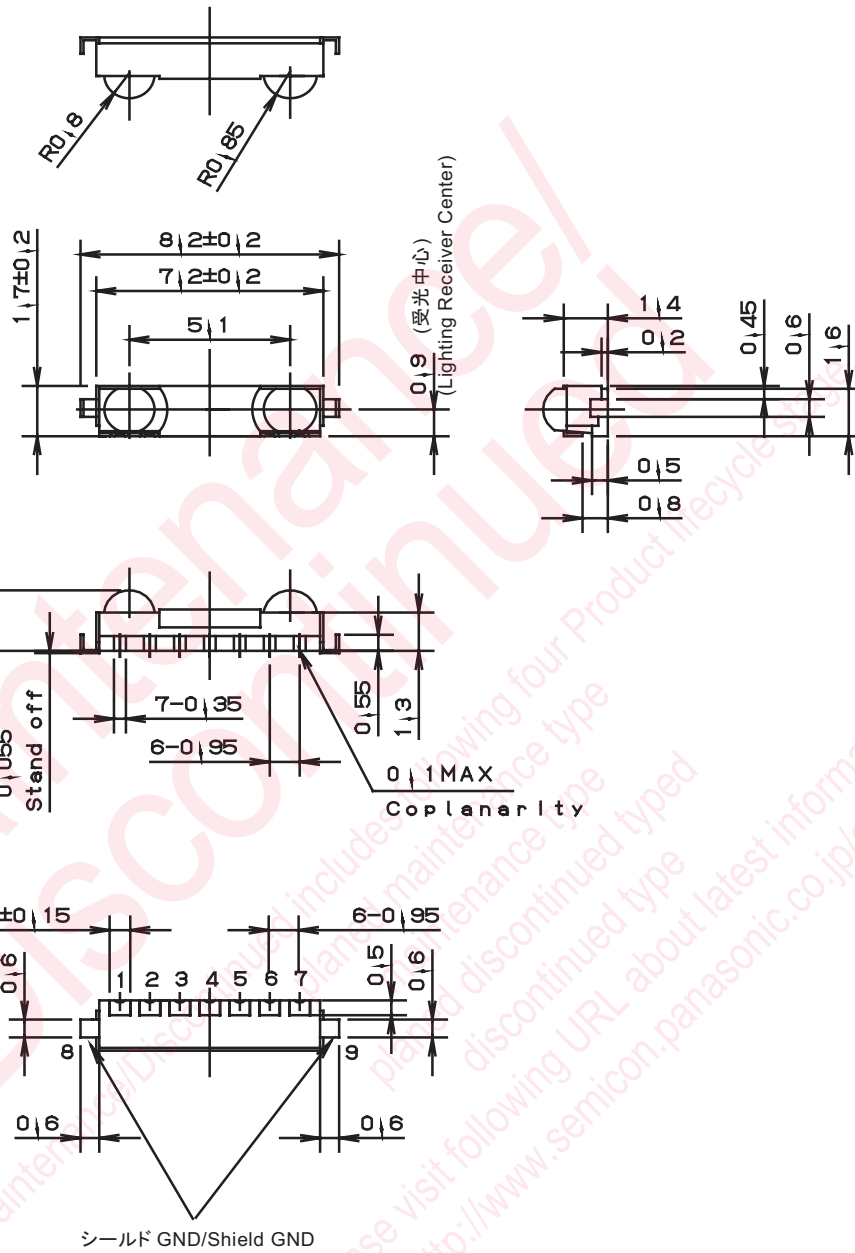
\*9:

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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