CND0215A

Infrared Optocal Module (IrDA)

Infrared data link for cellular phones, peripheral devices

■ Features

- Compliant with IrDA Ver.1.2
- Light emitting function for remote controller
- Corresponding low I/O (interface) voltage: 1.5 V
- Corresponding reflow solder (260°C)
- Ultra-small side view package (1.6 mm × 7.2 mm × 2.6 mm)

■ Type

- GaAlAs LED + IC + PIN Photodiode

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

Parameter	Symbol	Rating	Unit
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}	300	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 ≤ 25 %

■ Operatong Condition

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating supply voltage	V_{CC}		2.8		4.5	V
Input/output supply voltage	V_{IO}		1.5	1.8	3.0	V

■ Electrical-Optical Characteristics V_{CC} = 3.2 V, V_{IO} = 1.8 V, T_a = 25°C±3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High level supply current *1	I_{CCH}	E_I = 0, V_I = 0.5 V, V_{SD} ≤ 0.5 V		110	150	µA
Low level supply current *1	I_{CCL}	E_I = 3 mW/cm², V_I = 0.5 V, V_{SD} ≤ 0.5 V		170	380	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 *4	L_{max}	V_{SD} ≤ 0.5 V, External components	23	40		cm
RC maximum reception distance	L_{maxR}	RC S = 0.05 µW/cm²	5			m
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} = 3.2 V, V_{IO} = 1.8 V, T_a = 25°C±3°C

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Transmitter							
Peak emission wavelength *1		λ_P	V_{SD} ≤ 0.5 V, Duty 3/16 (IrDA mode)	878	883	888	nm
			V_{SD} ≤ 0.5 V, Duty 25% (RC mode)	878	894	910	nm
Pulse forward current *1		I_{FP}	V_{SD} ≤ 0.5 V, I-TXD Duty 3/16, R-TXD ≤ 0.5 V, (IrDA mode)	40	60	90	mA
			V_{CC} = 4.2 V, V_{SD} ≤ 0.5 V, R-TXD Duty 25%, I-TXD ≤ 0.5 V, (RC mode)	240	270	300	mA
			V_{CC} = 3.2 V, V_{SD} ≤ 0.5 V, R-TXD Duty 25%, I-TXD ≤ 0.5 V, (RC mode)	190	220	250	mA
Center radiant intensity *1, 2, 9	θ_T = 0	I_e	V_{CC} = 3.2 V, V_{SD} ≤ 0.5 V, I-TXD Duty 3/16, R-TXD ≤ 0.5 V, (IrDA mode)	9	18		mW/sr
			V_{CC} = 4.2 V, V_{SD} ≤ 0.5 V, R-TXD Duty 25%, I-TXD ≤ 0.5 V, (RC mode)	40	60	110	mW/sr
			V_{CC} = 3.2 V, V_{SD} ≤ 0.5 V, R-TXD Duty 25%, I-TXD ≤ 0.5 V, (RC mode)	36	58	102	mW/sr
	θ_T = ±15	I_{e15}	V_{CC} = 3.2 V, V_{SD} ≤ 0.5 V, I-TXD Duty 3/16, R-TXD ≤ 0.5 V, (IrDA mode)	6	10		mW/sr
			V_{CC} = 4.2 V, V_{SD} ≤ 0.5 V, R-TXD Duty 25%, I-TXD ≤ 0.5 V, (RC mode)	28	42	63	mW/sr
			V_{CC} = 3.2 V, V_{SD} ≤ 0.5 V, R-TXD Duty 25%, I-TXD ≤ 0.5 V, (RC mode)	28	40	60	mW/sr
High level input voltage *1		V_{IH}	I-TXD	V_{IO} − 0.5		V_{IO}	V
			R-TXD	V_{IO} − 0.5		V_{IO}	V
Low level input voltage *1		V_{IL}		0		0.5	V
TX half-angle		θ_T		±15			°
Rise time *1, 3		t_r	t_w = 1.6 µs, R_L = 50 Ω		0.3	0.6	µs
Fall time *1, 3		t_f	t_w = 1.6 µs, R_L = 50 Ω		0.3	0.6	µs
TX wake up time *7		t_{Twu}			0.3	1	µs
Intensity delay time *1, 3		I_{DT}				400	ns
Maximum pulse width		$T_{wLEDmax}$	I-TXD, R-TXD = Low → High	20	50	100	µs
Overshoot		O_S				25	%
Edge jitter		E_J		–40		40	ns

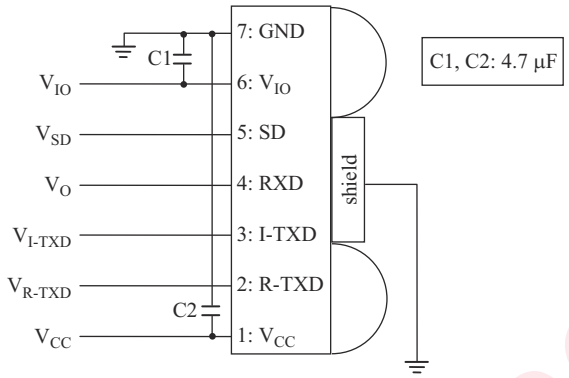
■ Electrical-Optical Characteristics (Continued) V_{CC} = 3.2 V, V_{IO} = 1.8 V, T_a = 25°C±3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Receiver						
Minimum input irradiance	$E_{I\,min}$	$V_{SD} \leq 0.5$ V		2.2	6.8	μW/cm²
Maximum input irradiance	$E_{I\,max}$	$V_{SD} \leq 0.5$ V	500			mW/cm²
High level output voltage *5	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 *6	V_{OL}	I_{OL} = 200 μA, $V_{SD} \leq 0.5$ V			0.3	V
RX half angle	θ_R		±15			°
RXD output pulse width	T_{WR}	C_L = 15 pF, 9.6 kbps to 115.2 kbps	1.3	2.3	4.2	μs
RX wake up time *8	t_{Rwu}	E_I = 8.1 μW/cm²		250	400	μs
Rise time	t_r	C_L = 15 pF		100	300	ns
Fall time	t_f	C_L = 15 pF		100	300	ns

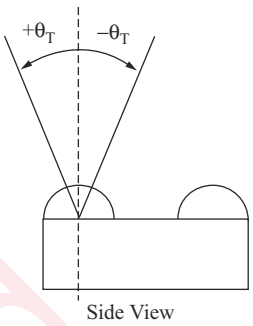
■ Electrical-Optical Characteristics (Continued)

Note) Measuring circuit

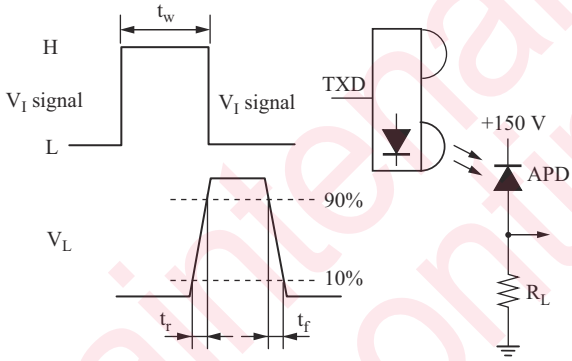
*1:



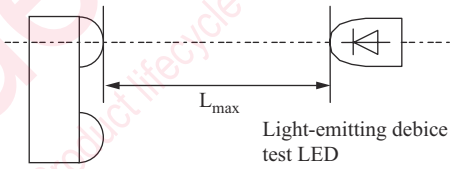
*2:



*3:

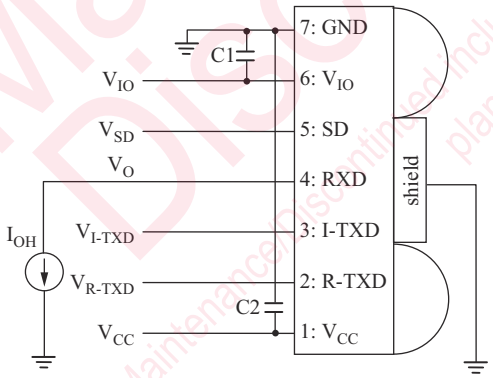


*4:

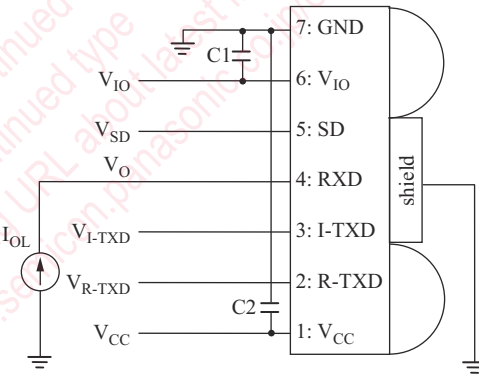


Light-emitting debice
test LED
(3.6 mW/sr)
$\theta_T = 0°\pm15°$

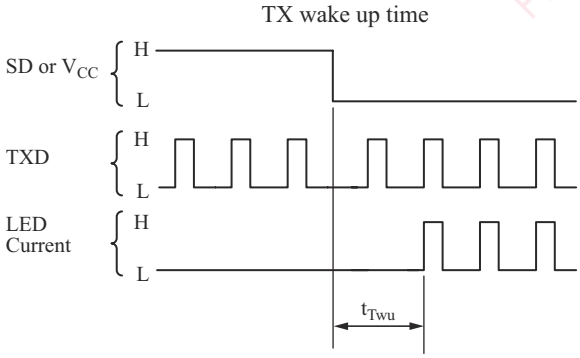
*5:



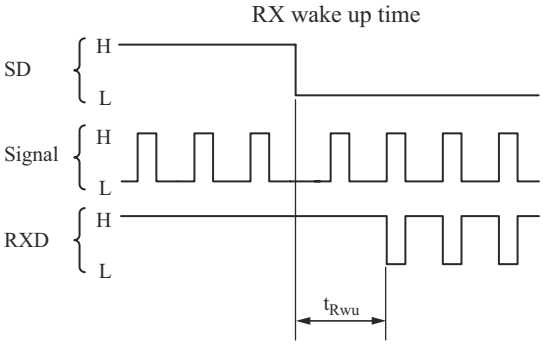
*6:



*7:



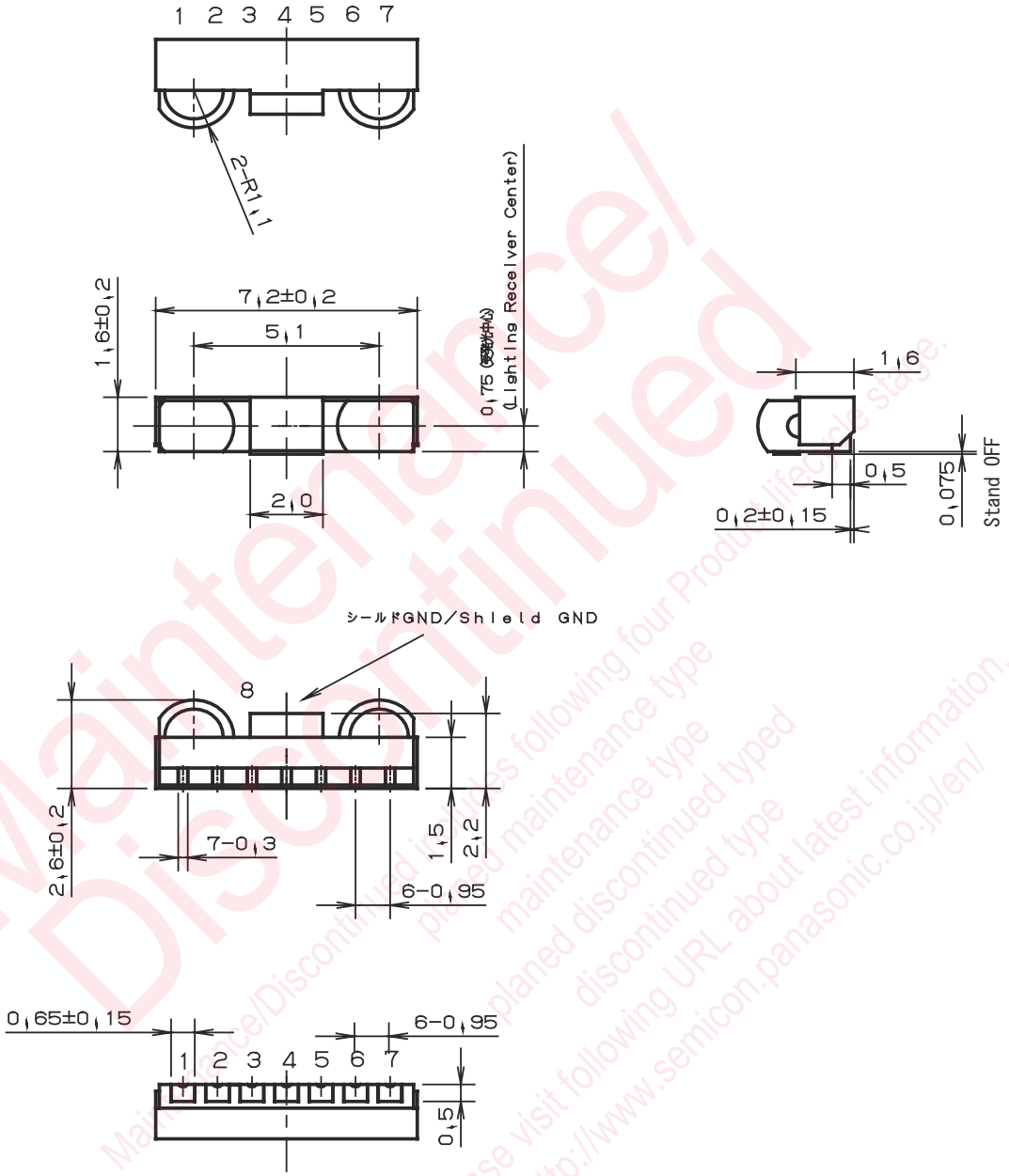
*8:



*9: Eye-Safety IEC60825-1 Class1 Eye safe

■ Package (Unit: mm)

KMTLSM7K0002



• Pin name

1. V_{CC}	5. SD
2. R-TXD	6. V_{IO}
3. I-TXD	7. GND
4. RXD	8. Shield GND

Request for your special attention and precautions in using the technical information and semiconductors described in this book

(1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.

(2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.

(3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.

(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.

20080805