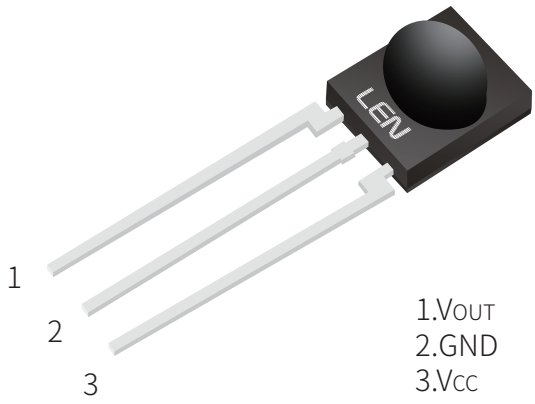
TSOP7000

IR Receiver for High Data Rate PCM at 455kHz

Descriptions

TSOP7000 is a miniaturized receiver for infrared remote control and IR data transmission. PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as IR filter. The demodulated output signal can directly be decoded by a microprocessor. The main benefit is the operation with high data rates and long distances.



DIP-3

Features

- ◇ Output active low
- ◇ Supply voltage :Vcc=5V
- ◇ TTL and CMOS compatibility
- ◇ Carrier frequency :fo=455 kHz(typ.)
- ◇ Visible light cut-off frequency:800 nm
- ◇ Internal shielding against electrical field disturbance

Applications

- ◇ High-speed optical remote controllers cordless controllers for videogames electronic organizers and other new portable information devices IR data communications.

Ordering Information

Part Number	Package	Shipping Quantity
TSOP7000	DIP-3	500 pcs / Bag , 3000 pcs / Box

Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V_{CC}	7	V
Operating Temperature	T_{OPR}	-20 ~ +60	°C
Storage Temperature	T_{STG}	-30 ~ +100	°C
Soldering Temperature(5s)	T_{SOL}	260	°C

Electro-Optical Characteristics (T_A=25°C, V_{CC}=5V, C=1000pF)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		3	5	7	V
Supply Current	I_{CC}	E=0		1.2	3	mA
Electromagnetic Sensitivity	E_S			250		Vp-p/m
Transmission Range	L	External light intensity <500 lx Output Current<10 μA	3	5		m
High-Level Output Voltage	V_{OH}	External light intensity <500 lx Output Current<10 μA	4			V
Low-Level Output Voltage	V_{OL}	External light intensity <500 lx Output Current<10 μA			0.5	V
ON Pulse Width	T_{ON}	External light intensity <500 lx Output Current<10 μA	16	25	40	μs
OFF Pulse Width	T_{OFF}	External light intensity <500 lx Output Current<10 μA		63		μs
Carrier Frequency	F_O			455		KHz
Radiation Angle	Θ_H	Horizontal angle,L/2	±55	±63		°
	Θ_V	Vertical angle,L/2	±22	±30		°

Notes: (*1) Measurements for the TSOP7000 are based on a standard circuit which includes a 1000-pF capaci tor between Vo and GND to prevent oscillation.

Basic Characteristics

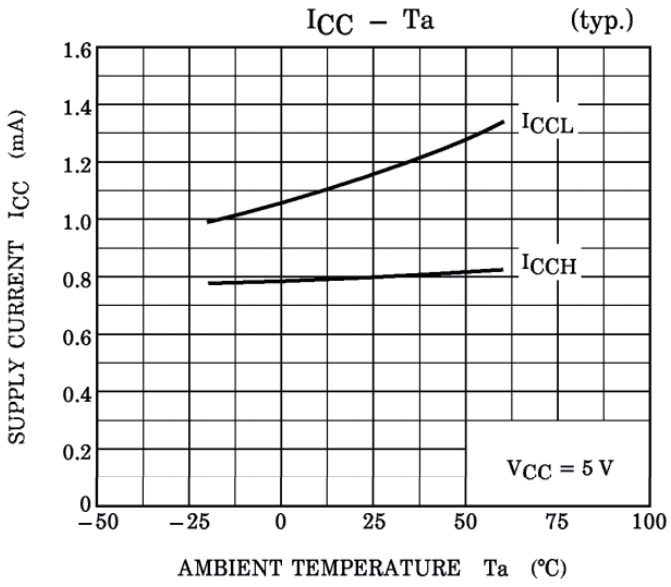


Fig.1 Supply Current vs. Ambient Temperature

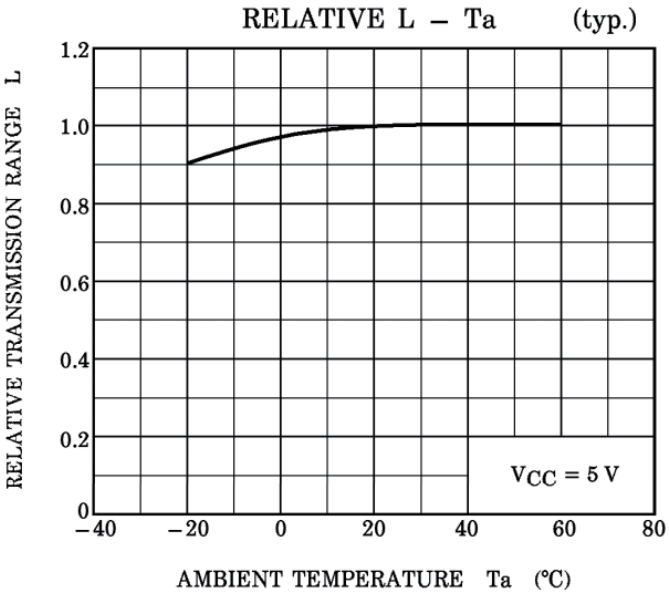


Fig.2 Relative Transmission Range vs. Ambient Temperature

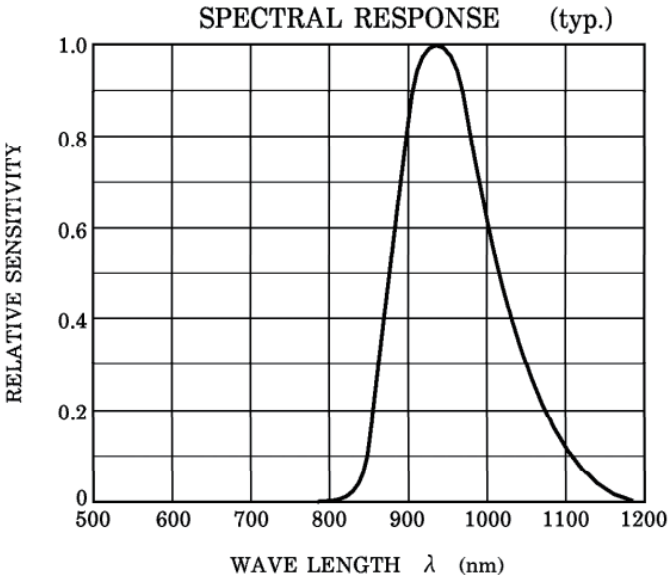


Fig.3 Relative Sensitvity vs. Wave Length

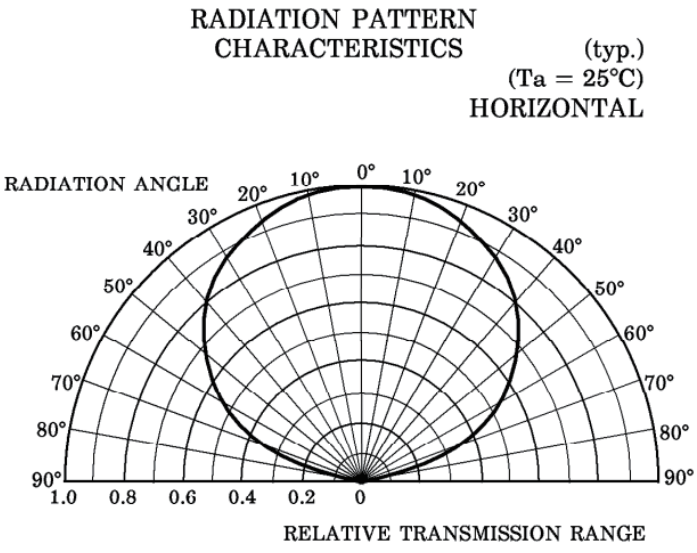


Fig.4 Radiation Pattern Characteristics

Basic Characteristics

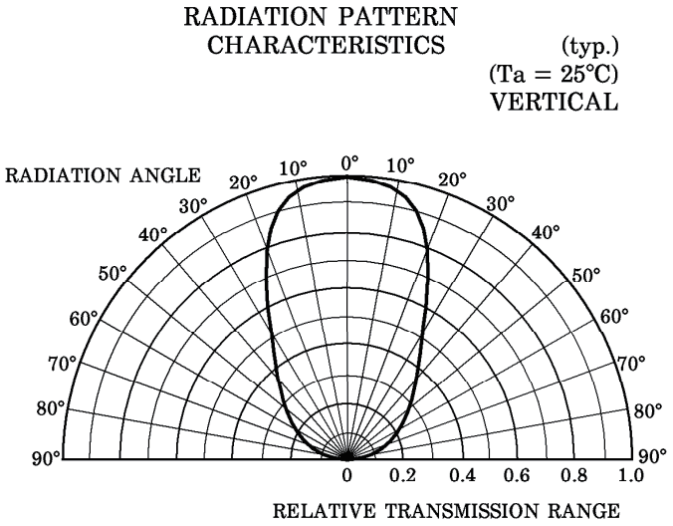


Fig.5 Radiation Pattern Characteristics

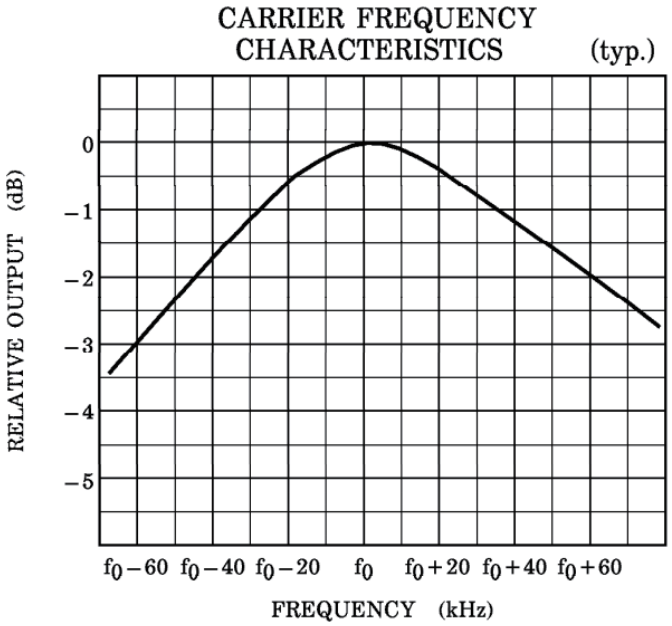
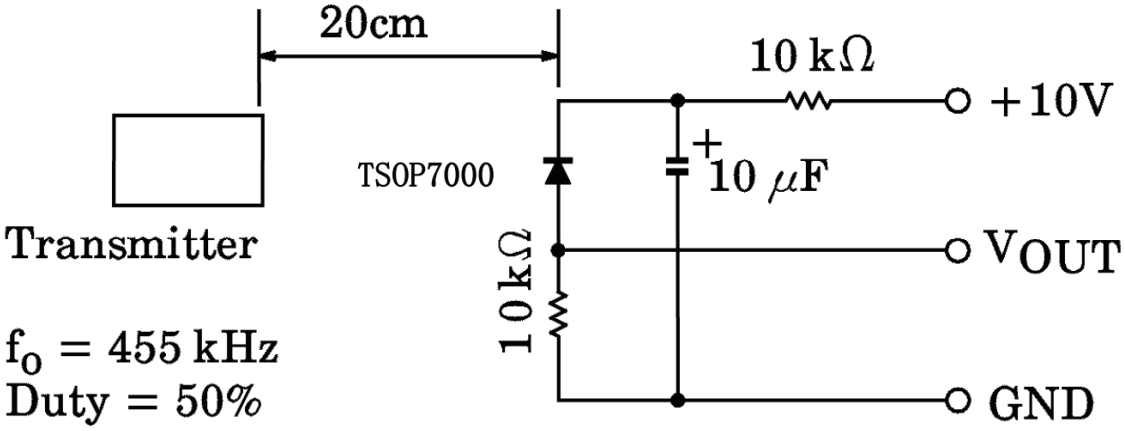


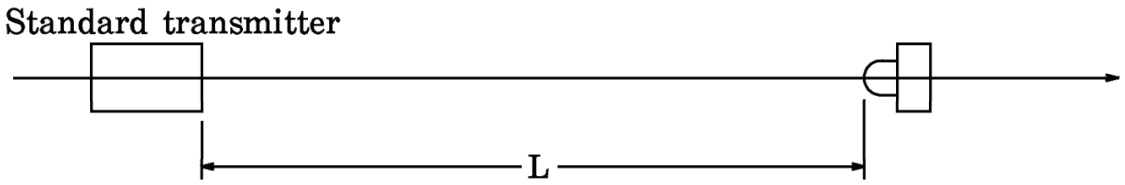
Fig.6 Relative output vs. Frequency

Standard Transmitter

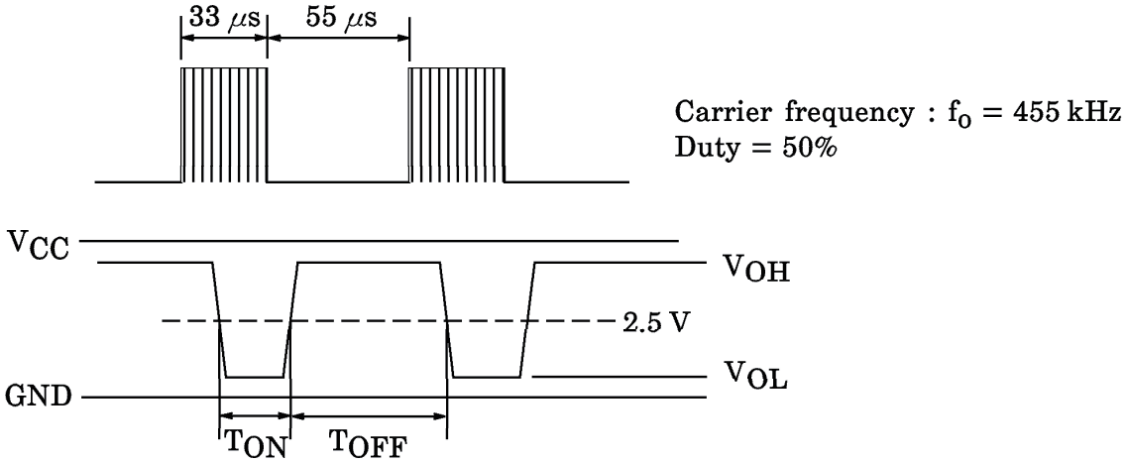


In the figure above,the transmitter output VOUT is 80 mVpp.
The TSOP7000 in this application has a short-circuit current of Isc=1.24 μA when measured at E=0.1mW/cm^2.
(E is the radiant incidence when a CIE standard light source A is used.)

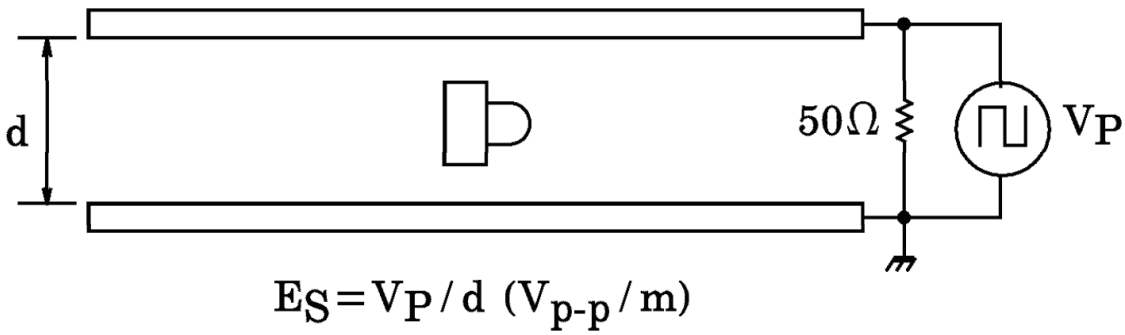
Transmission range L



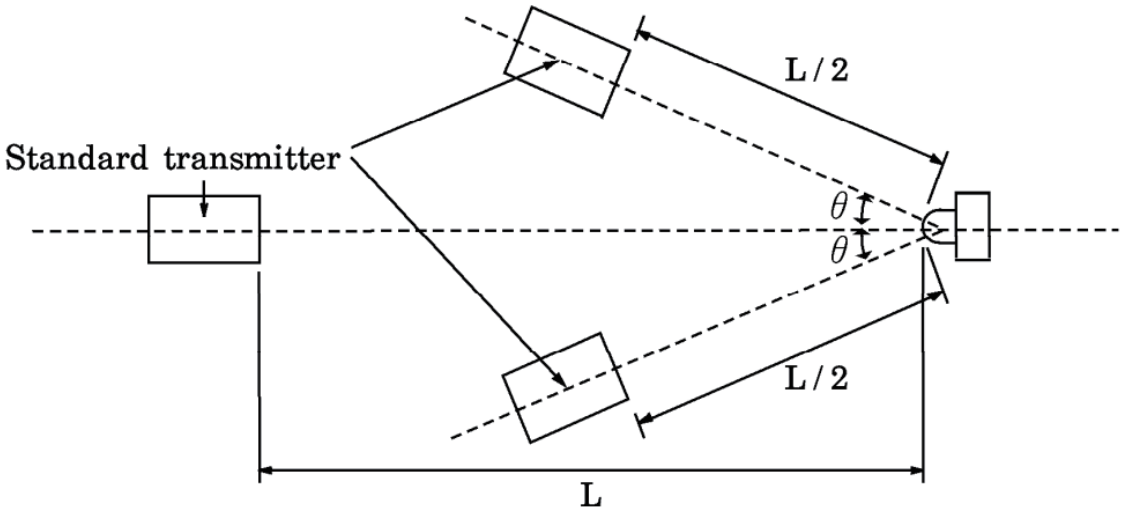
Burst Wave



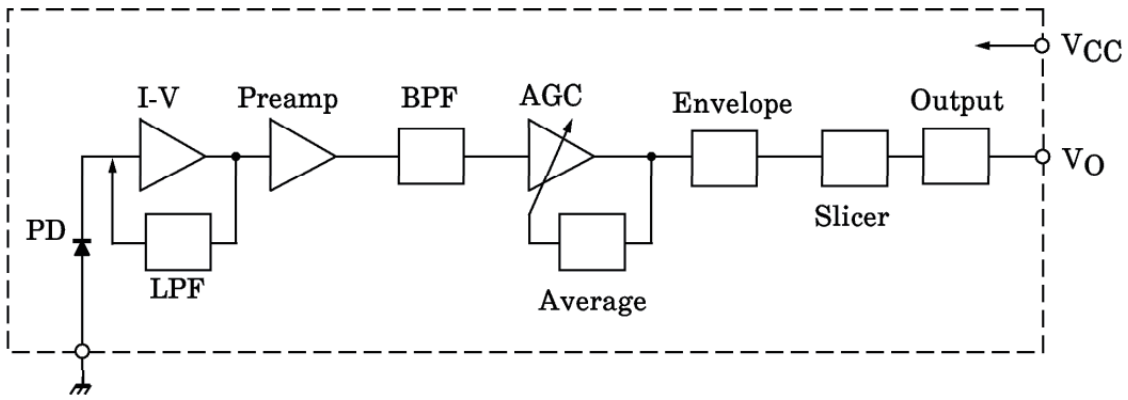
Electromagnetic Sensitivity



Radiation Angle



Block Diagram



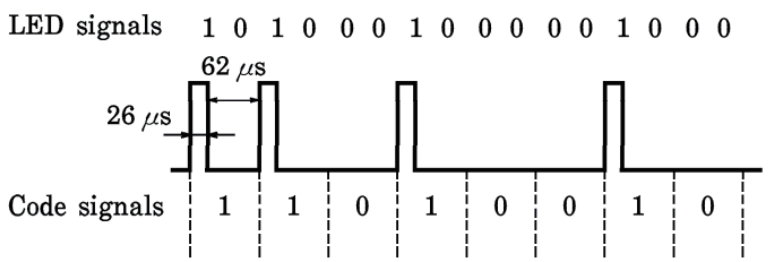
Bit pattern designing example (reference)

Example of code signal =11010010

Sequence of LED signals =1 must be avoided. If LED signals of TSOP700 may not receive LED signals properly. After ansequence, LED signal of 1,0 must be sent (55μor longer interval necessary). Please take this into account when designing a bit pattern.

The following shows the bit pattern t example that is converted atfirst code signals to LED signals as shown on the right diagram.

<Pattern example>



<Conversion example>

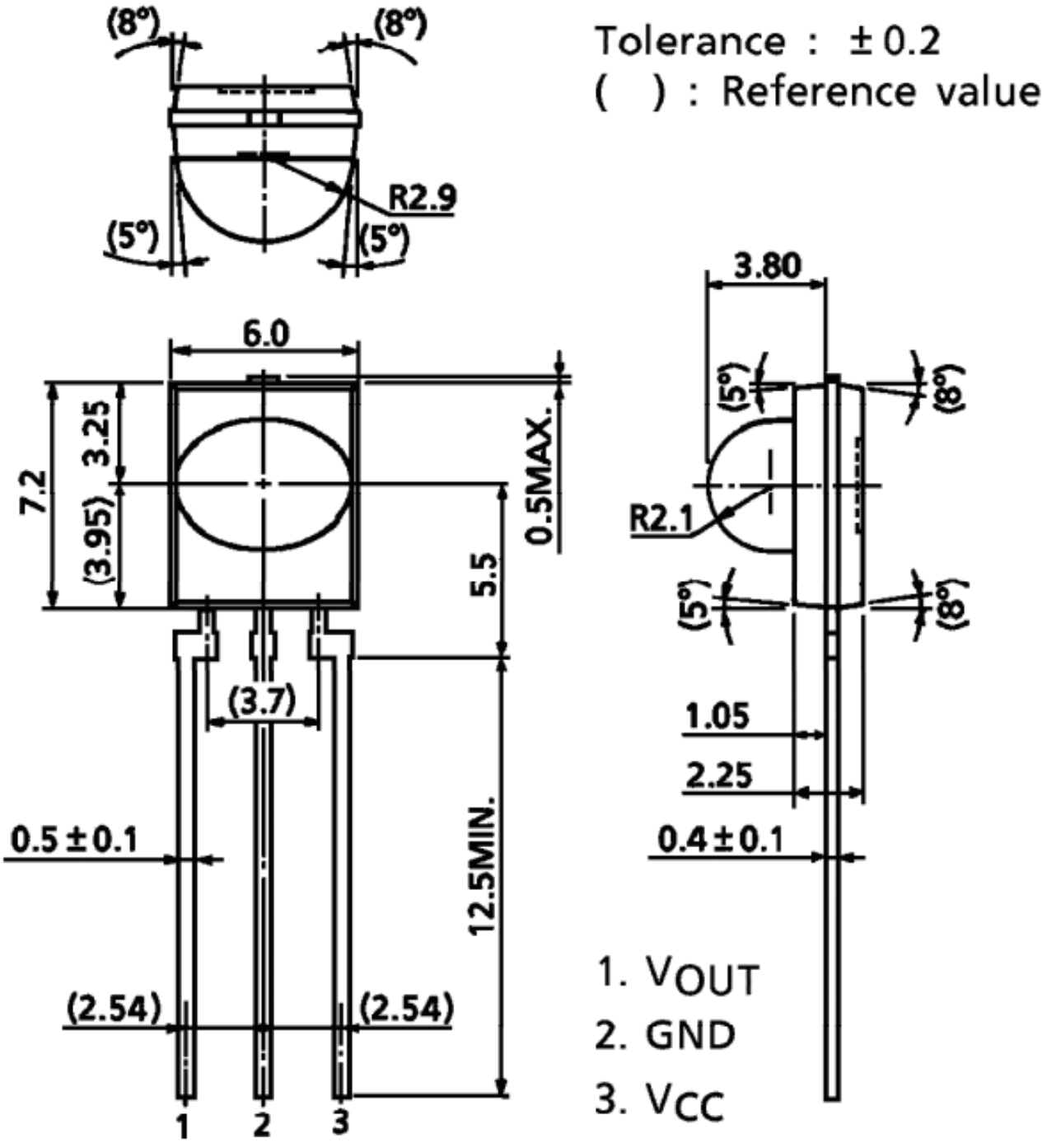
Code signal		LED signal
0	→	00
1	→	10

Precautions

1. To stabilize the power line, insert a bypass capacitor of up to 0.01μF between Vcc and GND, close to the device.
2. At power-on the internal circuit takes about 100μs to stabilize. During this period the output signal is unstable and may change.
3. To avoid unnecessary oscillation, insert a bypass capacitor of 1000 pF between Vcc and GND.
4. When using the device,please take the device's characteristics, the operating environment and the characteristics of pairing LED device into considerations.
5. Soldering temperature: ⩽260°C , Soldering time: ⩽5s (Soldering must be performed under the 2 mm from the body of the device.)
6. When forming the leads, bend each lead under the 2 mm from the body of the device. Soldering must be performed after the leads have been formed.

Package Dimensions

DIP-3



Unit:mm

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