

# KSM-91 LM1N

The KSM-91 LM1N consist of a PIN Photodiode of high speed and a preamplifier IC in the package as an receiver for Infrared remote control systems

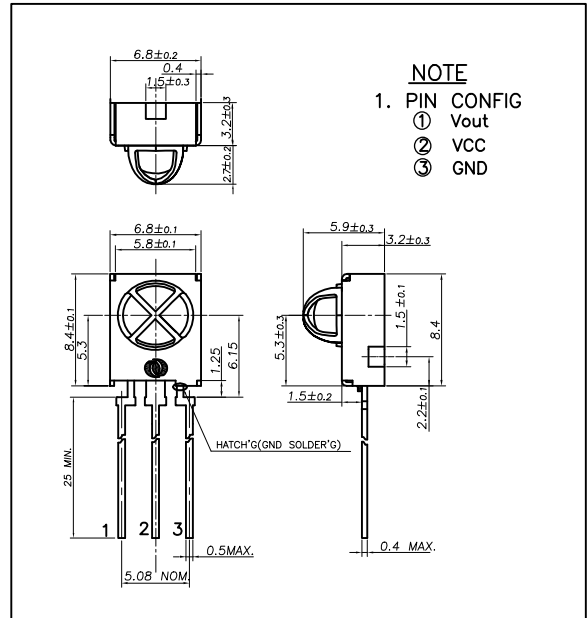
### Features

- Wide angle design
- Supply-voltage range : 4.5V to 5.5V
- Shielded against electrical field disturbance
- Enhanced immunity against ambient light disturbances
- Enhanced reception distance
- Continuous data transmission possible (NRZ 1000 bit/s)
- Available for carrier frequencies between 32.7KHz to 56.9KHz
- TTL and CMOS compatible

### Applications

- Audio & Video Applications (TV, VTR, Audio, DVDP, CDP)
- Home Appliances (Air conditioner, Computer, Camcoder)
- Wireless Toys
- Remote Control Equipment

### DIMENSIONS



### Maximum Ratings

[Ta=25 ]

| Parameter             | Symbol | Ratings            | Unit |
|-----------------------|--------|--------------------|------|
| Supply Voltage        | Vcc    | 6.0                | V    |
| Operating Temperature | Topr   | -10 ~ +60          |      |
| Storage Temperature   | Tstg   | -20 ~ +75          |      |
| Soldering Temperature | Tsol   | 260<br>(Max 5 sec) |      |

### B.P.F Center Frequency

| Model No.   | B.P.F Center Frequency(kHz) |
|-------------|-----------------------------|
| KSM-911LM1N | 40.0                        |
| KSM-912LM1N | 36.7                        |
| KSM-913LM1N | 37.9                        |
| KSM-914LM1N | 32.7                        |
| KSM-915LM1N | 56.9                        |

### Electro-Optical Characteristics

[Ta=25 , Vcc=5.0V]

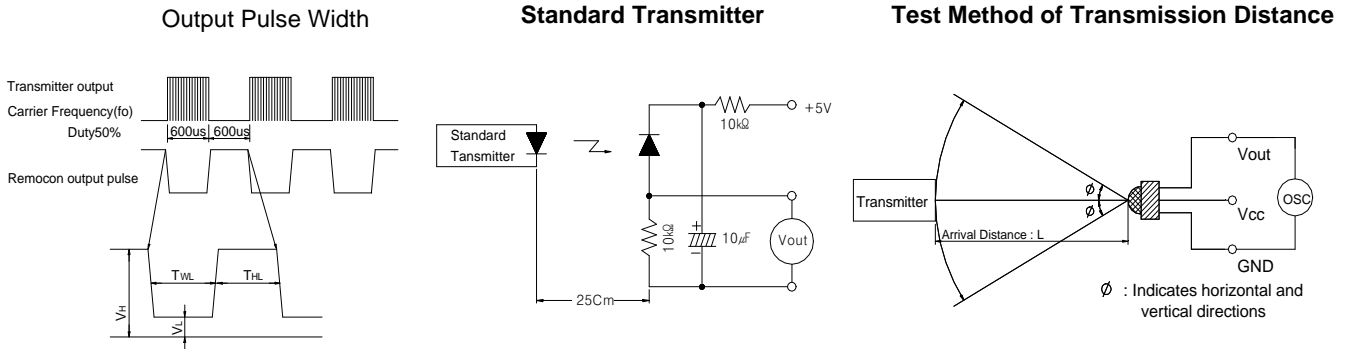
| Parameter                        | Symbol            | Condition              | Min.   | Typ. | Max. | Unit |   |
|----------------------------------|-------------------|------------------------|--------|------|------|------|---|
| Recommended Supply Voltage       | Vcc               |                        | 4.5    | 5    | 5.5  | V    |   |
| Current Consumption              | Icc               | No signal input        | -      | 1.2  | 2.2  | mA   |   |
| Peak Wavelength *1               | p                 |                        | -      | 940  | -    | nm   |   |
| B.P.F Center Frequency           | fo                |                        | -      | 37.9 | -    | kHz  |   |
| Transmission Distance *1         | L                 | 250 ± 50lx             | 0 °    | 25   | -    | -    | m |
|                                  |                   |                        | ± 30 ° | 21   | -    | -    |   |
| High level Output voltage *1     | V <sub>OH</sub>   | 30cm over the ray axis | 4.5    | 5.0  | -    | V    |   |
| Low level Output voltage *1      | V <sub>OL</sub>   |                        | -      | 0.1  | 0.5  | V    |   |
| High level Output Pulse Width *1 | T <sub>WH</sub>   | Burst wave=600µs       | 500    | 600  | 700  | µs   |   |
| Low level Output Pulse Width *1  | T <sub>WL</sub>   | Period = 1.2ms         | 500    | 600  | 700  | µs   |   |
| Output Form                      | Active Low Output |                        |        |      |      |      |   |

\*1. It specifies the maximum distance between emitter and detector that the output wave form satisfies the standard under the conditions below against the standard transmitter.

- 1) Measuring place : Indoor without extreme reflection of light
- 2) Ambient light source : Detecting surface illumination shall be irradiate 200 ± 50lx under ordinary white fluorescence lamp without high frequency lightning
- 3) Standard transmitter : Burst wave of standard transmitter shall be arranged to 50mVP-P under the measuring circuit

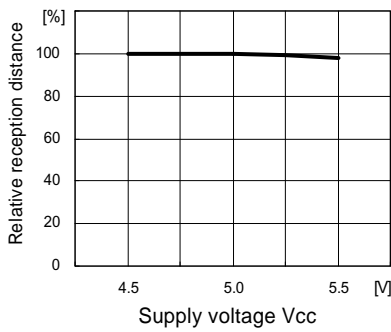
# KSM-91 □ LM1N

## Measuring Method [Ta=25°C]

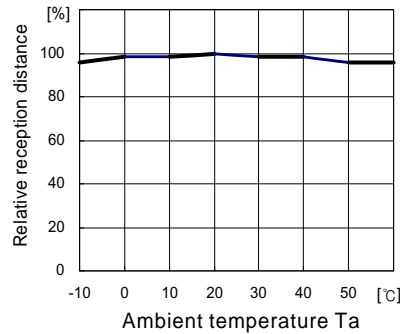


## Typical Characteristics Curve [Ta=25°C]

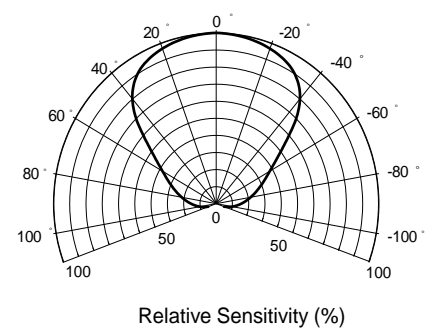
Relative reception distance Vs. Supply voltage



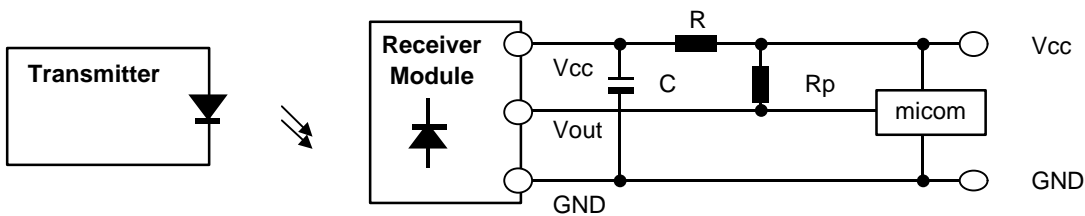
Relative reception distance Vs. Ambient temperature



Radiant pattern



## Standard Application Circuit with R-C Decoupling Filter



### \*1 Recommended Circuit Description

- 1) Transmitter(IRED) drive current  
: IFP = 300mA<sub>P-P</sub> ~ 600mA<sub>P-P</sub>
- 2) R-C Decoupling Filter with Lower Cut-off Frequency  
: R=100Ω , C=47µF ⇒  $f_c = 1/2 \pi RC = 33.9\text{Hz}$
- 3) External pull-up resistor(optional)  
: 10kΩ over