



Technical Data Sheet

Infrared Remote-control Receiver Module

IRM-V038/TR1

Features

- High shielding against electric field disturbance.
- Circular lens to improve the receive characteristic.
- Line-up for various center carrier frequencies.
- Low voltage and low power consumption.
- High immunity against ambient light.
- Photodiode with integrated circuit.
- TTL and CMOS compatibility.
- Long reception distance.
- High sensitivity.
- Side-received SMD.



Descriptions

The device is a miniature SMD type infrared remote control system receiver which has been developed and designed by utilizing the most updated IC technology. The PIN diode and preamplifier are assembled on PCB, the epoxy package is designed as an IR filter. The demodulated output signal can directly be decoded by a microprocessor. The main benefit is the reliable function even in disturbed ambient and the protection against uncontrolled output pulses.

Applications

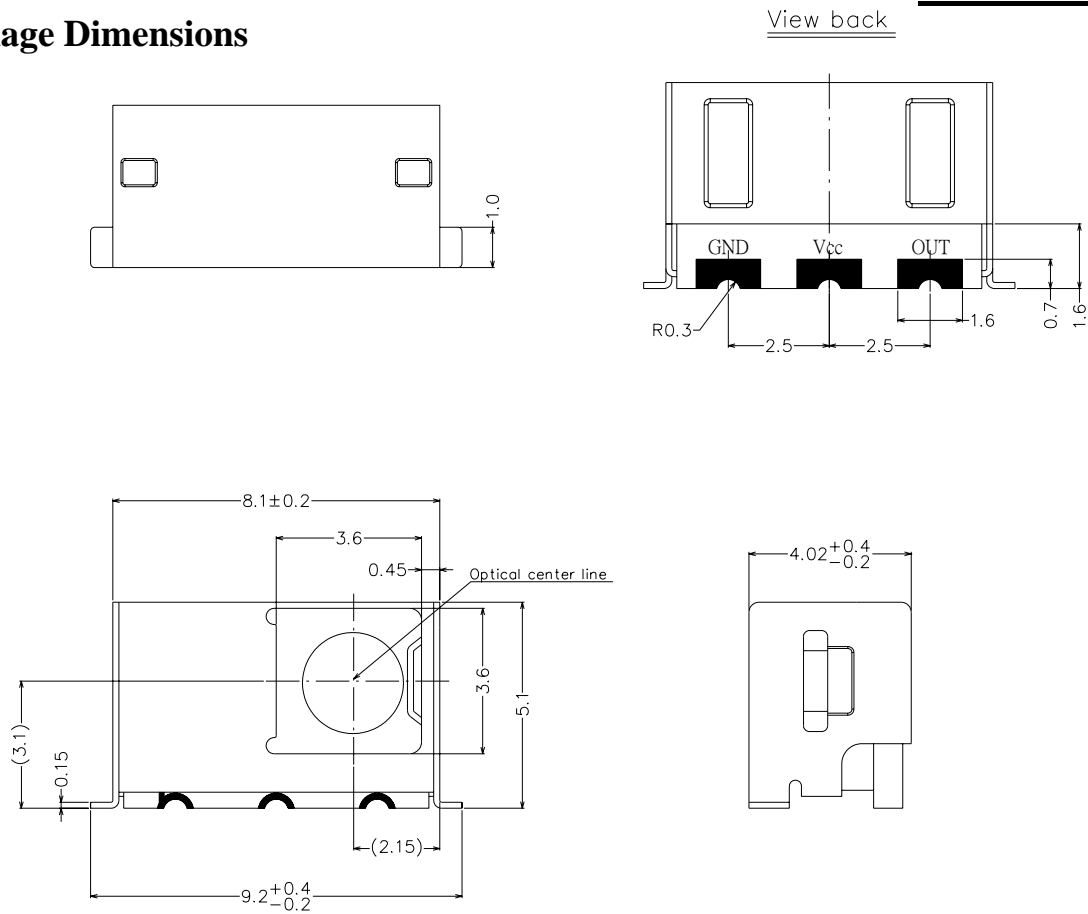
1. Optical switch
2. Light detecting portion of remote control
 - AV instruments such as Audio, TV, VCR, CD, MD, etc.
 - Home appliances such as Air-conditioner, Fan , etc.
 - The other equipments with wireless remote control.
 - CATV set top boxes
 - Multi-media Equipment

Device Selection Guide

PART	MATERIAL	COLOR
Chip	Silicon	---
Package	Epoxy	Black
Metal case	Tinplate	Silver white

IRM-V038/TR1

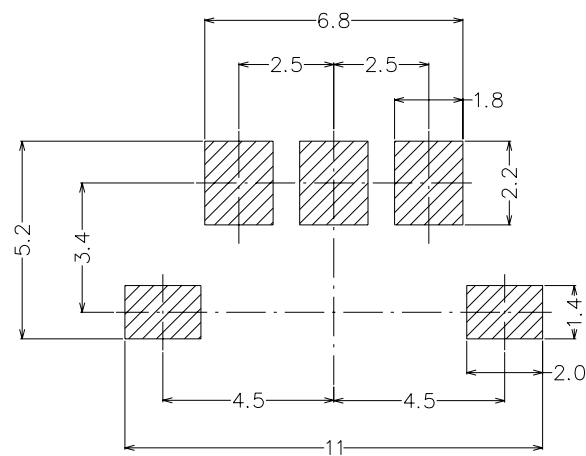
Package Dimensions



- Notes :**
- 1.All dimensions are in millimeters.
 - 2.Tolerances unless dimensions ± 0.3 mm.

Soldering patterns

The following soldering patterns are recommended for reflow-soldering :



Unit: mm

IRM-V038/TR1
Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit	Notice
Supply Voltage	Vcc	0~6	V	
Operating Temperature	Topr	-25 ~ +85	°C	
Storage Temperature	Tstg	-40 ~ +85	°C	

Recommended Operating Condition
Supply Voltage Rating: Vcc 2.7V to 5.5V
Electro-Optical Characteristics (Ta=25°C, and Vcc=3.0V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Supply Current	Icc	---	---	1.2	mA	No signal input
B.P.F Center Frequency	Fo	---	38	---	KHz	
Peak Wavelength	λ_p	---	940	---	nm	
Reception Distance	L ₀	10	---	---	m	At the ray axis *1
	L ₄₅	5	---	---		
Half Angle(Horizontal)	Θ_h	---	45	---	deg	
Half Angle(Vertical)	Θ_v	---	45	---	deg	
High Level Pulse Width	T _H	400	---	800	μs	
Low Level Pulse Width	T _L	400	---	800	μs	
High Level Output Voltage	V _H	2.7	---	---	V	
Low Level Output Voltage	V _L	---	0.2	0.5	V	

Notes:

*1 : The ray receiving surface at a vertex and relation to the ray axis in the range of $\theta=0^\circ$ and $\theta=45^\circ$.

*2 : A range from 30cm to the arrival distance. Average value of 50 pulses.

Test Method :

The specified electro-optical characteristics is satisfied under the following Conditions at the controllable distance.

①Measurement place

A place that is nothing of extreme light reflected in the room.

②External light

Project the light of ordinary white fluorescent lamps which are not high Frequency lamps and must be less then 10 Lux at the module surface.
($E_e \leq 10\text{Lux}$)

③Standard transmitter

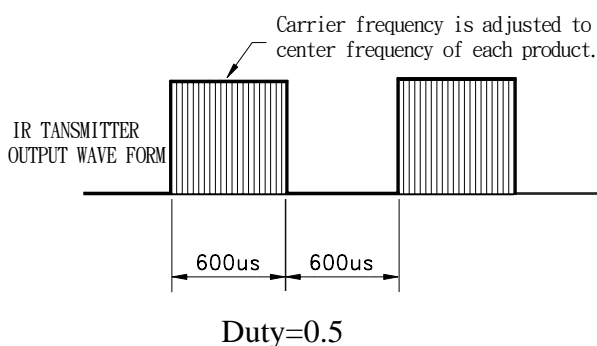
A transmitter whose output is so adjusted as to **$V_o=400\text{mVp-p}$** and the output Wave form shown in Fig.-1.According to the measurement method shown in Fig.-2 the standard transmitter is specified.

However , the infrared photodiode to be used for the transmitter should be $\lambda_p=940\text{nm}, \Delta\lambda=50\text{nm}$. Also, photodiode is used of PD438B($V_r=5\text{V}$).
(Standard light / Light source temperature 2856°K).

④Measuring system

According to the measuring system shown in Fig.-3

Fig.-1 Transmitter Wave Form



D.U.T output Pulse

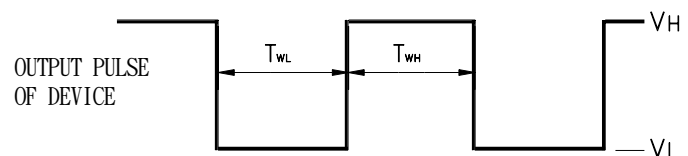


Fig.-2 Measuring Method

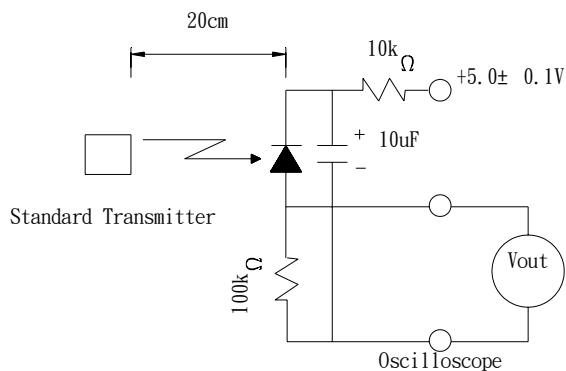
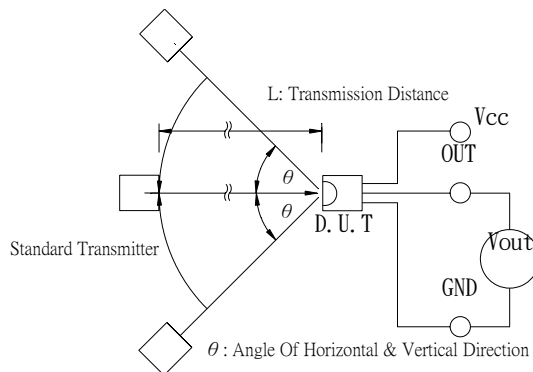
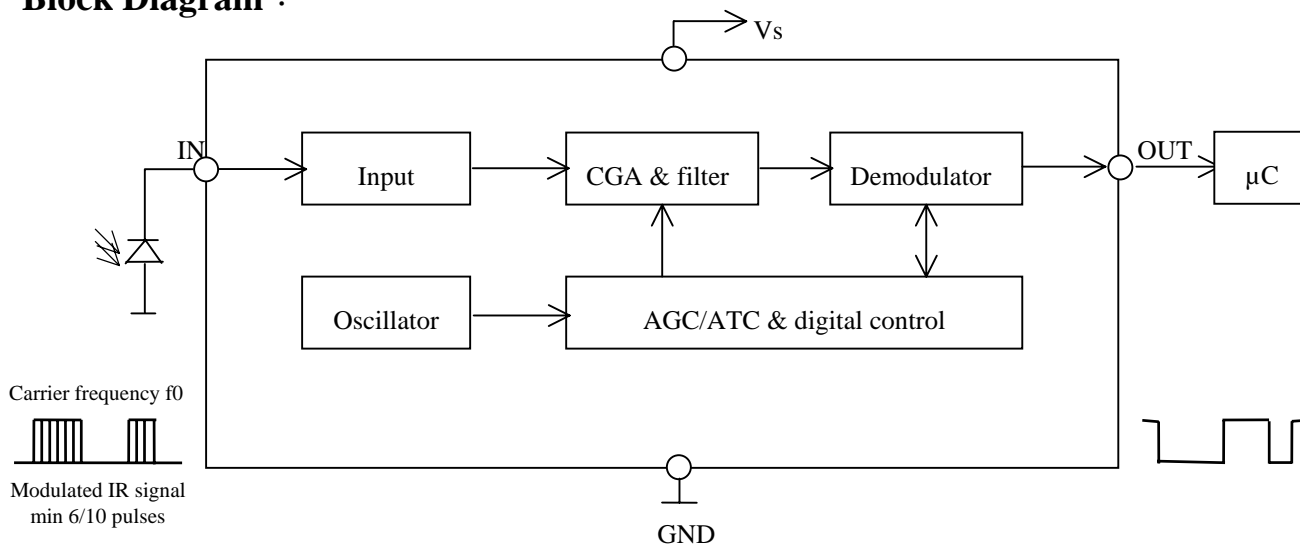


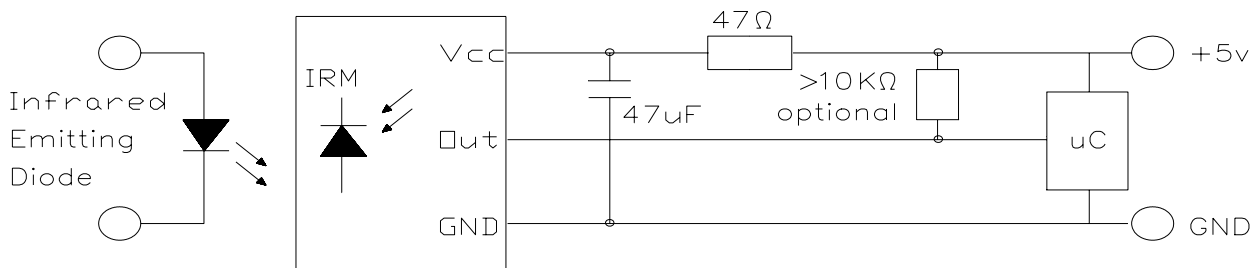
Fig.-3 Measuring System



Block Diagram :



Application Circuit :



RC Filter should be connected closely between Vcc pin and GND pin.

Typical Electro-Optical Characteristics Curves

Fig.-4 Relative Spectral Sensitivity vs.

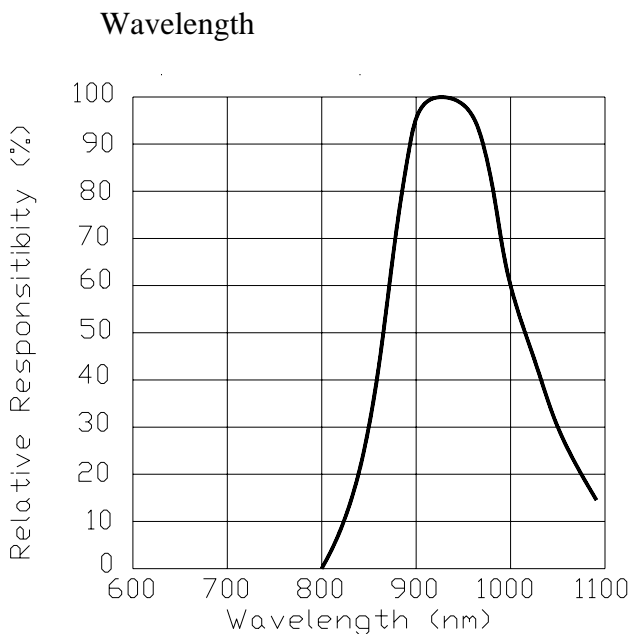


Fig.-5 Relative Transmission Distance vs.

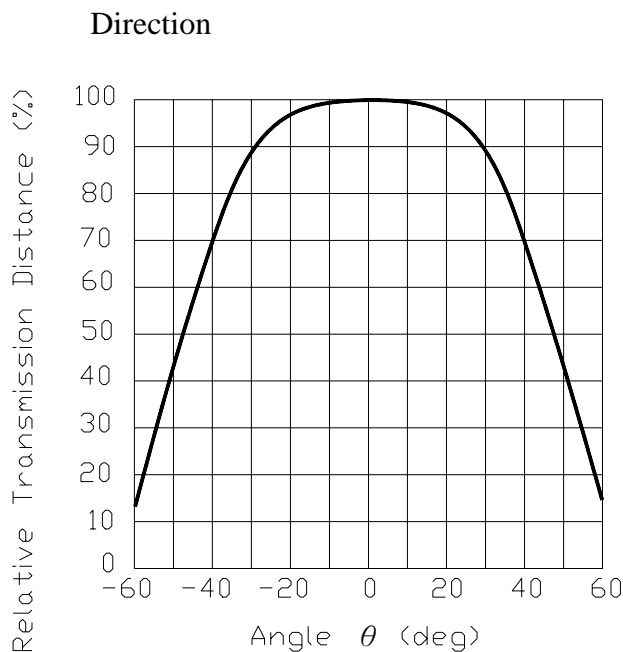


Fig.-6 Output Pulse Length vs. Arrival Distance

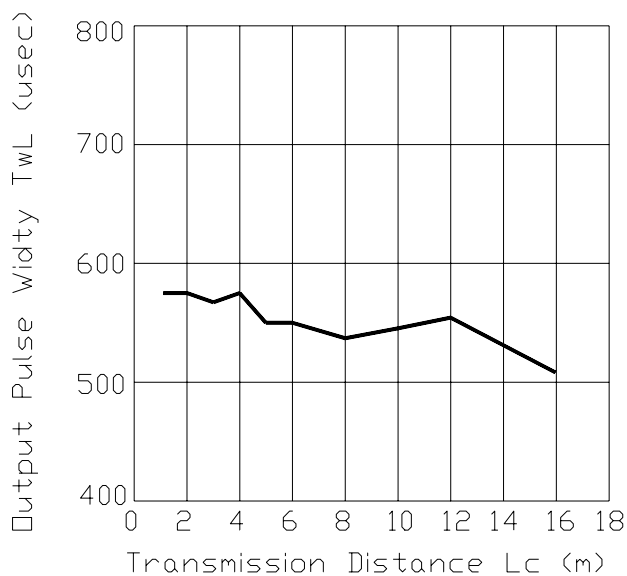
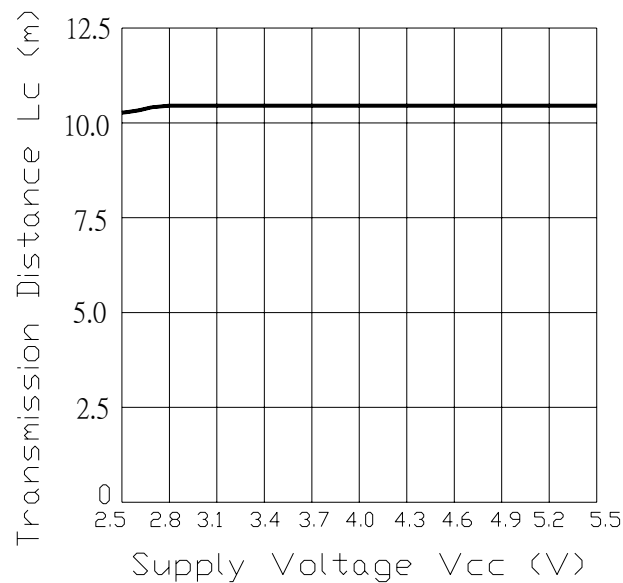


Fig.-7 Arrival Distance vs. Supply Voltage



Typical Electro-Optical Characteristics Curves

Fig.-8 Relative Transmission Distance vs. Center Carrier Frequency

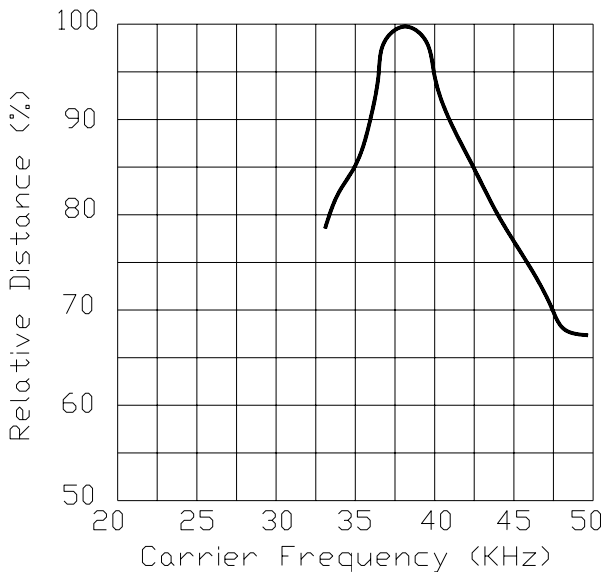
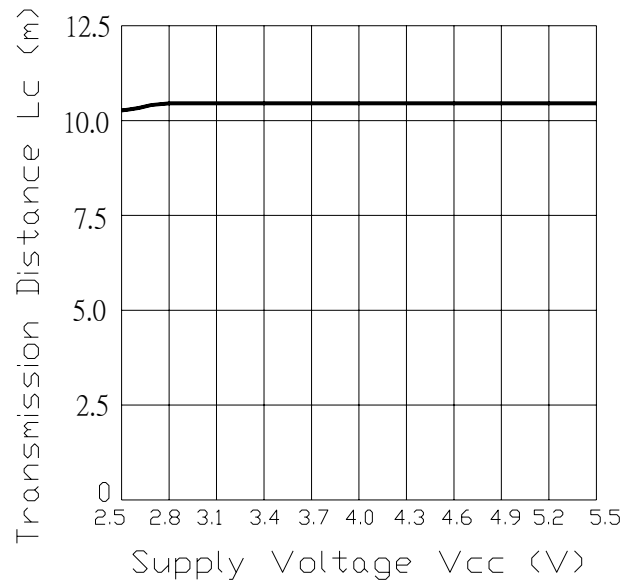


Fig.-9 Arrival Distance vs. Ambient Temperature



Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

Test Items	Test Conditions	Failure Judgement Criteria	<u>Samples(n)</u> Defective(c)
Temperature cycle	1 cycle : -25°C \longleftrightarrow +85°C (30min)(5min)(30min) 300 cycle test	$L_0 \leq L \times 0.8$ $L_{45} \leq L \times 0.8$ L: Lower specification limit	n=22,c=0
High temperature test	Temp : +85°C Vcc : 6V 1000hrs		n=22,c=0
Low temperature storage	Temp : -40°C 1000hrs		n=22,c=0
High temperature High humidity	Ta : 85°C , RH : 85% 1000hrs		n=22,c=0

Recommended method of storage

Dry box storage is recommended as soon as the aluminum bag has been opened prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10°C to 30°C
- Storage humidity $\leq 60\%RH$ max.

After more than 72 hours under these conditions moisture content will be too high for Reflow soldering:

In case of moisture absorption, the devices will recover to former condition by drying under the following condition:

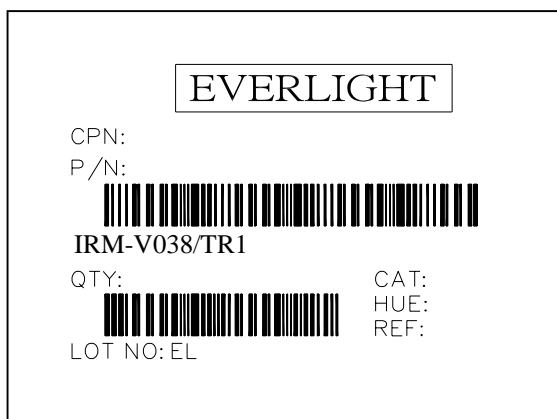
192 hours at 40°C+5°C/-0°C and 5%RH (dry air / nitrogen) or
96 hours at 60°C+5°C and < 5%RH for all device containers or
24 hours at 125°C+5°C not suitable for reel or tubes.

ESD Precaution

Proper storage and handing procedures should be followed to prevent ESD damage to the devices especially when they are removed from the Anti-static bag. Electro-Static Sensitive Devices warning labels are on the packing.

Packing Quantity Specification

1. 1000 PCS/1 Reel
2. 4 Reel /1Carton

Label Form Specification

CPN: Customer's Production Number
P/N : Production Number
QTY: Packing Quantity
CAT: Ranks
HUE: Peak Wavelength
REF: Reference
LOT No: Lot Number
MADE IN TAIWAN: Production Place

Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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