EVERLIGHT ELECTRONICS CO.,LTD.

Technical Data Sheet

Infrared Remote-control Receiver Module

IRM-3638BS28-P

Features

- Photo detector and preamplifier in one package.
- Output active low .
- Circular lens to improve the receive characteristic.
- Line-up for various center carrier frequencies.
- Low power consumption.
- TTL and CMOS compatibility.
- base immunity against ambient light.
- Suitable burst length≧10 cycles/burst.
- Pb free.
- The product itself will remain within RoHS compliant version

Descriptions

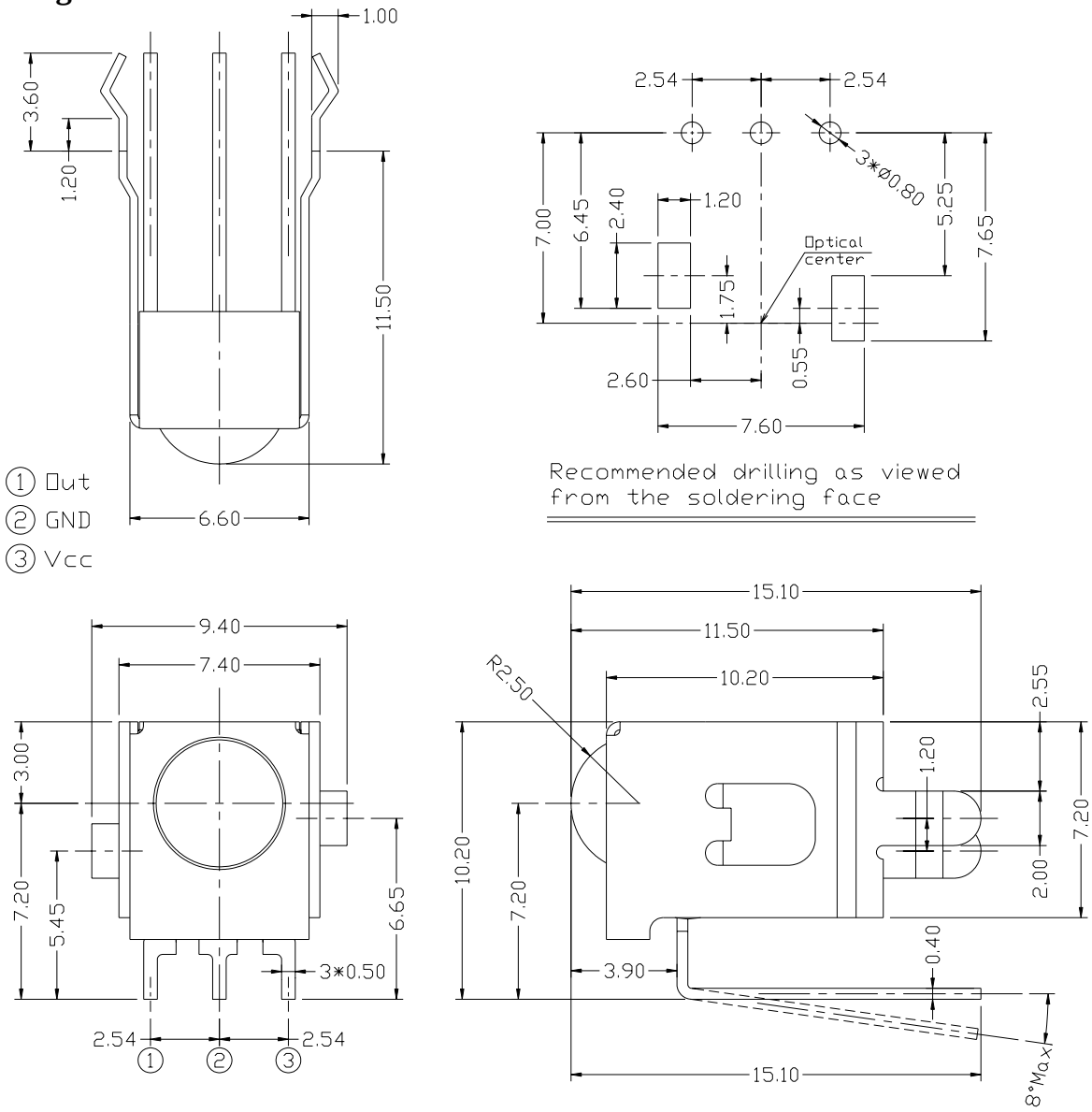
The device is a miniature type infrared remote control system receiver which has been developed and designed by utilizing the most updated IC technology. The PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as an IR filter. The demodulated output signal can directly be decoded by a microprocessor.

Applications

- 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

PART	MATERIAL	COLOR
Chip	Silicon	Black
Shell	SK7	Silver-white

Package Dimensions



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

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit	Notice
Supply Voltage	Vcc	0~6	V	
Operating Temperature	Topr	-25 ~ +80	℃	
Storage Temperature	Tstg	-40 ~ +85	℃	
Soldering Temperature	Tsol	260	℃	4mm from mold body less than 10 seconds

Recommended Operating Condition

Supply Voltage Rating: Vcc 2.7V to 5.5V

Electro-Optical Characteristics (Ta=25℃, and Vcc=3.0V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Consumption Current	Icc	---	0.8	1.0	mA	No signal input
B.P.F Center Frequency	Fo	---	38	---	KHz	
Peak Wavelength	λ_p	---	940	---	nm	
Reception Distance	L_0	8	---	---	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	At the ray axis *2
Low Level Pulse Width	T_L	400	---	800	μs	
High Level Output Voltage	V_H	2.7	---	---	V	
Low Level Output Voltage	V_L	---	---	0.25	V	

Notes:

*1:The ray receiving surface at a vertex and relation to the ray axis in the range of θ= 0° and θ=45°.

*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. (Ee≦10Lux)

③Standard transmitter

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

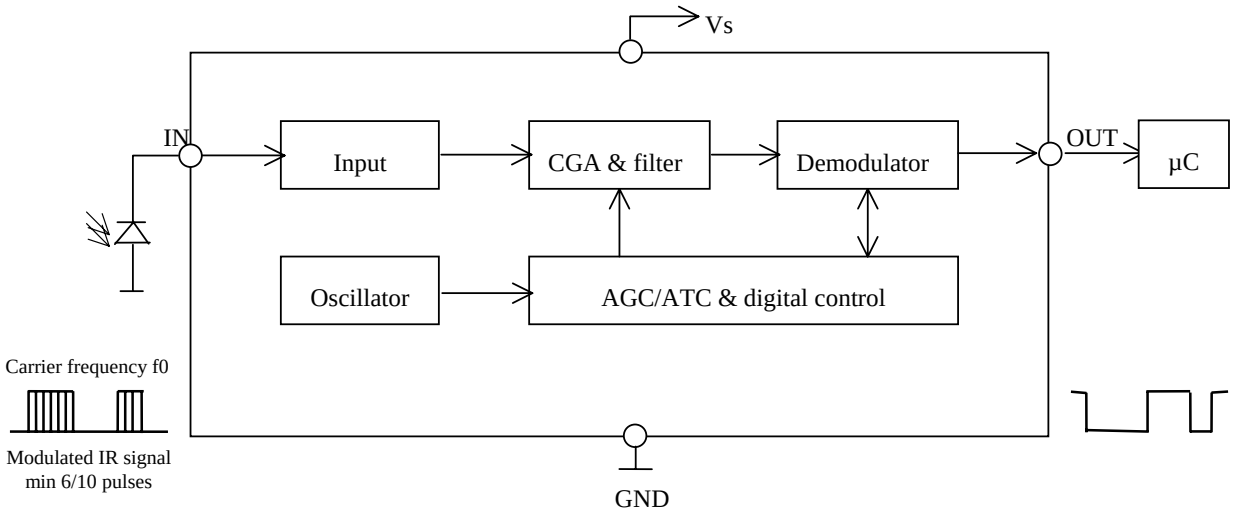
However , the infrared photodiode to be used for the transmitter should be λp=940nm,Δλ=50nm. Also, photodiode is used of PD438B(Vr=5V).

(Standard light / Light source temperature 2856°K).

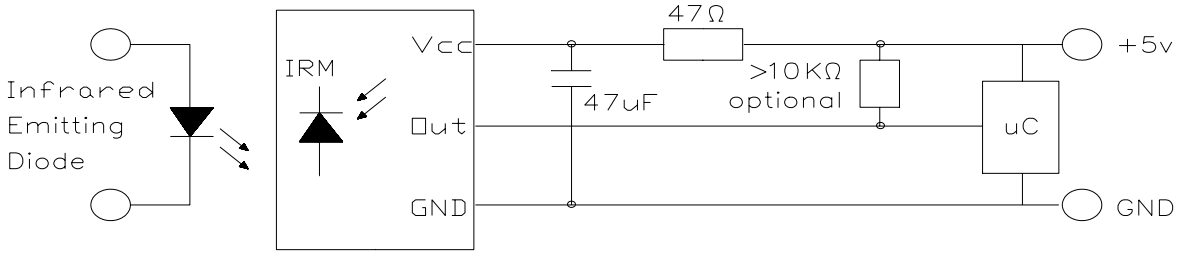
④Measuring system

According to the measuring system shown in Fig.-3

Block Diagram：

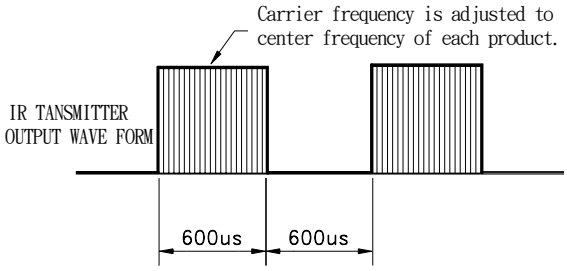


Application Circuit：



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

Fig.-1 Transmitter Wave Form



Duty=0.5

D.U.T output Pulse

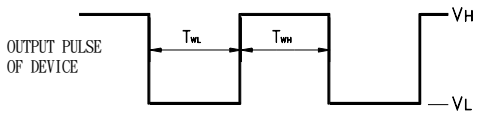


Fig.-2 Measuring Method

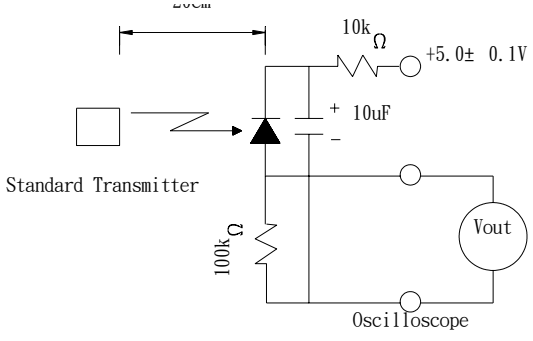
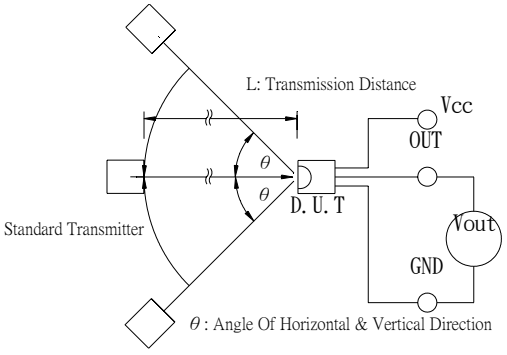


Fig.-3 Measuring System

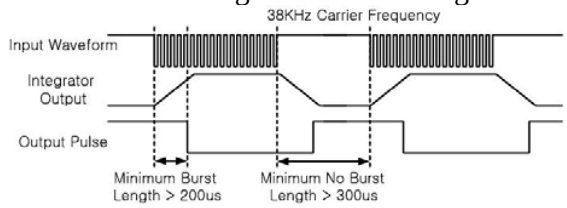


The Notice of Application:

Transmission of remote control signal consist of four parts: Encode Part, IR Transmitter Source, IRM device, Decode Part

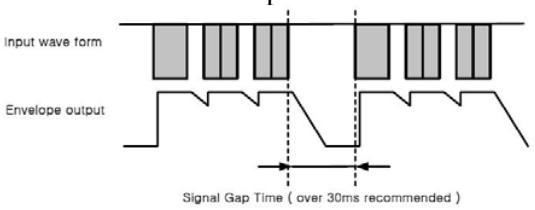
1. When IRM-3638BS28-P code select frequency, it need to well understand the center system of encode part.
2. Strong or weak light of IR Transmitter can affect distance of transmission.
3. When using IRM-3638BS28-P device, it requires the composition of code pattern to reach the demand as follows:

Minimum burst length & no burst length



*Minimum Burst Length > 200μs
*Minimum No Burst Length > 300μs

TX Recommended Repeat code frame



*Signal Gap Time > 30ms

4. It needs to ensure the translation range of decode part if it is applied to the pulse-width range.

If the above items hardly assure of its application, it'll cause NG(no good) message from the edge of signal.

IRM-3638BS28-P Code Property:

	Simple Code	Repeat Code
Grundig code	Best	Suppressed after a few seconds
NEC code	Best	Best
RC5 code	Best	Best
RC6 code	Best	Best
RCMM code	NG	NG
RCS-80 code	NG	NG
RCA code	NG	NG
Sharp code	Best	Best
Sony 12-bit code	Best	Good
Sony 15-bit code	Best	Suppressed after a few seconds
Sony 20-bit code	Good	Suppressed after a few seconds
Standard data rate code	Best	Best
High data rate (4000 bit/s)	NG	NG

Typical Electro-Optical Characteristics Curves

Fig.-4 Relative Spectral Sensitivity vs. Wavelength

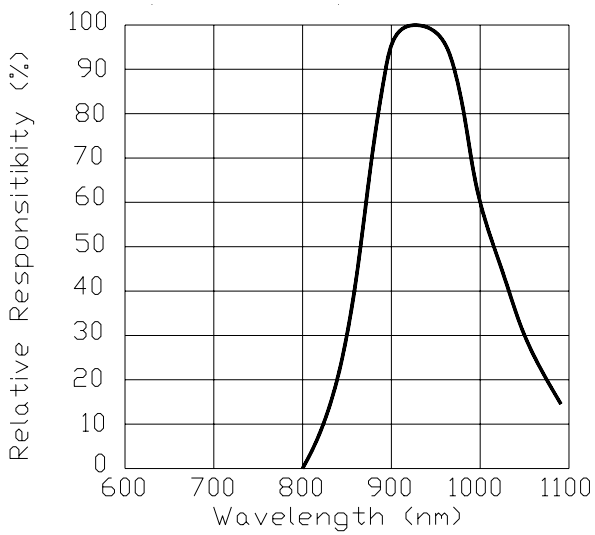


Fig.-5 Relative Transmission Distance vs. Direction

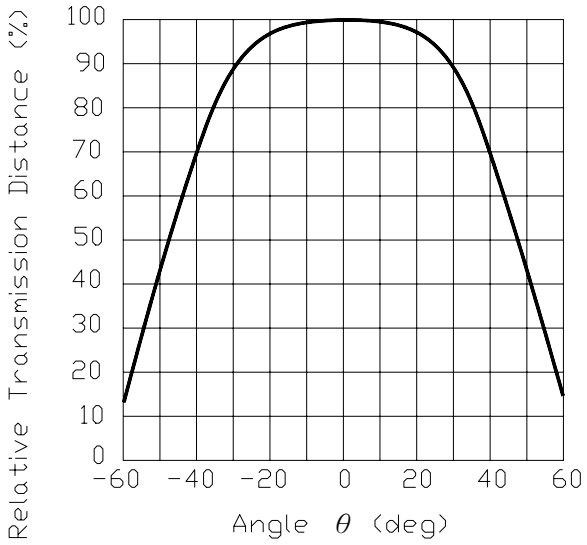


Fig.-6 Output Pulse Length vs. Arrival Distance

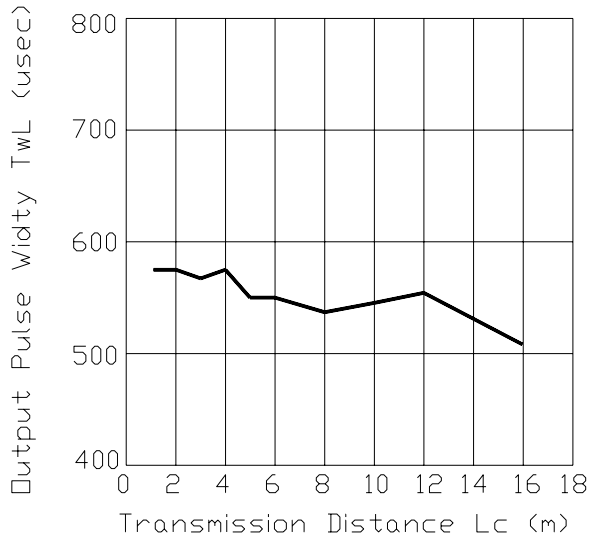
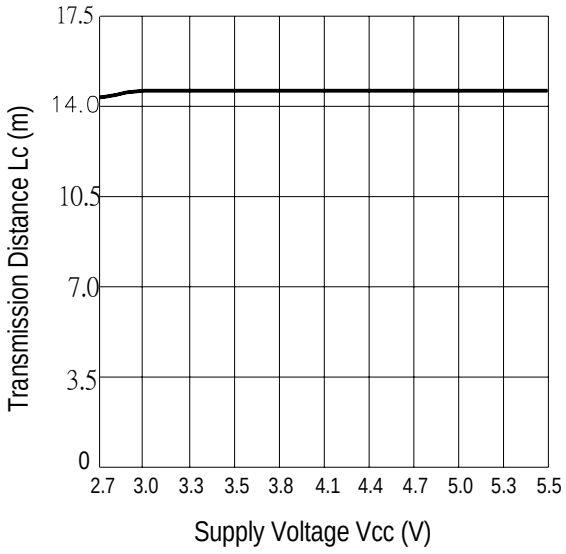


Fig.-7 Arrival Distance vs. Supply Voltage



Typical Electro-Optical Characteristics Curves

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

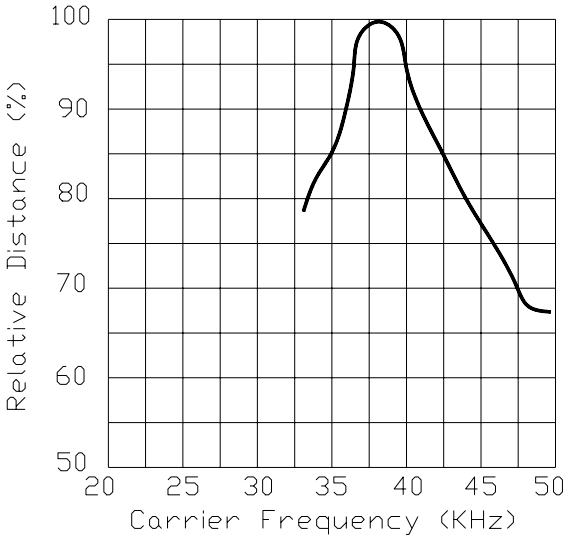
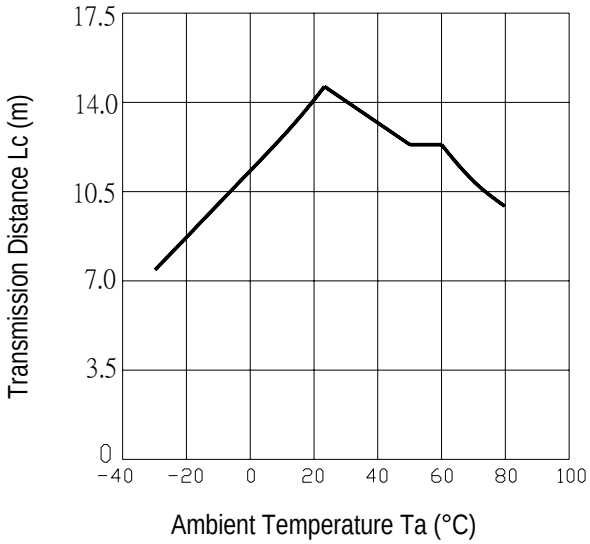


Fig.-9 Arrival Distance vs. Ambient Temperature



Reliability Test Item And Condition

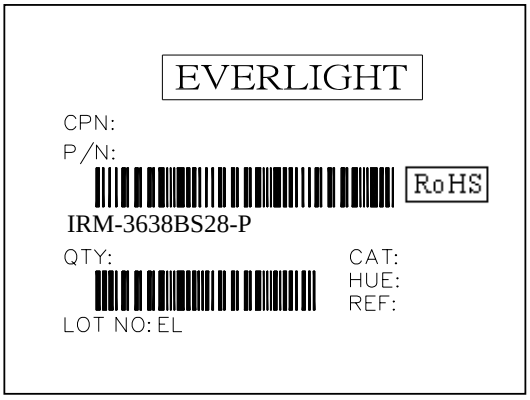
The reliability of products shall be satisfied with items listed below.
Confidence level：90%
LTPD：10%

Test Items	Test Conditions	Failure Judgement Criteria	Samples(n) Defective(c)
Temperature cycle	1 cycle -40℃ ⟷ +100℃ (15min)(5min)(15min) 300 cycle test	$L_0 \leqq$ Lx0.8 $L_{45} \leqq$ Lx0.8 L: Lower specification limit	n=22,c=0
High temperature test	Temp: +100℃ Vcc:6V 1000hrs		n=22,c=0
Low temperature storage	Temp: -40℃ 1000hrs		n=22,c=0
High temperature High humidity	Ta: 85℃,RH:85% 1000hrs		n=22,c=0
Solder heat	Temp: 260±5℃ 10sec 4mm From the bottom of the package.		n=22,c=0

Packing Quantity Specification

1. 750 PCS/1Box
2. 10 Boxes/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.
3. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT's consent.

EVERLIGHT ELECTRONICS CO., LTD.
Office: No 25, Lane 76, Sec 3, Chung Yang Rd, Tucheng, Taipei 236, Taiwan, R.O.C
Tel: 886-2-2267-2000, 2267-9936
Fax: 886-2267-6244, 2267-6189, 2267-6306
http:\\www.everlight.com