# EVERLIGHT ELECTRONICS CO.,LTD.

Technical Data Sheet
Infrared Remote-control Receiver Module

IRM-36xx SERIES

Features

- High data rate (up to 4000 bit/sec)
- Standard protection ability against EMI .
- 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.
- Suitable min. burst length$\geq$6 or 10 pulses/burst.
- Pb free.
- The product itself will remain within RoHS compliant version.
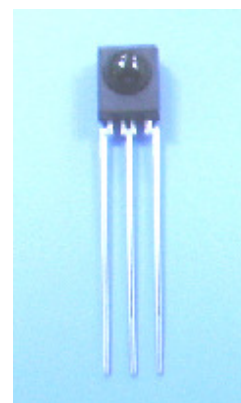
Descriptions

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.
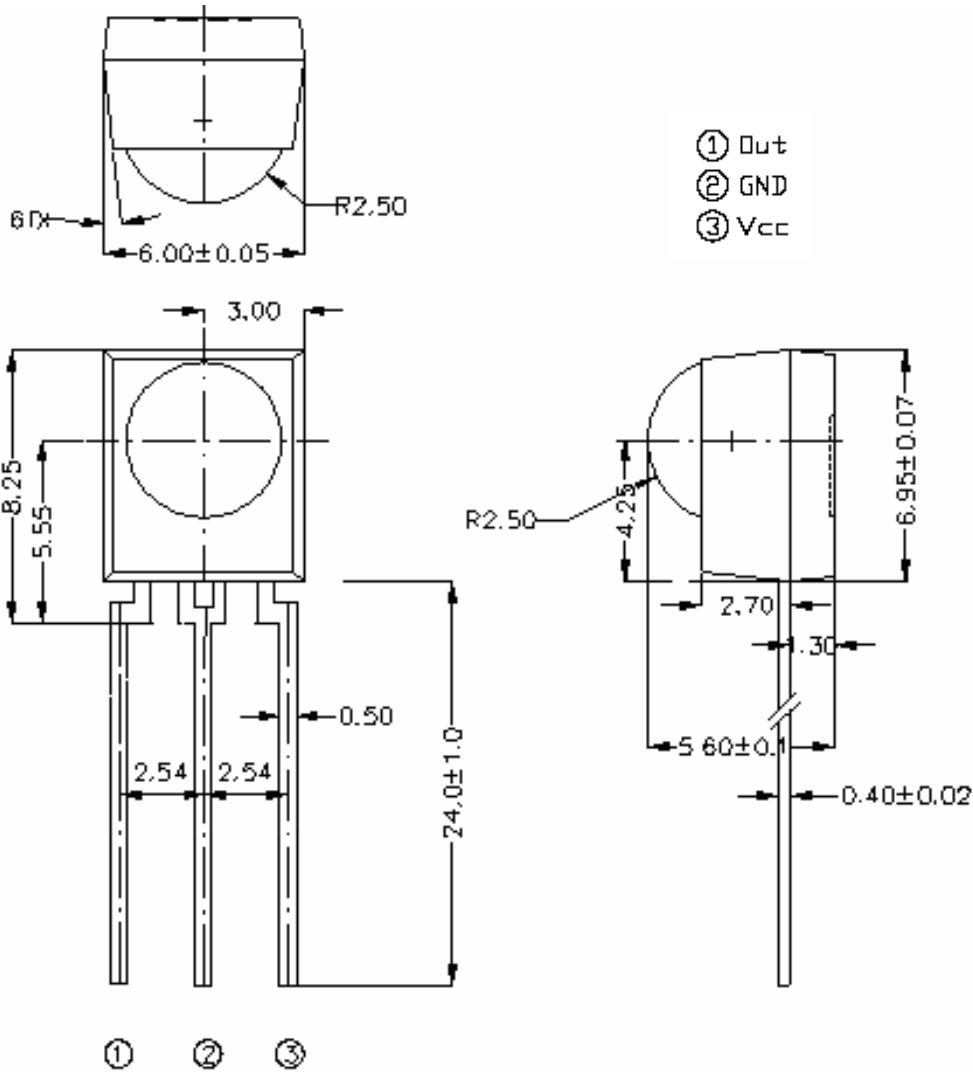
Applications

- 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	---
Compound	Epoxy	Black

Package Dimensions

① Out
② GND
③ Vcc

Unit:mm

Notes: 1.All dimensions are in millimeters.

   2.Tolerances unless dimensions ±0.3mm.

Available Types For Different Carrier Frequencies

Type	Carrier Frequencies (Typ)
IRM-3636	36 kHz
IRM-3638	38 kHz

Absolute Maximum Ratings (Ta=25℃)

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

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	---	---	2	mA	No signal input
Peak Wavelength	λ_p	---	940	---	nm	
Reception Distance	L_0	14	---	---	m	At the ray axis *1
	L_{45}	6	---	---		
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	---	0.2	0.5	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.
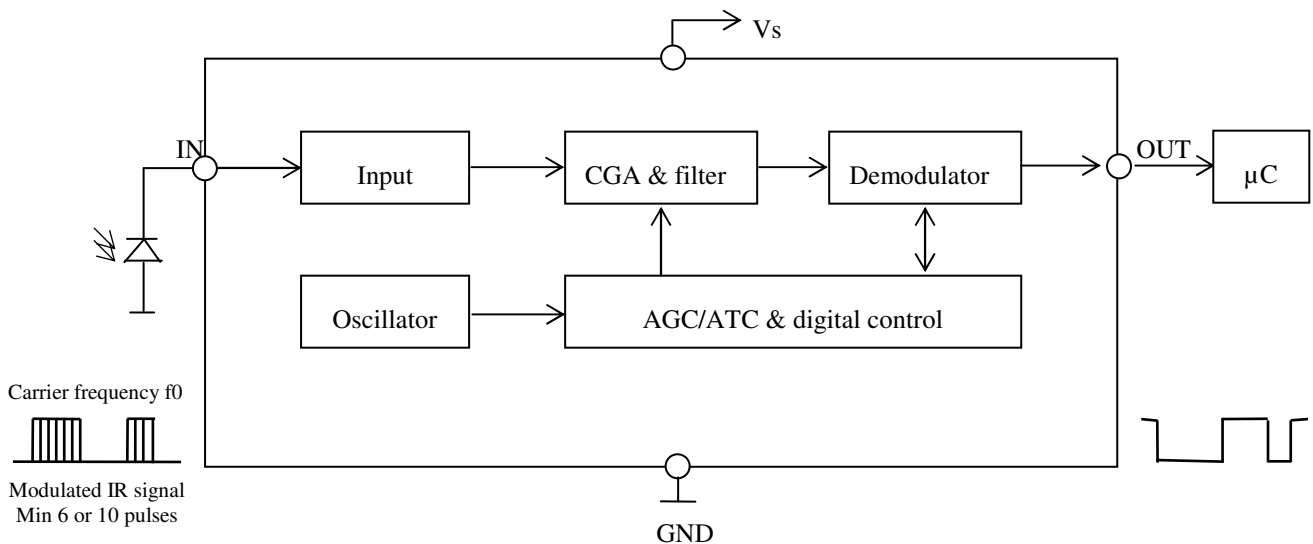(Ee≦10Lux)

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
$\lambda p=940nm, \Delta\lambda=50nm$. Also, photodiode is used of PD438B(Vr=5V).
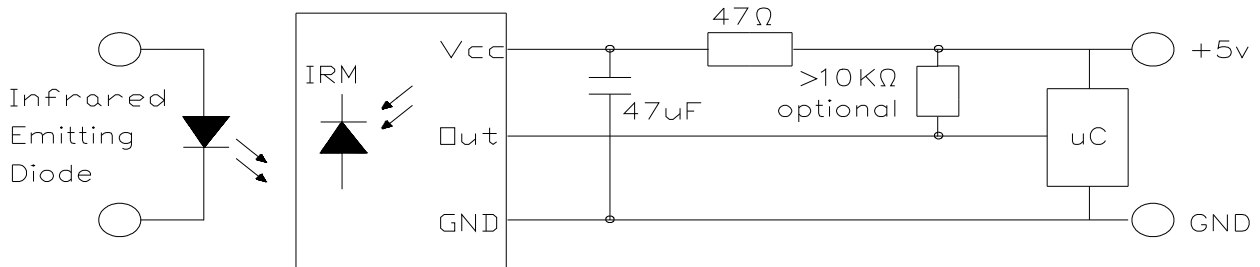(Standard light / Light source temperature 2856°K).

④Measuring system

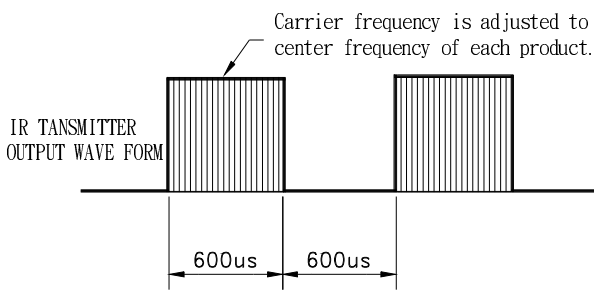According to the measuring system shown in Fig.-3

Block Diagram：

Carrier frequency f0

Modulated IR signal
Min 6 or 10 pulses

Vs

IN

| Input | CGA & filter | Demodulator | OUT | μC |

| Oscillator | AGC/ATC & digital control |

GND

Application Circuit：

RC Filter should be connected closely between Vcc pin and GND pin.
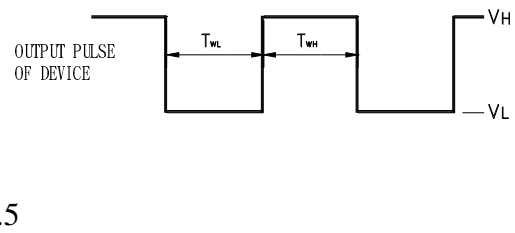
Fig.-1　Transmitter Wave Form

D.U.T output Pulse

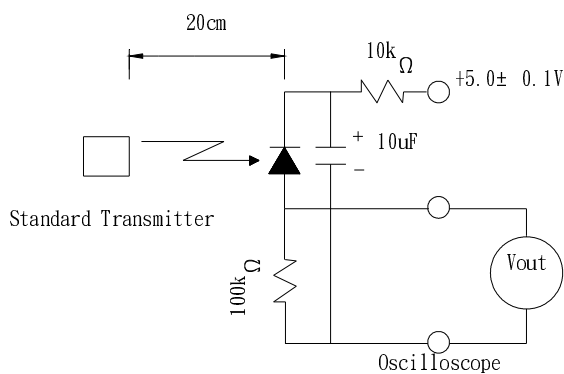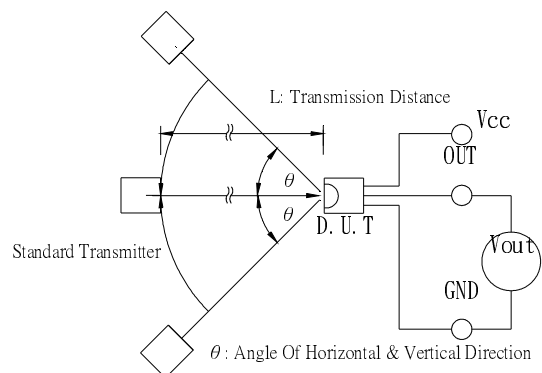Carrier frequency is adjusted to center frequency of each product.

IR TANSMITTER OUTPUT WAVE FORM

600us　600us

Duty=0.5

OUTPUT PULSE OF DEVICE

T_{WL}　T_{WH}

VH

VL

Fig.-2　Measuring Method

Fig.-3　　Measuring System

20cm

10kΩ　+5.0± 0.1V

+ 10uF −

Standard Transmitter

100kΩ

Vout

Oscilloscope

L: Transmission Distance

Vcc

OUT

θ

θ

D.U.T

Standard Transmitter

GND

Vout

θ: Angle Of Horizontal & Vertical Direction

The Notice of Application: (IRM-36xx SERIES)

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

1. When IRM-36xx SERIES 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. Minimum Burst Length T_{burst} (number of pulses per burst) : 6 or 10 cycles
4. It needs to ensure the translation range of decode part if it is applied to the pulse-width range.
5. IRM-36xx SERIES can be applied to the high data codes, but against disturbance slightly weak.

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

Typical Electro-Optical Characteristics Curves

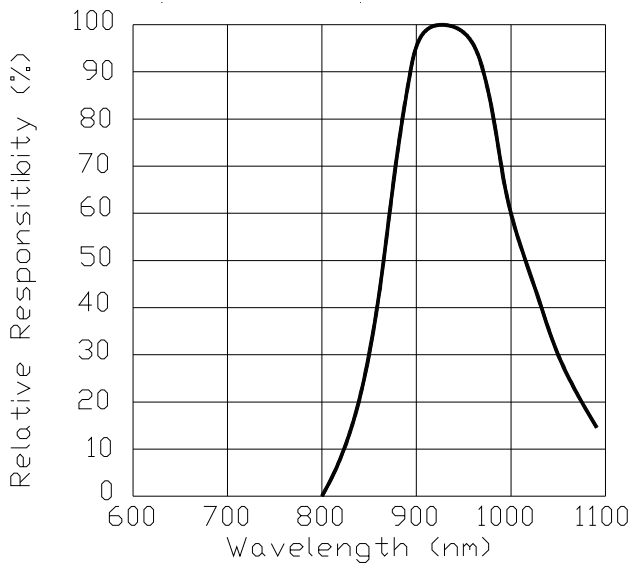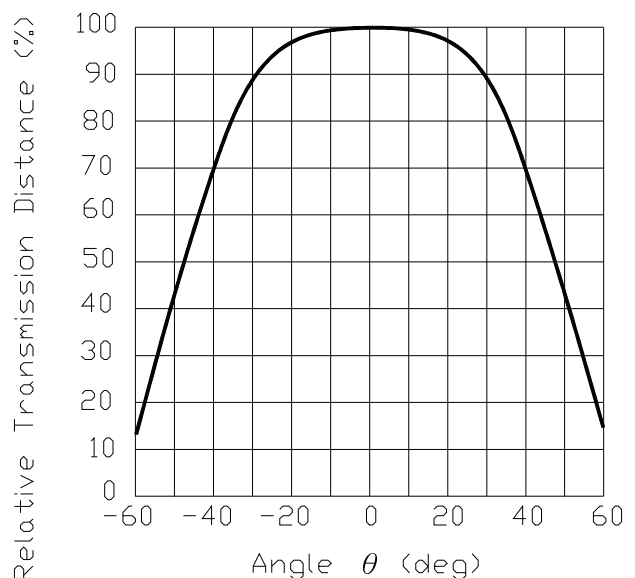Fig.-4 Relative Spectral Sensitivity vs. Wavelength

Fig.-5 Relative Transmission Distance vs. Direction

Typical Electro-Optical Characteristics Curves

Fig.-6 Output Pulse Length vs. Arrival Distance   Fig.-7 Arrival Distance vs. Supply Voltage
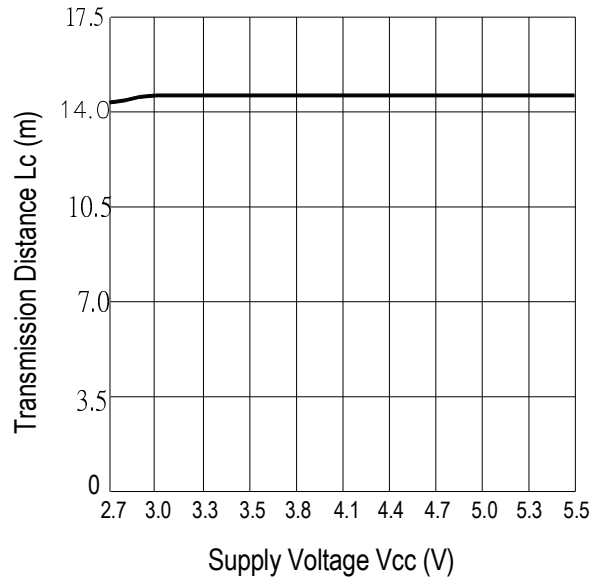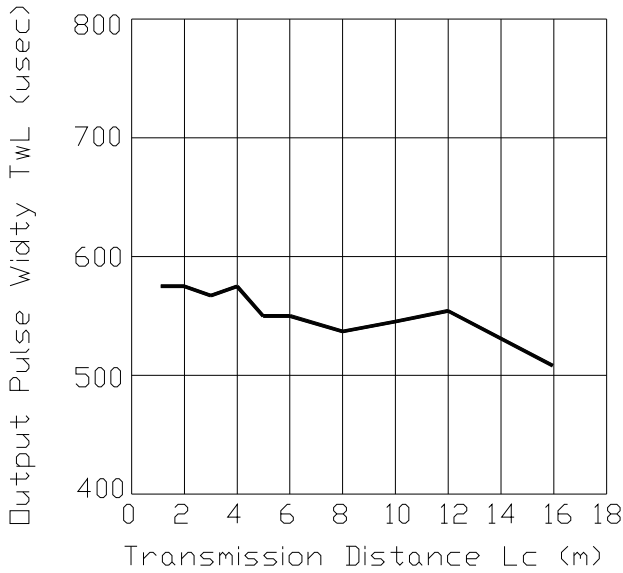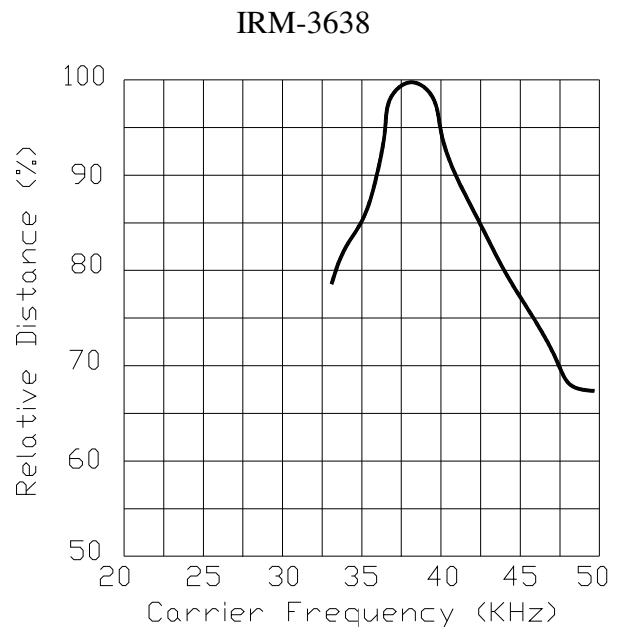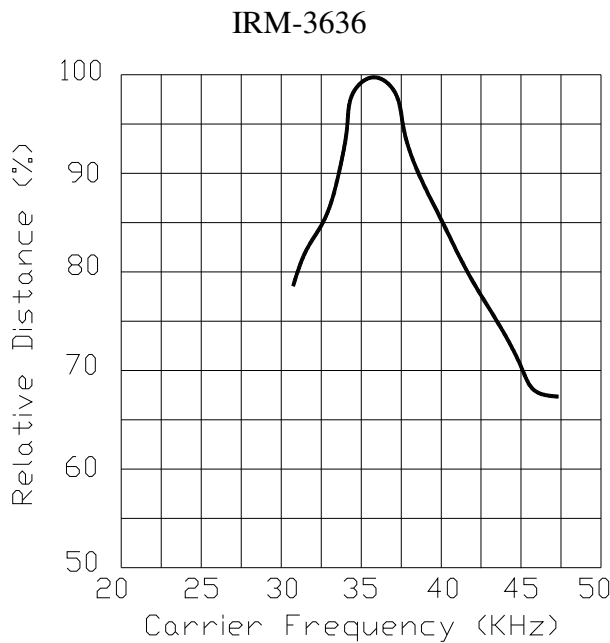

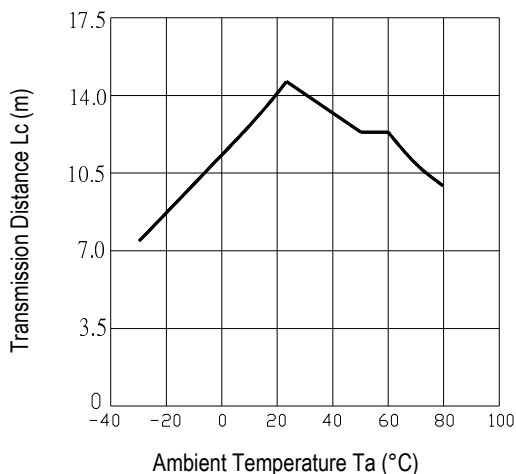Fig.-8 Relative Transmission Distance   vs. Center Carrier Frequency

IRM-3636   IRM-3638

Typical Electro-Optical Characteristics Curves

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		n=22,c=0
High temperature test	Temp: +100℃ Vcc:6V 1000hrs	$L_0 \leqq L \times 0.8$ $L_{45} \leqq L \times 0.8$ L: Lower specification limit	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. 1500PCS/1Box

2. 10Boxes/1Carton

Label Form Specification

EVERLIGHT
CPN:
P/N:
‖‖‖‖‖‖‖‖‖‖‖‖ RoHS
IRM-3636
QTY: CAT:
‖‖‖‖‖‖‖‖‖‖   HUE:
REF:
LOT NO:EL
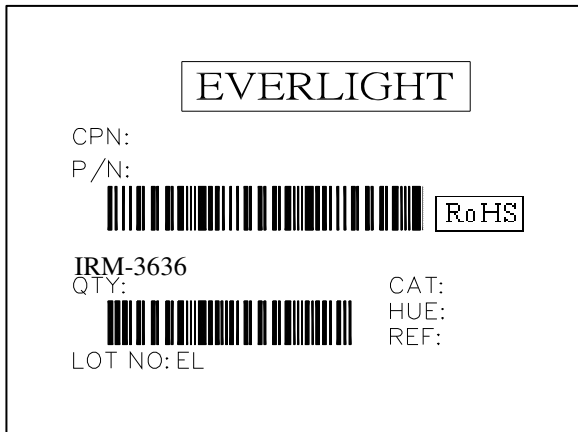
CPN: Customer's Production Number

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.