Infrared Receiver Module
IRM0038B-T

SIVAGO®
SEMICONDUCTOR

Features

Very low supply current

Photo detector and preamplifier in one package

Internal filter for PCM frequency

Improved shielding against EMI

Supply voltage: 2.5 V to 5.5 V

Improved immunity against ambient light

Insensitive to supply voltage ripple and noise

Material categorization: For definitions of compliance

Application

TV, VCR, AUDIO, SET TOP BOX

Home Appliances

Remote Control Equipment

Description

These products are miniaturized receivers for infrared remote control systems. A PIN diode and a preamplifier are assembled on a lead frame, the epoxy package acts as an IR filter.

The demodulated output signal can be directly decoded by a microprocessor. The IRM0038B-T is compatible with all common IR remote control data formats and can suppress almost all spurious pulses from energy saving fluorescent lamps.

This component has not been qualified according to automotive specifications.

◆ **Block Diagram**
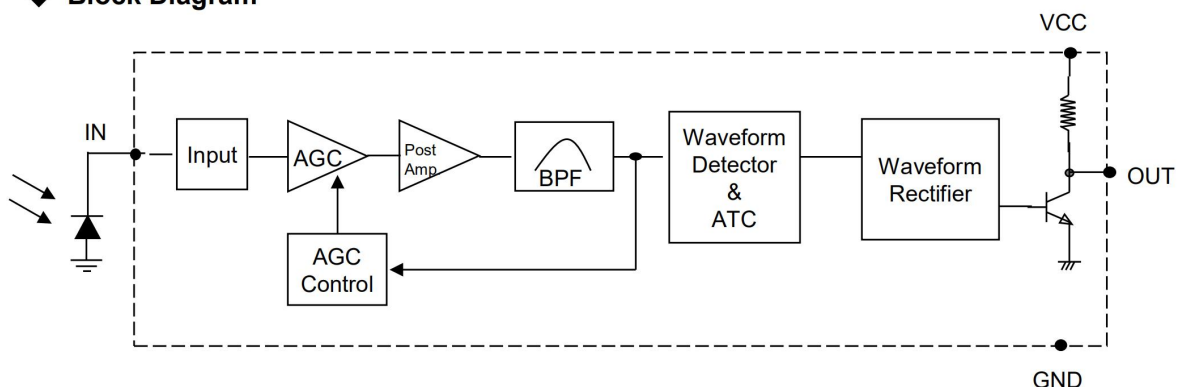
PACKAGE DIMENSIONS

① OUTPUT
② GND
③ Vcc
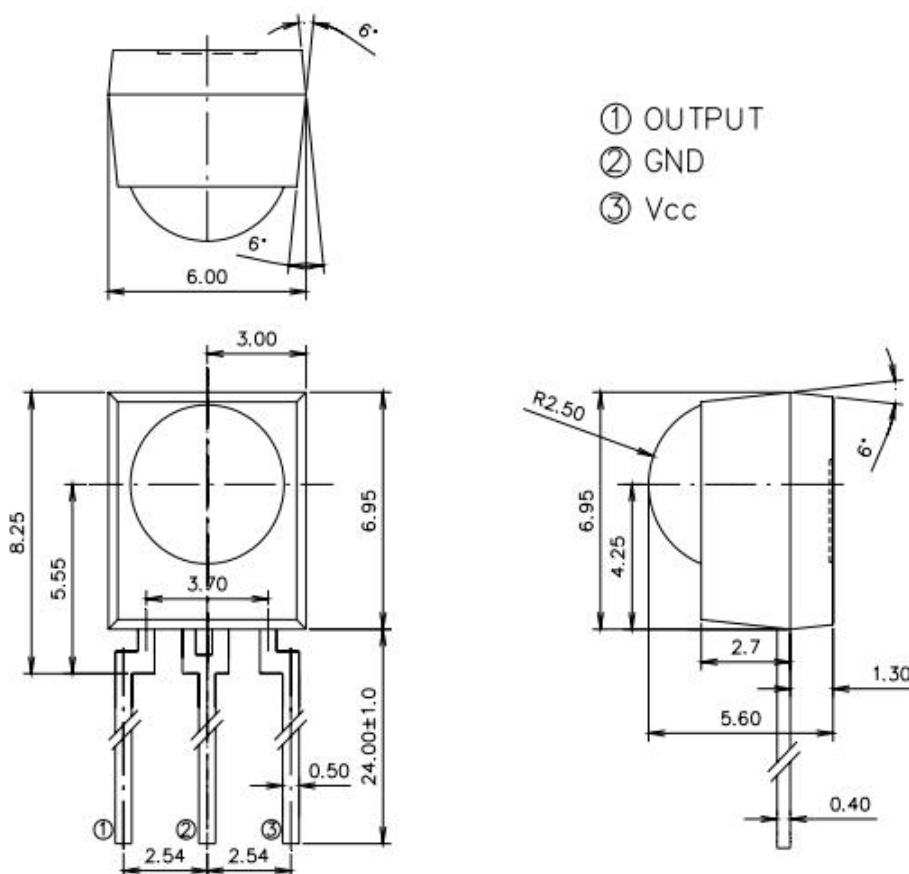
NOTES:

1. All dimensions are in millimeters (inches).

2. Tolerance is ±0.2mm(.010") unless otherwise noted.

3. Lead spacing is measured where the leads emerge from the package.

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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

Recommended Operating Condition

Supply Voltage Rating: Vcc 2.7V to 5.5V

Electro-Optical Characteristics (Ta=25℃, and Vcc=3V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Consumption Current	Icc	---	1.0	1.2	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	---	---	0.5	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.

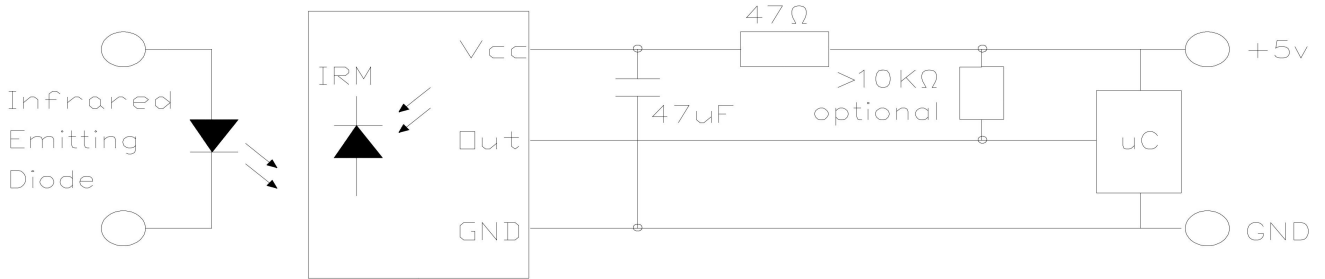　　However , the infrared photodiode to be used for the transmitter should be λp=940nm,Δλ=50nm.

　　(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 10 pulses
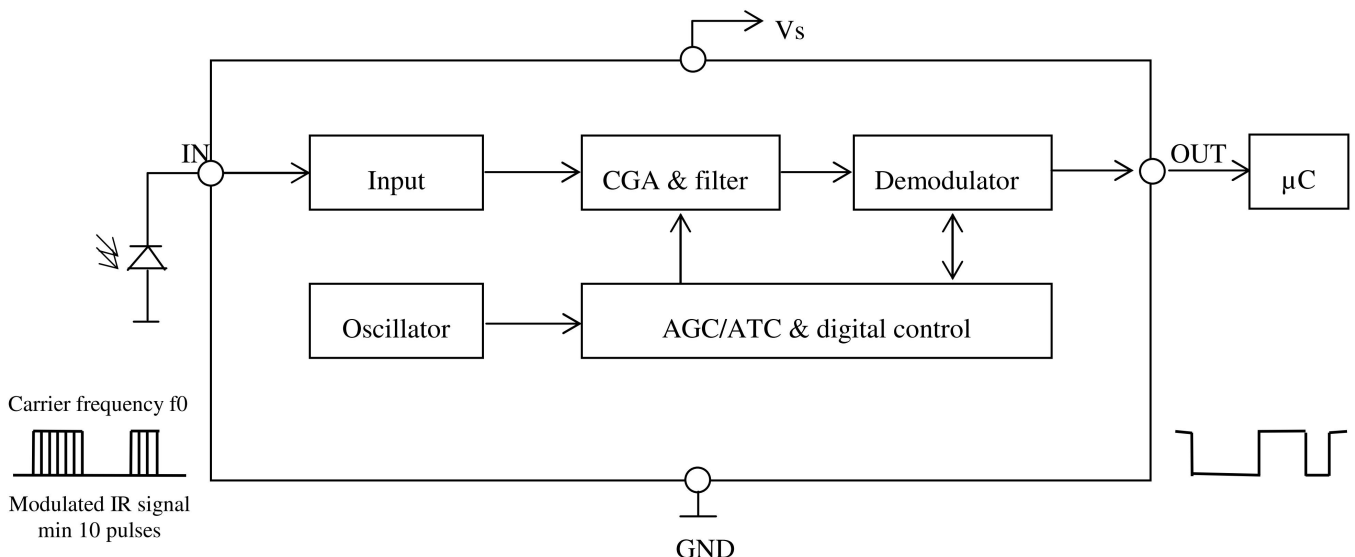
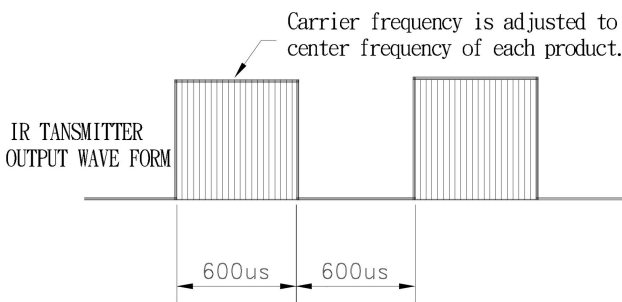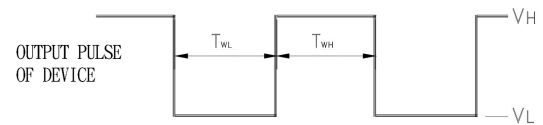## Application Circuit：

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

OUTPUT PULSE OF DEVICE

T_{WL} T_{WH}

VH

VL

Duty=0.5

Fig.-2   Measuring Method

Fig.-3   Measuring System

10kΩ +5.0± 0.1V

10uF

Standard Transmitter

100kΩ

Vout

Oscilloscope

L: Transmission Distance

Vcc

OUT

θ

θ

D.U.T

Standard Transmitter

Vout

GND

θ: Angle Of Horizontal & Vertical Direction
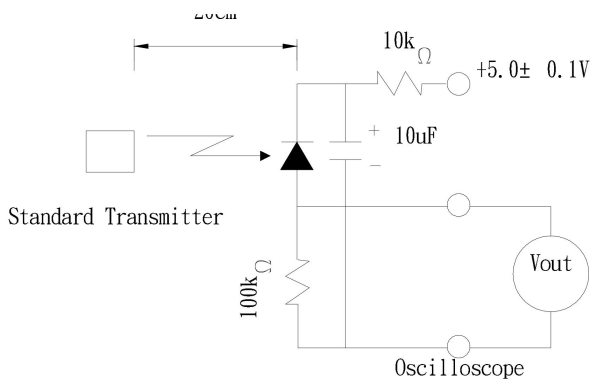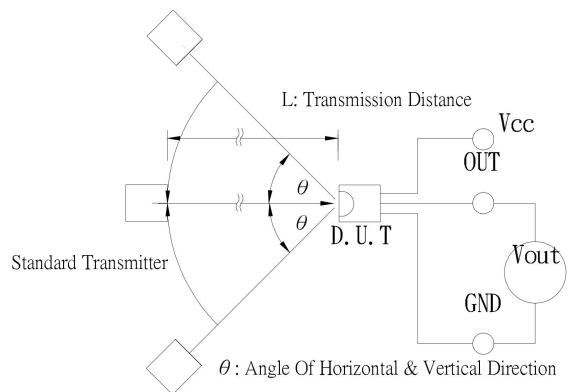
The Notice of Application:

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

1. When IRM0038B- T 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. When using IRM0038B-T SERIES device, it requires the composition of code pattern to reach the demand as follows:
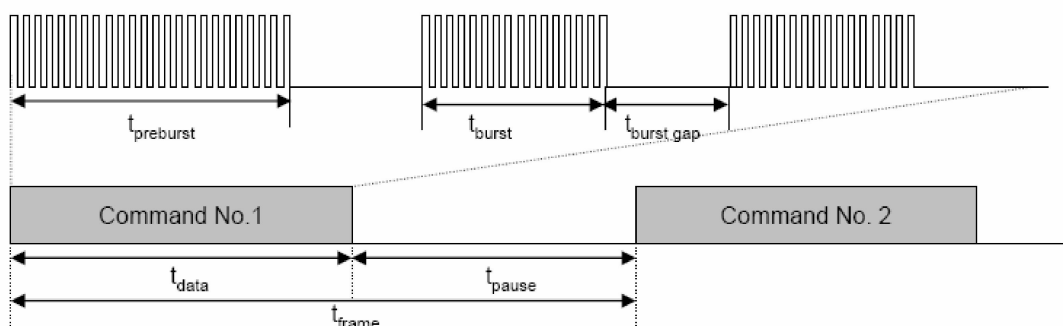
Minimum t_{burst} (number of pulses per burst)	Minimum t_{burst_gap} (number of pulses between two burst)	Minimum t_{pause}
10 pulses	14 pulses	25 msec

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.

IRM0038B-T SERIES Code Property:

Data format		Data format	
NEC	O	Sony 12 Bit	O
RC5 _ Philips	O	Sony 15 Bit	X
RC6 _ Philips	O	Sony 20 Bit	X
RCA _ Thomson	X	Matsushita	O
Toshiba	O	Mitsubishi	O
Sharp	O	Zenith	O
JVC	O	High data rate (4000 bit/s)	X

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Typical Electro-Optical Characteristics Curves

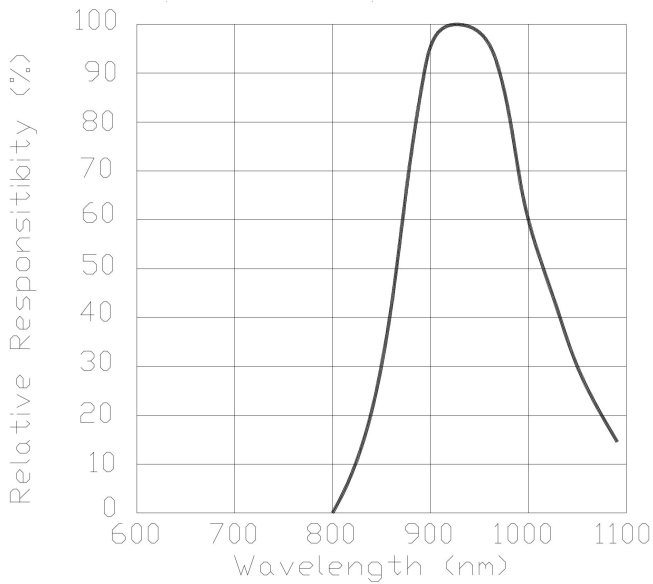Fig.-4 Relative Spectral Sensitivity vs. Wavelength

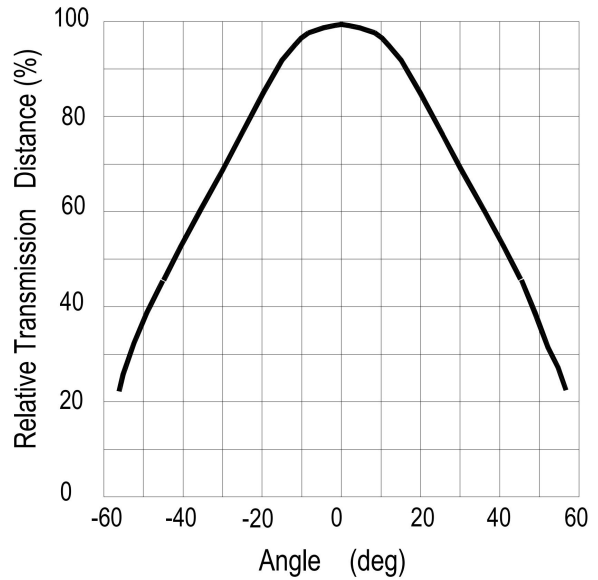Fig.-5 Relative Transmission Distance vs. Direction

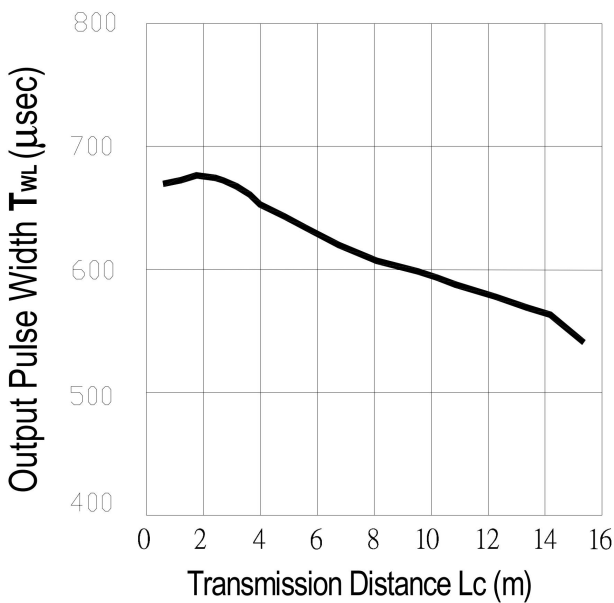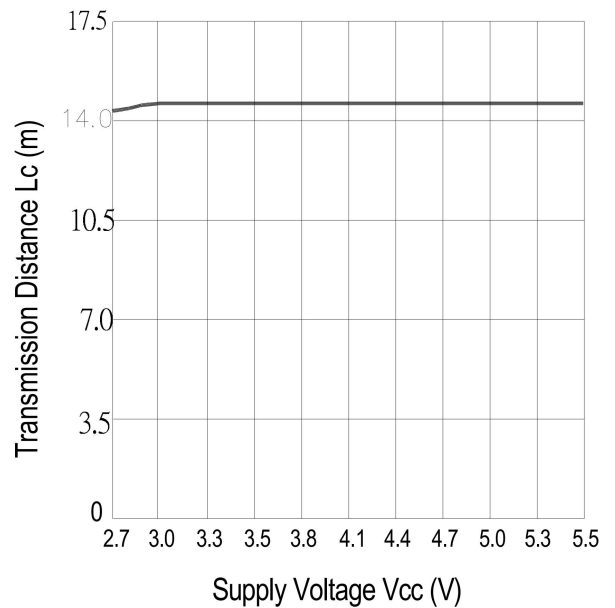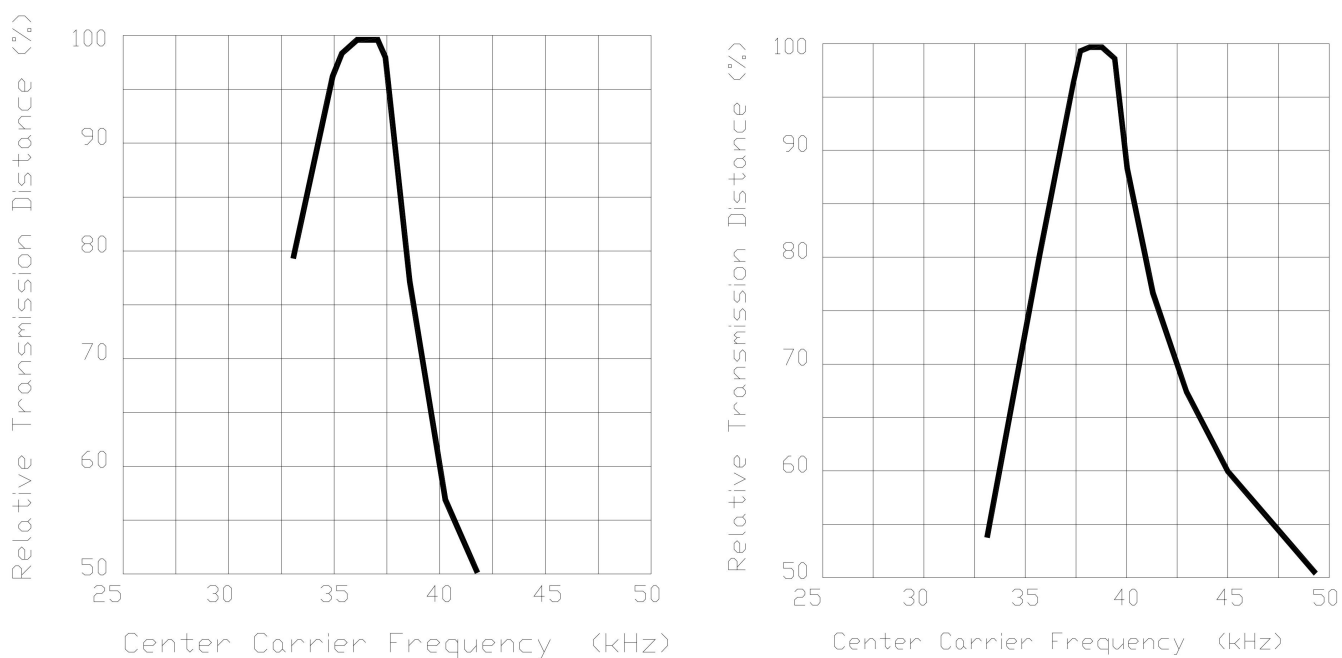Fig.-6 Output Pulse Length vs. Arrival Distance
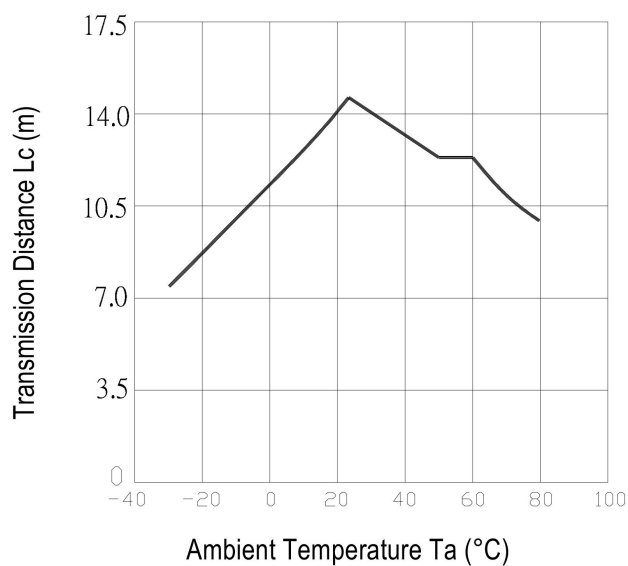
Fig.-7 Arrival Distance vs. Supply Voltage

Typical Electro-Optical Characteristics Curves

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

Typical Electro-Optical Characteristics Curves

Fig.-9 Arrival Distance vs. Ambient Temperature

Packing Quantity Specification

1. 500Pcs/1Bag,10 Bag/1Box

2. 4Boxes/1Carton

Label Form Specification

- · PRODUCT: Part Number
- · CODE NO.: Product Serial Number
- · QTY: Packing Quantity
- · LOT No: Lot Number
- · REMARKS:Remarks

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