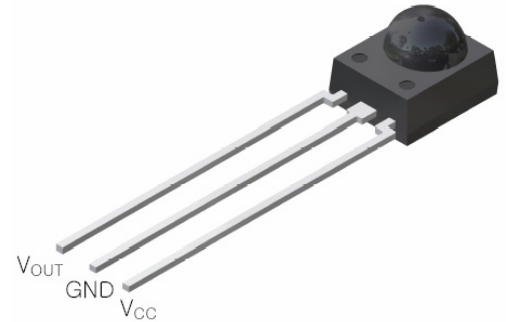


IR Receiver Modules for Remote Control Systems

Description

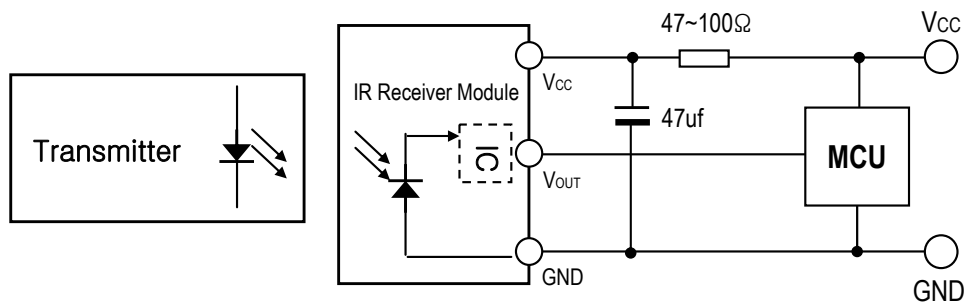
The FM-9038LM-5AN is remote control receiver modules. Pin diode and receiver IC are assembled on one module. Small-sized, light-weight, and low current consumption. modules have been achieved by using resin mold. The demodulated output signal can directly be decoded by a microprocessor. The main benefit is the reliable function even in disturbed ambient and the protection against uncontrolled output pulses.



Features

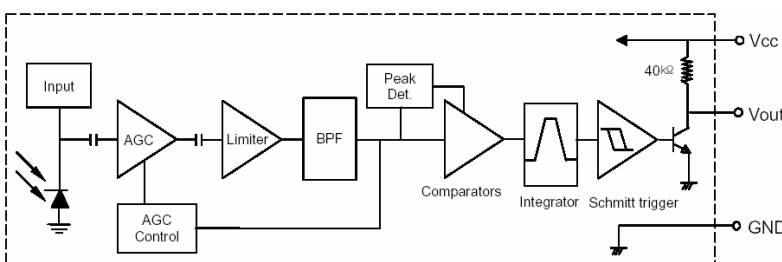
- Supply Voltage Range: 2.7V to 6.5V
- TTL and CMOS compatibility
- Photo detector and preamplifier in one package.
- Internal filter for PCM frequency
- Open collector output (built-in Pull-up resistor(40K)
- Output active low
- Enhanced Immunity against all kinds of disturbance light
- No occurrence of disturbance pulses at output pin within nominal conditions.
- Short settling time after power On.(below 1msec)
- Meet RoHS

Application Circuit



R-C filter recommended to suppress power supply disturbances.
R-C filter should be connected closely between Vcc pin and GND pin.

Block Diagram



Ordering Info.(carrier frequencies)

Type	Carrier Frequency (fo)
FM-9032LM-5AN	32.7 K
FM-9036LM-5AN	36.7 K
FM-9038LM-5AN	37.9 K
FM-9040LM-5AN	40.0 K
FM-9056LM-5AN	56.7 K

Absolute Maximum Ratings

(Ta = 25°C)

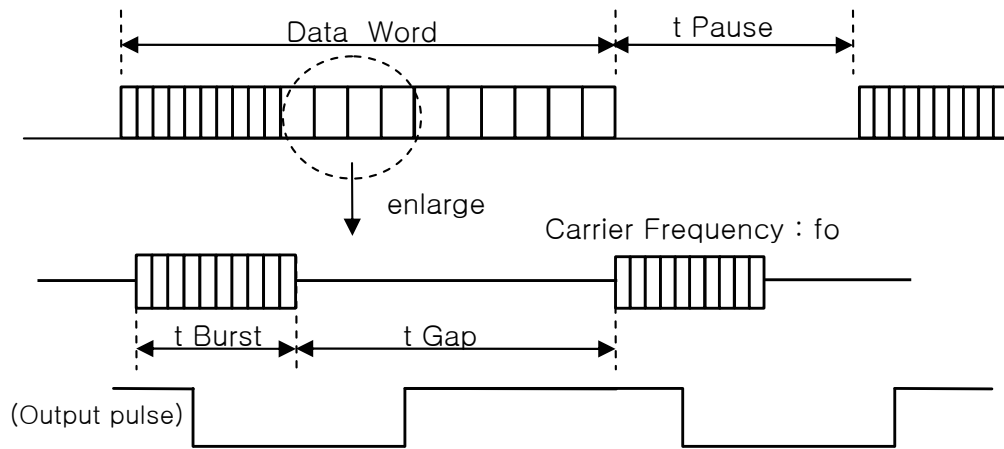
Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{CC}	7.0	V
Output Voltage	V _{OUT}	0.2 ~ V _{CC}	V
Output Current	I _{OUT}	2.5	mA
Operating Temperature	T _{opr}	-20 ~ +80	°C
Storage Temperature	T _{stg}	-30 ~ +85	°C
Soldering Temperature	T _{sd}	260°C, Max 5 sec	°C

Electro-optical Characteristics

(Ta = 25°C)

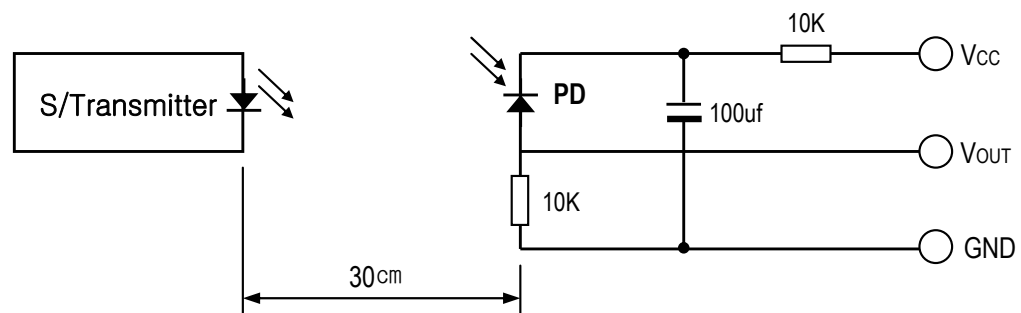
Parameter	Symbol	Min.	Typ.	Max.	Unit		
Supply Voltage	V _{CC}	2.7	5.0	6.5	V		
Supply Current	I _{CC}	0.8	1.0	1.3	mA	No input signal	
Max input current	I _{IN}	0.5	1.0	1.5	mA	V _{in} =0	
Output Voltage	V _{oh}	V _{CC} -0.5	-	-	V	V _{CC} =5V	
	V _{ol}	-	0.2	0.4	V		
Peak Wave Length	λ _p	-	940	-	nm		
Arrival Distance	L	±0°	-	15	-	m	Fig. 1,2,3
		±30°	-	10	-	m	
		±45°	-	7	-	m	
Max. Voltage Gain	A _v	70	76	82	dB	f _{in} =37.9kHz V _{in} =30μV _{pp}	
Internal Pull-up Resistor	R _{pul}	36	40	44	kΩ		
BPF Bandwidth	f _{bw}	-	3.5	-	kHz	f _{in} =37.9kHz V _{in} =30μV _{pp}	
BPF frequency	f _c	-3.5	f _o	+3.5	%		
Output Pulse width	T _{pw}	450	600	750	μs	Fig. 1,2,6	

[Fig.1] Data Signal diagram



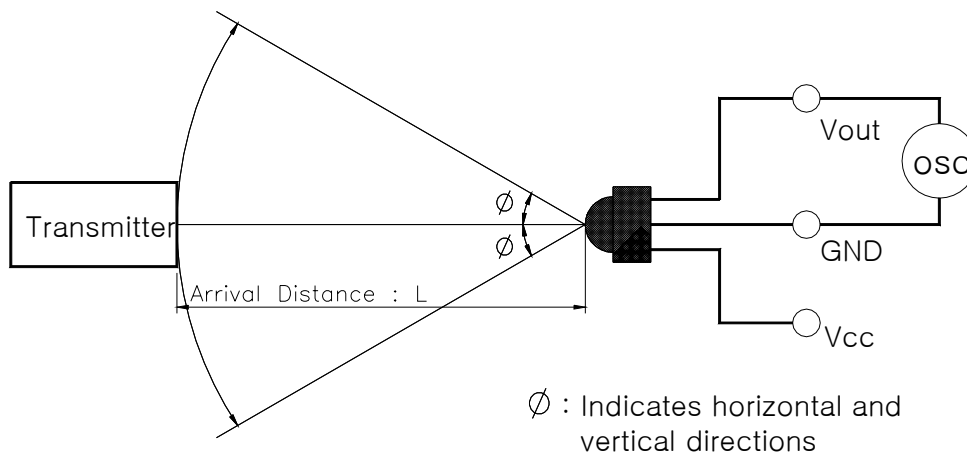
- t_{Gap} : Signal gap time between two burst in pulses of carrier. Minimum Gap Time $\geq 300\mu\text{s}$
- t_{Burst} : Length of a burst in pulses of the carrier frequency. Minimum Burst $\geq 300\mu\text{s}$
- t_{pause} : Data pause between two data words. Minimum Data Pause Time $\geq 20\text{ms}$

[Fig.2] Transmitter



※ The specifications shall be satisfied under the following conditions. The standard transmitter shall be specified of the burst wave form adjusted to $V_{\text{OUT}} 200\text{mVp-p}$ upon P_0 measuring circuit Standard Transmitter

[Fig.3] Test condition of arrival distance

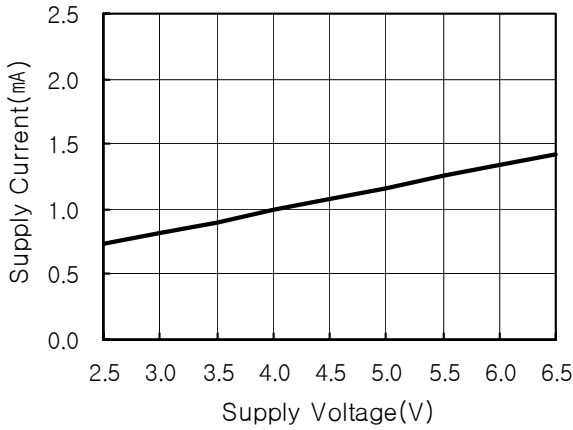


[Measurement condition for arrival distance]

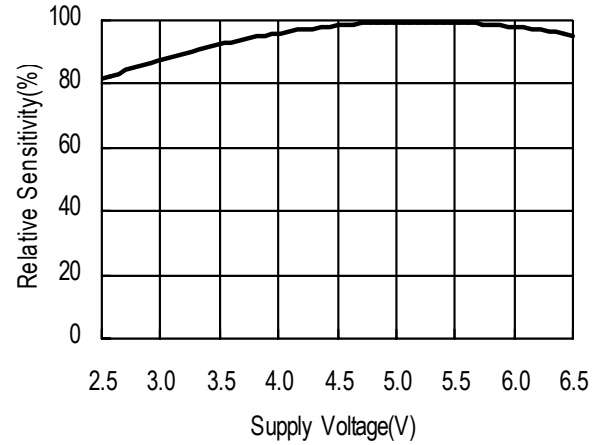
☞ Ambient light source : Detecting surface illumination shall be irradiate $200 \pm 50\text{Lux}$ under ordinary white fluorescence lamp without high frequency lighting

Electrical/Optical Characteristics

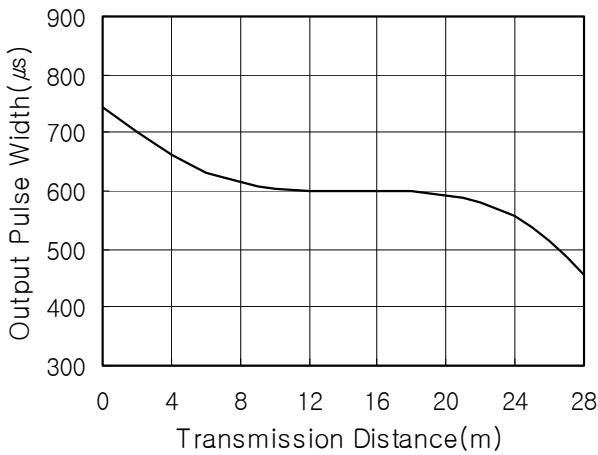
[Fig.4] Supply Current vs. Voltage



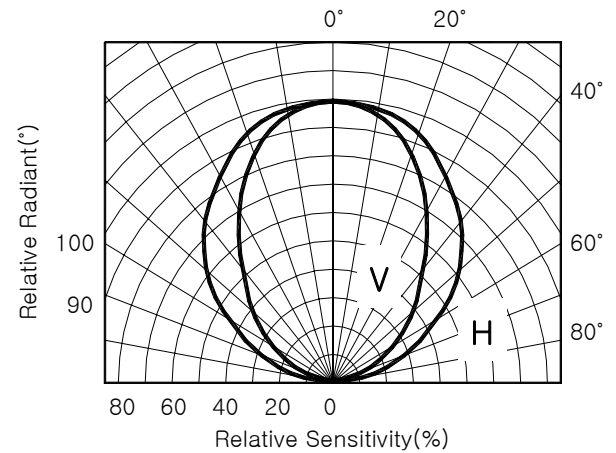
[Fig.5] Sensitivity vs. Supply Voltage



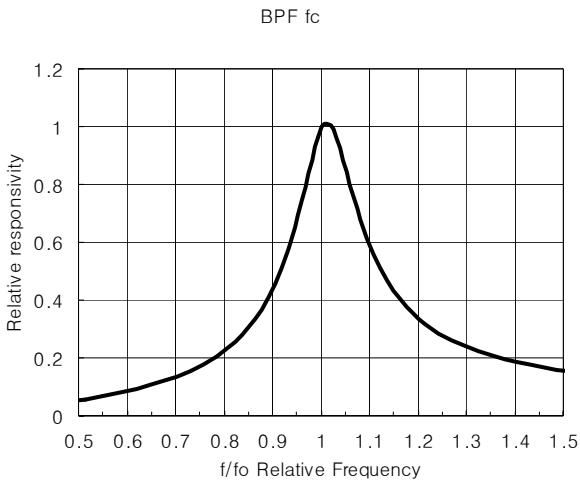
[Fig.6] Output Pulse Width vs. Distance



[Fig.7] Directivity (Horizontal/Vertical)

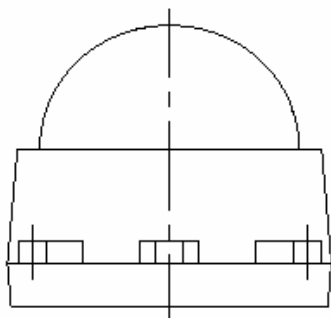
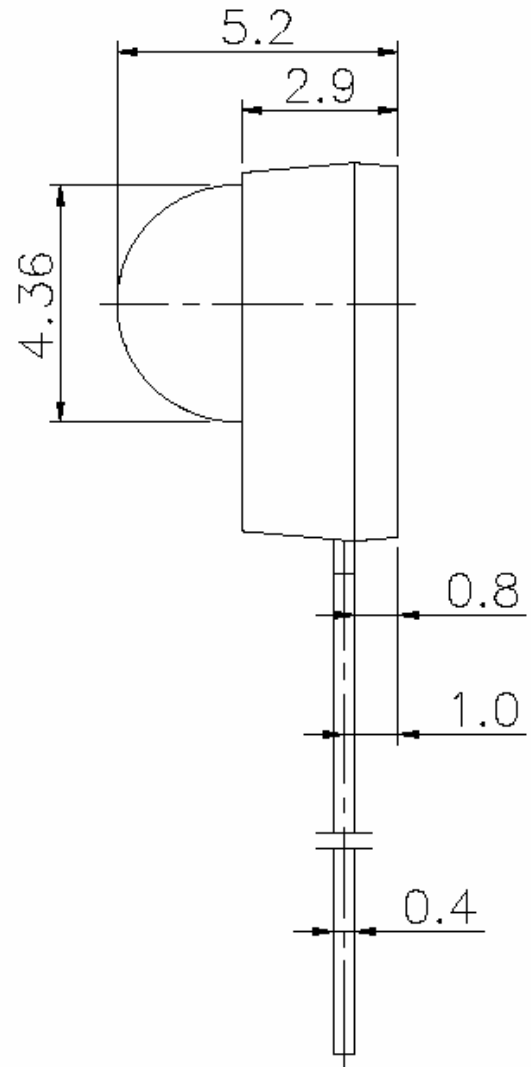
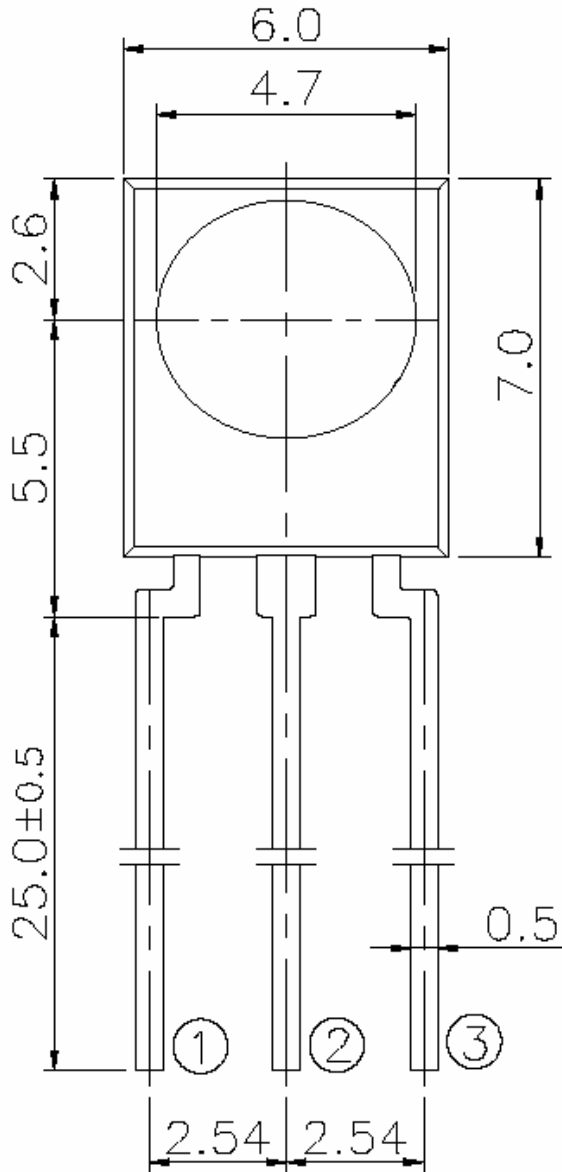


[Fig.8] BPF Fc Curve



ESD Test Results

Parameter	Conditions	Specification	Results
Machine Model	C=200pF R=0Ω	Min ±200V	>±200V
Human Body Model	C=100pf R=1.5KΩ	Min ±2000V	>±2000V



1. Pin Config.

① Vout

② GND

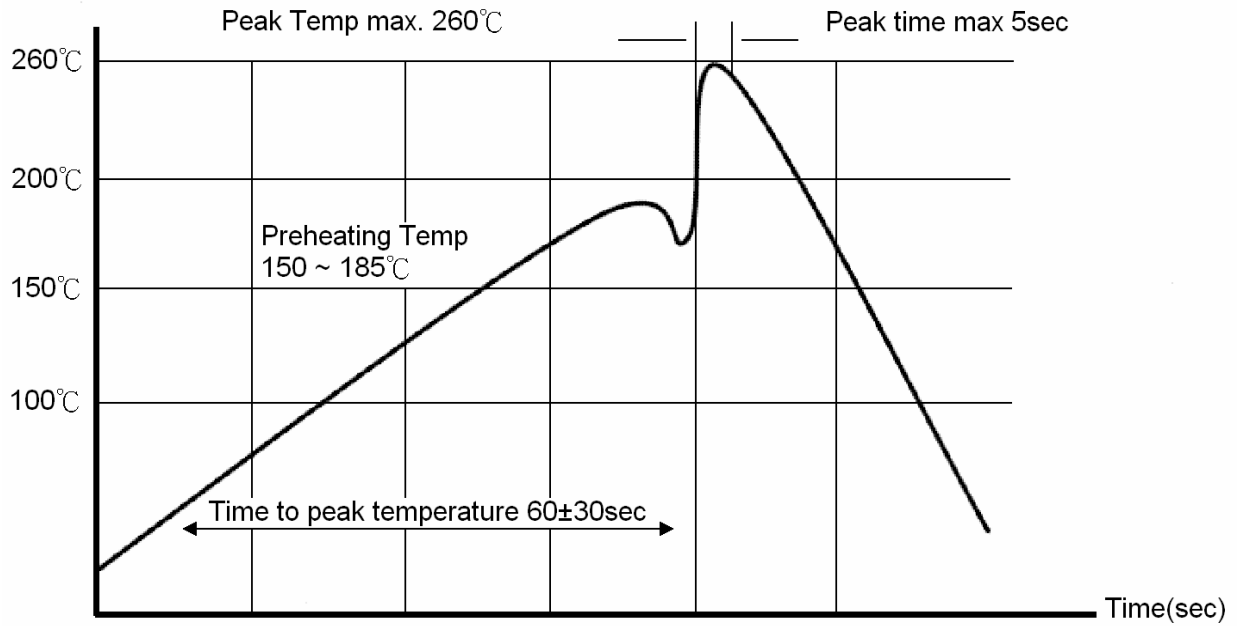
③ Vcc

2. G.T : ±0.3

◆ Recommended Soldering Condition

Flow Soldering Condition

Recommendation Flow Soldering condition Temp & Time



1. Packing unit for Remote control module

Package	Device	Packing Method	Units / Tube	Poly Bag/ Inner Box	Max Devices / Inner Box	Max Inner Box / Outer Box	Partial Shipment of Outer Box
Transfer mold Type		Poly Bag	200	5	1000	10	
				* Inner Box # 1	* Inner Box # 1	* Outer Box # 2	* Outer Box # 3

(unit : mm)

Inner Box #1 with Opto-Sensor Logo (170*240*65)

Outer Box #2 with Opto-Sensor Logo (365*360*270)

Outer Box #3 with Opto-Sensor Logo (385*750*300)

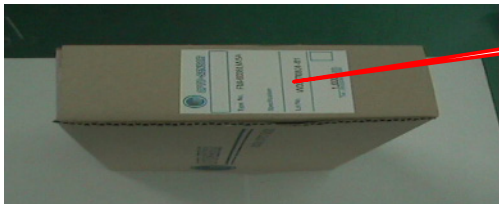
2. Packing method

1) Input max 200 units to one Poly bag and label should be attached middle of it.



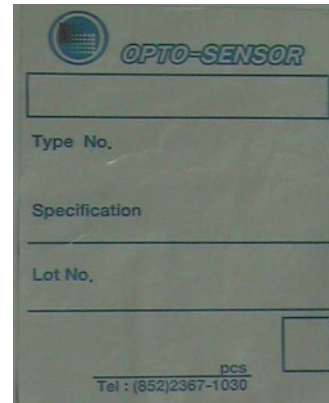
Antistatic Vinyl

2) Input 5 poly bags to one inner box and label should be attached as below.

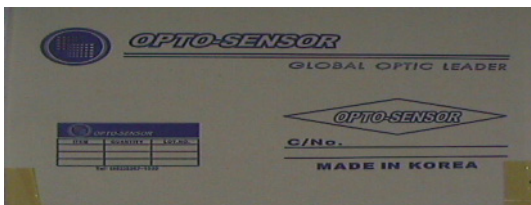


Label #1

<Inner Box # 1>



3) Input 10 inner boxes to outer box.



<Outer Box # 2>

4) Input 2 outer boxes into Box #3.



<Outer Box # 3>