IR Receiver Modules for Remote Control Systems

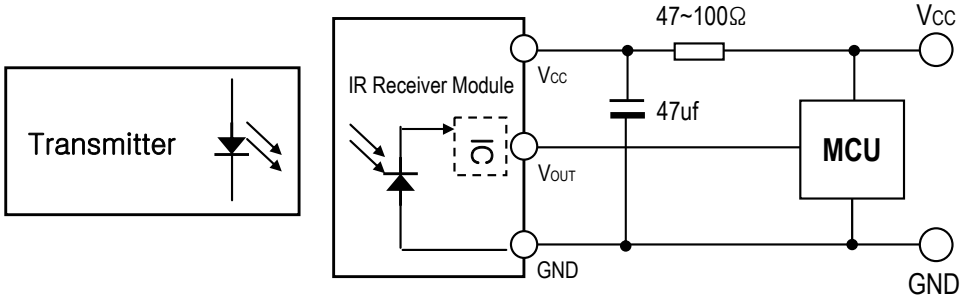
Description

The FM-3038□□-5CN is a Bi-CMOS IC for use in infrared remote control system.
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

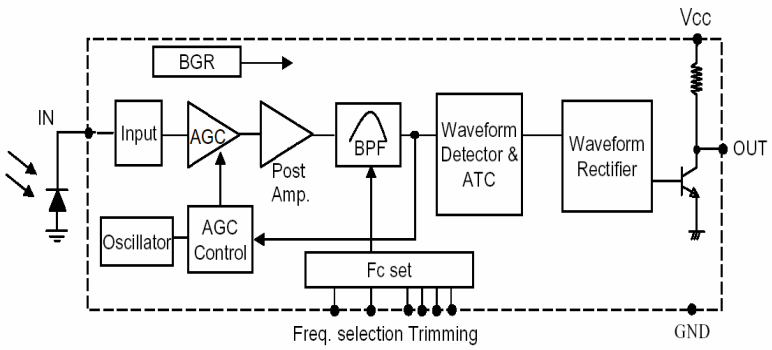
- Supply Voltage Range: 3.3V to 6.0V
- TTL and CMOS compatibility
- Photo detector and preamplifier in one package.
- Internal filter for PCM frequency
- Open collector output [built-in Pull-up resistor(40K)]
- Output active low
- Enhanced Immunity against all kinds of disturbance light
- No occurrence 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



B.P.F Center Frequency

Model No.	Carrier Frequency (fo)
FM-3032□□-5CN	32.7 K
FM-3036□□-5CNP	36.0 K
FM-3036□□-5CN	36.7 K
FM-3038□□-5CN	37.9 K
FM-3040□□-5CN	40.0 K
FM-3056□□-5CN	56.0 K

Suitable Data Format

Grundig code	◆	RCS-80 code	◇	Sony 15-bit code	◆◆
NEC code	◆◆	R-2000 code	◆	Sony 20-bit code	◆◆
RC5 code	◆◆	RCA code	◆	Zenith code	◆
RC6 code	◆◆	Sharp code	◆	High data rate code	◇
RCMM code	◇	Sony 12-bit code	◆	Disturbance suppression	◆◆

Note : ◆◆ : Best for this application ; ◆ : Suitable for this IR code ; ◇ : Not recommended

Absolute Maximum Ratings

(Ta = 25℃)

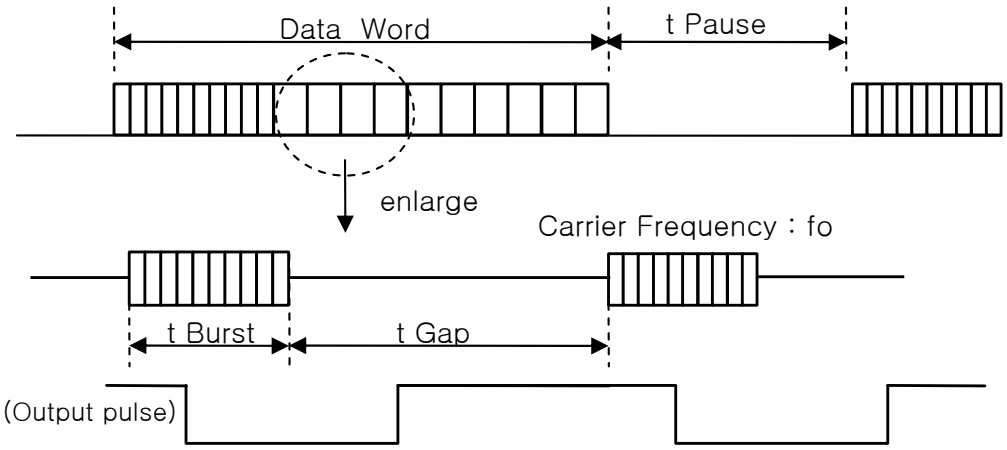
Parameter	Symbol	Ratings	Unit
Supply Voltage	Vcc	6.5	V
Supply Current	Icc	1.5	mA
Operating Temperature	T_{opr}	-20 ~ +80	℃
Storage Temperature	T_{stg}	-30 ~ +85	℃
Soldering Temperature	T_{sd}	260℃, Max 5 sec	℃

Electro-optical Characteristics

(Ta = 25℃)

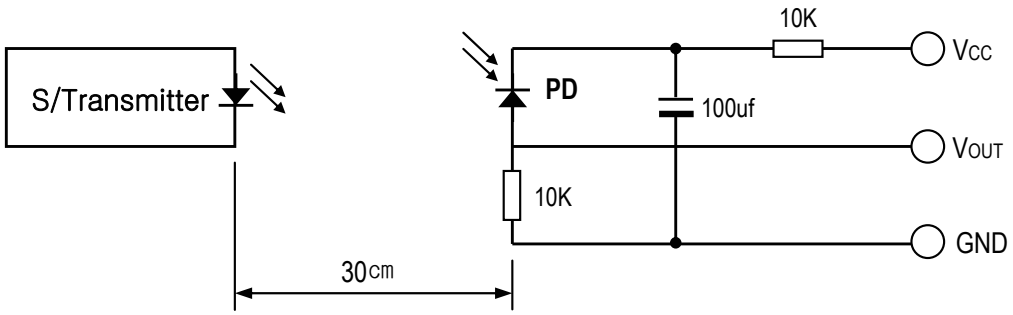
Parameter	Symbol	Min.	Typ.	Max.	Unit	
Supply Current	ICC	0.6	1	1.2	mA	No signal
Output Voltage	Voh	Vcc-0.5	-	-	V	
	Vol	-	0.2	0.4	V	
Peak Wave Length	λp	-	940	-	nm	
Internal Pull-up Resistor	Rpul	36	40	44	kΩ	
BPF frequency	fc	-3.5	fo	+3.5	%	
Output Pulse width	Tpw	400	600	800	μs	Burst Wave =600μs Period = 1.2ms

[Fig.1] Data Signal diagram



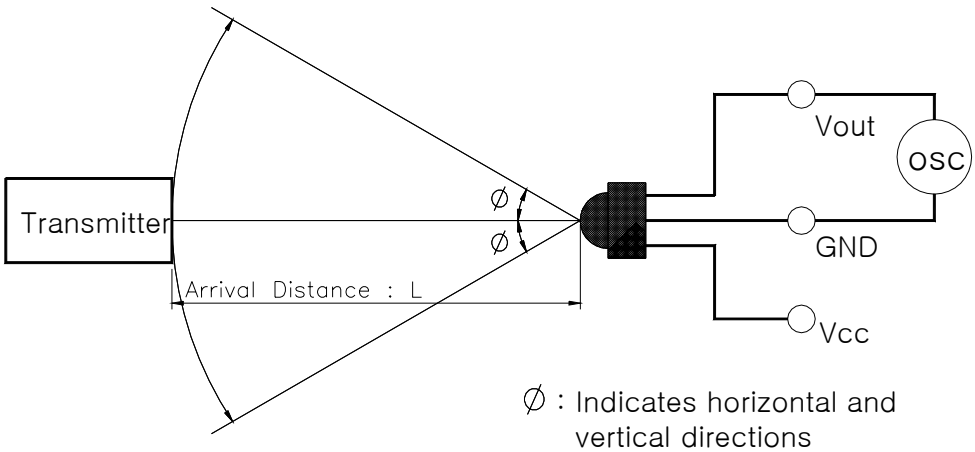
- t Gap : Signal gap time between two burst in pulses of carrier. Minimum Gap Time ≧ 300us
- t Burst : Length of a burst in pulses of the carrier frequency. Minimum Burst ≧ 300us
- t pause : Data pause between two data words. Minimum Data PauseTime ≧ 20ms

[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 VOUT 200mVp-p upon Po measuring circuit Standard Transmitter

[Fig.3] Test condition of arrival distance



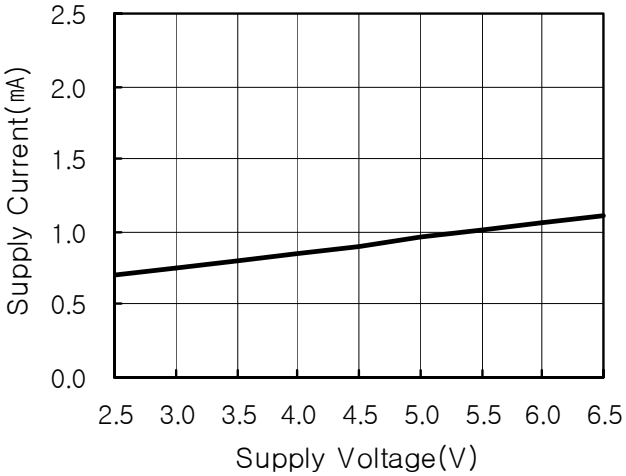
Ø : Indicates horizontal and vertical directions

[Measurement condition for arrival distance]

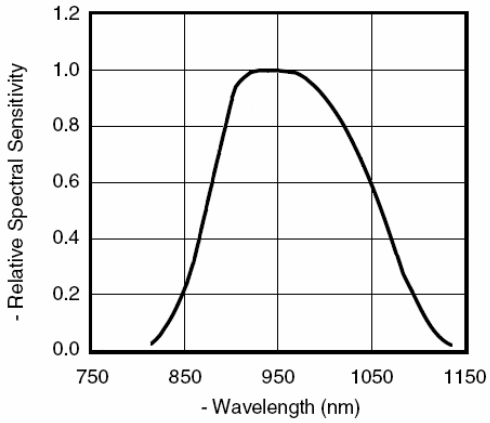
☞ Ambient light source : Detecting surface illumination shall be irradiate 200±50Lux under ordinary white fluorescence lamp without high frequency lighting

Electrical/Optical Characteristics

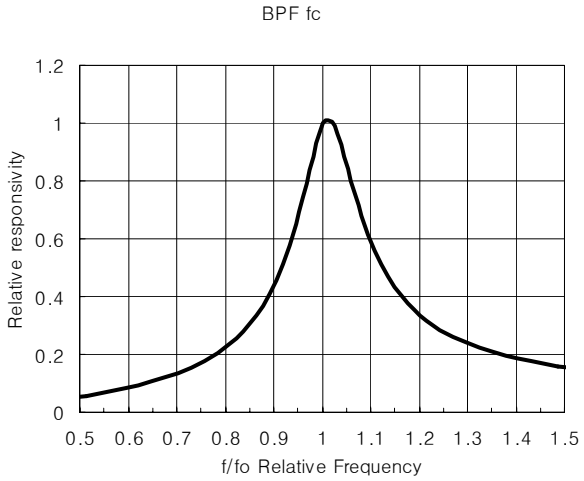
[Fig.4] Supply Current vs. Voltage



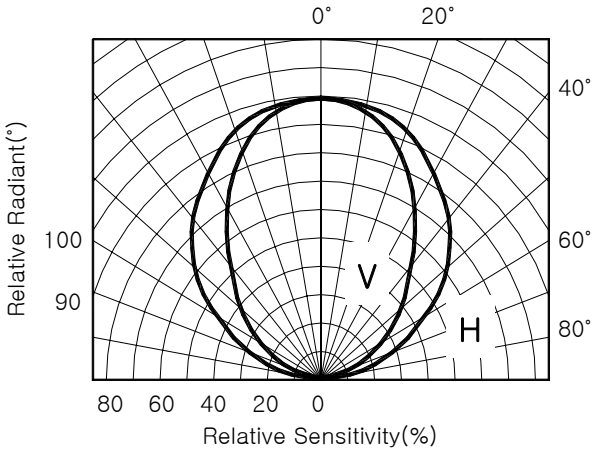
[Fig.5] Relative Spectral Sensitivity vs. Wavelength



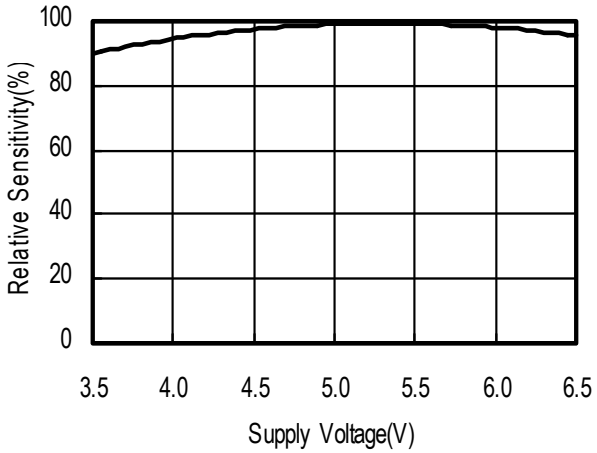
[Fig.6] BPF Fc Curve



[Fig.7] Directivity (Horizontal/Vertical)



[Fig.8] Sensitivity vs. Supply Voltage



ESD Test Results

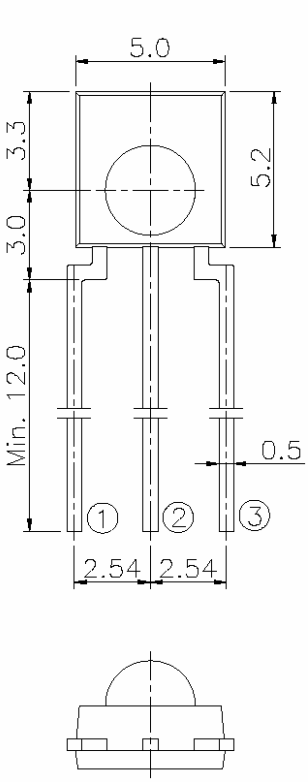
Parameter	Conditions	Specification	Results
Machine Model	C=200pF R=0Ω	Min ±200V	>±200V
Human Body Model	C=100pf R=1.5KΩ	Min ±2000V	>±2000V

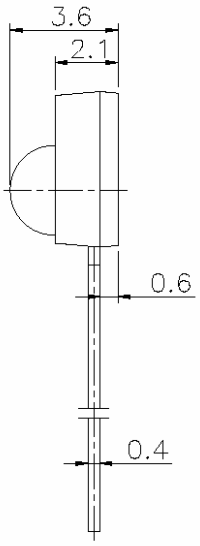
OPTO-SENSOR

RoHS COMPLIANT

Pb-Free

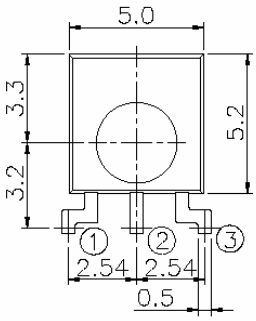
FM-3038LN-5CN

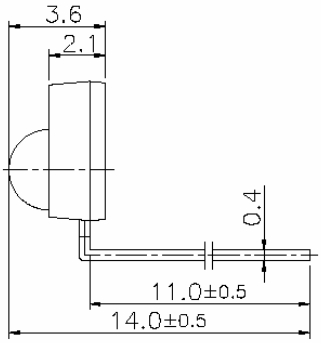


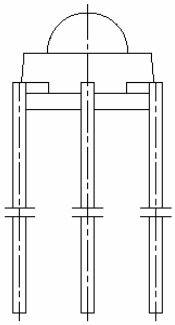


NOTE:
1.PIN CONFIG
①Vout
②GND
③Vcc
2.G.T±0.3
(UNIT: mm)

FM-3038TN2-5CN







NOTE:
1.PIN CONFIG
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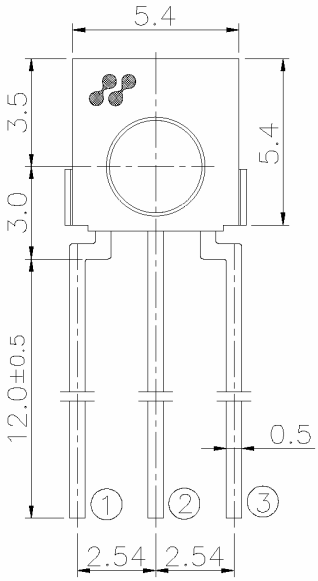
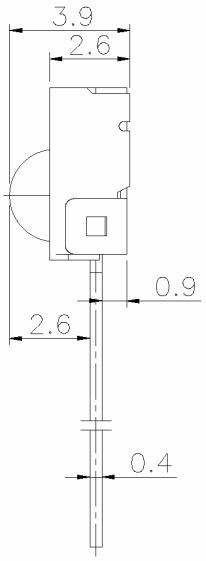
②GND
③Vcc
2.G.T±0.3
(UNIT: mm)

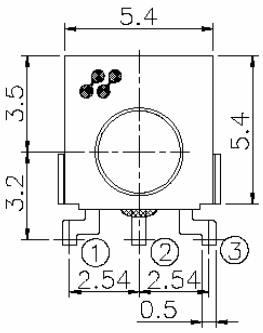
FM-3038LM-5CN

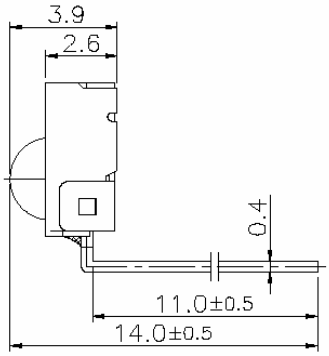


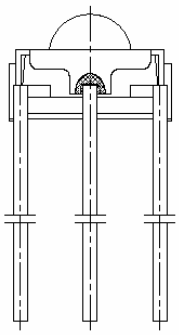


NOTE:
1.PIN CONFIG
①Vout
②GND
③Vcc
2.G.T±0.3
(UNIT: mm)

FM-3038TM2-5CN

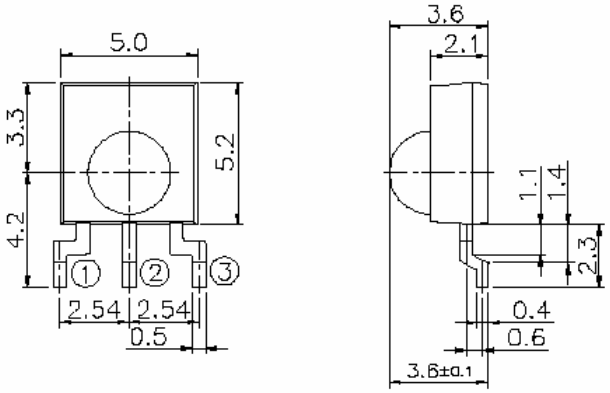




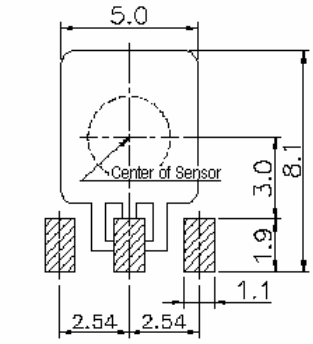


NOTE:
1.PIN CONFIG
①Vout
②GND
③Vcc
2.G.T±0.3
(UNIT: mm)

FM-3038SN-5CN

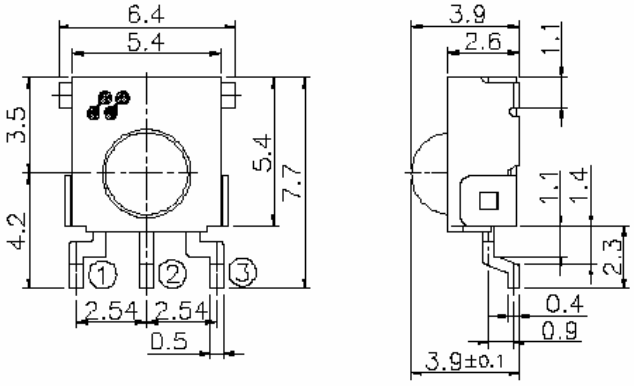


Soldering pad for reflow soldering

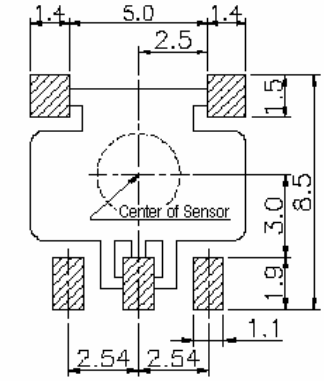


NOTE:
1.PIN CONFIG
①Vout
②GND
③Vcc
2.G.T±0.3
(UNIT: mm)

FM-3038SM-5CN



Soldering pad for reflow soldering



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1.PIN CONFIG
①Vout
②GND
③Vcc
2.G.T±0.3
(UNIT: mm)