

IR Receiver Modules for Remote Control Systems

Description

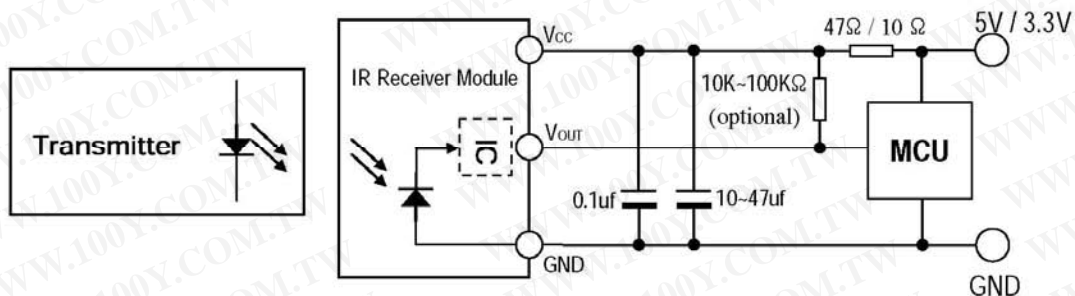
The FM-8038□□-5DN is miniaturized receiver for infrared remote control system. The PIN Photodiode and preamplifier are assembled on lead frame. The epoxy package is designed as IR filter. The module has excellent performance even in disturbed ambient light application and provides protection against uncontrolled output pulses.



Features

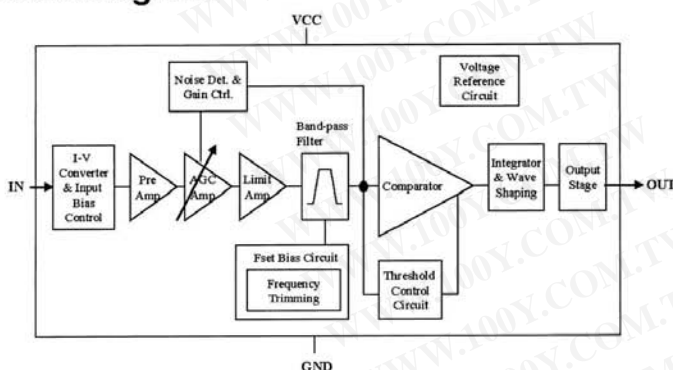
- Transfer Mold Package.
- Supply Voltage Range: 2.7V to 5.5 V
- Supply Current : 0.4mA
- Epoxy IR filter characteristic : 940nm
- Maximum interference safety against optical and electrical disturbance.
- Internal filter for a high frequency lighting fluorescent lamp.
- Internal Pull-Up output.
- Meet 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-8032□□-5DN	32.7 K
FM-8036□□-5DN	36.0 K
FM-8038□□-5DN	37.9 K
FM-8040□□-5DN	40.0 K

Suitable Data Format

NEC code	◆◆	Toshiba code	◆◆	Matsushita code	◆◆
RC5 code	◆◆	Sharp code	◆	Mitsubishi code	◆◆
RC6 code	◆◆	Sony 12-bit code	◆◆	JVC code	◆◆
RCMM code	◇	Sony 15-bit code	◆◆	Continuous code	◇
RCA code	◇	Sony 20-bit code	◇	Disturbance suppression	◆◆

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

Absolute Maximum Ratings

(Ta = 25°C)

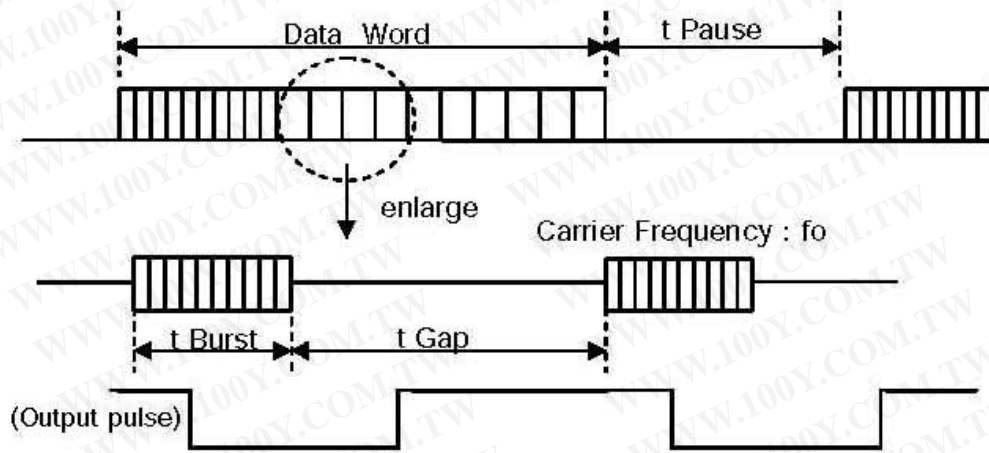
Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{CC}	6.5	V
Output Current	I _{sink}	1.5	mA
Operating Temperature	T _{opr}	-20 ~ +80	°C
Storage Temperature	T _{stg}	-30 ~ +85	°C
Soldering Temperature	T _{sd}	260°C, Max 5 sec	°C

Electro-optical Characteristics

(Ta = 25°C)

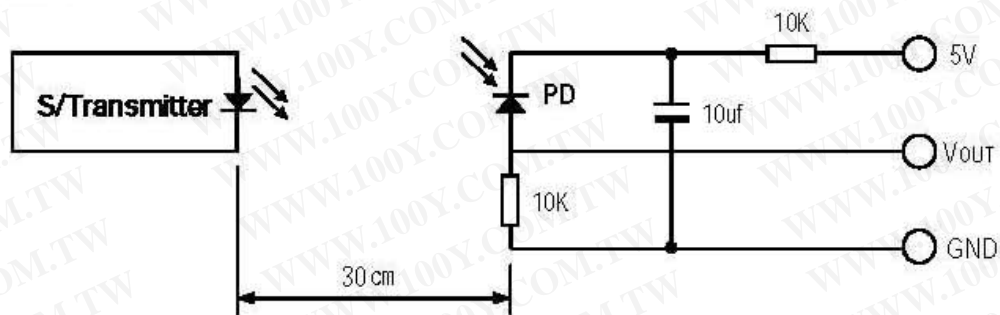
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
Supply Current	ICC	0.3	0.4	0.5	mA	No signal input	
Output Voltage	V _{oh}	V _{CC} -0.5	-	-	V	No external pull-up resistor (I _{sink} < 1mA)	
	V _{ol}	-	0.2	0.4	V		
Peak Wave Length	λ _p	-	940	-	nm		
Internal Pull-up Resistor	R _{pul}	-	94	-	kΩ		
Arrival Distance	L	±0°	20	-	-	m	Fig 1,2,3
		±30°	15	-	-	m	
		±45°	10	-	-	m	
Output Pulse width	T _{pw}	400	600	800	us	Burst Wave =600us Period = 1.2ms	

[Fig.1] Data Signal diagram



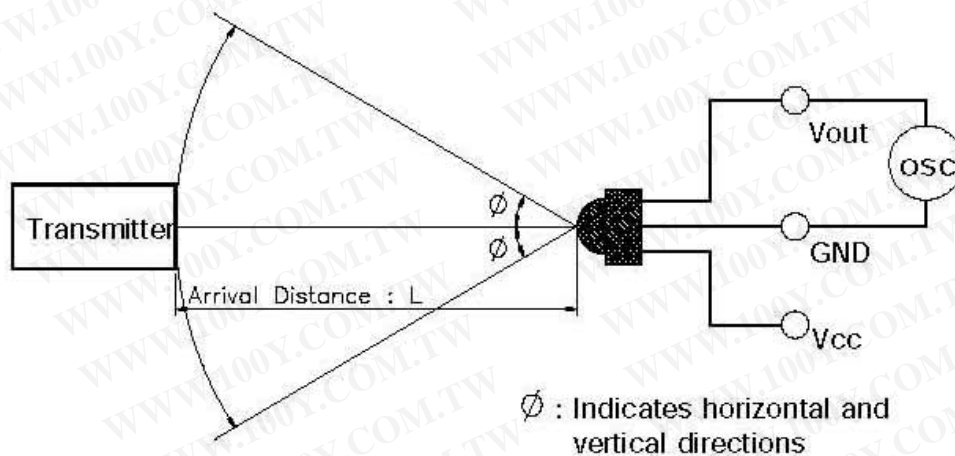
- t Gap : Signal gap time between two burst in pulses of carrier. Minimum Gap Time ≥ 16 pulses
- t Burst : Length of a burst in pulses of the carrier frequency. Minimum Burst ≥ 12 pulses
- t pause : Data pause between two data words. Minimum Data Pause Time ≥ 22 ms

[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_{out} 200mVp-p upon P_o measuring circuit Standard Transmitter

[Fig.3] Test condition of arrival distance

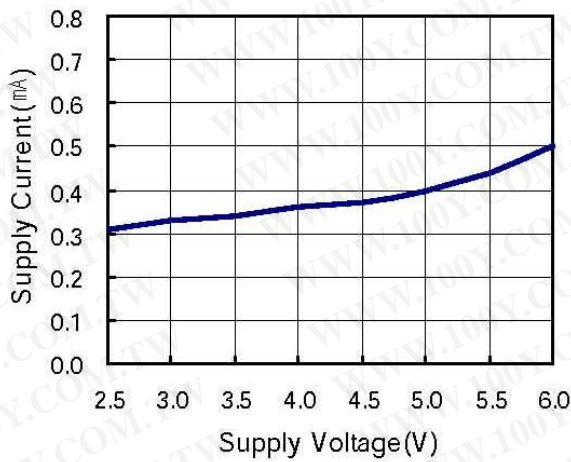


[Measurement condition for arrival distance]

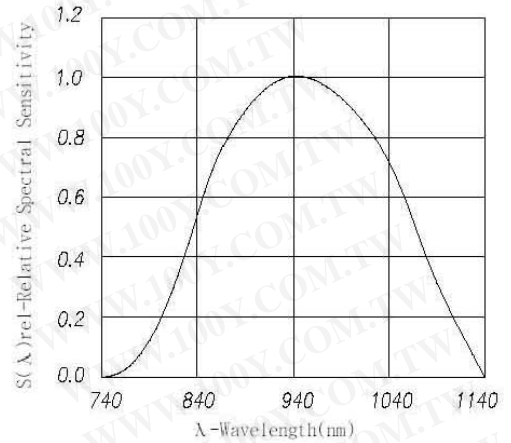
- ☞ Ambient light source : Detecting surface illumination shall be irradiate 200 ± 50 Lux under ordinary white fluorescence lamp without high frequency lighting

Electrical/Optical Characteristics

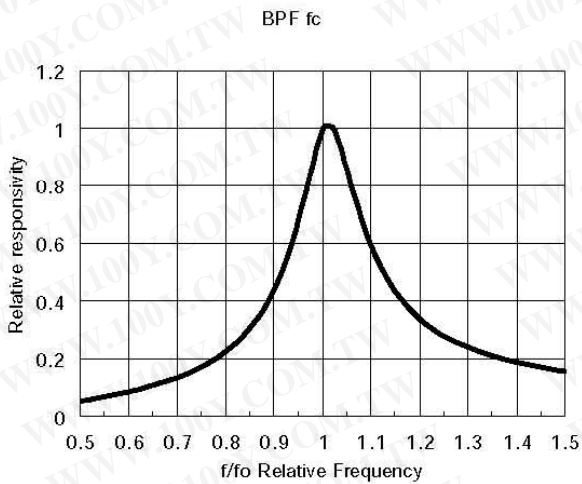
[Fig.4] Supply Current vs. Voltage



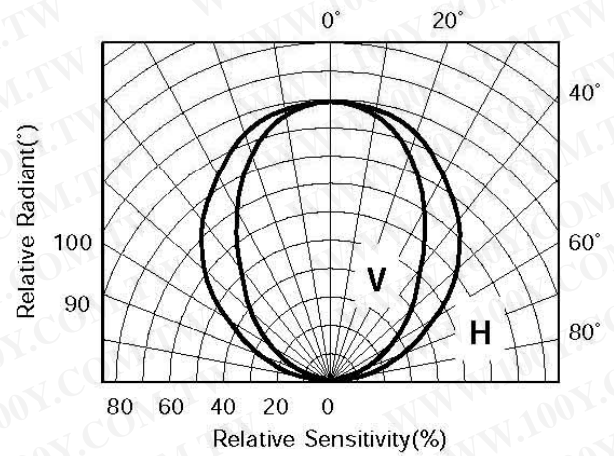
[Fig.5] Relative Spectral Sensitivity vs. Wavelength



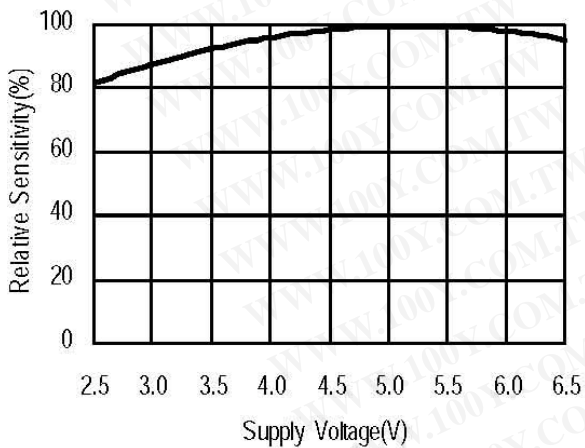
[Fig.6] BPF Fc Curve



[Fig.7] Directivity (Horizontal/Vertical)



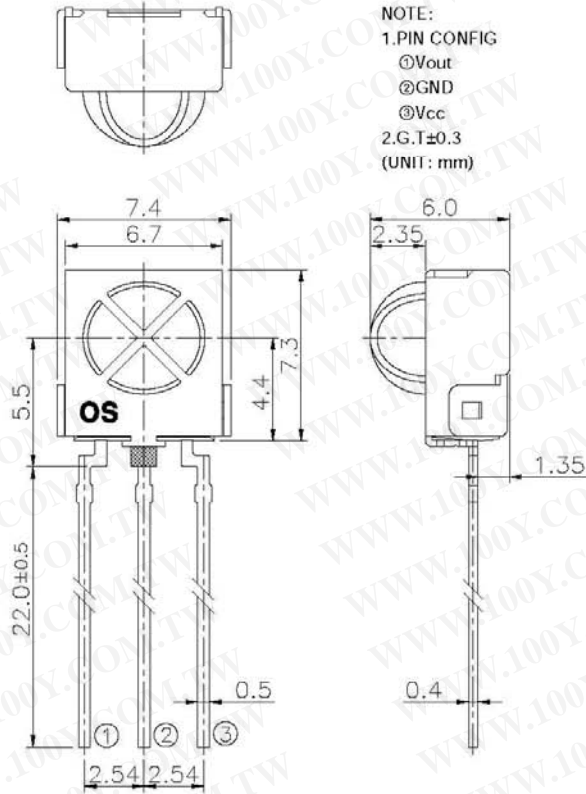
[Fig.8] Sensitivity vs. Supply Voltage



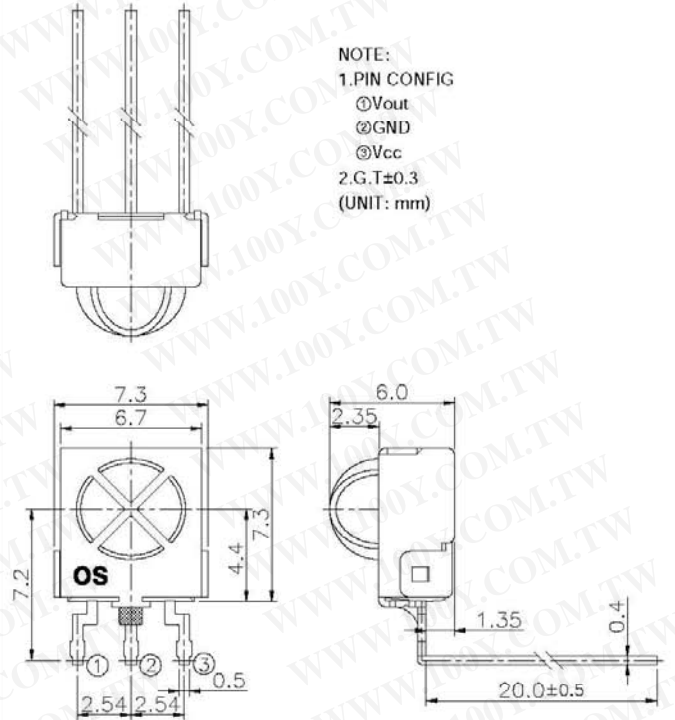
ESD Test Results

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

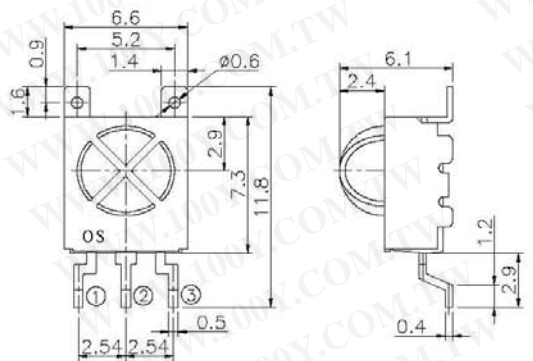
FM-8038LM-5DN



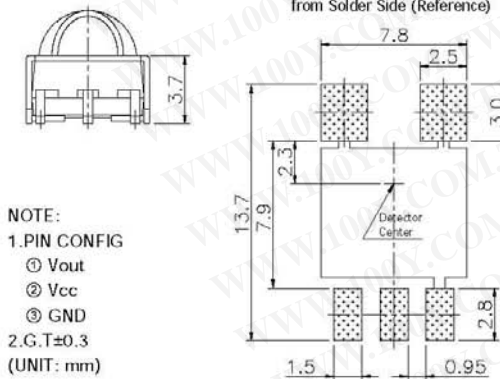
FM-8038TM2-5DN



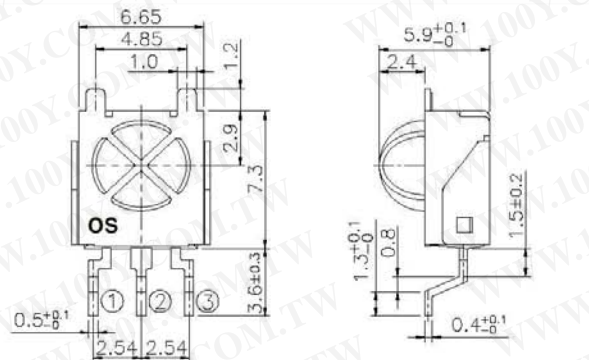
FM-8138SM-5DN



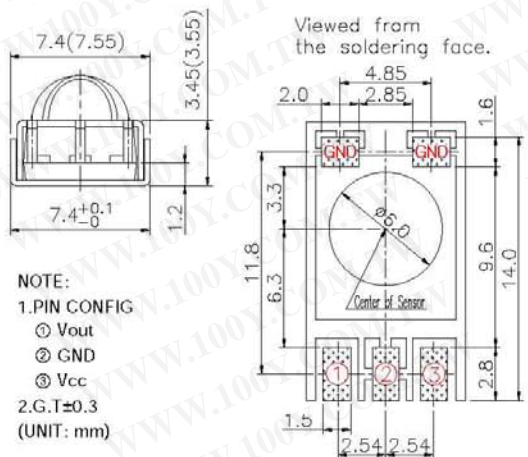
Example of Mounting drawing from Solder Side (Reference)



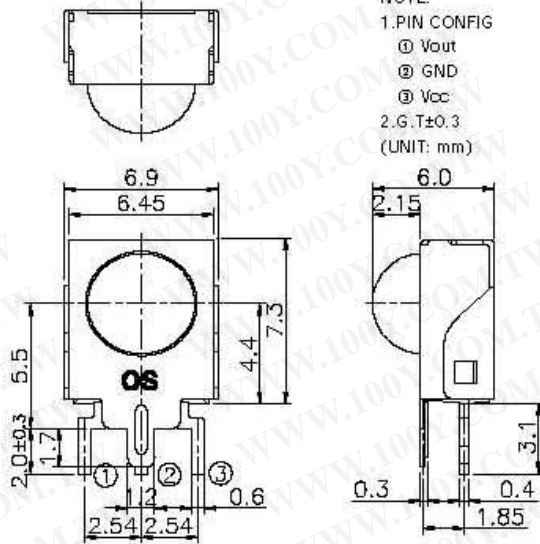
FM-8038SS-5DN



Viewed from the soldering face.



FM-8038SL-5DN



Example of Mounting drawing from Solder Side (Reference)