OPTO-SENSOR

F M-6038LM-5A

■ General Description

The photo IC is a complete IR receiver for data communication developed and optimized for use in carrier frequency modulated transmission applications. Its function can be described using the block diagram (see figure 1). The input stage meets two main functions. First, it provides a suitable bias voltage for the PIN diode. Secondly, the pulsed photo-current signals are transformed into a voltage by a special circuit which is optimized for low noise applications. After amplification by a controlled gain amplifier (CGA), the signals have to pass a tuned integrated narrow bandpass filter.The demodulator is used to convert the input butst signal into a digital envelope output pulse and to evaluate the signal information quality,I.e. unwanted pulses will be suppressed at the output pin. All this is done by means of an integrated dynamic feedback circuit which varies the gain as a function of the present environ mental condition (ambient light, modulated lamps etc.). Other special features are used to adapt to the current application to secure best transmission quality.

■ Features

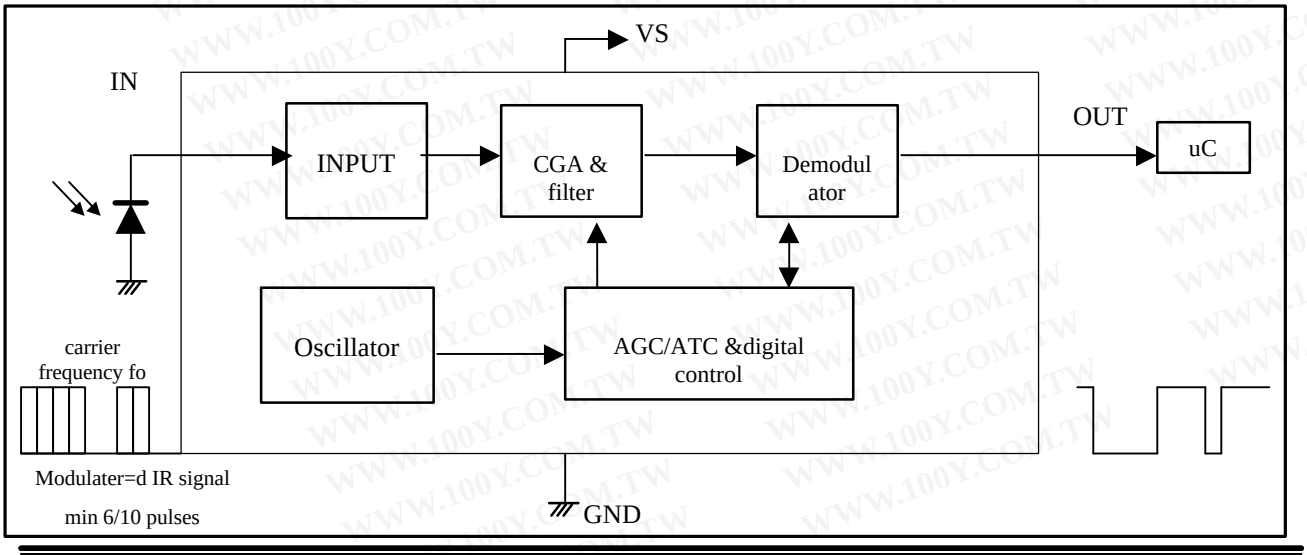
- No external components except PIN diode
- Supply-voltage range: 4.5V to 5.5V
- Automatic sensitivity adaptation (AGC)
- Automatic strong signal adaptation (ATC)
- Enhanced immunity against ambient light disturbance
- TTL and CMOS compatible
- Suitable min. burst length ≥10 pulses/burst

■ Application

- Audio video applications
- Home appliances
- Remote control equipment

■ Block Diagram

Figure 1.



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■ Absolute Maximum Ratings

(at 25 ℃ Unless otherwise note)

Parameter	Symbol	Ratings	Unit
Supply voltage	Vs	-0.3 to 5.5	V
Supply current	Is	5	mA
Input Voltage	Vin	-0.3 to Vs	V
Input DC current at Vs=5V	Iin	0.6	mA
Output voltage	Vo	-0.3 to 5.5	V
Storage temp.	Tstg	-40 to +125	℃
Operating temp.	Tamb	-25 to +85	℃
Power dissipation at Tamb=25°C	Ptot	30	mW
Soldering temp. *1	Tsd	260	℃

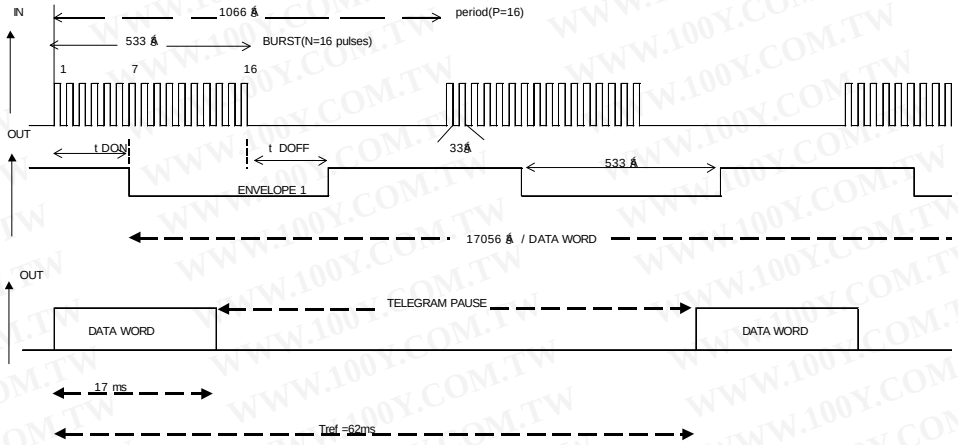
*1. t≦5s, 2mm from lead foundation.

■ Absolute Maximum Ratings

Tamb= -25 to 85℃, Vs=4.5 to 5.5V unless otherwise spe

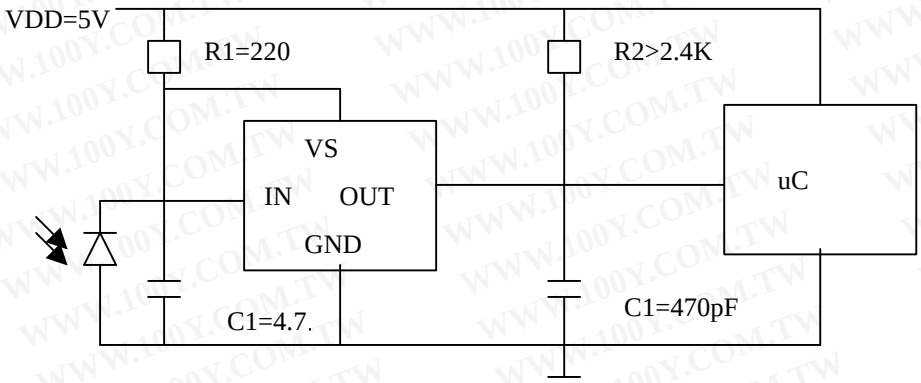
Parameter	Test Condition		Symbol	Min	Typ	Max	Unit
Supply voltage			Vs	4.5		5.5	V
Supply current(without Iin)	Iin=0		Is		1		mA
Internal pull-up resistor			Rpu		30~40		kΩ
Output voltage low	IOL=2mA		VOL	-		250	mV
Output voltage high			VOH	Vs-0.25		Vs	V
Max. DC output current	R2=2.4kΩ		Vodc			2	mA
Output current clamping	R2=0		IocL		7.5		mA
Max. input DC current	Vin=0		Vin			600	μA
AC input current at 100 Hz			I100			I	μA
Detection threshold current signal square peak to peak	38KHz		IEemin		500	1500	pA
Max. detection threshold current	Signal is square pp		IEemax		100		μA
Frequency			f	-	38	-	KHz
Center frequency zapping accuracy	T=25 ℃		fo	fo-1.5%	fo	fo+1.5%	KHz
Center frequency of bandpass			fo	fo-3%	fo	fo+3%	KHz
Arrival distance	200 ±50 Lux	0°	L	10	15	-	m
		±45°		7	10	-	

● Ustration of used terms

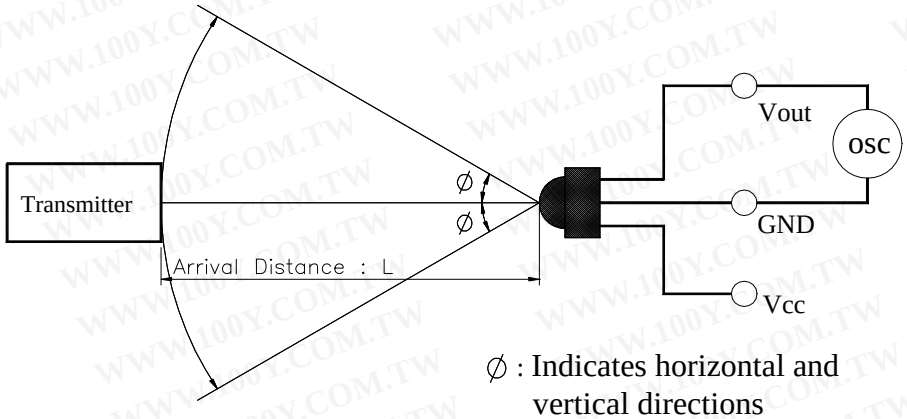


Example:f=30kHz,burst with 16 pulses,16 periods

● Application circuit



● Test condition of arrival distance



∅ : 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

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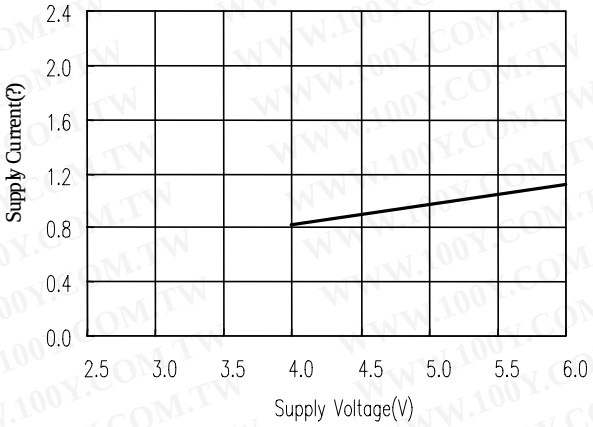
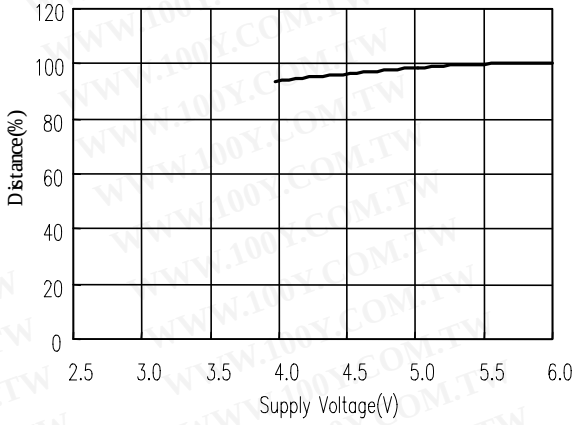
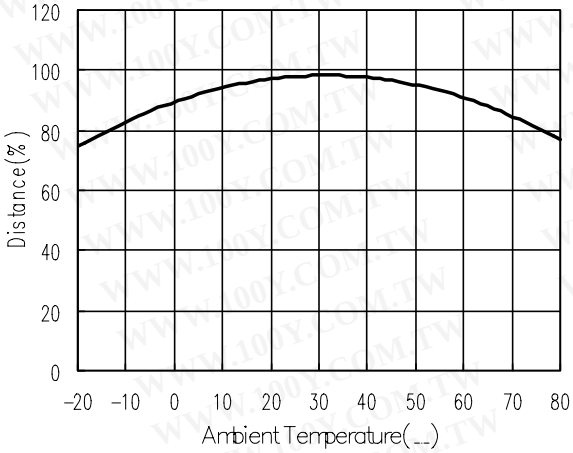
■ Typical Characteristics (Tamb = 25℃)



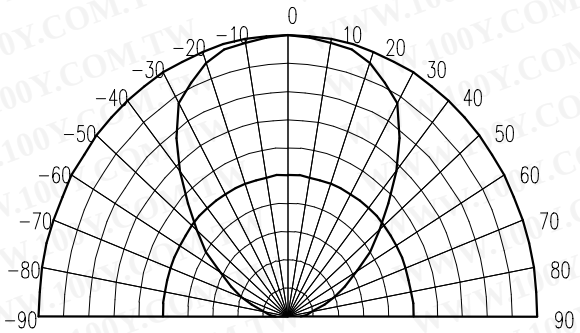
Supply Current vs.
Supply Voltage



Relative Distance vs.
Supply Voltage



Relative Distance vs.
Ambient Temperature



Sensitivity Angle
Characteristics for Reference

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NOTE:

1.PIN CONFIG

(1)Vout

(2)GND

(3)Vcc

2.G.T±0.3

(UNIT: mm)