

## Infrared receiving module

### 1、description:

W0038NL-7-M1 is With high speed and high sensitivity PIN photodiodes and low power consumption, high gain front amplifier IC, using plastic seal inner shield, used as receiver in infrared remote control system.



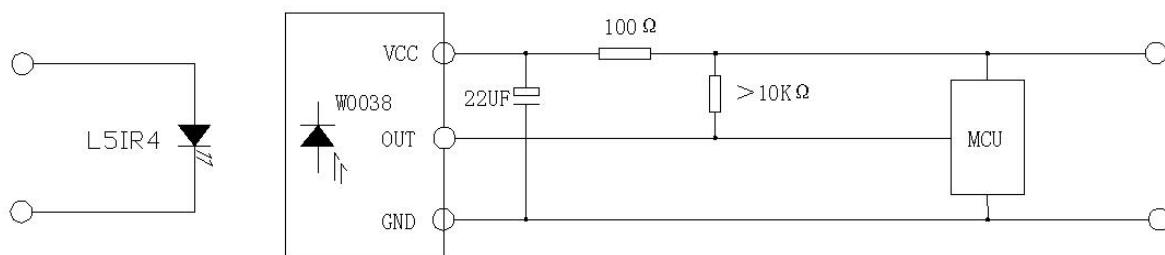
### 2、Features:

- ◆Supply Voltage Range: 2.7-5.5 V;
- ◆Modular encapsulation Inner shield;
- ◆TTL and CMOS compatibility;
- ◆Low power consumption;
- ◆Maximum working distance 20M;

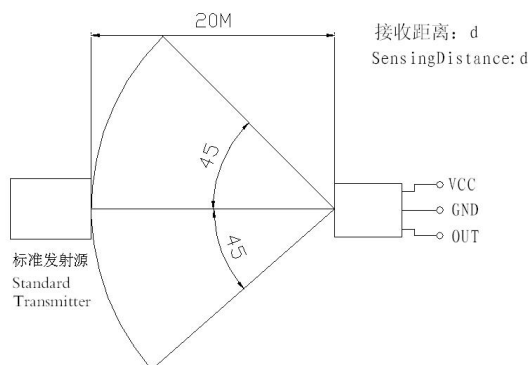
### 3、Applications:

- ◆VCD、DVD、TV
- ◆Toy、DVB

### 4、Application circuit :



### 5、Arrival distance •



## 6、Absolute Maximum Ratings : (Ta=25℃)

| Parameter             | Symbol           | Ratings    | Unit |
|-----------------------|------------------|------------|------|
| Supply Voltage        | VR <sub>cc</sub> | 0—6        | V    |
| Operating Temperature | Topr             | -40— +80   | ℃    |
| Storage Temperature   | Tstg             | -40 — +100 | ℃    |
| Soldering Temperature | Tsol             | 260 (5S)   | ℃    |

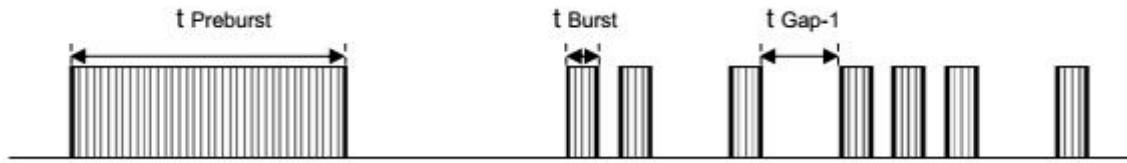
## 7、Electro-optical Characteristics :

Specifications hold over the Recommended Operating Conditions, unless Otherwise herein. All values are at 25℃ and Vcc=3.0v/5.0v

| Parameter                 | Symbol          | Min | Typ  | Max | Unit | Conditions                                     |
|---------------------------|-----------------|-----|------|-----|------|------------------------------------------------|
| Supply Current            | I <sub>cc</sub> | 0.2 | 0.4  | 0.6 | mA   | Lin=0 μ A , Vcc=3V                             |
|                           |                 | 0.3 | 0.53 | 0.7 | mA   | Lin=0 μ A , Vcc=5V                             |
| Max. Voltage Gain         | A <sub>v</sub>  | 70  | 76   | 85  | dB   | Fin=37.9kHz                                    |
|                           |                 |     |      |     |      | Vin=30 μ v kHz                                 |
| BPF Bandwidth             | fbw             |     | 5.0  |     | kHz  | -3Db Bandwidth,<br>Vin=30 μ v p-p kHz          |
| BPF Center Frequency      | F <sub>0</sub>  | —   | 37.9 | —   | kHz  | **                                             |
| Output Pulse Width        | T <sub>pw</sub> | 450 | 600  | 750 | μ s  | Fin=37.9kHz, burst wave<br>Vin=5 μ v p-pNote*1 |
| Low level Output Voltage  | V <sub>oL</sub> | —   | 0.2  | 0.4 | V    | I <sub>sink</sub> =2.0mA                       |
| High level Output Voltage | V <sub>oH</sub> | 2.7 | 3    | —   | V    | Vcc=3V                                         |
|                           |                 | 4.8 | 5    | —   | V    | Vcc=5V                                         |
| Reception distance        | L               | 0°  | —    | 20  | —    | VCC=5V                                         |
|                           |                 | 45° | —    | 12  | —    |                                                |
| Half angle                | Δ θ             |     | ±45  |     | Deg  | **                                             |

## 8、Test signal for output pulse width :

(Tamb=25°C unless otherwise specified)

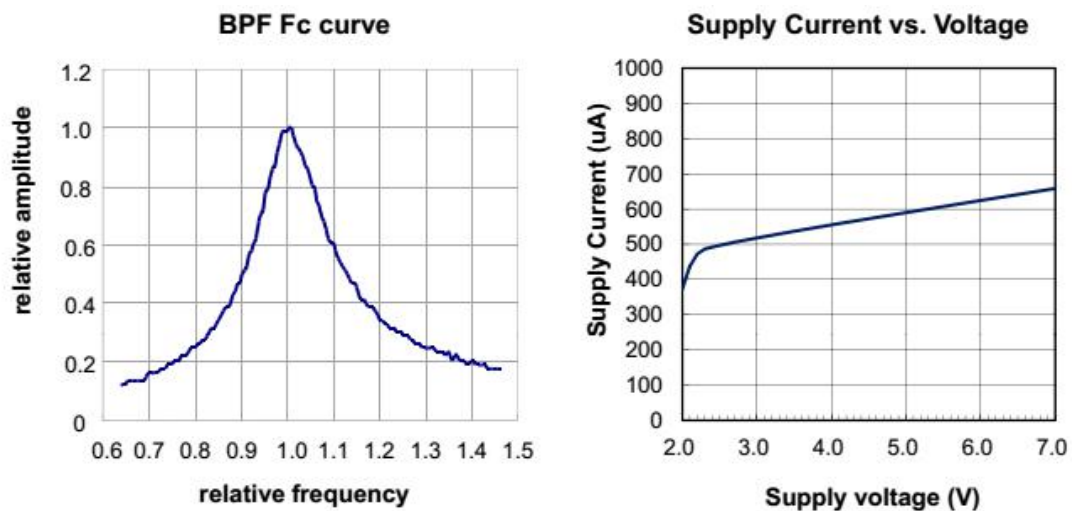


|                                                                                            |          |
|--------------------------------------------------------------------------------------------|----------|
| Minimum Burst length $t_{Burst}$<br>(number of pulses per burst)                           | 250us    |
| Minimum dat puse time $t_{Burst-gap}$<br>(number of pulses per burst)<br>Between two burst | 300us    |
| Minimum pause time in the data stream                                                      | Min.25ms |

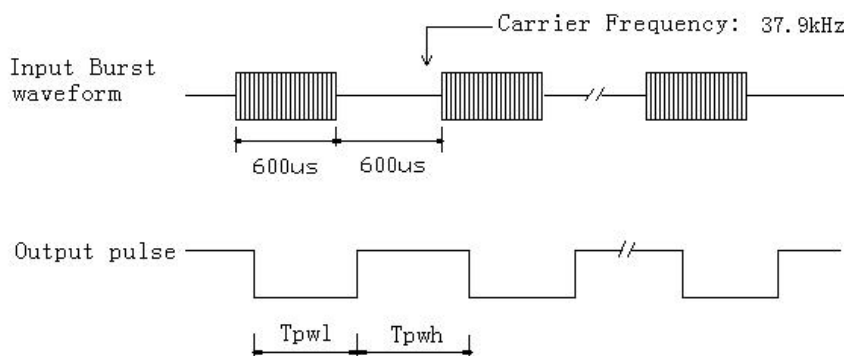
## 9、suitable data format :

|             |                             |     |
|-------------|-----------------------------|-----|
| Data format | NEC                         | yes |
|             | Toshiba Code                | yes |
|             | RC5 Code                    | yes |
|             | RC6 Code                    | yes |
|             | Sony 12bit/15bit/20bit Code | no  |
|             | XMP/RCMM Code               | no  |

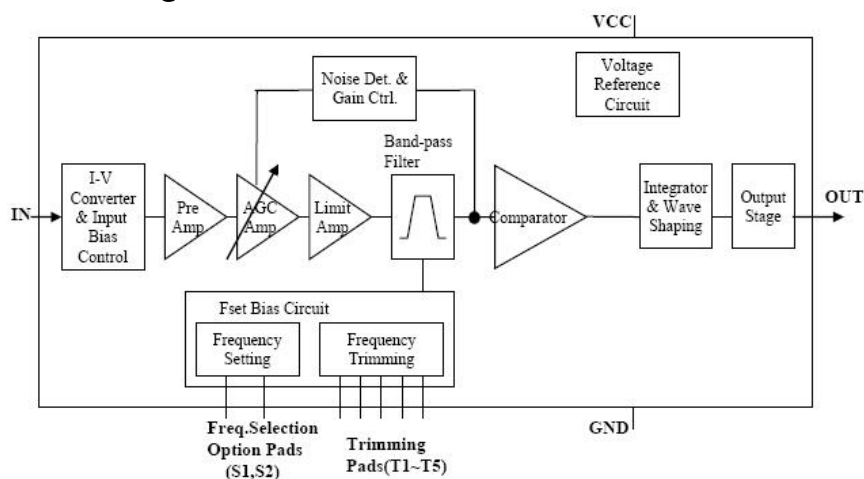
## 10、Characteristics Curve :



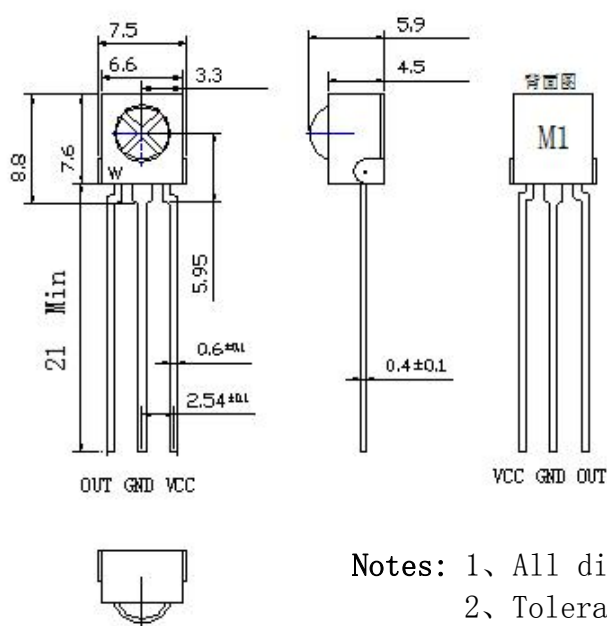
11、 Test waveform:



12、Circuit diagram :



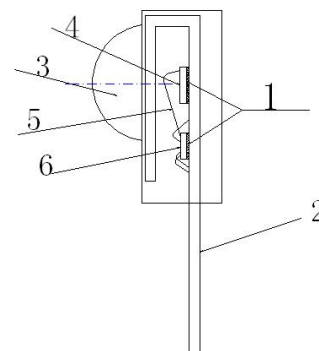
### 13、 Package Dimensions:



**Notes:** 1、 All dimensions are in millimeters;  
2、 Tolerances unless dimensions  $\pm 0.25\text{mm}$

#### 14、Construction & Materials :

| NO | Name       | Material    |
|----|------------|-------------|
| 1  | Bond       | Ag Paste    |
| 2  | Lead Frame | Fe          |
| 3  | Molding    | Epoxy Resin |
| 4  | PD chip    | Silicon     |
| 5  | Bond Wire  | Au Wire     |
| 6  | IC chip    | Silicon     |



#### 15、Reliability Test Item And condition :

| Test Items                     | Test conditions                                                                    | Test Indicators                                                                                               | Samples (n)<br>Defective (c) |
|--------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------|
| Temperature cycle              | 1 cycle-40℃ $\longleftrightarrow$ 100℃<br>(15min) (5min) (15min)<br>300 cycle test | After 1 hour of restoration, the photoelectric parameters are tested and the requirements of item 7 are met   | n=22<br>c=0                  |
| High Temperature test          | Temp:+100℃<br>Vcc: 6V<br>1000hrs                                                   | After 4 hours of restoration, the photoelectric parameters are tested and the requirements of item 7 are met. | n=22<br>c=0                  |
| Low Temperature storage        | Temp:-40℃<br>1000hrs                                                               |                                                                                                               | n=22<br>c=0                  |
| High Temperature High humidity | Ta:+85℃, Rh:85%<br>1000hrs                                                         |                                                                                                               | n=22<br>c=0                  |
| Solder heat                    | Temp:260±5℃ 10sec<br>2mm From the bottom of The package                            |                                                                                                               | n=22<br>c=0                  |
| Static resistance test (HBM)   | C=100pF, RL=1.5 kΩ                                                                 | 3 times, 1 second each, minimum ±2000V                                                                        | n=22<br>c=0                  |
| Static resistance test (MM)    | C=200pF, RL=0 kΩ                                                                   | 3 times, 1 second each, minimum ±200V                                                                         | n=22<br>c=0                  |

## 16、Use caveats :

### a、Welding conditions:

| Welding Method                                                                                                                                                                                                                                         | Condition                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wave Peak Welding                                                                                                                                                                                                                                      | Please weld it once within 260 ° C and 5 seconds, while avoiding the resin immersion in the tin trough. The welding point must be more than 2mm away from the root of the resin.             |
| soldering iron                                                                                                                                                                                                                                         | With a 30W soldering iron, the tip temperature is not more than 350 ° C, and welding is completed once within 5 seconds. The welding point must be more than 2mm from the root of the resin. |
| Reflow soldering                                                                                                                                                                                                                                       | Not applicable                                                                                                                                                                               |
| Remark: Do not apply external force to the product during welding. Take care not to cause corrosion or discoloration of the pin, otherwise it will cause welding difficulties. It is recommended to use it as soon as possible and in a timely manner. |                                                                                                                                                                                              |

### b、Use note:

#### ◆ Product warehouse storage requirements:

Products stored in clean, ventilated, non-corrosive gas warehouse, using anti-static bag packaging;

#### ◆The temperature and humidity of the warehouse meet the following requirements:

Storage temperature: below 25 °C -5 °C above humidity below: 75%

#### ◆ Online product storage requirements:

On-line products stored in clean, dust-free, dry thermostatic workshop, using electrostatic bag packaging;

The environmental conditions of exposed products are as follows:

Use temperature: below 25 °C -above 5 °C use humidity below: 70 RH

#### ◆ Production requirements and product packaging open, please note the following:

①Do not touch product pins with bare hands for a long time. Sweat will stick to the surface of pins. Subsequent storage or use will accelerate the discoloration and rust oxidation of the pins.

②Production should be equipped with anti-static gloves or finger sleeve operation, no bare-hand contact pin.

③Open packaging products need to be used in 24H, unfinished products need to put back anti-static bag sealed packaging, after installation products need to use sealed box packaging.

④Pin forming must be done before welding. The distance between the mounting holes in the circuit plate should be the same as the electrode pin.

⑤Pin cutting at high temperature will produce bad results. Please do pin cutting at normal temperature.

⑥IRM must not be subjected to any shock or external force before welding temperature returns to normal.

◆ electrostatic protection :

Electrostatic protection high brightness blue, green and white products are sensitive to static electricity, the use of the need to pay attention to electrostatic surge will damage or damage the product, contact with the product table please use conductive pad through the resistance grounding; The tip of the iron must be grounded; ion generators are recommended.

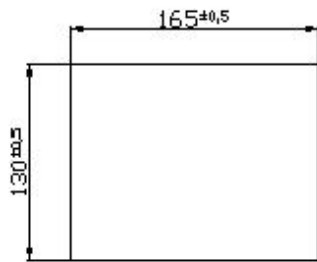
◆ wash:

Special care must be taken when cleaning the colloid with chemicals, as some chemicals damage the colloid surface and cause discoloration such as trichloroethylene, acetone, etc. Wipes and impregnates with ethanol for no more than 3 minutes at room temperature.

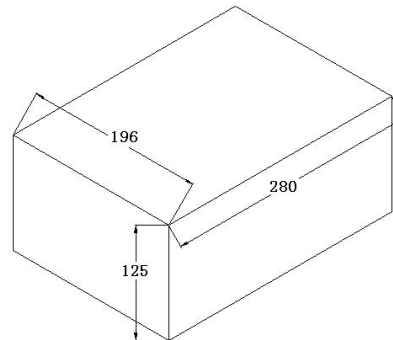
## 17、Packing requirements :

Packing shall be made of antistatic bag packing and outer paper packing. The outer paper packing case shall comply with the corresponding shipping requirements specified in GB191 and shall be marked with company name, trademark, address, product name, type, quantity, etc., and sealed, The case shall be certified, indicating the type, date of production and examiner code, etc.

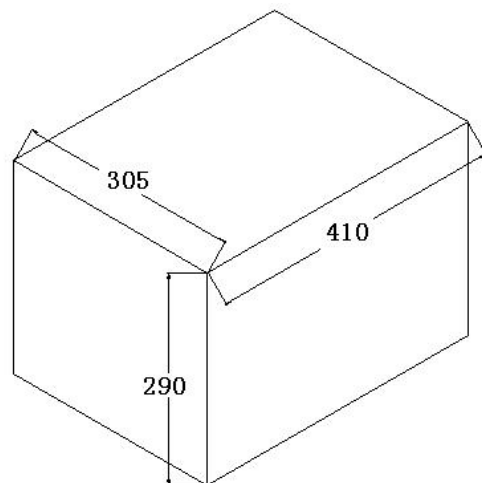
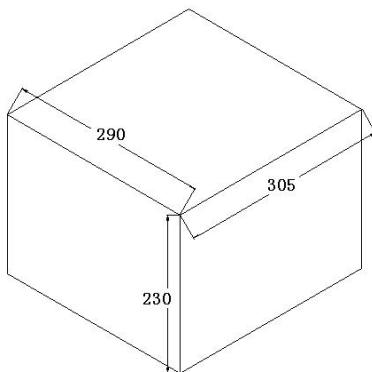
a. Bag size: unit: mm



b、Small outer box size (5Kpcs) unit: mm



c、Large outer box size (10K pcs / 20K pcs) (unit: mm)



d、Packing quantity:

250PCS per bag, 5000PCS per small carton, 10000PCS or 20000PCS per big carton