

## 1. Description

The R20□V1-7C(L) consist of a PIN Photodiode of high speed and a preamplifier IC in the package as an receiver for Infrared remote control systems

## 2. Features

- ◆ 2.7 ~ 5.5 Volt supply voltage, low power consumption
- ◆ Shielded against electrical field disturbance
- ◆ High immunity against ambient light
- ◆ Easy interface with the main board
- ◆ TTL and CMOS compatibility
- ◆ One mold package
- ◆ RoHS Compliance

## 3. Applications

- ◆ TV, VTR, Audio, Air Conditioners, Car Stereo Units, Computers, Interior controlling appliances, and appliances that require remote controlling

## 4. Package Outlines

See the attached Drawing No. RM-R20□V1-ASY-01

## 5. Absolute Maximum Ratings

[Ta = 25°C]

Parameter	Symbol	Rating	Unit
Supply Voltage / Output Voltage	V <sub>cc</sub>	6	V
Supply Current / Output Current	I <sub>out</sub>	2.5	mA
Operating Temperature	T <sub>opr.</sub>	-20°C~80°C	°C
Storage Temperature	T <sub>stg.</sub>	-25°C~85°C	°C
Soldering Temperature	T <sub>sol.</sub>	260(Max 5 sec)	°C

## 6. Reliability Test

Parameter	Rating
High Temperature *1	Ta= + 80°C, Vcc=5V t=240H
High Temperature / High Humidity *1	Ta= + 85°C, 85%RH, Vcc=5V t=240H
Low Temperature *1	Ta= - 30°C, Vcc=5V t=240H
Heat Cycle *1	-25°C(0.5H) ~ + 85°C(0.5H) 20cycle
Dropping *2	Test devices shall be dropped 3 time naturally onto hard wooden board from a 75cm height position

Note : \*1. Electro-optical Characteristics shall be satisfied after leaving 2hours in the normal temperature

\*2. Electro-optical Characteristics shall be satisfied and no deforms and destructions of appearance.  
(excepting deforms of terminals)

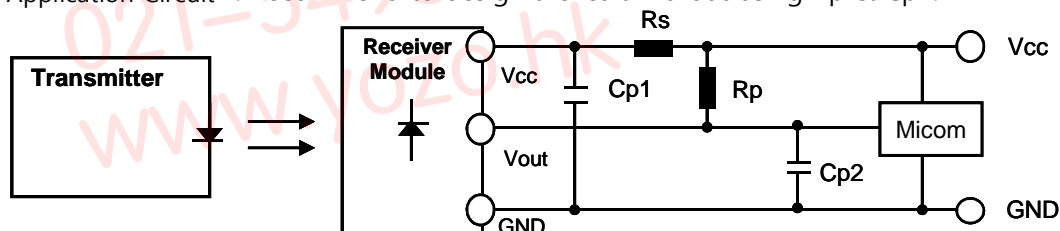
## 7. Electro-optical Characteristics

[ Ta= 25°C, Vcc=5.0V ]

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage Range	V <sub>CC</sub>		2.7	-	5.5	V
Current Consumption	I <sub>CC</sub>	No Input Signal	V <sub>CC</sub> =5V	-	0.5	mA
			V <sub>CC</sub> =3V	-	0.45	
Peak Wavelength *3	λ <sub>p</sub>		-	940	-	nm
B.P.F Center Frequency *4	f <sub>o</sub>		-	*4	-	kHz
Transmission Distance *3	L	250Lux	0 °	32	-	m
			±30 °	24	-	m
High Level Output Voltage *3	V <sub>OH</sub>	30cm over the ray axis	V <sub>CC</sub> -0.5	V <sub>CC</sub> -0.3	-	V
Low Level Output Voltage *3	V <sub>OL</sub>		-	0.2	0.5	V
High Level Output Pulse Width *3	T <sub>WH</sub>	Burst Wave = 600μs	400	-	800	μs
Low Level Output Pulse Width *3	T <sub>WL</sub>	Period = 1.2ms	400	-	800	μs
Output Form	Active Low Output					

Note : \*3. It specifies the maximum distance between emitter and detector that the output waveform satisfies the standard(8-2,3) under the conditions below against the standard transmitter

- 1) Measuring place : Indoor without extreme reflection of light
- 2) Ambient light source : Detecting surface illumination shall be irradiate 200±50Lux under ordinary white fluorescence lamp without high frequency lightning
- 3) Standard transmitter : Burst wave indicated in drawing(8-1) of standard transmitter shall be arranged to 1.6Vp-p under the measuring circuit specified in drawing(8-2,3)
- 4) Application Circuit : Recommend to design a circuit without using Rp & Cp2.



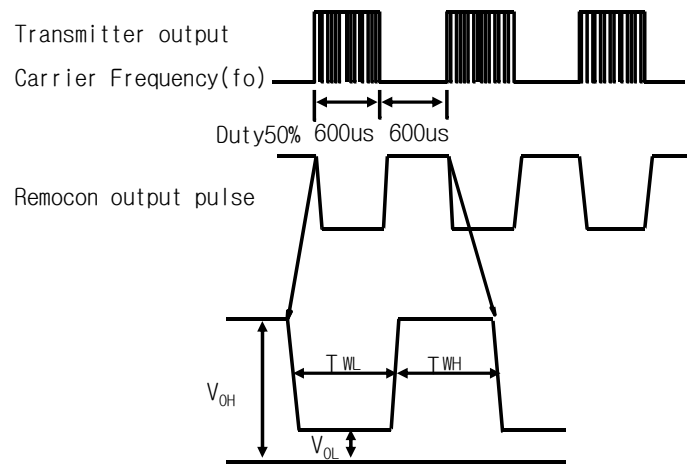
- 1) Rs (Vcc input series resistor) : 100 Ω ~ 470 Ω
- 2) Cp1(Vcc-GND terminal series Condenser) : 47 μF ~ 100 μF
- 3) Rp (Vcc-Vout terminal Pullup resistor) : Optional (when using 10kΩ or more )  
When Rp is lower than 10kΩ, Micom can't reply by a VoL rise
- 4) Cp2(Vout-GND terminal parallel Condenser) : Optional (when using 100 pF less than)

\*4. B.P.F Center Frequency(f<sub>o</sub>) of each model is shown below

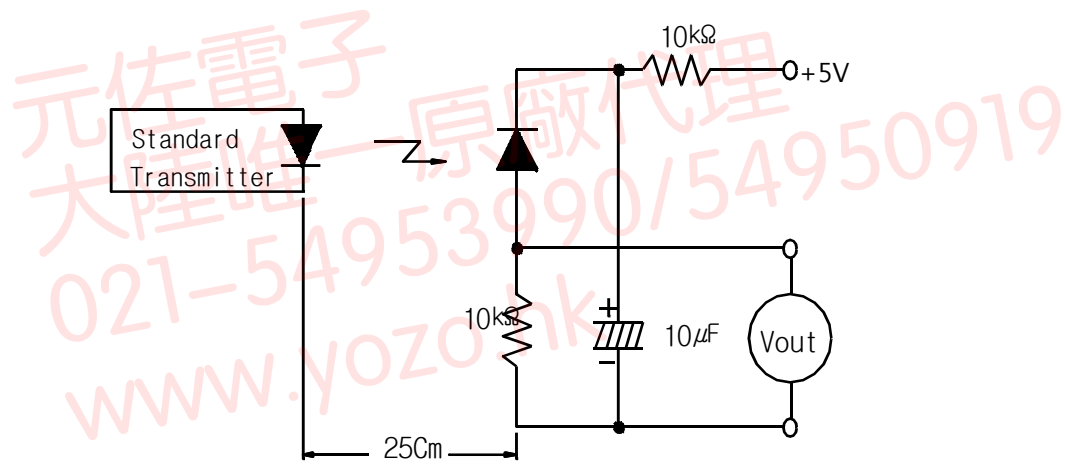
Model NO.	B.P.F Center Frequency(kHz)
R201V1-7C(L) Series	40.0
R202V1-7C(L) Series	36.0 & 36.7
R203V1-7C(L) Series	37.9
R204V1-7C(L) Series	32.7
Not Support	56.7

8. Measure Method

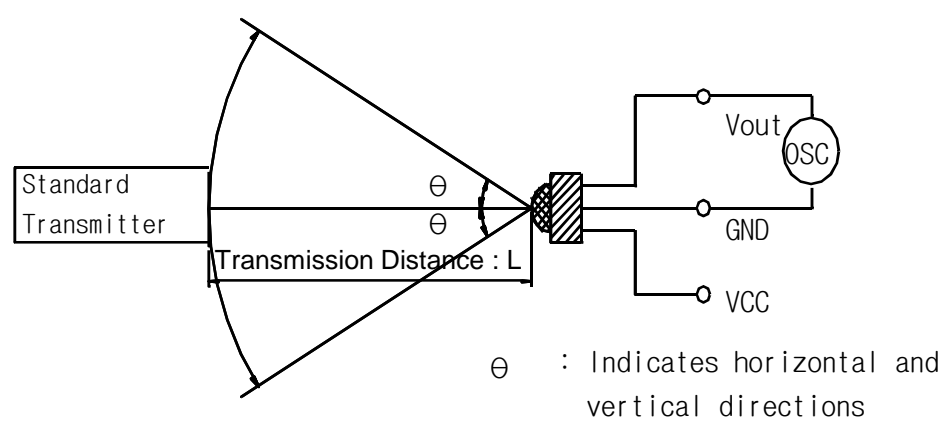
8-1. Output Pulse Width



8-2. Standard Transmitter



8-3. Test Condition of Transmission Distance



9. Inspection Criteria

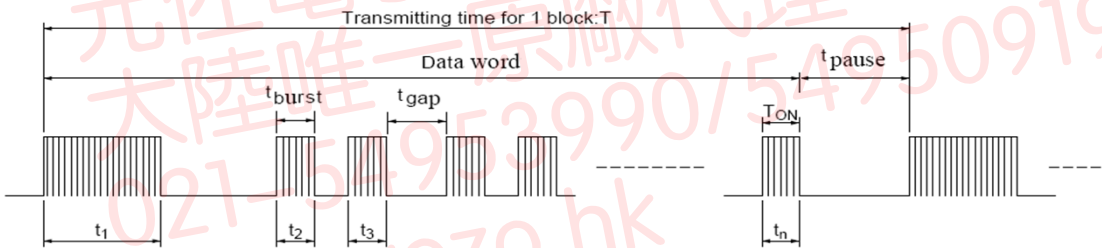
- In electro-optical characteristics, total quantity shall be inspected as below.
- Front distance between emitter and detector
  - Current consumption
  - High level output voltage
  - Low level output voltage

10. Customer must check below clauses before using

10-1. When this infrared remote control detecting unit shall be adopted for wireless remote control, please keep the following standards.

- 1) Data word length = Max. 100msec
- 2) t<sub>pause</sub> = Min. 25msec
- 3) Duty(Σt<sub>burst</sub> / T ) = Max. 30%
- 4) t<sub>Burst</sub> = Min. 300usec
- 5) t<sub>Gap</sub> = Min. 300usec
- 6) above (1)~(5) should be all meet and all remote control button should be operated properly.

suitable DATA FORMAT : ● : continuouse key    ×: one key					
NEC CODE	●	SONY 12bit	●	Matsushita Code	●
RC5 /RC6	●	SONY 15bit	×	Mitsubishi Code	×
Toshiba Micom Code	●	SONY 20bit	×	Zenith Code	●
Sharp Code	●	RCMM	×	JVC Code	●
Continuous Data communication don't support. (t <sub>pause</sub> = 0ms)					



10-2. We recomment minimum 30cm distance between RC-M and transmitter for normal operating.  
If the distance between RC-M and Transmitter is too near, it might not respond.

10-3. LCD Dimming have to be higher than Duty 30% And frequency 100Hz(= period 10ms)  
Ex) Good (100Hz Duty 30%, 120Hz Duty 20%), No Good ( 100Hz Duty 10%, 80Hz Duty 30%)

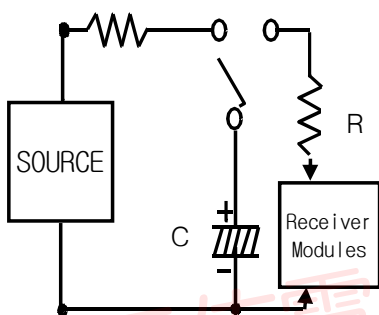
10-4. If your condition doesn't meet the above statement, it might not operate properly.

11. Caution(When use and storage of this device)

- 11-1. Store and use where there is no force causing transformation or change in quality
- 11-2. Store and use when there is no extreme humidity
- 11-3. Do not wash this device. Wipe the stains of diode side with a soft cloth.  
You can use the solvent, ethylalcohol or methylalcohol or isopropylalcohol only.
- 11-4. The shield case shall be grounded on the PCB pattern. There are two cases, one is that shield case and GND pin are connected in the shiled case, the other is not connected in it.  
If the receiver modules of shield case is not becoming ground connection, there is a possibility of being weak in the EMI(ElectroMagnetic interference) condition.
- 11-5. Solder pad within the condition of ratings. after soldering do not add extrorse force.

- 11-6 Solder pad within the condition of ratings. after soldering do not add extrorse force.
- 11-7. Put decoupling device between Vcc and GND for reduce the noise from power supply line.  
recommand Vcc-GND 47 $\mu$ F and Vcc- 100 $\Omega$ . Decoupling device should be near receiver modules.
- 11-8. The decrease in distance, the output noise, the malfunction, etc. might occur because of a surrounding electromagnetic environment.
- 11-9. To prevent static electricity damage to the Pre-AMP make sure that the human body, the soldering iron is connected to ground before using
- 11-10. This device has to control of static electricity

KODENSHIAUK Corp. guarantees a R20□V1-7C(L) up to M.M 200V , HBM 2KV



M.M = MACHINE MODEL(Resistance: 0K $\Omega$  Capacitor: 200pF)  
HBM = HUMAN BODY MODEL( Resistance: 1.5k $\Omega$  Capacitor: 100pF)

- 11-10. This device is not design to endure radiate rays and heavily charged particles.

## 12. Period of Guarantee and Extent of Guarantee

### 12-1.Period of Guarantee

1 year after designated place.

### 12-2.Extent of Guarantee

KODENSHI AUK Corp. Shall supply the replacements against defects that will caused from KODENSHI AUK Corp. fault.

### 12-3 .This product complies with RoHS directive.

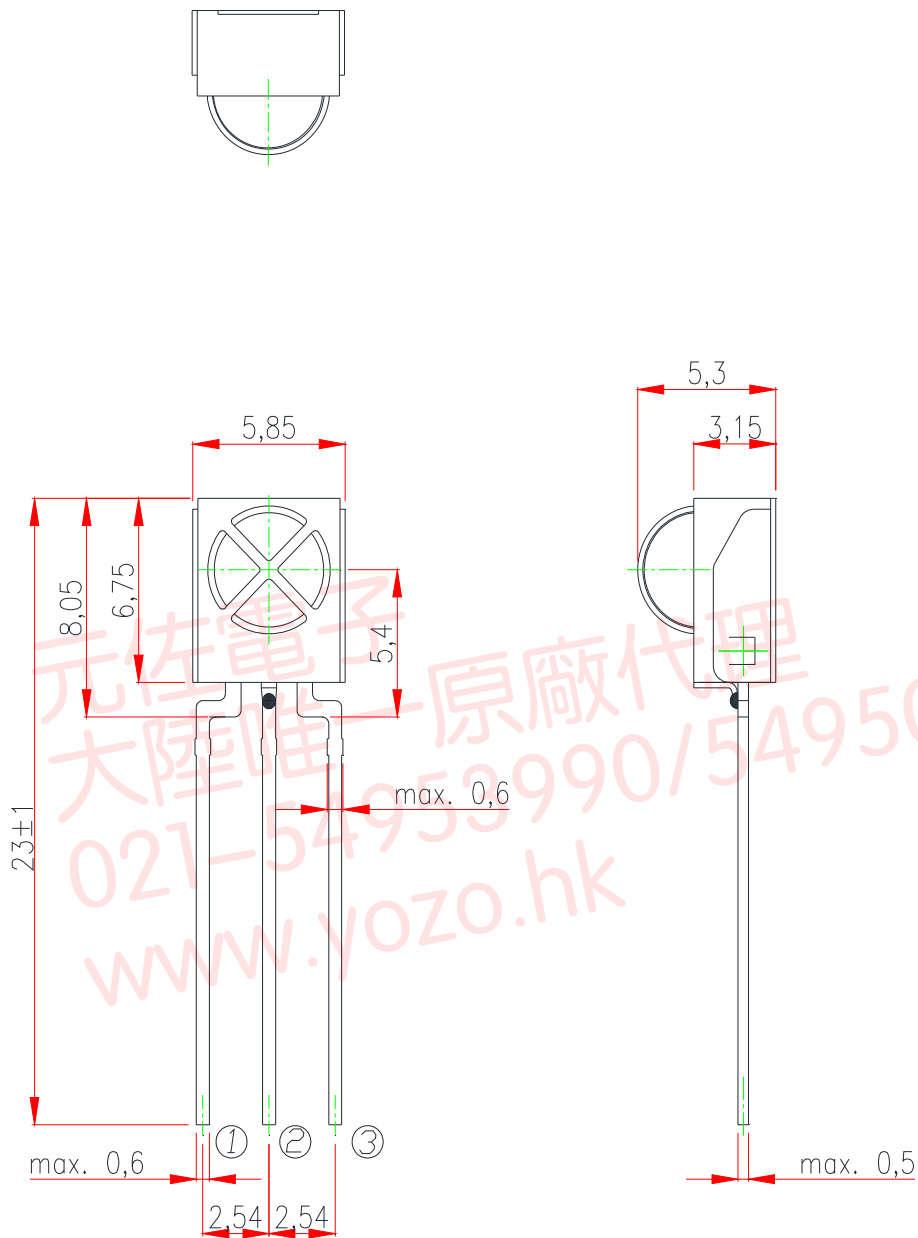
Object : mercury, lead, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl others

## 13. Manual Soldering

- 13-1. Use a soldering iron of 25W or less. Adjust the temperature of the soldering iron below 300°C.
- 13-2. Finish sodering within three seconds.
- 13-3. Handle products only after the temperature has cooled off.
- 13-4. To avoid the product is transformed and breakdown, it needs to take care that the power should not join to the product at soldering or immediately after soldering.

14. DIMENSION

14-1. DIMENSION



Drawing No : RM-R20□V1-ASY-01

- Pin configuration

- ① Vout
- ② GND
- ③ Vcc

- 1. Unit : mm
- 2. Unspecified tolerance :  $\pm 0.3\text{mm}$
- 3. Lead edge finish : Solder dip