

■ Description

The ROM-MN31xx... Series are 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.

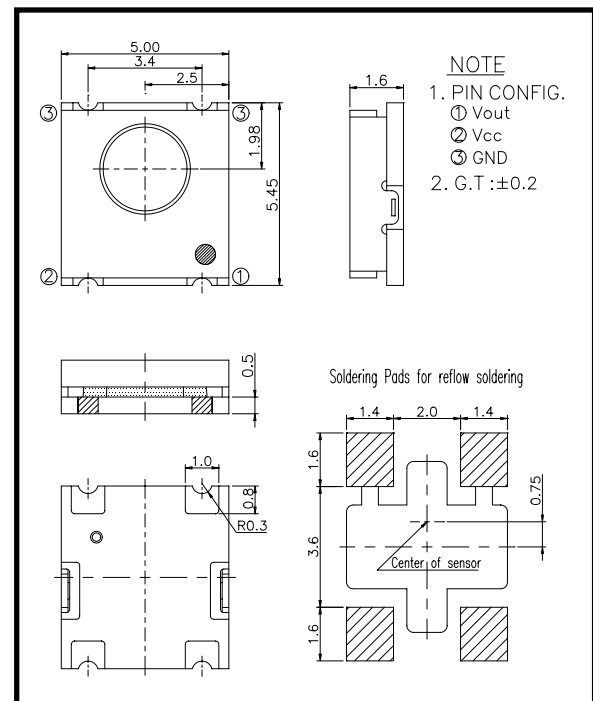
■ Features

- Small size package.
- Wide Operating Supply voltage 2.7V ~ 5.5V
- Maximum interference safety against optical and electrical disturbance.
- Various band pass frequency.
(32.7kHz/36.7kHz/37.9kHz/40kHz/56.7kHz)
- Internal filter for a high frequency lighting fluorescent lamp.
- Open collector output.

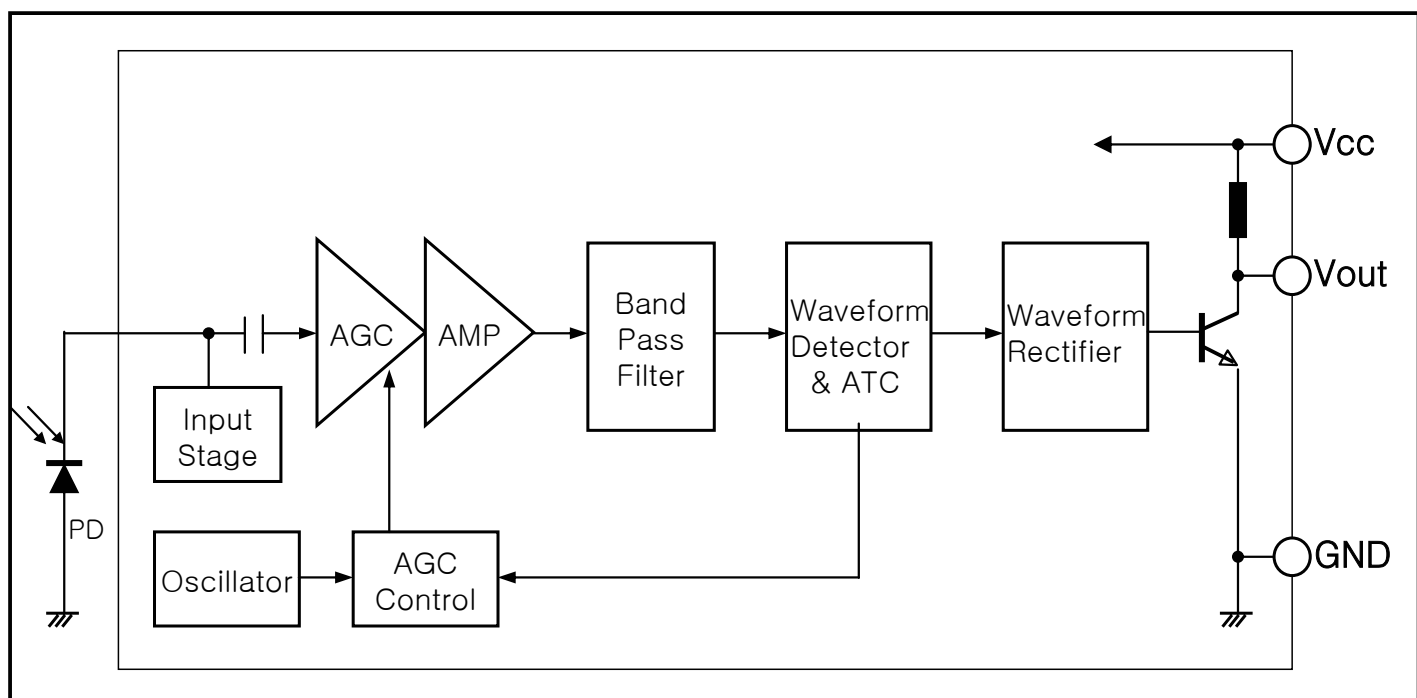
■ Application

- AV instruments (DVD, TV, SVR, Audio, CD player)
- Home appliances (Air conditioner, Computer, Camera)
- Remote control for wireless equipment.
- Infrared remote control Toys.

■ Outline Dimensions (Unit: mm)



■ Block Diagram



■ Absolute Maximum Ratings

(at 25°C Unless otherwise note)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{cc}	6.5	V
Output Current	I _{out}	2.0	mA
Operating Temperature	T _{opr}	-30 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +90	°C
Soldering Temperature	T _{sol}	240, 10sec(reflow soldering)	°C

■ Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit
Operating Voltage	V _{cc}	2.7 ~ 5.5	V
Input Frequency	f _{in}	30 ~ 60	kHz

■ Electro-Optical Characteristics

(T_a=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V _{cc}		2.7	–	5.5	V
Supply Current	I _{cc}	No signal input	–	1.2	1.5	mA
Peak Wavelength(*1)	λ _p		–	940	–	nm
Arrival Distance(*1)	L	Standard Signal	6	8	–	m
B.P.F Center Frequency(*2)	f _o		–	37.9	–	kHz
High Level Output Voltage(*1)	V _{OH}		V _{cc} –0.5	–	–	V
Low Level Output Voltage(*1)	V _{OL}		–	0.2	0.4	V
High Level Output Pulse Width(*1)	t _{WH}	Burst Wave =600μs Period = 1.2ms	500	600	700	μs
Low Level Output Pulse Width(*1)	t _{WL}		500	600	700	μs
Directivity(Half Angle)	Θ _{1/2}		–	±40	–	deg
Output Form	Active Low Output					

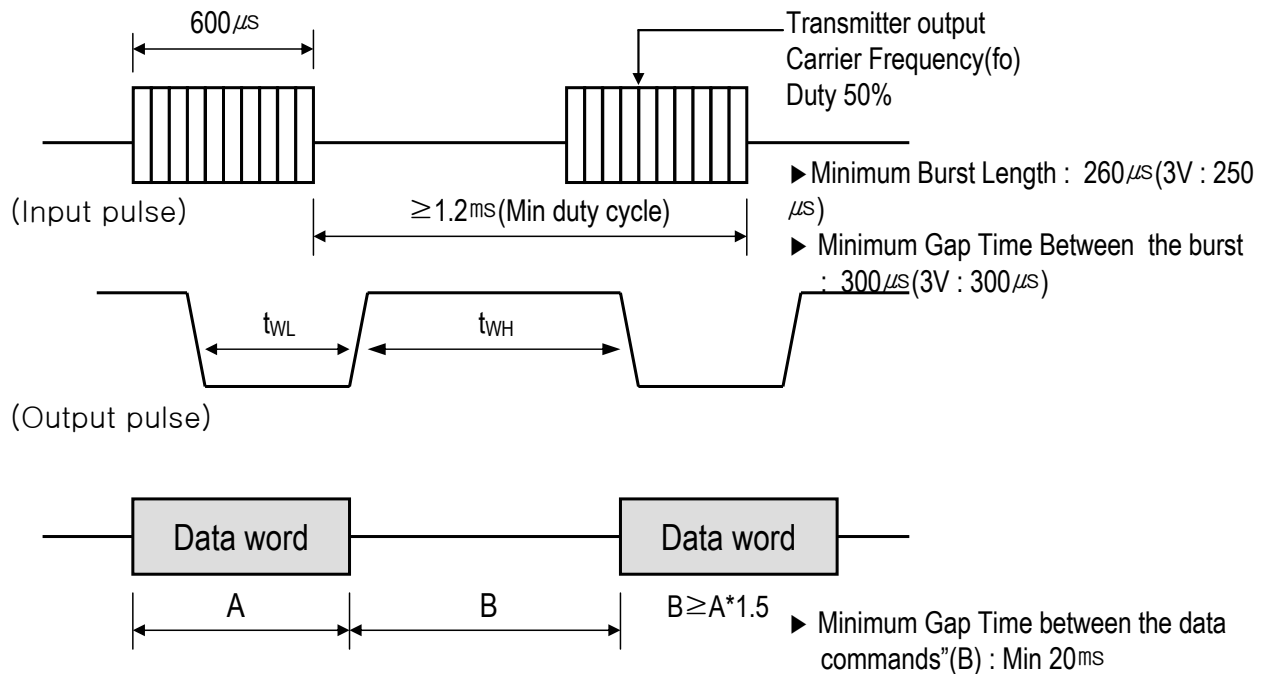
(*1) Distance between emitter and detector specifies maximum distance that output wave form satisfies the standard (fig.2) under the conditions below against the standard transmitter. ON/OFF pulse width is to be satisfied within 0.3m~ arrival distance length.

(*2) B.P.F center frequency(f_o) for varies with model is show below.

Model No.	B.P.F frequency(kHz)
ROM-MN3132○○	32.7
ROM-MN3136○○	36.7
ROM-MN3138○○	37.9
ROM-MN3140○○	40.0
ROM-MN3156○○	56.7

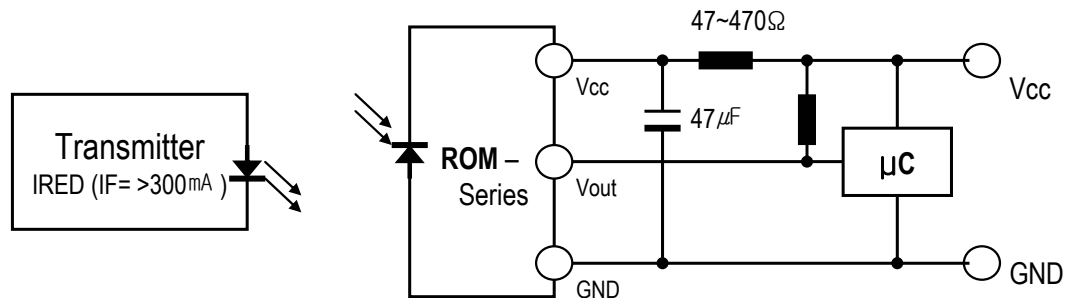
■ Measurement Conditions

● Output pulse width



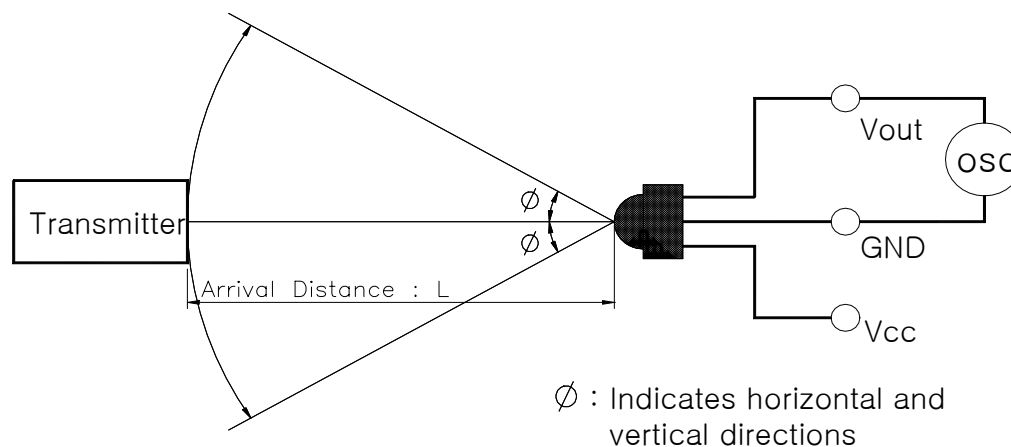
[Fig1. Burst wave, Output wave]

● Application circuit



[Fig2. Transmitter, Power Supply Circuit]

● Test condition of arrival distance



[Fig3. Measurement condition for arrival distance]

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

■ Reliability Test Items

Parameter	Conditions
High Temperature	Ta=+60℃, Vcc=5.0V t = 240h
High Temperature/High Humidity	Ta=+60℃, 90%RH, Vcc=5.0V t = 240h
Low Temperature	Ta=-10℃, Vcc=5.0V t = 240h
Heat Cycle	Ta=-20℃ (0.5h)~+75℃ (0.5h) 20cycle

☞ Electro-optical characteristics shall be satisfied after leaving 2 hours in the normal temperature.

■ Standard Inspection

Among electrical characteristics, total quantity shall be inspected as below.

- 1 Front distance between emitter and detector.
- 2 Current consumption.
- 3 High level output voltage.
- 4 Low level output voltage.

■ Typical Characteristics (Ta= 25℃)

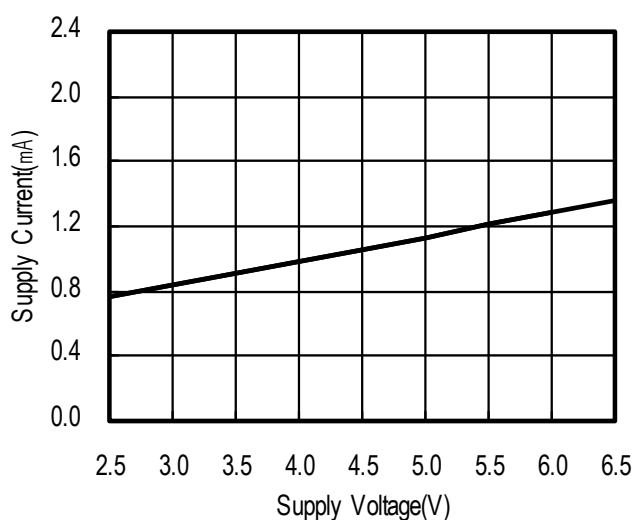


Fig.1 Supply Current vs. Supply Voltage

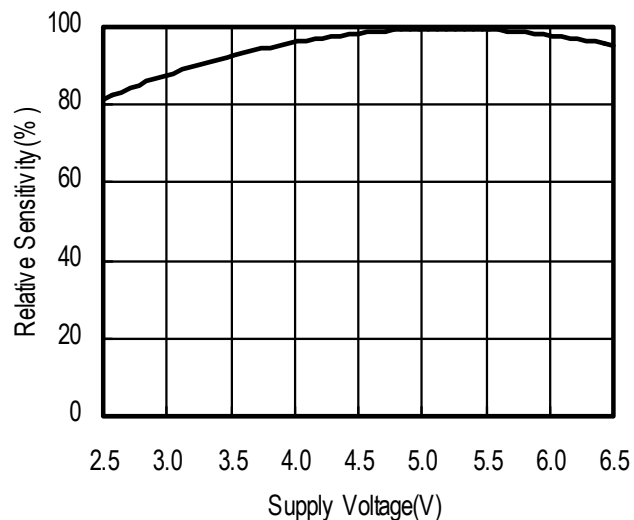


Fig.2 Relative Sensitivity vs. Supply Voltage

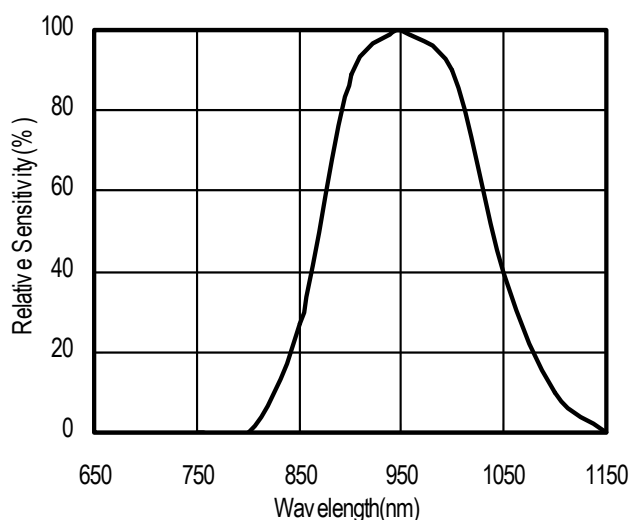


Fig.3 Relative Spectral Sensitivity vs. Wavelength

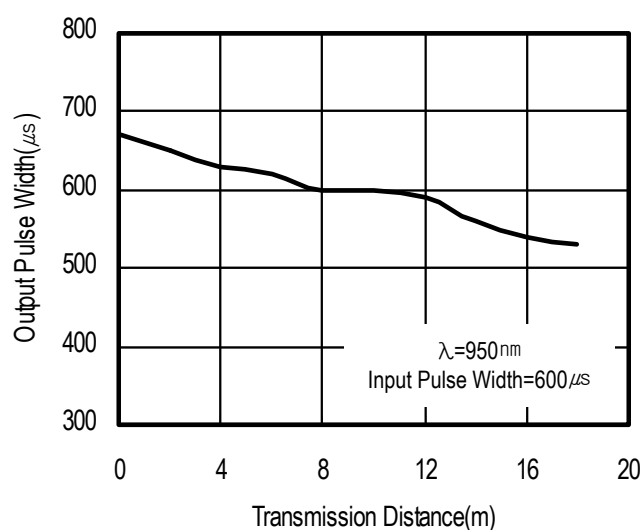


Fig.4 Output Pulse Width vs. Distance

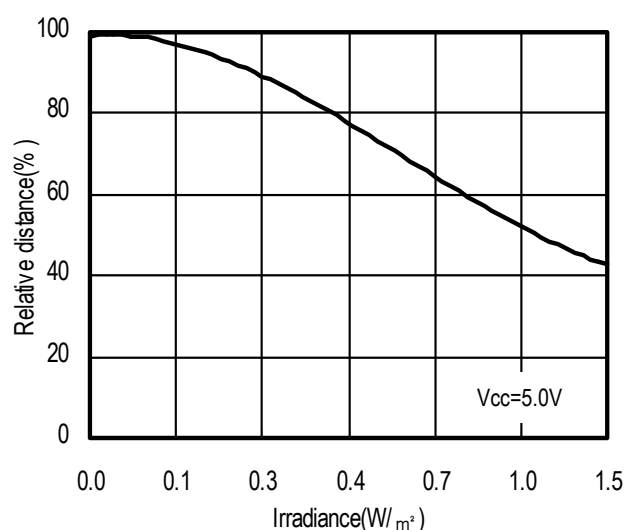


Fig.5 Sensitivity vs. Bright Ambient

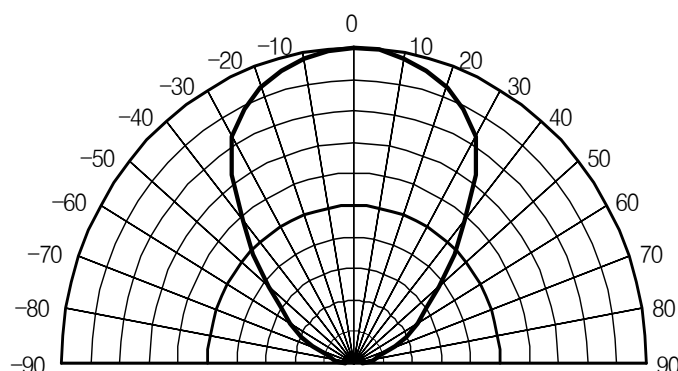


Fig.6 Sensitivity Angle Characteristics

■ Caution

- 1 The performance of remote control system depends on environment condition and ability of peripheral parts. Thus, it is highly recommended to evaluate the performance of the receiver module using the final product after the receiver module is assembled with peripheral components such as resistor, condenser, MICOM, and so on.
- 2 Store and use where there is no force causing transformation or change in quality.
- 3 Store and use when there is no extreme humidity.
- 4 Solder the lead-pin within the condition of ratings.
- 5 To prevent static electricity damage to the product, make sure that the human body and the soldering iron are connected to ground before using.
- 6 Put decoupling condenser($47\mu\text{F} \sim 470\mu\text{F}$) between Vcc and GND for reducing the noise from power supply line.
- 7 When a disturbance signal is applied to the ROM-Series, it can still receive the data signal. However, the sensitivity is reduced to the level that no unexpected pulses will occur. Some examples for such disturbance signals which are suppressed by the ROM-Series are :
 - .DC light.(ex. From tungsten lamp or sunlight)
 - .Continuous signal at center frequency or at any other frequency.
 - .Signals from fluorescent lamps with electronic ballast with high or low modulation.

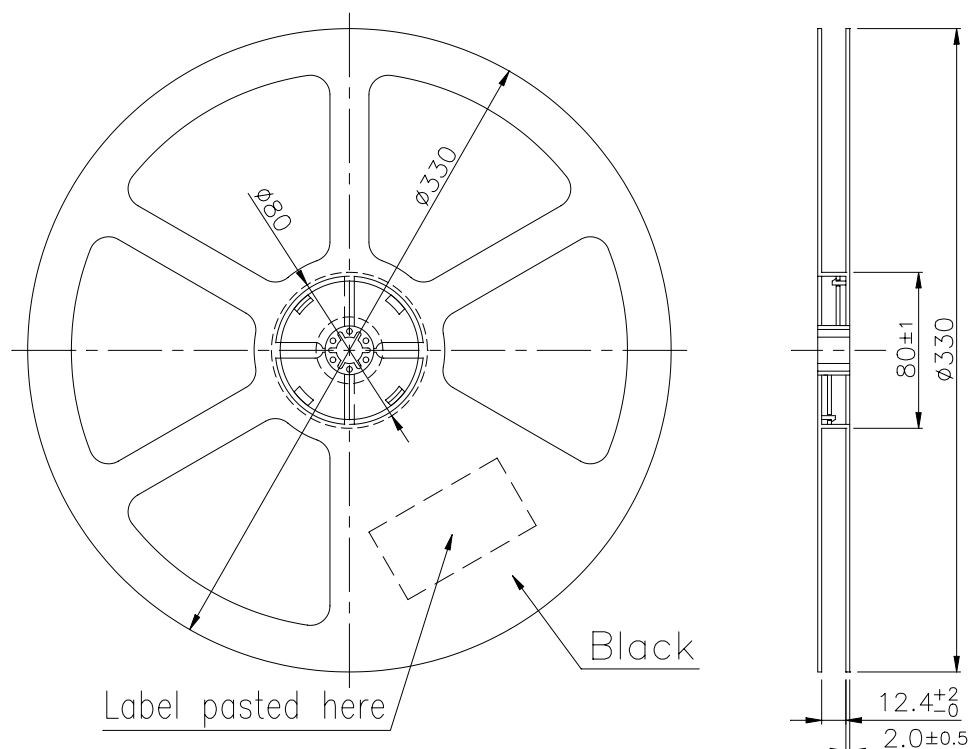
■ Others

In case where any trouble or questions arise, both parties agree to make full discussion covering the said problem.

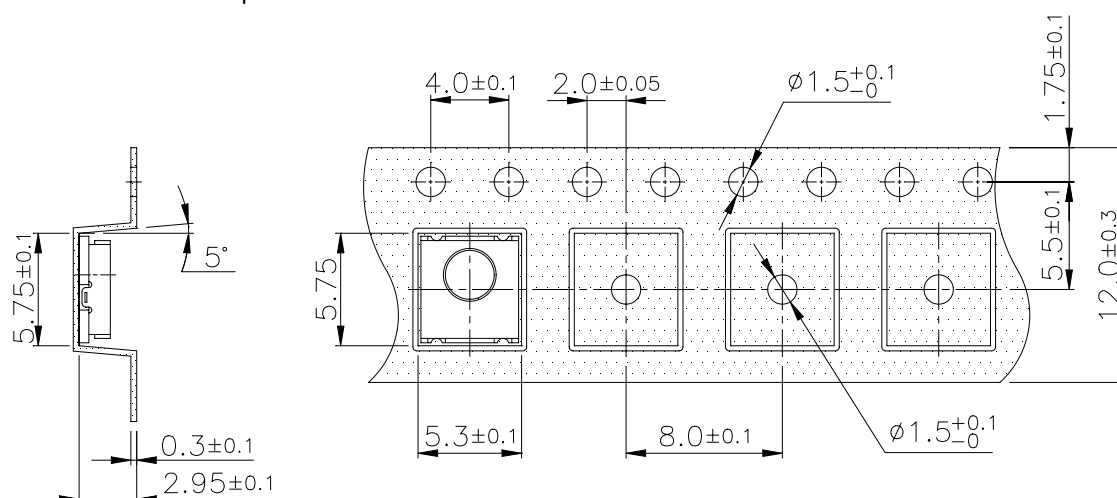
■ Tape and Reel Packing Specifications

1 Shape and Dimensions of Reels

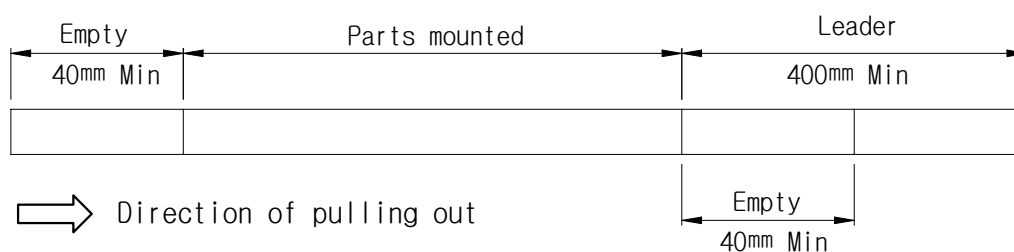
[Unit : mm]



2 Dimension of Tapes



3 Configuration of Tapes

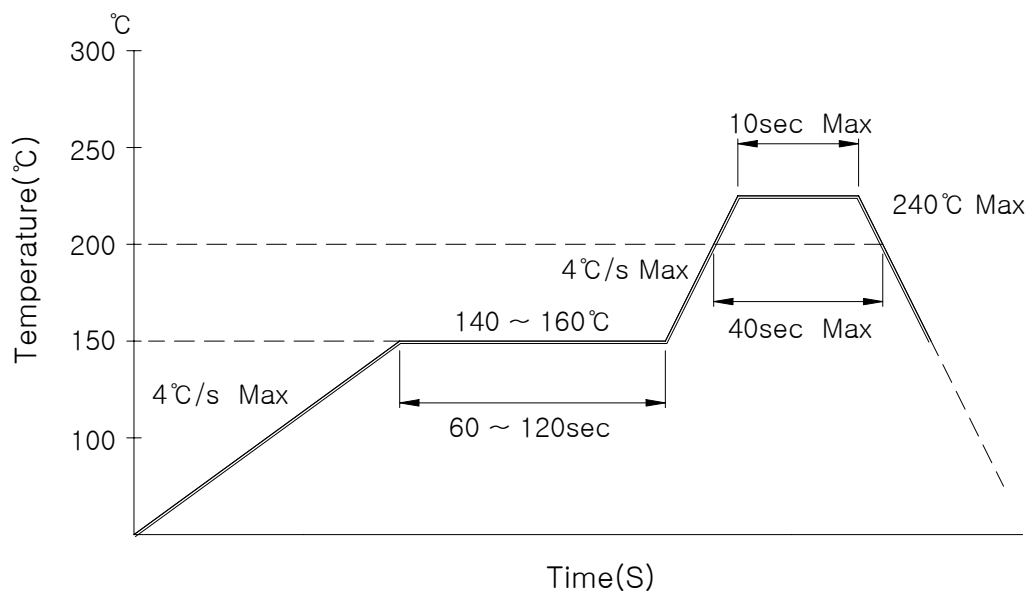


4 Quantity : 3,000pcs/reel

■ Precautions to be taken on mounting

1 Reflow soldering

- 1) Following soldering paste recommended.
Melting temperature : 178 ~ 192℃
Composition : Sn 63%, Pb 37%
- 2) Recommended thickness of metal mask is between 0.2mm and 0.25mm for screen printing.
- 3) The below illustrated temperature profile at the top surface of the product is requested for soldering.



2 Manual Soldering

- 1) Use the 6/4 solder or the solder containing silver.
- 2) Use a soldering iron of 25W or smaller.
Adjust the temperature of the soldering iron below 300℃
- 3) Finish soldering within 3 seconds.
- 4) Handle products only after the temperature is cooled off.

3 Cleaning

Perform cleaning after soldering strictly in conformance to the following conditions.

- 1) Cleaning agent : Alcohol.
- 2) Temperature and time : 30 seconds under the temperature below 50℃
or 3minuted below 30℃.
- 3) Ultrasonic cleaning : Below 20W.