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DATA SHEET

PART NO. : PL-IRM2202001

REV : A / 0

CUSTOMER'S APPROVAL : _____

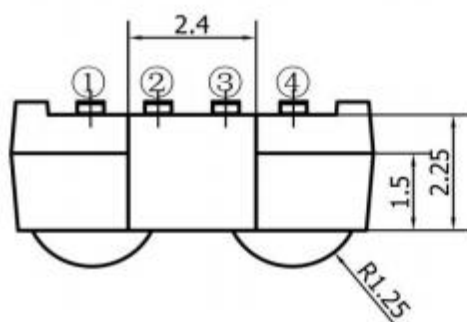
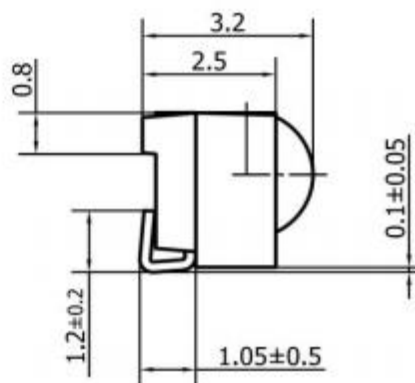
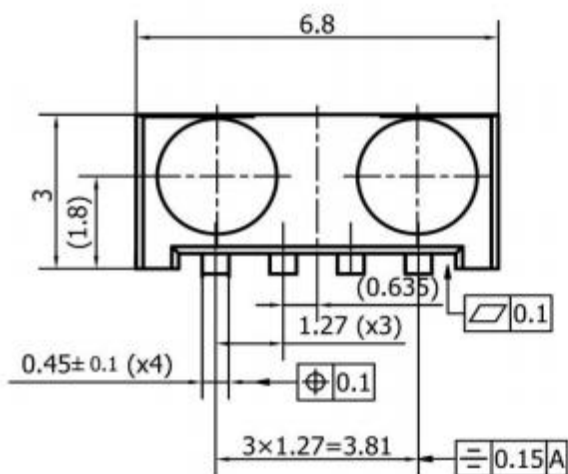
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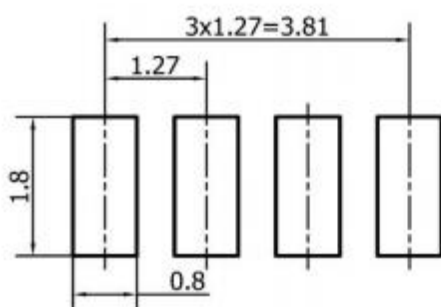
DATE : 2021-05-08

Page : 1

PACKAGE DIMENSIONS



P.C.B. Layout



Note

1. Unit mm
2. Unspecified tolerance : $\pm 0.3\text{mm}$
3. Reference dimension : ()
4. Electrode base material : Cu
5. Electrode terminal finish : Sn plating
6. Mold resin : optical filter Epoxy
7. Pin configuration
 - ① GND
 - ② VCC
 - ③ OUT
 - ④ GND

◆ Description

The PARA S Series is a IC for use in infrared remote control system.

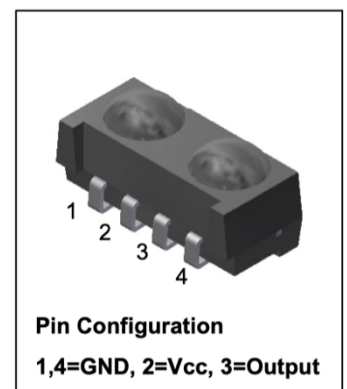
They are C-molded, small size, light weight and low current consumption modules.

The strong points of PARA SEMI IR modules are reliable operation

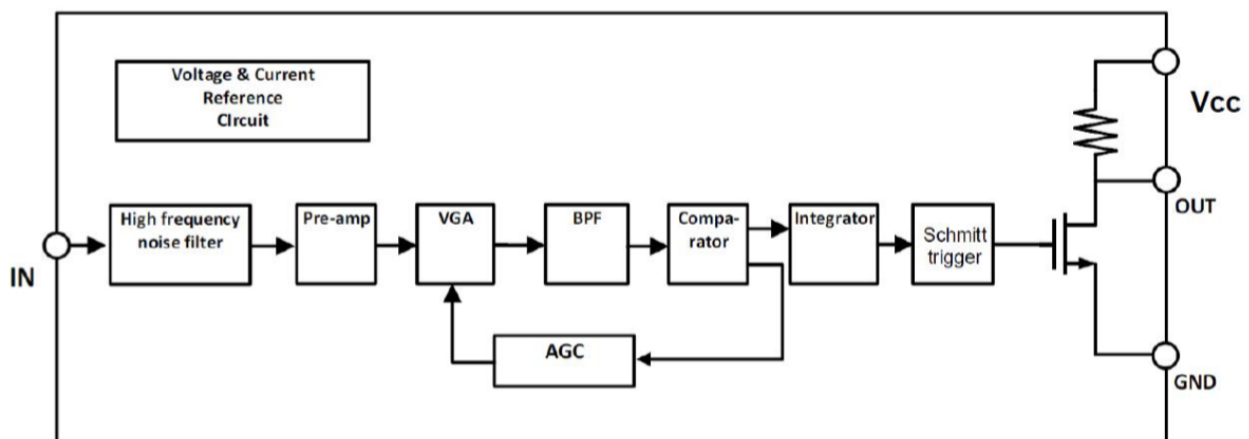
even under disturbing ambient light source, and the protection against uncontrolled output pulses.

◆ Feature

- Wide Operating Supply Voltage 2.7V ~ 5.5 V
- Low current consumption (Typ. 320uA@3V, 370uA@5V)
- Maximum interference safety against VCC noise & light noise
- Maximum distance under VCC ripple & light source noise include LCD TV
- Carrier frequency 37.9 kHz available
- High ESD level protection
- Output active low
- Open collector output (built-in Pull-up resistor 50 k Ω)



◆ Block Diagram



◆ Absolute Maximum Ratings

(Ta = 25°C)

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	VCC	0	6.0	V
Supply Current	ICC	0	5.0	mA
Output Voltage	Vout	0	6.0	V
Output Current	Iout	0	2.5	mA
Storage Temperature	Tstg	-20	+85	°C
Operating Tempera ture	Tamb	-20	+85	°C
Reflow Soldering Temperature	Tsol	260°C±5°C, Max 10 sec		°C
Moisture Sensitivity Levels	Level 5 (≤30°C / 60% RH 48 hours)			

* Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage of device. This is stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for longer periods may affect device reliability.

◆ Electro-optical Characteristics

(Ta = 25°C)

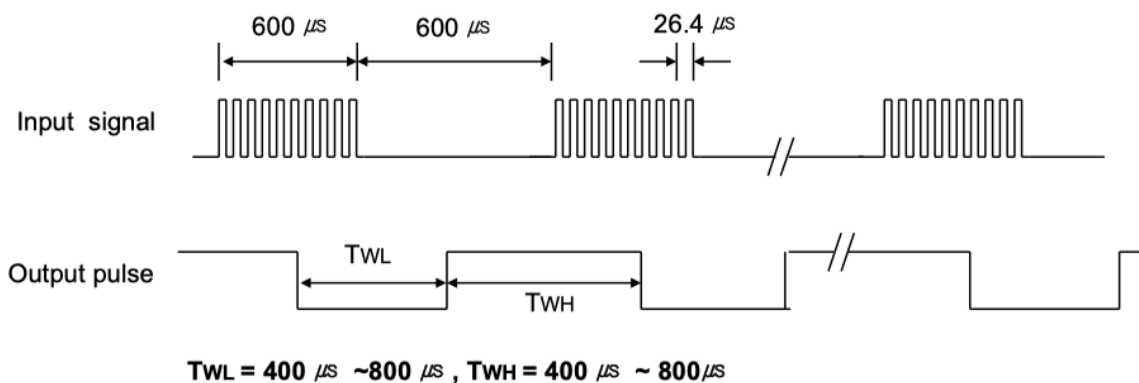
Parameter	Symbol	Conditions	Vcc	Min	Typ	Max	Unit	
Operating Voltage	V _{CC}	-	-	2.7	-	5.5	V	
Supply Current	I _{CC}	No input signal	5	-	0.35	0.55	mA	
			3		0.30			
B.P.F Center Frequency	f ₀		5	-	37.9	-	Khz	
			3	-	37.9	-		
Peak Wave Length	λ _P			-	940	-	nm	
High Level Output Voltage	V _{OH}	30cm over the ray axis	5	V _{CC} -0.5	-	-	V	
			3	V _{CC} -0.3	-	-		
Low Level Output Voltage	V _{OL}			5	-	0.2	0.4	V
				3		0.2	0.4	
High Level Output Pulse Width	T _{WH}	Burst Wave = 600μs Period = 1.2ms	5	400	600	800	μs	
			3	400	600	800		
Low Level Output Pulse Width	T _{WL}			5	400	600	800	μs
				3	400	600	800	
Arrival Distance	L	200Lux	±0°	40	-	-	m	
			±30°	35	-	-		
			±45°	16	-	-		
Output Form	Active Low							

※ 1. 600/600μs burst wave is transmitted by standard(Fig.2, Fig.3) transmitter. However, it measured after the initial transmission pulse is 10(60ms) pulse.

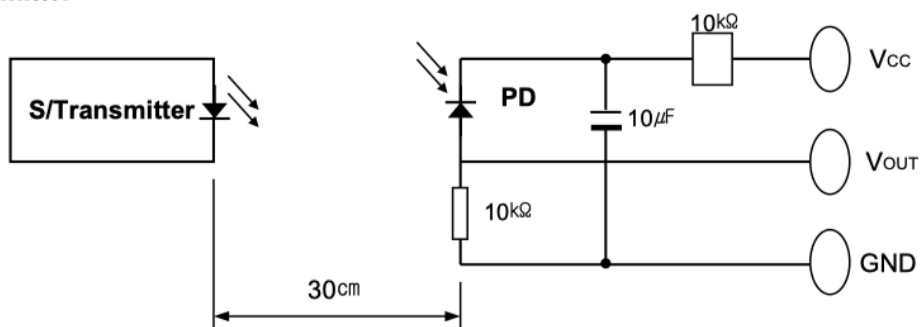
Arrival Distance Effected by Environment

◆ **Measurement Conditions** ($T_a=25^\circ$)

[Fig.1] **Output Waveform** (at freq.=37.9KHz)

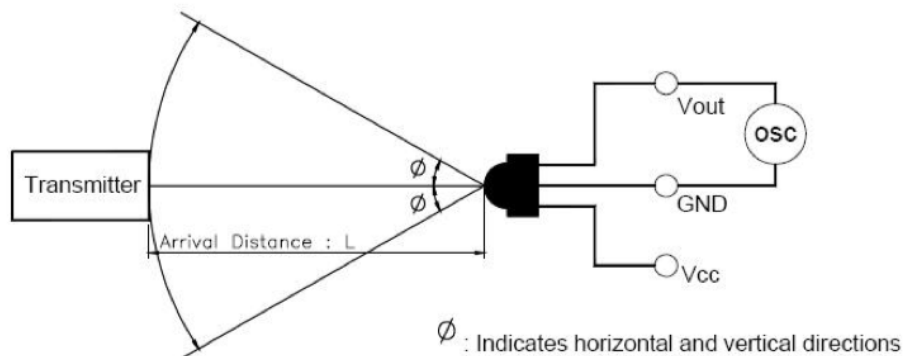


[Fig.2] **Transmitter**



※ 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 Po measuring circuit Standard Transmitter

[Fig.3] **Test condition of arrival distance**

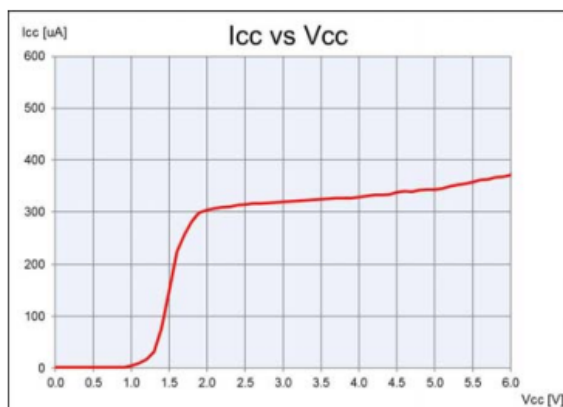


[Measurement condition for arrival distance]

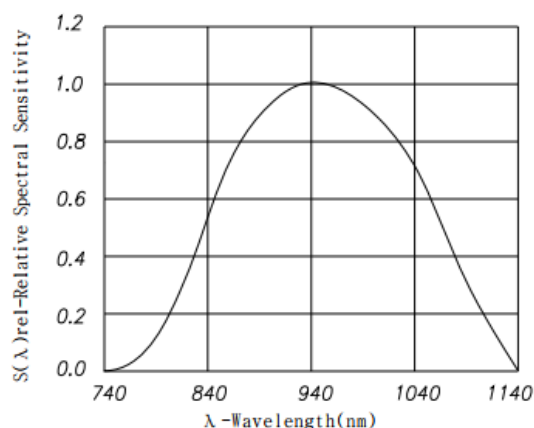
☞ Ambient light source : Detecting surface illumination shall be irradiate 200 ± 50 Lux under ordinary white fluorescence lamp without high frequency lighting

◆ Electrical / Optical Characteristics

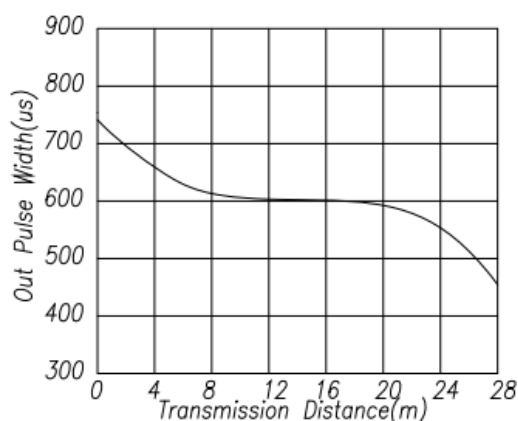
[Fig.4] Supply Current vs. Voltage



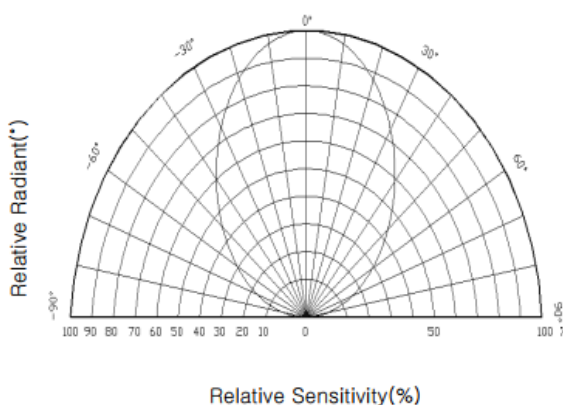
[Fig.5] Relative Spectral Sensitivity



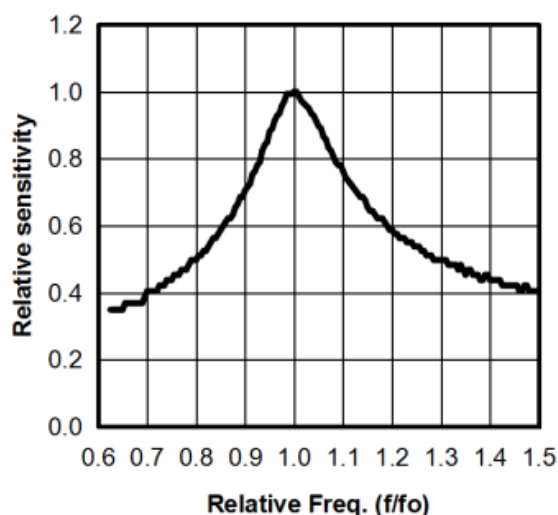
[Fig.6] Output Pulse Width vs. Distance



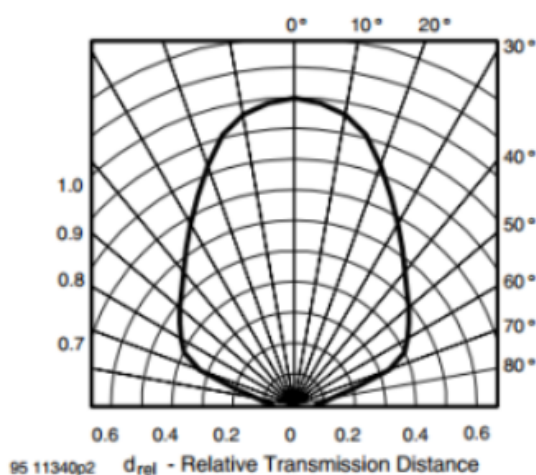
[Fig.7] Directivity



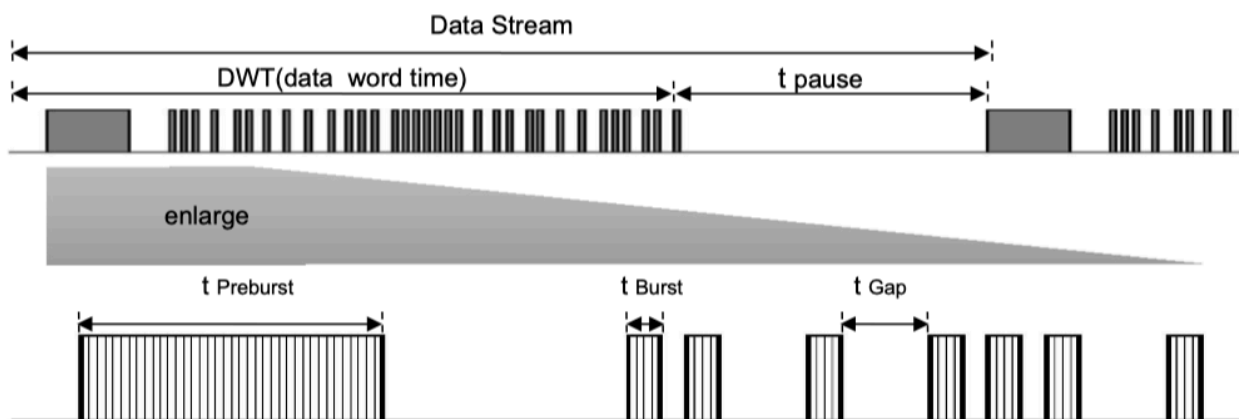
[Fig.8] BPF Fc Curve



[Fig.9] Directivity (V)



[Fig. 10] Data Signal diagram

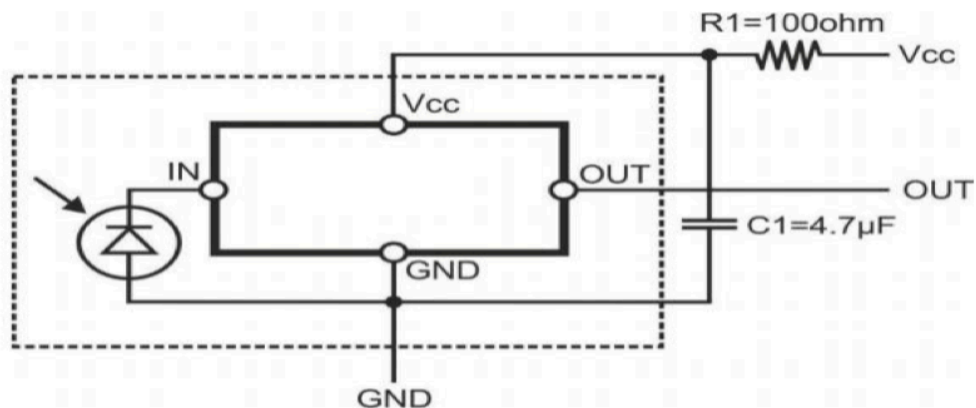


- t Burst ; length of a burst in pulses of the carrier frequency.
- t Gap ; length of the gap between two burst in pulses of carrier.
- t pause ; length of the pause between two data words.
- tPreburst ; lead code of data word

◆ External Application Circuit - Power Noise reduction & ESD Protection

[Fig.11] Application for power supply ripple suppression

A further influence to the IR receiver modules may come from a supply voltage which is not stable. Such a disturbed supply voltage can be caused by switching power supply, which is not filtered well or by other components in the circuit which produced spikes on the supply line. This disturbed supply will reduce the sensitivity of receiver modules. This application circuit will filter the disturbed supply voltage.





INFRARED REMOTE CONTROL RECEIVER MODULE

PL-IRM2202001

REV:A / 0

◆ Reliability Test Items

Parameter	Test conditions	Remark
High Temperature	Ta=+85, Vcc=5.0V t=1000h	※1, ※2
Low Temperature	Ta=-25, Vcc=5.0V t=1000h	※1, ※2
High Temp./ High Humidity	Ta=+85°C 85%RH t=1000h	※2
Heat Cycle	Ta=-25°C(0.5h) to +85°C(0.5h) 200 cycle	※2, ※3
Fall Test	Height=75cm, 3 times	※4

※ 1. Supply voltage of load test is 5V.

※ 2. Electro-optical characteristics shall be satisfied after leaving 2 hours in the normal condition.

※ 3. Heat cycle test shall repeat above condition 20 times under no load.

※ 4. The test devices shall be dropped three time on the hard wooden board from a height of 75cm.

◆ Material Configuration

Parameter	Configuration	Remark
IC	Silicon(99%)	
Photo diode	Silicon(99%)	
Lead frame	Iron(99.5%), Silver(0.5%)	Pin plating (Salt spray test for 12 hours)
Epoxy resin	Resin(55.5%), Hardener(45.5%)	
Silver epoxy	Silver(80%), Resin(10%), Hardener(10%)	
Bond wire	Gold(99.99%)	
Shield Case	Iron(99%), Tin(1%)	Inside

◆ ESD Test Results

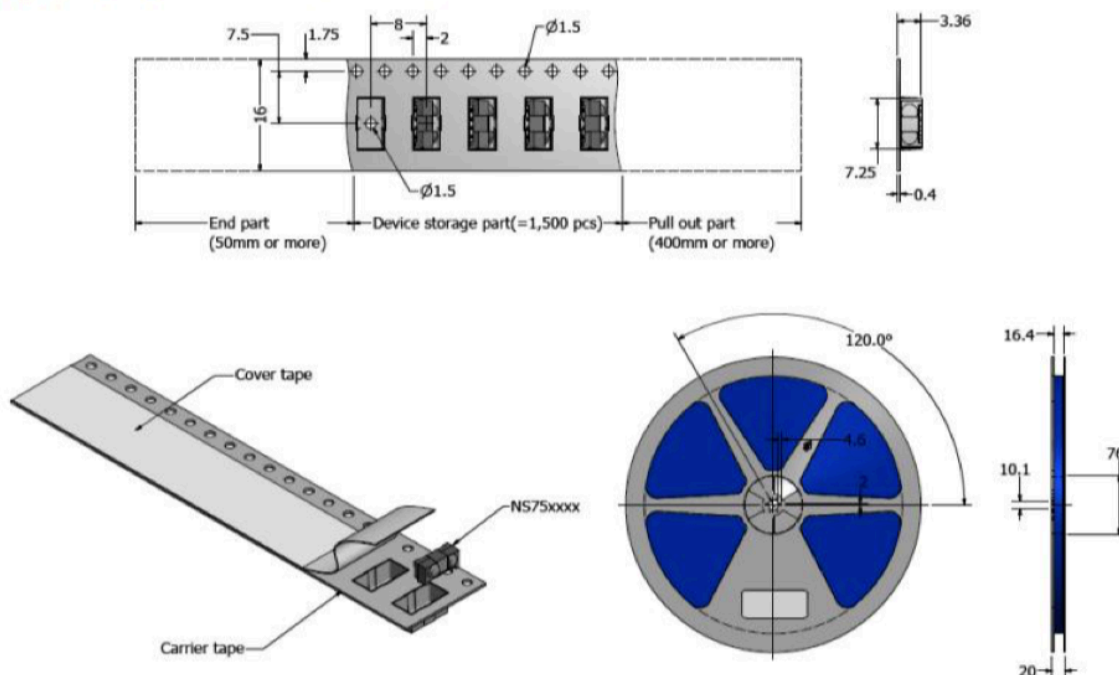
Parameter	Conditions	Specification	Results
Machine Model	C=200pF, R=0Ω	Min ±400V	>±400V
Human Body Model	C=100pF, R=1.5kΩ	Min ±4000V	>±4000V
Charged Device Model	R=100MΩ, 1Ω	Min ±800V	>±800V

◆ Suitable Data format for PL-IRM2202001 Series ;

data format	code acceptable
NEC	O
RC5_Philips	O
RC6_Philips	O
Sony 12 Bit	O
Sony 15 Bit / 20 Bit	O
Toshiba	O
XMP	X
RCMM	X
Continuous code	O
RCA	O
Power meter	X

◆ Taping specification

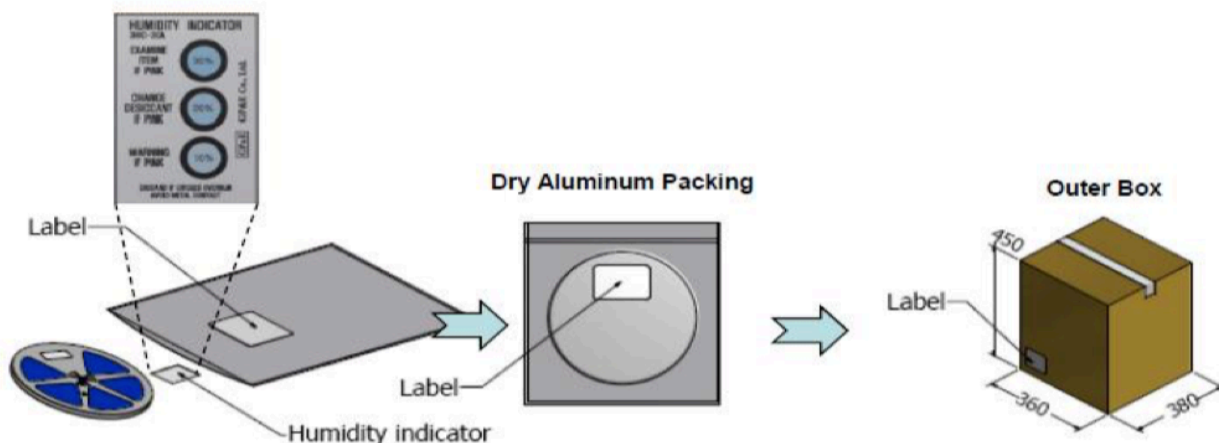
[Fig.11] Tape dimensions in mm for IR receiver



◆ Packing Method

Reel package dimension in mm for SMD Receiver (=2,500 pcs)

Parameter	Dimension	Quantity(pcs)
Reel + Dry Aluminum Bag	13" × 16mm	2,500
Outer Box (10 Inner Box)	360 x 380 x 450mm	25,000

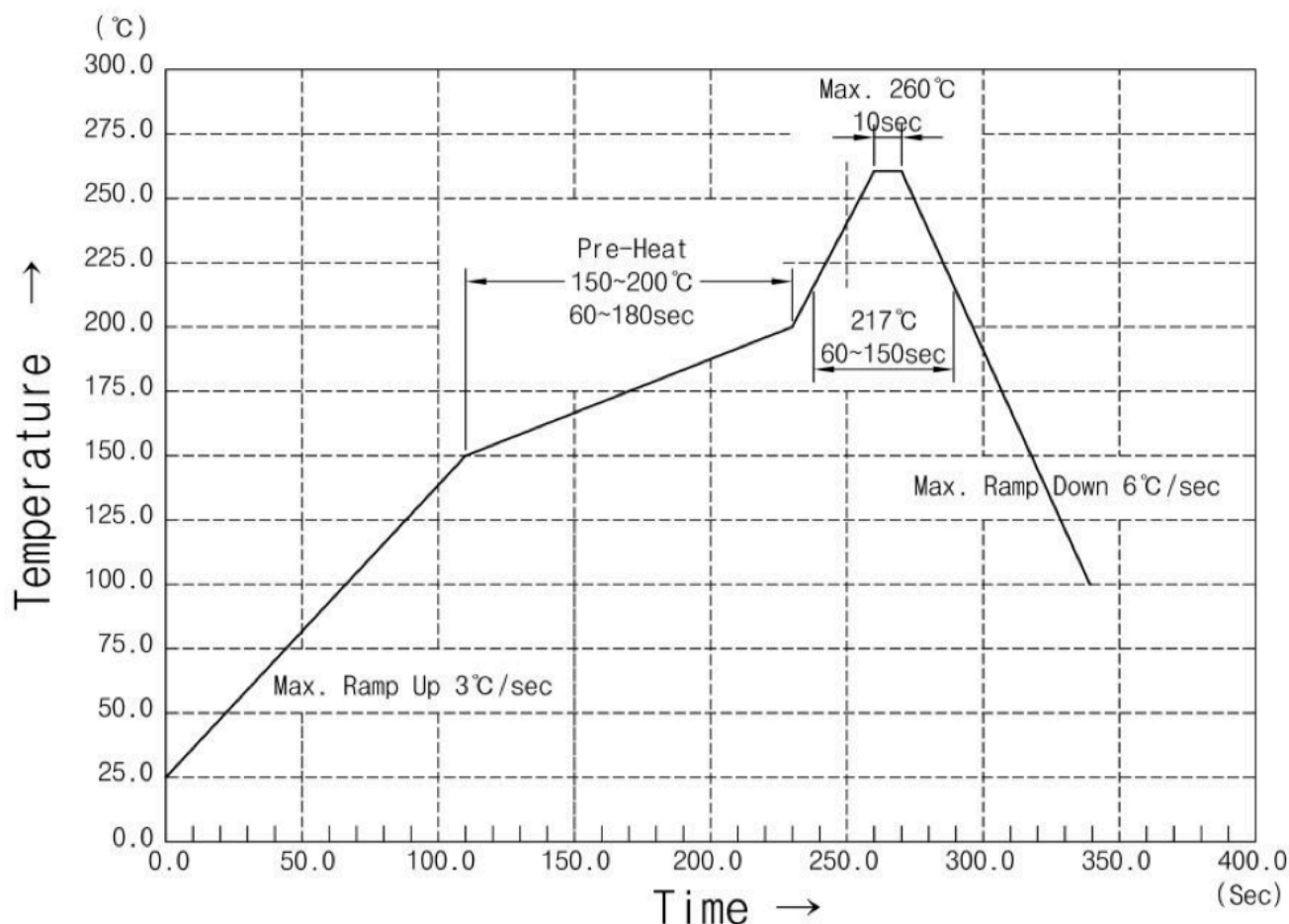


* note

: Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption.
The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

◆ Recommended lead free reflow soldering temperature profile.



attention:

- ◆ After removing the vacuum bag, the products shall be SMT within 48 hours, and shall not pass through the furnace for 3 times;
- ◆ If it has been disassembled and not used up for more than 48H, the bulk material shall be baked in an oven at $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 24H before SMT.
- ◆ If the removed vacuum bag is not used up for more than 48H, the undisassembled materials must be baked in an oven at $50^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for more than 96H before SMT.
- ◆ If the storage is not disassembled and not used for more than 6 months, the undisassembled materials must be baked in an oven at $50^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for more than 96H before SMT.