

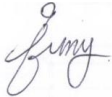




APPROVAL SHEET

CUSTOMER : _____
 DEVICE NAME : IR RECEIVER MODULE _____
 CODE No. : _____
 ITEM No. : ROM-C540L-R _____
 ISSUED DATE : 2009. 05. 15 _____

[CUSTOMER APPROVAL]

ACCEPT No.				
ACCEPT DATE				
ACCEPT	INSPECTER	CHECK	APPROVAL	COMMENT

	ISSUE	REVIEW	REVIEW	APPR'D
ISSUED DEPT.				



Tel : 82-42-863-2840
 Fax : 82-42-861-0843
<http://www.raytron.co.kr>

CUSTOMER :

<h1>SPECIFICATIONS</h1>		SHEET No.	1 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

1. Application

This Specification is applied to inspection and approval of the IR Receiver Module for surface mount type.

2. Description

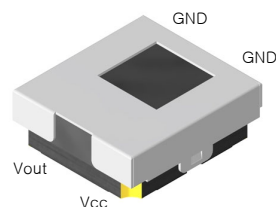
The ROM-C5xx Series are miniaturized receiver for infrared remote control system.

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.

3. Features

- 1) Surface Mount Package.
- 2) Wide Operating Supply voltage 2.7V ~ 5.5V
- 3) Supply Current : 3.3V(0.5mA), 5.0V(0.6mA)
- 4) Band pass filter center frequency : 40.0Khz
- 5) Epoxy IR filter characteristic : 940nm
- 6) Maximum interference safety against optical and electrical disturbance.
- 7) Internal filter for a high frequency lighting fluorescent lamp.
- 8) Internal Pull-Up output.
- 9) Lead(Pb)-free component.



4. Absolute Maximum Ratings

- 1) Supply Voltage : 6.0V
- 2) Supply Current : 2.0mA
- 3) Operating Temperature : -20°C ~ +85°C
- 4) Storage Temperature : -30°C ~ +90°C

5. Cautions

- 1) Store and use where there is no force causing transformation or change in quality.
- 2) Store and use where there is no extreme humidity.
- 3) In order to prevent damage from static electricity, make sure that the human body and the soldering iron are connected to ground before using.
- 4) The ripple noise from power supply lines may shorten detecting distance of IR Receiver Module. Thus, in order to ensure more reliable operating, Please add RC filter(R=100Ω, C=47μF) between Vcc and GND
- 5) 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 of such disturbance signals which can be suppressed by the ROM-Series :
 - ① DC lights. (ex. From tungsten lamp or sunlight)
 - ② Continuous signal at center frequency or at any other frequency.
 - ③ Signals from fluorescent lamps with electronic ballast with high or low modulation.

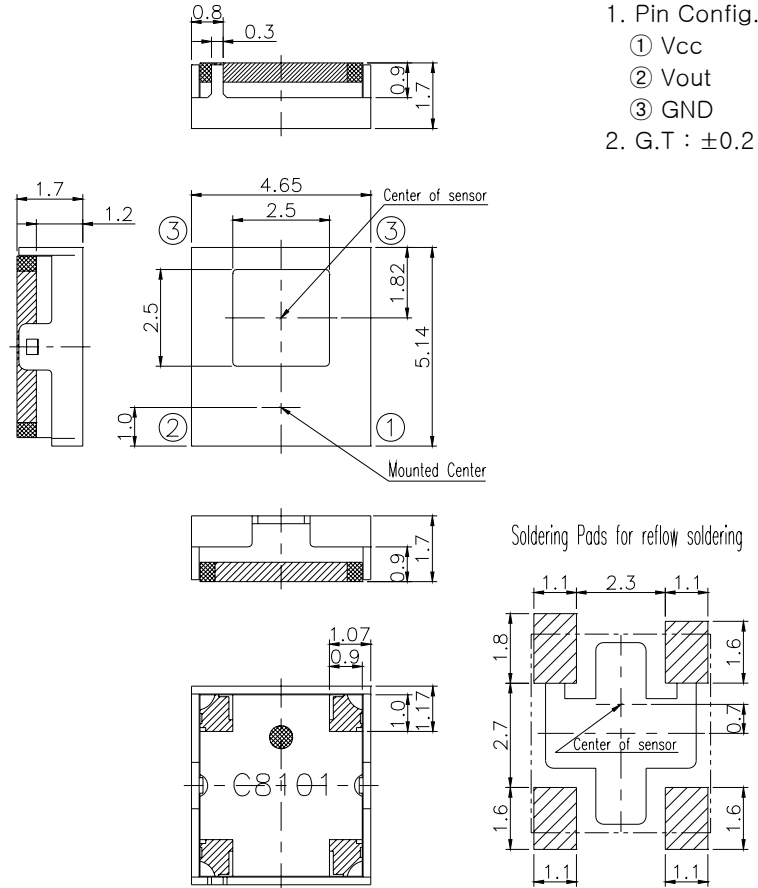
 <p>RAYTRON CO., LTD. HEAD OFFICE & FACTORY (KOREA) 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA TEL : +82-42-863-2840 FAX : +82-42-861-0843 FACTORY (CHINA) 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA TEL : +86-755-2744-7373 FAX : +86-755-2744-7235</p>	MANAGER	CHECK	APPROVAL
			
	FILE No.	RIS-090515-01	

CUSTOMER :

SPECIFICATIONS		SHEET No.	2 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

6. Appearance & Dimensions

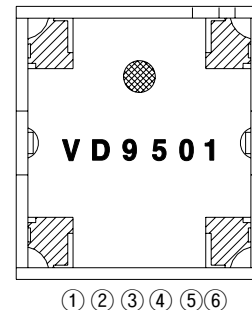
1) Package Dimension (Unit : mm)



2) Marking Position : Package Back Side

3) Laser Marking of Method

No.	Classification	Remark
①	Management	-
②	Center Freq.	A(32),B(36),C(38),D(40),E(57)
③	Year	0~9
④	Month	1~9,X(10),Y(11),Z(12)
⑤,⑥	Product Lot No.	01~99



RAYTRON CO., LTD.

HEAD OFFICE & FACTORY (KOREA)
 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA
 TEL : +82-42-863-2840 FAX : +82-42-861-0843

FACTORY (CHINA)
 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA
 TEL : +86-755-2744-7373 FAX : +86-755-2744-7235

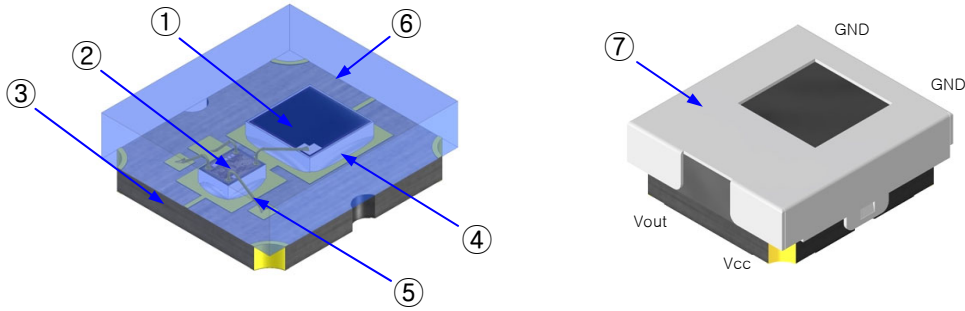
MANAGER	CHECK	APPROVAL
FILE No.	RIS-090515-01	

CUSTOMER :

SPECIFICATIONS		SHEET No.	3 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

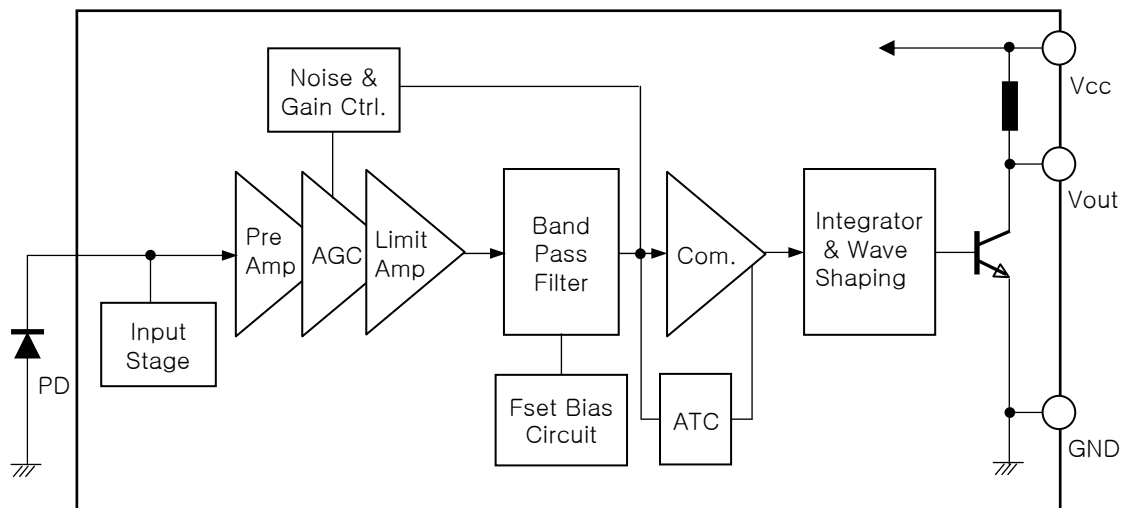
7. Schematic Diagram

1) Internal & outer structure of IR Receiver Module



No.	Component	Materials	Remark
①	Pin Photo Diode	Silicone	
②	Pre-amp IC	Silicone	
③	P.C.B	Epoxy Glass (Au Plating)	
④	Die Attach	Ag Paste	
⑤	Wire	Au Wire	
⑥	Molding	Non-fireproof epoxy resin	
⑦	Shield Case	Fe (Au plating)	

2) Functional Block Diagram



RAYTRON CO., LTD.

HEAD OFFICE & FACTORY (KOREA)
 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA
 TEL : +82-42-863-2840 FAX : +82-42-861-0843

FACTORY (CHINA)
 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA
 TEL : +86-755-2744-7373 FAX : +86-755-2744-7235

MANAGER	CHECK	APPROVAL
FILE No.	RIS-090515-01	

CUSTOMER :

SPECIFICATIONS		SHEET No.	4 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

8. Electro-Optical Characteristics

1) Absolute Maximum Ratings (at 25°C Unless otherwise note)

Parameter	Symbol	Ratings	Unit
Supply Voltage	Vcc	6.0	V
Output Current	Iout	2.0	mA
Operating Temperature	Topr	-20 ~ +85	°C
Storage Temperature	Tstg	-30 ~ +90	°C
Soldering Temperature (*1)	Tsol	260,10sec (reflow Soldering)	°C

(*1) Pb Free Solder

2) Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit
Operating Voltage	Vcc	2.7 ~ 5.5	V
Input Frequency	fin	30 ~ 60	kHz

3) Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	Vcc		2.7	-	5.5	V
Supply Current	Icc	no signal input	0.4	-	0.7	mA
Peak Wavelength (*1)	λ_p		-	940	-	nm
B.P.F Center Frequency (*2)	fo		-	40.0	-	kHz
High Level Output Voltage (*1)	VOH		Vcc-0.5	-	-	V
Low Level Output Voltage (*1)	VOL		-	0.2	0.4	V
Low Level Output Pulse Width (*1)	tWL	Burst Wave = 600 μ s Period = 1.2ms	400	-	700	μ s
High Level Output Pulse Width (*1)	tWH		500	-	800	μ s
Arrival Distance (*1)	D	$\pm 0^\circ$	-	9	-	m
		$\pm 30^\circ$	-	7	-	m
Output Form	Active Low Output					

*1. Distance between emitter and detector specifies maximum distance that output wave form satisfies the standard (fig.2, fig3) under the conditions below against the standard transmitter. ON/OFF pulse width is to be satisfied within 0.3m~ arrival distance length.

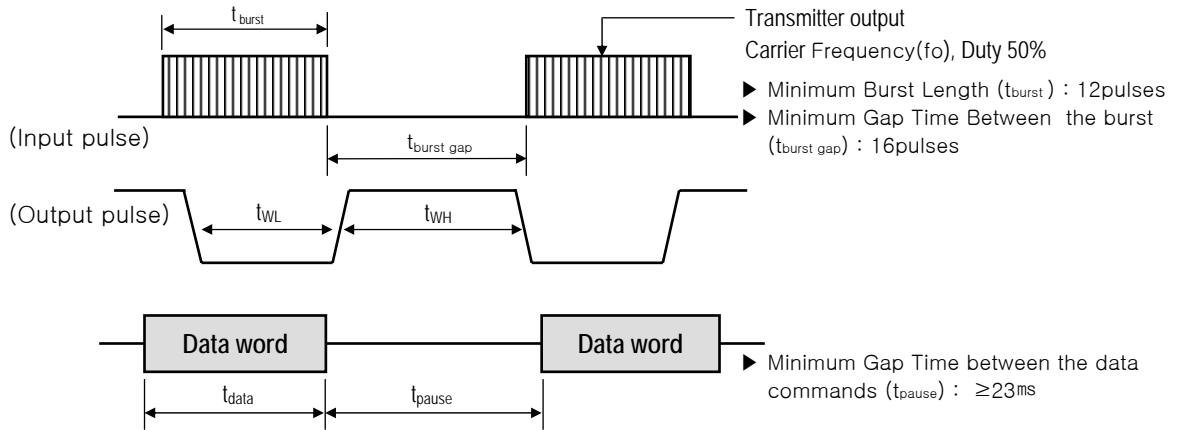
*2. The following band pass frequencies are available (32.7kHz/36kHz/36.7kHz/37.9kHz/40kHz/56.7kHz) carrier frequencies are adjusted by zener-diode fusing method.

 RAYTRON CO., LTD. HEAD OFFICE & FACTORY (KOREA) 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA TEL : +82-42-863-2840 FAX : +82-42-861-0843 FACTORY (CHINA) 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA TEL : +86-755-2744-7373 FAX : +86-755-2744-7235	MANAGER	CHECK	APPROVAL
			
	FILE No.	RIS-090515-01	

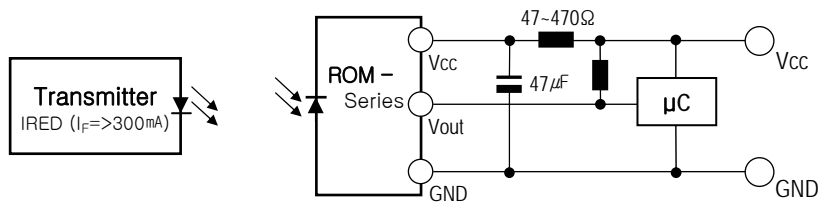
SPECIFICATIONS		SHEET No.	5 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

4) Measurement Conditions

① Fig.1 Burst wave, Output wave

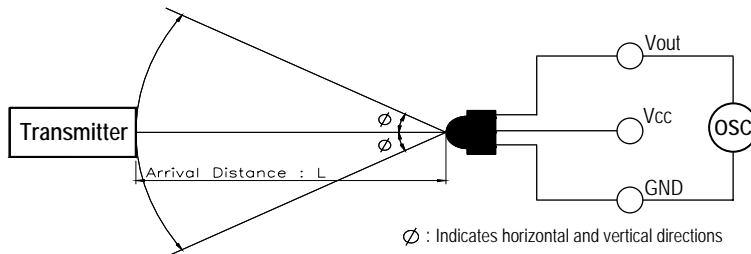


② Fig.2 Application Circuit



Please add the RC filter, resistor(40~470Ω) to Vcc line and , Condenser(47μF~470μF) between Vcc and GND, in order to reduce the noise from power supply line.
In addition, infrared LED used in the transmitter is set to λ_{peak}=940nm and current (I_F= >300mA)

③ Fig.3 Test Condition of Arrival Distance



Ambient light source : Detecting surface's illumination shall be 100Lux under ordinary white fluorescence lamp without high frequency lighting.



RAYTRON CO., LTD.

HEAD OFFICE & FACTORY (KOREA)
104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA
TEL : +82-42-863-2840 FAX : +82-42-861-0843

FACTORY (CHINA)
6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA
TEL : +86-755-2744-7373 FAX : +86-755-2744-7235

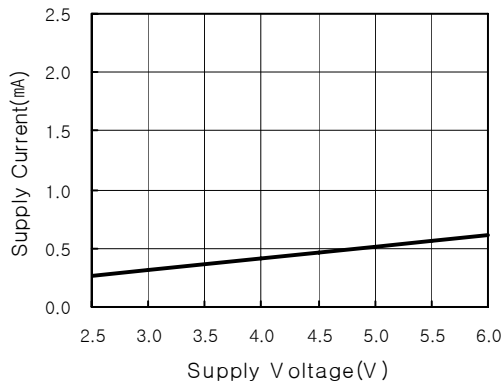
MANAGER	CHECK	APPROVAL
FILE No.	RIS-090515-01	

CUSTOMER :

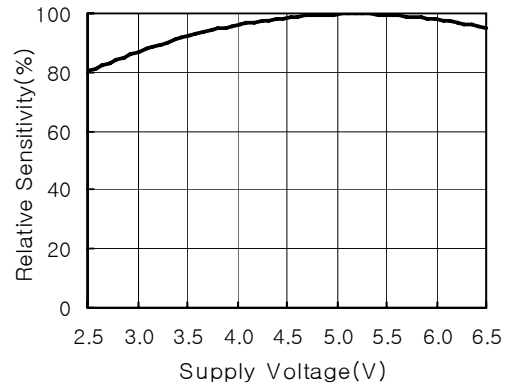
SPECIFICATIONS		SHEET No.	6 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

5) Graph of Electrical/Optical Characteristics

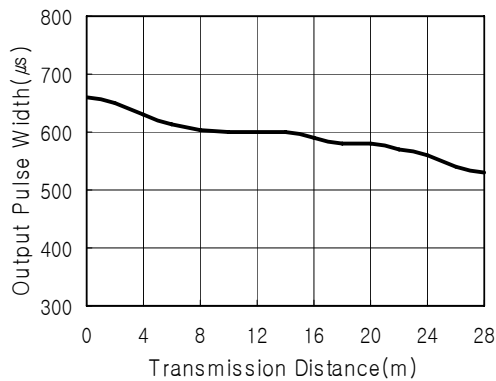
[Fig.1] Supply Current vs. Voltage



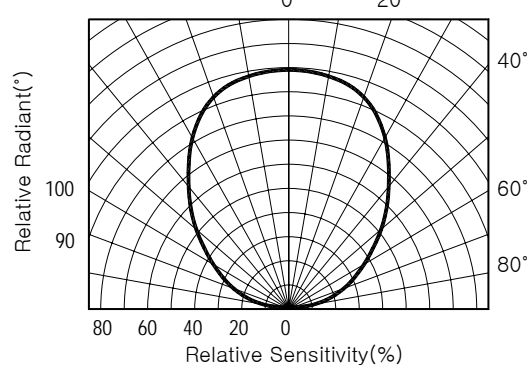
[Fig.2] Sensitivity vs. Supply Voltage



[Fig.3] Output Pulse Width vs. Distance



[Fig.4] Relative Sensitivity vs. Direction



6) Standard Inspection

All output products shall be inspected based on following items.

- ① Detecting distance.
- ② Current consumption.
- ③ High level output voltage.
- ④ Low level output voltage.
- ⑤ Output Pulse width.

7) Others

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

 <p>RAYTRON CO., LTD. HEAD OFFICE & FACTORY (KOREA) 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA TEL : +82-42-863-2840 FAX : +82-42-861-0843 FACTORY (CHINA) 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA TEL : +86-755-2744-7373 FAX : +86-755-2744-7235</p>	MANAGER	CHECK	APPROVAL
			
	FILE No.	RIS-090515-01	

CUSTOMER :

SPECIFICATIONS		SHEET No.	7 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

9. Reliability Test Item and Standard.

- 1) All output products shall satisfy below Reliability test items.
- 2) Related sampling quantity and acceptance/failure judgment standard accordance with MIL standard MIL-STD-883 is as listed below.

- ① Confidence level : 90%
 ② LTPD : 10% / 20%

No.	Test Item	Test Conditions	Judgment Standard	Fail(c) / Samples(n)
1	High Temp. Storage (*2)	Ta=+90℃, t=500hr	High level output voltage $V_{OH} (V_{CC}=5.0V)$ $V_{OH} > 4.5V$ Low level output voltage $V_{OL} (V_{CC}=5.0V)$ $V_{OL} < 0.4V$ $I_{CC} (V_{CC}=5.0V)$ Consumption current $I_{CC} < 1.0mA$ $D (V_{CC}=5.0V)$ Arrival Distance $D > 6m$	C=0 / n=22
2	Low Temp. Storage (*2)	Ta=-30℃, t=500hr		C=0 / n=22
3	High Temp. Operating (*1,*2)	Ta=+85℃, Vcc=5.0V t=500hr		C=0 / n=22
4	Low Temp. Operating (*1,*2)	Ta=-30℃, Vcc=5.0V t=500hr		C=0 / n=22
5	High Temp./ High Hum. Bias (*1,*2)	Ta=+85℃, 85%RH Vcc=5.0V, t=500hr		C=0 / n=22
6	Temperature Cycle (*2, *3)	Ta=-20℃(0.5h) to +85℃(0.5h) 20cycle		C=0 / n=22
7	P.C.T (*2)	Ta=+121℃ 100%RH, P=1atm, t=4hr		C=0 / n=22
8	Solder Heat (*2)	Ta=+270±5℃, 5s		C=0 / n=11
9	Variable frequency Vibration (*2)	Frequency range : 10 to 55Hz/sweep 1min Overall amplitude : 1.5mm X,Y,Z/2h each		C=0 / n=11
10	Falling (*4)	Height=75cm, 3 times		C=0 / n=11
11	Solderability (*5)	Soldering Temp.: +260±5℃, 10s Pb free solder : Sn/3.0Ag/0.5Cu		Leads shall be covered By solder more than 95%

- *1. Supply voltage of load test is 5V.(Standard Jig of Raytron)
- *2. Electro-optical characteristics shall be satisfied after leaving 2 hours in the normal condition.
- *3. Temperature 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.
- *5. Reflow Soldering.

In case any trouble or question arises related to above test items, both parties agree to make full discussion and covering the said matters.

 <p>RAYTRON CO., LTD. HEAD OFFICE & FACTORY (KOREA) 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA TEL : +82-42-863-2840 FAX : +82-42-861-0843 FACTORY (CHINA) 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA TEL : +86-755-2744-7373 FAX : +86-755-2744-7235</p>	MANAGER	CHECK	APPROVAL
			
	FILE No.	RIS-090515-01	

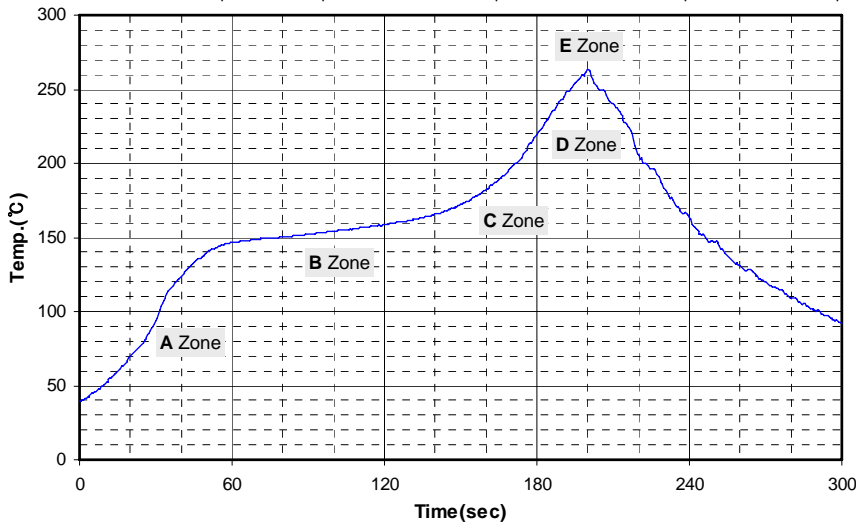
CUSTOMER :

SPECIFICATIONS		SHEET No.	8 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

10. Precautions to be taken on mounting

1) Reflow Soldering

- ① Following soldering paste recommended.
 - Melting temperature : 245 ~ 260°C
 - Composition : Pb-Free
- 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.



Zone	Time	Temperature
A	70 ~ 100sec	4°C/s max.
B	60 ~ 120sec	140 ~ 160°C
C	50 ~ 70sec	4°C/s max.
D	40sec max.	210 ~ 230°C
E	10sec max.	260°C max.

☞ Reflow System : Japan pulse Laboratories Inc.(RF-430)
Temp. Profile : SEF Eltronic GmbH (Mesh 3.0)

2) Manual Soldering

- ① Use the Pb-Free solder or the solder containing silver.
- ② Use a soldering iron of 25W or smaller.
Adjust the temperature of the soldering iron below 270°C
- 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 : 30seconds under the temperature below 50°C or 3minuted below 30°C.
- ③ Ultrasonic cleaning : Below 20W

 <p>RAYTRON CO., LTD. HEAD OFFICE & FACTORY (KOREA) 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA TEL : +82-42-863-2840 FAX : +82-42-861-0843 FACTORY (CHINA) 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA TEL : +86-755-2744-7373 FAX : +86-755-2744-7235</p>	MANAGER	CHECK	APPROVAL
			
	FILE No.	RIS-090515-01	

CUSTOMER :

SPECIFICATIONS		SHEET No.	9 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

4) Moisture-Proof Packing

- ① To avoid moisture absorption by the resin, the product the product is packed in an aluminum envelope with silica gel.
- ② Since the optical characteristics of the device may be affected by exposure to moisture in the air before soldering and they should therefore be stored after opening the moisture proof bag under the following conditions.
 - . Temperature : 10 to 30℃
 - . Humidity : 60% RH or less
 - . Time : 72h

5) Baking

product that has been in a condition of moisture resistant packaging for 6 months or longer. or for which 72 hours or longer have elapsed since the moisture resistant packaging was opened. should be baked according to the following conditions prior to use.

- ① Baking conditions
 - . 60℃, 48 hours or longer (Reels)
 - . 100℃, 4 hours or longer (Bulk)
 - . 125℃, 2 hours or longer (Bulk)
 - . 150℃, 1 hours or longer (Bulk)

6) Mounting Precautions

- ① Do not apply stress to the resin at high temperature.
- ② The resin part is easily scratched, so avoid friction with hard materials.
- ③ When installing the assembly board in equipment, ensure that this product does not come into contact with other components.

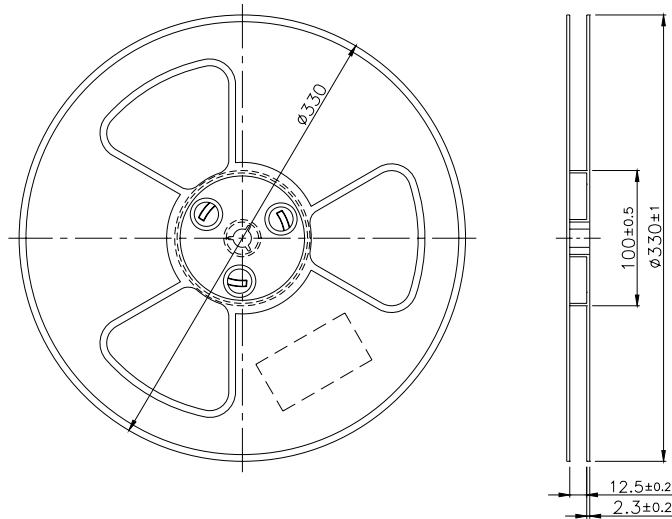
	RAYTRON CO., LTD. HEAD OFFICE & FACTORY (KOREA) 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA TEL : +82-42-863-2840 FAX : +82-42-861-0843 FACTORY (CHINA) 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA TEL : +86-755-2744-7373 FAX : +86-755-2744-7235	MANAGER	CHECK	APPROVAL
				
		FILE No.	RIS-090515-01	

CUSTOMER :

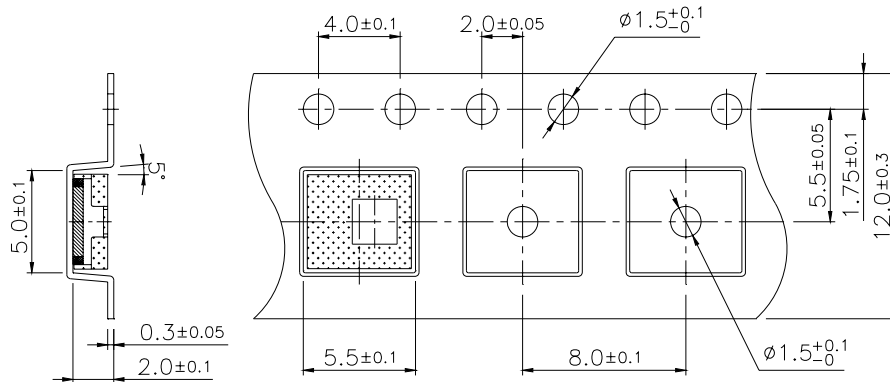
SPECIFICATIONS		SHEET No.	10 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

11. Tape and Reel Packing Specifications

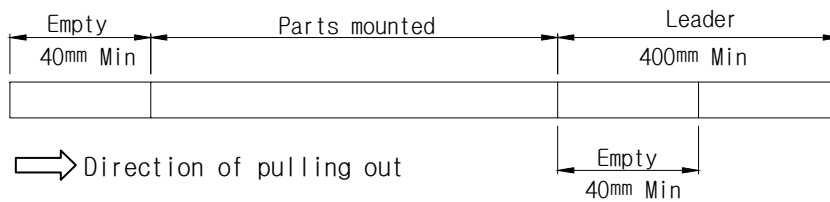
1) Shape and dimension of reels



2) Dimension of tapes



3) Configuration of tapes



RAYTRON CO., LTD.

HEAD OFFICE & FACTORY (KOREA)
104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA
TEL : +82-42-863-2840 FAX : +82-42-861-0843

FACTORY (CHINA)
6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA
TEL : +86-755-2744-7373 FAX : +86-755-2744-7235

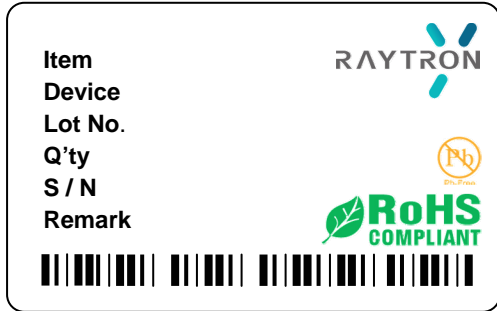
MANAGER	CHECK	APPROVAL
FILE No.	RIS-090515-01	

CUSTOMER :

SPECIFICATIONS		SHEET No.	11 of 11
		DATE	2009. 05.15
PART NAME	IR RECEIVER MODULE	MODEL NAME	
PART No.		TYPE No.	ROM-C540L-R

12. Packing Specifications

1) Label Specification (Bar Code Sticker)



Label Dimensions (Unit : mm)

Label Type	L	W	Remark
Label #1	65	40	

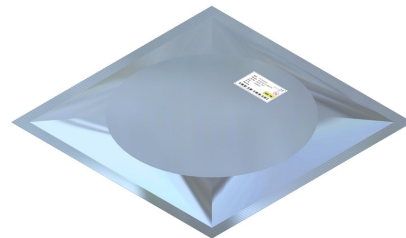
2) Box Specifications & Packing Method

(Unit : mm)

Packing Type	Materials	L x W x H	Quantity
Plastic Reel	Plastic	13"	3,500 pcs
Al Shielding Bag	Aluminum	400 x 480 x 0.1	3,500 pcs
SMD-#1	Corrugated Cardboard	350 x 350 x 40	3,500 pcs
SMD-#2	Corrugated Cardboard	380 x 380 x 420	35,000 pcs



1. Put 3,500pcs of products in a reel.



2. Put 1pcs of Al shielding bag.



4. Put 10pcs of #1 packing boxes in a #2 packing box.



3. Put them(1pcs of reel) in a #1 packing box.



RAYTRON CO., LTD.

HEAD OFFICE & FACTORY (KOREA)
 104-6, Moonji-Dong, Yusung-Gu, Daejeon, KOREA
 TEL : +82-42-863-2840 FAX : +82-42-861-0843

FACTORY (CHINA)
 6/F, BlockA, Huafeng GongYeYuan, Bao'an72, Shenzhen, CHINA
 TEL : +86-755-2744-7373 FAX : +86-755-2744-7235

MANAGER	CHECK	APPROVAL
FILE No.	RIS-090515-01	