SPECIFICATION

REFERENCE

ISSUED DATE : **2010. 01. 06**

DOCUMENT NO : PDCM-200□LM5R-01

CUSTOMER :

DESCRIPTION : IR RECEIVER MODULE

MODEL NO. : KSM-2002LM5R

[KODENSHI KOREA CORP.]

ISSUE DEPT.			PRODUCTION		Q/A	
ISSUE	REVIEW	APPR'L	REVIEW	APPR'L	REVIEW	APPR'L

[CUSTOMER APPROVAL]

ISSUE	REVIEW					

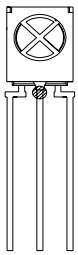
[REVISION]

NO	DATE	REVISION ITEMS	ISSUED BY	APPR'D BY

1. Scope

The KSM-200□LM5R 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 Outline

See the attached Drawing No. RM-200□LM□□-ASY-03

5. Absolute Maximum Ratings (at 25℃ Unless otherwise notes)

Parameter	Symbol	Ratings	Unit
Supply Voltage / Output Voltage	Vcc	6	V
Supply Current / Output Current	Iout	2.5	mA
Operating Temperature	Topr	-20℃ 80℃	℃
Storage Temperature	Tstg	-25℃ 85℃	℃
Manual soldering Temperature	Tsol	260(Max 5 sec)	℃

6. Reliability Test

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

[Ta= 25℃, Vcc= 5.0V]

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
Supply Voltage Range	Vcc			2.7	-	5.5	V
Current Consumption	Icc	No Input Signal	Vcc=5V	-	1.0	2.0	mA
			Vcc=3V	-	0.8		
Peak Wavelength *3	λp			-	940	-	nm
B.P.F Center Frequency *4	fo			-	*4	-	kHz
Arrival Distance *3	L	250Lux	0 °	24	-	-	m
			±30 °	20	-	-	m
H Level Output Voltage *3	V_{OH}	30cm over the ray axis		Vcc-0.5	Vcc-0.3	-	V
L Level Output Voltage *3	V_{OL}			-	0.2	0.5	V
H Level Output Pulse Width *3	T_{WH}	Burst Wave = 600μs Period = 1.2ms		500	-	700	μs
L Level Output Pulse Width *3	T_{WL}			500	-	700	μs
Output Form	Active Low Output						

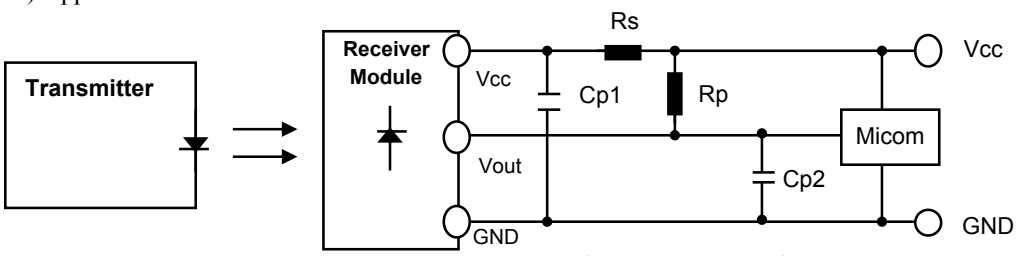
Note : *3. It specifies the maximum distance between emitter and detector that the output waveform satisfies the standard(8-2,3) under the conditions below against the standard transmitter

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 400㎷p-p under the measuring circuit specified in drawing(8-2,3)

4) Application Circuit



* Don't recommend Rp & Cp2

1) Rs (Vcc input series resistor) : 100 ohm ~ 470ohm

2) Cp1(Vcc-GND terminal series Condenser) : 47uF ~ 100uF

3) Rp (Vcc-Vout terminal Pullup resistor) : Optional (when using 10K ohm or more)
When Rp is lower than 10k, Micom can't reply by a VoL rise.

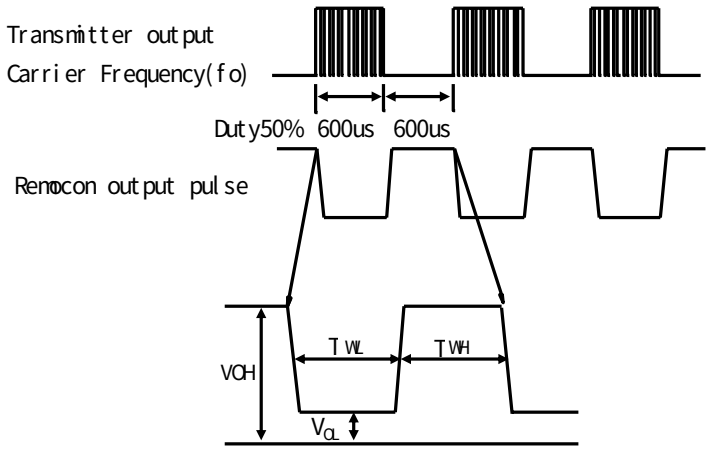
4) Cp2(Vout-GND terminal pararllel Condenser) : Optional (when using 100pF less than)

*4. B.P.F Center Frequency(fo) of each model is shown below

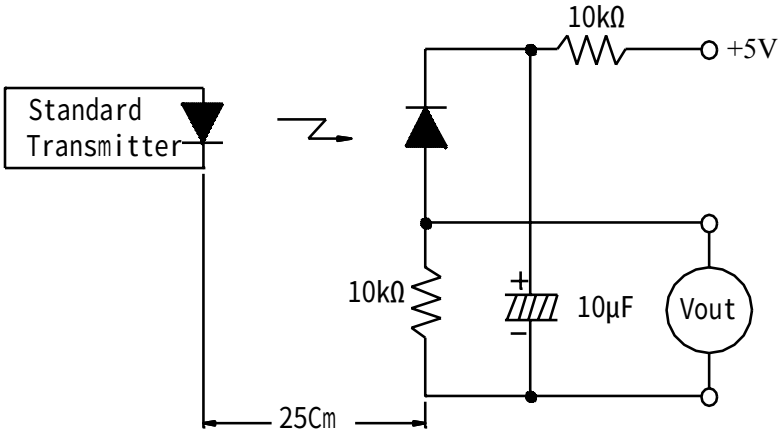
Model NO.	B.P.F Center Frequency(㎑)
KSM-2001 Series	40.0
KSM-2002 Series	36.7
KSM-2003 Series	37.9
KSM-2004 Series	32.7
KSM-2005 Series	56.9

8. Measure Method

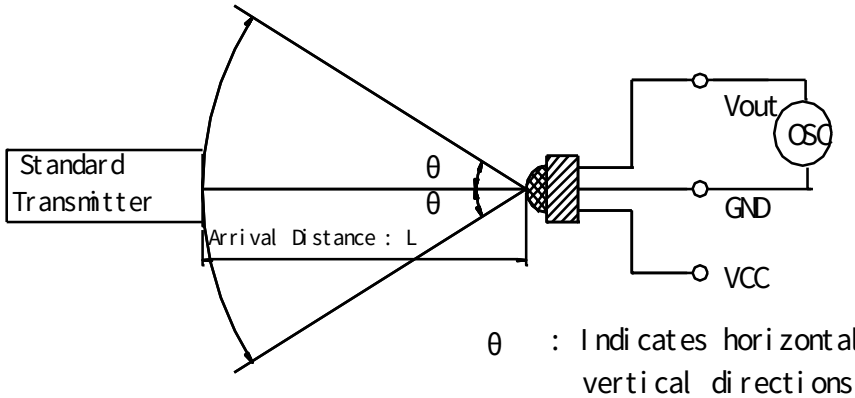
8-1. Output Pulse Width



8-2. Standard Transmitter



8-3. Test Condition of Arrival Distance



θ : Indicates horizontal and vertical directions

9. Standard Inspection

Among electrical characteristics, total quantity shall be inspected as below

9-1. Front distance between emitter and detector

9-2. Current consumption

9-3. H level output voltage

9-4. L level output voltage

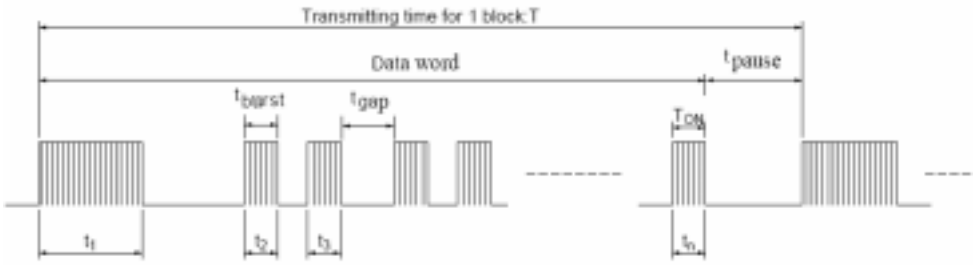
10. Customer must check below clauses before using

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) tpause = Min. 9msec
3) Duty(Σtburst /T) = Max. 30%
4) tBurst = Min. 150usec
5) tGap = Min. 250usec

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. (tpause = 0ms)					

6) above (1)~(5) should be all meet and all remote control button should be operated properly.



10-2. If your condition doesn't meet the above statement, it might not operate properly.

10-3. We recommand 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.

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(Electronic Microwave Interperence) condition.

11-5. Solder pad within the condition of ratings. after soldering do not add extrorse force.

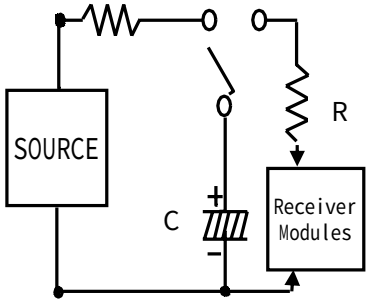
11-6. Put decoupling device between Vcc and GND for reduce the noise from power supply line.
recommand Vcc-GND 47μF and Vcc- 100Ω. Decoupling device should be near receiver modules.

11-7. The decrease in distance, the output noise, the malfunction, etc. might occur because of a surrounding electromagnetic environment.

11-8. To prevent static electricity damage to the Pre-AMP make sure that the human body, the soldering iron is connected to ground before using

11-9. This device has to control of static electricity

KODENSHI Korea Corp. guarantees a KSM-200□LM5R up to M.M 200V , HBM 2KV



M.M = MACHINE MODEL(Resistance: 0KΩ Capacitor: 200pF)

HBM = HUMAN BODY MODEL(Resistance: 1.5kΩ 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.

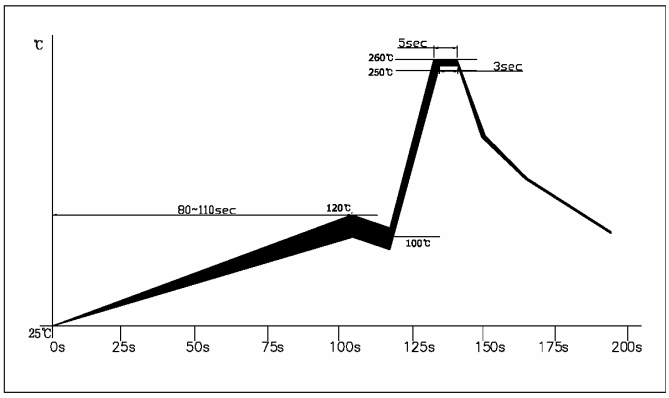
12-2.Extent of Guarantee

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

12-3 .This product complies with RoHS directive.

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

13. Recommand wave solder condition for Lead-free



13-1. Pre-heating temperature is 100~120℃, for a duration about 80~110seconds, the speed of raise temperature is 1~2℃/sec

13-2. The peak temperature is 255±5℃, the duration for 3~5seconds.

13-3. The speed of refrigerate is 10℃/sec

13-4. The total time of Wave solder is about 3.5 minutes.

14. Others

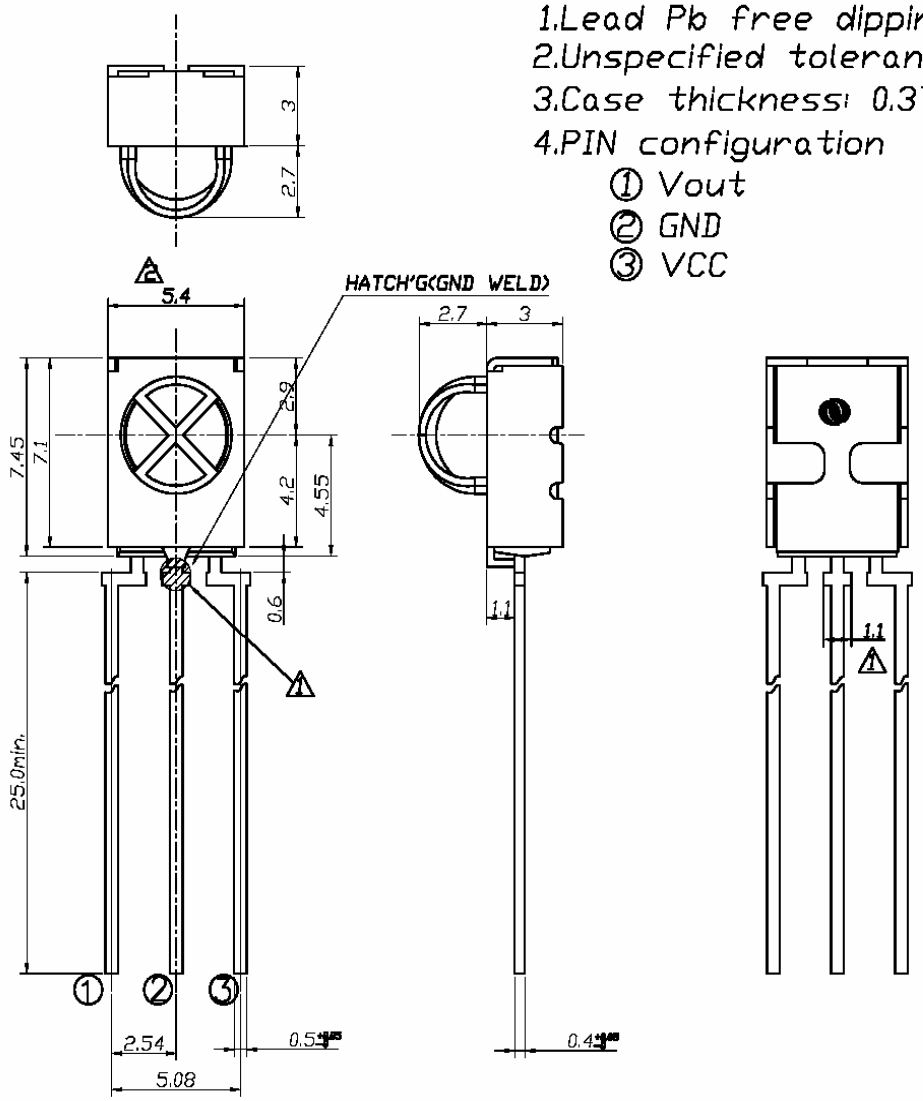
In case where any trouble or questions arise, both parties agree to make full discussion covering the said problem

Classification	Receiver Module	Name	KSM-20□□ Series

MARK	REVISION	DATE	NAME	SIGN
1	Lead tolerance adding	05.06.08	L.S.H	L.S.H
2	Correct	08.06.13	K.S.J	K.S.J

GENERAL TOLERANCE(±)						
Dimension \ Grade	0	1	2	3	4	5
~4 and below	0.005	0.05	0.05	0.1	0.2	0.5
4~16 and below	0.05	0.08	0.1	0.2	0.3	0.8
16~64 and below	0.08	0.1	0.2	0.3	0.5	1.2
63~250 and below	0.1	0.2	0.3	0.5	0.8	1.8

1.Lead Pb free dipping
2.Unspecified tolerance:±0.3
3.Case thickness: 0.3TYP
4.PIN configuration
① Vout
② GND
③ VCC



★RoHS Compliance

NO	DESCRIPTION	MAT'L	DIMENSION	REMARK

ISSUED DEPT.				Q'TY		TITLE (Ass'y)
ISSUE	REVIEW	REVIEW	APPR'L	UNIT	MM	KSM-200□LM□□
K.S.J 08.06.13	L.S.H 08.06.13		L.K.Y 08.06.13	SCALE	5/1	

DRAWING NO	REF DWG NO	
RM-200□LM□□-ASY-03	RM-200□LM□□-ASY-02	KODENSHI

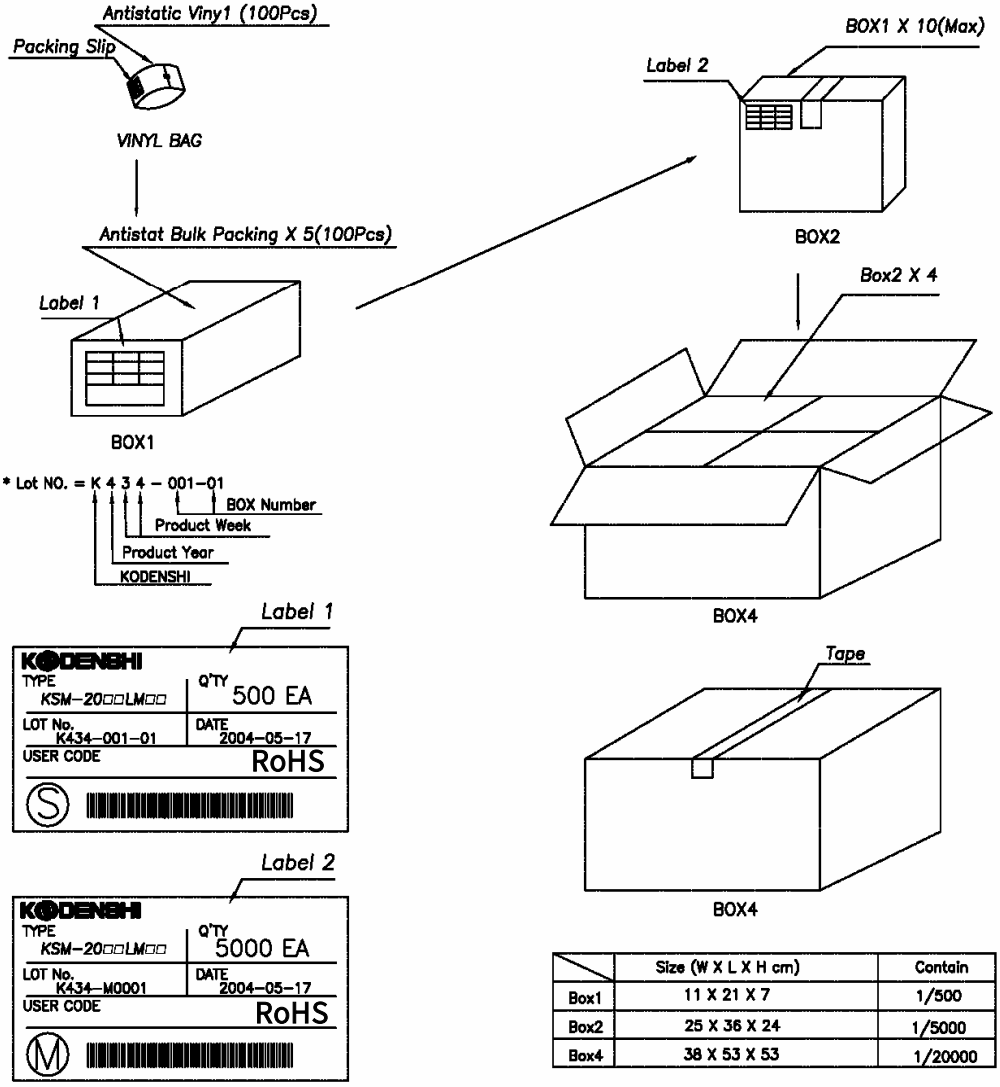
KKC-QM-067-3

MARK	REVISION	DATE	NAME	SIGN

GENERAL TOLERANCE(±)

Dimension \ Grade	0	1	2	3	4	5
~4 and below	0.005	0.05	0.08	0.1	0.2	0.5
4~16 and below	0.05	0.08	0.1	0.2	0.3	0.8
16~64 and below	0.08	0.1	0.2	0.3	0.5	1.2
63~250 and below	0.1	0.2	0.3	0.5	0.8	1.8

* Packing Specification



Label 1

KODENSHI	
TYPE KSM-20□□LM□□	Q'TY 500 EA
LOT No. K434-001-01	DATE 2004-05-17
USER CODE	RoHS
Ⓢ	

Label 2

KODENSHI	
TYPE KSM-20□□LM□□	Q'TY 5000 EA
LOT No. K434-M0001	DATE 2004-05-17
USER CODE	RoHS
Ⓜ	

	Size (W X L X H cm)	Contain
Box1	11 X 21 X 7	1/500
Box2	25 X 36 X 24	1/5000
Box4	38 X 53 X 53	1/20000

	PACKING STATUS			
NO	DESCRIPTION	MAT'L	DIMENSION	REMARK
ISSUED DERT.		Q'TY	EA	TITLE PACKING
DRAWN: L.S.H	DESIGN	UNIT	MM	KSM-20□□LM□□
CHECK'D	APPRV'D: L.K.Y	SCALE	N/S	
DRAWING NO: RM-20□□LM□□-PK-01	REF DWG NO	KODENSHI		

KKC-QM-067-4