

# DATA SHEET

## WIRELESS COMPONENTS

FR4 Chip Antenna  
ANT1204F002R0433A

433MHZ  
1204 Series



FEATURES

- Compact size
- Omni-directional Radiation
- Tape & reel automatic mounting
- Reflow process compatible
- RoHS compliant

APPLICATIONS

- Smart meter
- Industrial remote control
- ISM band equipment

ORDERING INFORMATION

All part numbers are identified by the series, packing type, material, size, antenna type, working frequency and packing quantity.

**PART NUMBER**

**ANT 1204 F 002 R 0433A**  
 (1) (2) (3) (4) (5) (6)

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**(1) PRODUCT**

ANT = Antenna

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**(2) SIZE**

1204=12× 4

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**(3) ANTENNA TYPE**

L, F, A=Chip antenna

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**(4) SERIAL NO.**

002

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**(5) PACKING STYLE**

R = Tape and Reel

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**(6) WORKING FREQUENCY**

0433=433 MHz

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**PHYCOMP CTC**

CAN4311059020431K

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**I2NC**

431105902043

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**SPECIFICATION**

Table 1

DESCRIPTION	VALUE
Centre Frequency	433 M Hz
Bandwidth	28M Hz ( Typ. )
Return Loss	6.5 dB min
Polarization	Linear
Azimuth Beamwidth	Omni-directional
Peak Gain	0.79 dBi ( Typ. )
Impedance	50 Ω
Operating Temperature	- 40~105 °C
Maximum Power	1 W
Termination	Cu / Au (Environmentally-Friendly Leadless)
Resistance to Soldering Heats	260°C , 10sec.

**NOTE**

I. The specification is defined on Yageo evaluation board

**DIMENSIONS**

Table 2 Machinical Dimension

	DIMENSION
L (mm)	12.30 ±0.20
W (mm)	4.00 ±0.20
T (mm)	1.60 ±0.20
A (mm)	0.50 ±0.20

**OUTLINES**

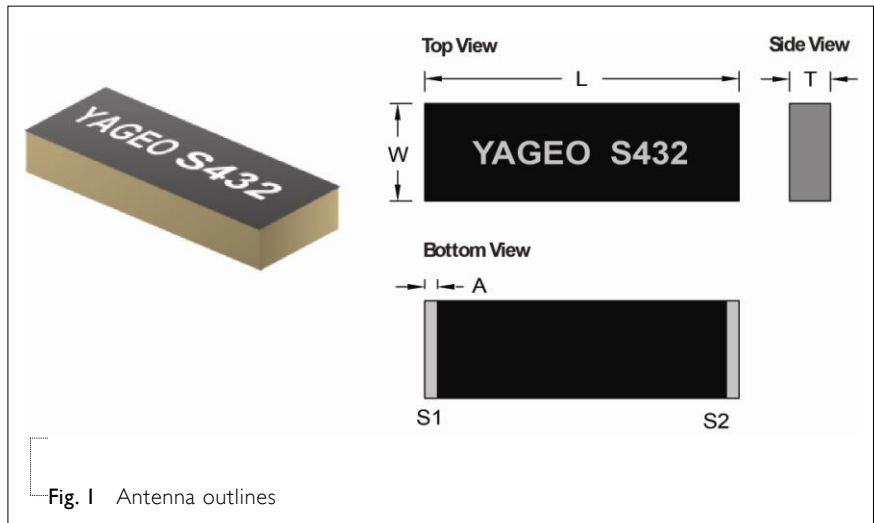
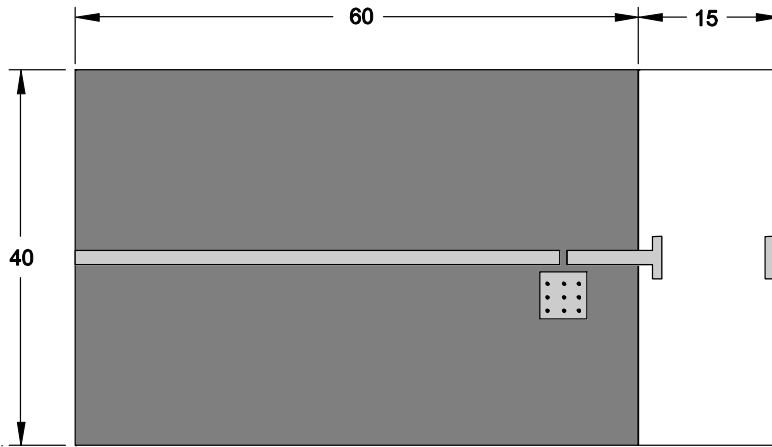


Fig. 1 Antenna outlines

Table 3 Termination configuration

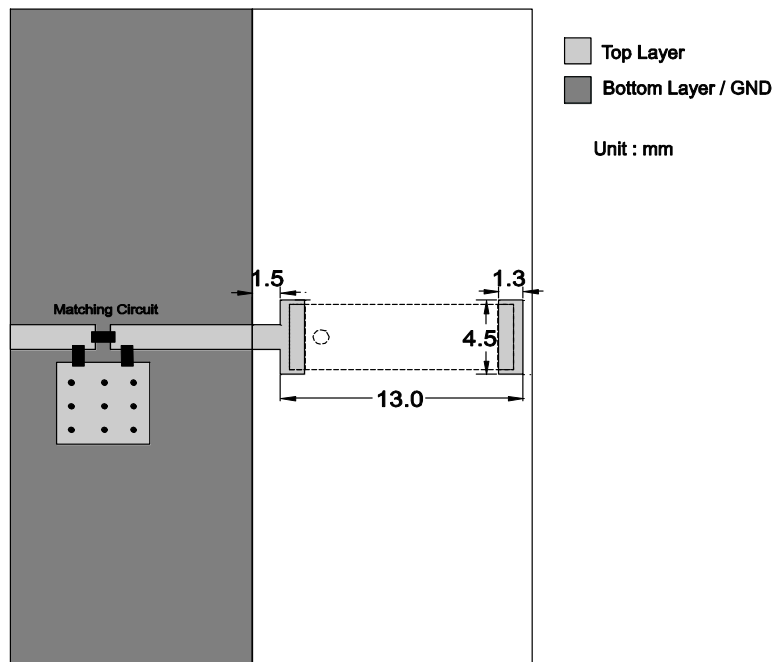
TERMINAL NAME	FUNCTION
S1	Feeding Point
S2	Soldering Point

**REFERENCE DESIGN OF EVALUATION BOARD**



Unit : mm

Fig. 3 Outlook and dimension of evaluation board

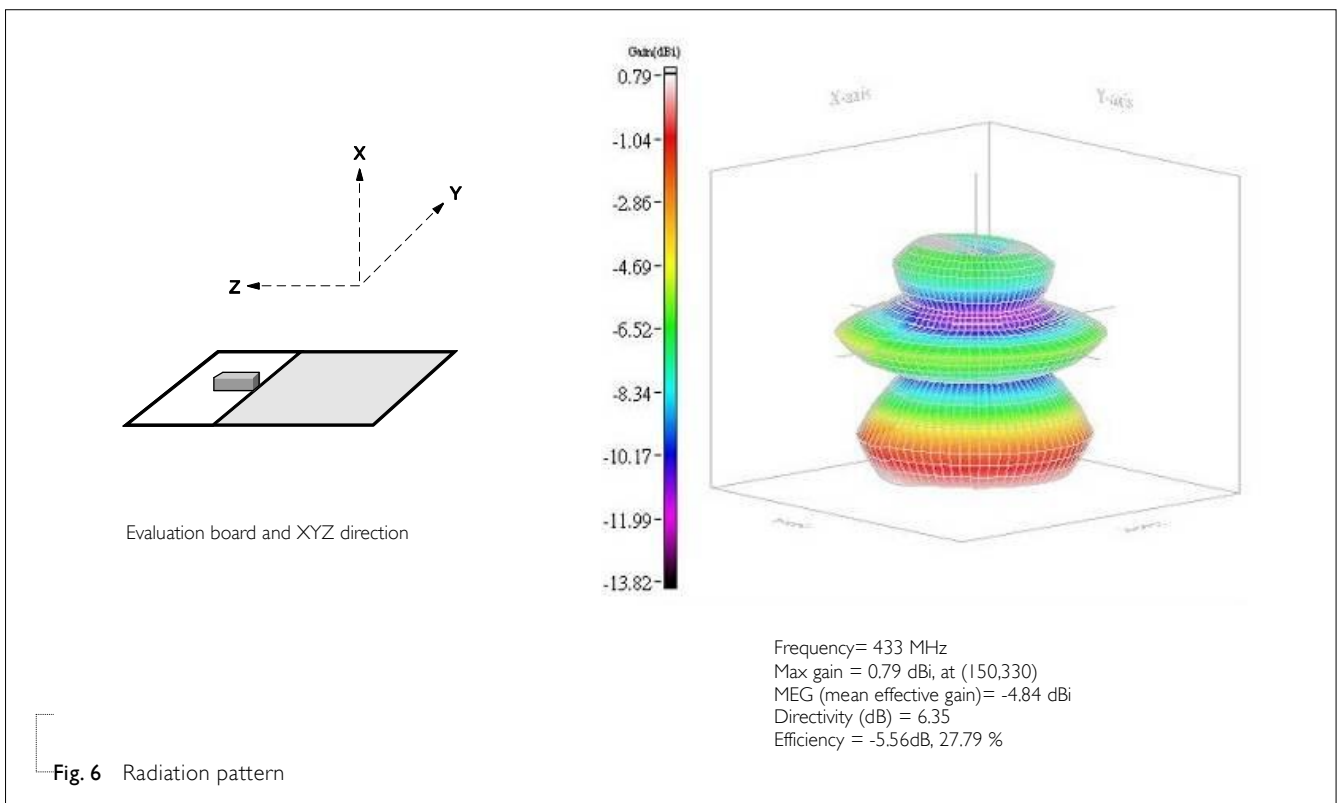
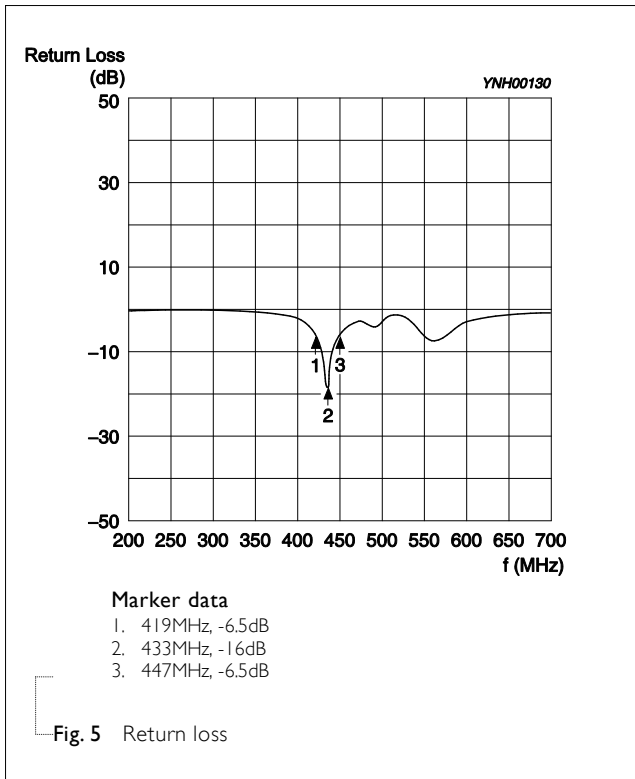


Unit : mm

YNH00129

Fig. 4 Details of soldering Pad

**ELECTRICAL PERFORMANCES**



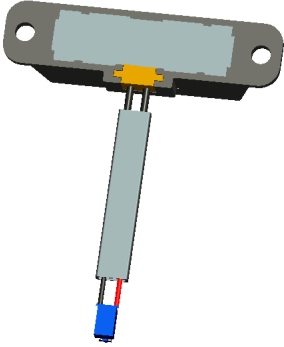
REVISION HISTORY**REVISION    DATE            CHANGE NOTIFICATION    DESCRIPTION**




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Version 0	Aug. 05, 2013	-	- New data sheet for SMD type antenna, 433MHz application, 1204 series
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# Product Approval Sheet

<b>Product Name</b>	<b>ANTENNA, LF: 2P-50mm (133KHz)</b>	<b>Product Image)</b>
<b>Model</b>	<b>Indoor LF Antenna</b>	
<b>Part No.</b>	<b>1-3602-00008</b>	
<b>Manufacturer</b>	<b>RF Controls Co. Ltd</b>	

DESIGN	CHECK	APPROVAL
		
2019.02.01.	2/1	

## **Contents**

- 1. Revision History**
- 2. Product Description**
- 3. Rated Specifications**
- 4. Drawing**
- 5. Related Standards**
- 6. Reliability Test**
- 7. Packing Specifications**
- 8. Precaution**



## 1. Revision History

Rev.	Contents	Description	Organization	Date
0	Production Release			
1	Resonance Frequency change (134KHz -> 133KHz)	Re-Approval	R&D Team	Immediately
2				
3				
4				

## 2. Product Descriptions

### 2.1 Outlines

#### 2.1.1 Product Name

Indoor LF Antenna

#### 2.1.2 Goal

This product is a transmission antenna and is mounted inside heavy equipment of Doosan Infracore. It functions to transmit an encrypted 133KHz LF signal for approval of security values to the user's smart key inside the vehicle, and vehicle control is possible when user authentication is completed in the smart key.

### 2.2 Application Range

Doosan Infracore Heavy Equipment to be developed after \*\* Month 2019

### 2.3 Warranty

1 year after vehicle delivery (hours of use: 2,960 hrs)

### 3. Rated Specifications

#### 3.1 Environment and Operation

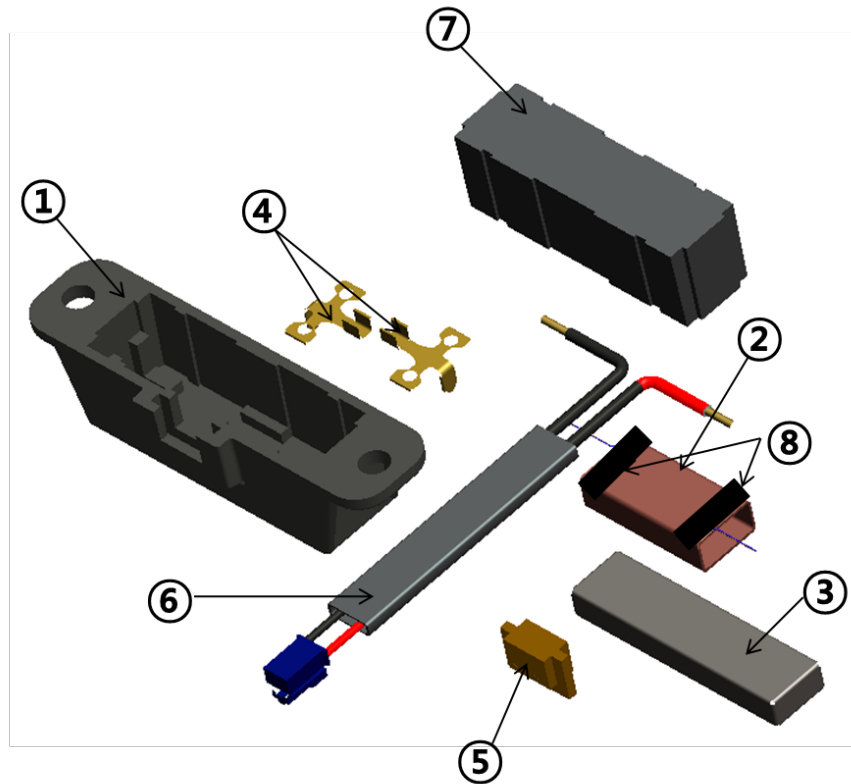
Environmental & Operation Specification		
No	Parameter	Specification
1	Storage Temperature	-40°C to 105°C
2	Operation Temperature	-30°C to 85°C

#### 3.2 Electrical

Electrical Specification		
No	Parameter	Specification
1	Resonance Frequency	133KHz $\pm$ 5%
2	Inductance	211uH $\pm$ 5%
3	VSWR	3 : 1 or less @ 133KHz

### 3.3 Components

#### 3.4.1 Body Antenna Assembly

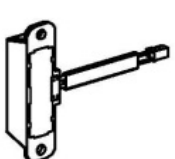


PART DESCRIPTION				
No	P/No	P/Name	Q'ty	Remark
1	0000517	LF HOUSING	1	Indoor/Outdoor Common
2	0000521	COIL	1	Indoor/Outdoor Common
3	0000520	FERRITE BAR	1	Indoor/Outdoor Common
4	0000518	TERMINAL A	2	Indoor/Outdoor Common
5	0000519	SEALPART	1	Indoor/Outdoor Common
6	0000527	CABLE ASSY	1	Yeonho SMH200-02
7	0000523	EPOXY	1	Indoor/Outdoor Common
8	0000560	ISOLATED TAPE	1	Indoor/Outdoor Common

# 4. Drawing

## 4.1 Mechanical Drawing

### 4.1.1 Indoor LF Antenna Assembly



ISO VIEW  
(Do not scale)

**1. Electrical Specifications**

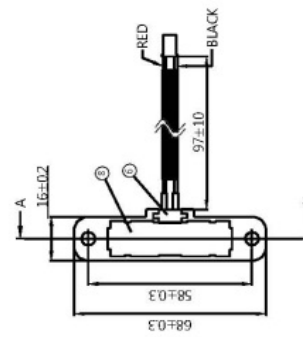
Parameter	Specification
1. Resonance Frequency	13.8MHz ± 5%
2. Inductance	211uH ± 5% @ 20Hz
3. VSWR	3:1 or less @ 13.8MHz

**2. Environment and Operation**

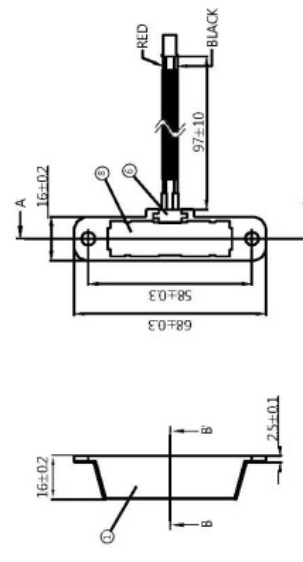
Parameter	Specification
1. Storage Temperature	-40°C to 105°C
2. Operation Temperature	-30°C to 85°C

**3. Reliability Test**

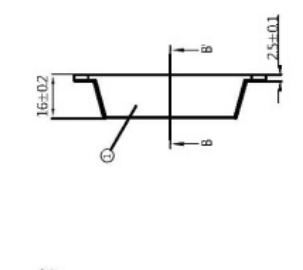
Standards	No	Test Title	Methods	Requirement
Electromagnetic parts Environmental test	1	Low Temperature Test	Storage at -40°C for 100 hours and leave at room temperature for 2 hours.	After completion of the test, the change in the performance value of the DUT is within 10%.
	2	High Temperature Test	Proced at +85°C for 100 hours and leave at room temperature for 2 hours.	After completion of the test, the change in the performance value of the DUT is within 10%.



SECTION B-B



SECTION A-A



SECTION C-C

**NOTE**

- There should be no flow, noise, or eccentricity after assembling with the counterpart assembly.
- Obtain drawing approval from supplier in accordance with final specification.
- The reliability test specifications and items comply with the customer request test procedure.
- Check the dimensions and tolerances in the drawing and adjust substances in the production.
- Be careful of deformation when handling products.
- Do epoxy molding after put the antenna in the housing.
- Do not allow the epoxy to protrude out of the housing when pouring.

**PARTLIST**

NO	PART NAME	Material
①	Connector Cable Assy	SMA-D01-027(white)/RMSL-PVC TUBE
②	SEAL PART	Flame Retardant VMD
③	COIL	2LEW 013
④	TERMINAL A	CR030501
⑤	PERITE BAR	PE7
⑥	LF HOLDING	PH8-GP3E BLACK (UL94V0)

2022.11.09	Design-Regulatory Change	RJC	RJC
2023.02.24	Production Release	RJC	RJC
<b>REVISION HISTORY</b> NO. REV. DATE REVISION BY 1 1.1 SEE TABLE - 010401 KIMAC 2 1.1 SEE TABLE - 010401 KIMAC 3 3.0623-0100B KIMAC 4 1.1 SEE TABLE - 010401 KIMAC 5 1.1 SEE TABLE - 010401 KIMAC 6 1.1 SEE TABLE - 010401 KIMAC 7 1.1 SEE TABLE - 010401 KIMAC			

**RF CONTROLS**  
 Indoor LF ANTENNA  
 ANTENNA LF 20-50mm(13.8MHz)

## 5. Related Standards

### 5.1 Environmental Test

Common	Performance Test	Basic Function Test	12	Performance Test after connecting test Jig	Check Specification
Indoor LF Antenna	Environmental Test	Low Temp. Test	6	Proceed at $-40\pm 2^{\circ}\text{C}$ for 100 hours and leave at room temperature for 2hrs	After completion of the test, the change in the performance value of the DUT is within 10%
	Environmental Test	High Temp. Test	6	Proceed at $+85\pm 2^{\circ}\text{C}$ for 100 hours and leave at room temperature for 2hrs	After completion of the test, the change in the performance value of the DUT is within 10%

## 6. Reliability Test

### 6.1 Environmental Test Results

Low Temperature Test		S i g n	Design	Check	Check	승 인
			J.H. Ko			W.K. Kim
Report No.	RFC-0104-003	Date	2019.01.04			
Test Date	2018.12.27~2018.12.31	Organization/Tester	R&D Team / J.H. Ko			
<b>1. General Status</b>						
Request Team	RFC Co. Ltd R&D Team	Purpose	Reliability Test			
Requester	J.H. Ko	Test Item	low Temperature Test			
<b>2. Test Target</b>						
Car	Wheel Loader/ Excavator	Part No.	0000515			
Model	ANTENNA,LF:2P-50mm(133KHz)	LOT NO.	#1 ~ #6			
<b>3. 시험현황</b>						
Management No.	RFC-0104-003	Test Equipment	Constant Temp. Chamber			
Test Site	RF Controls Co. Ltd	Number of Samples	6 EA			
<b>4. Test Methods and Criteria</b>						
Test Method	Proceed at $-40\pm 2^{\circ}\text{C}$ for 100 hours and leave at room temperature for 2hours					
Criteria	▶ After completion of the test, the change in the performance value of the DUT is within 10%					
<b>5. Test Results : " PASS " (Refer: Attached DATA)</b>						
<b>6. Remarks</b> - Reliability Test						
※ This is a test report only for samples submitted by the above request team and cannot be used for propaganda, litigation, or other legal requirements						

## Low Temperature Test

		3 : 1 or less @ 133KHz		
		Before Test	After Test	Rate of Change
Indoor LF Antenna	#1	1.70	1.76	3.53%
	#2	1.43	1.50	4.90%
	#3	1.44	1.52	5.56%
	#4	1.60	1.65	3.12%
	#5	1.84	1.93	4.89%
	#6	1.31	1.36	3.82%
	VSWR	OK		

Test Image



<b>High Temperature Test</b>		S i g n	Design	Check	Check	승 인
			J.H. Ko		/	W.K. Kim
Report No.	RFC-0104-004	Date	2019.01.04			
Test Date	2018.12.27~2018.12.31	Organization/Tester	R&D Team / J.H. Ko			
<b>1. General Status</b>						
Request Team	RFC Co. Ltd R&D Team	Purpose	Reliability Test			
Requester	J.H. Ko	Test Item	High Temperature Test			
<b>2. Test Target</b>						
Car	Wheel Loader/ Excavator	Part No.	0000515			
Model	ANTENNA,LF:2P-50mm(133KHz)	LOT NO.	#7 ~ #12			
<b>3. 시험현황</b>						
Management No.	RFC-0104-004	Test Equipment	Constant Temp. Chamber			
Test Site	RF Controls Co. Ltd	Number of Samples	6 EA			
<b>4. Test Methods and Criteria</b>						
Test Method	Proceed at +85±2°C for 100 hours and leave at room temperature for 2hours					
Criteria	▶ After completion of the test, the change in the performance value of the DUT is within 10%					
<b>5. Test Results : " PASS " (Refer: Attached DATA)</b>						
<b>6. Remarks</b> - Reliability Test						
※ This is a test report only for samples submitted by the above request team and cannot be used for propaganda, litigation, or other legal requirements						