Test Report

Product Name : Answer Call
Model No. : EC981
FCC ID. : PTCEC981-US

Applicant : Home-Lane Electronic Technology Co., Ltd.
Address : 4 Fl., No. 45, Lane 133, Linsen N. Rd., Taipei, Taiwan 104, R.O.C.

Date of Receipt : Oct. 18, 2001
Date of Test : Oct. 19, 2001
Report No. : 01AL035FI

Test Report Certification

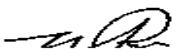
Test Date : Oct. 19, 2001
Report No. : 01AL035FI

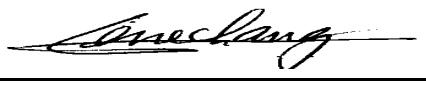
Accredited by NIST (NVLAP)
NVLAP Lab Code: 200533-0

Product Name	:	Answer Call
Applicant	:	Home-Lane Electronic Technology Co., Ltd.
Address	:	4 Fl., No. 45, Lane 133, Linsen N. Rd., Taipei, Taiwan 104, R.O.C.
Manufacturer	:	Home-Lane Electronic Technology Co., Ltd.
Model No.	:	EC981
FCC ID.	:	PTCEC981-US
Rated Voltage	:	DC 12V
Trade Name	:	Home Lane
Measurement Standard	:	FCC Part 15 Intentional Radiators for Subpart C Paragraph 15.231
Measurement Procedure	:	ANSI C63.4:1992
Test Result	:	Complied

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government.

Documented By : 
(Chialin Chen)

Tested By : 
(Wallace Pan)

Approved By : 
(Gene Chang)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Answer Call
Trade Name	Home Lane
FCC ID.	PTCEC981-US
Model No.	EC981
EUT Voltage	DC 12V
Freq. Range of Operation	433.92MHz
Channel number	1
Type of antenna	Printed
Type of Modulation	AM

Note:

1. The EUT is a Answer Call which sends response to master display unit.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.231.
3. This device is a composite device in accordance with Part 15 regulations. The function for the receiver was, measured and made a test report that the report number is 01AL034F, certified under verification.

1.2. Operation Description

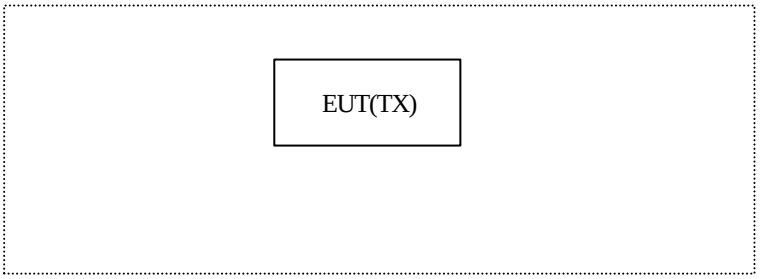
The EUT is a 433.92MHz transmitter intend to send response to master display unit.
The remote control signal can be transferred to receiver in 433.92MHz AM modulation.
The transmission antenna is soldered on the PCB directly.
The super regenerative receiver was used. An external excitation was used when the test of receiver was performed.

1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

✧ None

1.4. Configuration of tested System



1.5. EUT Exercise Software

(1) Setup the EUT and simulators as shown on 1.4.

(2) Enable RF function of EUT.

(3) EUT will work in typical condition.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: April, 22, 2001 File on

Federal Communications Commission

FCC Engineering Laboratory

7435 Oakland Mills Road

Columbia, MD 21046

Reference 31040/SIT1300F2

June 29, 2001 Accreditation on NVLAP

NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation

Site Address: No.5-22, Ruei-Shu Valley, Ruei-Ping Tsuen

Lin Kou Shiang, Taipei 244 Taiwan, R.O.C.

2. Radiated Emission

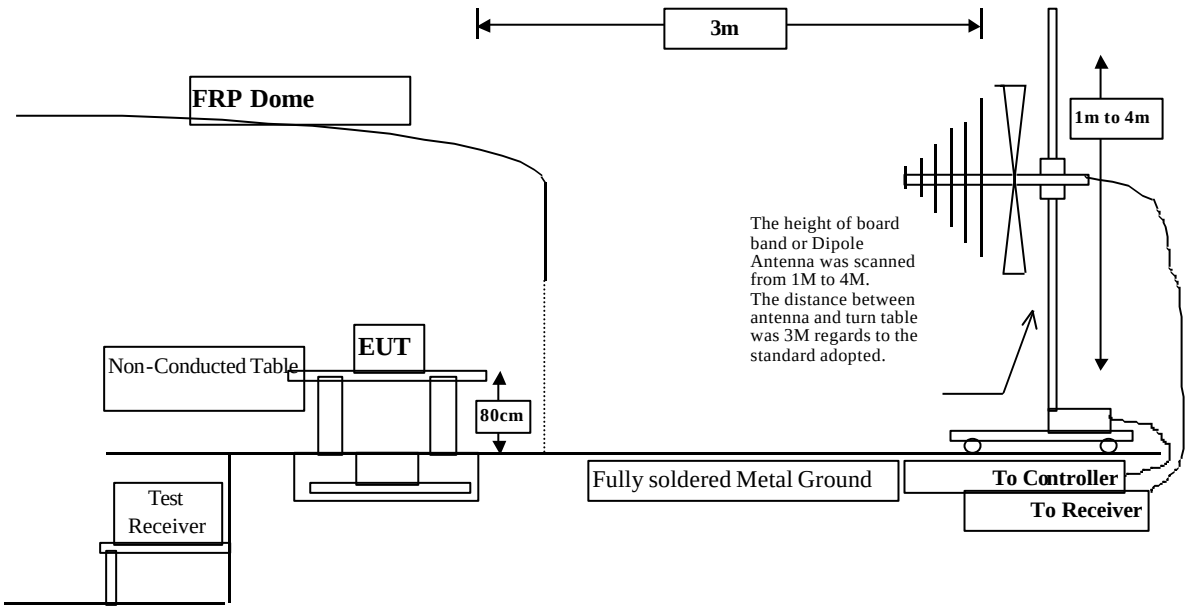
2.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 1	X	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2001
	X	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2001
	X	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2001
	X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2000
	X	Test Receiver	R & S	ESCS 30 / 836858/022	Nov., 2000
☐Site # 2	X	Spectrum Analyzer	Advantest	3162 / 100803466	May, 2001
	X	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2001
	X	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2001
	X	Horn Antenna	ETS	3115 / 0005-6160	July, 2001
	X	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	July, 2001

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

2.2. Test Setup



2.3. Limits

➢ FCC Part 15 Subpart C Paragraph 15.231 Limit

Fundamental Frequency MHz	Field strength of fundamental		Field Strength of spurious emissions	
	uV/m	dBuV/m	uV/m	dBuV/m
40.66-40.70	2250	67.0	225	47.0
70-130	1250	61.9	125	41.9
130-174	1250-3750[1]	61.9 – 71.5	125-375[1]	41.9 – 51.5
174-260	3750	71.5	375	51.5
260-470	3750-12500[1]	71.5 – 81.9	375-1250[1]	51.5 – 61.9
above 470	12500	81.9	1250	61.9

Remarks : 1. RF Line Voltage (dBuV) = 20 log RF Line Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➢ Frequencies in restricted band are complied to limits on Paragraph15.209.

Frequency MHz	15.209 Limits (dBuV/m @3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remarks : 1. RF Line Voltage (dBuV) = 20 log RF Line Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

2.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:1992 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harminics is checked.

2.5. Test Result of Radiated Emission

Product : Answer Call
Test Item : Fundamental Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Normal Operation

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Measurement
MHz	dB	dB/m	dB	dBuV	dBuV/m
Horizontal:					
Peak Detector					
433.950	2.95	13.75	0.00	55.11	71.82

Average Detector

Peak: 71.82dBuV/m

Duty Cycle: -2.01454dB

Average Measurement = Peak +Duty Cycle= 69.81 dBuV/m

Average Limit = 20log (41.6667*433.95-7083.3333) =80.83 dBuV/m

Vertical:					
Peak Detector					
433.920	1.00	21.53	27.41	36.00	31.12

Average Detector

Peak: 31.12dBuV/m

Duty Cycle: -2.01454dB

Average Measurement = Peak +Duty Cycle= 29.11 dBuV/m

Average Limit = 20log (41.6667*433.95-7083.3333) =80.83 dBuV/m

Note:

1. Average Limit (dBuV/m)=20log(41.6667(F)-7083.3333)
2. Measurement = Reading Level + Probe Factor + Cable loss – Preamp.

Product : Answer Call
Test Item : Harmonic Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Normal Operation

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Measurement	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal:							
Peak Detector							
867.865	5.19	17.34	0.00	39.10	61.63	0.27	61.90
1300.000	2.86	25.03	18.04	46.28	56.13	5.77	61.90
Vertical:							
Peak Detector							
867.870	1.60	24.81	27.46	36.00	34.94	26.96	61.90
1300.000	2.86	25.03	18.04	48.45	58.30	3.60	61.90

Note:

1. Emission Level = Reading Level + Antenna Factor + Cable loss
2. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Answer Call
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Normal Operation

	Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Measurement	Margin	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal:								
	43.580	0.94	11.19	0.00	3.16	15.29	24.71	40.00
	69.540	1.07	6.12	0.00	4.20	11.39	28.61	40.00
	128.310	1.37	11.69	0.00	2.13	15.19	28.31	43.50
	162.000	1.55	9.39	0.00	3.87	14.80	28.70	43.50
	238.210	1.94	10.22	0.00	6.30	18.47	27.53	46.00
*	439.210	2.98	15.79	0.00	3.10	21.86	24.14	46.00
Vertical:								
	58.320	1.02	5.30	0.00	3.30	9.61	30.39	40.00
*	82.380	1.14	7.53	0.00	4.98	13.65	26.35	40.00
	155.214	1.52	8.99	0.00	6.13	16.63	26.87	43.50
	162.540	1.56	8.47	0.00	4.20	14.23	29.27	43.50
	210.530	1.80	8.85	0.00	5.01	15.65	27.85	43.50
	294.670	2.24	12.23	0.00	4.35	18.81	27.19	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Antenna Factor + Cable loss

3. Occupied Bandwidth of Raidated Emission

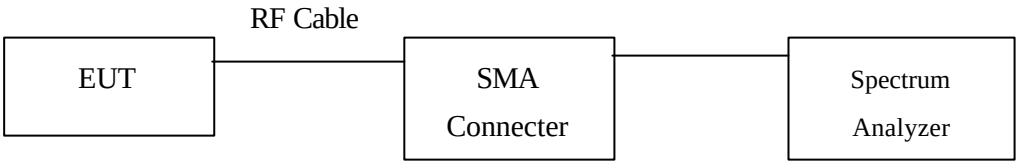
3.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Advantest	R3272 / 72421194	May. 2001

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup



3.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

3.4. Limits

(1) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

(2) The bandwidth of the emission shall be no wider than 0.5% of the center frequency for devices operating above 900MHz.

3.5. Test Procedure

The bandwidth of radiated emission is measured under the EUT condition produced the generated carrier signal.

3.6. Test Result of Occupied Bandwidth of Raidated Emission

Product : Answer Call
Test Item : Occupied Bandwidth of Raidated Emission
Test Site : No.1 OATS
Test Mode : Normal Operation

Center Frequency	433.95	MHz
Allowable Bandwidth (70-900 MHz:0.25%, Above 900MHz: 0.5%)	1084.875	kHz
Bandwidth at 20dB down (Max)	460	kHz
Result	Complied with regulation	

4. Duty Cycle Measurement

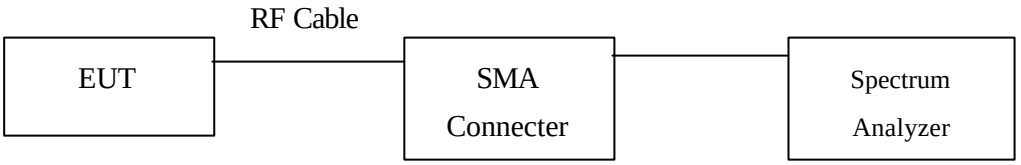
4.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum	Advantest	R3272 / 72421194	May, 2001

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

4.2. Test Setup



4.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

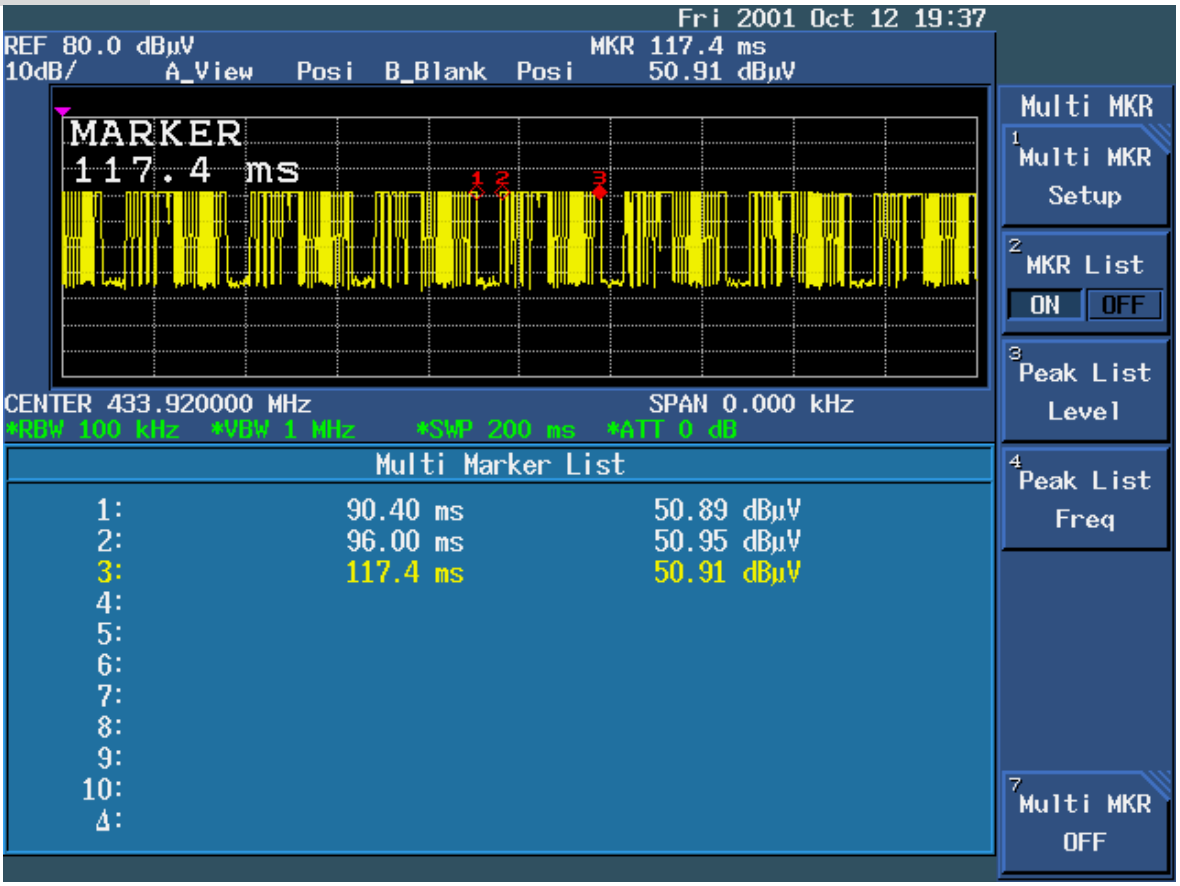
4.4. Test Proceudre

The bandwidth of radiated emission is measured under the EUT condition produced the generated carrier signal.

4.5. Test Result of Duty Cycle Measurement

Product : Answer Call
Test Item : Duty Cycle Measurement
Test Site : No.1 OATS
Test Mode : Normal Operation

433.92MHz



117.4 – 90.40 = 27 ms
117.4 – 96.00 = 21.4 ms
Duty Cycle
= 20 log (21.4 / 27)
= 20 log 0.793
= -2.01454dB

5. Tansmitter activated automatically Measurement

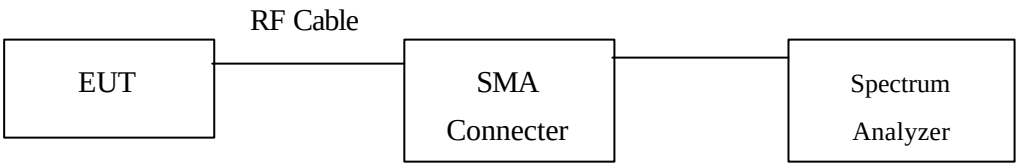
5.1. Test Equipme nt

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2001
X	Horn Antenna	EM	EM6917 / 103325	May, 2001

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

5.2. Test Setup



5.3. Test Condition

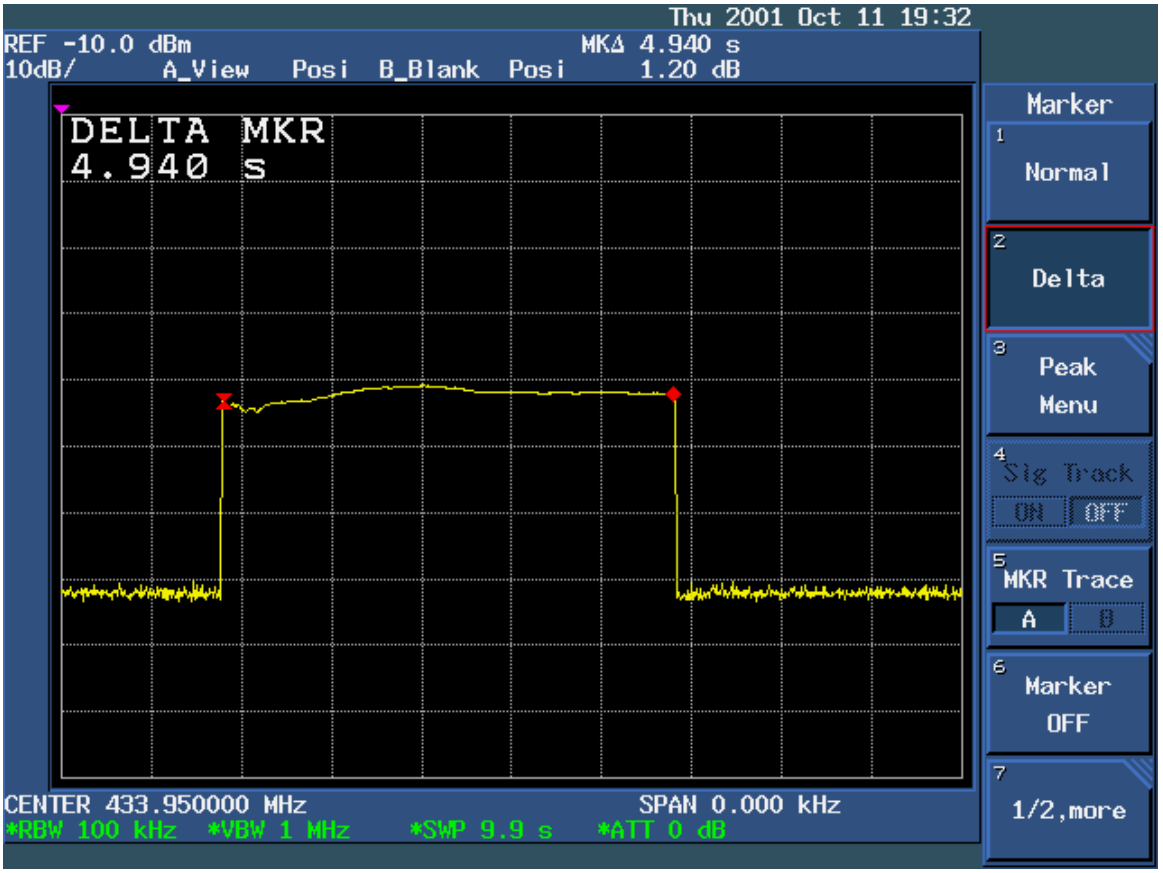
Standard Temperature and Humidity, Standard Test Voltage

5.4. Test Proceudre

The EUT on a non-conducted table was positioned such that the distance from antenna to the EUT was 15cm.
A transmitter deactivated automatically is measured under the EUT condition produced the generated carrier signal.

5.5. Test Result of Tansmitter activated automatically Measurement

Product : Answer Call
Test Item : Tansmitter activated automatically Measurement
Test Site : No.1 OATS
Test Mode : Normal Operation



6. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1 : EUT Test Photographs

Attachment 2 : EUT Detailed Photographs