TEST REPORT CERTIFICATION

Applicant	Name	BiSRO Co.,Ltd.
	Address	POST-BI Center, 932, Wongok-Dong, Danwon-Gu, Ansan-Shi, Gyeonggi-Do, South Korea
Manufacturer	Name	BiSRO Co.,Ltd.
	Address	POST-BI Center, 932, Wongok-Dong, Danwon-Gu, Ansan-Shi, Gyeonggi-Do, South Korea

Product	Name	One-Way Remote Control
	Model	ASF-301
	Usage	Car Alarm System
FCC Rule Section		FCC CFR 47, Part15, Subpart C - 15.205, 15.209, 15.231

※ Note: This test report is for customer shown above and their specific product only, It should not be reproduced except in full, without the written approval of our laboratory.

Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C 63.4-2003.

We attest to the accuracy of data and all measurements reported herein were performed by **KOSTEC Co.,Ltd.** and were made under Chief Engineer's supervision. We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test Date : 2008-07-28~ 2008-07-30	Reviewed Date : 2008-07-31
Signature 	Signature 
Tested By : Gyeong Hyeon, Park	Reviewed By : Kyung Chan, Kim

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1. GENERAL INFORMATION

1.1 Test Facility

The open area field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site at was fully described in a reports submitted to the Federal Communication Commission (FCC).

The details of these reports have been found to be in complies with the requirements of Section 2.948 of the FCC Rules on November 14, 2002. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.525762. The test site has been approved by the FCC for public use and is List in the FCC Public Access Link CORES (Commission Registration System)

⊙ **Name of Test Firm ;**

-. KOSTEC Co., Ltd.

⊙ **Head office and test Laboratory ;**

-. Address : 180-254, Annyung-dong, Hwasung-Si, Gyeonggi-do, South Korea 445-380

-. Telephone Number : +82-31-222-4251

-. Fax. Number : +82-31-222-4252

⊙ **Certification** ;

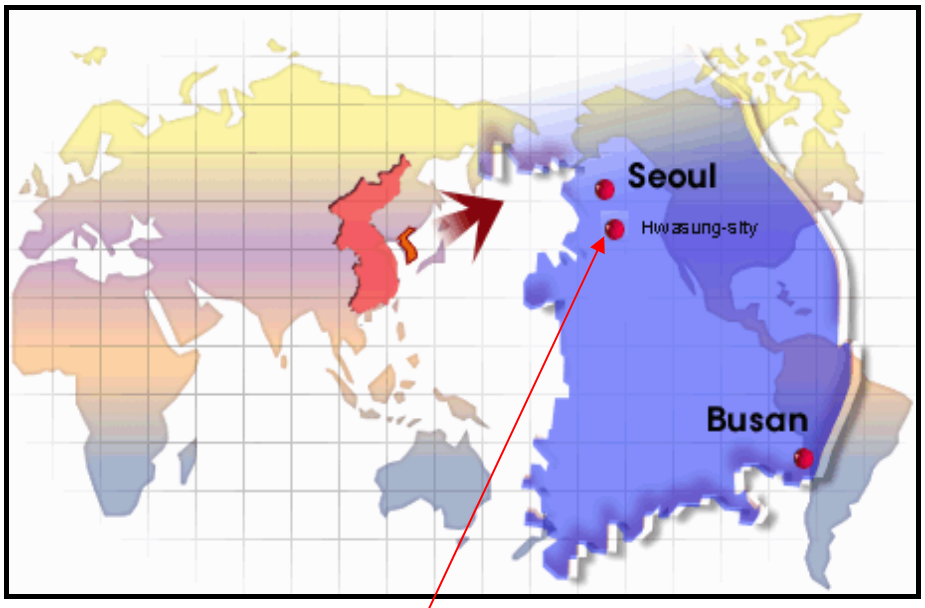
-. KCC (Korea Communications Commission) Number : KR0041

-. FCC Registration Number(FRN) : 525762

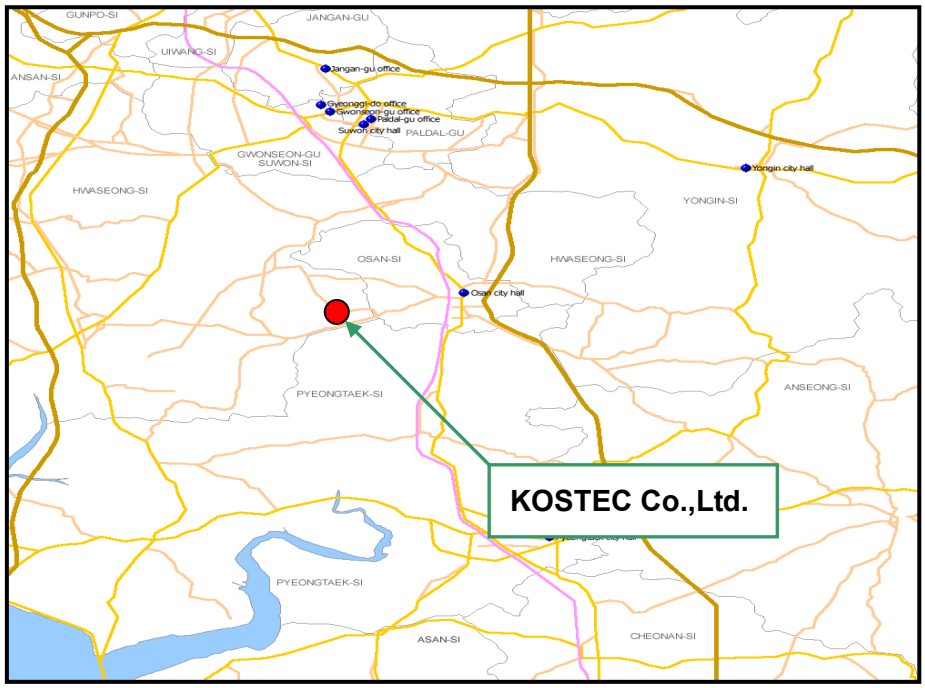
-. VCCI Registration Number : R-1657 / C –1763

1.2 MAP

■ KOREA



HWASUNG-SITY (OATS)



2. PRODUCT DESCRIPTION

The product specification described herein was declared by manufacturer and for more detailed features description. Please refer to the manufacturer's specifications or User's Manual.

1) FCC ID	WJ3ASF-301
2) Purpose of test	FCC Certification
3) FCC Rules Section	FCC CFR 47, Part15, Subpart C - 15.205, 15.209, 15.231
4) Test result	Compliance with above specification
5) Name of EUT	One-Way Remote control
6) Type designation	Car Alarm System
7) Model / Brand Name	ASF-301 / None
8) Serial Number	None
9) ITU emission Code	8K50F1D
10) Oscillation Type	X-TAL
11) Modulation Type	FSK(Frequency shift keying)
12) Working Frequency	447.275 MHz
13) Channel spacing / Number	Not applicable / 1(one)
14) Communication Type	One –Way, Simplex
15) Final Amplifier	IC1
16) Weight / Dimension	250g / 63(L) mm x 27(W) mm x 12(D) mm
17) Operation temperature	-20℃~ +70℃
18) Power Source	DC 3V (Lithium battery)
19) Antenna Description	Connect type: Fixed, Length: 15mm, Gain: 1.10 dBi

3. SYSTEM TEST CONFIGUTATION

3.1 Characteristics of Device

This device is remote control for Car's Engine start/stop and door open/close, it is Consist of Transmit part circuit and design to stand along type without peripheral device, rated power source was supply to internal battery, it is only operated when user is push button in it(EUT) The rated working frequency is 447.275 MHz.

▣ **Device for Tested System**

Device	Model Name	Serial No.	Manufacture	Remark
Remote Controller	ALD-401	None	BiSRO Co., Ltd.	None
Battery	CR2032	None	Panasonic	Internal with R/C*

R/C* : Remote Controller

3.2 Product Modification

Not Application

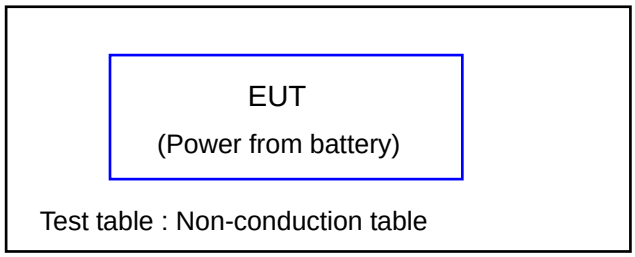
3.3 Justification

All measurement were intentional to maximum the emissions from EUT, therefore, the test result is sure to meet the applicable requirement.

3.4 Test Mode

Test mode is applied respectable differentially according to test item.

3.5 Test Setup of EUT



※Above test setup is general requirement condition

4. SUMMARY TEST RESULT

-. Please refer to see as follow Table

Description of Test	FCC Rule	Reference Clause	Test Result
20dB Bandwidth Testing	Part 15.231(C)	Clause 6.1	Pass
Deactivation Testing	Part 15.231(a)(1)	Clause 6.2	Pass
Restrict band of Operation	Part 15.205	Clause 6.4	Pass
General Requirement	Part 15.209	Clause 6.5	Pass
Radiated Emission	Part 15.231	Clause 6.5	Pass

5. GENERAL REQUIREMENT'S STANDARD

5.1 Labeling Requirement

Per 15 and 19, The device shall bear the following statement in a conspicuous location on the device

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference

(2) this device must accept any interference received, including interference that may cause undesired operation.

According to above requirement standard, This product is attached readily visible in Rear_side of EUT. So, comply with the above requirement standard.

5.2 User Information

Per 15 and 21, The users manual or instruction manual for an intentional or unintentional radiator shall caution. The user that changes or modifications not expressly approved by the party responsible for Compliance could void the user's authority to operate the equipment

According to above requirement standard, User's Manual is describe above requirement Information

5.3 Antenna Requirement

Per 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that user a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The manufacturer may design the unit so that broken antenna can be replaced by the user, but the Use of a standard antenna jack or electrical connector is prohibited.

According to above requirement standard, This product's Antenna type is an fixed type and directional gain is 1.10 dBi, also radiated emission field strength from EUT is below requirement standard limit [§15.209, §15.231(c)] So, comply with the above requirement standard.

6. MEASUREMENT RESULT

6.1 20dB Bandwidth Testing

6.1.1 Applicable Standard

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

6.1.2 Test Results Summary

According to following test procedure, Test result is complied with §15.231(c)

Please see refer to **Clause 6.1.5 Test Plot**

⊙ 20 dB BW Limit = Frequency x 0.25 % = 447.275 x 0.25 % = 1.118 MHz

Channel Frequency (MHz)	20 dB Bandwidth (MHz)	Limit (MHz)	Result
447.275	0.007116	1.118	Compliant

※ Measurement uncertainty : ± 0.082 MHz

6.1.3 Test Equipment List

Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Due Date
Spectrum Analyzer	8563E	3846A10662	Agilent Technology	2008-05-20	2009-05-20
Amplifier	8347A	3307A01571	Agilent Technology	2008-05-20	2009-05-20
Antenna Mast	AT14	None	Daeil EMC	-	-
Turn Table	TT15	none	Daeil EMC	-	-

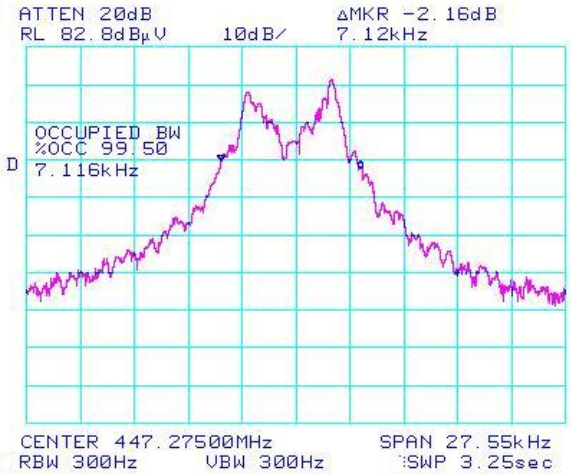
6.1.4 Test Procedure

With the EUT's antenna attached, the EUT's 20 dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

6.1.5 Test Plot

- ▶ Operation Mode : Continuous data frame Transmitting
- ▶ Environmental Conditions :

  -. Temperature: (26 ~ 29) ℃, Relative Humidity: (55 ~ 57)% R.H. Pressure: 100.2 kPa



6.2 Deactivation Testing

6.2.1 Applicable Standard

Per 15.231(1) of (a), A manually operated Transmitter shall employ a switch that will automatically deactivate the Transmitter within not more than 5 seconds of being released.

6.2.2 Test Results Summary

According to following test procedure, Test result is complied with §15.231(1) of (a)

Please see refer to **Clause 6.2.5 Test Plot**

6.2.3 Test Equipment List

Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Due Date
Spectrum Analyzer	8563E	3846A10662	Agilent Technology	2008-05-20	2009-05-20
Ultra broadband Antenna	HL562	100075	R & S	2008-03-20	2010-03-20
Amplifier	8347A	3307A01571	Agilent Technology	2008-05-20	2009-05-20
Antenna Mast	AT14	None	Daeil EMC	-	-
Turn Table	TT15	none	Daeil EMC	-	-

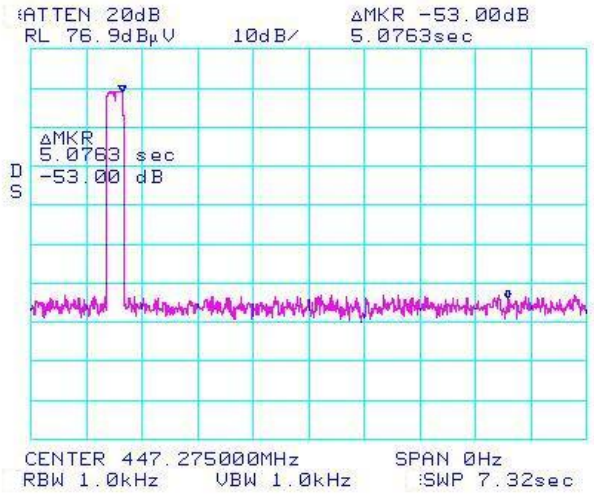
6.2.4 Test Procedure

The deactivation test was performed in the 3 meters OATS(Open Area Test Site), using the setup accordance with the ANSI C63.4-2003. Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

6.2.5 Test Plot

- ▶ Operation Mode : Normal operation Mode
- ▶ Environmental Conditions :

  -. Temperature: (26 ~ 29) ℃, Relative Humidity: (55 ~ 57)% R.H. Pressure: 100.2 kPa



6.3 Duty Cycle

6.3.1 Applicable Standard

Nil (No dedicated limit specified in the Rules).

6.3.2 Test Results Summary

Duty Cycle is 100%, when it is operating, emitted modulated RF Continuous data frame about 355ms

Please see refer to **Clause 6.3.5 Test Plot**

6.3.3 Test Equipment List

Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Due Date
Spectrum Analyzer	8563E	3846A10662	Agilent Technology	2008-05-20	2009-05-20
Attenuator	8498A	3318A09485	Agilent Technology	2008-05-20	2009-05-20

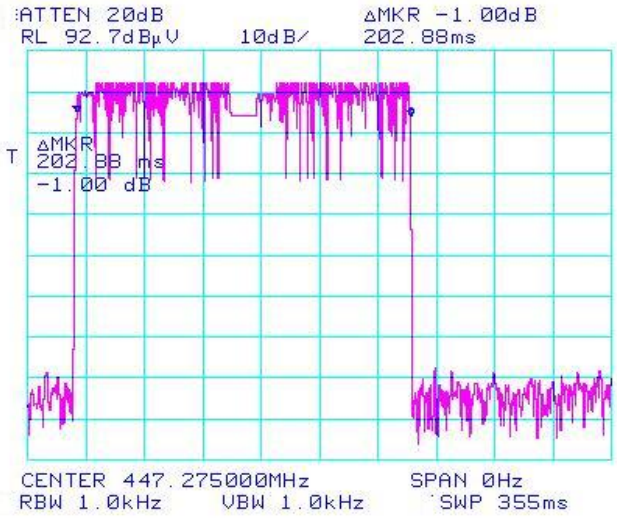
6.3.4 Test Procedure

1. Place the EUT on the table and set it in Normal operation mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer: operating frequency.
4. Spectrum analyzer was set as follows :
   - -. Resolution BW 1 kHz
   - -. Vide BW 1 kHz
   - -. Span 0 Hz
   - -. Detector Normal mode
   - -. Trigger Video(80% set of signal)
   - -. Sweep time 355 ms
5. Repeat above procedures until all frequency measured was complete.

6.3.5 Test Plot

- ▶ Operation Mode : Normal operation Mode
- ▶ Environmental Conditions :

  -. Temperature : 25 ℃, Relative Humidity : 55 % R.H.



6.4 Restrict Band of Operation

6.4.1 Applicable Standard

Per §15.205, Radiated emission from intentional radiators operated under this section shall comply with as follow table Only spurious emissions are permitted in any of the frequency bands listed below ;

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6

※ for more detailed standard description. Please refer to the §15.205.

6.4.2 Test Results Summary

According to following radiated emission test procedure, Test result is comply with this section.

Please see refer to **Clause 6.3.5 Test Plot**

6.5 Radiated Emission Test

6.5.1 Applicable Standard

Per §15.231, §15.209, §15.109 Radiated emission from intentional radiators operated under this Section shall comply with as below following table ;

(1) Intentional Radiated emission Limits ; §15.231

Periodic operation in the band 40.66-40.70 MHz and above 70 MHz,
The field strength of emissions from intentional radiators operated under this section shall not exceed the following ;

Frequency Band	Field strength of Fundamental (㎶/m)	Field strength of Spurious Emissions (㎶/m)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	*1,250 to 3,750	*125 to 375
174-260	3,750	375
260-470	*3,750 to 12,500	*375 to 1250
Above 470	12,500	1250
* Linear interpolations		

Field strength limits are at the distance of 3 meters, emissions radiated outside of the Specified bands, shall be according to the general radiated limits in **§15.209**, as following Table :

Frequency Band	Field strength of Fundamental (㎶/m)	Field strength of Fundamental (㏈㎶/m)
30 - 88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0
s shown in 15.35(b), for frequencies above 100MHz, the field strength limits are based on average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.		

6.5.2 Test Results Summary

According to following test procedure, Test result is complied with §15.231, §15.209, §15.109.
Please see refer to **Clause (1) of 6.5.8 Test Plot**

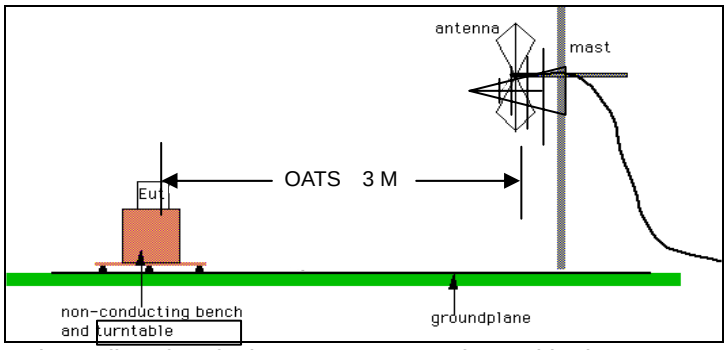
6.5.3 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.
The factors contributing to uncertainties are test receiver, Cable loss, Antenna factor calibration, Antenna directivity, Antenna factor variation with height, Antenna phase center variation, Antenna frequency interpolation, measurement distance variation, Site imperfection, mismatch, and system repeatability. Based on NIS 80,81, The measurement uncertainty level with a 95 % confidence level were apply to Uncertainty of a radiation emissions measurement at OATS(Open Area Test Site) of KOSTEC is ± 4.0 dB

6.5.4 Test Equipment List

Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Due Date
Test Receiver	ESCS30	100111	R & S	2008-03-07	2009-03-07
Spectrum Analyzer	8563E	3846A10662	Agilent Technology	2008-05-20	2009-05-20
Ultra broadband Antenna	HL562	100075	R & S	2008-03-20	2010-03-20
Horn Antenna	3115	2996	EMCO	2008-06-13	2009-06-13
Amplifier	8347A	3307A01571	Agilent Technology	2008-05-20	2009-05-20
Antenna Mast	AT14	None	Daeil EMC	-	-
Turn Table	TT15	none	Daeil EMC	-	-

6.5.5 EUT Setup



※The radiated emission tests were performed in the 3 meters OATS(Open Area Test Site), using the Setup accordance with the ANSI C63.4-2003. The specification used was the FCC §15.231, §15.209 and §15.109

6.5.6 Measurement Procedure

For Remote control, the following procedure was performed to determine the maximum emission axis of EUT ;

1. Setup the configuration per Clause 6.5.5 EUT Setup for frequencies measured below and above 1 GHz respectively. Turn on EUT and make sure that it is test mode function. Also was placed on a non-metallic table height of 0.8 m above the reference ground plane. If EUT is connected to cables, that were fixed to cause maximum emission.
   Antenna was used to Horn antenna for above 1 GHz and Broadband antenna below 1GHz. it made with the antenna positioned in both the horizontal and vertical planes of polarization.

2. For emission frequencies measured below and above 1 GHz, a pre-scan is performed in a shielded Chamber to determine the accurate frequencies before final test, After maximum emissions level will be checked on a open test site. and measuring distance is 3 meter from EUT to receiver antenna.

3. For emission frequencies measured below 1 GHz, set the Test Receiver on a 120KHz 120 KHz resolution bandwidth using measurement instrumentation employing a CISPR quasi-peak detector. and for above1 GHz, set the spectrum analyzer on a 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in Horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0º to 360º with a speed as slow as possible, and keep the Highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies to be measured were complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

7. Check the frequencies of highest emission with varying the placement of cables (if any) associated with EUT to obtain the worst case and record the result.

6.5.7 Calculation of Limit ; §15.231

Method of calculation formula about linear interpolations of §15.231 are as follows ;

[Where F is the frequency in MHz, the formulas for calculation the maximum permitted fundamental field strengths are as follows ;

For the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) – 6136.3636 and 260-470 MHz, uV/m at 3 meters = 41.667(F) – 7083.3333

According to above method of calculation formula, limit Value of FCC Part 15.231 in the table [**Clause (1) of 6.5.8 Test Data]** is record.

6.5.8 Test Data

(1) Fundamental and Harmonics (Transmitting)

- ▶ Operation Mode : Continuous Transmit
- ▶ Measurement distance : 3 meter
- ▶ Environmental Conditions :

-. Temperature: (26 ~ 29) ℃, Relative Humidity: (55 ~ 57)% R.H. Pressure: 100.2 kPa

▣ **30MHz – 1 GHz**

Test Date : 30th, July. 2008

Freq.	Reading	Detector	Tbl	Antenna			CL	Result	FCC Part 15.231/15.209		
(MHz)	(dBμV/m)	(QP)	(Deg.)	Height(m)	Pol.(H/V)	Fctr.(dB/m)	(dB)	(dBμV/m)	Lmt(dBμV/m)	Mgn.(dB)	Remark
78.150	19.25	QP	150°	2.0	H	7.89	2.85	29.99	40.00	10.01	Unwanted
155.127	21.36	QP	90°	1.3	V	7.41	4.10	32.87	43.52	10.65	Unwanted
175.230	24.25	QP	210°	2.5	H	7.97	4.31	36.53	43.52	6.99	Unwanted
447.275	42.56	QP	50°	3.2	V	14.51	7.15	64.22	81.25	17.03	Fundamental
750.240	9.25	QP	220°	1.8	V	19.16	9.58	37.99	61.93	23.94	Spurious

▣ **Above 1 GHz**

Test Date : 30th, July. 2008

Freq.	Reading	Detector	Tbl	Antenna			CL	Result	FCC Part 15.209	
(GHz)	(dBμV/m)	(PK/AV)	(Deg.)	Height(m)	Pol.(H/V)	Fctr.(dB/m)	(dB)	(dBμV/m)	Lmt(dBμV/m)	Remark
1.355	9.27/8.95	PK/AV	210°	1.8	V	25.52	12.25	47.04/46.72	54.00	Unwanted
1.560	5.52/4.98	PK/AV	145°	1.3	V	25.52	13.20	44.24/43.70	54.00	Unwanted
Above 2.000	Nil emission							-20dB below Limit		

※ Regend ; As below table

Freq.(MHz) : Measurement frequency, Reading(dBμV/m) : Indicated value for test receiver, Tbl(Deg) : Directional degree of Turn table, Antenna(Pol, Fctr) : Polarization and Factor CL(dB) : Cable loss, Result(dBμV/m) : Reading(dBμV/m) + Antenna factor.(dB/m)+ CL(dB) FCC Lmt(dBμV/m) : Limit value specified with FCC Rule, FCC Mgn(dB) : FCC Limit (dBμV/m)- Result(dBμV/m) Remark : Measured emission specification

⦿ *Notes :*

1. Above 1 GHz Video Bandwidth is decrease slowly until detector very lower signal with Power amplifier.

2. Signal of this Product have a Duty cycle facto(100%)