Electromagnetic Emission

FCC MEASUREMENT REPORT

CERTIFICATION OF COMPLIANCE

FCC Part 15 Certification Measurement

PRODUCT	:	RADAR DETECTOR
MODEL/TYPE NO	:	INTERCEPTOR / Proto-type
FCC ID	:	QKK-MC1
MULTIPLE MODEL	:	-
BRAND NAME	:	-
APPLICANT	:	Rocky Mountain Radar 6469 Doniphan Drive, El Paso, TX 79932, USA Attn. : Michael Churchman / President
MANUFACTURER	:	ATTOWAVE CO., LTD. 1005, 10F Leader's Tower, 60-15 Gasan-dong, Gumchun-gu, Seoul, 153-801 Korea
FCC CLASSIFICATION	:	DSC : Part 15 Security/Remote Control Transmitter
FCC RULE PART(S)	:	FCC Part 15 Subpart C
FCC PROCEDURE	:	ANSI C63.4-2003
TEST REPORT No.	:	ETLE110322.0212
DATES OF TEST	:	March 23, 2011 to March 24, 2011
REPORT ISSUE DATE	:	April 18, 2011
TEST LABORATORY	:	ETL Inc. (FCC Designation Number : KR0022)

This is RADAR DETECTOR, Model INTERCEPTOR has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 at the ETL Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart C section 15.231.
I attest to the accuracy of data. All measurement herein was performed by me or was made under my supervision and is correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.
The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Prepared by:
Kug Kyoung, Yoon (Test Engineer)
April 18, 2011

Reviewed by:
Yo Han, Park (Chief Engineer)
April 18, 2011

ETL Inc.
#371-51, Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea
Tel: 82-2-858-0786 Fax: 82-2-858-0788

The test report merely corresponds to the test sample(s).
This report shall not be reproduced, in whole or in part without the written approval of ETL Inc.

Table of Contents

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

FCC MEASUREMENT REPORT

Scope – *Measurement and determination of electromagnetic emission(EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)*

General Information

Applicant Name : Rocky Mountain Radar

Address : 6469 Doniphan Drive, El Paso, TX 79932, USA

Attention : Michael Churchman / President

- **EUT Type :** RADAR DETECTOR
- **Model Number :** INTERCEPTOR
- **FCC ID :** QKK-MC1
- **S/N :** Proto-type
- **Frequency Range :** 433.92 MHz
- **FCC Rule Part(s) :** FCC Part 15 Subpart C section 15.231
- **Test Procedure :** ANSI C63.4-2003
- **FCC Classification :** DSC: Part 15 Security/Remote Control Transmitter
- **Dates of Tests :** March 23, 2011 to March 24, 2011
- **Place of Tests :** ETL Inc. Testing Lab.

  Radiated Emission test;
  #499-1, Sagot-ri, Seosin-myeon, Hwaseong-si,
  Gyeonggi-do, 445-882, Korea

  Conducted Emission test;
  ETL Inc. Testing Lab.
  371-51, Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea
- **Test Report No. :** ETLE110322.0212

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

1. INTRODUCTION

The measurement test for radiated and conducted emission test was conducted at the ETL Inc. The site is constructed in conformance with the requirements of the ANSI C63.4-2003 and CISPR Publication 16. The ETL has site descriptions on file with the FCC for 3 m and 10 m site configurations. Detailed description of test facility was found to be in compliance with FCC Rules according to the ANSI C63.4-2003 and registered to the Federal Communications Commission (FCC Designation Number : KR0022).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions from the Rocky Mountain Radar Model: INTERCEPTOR

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the RADAR DETECTOR, Model: INTERCEPTOR

2.2 General Specification

General		
Power Requirement	12 Vdc (Car battery)	
Carrier Frequencies	433.92 MHz (Single Channel)	
Temperature Range	Operating	-20 ℃ to +70 ℃
	Storage	-30 ℃ to +100 ℃
Laser		
Receiver Type	Pulsed laser signal receiver	
Detector Type	Digital signal processor pulse width discriminator	
Optical sensor	Dual convex condenser lens and high speed photo diode detector, 800 nanometers (nm) ~ 1 100 nanometers (nm)	
Radar		
Receiver Type	Dual conversion super-heterodyne	
Antenna Type	Linear polarized, self-contained	
Detector Type	Scanning frequency discriminator	
Frequency of Operation	K Band: 24.150 GHz ± 100 MHz	
	Ka Band (Super-wide): 34.700 GHz ± 1 300 MHz	

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

3. DESCRIPTION OF TESTS

3.1 Radiated Emission Measurement

Radiated emission measurements were made in accordance with § 13 in ANSI C63.4-2003 "Measurement of Intentional radiators" The measurements were performed over the frequency range of 30 MHz to 40 GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak, Quasi-peak, Average" within a bandwidth of 100 Hz, 9 kHz, 120 kHz and above 1 GHz is 1 MHz.

Preliminary measurements were made at 3 m using broadband antennas, and spectrum analyzer to determine the frequency producing the maximum emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 9 kHz to 30 MHz using Loop antenna and 30 MHz to 1 000 MHz using Log-Bicon antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site at 3 m. The test equipment was laced on a wooden turn-table. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR Quasi-peak mode and the bandwidth of the receiver was set to 100 Hz, 9 kHz, 120 kHz or 1 MHz depending on the frequency of type of signal. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8 m high nonmetallic 1.0 m x 1.5 m table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 m to 4 m and stopped at the azimuth or height producing the maximum emission.

Varying the mode of operating frequencies of the EUT maximized each emission. The system was tested in all the three orthogonal planes and changing the polarity of the antenna. The worst-case emissions are recorded in the data tables. If necessary, the radiated emission measurement could be performed at a closer distance to ensure higher accuracy and the results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per section 15.31(f).

Photographs of the worst-case emission can be seen in Photographs of the worst-case emission test setup can be seen in Appendix B.

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

3.2 FCC Part 15.205 Restricted Bands of Operations

(a) Except as shown in paragraph (d) of this section, 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
[1]0.495 - 0.505	16.694 75 - 16.695 25	608 - 614	5.35 - 5.46
2.173 5 - 2.190 5	16.804 25 - 16.804 75	960 - 1 240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1 300 - 1 427	8.025 - 8.5
4.177 25 - 4.177 75	37.5 - 38.25	1 435 - 1 626.5	9.0 - 9.2
4.207 25 - 4.207 75	73 - 74.6	1 645.5 - 1 646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1 660 - 1 710	10.6 - 12.7
6.267 75 - 6.268 25	108 - 121.94	1 718.8 - 1 722.2	13.25 - 13.4
6.311 75 - 6.312 25	123 - 138	2 200 - 2 300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2 310 - 2 390	15.35 - 16.2
8.362 - 8.366	156.524 75 - 156.525 25	2 483.5 - 2 500	17.7 - 21.4
8.376 25 - 8.386 75	156.7 - 156.9	2 690 - 2 900	22.01 - 23.12
8.414 25 - 8.414 75	162.012 5 - 167.17	3 260 - 3 267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3 332 - 3 339	31.2 - 31.8
12.519 75 - 12.520 25	240 - 285	3 345.8 - 3 358	36.43 - 36.5
12.576 75 - 12.577 25	322 - 335.4	3 600 - 4 400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490 MHz - 0.510 MHz.
[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1 000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

4. TEST CONDITION

4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner and which tends to maximize its emission level in a typical application.

4.2 EUT operation

The EUT was connected as user's guide. And during the test executed EUT is operating on the following

- Function of transmitter
  The EUT (model: INTERCEPTOR) has been tested under operating condition.
  Fixed Channel (433.92 MHz) was chosen for testing.

4.3 Support Equipment Used

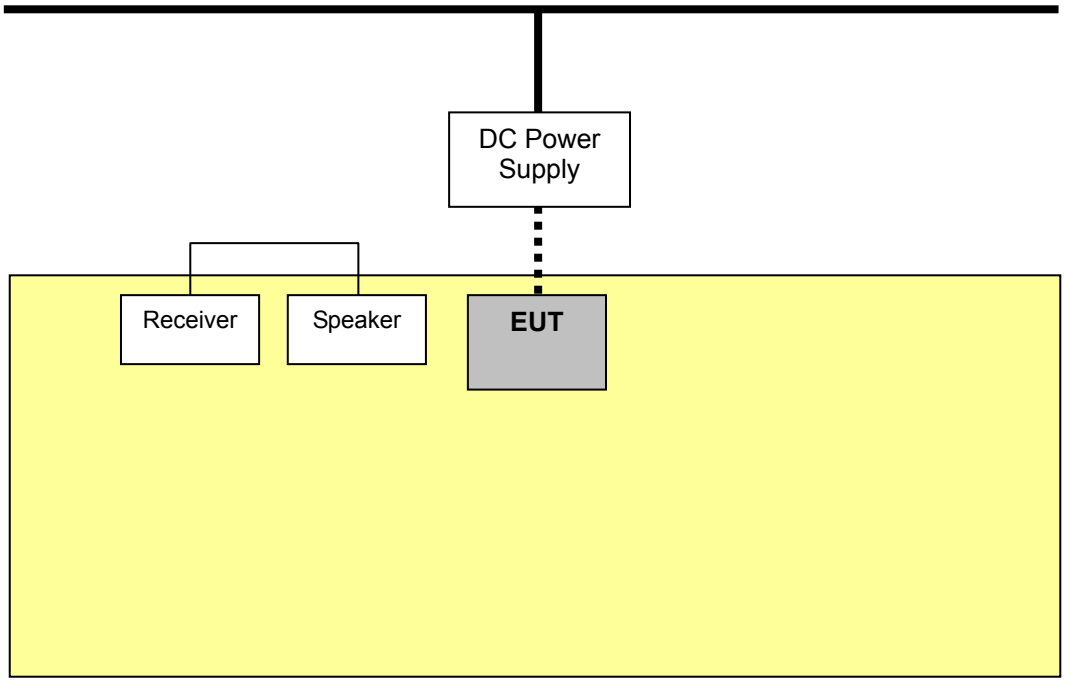
Description	Model Name	Serial No.	Manufacturer
Receiver	NONE	NONE	NONE
Speaker	NONE	NONE	NONE
DC Power Supply	DP30-05A	0300266	Toyo Tech

4.4 Type of Cables Used

Device from	Device to	Type of I/O port	Length[m]	Type of shield
EUT	DC Power Supply	DC Input	1.2	Unshielded
Receiver	Speaker	Signal line	0.5	Unshielded
DC Power Supply	Power socket	AC Input	1.0	Unshielded

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

4.5 The setup drawing(s)



: Data Line

: AC Power Line

: DC Power Line

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5. TEST RESULTS

5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

Applied Standard : 47 CFR Part 15, Subpart C			
FCC Rule	**Measurement Required**	**Result**	**Remarks**
15.207(a)	Power line Conducted Emissions	**N/A**	**1)**
15.231(a)(1)	Manually operated transmitter	**Pass**	
15.231(a)(2)	Automatically activated transmitter	**Pass**	
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	**Pass**	
15.231(a)(4)	Radiators used in cases of emergency	**Pass**	
15.231(a)(5)	Set-up information for security systems	**Pass**	
15.209(a) 15.231(b)	Radiated Emissions	**Pass**	
15.231(c)	20 dB Bandwidth	**Pass**	
15.231(d)	Devices operating within the frequency band 40.66 MHz - 40.70 MHz	**N/A**	**2)**
15.231(e)	Radiated emissions for Periodic radiators	**N/A**	**2)**

Notes:
1) The EUT is powered by DC power supply that uses Car battery only.
2) The frequency range of EUT is 433.92 MHz fixed.

The data collected shows that the **Rocky Mountain Radar / RADAR DETECTOR / INTERCEPTOR** complied with technical requirements of above rules part 15.209 and 15.231 limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement. No EMI suppression device(s) was added and/or modified during testing.

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5.2 Radiated Emissions Measurement

EUT	RADAR DETECTOR / INTERCEPTOR (S/N: Proto-type)
Limit apply to	FCC Part 15.209(a) & 15.231(b)
Test Date	March 24, 2011
Operating Condition	Continues transmitter (433.92 MHz)
Result	Passed

Part 15.209(a) except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequencies [MHz]	Field Strength [μV/m]	Measurement Distance [m]
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Part 15.231(b) In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency [MHz]	Field Strength of Fundamental [μV/m]	Field Strength of Spurious Emission [μV/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 1 250**
Above 470	12 500	1 250

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130 MHz - 174 MHz, μV/m at 3 m = 56.818 18(F) - 6 136.363 6; for the band 260 MHz - 470 MHz, μV/m at 3 m = 41.666 7(F) - 7 083.333 3. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

Fundamental: μV/m at 3 m = 41.666 7(433.92) - 7 083.333 3 = 10 996.681 = 20 log 10 996.681
= 80.83 dB(μV/m)
Spurious emissions: μV/m at 3 m = 20 dB below of fundamental level
= 60.83 dB(μV/m)

Test Results
- Refer to see the measured plot in next page.

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5.2.1 Radiated Emissions Data

- 9 kHz to 30 MHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.
Detector mode: CISPR Quasi-Peak mode (100 Hz, 9 kHz)

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
	Emission attenuated more than 20 dB below the limit are not reported.						

Result: All emissions below noise floor of 20 dB(μV/m)

NOTES:

1. *** H : Horizontal polarization , ** V : Vertical polarization**
2. **Result = Reading + Antenna factor + Cable loss**
3. **Margin value = Limit - Result**
4. **The measurement was performed for the frequency range 9 kHz to 30 MHz according to FCC Part 15.209.**

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

- 30 MHz to 4.4 GHz

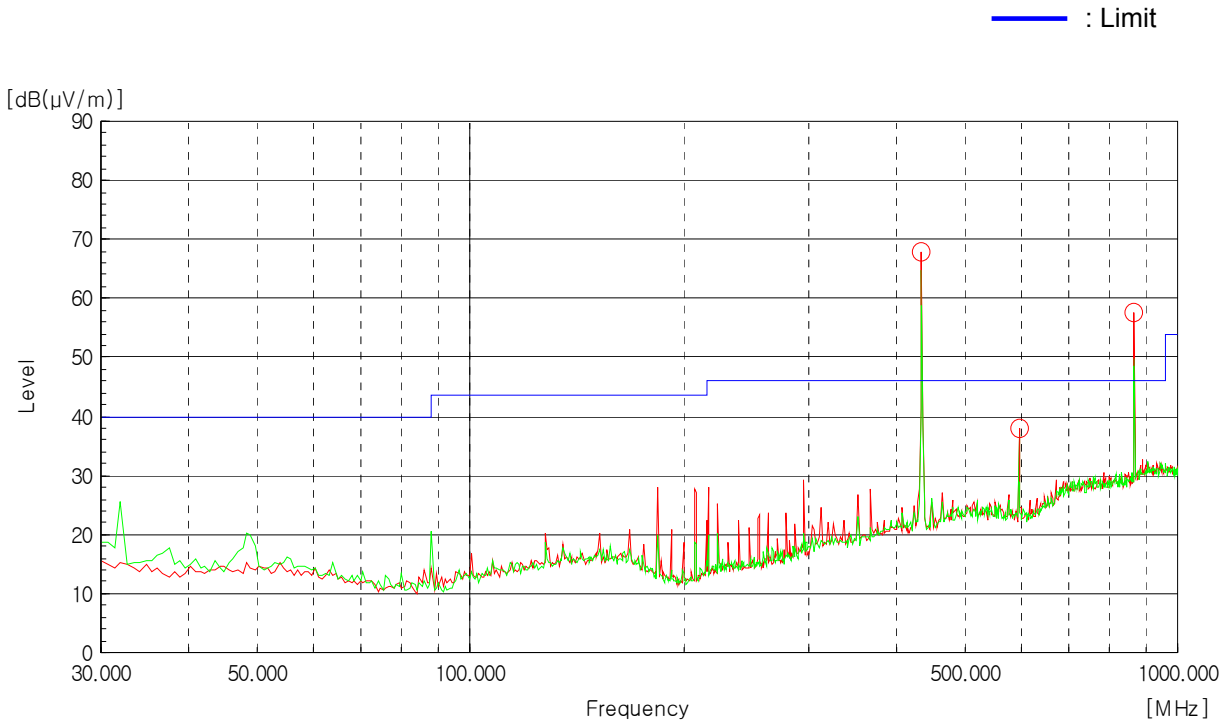
The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.
Detector mode: Quasi-Peak mode (RBW: 120 kHz) below 1 GHz
Peak or AV mode (RBW: 1 MHz) above 1 GHz

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
597.50	12.02	H	19.25	6.73	38.00	46.00	8.00
	Emission attenuated more than 20 dB below the limit are not reported.						

Result: All emissions below noise floor of 20 dB(μV/m)

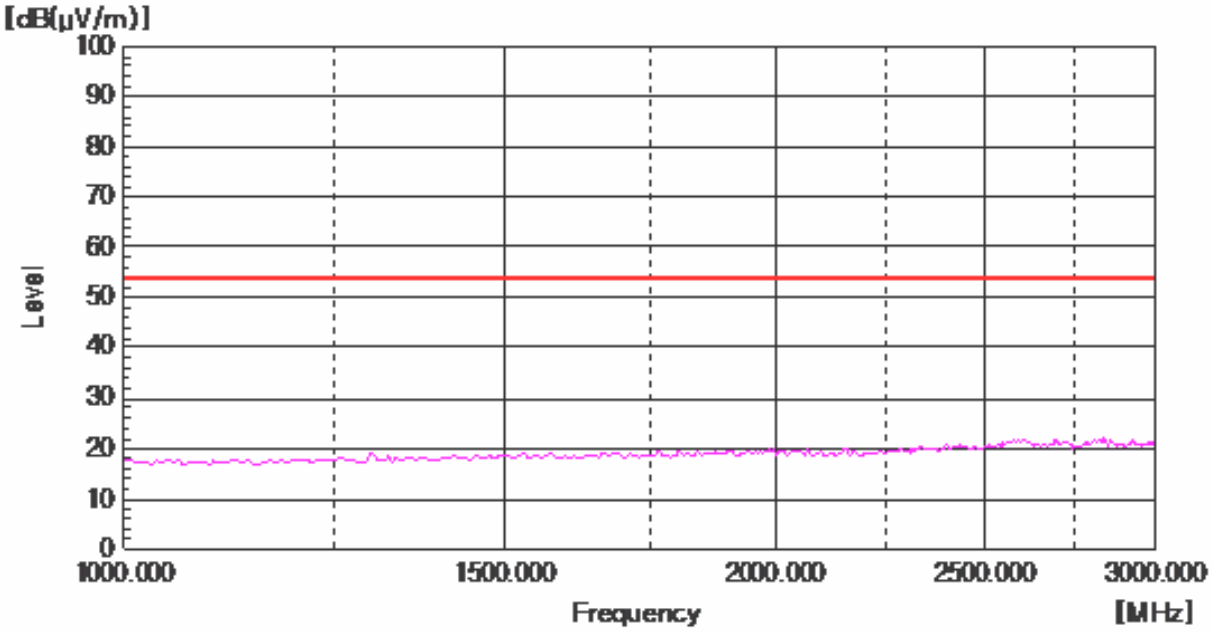
NOTES:

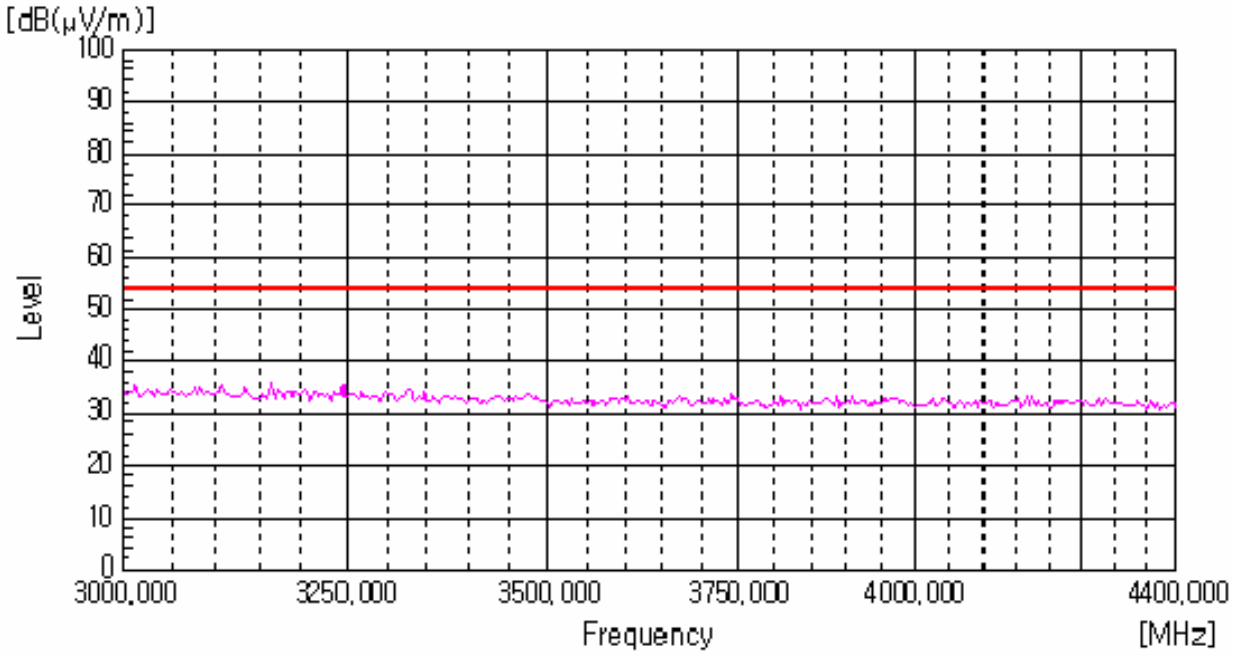
1. *** H : Horizontal polarization , ** V : Vertical polarization**
2. **Result = Reading + Antenna factor + Cable loss**
3. **Margin value = Limit - Result**
4. **Results found to be 20 dB or greater under the limit have not been included.**
5. **The measurement was performed for the frequency range 30 MHz - 4.4 GHz according to the FCC Part 15.209(a)**



Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

: Limit





Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5.2.2 Field Strength of Fundamental

- Peak mode test data

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
433.92	46.44	H	16.03	5.53	68.00	100.83	32.83

- Average mode test data

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Duty Cycle Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
433.92	46.44	H	16.03	5.53	-21.33	46.67	80.83	34.16

5.2.3 Spurious Emissions Data

- Peak mode test data

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
868.75	26.77	H	22.24	8.59	57.60	80.83	23.23
Other frequencies	-	–	-	-	-	-	-

- Average mode test data

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB]	Duty Cycle Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
868.75	26.77	V	22.24	8.59	-21.33	36.27	60.83	24.56
Other frequencies	-	–	-	-	-	-	-	-

Result: No signal detect emissions above 1 GHz

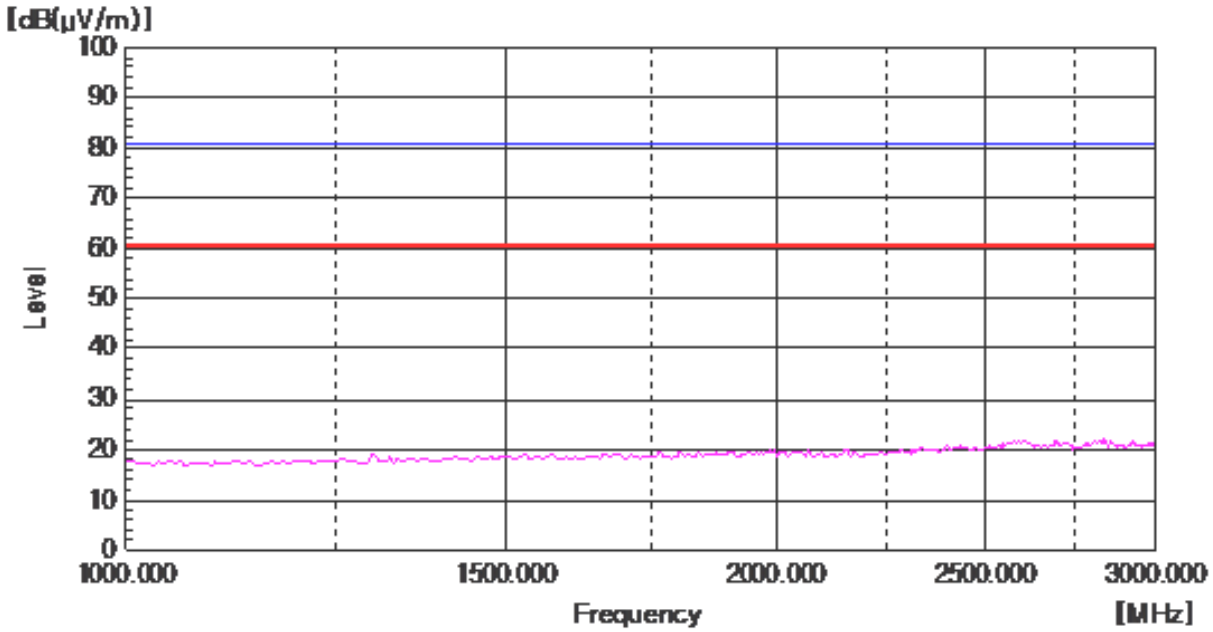
NOTES:

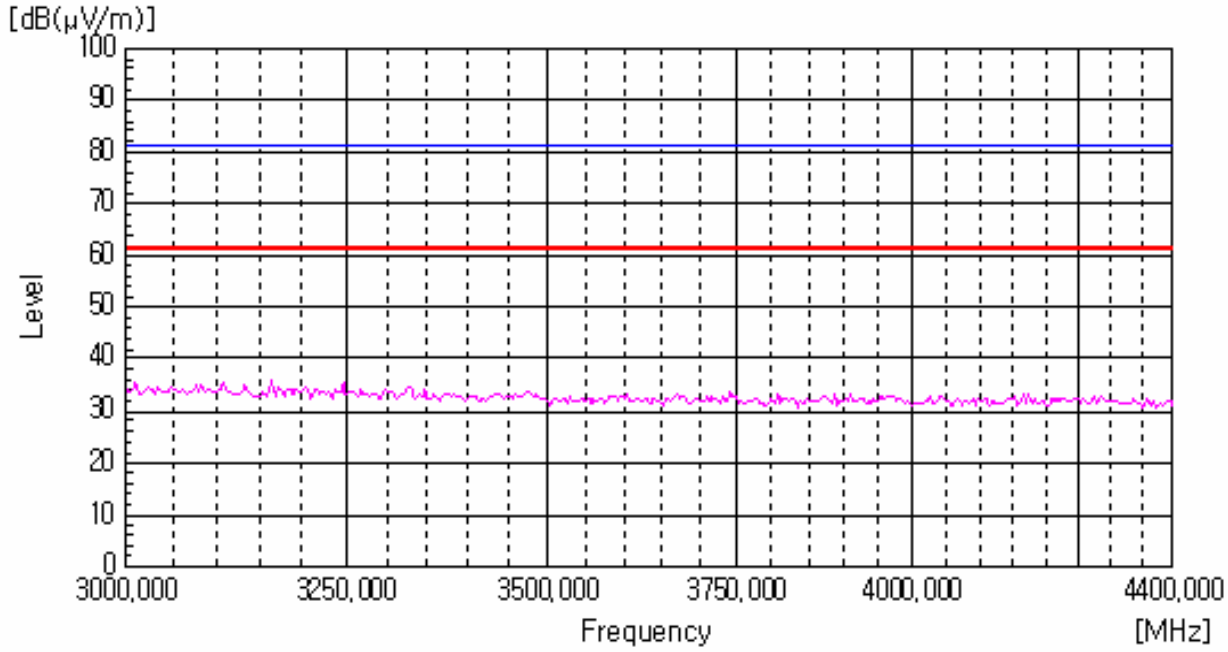
1. **The test was searched from 30 MHz to the 10th Harmonic. (30 MHz - 4.4 GHz)**
2. **Average level = Peak level + Duty factor.**

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

Peak Limit Line
AV Limit Line

Final data Peak

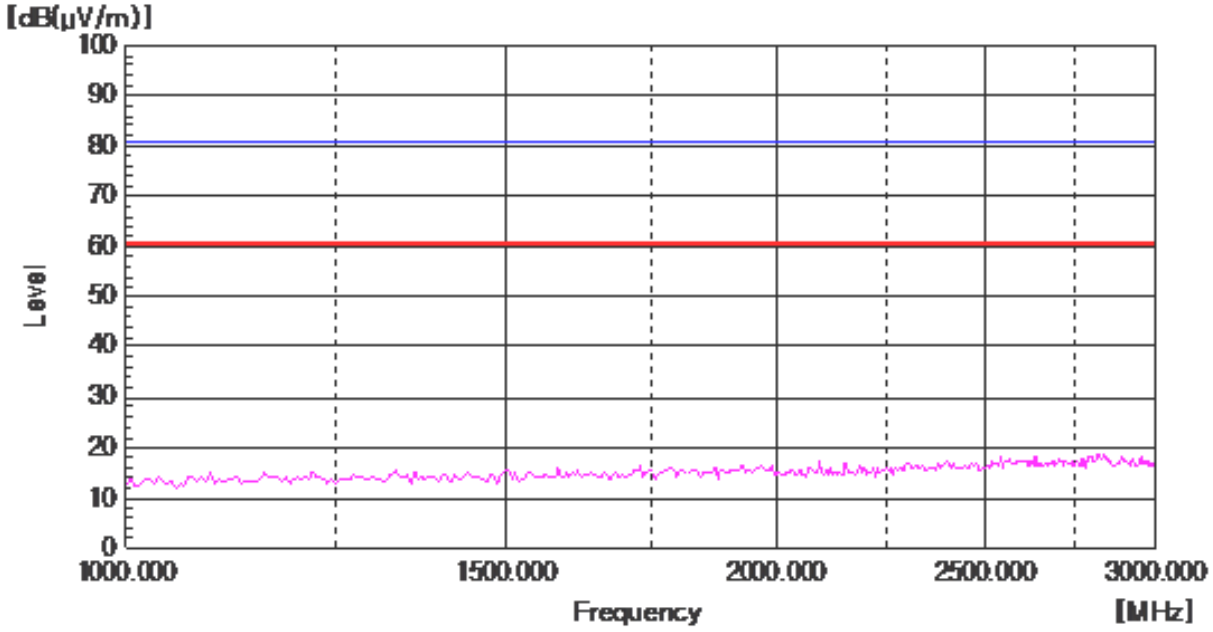


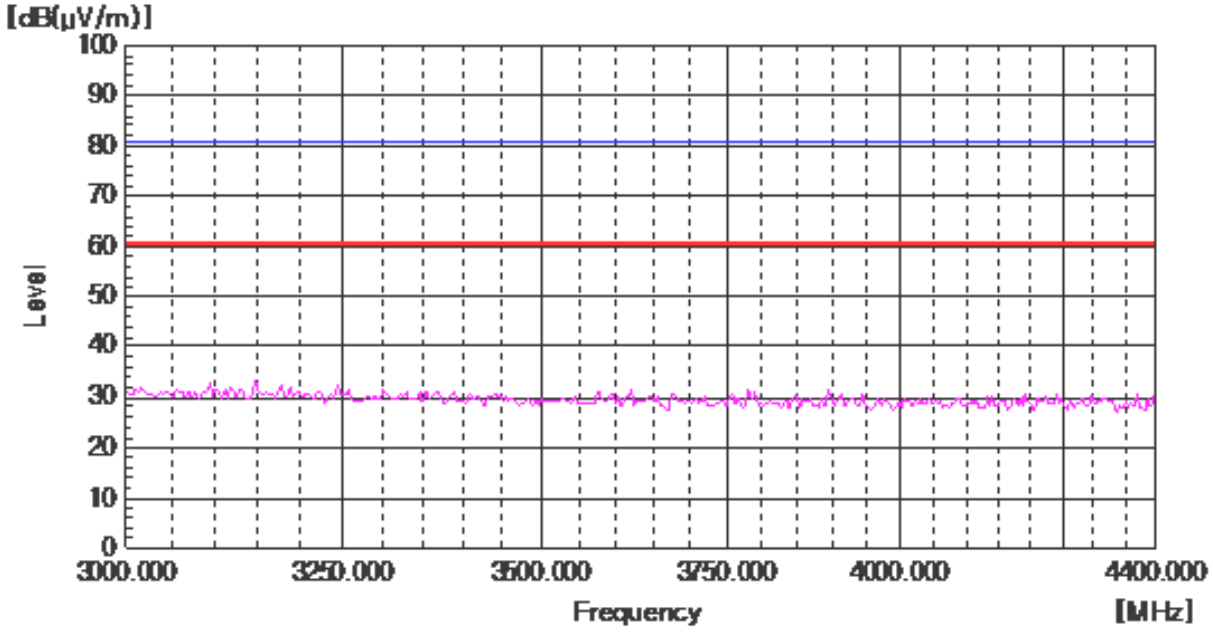


Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

Peak Limit Line
AV Limit Line

Final data AV





Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5.3 Occupied Bandwidth Measurement

5.3.1 20 dB Bandwidth

EUT	RADAR DETECTOR / INTERCEPTOR (S/N: Proto-type)
Limit apply to	FCC Part 15.231(c)
Test Date	March 23, 2011
Operating Condition	Continues transmitter (433.92 MHz)
Result	Passed

Limit

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. For devices operating above 900 MHz, the emission shall be no wider than 0.5 % of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

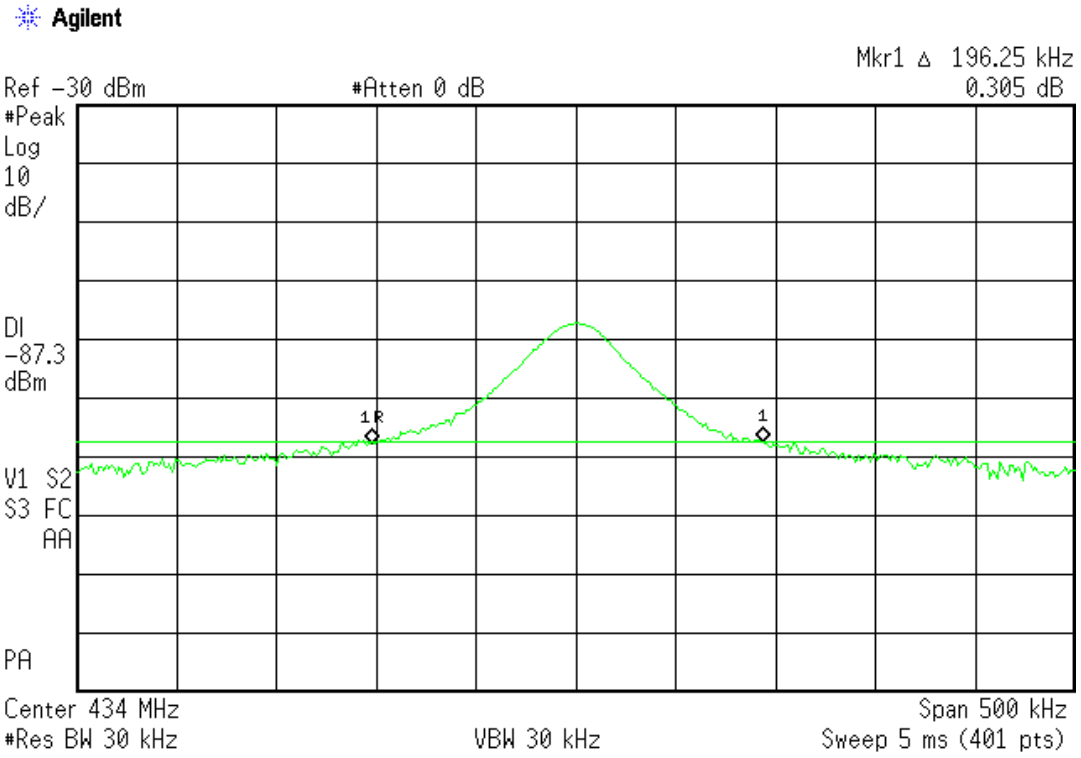
Test Data

Center Frequency [MHz]	Measured occupied bandwidth [MHz]	Limit [MHz]	Result
433.92	0.196	1.085 (0.25 %)	Pass

NOTES:

1. **Please see the measured bandwidth plot in next page.**
2. **The bandwidth is determined at the points 20 dB down from the modulated carrier.**

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788



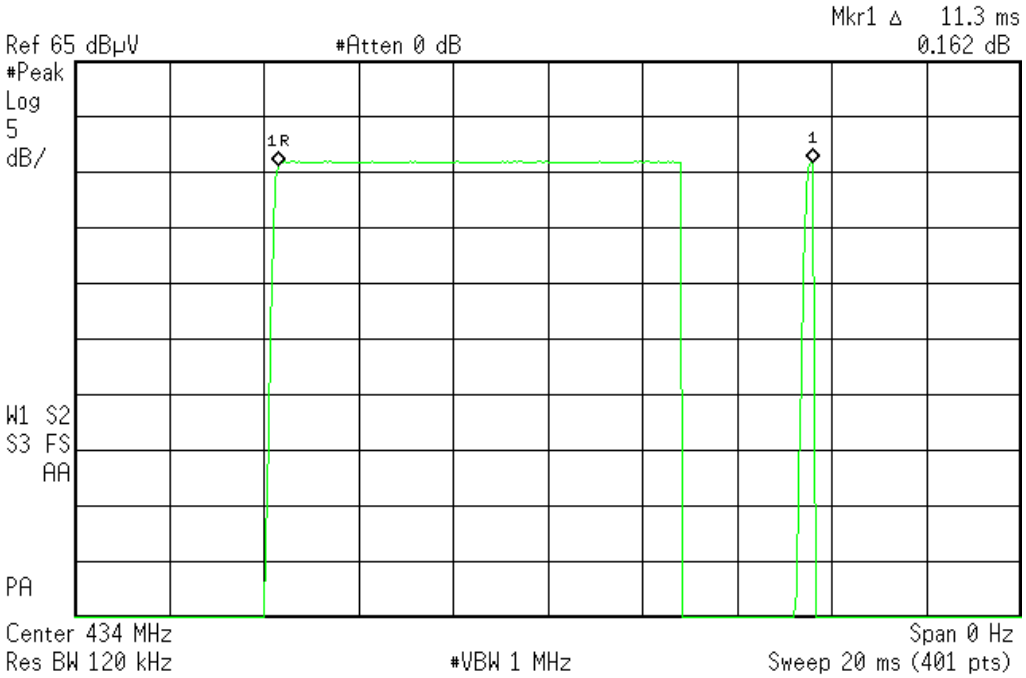
Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5.4 Periodic Operation Measurement Plot

TX on time = 11.30 ms

Limit [s] = 5 s

Result ■ Pass ☐ Fail

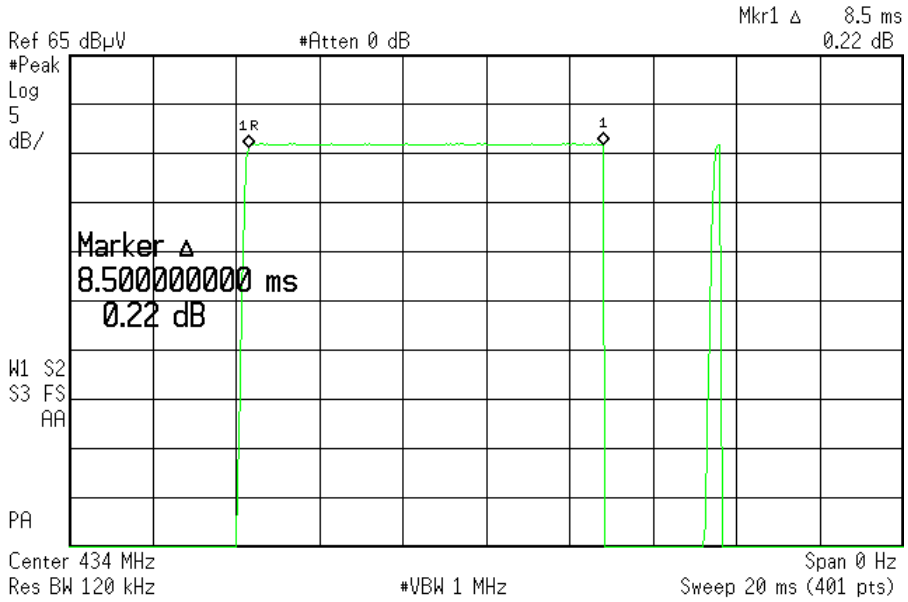


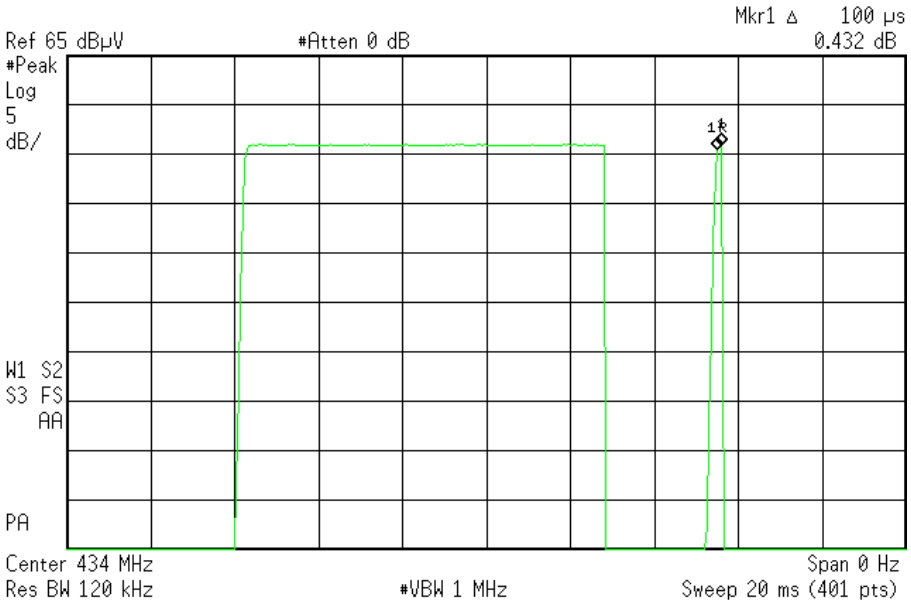
Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

5.4.1 Duty cycle

Calculation;
Duty cycle factor = 20 log (on time/period)
20 log (8.6 ms/100.0 ms) = -21.33 dB

On time = 8.5 ms + 0.1 ms = 8.6 ms
Period = 100.0 ms





Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

6. SAMPLE CALCULATION

Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

Where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor

$dB(\mu V) = 20 \log_{10} (\mu V)$

$dB(\mu V) = dBm + 107$

Example : @ 597.50 MHz

Limit = 46.00 dB(μV/m)

Reading = 12.02 dB(μV)

Antenna Factor + Cable Loss = 19.25 + 6.73 = 25.98 dB(μV/m)

Total = 38.00 dB(μV/m)

Margin = 46.00 – 38.00 = 8.00 dB

= 8.00 dB below Limit

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788

7. List of test equipments used for measurements

Test Equipment		Model	Mfg.	Serial No.	Cal. Due Date
☒	Spectrum Analyzer	E7405A	H.P.	US41160290	11.09.17
☒	EMI Test Receiver	ESVS 10	R&S	835165/001	12.03.22
☒	Horn Antenna	BBHA 9120D	Schwarzbeck	227	13.03.16
☒	LogBicon Antenna	VULB9160	Schwarzbeck	3082	12.02.22
☒	Loop Antenna	AL-130	Com-Power	17100	13.02.10
☒	Amplifier	AFS42-01001800-28-10P-42	MITEQ Inc.	1565819	12.03.22
☒	System Power Supply	6030A	Agilent	1036546	12.03.22
☒	Controller	HD2000	HD GmbH	C/125	N/A
☒	Antenna Master	MA2400	HD GmbH	N/A	N/A
☒	Turn-Table	MFT-120S	Max-Full Antenna Corp	-	N/A
☒	Antenna Master	MFA-440E	Max-Full Antenna Corp	-	N/A

Head Office: # 371-51 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea Tel : 82-2-858-0786 Fax : 82-2-858-0788