Nemko Korea CO., Ltd.

300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, KOREA
TEL:+82 31 330 1700 FAX:+82 31 322 2332

FCC and IC EVALUATION REPORT FOR CERTIFICATION

Applicant :

Samsung Electronics Co., Ltd.
416, Maetan-3Dong, Yeongtong-Gu,
Suwon-Si, Gyeonggi-Do, Korea.
(Post code : 443-742)
Attn. : Mr. Jay-woo,Lee

Dates of Issue : February 8, 2011
Test Report No. : NK-11-R-008
Test Site : Nemko Korea Co., Ltd.

FCC ID	**A3LSSG3700**
IC ID	**649E-SSG3700**
Brand Name	**SAMSUNG**
Contact Person	**Samsung Electronics Co., Ltd.** **416, Maetan-3Dong, Yeongtong-Gu,** **Suwon-Si, Gyeonggi-Do, Korea, 442-742.** **Mr. Jaywoo. Lee** **Telephone No. : +82-31-277-2569**

Applied Standard:	FCC 47 CFR Part 15C and IC RSS-210
Classification:	FCC Part 15 Spread Spectrum Transmitter (DSS)
EUT Type:	3D Active Glasses

The device bearing the brand name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are 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.

Feb 08. 2011
Tested By : Jin-Ha, Ko
Engineer

Feb. 08. 2011
Reviewed By : H.H. Kim
Manager & Chief Engineer

TABLE OF CONTENTS

1. SCOPE

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15 and IC RSS-210.

Responsible Party :	Samsung Electronics Co., Ltd.
Contact Person :	Mr. Jaywoo. Lee
Manufacturer :	Samsung Electronics Co., Ltd. 416 Maetan-3Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 KOREA

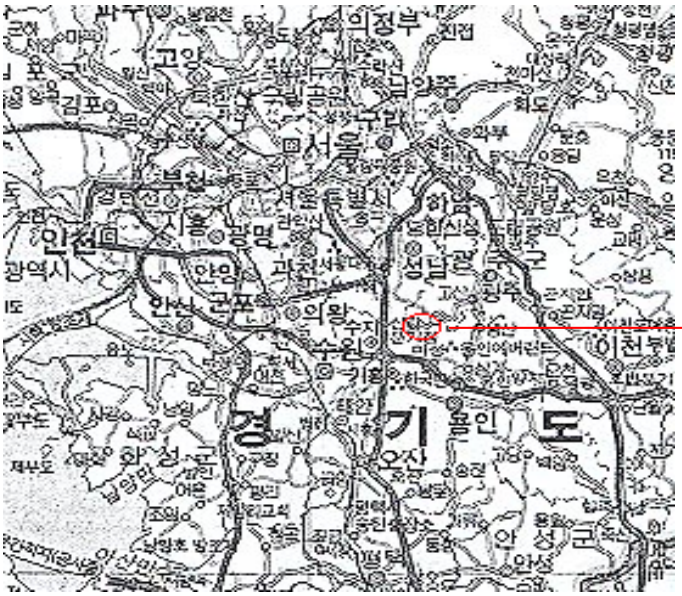
- FCC ID: A3LSSG3700
- IC 649E-SSG3700
- Model: SSG-3700
- Variant Model: SSG-3700CR
- Brand Name: SAMSUNG
- EUT Type: 3D Active Glasses
- Classification: FCC Class B
- Applied Standard: FCC 47 CFR Part 15 subpart C and IC RSS-210
- Test Procedure(s): ANSI C63.4 (2003)
- Dates of Test: Jan. 13, 2011 ~ Jan. 29, 2011
- Place of Tests: Nemko Korea Co., Ltd.

2. INTRODUCTION

2.1 Test facility

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions 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 emanating from **Samsung Electronics Co., Ltd.**
FCC ID : **A3LSSG3700** and **IC ID : 649E-SSG3700**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory***.
The site address is 300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, KOREA.
The area of Nemko Korea Corporation Ltd. EMC Test Site is located in a mountain area at 80 kilo-meters (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 kilometers (18miles) south-southeast from central Seoul.
It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.
The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 2003.



Nemko Korea Co., Ltd.
EMC Lab.
300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, KOREA 449-852
Tel)+82-31-330-1700

Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. EMC Lab. and Incheon Airport.

2.2 Accreditation and listing

Accreditation type		Accreditation number
FC	FCC part 15/18 Filing site	Registration No. 97992
	CAB Accreditation for DOC	Designation No. KR0026
KOLAS	KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)	Registration No. 155
Industry Canada	Canada IC Registered site	Site No. 2040E-1
VCCI	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
IECEE CB SCHEME	EMC CBTL	-
방송통신위원회	KCC(RRL)Designated Lab.	Registration No. KR0026
	SASO registered Lab and Certification Body	Registration No. 2008-15

3. TEST CONDITIONS & EUT INFORMATION

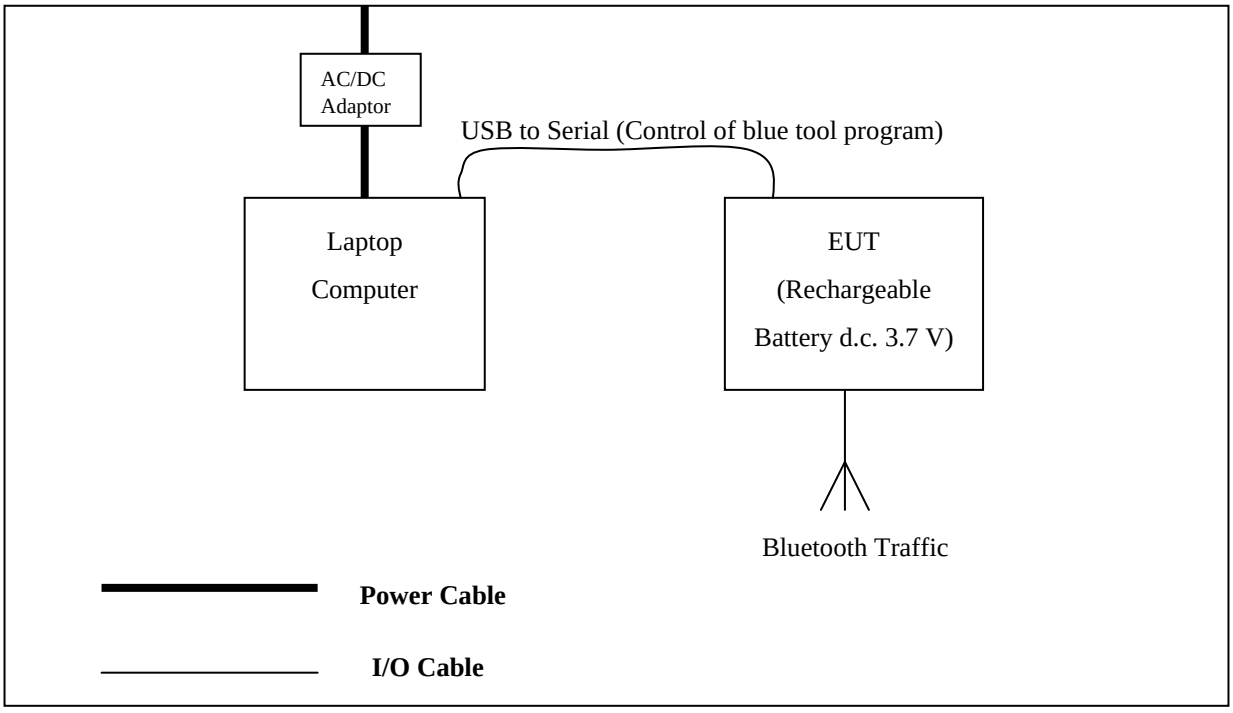
3.1 Operation During Test

The EUT was connected to a laptop computer and operated by internal rechargeable battery d.c. 3.7 V. The EUT was measured at three X, Y, Z-Axis in Bluetooth Traffic mode with the maximum output power in accordance with the manufacturer's specifications.
The worst data were recorded in the report.

3.2 Support Equipment

Laptop Computer	Samsung Electronics Co., Ltd. Model : NT-R520 1.0 m shielded USB cable	S/N: ZK6V93FS800012Y
AC/DC Adaptor	Dongguan Samsung Electro-Mechanics Co.,Ltd Model : AD-9019M 0.9 m unshielded power cable	FCC DOC S/N: CNBA4400147ASE
EUT	Samsung Electronics Co., Ltd. Model: SSG-3700 FCC ID : A3LSSG3700	S/N: N/A

3.3 Setup Drawing



3.4 EUT Information

The EUT is the **Samsung 3D Active Glasses FCC ID: A3LSSG3700, IC ID: 649E-SSG3700.**

Specifications:

EUT Type	3D Active Glasses
Model Name	SSG-3700
Variant Model Name	SSG-3700CR
Brand Name	SAMSUNG
RF Frequency	2402 MHz ~ 2480 MHz
Peak Power Output (Conducted)	- 2.58 dBm
FCC Classification	FCC Part 15 Spread Spectrum Tranmitter (DSS)
Method/System	Frequency Hopping Spread Spectrum (FHSS)
Channel Number	79
Modulation	GFSK
Antenna Gain (Peak)	1.99 dBi
Power	3.7 Vdc (Lithium Battery)
Size	130 mm x 170 mm x 35 mm
Weight	27 g

4. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specification:

Name of Test	FCC Paragraph No.	IC Paragraph No.	Result	Remark
Conducted Emission	15.207	RSS-GEN 7.2.4	Complies	
Radiated Emission	15.209	RSS-210 A8.5	Complies	
20dB Bandwidth and	15.247(a)(1)(iii)	RSS-210 A8.1	Complies	
Carrier Frequency Separation	15.247(a)(1)	RSS-210 A8.1(2)	Complies	
Transmitter Average Time of Occupancy	15.247(a)(1)(iii)	RSS-210 A8.1(4)	Complies	
Peak Power Output	15.247(b)(1)	RSS-210 A8.4(2)	Complies	
Conducted Spurious Emission	15.247(d)	RSS-210 A8.5	Complies	
Radiated Spurious Emission	15.247(d)	RSS-210 A8.5	Complies	
Number of Hopping channels	15.247(a)(1)(iii)	RSS-210 A8.1(4)	Complies	

5. RECOMMENDATION/CONCLUSION

The data collected shows that the **Samsung 3D Active Glasses FCC ID: A3LSSG3700, IC ID: 649E-SSG3700** is in compliance with Part 15 Subpart C 15.247 of the FCC Rules.

6. ANTENNA REQUIREMENTS

§15.203 of the FCC Rules part 15 Subpart C

: 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 uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The antenna of the **Samsung 3D Active Glasses FCC ID: A3LSSG3700, IC ID: 649E-SSG3700** is **Permanently attached** and there are no provisions for connection to an external antenna. It complies with the requirement of §15.203.

7. DESCRIPTION OF TESTS

7.1 Conducted Emissions

The Line conducted emission test facility is located inside a 4 x 7 x 2.5 meter shielded enclosure.
It is manufactured by EM engineering. The shielding effectiveness of the shielded room is in accordance with MIL-STD-285 or NSA 65-6.
A 1 m x 1.5 m wooden table 0.8 m height is placed 0.4 m away from the vertical wall and 1.5 m away from the side of wall of the shielded room Rohde & Schwarz (ESH3-Z5) and Kyoritsu (KNW-407) of the 50 ohm/50 uH Line Impedance Stabilization Network(LISN) are bonded to the shielded room.
The EUT is powered from the Rohde & Schwarz LISN and the support equipment is powered from the Kyoritsu (KNW-407). Power to the LISNs are filtered by high-current high insertion loss Power line filters. The purpose of filter is to attenuate ambient signal interference and this filter is also bonded to shielded enclosure. All electrical cables are shielded by tinned copper zipper tubing with inner diameter of 1 / 2 ".
If DC power device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the LISNs, All interconnecting cables more than 1 meter were shortened by non inductive bundling (serpentine fashion) to a 1 meter length.
Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.
The spectrum was scanned from 150 kHz to 30 MHz with 200 ms sweep time.
The frequency producing the maximum level was re-examined using the EMI test receiver. (Rohde & Schwarz ESCS30).
The detector functions were set to CISPR quasi-peak mode & average mode.
The bandwidth of receiver was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.
Each emission was maximized by; switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.
Each EME reported was calibrated using the R & S signal generator.

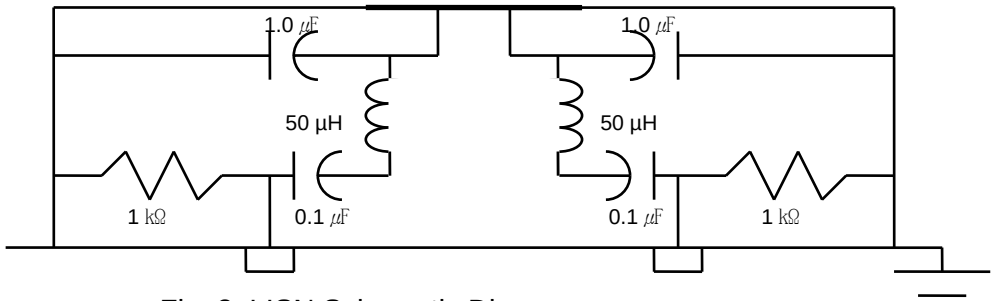


Fig. 2. LISN Schematic Diagram

7.2 Radiated Emissions

Preliminary measurements were made indoors at 3 meter using broad band antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The Technology configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was note for each frequency found. The spectrum was scanned from 9 kHz to 30 MHz using Loop Antenne(EMCO, 6502) and 30 to 1000 MHz using Bi-conical log Antenna(ARA, LPB-2520/A). Above 1 GHz, Horn antenna (Scwarzbeck BBHA 9120D: up to 18 GHz, Q-par Angus QSH20S20 : 18 to 26.5 GHz, QSH22K20: up to 40 GHz) was used. Final Measurements were made outdoors at 3 or 10 m test range using Loop Antenne(EMCO, 6502) and Logbicon Super Antenna (Schwarzbeck, VULB9168) or Horn antenna.(Scwarzbeck BBHA 9120D: up to 18 GHz, Q-par Angus QSH20S20 : 18 to 26.5 GHz, QSH22K20: up to 40 GHz).
The test equipment was placed on a wooden 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 reexamined and investigated using EMI test receiver (ESCS30) & (FSP40). The detector function was set to CISPR peak mode or quasi-peak mode or average mode and the band-width of the receiver was set to 120 kHz or 1 MHz depending on the frequency or type of signal. The half wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT support equipment and interconnecting cables were re configured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non- metallic 1.0 x 1.5 meter table. The EUT, support equipment and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turn table containing the Technology was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission Each emission was maximized by : switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.
Each EME reported was calibrated using the R/S signal generator.

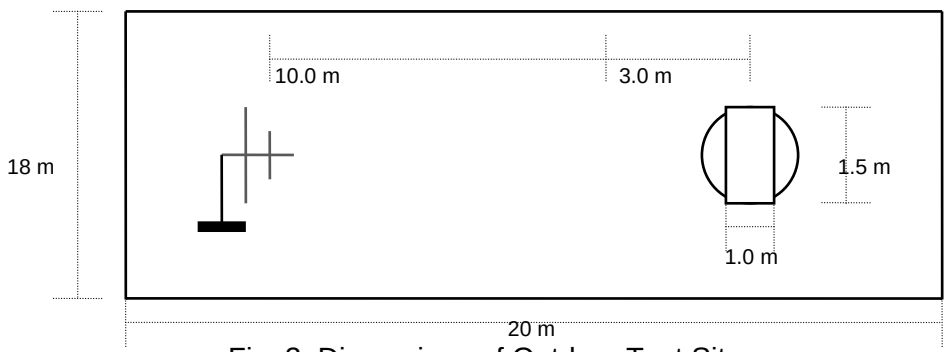
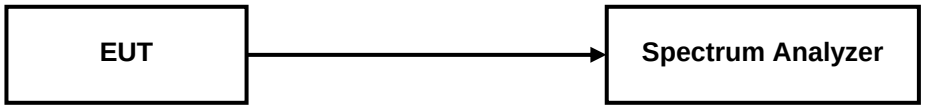


Fig. 3. Dimensions of Outdoor Test Site

7.3 20 dB Bandwidth and Carrier Frequency Separation

Test Setup

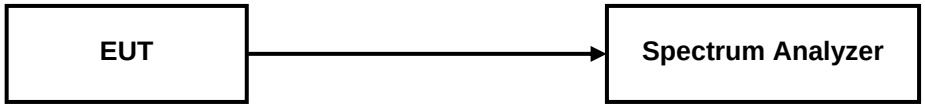


Test Procedure

The transmitter is set to the Low , Middle, High channels is connected to the spectrum analyzer. The RBW of spectrum analyzer is set to 30 kHz and VBW is set to the 100 kHz.
The sweep time is coupled.
The spectrum analyzer is set for peak detected and Max hold scan mode.
When Carrier Frequency separation is tested, Frequency hopping is set.

7.4 Transmitter Average Time of Occupancy

Test Setup



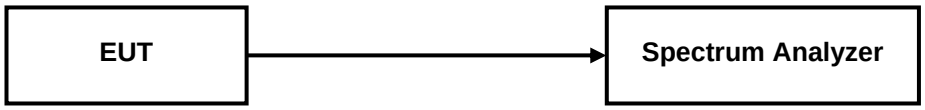
Test Procedure

The transmitter output is connected to a spectrum analyzer. The span is set to zero, centered on a single, selected hopping channel.
The width of a single pulse is measured in a fast scan. The number of pulses is measured in 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channel x 0.4 s) is equal to 10 x number of pulses in 3.16 second x pulse width.

7.5 Number of Hopping Channels

Test Setup

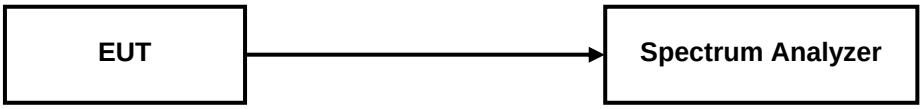


Test Procedure

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, In either a single sweep or in multiple continuous sweeps. The RBW is set to 1 % of the span.
The spectrum analyzer is set to Max Hold.

7.6 Maximum Peak Output Power

Test Setup

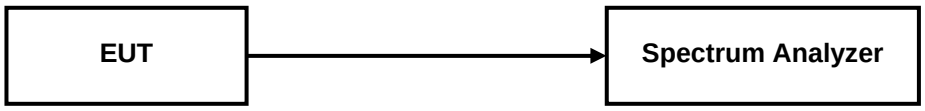


Test Procedure

The transmitter is set to the Low , Middle, High channels is connected to the spectrum analyzer. The RBW of spectrum analyzer is set to 3 MHz and VBW is set to the 3 MHz. The sweep time is coupled.

7.7 Conducted Spurious Emission

Test Setup



Test Procedure

The transmitter is connected to the spectrum analyzer.
The RBW of spectrum analyzer is set to 100 kHz and VBW is set to the 100 kHz.
Measurements are made over the 30 MHz to 26.5 GHz range with the transmitter set to the Lowest, Middle and highest channels.

8. TEST DATA

8.1 Conducted Emissions

FCC §15.207, RSS-Gen 7.2.4

Frequency	Level(dBμV)		*)Factor	**) Line	Limit(dBμV)		Margin(dB)	
(MHz)	Q-Peak	Average	(dB)		Q-Peak	Average	Q-Peak	Average
0.20	47.1	28.3	0.2	N	63.6	53.6	16.5	25.3
0.35	43.1	19.5	0.2	N	58.9	48.9	15.8	29.4
0.52	48.1	34.2	0.2	L	56.0	46.0	7.9	11.8
1.05	42.9	30.3	0.2	L	56.0	46.0	13.1	15.7
3.79	38.5	32.7	0.2	L	56.0	46.0	17.5	13.3
29.06	33.6	24.9	1.7	L	60.0	50.0	26.4	25.1

Line Conducted Emissions Tabulated Data

NOTES:

1. Measurements using CISPR quasi-peak mode & average mode.
2. All modes of operation were investigated and the worst -case emission are reported. See attached Plots.
3. Factor = LISN + Cable Loss
4. LINE : L =Line , N = Neutral
5. The limit is on the FCC Part section 15.207(a).

PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (Line)***

NEMKO KOREA (NK-11-R-008) 28 Jan 2011 21:51

Conducted Emissions

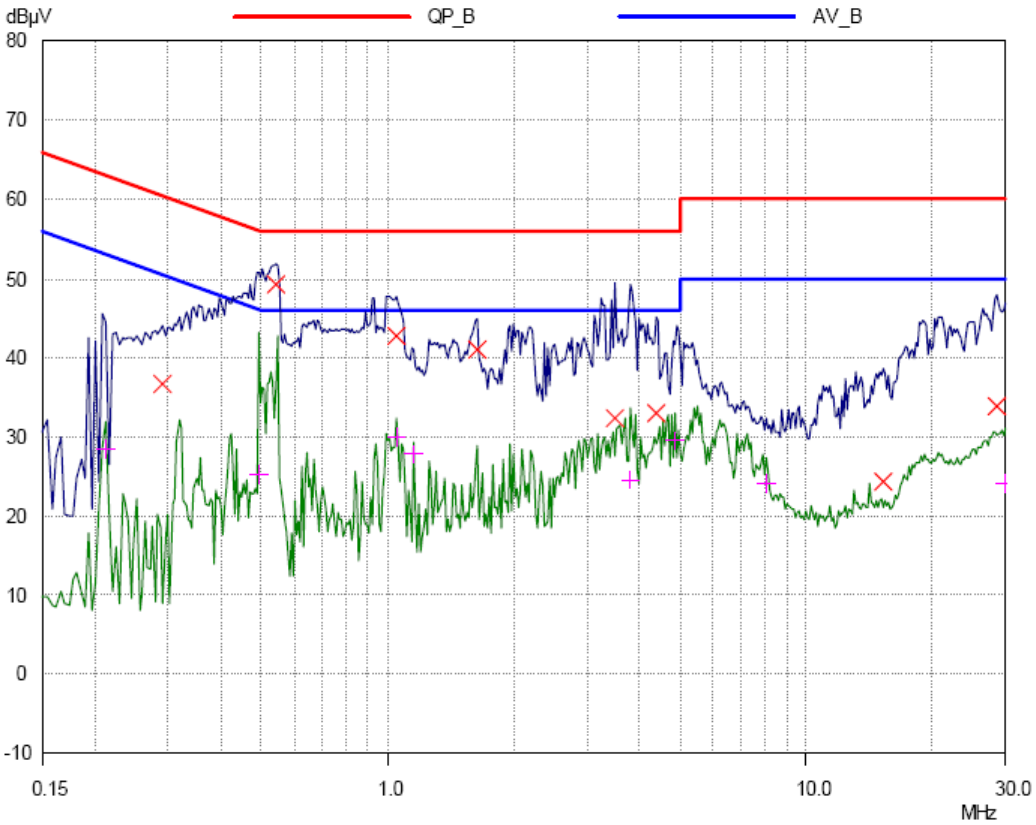
EUT:	3D Active glasses
Manuf:	Samsung Electronics
Op Cond:	a.c. 120 V, 60 Hz
Operator:	Jinha. KO
Test Spec:	FCC Part 15.207
Comment:	Model : SSG-3700
	LINE : L1

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	ESH3_LINE

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	30 dB



PLOTS OF EMISSIONS

- ***Conducted Emission at the Mains port (Neutral)***

NEMKO KOREA (NK-11-R-008) 28 Jan 2011 21:32

Conducted Emissions

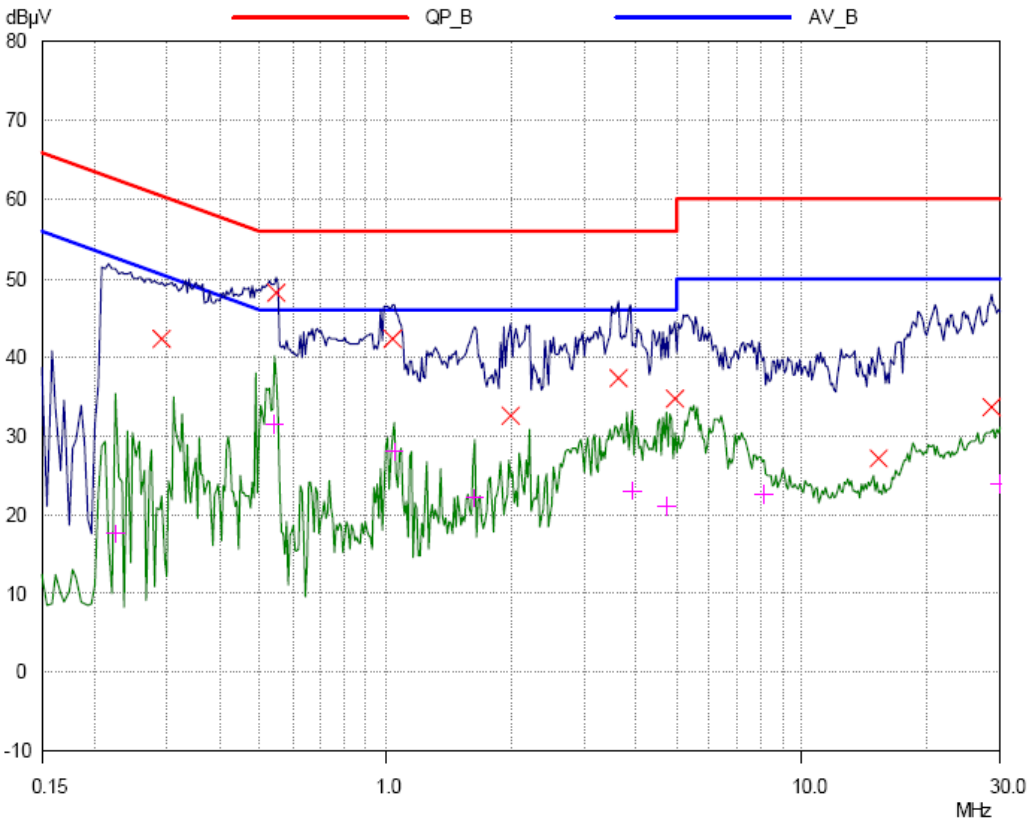
EUT:	3D Active glasses
Manuf:	Samsung Electronics
Op Cond:	a.c. 120 V, 60 Hz
Operator:	Jinha, KO
Test Spec:	FCC Part 15.207
Comment:	Model : SSG-3700
	LINE : Neutral

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	3.9063kHz	9kHz	PK+AV	20msec	20 dB	OFF	60dB

Transducer	No.	Start	Stop	Name
	1	150kHz	30MHz	ESH3_NEUT

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	1sec
	Subranges:	8
	Acc Margin:	30 dB



8.2 Radiated Emissions

FCC §15.209, IC RSS-210 A8.5

Frequency (MHz)	Reading (dBμV/m)	Pol* (H/V)	Antenna Height (cm)	Turntable Angles (°)	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
72.12	50.1	H	340	305	-18.9	31.2	40.0	8.8
144.05	49.8	H	252	272	-17.1	32.7	43.5	10.8
312.12	47.3	H	105	240	-13.6	33.7	46.0	12.3
336.13	51.2	H	121	300	-13.6	37.6	46.0	8.4
455.29	49.0	H	105	165	-11.1	37.9	46.0	8.1
461.22	50.0	H	102	241	-11.1	38.9	46.0	7.1

Radiated Measurements at 3 meters

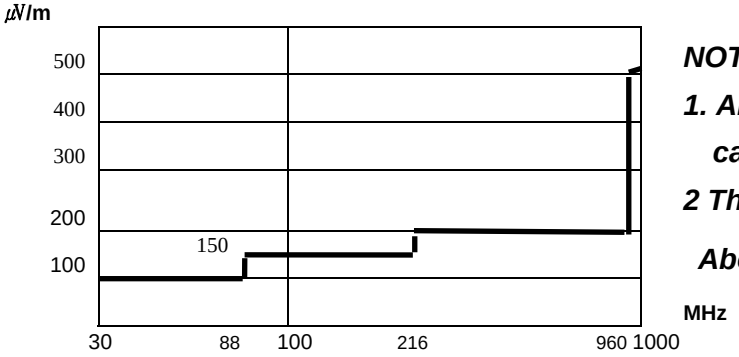


Fig. 4. Limits at 3 meters

NOTES:

1. All modes were measured and the worst-case emission was reported.

2 The radiated limits are shown on Figure 4. Above 1 GHz the limit is 500 μV/m.

NOTES:

1. *Pol. H = Horizontal V = Vertical

2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.

3. Measurements using CISPR quasi-peak mode below 1 GHz.

4. The radiated emissions testing were made by rotating through three orthogonal axes. The worst date was recorded.

5. The limit is on the FCC Part section 15.209(a).

8.3 20 dB Modulated Bandwidth

FCC §15.247(a)(1)(iii), RSS-210 A8.1

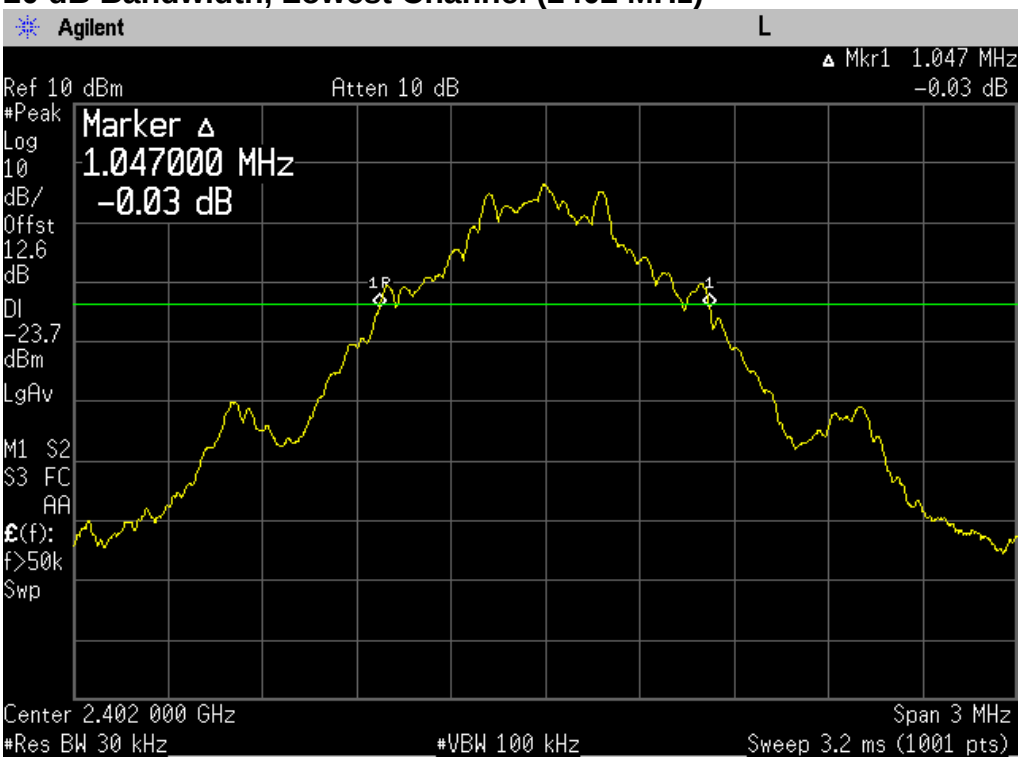
Test Mode : Set to Lowest channel, Middle channel and Highest channel

Result:

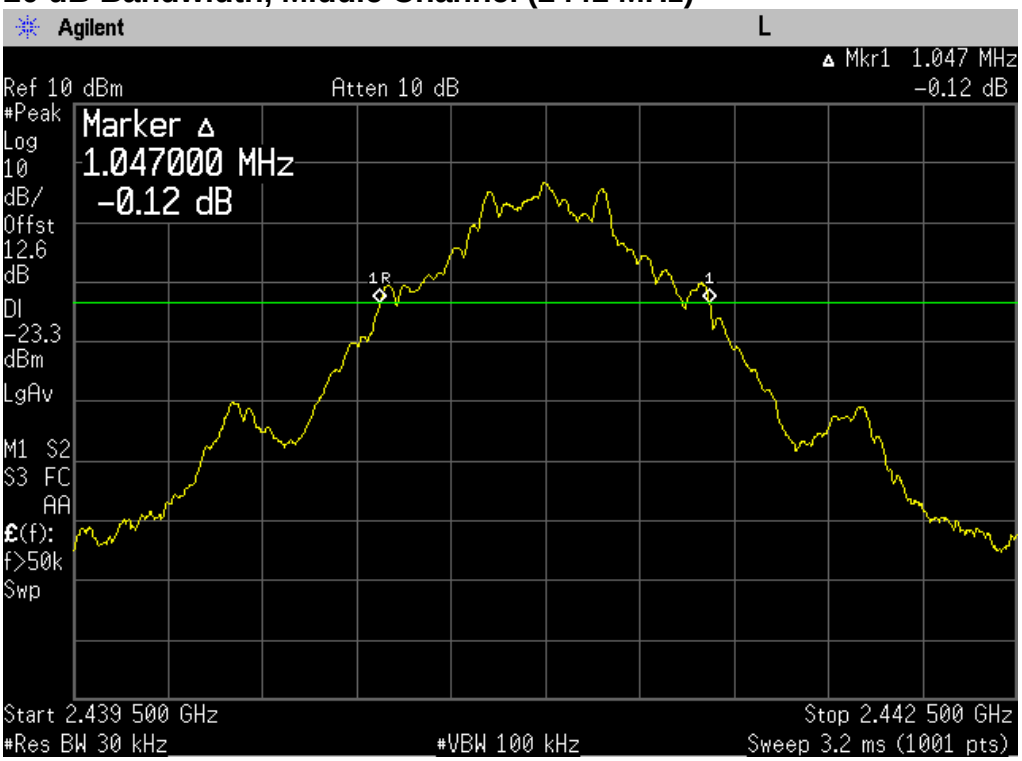
Modulation Mode	Frequency(MHz)	Result(KHz)	Limit(KHz)
GFSK	2402	1047	Non specified
GFSK	2441	1047	Non specified
GFSK	2480	1050	Non specified

PLOTS OF EMISSIONS

20 dB Bandwidth, Lowest Channel (2402 MHz)

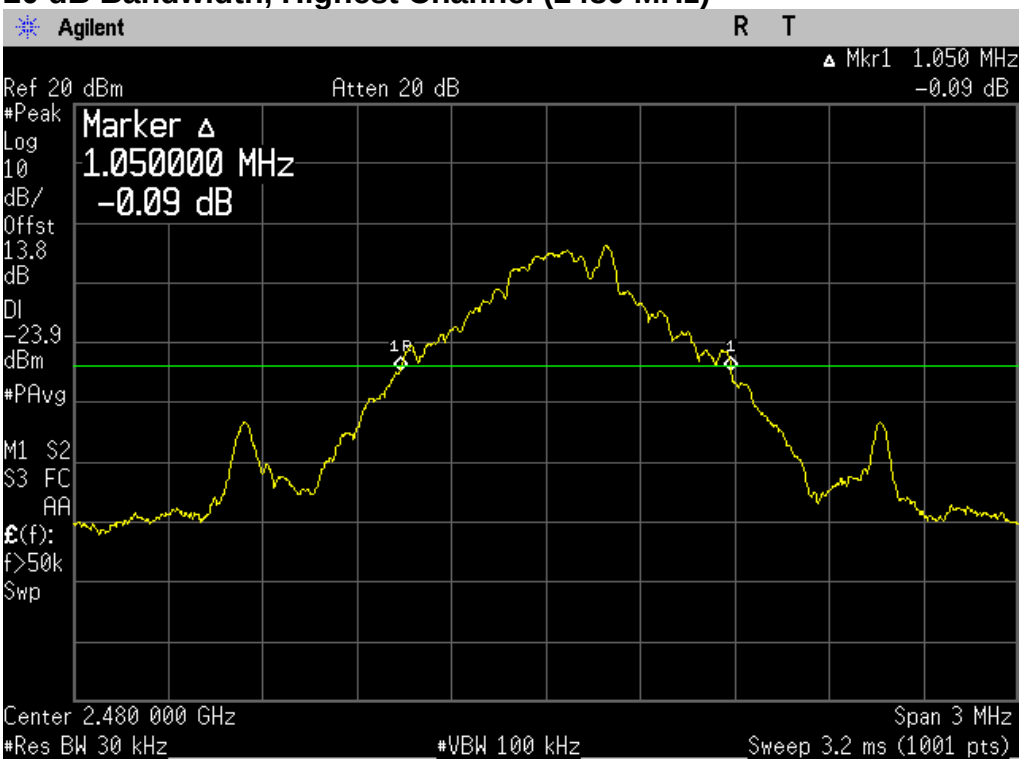


20 dB Bandwidth, Middle Channel (2441 MHz)



PLOTS OF EMISSIONS

20 dB Bandwidth, Highest Channel (2480 MHz)



8.4 Carrier Frequency Separation

FCC §15.247(a)(1), RSS-210 A8.1(2)

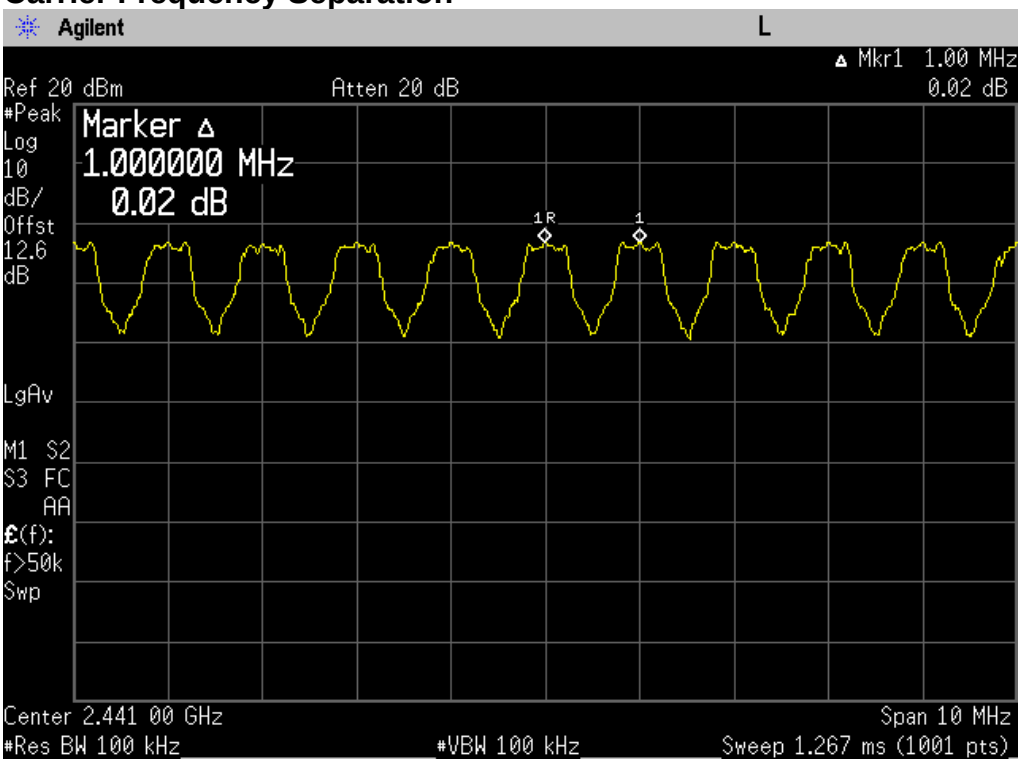
Test Mode : Set to Hopping mode

Result:

Modulation Mode	Carrier Frequency Separation (kHz)	Limit (2/3 of 20dB Bandwidth) (kHz)	Margin (kHz)
GFSK	1000.0	700	300

PLOTS OF EMISSIONS

Carrier Frequency Separation



8.5 Transmitter Average Time of Occupancy

FCC §15.247(a)(1)(iii), RSS-210 A8.1(4)

Test Mode : Set to Hopping mode

Result:

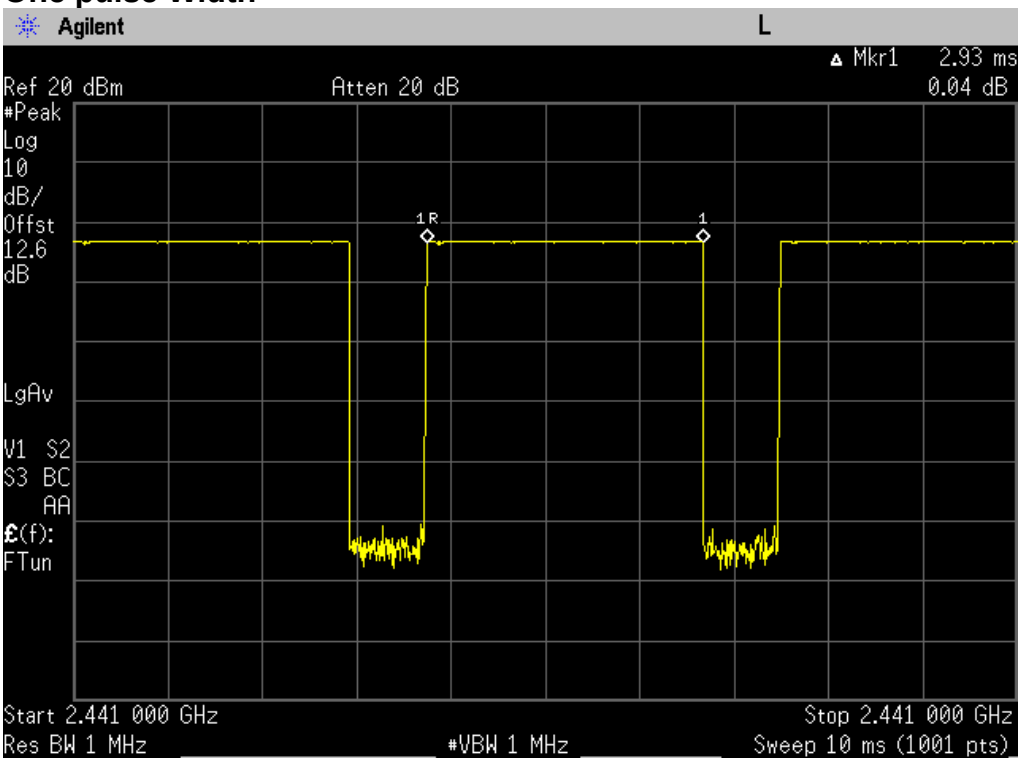
Modulation Mode	Pulse width (μs)	Number of 3.16 second	*) Average time of Occupancy(s)	Margin (s)
GFSK	2930	11	0.3223	0.0777

Notes:

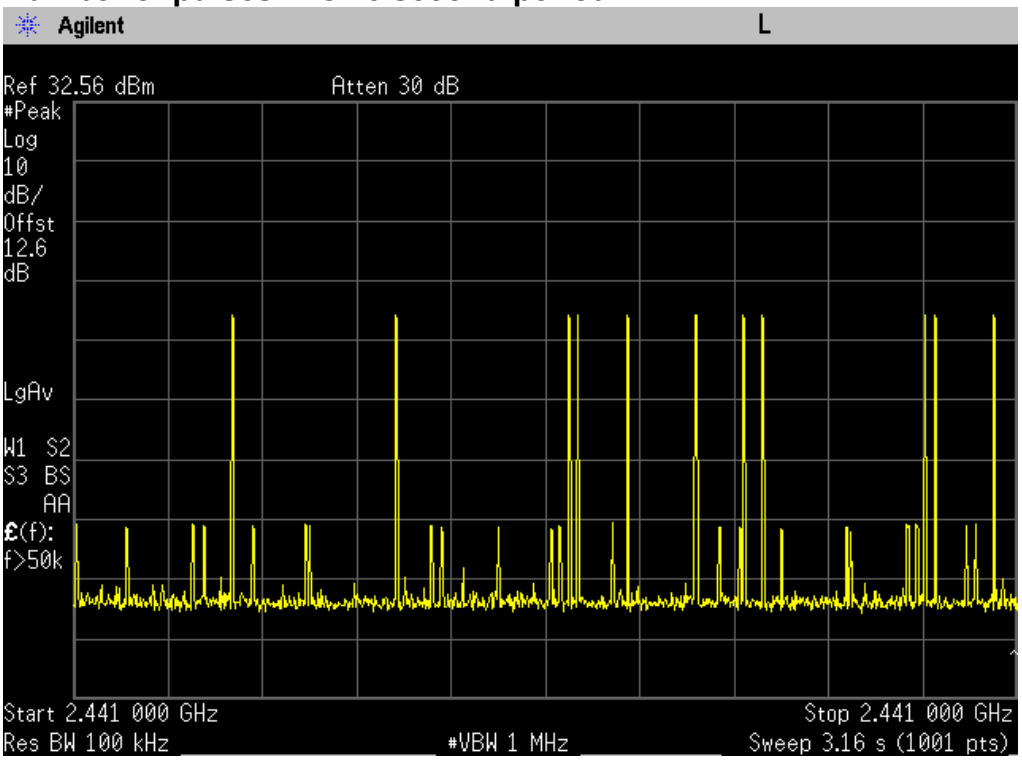
***) Average time of Occupancy = pulse width x Number of 3.16 sec x 10**

PLOT OF TEST DATA

One pulse Width



Number of pulses in 3.16 second period



8.6 Number of Hopping Channels

FCC §15.247(a)(1)(iii), RSS-210 A8.1(4)

Test Mode : Set to Hopping mode

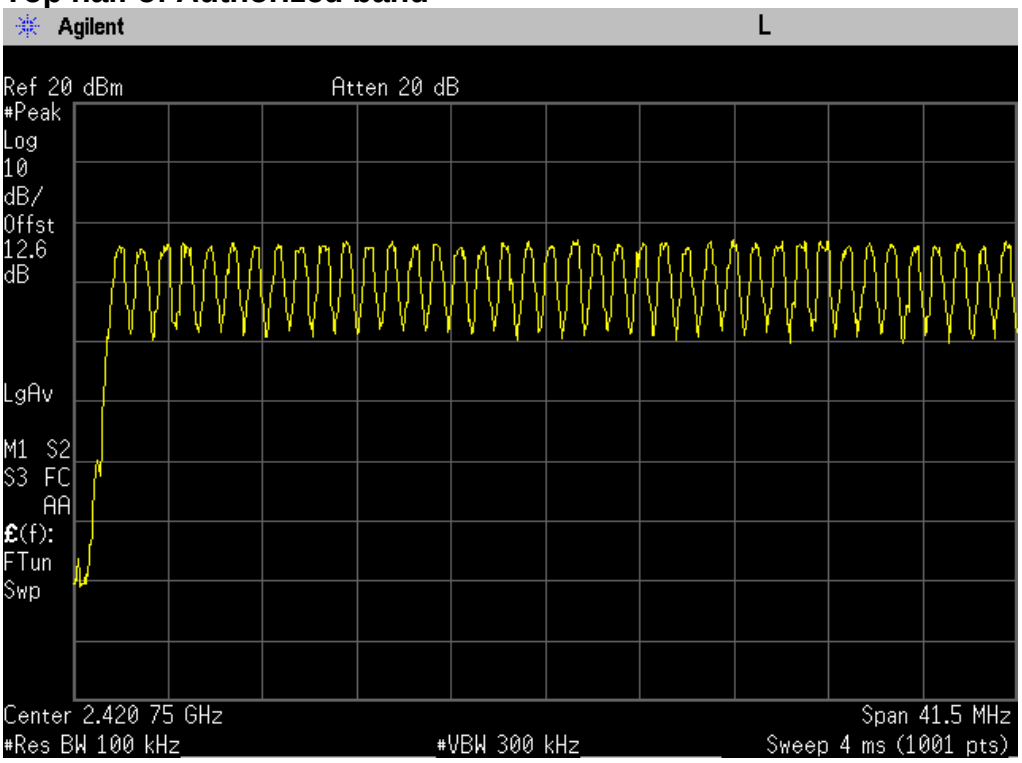
Result:

Total Hopping Channels = 40 + 39 = 79

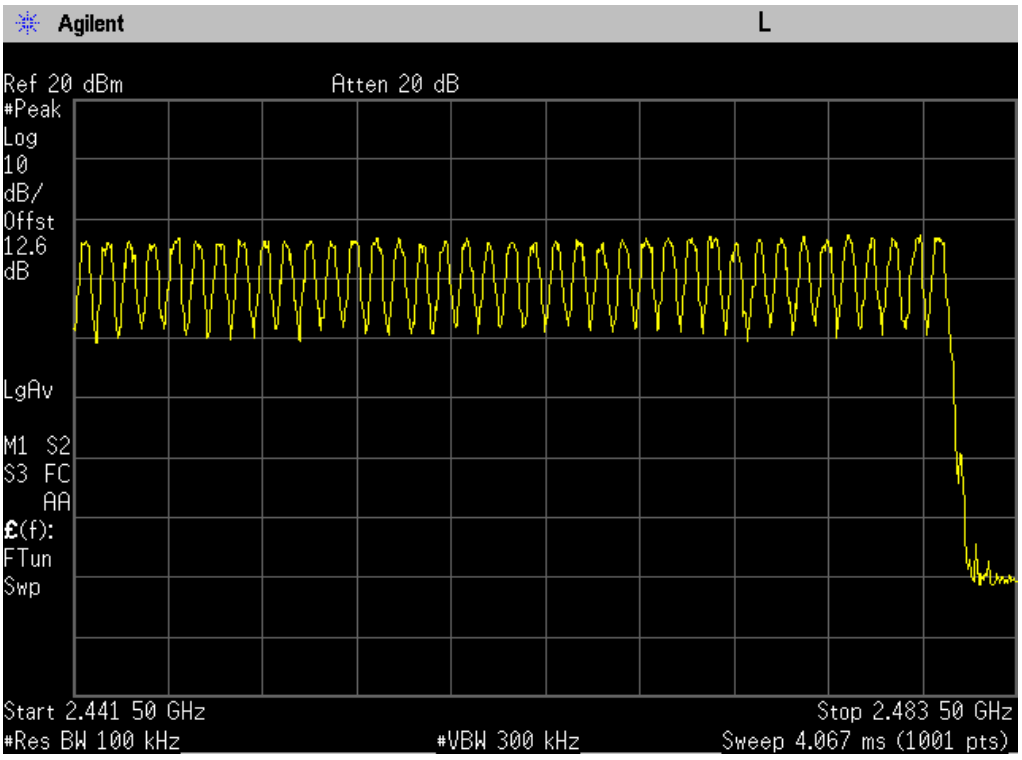
The EUT meets the specifications of Section 15.247(a)(1)(iii) for Number of Hopping Channels.

PLOT OF TEST DATA

Top half of Authorized band



Bottom half of Authorized band



8.7 Peak Power Output

FCC §15.247(b)(1), RSS-210 A8.4(2)

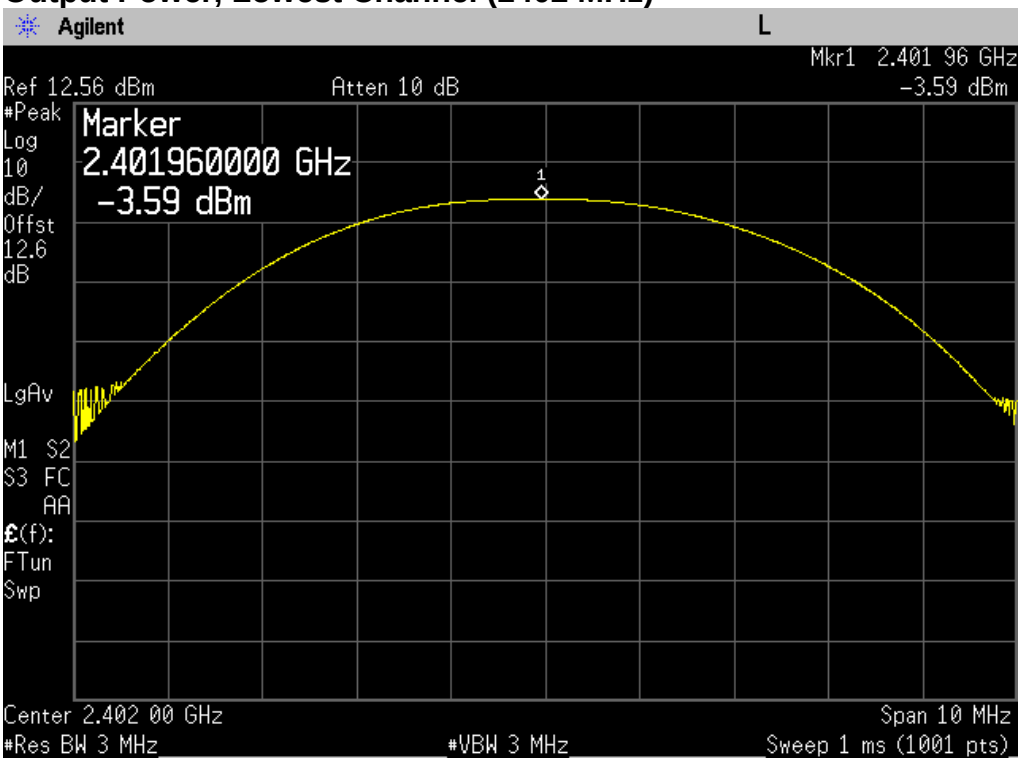
Test Mode : Set to Lowest channel, Middle channel and Highest channel

Result:

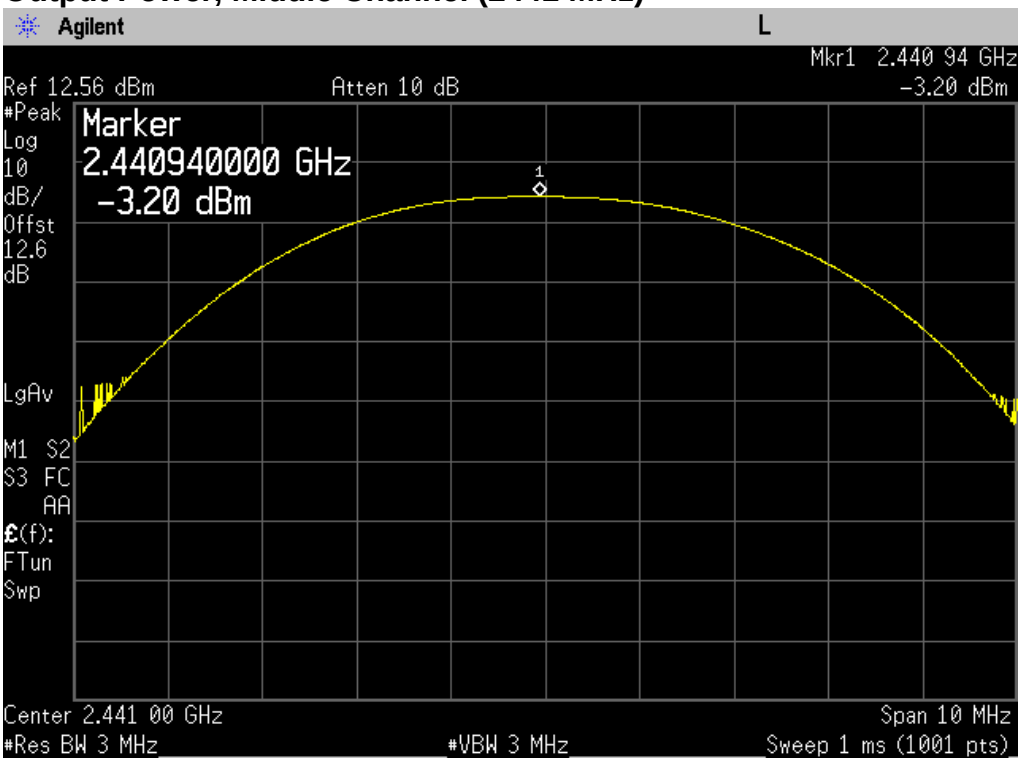
Modulation Mode	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)
GFSK	2402	-3.59	30
GFSK	2441	-3.20	30
GFSK	2480	-2.58	30

PLOT OF TEST DATA

Output Power, Lowest Channel (2402 MHz)

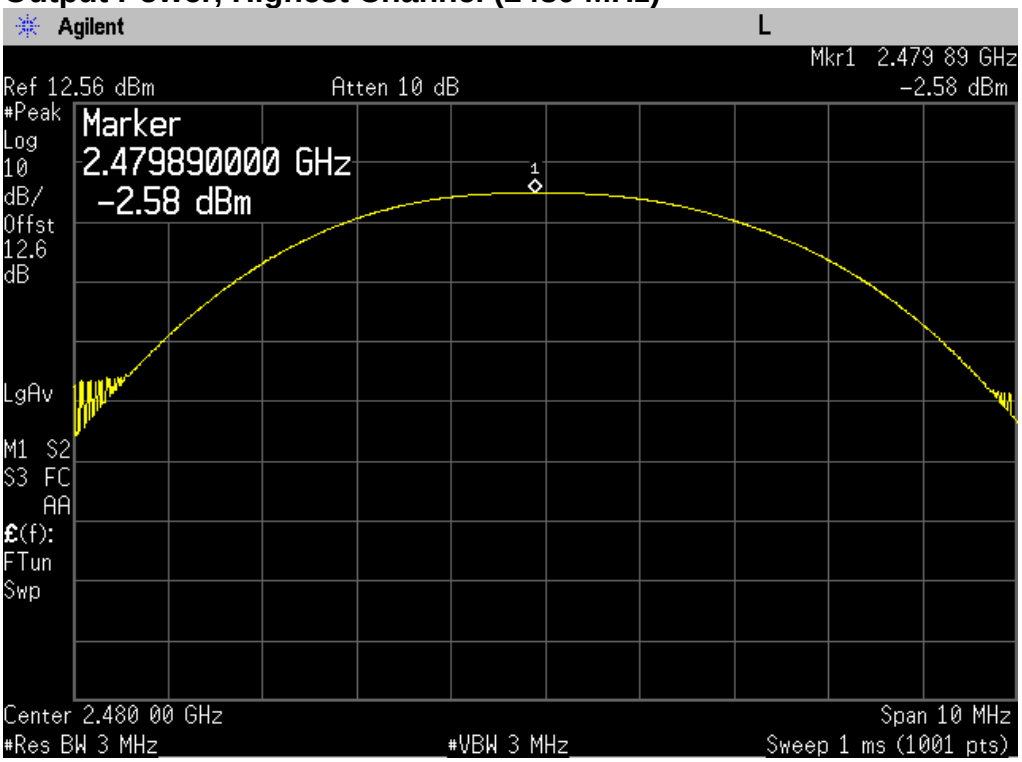


Output Power, Middle Channel (2441 MHz)



PLOT OF TEST DATA

Output Power, Highest Channel (2480 MHz)



8.8 Conducted Spurious Emission

FCC §15.247(d), RSS-210 A8.5

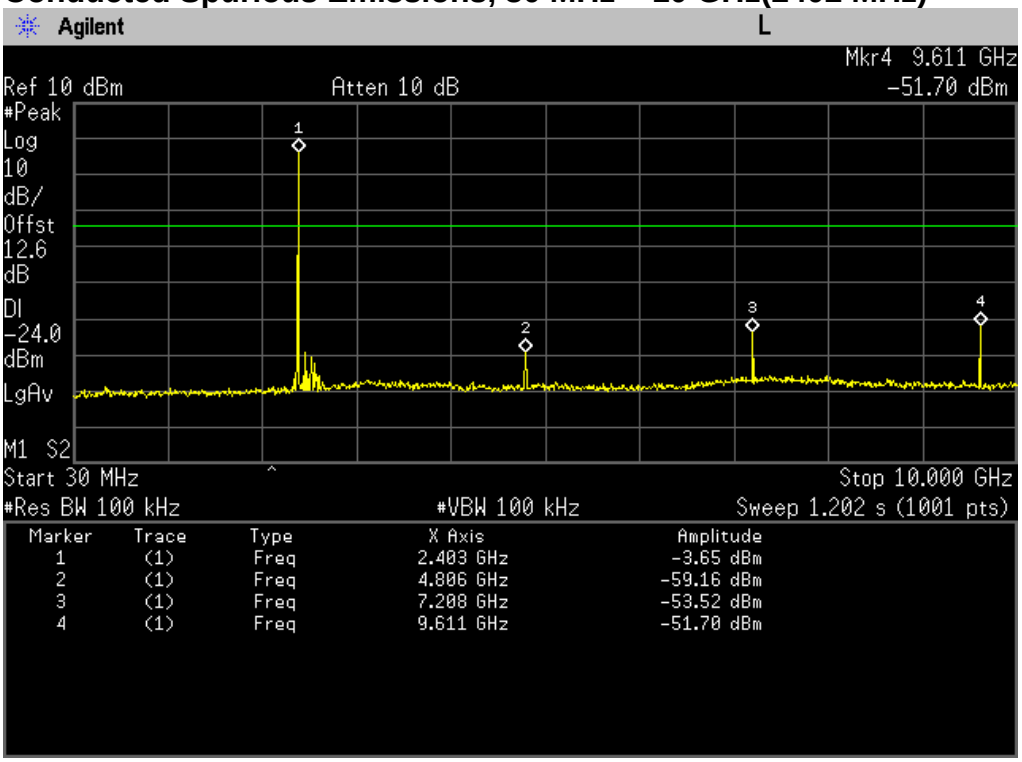
Test Mode : Set to Lowest channel, Middle channel and Highest channel

Result:

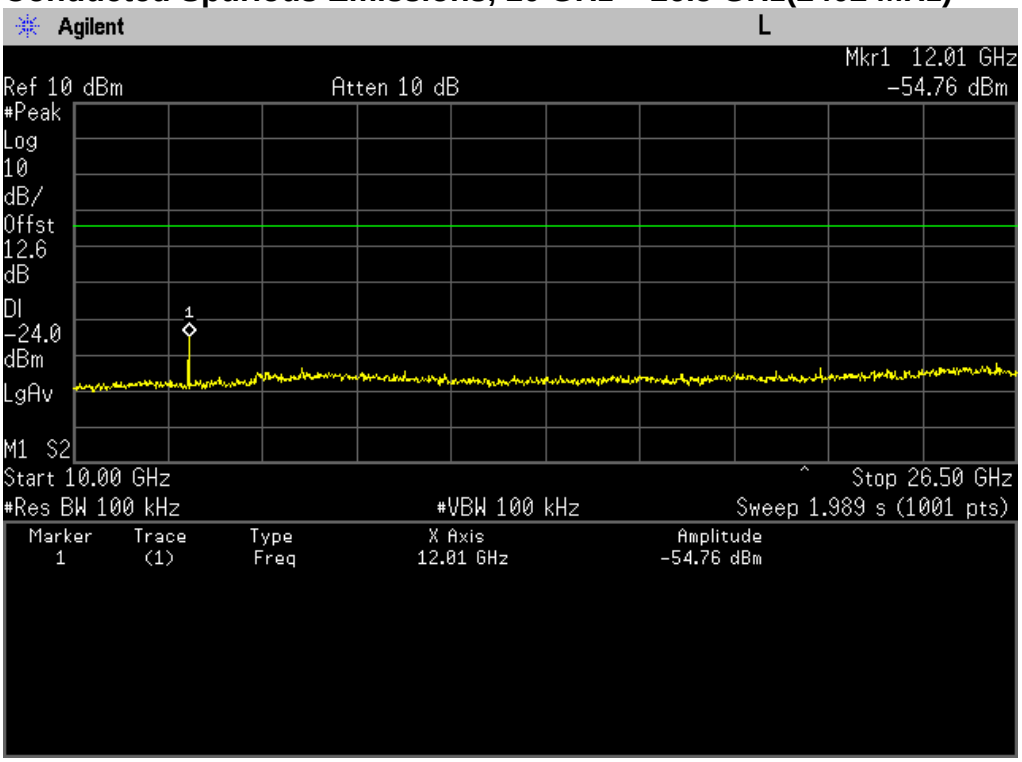
Modulation Mode	Frequency (MHz)	Spruious Emission (dBc)	Limit (dBc)
GFSK	2402	More than 30 dBc	20
GFSK	2441	More than 30 dBc	20
GFSK	2480	More than 30 dBc	20

PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz(2402 MHz)

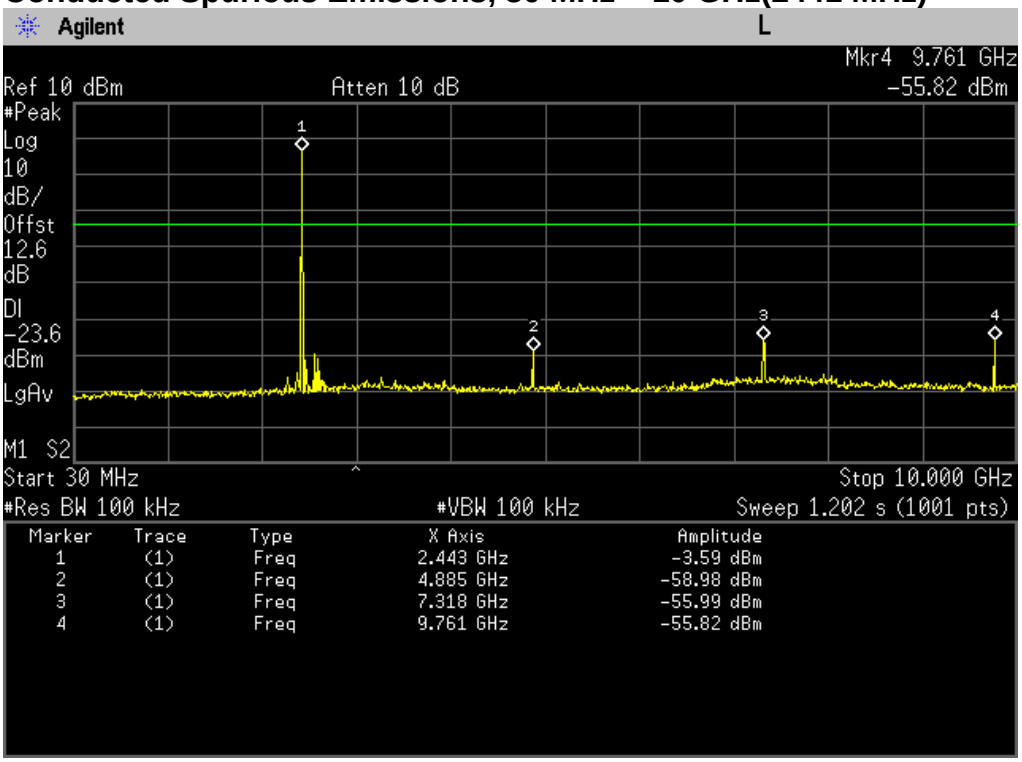


Conducted Spurious Emissions, 10 GHz ~ 26.5 GHz(2402 MHz)

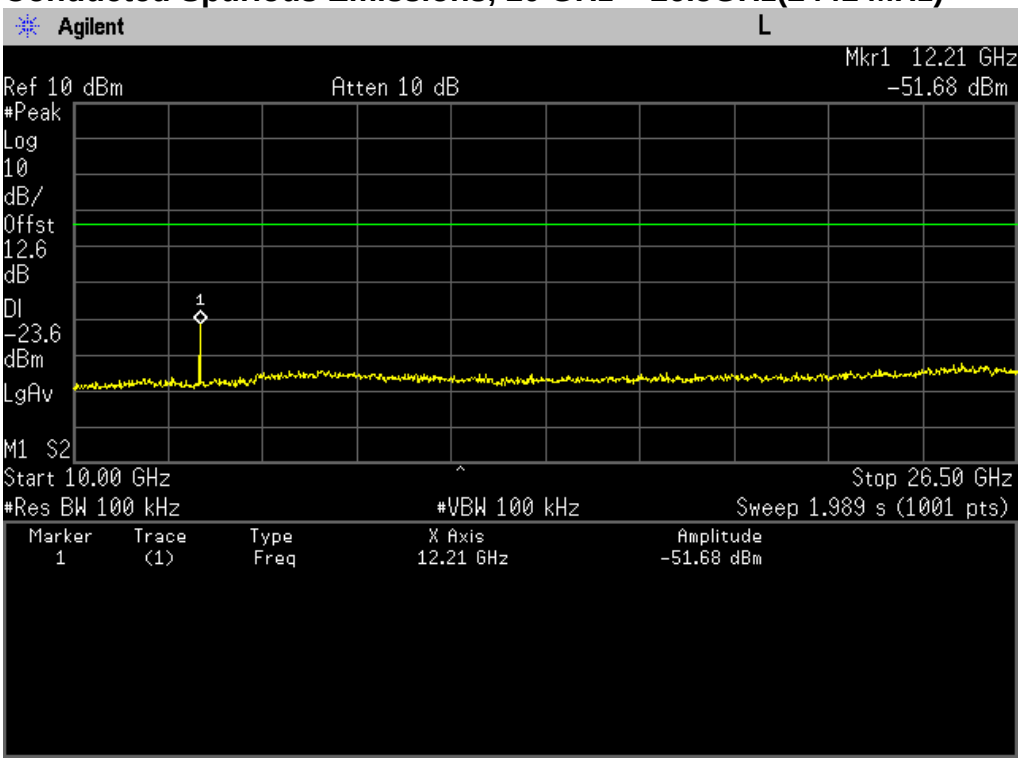


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz(2441 MHz)

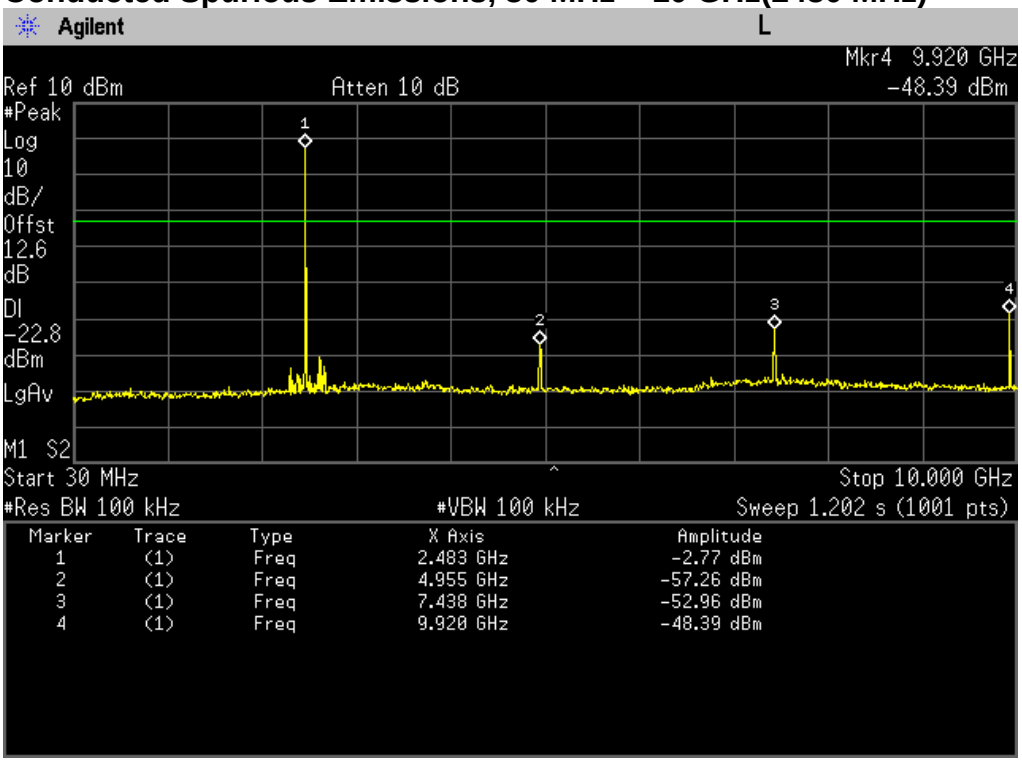


Conducted Spurious Emissions, 10 GHz ~ 26.5GHz(2441 MHz)

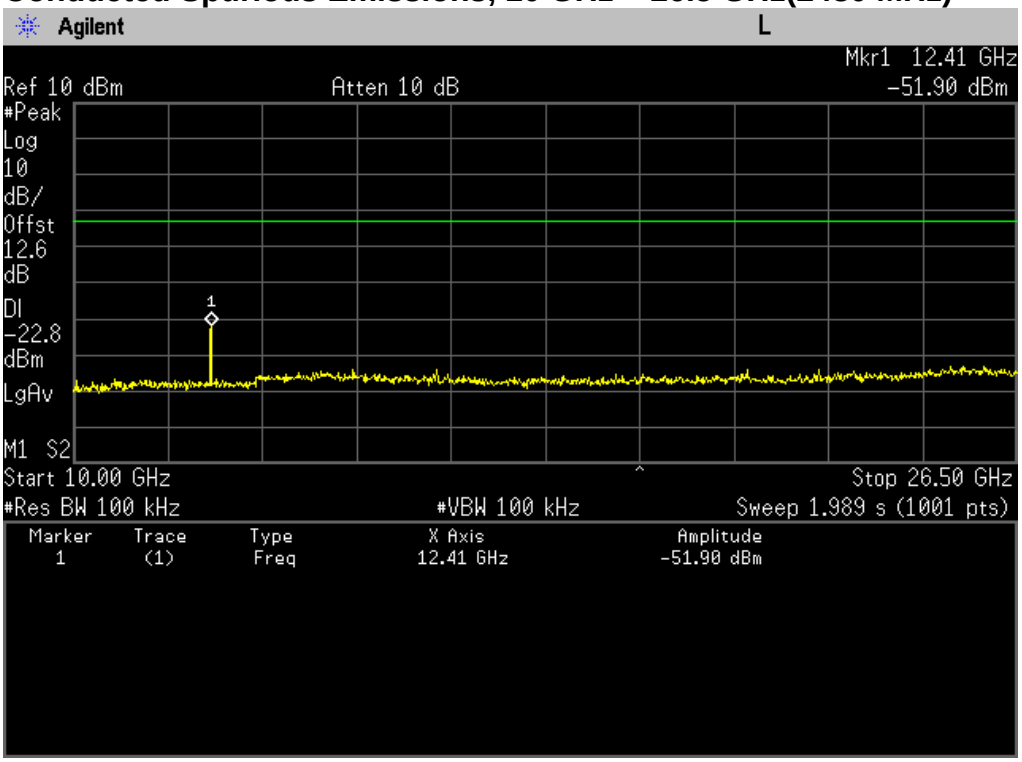


PLOT OF TEST DATA

Conducted Spurious Emissions, 30 MHz ~ 10 GHz(2480 MHz)

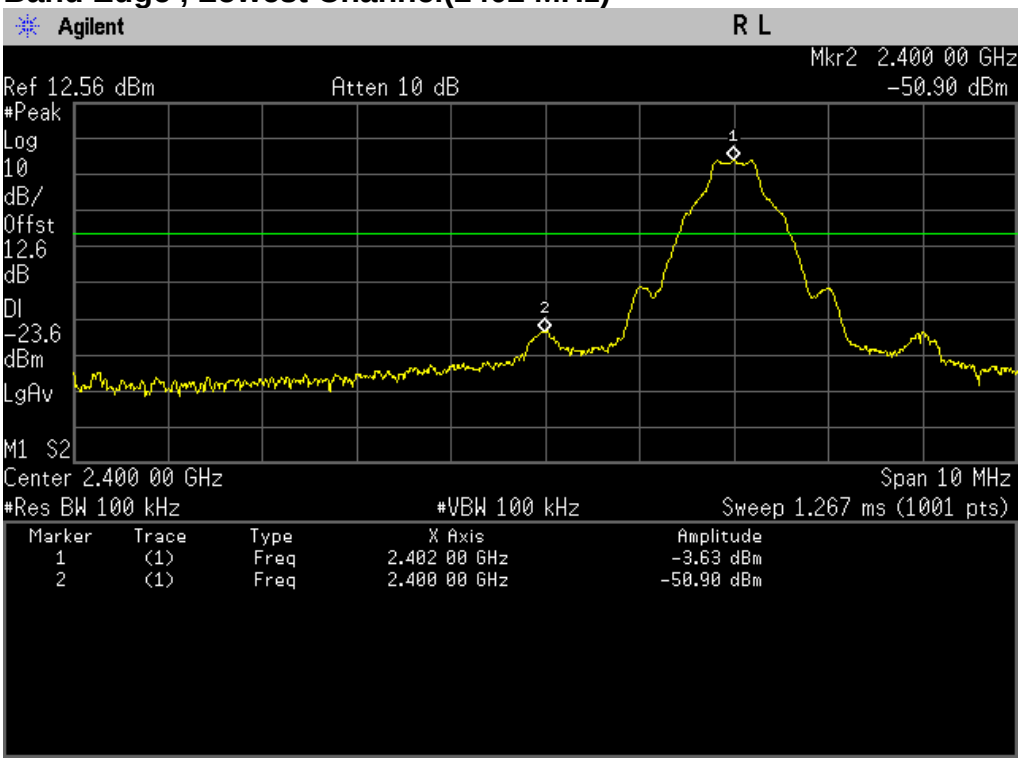


Conducted Spurious Emissions, 10 GHz ~ 26.5 GHz(2480 MHz)

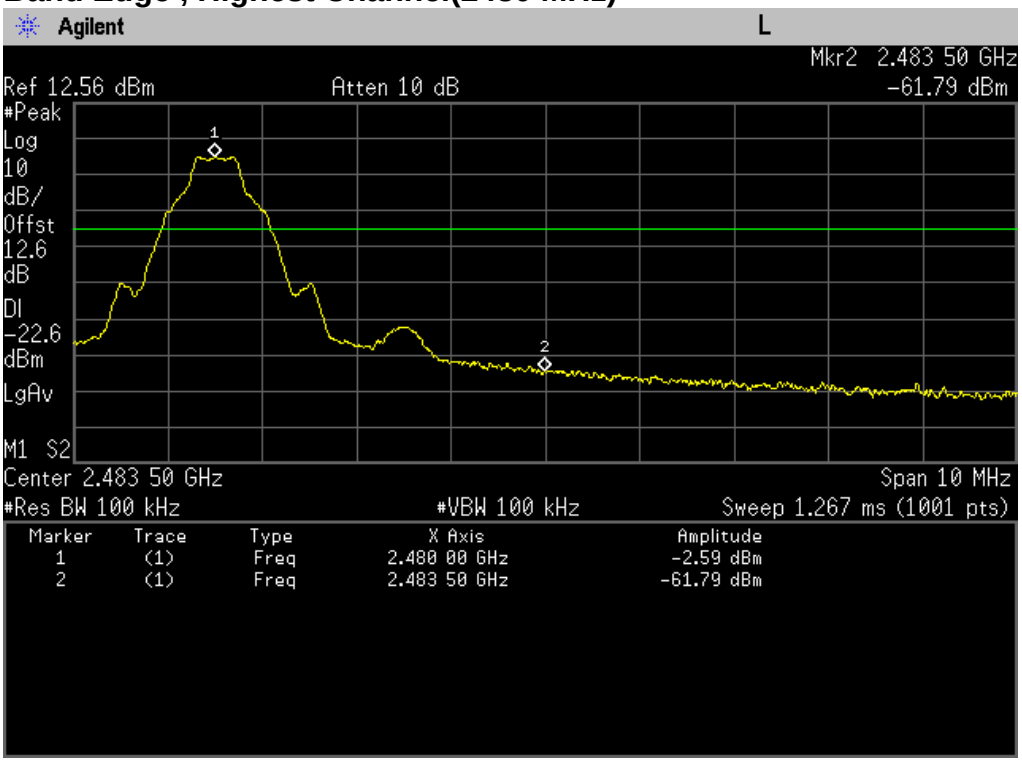


PLOT OF TEST DATA

Band Edge , Lowest Channel(2402 MHz)



Band Edge , Highest Channel(2480 MHz)



8.9 Radiated Spurious Emission

FCC §15.247(d), RSS-210 A8.5

Test Mode : Set to Lowest channel, Middle channel and Highest channel

Result:

Lowest Channel

Frequency (MHz)	Reading (dBμV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1497	50.0	V	peak	-4.6	45.4	74.0	28.6
1497	37.9	V	average	-4.6	33.3	54.0	20.7
2245	48.2	V	peak	-2.4	45.8	74.0	28.2
2245	35.9	V	average	-2.4	33.5	54.0	20.5
4804	41.9	V	peak	8.2	50.1	74.0	23.9
4804	32.4	V	average	8.2	40.6	54.0	13.4

Middle Channel

Frequency (MHz)	Reading (dBμV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1997	52.2	V	peak	-3.5	48.7	74.0	25.3
1997	39.4	V	average	-3.5	35.9	54.0	18.1
4882	41.3	V	peak	8.4	49.7	74.0	24.3
4882	31.9	V	average	8.4	40.3	54.0	13.7
7323	40.3	V	peak	14.9	55.2	74.0	18.8
7323	30.3	V	average	14.9	45.2	54.0	8.8

Highest Channel

Frequency (MHz)	Reading (dBμV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4960	41.6	V	peak	8.6	50.2	74.0	23.8
4960	32.2	V	average	8.6	40.8	54.0	13.2
7440	41.6	V	peak	15.0	56.6	74.0	17.4
7440	31.0	V	average	15.0	46.0	54.0	8.0

Note:

1. *Pol. H = Horizontal V = Vertical

2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.

3. Other spurious are under 20 dB below Fundamental.

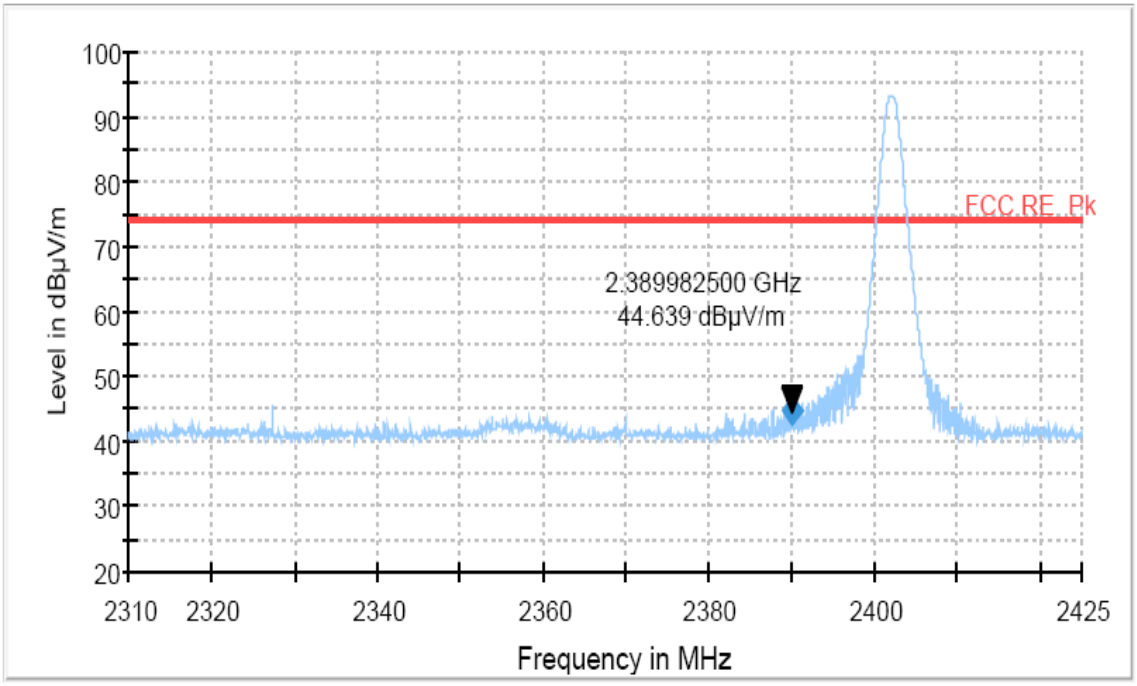
4. The radiated emissions testing were made by rotating through three orthogonal axes. The worst date was recorded.

5. For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

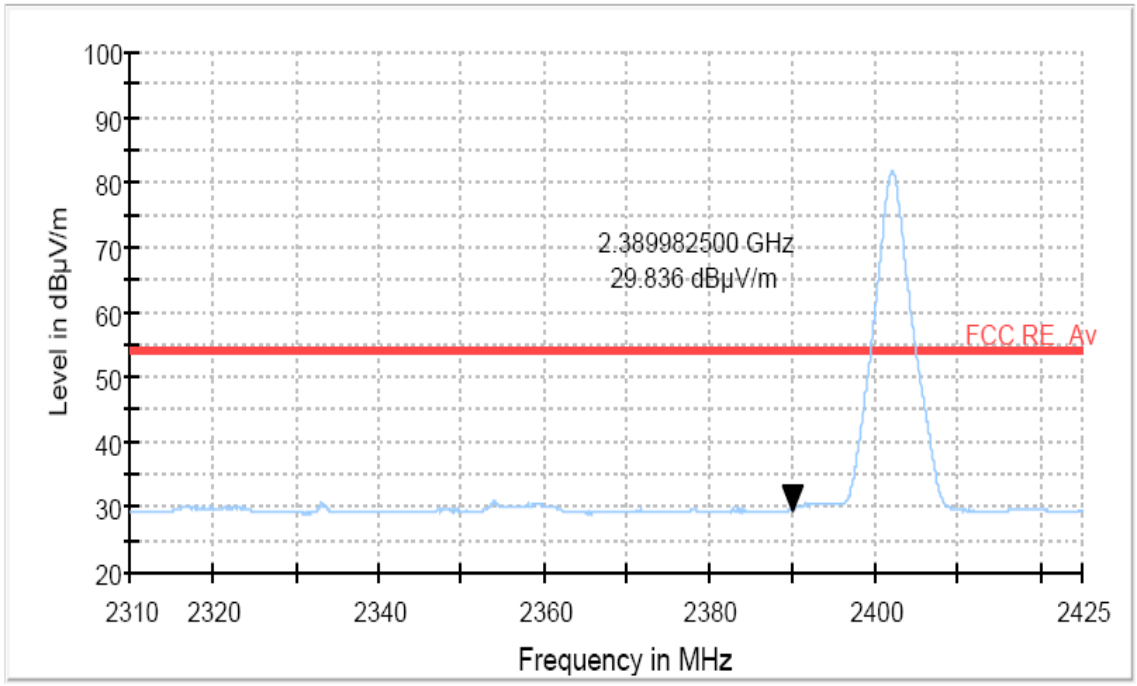
6. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.

PLOT OF TEST DATA

Restricted Band Spurious Emissions, Lowest channel (Peak)

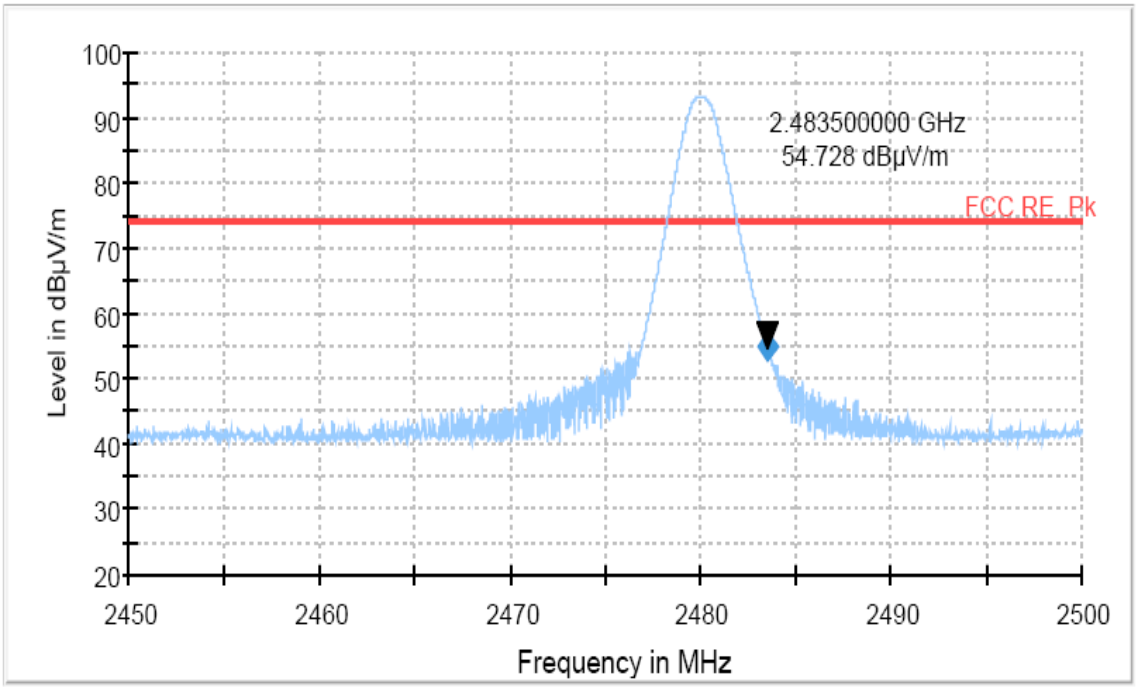


Restricted Band Spurious Emissions, Lowest channel (Average)

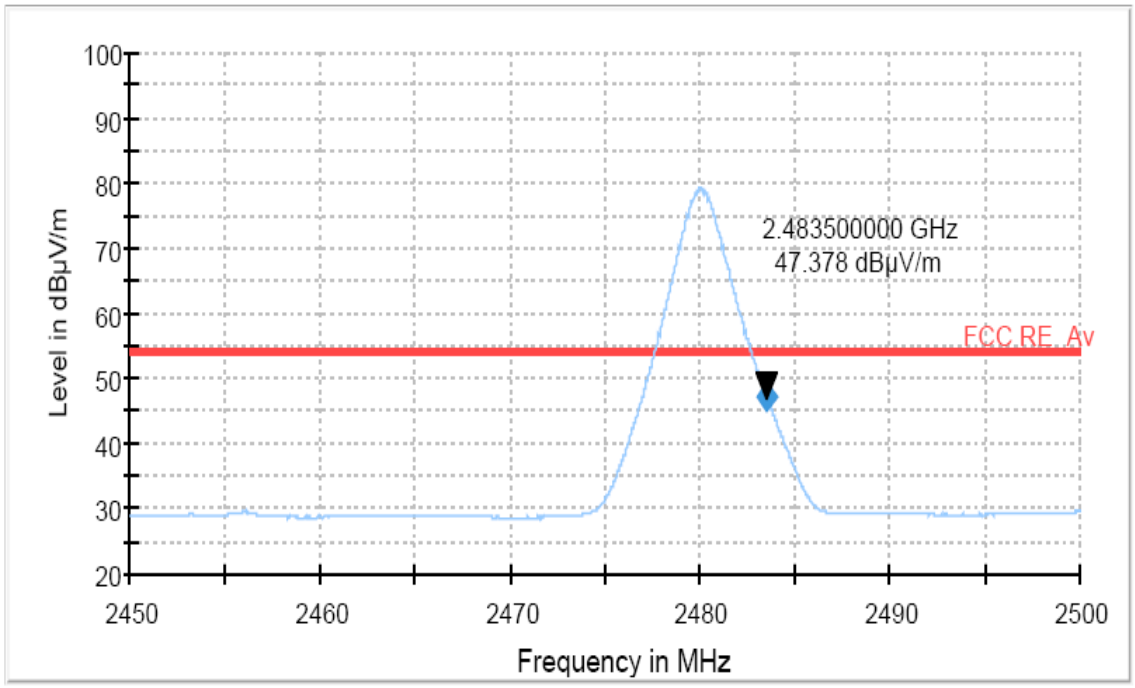


PLOT OF TEST DATA

Restricted Band Spurious Emissions, Highest channel (Peak)



Restricted Band Spurious Emissions, Highest channel (Average)



Note: For the radiated emission field strength measurements at the band edges, the resolution bandwidth was set to 1 MHz, and then the video bandwidth was set to 1 MHz for peak measurements and 10 Hz for average measurements.

9. TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	*Test Receiver	R & S	ESCS 30	833364/020	Mar. 24 2010	1 year
2	Test Receiver	R & S	ESCS 30	100302	Nov. 10 2010	1 year
3	*Amplifier	HP	8447F	2805A03427	Jul. 20 2010	1 year
4	*Amplifier	Sonoma Instrument	310N	291916	Jul. 20 2010	1 year
5	*Amplifier	R & S	SCU-26	10011	Jun. 11 2010	1 year
6	*Pre Amplifier	HP	8449B	3008A00107	Jan. 13 2011	1 year
7	*Pre Amplifier	HP	8447F	2805A03351	Oct. 06 2010	1 year
8	Spectrum Analyzer	HP	8593E	3926A04282	Nov. 10 2010	1 year
9	*Spectrum Analyzer	Agilent	E4440A	MY44303257	Jul. 20 2010	1 year
10	Spectrum Analyzer	Agilent	E4440A	MY44022567	Jun. 03 2010	1 year
11	*Spectrum Analyzer	R & S	FSP40	100361	Sep. 02 2010	1 year
12	*Loop Antenna	EMCO	6502	8911-2436	Jan. 19 2010	2 year
13	Power Meter	R & S	NRVS	835360/002	Jan. 13 2011	1 year
14	Peak Power Sensor	R & S	NRV-Z32	836019/028	Nov. 10 2010	1 year
15	*Biconical Log Antenna	ARA	LPB-2520/A	1180	Apr. 14 2010	2 year
16	*Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-508	Dec. 24 2010	2 year
17	*Horn Antenna	Q-par Angus	QSH20S20	8179	Apr. 12 2010	2 year
18	*Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-257	Apr. 14 2010	2 year
19	Logbicon Antenna	SCHWARZBECK	VULB9166	1067	Jul. 14 2010	2 year
20	*LISN	R & S	ESH3-Z5	833874/006	Nov. 10 2010	1 year
21	LISN	Kyoritsu	KNW-407	8-1034-10	Jan. 14 2011	1 year
22	*Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
23	*Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
24	*Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
25	*Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
26	*Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
27	*Position Controller	Seo-Young EMC	N/A	N/A	N/A	N/A
28	*Turn Table	Seo-Young EMC	N/A	N/A	N/A	N/A
29	*Antenna Mast	Seo-Young EMC	N/A	N/A	N/A	N/A
30	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
31	*Shielded Room	Seo-Young EMC	N/A	N/A	N/A	N/A

***) Test equipment used during the test**

10. ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of measurement uncertainty contained in CISPR 16-4-2 with the confidence level of 95%

1. Conducted Uncertainty Calculation

Source of Uncertainty	Xi	Uncertainty of Xi		Coverage factor k	u(Xi) (dB)	Ci	Ci u(Xi) (dB)
		Value (dB)	Probability Distribution				
Receiver reading	***RI***	± 0.1	normal 1	1.000	0.1	1	0.1
Attenuation AMN-Receiver	***LC***	± 0.08	normal 2	2.000	0.04	1	0.04
AMN Voltage division factor	***LAMN***	± 0.8	normal 2	2.000	0.4	1	0.4
Sine wave voltage	***dVSW***	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	***dVPA***	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	***dVPR***	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	***dVNF***	± 0.00	-	-	0.00	1	0.00
AMN Impedance	***dZ***	± 1.80	triangular	2.449	0.73	1	0.73
ⓐ Mismatch	***M***	+ 0.70	U-Shaped	1.414	0.49	1	0.49
ⓑ Mismatch	***M***	- 0.80	U-Shaped	1.414	- 0.56	1	- 0.56
Measurement System Repeatability	***RS***	0.05	normal 1	1.000	0.05	1	0.05
Remark	ⓐ: AMN-Receiver Mismatch : + ⓑ: AMN-Receiver Mismatch : -						
Combined Standard Uncertainty	Normal			± 1.88			
Expended Uncertainty U	Normal (k = 2)			± 3.76			

2. Radiation Uncertainty Calculation

Source of Uncertainty	*Xi*	Uncertainty of *Xi*		Coverage factor *k*	*u(Xi)* (dB)	*Ci*	*Ci u(Xi)* (dB)
		Value (dB)	Probability Distribution				
Receiver reading	***RI***	± 0.10	normal 1	1.000	0.10	1	0.10
Sine wave voltage	***dVsw***	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	***dVpa***	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	***dVpr***	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	***dVnf***	± 0.50	normal 2	2.000	0.25	1	0.25
Antenna Factor Calibration	***AF***	± 1.50	normal 2	2.000	0.75	1	0.75
Attenuation Antenna-receiver	***CL***	± 0.52	normal 2	2.000	0.26	1	0.26
Antenna Directivity	***AD***	± 1.00	rectangular	1.732	0.58	1	0.58
Antenna Factor Height Dependence	***AH***	± 0.50	rectangular	1.732	0.29	1	0.29
Antenna Phase Centre Variation	***AP***	± 0.30	rectangular	1.732	0.17	1	0.17
Antenna Factor Frequency Interpolation	***AI***	± 0.30	rectangular	1.732	0.17	1	0.17
Site Imperfections	***SI***	± 4.00	triangular	2.449	1.63	1	1.63
Measurement Distance Variation	***DV***	± 0.10	rectangular	1.732	0.06	1	0.06
Antenna Balance	***Dbal***	± 0.90	rectangular	1.732	0.52	1	0.52
Cross Polarisation	***DCross***	± 0.90	rectangular	1.732	0.52	1	0.52
ⓐ Mismatch	***M***	+ 0.25	U-Shaped	1.414	0.18	1	0.18
ⓑ Mismatch	***M***	- 0.26	U-Shaped	1.414	- 0.18	1	- 0.18
ⓒ Mismatch	***M***	+ 0.98	U-Shaped	1.414	0.69	1	0.69
ⓓ Mismatch	***M***	- 1.11	U-Shaped	1.414	- 0.79	1	- 0.79
Measurement System Repeatability	***RS***	0.09	normal 1	1.000	0.09	1	0.09
Remark	ⓐ: Biconical Antenna-receiver Mismatch : + (< 200 MHz) ⓑ: Biconical Antenna-receiver Mismatch : - (< 200 MHz) ⓒ: Log Periodic Antenna-receiver Mismatch : + (≧ 200 MHz) ⓓ: Log Periodic Antenna-receiver Mismatch : - (≧ 200 MHz)						
Combined Standard Uncertainty	Normal			± 2.63 (< 200 MHz) ± 2.74 (≧200 MHz)			
Expended Uncertainty U	Normal (*k* = 2)			± 5.26 (< 200 MHz) ± 5.48 (≧200 MHz)			