



# DIGITAL EMC CO., LTD.

683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

Tel: +82-31-321-2664 Fax: +82-31-321-1664

<http://www.digitalemccom>

## CERTIFICATION OF COMPLIANCE

### VK Corporation

VK B/D, 548-6, Anyang 8dong, Manan-gu,  
Anyang City, Kyonggi do, 430-716, Korea

Dates of Tests: February 13 ~ 17, 2006

Test Report S/N: DR50110602D

Test Site : DIGITAL EMC CO., LTD.

FCC ID

**SBWVK2010**

APPLICANT

**VK Corporation**

<b>FCC Classification</b>	<b>:</b>	<b>Frequency Hopping Spread Spectrum (FHSS)</b>
<b>Device name</b>	<b>:</b>	<b>GSM900/1800/PCS1900 Tri-Band GPRS Terminal With Bluetooth Equipment</b>
<b>Manufacturer</b>	<b>:</b>	<b>VK Corporation</b>
<b>FCC ID</b>	<b>:</b>	<b>SBWVK2010</b>
<b>Model name</b>	<b>:</b>	<b>VK2010</b>
<b>Test Device Serial number</b>	<b>:</b>	<b>Identical prototype</b>
<b>FCC Rule Part(s)</b>	<b>:</b>	<b>FCC Part 15.247 Subpart C ANSI C-63.4-2003</b>
<b>Frequency Range</b>	<b>:</b>	<b>2402 ~ 2480 MHz</b>
<b>Max. Output power</b>	<b>:</b>	<b>-1.83dBm Conducted</b>
<b>Data of issue</b>	<b>:</b>	<b>February 17, 2006</b>

I attest to the accuracy of data. 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.



NVLAP LAB CODE 200559-0

---

## **TABLE OF CONTENTS**

1. GENERAL INFORMATION	-----	3
2. INFORMATION ABOUT TEST ITEM	-----	4
3. TEST REPORT	-----	6
3.1 SUMMARY OF TESTS	-----	6
3.2 TRANSMITTER REQUIREMENTS	-----	7
3.2.1 CARRIER FREQUENCY SEPARATION	-----	7
3.2.2 NUMBER OF HOPPING FREQUENCIES	-----	9
3.2.3 20 dB BANDWIDTH	-----	12
3.2.4 TIME OF OCCUPANCY (Dwell Time)	-----	15
3.2.5 PEAK OUTPUT POWER	-----	19
3.2.6 CONDUCTED SPURIOUS EMISSIONS	-----	22
3.2.7 RADIATED EMISSIONS	-----	28
3.2.8 AC LINE CONDUCTED EMISSIONS	-----	34
APPENDIX TEST EQUIPMENT FOR TESTS	-----	41

## 1. General information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.

Address : 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

<http://www.digitalemc.com> E-mail : demc@unitel.co.kr

Tel: +82-31-321-2664 Fax: +82-31-321-1664

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competent of calibration and testing laboratory".

This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200559-0.

**Test operator: engineer**

February 17, 2006

Dong-Chul CHA



Data

Name

Signature

**Report Reviewed By: manager**

February 17, 2006

Harvay Sung



Data

Name

Signature

Ordering party:

Company name : VK Corporation

Address : VK B/D, 548-6, Anyang 8dong, Manan-gu, Anyang City,

Zip code : 430-716

City/town : Kyonggi do,

Country : Korea

Date of order : December 26, 2005

## 2. Information about test item

### SBWVK2010

#### 2.1 Equipment information

Equipment model name	VK2010
Type of equipment	GSM900/1800/PCS1900 Tri-Band GPRS, Terminal With Bluetooth Equipment
Frequency band	2402 ~ 2480 MHz
Type of Modulation	GFSK
Channel Spacing	1.0 MHz
Type of antenna	Multilayer Chip Antenna
Power	DC 3.7 V – Lithium Battery

#### 2.2 Tested frequency

Frequency	TX	RX
Low frequency	2402MHz	2402MHz
Middle frequency	2441MHz	2441MHz
High frequency	2480MHz	2480MHz

## SBWVK2010

**2.3 Tested environment**

Temperature	:	15 ~ 35 (°C)
Relative humidity content	:	20 ~ 75 %
Air pressure	:	86 ~ 103 kPa
Details of power supply	:	3.7 VDC

**2.4 Ancillary Equipment**

Equipment	Model No.	Serial No.	Manufacturer
-	-	-	-
-	-	-	-

**2.5 EMI Suppression Device(s)/Modifications**

EMI suppression device(s) added and/or modifications made during testing

-> None

### 3. Test Report

#### 3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
I. Test Items				
15.247(a)	Carrier Frequency Separation	> 25 kHz	Conducted	C
	Number of Hopping Frequencies	> 75 hops		C
	20 dB Bandwidth	< 1 MHz		C
	Dwell Time	0.4 seconds within a 30 second period per any frequency		C
15.247(b)	Transmitter Output Power	< 1Watt		C
15.247(c)	Band-edge /Conducted	The radiated emission to any 100 kHz of outband shall be at least 20dB below the highest inband spectral density.		C
	Conducted Spurious Emissions			C
15.205 15.209	Radiated Emissions	FCC 15.209 Limits	Radiated	C
15.207	AC Conducted Emissions	EN 55022	AC Line Conducted	C
Note 1: C=Complies    NC=Not Complies    NT=Not Tested    NA=Not Applicable				

The sample was tested according to the following specification:

FCC Parts 15.247; ANSI C-63.4-2003

## 3.2 Transmitter requirements

### 3.2.1 Carrier Frequency Separation

#### Procedure:

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = 3 MHz (wide enough to capture the peaks of two adjacent channels)

RBW = 30 kHz (1% of the span or more)      Sweep = auto

VBW = 30 kHz      Detector function = peak

Trace = max hold

#### Measurement Data:

Frequency of marker #1 (MHz)	Frequency of marker #2 (MHz)	Test Results	
		Carrier Frequency Separation (MHz)	Result
2440.990	2441.995	1.005	<b>Complies</b>

- See next pages for actual measured spectrum plots.

#### Minimum Standard:

The EUT shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

#### Measurement Setup

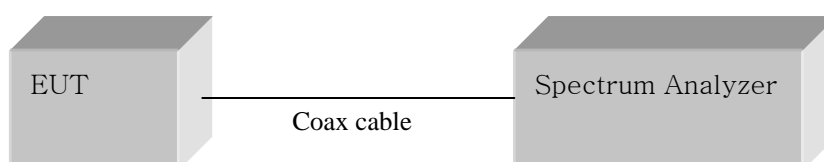
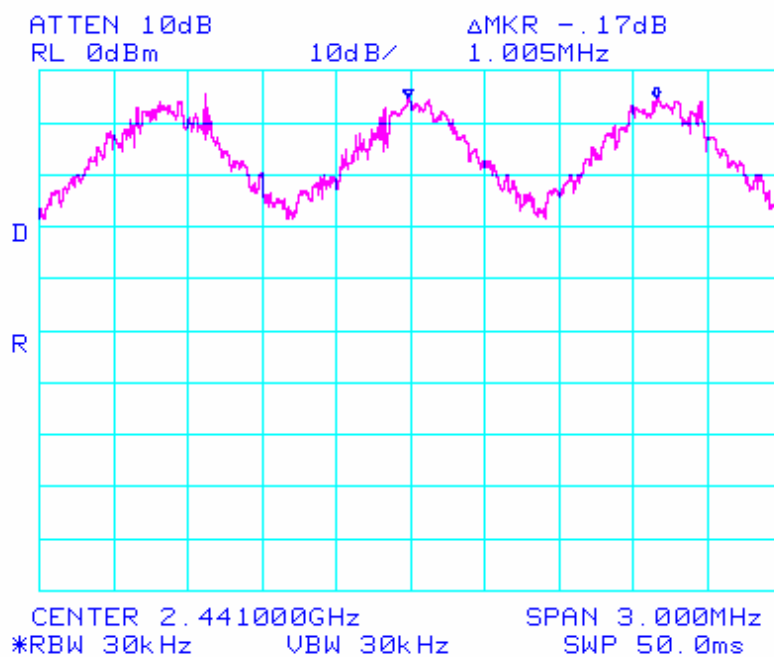


Figure 1: Measurement setup for the carrier frequency separation

## Carrier Frequency Separation





### 3.2.2 Number of Hopping Frequencies

#### Procedure:

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

To get higher resolution, four frequency ranges within the 2400 ~ 2483.5 MHz FH band were examined.

The spectrum analyzer is set to:

Frequency range    1: Start = 2389.5MHz,    Stop = 2414.5 MHz

2: Start = 2414.5MHz,    Stop = 2439.5 MHz

3: Start = 2439.5MHz,    Stop = 2464.5 MHz

4: Start = 2464.5MHz,    Stop = 2489.5 MHz

RBW = 300 kHz (1% of the span or more)    Sweep = auto

VBW = 300 kHz (VBW  $\geq$  RBW)    Detector function = peak

Trace = max hold    Span = 25MHz

#### Measurement Data: **Complies**

<b>Total number of Hopping Channels</b>	79
---	----

- See next pages for actual measured spectrum plots.

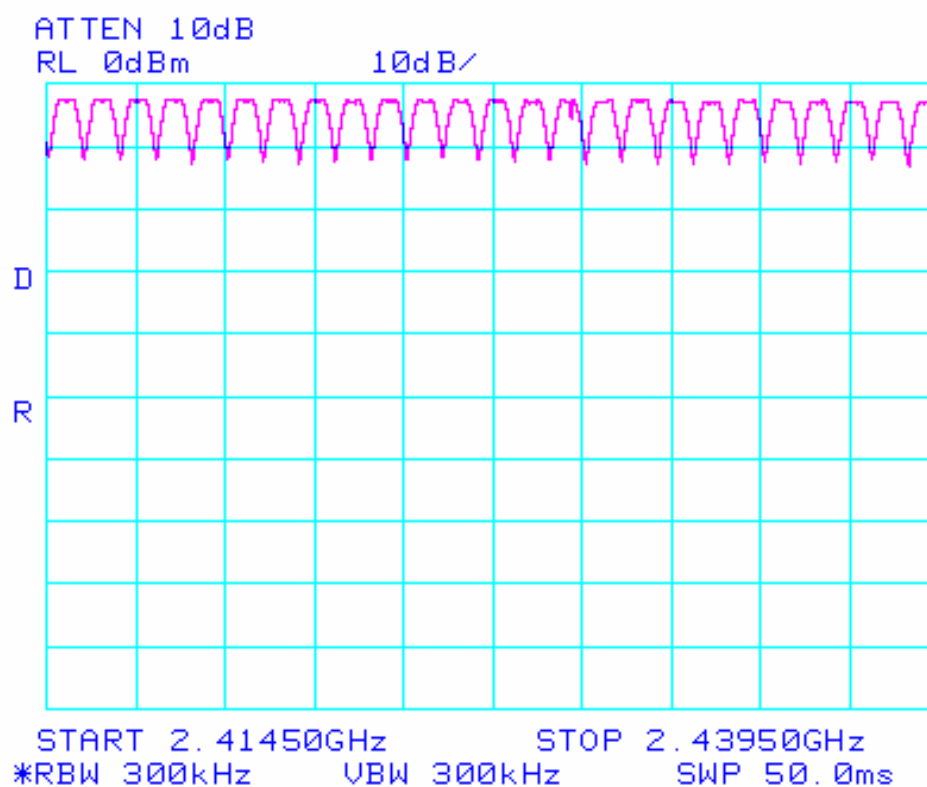
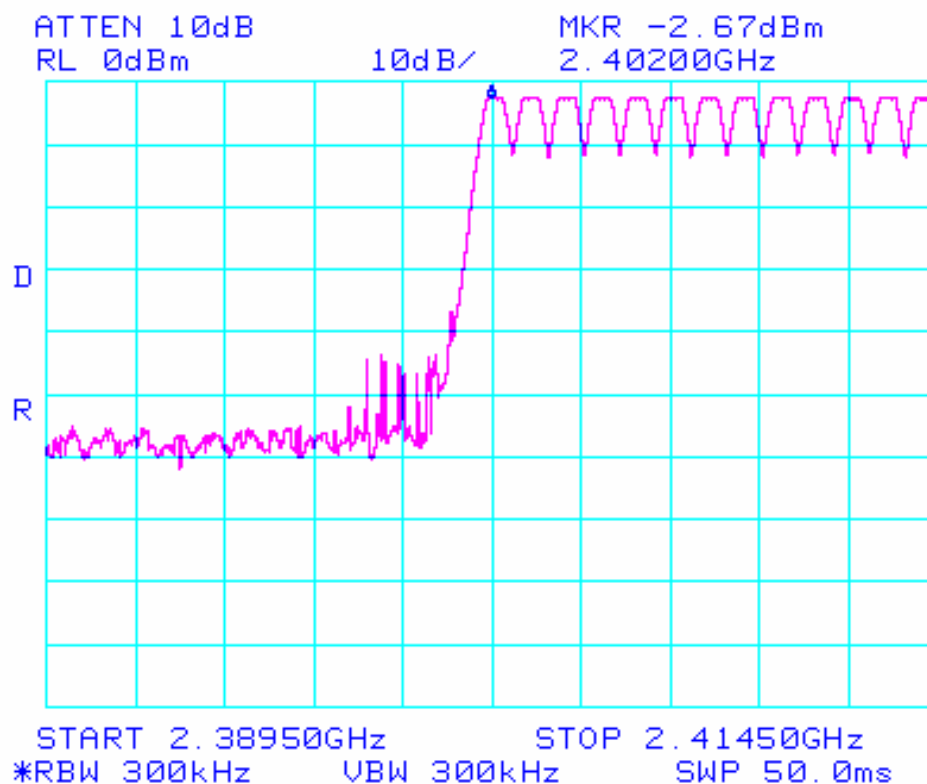
#### Minimum Standard:

At least 75 hopes
-------------------

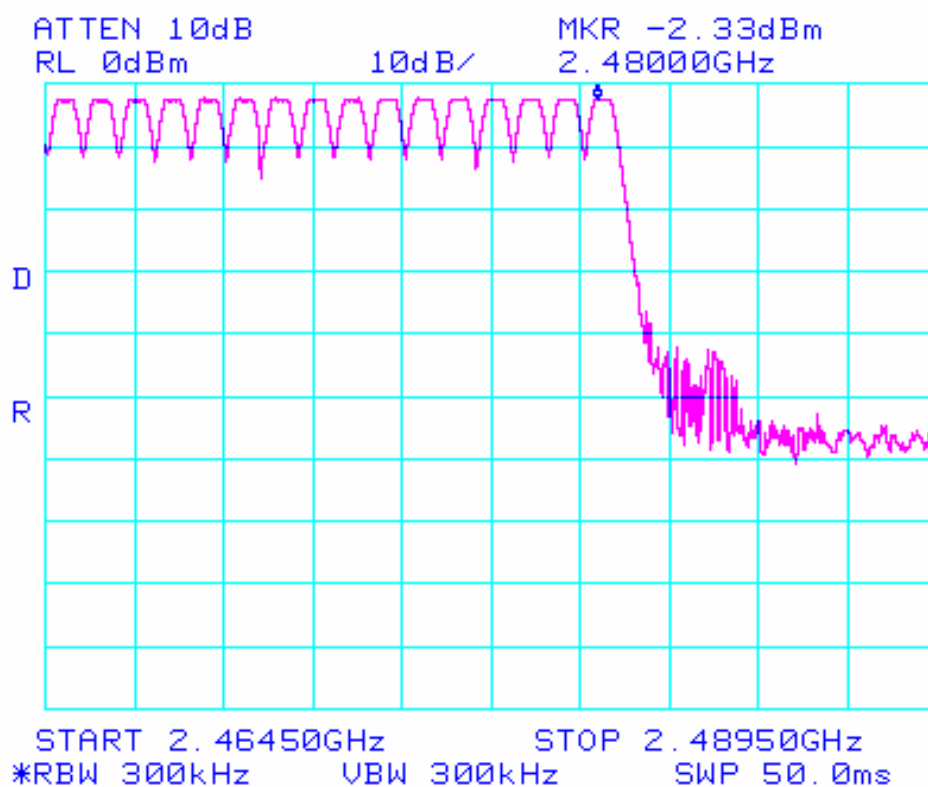
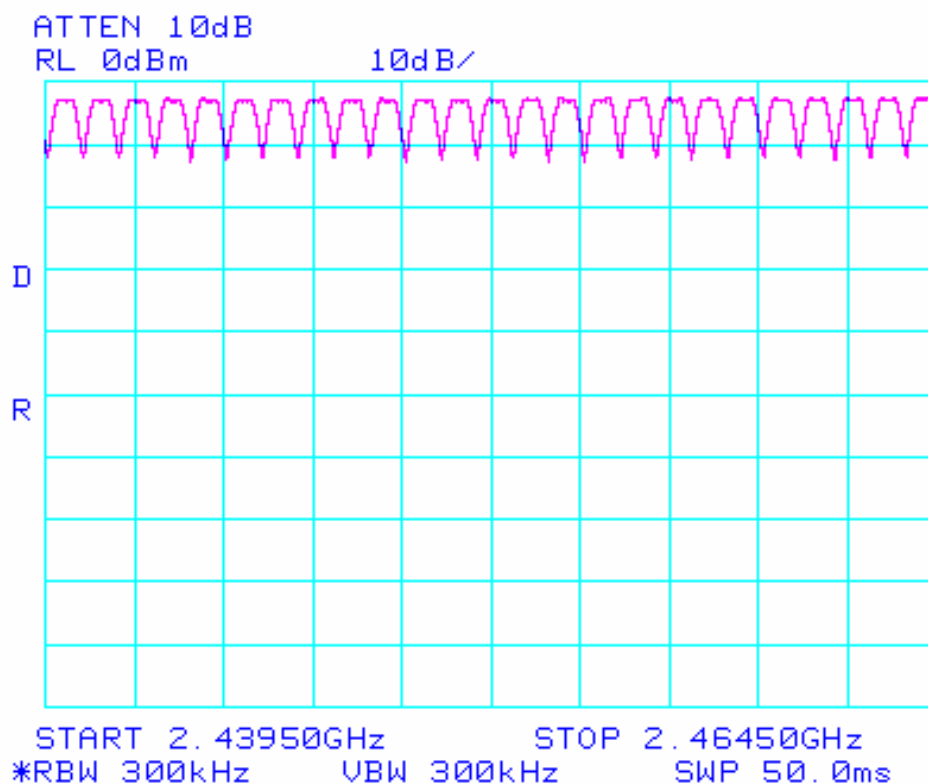
#### Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

# Number of Hopping Frequencies



# Number of Hopping Frequencies



### 3.2.3 20 dB Bandwidth

#### Procedure:

The bandwidth at 20 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is ( as close as possible to ) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 2 MHz (approximately 2 or 3 times of the 20 dB bandwidth)

RBW = 10 kHz (1% of the 20dB bandwidth or more) Sweep = auto

VBW = 30 kHz ( $VBW \geq RBW$ ) Detector function = peak

Trace = max hold

#### Measurement Data:

Frequency (MHz)	Channel No.	Test Results	
		Measured Bandwidth (MHz)	Result
2402	1	0.923	Complies
2441	40	0.927	Complies
2480	79	0.927	Complies

- See next pages for actual measured spectrum plots.

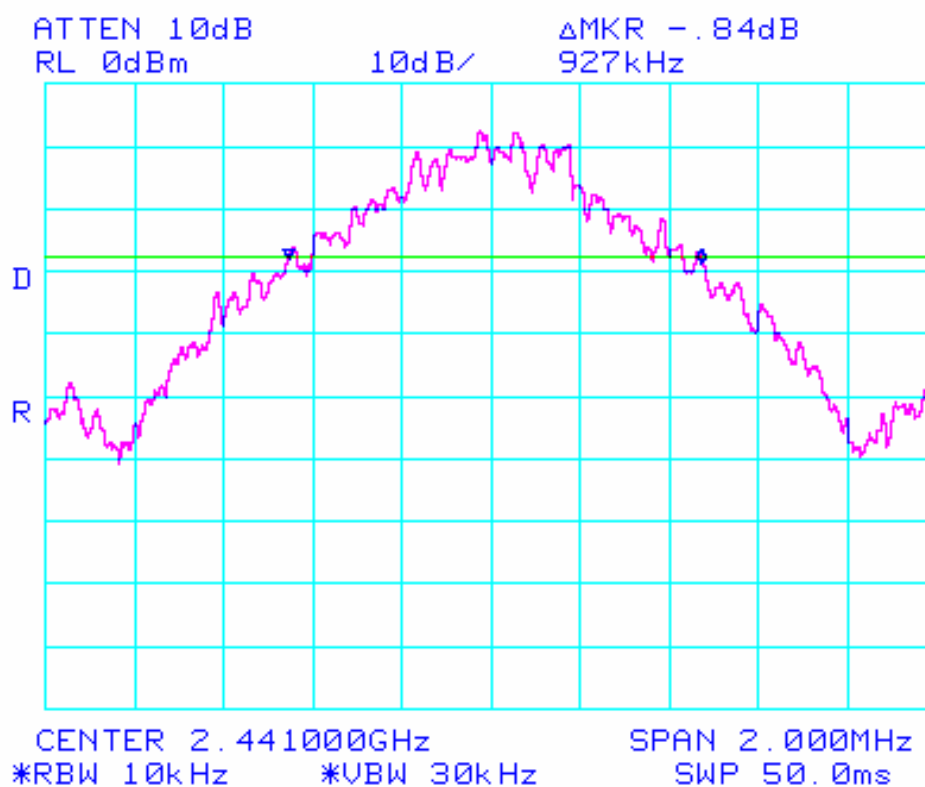
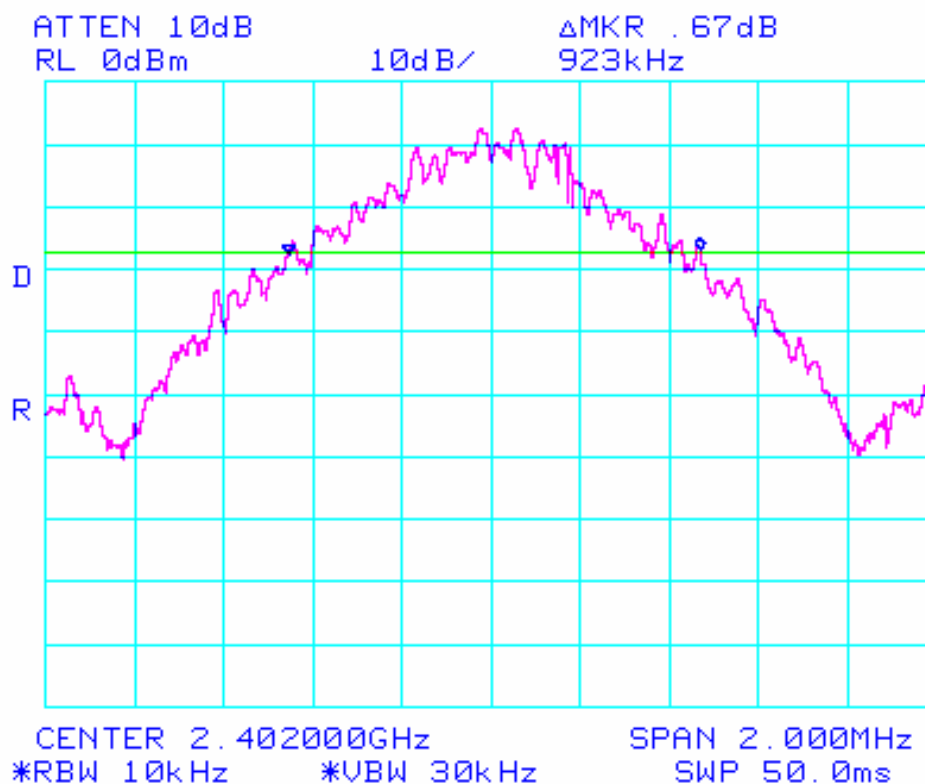
#### Minimum Standard:

The transmitter shall have a maximum 20dB bandwidth of 1 MHz.

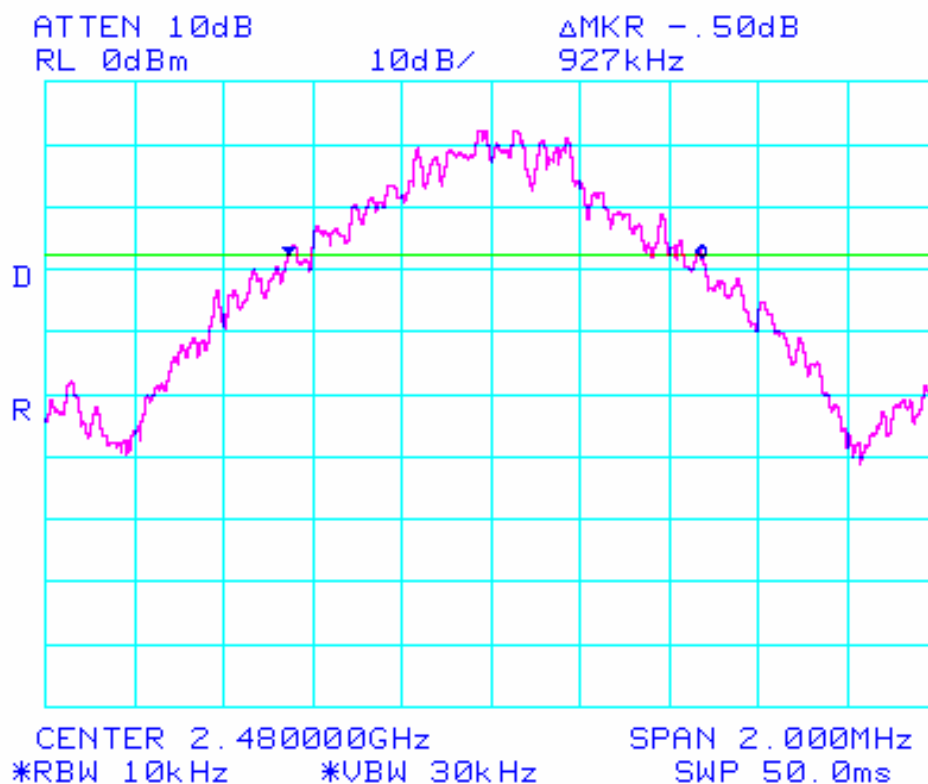
#### Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

20 dB Bandwidth



20 dB Bandwidth



### 3.2.4 Time of Occupancy (Dwell Time)

#### Procedure:

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Center frequency = 2441 MHz

Span = zero

RBW = 1 MHz

VBW = 1 MHz (VBW  $\geq$  RBW)

Trace = max hold

Detector function = peak

#### Measurement Data:

Packet Type	Burst duration in one hop (us)	Test Results	
		Dwell Time (ms)	Result
DH 1	380.0	121.641	Complies
DH 3	1.653	266.397	Complies
DH 5	2.880	306.691	Complies

- See next pages for actual measured spectrum plots.

#### Minimum Standard:

0.4 seconds within a 30 second period per any frequency
---

#### Measurement Setup

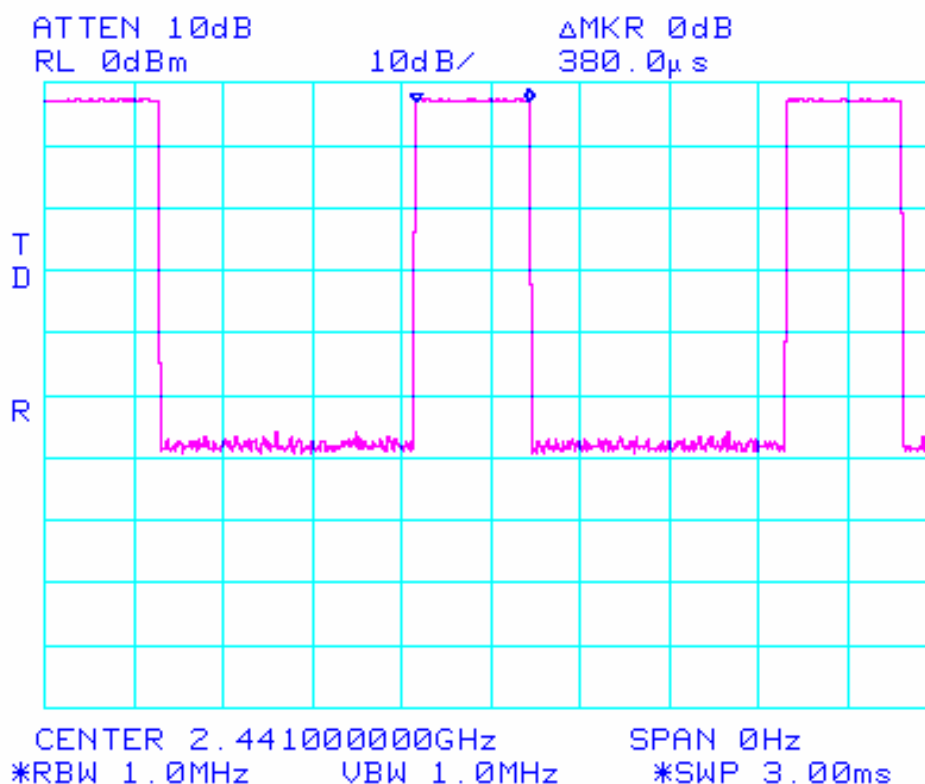
Same as the Chapter 3.2.1 (Figure 1)

### Time of Occupancy for Packet Type DH 1

The system makes worst case 1600 hops per second or 1 time slot has a length of 625 us with 79 channels. A DH 1 Packet need 1 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case  $1600/2 = 800$  hops per second with 79 channels. So you have each channel  $800/79 = 10.13$  times per second and so for a period of  $0.4 \times 79 = 31.6$  seconds you have  $10.13 \times 31.6 = 320.11$  times of appearance.

Each Tx-time per appearance is 380.0 us

So we have  $320.11 \times 380.0, \text{ us} = 121.642\text{ms}$  per 31.6 seconds.



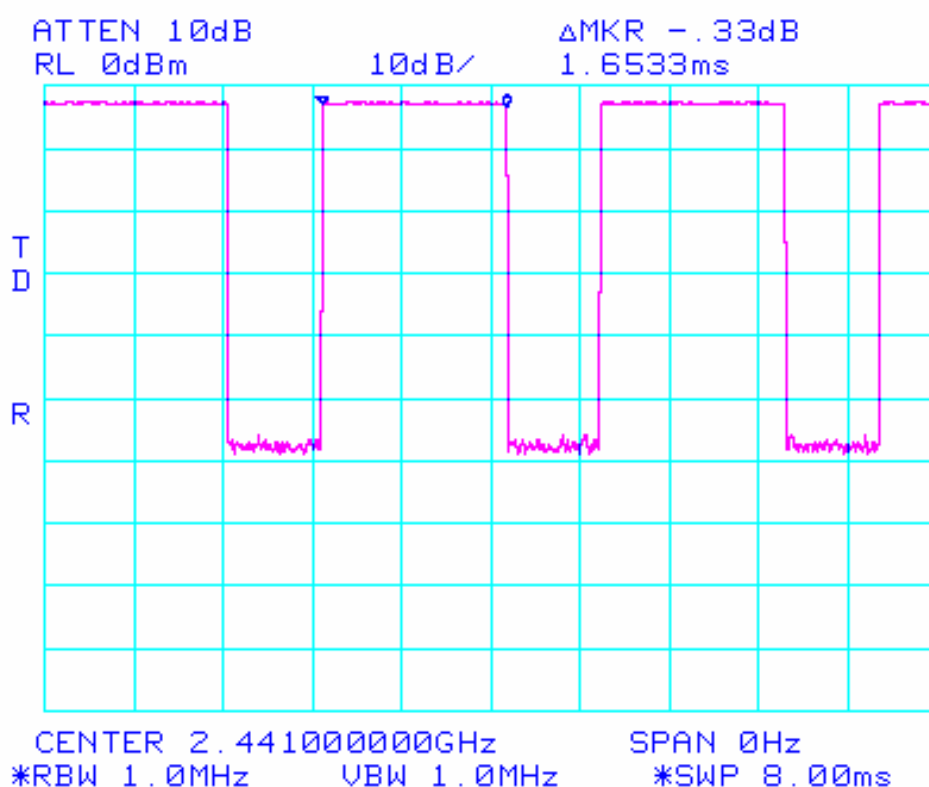


### Time of Occupancy for PACKET Type DH 3

The system makes worst case 1600 hops per second or 1 time slot has a length of 625 us with 79 channels. A DH 3 Packet need 3 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case  $1600/4 = 400$  hops per second with 79 channels. So you have each channel  $400/79 = 5.1$  times per second and so for a period of  $0.4 \times 79 = 31.6$  seconds you have  $5.1 \times 31.6 = 161.16$  times of appearance.

Each Tx-time per appearance is 1.653 ms

So we have  $161.16 \times 1.653 \text{ ms} = 266.397 \text{ ms}$  per 31.6 seconds.

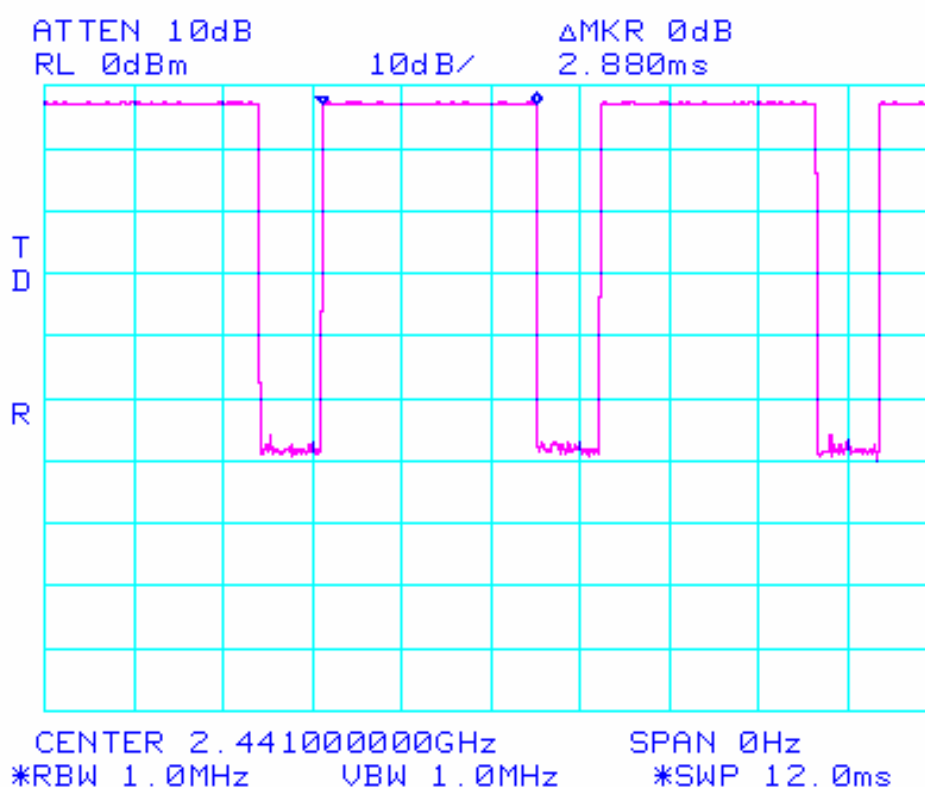


### Time of Occupancy for PACKET Type DH 5

The system makes worst case 1600 hops per second or 1 time slot has a length of 625 us with 79 channels. A DH 5 Packet need 5 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case  $1600/6 = 266.67$  hops per second with 79 channels. So you have each channel  $266.67/79 = 3.37$  times per second and so for a period of  $0.4 \times 79 = 31.6$  seconds you have  $3.37 \times 31.6 = 106.49$  times of appearance.

Each Tx-time per appearance is 2.880 ms

So we have  $106.49 \times 2.880 \text{ ms} = 306.691 \text{ ms}$  per 31.6 seconds.



### 3.2.5 Peak Output Power

#### Procedure:

The peak output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 5 MHz (approximately 5 times of the 20 dB bandwidth)

RBW = 1 MHz (greater than the 20dB bandwidth of the emission being measured)

VBW = 1 MHz (VBW  $\geq$  RBW)

Detector function = peak

Trace = max hold

Sweep = auto

#### Measurement Data:

Frequency (MHz)	Ch.	Test Results		
		dBm	mW	Result
2402	1	-1.83	0.656	Complies
2441	40	-2.33	0.585	Complies
2480	79	-2.00	0.631	Complies

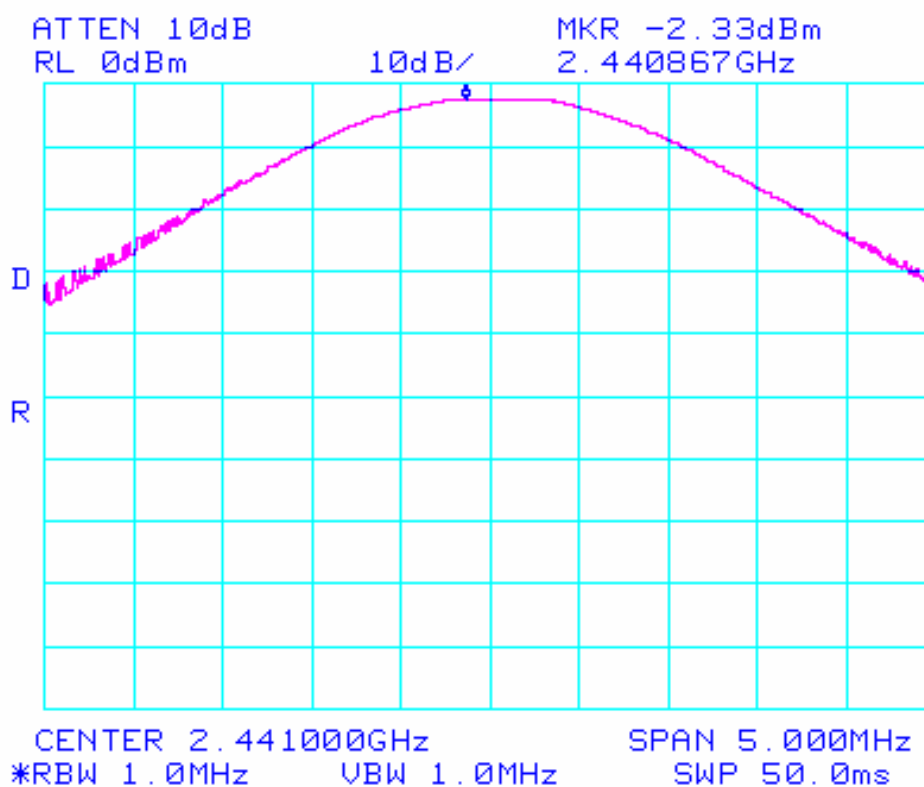
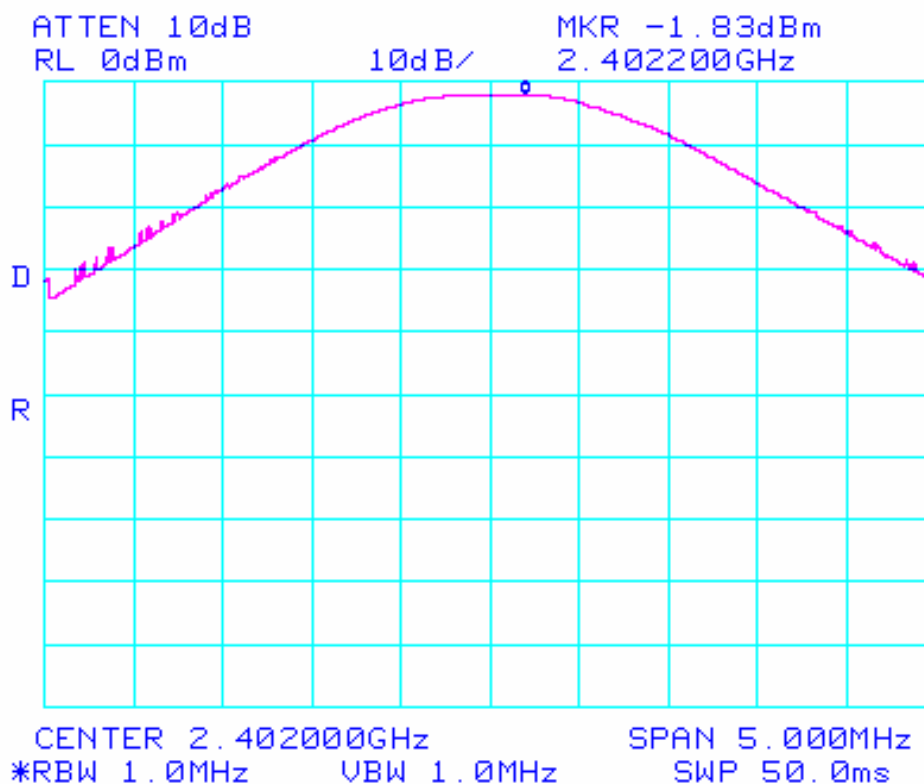
- See next pages for actual measured spectrum plots.

Minimum Standard:	< 1W
-------------------	------

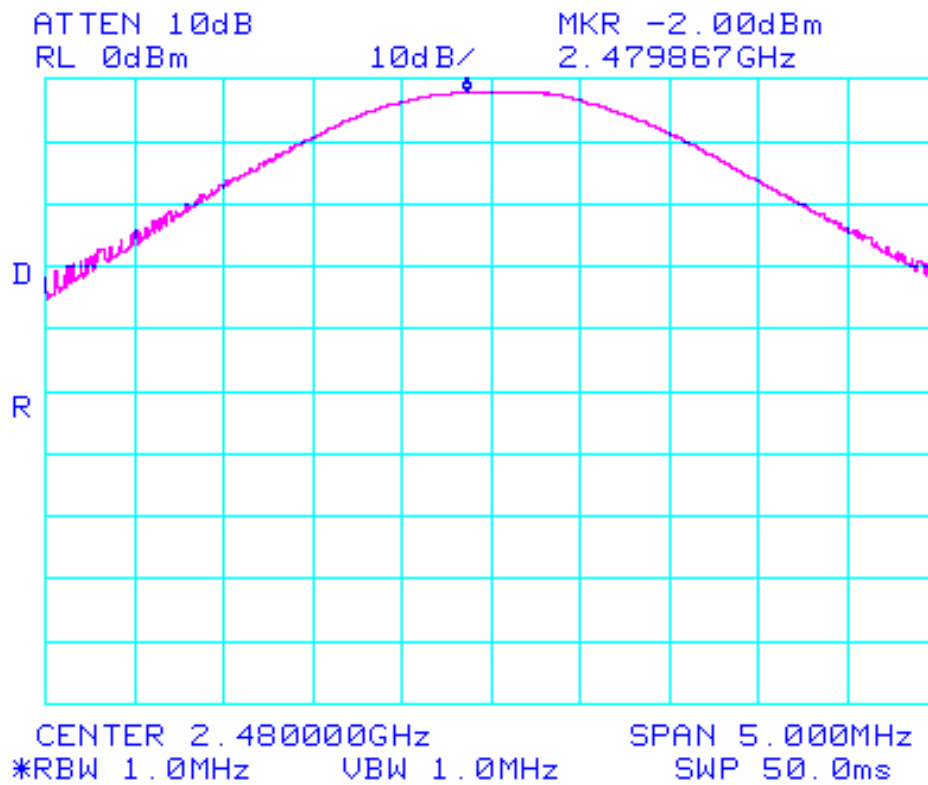
#### Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

# Peak Output Power



# Peak Output Power



### 3.2.6 Conducted Spurious Emissions

#### Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz

Span = 100 MHz

Detector function = peak

Trace = max hold

Sweep = auto

#### Measurement Data: **Complies**

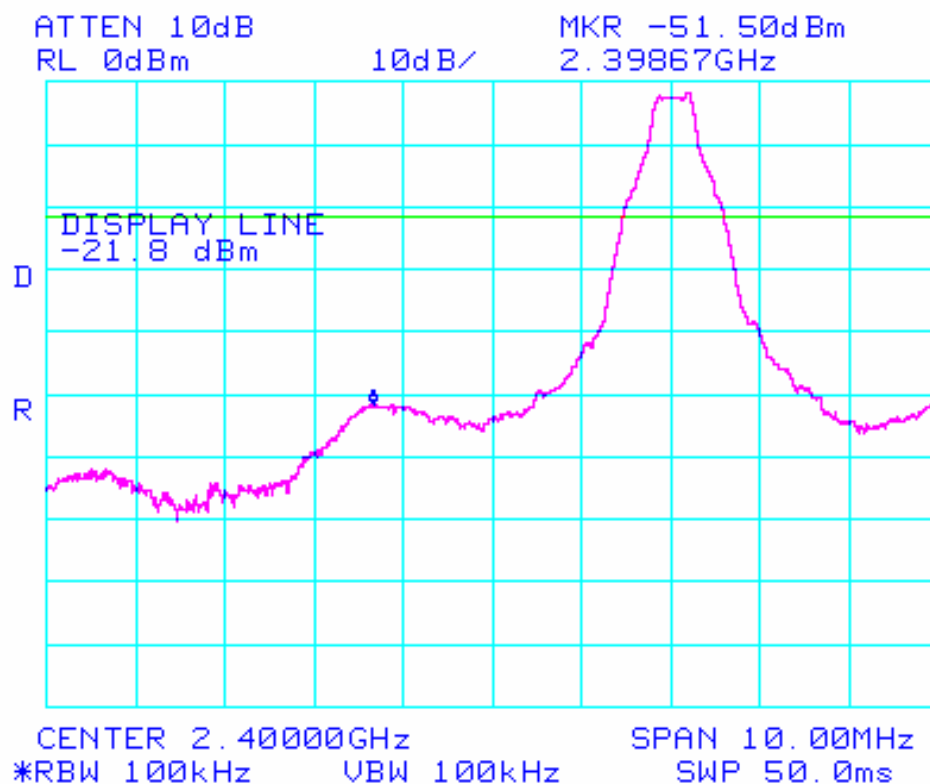
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

<b>Minimum Standard:</b>	> 20 dBc
--------------------------	----------

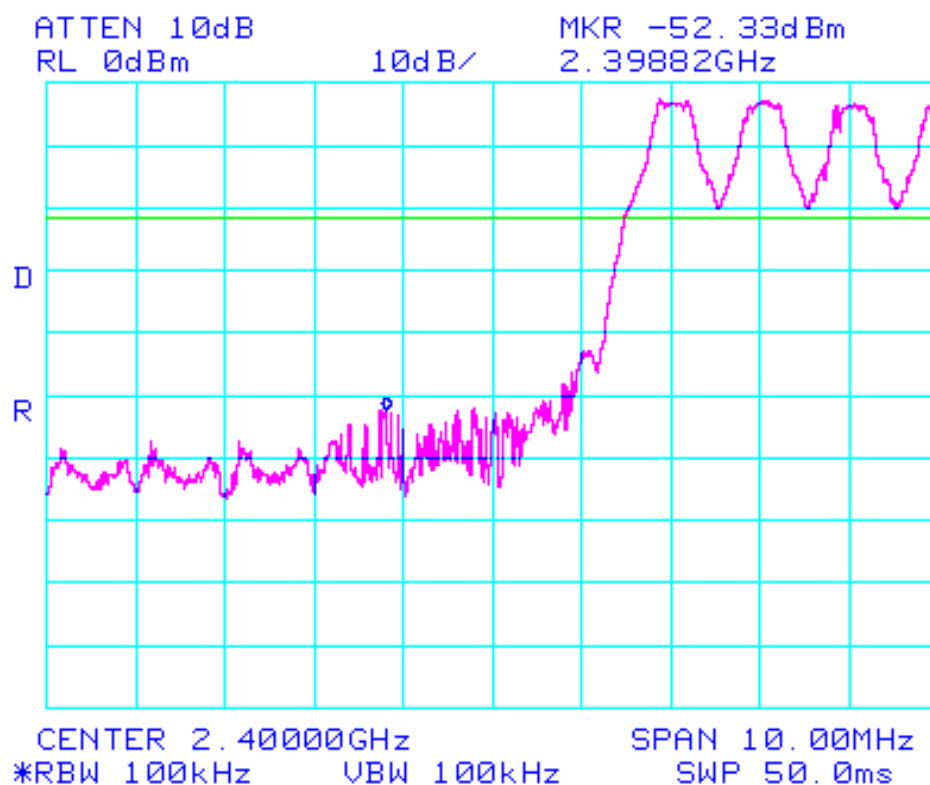
#### Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

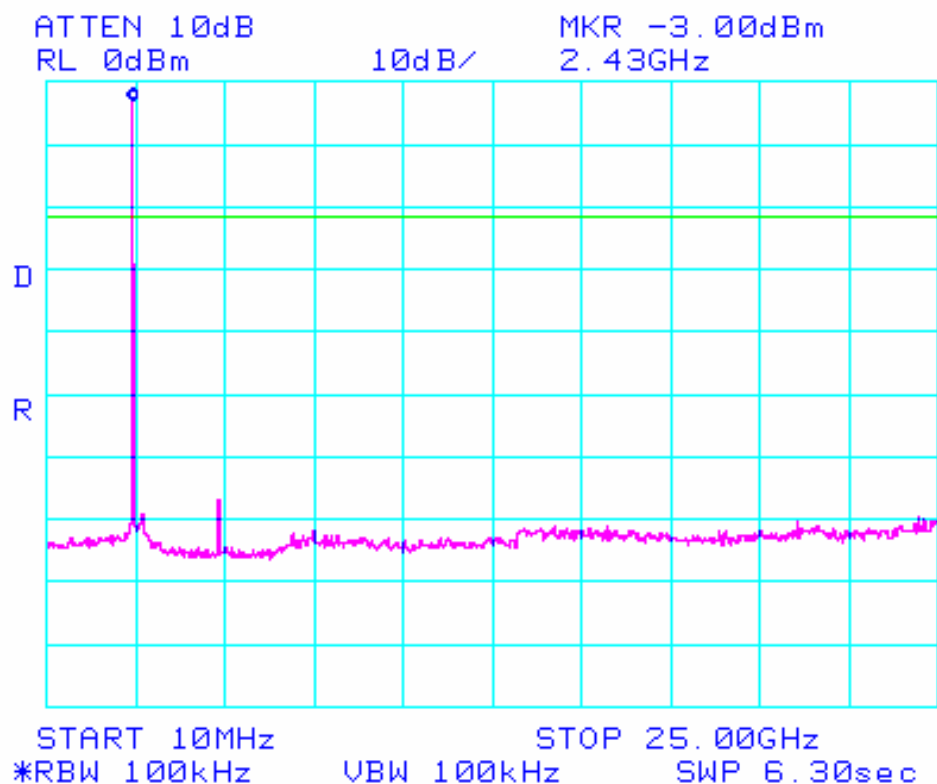
### Low band with hopping disabled



### Low band with hopping enabled

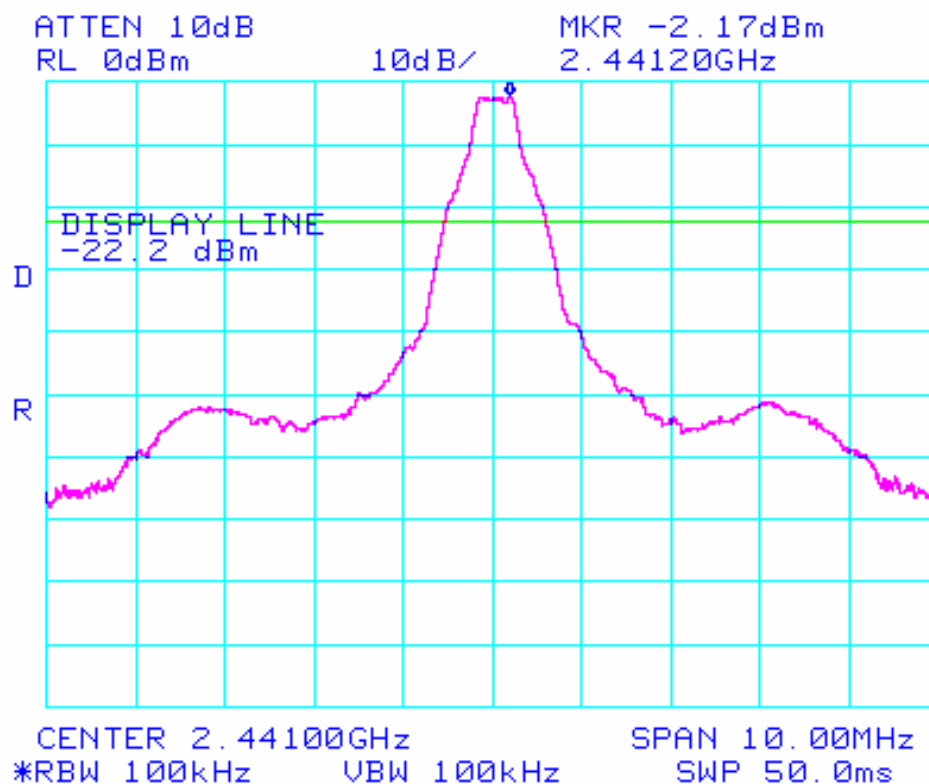


# Low channel spurious

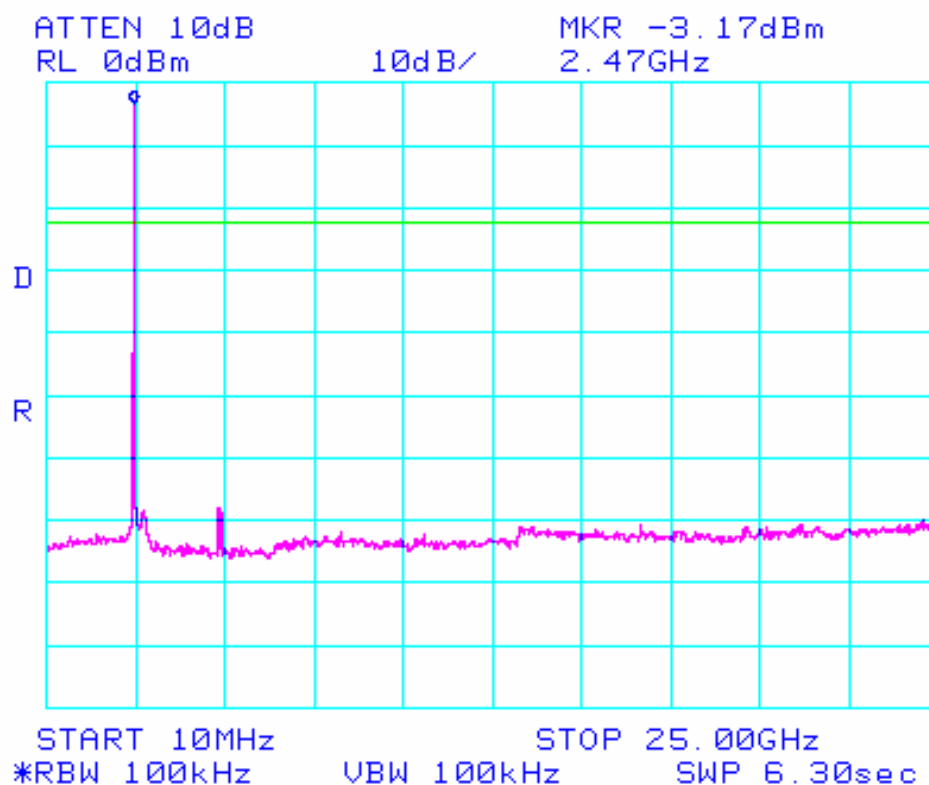




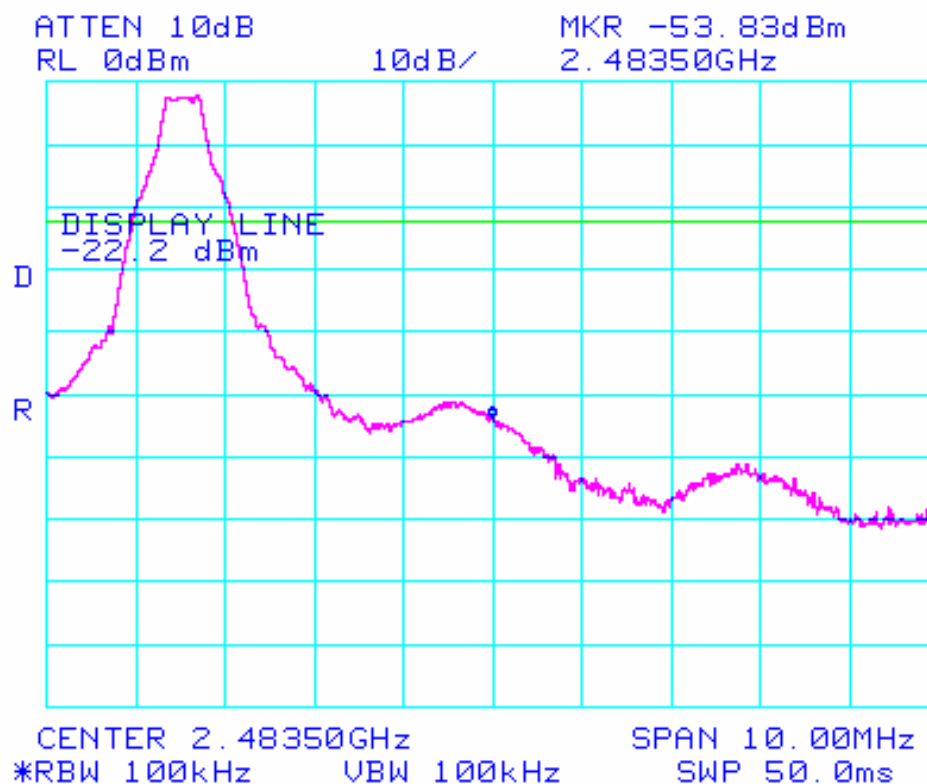
### Mid channel ref



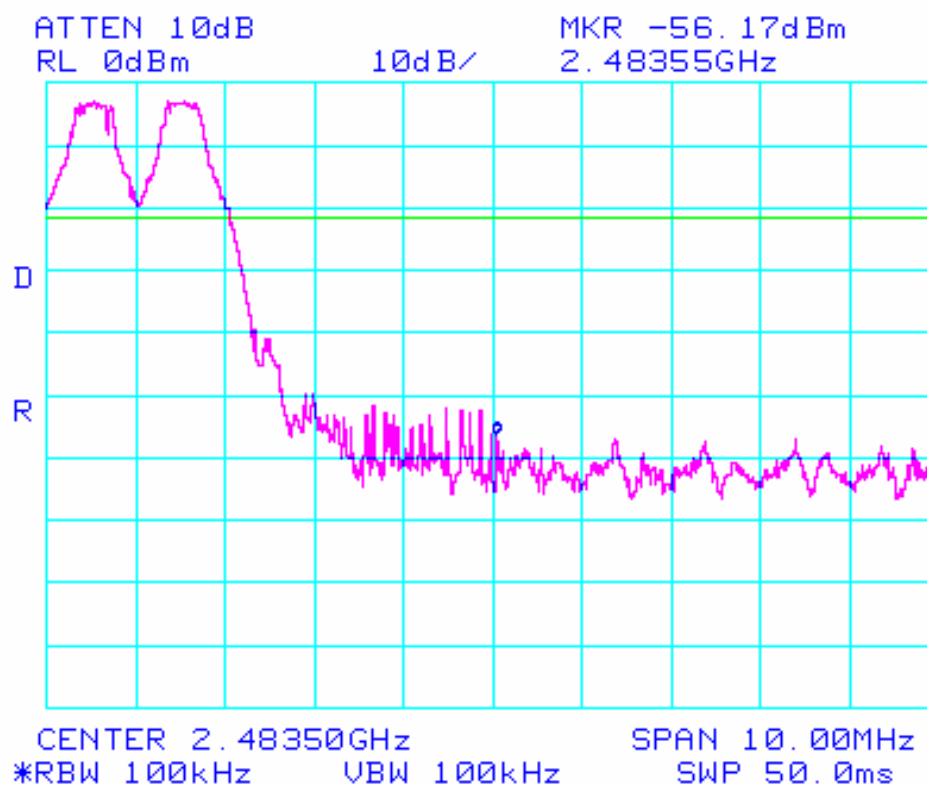
### Mid channel spurious



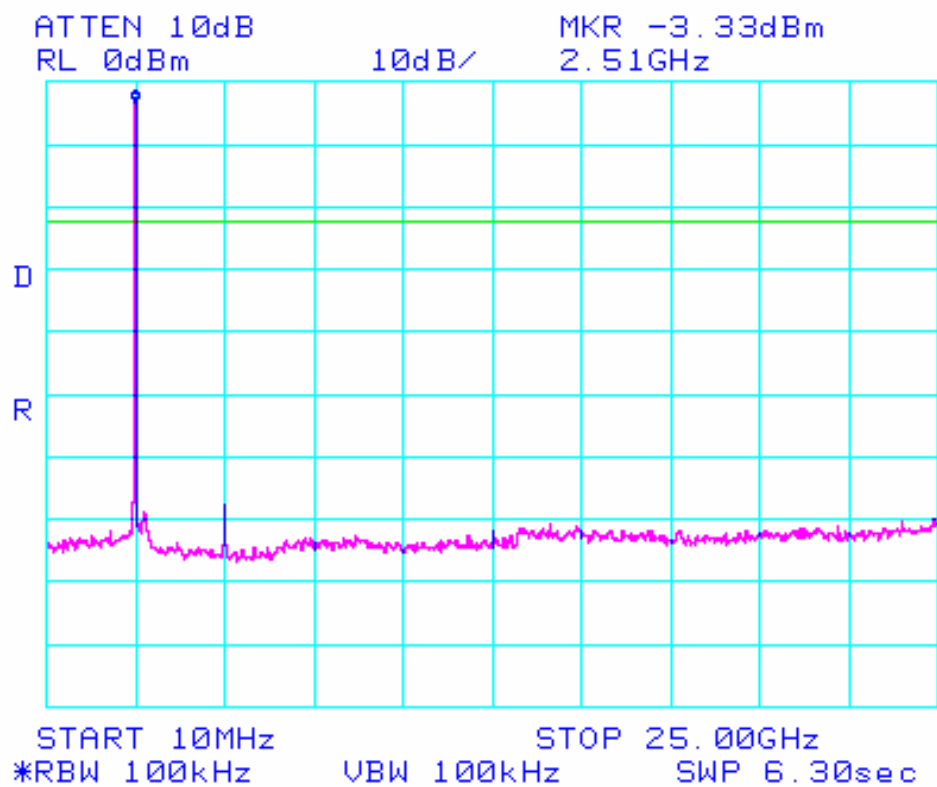
### High band with hopping disabled



### High band with hopping enabled



# High channel spurious



### 3.2.7 Radiated Emissions

#### Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic.

RBW = 120 kHz ( 30MHz ~ 1 GHz)

VBW ≥ RBW (Peak)

= 1 MHz (1 GHz ~ 10<sup>th</sup> harmonic )

VBW = 10Hz (Average)

Trace = max hold

Sweep = auto

#### Measurement Data: **Complies**

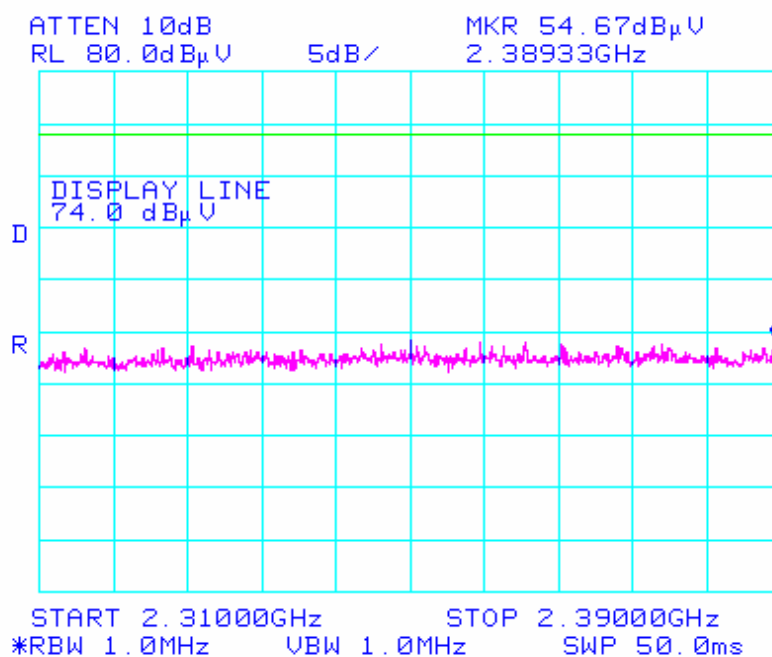
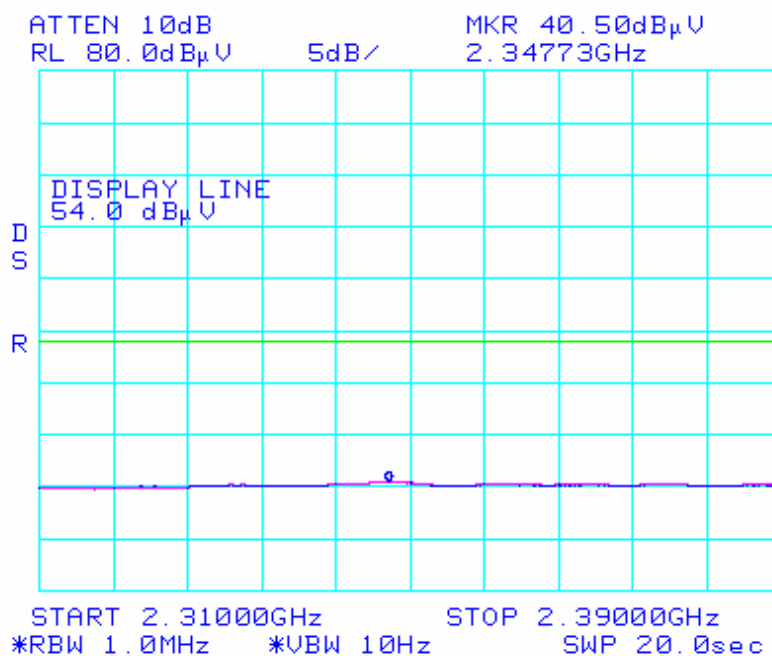
- No emissions were detected at a level greater than 10dB below limit.
- Refer to the next page.

**Minimum Standard: FCC Part 15.205 (a), 15.205(b), 15.209(a) and (b)**

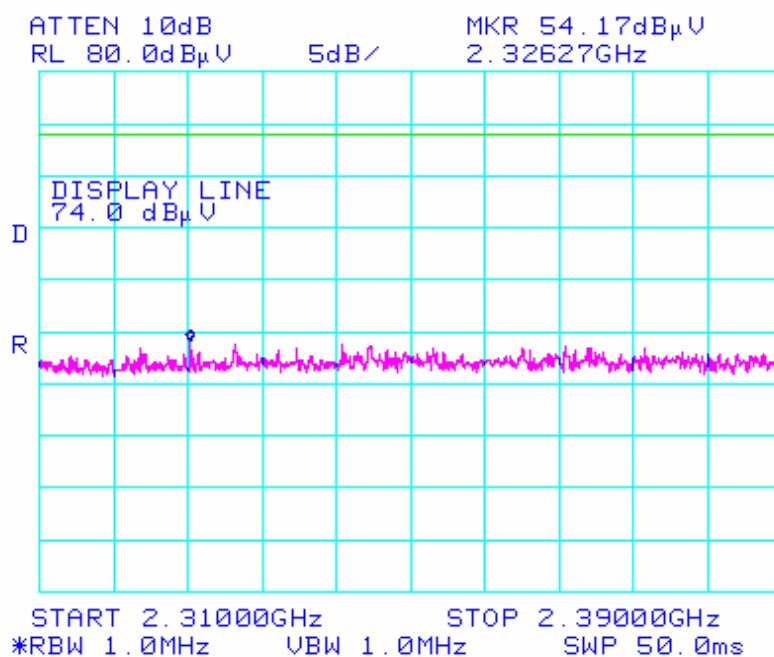
#### Limit : FCC P15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

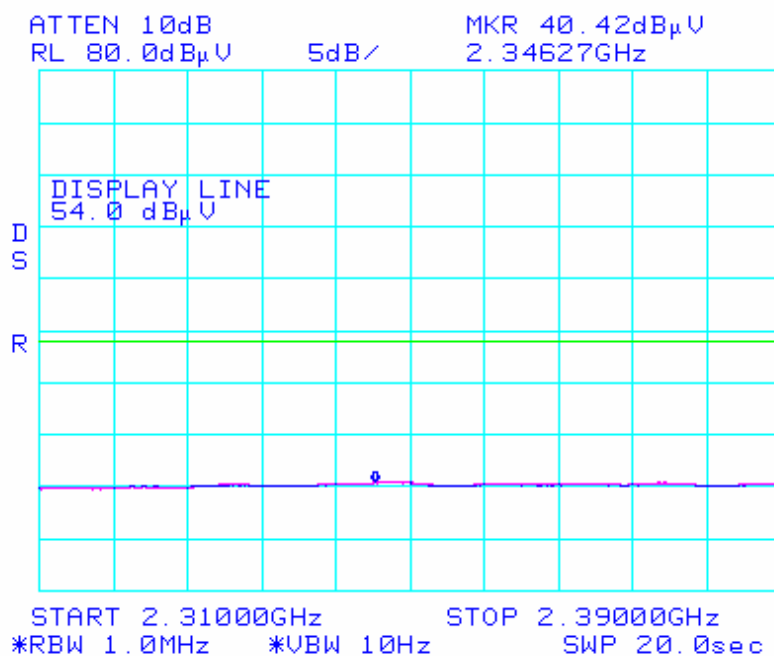
\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

**Restricted Band Edge: Low Channel (Peak, Horizontal)****Restricted Band Edge: Low Channel (Average, Horizontal)**

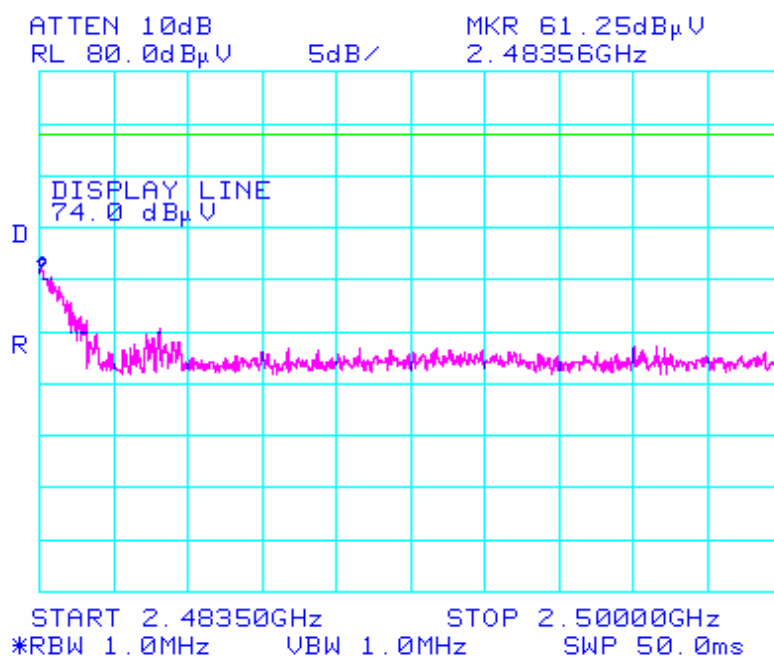
### Restricted Band Edge: Low Channel (Peak, Vertical)



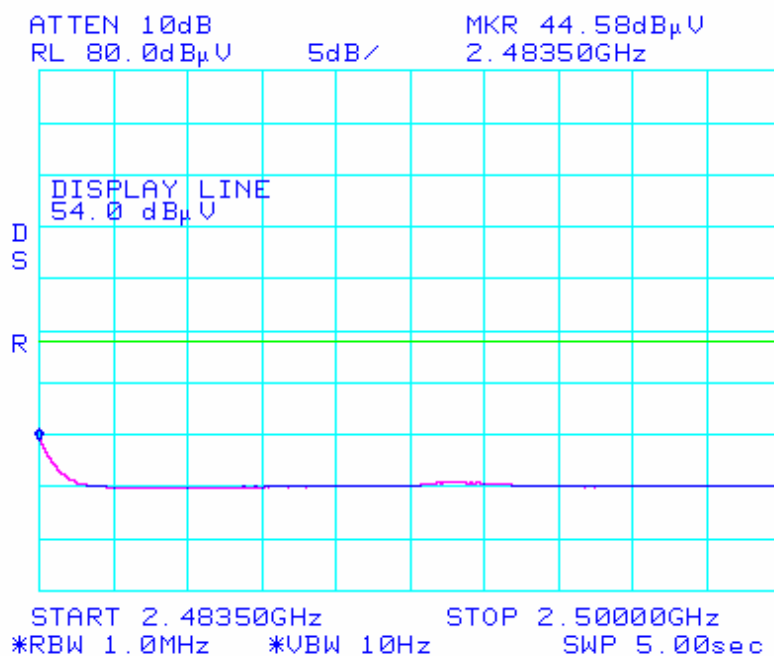
### Restricted Band Edge: Low Channel (Average, Vertical)



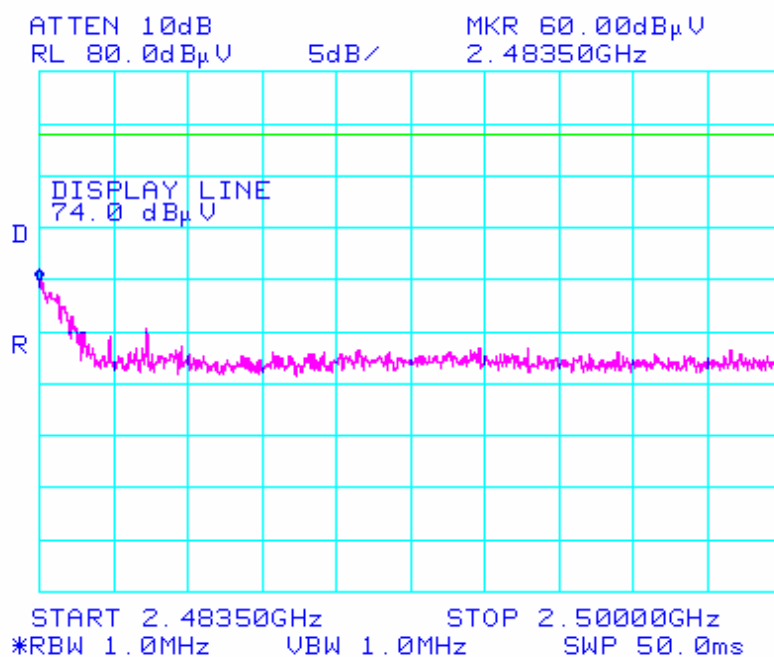
### Restricted Band Edge: High Channel (Peak, Horizontal)



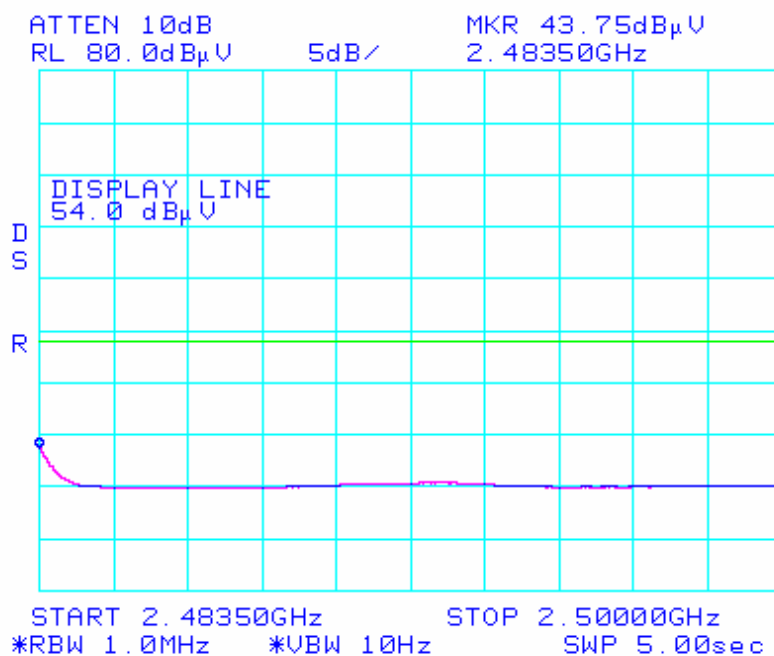
### Restricted Band Edge: High Channel (Average, Horizontal)



### Restricted Band Edge: High Channel (Peak, Vertical)



### Restricted Band Edge: High Channel (Average, Vertical)





## Radiated Spurious Emission Data

<b><u>Low Channel(2402MHz)</u></b>										
Frequency (MHz)	ANT Pol. (H/V)	Reading Value (dBuV)		T.F (dB)	Result (dBuV)		Limit (dBuV)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
No emissions were detected at a level greater than 10dB below limit.										
<b><u>Middle Channel(2441MHz)</u></b>										
Frequency (MHz)	ANT Pol. (H/V)	Reading Value (dBuV)		T.F (dB)	Result (dBuV)		Limit (dBuV)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
No emissions were detected at a level greater than 10dB below limit.										
<b><u>High Channel(2480MHz)</u></b>										
Frequency (MHz)	ANT Pol. (H/V)	Reading Value (dBuV)		T.F (dB)	Result (dBuV)		Limit (dBuV)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
No emissions were detected at a level greater than 10dB below limit.										

Not. 1. “ \*\* “ : No other emissions were detected at a level greater than 30dB below limit.

2. T.F(Total Factor) = Cable Loss + Ant Factor –AMP Gain

3. Result = Reading Value + T.F

4. Margin = Limit - Result

### 3.2.8 AC Line Conducted Emissions

#### Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

#### Measurement Data: **Complies**

- Refer to the next page.

#### Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

\* Decreases with the logarithm of the frequency

#### Measurement Setup

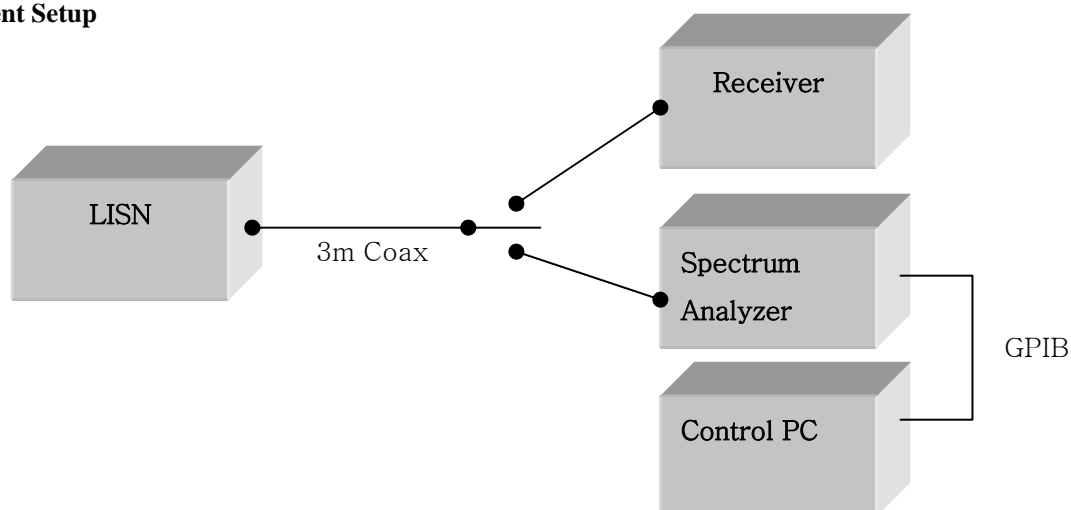
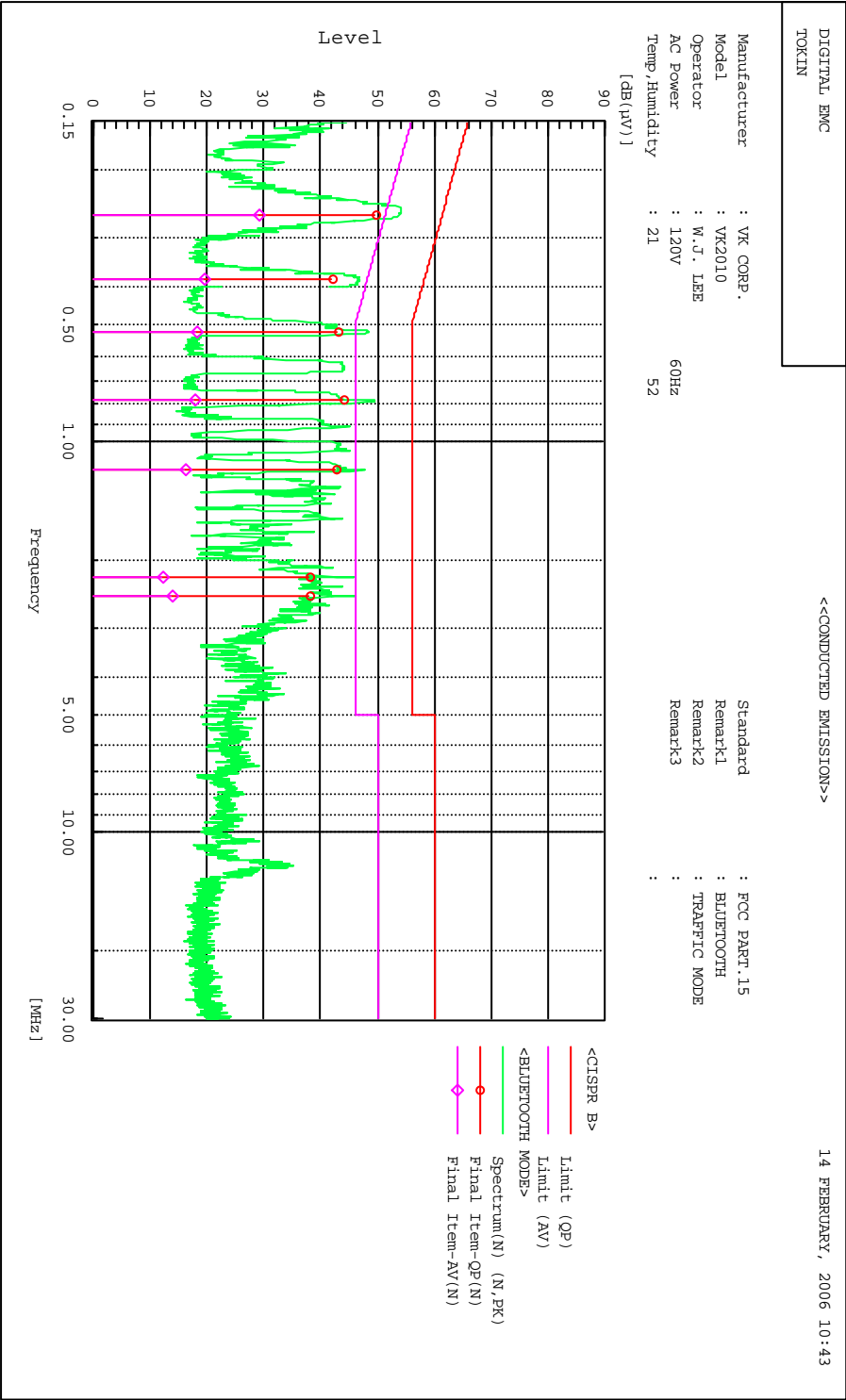
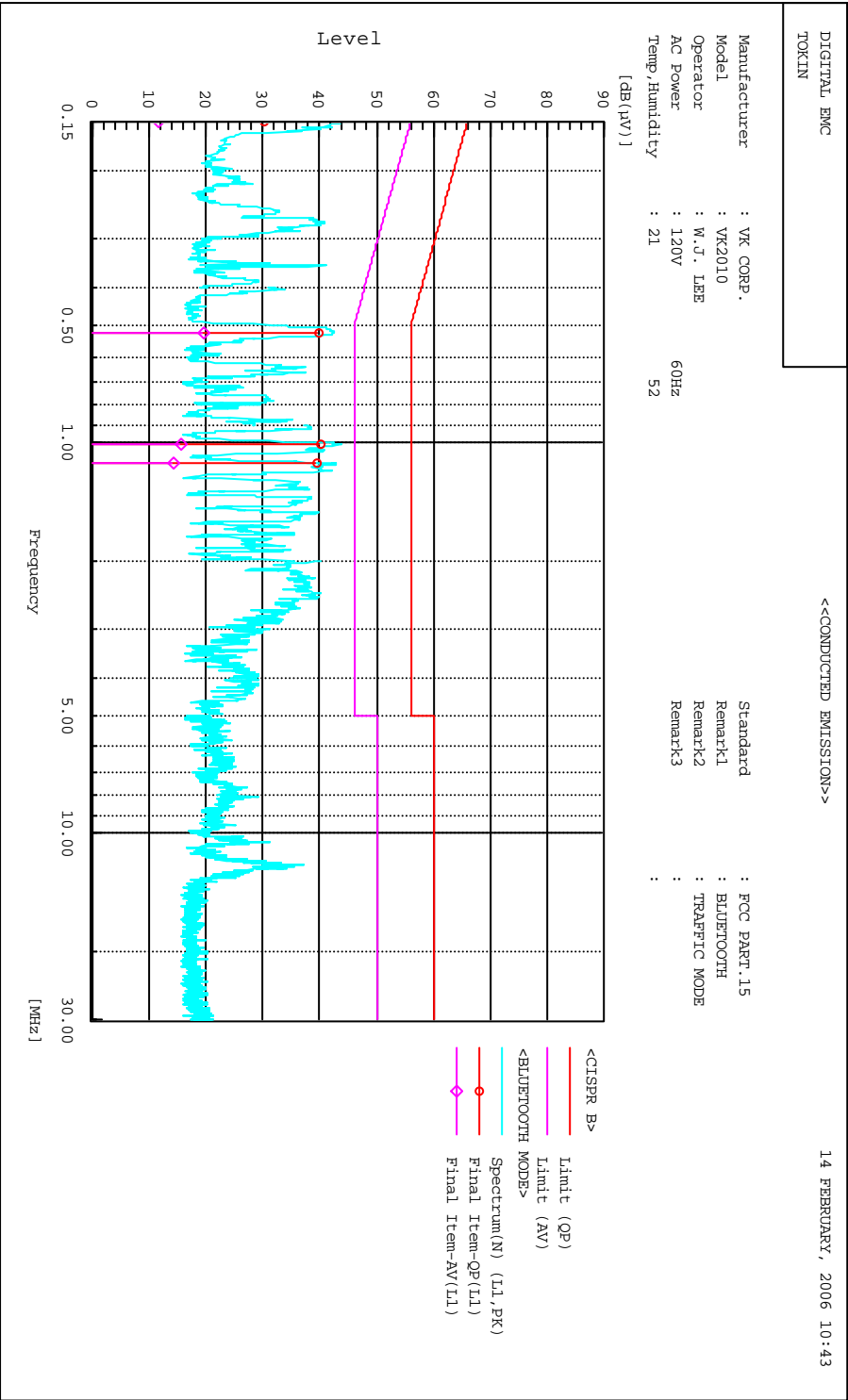


Figure 2: Measurement setup for AC Conducted Emission

Bluetooth Communication mode / Graph- Neutral



Bluetooth Communication mode / Graph- Line



# Bluetooth Communication mode / Data

\*\*\*\*\*  
 <<CONDUCTED EMISSION>>  
 \*\*\*\*\*

14 FEBRUARY, 2006 10:43

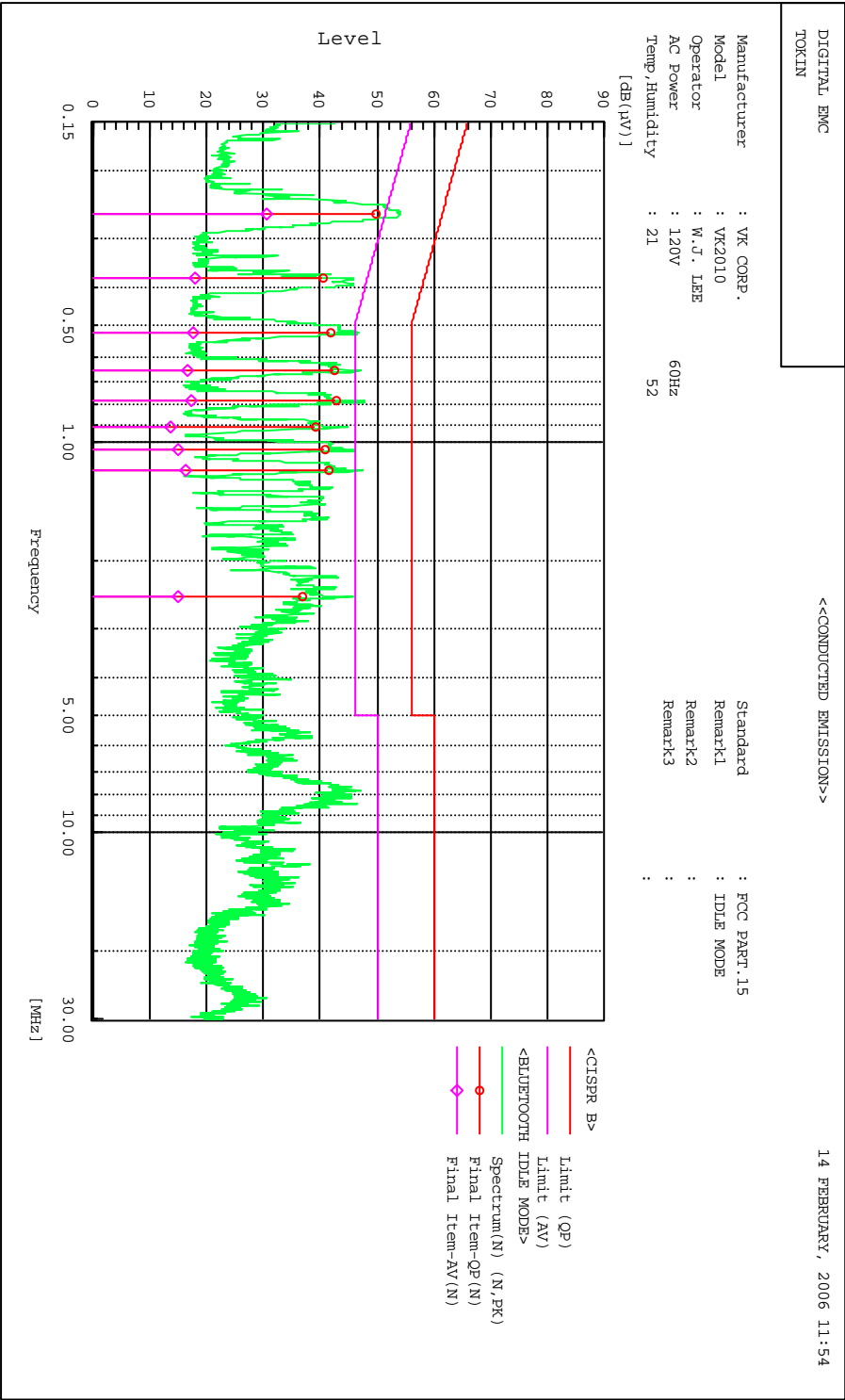
Standard : FCC PART.15  
 Manufacturer : VK CORP.  
 Model : VK2010  
 Operator : W.J. LEE  
 AC Power : 120V 60Hz  
 Temp, Humidity : 21 52  
 Remark1 : BLUETOOTH  
 Remark2 : TRAFFIC MODE  
 Remark3 :

\*\*\*\*\*  
 Final Result  
 \*\*\*\*\*

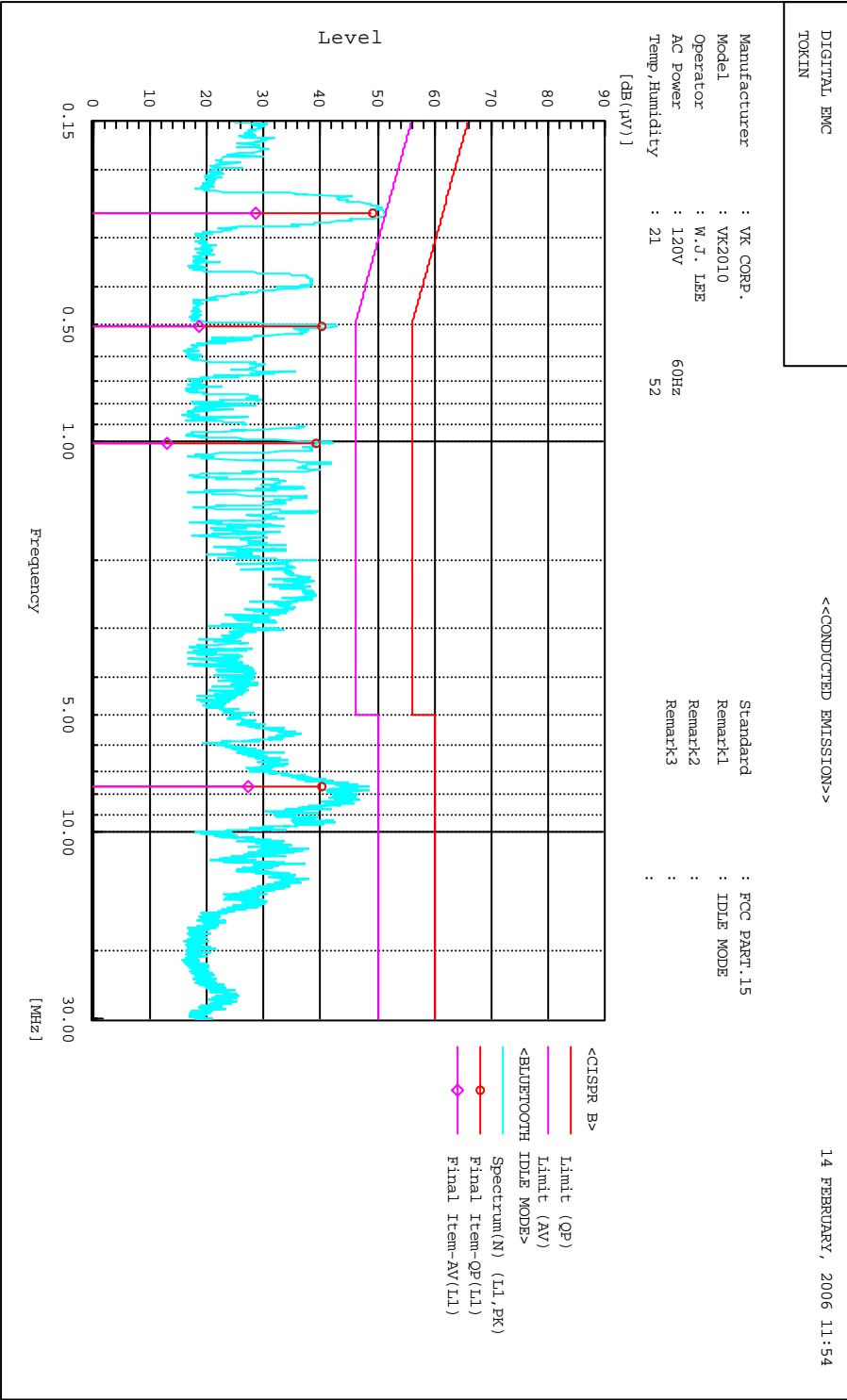
--- N Phase ---													
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark		
1	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]			
1	0.261	49.7	29.1	0.2	49.9	29.3	61.4	51.4	11.5	22.1			
2	0.381	42.1	19.3	0.2	42.3	19.5	58.3	48.3	16.0	28.8			
3	0.522	43.0	17.9	0.2	43.2	18.1	56.0	46.0	12.8	27.9			
4	0.783	44.1	17.9	0.1	44.2	18.0	56.0	46.0	11.8	28.0			
5	1.174	42.8	16.2	0.1	42.9	16.3	56.0	46.0	13.1	29.7			
6	2.478	38.2	13.8	0.1	38.3	13.9	56.0	46.0	17.7	32.1			
7	2.218	38.1	12.3	0.1	38.2	12.4	56.0	46.0	17.8	33.6			

--- I1 Phase ---													
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark		
1	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]			
1	0.150	29.9	11.5	0.2	30.1	11.7	66.0	56.0	35.9	44.3			
2	0.521	39.5	19.4	0.2	39.7	19.6	56.0	46.0	16.3	26.4			
3	1.003	40.0	15.4	0.1	40.1	15.5	56.0	46.0	15.9	30.5			
4	1.129	39.5	14.2	0.1	39.6	14.3	56.0	46.0	16.4	31.7			

Bluetooth Idle mode / Graph- Neutral



Bluetooth Idle mode / Graph- Line



# Bluetooth Idle mode / Data

\*\*\*\*\*  
 <<CONDUCTED EMISSION>>  
 \*\*\*\*\*

14 FEBRUARY, 2006 11:54

Standard : FCC PART.15  
 Manufacturer : VK CORP.  
 Model : VK2010  
 Operator : W.J. LEE  
 AC Power : 120V 60Hz  
 Temp, Humidity : 21 52  
 Remark1 : IDLE MODE  
 Remark2 :  
 Remark3 :  
 :

\*\*\*\*\*  
 Final Result  
 \*\*\*\*\*

--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
1	0.260	49.5	30.2	0.2	49.7	30.4	61.4	51.4	11.7	21.0	
2	0.379	40.4	17.7	0.2	40.6	17.9	58.3	48.3	17.7	30.4	
3	0.521	41.8	17.4	0.2	42.0	17.6	56.0	46.0	14.0	28.4	
4	0.652	42.4	16.4	0.1	42.5	16.5	56.0	46.0	13.5	29.5	
5	0.782	42.9	17.3	0.1	43.0	17.4	56.0	46.0	13.0	28.6	
6	1.173	41.5	16.2	0.1	41.6	16.3	56.0	46.0	14.4	29.7	
7	1.043	40.8	14.8	0.1	40.9	14.9	56.0	46.0	15.1	31.1	
8	0.913	39.1	13.6	0.1	39.2	13.7	56.0	46.0	16.8	32.3	
9	2.476	36.6	14.7	0.1	36.7	14.8	56.0	46.0	19.3	31.2	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
1	0.260	49.1	28.5	0.2	49.3	28.7	61.4	51.4	12.1	22.7	
2	0.502	40.0	18.4	0.2	40.2	18.6	56.0	46.0	15.8	27.4	
3	1.002	39.0	12.8	0.1	39.1	12.9	56.0	46.0	16.9	33.1	
4	7.654	39.7	26.7	0.4	40.1	27.1	60.0	50.0	19.9	22.9	



APPENDIX

**TEST EQUIPMENT FOR TESTS**

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
01	Spectrum Analyzer	Agilent	E4404B	18/04/06	US41061134
02	Spectrum Analyzer	Agilent	E4440A	05/10/07	MY45304199
03	Spectrum Analyzer	H.P	8563E	06/10/07	3551A04634
04	Power Meter	H.P	EPM-442A	04/07/06	GB37170413
05	Power Sensor	H.P	8481A	05/07/06	3318A96332
06	Frequency Counter	H.P	5342A	21/10/06	2119A04450
07	Multifunction Synthesizer	H.P	8904A	21/10/06	3633A08404
08	Signal Generator	Rohde Schwarz	SMR20	17/05/06	101251
09	Signal Generator	H.P	E4421A	05/07/06	US37230529
10	Audio Analyzer	H.P	8903B	07/07/06	3011A0944B
11	Modulation Analyzer	H.P	8901B	05/07/06	3028A03029
12	Oscilloscope	Tektronix	TDS3052	01/10/06	B016821
13	CDMA Mobile Station Test Set	H.P	8924C	21/10/06	US35360688
14	Universal Radio communication tester	Rohde Schwarz	CMU200	28/04/06	107631
15	MULTISYSTEM UE TESTER	Japan Radio Co.,Ltd	NJZ-2000	14/11/06	ET00095
16	Power Splitter	WEINSCHEL	1593	21/10/06	332
17	BAND Reject Filter	Microwave Circuits	N0308372	21/10/06	3125-01DC0312
18	BAND Reject Filter	Wainwright	WRCG1750	21/10/06	SN2
19	AC Power supply	DAEKWANG	5KVA	18/04/06	N/A
20	DC Power Supply	H.P	6622A	18/04/06	465487
21	Attenuator (30dB)	H.P	8498A	21/10/06	50101
22	Attenuator (10dB)	WEINSCHEL	23-10-34	21/10/06	BP4387
23	HORN ANT	EMCO	3115	06/03/07	6419
24	HORN ANT	EMCO	3115	25/04/07	21097
25	HORN ANT	A.H.Systems	SAS-574	09/11/06	154
26	HORN ANT	A.H.Systems	SAS-574	09/11/06	155
27	Dipole Antenna	Schwarzbeck	VHA9103	18/10/06	2116
28	Dipole Antenna	Schwarzbeck	VHA9103	18/10/06	2117
29	Dipole Antenna	Schwarzbeck	UHA9105	18/10/06	2261
30	Dipole Antenna	Schwarzbeck	UHA9105	18/10/06	2262

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	S/N
31	RFI/FIELD Intensity Meter	Kyorits	KNM-504D	07/07/06	SN-161-4
32	Frequency Converter	Kyorits	KCV-604C	07/07/06	4-230-3
33	TEMP & HUMIDITY Chamber	JISCO	J-RHC2	13/09/06	021031
34	Log Periodic Antenna	Schwarzbeck	UHALP9108A1	29/09/06	1098
35	Biconical Antenna	Schwarzbeck	VHA9103	18/04/06	2233
36	Digital Multimeter	H.P	34401A	18/04/06	3146A13475
37	Attenuator (10dB)	WEINSCHEL	23-10-34	21/10/06	BP4386
38	High-Pass Filter	ANRITSU	MP526	12/05/06	M27756
39	Attenuator (3dB)	Agilent	8491B	21/10/06	58177
40	Amplifier (25dB)	Agilent	8447D	18/04/06	2944A10144
41	Amplifier (30dB)	Agilent	8449B	21/10/06	3008A01590
42	Position Controller	TOKIN	5901T	N/A	14173
43	Driver	TOKIN	5902T2	N/A	14174
44	Spectrum Analyzer	H.P	8591E	18/04/06	3649A05889
45	RFI/FIELD Intensity Meter	Kyorits	KNW-2402	04/07/06	4N-170-3
46	LISN	Kyorits	KNW-407	11/08/06	8-317-8
47	LISN	Kyorits	KNW-242	11/08/06	8-654-15
48	CVCF	NF Electronic	4400	N/A	344536 4420064
49	Software	ToYo EMI	EP5/RE	N/A	Ver 2.0.800
50	Software	ToYo EMI	EP5/CE	N/A	Ver 2.0.801
51	Software	AUDIX	e3	N/A	Ver 3.0
52	Software	Agilent	Benchlink	N/A	A.01.09 021211