

FCC 47 CFR PART 22H and 24E**Test Report**

Product Type : Bluetooth GSM Hand-Held Terminal
Applicant : Skypioneer Technology Limited
Address : 6F, No 67, Wanda Rd, Wanhua Dist, Taipei City, Taiwan(10861)
Trade Name : WIME
Model Number : NanoSmart
Test Specification : FCC 47 CFR PART 22H: Oct, 2012
FCC 47 CFR PART 24E: Oct, 2012
ANSI/TIA-603-C-2004

Application Purpose : Original
Receive Date : Jan. 29, 2013
Test Period : Feb. 01 ~ Feb. 05, 2013
Issue Date : May 22, 2013

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	May 22, 2013	Initial Issue	

Verification of Compliance

Issued Date: 05/22/2013

Product Type : Bluetooth GSM Hand-Held Terminal
Applicant : Skypioneer Technology Limited
Address : 6F, No 67, Wanda Rd, Wanhua Dist, Taipei City, Taiwan(10861)
Trade Name : WIME
Model Number : NanoSmart
FCC ID : S65-NANOSMART
EUT Rated Voltage : DC 5.0V (USB Interface)
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 22H: Oct, 2012
FCC 47 CFR PART 24E: Oct, 2012
ANSI/TIA-603-C-2004

Application Purpose : Original

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330
<http://www.atl-lab.com.tw/e-index.htm>



The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 22H, Part 24E.

The test results of this report relate only to the tested sample identified in this report.

Approved By : 

(Manager)

(Murphy Wang)

Reviewed By : 

(Testing Engineer)

(Fly Lu)

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1 General Information

1.1. EUT Description

Applicant		Skypioneer Technology Limited			
Applicant Address		6F,No 67,Wanda Rd,Wanhua Dist,Taipei City,Taiwan(10861)			
Manufacturer		Skypioneer Technology Limited			
Manufacturer Address		6F,No 67,Wanda Rd,Wanhua Dist,Taipei City,Taiwan(10861)			
Product Type		Bluetooth GSM Hand-Held Terminal			
Trade Name		WIME			
Model Number		NanoSmart			
FCC ID		S65-NANOSMART			
IMEI No.		3557630550029622			
Mode	GSM/GPRS	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation
		850	824.2 ~ 848.8	869.2 ~ 893.8	GMSK/8PSK
		1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8	GMSK/8PSK
Channel Control		Auto			
Type of Antenna		Monopole Antenna			
Antenna Gain (dBi)		GSM/GPRS 850 : 1.0 dBi GSM/GPRS 1900 : 2.5 dBi			
Max. RF Output power		GSM/GPRS 850 : 32.76 dBm / 1.888 W GSM/GPRS 1900 : 30.32 dBm / 1.076 W			
Max. ERP/EIRP		GSM/GPRS 850 : 21.43 dBm / 0.139 W GSM/GPRS 1900 : 26.77 dBm / 0.475 W			
Emission Designator		GSM/GPRS 850 : 245KGXW GSM/GPRS 1900 : 245KGXW			

1.2. Mode of Operation

ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GSM 850 Link Mode
Mode 2: GSM 1900 Link Mode

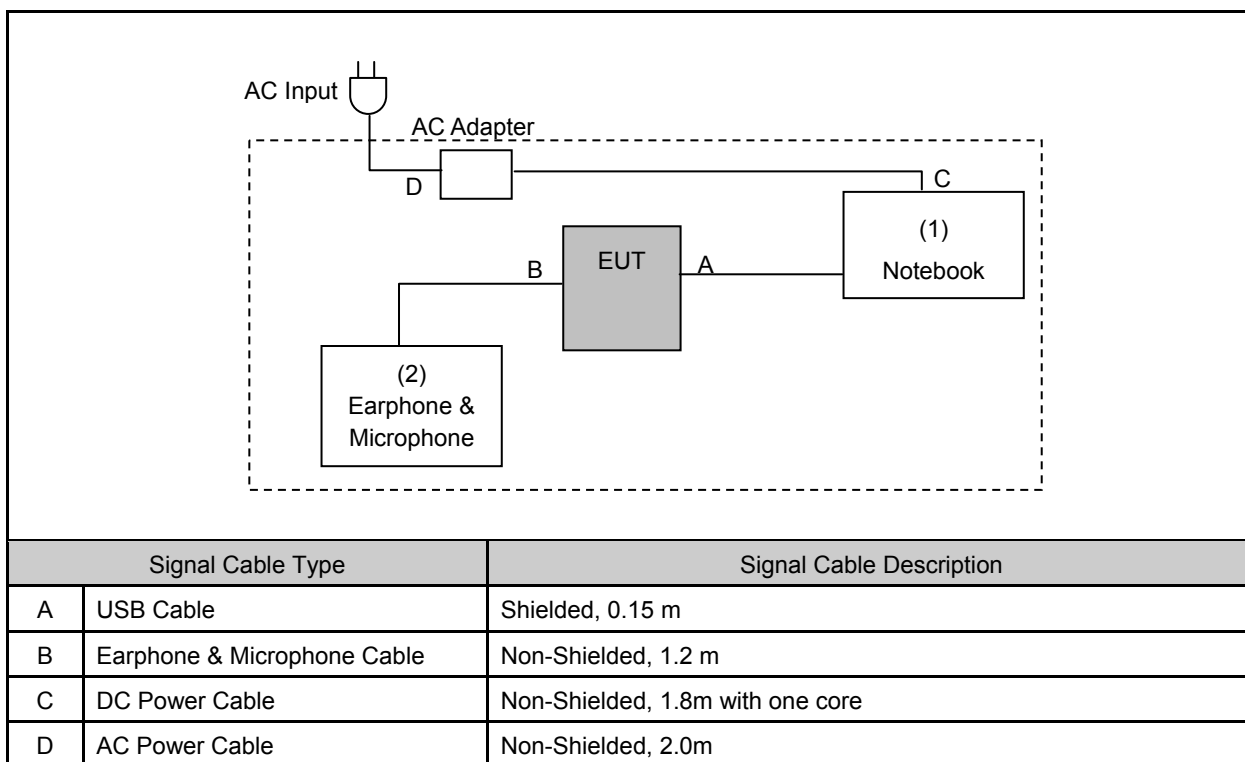
Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

1.3. EUT Exercise Software

1	Setup the EUT and Base Station (CMU200) as shown on 1.4.
2	Turn on the power of all equipment.

1.4. Configuration of Test System Details



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Notebook	ACER	4720	LZTK50X06681304A2D2000	Non-Shielded, 2.0m
(2)	Earphone & Microphone	N/A	N/A	N/A	N/A

1.5. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

1.6. Summary of Test Result

Description	FCC Rule	IC Rule	Limit	Result
Conducted Output Power	§2.1046	N/A	N/A	Pass
Effective Radiated Power	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	< 7 Watts for FCC (<6.3 Watts for IC)	Pass
Equivalent Isotropic Radiated Power	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	< 2 Watts	Pass
Occupied Bandwidth	§2.1049 §22.917(a) §24.238(a)	RSS-Gen (4.6.1)	N/A	Pass
Band Edge Measurement	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1)RSS-133 (6.5.1)	< 43+10log ₁₀ (P[Watts])	Pass
Conducted Spurious Emission	§2.1051 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	< 43+10log ₁₀ (P[Watts])	Pass
Field Strength of Spurious Radiation	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-Gen (4.10)	< 43+10log ₁₀ (P[Watts])	Pass
Frequency Stability for Temperature & Voltage	§2.1055 §22.355 §24.235	RSS-132(4.3) RSS-133(6.3)	< 2.5 ppm	Pass

2 RF Output Power Test

2.1. Limit

N/A

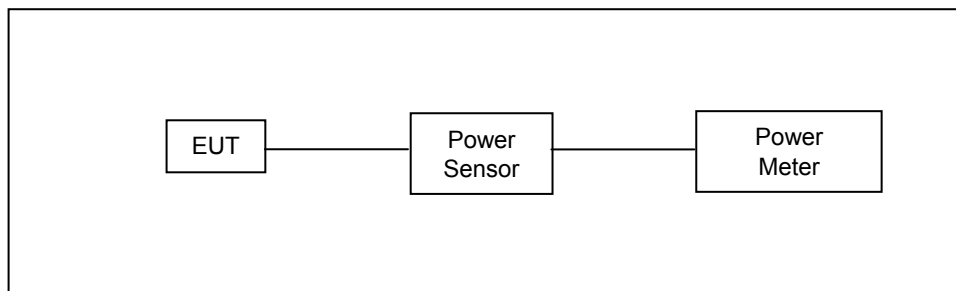
2.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2012	(2)
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	12/15/2011	(2)
Wideband Power Meter	Agilent	N1921A	MY45241957	12/15/2011	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

2.3. Test Setup



2.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

1. The transmitter output was connected to power meter and base station through Power Divider.
2. Set base station for EUT at GSM 850: PCL=5 and PCS 1900: PCL=0.
3. Set base station for EUT at WCDMA Band V and WCDMA Band II, power level was set to maximum.
4. Select lowest, middle, and highest channels for each band.

2.5. Uncertainty

The measurement uncertainty is defined as for RF output power measurement is 1.2 dB.

2.6. Test Result

Model Number	NanoSmart						
Test Item	RF Output Power						
Date of Test	02/01/2013			Test Site		TE05	
Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GSM 850	GMSK	-----	824.2	32.42	1.746	32.63	1.832
			836.6	32.51	1.782	32.72	1.871
			848.8	32.55	1.799	32.76	1.888
GRRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up (Duty Factor 1/8)	824.2	32.33	1.710	32.51	1.782
			836.6	32.47	1.766	32.66	1.845
			848.8	32.50	1.778	32.73	1.875
		3Down2Up (Duty Factor 2/8)	824.2	31.87	1.538	31.96	1.570
			836.6	31.92	1.556	32.01	1.589
			848.8	31.99	1.581	32.06	1.607
		2Down3Up (Duty Factor 3/8)	824.2	29.54	0.899	29.73	0.940
			836.6	29.58	0.908	29.76	0.946
			848.8	29.66	0.925	29.82	0.959
		1Down4Up (Duty Factor 4/8)	824.2	28.61	0.726	28.73	0.746
			836.6	28.72	0.745	28.84	0.766
			848.8	28.79	0.757	28.89	0.774

Note: The peak power testing result was used peak detector.

Model Number	NanoSmart						
Test Item	RF Output Power						
Date of Test	02/01/2013			Test Site		TE05	
Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GSM 1900	GMSK	-----	1850.2	30.11	1.026	30.22	1.052
			1880.0	30.14	1.033	30.27	1.064
			1909.8	30.19	1.045	30.32	1.076
GRRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up (Duty Factor 1/8)	1850.2	30.08	1.019	30.19	1.045
			1909.8	30.11	1.026	30.25	1.059
			1909.8	30.15	1.035	30.29	1.069
		3Down2Up (Duty Factor 2/8)	1850.2	29.18	0.828	29.38	0.867
			1909.8	29.21	0.834	29.41	0.873
			1909.8	29.25	0.841	29.44	0.879
		2Down3Up (Duty Factor 3/8)	1850.2	27.36	0.545	27.59	0.574
			1909.8	27.39	0.548	27.62	0.578
			1909.8	27.47	0.558	27.66	0.583
		1Down4Up (Duty Factor 4/8)	1850.2	26.54	0.451	26.69	0.467
			1909.8	26.57	0.454	26.71	0.469
			1909.8	26.64	0.461	26.74	0.472

Note: The peak power testing result was used peak detector.

3 Effective Radiated Power / Equivalent Isotropic Radiated Power Test

3.1. Limit

For FCC Part 22.913(a)(2): The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(b): The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

3.2. Test Instruments

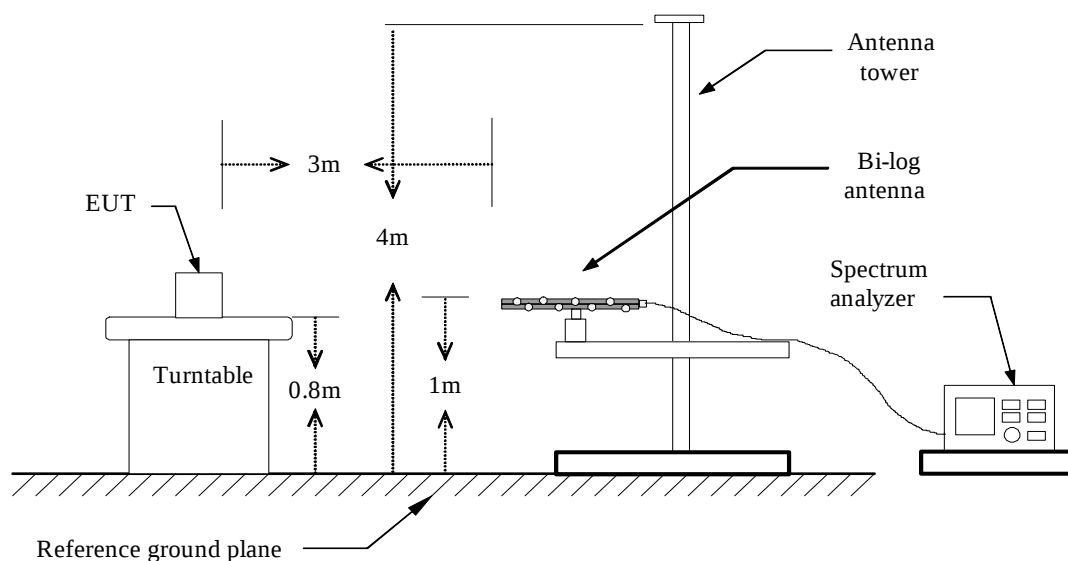
3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/21/2013	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/21/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	06/29/2012	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/15/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE01	888001	08/28/2012	(1)

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

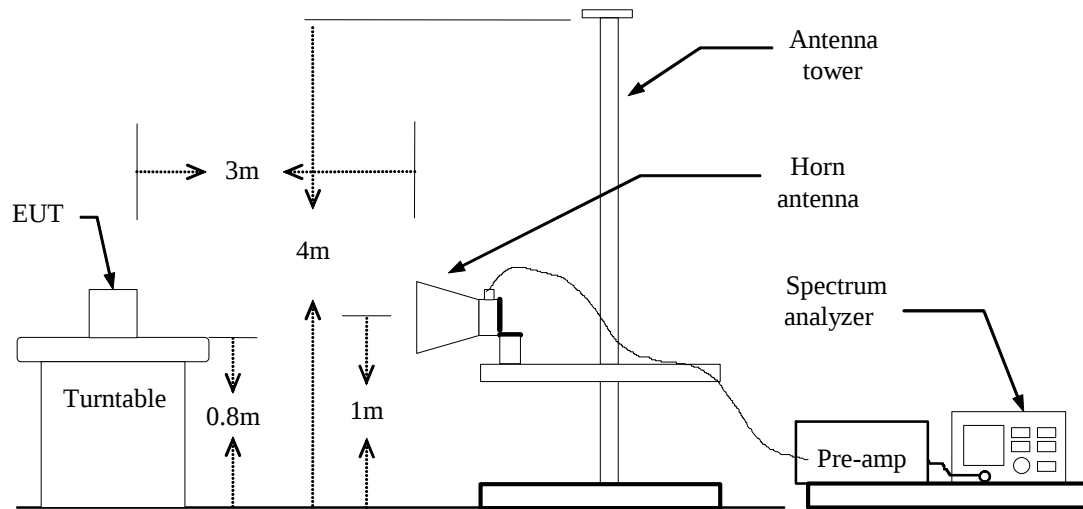
Note: N.C.R. = No Calibration Request.

3.3. Setup

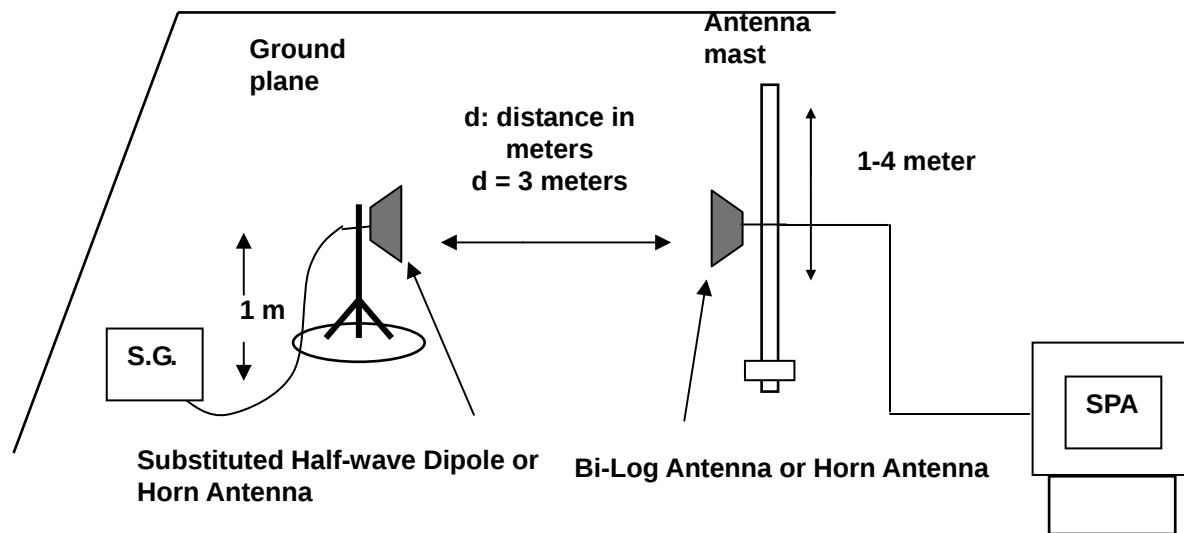
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



3.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna.

The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

3.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.

3.6. Test Result

Model Number	NanoSmart							
Test Item	ERP/EIRP							
Date of Test	02/01/2013					Test Site	TE01	
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	ERP		Limit
						(dBm)	(W)	
GSM 850	GMSK	824.2	H	7.58	11.95	19.53	0.090	< 7W
			V	9.44	11.29	20.73	0.118	< 7W
		836.6	H	8.93	12.50	21.43	0.139	< 7W
			V	8.57	12.07	20.64	0.116	< 7W
		848.8	H	6.96	12.50	19.46	0.088	< 7W
			V	8.89	11.34	20.23	0.105	< 7W

Model Number	NanoSmart							
Test Item	ERP/EIRP							
Date of Test	02/01/2013					Test Site	TE01	
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	EIRP		Limit
						(dBm)	(W)	
GSM 1900	GMSK	1850.20	H	9.06	13.55	22.61	0.182	< 2W
			V	15.30	11.39	26.69	0.467	< 2W
		1880.00	H	9.89	13.59	23.48	0.223	< 2W
			V	15.12	11.65	26.77	0.475	< 2W
		1909.80	H	9.94	13.62	23.56	0.227	< 2W
			V	14.77	11.91	26.68	0.466	< 2W

Note: 1. ERP/EIRP = Read Level + Correction factor.

2. For WCDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

4 Occupied Bandwidth Test

4.1. Limit

The Occupied Bandwidth Limit:

N/A.

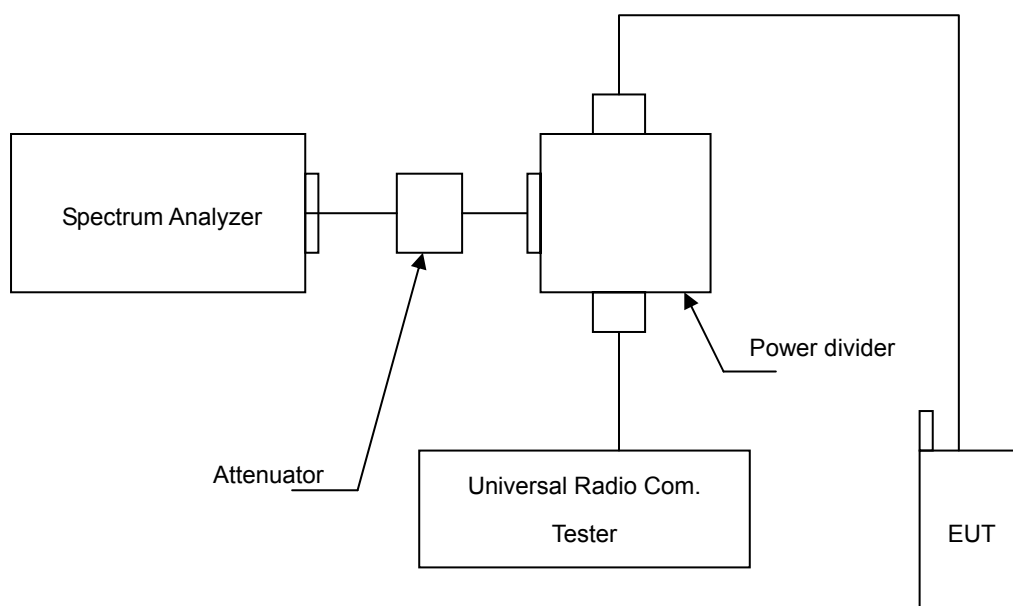
4.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2012	(2)
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

4.3. Setup



4.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.

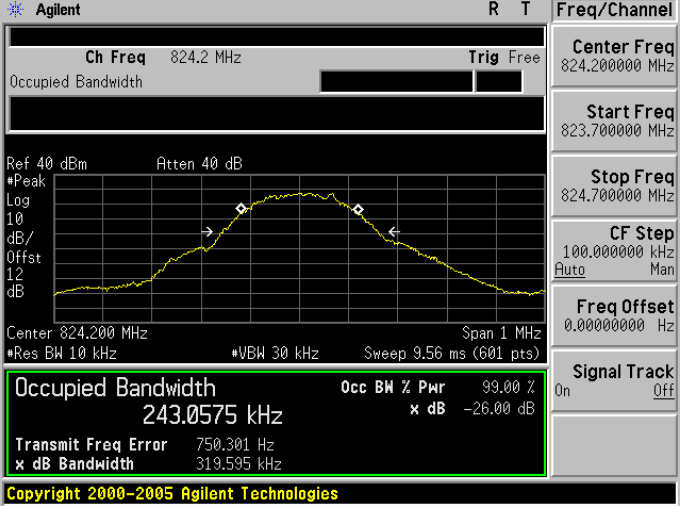
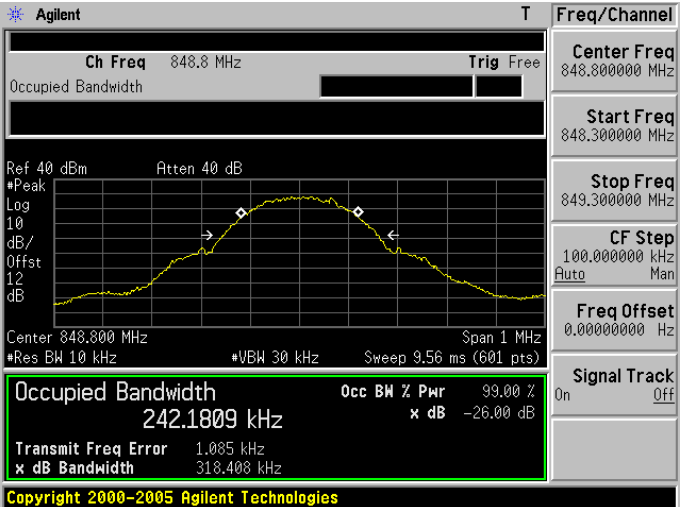
4.5. Uncertainty

The measurement uncertainty is defined as $\pm 10\text{Hz}$

4.6. Test Result

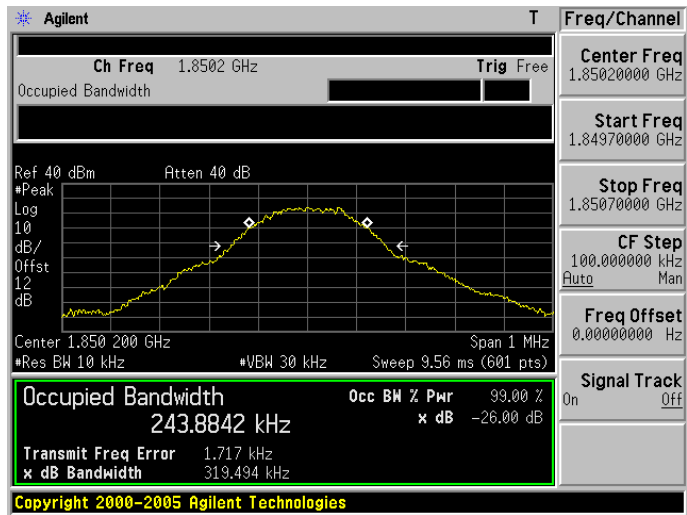
Model Number	NanoSmart			
Test Item	Occupied Bandwidth			
Date of Test	02/05/2013			Test Site TE05
Bands	Channel	Frequency (MHz)	99% Bandwidth (kHz)	Note
GSM 850	128	824.2	243.0575	RBW:10KHz , VBW:30KHz
	190	836.6	245.3028	RBW:10KHz , VBW:30KHz
	251	848.8	242.1809	RBW:10KHz , VBW:30KHz
GSM 1900	512	1850.20	243.8842	RBW:10KHz , VBW:30KHz
	661	1880.00	242.8714	RBW:10KHz , VBW:30KHz
	810	1909.80	245.0792	RBW:10KHz , VBW:30KHz

4.7. Test Graphs

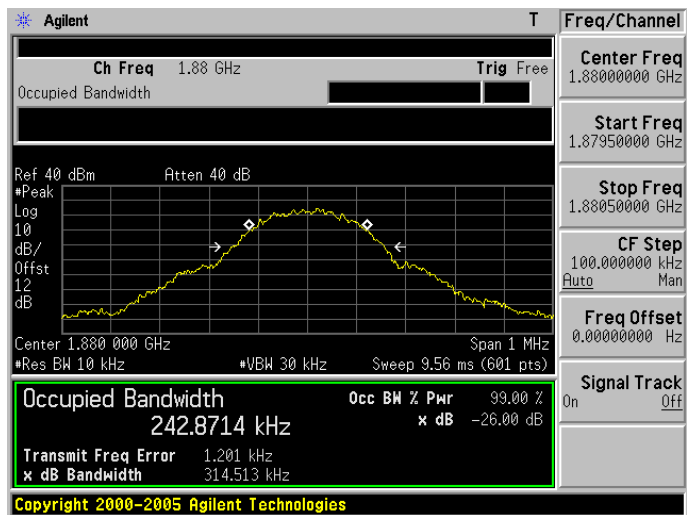
Mode 1: GSM 850 Link Mode	
824.2 MHz	 Copyright 2000-2005 Agilent Technologies
836.6 MHz	 Copyright 2000-2005 Agilent Technologies
848.8 MHz	 Copyright 2000-2005 Agilent Technologies

Mode 2: GSM 1900 Link Mode

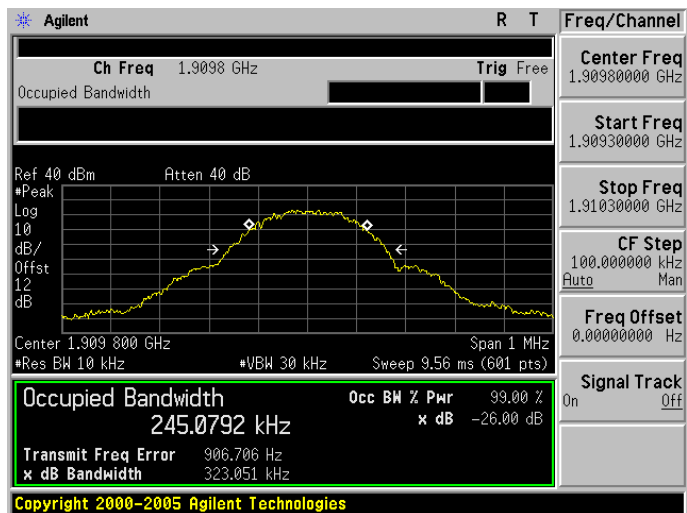
1850.20 MHz



1880.00 MHz



1909.80 MHz



5 Band Edge Test

5.1. Limit

The Band Edge Limit:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

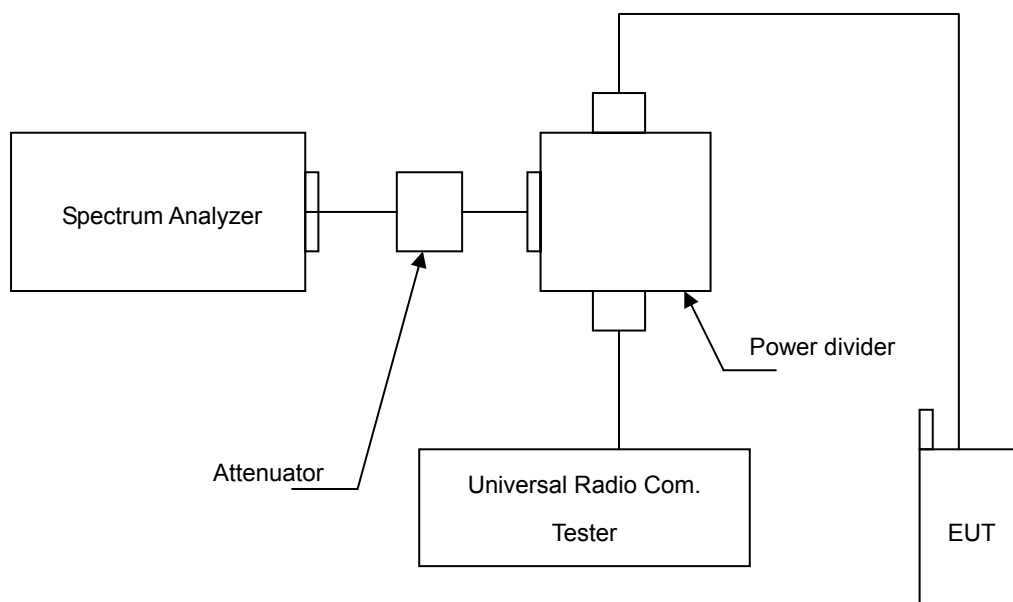
5.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2012	(2)
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

5.3. Setup



5.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

3. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
4. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
5. The band edge setting:
 - a. RB=10 kHz; VB=30 kHz for GSM 850 and PCS 1900.
 - b. RB=100 kHz; VB=300 kHz for WCDMA Band V and WCDMA Band II.

5.5. Uncertainty

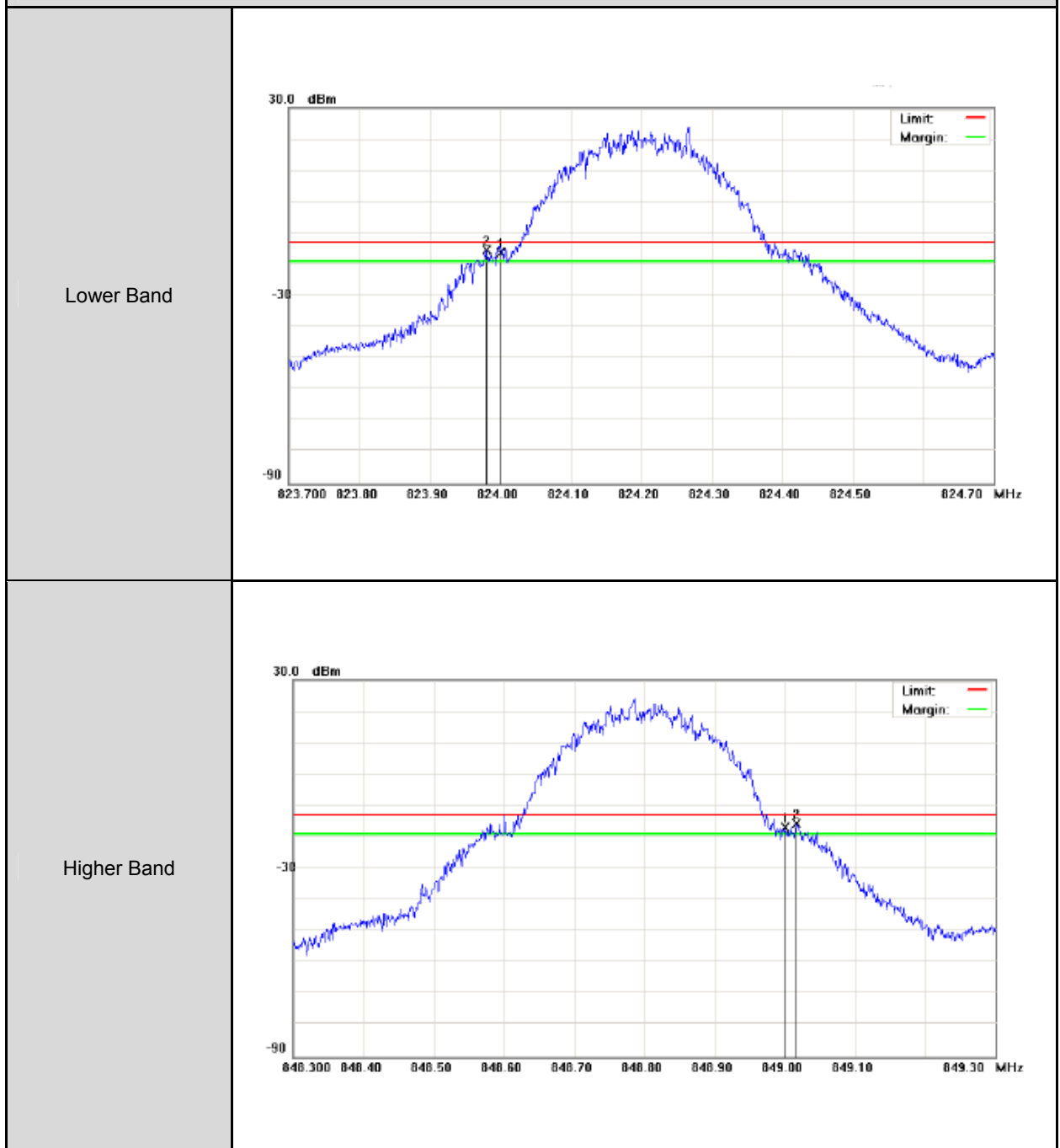
The measurement uncertainty is defined as $\pm 10\text{Hz}$

5.6. Test Result

Model Number		NanoSmart				
Test Item		Band Edge				
Date of Test		02/05/2013			Test Site	TE05
Bands		Channel	Frequency (MHz)	Bandwidth (dBm)	Limit (dBm)	Result
GSM 850	Lower	128	824.0000	-15.39	-13	Pass
	Higher	251	849.0000	-15.71	-13	Pass
GSM 1900	Lower	512	1850.000	-25.37	-13	Pass
	Higher	810	1910.000	-26.32	-13	Pass

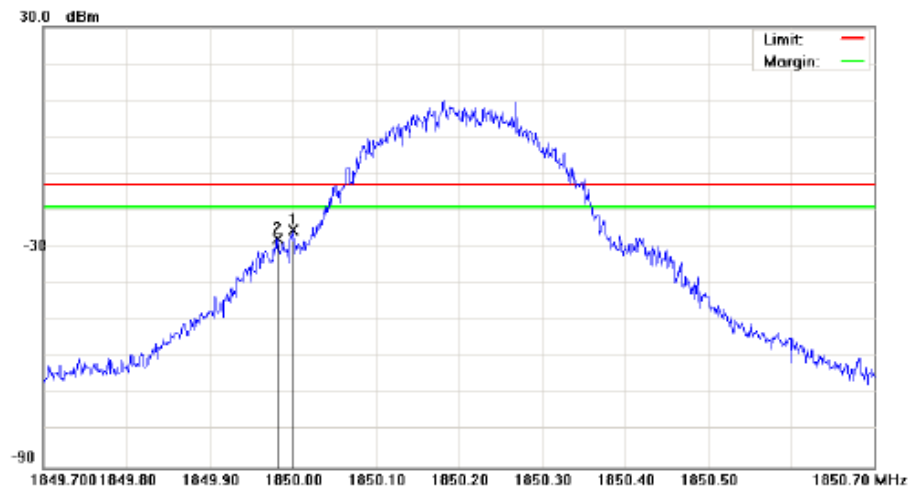
5.7. Test Graphs

Mode 1: GSM 850 Link Mode

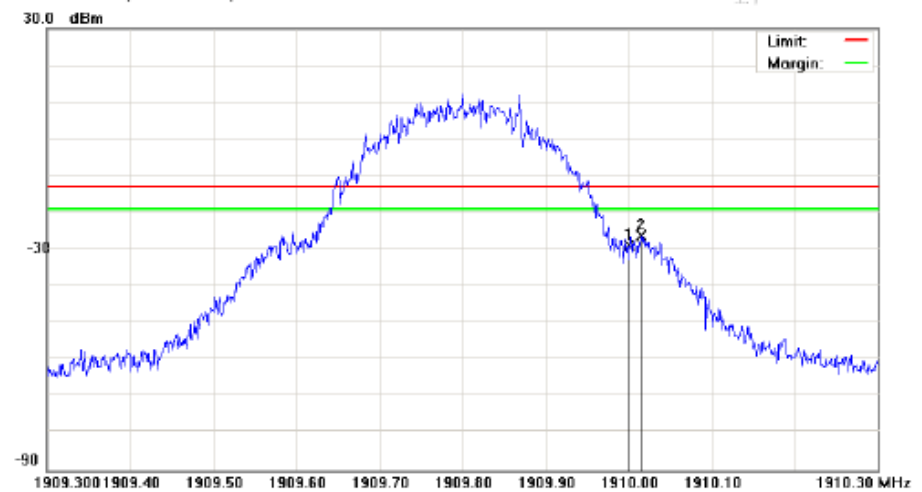


Mode 2: GSM 1900 Link Mode

Lower Band



Higher Band



6 Conducted Spurious Emission Test

6.1. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

6.2. Test Instruments

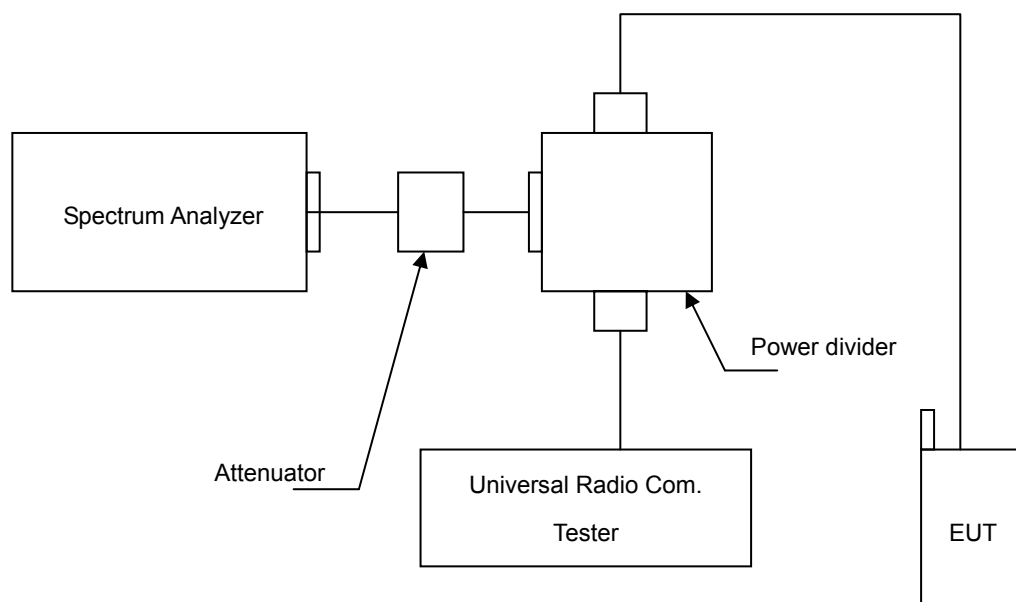
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2012	(2)
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

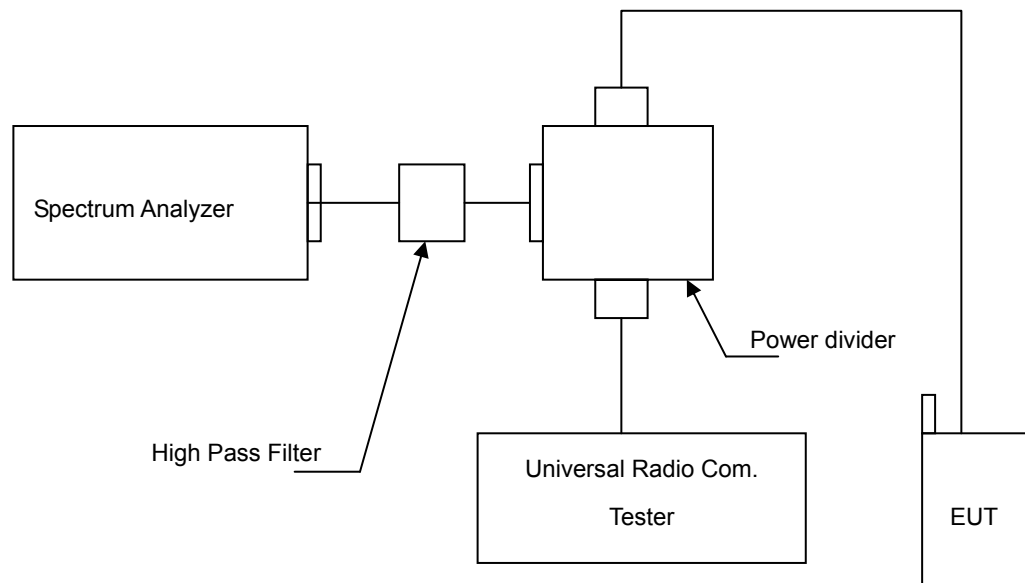
Note: N.C.R. = No Calibration Request.

6.3. Setup

Below 2.8GHz



Above 2.8GHz



6.4. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.
4. Test setting at GSM 850 RB>100 kHz, VB>100 kHz; PCS 1900 RB>1MHz, VB>1MHz.

6.5. Uncertainty

The measurement uncertainty is evaluated as ± 2.24 dB.

6.6. Test Result

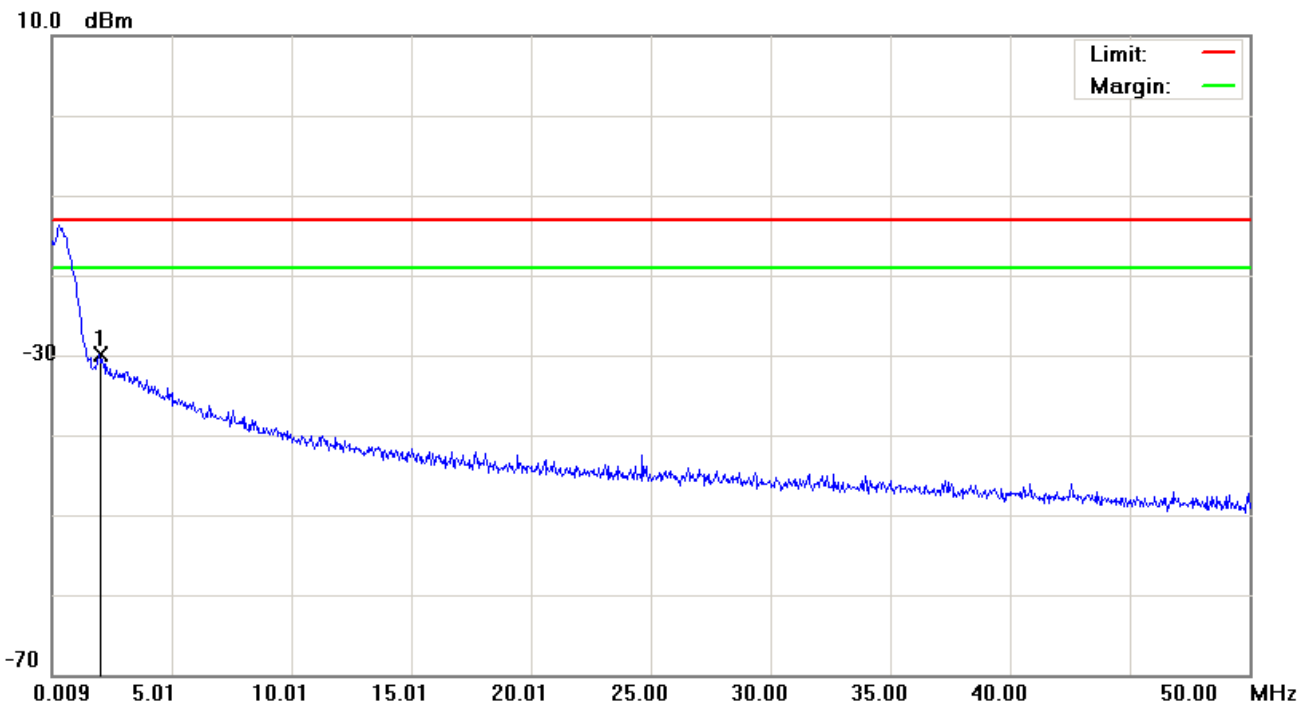
Model Number	NanoSmart		
Test Item	Conducted Emission		
Test Mode	Mode 1 / Mode 2		
Date of Test	02/05/2013	Test Site	TE05

File :NanoSmart(CH128)

Data :#1

Date:2013/2/5

Time: 上午 09:44:41



Site: : RF Conducted

Polarization: *Conducted po*

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	1.9836	-61.19	31.33	-29.86	-13.00	-16.86	peak		

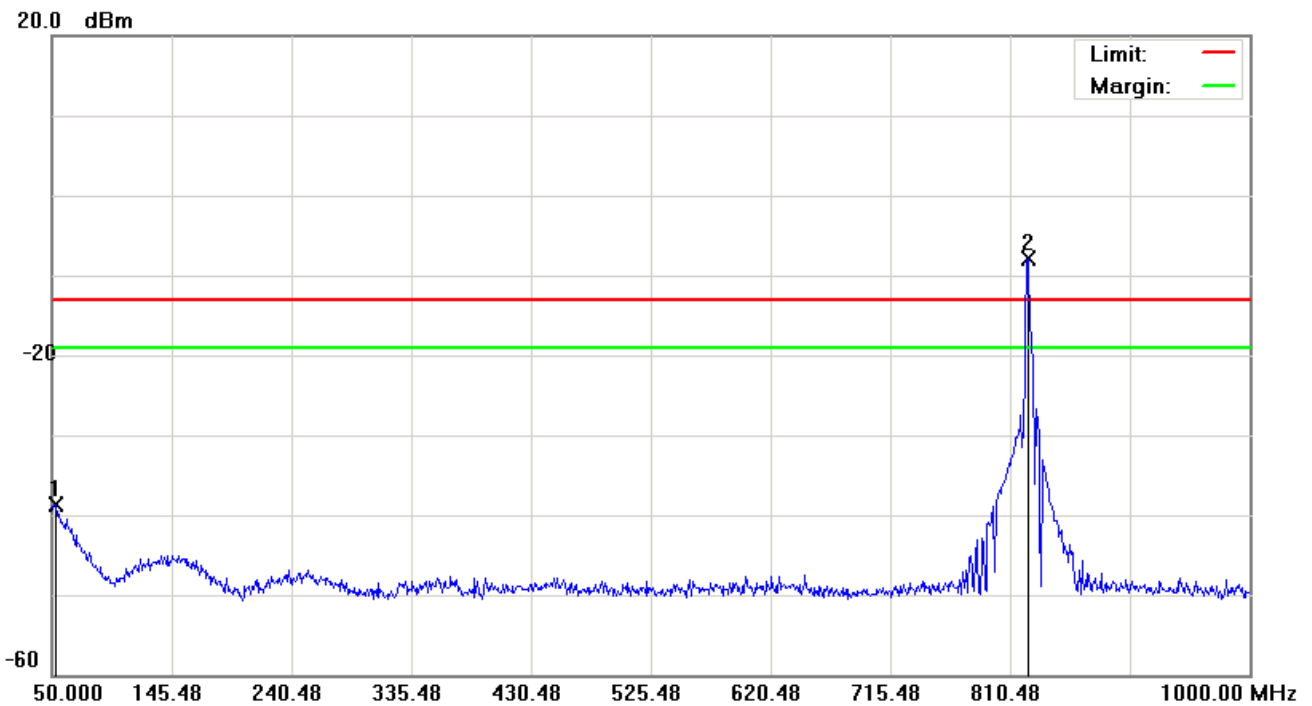
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH128)

Data :#2

Date: 2013/2/5

Time: 上午 09:45:05



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1		52.3750	-52.98	14.27	-38.71	-13.00	-25.71	peak		
2	*	824.2500	-11.71	3.84	-7.87	-13.00	5.13	peak		Tx

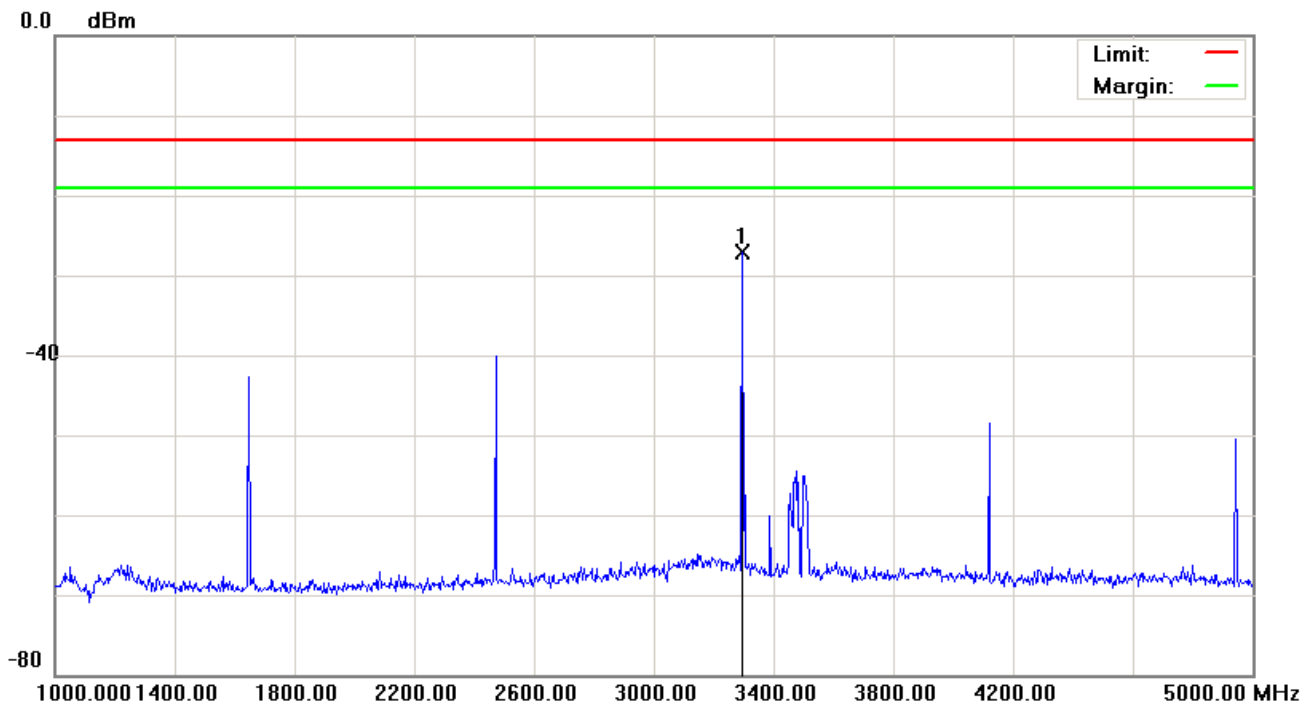
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH128)

Data :#3

Date:2013/2/5

Time: 上午 10:05:25



Site: : RF Conducted

Polarization: *Conducted po*

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	3296.000	-31.46	4.44	-27.02	-13.00	-14.02	peak		

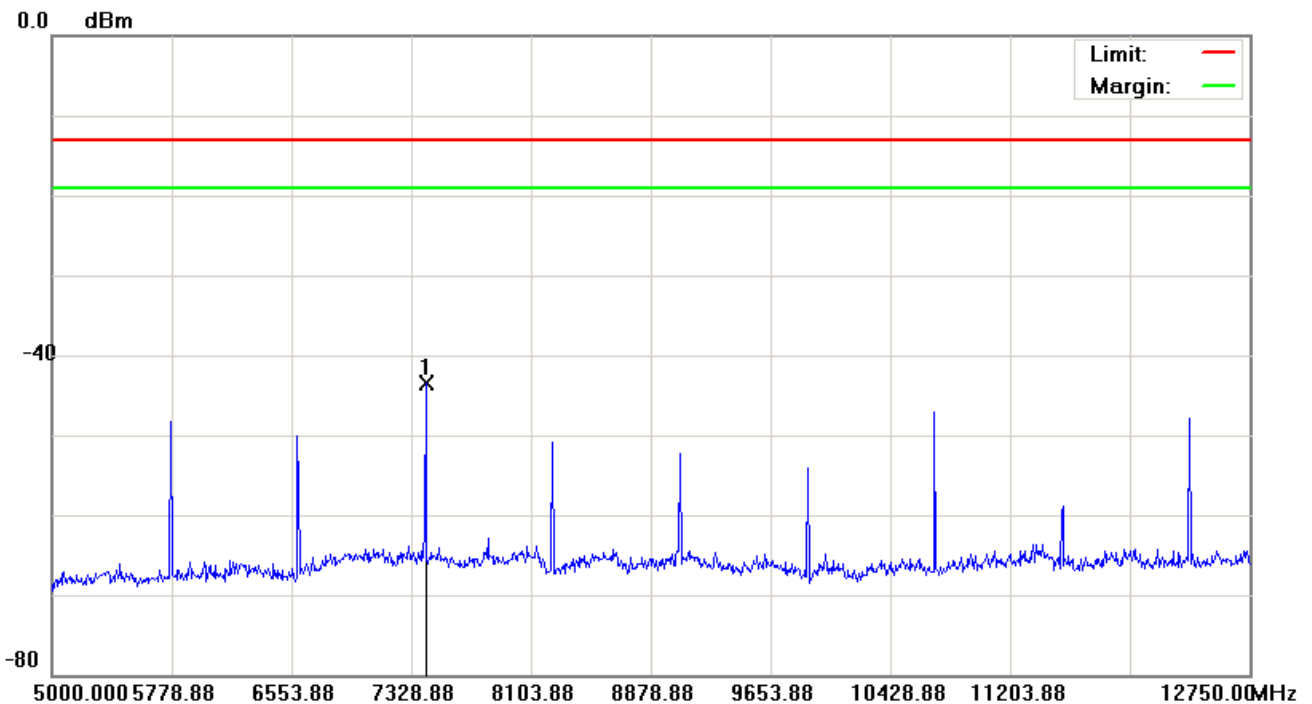
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH128)

Data :#4

Date:2013/2/5

Time: 上午 10:05:48



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	7418.000	-48.69	5.21	-43.48	-13.00	-30.48	peak		

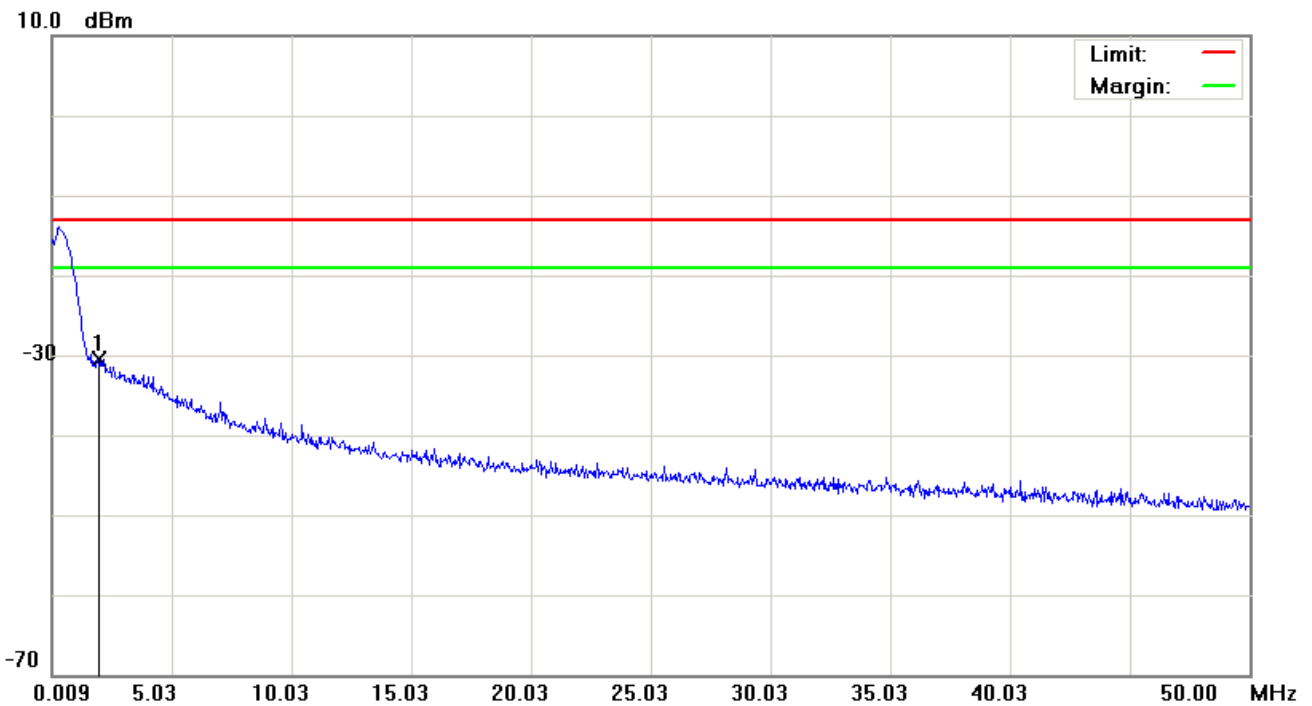
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH190)

Data :#1

Date: 2013/2/5

Time: 上午 09:46:43



Site: : RF Conducted

Polarization: *Conducted po*

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	1.9336	-61.75	31.24	-30.51	-13.00	-17.51	peak		

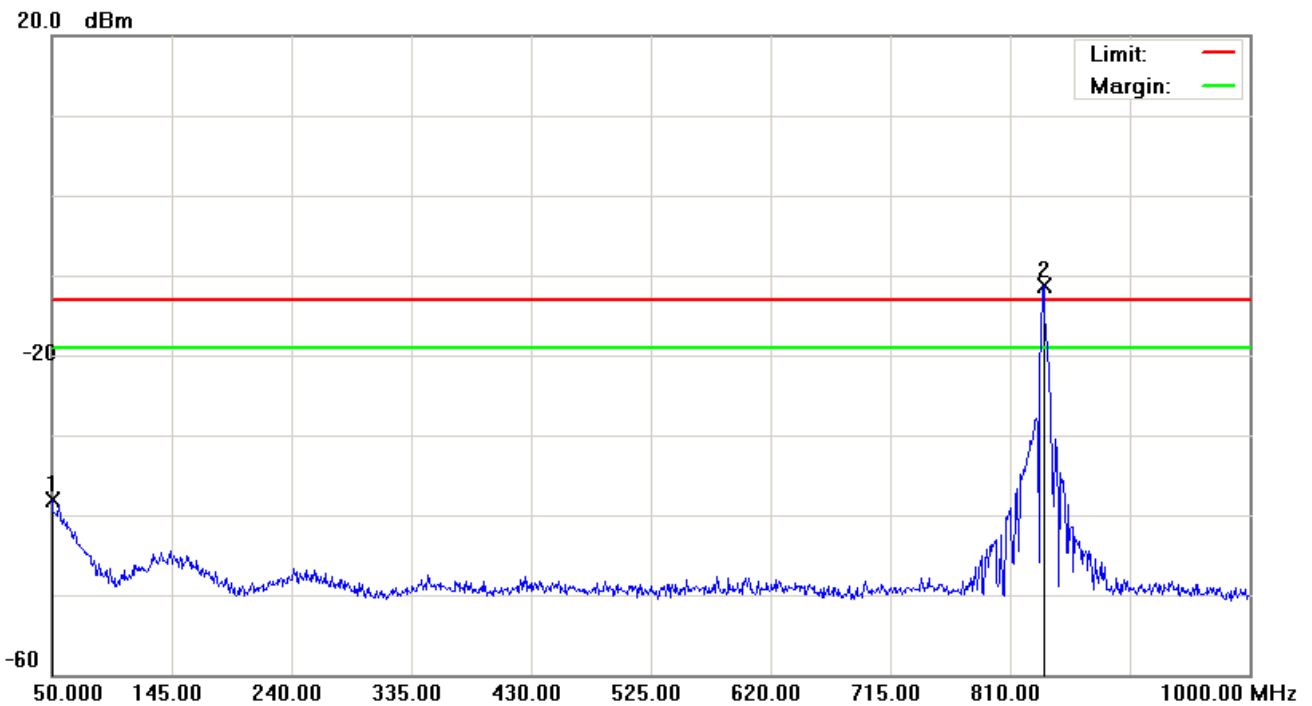
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH190)

Data :#2

Date: 2013/2/5

Time: 上午 09:47:07



Site: : RF Conducted

Polarization: *Conducted po*

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1		50.0000	-52.77	14.69	-38.08	-13.00	-25.08	peak		
2	*	836.6000	-15.18	3.96	-11.22	-13.00	1.78	peak		Tx

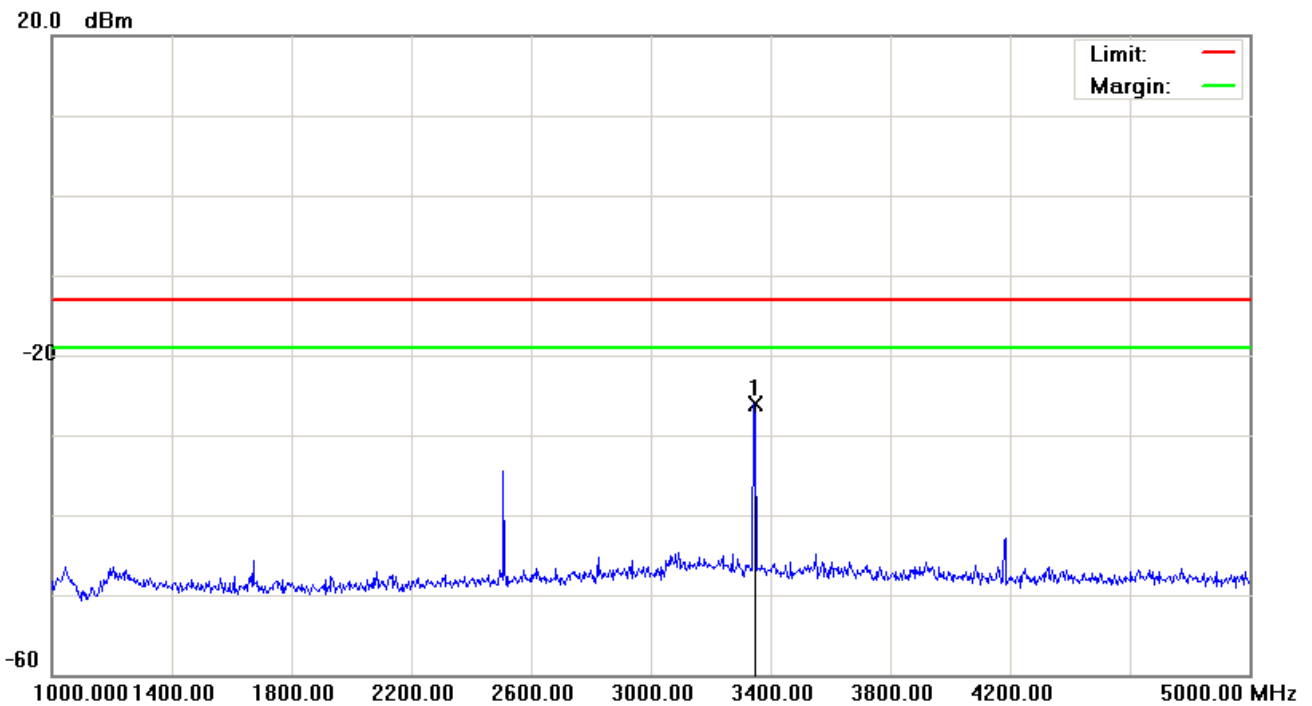
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH190)

Data :#3

Date:2013/2/5

Time: 上午 10:06:35



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	3346.000	-30.58	4.51	-26.07	-13.00	-13.07	peak		

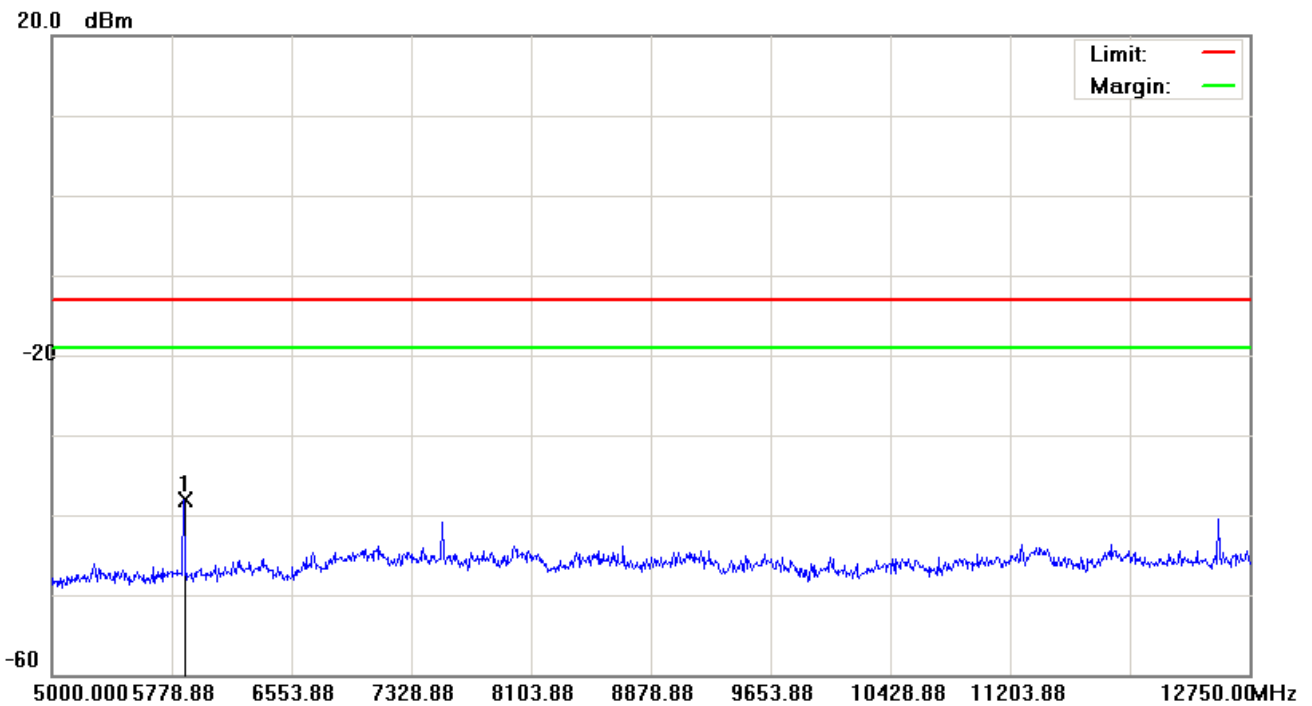
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH190)

Data : #4

Date: 2013/2/5

Time: 上午 10:06:58



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	5856.375	-42.93	4.88	-38.05	-13.00	-25.05	peak		

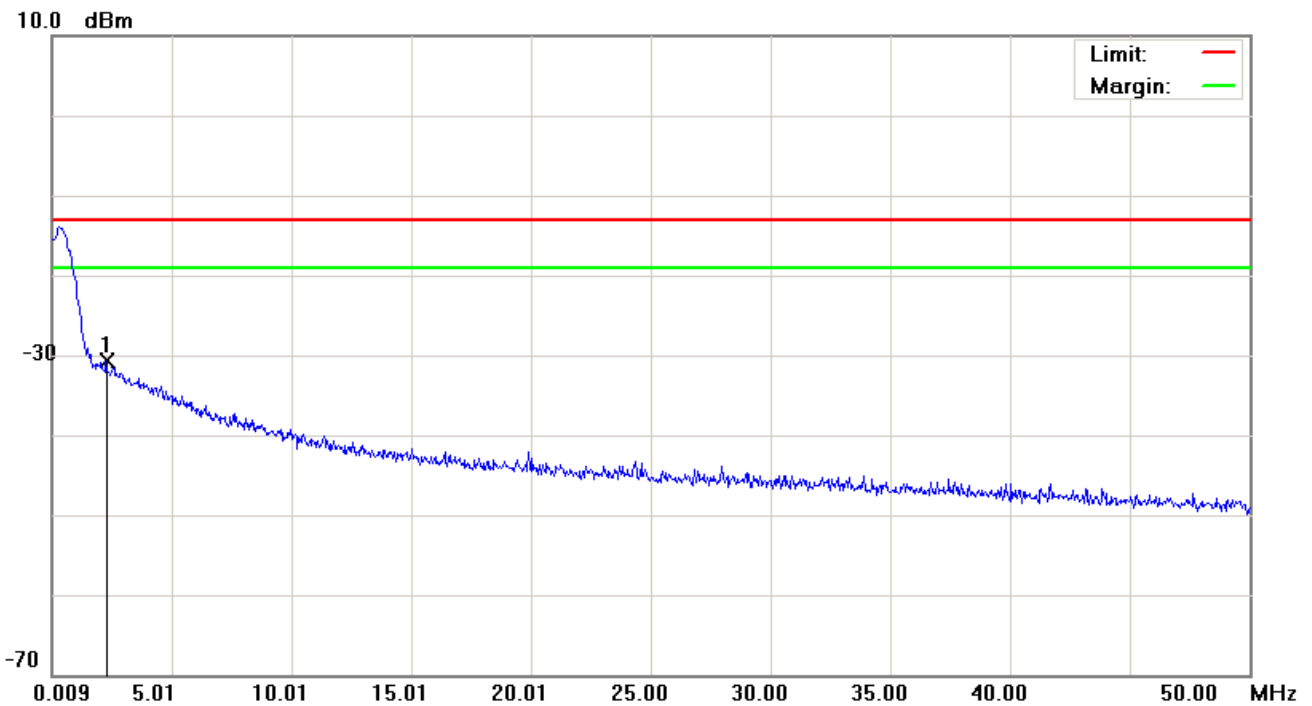
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH251)

Data :#1

Date: 2013/2/5

Time: 上午 09:48:53



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	
1	*	2.2835	-61.75	31.07	-30.68	-13.00	-17.68	peak	degree	Comment

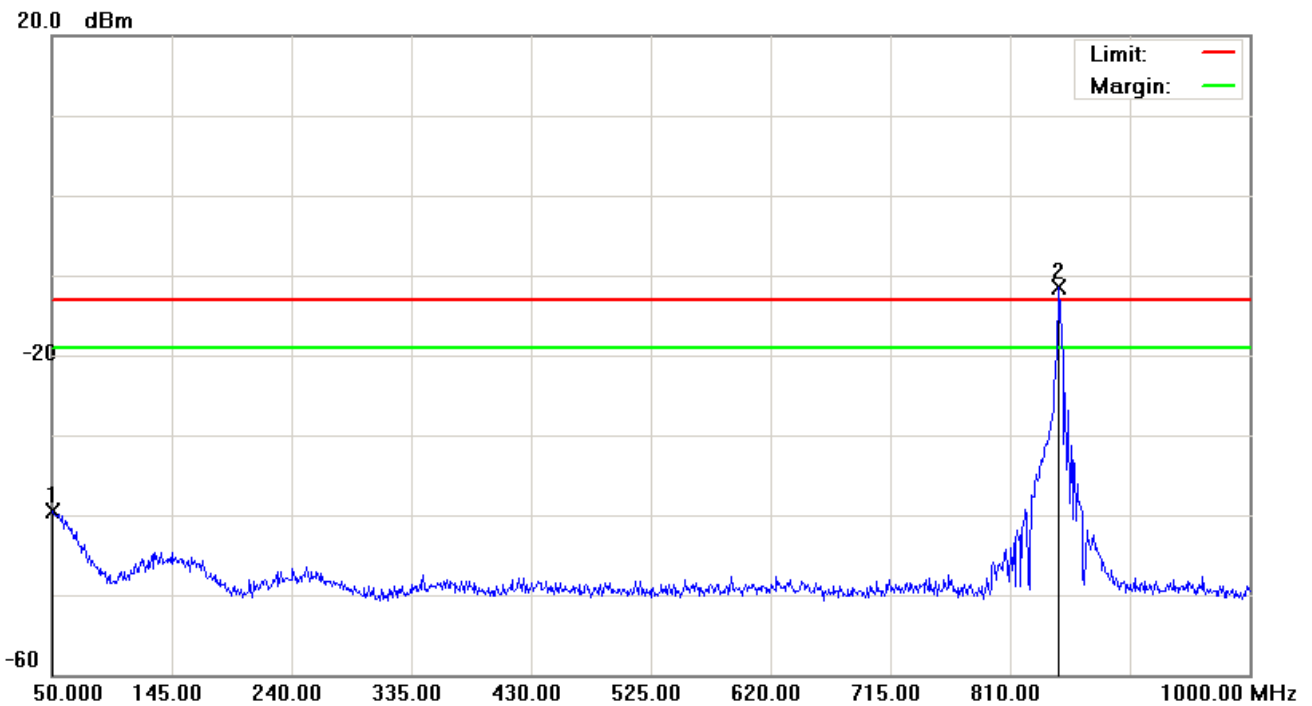
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH251)

Data :#2

Date: 2013/2/5

Time: 上午 09:49:18



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1		50.0000	-54.14	14.69	-39.45	-13.00	-26.45	peak		
2	*	848.9500	-15.48	3.98	-11.50	-13.00	1.50	peak		Tx

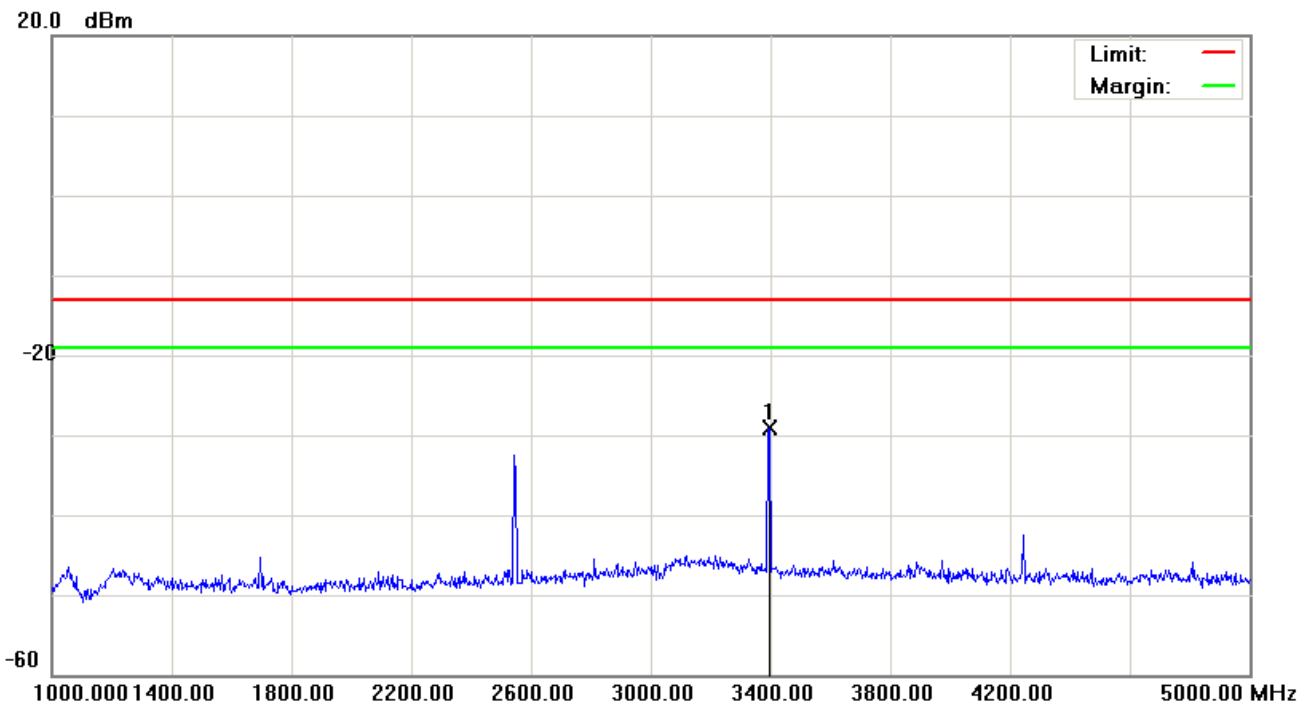
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH251)

Data :#3

Date:2013/2/5

Time: 上午 10:07:48



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	3396.000	-33.57	4.46	-29.11	-13.00	-16.11	peak		

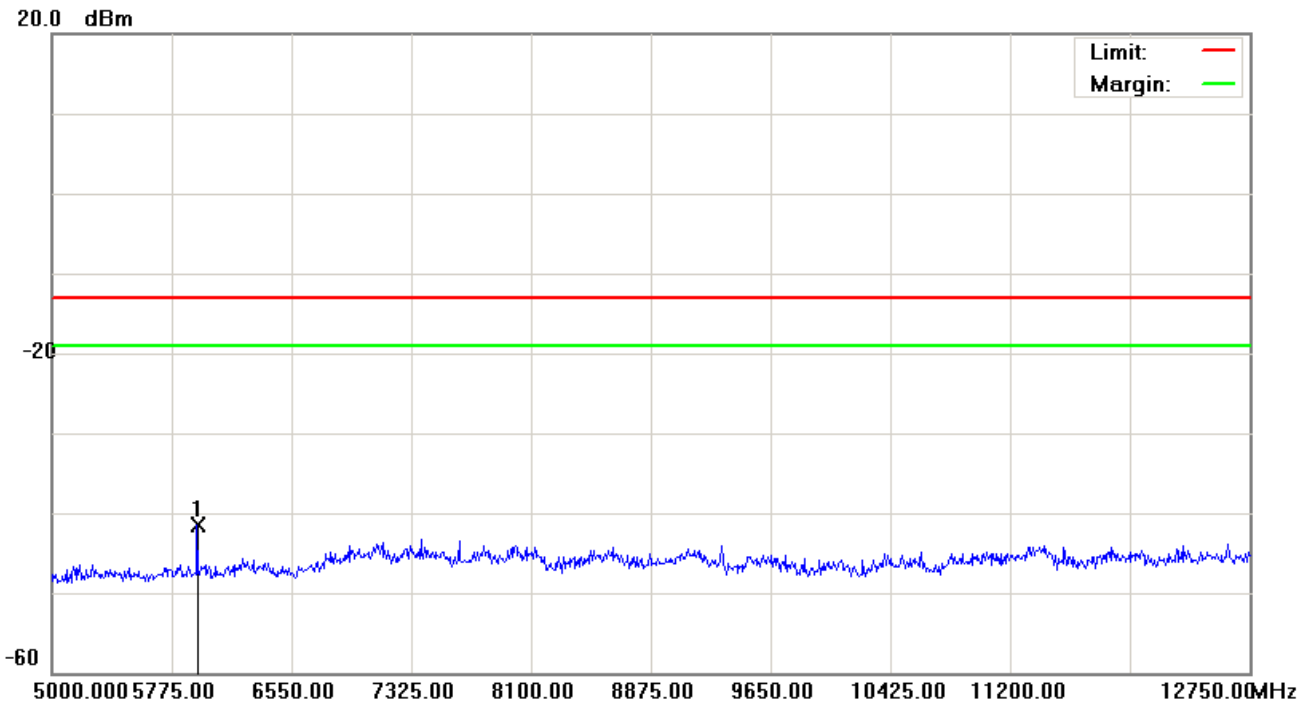
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH251)

Data : #4

Date: 2013/2/5

Time: 上午 10:08:11



Site: : RF Conducted

Polarization: *Conducted po*

Temperature: 23 °C

Limit: FCC Part 22 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 850

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	5941.625	-46.47	4.97	-41.50	-13.00	-28.50	peak		

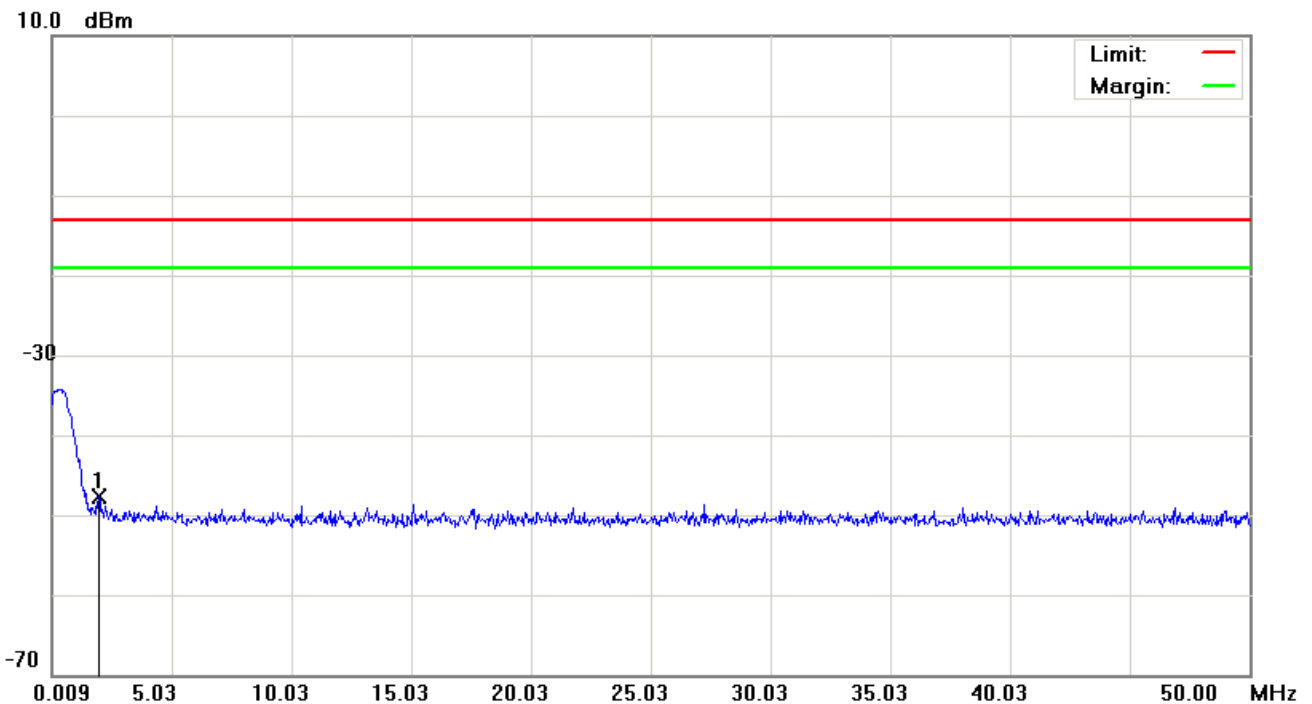
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH512)

Data : #1

Date: 2013/2/5

Time: 上午 09:33:05



Site: : RF Conducted

Polarization: *Conducted po*

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree
1	*	1.9585	-60.68	13.08	-47.60	-13.00	-34.60	peak		Comment

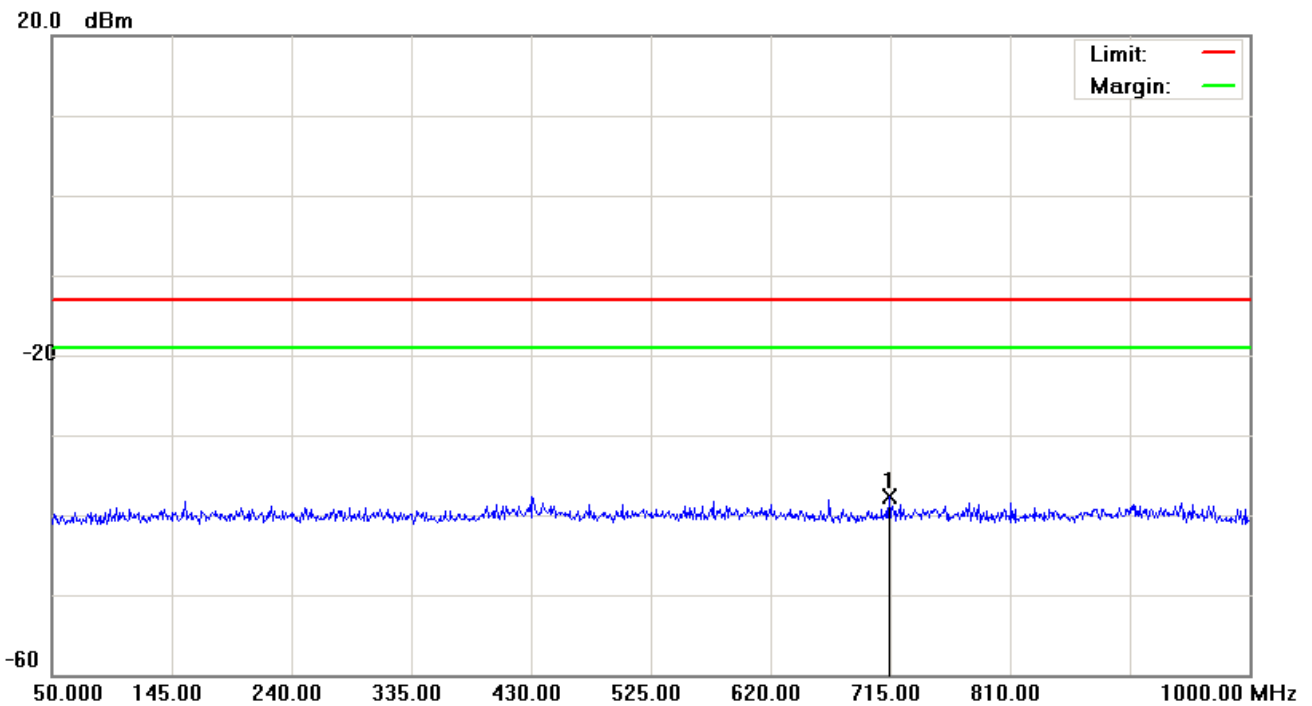
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH512)

Data :#2

Date: 2013/2/5

Time: 上午 09:33:29



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	714.0500	-50.85	13.14	-37.71	-13.00	-24.71	peak		

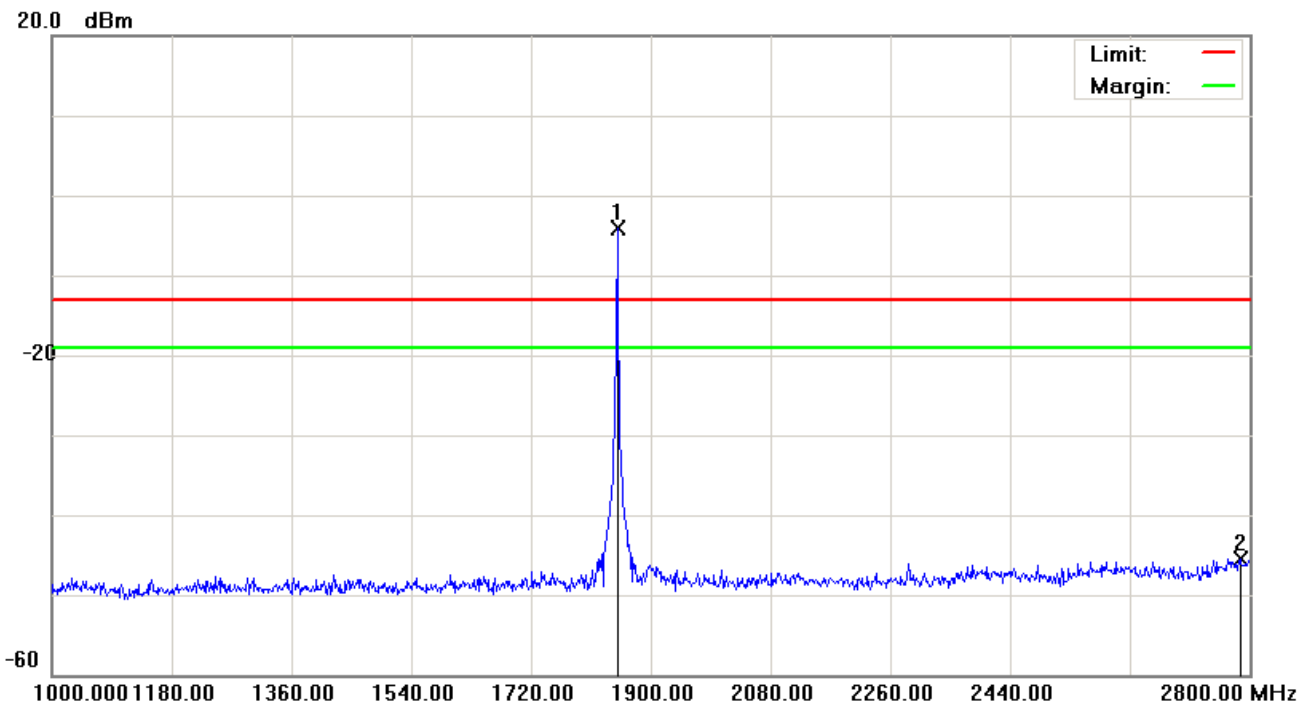
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH512)

Data :#3

Date: 2013/2/5

Time: 上午 09:38:57



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	1850.500	-8.39	4.26	-4.13	-13.00	8.87	peak		Tx
2		2785.600	-51.36	5.89	-45.47	-13.00	-32.47	peak		

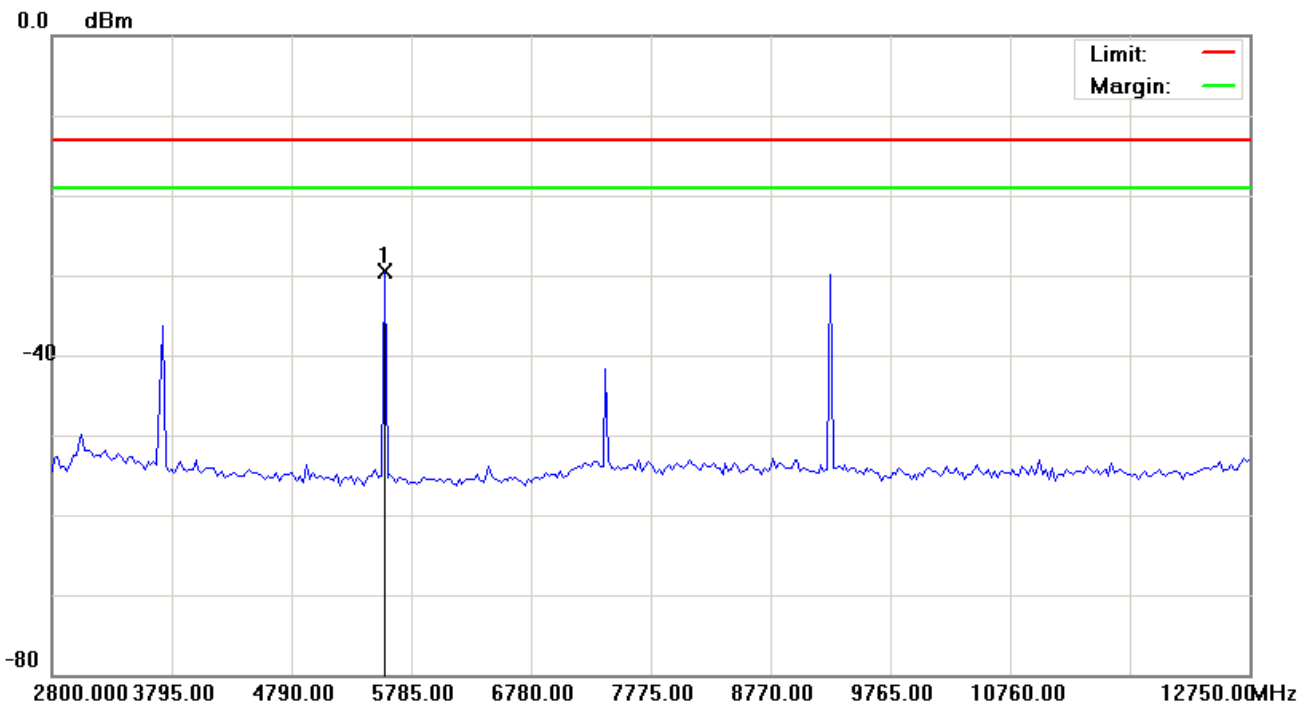
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH512)

Data : #4

Date: 2013/2/5

Time: 上午 10:11:15



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	5561.125	-34.40	4.89	-29.51	-13.00	-16.51	peak		

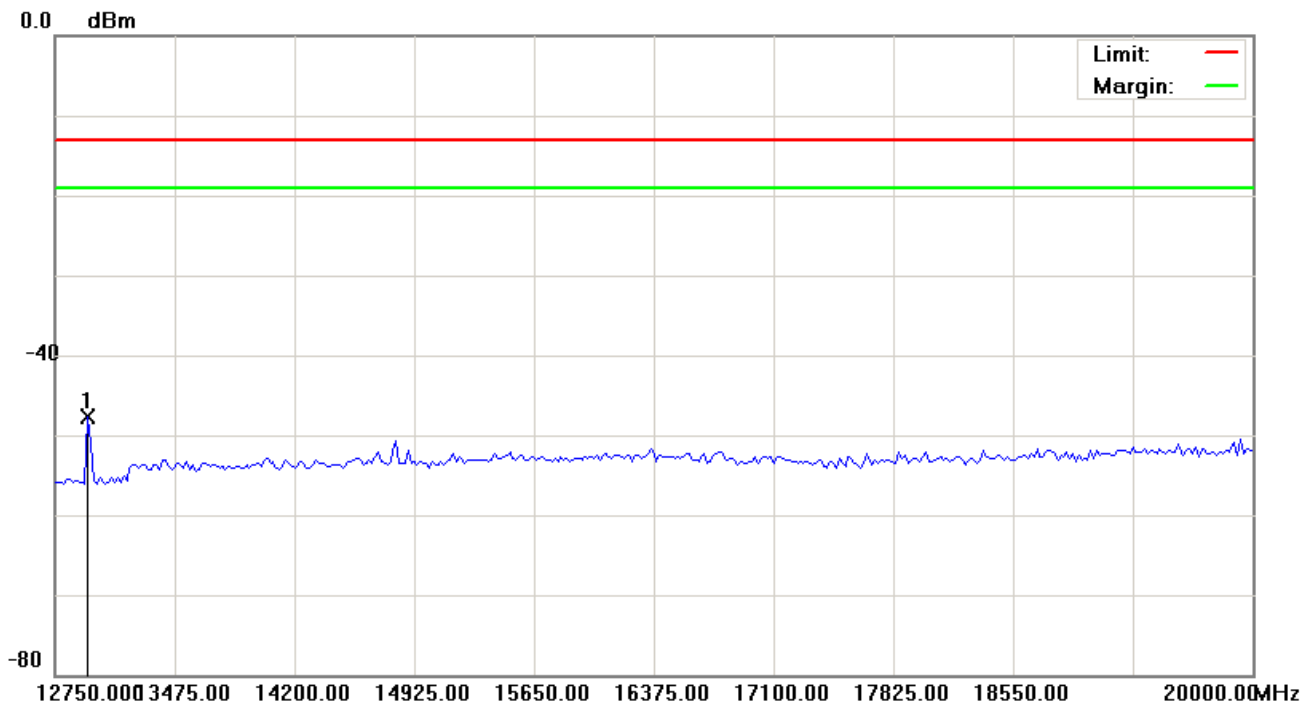
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH512)

Data :#5

Date: 2013/2/5

Time: 上午 10:11:35



Site: : RF Conducted	Polarization: Conducted po	Temperature: 23 °C
Limit: FCC Part 24 conducted(9k-26.5G)	Power: AC 120V/60Hz	Humidity: 55.2 %
EUT: Bluetooth GSM Hand-Held Terminal	Distance:	RBW: 1000 KHz VBW: 1000 KHz
M/N: NanoSmart		
Mode: GSM 1900		
Note:		

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	12949.375	-53.21	5.43	-47.78	-13.00	-34.78	peak		

*:Maximum data x:Over limit !:over margin

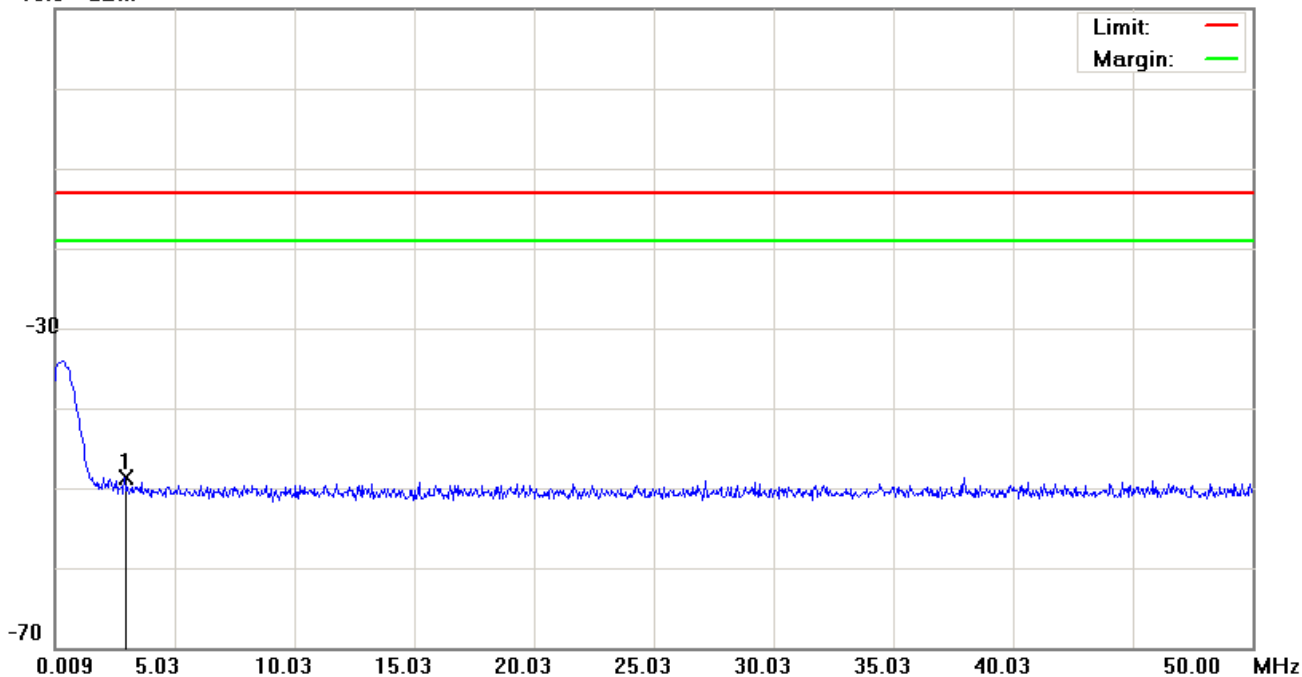
File :NanoSmart(CH661)

Data :#1

Date: 2013/2/5

Time: 上午 09:34:44

10.0 dBm



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	2.9334	-61.66	12.95	-48.71	-13.00	-35.71	peak		

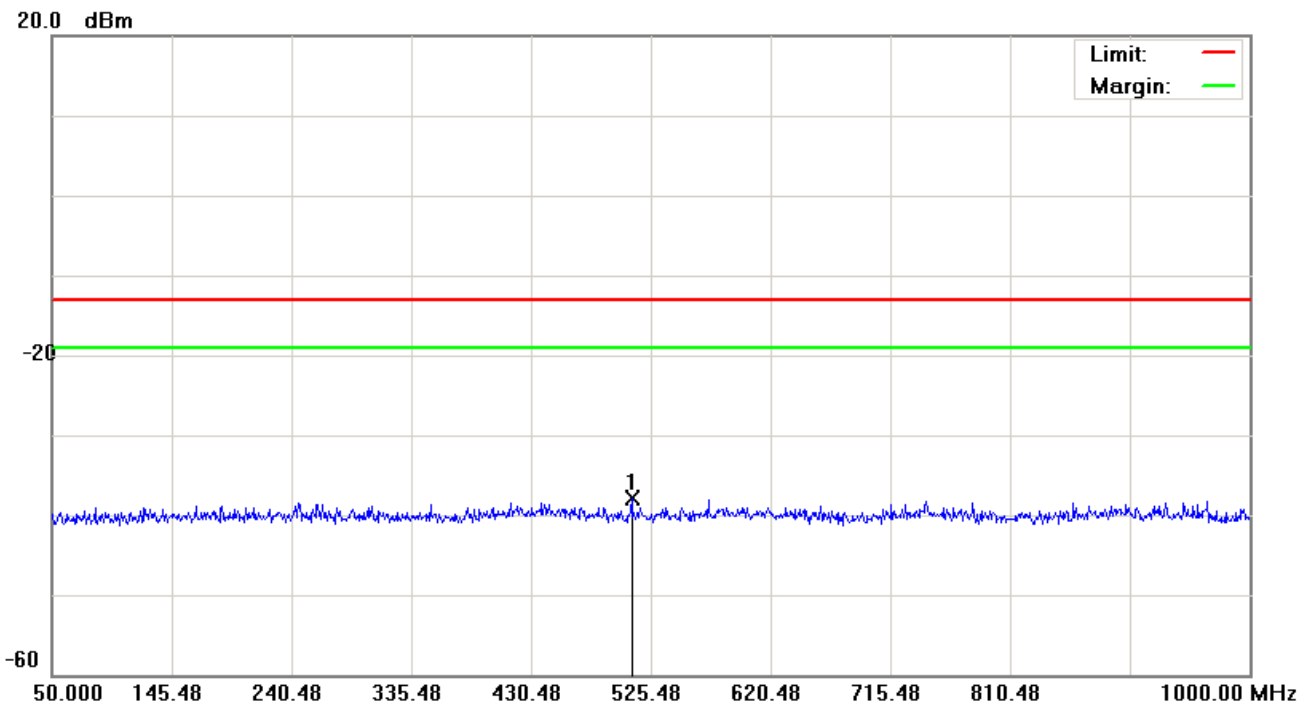
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH661)

Data :#2

Date: 2013/2/5

Time: 上午 09:35:08



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	509.8000	-51.06	13.14	-37.92	-13.00	-24.92	peak		

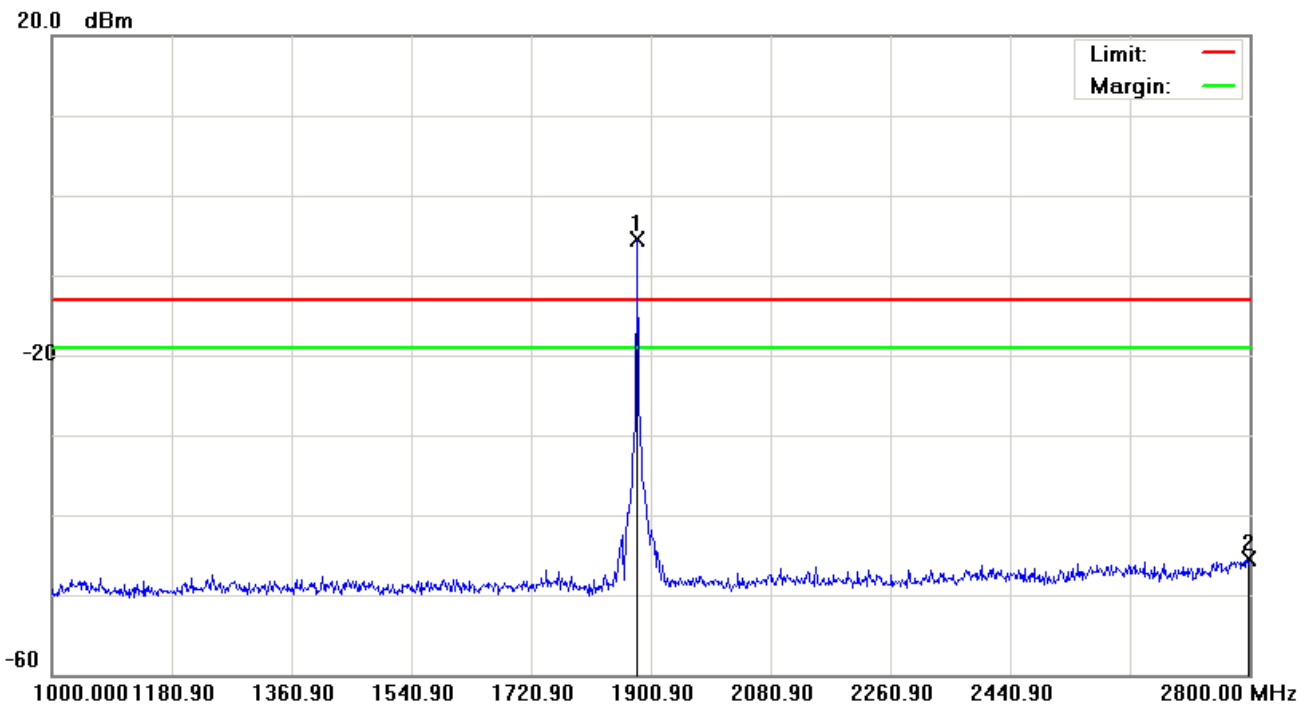
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH661)

Data :#3

Date: 2013/2/5

Time: 上午 09:40:13



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	1880.200	-10.13	4.65	-5.48	-13.00	7.52	peak		Tx
2		2797.300	-51.43	5.91	-45.52	-13.00	-32.52	peak		

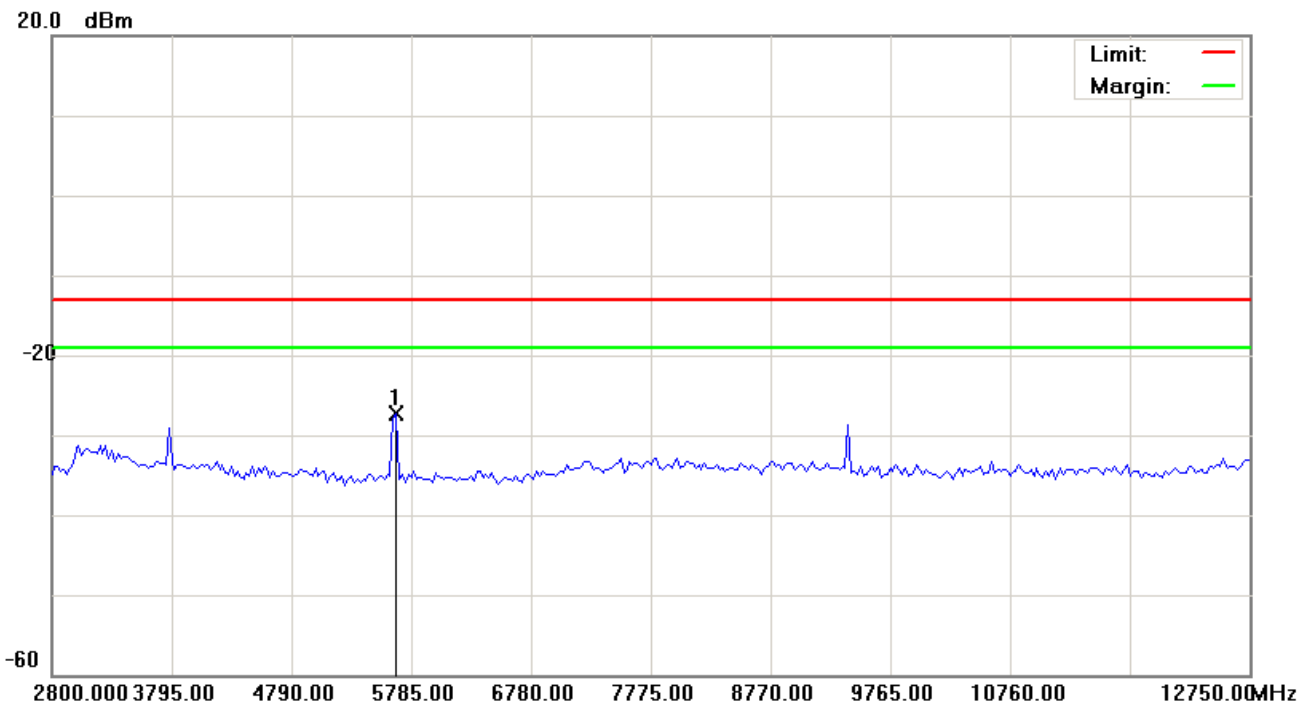
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH661)

Data :#4

Date:2013/2/5

Time: 上午 10:12:07



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	5660.625	-32.18	4.84	-27.34	-13.00	-14.34	peak		

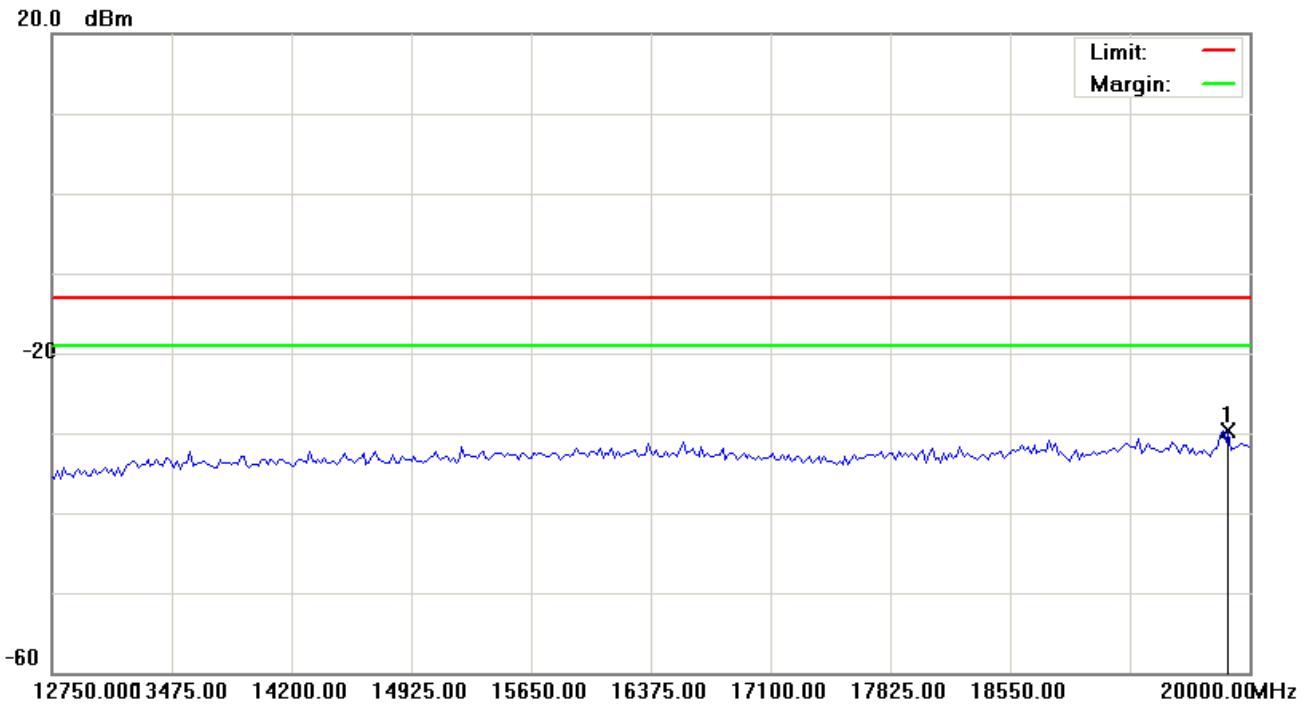
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH661)

Data : #5

Date: 2013/2/5

Time: 上午 10:12:26



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	19873.125	-37.14	7.40	-29.74	-13.00	-16.74	peak		

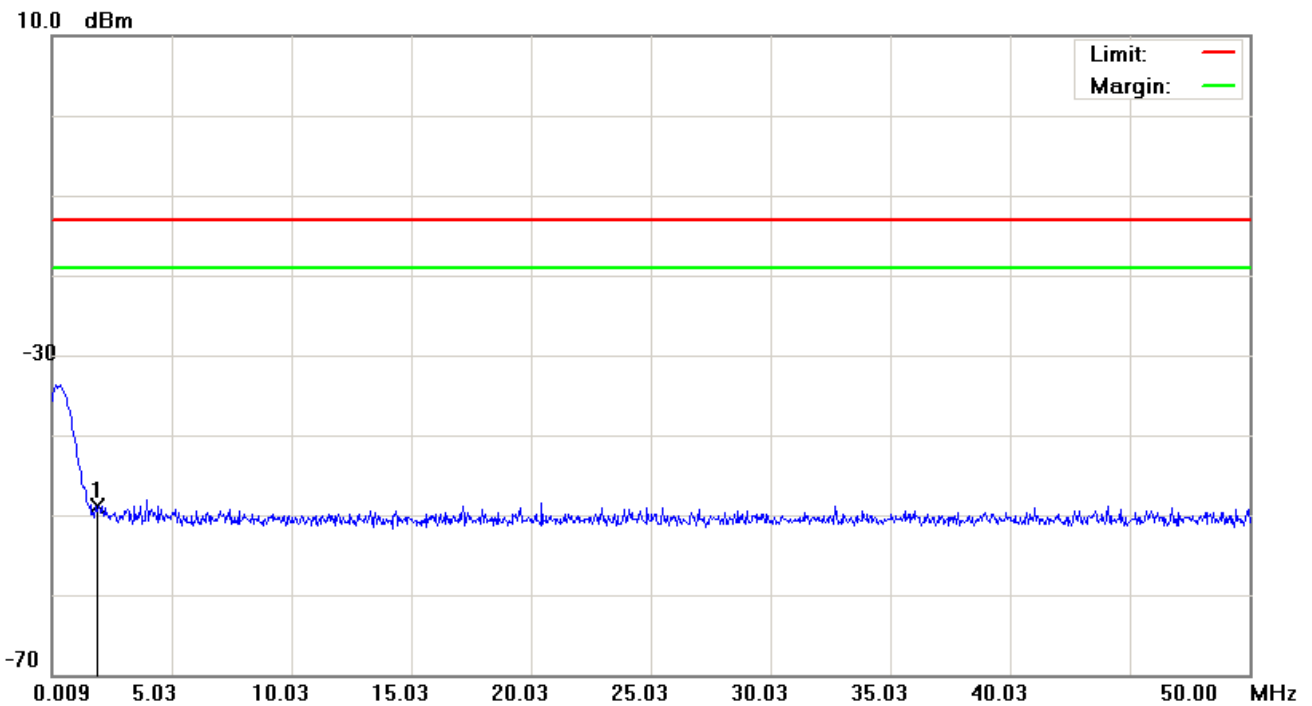
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH810)

Data : #1

Date: 2013/2/5

Time: 上午 09:36:44



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree
1	*	1.8836	-61.71	12.88	-48.83	-13.00	-35.83	peak		Comment

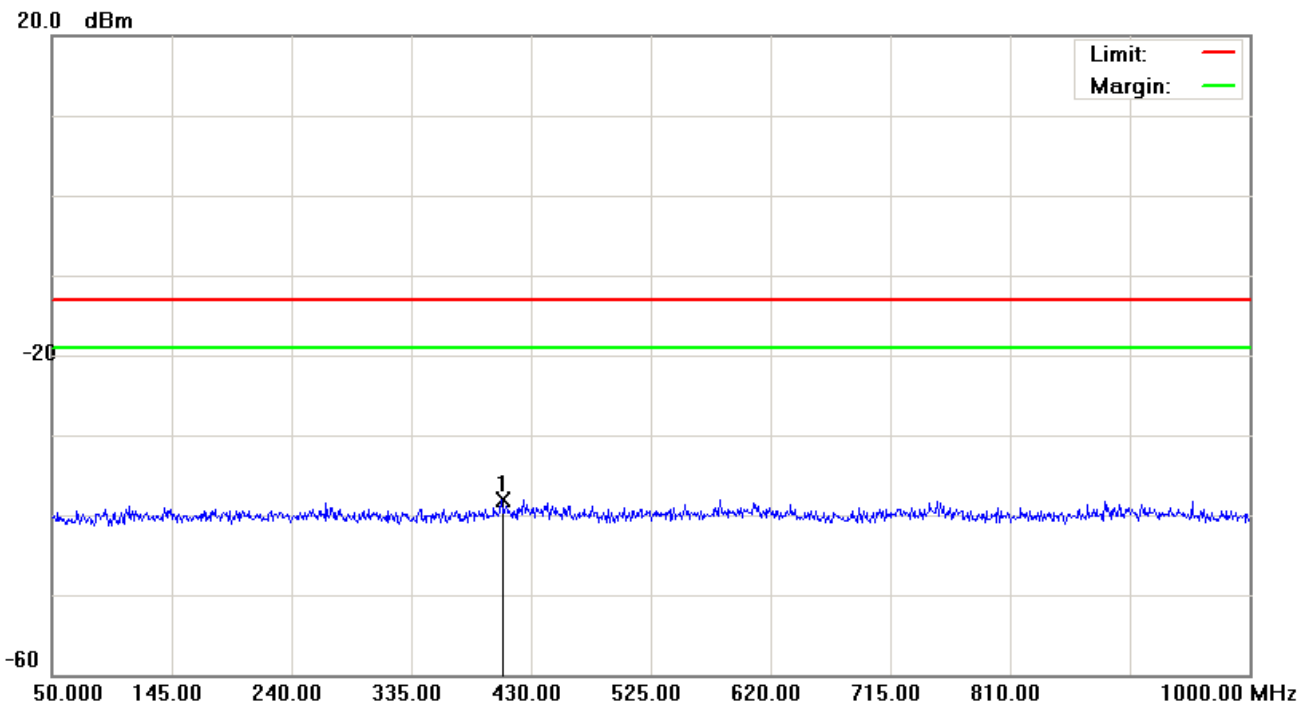
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH810)

Data :#2

Date: 2013/2/5

Time: 上午 09:37:08



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	406.7250	-51.30	13.25	-38.05	-13.00	-25.05	peak		

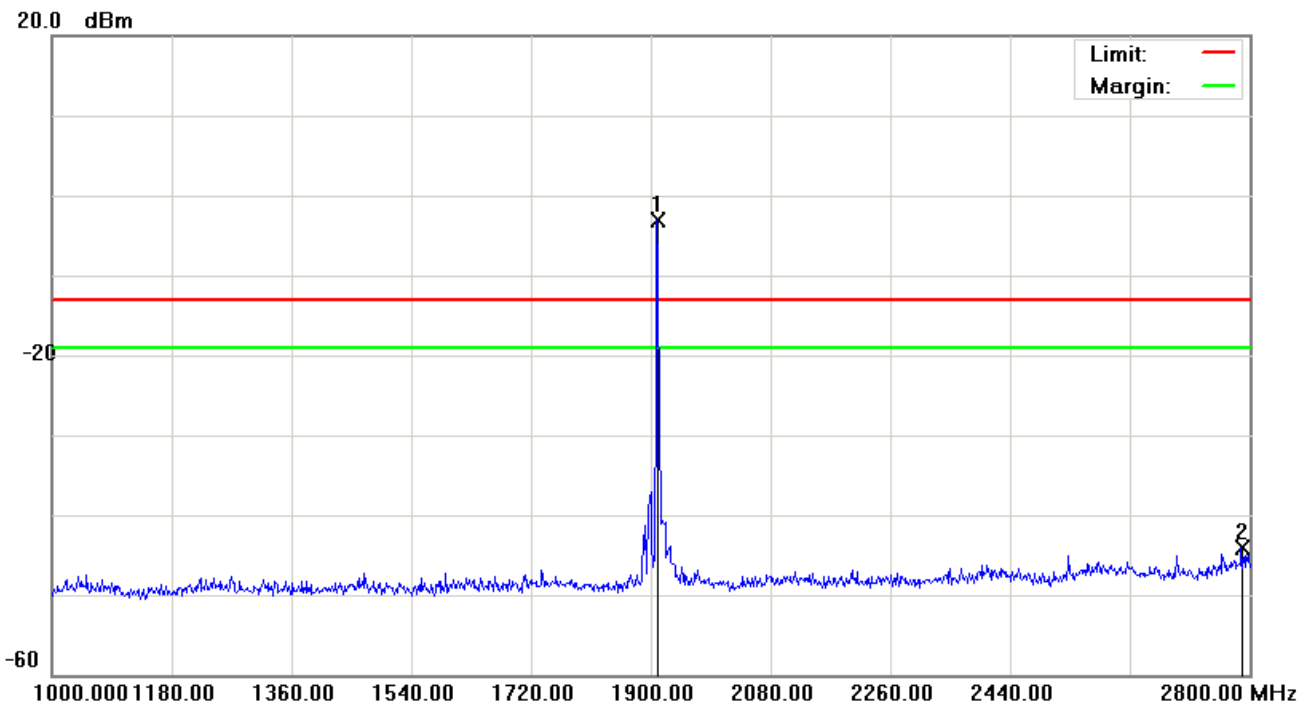
*:Maximum data x:Over limit !:over margin

File :NanoSmart(CH810)

Data :#3

Date: 2013/2/5

Time: 上午 09:41:30



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	1909.900	-8.76	5.71	-3.05	-13.00	9.95	peak		Tx
2		2788.300	-50.01	5.89	-44.12	-13.00	-31.12	peak		

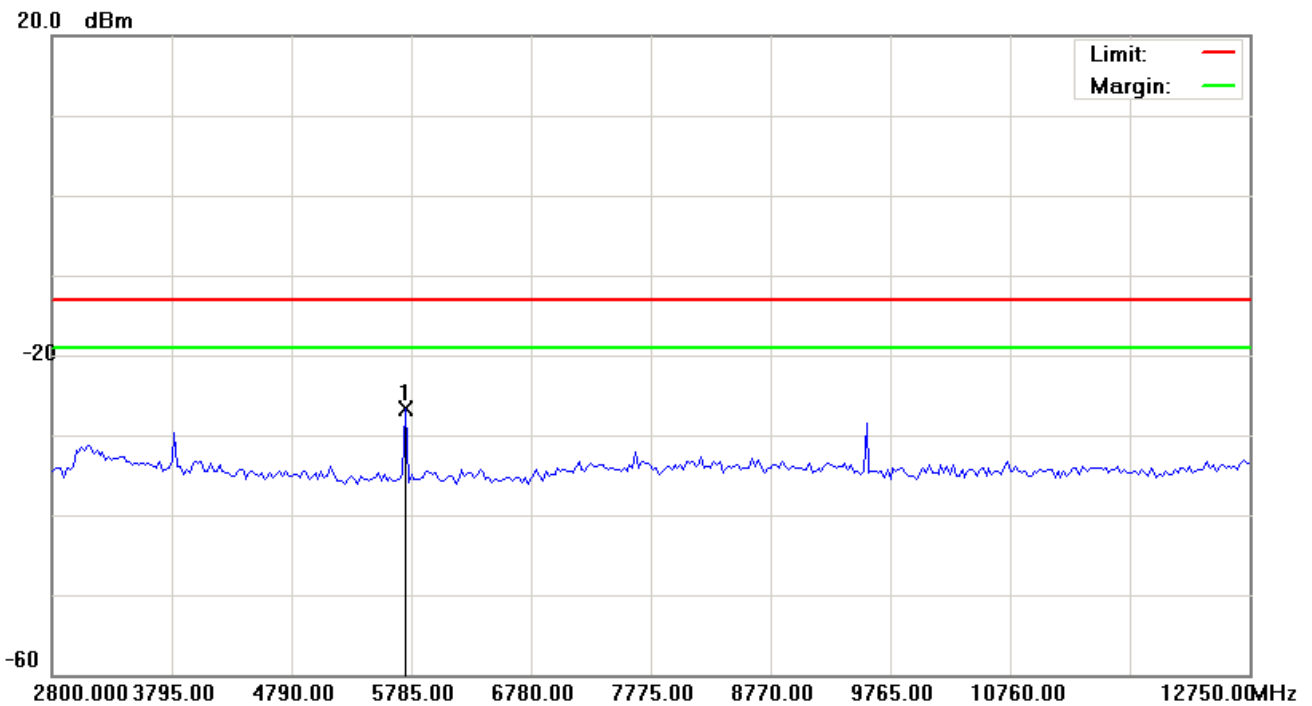
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH810)

Data : #4

Date: 2013/2/5

Time: 上午 10:13:01



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	5735.250	-31.53	4.89	-26.64	-13.00	-13.64	peak		

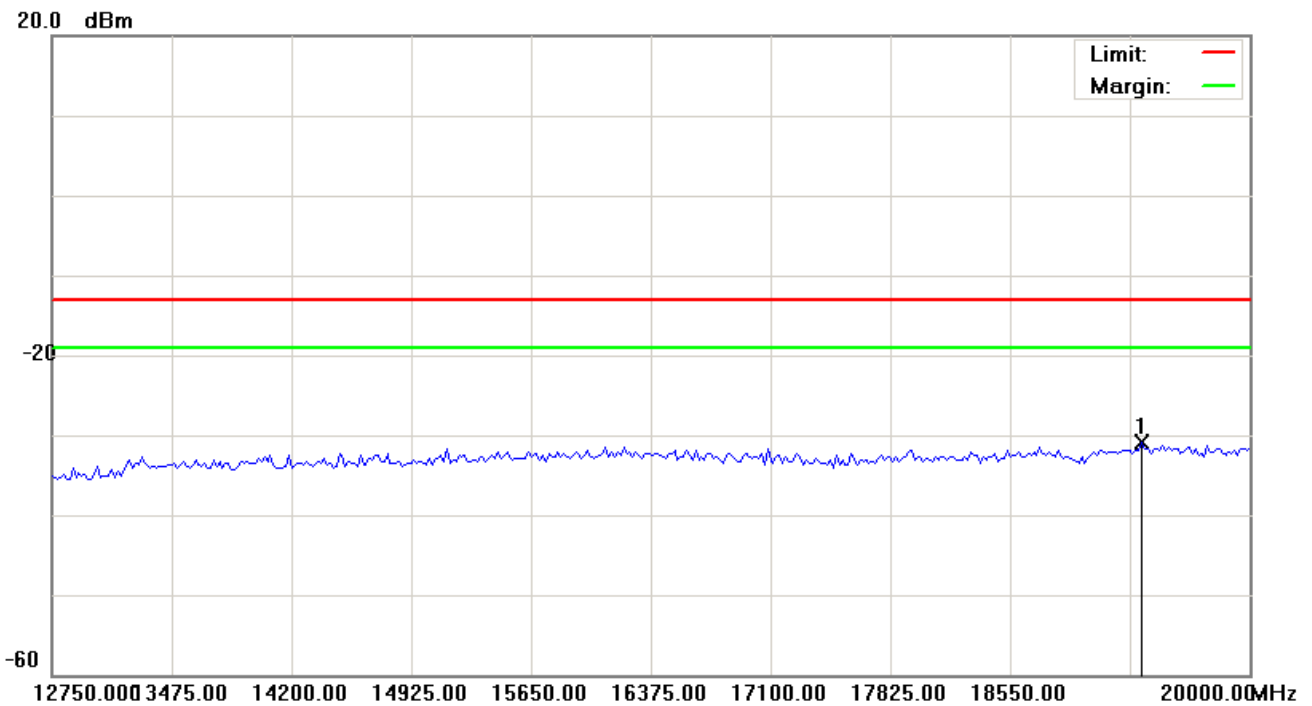
*:Maximum data x:Over limit !:over margin

File : NanoSmart(CH810)

Data : #5

Date: 2013/2/5

Time: 上午 10:13:21



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 24 conducted(9k-26.5G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: Bluetooth GSM Hand-Held Terminal

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: NanoSmart

Mode: GSM 1900

Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	19347.500	-38.24	7.25	-30.99	-13.00	-17.99	peak		

*:Maximum data x:Over limit !:over margin

7 Field Strength of Spurious Radiation Test

7.1. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

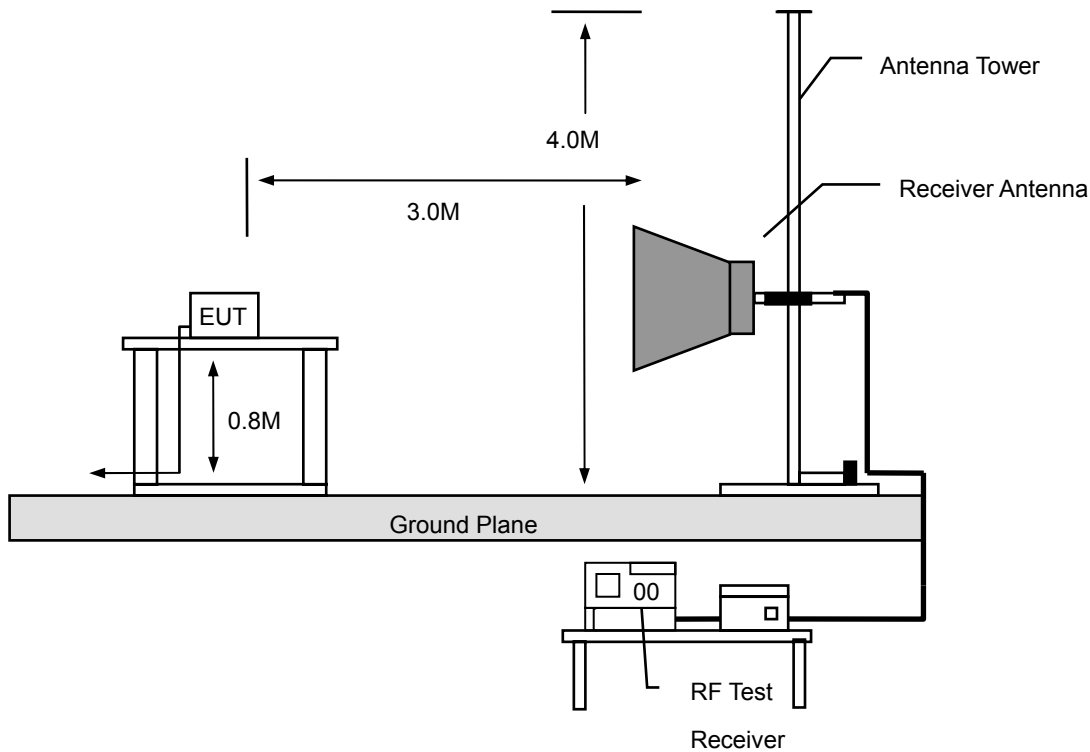
7.2. Test Instruments

3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/21/2013	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/21/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	06/29/2012	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/15/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE01	888001	08/28/2012	(1)

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

7.3. Setup



7.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz 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.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in decibels referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) $\text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) $\text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis(dB)}$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

7.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.

7.6. Test Result

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NanoSmart	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	02/01/2013
Frequency:	824.2 MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
160.0000	-70.25	1.45	-68.80	-13.00	-55.80	peak	H
260.0000	-58.58	-4.34	-62.92	-13.00	-49.92	peak	H
390.0000	-69.85	1.66	-68.19	-13.00	-55.19	peak	H
550.0000	-75.23	8.03	-67.20	-13.00	-54.20	peak	H
612.5000	-79.94	7.80	-72.14	-13.00	-59.14	peak	H
728.0000	-75.48	7.78	-67.70	-13.00	-54.70	peak	H
2788.000	-67.87	17.21	-50.66	-13.00	-37.66	peak	H
5272.000	-70.68	25.01	-45.67	-13.00	-32.67	peak	H
7360.000	-70.66	33.46	-37.20	-13.00	-24.20	peak	H
137.5000	-68.05	10.31	-57.74	-13.00	-44.74	peak	V
206.5000	-68.60	9.37	-59.23	-13.00	-46.23	peak	V
299.0000	-71.43	2.63	-68.80	-13.00	-55.80	peak	V
450.5000	-71.63	1.59	-70.04	-13.00	-57.04	peak	V
597.5000	-75.70	7.26	-68.44	-13.00	-55.44	peak	V
751.5000	-77.75	10.76	-66.99	-13.00	-53.99	peak	V
2836.000	-67.78	19.05	-48.73	-13.00	-35.73	peak	V
4648.000	-70.58	26.47	-44.11	-13.00	-31.11	peak	V
6976.000	-71.08	30.51	-40.57	-13.00	-27.57	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NanoSmart	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	02/01/2013
Frequency:	836.6 MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
160.0000	-69.68	1.45	-68.23	-13.00	-55.23	peak	H
260.0000	-59.79	-4.34	-64.13	-13.00	-51.13	peak	H
350.0000	-74.14	-0.26	-74.40	-13.00	-61.40	peak	H
498.5000	-74.12	6.87	-67.25	-13.00	-54.25	peak	H
612.0000	-79.79	7.79	-72.00	-13.00	-59.00	peak	H
728.0000	-76.40	7.78	-68.62	-13.00	-55.62	peak	H
2968.000	-68.51	17.66	-50.85	-13.00	-37.85	peak	H
5320.000	-70.95	25.23	-45.72	-13.00	-32.72	peak	H
7420.000	-70.93	33.60	-37.33	-13.00	-24.33	peak	H
160.0000	-69.23	12.68	-56.55	-13.00	-43.55	peak	V
260.0000	-64.87	-1.56	-66.43	-13.00	-53.43	peak	V
390.0000	-70.24	1.49	-68.75	-13.00	-55.75	peak	V
552.0000	-72.28	4.32	-67.96	-13.00	-54.96	peak	V
666.0000	-75.40	9.45	-65.95	-13.00	-52.95	peak	V
748.0000	-78.41	10.68	-67.73	-13.00	-54.73	peak	V
2800.000	-67.49	18.79	-48.70	-13.00	-35.70	peak	V
4612.000	-70.51	26.40	-44.11	-13.00	-31.11	peak	V
7072.000	-71.13	30.64	-40.49	-13.00	-27.49	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NanoSmart	Temp.(°C)/Hum. (%RH):	26(°C)/60%RH
Mode:	1	Date:	02/01/2013
Frequency:	848.8 MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
158.0000	-70.87	0.82	-70.05	-13.00	-57.05	peak	H
260.0000	-59.87	-4.34	-64.21	-13.00	-51.21	peak	H
390.0000	-69.71	1.66	-68.05	-13.00	-55.05	peak	H
501.5000	-73.77	7.03	-66.74	-13.00	-53.74	peak	H
598.0000	-78.65	7.90	-70.75	-13.00	-57.75	peak	H
728.0000	-75.90	7.78	-68.12	-13.00	-55.12	peak	H
2716.000	-68.28	17.03	-51.25	-13.00	-38.25	peak	H
4768.000	-70.73	22.52	-48.21	-13.00	-35.21	peak	H
6772.000	-71.00	31.66	-39.34	-13.00	-26.34	peak	H
158.5000	-68.30	11.96	-56.34	-13.00	-43.34	peak	V
249.5000	-62.72	-0.85	-63.57	-13.00	-50.57	peak	V
349.5000	-75.88	1.77	-74.11	-13.00	-61.11	peak	V
498.5000	-66.77	2.71	-64.06	-13.00	-51.06	peak	V
601.5000	-77.01	7.57	-69.44	-13.00	-56.44	peak	V
780.0000	-77.67	11.28	-66.39	-13.00	-53.39	peak	V
2824.000	-68.46	18.96	-49.50	-13.00	-36.50	peak	V
5104.000	-71.25	27.27	-43.98	-13.00	-30.98	peak	V
6832.000	-71.48	30.13	-41.35	-13.00	-28.35	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NanoSmart	Temp.(°C)/Hum. (%RH):	26(°C)/60%RH
Mode:	2	Date:	02/01/2013
Frequency:	1850.2 MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
161.5000	-69.41	0.28	-69.13	-13.00	-56.13	peak	H
260.0000	-60.49	-4.34	-64.83	-13.00	-51.83	peak	H
390.0000	-68.08	1.66	-66.42	-13.00	-53.42	peak	H
498.0000	-73.84	6.85	-66.99	-13.00	-53.99	peak	H
680.0000	-75.21	7.02	-68.19	-13.00	-55.19	peak	H
850.0000	-78.54	12.56	-65.98	-13.00	-52.98	peak	H
3292.000	-68.15	18.53	-49.62	-13.00	-36.62	peak	H
5788.000	-71.12	27.22	-43.90	-13.00	-30.90	peak	H
7708.000	-70.44	33.73	-36.71	-13.00	-23.71	peak	H
160.0000	-69.90	12.68	-57.22	-13.00	-44.22	peak	V
249.0000	-63.05	-0.79	-63.84	-13.00	-50.84	peak	V
390.0000	-69.03	1.49	-67.54	-13.00	-54.54	peak	V
550.0000	-71.59	4.31	-67.28	-13.00	-54.28	peak	V
666.0000	-75.71	9.45	-66.26	-13.00	-53.26	peak	V
831.0000	-79.15	11.32	-67.83	-13.00	-54.83	peak	V
3148.000	-77.24	21.08	-56.16	-13.00	-43.16	peak	V
5380.000	-80.55	27.67	-52.88	-13.00	-39.88	peak	V
7228.000	-80.44	30.81	-49.63	-13.00	-36.63	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NanoSmart	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	02/01/2013
Frequency:	1880.0 MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
160.0000	-70.72	1.45	-69.27	-13.00	-56.27	peak	H
260.0000	-58.85	-4.34	-63.19	-13.00	-50.19	peak	H
390.0000	-69.17	1.66	-67.51	-13.00	-54.51	peak	H
550.0000	-75.10	8.03	-67.07	-13.00	-54.07	peak	H
680.0000	-75.24	7.02	-68.22	-13.00	-55.22	peak	H
899.5000	-78.85	14.04	-64.81	-13.00	-51.81	peak	H
2968.000	-68.74	17.66	-51.08	-13.00	-38.08	peak	H
5716.000	-71.40	26.92	-44.48	-13.00	-31.48	peak	H
7624.000	-70.68	33.75	-36.93	-13.00	-23.93	peak	H
137.5000	-68.87	10.31	-58.56	-13.00	-45.56	peak	V
207.0000	-67.66	9.31	-58.35	-13.00	-45.35	peak	V
289.5000	-70.97	1.77	-69.20	-13.00	-56.20	peak	V
498.0000	-67.31	2.71	-64.60	-13.00	-51.60	peak	V
680.0000	-76.96	9.56	-67.40	-13.00	-54.40	peak	V
831.0000	-77.50	11.32	-66.18	-13.00	-53.18	peak	V
3268.000	-68.02	21.77	-46.25	-13.00	-33.25	peak	V
5728.000	-70.66	27.82	-42.84	-13.00	-29.84	peak	V
7648.000	-70.50	30.89	-39.61	-13.00	-26.61	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	NanoSmart	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	02/01/2013
Frequency:	1909.8 MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
160.0000	-70.87	1.45	-69.42	-13.00	-56.42	peak	H
260.0000	-60.68	-4.34	-65.02	-13.00	-52.02	peak	H
390.0000	-68.57	1.66	-66.91	-13.00	-53.91	peak	H
550.0000	-74.83	8.03	-66.80	-13.00	-53.80	peak	H
728.0000	-76.60	7.78	-68.82	-13.00	-55.82	peak	H
920.0000	-80.67	14.74	-65.93	-13.00	-52.93	peak	H
3256.000	-68.21	18.43	-49.78	-13.00	-36.78	peak	H
5200.000	-70.66	24.67	-45.99	-13.00	-32.99	peak	H
7240.000	-71.25	33.19	-38.06	-13.00	-25.06	peak	H
155.5000	-67.45	10.51	-56.94	-13.00	-43.94	peak	V
249.0000	-63.19	-0.79	-63.98	-13.00	-50.98	peak	V
390.0000	-68.76	1.49	-67.27	-13.00	-54.27	peak	V
552.0000	-72.47	4.32	-68.15	-13.00	-55.15	peak	V
680.0000	-75.82	9.56	-66.26	-13.00	-53.26	peak	V
831.0000	-78.65	11.32	-67.33	-13.00	-54.33	peak	V
2812.000	-68.10	18.88	-49.22	-13.00	-36.22	peak	V
5260.000	-71.15	27.49	-43.66	-13.00	-30.66	peak	V
7108.000	-70.06	30.68	-39.38	-13.00	-26.38	peak	V

8 Frequency Stability (Temperature & Voltage Variation) Test

8.1. Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

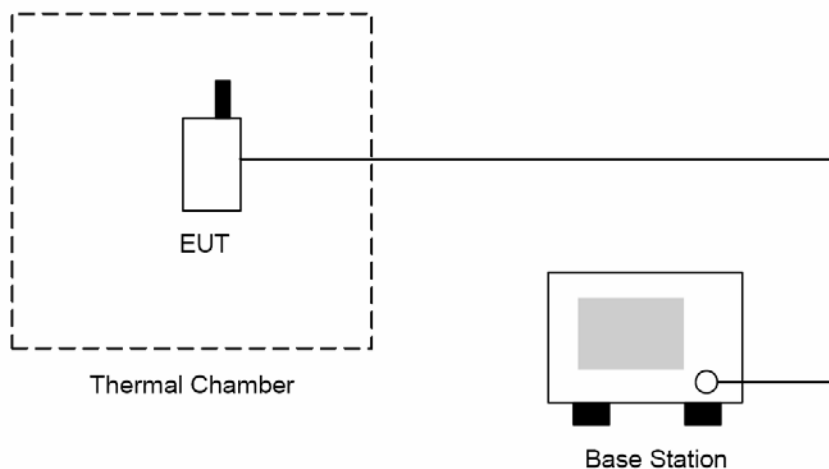
8.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2012	(2)
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	08/07/2012	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

8.3. Setup



8.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

8.5. Uncertainty

The measurement uncertainty is defined as for Frequency Stability (Temperature Variation) measurement is $\pm 10\text{Hz}$.

8.6. Test Result

Model Number	NanoSmart					
Test Item	Frequency Stability (Temperature & Voltage Variation)					
Test Mode	Mode 1					
Date of Test	02/05/2013				Test Site	TE05
Level	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
Normal	3.70	-30	-41	-0.049	±2.5	Pass
Normal	3.70	-20	-43	-0.051	±2.5	Pass
Normal	3.70	-10	-38	-0.045	±2.5	Pass
Normal	3.70	0	-32	-0.038	±2.5	Pass
Normal	3.70	10	-36	-0.043	±2.5	Pass
Battery full point	4.20	20	-36	-0.043	±2.5	Pass
Normal	3.70	20	-41	-0.049	±2.5	Pass
Battery cut-off point	3.40	20	-29	-0.035	±2.5	Pass
Normal	3.70	30	-39	-0.047	±2.5	Pass
Normal	3.70	40	-37	-0.044	±2.5	Pass
Normal	3.70	50	-34	-0.041	±2.5	Pass

Model Number	NanoSmart					
Test Item	Frequency Stability (Temperature & Voltage Variation)					
Test Mode	Mode 2					
Date of Test	02/05/2013				Test Site	TE05
Level	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
Normal	3.70	-30	-21	-0.011	±2.5	Pass
Normal	3.70	-20	-34	-0.018	±2.5	Pass
Normal	3.70	-10	-35	-0.019	±2.5	Pass
Normal	3.70	0	-32	-0.017	±2.5	Pass
Normal	3.70	10	-22	-0.012	±2.5	Pass
Battery full point	4.20	20	-36	-0.019	±2.5	Pass
Normal	3.70	20	-28	-0.015	±2.5	Pass
Battery cut-off point	3.40	20	-34	-0.018	±2.5	Pass
Normal	3.70	30	-24	-0.013	±2.5	Pass
Normal	3.70	40	-35	-0.019	±2.5	Pass
Normal	3.70	50	-28	-0.015	±2.5	Pass