RF TEST REPORT

Test item	:	Smart RFID Dongle Reader
Model No.	:	A100-U
Order No.	:	DEMC1306-01803
Date of receipt	:	2013-06-10
Test duration	:	2016-06-20 ~ 2013-07-11
Date of issue	:	2013-07-19
Use of report	:	FCC Original Grant

Applicant : PHYCHIPS Inc.
#205 Migun Techno World 1, 533 Yongsan-dong, Yuseong-gu, Daejeon, Korea, 305-500

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification	:	FCC Part 15 Subpart C 247
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

Tested by:	Witnessed by:	Reviewed by:
Engineer HongHee Lee	N/A	Technical Director Harvey Sung

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1. General Information

1.1 Testing Laboratory

Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea
www.digitalemc.com
Test Lab Site Number : 678747
Telephone : + 82-31-321-2664
FAX : + 82-31-321-1664

1.2 Details of Applicant

Applicant	:	PHYCHIPS Inc.
Address	:	#205 Migun Techno World 1, 533 Yongsan-dong, Yuseong-gu, Daejeon, Korea, 305-500
Contact person	:	Laekyu Chang
Phone No.	:	+82-42-864-2402

1.3 Description of EUT

Product	Smart RFID Dongle Reader
Model Name	A100-U
Serial Number	Identical prototype
Power Supply	DC 3.7 V
Frequency Range	917.10 ~ 926.90 MHz
Modulation Technique	A1D
Number of Channels	50 (Channel Spacing 200 kHz)
Antenna Type	Circular Polarization Antenna
Antenna Gain	Max. PK -3.5 dBi

1.4. Declaration by the manufacturer

- N/A

1.6. Test Equipment List

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	E4440A	12/10/22	13/10/22	US45303051
MXA Signal Analyzer	Agilent	N9020A	13/04/10	14/04/10	MY50200816
Spectrum Analyzer	Rohde Schwarz	FSQ26	13/02/14	14/02/14	200445
Digital Multimeter	H.P	34401A	13/02/27	14/02/27	3146A13475
Signal Generator	Rohde Schwarz	SMR20	13/02/28	14/02/28	101251
Vector Signal Generator	Rohde Schwarz	SMJ100A	13/01/08	14/01/08	255571
Thermo hygrometer	BODYCOM	BJ5478	13/06/01	14/06/01	120612-2
DC Power Supply	H.P	6622A	13/02/27	14/02/27	3448A03760
High-Pass Filter	Wainwright	WHKX1.0	12/09/17	13/09/17	9
Attenuator (10dB)	WEINSCHEL	86-10-11	12/09/17	13/09/17	446
BILOG ANTENNA	SCHAFFNER	CBL6112B	12/11/06	14/11/06	2737
HORN ANT	ETS	3115	12/02/20	14/02/20	6419
Loop Antenna	Schwarzbeck	FMZB1513	12/09/24	13/09/24	1513-128
Amplifier (22dB)	H.P	8447E	13/01/08	14/01/08	2945A02865
Amplifier (30dB)	Agilent	8449B	13/02/27	14/02/27	3008A00370
EMI TEST RECEIVER	R&S	ESU	13/01/08	14/01/08	100014
EMI TEST RECEIVER	R&S	ESCI	13/02/27	14/02/27	100364
CVCF	KIKUSUI	PCR1000L	12/09/15	13/09/15	14110610
LISN	Rohde Schwarz	ESH2-Z5	12/09/18	13/09/18	828739/006

1.7. Summary of Test Results

FCC Part Section(s)	Parameter	Test Condition	Status Note 1
I. Transmit mode (TX)			
15.247(a)	Carrier Frequency Separation	Conducted	C
	Number of Hopping Frequencies		C
	20 dB Bandwidth		C
	Dwell Time		C
15.247(b)	Transmitter Output Power		C
15.247(d)	Band-edge /Conducted		C
	Conducted Spurious Emissions		C
15.205, 15.209	Radiated Spurious Emissions	Radiated	C Note.2
15.207	AC Conducted Emissions	AC Line Conducted	C
15.203	Antenna Requirements	-	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: This test item was performed in each axis. And the worst case data were reported.

1.8 Conclusion of worst-case and operation mode

The field strength of spurious emission was measured in three orthogonal EUT positions(X-axis, Y-axis and Z-axis).

Tested frequency information,

- Hopping Function: Enable

	TX Frequency (MHz)	RX Frequency (MHz)
Hopping Band	917.10 ~ 926.90	917.10 ~ 926.90

- Hopping Function: Disable

	TX Frequency (MHz)	RX Frequency (MHz)
Lowest Channel	917.10	917.10
Middle Channel	921.90	921.90
Highest Channel	926.90	926.90

1.9 Test report revision

Test Report No.	Date	Description
DRTFCC1307-0695	Jul. 19, 2013	Final version for Approval

2. Radiated Spurious Emissions and Conducted Spurious Emission

2.1. Test Setup

Refer to the APPENDIX I.

2.2. Limit

According to §15.247(d), in any 100 ㎑ bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 ㏈ below that in the 100 ㎑ bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement , provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval , as permitted under paragraph(b)(3) of this section , the attenuation required under this paragraph shall be 30 ㏈ instead of 20 ㏈. Attenuation below the general limits specified in section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section §15.205(a), must also comply the radiated emission limits specified in section §15.209(a) (see section §15.205(c))

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

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.

According to § 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	3600 ~ 4400	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	4.5 ~ 5.15	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~ 167.17	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.72 ~ 173.2	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	240 ~ 285	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	37.5 ~ 38.25	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	608 ~ 614	3345.8 ~ 3358		
		960 ~ 1240			

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

2.3. Test Procedures

Radiated emissions from the EUT were measured according to the DA 00-705 and ANSI C63.4:2003

2.3.1. Test Procedures for Radiated Spurious Emissions

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 ㎓, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 ㏈ lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 ㏈ margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE ;
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 ㎑ for Quasi-peak detection (QP) at frequency below 1 ㎓.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1㎒ for Peak detection and frequency above 1 ㎓.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 ㎒ and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 ㎓.

2.3.2. Test Procedures for Conducted Spurious Emissions

1. The transmitter output was connected to the spectrum analyzer.
2. The reference level of the fundamental frequency was measured with the spectrum analyzer using RBW=100 ㎑, VBW ≥ RBW.
3. The conducted spurious emission was performed using the spectrum analyzer's spurious from the lowest frequency generator used up to the 10^{th} harmonics. The following spectrum settings was,
   RBW=100 ㎑, VBW ≥ RBW, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD.

2.4. Test Results

Ambient temperature : 24 °C
Relative humidity : 49 %

2.4.1. Radiated Emission

9kHz ~ 10GHz Data

▪ Lowest Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2751.330	V	Y	PK	55.66	-1.71	N/A	53.95	74.00	20.05
2751.310	V	Y	AV	48.72	-1.71	N/A	47.01	54.00	6.99
3668.340	H	X	PK	56.24	2.36	N/A	58.60	74.00	15.40
3668.320	H	X	AV	49.87	2.36	N/A	52.23	54.00	1.77
4585.480	H	X	PK	51.90	4.98	N/A	56.88	74.00	17.12
4585.550	H	X	AV	45.69	4.98	N/A	50.67	54.00	3.33

▪ Middle Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2765.640	V	Y	PK	55.71	-1.66	N/A	54.05	74.00	19.95
2765.660	V	Y	AV	49.38	-1.66	N/A	47.72	54.00	6.28
3687.650	H	X	PK	56.27	2.47	N/A	58.74	74.00	15.26
3687.660	H	X	AV	49.19	2.47	N/A	51.66	54.00	2.34
4609.450	H	X	PK	52.18	5.03	N/A	57.21	74.00	16.79
4609.400	H	X	AV	44.37	5.03	N/A	49.40	54.00	4.60

▪ Highest Channel

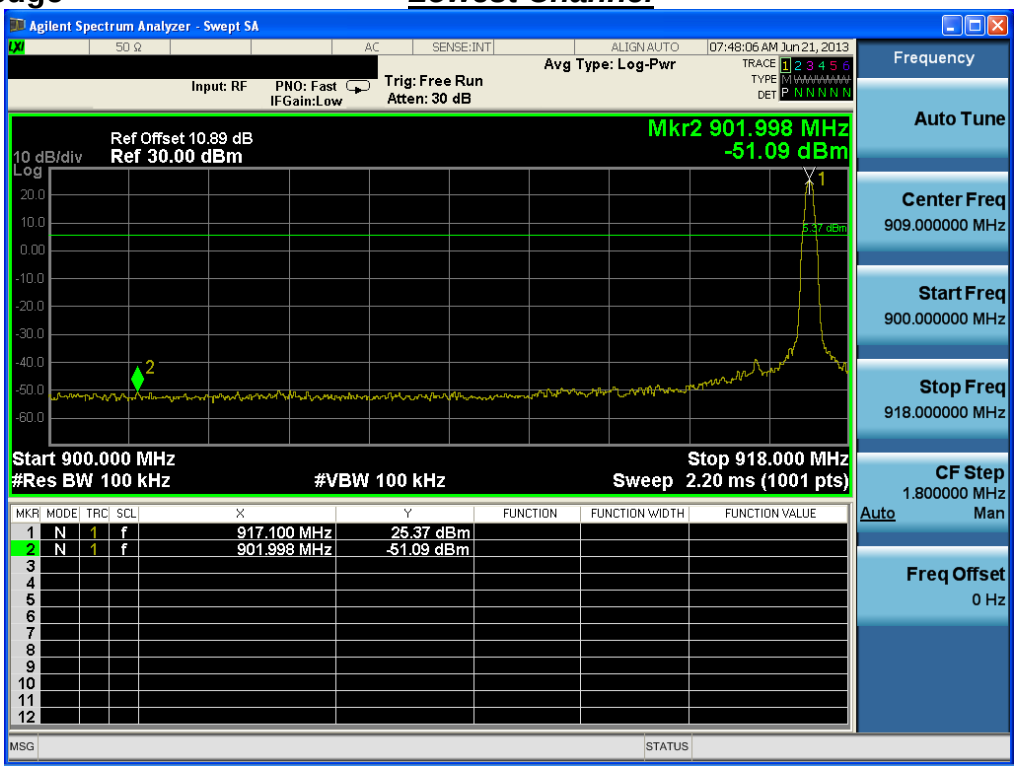
Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2780.170	V	Y	PK	57.08	-1.60	N/A	55.48	74.00	18.52
2780.700	V	Y	AV	51.07	-1.60	N/A	49.47	54.00	4.53
3707.610	H	X	PK	55.70	2.59	N/A	58.29	74.00	15.71
3707.610	H	X	AV	49.81	2.59	N/A	52.40	54.00	1.60
4634.450	H	X	PK	52.36	5.07	N/A	57.43	74.00	16.57
4634.550	H	X	AV	44.64	5.07	N/A	49.71	54.00	4.29

Note.

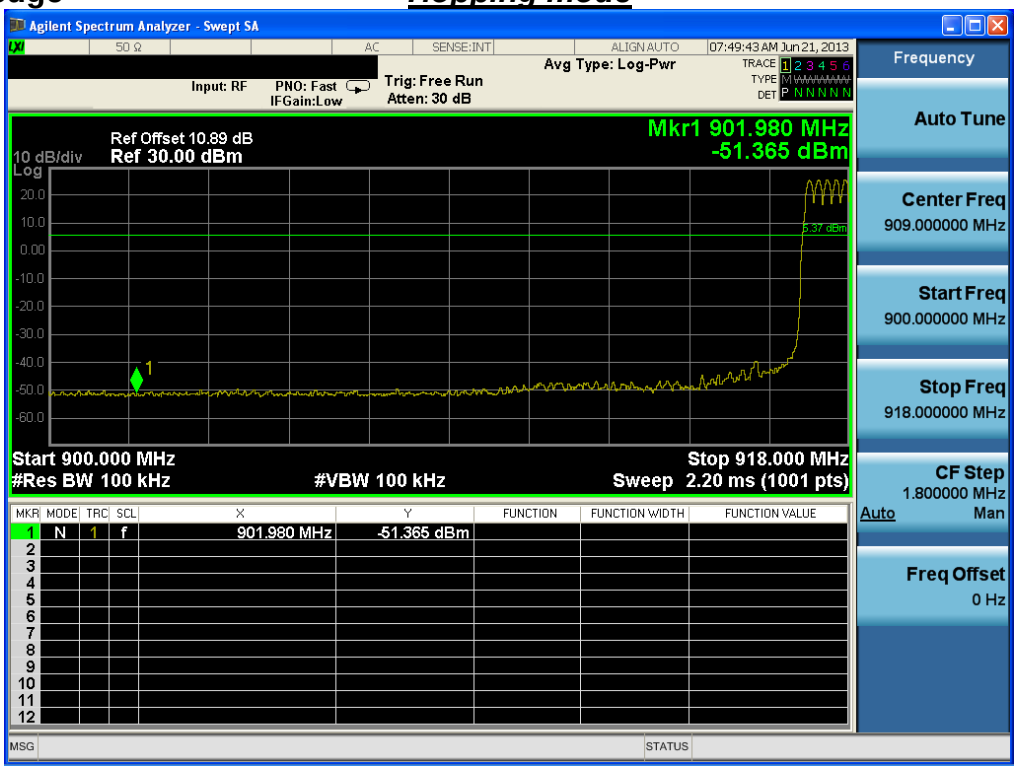
1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCF = Duty Cycle Correction Factor

2.4.2. Conducted Spurious Emissions

Low Band-edge ***Lowest Channel***

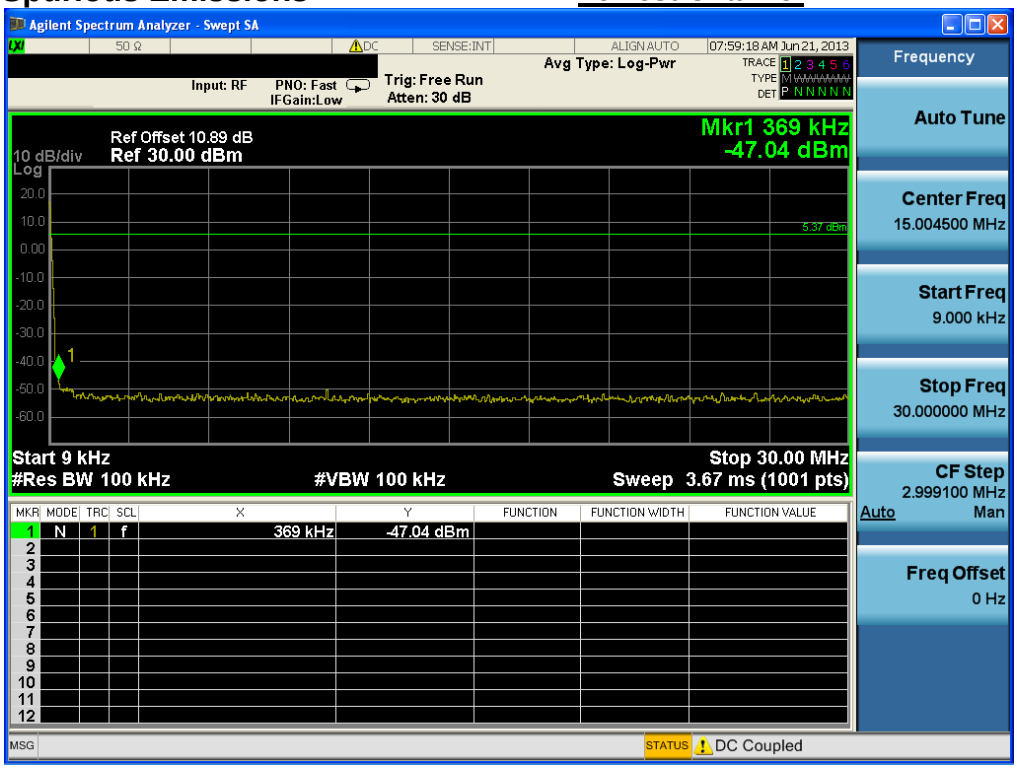


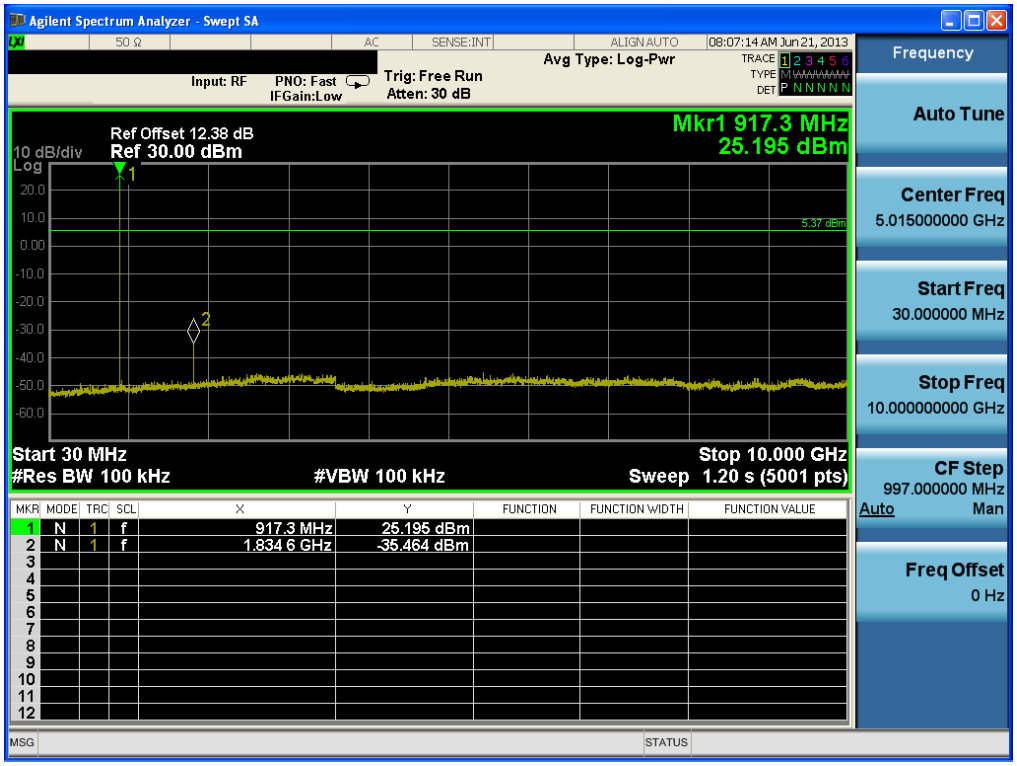
Low Band-edge ***Hopping mode***



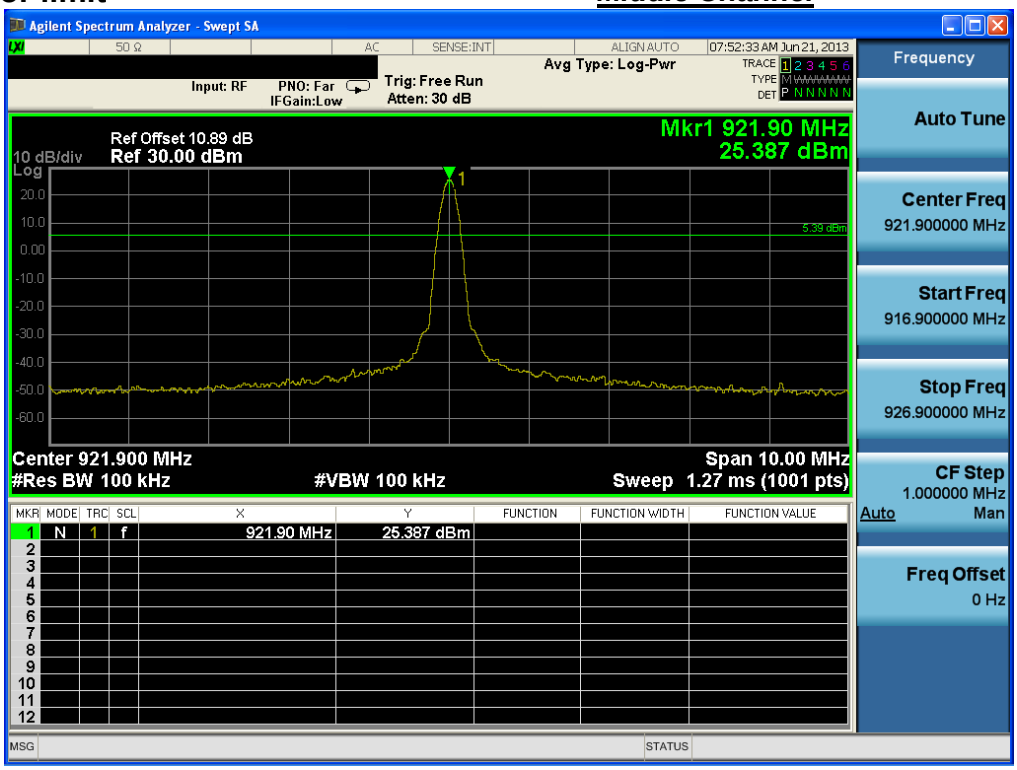
Conducted Spurious Emissions

Lowest Channel



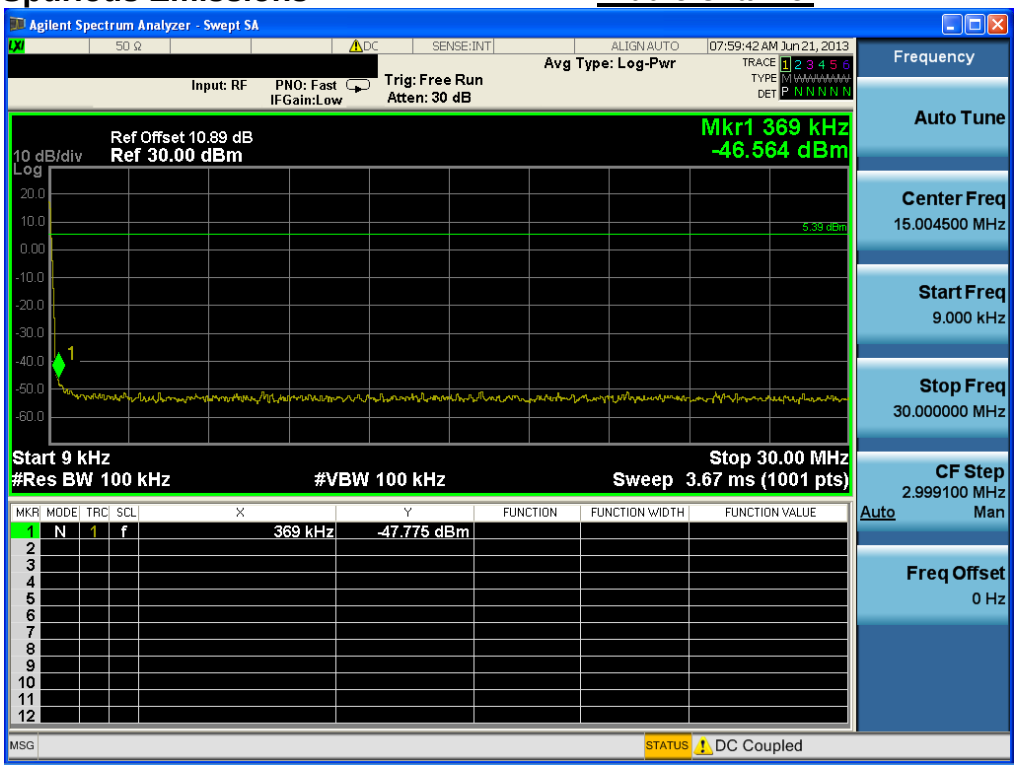


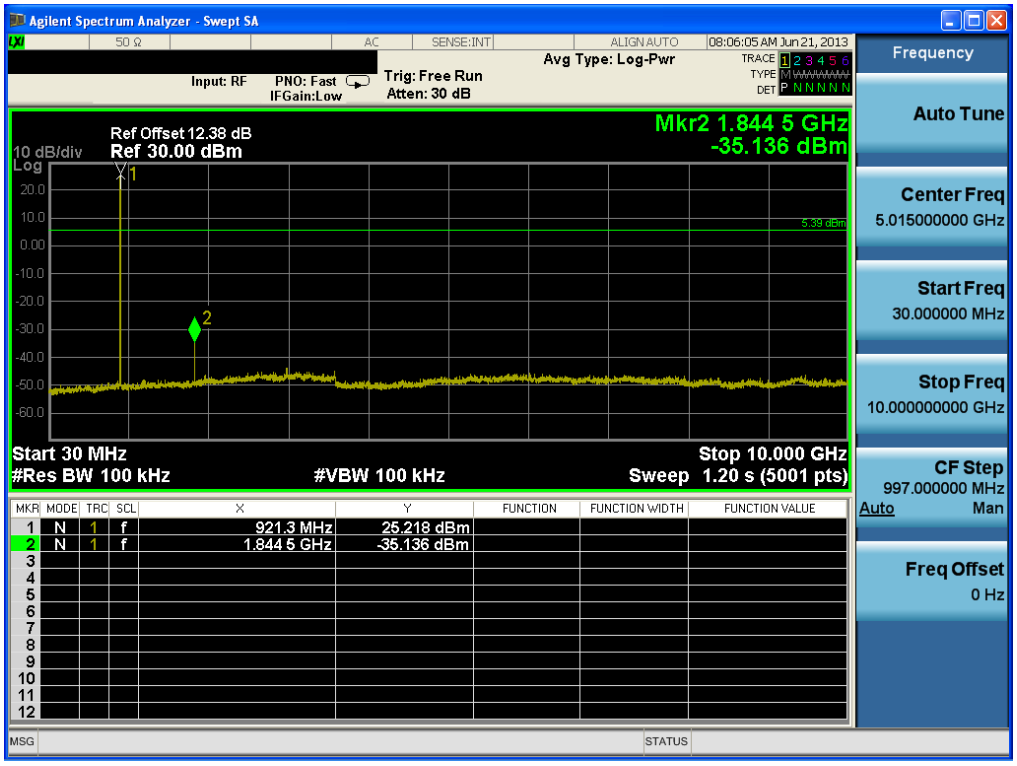
Reference for limit ***Middle Channel***



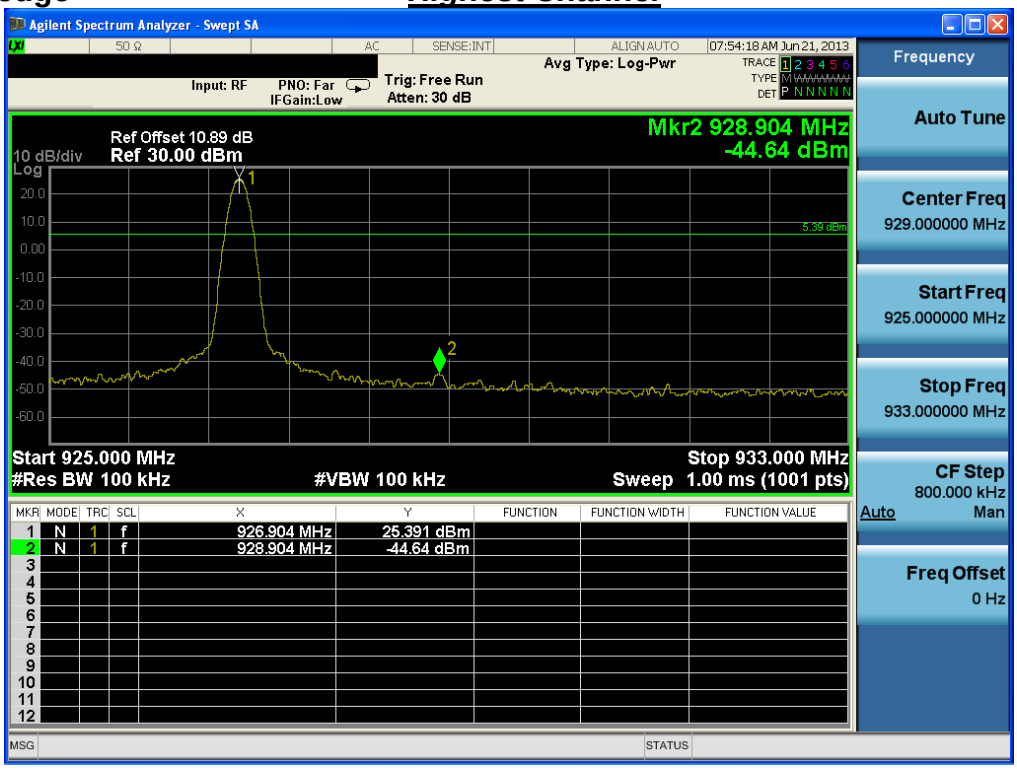
Conducted Spurious Emissions

Middle Channel

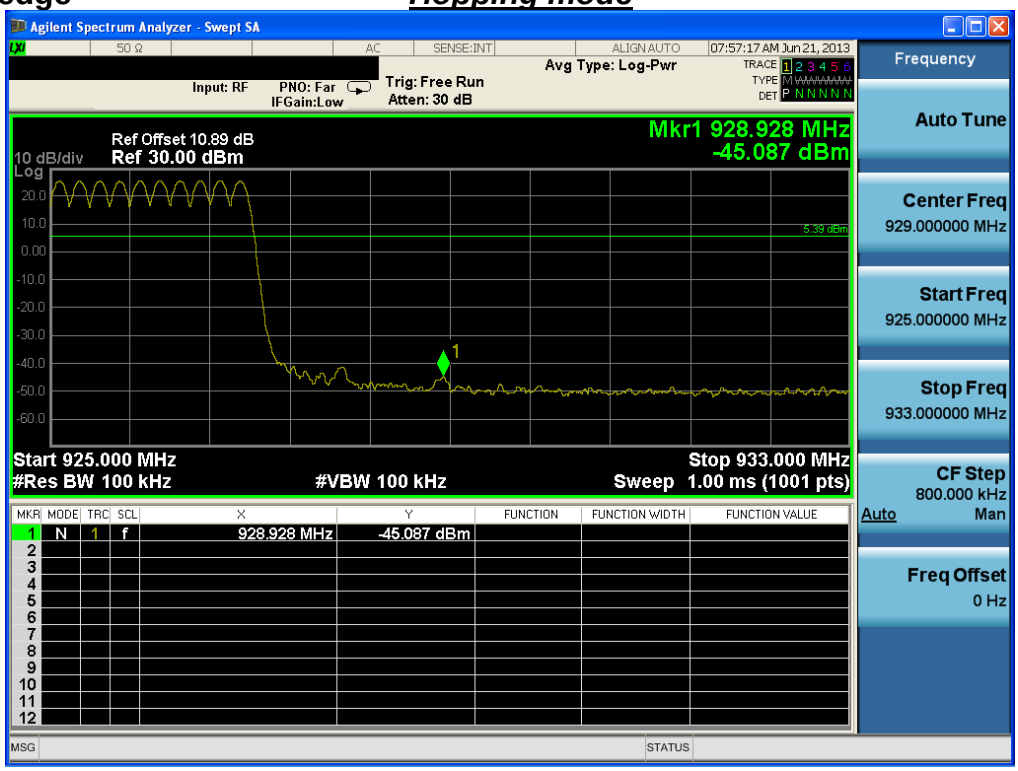




High Band-edge *Highest Channel*

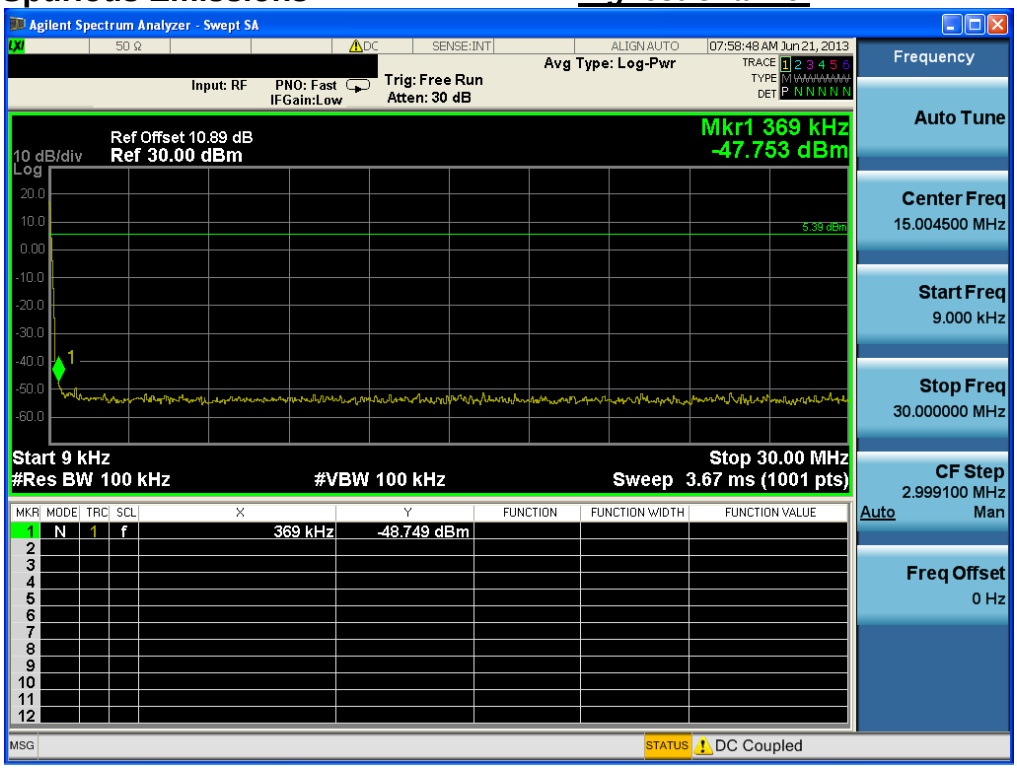


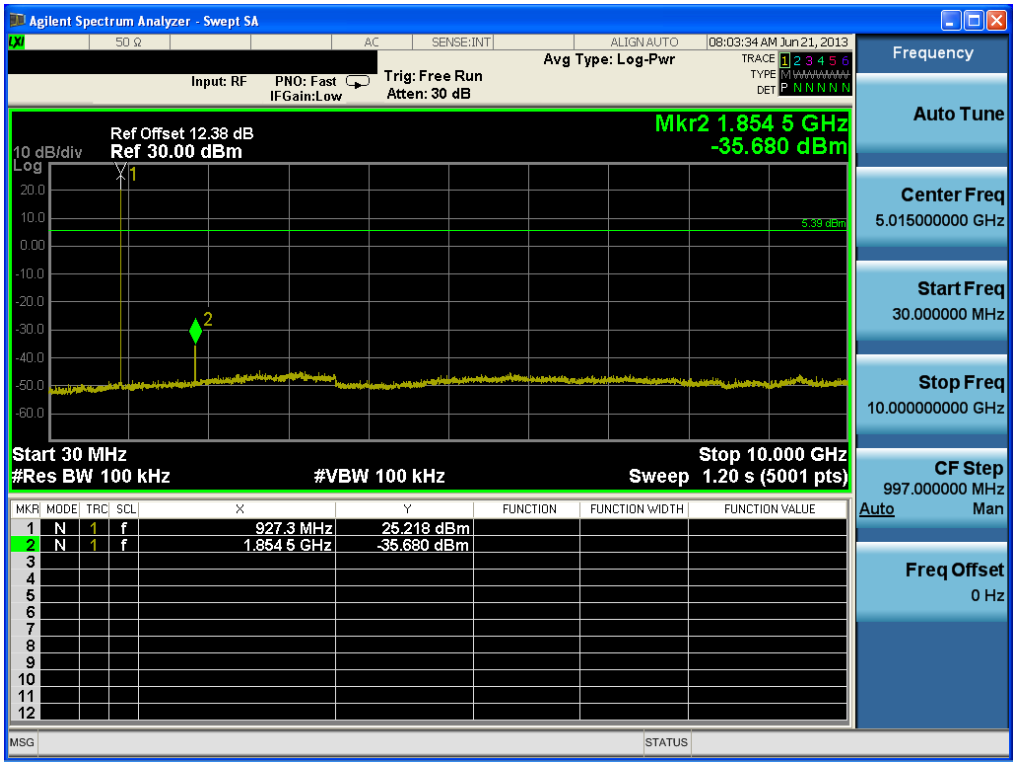
High Band-edge *Hopping mode*



Conducted Spurious Emissions

Highest Channel





3. Carrier Frequency Separation

3.1. Test Setup

Refer to the APPENDIX I.

3.2. Limit

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.

3.3 Test 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 = wide enough to capture the peaks of two adjacent channels
RBW = 1% of the span
VBW = ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

3.4 Test Results:

Hopping Mode	Peak of center channel (MHz)	Peak of adjacent Channel (MHz)	Test Result (kHz)
Enable	921.9	922.1	200

4. Number of Hopping Frequencies

4.1. Test Setup

Refer to the APPENDIX I.

4.2. Limit

Limit: >= 50 hops

4.3 Test Procedure:

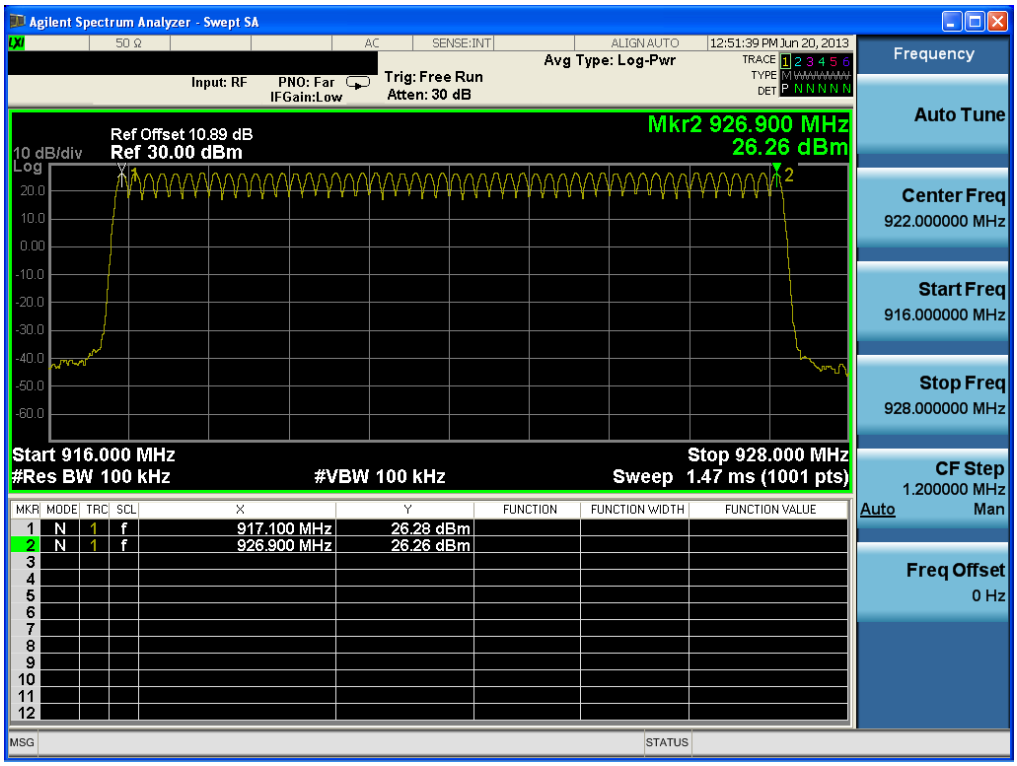
The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.
To get higher resolution, four frequency ranges within the 902 ~ 930 MHz FH band were examined.

The spectrum analyzer is set to:

Span = 18 MHz(Start Frequency = 916 MHz / Stop Frequency = 928 MHz)
RBW = 1% of the span or more
Sweep = auto
VBW = ≥ RBW
Detector function = peak
Trace = max hold

4.4 Test Results:

Hopping mode	Test Result (Total Hops)
Enable	50



5. 20dBc BW

5.1. Test Setup

Refer to the APPENDIX I.

5.2. Limit

Limit: < 250kHz for applying the hopping frequencies and the average time of occupancy

5.3. Test 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 = 500 kHz
RBW = 1 kHz
VBW = ≥ RBW
Trace = max hold
Sweep = auto
Detector function = peak

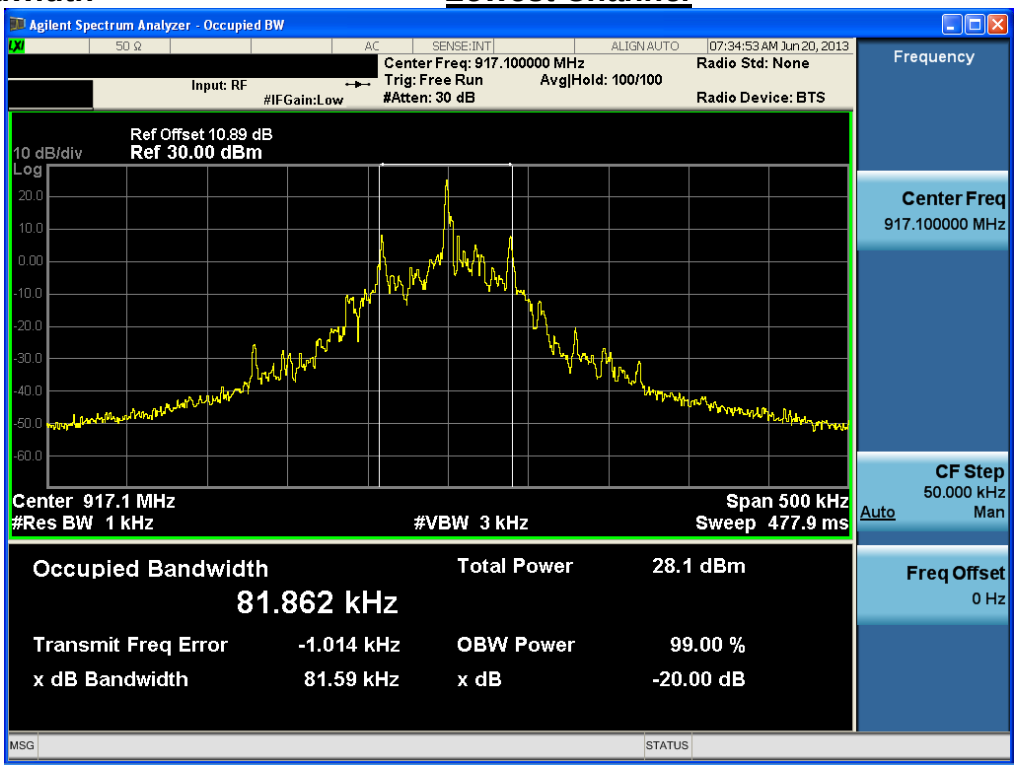
5.4. Test Results

Ambient temperature : 22 °C
Relative humidity : 53 %

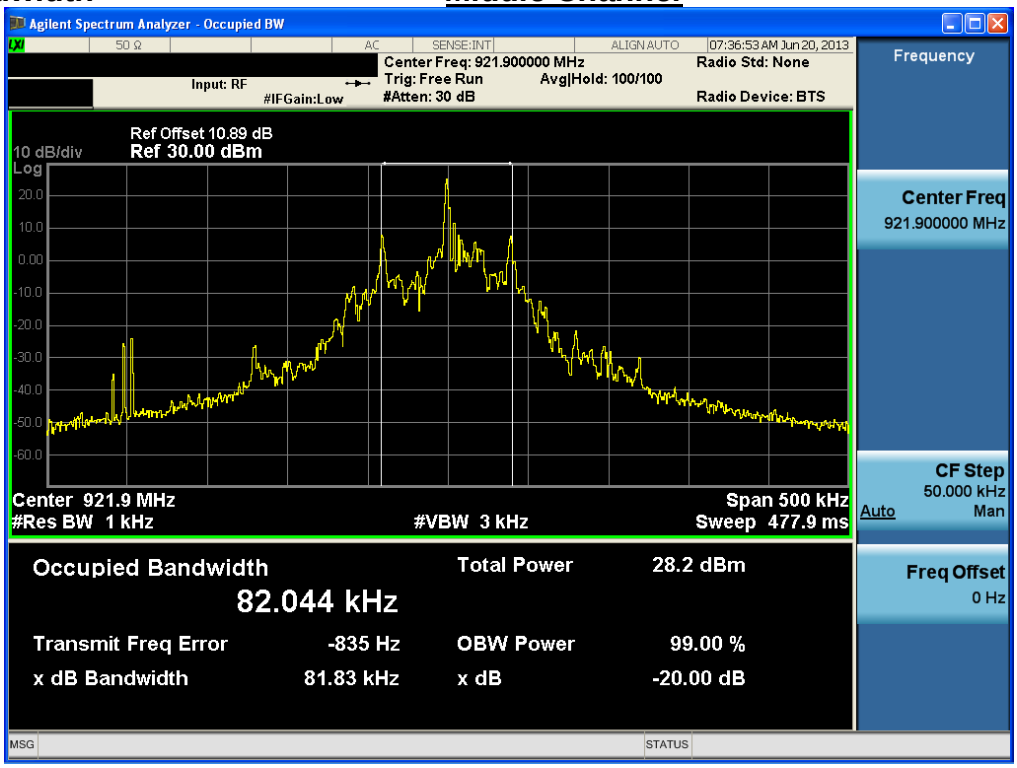
Frequency (MHz)	Tested Channel	20dBc BW (kHz)
917.10	Lowest	81.59
921.90	Middle	81.83
926.90	Highest	81.27

Note 1: See next pages for actual measured spectrum plots.

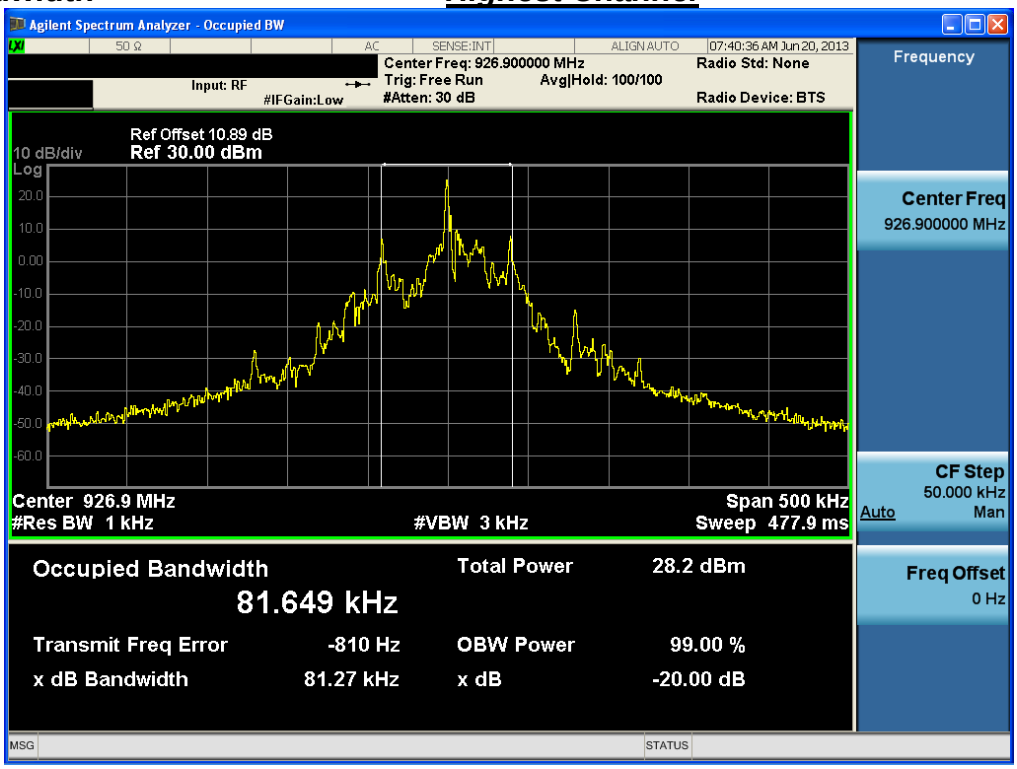
20dBc Bandwidth *Lowest Channel*



20dBc Bandwidth *Middle Channel*



20dBc Bandwidth ***Highest Channel***



6. Time of Occupancy (Dwell Time)

6.1. Test Setup

Refer to the APPENDIX I.

6.2. Limit

Limit: < 0.4 seconds within a 20 second period

6.3. Test Procedure

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

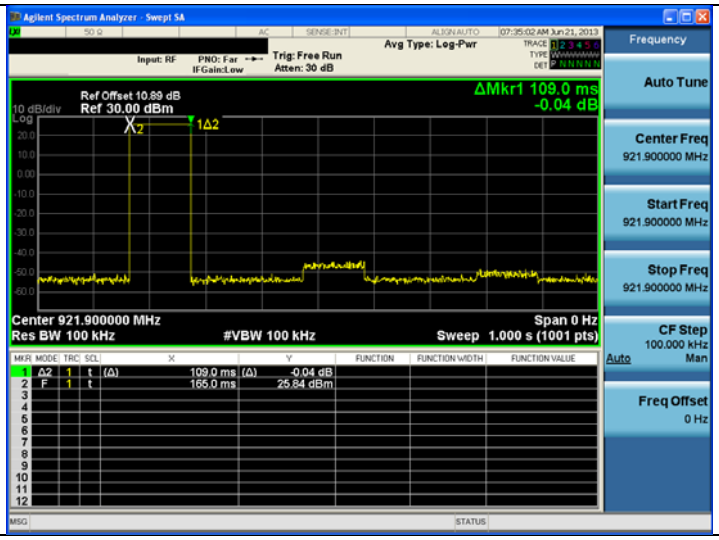
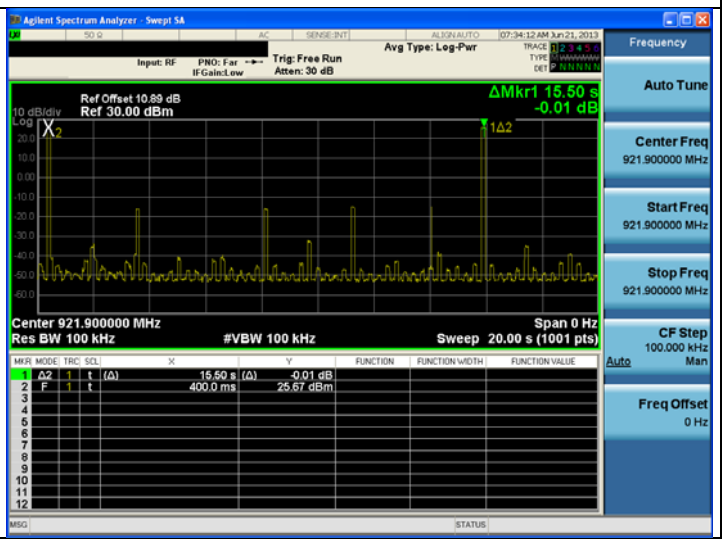
The spectrum analyzer is set to:

RBW = 100 kHz
VBW = ≥ RBW
Span = zero
Detector function = peak
Trace max hold

6.4. Test Results

Ambient temperature : 22 °C
Relative humidity : 53 %

Channel Frequency (MHz)	Length (ms)	Number	Dwell Time (ms)
921.90	109.0	2	218.0

Length	Period
	

7. Maximum Peak Output Power Measurement

7.1. Test Setup

Refer to the APPENDIX I.

7.2. Limit

The maximum peak output power of the intentional radiator shall not exceed the following :

1. §15.247(b)(2), For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels,

7.3. Test Procedure

1. The RF power output was measured with a Spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency, A spectrum analyzer was used to record the shape of the transmit signal.

2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using ;
   RBW ≥ 20dB BW
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold

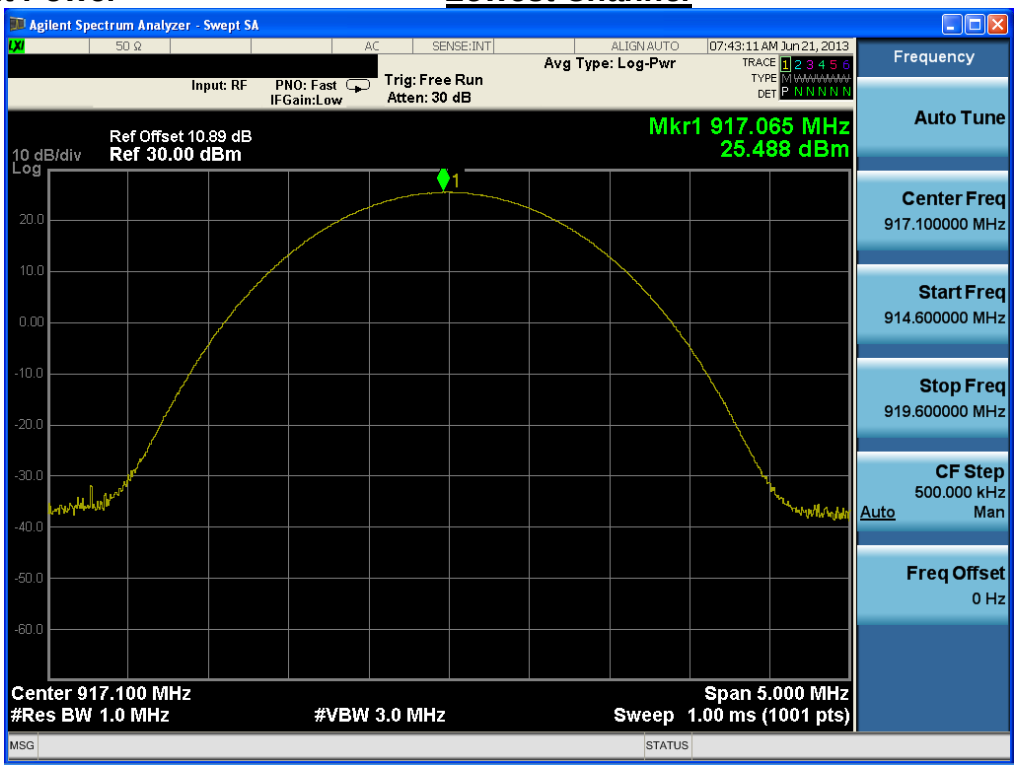
7.4. Test Results

Ambient temperature : 22 °C
Relative humidity : 53 %

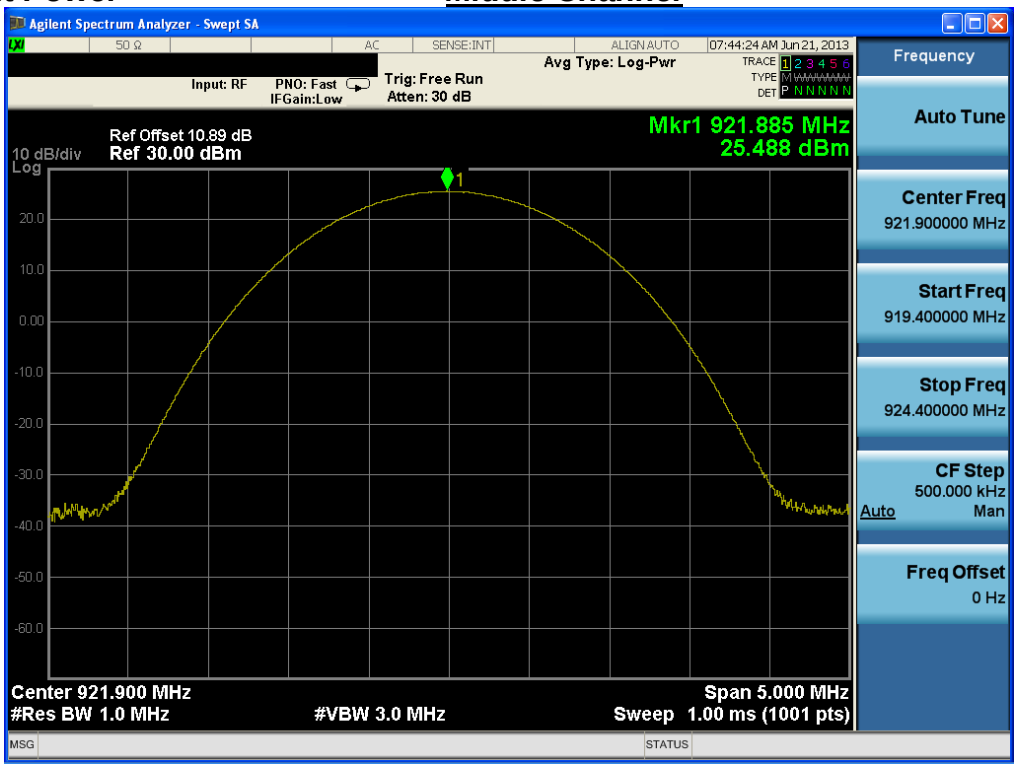
Tested Channel	Peak Output Power	
	dBm	mW
Lowest	**25.488**	**353.834**
Middle	25.488	353.834
Highest	25.483	353.427

Note 1: See next pages for actual measured spectrum plots.

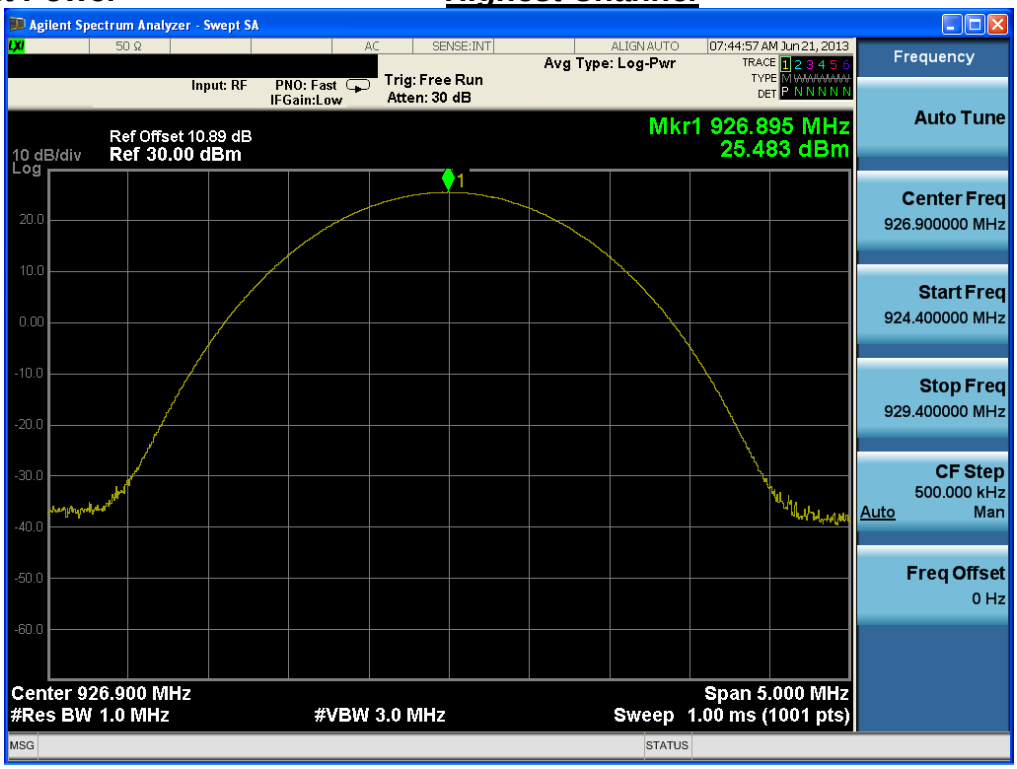
Peak Output Power *Lowest Channel*



Peak Output Power *Middle Channel*



Peak Output Power ***Highest Channel***



8. Transmitter AC Power Line Conducted Emission

8.1. Test Setup

Refer to test setup photo.

8.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

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

8.3. Test Procedures

Conducted emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

8.4. Test Results

AC Line Conducted Emissions (Graph)

Digital EMC

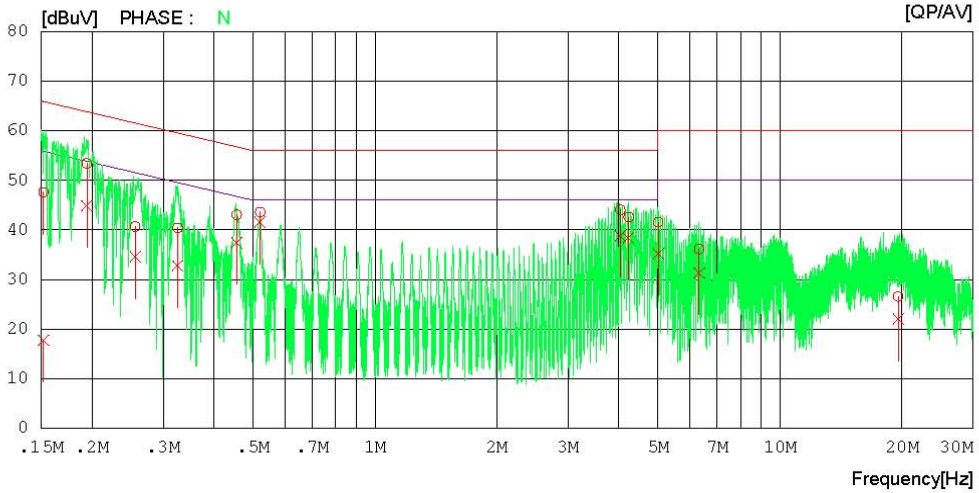
Results of Conducted Emission

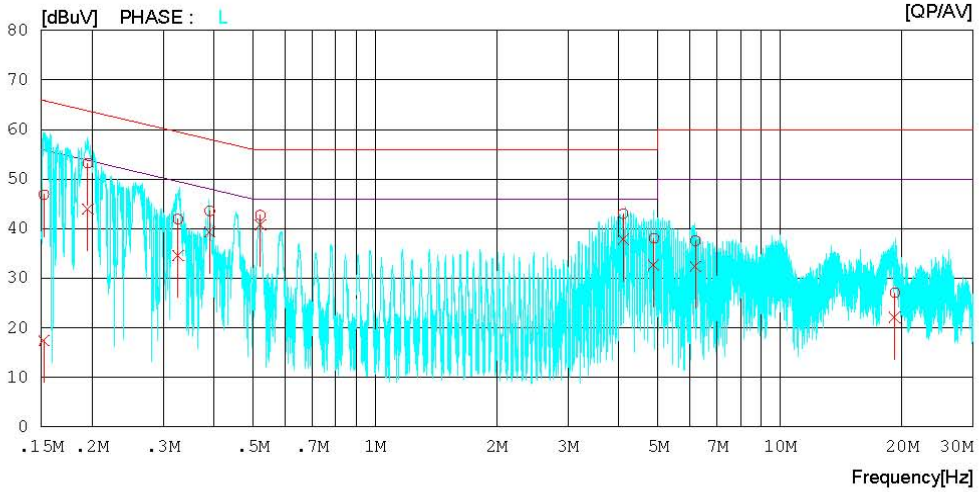
Digital EMC
Date : 2013-06-30

Model No.	:	A100-U	Referrence No.	:	
Type	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 35 % R.H.
Test Condition	:	UHF	Operator	:	H.H.LEE

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV





AC Line Conducted Emissions (List)

Results of Conducted Emission

Digital EMC
Date : 2013-06-30

Model No.	:	A100-U	Referrence No.	:	
Type	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 35 % R.H.
Test Condition	:	UHF	Operator	:	H.H.LEE

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15191	47.4	17.6	0.2	47.6	17.8	65.9	55.9	18.3	38.1	N
2	0.19444	53.2	44.7	0.2	53.4	44.9	63.8	53.8	10.4	8.9	N
3	0.25615	40.5	34.4	0.2	40.7	34.6	61.6	51.6	20.9	17.0	N
4	0.32588	40.2	32.5	0.2	40.4	32.7	59.6	49.6	19.2	16.9	N
5	0.45575	42.9	37.2	0.2	43.1	37.4	56.8	46.8	13.7	9.4	N
6	0.52058	43.4	41.4	0.2	43.6	41.6	56.0	46.0	12.4	4.4	N
7	4.03640	43.7	38.5	0.3	44.0	38.8	56.0	46.0	12.0	7.2	N
8	4.22940	42.3	38.1	0.3	42.6	38.4	56.0	46.0	13.4	7.6	N
9	5.01280	41.1	34.8	0.4	41.5	35.2	60.0	50.0	18.5	14.8	N
10	6.31400	35.6	30.8	0.5	36.1	31.3	60.0	50.0	23.9	18.7	N
11	19.59680	25.6	21.2	0.9	26.5	22.1	60.0	50.0	33.5	27.9	N
12	0.15232	46.7	17.2	0.2	46.9	17.4	65.9	55.9	19.0	38.5	L
13	0.19541	53.0	43.8	0.2	53.2	44.0	63.8	53.8	10.6	9.8	L
14	0.32650	41.7	34.4	0.2	41.9	34.6	59.5	49.5	17.6	14.9	L
15	0.39104	43.4	39.2	0.2	43.6	39.4	58.0	48.0	14.4	8.6	L
16	0.52111	42.5	40.6	0.2	42.7	40.8	56.0	46.0	13.3	5.2	L
17	4.10200	42.7	37.6	0.3	43.0	37.9	56.0	46.0	13.0	8.1	L
18	4.88260	37.7	32.3	0.4	38.1	32.7	56.0	46.0	17.9	13.3	L
19	6.18680	37.1	31.9	0.5	37.6	32.4	60.0	50.0	22.4	17.6	L
20	19.21520	26.2	21.2	0.9	27.1	22.1	60.0	50.0	32.9	27.9	L

9. Antenna Requirement

9.1. Test Setup

N/A

9.2 Limit

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.

9.3 Test Procedure

N/A

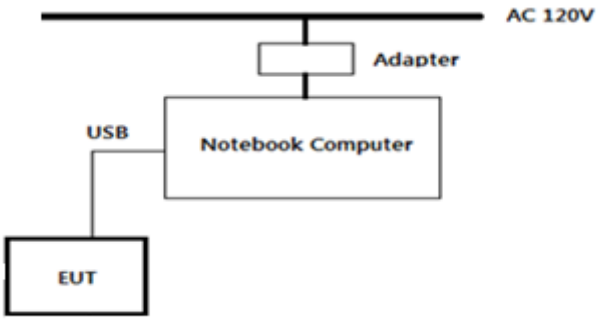
9.4 Conclusion:

The internal antenna is attached on the main PCB using the soldering. (Refer to Internal Photo file.)

APPENDIX I

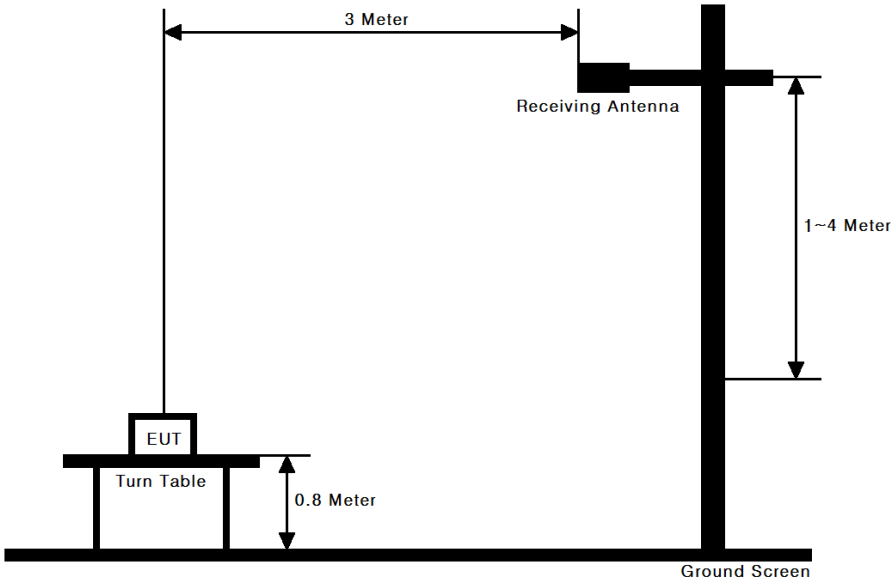
Test set up Diagrams

- **EUT Configuration for Test**



- **Radiated Measurement**

The diagram below shows the test setup that is utilized to make the measurements for emission from 9kHz to 10GHz Emissions.



- **Conducted Measurement**