ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**PDA Phone**
Brand Name:	**Sony**
Type No.:	**PM-0871-BV**
Model Difference:	**N/A**
FCC ID:	**PY7-PM0871**
Report No.:	**ER/2015/50041**
Issue Date:	**Jun. 05, 2015**
FCC Rule Part:	**§15.225**
Prepared for:	**Sony Mobile Communications AB Nya Vattentornet 22188 Lund/ Sweden**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803**

Testing Laboratory
0513

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VERIFICATION OF COMPLIANCE

Applicant:	Sony Mobile Communications AB Nya Vattentornet 22188 Lund/Sweden
Product Name:	PDA Phone
Brand Name:	Sony
Type No.:	PM-0871-BV
Model Difference:	N/A
FCC ID:	PY7-PM0871
File Number:	ER/2015/50041
Date of test:	Apr. 22, 2015 ~ Jun. 05, 2015
Date of EUT Received:	Apr. 22, 2015

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.
The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Tseng	*Date:*	Jun. 05, 2015
	Marcus Tseng / Engineer		
Prepared By:	Tiffany Kao	*Date:*	Jun. 05, 2015
	Tiffany Kao / Clerk		
Approved By	Jim Chang	*Date:*	Jun. 05, 2015
	Jim Chang / Asst. Manager		

Revision History

Report Number	Revision	Description	Issue Date
ER/2015/50041	Rev.00	Initial creation of document	Jun. 05, 2015

Table of Contents

1 GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	PDA Phone	
Brand Name:	Sony	
Type No.:	PM-0871-BV	
Model Difference:	N/A	
Data Cable (USB):	Model No.: EC450, Supplier: K-one Part No.: 1242-6715.3, Length: 100 cm	
Simple Hands-Free (SHF-White):	Model No.: MH410c, Supplier: Foster Electric Type No.: AG-1100	
Car Charger:	Model No.: AN400, Supplier: Salcomp Type No.: CAA-0003013	
BT PHF:	Model No.: MW600, Supplier: BALDA Type No.: DDA-0002029.B coupling with Simple Hands Free (Model No.: : MH755, Supplier: BALDA, Type No.: AG-0502)	
Product SW/HW version:	30.0.B.1.10 / A	
Radio SW/HW version:	30.0.B.1.10 / A	
Test SW Version:	N/A	
RF power setting in TEST SW:	N/A	
Power Supply:	3.8Vdc	
	Battery:	Model No.: AGPB016-A001, Supplier: Sony Type No.: N/A
	Adapter:	1. Model No.: EP800, Supplier: Phihong Type No.: AC-0300-US 2. Model No.: EP800, Supplier: Salcomp Type No.: AC-0030-US

NFC:

Operating Frequency:	13.56MHz
Transmit Power:	< 123.90dBuV/m at 3m.
Number of Channels:	1
Antenna Type:	Loop Antenna
Modulation Type:	ASK, BPSK

1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is PDA Phone supporting, GSM / WCDMA / LTE, Wi-Fi 802.11abgn, Bluetooth with GPS and NFC features, and below is details of information.

Product Feature	
Product Name:	PDA Phone
Brand Name:	Sony
Type No.:	PM-0871-BV
Model Difference:	N/A
FCC ID	PY7-PM0871
GSM Operating Band(s)	GSM 850/1900MHz
GPRS / EGPRS Multi Slot Class	Class 12
WCDMA Operating Band(s)	FDD Band II / V
WCDMA Rel. Version	Release 8
LTE Operating Band(s)	FCC Band 2 / 4 / 5 / 7
LTE Rel. Version	Release 9 / Category 4
Wi-Fi Specification	802.11a/b/g/n
Bluetooth Version	V4.0 dual mode + HS
NFC Specification	NFC

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.225

ANSI C63.10:2009

All test items have been performed and record as per the above standards.

The composite system (digital device) is compliance with FCC Subpart B is authorized under the certification procedure.

1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan. (TAF code 0513)

FCC Registration Numbers are: 990257 (Wugu)

Canada Registration Number: 4620A-5.

1.5 Special Accessories

There is no special accessory used while test was conducted.

1.6 Equipment Modifications

There was no modification incorporated into the EUT.

2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission

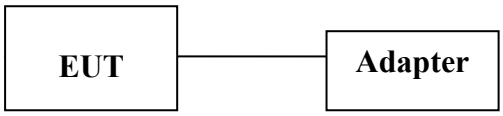


Fig. 2-2 AC Power Line Conducted Emission

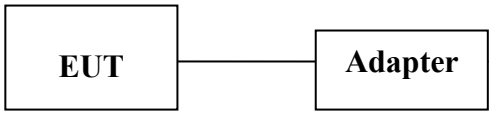


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	NFC Test Software	N/A	N/A	N/A	N/A	N/A

3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.225 (a)-(d)	Radiated Emission	Compliant
§15.209	Radiated Emission Limits, general requirement	Compliant
§15.225 (e)	Frequency Stability	Compliant
§2.1049 §15.215 (c)	20 dB Bandwidth	Compliant
§15.203	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Channel Details

1. The EUT stay in continuous transmitting mode.
2. The frequency 13.56 MHz is the default channel to test, where it is the only manipulative channel as this application supports.
3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK
FREQUENCY STABILITY			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK
20dB BANDWIDTH			
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION
NFC	1	1	ASK

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for NFC Transmitter for channel the worst case H position was reported.

Note: Type no, PM-0871-BV, and Type no PM-0873-BV share the equivalently identical enclosure, material of coating, I/O function, PCB board, display, and power source. In addition, PM-0871-BV, and Type no.PM-0873-BV implement the same NFC chipset/module with the same antenna that operates with the same transmitted power level. Hence, this given test report contains the identical test results that inherent from PM-0873-BV.

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Frequency Stability	+/- 51.33 Hz
20 dB OCCUPIED BANDWIDTH	+/- 51.33 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : **Vertical**)	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB

Measurement uncertainty (Polarization : **Horizontal**)	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable:

According to §15.207, frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

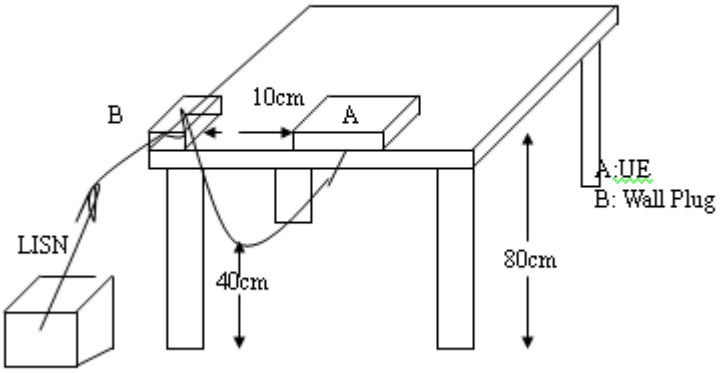
6.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCI 3	101311	06/20/2014	06/19/2015
LISN	Schwarzbeck	NSLK 8127	8127-648	06/10/2014	06/09/2015
LISN	Rolf-Heine	NNB-2/16Z	99012	03/04/2015	03/03/2016
Coaxial Cables	N/A	N30N30-1042-150cm	N/A	01/06/2015	01/07/2016

6.3 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2009.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

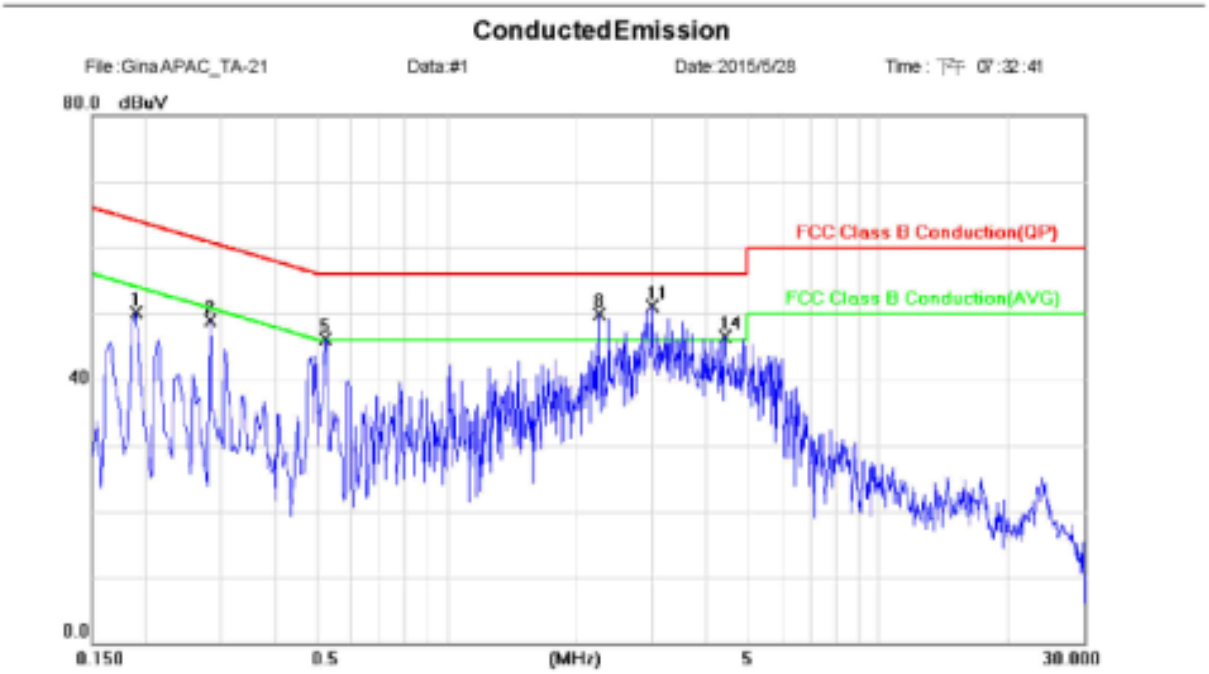
6.6 Measurement Result:

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit

AC POWER LINE CONDUCTED EMISSION TEST DATA

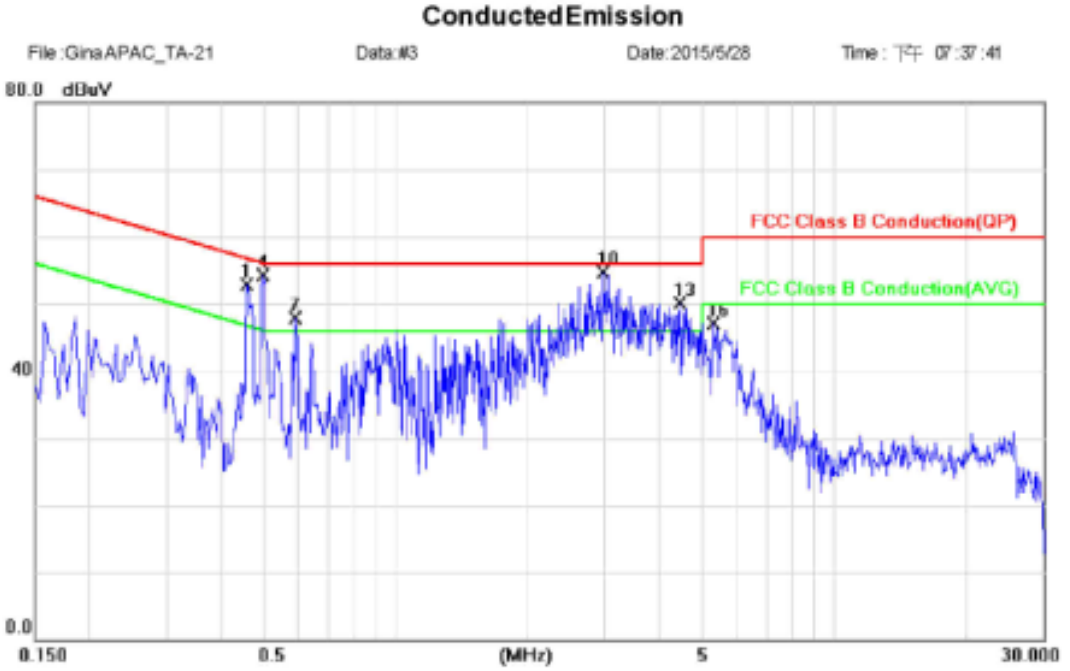
Operation Mode:	Operation mode			Test Date:	May 28, 2015
Temperature:	24 ℃	Humidity:	66 %	Test By:	Marcus
Model No.:	Adapter: EP800, Supplier: Phihong			Phase:	L1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1900	50.03	0.06	50.09	64.04	-13.95	peak	
2		0.2820	48.78	0.06	48.84	60.76	-11.92	peak	
3		0.2820	34.60	0.06	34.66	60.76	-26.10	QP	
4		0.2820	23.70	0.06	23.76	50.76	-27.00	AVG	
5		0.5220	46.00	0.06	46.06	56.00	-9.94	peak	
6		0.5220	43.00	0.06	43.06	56.00	-12.94	QP	
7		0.5220	29.90	0.06	29.96	46.00	-16.04	AVG	
8		2.2580	49.88	0.10	49.98	56.00	-6.02	peak	
9		2.2580	33.90	0.10	34.00	56.00	-22.00	QP	
10		2.2580	25.40	0.10	25.50	46.00	-20.50	AVG	
11	*	2.9860	50.99	0.11	51.10	56.00	-4.90	peak	
12		2.9860	38.10	0.11	38.21	56.00	-17.79	QP	
13		2.9860	28.30	0.11	28.41	46.00	-17.59	AVG	

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
14		4.4300	46.33	0.15	46.48	56.00	-9.52	peak	
15		4.4300	35.60	0.15	35.75	56.00	-20.25	QP	
16		4.4300	24.80	0.15	24.95	46.00	-21.05	AVG	

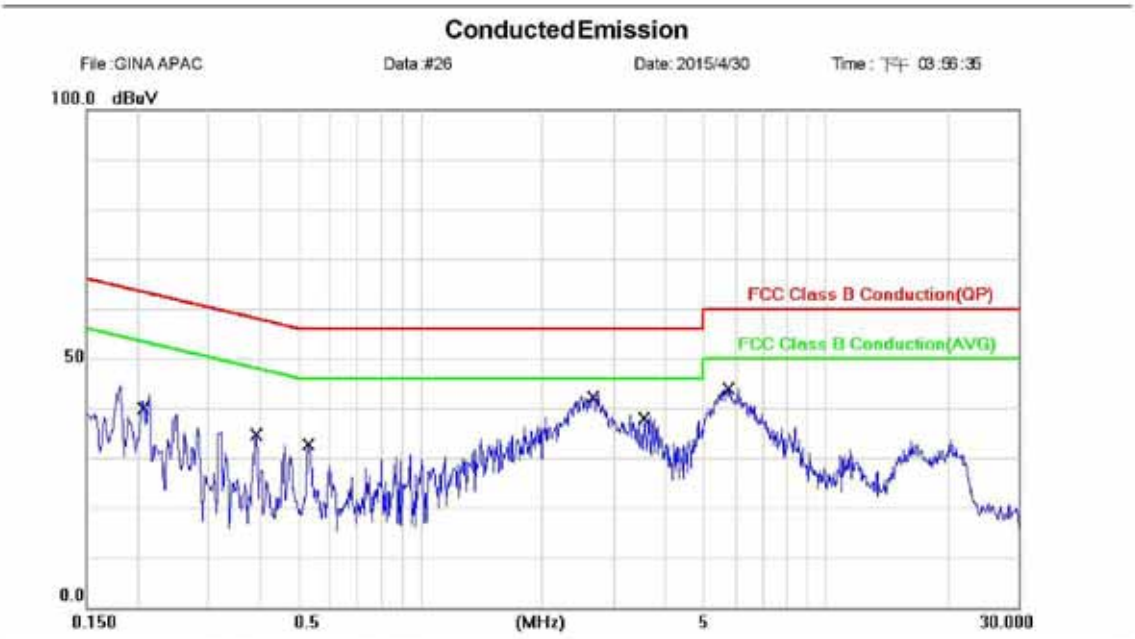
Operation Mode:	Operation mode			Test Date:	May 28, 2015
Temperature:	24 ℃	Humidity:	66 %	Test By:	Marcus
Model No.:	Adapter: EP800, Supplier: Phihong			Phase:	N



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4580	52.82	0.06	52.88	56.73	-3.85	peak	
2		0.4580	39.90	0.06	39.96	56.73	-16.77	QP	
3		0.4580	28.80	0.06	28.86	46.73	-17.87	AVG	
4		0.4980	54.26	0.06	54.32	56.03	-1.71	peak	
5		0.4980	46.40	0.06	46.46	56.03	-9.57	QP	
6		0.4980	33.10	0.06	33.16	46.03	-12.87	AVG	
7		0.5900	47.78	0.06	47.84	56.00	-8.16	peak	
8		0.5900	37.40	0.06	37.46	56.00	-18.54	QP	
9		0.5900	30.80	0.06	30.86	46.00	-15.14	AVG	
10	*	2.9660	54.56	0.11	54.67	56.00	-1.33	peak	
11		2.9660	43.30	0.11	43.41	56.00	-12.59	QP	
12		2.9660	33.20	0.11	33.31	46.00	-12.69	AVG	
13		4.4500	49.90	0.15	50.05	56.00	-5.95	peak	

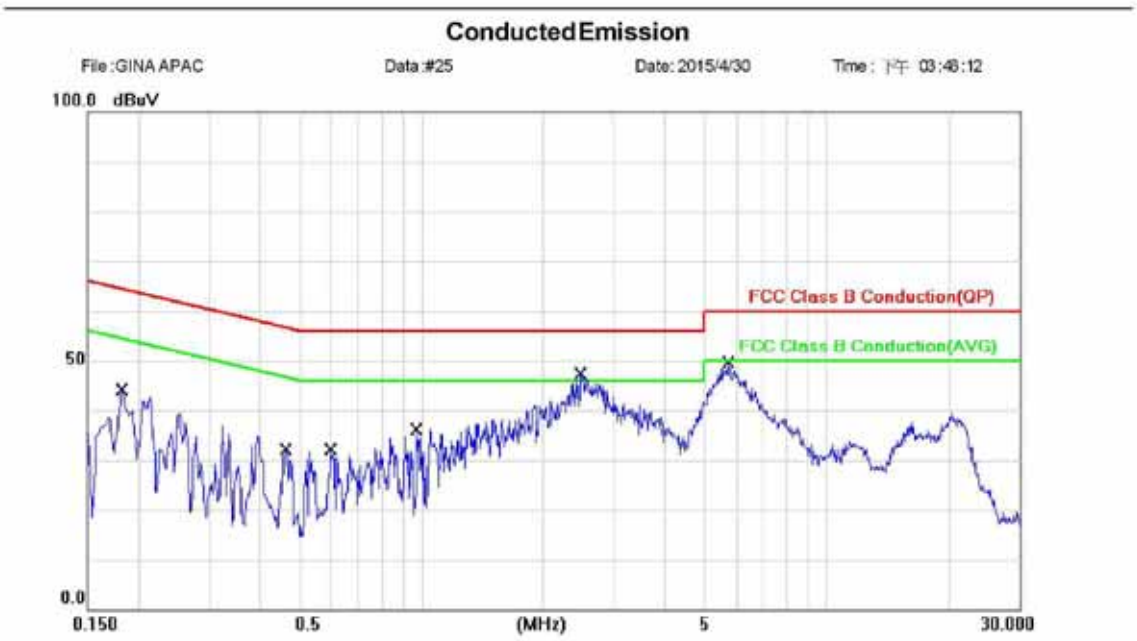
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
14		4.4500	39.20	0.15	39.35	56.00	-16.65	QP	
15		4.4500	28.80	0.15	28.95	46.00	-17.05	AVG	
16		5.3300	46.99	0.16	47.15	60.00	-12.85	peak	
17		5.3300	35.20	0.16	35.36	60.00	-24.64	QP	
18		5.3300	24.60	0.16	24.76	50.00	-25.24	AVG	

Operation Mode:	Operation mode			Test Date:	Apr. 30, 2015
Temperature:	24 ℃	Humidity:	66 %	Test By:	Tin
Model No.:	Adapter: EP800, Supplier: Salcomp			Phase:	L1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2100	34.20	9.94	44.14	63.21	-19.07	QP	
2		0.2100	19.60	9.94	29.54	53.21	-23.67	AVG	
3		0.3933	19.70	9.93	29.63	57.99	-28.36	QP	
4		0.3933	6.40	9.93	16.33	47.99	-31.66	AVG	
5		0.5303	15.90	9.93	25.83	56.00	-30.17	QP	
6		0.5303	12.50	9.93	22.43	46.00	-23.57	AVG	
7		2.6300	27.80	9.98	37.78	56.00	-18.22	QP	
8	*	2.6300	18.70	9.98	28.68	46.00	-17.32	AVG	
9		3.5880	18.60	9.99	28.59	56.00	-27.41	QP	
10		3.5880	9.90	9.99	19.89	46.00	-26.11	AVG	
11		5.6860	28.60	10.03	38.63	60.00	-21.37	QP	
12		5.6860	20.70	10.03	30.73	50.00	-19.27	AVG	

Operation Mode:	Operation mode			Test Date:	Apr. 30, 2015
Temperature:	24 ℃	Humidity:	66 %	Test By:	Tin
Model No.:	Adapter: EP800, Supplier: Salcomp			Phase:	N



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1846	32.50	9.92	42.42	64.28	-21.86	QP	
2		0.1846	12.70	9.92	22.62	54.28	-31.66	AVG	
3		0.4652	19.20	9.92	29.12	56.60	-27.48	QP	
4		0.4652	9.00	9.92	18.92	46.60	-27.68	AVG	
5		0.5983	20.50	9.92	30.42	56.00	-25.58	QP	
6		0.5983	9.60	9.92	19.52	46.00	-26.48	AVG	
7		0.9827	22.80	9.93	32.73	56.00	-23.27	QP	
8		0.9827	9.90	9.93	19.83	46.00	-26.17	AVG	
9	*	2.4830	34.60	9.96	44.56	56.00	-11.44	QP	
10		2.4830	21.80	9.96	31.76	46.00	-14.24	AVG	
11		5.7180	32.80	10.02	42.82	60.00	-17.18	QP	
12		5.7180	23.90	10.02	33.92	50.00	-16.08	AVG	

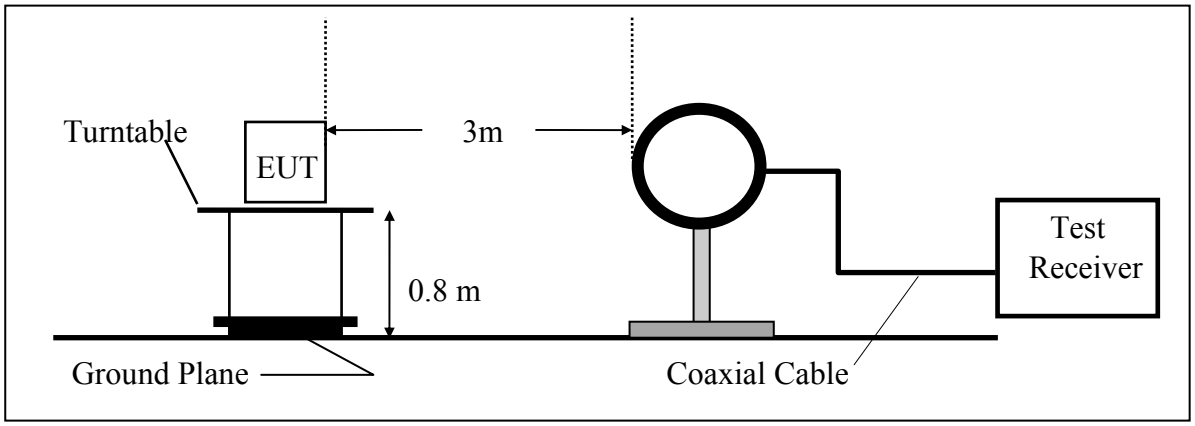
7 RADIATED TEST ITEMS

7.1 Measurement Procedure

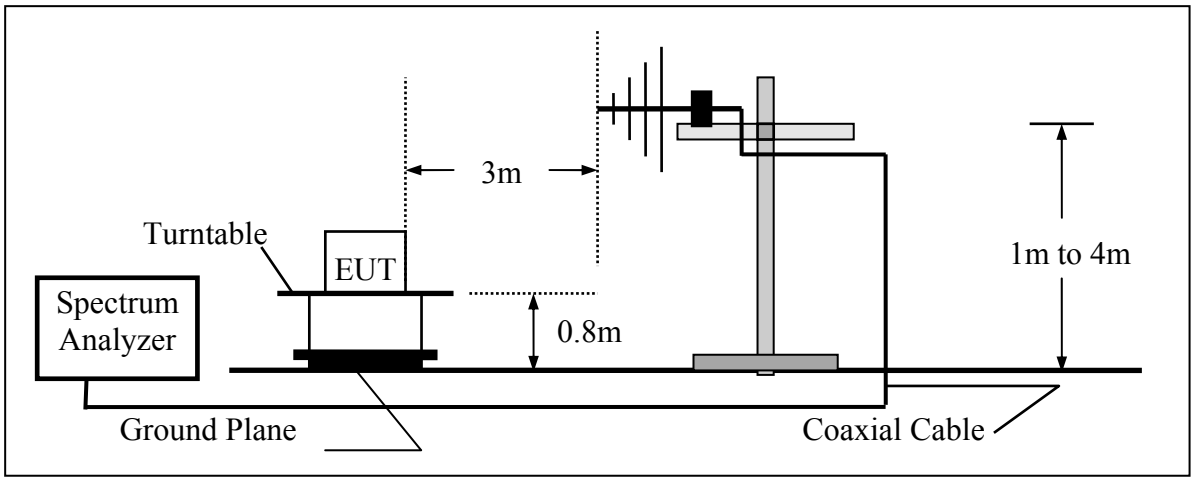
1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all default test channel measured were complete

7.2 Test SET-UP

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



7.3 Measurement Equipment Used

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/04/2015	05/03/2016
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	12/22/2014	12/21/2015
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/23/2014	12/22/2015
Loop Antenna	ETS.LINDGREN	6502	00148045	07/03/2014	07/02/2015
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2015	01/01/2016
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/02/2015	01/01/2016
3m Site NSA	SGS	966 chamber	N/A	07/15/2014	07/14/2015

7.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note :

"**F**" : denotes Fundamental Frequency. ; "**H**" : denotes Harmonic Frequency.

"**E**" : denotes Band Edge Frequency. ; "**S**" : denotes Spurious Frequency.

7.5 Field Strength of Fundamental Emissions and Mask Measurement

7.5.1 Standard Applicable

Limit:

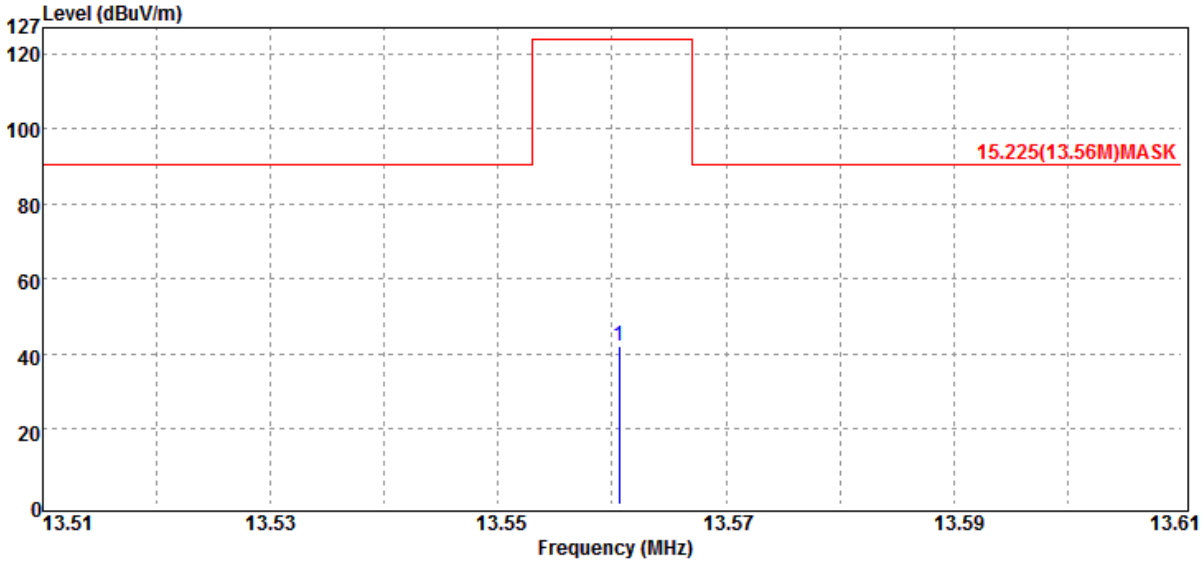
Rules and specifiactions	CFR 47 Part 15 section 15.225(a)-(d)		
Frequency of Emission (MHz)	Field Strength (μV/m)at 30m	Field Strength (dBμV/m)at 30m	Field Strength (dBμV/m)at 3m
1.705~13.110	30	29.5	69.5
13.110~13.410	106	40.5	80.5
13.410~13.553	334	50.5	90.47
13.553~13.567	15848	84	123.9
13.567~13.710	334	50.5	90.47
13.710~14.010	106	40.5	80.5
14.010~30.00	30	29.5	69.5

Note:

1. Emission level in dBuV/m=20 log (μV/m)
2. Distance extrapolation factor = 40 log (required distance/ test distance) (dB)
3. The lower limit shall apply at the transition frequencies.
4. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.

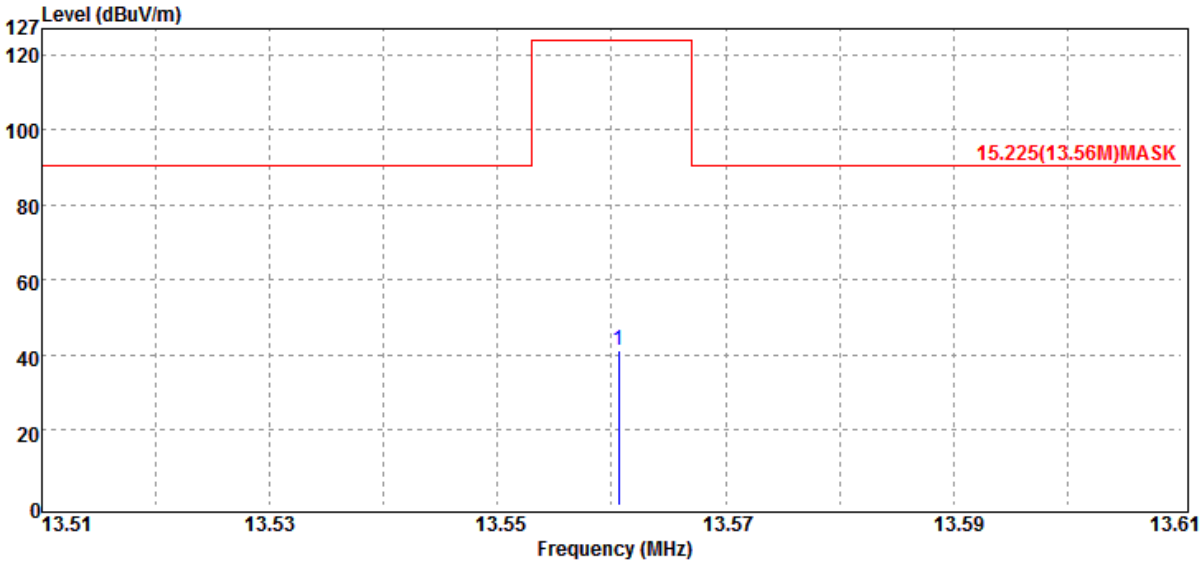
7.5.2 Field Strength of Fundamental Emission Measurement Result

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:MAIN	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
13.56	F	Peak	30.81	11.38	42.19	123.90	-81.71

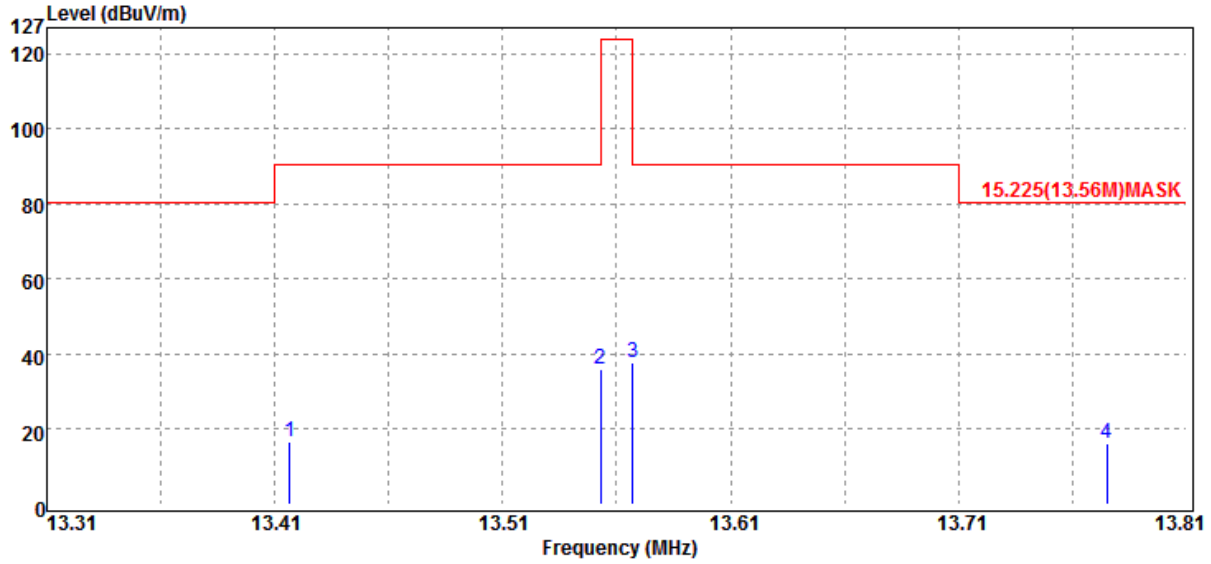
Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:MAIN	Engineer	:Curry
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
13.56	F	Peak	29.97	11.38	41.35	123.90	-82.55

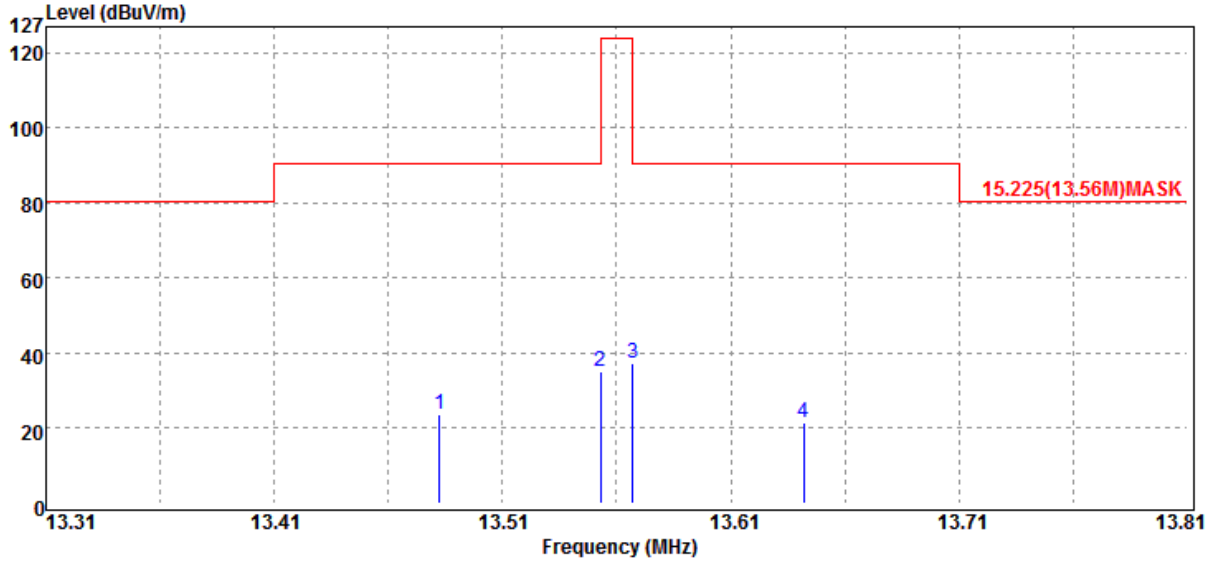
7.5.3 Mask Measurement Result

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:MASK	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
13.42	S	Peak	5.29	11.38	16.67	90.47	-73.80
13.55	S	Peak	24.44	11.38	35.82	90.47	-54.65
13.57	S	Peak	26.49	11.38	37.87	90.47	-52.60
13.78	S	Peak	4.92	11.39	16.31	80.50	-64.19

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:MASK	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
13.48	S	Peak	12.53	11.38	23.91	90.47	-66.56
13.55	S	Peak	23.75	11.38	35.13	90.47	-55.34
13.57	S	Peak	25.95	11.38	37.33	90.47	-53.14
13.64	S	Peak	10.36	11.38	21.74	90.47	-68.73

7.6 Radiated Emission Measurement

7.6.1 Standard Applicable

The field strength of any emission which appear outside of 13.553~13.567MHz Band shall not exceed the general radiated emissions limits.

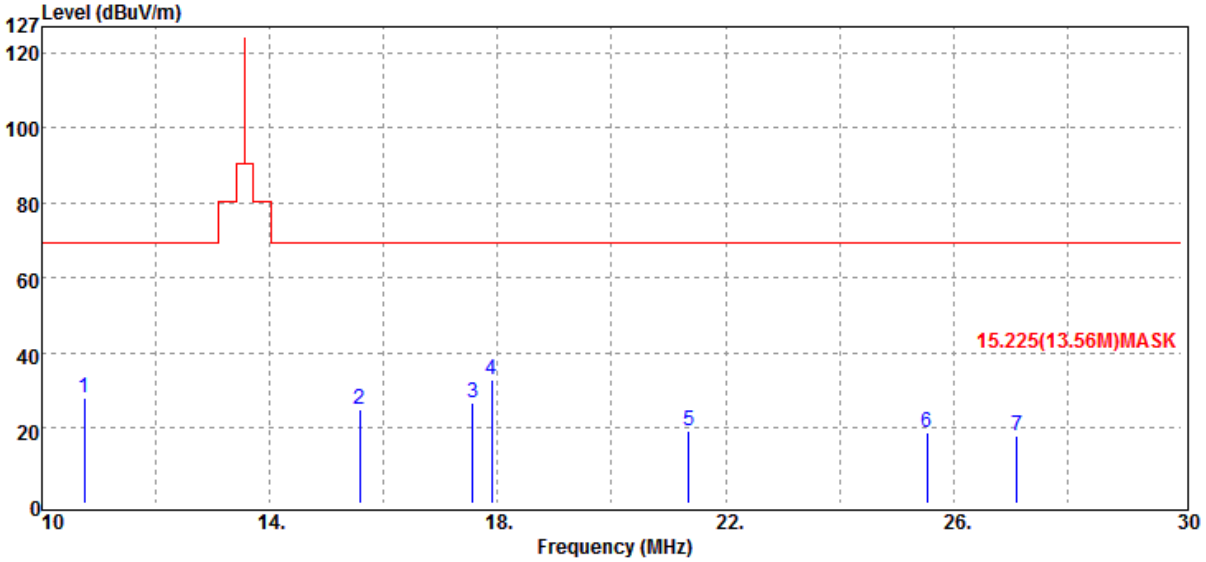
Frequency (MHz)	Field strength (μV/m)	Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

1. Emission level in dBμV/m=20 log (μV/m)
2. Distance extrapolation factor = 40 log (required distance/ test distance) (dB)
3. The lower limit shall apply at the transition frequencies.
4. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.

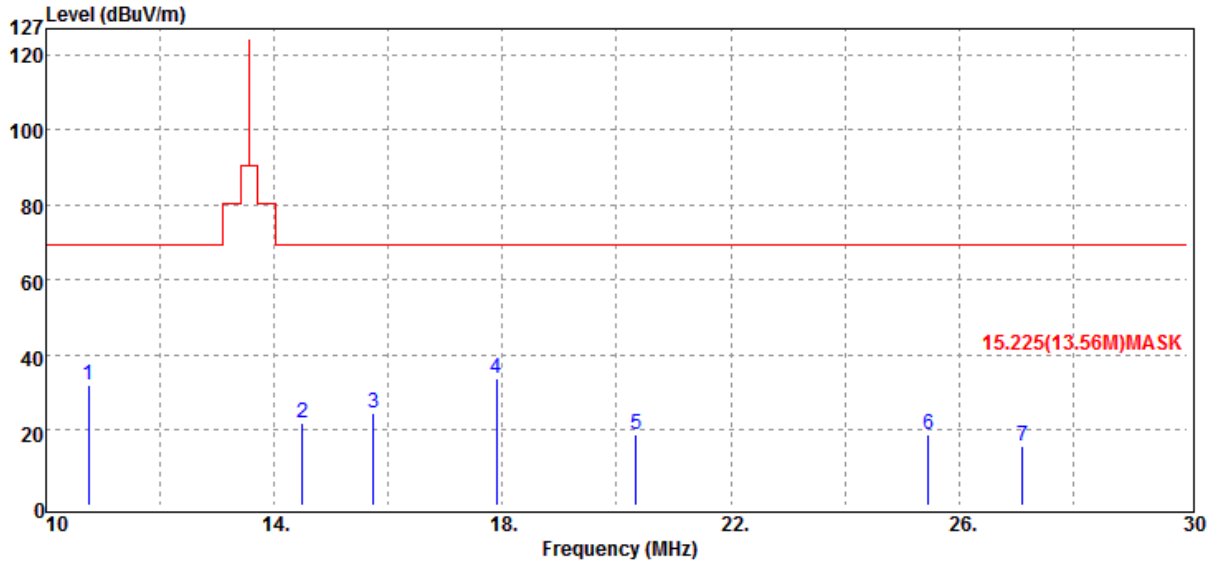
7.6.2 Radiated Emission Measurement Result

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:TX	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



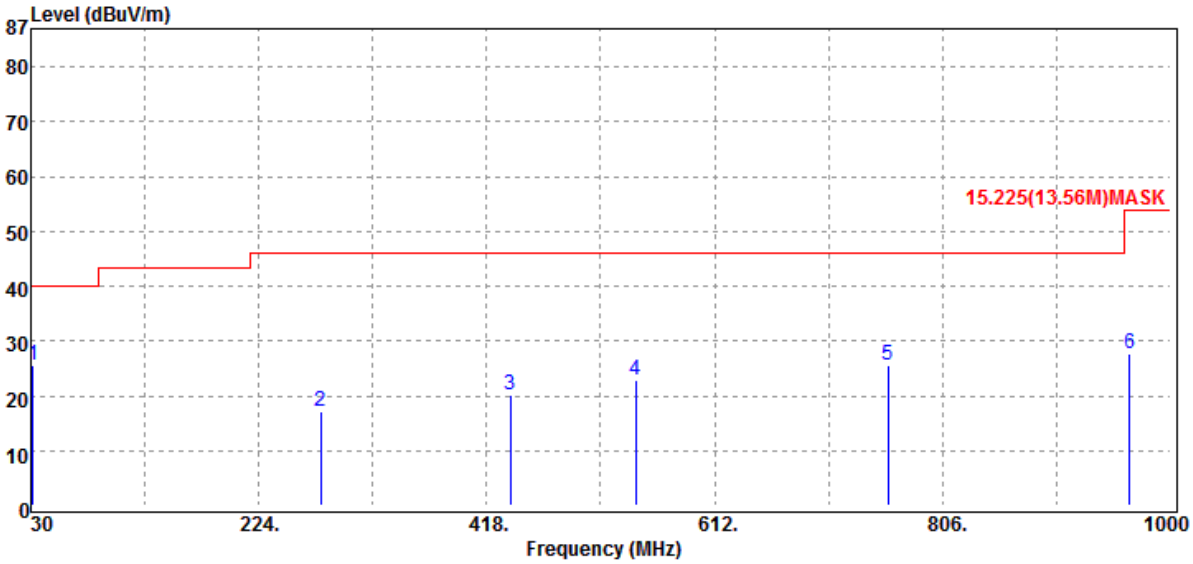
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
10.74	S	Peak	16.69	11.31	28.00	69.54	-41.54
15.58	S	Peak	13.59	11.42	25.01	69.54	-44.53
17.56	S	Peak	15.24	11.46	26.70	69.54	-42.84
17.90	S	Peak	21.57	11.46	33.03	69.54	-36.51
21.36	S	Peak	8.22	11.09	19.31	69.54	-50.23
25.54	S	Peak	9.02	9.97	18.99	69.54	-50.55
27.12	H	Peak	8.26	9.62	17.88	69.54	-51.66

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:TX	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



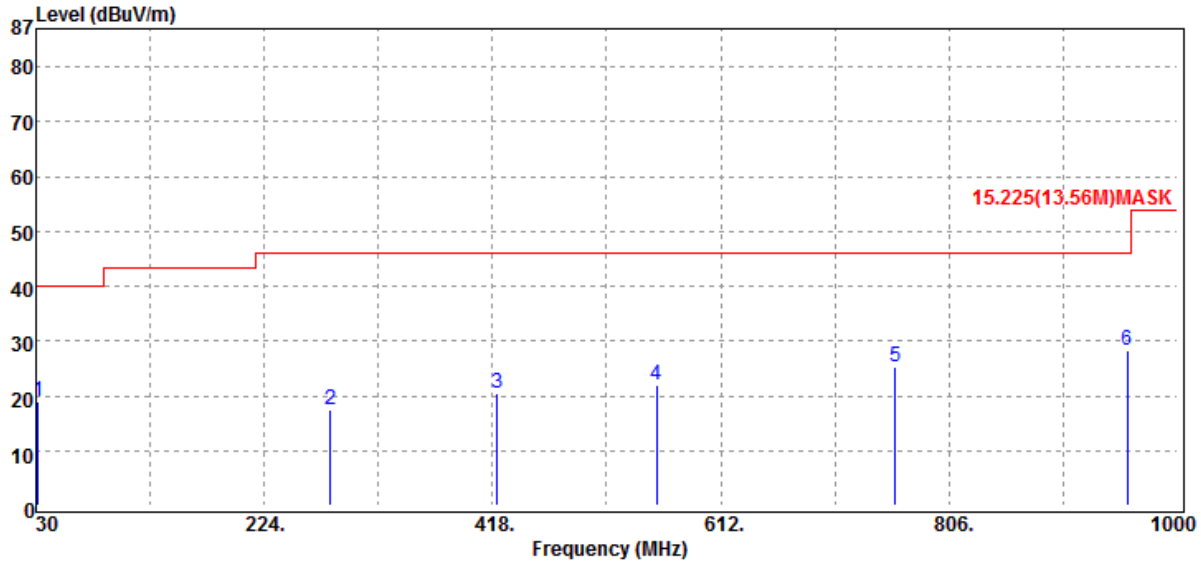
Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
10.74	S	Peak	20.92	11.31	32.23	69.54	-37.31
14.50	S	Peak	10.69	11.40	22.09	69.54	-47.45
15.74	S	Peak	13.16	11.43	24.59	69.54	-44.95
17.90	S	Peak	22.48	11.46	33.94	69.54	-35.60
20.34	S	Peak	7.43	11.40	18.83	69.54	-50.71
25.46	S	Peak	9.00	9.99	18.99	69.54	-50.55
27.12	H	Peak	6.17	9.62	15.79	69.54	-53.75

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:TX	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
31.94	S	Peak	35.84	-10.22	25.62	40.00	-14.38
276.38	S	Peak	25.72	-8.60	17.12	46.00	-28.88
438.37	S	Peak	25.99	-5.84	20.15	46.00	-25.85
545.07	S	Peak	26.93	-4.01	22.92	46.00	-23.08
759.44	S	Peak	24.43	1.07	25.50	46.00	-20.50
965.08	S	Peak	23.98	3.69	27.67	54.00	-26.33

Operation Band	:NFC	Test Date	:2015-05-26
Fundamental Frequency	:13.56 MHz	Temp./Humi.	:19.2 deg_C/58RH
Operation Mode	:TX	Engineer	:Curry
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV / m	dBµV / m	dB
31.94	S	Peak	29.23	-10.22	19.01	40.00	-20.99
280.26	S	Peak	25.95	-8.38	17.57	46.00	-28.43
421.88	S	Peak	26.26	-5.68	20.58	46.00	-25.42
557.68	S	Peak	25.90	-3.89	22.01	46.00	-23.99
760.41	S	Peak	24.30	1.11	25.41	46.00	-20.59
957.32	S	Peak	24.68	3.59	28.27	46.00	-17.73

8 FREQUENCY STABILITY

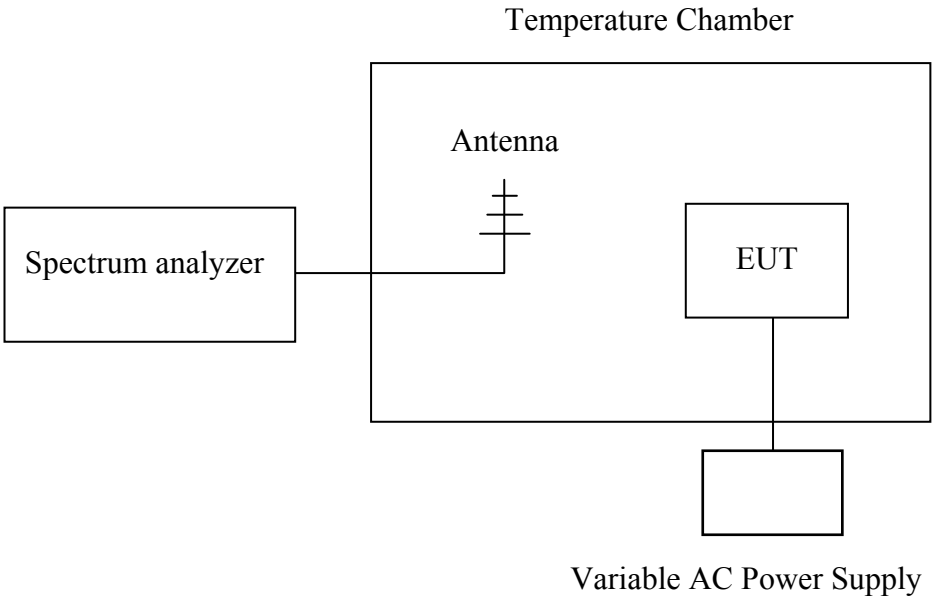
8.1 Standard Applicable

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.2 Measurement Procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.
7. Set spectrum Center Frequency = fundamental frequency, RBW, VBW= 10 kHz, Span =100 kHz, Detector =Max hold, Mark peak.

8.3 Test SET-UP



8.4 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016
Temperature Chamber	TERCHY	MHG-120LF	911009	05/06/2015	05/05/2016
AC Power Supply	APW-105N	887592	All Power	N/A	N/A

8.5 Measurement Results

Refer to attached data chart.

A. Temperature Variation

Power Supply	Environment	Frequency	Delta (Hz)	Limit (KHz)
Vdc	Temperature (℃)	(MHz)		
3.8	-20	13.5608	-130.00	+/- 1.356
3.8	-10	13.56081	-140.00	+/- 1.356
3.8	0	13.56077	-100.00	+/- 1.356
3.8	10	13.56071	-40.00	+/- 1.356
3.8	20	13.56067	0.00	+/- 1.356
3.8	30	13.5606	70.00	+/- 1.356
3.8	40	13.56055	120.00	+/- 1.356
3.8	50	13.56058	90.00	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (Hz)	Limit (KHz)
Vdc	Temperature (℃)	(MHz)		
4.2	20	13.56073	-60.00	+/- 1.356
3.8	20	13.56067	0.00	+/- 1.356
3.2	20	13.56061	60.00	+/- 1.356

9 20 dB OCCUPIED BANDWIDTH MEASUREMENT

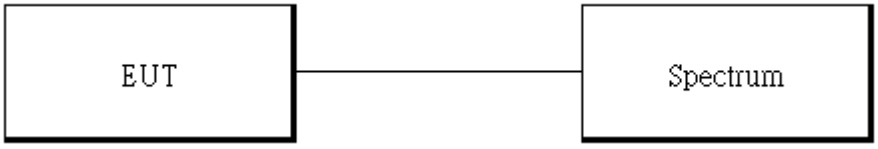
9.1 Standard Applicable:

The 20 dB bandwidth shall be specified in operating frequency band.

9.2 Limit:

None

9.3 Test Set-up



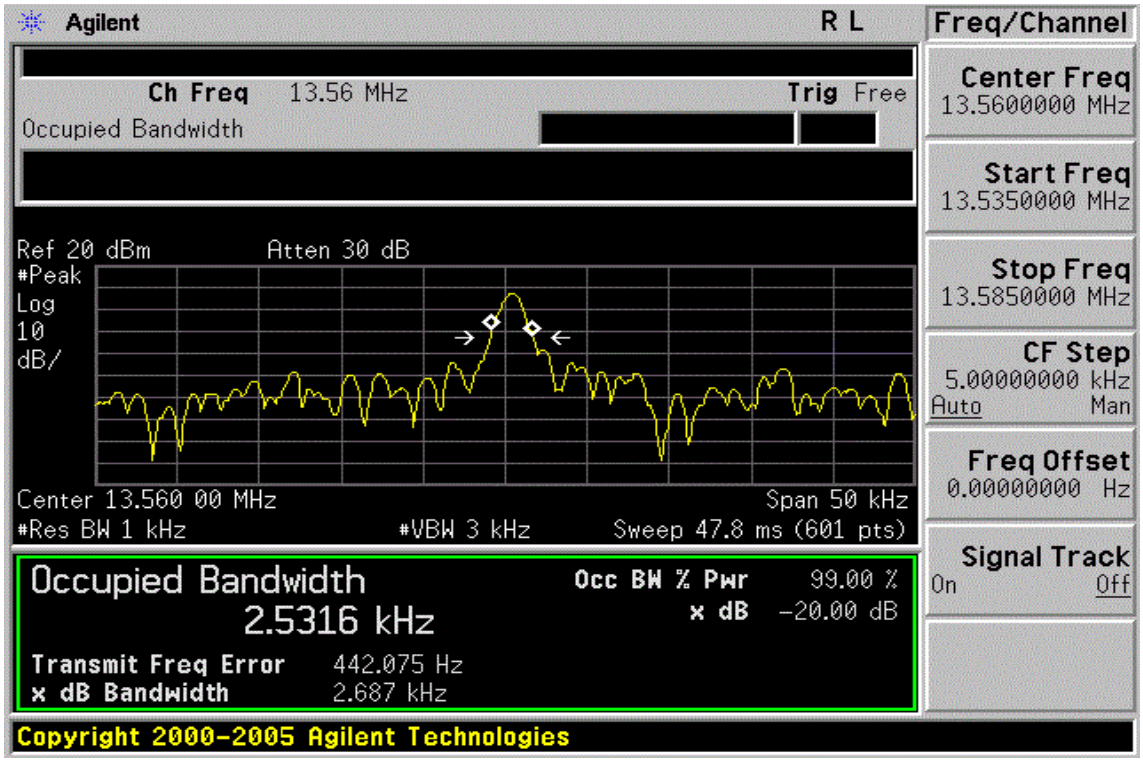
9.4 Measurement Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. 20dB Bandwidth the resolution bandwidth of 1 kHz and the video bandwidth of 3 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

9.5 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2015	01/28/2016

9.6 20dB Bandwidth Measurement Result



10 ANTENNA REQUIREMENT

10.1. Standard Applicable

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer.

For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power limits.

10.2. Antenna Connected Construction

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~