FCC Part 74 Subpart H

EMI TEST REPORT

of

E.U.T.	:	UHF Pendant transmitter
FCC ID.	:	2AA9S-SIMEON51T
Model No.	:	Simeon 5.1T
Working Frequency	:	514~544 MHz

for

APPLICANT	:	Supportive Hearing Systems Inc.
ADDRESS	:	283 MacPherson Avenue Toronto, Ontario M4V 1A4, Canada

Test Performed by

ELECTRONICS TESTING CENTER (ETC) , TAIWAN
NO. 34. LIN 5, DINGFU VIL., LINKOU DIST.,
NEW TAIPEI CITY, TAIWAN, 24442, R.O.C.
TEL : (02)26023052 FAX : (02)26010910
http:// www.etc.org.tw ; e-mail:emc@etc.org.tw

Report Number : 15-08-RBF-011

TEST REPORT CERTIFICATION

Applicant	:	Supportive Hearing Systems Inc. 283 MacPherson Avenue Toronto, Ontario M4V 1A4, Canada
Manufacturer	:	OKAYO ELECTRONICS CO., LTD. No.2, Gongye 10th Rd., Dali Dist., Taichung 41280, Taiwan
Description of EUT	:	
a) Type of EUT	:	UHF Pendant transmitter
b) Trade Name	:	Simeon
c) Model No.	:	Simeon 5.1T
d) FCC ID	:	2AA9S-SIMEON51T
e) Working Frequency	:	514~544 MHz
f) Power Supply	:	3.7 V Li-ion rechargeable battery / AC/DC Power Adapter; Model: ATS005-W050U I/P: AC100~240V, 50-60Hz, 0.19A MAX O/P: DC5.0V, 1.0A, 5.00W MAX

Regulation Applied : FCC Rules and Regulations Part 74 Subpart H

I HEREBY CERTIFY THAT; The data shown in this report were made in accordance with the procedures given in ANSI C63.10-2009 and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Issued Date : Feb. 15, 2016

Test Engineer : ______________________
(Vincent Chang , Engineer)

Approve & Authorized Signer : ______________________
S. S. Liou, Section Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

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1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT	:	UHF Pendant transmitter
b) Trade Name	:	Simeon
c) Model No.	:	Simeon 5.1T
d) FCC ID	:	2AA9S-SIMEON51T
e) Working Frequency	:	514~544 MHz
f) Power Supply	:	3.7 V Li-ion rechargeable battery / AC/DC Power Adapter; Model: ATS005-W050U I/P: AC100~240V, 50-60Hz, 0.19A MAX O/P: DC5.0V, 1.0A, 5.00W MAX
g) Emission Designator	:	102KF3E 2M+2DK=2x(5kHz)+2x(46kHz)x1=102kHz

1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10-2009. Test also follow “TIA-603-C(2004)-Land Mobile FM or PM Communications Equipment Measurement and Performance Standsrds” and section 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, and 2.1055 of Part 2 of CFR 47.

Measueement Software

Software	Version	Note
e3	Version 6.100618b	Radiated Emission Test
e3	Version 6.100421	Conducted Emission Test

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, Lin 5, Dingfu Vil., Linkou Dist., New Taipei City, Taiwan 24442, R.O.C.

This site is FCC 2.948 listed and accepted in a letter dated Jan. 29, 2014.

Registration Number: 90589

2. REQUIREMENTS OF PROVISIONS

2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Frequencies Available

According to sec. 74.802 of Part 74, the following frequencies are available for low power auxiliary station :

Frequencies (MHz)	
26.100-26.480	455.000-456.000
54.000-72.000	470.000-488.000
76.000-88.000	488.000-494.000
161.625-161.775	494.000-608.000
174.000-216.000	614.000-806.000
450.000-451.000	944.000-952.000

2.3 Requirements for Radio Equipment on Certification

(1) RF Output Power

For transmitters, the power output shall be measured at the RF output terminals.

(2) Modulation Characteristics

For Voice Modulated Communication Equipment, a curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.

(3) Occupied Bandwidth

For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

(4) Spurious Emissions at Antenna Terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminal when properly loaded with a suitable artificial antenna.

(5) Field Strength of Spurious Emissions

Measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation.

(6) Frequencies Tolerance

a) The frequency stability shall be measured with variation of ambient temperature.
b) The frequency stability shall be measured with variation of primary supply voltage.

2.4 Labeling Requirement

Each equipment for which a type acceptance application is filed on or after May 1,1981, shall bear an identification plate or label pursuant to §2.925（Identification of equipment） and §2.926（FCC identifier）.

3. OUTPUT POWER MEASUREMENT

3.1 Provision Applicable

According to §74.861(e)(1)(ii), the output power shall not exceed 250 milliwatts.

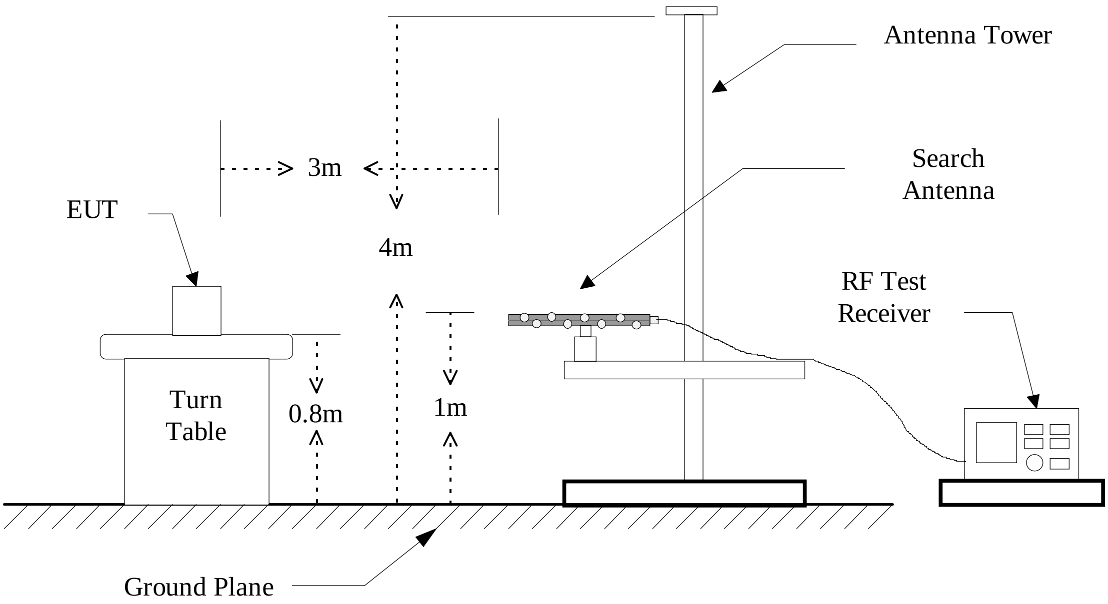
3.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively, adjusting the input voltage to produce the maximum power.
2. Adjust the analyzer for each frequency measured in chapter 6 on a 1 MHz frequency span and 1MHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360°, and record the highest value indicated on spectrum analyzer as reference value.
4. Repeat step 3 until all frequencies need to be measured were complete.
5. Repeat step 4 with search antenna in vertical polarized orientations.
6. Replace the EUT with a tuned dipole antenna (horn antenna for above 1 GHz) relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a identical value derived from step 3 on spectrum analyzer. Record this value for result calculated.

7. Repeat step 6 until all frequencies need to be measured were complete.

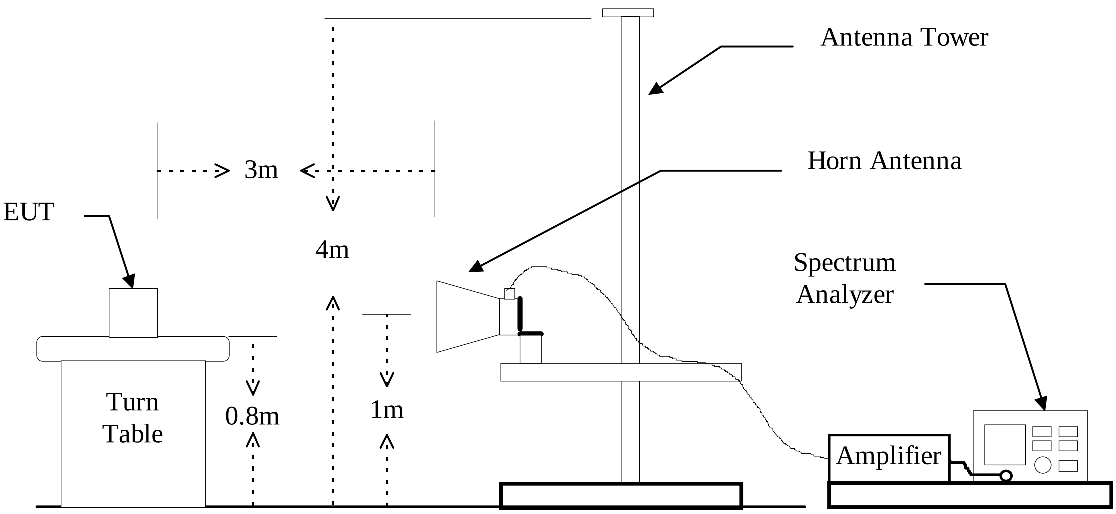
8. Repeat step 7 with both dipole antenna (horn antenna for above 1 GHz) and search antenna in vertical polarized orientations.

Figure 1 : Frequencies measured below 1 GHz configuration



Note: For substitution method, replace the EUT with a tuned dipole antenna relative to each frequency and connect to a standard signal generator (SG) via a low loss cable.

Figure 2 : Frequencies measured above 1 GHz configuration



Note: For substitution method, replace the EUT with a horn antenna and connect to a standard signal generator (SG) via a low loss cable.

3.3 Test Data

Operated mode : TX   Test Date : May 22, 2015
Temperature : 25 °C   Humidity : 68 %

Frequency (MHz)	Meter Reading (dBμV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
514.100	83.70	10.90	2.0	----	8.90	7.762	250.0

Frequency (MHz)	Meter Reading (dBμV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
529.000	84.30	11.50	2.0	----	9.50	8.913	250.0

Frequency (MHz)	Meter Reading (dBμV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
543.900	83.90	11.30	2.0	----	9.30	8.511	250.0

Note: For measured frequency below 1GHz, a tuned dipole antenna is used.

3.4 Result Calculation

Result calculation is as following :

Result ＝ SG Reading ＋Cable Loss ＋Antenna Gain Corrected

Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

$$mW = \log^{-1}\left[\frac{\text{Result(dBm)}}{10}\right]$$

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESL	2014/09/26	2015/09/25
Biconical Antenna	EMCO	3110	2014/11/04	2015/11/03
Log-periodic Antenna	EMCO	3146	2014/11/04	2015/11/03
Amplifier	HP	8447D	2014/05/29	2015/05/28
Signal generator	HP	83732B	2014/10/16	2015/10/15

4. MODULATION CHARACTERISTICS

4.1 Provisions Applicable

According to § 2.1047 (a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be measured.

4.2 Measurement Method

A) Modulation Limit

1. Position the EUT as shown in figure 3, adjust the audio input frequency to 100 Hz and the input level from 0V to maximum permitted input voltage with recording each carrier frequency deviation responding to respective input level.

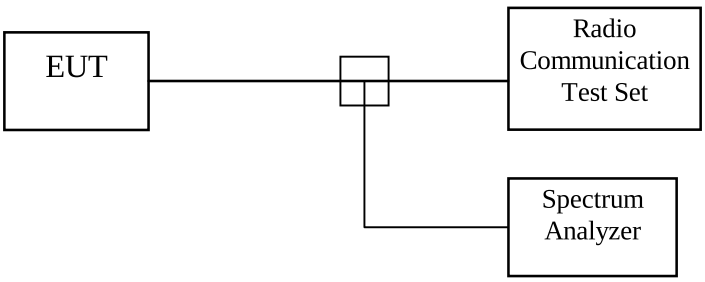
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

B) Frequency response of all circuits

1. Position the EUT as shown in figure 3.

2. Vary the modulating frequency from 100 Hz to 15000 Hz with constant input voltage (derived from 5.4(a) of this test report), and observe the change in output.

Figure 3 : Modulation characteristic measurement configuration



4.3 Measurement Instrument

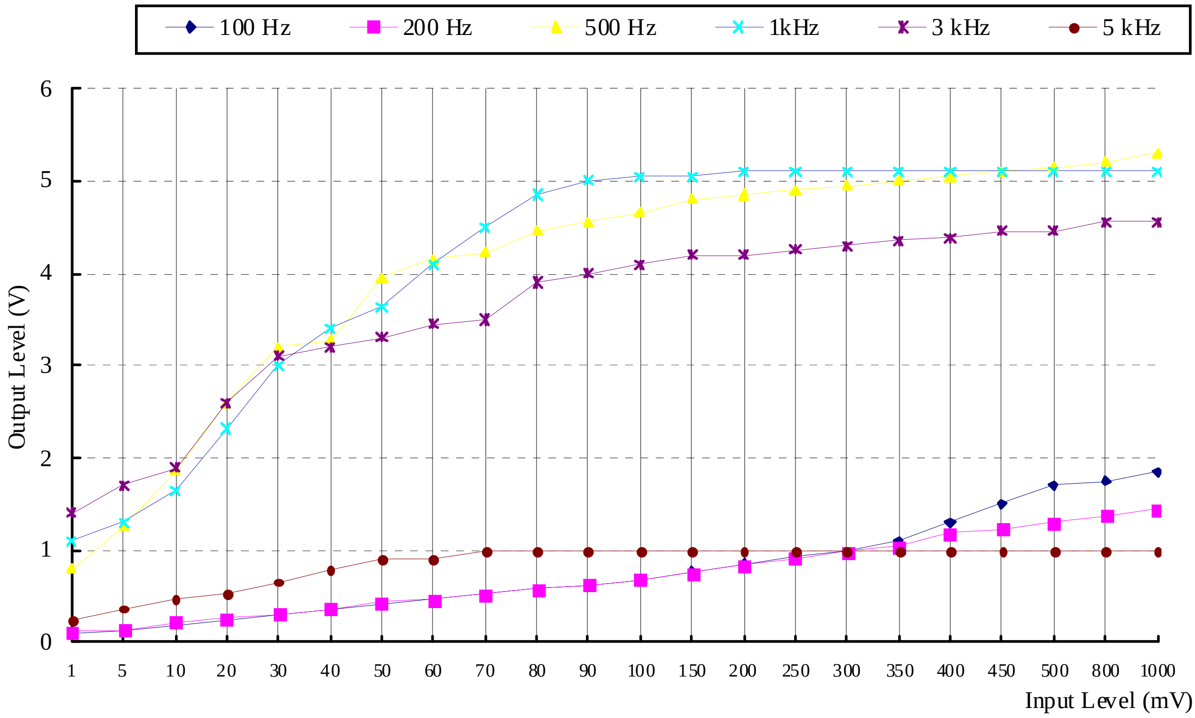
Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Communications Service Monitor	AEROFLEX	2945B	2014/08/12	2015/08/11
EMI Test Receiver	Rohde & Schwarz	ESU 40	2014/08/15	2015/08/14

4.4 Measurement Result

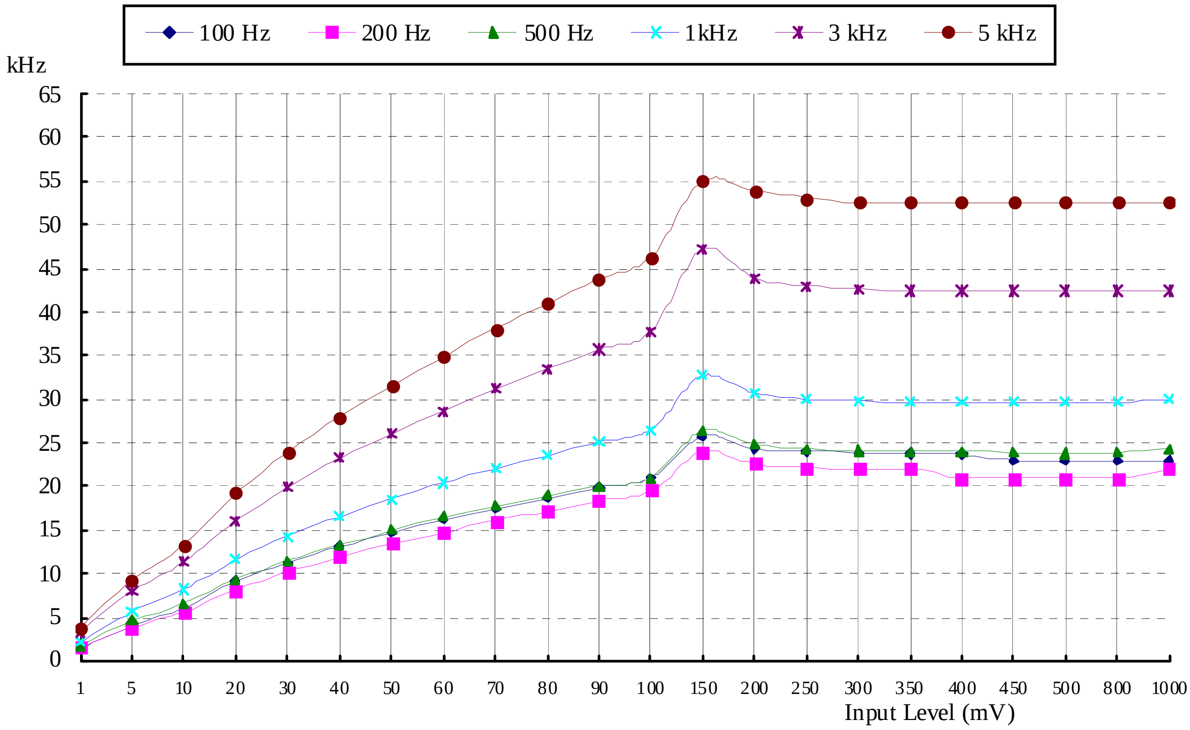
RF Frequency : 514.100MHz

Test Date : May 22, 2015 Temperature : 25 °C Humidity : 68 %

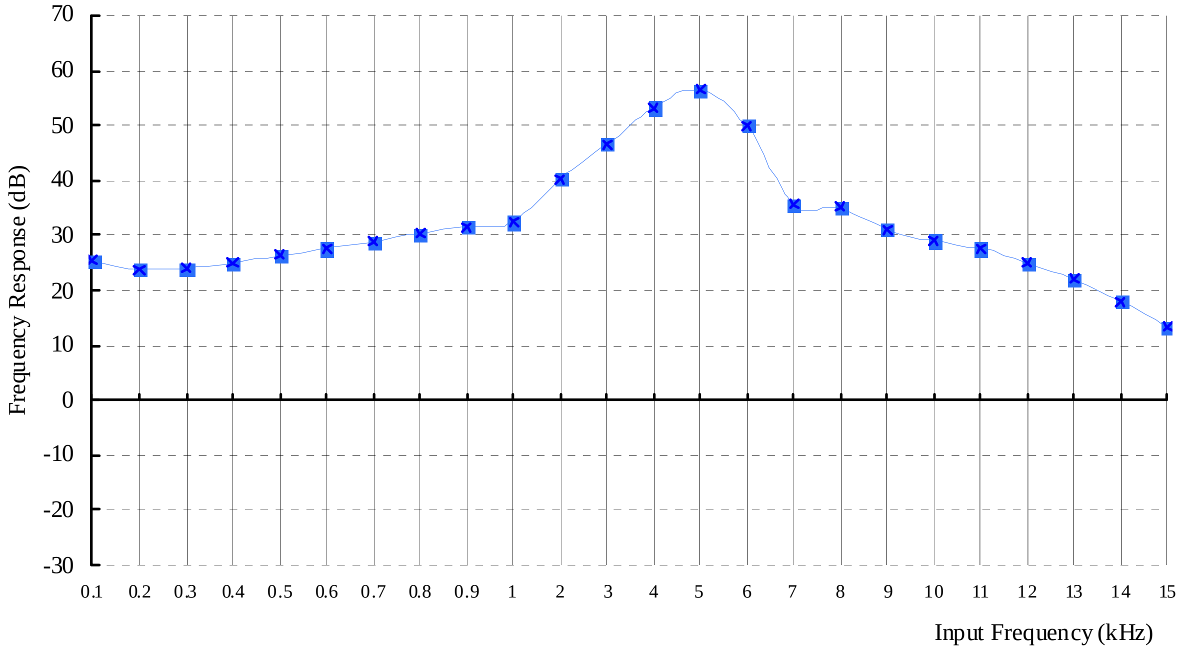
A). Frequency response
Mode : MIC IN



B). Modulation Limit
Mode : MIC IN



C). Frequency response of all circuits
Mode : MIC IN



5. OCCUPIED BANDWIDTH OF EMISSION

5.1 Provisions Applicable

According to §2.1049 (c)(1), For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.
According to §74.861(e)(5), the frequency emission bandwidth shall not exceed 200 kHz.

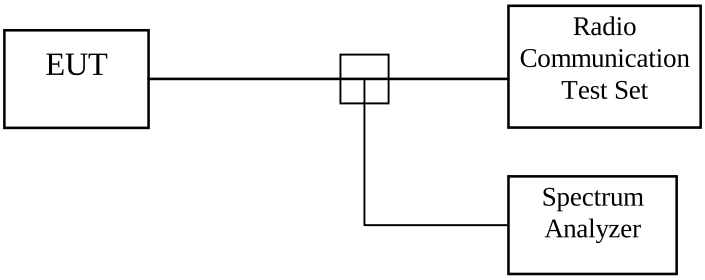
5.2 Measurement Method

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT as shown in figure 4, and Install new batteries in the EUT. Turn on the EUT ant set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Apply a 2.5 kHz modulation signal to EUT and measure the frequencies of the modulated signal from the EUT where it is the specified number of dB below the reference level set in step 2. This is the occupied bandwidth specified.

Figure 4 : Occupied bandwidth measurement configuration



5.3 Occupied Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
Communications Service Monitor	AEROFLEX	2945B	2014/08/12	2015/08/11
EMI Test Receiver	Rohde & Schwarz	ESU 40	2014/08/15	2015/08/14

5.4 Bandwidth Measured

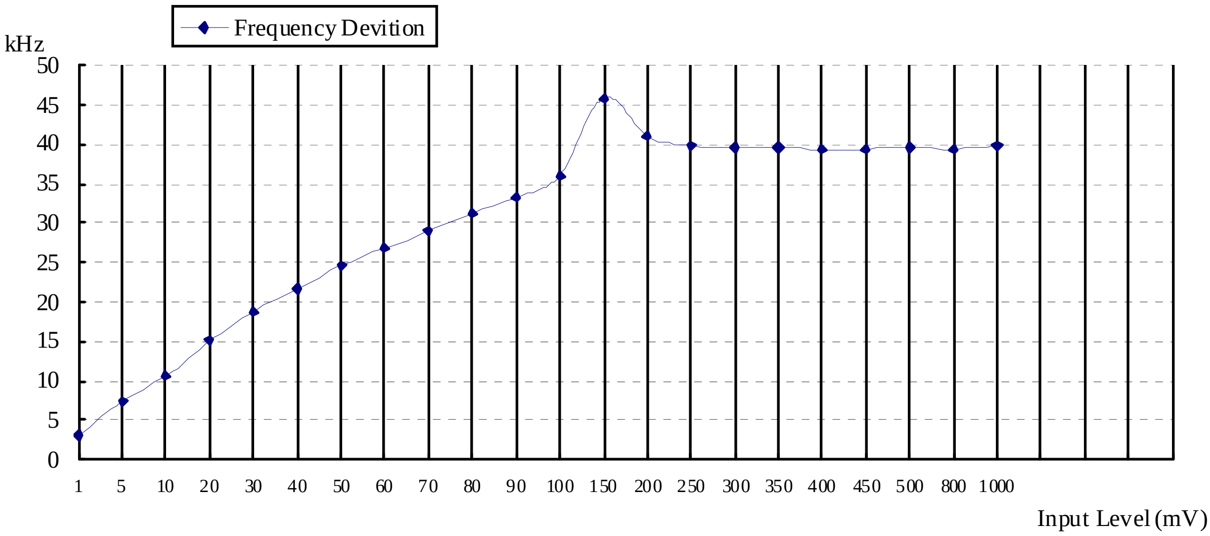
5.4.1 Input Level Derived

RF Frequency : 514.100MHz

Test Date : May 22, 2015 Temperature : 25 °C Humidity : 68 %

Input Audio Frequency : 2.5 kHz, Sine Wave

Mode : MIC IN

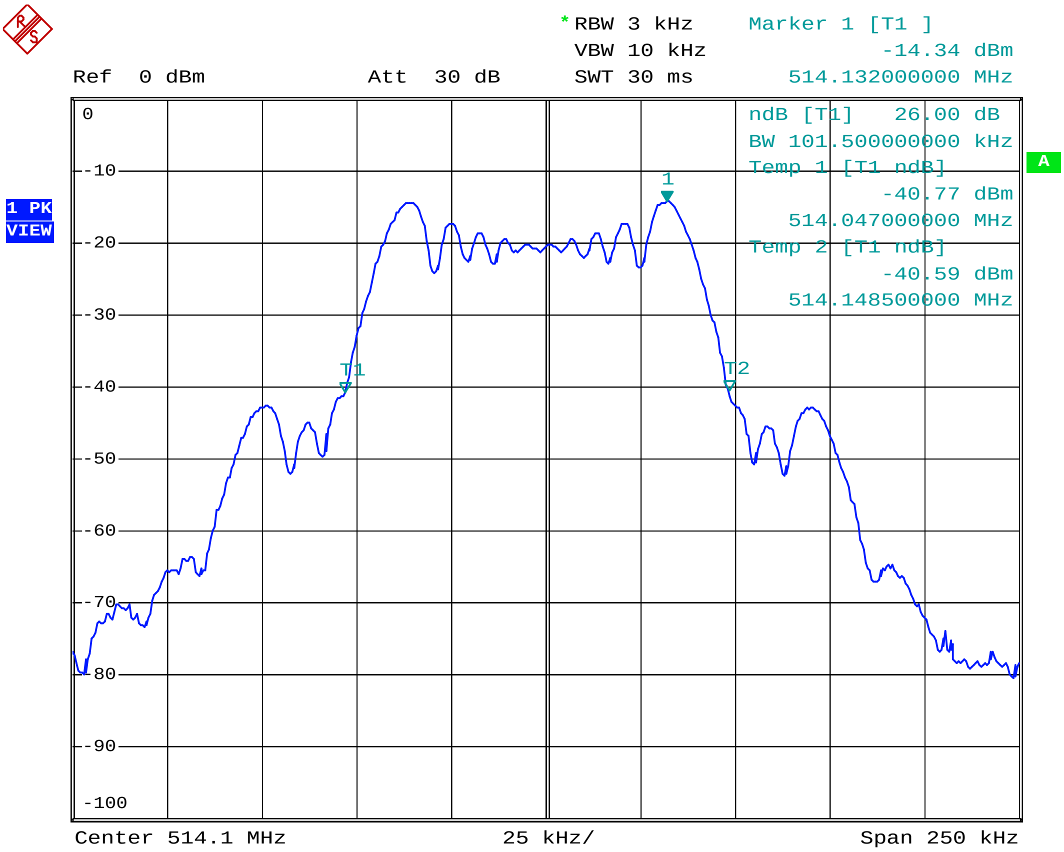


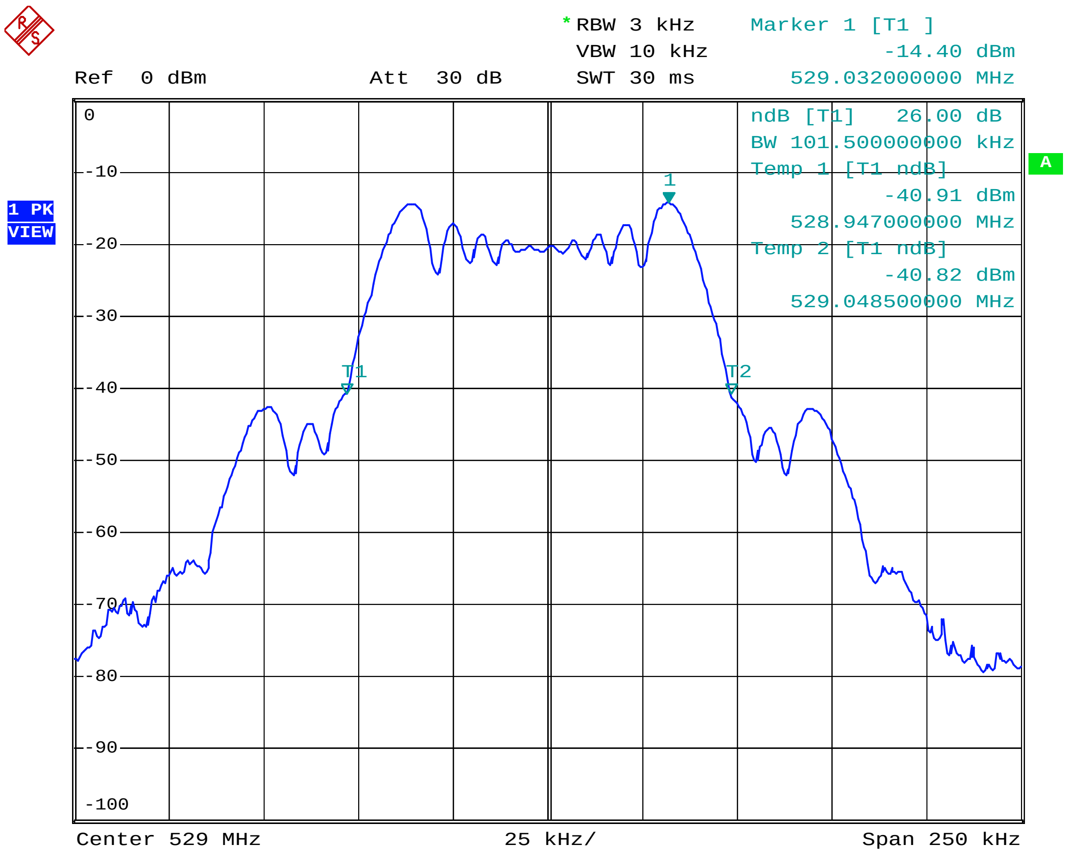
The Level input to produce 50% modulation is 40 mV, therefore the magnitude 16 dB greater than it is 252.3 mV.

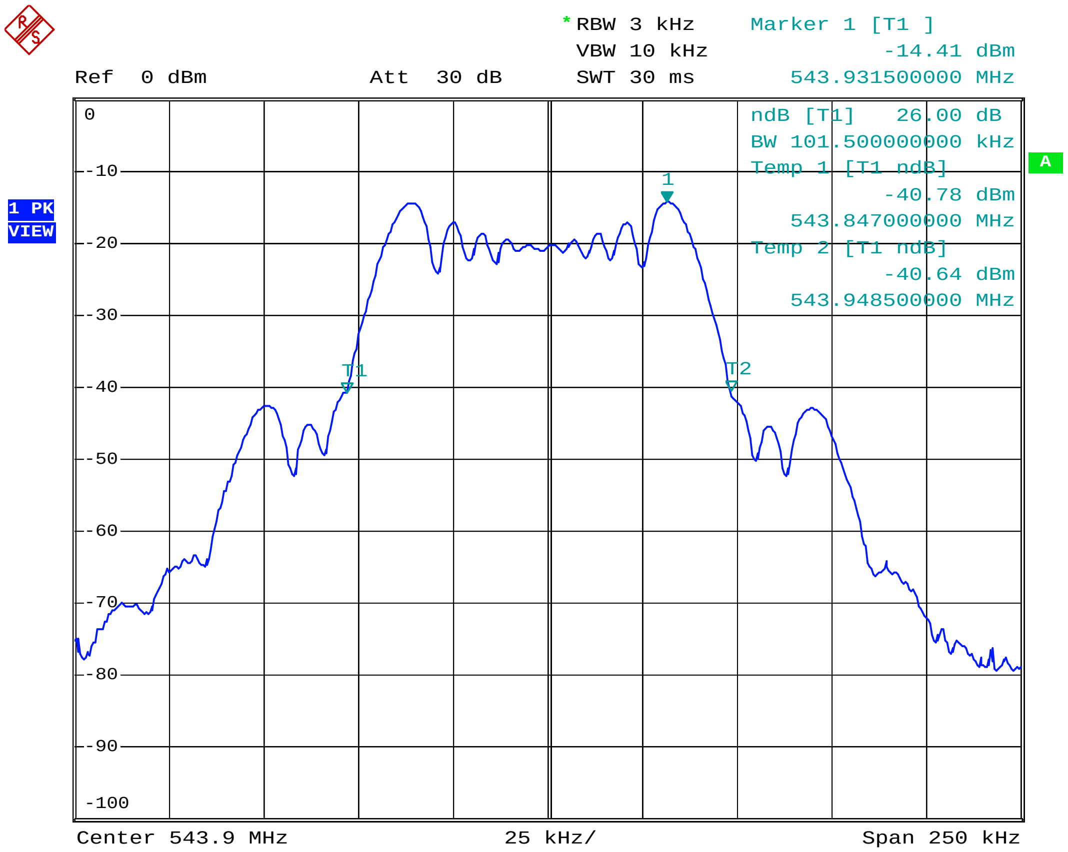
5.4.2 Occupied Bandwidth Plotted

Test Date : May 22, 2015 Temperature : 25 °C Humidity : 68 %

RF Frequency (MHz)	26 dB Bandwidth (kHz)
514.100	101.5
529.000	101.5
543.900	101.5


*RBW 3 kHz
VBW 10 kHz
SWT 30 ms
Ref 0 dBm
Att 30 dB
Marker 1 [T1]
-14.34 dBm
514.132000000 MHz
ndB [T1] 26.00 dB
BW 101.500000000 kHz
Temp 1 [T1 ndB]
-40.77 dBm
514.047000000 MHz
Temp 2 [T1 ndB]
-40.59 dBm
514.148500000 MHz
1 PK
VIEW
A
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
1
T1
T2
Center 514.1 MHz
25 kHz/
Span 250 kHz


*RBW 3 kHz
VBW 10 kHz
SWT 30 ms
Ref 0 dBm
Att 30 dB
Marker 1 [T1]
-14.40 dBm
529.032000000 MHz
ndB [T1] 26.00 dB
BW 101.500000000 kHz
Temp 1 [T1 ndB]
-40.91 dBm
528.947000000 MHz
Temp 2 [T1 ndB]
-40.82 dBm
529.048500000 MHz
1 PK
VIEW
A
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
1
T1
T2
Center 529 MHz
25 kHz/
Span 250 kHz


*RBW 3 kHz
VBW 10 kHz
SWT 30 ms
Ref 0 dBm
Att 30 dB
Marker 1 [T1]
-14.41 dBm
543.931500000 MHz
ndB [T1] 26.00 dB
BW 101.500000000 kHz
Temp 1 [T1 ndB]
-40.78 dBm
543.847000000 MHz
Temp 2 [T1 ndB]
-40.64 dBm
543.948500000 MHz
1 PK
VIEW
A
1
T1
T2
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 543.9 MHz
25 kHz/
Span 250 kHz

6. FIELD STRENGTH OF EMISSION

6.1 Provisions Applicable

According to §2.1053, measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation. Information submitted shall include the relative radiated power of spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from a halfwave dipole antenna.

According to §74.861(e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the follwing sceedule:

(i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(iii) on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth shall be attenuated below the unmodulated carrier by at least 43 plus 10 Log(output power in watts) dB.

6.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively, adjusting the input voltage to produce the maximum power as measured in chapter 3.
2. Adjust the analyzer for each frequency measured in chapter 6 on a 1 MHz frequency span and 1MHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° , and record the highest value indicated on spectrum analyzer as reference value.
4. Repeat step 3 until all frequencies need to be measured were complete.
5. Repeat step 4 with search antenna in vertical polarized orientations.
6. Replace the EUT with a tuned dipole antenna (horn antenna for above 1 GHz) relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a identical value derived from step 3 on spectrum analyzer. Record this value for result calculated.

7. Repeat step 6 until all frequencies need to be measured were complete.
8. Repeat step 7 with both dipole antenna (horn antenna for above 1 GHz) and search antenna in vertical polarized orientations.

6.3 Measuring Instrument

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESU 40	2014/08/15	2015/08/14
Double Ridged Antenna	EMCO	3115	2014/10/22	2015/10/21
Double Ridged Antenna	EMCO	3115	2014/08/18	2015/08/17
Log-periodic Antenna	EMCO	3146	2014/11/04	2015/11/03
Biconical Antenna	EMCO	3110	2014/11/04	2015/11/03
Amplifier	HP	8449B	2014/08/12	2015/08/11
Amplifier	HP	8447D	2014/11/10	2015/11/09
Signal generator	HP	83732B	2014/10/16	2015/10/15

Measuring instrument setup in frequency band measured is as following :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz

6.4 Measuring Data

6.4.1. Emission Test Data

1. Tx Frequency:514~544MHz

a. Tx Frequency: 514.100MHz

Operated mode : TX   Test Date :May 22, 2015

Temperature : 25°C   Humidity : 68%

Unmodulated carrier output power is 8.9 dBm , or 7.762 mW (ERP).

The limit of spurious or harmonics is calculated as following :

8.9-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBμV) H	Meter Reading (dBμV) V	SG Reading (dBm) H	SG Reading (dBm) V	Antenna Gain	Antenna Gain Corr’	Cable Loss (dB)	Result (dBm) H	Result (dBm) V	Limit (dBm)	Margin (dB)
1028.200	60.4	64.5	-52.1	-48.0	5.9	-2.0	2.1	-50.3	-46.2	-13.0	-33.2
1542.300	---	---	---	---	8.2	-2.0	2.6	---	---	-13.0	---
2056.400	---	---	---	---	8.3	-2.0	3.0	---	---	-13.0	---
2570.500	---	---	---	---	9.5	-2.0	3.4	---	---	-13.0	---
3084.600	---	---	---	---	9.2	-2.0	3.8	---	---	-13.0	---
3598.700	---	---	---	---	9.3	-2.0	4.1	---	---	-13.0	---
4112.800	---	---	---	---	9.7	-2.0	4.4	---	---	-13.0	---
4626.900	---	---	---	---	10.5	-2.0	4.7	---	---	-13.0	---
5141.000	---	---	---	---	10.1	-2.0	5.0	---	---	-13.0	---

Note :

1. Remark “---“ means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :

   Result ＝ SG Reading - Cable Loss +Antenna Gain +Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

b. Tx Frequency: 529.000MHz

Operated mode : TX Test Date :May 22, 2015
Temperature : 22°C Humidity : 68%

Unmodulated carrier output power is 9.5 dBm , or 8.913 mW (ERP).

The limit of spurious or harmonics is calculated as following :

9.5-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBμV) H	Meter Reading (dBμV) V	SG Reading (dBm) H	SG Reading (dBm) V	Antenna Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm) H	Result (dBm) V	Limit (dBm)	Margin (dB)
1058.000	60.3	64.6	-52.1	-47.7	6.0	-2.0	2.1	-50.2	-45.8	-13.0	-32.8
1587.000	---	---	---	---	8.2	-2.0	2.6	---	---	-13.0	---
2116.000	---	---	---	---	8.5	-2.0	3.1	---	---	-13.0	---
2645.000	---	---	---	---	9.5	-2.0	3.5	---	---	-13.0	---
3174.000	---	---	---	---	9.2	-2.0	3.8	---	---	-13.0	---
3703.000	---	---	---	---	9.3	-2.0	4.2	---	---	-13.0	---
4232.000	---	---	---	---	10.0	-2.0	4.5	---	---	-13.0	---
4761.000	---	---	---	---	10.3	-2.0	4.8	---	---	-13.0	---
5290.000	---	---	---	---	10.2	-2.0	5.1	---	---	-13.0	---

Note :

1. Remark “---“ means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :

   Result ＝ SG Reading - Cable Loss +Antenna Gain +Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

c. Tx Frequency: 543.900MHz

Operated mode : TX Test Date :May 22, 2015
Temperature : 22°C Humidity : 68%

Unmodulated carrier output power is 9.3 dBm , or 8.511 mW (ERP).

The limit of spurious or harmonics is calculated as following :

9.3-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBμV)		SG Reading (dBm)		Antenna Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm)		Limit (dBm)	Margin (dB)
	H	V	H	V				H	V		
1087.800	60.8	64.6	-51.5	-47.6	6.2	-2.0	2.2	-49.5	-45.6	-13.0	-32.6
1631.700	---	---	---	---	8.2	-2.0	2.7	---	---	-13.0	---
2175.600	---	---	---	---	8.7	-2.0	3.1	---	---	-13.0	---
2719.500	---	---	---	---	9.4	-2.0	3.5	---	---	-13.0	---
3263.400	---	---	---	---	9.3	-2.0	3.9	---	---	-13.0	---
3807.300	---	---	---	---	9.4	-2.0	4.2	---	---	-13.0	---
4351.200	---	---	---	---	10.2	-2.0	4.5	---	---	-13.0	---
4895.100	---	---	---	---	10.1	-2.0	4.8	---	---	-13.0	---
5439.000	---	---	---	---	10.3	-2.0	5.1	---	---	-13.0	---

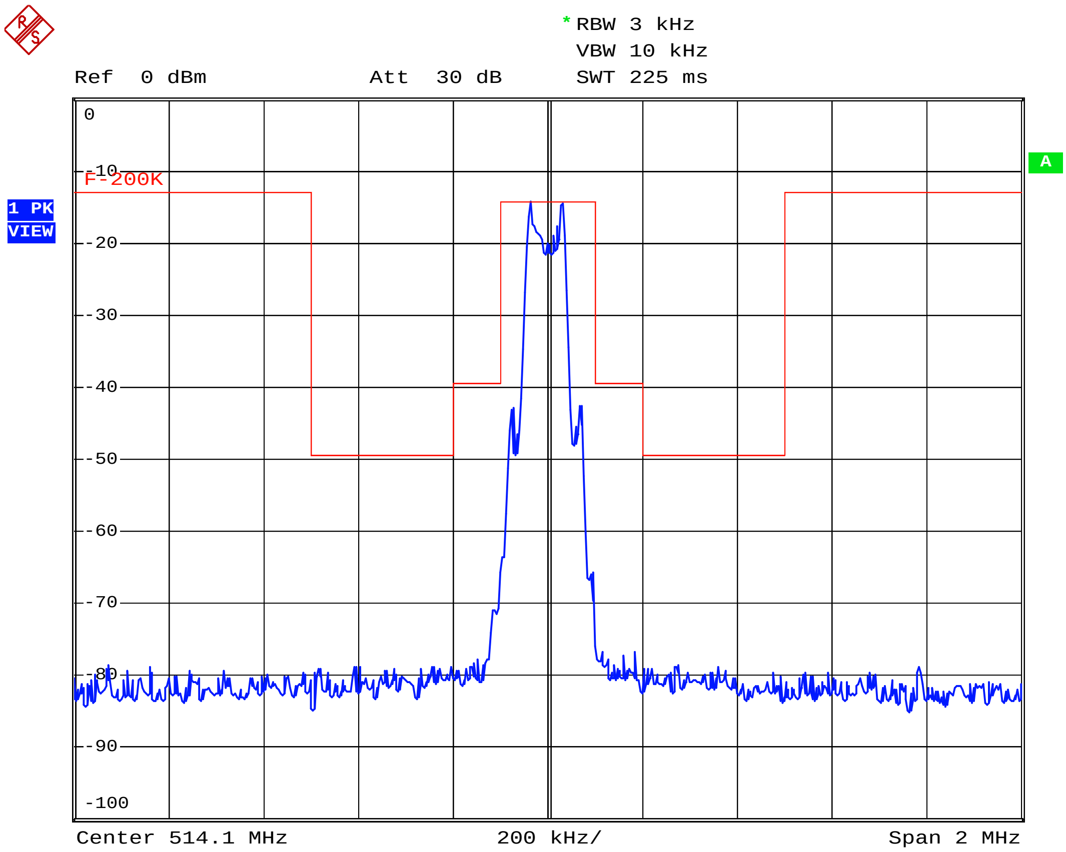
Note :

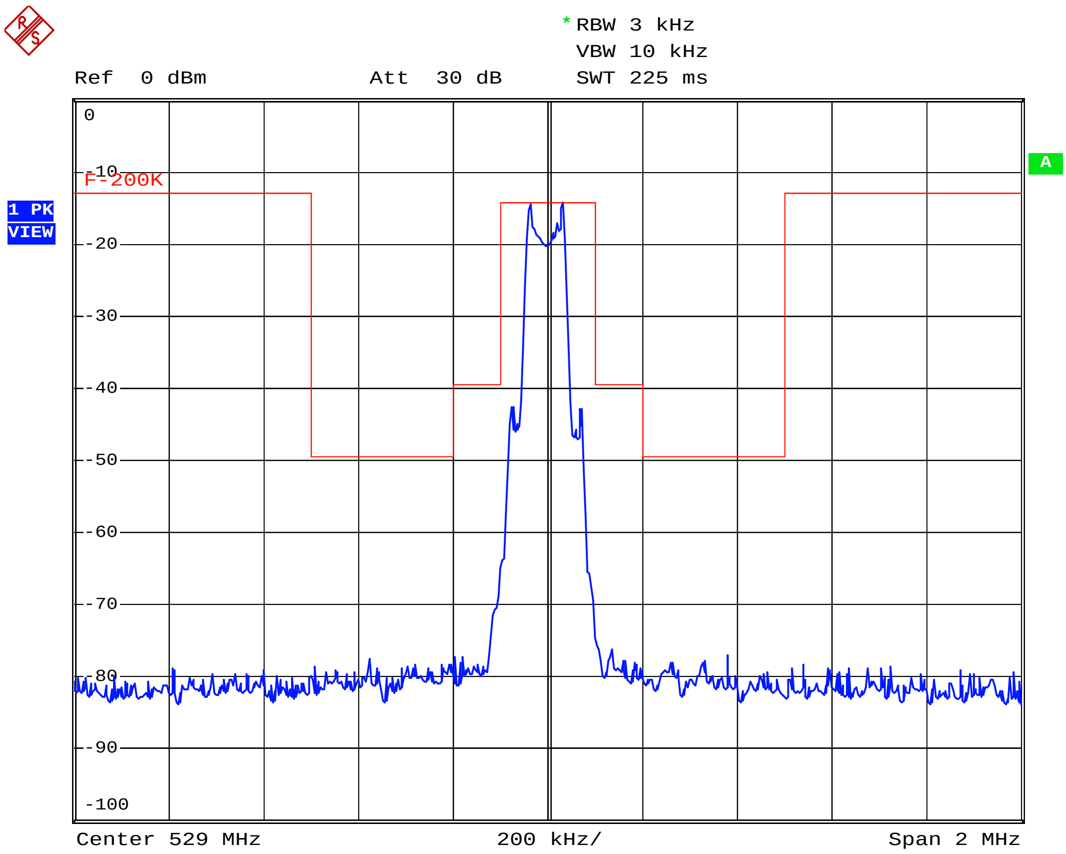
1. Remark "---" means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :

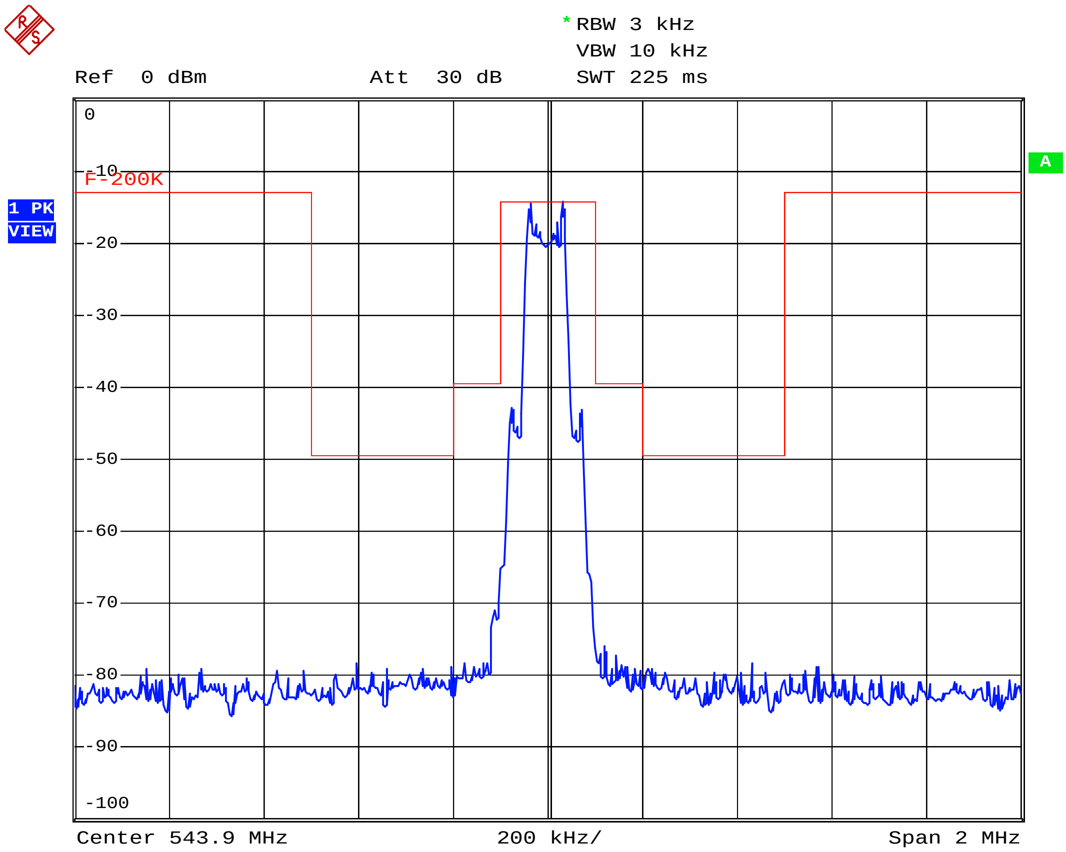
   Result ＝ SG Reading - Cable Loss +Antenna Gain +Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

6.4.2 Emission mask plots



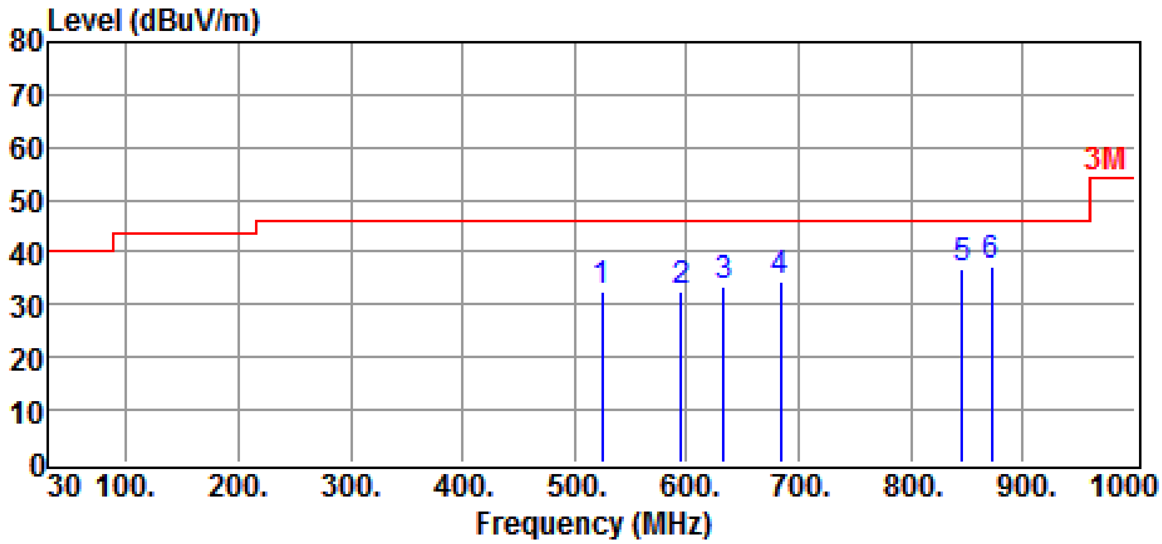

*RBW 3 kHz
VBW 10 kHz
Ref 0 dBm
Att 30 dB
SWT 225 ms
F-200K
1 PK
VIEW
A
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 529 MHz
200 kHz/
Span 2 MHz


*RBW 3 kHz
VBW 10 kHz
Ref 0 dBm
Att 30 dB
SWT 225 ms
0
-10
F-200K
1 PK
VIEW
A
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 543.9 MHz
200 kHz/
Span 2 MHz

6.5 Other Emission

a) Emission frequencies below 1 GHz

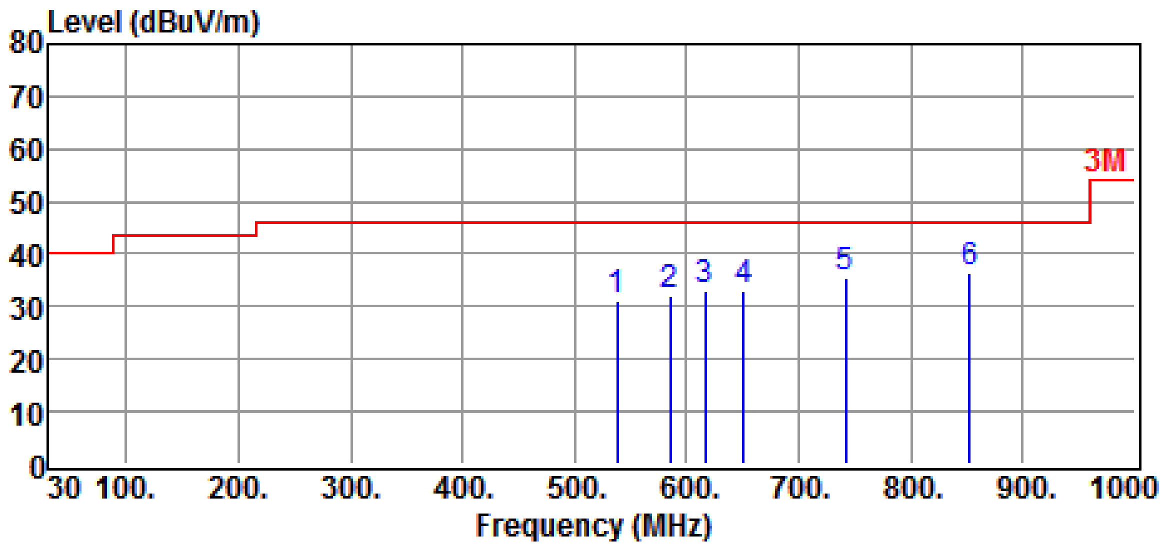
Test Date : May 20, 2015 Temperature : 25°C Humidity : 68 %



Site	:OPEN SITE	Date	:2015-05-20
Limit	:3M	Ant. Pol.	:HORIZONTAL
EUT	:UHF Pendant transmitter	Temp.	:25℃
Power Rating	:DC BATTERY	Humi.	:68%
Model	:Simeon 5.1T	Engineer.	:VC
Test Mode	:OPERATION MODE		

Freq MHz	Reading dBμV	Correction Factor dB	Result dBμV/m	Limits dBμV/m	Over limit dB	Detector
524.7000	10.2	22.2	32.4	46.0	-13.6	QP
594.5400	9.4	23.2	32.6	46.0	-13.4	QP
633.3400	9.5	24.0	33.5	46.0	-12.5	QP
683.7800	9.4	25.2	34.6	46.0	-11.4	QP
845.7700	9.1	27.6	36.7	46.0	-9.3	QP
871.9600	9.6	28.0	37.6	46.0	-8.4	QP

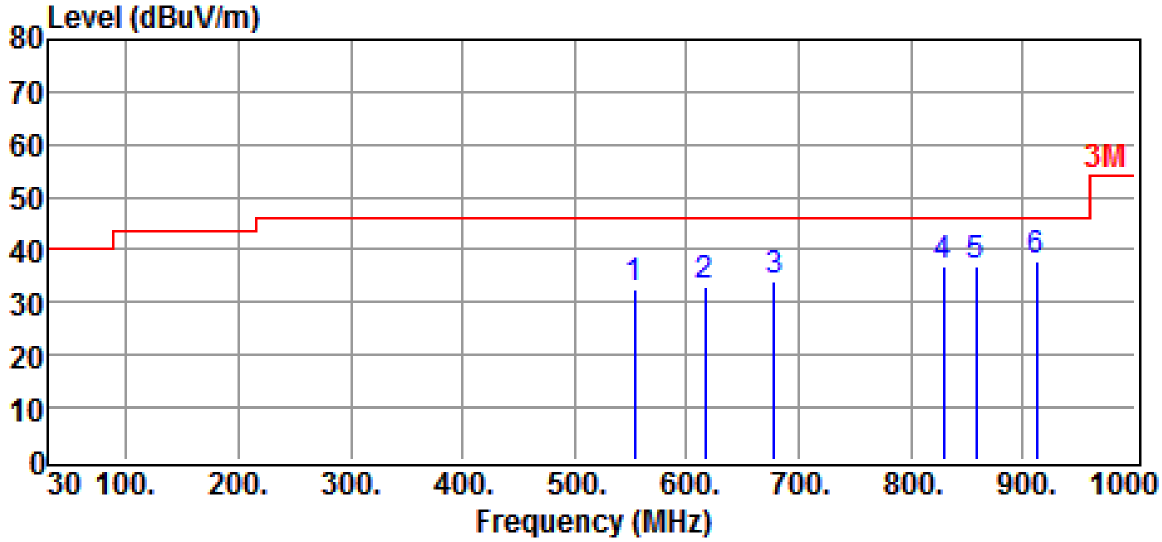
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss
3. The margin value=Limit - Result



Site	:OPEN SITE	Date	:2015-05-20
Limit	:3M	Ant. Pol.	:VERTICAL
EUT	:UHF Pendant transmitter	Temp.	:25℃
Power Rating	:DC BATTERY	Humi.	:68%
Model	:Simeon 5.1T	Engineer.	:VC
Test Mode	:OPERATION MODE		

Freq MHz	Reading dBμV	Correction Factor dB	Result dBμV/m	Limits dBμV/m	Over limit dB	Detector
538.2800	8.9	22.4	31.3	46.0	-14.7	QP
584.8400	9.0	23.0	32.0	46.0	-14.0	QP
615.8800	9.7	23.5	33.2	46.0	-12.8	QP
650.8000	8.4	24.4	32.8	46.0	-13.2	QP
741.9800	9.6	26.0	35.6	46.0	-10.4	QP
852.5600	8.6	27.7	36.3	46.0	-9.7	QP

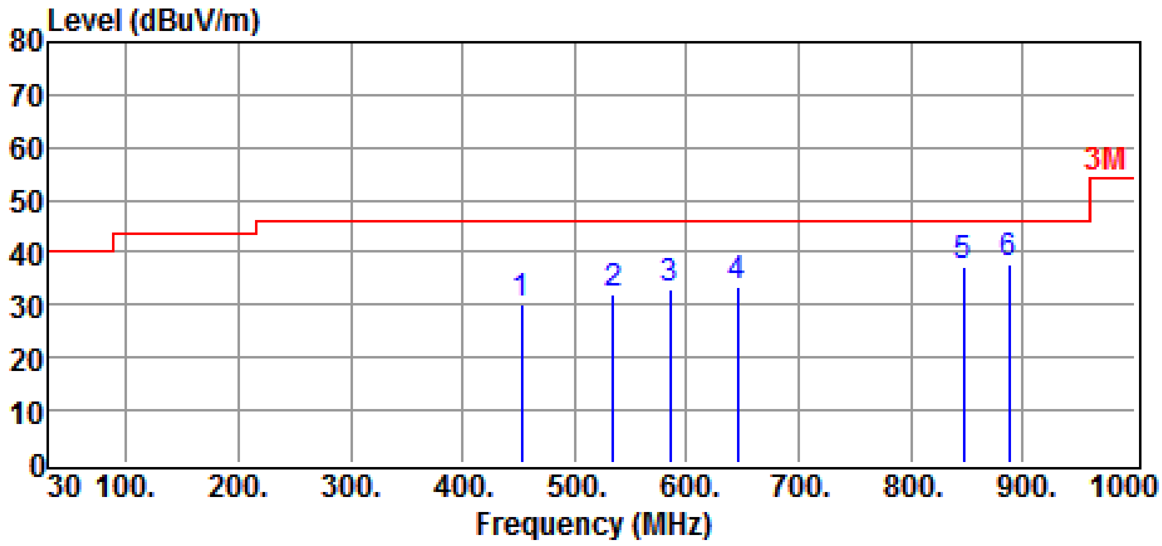
Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss
3. The margin value=Limit - Result



Site	:OPEN SITE	Date	:2015-05-20
Limit	:3M	Ant. Pol.	:HORIZONTAL
EUT	:UHF Pendant transmitter	Temp.	:25℃
Power Rating	:AC120V/60Hz	Humi.	:68%
Model	:Simeon 5.1T	Engineer.	:VC
Test Mode	:CHARGE MODE		

Freq MHz	Reading dBμV	Correction Factor dB	Result dBμV/m	Limits dBμV/m	Over limit dB	Detector
553.8000	9.9	22.6	32.5	46.0	-13.5	QP
615.8800	9.7	23.5	33.2	46.0	-12.8	QP
677.9600	8.8	25.1	33.9	46.0	-12.1	QP
829.2800	9.5	27.2	36.7	46.0	-9.3	QP
858.3800	8.9	27.9	36.8	46.0	-9.2	QP
911.7300	9.5	28.6	38.1	46.0	-7.9	QP

Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss
3. The margin value=Limit - Result



Site	:OPEN SITE	Date	:2015-05-20
Limit	:3M	Ant. Pol.	:VERTICAL
EUT	:UHF Pendant transmitter	Temp.	:25℃
Power Rating	:AC120V/60Hz	Humi.	:68%
Model	:Simeon 5.1T	Engineer.	:VC
Test Mode	:CHARGE MODE		

Freq MHz	Reading dBμV	Correction Factor dB	Result dBμV/m	Limits dBμV/m	Over limit dB	Detector
452.9200	9.5	20.6	30.1	46.0	-15.9	QP
534.4000	9.9	22.4	32.3	46.0	-13.7	QP
584.8400	10.1	23.0	33.1	46.0	-12.9	QP
644.9800	9.4	24.3	33.7	46.0	-12.3	QP
846.7400	9.9	27.6	37.5	46.0	-8.5	QP
887.4800	9.6	28.2	37.8	46.0	-8.2	QP

Note :
1. Result = Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss
3. The margin value=Limit - Result

b) Emission frequencies above 1 GHz

Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured with a pre-amplifier of 35 dB.

6.6 Radiated Measurement Photos

(Battery Mode)

(Charge Mode)

7. FREQUENCY STABILITY MEASUREMENT

7.1 Provisions Applicable

According to §2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30℃to +50℃centigrade, and according to §2.1055 (d)(2), the frequency stability shall be measured with variation of primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

According to §74.861(e)(4), the frequency tolerance of the transmitter shall be 0.005 percent.

7.2 Measurement Procedure

A) Frequency stability versus environmental temperature

1. Setup the configuration per figure 5 for frequencies measured at ambient temperature if it is within 15℃to 25℃. Otherwise, an environmental chamber set for a temperature of 20℃shall be used.

2. Turn on EUT and set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. Set the temperature of chamber to 50℃. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

4. Repeat step 2 with a 10℃decreased per stage until the lowest temperature -30℃is measured, record all measurement frequencies.

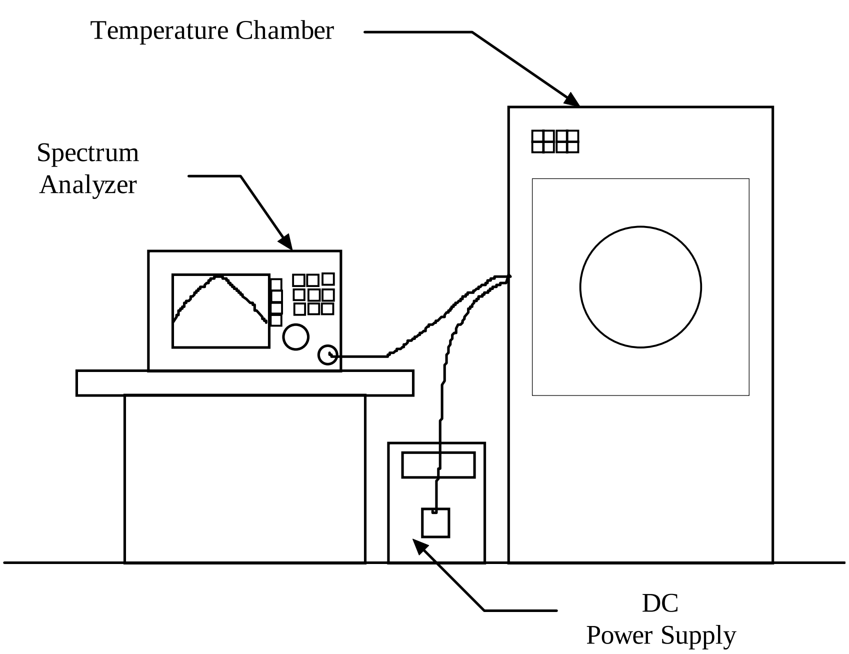
B) Frequency stability versus input voltage

1. Setup the configuration per figure 7 for frequencies measured at ambient temperature if it is within 15℃to 25℃. Otherwise, an environmental chamber set for a temperature of 20℃shall be used. Install new batteries in the EUT.

2. Set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. For non hand carried, battery operated device, supply the EUT primary voltage with 85 and 115 percent of the nominal value and record the frequency.

Figure 5 : Frequency stability measurement configuration



7.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESU 40	2014/08/15	2015/08/14
Temperature Chamber	MALLIER	MCT-2X-M	2014/10/27	2015/10/26

7.4 Measurement Data

Test Date : May 20, 2015 Temperature : 25 °C Humidity : 68 %

A. Tx Frequency 514.100MHz

A1. Frequency stability versus enviroment tempture

Reference Frequency 514.100 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vac)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	120.0	514.1159	0.00309	514.1153	0.00298	514.1157	0.00305
40		514.1104	0.00202	514.1110	0.00214	514.1125	0.00243
30		514.1075	0.00146	514.1079	0.00154	514.1070	0.00136
20		514.1035	0.00068	514.1038	0.00074	514.1042	0.00082
10		514.0993	-0.00014	514.0986	-0.00027	514.0985	-0.00029
0		514.0932	-0.00132	514.0934	-0.00128	514.0940	-0.00117
-10		514.0909	-0.00177	514.0914	-0.00167	514.0908	-0.00179
-20		514.0866	-0.00261	514.0867	-0.00259	514.0864	-0.00265
-30		514.0813	-0.00364	514.0814	-0.00362	514.0812	-0.00366

A2. Frequency stability versus supplied voltage (85% - 115%)

Reference Frequency : 514.100 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vac)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	138.0	514.1061	0.00119	514.1060	0.00117	514.1057	0.00111
25	102.0	514.1071	0.00138	514.1064	0.00124	514.1068	0.00132

Test Date : May 20, 2015 Temperature : 25 °C Humidity : 68 %

B. Tx Frequency 543.900MHz

B1. Frequency stability versus enviroment tempture

Reference Frequency : 543.900MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vac)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	120.0	543.9047	0.00086	543.8800	-0.00368	543.9048	0.00088
40		543.9189	0.00347	543.9072	0.00132	543.9026	0.00048
30		543.9068	0.00125	543.9094	0.00173	543.9182	0.00335
20		543.8971	-0.00053	543.9103	0.00189	543.9020	0.00037
10		543.8858	-0.00261	543.8877	-0.00226	543.9051	0.00094
0		543.9045	0.00083	543.9007	0.00013	543.8941	-0.00108
-10		543.8961	-0.00072	543.9125	0.00230	543.9080	0.00147
-20		543.8859	-0.00259	543.9202	0.00371	543.9015	0.00028
-30		543.8920	-0.00147	543.9089	0.00164	543.9188	0.00346

B2. Frequency stability versus supplied voltage (85% - 115%)

Reference Frequency : 543.900MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vac)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	138.0	543.9090	0.00165	543.9012	0.00022	543.9051	0.00094
25	102.0	543.9196	0.00360	543.8851	-0.00274	543.9101	0.00186

8 CONDUCTED EMISSION MEASUREMENT

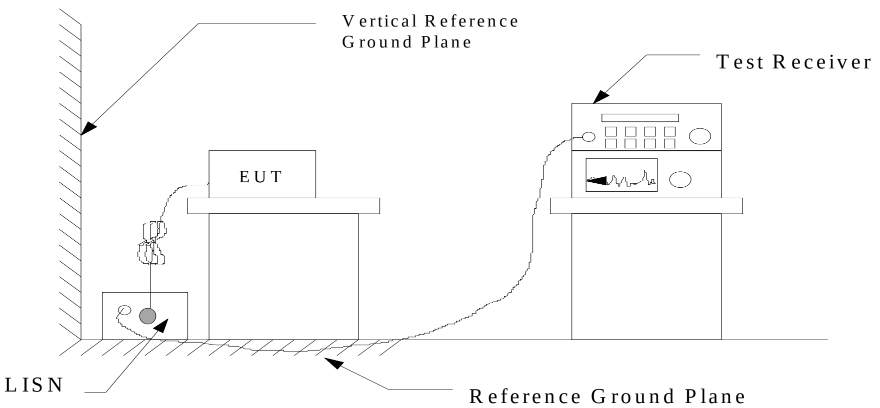
8.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to §15.107(a) and §15.207(a) respectively. Both Limits are identical specification.

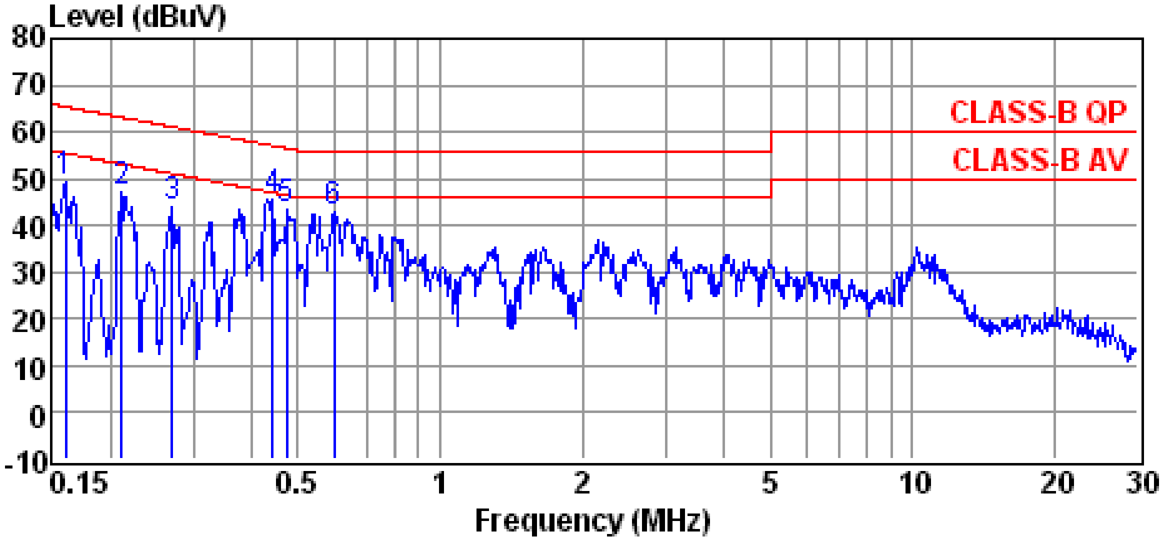
8.2 Measurement Procedure

1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 or 8 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



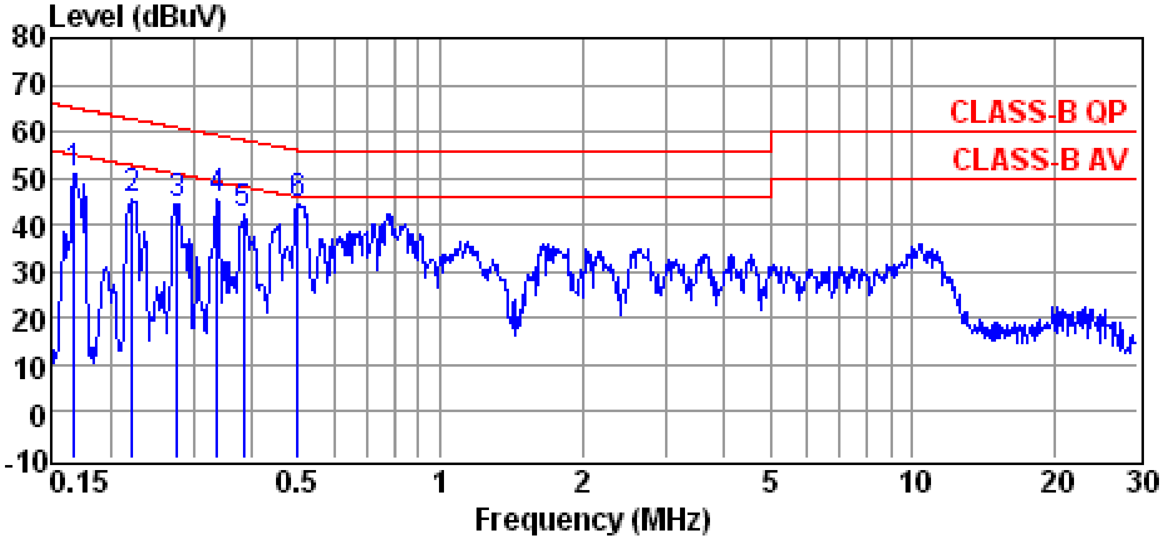
8.3 Conducted Emission Data



Site	: conducted #1	Date	: 05-21-2015
Condition	: CLASS-B QP	LISN	: NEUTRAL
Tem / Hum	: 25 ℃ / 68%	Test Mode	: charge mode
EUT	:UHF Pendant transmitter		
Power Rating	: AC120V/60Hz (ADAPTER)		
Memo	:	Memo	:

Freq (MHz)	Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Remark
0.1607	39.12	10.14	49.26	65.43	-16.17	QP
0.2117	36.98	10.14	47.12	63.14	-16.02	QP
0.2701	33.91	10.15	44.06	61.12	-17.06	QP
0.4421	35.60	10.16	45.76	57.02	-11.26	QP
0.4736	33.10	10.17	43.27	56.45	-13.18	QP
0.5948	32.44	10.18	42.62	56.00	-13.38	QP

Note :
1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss



Site	: conducted #1	Date	: 05-21-2015
Condition	: CLASS-B QP	LISN	: LINE
Tem / Hum	: 25 ℃ / 68%	Test Mode	: charge mode
EUT	:UHF Pendant transmitter		
Power Rating	: AC120V/60Hz (ADAPTER)		
Memo	:	Memo	:

Freq (MHz)	Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Remark
0.1677	40.74	10.13	50.87	65.08	-14.21	QP
0.2220	35.63	10.13	45.76	62.74	-16.98	QP
0.2773	34.49	10.14	44.63	60.90	-16.27	QP
0.3374	35.11	10.15	45.26	59.27	-14.01	QP
0.3832	32.32	10.15	42.47	58.21	-15.74	QP
0.4994	34.43	10.16	44.59	56.01	-11.42	QP

Note :
1. Result = Reading + Factor
2. Factor = LISN Factor + Cable Loss

8.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR

Assume a receiver reading of 22.5 dBμV is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dBμV.

RESULT = 22.5 + 0.1 = 22.6 dBμV
Level in μV = Common Antilogarithm[(22.6 dBμV)/20]
= 13.48 μV

8.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test .

Equipment	Manufacturer	Model No.	Calibration Date	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESCI	2014/09/09	2015/09/08
LISN	EMCO	3625/2	2014/10/29	2015/10/28
LISN	Rohde & Schwarz	ESH2-Z5	2015/04/09	2016/04/08

8.6 Photos of Conduction Measuring Setup