

FCC&IC Radio Test Report

FCC ID: 2AANUCSS5530

IC: 11260A-CSS5530

This report concerns (check one): ☒ Original Grant ☐ Class II Change

Project No. : 1507C061
Equipment : Cinema Speaker
Model Name for FCC : CSS5530B/37; CSS5530X/**
Model Name for IC : CSS5530B/37
Applicant : Gibson Innovations Limited
Address : 5/F-6/F PHILIPS ELECTRONICS BLDG 5
SCIENCE PARK AVE HONG KONG SCIENCE
PARK NT

Date of Receipt : Jul, 07. 2015
Date of Test : Jul, 07. 2015~Jul, 16. 2015
Issued Date : Jul, 17. 2015
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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FICP-2-1507C061	Original Issue.	Jul, 17. 2015

1. CERTIFICATION

Equipment	: Cinema Speaker
Brand Name	: PHILIPS
Model Name for FCC	: CSS5530B/37; CSS5530X/**
Model Name for IC	: CSS5530B/37
Applicant	: Gibson Innovations Limited
Manufacturer	: Gibson Innovations Limited
Address	: 5/F-6/F PHILIPS ELECTRONICS BLDG 5 SCIENCE PARK AVE HONG KONG SCIENCE PARK NT
Factory	: Eastech Electronics (Hui Yang) Co. Ltd.
Address	: Dong Feng District,Xinxuu, Hui Yang,Huizhou, Guuangdong, China
Date of Test	: Jul, 07. 2015~Jul, 16. 2015
Test Sample	: ENGINEERING SAMPLE
Standard(s)	: FCC Part15, Subpart E(15.407) / ANSI C63.10-2013 FCC KDB 789033 D02 General UNII Test Procedures New Rules v01. Canada RSS-247 Issue 1, May 2015 RSS-GEN Issue 4, Nov 2014

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FICP-2-1507C061) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart E Canada RSS-247 Issue 1May 2015/RSS-GEN Issue 4, Nov 2014				
Standard(s) Section		Test Item	Judgment	Remark
FCC	IC			
15.207	RSS-GEN 8.8	AC Power Line Conducted Emissions	PASS	
15.407(a)	RSS-247 5.2 (1)	6dB Bandwidth	PASS	
15.407(a)	RSS-247 5.4 (4)	Maximum Conducted Output Power	PASS	
15.407(a)	RSS-247 5.2 (2)	Power Spectral Density	PASS	
15.407(a)	RSS-247 5.5	Radiated Emissions	PASS	
15.407(b)	RSS-247 5.5	Band Edge Emissions	PASS	
15.407(b)	RSS-247 5.5	Antenna conducted Spurious Emission	PASS	
15.407(g)	-	Frequency Stability	PASS	
15.203	RSS-247 5.5	Antenna Requirements	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's test firm number for FCC: 319330

BTL's test firm number for IC: 4428B-1

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95%**.

The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	Note
DG-C02	CISPR	150 KHz~30MHz	2.32	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)	Note
DG-CB03	CISPR	9kHz~30MHz	V	3.79	
		9kHz~30MHz	H	3.57	
		30MHz~200MHz	V	3.82	
		30MHz~200MHz	H	3.78	
		200MHz~ 1,000MHz	V	4.10	
		200MHz~ 1,000MHz	H	4.06	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Cinema Speaker	
Brand Name	PHILIPS	
Model Name for FCC	CSS5530B/37; CSS5530X/**	
Model Name for IC	CSS5530B/37	
Model Difference	The product includes soundbar and subwoofer and Wireless box; the whole system's model name is CSS5530B/37; CSS5530X/**; soundbar model name are CSS5530B/37; CSS5530X/** (bluetooth and wireless transmitting function); and subwoofer model names are SW5530B/37; SW5530B/** (wireless receiving function only), and Wireless box model names are WB5530B/37; WB5530B/** (wireless receiving function only) The "X" can be A to Z for colour, The "***" can be 37 or F7 for market use.	
Product Description	Operation Frequency	5736-5814MHz
	Modulation Type	QPSK
	Bit Rate of Transmitter	192kbps
	Output Power (Max.)-for Soundbar	7.88dBm
Power Source	DC Voltage supplied from AC/DC adapter Brand/model: PHILIPS /DYS602-210309W	
Power Rating	I/P 100-240V~ 50/60Hz 1.5A MAX O/P DC21.0V 3.09A	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. Channel List:

Channel	Frequency (MHz)
01	5736
02	5762
03	5814

3. Antenna Specification:

For Soundbar

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
A	N/A	N/A	Printed	N/A	1.44	TX/RX
B	N/A	N/A	Printed	N/A	1.44	TX/RX

For Subwoofer

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
A	N/A	N/A	Printed	N/A	1.44	RX
B	N/A	N/A	Printed	N/A	1.44	RX

For Wireless Box

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
A	N/A	N/A	Printed	N/A	1.44	RX
B	N/A	N/A	Printed	N/A	1.44	RX

Only “one” antenna is selected for use at any one time, through the on-board Transmit-Receive / Diversity RF switch.

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Test Mode	Description
Mode 1	TX Mode/ CH01, CH02, CH03

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test	
Final Test Mode	Description
Mode 1	TX Mode

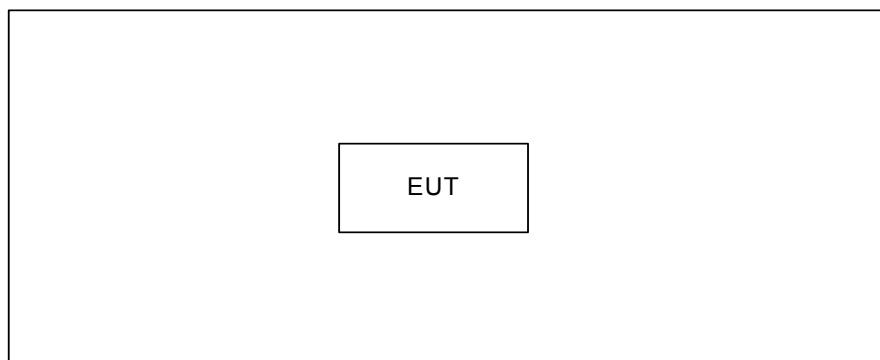
For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode/ CH01, CH02, CH03

3.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product

Test Software Version	N/A		
Frequency (MHz)	5736	5762	5814
	N/A	N/A	N/A

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
-	-	-	-	-	-	

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value - Limit Value

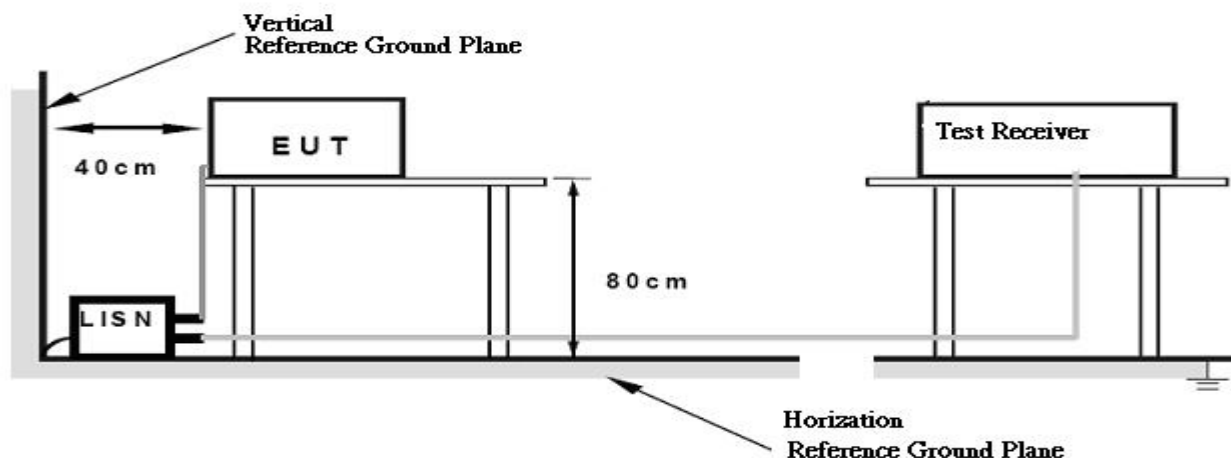
4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the groundplane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting/TX Mode mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 24°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150kHz to 30MHz.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

In case the emission fall within the restricted band specified on 15.205(a) and RSS-247 6.2.2 (2), then the 15.209(a) and RSS-Gen limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBμV/m)
5150-5250	-27	68.3
5250-5350	-27	68.3
5470-5725	-27	68.3
5725-5850	-27 (beyond 10MHz of the band edge)	68.3
	-17 (within 10 MHz of band edge)	78.3

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field

strength: $E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m}$, where P is the eirp (Watts)

4.2.2 TESTPROCEDURE

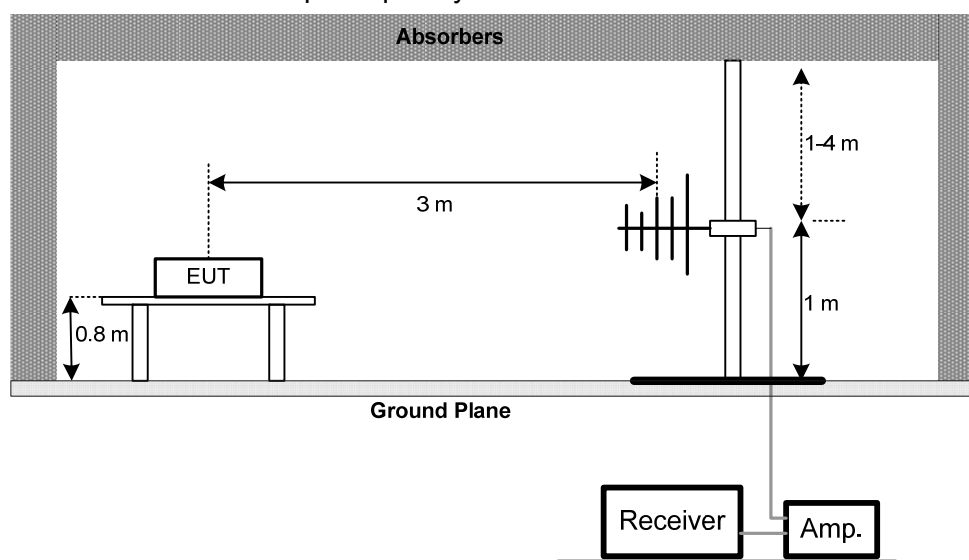
- The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

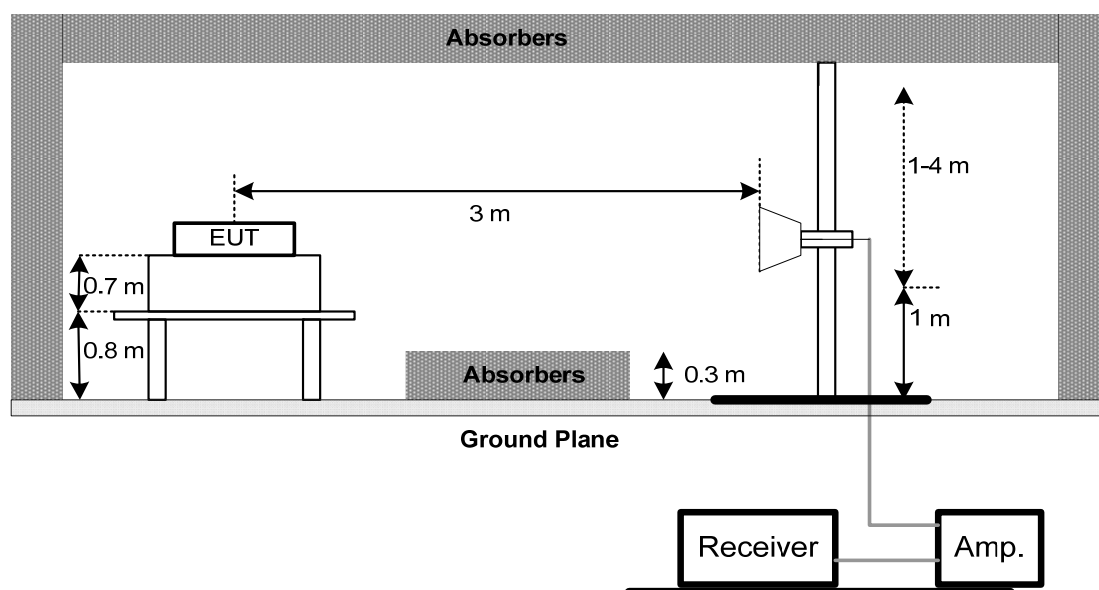
No deviation

4.2.4 TEST SETUP

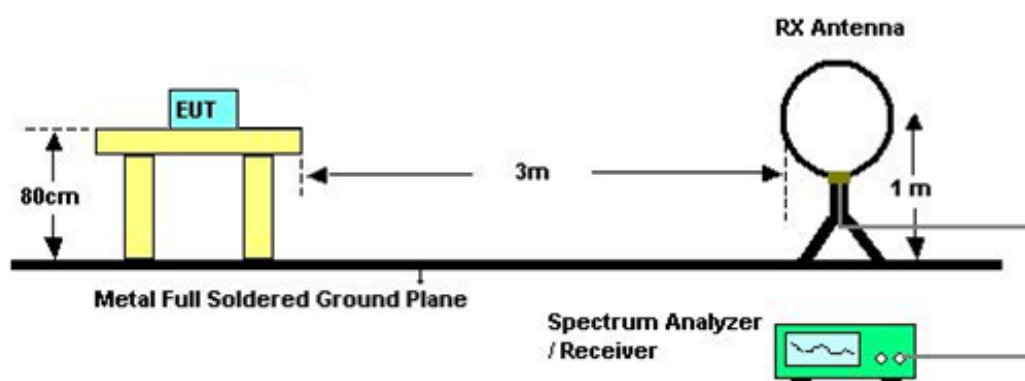
(A) Radiated Emission Test Set-Up Frequency Below 1GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) Radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 EUT TEST CONDITIONS

Temperature: 28°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

4.2.7 TEST RESULTS (9K TO 30MHz)

Please refer to the Attachment B

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8 TEST RESULTS (30 TO 1000 MHz)

Please refer to the Attachment C.

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Modewith Detector BW=120kHz ; SPA setting in RBW=120kHz, VBW =120kHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

4.2.9 TEST RESULTS (ABOVE1000 MHz)

Please refer to the Attachment D.

Remark:

- (1) All readings are Peak unless otherwise stated AV in column of 『Note』 . Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (3) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (5) EUT Orthogonal Axes:
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (6) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.
- (7) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

5.2 6dB SPECTRUM BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E/ RSS-247			
Test Item	Limit	Frequency Range (MHz)	Result
Bandwidth	Minimum 500kHz 6dB Bandwidth	5725-5850	PASS

5.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RBW	300 kHz
VBW	1000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- c. Measured the spectrum width with power higher than 26dB below carrier

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 EUT TEST CONDITIONS

Temperature: 28°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

5.1.6 TEST RESULTS

Please refer to the Attachment E.

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E/ RSS-247			
Test Item	Limit	Frequency Range (MHz)	Result
Conducted Output Power	1 Watt (30dBm)	5725-5850	PASS

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) ofthe signal
RBW	= 1MHz.
VBW	$\geq$ 3MHz.
Detector	RMS
Trace	Max Hold
Sweep Time	auto

- c. Test was performed in accordance with method of KDB 789033 D02.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 EUT TEST CONDITIONS

Temperature: 28°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

6.1.6 TEST RESULTS

Please refer to the Attachment F.

7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E/ RSS-247			
Test Item	Limit	Frequency Range (MHz)	Result
Antenna conducted Spurious Emission	Below -17dBm/MHz within 10MHz of band edge, below -27dBm/MHz beyond 10MHz of the band edge	5725-5850	PASS

7.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
RBW	1000kHz
VBW	1000kHz
Trace	Max Hold
Sweep Time	Auto

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 EUT TEST CONDITIONS

Temperature: 28°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

7.1.6 TEST RESULTS

Please refer to the Attachment G.

8. POWER SPECTRAL DENSITY TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E/ RSS-247			
Test Item	Limit	Frequency Range (MHz)	Result
Power Spectral Density	30dBm/500kHz	5725-5850	PASS

8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) ofthe signal
RBW	= 1MHz.
VBW	≥ 3MHz.
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

Note:

1. According to KDB publication 789033 D02 General UNII Test Procedures New Rules v01, section II.F.5., it is acceptable to set RBW at 1MHz and VBW at 3MHz if the spectrum analyzer does not have 500kHz RBW.
2. The value measured with RBW=1MHz is to be added with $10\log(500\text{kHz}/1\text{MHz})$ which is -3dB. For example, if the measured value is +10dBm using RBW=1MHz (that is +10dBm/MHz), then the converted value will be +7dBm/500kHz.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 EUT TEST CONDITIONS

Temperature: 28°C Relative Humidity: 60% Test Voltage: AC 120V/60Hz

8.1.6 TEST RESULTS

Please refer to the Attachment H.

9. FREQUENCY STABILITY MEASUREMENT

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E/ RSS-247			
Test Item	Limit	Frequency Range (MHz)	Result
Frequency Stability	Specified in the user's manual	5725-5850	PASS

9.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.

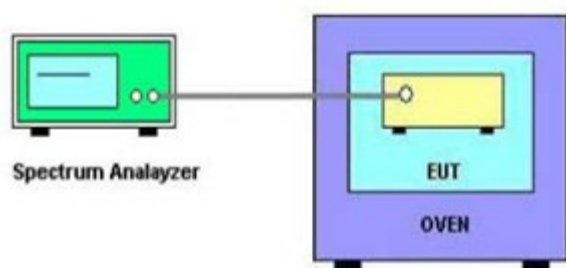
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10kHz
Sweep Time	Auto

- c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
- d. User manual temperature is -10°C~60°C.

9.1.2 DEVIATION FROM STANDARD

No deviation.

9.1.3 TEST SETUP



9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

9.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: AC 120V/60Hz

9.1.6 TEST RESULTS

Please refer to the Attachment I.

10. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Mar. 28, 2016
2	LISN	R&S	ENV216	101447	Mar. 28, 2016
3	Test Cable	N/A	C_17	N/A	Mar. 13, 2016
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 28, 2016
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 28, 2016
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 17, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
4	Test Cable	emci	LMR-400(30M Hz-1GHz)	C-01	Jun. 28, 2016
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	Mar. 28, 2016
7	Amplifier	Agilent	8449B	3008A02274	Nov. 02, 2015
8	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
9	Test Cable	emci	EMC104-SM-S M-10000(1GH z-26.5GHz)	C-68	Jun. 28, 2016
10	Controller	CT	SC100	N/A	N/A
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
12	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
13	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 16, 2015
14	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Spectrum Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Maximum Conducted Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	power Meter	ANRITSU	ML2495A	1128009	Mar. 28, 2016
2	Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 28, 2016

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015
2	Const Temp. & Humidity Chamber	GIANT FORCE	ITH-1200-40-CP-AR	IAA1210-003	Aug.01, 2015

Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

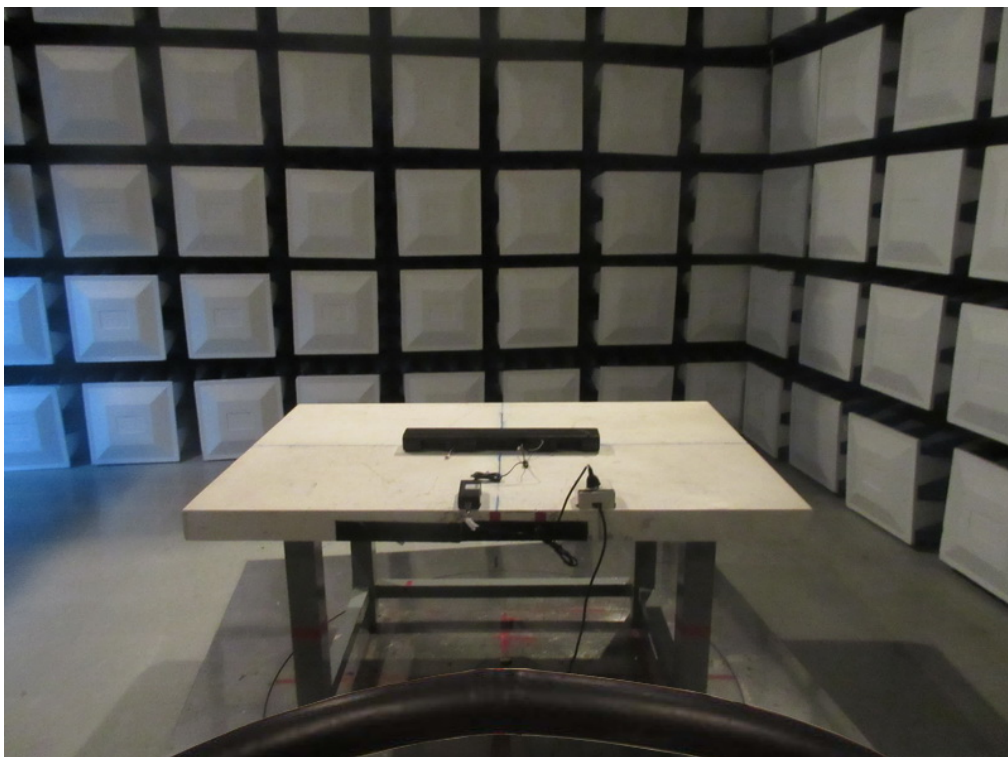
11. EUT TEST PHOTOS

Conducted Measurement Photos



Radiated Measurement Photos

9KHz to 30MHz



Radiated Measurement Photos

30MHz to 1000MHz



Radiated Measurement Photos

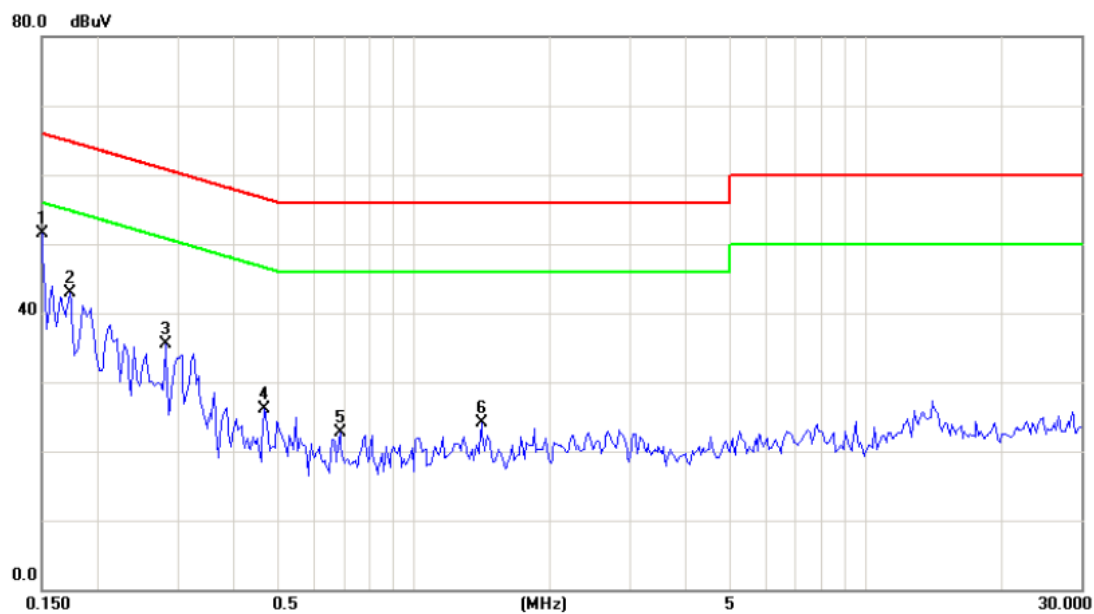
Above 1000MHz



ATTACHMENT A -CONDUCTED EMISSION

Test Mode: TX MODE

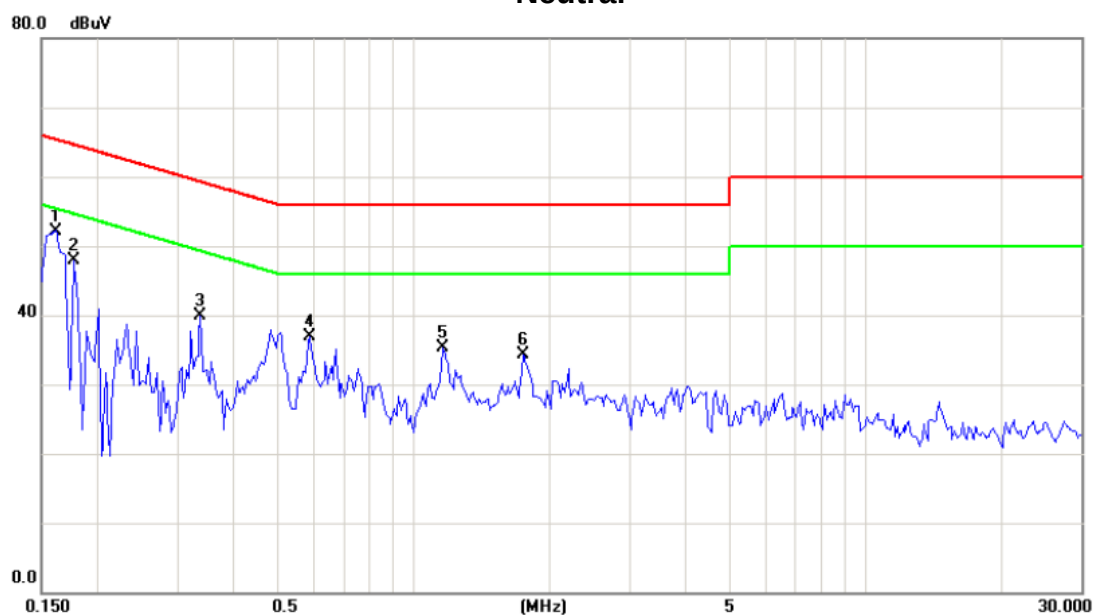
Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1500	41.99	9.54	51.53	66.00	-14.47	peak	
2		0.1734	33.38	9.56	42.94	64.80	-21.86	peak	
3		0.2828	25.92	9.63	35.55	60.73	-25.18	peak	
4		0.4664	16.35	9.68	26.03	56.58	-30.55	peak	
5		0.6851	12.92	9.74	22.66	56.00	-33.34	peak	
6		1.4117	14.18	9.83	24.01	56.00	-31.99	peak	

Test Mode: TX MODE

Neutral



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1	*	0.1617	42.72	9.48	52.20	65.38	-13.18	peak	
2		0.1773	38.48	9.48	47.96	64.61	-16.65	peak	
3		0.3375	30.39	9.53	39.92	59.26	-19.34	peak	
4		0.5875	27.43	9.56	36.99	56.00	-19.01	peak	
5		1.1617	25.78	9.61	35.39	56.00	-20.61	peak	
6		1.7477	24.66	9.68	34.34	56.00	-21.66	peak	

ATTACHMENT B -RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode:	TX MODE
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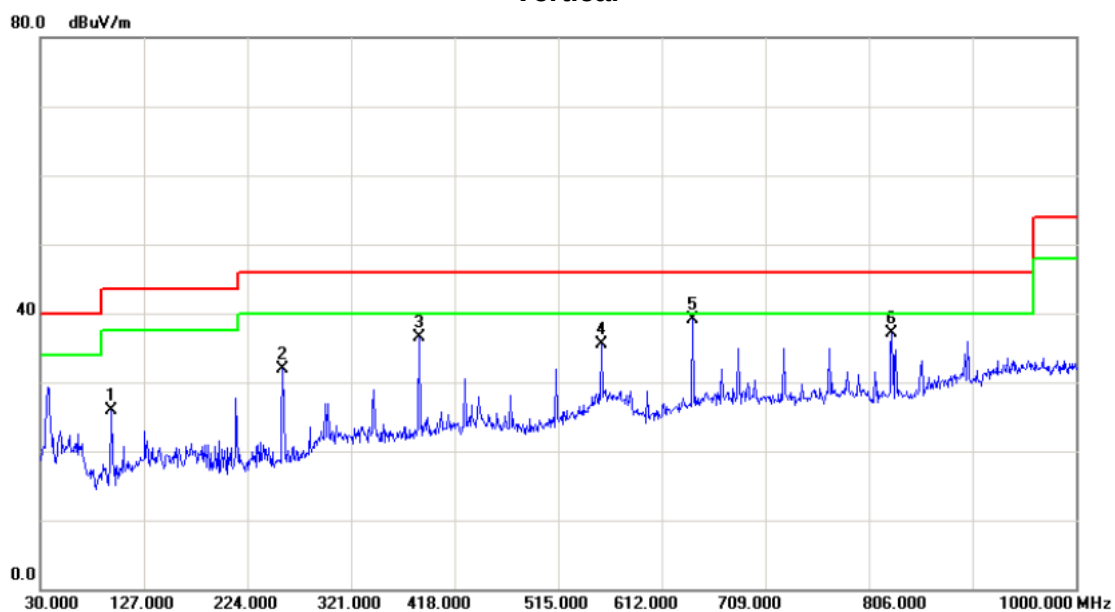
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0094	0°	13.31	24.97	38.28	128.14	-89.86	AVG
0.0094	0°	14.27	24.97	39.24	148.14	-108.90	PEAK
0.0226	0°	6.70	24.14	30.84	120.52	-89.69	AVG
0.0226	0°	8.11	24.14	32.25	140.52	-108.28	PEAK
0.0318	0°	3.16	23.55	26.71	117.56	-90.84	AVG
0.0318	0°	5.53	23.55	29.08	137.56	-108.47	PEAK
0.0420	0°	1.14	22.91	24.05	115.14	-91.09	AVG
0.0420	0°	2.52	22.91	25.43	135.14	-109.71	PEAK
0.4917	0°	19.34	19.82	39.16	73.77	-34.61	QP
1.7153	0°	23.63	19.53	43.16	69.54	-26.38	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0093	90°	13.12	24.30	37.42	128.22	-90.80	AVG
0.0093	90°	14.79	24.30	39.09	148.22	-109.13	PEAK
0.0252	90°	7.36	23.97	31.33	119.58	-88.25	AVG
0.0252	90°	8.72	23.97	32.69	139.58	-106.89	PEAK
0.0310	90°	5.27	23.60	28.87	117.78	-88.90	AVG
0.0310	90°	6.16	23.60	29.76	137.78	-108.01	PEAK
0.0434	90°	1.43	22.82	24.25	114.85	-90.61	AVG
0.0434	90°	2.75	22.82	25.57	134.85	-109.29	PEAK
0.4914	90°	22.16	19.82	41.98	73.78	-31.79	QP
1.7166	90°	24.46	19.53	43.99	69.54	-25.55	QP

ATTACHMENT C -RADIATED EMISSION (30MHZ TO 1000MHZ)

Test Mode: TX Mode 5736MHz

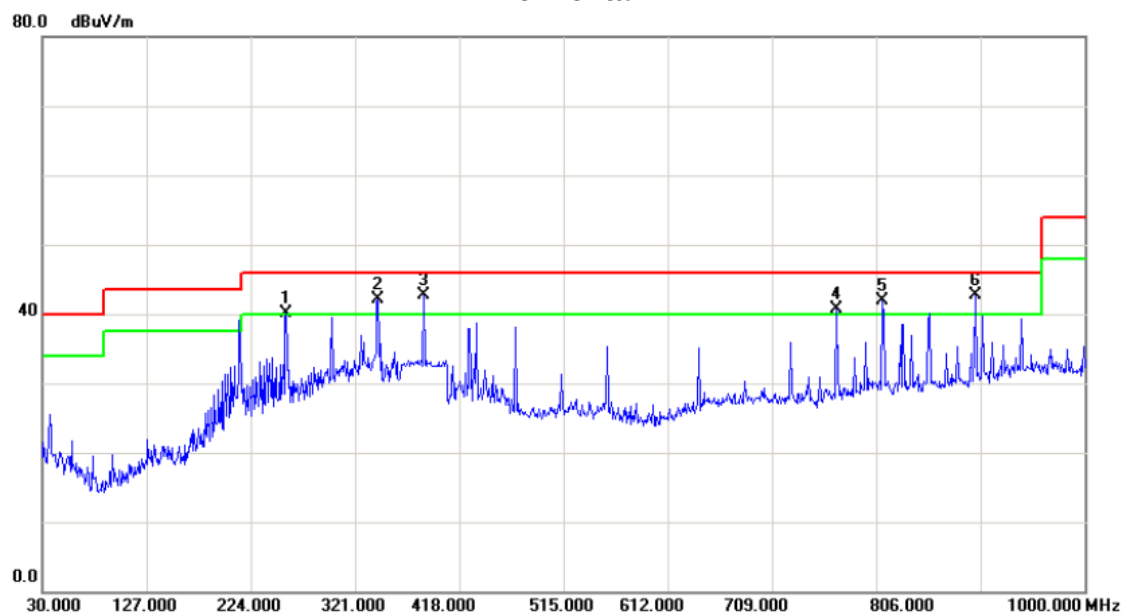
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		96.9300	41.00	-15.19	25.81	43.50	-17.69	peak	
2		256.9800	44.55	-12.64	31.91	46.00	-14.09	peak	
3		385.0200	44.64	-8.06	36.58	46.00	-9.42	peak	
4		555.7400	40.18	-4.61	35.57	46.00	-10.43	peak	
5	*	641.1000	41.19	-2.18	39.01	46.00	-6.99	peak	
6		827.3400	36.89	0.14	37.03	46.00	-8.97	peak	

Test Mode: TX Mode 5736MHz

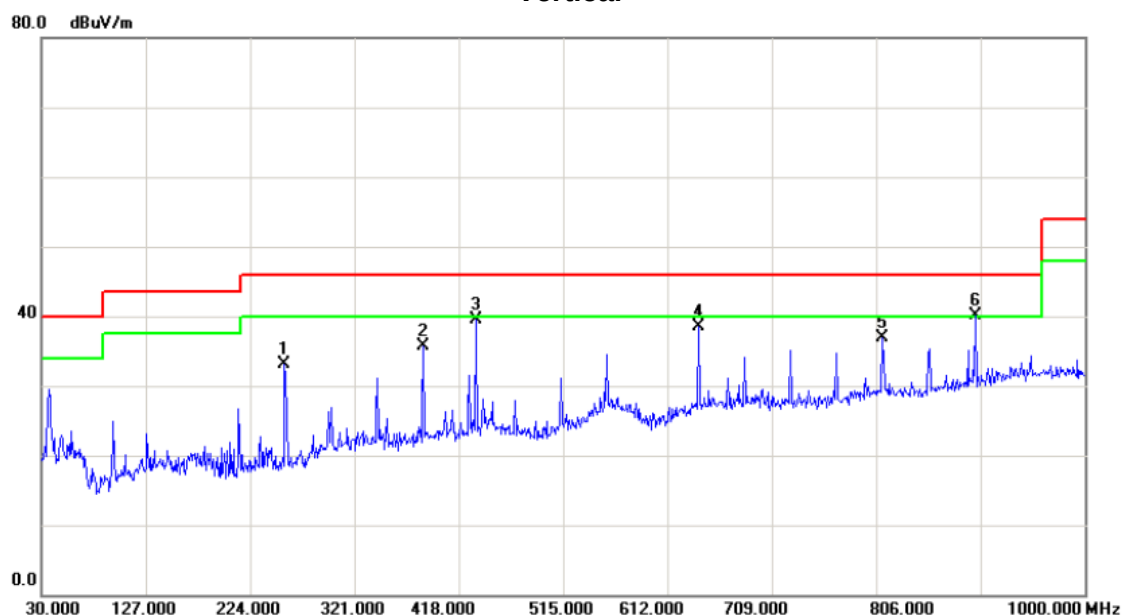
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	!	256.9800	52.82	-12.64	40.18	46.00	-5.82	peak	
2	!	342.3400	52.04	-9.87	42.17	46.00	-3.83	peak	
3	!	385.0200	50.72	-8.06	42.66	46.00	-3.34	peak	
4	!	769.1400	41.43	-0.82	40.61	46.00	-5.39	peak	
5	!	811.8200	41.80	0.15	41.95	46.00	-4.05	peak	
6	*	898.1500	41.11	1.62	42.73	46.00	-3.27	peak	

Test Mode: TX Mode 5762MHz

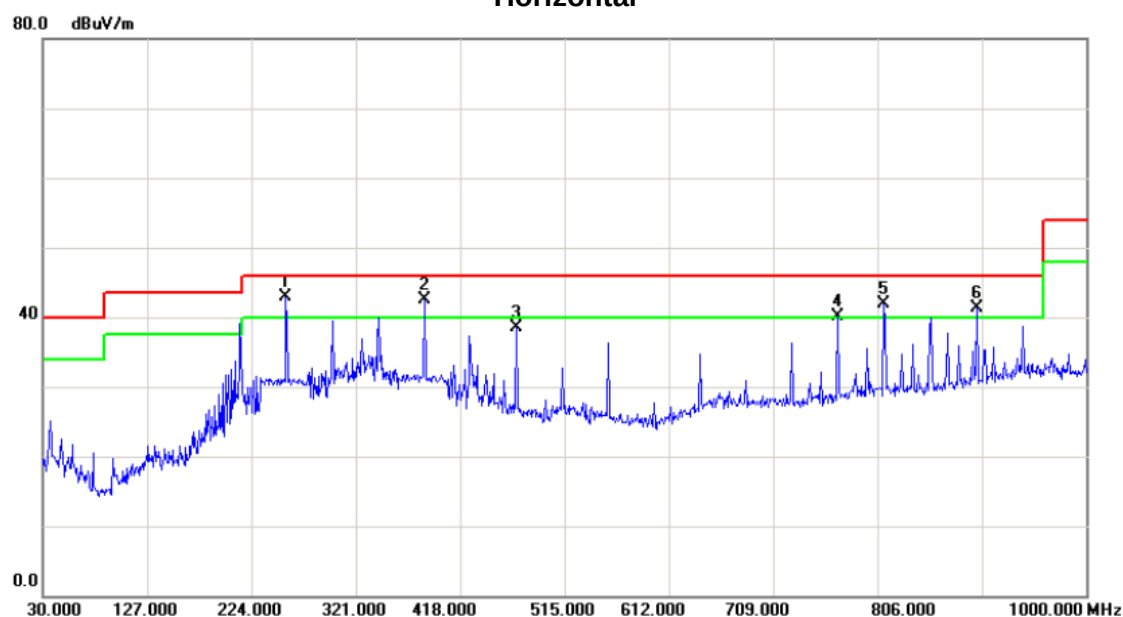
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		256.0100	45.67	-12.65	33.02	46.00	-12.98	peak	
2		385.0200	43.70	-8.06	35.64	46.00	-10.36	peak	
3		433.5200	45.79	-6.35	39.44	46.00	-6.56	peak	
4		641.1000	40.59	-2.18	38.41	46.00	-7.59	peak	
5		811.8200	36.72	0.15	36.87	46.00	-9.13	peak	
6	*	898.1500	38.56	1.62	40.18	46.00	-5.82	peak	

Test Mode: TX Mode 5762MHz

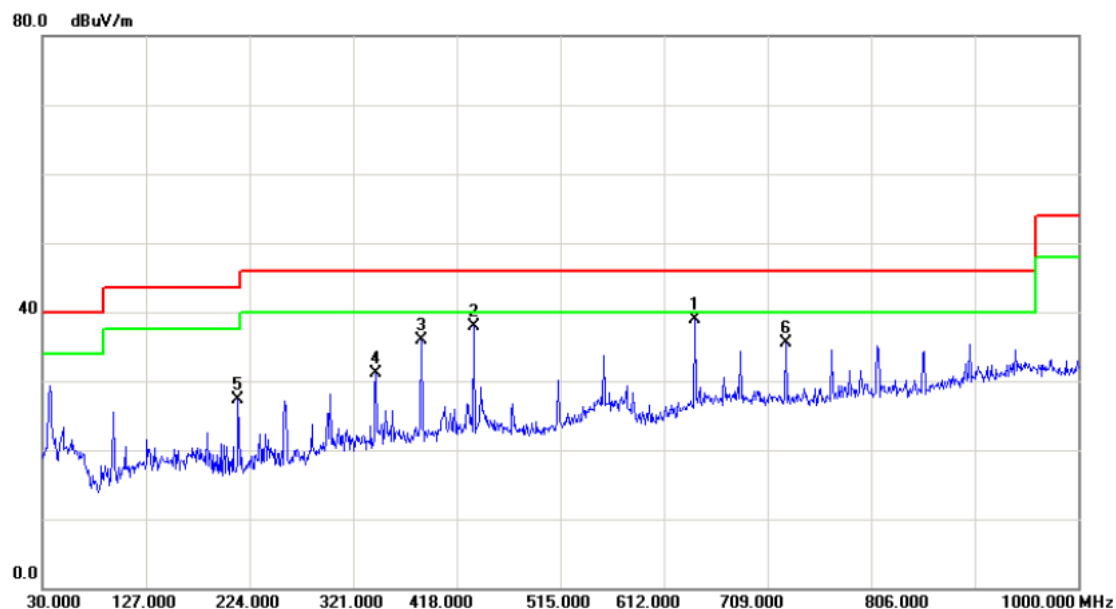
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	256.0100	55.58	-12.65	42.93	46.00	-3.07	peak	
2	!	385.0200	50.52	-8.06	42.46	46.00	-3.54	peak	
3		470.3800	44.93	-6.50	38.43	46.00	-7.57	peak	
4	!	769.1400	40.91	-0.82	40.09	46.00	-5.91	peak	
5	!	811.8200	41.70	0.15	41.85	46.00	-4.15	peak	
6	!	898.1500	39.68	1.62	41.30	46.00	-4.70	peak	

Test Mode: TX Mode 5762MHz

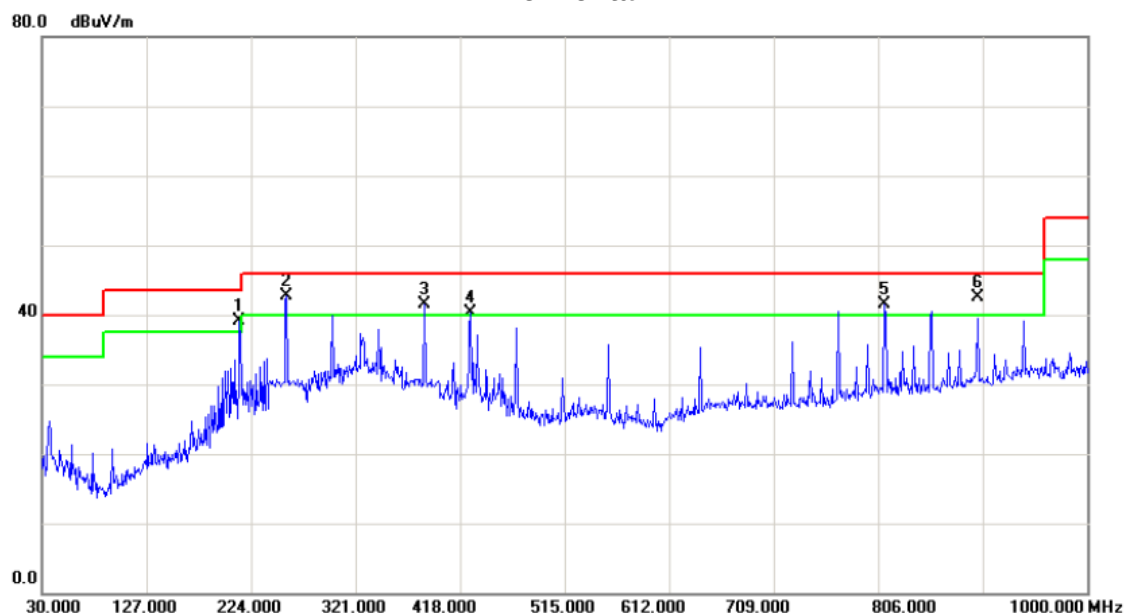
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	641.1000	41.08	-2.18	38.90	46.00	-7.10	peak	
2		433.5200	44.20	-6.35	37.85	46.00	-8.15	peak	
3		385.0200	43.91	-8.06	35.85	46.00	-10.15	peak	
4		342.3400	41.05	-9.87	31.18	46.00	-14.82	peak	
5		213.3300	40.89	-13.62	27.27	43.50	-16.23	peak	
6		726.4600	37.03	-1.45	35.58	46.00	-10.42	peak	

Test Mode: TX Mode 5762MHz

Horizontal

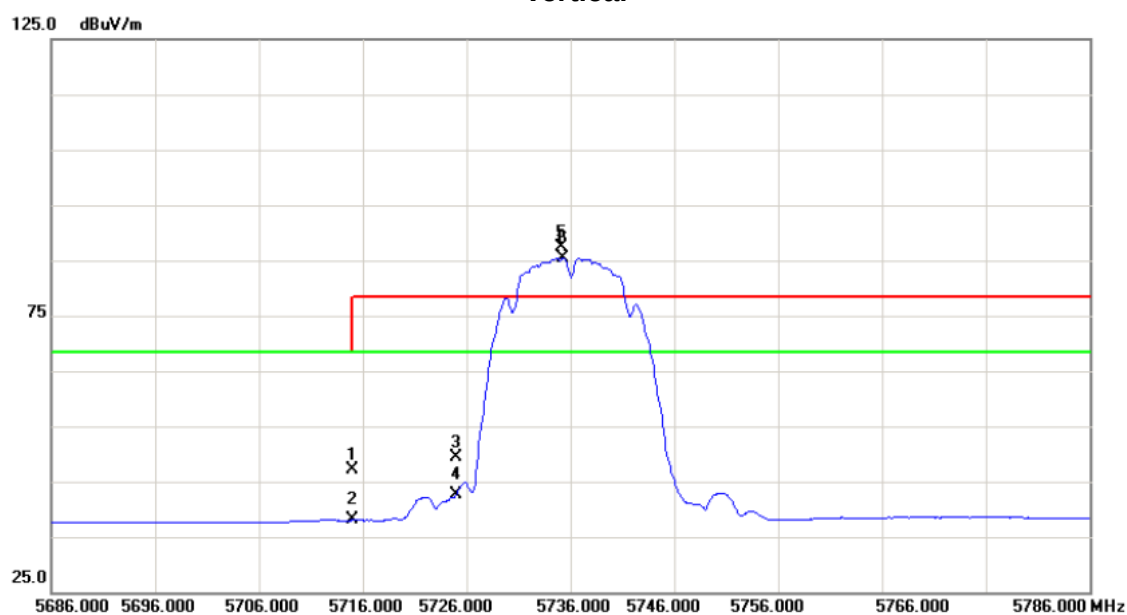


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	!	213.3300	52.72	-13.62	39.10	43.50	-4.40	peak	
2	*	256.9800	55.38	-12.64	42.74	46.00	-3.26	peak	
3	!	385.0200	49.54	-8.06	41.48	46.00	-4.52	peak	
4	!	427.7000	46.83	-6.50	40.33	46.00	-5.67	peak	
5	!	811.8200	41.39	0.15	41.54	46.00	-4.46	peak	
6	!	898.1500	40.83	1.62	42.45	46.00	-3.55	peak	

ATTACHMENT D -RADIATED EMISSION (ABOVE 1000MHZ)

Test Mode:	TX Mode 5736MHz
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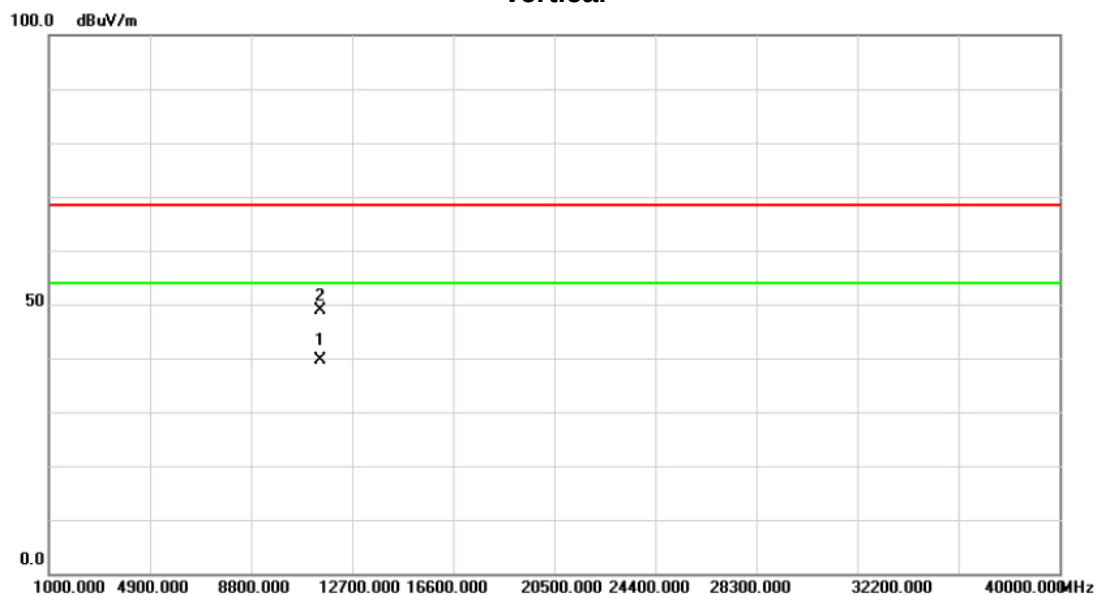
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		5715.000	4.56	42.61	47.17	68.30	-21.13	peak	
2		5715.000	-4.60	42.61	38.01	68.30	-30.29	AVG	
3		5725.000	6.61	42.66	49.27	78.30	-29.03	peak	
4		5725.000	-0.08	42.66	42.58	68.30	-25.72	AVG	
5	X	5735.200	44.57	42.70	87.27	78.30	8.97	peak	No Limit
6	*	5735.300	42.70	42.70	85.40	68.30	17.10	AVG	No Limit

Test Mode:	TX Mode 5736MHz
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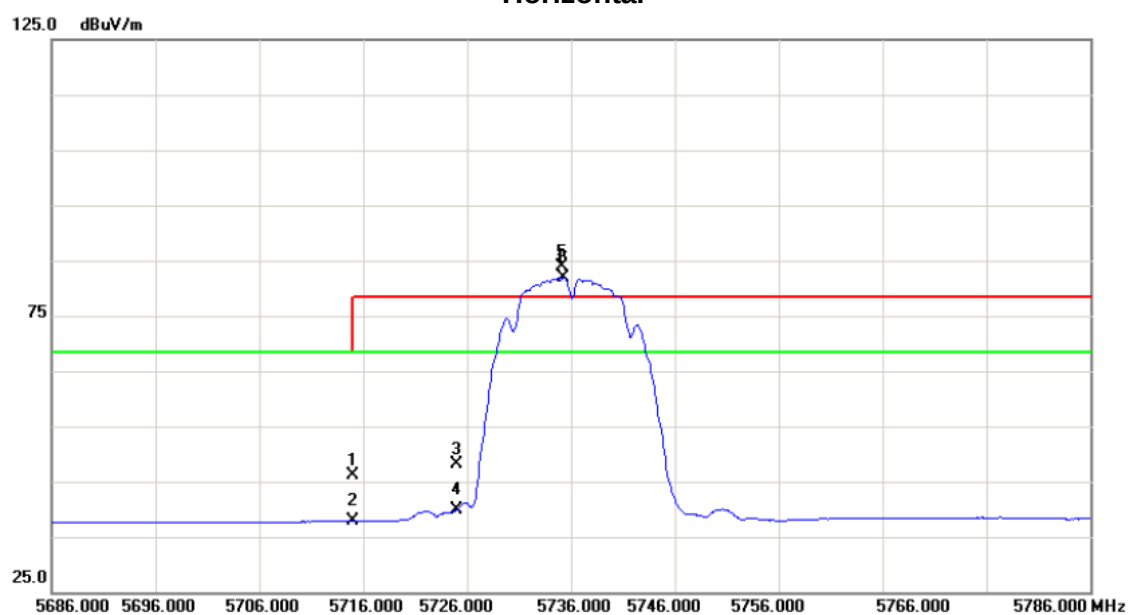
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	11472.10	20.80	18.86	39.66	54.00	-14.34	AVG	
2		11472.20	30.10	18.86	48.96	68.30	-19.34	peak	

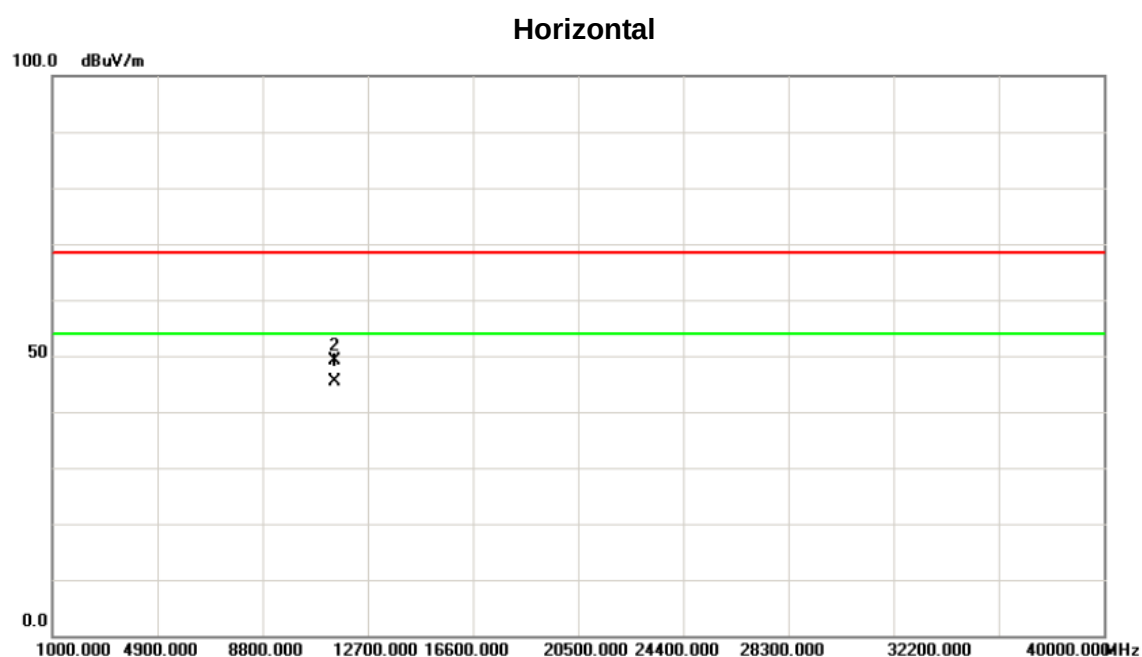
Test Mode: TX Mode 5736MHz

Horizontal



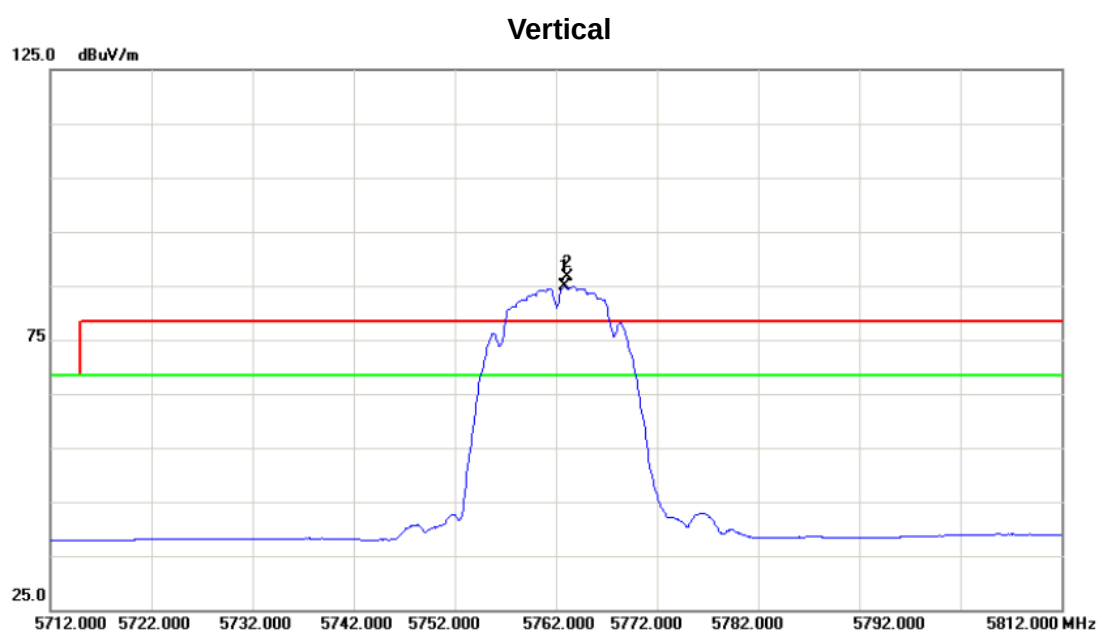
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		5715.000	3.55	42.61	46.16	68.30	-22.14	peak	
2		5715.000	-4.77	42.61	37.84	68.30	-30.46	AVG	
3		5725.000	5.46	42.66	48.12	78.30	-30.18	peak	
4		5725.000	-2.82	42.66	39.84	68.30	-28.46	AVG	
5	X	5735.200	41.09	42.70	83.79	78.30	5.49	peak	No Limit
6	*	5735.300	39.14	42.70	81.84	68.30	13.54	AVG	No Limit

Test Mode:	TX Mode 5736MHz
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	11472.10	26.56	18.86	45.42	54.00	-8.58	AVG	
2		11472.00	30.26	18.86	49.12	68.30	-19.18	peak	

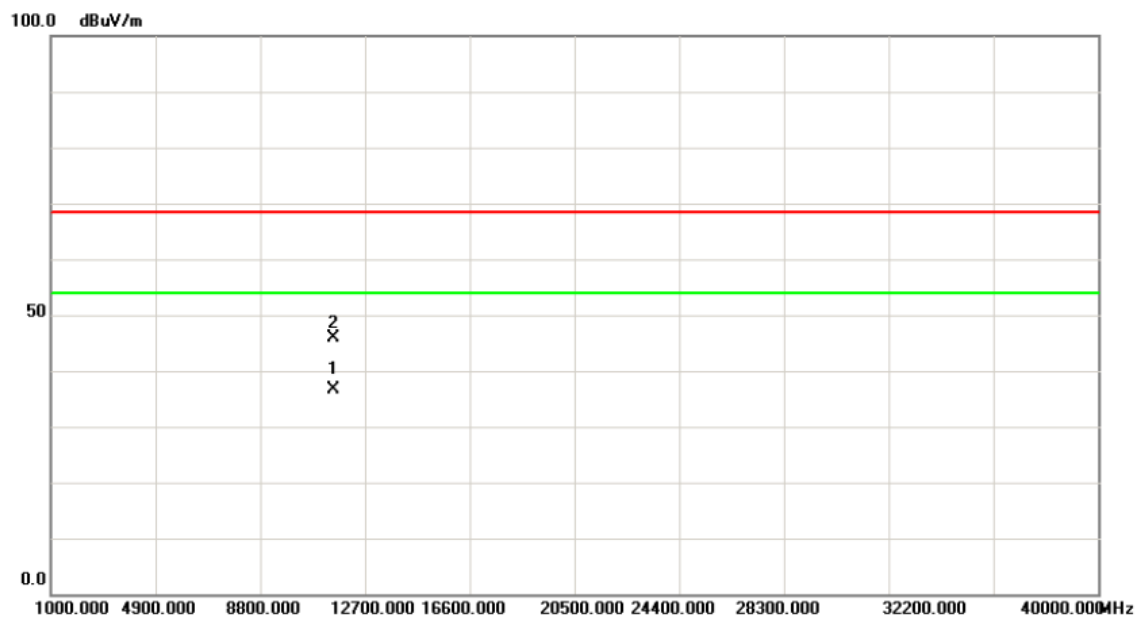
Test Mode:	TX Mode 5762MHz
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	5762.800	41.95	42.83	84.78	68.30	16.48	AVG	No Limit
2	X	5763.100	43.80	42.83	86.63	78.30	8.33	peak	No Limit

Test Mode:	TX Mode 5762MHz
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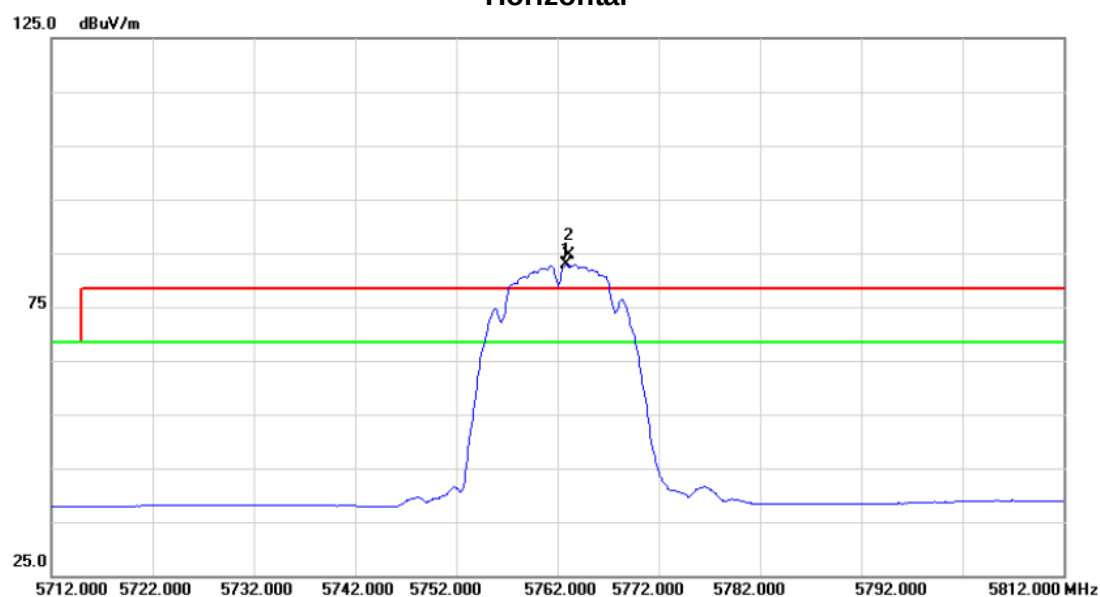
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	11524.05	17.65	18.92	36.57	54.00	-17.43	AVG	
2		11523.95	26.90	18.92	45.82	68.30	-22.48	peak	

Test Mode:	TX Mode 5762MHz
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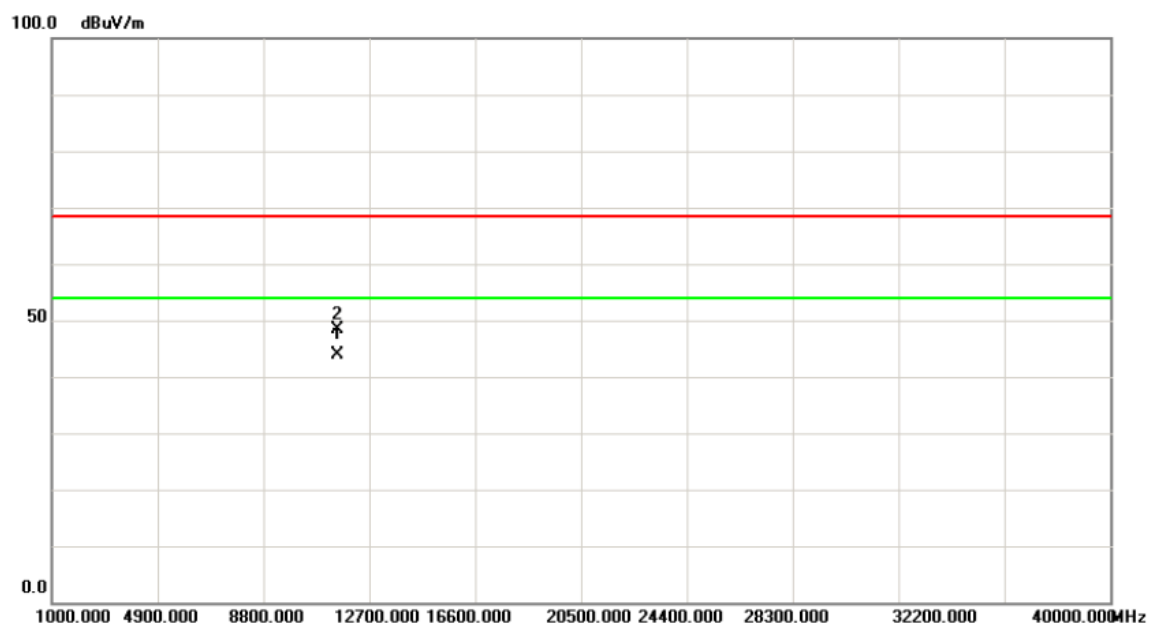
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	5762.800	39.98	42.83	82.81	78.30	4.51	peak	No Limit
2	*	5763.100	41.86	42.83	84.69	68.30	16.39	AVG	No Limit

Test Mode:	TX Mode 5762MHz
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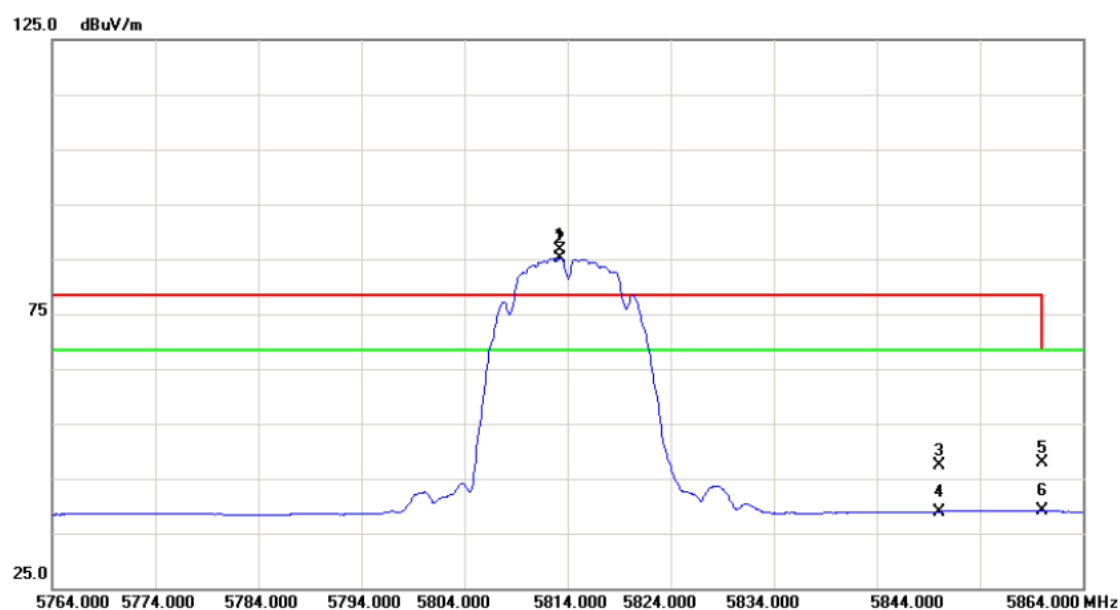
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	11524.10	24.89	18.92	43.81	54.00	-10.19	AVG	
2		11524.05	29.52	18.92	48.44	68.30	-19.86	peak	

Test Mode:	TX Mode 5814MHz
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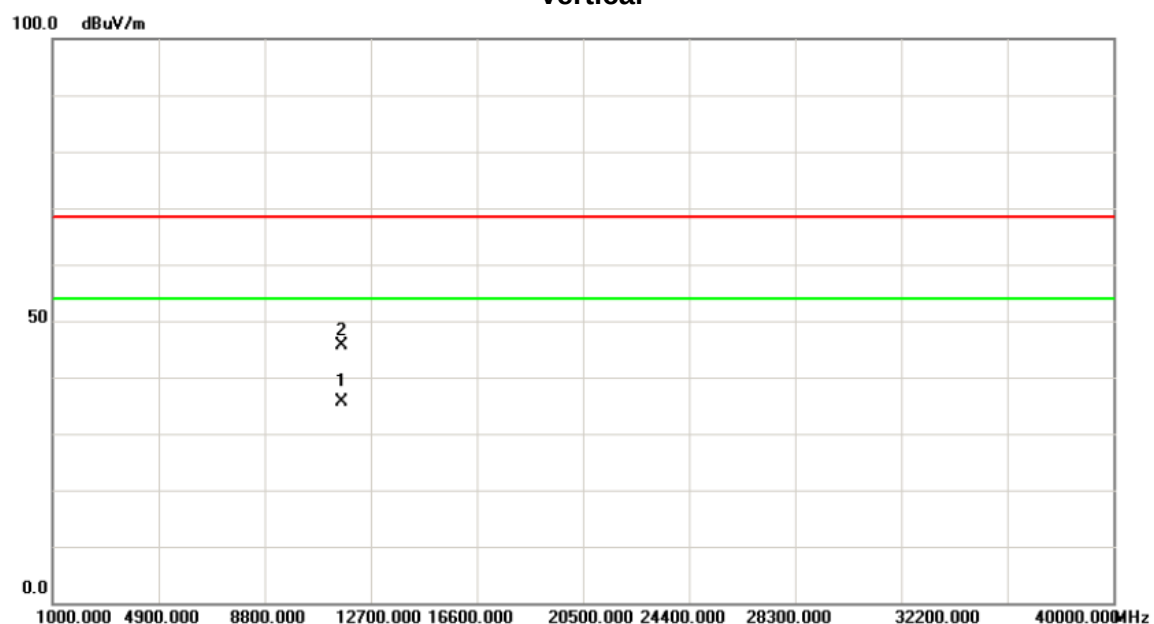
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	5813.300	43.53	43.06	86.59	78.30	8.29	peak	No Limit
2	*	5813.300	42.06	43.06	85.12	68.30	16.82	AVG	No Limit
3		5850.000	4.25	43.23	47.48	78.30	-30.82	peak	
4		5850.000	-4.26	43.23	38.97	68.30	-29.33	AVG	
5		5860.000	4.48	43.28	47.76	68.30	-20.54	peak	
6		5860.000	-4.25	43.28	39.03	68.30	-29.27	AVG	

Test Mode: TX Mode 5814MHz

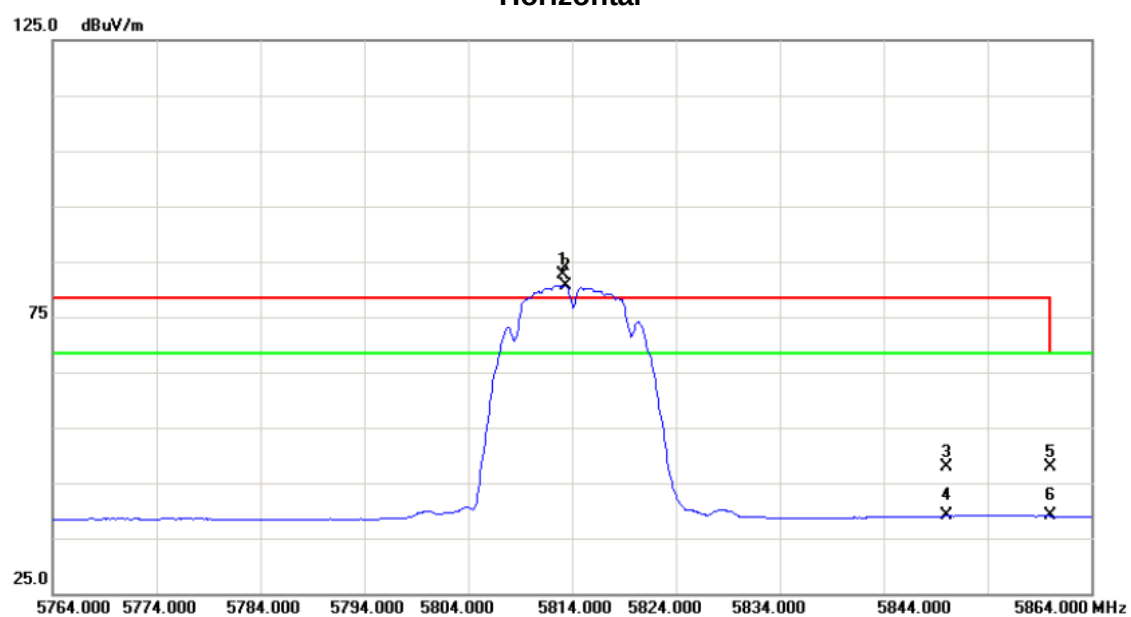
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	11628.10	16.74	19.01	35.75	54.00	-18.25	AVG	
2		11628.90	26.57	19.01	45.58	68.30	-22.72	peak	

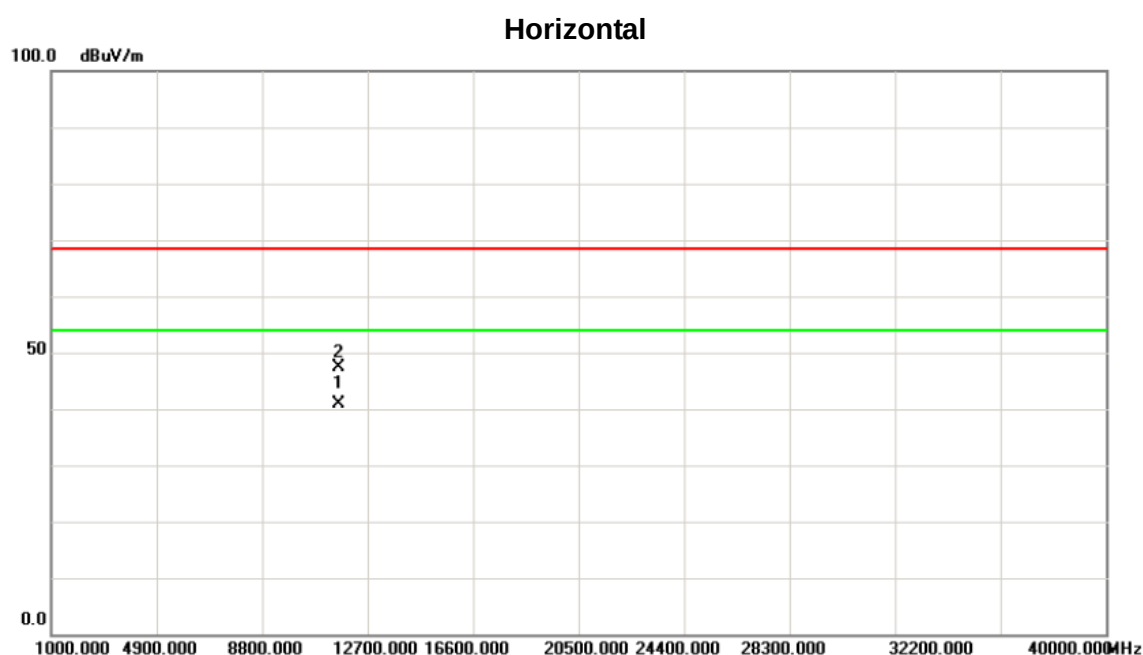
Test Mode: TX Mode 5814MHz

Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	5813.200	39.47	43.06	82.53	78.30	4.23	peak	No Limit
2	*	5813.400	37.51	43.06	80.57	68.30	12.27	AVG	No Limit
3		5850.000	4.59	43.23	47.82	78.30	-30.48	peak	
4		5850.000	-4.21	43.23	39.02	68.30	-29.28	AVG	
5		5860.000	4.49	43.28	47.77	68.30	-20.53	peak	
6		5860.000	-4.26	43.28	39.02	68.30	-29.28	AVG	

Test Mode:	TX Mode 5814MHz
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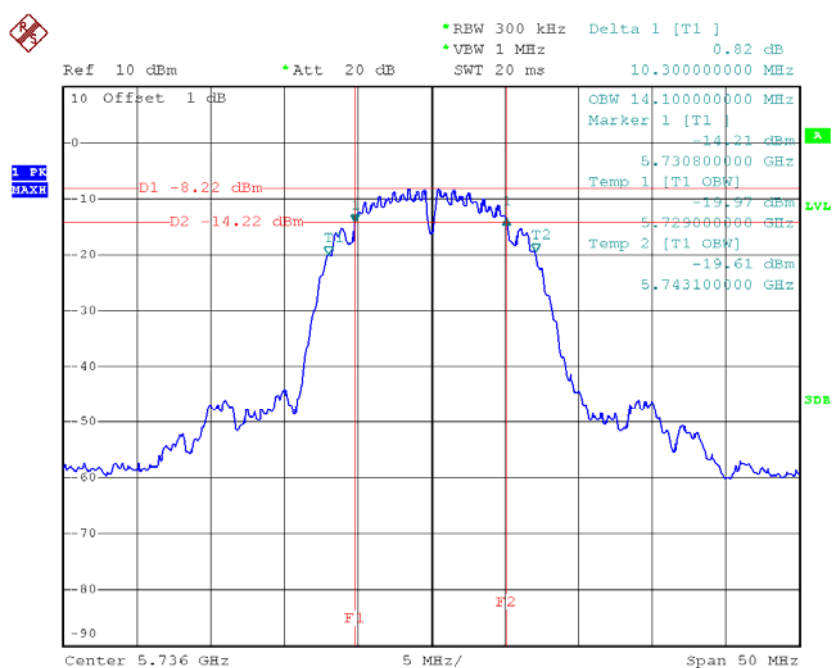
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	11628.10	21.80	19.01	40.81	54.00	-13.19	AVG	
2		11628.20	28.34	19.01	47.35	68.30	-20.95	peak	

ATTACHMENT E -BANDWIDTH

Test Mode :	TX Mode
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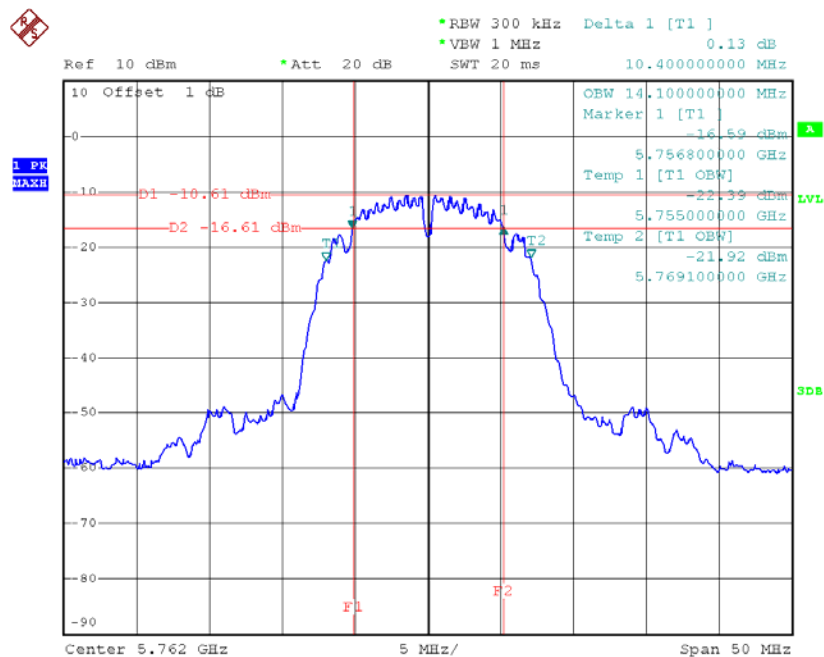
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Result
5736	10.30	14.10	500	Pass
5762	10.40	14.10	500	Pass
5814	10.30	14.00	500	Pass

TX CH01



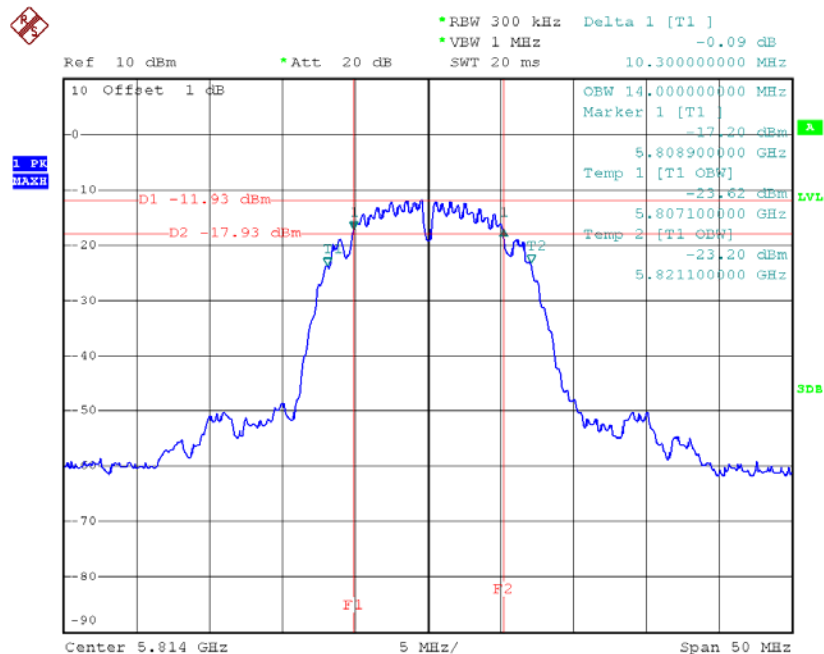
Date: 13.JUL.2015 09:42:28

TX CH02



Date: 13.JUL.2015 09:47:29

TX CH03



Date: 13.JUL.2015 19:18:09

ATTACHMENT F - MAXIMUM OUTPUT POWER

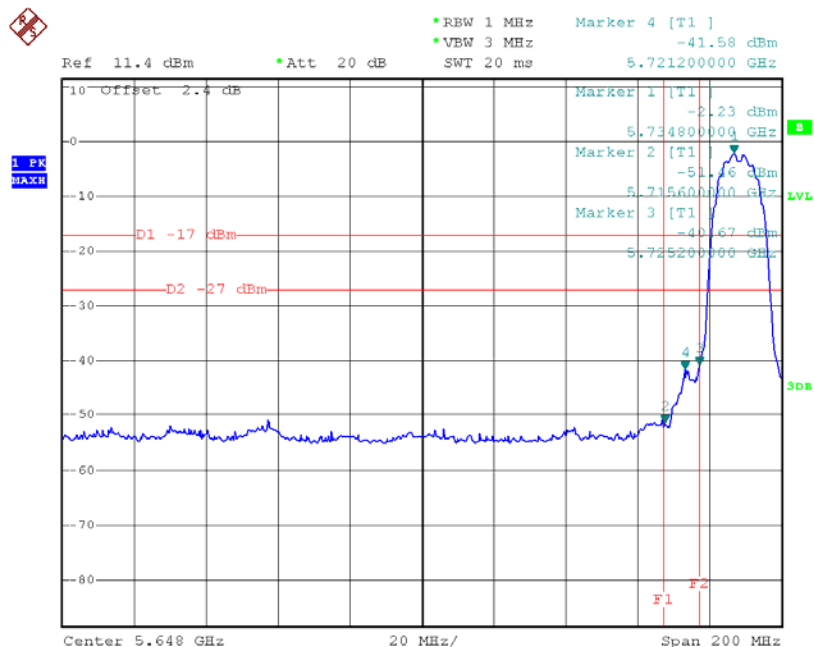
Test Mode:	TX Mode
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Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
5736	6.83	0.0048	30.00	1.00	Pass
5762	6.42	0.0044	30.00	1.00	Pass
5814	7.88	0.0061	30.00	1.00	Pass

ATTACHMENT G - ANTENNA CONDUCTED SPURIOUS EMISSION

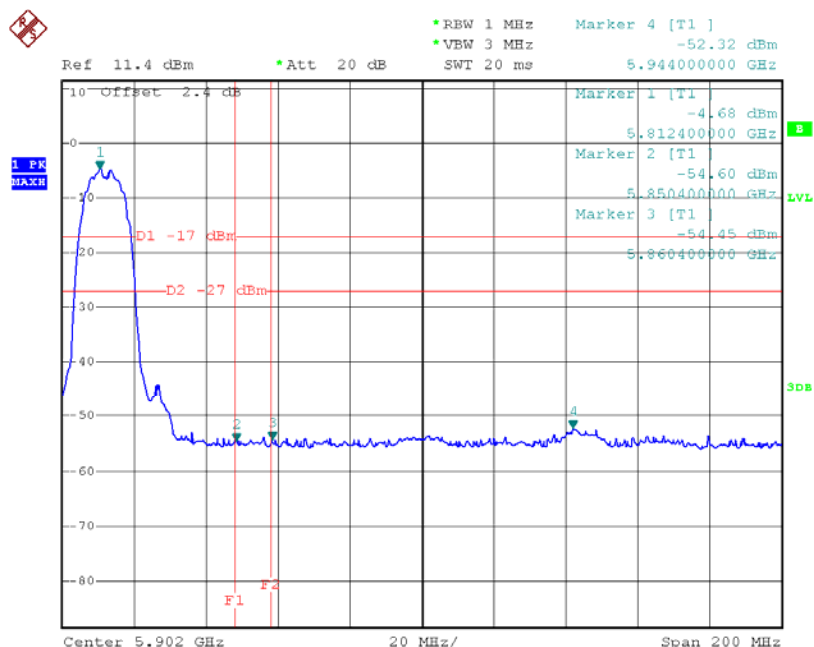
Test Mode: TX Mode

TX mode CH01



Date: 13.JUL.2015 10:05:46

TX mode CH03

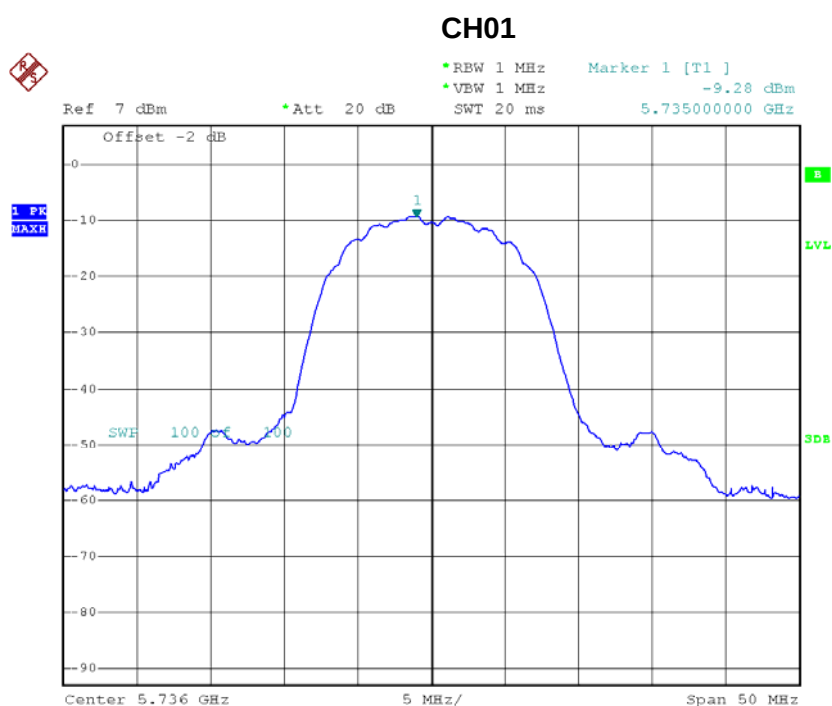


Date: 13.JUL.2015 09:58:37

ATTACHMENT H - POWER SPECTRAL DENSITY

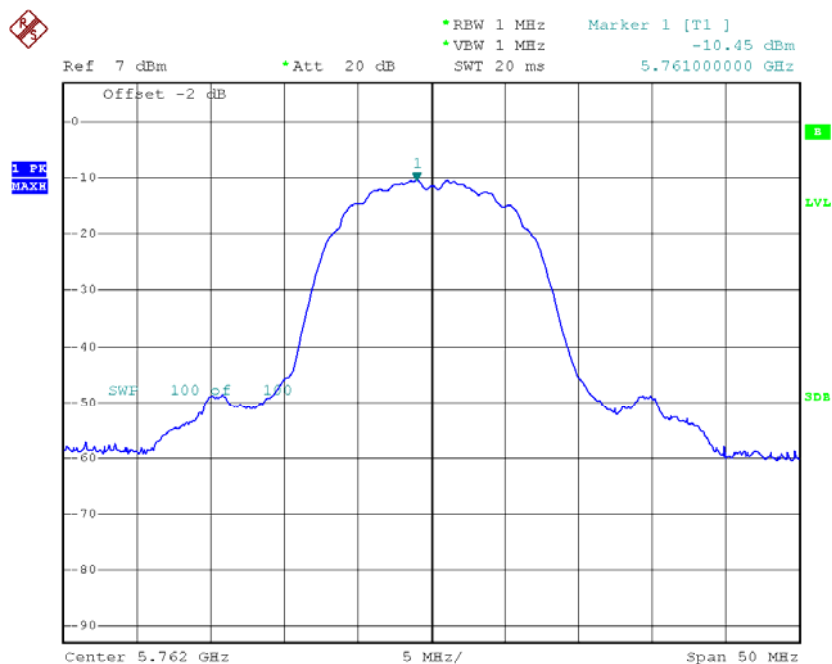
Test Mode:	TX Mode
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Frequency (MHz)	Power Density (dBm/500kHz)	Power Density (dBm/500kHz)	Max. Limit (dBm/500kHz)	Result
5736	-9.28	0.12	30.00	Pass
5762	-10.45	0.09	30.00	Pass
5814	-11.70	0.07	30.00	Pass



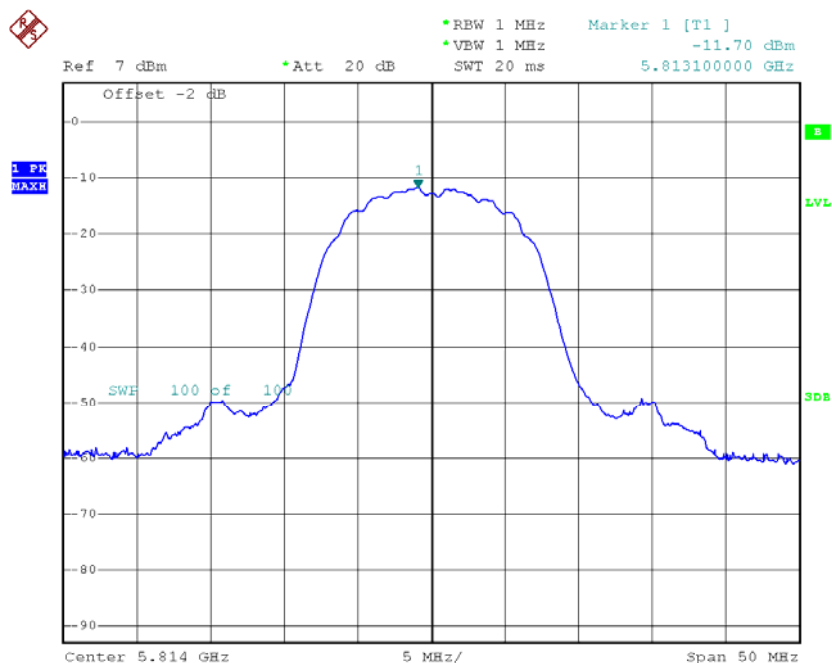
Date: 13.JUL.2015 09:44:27

CH02



Date: 13.JUL.2015 09:47:48

CH03



Date: 13.JUL.2015 19:13:08

ATTACHMENT I-FREQUENCY STABILITY

Test Mode:	TX Mode
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Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5736.0000
132	5736.0149
120	5736.0151
108	5736.0152
Max. Deviation (MHz)	0.0152
Max. Deviation (ppm)	2.6499

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5736.0000
-10	5736.0148
5	5736.0150
15	5736.0151
25	5736.0152
35	5736.0150
45	5736.0149
60	5736.0154
Max. Deviation (MHz)	0.0154
Max. Deviation (ppm)	2.6848