FCC Radio Test Report

FCC ID: ACQHDUDTAP2

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

Project No.	:	1411181
Equipment	:	Universal Digital Transport Adapter
Model Name	:	HD-DTA100u/4301/000; HD-DTA100u/XXXX/XXX (where X represents additional numeric suffix for non-hazardous differences)
Applicant	:	ARRIS GROUP INC
Address	:	101 Tournament DR. Horsham, PA 19044-3603, USA

Date of Receipt	:	Nov. 24, 2014
Date of Test	:	Nov. 24, 2014 ~ Dec. 05, 2014
Issued Date	:	Dec. 08, 2014
Tested by	:	BTL Inc.

Testing Engineer : David Mao
(David Mao)

Technical Manager : Leo Hung
(Leo Hung)

Authorized Signatory : Steven Lu
(Steven Lu)

BTL INC.

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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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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1411181	Original Issue.	Dec. 08, 2014

1. CERTIFICATION

Equipment	:	Universal Digital Transport Adapter
Brand Name	:	ARRIS
Model Name	:	HD-DTA100u/4301/000; HD-DTA100u/XXXX/XXX (where X represents additional numeric suffix for non-hazardous differences)
Applicant	:	ARRIS GROUP INC
Manufacturer	:	ARRIS GROUP INC
Address	:	101 Tournament DR. Horsham, PA 19044-3603, USA
Factory	:	Nanning Fugui Precision Industrial Co., Ltd.
Address	:	No. 18, Zongbu Road, Nanning New&High-tech Industrial Development Zone, Guangxi
Date of Test	:	Nov. 24, 2014 ~ Dec. 05, 2014
Test Sample	:	ENGINEERING SAMPLE
Standard(s)	:	FCC Part15, Subpart C :2013 (15.247) / ANSI C63.4-2009

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-FCCP-1-1411181) 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):

Applied Standard(s): FCC Part15 (15.247) , Subpart C			
Standard(s) Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -18.37 dB at 0.1540 MHz.
15.247(d)	Radiated Emissions Below 1000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -4.96 dB at 49.40 MHz.
15.247(d)	Radiated Emissions Above 1000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -6.94 dB at 2483.50 MHz.
15.247(a)(2)	6dB Bandwidth	PASS	Meets the requirements
15.247(b)(3)	Peak Output Power	PASS	Meets the requirements
15.247(d)	Antenna conducted Spurious Emission	PASS	Meets the requirements
15.247(e)	Power Spectral Density	PASS	Meets the requirements
15.203	Antenna Requirement	PASS	Meets the requirements

NOTE:

(1)" N/A" denotes test is not applicable to this device.

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r02 (Measurement Guidelines of DTS)

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.523792
BTL's test firm number for FCC: 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	Note
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

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	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Universal Digital Transport Adapter	
Brand Name	ARRIS	
Model Name	HD-DTA100u/4301/000; HD-DTA100u/XXXX/XXX	
Model Difference	where X represents additional numeric suffix for non-hazardous differences	
Product Description	Operation Frequency	2425-2475 MHz
	Modulation Technology	O-QPSK (digital modulation)
	Bit Rate of Transmitter	250 kbps
	Output Power (Max.)	-0.23 dBm
Power Source	DC voltage supplied from AC adapter. Brand/Model: AmpowerTek/AL08AA-00	
Power Rating	I/P: 100-120V~0.25A 60Hz O/P: 5V/1.5A	
Connecting I/O Port(s)	HDMI port Cable in To TV port CH3/4 Switch port Power	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2.

Freqeuncy Band	Channel No.	Frequency
2400~2483.5MHz	15	2425 MHz
	20	2450 MHz
	25	2475 MHz

3.

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	3.25
2	N/A	N/A	PCB	N/A	3.25

Note:

1. Both Ant. 1 and Ant. 2 support transmitting and receiving functions, but they cannot transmit at the same time, only one of them will be used at one time.
2. The Ant. 1 generated the worst case, so it was selected to test and record in the report.

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 Mode	Description
Mode 1	TX Mode CH15/20/25
Mode 2	TX Mode

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 2	TX Mode

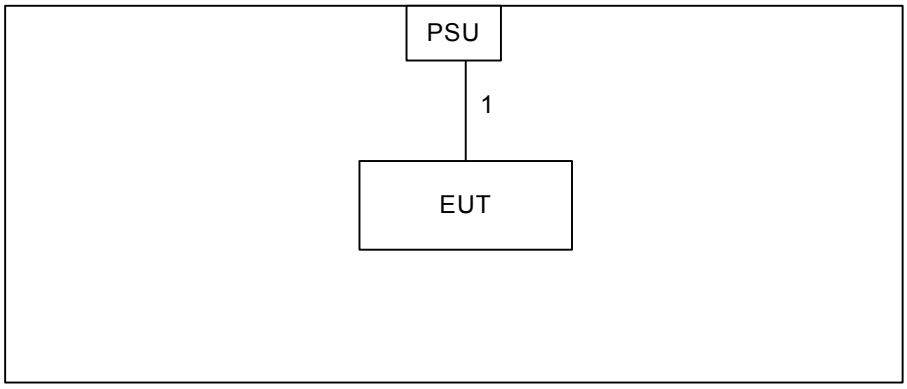
For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode CH15/20/25

3.3 TABLE OF PARAMETERS OF TEXT 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 power parameters of WLAN

Test Software Version	RT3052QA		
Frequency (MHz)	2425	2450	2475
DSSS	3	3	3

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	Shielded Type	Ferrite Core	Length	Note
1	YES	YES	1.5m	DC Cable

Note:

(1) For detachable type I/O cable should be specified the length in m in 『Length』 column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 -0.5	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

Note:

(1) The limit of " * " decreases with the logarithm of the frequency

(2) 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

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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 ground plane 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.

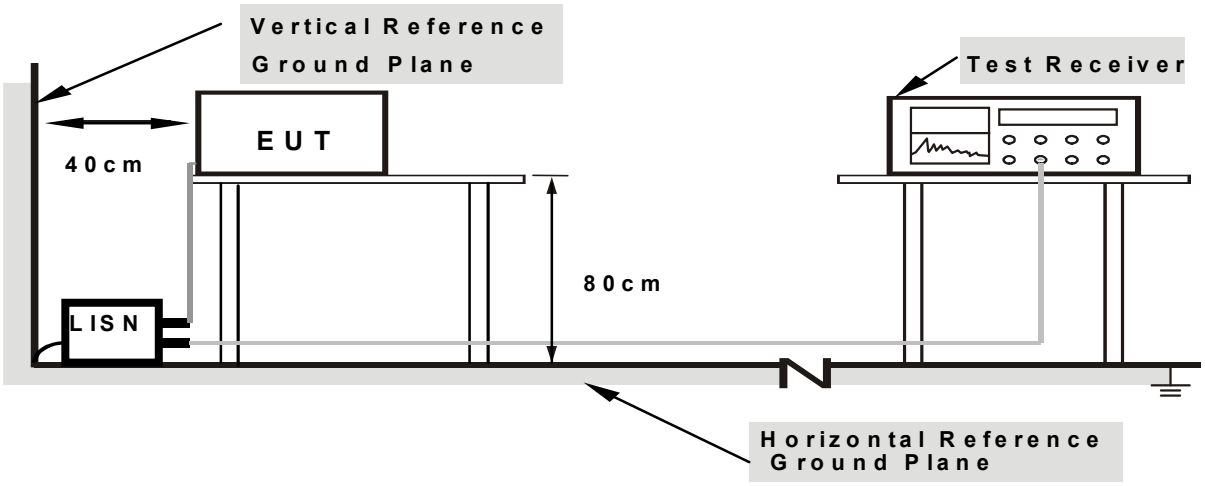
d. LISN at least 80 cm from nearest part of EUT chassis.

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



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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.

4.1.6 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
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.
(3) " N/A" denotes test is not applicable to this device.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

20dB in any 100 KHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a, then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9KHz-1000MHz)

Frequency (MHz)	Field Strength (microvolts/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
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2.2 TEST PROCEDURE

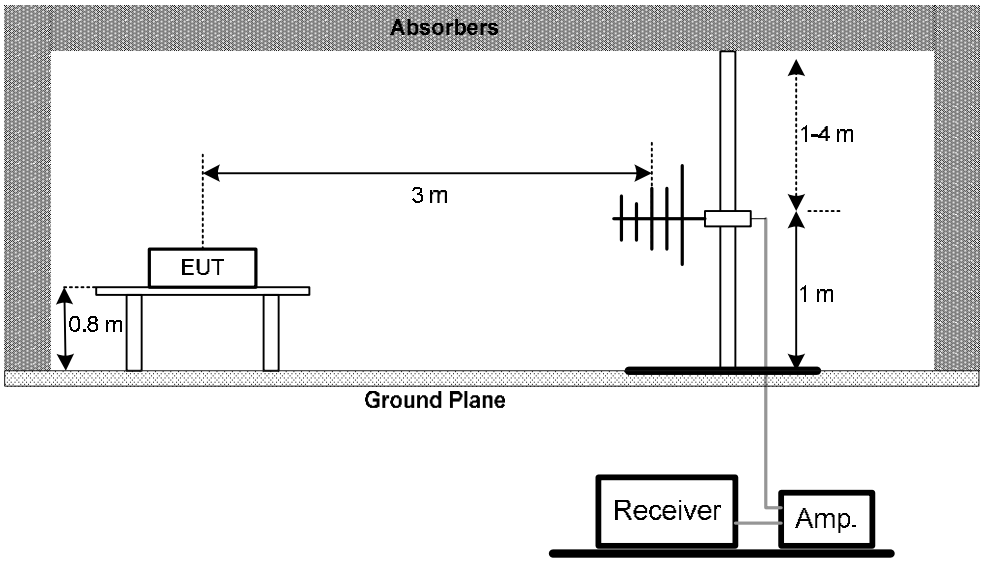
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8 m; 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.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

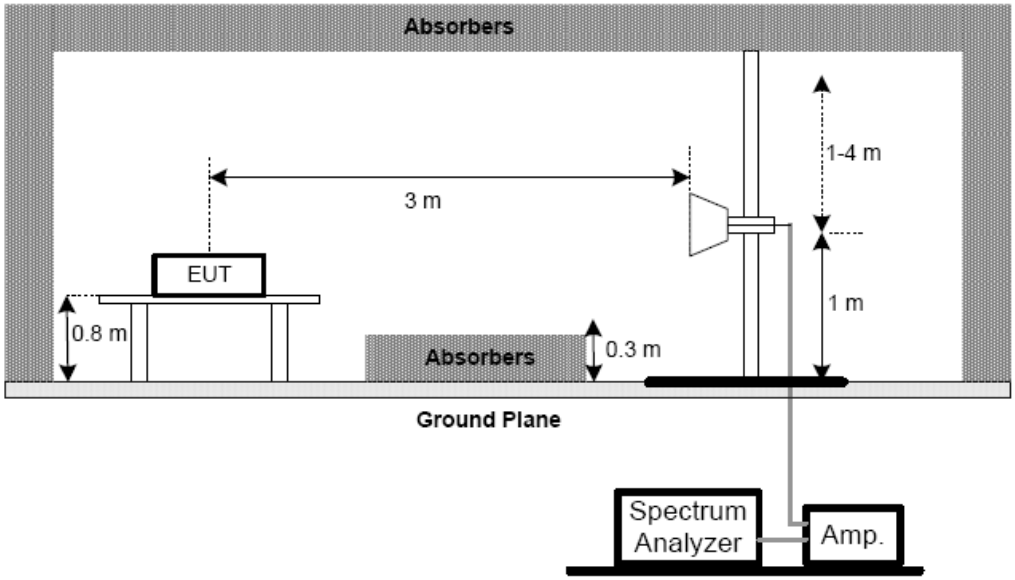
No deviation

4.2.4 TEST SETUP

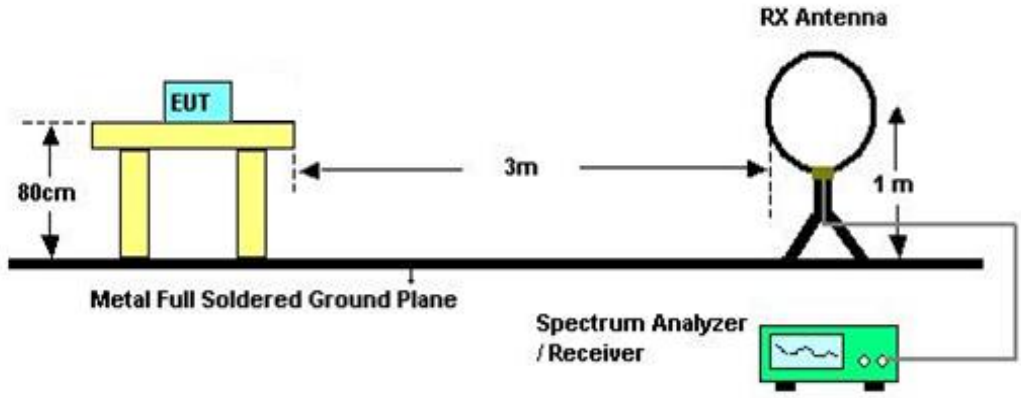
(A) Radiated Emission Test Set-Up Frequency 30MHz to 1000MHz



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



(C) For radiated emissions 9kHz to 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: 25°C
Relative Humidity: 55%
Test Voltage: AC 120V 60Hz

4.2.7TEST RESULTS (9KHZ 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 (specific distance / test distance) (dB).
(3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8TEST RESULTS (30MHZ TO 1000 MHZ)

Please refer to the Attachment C.

Remar

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with 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.
(5) Measured level (dBuV/m)= Raw value (dBuV) + Correction Factor(dB/m).
Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor(dB).
Margin value = Emission level - Limit value.

4.2.9TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

Remark

(1) 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.
(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) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
(4) EUT Orthogonal Axis:
"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand
(5) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
(6) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.
(7) Reading in which marked as Peak or AVG means measurements by using are Peak Mode or AVG with Detector BW=1MHz; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz, AVG Mode with detector BW=1MHz; SPA setting in RBW=1MHz, VBW =10Hz, Swp. Time = 0.3 sec./MHz ◦
(8) Measured level (dBuV/m)= Raw value (dBuV) + Correction Factor(dB/m).
Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor(dB).
Margin value = Emission level - Limit value.

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2425-2475 MHz	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 Setting : RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

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

5.1.6 TEST RESULTS

Please refer to the Attachment E.

6. MAXIMUM OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Maximum Output Power	1 watt or 30dBm	2425-2475 MHz	PASS

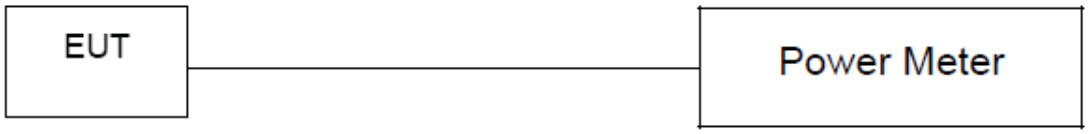
6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
b. The maximum peak conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance v03r02.

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.
Transmit output power was measured while the host equipment supply voltage was varied from 85 % to 115 % of the nominal rated supply voltage. No change in transmit output power was observed.

6.1.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
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

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

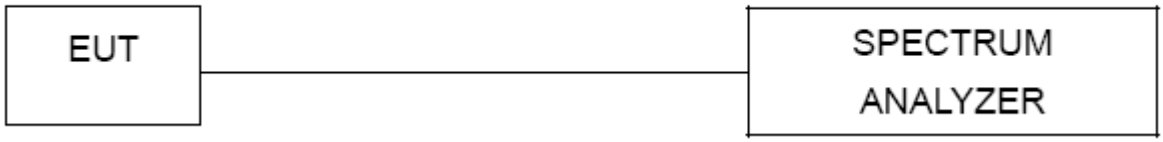
7.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=300KHz, Sweep time = 10 ms.

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: 25°C
Relative Humidity: 55%
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 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	8 dBm (in any 3KHz)	2425-2475 MHz	PASS

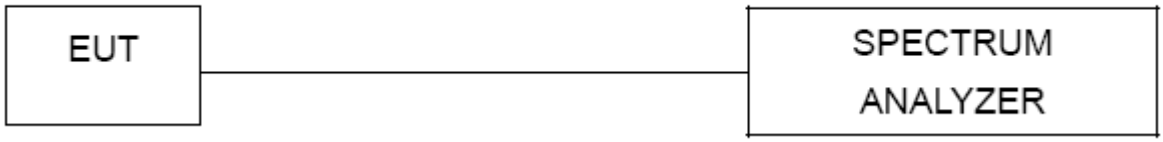
8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW=3KHz, VBW=10 KHz, Sweep time = auto.

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

8.1.6 TEST RESULTS

Please refer to the Attachment H.

9. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Mar. 29, 2015
2	LISN	R&S	ENV216	101447	Mar. 29, 2015
3	Test Cable	N/A	C_17	N/A	Mar. 14, 2015
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 29, 2015
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 29, 2015
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement Below 1000MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 29, 2015
2	Amplifier	HP	8447D	2944A09673	Mar. 29, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 01, 2015
5	Controller	CT	SC100	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Mar. 29, 2015

Radiated Emission Measurement Above 1000MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	ETS	3115	00075789	Mar. 29, 2015
2	Amplifier	Agilent	8449B	3008A02274	Mar. 29, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
4	Test Cable	HUBER+SUHNER	C-48	N/A	Apr. 30, 2015
5	Controller	CT	SC100	N/A	N/A
6	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Feb. 22, 2015
7	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Feb. 22, 2015
8	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Mar. 29, 2015
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Mar. 29, 2015

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

Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.
The IC Site Registration No. is 4428B-1 (DG-CB03)
The FCC Site Registration No. is 319330 (DG-CB03)

10. EUT TEST PHOTO

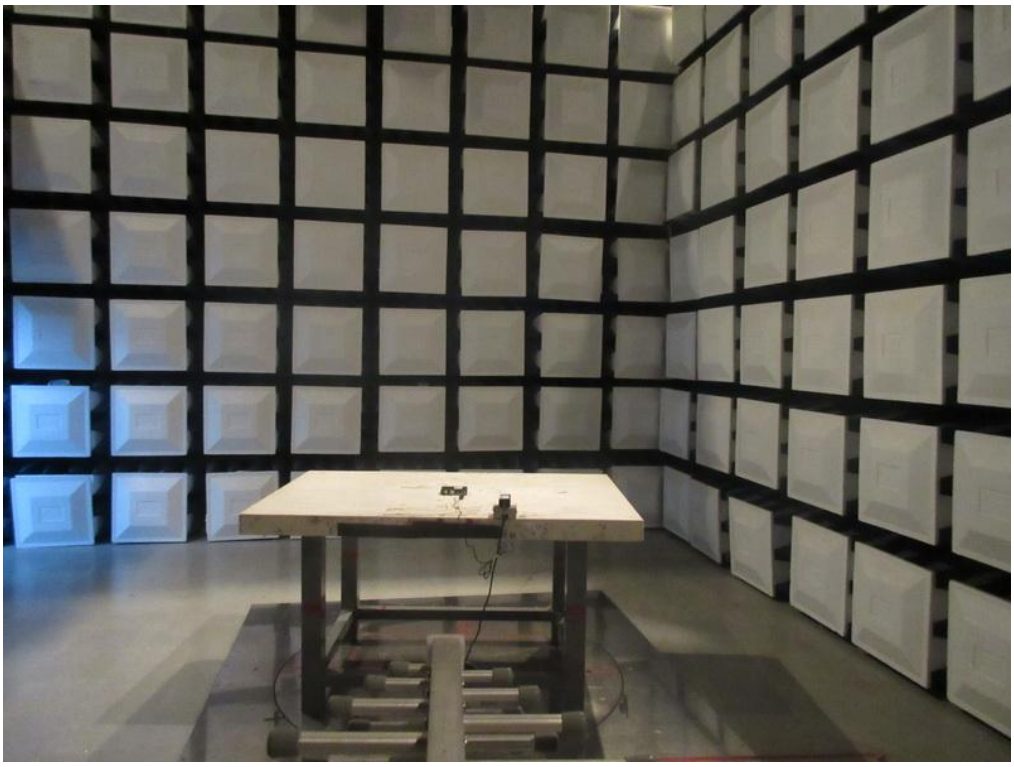
Conducted Measurement Photos

Radiated Measurement Photos

9KHz to 30MHz

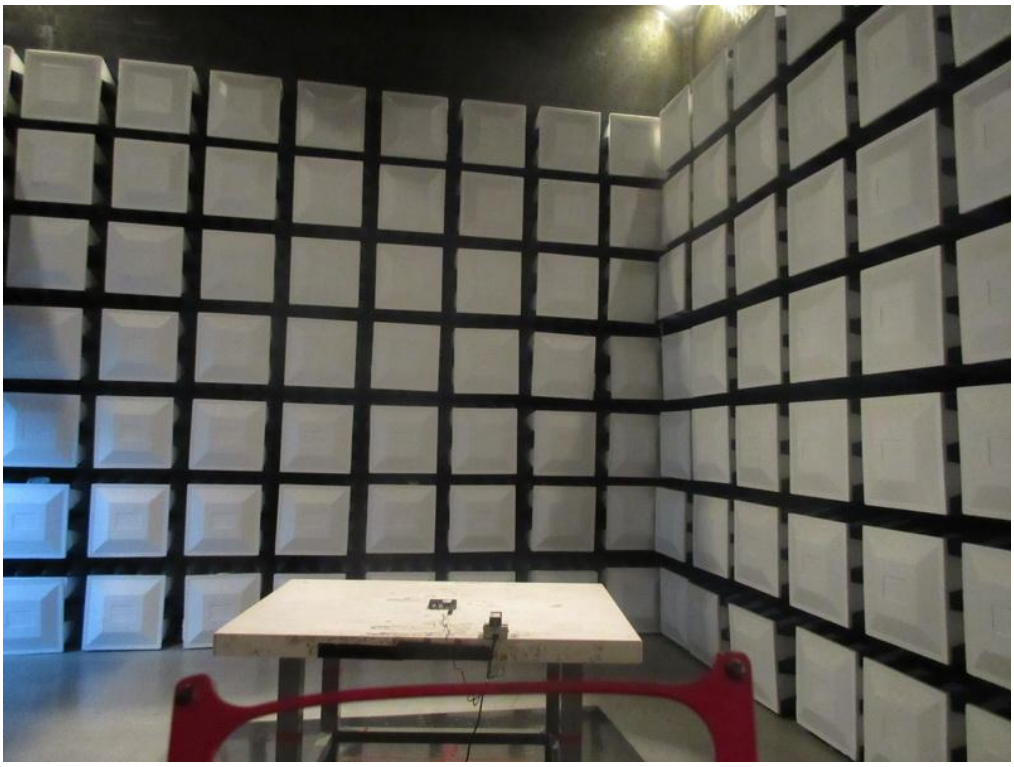
Radiated Measurement Photos

30M to 1000MHz



Radiated Measurement Photos

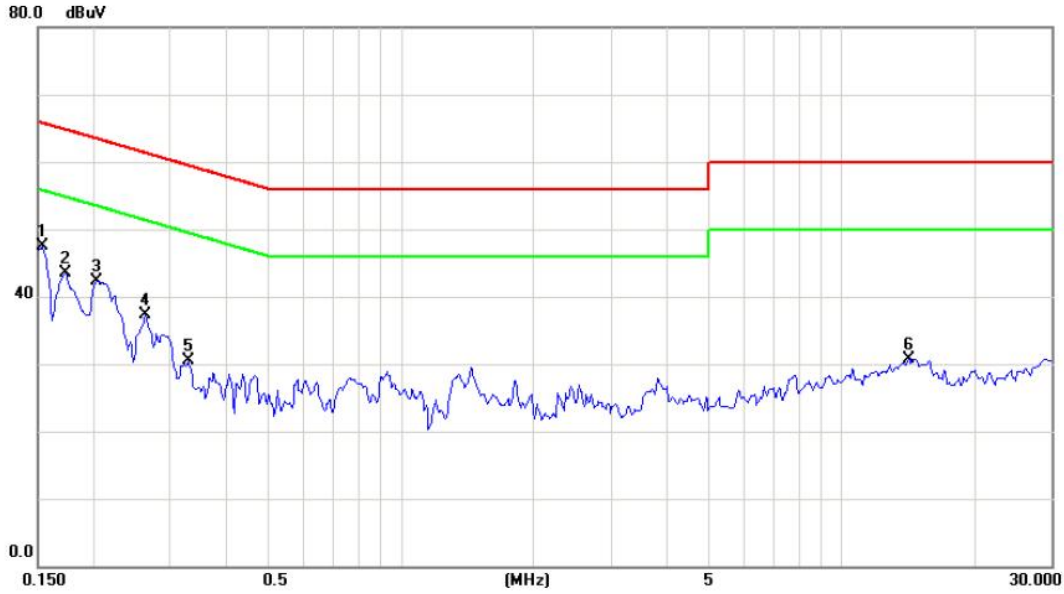
Above 1000MHz



ATTACHMENT A - CONDUCTED EMISSION

Test Mode:	TX Mode

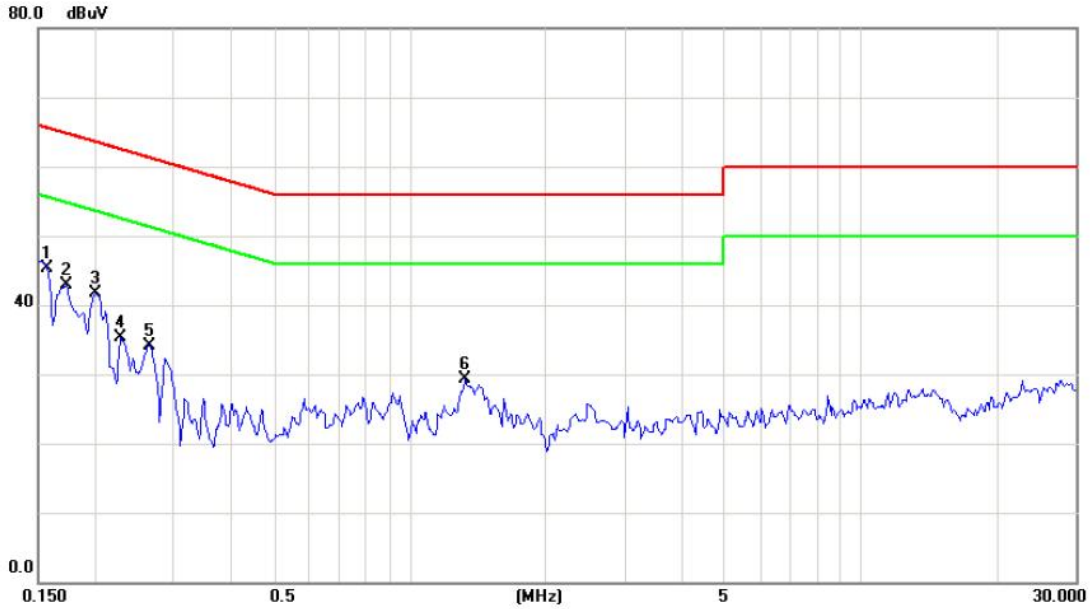
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1540	37.89	9.52	47.41	65.78	-18.37	peak	
2		0.1734	34.05	9.53	43.58	64.80	-21.22	peak	
3		0.2047	32.72	9.54	42.26	63.42	-21.16	peak	
4		0.2633	27.66	9.58	37.24	61.33	-24.09	peak	
5		0.3297	20.90	9.61	30.51	59.46	-28.95	peak	
6		14.2695	20.55	10.21	30.76	60.00	-29.24	peak	

Test Mode:	TX Mode

Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1578	35.74	9.63	45.37	65.58	-20.21	peak	
2		0.1734	33.26	9.62	42.88	64.80	-21.92	peak	
3		0.2008	32.01	9.61	41.62	63.58	-21.96	peak	
4		0.2281	25.66	9.61	35.27	62.52	-27.25	peak	
5		0.2633	24.44	9.62	34.06	61.33	-27.27	peak	
6		1.3258	19.60	9.69	29.29	56.00	-26.71	peak	

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

Test Mode:	TX Mode

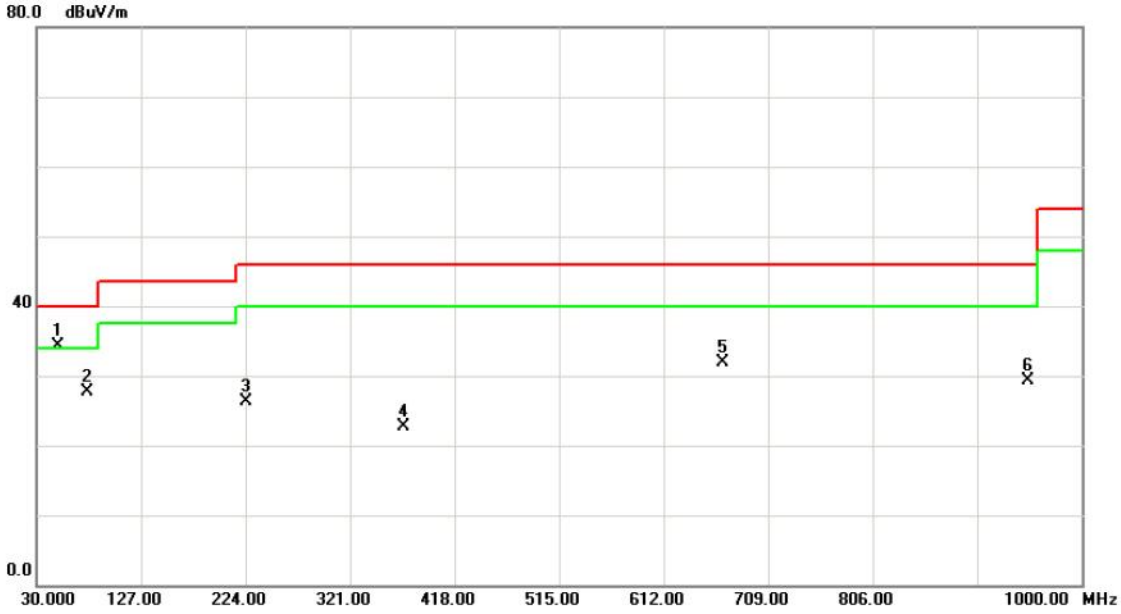
Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0163	0°	5.84	24.53	30.37	103.36	-72.99	AVG
0.0163	0°	9.92	24.53	34.45	123.36	-88.91	PEAK
0.0250	0°	6.09	23.98	30.07	99.65	-69.57	AVG
0.0250	0°	11.48	23.98	35.46	119.65	-84.18	PEAK
0.0553	0°	7.86	22.29	30.15	92.75	-62.60	AVG
0.0553	0°	13.62	22.29	35.91	112.75	-76.84	PEAK
0.0959	0°	8.12	21.48	29.60	87.97	-58.37	AVG
0.0959	0°	14.49	21.48	35.97	107.97	-72.00	PEAK
0.4987	0°	17.91	19.80	37.71	73.65	-35.93	QP
1.6422	0°	20.18	19.54	39.72	63.30	-23.58	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0160	90°	6.55	24.30	30.85	123.52	-92.67	AVG
0.0160	90°	10.96	24.30	35.26	143.52	-108.26	PEAK
0.0341	90°	7.23	23.41	30.64	116.95	-86.31	AVG
0.0341	90°	11.58	23.41	34.99	136.95	-101.96	PEAK
0.0615	90°	9.45	22.17	31.62	111.83	-80.21	AVG
0.0615	90°	12.01	22.17	34.18	131.83	-97.65	PEAK
0.0811	90°	10.39	21.78	32.17	109.42	-77.26	AVG
0.0811	90°	14.03	21.78	35.81	129.42	-93.62	PEAK
0.4993	90°	18.75	19.80	38.55	73.64	-35.09	QP
1.6126	90°	21.26	19.54	40.80	63.45	-22.65	QP

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

Test Mode:	TX 2425MHz -CH15

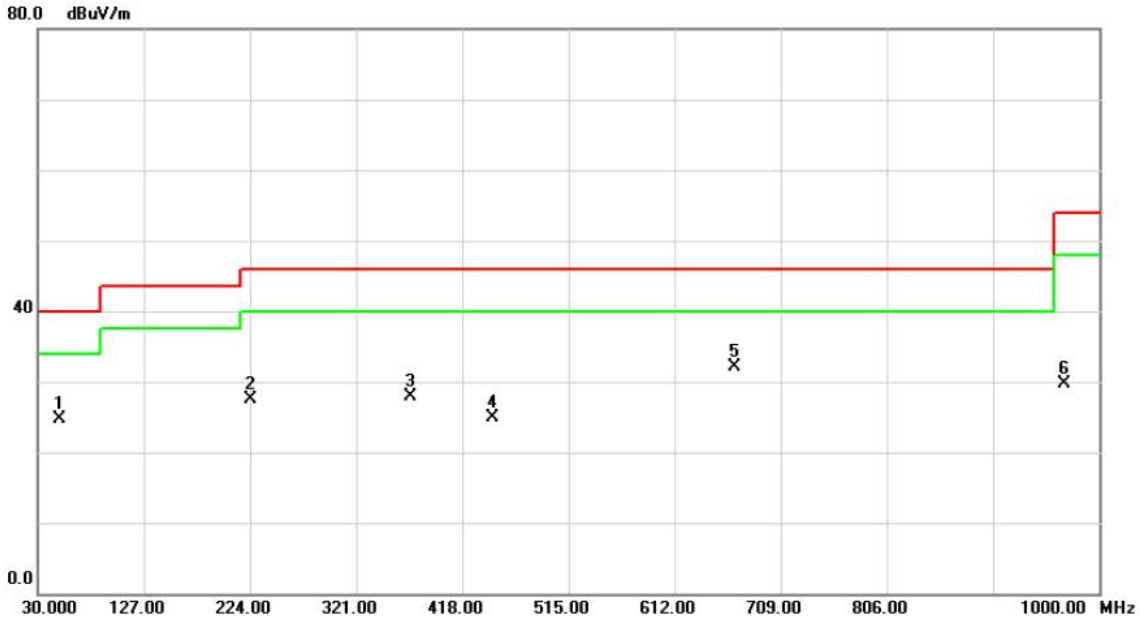
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	49.4000	48.36	-14.04	34.32	40.00	-5.68	peak	
2		77.5300	44.52	-16.87	27.65	40.00	-12.35	peak	
3		224.9700	40.95	-14.56	26.39	46.00	-19.61	peak	
4		370.4700	33.60	-10.86	22.74	46.00	-23.26	peak	
5		666.3200	36.94	-5.08	31.86	46.00	-14.14	peak	
6		949.5600	29.54	-0.22	29.32	46.00	-16.68	peak	

Test Mode:	TX 2425MHz -CH15

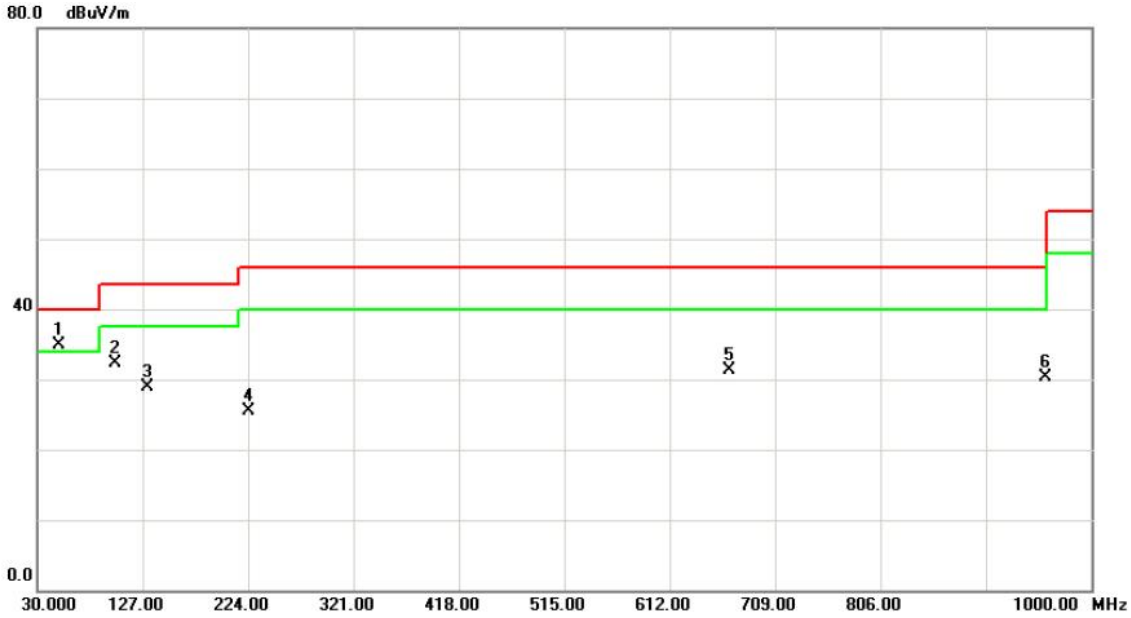
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		49.4000	38.66	-14.04	24.62	40.00	-15.38	peak	
2		224.9700	42.08	-14.56	27.52	46.00	-18.48	peak	
3		370.4700	38.73	-10.86	27.87	46.00	-18.13	peak	
4		445.1600	33.64	-8.71	24.93	46.00	-21.07	peak	
5	*	666.3200	37.11	-5.08	32.03	46.00	-13.97	peak	
6		967.9900	29.91	-0.28	29.63	54.00	-24.37	peak	

Test Mode:	TX 2450MHz -CH20

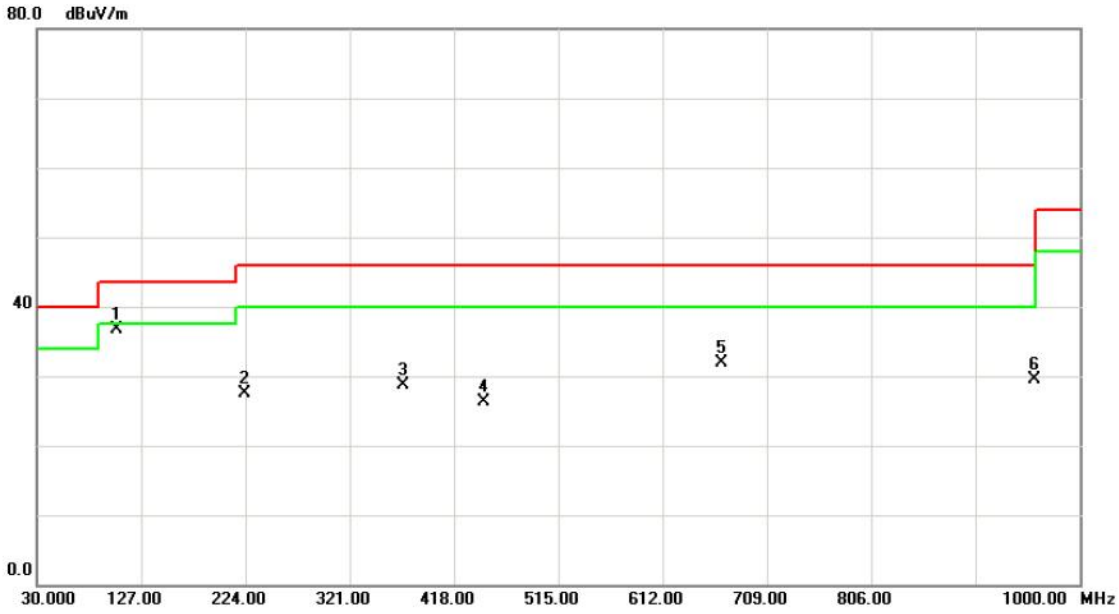
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	49.4000	48.90	-14.04	34.86	40.00	-5.14	peak	
2		101.7800	48.48	-16.19	32.29	43.50	-11.21	peak	
3		130.8800	41.91	-13.07	28.84	43.50	-14.66	peak	
4		224.9700	40.12	-14.56	25.56	46.00	-20.44	peak	
5		666.3200	36.45	-5.08	31.37	46.00	-14.63	peak	
6		957.3200	30.49	-0.24	30.25	46.00	-15.75	peak	

Test Mode:	TX 2450MHz -CH20

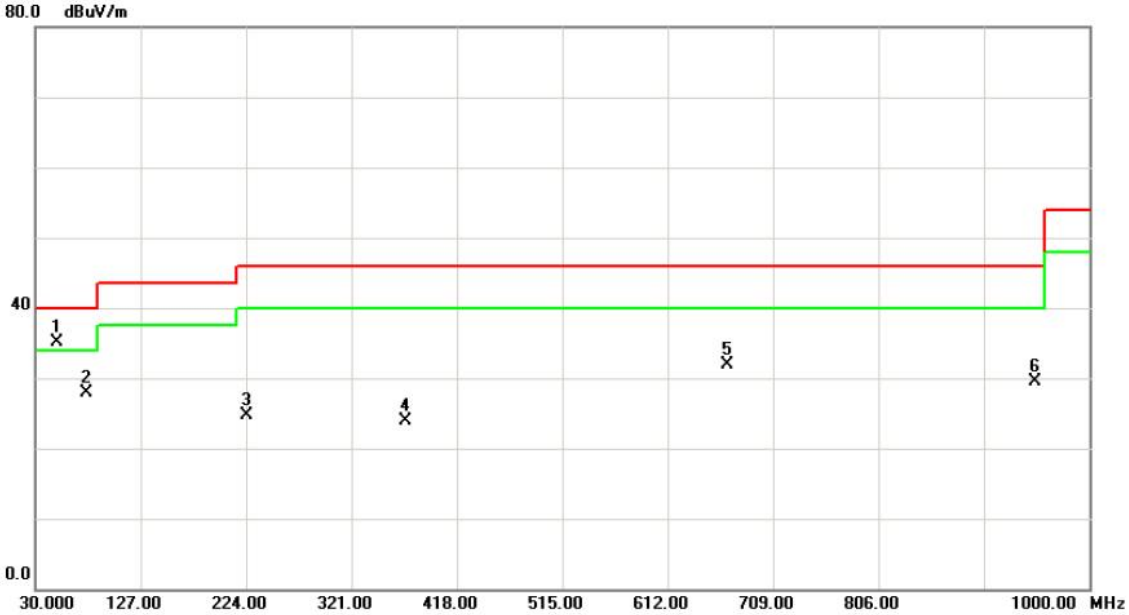
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	104.6900	52.48	-15.87	36.61	43.50	-6.89	peak	
2		223.0300	42.18	-14.68	27.50	46.00	-18.50	peak	
3		370.4700	39.58	-10.86	28.72	46.00	-17.28	peak	
4		445.1600	34.95	-8.71	26.24	46.00	-19.76	peak	
5		666.3200	36.99	-5.08	31.91	46.00	-14.09	peak	
6		957.3200	29.81	-0.24	29.57	46.00	-16.43	peak	

Test Mode:	TX 2475MHz -CH25

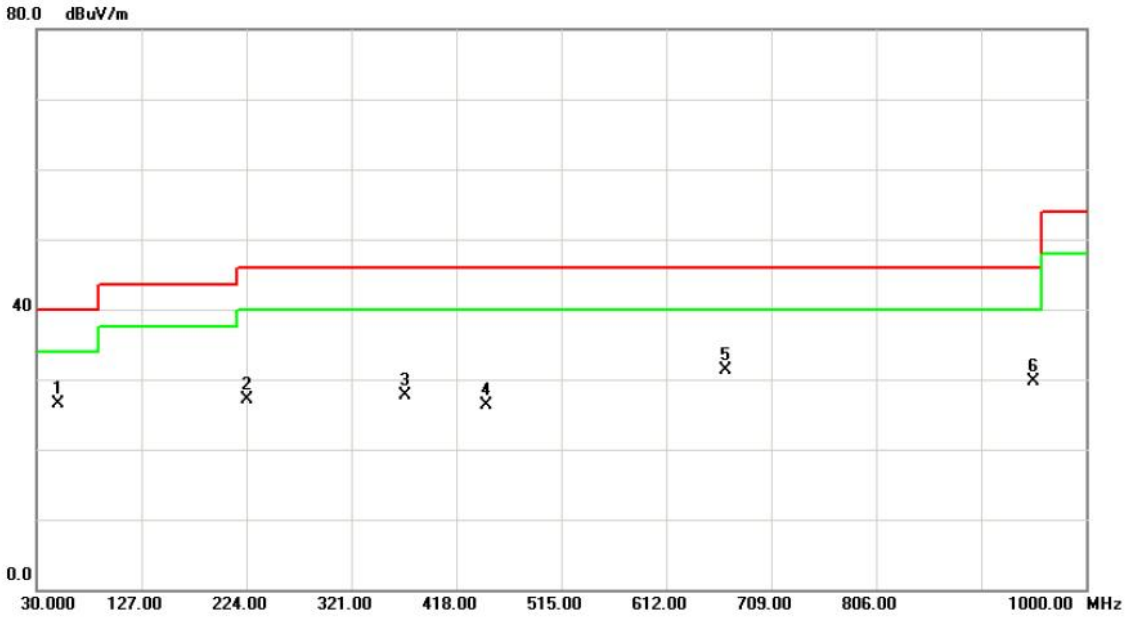
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	49.4000	49.08	-14.04	35.04	40.00	-4.96	peak	
2		77.5300	44.73	-16.87	27.86	40.00	-12.14	peak	
3		224.9700	39.33	-14.56	24.77	46.00	-21.23	peak	
4		370.4700	34.76	-10.86	23.90	46.00	-22.10	peak	
5		666.3200	36.93	-5.08	31.85	46.00	-14.15	peak	
6		949.5600	29.75	-0.22	29.53	46.00	-16.47	peak	

Test Mode:	TX 2475MHz -CH25

Horizontal

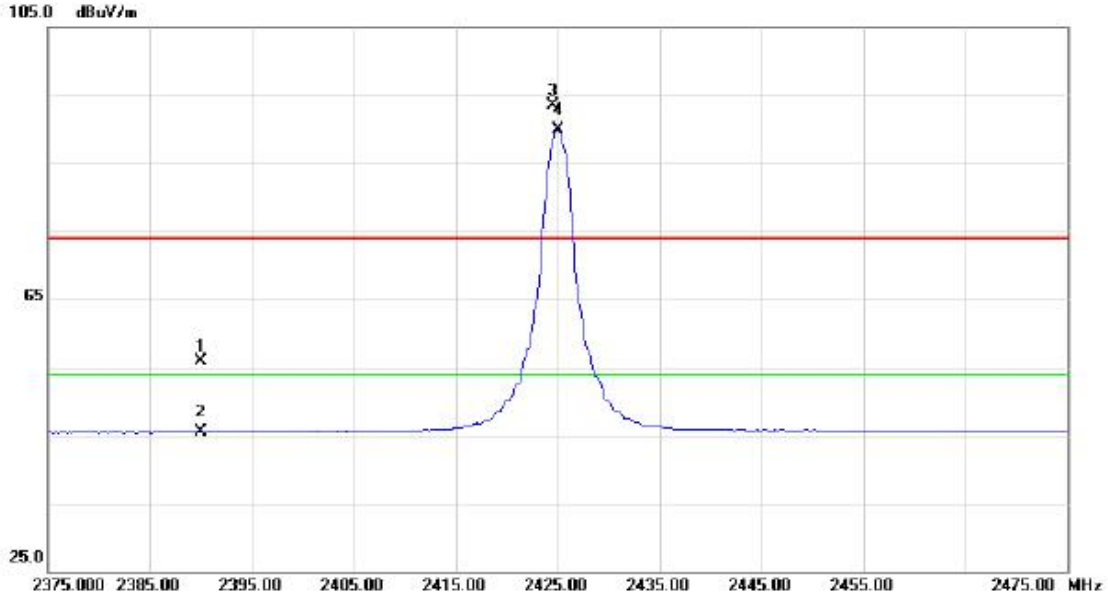


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	49.4000	40.64	-14.04	26.60	40.00	-13.40	peak	
2		224.9700	41.61	-14.56	27.05	46.00	-18.95	peak	
3		370.4700	38.62	-10.86	27.76	46.00	-18.24	peak	
4		445.1600	35.05	-8.71	26.34	46.00	-19.66	peak	
5		666.3200	36.46	-5.08	31.38	46.00	-14.62	peak	
6		951.5000	29.97	-0.21	29.76	46.00	-16.24	peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode :	TX 2425MHz _CH15

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.06	31.88	55.94	74.00	-18.06	peak	
2		2390.000	13.66	31.88	45.54	54.00	-8.46	AVG	
3	X	2424.500	61.51	31.93	93.44	74.00	19.44	peak	no limit
4	*	2425.000	58.06	31.93	89.99	54.00	35.99	AVG	no limit

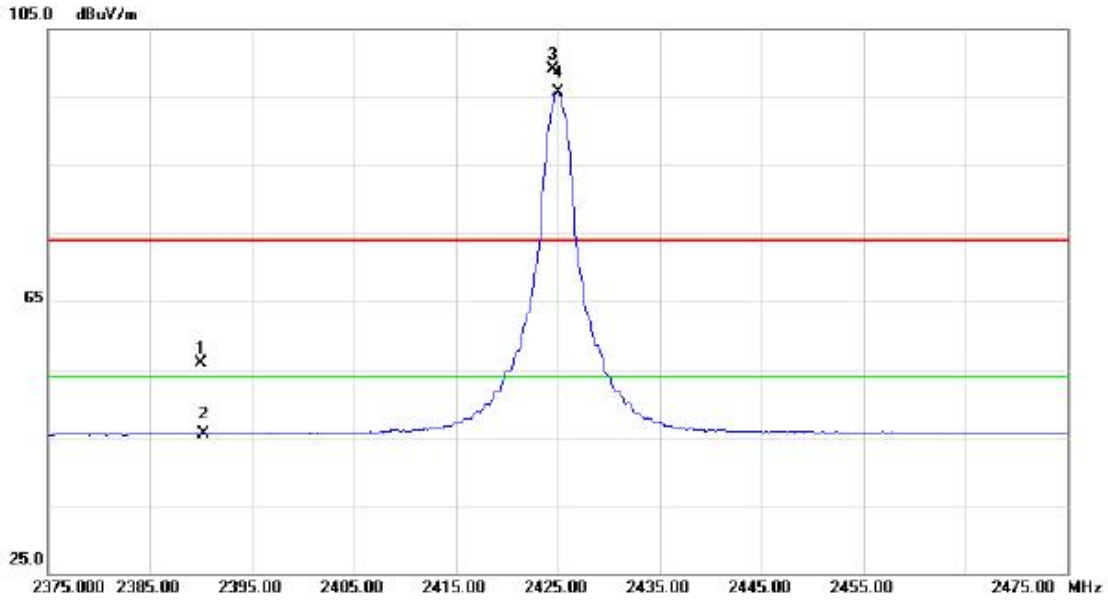
Orthogonal Axis :	X
Test Mode :	TX 2425MHz _CH15

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4850.900	37.93	3.67	41.60	54.00	-12.40	AVG	
2		4851.000	45.36	3.67	49.03	74.00	-24.97	peak	

Orthogonal Axis :	X
Test Mode :	TX 2425MHz _CH15

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.09	31.88	55.97	74.00	-18.03	peak	
2		2390.000	13.63	31.88	45.51	54.00	-8.49	AVG	
3	X	2424.500	67.09	31.93	99.02	74.00	25.02	peak	no limit
4	*	2425.000	63.72	31.93	95.65	54.00	41.65	AVG	no limit

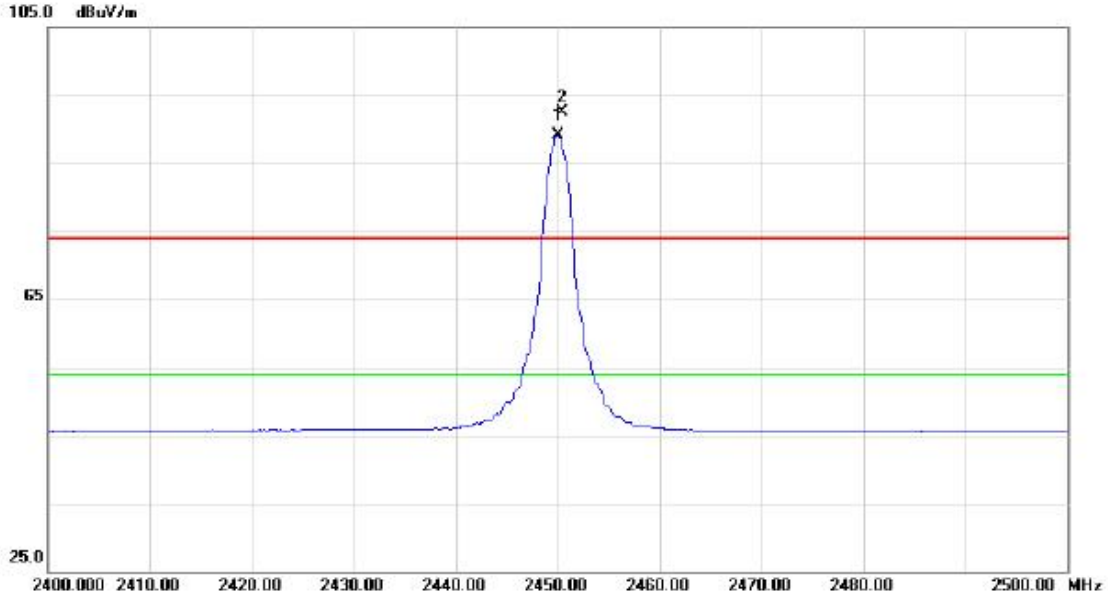
Orthogonal Axis :	X
Test Mode :	TX 2425MHz _CH15

Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4849.000	36.27	3.67	39.94	54.00	-14.06	AVG	
2		4849.850	44.16	3.67	47.83	74.00	-26.17	peak	

Orthogonal Axis :	X
Test Mode :	TX 2450MHz _CH20

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2450.000	57.18	31.96	89.14	54.00	35.14	AVG	no limit
2	X	2450.500	60.56	31.96	92.52	74.00	18.52	peak	no limit

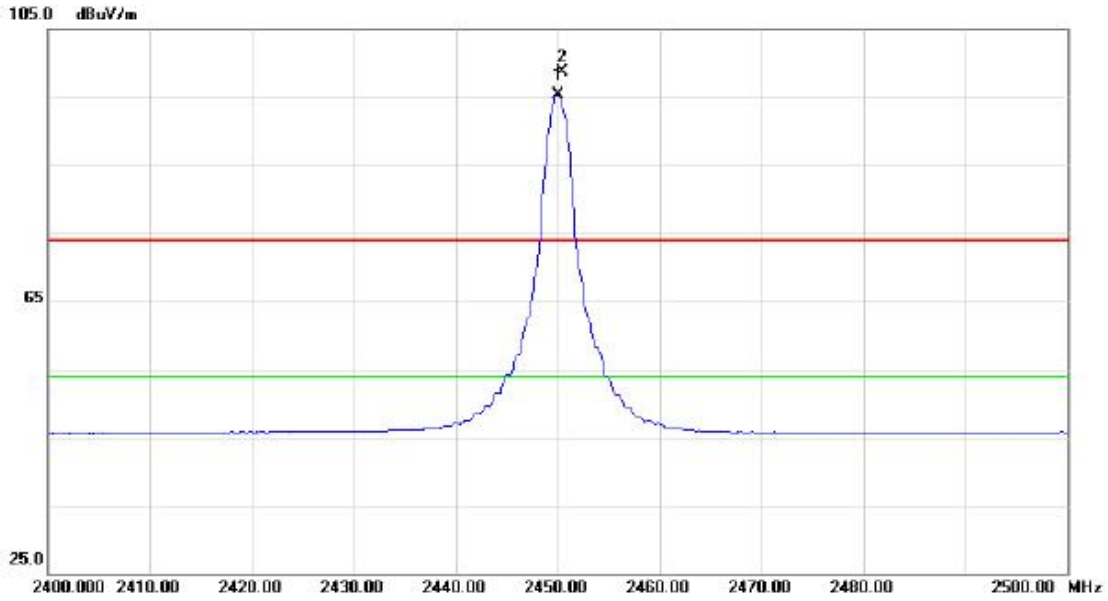
Orthogonal Axis :	X
Test Mode :	TX 2450MHz _CH20

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4900.850	46.70	3.76	50.46	74.00	-23.54	peak	
2	*	4900.950	39.88	3.76	43.64	54.00	-10.36	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2450MHz _CH20

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2450.000	63.44	31.96	95.40	54.00	41.40	AVG	no limit
2	X	2450.500	66.83	31.96	98.79	74.00	24.79	peak	no limit

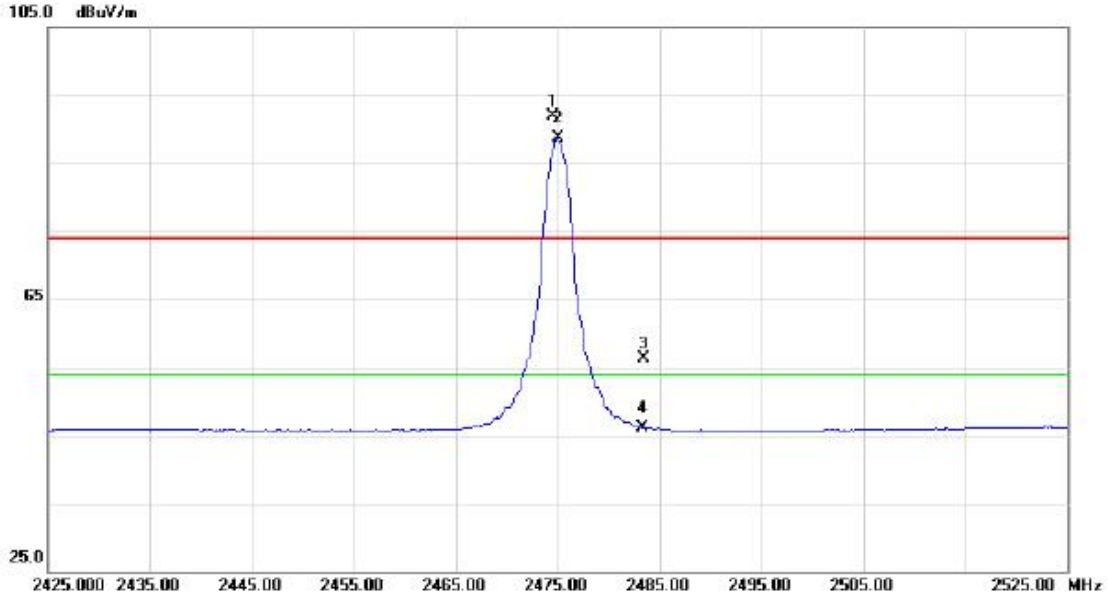
Orthogonal Axis :	X
Test Mode :	TX 2450MHz _CH20

Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4899.050	37.85	3.77	41.62	54.00	-12.38	AVG	
2		4901.050	45.46	3.76	49.22	74.00	-24.78	peak	

Orthogonal Axis :	X
Test Mode :	TX 2475MHz _CH25

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2474.500	59.99	32.00	91.99	74.00	17.99	peak	no limit
2	*	2475.000	56.64	32.00	88.64	54.00	34.64	AVG	no limit
3		2483.500	24.20	32.01	56.21	74.00	-17.79	peak	
4		2483.500	14.09	32.01	46.10	54.00	-7.90	AVG	

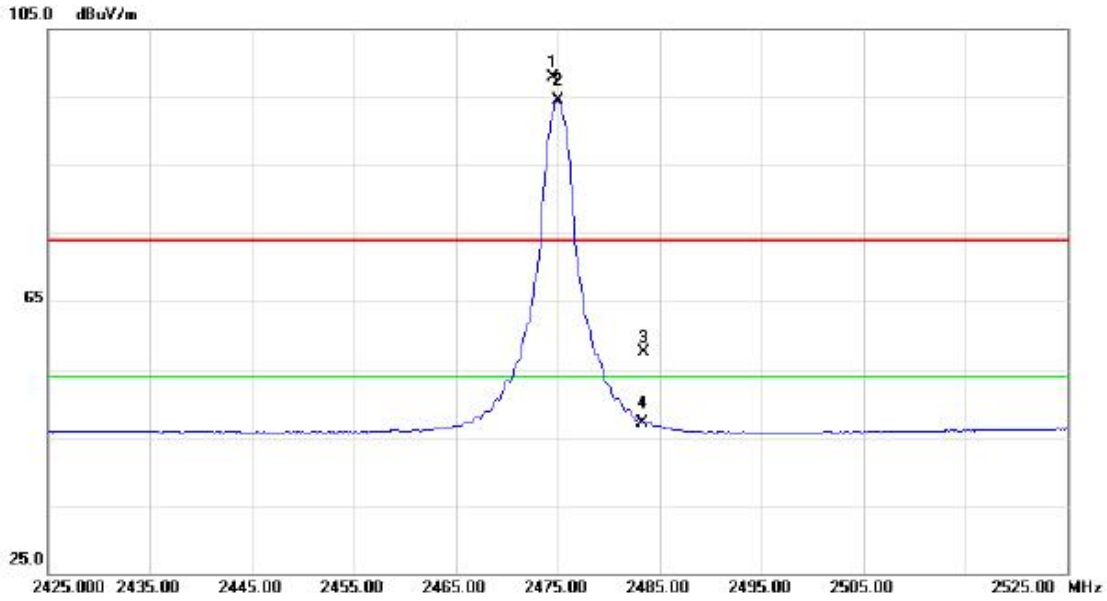
Orthogonal Axis :	X
Test Mode :	TX 2475MHz _CH25

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4949.000	38.99	3.85	42.84	54.00	-11.16	AVG	
2		4949.900	45.99	3.85	49.84	74.00	-24.16	peak	

Orthogonal Axis :	X
Test Mode :	TX 2475MHz _CH25

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2474.500	65.85	32.00	97.85	74.00	23.85	peak	no limit
2	*	2475.000	62.52	32.00	94.52	54.00	40.52	AVG	no limit
3		2483.500	25.43	32.01	57.44	74.00	-16.56	peak	
4		2483.500	15.05	32.01	47.06	54.00	-6.94	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2475MHz _CH25

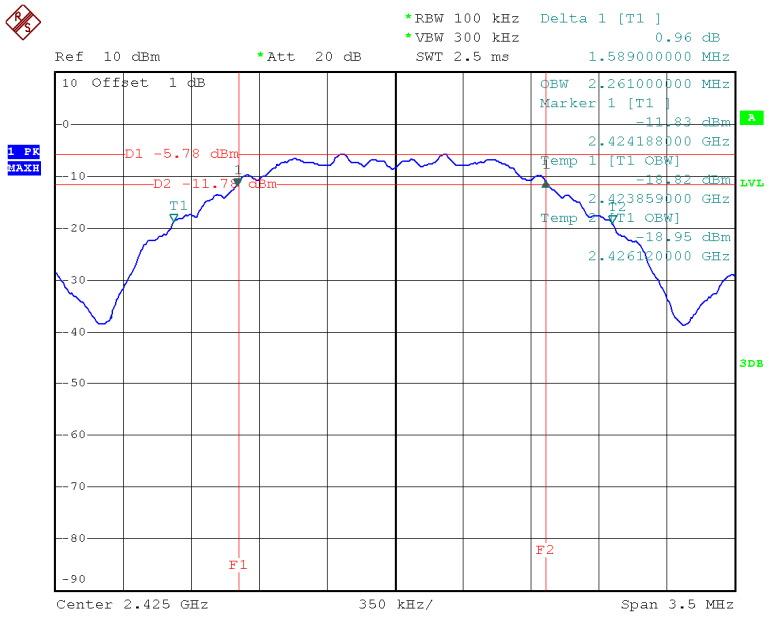
Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4949.000	36.77	3.85	40.62	54.00	-13.38	AVG	
2		4950.950	44.91	3.85	48.76	74.00	-25.24	peak	

ATTACHMENT E - BANDWIDTH

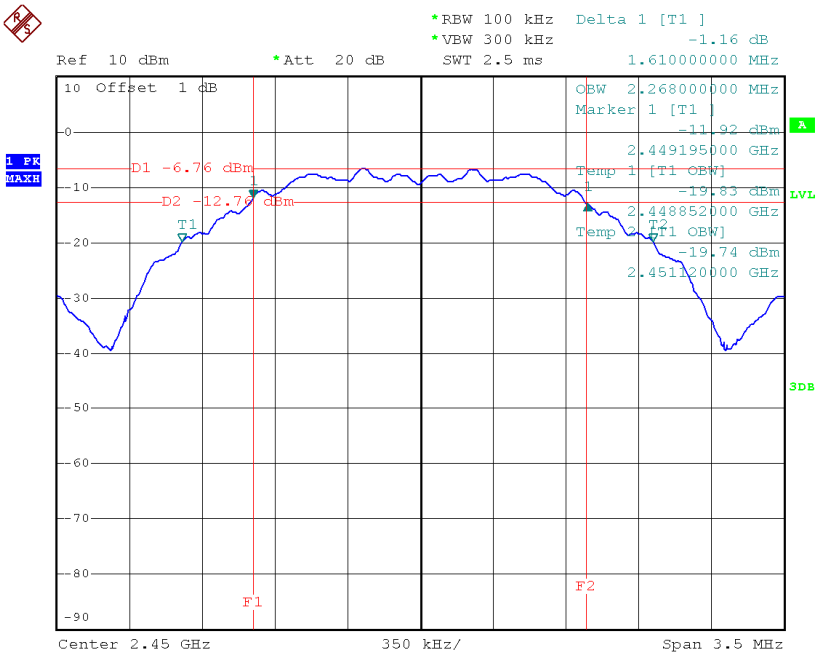
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2425	1.589	2.261	500	Complies
2450	1.610	2.268	500	Complies
2475	1.617	2.261	500	Complies

TX CH15



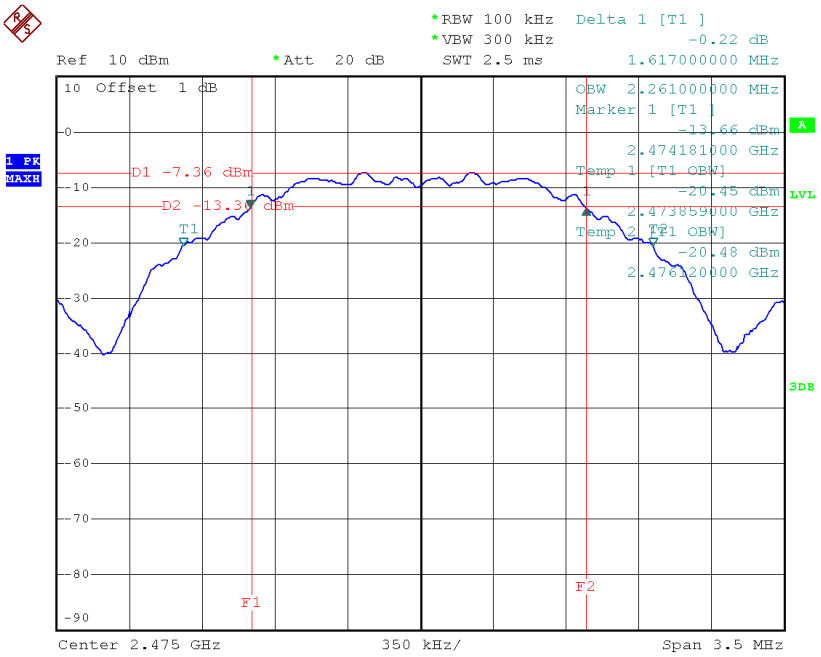
Date: 3.DEC.2014 20:47:19

TX CH20



Date: 3.DEC.2014 20:52:17

TX CH25



Date: 3.DEC.2014 20:42:29

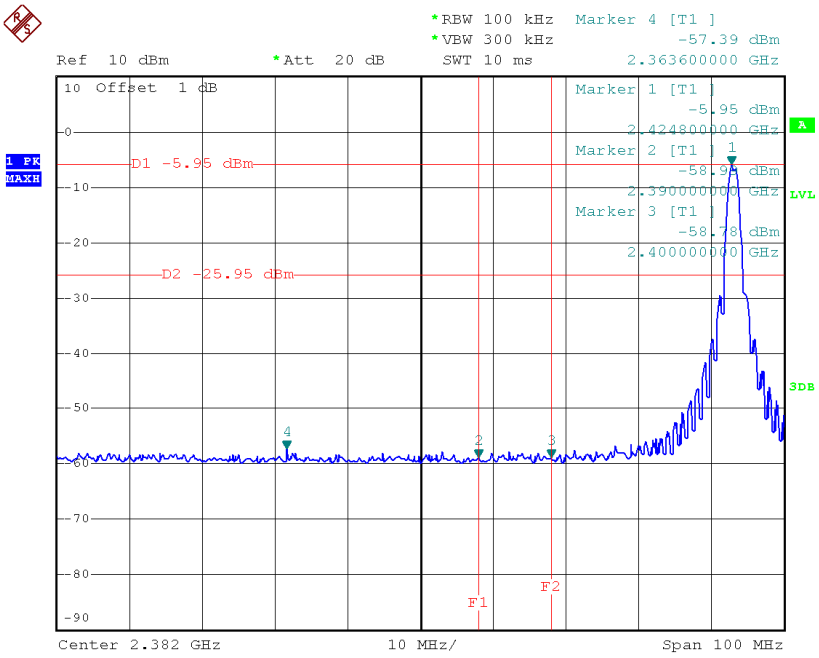
ATTACHMENT F - MAXIMUM OUTPUT POWER TEST

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2425	-0.23	0.0009	30.00	1.00	Complies
2450	-0.84	0.0008	30.00	1.00	Complies
2475	-1.59	0.0007	30.00	1.00	Complies

ATTACHMENT G - ANTENNA CONDUCTED SPURIOUS EMISSION

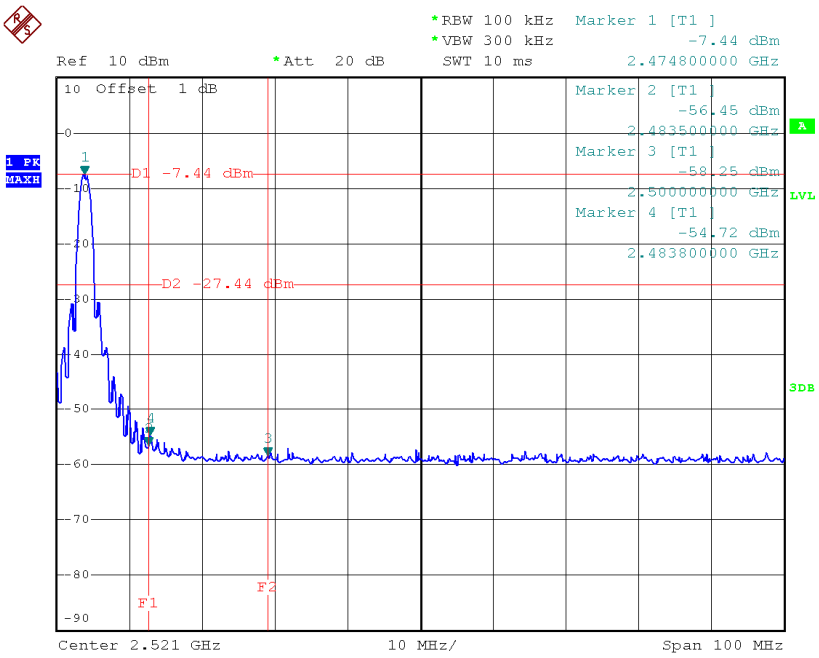
Test Mode :	CH15, CH20, CH25

CH15 (Lower)



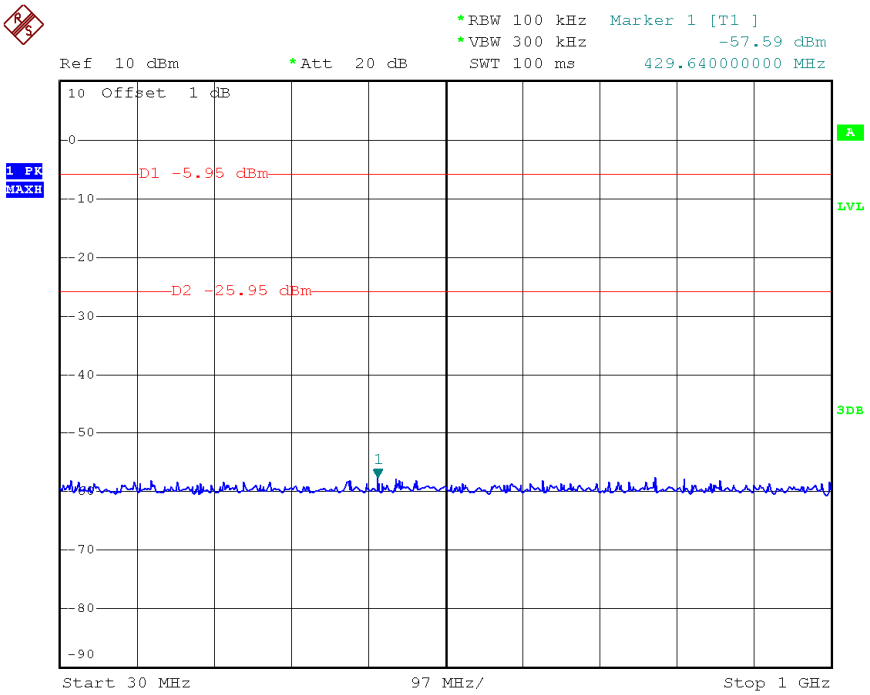
Date: 3.DEC.2014 19:37:43

CH25 (upper)



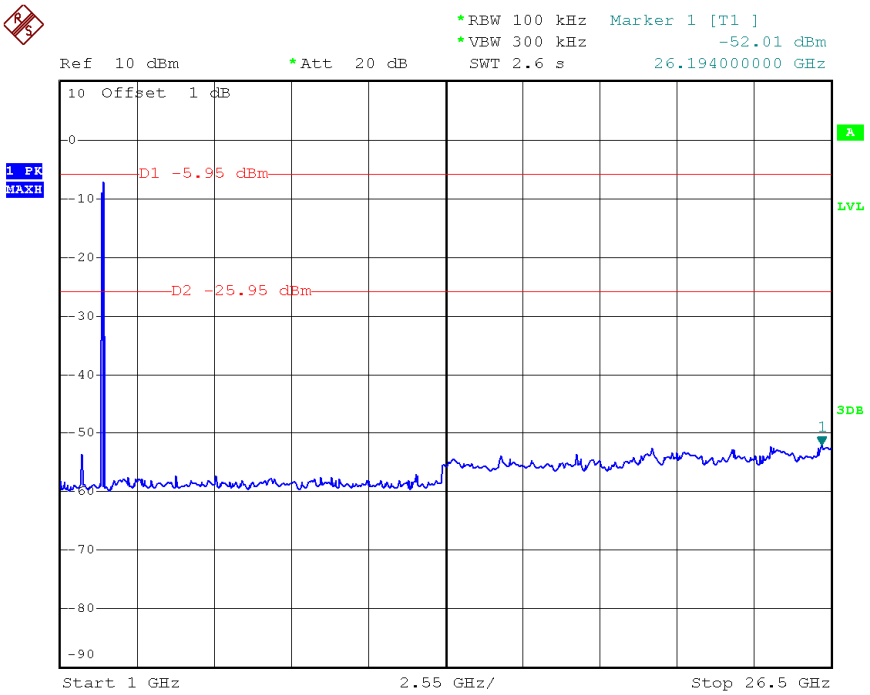
Date: 3.DEC.2014 17:23:33

TX mode CH15 (30M~1000MHz)



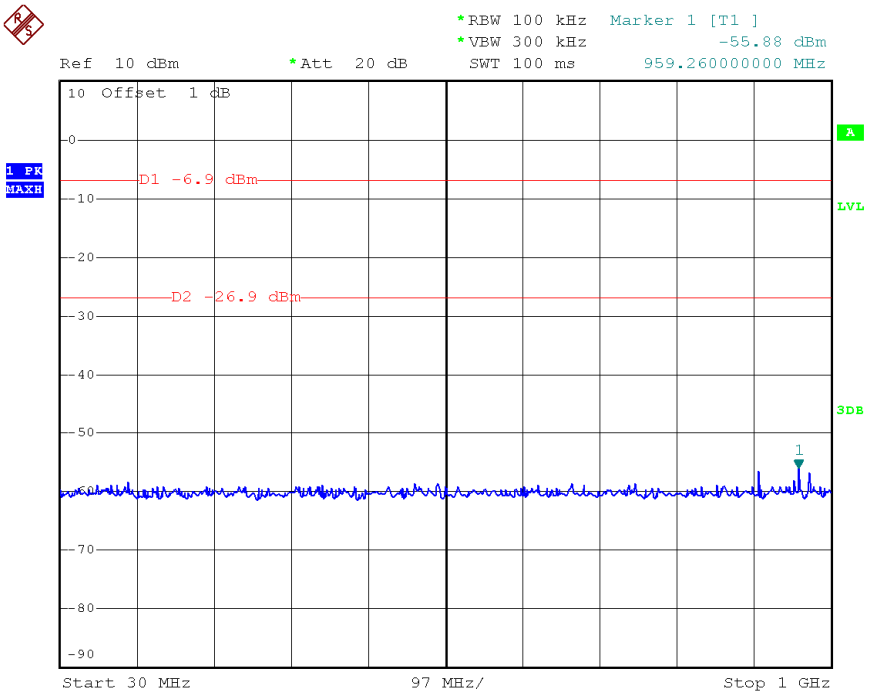
Date: 3.DEC.2014 19:39:22

TX mode CH15 (1000MHz~10th Harmonic)



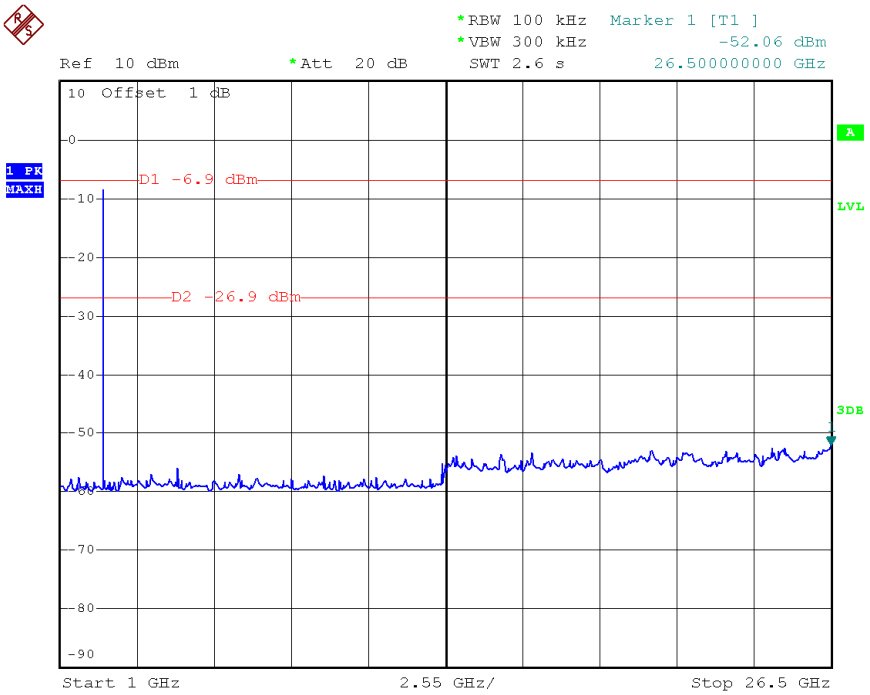
Date: 3.DEC.2014 19:41:58

TX mode CH20 (30M~1000MHz)



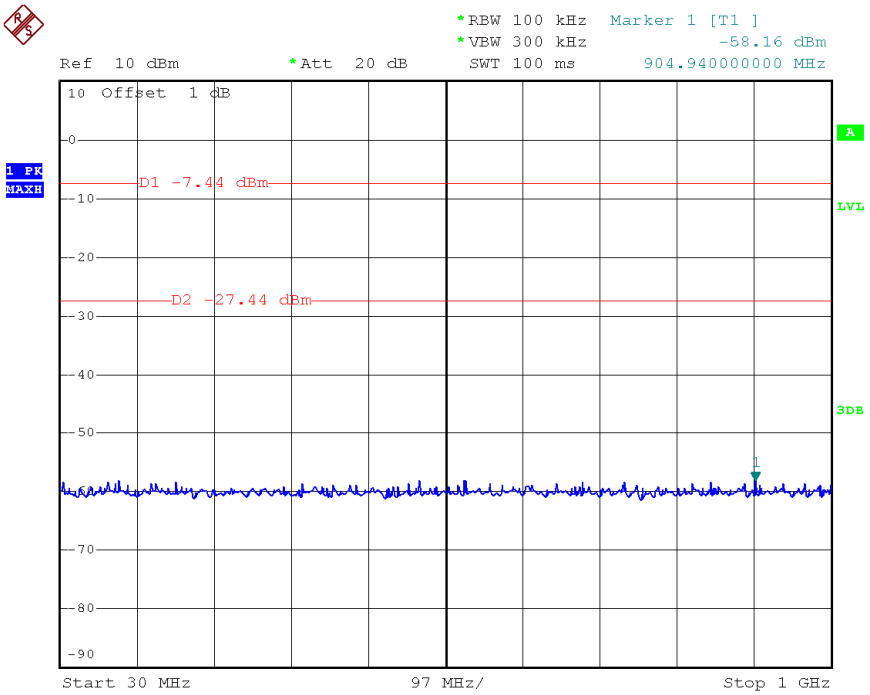
Date: 3.DEC.2014 19:50:17

TX mode CH20 (1000MHz~10th Harmonic)



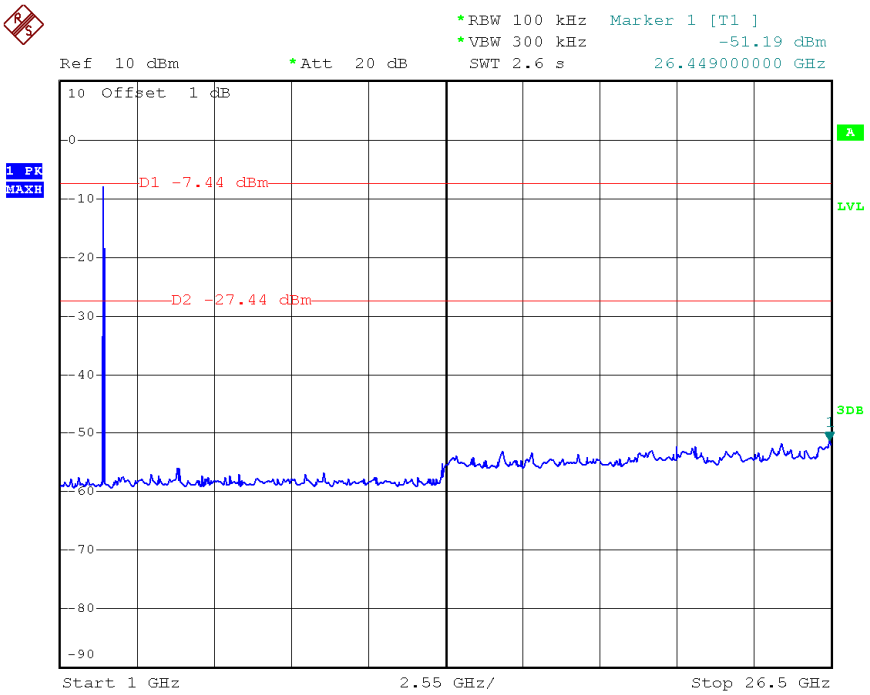
Date: 3.DEC.2014 19:51:50

TX mode CH25 (30M~1000MHz)



Date: 3.DEC.2014 19:55:51

TX mode CH25 (1000MHz~10th Harmonic)

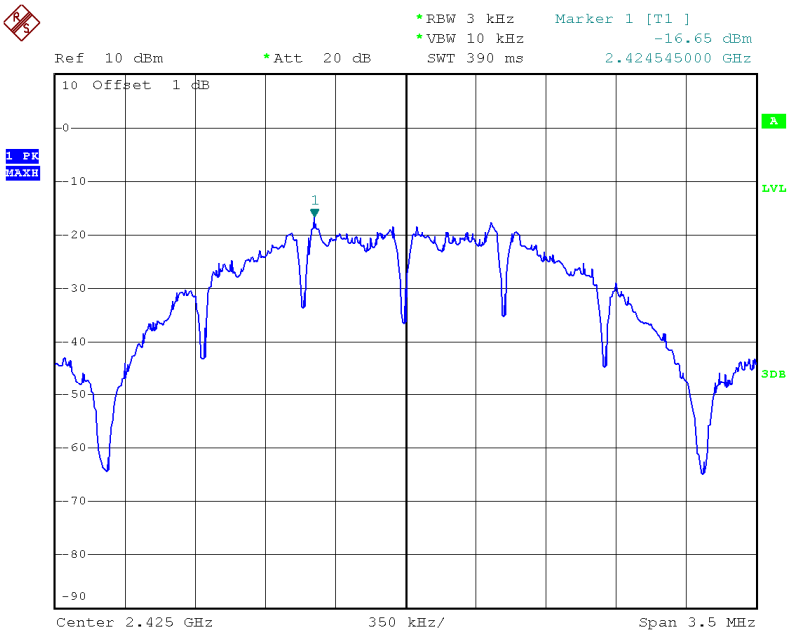


Date: 3.DEC.2014 19:55:19

ATTACHMENT H - POWER SPECTRAL DENSITY TEST

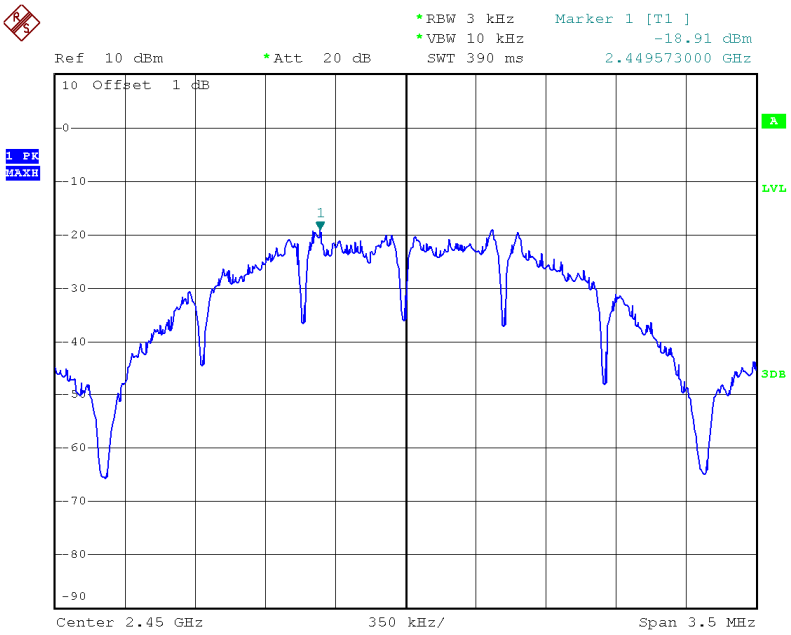
Frequency (MHz)	Power Density (dBm)	Max. Limit (dBm)	Result
2425	-16.65	8	Complies
2450	-18.91	8	Complies
2475	-19.19	8	Complies

TX CH15



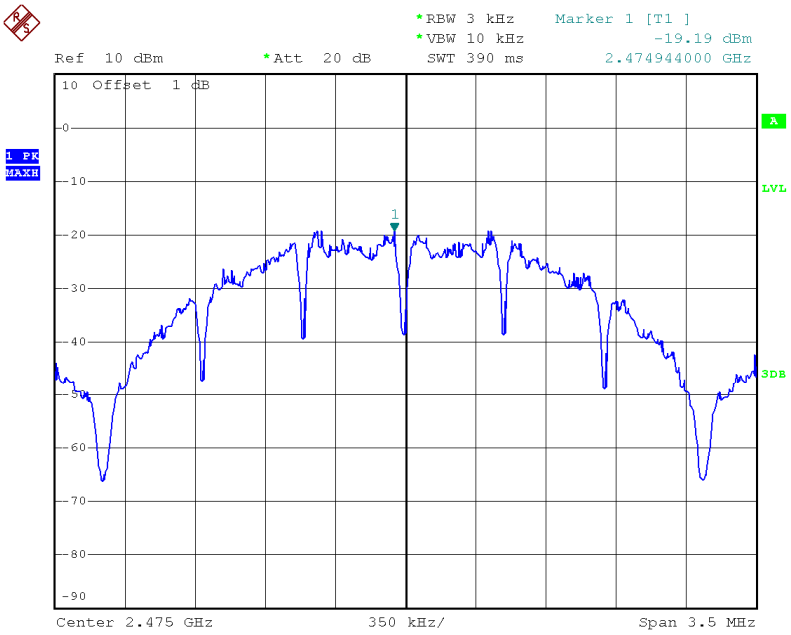
Date: 3.DEC.2014 20:36:14

TX CH20



Date: 3.DEC.2014 20:36:57

TX CH25



Date: 3.DEC.2014 20:37:43