FCC&IC Radio Test Report

FCC ID: VOB-P2570

IC: 7361A-P2570

This report concerns (check one): ■ **Original Grant** □ **Class II Change**

Project No.	:	1404C046
Equipment	:	Wireless Controller
Model Name	:	P2570
Applicant	:	NVIDIA Corporation
Address	:	2701 San Tomas Expressway Santa Clara, CA95050

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Apr. 09, 2014
Date of Test: Apr. 09, 2014~ May. 19, 2014
Issued Date: May.20, 2014

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Declaration

Neutron 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
NEI-FICP-3-1404C046	Original Issue.	May.20, 2014

1. CERTIFICATION

Equipment	:	Wireless Controller
Brand Name	:	NVIDIA
Model Name	:	P2570
Applicant		NVIDIA Corporation
Manufacturer	:	NVIDIA Corporation
Address	:	2701 San Tomas Expressway Santa Clara, CA95050
Factory	:	NVIDIA Corporation
Address	:	2701 San Tomas Expressway Santa Clara, CA95050
Date of Test	:	Apr. 09, 2014~ May. 19, 2014
Test Item	:	ENGINEERING SAMPLE
Standard(s)	:	FCC Part15, Subpart C(15.247) / ANSI C63.4-2009 Canada RSS-210:2010 RSS-GEN Issue 3, Dec 2010

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FICP-3-1404C046) 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 Canada RSS-210:2010; RSS-GEN Issue 3, Dec 2010				
Standard(s) Section		Test Item	Judgment	Remark
FCC	IC			
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	
15.247(d)	RSS-210 Annex 8 (A8.5)	Antenna conducted Spurious Emission	PASS	
15.247(a)(2)	RSS-210 Annex 8 (A8.2(a))	6dB Bandwidth	PASS	
15.247(b)(3)	RSS-210 Annex 8 (A8.4(4))	Peak Output Power	PASS	
15.247(e)	RSS-210 Annex 8 (A8.2(b))	Power Spectral Density	PASS	
15.203	-	Antenna Requirement	PASS	
15.209/15.205	RSS-210 Annex 8 (A8.5)	Transmitter Radiated Emissions	PASS	

NOTE:

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

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r01 (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, Dong Guan, China.523792
Neutron's test firm number for FCC: 319330
Neutron's test firm number for IC: 4428B-1

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	Wireless Controller	
Brand Name	NVIDIA	
Model Name	P2570	
Model Difference	N/A	
Product Description	Operation Frequency	5745~5825 MHz
	Modulation Technology	802.11a:OFDM
	Bit Rate of Transmitter	Up to 24Mbps
	Output Power (Max.)	802.11a: 11.63 dBm
Power Source	#1 Supplied from Lithium-ion Polymer rechargeable battery. 1)Model:PT553759 2)Model:LC18650-2200mAh #2 Supplied from USB port.	
Power Rating	#1 1) DC 3.7V 1250mAh 2) DC 3.6V 2200mAh #2 DC 5V 0.5A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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

2.

802.11a					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	**5745**	153	5765	**157**	**5785**
161	5805	**165**	**5825**		

3 Table for Filed Antenna

.

Ant.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)
1	Yageo Corp.	ANT5320LL24R2455A	Chip	N/A	3.51
2	Yageo Corp.	ANT5320LL24R2455A	Chip	N/A	3.51

Note:
The EUT incorporates a SISO function and only one antenna used per time

4.

Operating Mode / TX Mode	1TX	2TX
802.11a	V (ANT 1 or ANT 2)	-

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 A MODE CHANNEL 149/157/165
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 A MODE CHANNEL 149/157/165

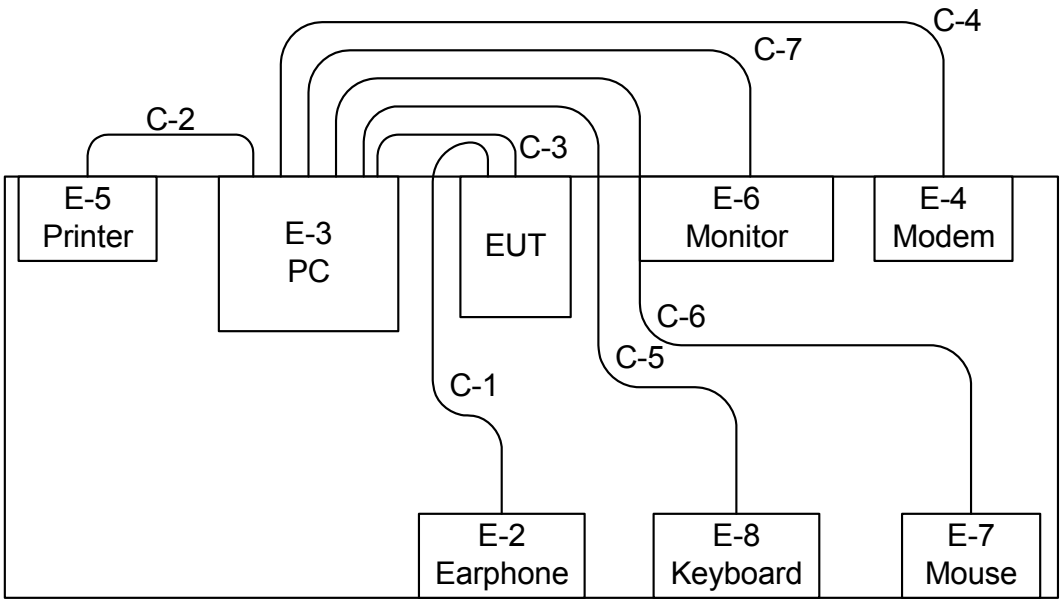
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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	Tera Term		
Frequency	**5745 MHz**	**5785 MHz**	**5825 MHz**
IEEE 802.11a	:SPW 0	:SPW 0	:SPW 0

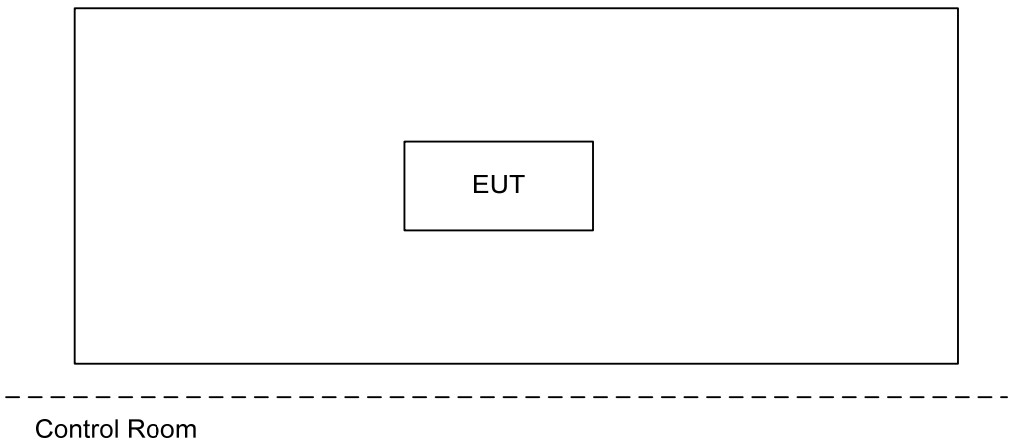
3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted EmissionsTX Mode:



C-1 Audio Cable
C-2 Parallel Cable
C-3 USB Cable
C-4 RS232 Cable
C-5 USB Cable
C-6 USB Cable
C-7 D-Sub Cable

Radiated Emissions TX Mode:



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
E-1	Host	NVIDIA	P2450	VOB-P2450	N/A	
E-2	Earphone	Apple	N/A	DOC	N/A	
E-3	PC	DELL	DCSM	DOC	G7K832X	
E-4	Modem	ACEEX	DM-1414V	N/A	0603002131	
E-5	Printer	SII	DPU-414	DOC	018507 B	
E-6	LCD monitor	Dell	E177FPc	DOC	CNOFJ179-64180-6AG-1WNS	
E-7	USB Mouse	Dell	MO56UOA	DOC	G01003HO	
E-8	USB Keyboard	Dell	L100	DOC	CNORH6596589085C00U7	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.5m	
C-2	YES	NO	1.5m	
C-3	YES	YES	1.5m	
C-4	YES	NO	1.5m	
C-5	YES	NO	1.5m	
C-6	YES	NO	1.5m	
C-7	YES	YES	1.5m	

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

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.

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.

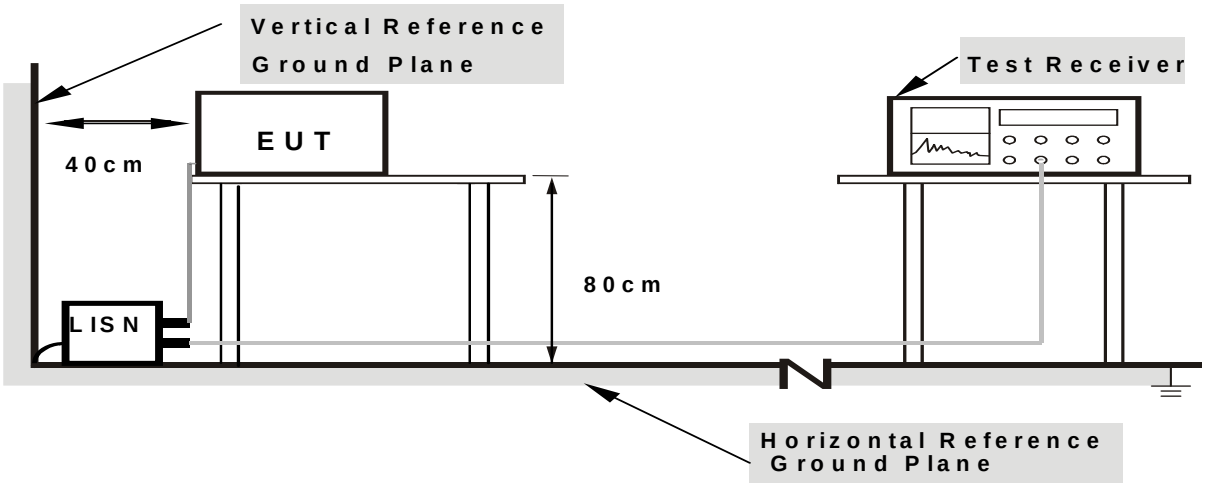
d. LISN at least 80 cm from nearest part of EUT chassis.

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

Note: The EUT does not connect to the LISN directly but through a PC. The detail setup is shown on chapter 3.4.

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: DC 5V(Powered through USB cable)

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 (Frequency Range 9KHz-1000MHz)

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) & RSS-210 section 2.2& Annex 8 (A8.5), then the 15.209(a)& RSS-Gen limit in the table below has to be followed.

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).

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

DUTY CYCLE: TX A 5745MHz

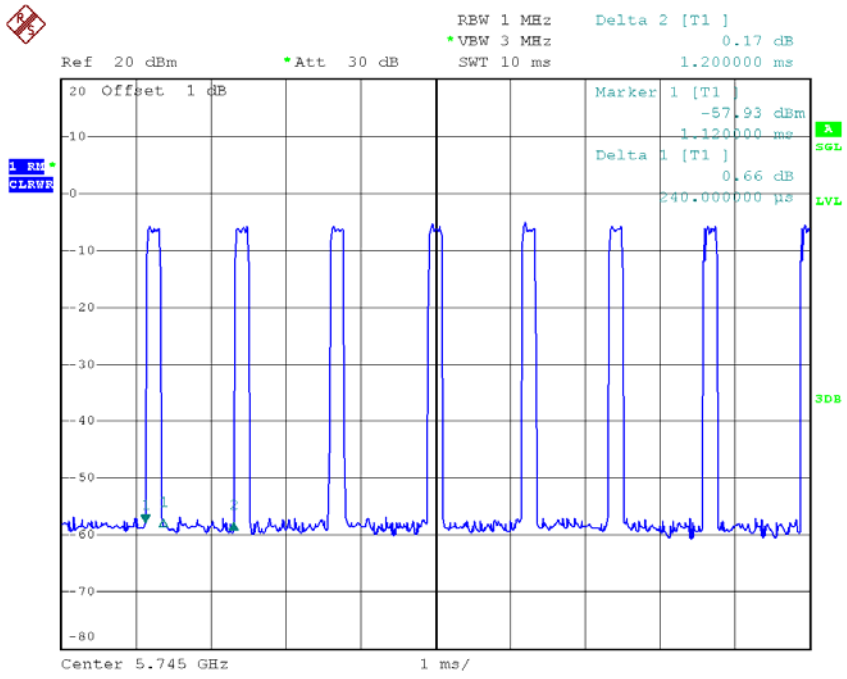
Duty Cycle=ON/(ON+OFF)

Duty Cycle=0.24/1.20

AV=Peak Value+20log(Duty Cycle)

AV=PK-13.98

On Time =0.24 msec



Date: 18.MAY.2014 14:01:33

Note:For 802.11a mode the average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) ， Final AV=PK-13.98

4.2.2 TEST PROCEDURE

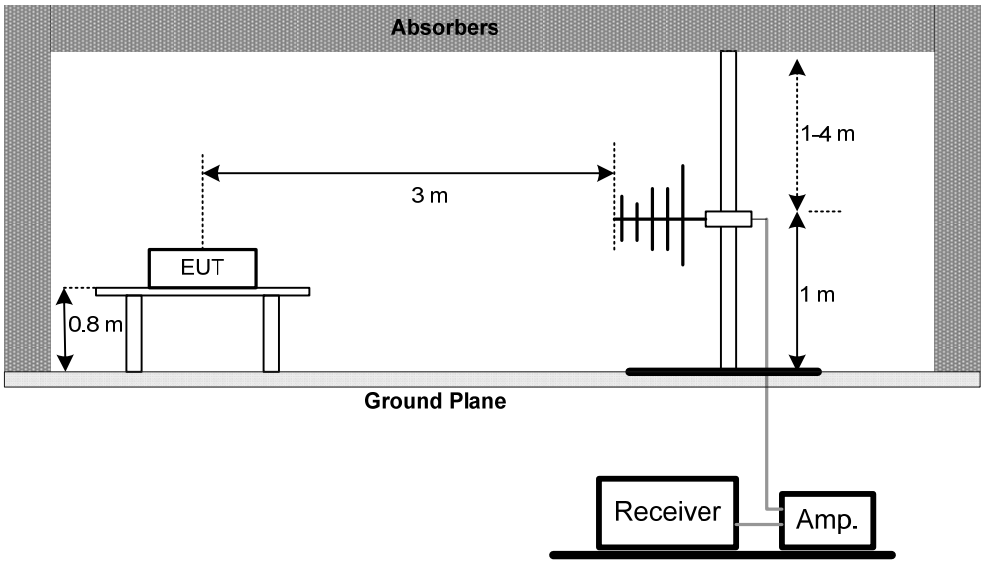
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 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

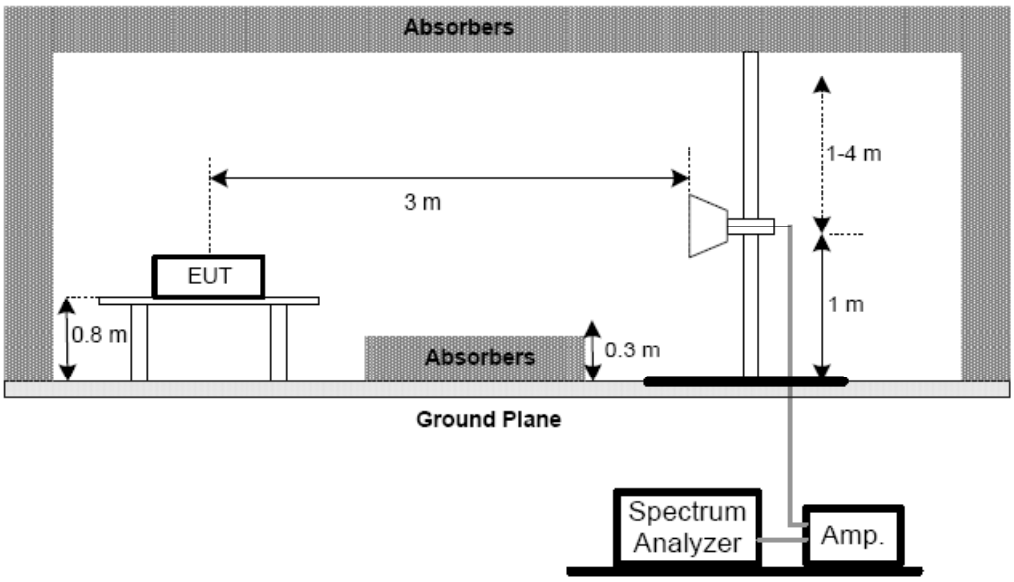
No deviation

4.2.4 TEST SETUP

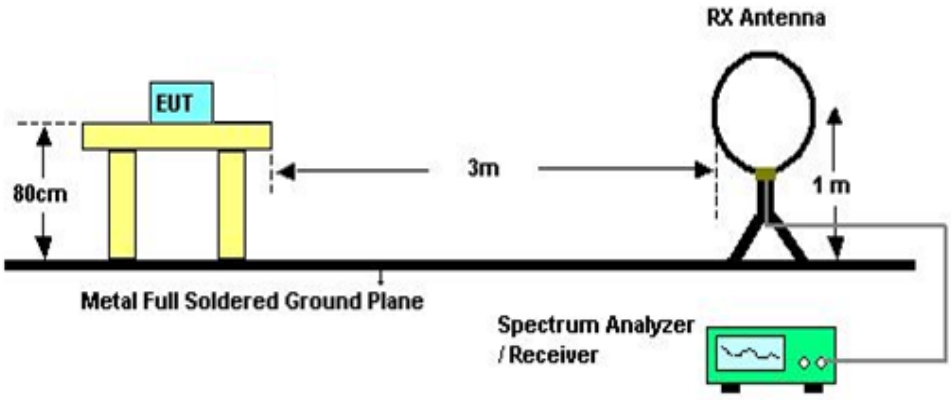
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** 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: DC 3.7V(Powered by battery)

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 (specific distance / test distance) (dB).
(3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8 TEST RESULTS (BETWEEN 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 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.

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

Remark:

(1) All readings are Peak unless otherwise stated AVG in column of『Note』. Peak denotes that the Peak reading compliance with the AVG Limits and then AVG 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

5. BANDWIDTH TEST

5.1 Applied procedures

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(2) RSS-GEN section 4.6.1 RSS-210 Annex 8 (A8.2(a))	Bandwidth	5725 - 5825	PASS

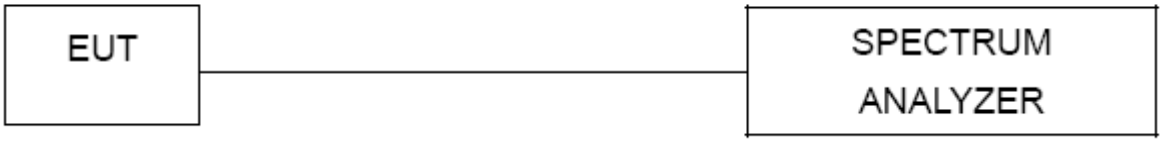
5.1.1 TEST PROCEDURE

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 = Auto.

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 4.1.6 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: DC 3.7V(Powered by battery)

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/ RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) RSS-210 Annex 8.4(4)	Maximum Output Power	1 Watt or 30dBm	5725 - 5825	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 9.1.3 of FCC KDB 558074 D01 DTS Meas Guidance v03r01.

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 4.1.6 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: DC 3.7V(Powered by battery)

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.

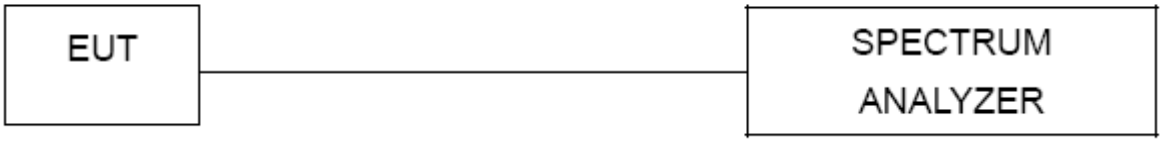
7.1.1 TEST PROCEDURE

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 = 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 4.1.6 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: DC 3.7V(Powered by battery)

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 / RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e) RSS-210 Annex 8(A8.2(b))	Power Spectral Density	8 dBm (in any 3KHz)	5745 - 5825	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=10KHz, 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 4.1.6 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: DC 3.7V(Powered by battery)

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

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	EMCO	3142C	00066462	Mar. 29, 2015
2	Antenna	EMCO	3142C	00066464	Mar. 29, 2015
3	Amplifier	Agilent	8447D	2944A11203	Nov. 11, 2014
4	Amplifier	Agilent	8447D	2944A11204	Nov. 11, 2014
5	Spectrum Analyzer	Agilent	E4443A	MY48250370	Nov. 11, 2014
6	RF Pre-selector	Agilent	N9039A	MY46520201	Nov. 11, 2014
7	Test Cable	N/A	Cable_5m_8m_15m	N/A	Jan. 14, 2015
8	Test Cable	N/A	Cable_5m_11m_15m	N/A	Jan. 14, 2015
9	Spectrum Analyzer	Agilent	E4447A	MY48250208	Nov. 11, 2014
10	RF Pre-selector	Agilent	N9039A	MY46520214	Nov. 11, 2014
11	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
12	Horn Antenna	EMCO	3115	9605-4803	Mar. 29, 2015
13	Amplifier	Agilent	8449B	3008A02584	Nov. 11, 2014
14	Spectrum Analyzer	Agilent	E4447A	MY48250208	Nov. 11, 2014
15	Test Cable	Huber+Suhner	SUCOFLEX_15m_4m	N/A	Jan. 14, 2015

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	May. 29, 2015
2	Wireband Power sensor	Agilent	N1921A	MY51100041	May. 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. 11, 2014

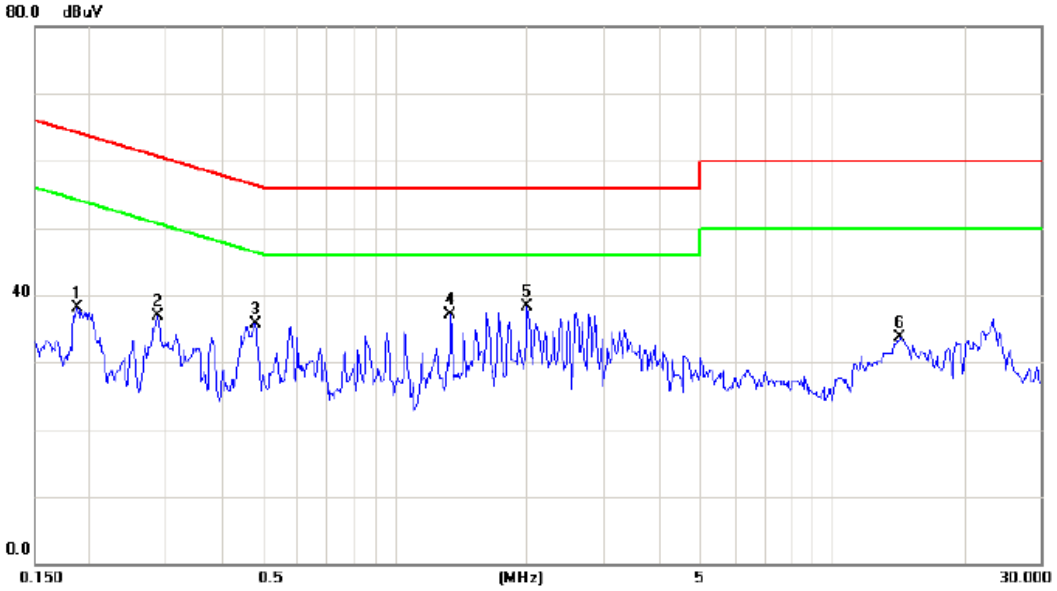
Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014

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

ATTACHMENT A - CONDUCTED EMISSION

Test Mode :	TX MODE

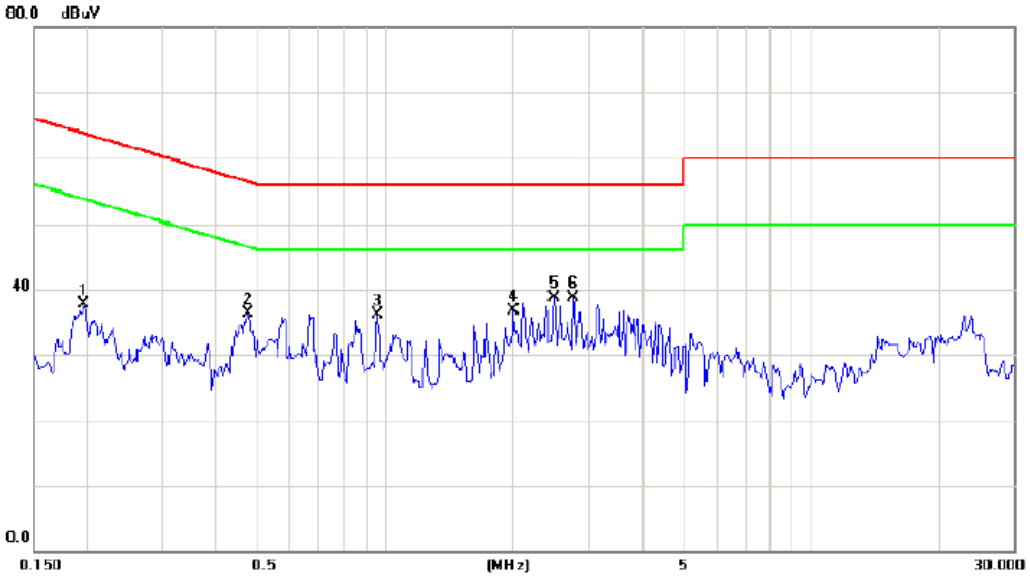
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1872	28.40	9.65	38.05	64.16	-26.11	peak	
2		0.2867	27.20	9.67	36.87	60.62	-23.75	peak	
3		0.4786	26.07	9.70	35.77	56.36	-20.59	peak	
4		1.3410	27.25	9.78	37.03	56.00	-18.97	peak	
5	*	2.0093	28.50	9.84	38.34	56.00	-17.66	peak	
6		14.2652	23.42	10.30	33.72	60.00	-26.28	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		0.1952	27.92	9.71	37.63	63.81	-26.18	peak	
2		0.4781	26.59	9.74	36.33	56.37	-20.04	peak	
3		0.9585	26.29	9.77	36.06	56.00	-19.94	peak	
4		2.0093	26.85	9.86	36.71	56.00	-19.29	peak	
5	*	2.4897	28.90	9.88	38.78	56.00	-17.22	peak	
6		2.7750	28.84	9.88	38.72	56.00	-17.28	peak	

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

Test Mode :	TX Mode 5745MHz

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0212	0°	16.73	24.22	40.95	121.08	-80.12	AVG
0.0220	0°	20.44	24.22	44.66	141.08	-96.41	PEAK
0.0279	0°	16.81	23.80	40.61	118.69	-78.08	AVG
0.0279	0°	23.17	23.80	46.97	138.69	-91.72	PEAK
0.0333	0°	16.92	23.46	40.38	117.16	-76.78	AVG
0.0333	0°	22.63	23.46	46.09	137.16	-91.07	PEAK
0.0528	0°	20.82	22.34	43.16	113.15	-69.99	AVG
0.0528	0°	24.98	22.34	47.32	133.15	-85.83	PEAK
0.3170	0°	18.03	20.24	38.27	97.58	-59.31	AVG
0.3170	0°	22.19	20.24	42.43	117.58	-75.15	PEAK
1.5210	0°	16.87	19.55	36.42	63.96	-27.54	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0175	90°	16.85	24.30	41.15	122.74	-81.59	AVG
0.0175	90°	22.16	24.30	46.46	142.74	-96.28	PEAK
0.0269	90°	16.82	23.86	40.68	119.01	-78.33	AVG
0.0269	90°	19.16	23.86	43.02	139.01	-95.99	PEAK
0.0375	90°	21.41	23.19	44.60	116.12	-71.52	AVG
0.0375	90°	28.13	23.19	51.32	136.12	-84.80	PEAK
0.0519	90°	16.14	22.36	38.50	113.30	-74.80	AVG
0.0519	90°	22.10	22.36	44.46	133.30	-88.84	PEAK
0.3260	90°	15.46	20.22	35.68	97.34	-61.66	AVG
0.3260	90°	20.14	20.22	40.36	117.34	-76.98	PEAK
1.6750	90°	16.16	19.53	35.69	63.12	-27.43	QP

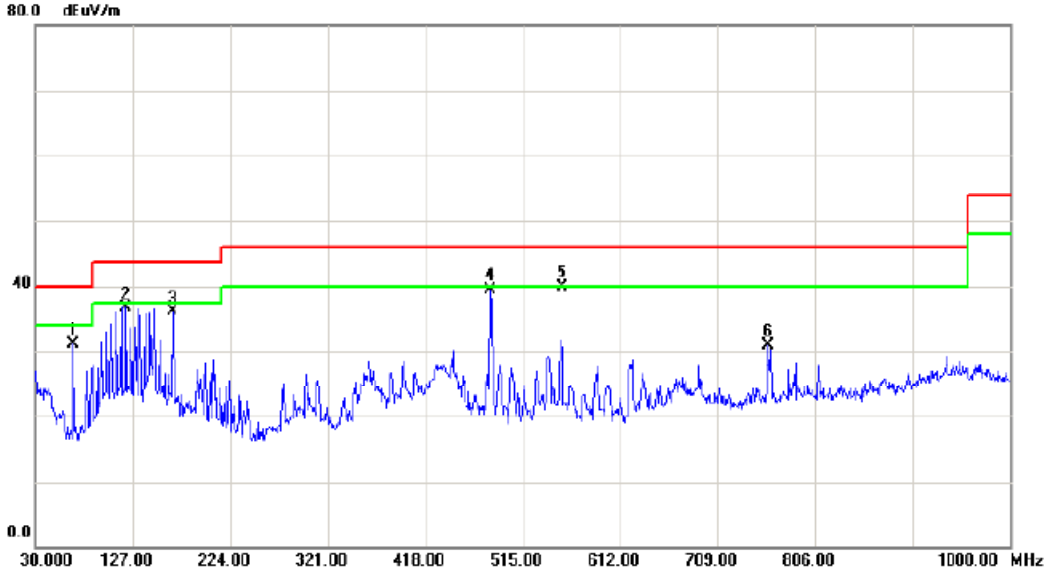
Remark:

(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.

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

Test Mode:	TX A MODE 5745MHz

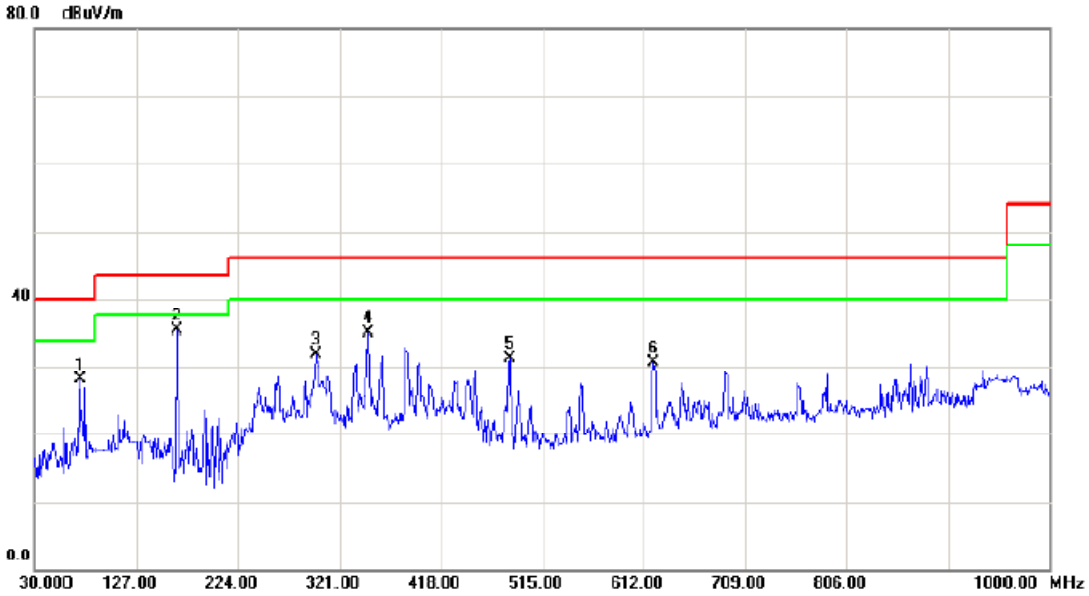
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		66.8600	47.03	-15.89	31.14	40.00	-8.86	peak	
2		120.2100	50.64	-13.88	36.76	43.50	-6.74	peak	
3		165.8000	49.26	-13.11	36.15	43.50	-7.35	peak	
4		482.9900	49.39	-9.85	39.54	46.00	-6.46	peak	
5	*	554.7700	47.62	-7.69	39.93	46.00	-6.07	peak	
6		759.4400	35.39	-4.57	30.82	46.00	-15.18	peak	

Test Mode:	TX A MODE 5745MHz

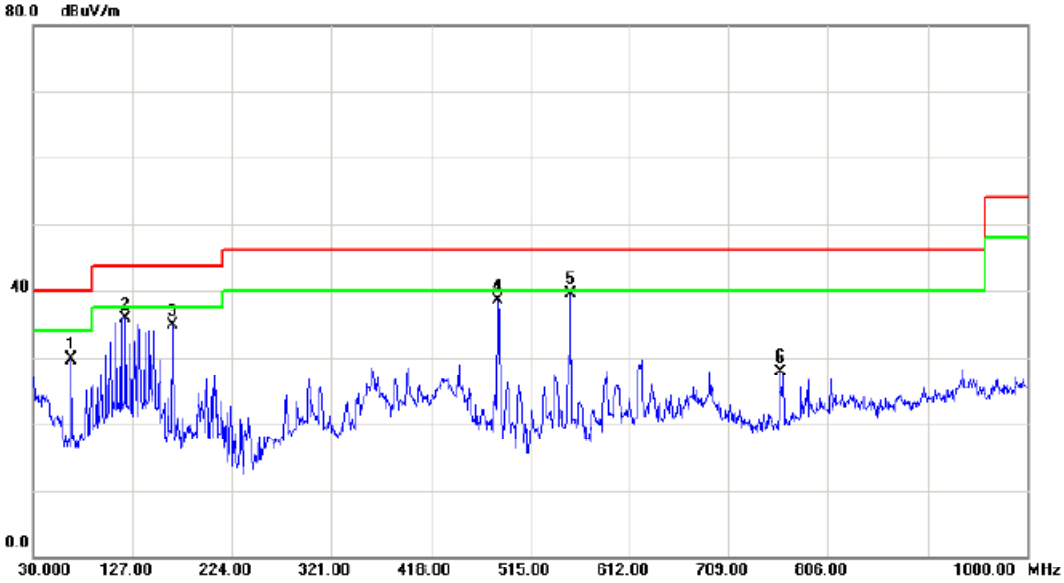
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		72.6800	44.64	-16.55	28.09	40.00	-11.91	peak	
2	*	165.8000	48.38	-13.11	35.27	43.50	-8.23	peak	
3		299.6600	43.26	-11.27	31.99	46.00	-14.01	peak	
4		349.1300	46.42	-11.46	34.96	46.00	-11.04	peak	
5		484.9300	41.13	-9.91	31.22	46.00	-14.78	peak	
6		621.7000	37.79	-7.00	30.79	46.00	-15.21	peak	

Test Mode:	TX A MODE 5785MHz

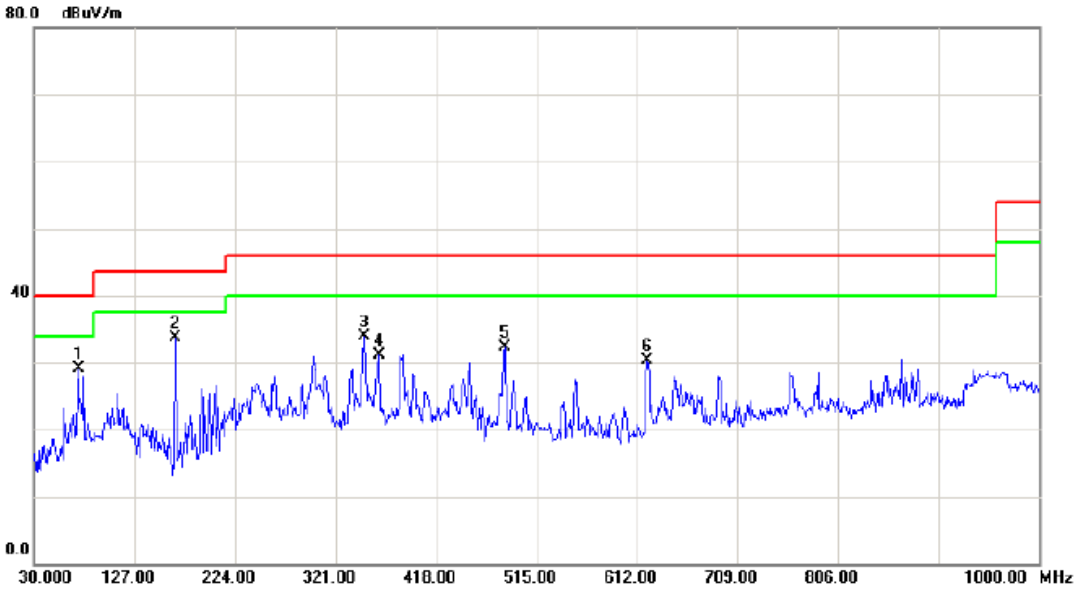
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		66.8600	45.53	-15.89	29.64	40.00	-10.36	peak	
2		120.2100	49.64	-13.88	35.76	43.50	-7.74	peak	
3		165.8000	47.76	-13.11	34.65	43.50	-8.85	peak	
4		482.9900	48.39	-9.85	38.54	46.00	-7.46	peak	
5	*	554.7700	47.12	-7.69	39.43	46.00	-6.57	peak	
6		759.4400	32.39	-4.57	27.82	46.00	-18.18	peak	

Test Mode:	TX A MODE 5785MHz

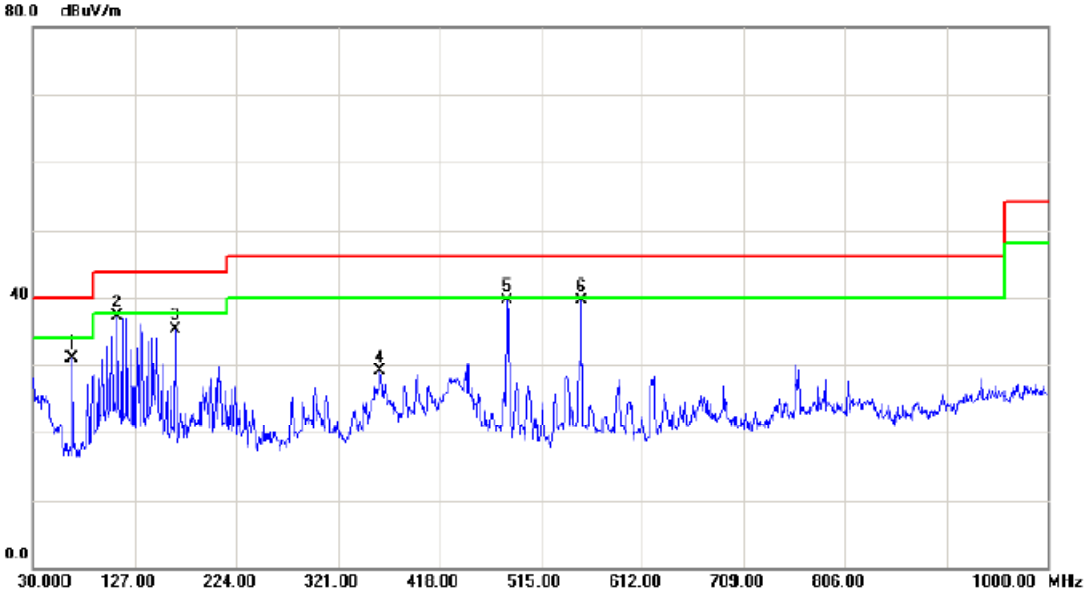
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		72.6800	45.64	-16.55	29.09	40.00	-10.91	peak	
2	*	165.8000	46.88	-13.11	33.77	43.50	-9.73	peak	
3		349.1300	45.42	-11.46	33.96	46.00	-12.04	peak	
4		362.7100	42.19	-11.06	31.13	46.00	-14.87	peak	
5		484.9300	42.13	-9.91	32.22	46.00	-13.78	peak	
6		621.7000	37.29	-7.00	30.29	46.00	-15.71	peak	

Test Mode:	TX A MODE 5825MHz

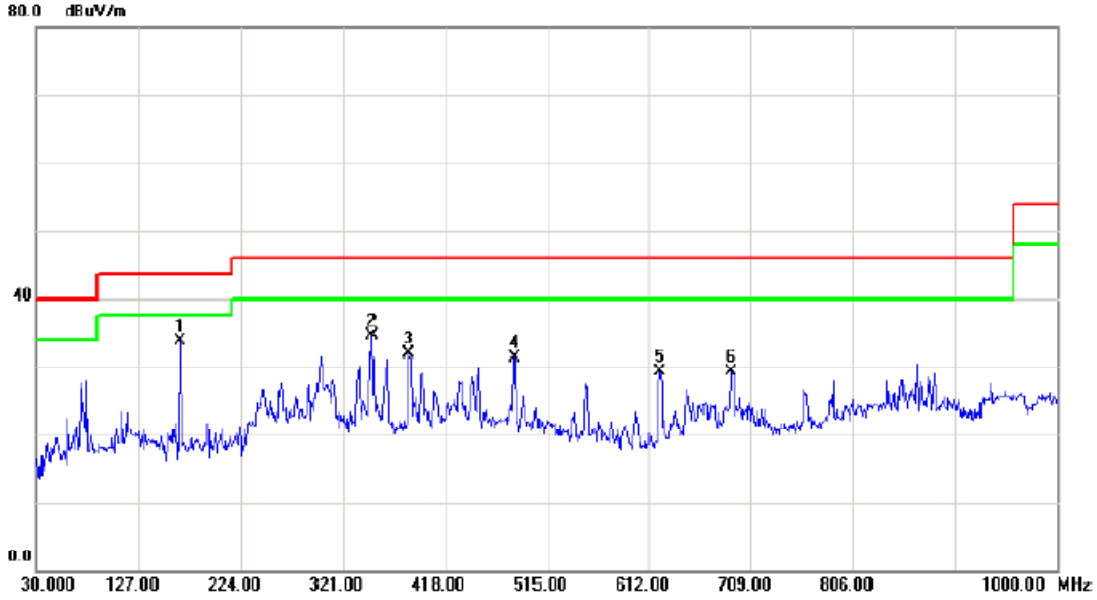
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		66.8600	47.03	-15.89	31.14	40.00	-8.86	peak	
2		110.5100	51.70	-14.69	37.01	43.50	-6.49	peak	
3		165.8000	48.26	-13.11	35.15	43.50	-8.35	peak	
4		361.7400	40.17	-11.09	29.08	46.00	-16.92	peak	
5	*	482.9900	49.39	-9.85	39.54	46.00	-6.46	peak	
6		554.7700	47.12	-7.69	39.43	46.00	-6.57	peak	

Test Mode:	TX A MODE 5825MHz

Horizontal

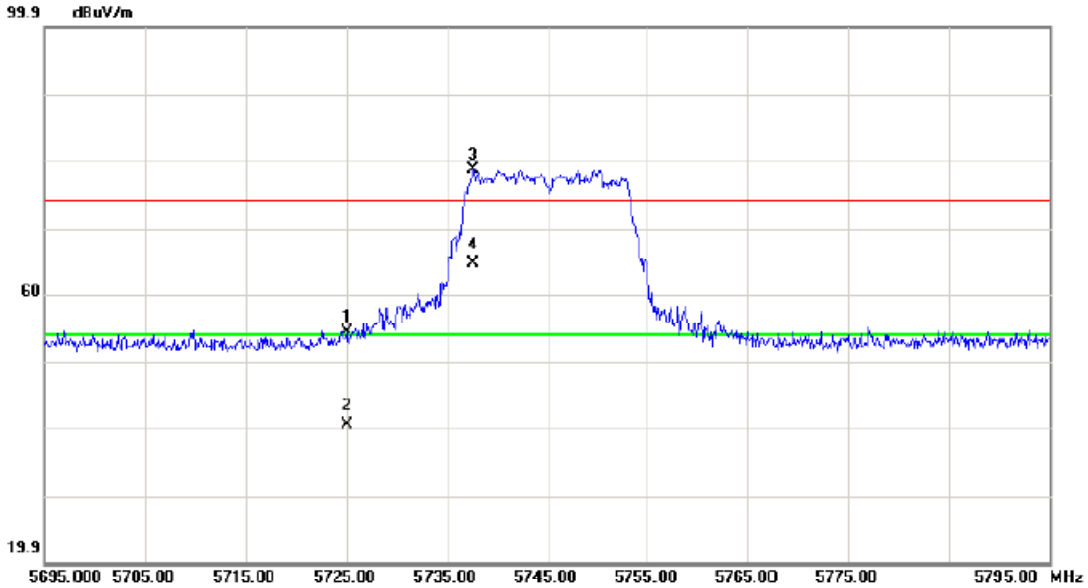


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	165.8000	46.88	-13.11	33.77	43.50	-9.73	peak	
2		349.1300	45.92	-11.46	34.46	46.00	-11.54	peak	
3		384.0500	42.24	-10.38	31.86	46.00	-14.14	peak	
4		484.9300	41.13	-9.91	31.22	46.00	-14.78	peak	
5		621.7000	36.29	-7.00	29.29	46.00	-16.71	peak	
6		690.5700	34.30	-4.94	29.36	46.00	-16.64	peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode :	TX A Mode 5745MHz

Vertical

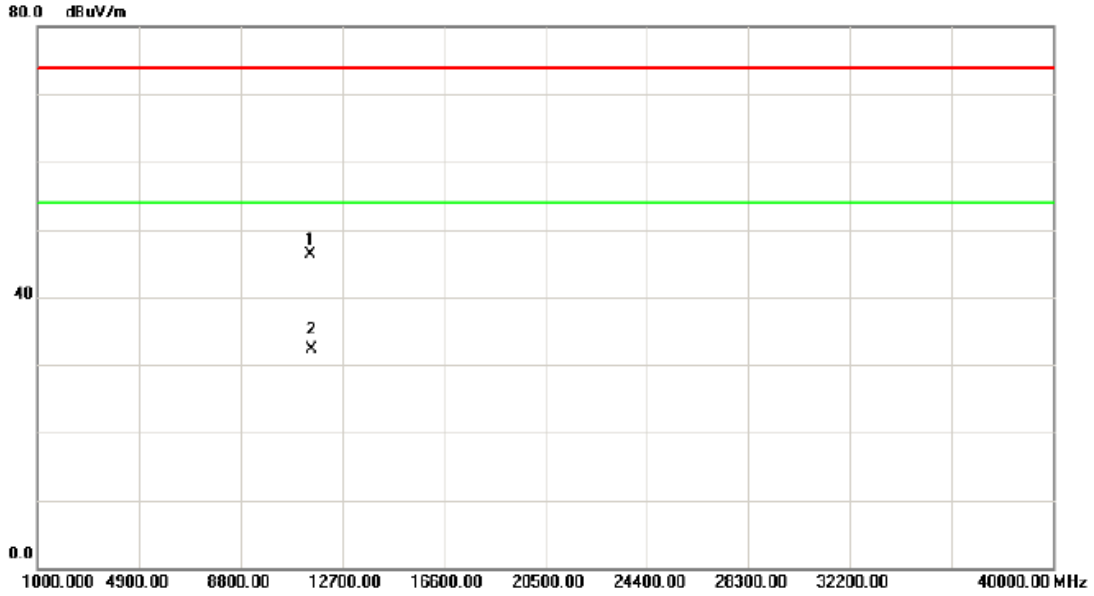


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5725.000	9.86	44.58	54.44	74.00	-19.56	peak	
2		5725.000	-4.12	44.58	40.46	54.00	-13.54	AVG	
3	X	5737.600	34.02	44.65	78.67	74.00	4.67	peak	Fundamental frequency, no limit
4	*	5737.600	20.04	44.65	64.69	54.00	10.69	AVG	Fundamental frequency, no limit

Note:The band edge frequency Limit line= fundamental - 20dB

Orthogonal Axis :	X
Test Mode :	TX A Mode 5745MHz

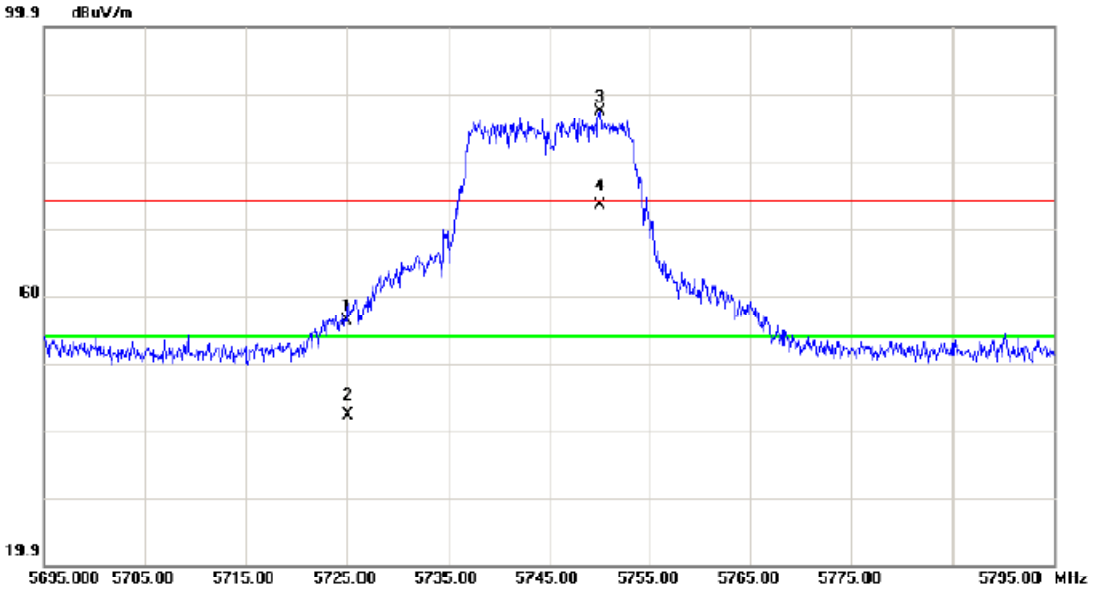
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		11490.12	27.78	18.47	46.25	74.00	-27.75	peak	
2	*	11490.12	13.80	18.47	32.27	54.00	-21.73	AVG	

Orthogonal Axis :	X
Test Mode :	TX A Mode 5745MHz

Horizontal

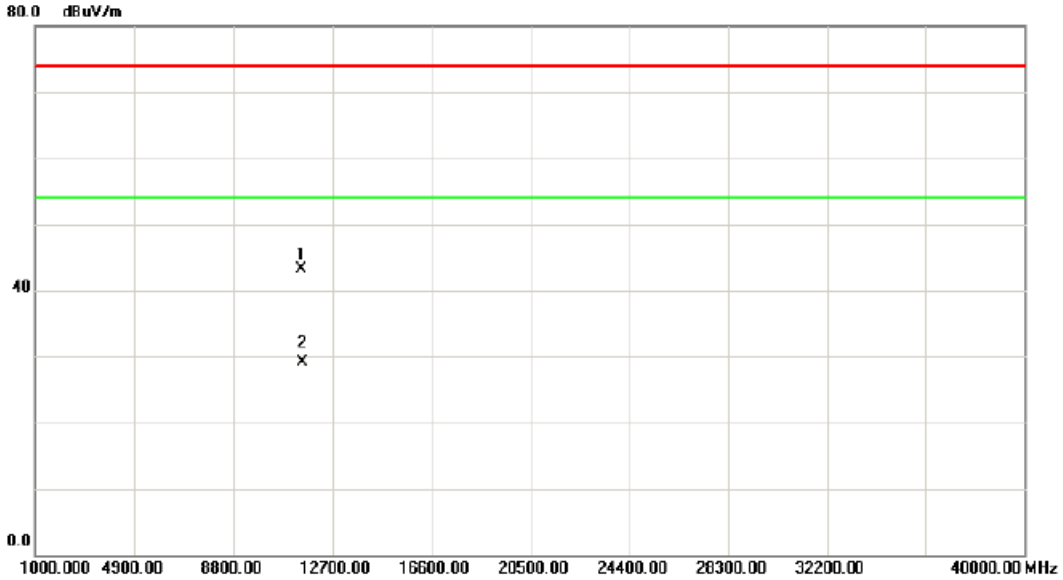


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		5725.000	11.62	44.58	56.20	74.00	-17.80	peak	
2		5725.000	-2.36	44.58	42.22	54.00	-11.78	AVG	
3	X	5750.100	42.64	44.71	87.35	74.00	13.35	peak	Fundamental frequency, no limit
4	*	5750.100	28.66	44.71	73.37	54.00	19.37	AVG	Fundamental frequency, no limit

Note:The band edge frequency Limit line= fundamental - 20dB

Orthogonal Axis :	X
Test Mode :	TX A Mode 5745MHz

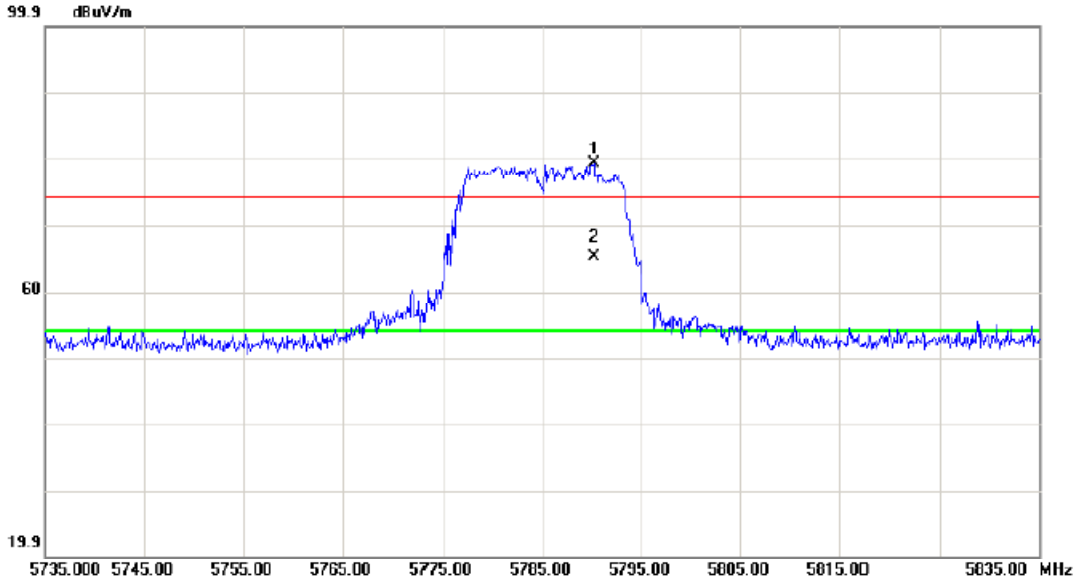
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		11490.14	24.69	18.47	43.16	74.00	-30.84	peak	
2	*	11490.14	10.70	18.47	29.17	54.00	-24.83	AVG	

Orthogonal Axis :	X
Test Mode :	TX A Mode 5785MHz

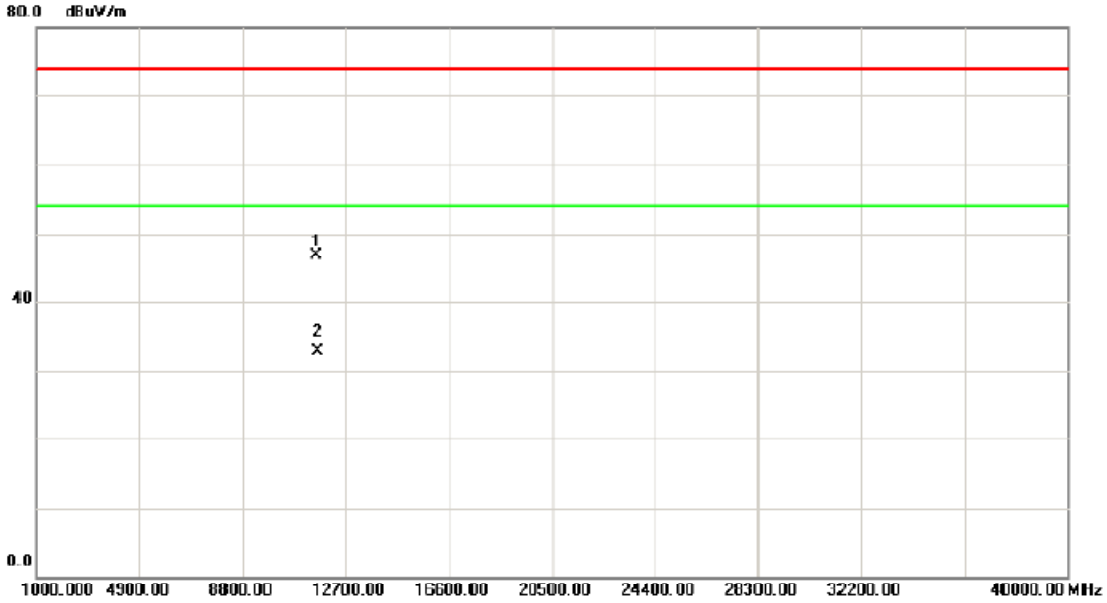
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5790.200	34.35	44.92	79.27	74.00	5.27	peak	Fundamental frequency, no limit
2	*	5790.200	20.37	44.92	65.29	54.00	11.29	AVG	Fundamental frequency, no limit

Orthogonal Axis :	X
Test Mode :	TX A Mode 5785MHz

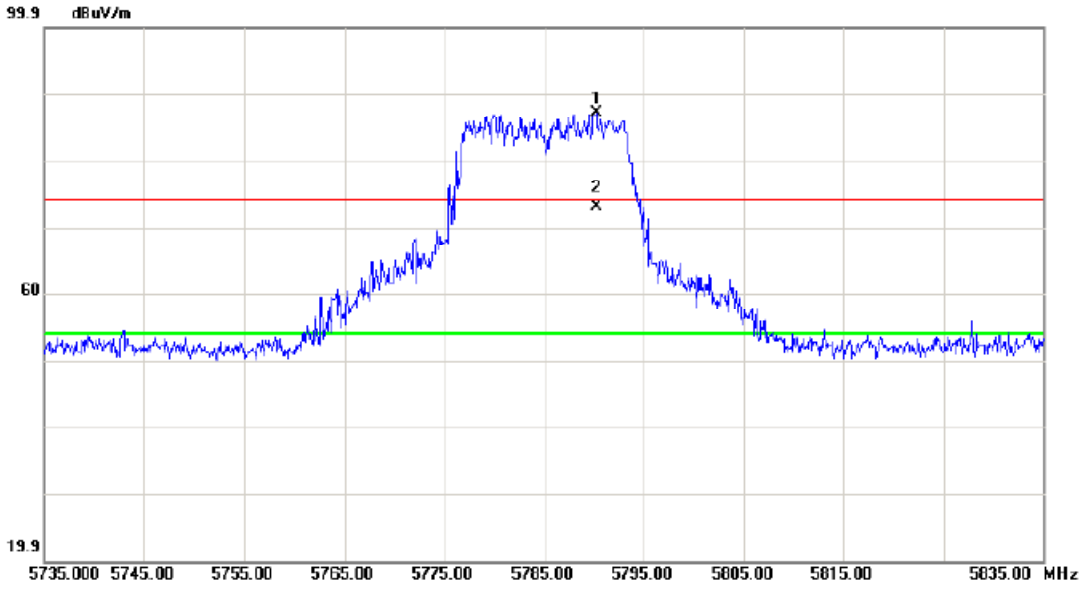
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		11570.21	28.08	18.67	46.75	74.00	-27.25	peak	
2	*	11570.21	14.10	18.67	32.77	54.00	-21.23	AVG	

Orthogonal Axis :	X
Test Mode :	TX A Mode 5785MHz

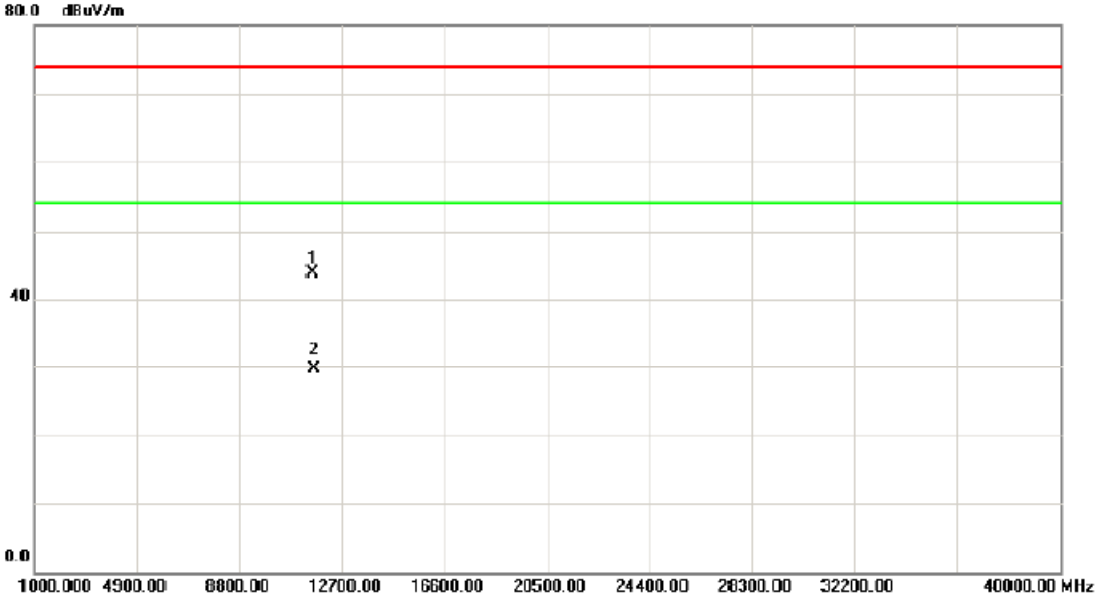
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5790.200	42.16	44.92	87.08	74.00	13.08	peak	Fundamental frequency, no limit
2	*	5790.200	28.18	44.92	73.10	54.00	19.10	AVG	Fundamental frequency, no limit

Orthogonal Axis :	X
Test Mode :	TX A Mode 5785MHz

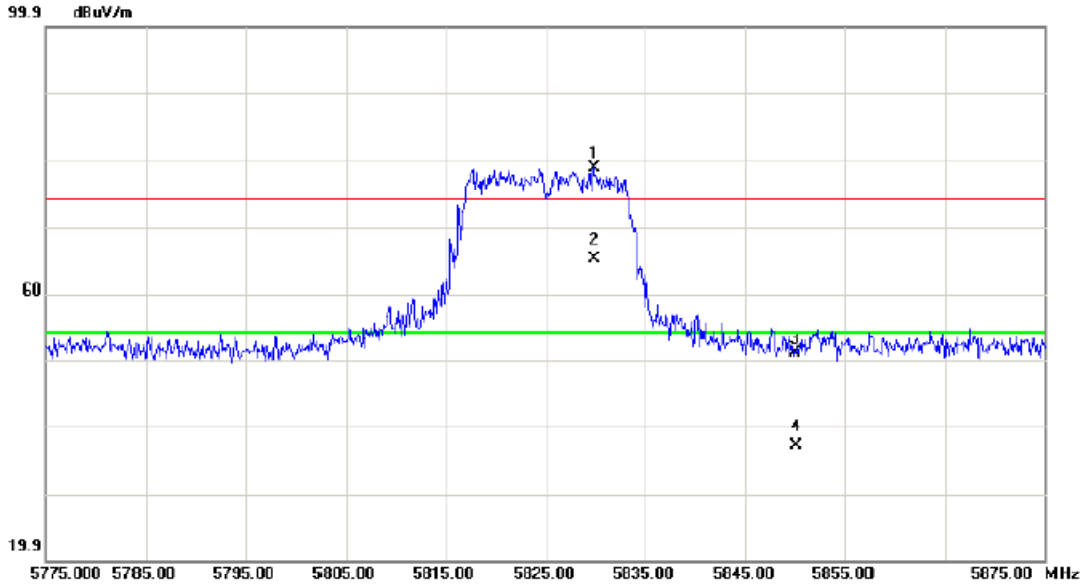
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		11570.14	24.94	18.67	43.61	74.00	-30.39	peak	
2	*	11570.14	10.96	18.67	29.63	54.00	-24.37	AVG	

Orthogonal Axis :	X
Test Mode :	TX A Mode 5825MHz

Vertical

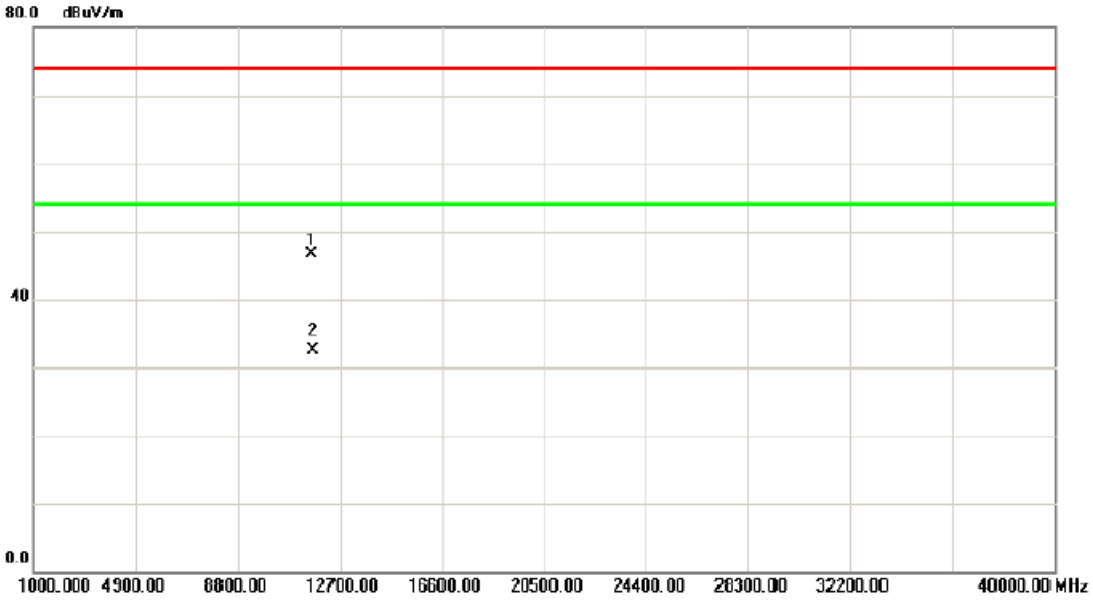


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5829.800	33.78	45.12	78.90	74.00	4.90	peak	Fundamental frequency, no limit
2	*	5829.800	19.80	45.12	64.92	54.00	10.92	AVG	Fundamental frequency, no limit
3		5850.000	5.78	45.23	51.01	74.00	-22.99	peak	
4		5850.000	-8.19	45.23	37.04	54.00	-16.96	AVG	

Note:The band edge frequency Limit line= fundamental - 20dB

Orthogonal Axis :	X
Test Mode :	TX A Mode 5825MHz

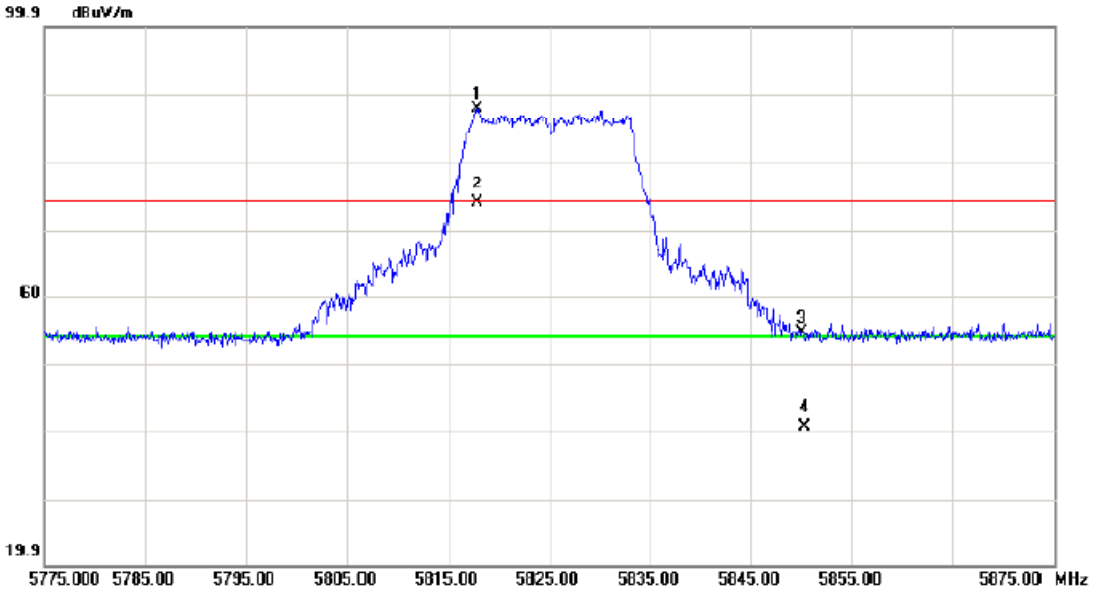
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		11650.15	27.54	18.87	46.41	74.00	-27.59	peak	
2	*	11650.15	13.56	18.87	32.43	54.00	-21.57	AVG	

Orthogonal Axis :	X
Test Mode :	TX A Mode 5825MHz

Horizontal

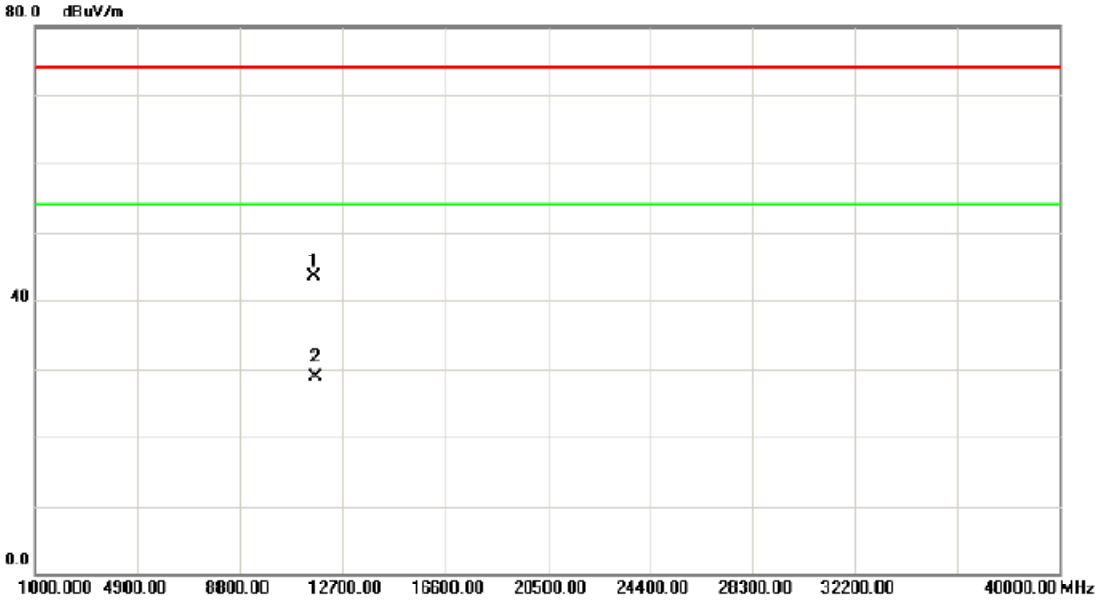


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	5817.800	42.65	45.06	87.71	74.00	13.71	peak	Fundamental frequency, no limit
2	*	5817.800	28.67	45.06	73.73	54.00	19.73	AVG	Fundamental frequency, no limit
3		5850.000	9.36	45.23	54.59	74.00	-19.41	peak	
4		5850.000	-4.62	45.23	40.61	54.00	-13.39	AVG	

Note:The band edge frequency Limit line= fundamental - 20dB

Orthogonal Axis :	X
Test Mode :	TX A Mode 5825MHz

Horizontal

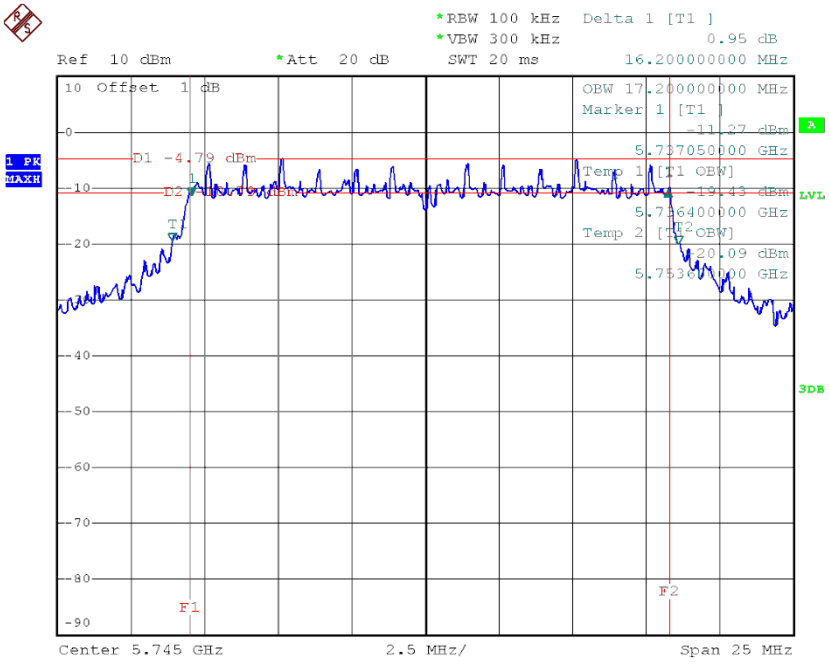


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		11650.17	24.71	18.87	43.58	74.00	-30.42	peak	
2	*	11650.17	9.99	18.87	28.86	54.00	-25.14	AVG	

ATTACHMENT E - BANDWIDTH

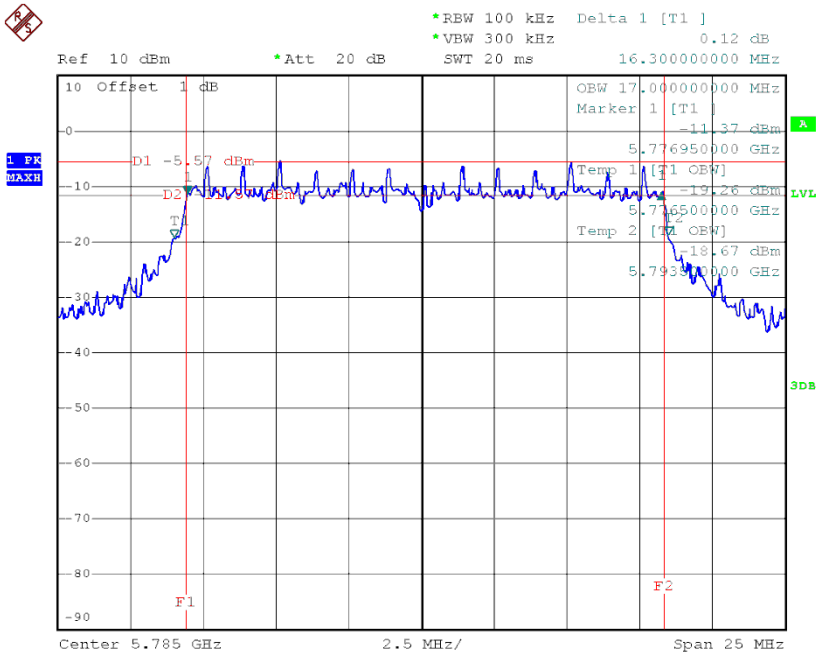
Test Mode : TX A Mode_CH149/157/165

TX CH 149



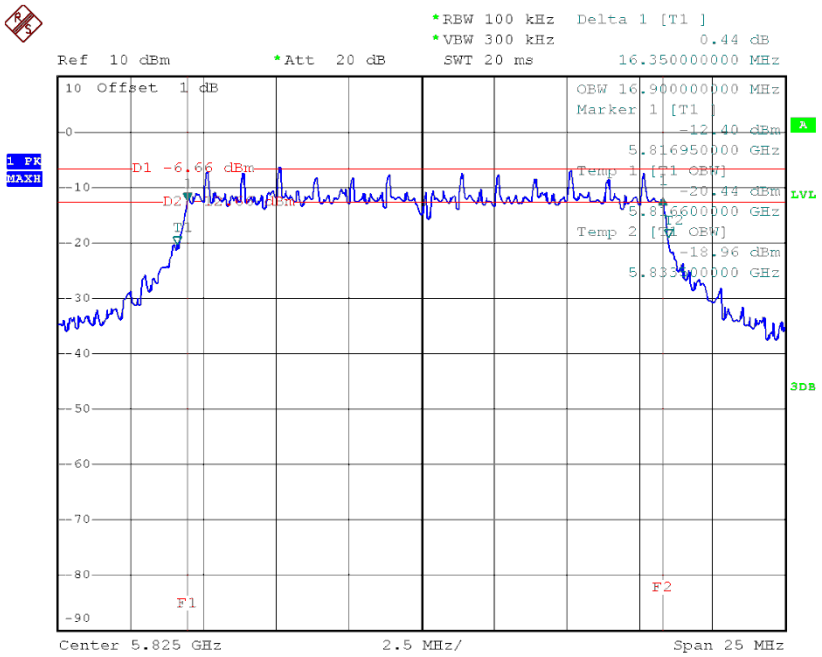
Date: 15.MAY.2014 22:48:12

TX CH 157



Date: 15.MAY.2014 22:43:35

TX CH 165



Date: 15.MAY.2014 22:39:51

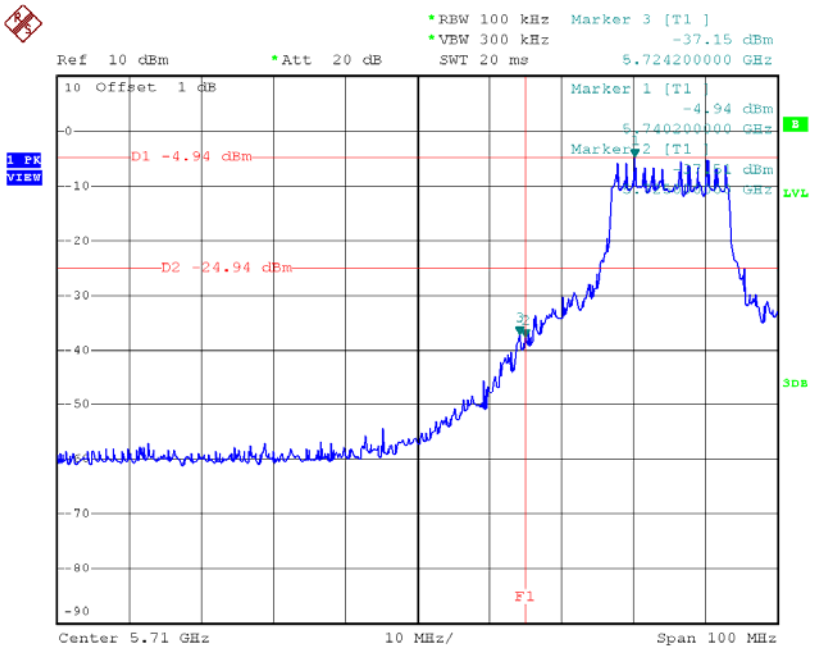
ATTACHMENT F - MAXIMUM OUTPUT POWER

Test Mode : TX A Mode				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH149	5745	11.63	30	1
CH157	5785	11.42	30	1
CH165	5825	10.98	30	1

ATTACHMENT G – ANTENNA CONDUCTED SPURIOUS EMISSION

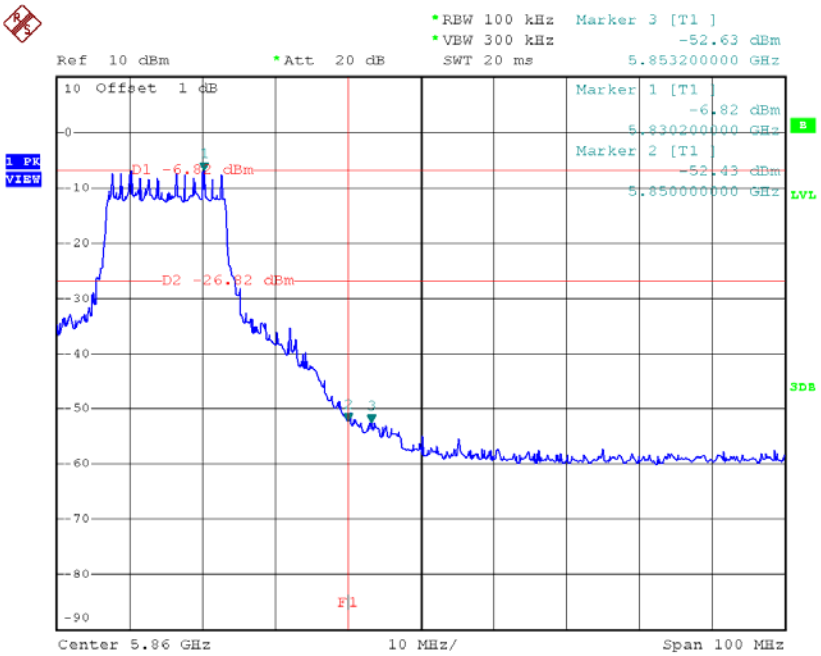
Test Mode :	TX A Mode

TX A Mode CH149



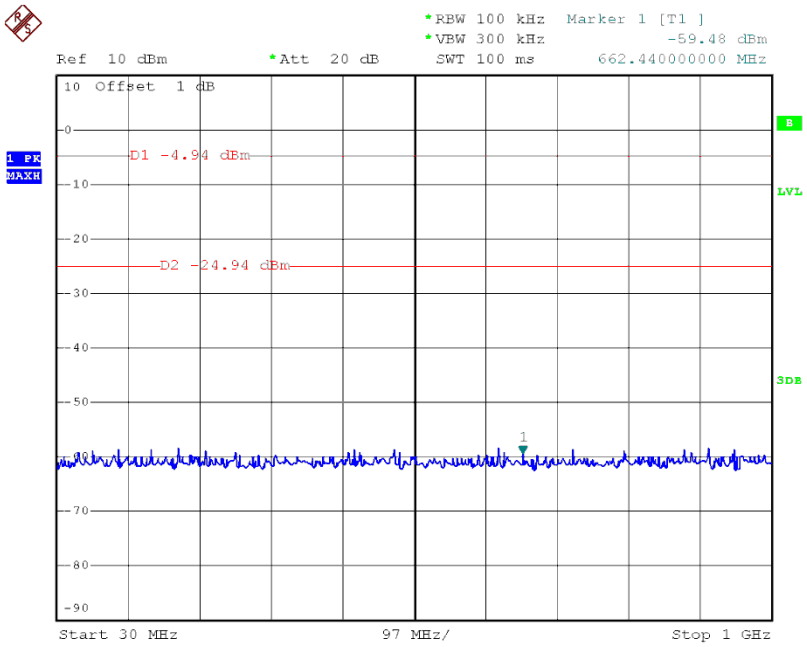
Date: 15.MAY.2014 22:46:15

TX A Mode CH165



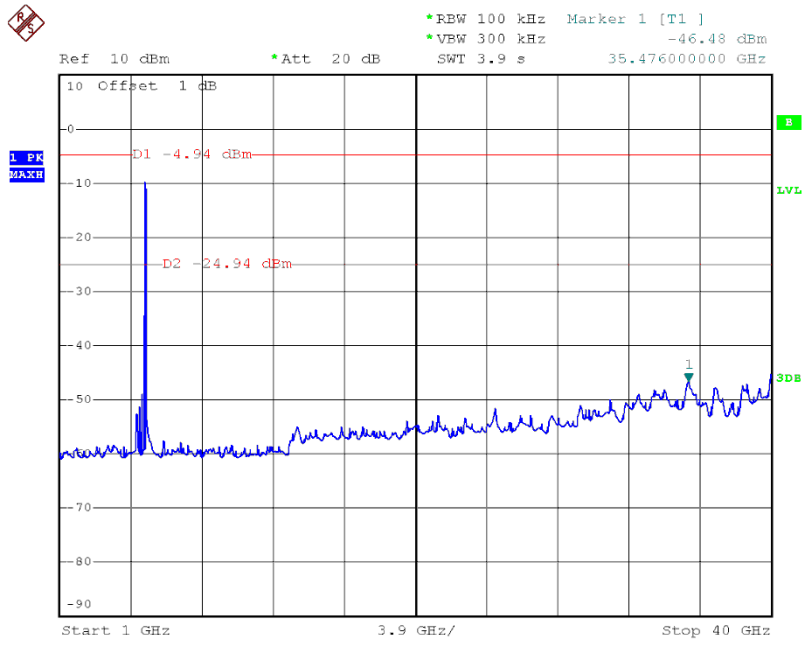
Date: 15.MAY.2014 22:37:57

TX A Mode CH149 (30MHz to 1000MHz)



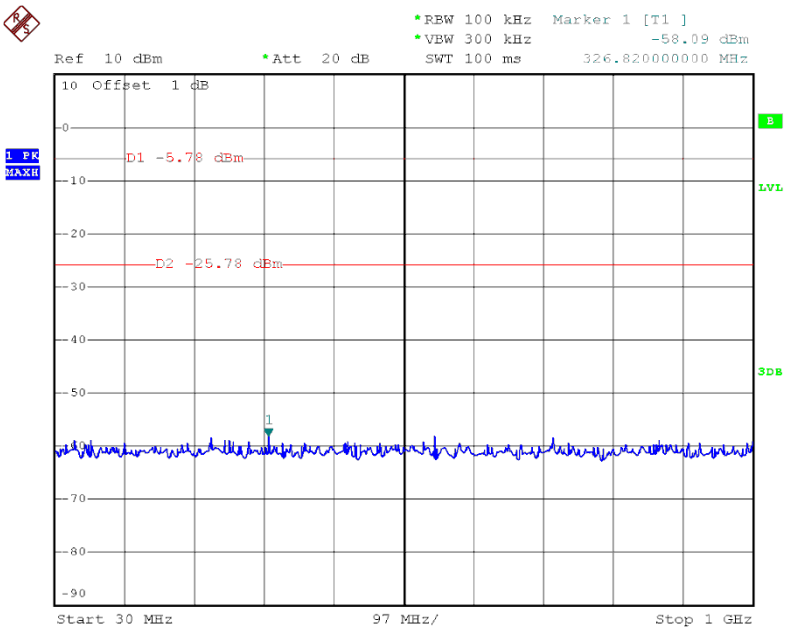
Date: 15.MAY.2014 22:47:01

TX A Mode CH149 (1000MHz to 10th Harmonic)



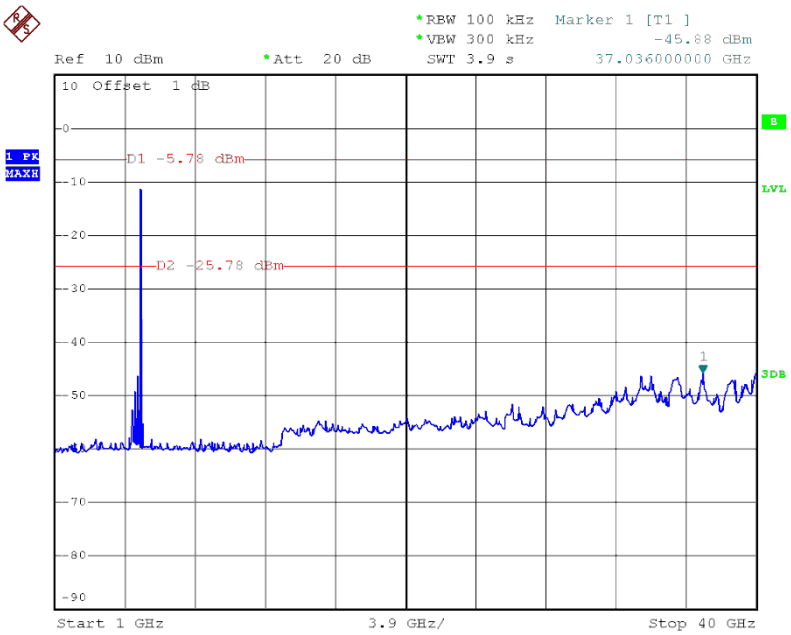
Date: 15.MAY.2014 22:47:18

TX A Mode CH157 (30MHz to 1000MHz)



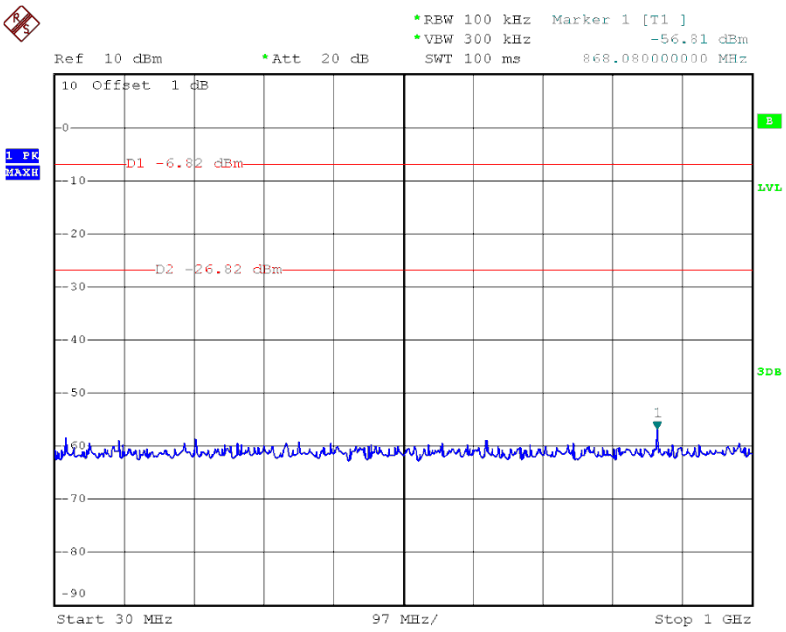
Date: 15.MAY.2014 22:44:13

TX A Mode CH157 (1000MHz to 10th Harmonic)



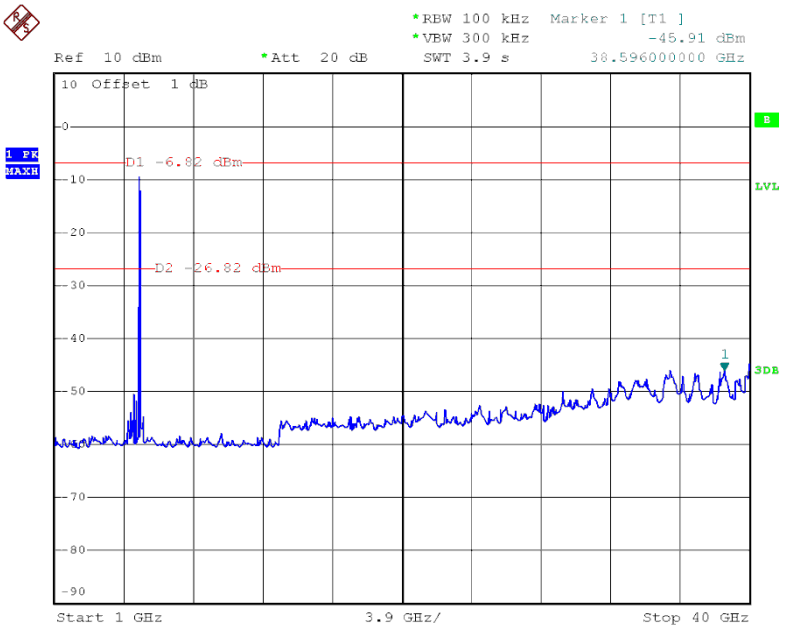
Date: 15.MAY.2014 22:44:39

TX A Mode CH165 (30MHz to 1000MHz)



Date: 15.MAY.2014 22:41:10

TX A Mode CH165 (1000MHz to 10th Harmonic)

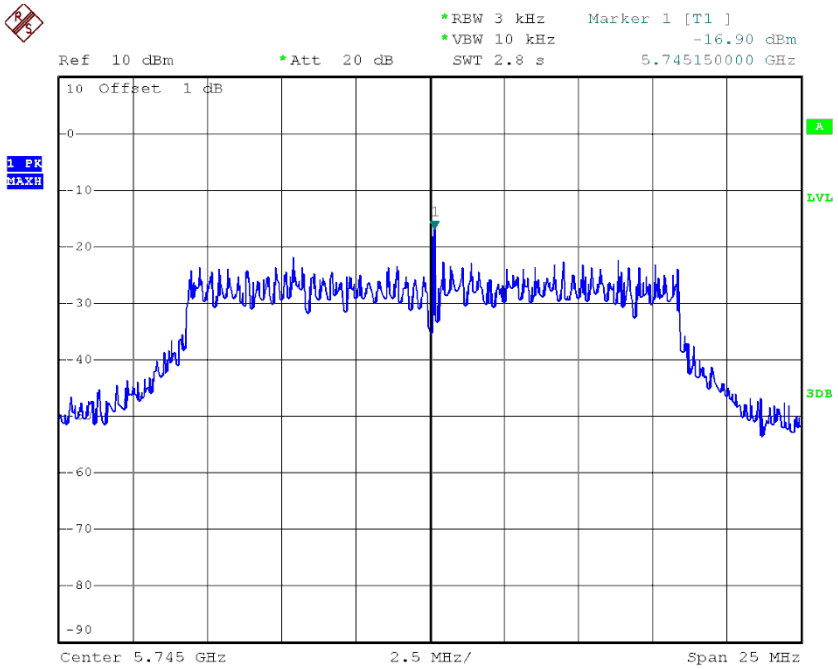


Date: 15.MAY.2014 22:41:35

ATTACHMENT H – POWER SPECTRAL DENSITY

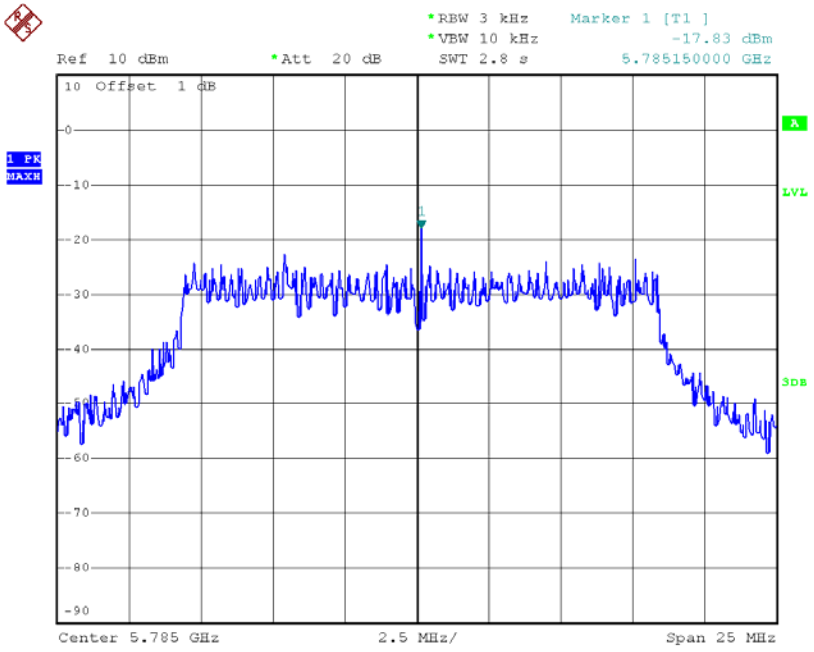
Test Mode :TX A Mode_CH149/157/165

TX CH149



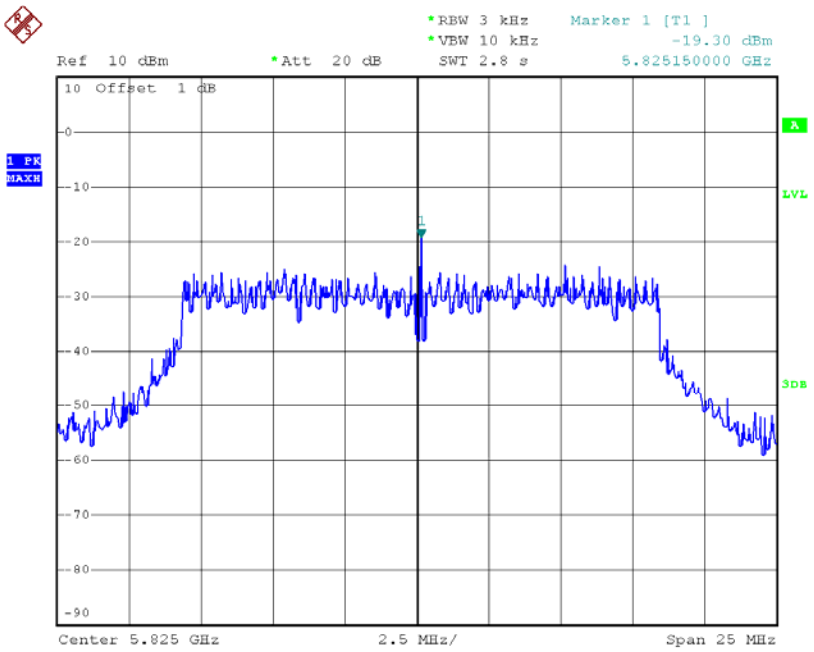
Date: 15.MAY.2014 22:48:54

TX CH157



Date: 15.MAY.2014 22:42:38

TX CH165



Date: 15.MAY.2014 22:40:32