



**Neutron Engineering Inc.**

# FCC Radio Test Report

## FCC ID: QISHG658

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

**Issued Date** : Nov. 15, 2012  
**Project No.** : 1211C017  
**Equipment** : Home Gateway  
**Model Name** : HG658  
**Applicant** : Huawei Technologies Co., Ltd.  
**Address** : Bantian, Longgang District, Shenzhen China  
**Manufacturer** : Huawei Technologies Co., Ltd.  
**Address** : Administration Building, Huawei Base, Bantian,  
Longgang District , Shenzhen 518129, P.R. China

**Tested by:**

Neutron Engineering Inc. EMC Laboratory

**Date of Receipt:** Nov. 01, 2012

**Date of Test:**

Nov. 01, 2012 ~ Nov. 14, 2012

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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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**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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## 1. CERTIFICATION

Equipment : Home Gateway  
Brand Name : HUAWEI  
Model Name : HG658  
Applicant : Huawei Technologies Co., Ltd.  
Date of Test : Nov. 01, 2012 ~ Nov. 14, 2012  
Test Item : ENGINEERING SAMPLE  
Standards : FCC Part15, Subpart C(15.247) / ANSI C63.4-2009

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-FCCP-1-1211C017) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C				
Standard	Section	Test Item	Judgment	Remark
15.207		Conducted Emission	PASS	
15.247(d)		Antenna conducted Spurious Emission	PASS	
15.247(a)(2)		6dB Bandwidth	PASS	
15.247(b)(3)		Peak Output Power	PASS	
15.209/15.205		Radiated Spurious Emission	PASS	
15.247(e)		Power Spectral Density	PASS	
15.203		Antenna Requirement	PASS	

**NOTE:**

- (1) "N/A" denotes test is not applicable in this test report
- (2) The test follows FCC KDB Publication No,558074(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 is 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  $y \pm U$  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 %.

**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	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	4.04	
		18GHz~40GHz	H	4.01	



**3. GENERAL INFORMATION**

**3.1 GENERAL DESCRIPTION OF EUT**

Equipment	Home Gateway	
Brand Name	HUAWEI	
Model Name	HG658	
Model Difference	N/A	
Product Description	The EUT is a Home Gateway.	
	Operation Frequency:	2412~2462 MHz
	Modulation Technology:	802.11b:DSSS 802.11g:OFDM 802.11n:OFDM
	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps Draft 802.11n:up to 300Mbps
	Number of Channel:	11 CH, Please see note 3. (Page 9)
	Antenna Designation:	Please see note 4.(Page 9)
	Antenna Gain(Peak):	
	Output Power:	802.11b: 11.18dBm 802.11g: 19.50dBm 802.11n(20MHz): 20.45 dBm 802.11n(40MHz): 17.97 dBm
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
	Power Source	DC voltage supplied from AC Adapter. #1 Brand / Model name: HUAWEI / HW-120200U6W (HK) #2 Brand / Model name: HUAWEI / HW-120200U6W (XQ)
Power Rating	I/P: 100-240V~50/60Hz, 0.8A O/P: 12.0V 2.0A	
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. The Common Mode Choke of DSL circuit part has MingPu and HaiGuang two manufacturers.



3. CH 01 – CH 11 for 802.11b, 802.11g, 802.11n(20MHz)  
 CH 03 – CH 09 for 802.11n(40MHz)

**Channel List**

Channel	Frequency (MHz)						
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

4. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	HUAWEI	N/A	PCB antenna	N/A	2.0	-
2	HUAWEI	N/A	PCB antenna	N/A	2.0	-

**Note:**

The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R).

- 4.

Operating Mode / TX Mode	1TX	2TX
802.11b	V (ANT1 or ANT2)	-
802.11g	V (ANT1 or ANT2)	-
802.11n(20MHz)	-	V (ANT1 & ANT2)
802.11n(40MHz)	-	V (ANT1 & ANT2)



**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 B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09
Mode 5	Normal Link

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 5	Normal Link

For Radiated Test	
Final Test Mode	Description
Mode 1	TX B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: DBPSK (1Mbps)  
 802.11g mode: OFDM (6Mbps)  
 802.11n HT20 mode : BPSK (6.5Mbps)  
 802.11n HT40 mode : BPSK (13.5Mbps)  
 For radiated emission tests, the highest output powers were set for final test.
- (3) The EUT system operated AC adapter between HUAWEI / HW-120200U6W (HK) and HUAWEI / HW-120200U6W (XQ), were found adapter HUAWEI / HW-120200U6W (XQ) was worst-case mode for 30-1000 MHz radiated



**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

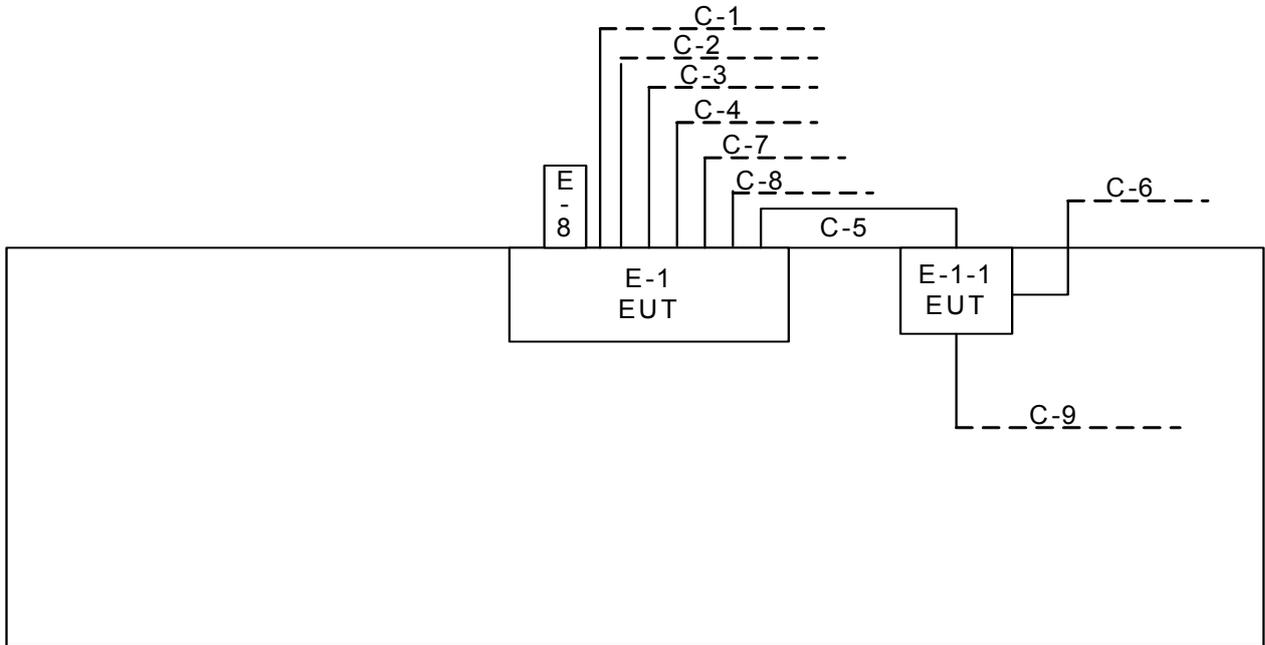
Test software Version	Cart		
<b>Frequency</b>	<b>2412 MHz</b>	<b>2437 MHz</b>	<b>2462 MHz</b>
IEEE 802.11b DSSS	38	36	36
IEEE 802.11g OFDM	52	58	54

Test software Version	Cart		
<b>Frequency (MHz)</b>	<b>2412 MHz</b>	<b>2437 MHz</b>	<b>2462 MHz</b>
IEEE 802.11n (20MHz)	46	50	48
<b>Frequency (MHz)</b>	<b>2422 MHz</b>	<b>2437 MHz</b>	<b>2452 MHz</b>
IEEE 802.11n (40MHz)	36	40	36

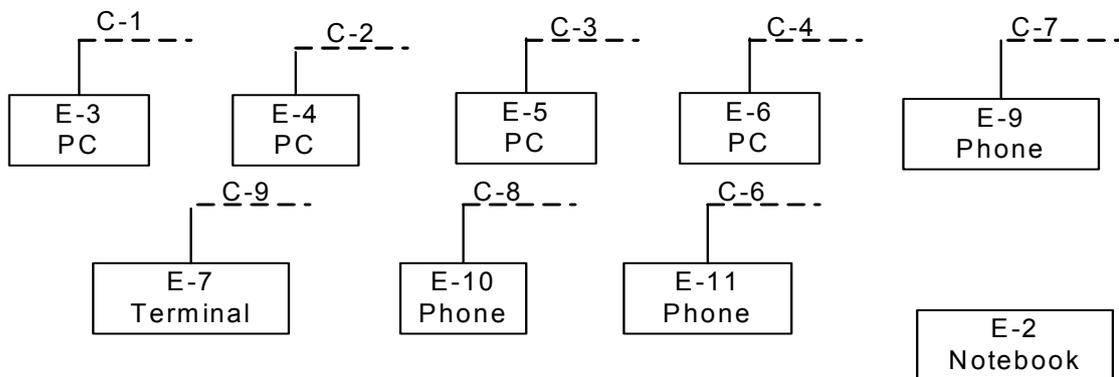


**3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**

**Conducted Mode:**



Control Room

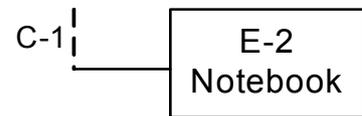
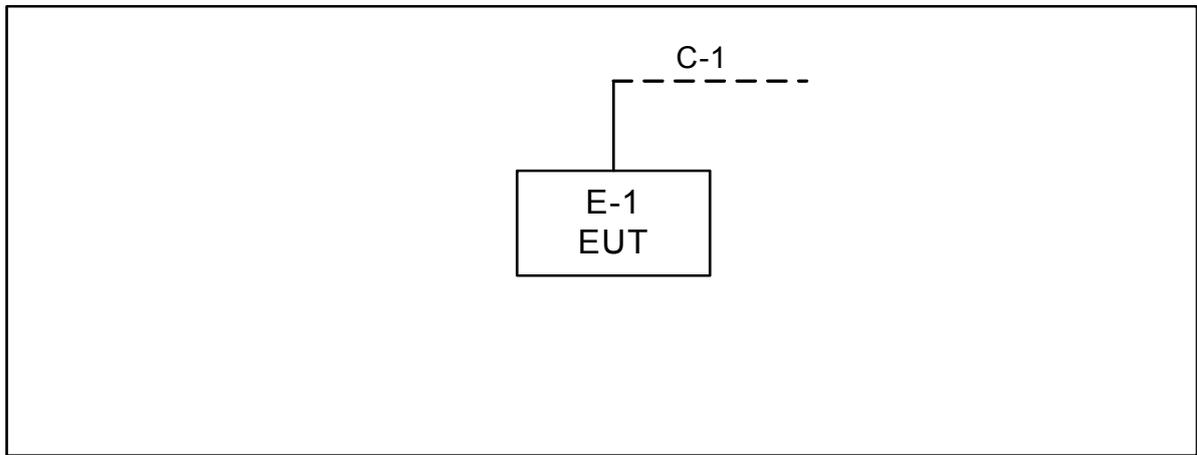


E-8: HSPA+ USB Modem

- C-1: RJ45 Cable
- C-2: RJ45 Cable
- C-3: RJ45 Cable
- C-4: RJ11 Cable
- C-5: RJ11 Cable
- C-6: RJ45 Cable
- C-7: RJ11 Cable
- C-8: RJ11 Cable
- C-9: RJ11 Cable



**Radiated TX Mode:**



C-1: RJ45 Cable



**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	Home Gateway	HUAWEI	HG658	QISHG658	N/A	EUT
E-2	NOTEBOOK	DELL	INSPIRON 1420	NA	NA	
E-3	PC	HP	HP Compaq dx7400	DOC	SGH7480DKZ	
E-4	PC	HP	HP Compaq dx7300 MT	DOC	SGH71505LH	
E-5	PC	IBM	8175-I5V	DOC	99MYG14	
E-6	PC	HP	xw8200	DOC	SGH50402C3	
E-7	Terminal	BROADCOM	BCM96358M-30-A1	NA	NA	
E-8	HSPA+USB Modem	HUAWEI	E352S-5	NA	NA	
E-9	PHONE	SIEMENS	Euroset 5010	NA	NA	
E-10	PHONE	SIEMENS	Euroset 5010	NA	NA	
E-11	PHONE	SIEMENS	Euroset 5010	NA	NA	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	10m	
C-2	NO	NO	10m	
C-3	NO	NO	10m	
C-4	NO	NO	10m	
C-5	NO	NO	1.2m	
C-6	NO	NO	10m	
C-7	NO	NO	10m	
C-8	NO	NO	10m	
C-9	NO	NO	10m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) 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.

**4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	LISN	EMCO	3816/2	00052765	May.26.2012	May.04.2013
2	LISN	R&S	ENV216	100087	May.26.2012	May.04.2013
3	Test Cable	N/A	C_17	N/A	Mar.18.2012	Mar.28.2013
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.26.2012	May.04.2013
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.26.2012	May.04.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

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

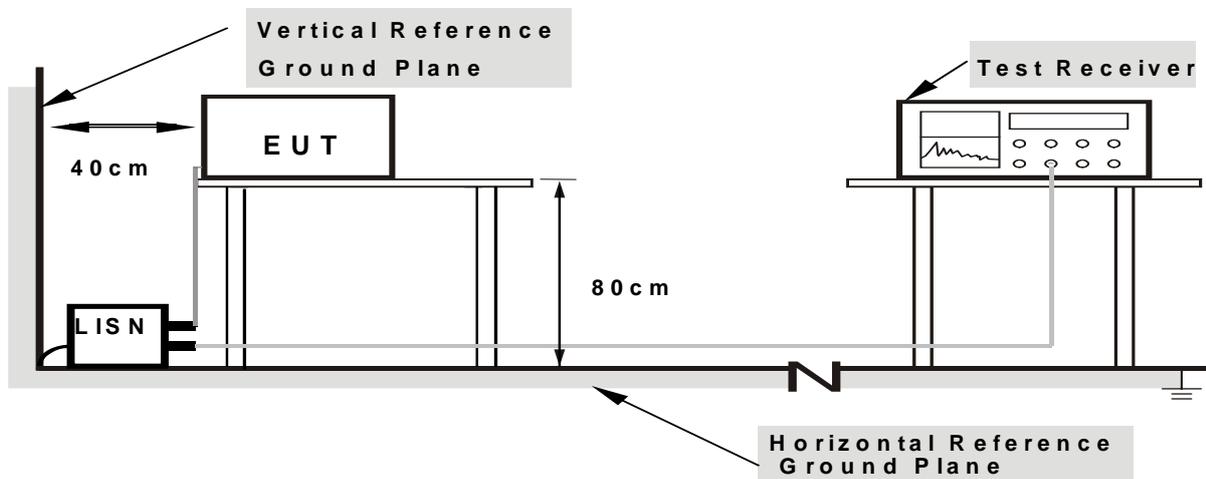
#### 4.1.3 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



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

#### 4.1.6 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 mode.



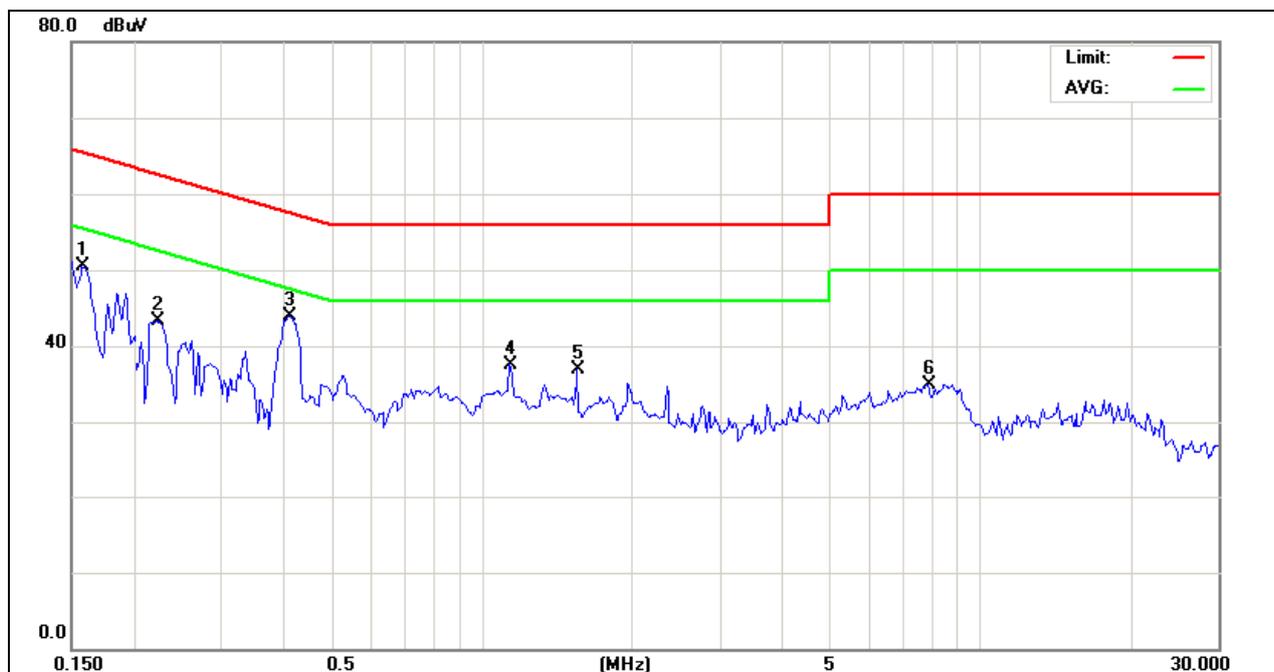
**4.1.7 TEST RESULTS**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : MingPu Adapter: HUAWEI / HW-120200U6W (HK)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	Line	50.45	*	65.58	55.58	-15.13	(QP)
0.22	Line	43.32	*	62.66	52.66	-19.34	(QP)
0.41	Line	43.90	*	57.61	47.61	-13.71	(QP)
1.14	Line	37.60	*	56.00	46.00	-18.40	(QP)
1.55	Line	37.00	*	56.00	46.00	-19.00	(QP)
7.86	Line	34.93	*	60.00	50.00	-25.07	(QP)

**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.



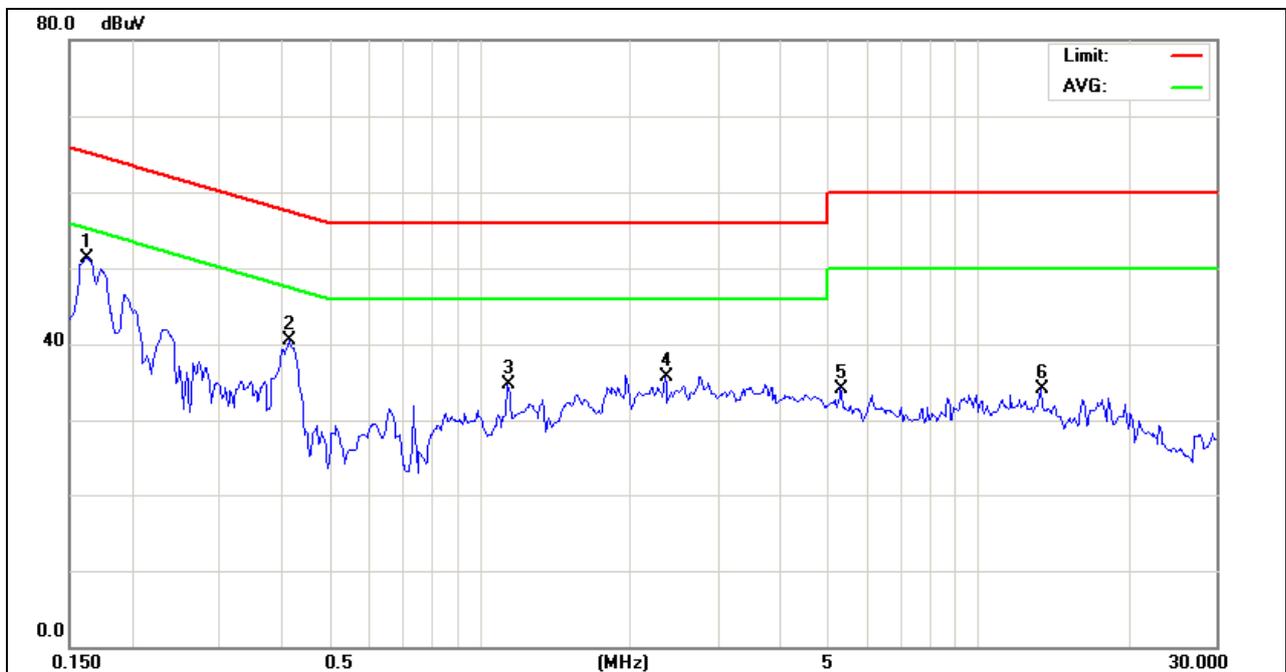


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : MingPu Adapter: HUAWEI / HW-120200U6W (HK)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	Neutral	51.34	*	65.38	55.38	-14.04	(QP)
0.42	Neutral	40.47	*	57.54	47.54	-17.07	(QP)
1.14	Neutral	34.79	*	56.00	46.00	-21.21	(QP)
2.35	Neutral	35.75	*	56.00	46.00	-20.25	(QP)
5.32	Neutral	34.20	*	60.00	50.00	-25.80	(QP)
13.36	Neutral	34.03	*	60.00	50.00	-25.97	(QP)

**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.



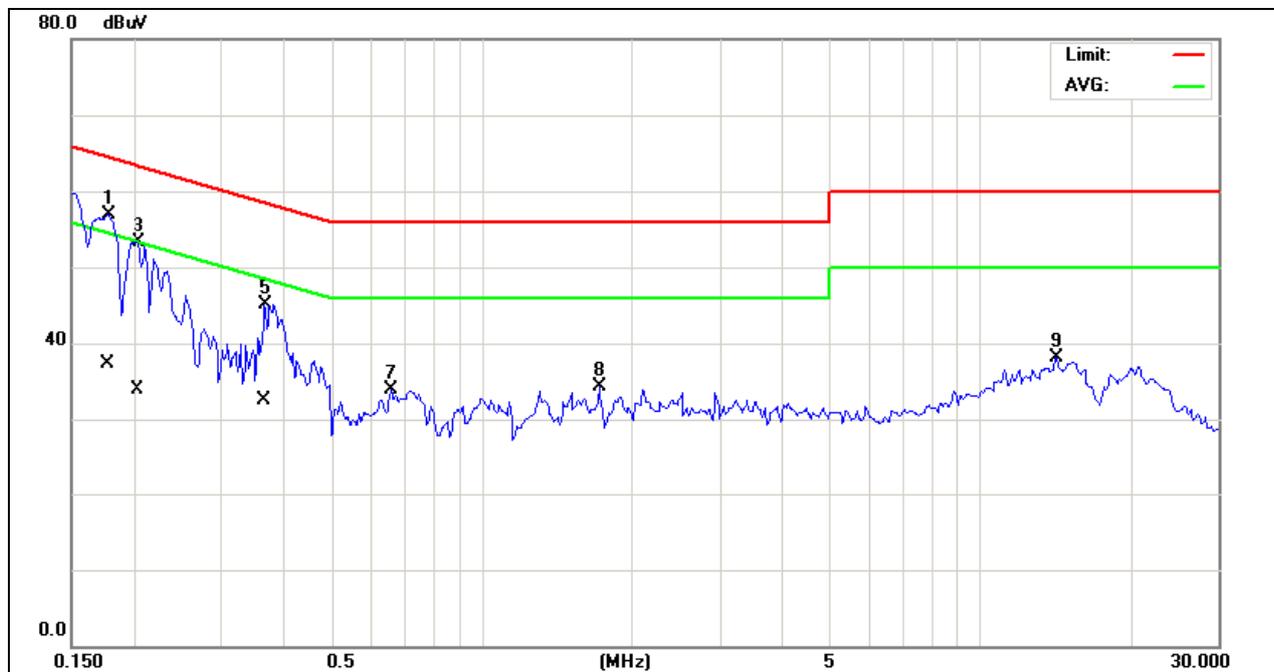


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : MingPu Adapter: HUAWEI / HW-120200U6W (XQ)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.18	Line	56.98	37.35	64.61	54.61	-7.63	(QP)
0.20	Line	53.35	33.85	63.42	53.42	-10.07	(QP)
0.37	Line	45.15	32.44	58.53	48.53	-13.38	(QP)
0.66	Line	33.81	*	56.00	46.00	-22.19	(QP)
1.72	Line	34.24	*	56.00	46.00	-21.76	(QP)
14.21	Line	38.03	*	60.00	50.00	-21.97	(QP)

**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.



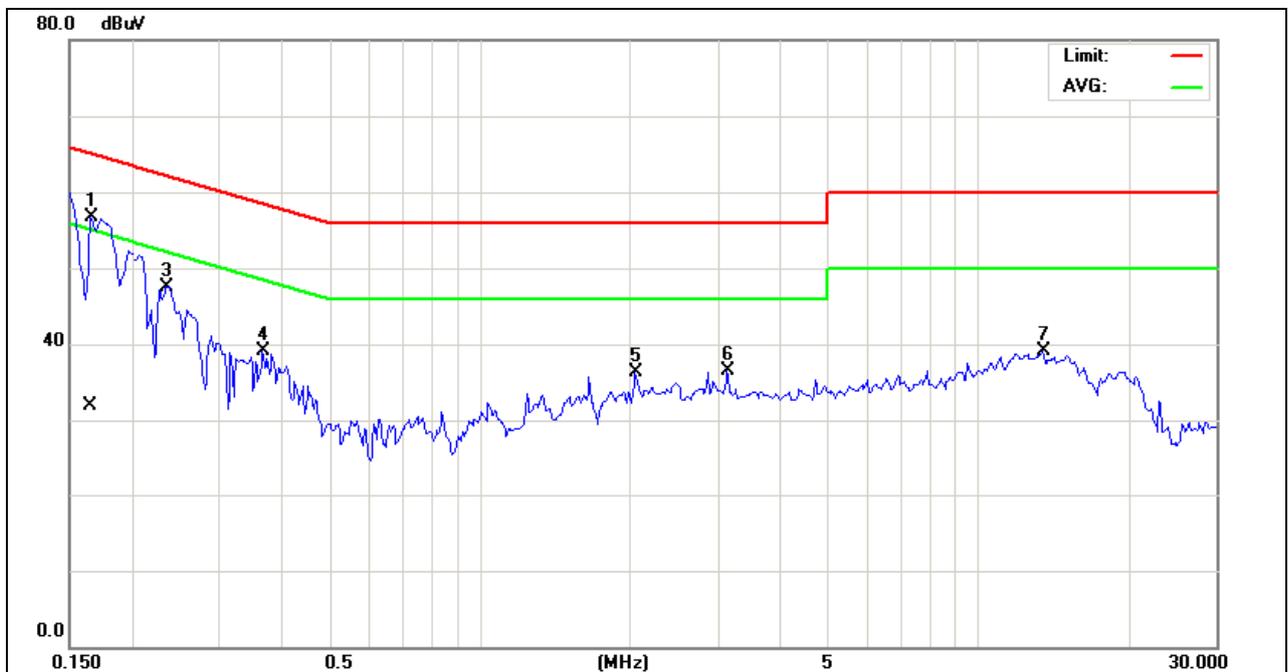


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : MingPu Adapter: HUAWEI / HW-120200U6W (XQ)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Neutral	56.68	31.85	65.18	55.18	-8.50	(QP)
0.24	Neutral	47.55	*	62.24	52.24	-14.69	(QP)
0.37	Neutral	39.03	*	58.53	48.53	-19.50	(QP)
2.04	Neutral	36.31	*	56.00	46.00	-19.69	(QP)
3.13	Neutral	36.50	*	56.00	46.00	-19.50	(QP)
13.50	Neutral	39.03	*	60.00	50.00	-20.97	(QP)

**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.



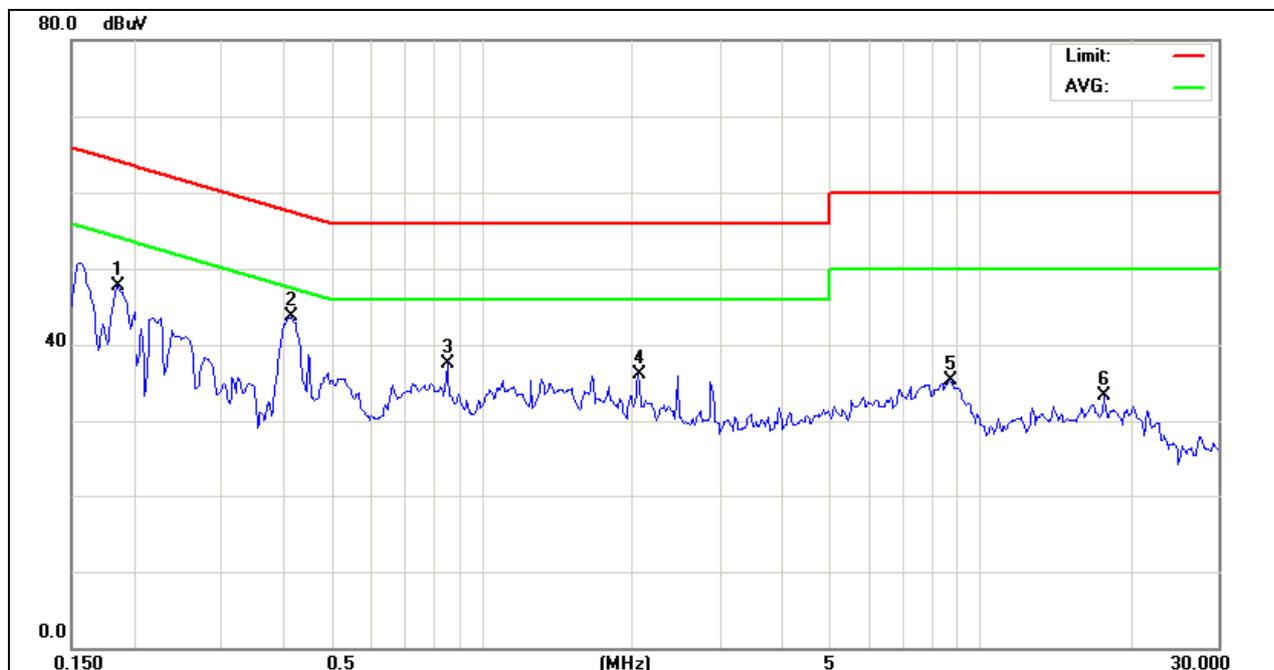


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : HaiGuang Adapter: HUAWEI / HW-120200U6W (HK)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.19	Line	47.69	*	64.25	54.25	-16.56	(QP)
0.42	Line	43.74	*	57.54	47.54	-13.80	(QP)
0.85	Line	37.55	*	56.00	46.00	-18.45	(QP)
2.06	Line	36.11	*	56.00	46.00	-19.89	(QP)
8.71	Line	35.26	*	60.00	50.00	-24.74	(QP)
17.69	Line	33.26	*	60.00	50.00	-26.74	(QP)

**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.



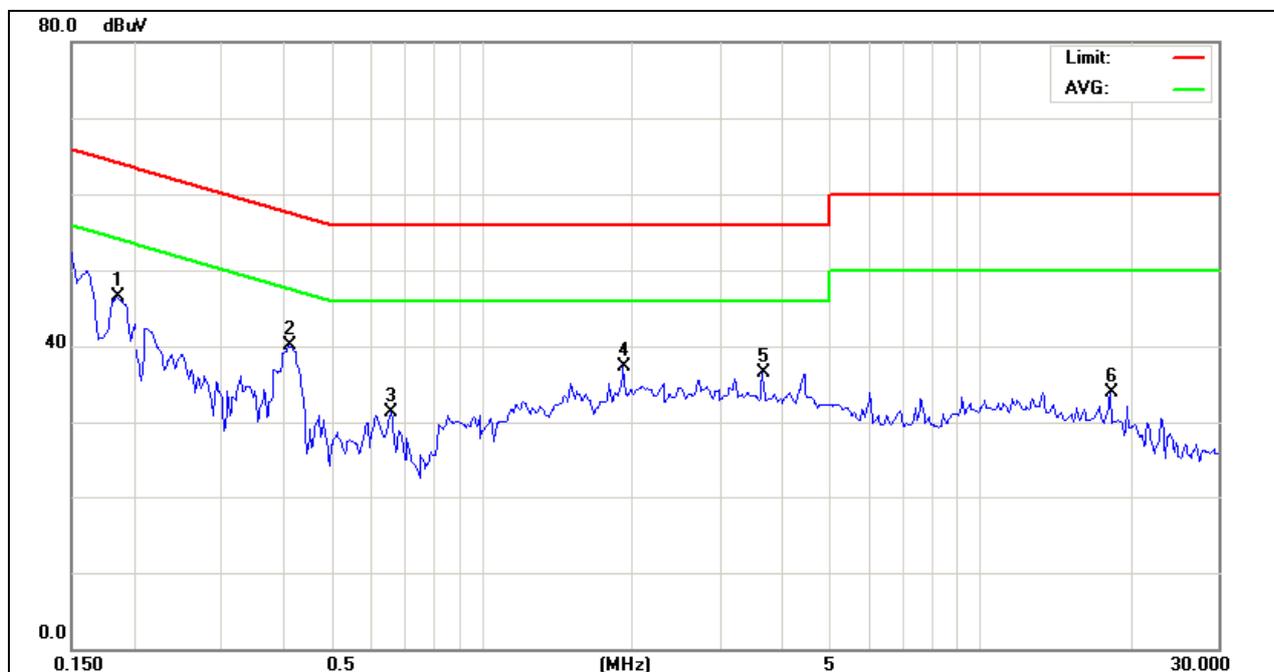


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : HaiGuang Adapter: HUAWEI / HW-120200U6W (HK)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.19	Neutral	46.42	*	64.25	54.25	-17.83	(QP)
0.41	Neutral	40.01	*	57.61	47.61	-17.60	(QP)
0.66	Neutral	31.34	*	56.00	46.00	-24.66	(QP)
1.92	Neutral	37.36	*	56.00	46.00	-18.64	(QP)
3.64	Neutral	36.59	*	56.00	46.00	-19.41	(QP)
18.24	Neutral	34.00	*	60.00	50.00	-26.00	(QP)

**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.



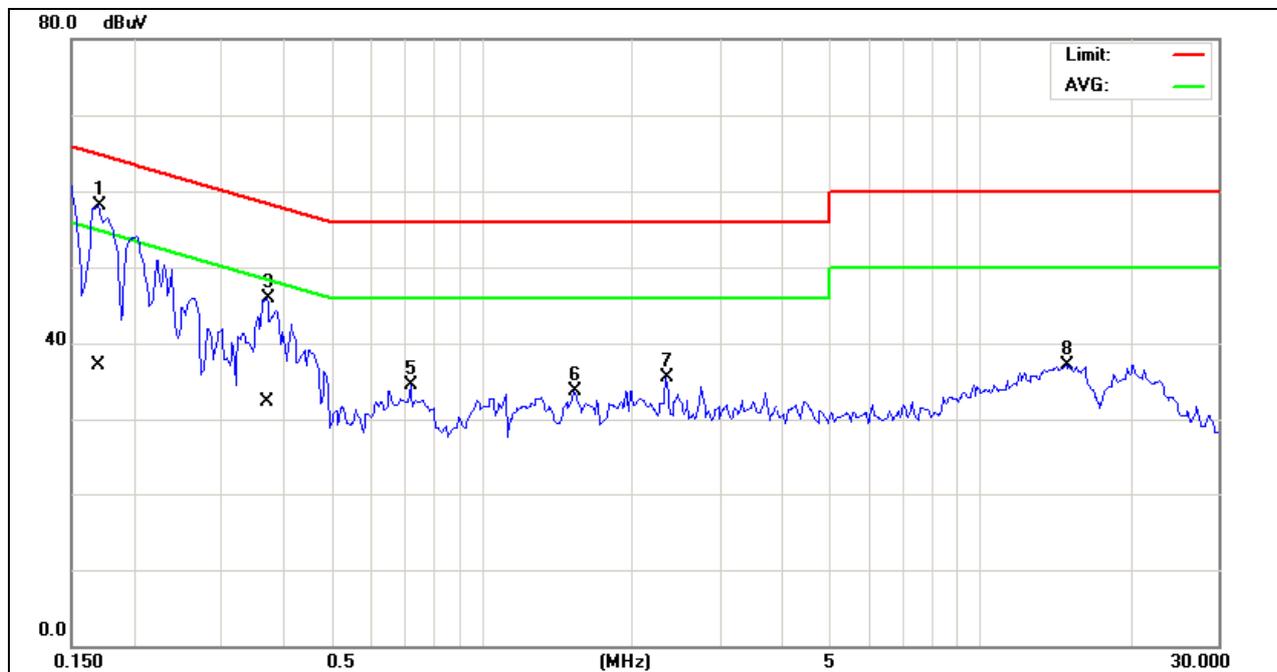


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : HaiGuang Adapter: HUAWEI / HW-120200U6W (XQ)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Line	58.06	37.05	64.99	54.99	-6.93	(QP)
0.37	Line	45.94	32.24	58.44	48.44	-12.50	(QP)
0.72	Line	34.57	*	56.00	46.00	-21.43	(QP)
1.53	Line	33.69	*	56.00	46.00	-22.31	(QP)
2.34	Line	35.47	*	56.00	46.00	-20.53	(QP)
14.87	Line	37.17	*	60.00	50.00	-22.83	(QP)

**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.



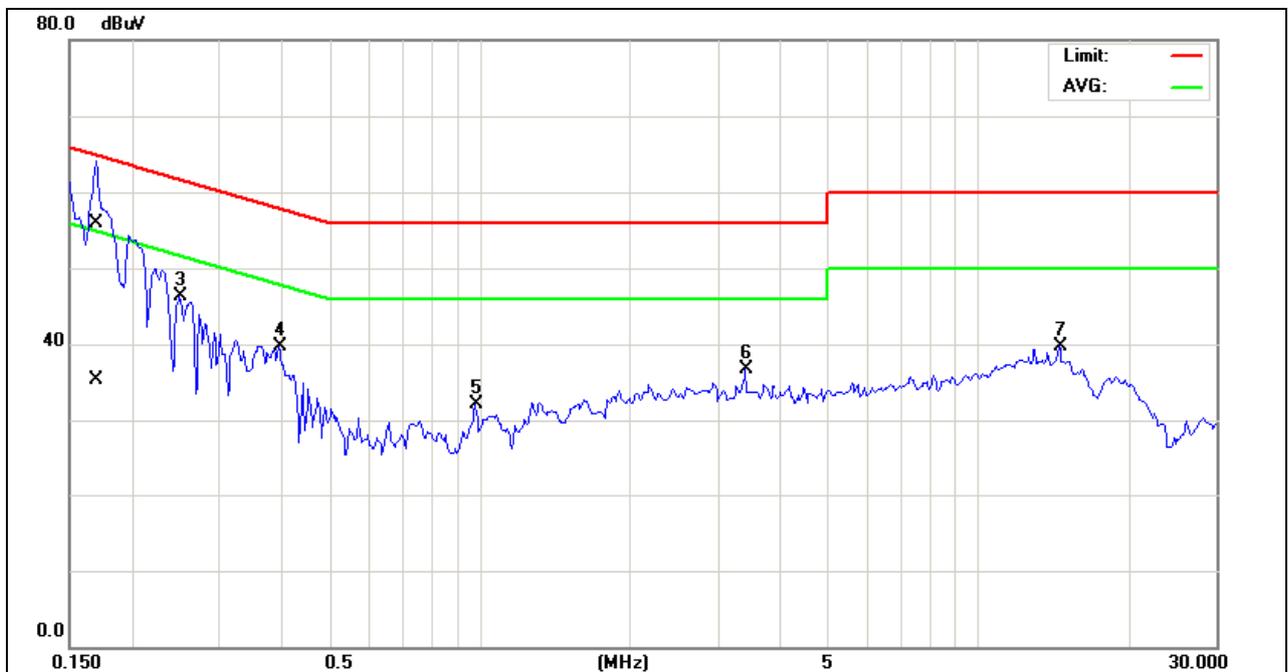


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	53 %
Pressure :	1010hPa	Test Power :	AC 120V/60Hz
Test Mode :	Normal Link –Common-mode Inductor : HaiGuang Adapter: HUAWEI / HW-120200U6W (XQ)		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Neutral	55.85	35.25	64.99	54.99	-9.14	(QP)
0.25	Neutral	46.23	*	61.70	51.70	-15.47	(QP)
0.40	Neutral	39.69	*	57.94	47.94	-18.25	(QP)
0.98	Neutral	32.14	*	56.00	46.00	-23.86	(QP)
3.41	Neutral	36.78	*	56.00	46.00	-19.22	(QP)
14.58	Neutral	39.62	*	60.00	50.00	-20.38	(QP)

**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)**

20dBc 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.

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
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	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).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



**4.2.2 MEASUREMENT INSTRUMENTS LIST AND SETTING**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Jun .04.2012	May.25.2013
2	Amplifier	HP	8447D	2944A09673	May.26.2012	May.04.2013
3	Test Receiver	R&S	ESCI	100382	May.26.2012	May.04.2013
4	Test Cable	N/A	C-01_CB03	N/A	Jul.01.2011	Jul.01.2013
5	Antenna	ETS	3115	00075789	May.26.2012	May.25.2013
6	Amplifier	Agilent	8449B	3008A02274	May.26.2012	May.04.2013
7	Spectrum	Agilent	E4408B	US39240143	Nov.25.2012	Nov.25.2012
8	Test Cable	HUBER+SUHNER	C-45	N/A	May.04.2012	May.02.2013
9	Controller	CT	SC100	N/A	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	May.26.2012	May.25.2013
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Oct.13.2012	May.04.2013
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct.13.2011	Oct.12.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (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



**4.2.3 TEST PROCEDURE**

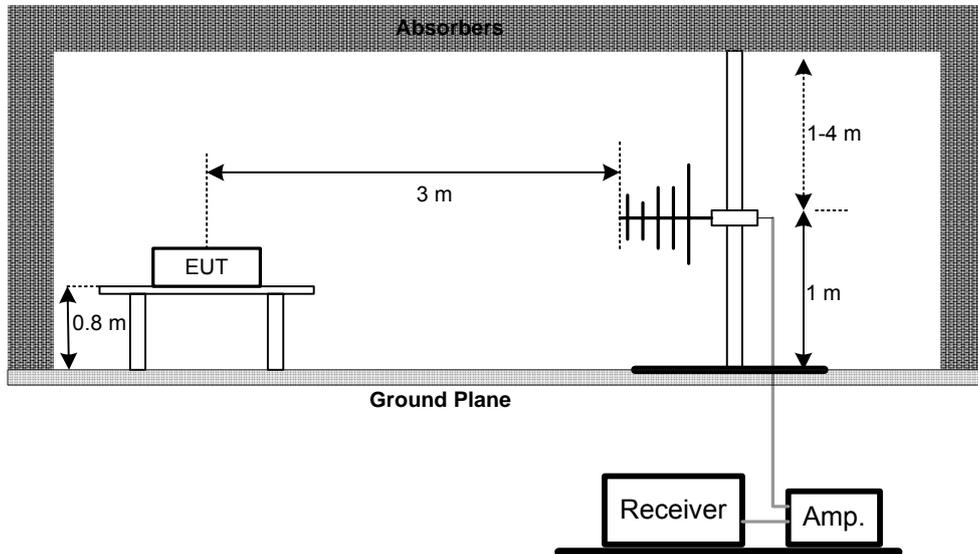
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at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

**4.2.4 DEVIATION FROM TEST STANDARD**

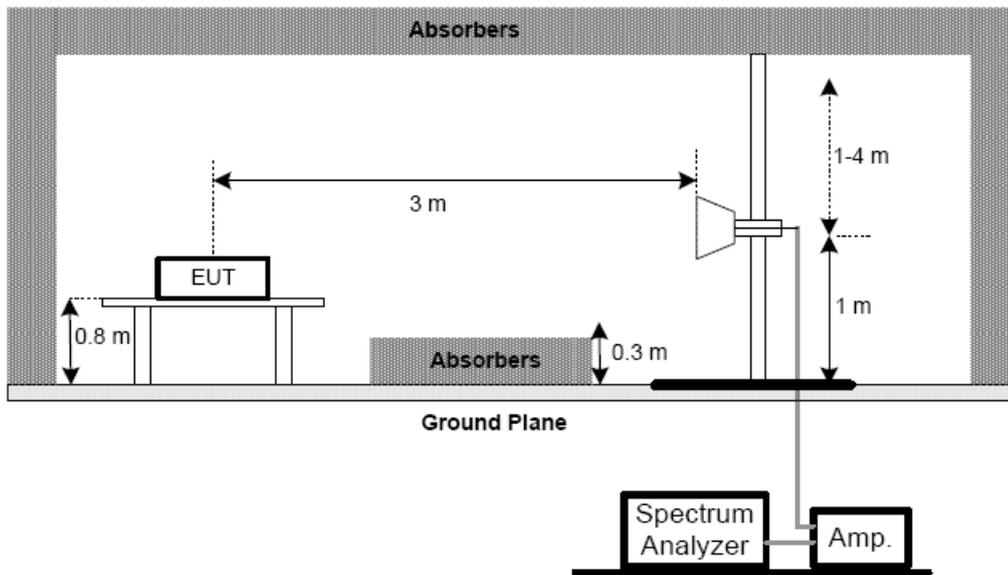
No deviation

**4.2.5 TEST SETUP**

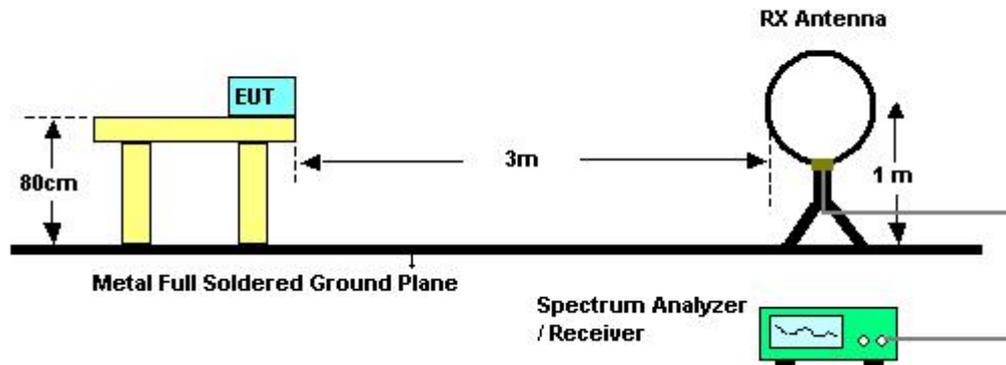
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For radiated emissions below 30MHz



#### 4.2.6 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.



**4.2.7 TEST RESULTS (9K~ 30MHZ)**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode- Common-mode Inductor : MingPu Adapter: HUAWEI / HW-120200U6W (HK)		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0095	0°	17.45	24.30	41.75	128.10	-86.35	AVG
0.0095	0°	20.12	24.30	44.42	148.10	-103.68	PK
0.0138	0°	18.36	24.30	42.66	124.81	-82.15	AVG
0.0138	0°	21.14	24.30	45.44	144.81	-99.37	PK
0.0246	0°	18.21	24.01	42.22	119.79	-77.57	AVG
0.0246	0°	20.84	24.01	44.85	139.79	-94.94	PK
0.0369	0°	17.69	23.23	40.92	116.26	-75.34	AVG
0.0369	0°	19.97	23.23	43.20	136.26	-93.06	PK
0.3572	0°	17.58	20.14	37.72	96.55	-58.82	AVG
0.3572	0°	20.17	20.14	40.31	116.55	-76.23	PK
1.2750	0°	19.65	19.57	39.22	65.49	-26.27	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0096	90°	17.58	24.30	41.88	127.96	-86.08	AVG
0.0096	90°	20.14	24.30	44.44	147.96	-103.52	PK
0.0257	90°	17.42	23.94	41.36	119.41	-78.05	AVG
0.0257	90°	19.68	23.94	43.62	139.41	-95.79	PK
0.0325	90°	16.75	23.51	40.26	117.37	-77.11	AVG
0.0325	90°	19.95	23.51	43.46	137.37	-93.91	PK
0.0496	90°	17.88	22.43	40.31	113.69	-73.39	AVG
0.0496	90°	20.35	22.43	42.78	133.69	-90.92	PK
0.2845	90°	17.66	20.32	37.98	98.53	-60.55	AVG
0.2845	90°	19.87	20.32	40.19	118.52	-78.34	PK
1.5350	90°	18.74	19.55	38.29	63.88	-25.60	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..



## Neutron Engineering Inc.

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode- Common-mode Inductor : MingPu Adapter: HUAWEI / HW-120200U6W (XQ)		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0094	0°	16.78	24.30	41.08	128.19	-87.11	AVG
0.0094	0°	19.56	24.30	43.86	148.19	-104.33	PK
0.0245	0°	18.05	24.02	42.07	119.82	-77.76	AVG
0.0245	0°	20.15	24.02	44.17	139.82	-95.66	PK
0.0327	0°	17.84	23.49	41.33	117.30	-75.97	AVG
0.0327	0°	20.63	23.49	44.12	137.30	-93.18	PK
0.0633	0°	17.52	22.14	39.66	111.58	-71.93	AVG
0.0633	0°	20.49	22.14	42.63	131.58	-88.96	PK
0.2436	0°	18.09	20.41	38.50	99.87	-61.37	AVG
0.2436	0°	20.55	20.41	40.96	119.87	-78.91	PK
1.2450	0°	19.48	19.58	39.06	65.70	-26.65	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0095	90°	17.42	24.30	41.72	128.09	-86.37	AVG
0.0095	90°	20.19	24.30	44.49	148.09	-103.60	PK
0.0263	90°	17.26	23.90	41.16	119.22	-78.06	AVG
0.0263	90°	19.68	23.90	43.58	139.22	-95.64	PK
0.0348	90°	17.12	23.37	40.49	116.79	-76.30	AVG
0.0348	90°	19.68	23.37	43.05	136.79	-93.74	PK
0.0639	90°	18.05	2.12	20.17	111.49	-91.32	AVG
0.0639	90°	20.35	22.12	42.47	131.49	-89.02	PK
0.2574	90°	18.12	20.38	38.50	99.39	-60.89	AVG
0.0257	90°	20.39	20.38	40.77	119.39	-78.62	PK
1.4850	90°	19.96	19.55	39.51	64.17	-24.66	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..



EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode- Common-mode Inductor : HaiGuang Adapter: HUAWEI / HW-120200U6W (HK)		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0095	0°	16.40	24.30	40.70	128.10	-87.40	AVG
0.0095	0°	19.62	24.30	43.92	148.10	-104.18	PK
0.0138	0°	18.32	24.30	42.62	124.81	-82.19	AVG
0.0138	0°	19.78	24.30	44.08	144.81	-100.73	PK
0.0246	0°	16.89	24.01	40.90	119.79	-78.89	AVG
0.0246	0°	19.87	24.01	43.88	139.79	-95.91	PK
0.0369	0°	17.25	23.23	40.48	116.26	-75.78	AVG
0.0369	0°	20.14	23.23	43.37	136.26	-92.89	PK
0.3572	0°	17.74	20.14	37.88	96.55	-58.66	AVG
0.3572	0°	20.16	20.14	40.30	116.55	-76.24	PK
1.2750	0°	18.44	19.57	38.01	65.49	-27.48	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0096	90°	17.12	24.30	41.42	127.96	-86.54	AVG
0.0096	90°	19.86	24.30	44.16	147.96	-103.80	PK
0.0257	90°	17.11	23.94	41.05	119.41	-78.36	AVG
0.0257	90°	19.79	23.94	43.73	139.41	-95.68	PK
0.0325	90°	17.15	23.51	40.66	117.37	-76.71	AVG
0.0325	90°	20.04	23.51	43.55	137.37	-93.82	PK
0.0496	90°	17.36	22.43	39.79	113.69	-73.91	AVG
0.0496	90°	22.46	22.43	44.89	133.69	-88.81	PK
0.2845	90°	18.04	20.32	38.36	98.53	-60.17	AVG
0.2845	90°	20.39	20.32	40.71	118.52	-77.82	PK
1.5350	90°	19.64	19.55	39.19	63.88	-24.70	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..



## Neutron Engineering Inc.

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Mode- Common-mode Inductor : HaiGuang Adapter: HUAWEI / HW-120200U6W (XQ)		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0094	0°	18.75	24.30	43.05	128.19	-85.14	AVG
0.0094	0°	21.15	24.30	45.45	148.19	-102.74	PK
0.0245	0°	18.42	24.02	42.44	119.82	-77.39	AVG
0.0245	0°	20.72	24.02	44.74	139.82	-95.09	PK
0.0327	0°	17.58	23.49	41.07	117.30	-76.23	AVG
0.0327	0°	20.69	23.49	44.18	137.30	-93.12	PK
0.0633	0°	19.57	22.14	41.71	111.58	-69.88	AVG
0.0633	0°	21.84	22.14	43.98	131.58	-87.61	PK
0.2436	0°	19.83	20.41	40.24	99.87	-59.63	AVG
0.2436	0°	21.65	20.41	42.06	119.87	-77.81	PK
1.2450	0°	21.42	19.58	41.00	65.70	-24.71	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0095	90°	18.12	24.30	42.42	128.09	-85.67	AVG
0.0095	90°	20.43	24.30	44.73	148.09	-103.36	PK
0.0263	90°	17.43	23.90	41.33	119.22	-77.89	AVG
0.0263	90°	19.78	23.90	43.68	139.22	-95.54	PK
0.0348	90°	17.24	23.37	40.61	116.79	-76.18	AVG
0.0348	90°	21.52	23.37	44.89	136.79	-91.90	PK
0.0639	90°	18.63	2.12	20.75	111.49	-90.74	AVG
0.0639	90°	20.74	22.12	42.86	131.49	-88.63	PK
0.2574	90°	19.35	20.38	39.73	99.39	-59.66	AVG
0.0257	90°	21.78	20.38	42.16	119.39	-77.23	PK
1.4850	90°	21.04	19.55	40.59	64.17	-23.58	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..



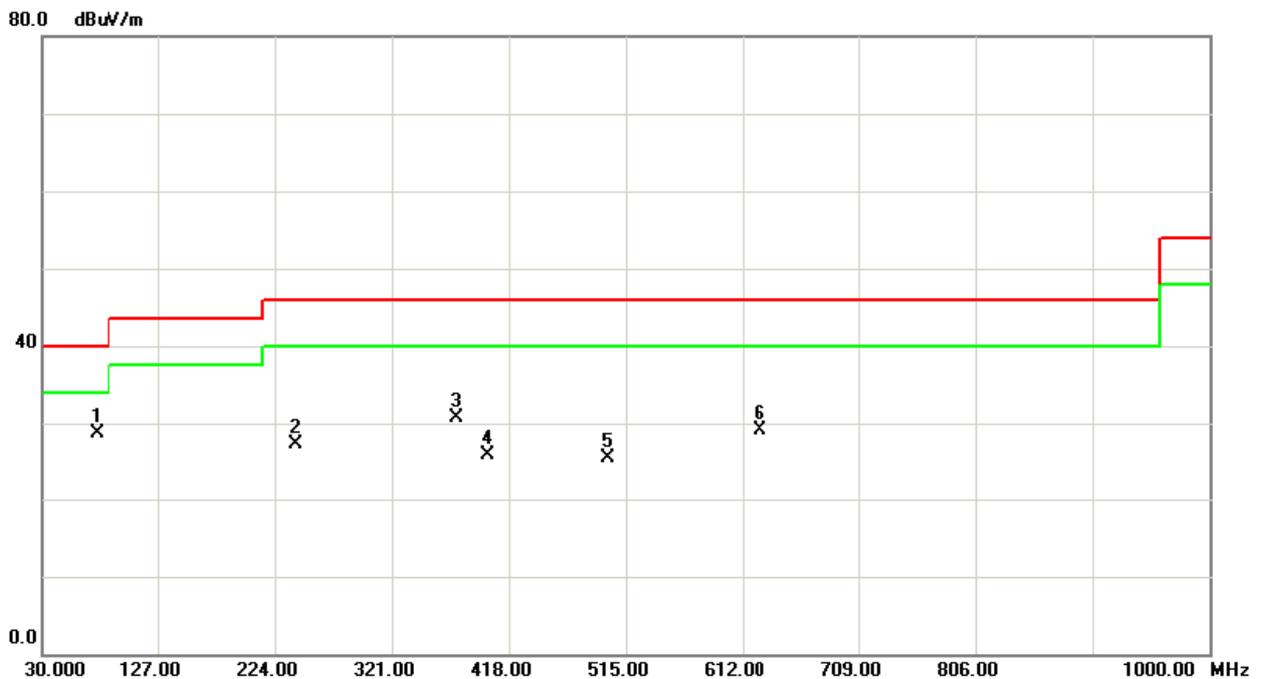
**4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHZ)**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 01- Common-mode Inductor : MingPu		

Freq. (MHz)	Ant H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.08	V	47.70	-19.01	28.69	40.00	- 11.31	
240.98	V	42.89	-15.63	27.26	46.00	- 18.74	
374.35	V	41.44	-10.69	30.75	46.00	- 15.25	
401.03	V	35.75	-9.80	25.95	46.00	- 20.05	
500.45	V	33.83	-8.37	25.46	46.00	- 20.54	
626.55	V	34.13	-5.05	29.08	46.00	- 16.92	

**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 ◦



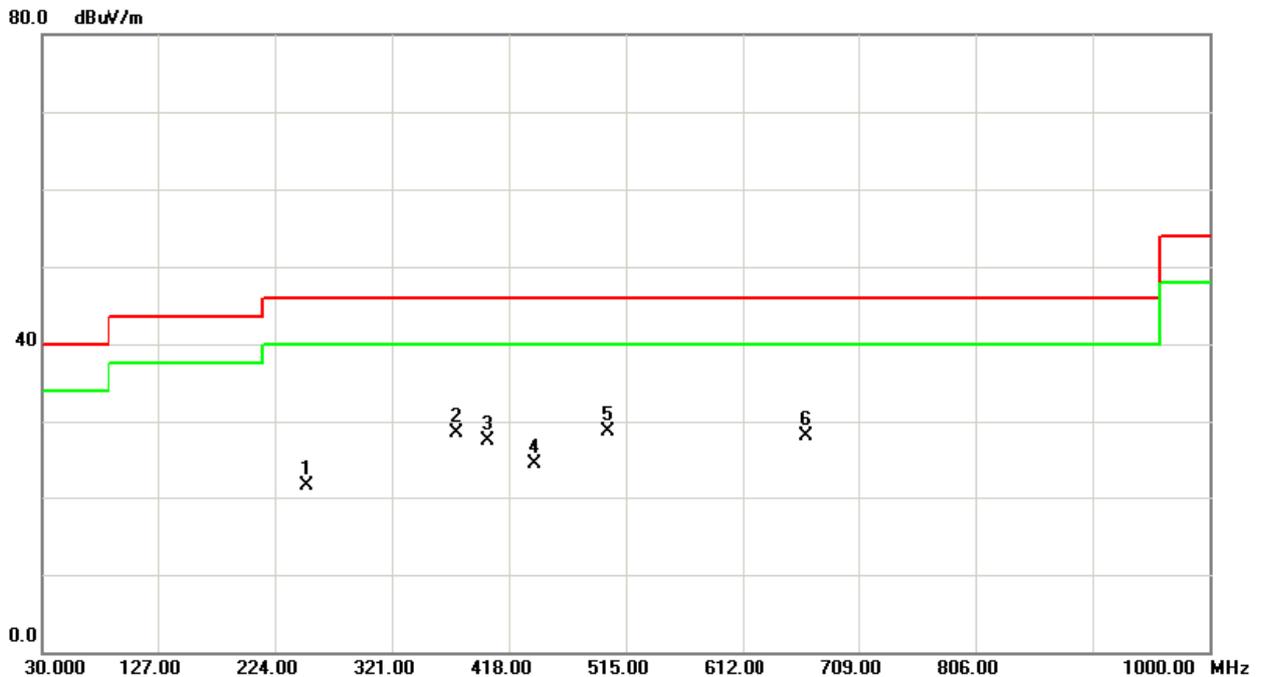


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 01-Common-mode Inductor : MingPu		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
250.68	H	36.74	-14.99	21.75	46.00	- 24.25	
374.35	H	39.20	-10.69	28.51	46.00	- 17.49	
401.03	H	37.38	-9.80	27.58	46.00	- 18.42	
439.83	H	33.61	-9.17	24.44	46.00	- 21.56	
500.45	H	37.15	-8.37	28.78	46.00	- 17.22	
665.35	H	32.68	-4.67	28.01	46.00	- 17.99	

**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 ◦



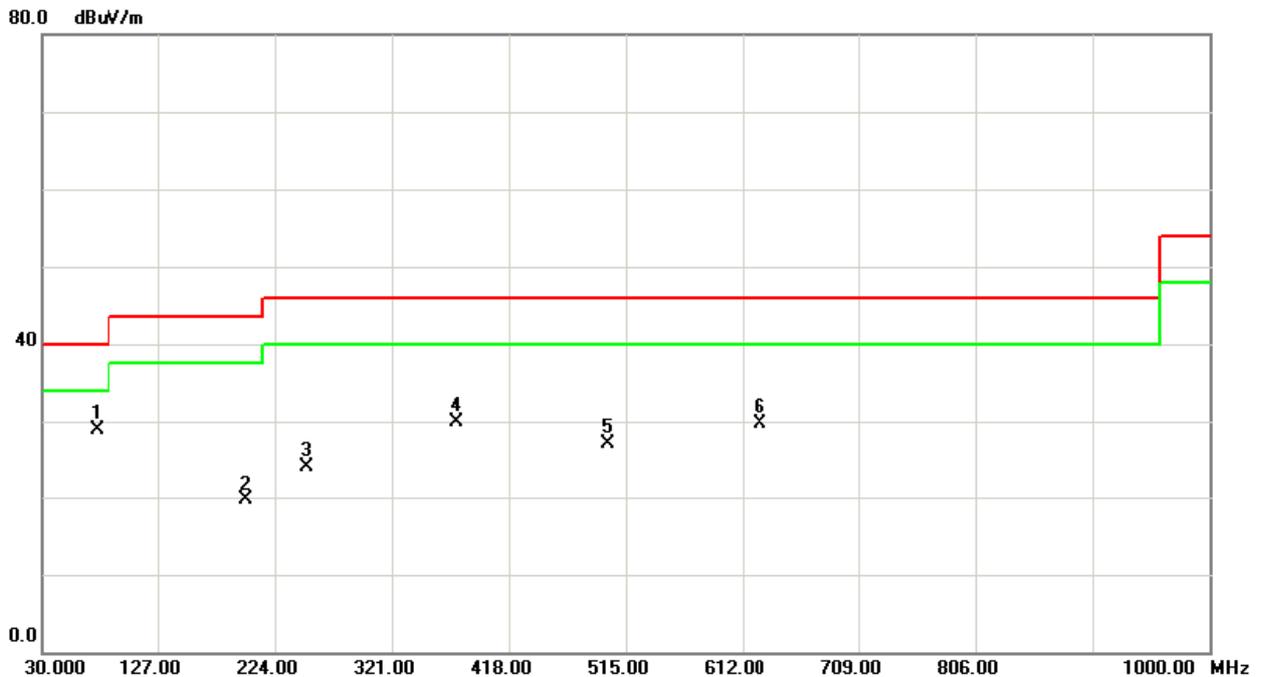


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 06-Common-mode Inductor : MingPu		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.08	V	47.94	-19.01	28.93	40.00	- 11.07	
199.75	V	36.73	-16.93	19.80	43.50	- 23.70	
250.68	V	39.09	-14.99	24.10	46.00	- 21.90	
374.35	V	40.68	-10.69	29.99	46.00	- 16.01	
500.45	V	35.51	-8.37	27.14	46.00	- 18.86	
626.55	V	34.82	-5.05	29.77	46.00	- 16.23	

**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 ◦



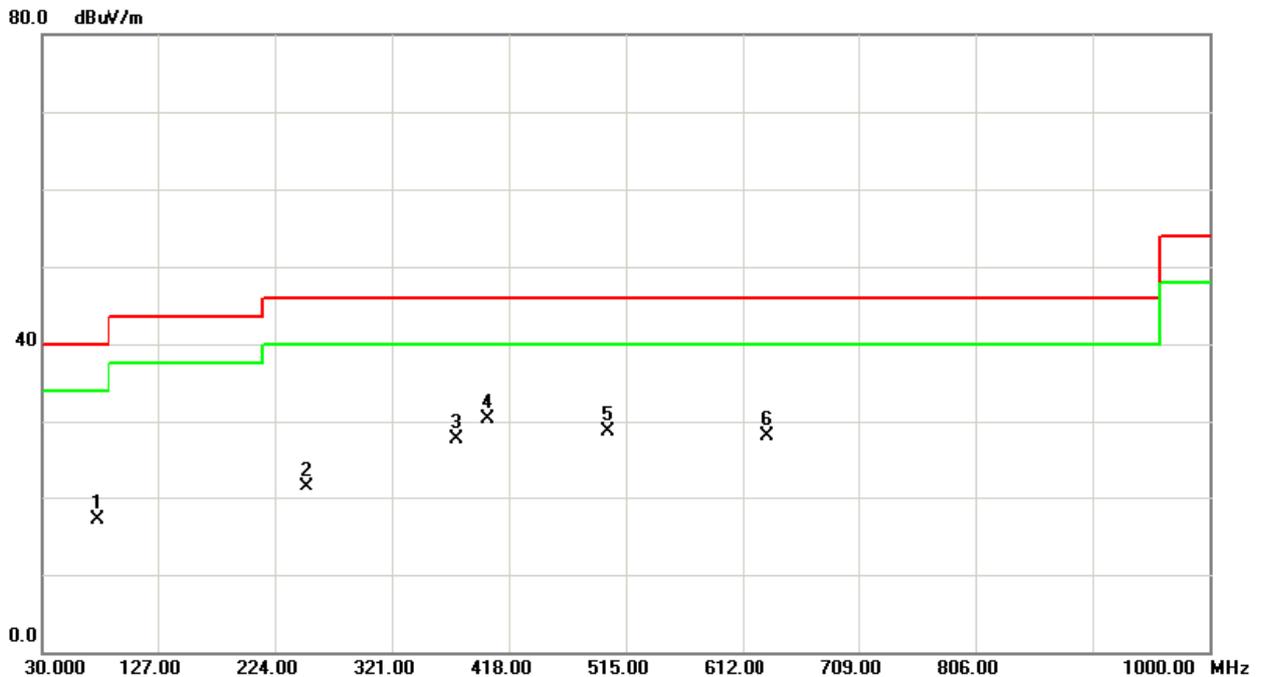


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 06-Common-mode Inductor : MingPu		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.08	H	36.13	-19.01	17.12	40.00	- 22.88	
250.68	H	36.46	-14.99	21.47	46.00	- 24.53	
374.35	H	38.40	-10.69	27.71	46.00	- 18.29	
401.03	H	40.17	-9.80	30.37	46.00	- 15.63	
500.45	H	37.14	-8.37	28.77	46.00	- 17.23	
633.83	H	33.02	-4.92	28.10	46.00	- 17.90	

**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 ◦





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 11-Common-mode Inductor : MingPu		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.08	V	48.36	-19.01	29.35	40.00	- 10.65	
250.68	V	38.92	-14.99	23.93	46.00	- 22.07	
359.80	V	40.90	-11.19	29.71	46.00	- 16.29	
374.35	V	41.77	-10.69	31.08	46.00	- 14.92	
561.08	V	33.76	-6.36	27.40	46.00	- 18.60	
626.55	V	34.97	-5.05	29.92	46.00	- 16.08	

**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 ◦



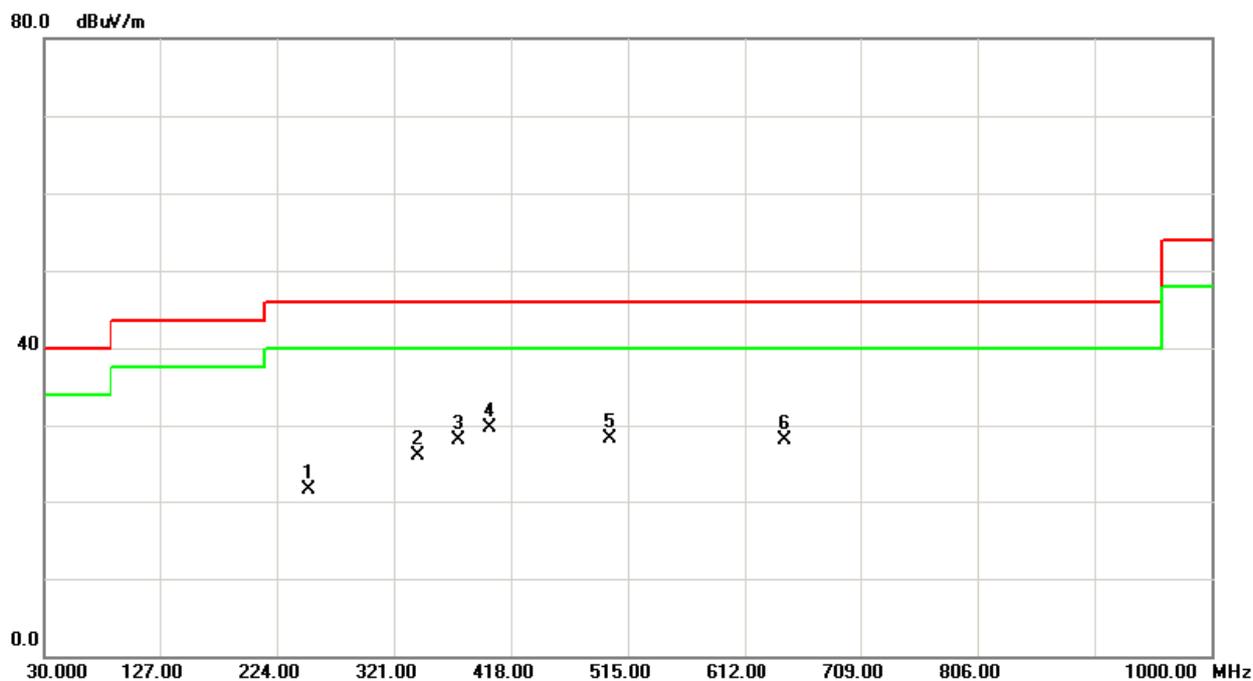


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 11-Common-mode Inductor : MingPu		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
75.00	H	36.65	-14.99	21.66	46.00	- 24.34	
340.40	H	37.91	-11.73	26.18	46.00	- 19.82	
374.35	H	38.70	-10.69	28.01	46.00	- 17.99	
401.03	H	39.57	-9.80	29.77	46.00	- 16.23	
500.45	H	36.68	-8.37	28.31	46.00	- 17.69	
645.95	H	32.85	-4.74	28.11	46.00	- 17.89	

**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 ◦



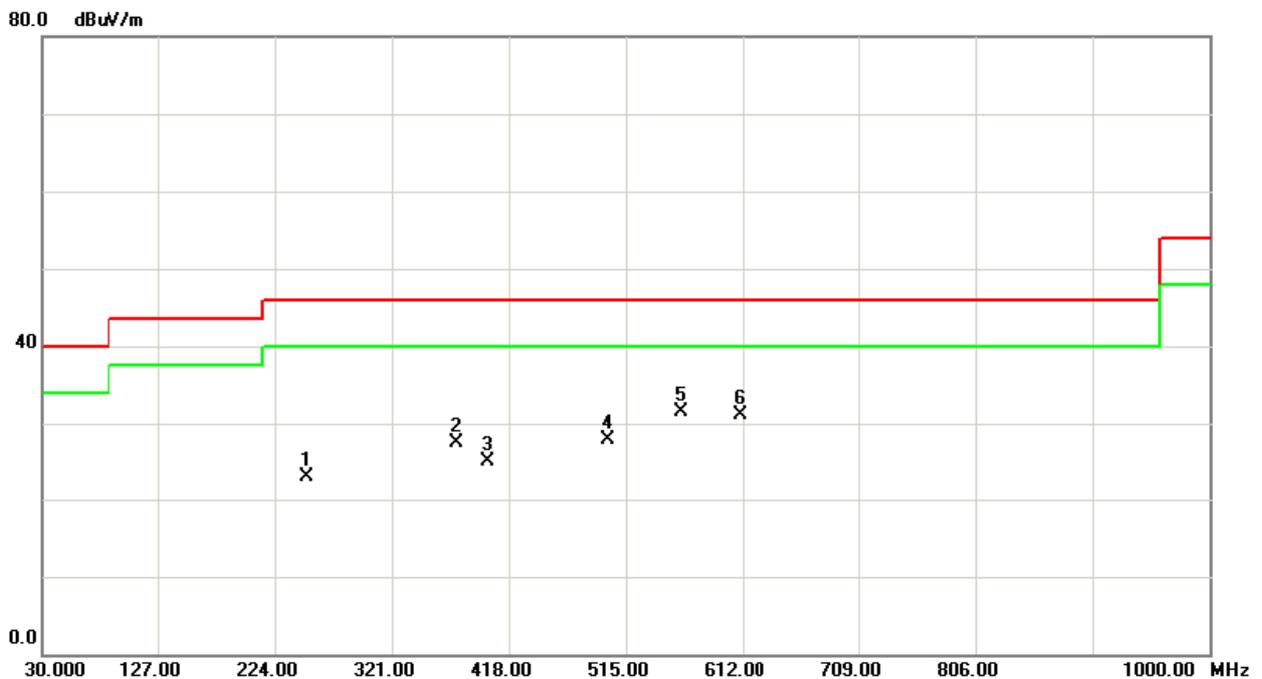


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 01- Common-mode Inductor : HaiGuang		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
250.68	V	38.14	-14.99	23.15	46.00	- 22.85	
374.35	V	38.28	-10.69	27.59	46.00	- 18.41	
401.03	V	34.95	-9.80	25.15	46.00	- 20.85	
500.45	V	36.27	-8.37	27.90	46.00	- 18.10	
561.08	V	37.96	-6.36	31.60	46.00	- 14.40	
609.58	V	36.34	-5.33	31.01	46.00	- 14.99	

**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 ◦



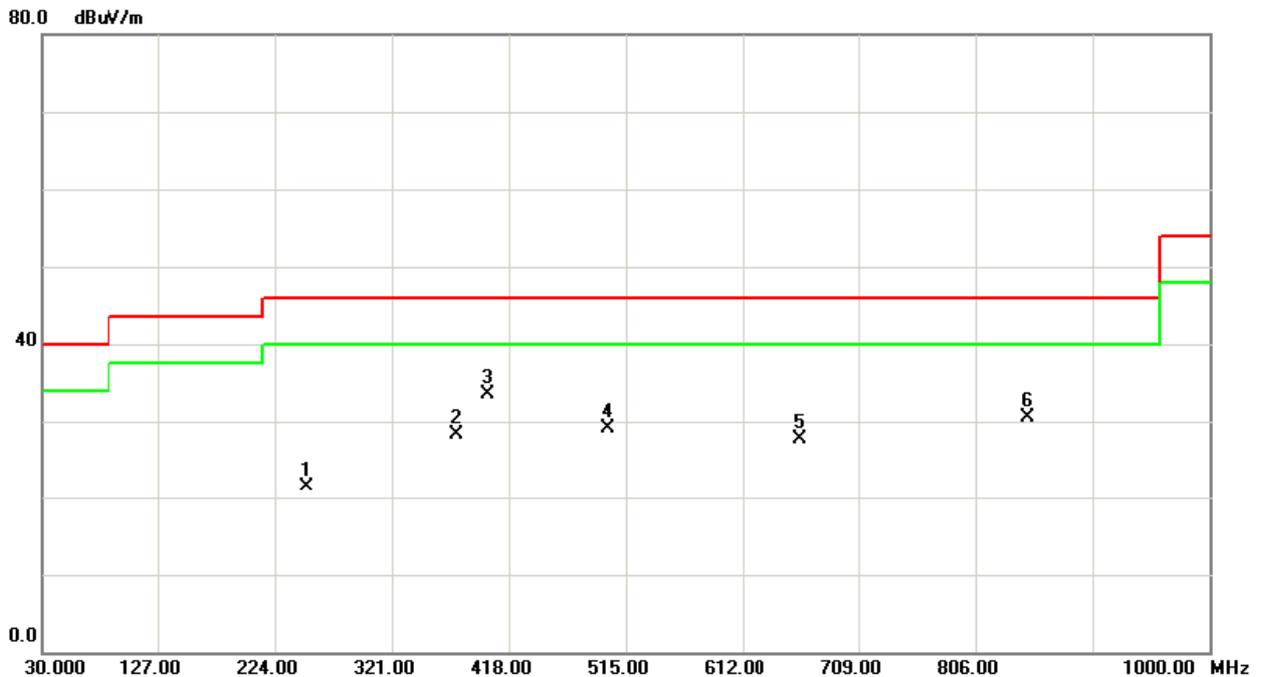


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 01-Common-mode Inductor : HaiGuang		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
250.68	H	36.42	-14.99	21.43	46.00	- 24.57	
374.35	H	38.92	-10.69	28.23	46.00	- 17.77	
401.03	H	43.33	-9.80	33.53	46.00	- 12.47	
500.45	H	37.52	-8.37	29.15	46.00	- 16.85	
660.50	H	32.35	-4.67	27.68	46.00	- 18.32	
849.65	H	33.14	-2.73	30.41	46.00	- 15.59	

**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 ◦



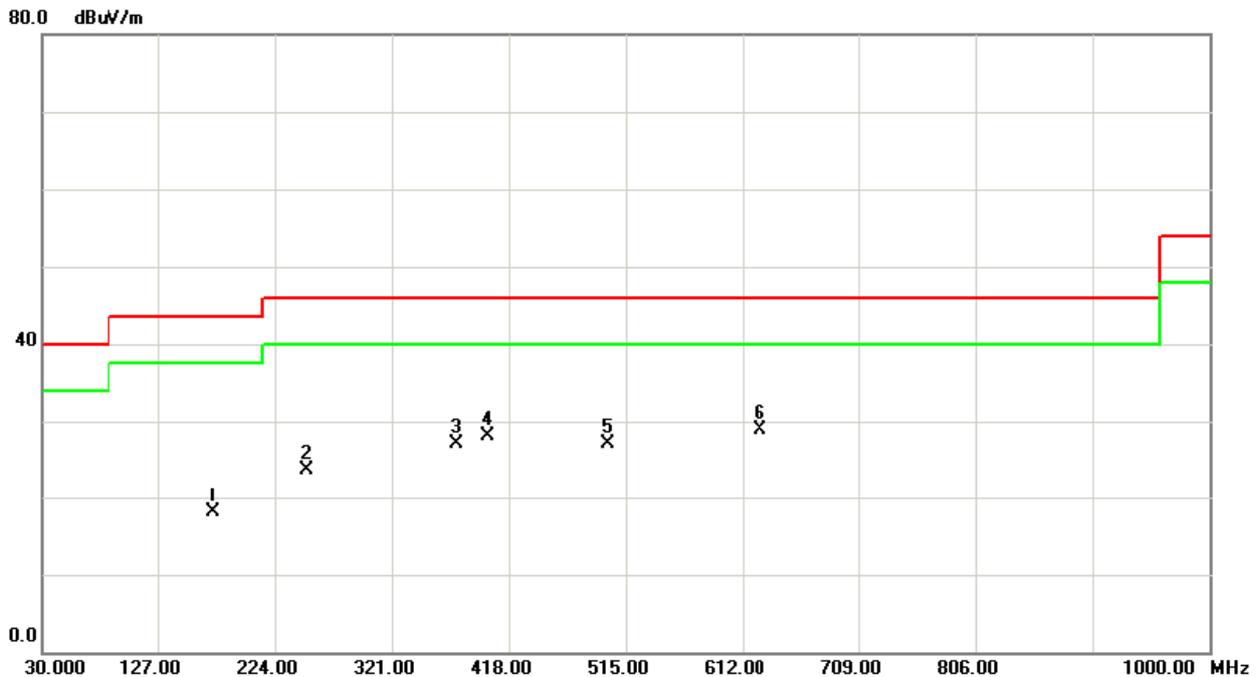


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 06-Common-mode Inductor : HaiGuang		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
173.08	V	35.60	-17.51	18.09	43.50	- 25.41	
250.68	V	38.64	-14.99	23.65	46.00	- 22.35	
374.35	V	37.87	-10.69	27.18	46.00	- 18.82	
401.03	V	37.93	-9.80	28.13	46.00	- 17.87	
500.45	V	35.56	-8.37	27.19	46.00	- 18.81	
626.55	V	34.05	-5.05	29.00	46.00	- 17.00	

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 ◦



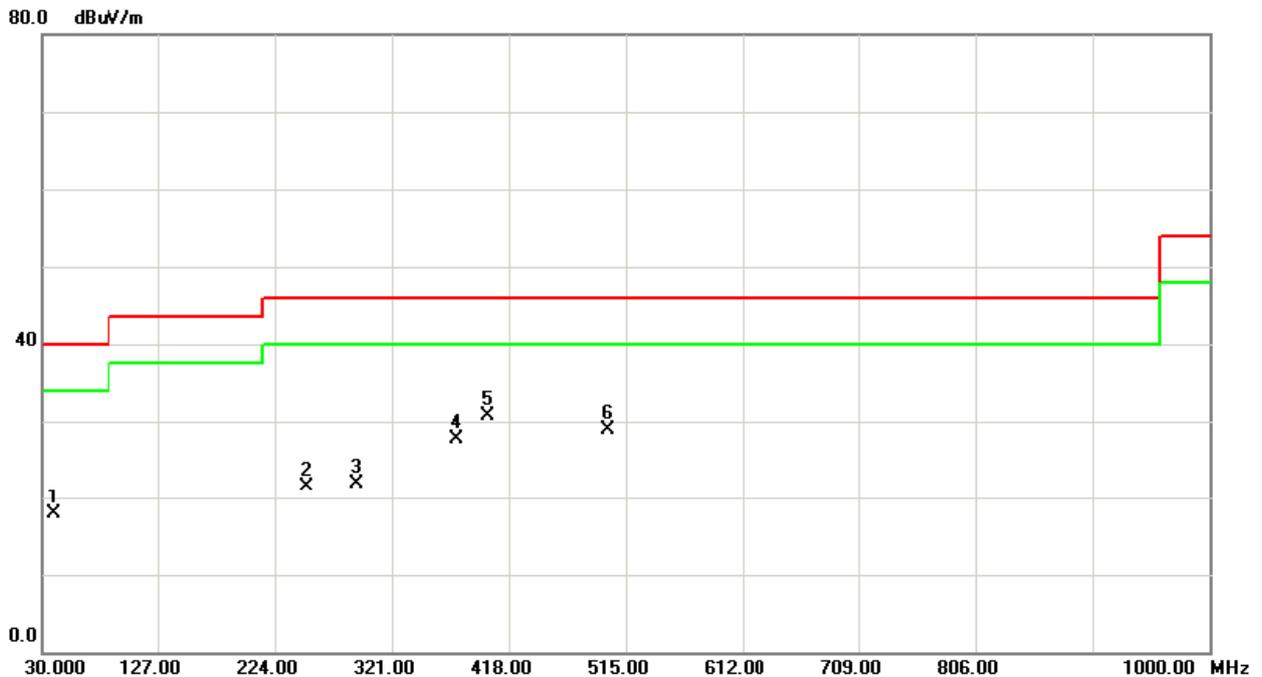


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 06-Common-mode Inductor : HaiGuang		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
39.70	H	34.73	-16.90	17.83	40.00	- 22.17	
250.68	H	36.59	-14.99	21.60	46.00	- 24.40	
291.90	H	34.47	-12.62	21.85	46.00	- 24.15	
374.35	H	38.37	-10.69	27.68	46.00	- 18.32	
401.03	H	40.52	-9.80	30.72	46.00	- 15.28	
500.45	H	37.19	-8.37	28.82	46.00	- 17.18	

**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 ◦



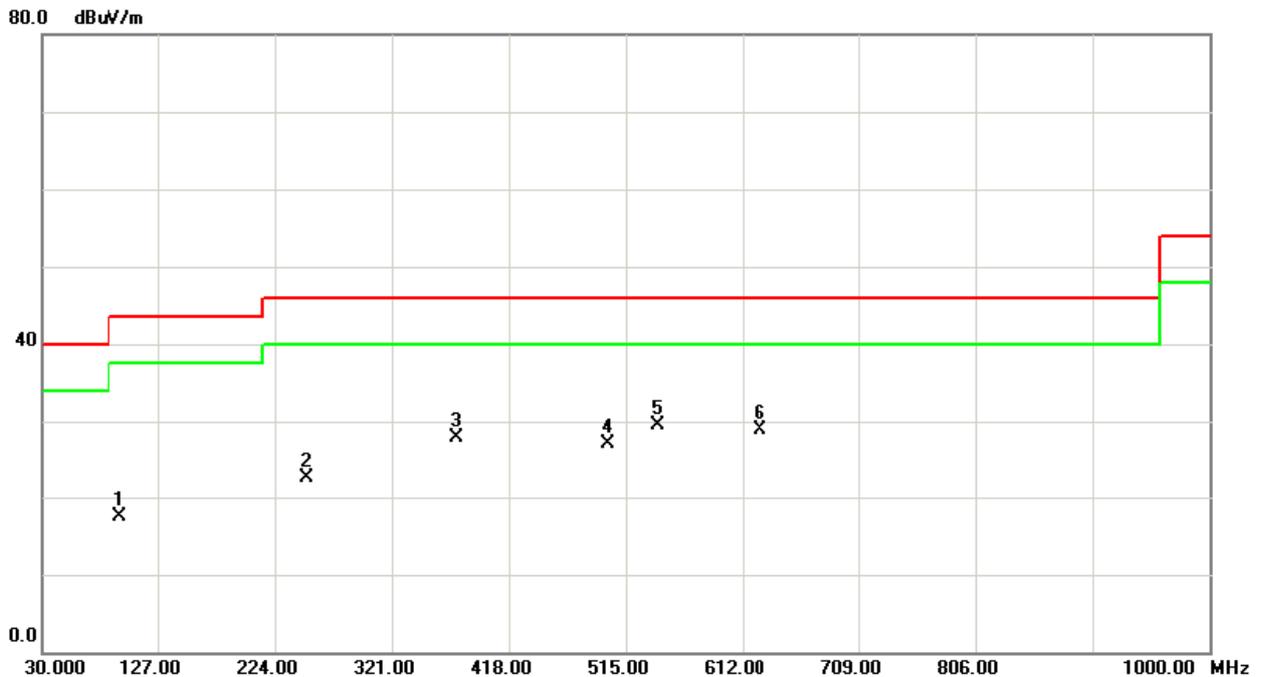


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 11-Common-mode Inductor : HaiGuang		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
95.48	V	36.27	-18.70	17.57	43.50	- 25.93	
250.68	V	37.76	-14.99	22.77	46.00	- 23.23	
374.35	V	38.52	-10.69	27.83	46.00	- 18.17	
500.45	V	35.48	-8.37	27.11	46.00	- 18.89	
541.68	V	36.41	-6.90	29.51	46.00	- 16.49	
626.55	V	33.96	-5.05	28.91	46.00	- 17.09	

**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 ◦



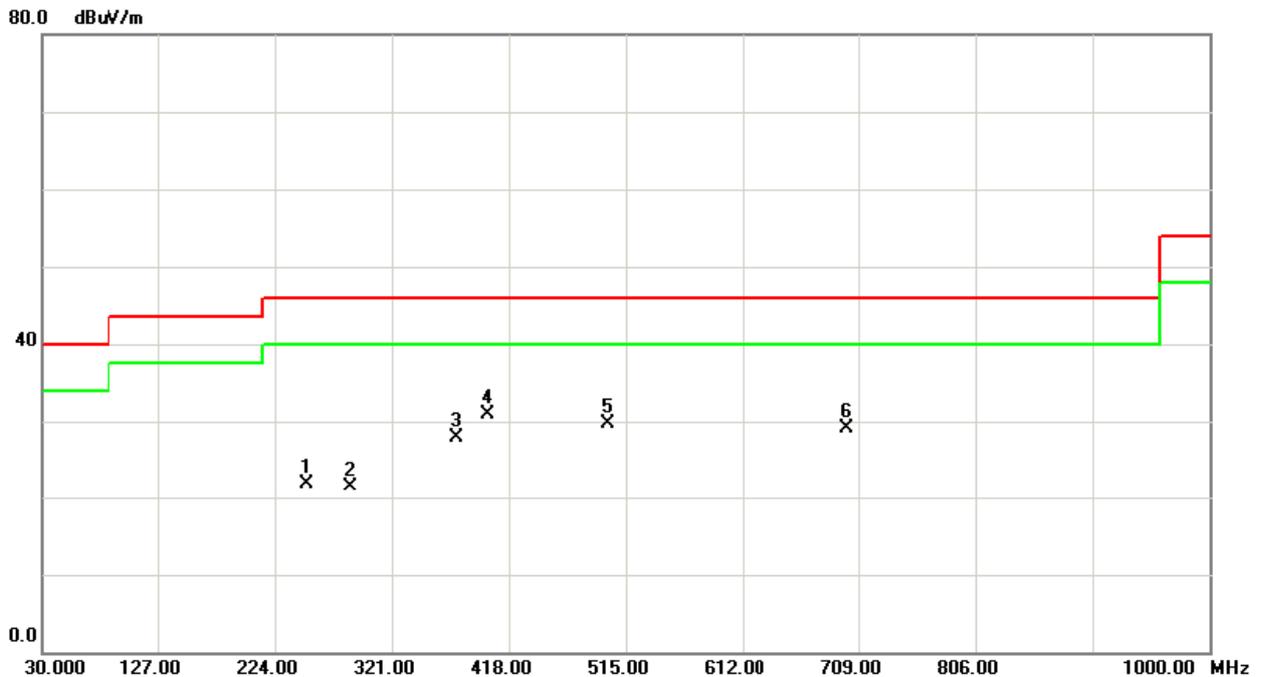


EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 11-Common-mode Inductor : HaiGuang		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
250.68	H	36.92	-14.99	21.93	46.00	- 24.07	
287.05	H	34.19	-12.77	21.42	46.00	- 24.58	
35.00	H	38.68	-10.69	27.99	46.00	- 18.01	
401.03	H	40.78	-9.80	30.98	46.00	- 15.02	
500.45	H	38.02	-8.37	29.65	46.00	- 16.35	
699.30	H	33.70	-4.65	29.05	46.00	- 16.95	

**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)**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE 2412MHz		

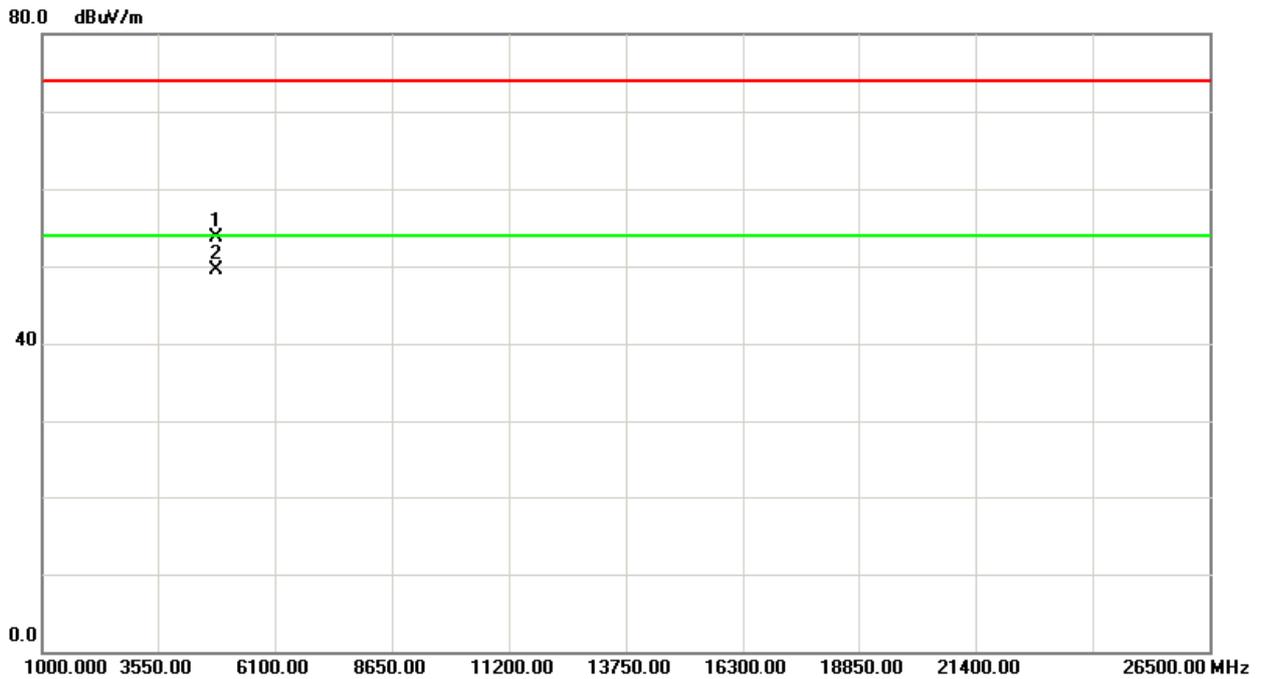
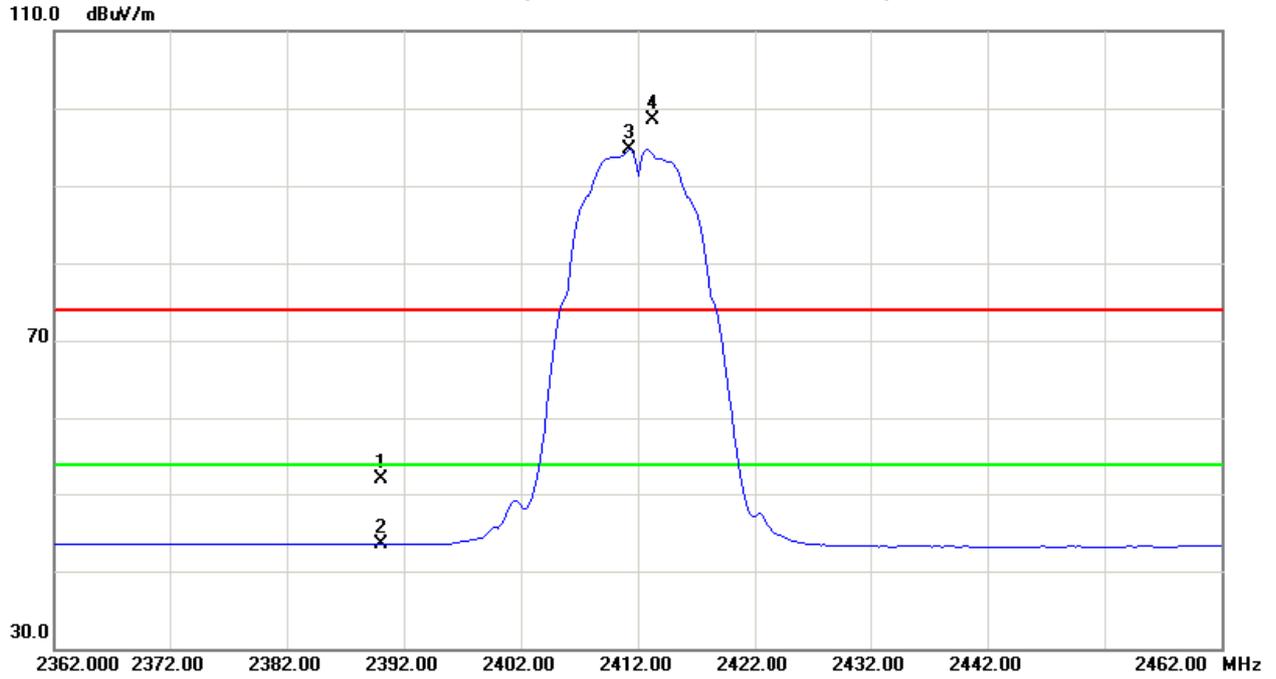
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	19.77	11.25	32.28	52.05	43.53	74.00	54.00	X/E
<b>2413.25</b>	<b>V</b>	<b>66.32</b>	<b>62.38</b>	<b>32.25</b>	<b>98.57</b>	<b>94.63</b>			<b>X/F</b>
4823.78	V	47.44	43.22	6.19	53.63	49.41	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH01 (Above 1000 MHz, Vertical)





## Neutron Engineering Inc.

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE 2412MHz		

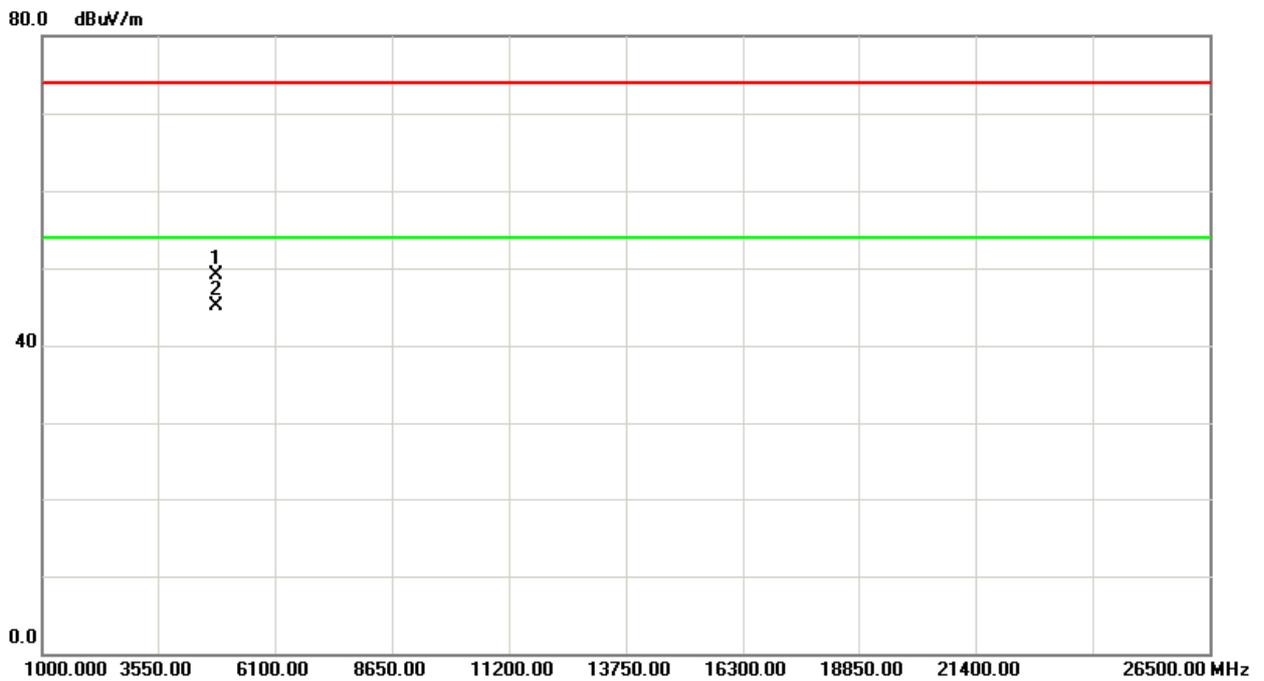
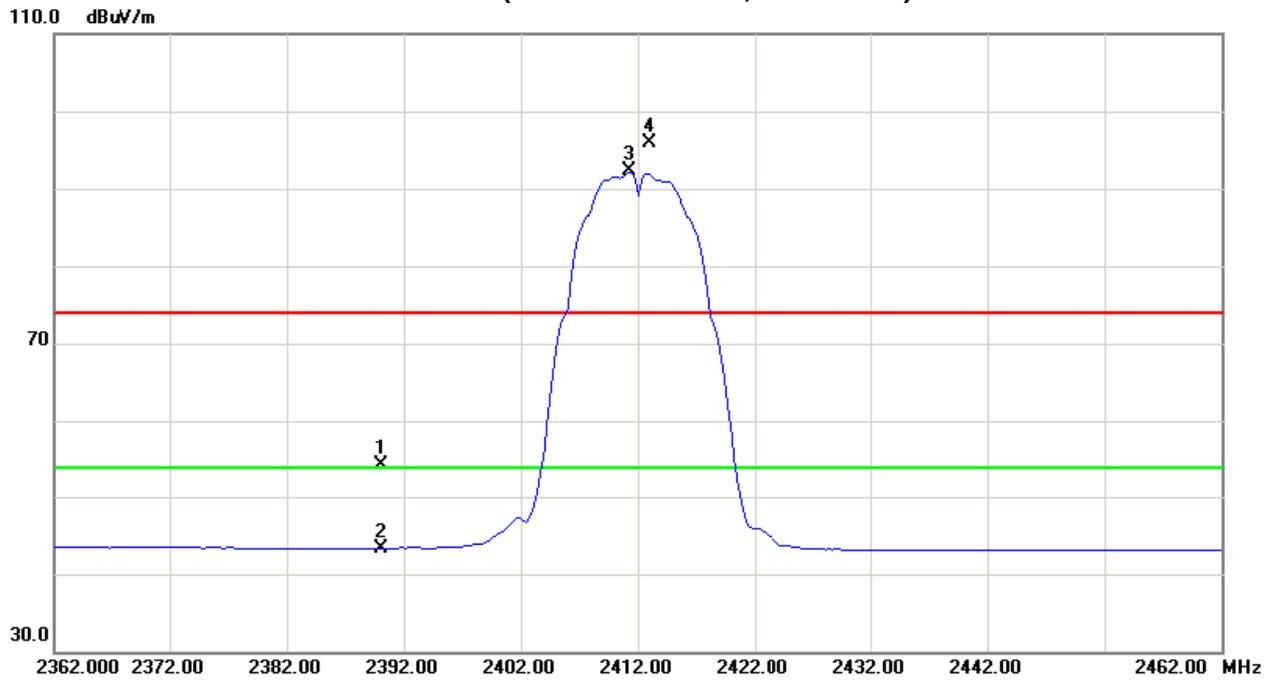
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	22.09	11.11	32.28	54.37	43.39	74.00	54.00	X/E
<b>2411.25</b>	<b>H</b>	<b>63.73</b>	<b>60.04</b>	<b>32.25</b>	<b>95.98</b>	<b>92.29</b>			<b>X/F</b>
4823.85	H	43.74	39.87	5.29	49.03	45.16	74.00	54.00	X/H

### 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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH01 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE 2437MHz		

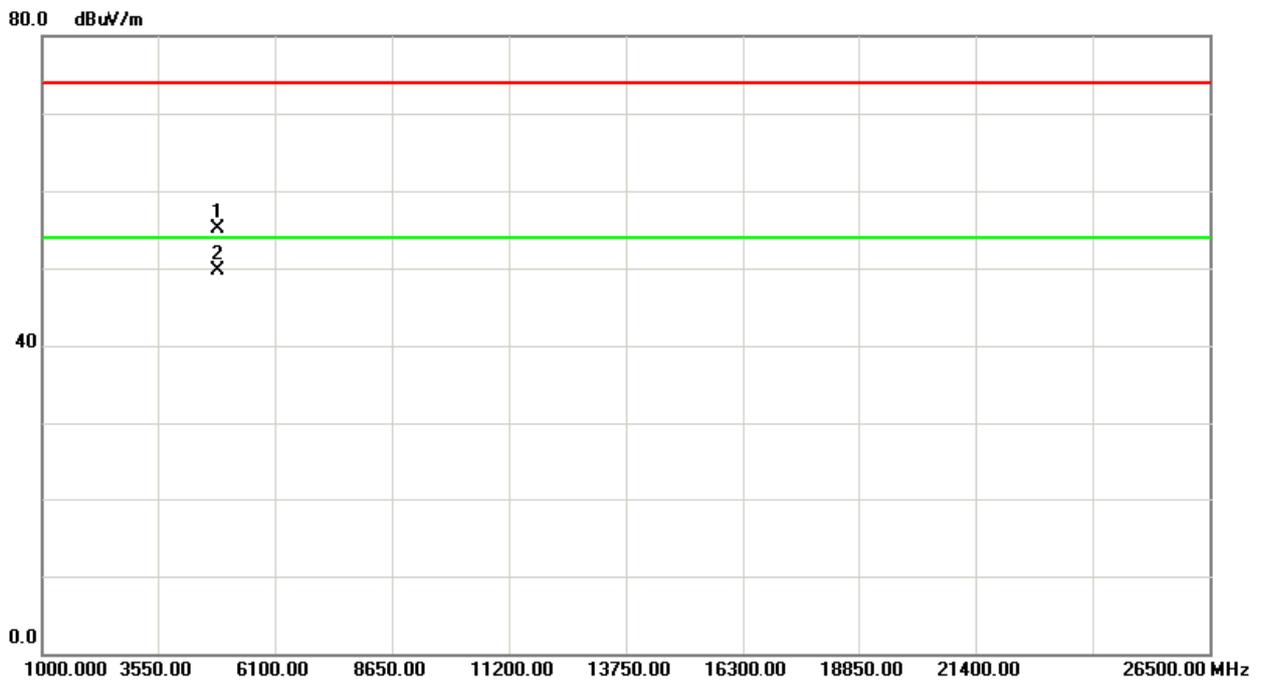
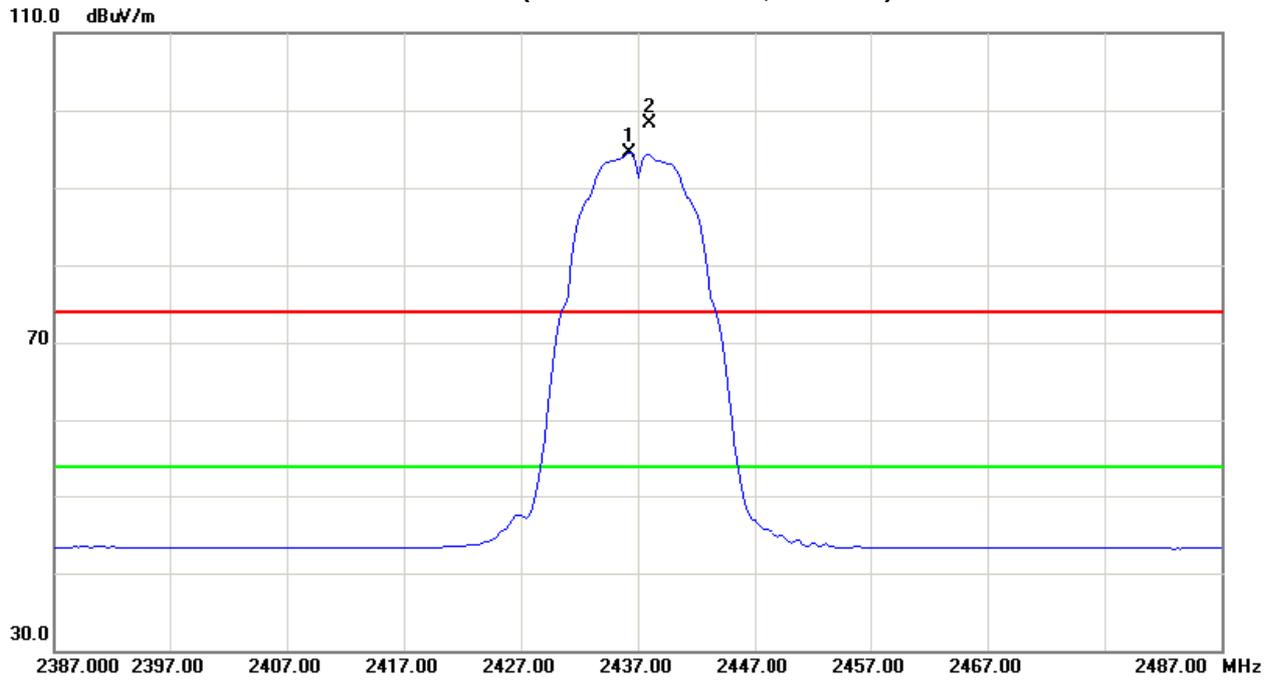
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2436.25</b>	<b>V</b>	<b>66.07</b>	<b>62.33</b>	<b>32.22</b>	<b>98.29</b>	<b>94.55</b>			<b>X/F</b>
4874.03	V	48.77	43.33	6.39	55.16	49.72	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE 2437MHz		

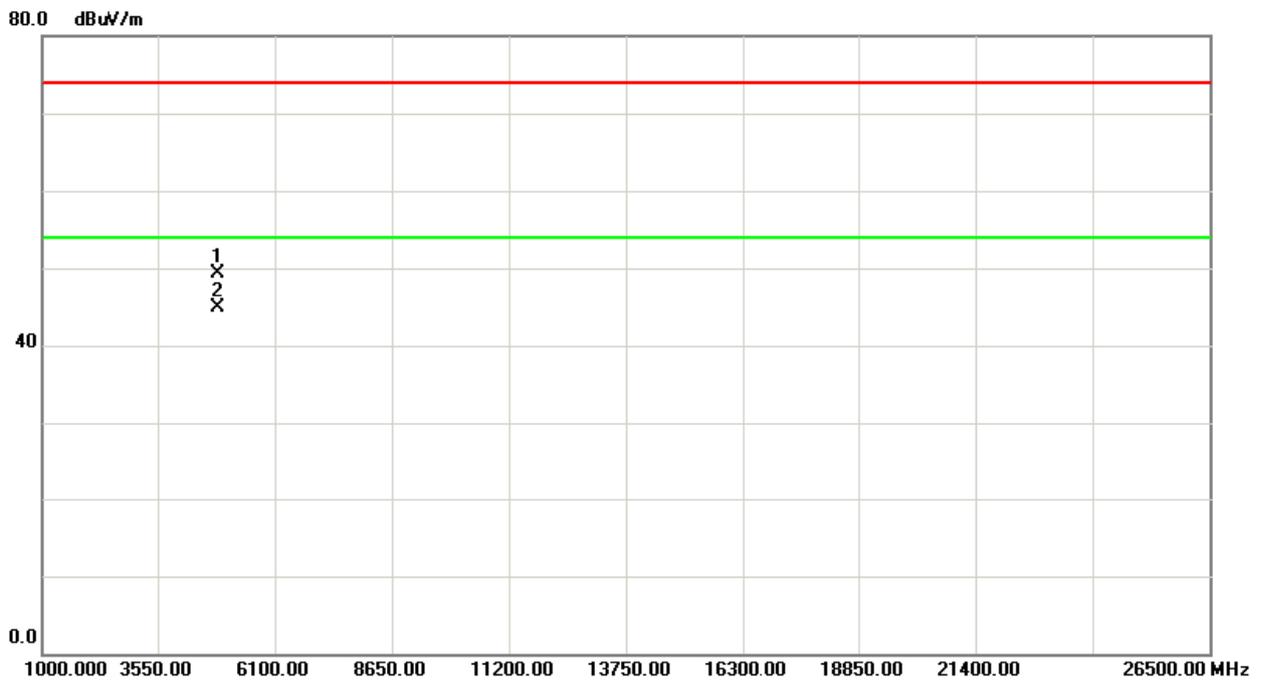
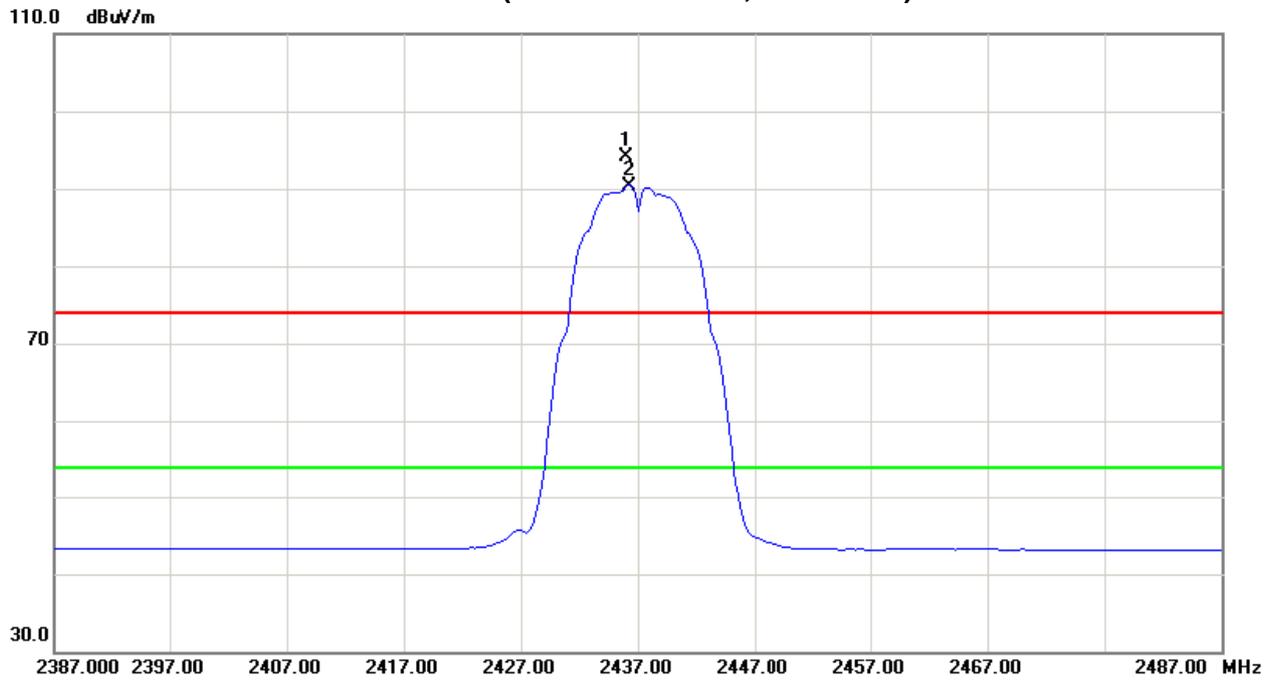
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>2436.00</b>	<b>H</b>	<b>61.89</b>	<b>58.17</b>	<b>32.23</b>	<b>94.12</b>	<b>90.40</b>			<b>X/F</b>
4873.73	H	43.93	39.42	5.47	49.40	44.89	74.00	54.00	X/E

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE 2462MHz		

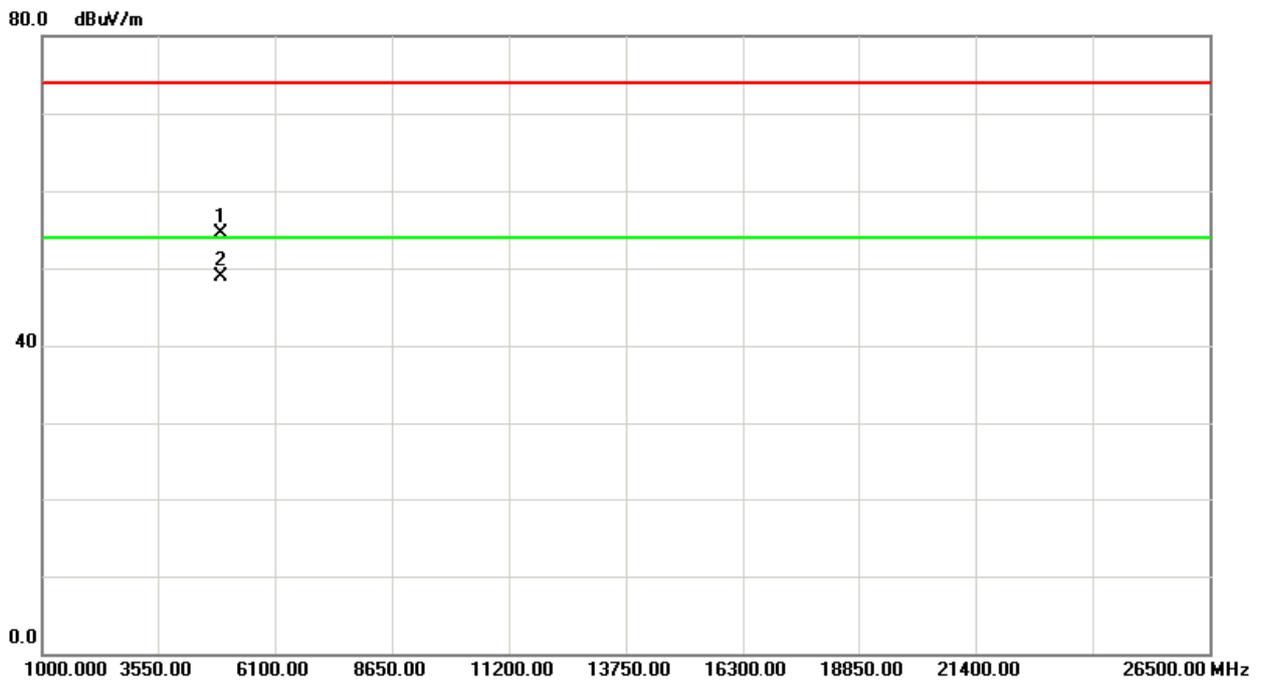
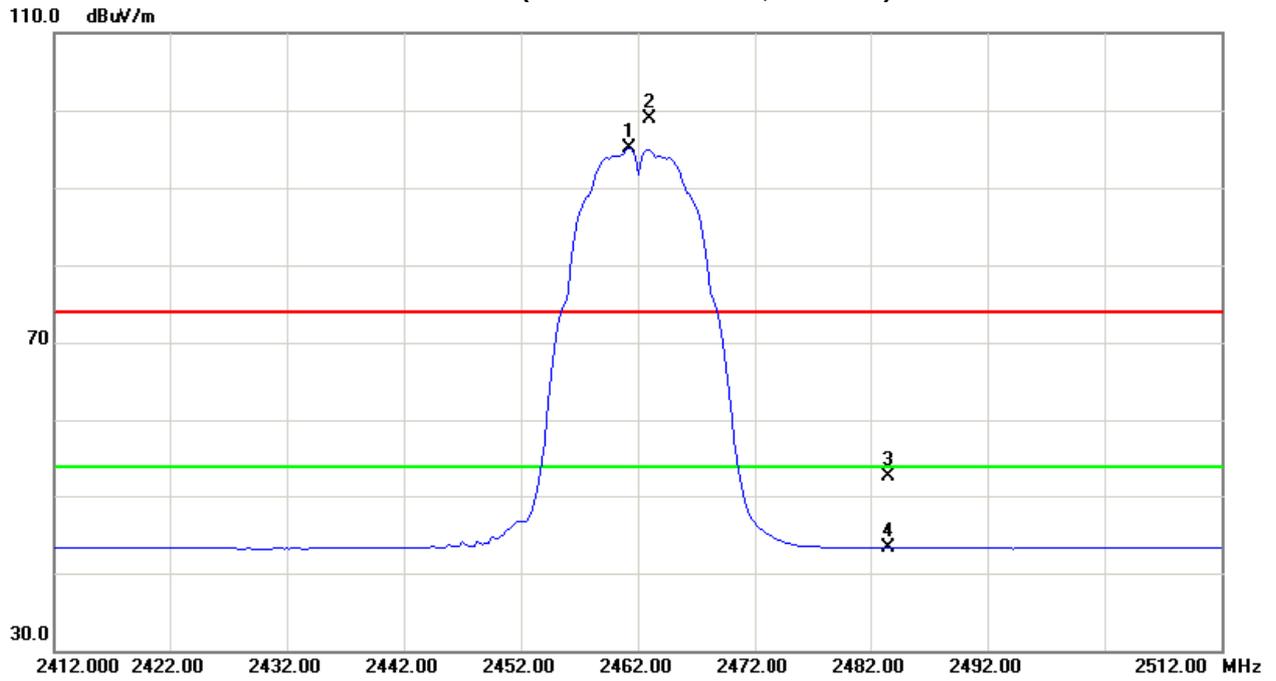
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2461.25</b>	<b>V</b>	<b>66.72</b>	<b>62.87</b>	<b>32.20</b>	<b>98.92</b>	<b>95.07</b>			<b>X/F</b>
2483.50	V	20.49	11.14	32.17	52.66	43.31	74.00	54.00	X/H
4923.95	V	47.83	42.26	6.59	54.42	48.85	74.00	54.00	X/E

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) 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



TX CH11 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE 2462MHz		

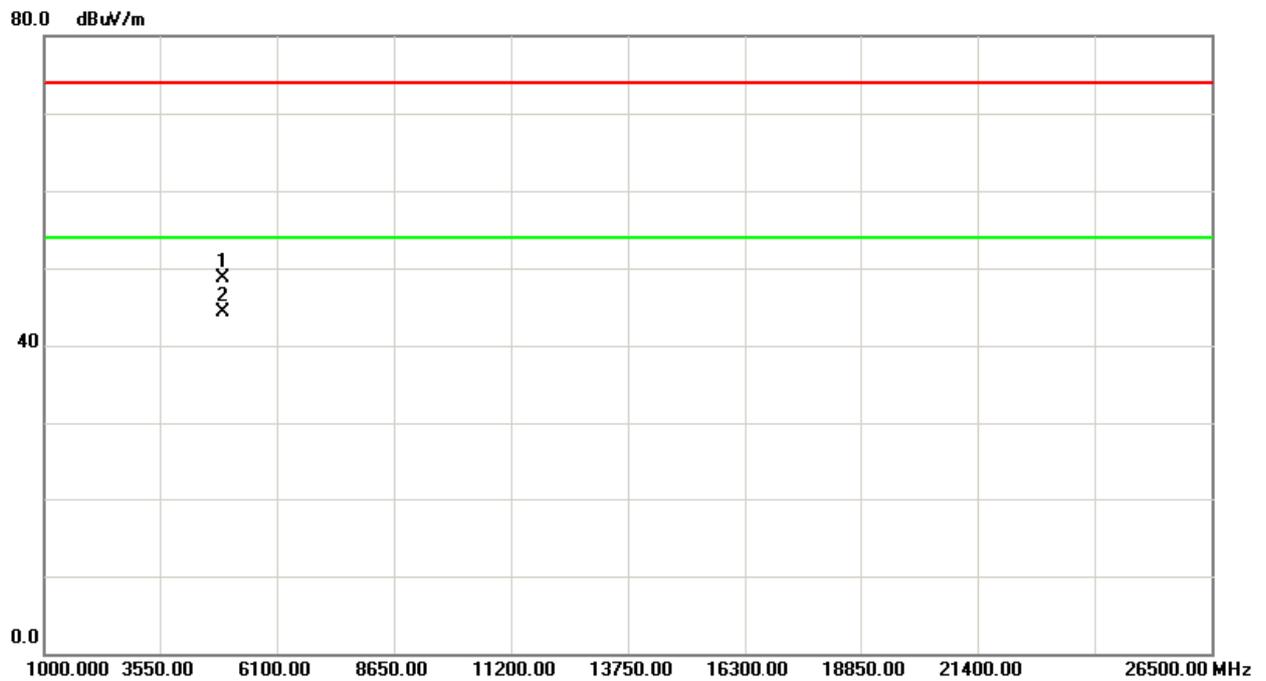
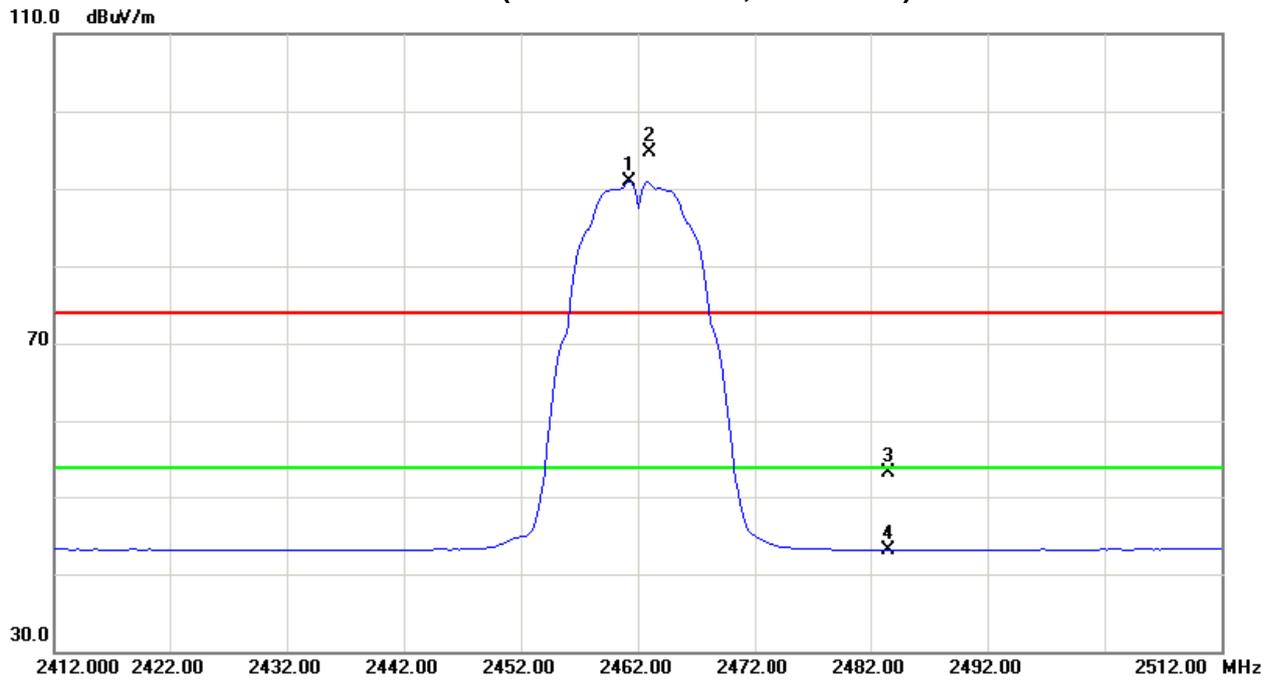
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2461.25</b>	<b>H</b>	<b>62.54</b>	<b>58.73</b>	<b>32.20</b>	<b>94.74</b>	<b>90.93</b>			<b>X/F</b>
2483.50	H	21.20	10.97	32.17	53.37	43.14	74.00	54.00	X/H
4923.87	H	43.07	38.64	5.65	48.72	44.29	74.00	54.00	X/H

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH11 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE 2412MHz		

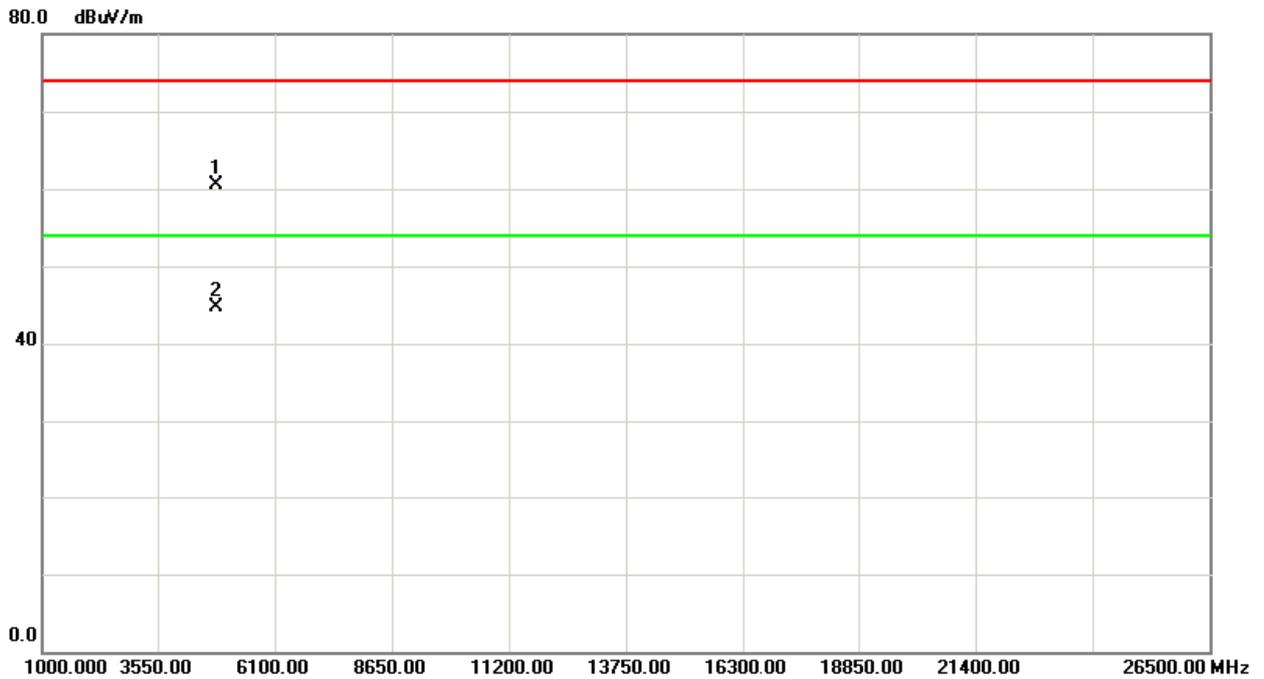
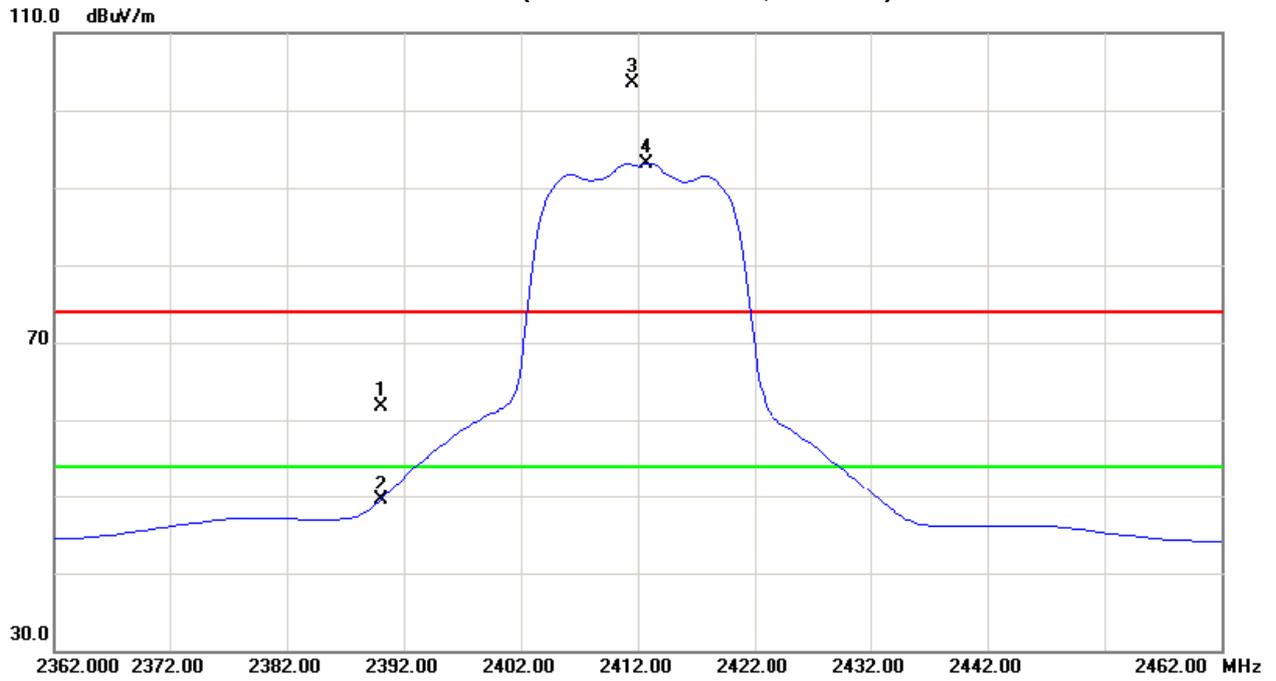
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	29.45	17.19	32.28	61.73	49.47	74.00	54.00	X/E
<b>2411.50</b>	<b>V</b>	<b>71.18</b>	<b>60.87</b>	<b>32.26</b>	<b>103.44</b>	<b>93.13</b>			<b>X/F</b>
4823.35	V	54.27	38.59	6.19	60.46	44.78	74.00	54.00	X/H

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH01 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE 2412MHz		

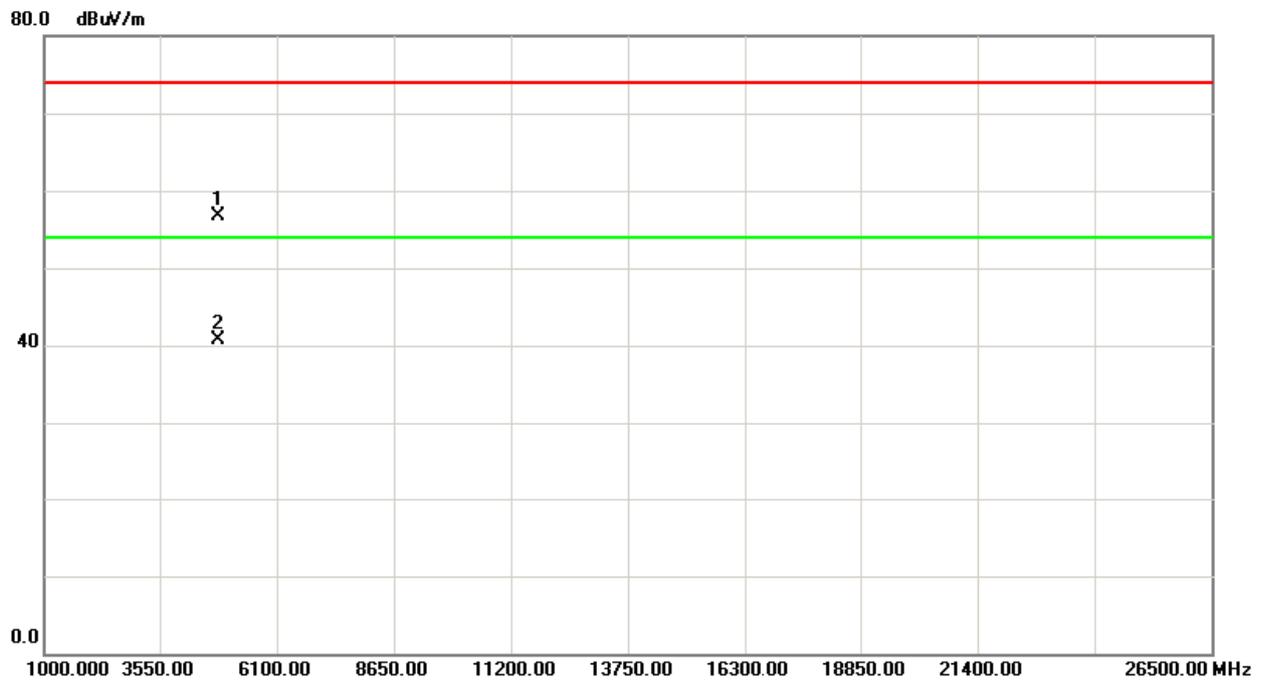
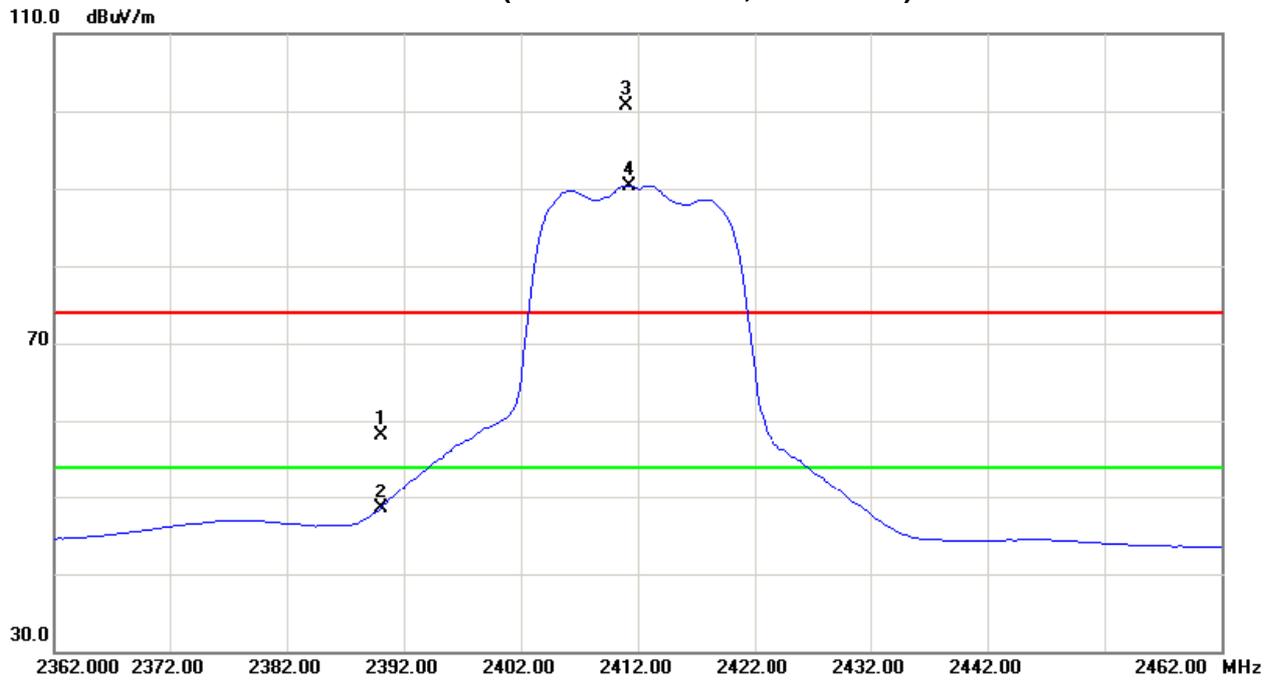
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	25.77	16.28	32.28	58.05	48.56	74.00	54.00	X/E
<b>2411.00</b>	<b>H</b>	<b>68.43</b>	<b>58.11</b>	<b>32.26</b>	<b>100.69</b>	<b>90.37</b>			<b>X/F</b>
4824.16	H	51.42	35.37	5.29	56.71	40.66	74.00	54.00	X/H

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH01 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE 2437MHz		

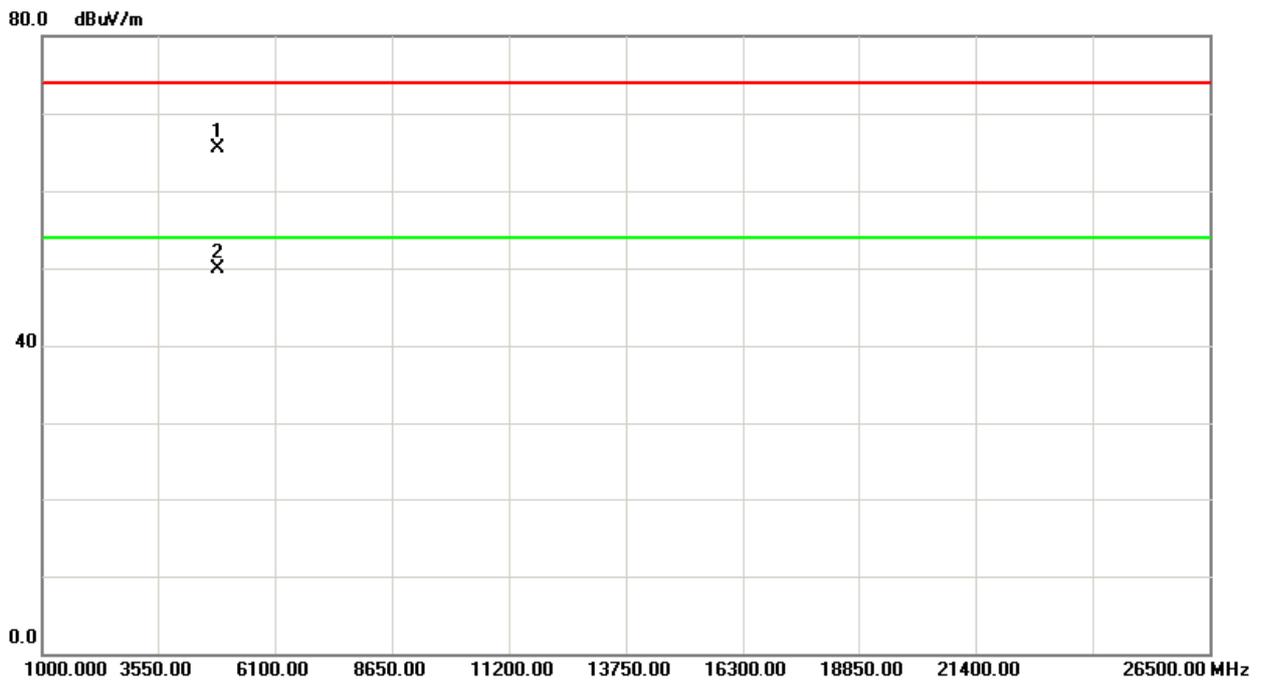
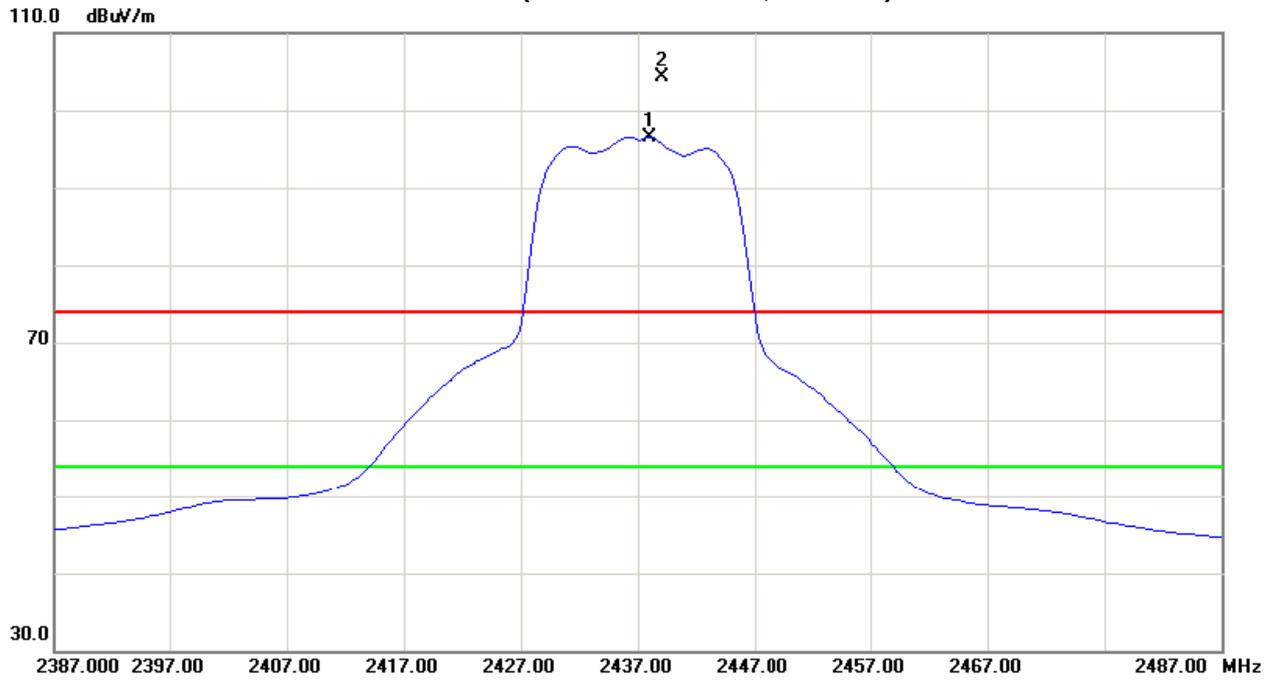
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>2439.00</b>	<b>V</b>	<b>72.08</b>	<b>64.30</b>	<b>32.22</b>	<b>104.30</b>	<b>96.52</b>			<b>X/F</b>
4873.50	V	59.07	43.53	6.39	65.46	49.92	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE 2437MHz		

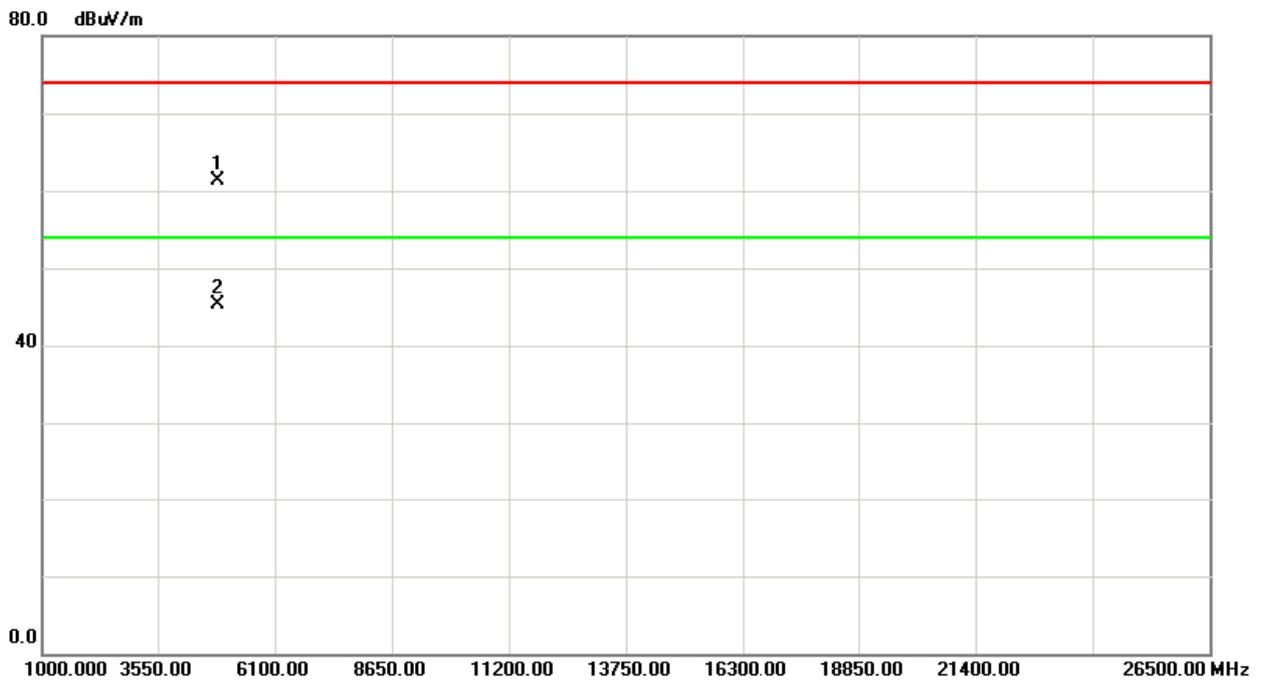
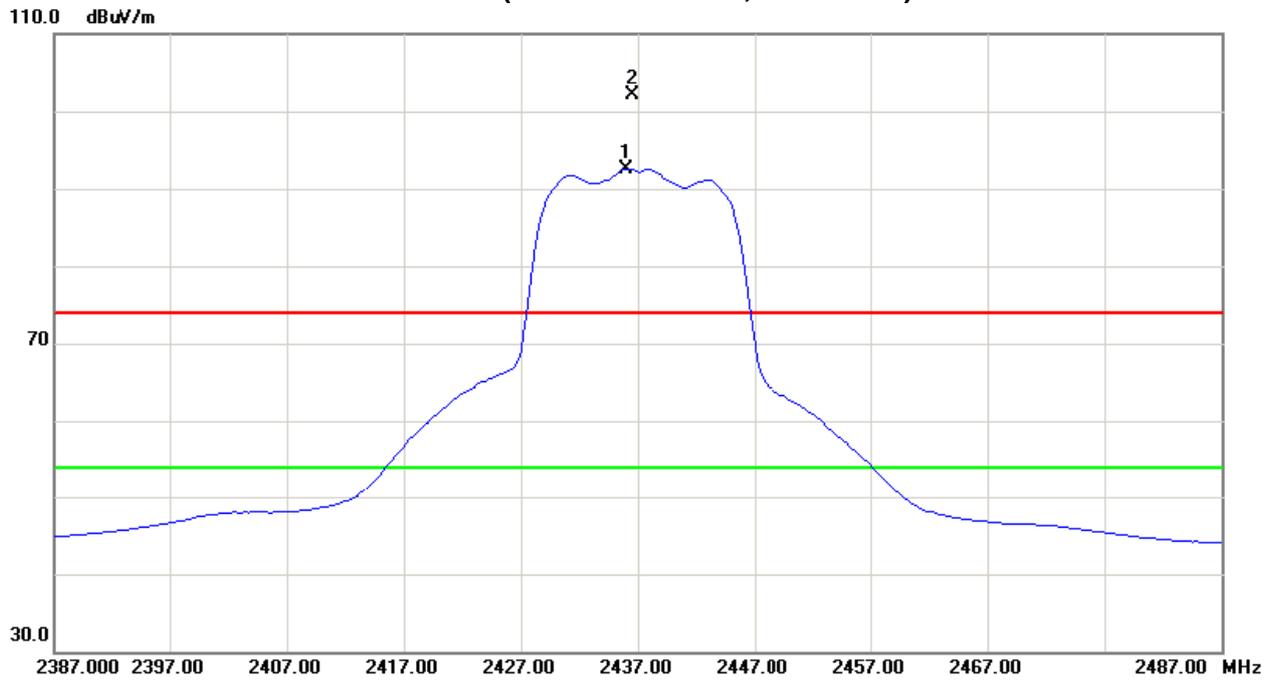
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2436.50</b>	<b>H</b>	<b>69.97</b>	<b>60.31</b>	<b>32.23</b>	<b>102.20</b>	<b>92.54</b>			<b>X/F</b>
4873.75	H	55.86	39.76	5.47	61.33	45.23	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE 2462MHz		

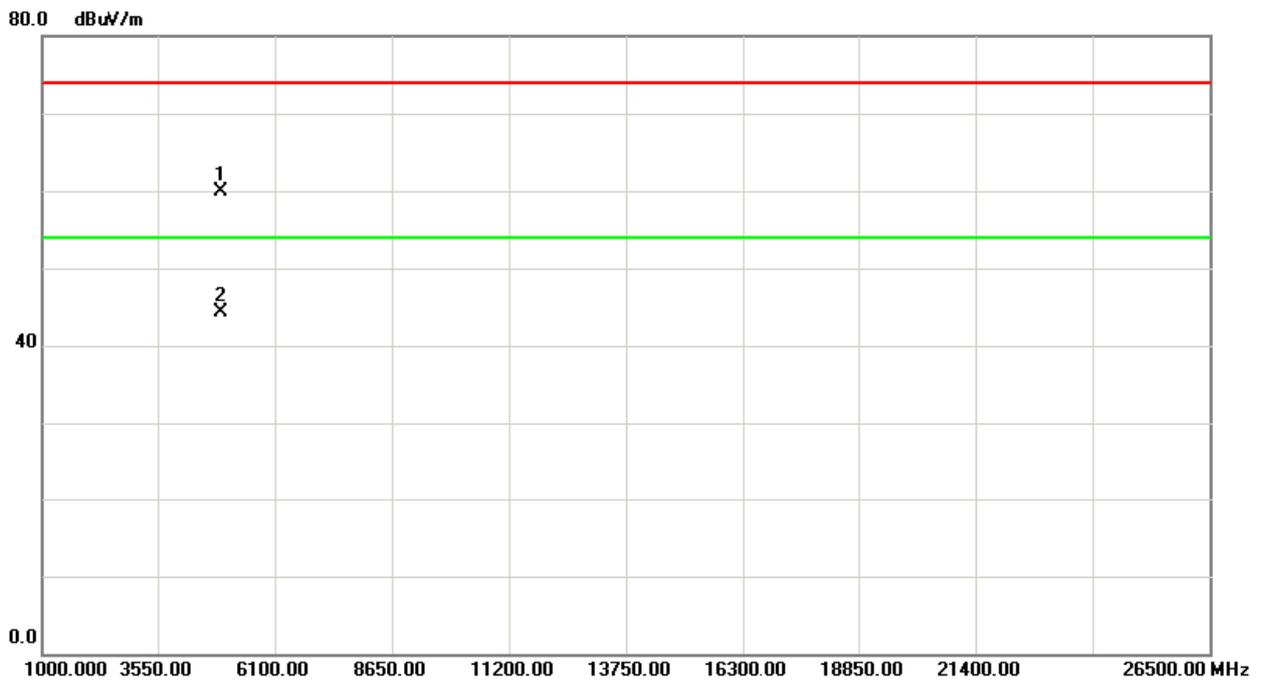
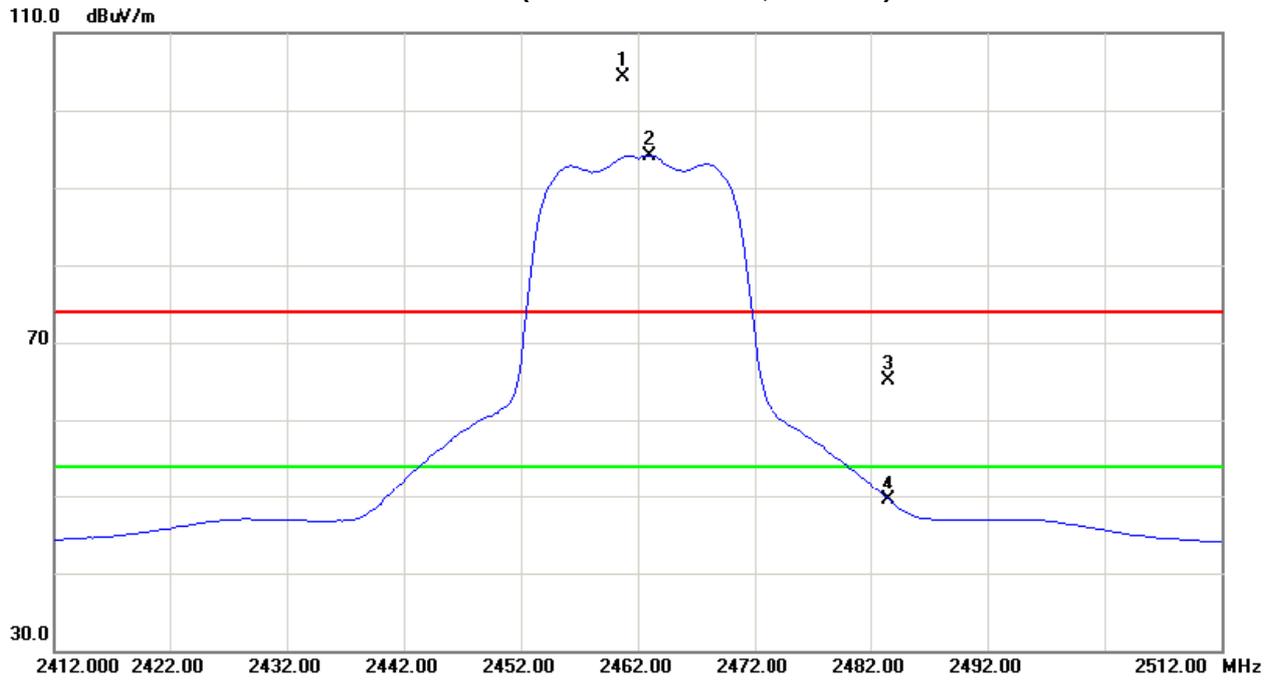
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2460.75</b>	<b>V</b>	<b>72.15</b>	<b>61.99</b>	<b>32.20</b>	<b>104.35</b>	<b>94.19</b>			<b>X/F</b>
2483.50	V	32.92	17.43	32.17	65.09	49.60	74.00	54.00	X/E
4923.96	V	54.24	38.66	5.65	59.89	44.31	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH11 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE 2462MHz		

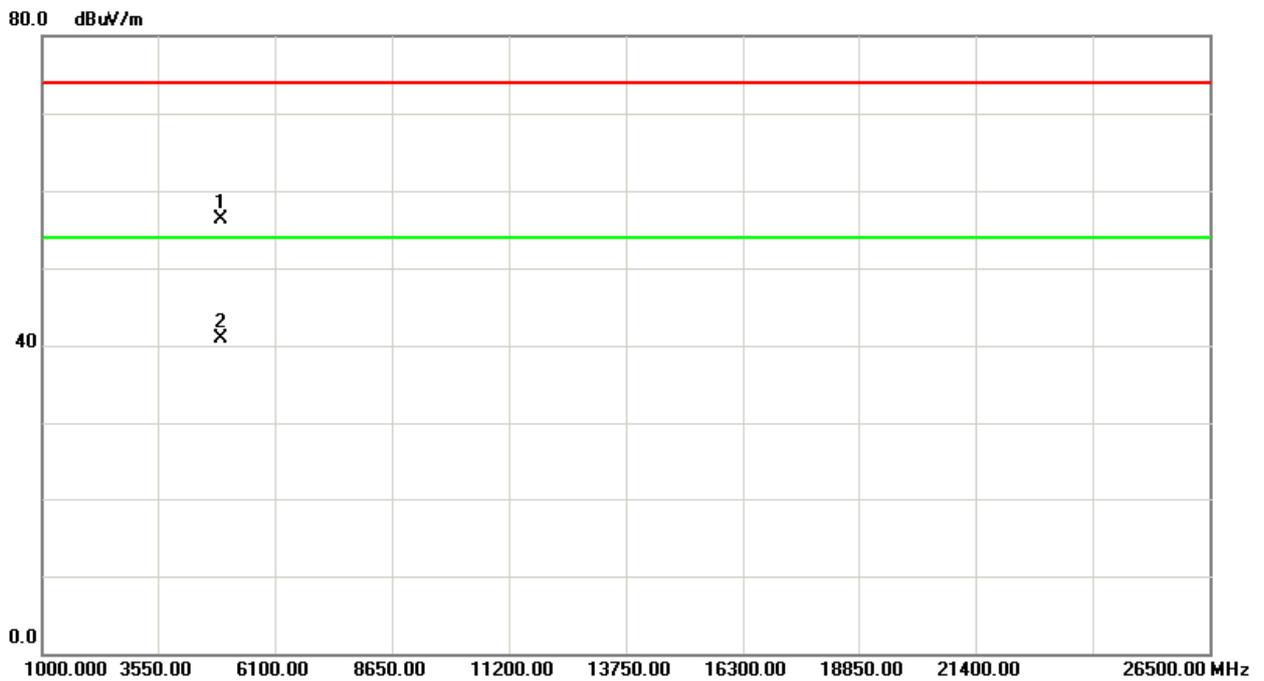
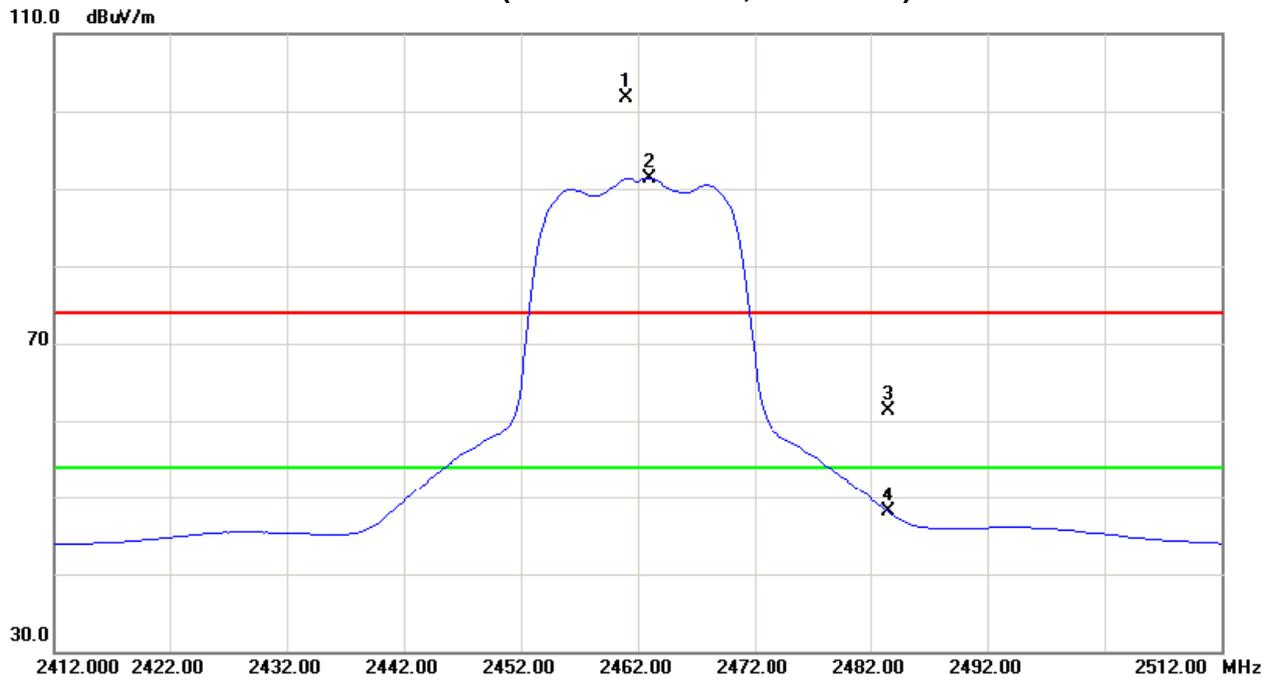
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2461.00</b>	<b>H</b>	<b>69.42</b>	<b>59.16</b>	<b>32.20</b>	<b>101.62</b>	<b>91.36</b>			<b>X/F</b>
2483.50	H	29.23	15.87	32.17	61.40	48.04	74.00	54.00	X/E
4923.84	H	50.57	35.28	5.65	56.22	40.93	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH11 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE 2412MHz		

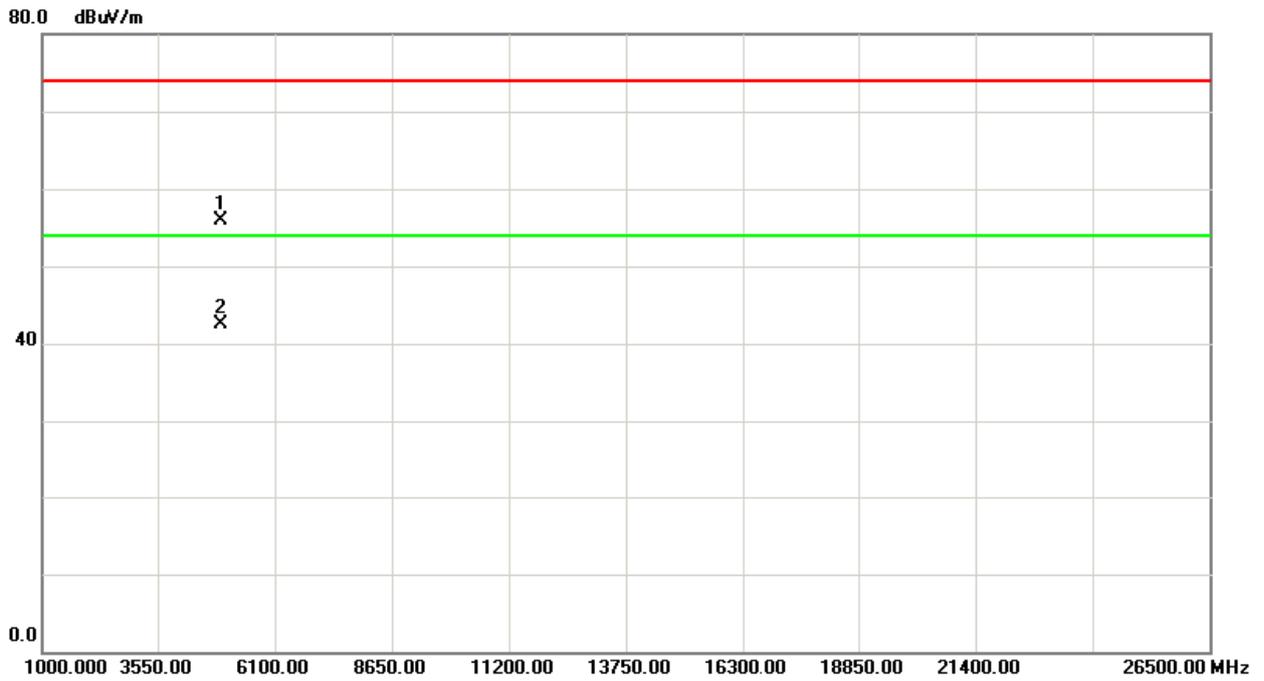
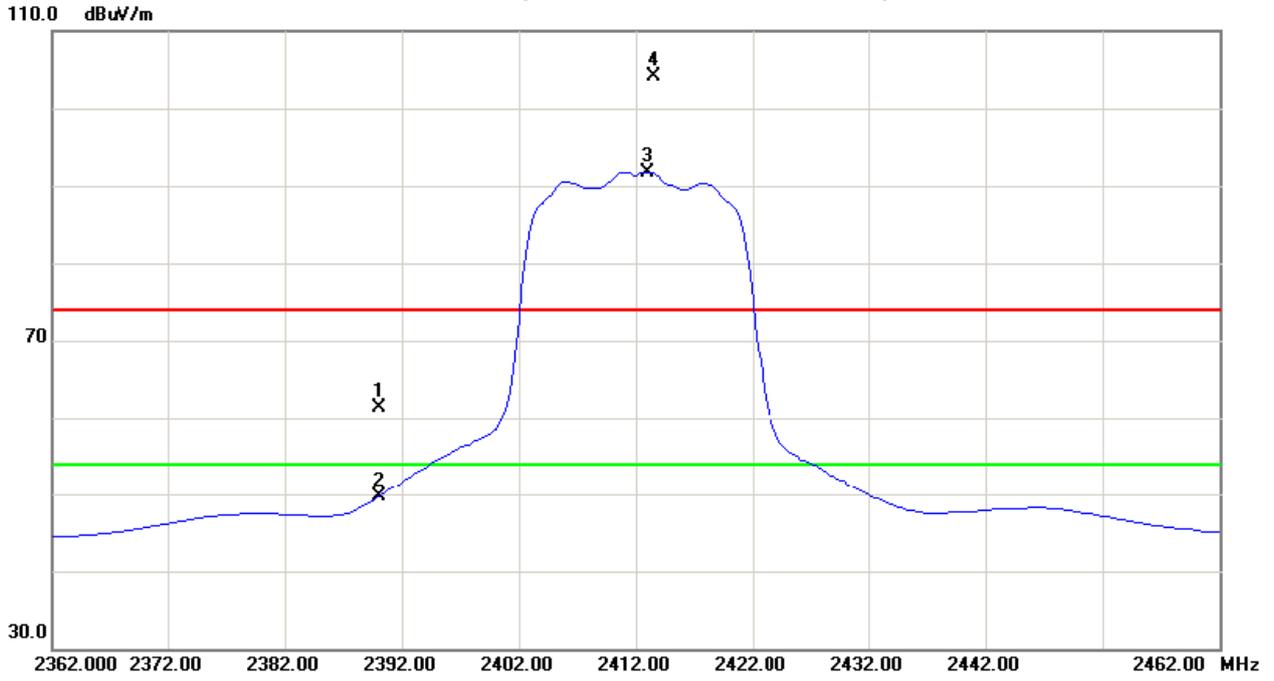
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	29.01	17.34	32.28	61.29	49.62	74.00	54.00	X/E
<b>2413.50</b>	<b>V</b>	<b>71.85</b>	<b>59.55</b>	<b>32.25</b>	<b>104.10</b>	<b>91.80</b>			<b>X/F</b>
4823.85	V	50.35	36.76	5.65	56.00	42.41	74.00	54.00	X/H

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH01 (Above 1000 MHz, Vertical)





## Neutron Engineering Inc.

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE 2412MHz		

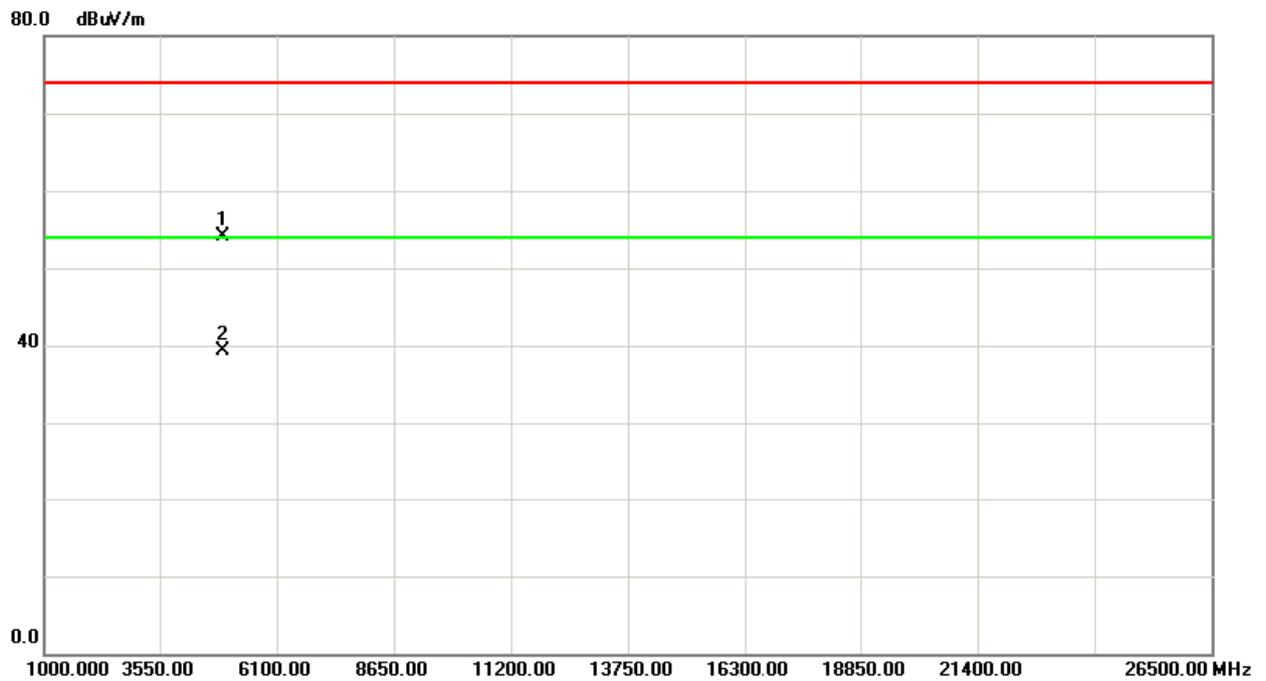
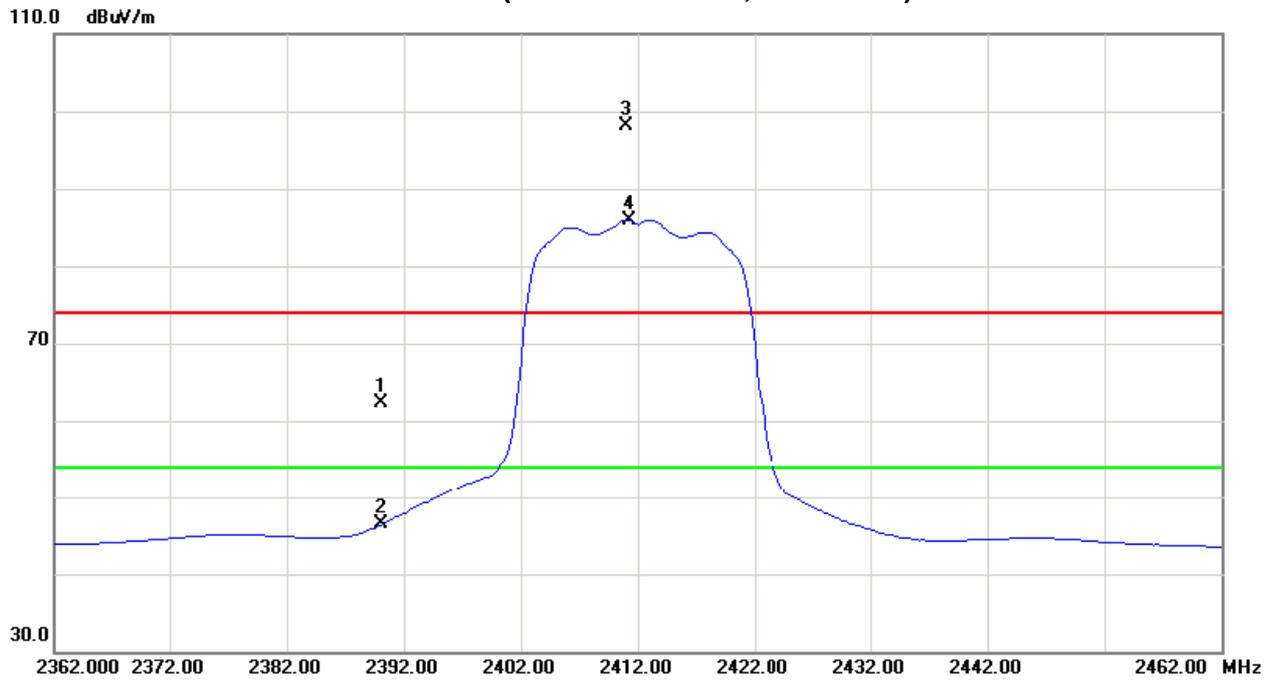
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	30.09	14.13	32.28	62.37	46.41	74.00	54.00	X/E
<b>2411.00</b>	<b>H</b>	<b>65.78</b>	<b>53.70</b>	<b>32.26</b>	<b>98.04</b>	<b>85.96</b>			<b>X/F</b>
4823.93	H	48.42	33.58	5.65	54.07	39.23	74.00	54.00	X/H

### 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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH01 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE 2437MHz		

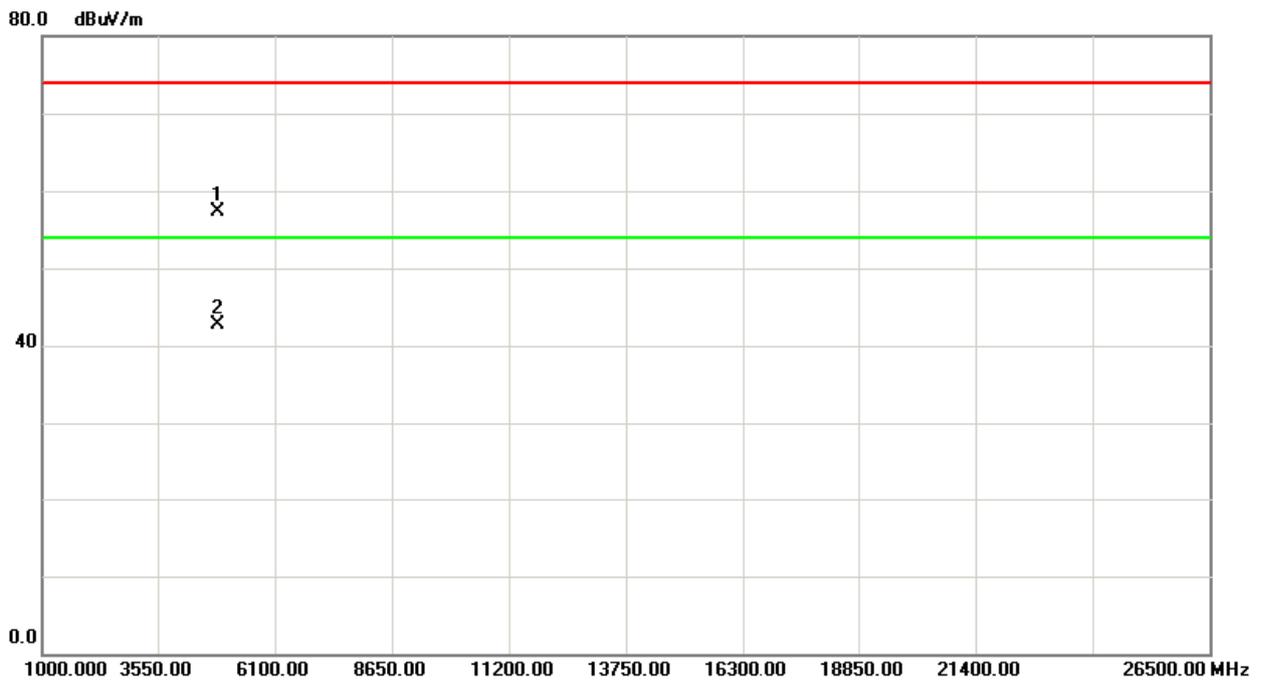
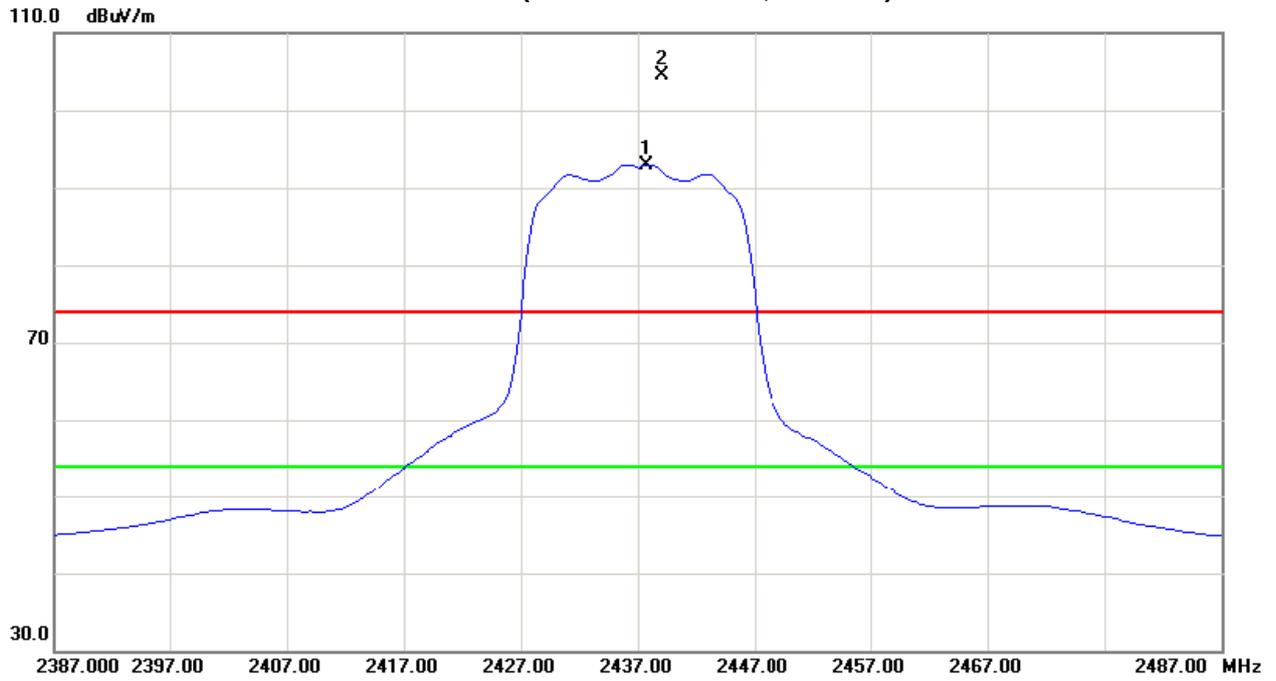
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2437.75</b>	<b>V</b>	<b>72.21</b>	<b>60.76</b>	<b>32.22</b>	<b>104.43</b>	<b>92.98</b>			<b>X/F</b>
4873.83	V	51.74	37.18	5.47	57.21	42.65	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE 2437MHz		

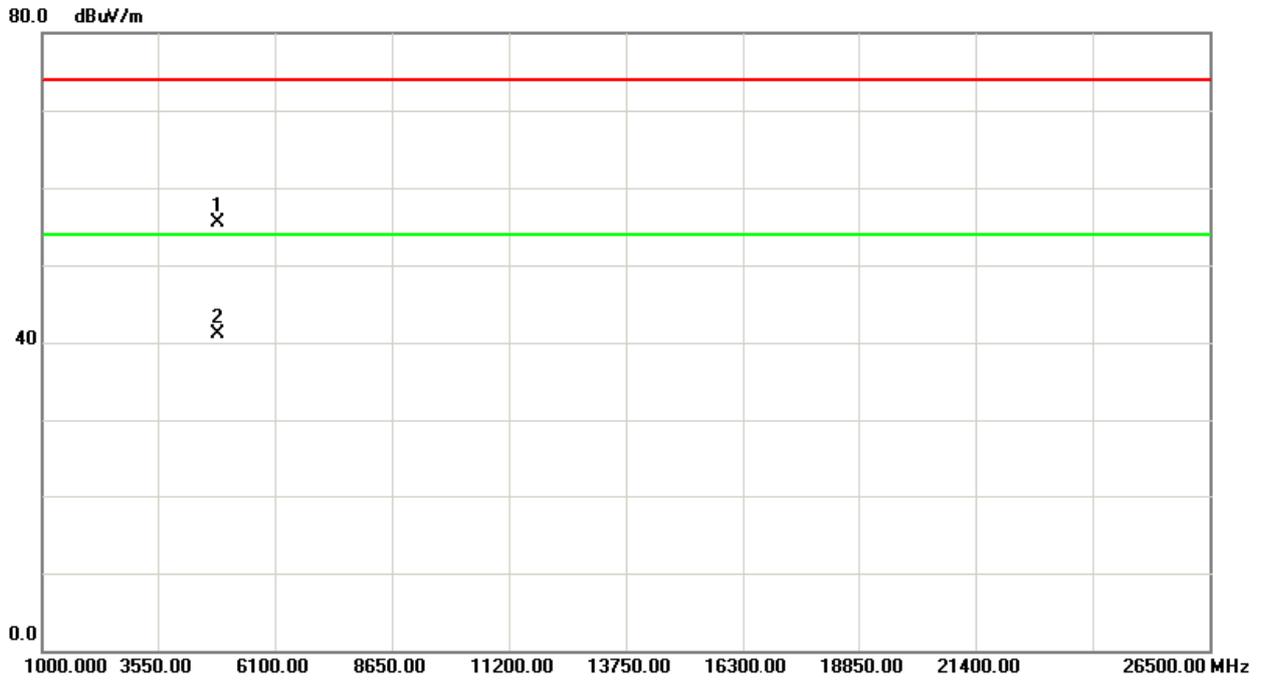
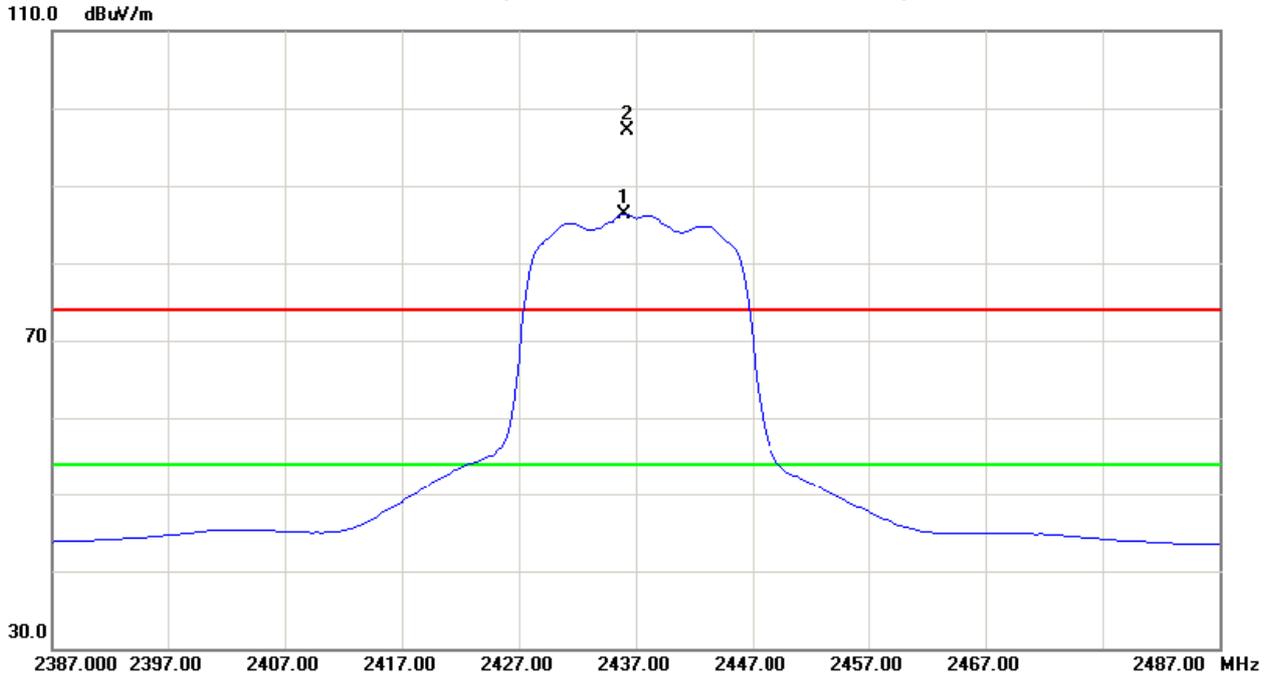
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2436.25</b>	<b>H</b>	<b>64.85</b>	<b>54.04</b>	<b>32.23</b>	<b>97.08</b>	<b>86.27</b>			<b>X/F</b>
4873.69	H	49.98	35.72	5.47	55.45	41.19	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Horizontal)





## Neutron Engineering Inc.

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE 2462MHz		

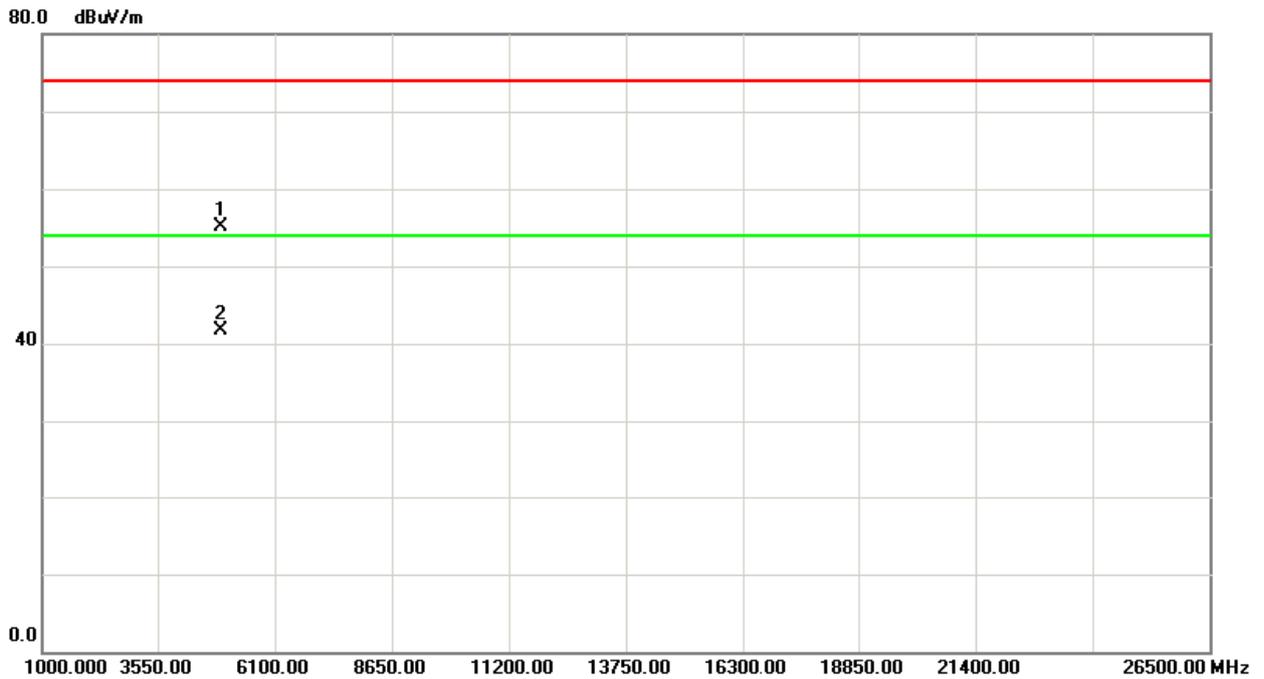
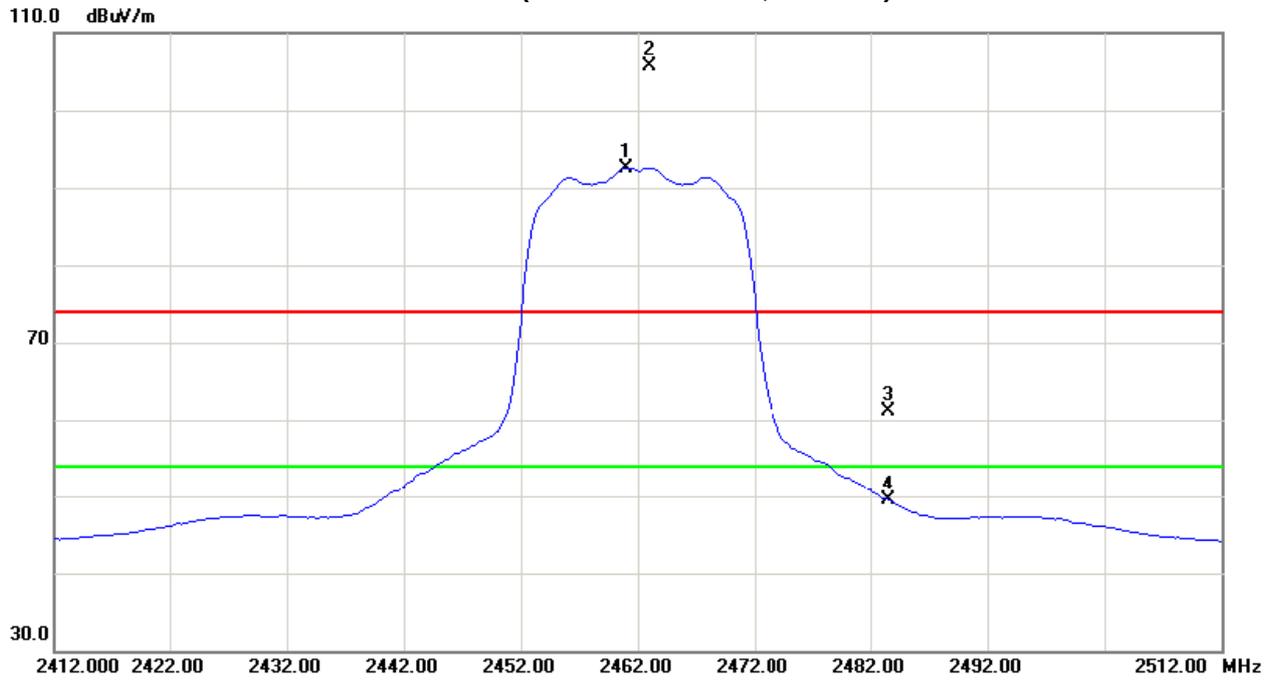
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2461.00</b>	<b>V</b>	<b>73.54</b>	<b>60.35</b>	<b>32.20</b>	<b>105.74</b>	<b>92.55</b>			<b>X/F</b>
2483.50	V	28.87	17.31	32.17	61.04	49.48	74.00	54.00	X/E
4923.85	V	49.54	36.09	5.65	55.19	41.74	74.00	54.00	X/H

### 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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH11 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE 2462MHz		

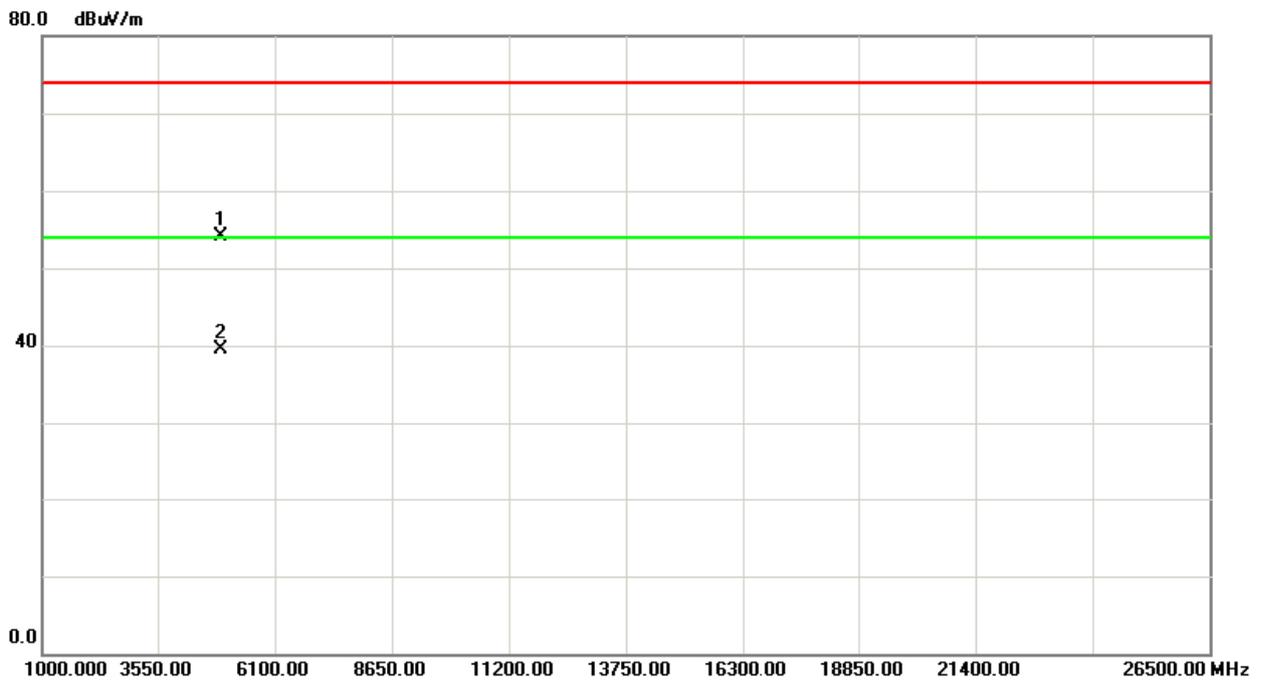
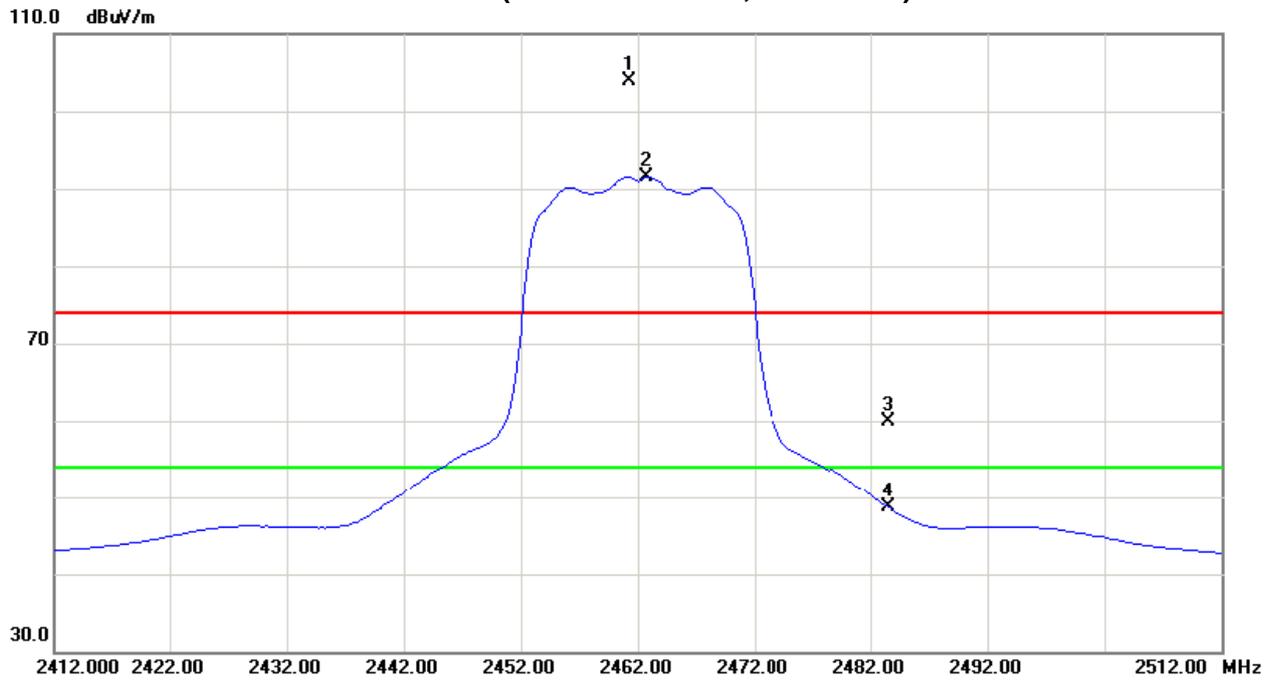
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2461.25</b>	<b>H</b>	<b>71.65</b>	<b>59.28</b>	<b>32.20</b>	<b>103.85</b>	<b>91.48</b>			<b>X/F</b>
2483.50	H	27.64	16.48	32.17	59.81	48.65	74.00	54.00	X/E
4923.97	H	48.46	33.76	5.65	54.11	39.41	74.00	54.00	X/H

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH11 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE 2422MHz		

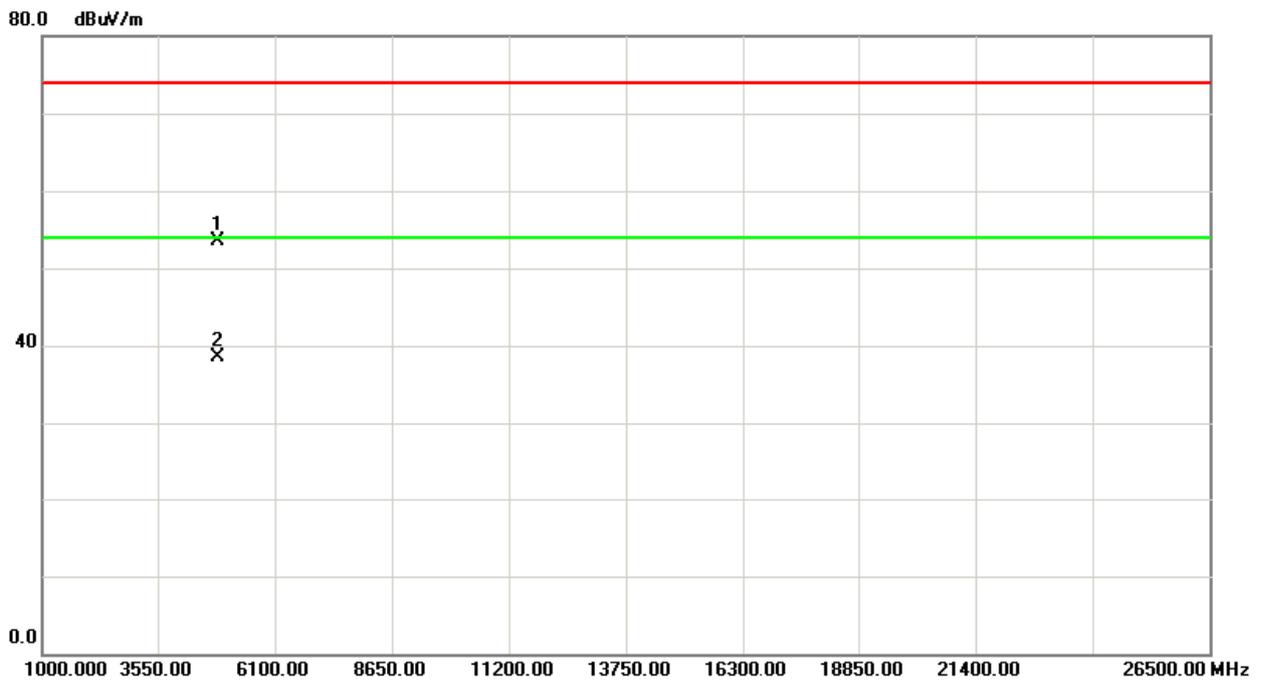
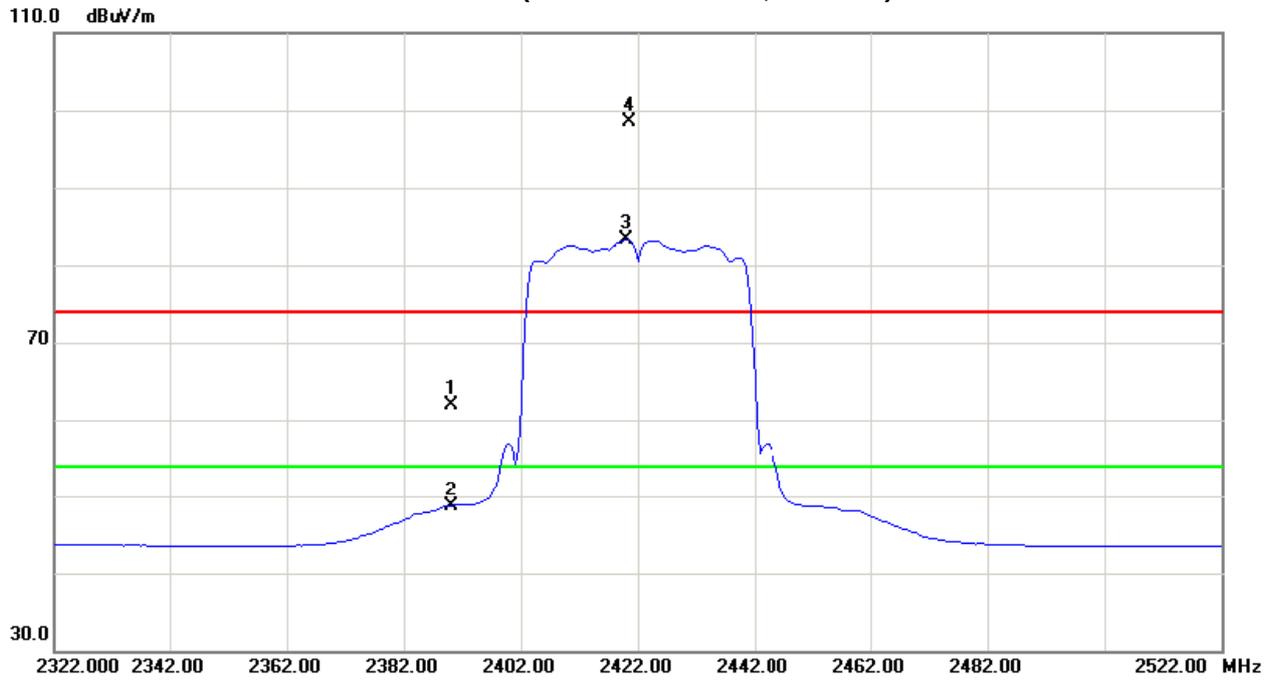
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	29.62	16.40	32.28	61.90	48.68	74.00	54.00	X/E
<b>2420.50</b>	<b>V</b>	<b>66.22</b>	<b>50.98</b>	<b>32.25</b>	<b>98.47</b>	<b>83.23</b>			<b>X/F</b>
4843.72	V	48.17	33.09	5.35	53.52	38.44	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH03 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE 2422MHz		

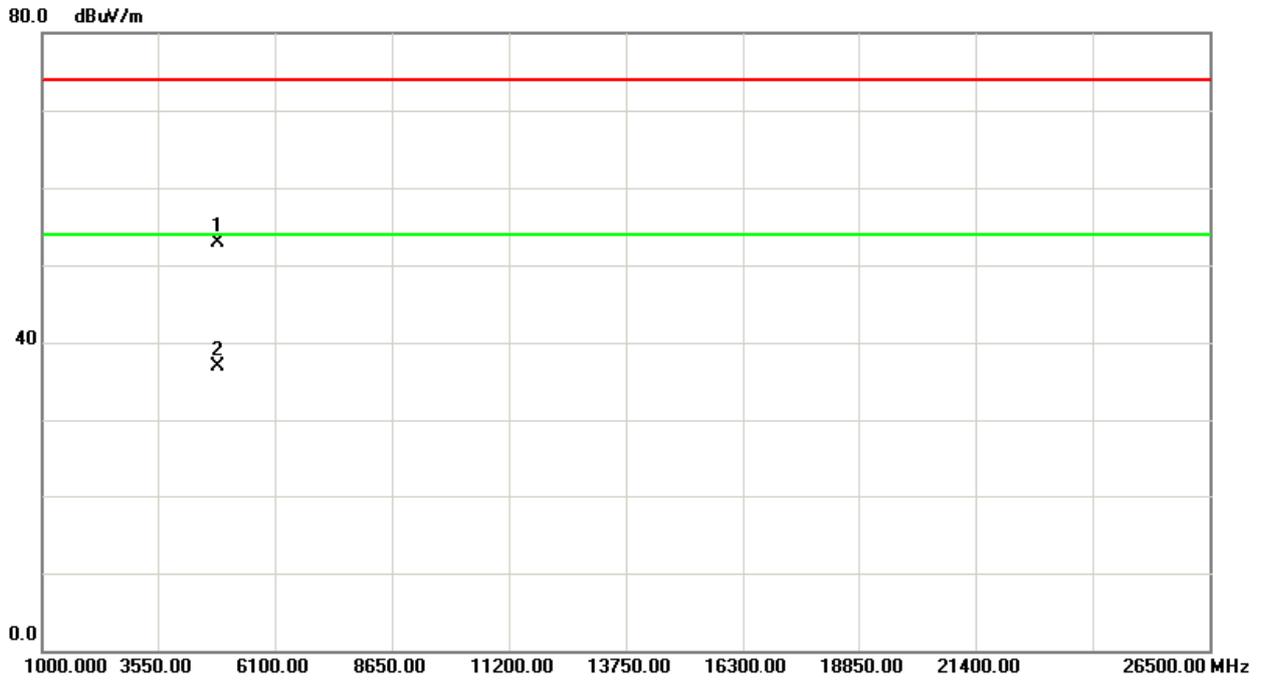
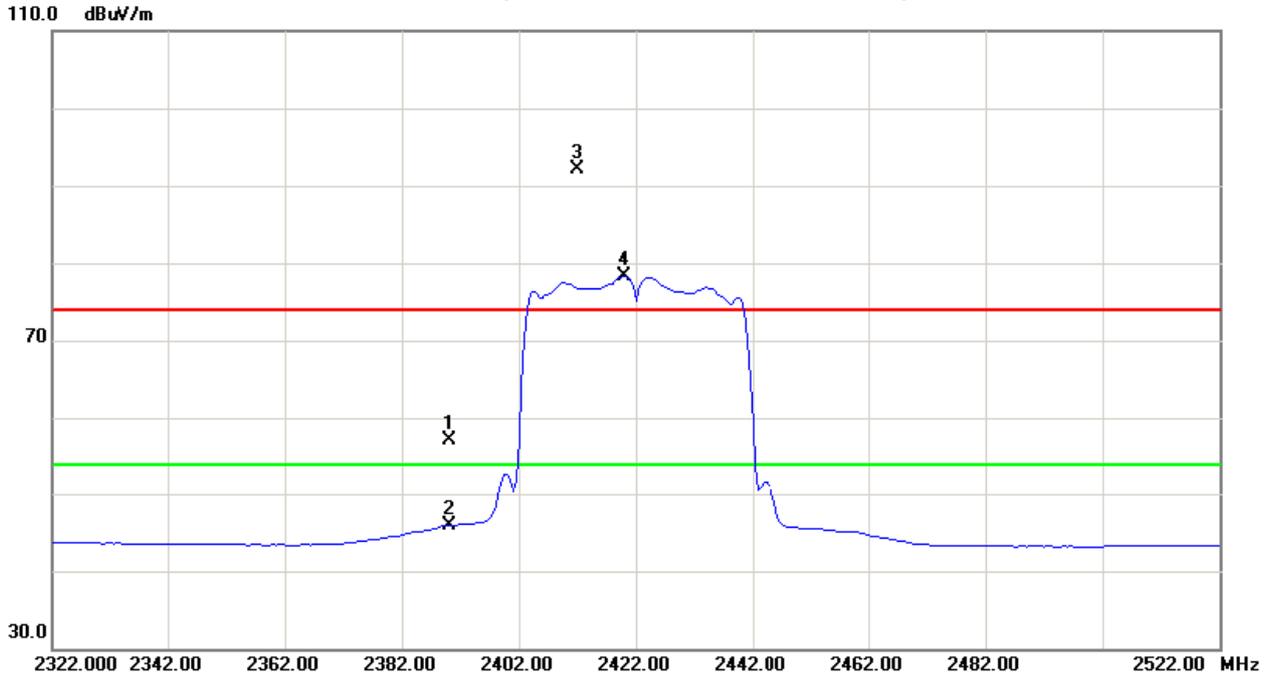
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	24.82	13.67	32.28	57.10	45.95	74.00	54.00	X/E
<b>2412.00</b>	<b>H</b>	<b>59.76</b>	<b>45.97</b>	<b>32.26</b>	<b>92.02</b>	<b>78.23</b>			<b>X/F</b>
4843.64	H	47.65	31.59	5.35	53.00	36.94	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH03 (Above 1000 MHz, Horizontal)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE 2437MHz		

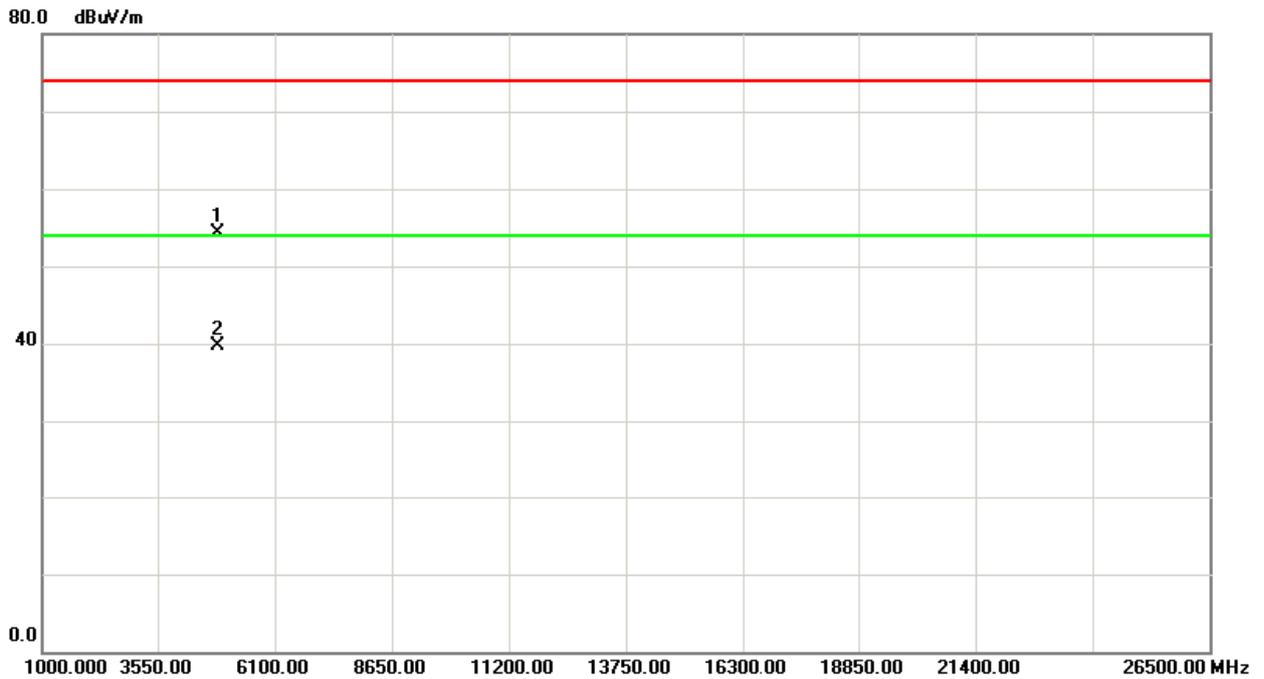
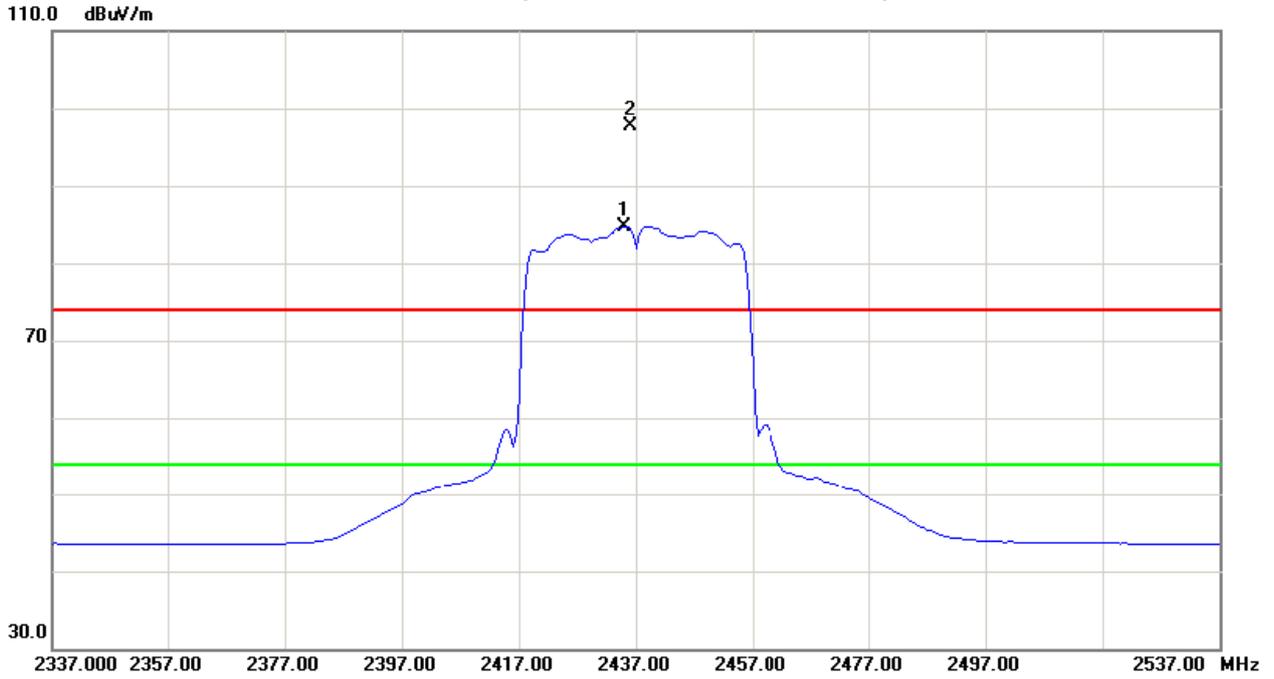
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>2435.00</b>	<b>V</b>	<b>65.56</b>	<b>52.48</b>	<b>32.23</b>	<b>97.79</b>	<b>84.71</b>			<b>X/F</b>
4873.79	V	48.79	34.15	5.47	54.26	39.62	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE 2437MHz		

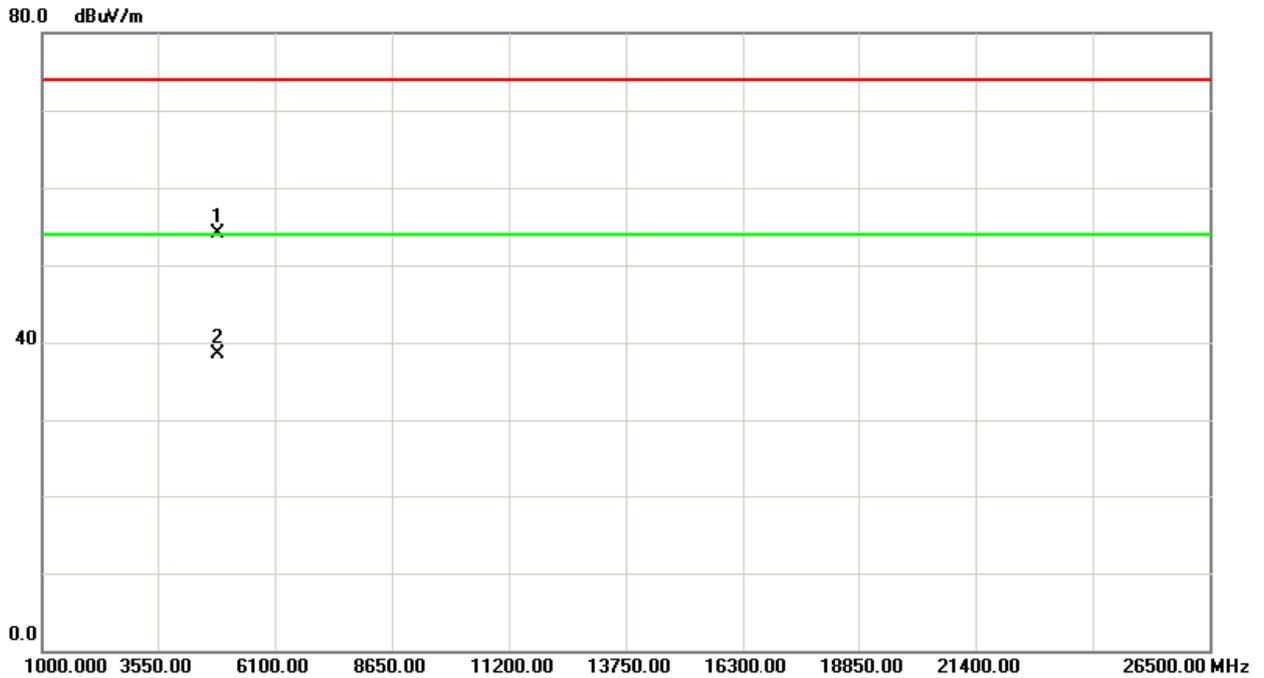
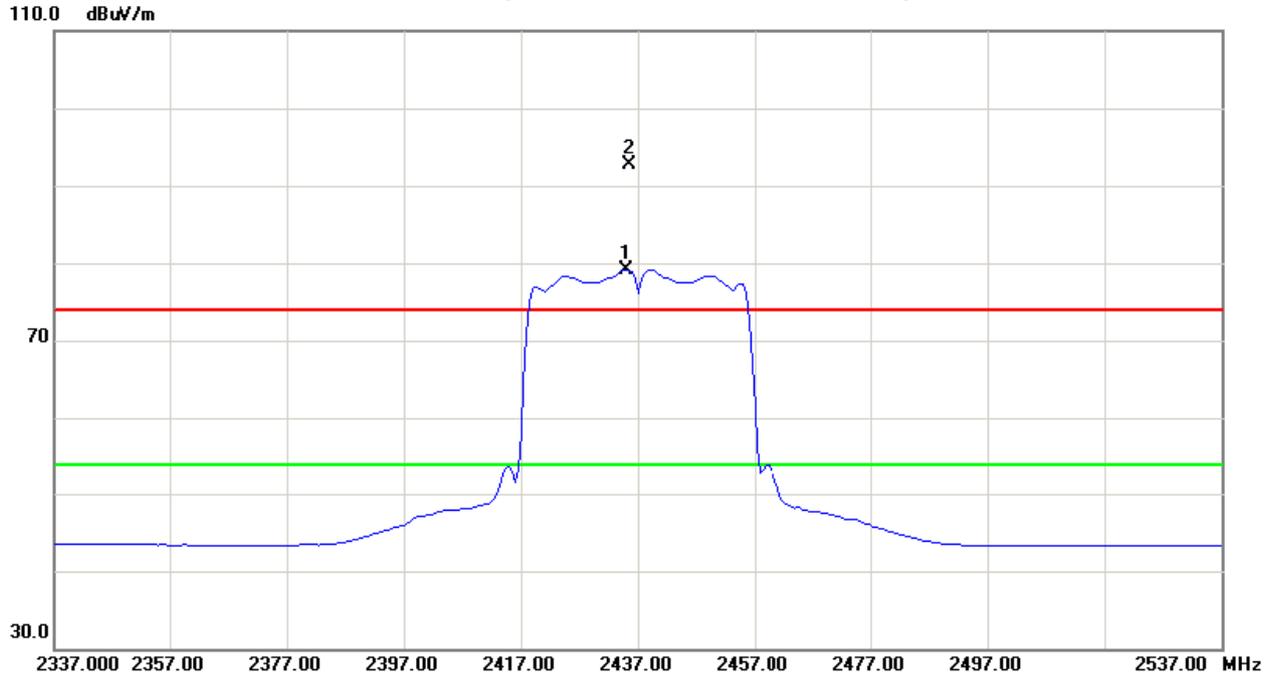
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2435.50</b>	<b>H</b>	<b>60.43</b>	<b>46.86</b>	<b>32.23</b>	<b>92.66</b>	<b>79.09</b>			<b>X/F</b>
4873.59	H	48.67	33.12	5.47	54.14	38.59	74.00	54.00	X/H

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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH06 (Above 1000 MHz, Horizontal)





## Neutron Engineering Inc.

EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE 2452MHz		

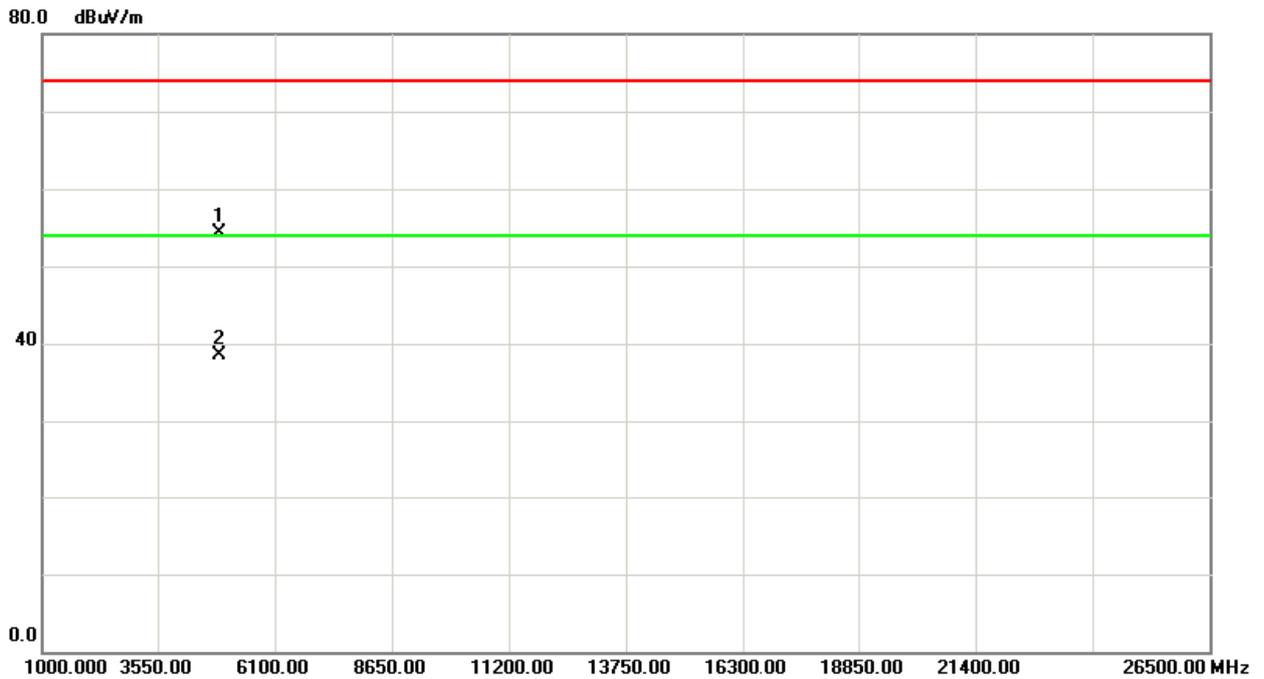
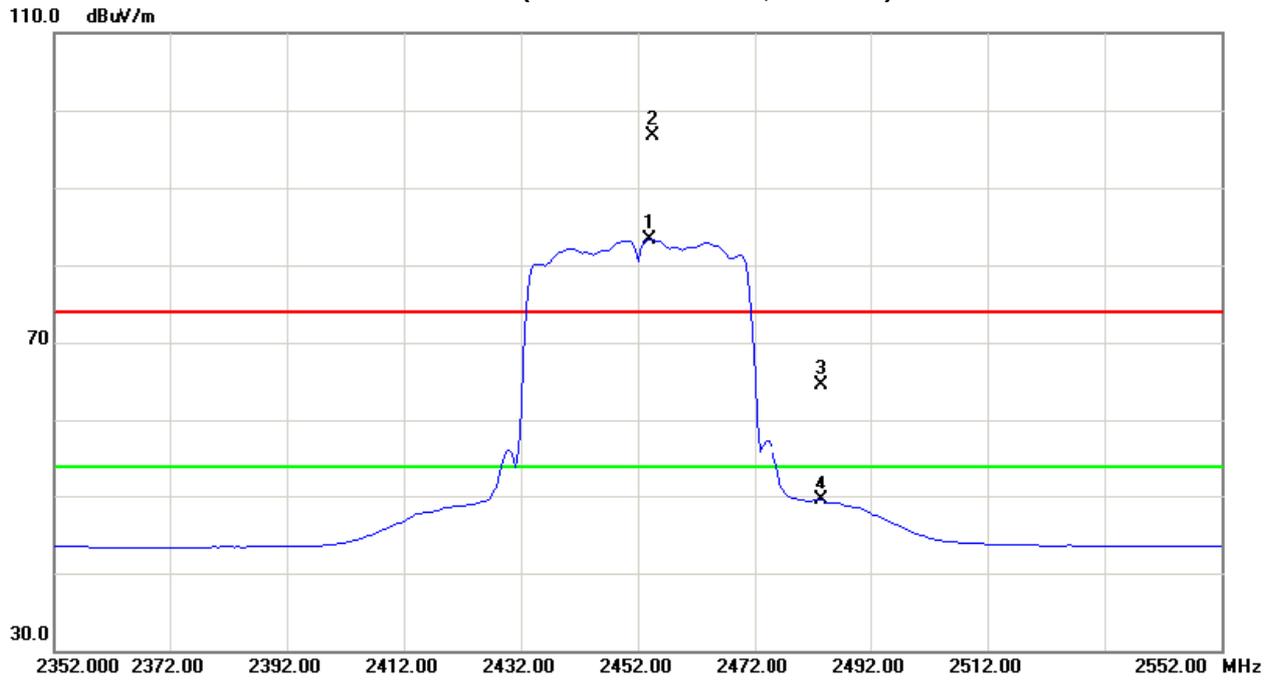
Freq. (MHz)	Ant. Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2454.50</b>	<b>V</b>	<b>64.50</b>	<b>51.50</b>	<b>32.21</b>	<b>96.71</b>	<b>83.71</b>			<b>X/F</b>
2483.50	V	32.38	17.26	32.17	64.55	49.43	74.00	54.00	X/E
4903.82	V	48.78	32.84	5.58	54.36	38.42	74.00	54.00	X/H

### 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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH09 (Above 1000 MHz, Vertical)





EUT :	Home Gateway	Model Name :	HG658
Temperature :	25 °C	Relative Humidity :	51 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE 2452MHz		

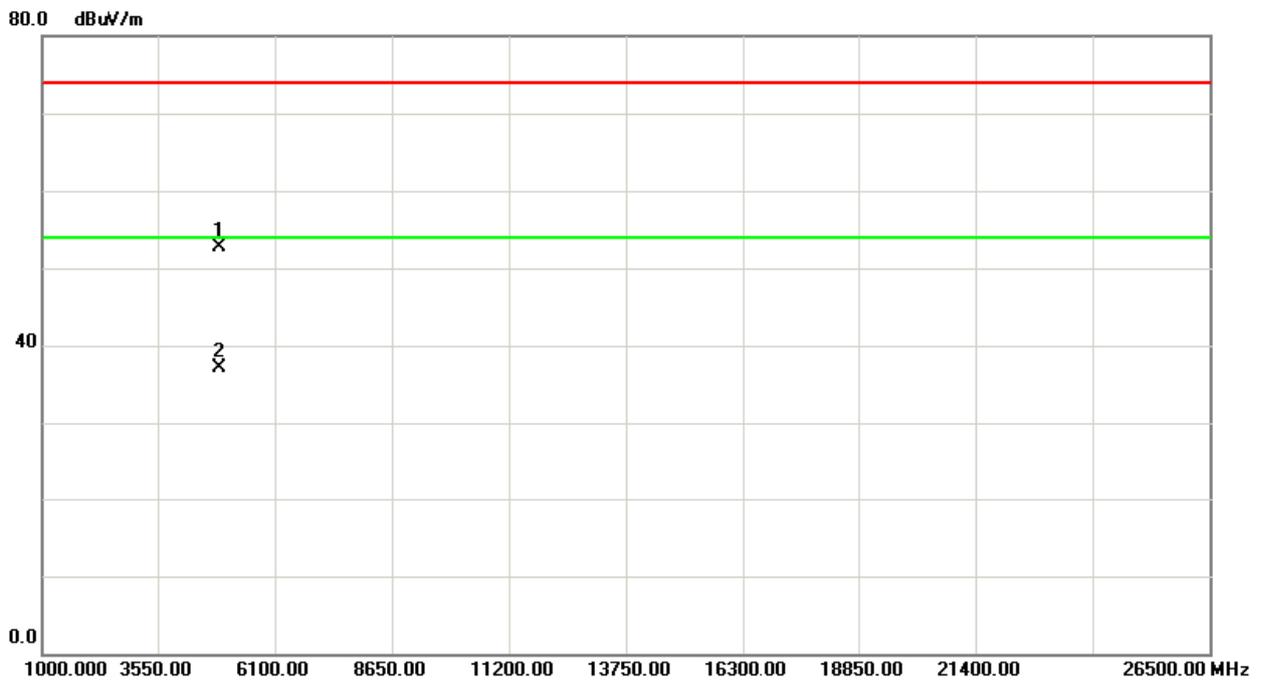
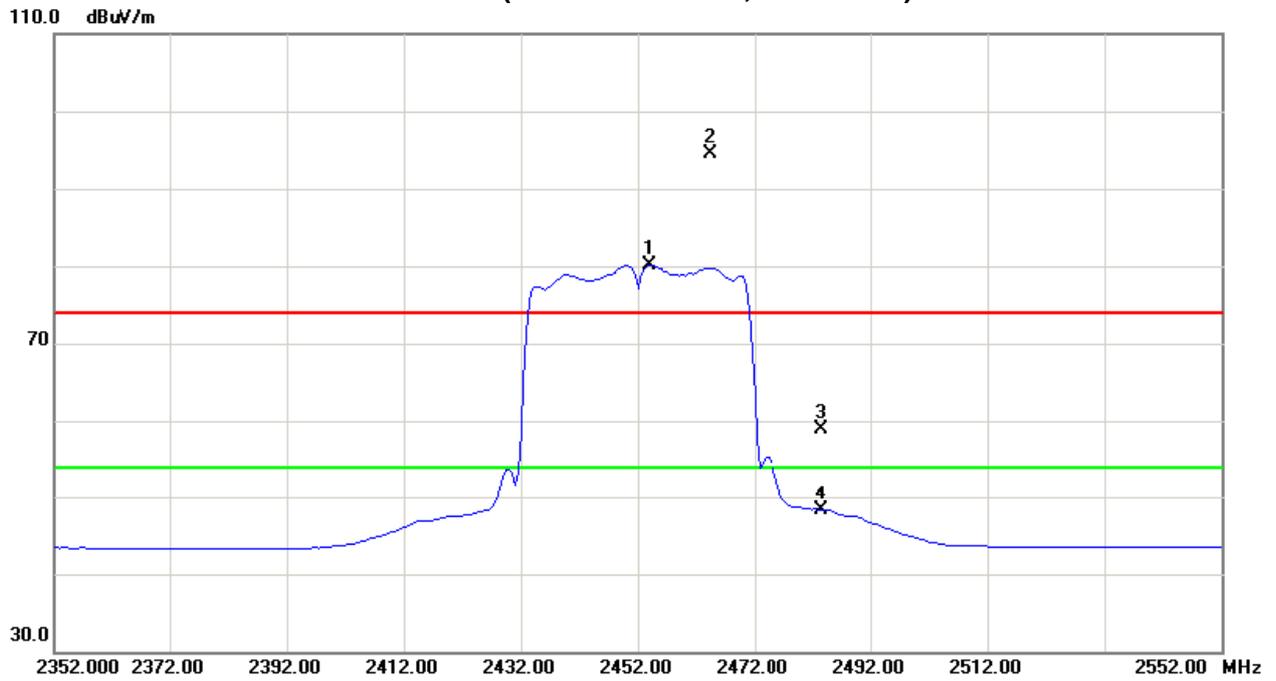
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
<b>2454.50</b>	<b>H</b>	<b>62.40</b>	<b>47.89</b>	<b>32.20</b>	<b>94.60</b>	<b>80.09</b>			<b>X/F</b>
2483.50	H	26.81	16.12	32.17	58.98	48.29	74.00	54.00	X/E
4903.68	H	47.09	31.48	5.58	52.67	37.06	74.00	54.00	X/H

**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) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) 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.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) 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



TX CH09 (Above 1000 MHz, Horizontal)





**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)	2400-2483.5	PASS

**5.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.24.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

**5.1.2 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= 300KHz, VBW=1MHz, Sweep time = 2.5 ms.

**5.1.3 DEVIATION FROM STANDARD**

No deviation.

**5.1.4 TEST SETUP**



**5.1.5 EUT OPERATION CONDITIONS**

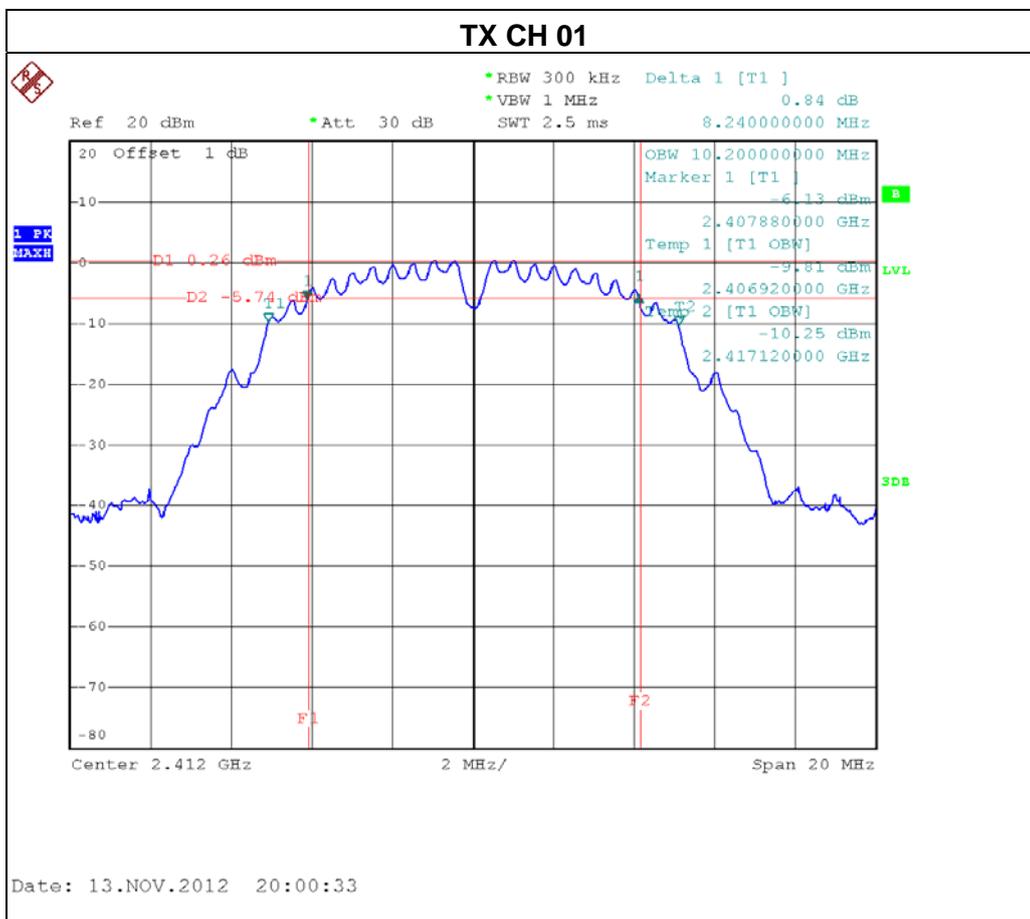
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

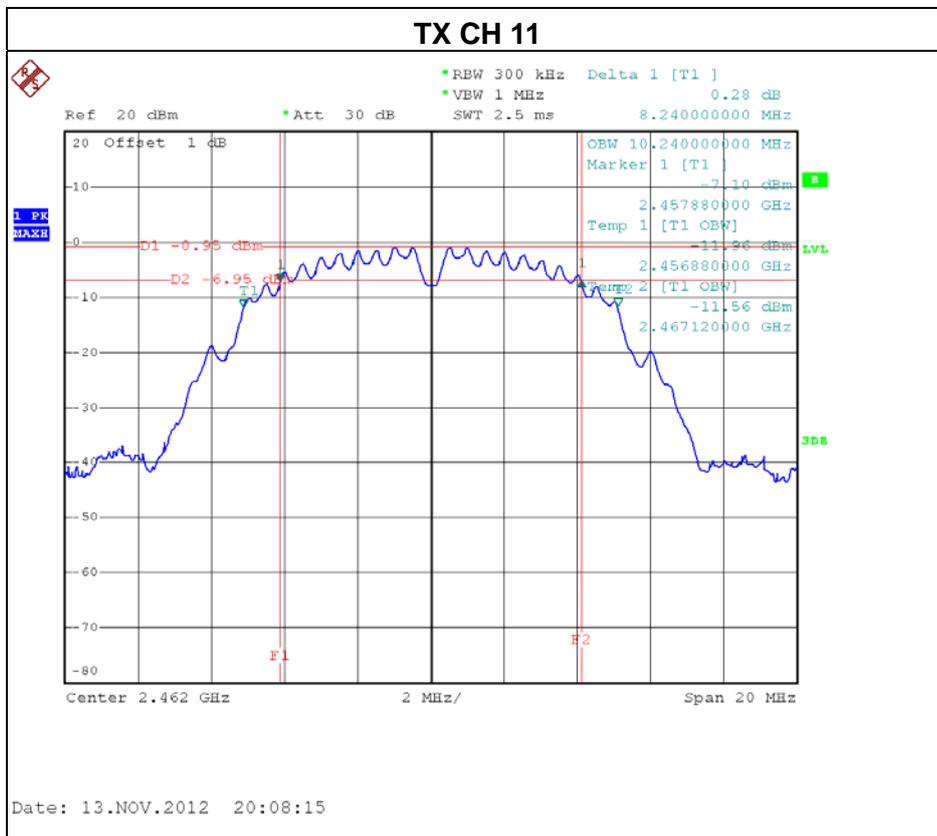
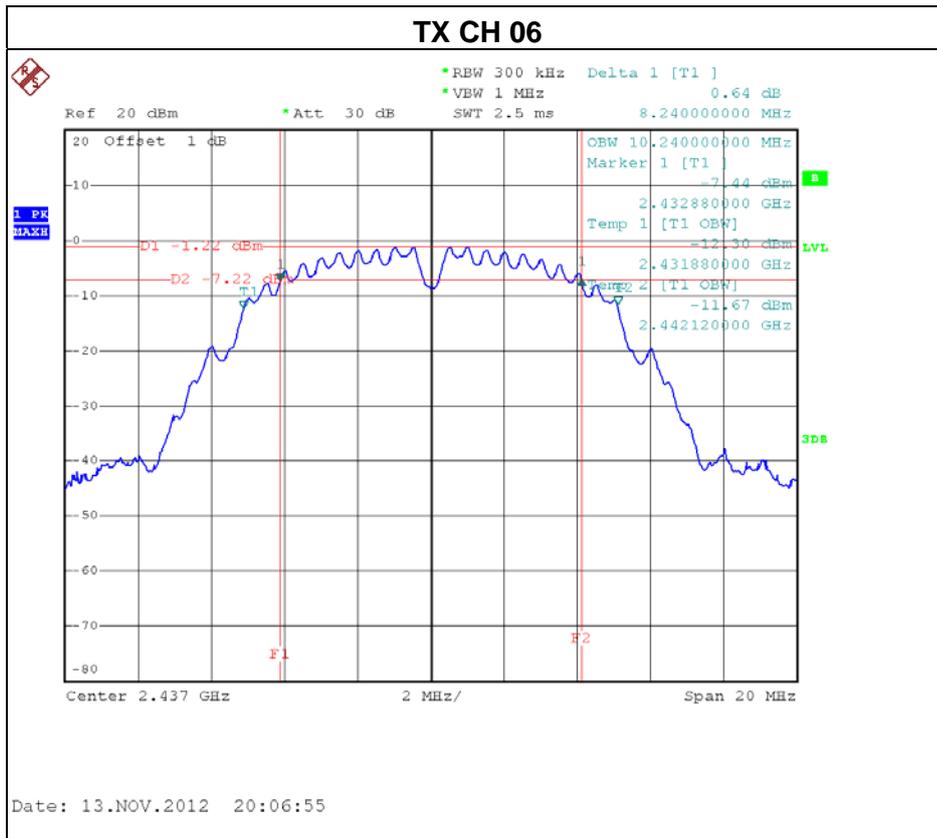


**5.1.6 TEST RESULTS**

EUT :	Home Gateway	Model Name. :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	LIMIT (MHz)
CH01	2412	8.24	>=500KHz
CH06	2437	8.24	>=500KHz
CH11	2462	8.24	>=500KHz

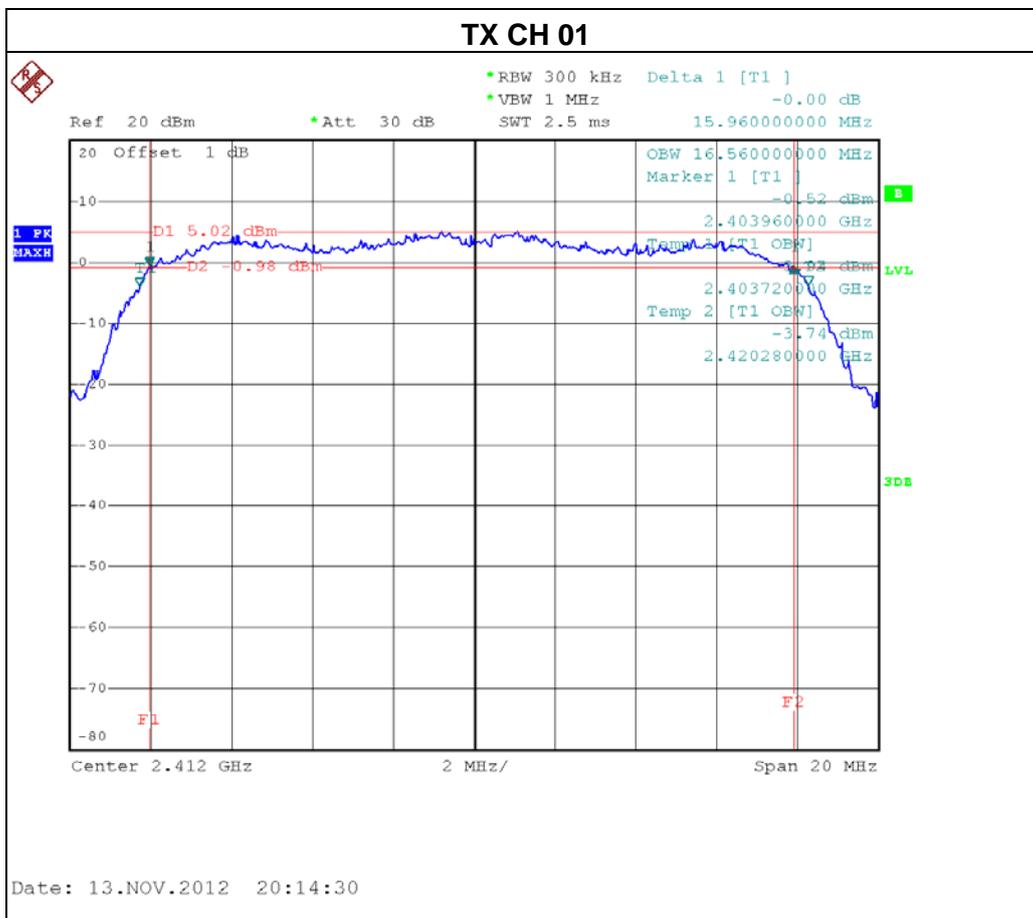


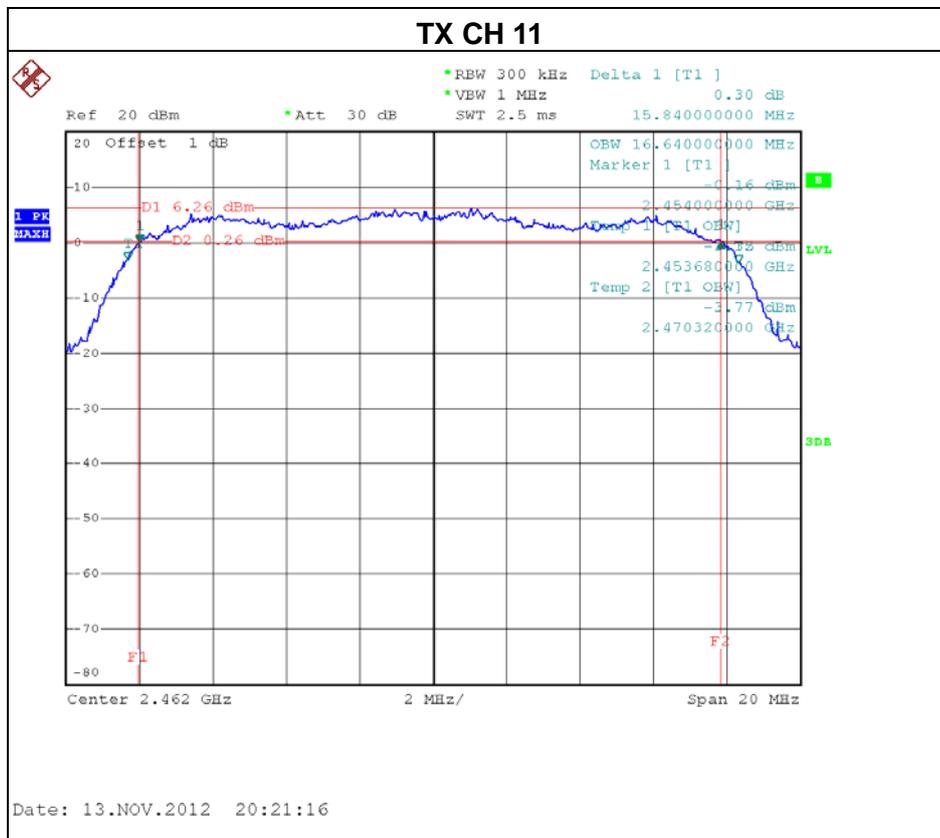
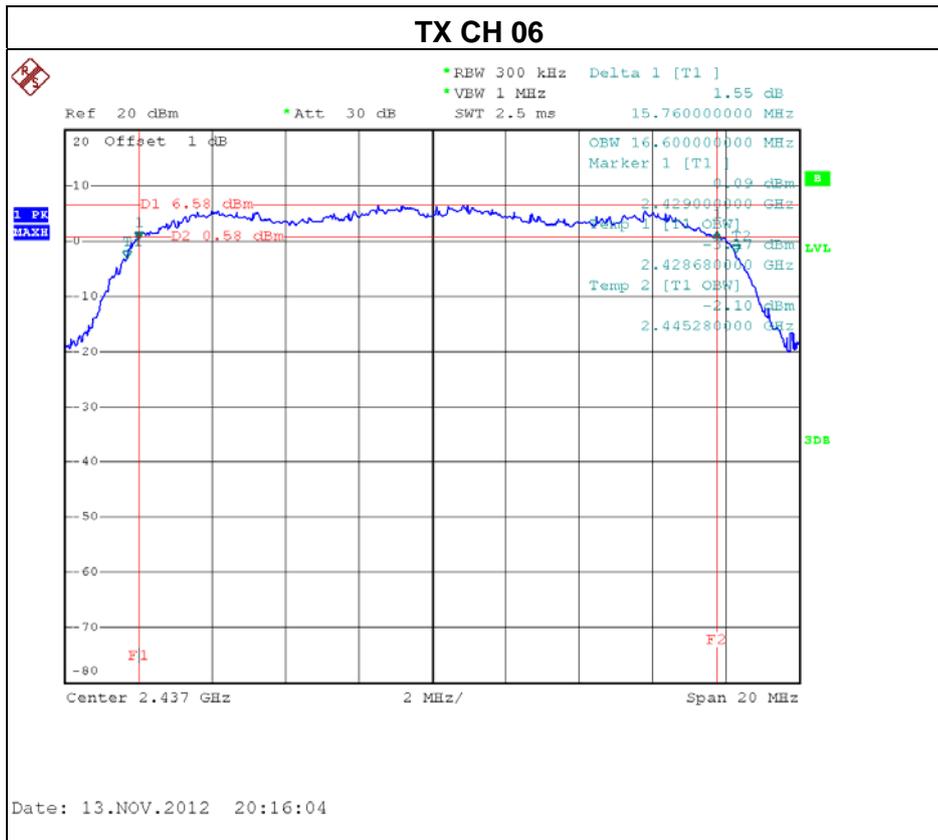




EUT :	Home Gateway	Model Name. :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	LIMIT (MHz)
CH01	2412	15.96	>=500KHz
CH06	2437	15.76	>=500KHz
CH11	2462	15.84	>=500KHz

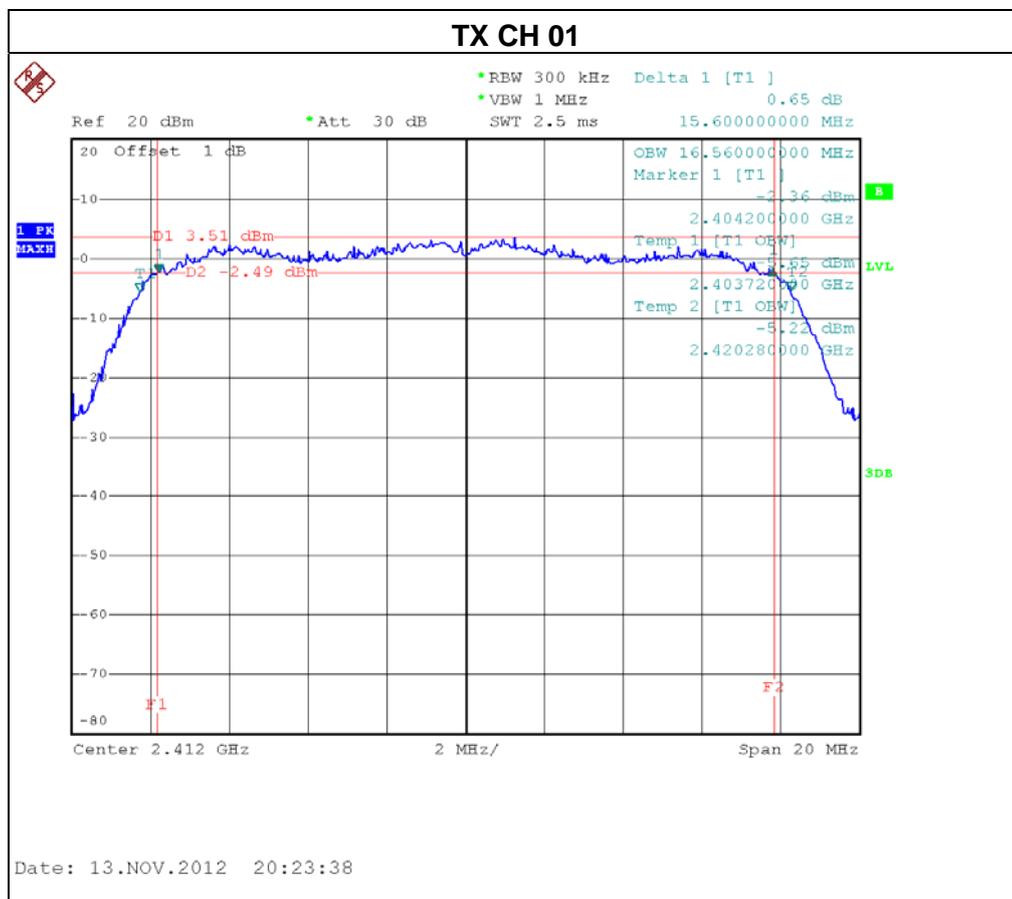


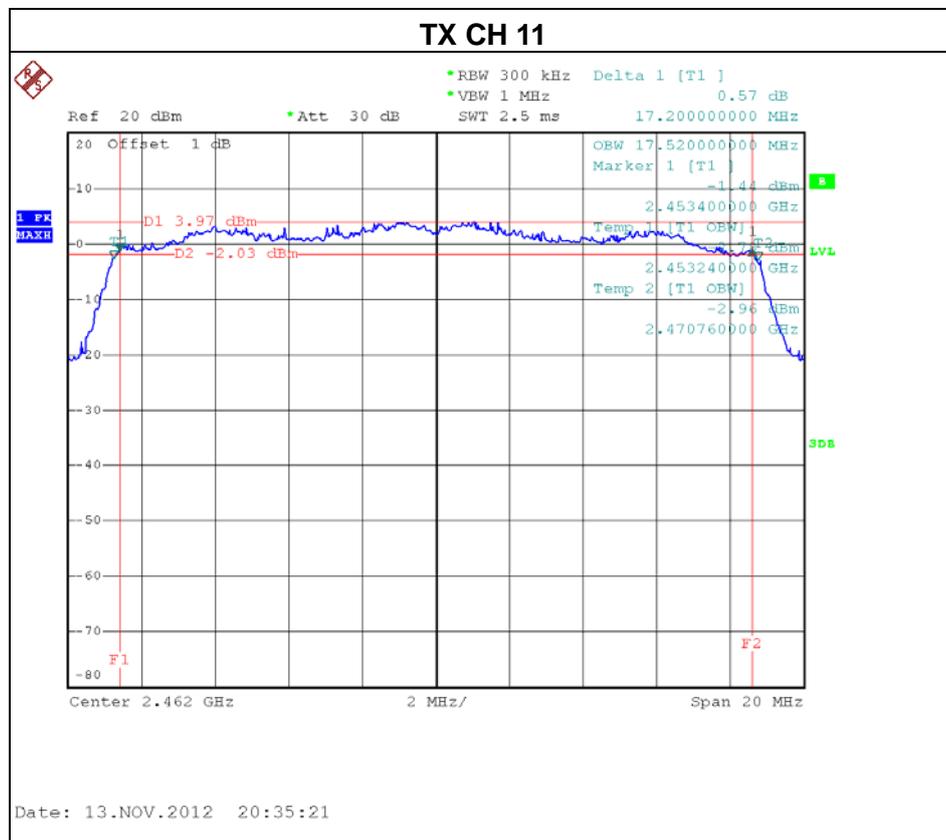
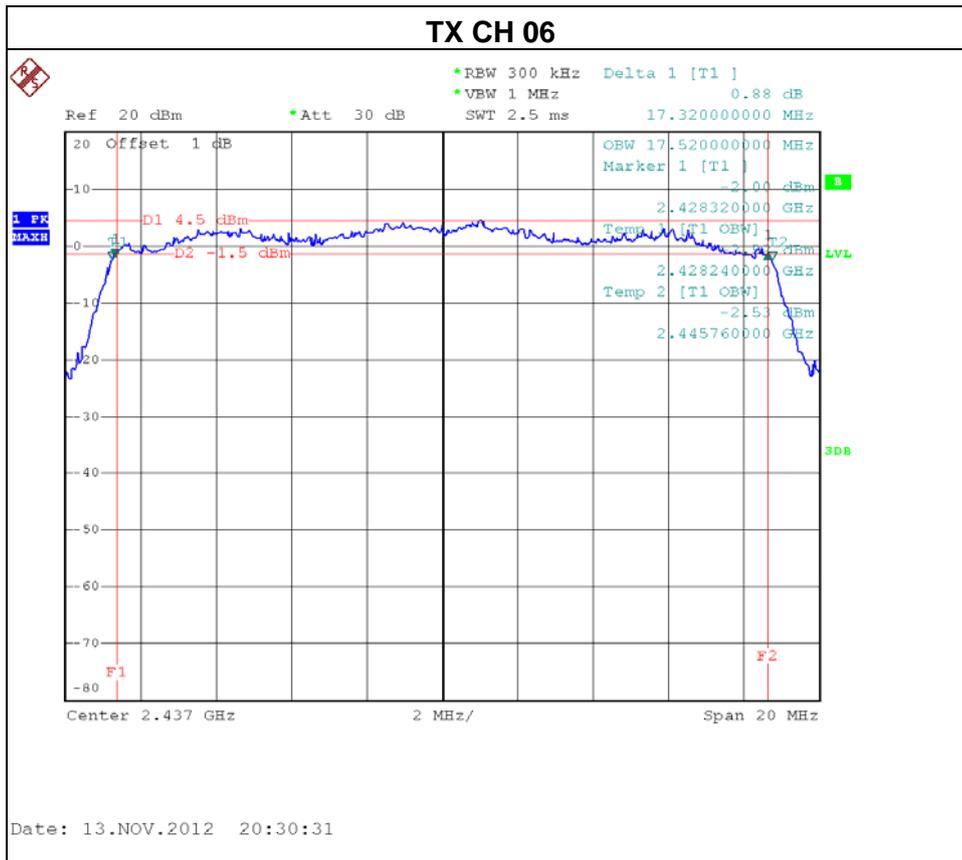




EUT :	Home Gateway	Model Name. :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE -20MHz/ CH01, CH06, CH11—ANT 1		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	LIMIT (MHz)
CH01	2412	15.60	>=500KHz
CH06	2437	17.32	>=500KHz
CH11	2462	17.20	>=500KHz

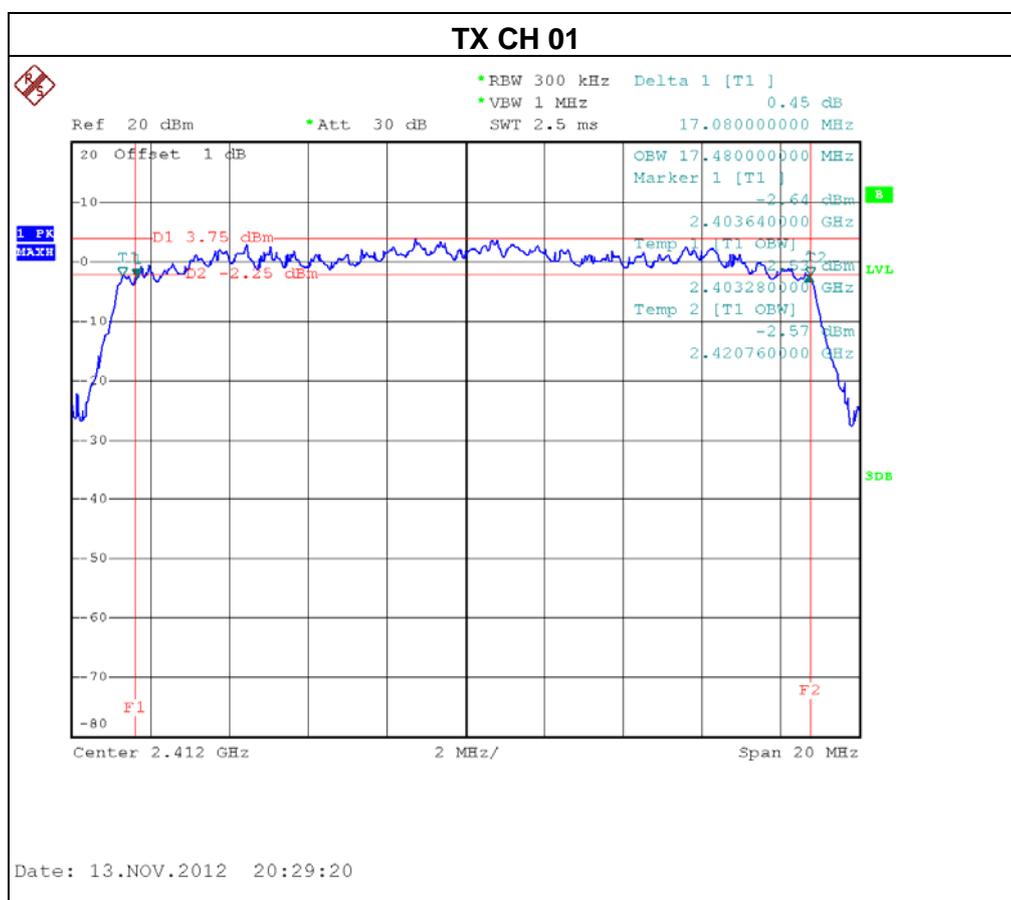


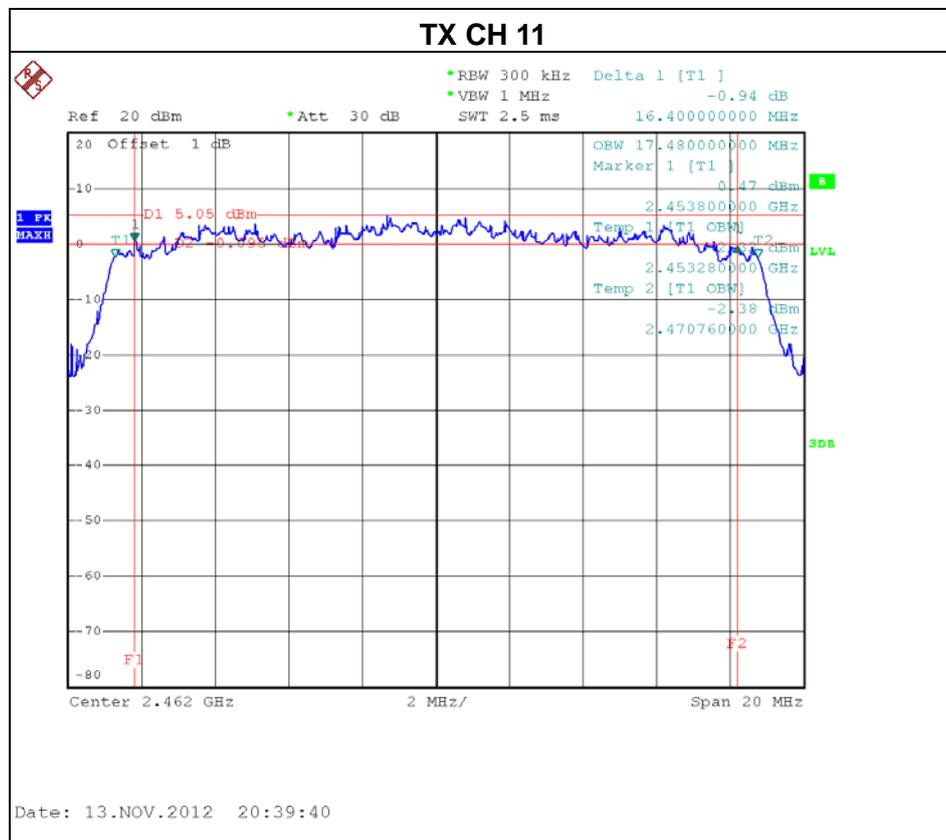
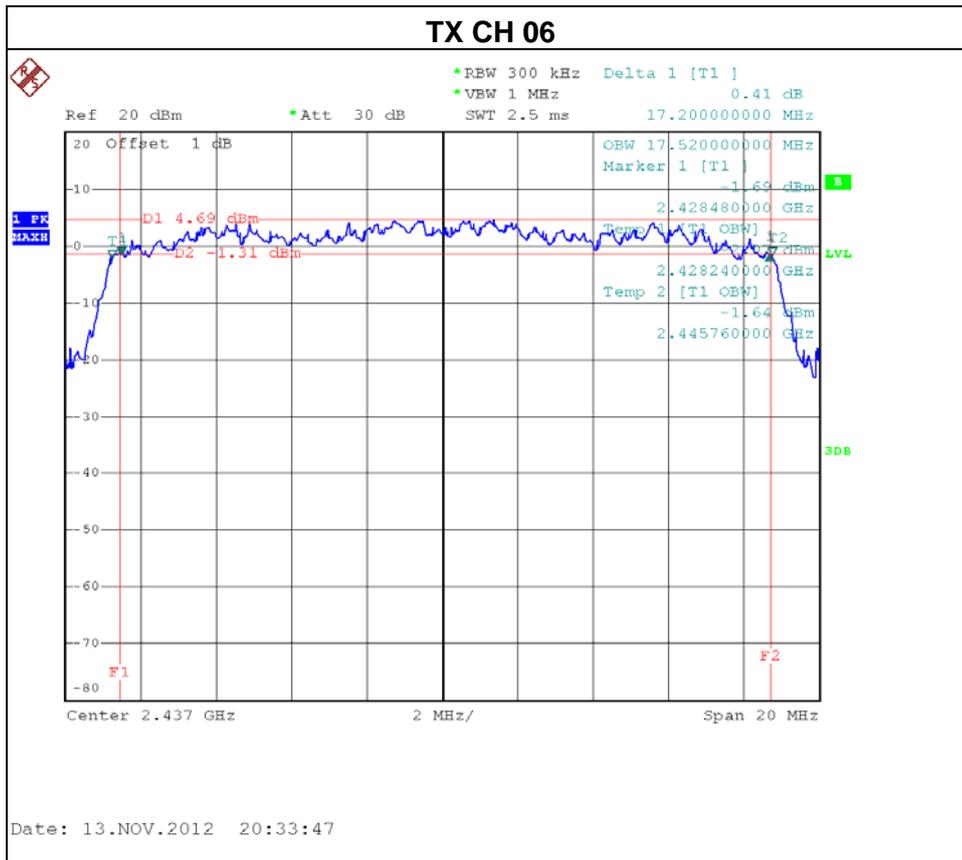




EUT :	Home Gateway	Model Name. :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE -20MHz/ CH01, CH06, CH11—ANT 2		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	LIMIT (MHz)
CH01	2412	17.08	>=500KHz
CH06	2437	17.20	>=500KHz
CH11	2462	16.40	>=500KHz

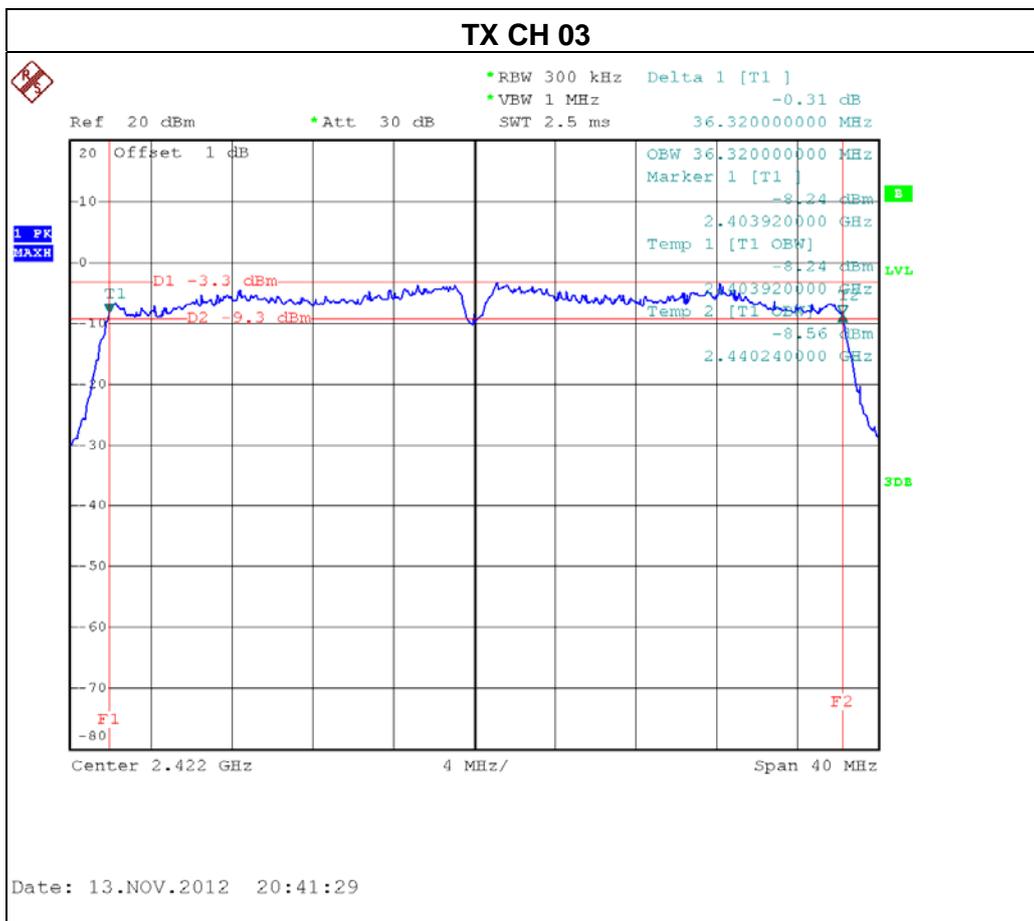


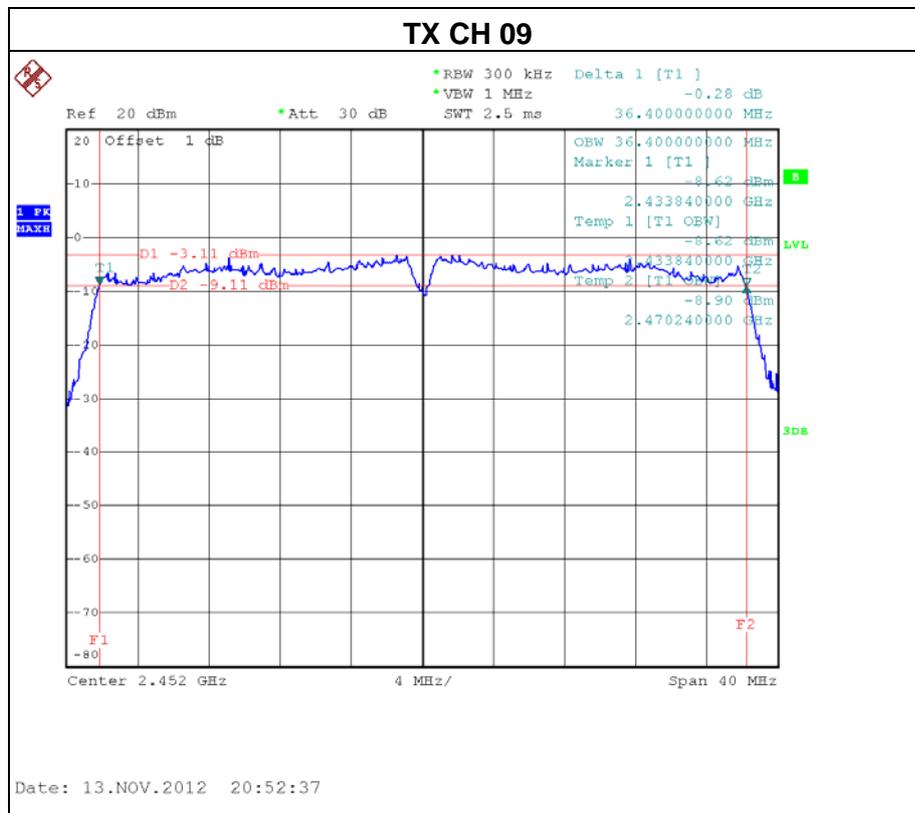
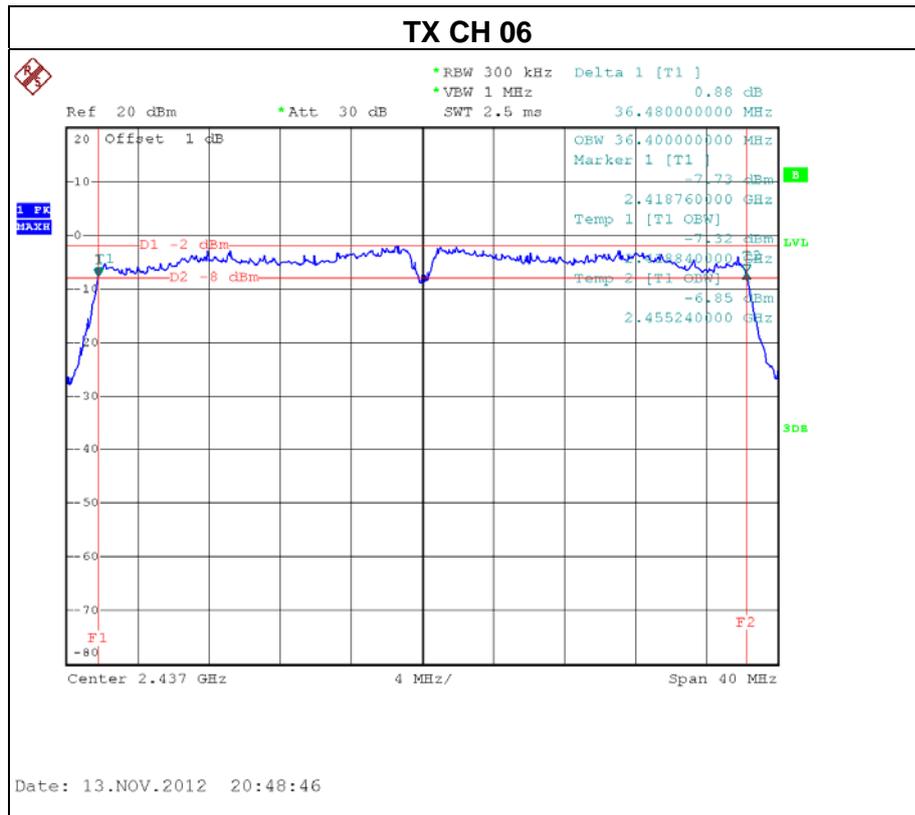




EUT :	Home Gateway	Model Name. :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE -40MHz/ CH03, CH06, CH09 —ANT 1		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	LIMIT (MHz)
CH03	2422	36.32	>=500KHz
CH06	2437	36.48	>=500KHz
CH09	2452	36.40	>=500KHz

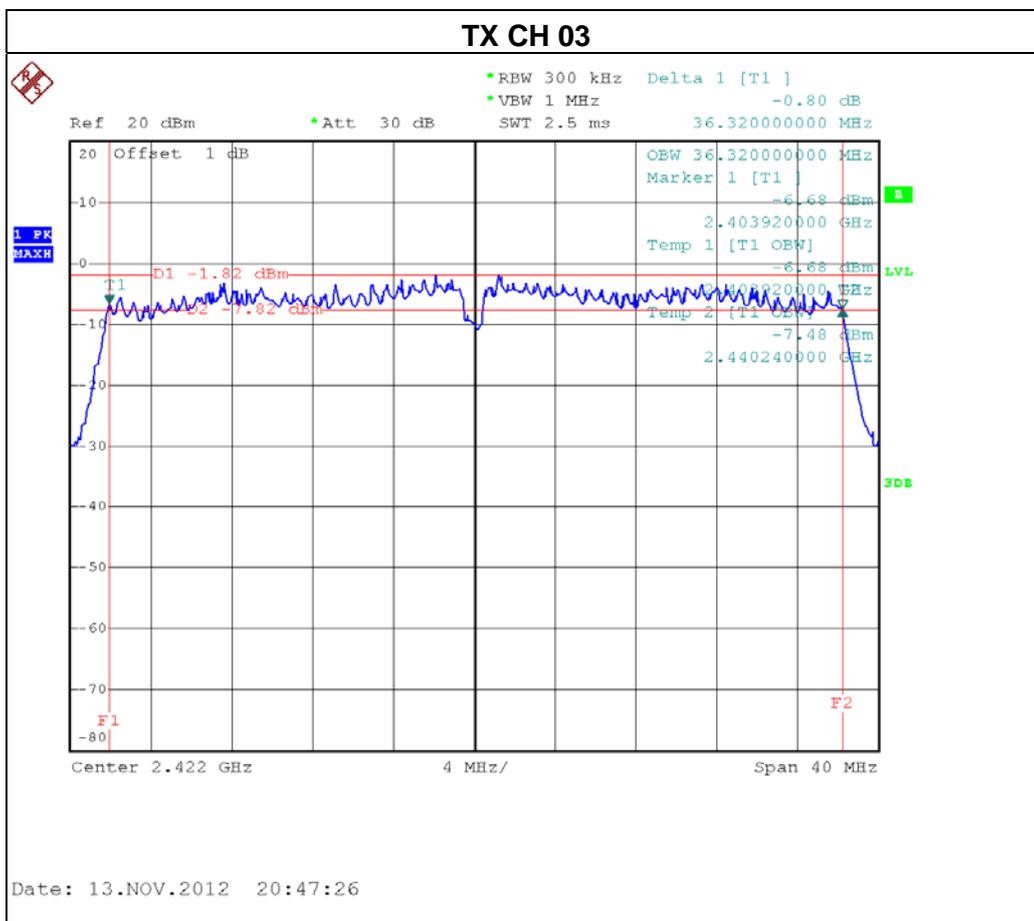


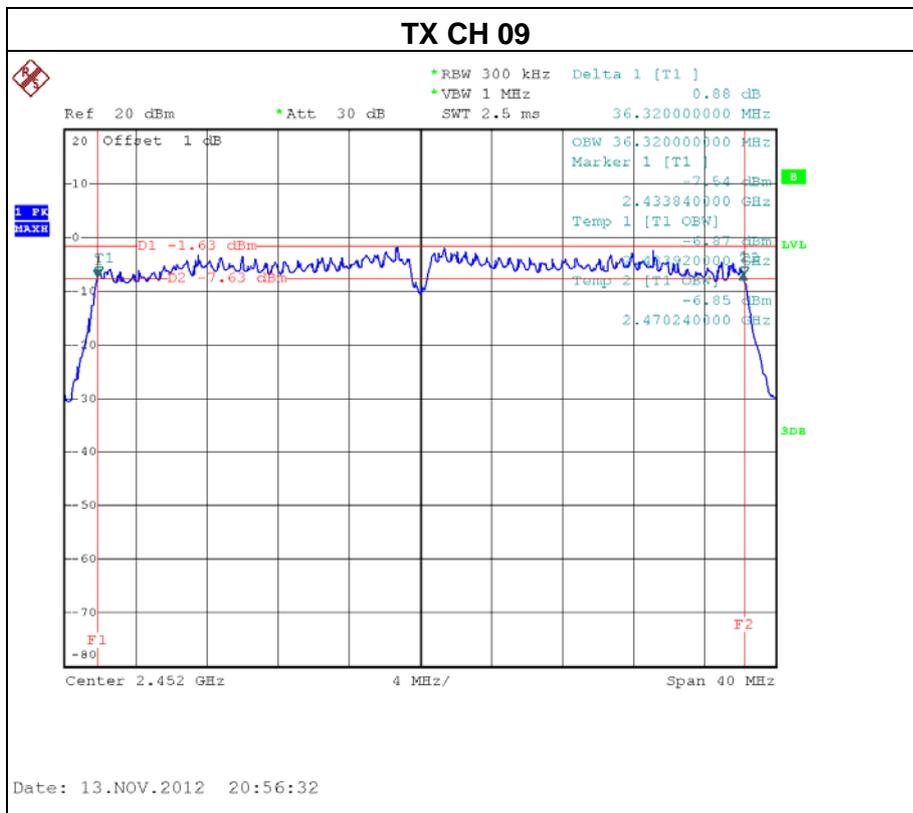
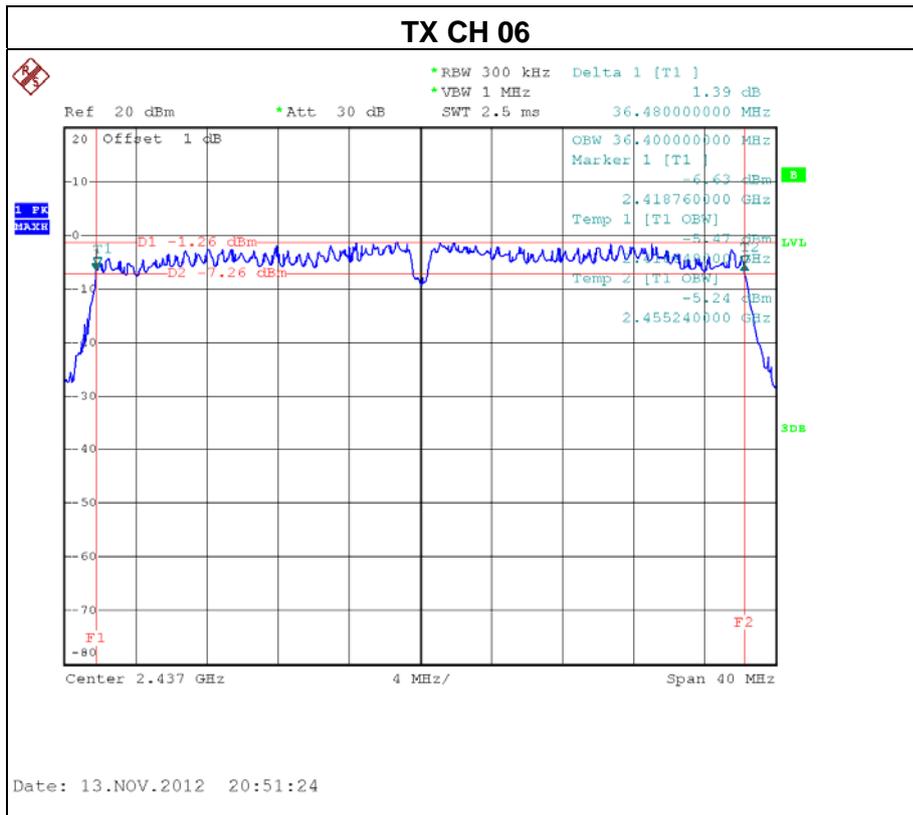




EUT :	Home Gateway	Model Name. :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE -40MHz/ CH03, CH06, CH09 —ANT 2		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	LIMIT (MHz)
CH03	2422	36.32	>=500KHz
CH06	2437	36.48	>=500KHz
CH09	2452	36.32	>=500KHz







**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	2400-2483.5	PASS

**6.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Power Meter	Anritsu	ML2495A	1128009	Nov.01.2012	Nov.01.2013
2	Pluse Power Sensor	Anritsu	MA2411B	1128009	Nov.01.2012	Nov.01.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

**6.1.2 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= 1MHz, VBW=3MHz, Sample detector, Sweep time = Auto.

**6.1.3 DEVIATION FROM STANDARD**

No deviation.

**6.1.4 TEST SETUP**



**6.1.5 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.



**6.1.6 TEST RESULTS**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE /CH01, CH06, CH11		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2412 MHz	11.18	30	1
CH06	2437 MHz	9.85	30	1
CH11	2462 MHz	10.04	30	1

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE /CH01, CH06, CH11		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2412 MHz	17.92	30	1
CH06	2437 MHz	19.50	30	1
CH11	2462 MHz	18.82	30	1

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE /CH01, CH06, CH11--ANT 1		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2412 MHz	16.35	30	1
CH06	2437 MHz	17.46	30	1
CH11	2462 MHz	17.15	30	1



EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE /CH01, CH06, CH11--ANT 2		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2412 MHz	16.43	30	1
CH06	2437 MHz	17.42	30	1
CH11	2462 MHz	17.29	30	1

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09--ANT 1		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH03	2422 MHz	13.11	30	1
CH06	2437 MHz	14.63	30	1
CH09	2452 MHz	13.34	30	1

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09--ANT 2		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH03	2422 MHz	14.03	30	1
CH06	2437 MHz	15.27	30	1
CH09	2452 MHz	13.98	30	1



EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE /CH03, CH06, CH09 -- ANT 1+ ANT 2		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH03	2422 MHz	19.40	30	1
CH06	2437 MHz	20.45	30	1
CH09	2452 MHz	20.23	30	1

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09 -- ANT 1+ ANT 2		

**Maximum Output Power**

Test Channel	Frequency (MHz)	Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH03	2422 MHz	16.60	30	1
CH06	2437 MHz	17.97	30	1
CH09	2452 MHz	16.68	30	1



**7. ANTENNA CONDUCTED SPURIOUS EMISSION**

**7.1 Applied procedures / limit**

30dBc 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.

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
960~1000	500	3

**7.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.24.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

**7.1.2 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.

**7.1.3 DEVIATION FROM STANDARD**

No deviation.

**7.1.4 TEST SETUP**



**7.1.5 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.



**7.1.6 TEST RESULTS**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE /CH01, CH06 , CH11		

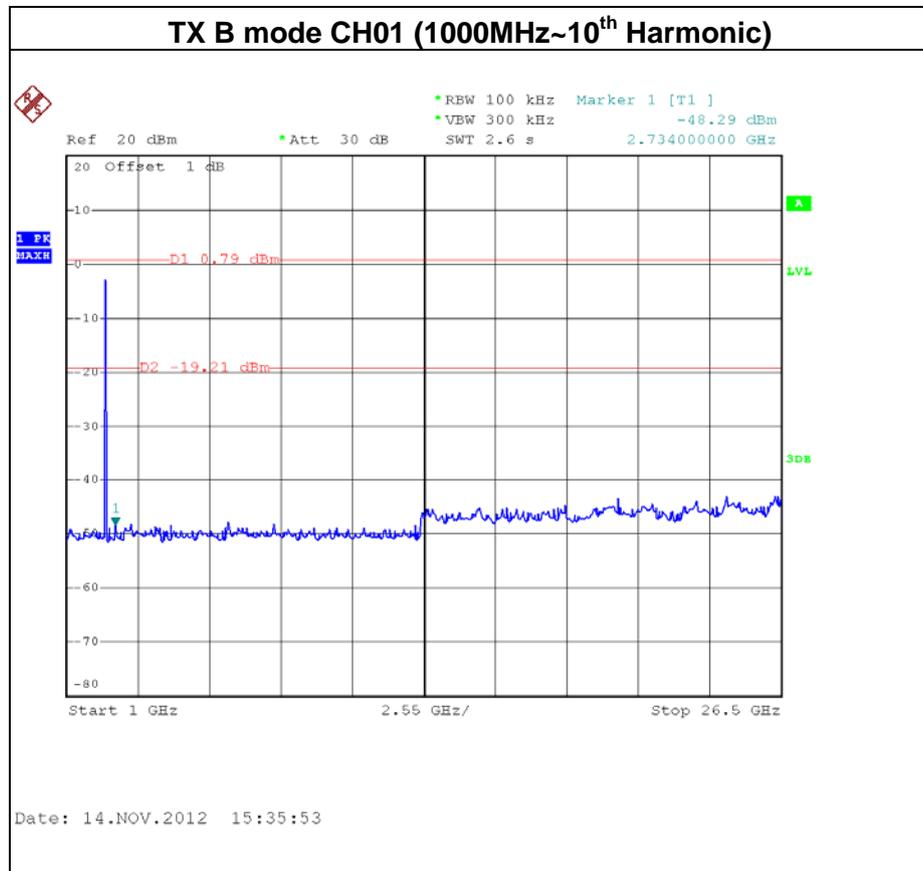
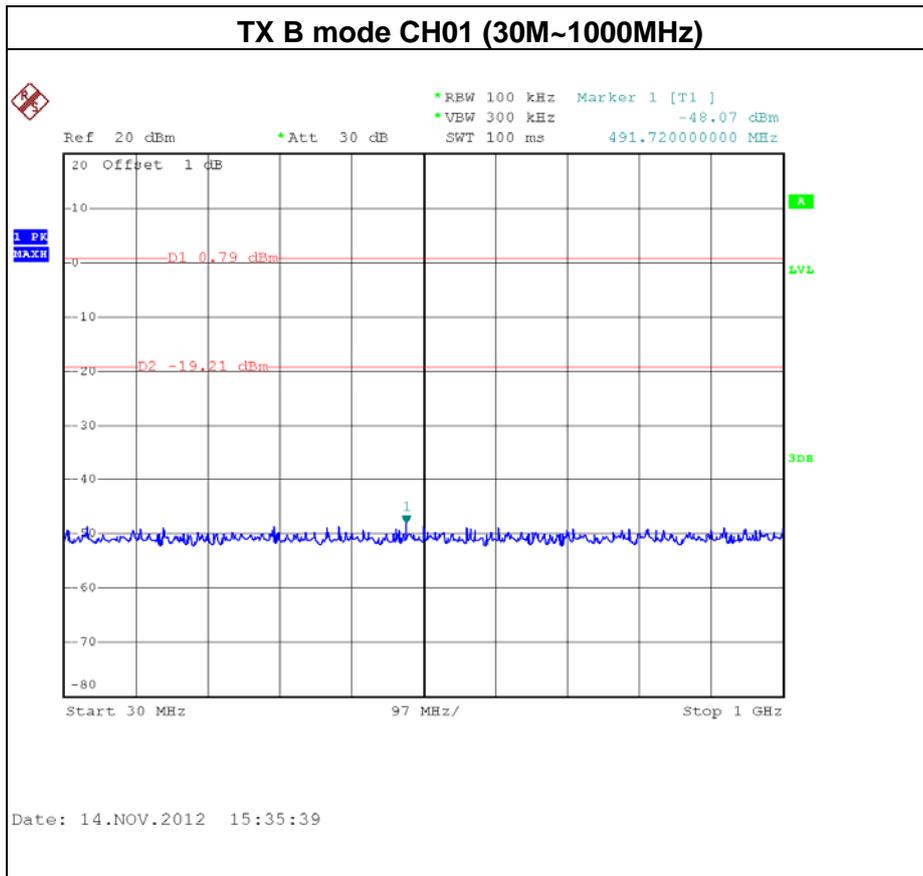
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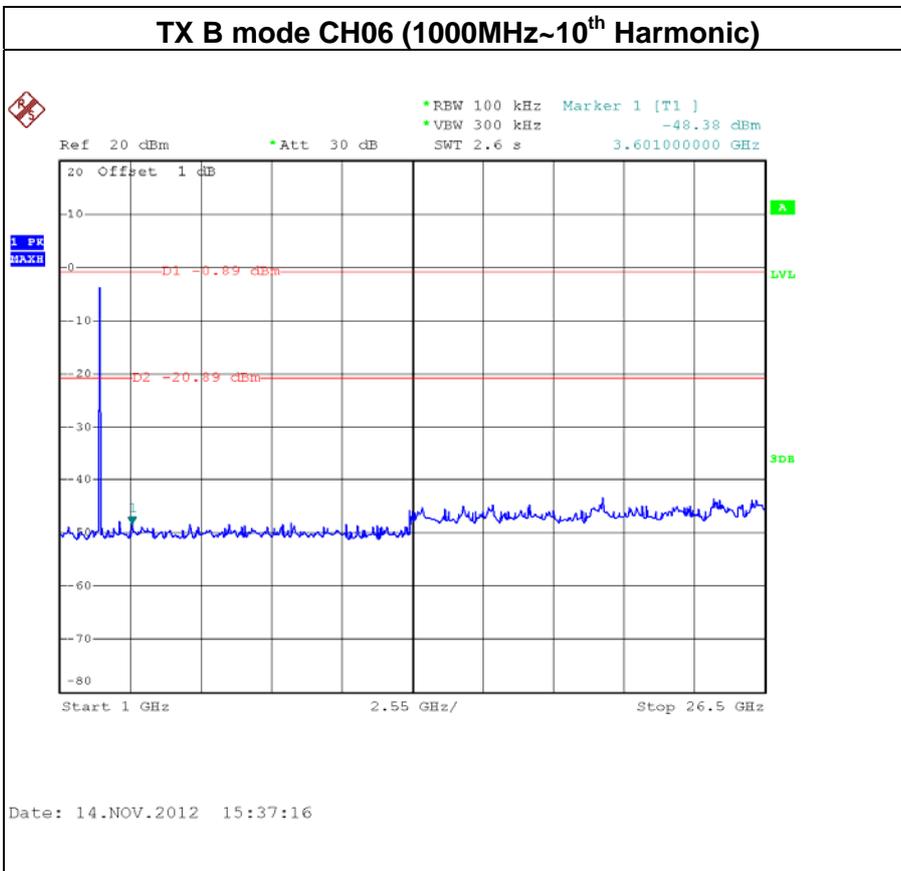
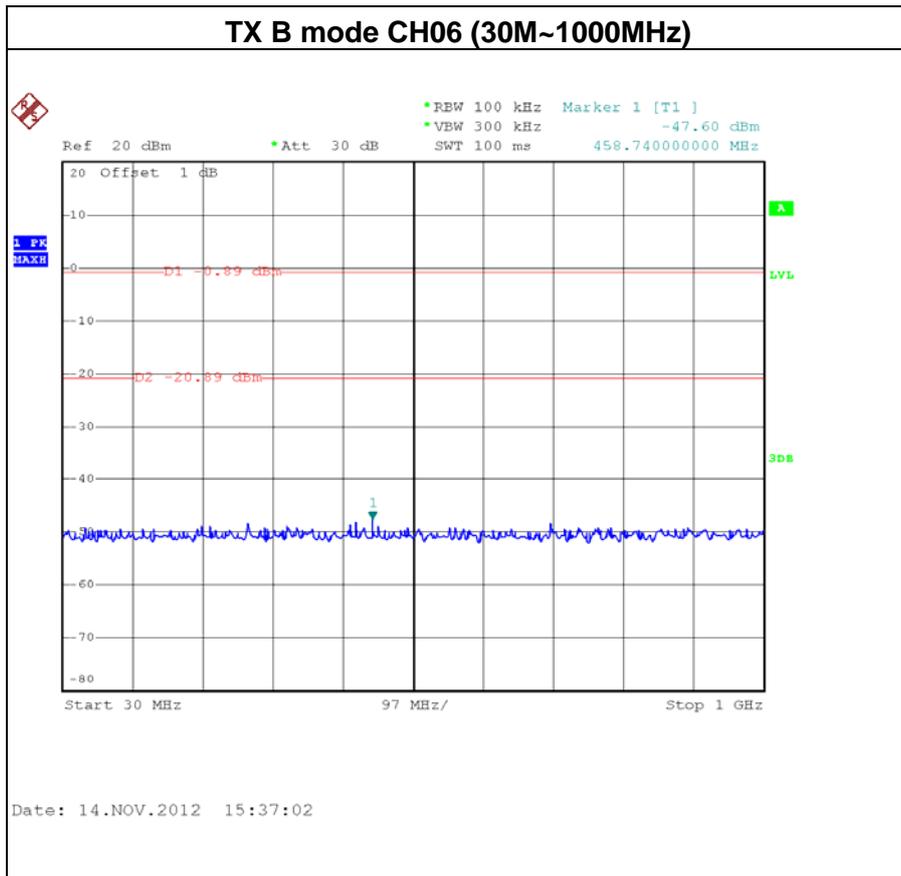
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth outside the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2390.00	-48.55	2487.60	-49.20

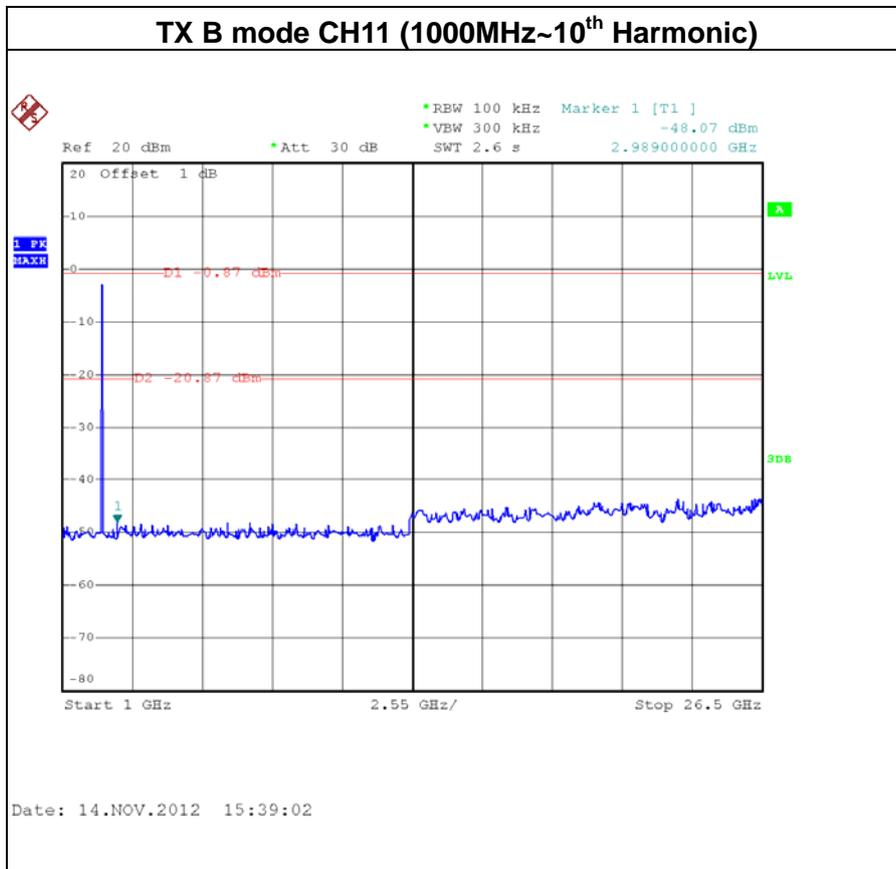
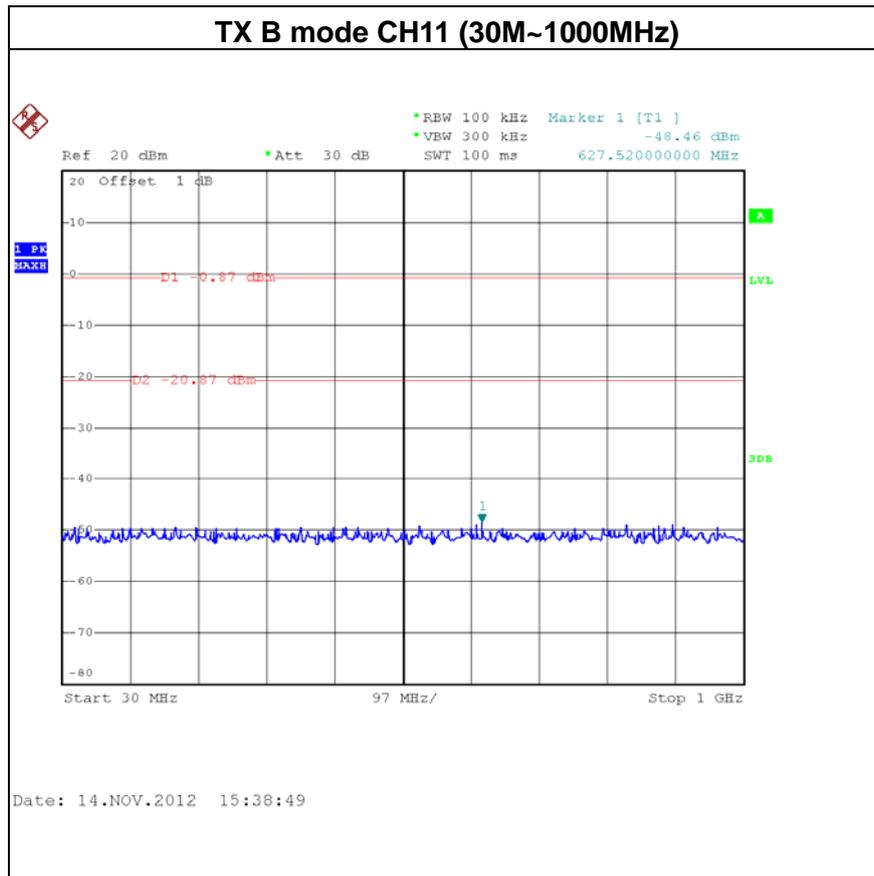
Result

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.





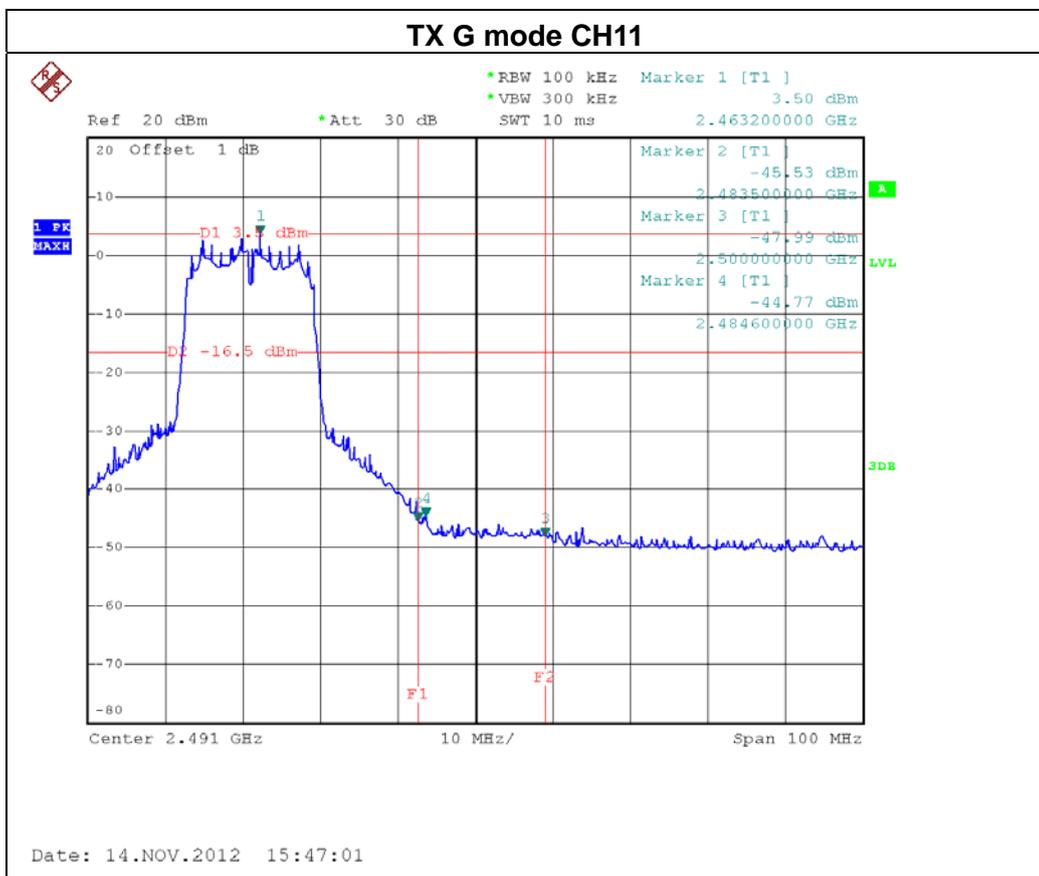
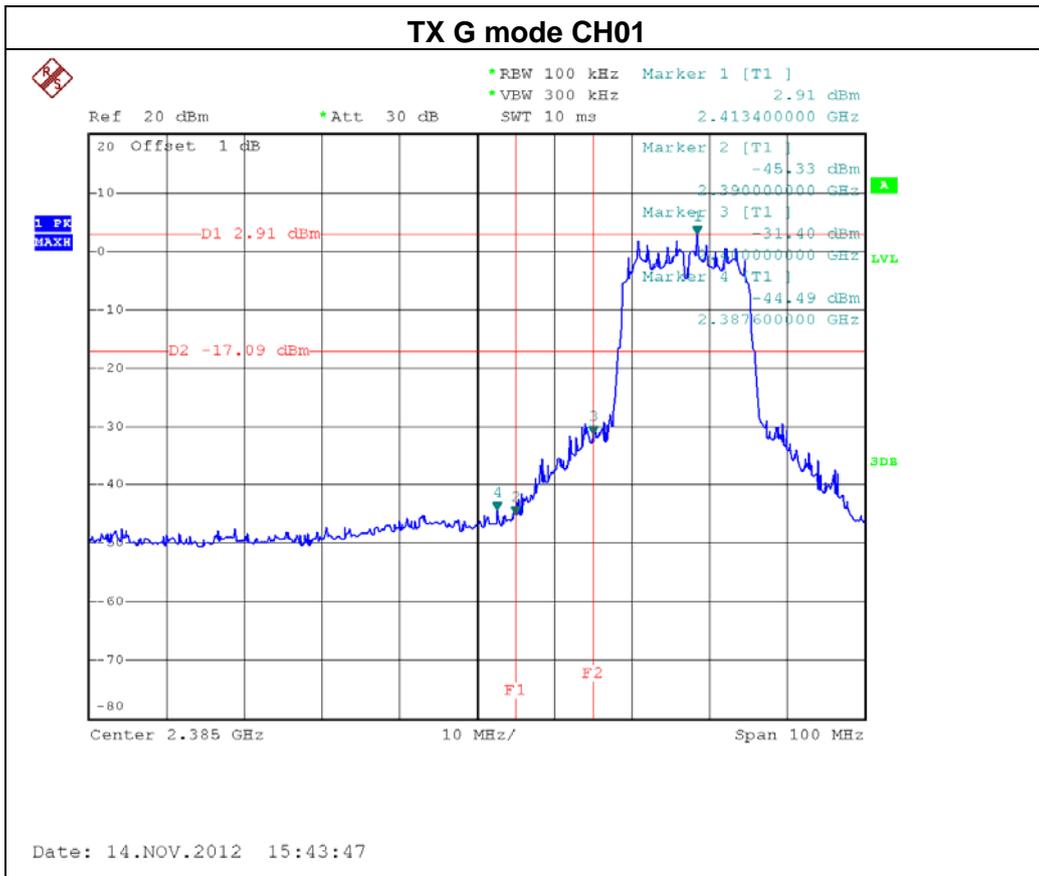


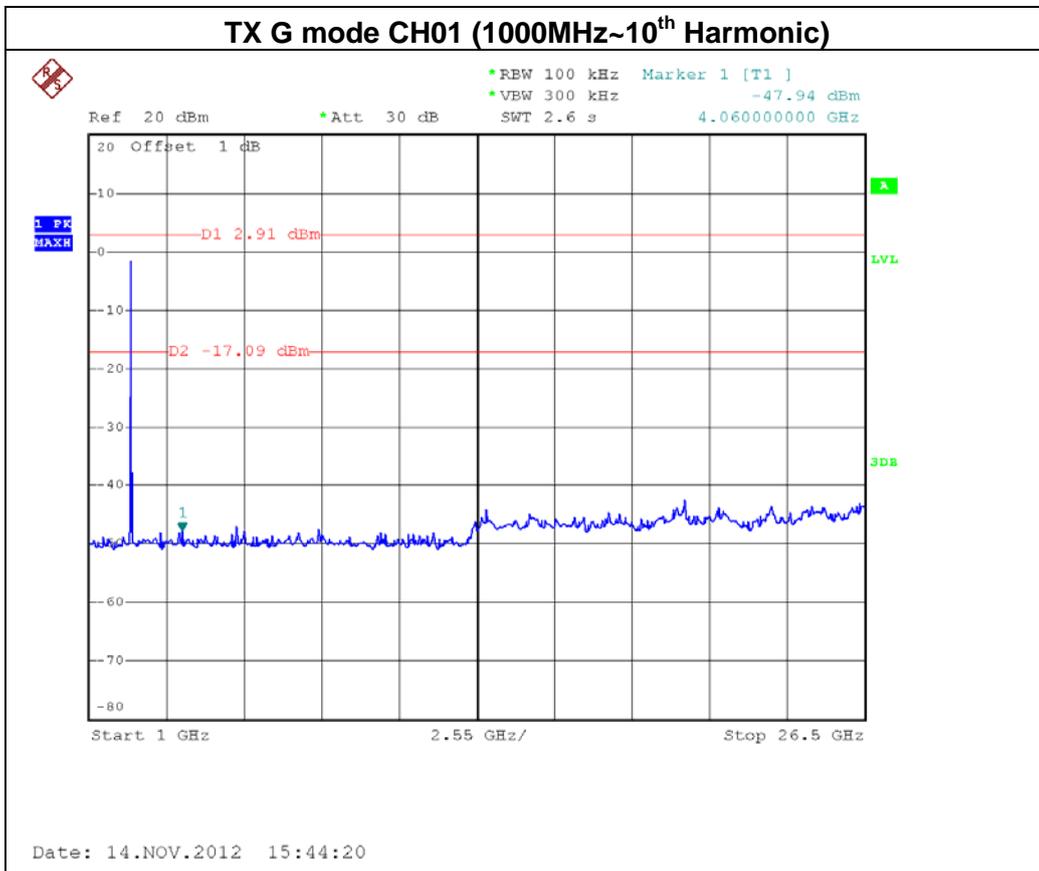
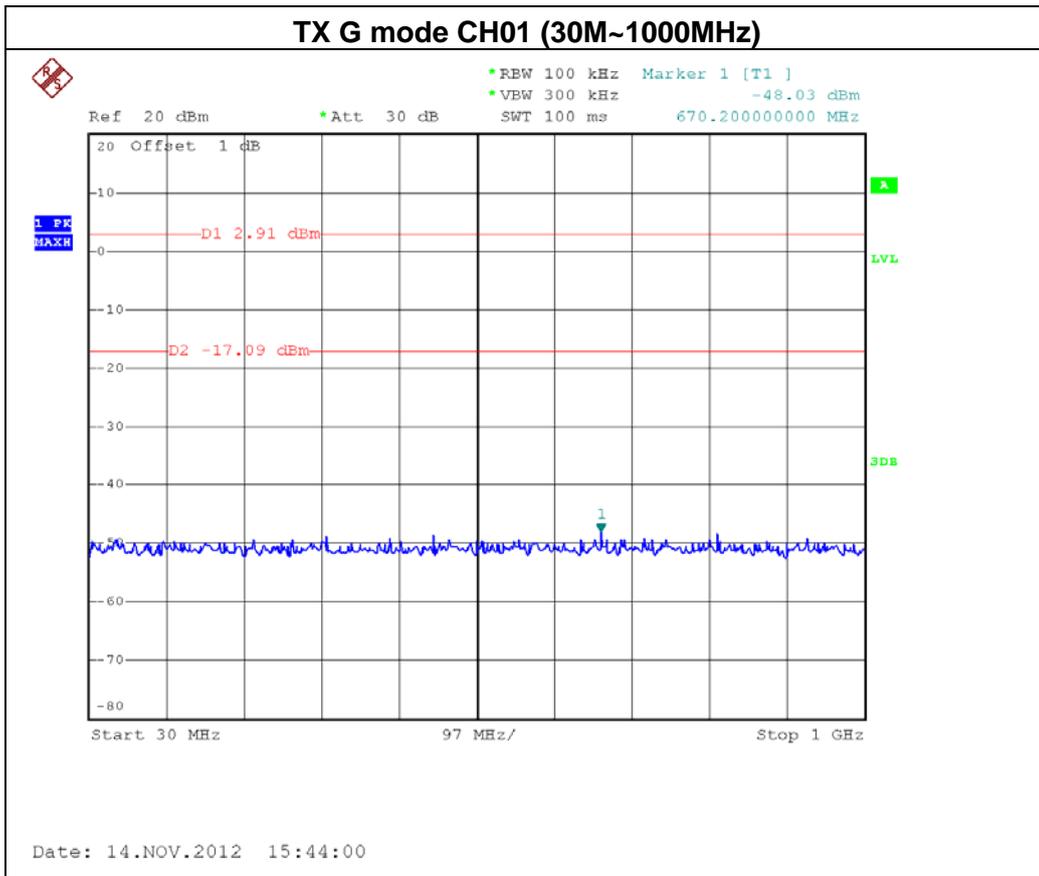


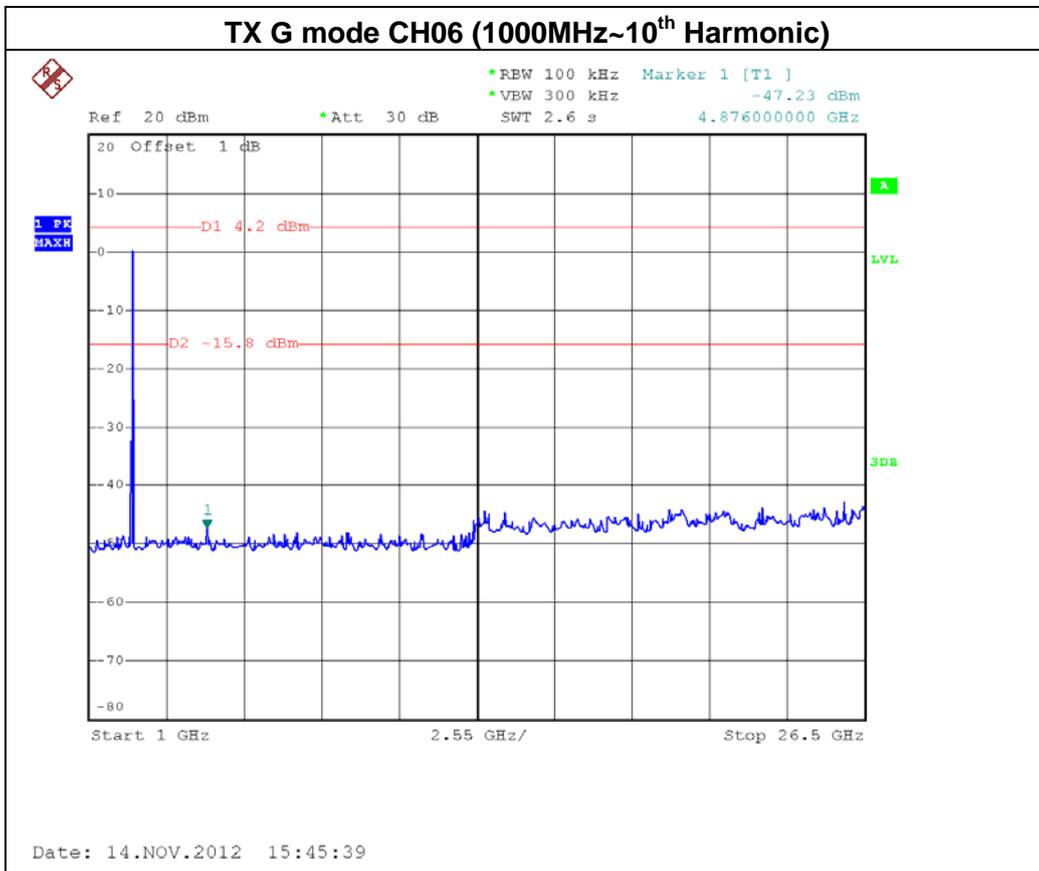
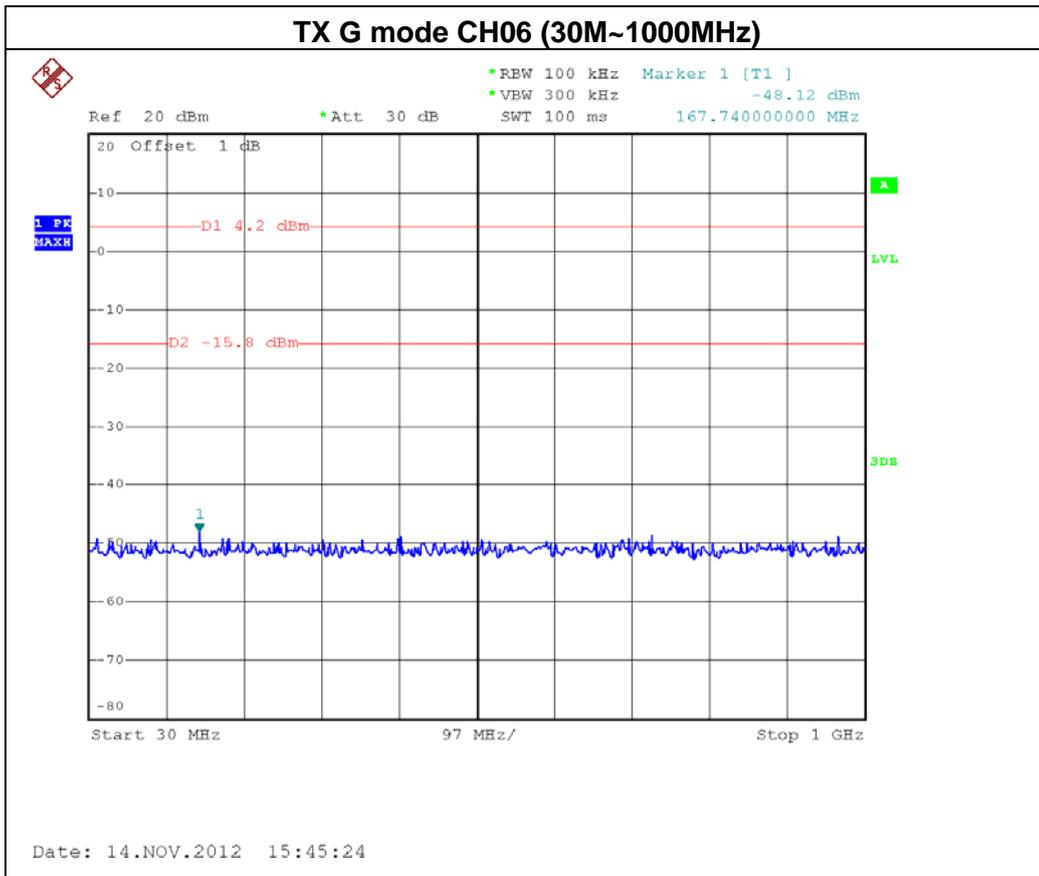


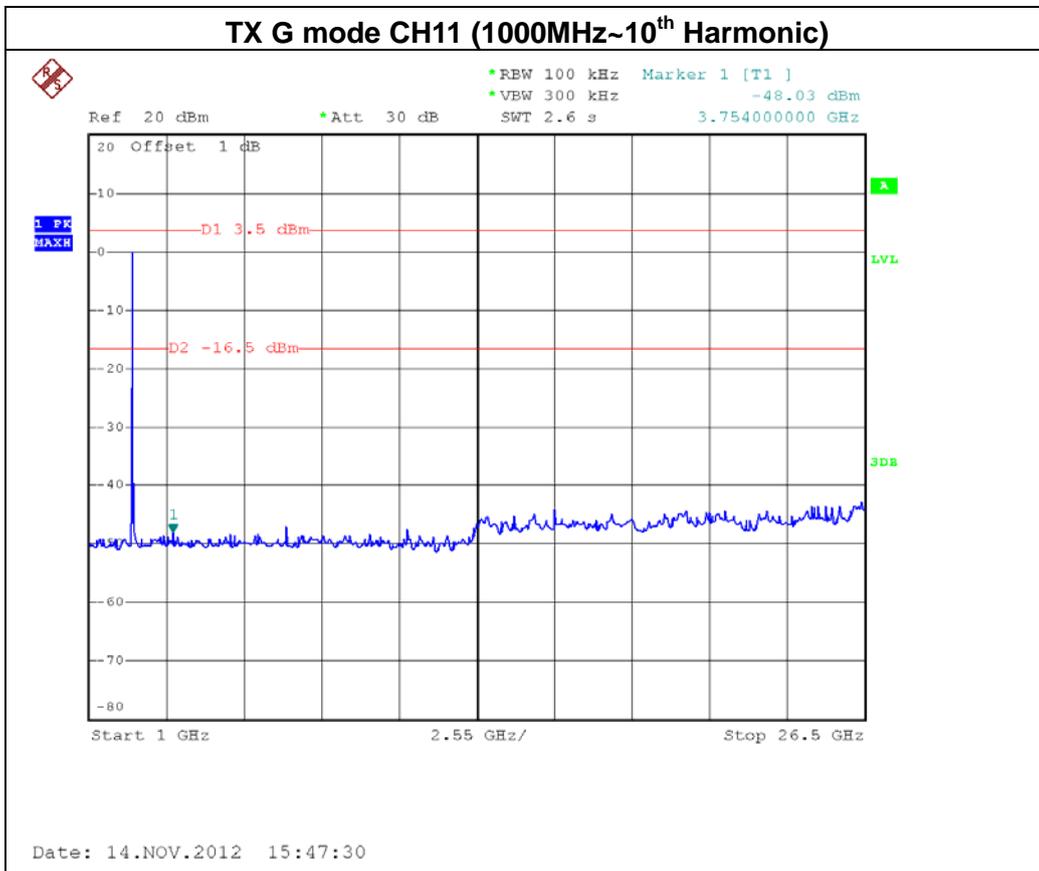
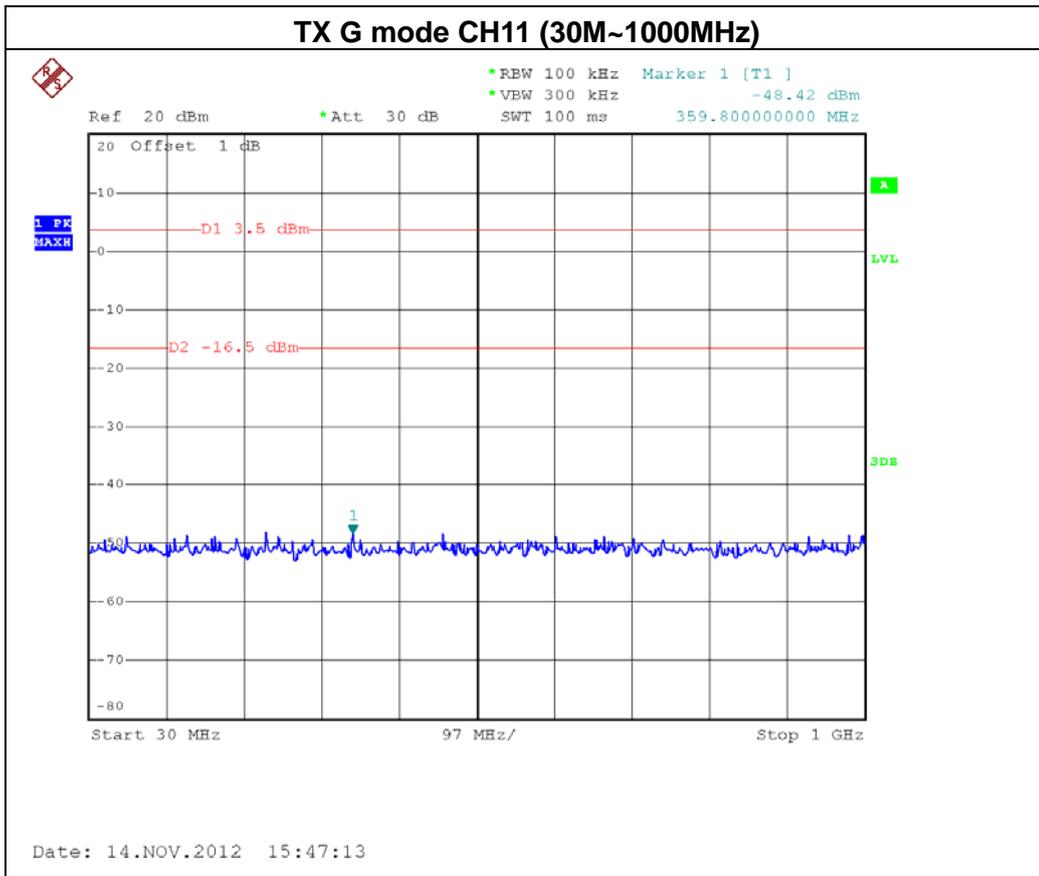
EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE / CH01, CH06 , CH11		

Channel of Worst Data: CH01			
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth outside the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-31.40	2484.60	-44.77
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.			









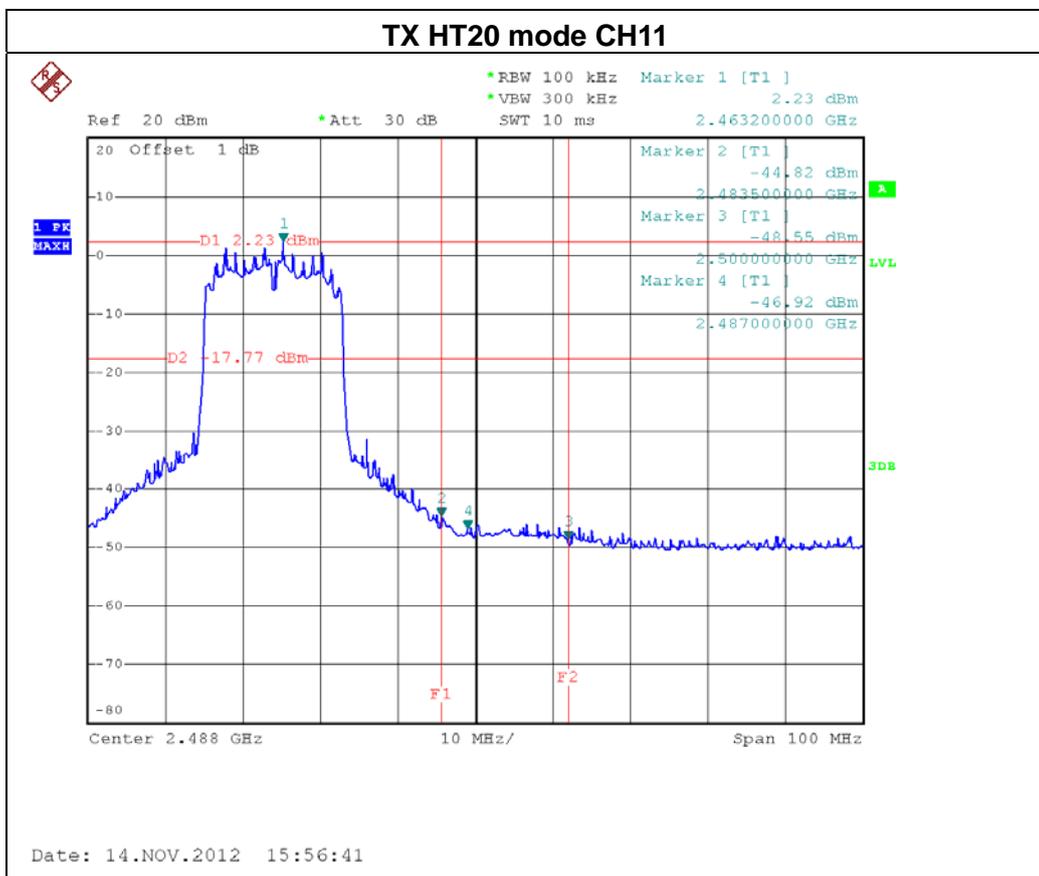
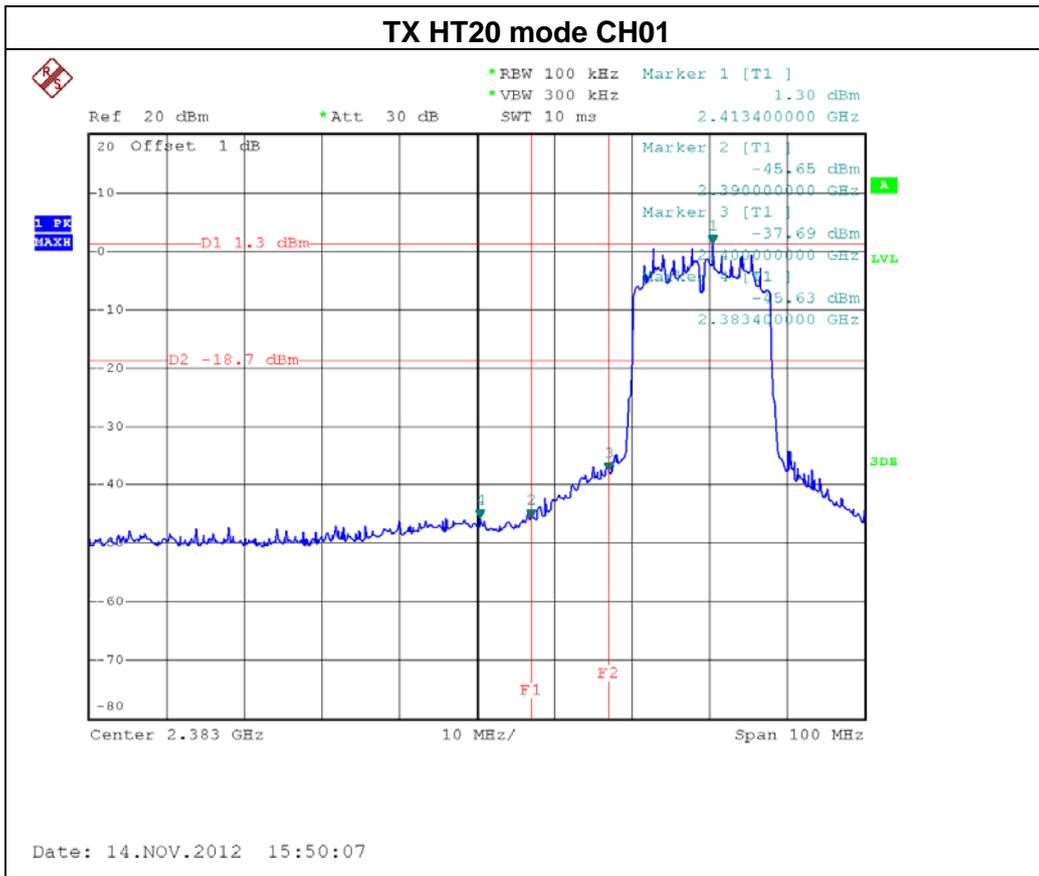


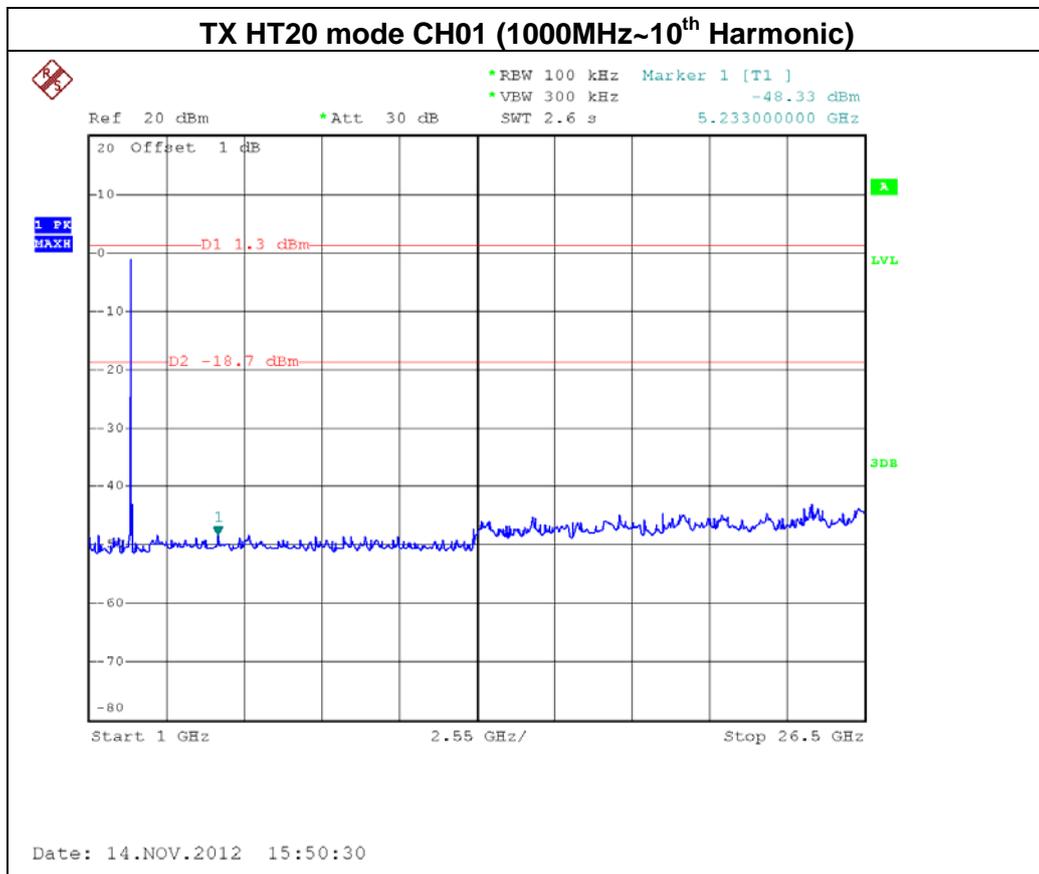
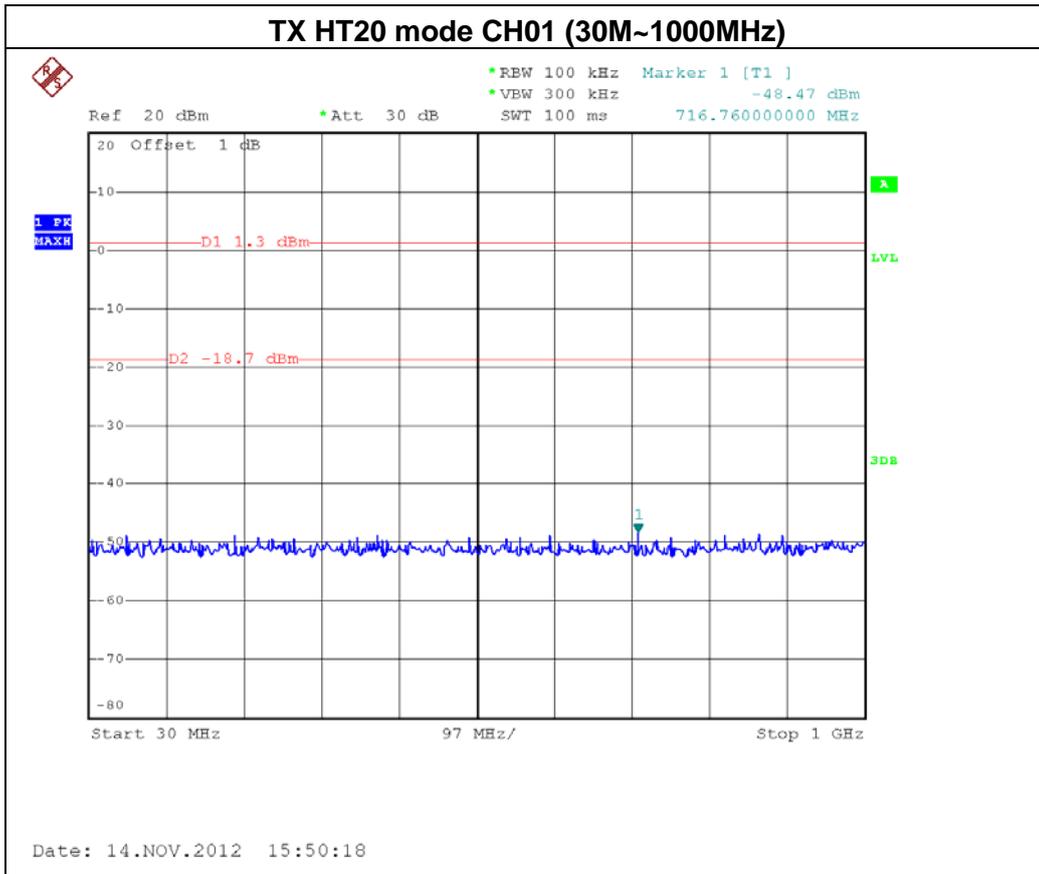
EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE / CH01, CH06 , CH11 --ANT 1		

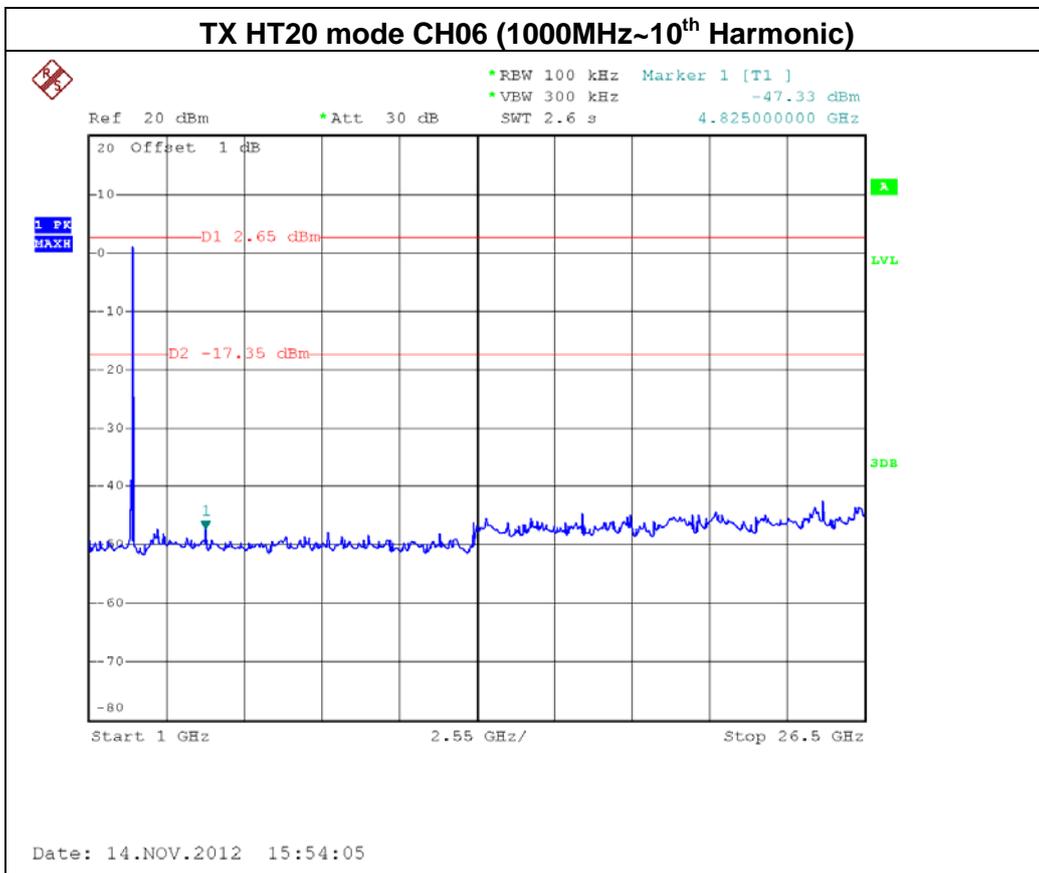
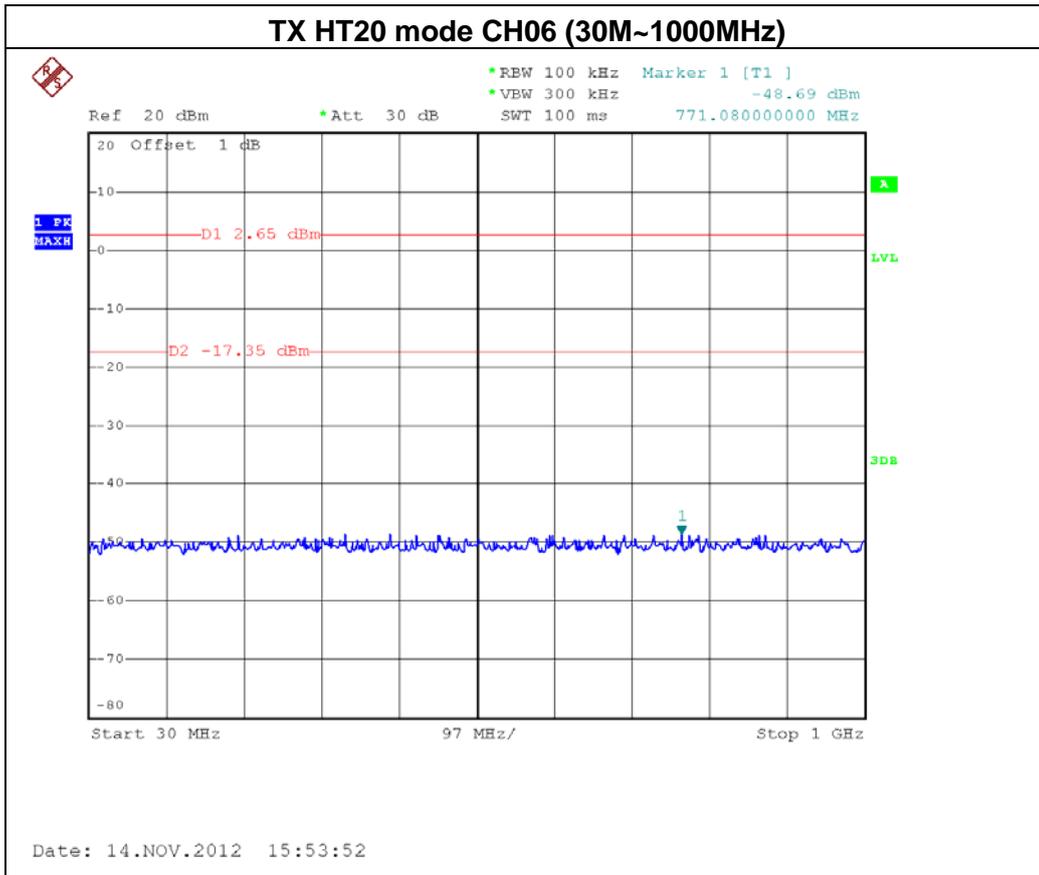
Channel of Worst Data: CH01			
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-37.69	2483.50	-44.82

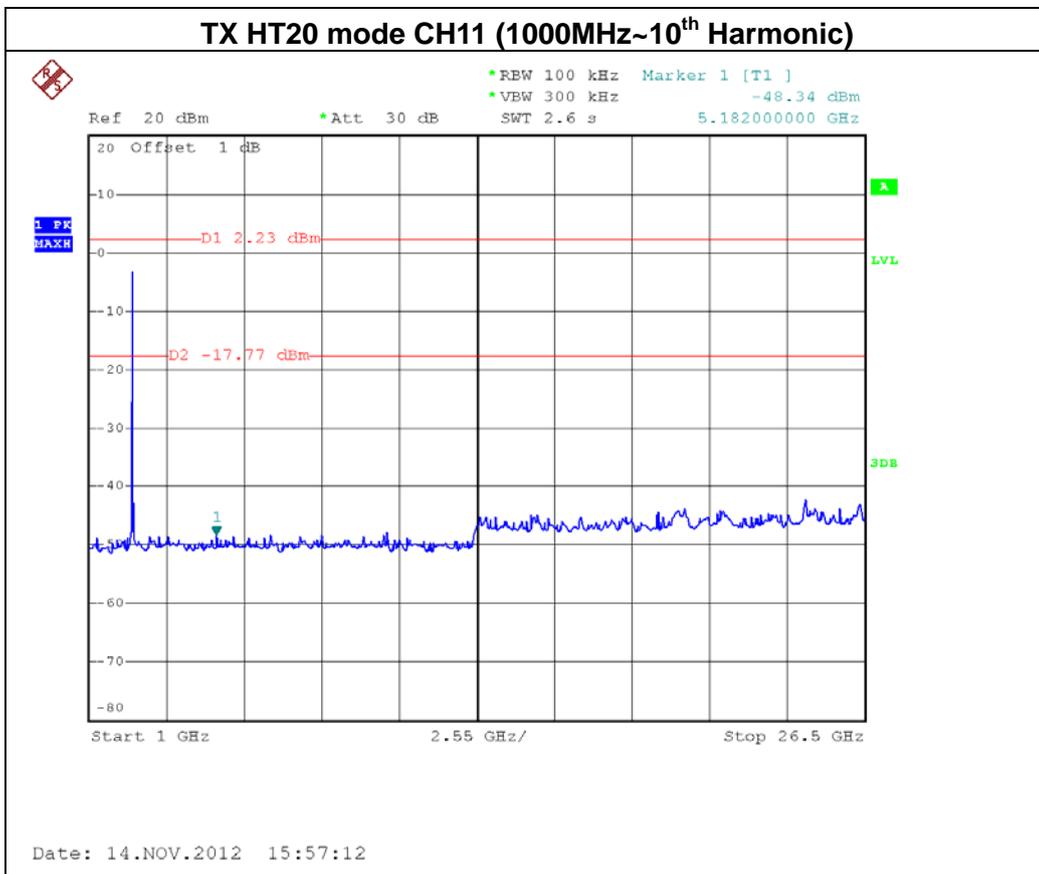
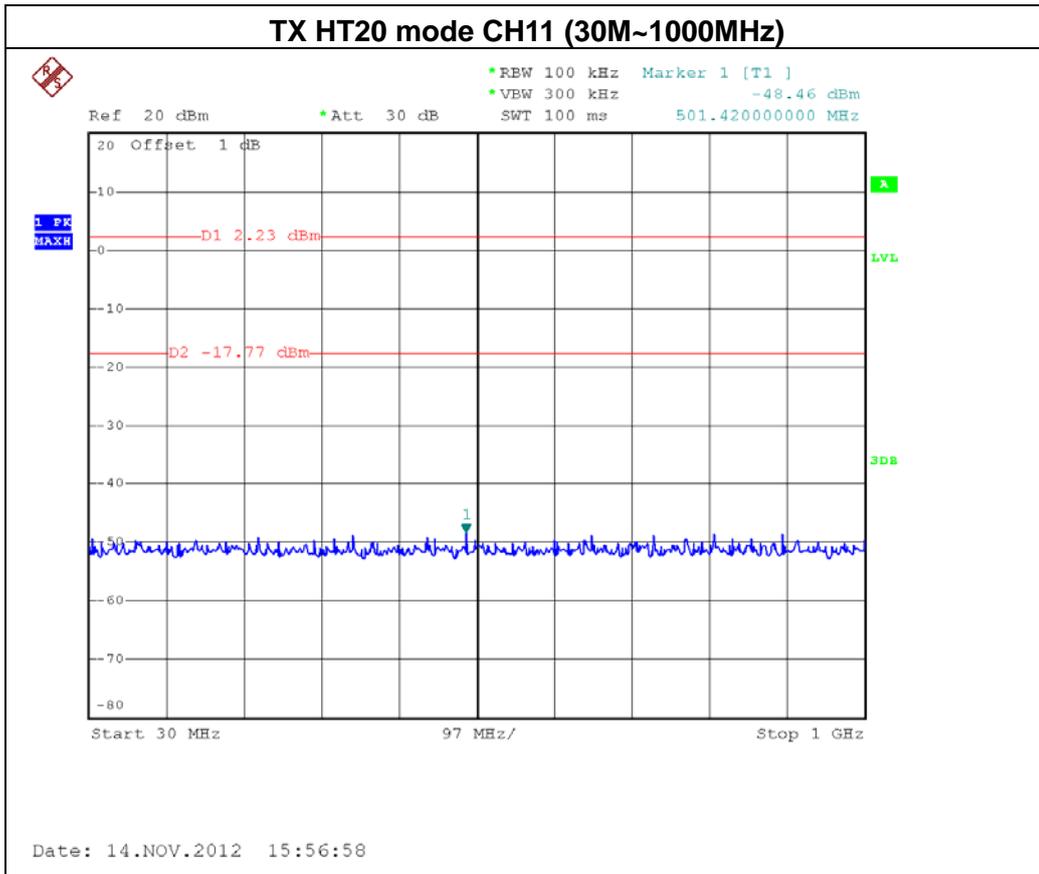
**Result**

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.





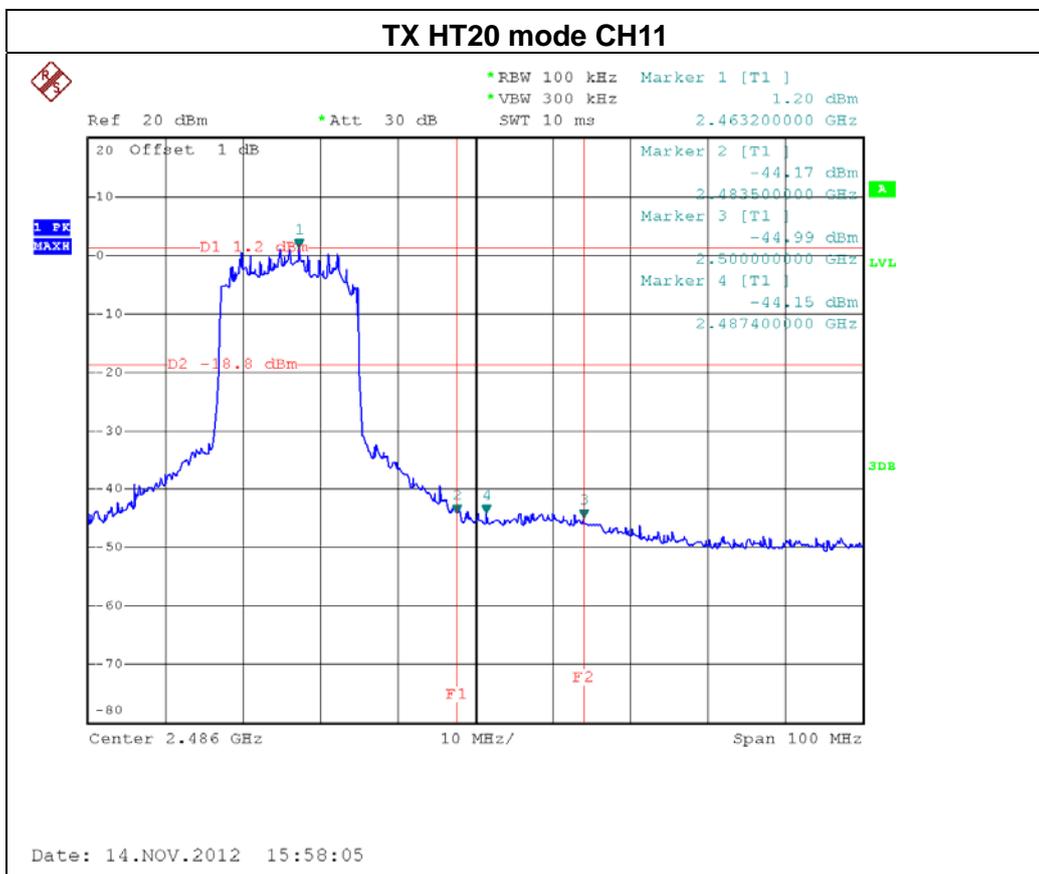
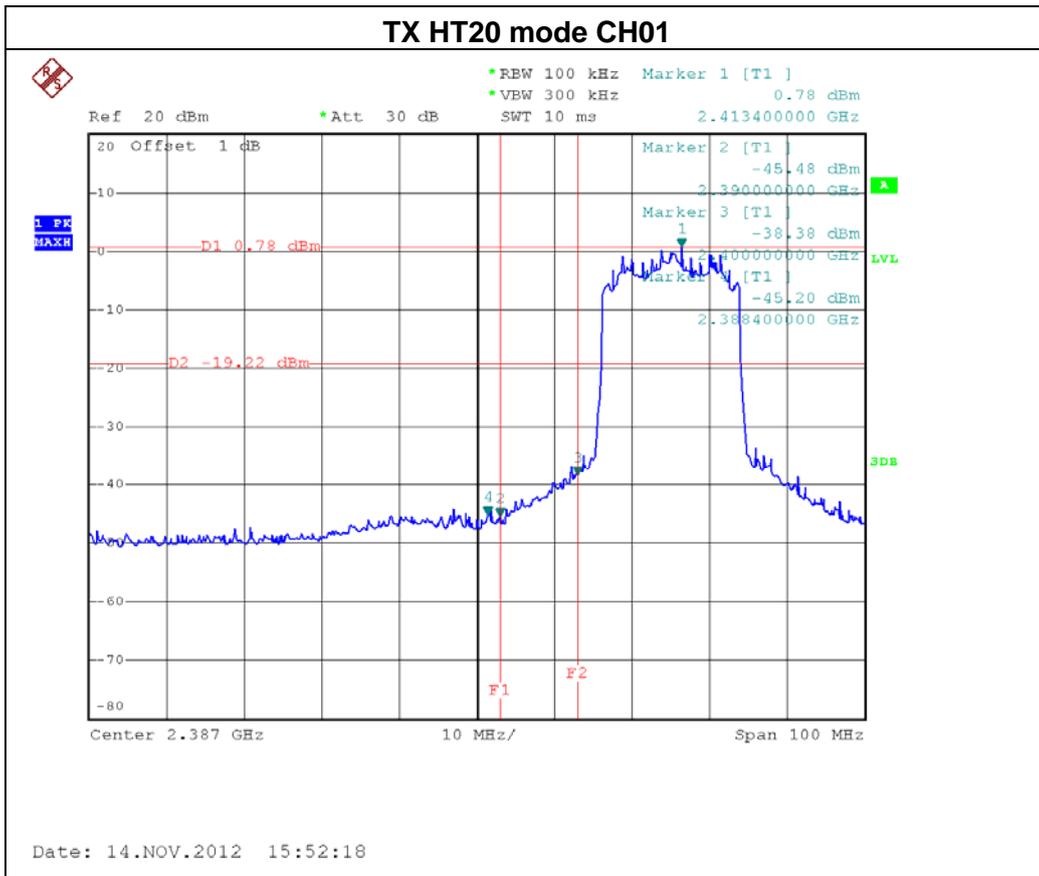


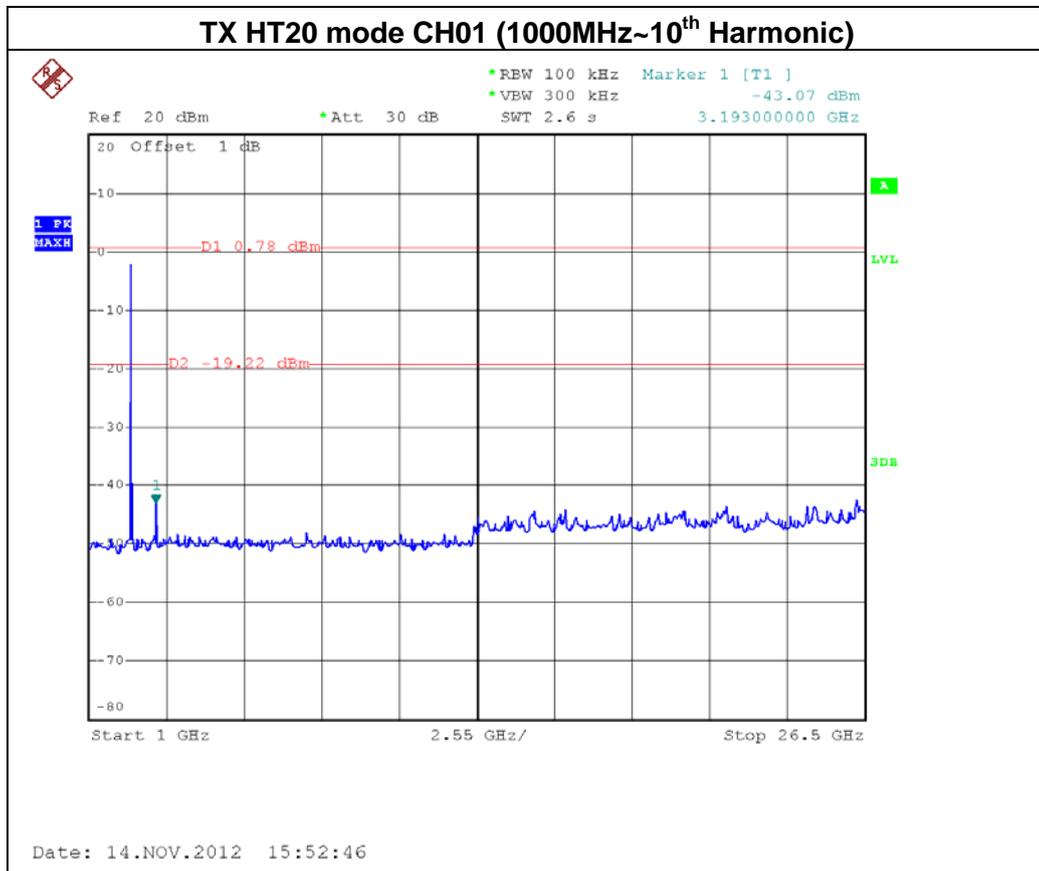
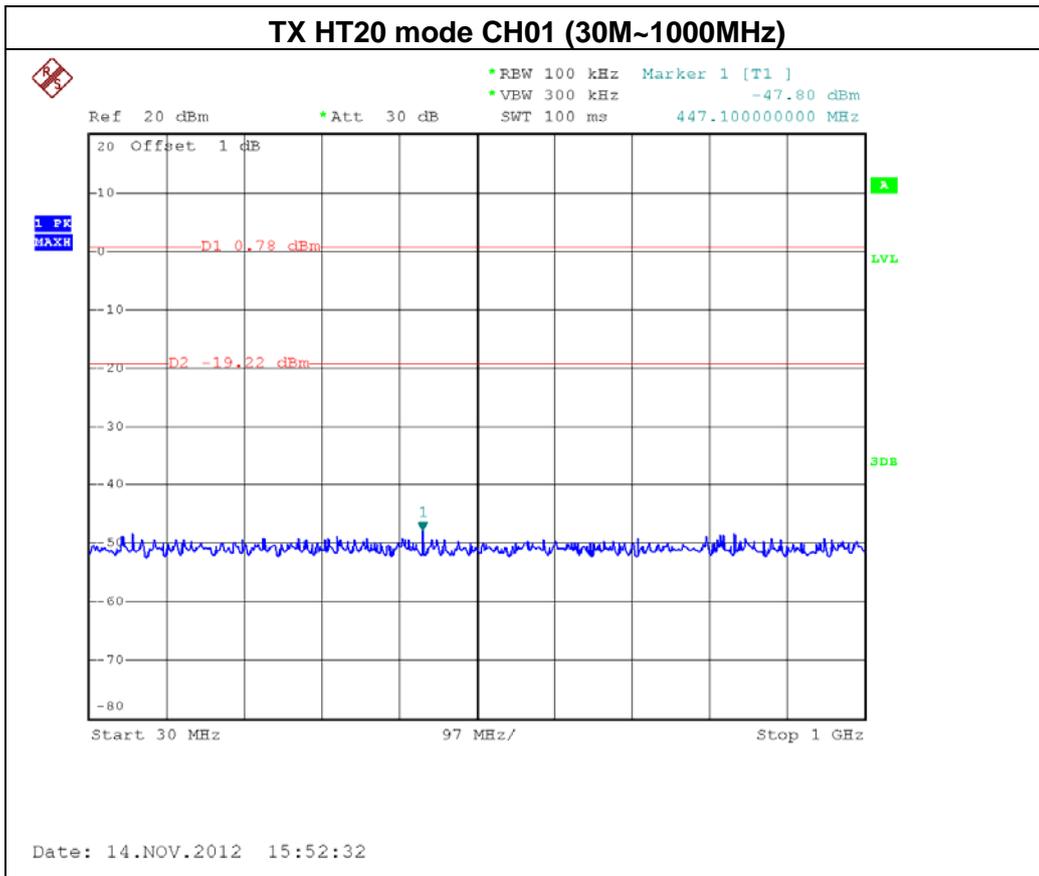


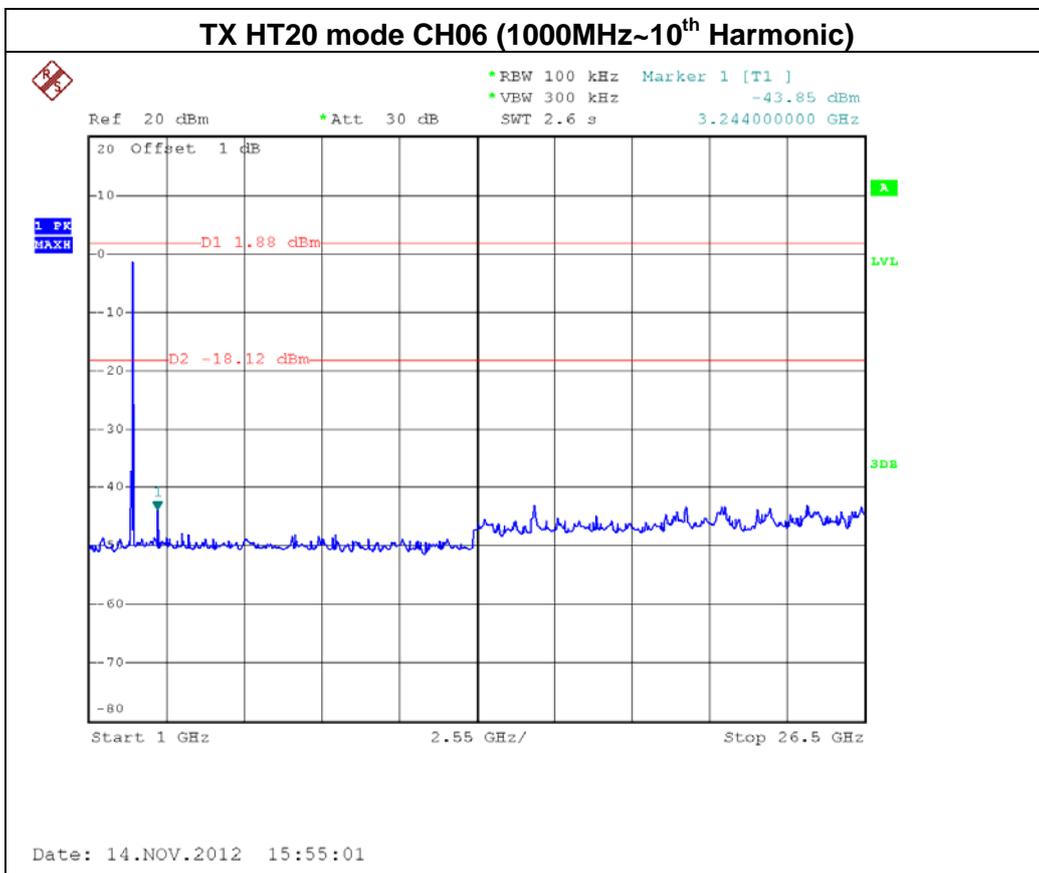
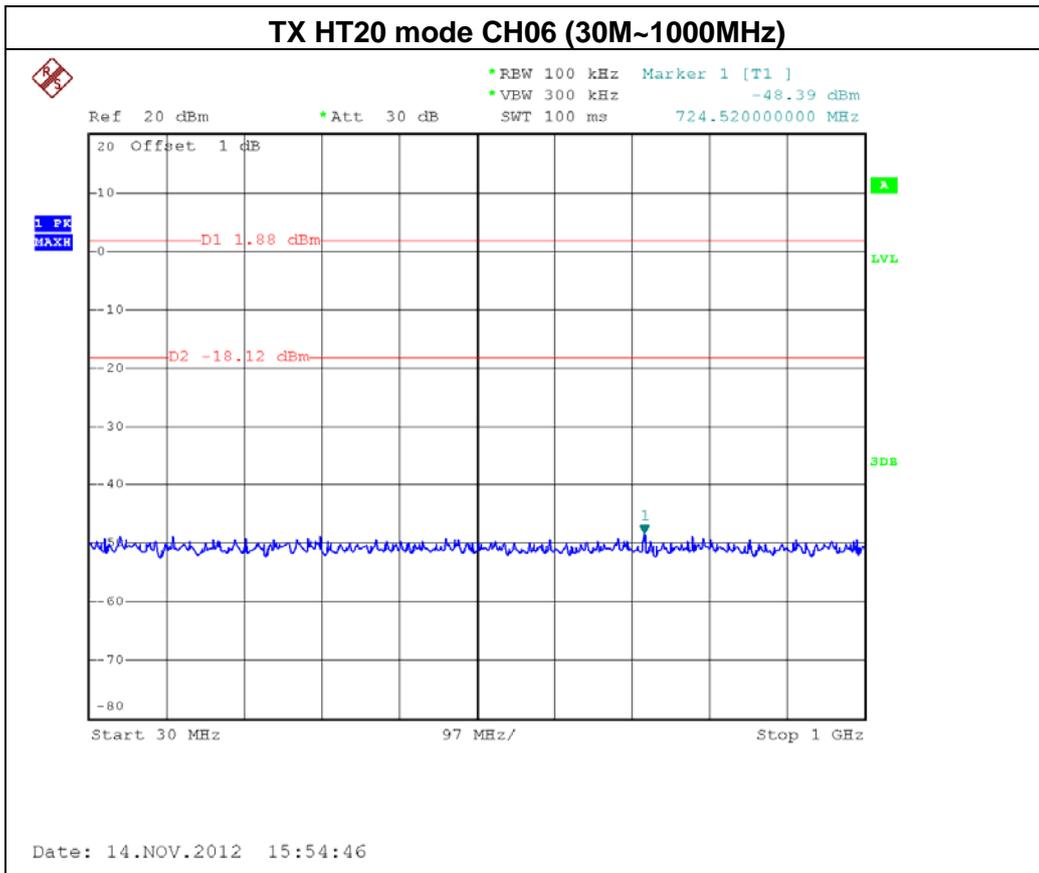


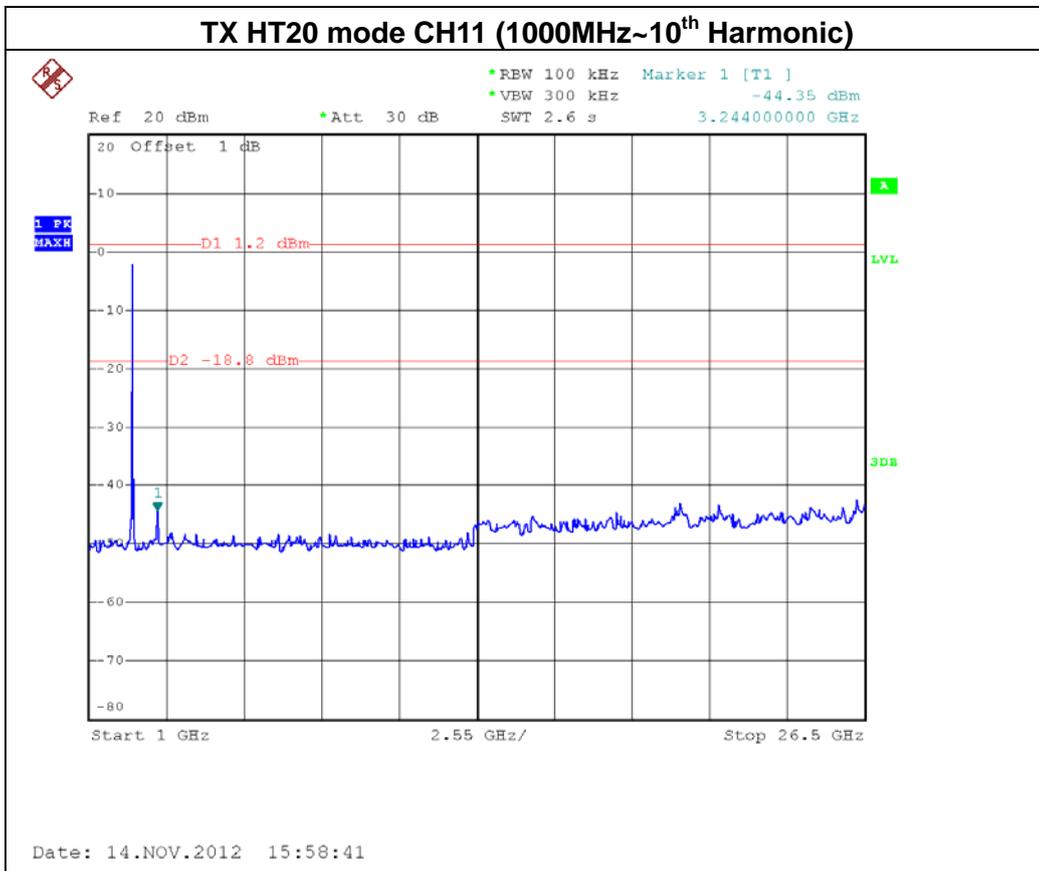
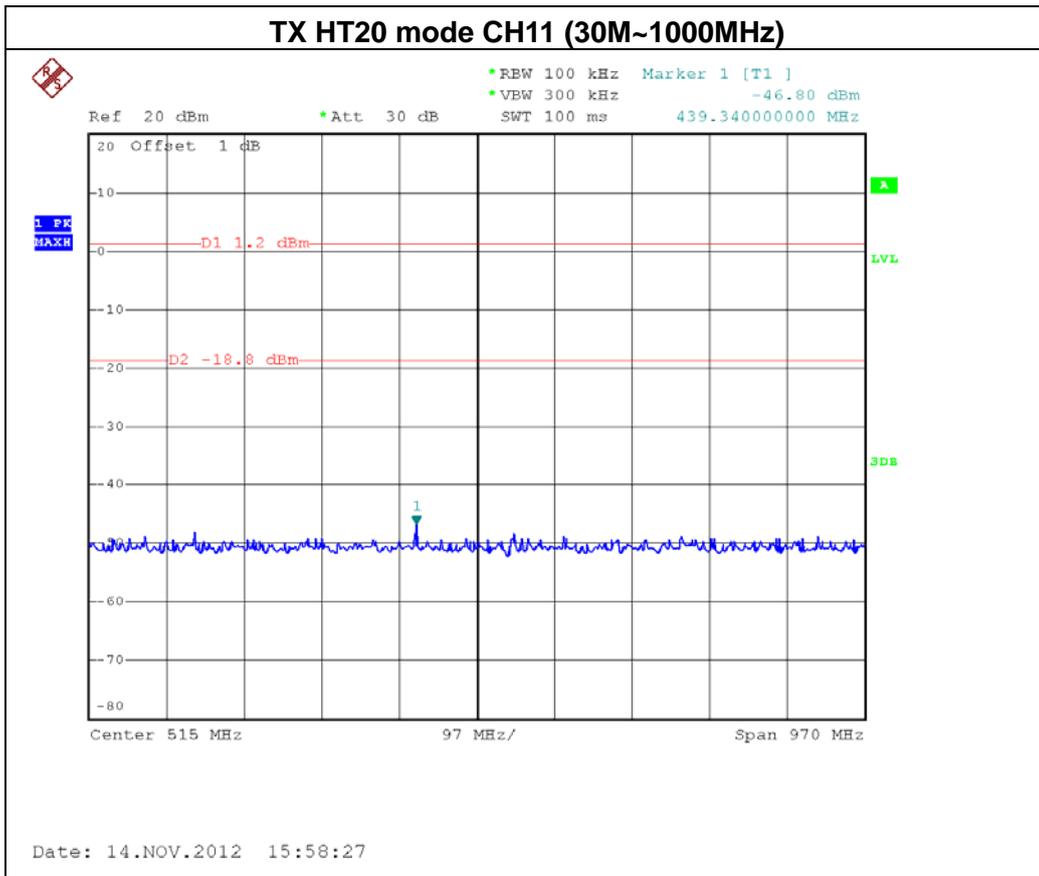
EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE / CH01, CH06 , CH11 --ANT 2		

Channel of Worst Data: CH01			
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-38.38	2487.40	-44.15
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.			





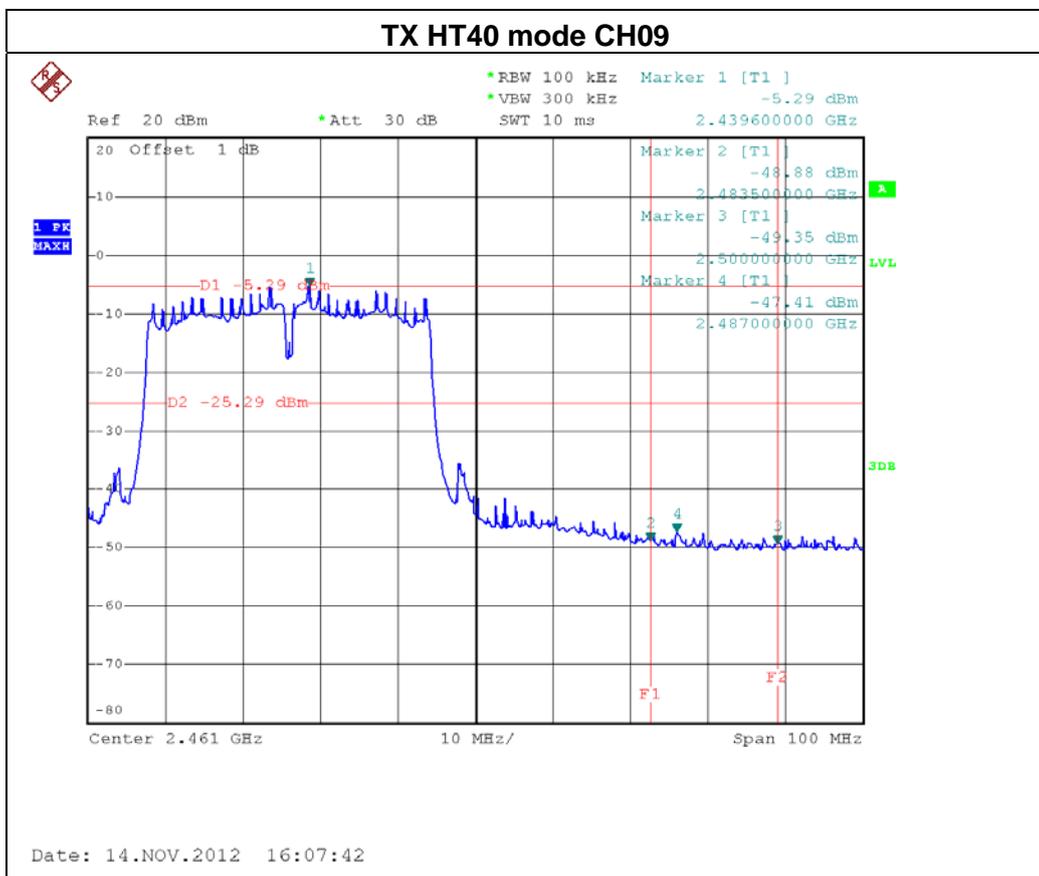
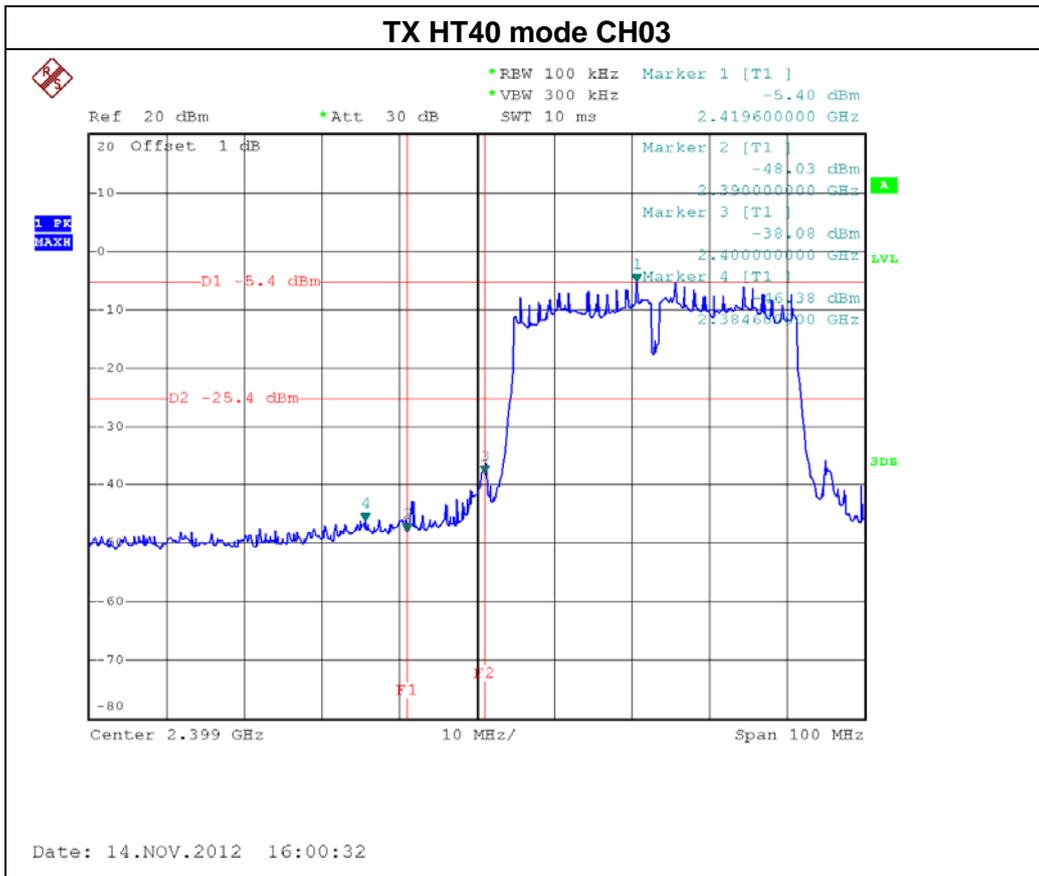


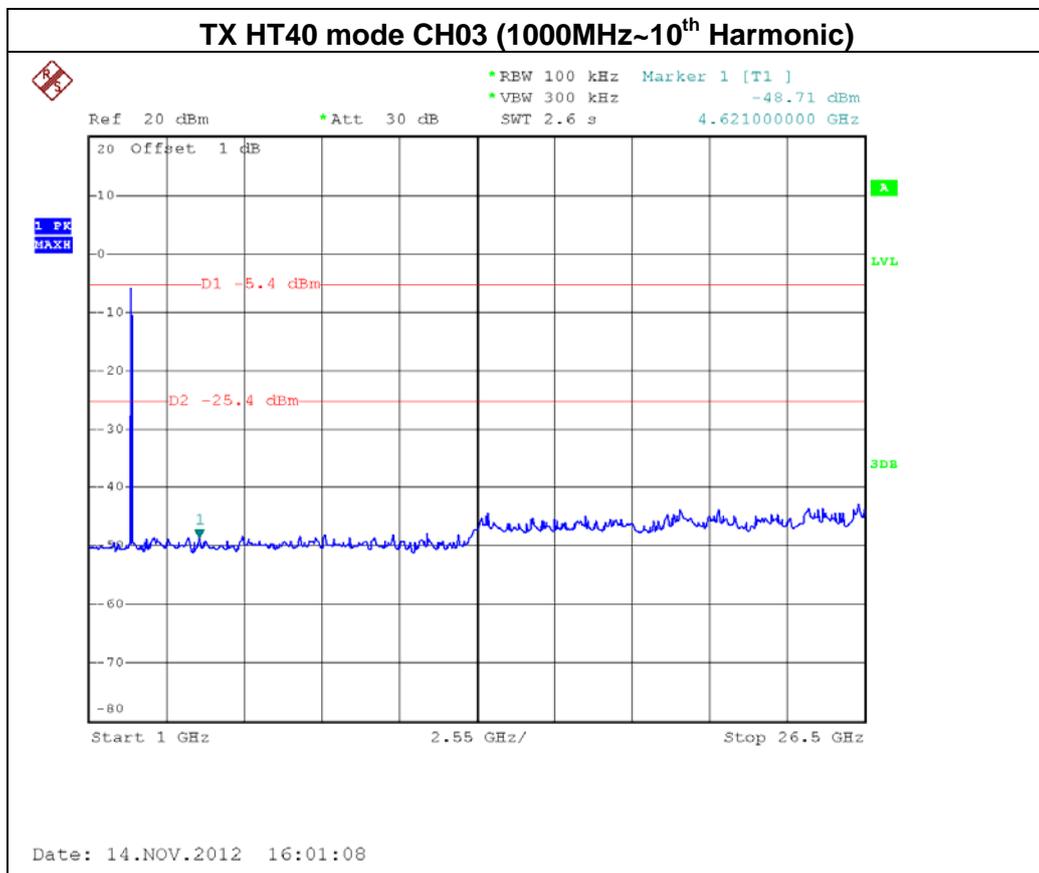
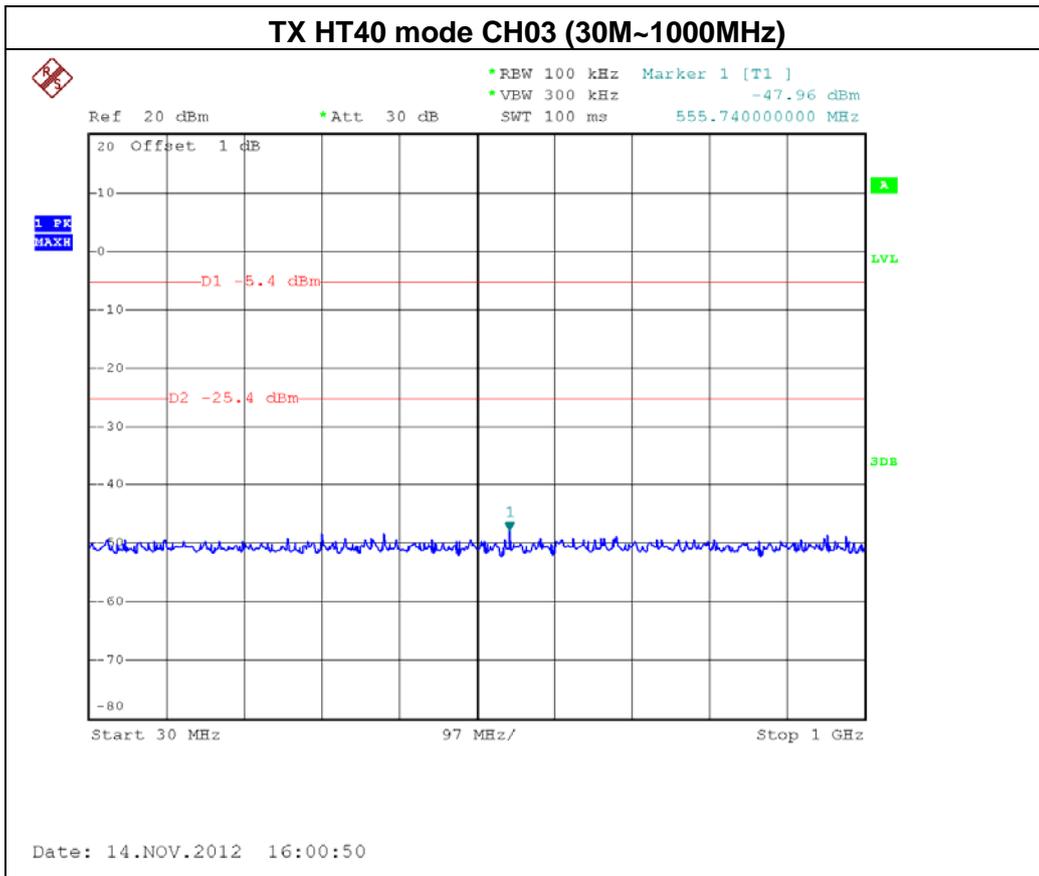


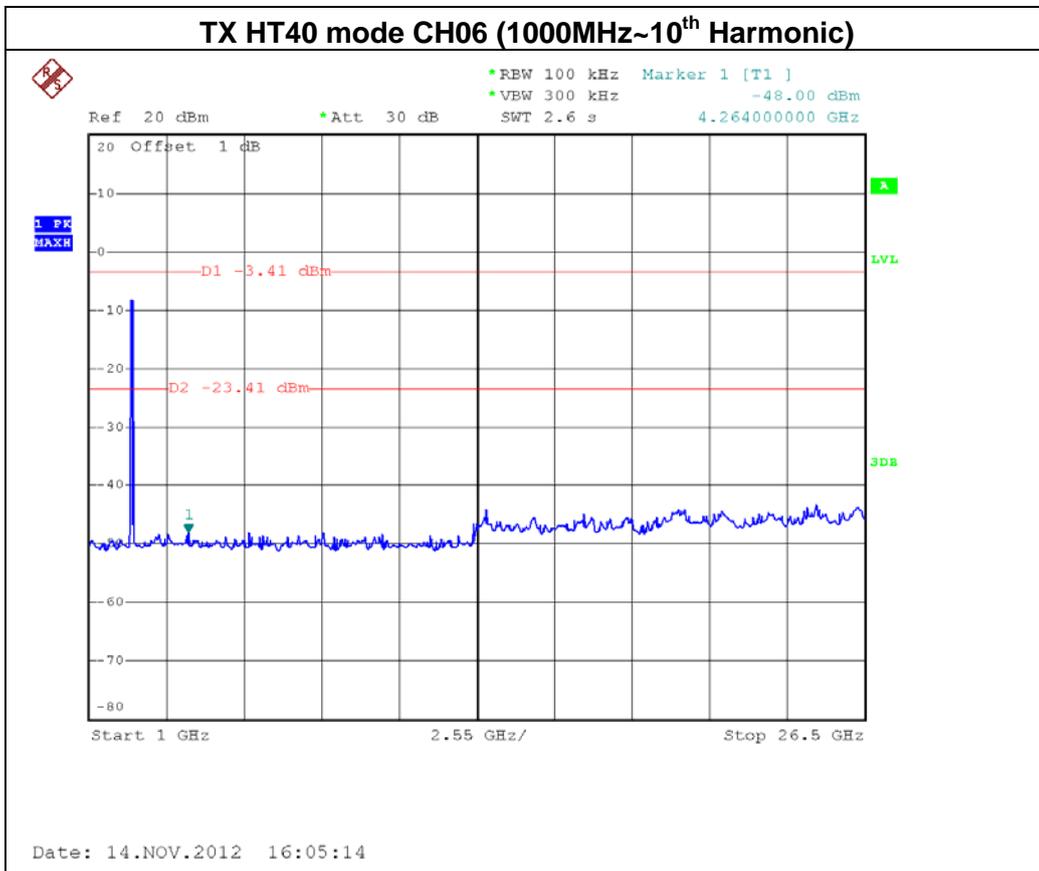
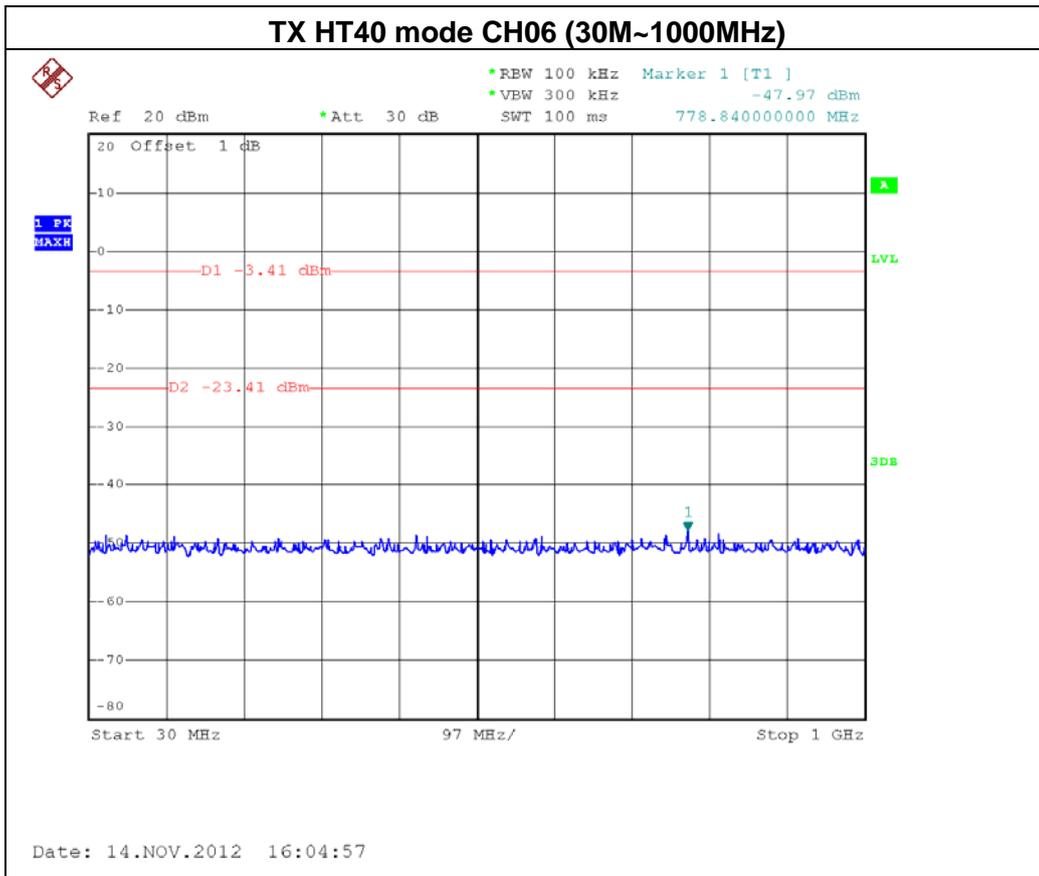


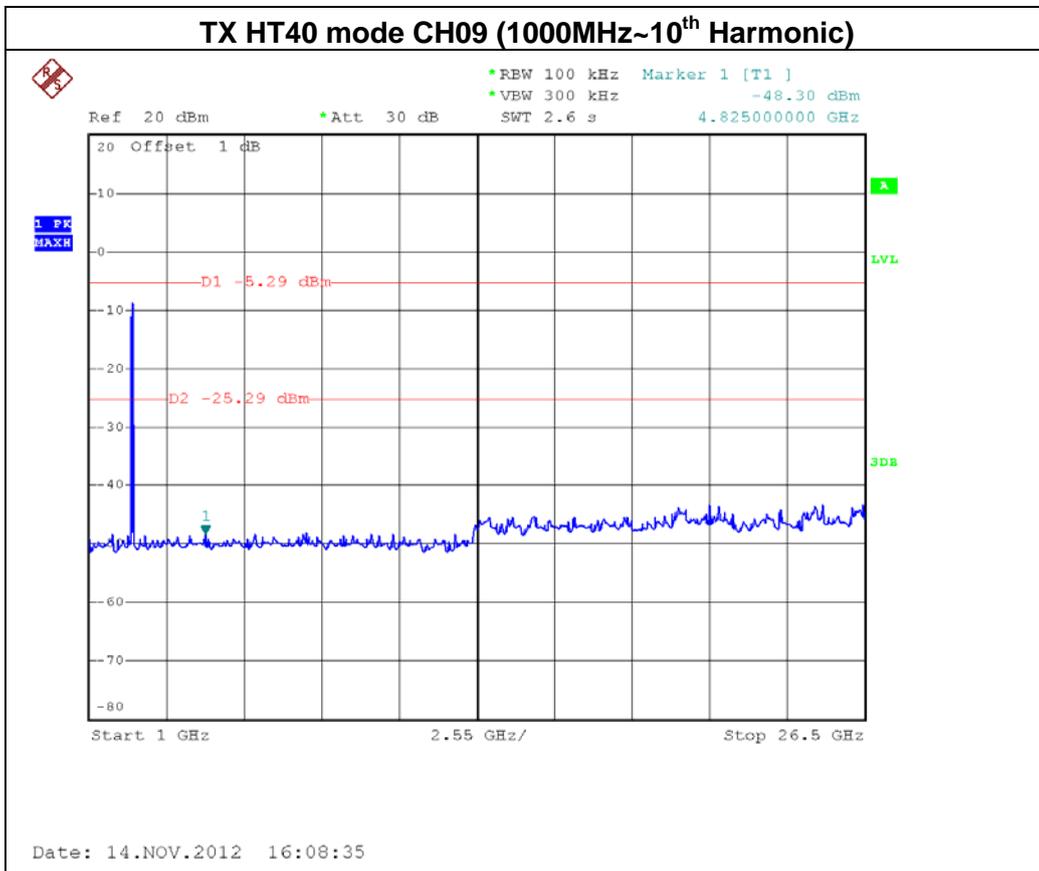
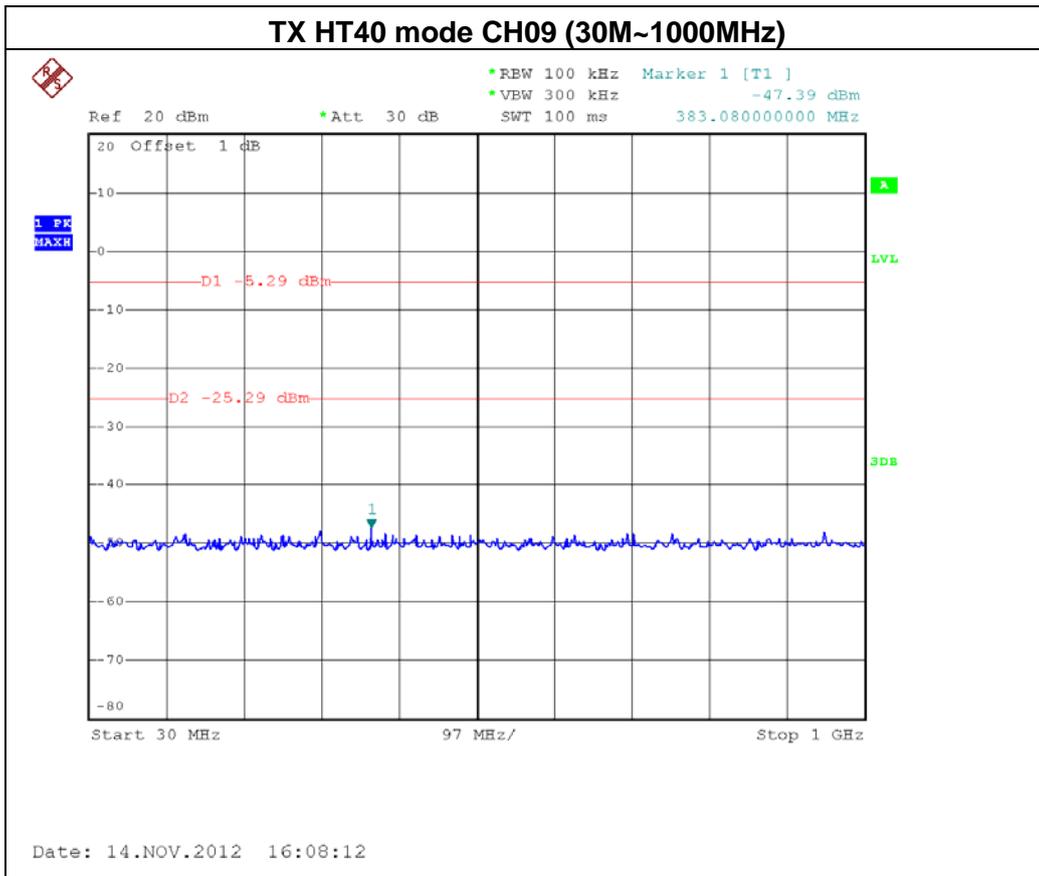
EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE / CH03, CH06 , CH09 --ANT 1		

Channel of Worst Data: CH03			
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-38.08	2487.00	-47.41
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.			









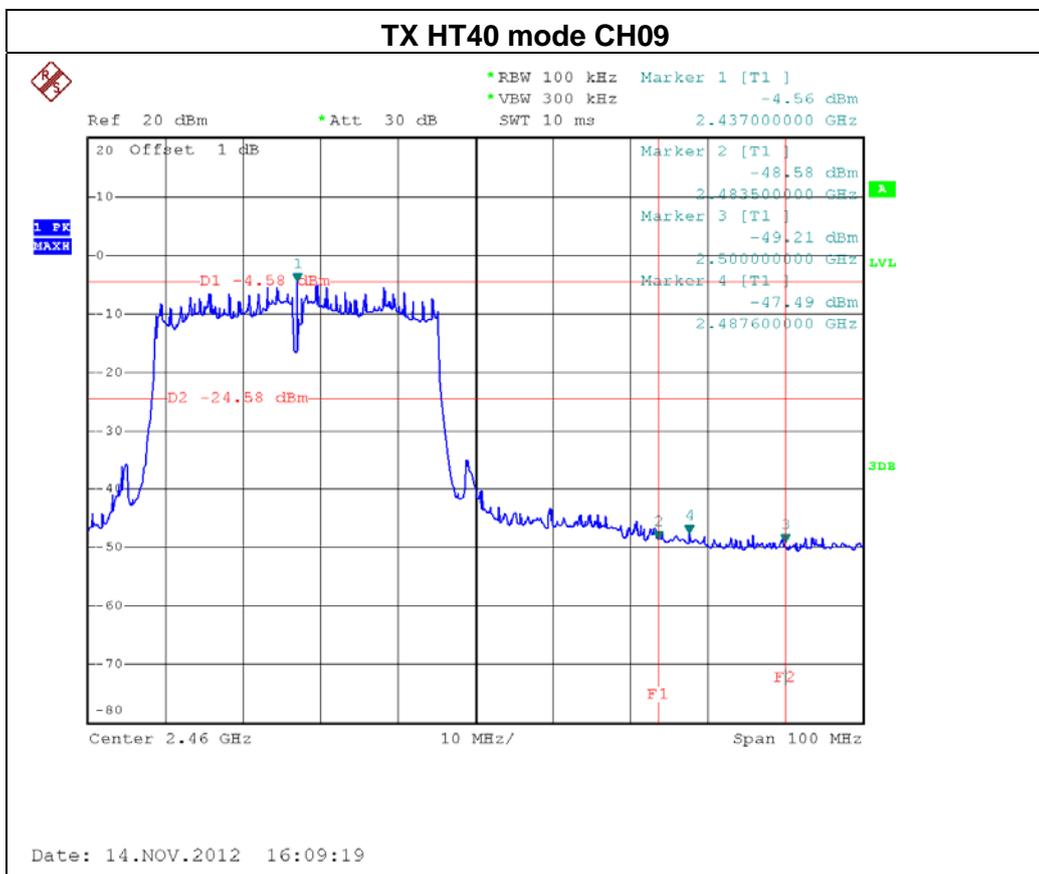
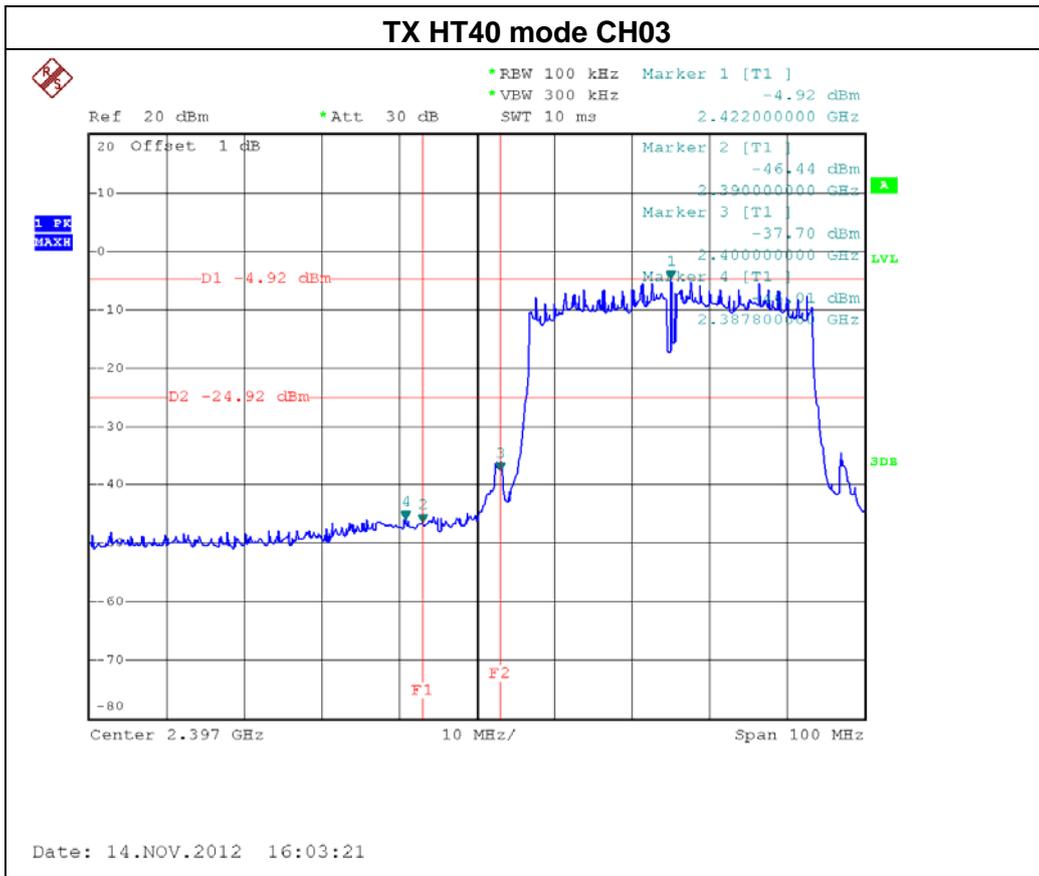


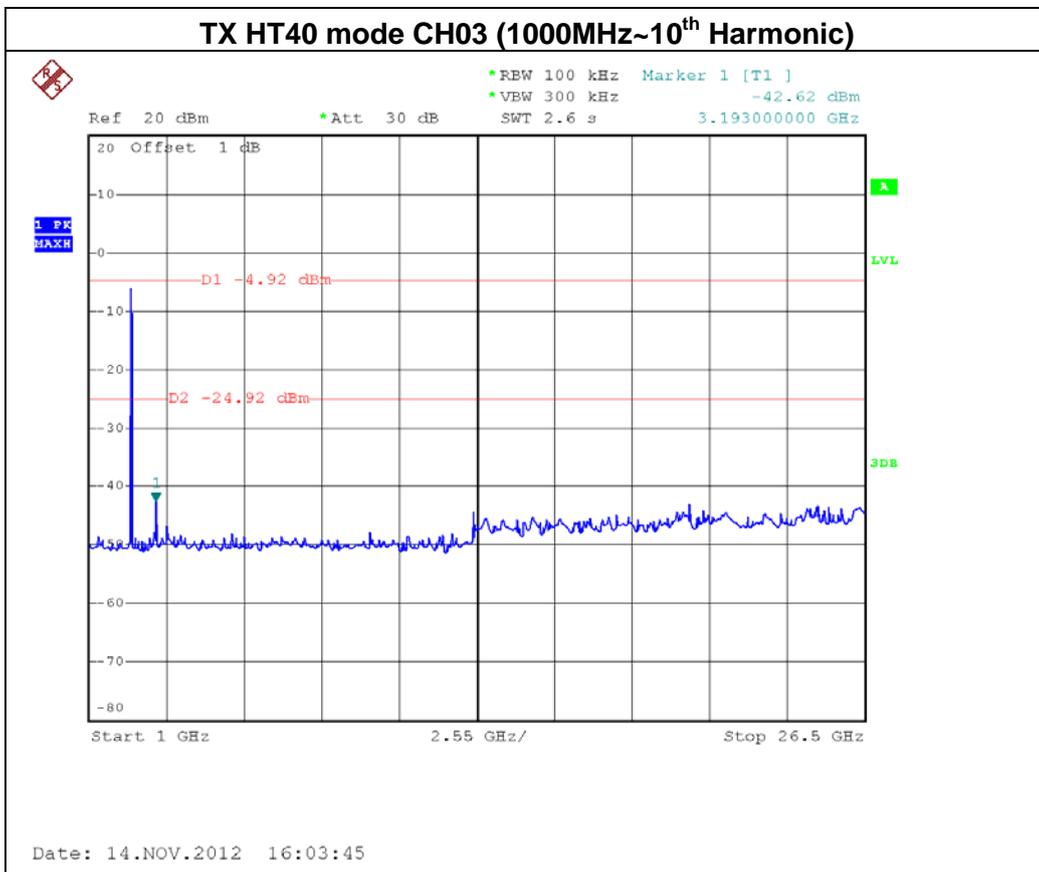
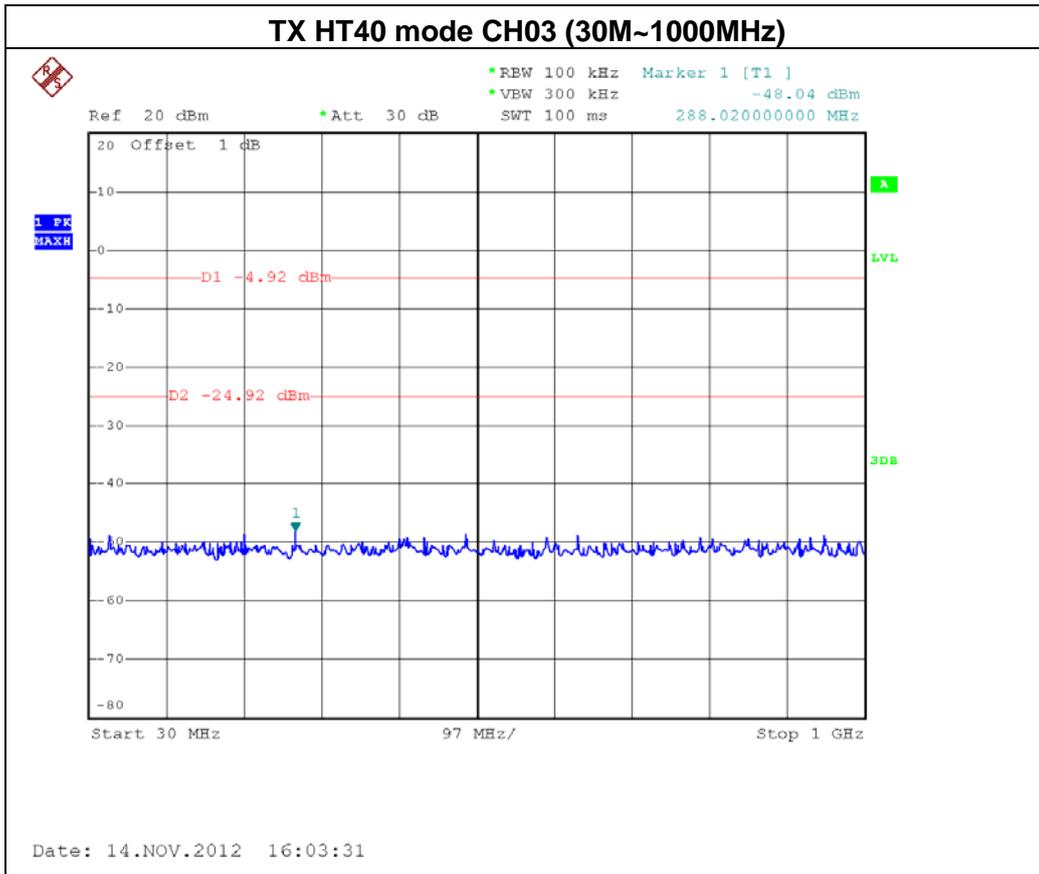
EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09--ANT 2		

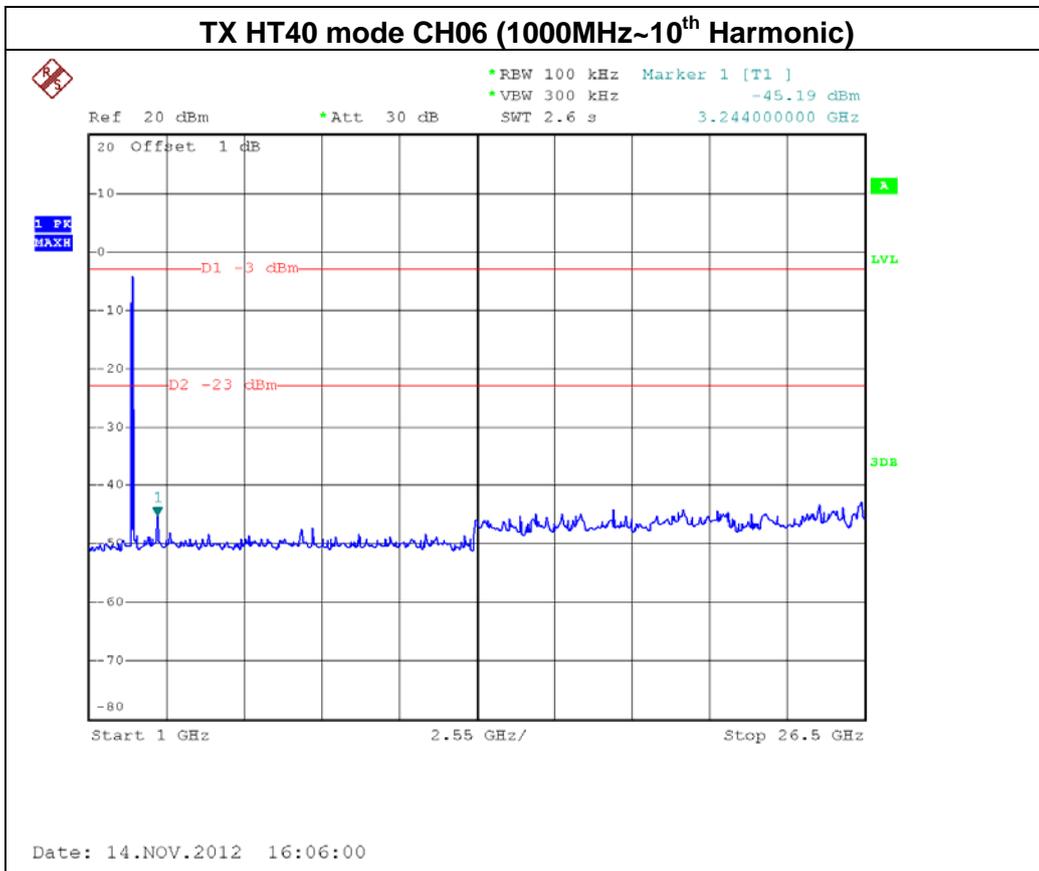
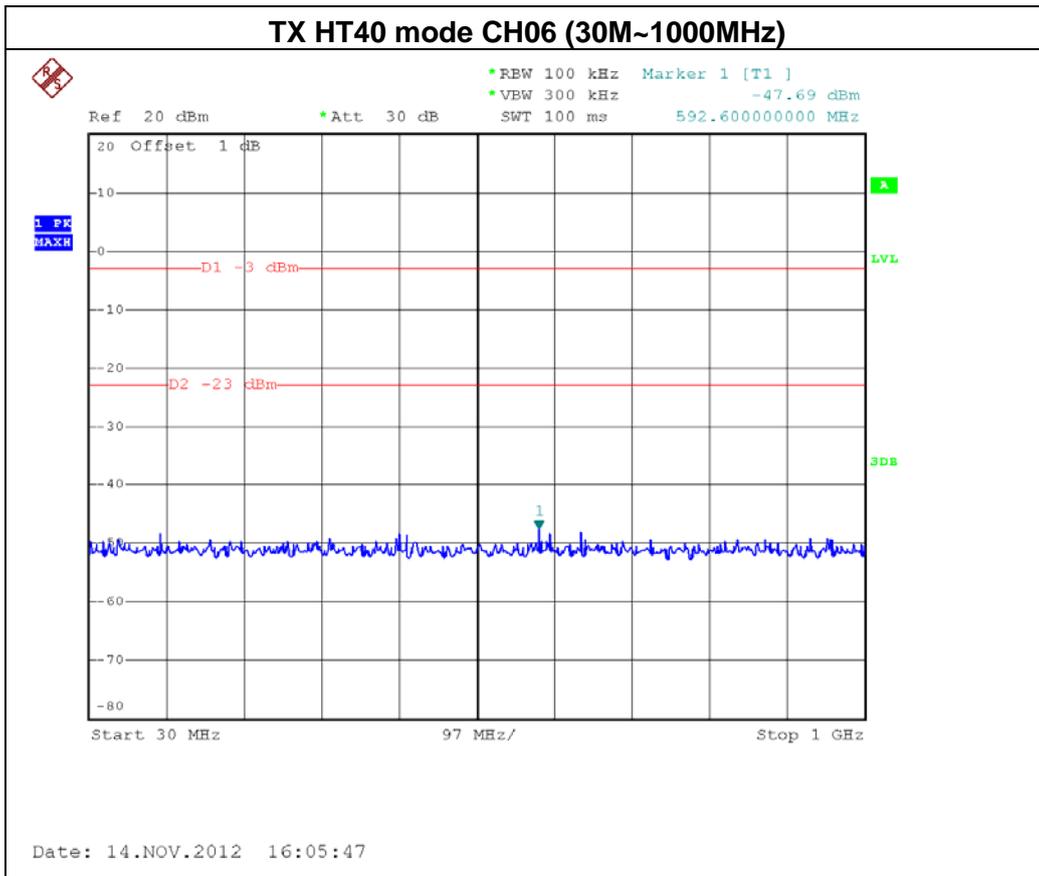
Channel of Worst Data: CH03			
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth outside the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-37.70	2487.60	-47.49

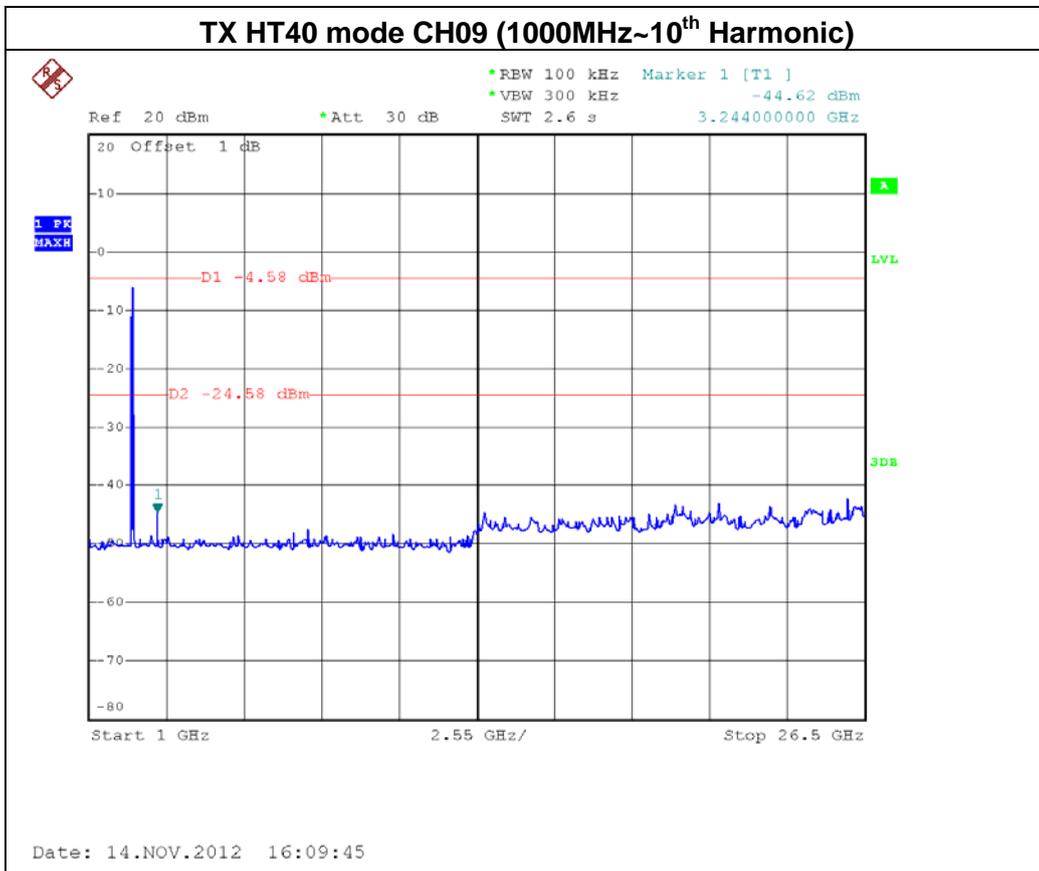
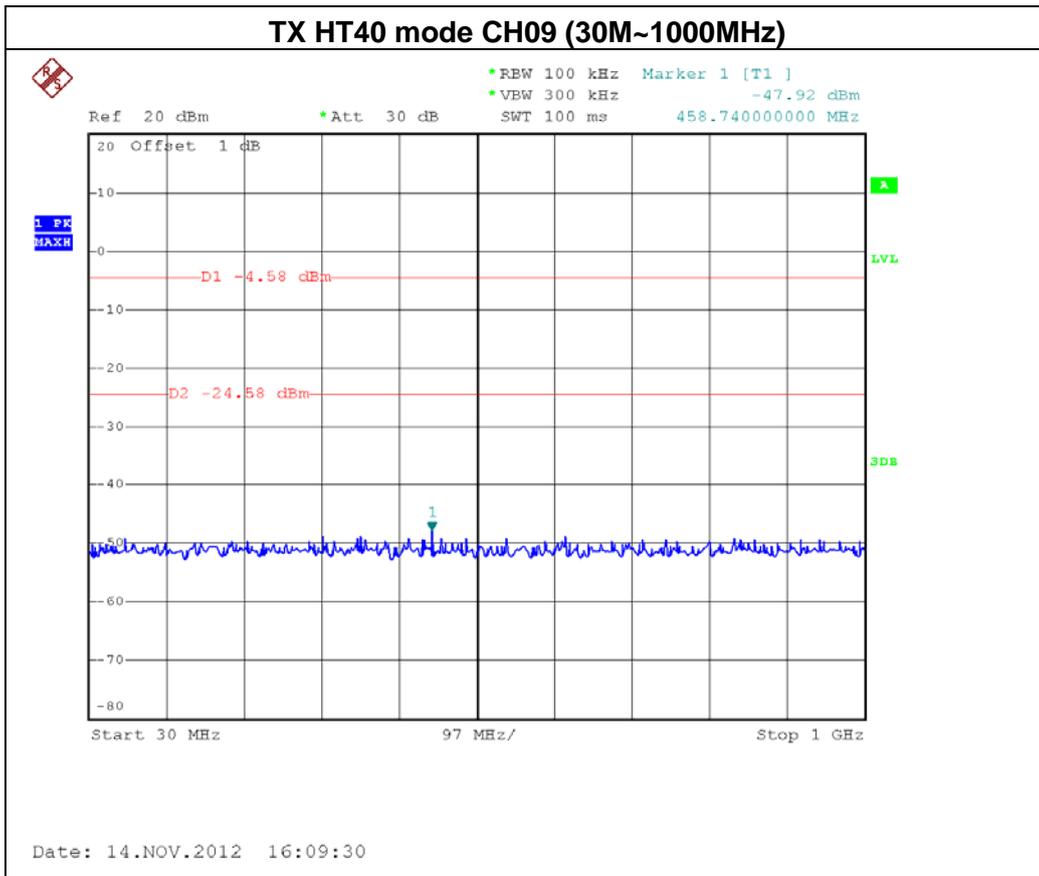
Result

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.











**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)	2400-2483.5	PASS

**8.1.1 MEASUREMENT INSTRUMENTS LIST**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Next Calibration
1	Spectrum Analyzer	R&S	FSP_40	100185	Nov.25.2012	Nov.24.2013

Remark: "N/A" denotes no model name, serial no. or calibration specified.

**8.1.2 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=300 KHz, Sweep time = 2.5ms.

**8.1.3 DEVIATION FROM STANDARD**

No deviation.

**8.1.4 TEST SETUP**



**8.1.5 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.

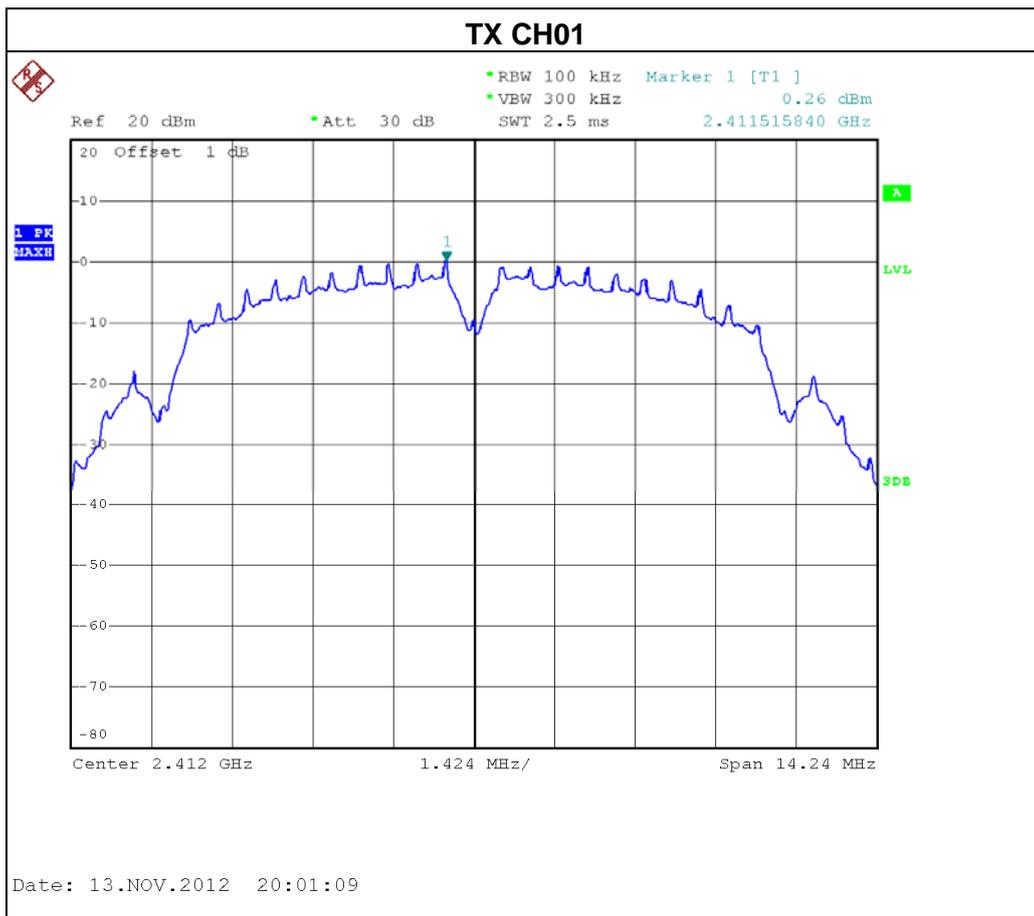


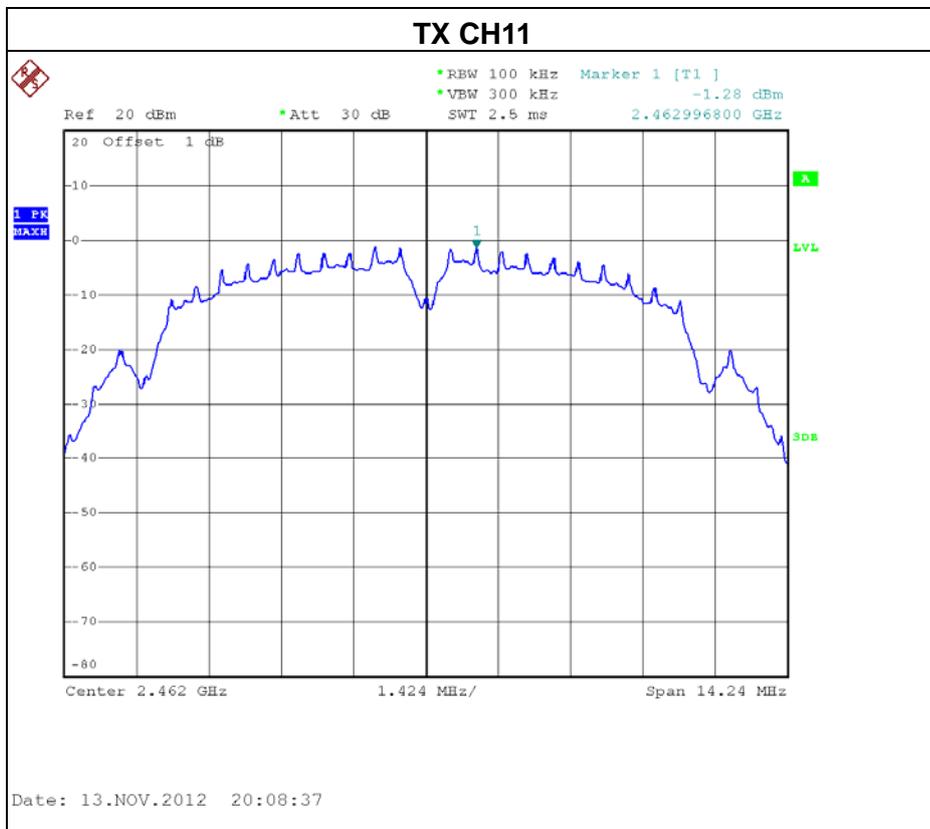
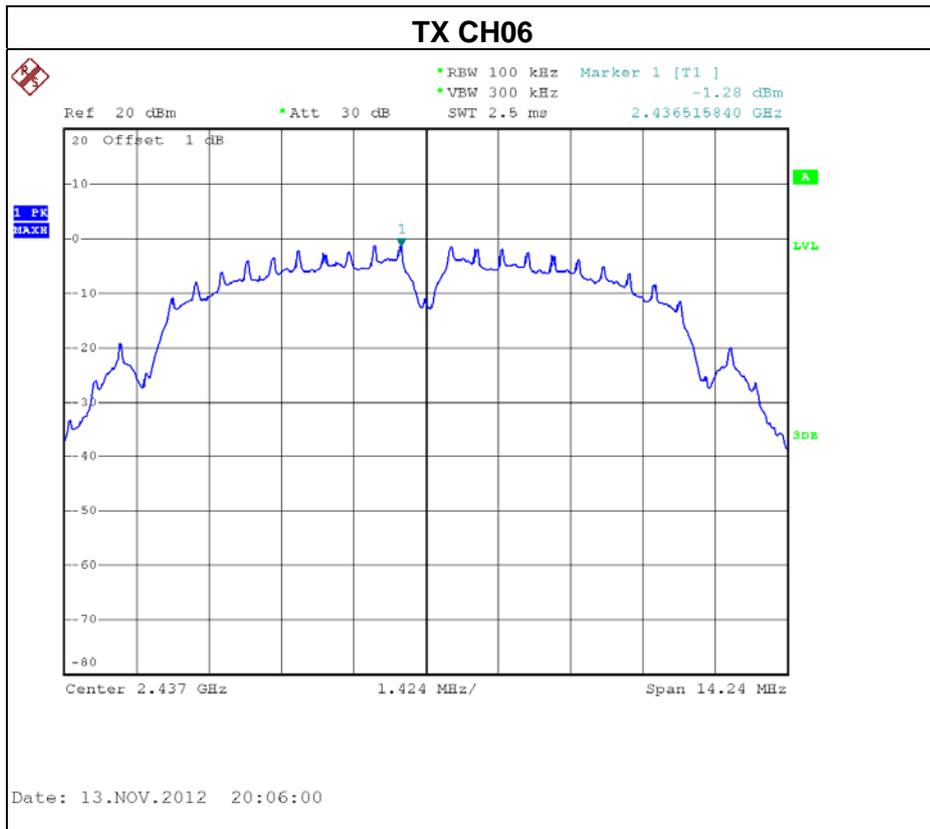
**8.1.6 TEST RESULTS**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2412 MHz	-14.96	8
CH06	2437 MHz	-16.50	8
CH11	2462 MHz	-16.50	8

Note: Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{kHz}) = -15.22\text{ dB}$ .



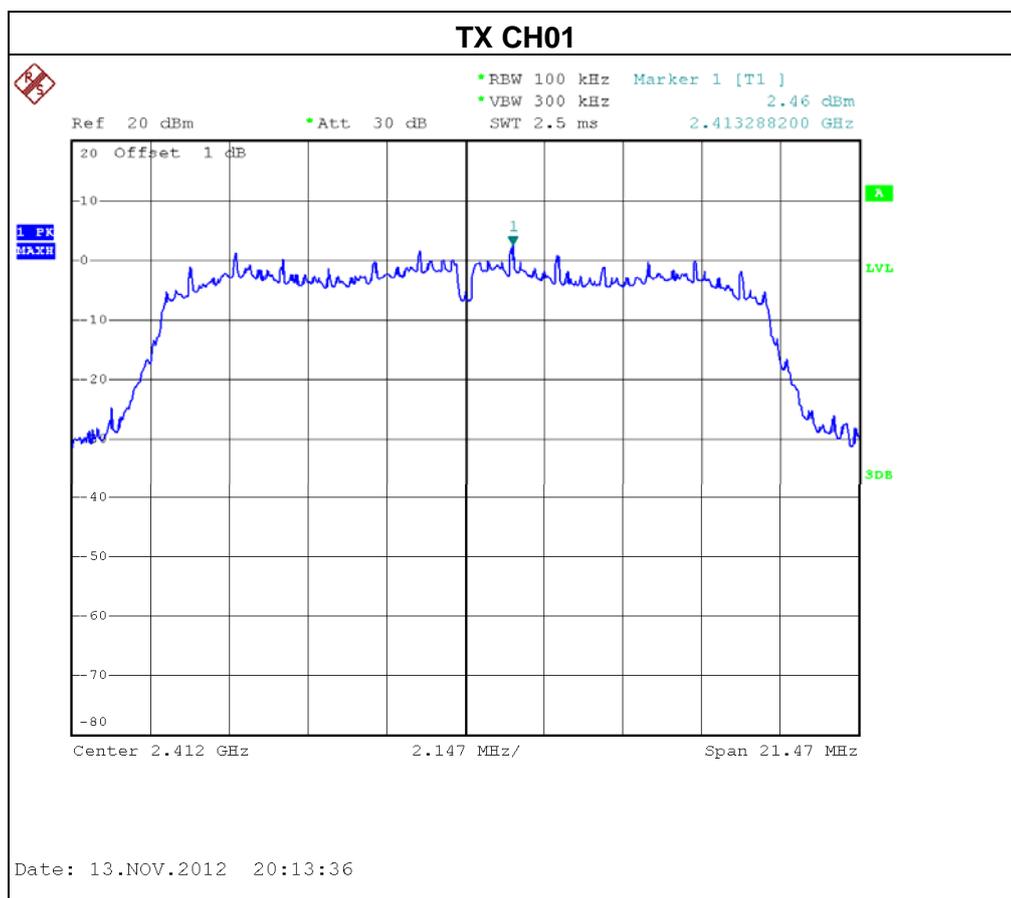


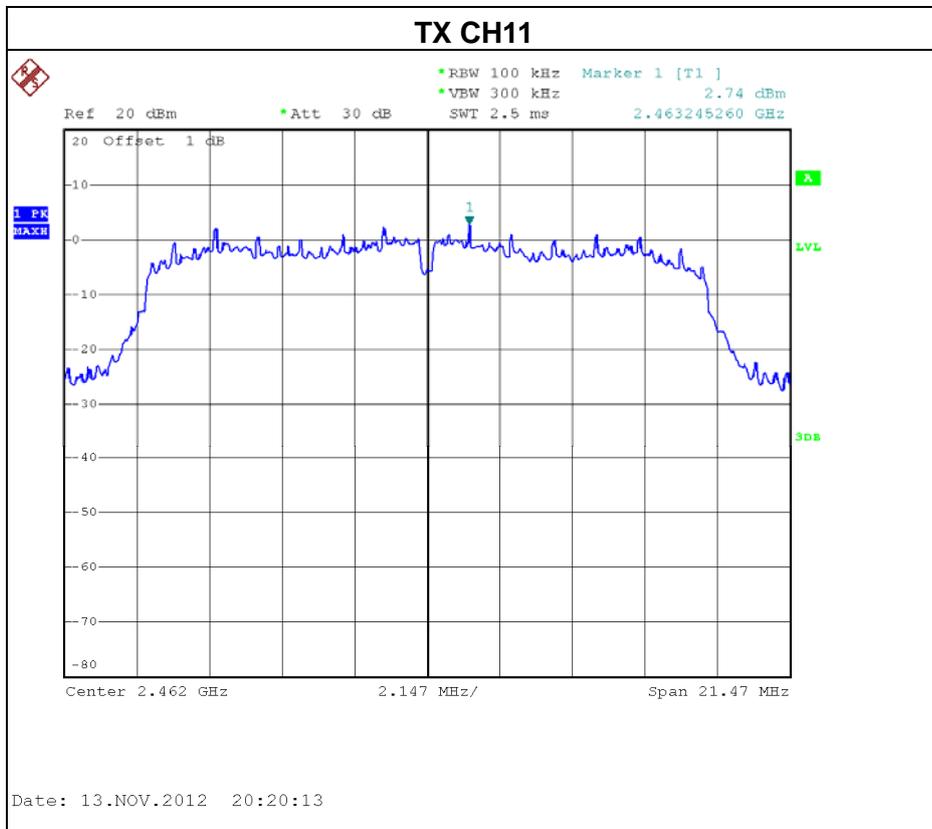
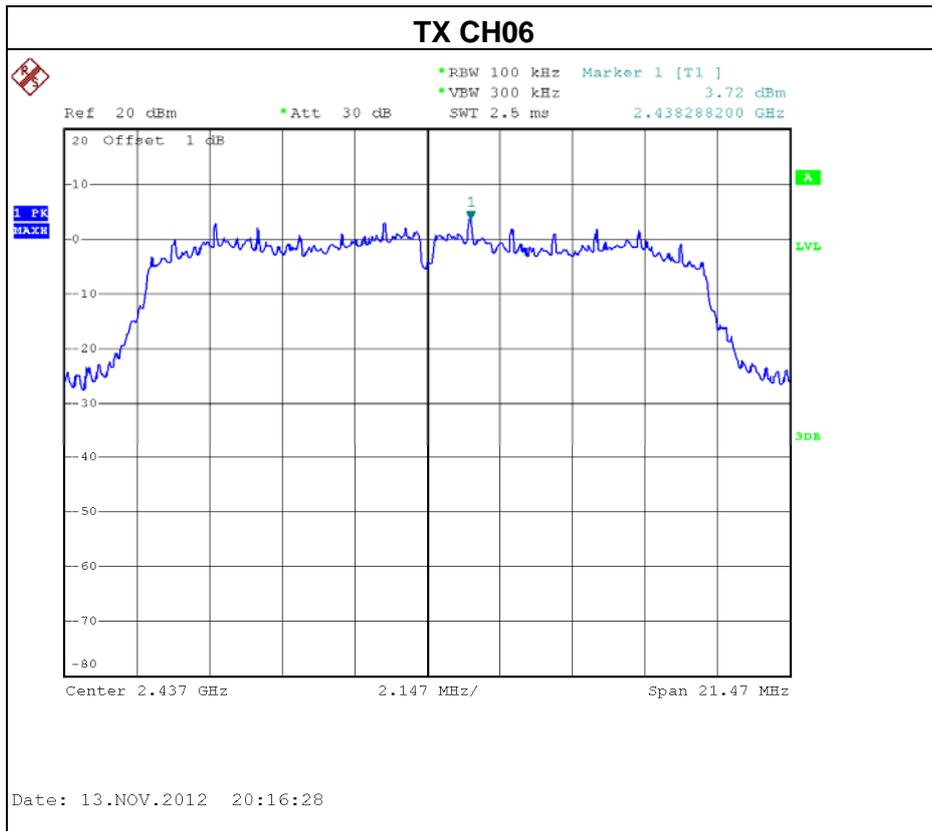


EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2412 MHz	-12.76	8
CH06	2437 MHz	-11.50	8
CH11	2462 MHz	-12.48	8

Note: Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.22\text{ dB}$ .



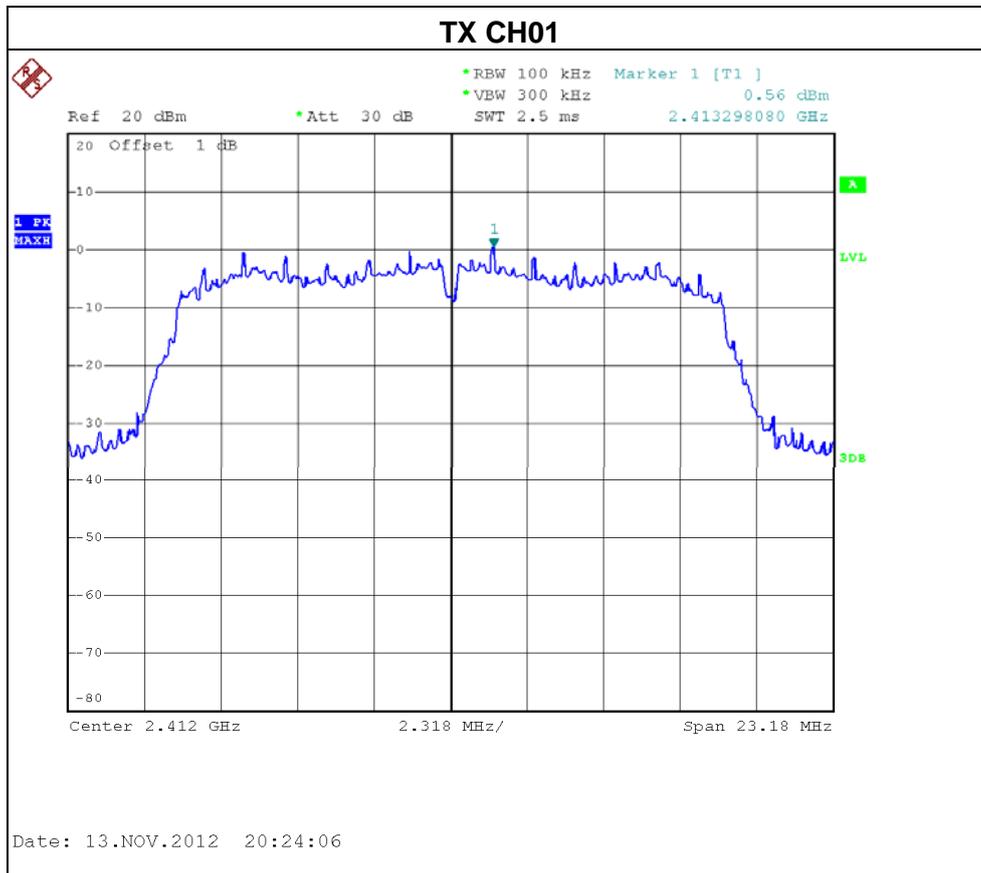


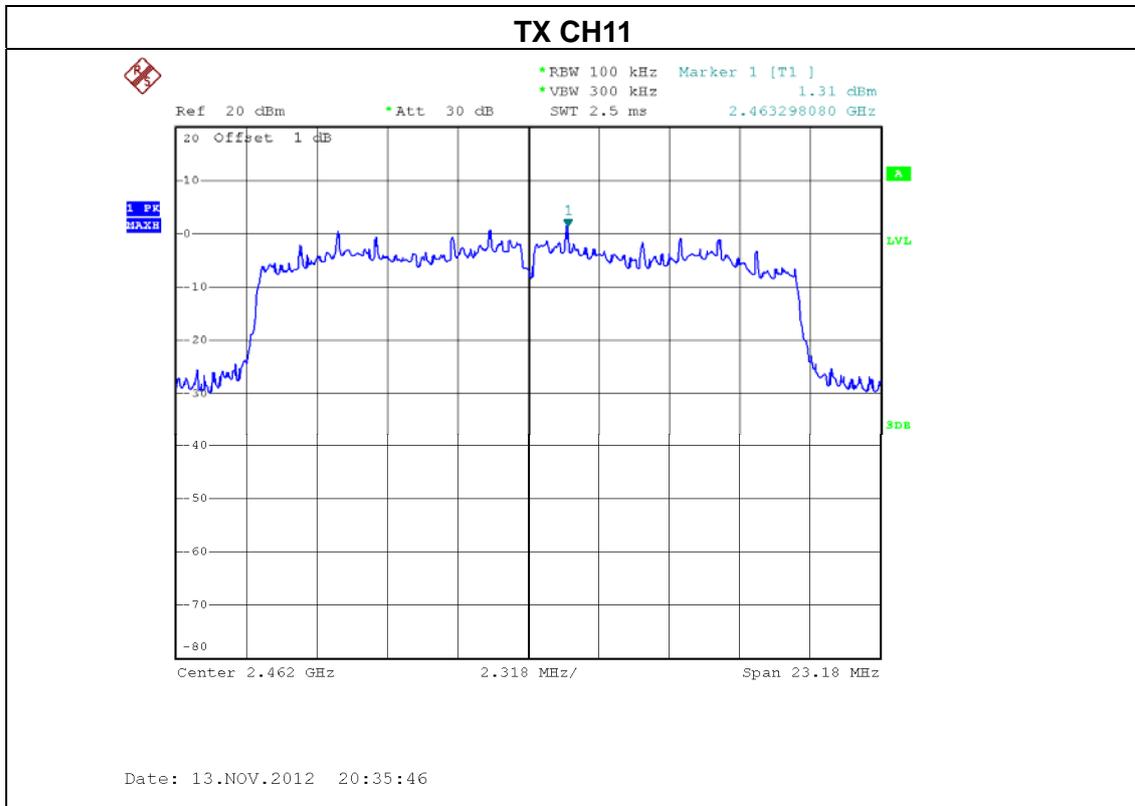
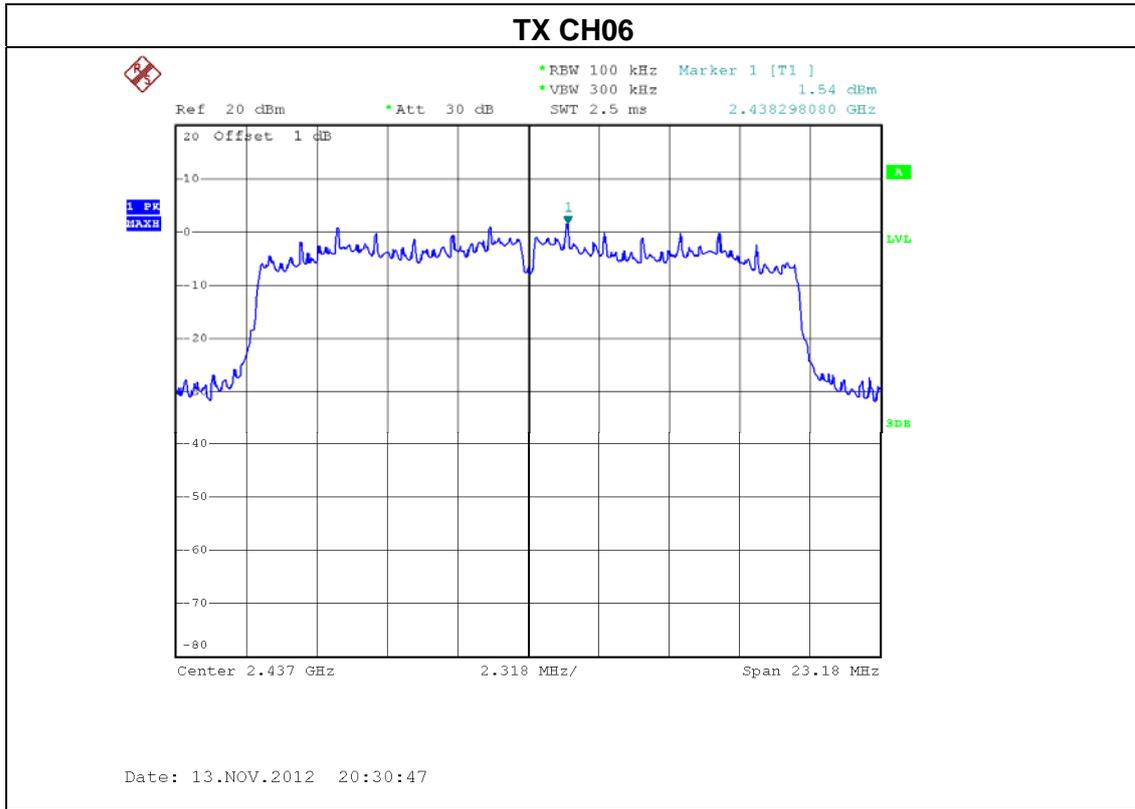


EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE-20MHz /CH01, CH06, CH11 --ANT 1		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2412 MHz	-14.66	8
CH06	2437 MHz	-13.68	8
CH11	2462 MHz	-13.91	8

Note: Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{kHz}) = -15.22\text{ dB}$ .



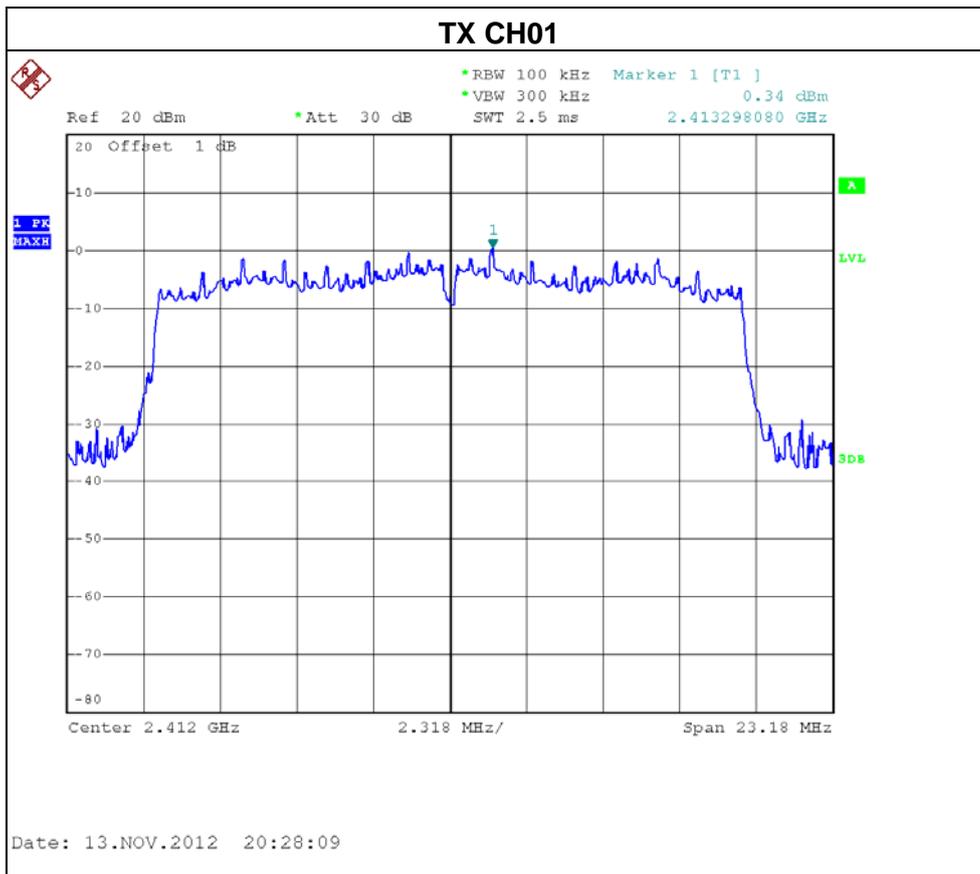


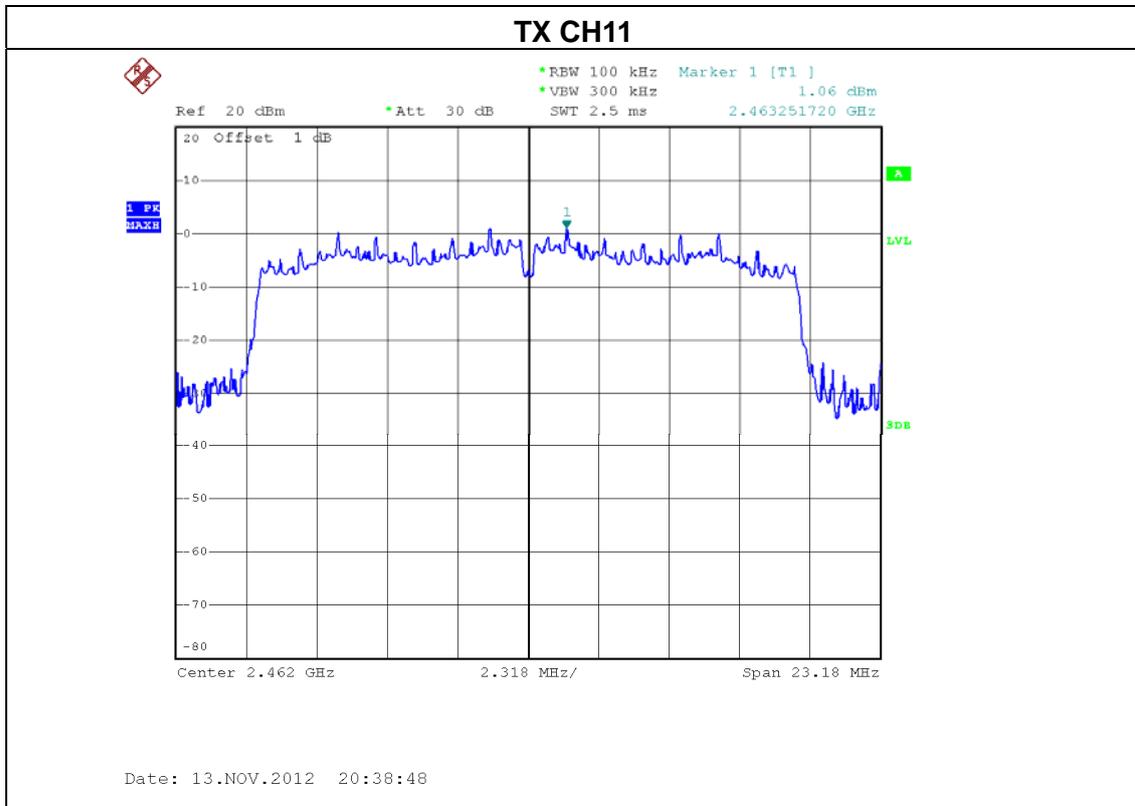
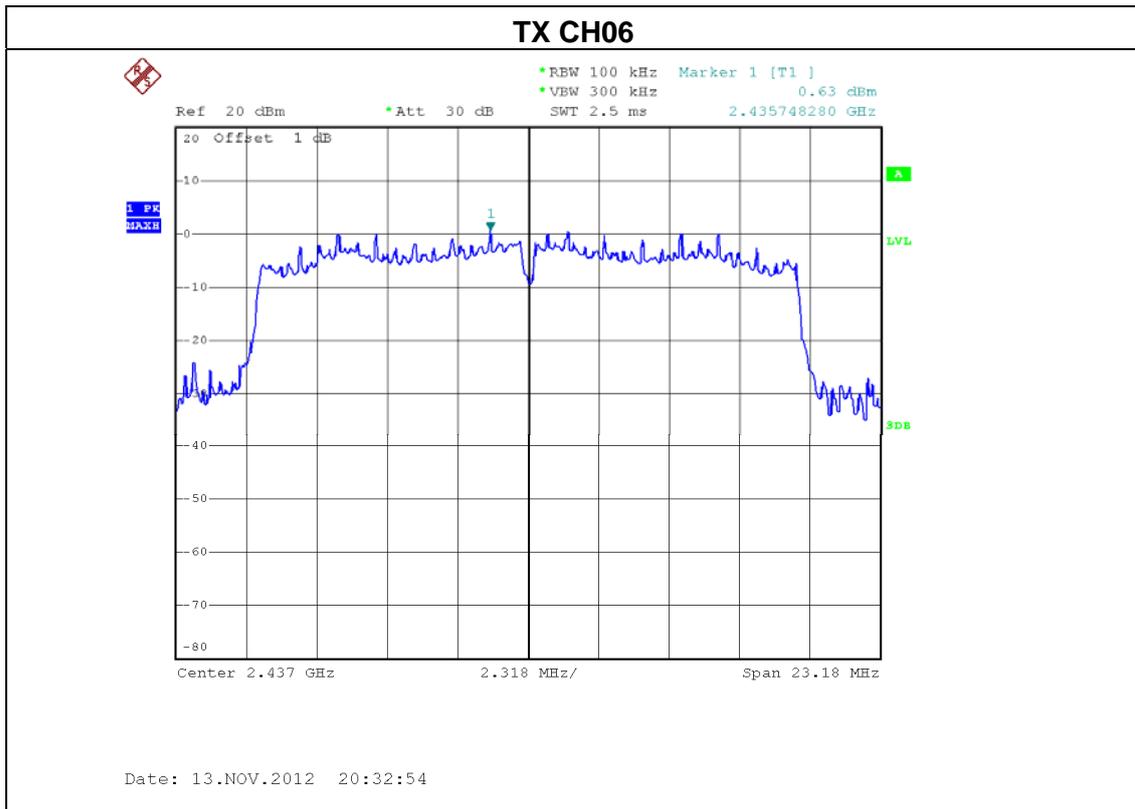


EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE-20MHz /CH01, CH06, CH11 --ANT 2		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2412 MHz	-14.88	8
CH06	2437 MHz	-14.59	8
CH11	2462 MHz	-14.16	8

Note: Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.22\text{ dB}$ .







EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE-20MHz /CH01, CH06, CH11 –ANT1+ANT2		

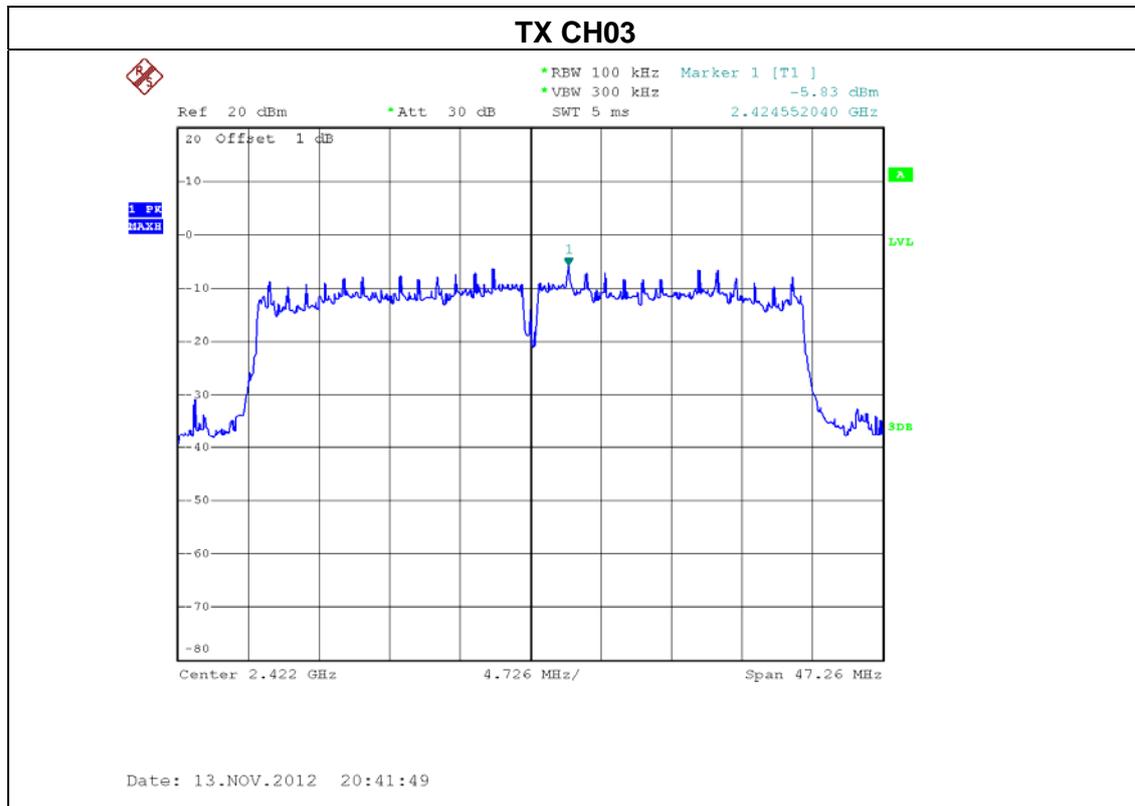
Total (Ant 1 + Ant 2)					
Test Channel	Frequency (MHz)	Power density (dBm) (mW)		LIMIT (dBm)	PASS/FAIL
CH01	2412	-11.76	0.07	8	PASS
CH06	2437	-11.10	0.08	8	PASS
CH11	2462	-11.02	0.08	8	PASS

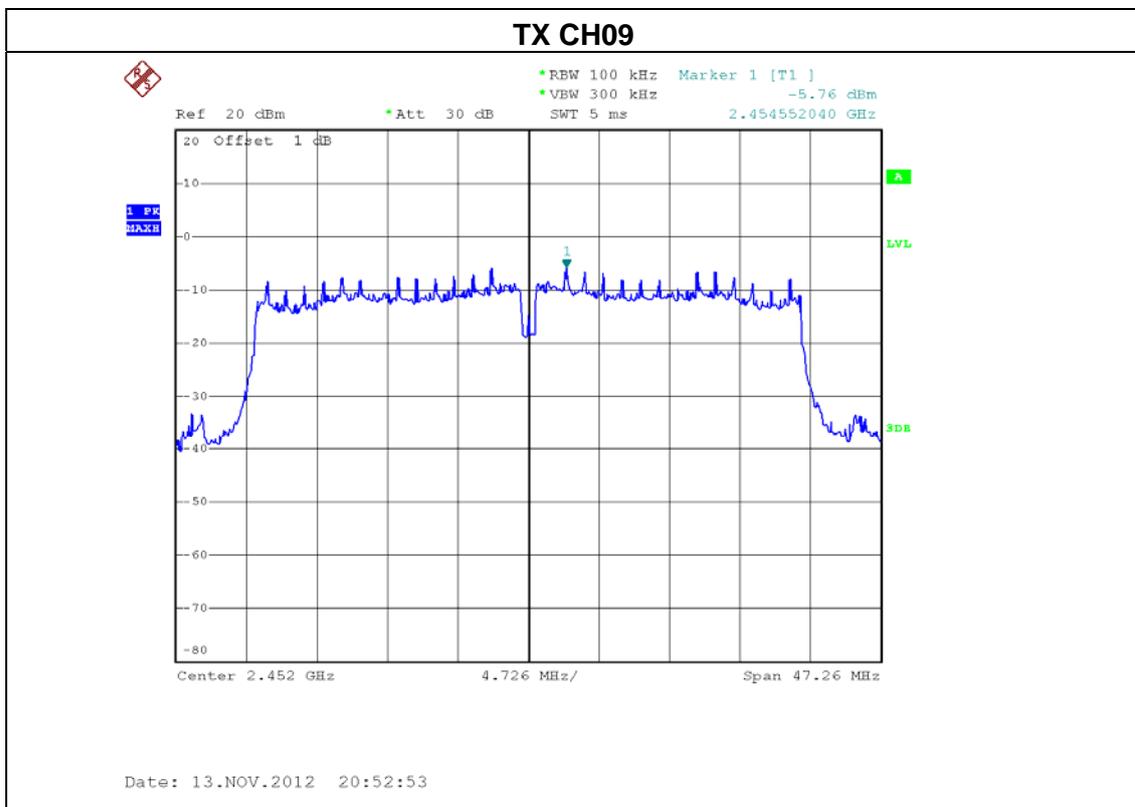
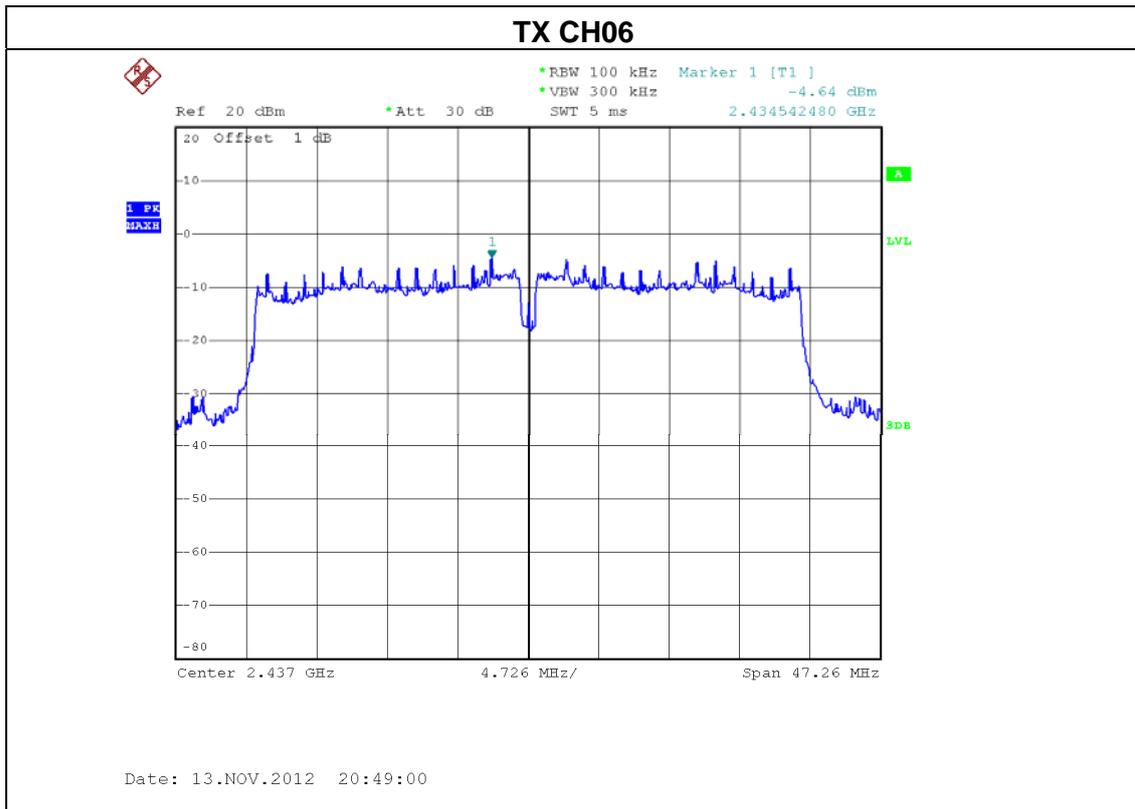


EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE-40MHz /CH03, CH06, CH09—ANT 1		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH03	2422 MHz	-21.05	8
CH06	2437 MHz	-19.86	8
CH09	2462 MHz	-20.98	8

Note: Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{kHz}) = -15.22\text{ dB}$ .



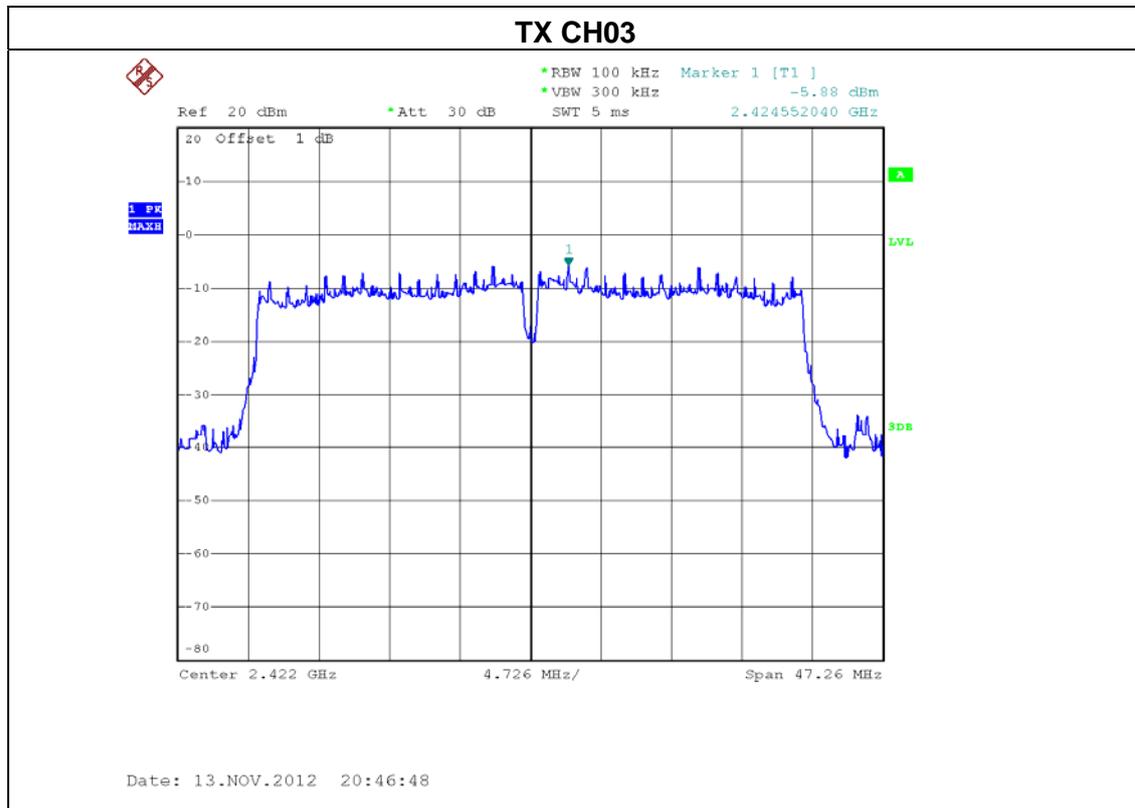


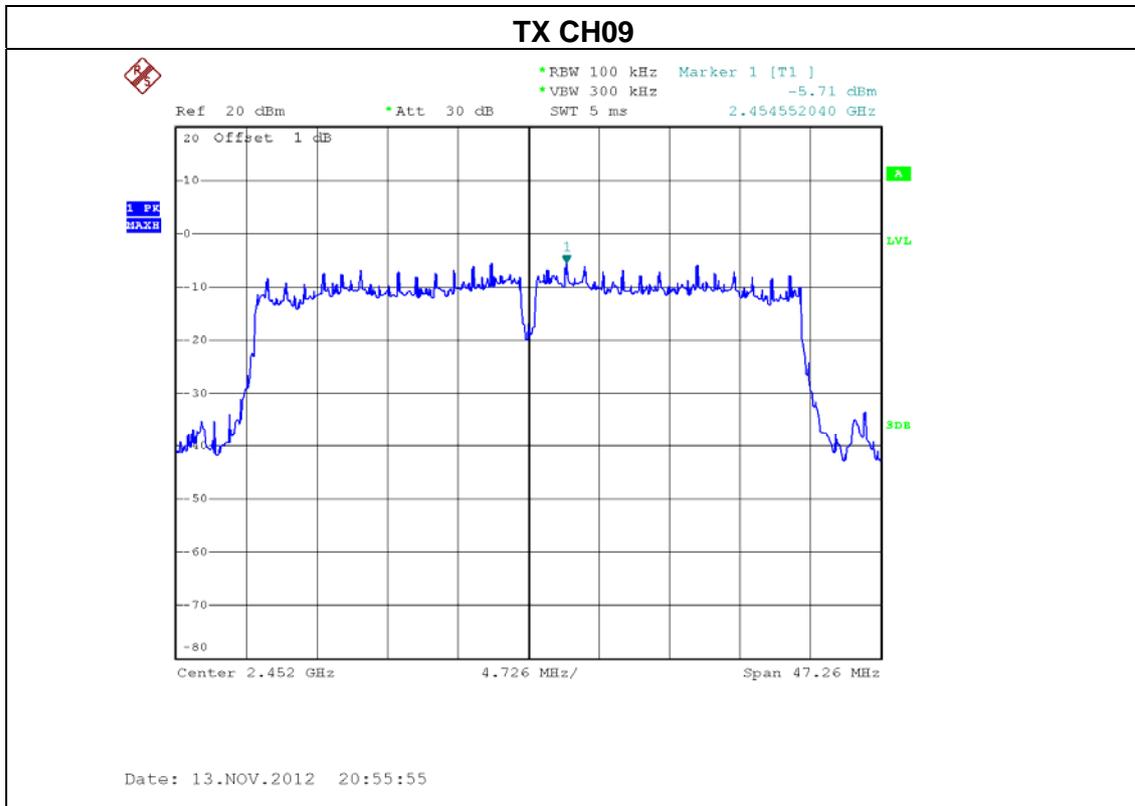
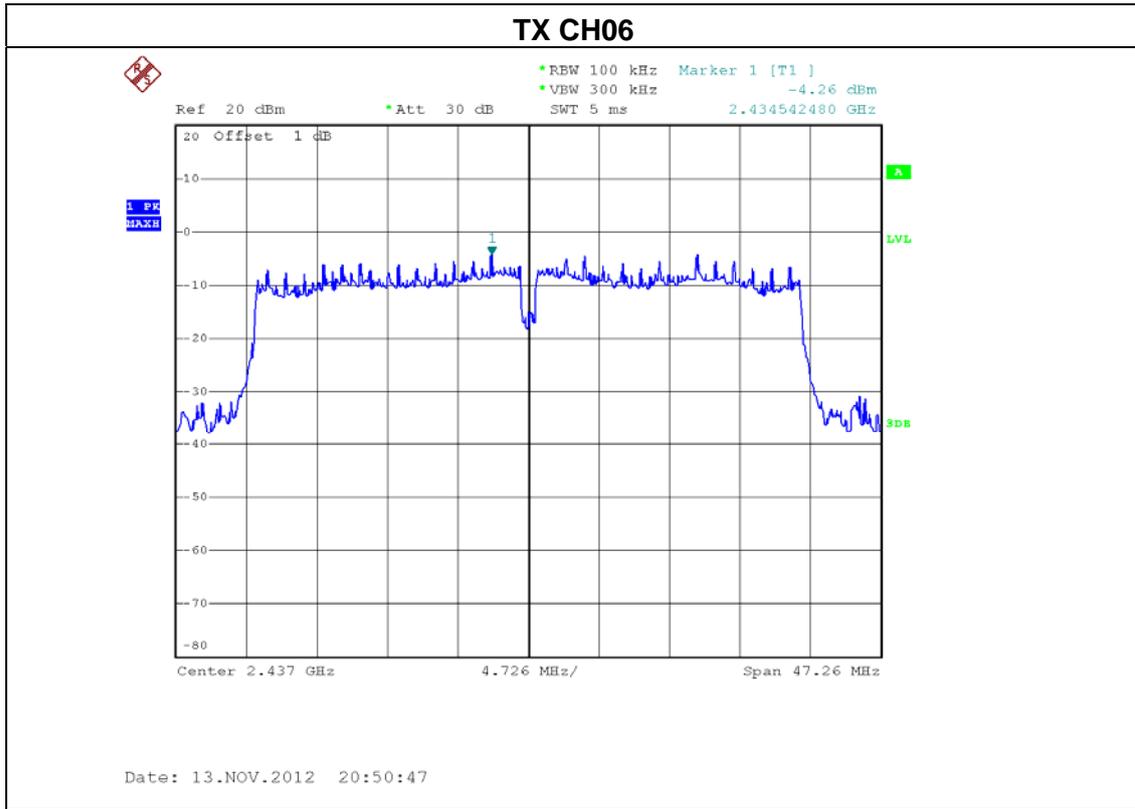


EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE-40MHz /CH03, CH06, CH09—ANT 2		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH03	2422 MHz	-21.10	8
CH06	2437 MHz	-19.48	8
CH09	2462 MHz	-20.93	8

Note: Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{kHz}) = -15.22\text{ dB}$ .







**Neutron Engineering Inc.**

EUT :	Home Gateway	Model Name :	HG658
Temperature :	24 °C	Relative Humidity :	60 %
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N MODE-40MHz /CH03, CH06, CH09—ANT 1+ANT 2		

Total (Ant 1 + Ant 2)					
Test Channel	Frequency (MHz)	Power density		LIMIT (dBm)	PASS/FAIL
		(dBm)	(mW)		
CH03	2422	-18.06	0.02	8	PASS
CH06	2437	-16.66	0.02	8	PASS
CH09	2452	-17.94	0.02	8	PASS

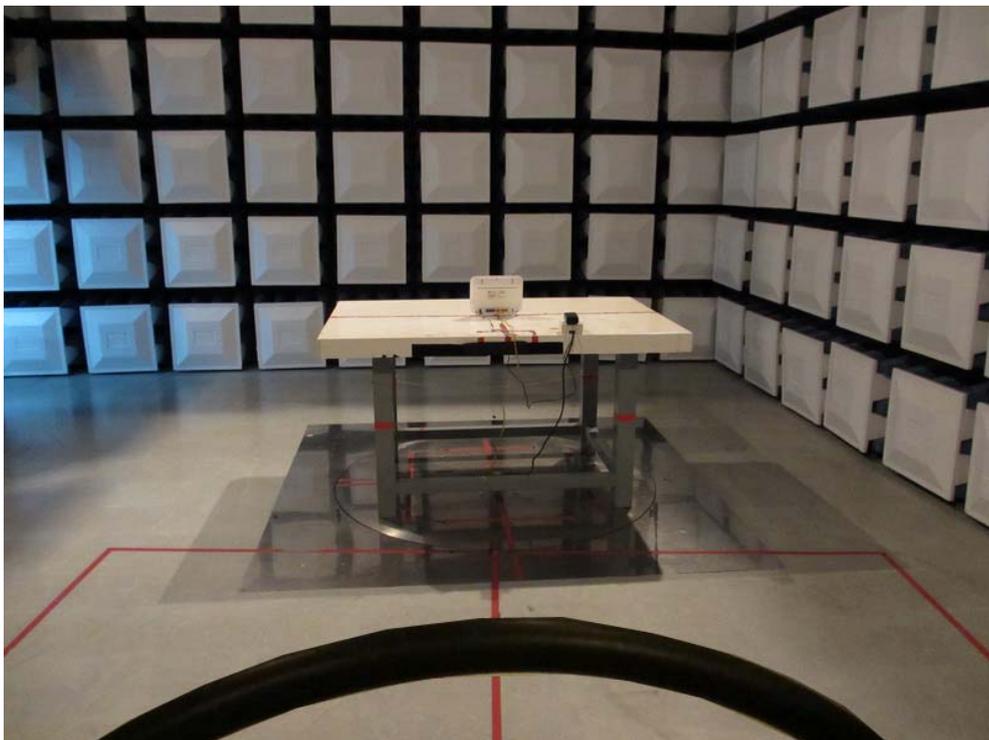
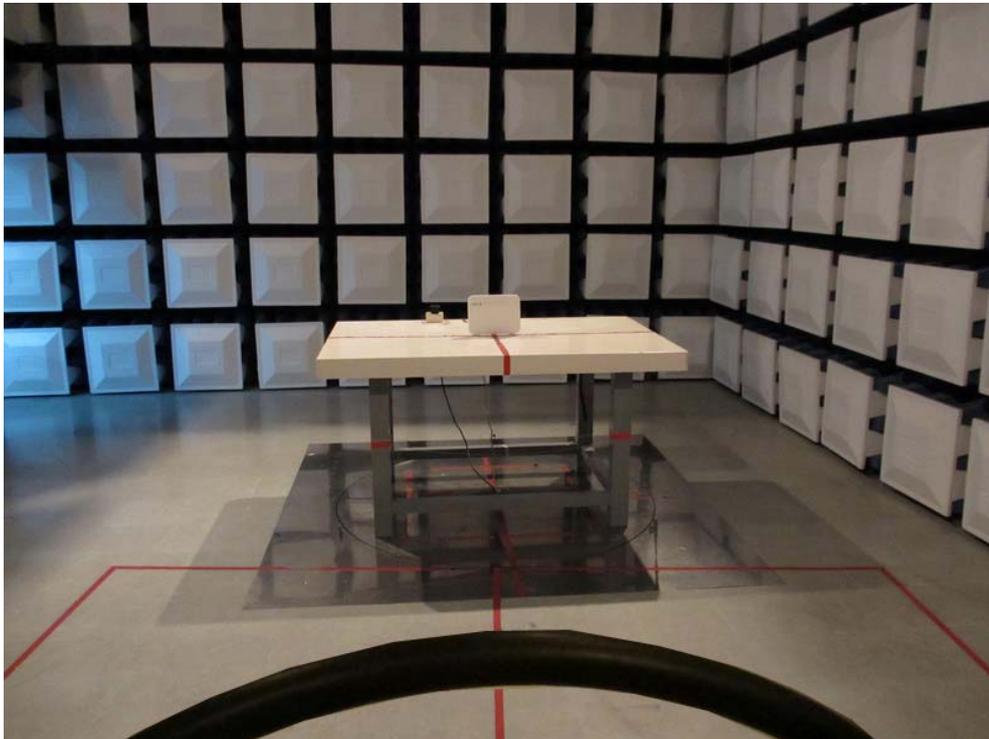


**9. EUT TEST PHOTO**

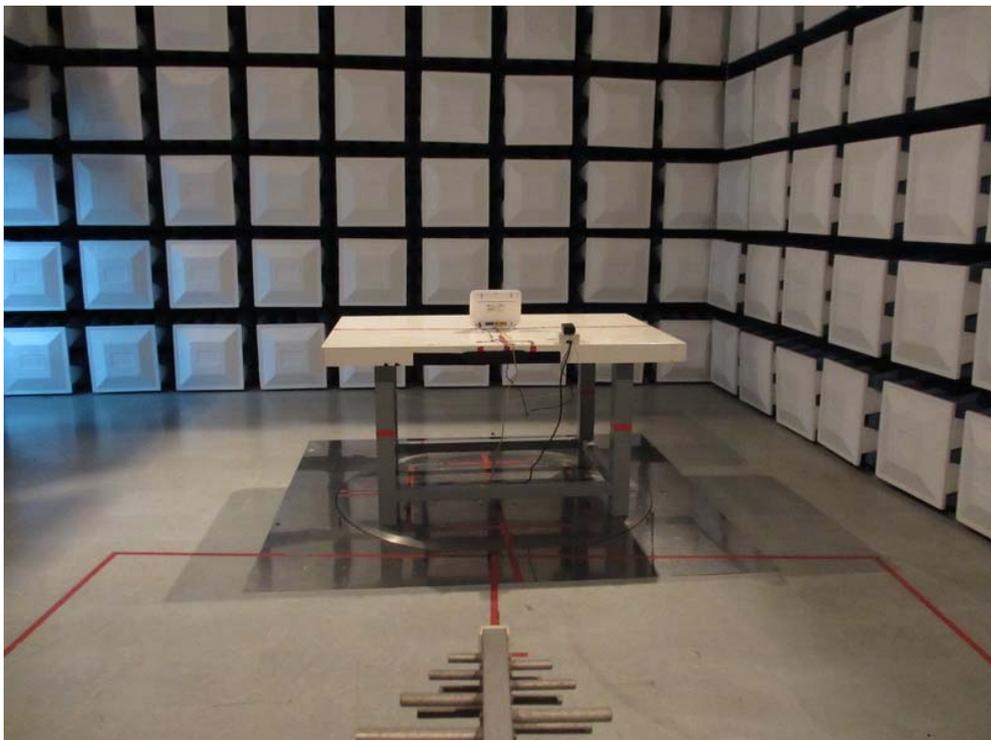
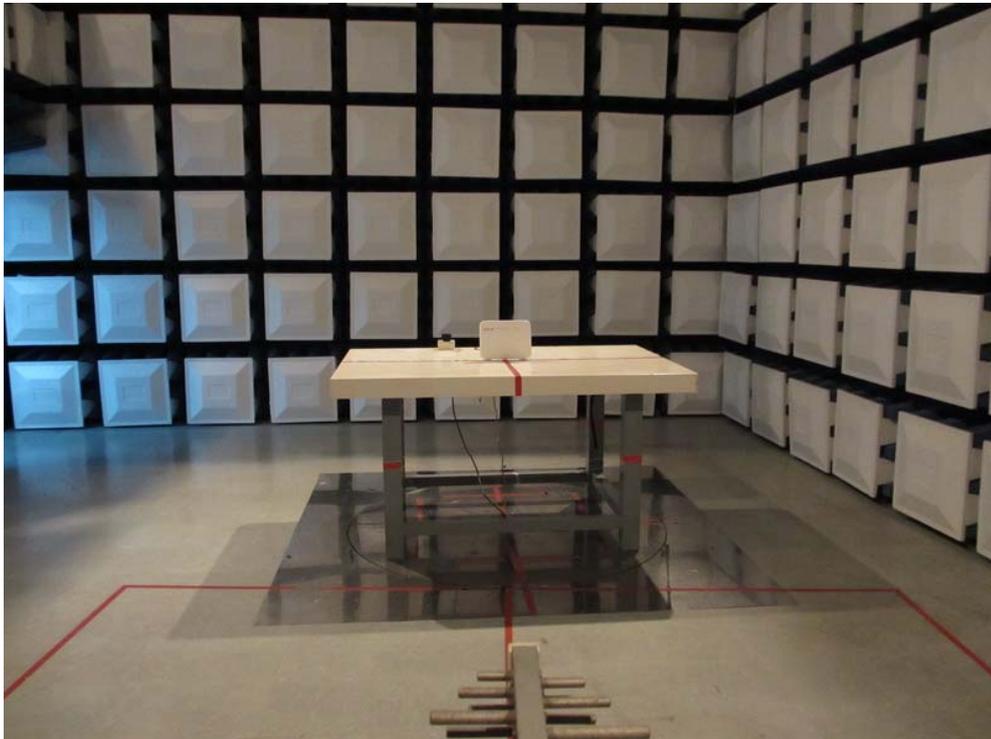
**Conducted Measurement Photos**



**Radiated Measurement Photos  
9K~30MHz**



**Radiated Measurement Photos  
30~1000MHz**



**Radiated Measurement Photos  
Above 1000MHz**

