



# **FCC RADIO TEST REPORT**

## **FCC ID: 2AC8NS8PRO**

**Product :** TV Box

**Trade Name :** N/A

**Model Name :** S8 pro

**Serial Model :** S802, S812, A9, M8

**Report No. :** NTEK-2014NT0928495F2

### **Prepared for**

Shenzhen Tayun Smart Technology Co.,Ltd.  
431.433# District 3 Building B,Mingyou Products Procurement Center,  
NO.168 Baoyuan Rd, Xixiang, Baoan, Shenzhen, China

### **Prepared by**

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... Shenzhen Tayun Smart Technology Co.,Ltd.

**Address** ..... 431.433# District 3 Building B,Mingyou Products Procurement Center,  
NO.168 Baoyuan Rd, Xixiang, Baoan, Shenzhen, China

**Manufacture's Name**... Shenzhen Tayun Smart Technology Co.,Ltd.

**Address** ..... 431.433# District 3 Building B,Mingyou Products Procurement Center,  
NO.168 Baoyuan Rd, Xixiang, Baoan, Shenzhen, China

### Product description

**Product name** ..... TV Box

**Model and/or type** ..... S8 pro  
**reference** .....

**Serial Model** ..... S802, S812, A9, M8

**Standards** ..... FCC Part15.247: 01 Oct. 2013

**Test procedure** ..... ANSI C63.4-2003 and KDB 558074: June 5, 2014

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test** .....

**Date (s) of performance of tests** ..... 28 Sep. 2014 ~23 Oct. 2014

**Date of Issue** ..... 23 Oct. 2014

**Test Result** ..... **Pass**

**Testing Engineer** : Kyle Xu  
(Kyle Xu)

**Technical Manager** : Brown Lu  
(Brown Lu)

**Authorized Signatory** : Bill Yao  
(Bill Yao)

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## 1. 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 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

### NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

## 1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

## 1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	TV Box	
Trade Name	N/A	
Model Name	S8 pro	
Serial Model	S802, S812, A9, M8	
Model Difference	All the model are the same circuit and RF module, except the model name and colour.	
Product Description	The EUT is a TV Box	
	Operation Frequency:	802.11b/g/n(20MHz):2412~2462 MHz
	Modulation Type:	CCK/OFDM/DBPSK
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20MHz):150/144.44/130/117/115.56/104/86.67/78/52/6.5Mbps
	Number Of Channel	802.11b/g/n20MHz:11CH
	Max.Output Power(Conducted):	15.35 dBm
	Operation Frequency:	5725 MHz ~ 5850 MHz
	Modulation Type:	OFDM (BPSK / QPSK / 16QAM / 64QAM)
	Max.Output Power(Conducted):	13.89 dBm
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	Please see Note 3.
	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.	
Channel List	Please refer to the Note 2.	
Ratings	DC 5.0V,2.0A	
Adapter	Model:ZB-01-5020US Input: 100-240V,50/60 Hz,0.5A max Output: 5.0V $\overline{\text{---}}$ , 2000mA	
Battery	N/A	
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. 2.4GHz

Channel List for 802.11b/g/n(20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	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	-	-

## 5GHz

802.11a/n20 MHz Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

## 3.

### Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	FPCB antenna	2.4G/5G:1.0	Wifi Antenna



## 2.2 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	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11a /n20 CH149/ CH157/ CH165
Mode 5	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

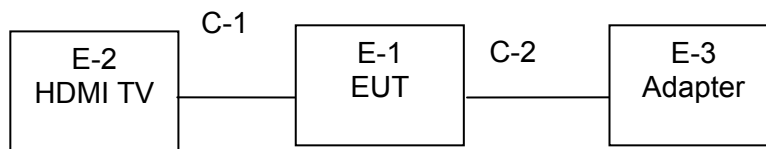
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11a /n20 CH149/ CH157/ CH165
Mode 5	Link Mode

Note:

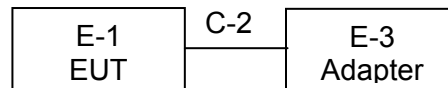
- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

#### Conducted Emission Test



#### Radiated Emission Test



## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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	Brand	Model/Type No.	Series No.	Note
E-1	TV Box	Actiontec	S8 pro	N/A	EUT
E-2	TV	SONY	KDL-24EX520	N/A	
E-3	Adapter	Actiontec	ZB-01-5020US	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	120cm	
C-2	NO	NO	120cm	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.06	2015.06.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.06	2015.06.05	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.06	2015.06.05	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2013.12.22	2014.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.06	2015.06.05	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	1 year

### Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2014.06.06	2015.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.06.06	2015.06.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.06	2015.06.05	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.06	2015.06.05	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.06	2015.06.05	1 year

1	Attenuation	MCE	24-10-34	BN9258	2014.06.06	2015.06.05	1 year
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### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

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

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

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

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

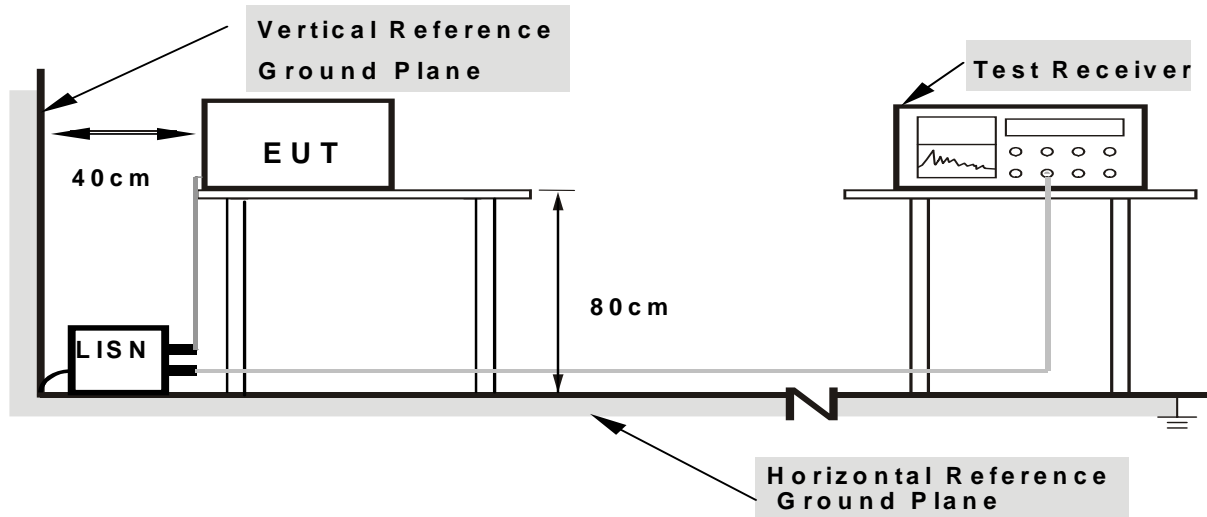
### 3.1.2 TEST PROCEDURE

- 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.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



**Note: 1.**Support units were connected to second LISN.

**2.**Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 3.1.5 EUT OPERATING CONDITIONS

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

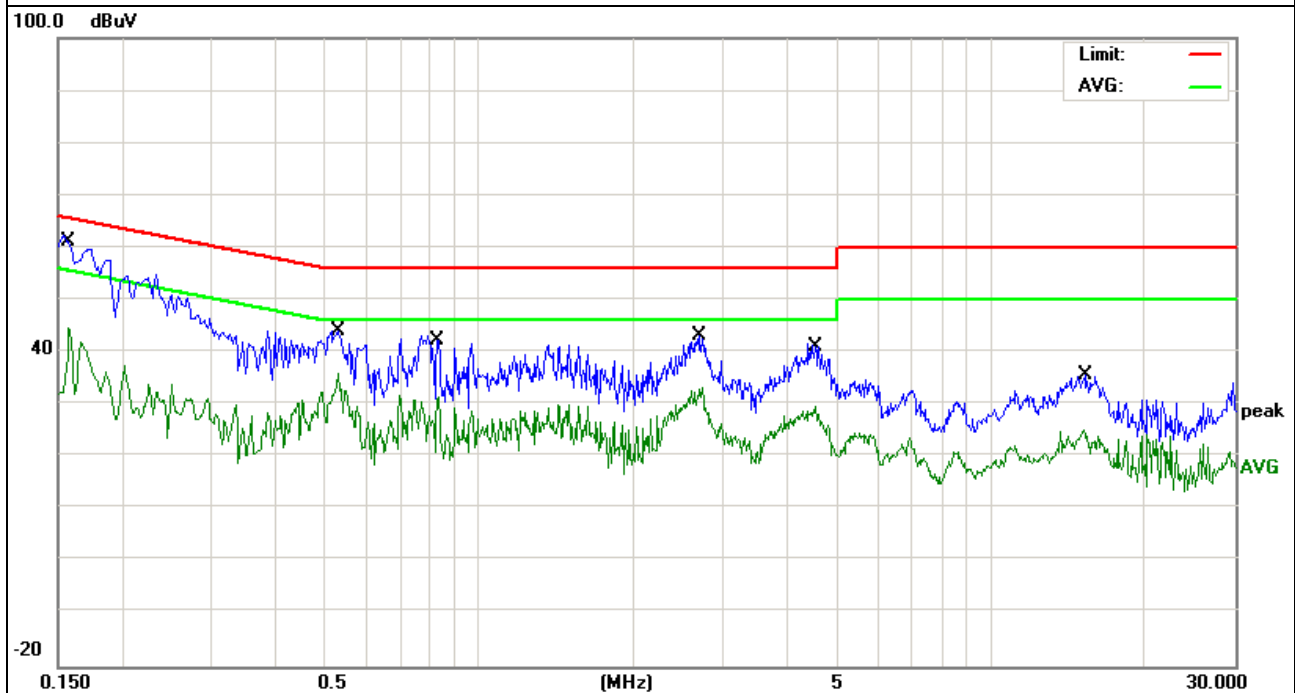
### 3.1.6 TEST RESULTS

EUT :	TV Box	Model Name. :	S8 pro
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5(2.4G)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1580	51.69	9.60	61.29	65.56	-4.27	QP
0.1580	35.16	9.60	44.76	55.56	-10.80	AVG
0.5299	34.46	9.51	43.97	56.00	-12.03	QP
0.5299	26.32	9.51	35.83	46.00	-10.17	AVG
0.8339	32.63	9.53	42.16	56.00	-13.84	QP
0.8339	22.00	9.53	31.53	46.00	-14.47	AVG
2.7259	32.94	9.56	42.50	56.00	-13.50	QP
2.7259	23.60	9.56	33.16	46.00	-12.84	AVG
4.5339	31.40	9.60	41.00	56.00	-15.00	QP
4.5339	20.16	9.60	29.76	46.00	-16.24	AVG
15.1539	25.05	9.85	34.90	60.00	-25.10	QP
15.1539	15.30	9.85	25.15	50.00	-24.85	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

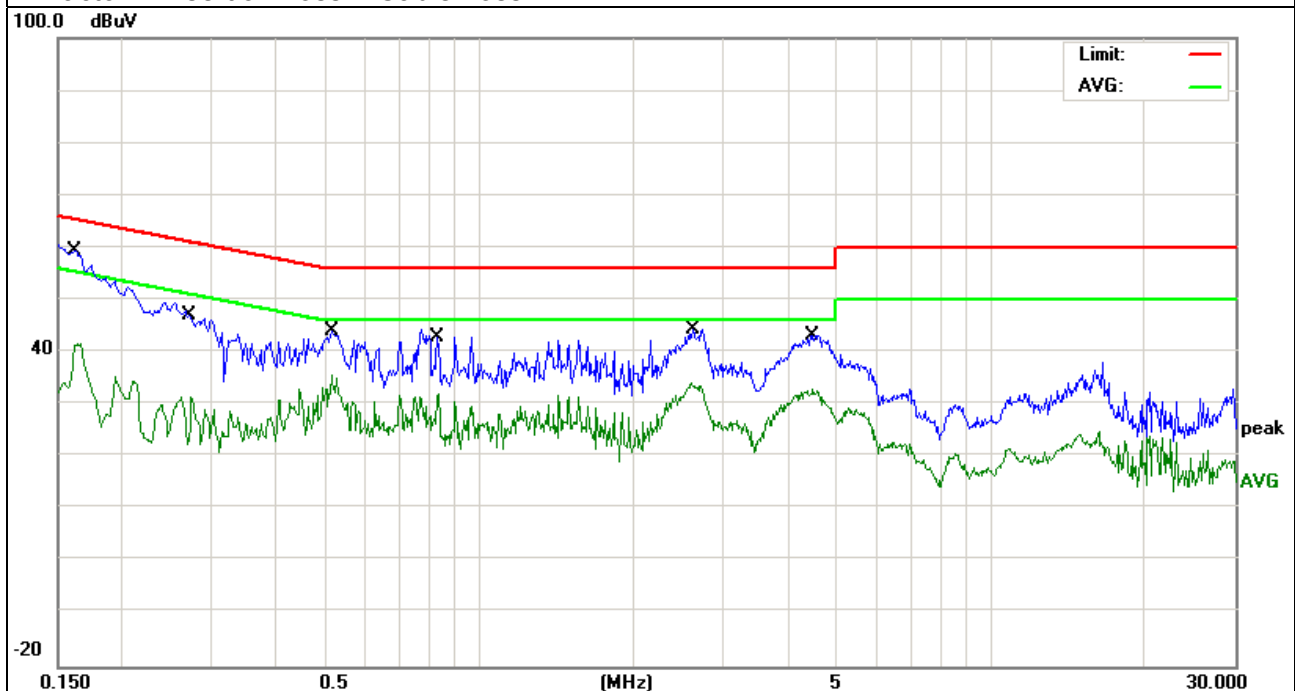


EUT :	TV Box	Model Name. :	S8 pro
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5(2.4G)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1632	49.54	9.62	59.16	65.29	-6.13	QP
0.1632	31.99	9.62	41.61	55.29	-13.68	AVG
0.2740	37.19	9.51	46.70	60.99	-14.29	QP
0.2740	21.97	9.51	31.48	50.99	-19.51	AVG
0.5140	34.52	9.53	44.05	56.00	-11.95	QP
0.5140	26.02	9.53	35.55	46.00	-10.45	AVG
0.8337	31.53	9.54	41.07	56.00	-14.93	QP
0.8337	22.63	9.54	32.17	46.00	-13.83	AVG
2.6059	33.14	9.57	42.71	56.00	-13.29	QP
2.6059	24.54	9.57	34.11	46.00	-11.89	AVG
4.4778	33.63	9.60	43.23	56.00	-12.77	QP
4.4778	23.43	9.60	33.03	46.00	-12.97	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.





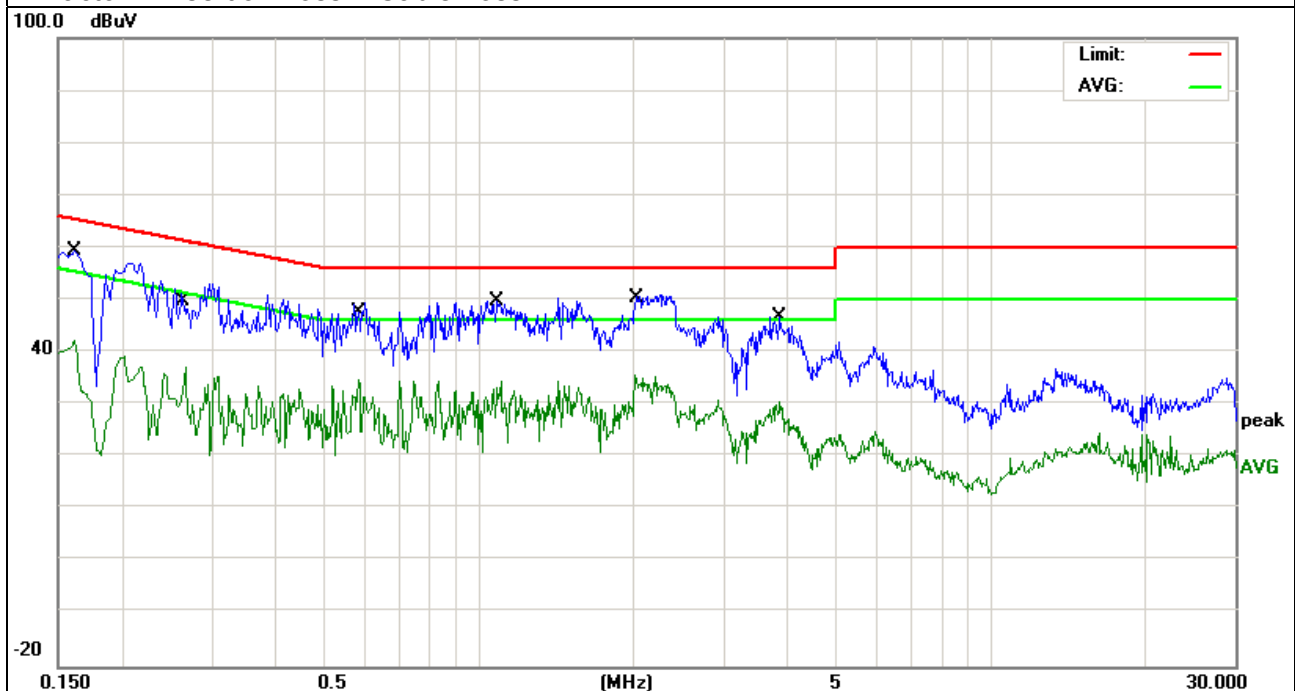
EUT :	TV Box	Model Name. :	S8 pro
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5(5G)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1620	49.75	9.62	59.37	65.36	-5.99	QP
0.1620	32.54	9.62	42.16	55.36	-13.20	AVG
0.2660	37.77	9.51	47.28	61.24	-13.96	QP
0.2660	27.59	9.51	37.10	51.24	-14.14	AVG
0.5819	38.07	9.53	47.60	56.00	-8.40	QP
0.5819	25.18	9.53	34.71	46.00	-11.29	AVG
1.1019	38.77	9.55	48.32	56.00	-7.68	QP
1.1019	24.95	9.55	34.50	46.00	-11.50	AVG
2.0219	39.00	9.57	48.57	56.00	-7.43	QP
2.0219	25.97	9.57	35.54	46.00	-10.46	AVG
3.8620	37.02	9.59	46.61	56.00	-9.39	QP
3.8620	21.06	9.59	30.65	46.00	-15.35	AVG

Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.



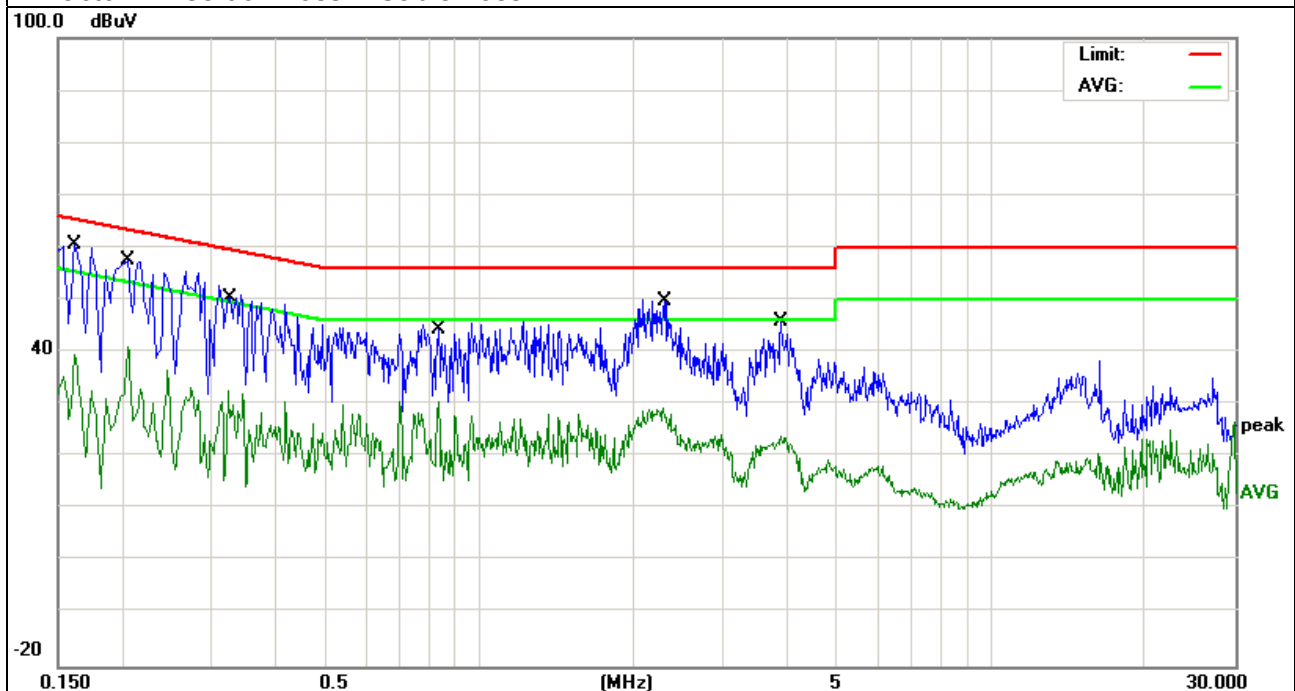
EUT :	TV Box	Model Name. :	S8 pro
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5(5G)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1620	50.97	9.62	60.59	65.36	-4.77	QP
0.1620	30.01	9.62	39.63	55.36	-15.73	AVG
0.2058	47.99	9.50	57.49	63.37	-5.88	QP
0.2058	31.48	9.50	40.98	53.37	-12.39	AVG
0.3220	40.76	9.51	50.27	59.65	-9.38	QP
0.3220	23.18	9.51	32.69	49.65	-16.96	AVG
0.8338	34.83	9.54	44.37	56.00	-11.63	QP
0.8338	20.95	9.54	30.49	46.00	-15.51	AVG
2.2940	38.31	9.57	47.88	56.00	-8.12	QP
2.2940	19.66	9.57	29.23	46.00	-16.77	AVG
3.8860	36.29	9.59	45.88	56.00	-10.12	QP
3.8860	14.50	9.59	24.09	46.00	-21.91	AVG

Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.



### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 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
Above 960	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).

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

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

### 3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

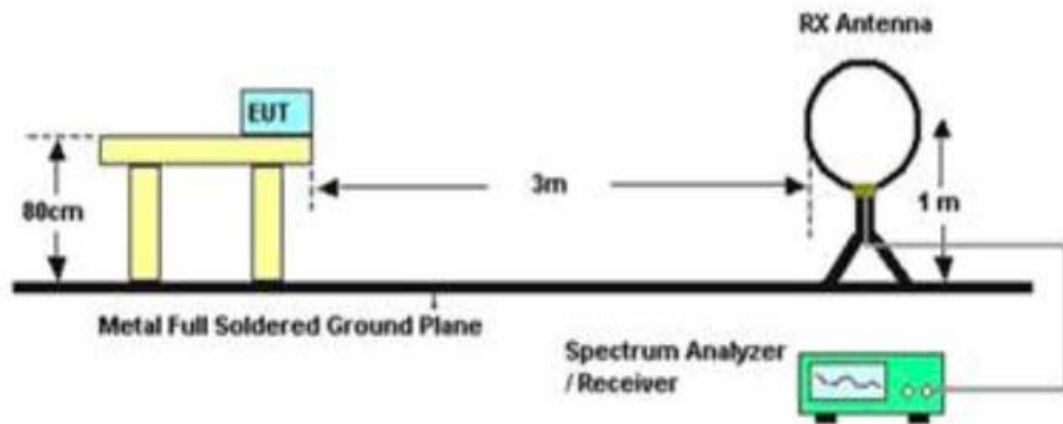
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Peak	1 MHz	10 Hz

### 3.2.3 DEVIATION FROM TEST STANDARD

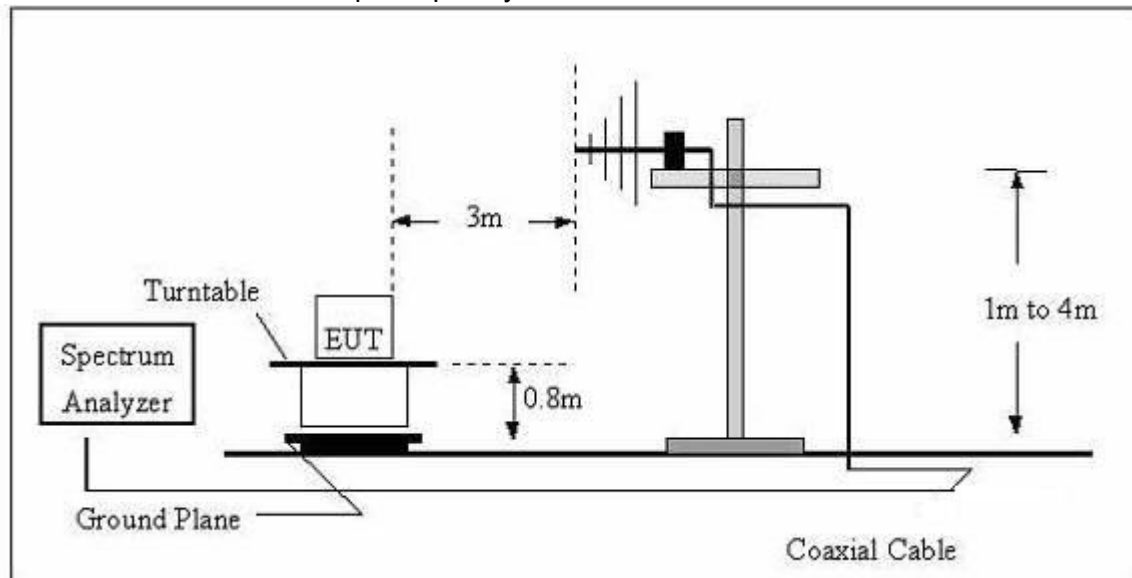
No deviation

### 3.2.4 TEST SETUP

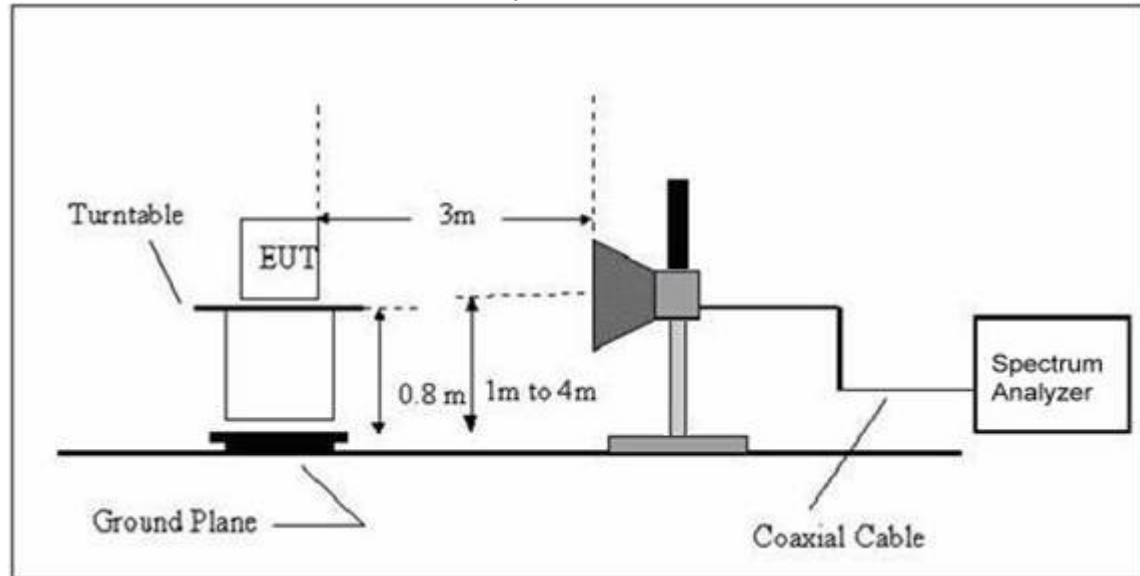
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



## (C) Radiated Emission Test-Up Frequency Above 1GHz

**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	TV Box	Model Name. :	S8 pro
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

#### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})(\text{dB})$ ;

Limit line = specific limits(dBuv) + distance extrapolation factor.

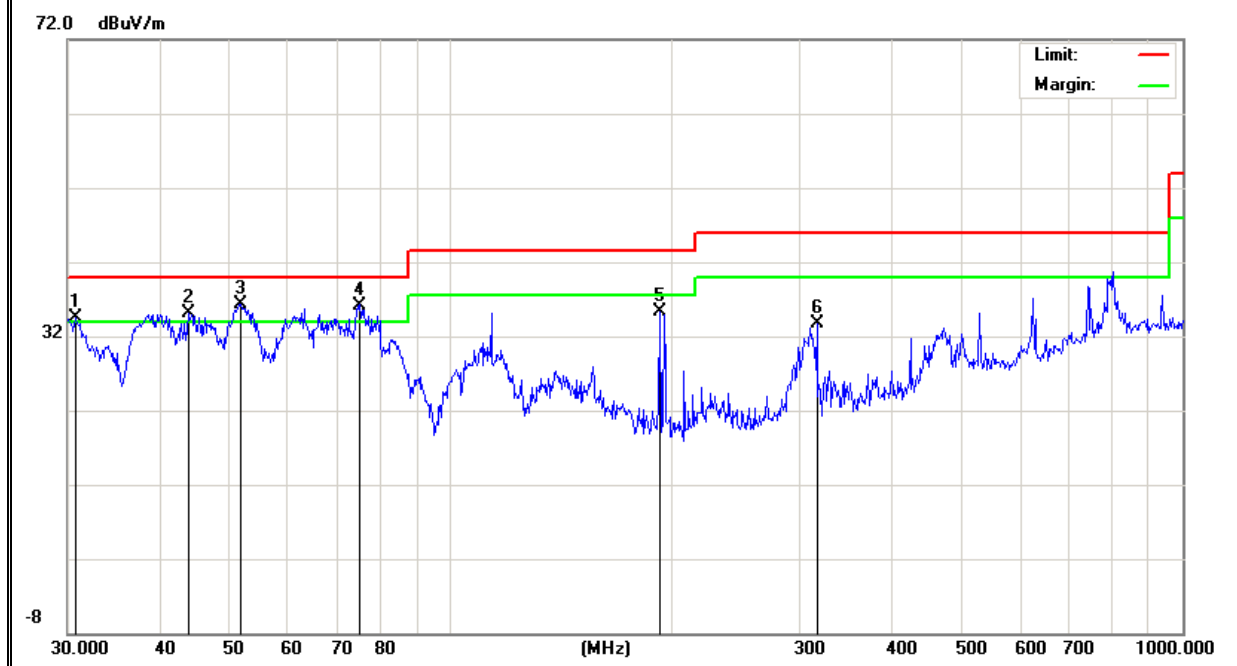
### 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	TV Box	Model Name :	S8 pro
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (2.4G)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	30.7454	15.42	19.03	34.45	40.00	-5.55	QP
V	43.8119	22.83	12.31	35.14	40.00	-4.86	QP
V	51.6614	26.11	10.22	36.33	40.00	-3.67	QP
V	75.1821	30.49	5.71	36.20	40.00	-3.80	QP
V	193.0945	24.62	10.72	35.34	43.50	-8.16	QP
V	316.5889	18.79	14.85	33.64	46.00	-12.36	QP

#### Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

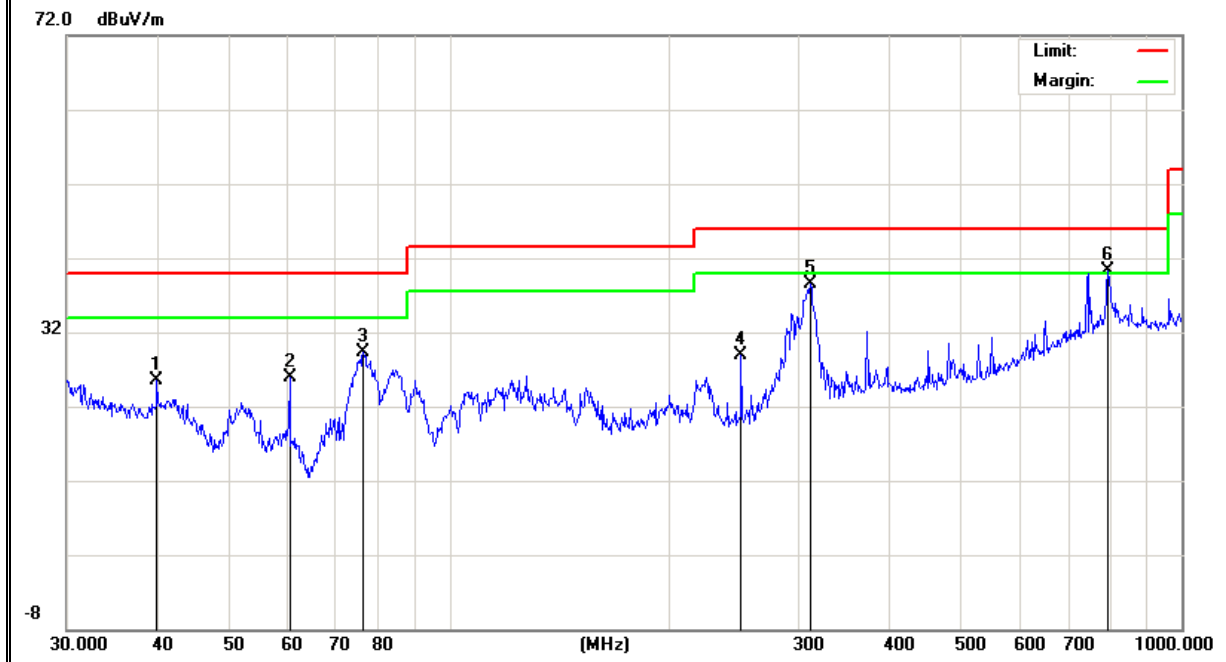




Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	39.8542	11.83	13.63	25.46	40.00	-14.54	QP
H	60.4919	18.10	7.72	25.82	40.00	-14.18	QP
H	76.2442	23.49	5.74	29.23	40.00	-10.77	QP
H	250.3012	15.25	13.59	28.84	46.00	-17.16	QP
H	311.0867	23.89	14.62	38.51	46.00	-7.49	QP
H	793.3958	13.16	27.24	40.40	46.00	-5.60	QP

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

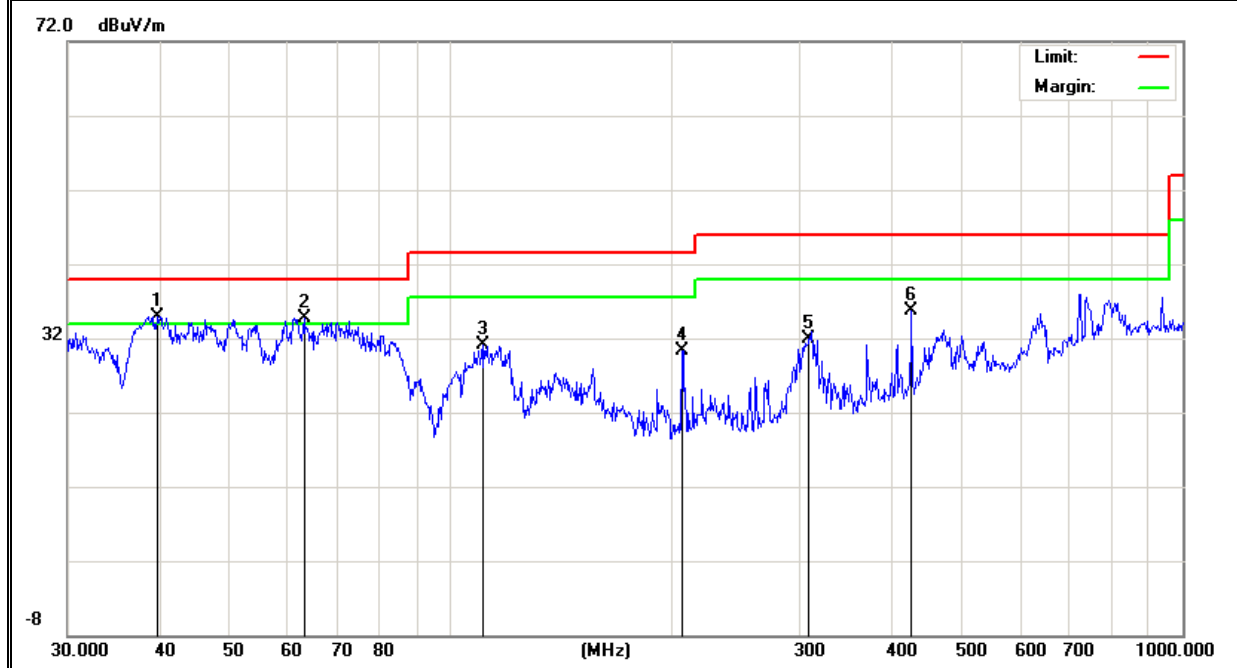


EUT :	TV Box	Model Name :	S8 pro
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX(5.0G)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	39.8541	21.37	13.63	35.00	40.00	-5.00	QP
V	63.0915	27.66	7.14	34.80	40.00	-5.20	QP
V	110.5687	21.10	10.07	31.17	43.50	-12.33	QP
V	207.1226	19.04	11.26	30.30	43.50	-13.20	QP
V	308.9125	17.47	14.53	32.00	46.00	-14.00	QP
V	426.521	16.96	18.84	35.80	46.00	-10.20	QP

**Remark:**

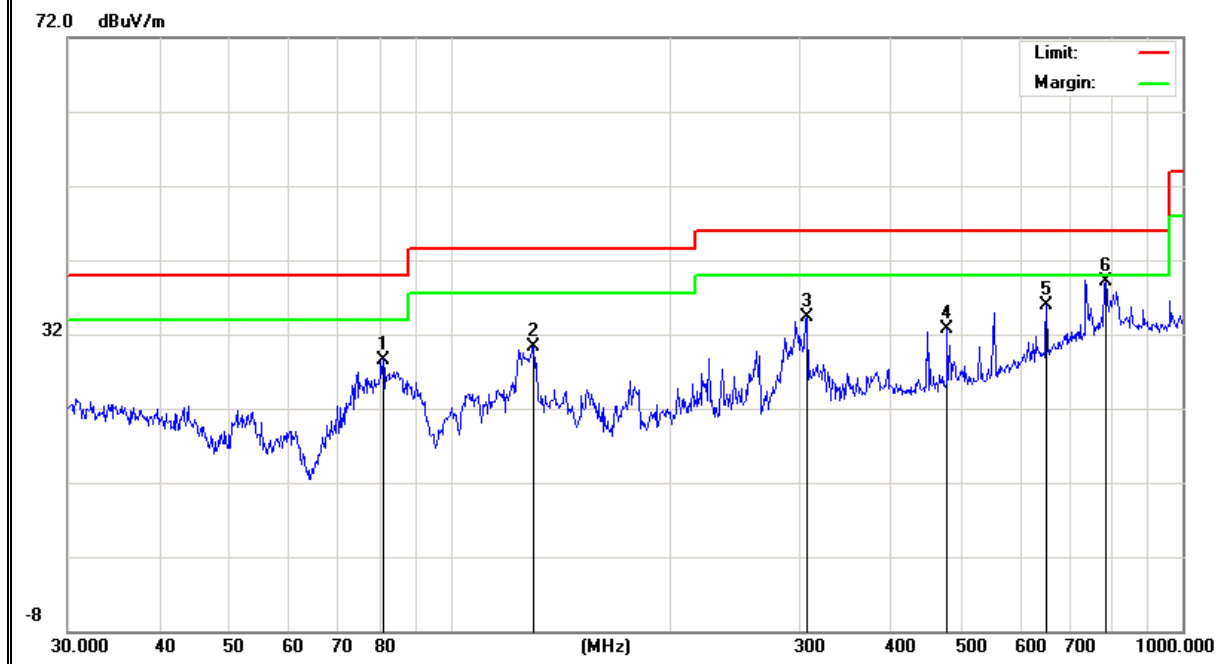
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	80.9274	22.56	6.04	28.60	40.00	-11.40	QP
H	129.9225	18.41	11.89	30.30	43.50	-13.20	QP
H	306.7536	19.96	14.44	34.40	46.00	-11.60	QP
H	477.1693	12.87	19.83	32.70	46.00	-13.30	QP
H	651.9415	12.54	23.46	36.00	46.00	-10.00	QP
H	785.0932	12.18	27.02	39.20	46.00	-6.80	QP

**Remark:**

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



### 3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	TV Box	Model Name :	S8 pro
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (2.4G)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
<b>Low Channel (2412 MHz)-Above 1G</b>							
Vertical	4824.000	48.89	10.44	59.33	74	-14.67	Pk
Vertical	4824.000	31.65	10.44	42.09	54	-11.91	AV
Vertical	7236.000	37.87	12.39	50.26	74	-23.74	pk
Horizontal	4824.000	42.93	10.44	53.37	74	-20.63	pk
Horizontal	4824.000	24.51	10.44	34.95	54	-19.05	AV
Horizontal	7236.000	34.09	12.39	46.48	74	-27.52	pk
<b>Mid Channel (2437 MHz)-Above 1G</b>							
Vertical	4874.000	47.65	10.4	58.05	74	-15.95	pk
Vertical	4874.000	30.03	10.4	40.43	54	-13.57	AV
Vertical	7311.000	36.78	12.75	49.53	74	-24.47	Pk
Horizontal	4874.000	46.82	10.4	57.22	74	-16.78	Pk
Horizontal	4874.000	29.72	10.4	40.12	54	-13.88	AV
Horizontal	7311.000	31.53	12.75	44.28	74	-29.72	Pk
<b>High Channel (2462 MHz)- Above 1G</b>							
Vertical	4924.000	45.58	10.39	55.97	74	-18.03	pk
Vertical	4924.000	31.53	10.39	41.92	54	-12.08	AV
Vertical	7386.000	37.21	12.68	49.89	74	-24.11	pk
Horizontal	4924.000	46.29	10.39	56.68	74	-17.32	pk
Horizontal	4924.000	31.24	10.39	41.63	54	-12.37	AV
Horizontal	7386.000	34.82	12.68	47.5	74	-26.5	pk

Note:"802.11b" mode is the worst mode. When PK value is lower than the Average value limit, average didn't record.

EUT :	TV Box	Model Name :	S8 pro
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (5.0G)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
Low Channel (5745 MHz)-Above 1G							
Vertical	11490.000	35.87	14.21	50.08	74	-23.92	Pk
Vertical	17235.000	34.62	16.09	50.71	74	-23.29	Pk
Horizontal	11490.000	33.83	14.21	48.04	74	-25.96	Pk
Horizontal	17235.000	35.13	16.09	51.22	74	-22.78	Pk
middle Channel (5785 MHz)-Above 1G							
Vertical	11570.000	35.81	14.51	50.32	74	-23.68	Pk
Vertical	17355.000	37.14	16.15	53.29	74	-20.71	Pk
Horizontal	11570.000	36.82	14.51	51.33	74	-22.67	Pk
Horizontal	17355.000	35.04	16.15	51.19	74	-22.81	Pk
High Channel (5825 MHz)-Above 1G							
Vertical	11590.000	38.14	14.55	52.69	74	-21.31	Pk
Vertical	17385.000	36.77	16.18	52.95	74	-21.05	Pk
Horizontal	11590.000	38.93	14.55	53.48	74	-20.52	Pk
Horizontal	17385.000	37.13	16.18	53.31	74	-20.69	Pk

Note:"802.11a(5G)" mode is the worst mode. When PK value is lower than the Average value limit, average didn't record.

## 4. POWER SPECTRAL DENSITY TEST

### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

#### 4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. 3 kHz  $\leq$  Set the RBW  $\leq$  100 kHz.
4. Set the VBW  $\geq$  3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



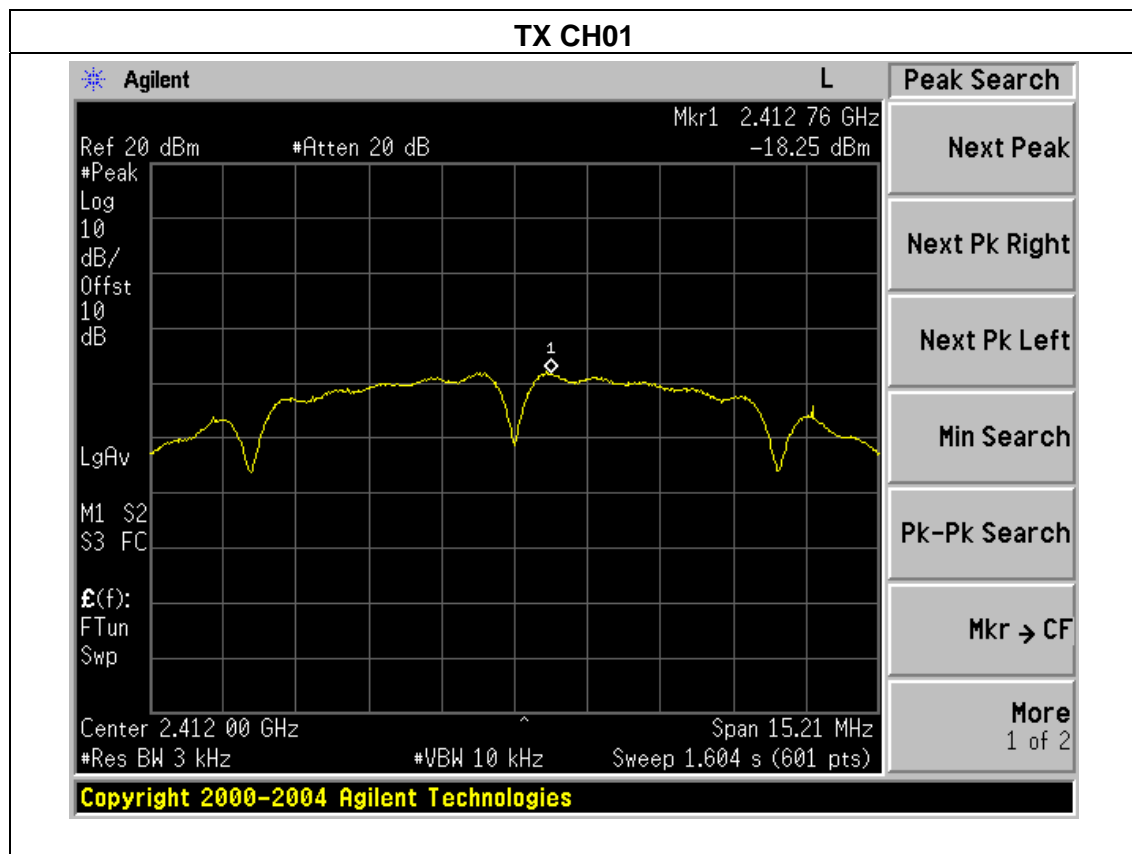
#### 4.1.4 EUT OPERATION CONDITIONS

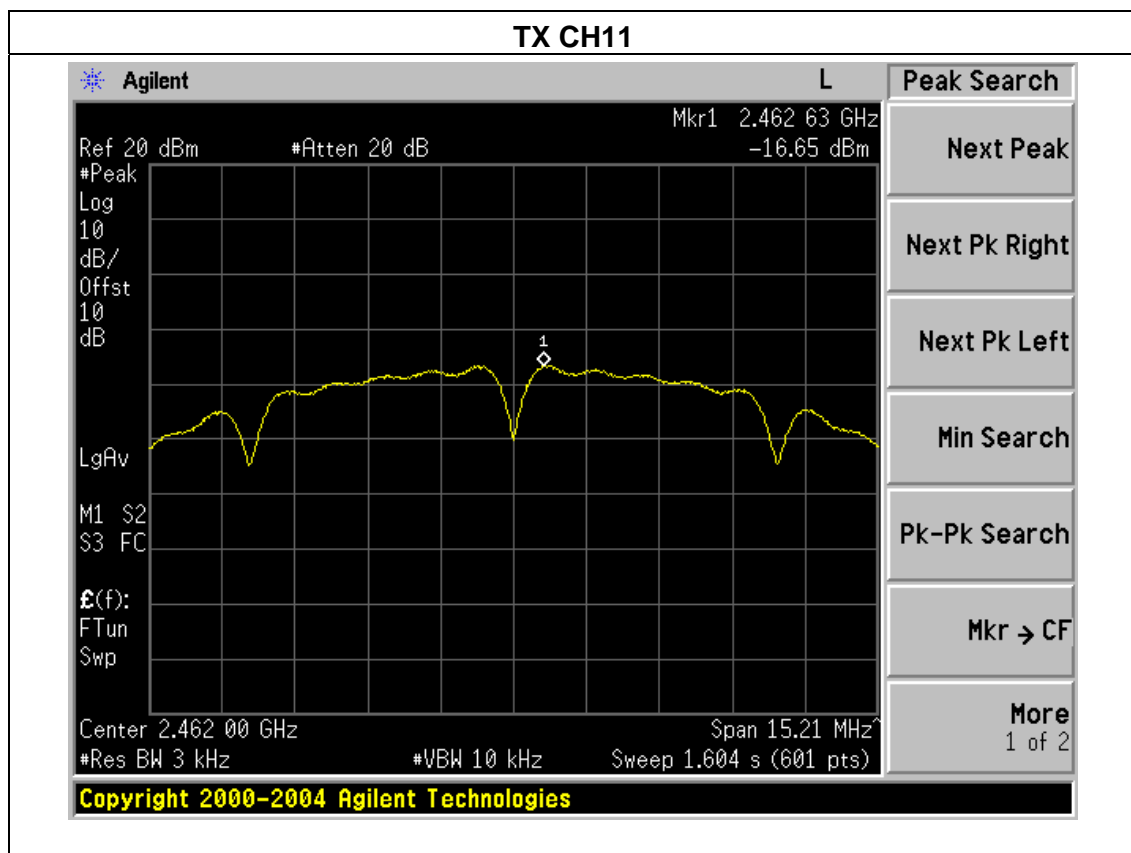
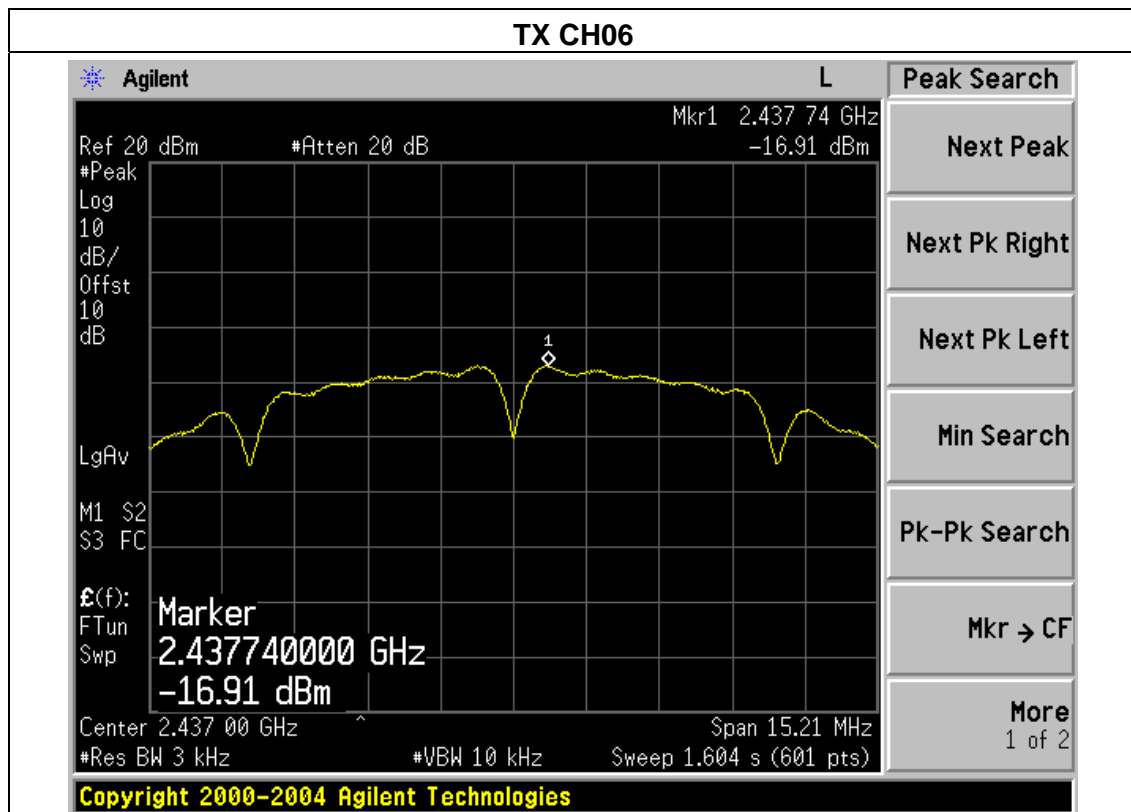
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.1.5 TEST RESULTS

EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX b Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-18.25	8	PASS
2437 MHz	-16.91	8	PASS
2462 MHz	-16.65	8	PASS

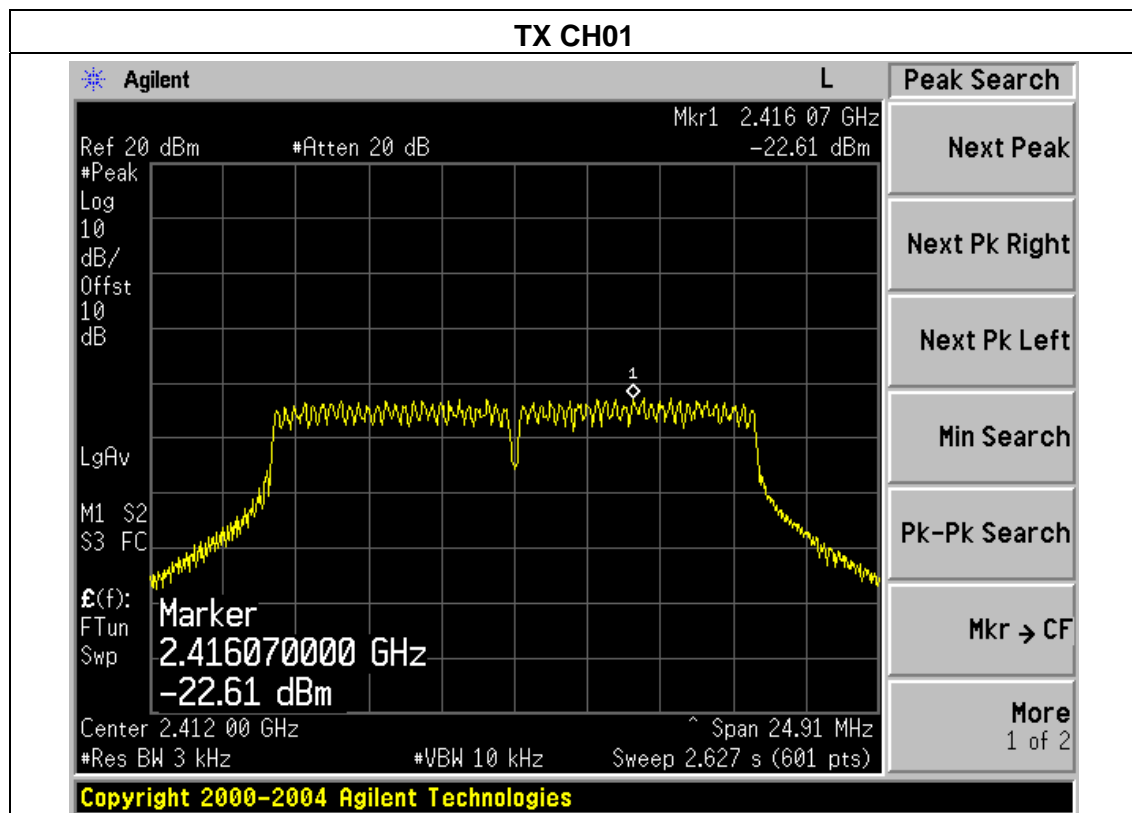


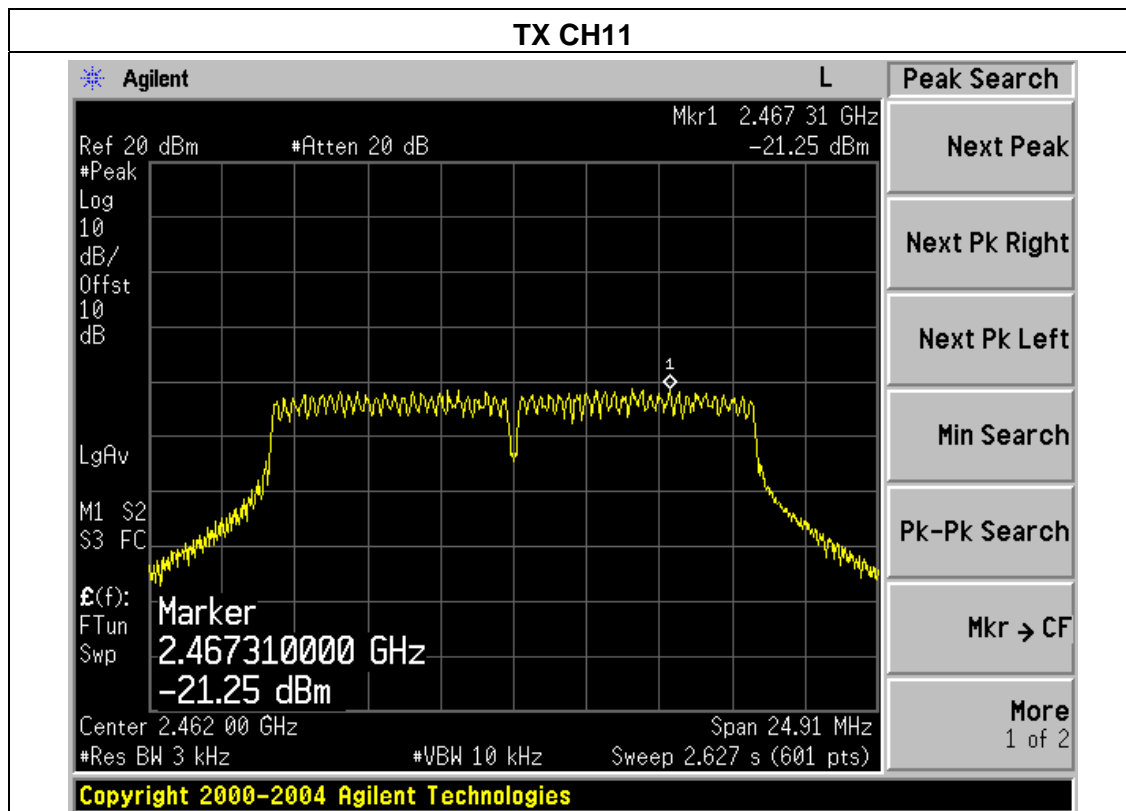
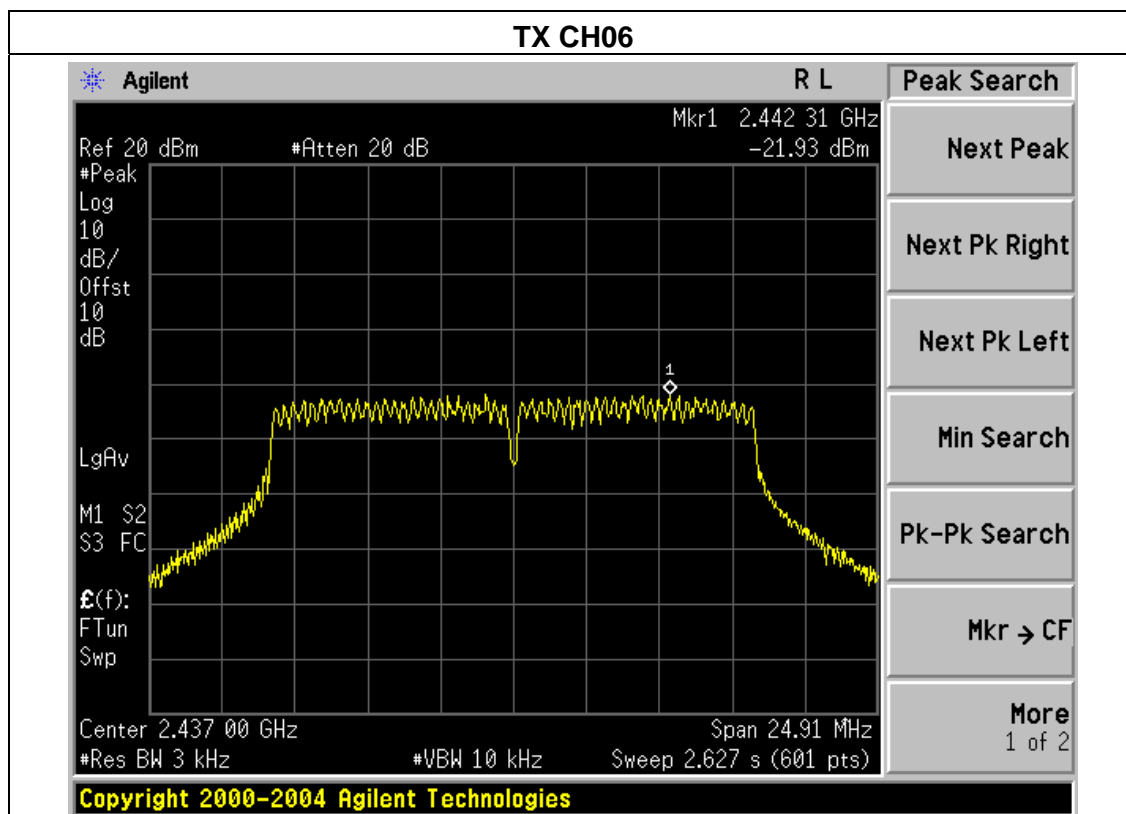




EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX g Mode /CH01, CH06, CH11		

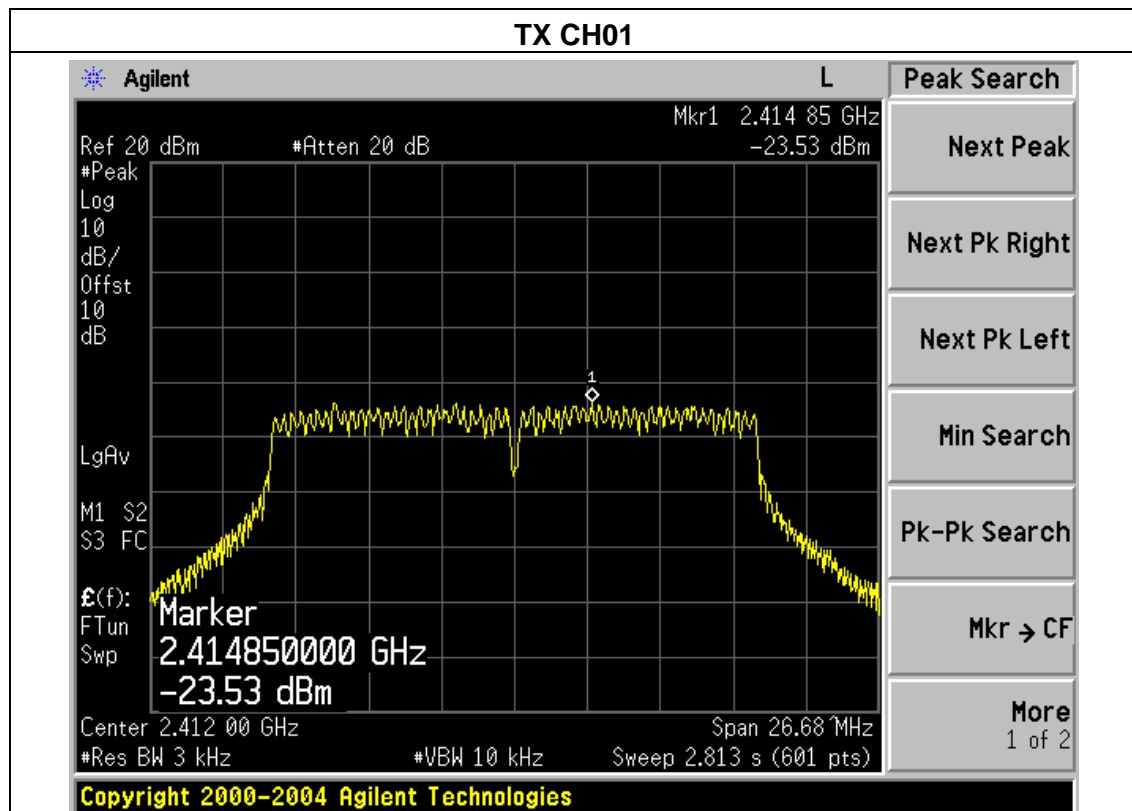
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-22.61	8	PASS
2437 MHz	-21.93	8	PASS
2462 MHz	-21.25	8	PASS



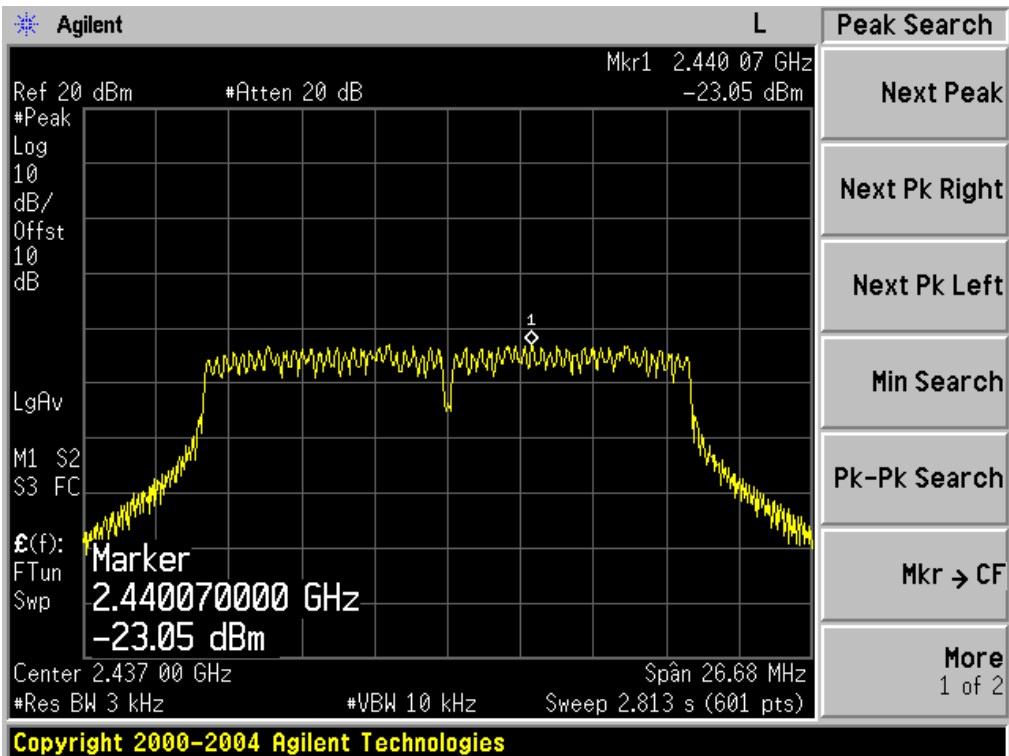


EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX n Mode (20MHz)/CH01, CH06, CH11		

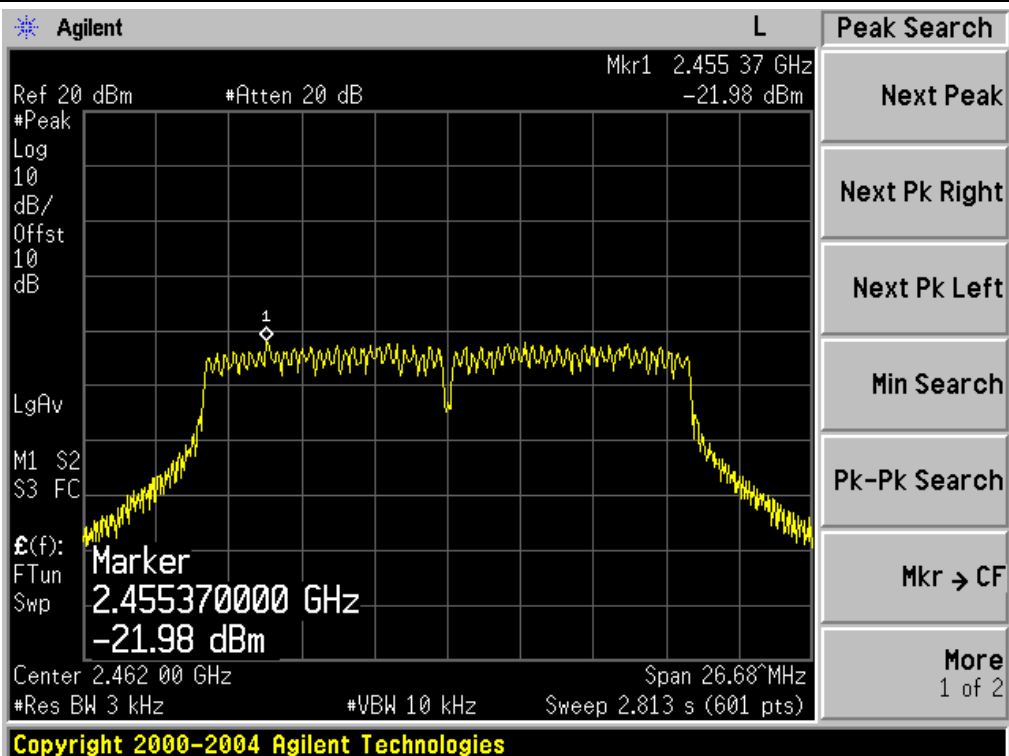
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-23.53	8	PASS
2437 MHz	-23.05	8	PASS
2462 MHz	-21.98	8	PASS



### TX CH06

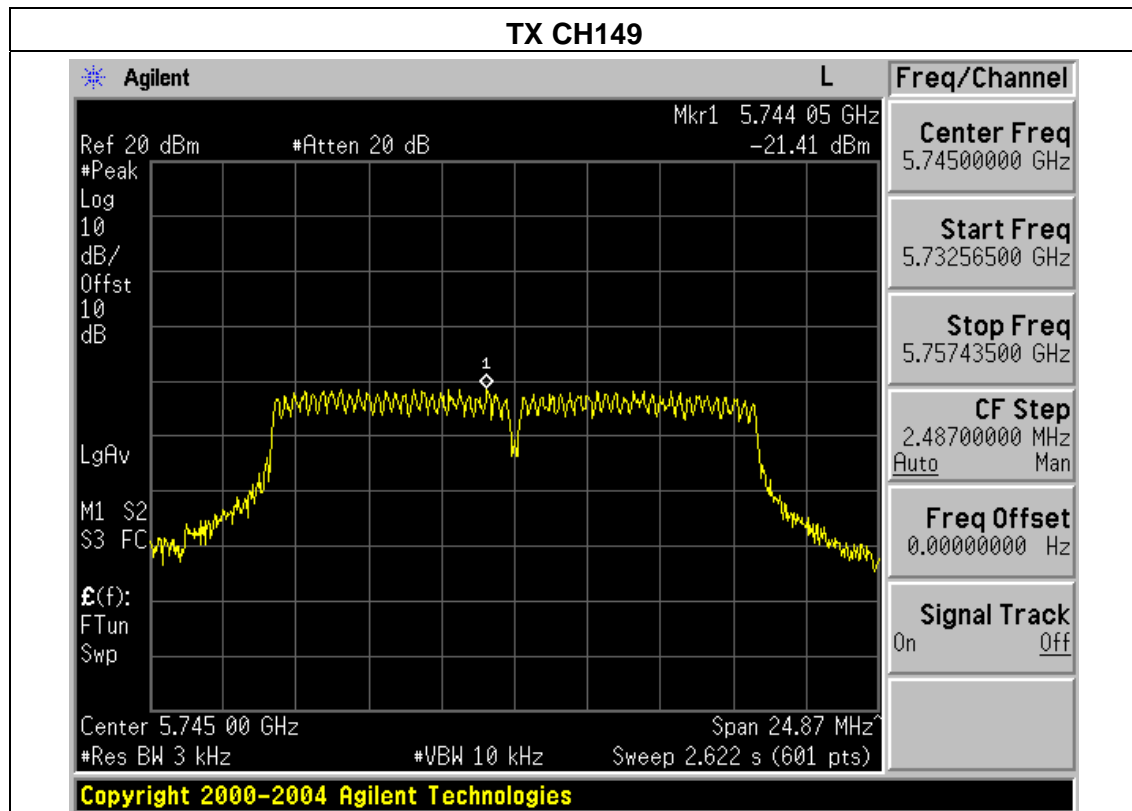


### TX CH11

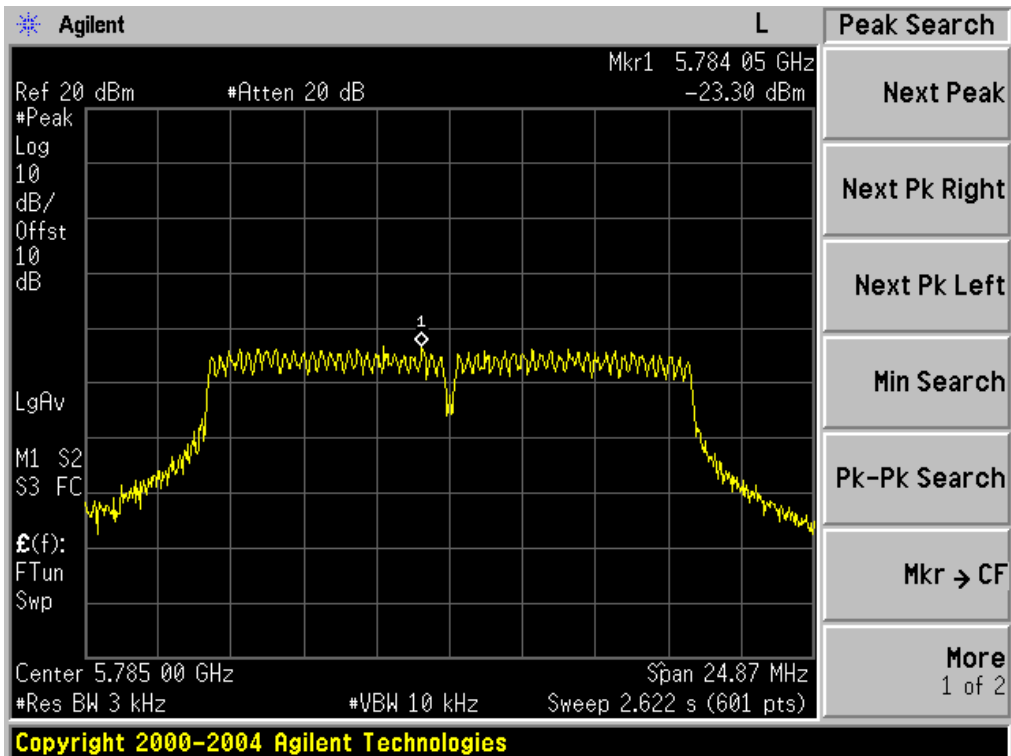


EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX a Mode /CH149, CH157, CH165		

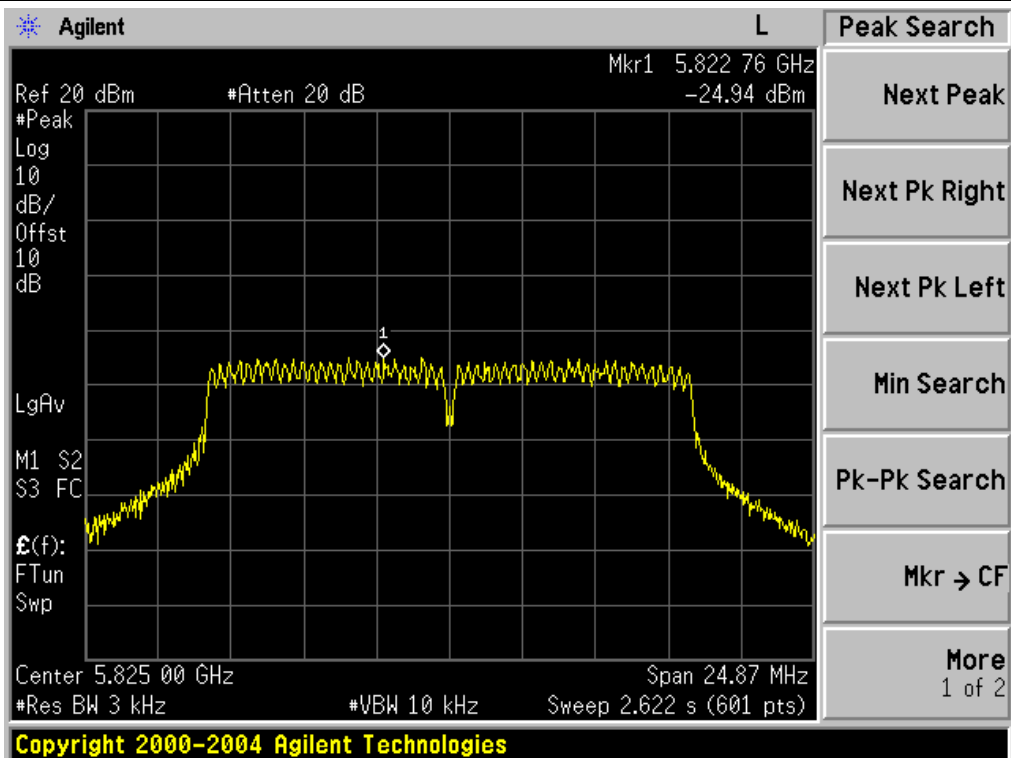
Frequency	Power Density (dBm)	Limit (dBm)	Result
5745MHz	-21.41	8	PASS
5785 MHz	-23.30	8	PASS
5825 MHz	-24.94	8	PASS



### TX CH157

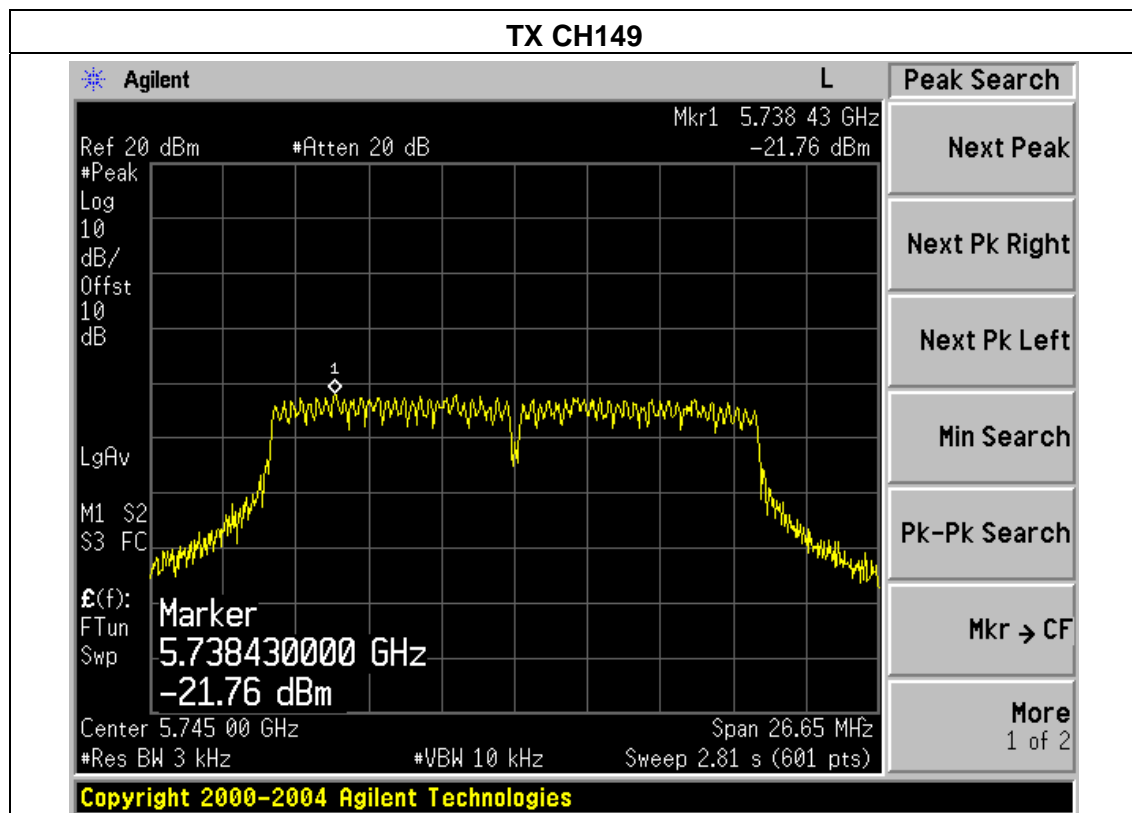


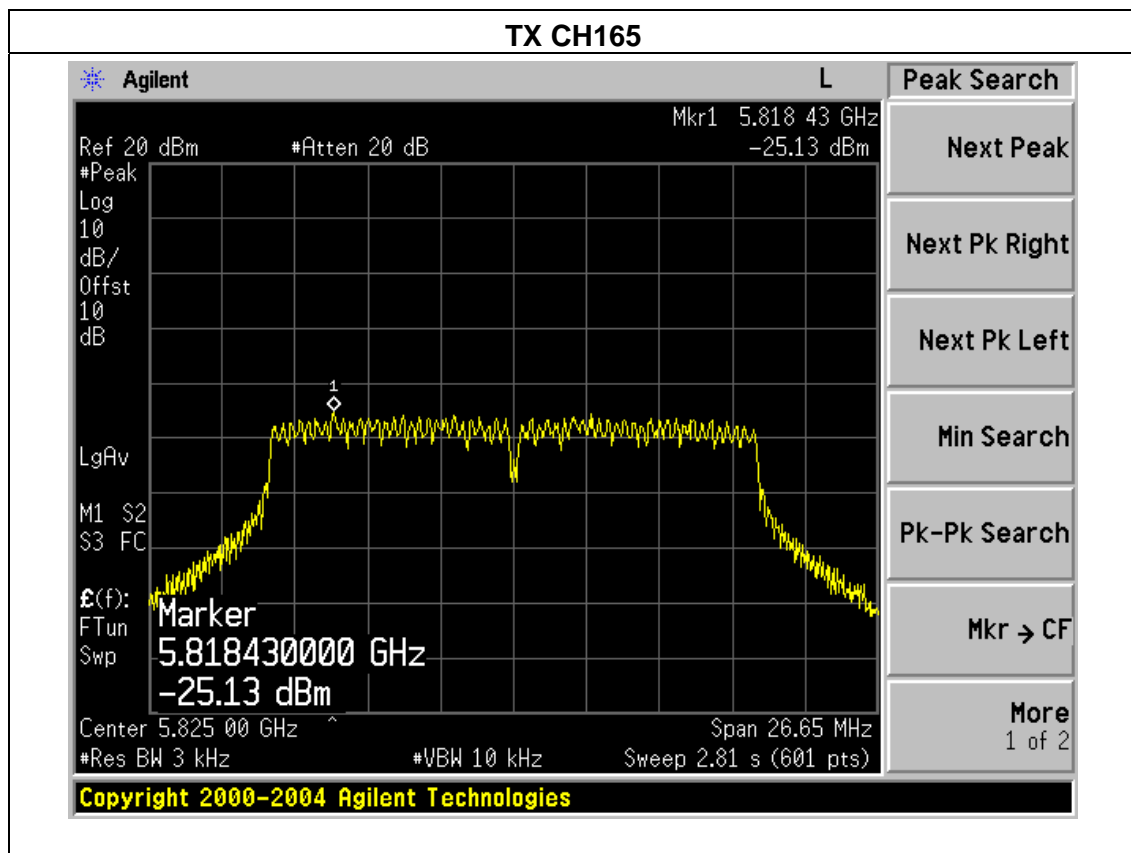
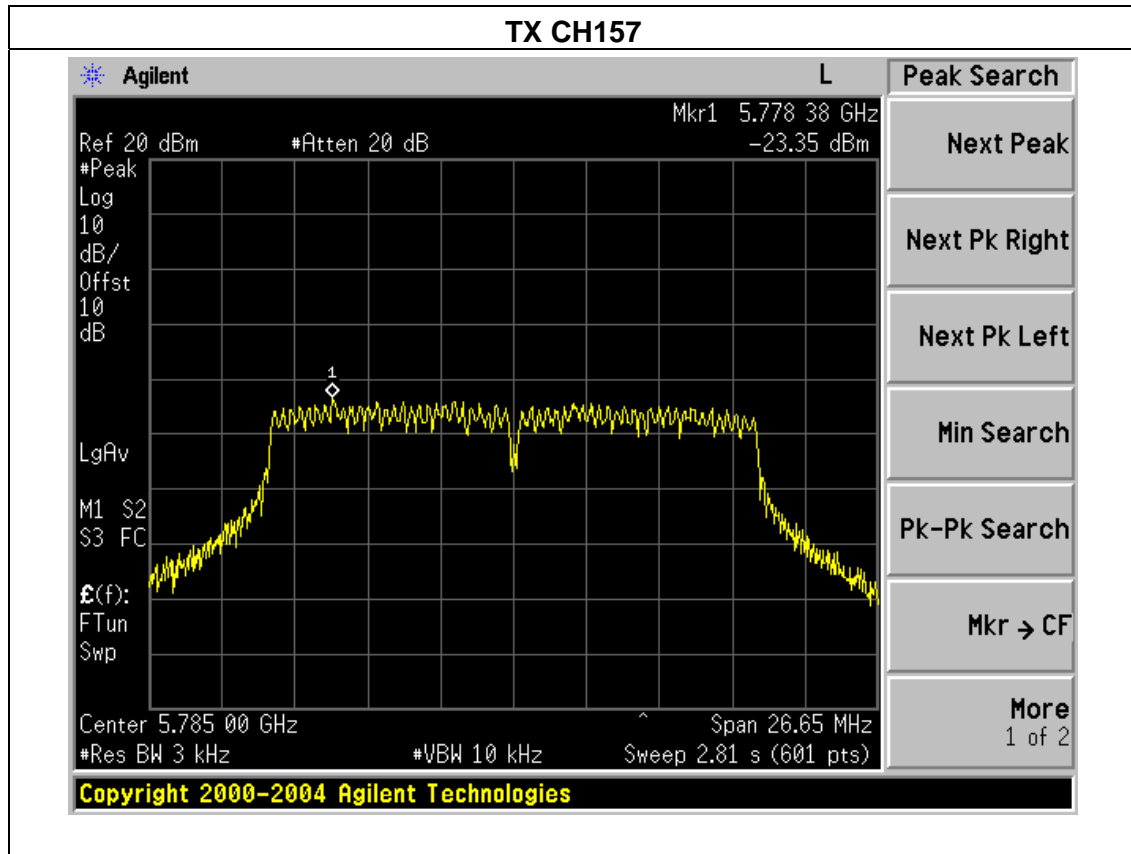
### TX CH165



EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX n(20) Mode(5G) /CH149, CH157, CH165		

Frequency	Power Density (dBm)	Limit (dBm)	Result
5745MHz	-21.76	8	PASS
5785 MHz	-23.35	8	PASS
5825 MHz	-25.13	8	PASS







## 5. BANDWIDTH TEST

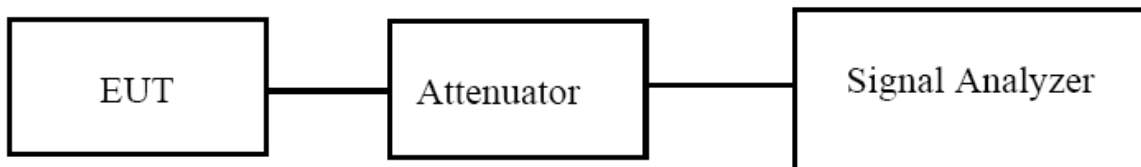
### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

#### 5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### TEST SETUP



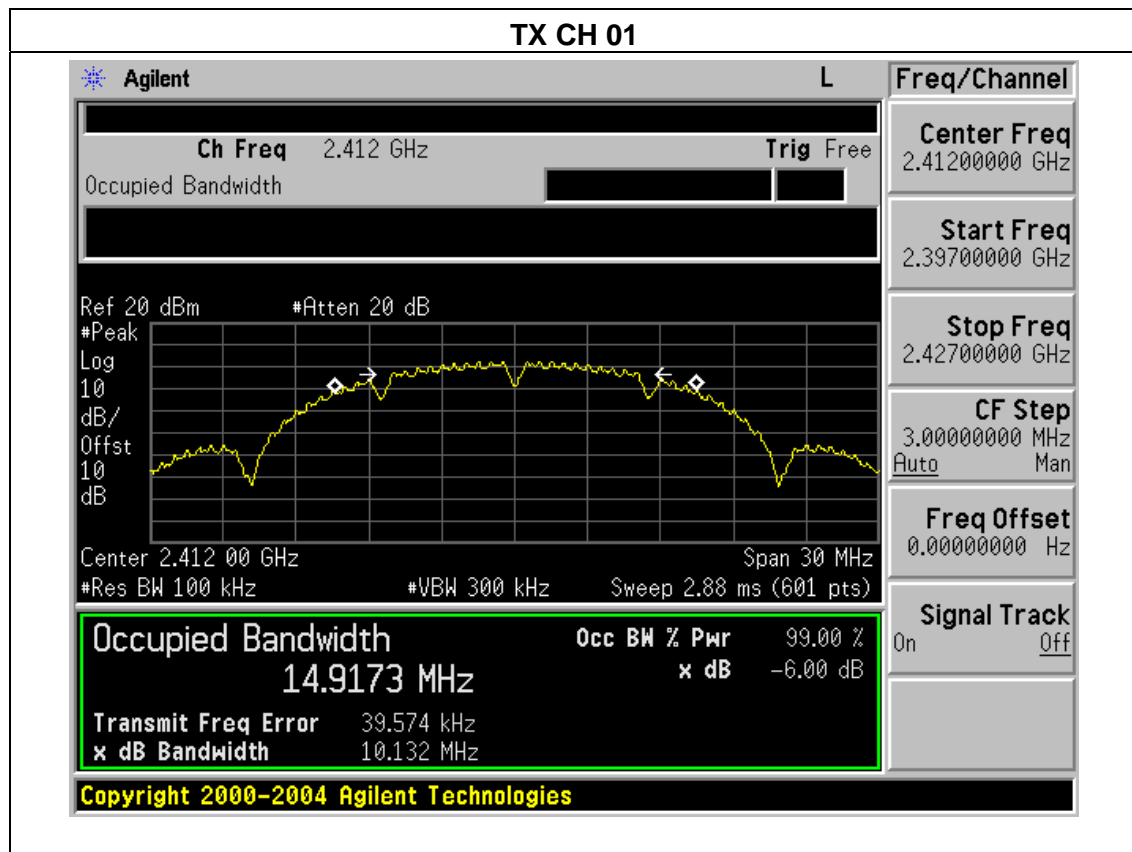
#### 5.1.2 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

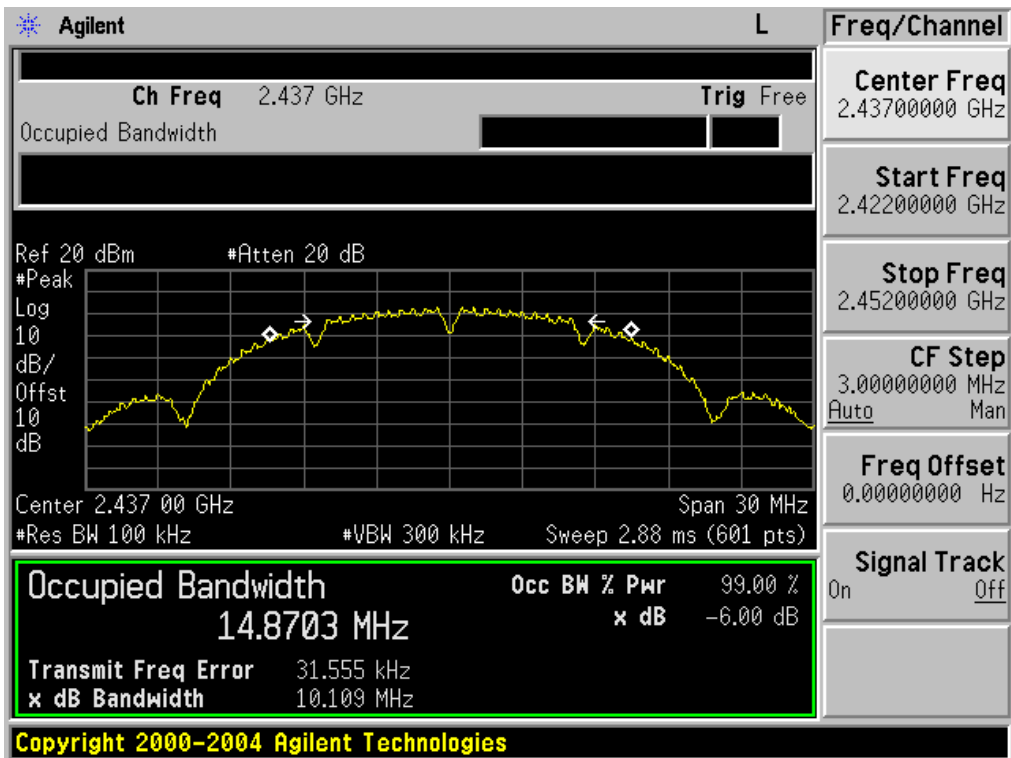
### 5.1.3 TEST RESULTS

EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX b Mode /CH01, CH06, CH11		

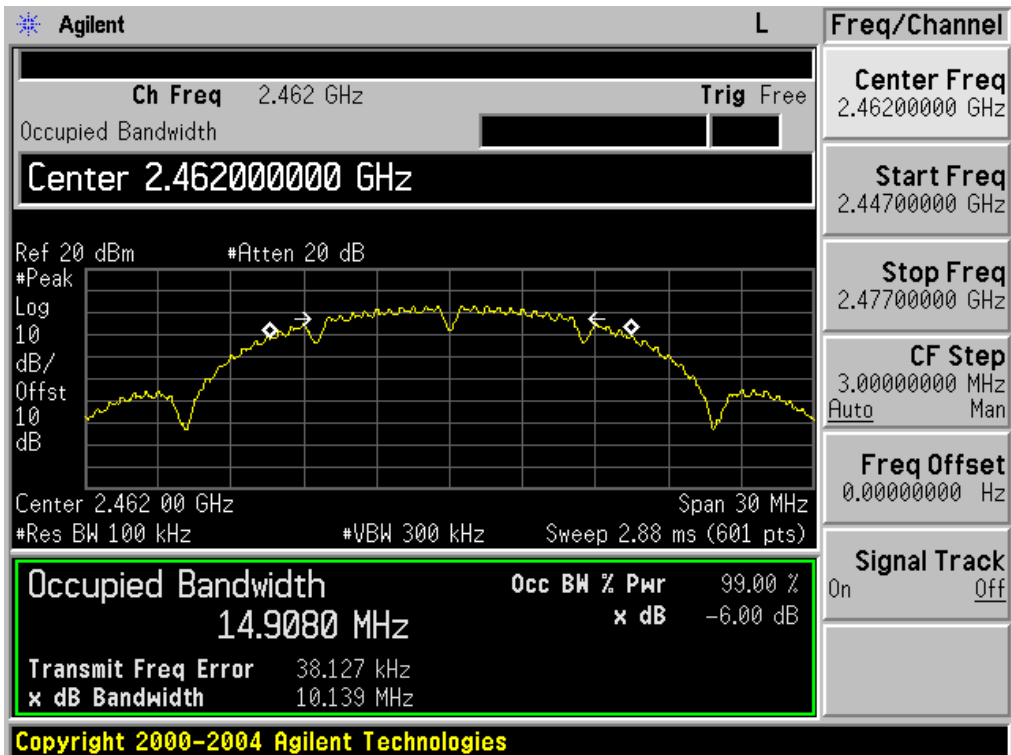
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.132	500	Pass
Middle	2437	10.109	500	Pass
High	2462	10.139	500	Pass



### TX CH 06

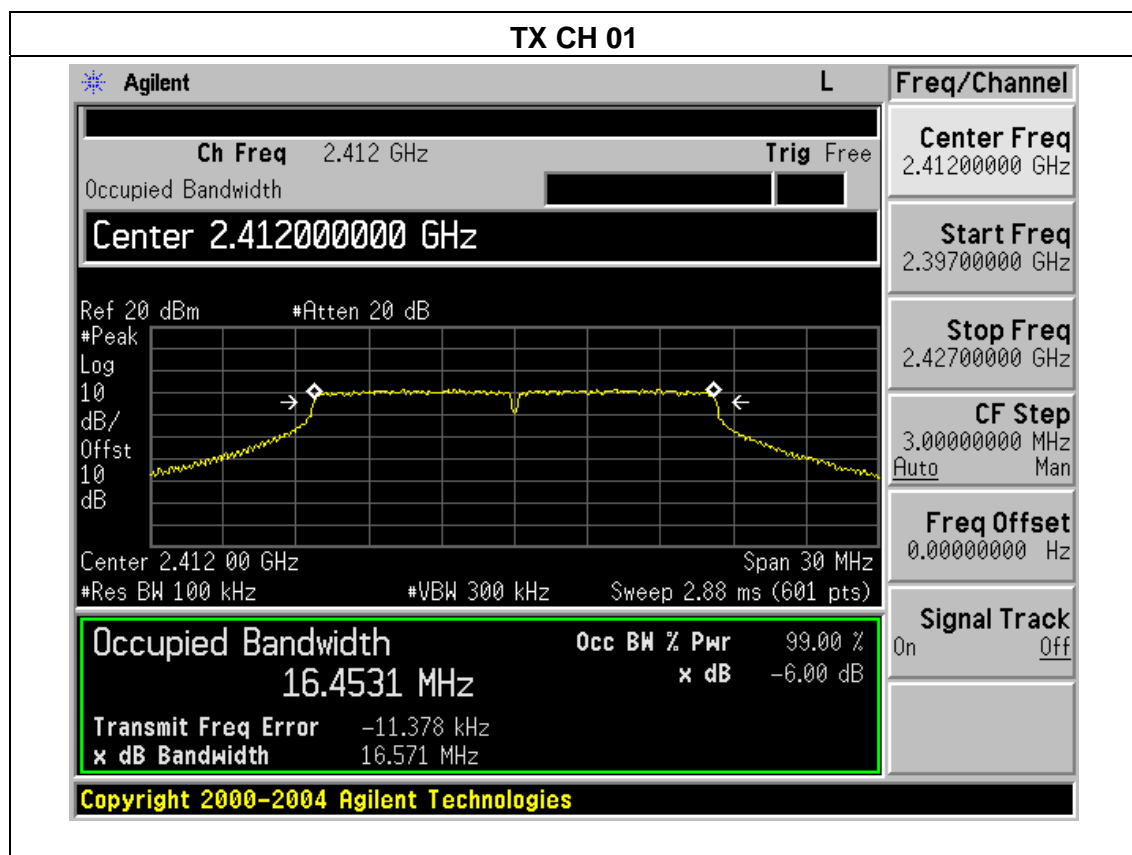


### TX CH 11

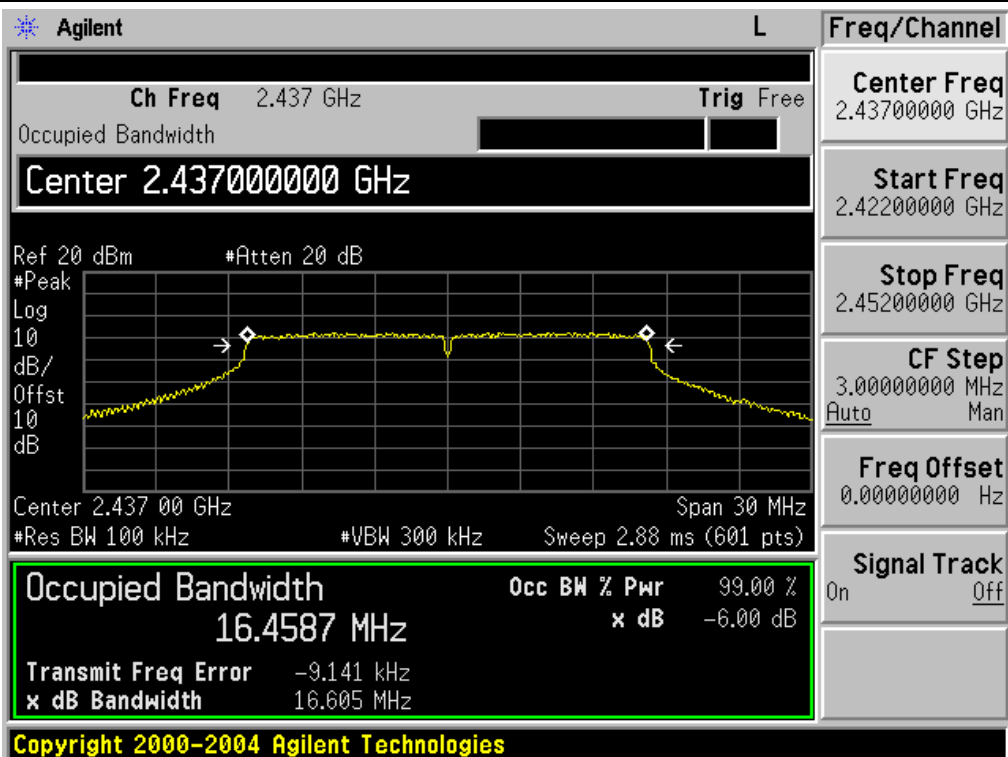


EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX g Mode /CH01, CH06, CH11		

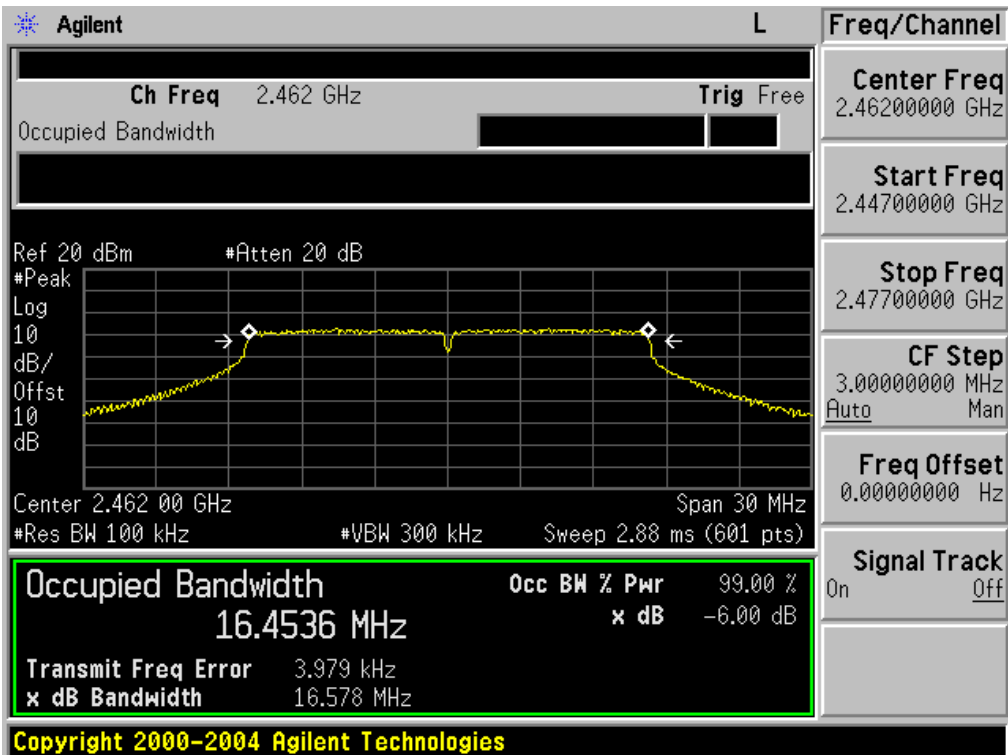
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.571	500	Pass
Middle	2437	16.605	500	Pass
High	2462	16.578	500	Pass



## TX CH 06

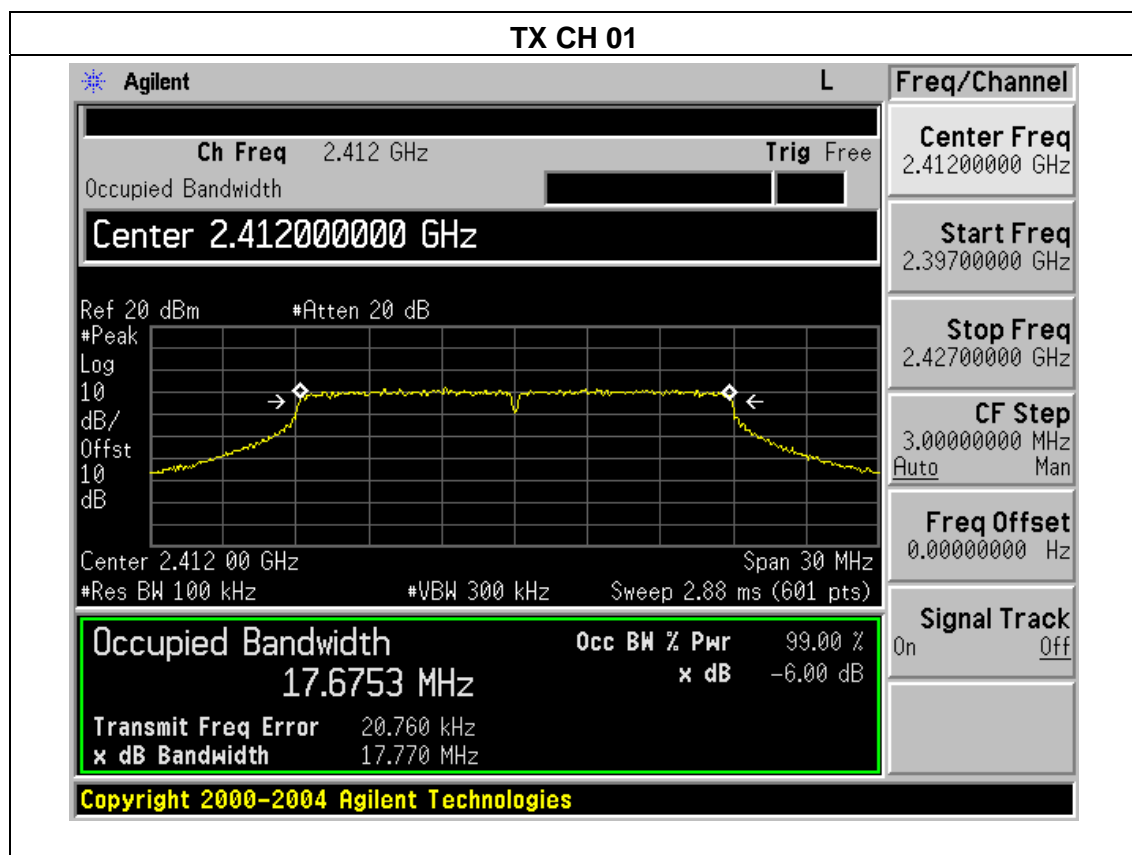


## TX CH 11

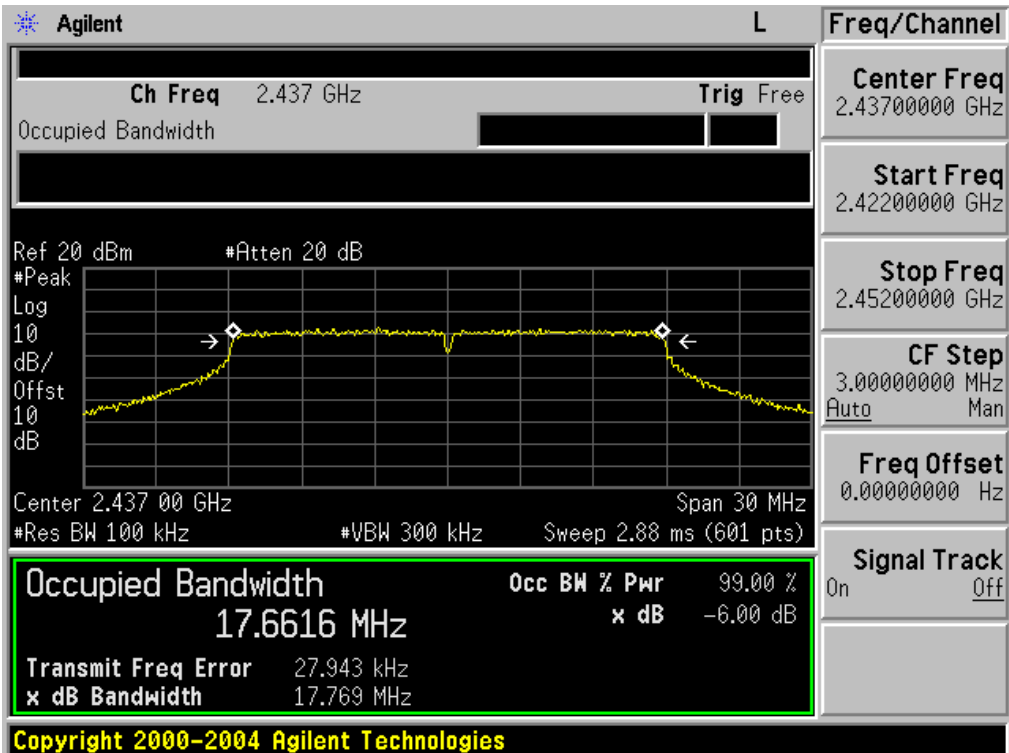


EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX n Mode(20M) /CH01, CH06, CH11		

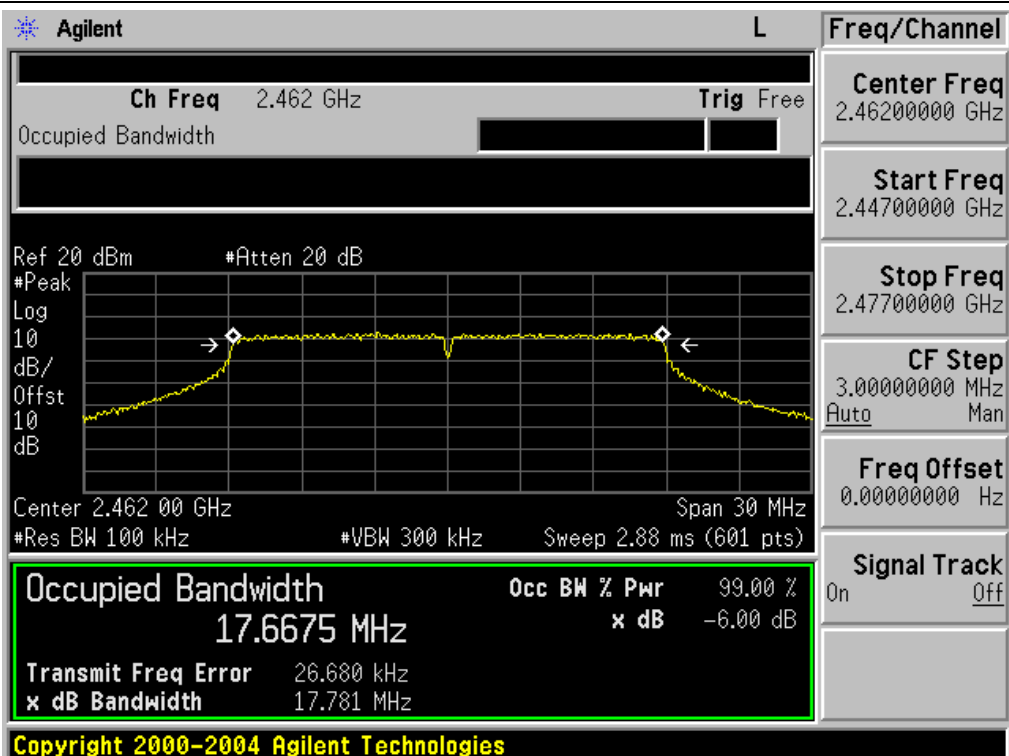
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.770	500	Pass
Middle	2437	17.769	500	Pass
High	2462	17.781	500	Pass



TX CH 06



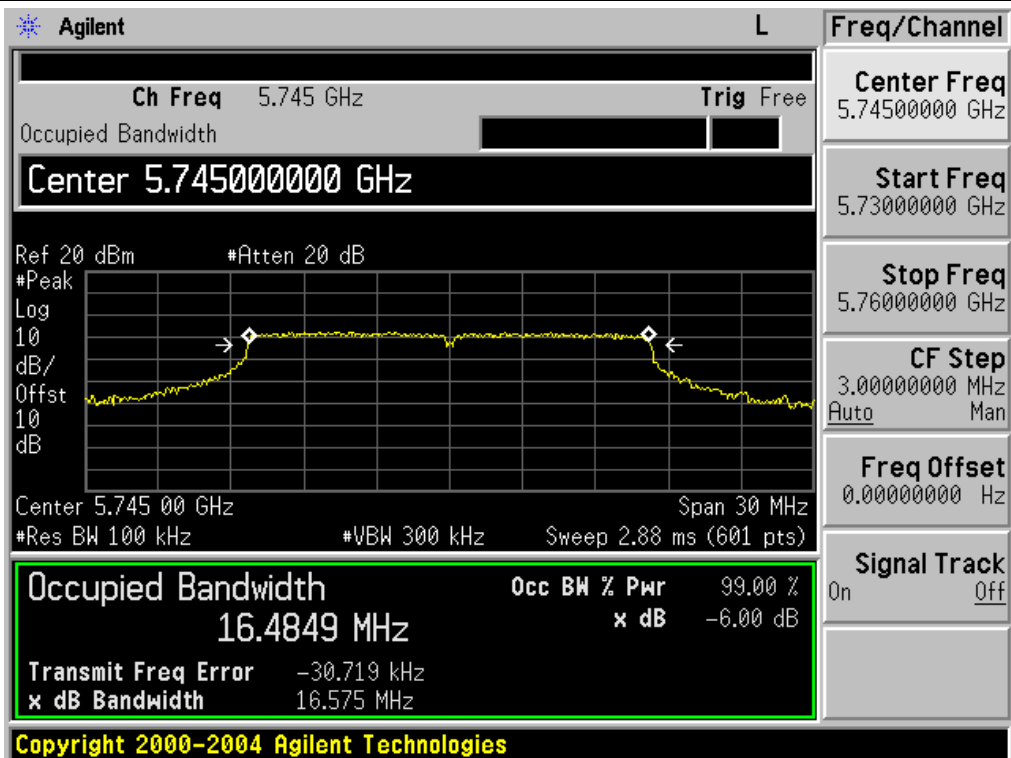
TX CH 11



EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX a Mode /CH149, CH157, CH165		

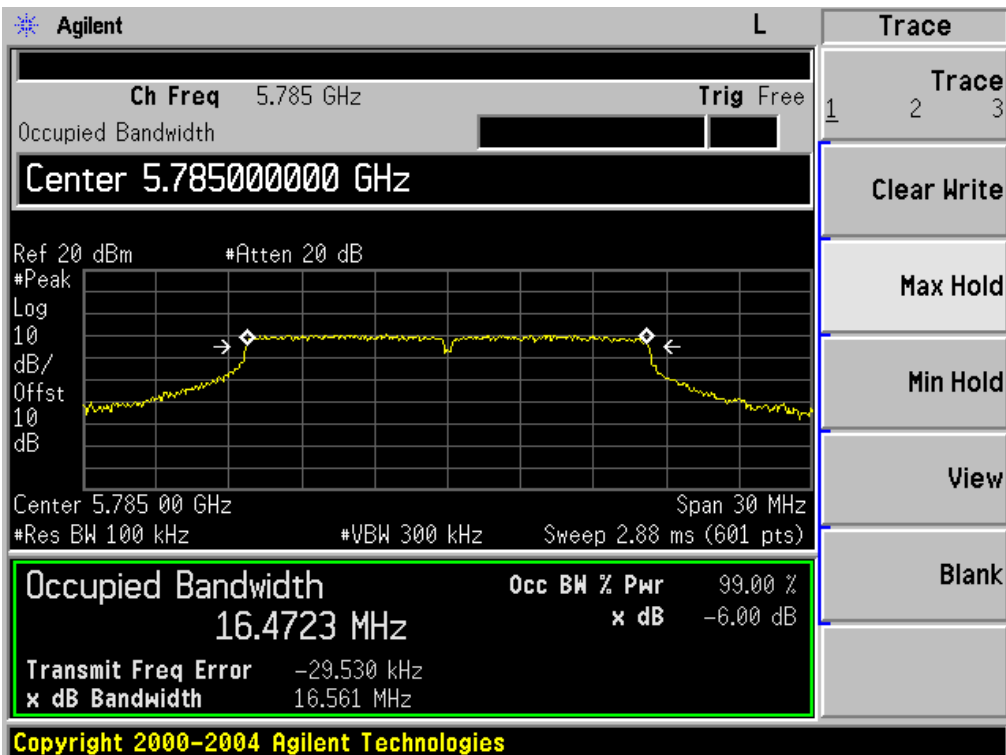
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	5745	16.575	500	Pass
Middle	5785	16.561	500	Pass
High	5825	16.575	500	Pass

### TX CH 149

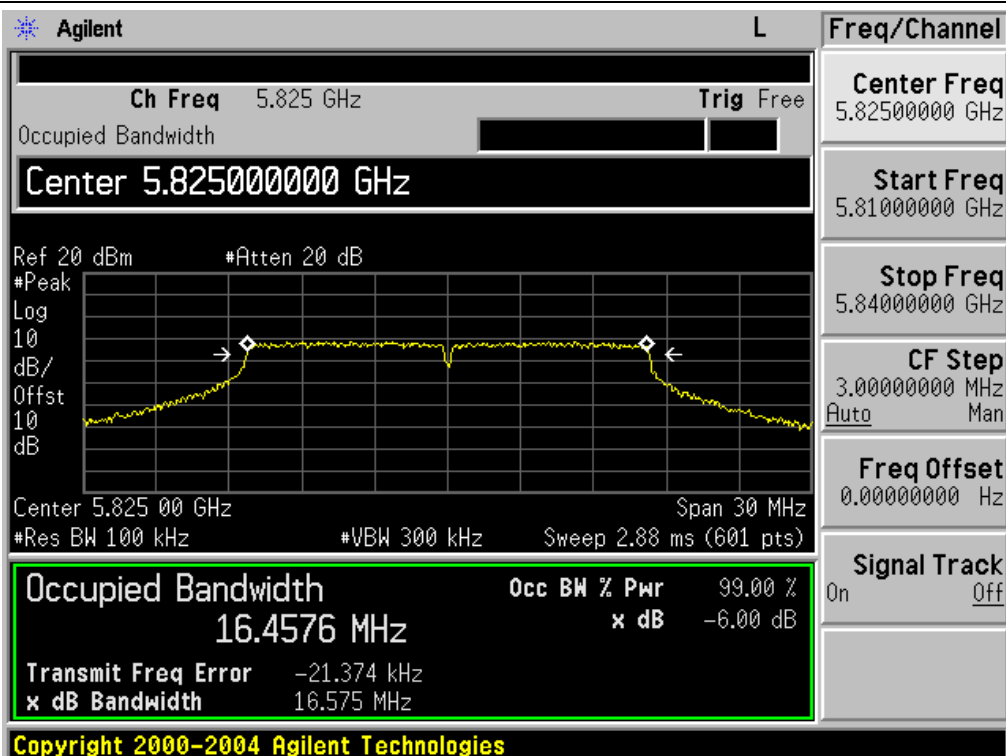




### TX CH 157



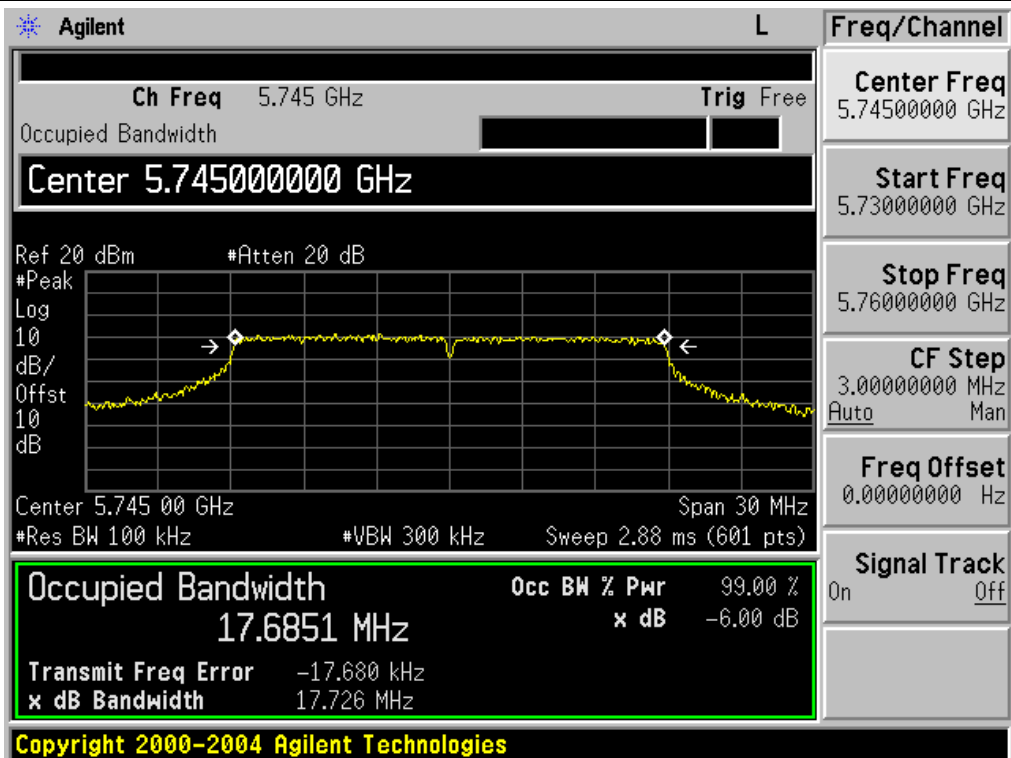
### TX CH 165



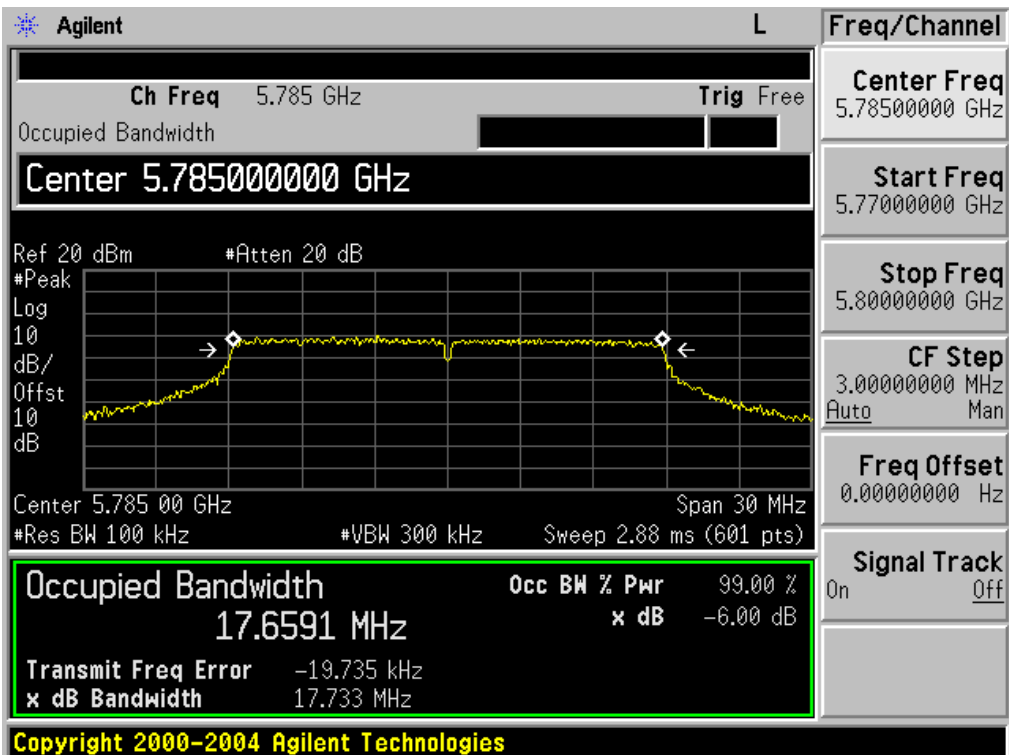
EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX n(20) Mode(5G) /CH149, CH157, CH165		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.726	500	Pass
Middle	5785	17.733	500	Pass
High	5825	17.763	500	Pass

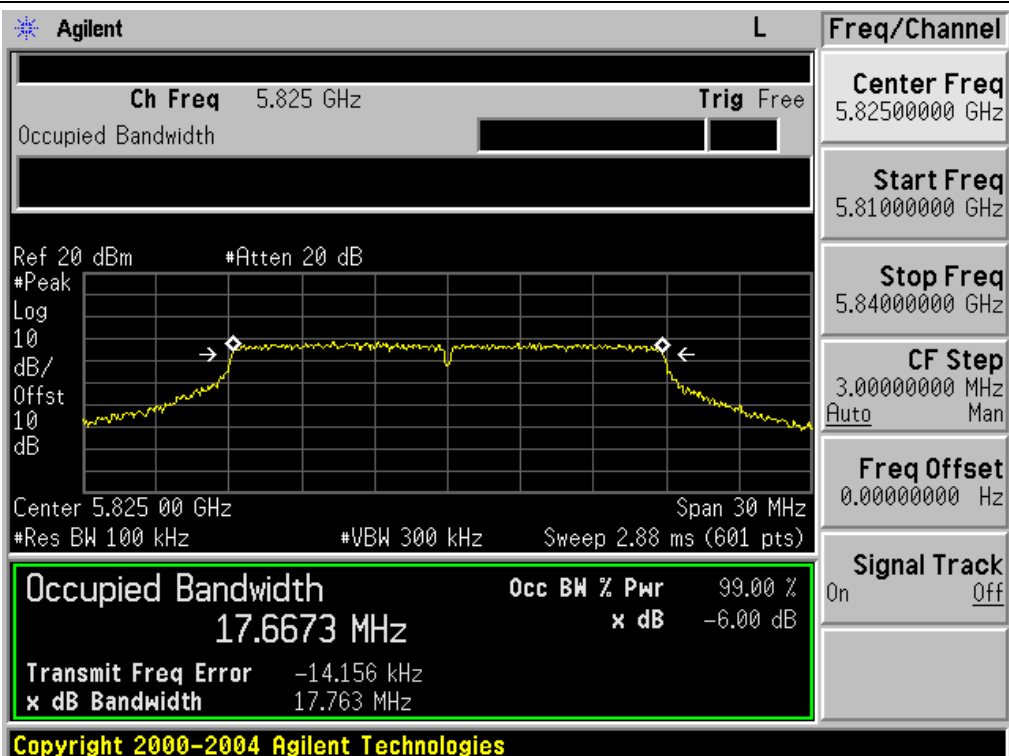
### TX CH 149



### TX CH 157



### TX CH 165



## 6. PEAK 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)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

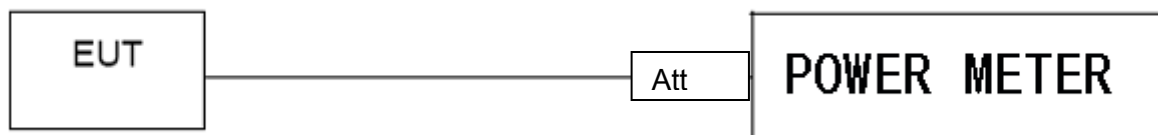
#### 6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### 6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 6.1.5 TEST RESULTS

EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX b/g/n(20M) Mode		

#### TX 802.11b Mode

Test Channe	Frequency	Maximum Peak Conducted Output Power (PK)	Maximum Peak Conducted Output Power (AV)	LIMIT
	(MHz)	(dBm)	(dBm)	dBm
CH01	2412	15.26	12.57	30
CH06	2437	15.21	12.35	30
CH11	2462	15.35	12.51	30

#### TX 802.11g Mode

CH01	2412	13.51	10.31	30
CH06	2437	13.36	10.23	30
CH11	2462	13.42	10.28	30

#### TX 802.11n(20) Mode

CH01	2412	11.44	8.58	30
CH06	2437	11.68	8.52	30
CH11	2462	11.43	8.46	30

EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX a/n(5G) Mode		

Test Channe	Frequency	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(AV)	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)
<b>TX 802.11a Mode</b>				
CH149	5745	13.75	10.11	30
CH157	5785	13.89	10.54	30
CH165	5825	13.43	10.12	30
<b>TX 802.11n-HT20 Mode</b>				
CH149	5745	10.09	7.13	30
CH157	5785	10.11	7.81	30
CH165	5825	10.34	7.76	30

## 7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

### APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

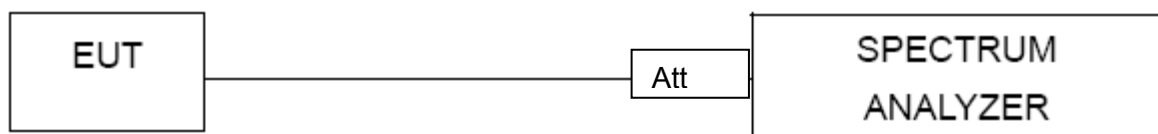
### TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

### 7.1 DEVIATION FROM STANDARD

No deviation.

### 7.2 TEST SETUP



### 7.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

## 7.4 TEST RESULTS

EUT :	TV Box	Model Name :	S8 pro
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
802.11b mode			
Left-band	38.53	20	Pass
Right-band	57.59	20	Pass
802.11g mode			
Left-band	29.93	20	Pass
Right-band	48.25	20	Pass
802.11n-HT20 mode			
Left-band	29.80	20	Pass
Right-band	48.57	20	Pass

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
802.11a mode			
Left-band	36.69	20	Pass
Right-band	48.29	20	Pass
802.11n20 mode			
Left-band	36.30	20	Pass
Right-band	47.68	20	Pass



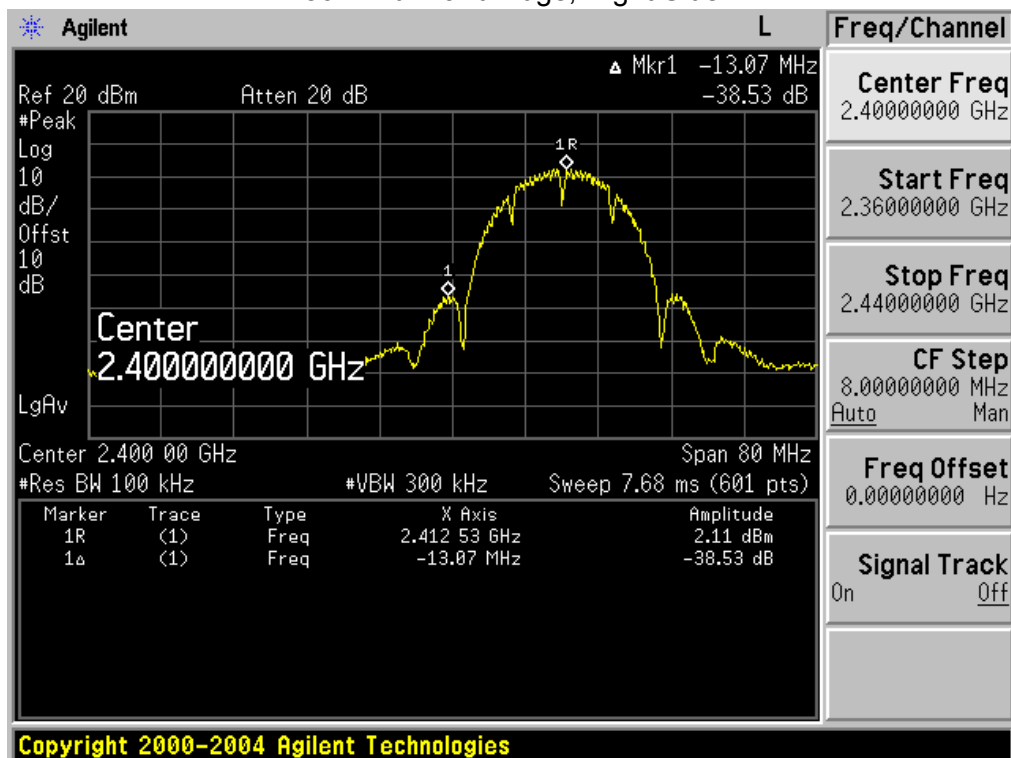
## Radiated band edge:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b							
2390	60.13	-13.06	47.07	74	-26.93	peak	Vertical
2390	56.88	-13.06	43.82	74	-30.18	peak	Horizontal
2483.5	57.93	-12.78	45.15	74	-28.85	peak	Vertical
2483.5	56.13	-12.78	43.35	74	-30.65	peak	Horizontal
802.11g							
2390	59.83	-13.06	46.77	74	-27.23	peak	Vertical
2390	57.39	-13.06	44.33	74	-29.67	peak	Horizontal
2483.5	56.21	-12.78	43.43	74	-30.57	peak	Vertical
2483.5	58.93	-12.78	46.15	74	-27.85	peak	Horizontal
802.11n (20)							
2390	58.81	-13.06	45.75	74	-28.25	peak	Vertical
2390	57.96	-13.06	44.9	74	-29.1	peak	Horizontal
2483.5	57.29	-12.78	44.51	74	-29.49	peak	Vertical
2483.5	59.52	-12.78	46.74	74	-27.26	peak	Horizontal

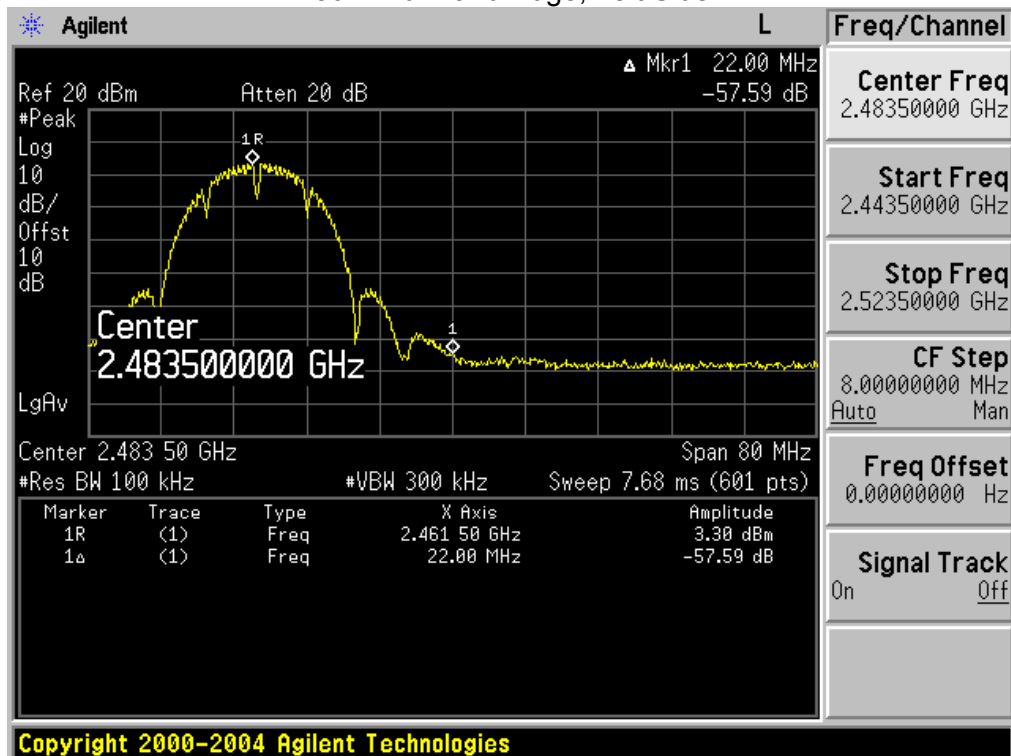
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11a-5G							
5725	41.12	11.79	52.91	74	-21.09	peak	Vertical
5725	40.25	11.79	52.04	74	-21.96	peak	Horizontal
5850	39.09	11.93	51.02	74	-22.98	peak	Vertical
5850	40.34	11.93	52.27	74	-21.73	peak	Horizontal
802.11n20-5G							
5725	40.89	11.79	52.68	74	-21.32	peak	Vertical
5725	41.11	11.79	52.9	74	-21.1	peak	Horizontal
5850	39.64	11.93	51.57	74	-22.43	peak	Vertical
5850	40.15	11.93	52.08	74	-21.92	peak	Horizontal

Note: Test method to see chapter 3.2 . When PK value is lower than the Average value limit, average not record.

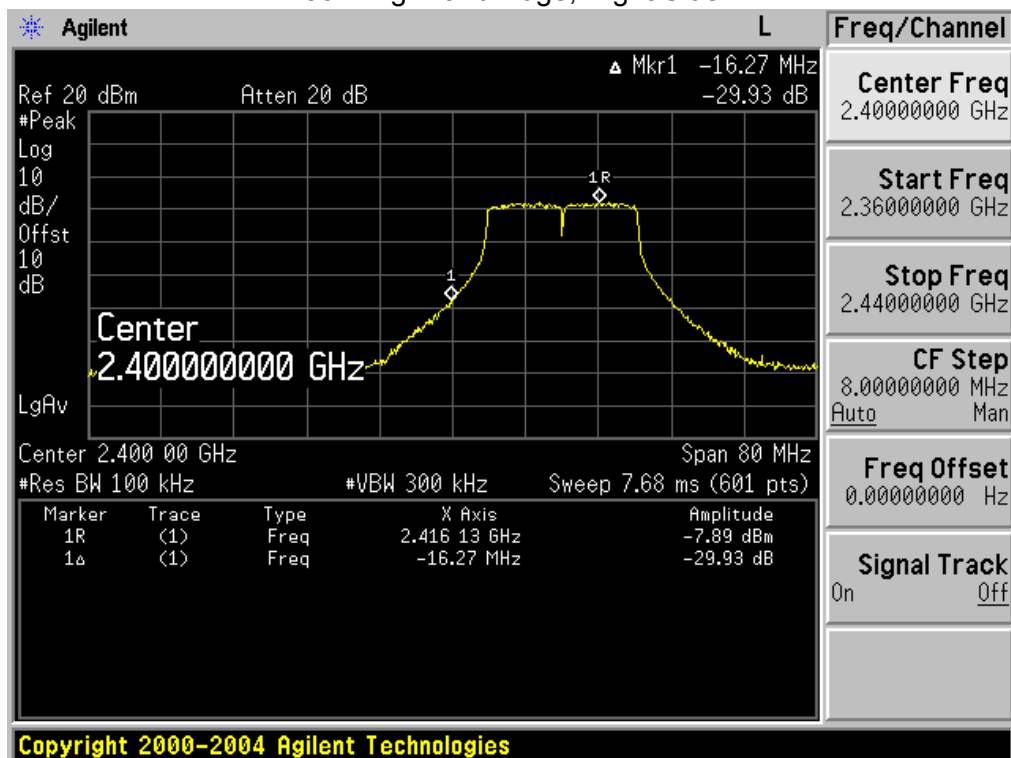
802.11b: Band Edge, Right Side



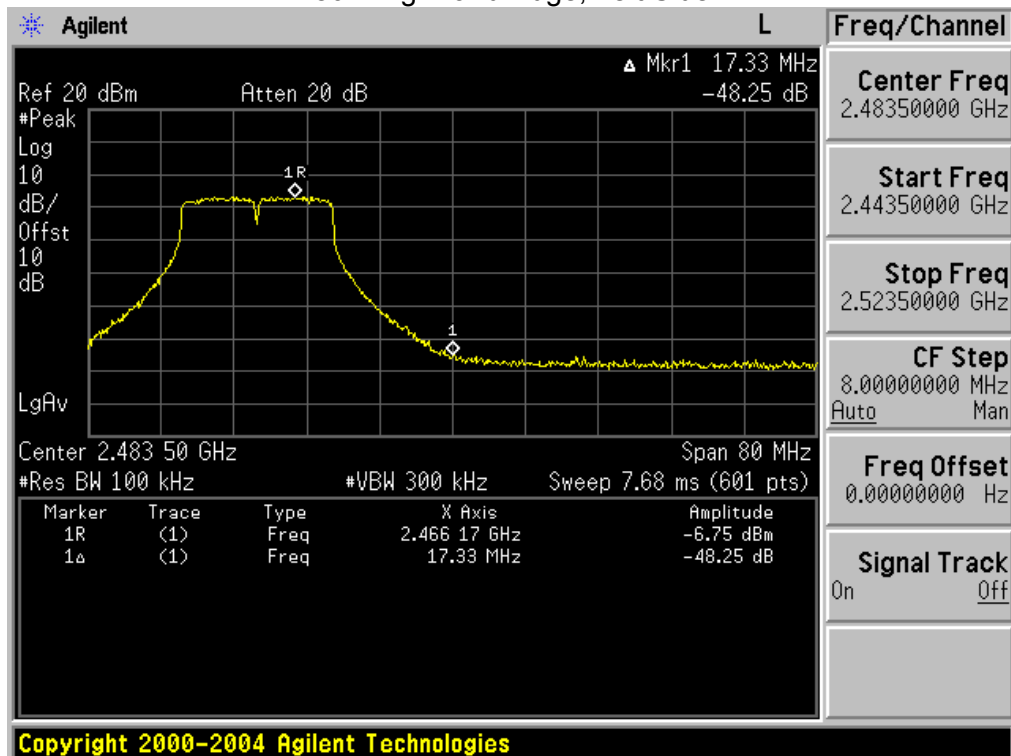
802.11b: Band Edge, Left Side



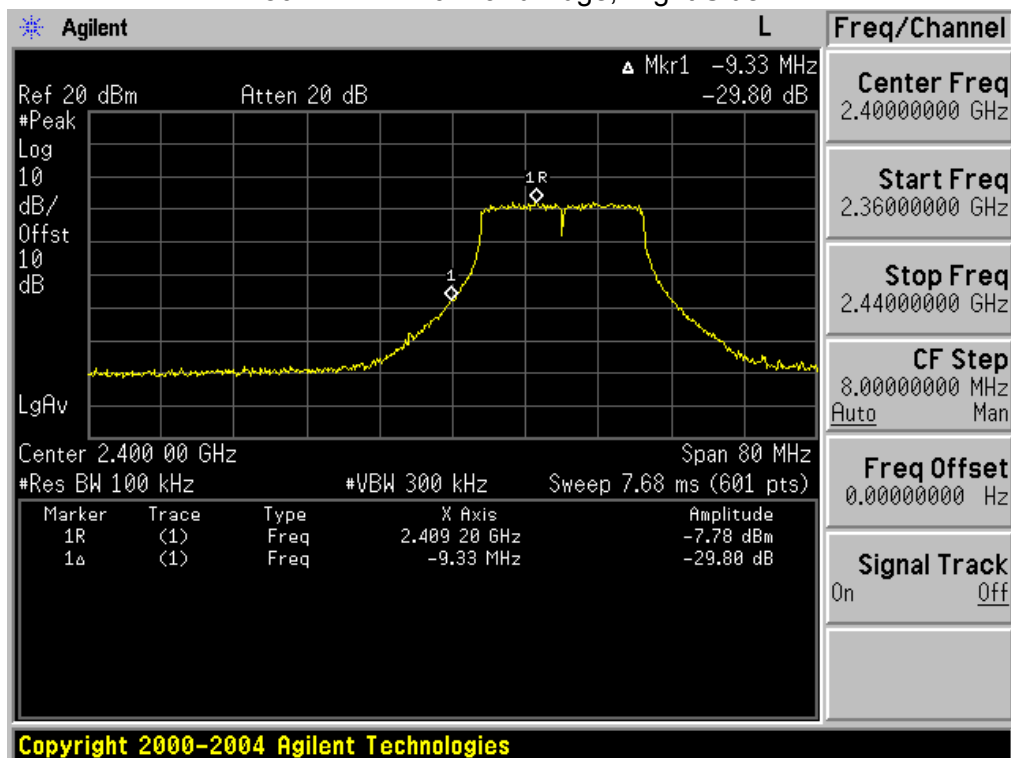
802.11g: Band Edge, Right Side



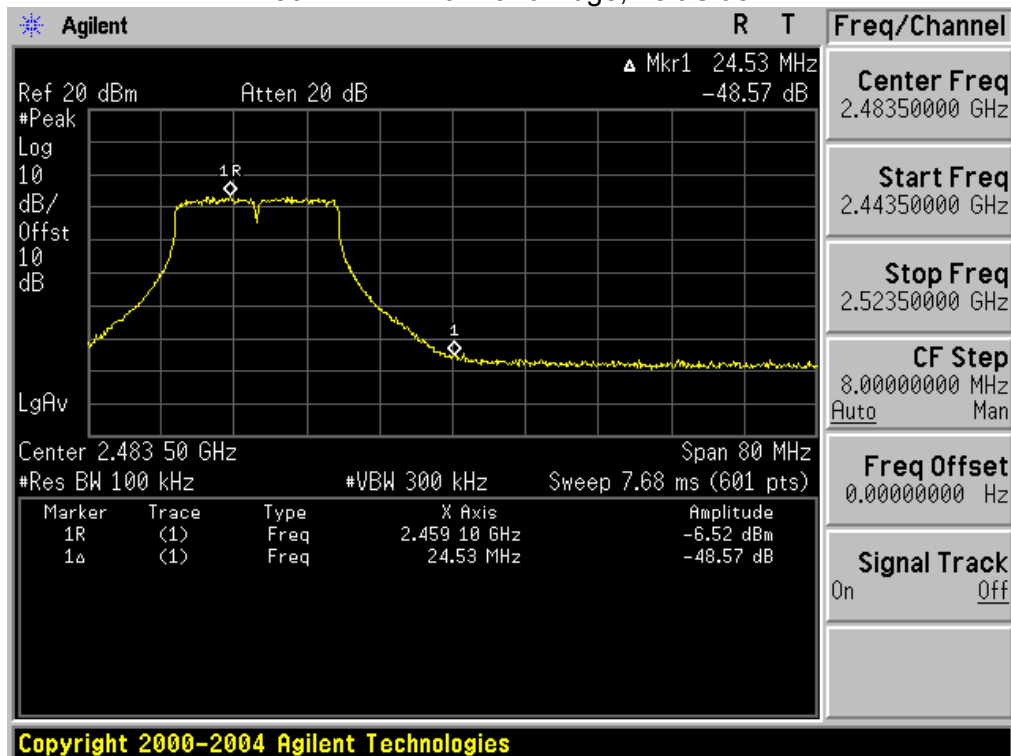
802.11g: Band Edge, Left Side



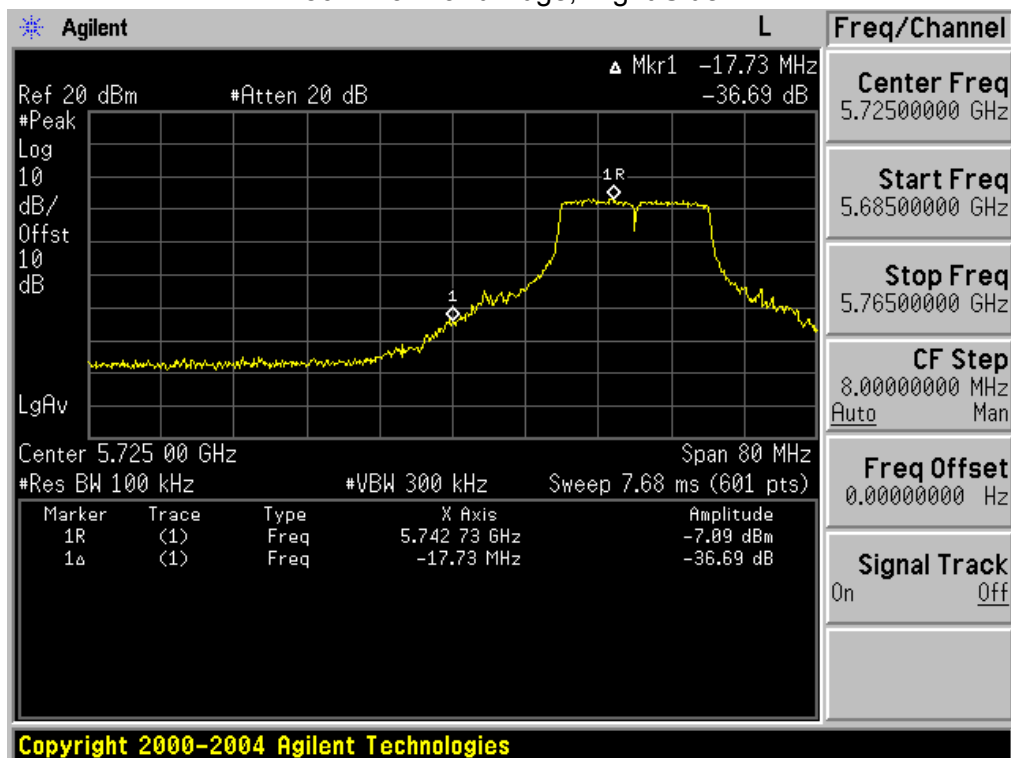
802.11n-HT20: Band Edge, Right Side



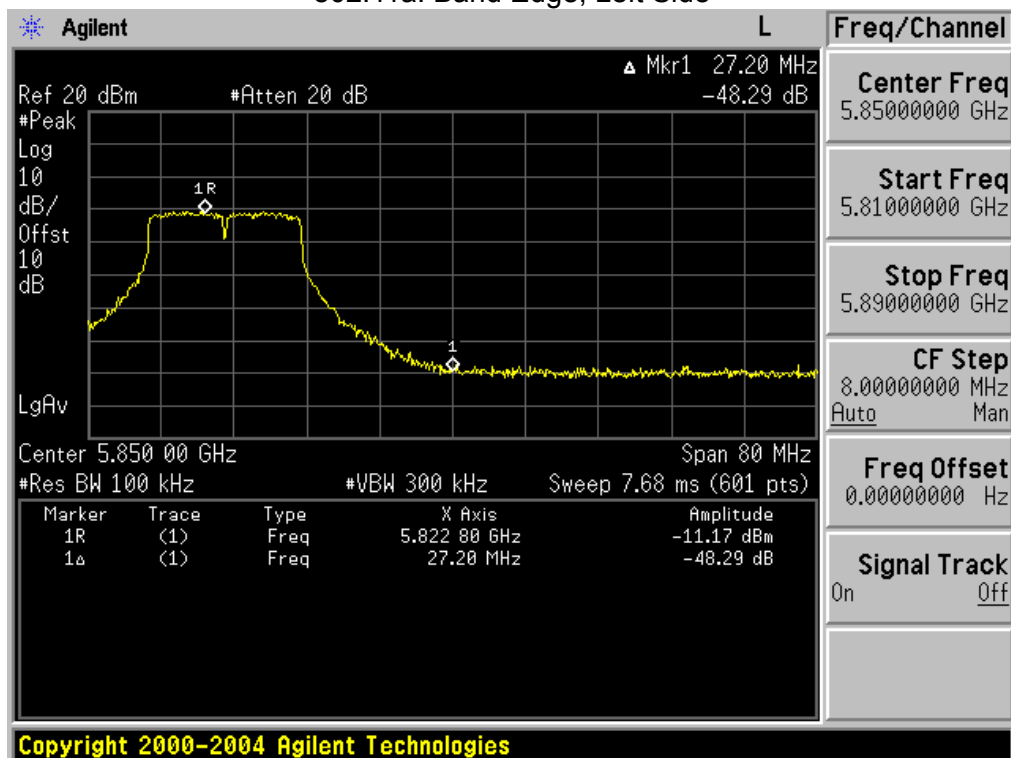
802.11n-HT20: Band Edge, Left Side



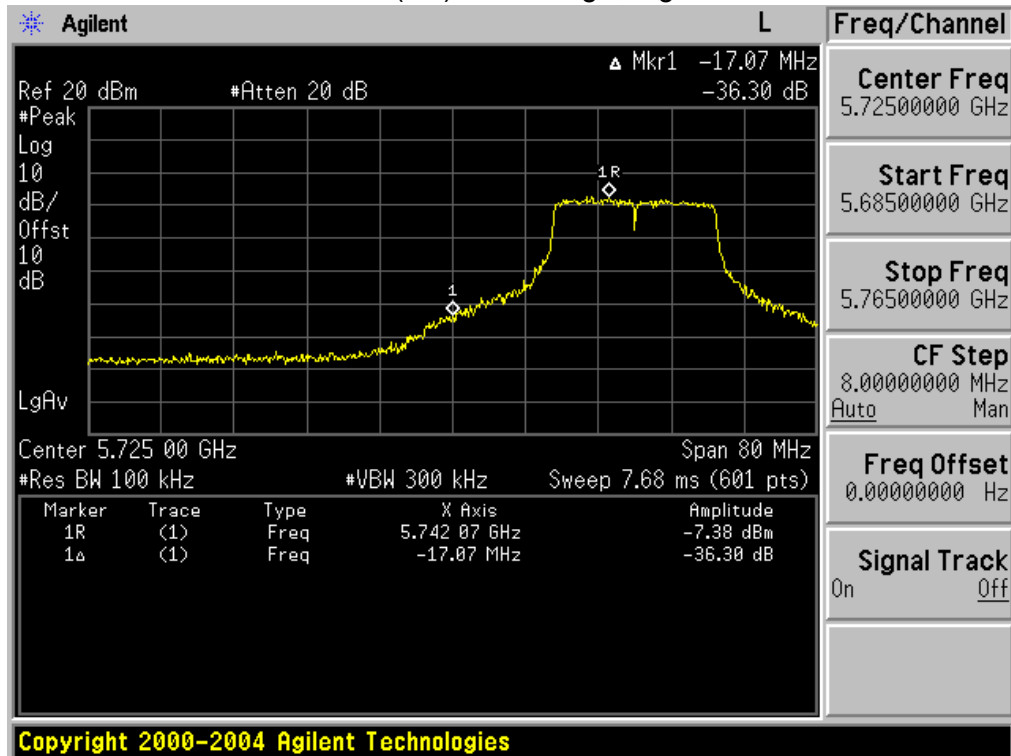
802.11a: Band Edge, Right Side



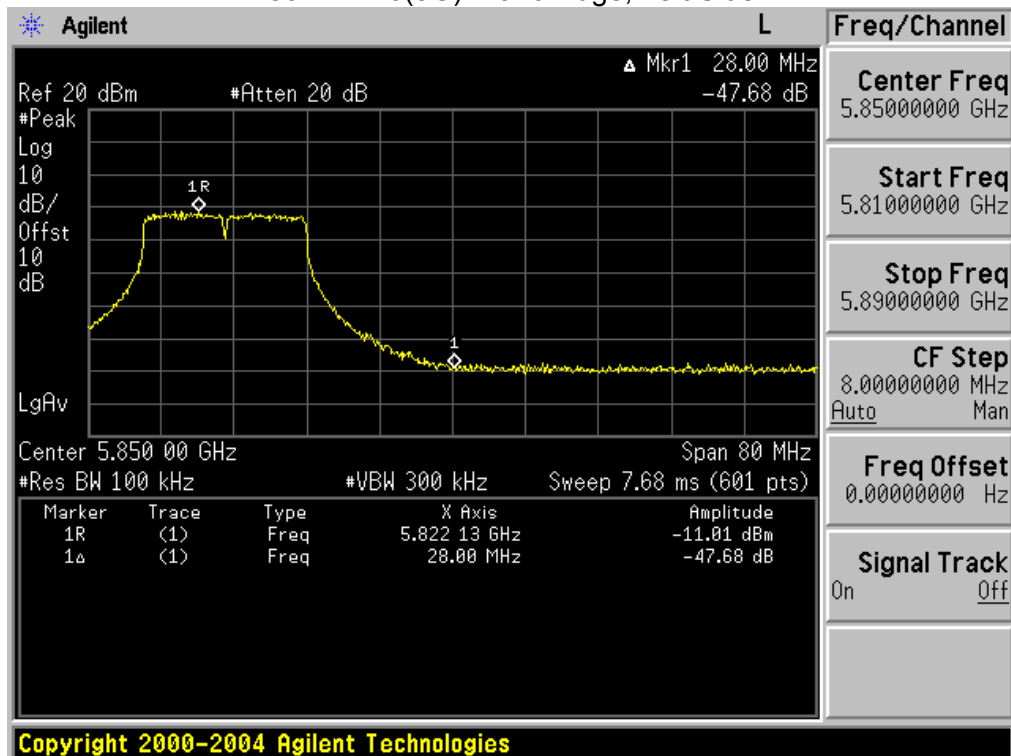
802.11a: Band Edge, Left Side



802.11n20(5G): Band Edge, Right Side



802.11n20(5G): Band Edge, Left Side



## **8. ANTENNA REQUIREMENT**

### **8.1 STANDARD REQUIREMENT**

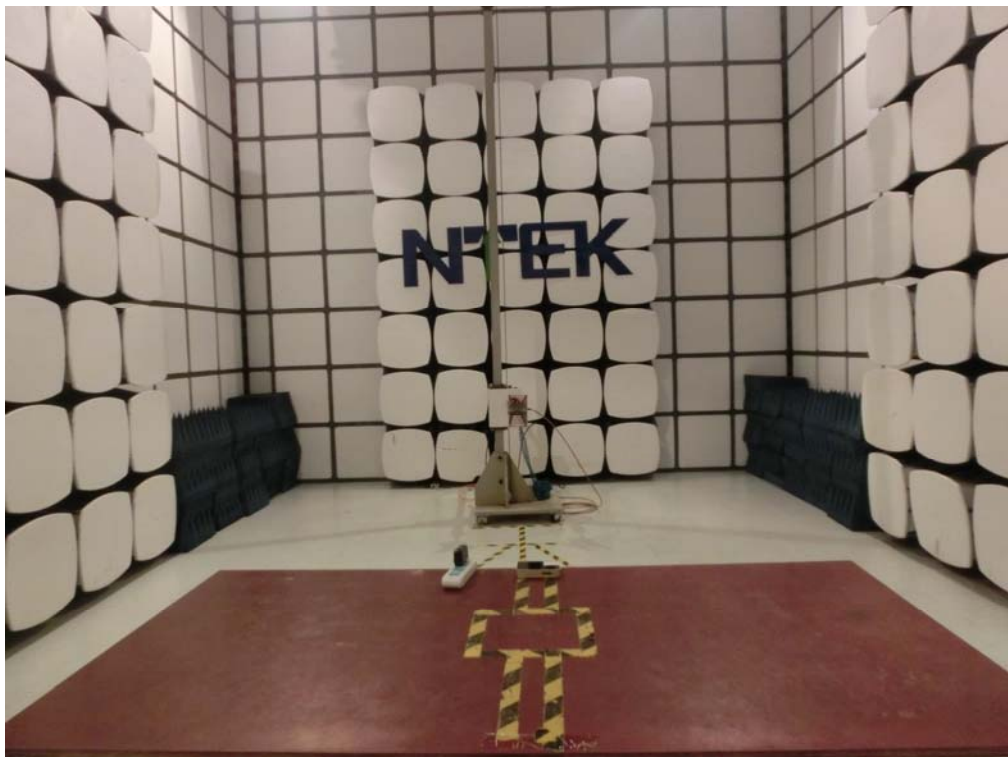
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **8.2 EUT ANTENNA**

The EUT antenna is FPCB antenna. It comply with the standard requirement.

## 9. EUT TEST PHOTO

### Radiated Measurement Photos





**Conducted Measurement Photos**