



Test Report

FCC ID:ZCB-634GBU

Date of issue: Dec. 06, 2017

Report Number:	CF17121301
Sample Description:	IP Camera
Model(s):	634GBU, 622GBU, 625GBU, 631GBU, 632GBU, 635GBU, 629GBU, 705GBU, 754GBU, 750GBU
Applicant:	Shenzhen Smarteye Digital Electronics Co., Ltd
Address:	#6 Northern Area, Shangxue S&T Industrial Park, Bantian, Longgang, Shenzhen
Date of Test:	Nov. 13, 2017 – Dec. 06, 2017



TEST RESULT CERTIFICATION

TEST RESULT CERTIFICATION	
Applicant's name	Shenzhen Smarteye Digital Electronics Co., Ltd
Address	#6 Northern Area, Shangxue S&T Industrial Park, Bantian, Longgang, Shenzhen
Manufacture's Name	Shenzhen Smarteye Digital Electronics Co., Ltd
Address	#6 Northern Area, Shangxue S&T Industrial Park, Bantian, Longgang, Shenzhen
Product description	
Product name	IP Camera
Model and/or type reference :	634GBU
Serial Model	622GBU, 625GBU, 631GBU, 632GBU, 635GBU, 629GBU, 705GBU, 754GBU, 750GBU
Standards	FCC Part15.247
Test procedure	ANSI C63.10:2013

This device described above has been tested by WH Technology Corp. 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.

Tested by:

Bell Wei

Dec. 06, 2017

Approved by:

Mike Lee

Dec. 06, 2017



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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

WH Technology Corp.

Add.: 7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

FCC Registration No.: TW1083

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	IP Camera	
Trade Name	N/A	
Model Name	634GBU	
Serial Model	622GBU, 625GBU, 631GBU, 632GBU, 635GBU, 629GBU, 705GBU, 754GBU, 750GBU	
Model Difference	Internal structure, PCB, circuit are the same, just the difference between the shell and color	
Product Description	The EUT is a IP Camera	
	Operation Frequency:	802.11b/g/n20:2412~2462 MHz
	Modulation Type:	11n: BPSK, QPSK, 16QAM, 64QAM with OFDM 11g: BPSK, QPSK, 16QAM, 64QAM, OFDM 11b: DQPSK, DBPSK, DSSS, CCK
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n:65/52/6.5Mbps
	Number Of Channel	802.11b/g/n20:11CH
	Antenna Designation:	Please see Note 3.
	Output Power(Conducted):	802.11b: 8.97 dBm (Max.) 802.11g: 8.63 dBm (Max.) 802.11n20: 8.91 dBm (Max.)
	Antenna Gain (dBi)	3dbi
	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.	
Adapter information:	Model:D31-05050100 Input:100-240V AC~ 50/60Hz 0.3A Output:5V DC 1000mA	
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. Channel List

Channel List for 802.11b/g/n(20)							
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		

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Chip antenna	/	3	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	802.11n CH1/ CH6/ CH11
Mode 4	TX Mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	TX Mode

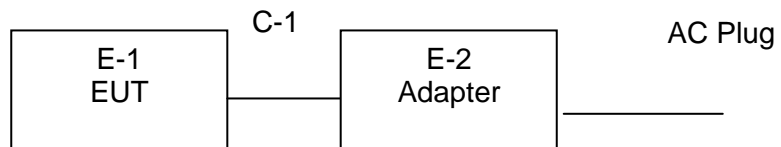
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n CH1/ CH6/ CH11

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





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	IP Camera	N/A	634GBU	N/A	EUT
E-2	Adapter	N/A	D31-05050100	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.0m	
C-2	NO	NO	0.8m	

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

For RF conducted test:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Universal Radio Communication Tester	Rohde&schwarz	CMU200	2017/11/05	2018/11/04
Spectrum Analyzer	Agilent	N9020A	2017/03/06	2018/03/05
Vector Signal generator	Agilent	N5181A	2017/03/06	2018/03/05
Signal generator	Agilent	E4421B	2017/03/06	2018/03/05
Dc Power Supply	GW	GPR-6030D	/	2018/11/04
Temperature & Humidity Chamber	GIANT FORCE	GTH-056P	2017/11/05	2018/11/14
Fading Simulator	R&S	ABFS	2017/03/06	2018/03/05
Fading Simulator	R&S	ABFS	2017/03/06	2018/03/05
Broadband TRILOG Antenna	Schwarabeck	VULB9163	2017/11/5	2018/11/14
Broadband TRILOG Antenna	Schwarabeck	VULB9163	2017/11/5	2018/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	2017/11/5	2018/11/14
Horn Antenna	Schwarzbeck	BBHA 9120 D	2017/11/5	2018/11/14
Amplifier	HP	8447D	2017/11/5	2018/11/04
Amplifier	Agilent	8449B	2017/11/5	2018/11/04
Test Receiver	Schwarabeck	ESPI7	2017/11/5	2018/11/04
Spectrum analyzer	Agilent	E4407B	2017/11/5	2018/11/04
Signal Generator	R&S	SMT 06	2017/11/5	2018/11/04
High-Pass Filter	K&L	9SH10-2700/X1 2750-O/O	2017/03/06	2018/03/05
High-Pass Filter	K&L	41H10-1375/U1 2750-O/O	2017/03/06	2018/03/05
Universal Radio Communication Tester	Rohde&schwarz	CMU200	2017/11/5	2018/11/04
Test Cable	United Microwave	57793	1m	2017.12.05
Test Cable	United Microwave	A30A30-5006	10m	2017.12.05

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency (MHz)	Limit	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Note:

(1) Decreases with the logarithm of the frequency from 0.15MHz to 0.5MHz.

3.1.2 TEST METHOD

1. 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 equipment powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

2. 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.

3. 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.

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

5. The resolution bandwidth of EMI test receiver is set at 9kHz.

3.1.3 TEST RESULT

Not application because of the EUT is power by battery.

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



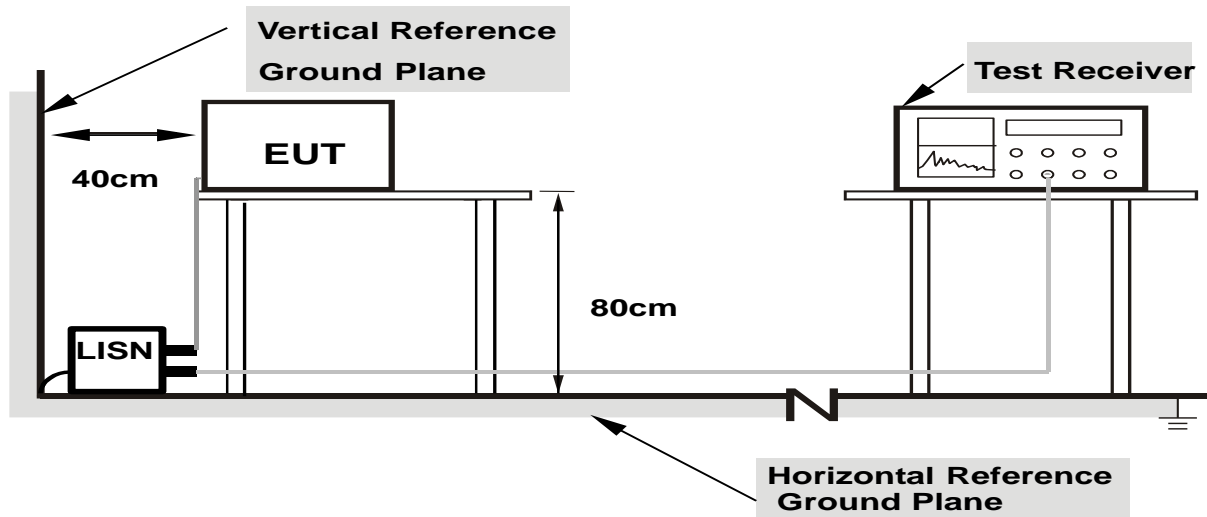
3.1.4 TEST PROCEDURE

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

3.1.5 DEVIATION FROM TEST STANDARD

No deviation

3.1.6 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

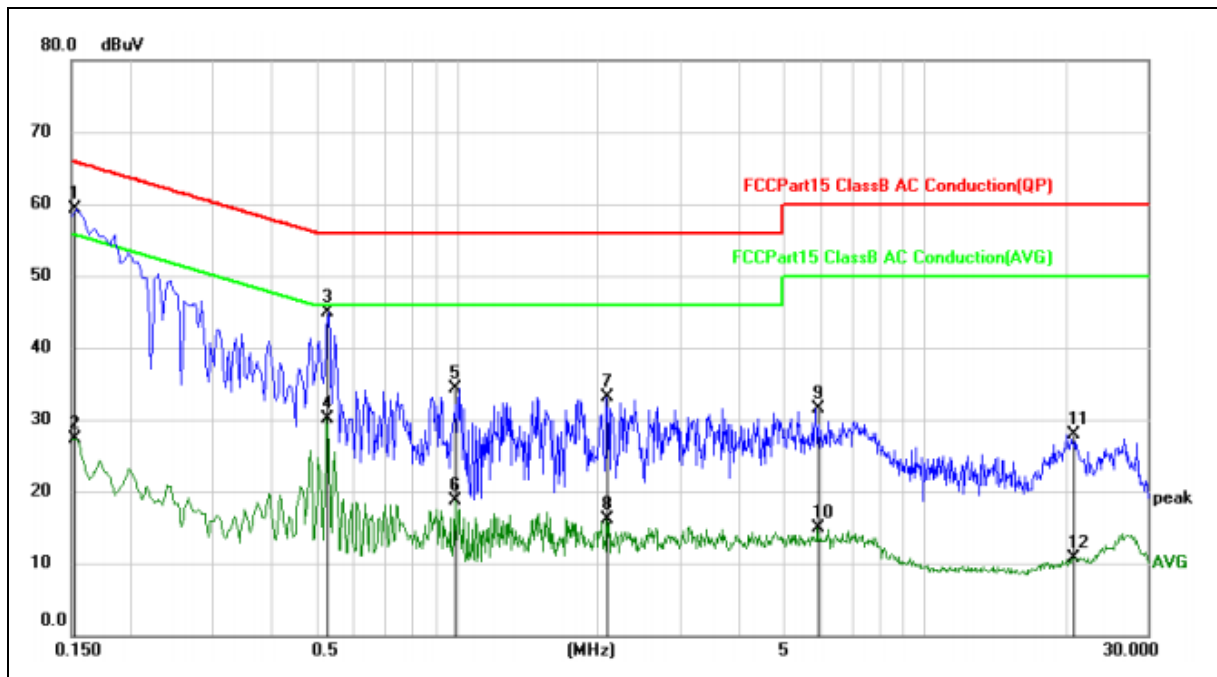
3.1.7 EUT OPERATING CONDITIONS

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.



3.1.8 TEST RESULT

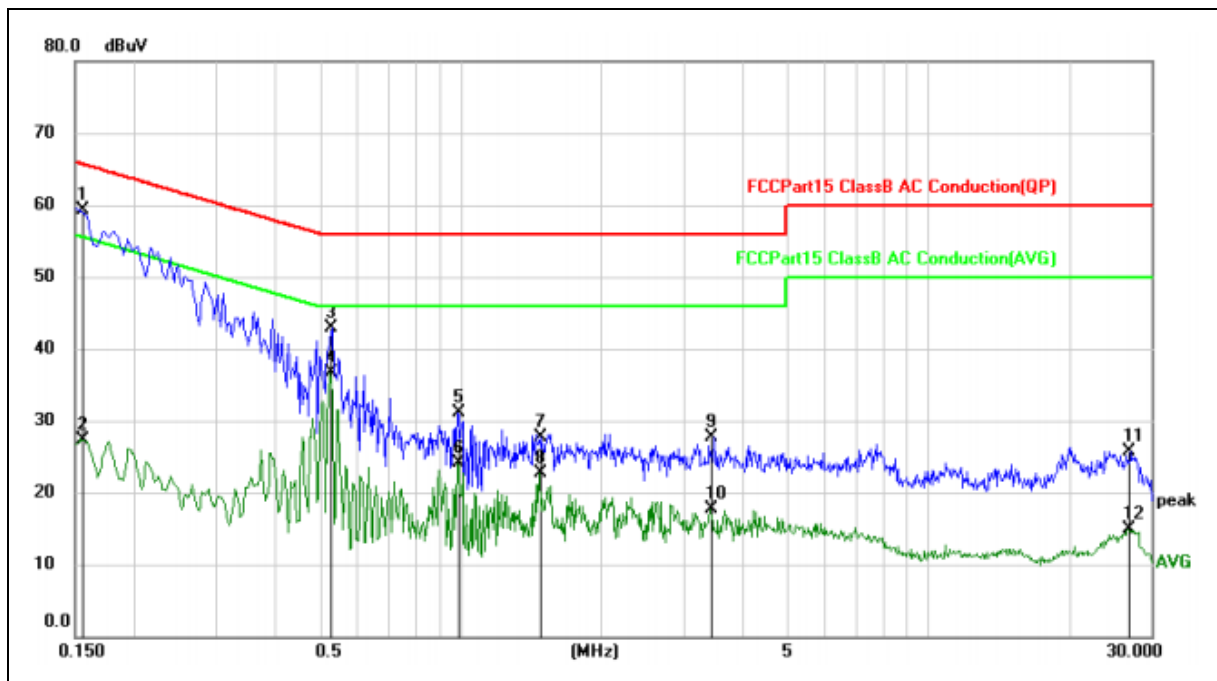
EUT :	IP Camera	Model Name. :	634GBU
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz	Test Mode :	Mode 4



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1524	59.32	0.00	59.32	65.87	-6.55	QP	
2		0.1524	27.37	0.00	27.37	55.87	-28.50	AVG	
3		0.5280	44.95	0.00	44.95	56.00	-11.05	QP	
4		0.5280	30.11	0.00	30.11	46.00	-15.89	AVG	
5		0.9915	34.38	0.00	34.38	56.00	-21.62	QP	
6		0.9915	18.62	0.00	18.62	46.00	-27.38	AVG	
7		2.0985	33.09	0.00	33.09	56.00	-22.91	QP	
8		2.0985	16.03	0.00	16.03	46.00	-29.97	AVG	
9		5.9010	31.53	0.00	31.53	60.00	-28.47	QP	
10		5.9010	14.97	0.00	14.97	50.00	-35.03	AVG	
11		20.7060	27.91	0.00	27.91	60.00	-32.09	QP	
12		20.7060	10.74	0.00	10.74	50.00	-39.26	AVG	



EUT :	IP Camera	Model Name. :	634GBU
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz	Test Mode :	Mode 5



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1556	59.34	0.00	59.34	65.70	-6.36	QP	
2		0.1556	27.33	0.00	27.33	55.70	-28.37	AVG	
3		0.5280	42.82	0.00	42.82	56.00	-13.18	QP	
4		0.5280	36.76	0.00	36.76	46.00	-9.24	AVG	
5		0.9870	31.04	0.00	31.04	56.00	-24.96	QP	
6		0.9870	24.15	0.00	24.15	46.00	-21.85	AVG	
7		1.4775	27.63	0.00	27.63	56.00	-28.37	QP	
8		1.4775	22.67	0.00	22.67	46.00	-23.33	AVG	
9		3.4305	27.76	0.00	27.76	56.00	-28.24	QP	
10		3.4305	17.61	0.00	17.61	46.00	-28.39	AVG	
11		26.7495	25.64	0.00	25.64	60.00	-34.36	QP	
12		26.7495	14.81	0.00	14.81	50.00	-35.19	AVG	



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

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

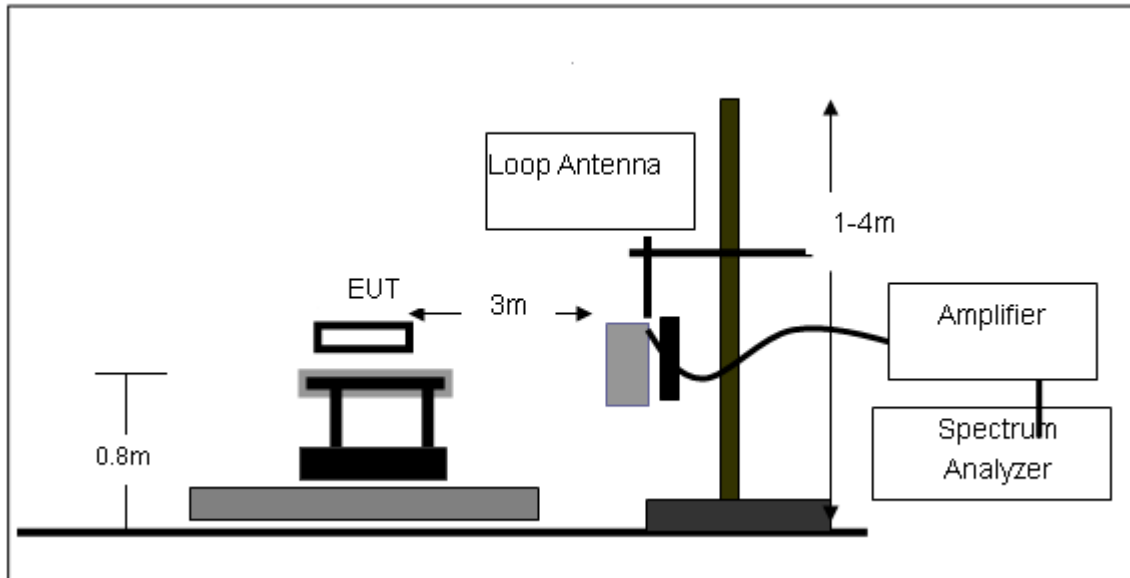
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

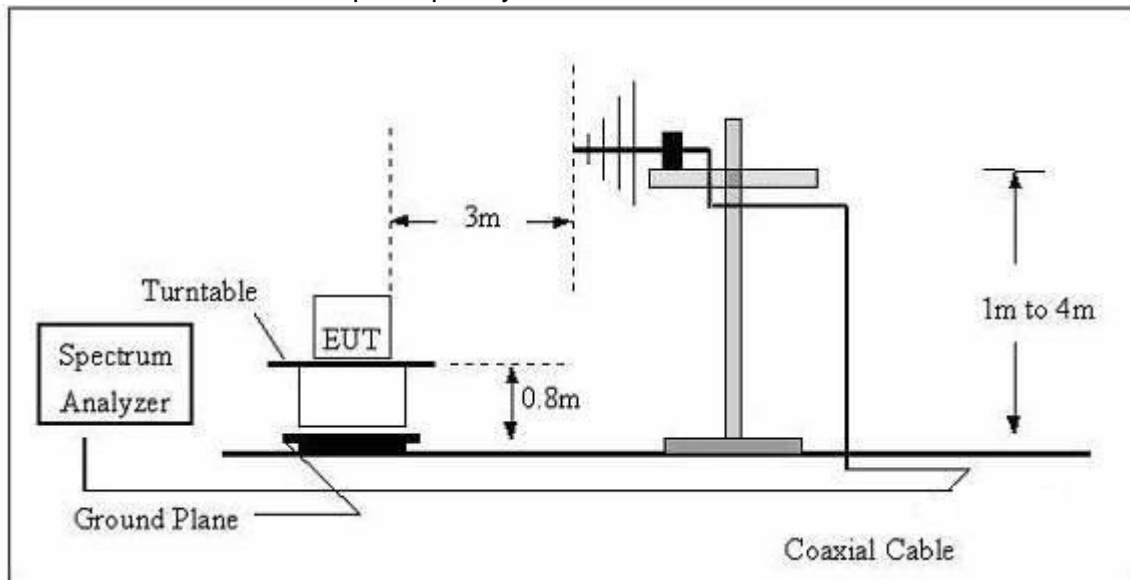


3.2.4 TEST SETUP

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

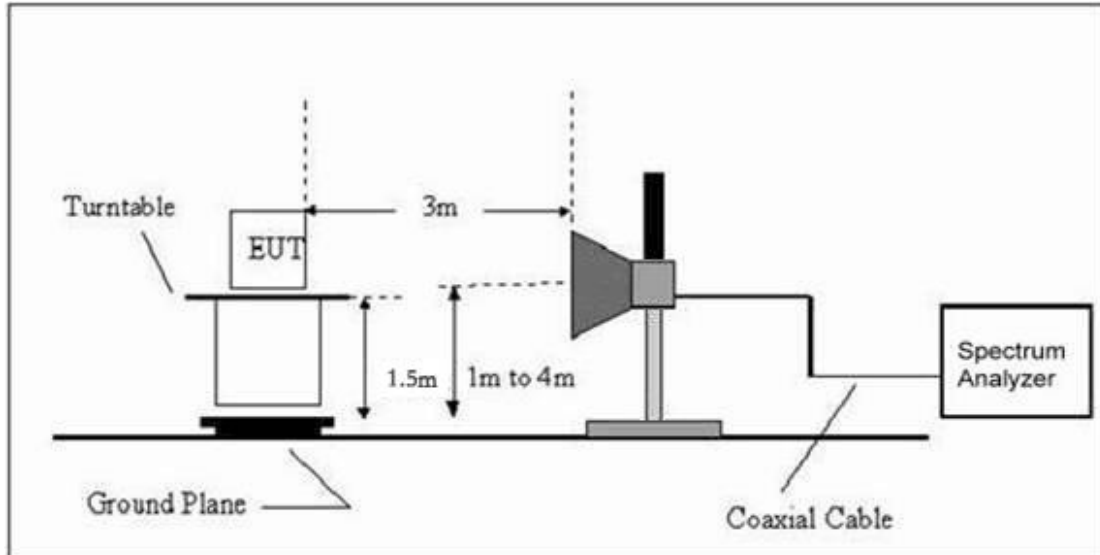


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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-30MHZ)

EUT:	IP Camera	Model Name. :	634GBU
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter AC 120V/60Hz
Test Mode :	TX	Polarization :	--

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

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

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



3.2.7 TEST RESULTS (BETWEEN 30MHZ-1GHZ)

EUT :	IP Camera	Model Name :	634GBU
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	270.3747	42.05	-8.45	33.60	46.00	-12.40	QP
V	300.3672	43.45	-7.65	35.80	46.00	-10.20	QP
V	330.1949	40.40	-8.00	32.40	46.00	-13.60	QP
V	651.9416	37.45	-4.75	32.70	46.00	-13.30	QP
V	750.1083	42.50	-3.50	39.00	46.00	-7.00	QP
V	851.0353	39.12	-2.02	37.10	46.00	-8.90	QP
H	270.3747	38.25	-9.45	28.80	46.00	-17.20	QP
H	300.3672	47.31	-8.61	38.70	46.00	-7.30	QP
H	550.9479	33.51	-5.21	28.30	46.00	-17.70	QP
H	750.1082	38.40	-3.50	34.90	46.00	-11.10	QP
H	851.0353	35.02	-2.02	33.00	46.00	-13.00	QP
H	932.2715	38.78	-0.98	37.80	46.00	-8.20	QP

Remark:

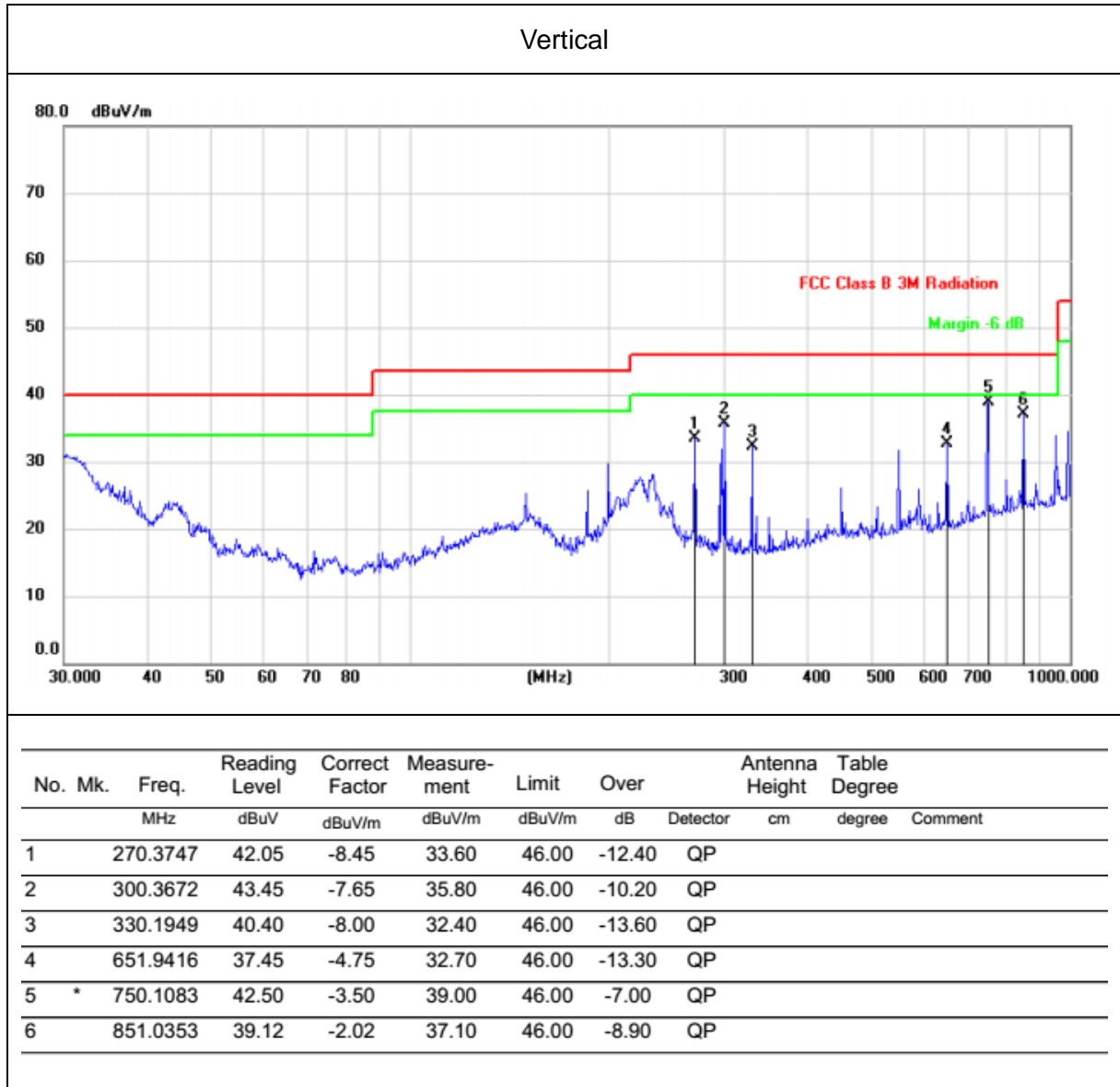
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level- Limit

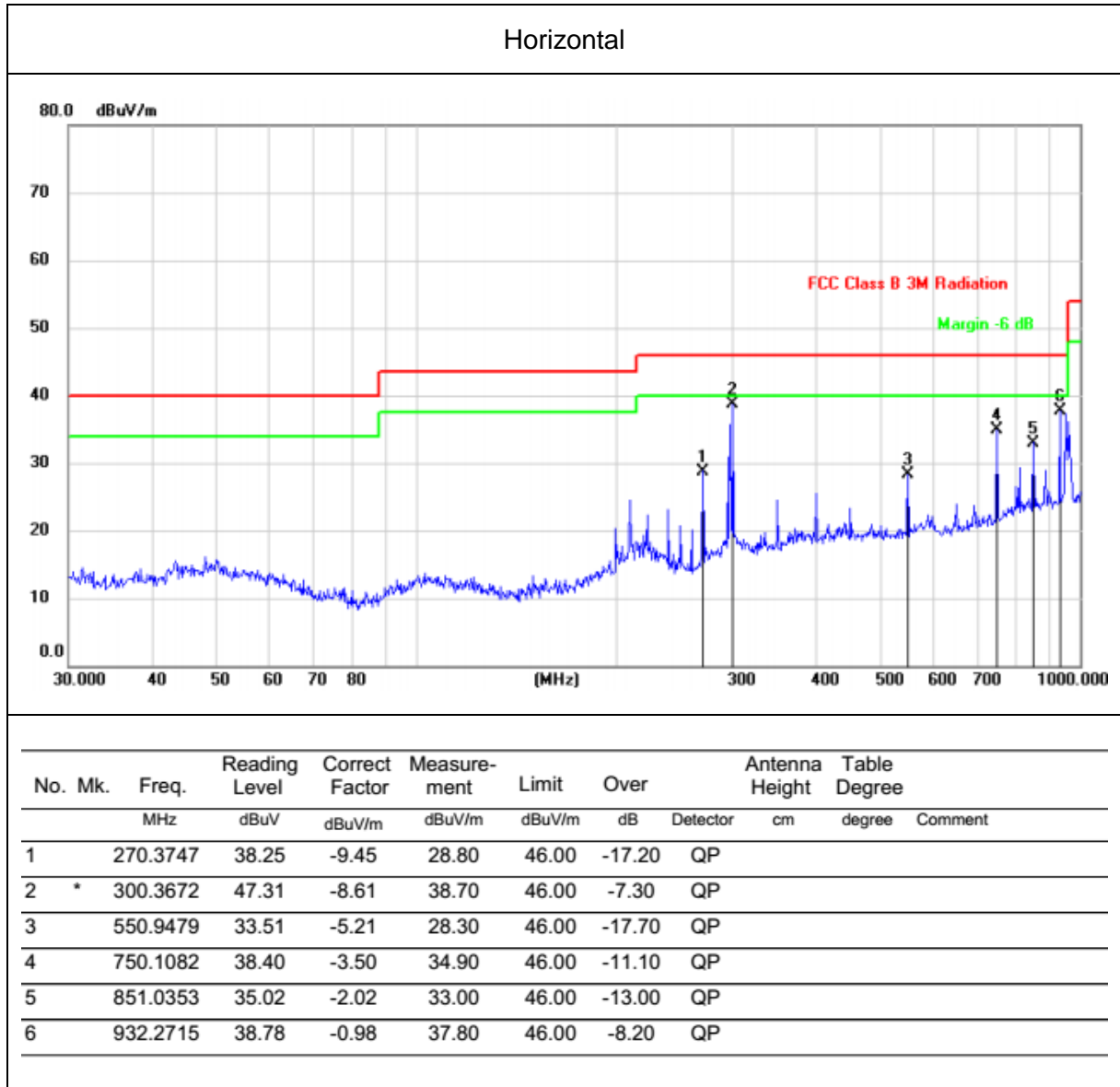
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Factor added by measurement software automatically



Test plots:







3.2.8 TEST RESULTS (1GHZ-25GHZ)

802.11b

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	dB	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (2412 MHz)							
Vertical	2491.000	59.26	-9.91	49.35	74	-24.65	Pk
Horizontal	2498.000	56.16	-12.54	43.62	74	-30.38	Pk
Vertical	4281.000	47.68	-5.91	41.77	74	-32.23	Pk
Horizontal	4281.000	53.97	-11.74	42.23	74	-31.77	Pk
Vertical	10452.000	46.69	-0.97	45.72	74	-28.28	Pk
Vertical	14311.000	46.28	3.86	50.14	74	-23.86	Pk
Vertical	16606.000	44.48	4.27	48.75	74	-25.25	Pk
Horizontal	10707.000	46.28	-1	45.28	74	-28.72	Pk
Horizontal	13614.000	45.52	3.11	48.63	74	-25.37	Pk
Horizontal	14447.000	46.05	4.23	50.28	74	-23.72	Pk
Mid Channel (2437 MHz)							
Vertical	2474.000	55.97	-8.45	47.52	74	-26.48	Pk
Horizontal	2474.000	56.66	-12.63	44.03	74	-29.97	Pk
Vertical	3618.000	47.51	-4.77	42.74	74	-31.26	Pk
Horizontal	3618.000	53.15	-8.98	44.17	74	-29.83	Pk
Vertical	7324.000	51.19	-5.37	45.82	74	-28.18	Pk
Vertical	10061.000	47.16	0.12	47.28	74	-26.72	Pk
Vertical	13801.000	45.09	5.99	51.08	74	-22.92	Pk
Horizontal	7324.000	47.69	-5.33	42.36	74	-31.64	Pk
Horizontal	9670.000	46.96	-1.03	45.93	74	-28.07	Pk
Horizontal	12917.000	46.65	-0.27	46.38	74	-27.62	Pk
High Channel (2462 MHz)							
Vertical	2453.883	56.28	-9	47.28	74	-26.72	Pk
Horizontal	2453.839	56.28	-11.32	44.96	74	-29.04	Pk
Vertical	7018.000	46.37	-6.09	40.28	74	-33.72	Pk
Horizontal	4926.683	55.28	-8.93	46.35	74	-27.65	Pk
Vertical	9619.000	46.34	-4.29	42.05	74	-31.95	Pk
Vertical	11472.000	47.19	-0.24	46.95	74	-27.05	Pk
Vertical	14396.000	46.53	3.64	50.17	74	-23.83	Pk
Horizontal	7324.000	51.19	-5.91	45.28	74	-28.72	Pk
Horizontal	10061.000	47.16	-0.91	46.25	74	-27.75	Pk
Horizontal	13801.000	45.09	4.49	49.58	74	-24.42	Pk



802.11g

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	6933.000	46.24	-6.01	40.23	74	-33.77	Pk
V	6933.000	33.9	-3.04	30.86	54	-23.14	AV
H	6933.000	50.48	0.46	50.94	74	-23.06	Pk
H	6933.000	34.12	-2.85	31.27	54	-22.73	AV
operation frequency:2437							
V	4281.000	47.97	-4.32	43.65	74	-30.35	Pk
V	4281.000	35.18	-4.44	30.74	54	-23.26	AV
H	4281.000	46.88	-2.05	44.83	74	-29.17	Pk
H	4281.000	34.27	-4.22	30.05	54	-23.95	AV
operation frequency:2462							
V	4400.000	46.19	-5.32	40.87	74	-33.13	pk
V	4400.000	34.01	-6.03	27.98	54	-26.02	AV
H	4400.000	50.59	-10.21	40.38	74	-33.62	pk
H	4400.000	34.23	-3.56	30.67	54	-23.33	AV
Remark:							
Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit							



802.11n(20)

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	4824.000	50.59	-5.33	45.26	74	-28.74	Pk
H	4824.000	53.64	-2.77	50.87	74	-23.13	Pk
operation frequency:2437							
V	4873.000	50.99	-7.93	43.06	74	-30.94	Pk
H	4875.000	53.28	-6.7	46.58	74	-27.42	Pk
operation frequency:2462							
V	4924.000	52.05	-5.68	46.37	74	-27.63	pk
H	4924.000	50.91	-6.25	44.66	74	-29.34	pk
Remark:							
Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit							

Note:The PK value is less than the AV value, AV value is not required
Factor added by measurement software automatically.



BAND EDGE(Radiated)

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type	Comment
802.11b							
2390	56.47	-12.82	43.65	74	-30.35	peak	Vertical
2390	57.57	-12.82	44.75	74	-29.25	peak	Horizontal
2483.5	56.9	-10.52	46.38	74	-27.62	peak	Vertical
2483.5	54.03	-11.07	42.96	74	-31.04	peak	Horizontal
802.11g							
2390	56.87	-10.06	46.81	74	-27.19	peak	Vertical
2390	57.32	-13.6	43.72	74	-30.28	peak	Horizontal
2483.5	57.96	-13.68	44.28	74	-29.72	peak	Vertical
2483.5	58.22	-14.53	43.69	74	-30.31	peak	Horizontal
802.11n20							
2390	57.65	-14.38	43.27	74	-30.73	peak	Vertical
2390	57.96	-15.1	42.86	74	-31.14	peak	Horizontal
2483.5	57.68	-13.66	44.02	74	-29.98	peak	Vertical
2483.5	56.11	-15.03	41.08	74	-32.92	peak	Horizontal

NOTE: The PK value is less than the AV value, AV value is not required.



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

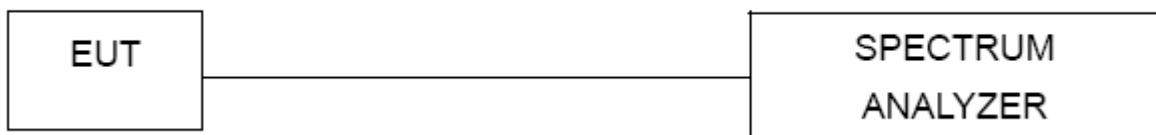
4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW \geq 3 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.
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

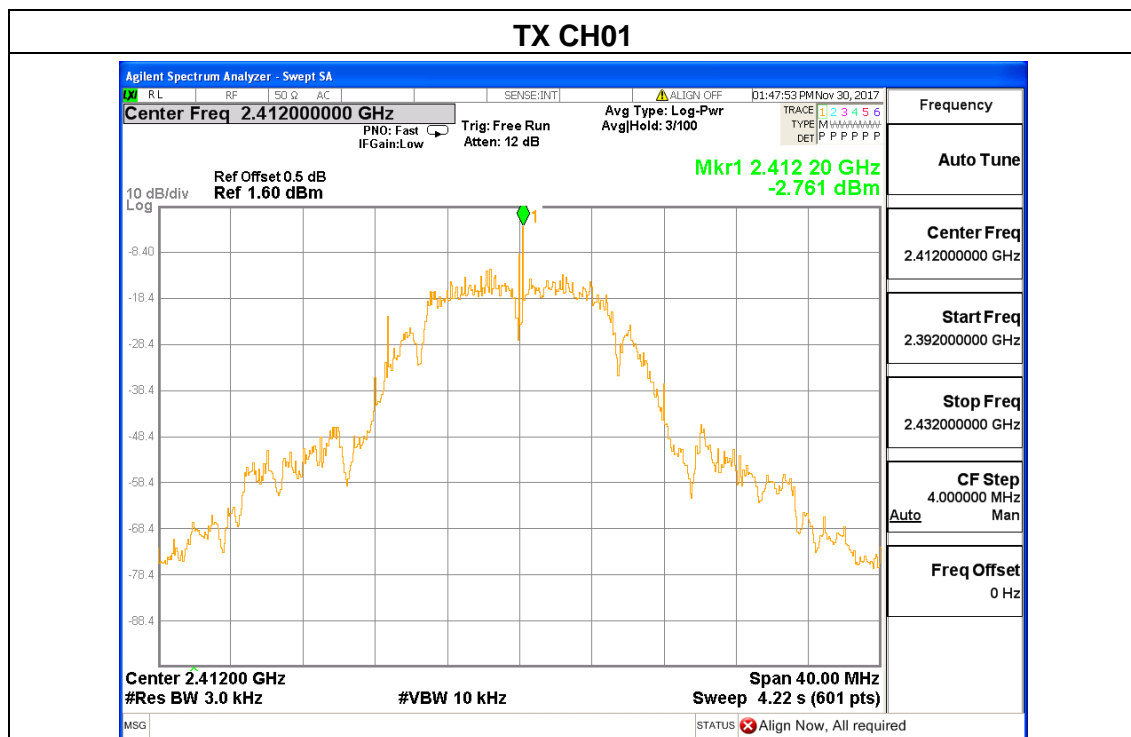
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

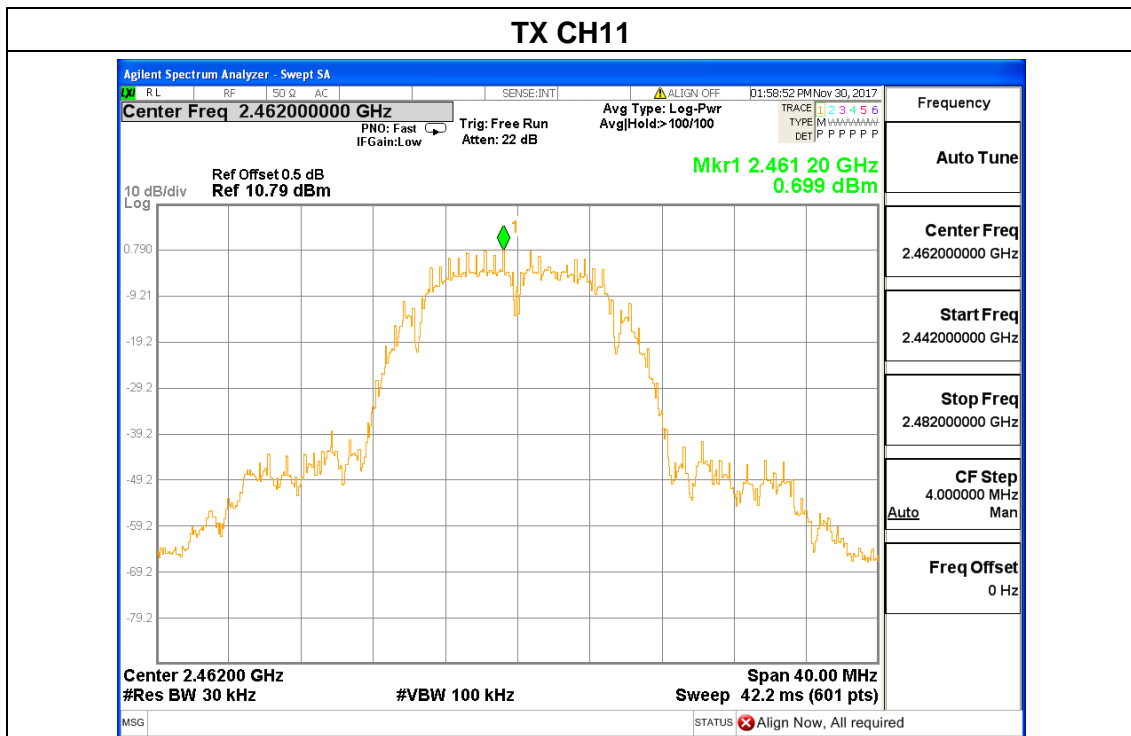
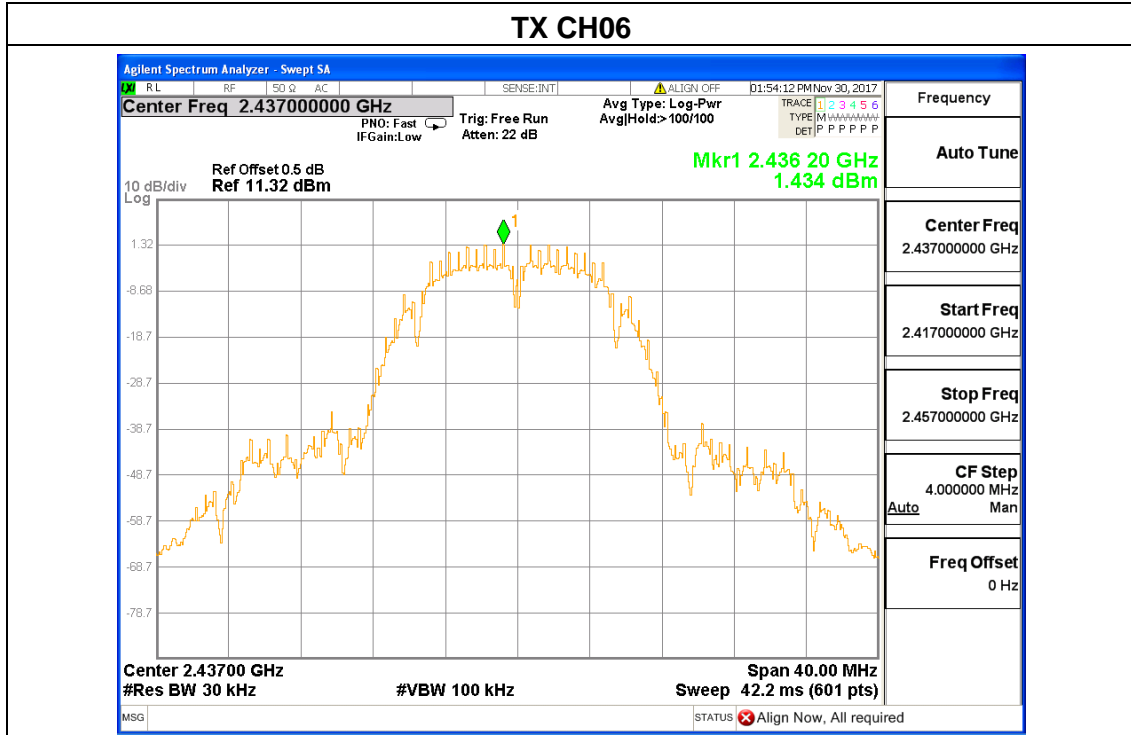


4.1.5 TEST RESULTS

EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX b Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-2.761	8	PASS
2437 MHz	1.434	8	PASS
2462 MHz	0.699	8	PASS

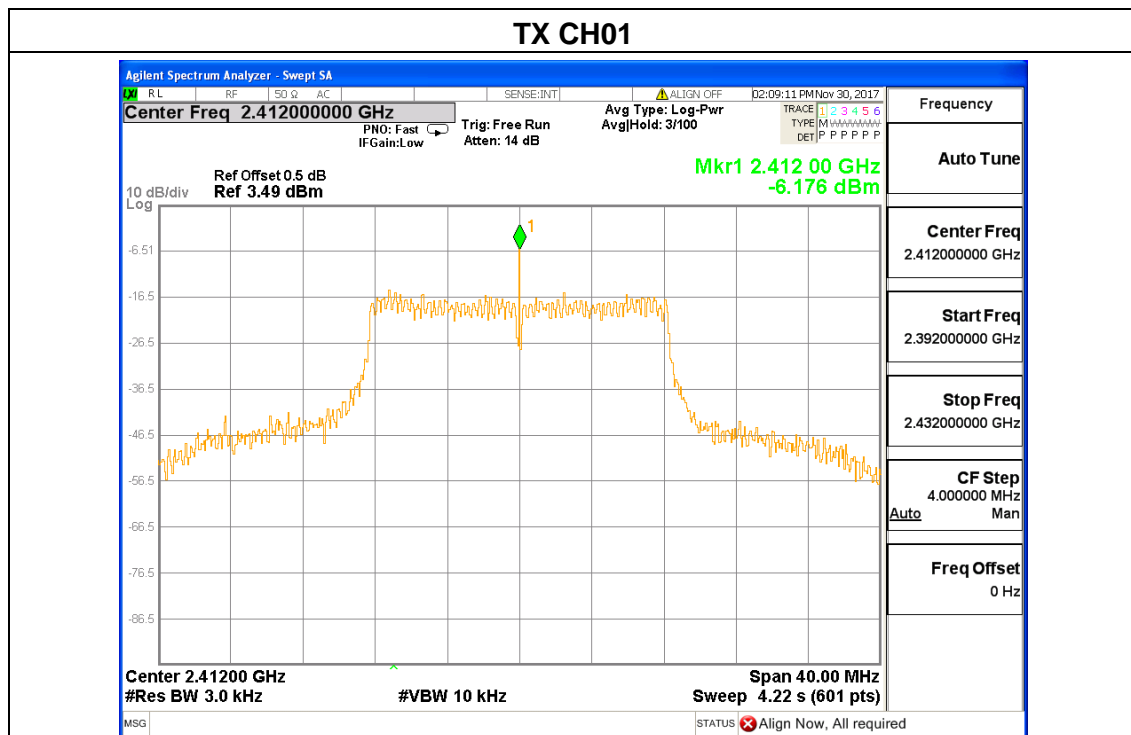






EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX g Mode /CH01, CH06, CH11		

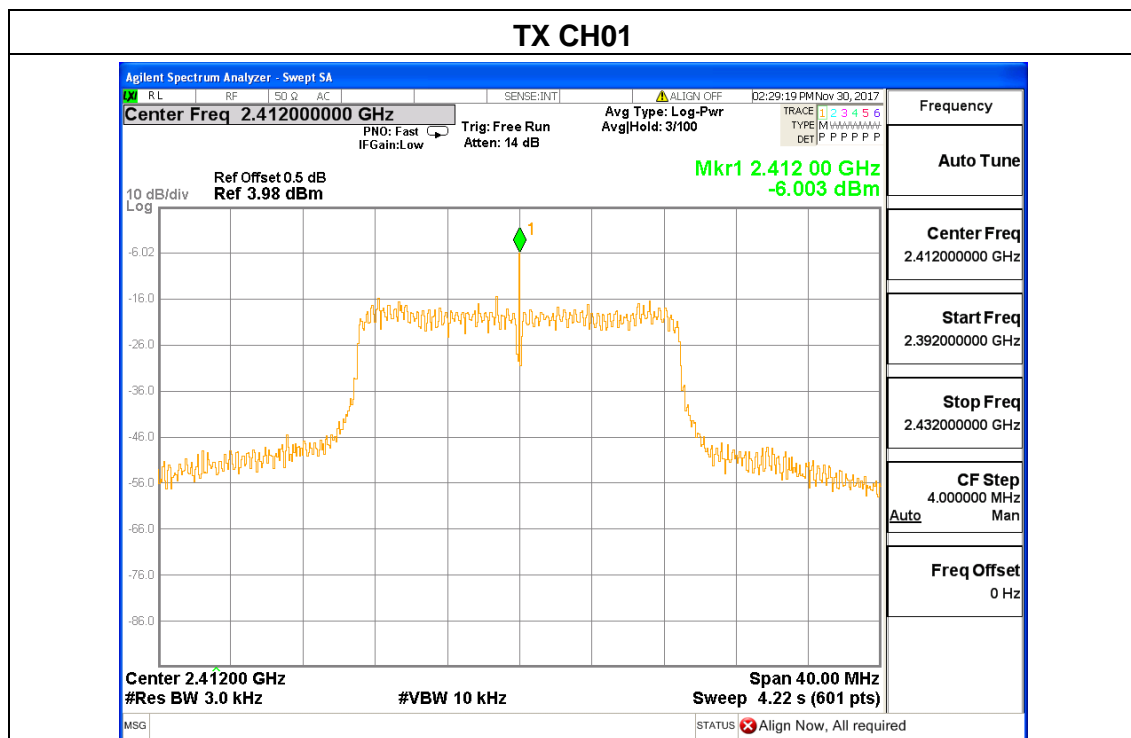
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-6.176	8	PASS
2437 MHz	-3.414	8	PASS
2462 MHz	-3.974	8	PASS

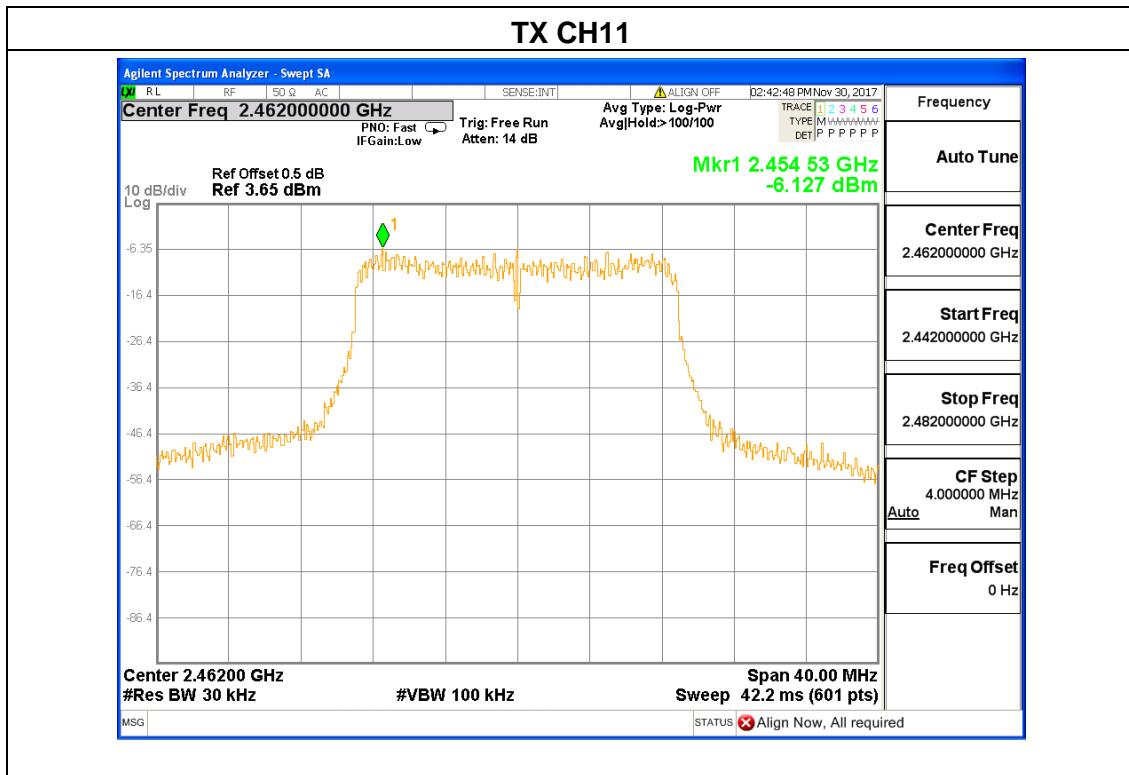
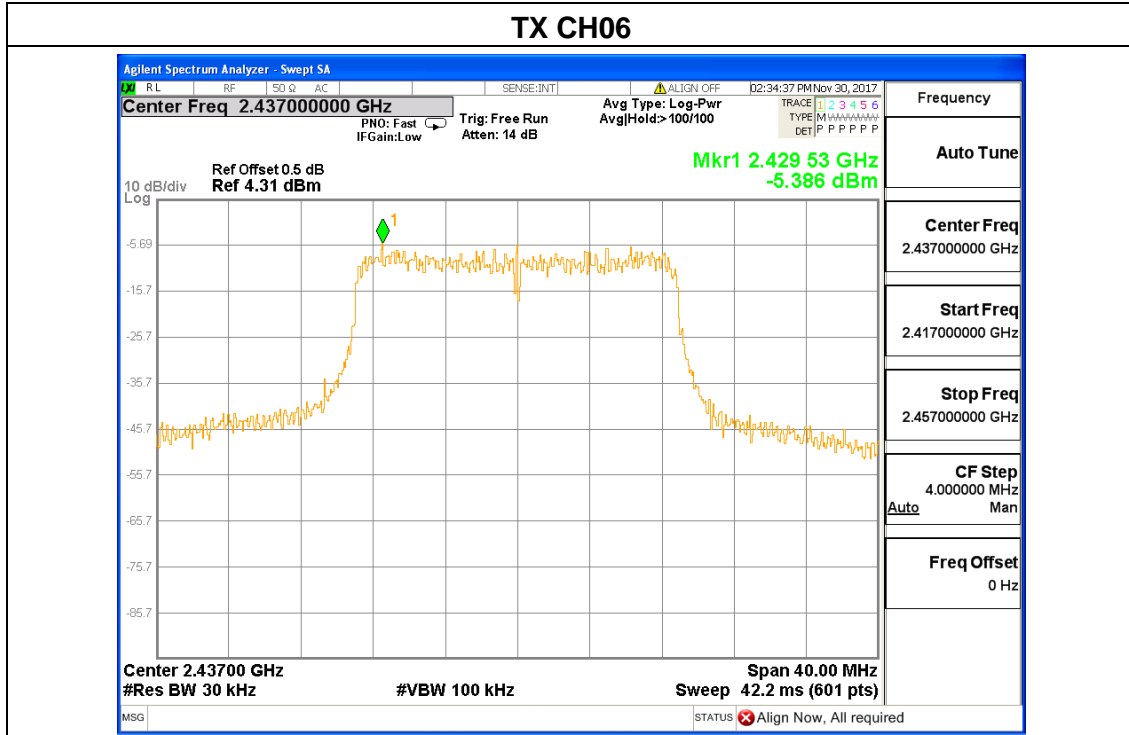




EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX n20 Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-6.003	8	PASS
2437 MHz	-5.386	8	PASS
2462 MHz	-6.127	8	PASS







5. 6DB EMISSION BANDWIDTH & 99% OCCUPIED BANDWIDTH

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.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

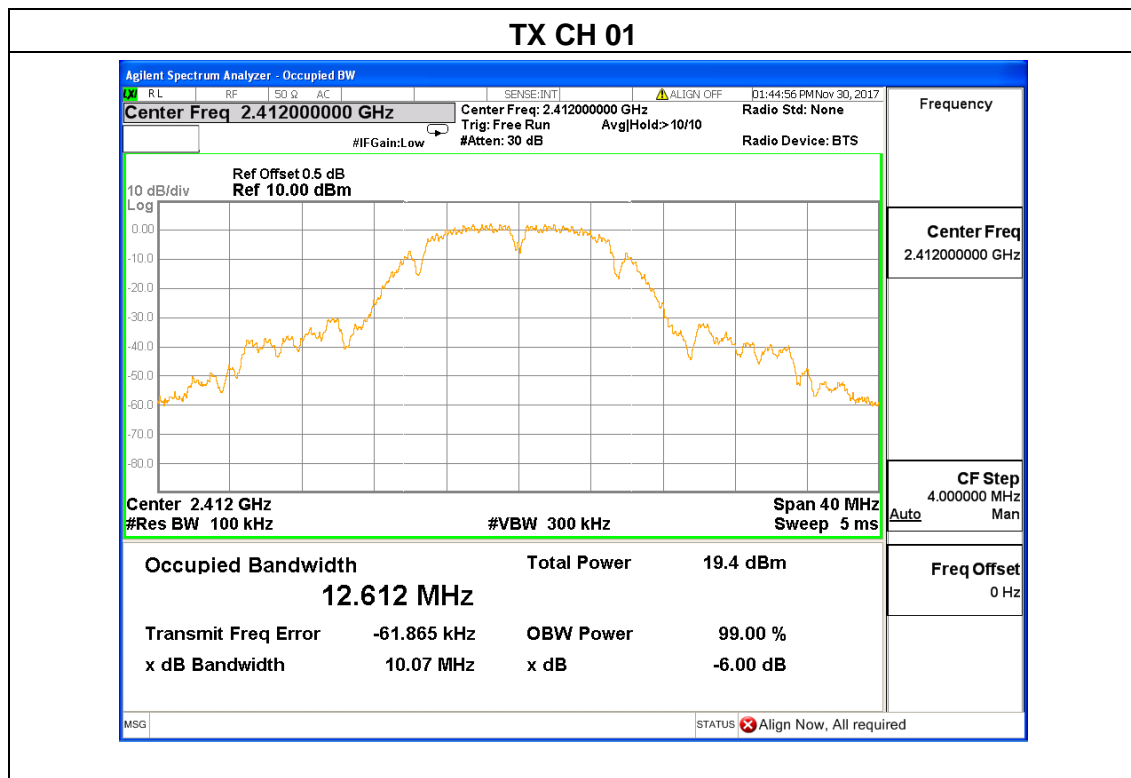
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

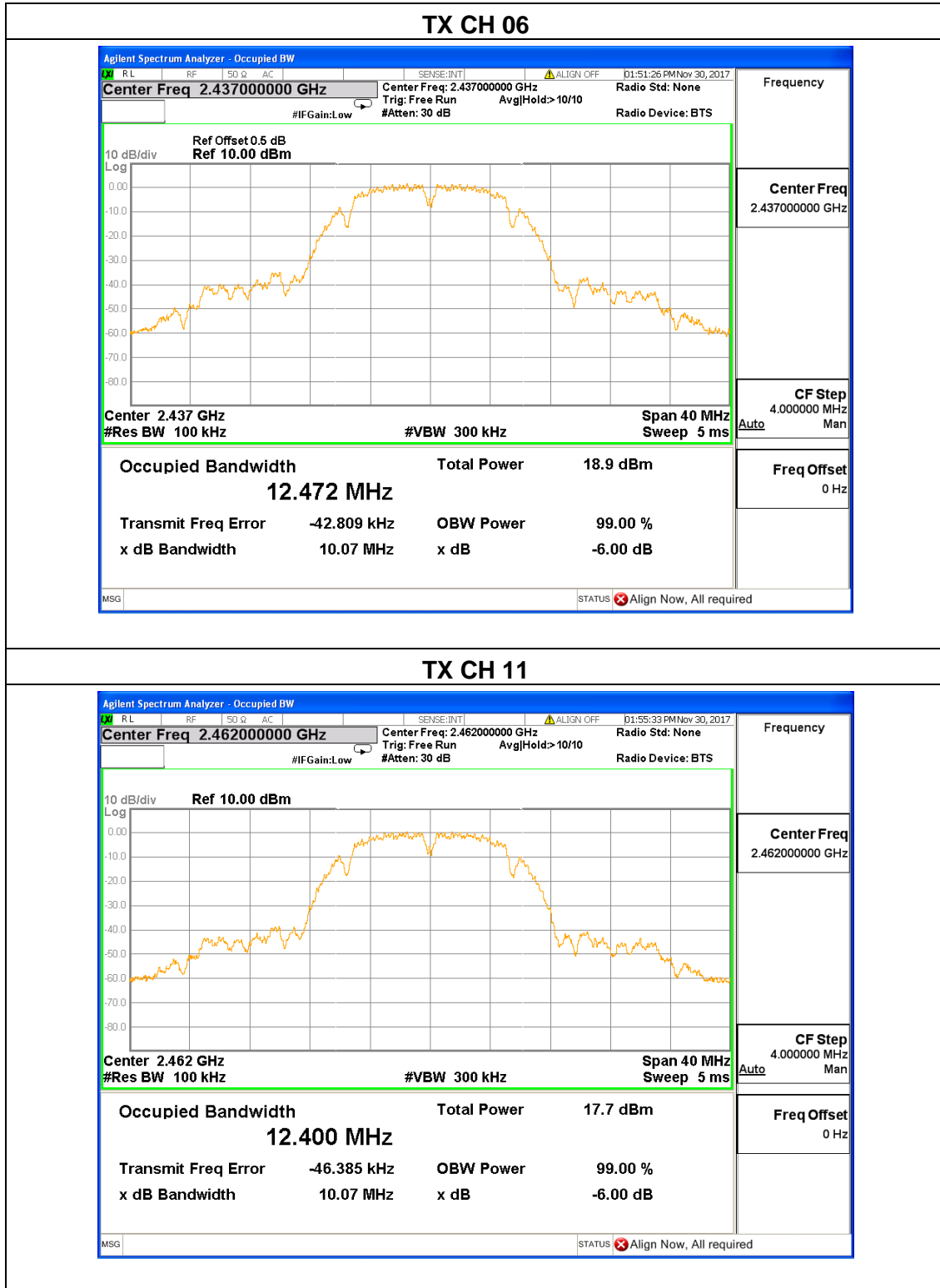


5.1.5 TEST RESULTS

EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.07	/	500	Pass
Middle	2437	10.07	/	500	Pass
High	2462	10.07	/	500	Pass





TX CH 11

Agilent Spectrum Analyzer - Occupied BW
 RL RF 50 Ω AC SENSE:INT ALIGN OFF D1:55:33 PM Nov 30, 2017

Frequency
 Center Freq 2.46200000 GHz

Center Freq 2.46200000 GHz
 #IFGain:Low #Atten: 30 dB Radio Device: BTS

Center Freq: 2.462000000 GHz
 Trig: Free Run Avg|Hold> 10/10

Radio Std: None
 Radio Device: BTS

Ref 10.00 dBm

Center 2.462 GHz
 #Res BW 100 kHz

#VBW 300 kHz

Span 40 MHz
 Sweep 5 ms

Occupied Bandwidth	12.400 MHz	Total Power	17.7 dBm
Transmit Freq Error	-46.385 kHz	OBW Power	99.00 %
x dB Bandwidth	10.07 MHz	x dB	-6.00 dB

MSG

STATUS ✖ Align Now, All required

Frequency
 Center Freq 2.46200000 GHz

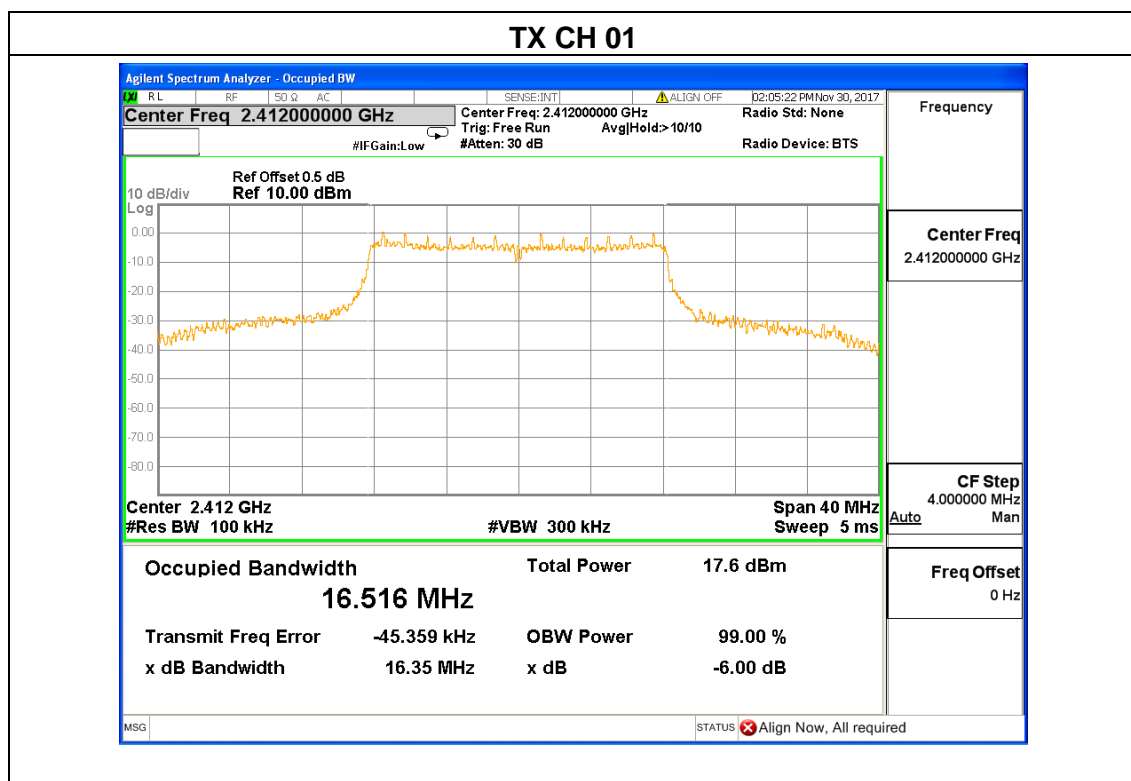
CF Step 4.000000 MHz
 Auto Man

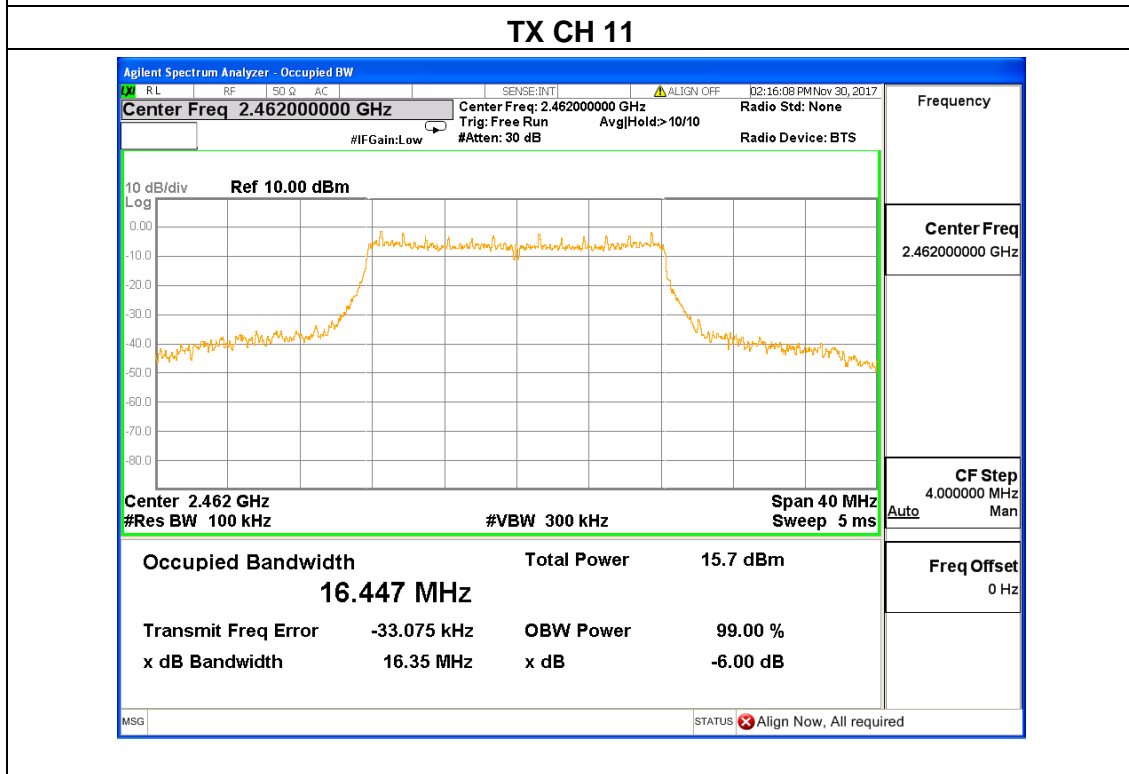
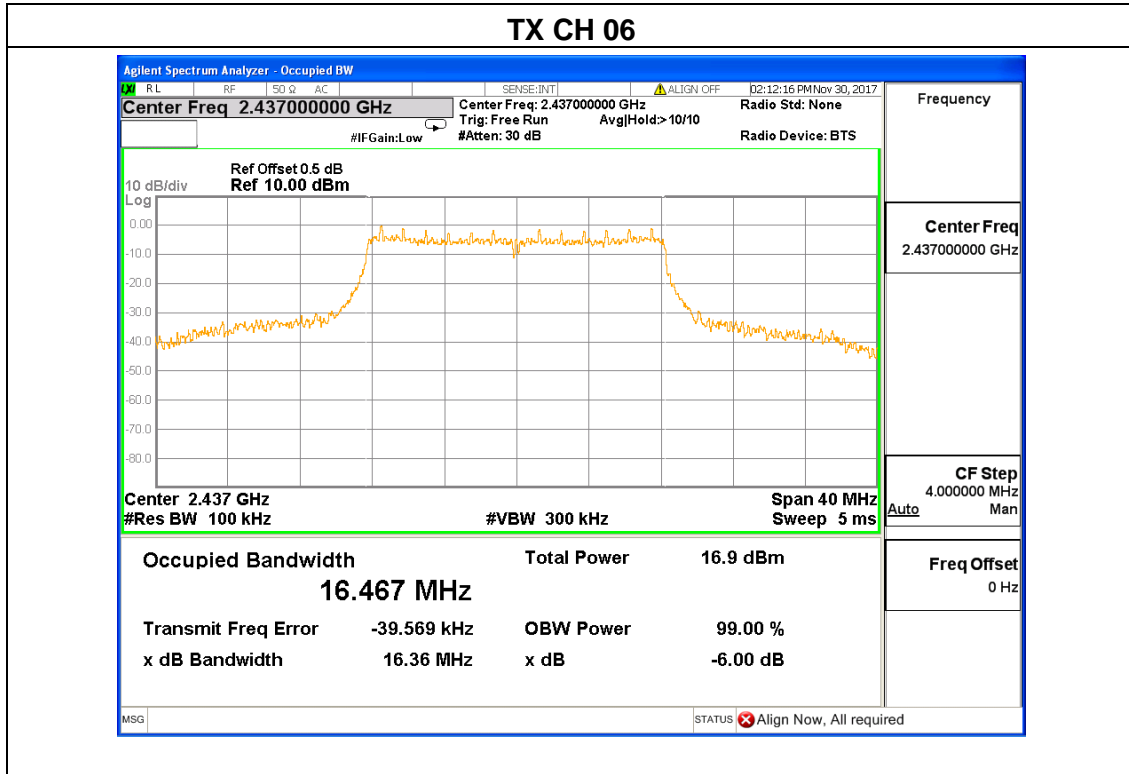
Freq Offset 0 Hz



EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.35	/	500	Pass
Middle	2437	16.36	/	500	Pass
High	2462	16.35	/	500	Pass

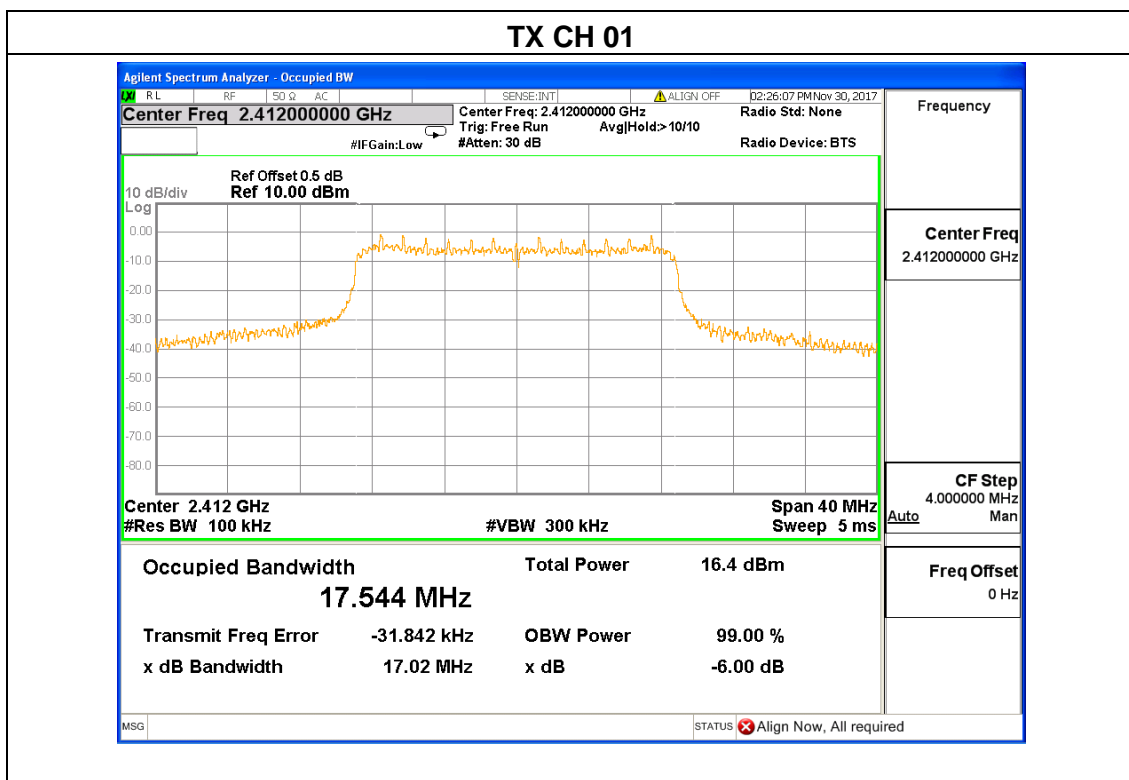


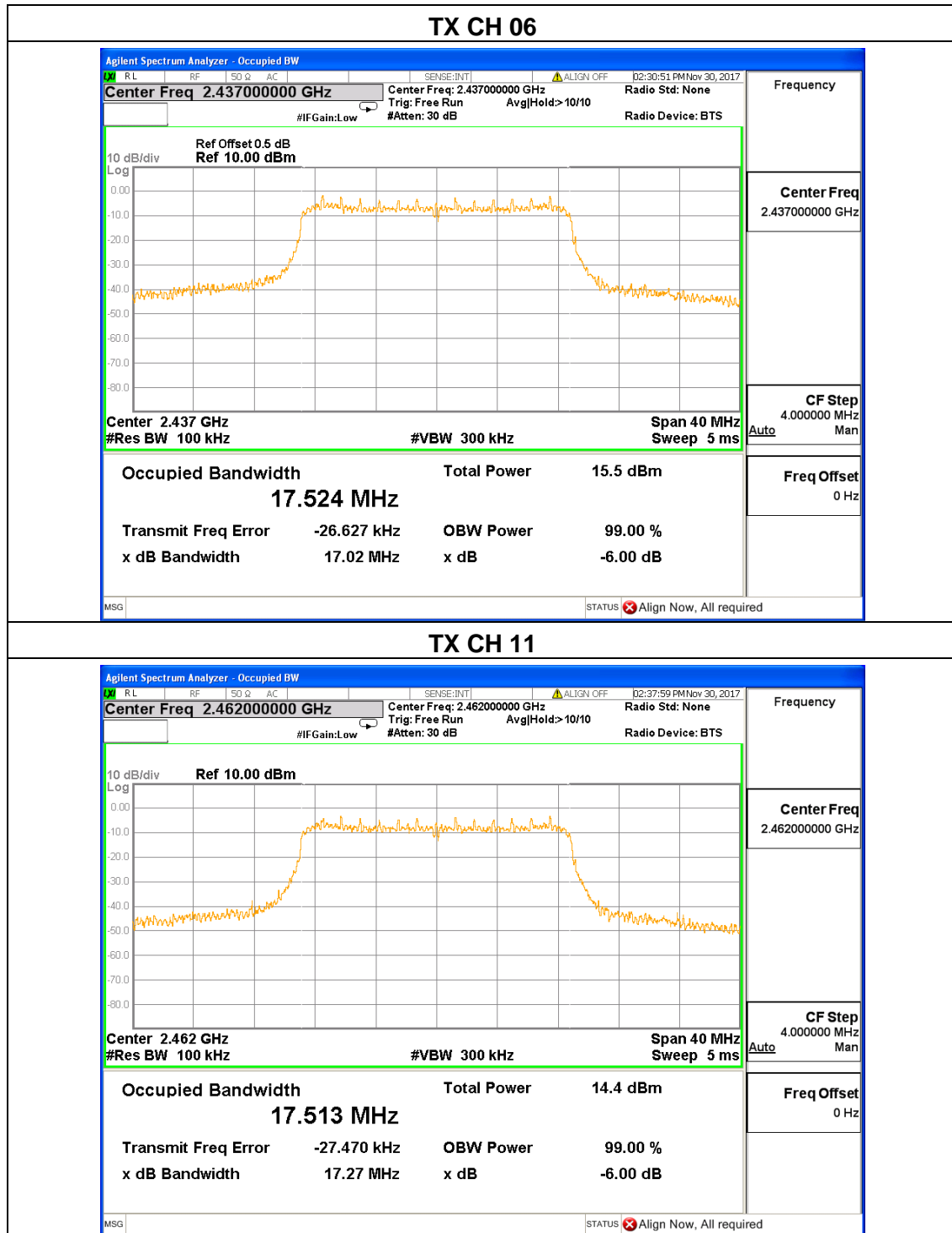




EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX n20 Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.02	/	500	Pass
Middle	2437	17.02	/	500	Pass
High	2462	17.27	/	500	Pass







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 :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter
Test Mode :	TX b/g/n Mode /CH01, CH06, CH11		

TX 802.11b Mode			
Test Channe	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	8.97	30
CH06	2437	8.06	30
CH11	2462	8.24	30
TX 802.11g Mode			
CH01	2412	8.63	30
CH06	2437	8.37	30
CH11	2462	8.06	30
TX 802.11n20 Mode			
CH01	2412	8.91	30
CH06	2437	8.66	30
CH11	2462	8.38	30

||||



7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

7.1 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)).

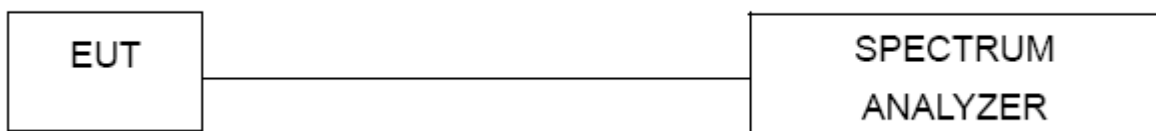
7.2 TEST PROCEDURE

- 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.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP





7.5 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.



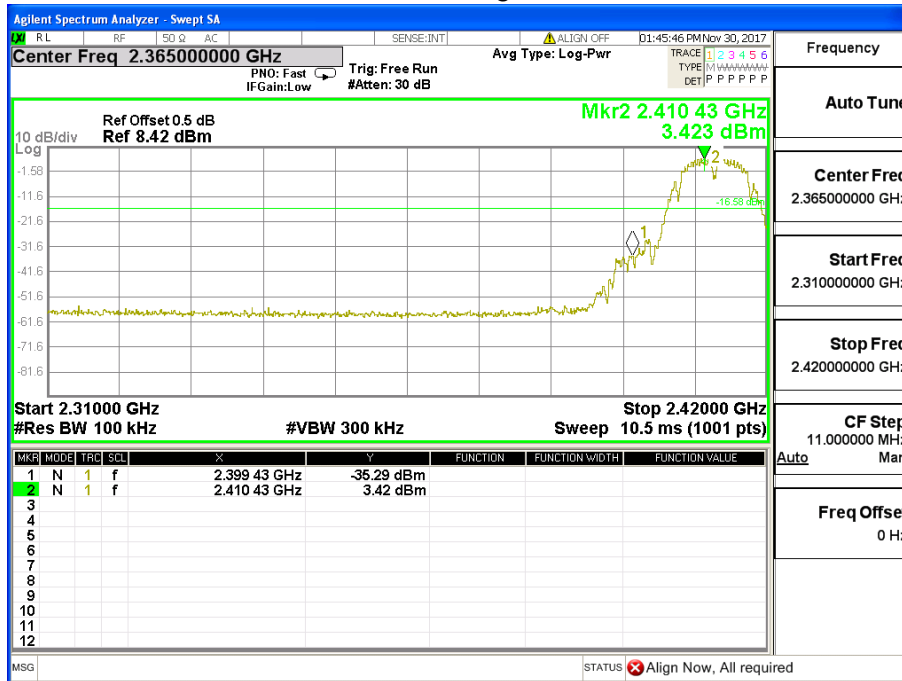
7.6 TEST RESULTS

EUT :	IP Camera	Model Name :	634GBU
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5Vfrom adapter

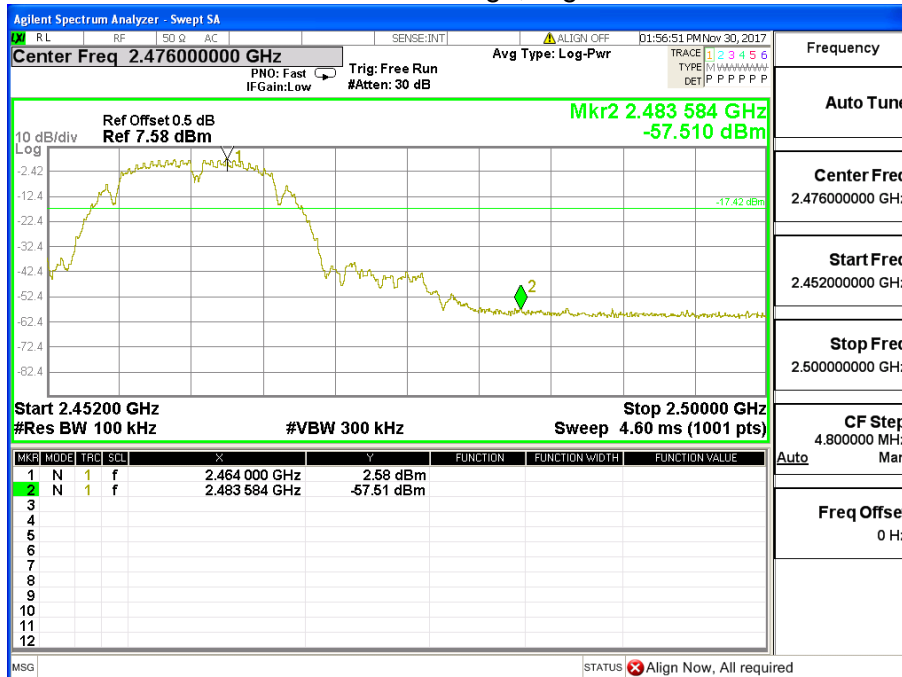
Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
802.11b mode			
Left-band	38.71	20	Pass
Right-band	60.09	20	Pass
802.11g mode			
Left-band	27.73	20	Pass
Right-band	47.03	20	Pass
802.11n20 mode			
Left-band	29.1	20	Pass
Right-band	47.94	20	Pass



802.11b: Band Edge, Left Side

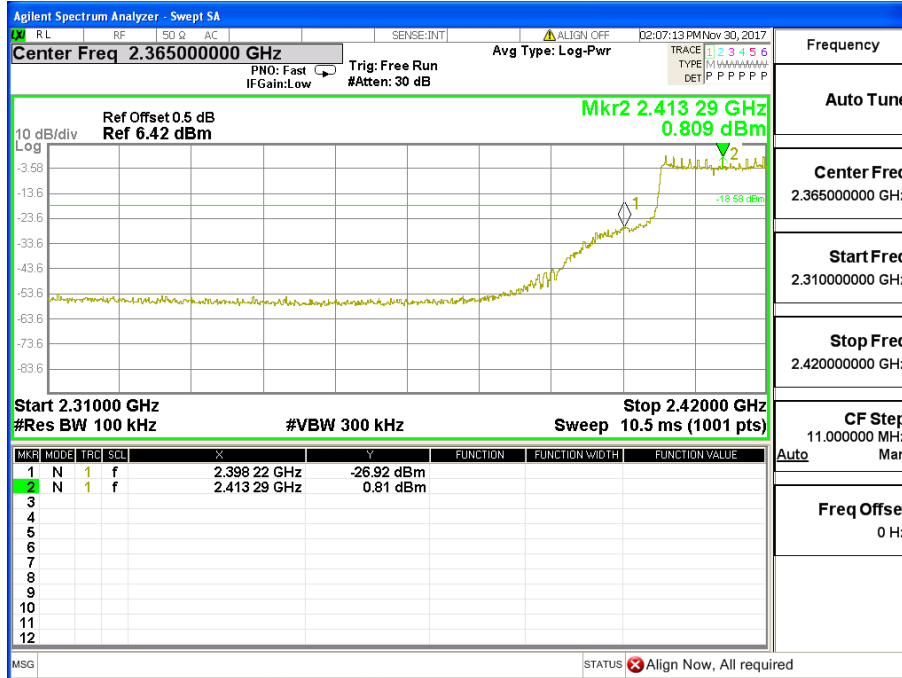


802.11b: Band Edge, Right Side

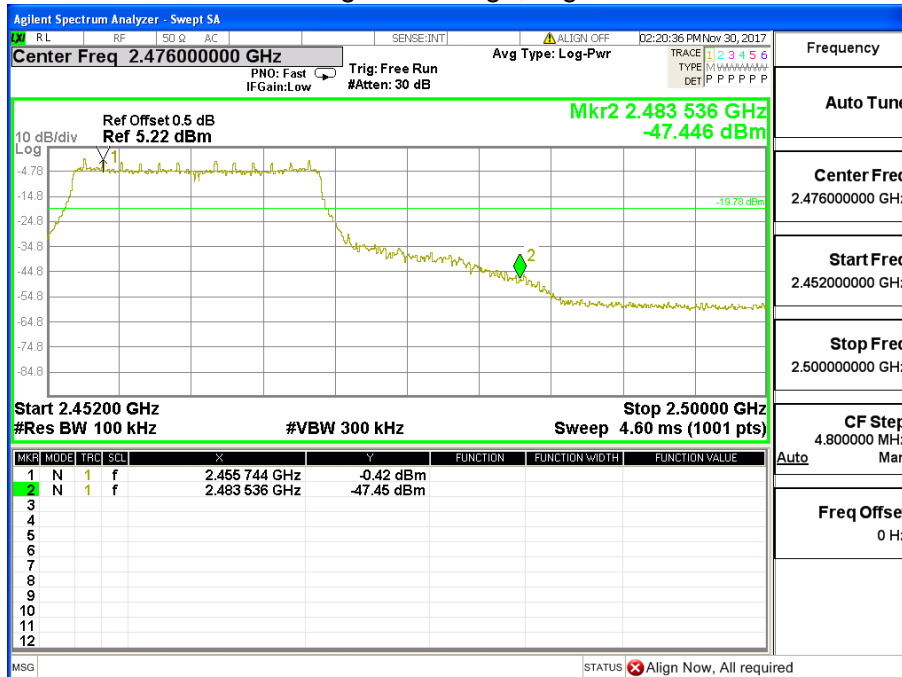




802.11g: Band Edge, Left Side

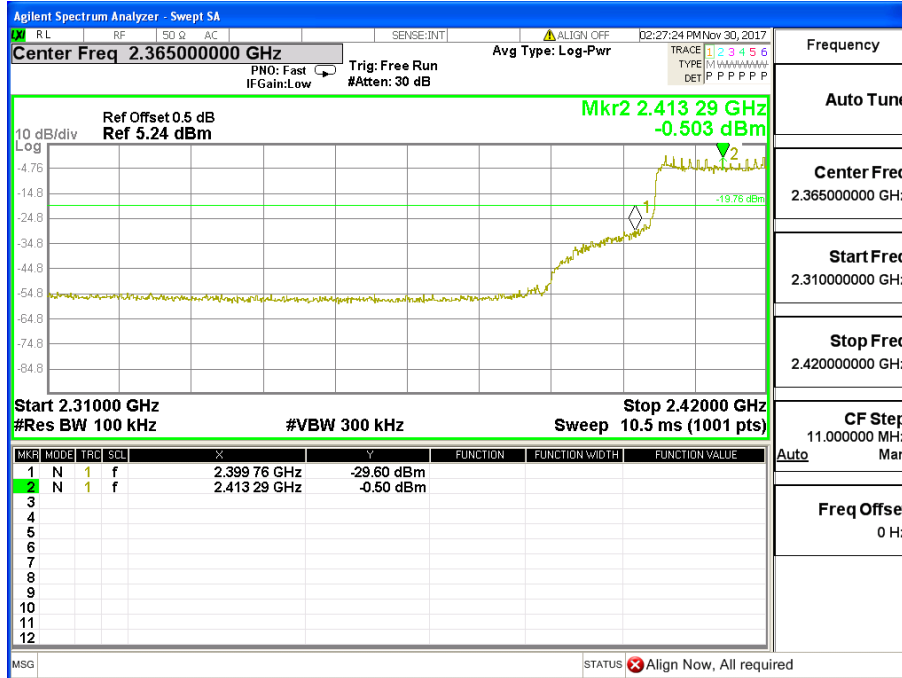


802.11g: Band Edge, Right Side

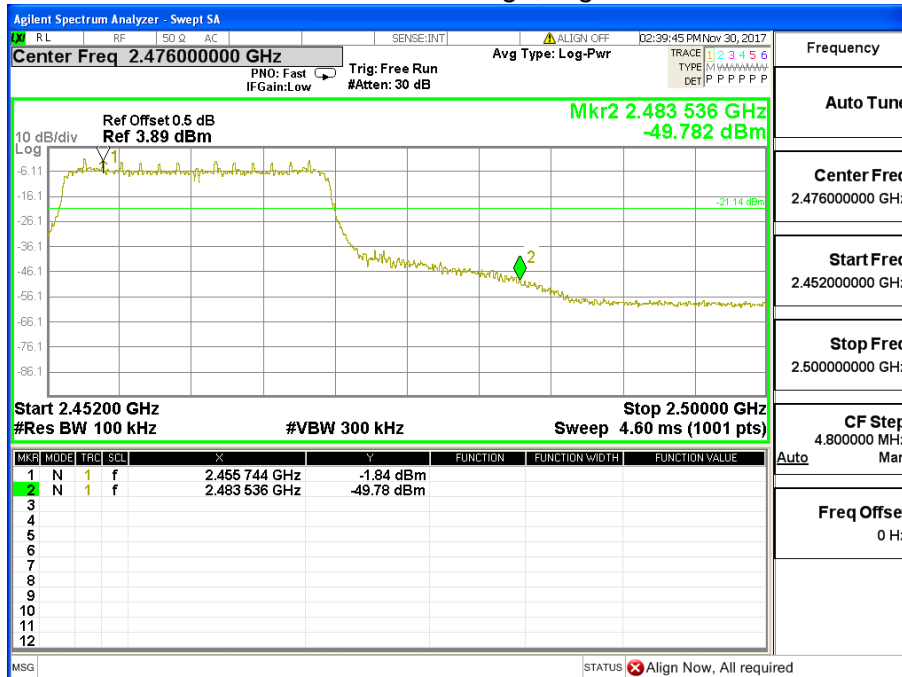




802.11n20: Band Edge, Left Side



802.11n20: Band Edge, Right 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 Chip antenna (Antenna Gain: 3dBi). It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

----END OF REPORT----