FCC RADIO TEST REPORT
FCC ID: 2AJ3I-V1

Product： Vispect ADAS V1

Trade Name： vispect

Model Name： V1

Serial Model： N/A

Report No.： STUEMO016101306342RF2

Prepared for

Guangzhou Vispect Intelligent Technology Co., Ltd

RM507-508, NO.242, TIANHE EAST ROAD, TIANHE DISTRICT,
GUANGZHOU, CHINA

Prepared by

BZT Testing Technology Co., Ltd.

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TEST RESULT CERTIFICATION

Applicant's name ..... : Guangzhou Vispect Intelligent Technology Co., Ltd

Address ..... : RM507-508, NO.242, TIANHE EAST ROAD, TIANHE DISTRICT, GUANGZHOU, CHINA

Manufacture's Name..... : Guangzhou Vispect Intelligent Technology Co., Ltd

Address ..... : RM507-508, NO.242, TIANHE EAST ROAD, TIANHE DISTRICT, GUANGZHOU, CHINA

Product description

Product name ..... : Vispect ADAS V1

Model and/or type reference : V1

Serial Model..... : N/A

Standards ..... : FCC Part 15.247

Test procedure..... ANSI C63.10-2013

This device described above has been tested by BZT, 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 .....: 1 Dec. 2016 ~12 Dec. 2016

Date of Issue.....: 12 Dec. 2016

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

Testing Engineer : Jerry Lin

(Jerry Lin)

Technical Manager : Jimmy Yao

(Jimmy Yao)

Authorized Signatory : Terry Yang

(Terry Yang)

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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

BZT Testing Technology Co., Ltd.
Add. : Buliding 17, Xinghua Road Xingwei industrial Park Fuyong, Baoan District, Shenzhen, Guangdong, China
FCC Registered No.: 701733

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Vispect ADAS V1
Trade Name	vispect
Model Name	V1
Serial Model	N/A
Product Description	The EUT is a Vispect ADAS V1
	Operation Frequency: 802.11b/g/n20MHz:2412~2462 MHz
	Modulation Type: CCK/OFDM/DBPSK/DAPSK
	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): 78/52/6.5Mbps
	Number Of Channel 802.11b/g/n20MHz:11CH
	Antenna Designation: Please see Note 3.
	Output Power(Conducted): 802.11b: 14.31 dBm (Max.)
	Antenna Gain (dBi) 1.1dbi
Channel List	Please refer to the Note 2.
Adapter	Input: 100-240V~50/60Hz, 0.35A Output: 12V, 2000mA
Power	DC 7V-16V
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 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	Integrated antenna	N/A	1.1	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	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	Link Mode

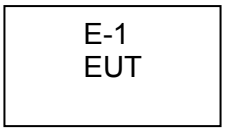
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n CH1/ CH6/ CH11
Mode 4	Link Mode

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



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	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Vispect ADAS V1	vispect	V1	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.9M	

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	2016.07.06	2017.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2016.06.07	2017.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2015.07.06	2017.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2016.06.07	2017.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2016.06.07	2017.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2016.07.06	2017.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2016.07.06	2017.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2015.12.22	2016.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2016.06.08	2017.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2016.07.06	2017.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2016.07.06	2017.07.05	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	2016.06.06	2017.06.05	1 year
2	LISN	R&S	ENV216	101313	2016.08.24	2017.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2016.08.24	2017.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2016.06.07	2017.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2016.06.07	2017.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2016.06.08	2017.06.07	1 year

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

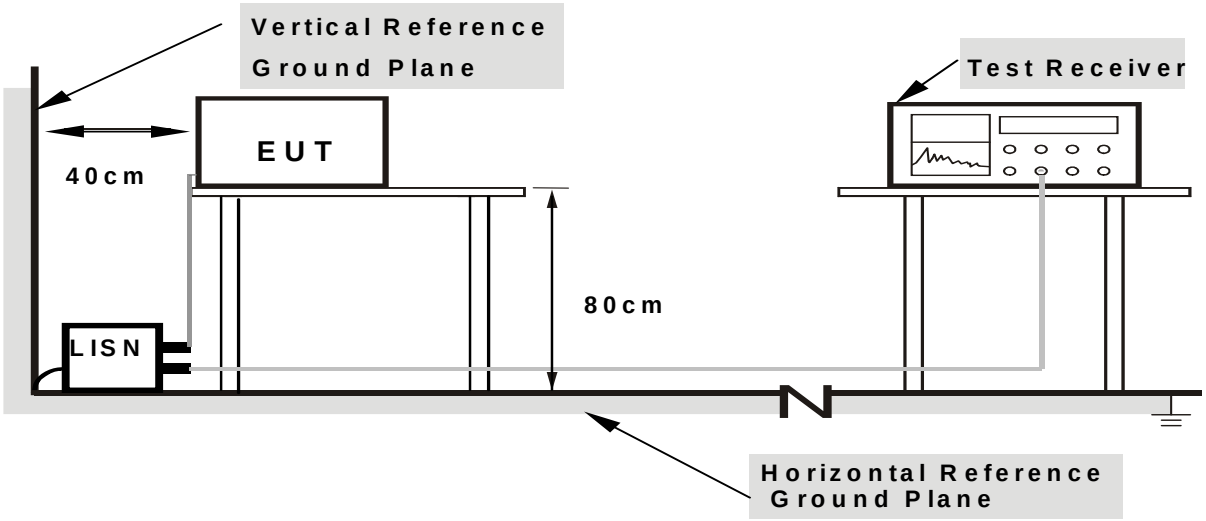
3.1.2 TEST PROCEDURE

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.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



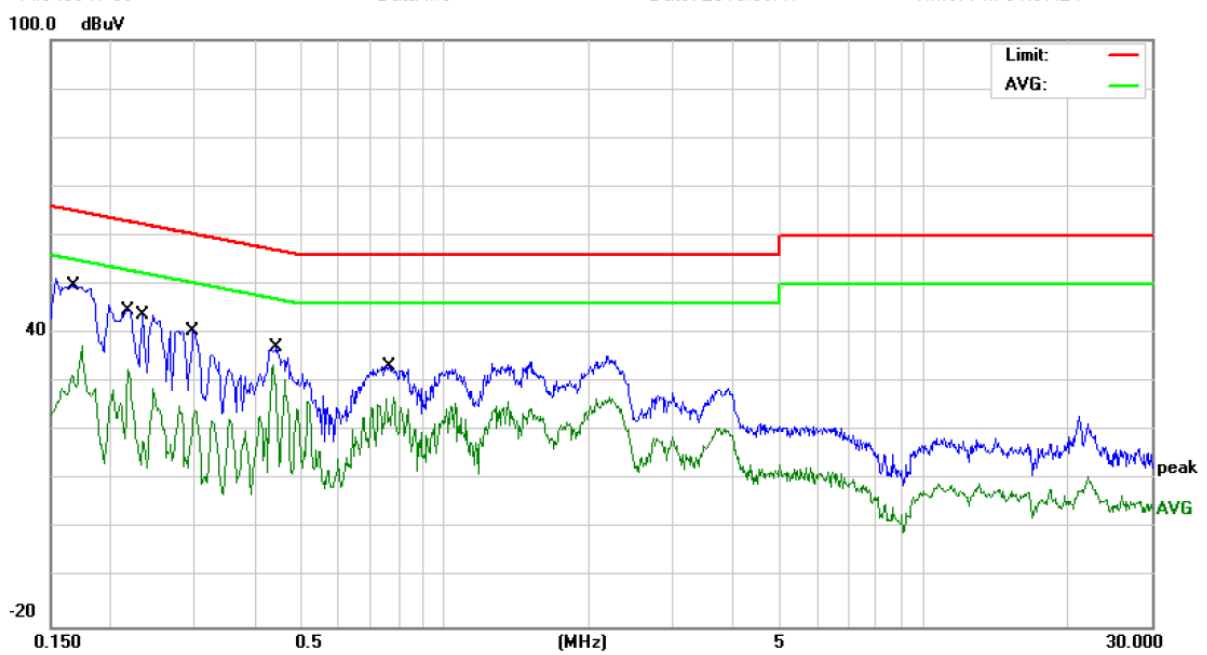
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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：	Vispect ADAS V1	Model Name. ：	V1
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC120V/60Hz	Test Mode：	Mode 4



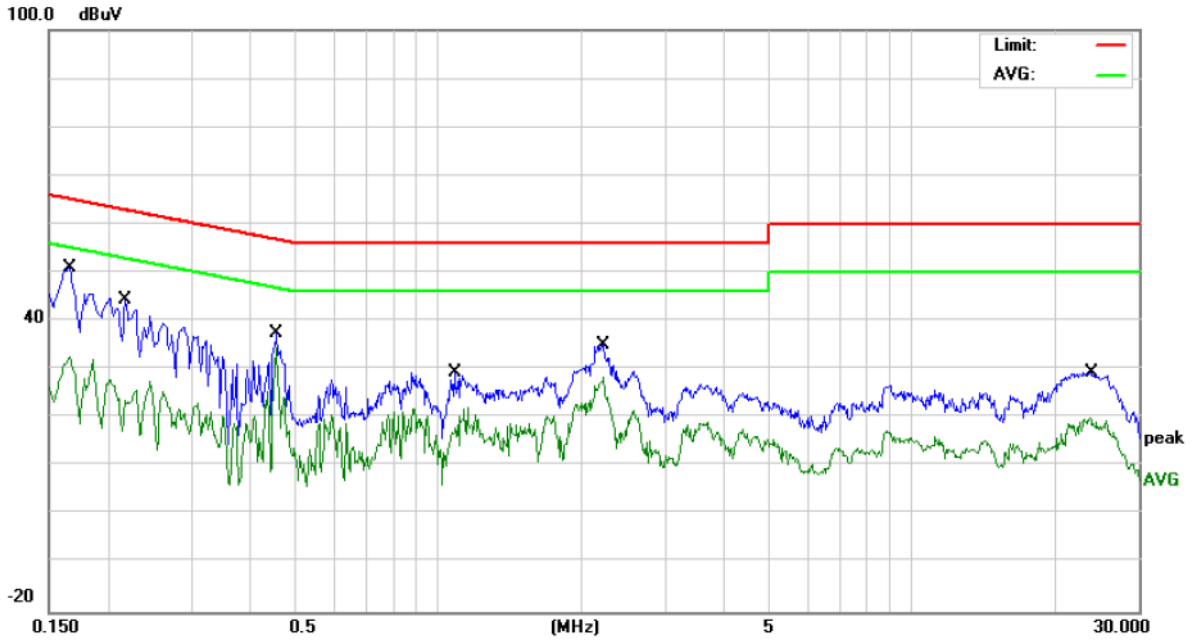
Site
Limit: FCC Part 15B_(0.15-30MHz) _Main_QP

Phase: *L1*
Power: AC 120V/60Hz

Temperature: 22
Humidity: 51 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1665	49.78	0.00	49.78	65.13	-15.35	QP	
2		0.1665	37.42	0.00	37.42	55.13	-17.71	AVG	
3		0.2179	44.75	0.00	44.75	62.89	-18.14	QP	
4		0.2179	32.59	0.00	32.59	52.89	-20.30	AVG	
5		0.2340	43.83	0.00	43.83	62.30	-18.47	QP	
6		0.2340	28.87	0.00	28.87	52.30	-23.43	AVG	
7		0.2977	40.30	0.00	40.30	60.30	-20.00	QP	
8		0.2977	25.09	0.00	25.09	50.30	-25.21	AVG	
9		0.4460	37.13	0.00	37.13	56.95	-19.82	QP	
10	*	0.4460	33.62	0.00	33.62	46.95	-13.33	AVG	
11		0.7660	33.39	0.00	33.39	56.00	-22.61	QP	
12		0.7660	26.85	0.00	26.85	46.00	-19.15	AVG	

EUT：	Vispect ADAS V1	Model Name. ：	V1
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	AC 120V	Test Mode：	Mode 4



Site Phase: N Temperature: 22
Limit: FCC Part 15B_(0.15-30MHz) _Main_QP Power: AC 120V/60Hz Humidity: 51 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1660	50.89	0.00	50.89	65.15	-14.26	QP	
2		0.1660	32.58	0.00	32.58	55.15	-22.57	AVG	
3		0.2179	44.47	0.00	44.47	62.89	-18.42	QP	
4		0.2179	27.83	0.00	27.83	52.89	-25.06	AVG	
5		0.4540	37.48	0.00	37.48	56.80	-19.32	QP	
6	*	0.4540	34.52	0.00	34.52	46.80	-12.28	AVG	
7		1.0820	29.38	0.00	29.38	56.00	-26.62	QP	
8		1.0820	22.13	0.00	22.13	46.00	-23.87	AVG	
9		2.2179	35.17	0.00	35.17	56.00	-20.83	QP	
10		2.2179	28.36	0.00	28.36	46.00	-17.64	AVG	
11		23.8140	29.36	0.00	29.36	60.00	-30.64	QP	
12		23.8140	20.03	0.00	20.03	50.00	-29.97	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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	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:

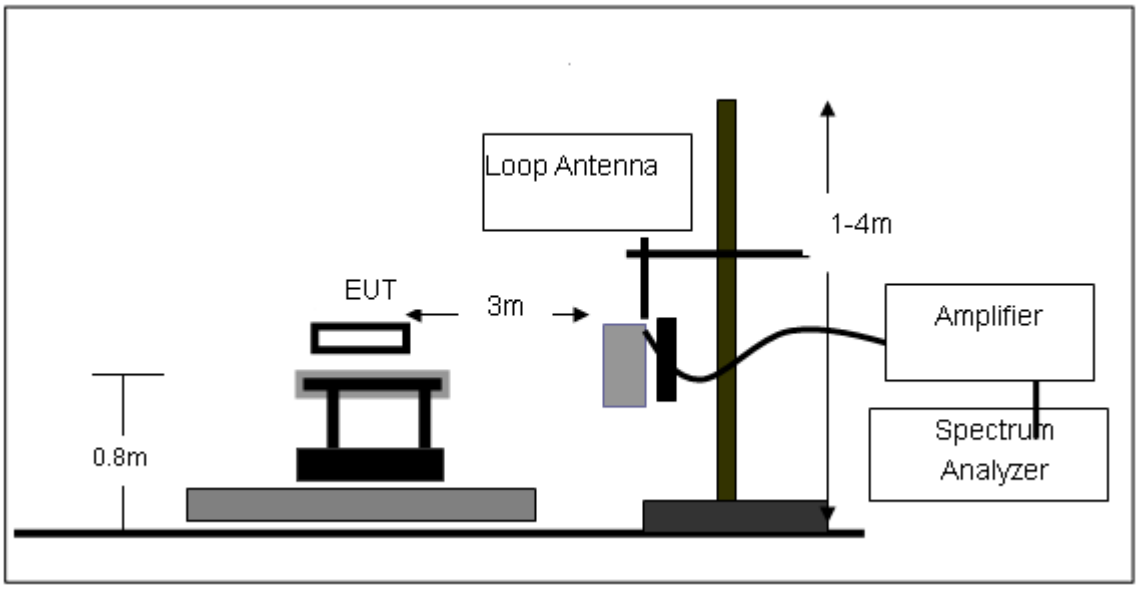
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

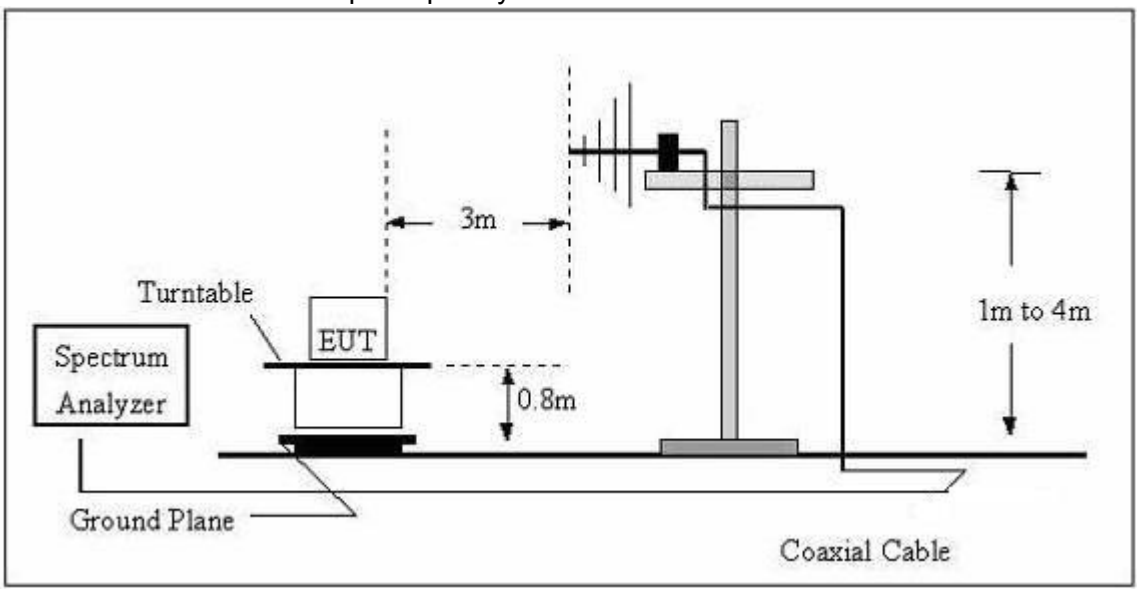
No deviation

3.2.4 TEST SETUP

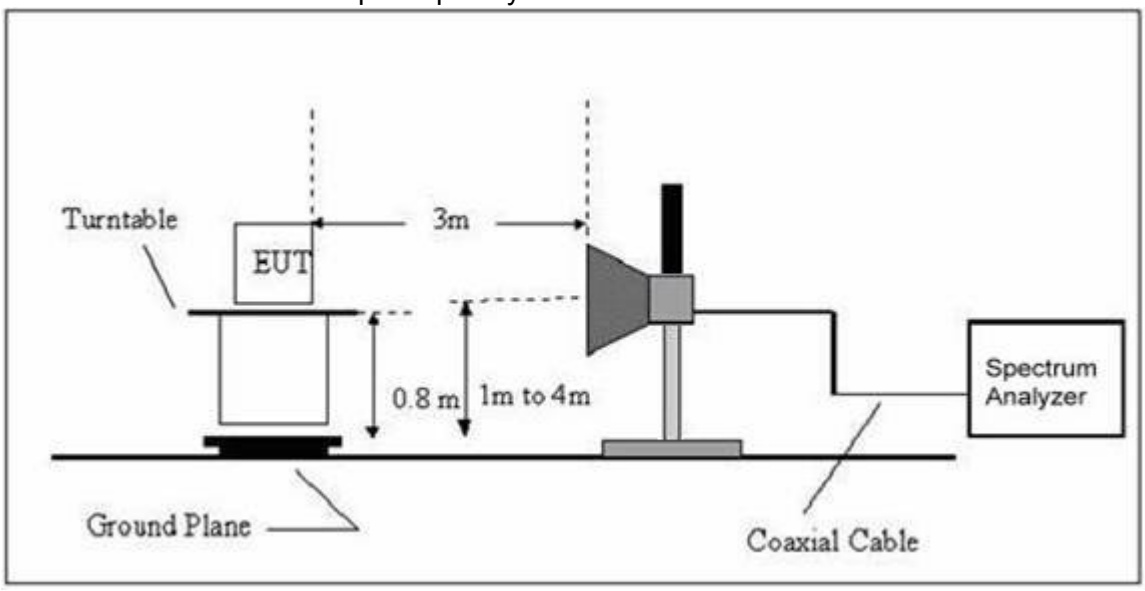
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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：	Vispect ADAS V1	Model Name. ：	V1
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX	Polarization :	--

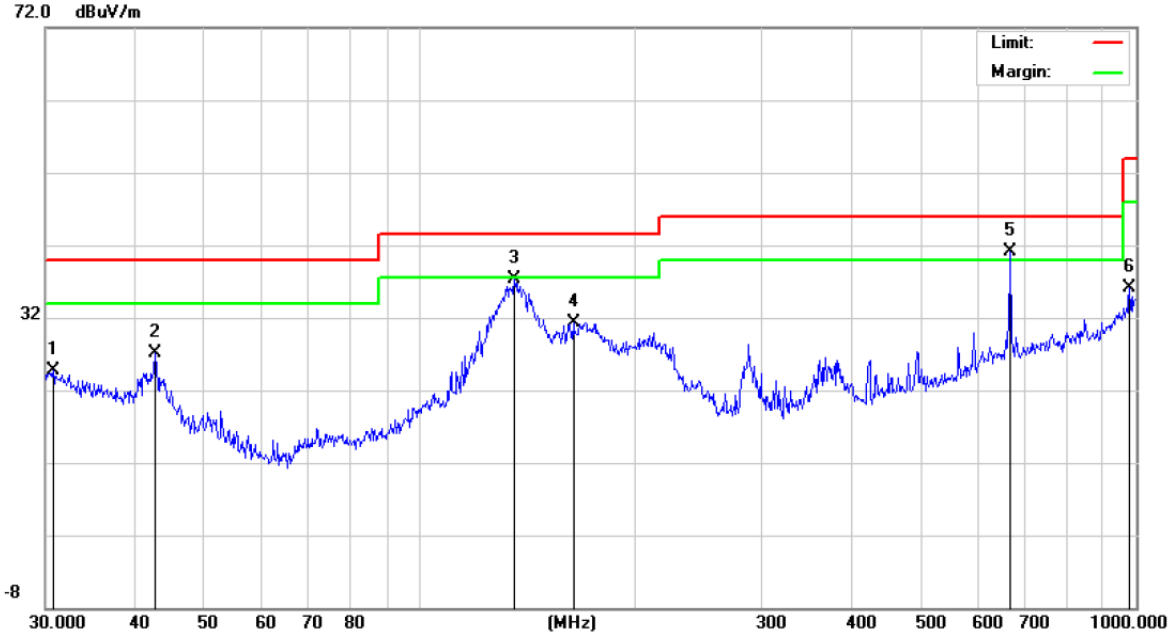
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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 (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC12.0V
Test Mode ：Mode 4			



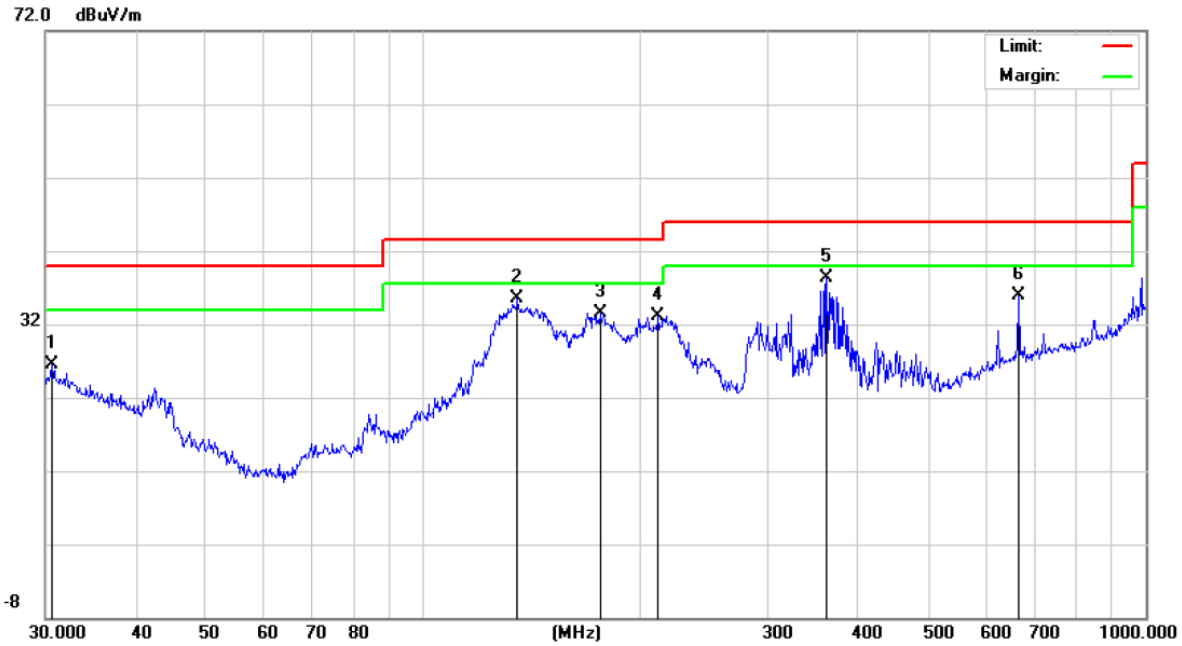
Site
Limit: FCC_PART15_B_03m_QP

Polarization: *Vertical*
Power: AC 120V/60Hz

Temperature: 24
Humidity: 50 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		33.5623	14.13	17.82	31.95	40.00	-8.05	QP
2	*	44.2751	19.85	12.38	32.23	40.00	-7.77	QP
3		60.9176	25.76	6.01	31.77	40.00	-8.23	QP
4		77.8653	19.23	9.52	28.75	40.00	-11.25	QP
5		105.2716	19.63	10.29	29.92	43.50	-13.58	QP
6		246.8147	23.26	10.71	33.97	46.00	-12.03	QP

EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC12.0V
Test Mode ：Mode 4			



Site
Limit: FCC_PART15_B_03m_QP
Polarization: *Horizontal*
Power: AC 120V/60Hz
Temperature: 24
Humidity: 50 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		32.1794	6.35	18.73	25.08	40.00	-14.92	QP
2		84.1099	15.26	9.14	24.40	40.00	-15.60	QP
3		103.8054	13.85	10.28	24.13	43.50	-19.37	QP
4		176.8877	11.92	12.16	24.08	43.50	-19.42	QP
5		247.6819	19.14	10.74	29.88	46.00	-16.12	QP
6	*	938.8325	10.00	26.00	36.00	46.00	-10.00	QP

3.2.8 TEST RESULTS (1G-25GHZ)

EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC12.0V

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	Comment
Low Channel (2412 MHz)-Above 1G							
4824.40	52.69	10.44	63.13	74.00	-10.87	Pk	Vertical
4824.40	36.66	10.44	47.10	54.00	-6.90	AV	Vertical
7236.28	49.32	12.39	61.71	74.00	-12.29	Pk	Vertical
7236.28	33.01	12.39	45.40	54.00	-8.60	AV	Vertical
4824.55	52.78	10.44	63.22	74.00	-10.78	Pk	Horizontal
4824.55	33.06	10.44	43.50	54.00	-10.50	AV	Horizontal
7236.30	48.81	12.39	61.20	74.00	-12.80	Pk	Horizontal
7236.30	30.68	12.39	43.07	54.00	-10.93	AV	Horizontal
Mid Channel (2437 MHz)-Above 1G							
4874.40	54.06	10.40	64.46	74.00	-9.54	Pk	Vertical
4874.40	32.84	10.40	43.24	54.00	-10.76	AV	Vertical
7311.39	49.79	12.75	62.54	74.00	-11.46	Pk	Vertical
7311.39	34.00	12.75	46.75	54.00	-7.25	AV	Vertical
4874.38	52.58	10.40	62.98	74.00	-11.02	Pk	Horizontal
4874.38	34.33	10.40	44.73	54.00	-9.27	AV	Horizontal
7311.29	47.79	12.75	60.54	74.00	-13.46	Pk	Horizontal
7311.29	32.49	12.75	45.24	54.00	-8.76	AV	Horizontal
High Channel (2462 MHz)- Above 1G							
4924.41	52.53	10.39	62.92	74.00	-11.08	Pk	Vertical
4924.41	34.01	10.39	44.40	54.00	-9.60	AV	Vertical
7386.31	47.86	12.68	60.54	74.00	-13.46	Pk	Vertical
7386.31	31.89	12.68	44.57	54.00	-9.43	AV	Vertical
4924.83	53.83	10.39	64.22	74.00	-9.78	Pk	Horizontal
4924.83	32.62	10.39	43.01	54.00	-10.99	AV	Horizontal
7386.51	50.46	12.68	63.14	74.00	-10.86	Pk	Horizontal
7386.51	32.79	12.68	45.47	54.00	-8.53	AV	Horizontal

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3)All other emissions more than 20dB below the limit.

EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC12.0V

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b							
2348.11	61.72	-13.06	48.66	74	-25.34	Pk	Vertical
2348.11	55.86	-13.06	42.8	54	-11.2	AV	Vertical
2400	64.53	-13.06	51.47	74	-22.53	Pk	Vertical
2400	56.26	-13.06	43.2	54	-10.8	AV	Vertical
2390	61.61	-13.06	48.55	74	-25.45	Pk	Horizontal
2390	55.8	-13.06	42.74	54	-11.26	AV	Horizontal
2400	64.82	-13.06	51.76	74	-22.24	Pk	Horizontal
2400	55.88	-13.06	42.82	54	-11.18	AV	Horizontal
2483.5	63.36	-12.78	50.58	74	-23.42	Pk	Vertical
2483.5	62.28	-12.78	49.5	54	-4.5	AV	Vertical
2483.5	61.72	-13.06	48.66	74	-25.34	Pk	Horizontal
2483.5	55.86	-13.06	42.8	54	-11.2	AV	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11g							
2368.83	61.56	-13.06	48.5	74	-25.5	Pk	Vertical
2368.83	55.7	-13.06	42.64	54	-11.36	AV	Vertical
2400	64.37	-13.06	51.31	74	-22.69	Pk	Vertical
2400	56.1	-13.06	43.04	54	-10.96	AV	Vertical
2360.24	61.45	-13.06	48.39	74	-25.61	Pk	Horizontal
2360.24	55.64	-13.06	42.58	54	-11.42	AV	Horizontal
2400	64.66	-13.06	51.6	74	-22.4	Pk	Horizontal
2400	55.72	-13.06	42.66	54	-11.34	AV	Horizontal
2483.5	63.2	-12.78	50.42	74	-23.58	Pk	Vertical
2483.5	62.12	-12.78	49.34	54	-4.66	AV	Vertical
2483.5	63.13	-12.78	50.35	74	-23.65	Pk	Horizontal
2483.5	62.02	-12.78	49.24	54	-4.76	AV	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11n(20)							
2381.21	62.03	-13.06	48.97	74	-25.03	Pk	Vertical
2381.21	55.24	-13.06	42.18	54	-11.82	AV	Vertical
2400	64.91	-13.06	51.85	74	-22.15	Pk	Vertical
2400	54.99	-13.06	41.93	54	-12.07	AV	Vertical
2362.45	61.92	-13.06	48.86	74	-25.14	Pk	Horizontal
2362.45	55.05	-13.06	41.99	54	-12.01	AV	Horizontal
2400	64.83	-13.06	51.77	74	-22.23	Pk	Horizontal
2400	55.93	-13.06	42.87	54	-11.13	AV	Horizontal
2483.5	63.22	-12.78	50.44	74	-23.56	Pk	Vertical
2483.5	62.23	-12.78	49.45	54	-4.55	AV	Vertical
2483.5	63	-12.78	50.22	74	-23.78	Pk	Horizontal
2483.5	62.09	-12.78	49.31	54	-4.69	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.

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

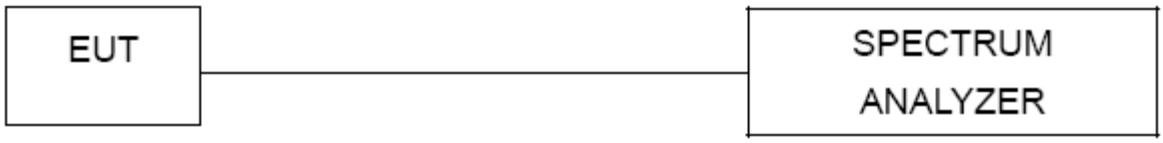
4.1.1 TEST PROCEDURE

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 ≥ 3 kHz.
4. Set the VBW ≥ 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

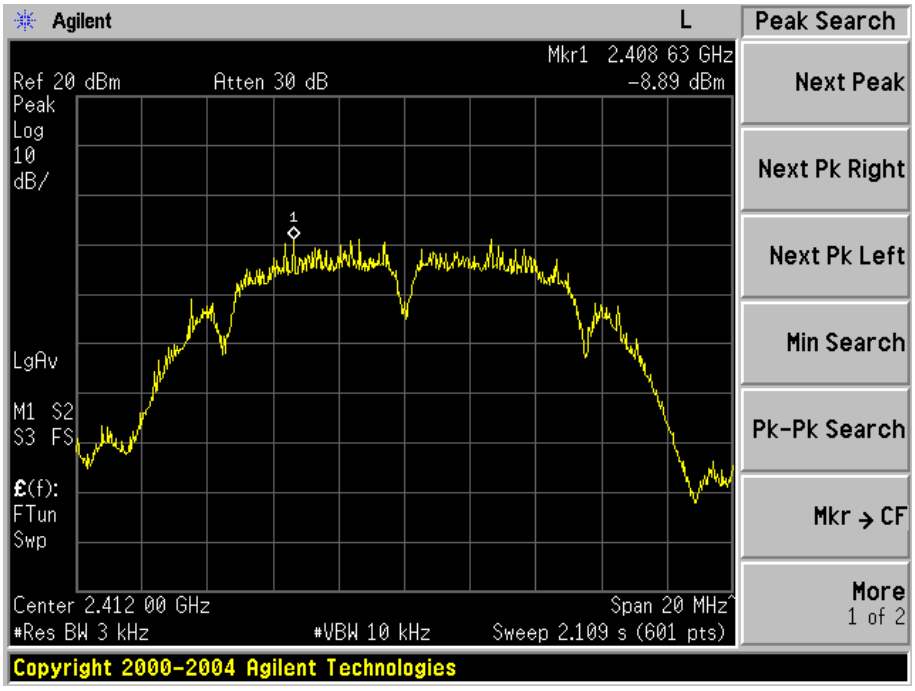
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

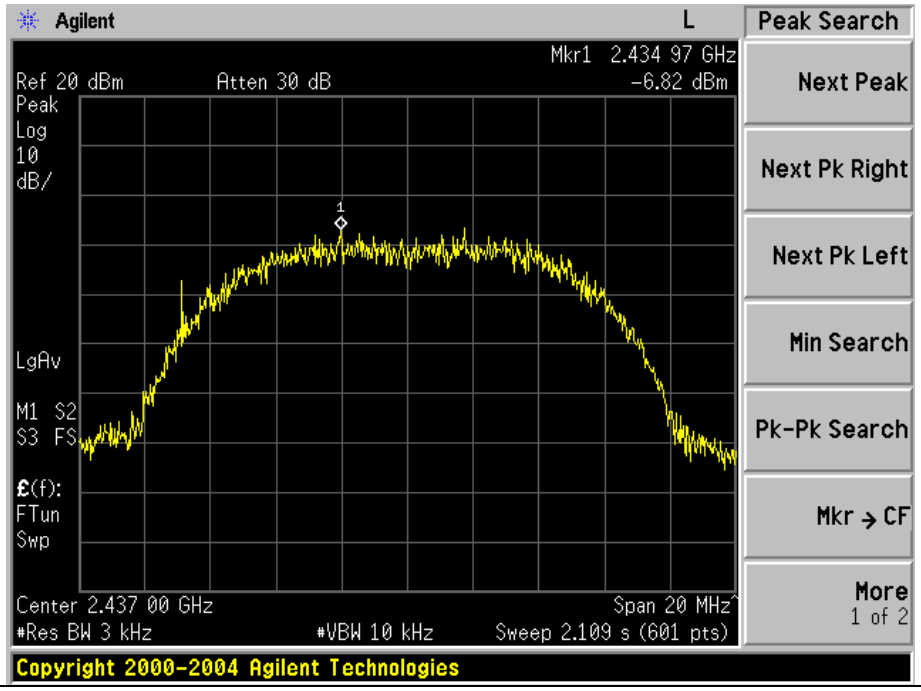
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-8.89	8	PASS
2437 MHz	-6.82	8	PASS
2462 MHz	-7.96	8	PASS

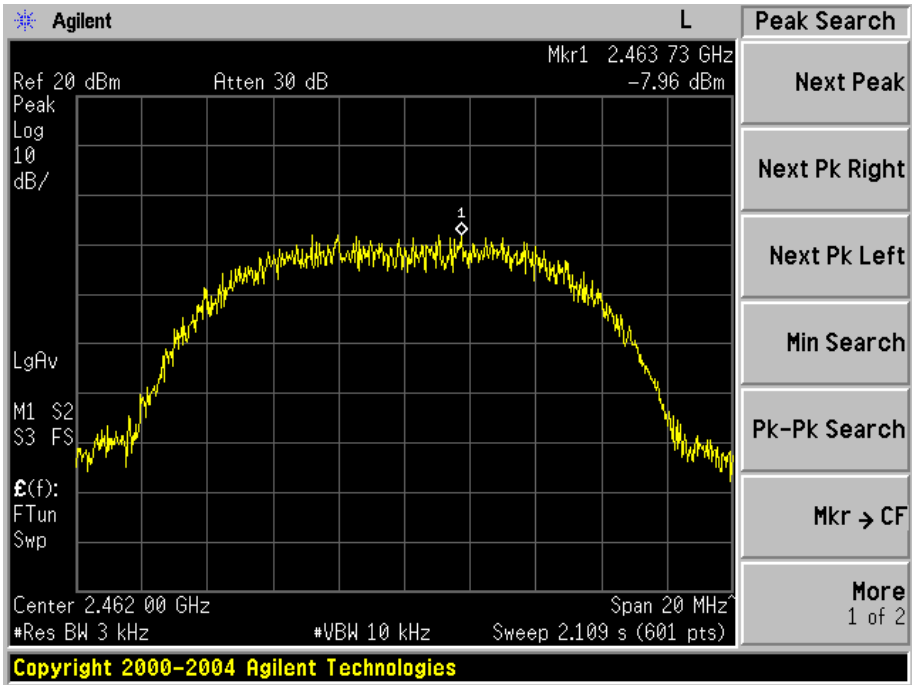
TX CH01



TX CH06



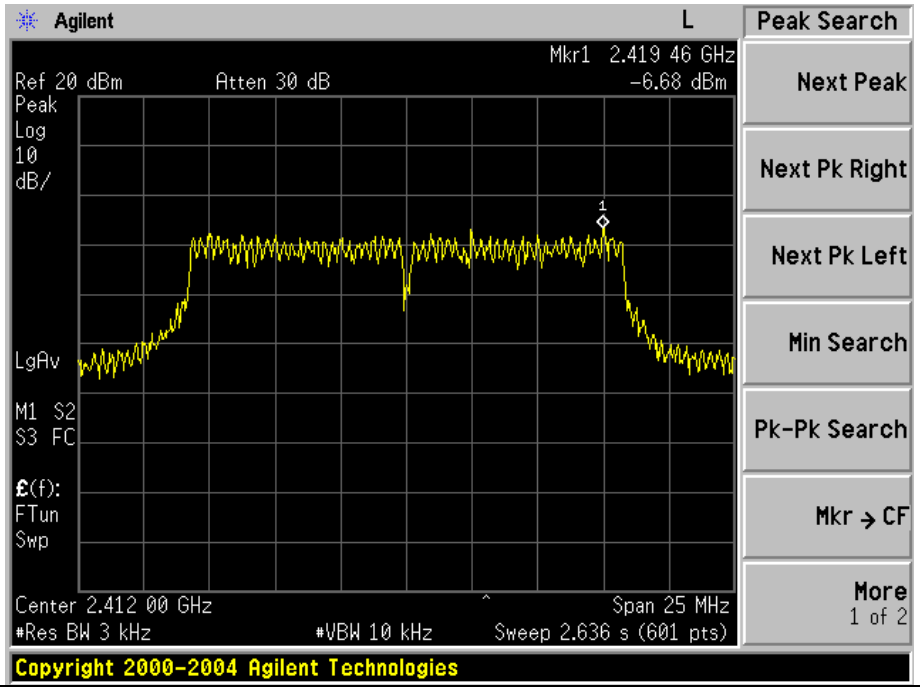
TX CH11



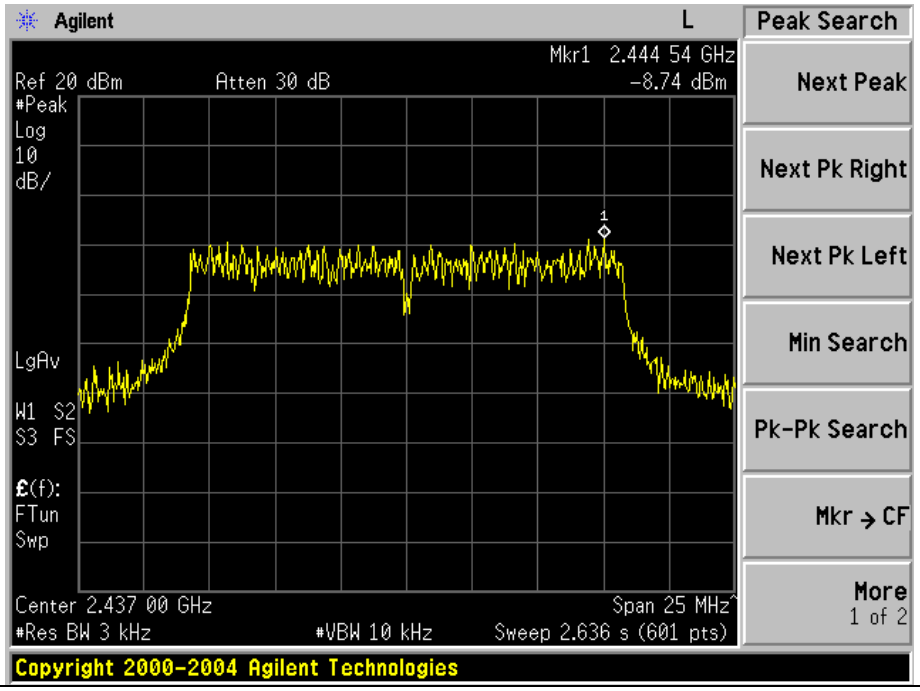
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-6.68	8	PASS
2437 MHz	-8.74	8	PASS
2462 MHz	-7.56	8	PASS

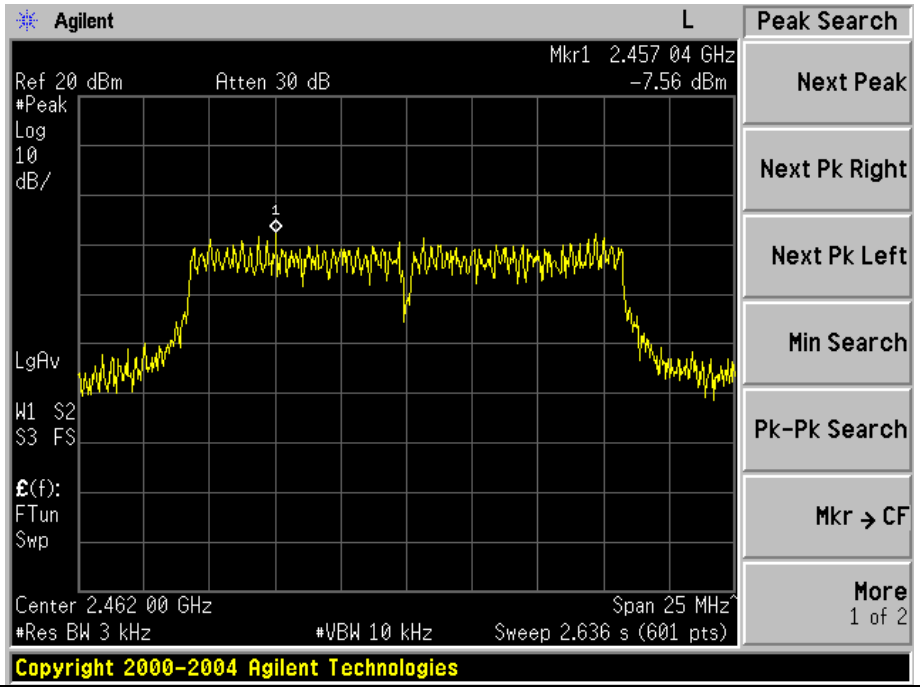
TX CH01



TX CH06



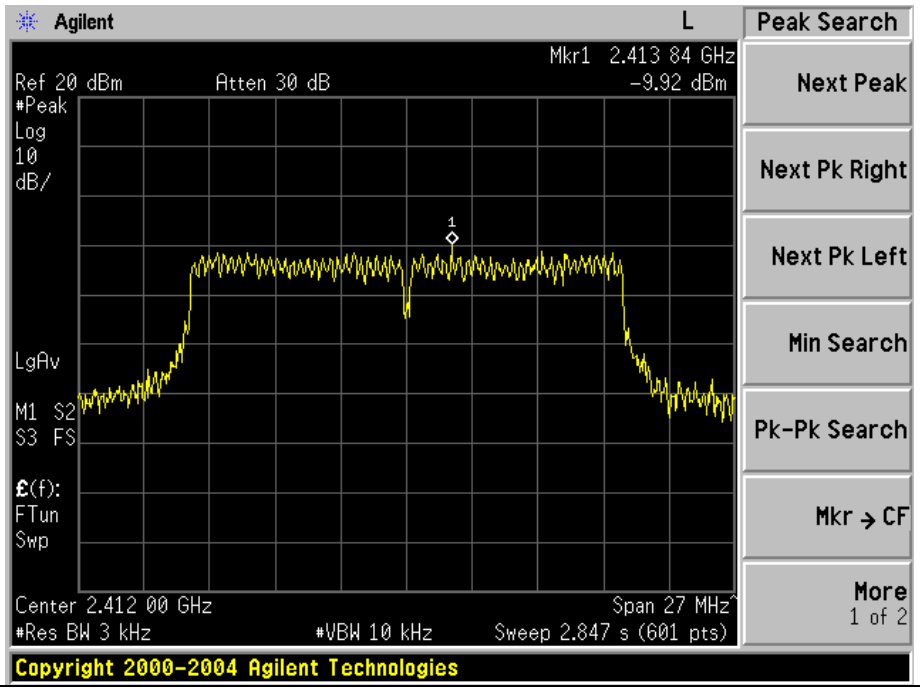
TX CH11



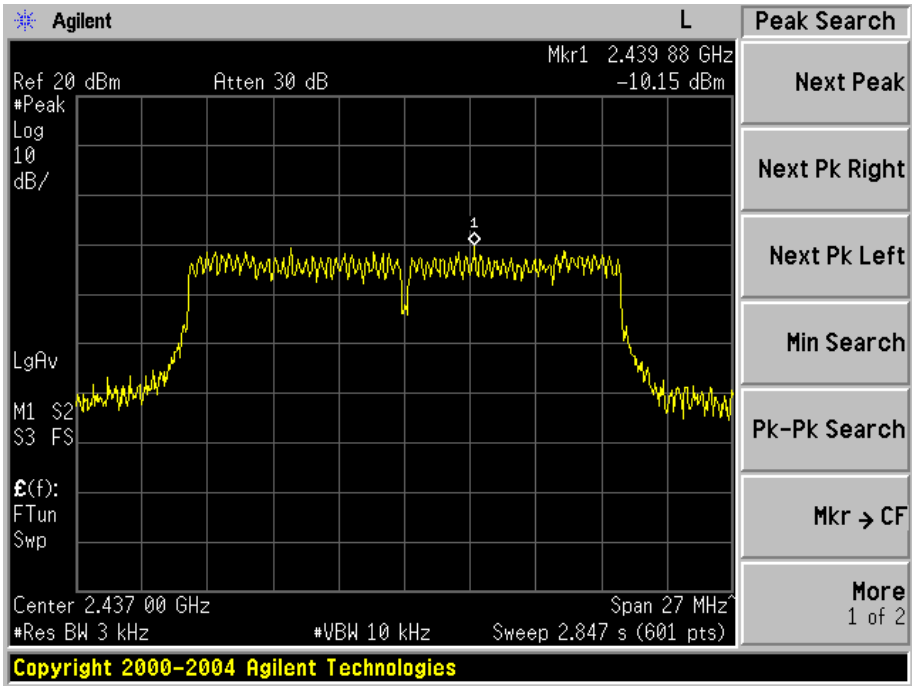
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX n Mode(20M) /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-9.92	8	PASS
2437 MHz	-10.15	8	PASS
2462 MHz	-9.81	8	PASS

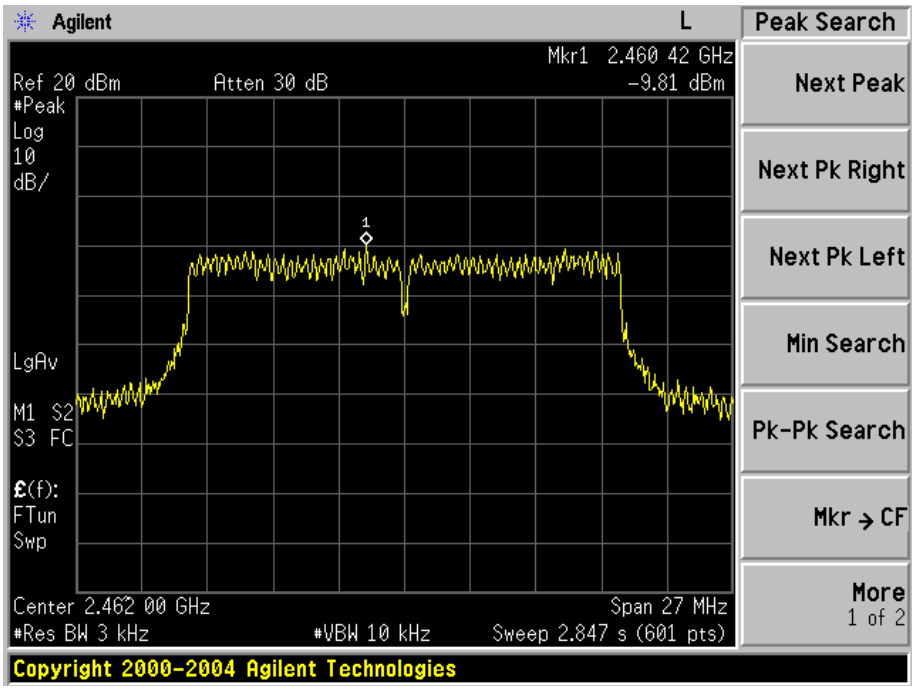
TX CH01



TX CH06



TX CH11



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

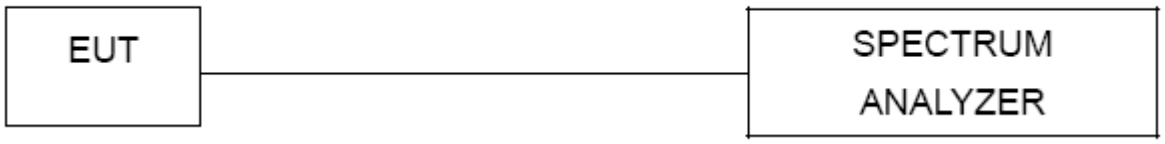
5.1.1 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x 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

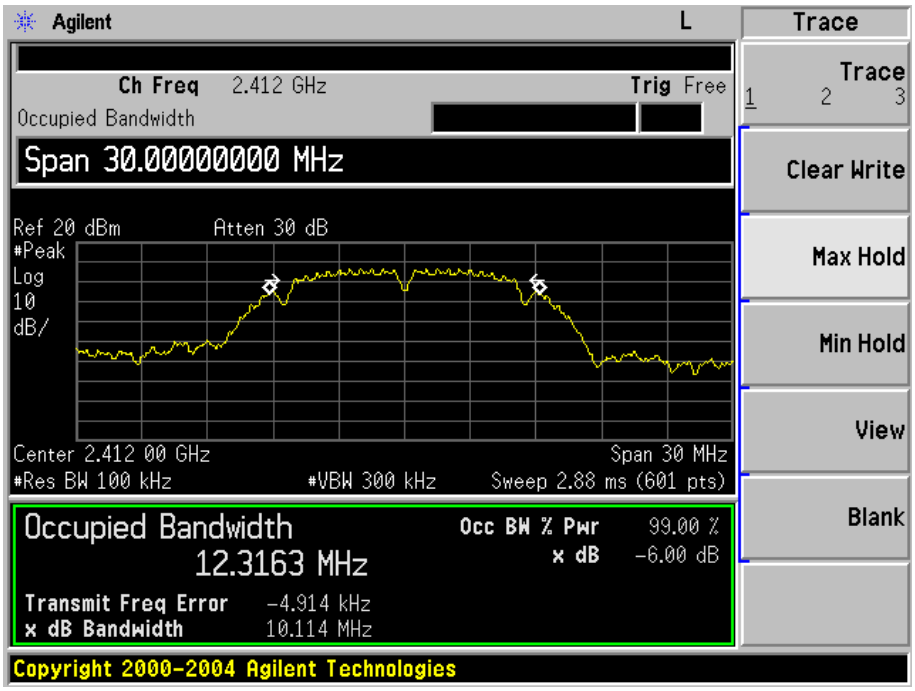
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

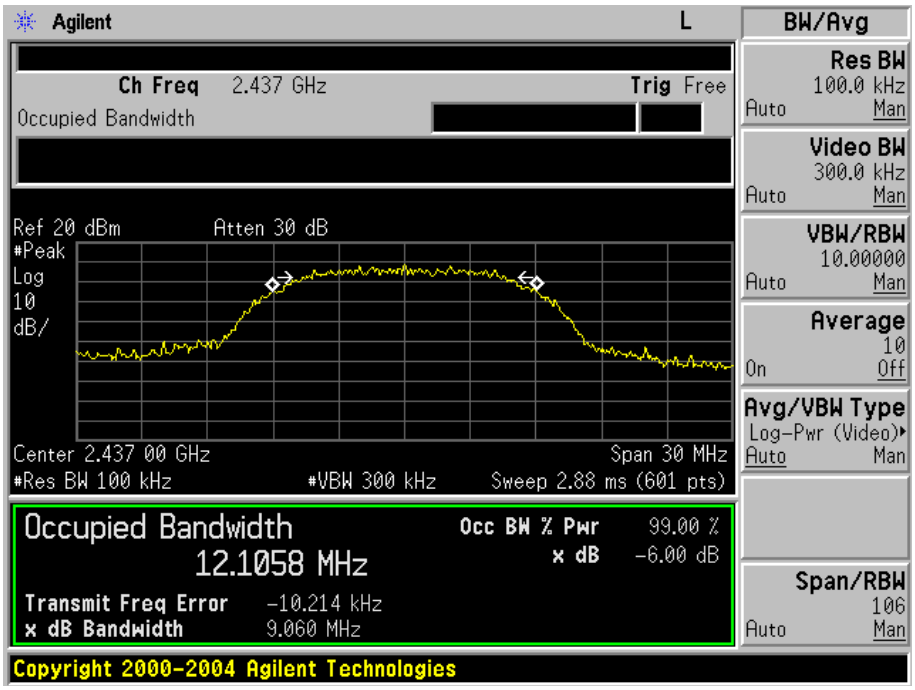
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.114	500	Pass
Middle	2437	9.060	500	Pass
High	2462	9.053	500	Pass

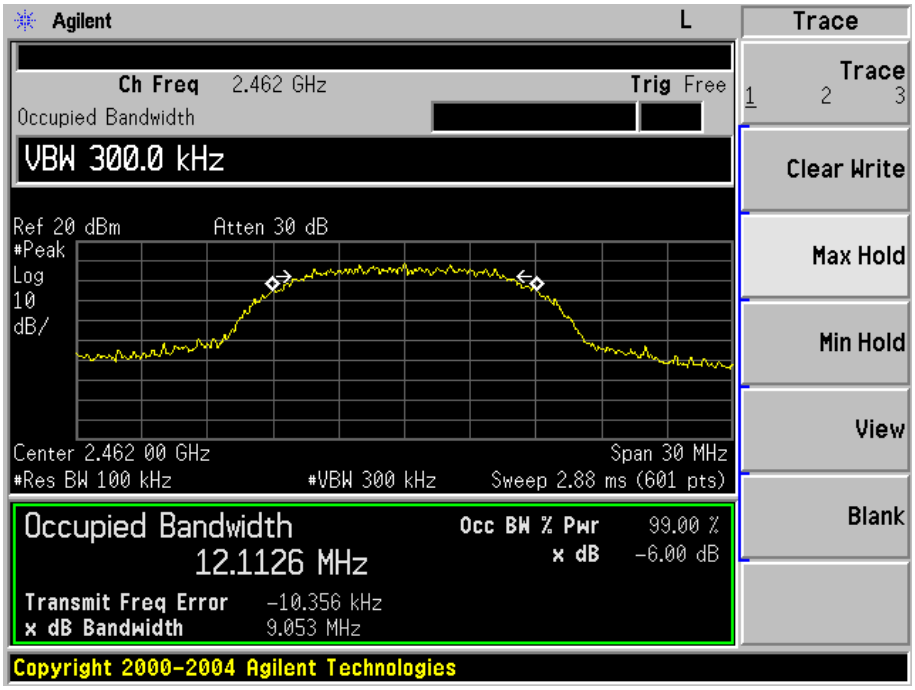
TX CH 01



TX CH 06



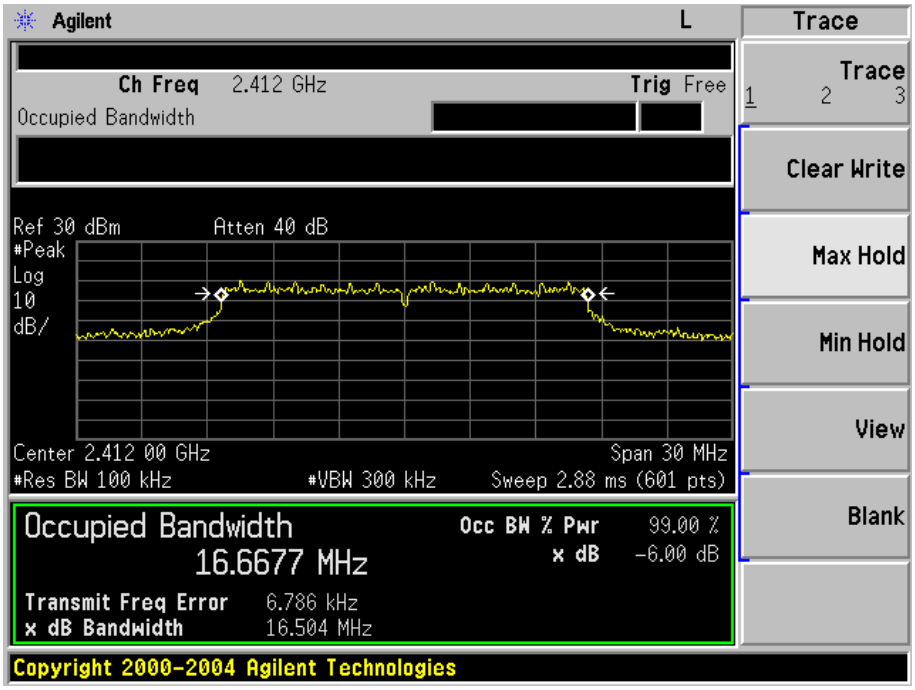
TX CH 11



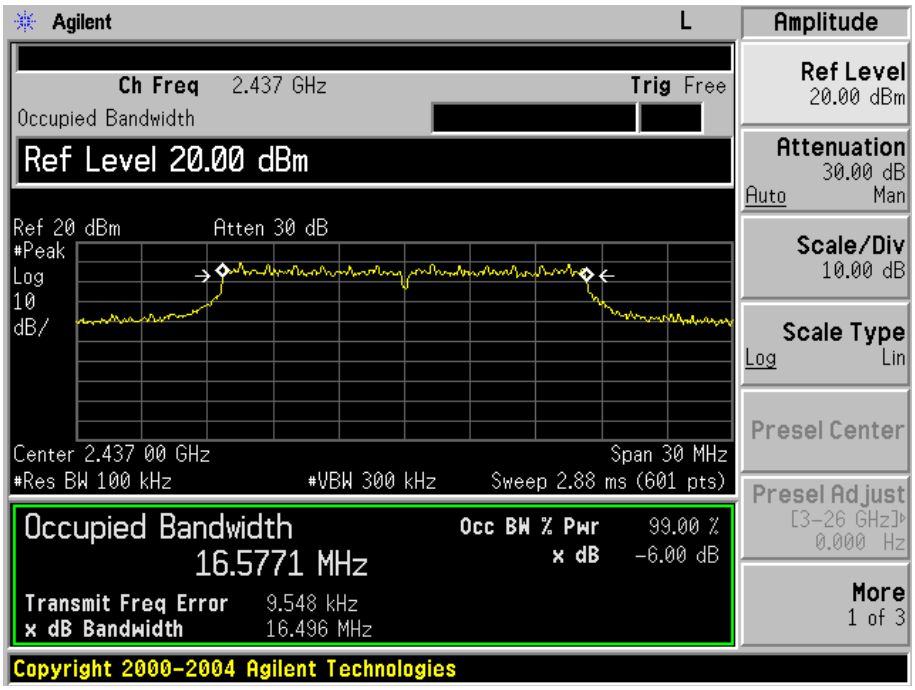
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.504	500	Pass
Middle	2437	16.496	500	Pass
High	2462	16.514	500	Pass

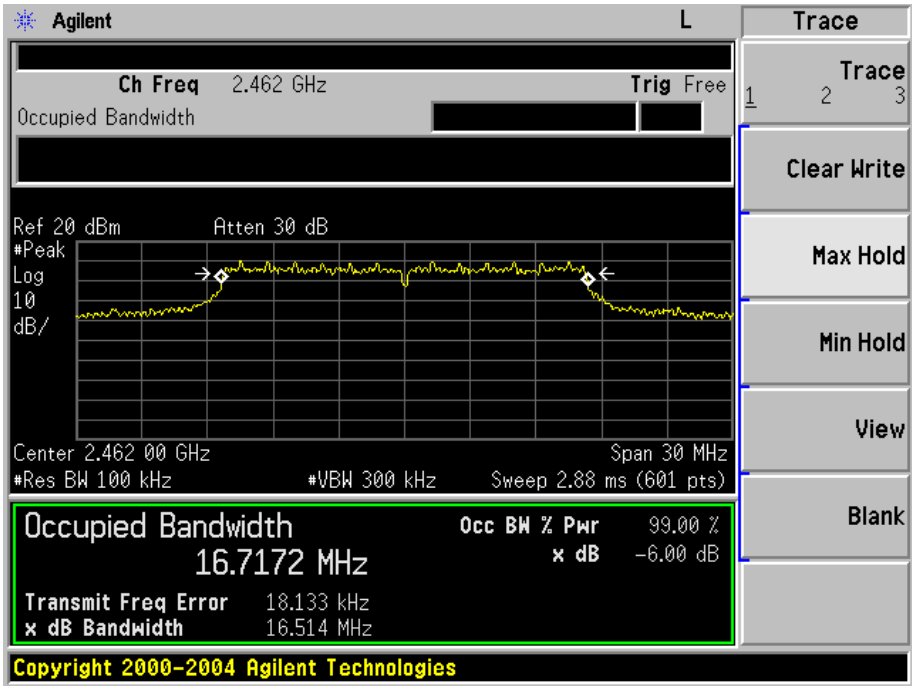
TX CH 01



TX CH 06



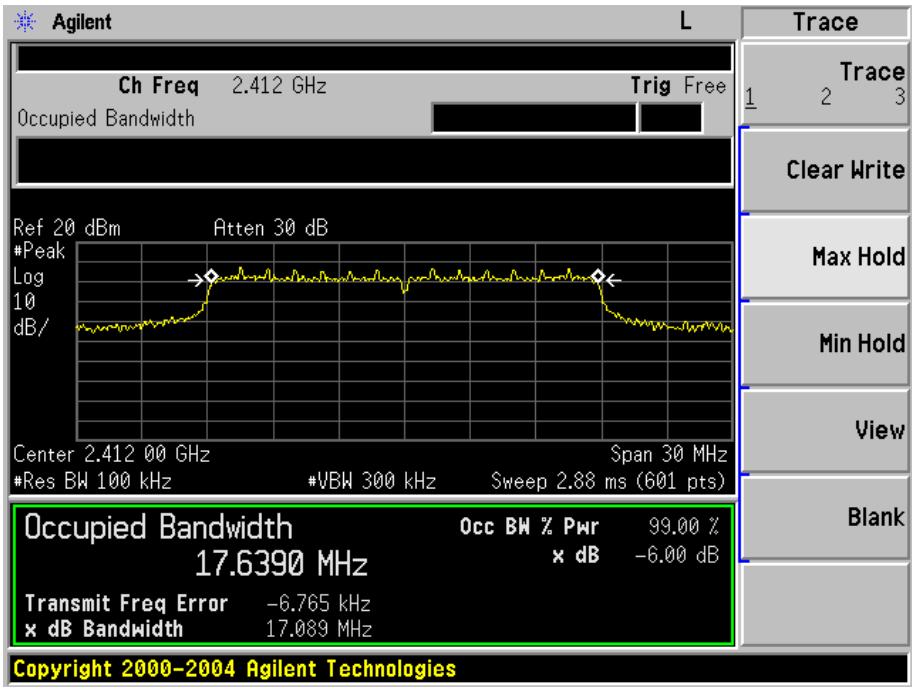
TX CH 11



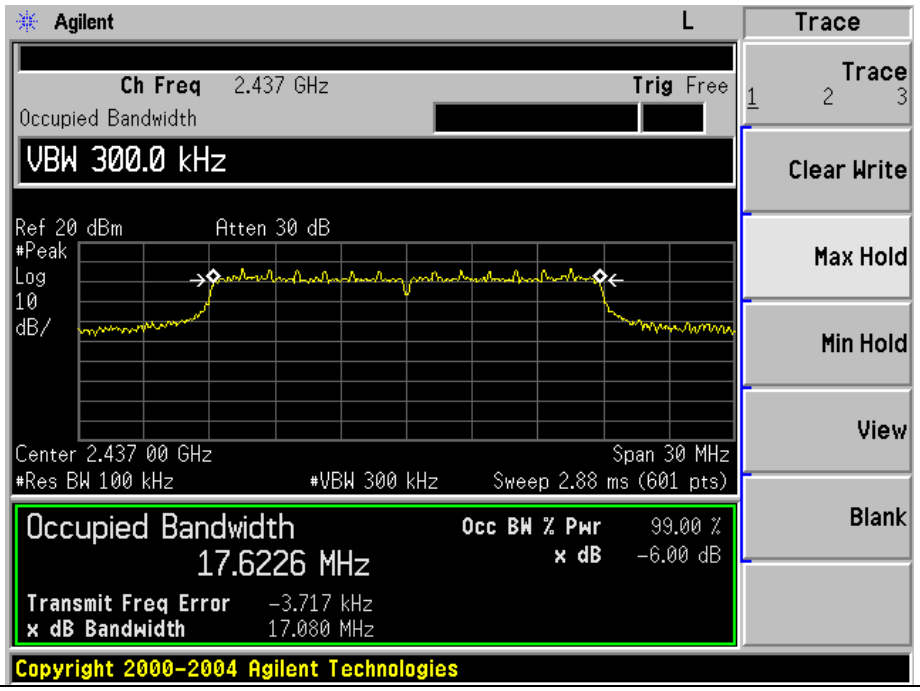
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX n Mode(20M) /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.089	500	Pass
Middle	2437	17.080	500	Pass
High	2462	17.351	500	Pass

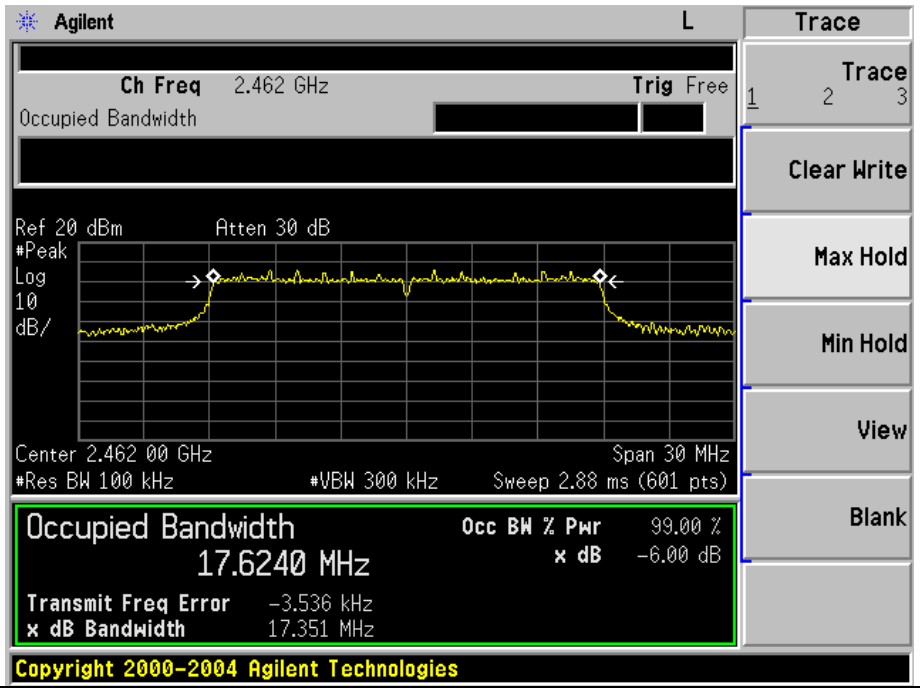
TX CH 01



TX CH 06



TX CH 11



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

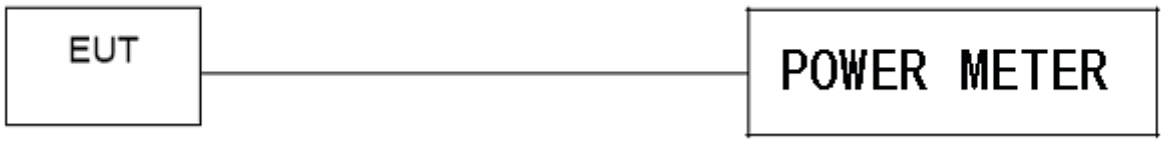
6.1.1 TEST PROCEDURE

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：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 12V
Test Mode ：	TX b/g/n(20M)		

TX 802.11b Mode			
Test Channe	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	14.09	30
CH06	2437	14.11	30
CH11	2462	14.31	30
TX 802.11g Mode			
CH01	2412	13.79	30
CH06	2437	13.65	30
CH11	2462	13.70	30
TX 802.11n-HT20 Mode			
CH01	2412	12.77	30
CH06	2437	12.72	30
CH11	2462	12.64	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)).

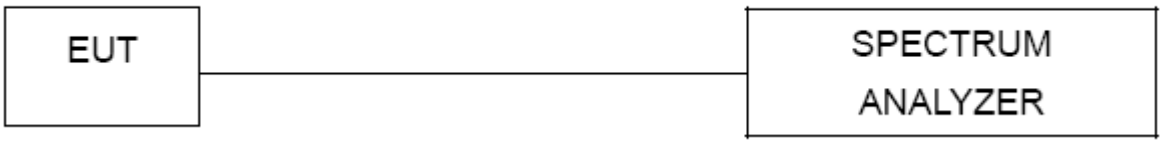
TEST PROCEDURE

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

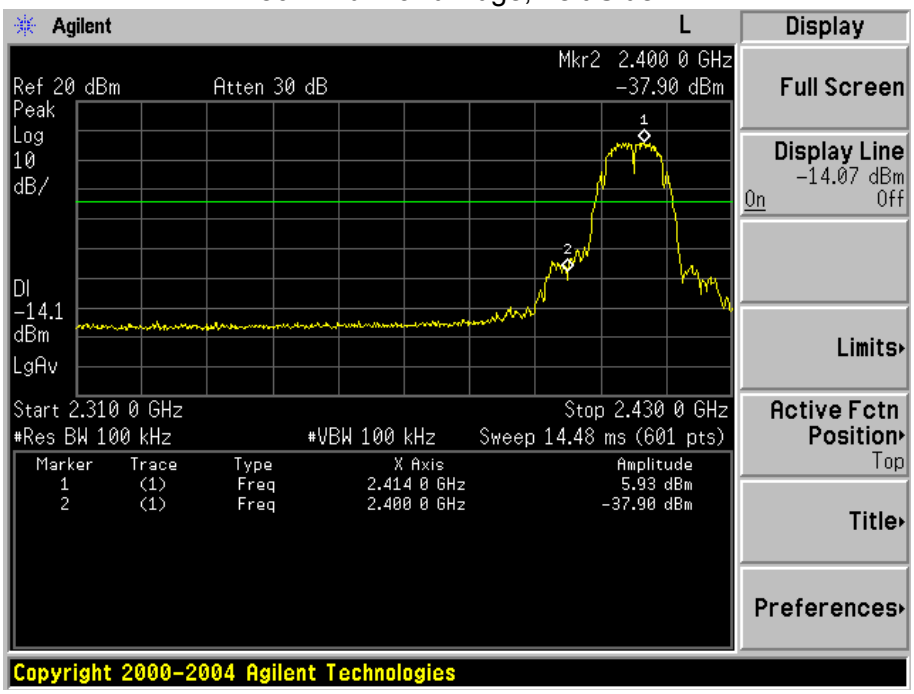
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.4 TEST RESULTS

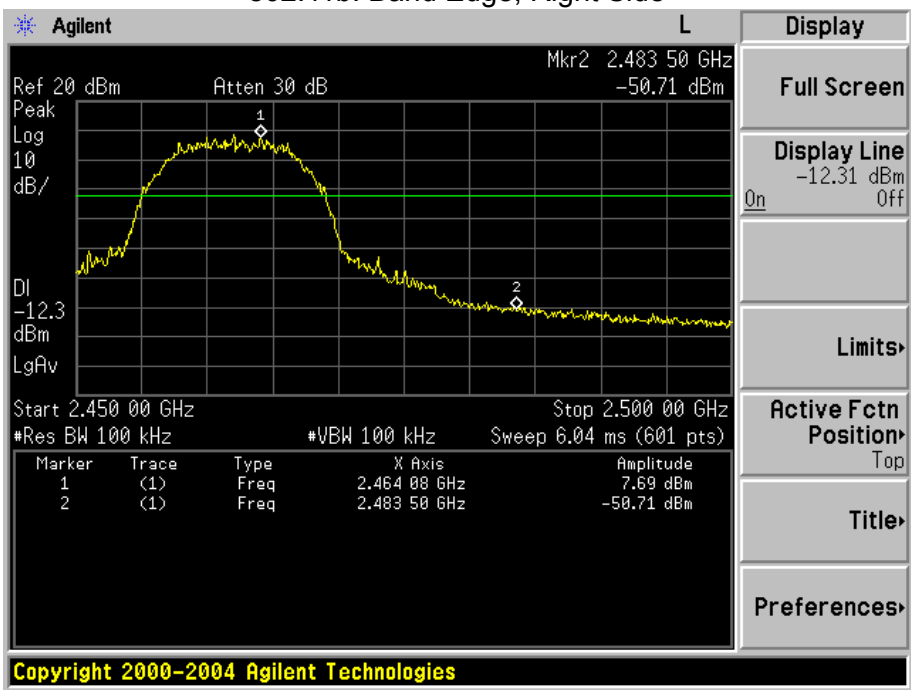
EUT：	Vispect ADAS V1	Model Name ：	V1
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 12V

Frequency Band	Delta Peak to band emission (dBc)	＞Limit (dBc)	Result
802.11b mode			
Left-band	43.83	20	Pass
Right-band	58.40	20	Pass
802.11g mode			
Left-band	25.59	20	Pass
Right-band	34.95	20	Pass
802.11n-HT20 mode			
Left-band	27.11	20	Pass
Right-band	37.55	20	Pass

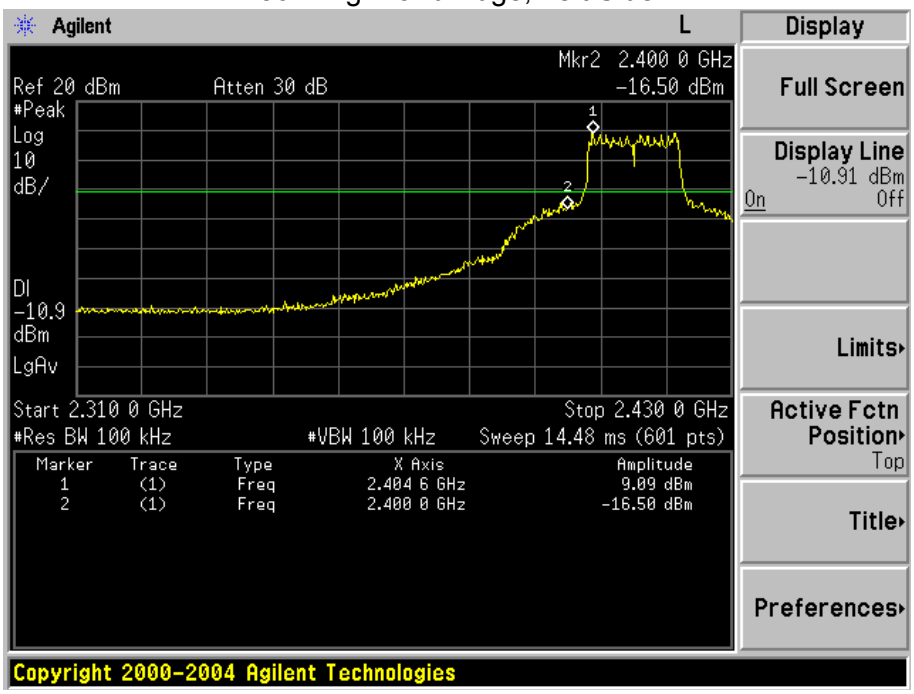
802.11b: Band Edge, Left Side



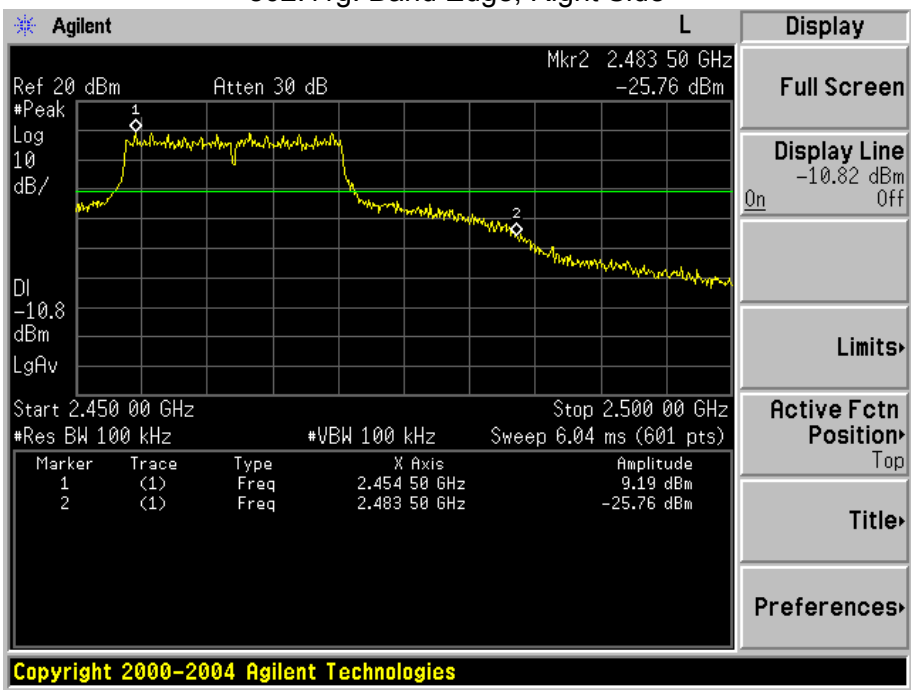
802.11b: Band Edge, Right Side



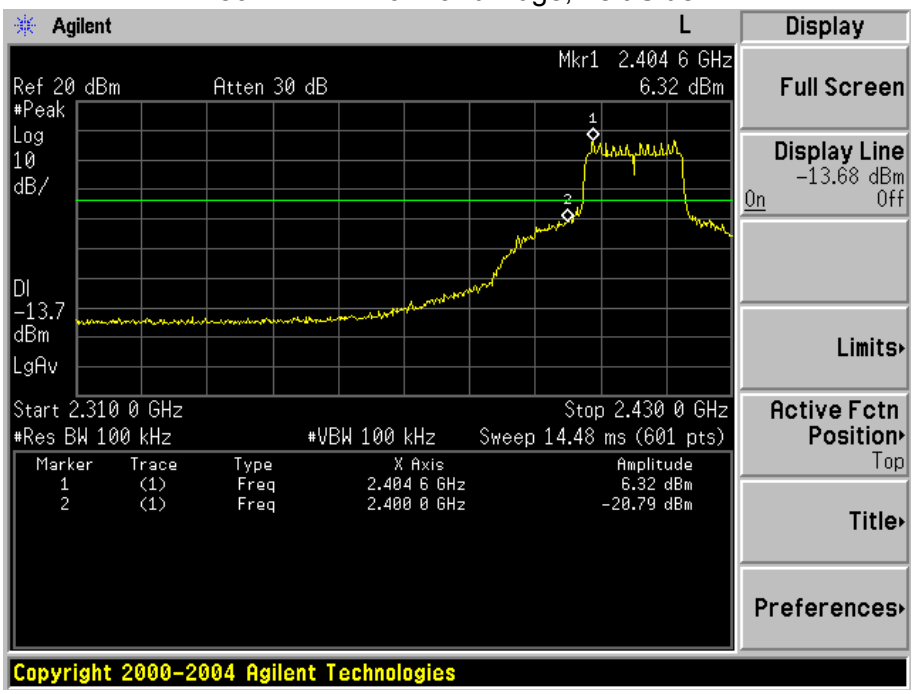
802.11g: Band Edge, Left Side



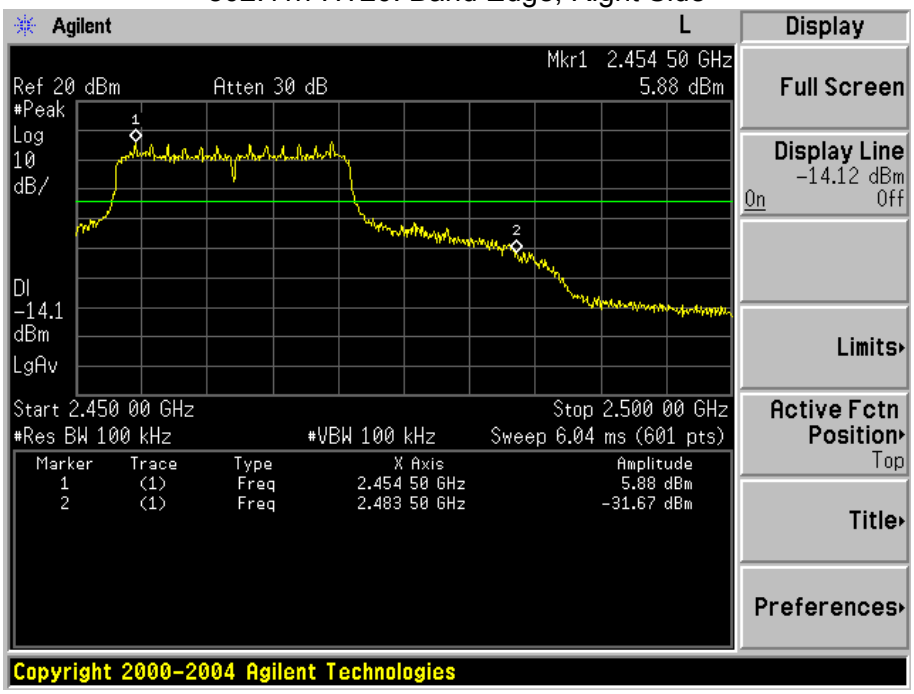
802.11g: Band Edge, Right Side



802.11n-HT20: Band Edge, Left Side



802.11n-HT20: Band Edge, Right Side



8.CONDUCTED SPURIOUS EMISSIONS

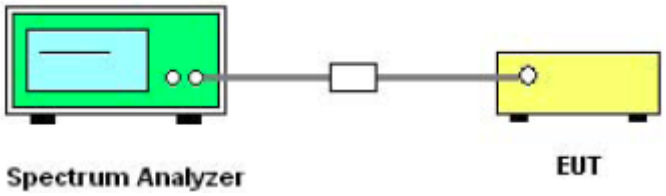
8.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.2 TEST PROCEDURE

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

8.3 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

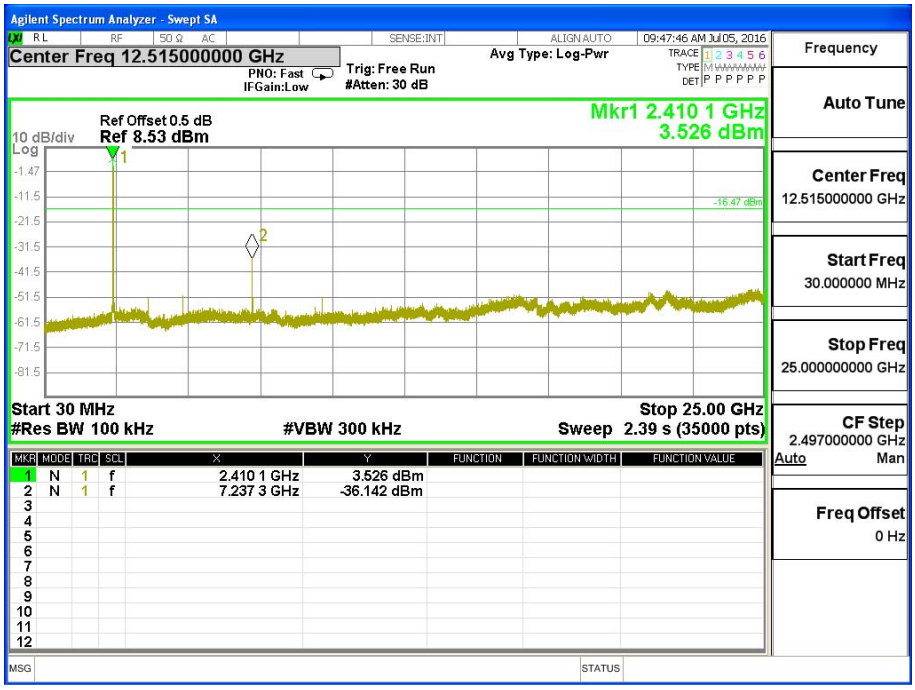
8.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

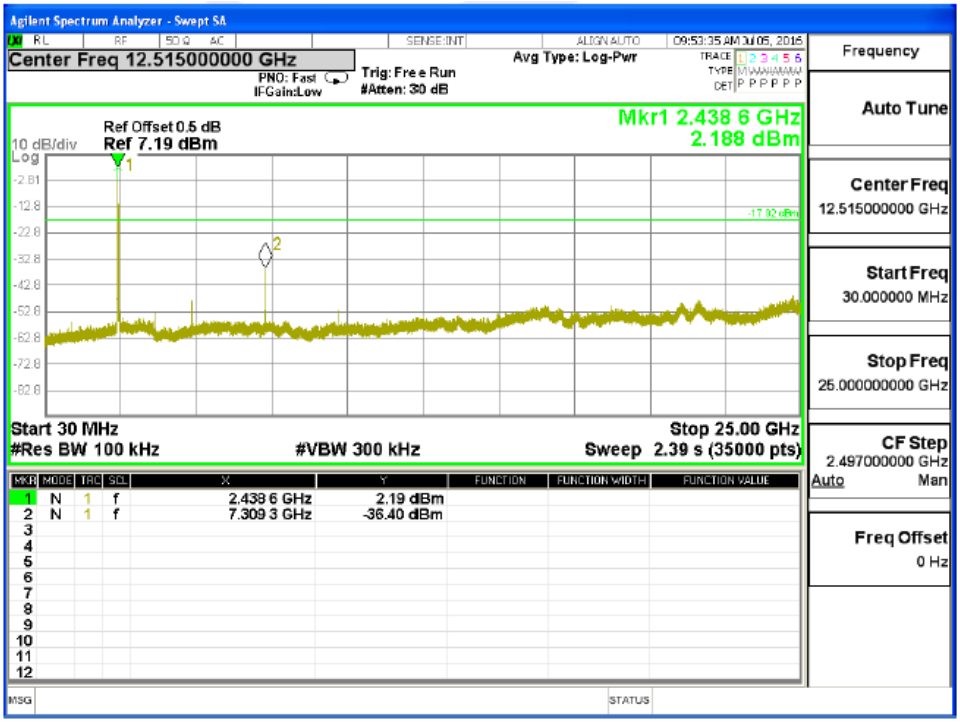
8.5 TEST RESULTS

802.11b:

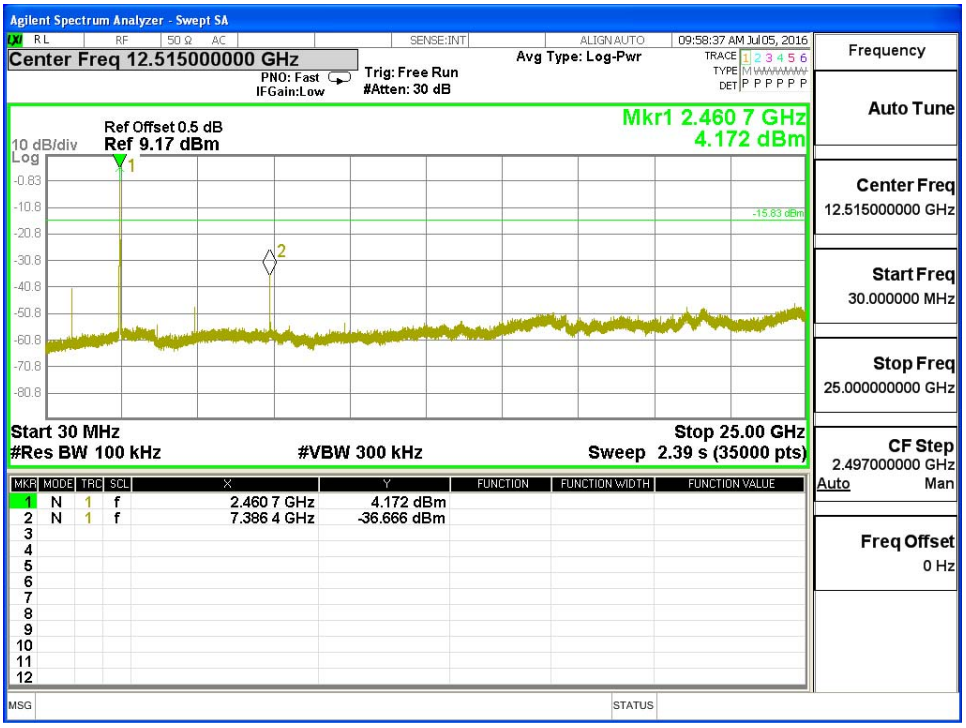
CH01



CH 06

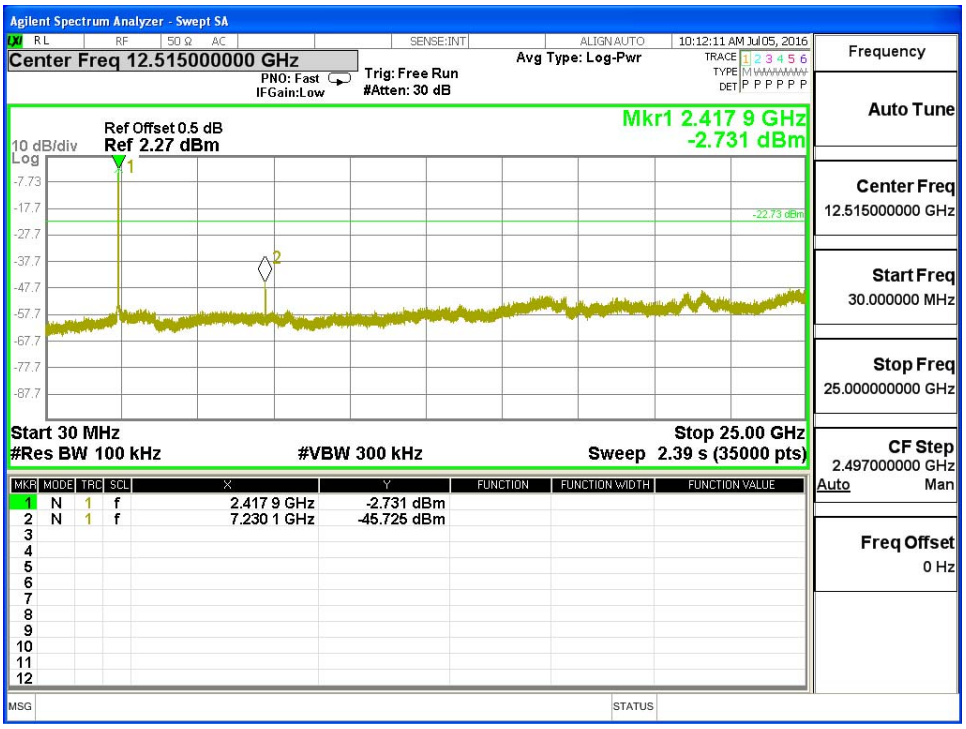


CH11

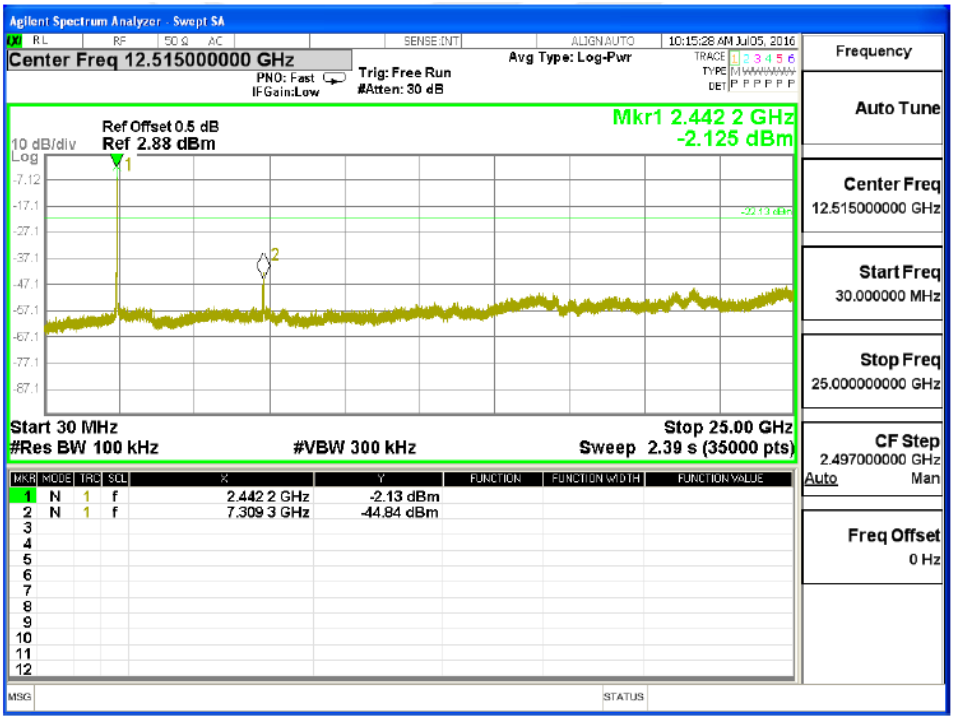


802.11g:

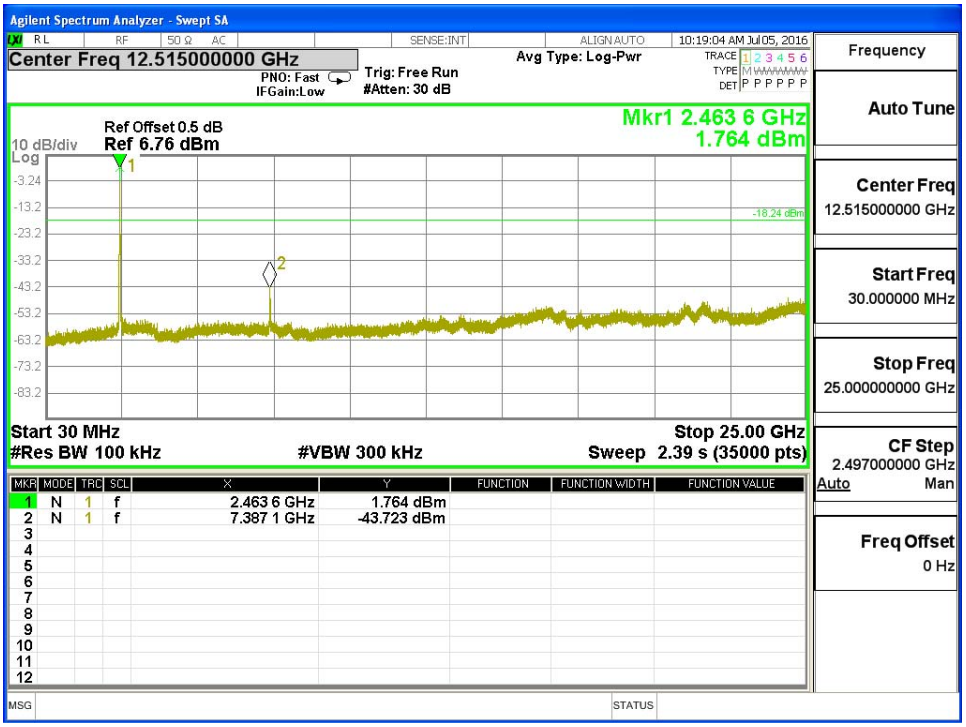
CH01



CH06

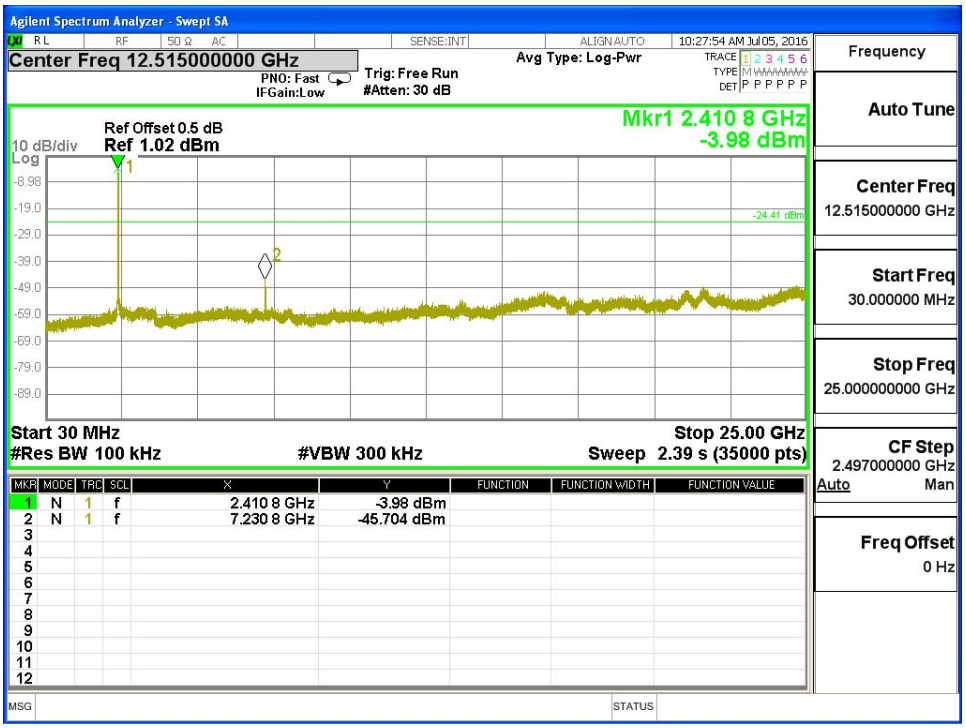

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
10:15:28 AM Jul 05, 2016
Ref Offset 0.5 dB
10 dB/div
Ref 2.88 dBm
Mkr1 2.442 2 GHz
-2.125 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.39 s (35000 pts)
1 N 1 f 2.442 2 GHz -2.13 dBm
2 N 1 f 7.309 3 GHz -44.84 dBm
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto Man
Freq Offset
0 Hz

CH11

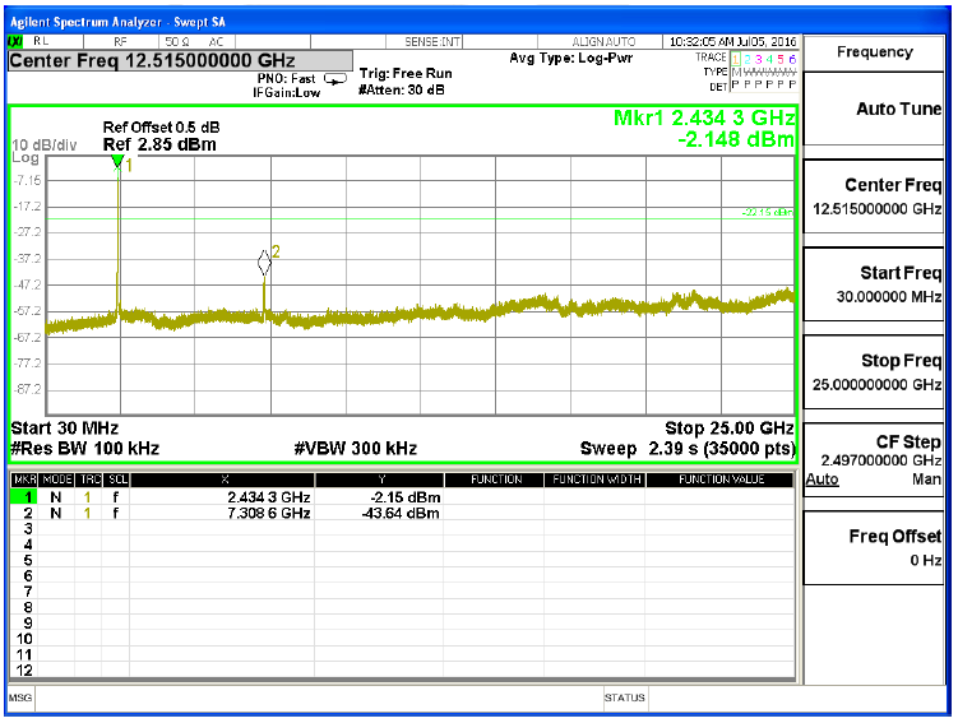

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
10:19:04 AM Jul 05, 2016
Ref Offset 0.5 dB
10 dB/div
Ref 6.76 dBm
Mkr1 2.463 6 GHz
1.764 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.39 s (35000 pts)
1 N 1 f 2.463 6 GHz 1.764 dBm
2 N 1 f 7.387 1 GHz -43.723 dBm
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto Man
Freq Offset
0 Hz

802.11n20:

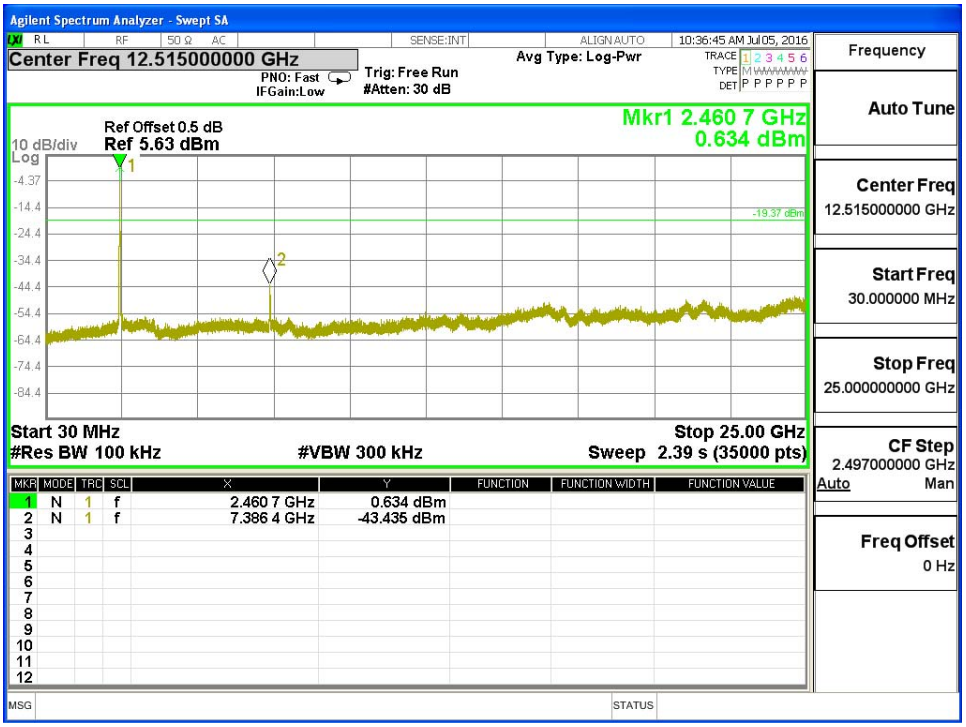
CH1



CH06



CH11


Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
10:36:45 AM Jul 05, 2016
Mkr1 2.460 7 GHz
0.634 dBm
Ref Offset 0.5 dB
10 dB/div
Ref 5.63 dBm
Log
-19.37 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.39 s (35000 pts)
1 N 1 f 2.460 7 GHz 0.634 dBm
2 N 1 f 7.386 4 GHz -43.435 dBm
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto Man
Freq Offset
0 Hz

9. ANTENNA REQUIREMENT

9.1 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.

9.2 EUT ANTENNA

The EUT antenna is Integrated antenna. It's permanent attached antenna. It comply with the standard requirement.