RADIO TEST REPORT

FCC ID:2AG9UED01-001

Product： Edyn Water Valve

Trade Name： N/A

Model Name： ED01-001

Serial Model： N/A

Report No.： ISOT151230229R

Prepared for

Soil I.Q., Inc.

405 15th St Oakland, California 94612,United States

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... Soil I.Q., Inc.

Address ..... 405 15th St Oakland, California 94612,United States

Manufacture's Name... BCD China Electronics Manufacturing (Shenzhen) Ltd

Address ..... 3/F, Bldg B2,Xin An No. 3 Industrial Park,HangCheng Industrial Zone,Qian Jin Rd, Xi Xiang, Bao An District, Shenzhen,China

Product description

Product name ..... Edyn Water Valve

Model and/or type reference ED01-001

Serial Model ..... N/A

Standards ..... FCC Part15.247:2016

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

This device described above has been tested by ISOTek, 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 Dec. 2015 ~25 Jan. 2016

Date of Issue..... 25 Jan. 2016

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

Compiled by:	Approved by:
Lisa Huang/ Project Engineer	Richard Chen/ Manager

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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	N/A	
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

Shenzhen ISOTek Standards Technical Services Co.,Ltd.
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FCC Registration No.: **918037**; IC Registration Number:**20400-1**

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

<table>
<tr><td>Equipment</td><td>Edyn Water Valve</td></tr>
<tr><td>Trade Name</td><td>N/A</td></tr>
<tr><td>Model Name</td><td>ED01-001</td></tr>
<tr><td>Serial Model</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>
<table>
<tr><td>Operation Frequency:</td><td>802.11b/g/n(20MHz): 2412~2462MHz</td></tr>
<tr><td>Modulation Type:</td><td>IEEE 802.11b :
DSSS (CCK, QPSK, DBPSK)
IEEE 802.11g/n (HT20) : OFDM
(64QAM, 16QAM, QPSK, BPSK)</td></tr>
<tr><td>Bit Rate of Transmitter</td><td>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</td></tr>
<tr><td>Number Of Channel</td><td>802.11b/g/n20MHz:11CH</td></tr>
<tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr>
<tr><td>Antenna Gain (dBi)</td><td>1.51 dBi</td></tr>
</table>
</td></tr>
<tr><td>Channel List</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Ratings</td><td>DC 3.2V</td></tr>
<tr><td>Adapter</td><td>N/A</td></tr>
<tr><td>Battery</td><td>DC 3.2V ,1000mAh</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
<tr><td>Hardware version:</td><td>T10-ED01M-X2 2015-10-21 REV:02</td></tr>
<tr><td>Software version:</td><td>REV01</td></tr>
<tr><td>Radio firmware Version</td><td>V1.0</td></tr>
<tr><td>Radio software Version</td><td>V1.0</td></tr>
</table>

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 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		

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	PCB Antenna	N/A	1.51	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	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	802.11n20 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(802.11b:1Mbps; 802.11g:6Mbps; 802.11n20:65Mbps,)

Test program power setting：18 level

(3) EUT configured to transmit continuously:

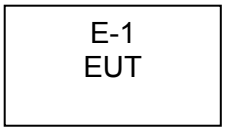
(4) The EUT use fully-charged battery.

(5) The control software is link to the step by step **RF certification guide for the im002**, hardware after welding is good ,according to the related connection of control software is OK.

Operated Mode for Worst Duty Cycle	
Test Signal Duty Cycle (x)	Average correction factor (dB)
100% - IEEE 802.11b	0
100% - IEEE 802.11g	0
100% - IEEE 802.11n (HT20)	0

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious 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	Edyn Water Valve	N/A	ED01-001	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

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 &other conducted test test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Aglient	E4446A	US44300451	2015.07.06	2016.07.05	1 year
2	EMI Test Receiver	R&S	ESCI	101165	2015.07.06	2016.07.05	1 year
3	Loop Antenna	ARA	PLA - 1030/B	1029	2015.07.06	2016.07.05	1 year
4	Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2015.07.06	2016.07.05	1 year
5	Horn Antenna	Schwarzbeck	BBHA 9170	9170-182	2015.07.06	2016.07.05	1 year
6	Amplifier	Schwarzbeck	BBV9743	9743-019	2015.07.06	2016.07.05	1 year
7	Test Cable Below 1GHz	ATM	R-01	3564	2015.07.06	2016.07.05	1 year
8	Test Cable Above 1GHz	ATM	R-02	3565	2015.07.06	2016.07.05	1 year
9	Power Meter	R&S	NRVS	100696	2015.07.06	2016.07.05	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.07.06	2016.07.05	1 year
11	Horn Antenna	Sunol Sciences	DRH-118	A052604	2015.07.06	2016.07.05	1 year
12	temporary antenna connector	ATM	A-01	8743	2015.07.06	2016.07.05	1 year

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

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

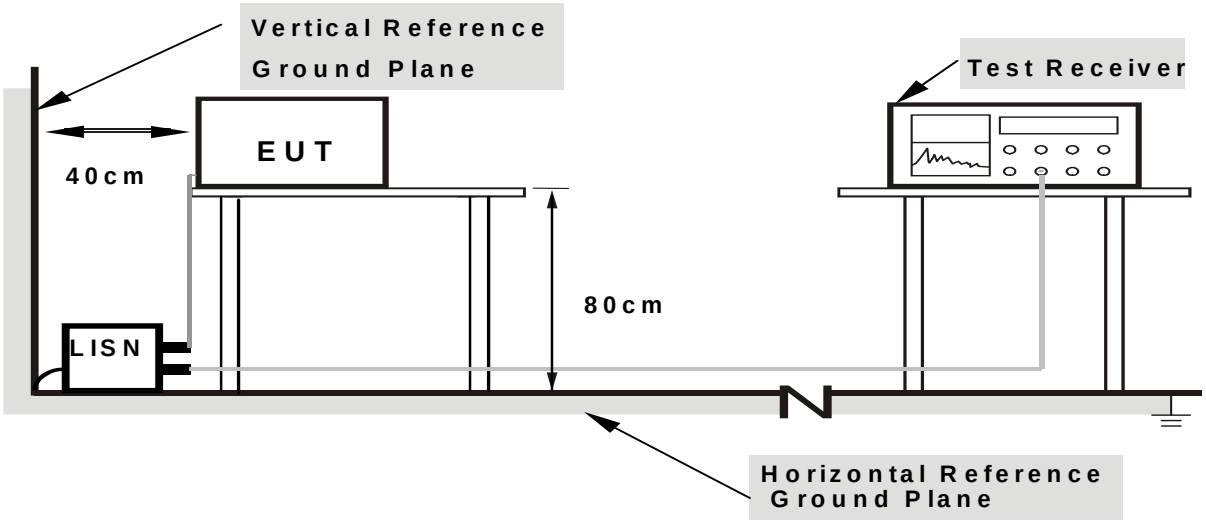
3.1.2 TEST PROCEDURE

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

This item is not applicable.

3.1.6 TEST RESULTS

EUT：	Edyn Water Valve	Model Name. ：	ED01-001
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase :	N/A
Test Voltage ：	N/A	Test Mode：	N/A

solar energy charging,not Applicable.

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 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter 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 for below 1GHz and 1.5m for above 1GHz; 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:

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

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:

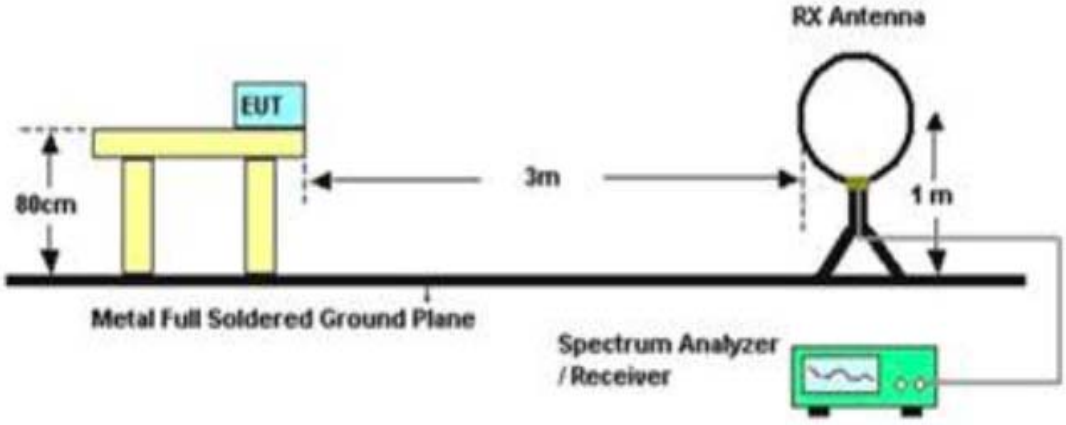
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

3.2.3 DEVIATION FROM TEST STANDARD

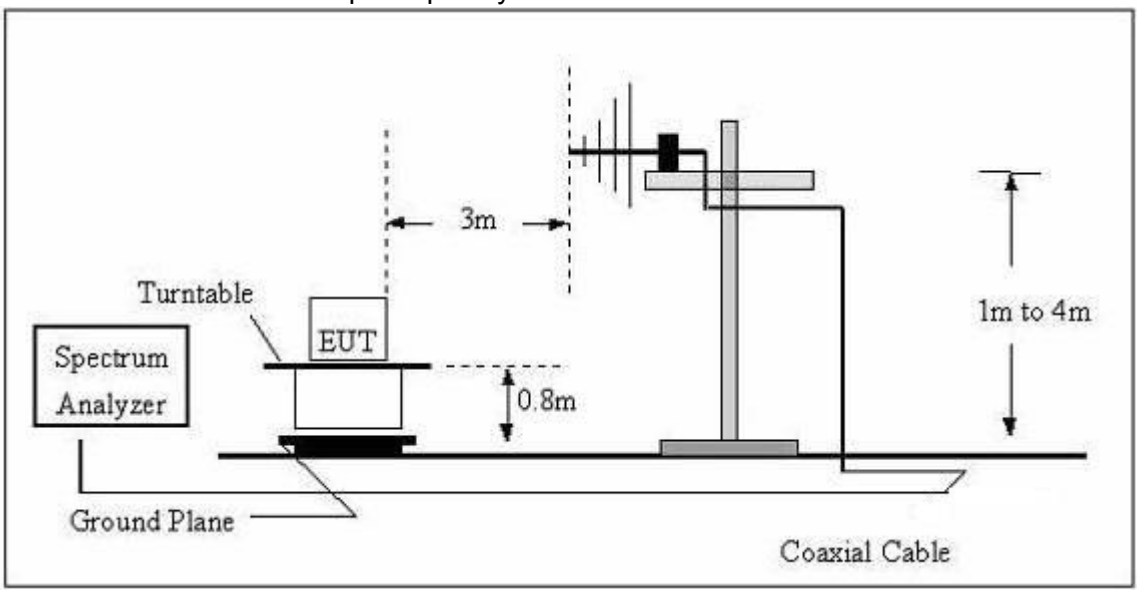
No deviation

3.2.4 TEST SETUP

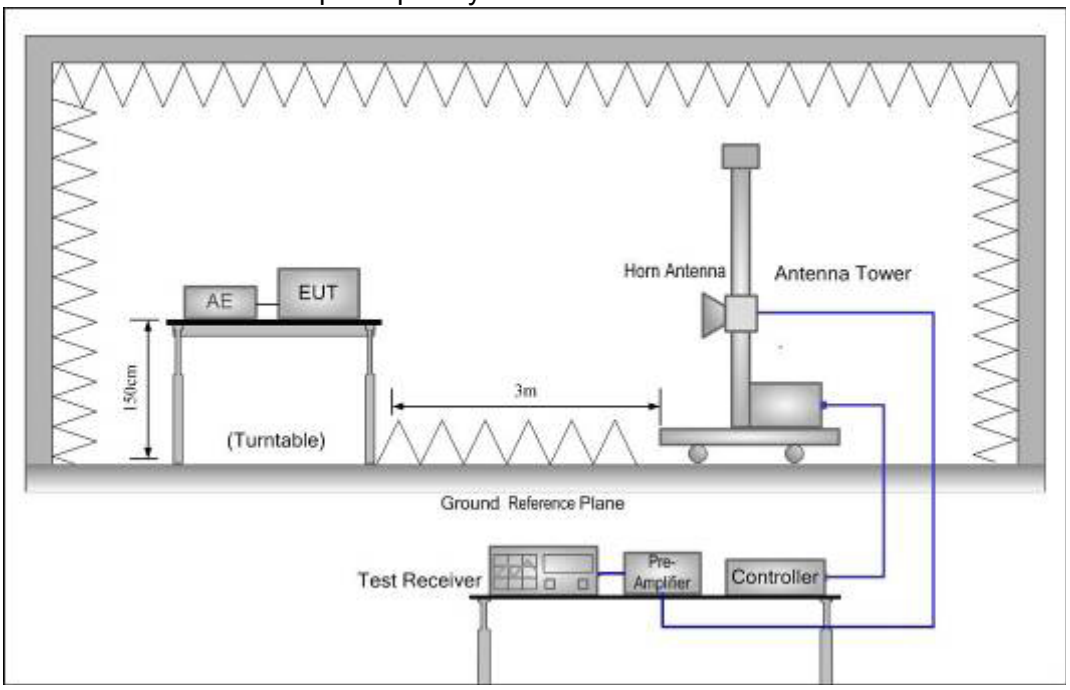
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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：	Edyn Water Valve	Model Name. ：	ED01-001
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX	Polarization :	--

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

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.
”802.11b”(High CH) mode is the worst mode.

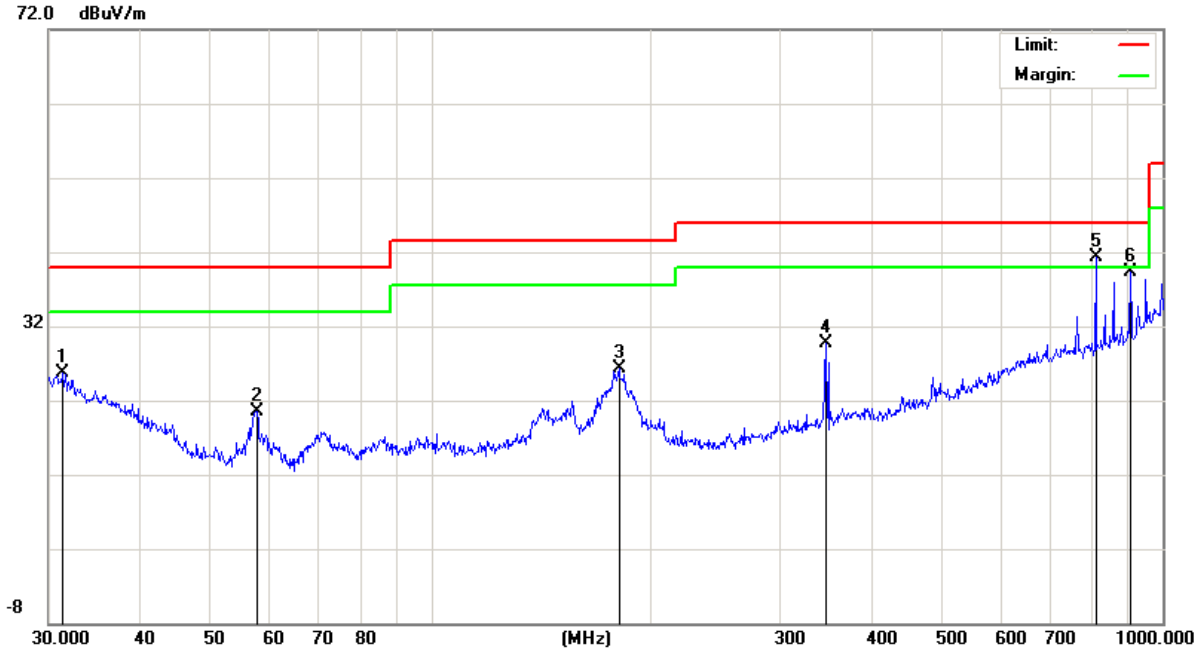
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	31.3992	6.69	19.07	25.76	40.00	-14.24	QP
H	57.7962	14.34	6.24	20.58	40.00	-19.42	QP
H	180.6488	14.34	11.89	26.23	43.50	-17.27	QP
H	346.8092	15.57	14.05	29.62	46.00	-16.38	QP
H	810.2654	18.58	22.80	41.38	46.00	-4.62	QP
H	903.3093	15.00	24.23	39.23	46.00	-6.77	QP

Remark:

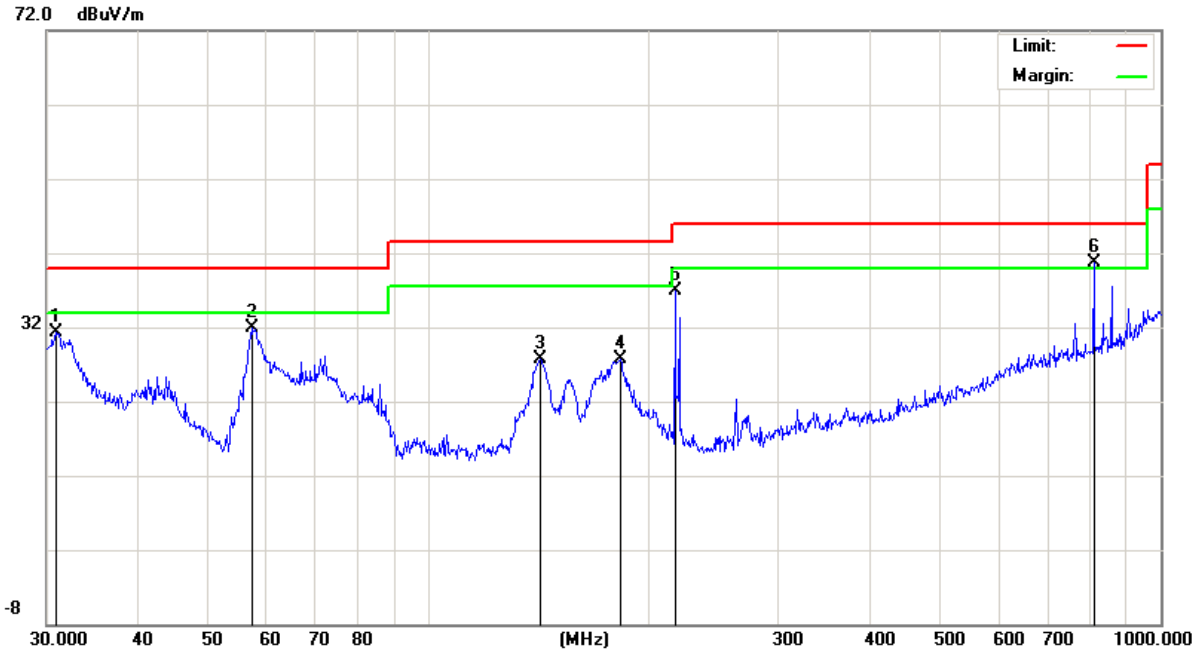
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	30.8535	12.11	19.26	31.37	40.00	-8.63	QP
V	57.1914	25.42	6.39	31.81	40.00	-8.19	QP
V	141.8262	16.52	11.10	27.62	43.50	-15.88	QP
V	182.5592	15.75	11.86	27.61	43.50	-15.89	QP
V	216.7828	25.85	10.97	36.82	46.00	-9.18	QP
V	810.2654	17.81	22.80	40.61	46.00	-5.39	QP

Remark:

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



Note: ”802.11b”(High CH) mode is the worst mode.

3.2.8 TEST RESULTS (1000-25000 MHZ)

EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX		

802.11b mode

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)-Above 1G							
Vertical	4824.231	54.14	10.44	64.58	74.00	-9.42	Pk
Vertical	4824.231	31.58	10.44	42.02	54.00	-11.98	Av
Vertical	7236.189	49.89	12.39	62.28	74.00	-11.72	Pk
Vertical	7236.189	31.17	12.39	43.56	54.00	-10.44	Av
Horizontal	4824.225	50.66	10.44	61.10	74.00	-12.90	Pk
Horizontal	4824.225	31.08	10.44	41.52	54.00	-12.48	Av
Horizontal	7236.104	47.73	12.39	60.12	74.00	-13.88	Pk
Horizontal	7236.104	30.33	12.39	42.72	54.00	-11.28	Av
Mid Channel (2437 MHz)-Above 1G							
Vertical	4874.308	51.12	10.40	61.52	74.00	-12.48	Pk
Vertical	4874.308	32.23	10.40	42.63	54.00	-11.37	Av
Vertical	7311.203	47.46	12.75	60.21	74.00	-13.79	Pk
Vertical	7311.203	30.09	12.75	42.84	54.00	-11.16	Av
Horizontal	4874.111	52.15	10.40	62.55	74.00	-11.45	Pk
Horizontal	4874.111	31.22	10.40	41.62	54.00	-12.38	Av
Horizontal	7311.107	46.52	12.75	59.27	74.00	-14.73	Pk
Horizontal	7311.107	29.96	12.75	42.71	54.00	-11.29	Av
High Channel (2462 MHz)- Above 1G							
Vertical	4924.224	50.11	10.39	60.50	74.00	-13.50	Pk
Vertical	4924.224	30.08	10.39	40.47	54.00	-13.53	Av
Vertical	7386.156	46.75	12.68	59.43	74.00	-14.57	Pk
Vertical	7386.156	28.62	12.68	41.30	54.00	-12.70	Av
Horizontal	4924.131	50.44	10.39	60.83	74.00	-13.17	Pk
Horizontal	4924.131	30.26	10.39	40.65	54.00	-13.35	Av
Horizontal	7386.399	48.49	12.68	61.17	74.00	-12.83	Pk
Horizontal	7386.399	30.06	12.68	42.74	54.00	-11.26	Av

802.11g mode

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)-Above 1G							
Vertical	4824.133	52.02	10.44	62.46	74.00	-11.54	Pk
Vertical	4824.133	33.58	10.44	44.02	54.00	-9.98	Av
Vertical	7236.206	45.23	12.39	57.62	74.00	-16.38	Pk
Vertical	7236.206	29.51	12.39	41.90	54.00	-12.10	Av
Horizontal	4824.148	53.77	10.44	64.21	74.00	-9.79	Pk
Horizontal	4824.148	32.49	10.44	42.93	54.00	-11.07	Av
Horizontal	7236.311	45.93	12.39	58.32	74.00	-15.68	Pk
Horizontal	7236.311	31.07	12.39	43.46	54.00	-10.54	Av
Mid Channel (2437 MHz)-Above 1G							
Vertical	4874.326	51.43	10.40	61.83	74.00	-12.17	Pk
Vertical	4874.326	32.35	10.40	42.75	54.00	-11.25	Av
Vertical	7311.142	45.09	12.75	57.84	74.00	-16.16	Pk
Vertical	7311.142	28.08	12.75	40.83	54.00	-13.17	Av
Horizontal	4874.096	52.2	10.40	62.60	74.00	-11.40	Pk
Horizontal	4874.096	33.43	10.40	43.83	54.00	-10.17	Av
Horizontal	7311.263	48.31	12.75	61.06	74.00	-12.94	Pk
Horizontal	7311.263	29	12.75	41.75	54.00	-12.25	Av
High Channel (2462 MHz)- Above 1G							
Vertical	4924.326	51.37	10.39	61.76	74.00	-12.24	Pk
Vertical	4924.326	33	10.39	43.39	54.00	-10.61	Av
Vertical	7386.247	44.77	12.68	57.45	74.00	-16.55	Pk
Vertical	7386.247	28.41	12.68	41.09	54.00	-12.91	Av
Horizontal	4924.089	51.4	10.39	61.79	74.00	-12.21	Pk
Horizontal	4924.089	33.5	10.39	43.89	54.00	-10.11	Av
Horizontal	7386.147	47.79	12.68	60.47	74.00	-13.53	Pk
Horizontal	7386.147	29.09	12.68	41.77	54.00	-12.23	Av

802.11n-20M mode

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)-Above 1G							
Vertical	4824.249	51.64	10.44	62.08	74	-11.92	Pk
Vertical	4824.249	35.81	10.44	46.25	54	-7.75	Av
Vertical	7236.188	47.15	12.39	59.54	74	-14.46	Pk
Vertical	7236.188	31.22	12.39	43.61	54	-10.39	Av
Horizontal	4824.261	51.74	10.44	62.18	74	-11.82	Pk
Horizontal	4824.261	31.29	10.44	41.73	54	-12.27	Av
Horizontal	7236.102	47.51	12.39	59.90	74	-14.10	Pk
Horizontal	7236.102	29.68	12.39	42.07	54	-11.93	Av
Mid Channel (2437 MHz)-Above 1G							
Vertical	4874.194	52.46	10.40	62.86	74	-11.14	Pk
Vertical	4874.194	31.84	10.40	42.24	54	-11.76	Av
Vertical	7311.225	48.91	12.75	61.66	74	-12.34	Pk
Vertical	7311.225	31.04	12.75	43.79	54	-10.21	Av
Horizontal	4874.166	51.47	10.40	61.87	74	-12.13	Pk
Horizontal	4874.166	32.22	10.40	42.62	54	-11.38	Av
Horizontal	7311.151	48.33	12.75	61.08	74	-12.92	Pk
Horizontal	7311.151	31.09	12.75	43.84	54	-10.16	Av
High Channel (2462 MHz)- Above 1G							
Vertical	4924.303	51.28	10.39	61.67	74	-12.33	Pk
Vertical	4924.303	32.46	10.39	42.85	54	-11.15	Av
Vertical	7386.122	46.23	12.68	58.91	74	-15.09	Pk
Vertical	7386.122	30.59	12.68	43.27	54	-10.73	Av
Horizontal	4924.255	51.44	10.39	61.83	74	-12.17	Pk
Horizontal	4924.255	31.26	10.39	41.65	54	-12.35	Av
Horizontal	7386.277	49.58	12.68	62.26	74	-11.74	Pk
Horizontal	7386.277	31.62	12.68	44.30	54	-9.70	Av

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

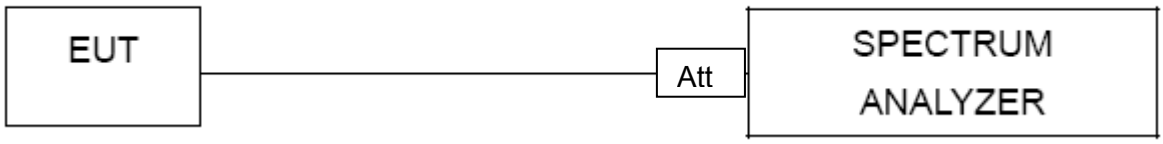
4.1.1 TEST PROCEDURE

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 ≤Set the RBW≤100 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 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

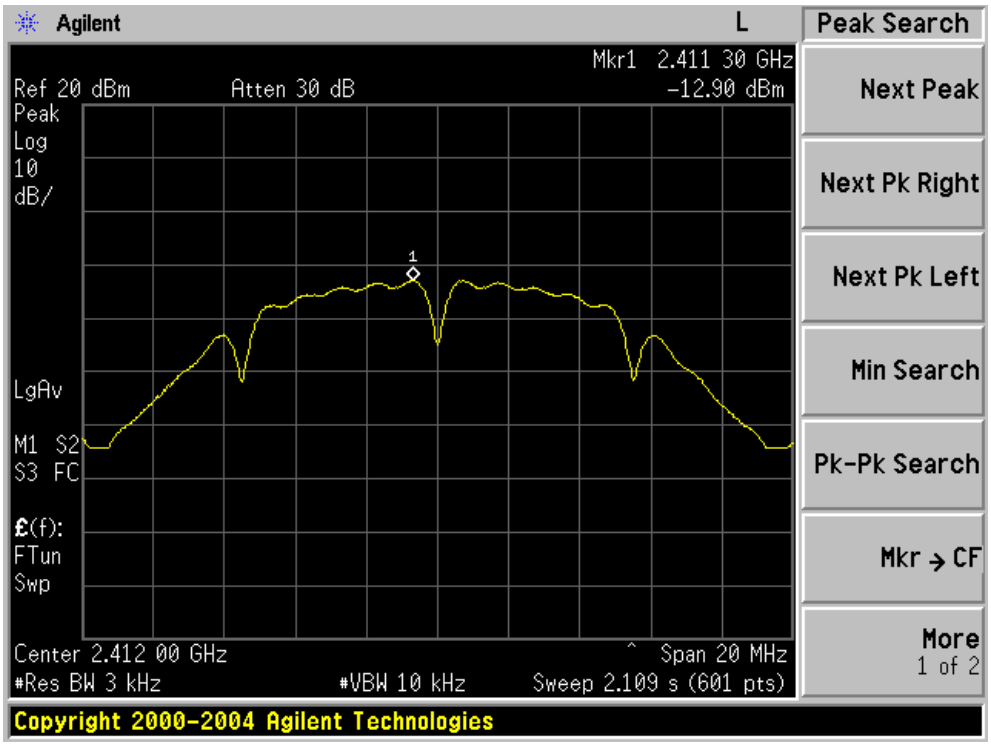
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

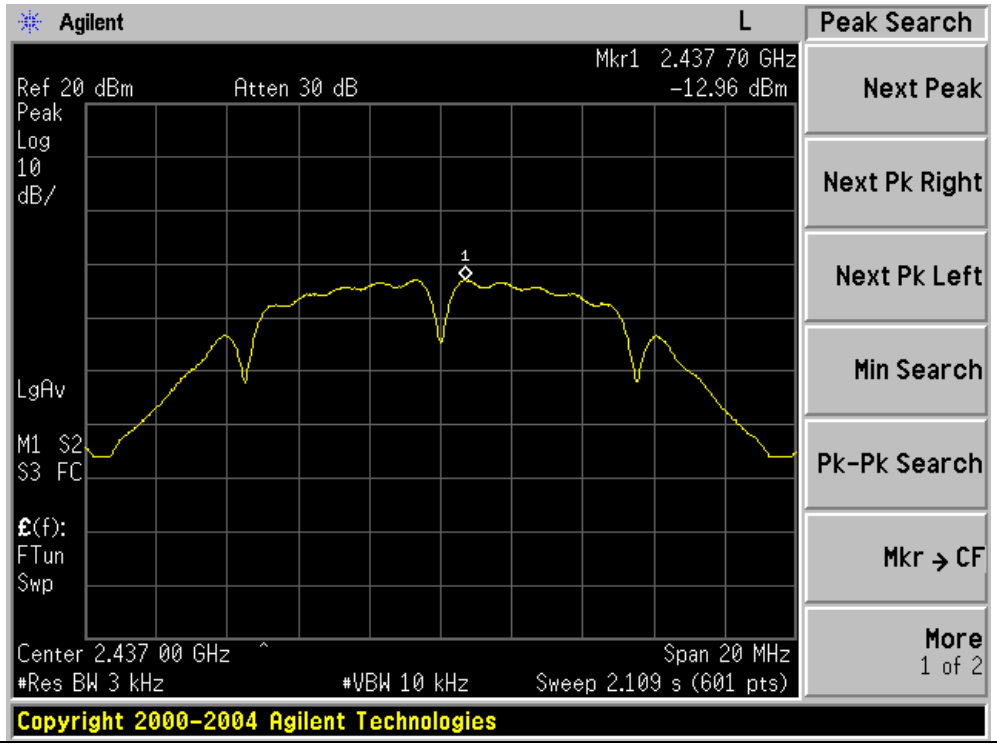
EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm3KHz)	Limit (dBm3KHz)	Result
2412 MHz	-12.90	8	PASS
2437 MHz	-12.96	8	PASS
2462 MHz	-13.06	8	PASS

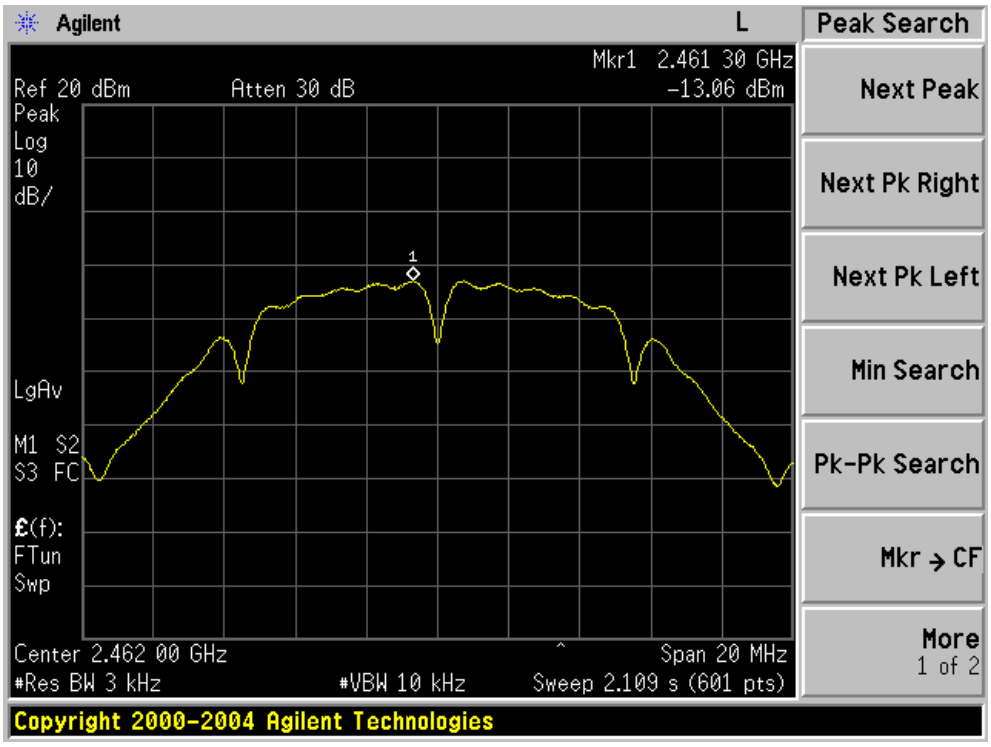
TX CH01



TX CH06



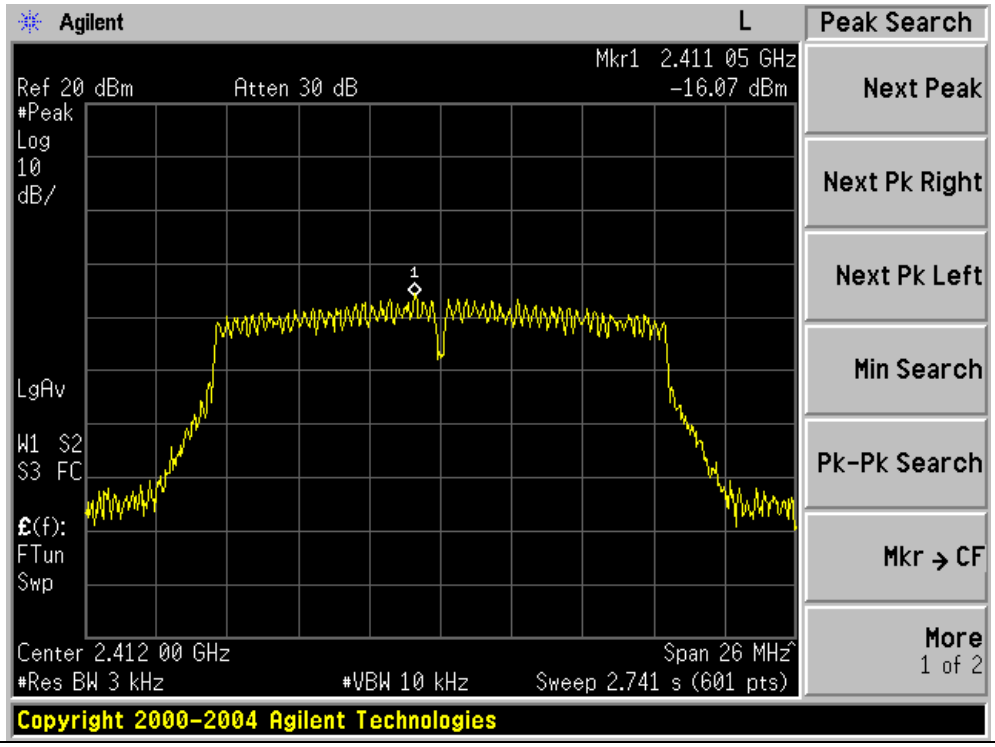
TX CH11



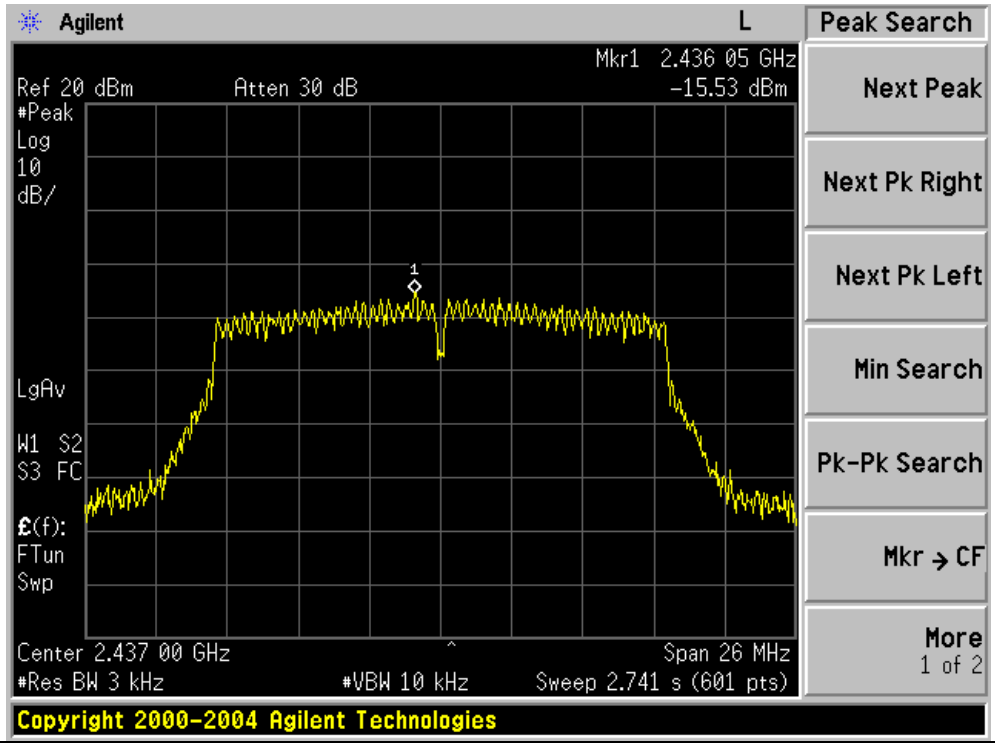
EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm3KHz)	Limit (dBm3KHz)	Result
2412 MHz	-16.07	8	PASS
2437 MHz	-15.53	8	PASS
2462 MHz	-16.73	8	PASS

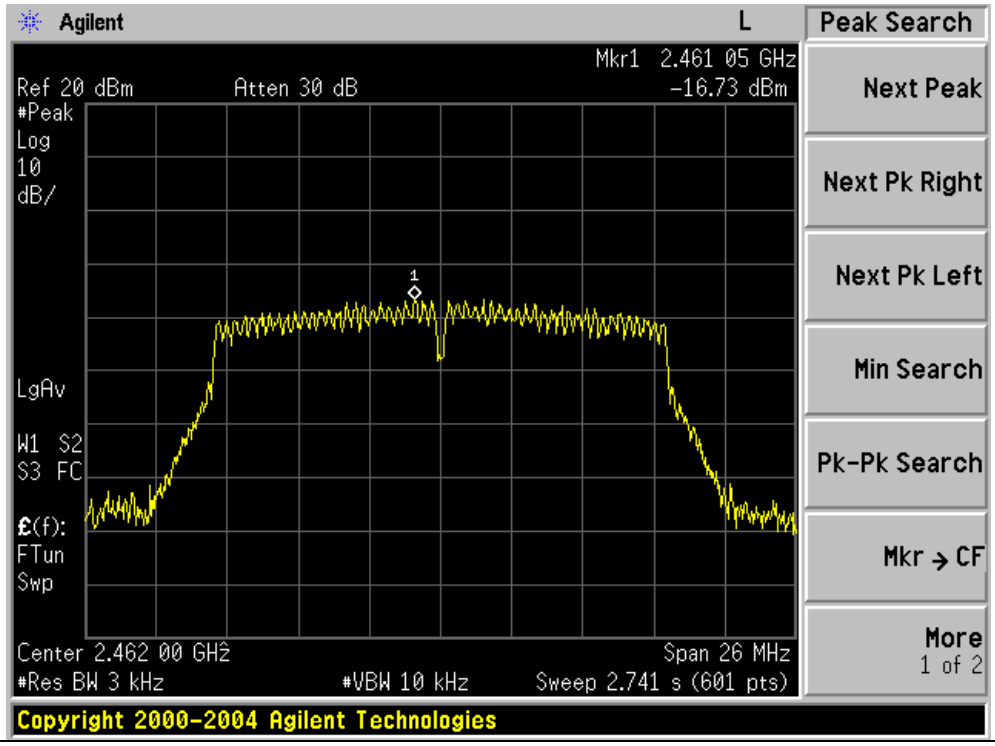
TX CH01



TX CH06



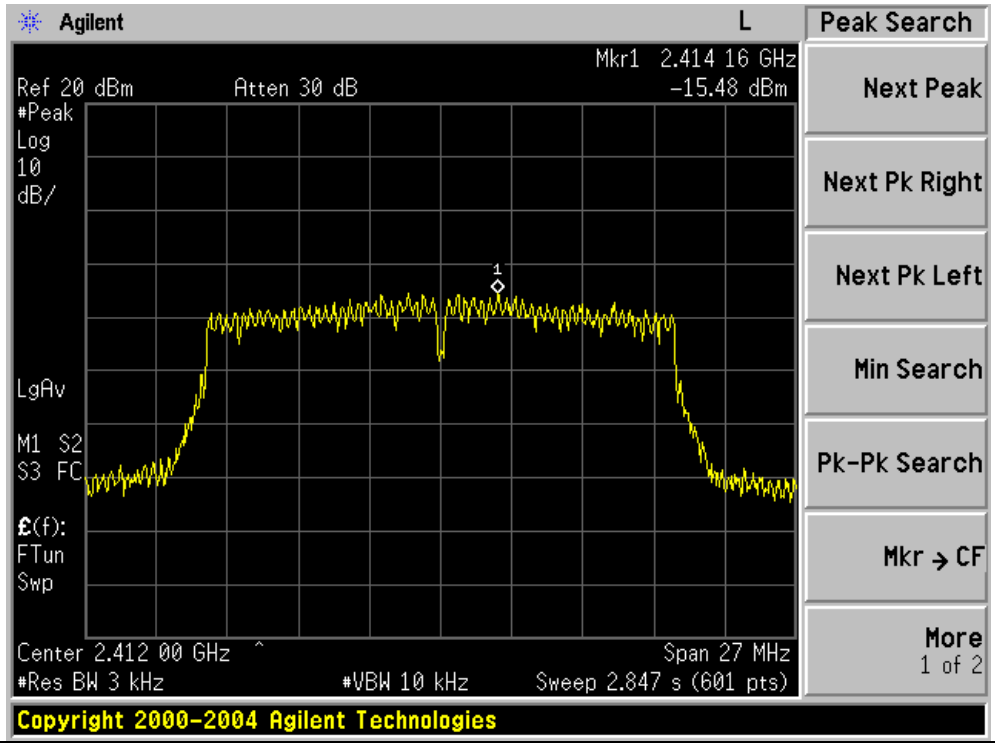
TX CH11



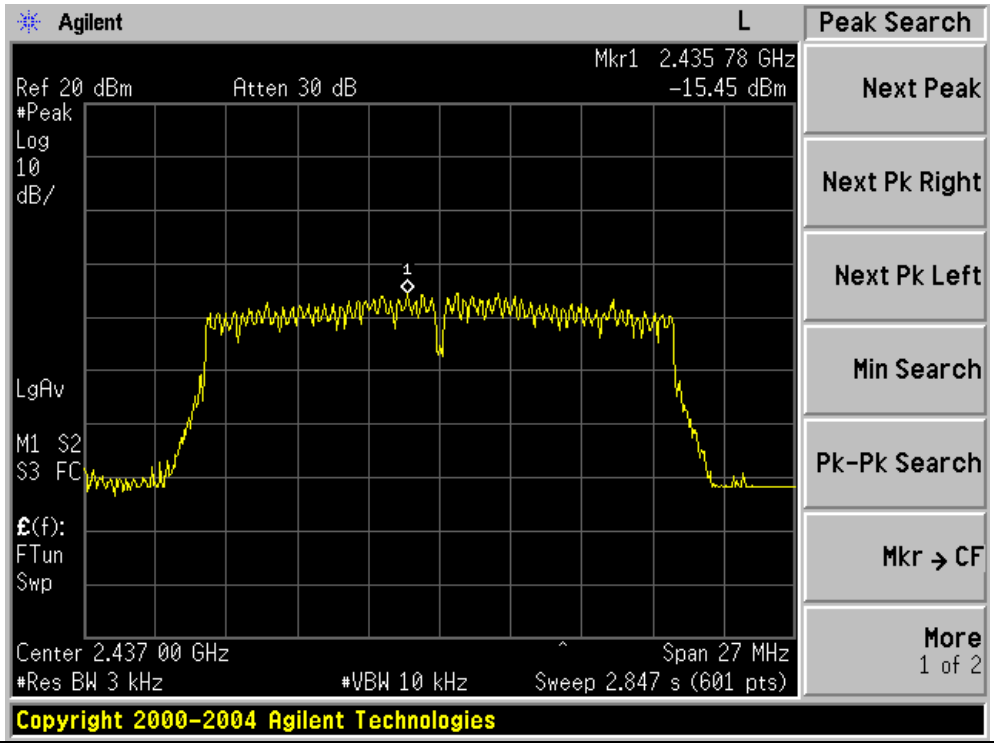
EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX n Mode (20MHz)/CH01, CH06, CH11		

Frequency	Power Density (dBm3KHz)	Limit (dBm3KHz)	Result
2412 MHz	-15.48	8	PASS
2437 MHz	-15.45	8	PASS
2462 MHz	-15.82	8	PASS

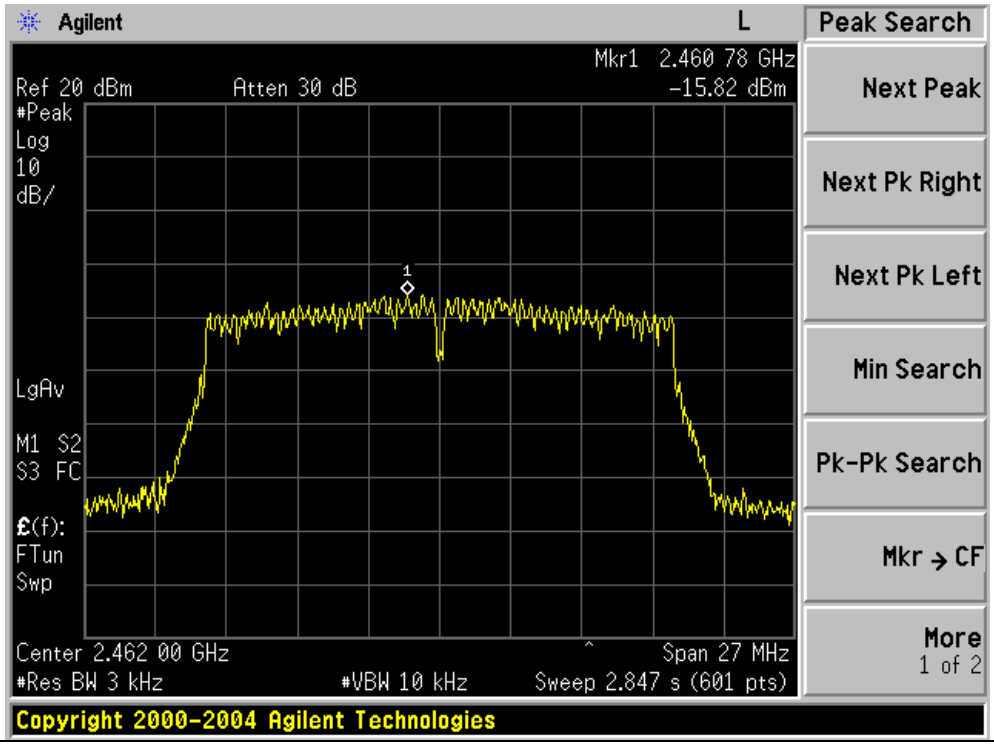
TX CH01



TX CH06



TX CH11



5. BANDWIDTH TEST

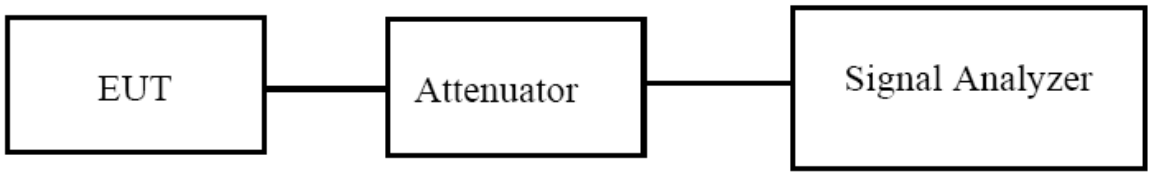
5.1 APPLIED PROCEDURES / LIMIT

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 RBW = 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.

TEST SETUP



5.1.2 EUT OPERATION CONDITIONS

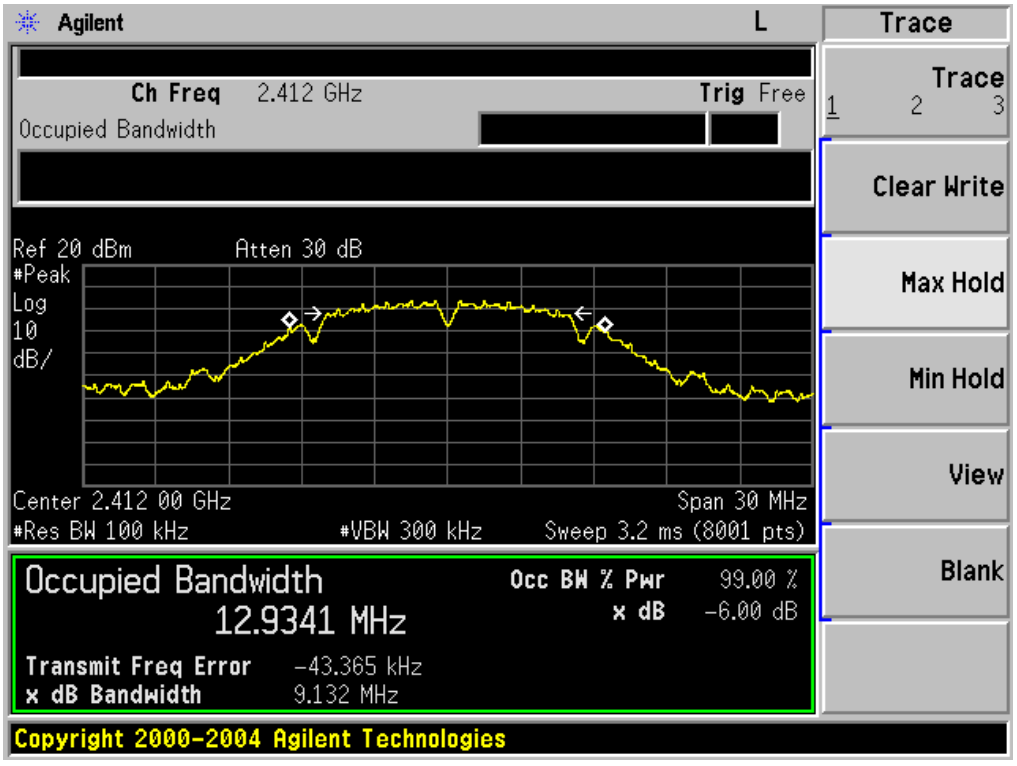
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.3 TEST RESULTS

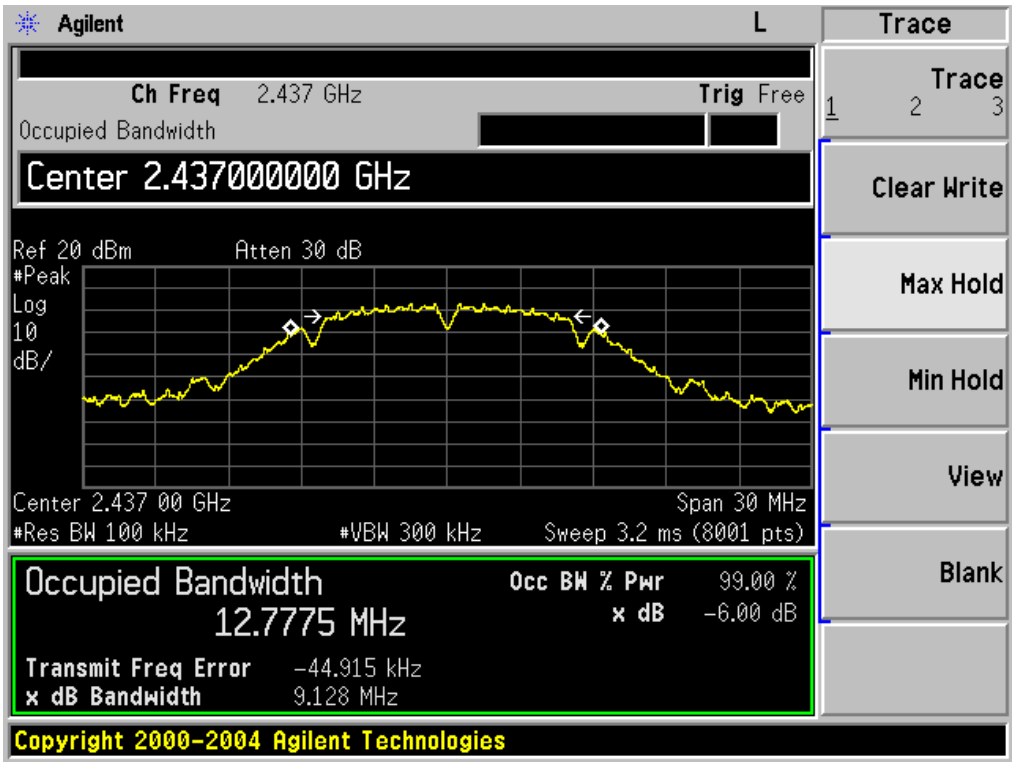
EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	14.807	9.132	500	Pass
Middle	2437	14.812	9.128	500	Pass
High	2462	14.806	9.126	500	Pass

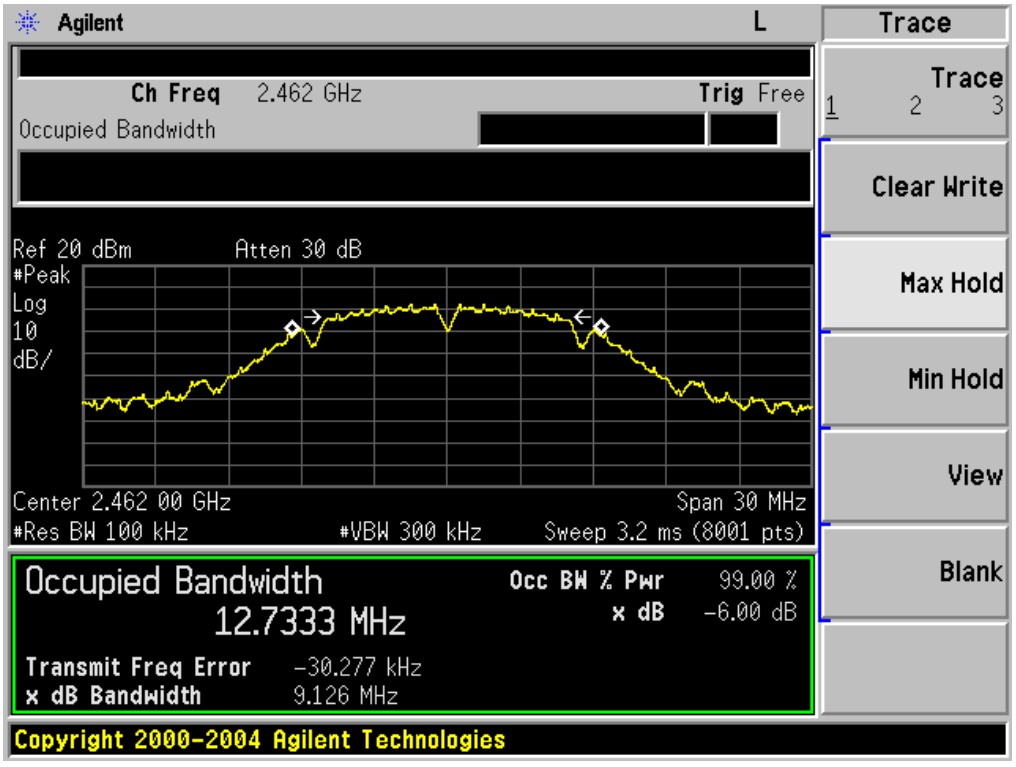
TX CH 01



TX CH 06

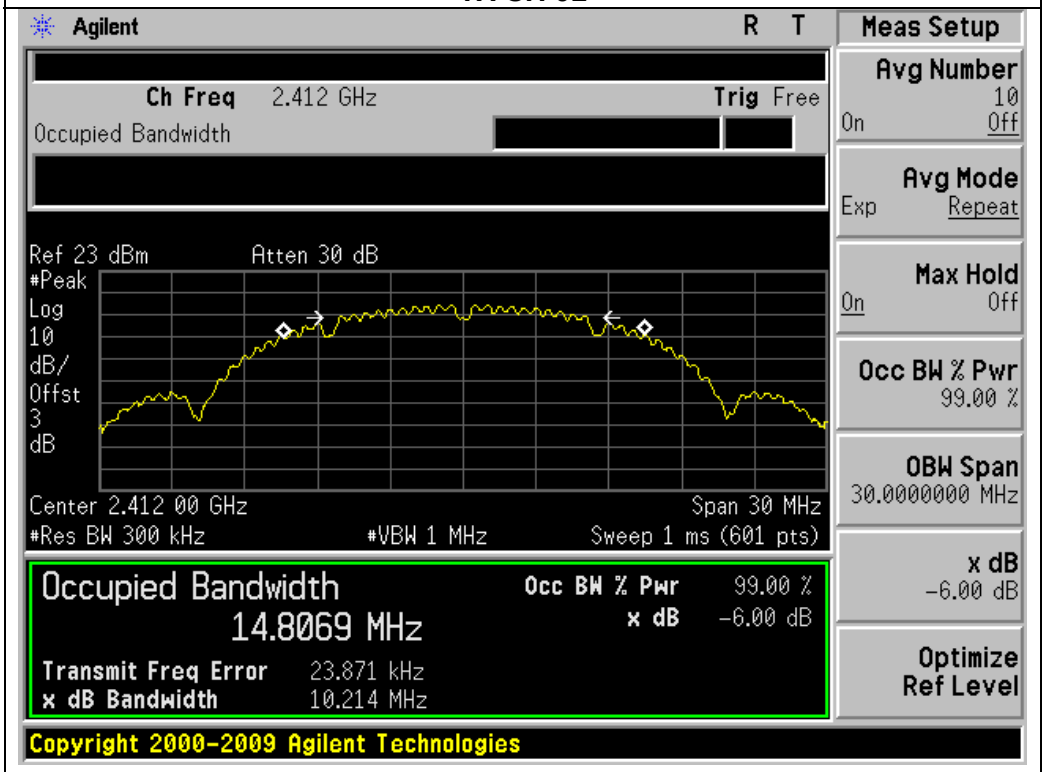


TX CH 11

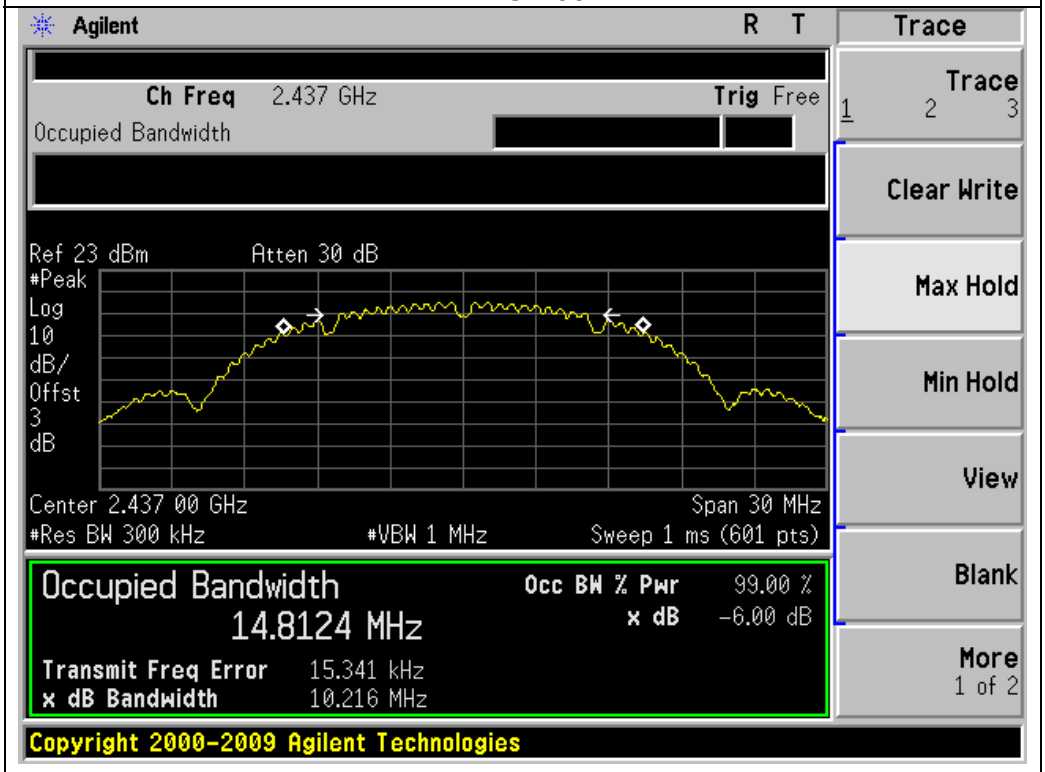


99% **bandwidth**

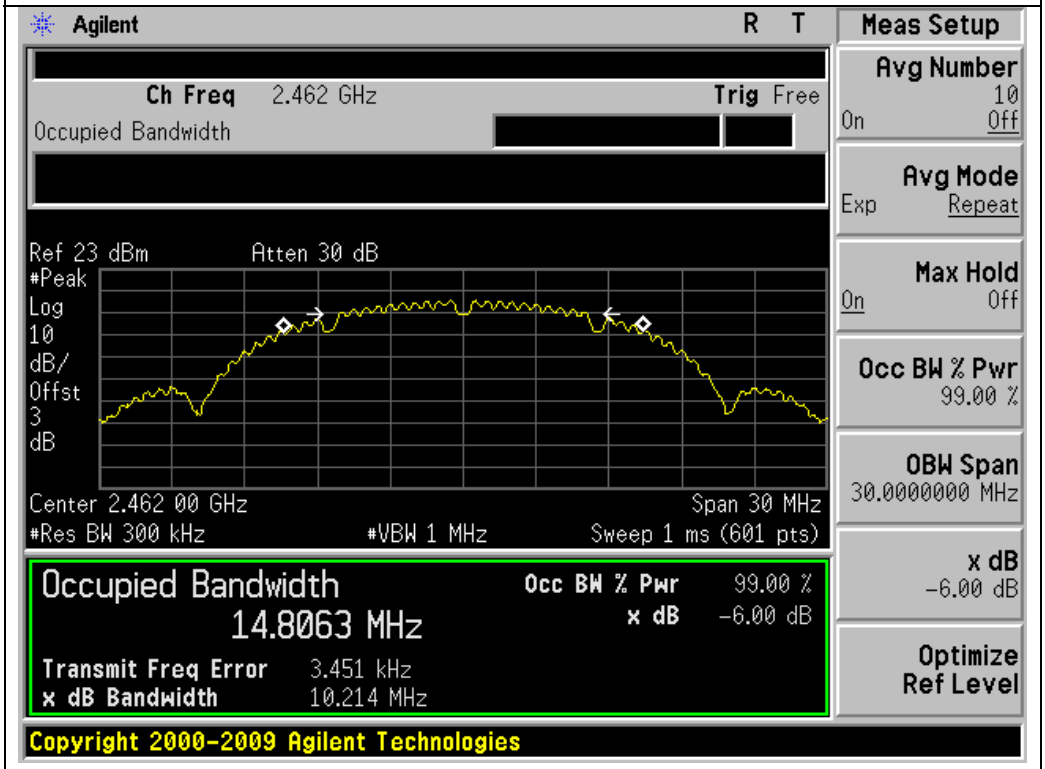
TX CH 01



TX CH 06



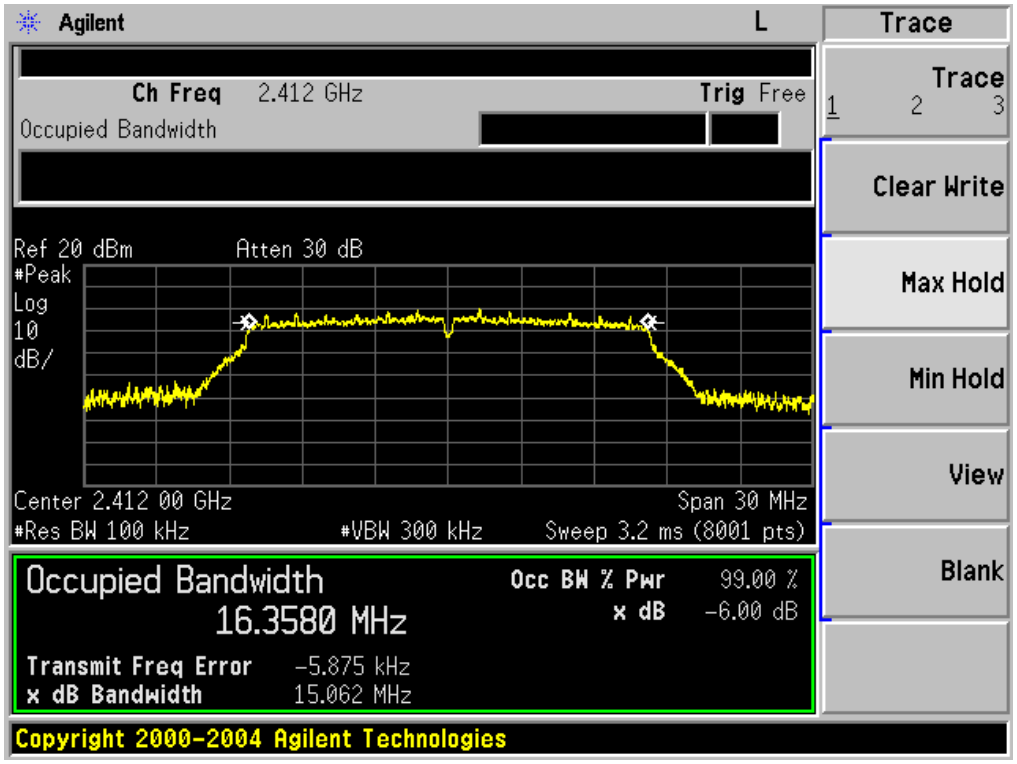
TX CH 11


Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 23 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
3
dB
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 300 kHz
#VBW 1 MHz
Sweep 1 ms (601 pts)
Occupied Bandwidth
14.8063 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
x dB
-6.00 dB
Transmit Freq Error 3.451 kHz
x dB Bandwidth 10.214 MHz
Optimize
Ref Level
Copyright 2000-2009 Agilent Technologies

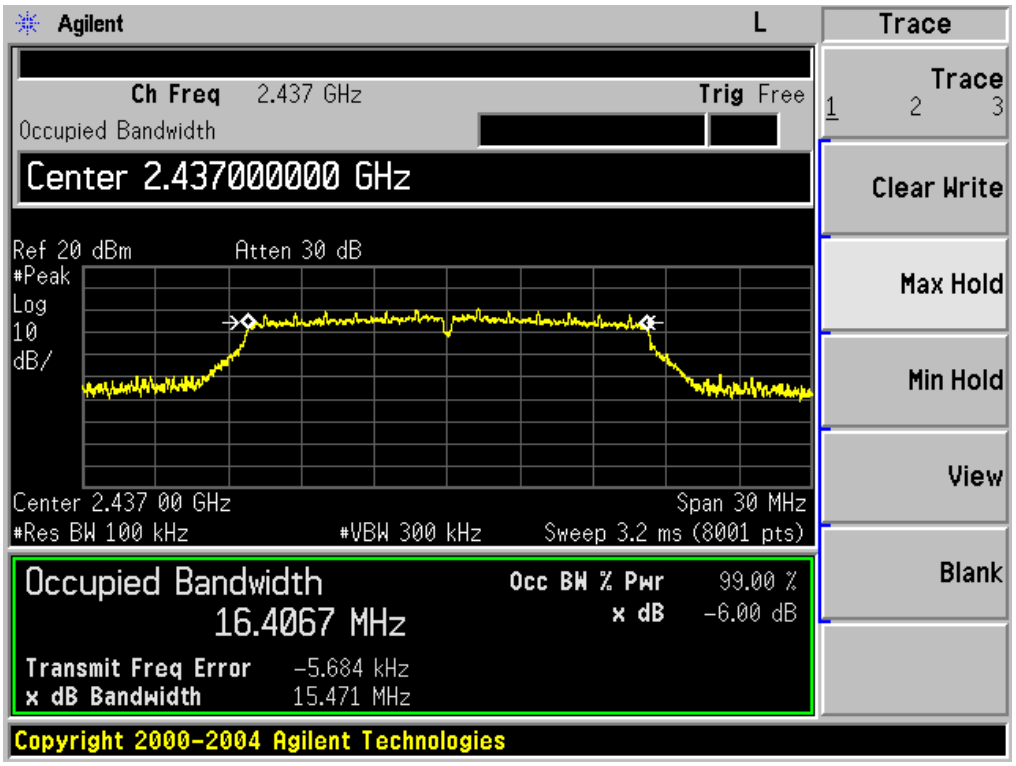
EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.829	15.062	500	Pass
Middle	2437	16.792	15.471	500	Pass
High	2462	16.805	15.679	500	Pass

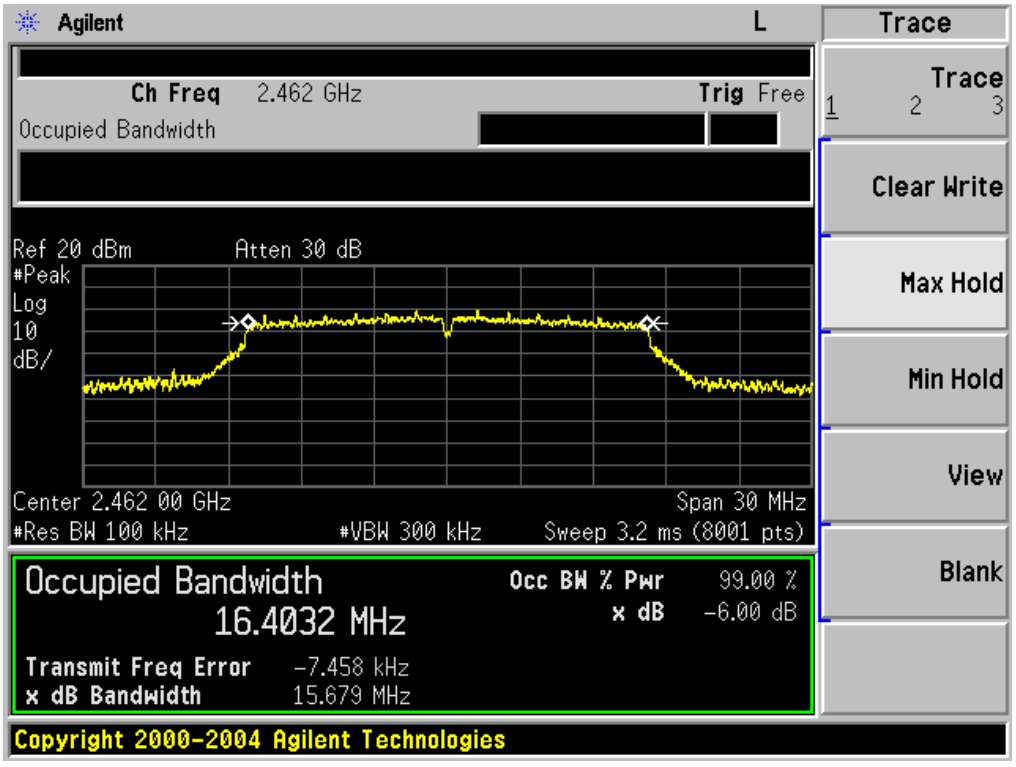
TX CH 01

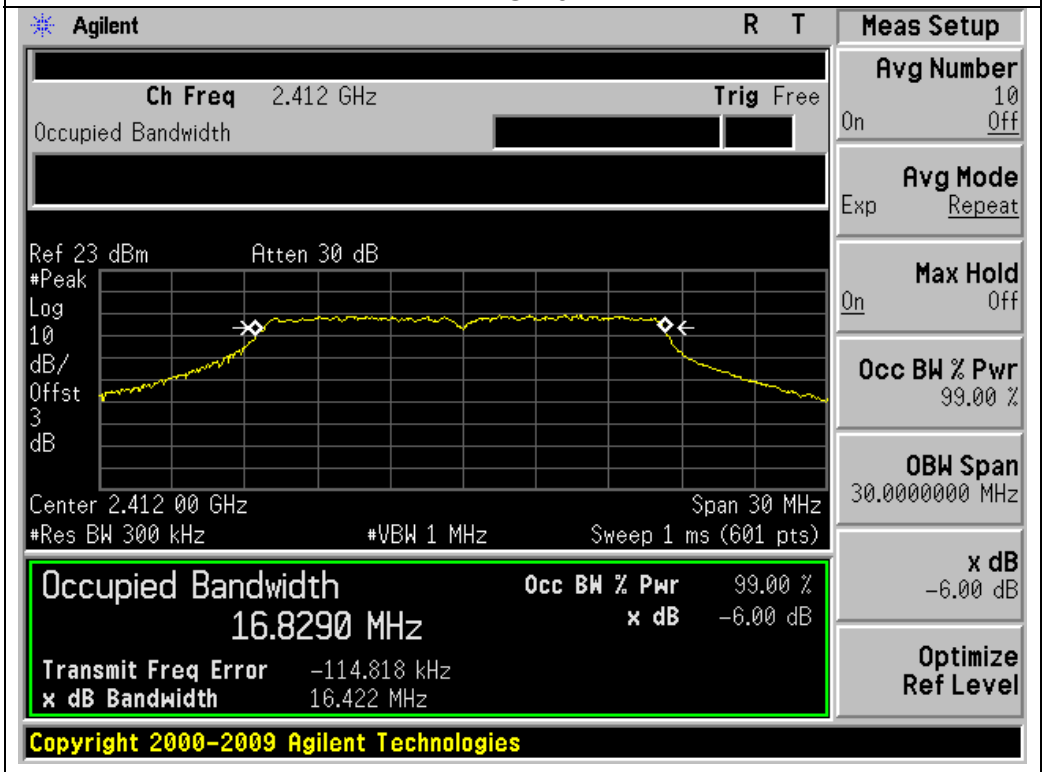
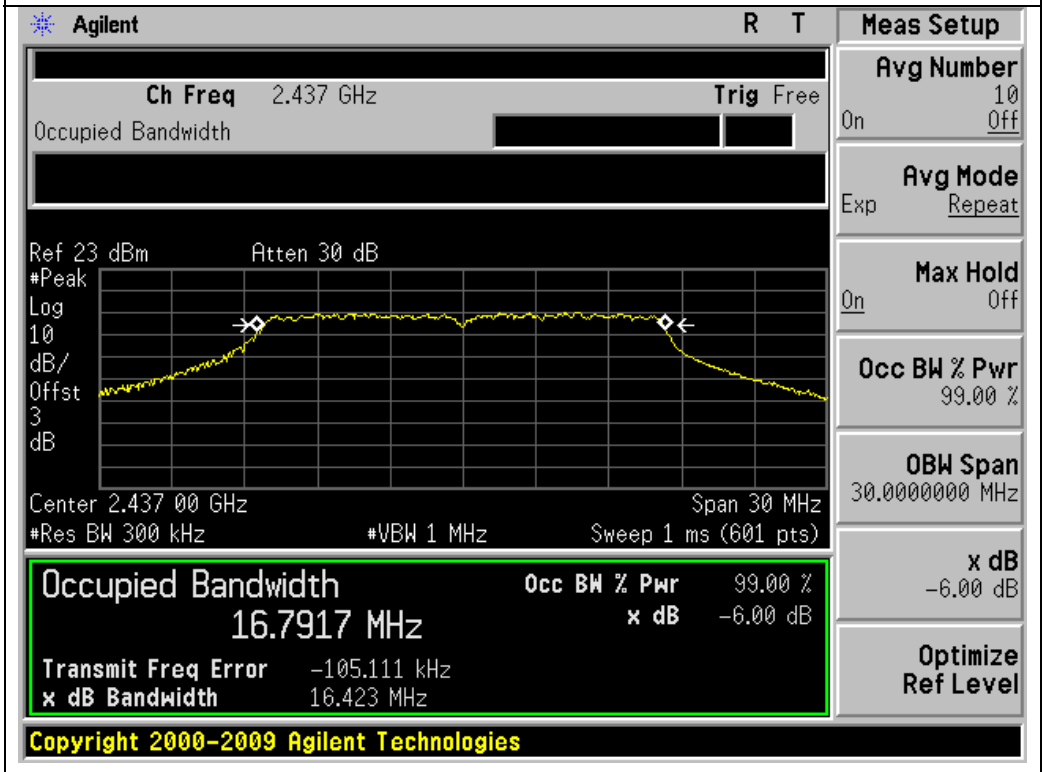


TX CH 06

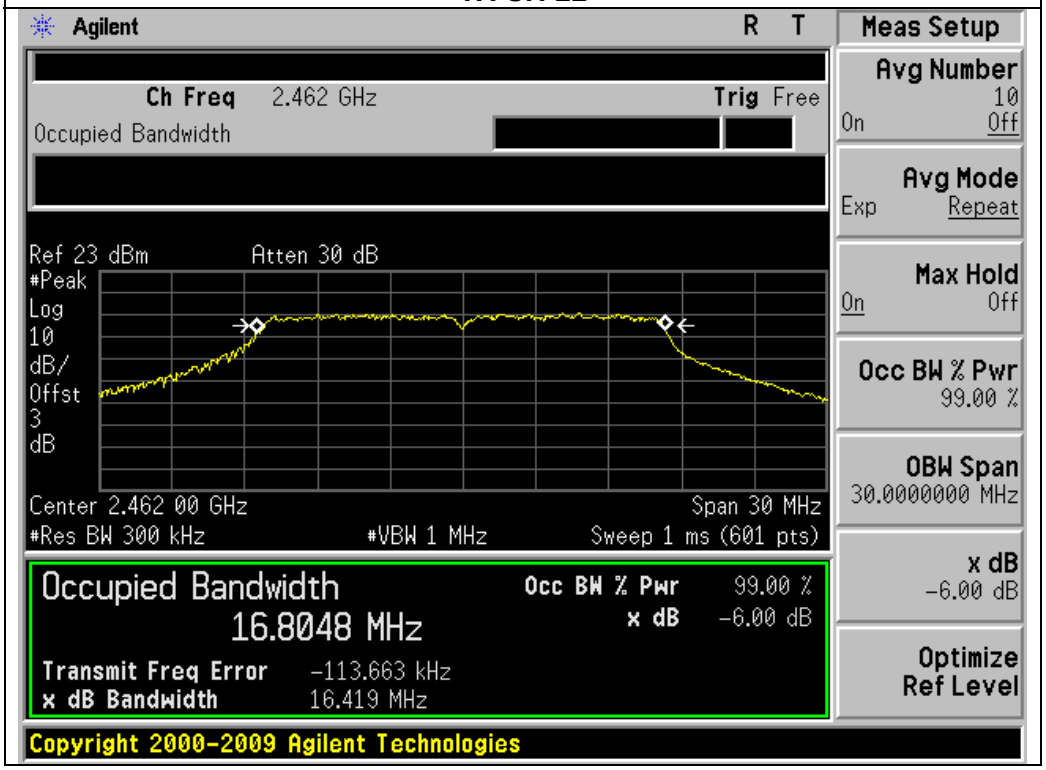


TX CH 11



99% **bandwidth**
TX CH 01

TX CH 06


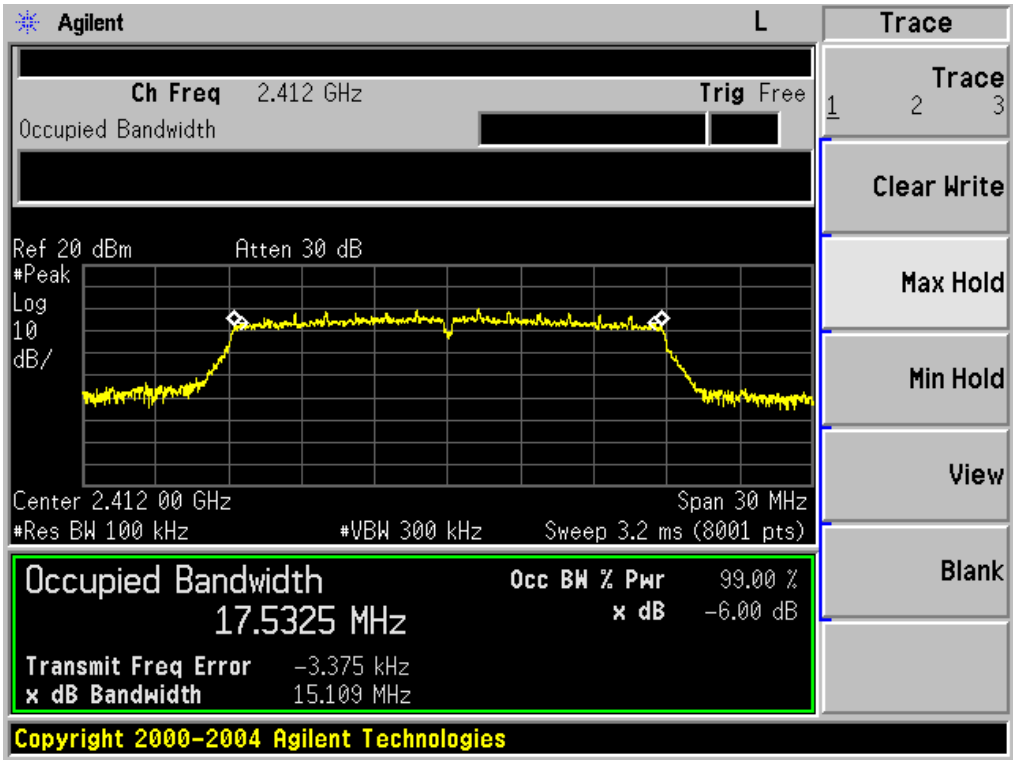
TX CH 11


Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 23 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
3
dB
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 300 kHz
#VBW 1 MHz
Sweep 1 ms (601 pts)
x dB
-6.00 dB
Occupied Bandwidth
16.8048 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -113.663 kHz
x dB Bandwidth 16.419 MHz
Optimize
Ref Level
Copyright 2000-2009 Agilent Technologies

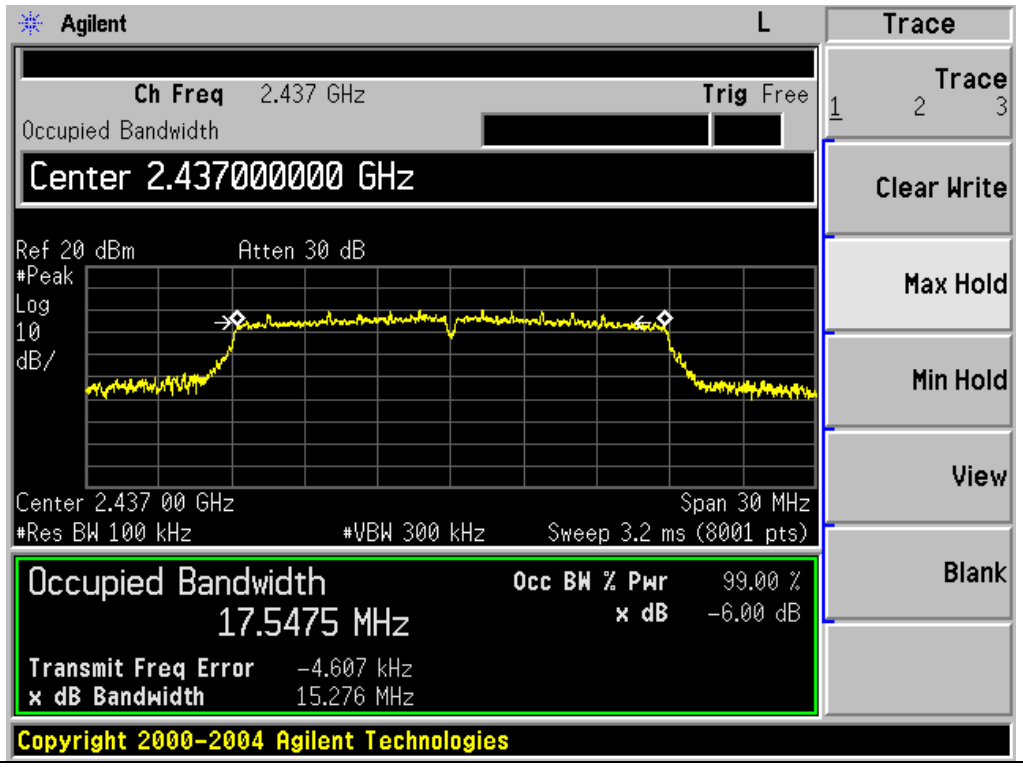
EUT：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX n Mode(20M) /CH01, CH06, CH11		

Channel	Frequency (MHz)	99% bandwidth (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.900	15.109	500	Pass
Middle	2437	17.892	15.276	500	Pass
High	2462	17.917	17.262	500	Pass

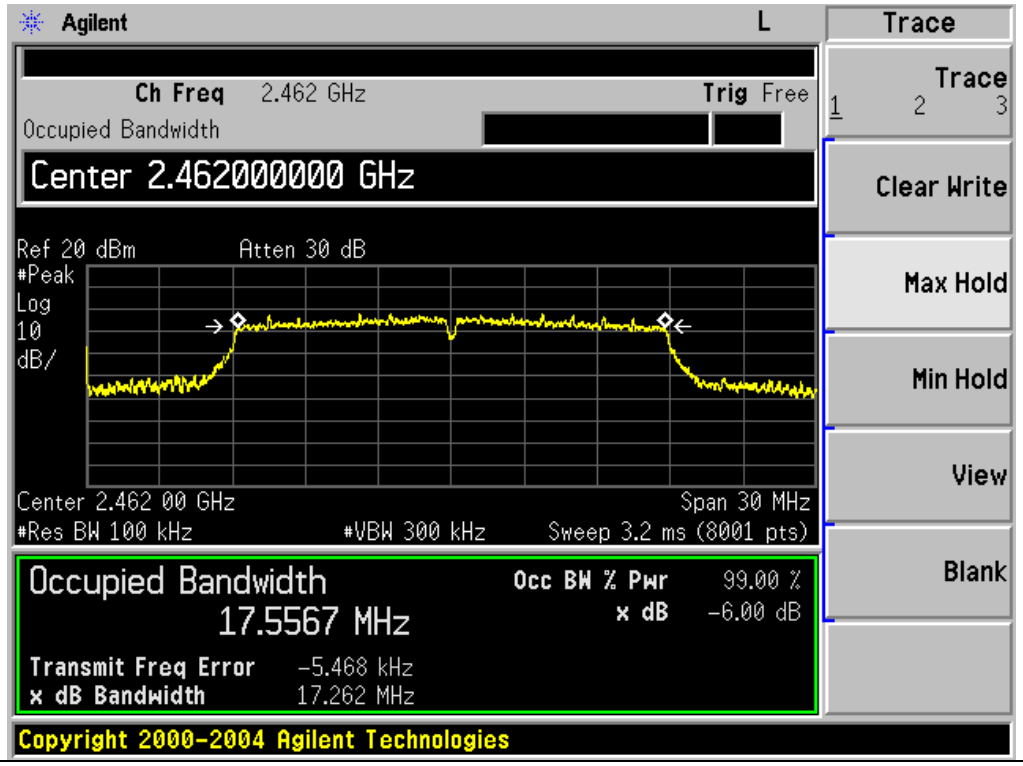
TX CH 01



TX CH 06

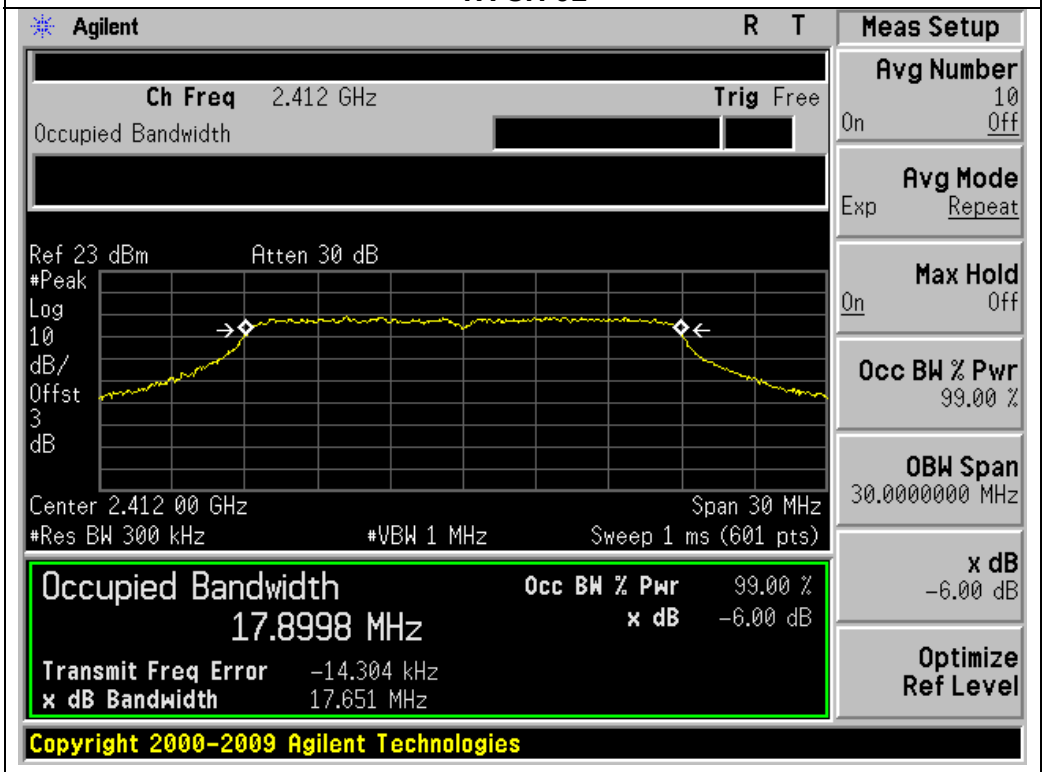


TX CH 11

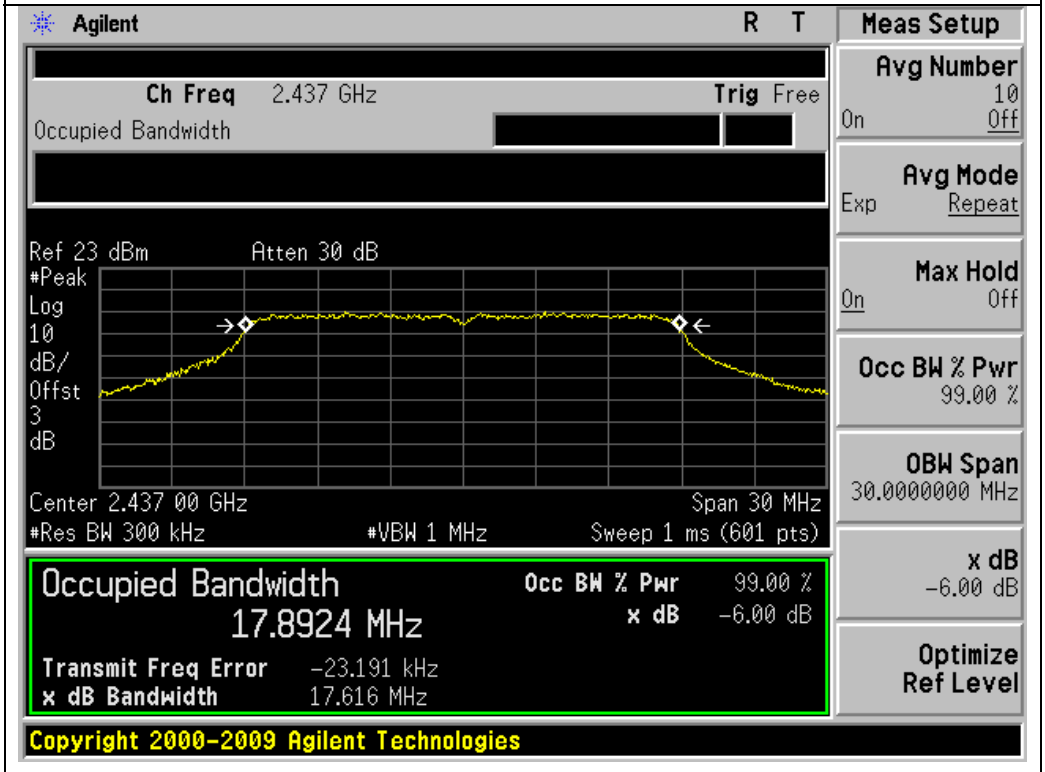


99%bandwidth

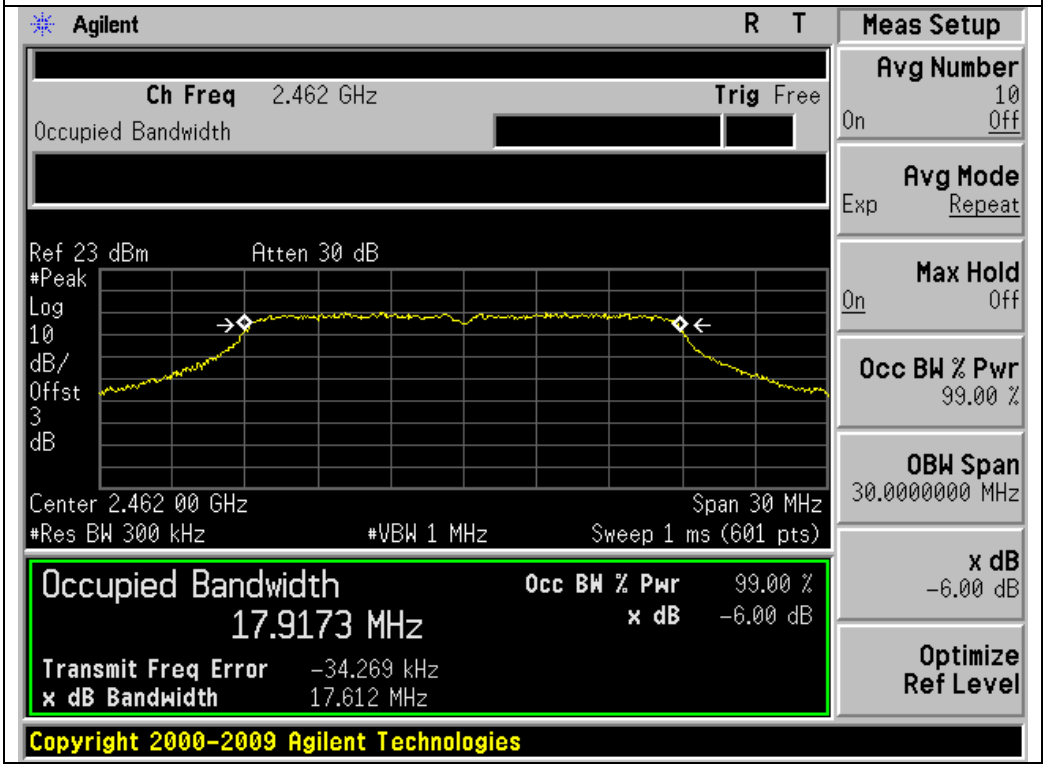
TX CH 01



TX CH 06



TX CH11


Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 23 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
3
dB
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 300 kHz
#VBW 1 MHz
Sweep 1 ms (601 pts)
Occupied Bandwidth
17.9173 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
x dB
-6.00 dB
Transmit Freq Error -34.269 kHz
x dB Bandwidth 17.612 MHz
Optimize
Ref Level
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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

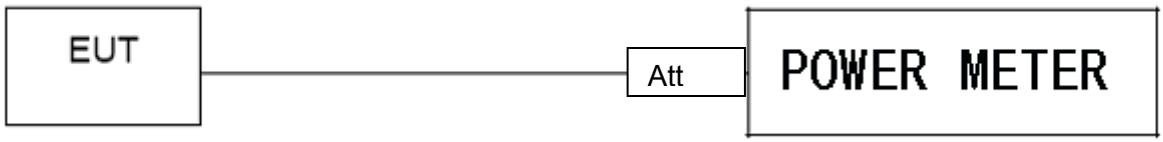
6.1.1 TEST PROCEDURE

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：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.2V
Test Mode ：	TX b/g/n(20M) Mode		

TX 802.11b Mode				
Test Channe	Frequency	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(AV)	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)
CH01	2412	19.56	14.66	30
CH06	2437	19.65	14.56	30
CH11	2462	19.58	14.63	30
TX 802.11g Mode				
CH01	2412	17.34	9.39	30
CH06	2437	17.32	9.46	30
CH11	2462	17.36	9.64	30
TX 802.11n-HT20 Mode				
CH01	2412	18.54	7.37	30
CH06	2437	18.47	7.45	30
CH11	2462	18.52	7.34	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)).

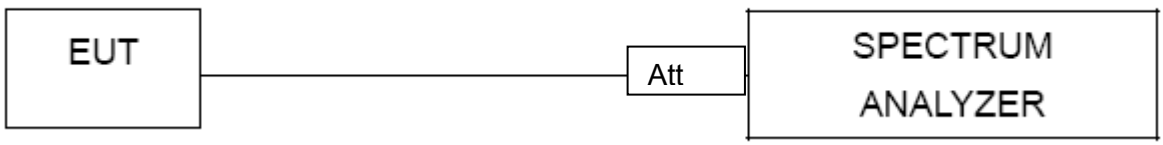
TEST PROCEDURE

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：	Edyn Water Valve	Model Name ：	ED01-001
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.2V

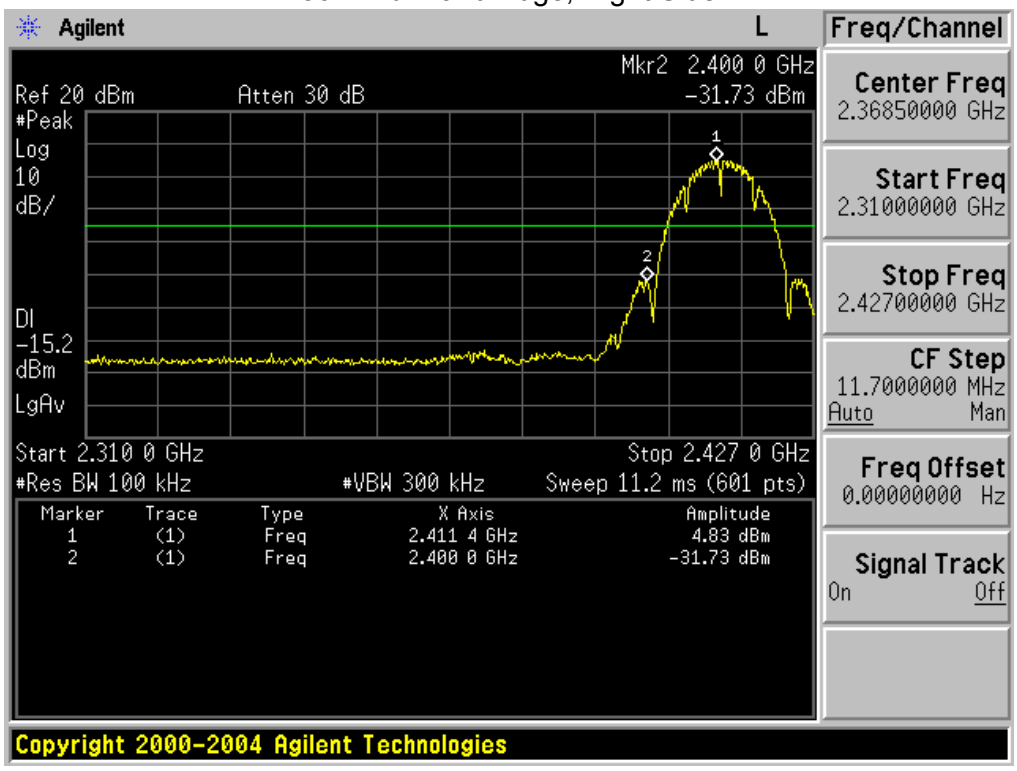
Frequency Band MHz	Delta Peak to band emission (dBc)	＞Limit (dBc)	Result
802.11b mode			
2400	36.56	20	Pass
2483.5	59.17	20	Pass
802.11g mode			
2400	26.85	20	Pass
2483.5	52.40	20	Pass
802.11n-HT20 mode			
2400	27.48	20	Pass
2483.5	53.17	20	Pass

Radiated band edge:

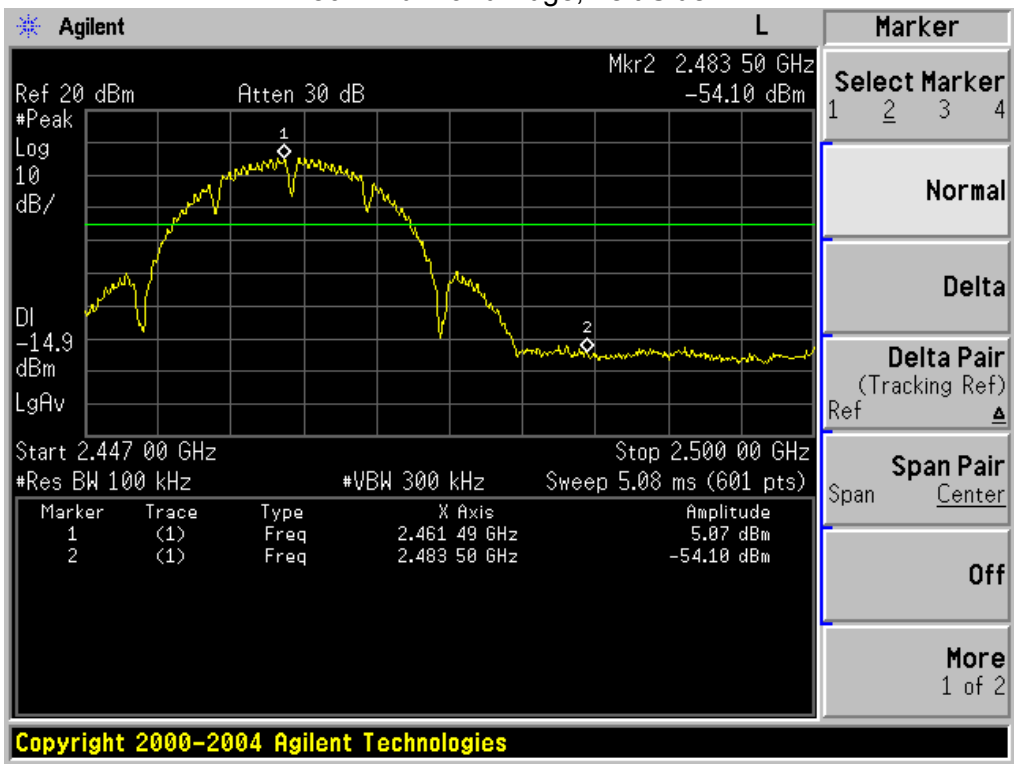
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b							
2390	58.64	-13.06	45.58	74	-28.42	peak	Vertical
2390	58.1	-13.06	45.04	74	-28.96	peak	Horizontal
2483.5	60.31	-12.78	47.53	74	-26.47	peak	Vertical
2483.5	59.67	-12.78	46.89	74	-27.11	peak	Horizontal
802.11g							
2390	58.88	-13.06	45.82	74	-28.18	peak	Vertical
2390	58.12	-13.06	45.06	74	-28.94	peak	Horizontal
2483.5	59.21	-12.78	46.43	74	-27.57	peak	Vertical
2483.5	59.47	-12.78	46.69	74	-27.31	peak	Horizontal
802.11n（20）							
2390	60.34	-13.06	47.28	74	-26.72	peak	Vertical
2390	59.96	-13.06	46.9	74	-27.10	peak	Horizontal
2483.5	60.42	-12.78	47.64	74	-26.36	peak	Vertical
2483.5	60.06	-12.78	47.28	74	-26.72	peak	Horizontal

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

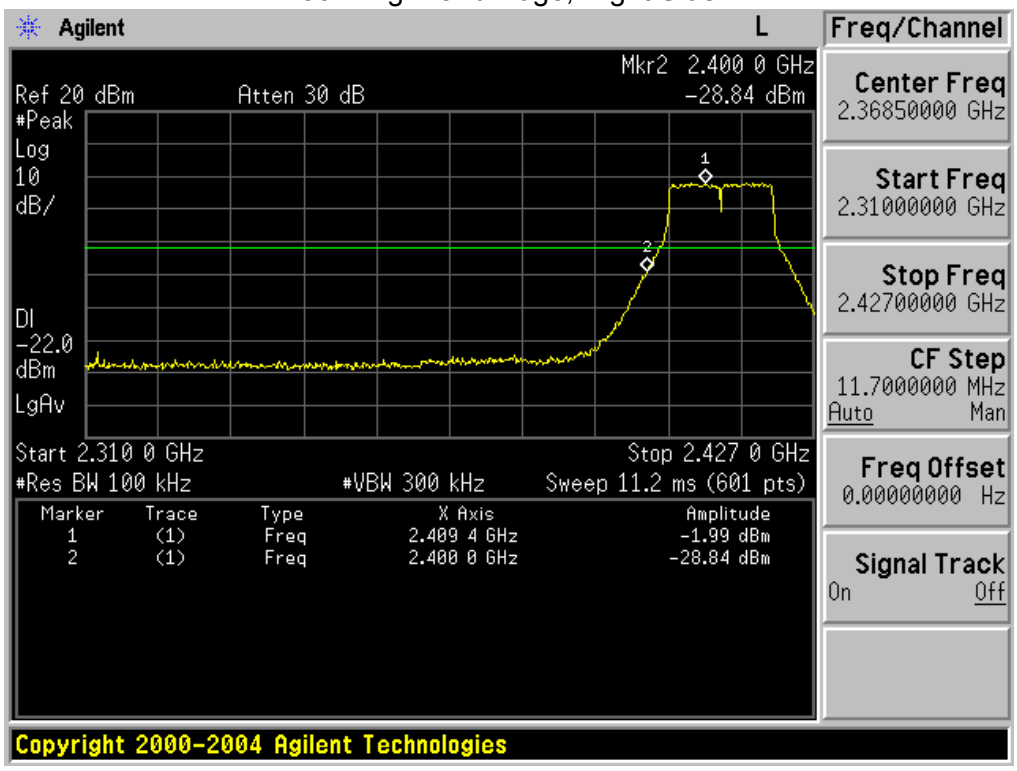
802.11b: Band Edge, Right Side



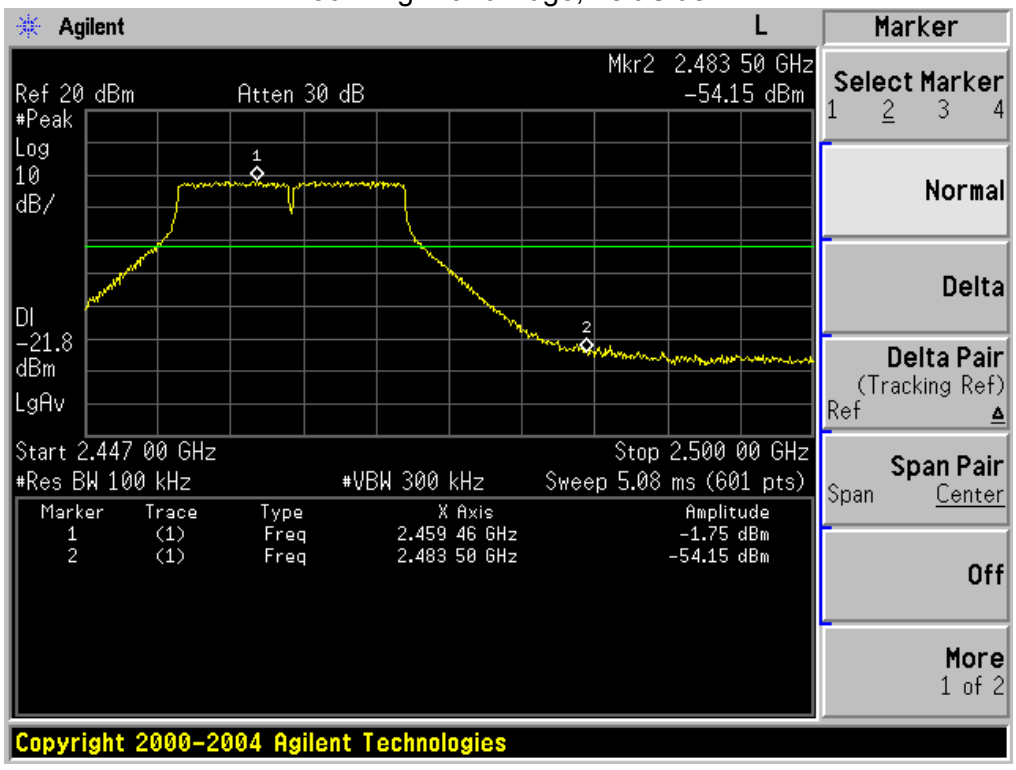
802.11b: Band Edge, Left Side



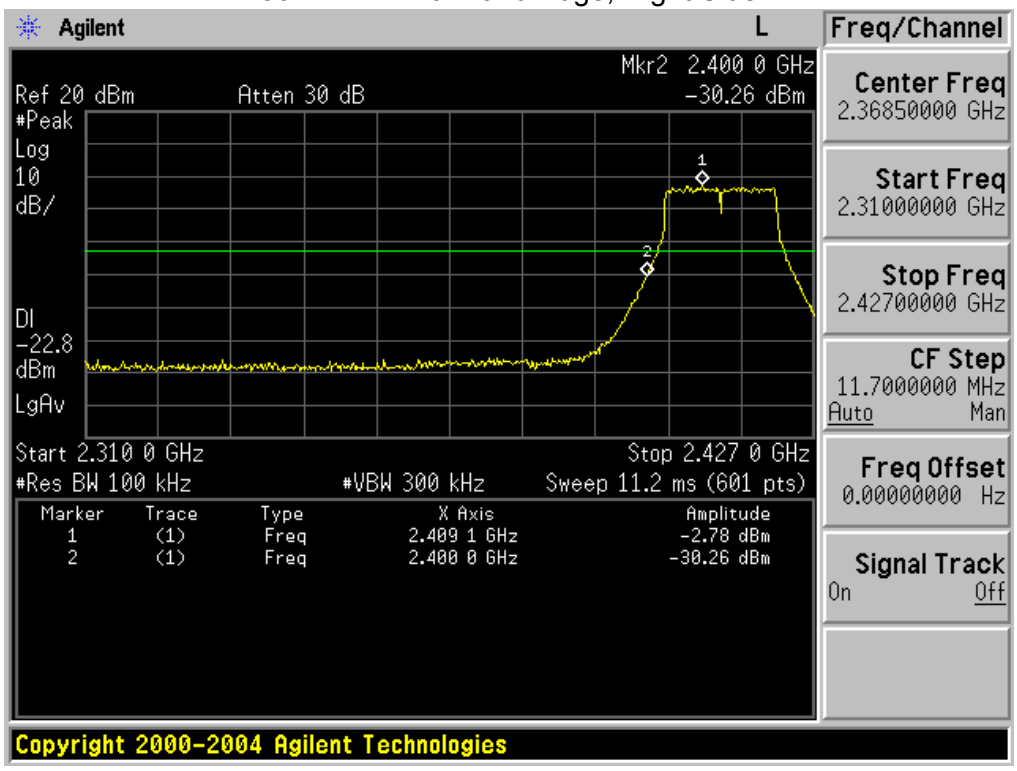
802.11g: Band Edge, Right Side



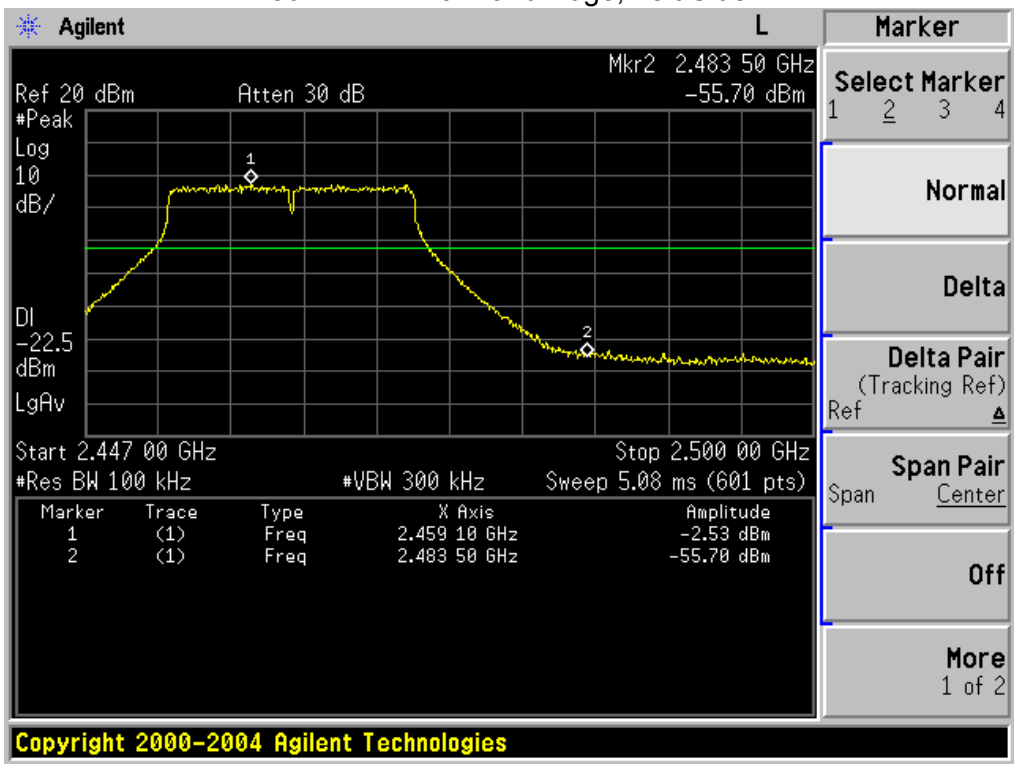
802.11g: Band Edge, Left Side



802.11n-HT20: Band Edge, Right Side



802.11n-HT20: Band Edge, Left Side



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 permanent attached antenna. It comply with the standard requirement.

9. EUT TEST PHOTO

Radiated Measurement Photos