FCC RADIO TEST REPORT
FCC ID: 2ALUDX3001

Product：	Projector
Trade Name：	CRE
Model Name：	X3001
Serial Model：	X1500,X300,X5000,X5001,X5002, X5008,X6000,X1600,X1602,X1800, X2001,X2002,X3002,X3500,X8000,X8800
Report No.：	BZT- 2017040213R

Prepared for

CRE Electronic Technology Company Limited

No.503/504, Block 3, Zone A, 1st Phase, Jindao Industrial Park,
No.169, Huizhi Rd.(M), High-tech Park, Changsha, Hunan ,China

Prepared by

BZT Testing Technology Co., Ltd.

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

TEST RESULT CERTIFICATION

Applicant's name	:	CRE Electronic Technology Company Limited
Address	:	No.503/504, Block 3, Zone A, 1st Phase, Jindao Industrial Park, No.169, Huizhi Rd.(M), High-tech Park, Changsha, Hunan ,China
Manufacture's Name	:	CRE Electronic Technology Company Limited
Address	:	No.503/504, Block 3, Zone A, 1st Phase, Jindao Industrial Park, No.169, Huizhi Rd.(M), High-tech Park, Changsha, Hunan ,China

Product description

Product name	:	Projector
Model and/or type reference	:	X3001, X1500,X300,X5000,X5001,X5002, X5008,X6000,X1600,X1602,X1800, X2001,X2002,X3002,X3500,X8000,X8800
Standards	:	FCC Part15.247
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	:	2 Apr. 2017 ~14 Apr. 2017
Date of Issue	:	14 Apr. 2016
Test Result	:	**Pass**

Testing Engineer **:** Lynn Chen

(Lynn Chen)

Technical Manager **:** Carlen

(Carlen Liu)

Authorized Signatory **:** Tommy Zhang

(Tommy zhang)

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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-Registration 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

<table>
<tr><td>Equipment</td><td>Projector</td></tr>
<tr><td>Trade Name</td><td>CRE</td></tr>
<tr><td>Model Name</td><td>X3001</td></tr>
<tr><td>Serial Model</td><td>X1500,X300,X5000,X5001,X5002,
X5008,X6000,X1600,X1602,X1800,
X2001,X2002,X3002,X3500,X8000,X8800</td></tr>
<tr><td>Model Difference</td><td>All the model are the same circuit and RF module,
except the model name.</td></tr>
<tr><td>Product Description</td><td>The EUT is a Projector
<table>
<tr><td>Operation Frequency:</td><td>802.11b/g/n(20MHz):2412~2462 MHz
802.11n(40MHz):2422~2452</td></tr>
<tr><td>Modulation Type:</td><td>CCK/OFDM/DBPSK/DAPSK</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
802.11n(40MHz):300/270/240/180/150
/120/108/90/54 Mbps</td></tr>
<tr><td>Number Of Channel</td><td>802.11b/g/n20MHz:11CH
802.11n40MHz:7CH</td></tr>
<tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr>
<tr><td>Output Power(Conducted):</td><td>17.78dBm</td></tr>
</table></td></tr>
<tr><td>Channel List</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Ratings</td><td>AC 120V</td></tr>
<tr><td>Adapter</td><td>N/A</td></tr>
<tr><td>Battery</td><td>N/A</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.

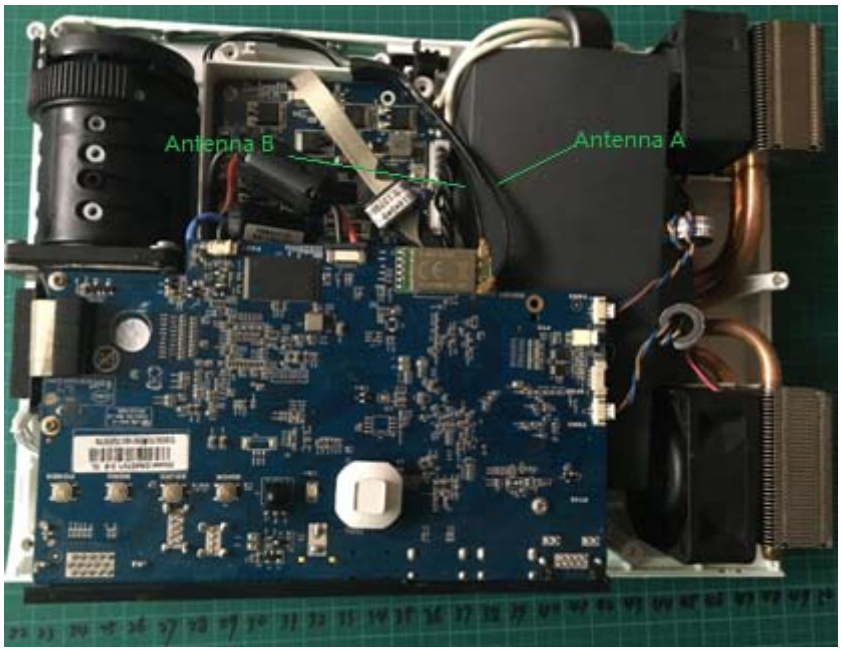
Channel List for 802.11b/g/n(20)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

Channel List for 802.11n(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	06	2437	09	2452		
04	2427	07	2442				
05	2432	08	2447				

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Internal Antenna	N/A	0.8	Wifi Antenna
B	N/A	N/A	Internal Antenna	N/A	0.8	Wifi Antenna



The Control software(tool_WIFI.exe) can control antenna A B,

For 2.4GHz mode, antenna A B are transmitting, two antennas simultaneously transmit in MIMO mode.And the data is recorded for radiated emission and band edge.

For MIMO mode , Directional gain=GANT +10log(N)dbi =3.8dbi in 2.4GHz

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9
Mode 5	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

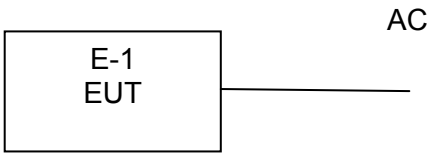
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9
Mode 5	Link Mode

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



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	Projector	CRE	X3001	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 Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	EMI Test Receiver	R&S	ESU8	100316	2016/10/25	2017/10/24
2	Double Ridged Horn Antenna (0.8GHz-18GHz)	R&S	HF907	100276	2016/11/01	2017/10/31
3	Log-periodic Dipole Antenna (30MHz-1GHz)	R&S	HL223	100435	2016/11/01	2017/10/31
4	Biconical Antenna (9K-30MHz)	R&S	HK116	100431	2016/10/25	2017/10/24
5	Pre-amplifer	Schwarzbeck	VULB 9163	9163-462	2016/04/12	2017/04/11
6	Signal Conditioning Unit	R&S	SCU-08	10008	2016/10/25	2017/10/24
7	Rod Antenna (9K-30MHz)	R&S	HFH2-Z6	100386	2016/11/01	2017/10/31
8	Pre-amplifer	R&S	SCU-01	10049	2016/10/25	2017/10/24
9	Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	2016/11/01	2017/10/31
10	Spectrum Analyzer	Agilent	E4407B	MY45109572	2016/11/01	2017/10/31
11	Power Meter	R&S	NRVS	100696	2016/11/01	2017/10/31
12	Power Sensor	R&S	URV5-Z4	0395.1619.05	2016/11/01	2017/10/31

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESU8	100316	2016/10/25	2017/10/24
	Current Probe	R&S	EZ-17	100532	2016/10/25	2017/10/24
3	Two Line V-Network	R&S	ENV216	101109	2016/10/25	2017/10/24
4	Passive Voltage Probe	R&S	ESH2-Z3	100169	2016/10/25	2017/10/24
5	V-Network	R&S	ESH3-Z6	100694	2016/10/25	2017/10/24
6	V-Network	R&S	ESH3-Z6	100690	2016/10/25	2017/10/24
7	Artificial mains	R&S	ESH2-Z5	100309	2016/10/25	2017/10/24
8	Pulse Limiter	R&S	ESH3-Z2	101242	2016/10/25	2017/10/24

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

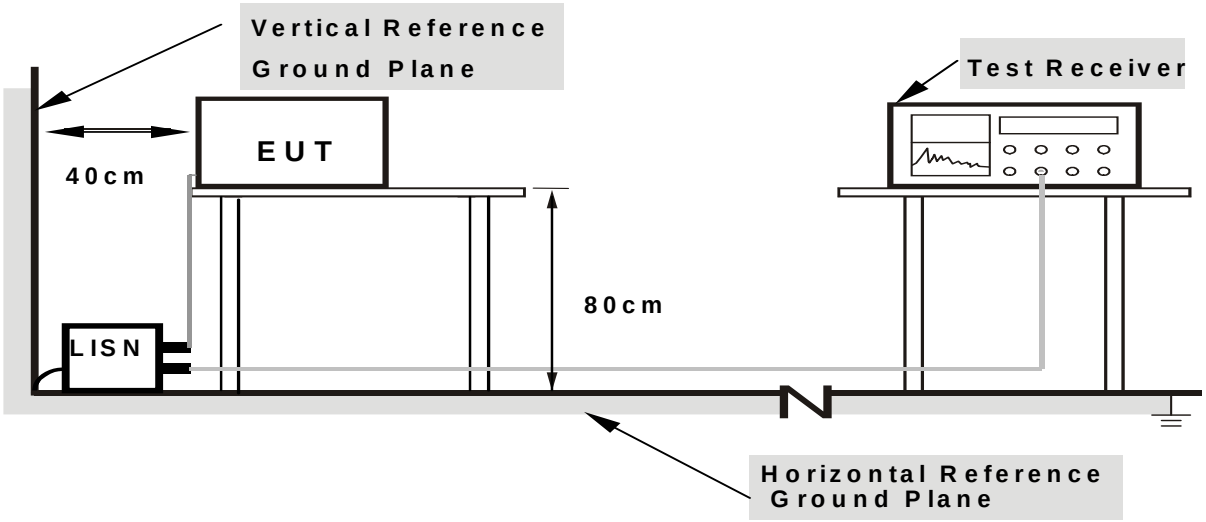
3.1.2 TEST PROCEDURE

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

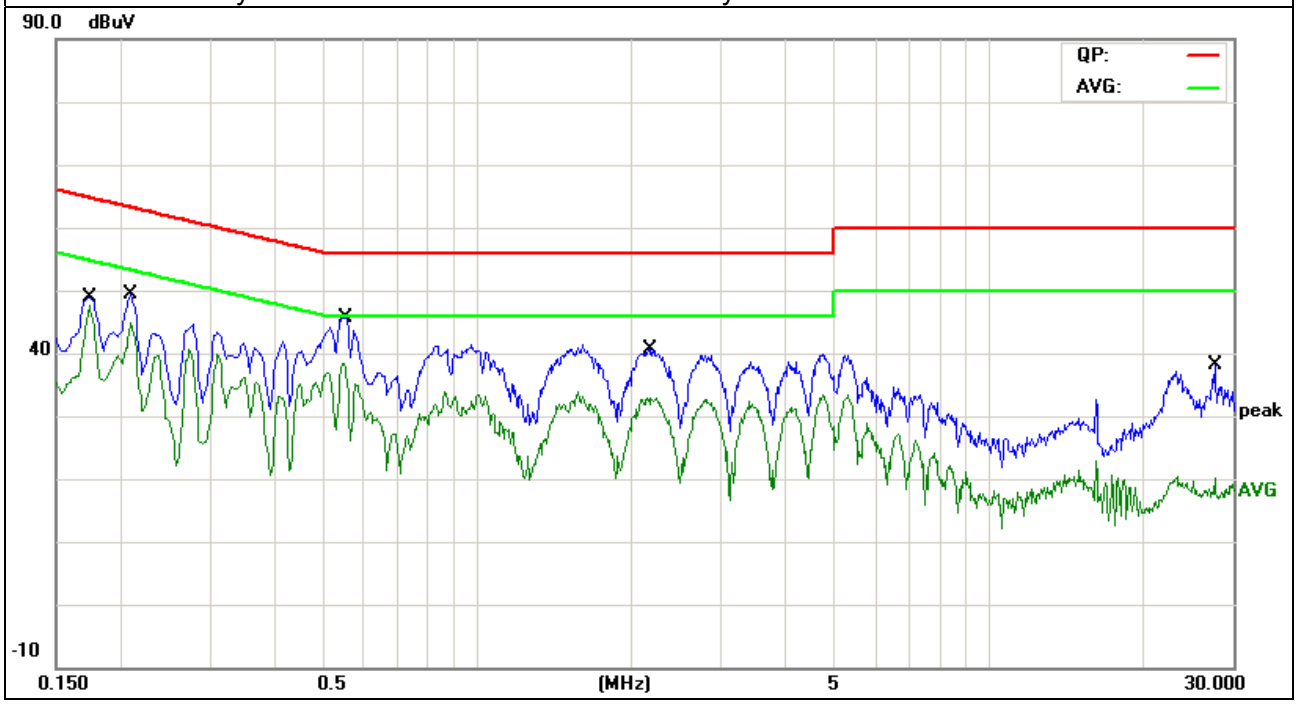
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	Projector	Model Name. ：	X3001
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC 120V/60Hz	Test Mode：	Mode 5

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1740	38.18	9.97	48.15	64.76	-16.61	QP
0.1740	37.69	9.97	47.66	54.76	-7.10	AVG
0.2100	38.07	10.02	48.09	63.20	-15.11	QP
0.2100	34.74	10.02	44.76	53.20	-8.44	AVG
0.5540	35.29	10.05	45.34	56.00	-10.66	QP
0.5540	27.45	10.05	37.50	46.00	-8.50	AVG
2.1860	28.69	10.05	38.74	56.00	-17.26	QP
2.1860	22.87	10.05	32.92	46.00	-13.08	AVG
27.5860	12.32	10.21	22.53	60.00	-37.47	QP
27.5860	2.74	10.21	12.95	50.00	-37.05	AVG

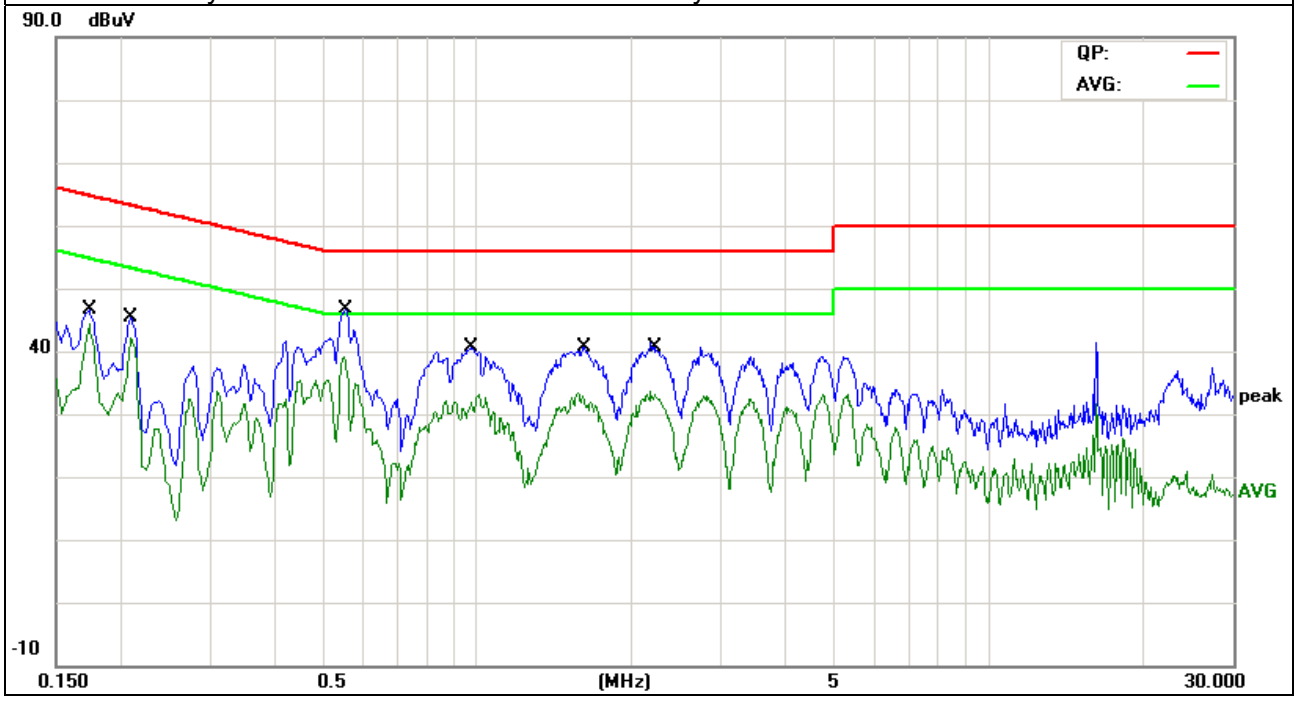
Remark:
1. All readings are Quasi-Peak and Average values.
2. lever = Read lever + factor (LISN Factor +cable loss)
   Factor added by measurement software automatically.



EUT：	Projector	Model Name. ：	X3001
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC 120V/60Hz	Test Mode：	Mode 4

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1740	34.64	10.12	44.76	64.76	-20.00	QP
0.1740	34.04	10.12	44.16	54.76	-10.60	AVG
0.2100	34.18	10.12	44.30	63.20	-18.90	QP
0.2100	32.34	10.12	42.46	53.20	-10.74	AVG
0.5540	36.21	10.02	46.23	56.00	-9.77	QP
0.5540	28.24	10.02	38.26	46.00	-7.74	AVG
0.9700	28.87	10.15	39.02	56.00	-16.98	QP
0.9700	21.06	10.15	31.21	46.00	-14.79	AVG
1.6220	28.51	10.10	38.61	56.00	-17.39	QP
1.6220	21.66	10.10	31.76	46.00	-14.24	AVG
2.2260	27.44	10.06	37.50	56.00	-18.50	QP
2.2260	22.86	10.06	32.92	46.00	-13.08	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. lever = Read lever + factor (LISN Factor +cable loss)
Factor added by measurement software automatically.



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:

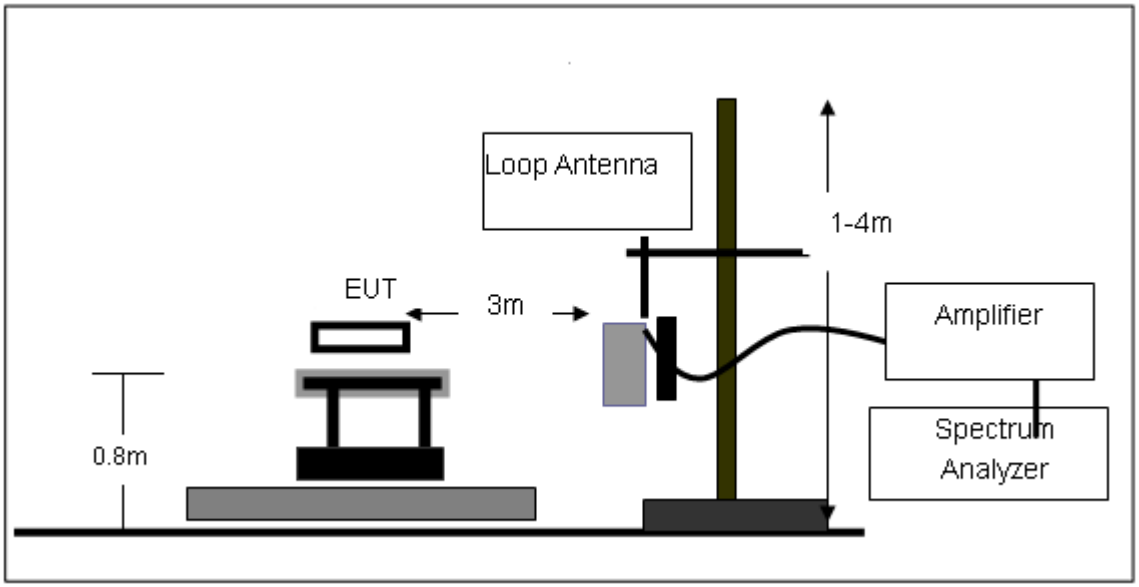
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

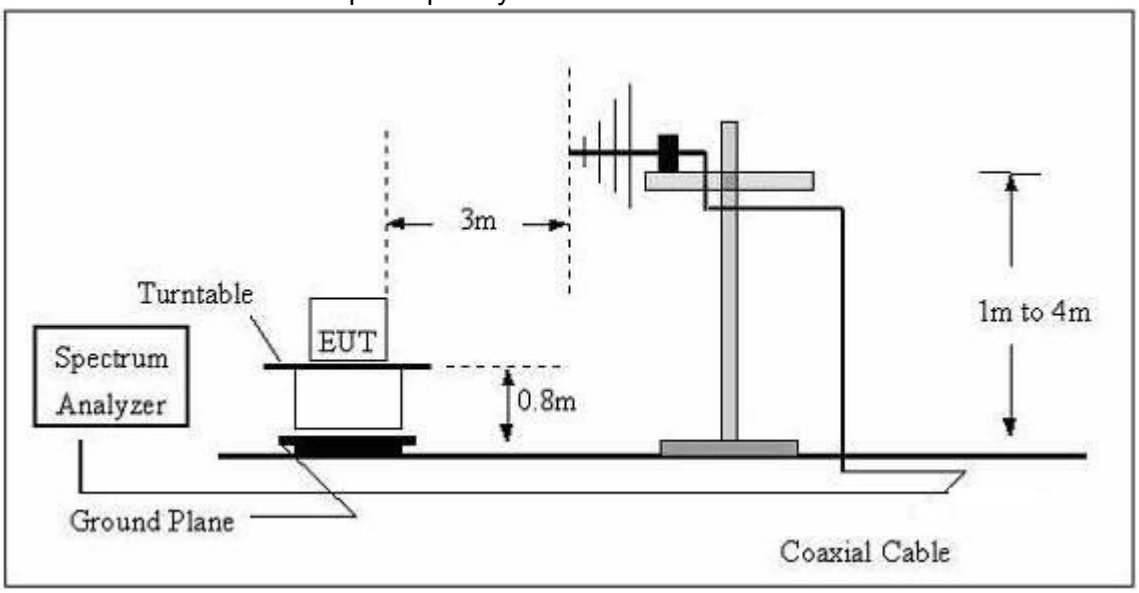
No deviation

3.2.4 TEST SETUP

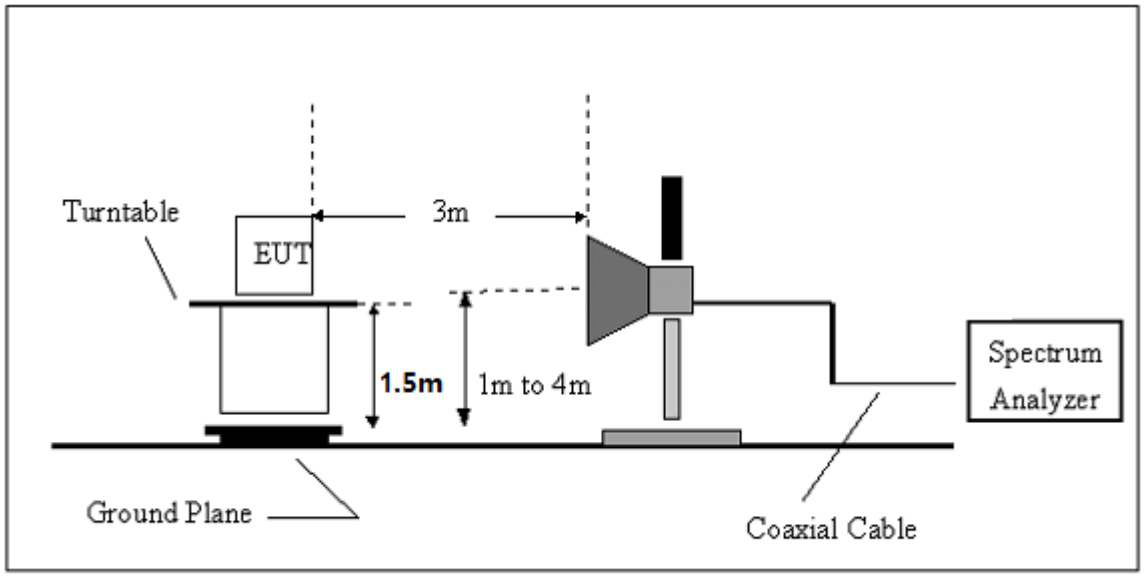
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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 – 30 MHZ)

EUT：	Projector	Model Name. ：	X3001
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX	Polarization :	--

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

NOTE:

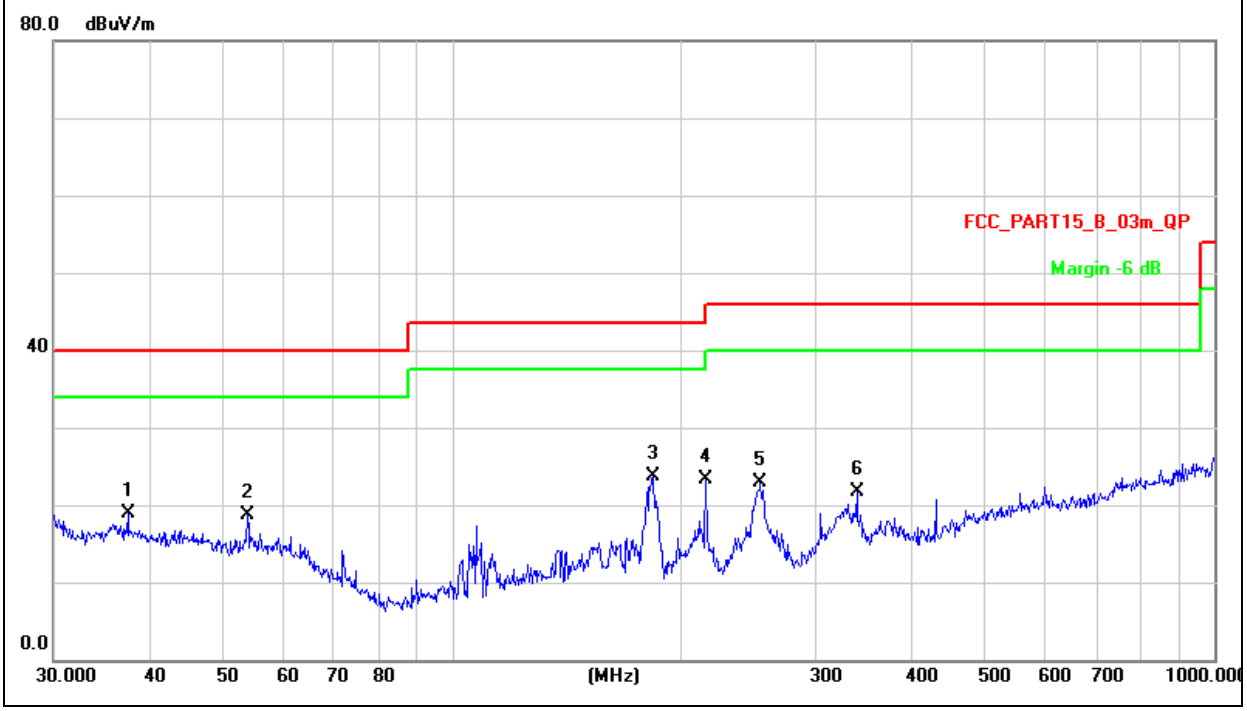
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	Projector	Model Name ：	X3001
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	AC 120V/60Hz		
Test Mode ：	TX		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
37.5479	27.55	-8.73	18.82	40.00	-21.18	QP
53.8818	29.57	-10.93	18.64	40.00	-21.36	QP
183.2005	38.44	-14.73	23.71	43.50	-19.79	QP
215.2678	39.09	-15.77	23.32	43.50	-20.18	QP
253.8367	37.06	-14.09	22.97	46.00	-23.03	QP
339.5888	33.35	-11.57	21.78	46.00	-24.22	QP

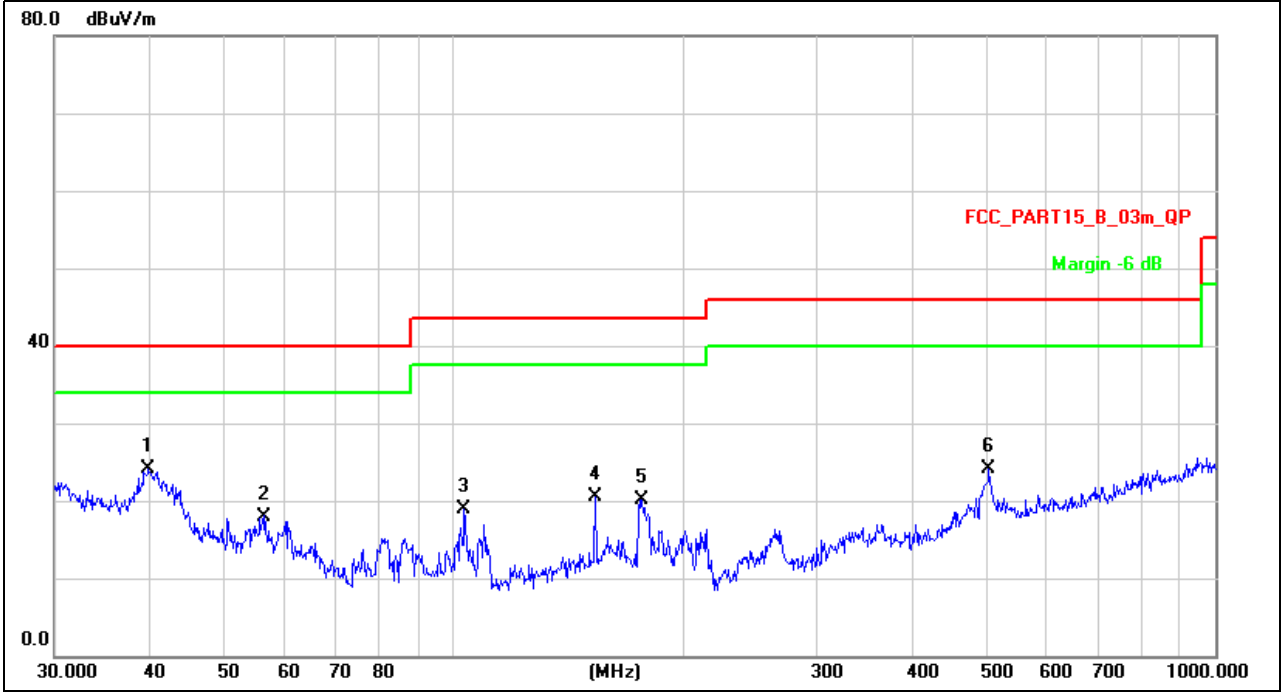
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Projector	Model Name ：	X3001
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	AC 120V/60Hz		
Test Mode ：	TX		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
39.8542	32.98	-8.84	24.14	40.00	-15.86	QP
56.5929	29.25	-11.25	18.00	40.00	-22.00	QP
103.4421	35.13	-16.19	18.94	43.50	-24.56	QP
153.7385	33.34	-12.86	20.48	43.50	-23.02	QP
176.8878	34.26	-14.07	20.19	43.50	-23.31	QP
504.7062	32.25	-8.12	24.13	46.00	-21.87	QP

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



3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

802.11b

Normal Voltage

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Mid Channel (2412 MHz)							
Vertical	2491.777	59.40	-11.65	47.75	74	-26.25	Pk
Horizontal	2498.247	56.30	-12.73	43.57	74	-30.43	Pk
Vertical	4821.884	56.40	-3.60	52.8	74	-21.2	Pk
Horizontal	4821.749	56.40	-9.23	44.54	74	-29.46	Pk
Vertical	1485.838	60.10	-17.10	43.00	74	-31.00	Pk
Vertical	1636.784	59.79	-16.06	43.73	74	-30.27	Pk
Vertical	2095.928	58.60	-11.88	46.72	74	-27.28	Pk
Horizontal	1074.301	60.33	-19.69	40.64	74	-33.36	Pk
Horizontal	1483.178	59.32	-17.09	42.23	74	-31.77	Pk
Horizontal	1895.832	56.34	-14.25	42.09	74	-31.91	Pk
Mid Channel (2437 MHz)							
Vertical	2474.777	56.14	-11.65	44.49	74	-29.51	Pk
Horizontal	2474.144	56.83	-9.37	47.46	74	-26.54	Pk
Vertical	4818.425	56.21	-6.15	47.47	74	-26.53	Pk
Horizontal	4818.979	56.21	-6.83	49.38	74	-24.62	Pk
Vertical	1433.535	63.20	-17.12	46.08	74	-27.92	Pk
Vertical	1636.784	60.53	-16.06	44.47	74	-29.53	Pk
Vertical	2284.166	54.27	-12.83	41.44	74	-32.56	Pk
Horizontal	1280.515	59.93	-17.82	42.11	74	-31.89	Pk
Horizontal	1636.784	58.76	-16.06	42.7	74	-31.3	Pk
Horizontal	1892.438	58.88	-14.28	44.6	74	-29.4	Pk
High Channel (2462 MHz)							
Vertical	2453.883	56.89	-12.91	43.98	74	-30.02	Pk
Horizontal	2453.839	56.89	-11.59	44.65	74	-29.35	Pk
Vertical	4926.325	53.40	-9.22	44.18	74	-29.82	Pk
Horizontal	4926.683	53.40	-3.64	49.62	74	-24.38	Pk
Vertical	1187.688	57.92	-18.27	39.65	74	-34.35	Pk
Vertical	1636.784	56.73	-16.06	40.67	74	-33.33	Pk
Vertical	2084.693	54.32	-11.99	42.33	74	-31.67	Pk
Horizontal	1534.540	56.98	-16.94	40.04	74	-33.96	Pk
Horizontal	1786.985	56.69	-15.04	41.65	74	-32.35	Pk
Horizontal	1892.438	56.57	-14.28	42.29	74	-31.71	Pk

Note:”802.11b” mode is the worst mode.

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.

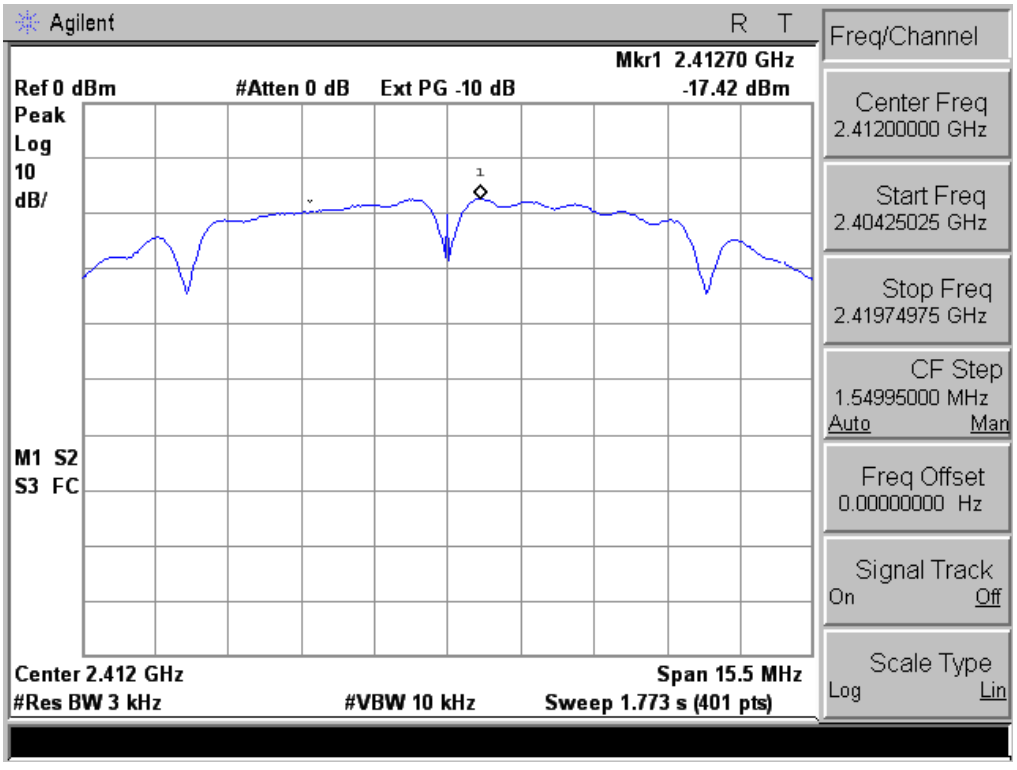
4.1.5 TEST RESULTS

EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX b Mode /CH01, CH06, CH11		

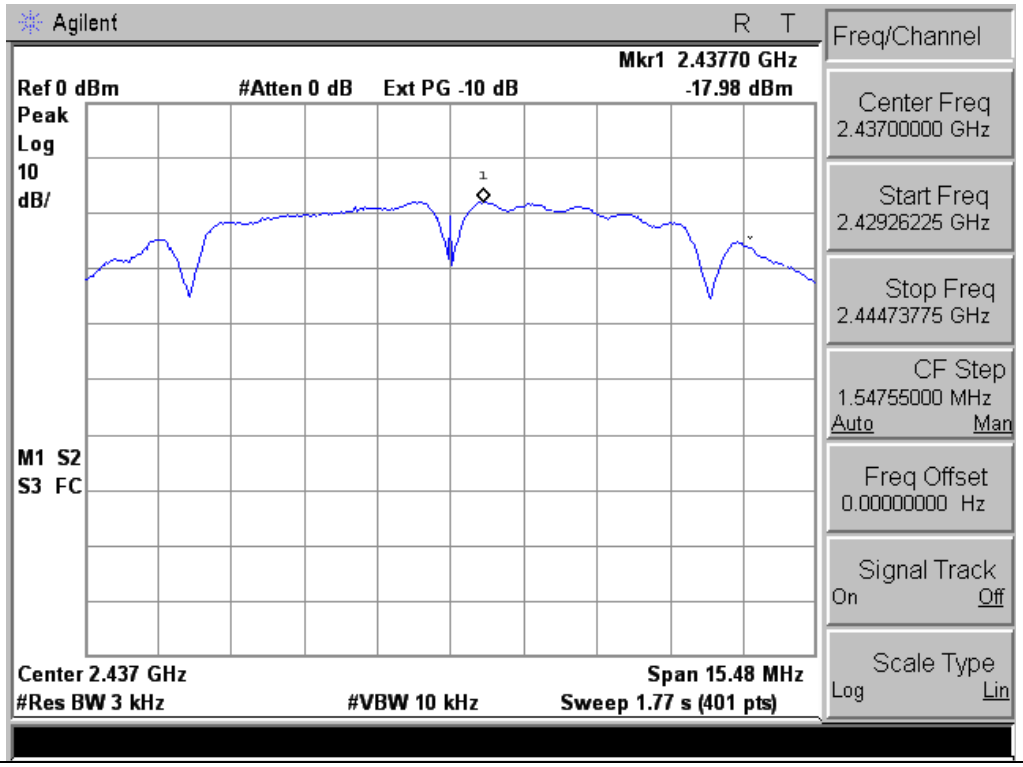
Frequency	Power Density A (dBm)	Power Density B (dBm)	Limit (dBm)	Result
2412 MHz	-17.42	-18.12	8	PASS
2437 MHz	-17.98	-18.23	8	PASS
2462 MHz	-17.72	-18.24	8	PASS

NOTE: A B Represent the value of antennaA and B,The worst data is A Antenna a ,only shown Antenna A Plot.

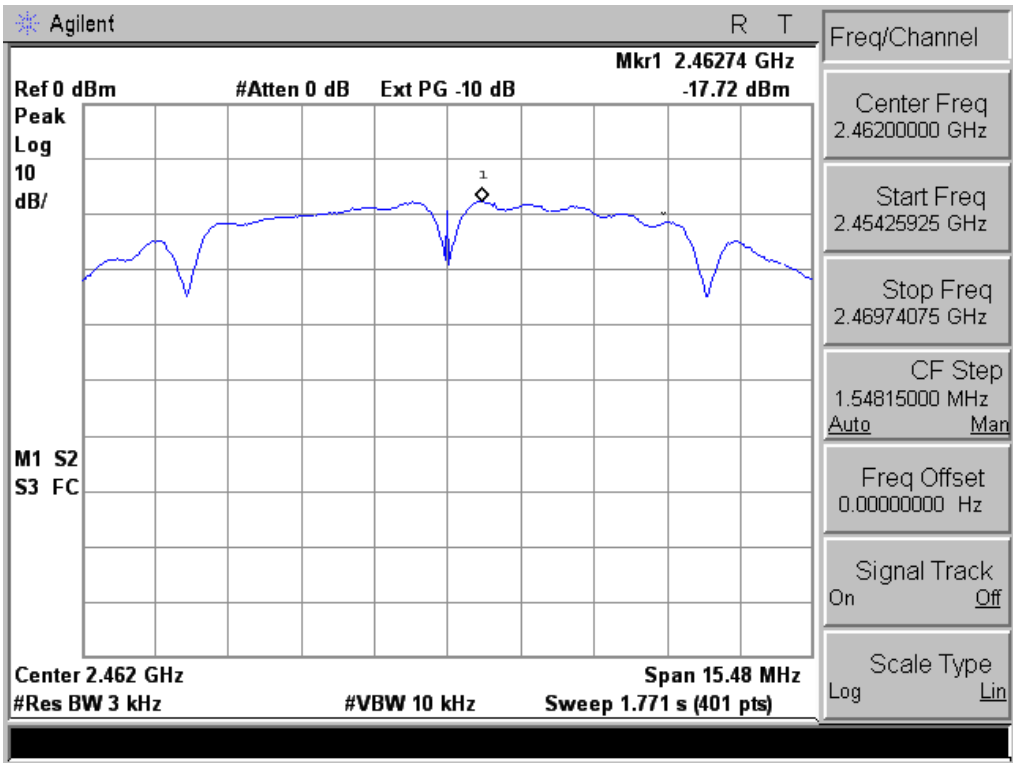
TX CH01



TX CH06



TX CH11

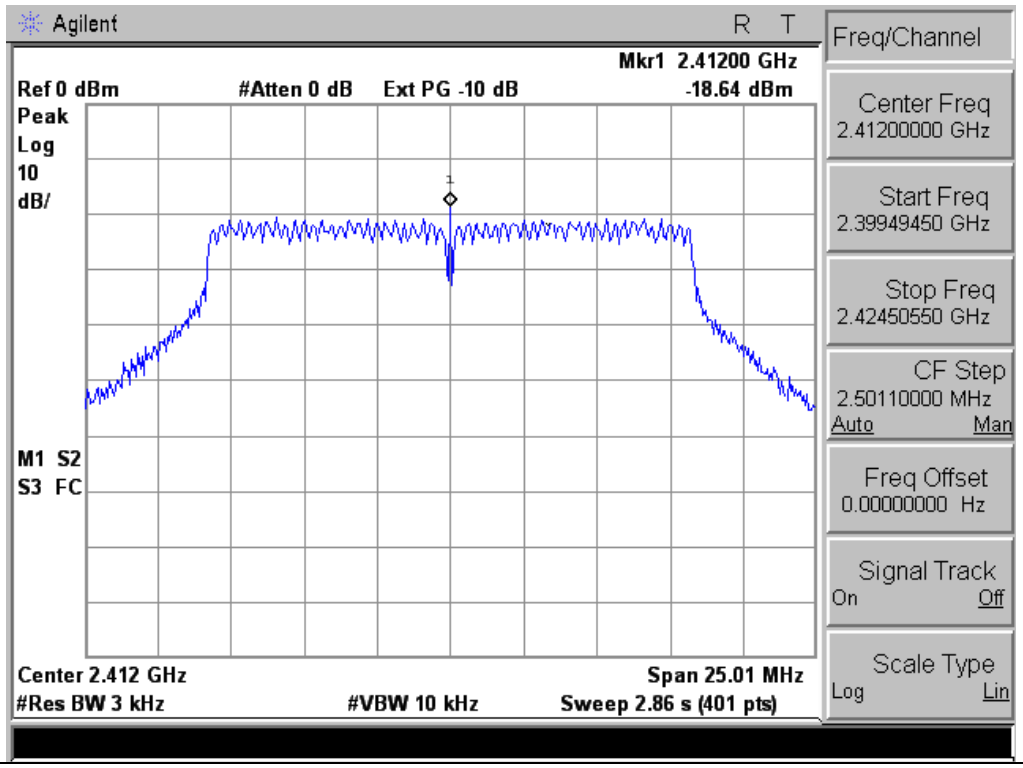


EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX g Mode /CH01, CH06, CH11		

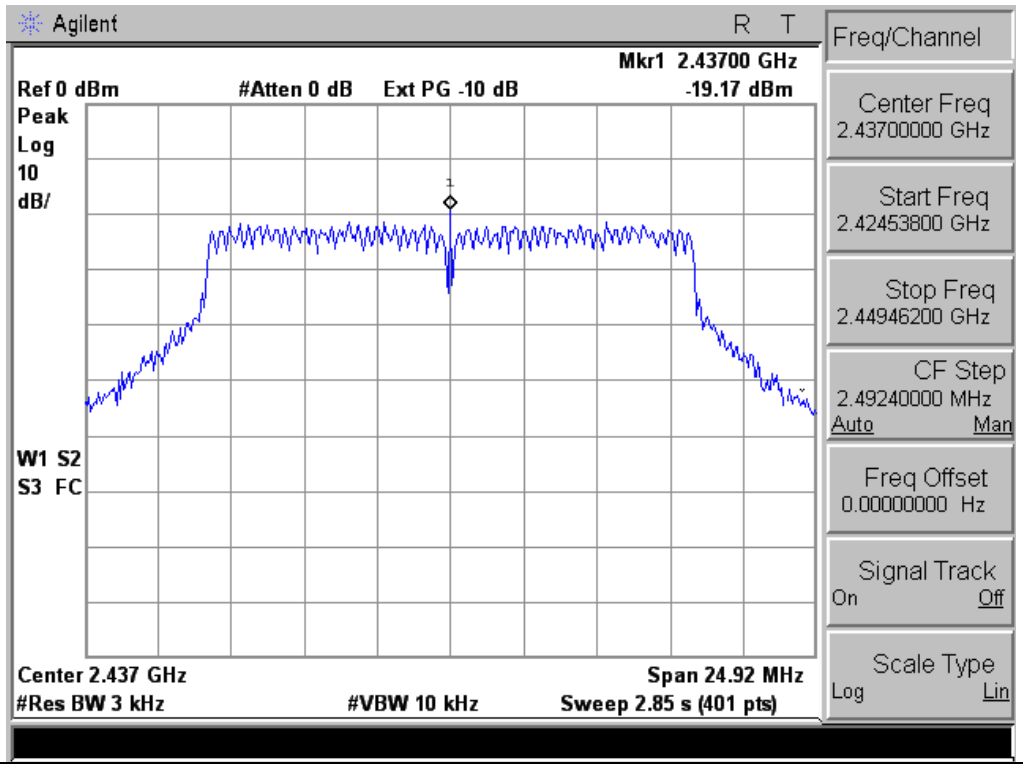
Frequency	Power Density A (dBm)	Power Density B (dBm)	Limit (dBm)	Result
2412 MHz	-18.64	-19.12	8	PASS
2437 MHz	-19.17	-19.23	8	PASS
2462 MHz	-18.43	-19.02	8	PASS

NOTE: A B Represent the value of antennaA and B,C,The worst data is A Antenna a ,only shown Antenna A Plot.

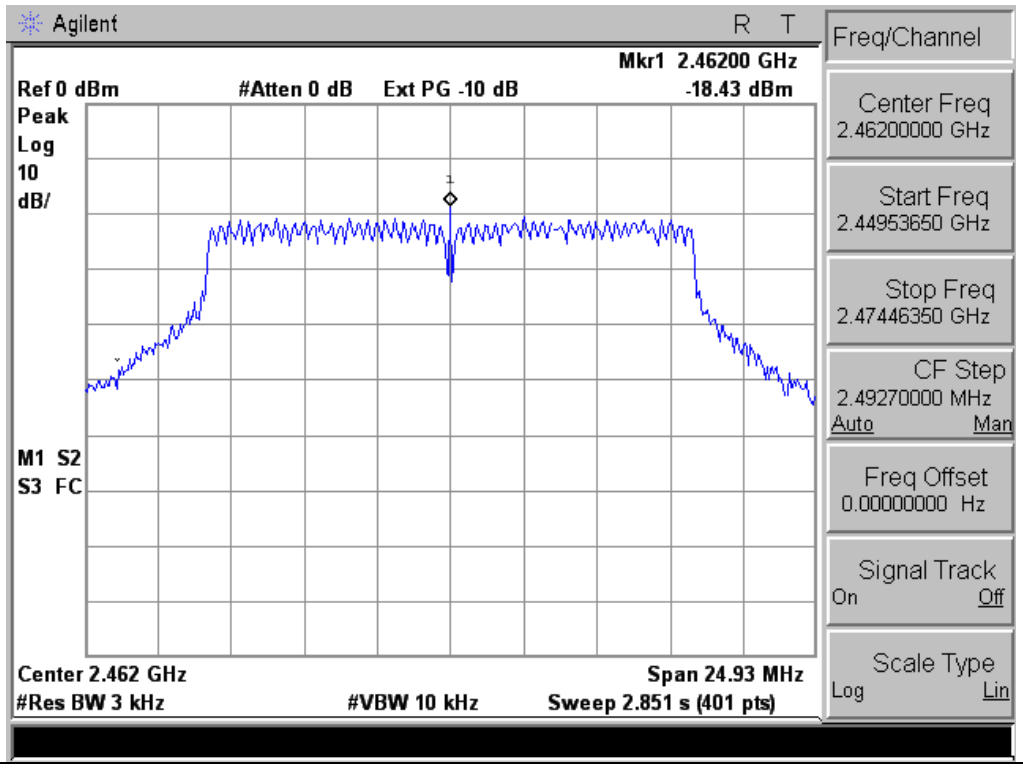
TX CH01



TX CH06



TX CH11

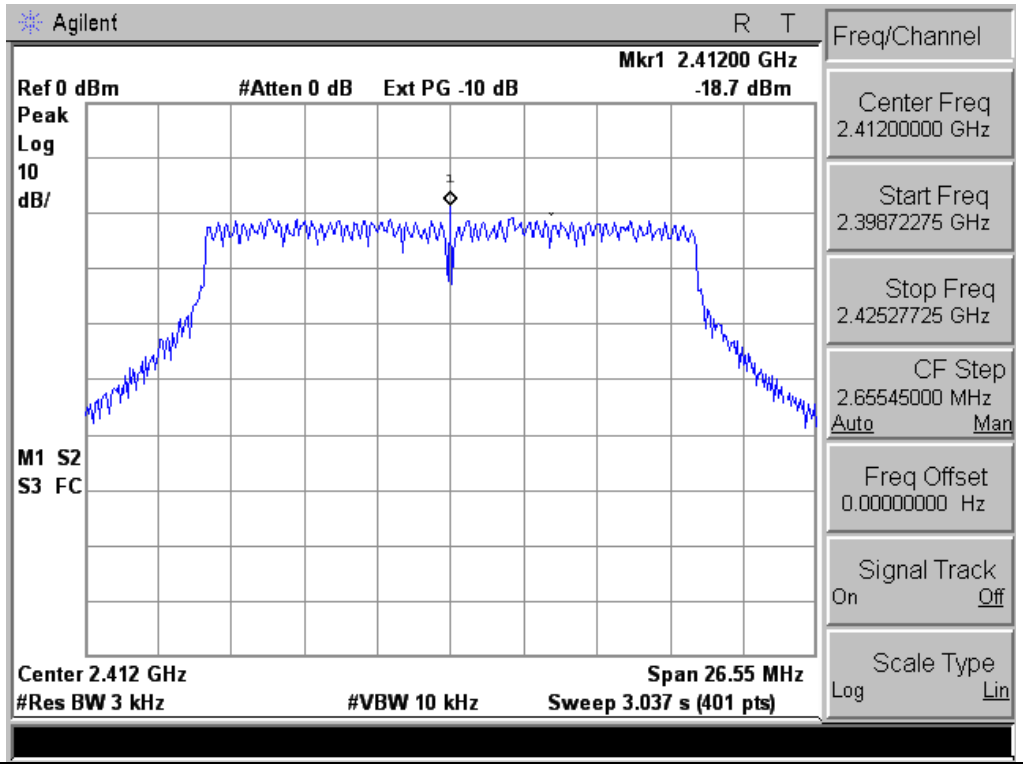


EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX n Mode(20M) /CH01, CH06, CH11		

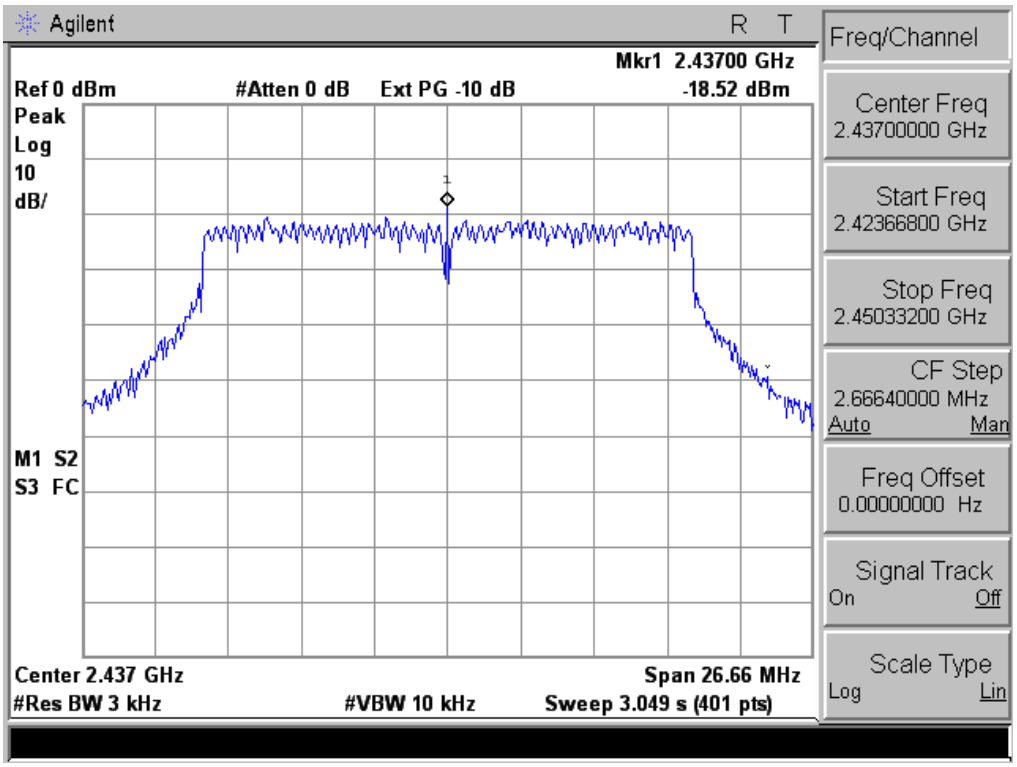
Frequency	Power Density A (dBm)	Power Density B (dBm)	Tolal Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-18.64	-19.12	-15.863	8	PASS
2437 MHz	-19.17	-19.23	-16.190	8	PASS
2462 MHz	-18.43	-19.02	-15.705	8	PASS

NOTE: A B Represent the value of antennaA and B,,The worst data is A Antenna a ,only shown Antenna A Plot.

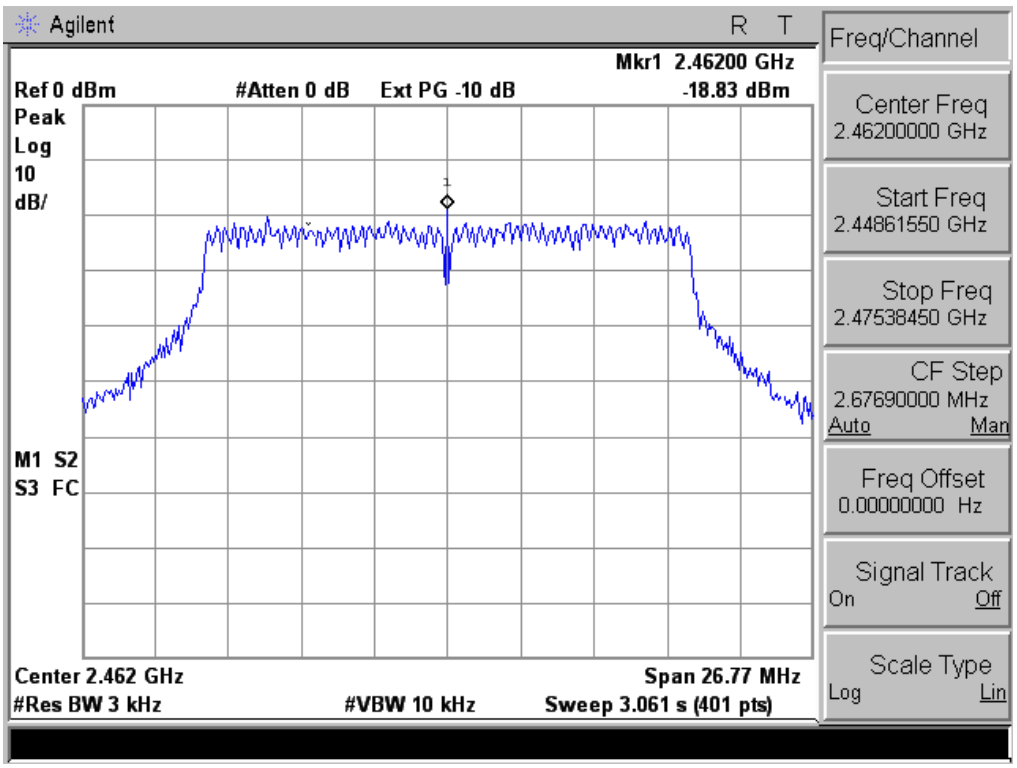
TX CH01



TX CH06



TX CH11

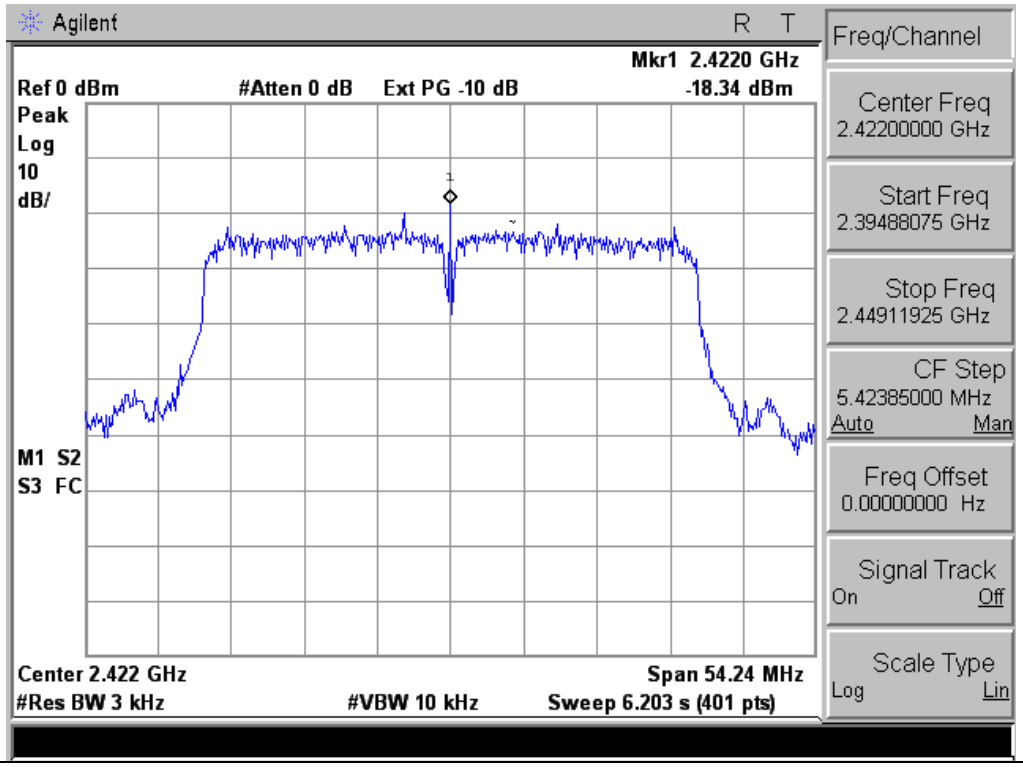


EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX n Mode(40M) /CH03, CH06, CH09		

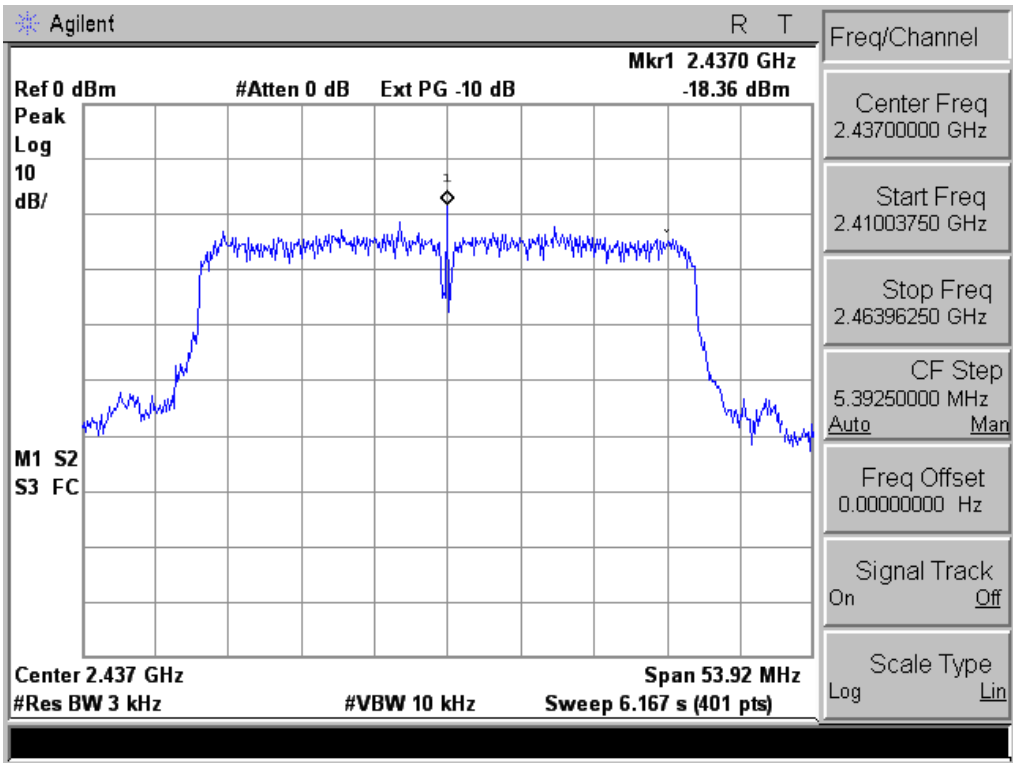
Frequency	Power Density A (dBm)	Power Density B (dBm)	Tolal Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-18.34	-19.07	-15.679	8	PASS
2437 MHz	-18.36	-19.11	-15.709	8	PASS
2452 MHz	-18.94	-19.02	-15.970	8	PASS

NOTE: A B Represent the value of antennaA and B,The worst data is A Antenna a ,only shown Antenna A Plot.

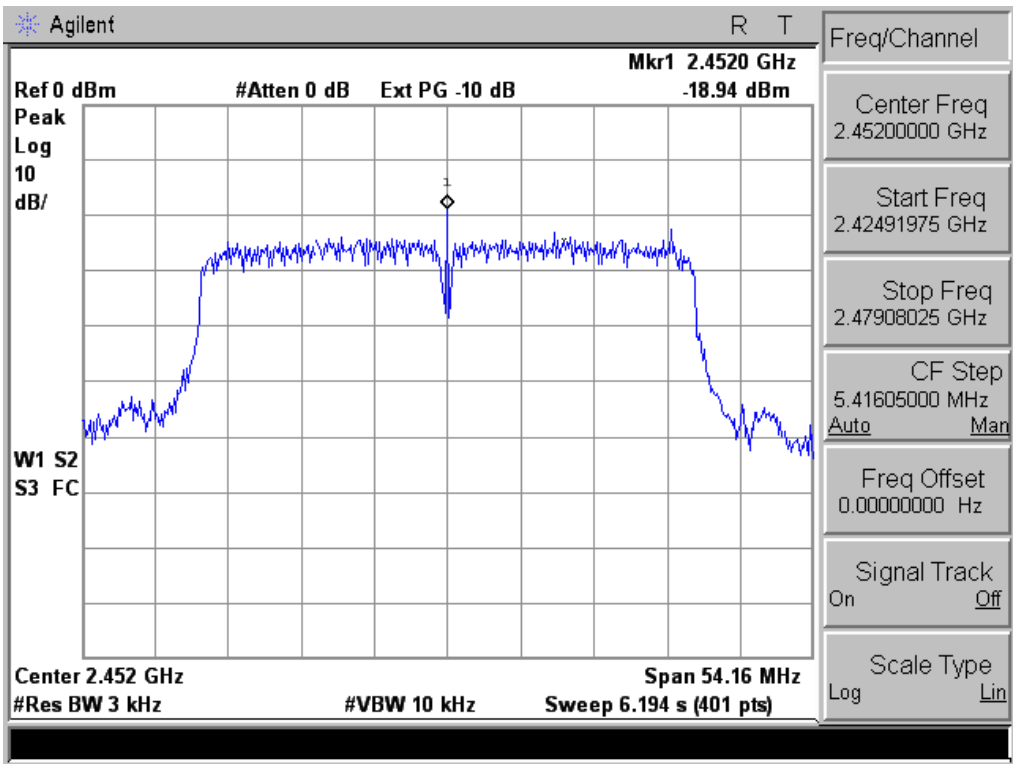
TX CH03



TX CH06



TX CH09



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

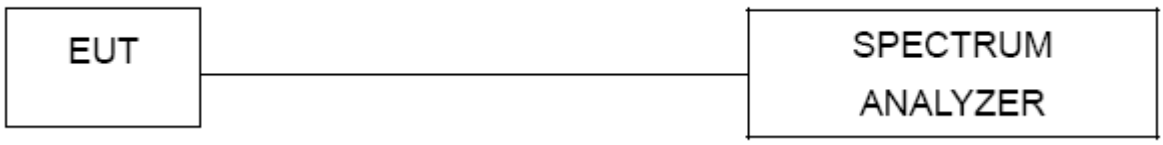
5.1.1 TEST PROCEDURE

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

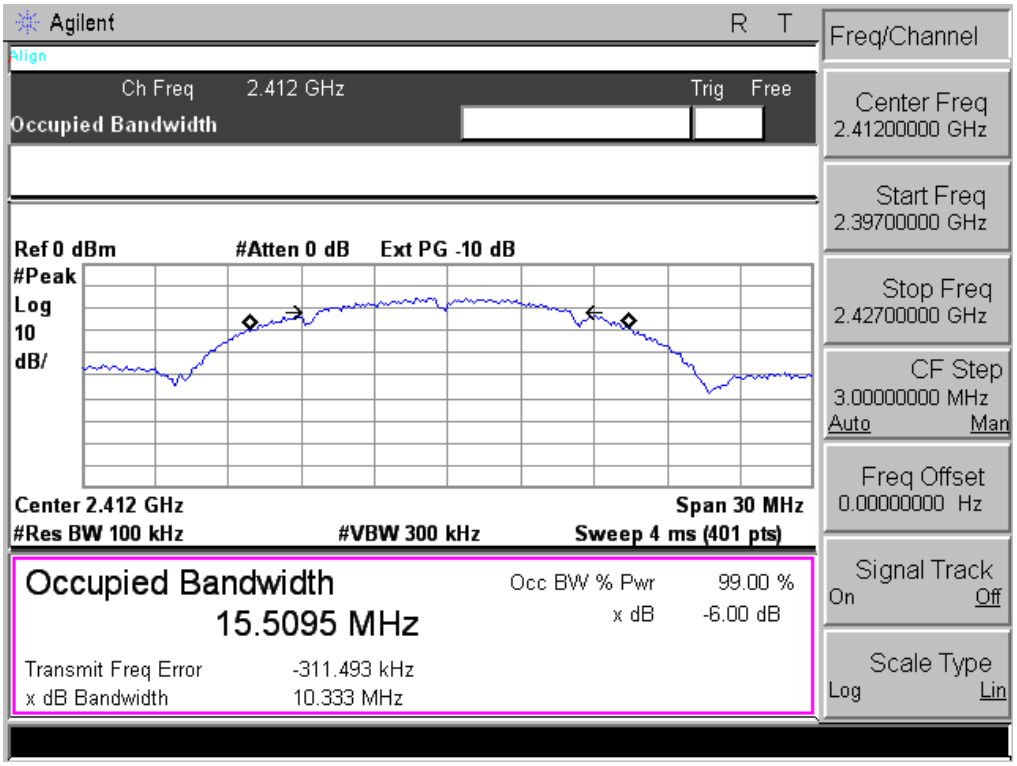
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

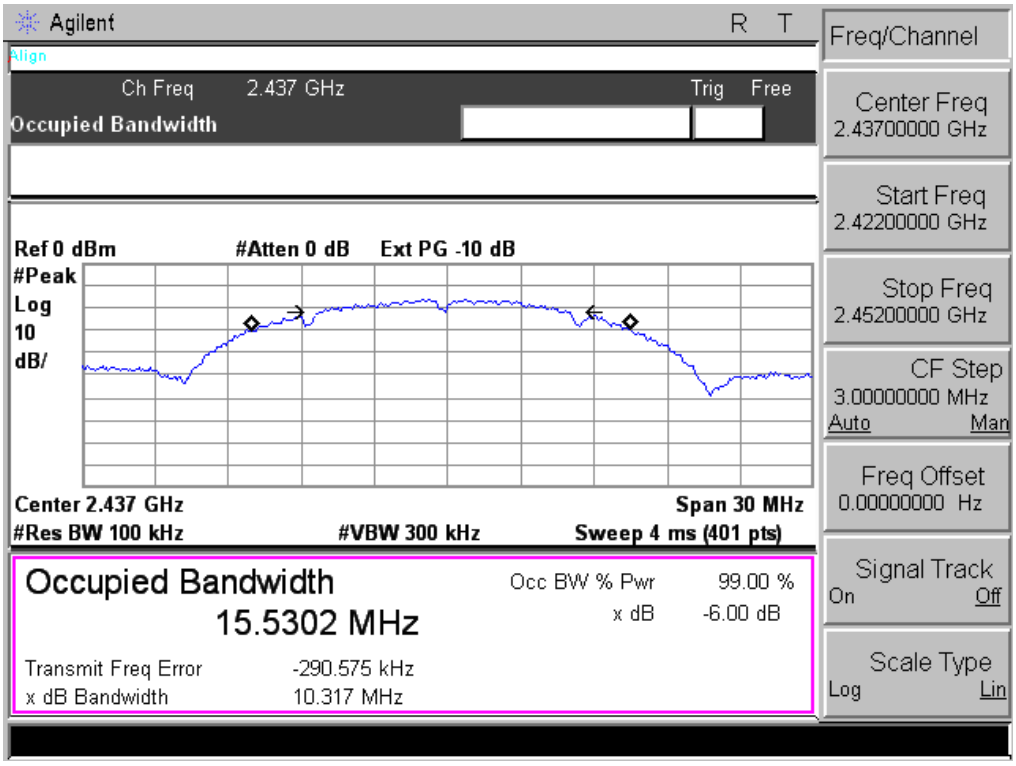
EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.33	500	Pass
Middle	2437	10.32	500	Pass
High	2462	10.32	500	Pass

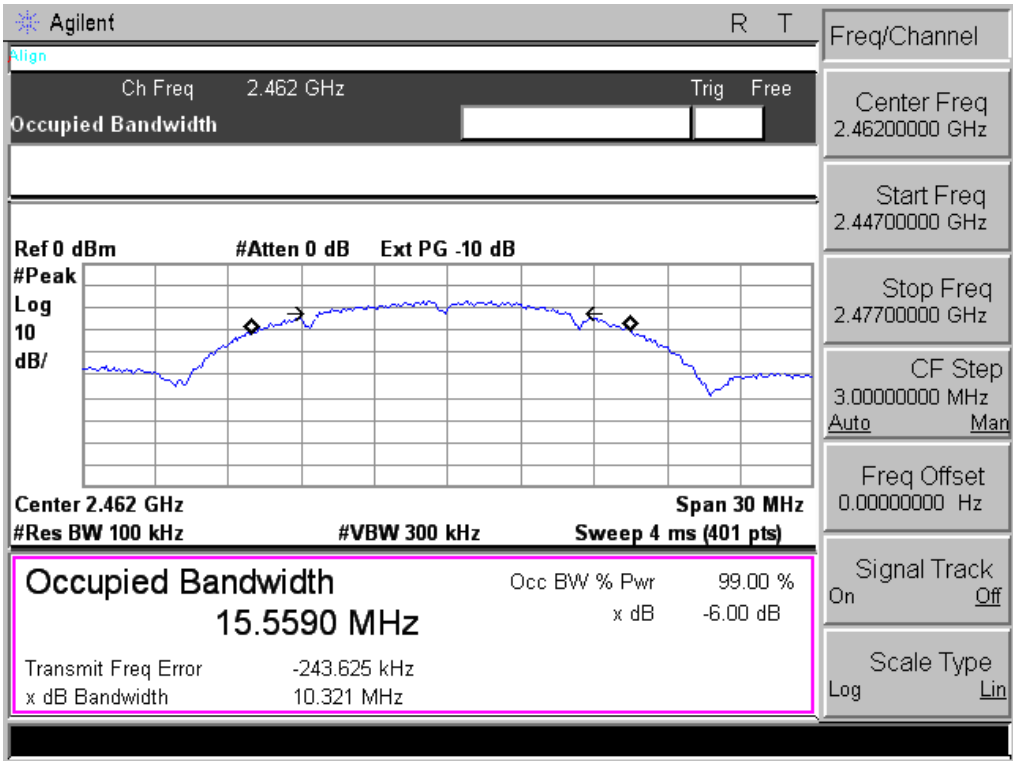
TX CH 01



TX CH 06



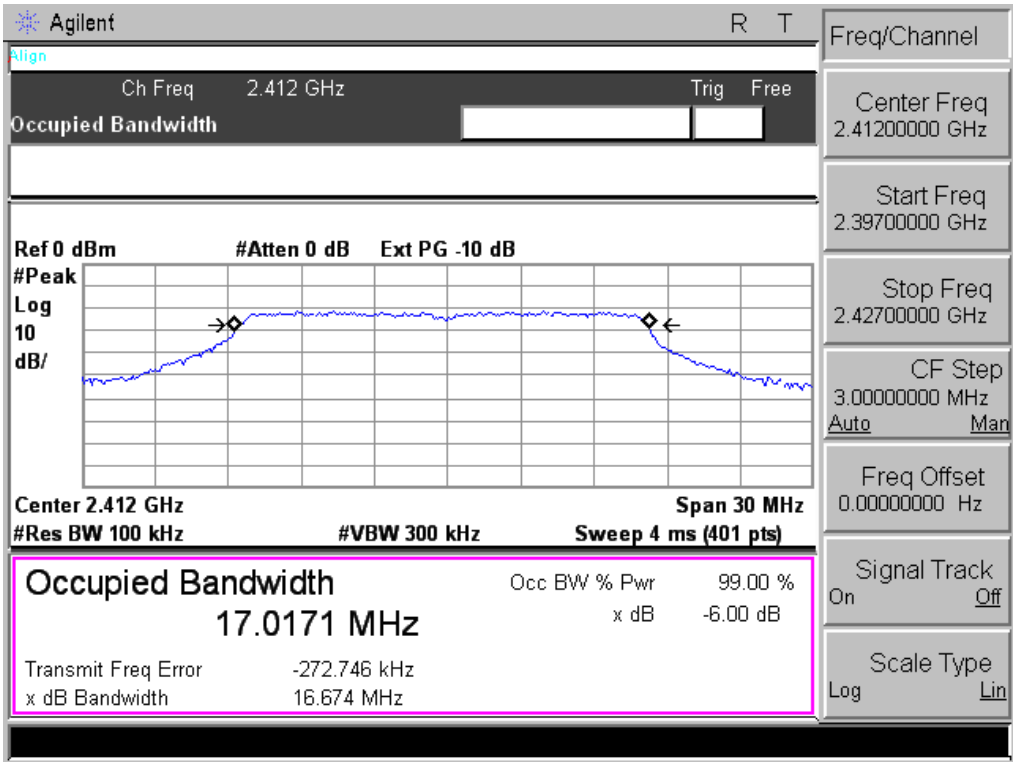
TX CH 11



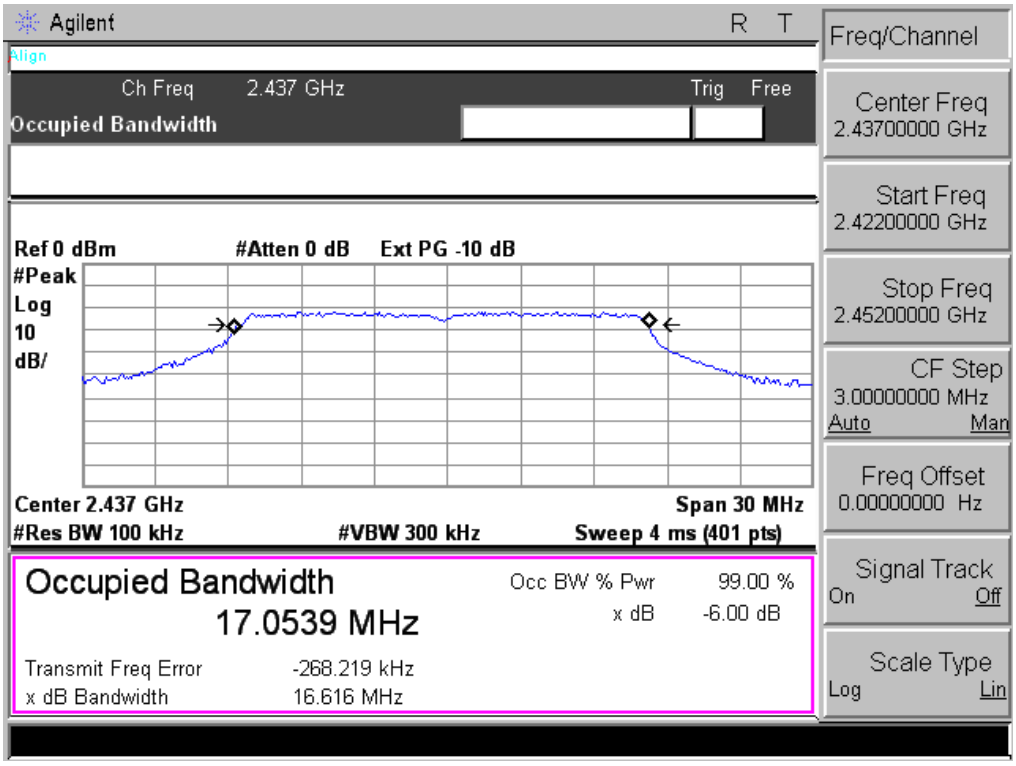
EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.67	500	Pass
Middle	2437	16.62	500	Pass
High	2462	16.62	500	Pass

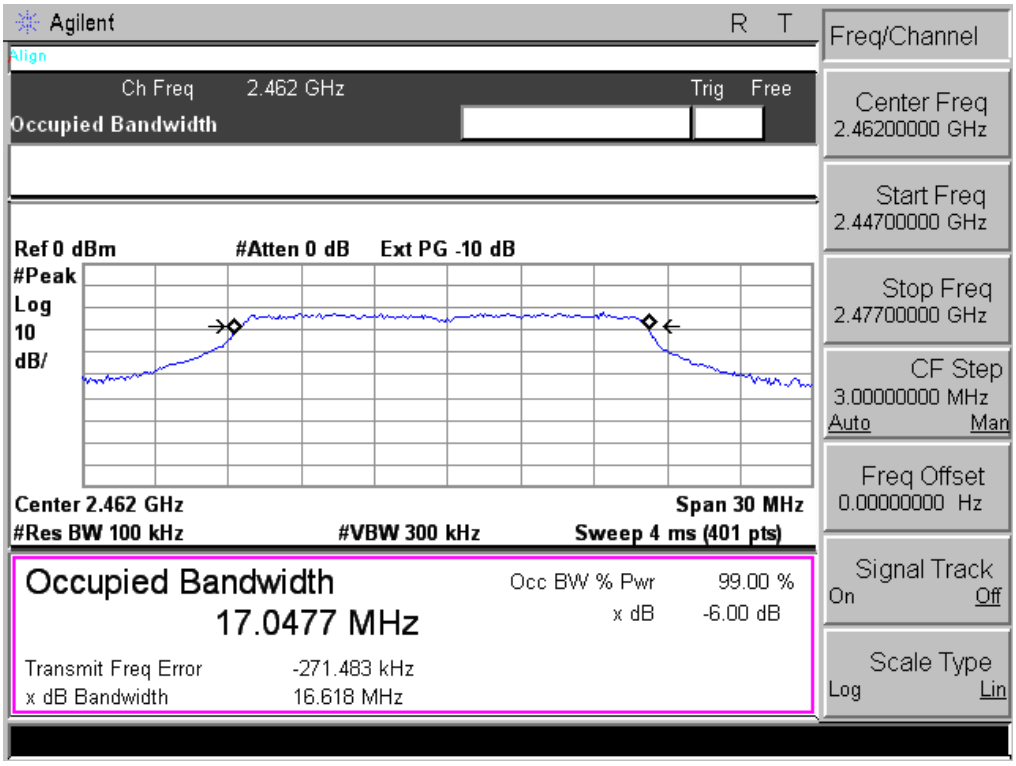
TX CH 01



TX CH 06



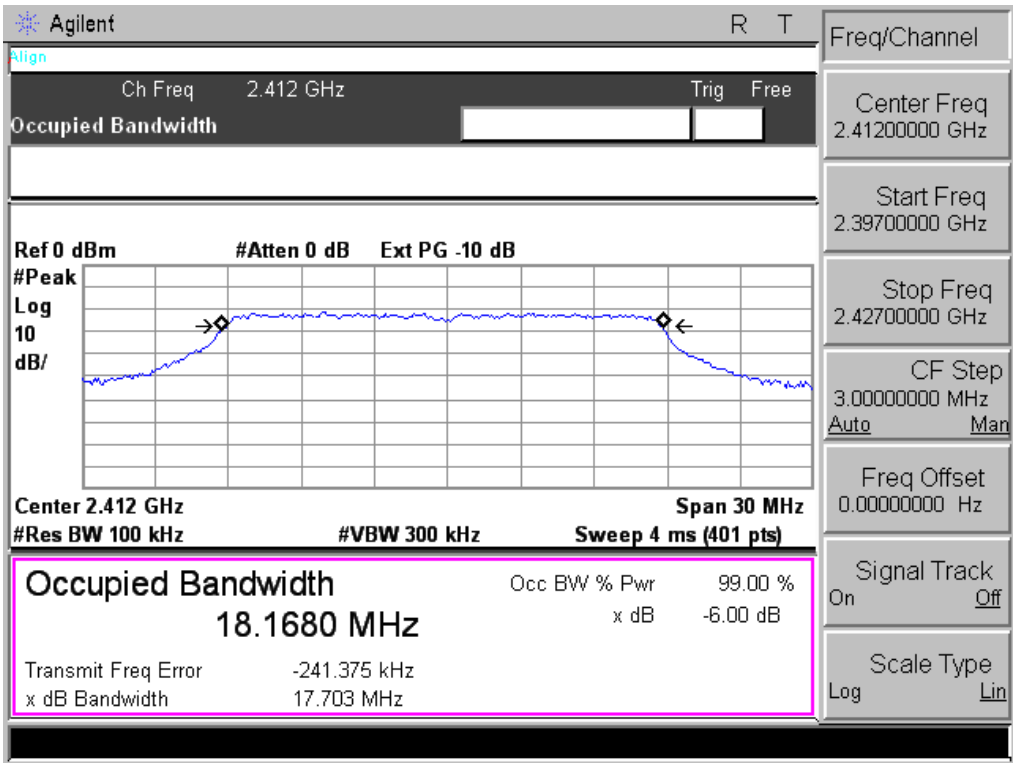
TX CH 11



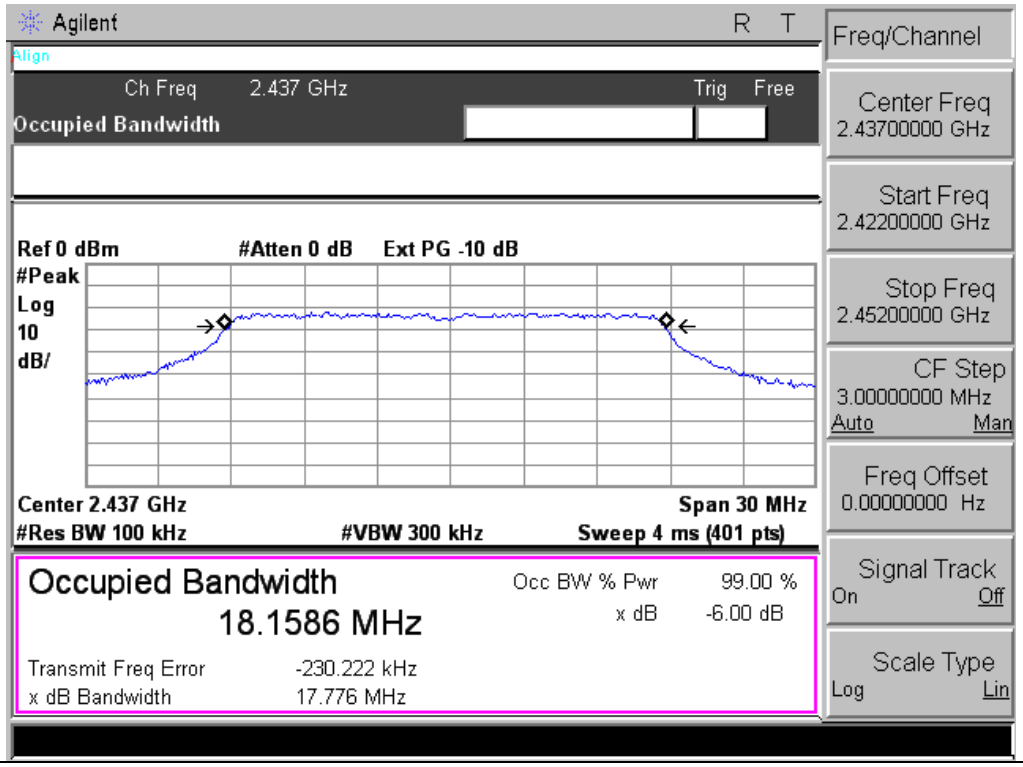
EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX n Mode(20M) /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.70	500	Pass
Middle	2437	17.78	500	Pass
High	2462	17.85	500	Pass

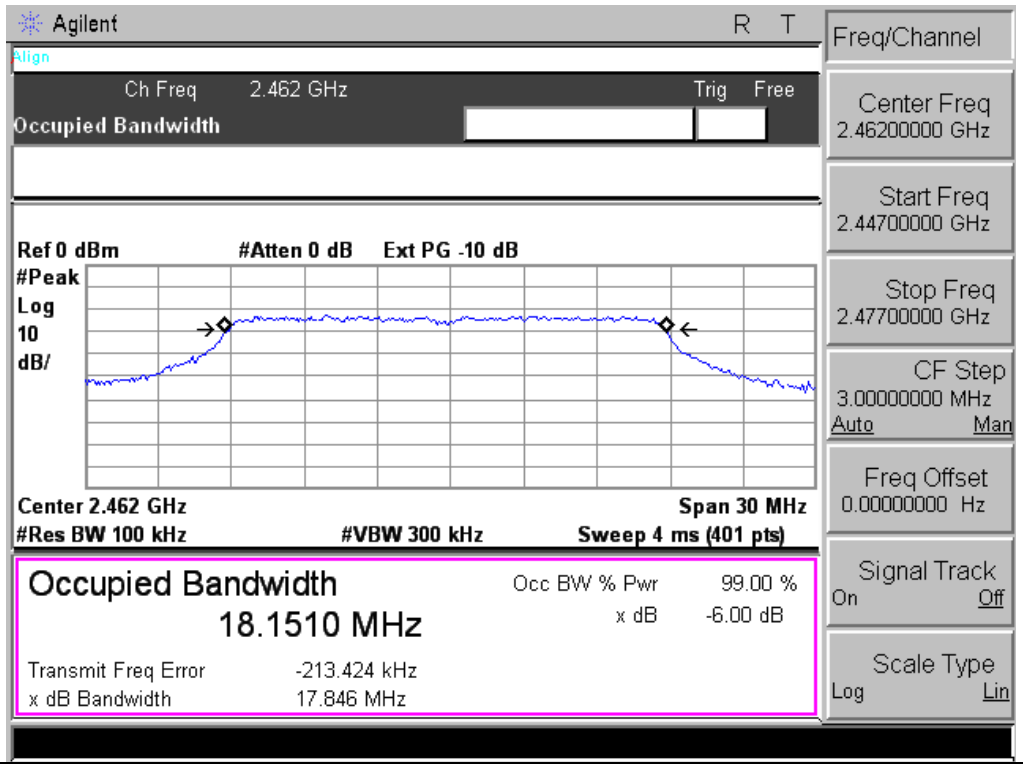
TX CH 01



TX CH 06



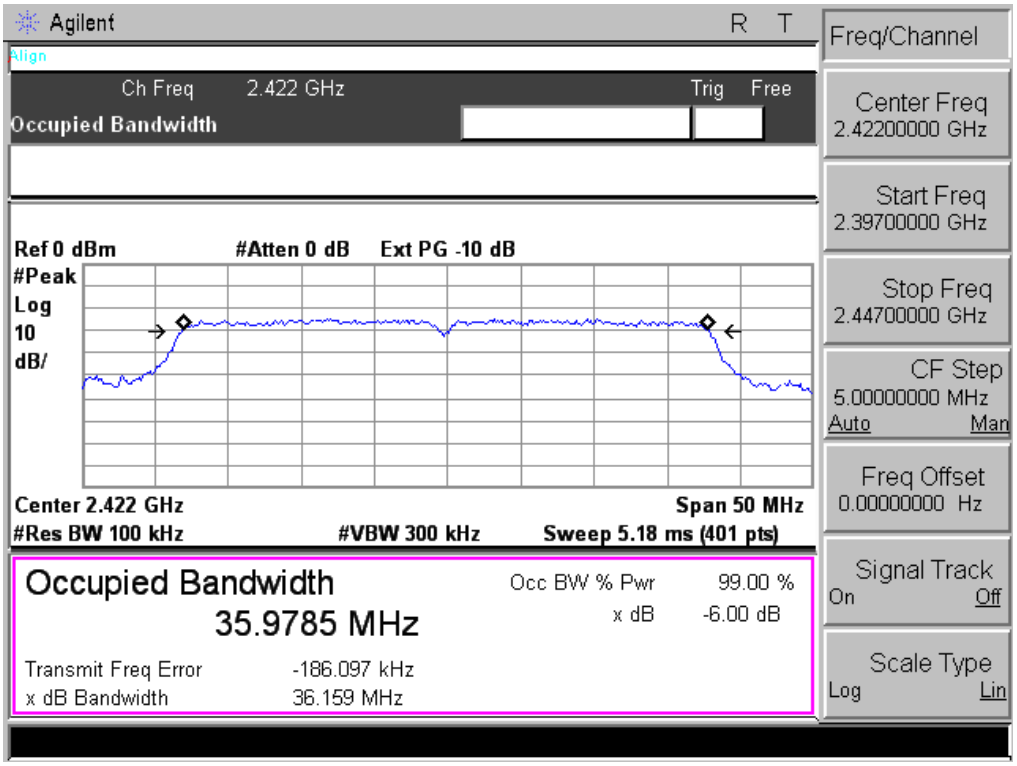
TX CH 11



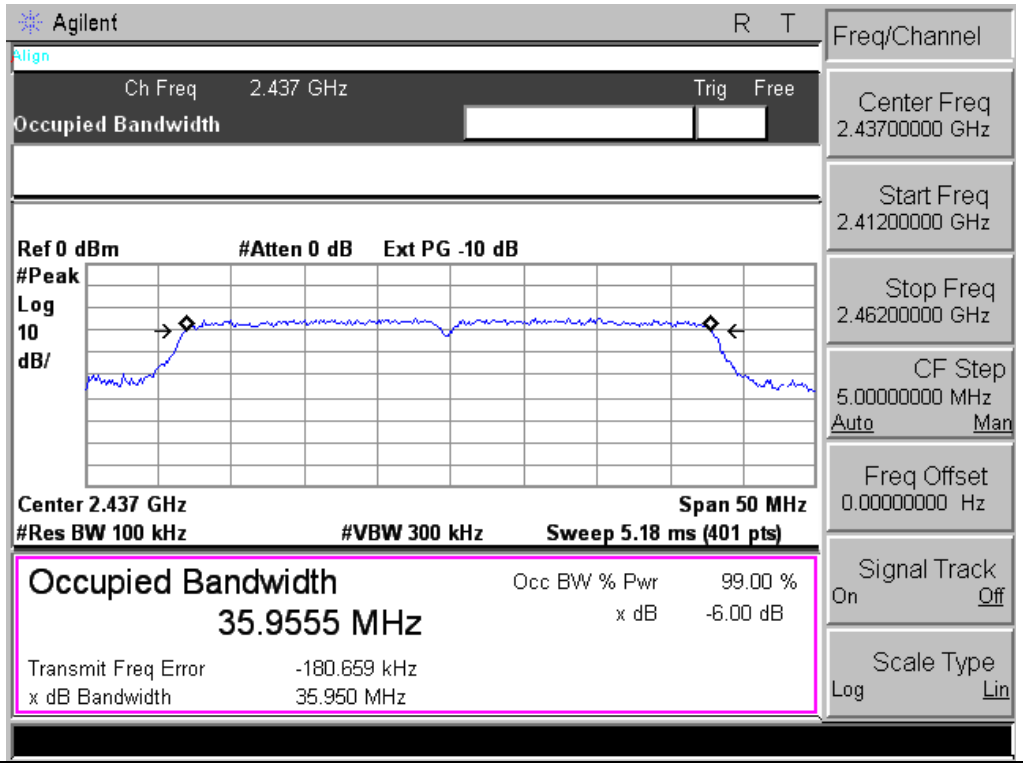
EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX n Mode(40M) /CH03, CH06, CH09		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.16	500	Pass
Middle	2437	35.95	500	Pass
High	2452	36.11	500	Pass

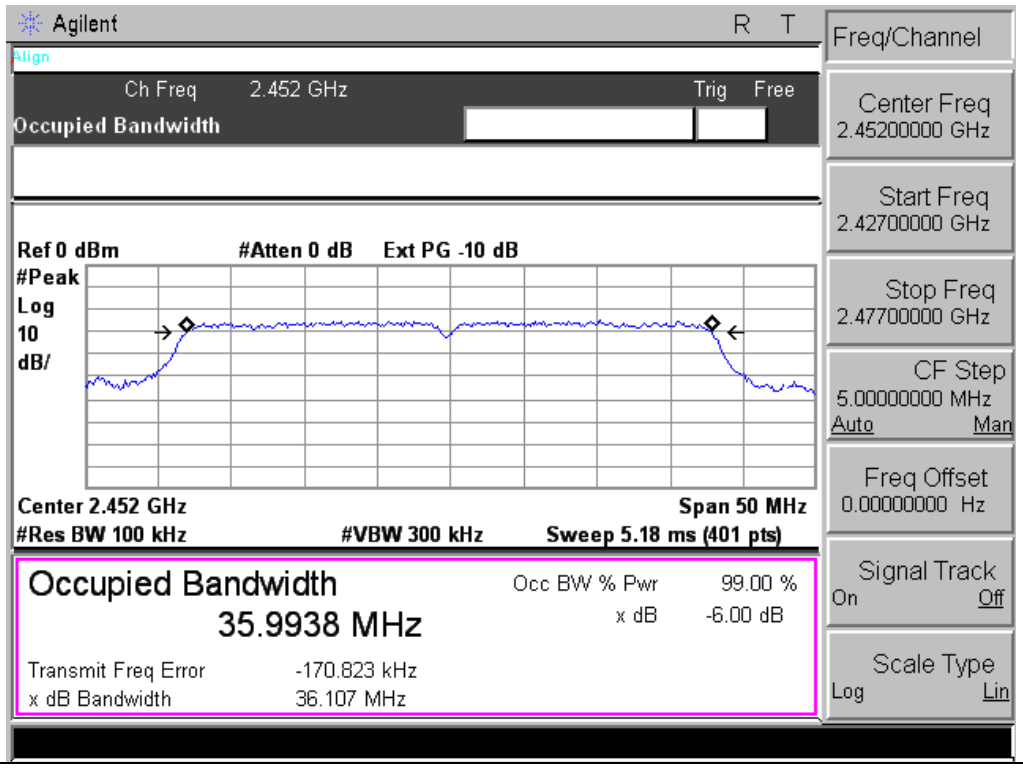
TX CH 03



TX CH 06



TX CH 09



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

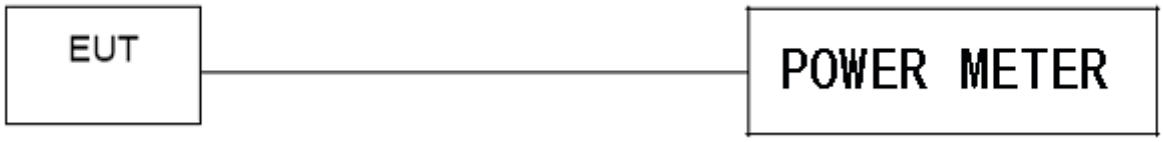
6.1.1 TEST PROCEDURE

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：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC 120V
Test Mode ：	TX b/g/n(20M, 40M) Mode /CH01, CH06, CH11		

Test Channe	Frequency	Maximum Conducted Output Power A (PK)	Maximum Conducted Output Power B (PK)	Total Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)	dBm
TX 802.11b Mode					
CH01	2412	17.12	17.21	--	30
CH06	2437	17.78	17.08	--	30
CH11	2462	17.70	17.07	--	30
TX 802.11g Mode					
CH01	2412	15.87	15.21	--	30
CH06	2437	15.68	15.21	--	30
CH11	2462	15.59	15.33	--	30
TX 802.11n-HT20 Mode					
CH01	2412	14.77	14.33	17.56	30
CH06	2437	14.73	14.36	17.55	30
CH11	2462	14.59	14.41	17.51	30
TX 802.11n-HT40 Mode					
CH03	2422	13.48	13.11	16.30	30
CH06	2437	13.75	13.11	16.45	30
CH09	2452	13.35	13.21	16.29	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.

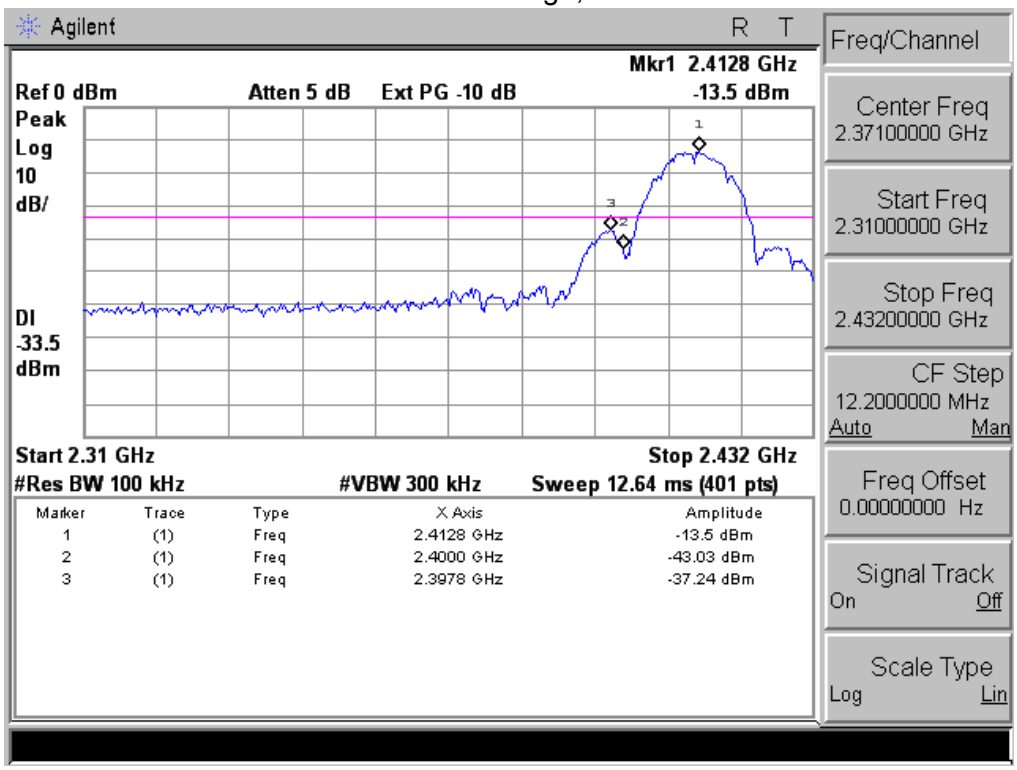
7.4 TEST RESULTS

EUT：	Projector	Model Name ：	X3001
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	AC 120V

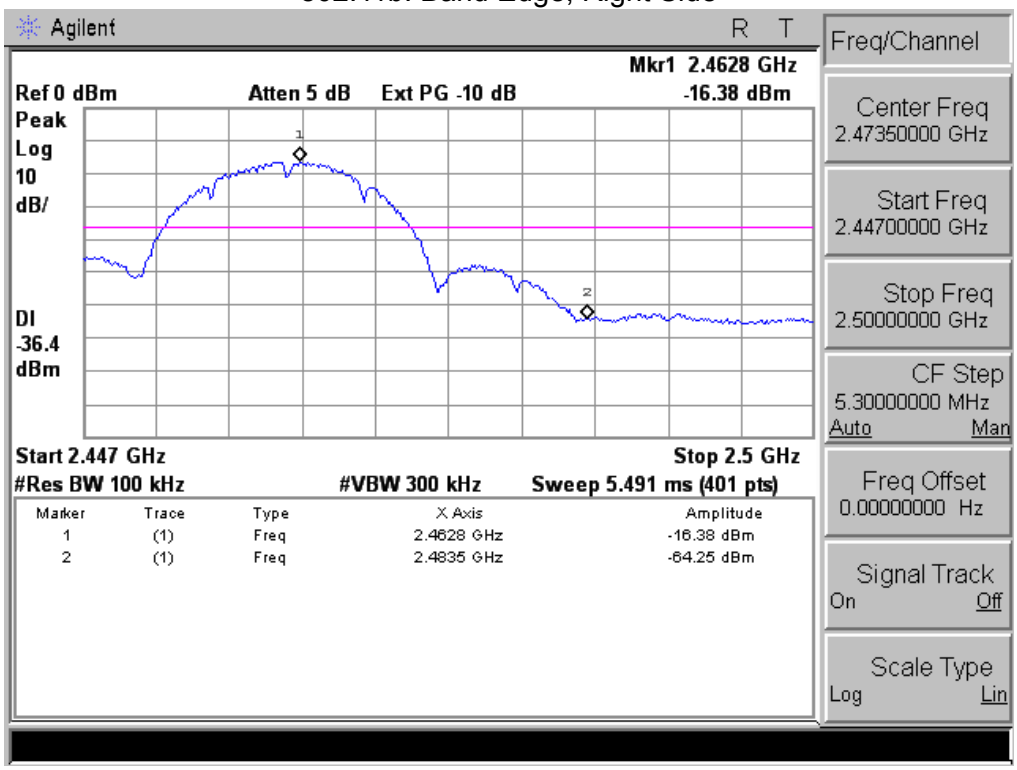
Frequency Band	Delta Peak to band emission (dBc)	＞Limit (dBc)	Result
802.11b mode			
Left-band	29.53	20	Pass
Right-band	47.87	20	Pass
802.11g mode			
Left-band	23.22	20	Pass
Right-band	37.20	20	Pass
802.11n-HT20 mode			
Left-band	24.89	20	Pass
Right-band	34.46	20	Pass
802.11n-HT40 mode			
Left-band	24.64	20	Pass
Right-band	32.11	20	Pass

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
802.11b							
2390	58.36	-13.06	45.30	74	-28.70	peak	Vertical
2390	59.20	-13.06	46.14	74	-27.86	peak	Horizontal
2483.5	59.20	-12.78	46.42	74	-27.58	peak	Vertical
2483.5	52.74	-12.78	39.96	74	-34.04	peak	Horizontal
802.11g							
2390	58.41	-13.06	45.35	74	-28.65	peak	Vertical
2390	55.29	-13.06	42.23	74	-31.77	peak	Horizontal
2483.5	60.51	-12.78	47.73	74	-26.27	peak	Vertical
2483.5	61.19	-12.78	48.41	74	-25.59	peak	Horizontal
802.11n							
2390	61.94	-13.06	48.88	74	-25.12	peak	Vertical
2390	61.97	-13.06	48.91	74	-25.09	peak	Horizontal
2483.5	58.21	-12.78	45.46	74	-28.54	peak	Vertical
2483.5	55.51	-12.78	42.73	74	-31.27	peak	Horizontal

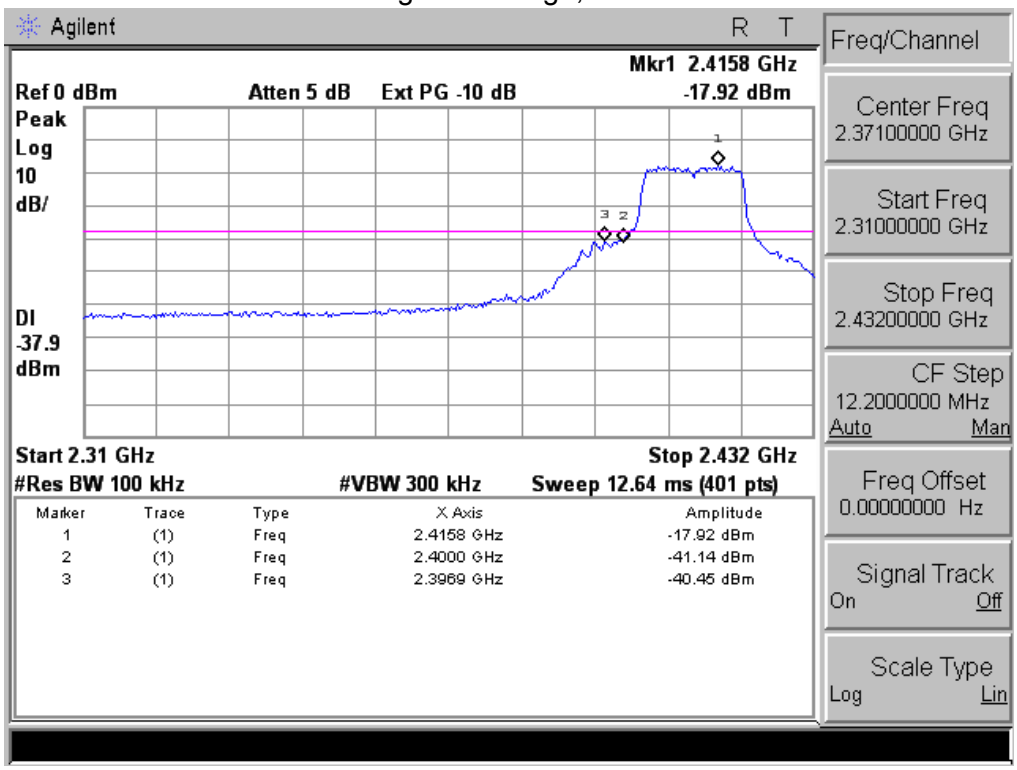
802.11b: Band Edge, Left Side



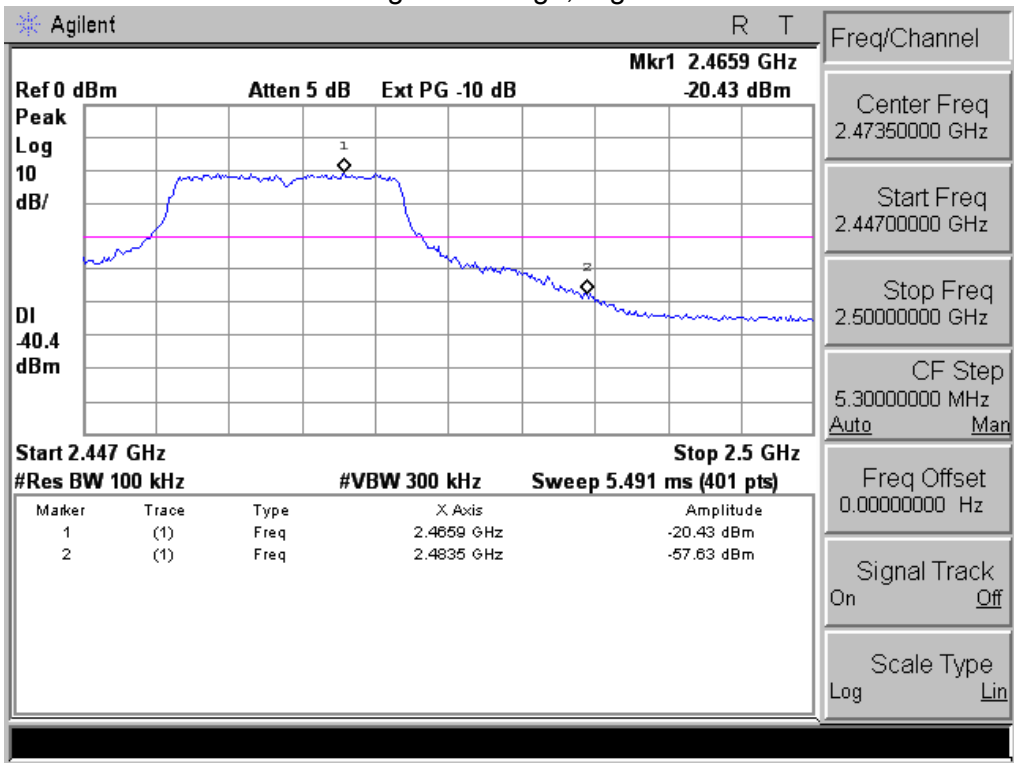
802.11b: Band Edge, Right Side



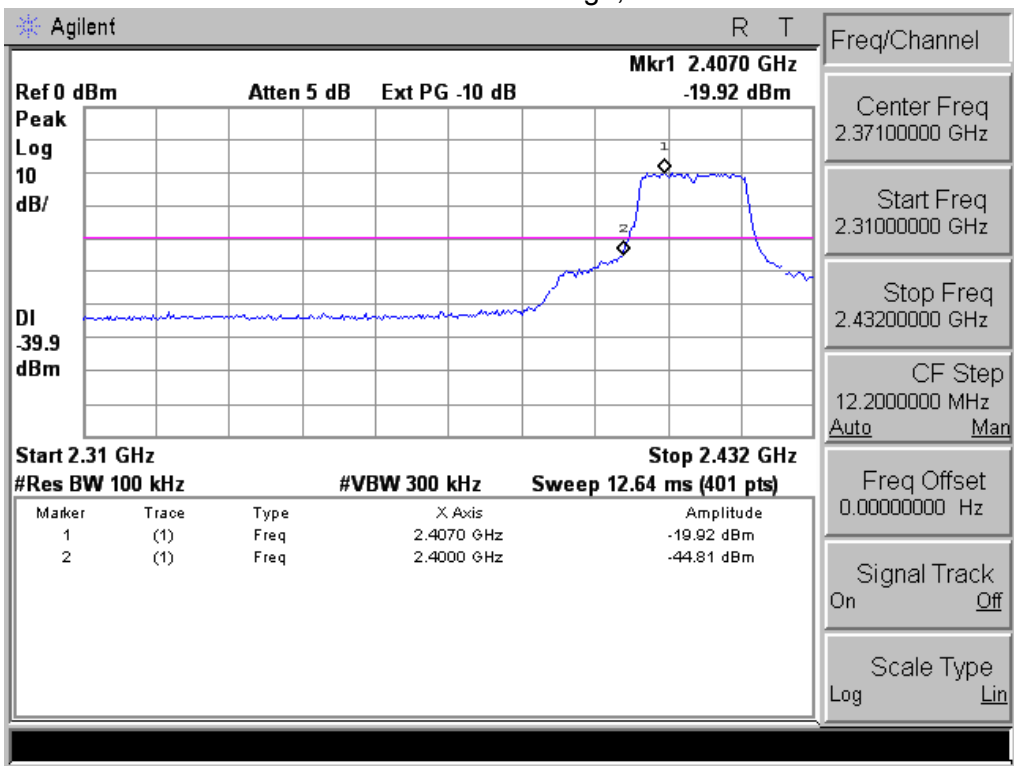
802.11g: Band Edge, Left Side



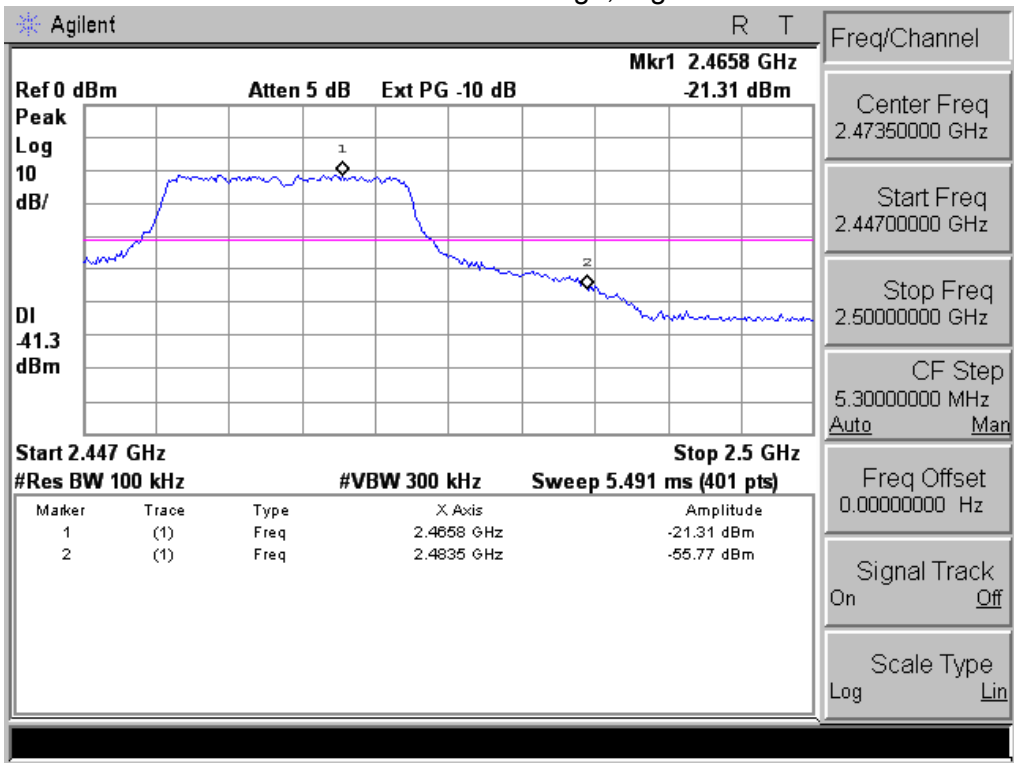
802.11g: Band Edge, Right Side



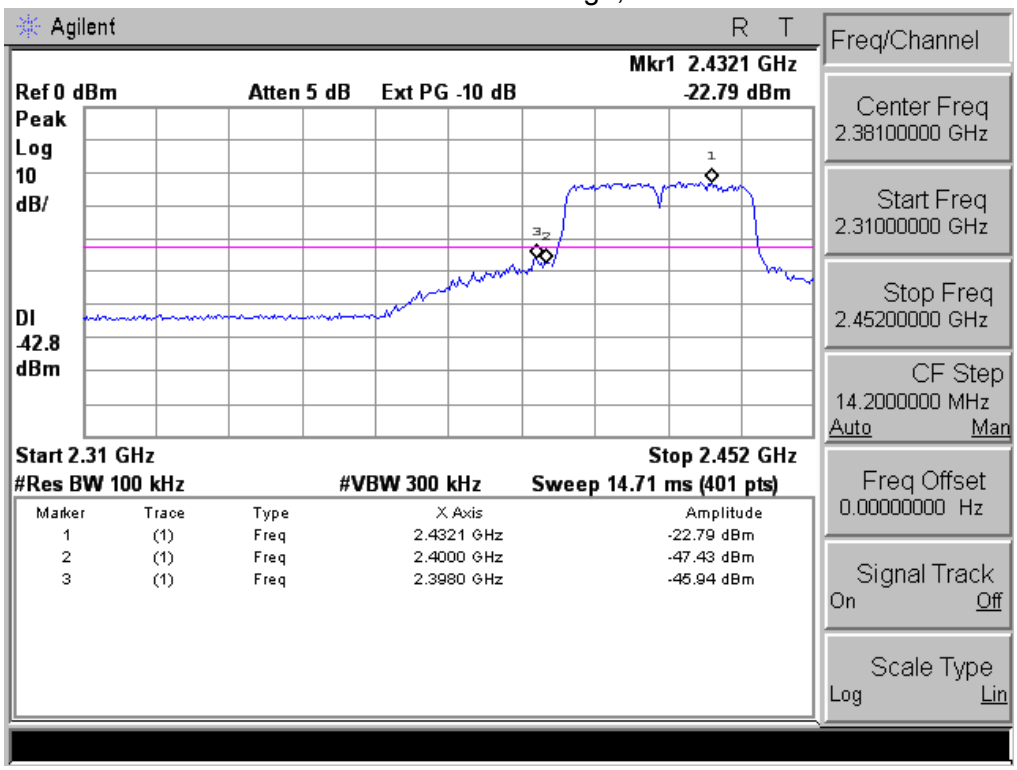
802.11n-HT20: Band Edge, Left Side



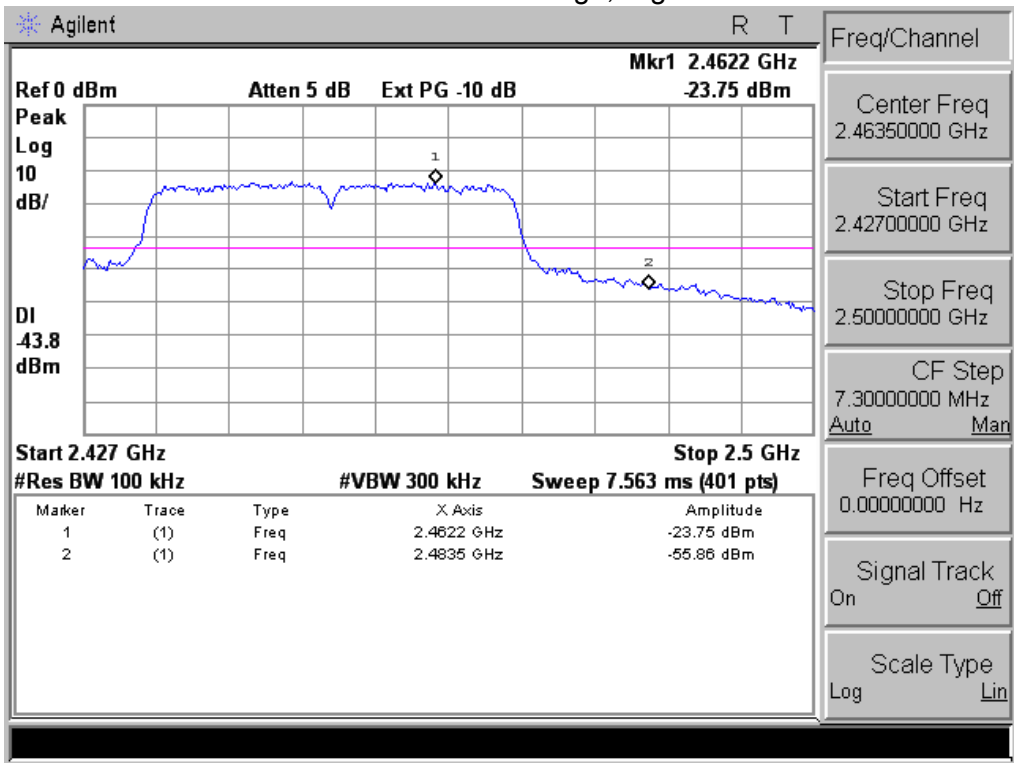
802.11n-HT20: Band Edge, Right Side



802.11n-HT40: Band Edge, Left Side



802.11n-HT40: 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 Internal Antenna. It comply with the standard requirement.