FCC Radio Test Report

FCC ID: QWHULM300M

This report concerns (check one): ☒Original Grant ☐Class II Change

Project No.	:	1601C040
Equipment	:	Wireless Microphone System
Model Name	:	ULM300M
Applicant	:	Music Group Services PH Corp
Address	:	25th Floor Ayala Life FGU Center, 6811 Ayala Avenue, Makati City 1209, Philippines

Date of Receipt	:	Jan. 08, 2016
Date of Test	:	Jan. 08, 2016 ~ Jan. 25, 2016
Issued Date	:	Jan. 26, 2016
Tested by	:	BTL Inc.

Testing Engineer : Shawn xiao
(Shawn Xiao)

Technical Manager : David Mao
(David Mao)

Authorized Signatory : Steven Lu
(Steven Lu)

BTL INC.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1601C040	Original Issue.	Jan. 26, 2016

1. CERTIFICATION

Equipment	:	Wireless Microphone System
Brand Name	:	BEHRINGER,
Model Name	:	ULM300M
Applicant		Music Group Services PH Corp
Manufacturer	:	Zhongshan Eurotec Electronics Ltd.
Address	:	Eurotec Industrial Park #1 Junjing Rd., Min Zhong Town, Zhongshan, Guangdong 528441 China.
Factory	:	Zhongshan Eurotec Electronics Ltd.
Address	:	Eurotec Industrial Park #1 Junjing Rd., Min Zhong Town, Zhongshan, Guangdong 528441 China.
Date of Test	:	Jan. 08, 2016 ~ Jan. 25, 2016
Test Sample	:	Engineering Sample
Standard(s)	:	FCC Part15, Subpart C :2014 (15.247) / ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1601C040) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247) , Subpart C: 2014		
Standard(s) Section	Test Item	Judgment
15.207	Conducted Emission	N/A **NOTE (1)**
15.247(d)	Antenna conducted Spurious Emission	PASS
15.247(a)(2)	6dB Bandwidth	PASS
15.247(b)(3)	Peak Output Power	PASS
15.247(e)	Power Spectral Density	PASS
15.203	Antenna Requirement	PASS
15.209/15.205	Transmitter Radiated Emissions	PASS

NOTE:

(1)" N/A" denotes test is not applicable to this device.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's test firm number for FCC: 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

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

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB
DG-CB03 (3m)	CISPR	9KHz~30MHz	V	3.79
		9KHz~30MHz	H	3.57
		30MHz ~ 200MHz	V	3.82
		30MHz ~ 200MHz	H	3.78
		200MHz ~ 1,000MHz	V	4.10
		200MHz ~ 1,000MHz	H	4.06
		1GHz~18GHz	V	3.12
		1GHz~18GHz	H	3.68
		18GHz~40GHz	V	4.15
		18GHz~40GHz	H	4.14

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Microphone System	
Brand Name	BEHRINGER,	
Model Name	ULM300M	
Model Difference	N/A	
Product Description	Operation Frequency	2404~2468 MHz
	Modulation Technology	DFSK (2Mbps)
	Bit Rate of Transmitter	
	Output Power (Max.)	8.96dBm
Power Source	Supplied from 2*AA(LR6) battery	
Power Rating	DC 3V	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2404**	10	2436
02	2408	11	2444
03	2412	12	2448
04	2416	13	2452
05	2420	14	2456
06	2424	15	2460
07	2428	16	2464
08	2432	**17**	**2468**
09	**2436**		

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	0

3.2 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	TX Mode **NOTE (1)**

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode **NOTE (1)**

Note:

(1) The measurements are performed at the high, middle, low available channels.

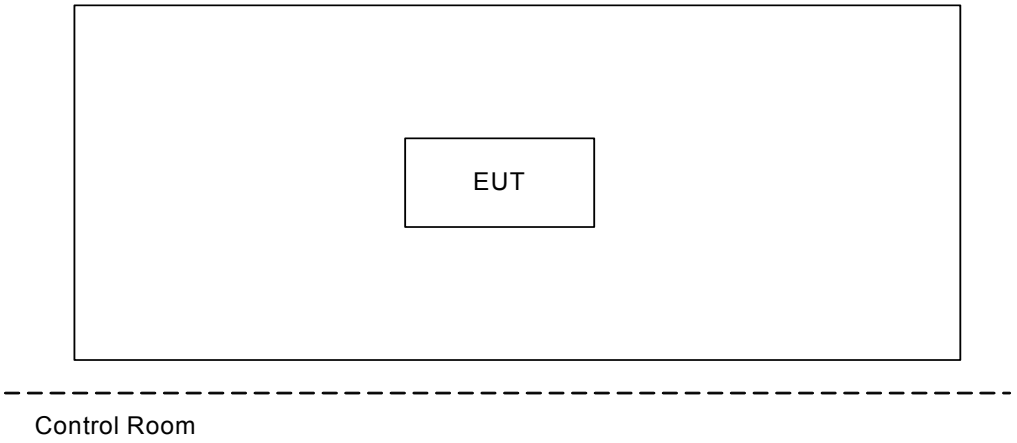
(2) The EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN

Test Software Version	N/A		
Frequency (MHz)	2404	2436	2468
DSSS	N/A	N/A	N/A

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 DESCRIPTION OF SUPPORT UNITS

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.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

Note:

(1) For detachable type I/O cable should be specified the length in m in 『Length』 column.

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 -0.5	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

Note:

(1) The limit of " * " decreases with the logarithm of the frequency

(2) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
Margin Level = Measurement Value - Limit Value

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

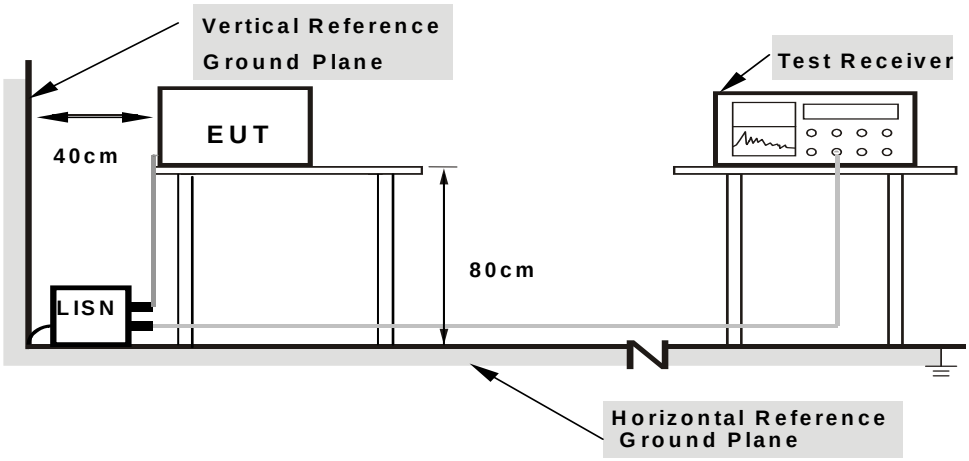
4.1.2 TEST PROCEDURE

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.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 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

4.1.5 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.

4.1.6 EUT TEST CONDITIONS

Temperature: N/A°C
Relative Humidity: N/A%
Test Voltage: N/A

4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform.In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.
(2) Measuring frequency range from 150KHz to 30MHz.
(3) " N/A" denotes test is not applicable to this device.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

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.

LIMITS OF RADIATED EMISSION MEASUREMENT (9KHz-1000MHz)

Frequency (MHz)	Field Strength (microvolts/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
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	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).

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	RBW 1MHz VBW 3MHz peak detector for Pk value RMS detector for AV value

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz~110KHz for QP detector
Start ~ Stop Frequency	110KHz~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

4.2.2 TEST PROCEDURE

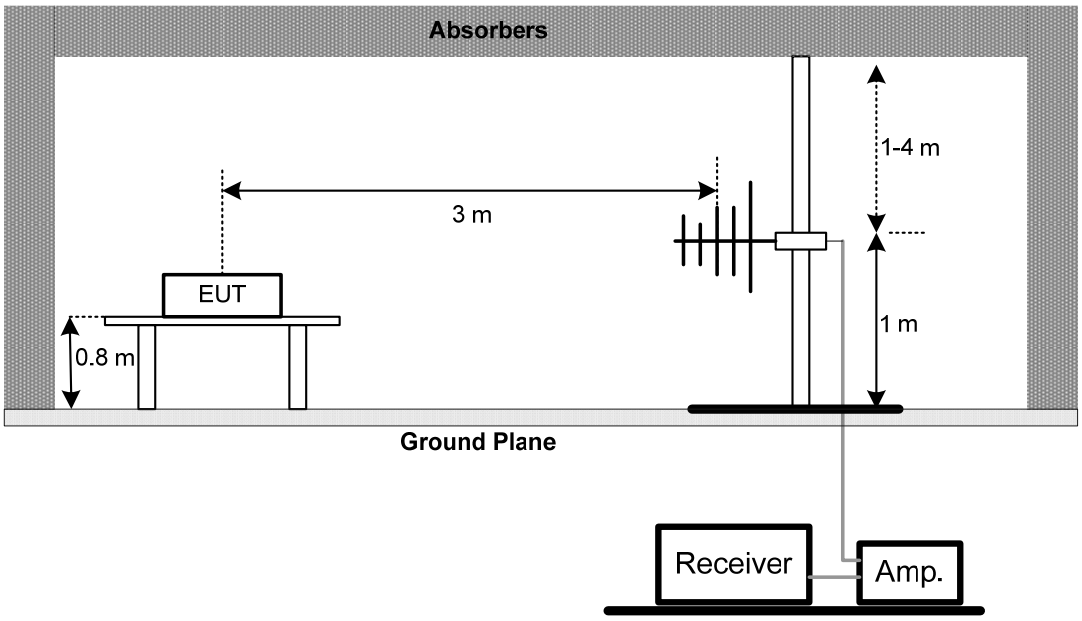
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 m semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5m; 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 radiated emission data is a receiver 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.

4.2.3 DEVIATION FROM TEST STANDARD

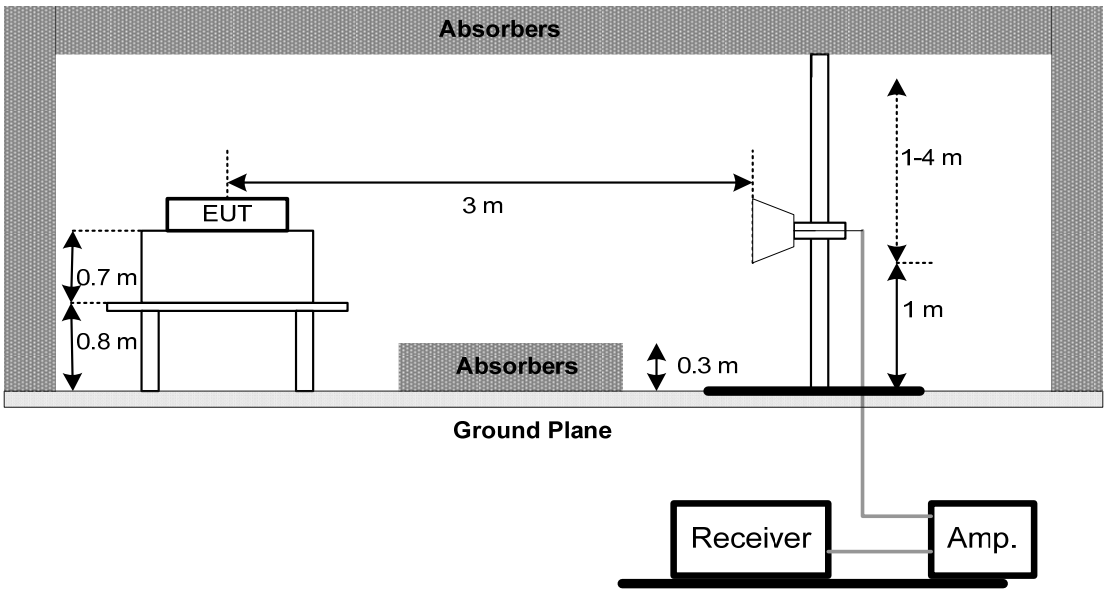
No deviation

4.2.4 TEST SETUP

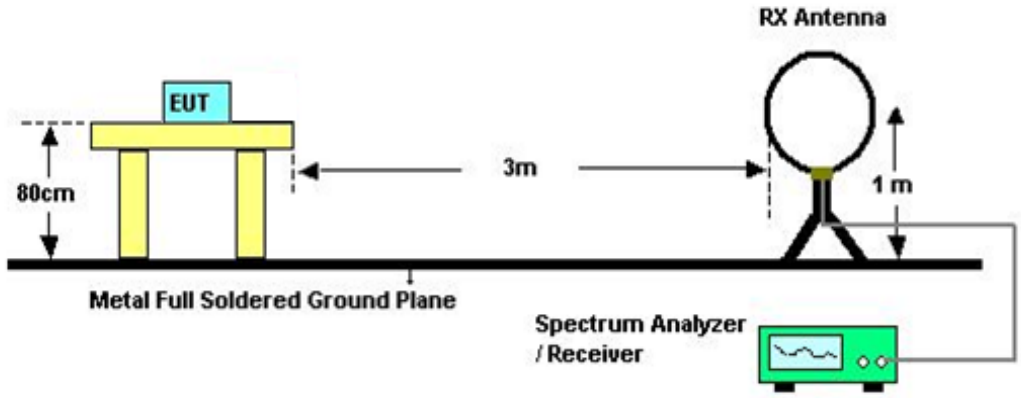
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 EUT TEST CONDITIONS

Temperature: 22°C
Relative Humidity: 56%
Test Voltage: DC 3V

4.2.7TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment B

Remark:

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

4.2.8TEST RESULTS (30MHZ TO 1000 MHZ)

Please refer to the Attachment C.

Remark:

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
(2) Measuring frequency range from 30MHz to 1000MHz.
(3) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

4.2.9TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

Remark:

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
(2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
(3) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
(4) EUT Orthogonal Axis:
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand
(5) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
(6) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

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

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

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 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: DC 3V

5.1.6 TEST RESULTS

Please refer to the Attachment E.

6. MAXIMUM 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)	Maximum Output Power	1 watt or 30dBm	2400-2483.5	PASS

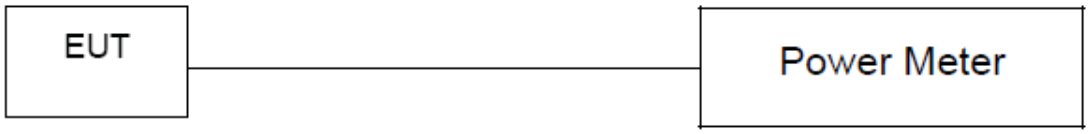
6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
b. The maximum peak conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance v03r03.

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 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: DC 3V

6.1.6 TEST RESULTS

Please refer to the Attachment F.

7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 Applied procedures / limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits.

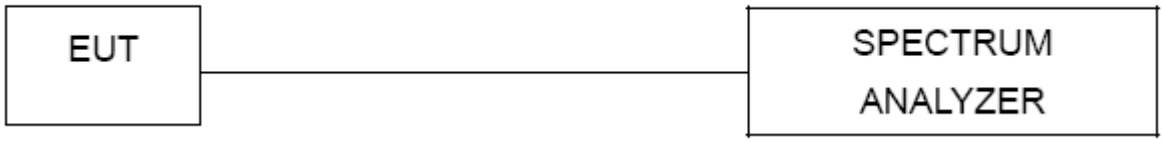
7.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=300KHz, Sweep time = 10 ms.
c. Offset=antanna gain + cable loss

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: DC 3V

7.1.6 TEST RESULTS

Please refer to the Attachment G.

8. POWER SPECTRAL DENSITY TEST

8.1 Applied procedures / limit

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

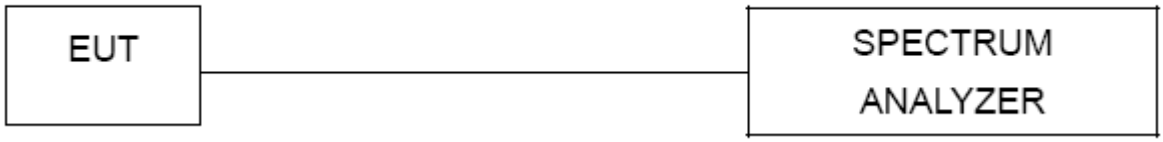
8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW=3KHz, VBW=10 KHz, Sweep time = auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: DC 3V

8.1.6 TEST RESULTS

Please refer to the Attachment H.

9. MEASUREMENT INSTRUMENTS LIST

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 16, 2016
3	Receiver	AGILENT	N9038A	MY52130039	Oct. 11, 2016
4	Test Cable	emci	LMR-400(30MHz-1GHz)	C-01	Jun. 28, 2016
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	Mar. 28, 2016
7	Amplifier	Agilent	8449B	3008A02274	Nov. 01, 2016
8	Test Cable	emci	EMC104-SM-SM-10000(1GHz－26.5GHz)	C-68	Jun. 28, 2016
9	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
10	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 07, 2016
12	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	ANRITSU	ML2495A	1128009	Mar. 28, 2016
2	Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 28, 2016

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

10. EUT TEST PHOTO

Radiated Measurement Photos

9KHz to 30MHz

Radiated Measurement Photos

30MHz to 1000MHz

Radiated Measurement Photos

Above 1000MHz

ATTACHMENT A - CONDUCTED EMISSION

Test Mode: N/A

Note: “N/A” denotes test is not applicable to this device.

ATTACHMENT A - RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode:	TX Mode

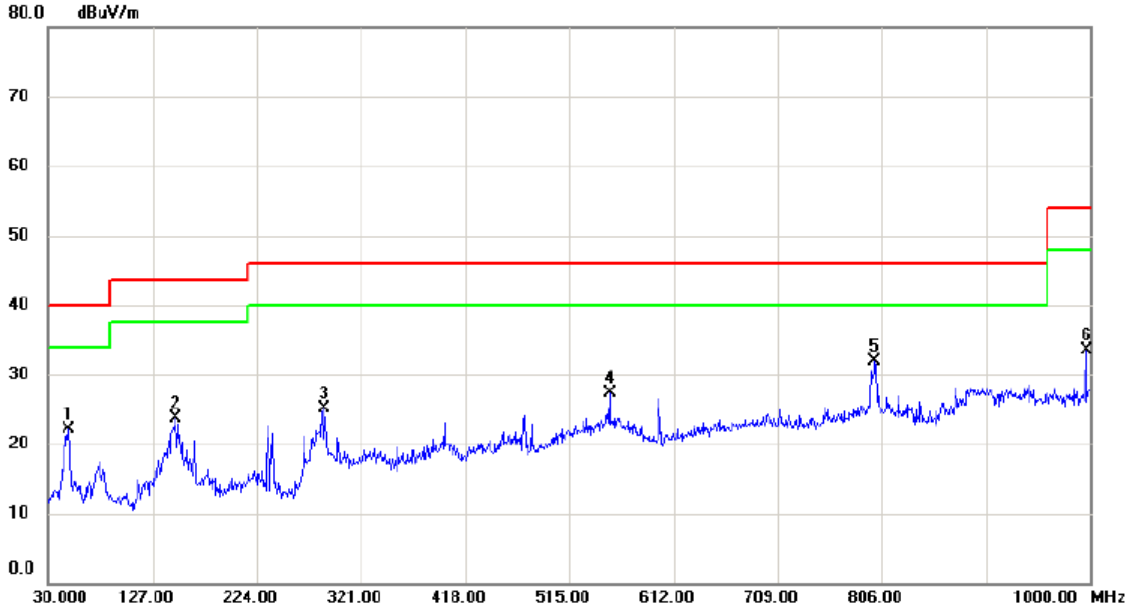
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0121	0°	13.57	24.80	38.37	125.95	-87.58	AVG
0.0121	0°	14.73	24.80	39.53	145.95	-106.42	PEAK
0.0297	0°	6.92	23.69	30.61	118.15	-87.54	AVG
0.0297	0°	8.37	23.69	32.06	138.15	-106.09	PEAK
0.0389	0°	3.58	23.10	26.68	115.81	-89.12	AVG
0.0389	0°	5.93	23.10	29.03	135.81	-106.77	PEAK
0.0636	0°	1.55	22.13	23.68	111.54	-87.86	AVG
0.0636	0°	2.84	22.13	24.97	131.54	-106.57	PEAK
0.6245	0°	20.07	20.20	40.27	71.69	-31.43	QP
1.9738	0°	23.87	19.50	43.37	69.54	-26.17	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0188	90°	13.28	24.30	37.58	122.12	-84.54	AVG
0.0188	90°	15.07	24.30	39.37	142.12	-102.75	PEAK
0.0241	90°	7.18	24.04	31.22	119.96	-88.74	AVG
0.0241	90°	8.68	24.04	32.72	139.96	-107.24	PEAK
0.0447	90°	5.47	22.74	28.21	114.60	-86.39	AVG
0.0447	90°	6.49	22.74	29.23	134.60	-105.37	PEAK
0.0598	90°	1.77	22.20	23.97	112.07	-88.10	AVG
0.0598	90°	2.90	22.20	25.10	132.07	-106.97	PEAK
0.6365	90°	22.38	20.24	42.62	71.53	-28.91	QP
2.0670	90°	24.77	19.46	44.23	69.54	-25.31	QP

ATTACHMENT B - RADIATED EMISSION (30MHZ TO 1000MHZ)

Test Mode:	TX 2404MHz -CH01

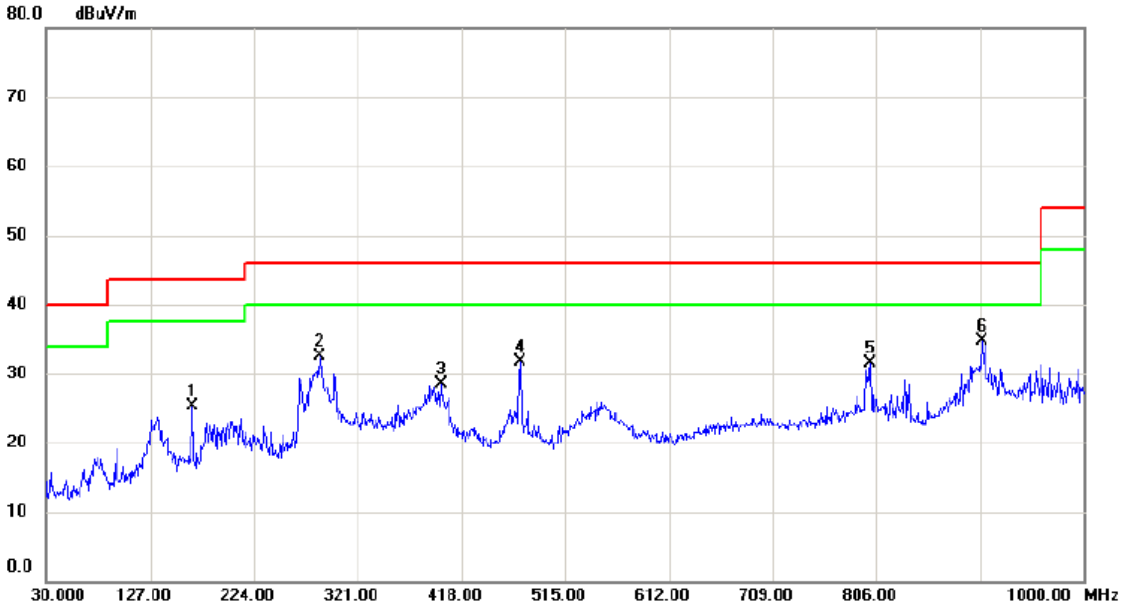
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		48.4300	35.95	-13.80	22.15	40.00	-17.85	peak	
2		148.3400	36.91	-13.19	23.72	43.50	-19.78	peak	
3		287.0500	36.45	-11.36	25.09	46.00	-20.91	peak	
4		552.8300	32.56	-5.29	27.27	46.00	-18.73	peak	
5	*	799.2100	34.10	-2.11	31.99	46.00	-14.01	peak	
6		996.1200	33.88	-0.35	33.53	54.00	-20.47	peak	

Test Mode:	TX 2404MHz -CH01

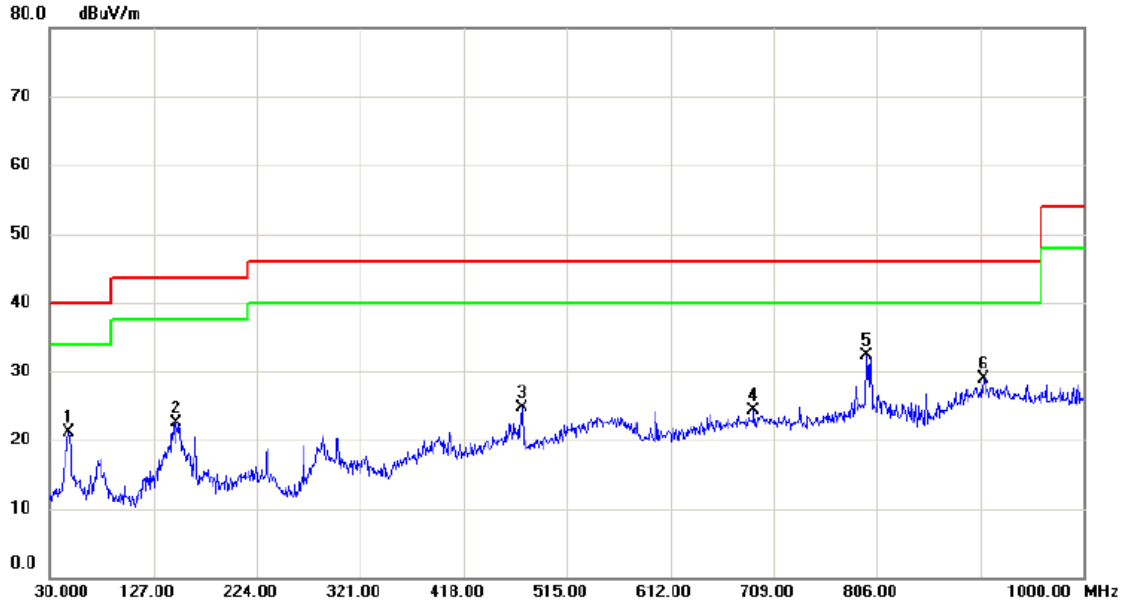
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		166.7700	38.11	-12.73	25.38	43.50	-18.12	peak	
2		285.1100	44.14	-11.61	32.53	46.00	-13.47	peak	
3		398.6000	37.94	-9.38	28.56	46.00	-17.44	peak	
4		473.2900	40.69	-8.95	31.74	46.00	-14.26	peak	
5		800.1800	33.49	-2.08	31.41	46.00	-14.59	peak	
6	*	904.9400	34.38	0.39	34.77	46.00	-11.23	peak	

Test Mode:	TX 2436MHz -CH09

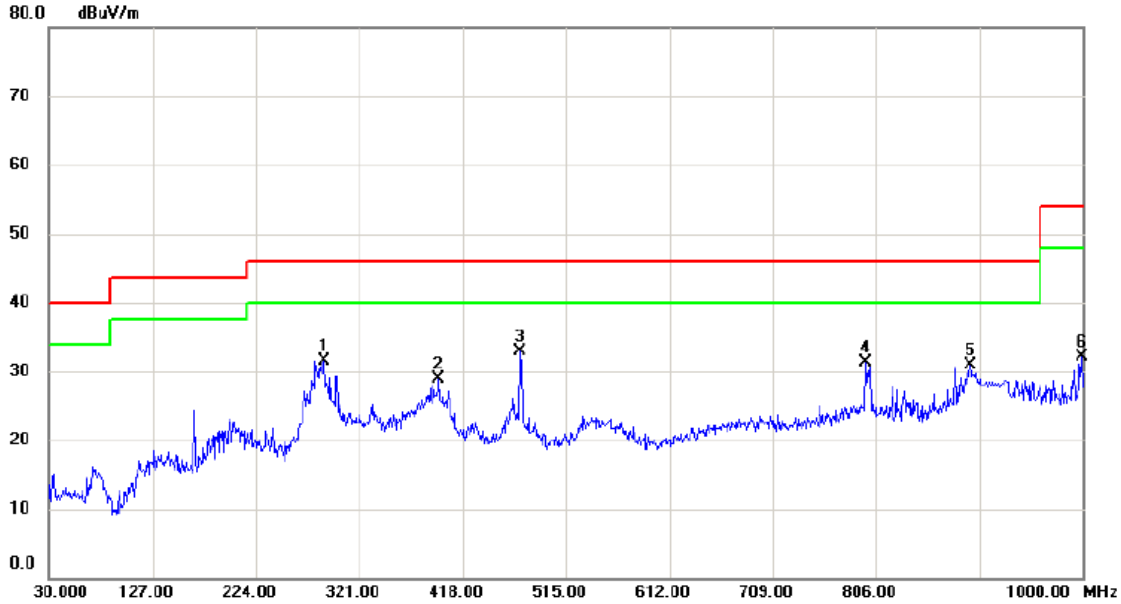
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		47.4600	34.63	-13.62	21.01	40.00	-18.99	peak	
2		148.3400	35.64	-13.19	22.45	43.50	-21.05	peak	
3		473.2900	33.56	-8.95	24.61	46.00	-21.39	peak	
4		690.5700	28.57	-4.36	24.21	46.00	-21.79	peak	
5	*	796.3000	34.56	-2.26	32.30	46.00	-13.70	peak	
6		905.9100	28.45	0.37	28.82	46.00	-17.18	peak	

Test Mode:	TX 2436MHz -CH09

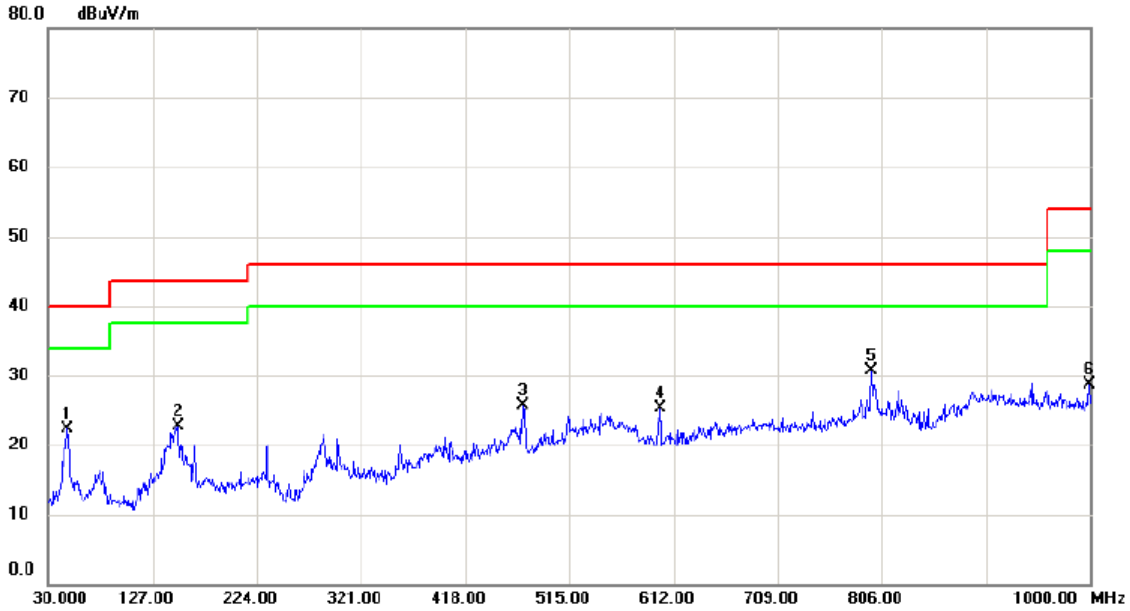
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		288.0200	42.72	-11.25	31.47	46.00	-14.53	peak	
2		395.6900	38.38	-9.49	28.89	46.00	-17.11	peak	
3	*	471.3500	41.83	-8.88	32.95	46.00	-13.05	peak	
4		796.3000	33.53	-2.26	31.27	46.00	-14.73	peak	
5		894.2700	30.91	-0.06	30.85	46.00	-15.15	peak	
6		999.0300	32.49	-0.35	32.14	54.00	-21.86	peak	

Test Mode:	TX 2468MHz -CH17

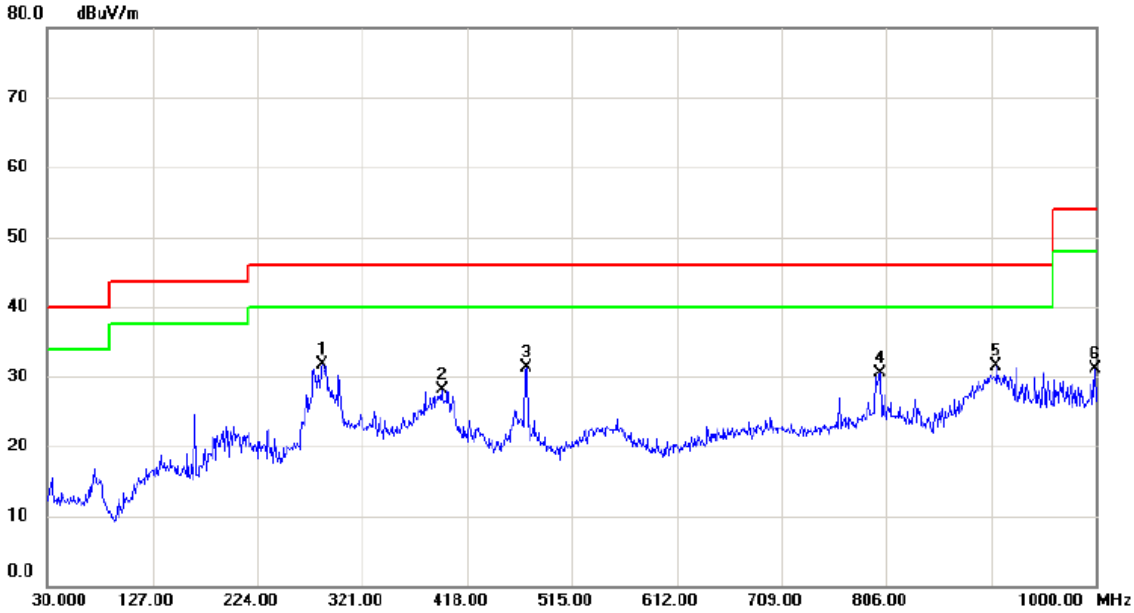
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		47.4600	35.93	-13.62	22.31	40.00	-17.69	peak	
2		150.2800	35.68	-13.00	22.68	43.50	-20.82	peak	
3		471.3500	34.64	-8.88	25.76	46.00	-20.24	peak	
4		599.3900	33.13	-7.83	25.30	46.00	-20.70	peak	
5	*	796.3000	32.91	-2.26	30.65	46.00	-15.35	peak	
6		999.0300	29.00	-0.35	28.65	54.00	-25.35	peak	

Test Mode:	TX 2468MHz -CH17

Horizontal

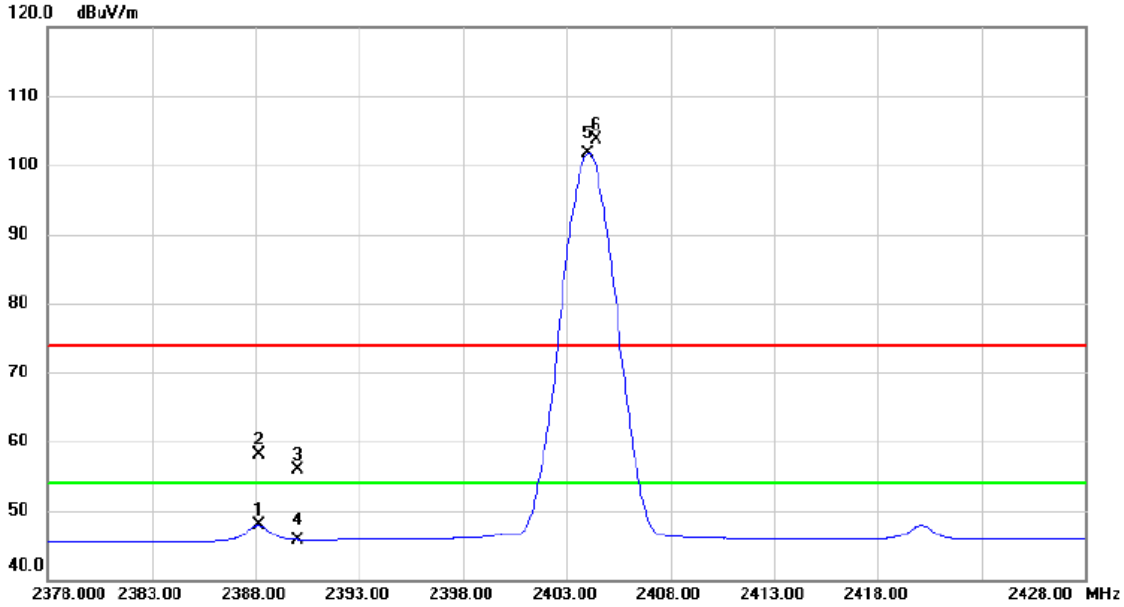


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	284.1400	43.41	-11.72	31.69	46.00	-14.31	peak	
2		394.7200	37.60	-9.53	28.07	46.00	-17.93	peak	
3		473.2900	40.32	-8.95	31.37	46.00	-14.63	peak	
4		800.1800	32.61	-2.08	30.53	46.00	-15.47	peak	
5		907.8500	31.14	0.35	31.49	46.00	-14.51	peak	
6		999.0300	31.37	-0.35	31.02	54.00	-22.98	peak	

ATTACHMENT C - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode :	TX 2404MHz _CH01

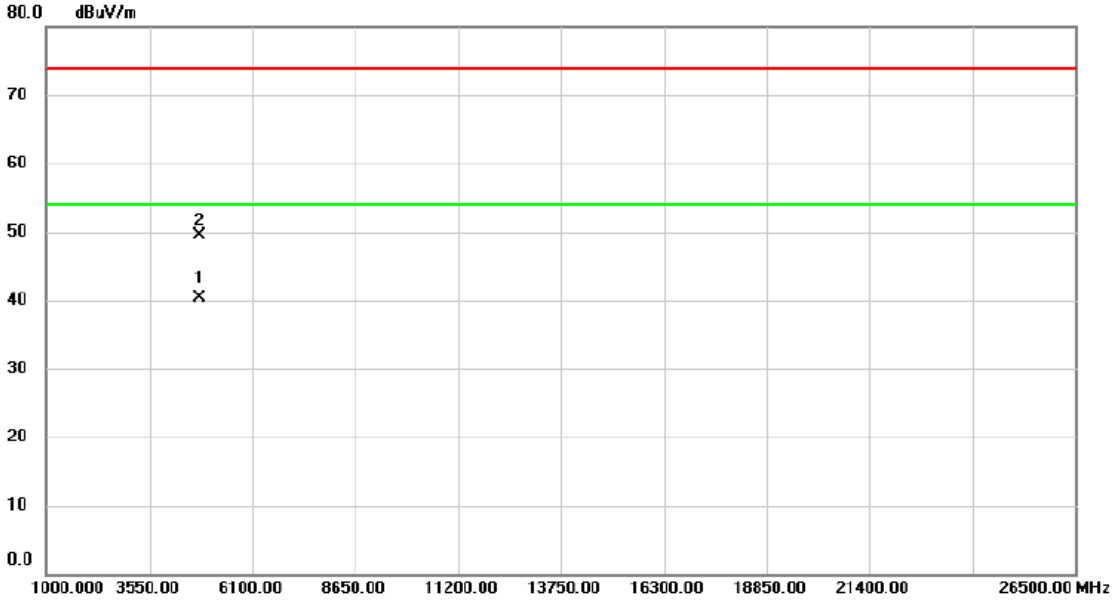
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2388.150	15.16	32.68	47.84	74.00	-26.16	peak	
2		2388.150	25.39	32.68	58.07	74.00	-15.93	peak	
3		2390.000	23.23	32.68	55.91	74.00	-18.09	peak	
4		2390.000	13.12	32.68	45.80	54.00	-8.20	AVG	
5	*	2404.050	69.05	32.69	101.74	54.00	47.74	AVG	No Limit
6	X	2404.400	70.97	32.69	103.66	74.00	29.66	peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2404MHz _CH01

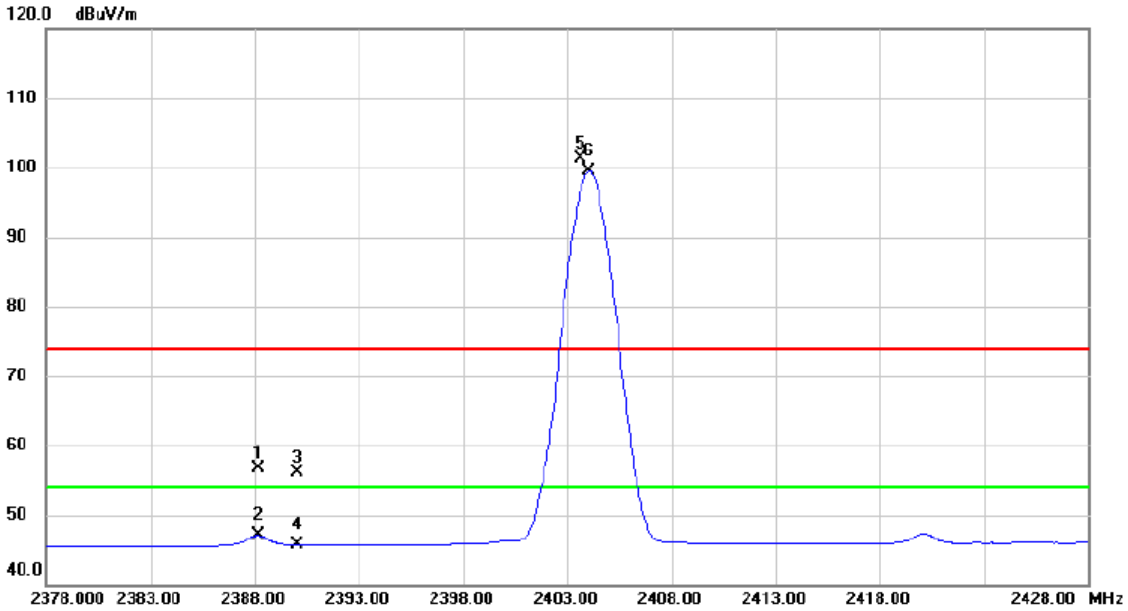
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4806.160	34.59	5.81	40.40	54.00	-13.60	AVG	
2		4807.300	43.78	5.82	49.60	74.00	-24.40	peak	

Orthogonal Axis :	X
Test Mode :	TX 2404MHz _CH01

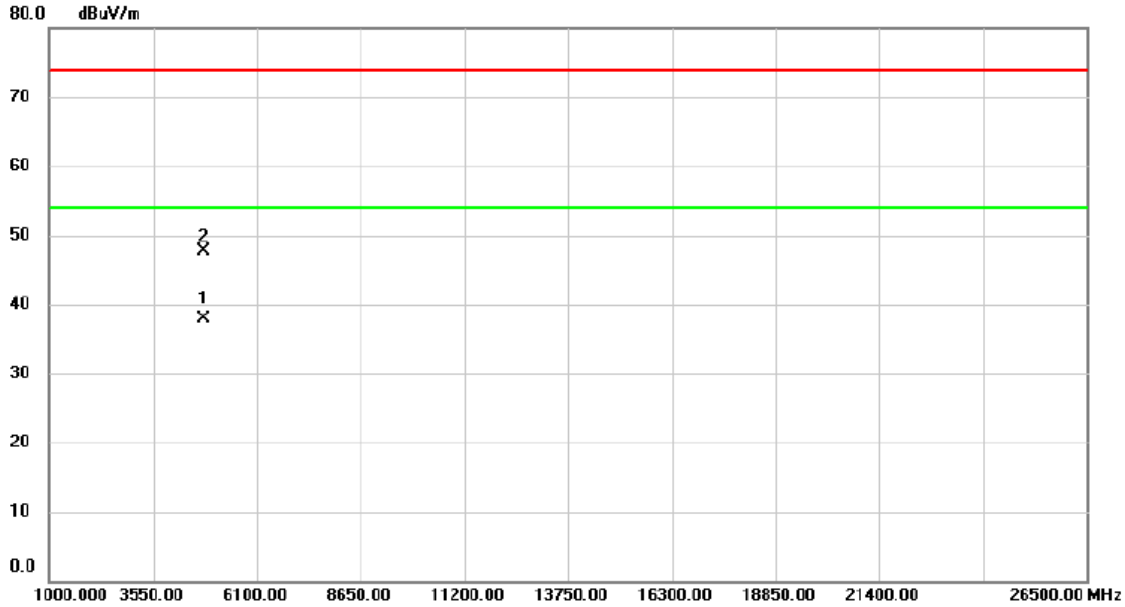
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2388.150	24.01	32.68	56.69	74.00	-17.31	peak	
2		2388.150	14.34	32.68	47.02	54.00	-6.98	AVG	
3		2390.000	23.41	32.68	56.09	74.00	-17.91	peak	
4		2390.000	12.98	32.68	45.66	54.00	-8.34	AVG	
5	X	2403.650	68.70	32.69	101.39	74.00	27.39	peak	No Limit
6	*	2404.050	66.83	32.69	99.52	54.00	45.52	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2404MHz _CH01

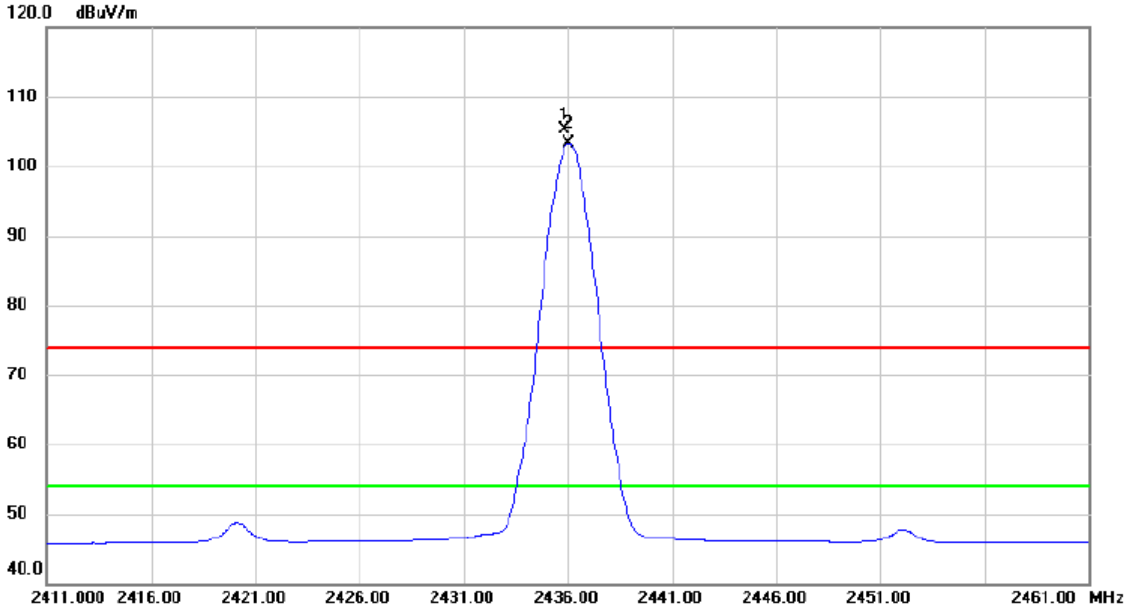
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4806.190	32.05	5.81	37.86	54.00	-16.14	AVG	
2		4806.240	41.91	5.81	47.72	74.00	-26.28	peak	

Orthogonal Axis :	X
Test Mode :	TX 2436MHz _CH09

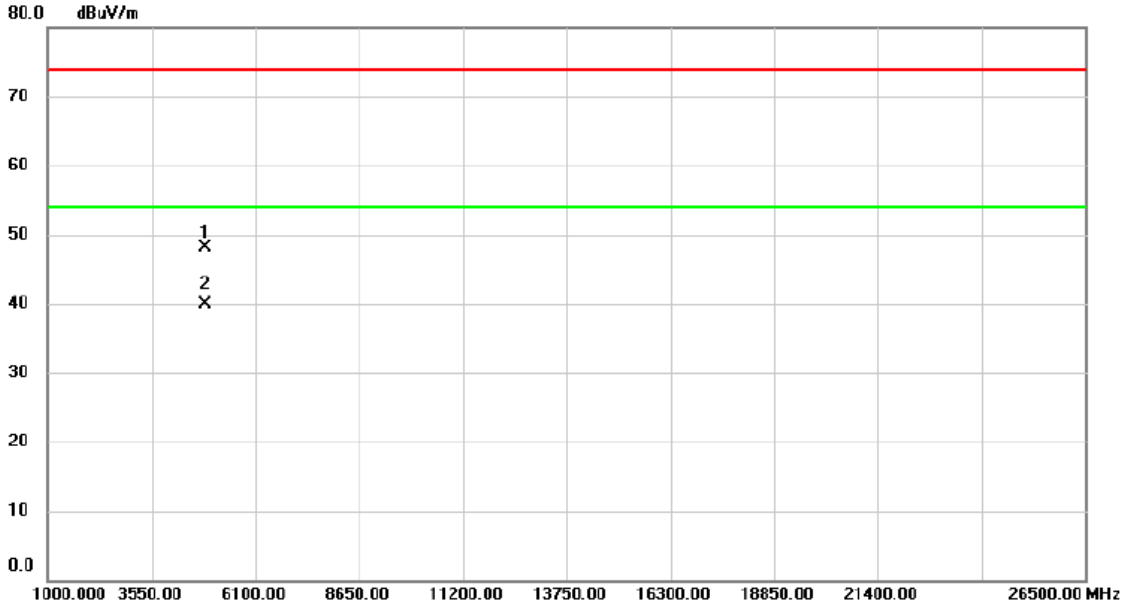
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2435.850	72.50	32.74	105.24	74.00	31.24	peak	No Limit
2	*	2436.050	70.60	32.74	103.34	54.00	49.34	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2436MHz _CH09

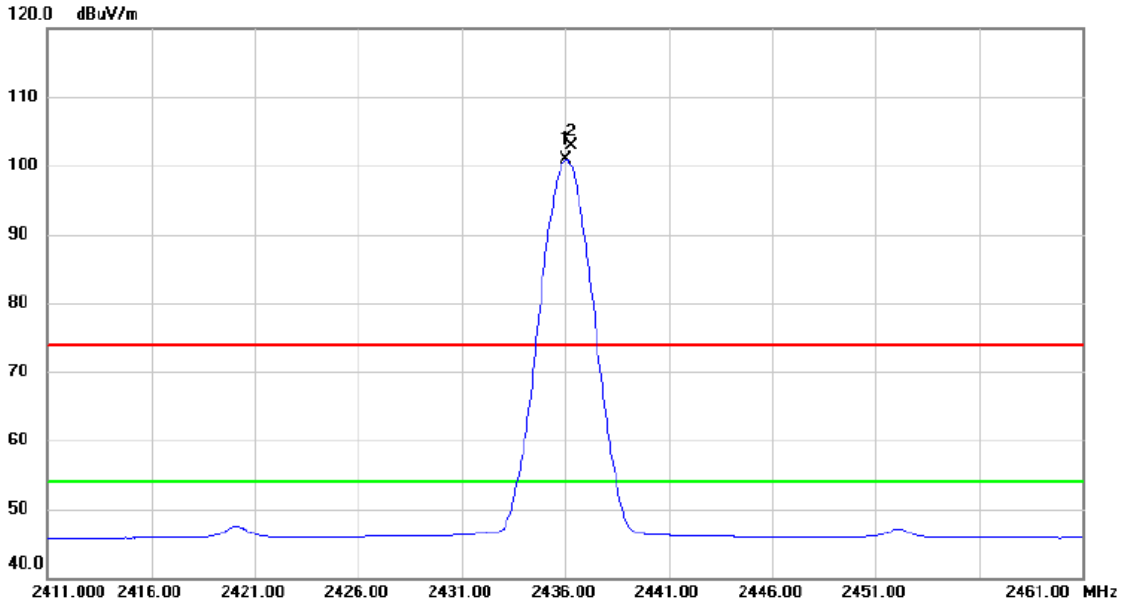
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4872.100	42.05	6.00	48.05	74.00	-25.95	peak	
2	*	4872.610	33.90	6.00	39.90	54.00	-14.10	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2436MHz _CH09

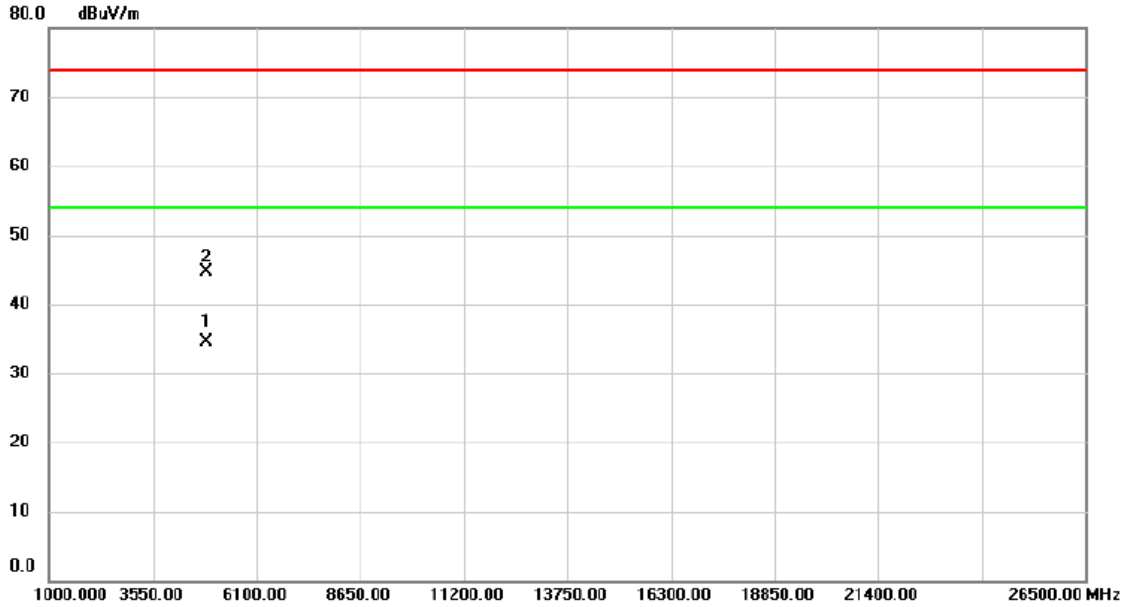
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2436.050	68.17	32.74	100.91	54.00	46.91	AVG	No Limit
2	X	2436.300	70.07	32.74	102.81	74.00	28.81	peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2436MHz _CH09

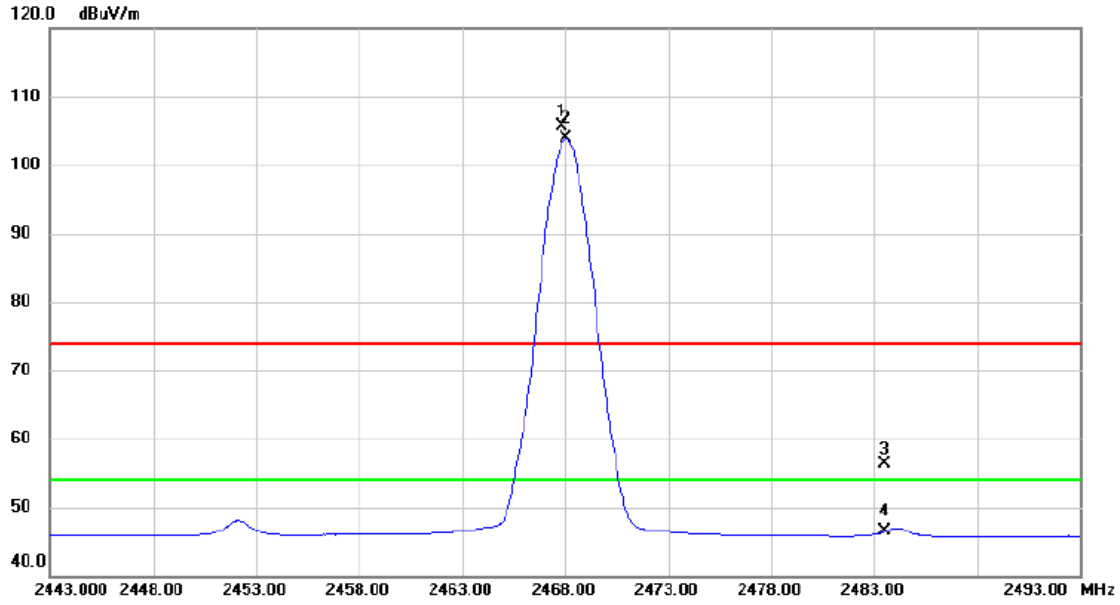
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4871.690	28.57	6.00	34.57	54.00	-19.43	AVG	
2		4872.850	38.63	6.00	44.63	74.00	-29.37	peak	

Orthogonal Axis :	X
Test Mode :	TX 2468MHz _CH17

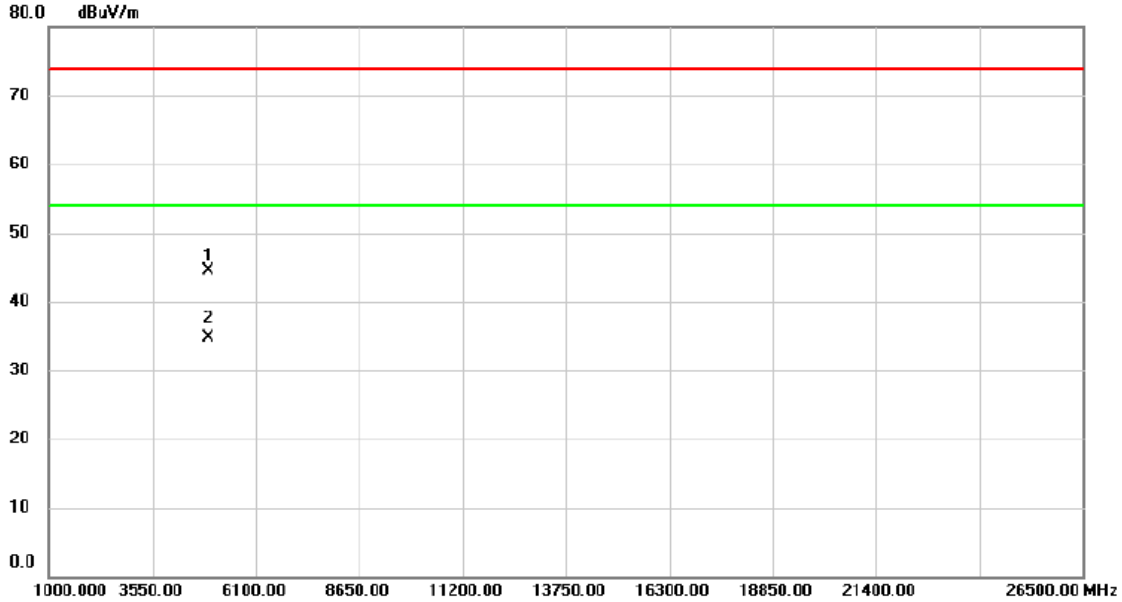
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2467.800	72.99	32.78	105.77	74.00	31.77	peak	No Limit
2	*	2468.050	71.10	32.78	103.88	54.00	49.88	AVG	No Limit
3		2483.500	23.46	32.81	56.27	74.00	-17.73	peak	
4		2483.500	13.60	32.81	46.41	54.00	-7.59	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2468MHz _CH17

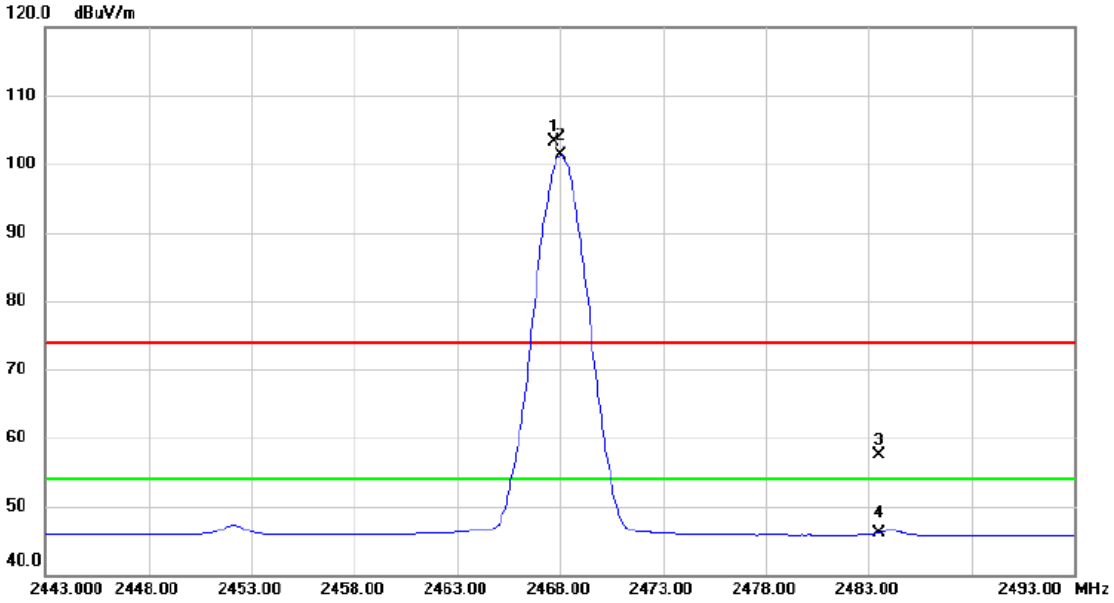
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4935.750	38.30	6.17	44.47	74.00	-29.53	peak	
2	*	4936.700	28.63	6.17	34.80	54.00	-19.20	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2468MHz _CH17

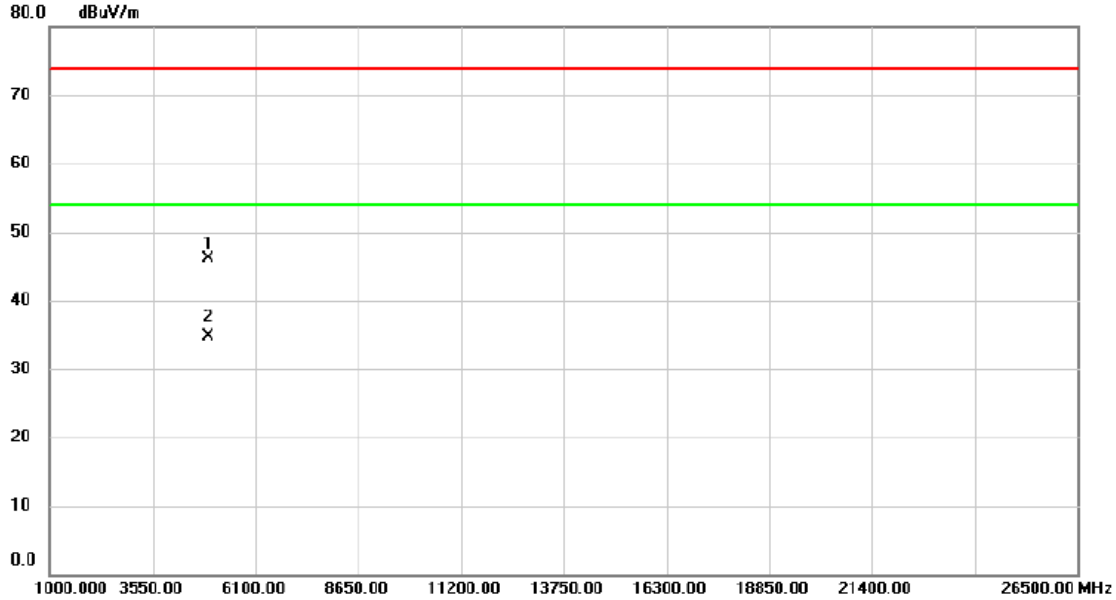
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2467.700	70.45	32.78	103.23	74.00	29.23	peak	No Limit
2	*	2468.050	68.54	32.78	101.32	54.00	47.32	AVG	No Limit
3		2483.500	24.70	32.81	57.51	74.00	-16.49	peak	
4		2483.500	13.30	32.81	46.11	54.00	-7.89	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2468MHz _CH17

Horizontal



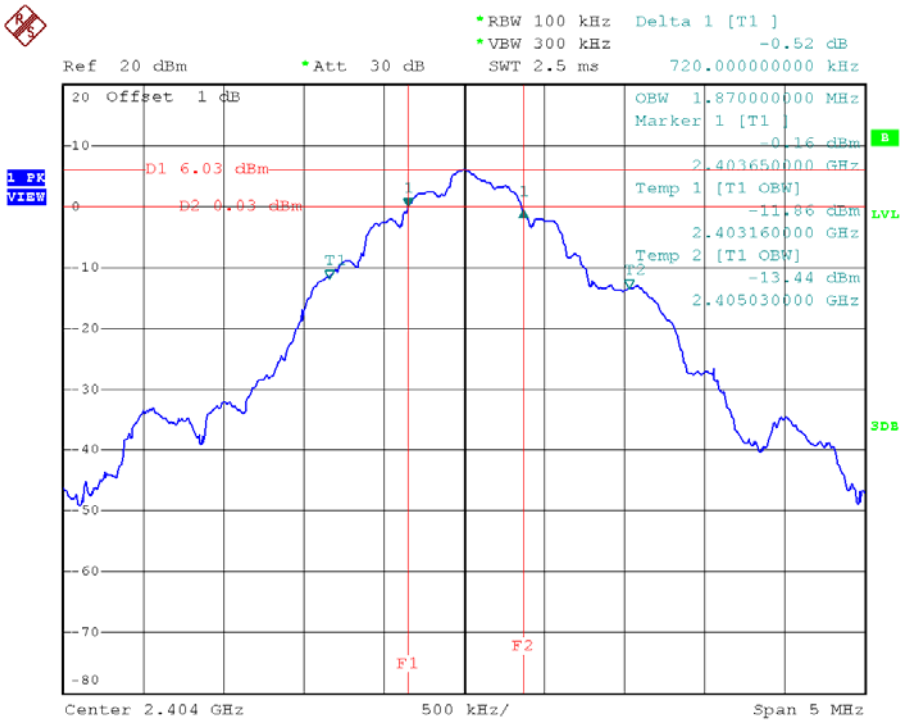
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4935.700	40.00	6.17	46.17	74.00	-27.83	peak	
2	*	4936.850	28.51	6.17	34.68	54.00	-19.32	AVG	

ATTACHMENT D - BANDWIDTH

Test Mode :	CH01, CH09 , CH17

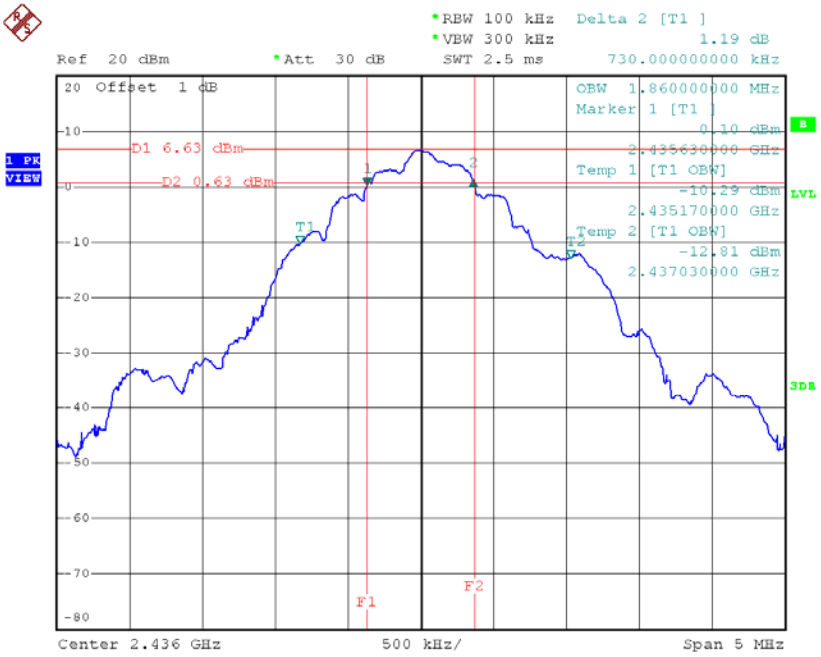
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2404	0.72	1.87	500	Complies
2436	0.73	1.86	500	Complies
2468	0.72	1.87	500	Complies

TX CH01



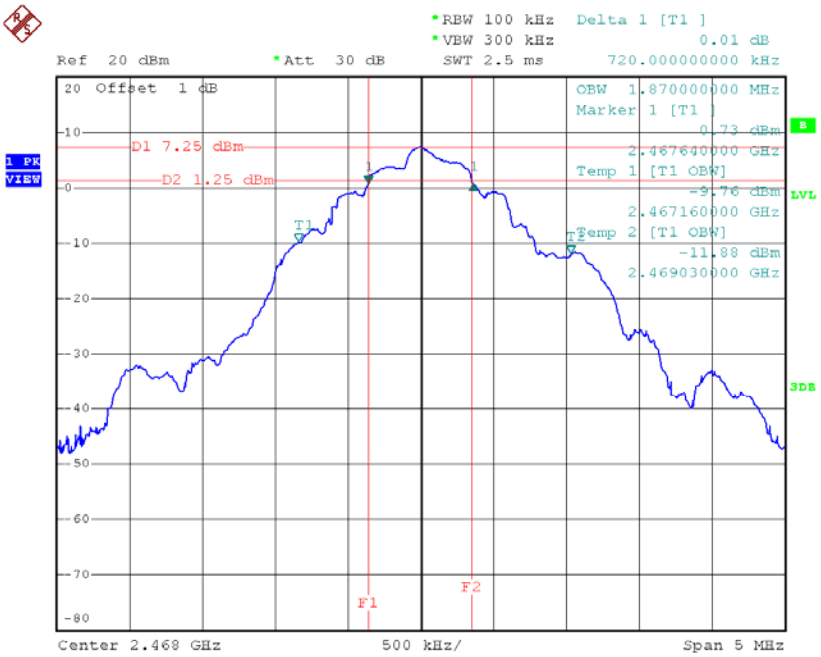
Date: 20.JAN.2016 09:05:59

TX CH09



Date: 20.JAN.2016 09:11:36

TX CH17



Date: 20.JAN.2016 09:16:01

ATTACHMENT E - MAXIMUM OUTPUT POWER TEST

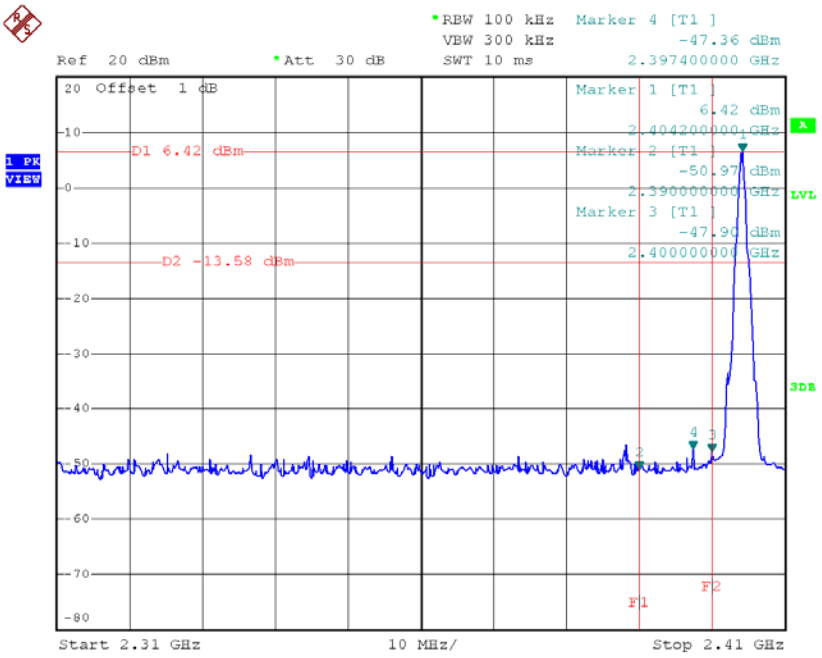
Test Mode :	CH01, CH09 , CH17

Frequency	Conducted Power (dBm)	Conducted Power (W)	Max. Limit(dBm)	Max. Limit(W)	Result
2404 MHz	7.48	0.0056	30.00	1.0000	Complies
2436 MHz	8.56	0.0072	30.00	1.0000	Complies
2468 MHz	8.96	0.0079	30.00	1.0000	Complies

ATTACHMENT F - ANTENNA CONDUCTED SPURIOUS EMISSION

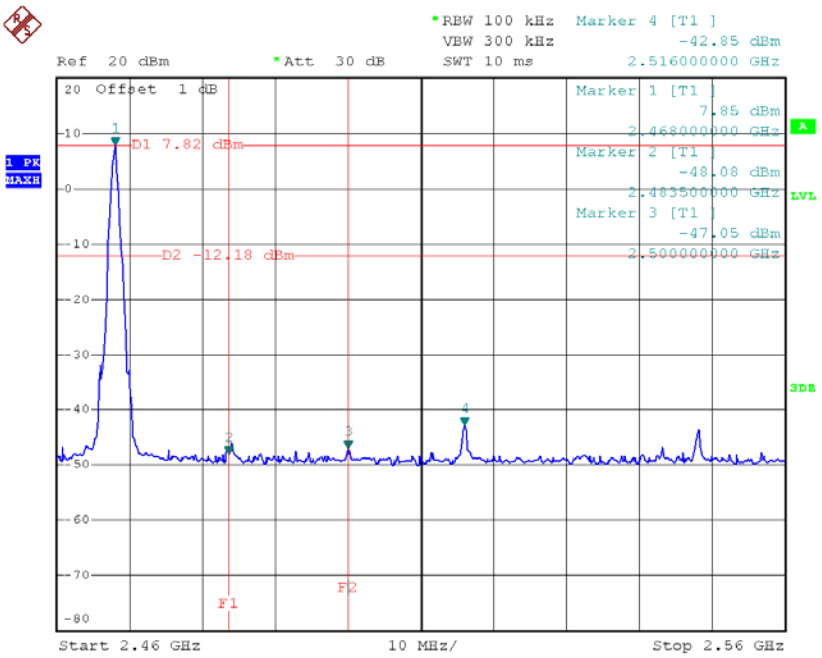
Test Mode :	CH01, CH09 , CH17

CH01 (Lower)



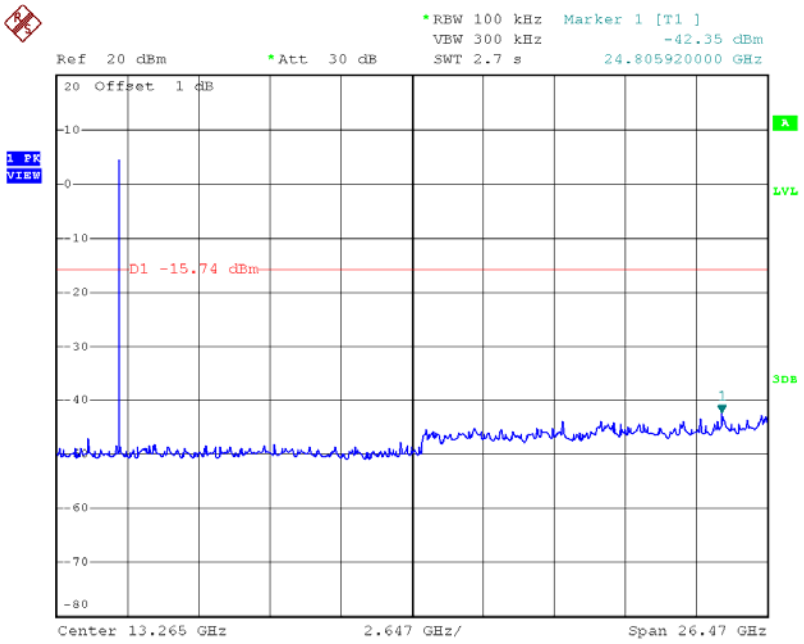
Date: 20.JAN.2016 09:00:55

CH17 (upper) - 1Mbps



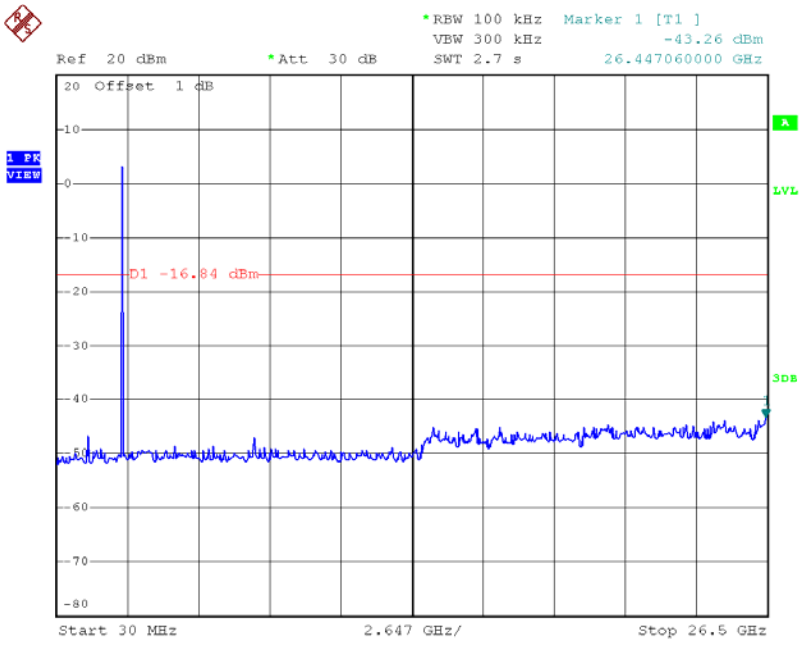
Date: 20.JAN.2016 09:25:51

CH01 (10 Harmonic of the frequency)



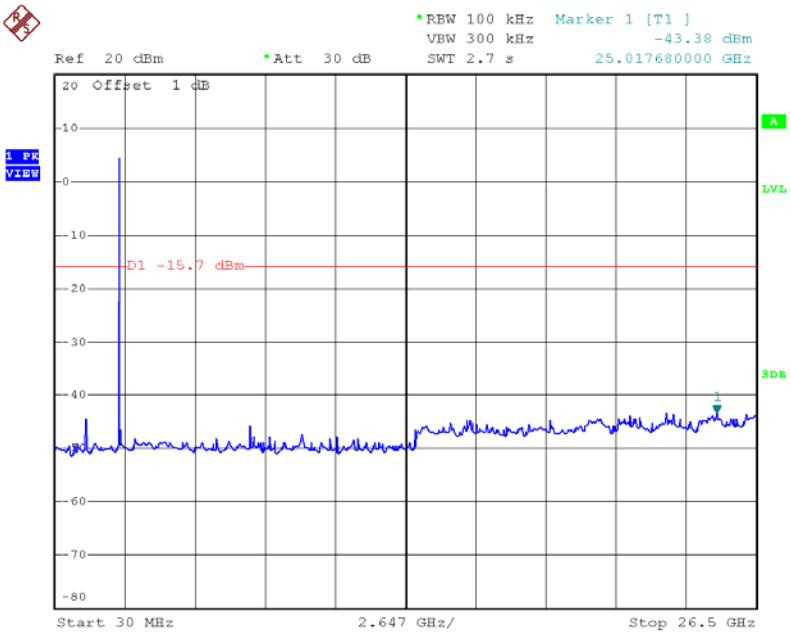
Date: 20.JAN.2016 09:50:21

CH09 (10 Harmonic of the frequency)



Date: 20.JAN.2016 09:31:12

CH17 (10 Harmonic of the frequency)



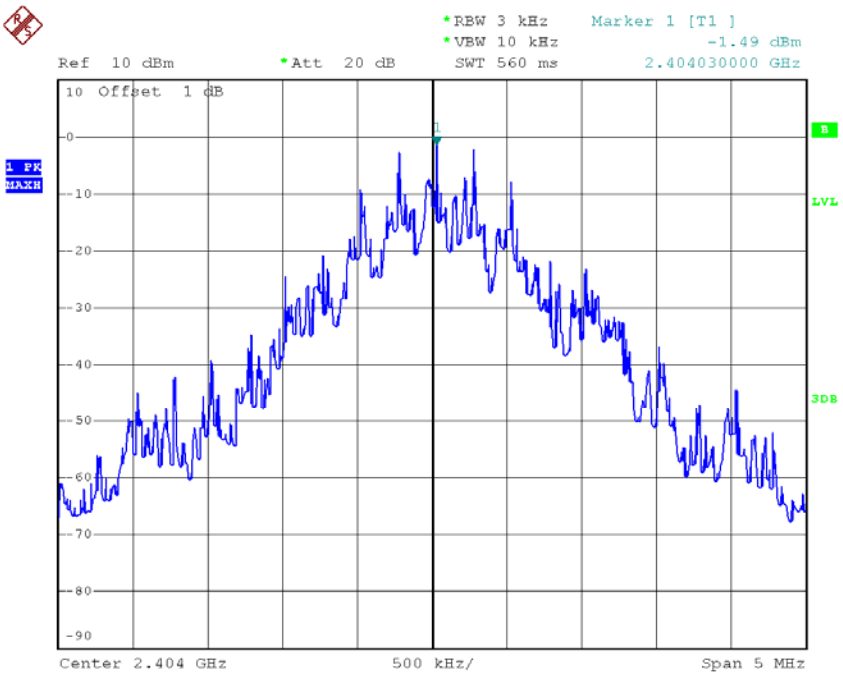
Date: 20.JAN.2016 09:28:34

ATTACHMENT G - POWER SPECTRAL DENSITY TEST

Test Mode :	CH01, CH09 , CH17

Frequency (MHz)	Power Density (dBm)	Max. Limit (dBm)	Result
2404	-1.49	8	Complies
2436	-0.83	8	Complies
2468	-0.17	8	Complies

TX CH01



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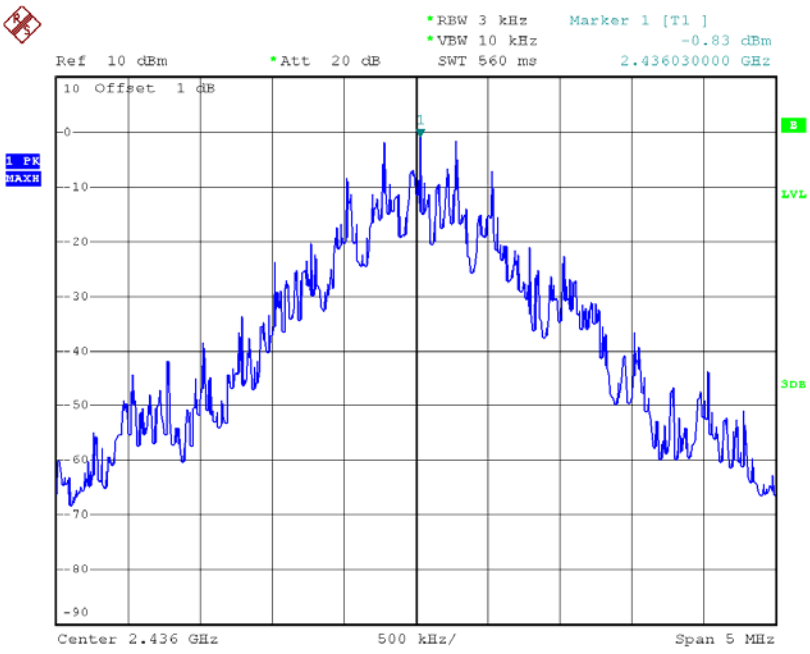

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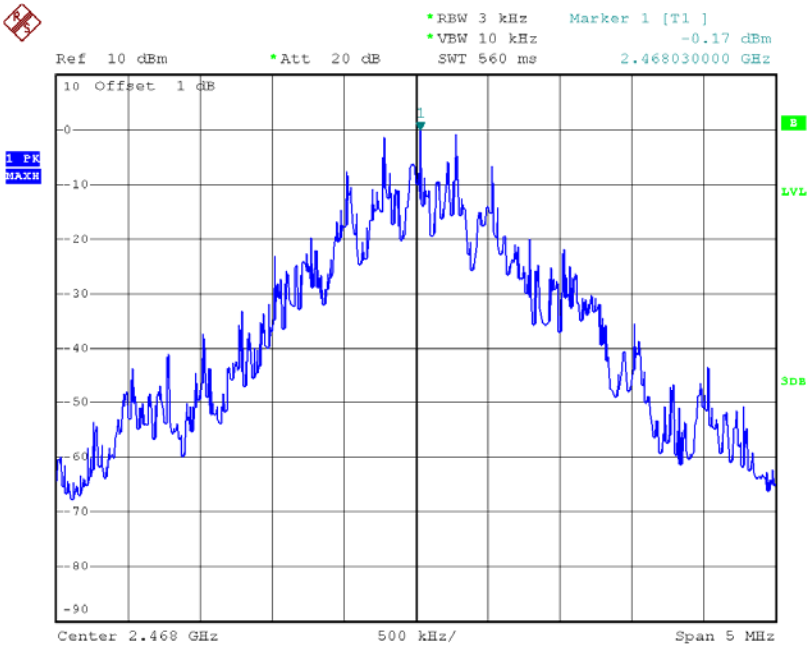

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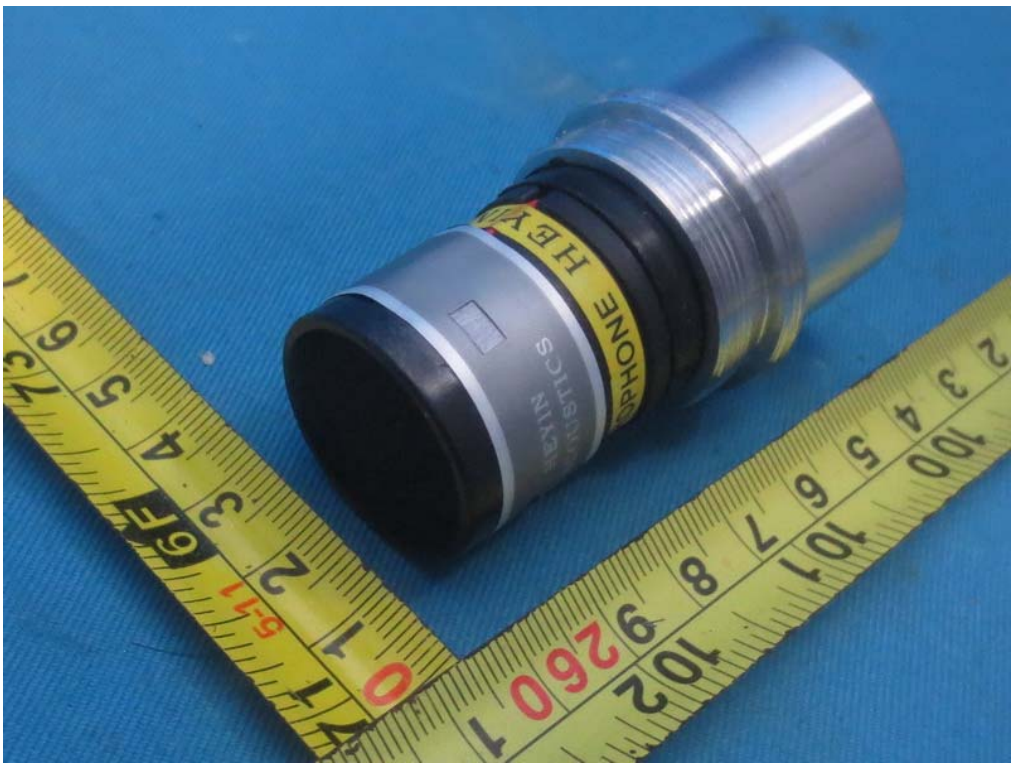
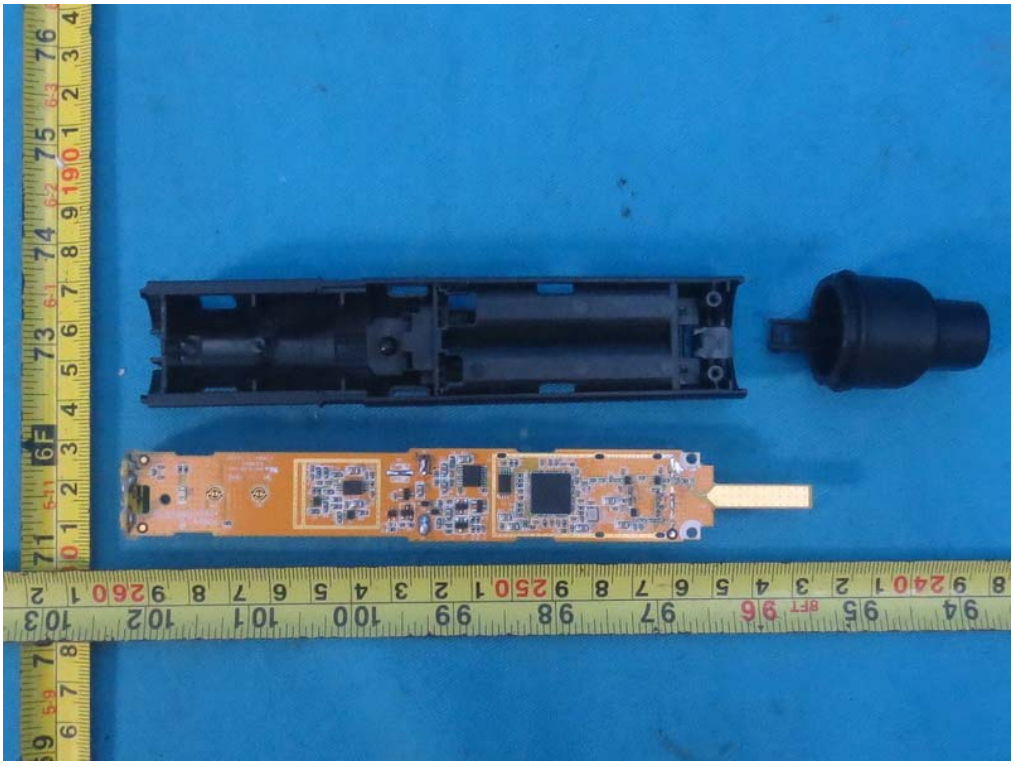
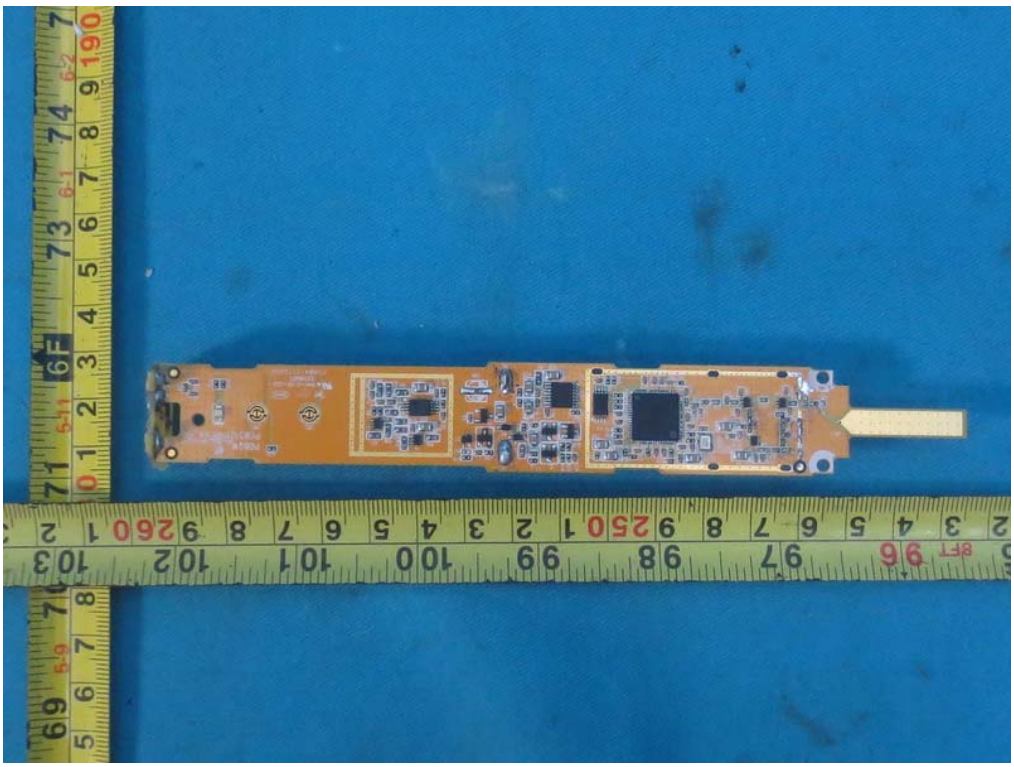
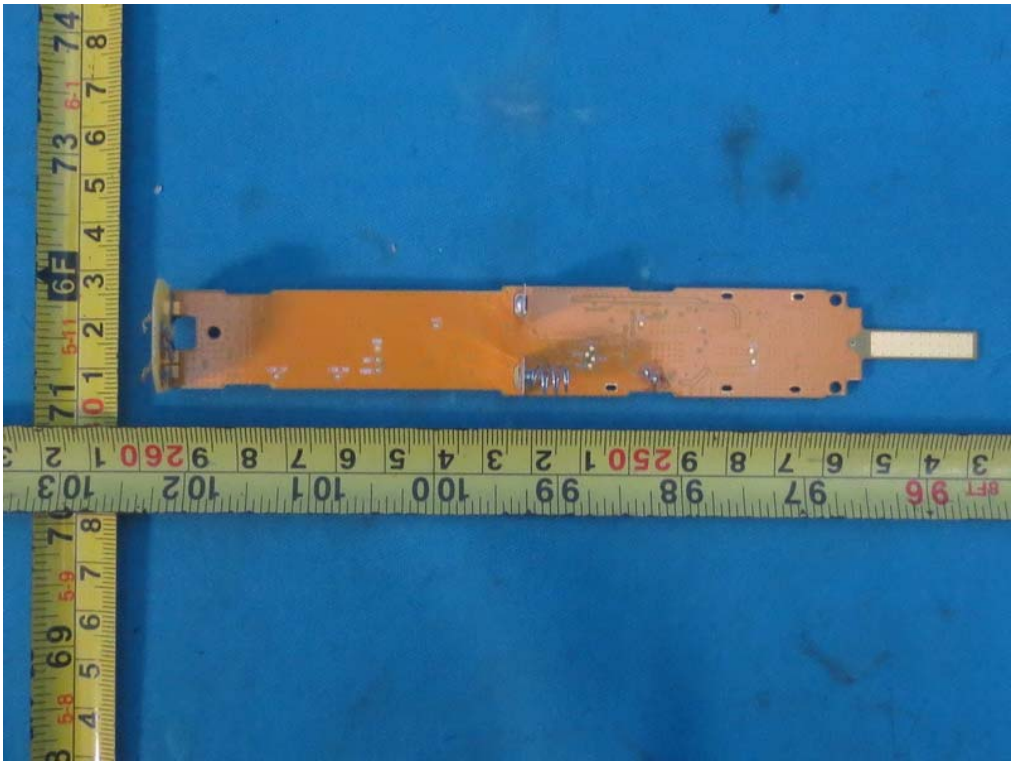
ATTACHMENT H - PHOTOGRAPHS OF EUT







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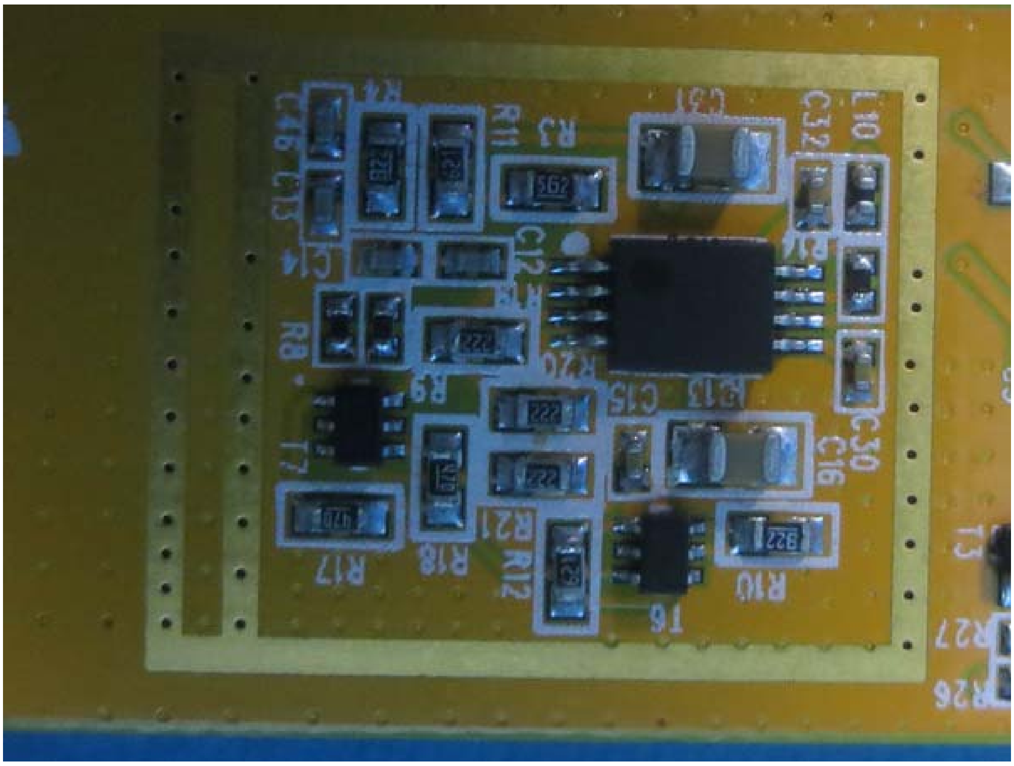

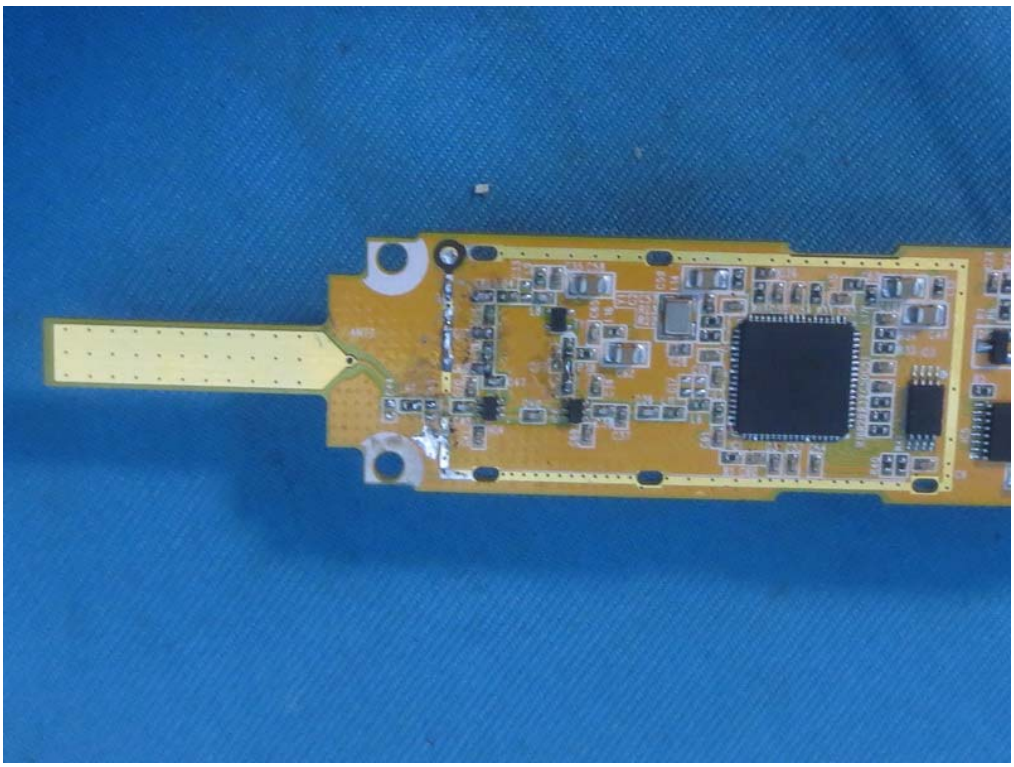

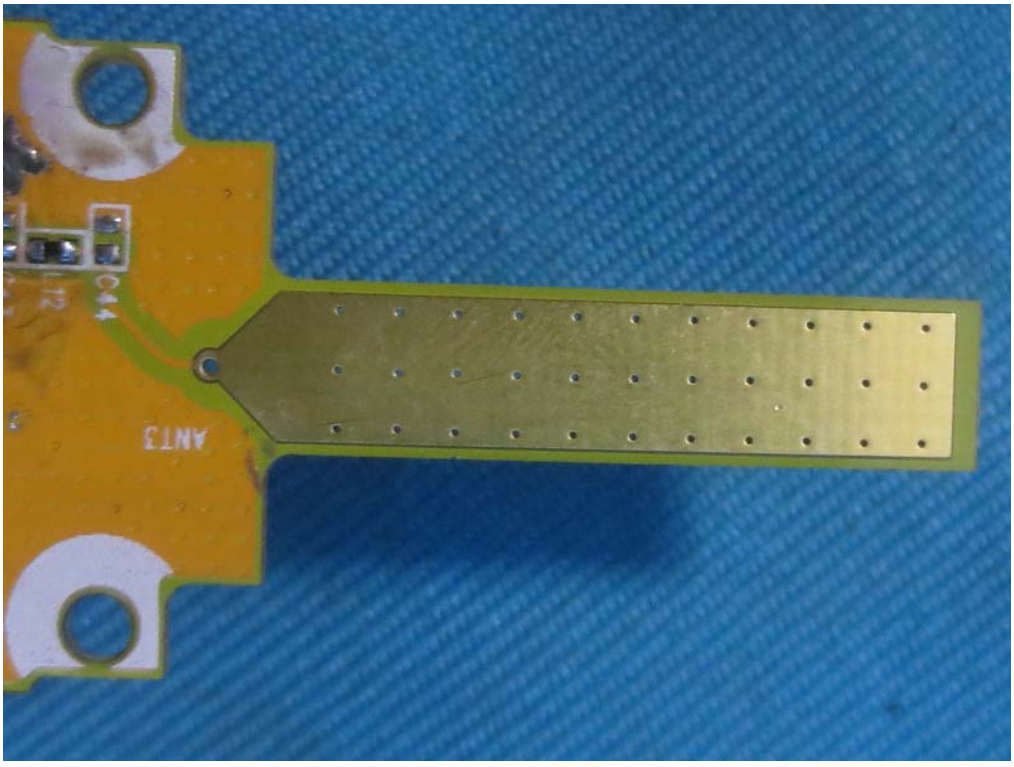
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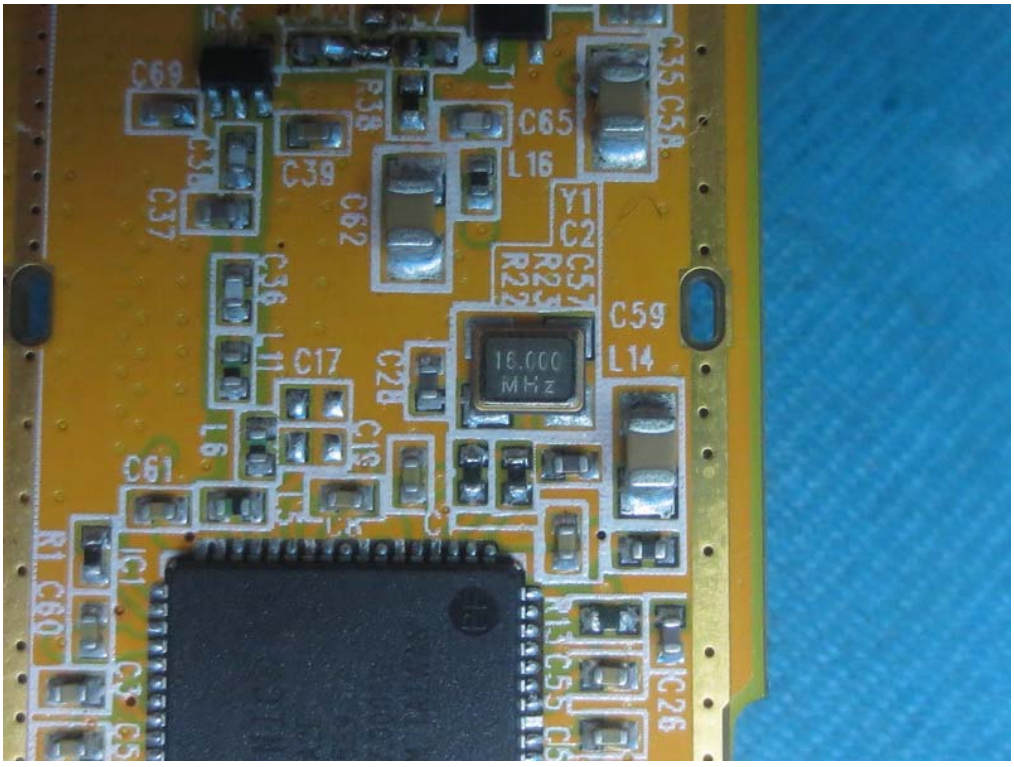
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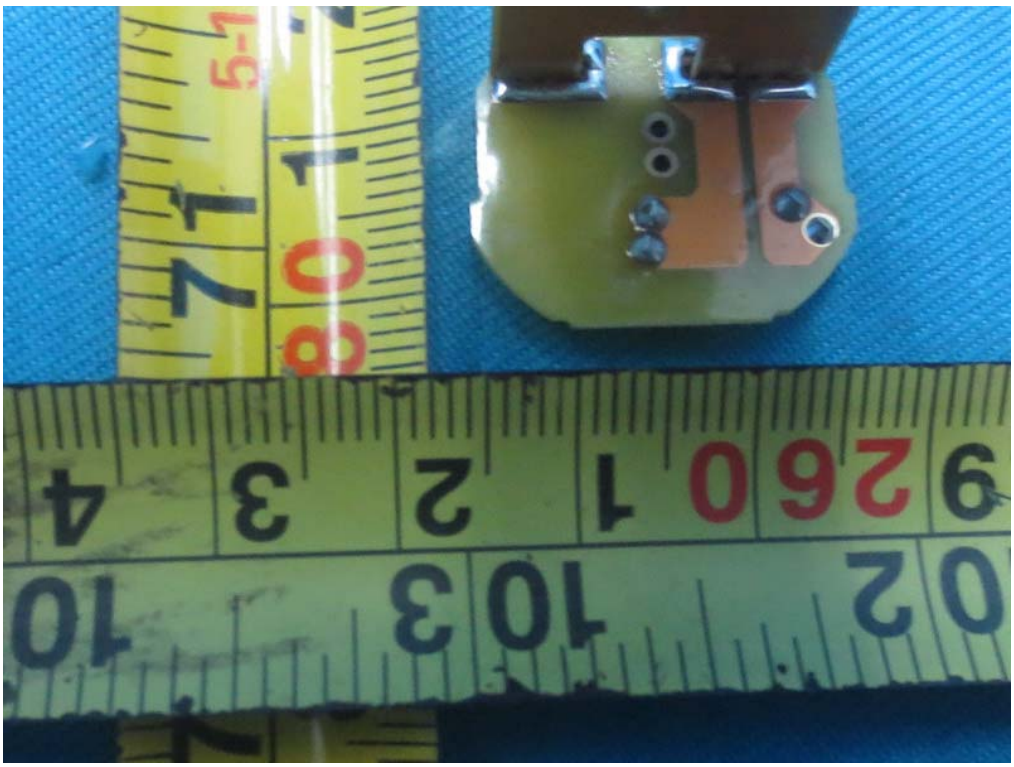

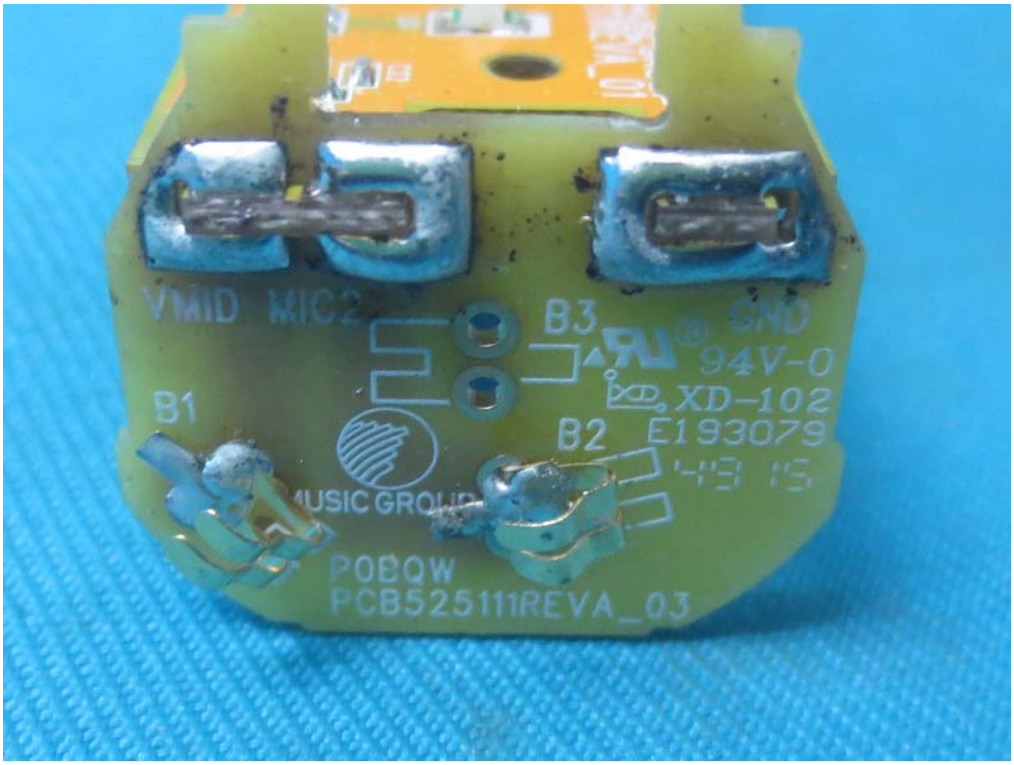
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