



**Shenzhen Asia Test Technology Co., Ltd.**

Report No. ATT-2017SZ0217856F  
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# **FCC RADIO TEST REPORT**

## **FCC ID: 2ALANIBT-2X**

**Product :** Bluetooth Cooking Thermometer

**Trade Name :** Inkbird

**Model Name :** IBT-2X

**Serial Model :** IBT-4X, IBT-6X, IBT-3X, IBT-1X, IBT-360,  
IBT-160

### **Prepared for**

Shenzhen Inkbird Tech. Co. Limited

Floor 2<sup>nd</sup> West, Building 713, Peng Ji Industrial Zone, Luo Hu District, Shen Zhen City,  
Guang Dong Province, China

### **Prepared by**

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... Shenzhen Inkbird Tech. Co. Limited  
**Address** ..... Floor 2<sup>nd</sup> West, Building 713, Peng Ji Industrial Zone, Luo Hu District,  
Shen Zhen City, Guang Dong Province, China  
**Manufacture's Name**..... Shenzhen Inkbird Tech. Co. Limited  
**Address** ..... Floor 2<sup>nd</sup> West, Building 713, Peng Ji Industrial Zone, Luo Hu District,  
Shen Zhen City, Guang Dong Province, China

### Product description

**Product name** ..... Bluetooth Cooking Thermometer  
**Model and/or type** ..... IBT-2X  
**reference** .....  
**Serial Model** ..... IBT-4X, IBT-6X, IBT-3X, IBT-1X, IBT-360, IBT-160

**Standards** ..... FCC Part15.247

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

This device described above has been tested by ATT, 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** ..... Jan. 22 2017 ~Feb. 12 2017

**Date of Issue**..... Feb. 12 2017

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

Testing Engineer :

(Seal Chen)

Technical Manager :

(Jackie Deng)



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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



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## 1.1 TEST FACILITY

Shenzhen Asia Test Technology Co.,Ltd.

7 / F, Xinwei Building, Gushu Village, Xixiang Town, Baoan District, Shenzhen, China

FCC Registration No.: 348715; IC Registration No.: 12198A

## 1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



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## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Bluetooth Cooking Thermometer	
Model Name	IBT-2X	
Serial Model	IBT-4X, IBT-6X, IBT-3X, IBT-1X, IBT-360, IBT-160	
Model Difference	All models are identical except model name.	
Product Description	The EUT is a Bluetooth Cooking Thermometer	
	Operation Frequency:	2402~2480MHz
	Modulation Type:	GFSK
	Bluetooth version:	4.0 BLE
	Bit Rate of Transmitter	1 Mbps
	Number Of Channel	40CH
	Antenna Designation:	Please see Note 3.
	Output Power(Conducted):	3.79dBm(PK)
	Antenna Gain (dBi)	0dbi
Channel List	Please refer to the Note 2.	
Ratings	DC 3V	
Adapter	N/A	
Battery	2*DC 1.5V AAA Battery	
BT versions	V4.0 BLE because the firmware limitation, this product only supports BT4.0 BLE. And users can not enable other RF function by themselves.	
HW	V1.0	
SW	V1.1	

Note:

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

2.

Channel	Frequency (MHz)
00	2402
01	2404
.....	.....
38	2478
39	2480

3.

Table for Filed Antenna



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Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Internal antenna	Pogo pin connector	0	BT 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	CH00
Mode 2	CH19
Mode 3	CH39
Mode 4	BT link

For Conducted Emission	
Final Test Mode	Description
Mode 4	BT link

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels. Test performed by new battery.
- (2) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.



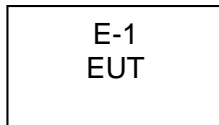


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### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test





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### 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	Bluetooth Cooking Thermometer	N/A	IBT-2X	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.



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### 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Equipment No.	Instrument	Manufacturer	Model Name	Serial Number	Specification	Cal. Data
1	Semi-anechoic chamber	Changzhou Chengyu	EC3088	N/A	9*6*6m	10/25/2016
2	Broadband antenna	R&S	VULB 9160	VULB91 60-516	30MHz-1500 MHz	10/25/2016
3	Horn antenna	R&S	BBHA 9120D	10087	1GHz-18GHz	06/05/2016
4	Test receiver	R&S	ESCI	101686	9KHz-3GHz	10/25/2016
5	EMI Measuring Receiver	R&S	ESR	101660	9KHz-40GHz	10/25/2016
6	Multi-device controller	MF	MF-7868	MF78680 8762	N/A	10/25/2016
7	Amplifier	EM	EM-30180	060538	1GHz-18GHz	10/25/2016
8	Amplifier	Schwarzbeck	BBV 9475	BBV 9475-663	1GHz-18GHz	06/05/2016
9	Spectrum Analyzer	agilent	E4440B	US44300368	1GHz-26.5GHz	06/05/2016
10	Test receiver	R&S	ESCI	101689	9KHz-3GHz	10/25/2016
11	LISN	R&S	NSLK81 26	8126466	9k-30MHz	10/25/2016
12	LISN	Narda	L2-16B	5589756	9k-30MHz	10/25/2016
13	Power Meter	Anritsu	ML2495A	N/A	40MHz	10/25/2016
14	Power sensor	Anritsu	MA2411B	N/A	40MHz	10/25/2016
15	Radiated Cable 1#	FUJIKURA	5D-2W	01	30MHz-1GHz	10/25/2016
16	Radiated Cable 2#	FUJIKURA	10D2W	02	1GHz -25GHz	10/25/2016

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### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

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

FREQUENCY (MHz)	dBuV		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	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



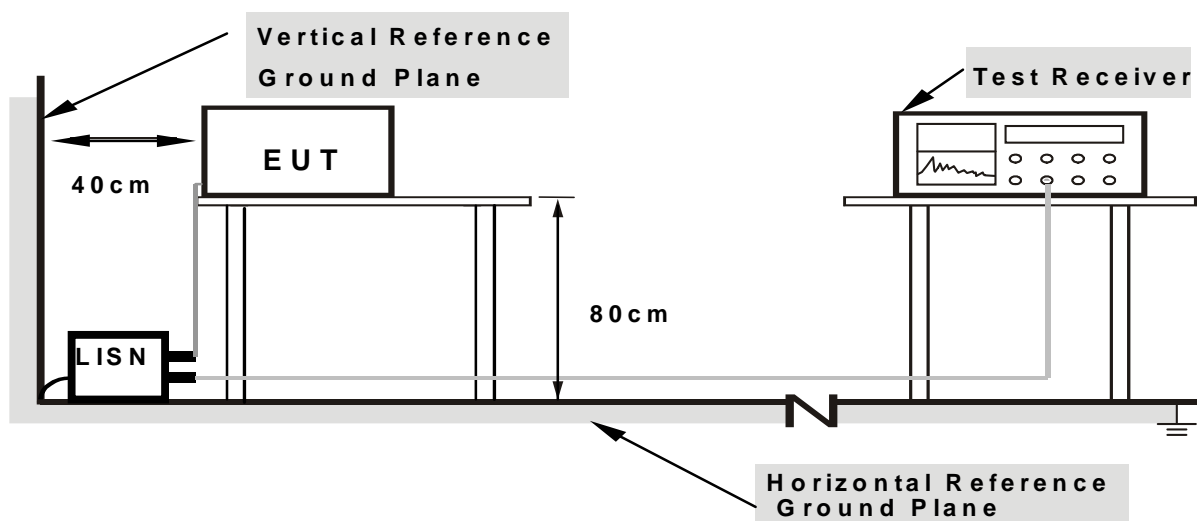
## 3.1.2 TEST PROCEDURE

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



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### 3.1.6 TEST RESULTS

EUT:	Bluetooth Cooking Thermometer	Model Name. :	IBT-2X
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	N/A
Test Mode :	N/A	Phase:	N/A

Due to this device powered by battery only, this test is 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)&A8.5, then the 15.209(a) limit in the table below has to be followed.

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. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

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) 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





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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

- 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.
- The EUT was placed on the top of a rotating table 0.8m(1.5m above 1G) 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.
- 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.
- 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.
- 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note: For radiated emission test above 1GHz:

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

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.

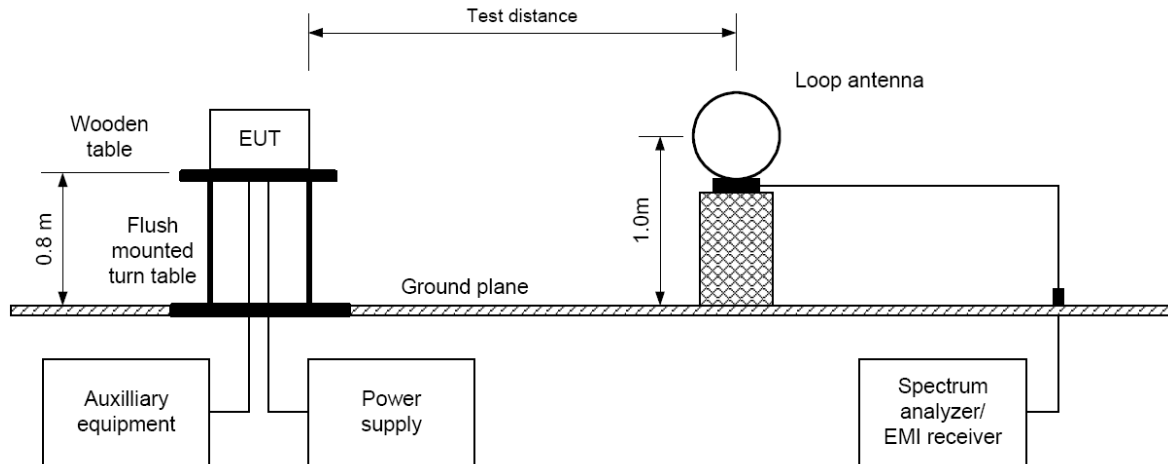
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

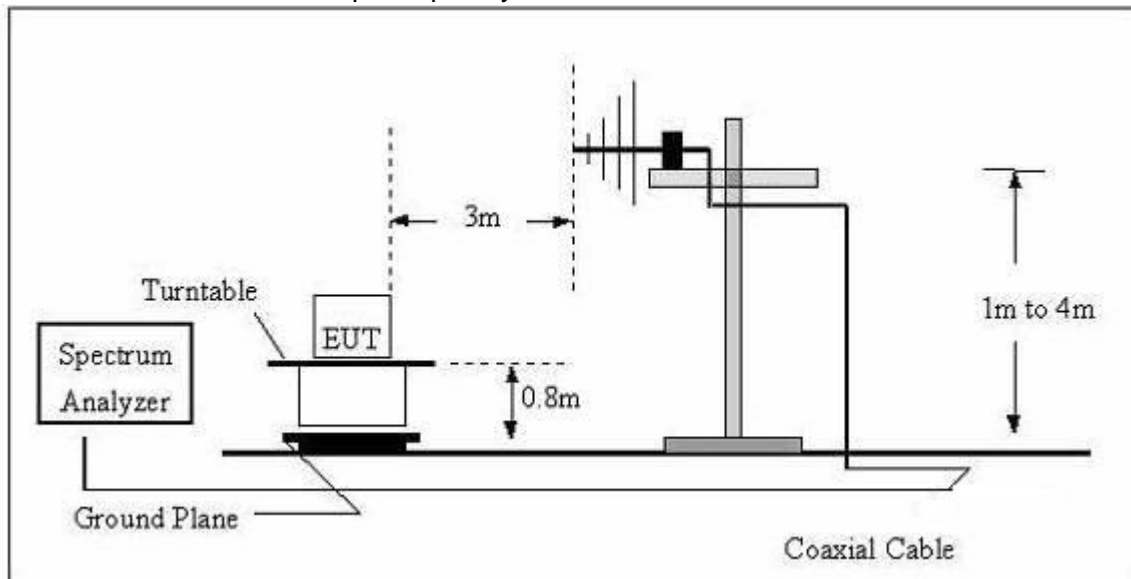


### 3.2.4 TEST SETUP

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

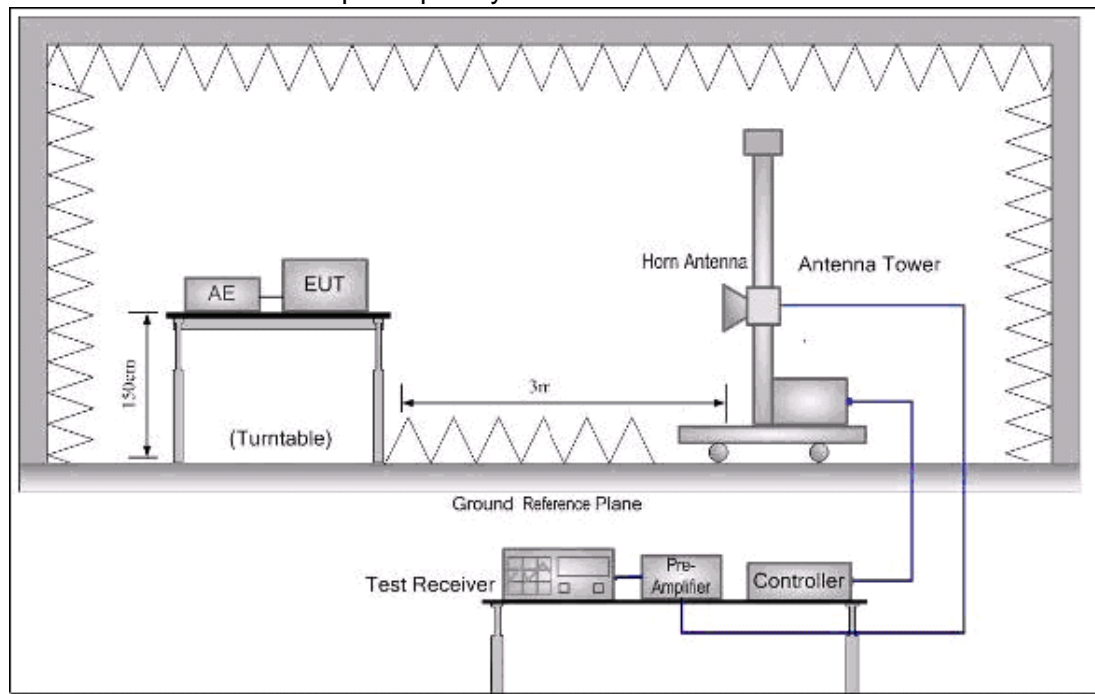


#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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.



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### 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	Bluetooth Cooking Thermometer	Model Name. :	IBT-2X
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3V by battery
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 =  $40 \log (\text{specific distance/test distance})$ (dB);

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

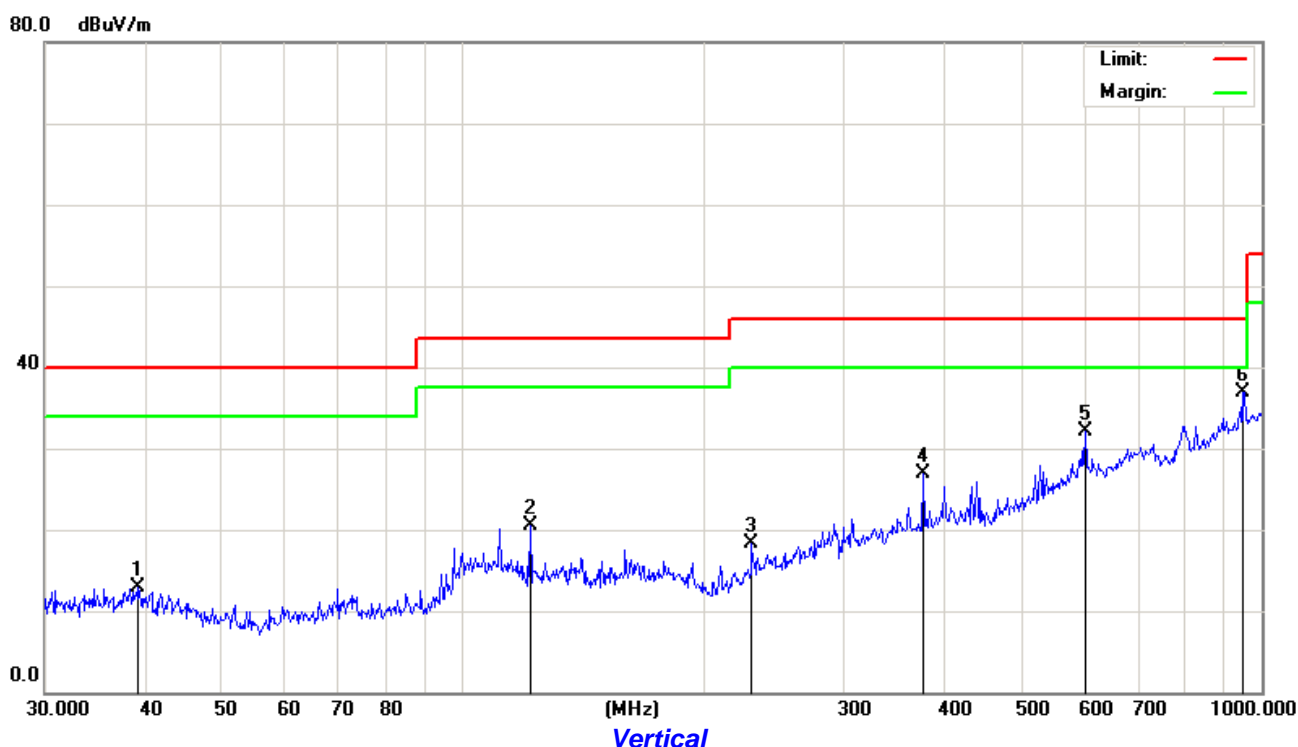


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## 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Bluetooth Cooking Thermometer	Model Name :	IBT-2X
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 3V by battery
Test Mode :	TX 2440(worse-case)		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		39.2991	29.62	-16.62	13.00	40.00	-27.00	QP		
2		121.5486	35.41	-14.98	20.43	43.50	-23.07	peak		
3		230.0985	33.52	-15.12	18.40	46.00	-27.60	QP		
4		377.2591	34.51	-7.55	26.96	46.00	-19.04	QP		
5		601.4265	32.98	-0.89	32.09	46.00	-13.91	QP		
6	*	945.4399	33.32	3.63	36.95	46.00	-9.05	QP		

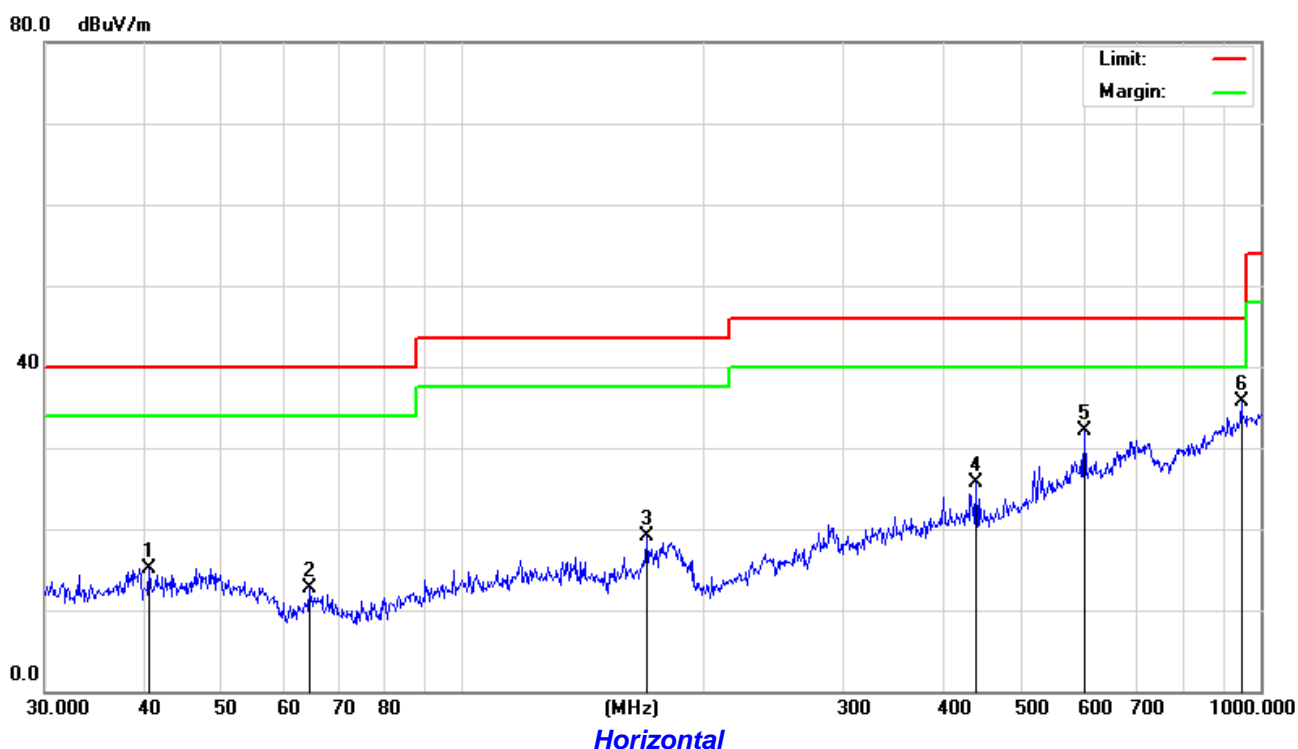
### Remark:

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



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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		40.5591	29.72	-14.59	15.13	40.00	-24.87	QP		
2		64.4331	30.15	-17.54	12.61	40.00	-27.39	QP		
3		170.1948	32.51	-13.38	19.13	43.50	-24.37	QP		
4		440.1963	32.38	-6.68	25.70	46.00	-20.30	QP		
5		601.4265	33.80	-1.74	32.06	46.00	-13.94	QP		
6	*	945.4399	32.17	3.63	35.80	46.00	-10.20	QP		

## Remark:

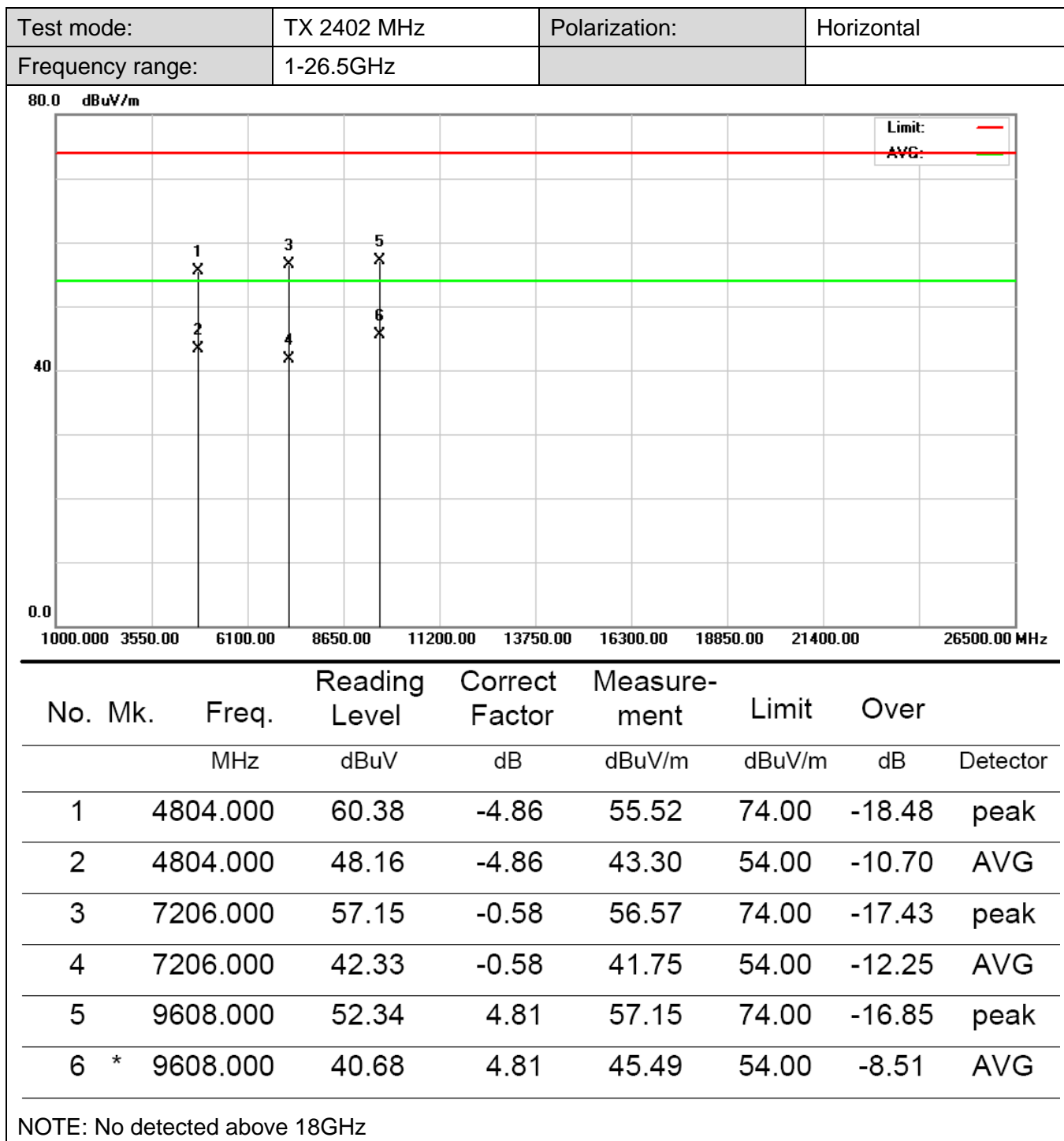
Measurement Level= ReadingLevel+ Factor, Margin= Measurement Level - Limit



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## 3.2.8 TEST RESULTS (1GHZ~ 10TH HARMONIC)

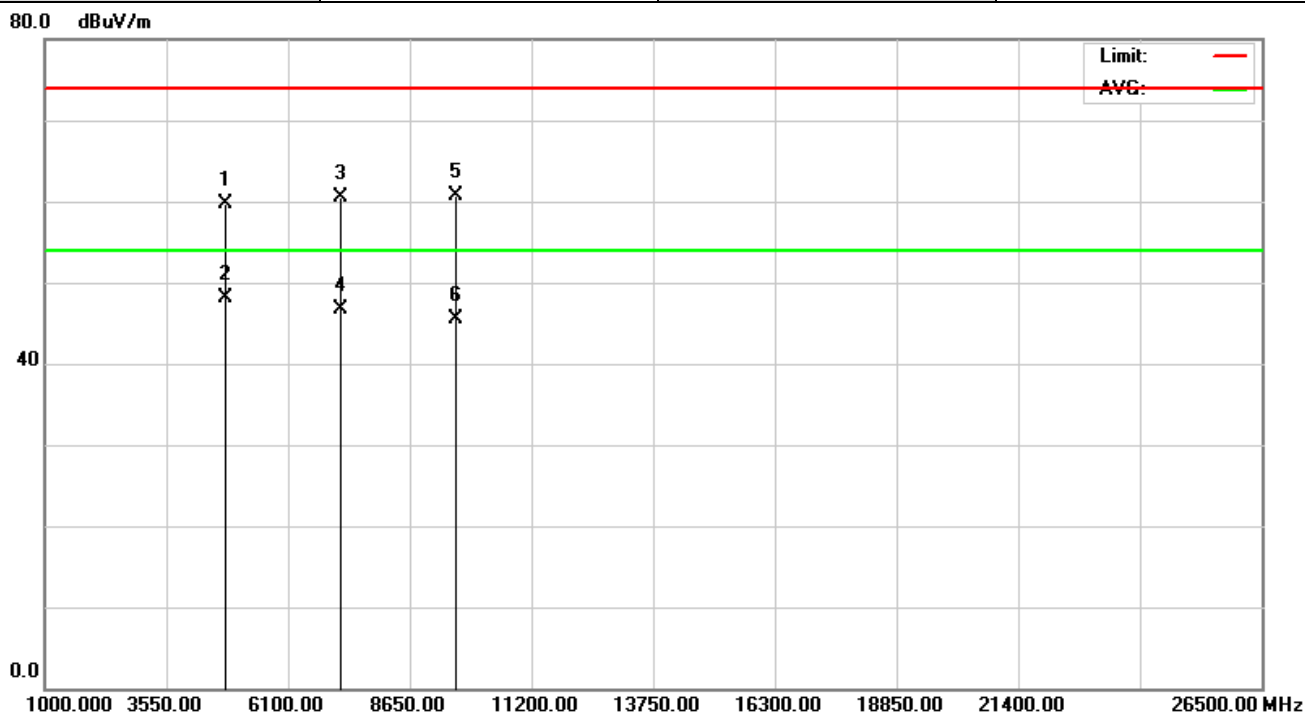




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Test mode:	TX 2402 MHz	Polarization:	Vertical
Frequency range:	1-26.5GHz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4804.000	64.66	-4.86	59.80	74.00	-14.20	peak
2	*	4804.000	52.97	-4.86	48.11	54.00	-5.89	AVG
3		7206.000	61.18	-0.58	60.60	74.00	-13.40	peak
4		7206.000	47.38	-0.58	46.80	54.00	-7.20	AVG
5		9608.000	55.82	4.81	60.63	74.00	-13.37	peak
6		9608.000	40.69	4.81	45.50	54.00	-8.50	AVG

NOTE: No detected above 18GHz

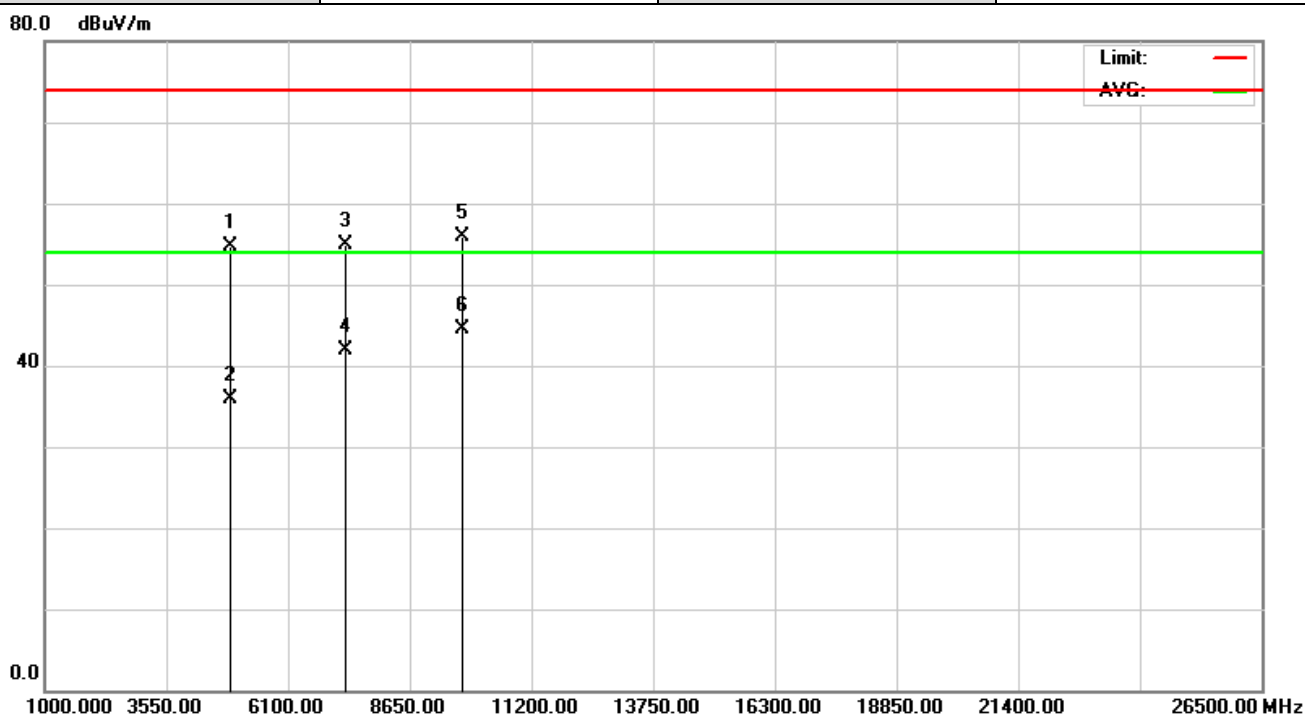




# Shenzhen Asia Test Technology Co., Ltd.

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Test mode:	TX 2440 MHz	Polarization:	Horizontal
Frequency range:	1-26.5GHz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4882.000	59.34	-4.73	54.61	74.00	-19.39	peak
2		4882.000	40.67	-4.73	35.94	54.00	-18.06	AVG
3		7323.000	55.17	-0.30	54.87	74.00	-19.13	peak
4		7323.000	42.26	-0.30	41.96	54.00	-12.04	AVG
5		9764.000	50.64	5.26	55.90	74.00	-18.10	peak
6	*	9764.000	39.32	5.26	44.58	54.00	-9.42	AVG

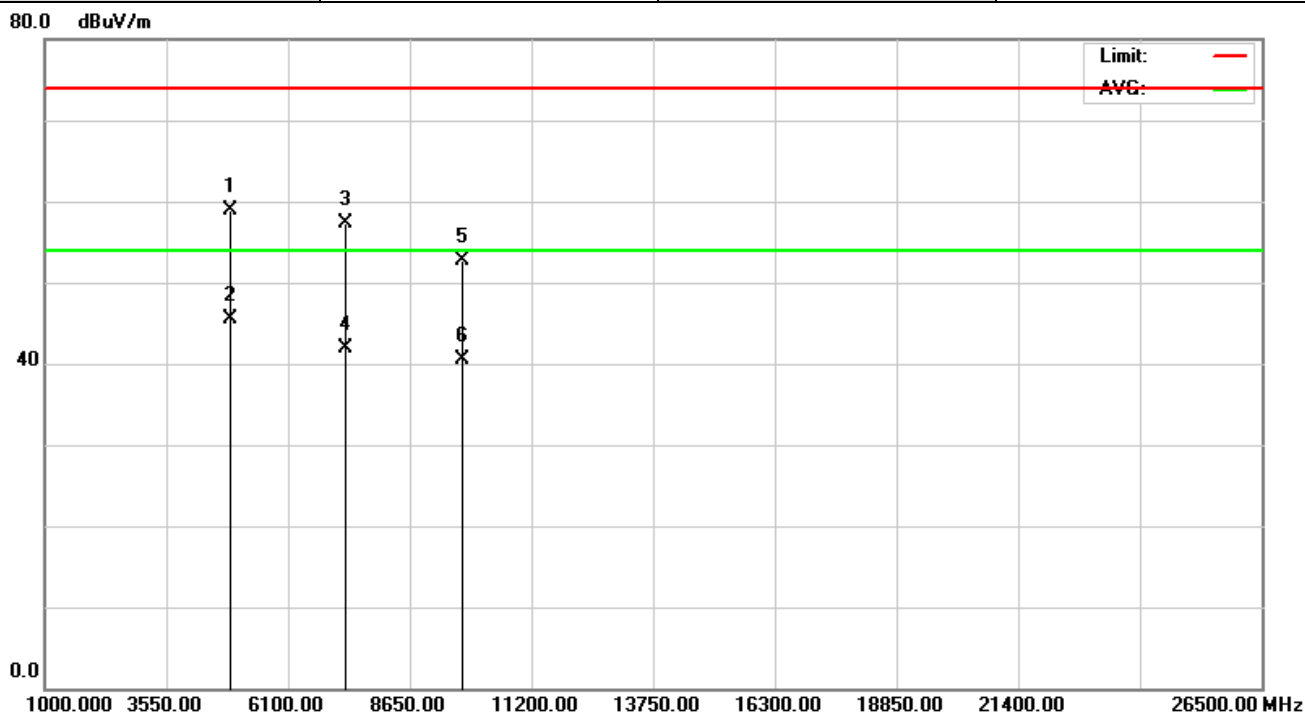
NOTE: No detected above 18GHz



# Shenzhen Asia Test Technology Co., Ltd.

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Test mode:	TX 2440 MHz	Polarization:	Vertical
Frequency range:	1-26.5GHz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4882.000	63.67	-4.73	58.94	74.00	-15.06	peak
2	*	4882.000	50.18	-4.73	45.45	54.00	-8.55	AVG
3		7323.000	57.68	-0.30	57.38	74.00	-16.62	peak
4		7323.000	42.15	-0.30	41.85	54.00	-12.15	AVG
5		9764.000	47.49	5.26	52.75	74.00	-21.25	peak
6		9764.000	35.22	5.26	40.48	54.00	-13.52	AVG

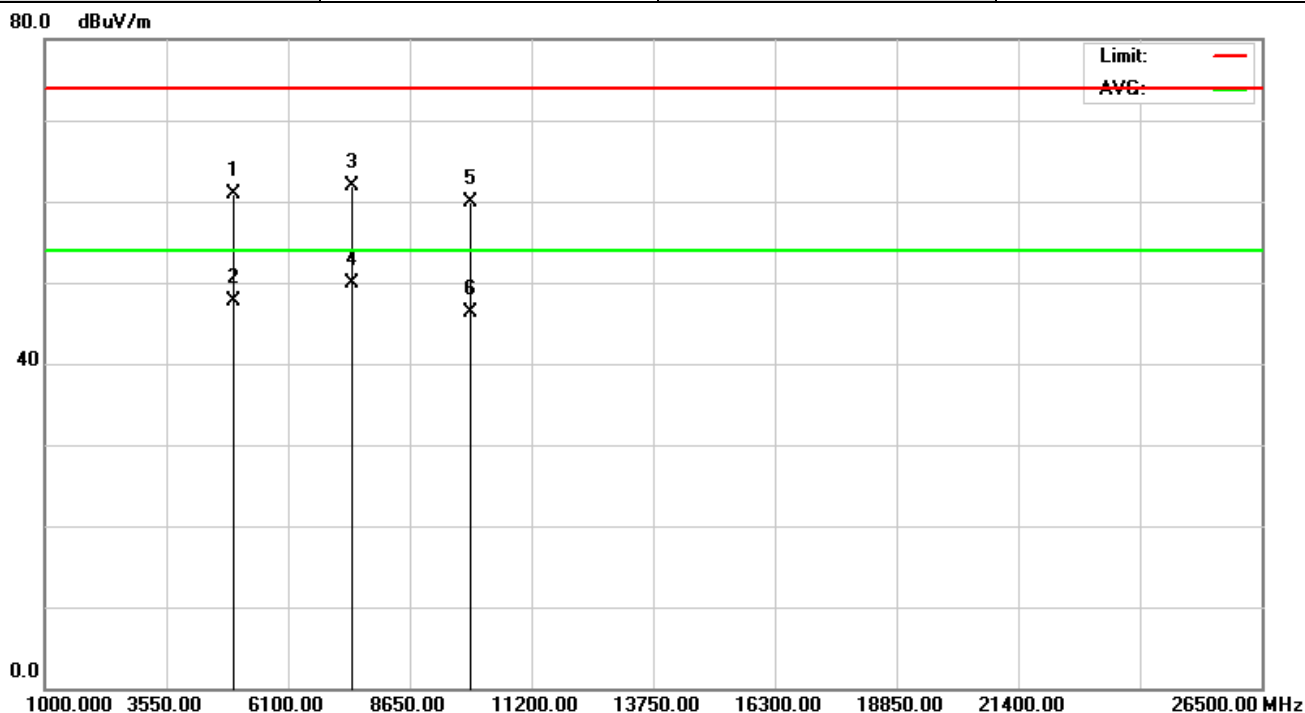
NOTE: No detected above 18GHz



# Shenzhen Asia Test Technology Co., Ltd.

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Test mode:	TX 2480 MHz	Polarization:	Horizontal
Frequency range:	1-26.5GHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4960.000	65.47	-4.60	60.87	74.00	-13.13	peak
2		4960.000	52.34	-4.60	47.74	54.00	-6.26	AVG
3		7440.000	61.89	-0.02	61.87	74.00	-12.13	peak
4	*	7440.000	49.88	-0.02	49.86	54.00	-4.14	AVG
5		9920.000	54.24	5.66	59.90	74.00	-14.10	peak
6		9920.000	40.67	5.66	46.33	54.00	-7.67	AVG

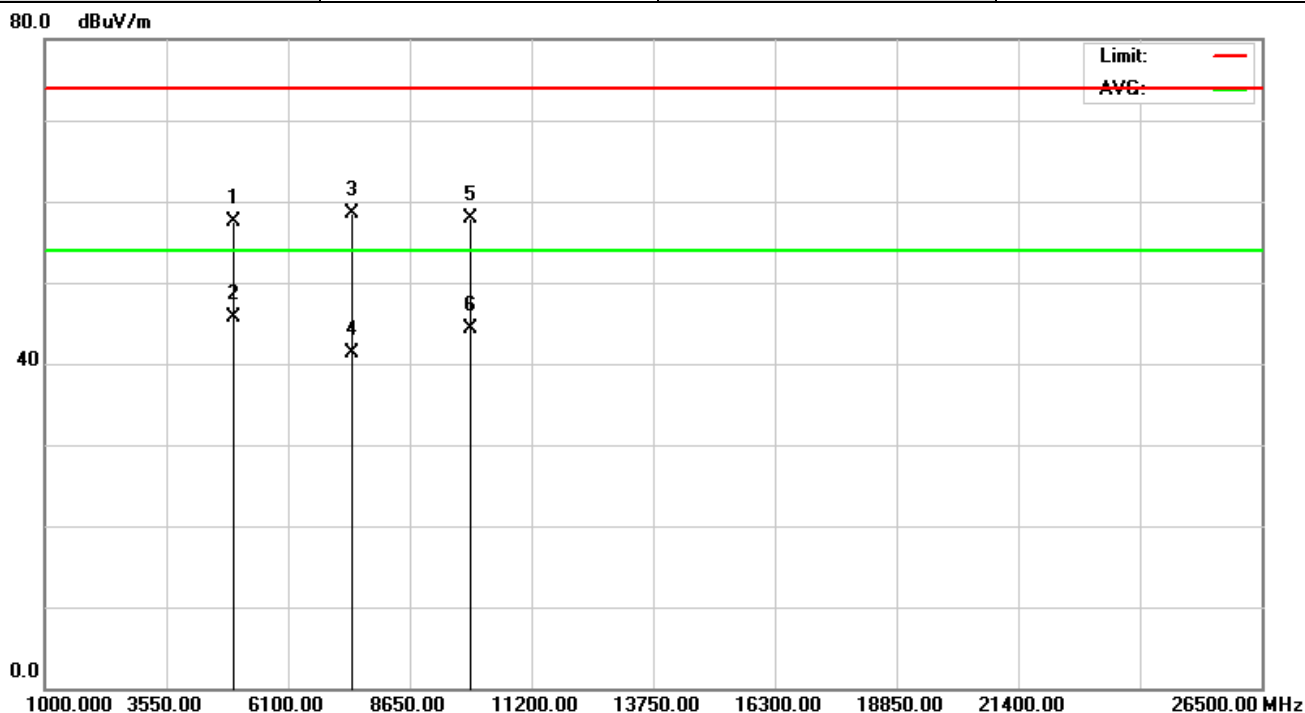
NOTE: No detected above 18GHz



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Test mode:	TX 2480 MHz	Polarization:	Vertical
Frequency range:	1-26.5GHz		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		4960.000	62.17	-4.60	57.57	74.00	-16.43	peak
2	*	4960.000	50.33	-4.60	45.73	54.00	-8.27	AVG
3		7440.000	58.54	-0.02	58.52	74.00	-15.48	peak
4		7440.000	41.36	-0.02	41.34	54.00	-12.66	AVG
5		9920.000	52.34	5.66	58.00	74.00	-16.00	peak
6		9920.000	38.67	5.66	44.33	54.00	-9.67	AVG

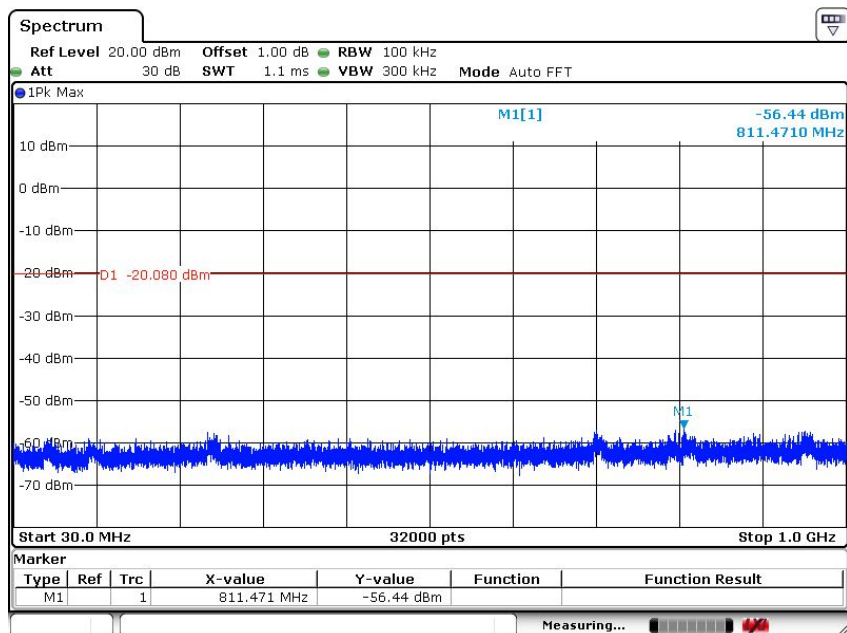
NOTE: No detected above 18GHz



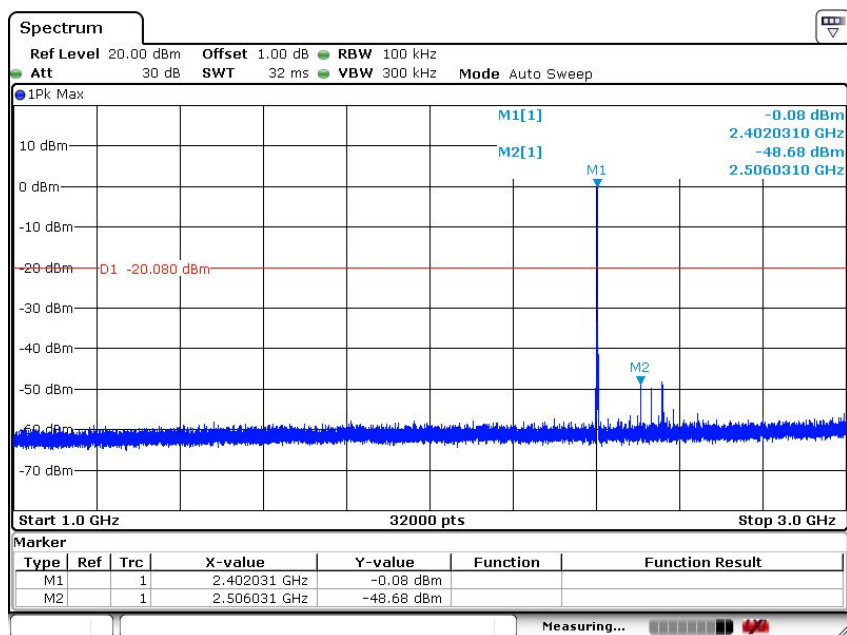
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## Conducted Spurious Emissions at Antenna Port: Low Channel



Date: 5 FEB 2017 10:43:18



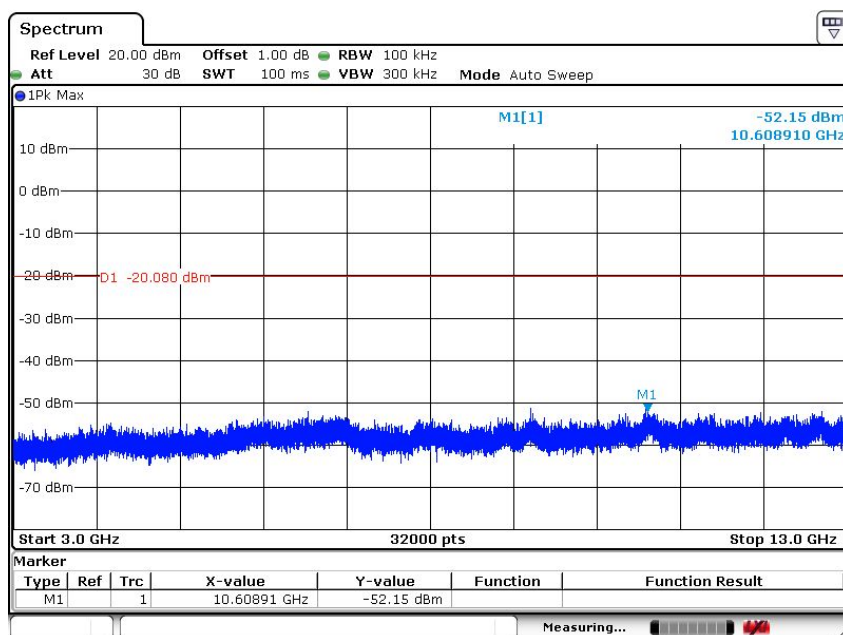
Date: 5 FEB 2017 10:43:05



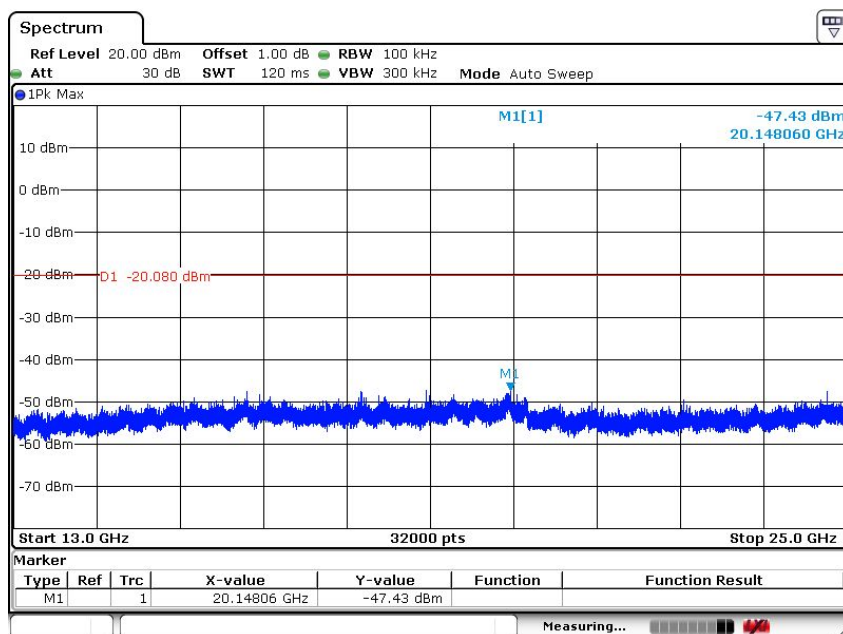
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Date: 5.FEB.2017 10:43:29



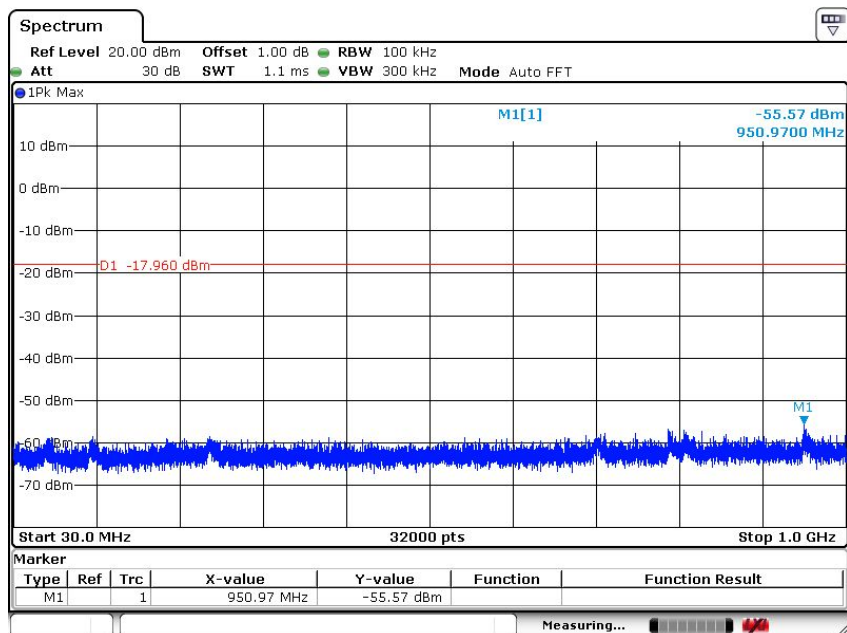
Date: 5.FEB.2017 10:43:48



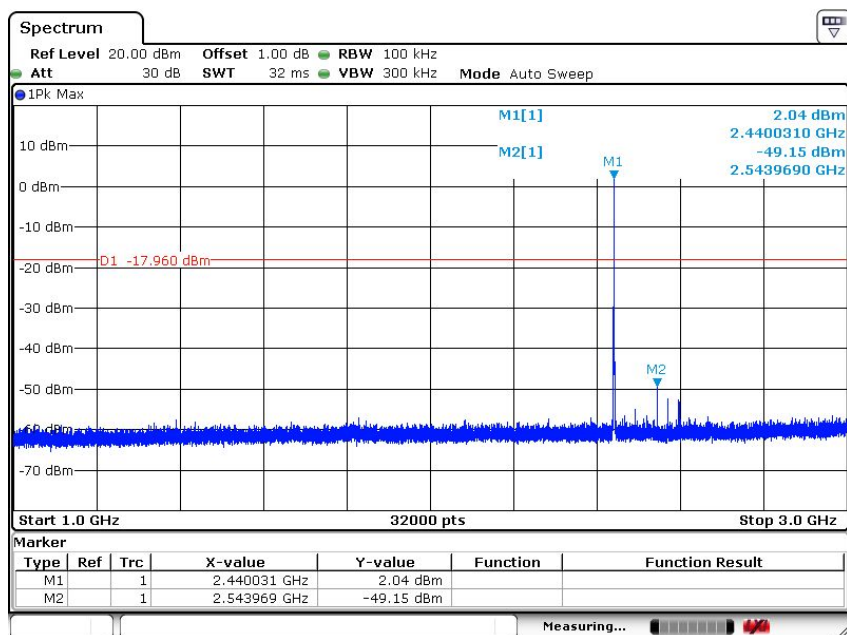
# Shenzhen Asia Test Technology Co., Ltd.

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## Middle Channel



Date: 5 FEB 2017 10:45:18

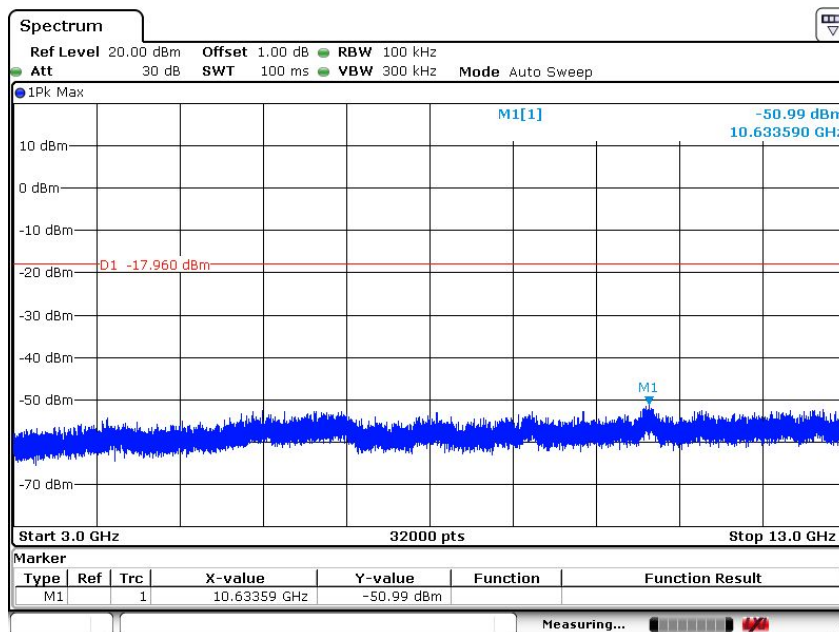


Date: 5 FEB 2017 10:45:04

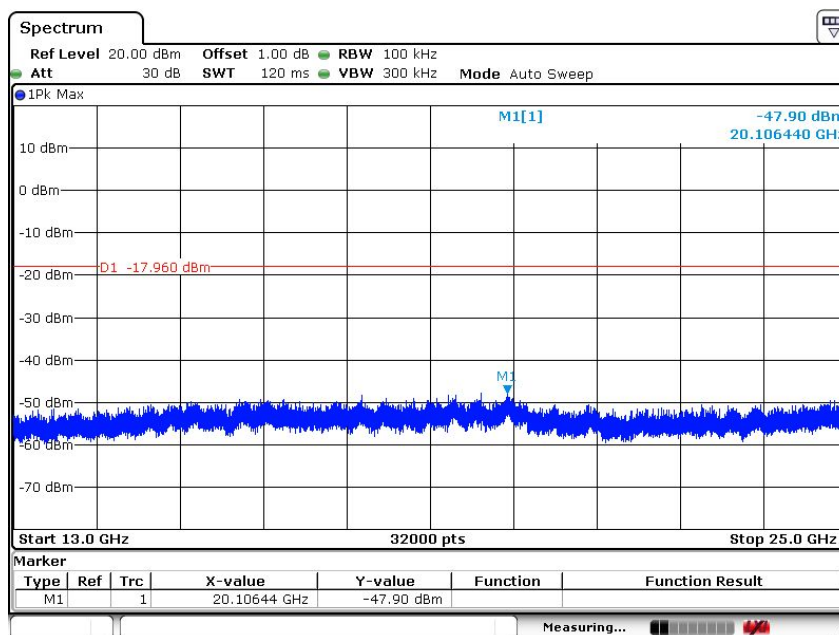


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Date: 5 FEB 2017 10:45:30



Date: 5 FEB 2017 10:45:50

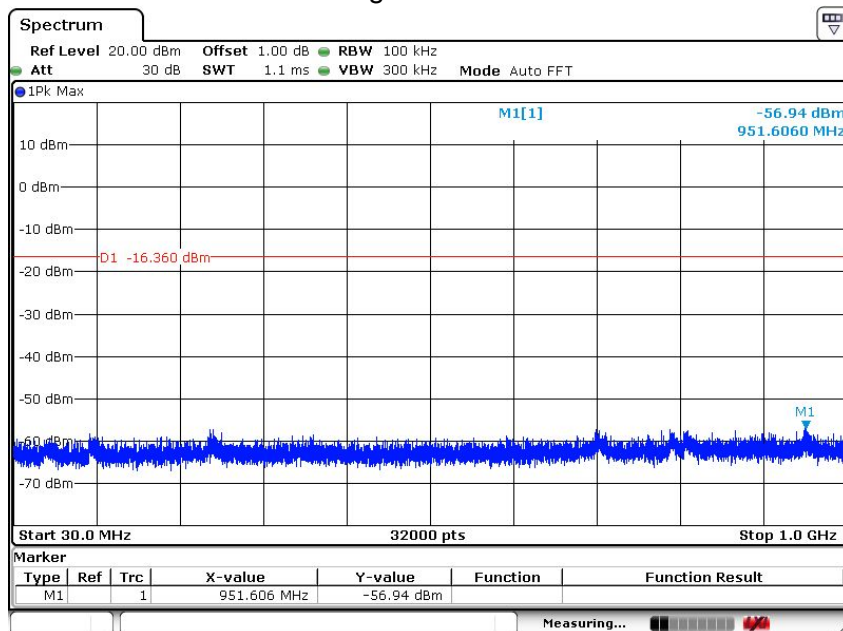




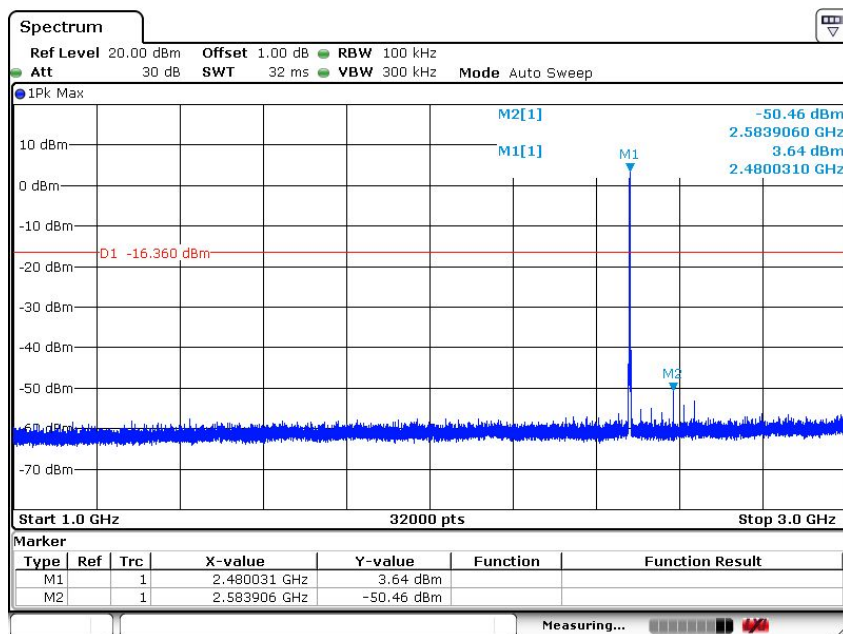
# Shenzhen Asia Test Technology Co., Ltd.

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## High Channel



Date: 5 FEB 2017 10:42:09



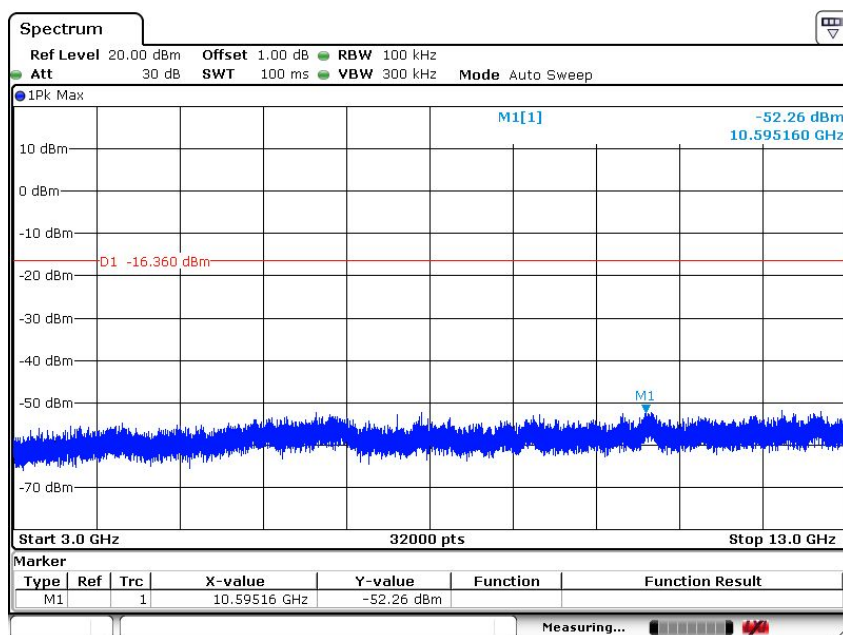
Date: 5 FEB 2017 10:41:54



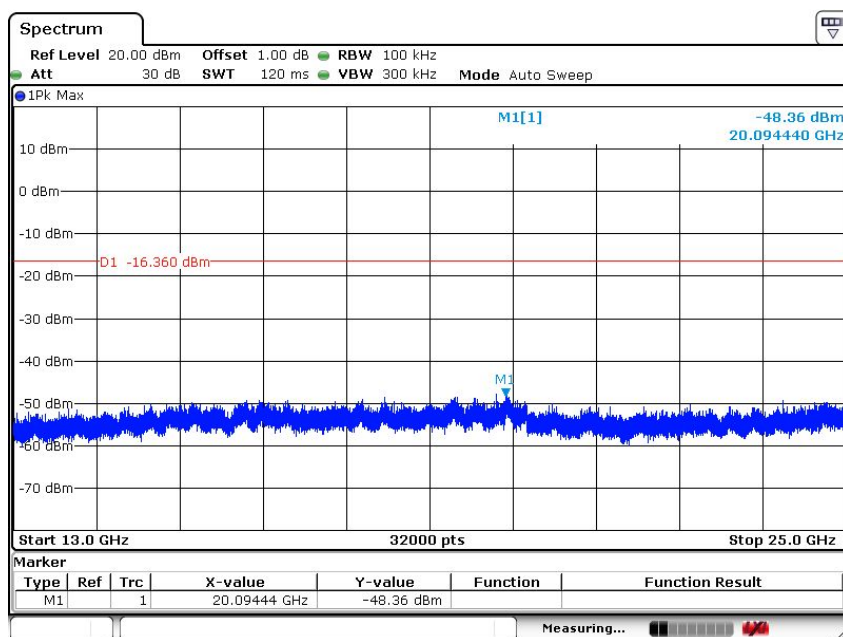
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Date: 5 FEB 2017 10:42:20



Date: 5 FEB 2017 10:42:34



#### 4. POWER SPECTRAL DENSITY TEST

##### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C&A8.2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

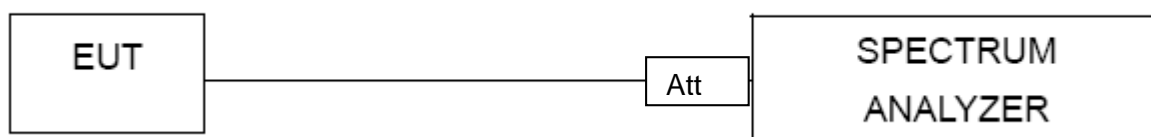
##### 4.1.1 TEST PROCEDURE

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



# Shenzhen Asia Test Technology Co., Ltd.

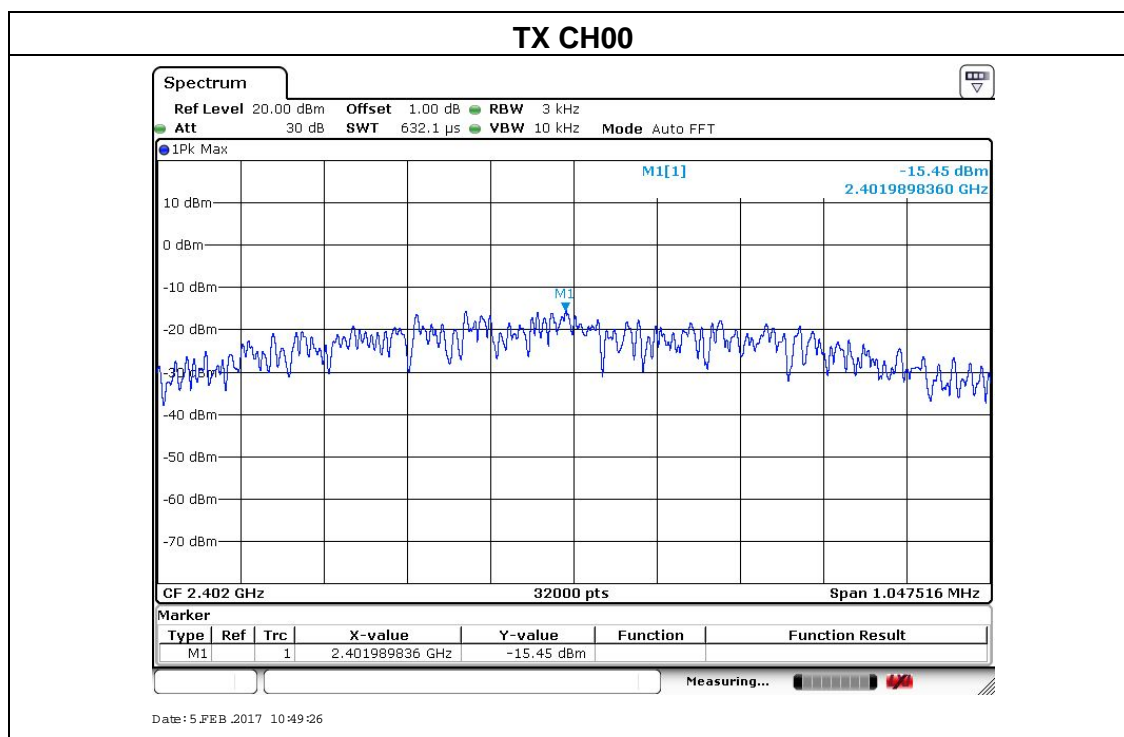
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## 4.1.5 TEST RESULTS

EUT :	Bluetooth Cooking Thermometer	Model Name :	IBT-2X
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 3V
Test Mode :	TX Mode /CH00, CH19, CH39		

Note: The relevant measured result has the offset with cable loss already.

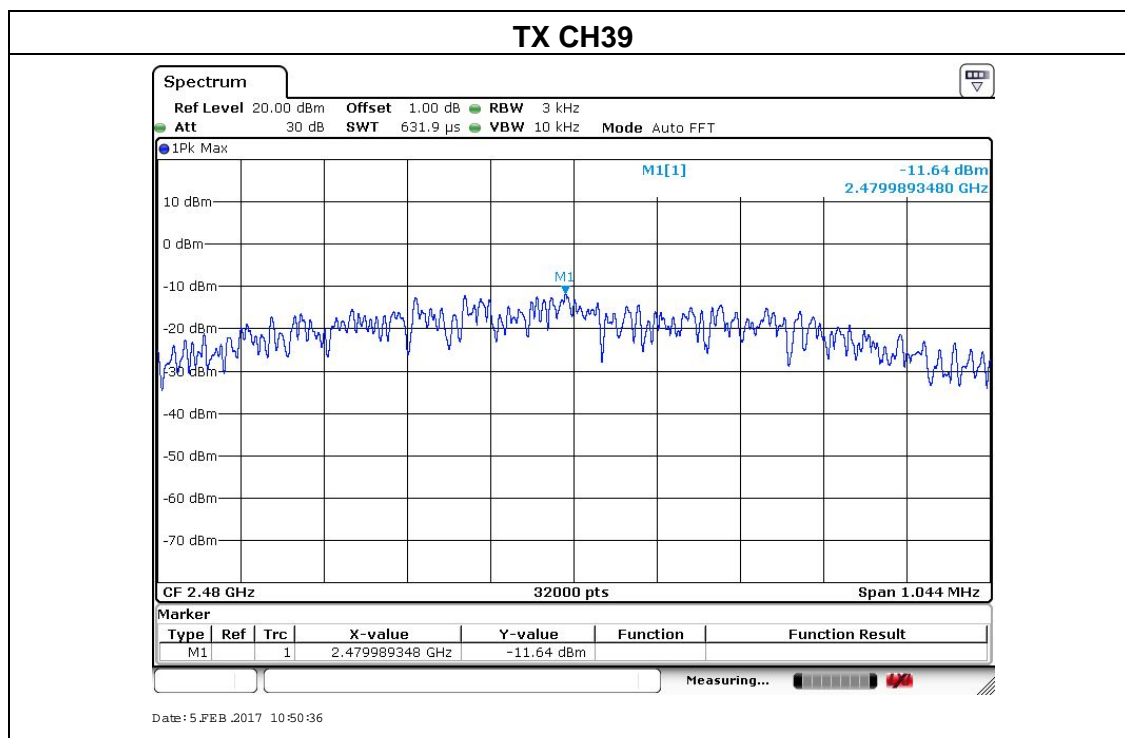
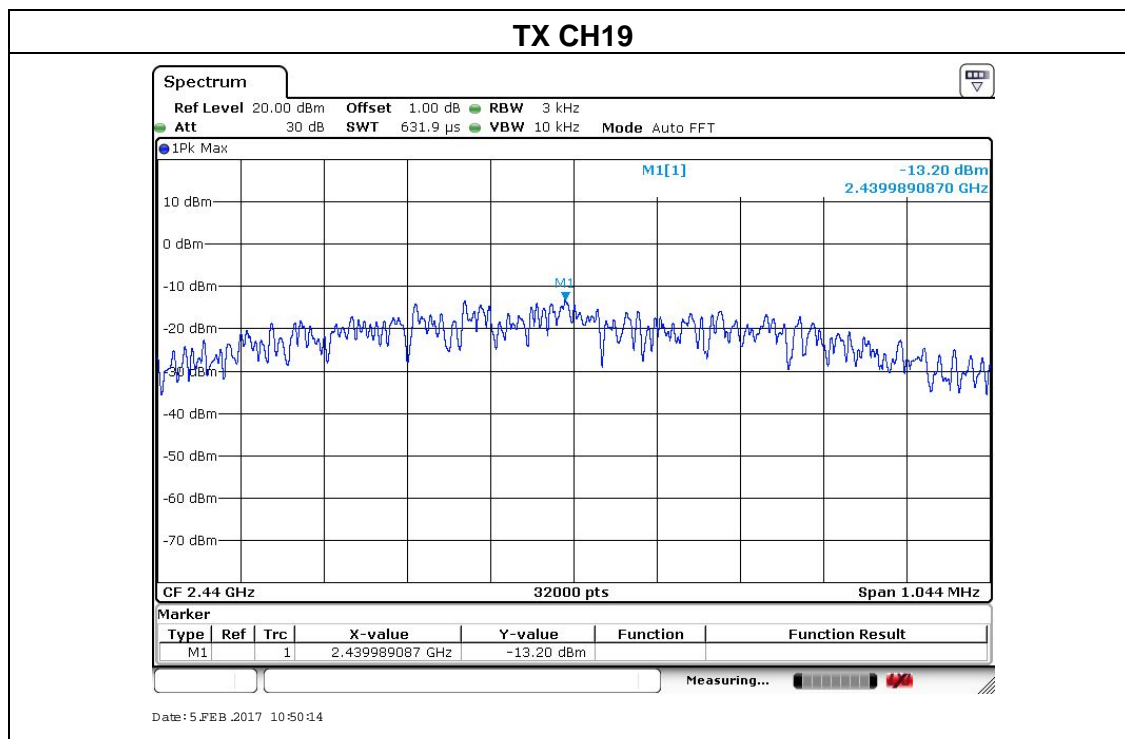
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3 kHz)	Result
2402 MHz	-15.45	8	PASS
2440 MHz	-13.20	8	PASS
2480 MHz	-11.64	8	PASS





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## 5. BANDWIDTH TEST

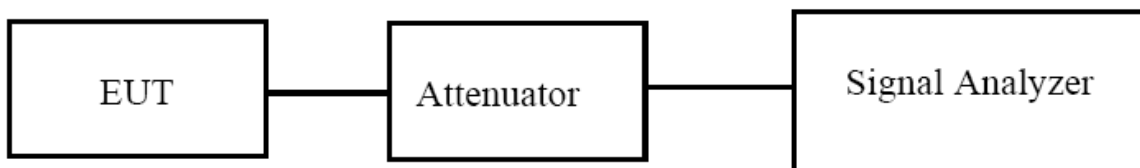
### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C&A8.2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2) &A8.2	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

#### 5.1.1 TEST PROCEDURE

According to KDB 558074 D01 DTS Meas Guidance v03r04

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



#### 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.



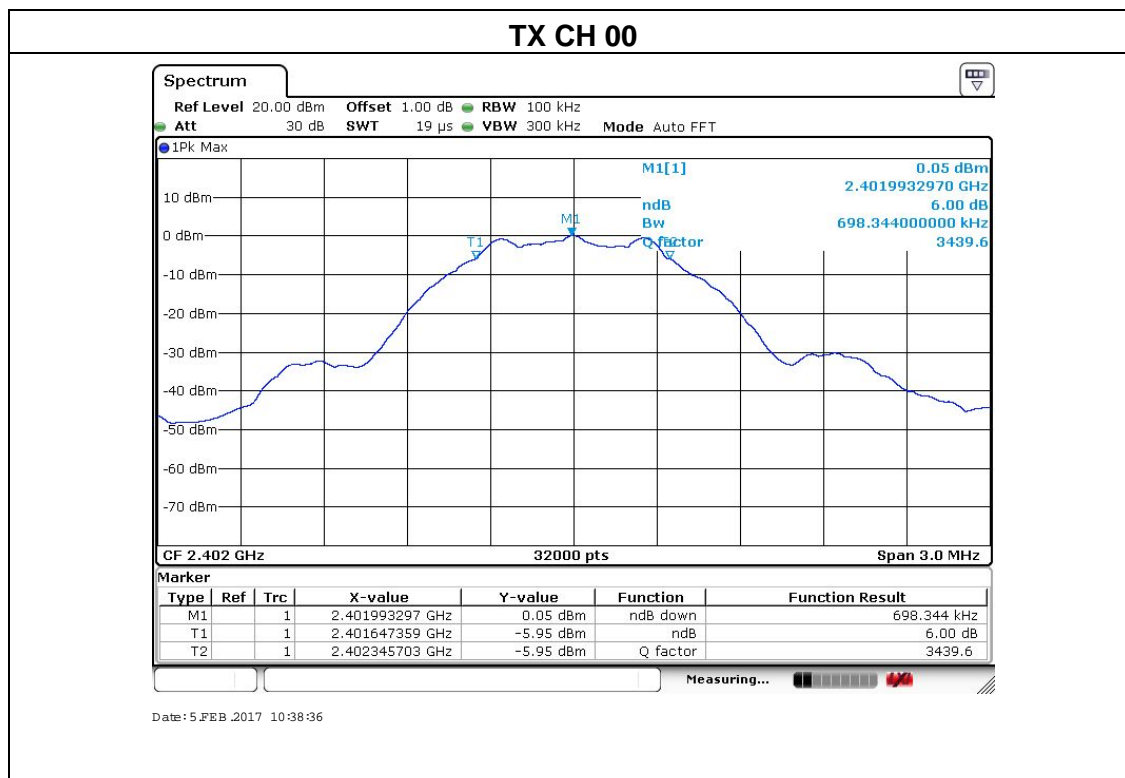
# Shenzhen Asia Test Technology Co., Ltd.

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## 5.1.3 TEST RESULTS

EUT :	Bluetooth Cooking Thermometer	Model Name :	IBT-2X
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3V
Test Mode :	TX Mode /CH00, CH19, CH39		

Channel	Frequency (MHz)	6dB bandwidth (kHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2402	698.34	/	>500	Pass
Middle	2440	696.00	/	>500	Pass
High	2480	696.00	/	>500	Pass

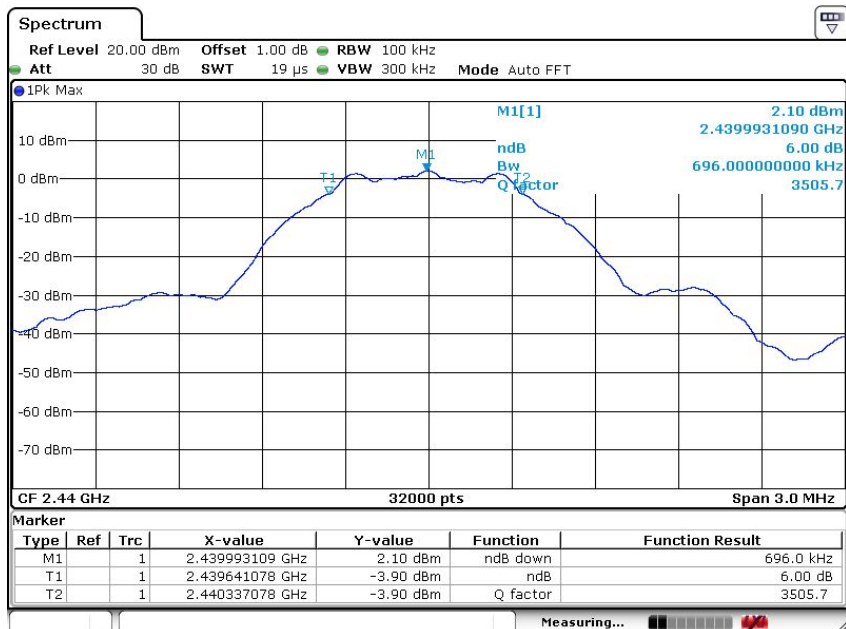




# Shenzhen Asia Test Technology Co., Ltd.

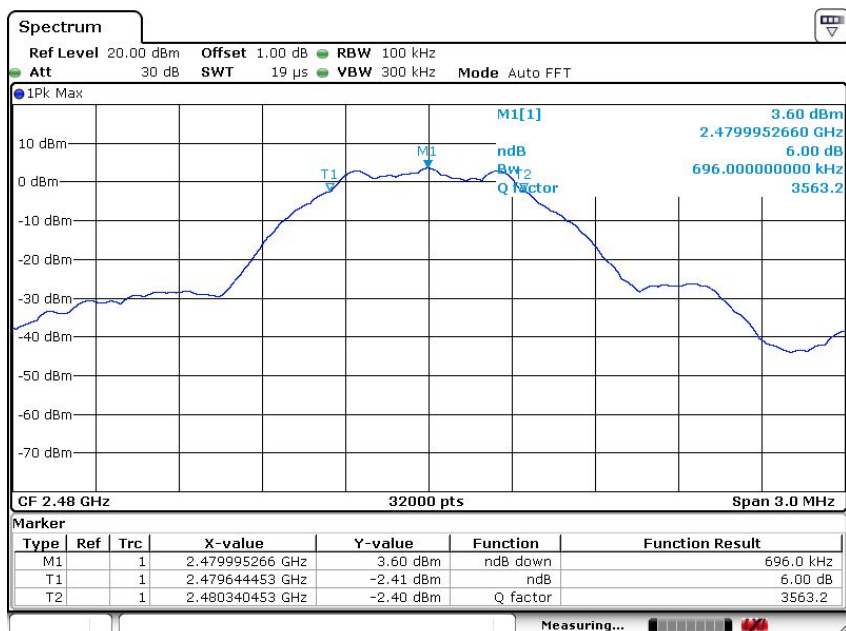
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## TX CH 19



Date: 5 FEB 2017 10:38:06

## TX CH 39



Date: 5 FEB 2017 10:39:00





## **6. PEAK OUTPUT POWER TEST**

### **6.1 APPLIED PROCEDURES / LIMIT**

FCC Part15 (15.247) , Subpart C &A8.4				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) &A8.4	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.



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### 6.1.5 TEST RESULTS

EUT :	Bluetooth Cooking Thermometer	Model Name :	IBT-2X
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3V
Test Mode :	TX Mode		

TX Mode			
Test Channel	Frequency	Maximum Conducted Output Power (PK)	LIMIT
	(MHz)	(dBm)	dBm
CH00	2402	2.32	30
CH19	2440	2.28	30
CH39	2480	3.79	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)&A1.1 is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a)&A8.5, must also comply with the radiated emission limits specified in §15.209(a) &A1.1 (see §15.205(c)) &A8.5.

### TEST PROCEDURE

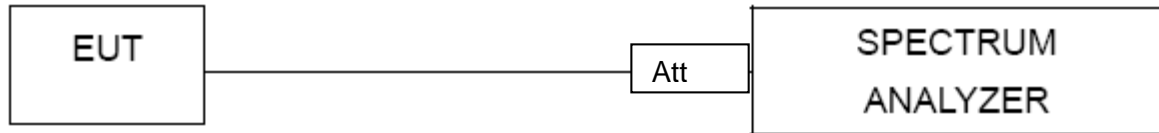
- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. 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.



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### 7.4 TEST RESULTS

EUT :	Bluetooth Cooking Thermometer	Model Name :	IBT-2X
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3V

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
2390.00	45.93	20	Pass
2483.50	54.89	20	Pass

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
2390	50.24	1.05	51.29	74	-22.71	peak	Vertical
2390	46.88	1.05	47.93	74	-26.07	peak	Horizontal
2483.5	49.15	1.29	50.44	74	-23.56	peak	Vertical
2483.5	47.66	1.29	48.95	74	-25.05	peak	Horizontal

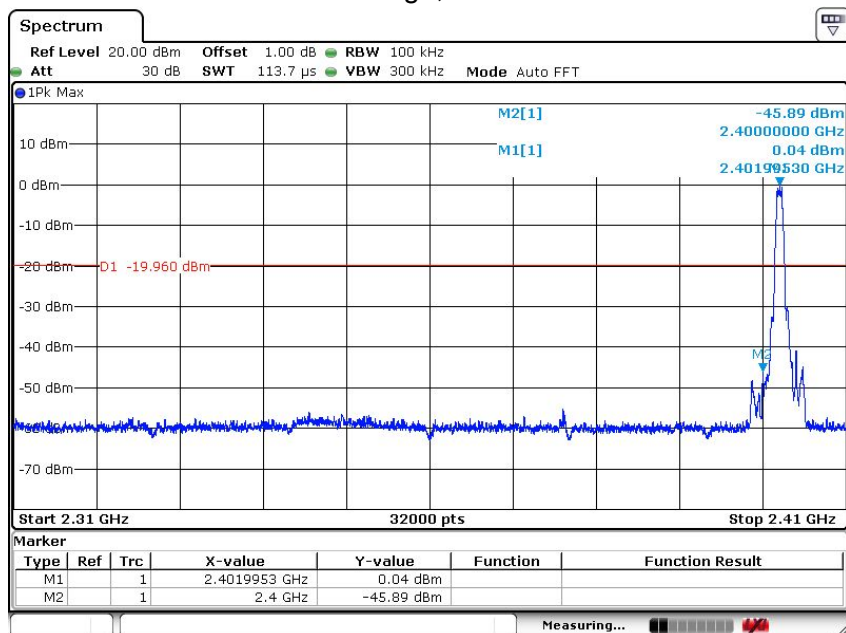
Note: Test method to see chapter 3.2 . When PK value is lower than the Average value limit, average not record.



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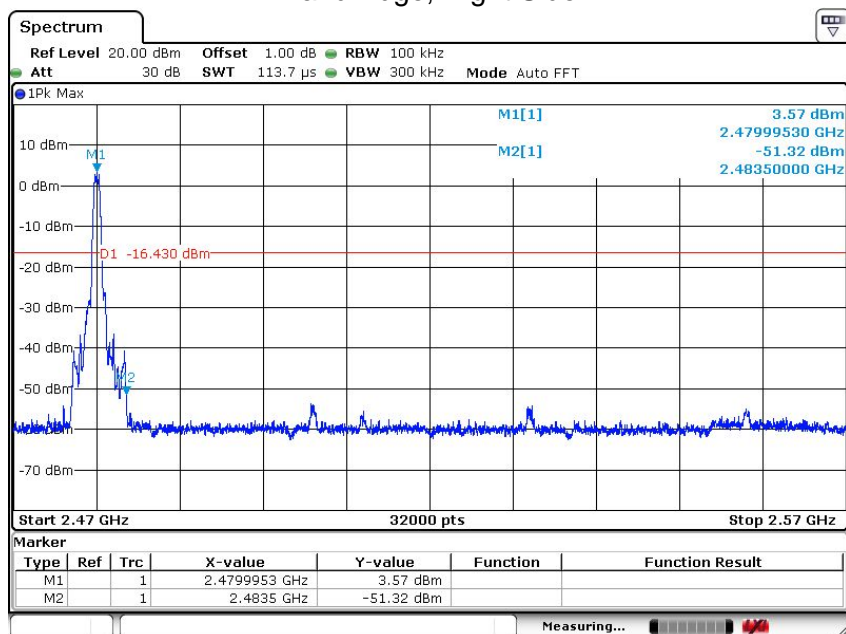
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## Band Edge, Left Side



Date: 5 FEB 2017 10:40:45

## Band Edge, Right Side



Date: 5 FEB 2017 10:41:19



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## 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 PCB antenna, 0dBi gain. It Conform to the requirements of the antenna.



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## 9. EUT TEST PHOTO

### Radiated Measurement Photos

