



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F

- Page 1 of 50 -

FCC RADIO TEST REPORT

FCC ID: 2ALC3KYTO2935

Product : Bluetooth heart rate monitor

Trade Name : KYTO

Model Name : KYTO2935

Serial Model : KYTO2936, KYTO2937, KYTO2938

Prepared for

KYTO FITNESS TECHNOLOGY CO., LIMITED

No. 3, 1st Langjiu Road, Shijing, Dongcheng Street, Dongguan city,
Guangdong province, China

Prepared by

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Report No. ATT-2017SZ0217856F
- Page 2 of 50 -

TEST RESULT CERTIFICATION

Applicant's name KYTO FITNESS TECHNOLOGY CO., LIMITED
Address No. 3, 1st Langjiu Road, Shijing, Dongcheng Street, Dongguan city, Guangdong province, China

Manufacturer's Name..... KYTO FITNESS TECHNOLOGY CO., LIMITED
Address No. 3, 1st Langjiu Road, Shijing, Dongcheng Street, Dongguan city, Guangdong province, China

Product description

Product name Bluetooth heart rate monitor
Model and/or type reference KYTO2935
Serial Model KYTO2936, KYTO2937, KYTO2938

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 Feb. 22 2017 ~Mar. 02 2017

Date of Issue..... Mar. 02 2017

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

Testing Engineer :

(Seal Chen)

Technical Manager :

(Jackie Deng)



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 3 of 50 -

Table of Contents	Page
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
2 . GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	8
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	9
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	10
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	11
3 . EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
3.1.2 TEST PROCEDURE	14
3.1.3 DEVIATION FROM TEST STANDARD	14
3.1.4 TEST SETUP	14
3.1.5 EUT OPERATING CONDITIONS	14
3.1.6 TEST RESULTS	15
3.2 RADIATED EMISSION MEASUREMENT	17
3.2.1 RADIATED EMISSION LIMITS	17
3.2.2 TEST PROCEDURE	18
3.2.3 DEVIATION FROM TEST STANDARD	18
3.2.4 TEST SETUP	19
3.2.5 EUT OPERATING CONDITIONS	20
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	21
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	22
3.2.8 TEST RESULTS (1GHZ~ 10TH HARMONIC)	24
4 . POWER SPECTRAL DENSITY TEST	36
4.1 APPLIED PROCEDURES / LIMIT	36
4.1.1 TEST PROCEDURE	36
4.1.2 DEVIATION FROM STANDARD	36
4.1.3 TEST SETUP	36
4.1.4 EUT OPERATION CONDITIONS	36
4.1.5 TEST RESULTS	37



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 4 of 50 -

Table of Contents	Page
5 . BANDWIDTH TEST	39
5.1 APPLIED PROCEDURES / LIMIT	39
5.1.1 TEST PROCEDURE	39
5.1.2 EUT OPERATION CONDITIONS	39
5.1.3 TEST RESULTS	40
6 . PEAK OUTPUT POWER TEST	42
6.1 APPLIED PROCEDURES / LIMIT	42
6.1.1 TEST PROCEDURE	42
6.1.2 DEVIATION FROM STANDARD	42
6.1.3 TEST SETUP	42
6.1.4 EUT OPERATION CONDITIONS	42
6.1.5 TEST RESULTS	43
7 . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE	44
7.1 DEVIATION FROM STANDARD	44
7.2 TEST SETUP	45
7.3 EUT OPERATION CONDITIONS	45
7.4 TEST RESULTS	46
8 . ANTENNA REQUIREMENT	48
8.1 STANDARD REQUIREMENT	48
8.2 EUT ANTENNA	48
9 . EUT TEST PHOTO	49
APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 5 of 50 -

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



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 6 of 50 -

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	$\pm 2\%$



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 7 of 50 -

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Bluetooth heart rate monitor	
Model Name	KYTO2935	
Serial Model	KYTO2936, KYTO2937, KYTO2938	
Model Difference	All models are identical except model name.	
Product Description	The EUT is a Bluetooth heart rate monitor	
	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):	3.64dBm(PK)
	Antenna Gain (dBi)	0dbi
Channel List	Please refer to the Note 2.	
Ratings	DC 3.7V	
Adapter	M/N:MS0501000US INPUT:AC 100-240V, 50/60Hz, 0.5A OUTPUT:DC 5V, 1A NOTE:This Power adapter provide by test lab.	
Battery	DC 3.7V, 150mA	
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	V1.2	
SW	V02	

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



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 8 of 50 -

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	PCB	N/A	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

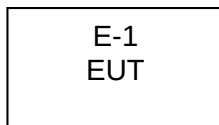
Note:

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

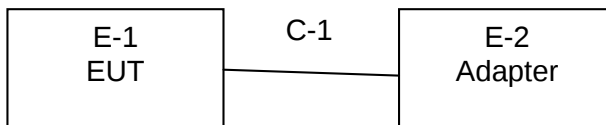


2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



CE Spurious Emission Test





Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 10 of 50 -

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 heart rate monitor	KYTO	KYTO2935	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	20	USB Cable

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.



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 11 of 50 -

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



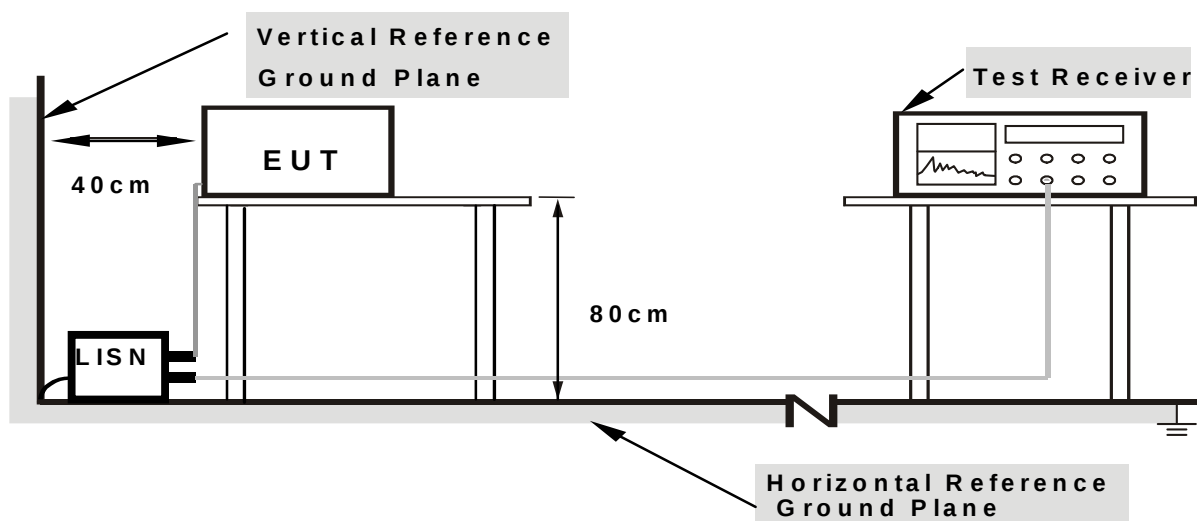
3.1.2 TEST PROCEDURE

- 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 cm 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.

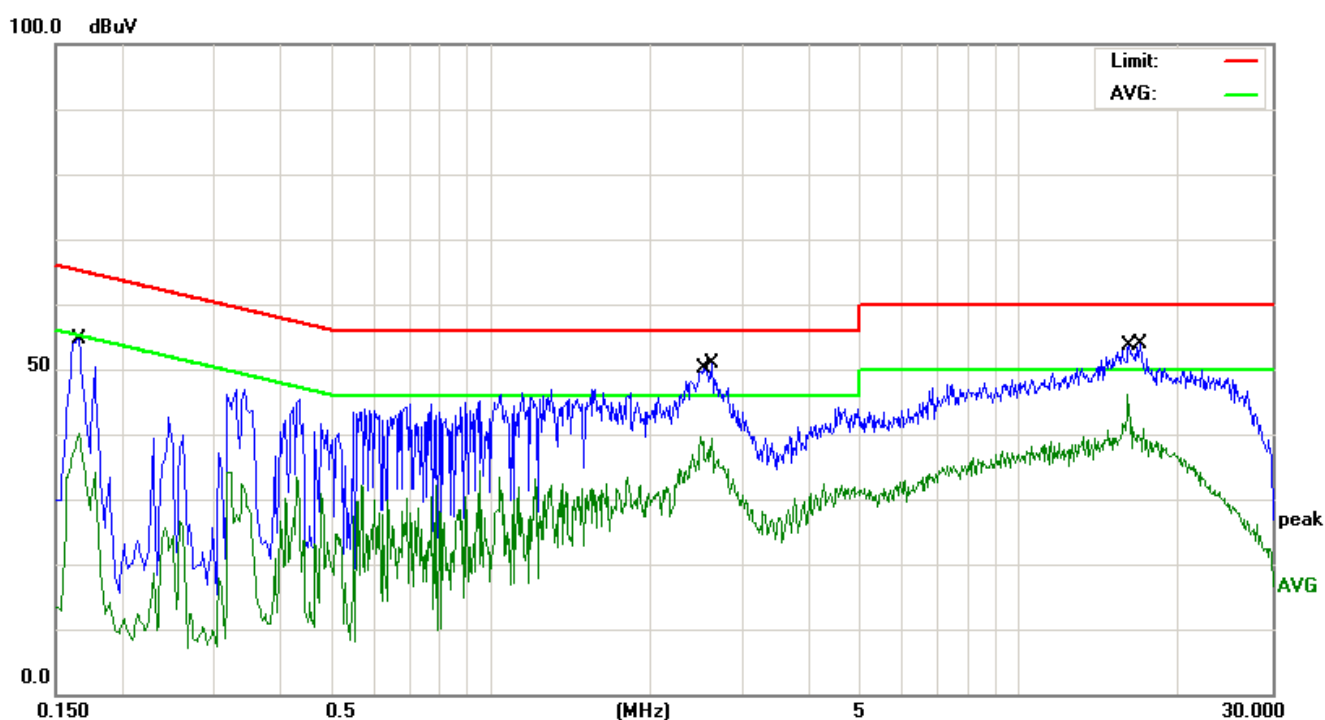


Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 15 of 50 -

3.1.6 TEST RESULTS

EUT:	Bluetooth heart rate monitor	Model Name. :	KYTO2935
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V by adapter AC 120V/60Hz
Test Mode :	4	Phase:	L



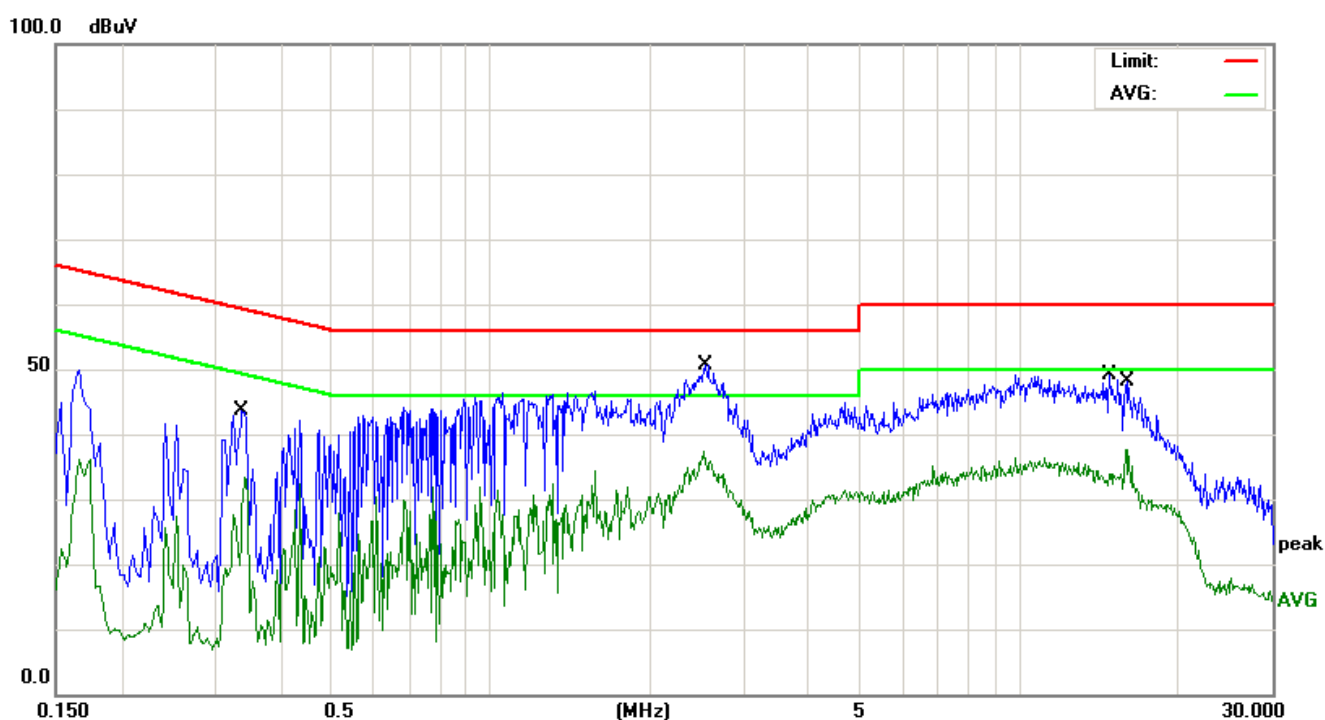
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1660	43.11	11.61	54.72	65.15	-10.43	QP	
2		0.1660	28.52	11.61	40.13	55.15	-15.02	AVG	
3		2.4900	29.57	10.01	39.58	46.00	-6.42	AVG	
4		2.6180	40.86	10.01	50.87	56.00	-5.13	QP	
5	*	15.9739	44.54	1.52	46.06	50.00	-3.94	AVG	
6		16.8458	52.14	1.64	53.78	60.00	-6.22	QP	



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 16 of 50 -

EUT:	Bluetooth heart rate monitor	Model Name. :	KYTO2935
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V by adapter AC 120V/60Hz
Test Mode :	4	Phase:	N



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.3379	33.34	10.18	43.52	59.25	-15.73	QP	
2		0.3420	23.14	10.17	33.31	49.15	-15.84	AVG	
3		2.5300	27.33	10.01	37.34	46.00	-8.66	AVG	
4	*	2.5420	40.63	10.01	50.64	56.00	-5.36	QP	
5		14.7540	47.62	1.39	49.01	60.00	-10.99	QP	
6		15.8020	36.18	1.50	37.68	50.00	-12.32	AVG	



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a)&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



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 18 of 50 -

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.

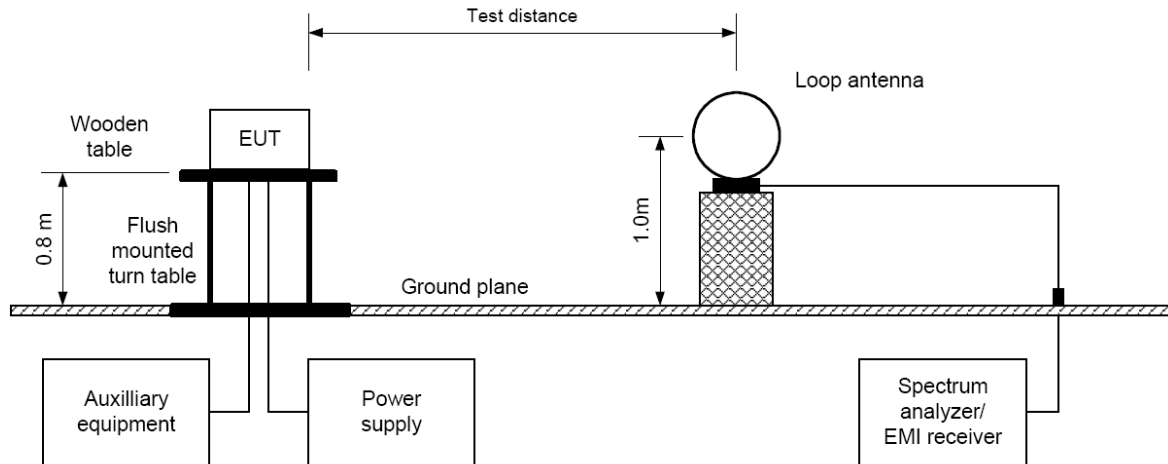
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

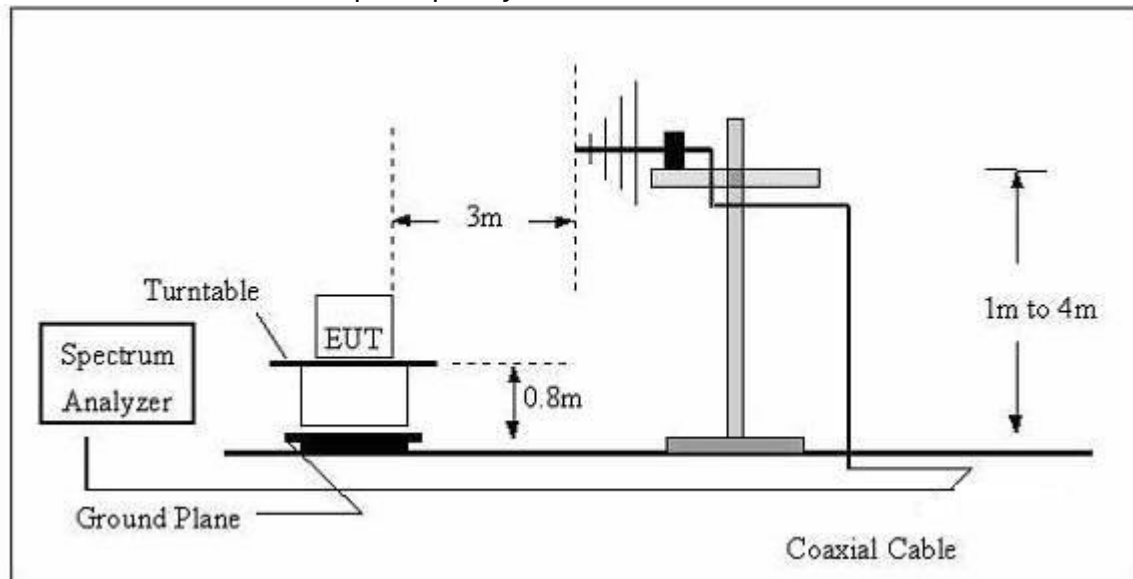


3.2.4 TEST SETUP

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

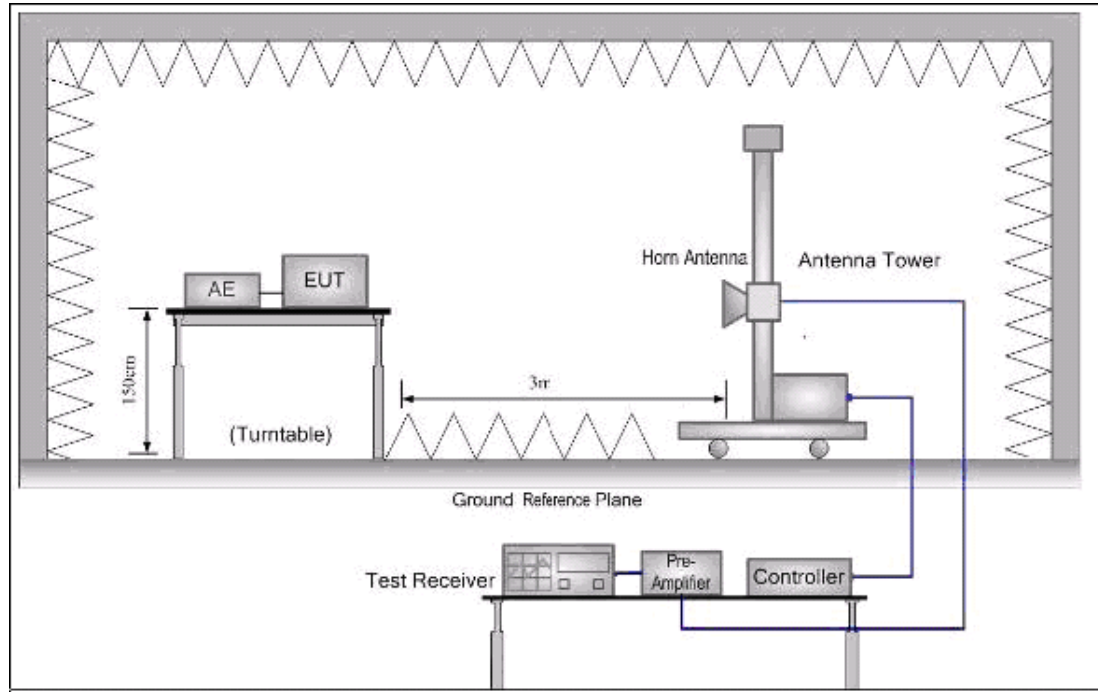


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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.



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 21 of 50 -

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	Bluetooth heart rate monitor	Model Name. :	KYTO2935
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V 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.

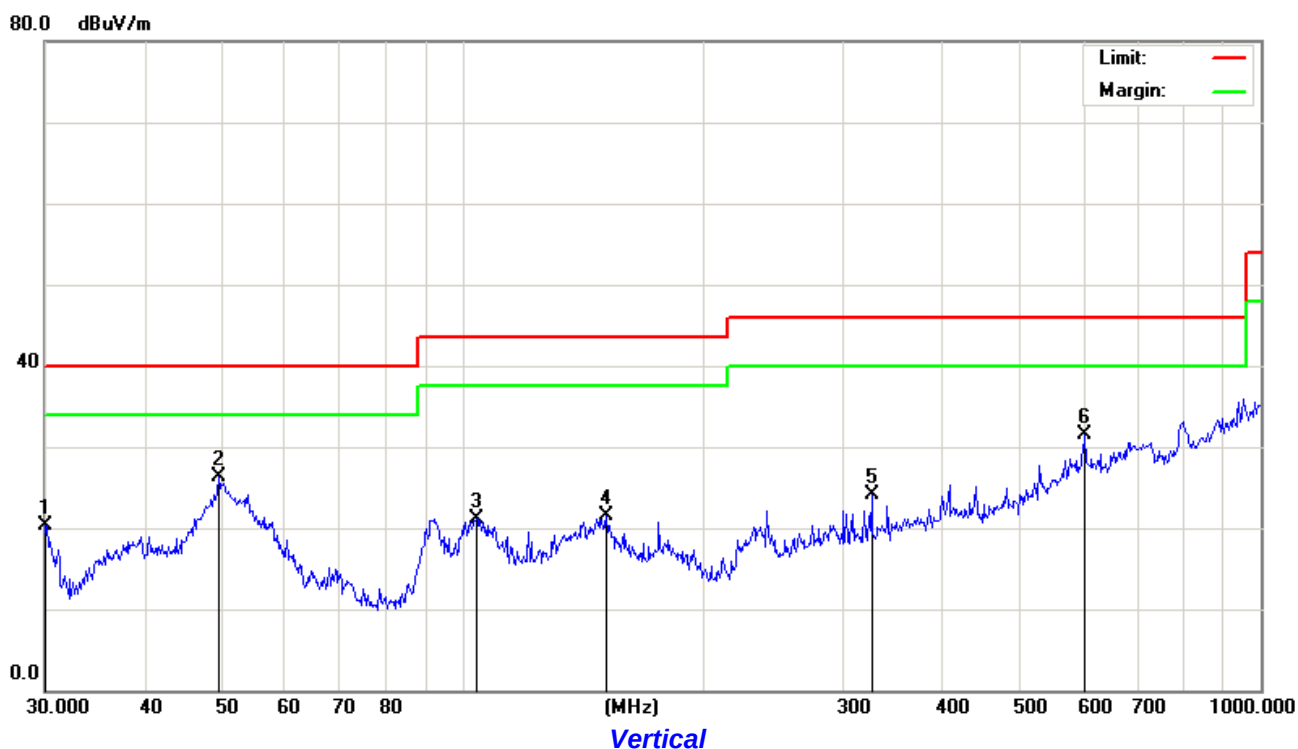


Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 22 of 50 -

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Bluetooth heart rate monitor	Model Name :	KYTO2935
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V by battery
Test Mode :	TX 2440(worse-case)		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		30.0000	37.76	-17.50	20.26	40.00	-19.74	QP		
2	*	49.5328	44.86	-18.62	26.24	40.00	-13.76	QP		
3		104.1701	34.75	-13.63	21.12	43.50	-22.38	QP		
4		151.5971	36.84	-15.41	21.43	43.50	-22.07	QP		
5		325.5957	32.80	-8.75	24.05	46.00	-21.95	QP		
6		601.4265	32.40	-0.89	31.51	46.00	-14.49	QP		

Remark:

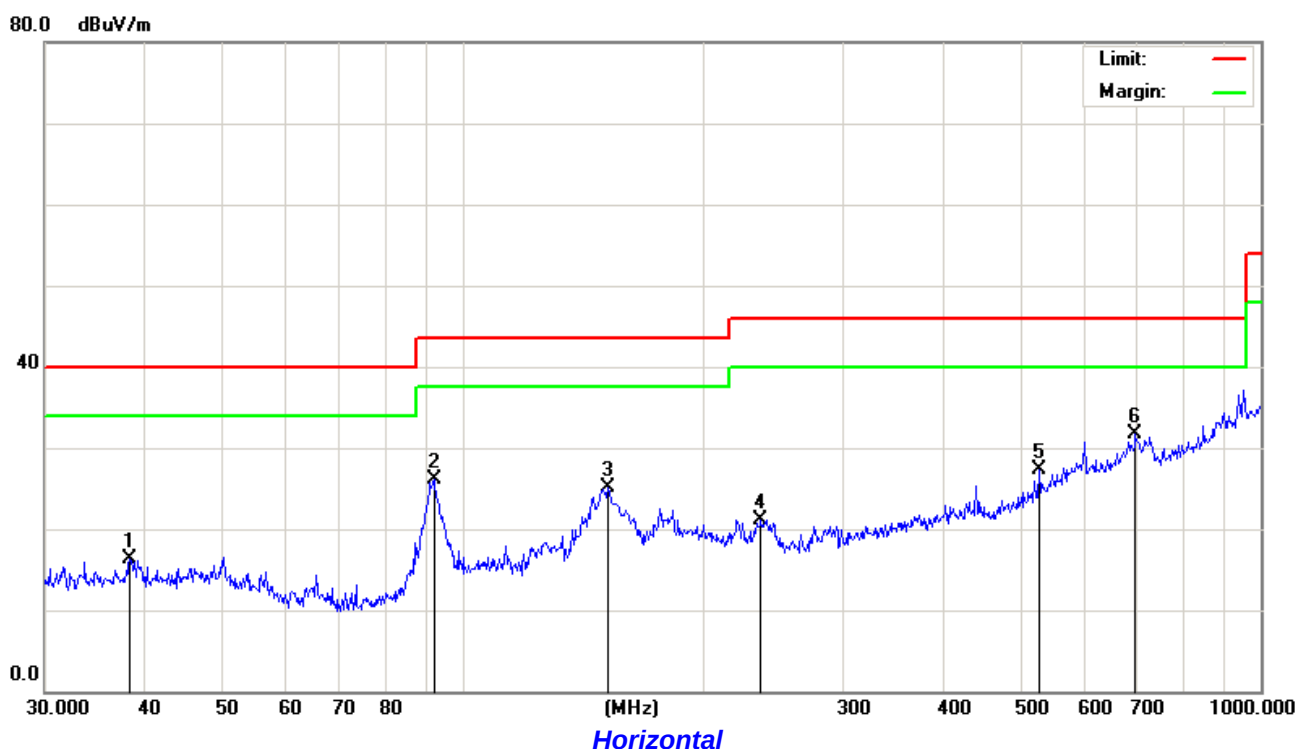
Measurement Level= ReadingLevel+ Factor, Margin= Measurement Level - Limit



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F

- Page 23 of 50 -



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		38.3462	30.86	-14.46	16.40	40.00	-23.60	QP		
2		92.1388	42.73	-16.69	26.04	43.50	-17.46	QP		
3		152.1297	40.68	-15.60	25.08	43.50	-18.42	QP		
4		236.6447	35.54	-14.39	21.15	46.00	-24.85	QP		
5		528.2458	32.01	-4.65	27.36	46.00	-18.64	QP		
6	*	696.8567	31.39	0.24	31.63	46.00	-14.37	QP		

Remark:

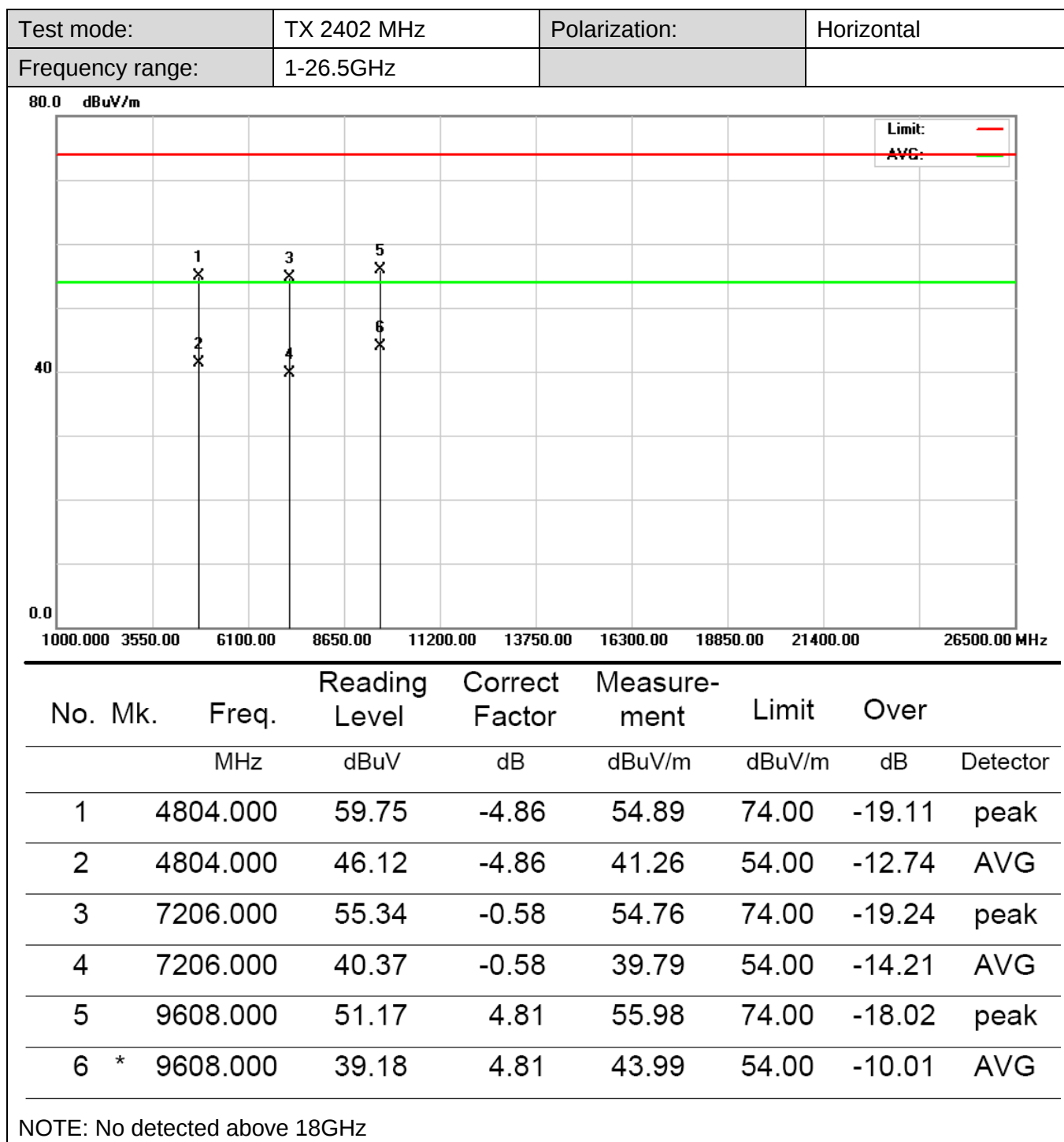
Measurement Level= ReadingLevel+ Factor, Margin= Measurement Level - Limit



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Report No. ATT-2017SZ0217856F
- Page 24 of 50 -

3.2.8 TEST RESULTS (1GHZ~ 10TH HARMONIC)

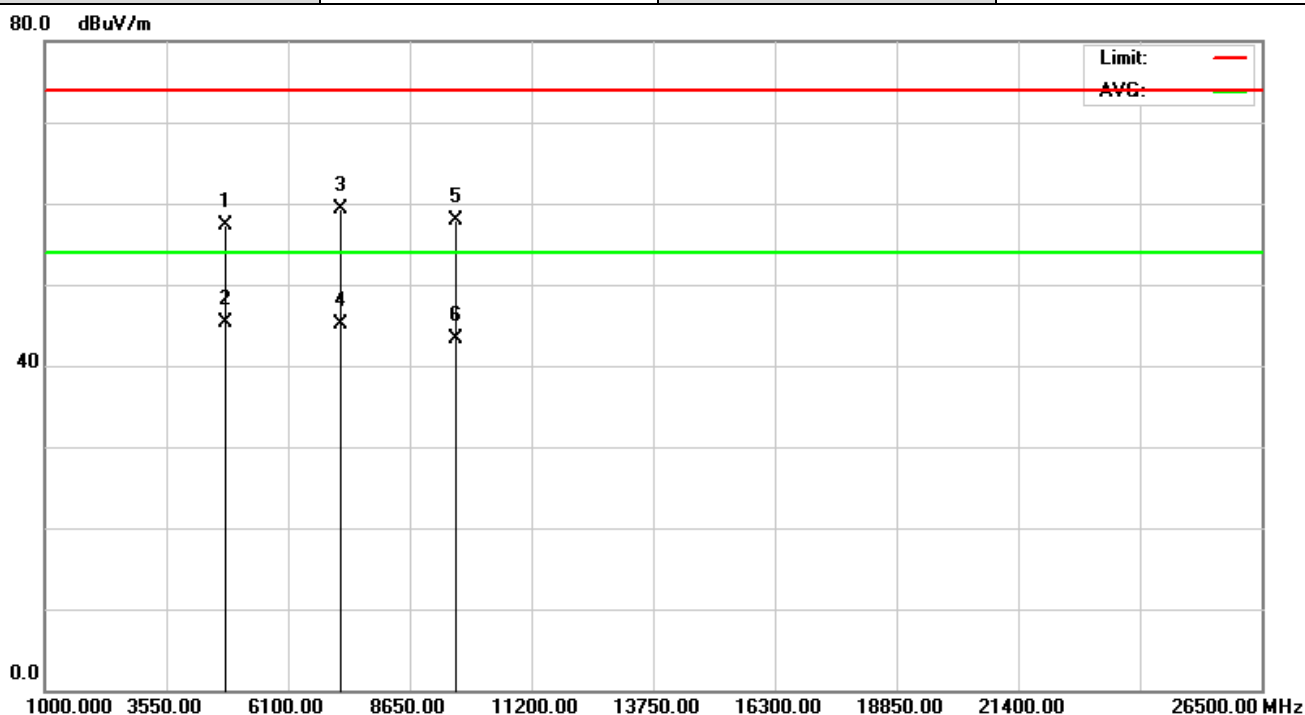




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Report No. ATT-2017SZ0217856F
- Page 25 of 50 -

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



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4804.000	62.11	-4.86	57.25	74.00	-16.75	peak
2	*	4804.000	50.08	-4.86	45.22	54.00	-8.78	AVG
3		7206.000	59.87	-0.58	59.29	74.00	-14.71	peak
4		7206.000	45.62	-0.58	45.04	54.00	-8.96	AVG
5		9608.000	53.18	4.81	57.99	74.00	-16.01	peak
6		9608.000	38.54	4.81	43.35	54.00	-10.65	AVG

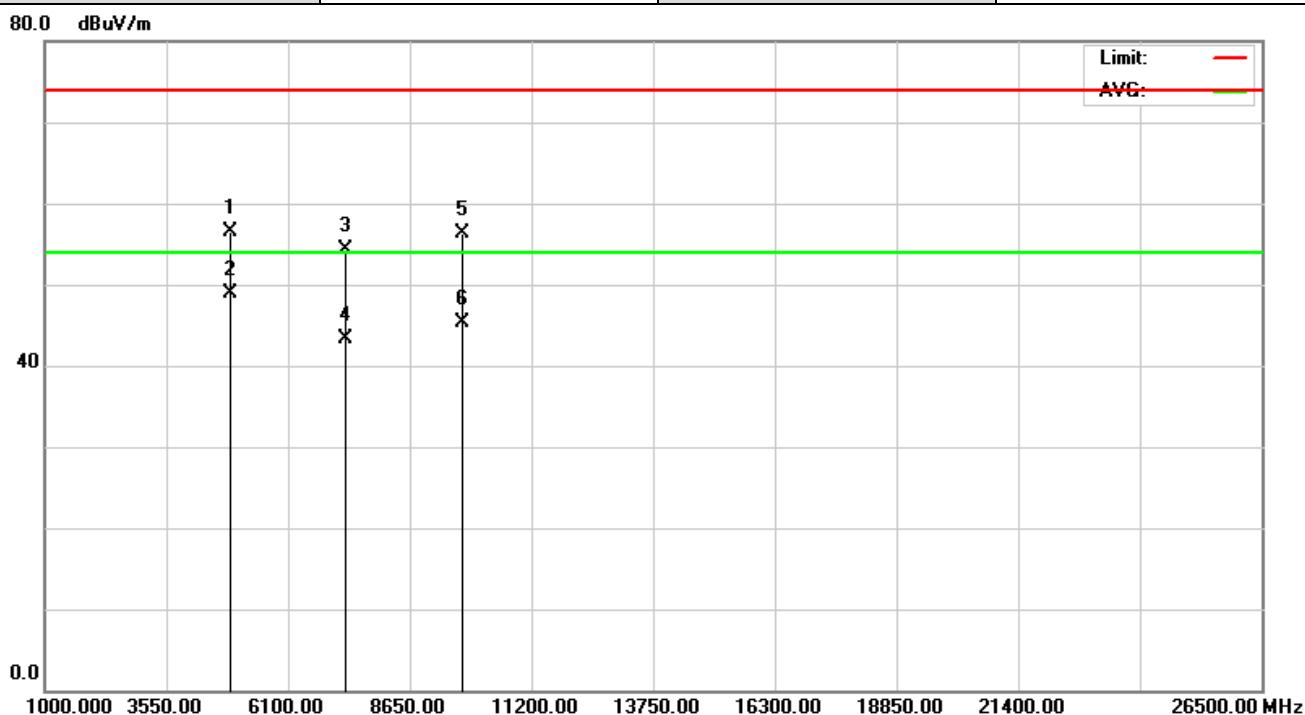
NOTE: No detected above 18GHz



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 26 of 50 -

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	61.14	-4.73	56.41	74.00	-17.59	peak
2	*	4882.000	53.72	-4.73	48.99	54.00	-5.01	AVG
3		7323.000	54.62	-0.30	54.32	74.00	-19.68	peak
4		7323.000	43.69	-0.30	43.39	54.00	-10.61	AVG
5		9764.000	51.14	5.26	56.40	74.00	-17.60	peak
6		9764.000	40.00	5.26	45.26	54.00	-8.74	AVG

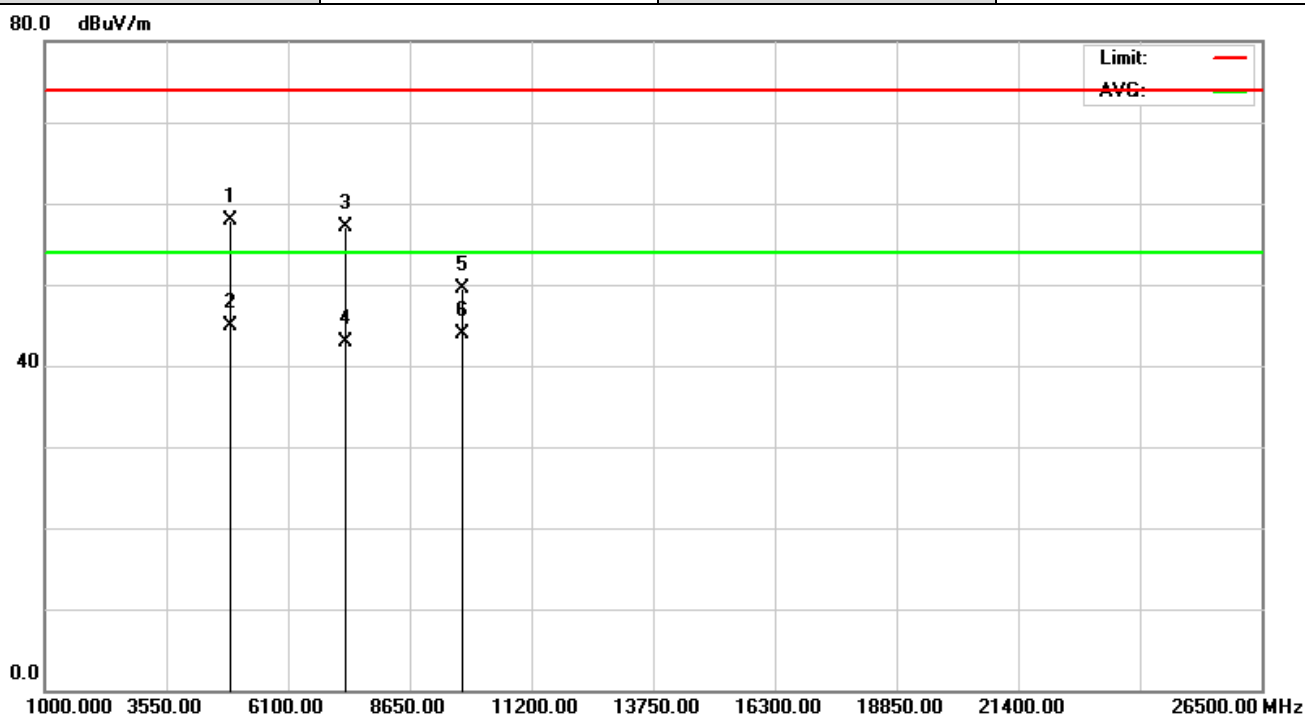
NOTE: No detected above 18GHz



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 27 of 50 -

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	62.67	-4.73	57.94	74.00	-16.06	peak
2	*	4882.000	49.61	-4.73	44.88	54.00	-9.12	AVG
3		7323.000	57.48	-0.30	57.18	74.00	-16.82	peak
4		7323.000	43.29	-0.30	42.99	54.00	-11.01	AVG
5		9764.000	44.18	5.26	49.44	74.00	-24.56	peak
6		9764.000	38.64	5.26	43.90	54.00	-10.10	AVG

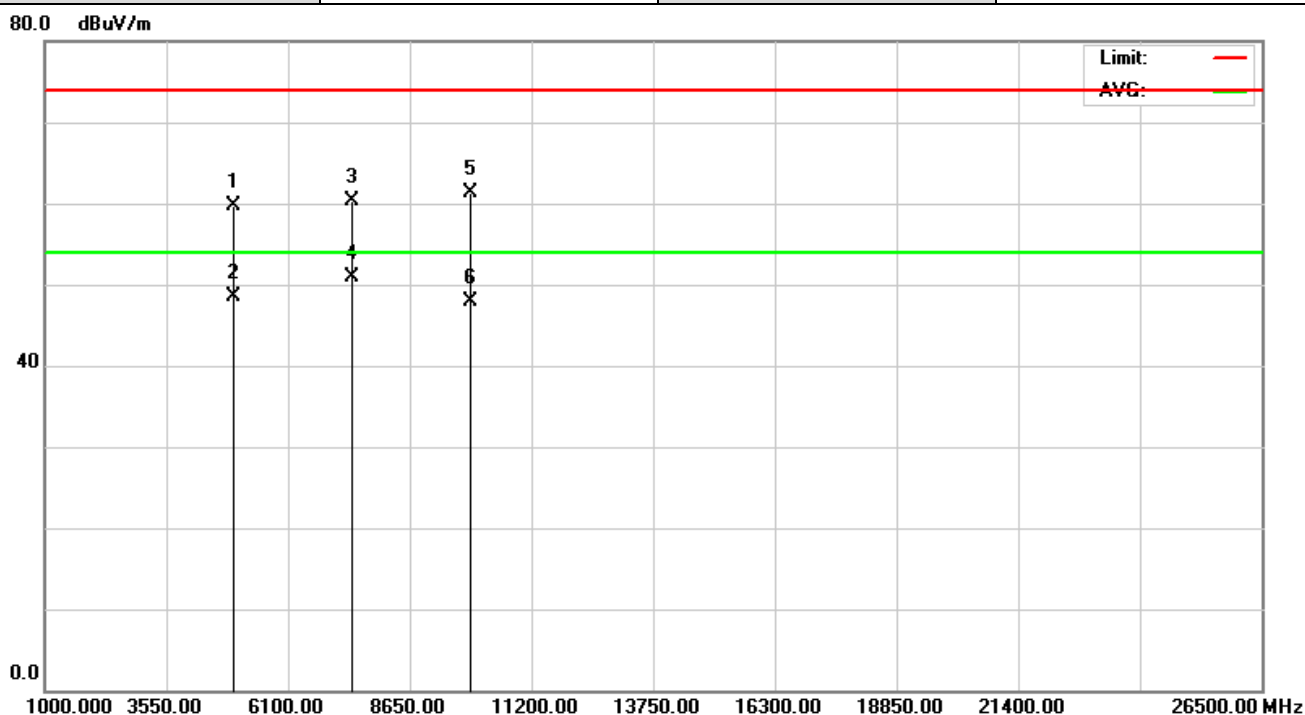
NOTE: No detected above 18GHz



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 28 of 50 -

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	64.29	-4.60	59.69	74.00	-14.31	peak
2		4960.000	53.11	-4.60	48.51	54.00	-5.49	AVG
3		7440.000	60.37	-0.02	60.35	74.00	-13.65	peak
4	*	7440.000	50.95	-0.02	50.93	54.00	-3.07	AVG
5		9920.000	55.68	5.66	61.34	74.00	-12.66	peak
6		9920.000	42.29	5.66	47.95	54.00	-6.05	AVG

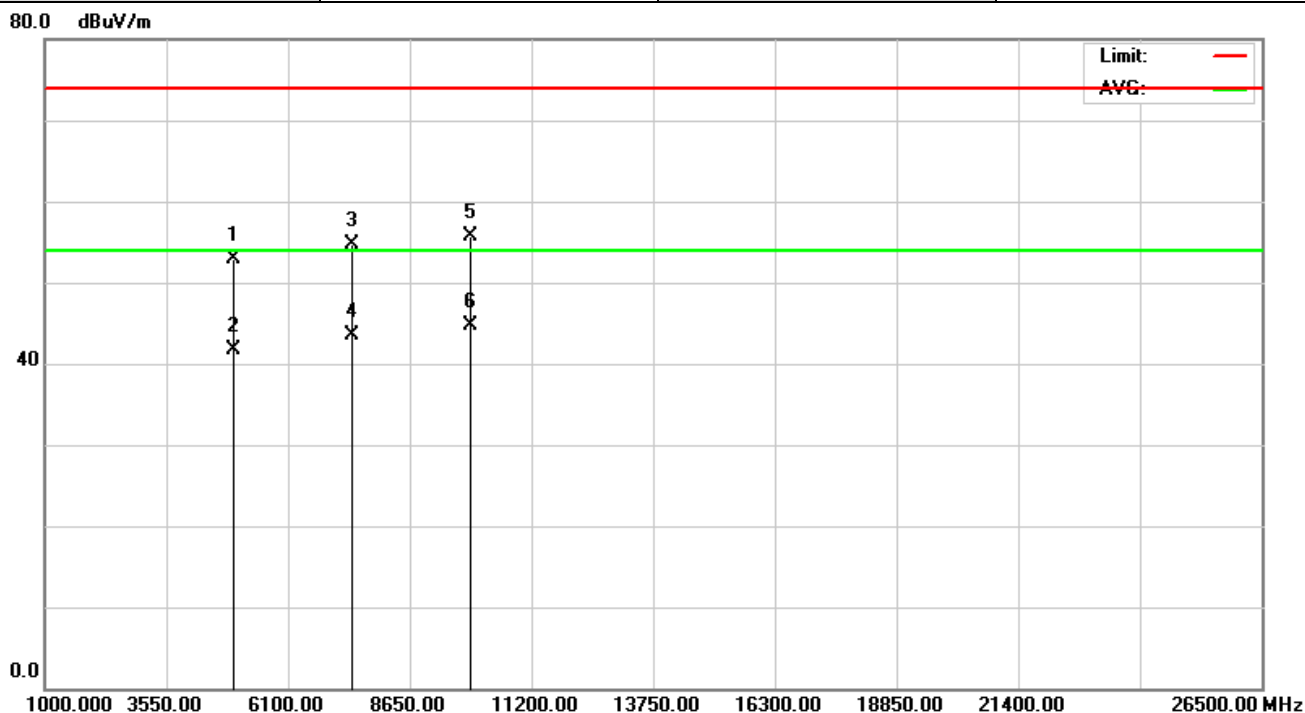
NOTE: No detected above 18GHz



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 29 of 50 -

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	57.43	-4.60	52.83	74.00	-21.17	peak
2		4960.000	46.32	-4.60	41.72	54.00	-12.28	AVG
3		7440.000	54.79	-0.02	54.77	74.00	-19.23	peak
4		7440.000	43.61	-0.02	43.59	54.00	-10.41	AVG
5		9920.000	50.14	5.66	55.80	74.00	-18.20	peak
6	*	9920.000	39.11	5.66	44.77	54.00	-9.23	AVG

NOTE: No detected above 18GHz



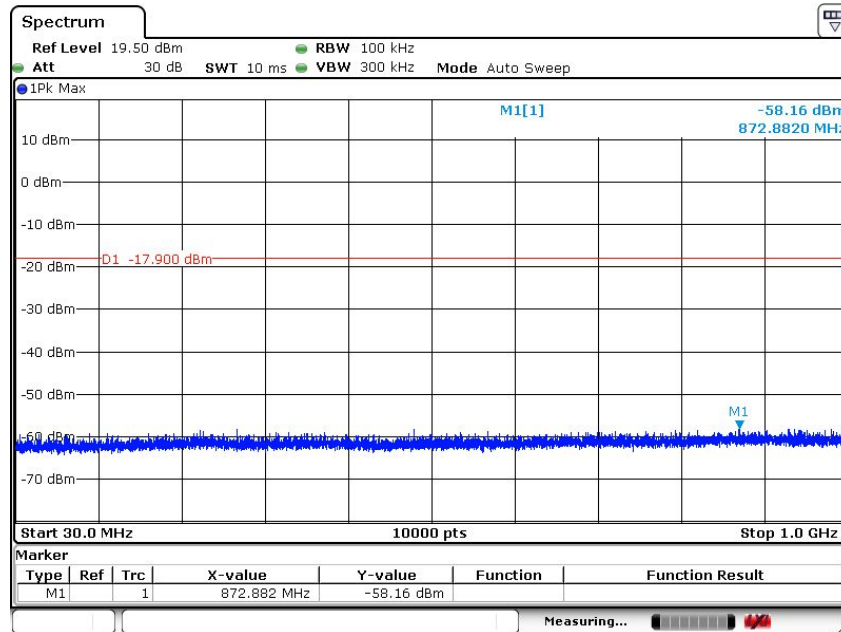
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Report No. ATT-2017SZ0217856F

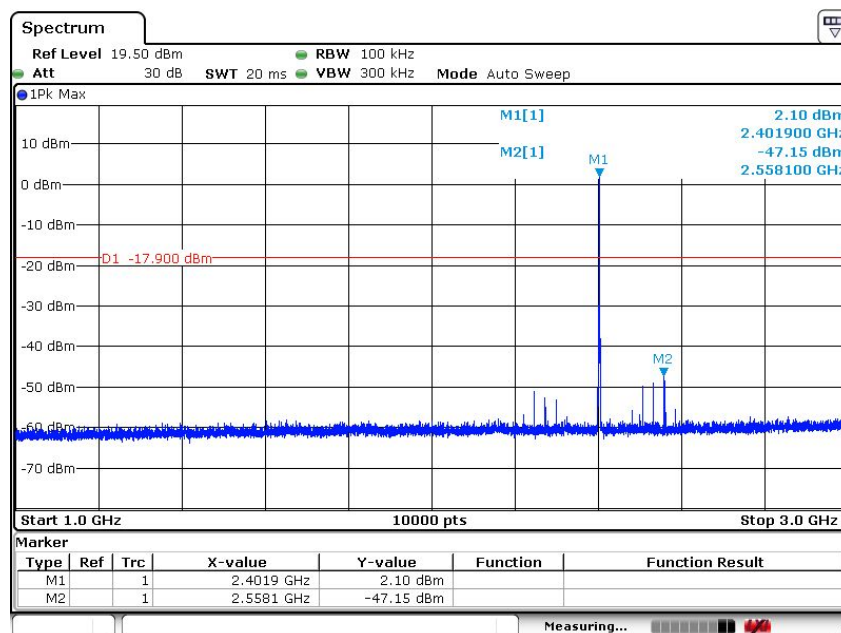
- Page 30 of 50 -

Conducted Spurious Emissions at Antenna Port:

Low Channel



Date: 1 MAR 2017 16:07:19



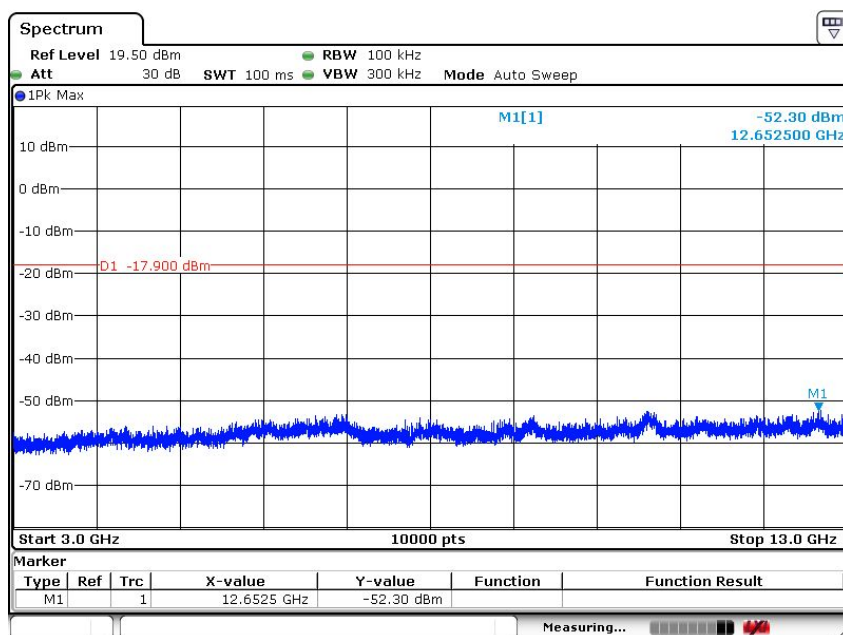
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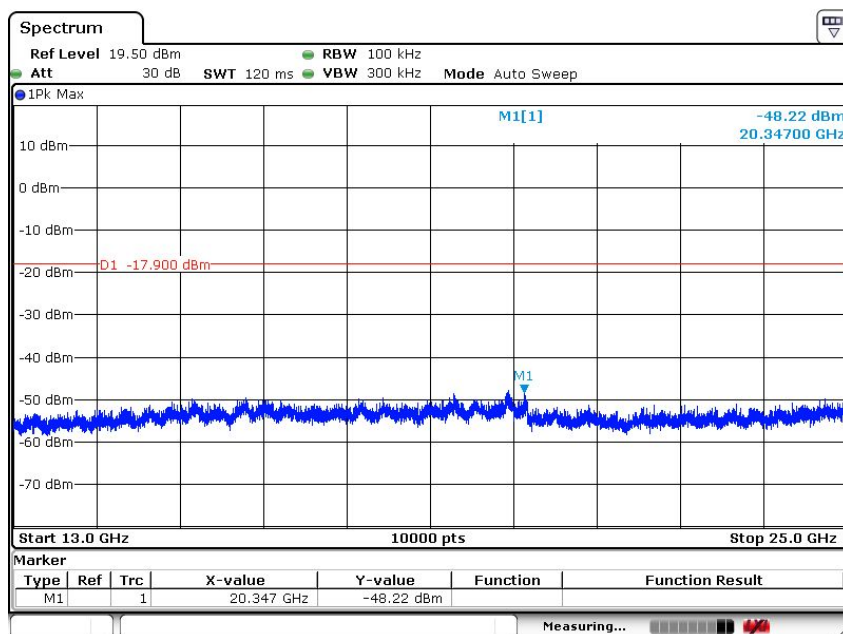
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Report No. ATT-2017SZ0217856F

- Page 31 of 50 -



Date: 1 MAR 2017 16:07:35



Date: 1 MAR 2017 16:07:49

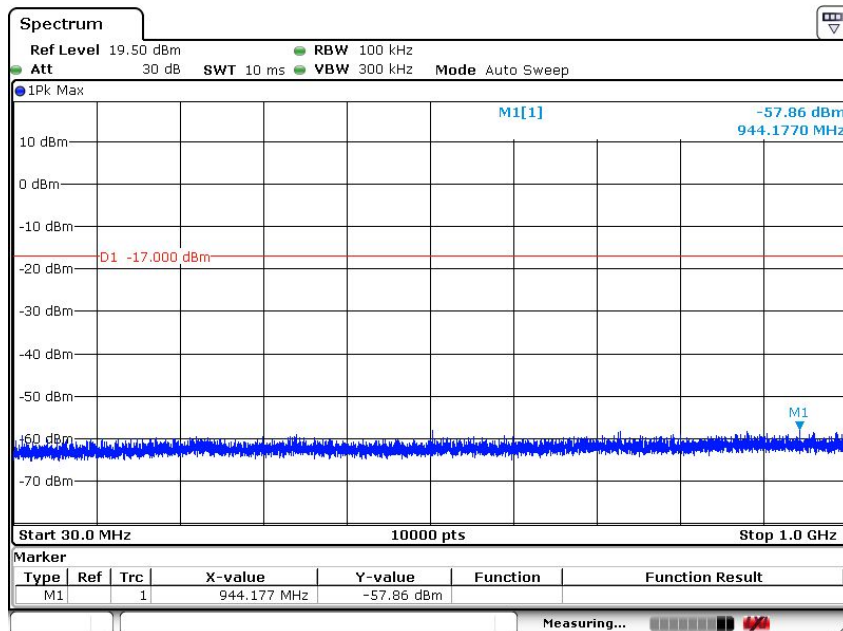


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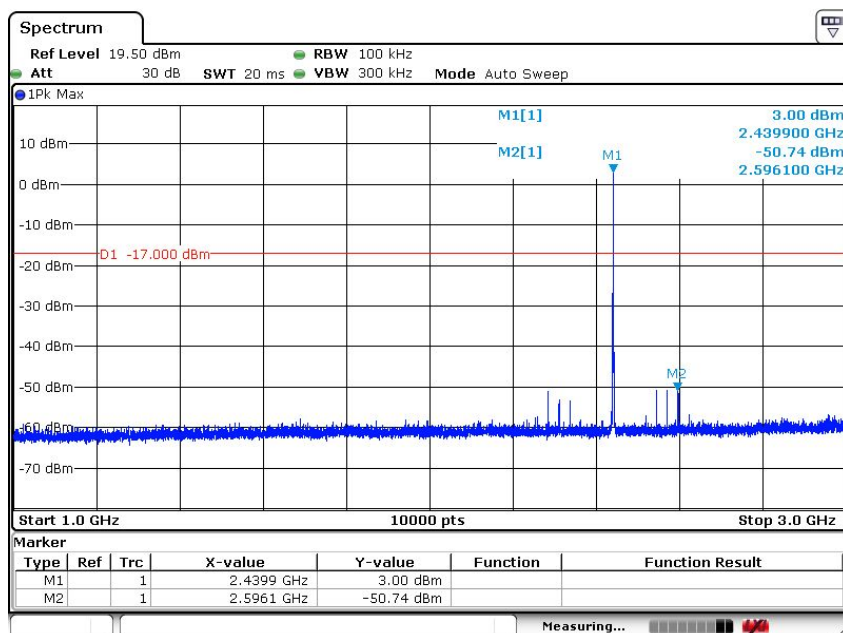
Report No. ATT-2017SZ0217856F

- Page 32 of 50 -

Middle Channel



Date: 1 MAR 2017 16:08:37



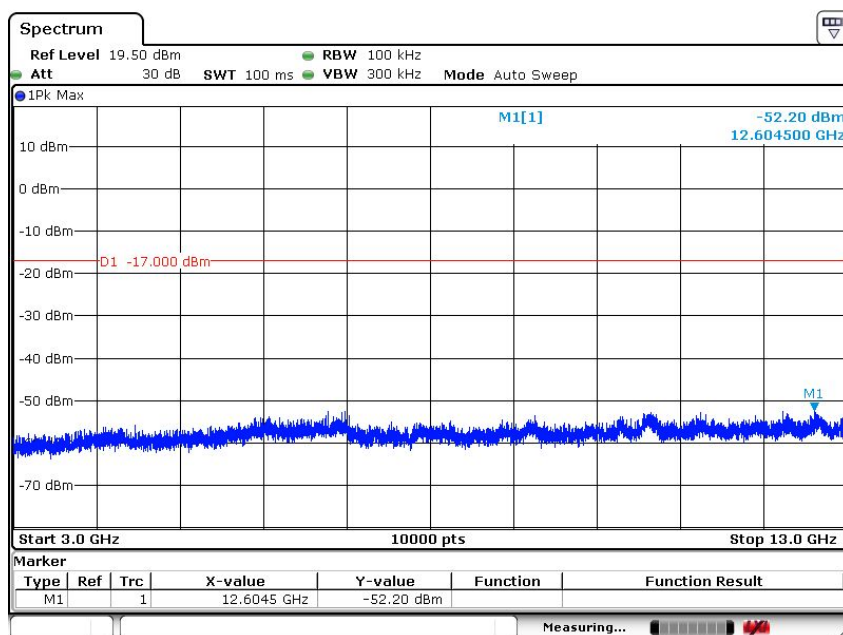
Date: 1 MAR 2017 16:08:23



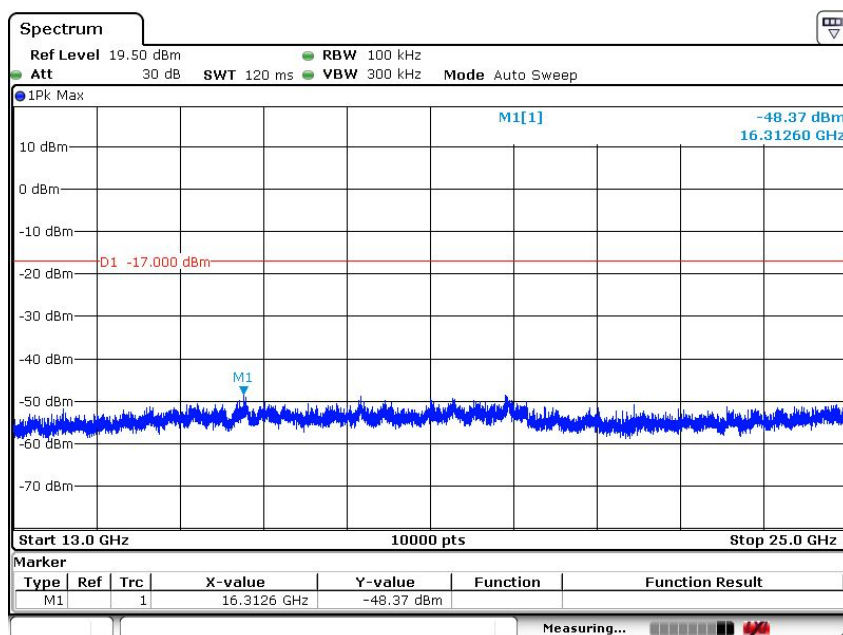
Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F

- Page 33 of 50 -



Date: 1 MAR 2017 16:08:50



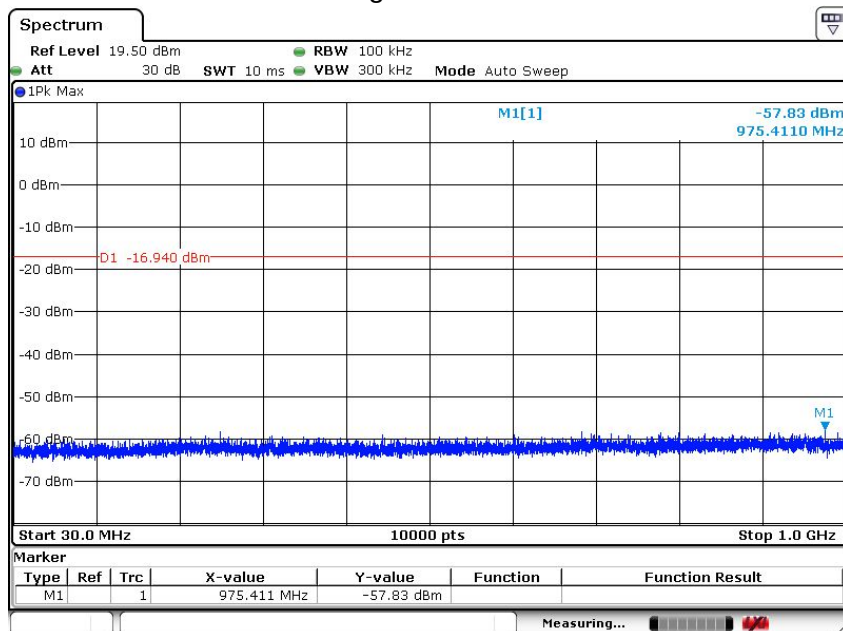
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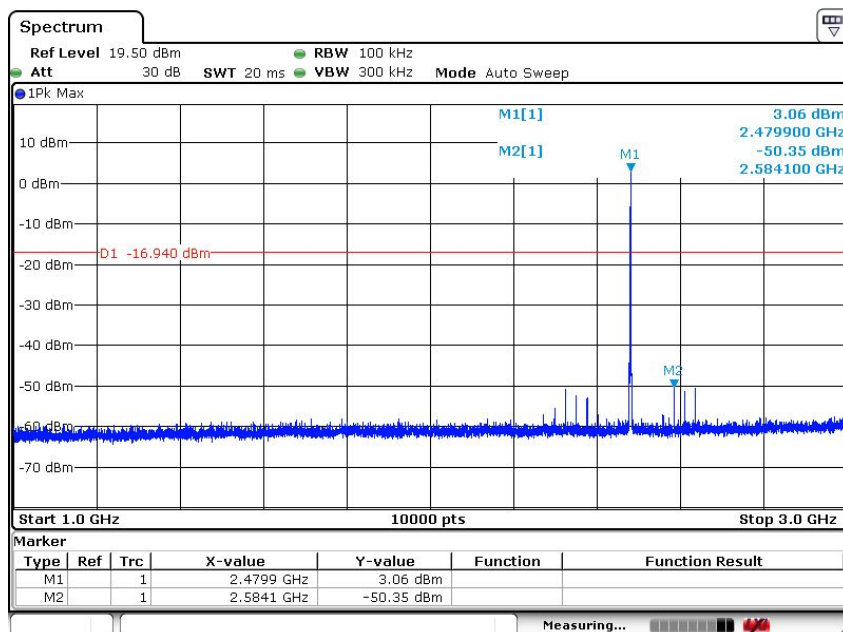
Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 34 of 50 -

High Channel



Date: 1 MAR 2017 16:12:56



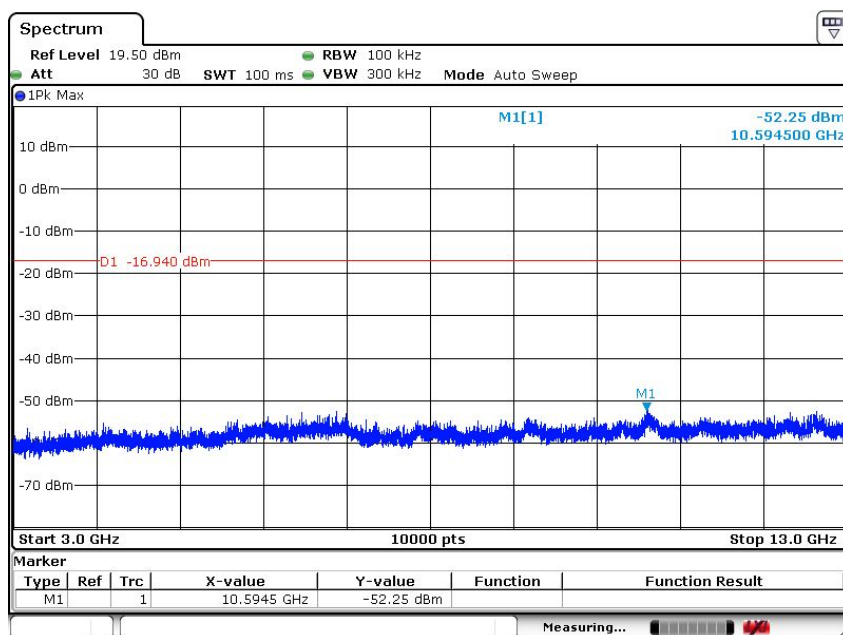
Date: 1 MAR 2017 16:12:38



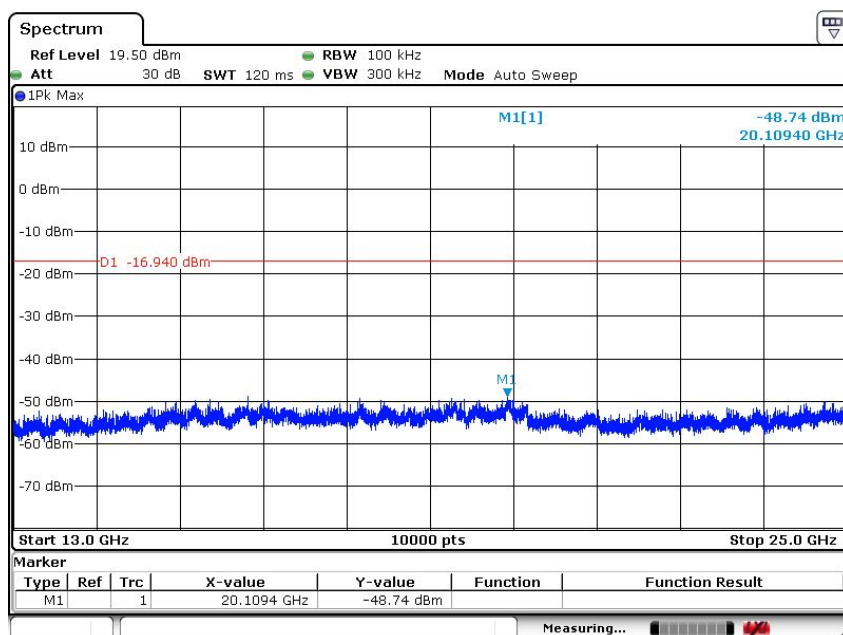
Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F

- Page 35 of 50 -



Date: 1 MAR 2017 16:13:08



Date: 1 MAR 2017 16:13:21



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

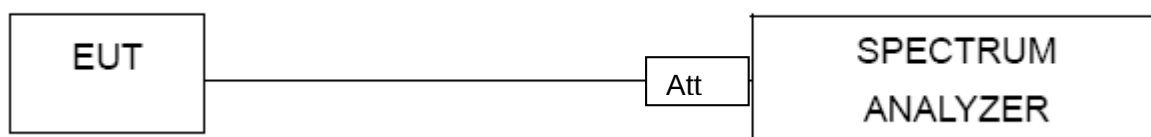
4.1.1 TEST PROCEDURE

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 ≥ 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.



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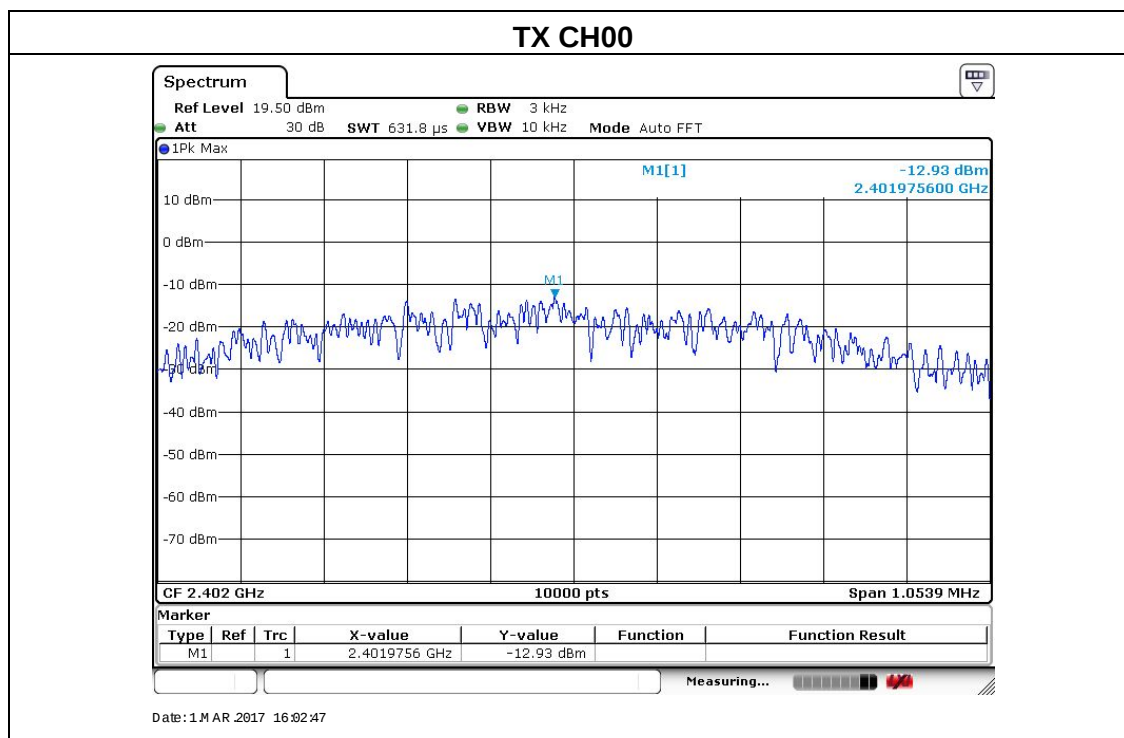
Report No. ATT-2017SZ0217856F
- Page 37 of 50 -

4.1.5 TEST RESULTS

EUT :	Bluetooth heart rate monitor	Model Name :	KYTO2935
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH00, CH19, CH39		

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

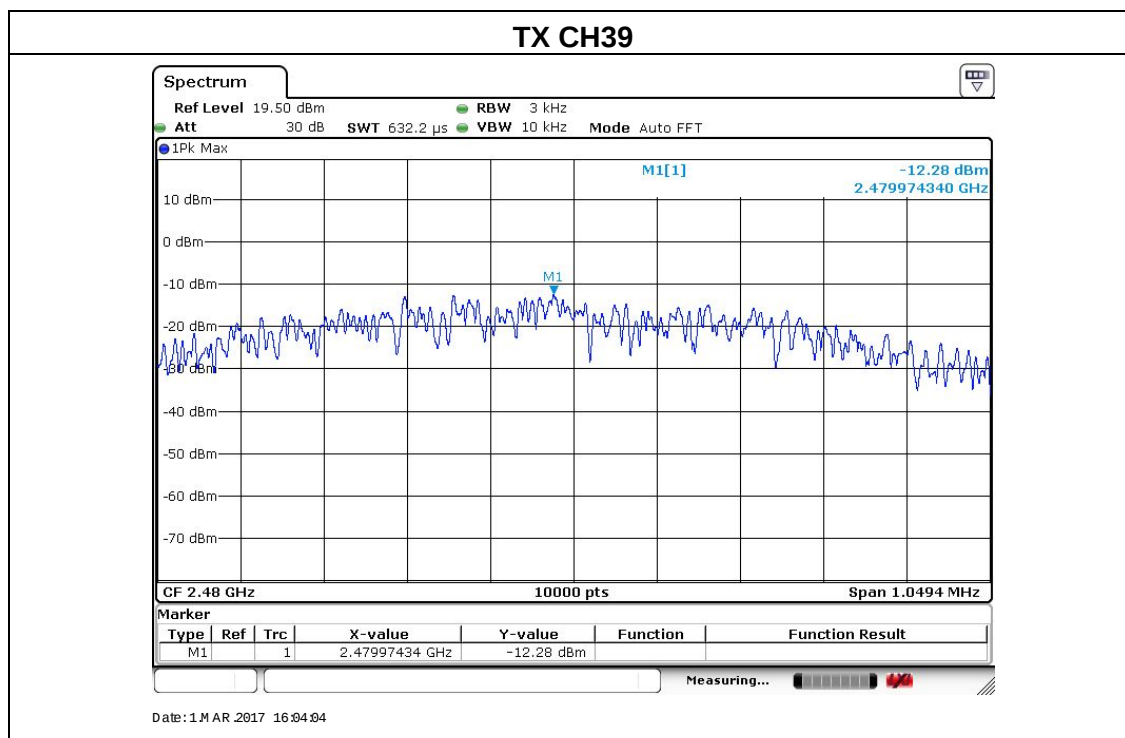
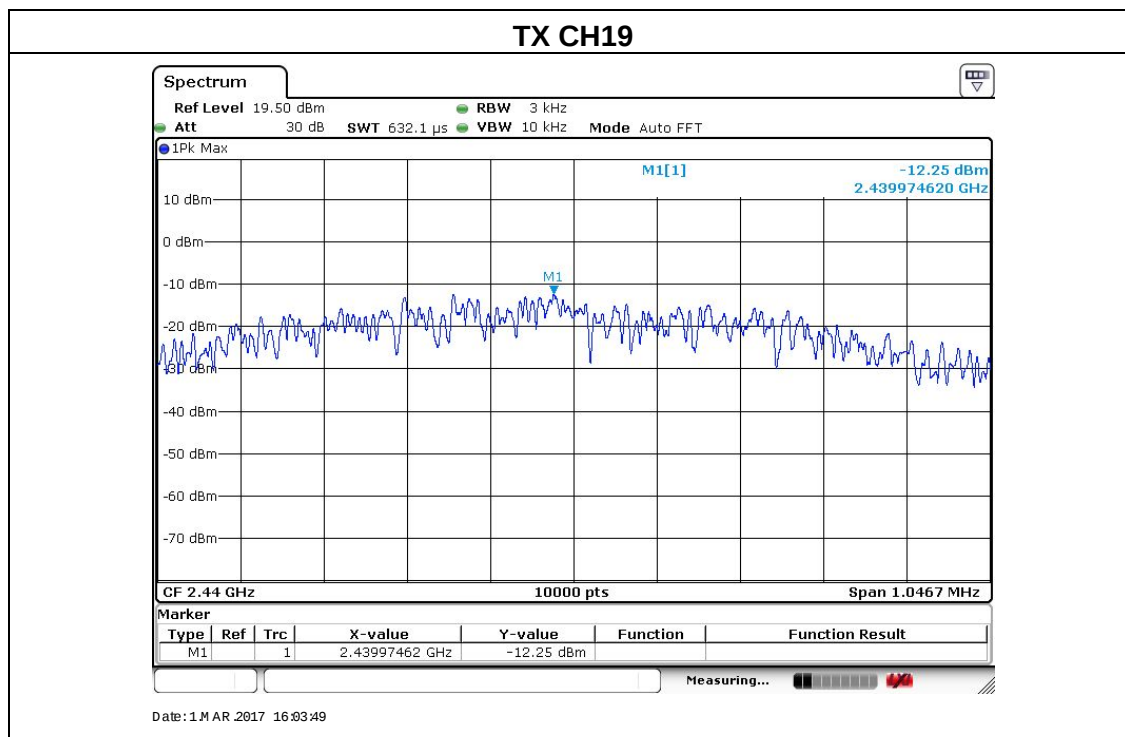
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3 kHz)	Result
2402 MHz	-12.93	8	PASS
2440 MHz	-12.25	8	PASS
2480 MHz	-12.28	8	PASS





Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 38 of 50 -





5. BANDWIDTH TEST

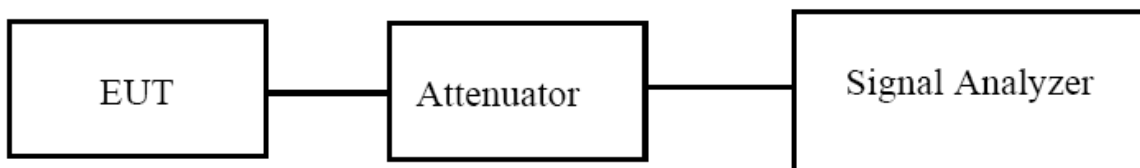
5.1 APPLIED PROCEDURES / LIMIT

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.



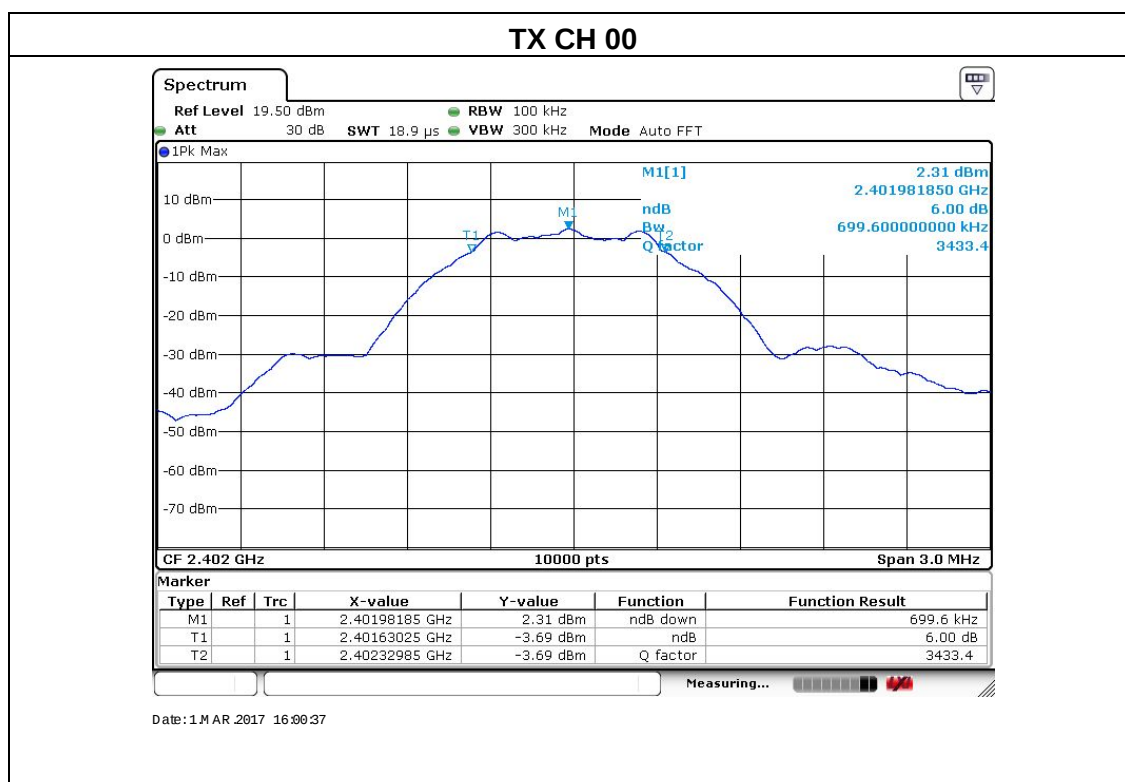
Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 40 of 50 -

5.1.3 TEST RESULTS

EUT :	Bluetooth heart rate monitor	Model Name :	KYTO2935
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode /CH00, CH19, CH39		

Channel	Frequency (MHz)	6dB bandwidth (kHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2402	699.6	/	> 500	Pass
Middle	2440	697.8	/	> 500	Pass
High	2480	702.6	/	> 500	Pass

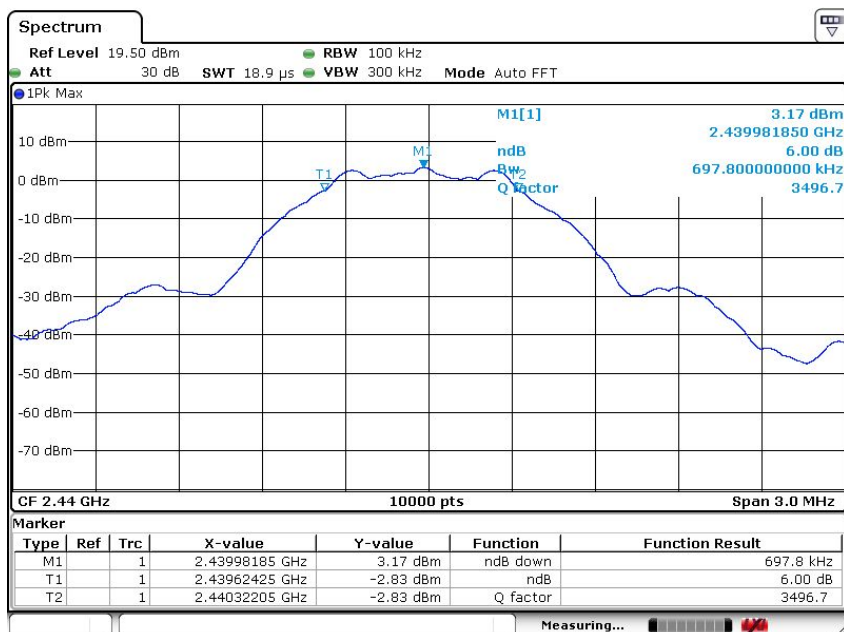




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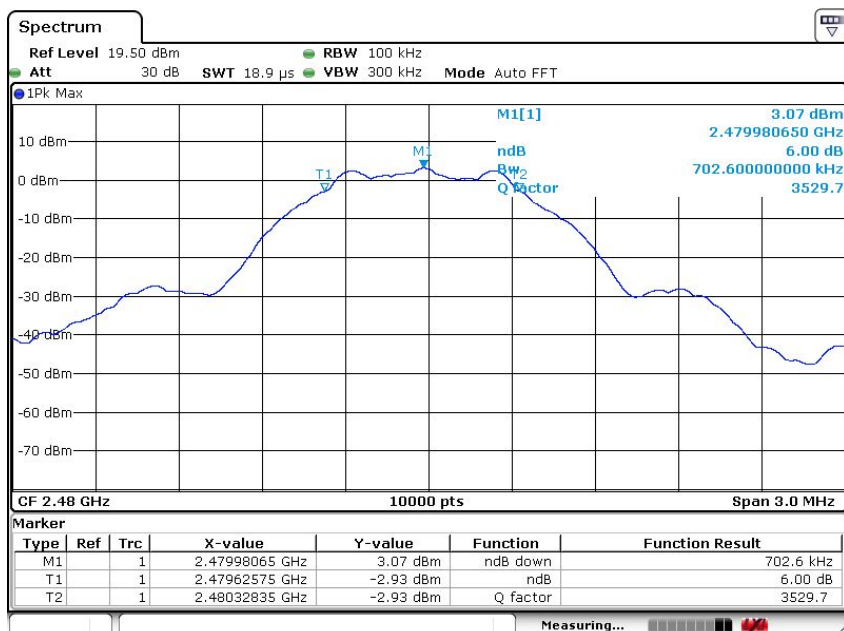
Report No. ATT-2017SZ0217856F
- Page 41 of 50 -

TX CH 19



Date: 1 MAR 2017 16:00:11

TX CH 39



Date: 1 MAR 2017 15:59:27



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.



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 43 of 50 -

6.1.5 TEST RESULTS

EUT :	Bluetooth heart rate monitor	Model Name :	KYTO2935
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	TX Mode		

TX Mode			
Test Channe	Frequency	Maximum Conducted Output Power (PK)	LIMIT
	(MHz)	(dBm)	dBm
CH00	2402	3.58	30
CH19	2440	3.42	30
CH39	2480	3.64	30



7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a)&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

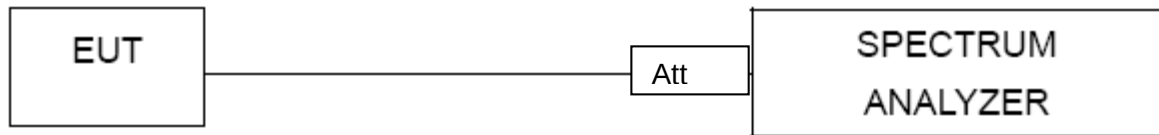
- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable.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



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 46 of 50 -

7.4 TEST RESULTS

EUT :	Bluetooth heart rate monitor	Model Name :	KYTO2935
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
2390.00	44.73	20	Pass
2483.50	59.59	20	Pass

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
2390	45.67	1.05	46.72	74	-27.28	peak	Vertical
2390	43.68	1.05	44.73	74	-29.27	peak	Horizontal
2483.5	45.12	1.29	46.41	74	-27.59	peak	Vertical
2483.5	48.35	1.29	49.64	74	-24.36	peak	Horizontal

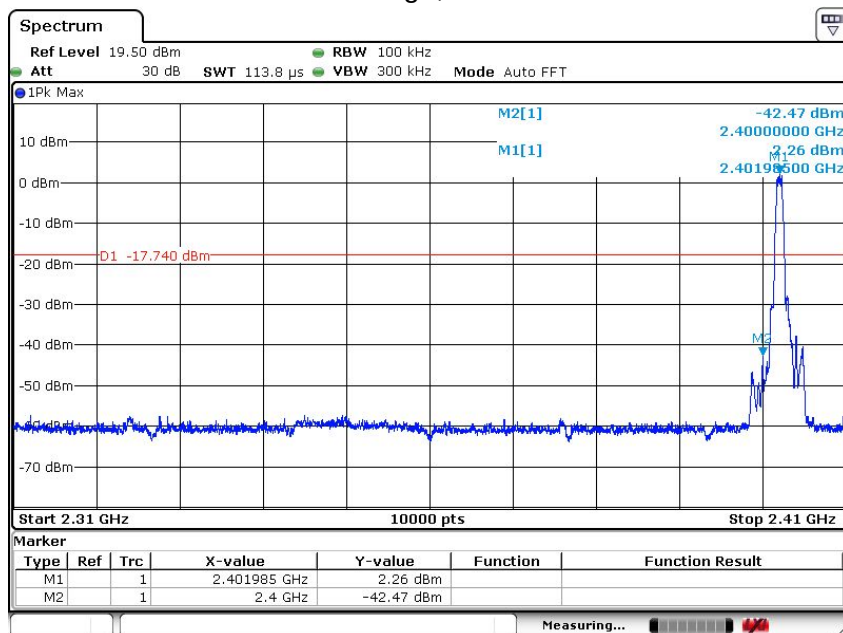
Note: Test method to see chapter 3.2 . When PK value is lower than the Average value limit, average not record.



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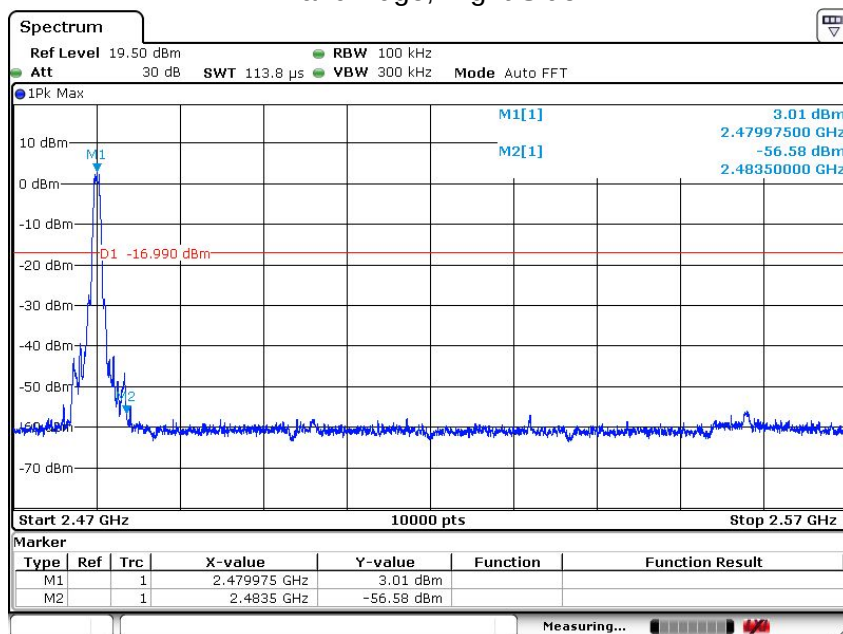
Report No. ATT-2017SZ0217856F
- Page 47 of 50 -

Band Edge, Left Side



Date: 1 MAR 2017 16:05:25

Band Edge, Right Side



Date: 1 MAR 2017 16:06:00



Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F
- Page 48 of 50 -

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.



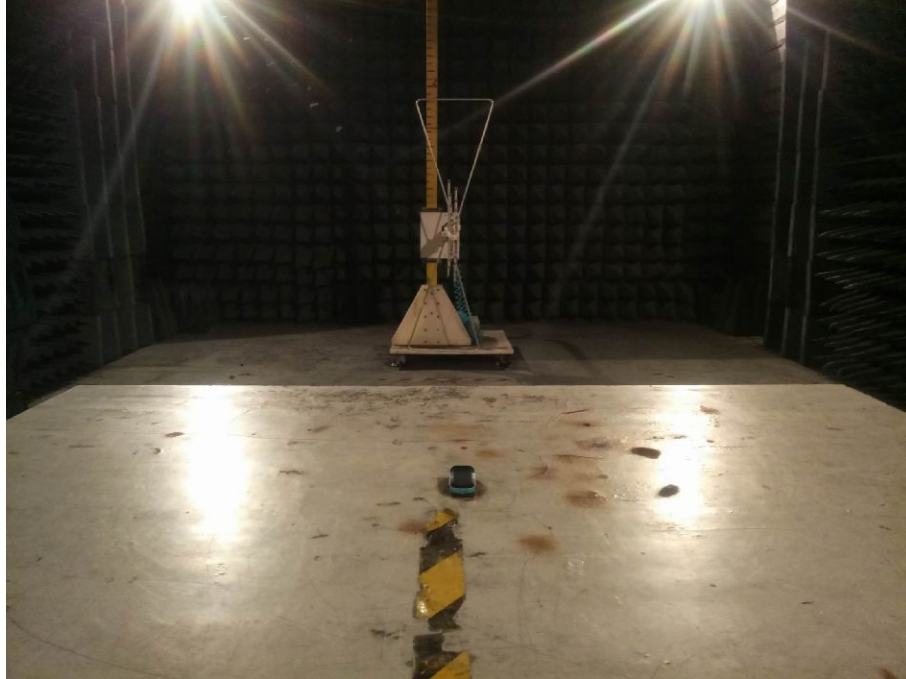
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Report No. ATT-2017SZ0217856F

- Page 49 of 50 -

9. EUT TEST PHOTO

Radiated Measurement Photos





Shenzhen Asia Test Technology Co., Ltd.

Report No. ATT-2017SZ0217856F

- Page 50 of 50 -

CE Measurement Photos

