

FCC Test Report

Report No.: AGC00635180605FE03

FCC ID : 2AFZB-ZUTMBKPED

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : TPMS Sensor

BRAND NAME : JITEXING

MODEL NAME : N02

CLIENT : No NDA Inc.

DATE OF ISSUE : Aug. 15, 2018

STANDARD(S) : FCC Part 15 Rules

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug. 15, 2018	Valid	Initial Release

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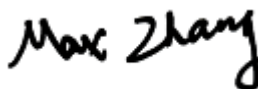
1. VERIFICATION OF CONFORMITY

Applicant	No NDA Inc.
Address	320 Mountain View Ave., Mountain View, CA 94041
Manufacturer	ShenZhen JTX Electronic Technology Co., Ltd
Address	3A-5 Zhong Yang Commercial Building, Fuzhou Avenue, Fuyong Street, Baoan District, Shenzhen
Product Designation	TPMS Sensor
Brand Name	JITEXING
Test Model:	N02
Date of test	Jul. 09, 2018 to Jul. 14, 2018
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.231.

Tested By



Max Zhang(Zhang Yi)

Aug. 15, 2018

Reviewed By



Bart Xie(Xie Xiaobin)

Aug. 15, 2018

Approved By



Forrest Lei(Lei Yonggang)
Authorized Officer

Aug. 15, 2018

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	433.92MHz
Field Strength(3m)	70.53dBuV/m(Peak)@3m
Modulation	ASK
Number of channels	1
Hardware Version	157880Y_P9-180607
Software Version	V1.0
Antenna Designation	Fixed antenna
Antenna Gain	2.1dBi
Power Supply	DC 3V by Battery

2.2. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AFZB-ZUTMBKPED** filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules.

2.3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.4. SPECIAL ACCESSORIES

Refer to section 5.1.

2.5. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting mode

Note:
1. Different button of the EUT have been tested, and only the data of the worst case recorded in the test report.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure :



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	TPMS Sensor	JITEXING	N02	EUT

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.231(e)	Operate at a periodic rate exceeding that specified in paragraph (a)	Compliant
§15.231(b)	Average Factor	N/A
§15.231(e) & §15.209	Field Strength of Fundamental and Spurious Emission	Compliant
§15.231(c)	Bandwidth	Compliant

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012
NVLAP LAB CODE	600153-0
Designation Number	CN5028
FCC Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

TEST EQUIPMENT OF RADIATED EMISSION TEST

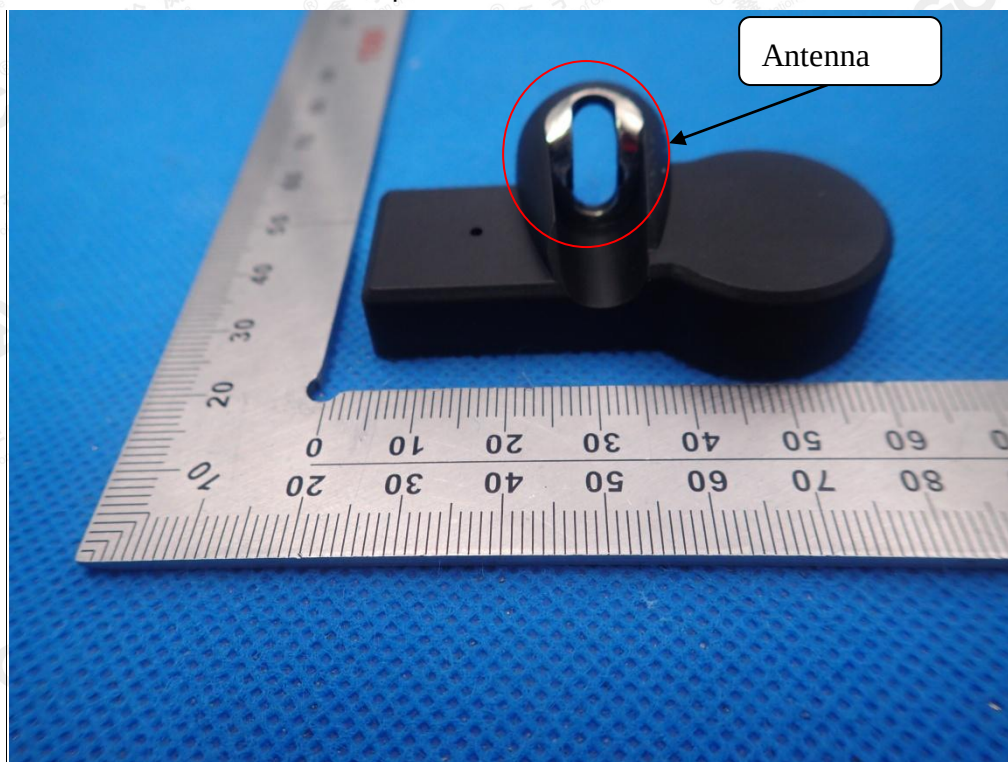
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2018	Jun.11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
preamplifier	ChengYi	EMC184045SE	980508	Sep.15, 2017	Sep.14, 2018
Loop Antenna	ZHINAN	ZN30900C	--	Mar. 01, 2018	Feb. 28, 2019
Telecommunication Test Set	HP	8920B	3104A03367	Jun.12, 2018	Jun.11, 2019
H & T CHAMBER	EXPERY	TN-400	TN2007SR038	Jun.12, 2018	Jun.11, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018

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7. ANTENNA REQUIREMENT

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.

The EuT has fixed antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EuT photo for details.



The requirements of section 15.203 are **FULFILLED**.

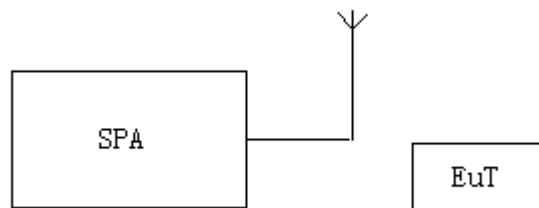
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8. PROVISION FOR MOMENTARY OPERATION

8.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=1MHz, VBW=3MHz
Span: 0Hz
Sweep time: 10S
2. Set the EUT to transmit by manually operated. Use the "View" function of SPA to find the transmission time of being released.
3. Record the data and Reported.

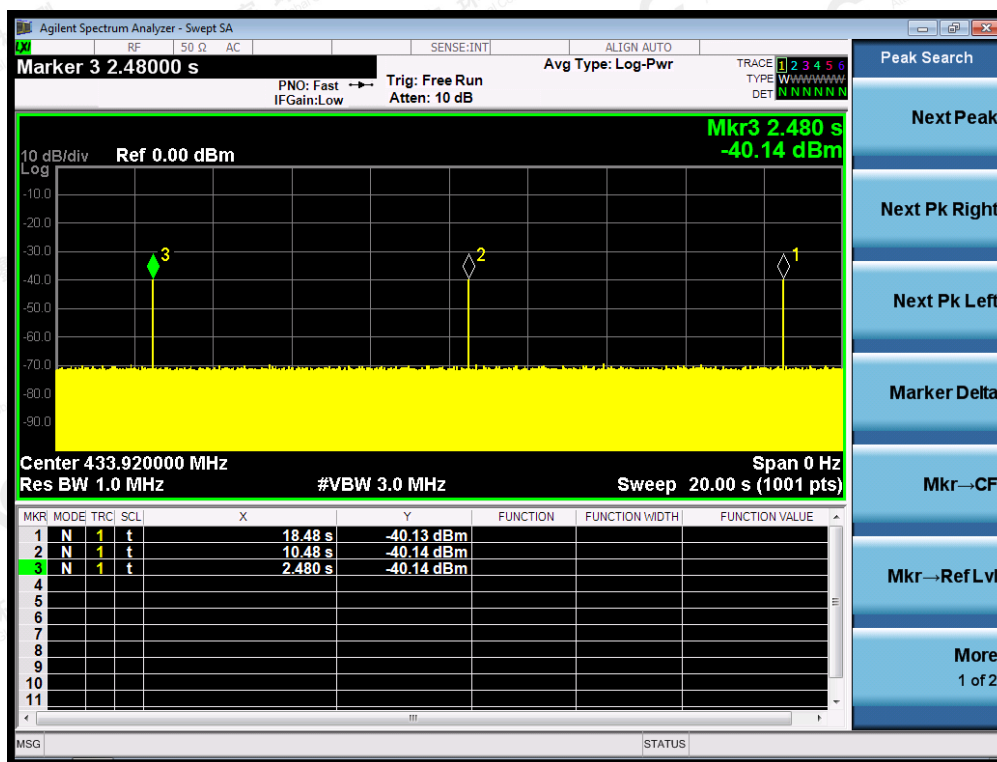
8.2 TEST SETUP



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8.3 TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter



periodic rate=8s

RESULT: PASS

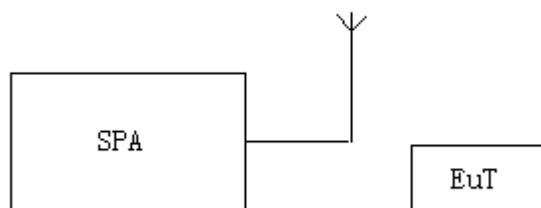
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9. DUTY CYCLE CORRECTION FACTOR

9.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=1MHz; VBW=3MHz
Span: 0Hz
Sweep time: more than two pulse trains or more than each type of pulse occupancy time
2. Set the EUT to transmit by manually operated. Use the “Delta mark” function of SPA to find the period time between two pulse trains and each type of pulse occupancy time.
3. Record the plots and Reported.

9.2 TEST SETUP



9.3 TEST RESULT

Note: The level of the peak emission are less than the average limit, so the average factor need not to be tested.

10. RADIATED EMISSION

10.1. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. 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.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

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The following table is the setting of spectrum analyzer and receiver.

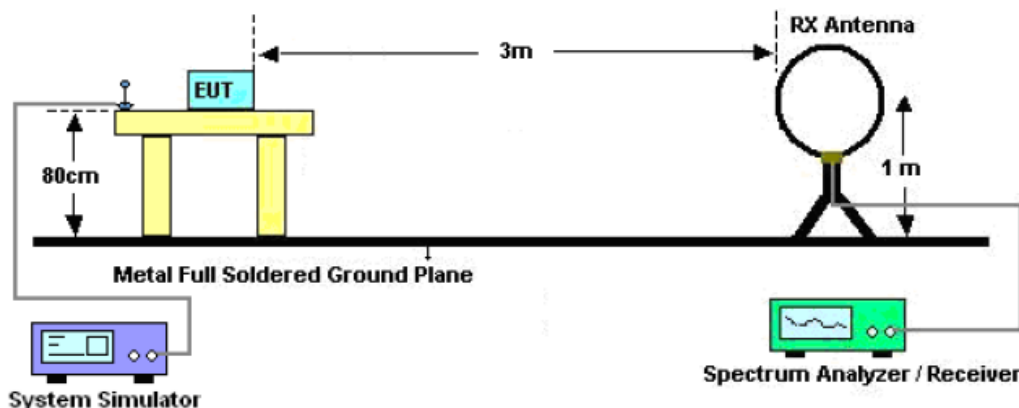
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

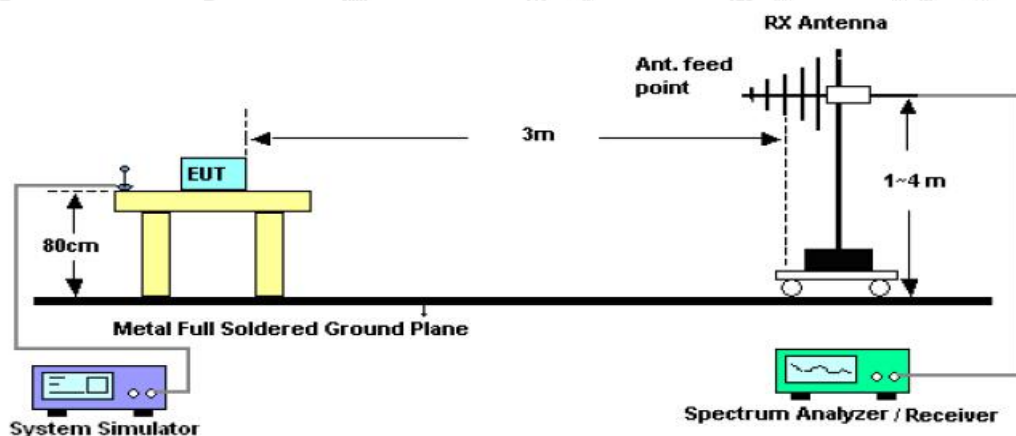
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10.2. TEST SETUP

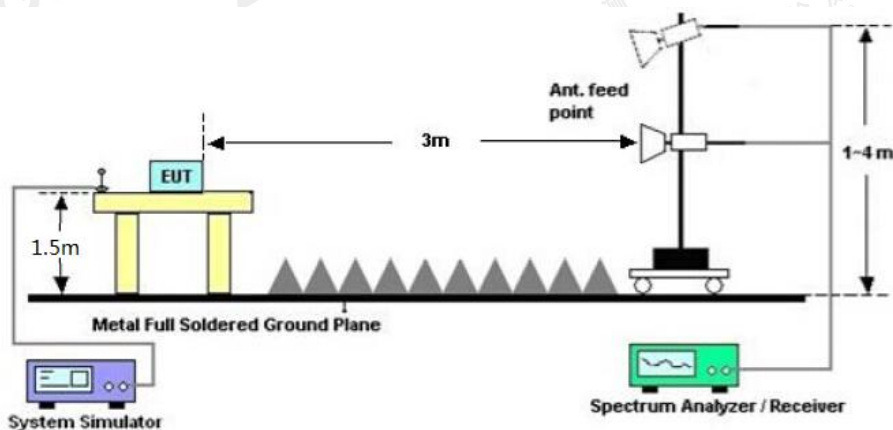
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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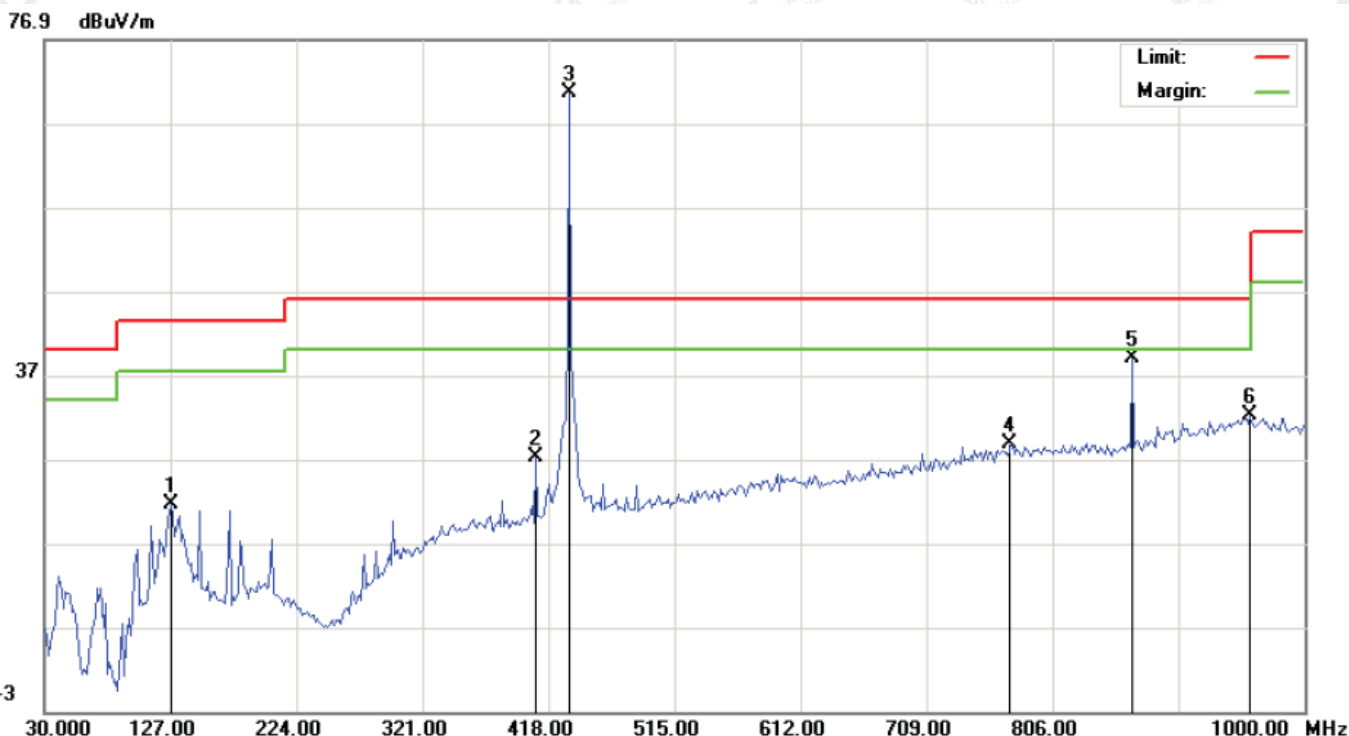
10.3. TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

RADIATED EMISSION BELOW 30MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

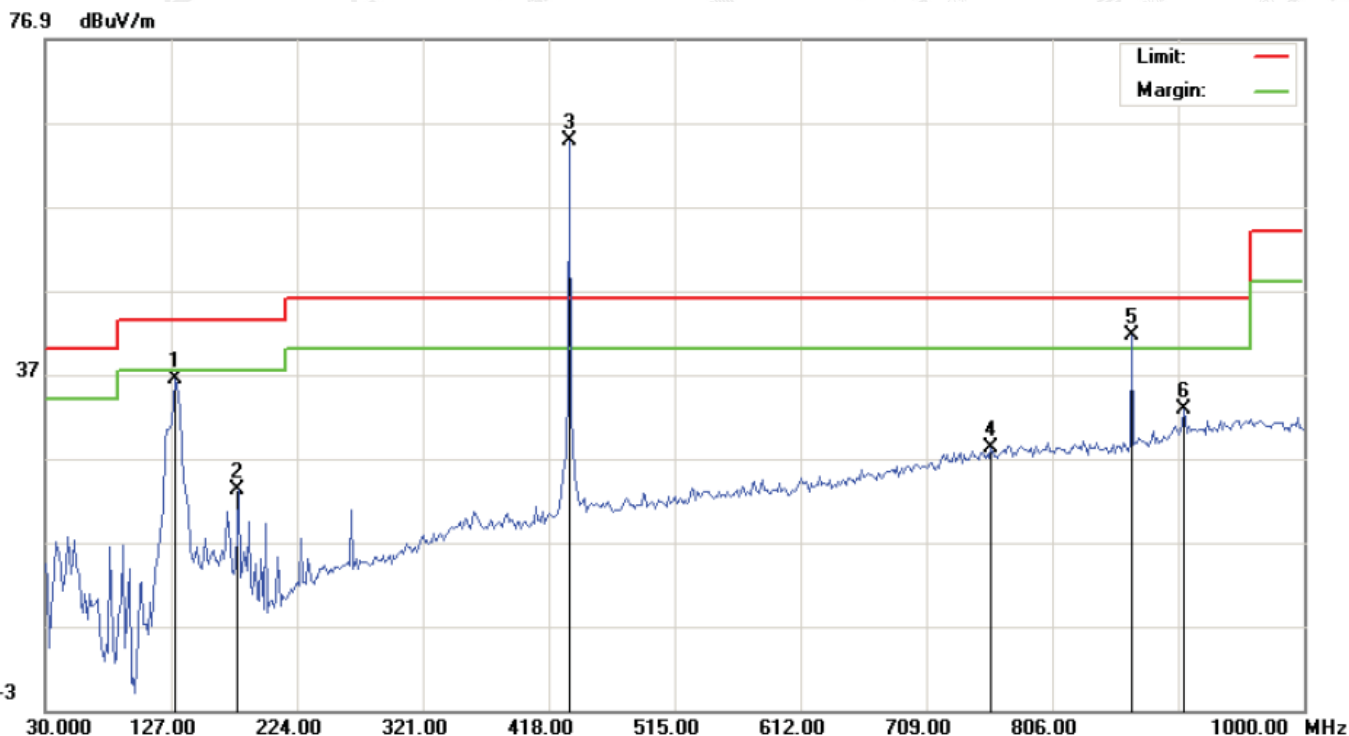
RADIATED EMISSION BELOW 1GHZ-Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		127.0000	12.42	9.13	21.55	43.50	-21.95	peak			
2		408.3000	7.81	19.32	27.13	46.00	-18.87	peak			
3	*	433.9208	50.42	20.11	70.53	72.86	-2.33	peak			
4		773.6666	1.80	26.96	28.76	46.00	-17.24	peak			
5		867.8408	11.24	27.76	39.00	52.86	-13.86	peak			
6		957.9666	2.25	29.92	32.17	46.00	-13.83	peak			

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RADIATED EMISSION BELOW 1GHZ-Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		130.2332	25.21	11.13	36.34	43.50	-7.16	peak			
2		178.7332	9.14	14.15	23.29	43.50	-20.21	peak			
3	*	433.9204	44.73	20.11	64.84	72.86	-8.02	peak			
4		759.1167	1.40	26.76	28.16	46.00	-17.84	peak			
5	!	867.8408	13.78	27.76	41.54	52.86	-11.32	peak			
6		907.8500	3.99	28.83	32.82	46.00	-13.18	peak			

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

3. Emissions of frequency range from 1GHz to 5GHz have 20dB margin. No recording in the test report.

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11. BANDWIDTH

11.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:

Centre frequency = Operation Frequency

RBW=3KHz

VBW=10KHz

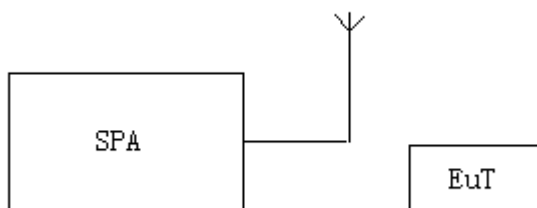
Span: 300kHz

Sweep time: Auto

2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.

3. Record the plots and Reported.

11.2. TEST SETUP

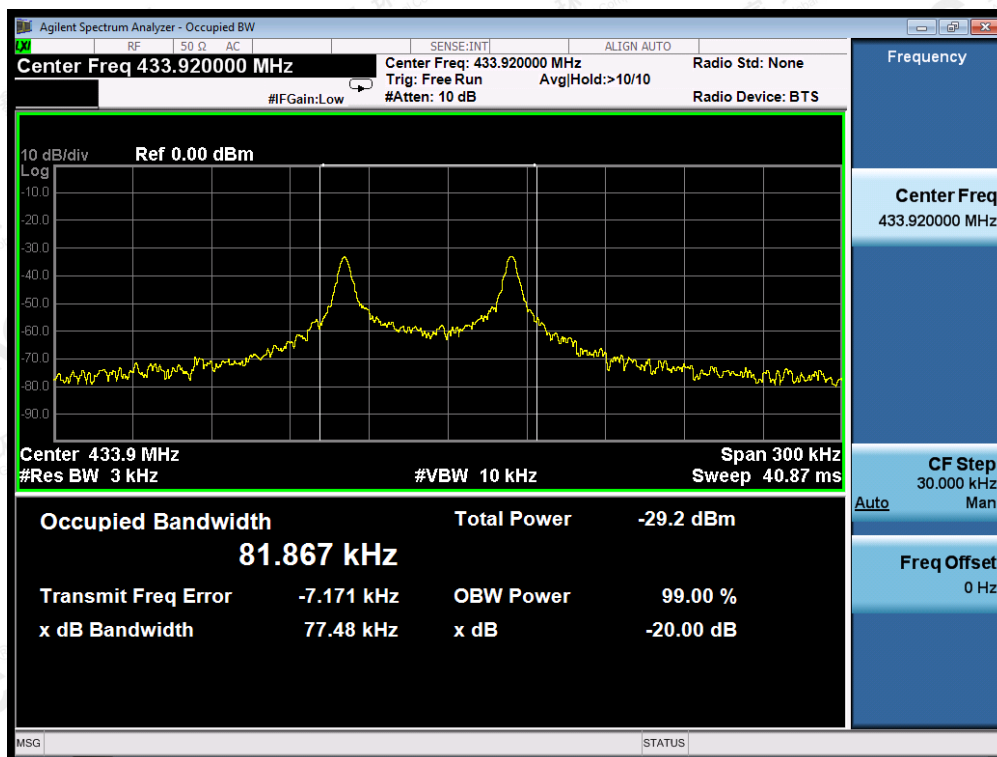


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11.3. TEST RESULT

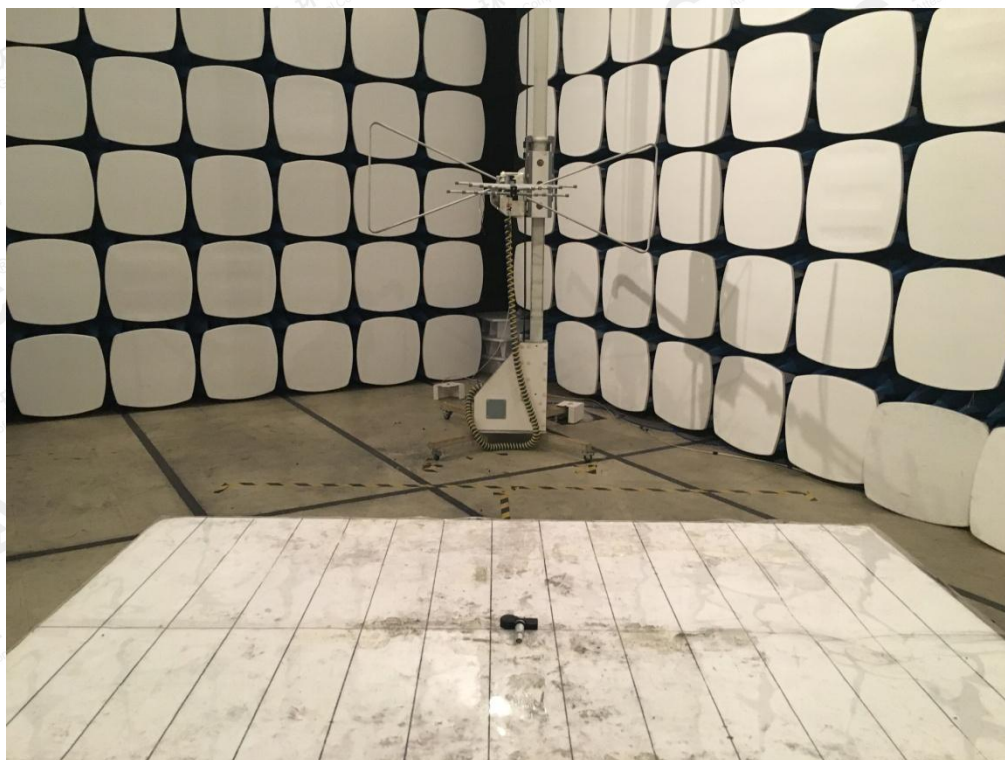
Test Mode: EUT @ 433.92MHz for RF Transmitter

-20dB bandwidth	LIMIT	RESULT
77.48kHz	1084.8KHz	Pass
Note: Limit= Operation Frequency x0.25%		

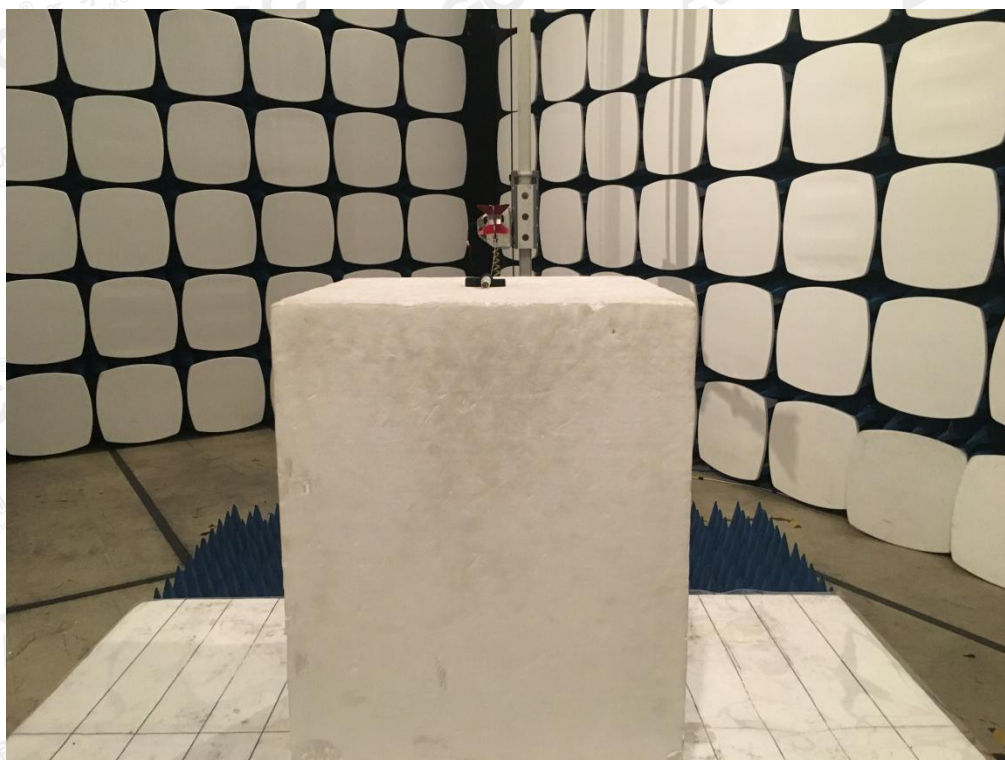


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APPENDIX A: PHOTOGRAPHS OF TEST SETUP
RADIATED EMISSION TEST SETUP BELOW 1GHz



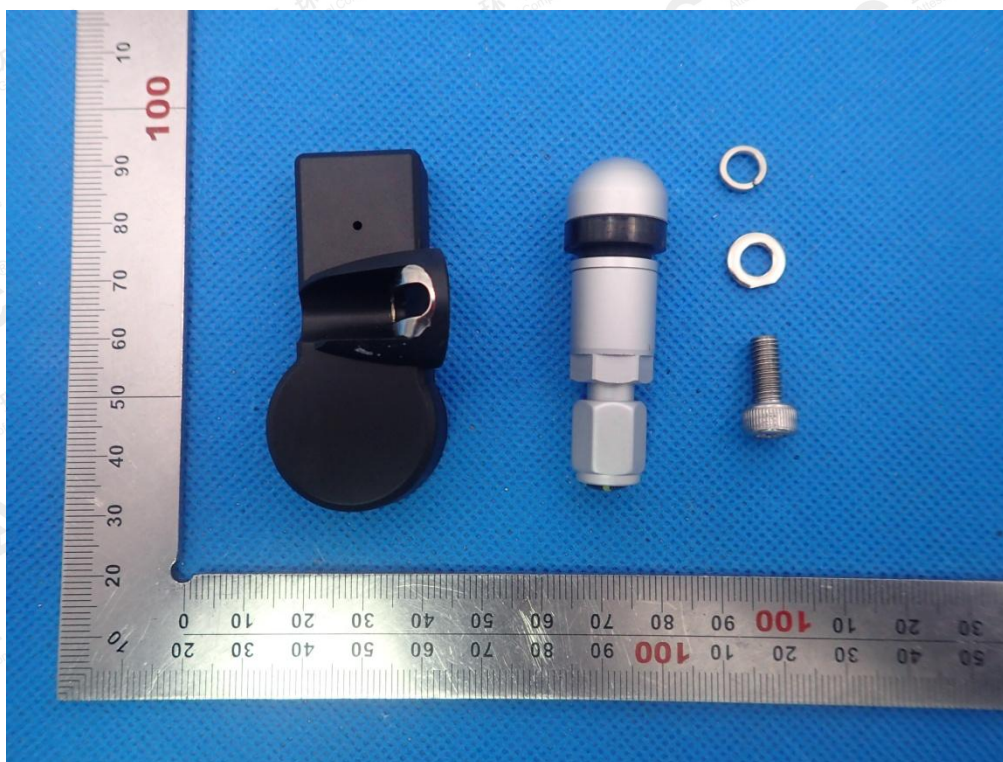
RADIATED EMISSION TEST SETUP ABOVE 1GHz



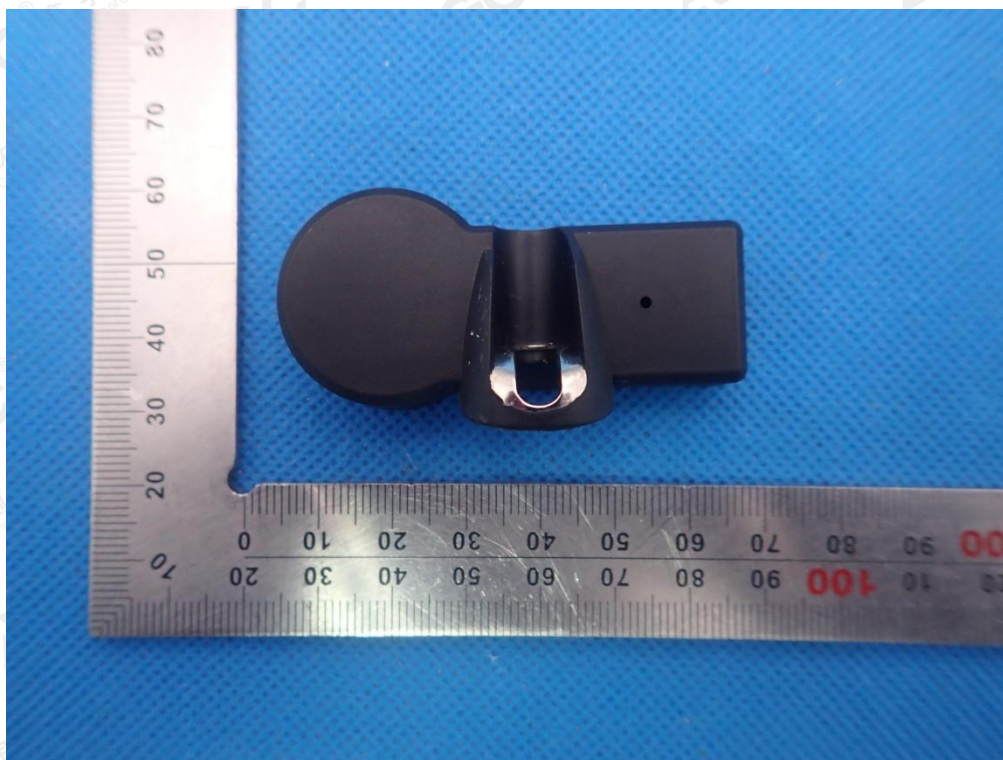
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APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT



TOP VIEW OF EUT

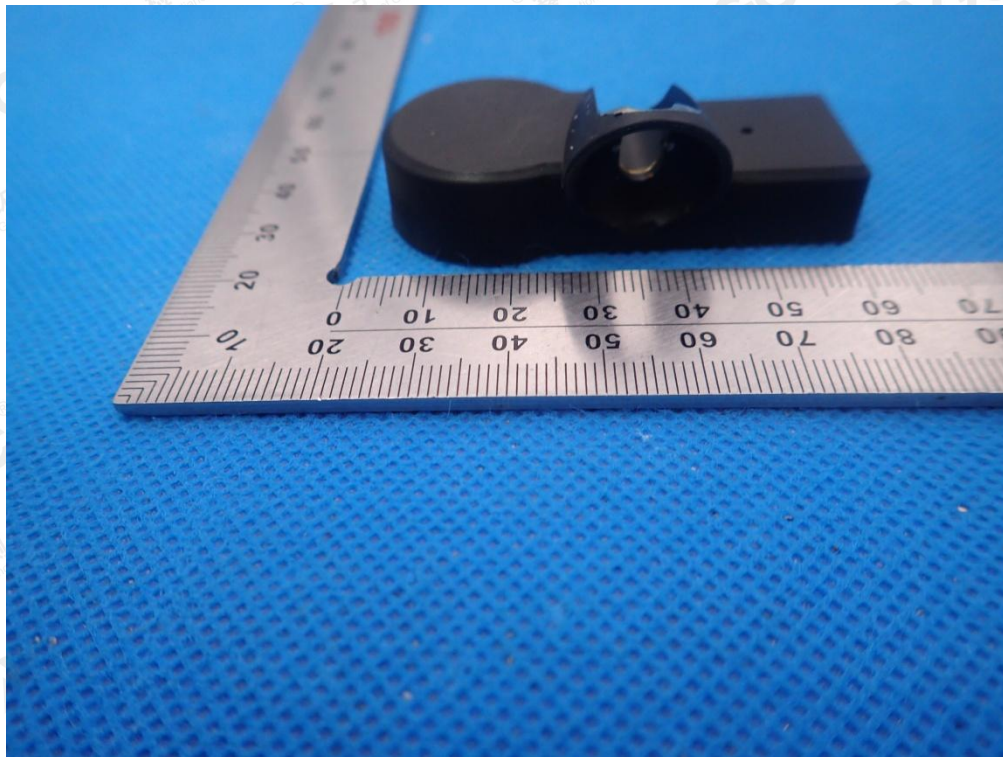


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BOTTOM VIEW OF EUT

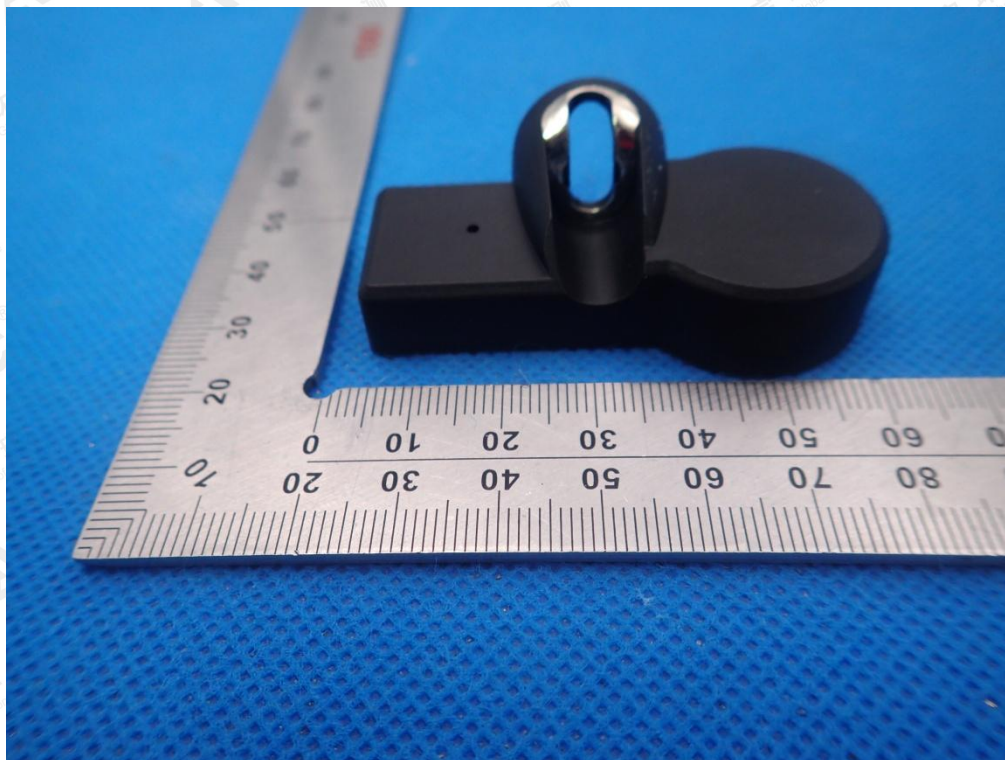


FRONT VIEW OF EUT

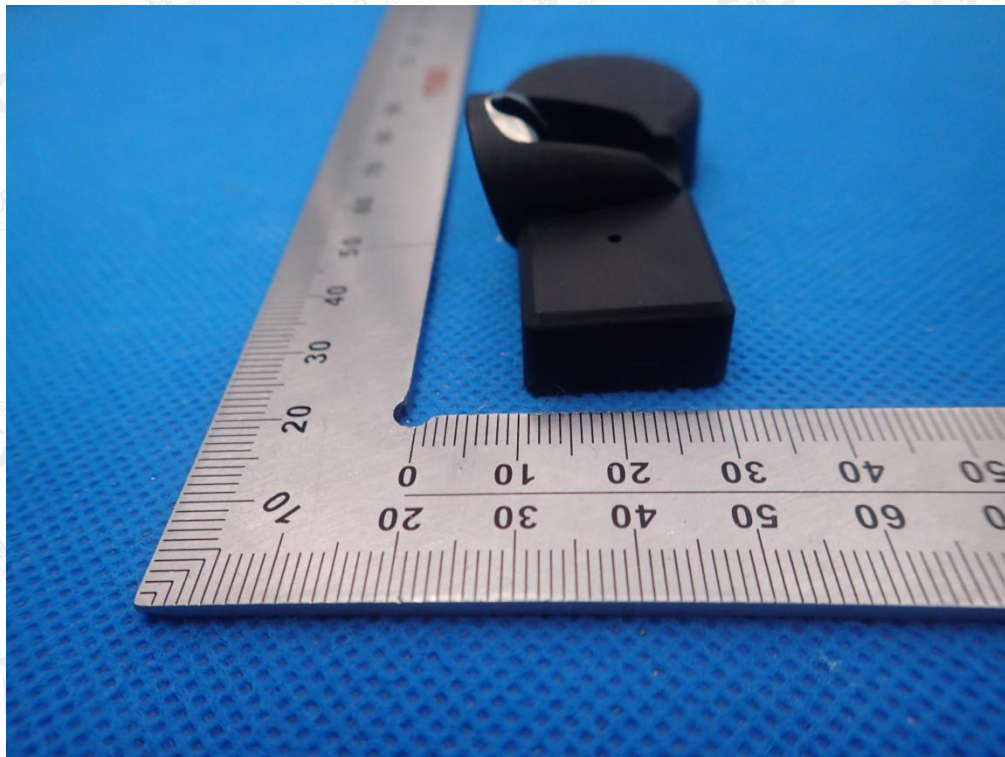


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BACK VIEW OF EUT



LEFT VIEW OF EUT

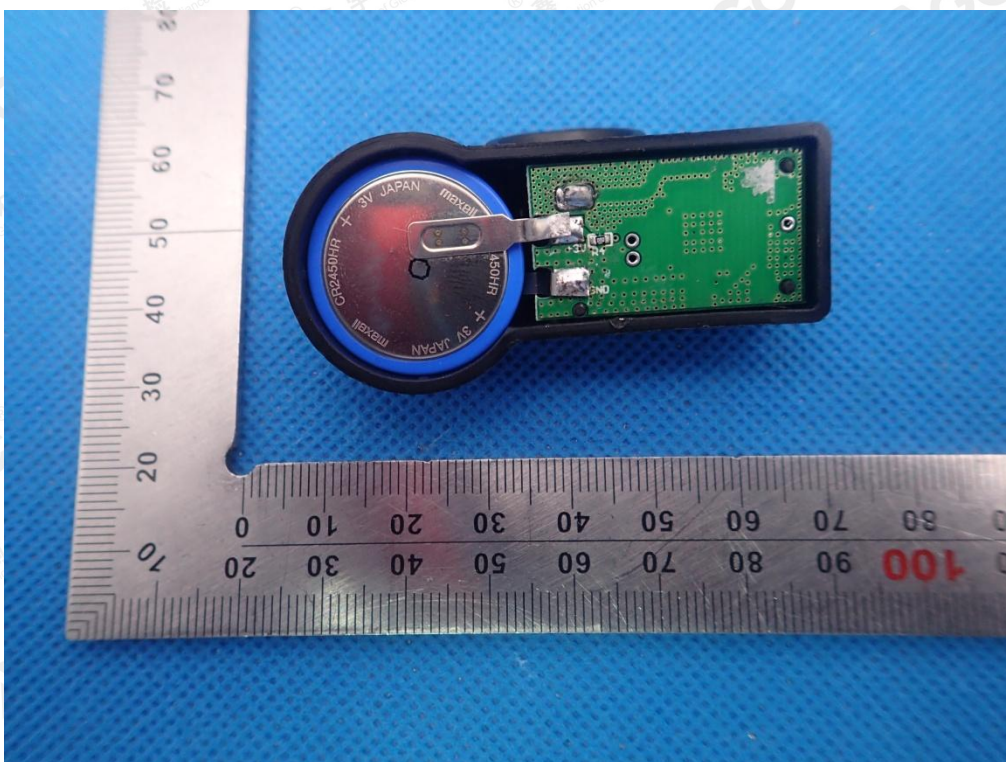


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RIGHT VIEW OF EUT

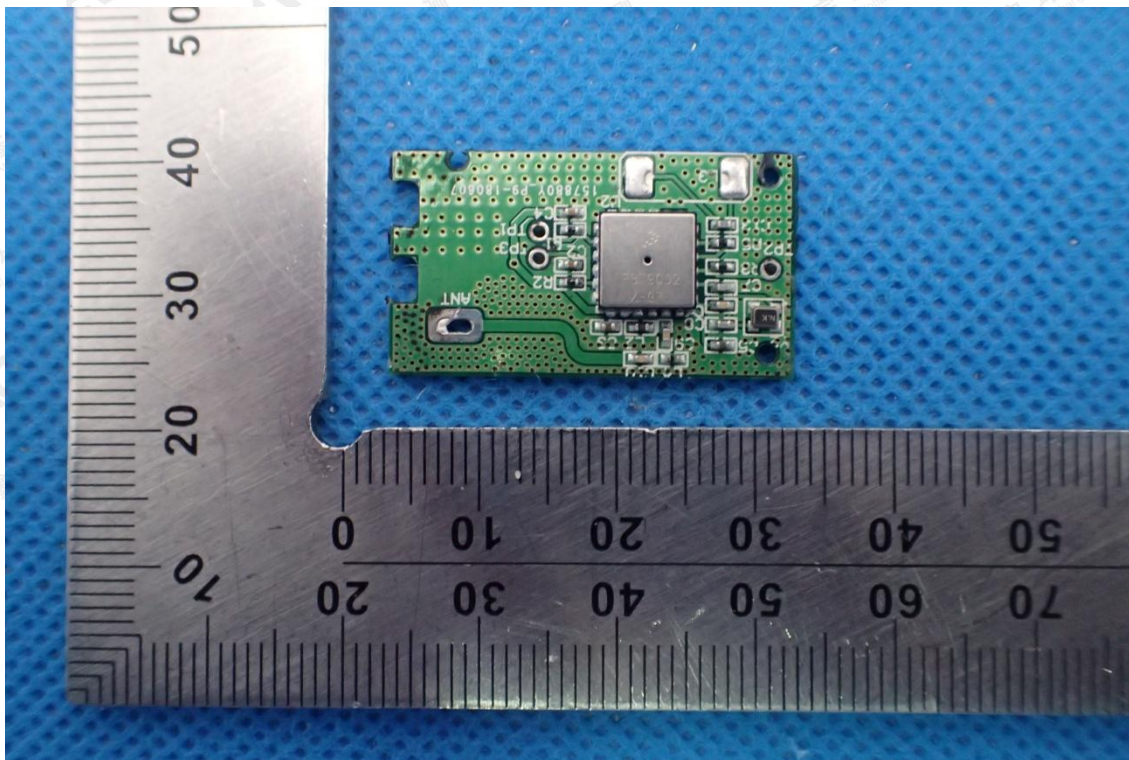


OPEN VIEW OF EUT

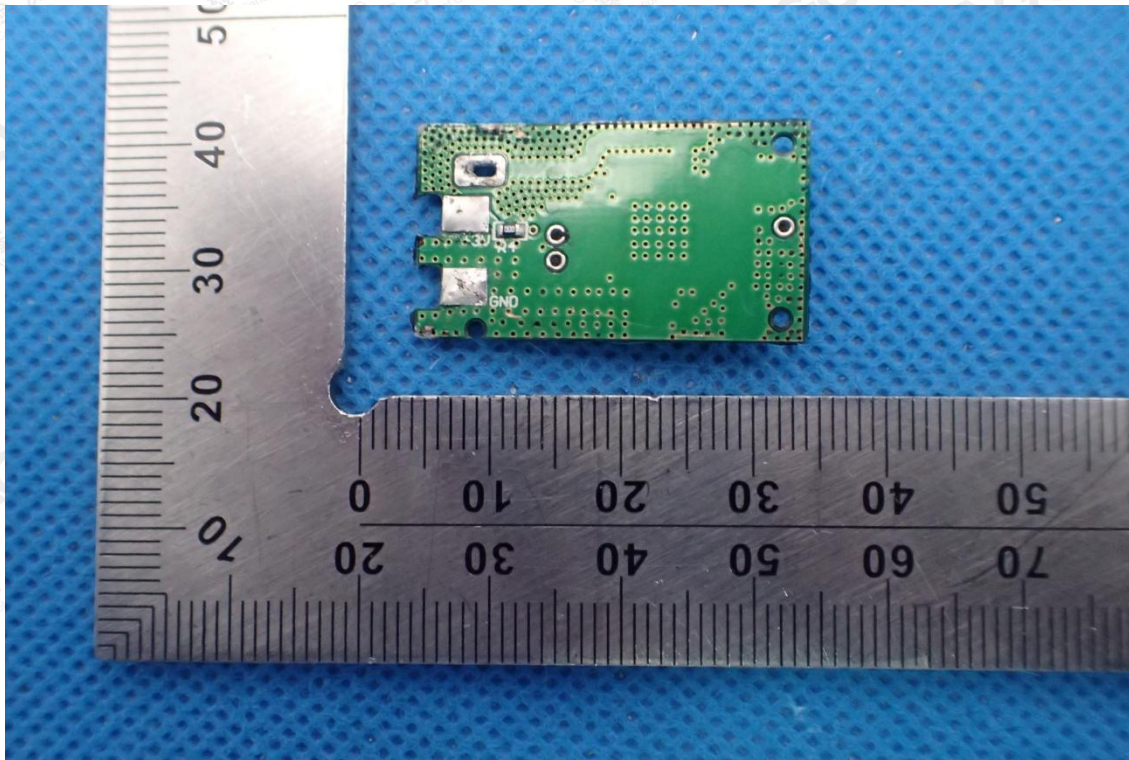


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INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



-----END OF REPORT-----

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