China

RF - TEST REPORT

Report Number	:	**64.790.10.590.01-FCC**	Date of Issue:	2011-03-04

Model	:	QA, QAS, WA, WAS /NIL
Product Type	:	Wireless Doorbell
FCC ID	:	Q2I-QASTX
Applicant	:	FOSHAN SHUNDE ADVANTE ELECTRON LTD
Address	:	North Second XinXi Road, LunJiao Industrial Avenue, LunJiao, Shunde, Foshan, Guangdong, China, 528308
Production Facility	:	FOSHAN SHUNDE ADVANTE ELECTRON LTD
Address	:	North Second XinXi Road, LunJiao Industrial Avenue, LunJiao, Shunde, Foshan, Guangdong, China, 528308

Test Result	:	■ **Positive** ☐ **Negative**
Total pages including Appendices	:	24

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1. DETAILS ABOUT THE TEST LABORATORY

Details about the Test Laboratory

Company name: Neutron Engineering Inc.
No.3.JinShaGang 1st Road,
ShiXia,DaLang Town,
DongGuan, China

Telephone: 86 769 83183000
Fax: 86 769 83196000

January 24, 2005 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

Registration Number: 319330

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2. DESCRIPTION OF THE EQUIPMENT UNDER TEST

Test Standards	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Equipment	Wireless Doorbell
Brand Name	ADVANTE
Model Name.	QA, QAS, WA, WAS /NIL
OEM Brand/Model Name	N/A
Model Difference	All modes are identical in circuit design, PCB layout and electronic components used. Appearance of QAS is same as QA, but QAS have one more switch to set different pair codes to avoid interference. Appearance of WAS is same as WA, but WAS have one more switch to set different pair codes to avoid interference.
Product Description	The EUT is a 433.99MHz remote controller Product Type: Low Power Communication Device Operation Frequency: 433.99MHz Modulation Type: ASK Antenna Designation: Printed antenna Output Power: 61.86dBuV/m More details of EUT technical specification. Please refer to the User's Manual.
Power Source	DC Voltage supplied from Battery
Power Rating	DC 12V(ALKALINE battery)
Products Covered	N/A

Note:

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

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3. SUMMARY OF TEST RESULTS

Technical Requirements				
Transmitter mode				
Test Condition		Test Result		
		Pass	Fail	N/A
15.205 Restricted bands		☒	☐	☐
15.209 Radiated Emission		☒	☐	☐
15.231 Periodic operation in the band 40.66 - 40.70 MHz and above 70 MHz.		☒	☐	☐

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4. GENERAL REMARKS

This submittal(s) (test report) is intended for
FCC ID:Q2I-QASTX;
filing to comply with
- Section 15.205, 15.209, 15.231 of the FCC Part 15, Subpart C Rules. Tests have been carried out in accordance with FCC rules Part 15 Subpart C, ANSI C63.4 (2009), Public Notice DA 00-705 and DTS procedures KDB 558074.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Testing Start Date: 2011-01-28

Testing End Date: 2011-03-04

- JIANGSU TÜV PRODUCT SERVICE LTD. GUANGZHOU BRANCH-

Reviewed by: Tested by:

Kitty Xu

Celia Xiang

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5. DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was performed based 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.

For Radiated Test	
Final Test Mode	Description
	Continuous transmitting mode

Note:

(1) The EUT used the new battery

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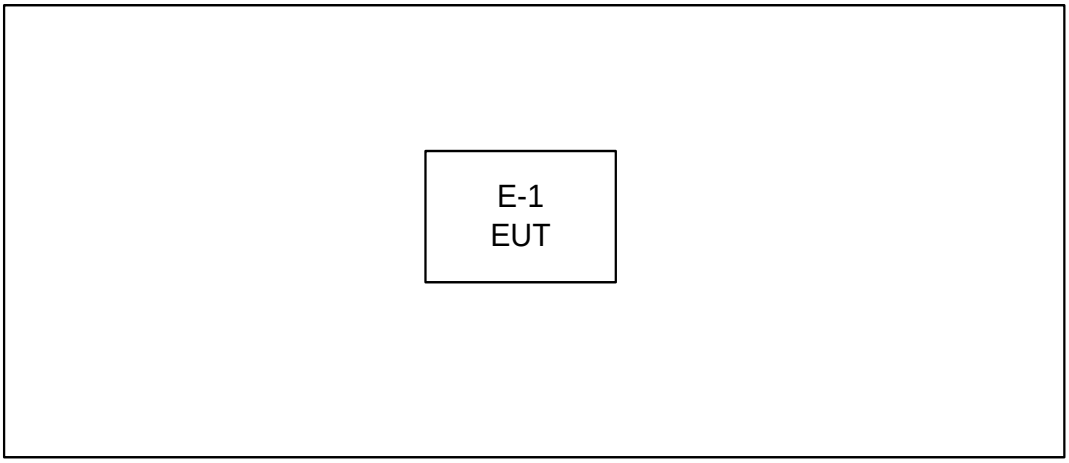
5.1 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



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6. TEST RESULTS

6.1 RADIATED EMISSION MEASUREMENT

6.1.1 Radiated Emission Limits (FCC 15.209)

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

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.231b)

FCC Part15 (15.231b)		
Frequency	Field Strength	
Fundamental 433.99	10996.7uV/m	80.83dBuV/m
Harmonic	1099.67uV/m	60.83dBuV/m

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6.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	ETS	3115	00075789	May.27.2011
2	Amplifier	Agilent	8449B	3008A02274	May.26.2011
3	Spectrum	Agilent	E4408B	US39240143	Nov.16.2011
4	Test Cable	HUBER+SUHNER	SUOFLEX_8m	313794/4	Apr.12.2011
5	Antenna	Schwarbeck	VULB9160	9160-3232	Jun.08.2011
6	Amplifier	HP	8447D	2944A09673	May.26.2011
7	Test Receiver	R&S	ESCI	100895	May.26.2011
8	Test Cable	N/A	C-01_CB03	N/A	Jul.06.2011
9	Controller	CT	SC100	N/A	N/A

Remark: ” N/A” denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1 MHz / 1 MHz for Peak, Average=PK-dycty cycle

Receiver Parameter	Setting
Attenuation	Auto
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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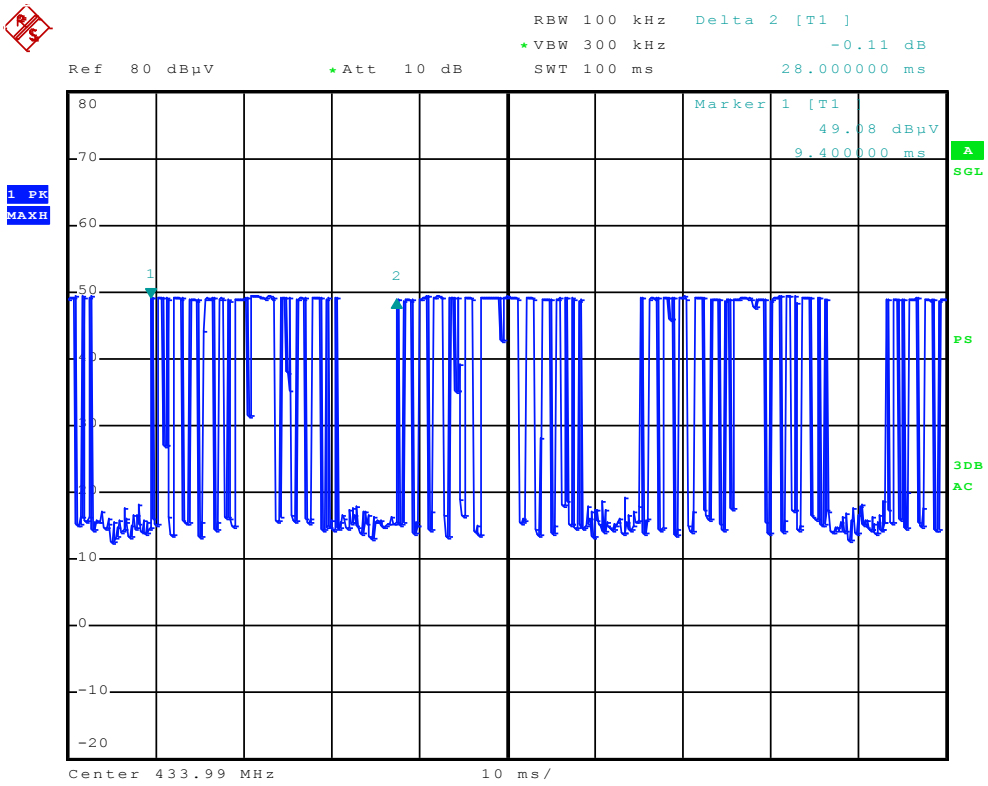
6.1.3 DUTY CYCLE

DUTY CYCLE=(0.62x13 + 0.26x12)/28=0.399

AVG=PEAK+20LOG(DUTY CYCLE)=PEAK-7.98dB

Total time(ON+OFF)= 28 msec ;



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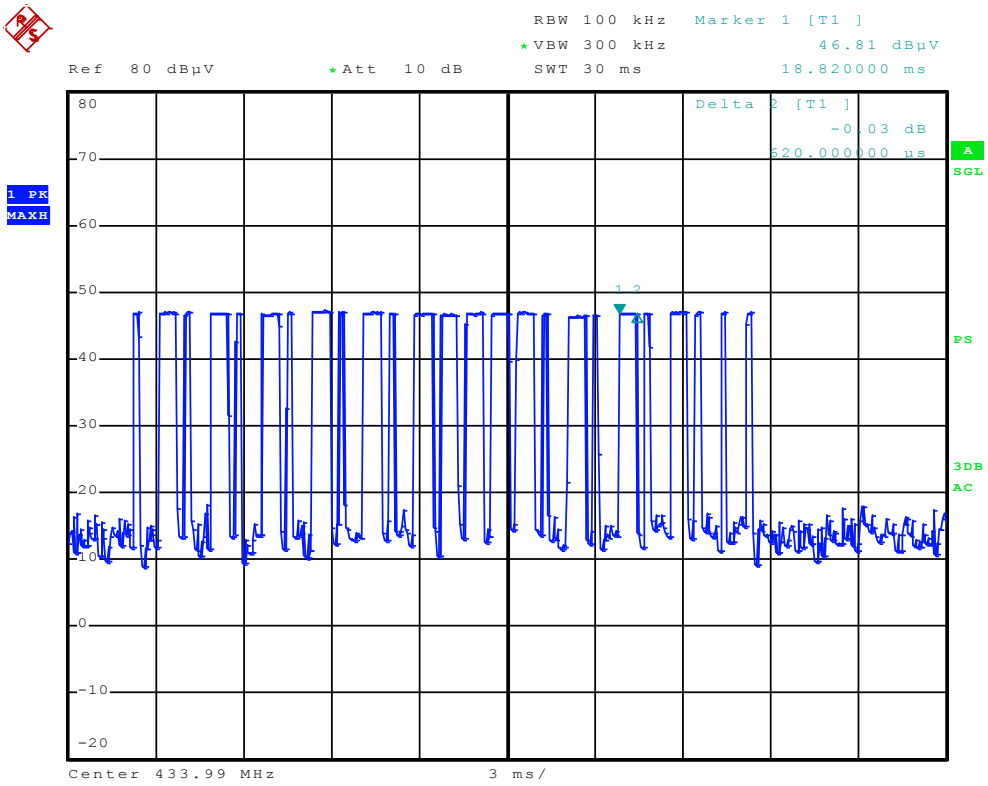

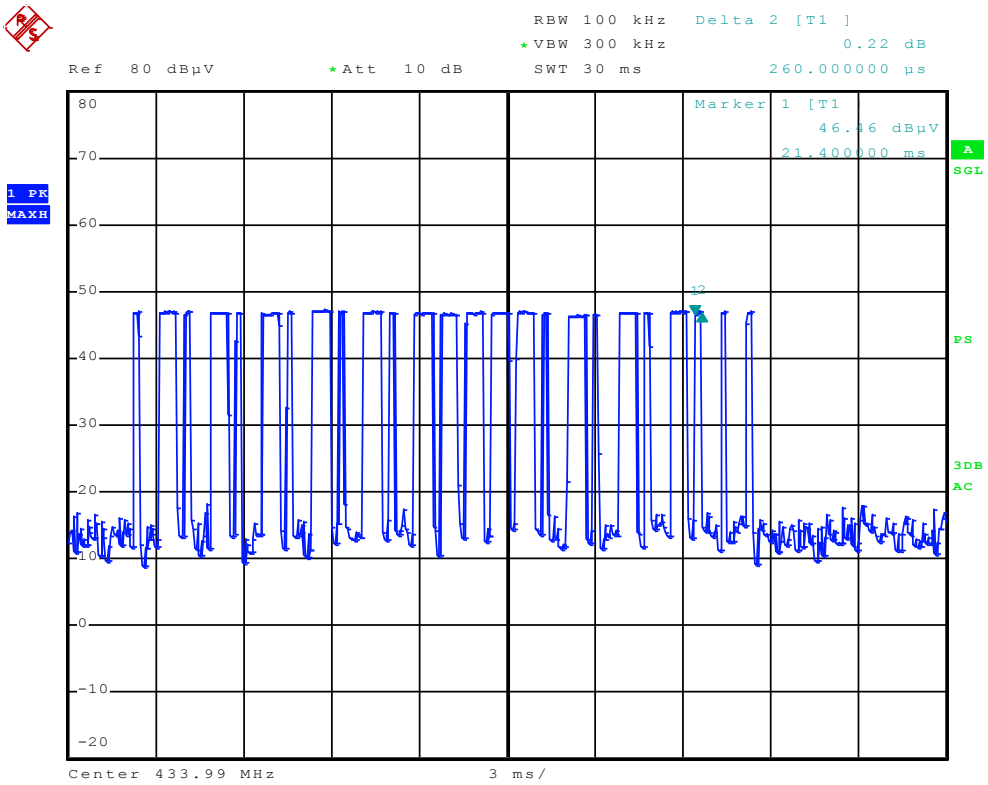

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6.1.4 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

6.1.5 DEVIATION FROM TEST STANDARD

No deviation

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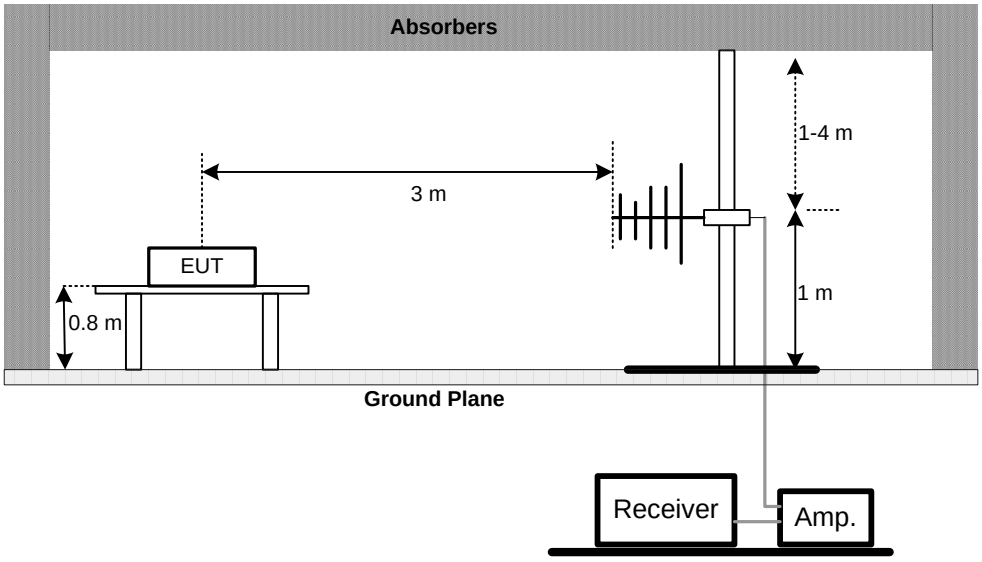
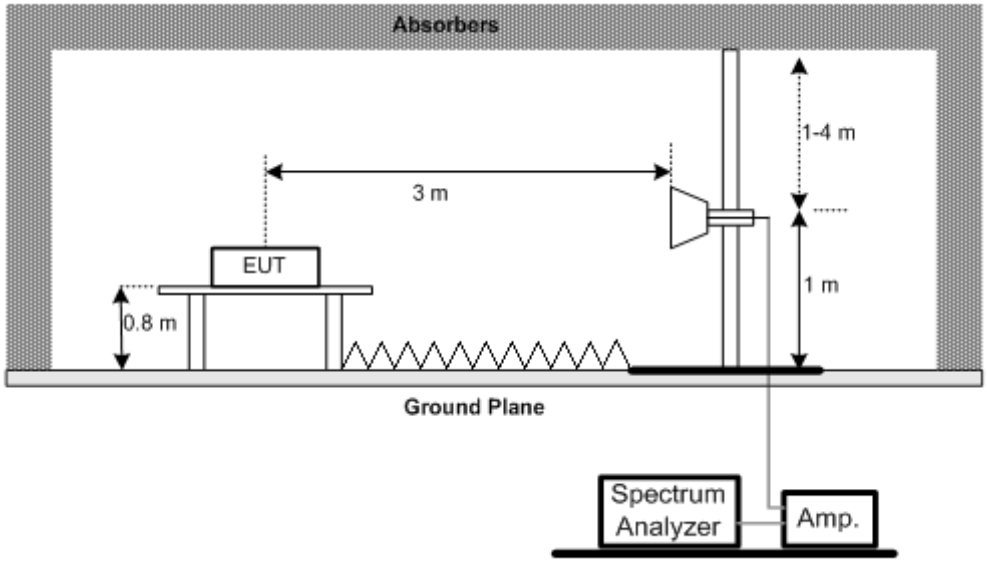
6.1.6 TEST SETUP

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



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



6.1.7 EUT OPERATING CONDITIONS

Normal operation with continuous transmitting mode.

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6.1.8 TEST RESULTS(BETWEEN 30 – 5000 MHz)

EUT：	Wireless Doorbell	Model Name. ：	QAS
Temperature：	23℃	Relative Humidity：	58 %
Pressure：	1012 hPa	Test Power ：	DC 12V
Test Mode ：	Normal operation		

Freq. (MHz)	Ant. H/V	Reading (dBuV)	Corr. Factor (dB)	Measured (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
433.99	V	70.26	-8.40	61.86	100.8	-38.94	PK
433.99	V	-	-	53.88	80.8	-26.92	AV
867.98	V	54.69	-0.58	54.11	80.8	-26.69	PK
867.98	V	-	-	46.13	60.8	-14.67	AV
1301.97	V	58.82	-7.47	51.35	80.8	-29.45	PK
1301.97	V	-	-	43.37	60.8	-17.43	AV
433.99	H	64.95	-8.40	56.55	100.8	-44.25	PK
433.99	H	-	-	48.57	80.8	-32.23	AV
867.98	H	55.11	-0.58	54.53	80.8	-26.27	PK
867.98	H	-	-	46.55	60.8	-14.25	AV
1301.97	H	67.81	-7.47	60.34	80.8	-20.46	PK
1301.97	H	-	-	52.36	60.8	-8.44	AV

Remark

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

(8) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle)， Final AV=PK-7.98

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6.2 BANDWIDTH TEST

6.2.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Receiver	R&S	ESCI	100727	2011-11-21

6.2.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 10KHz, VBW=30KHz, Sweep time = 5 ms.

6.2.3 DEVIATION FROM STANDARD

No deviation.

6.2.4 EUT OPERATION CONDITIONS

Normal operation with continuous transmitting mode.

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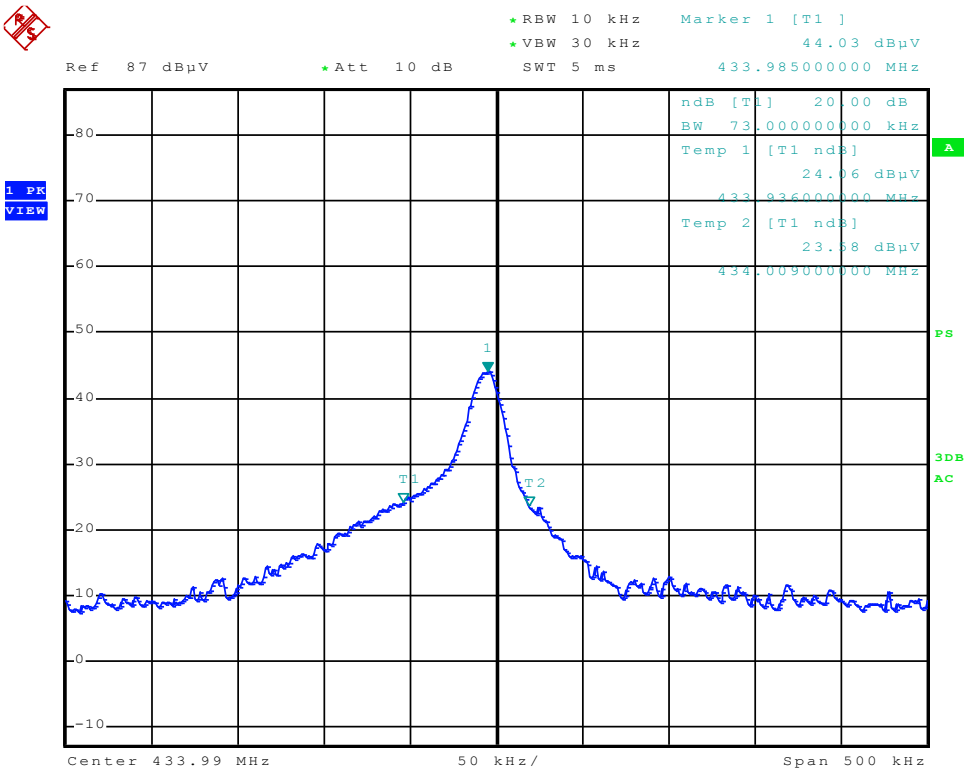
6.2.5 TEST RESULTS

EUT：	Wireless Doorbell	Model Name. ：	QAS
Temperature：	22℃	Relative Humidity ：	56 %
Pressure：	1012 hPa	Test Power ：	DC 12V
Test Mode ：	Normal operation		

Measured Bandwidth (MHz)	20 dB Bandwidth Limit(MHz)	Result
433.936~434.009	1.08	Pass

Normal operation



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6.3 Release Time Test

6.3.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Receiver	R&S	ESCI	100727	2011-11-21

6.3.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 10KHz, VBW=30KHz, Sweep time = 1s.

6.3.3 DEVIATION FROM STANDARD

No deviation.

6.3.4 EUT OPERATION CONDITIONS

Press the button and release it immediately.

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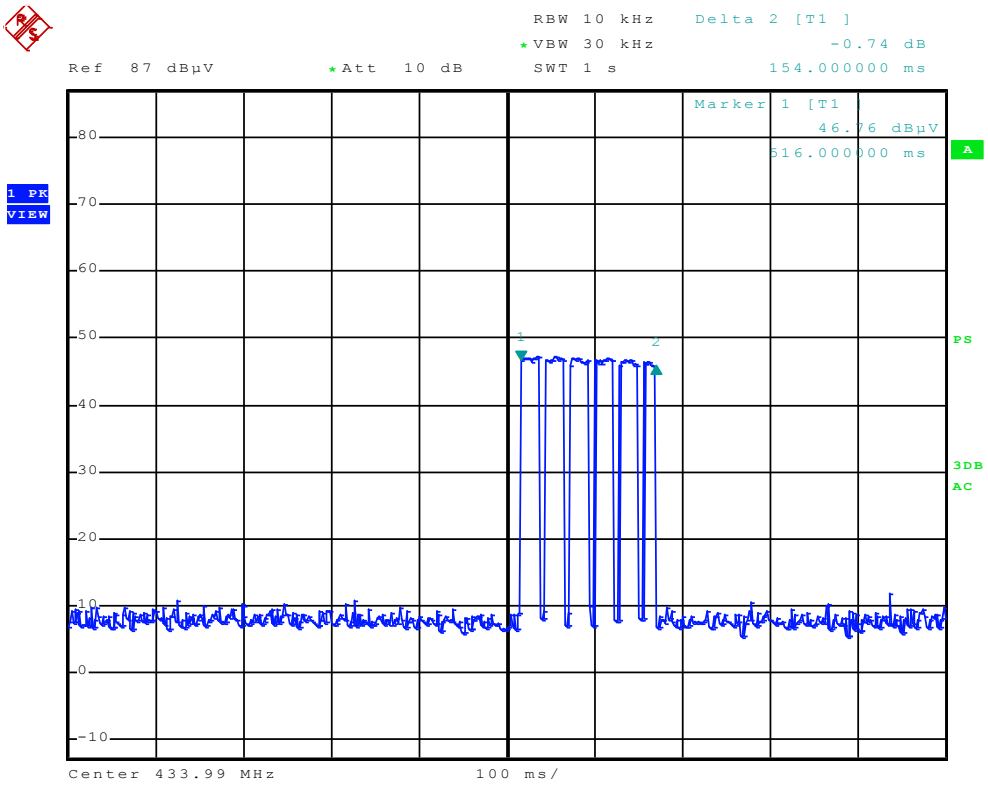
6.3.5 TEST RESULTS

EUT：	Wireless Doorbell	Model Name. ：	QAS
Temperature：	22℃	Relative Humidity ：	56 %
Pressure：	1001 hPa	Test Power ：	DC 12V
Test Mode ：	Normal operation		

Test result: The release time is 154ms(less than 5s).



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