



TEST REPORT

FCC ID: 2AAUL-OVO-J1

Wireless Microphone

Model: OVO-J1,OVO-J1-D

Trade Mark: OVO

Test Report Number: WSCT-A2LA-R&E211000009A-UHF

Issued Date: 04 November 2021

Issued for

OVOMEDIA CREATIVE INC

3F., No.151, Ziqiang 5th Rd., Zhubei City, Hsinchu County, Taiwan

Issued By:

WORLD STANDARDIZATION CERTIFICATION & TESTING GROUP
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Note: In recognition of the successful completion of the A2LA evaluation process,
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laboratory to perform the following tests: EMC, electromagnetic compatibility,
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Report No.: WSCT-A2LA-R&E211000009A-UHF

Certificate Number 5768.01

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Revision History Of Report

Rev.	Issue No.	Revisions	Effect Page	Revised By
00	WSCT-A2LA-R&E211000009A-UHF	Initial Issue	ALL	Wang Fengbing



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Table of Contents

1. TEST CERTIFICATION	4
2. EUT DESCRIPTION	5
2.1. GENERAL INFORMATION	5
3. SUMMARY OF TEST RESULTS	7
4. TEST DESCRIPTION	8
4.1 MEASUREMENT UNCERTAINTY	8
5. FACILITIES AND ACCREDITATIONS	9
5.1 FACILITIES	9
ACCREDITATIONS	9
6. MEASUREMENT INSTRUMENTS	10
7. EMC EMISSION TEST	11
8. RADIATED EMISSION MEASUREMENT	13
9. BANDWIDTH TEST	20
10. MAX. CONDUCTED OUTPUT POWER	24
11. NECESSARY BANDWIDTH	27
12. FREQUENCY STABILITY	30
13. EUT TEST PHOTO	32
14. PHOTOGRAPHS OF EUT	33



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1. TEST CERTIFICATION

Product:	Wireless Microphone
Model:	OVO-J1
Additional Model:	OVO-J1-D
Trade Mark:	OVO
Applicant:	OVOMEDIA CREATIVE INC 3F., No.151, Ziqiang 5th Rd., Zhubei City, Hsinchu County, Taiwan
Manufacturer :	ShenZhen BestLink Electronics co.,LTD 401, building A11, silicon valley power QingHu Park, DaHe Road, QingHu street, LongHua District, Shenzhen
Factory:	ShenZhen BestLink Electronics co.,LTD 401, building A11, silicon valley power QingHu Park, DaHe Road, QingHu street, LongHua District, Shenzhen
Tested:	22 October 2021 ~ 04 November 2021
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.236

Deviation from Applicable Standard

None

The above equipment has been tested by WORLD STANDARDIZATION CERTIFICATION & TESTING GROUP (SHENZHEN) CO., LTD. And found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Wang Xiang

(Wang Xiang)

Check By: Qin Shuiquan

(Qin Shuiquan)

Approved By: Wang Fengbing

(Wang Fengbing)

Date: 04 Nov. 2021世标检测认证股份
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2. EUT DESCRIPTION

2.1. GENERAL INFORMATION

Product	Wireless Microphone
Model	OVO-J1
Additional Model	OVO-J1-D
Trade Mark	OVO
Software Version	C language
Hardware Version	AD
EUT Type	<input checked="" type="checkbox"/> Engineering Sample. <input type="checkbox"/> Product Sample, <input type="checkbox"/> Mass Product Sample.
Antenna Type	PCB Antenna
Antenna gain	2 dbi
Channel Spacing:	500KHz
Channel Number:	7
Nominal bandwidth	100KHz
EUT Power Rating	DC : AA(1.5V)*2 Voltage: 3V
Type of the Equipment	Portable Equipment
Operating Frequency	657 ~ 663 MHz (TX/RX);
Modulation type	FM

Note: N/A stands for no applicable.

Models difference

Model	Additional Model	Models difference
OVO-J1	OVO-J1-D	Only the model is different, all tests are carried out on OVO-J1



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Channel list:

Channel List	
Channel	Frequency (MHz)
01	657.5
02	658.0
03	658.5
04	659.0
05	659.5
06	661.0
07	662.5

Note: The Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	657.5MHz
The middle channel	659.0MHz
The Highest channel	662.5MHz



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3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.236(d)	Output Power Measurement	PASS
§15.236(f)(2)	Occupied Bandwidth Emission	PASS
§15.236(g)	Radiated Spurious Emission	PASS
§15.236(g)	Emission mask	PASS
§15.236(f)(3)	Frequency Stability	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.
5. The equipment meets §15.236(f)(1) requirements.





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4. TEST DESCRIPTION

4.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended 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	Conditions	Uncertainty
1	RF Output Power	Conducted	$\pm 0.16\text{dB}$
2	Occupied Bandwidth	---	$\pm 1 \times 10^{-7}$
3	Frequency Stability	2.3%	$\pm 5\%$
4	Conducted Spurious Emission	Conducted	$\pm 4.7\text{dB}$
5	Conducted Emissions	Conducted	$\pm 3.2\text{dB}$
6	Transmitter Spurious Emissions	Radiated	$\pm 0.21\text{dB}$



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5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the WORLD STANDARDIZATION CERTIFICATION & TESTING GROUP (SHENZHEN) CO., LTD.**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

ACCREDITATIONS

China National Accreditation Service for Conformity Assessment (CNAS)
Registration number NO: L3732

American Association for Laboratory Accreditation(A2LA)

Registration NO : 5768.01

Copies of granted accreditation certificates are available for downloading from our web site,
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6. MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
EMI Test Receiver	R&S	ESCI	100005	11/05/2020	11/04/2021
LISN	AFJ	LS16	16010222119	11/05/2020	11/04/2021
LISN(EUT)	Mestec	AN3016	04/10040	11/05/2020	11/04/2021
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	11/05/2020	11/04/2021
Coaxial cable	Megalon	LMR400	N/A	11/05/2020	11/04/2021
GPIB cable	Megalon	GPIB	N/A	11/05/2020	11/04/2021
Spectrum Analyzer	R&S	FSU	100114	11/05/2020	11/04/2021
Pre Amplifier	H.P.	HP8447E	2945A02715	11/05/2020	11/04/2021
Pre-Amplifier	CDSI	PAP-1G18-38	--	11/05/2020	11/04/2021
Bi-log Antenna	SUNOL Sciences	JB3	A021907	11/05/2020	11/04/2021
9*6*6 Anechoic	--	--	--	11/05/2020	11/04/2021
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	--	11/05/2020	11/04/2021
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	11/05/2020	11/04/2021
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	11/05/2020	11/04/2021
System-Controller	CCS	N/A	N/A	N.C.R	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R	N.C.R
RF cable	Murata	MXHQ87WA3000	--	11/05/2020	11/04/2021
Loop Antenna	EMCO	6502	00042960	11/05/2020	11/04/2021
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	11/05/2020	11/04/2021
Power meter	Anritsu	ML2487A	6K00003613	11/05/2020	11/04/2021
Power sensor	Anritsu	MX248XD	--	11/05/2020	11/04/2021





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7. EMC EMISSION TEST

7.1 CONDUCTED EMISSION MEASUREMENT

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

FREQUENCY (MHz)	Conducted limit (dB μ V)		Conducted limit (dB μ V)
	Quasi-peak	Quasi-peak	
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



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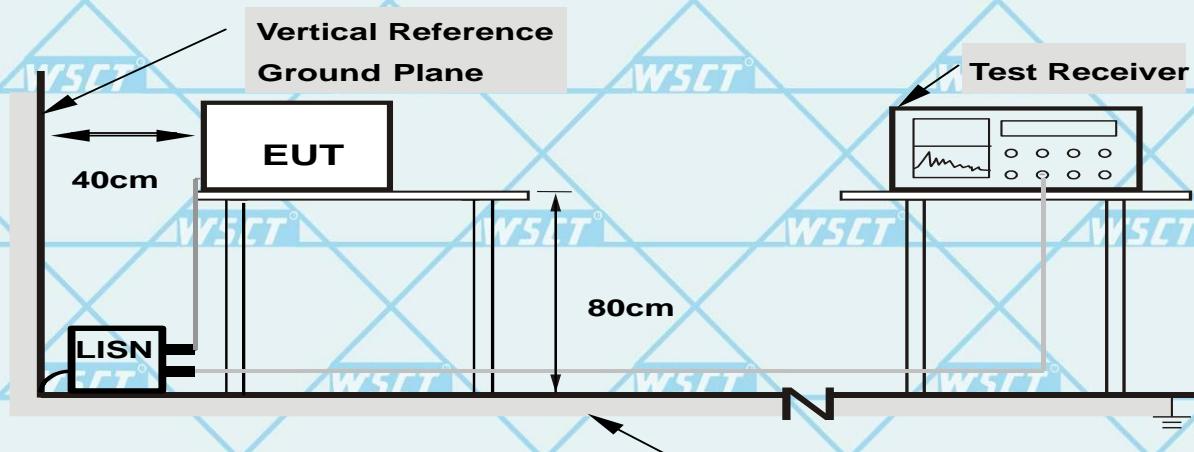
7.1.2 TEST PROCEDURE

- The EUT was placed 0.4 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.

7.1.3 DEVIATION FROM TEST STANDARD

No deviation

7.1.4 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

7.1.5 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.

7.1.6 TEST RESULTS

Not applicable. Due to this product is supplied by battery.





8. RADIATED EMISSION MEASUREMENT

According to FCC 15.236(g), Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in § 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement*. Emissions outside of this band shall comply with the limits specified in **section 8.4** of ETSI EN 300 422-1 V1.4.2 (2011-08).

Table 3: Limits for spurious emissions

State	Frequency		
	47 MHz to 74 MHz 87,5 MHz to 137 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies below 1 000 MHz	Frequencies above 1 000 MHz
Operation	4 nW	250 nW	1 μ W
Standby	2 nW	2 nW	20 nW

8.1 Test Procedure

The setup of EUT is according with ANSI C63.4-2014 measurement procedure.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the

EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

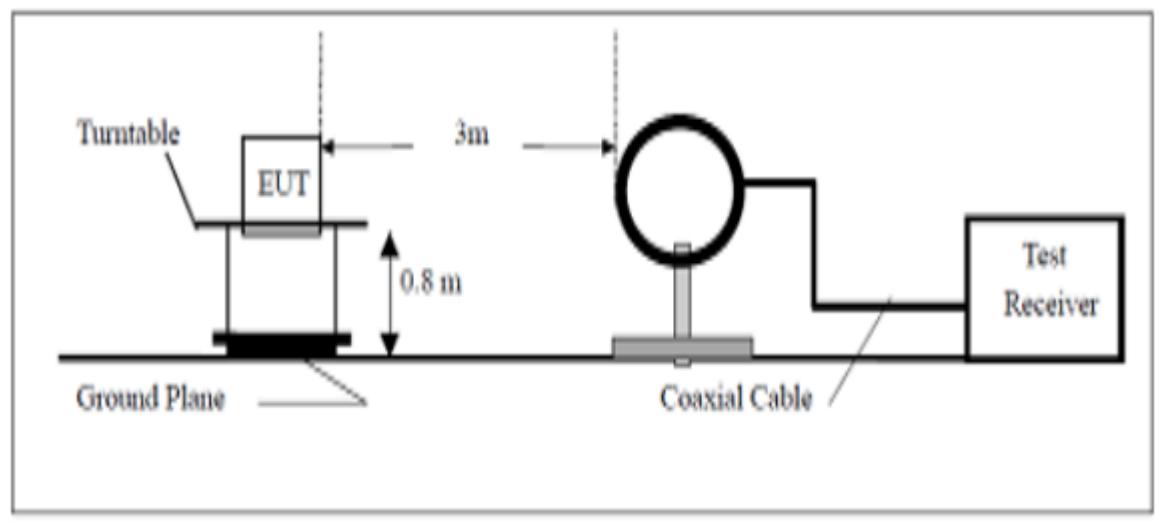
Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.



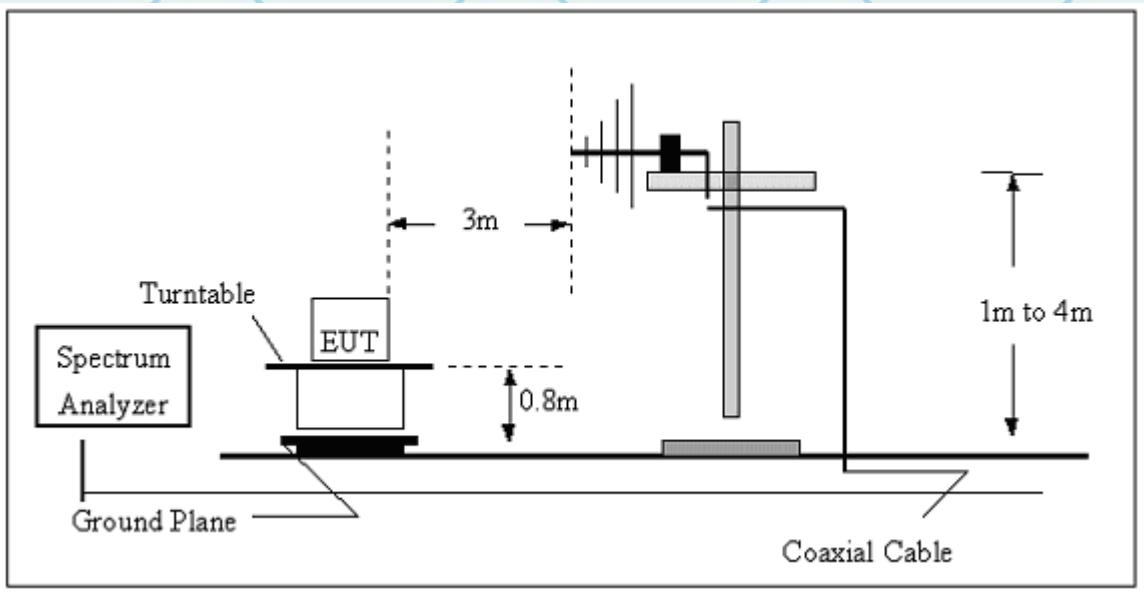


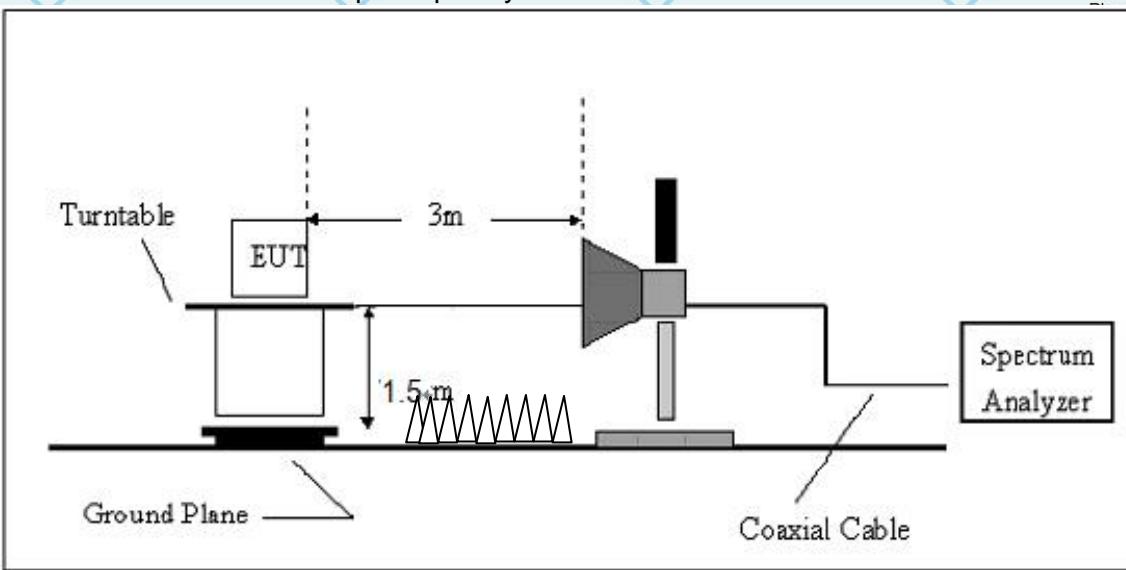
8.2. TEST SETUP

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



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





8.3 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.



8.4 RESULTS (Below 30 MHz)

Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization	Horizontal / Vertical

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State
--	--	--	--	P/F
--	--	--	--	P
--	--	--	--	P

NOTE:

No result in this part for margin above 20dB.

Distance extrapolation factor = $40 \log(\text{specific distance}/\text{test distance})$ (dB);

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

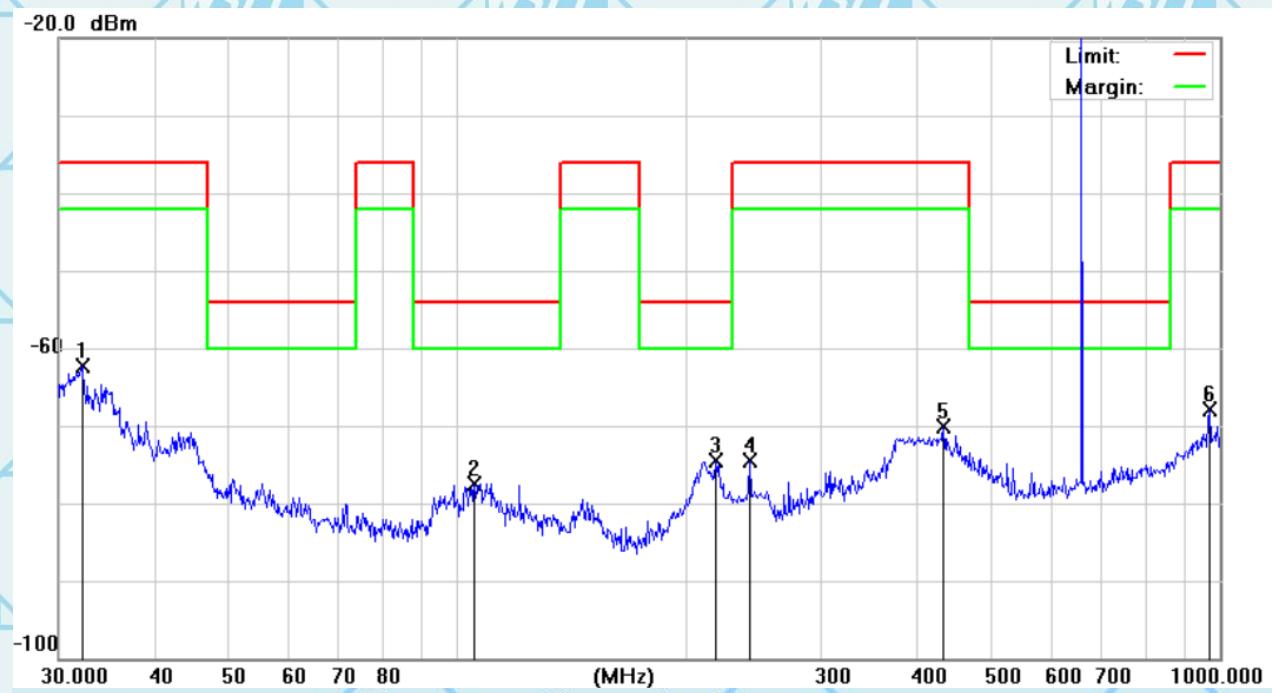
All the x/y/z orientation has been investigated, and only worst case is presented in this report.





8.5 TEST RESULTS (Between 30M – 1000 MHz)

Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Horizontal
Test Mode	Middle Channel		

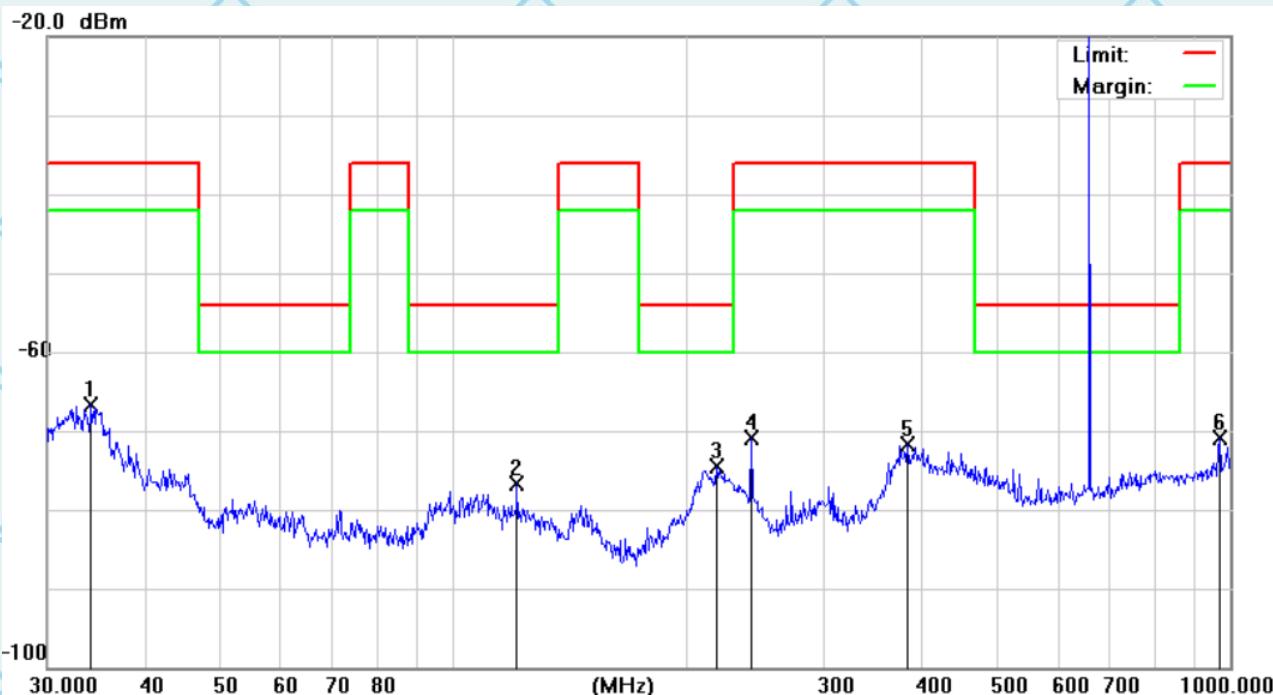


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBm	dB	dBm	dBm	dB	Detector
1	32.1794	-66.26	3.96	-62.30	-36.00	-26.30	-26.30	QP
2	105.2716	-74.69	-2.80	-77.49	-54.00	-23.49	-23.49	QP
3	*	218.3085	-68.39	-6.16	-74.55	-54.00	-20.55	QP
4		241.6759	-69.31	-5.11	-74.42	-36.00	-38.42	QP
5		434.0649	-69.73	-0.43	-70.16	-36.00	-34.16	QP
6		968.9338	-74.68	6.76	-67.92	-36.00	-31.92	QP

Remark: All the modes have been investigated, and only worst mode is presented in this report.



Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Vertical
Test Mode	Middle Channel		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
1		34.1561	-69.90	3.20	-66.70	-36.00	-30.70
2		120.6991	-73.87	-2.88	-76.75	-54.00	-22.75
3	*	218.3085	-68.39	-6.16	-74.55	-54.00	-20.55
4		241.6759	-65.81	-5.11	-70.92	-36.00	-34.92
5		383.9318	-70.52	-1.16	-71.68	-36.00	-35.68
6		968.9338	-77.68	6.76	-70.92	-36.00	-34.92

Remark: All the modes have been investigated, and only worst mode is presented in this report.





Spurious Emission Above 1GHz

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Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dBm)	Polar
Low Channel (657.5MHz)						
2630	-48.64	8.23	-40.41	-30	10.41	V
2630	-46.40	8.23	-38.17	-30	8.17	H
1972.5	-46.80	9.57	-37.23	-30	7.23	V
1972.5	-51.72	9.57	-42.15	-30	12.15	H
1315	-46.15	13.02	-33.13	-30	3.13	V
1315	-48.39	13.02	-35.37	-30	5.37	H

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dBm)	Polar
Middle Channel (659.0MHz)						
2636	-49.71	8.23	-41.48	-30	11.48	V
2636	-46.31	8.23	-38.08	-30	8.08	H
1977	-51.87	9.57	-42.30	-30	12.30	V
1977	-49.85	9.57	-40.28	-30	10.28	H
1318	-45.47	13.02	-32.45	-30	2.45	V
1318	-45.76	13.02	-32.74	-30	2.74	H

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dBm)	Polar
High Channel (662.5MHz)						
2650	-48.44	8.23	-40.21	-30	10.21	V
2650	-49.70	8.23	-41.47	-30	11.47	H
1987.5	-49.09	9.57	-39.52	-30	9.52	V
1987.5	-46.39	9.57	-36.82	-30	6.82	H
1325	-44.05	13.02	-31.03	-30	1.03	V
1325	-50.83	13.02	-37.81	-30	7.81	H

Remark:

Note: is carried out with frequency rang 30MHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. With above 1GHz date is based on 1m test transform to 3m.



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9. BANDWIDTH TEST

9.1 Applied procedures

According to FCC 15.236(f), The operating frequency within a permissible band of operation as defined in paragraph (c) must comply with the following requirements.

- (1) The frequency selection shall be offset from the upper or lower band limits by 25 kHz or an integral multiple thereof.
- (2) One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in Section 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08) (incorporated by reference, see

§15.38). Emissions outside this band shall comply with the limit specified at the edges of the ETSI mask

9.2 Test Procedure

According to ANSI C63.10-2013 section 6.9 for additional Test Set-Up procedures, the occupied bandwidth of emission was measured with a Spectrum Analyzer connected to the antenna terminal while EUT was operating in 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. Then mark the -26dB Bandwidth and record it.

9.4 TEST SETUP

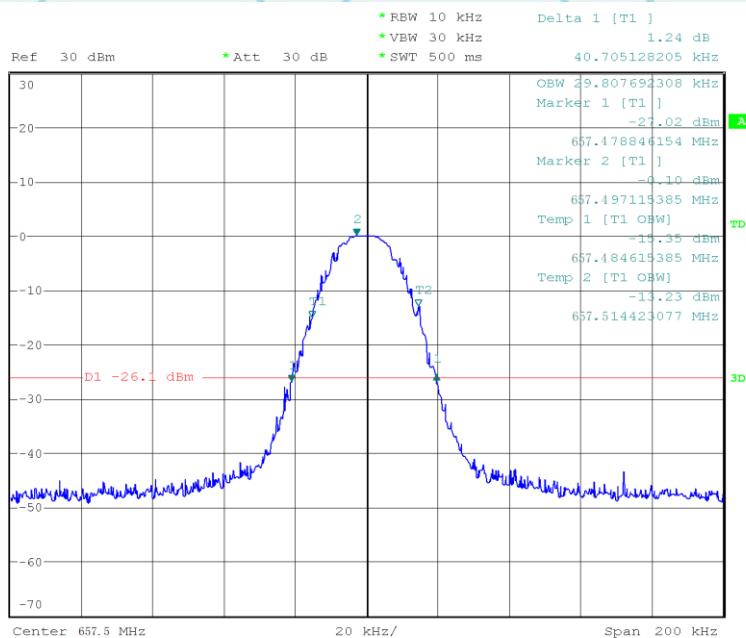




9.5 Test Results/Plots

Test Channel	Frequency (MHz)	-26dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit (kHz)
Low	657.5	40.705	29.808	200
Middle	659.0	39.744	28.526	200
High	662.5	40.705	29.487	200

Low Channel (657.5MHz)

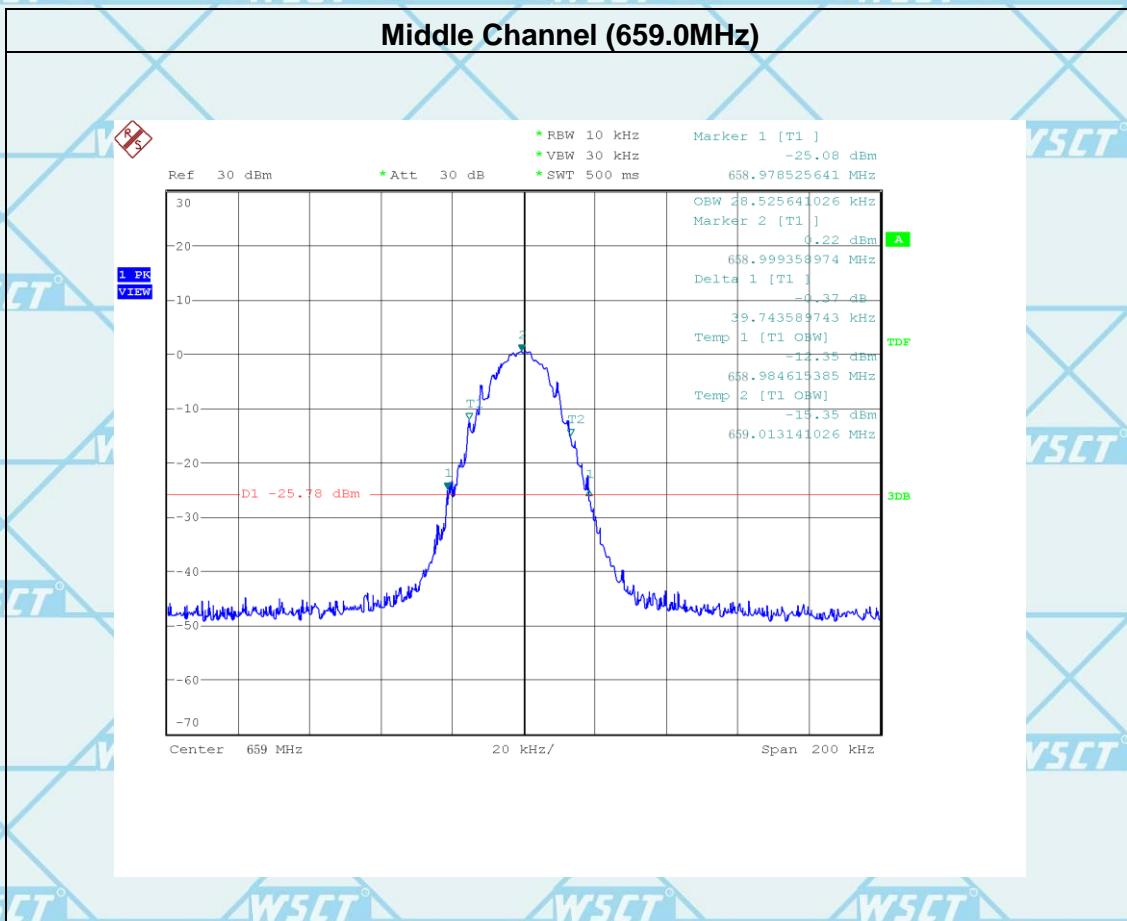




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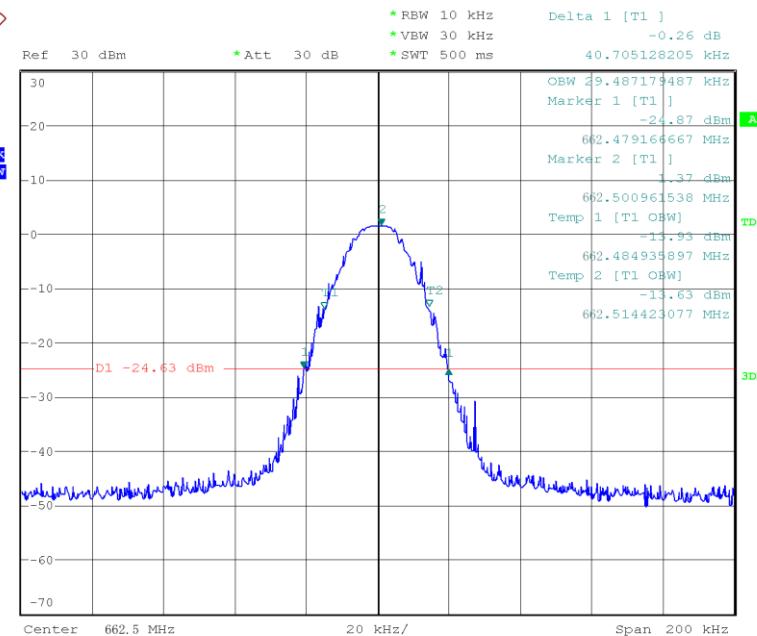


Report No.: WSCT-A2LA-R&E211000009A-UHF

Certificate Number 5768.01

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High Channel (662.5MHz)



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10. MAX. CONDUCTED OUTPUT POWER

10.1 Limit

Maximum Conducted Output power at Antenna Terminals, FCC Rules 15.236(d):

(1) In the bands allocated and assigned for broadcast television and in the 600MHz service band: 50mW EIRP.

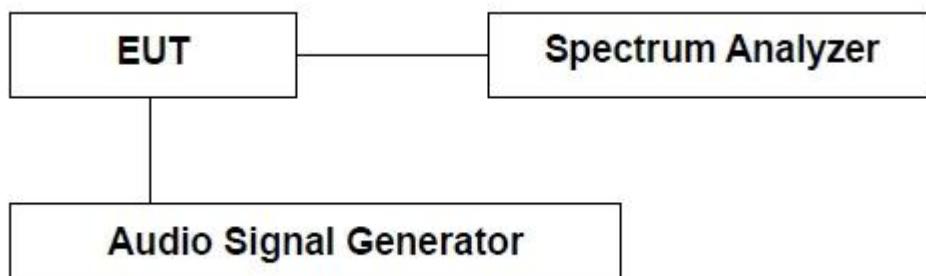
(2) In the 600MHz guard bands including the duplex gap: 20mW EIRP

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10.2 TEST PROCEDURE

1. The maximum peak output power was measured with a Spectrum Analyzer connected to the antenna terminal while EUT was operating in un modulated situation.
2. Power was supplied to the battery input connector a power supply. The power supply was set for +3.0VDC. The Spectrum Analyzer was connected at antenna terminal to measure RF power of the carrier.
3. A Multimeter was connected in series with final RF Stage to measure the current; A Multimeter was used to measure final RF Stage supply voltage. Then the voltage v.s. current of the final RF Stage can be showed.

10.4 TEST SETUP



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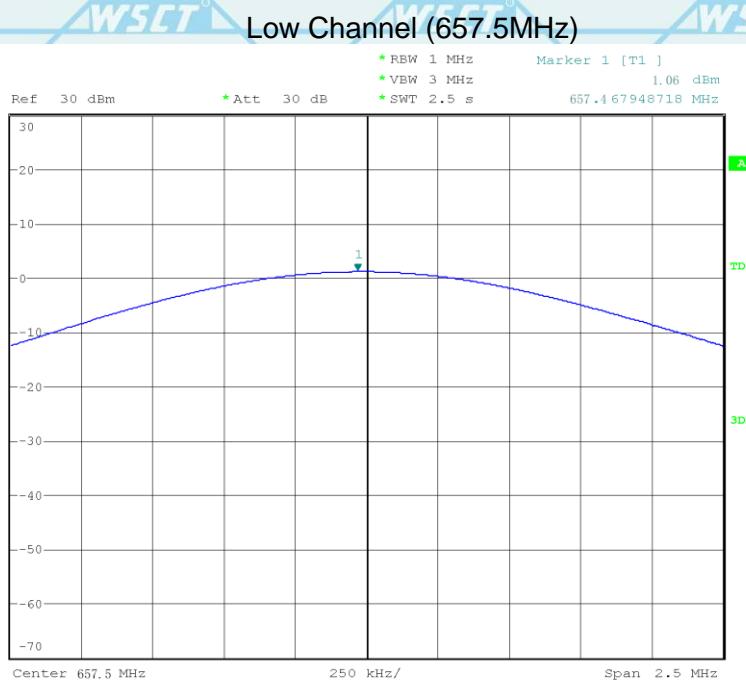
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10.5 Test Result/Plots

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low	657.5	1.06	13
Middle	659.0	1.73	13
High	662.5	0.32	13



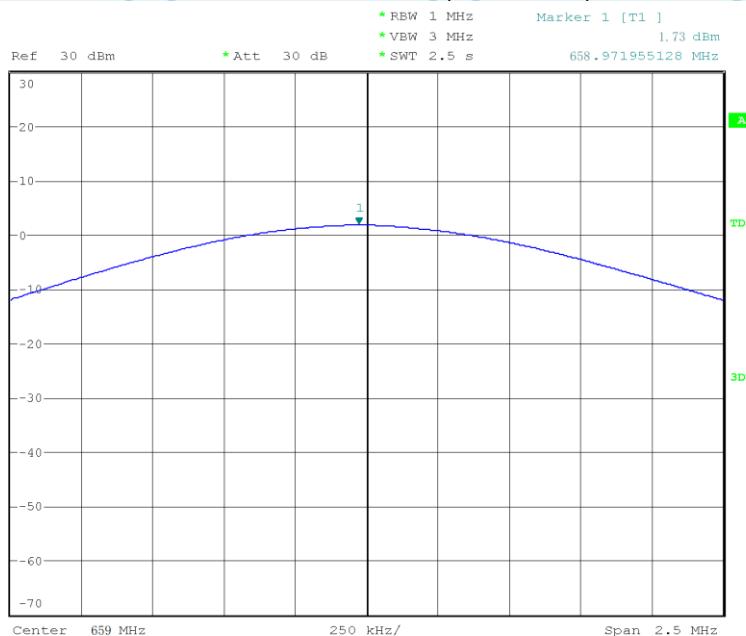


Report No.: WSCT-A2LA-R&E211000009A-UHF

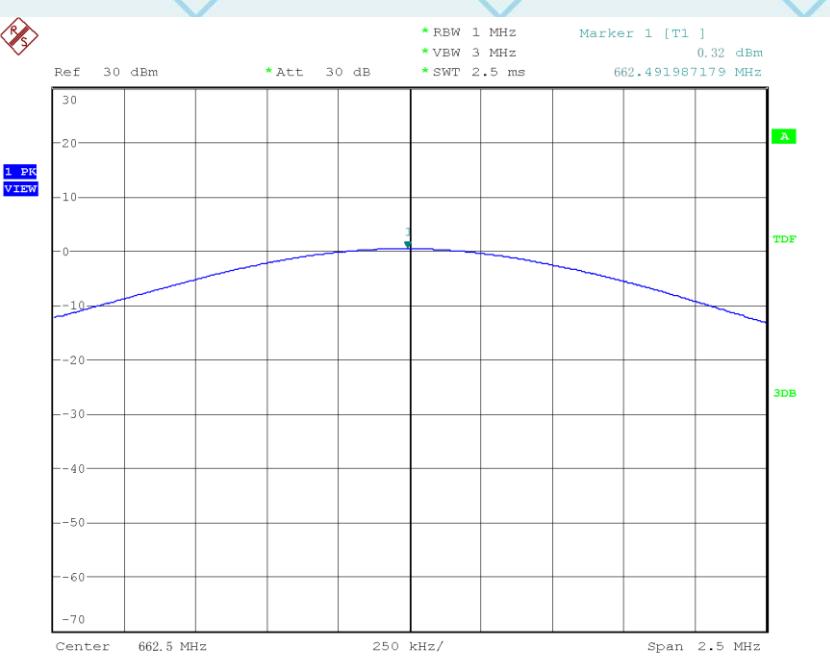
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Middle Channel (659.0MHz)



High Channel (662.5MHz)



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11. NECESSARY BANDWIDTH

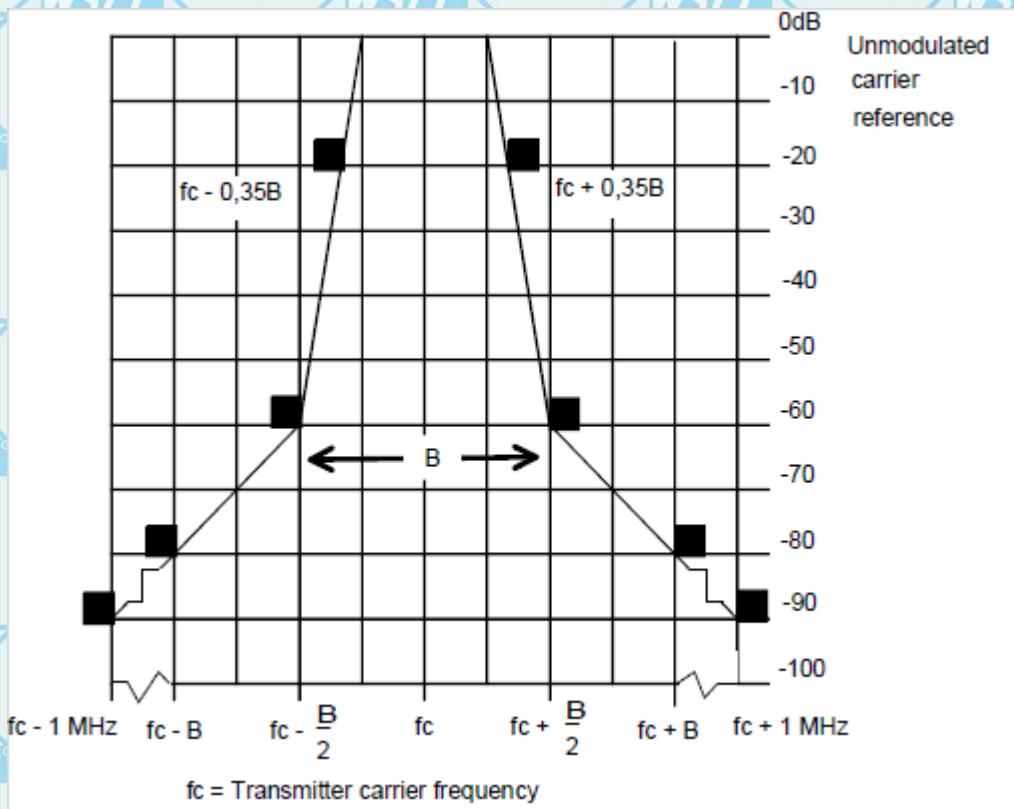
Test Procedure

According to ETSI EN 300 422-1 V1.4.2 (2011-08) §8.3.2.1, conducted method.

Limit

According to ETSI EN 300 422-1 V1.4.2 (2011-08) §8.3.2.2,

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Note: fc=200kHz



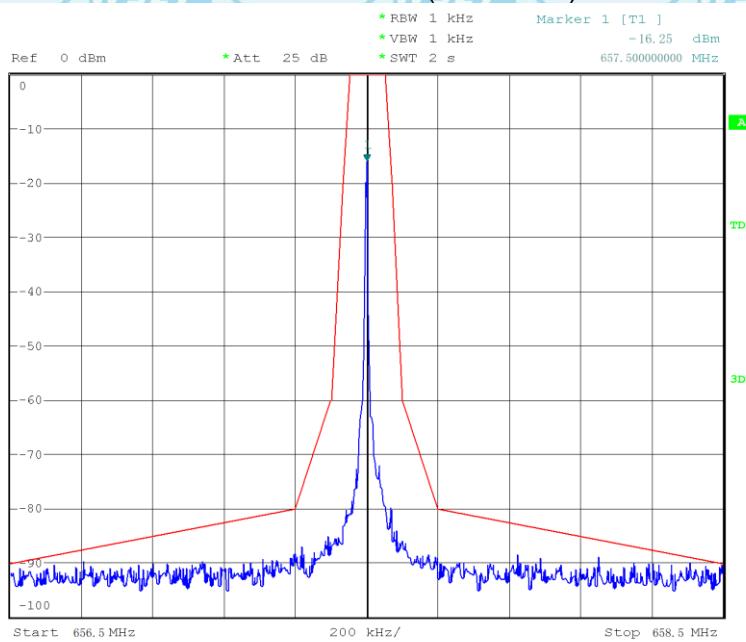
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Certificate Number 5768.01

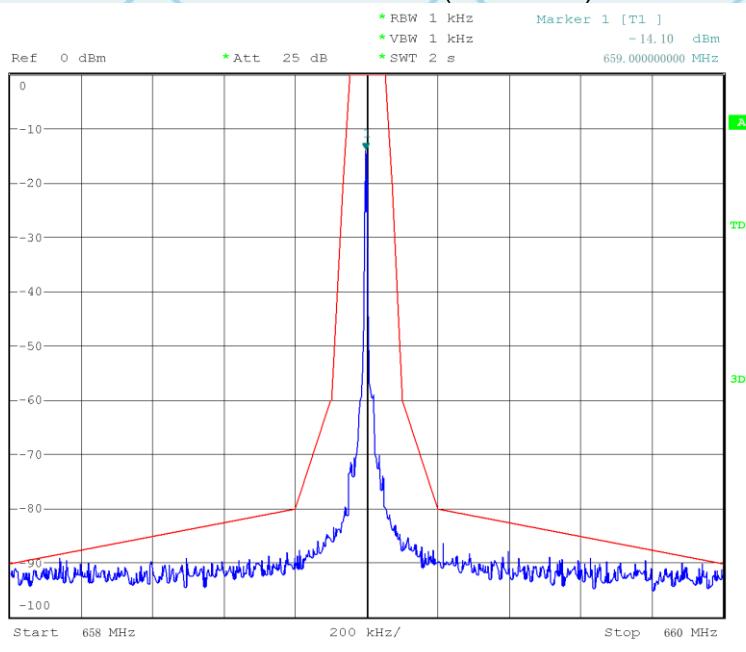
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Test Data

Low Channel (657.5MHz)



Middle Channel (659.0MHz)



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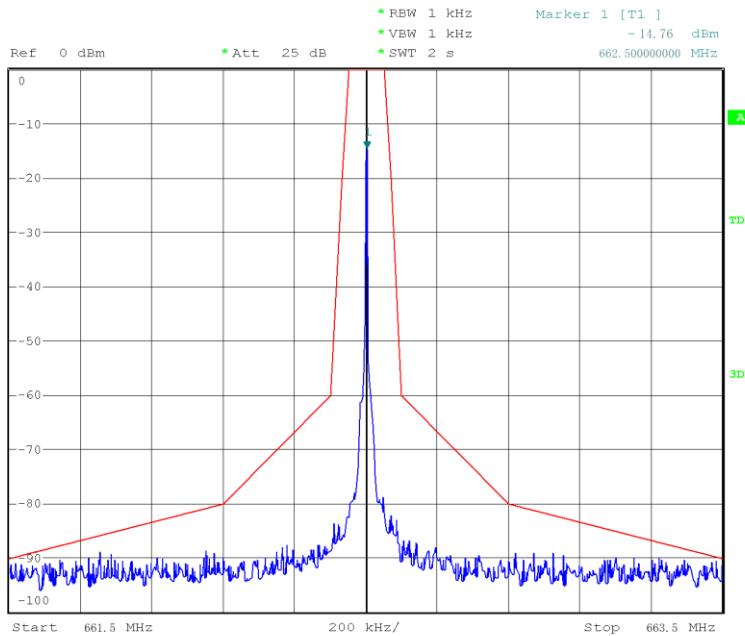


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High Channel (662.5MHz)



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12. FREQUENCY STABILITY

12.1 Standard Applicable

According to FCC 15.236(f) (3), The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

12.2 Test Procedure

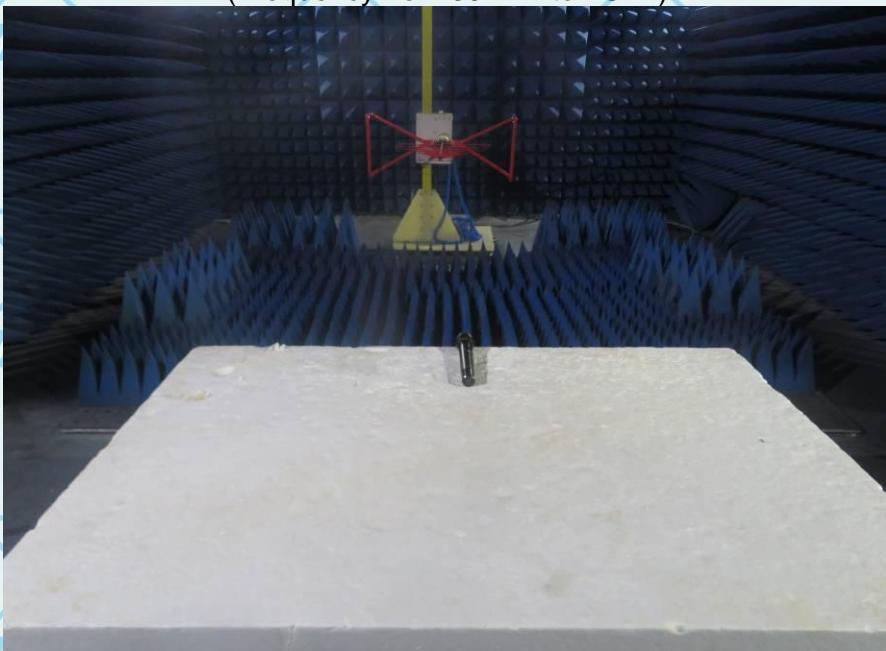
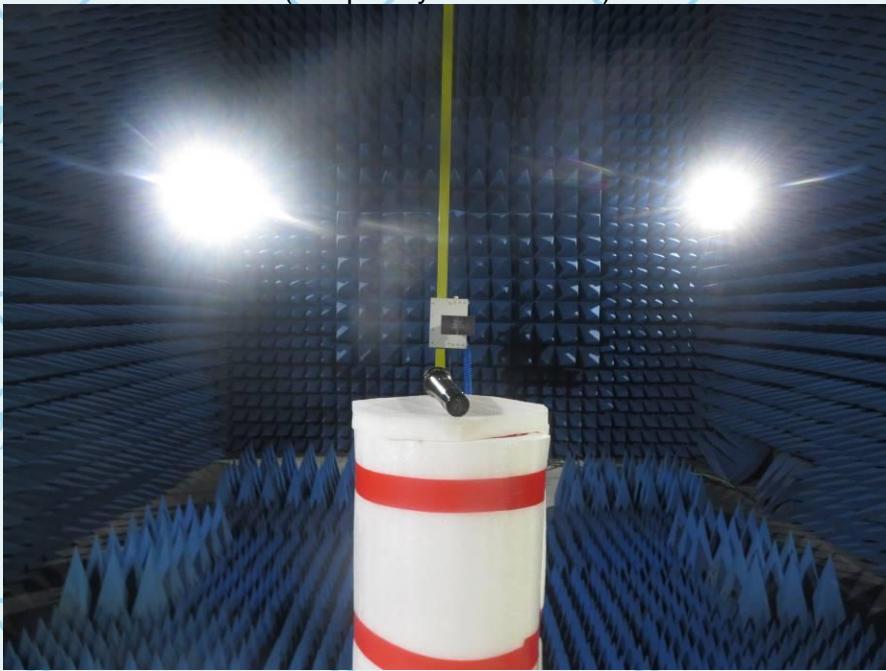
1. Setup the configuration of the ambient temperature form -20°C to 50°C with sufficient time. And measure the different power of the EUT with an artificial power from highest to end point voltage.
2. Set frequency counter center frequency to the right frequency needs to be measured.



12.3 Test Results/Plots

Test conditions		Frequency Error		
		657.5MHz	659.0 MHz	662.5 MHz
T _{nom} (20°C)	V _{min} (2.55V)	656.5456	658.7996	662.3210
	V _{max} (3.0V)	656.7579	658.0427	661.5300
T(-20°C)	V _{max} (3.0V)	657.4134	658.7838	662.3944
T(-10°C)	V _{max} (3.0V)	656.8634	658.9881	661.9304
T(0°C)	V _{max} (3.0V)	657.3442	658.2355	661.9727
T(10°C)	V _{max} (3.0V)	656.6327	658.8746	661.6159
T _{nom} (20°C)	V _{max} (3.0V)	657.1183	658.6661	661.7790
T(30°C)	V _{max} (3.0V)	656.6433	658.1708	662.3149
T(40°C)	V _{max} (3.0V)	657.2985	658.4217	662.1254
T(50°C)	V _{max} (3.0V)	656.6620	658.3303	662.4908
T _{nom} (20°C)	V _{min} (2.55V)	657.3317	658.8251	662.0745
	V _{max} (3.0V)	657.4905	658.4043	662.4000
Max. Deviation (MHz)		-0.0095	-0.0119	-0.0092
Max. frequency error (ppm)		-14.48	-18.03	-13.85
Limit (ppm)		50ppm		
End Point DC		DC 3.0V		



13. EUT TEST PHOTORADIATED EMISSION TEST
(Frequency from 30MHz to 1GHz)RADIATED EMISSION TEST
(Frequency above 1GHz)

14. PHOTOGRAPHS OF EUT

Appearance photograph of EUT



Appearance photograph of EUT





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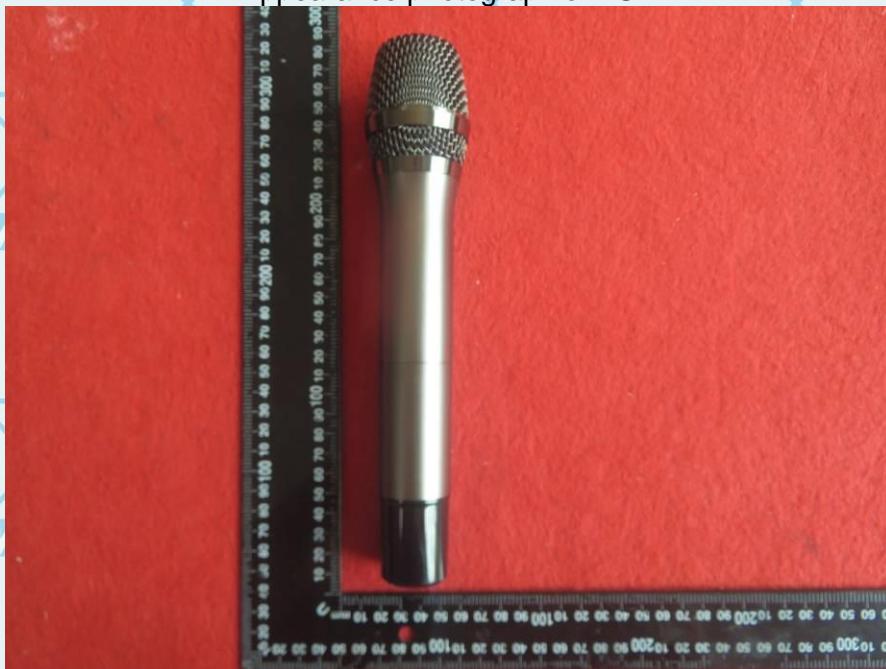


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Appearance photograph of EUT



Appearance photograph of EUT



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Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Internal photograph of EUT





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Internal photograph of EUT



Internal photograph of EUT



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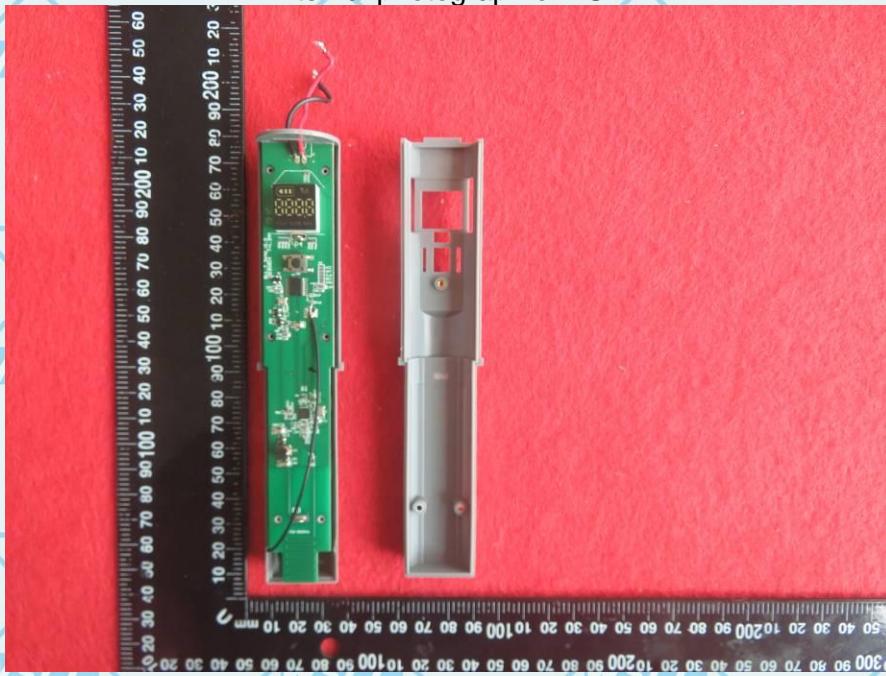
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Internal photograph of EUT



Internal photograph of EUT



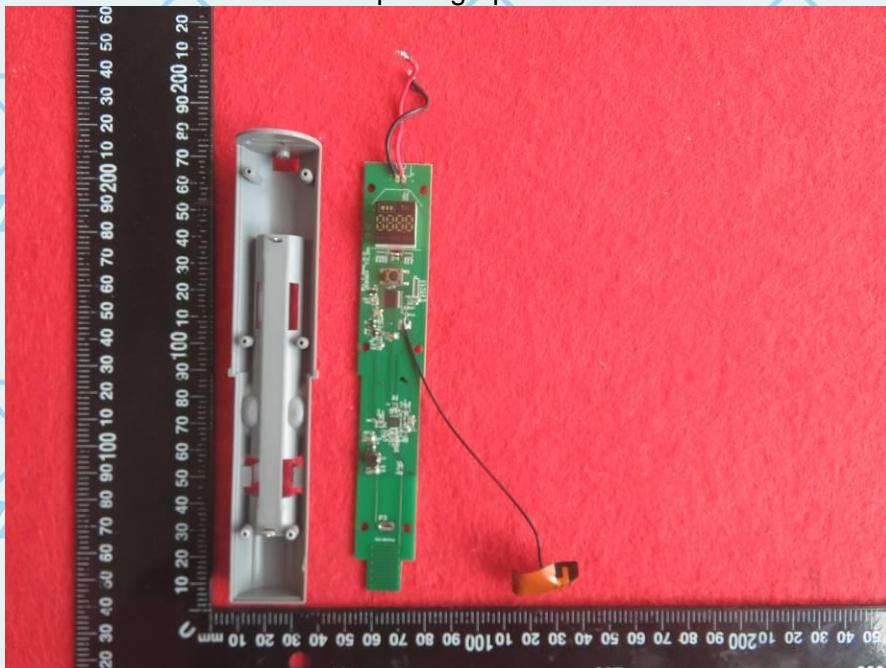


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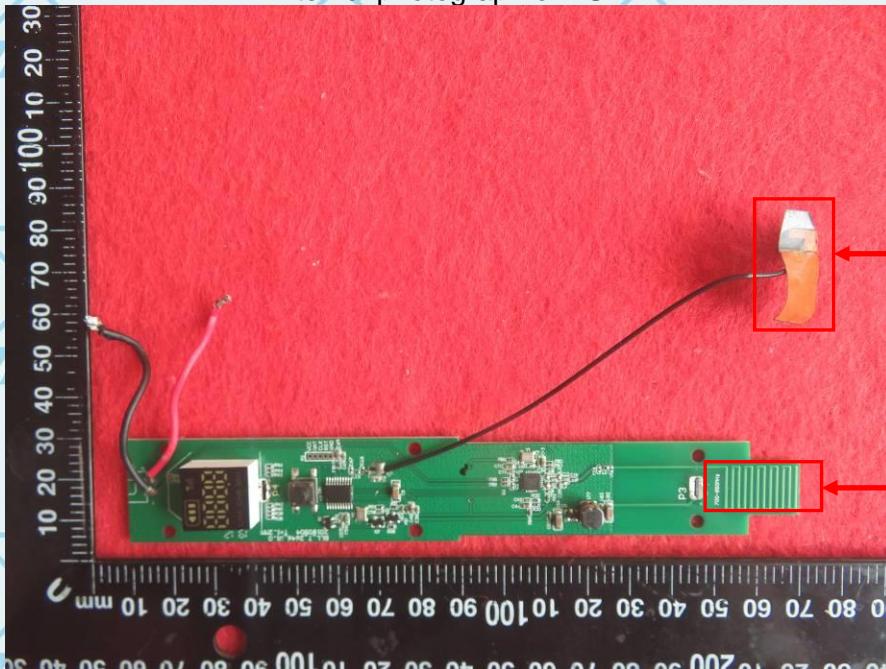
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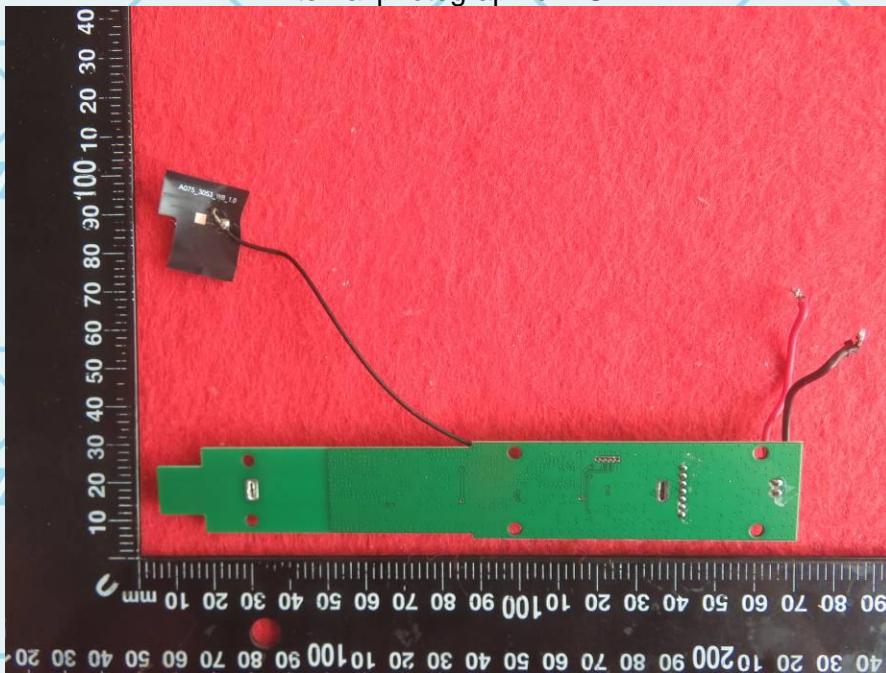
Internal photograph of EUT



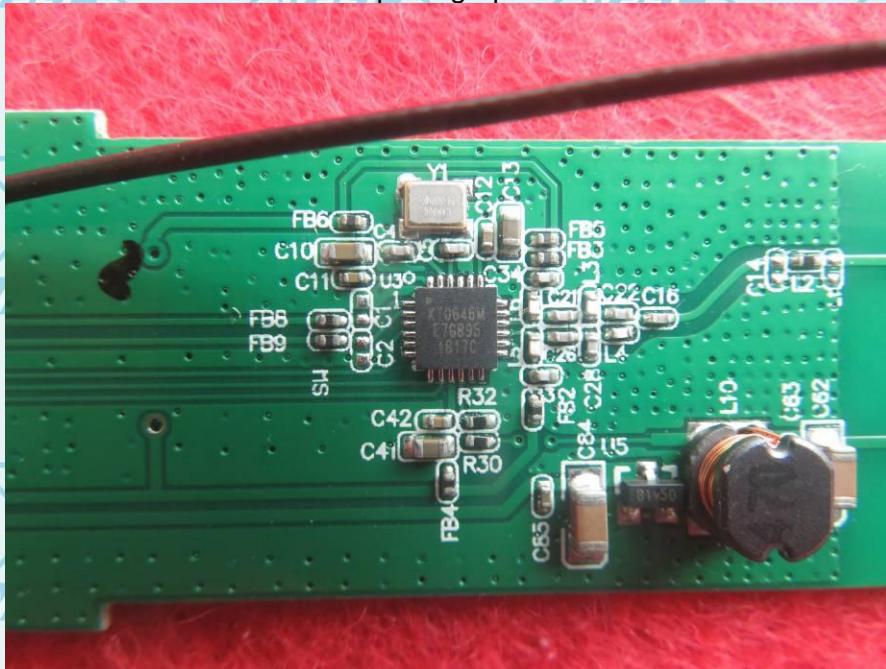
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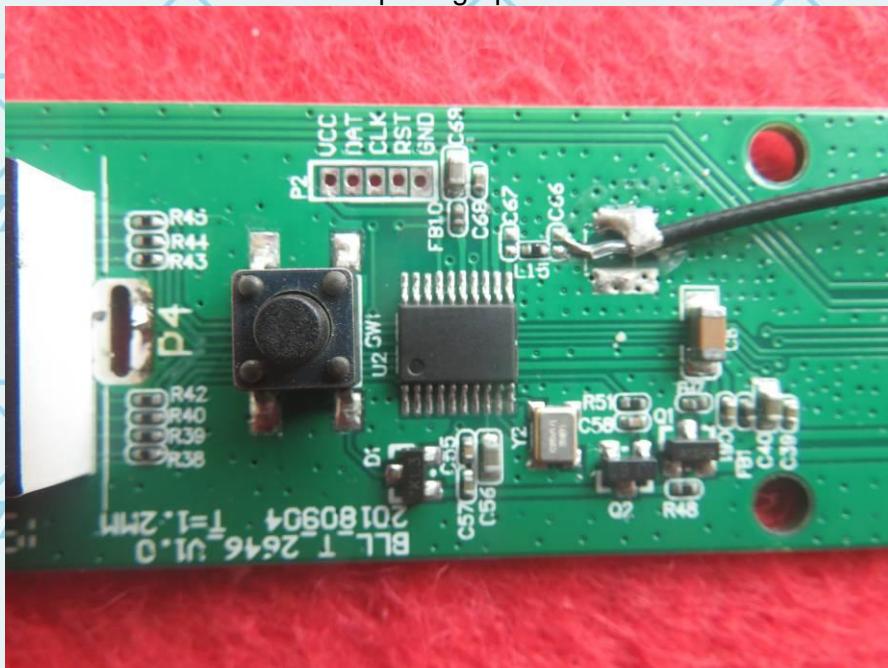
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT

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