



# TEST REPORT

FCC ID: 2AOKDSDU0070

Product: SDU-0070

Model No.: SDU-0070-001

Additional Model No.: SDU-0070-002(XXX=002-999)

Trade Mark: ad notam®

Report No.: FCC18010018A-15B

Issued Date: February 26, 2018

Issued for:

ad notam AG

Obere Giesswiesen 11-13, 78247 Hilzingen, Germany

Issued By:

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**Note:** The results contained in this report pertain only to the tested sample. This report shall not be reproduced, except in full, without written approval of World Standardization Certification & Testing Group Co., Ltd. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government..







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# 1. Test Certification

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Product:	SDU-0070
Model No.:	SDU-0070-001
Additional Model No.:	SDU-0070-002(XXX=002-999)
Trade Mark:	ad notam ®
Applicant:	ad notam AG
Address:	Obere Giesswiesen 11-13, 78247 Hilzingen, Germany
Manufacturer:	Shenzhen KOHO Technology Co., Ltd
Address:	F4, Building 3, Fubilun Dingfeng Hi-Tech Industrial Park, Songgang Blvd, Bao'an District, Shenzhen, China 518105
Date of Test:	February 10, 2018 to February 25, 2018
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart B

The above equipment has been tested by World Standardization Certification & Testing Group 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: Wen Quan  
(Wen Quan)Date: 2018.02.26Check By: Li Huaibi  
(Li Huaibi)Date: 2018.02.26Approved By: Wang Fengbing  
(Wang Fengbing)Date: 2018.02.26世标检测认证股份  
World Standardization Certification & Testing Group Co., Ltd.ADD: Building A-B Baoshi Science & technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China  
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## 2. Test Result Summary

Requirement	CFR 47 Section	Result
CONDUCTED EMISSION	§15.107	PASS
RADIATED EMISSION	§15.109	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.





### 3. EUT Description

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	Video Recording
Model 2	Video Playing
Mode 3	Exchange data with computer(the worst case)

#### 3.1 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	MU
1	Conducted Emission Test	$\pm 3.2\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.7\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.7\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2.0\%$





## 4. MEASUREMENT INSTRUMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibrated	Calibrated until
ESCI Test Receiver	R&S	ESCI	100005	08/19/2017	08/18/2018
LISN	AFJ	LS16	16010222119	08/19/2017	08/18/2018
LISN(EUT)	Mestec	AN3016	04/10040	08/19/2017	08/18/2018
pre-amplifier	CDSI	PAP-1G18-38	--	08/19/2017	08/18/2018
System Controller	CT	SC100	-	08/19/2017	08/18/2018
Bi-log Antenna	Chase	CBL6111C	2576	08/19/2017	08/18/2018
Spectrum analyzer	R&S	FSU26	200409	08/19/2017	08/18/2018
Horn Antenna	SCHWARZBECK	9120D	1141	08/19/2017	08/18/2018
Bi-log Antenna	SCHWABECK	VULB9163	9163/340	08/19/2017	08/18/2018
Pre Amplifier	H.P.	HP8447E	2945A02715	10/13/2017	10/12/2018
9*6*6 Anechoic	--	--	--	08/21/2017	08/20/2018



## 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 CO., LTD**

**Registration Number: 366353**

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."

### 5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

**USA**

**NVLAP** (The certificate registration number is NVLAP LAB CODE:600142-0)

**Japan**

**VCCI** (The certificate registration number is C-4790, R-3684, G-837)

**Canada**

**INDUSTRY CANADA**

(The certificated registration number is 7700A-1)

**China**

**CNAS** (The certificated registration number is L3732)

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.wsct-cert.com>







## 6. EMC EMISSION TEST

### 6.1. CONDUCTED EMISSION MEASUREMENT

#### 6.1.1. POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	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



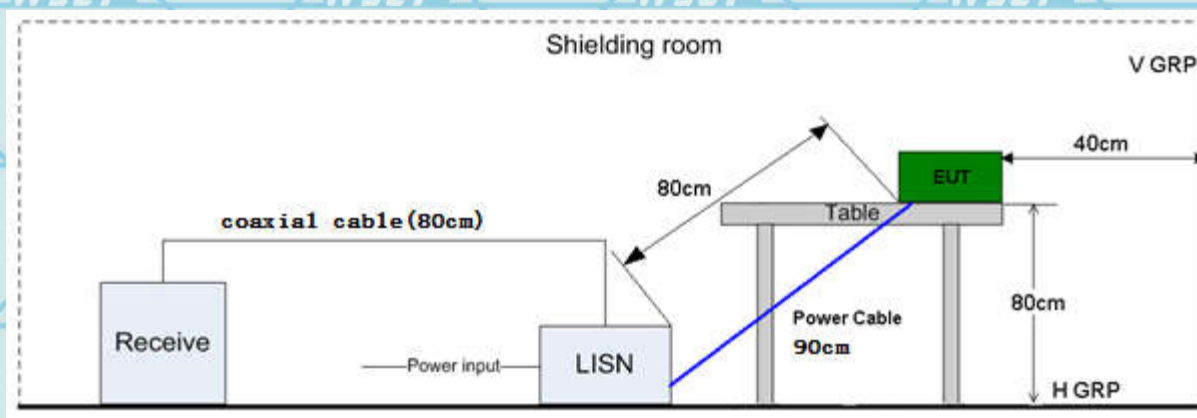


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## TEST PROCEDURE

- 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.

## TEST SETUP



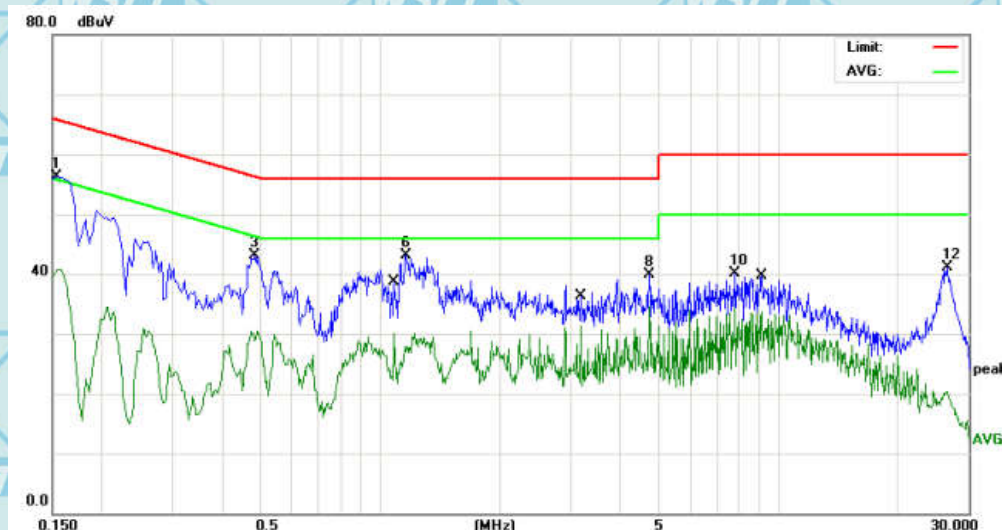




## 6.1.2. Test Results

Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 3(the worst case)

## Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1539	45.88	10.44	56.32	65.78	-9.46	peak
2		0.1539	30.26	10.44	40.70	55.78	-15.08	AVG
3		0.4860	32.80	10.40	43.20	56.24	-13.04	peak
4		0.4900	20.20	10.40	30.60	46.17	-15.57	AVG
5		1.0859	19.82	10.34	30.16	46.00	-15.84	AVG
6		1.1620	32.84	10.33	43.17	56.00	-12.83	peak
7		3.1860	20.96	10.27	31.23	46.00	-14.77	AVG
8		4.7460	29.75	10.24	39.99	56.00	-16.01	peak
9		4.7460	24.31	10.24	34.55	46.00	-11.45	AVG
10		7.7980	29.86	10.21	40.07	60.00	-19.93	peak
11		9.0860	23.55	10.20	33.75	50.00	-16.25	AVG
12		26.4260	31.02	10.10	41.12	60.00	-18.88	peak

## Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak

AVG =average

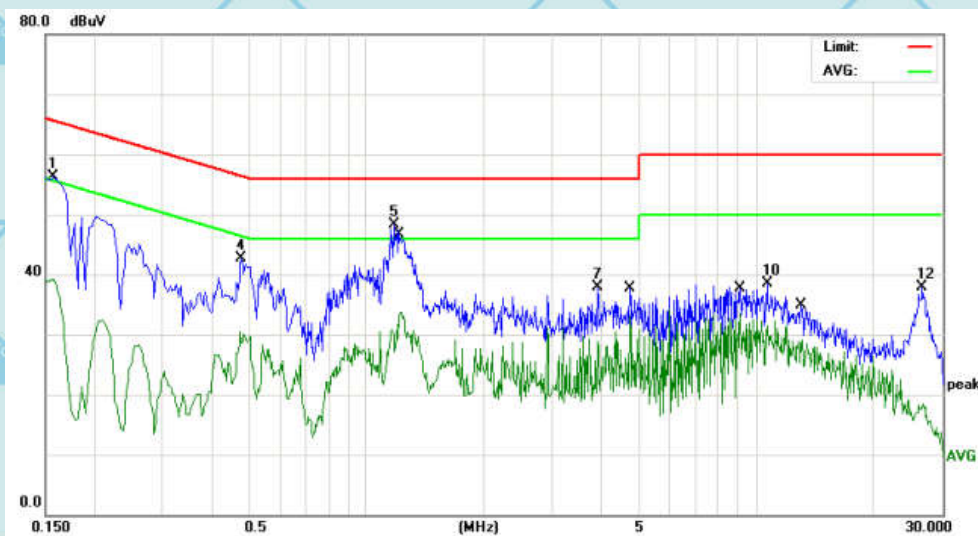
\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz







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**Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)**

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1580	45.90	10.44	56.34	65.56	-9.22	peak
2		0.1580	28.77	10.44	39.21	55.56	-16.35	AVG
3		0.4740	20.19	10.40	30.59	46.44	-15.85	AVG
4		0.4780	32.27	10.40	42.67	56.37	-13.70	peak
5	*	1.1780	37.91	10.33	48.24	56.00	-7.76	peak
6		1.2180	23.46	10.33	33.79	46.00	-12.21	AVG
7		3.9220	27.67	10.25	37.92	56.00	-18.08	peak
8		4.7460	22.82	10.24	33.06	46.00	-12.94	AVG
9		9.0860	23.35	10.20	33.55	50.00	-16.45	AVG
10		10.6380	28.39	10.18	38.57	60.00	-21.43	peak
11		13.0900	18.86	10.17	29.03	50.00	-20.97	AVG
12		26.6620	27.71	10.10	37.81	60.00	-22.19	peak

**Note1:**

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.







## 6.2.RADIATED EMISSION MEASUREMENT

### 6.2.1. Radiated Emission Limits

The field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15B.
- (2) The tighter limit applies at the band edges.
- (3) 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 / 1Hz for Average

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





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**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 3 meter open area test site. 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.



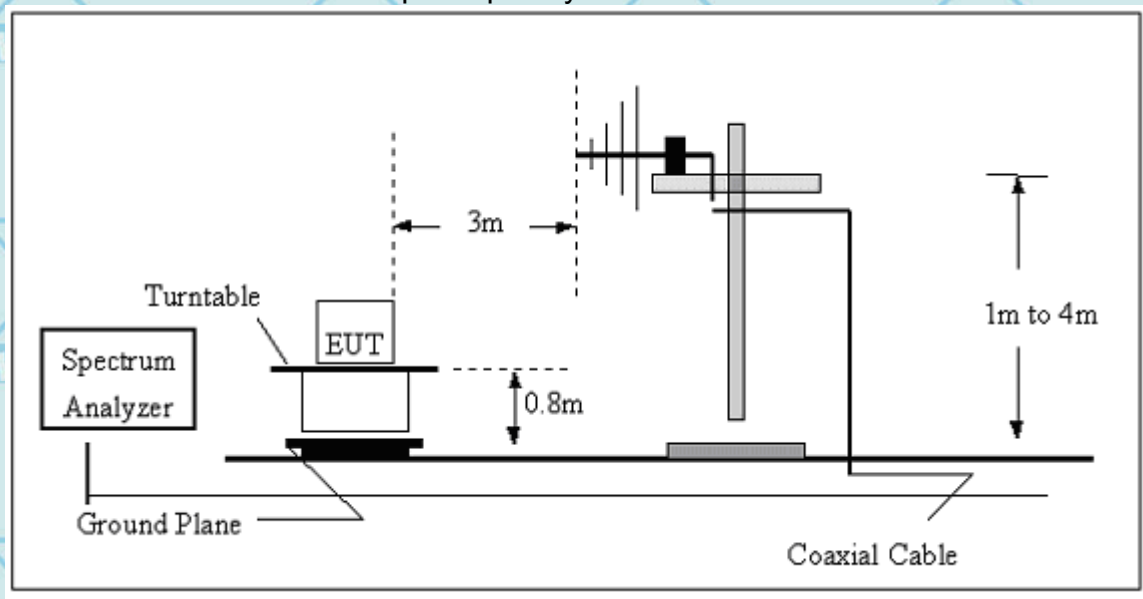




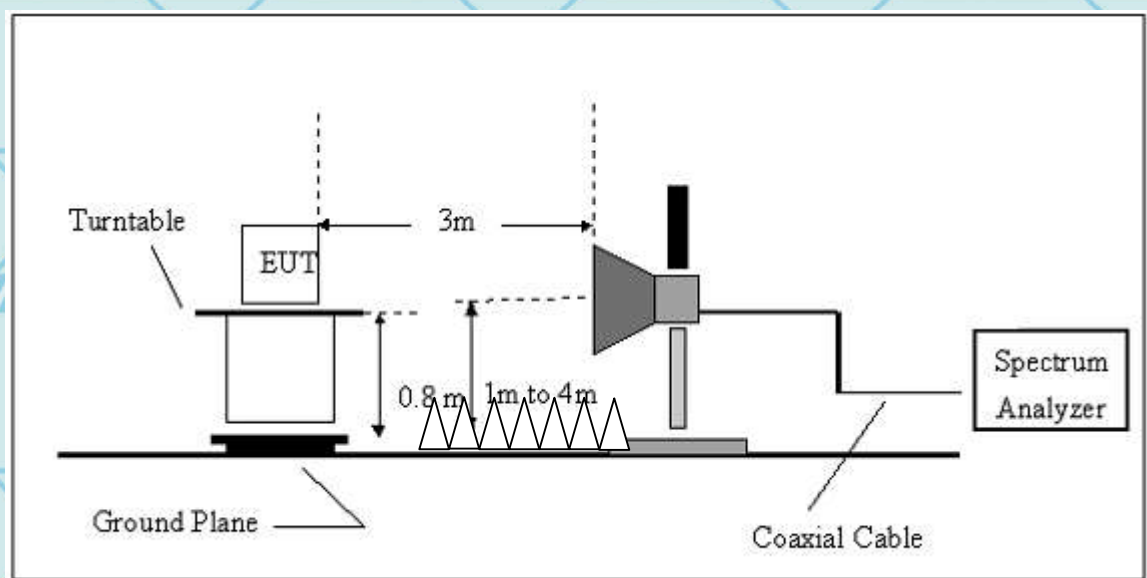
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## TEST SETUP

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



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







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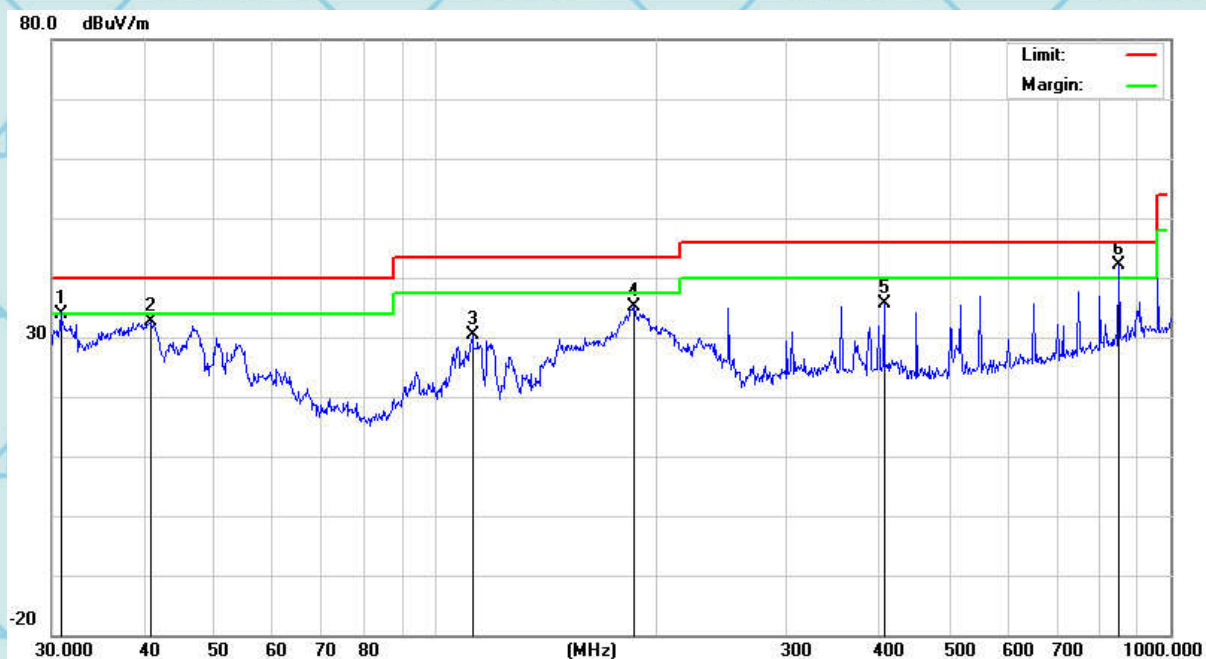
## 6.2.2. Test Results

Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 3(the worst case)

Please refer to following diagram for individual

Below 1GHz

Horizontal:



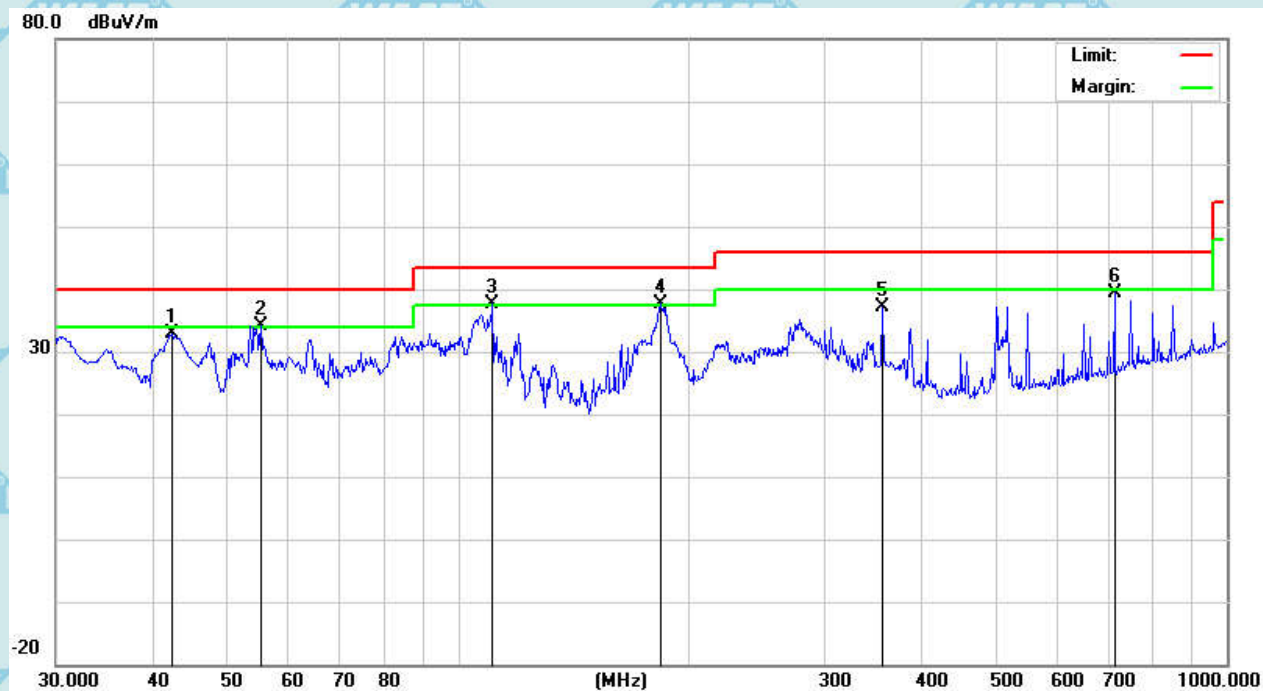
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		30.8535	29.53	4.47	34.00	40.00	-6.00	QP
2		40.9881	33.12	-0.47	32.65	40.00	-7.35	QP
3		112.1304	32.43	-2.07	30.36	43.50	-13.14	QP
4		186.4407	42.30	-7.13	35.17	43.50	-8.33	QP
5		407.5144	37.20	-1.47	35.73	46.00	-10.27	QP
6	*	851.0353	37.26	4.75	42.01	46.00	-3.99	QP





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Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		42.4508	33.94	-1.04	32.90	40.00	-7.10	QP
2	*	55.4147	39.78	-5.66	34.12	40.00	-5.88	QP
3	!	110.9570	39.58	-1.96	37.62	43.50	-5.88	QP
4	!	183.2005	44.60	-7.08	37.52	43.50	-5.98	QP
5		356.6757	38.73	-1.50	37.23	46.00	-8.77	QP
6		714.1734	36.96	2.48	39.44	46.00	-6.56	QP





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**TEST RESULTS**

Above 1GHz :( Mode 3—worst case

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1679.59	V	58.40	40.66	74	54	-15.60	-13.34
2219.39	V	58.78	40.82	74	54	-15.22	-13.18
1681.31	H	58.64	41.00	74	54	-15.36	-13.00
2393.49	H	59.23	40.23	74	54	-14.77	-13.77







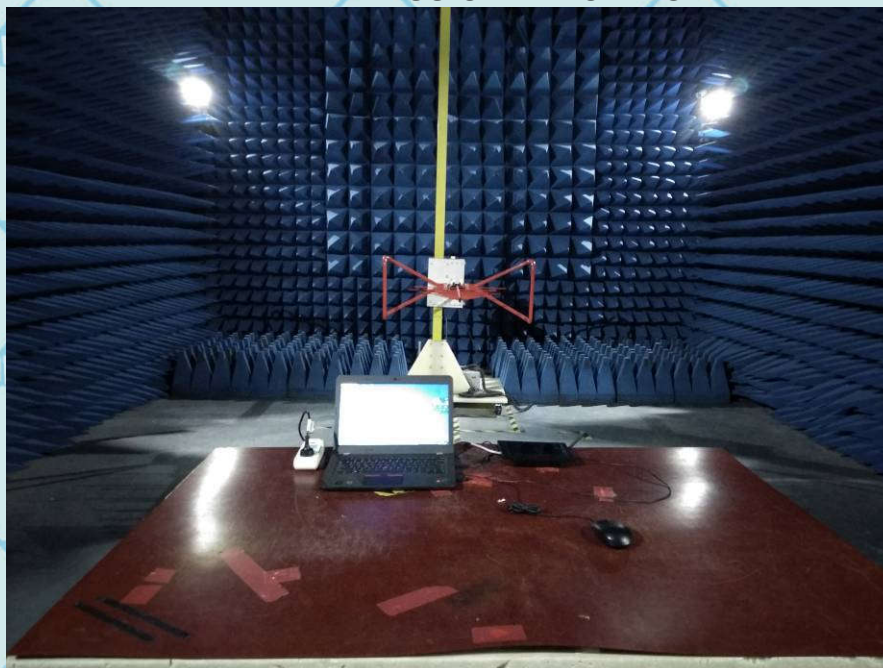
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## 7. Appendix A: Photographs of Test Setup

### CONDUCTED EMISSION



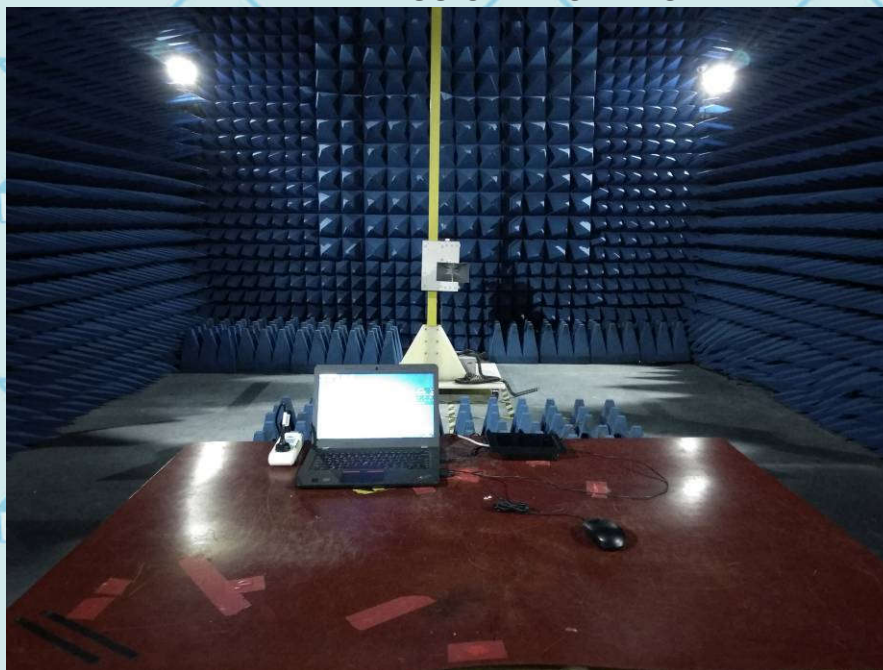
### RADIATED EMISSION BELOW 1GHz







## RADIATED EMISSION ABOVE 1GHz







## 8. Appendix B: Photographs of EUT

Appearance photograph of EUT



Appearance photograph of EUT



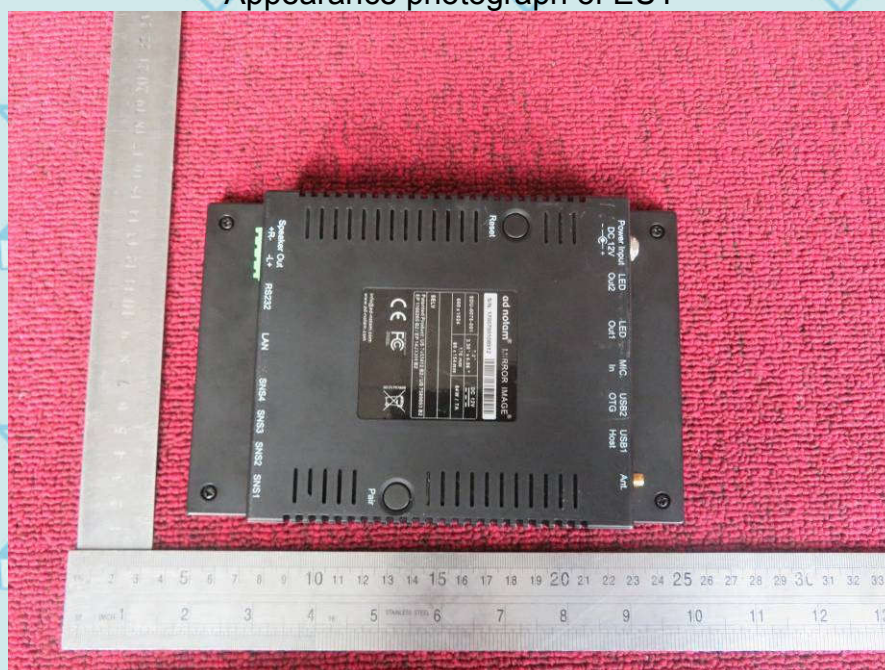




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Appearance photograph of EUT



Appearance photograph of EUT







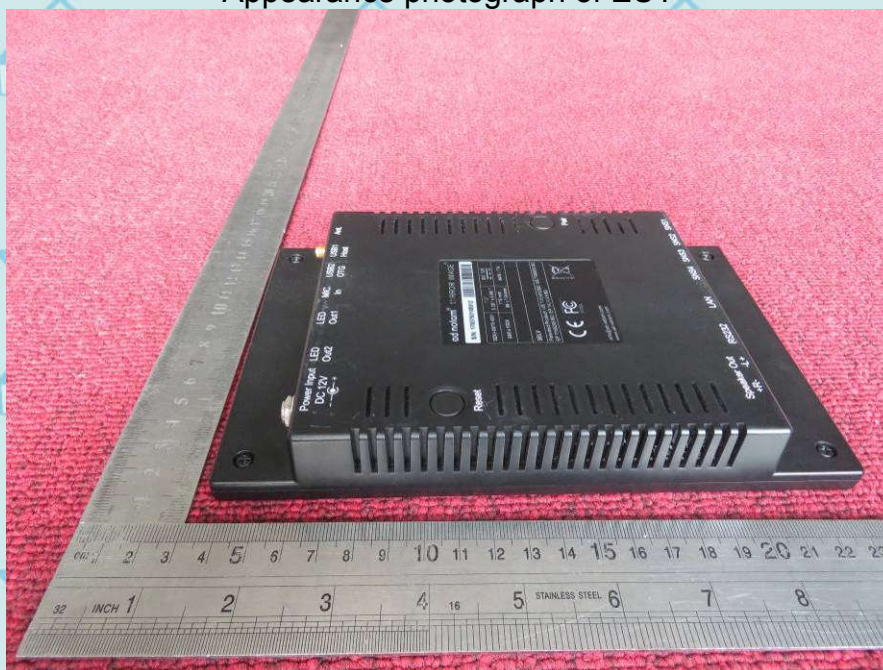
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Appearance photograph of EUT



Appearance photograph of EUT







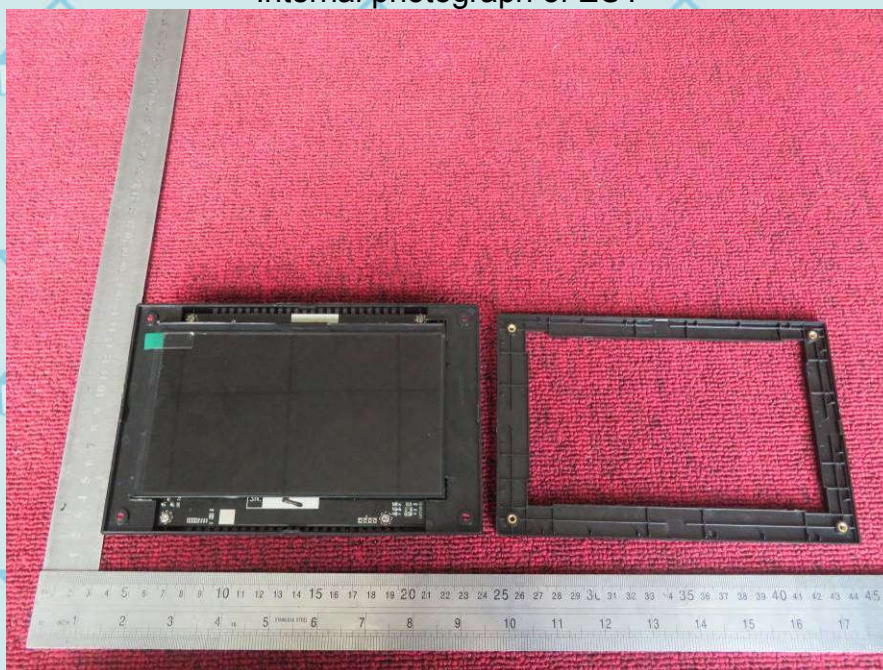
For Question,  
Please Contact with WSCT  
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### Appearance photograph of EUT



### Internal photograph of EUT



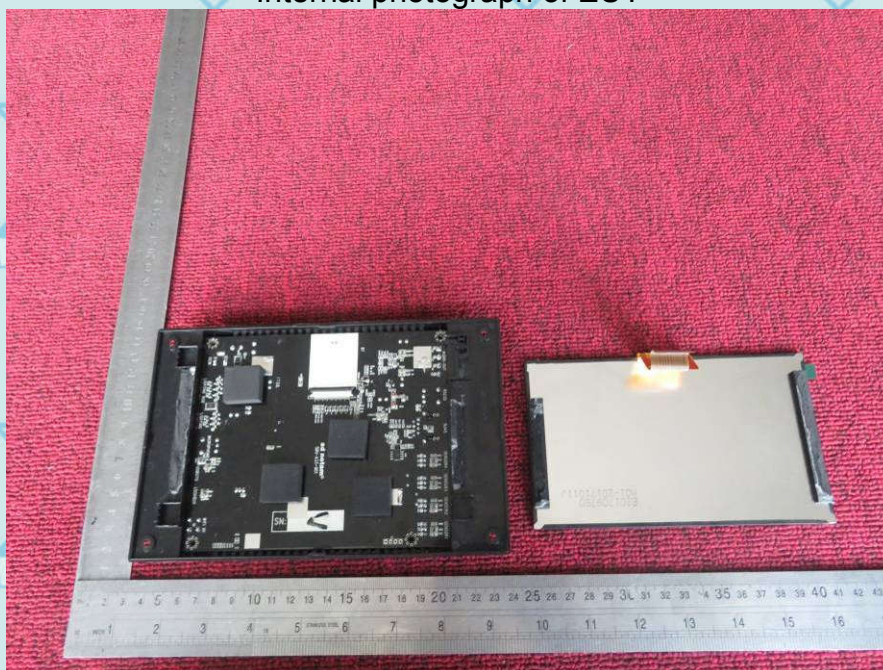




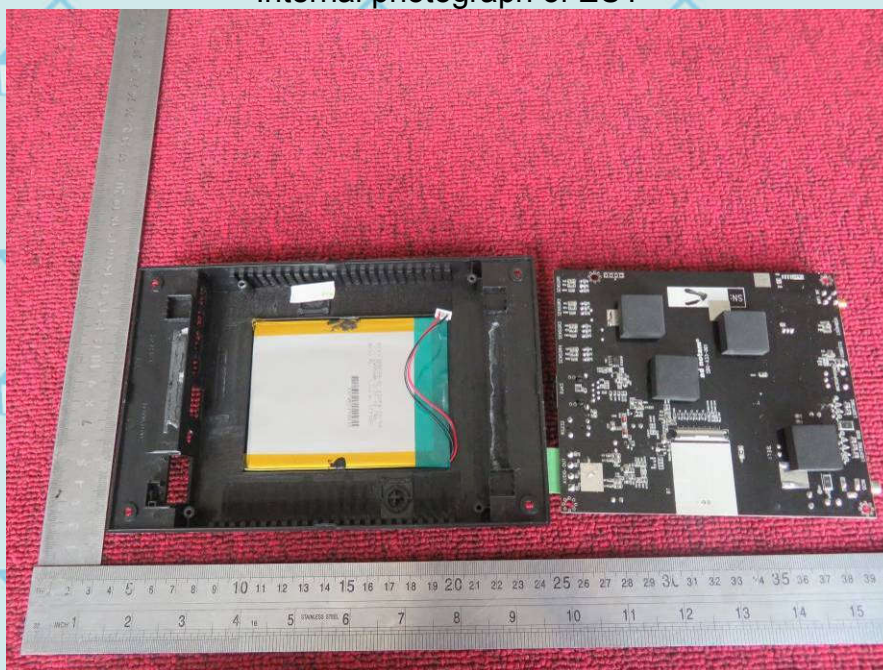
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Internal photograph of EUT



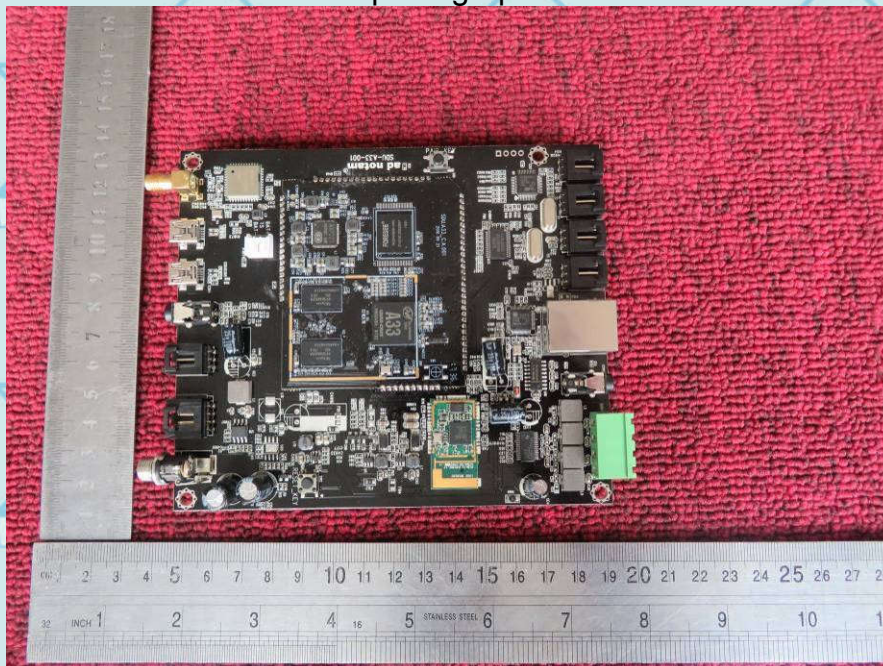
Internal photograph of EUT







Internal photograph of EUT



Internal photograph of EUT



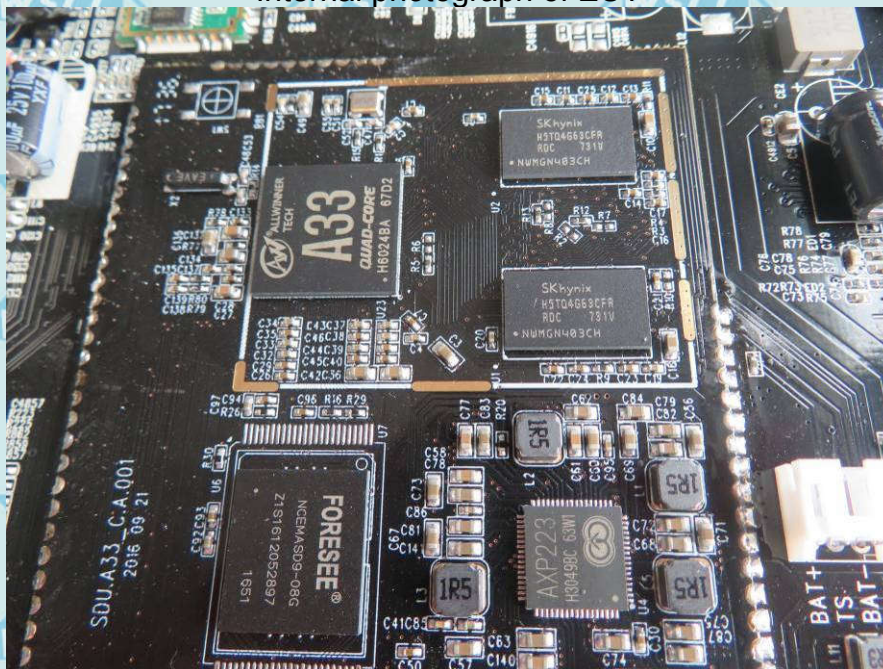




Internal photograph of EUT



Internal photograph of EUT

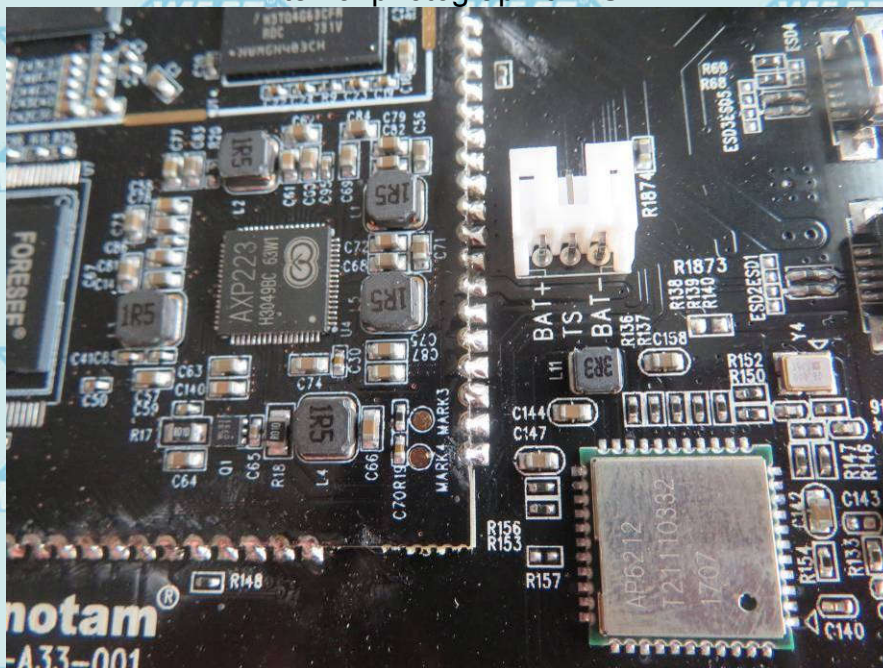




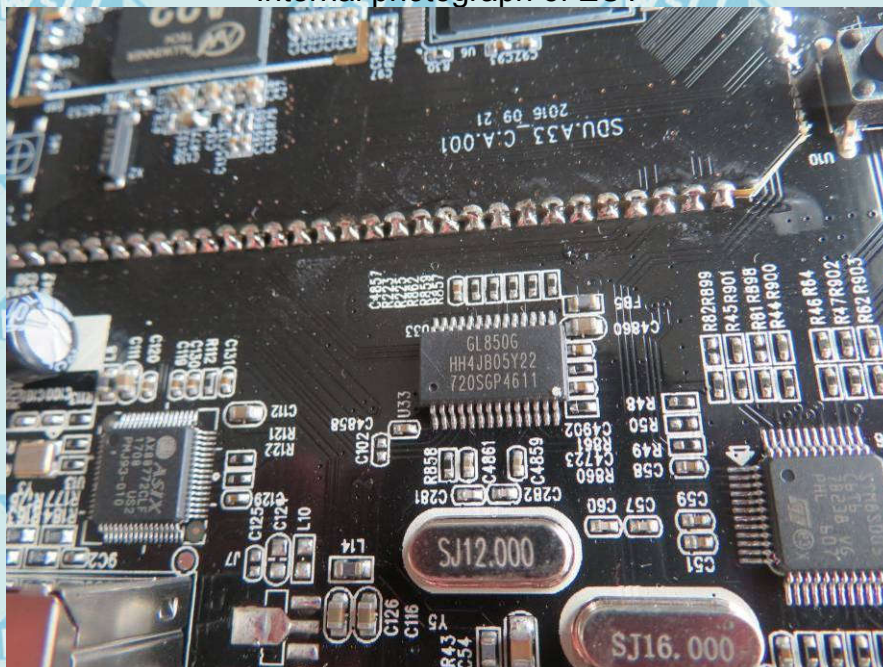


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Internal photograph of EUT



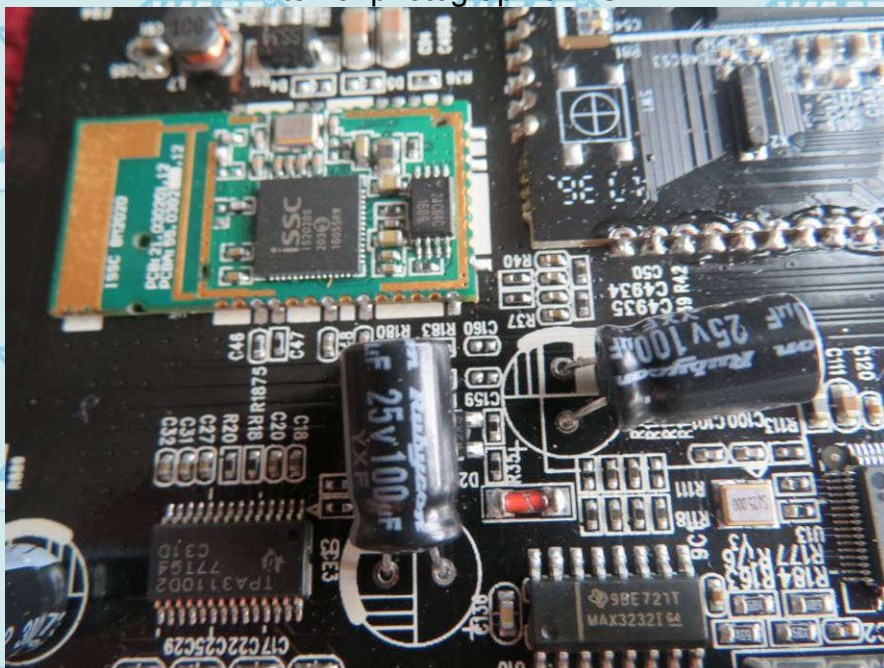
Internal photograph of EUT







Internal photograph of EUT



**\*\*\*\*\*END OF REPORT\*\*\*\*\***