

FCC Report

Application Purpose : Original grant
Applicant Name: : HUNG WAI PRODUCTS LIMITED
FCC ID : 2AB6Z-MS-W10
Equipment Type : 8 inch Windows OS Tablet
Model Name : DT080-MS-W10
Report Number : FCC17060478A-4
Standard(S) : FCC Part 15 Subpart B
Date Of Receipt : June 09, 2017
Date Of Issue : July 01, 2017

Test By : 

(Dekun Liu)

Reviewed By : 

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Authorized by : 

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Registration Number: 588523

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	July 01, 2017	Valid	Original Report

Table of Contents	Page
1. GENERAL INFORMATION	4
2. TEST DESCRIPTION	6
2.1 MEASUREMENT UNCERTAINTY	6
2.2 DESCRIPTION OF TEST MODES	7
2.3 CONFIGURATION OF SYSTEM UNDER TEST	8
2.4 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)	9
3. SUMMARY OF TEST RESULTS	10
4. MEASUREMENT INSTRUMENTS	11
5. EMC EMISSION TEST	12
5.1 CONDUCTED EMISSION MEASUREMENT	12
5.1.1 POWER LINE CONDUCTED EMISSION LIMITS	12
5.1.2 TEST PROCEDURE	13
5.1.3 DEVIATION FROM TEST STANDARD	13
5.1.4 TEST SETUP	13
5.1.5 EUT OPERATING CONDITIONS	13
5.1.6 TEST RESULTS	14
5.2 RADIATED EMISSION MEASUREMENT	16
5.2.1 RADIATED EMISSION LIMITS	16
5.2.2 TEST PROCEDURE	16
5.2.3 DEVIATION FROM TEST STANDARD	17
5.2.4 TEST SETUP	18
5.2.5 EUT OPERATING CONDITIONS	18
5.2.5.1 TEST RESULTS (BETWEEN 30M – 1000 MHZ)	19
5.2.5.2 TEST RESULTS (1GHZ TO 25GHZ)	21
6. EUT TEST PHOTO	22
7. PHOTOGRAPHS OF EUT	26

1. GENERAL INFORMATION

Test Model	DT080-MS-W10
Applicant	HUNG WAI PRODUCTS LIMITED
Address	Unit 11, 12/F., New Commerce Centre, 19 On Sum Street, Shatin, Hong Kong
Manufacturer	HUNG WAI ELECTRONICS (HUIZHOU) LTD
Address	3rd floor, NO. 1, Minfeng Road, Huinan High and New Technology Industry Park, Huiao Avenue, Huizhou City, Guangdong
Equipment Type	8 inch Windows OS Tablet
Brand Name	N/A
Hardware	V02
Software	CSR1.0.12
Adapter Information:	Adapter: PS12F120K1000UD Input: AC 100~240V 50/60Hz 0.35A Output: DC 12V  1000mA
Battery information:	Li-Polymer Battery : 266177YL Voltage: 3.7V Capacity: 1000mAh Limited Charge Voltage: 4.2V
Data of receipt	June 01, 2017
Date of test	June 20, 2017 to July 01, 2017
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

The above equipment was tested by QTC Certification & Testing Co., Ltd.

2nd Floor,BI Building,Fengyeyuan Industrial Plant,, Liuxian 2st. Road, Xin'an Street, Bao'an District,,Shenzhen,518000

Registration Number: 588523

The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2014. The sample tested as described in this report is in compliance with the FCC Rules Part15 Subpart B.

The test results of this report relate only to the tested sample identified in this report.

2. TEST DESCRIPTION

2.1 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	$\pm 3.2\text{dB}$
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	$\pm 2\%$

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

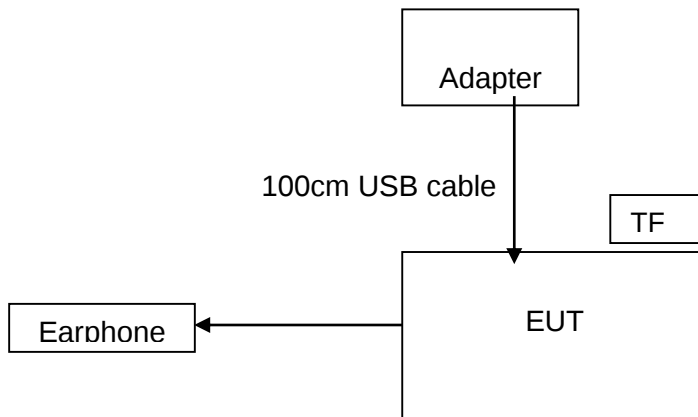
Pretest Mode	Description
Model 1	Video Playing
Mode 2	Exchange data with computer

For Conducted Emission	
Final Test Mode	Test with Keyboard and Mouse
Model 1	Video Playing
Mode 2	Exchange data with computer

For Radiated Emission	
Final Test Mode	Test with Keyboard and Mouse
Model 1	Video Playing
Mode 2	Exchange data with computer

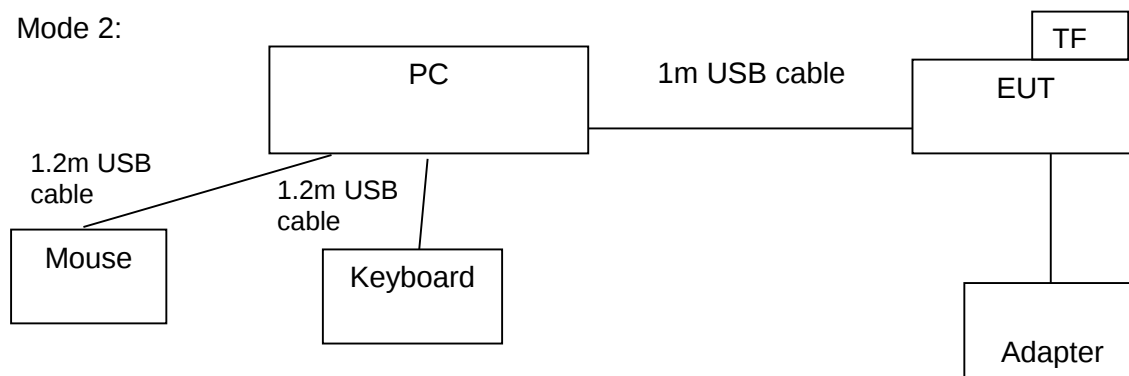
2.3 CONFIGURATION OF SYSTEM UNDER TEST

Mode 1:



(EUT: 8 inch Windows OS Tablet)

Mode 2:



(EUT: 8 inch Windows OS Tablet)

I/O Port of EUT			
I/O Port Type	Q'TY	Cable	Tested with
Power	1	1m USB cable, unshielded	1
Earphone	1	1m USB cable, unshielded	1

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	Mfr/Brand	Model/Type No.	Series No.	Note
1	Adapter	/	PS12F120K1000UD	/	/
2	Keyboard	HP	SK-2880	435302-AA-	/
3	Mouse	DELL	MS111-1	/	/

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.

3. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart B			
Standard Section	Test Item	Judgment	Remark
15.107	CONDUCTED EMISSION	PASS	
15.109	RADIATED EMISSION	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this test report.

4. MEASUREMENT INSTRUMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibrated	Calibrated until
ESCI Test Receiver	R&S	ESCI	100005	08/19/2016	08/18/2017
LISN	AFJ	LS16	16010222119	08/19/2016	08/18/2017
LISN(EUT)	Mestec	AN3016	04/10040	08/19/2016	08/18/2017
pre-amplifier	CDSI	PAP-1G18-38	--	08/19/2016	08/18/2017
System Controller	CT	SC100	-	08/19/2016	08/18/2017
Bi-log Antenna	Chase	CBL6111C	2576	08/19/2016	08/18/2017
Spectrum analyzer	R&S	FSU26	200409	08/19/2016	08/18/2017
Horn Antenna	SCHWARZBECK	9120D	1141	08/19/2016	08/18/2017
Bi-log Antenna	SCHWAREBECK	VULB9163	9163/340	08/19/2016	08/18/2017
Pre Amplifier	H.P.	HP8447E	2945A02715	10/13/2016	10/12/2017
9*6*6 Anechoic	--	--	--	08/21/2016	08/20/2017

5. EMC EMISSION TEST

5.1 CONDUCTED EMISSION MEASUREMENT

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

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

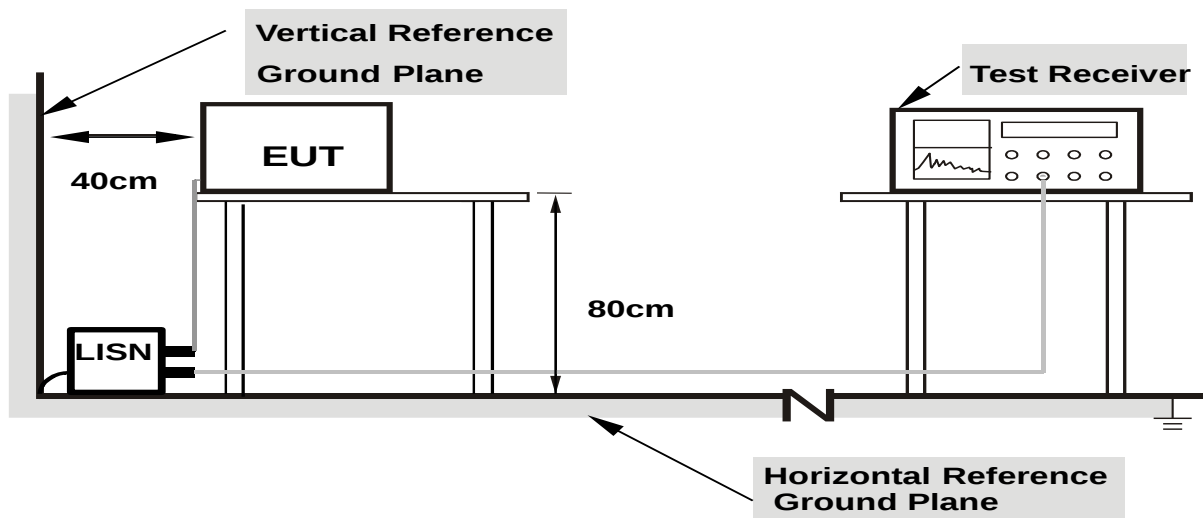
5.1.2 TEST PROCEDURE

- 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.

5.1.3 DEVIATION FROM TEST STANDARD

No deviation

5.1.4 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 from other units and other metal planes**

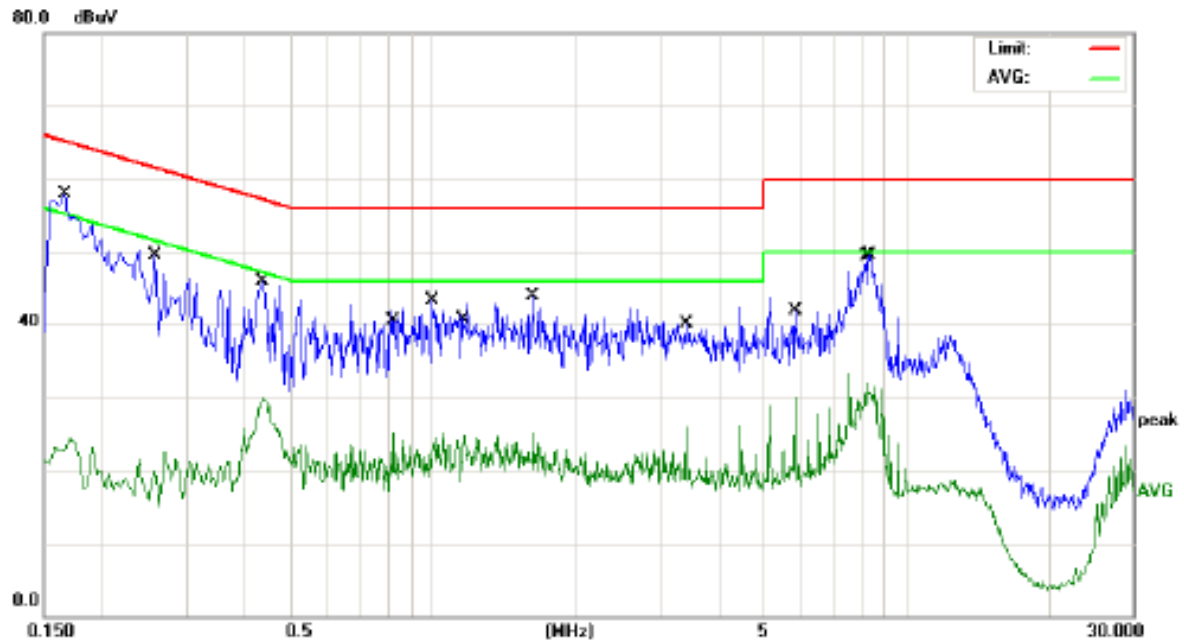
5.1.5 EUT OPERATING CONDITIONS

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.

5.1.6 TEST RESULTS

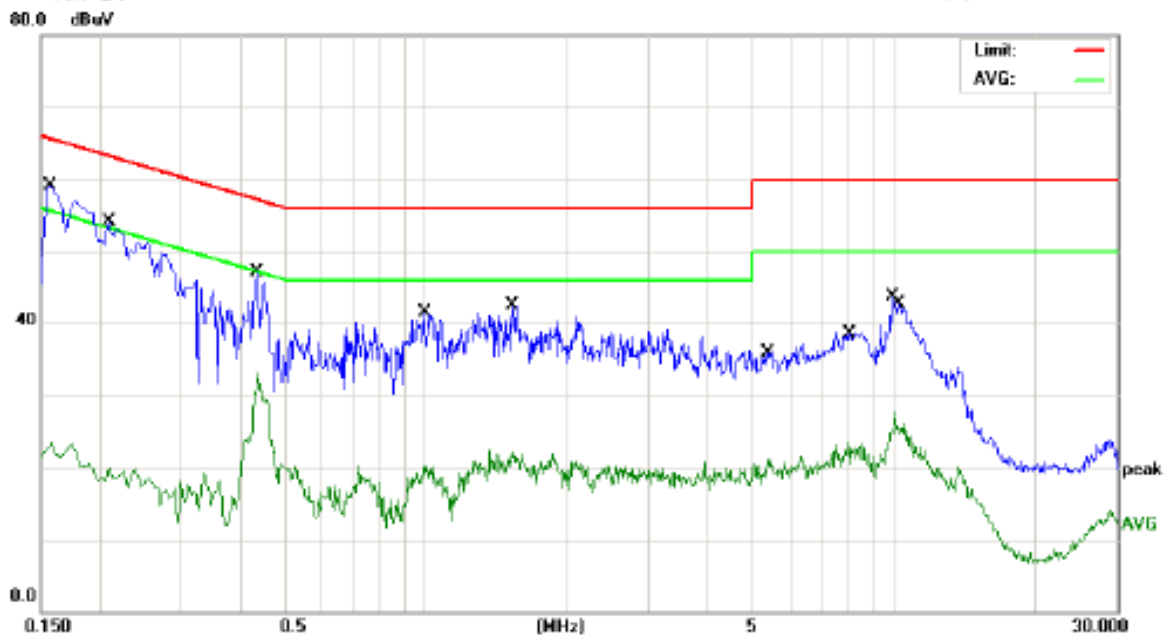
EUT	8 inch Windows OS Tablet	Model Name	DT080-MS-W10
Temperature	26 °C	Relative Humidity	54%
Pressure	1010hPa	Phase	L
Test Date	June 26, 2017	Test Mode	Mode 2

Note: All modes ,only the worst case is presented in this report .



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1660	46.16	11.68	57.84	65.15	-7.31	QP
2		0.2580	38.40	11.12	49.52	61.49	-11.97	QP
3		0.4340	34.93	10.90	45.83	57.18	-11.35	QP
4		0.4380	18.66	10.89	29.55	47.10	-17.55	AVG
5		0.8260	14.38	10.71	25.09	46.00	-20.91	AVG
6		0.9980	32.67	10.63	43.30	56.00	-12.70	QP
7		1.1620	14.23	10.62	24.85	46.00	-21.15	AVG
8		1.6220	33.22	10.60	43.82	56.00	-12.18	QP
9		3.4220	15.44	10.56	26.00	46.00	-20.00	AVG
10		5.8180	19.48	10.54	30.02	50.00	-19.98	AVG
11		8.2100	21.29	10.57	31.86	50.00	-18.14	AVG
12		8.3620	38.85	10.57	49.42	60.00	-10.58	QP

EUT	8 inch Windows OS Tablet	Model Name	DT080-MS-W10
Temperature	26 °C	Relative Humidity	54%
Pressure	1010hPa	Phase	N
Test Date	June 26, 2017	Test Mode	Mode 2



No.	Mk.	Freq. MHz	Reading Level dBμV	Correct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	C
1	*	0.1580	47.30	11.79	59.09	65.58	-6.47	QP	
2		0.1582	11.53	11.79	23.32	55.55	-32.23	AVG	
3		0.2100	42.81	11.19	54.00	63.20	-9.20	QP	
4		0.4340	36.21	10.90	47.11	57.18	-10.07	QP	
5		0.4380	22.23	10.89	33.12	47.10	-13.98	AVG	
6		0.9900	30.92	10.63	41.55	56.00	-14.45	QP	
7		1.5300	31.96	10.60	42.56	56.00	-13.44	QP	
8		1.5300	11.42	10.60	22.02	46.00	-23.98	AVG	
9		5.3780	10.55	10.54	21.09	50.00	-28.91	AVG	
10		8.0060	12.86	10.58	23.44	50.00	-26.56	AVG	
11		10.0380	17.03	10.59	27.62	50.00	-22.38	AVG	
12		10.2260	32.19	10.59	42.78	60.00	-17.22	QP	

5.2 RADIATED EMISSION MEASUREMENT

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

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

5.2.2 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.

Note:

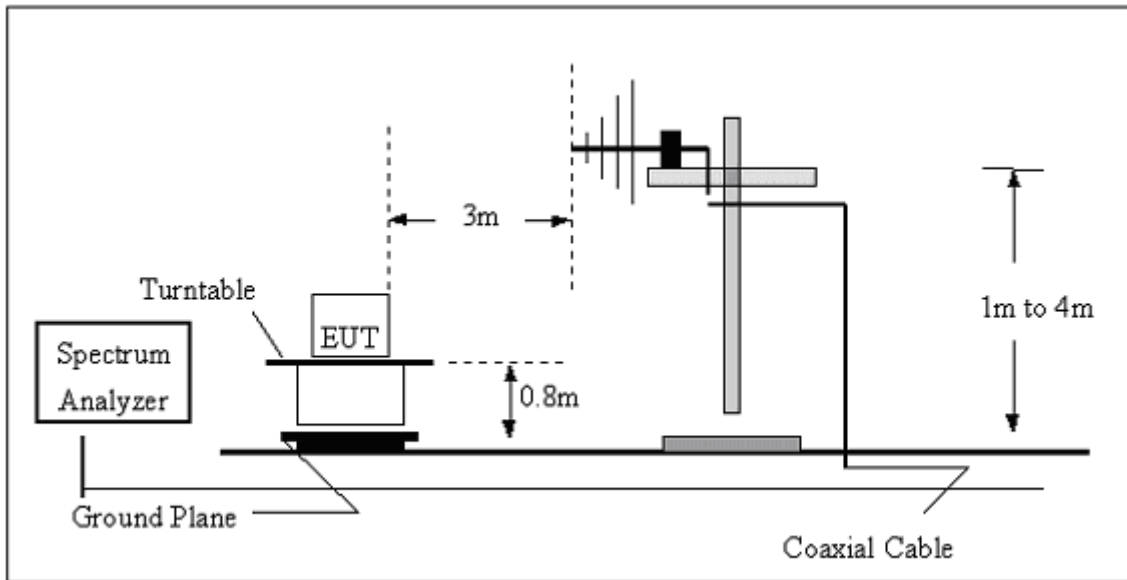
***Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported***

5.2.3 DEVIATION FROM TEST STANDARD

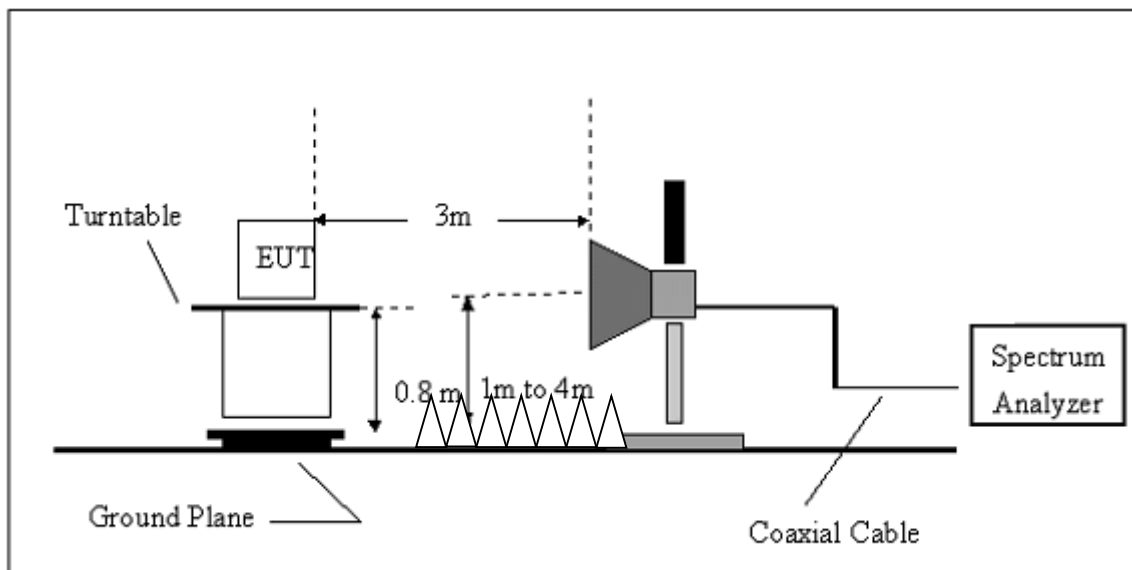
No deviation

5.2.4 TEST SETUP

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



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



5.2.5 EUT OPERATING CONDITIONS

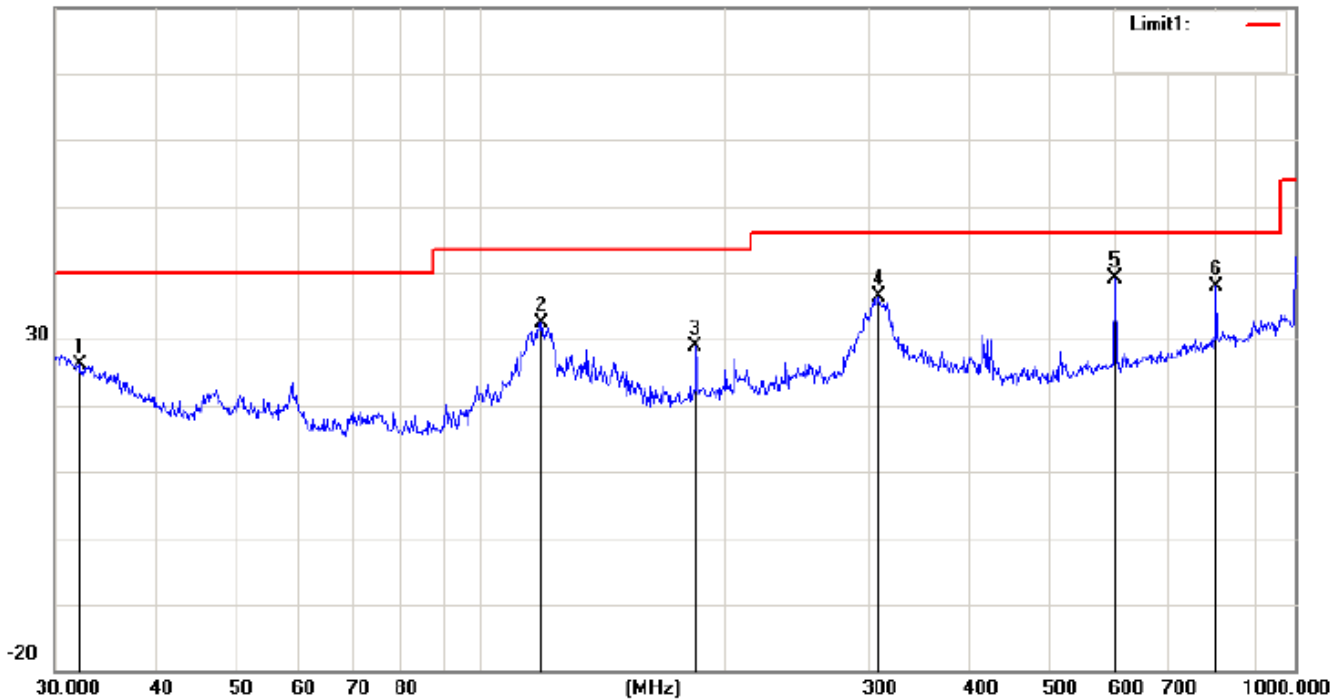
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.2.5.1 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

EUT	8 inch Windows OS Tablet	Model Name	DT080-MS-W10
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Horizontal
Test Mode	Mode 3	Test Date	June 26, 2017

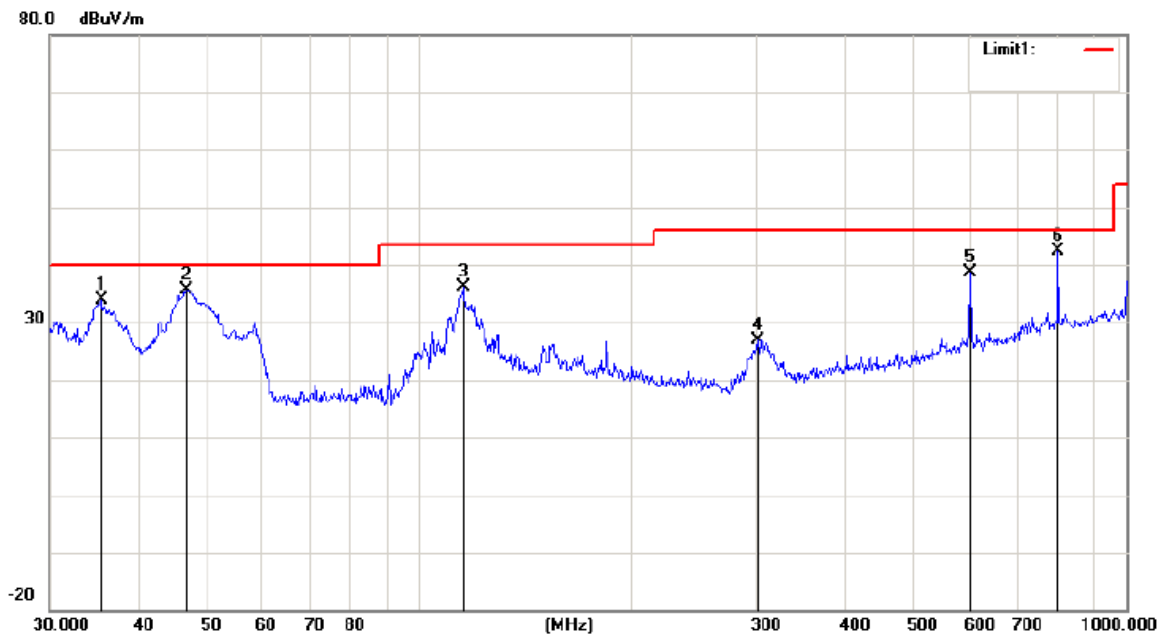
Note: All modes ,only the worst case is presented in this report .

80.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		32.1795	24.11	2.03	26.14	40.00	-13.86	QP
2		119.0180	34.77	-2.41	32.36	43.50	-11.14	QP
3		183.8440	34.03	-5.25	28.78	43.50	-14.72	QP
4		308.9126	40.90	-4.47	36.43	46.00	-9.57	QP
5	*	601.4265	38.11	1.04	39.15	46.00	-6.85	QP
6		801.7863	33.65	4.29	37.94	46.00	-8.06	QP

EUT	8 inch Windows OS Tablet	Model Name	DT080-MS-W10
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Vertical
Test Mode	Mode 3	Test Date	June 26, 2017



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		35.4993	33.99	-0.23	33.76	40.00	-6.24	QP
2		46.8303	43.20	-7.56	35.64	40.00	-4.36	QP
3		115.3205	38.94	-2.74	36.20	43.50	-7.30	QP
4		301.4224	32.48	-5.54	26.94	46.00	-19.06	QP
5		601.4265	37.47	1.04	38.51	46.00	-7.49	QP
6	*	801.7863	38.15	4.29	42.44	46.00	-3.56	QP

5.2.5.2 TEST RESULTS (1GHZ TO 25GHZ)

EUT	8 inch Windows OS Tablet	Model Name	DT080-MS-W10
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 2
Test Date	June 26, 2017		

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1632.45	V	59.67	39.01	74	54	-14.33	-14.99
2829.27	V	59.51	40.10	74	54	-14.49	-13.90
1684.52	H	59.26	40.88	74	54	-14.74	-13.12
2831.6	H	58.64	39.64	74	54	-15.36	-14.36

Remark:

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

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

All modes ,only the worst case is presented in this report .

6. EUT TEST PHOTO

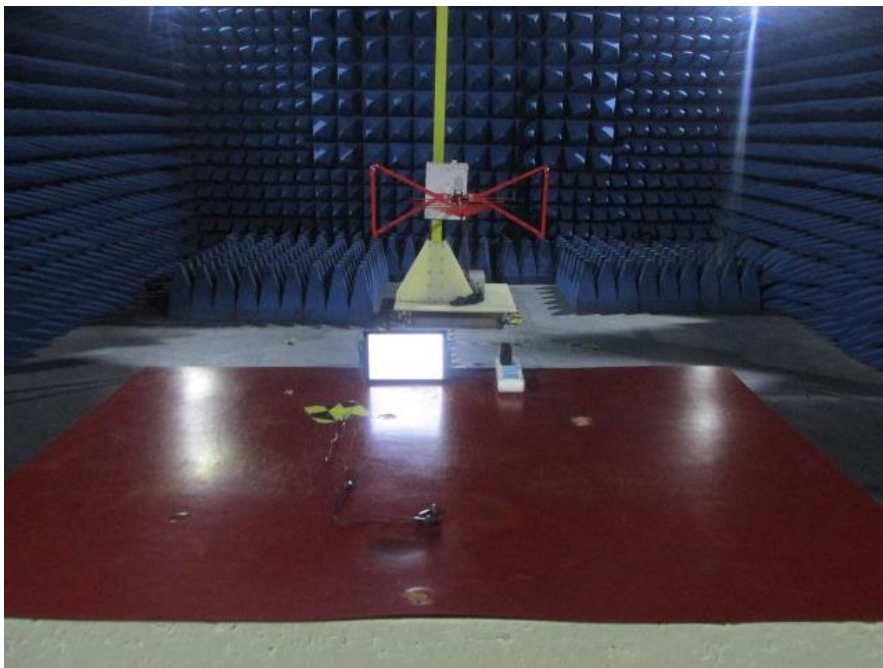
CONDUCTED EMISSION TEST



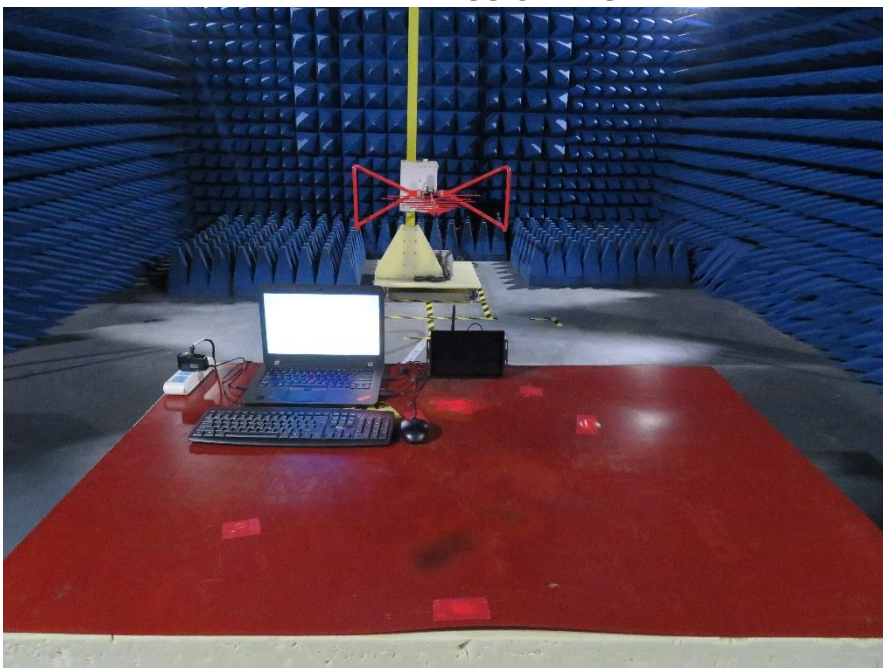
CONDUCTED EMISSION TEST



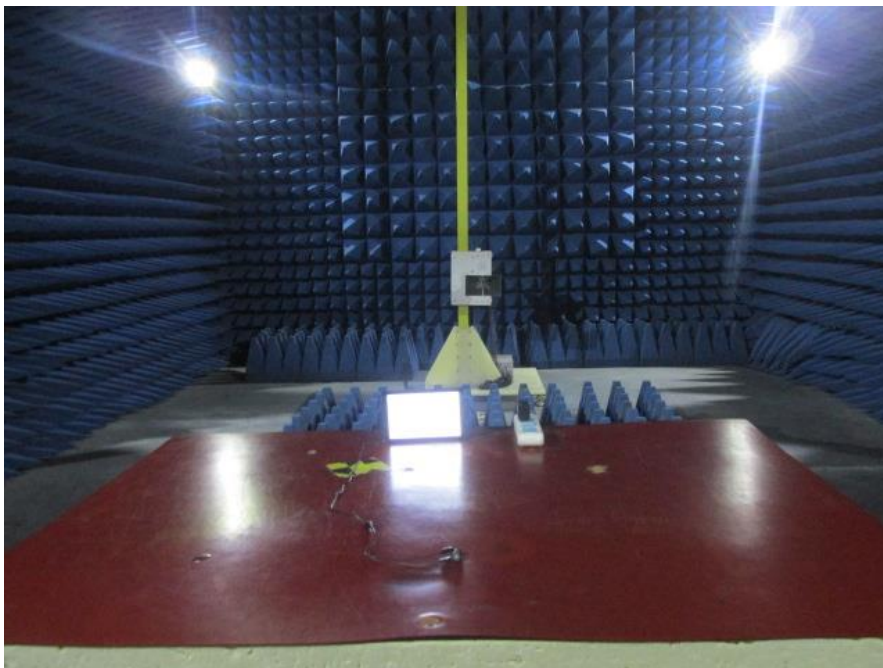
RADIATED EMISSION TEST



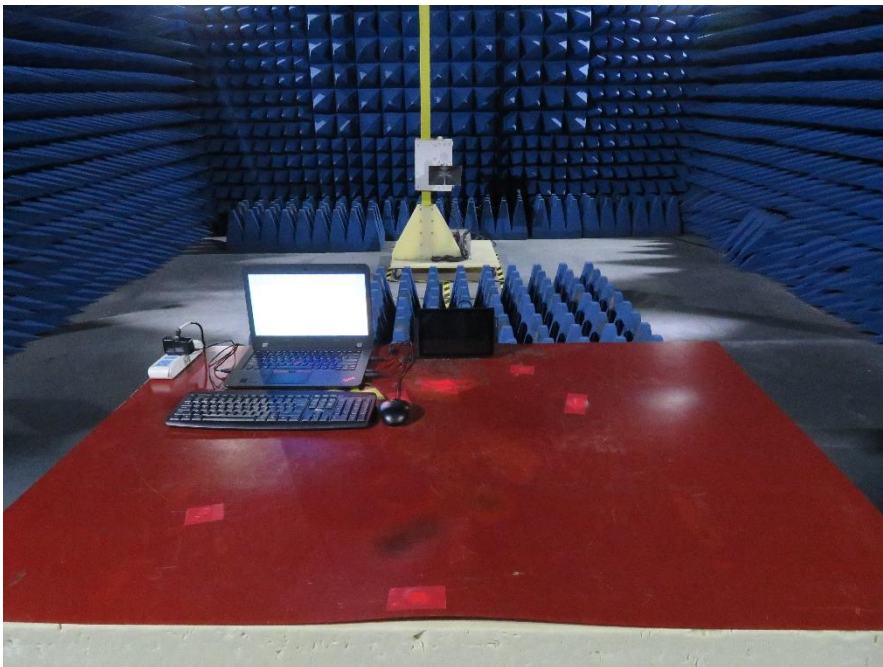
RADIATED EMISSION TEST



RADIATED EMISSION TEST



RADIATED EMISSION TEST



RADIATED EMISSION TEST



7. PHOTOGRAPHS OF EUT

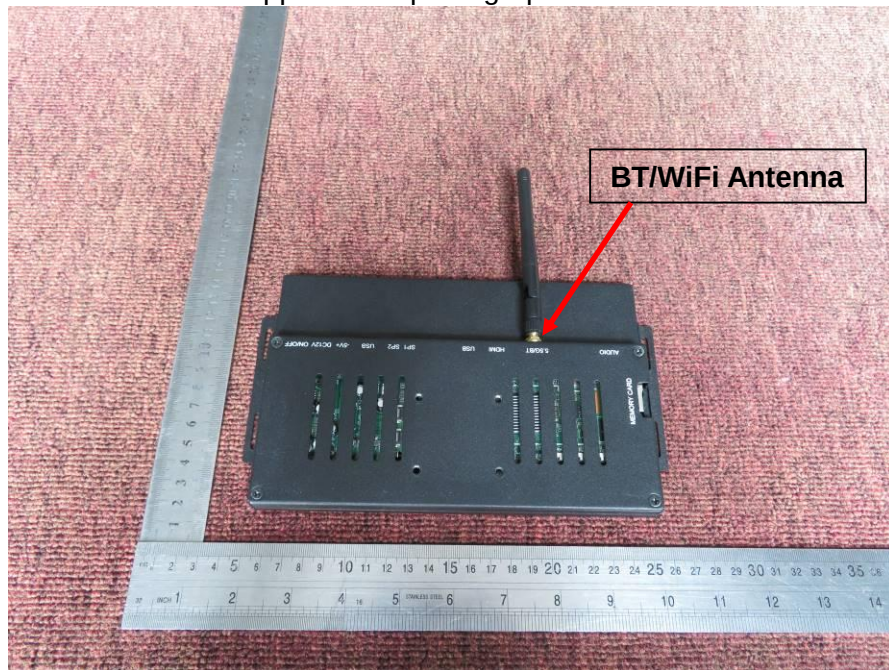
Appearance photograph of EUT



Appearance photograph of EUT



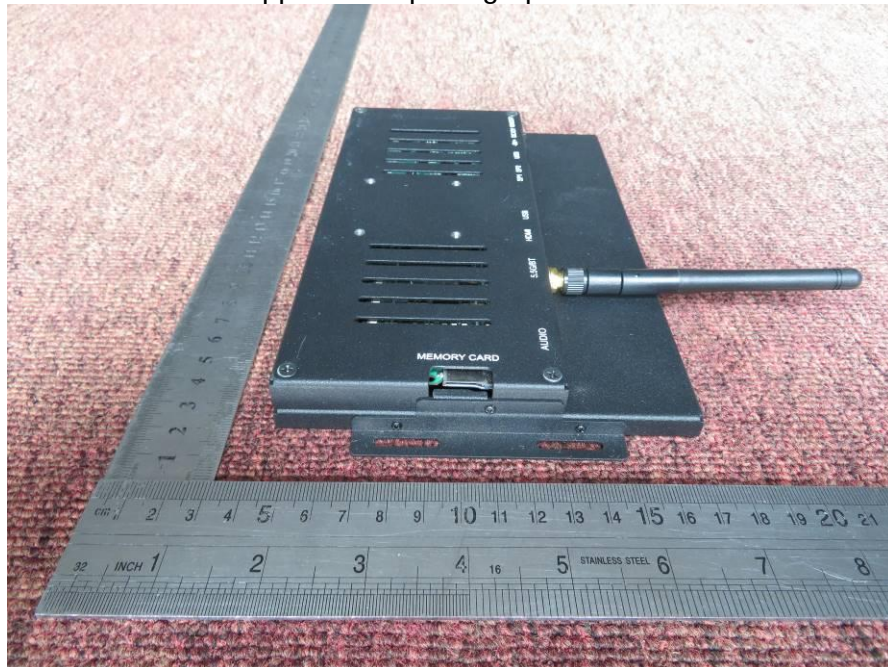
Appearance photograph of EUT



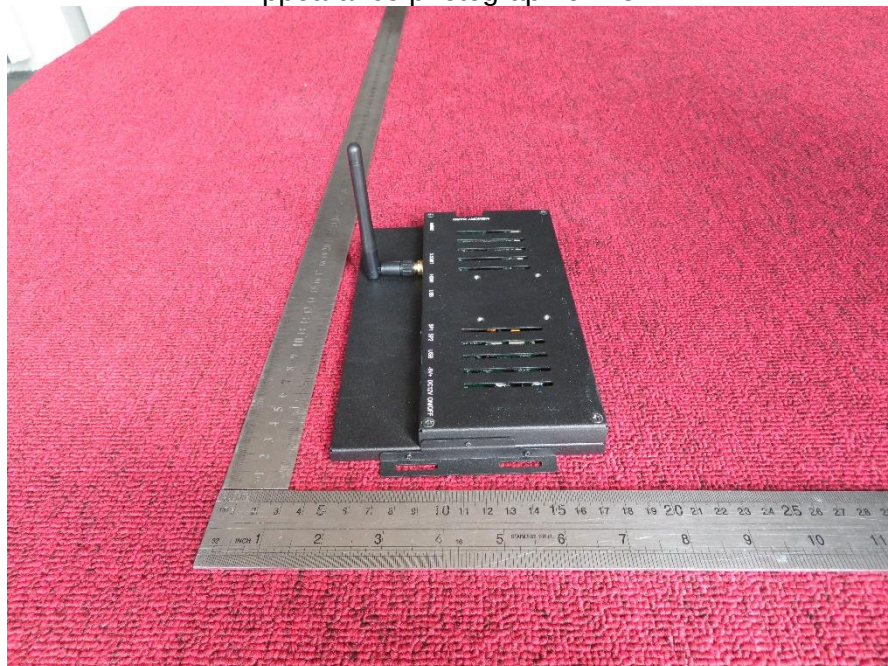
Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



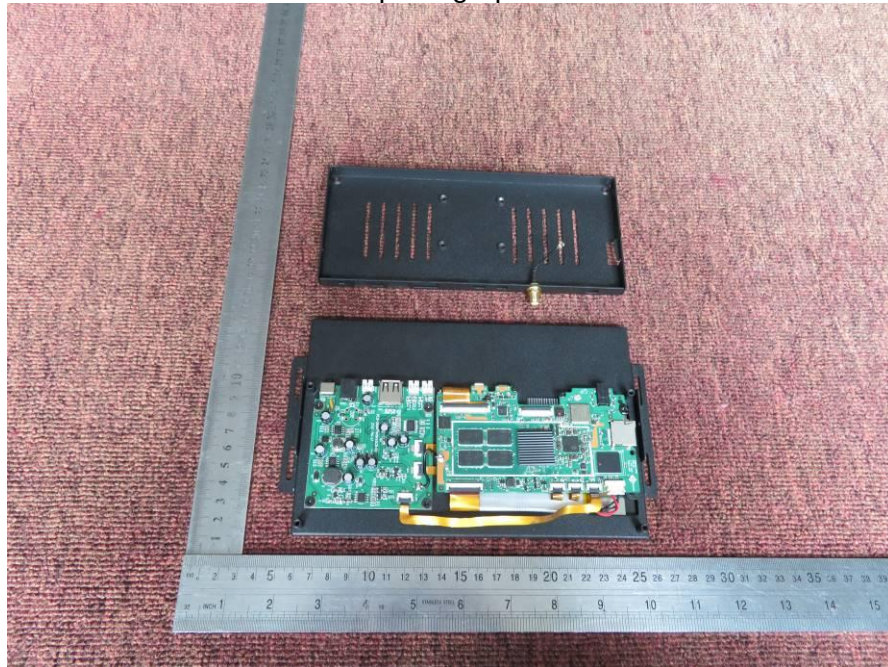
Appearance photograph of EUT



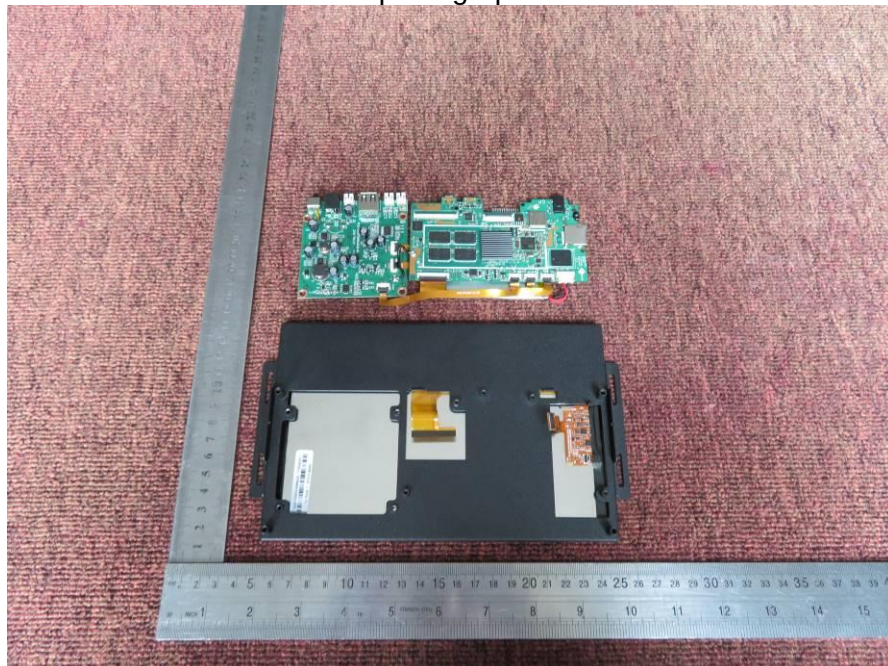
Appearance photograph of EUT



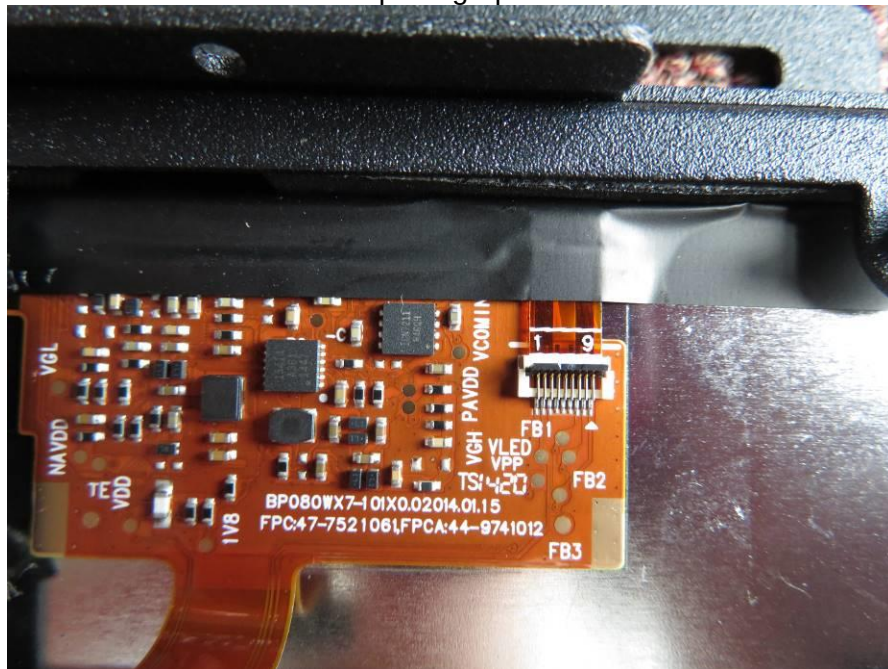
Internal photograph of EUT



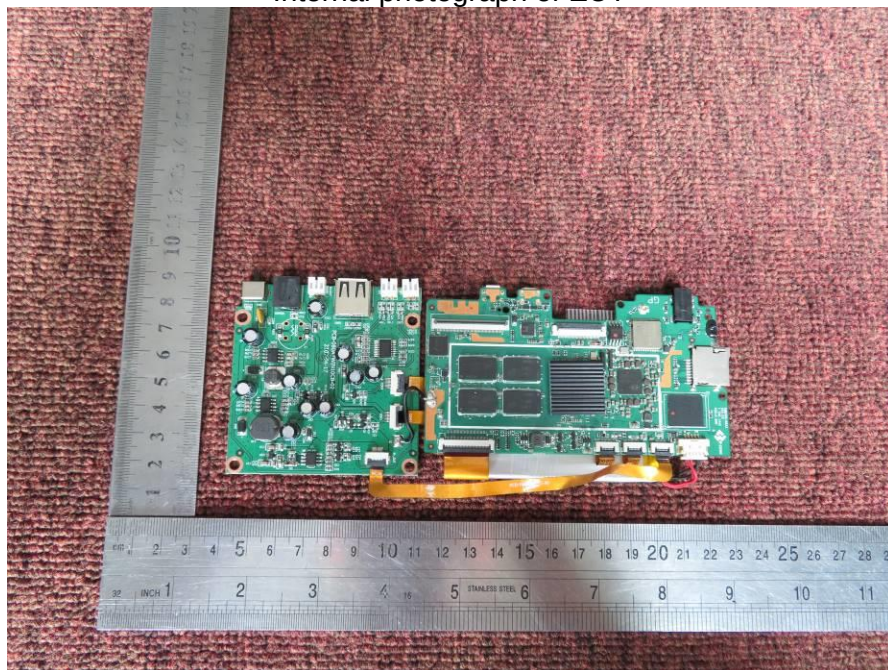
Internal photograph of EUT



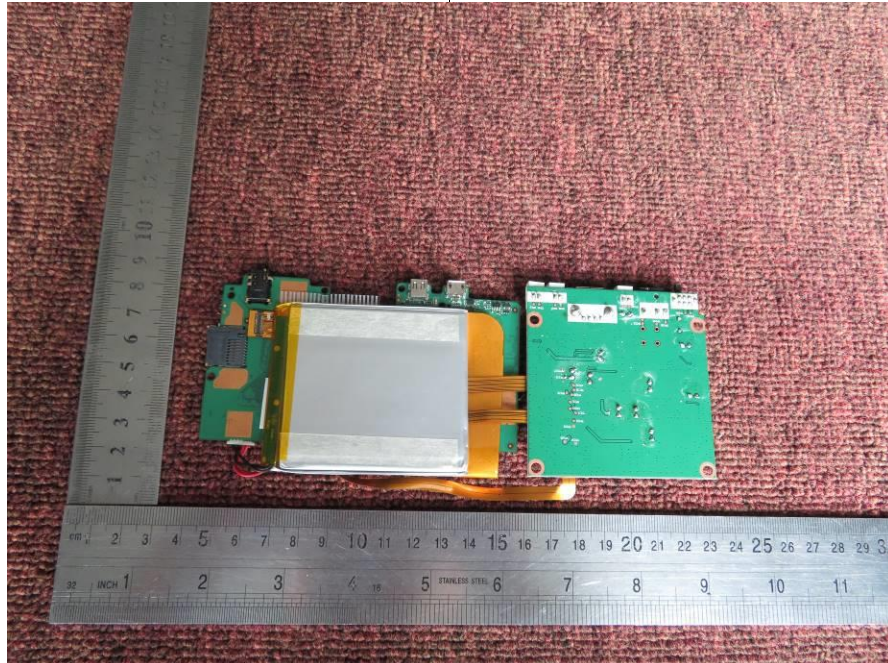
Internal photograph of EUT



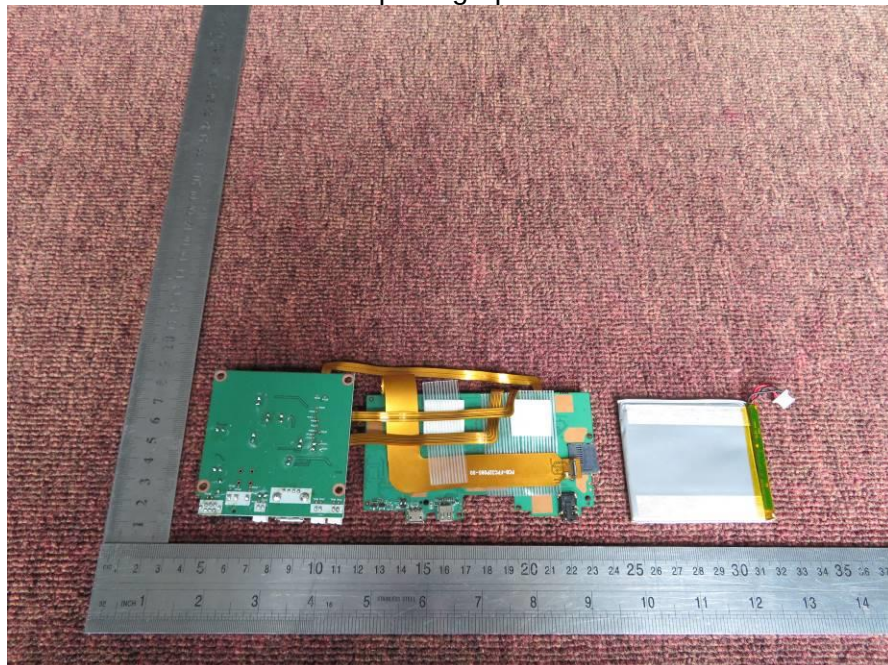
Internal photograph of EUT



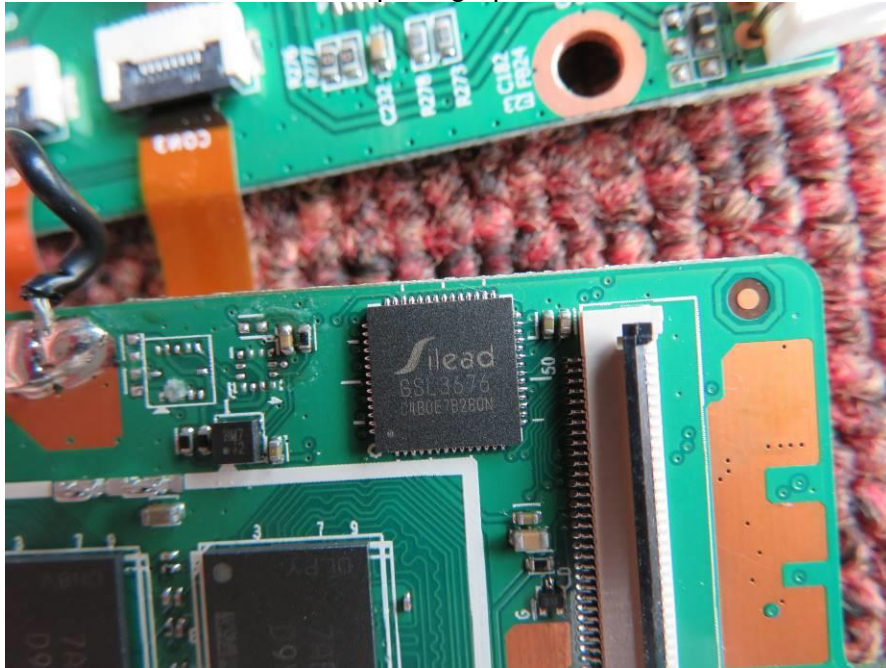
Internal photograph of EUT



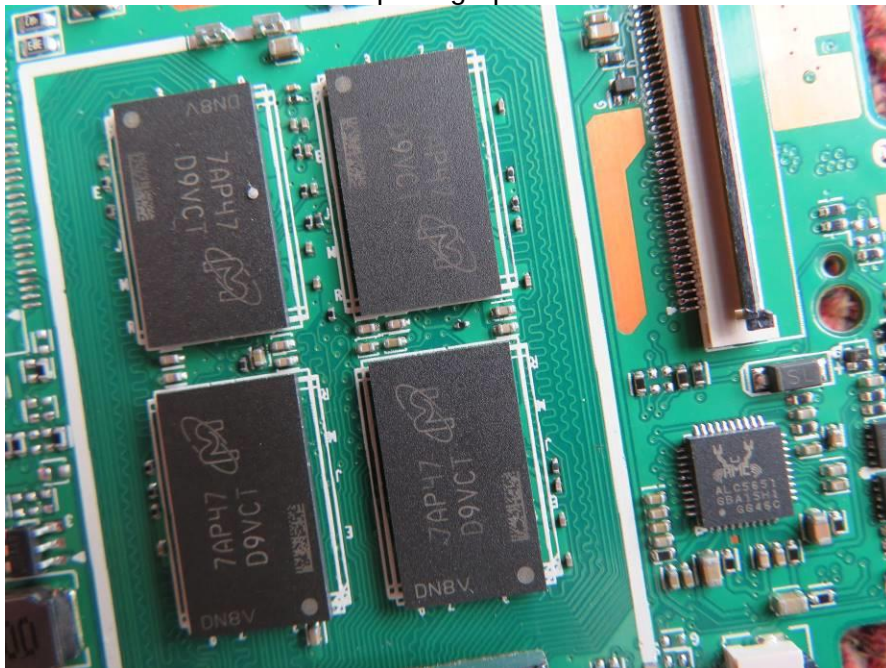
Internal photograph of EUT



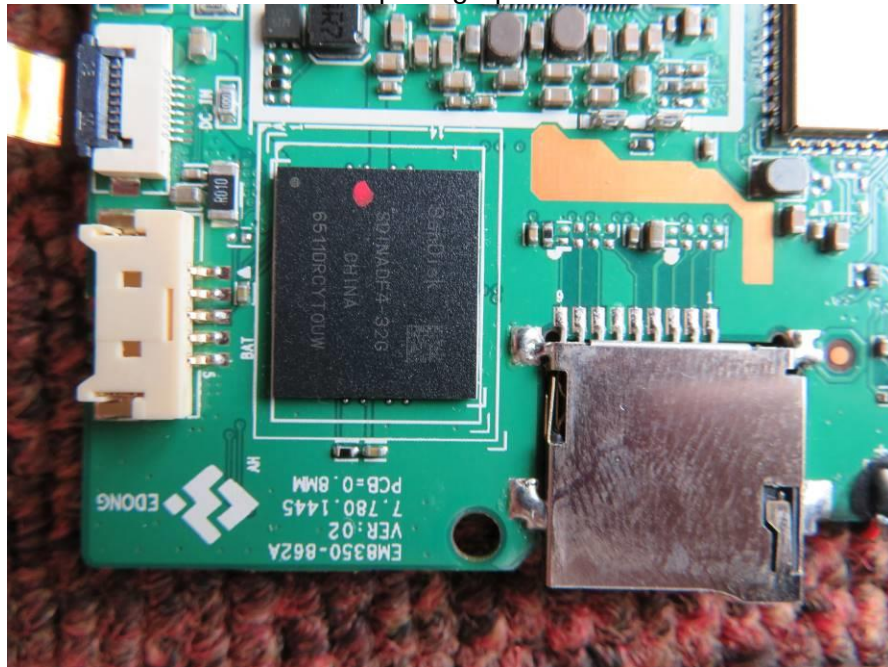
Internal photograph of EUT



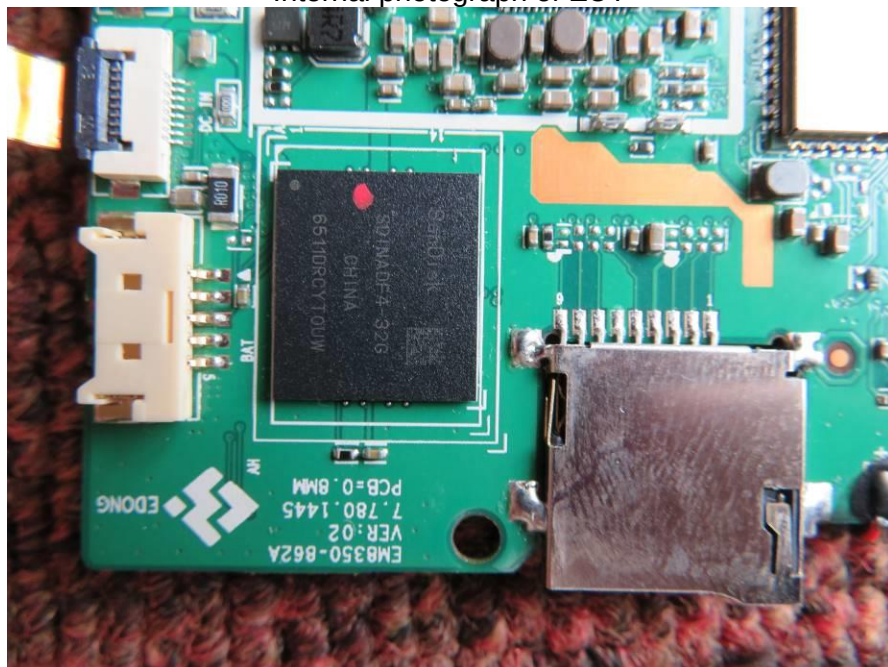
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



---END OF REPORT---