

EMC Report

Product: Bluetooth Keyboard

Model No.: B033

Additional Model No.: N/A

Trade Mark: N/A

Report No.: TCT170610E035

Issued Date: Jun. 15, 2017

Issued for:

MIUC Technology (Shenzhen) Co., Ltd.

**2th Floor, Xinjihui Industrial Park 5 building, No.5 Shangxue Rd,
Bantian, Shenzhen, China**

Issued By:

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1. Test Certification

Product:	Bluetooth Keyboard
Model No.:	B033
Additional Model:	N/A
Applicant:	MIUC Technology (Shenzhen) Co., Ltd.
Address:	2th Floor, Xinjihui Industrial 5 building, No.5 Shangxue Rd, Bantian, Shenzhen, China
Manufacturer:	MIUC Technology (Shenzhen) Co., Ltd.
Address:	2th Floor, Xinjihui Industrial 5 building, No.5 Shangxue Rd, Bantian, Shenzhen, China
Date of Test:	Jun. 12– Jun. 14, 2017
Applicable Standards:	Draft ETSI EN 301 489-17 V3.2.0 (2017-03) Draft ETSI EN 301 489-1 V2.2.0 (2017-03)

The above equipment has been tested by Shenzhen TCT Testing Technology 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.

This report is covering the essential requirement of directive 2014/53/EU.

Tested By:



Beryl Zhao

Date:

Jun. 14, 2017

Reviewed By:



Tomsin

Date:

Jun. 15, 2017

Approved By:

Date:

Jun. 15, 2017

2. Test Result Summary

EMI Test				
Test Item	Test Requirement	Test Method	Application	Result
Radiated Emission	ETSI EN301 489-1	EN 55032	Enclosure	PASS
Conducted Emission	ETSI EN301 489-1	EN 55032	AC port	PASS
Harmonic Current Emissions	ETSI EN301 489-1	EN 61000-3-2	AC port	N/A
Voltage Fluctuations and Flicker	ETSI EN301 489-1	EN 61000-3-3	AC port	N/A
EMS Test				
ESD (Electrostatic Discharge)	ETSI EN301 489-1	EN 61000-4-2	Enclosure	PASS
Radiated Immunity	ETSI EN301 489-1	EN 61000-4-3	Enclosure	PASS
EFT (Electrical Fast Transients)	ETSI EN301 489-1	EN 61000-4-4	AC port	N/A
Surge Immunity	ETSI EN301 489-1	EN 61000-4-5	AC port	N/A
Injected Currents	ETSI EN301 489-1	EN 61000-4-6	AC port	N/A
Voltage Dips and Interruptions	ETSI EN301 489-1	EN 61000-4-11	AC port	N/A
Note: 1 Pass: Test item meets the requirement. 2. N/A: Test case does not apply to the test object. 3. The test result judgment is decided by the limit of test standard.				

3. EUT Description

Product Name:	Bluetooth Keyboard
Model :	B033
Additional Model:	N/A
Trade Mark:	N/A
Hardware Version	V2.1
Software Version	V3.0
Operation Frequency:	2402MHz~2480MHz
Transfer Rate:	1Mbps
Modulation Technology:	GFSK
Antenna Type:	Internal Antenna
Antenna Gain:	1.87 dBi
Power Supply:	Rechargeable Li-ion Battery DC3.7V

4. General Information

4.1. Test environment and mode

Item	Normal condition
Temperature	+25°C
Voltage	DC 3.7V
Humidity	56%
Atmospheric Pressure:	96 mbar
Test Mode:	
TM1	Charging+BT Link

4.2. Description of Support Units

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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Notebook	G485	/	/	Lenovo
Mobile Phone	M2	20141124	/	MI

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.3. Test Instruments List

Name	Model No.	Manufacturer	Date of Cal.	Due Date
Conducted Emission				
EMI Test Receiver	ESCS30	R&S	Aug. 12, 2016	Aug. 11, 2017
LISN	NSLK 8126	Schwarzbeck	Aug. 17, 2016	Aug. 16, 2017
Attenuator	N/A	N/A	Aug. 17, 2016	Aug. 16, 2017
Coaxial Cable	N/A	TCT	Aug. 13, 2016	Aug. 12, 2017
Radiated Emission				
Test Receiver	ESVD	R&S	Aug. 12, 2016	Aug. 11, 2017
Spectrum Analyzer	FSEM	R&S	Aug. 12, 2016	Aug. 11, 2017
Pre-amplifier	8447D	H.P.	Aug. 12, 2016	Aug. 11, 2017
Pre-amplifier	EM30265	EM Electronics Corporation CO.,LTD	Aug. 12, 2016	Aug. 11, 2017
BiConiLog Antenna	VULB9163	Schwarzbeck Mess-Elektronik	Aug. 14, 2016	Aug. 13, 2017
Double -ridged waveguide horn	BBHA9120D	Schwarzbeck Mess-Elektronik	Aug. 14, 2016	Aug. 13, 2017
Coaxial Cable	N/A	TCT	Aug. 13, 2016	Aug. 12, 2017
Coaxial Cable	N/A	TCT	Aug. 13, 2016	Aug. 12, 2017
Coaxial Cable	N/A	TCT	Aug. 13, 2016	Aug. 12, 2017
Coaxial Cable	N/A	TCT	Aug. 13, 2016	Aug. 12, 2017
Loop antenna	ZN30900A	ZHINAN	Aug. 14, 2016	Aug. 13, 2017
Electrostatic Discharge				
Electostatic Discharge Generator	ESD61002AG	Prima	Aug. 12, 2016	Aug. 11, 2017
Continuous Radiated Disturbances				
Signal Generator	2022D	Maconi	Aug. 13, 2016	Aug. 12, 2017
Power Amplifier	A00181-1000	M2S	Aug. 13, 2016	Aug. 12, 2017
Power Amplifier	AC8113/800-250A	M2S	Aug. 13, 2016	Aug. 12, 2017
Power Antenna	CBL6140A	SCHAFFNER	Aug. 13, 2016	Aug. 12, 2017
Antenna Tripod	TP1000A	Amplifier Research	N/A	N/A
High Gain Horn Antenna (0.8-6GHz)	AT4002A	Amplifier Research	N/A	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 572331

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen TCT Testing Technology Co., Ltd.

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

Tel: +86-755-27673339

5.3. Measurement Uncertainty

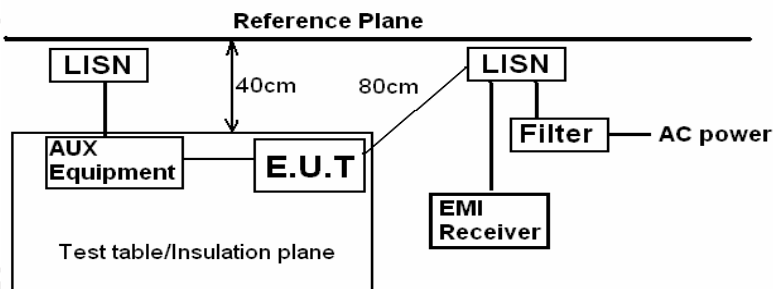
The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Temperature	$\pm 0.1^{\circ}\text{C}$
2	Humidity	$\pm 1.0 \%$
3	Spurious Emissions, Conducted	$\pm 2.56 \text{ dB}$
4	All Emissions, Radiated	$\pm 4.28\text{dB}$

6. Emission Test

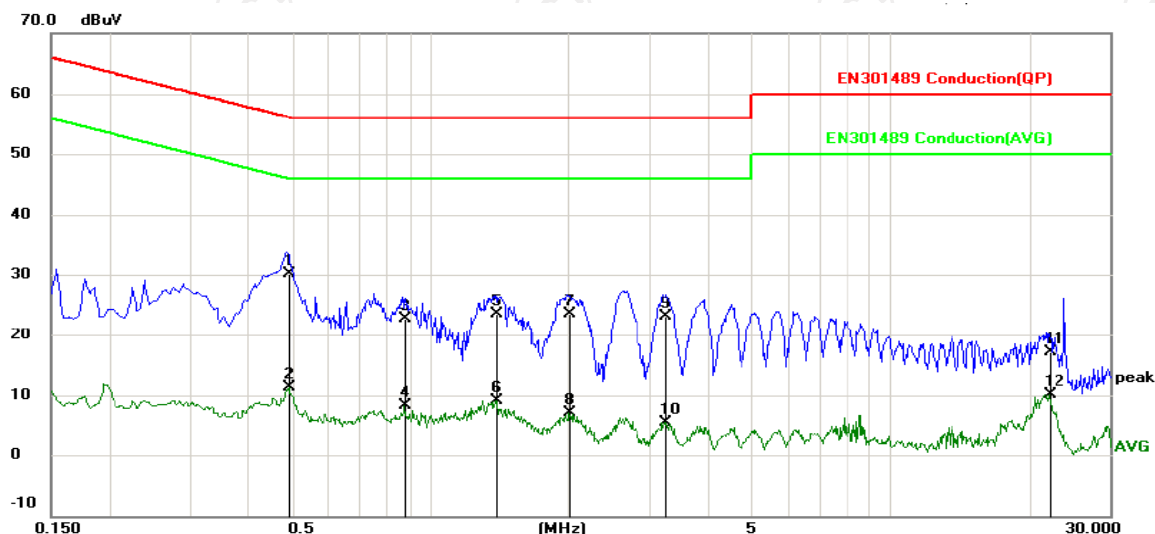
6.1. Conducted Emission

6.1.1. Test Specification

Test Requirement:	ETSI EN 301 489-1		
Test Method:	EN 55032		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity: Class B	Class B		
Receiver Setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Setup:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Procedure	The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN55032 Class B on conducted measurement.		
Test Instrument:	Refer to section 4.3 for details		
Test Mode:	Refer to section 4.1 for details		
Test Results:	PASS		

6.1.2. Test Data

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



Site: Limit: EN301489 Conduction(QP) Phase: L1 Temperature: 26
Power: Humidity: 60 %

No.	Mk.	Freq. MHz	Reading Level dBμV	Correct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	Comment
1	*	0.4920	18.90	11.30	30.20	56.13	-25.93	QP	
2		0.4920	-0.06	11.30	11.24	46.13	-34.89	AVG	
3		0.8789	11.40	11.21	22.61	56.00	-33.39	QP	
4		0.8789	-2.88	11.21	8.33	46.00	-37.67	AVG	
5		1.3874	12.10	11.38	23.48	56.00	-32.52	QP	
6		1.3874	-2.20	11.38	9.18	46.00	-36.82	AVG	
7		2.0039	11.90	11.69	23.59	56.00	-32.41	QP	
8		2.0039	-4.64	11.69	7.05	46.00	-38.95	AVG	
9		3.2325	11.90	11.25	23.15	56.00	-32.85	QP	
10		3.2325	-5.71	11.25	5.54	46.00	-40.46	AVG	
11		22.1505	6.50	10.65	17.15	60.00	-42.85	QP	
12		22.1505	-0.56	10.65	10.09	50.00	-39.91	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

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

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

Limit (dBμV) = Limit stated in standard

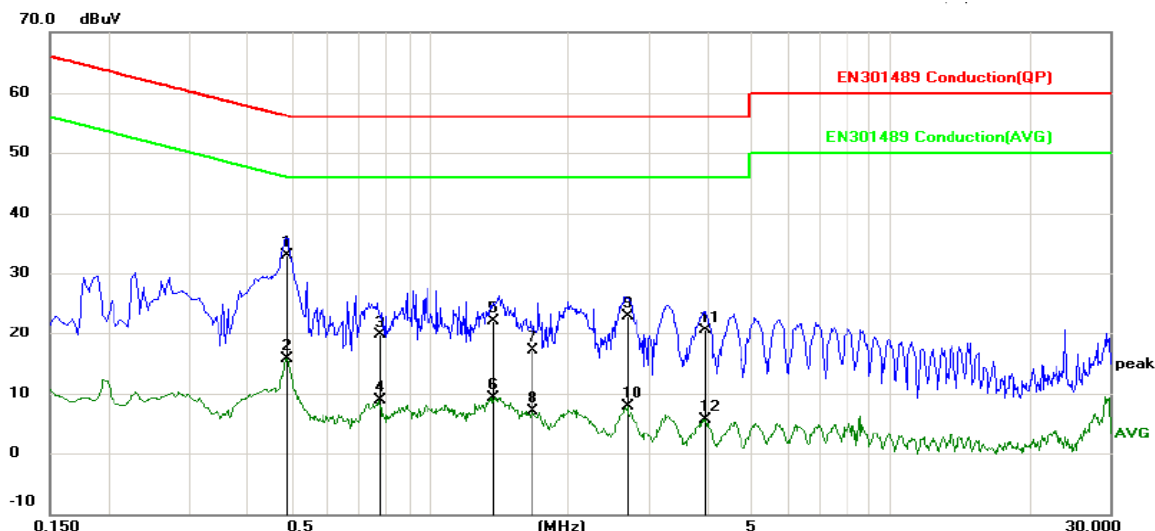
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

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

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



Site: EN301489 Conduction(QP) Phase: N Temperature: 26
Limit: EN301489 Conduction(QP) Power: Humidity: 60 %

No.	Mk.	Freq. MHz	Reading Level dBμV	Correct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	Comment
1	*	0.4875	21.50	11.31	32.81	56.21	-23.40	QP	
2		0.4875	4.45	11.31	15.76	46.21	-30.45	AVG	
3		0.7755	8.50	11.22	19.72	56.00	-36.28	QP	
4		0.7755	-2.23	11.22	8.99	46.00	-37.01	AVG	
5		1.3695	10.70	11.38	22.08	56.00	-33.92	QP	
6		1.3695	-2.00	11.38	9.38	46.00	-36.62	AVG	
7		1.6710	5.50	11.53	17.03	56.00	-38.97	QP	
8		1.6710	-4.43	11.53	7.10	46.00	-38.90	AVG	
9		2.6790	11.50	11.44	22.94	56.00	-33.06	QP	
10		2.6790	-3.53	11.44	7.91	46.00	-38.09	AVG	
11		3.9570	9.60	10.98	20.58	56.00	-35.42	QP	
12		3.9570	-5.20	10.98	5.78	46.00	-40.22	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

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

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

Limit (dBμV) = Limit stated in standard

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

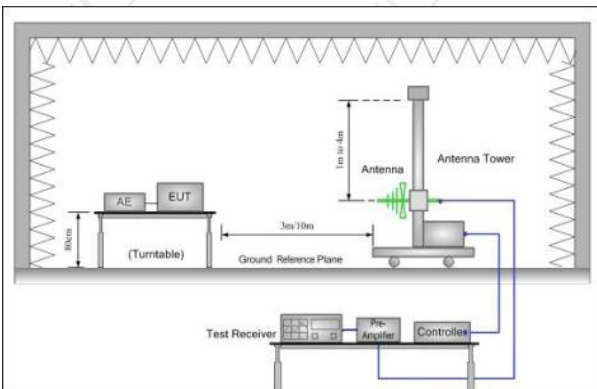
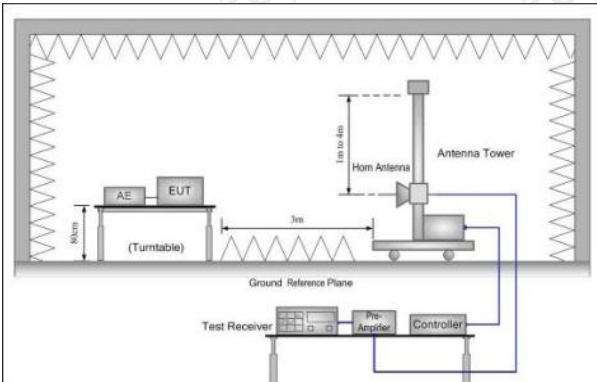
Q.P. =Quasi-Peak

AVG =average

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

6.2. Radiated Emission

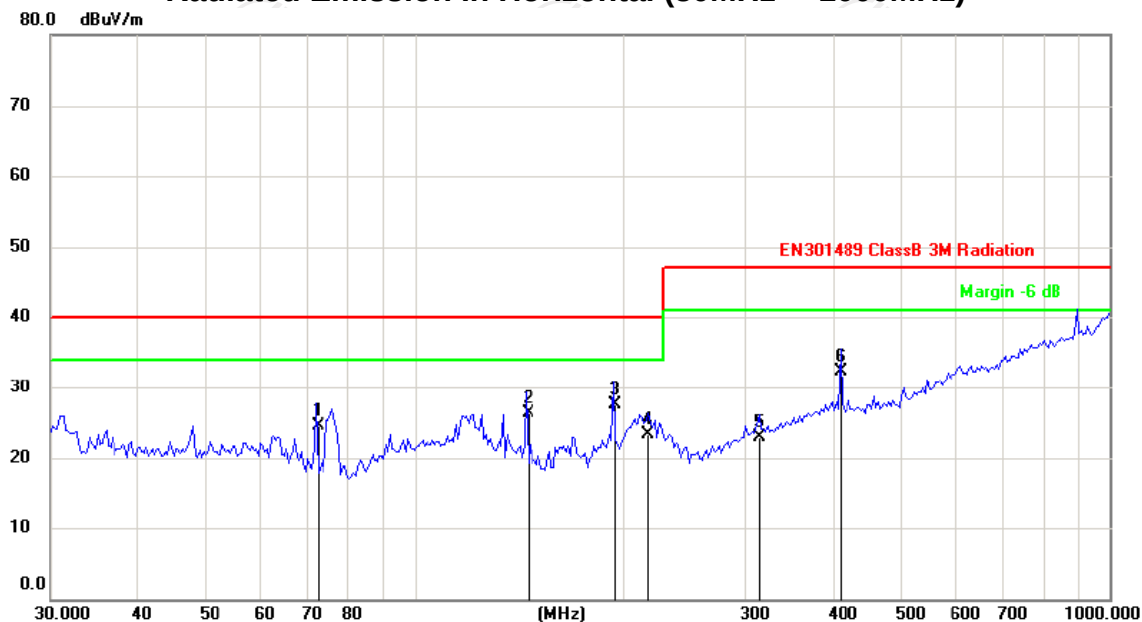
6.2.1. Test Specification

Test Requirement:	ETSI EN 301 489-1				
Test Method:	EN 55032				
Test Frequency Range:	30MHz to 6GHz				
Test Site:	Measurement Distance: 3m				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak Average	1MHz 1MHz	3MHz 10Hz	Peak Value Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-230MHz		40.0		Quasi-peak Value
	230MHz-1GHz		47.0		Quasi-peak Value
	1GHz-3GHz		50.0		Average Value
			70.0		Peak Value
	3GHz-6GHz		54.0		Average Value
			74.0		Peak Value
Test Setup:	Below 1GHz				
					
Test Setup:	Above 1GHz				
					
Test Procedure:	From 30MHz to 1GHz: 1. The radiated emissions test was conducted in a				

	semi-anechoic chamber. - The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. - Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT. - The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. Above 1GHz: - The radiated emissions test was conducted in a fully-anechoic chamber. - The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. - Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT. - The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
Test Instrument:	Refer to section 4.3 for details
Test Mode:	Refer to section 4.1 for details
Test Results:	PASS

6.2.2. Test Data

Radiated Emission In Horizontal (30MHz----1000MHz)



Site: Polarization: **Horizontal** Temperature: 25
Limit: EN301489 ClassB 3M Radiation Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		72.2111	35.70	-11.10	24.60	40.00	-15.40	QP		
2		144.7899	36.70	-10.45	26.25	40.00	-13.75	QP		
3	*	193.1366	36.80	-9.25	27.55	40.00	-12.45	QP		
4		217.6437	32.40	-9.06	23.34	40.00	-16.66	QP		
5		313.6482	27.70	-4.71	22.99	47.00	-24.01	QP		
6		409.6506	33.90	-1.53	32.37	47.00	-14.63	QP		

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

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

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

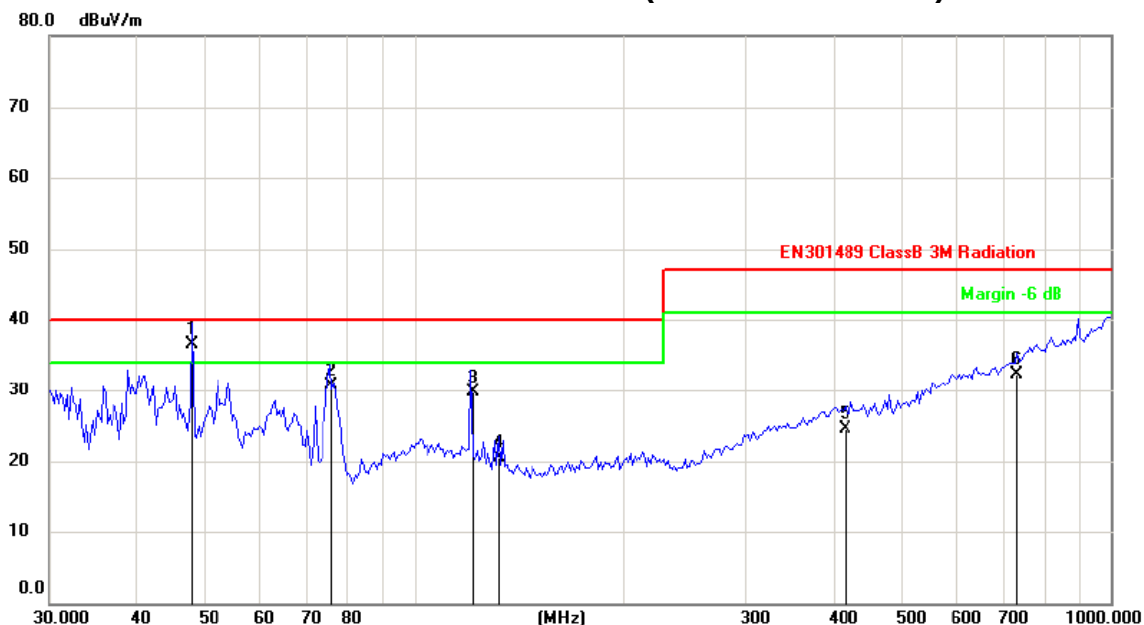
Limit (dBμV) = Limit stated in standard

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

Any value more than 10dB below limit have not been specifically reported.

* is meaning the worst frequency has been tested in the test frequency range

Radiated Emission In Vertical (30MHz----1000MHz)



Site: Polarization: **Vertical** Temperature: 25
Limit: EN301489 ClassB 3M Radiation Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	48.0392	43.30	-6.82	36.48	40.00	-3.52	QP		
2		75.8520	41.80	-11.09	30.71	40.00	-9.29	QP		
3		120.6118	38.60	-8.82	29.78	40.00	-10.22	QP		
4		132.1489	30.80	-10.23	20.57	40.00	-19.43	QP		
5		415.4485	26.10	-1.57	24.53	47.00	-22.47	QP		
6		734.0372	27.60	4.62	32.22	47.00	-14.78	QP		

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

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

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

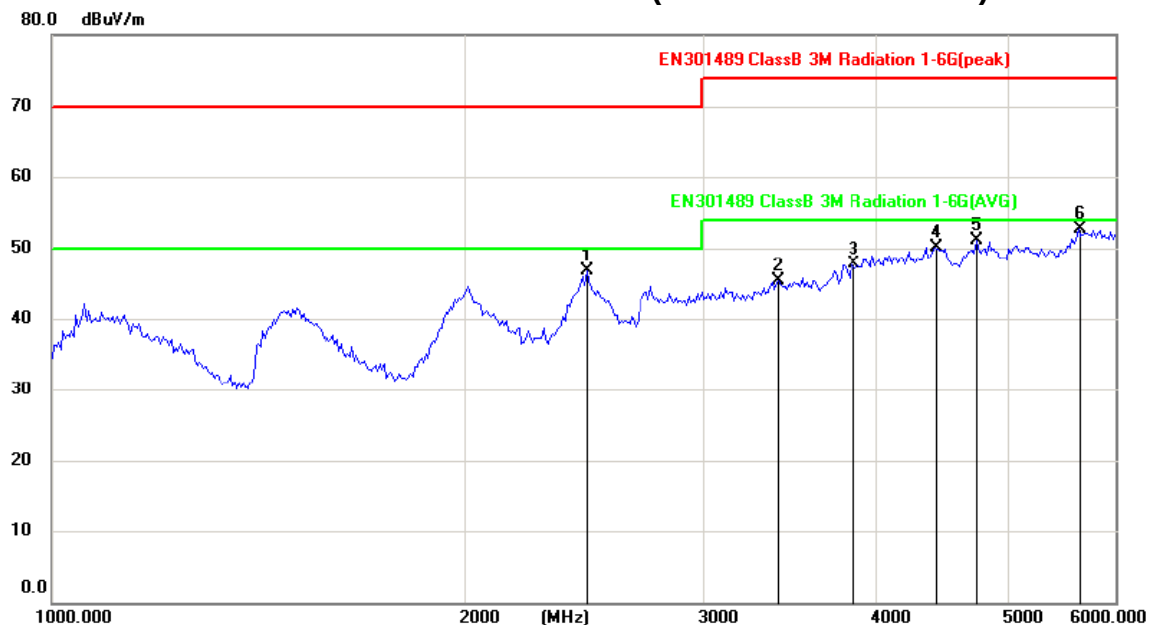
Limit (dBμV) = Limit stated in standard

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

Any value more than 10dB below limit have not been specifically reported.

* is meaning the worst frequency has been tested in the test frequency range

Radiated Emission In Horizontal (1000MHz----6000MHz)



Site: Polarization: **Horizontal** Temperature: 25
 Limit: EN301489 ClassB 3M Radiation 1-6G(peak) Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		2462.718	53.71	-7.08	46.63	70.00	-23.37	peak		
2		3402.222	49.81	-4.59	45.22	74.00	-28.78	peak		
3		3843.997	47.41	0.28	47.69	74.00	-26.31	peak		
4		4421.814	47.15	2.98	50.13	74.00	-23.87	peak		
5		4751.042	46.96	4.21	51.17	74.00	-22.83	peak		
6	*	5644.703	44.90	7.79	52.69	74.00	-21.31	peak		

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

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

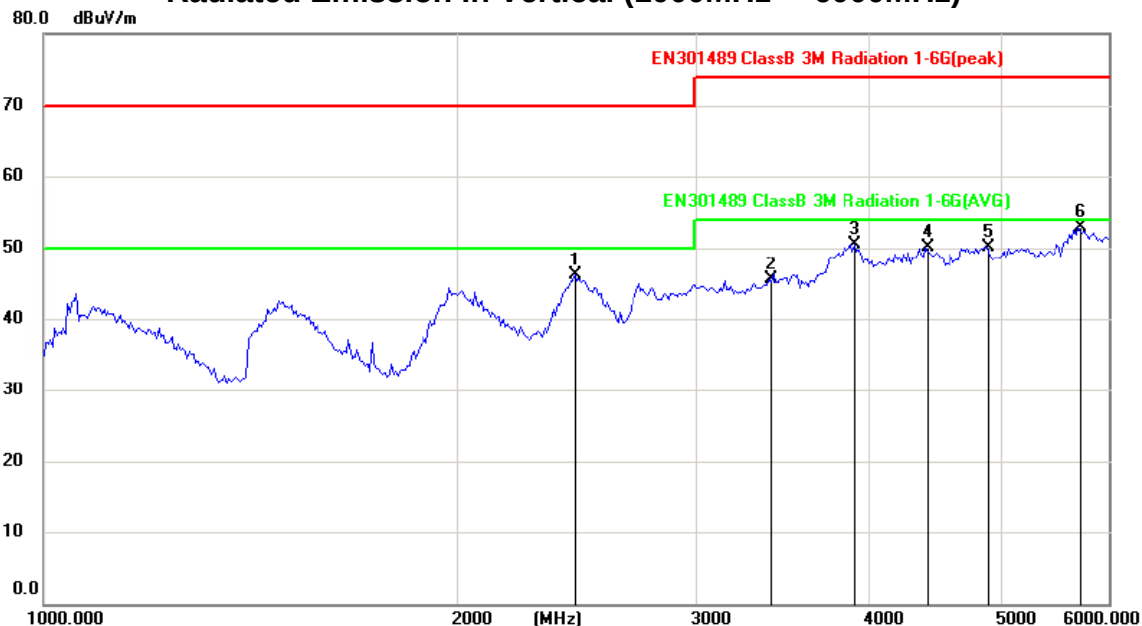
Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

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

* is meaning the worst frequency has been tested in the test frequency range

Radiated Emission In Vertical (1000MHz----6000MHz)



Site: Polarization: **Vertical** Temperature: 25
 Limit: EN301489 ClassB 3M Radiation 1-6G(peak) Power: Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		2445.096	53.36	-7.17	46.19	70.00	-23.81	peak		
2		3390.028	50.19	-4.64	45.55	74.00	-28.45	peak		
3		3913.633	49.37	1.20	50.57	74.00	-23.43	peak		
4		4405.965	47.07	2.95	50.02	74.00	-23.98	peak		
5		4889.498	45.30	4.82	50.12	74.00	-23.88	peak		
6	*	5705.837	44.70	8.11	52.81	74.00	-21.19	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)

* is meaning the worst frequency has been tested in the test frequency rang

6.3. Harmonic Current Emissions

6.3.1. Test Specification

Test Result:	EUT belongs to portable equipment, Not applicable
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6.4. Flicker and Voltage Fluctuation

6.4.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable
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7. Immunity Test

7.1. Performance Criteria

Performance Criteria of ETSI EN 301 489-1, sub clause 6

Criteria	Performance Criteria
CT/CR	During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.
TT/TR	After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.

Performance Criteria of ETSI EN 301 489-17, sub clause 6

Criteria	Performance Criteria
CT/CR	The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or Not acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.
TT/TR	The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

7.2. Surges

7.2.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable
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7.3. Electrical Fast Transient (EFT)

7.3.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable
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7.4. Radio-frequency Continuous Conducted (CS)

7.4.1. Test Specification

Test result:	EUT belongs to portable equipment, Not applicable
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7.5. Voltage Dips and Voltage Interruption

7.5.1. Test Specification

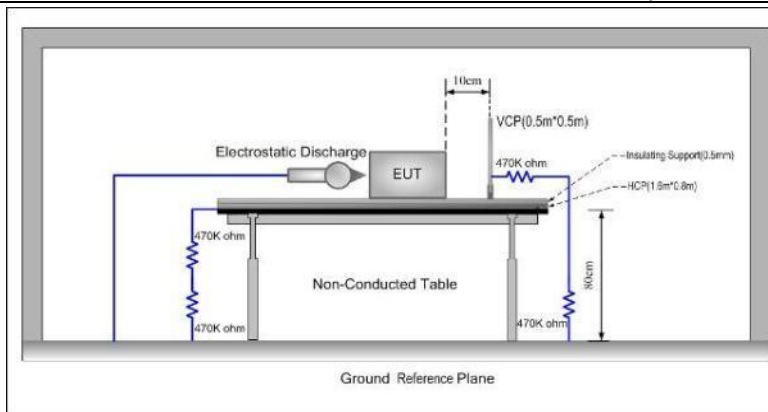
Test result:	EUT belongs to portable equipment, Not applicable
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7.6. Electrostatic Discharge

7.6.1. Test Specification

Test Requirement:	EN 301489-1
Test Method:	EN 61000-4-2
Discharge Voltage:	Contract Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$ Air Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$, $\pm 8\text{kV}$ HCP/VCP: $\pm 2\text{kV}$, $\pm 4\text{kV}$
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: Minimum 25 times at each test point, Air Discharge: Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

Test Setup:



Test Procedure:

1) Air discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed

2) Contact Discharge:

The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated.

3) Indirect discharge for horizontal coupling plane

At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT.

4) Indirect discharge for vertical coupling plane

At least 10 single discharges were applied to the centre of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Instrument:

Refer to Section 4.3 for Details

Test Mode:

Refer to Section 4.1 for Details

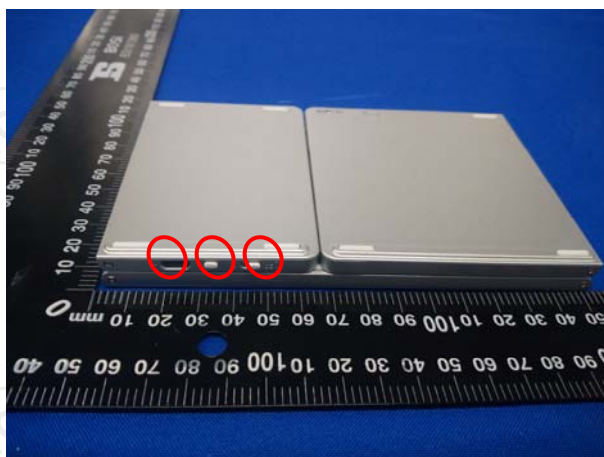
Test Results:

PASS

7.6.2. Test data

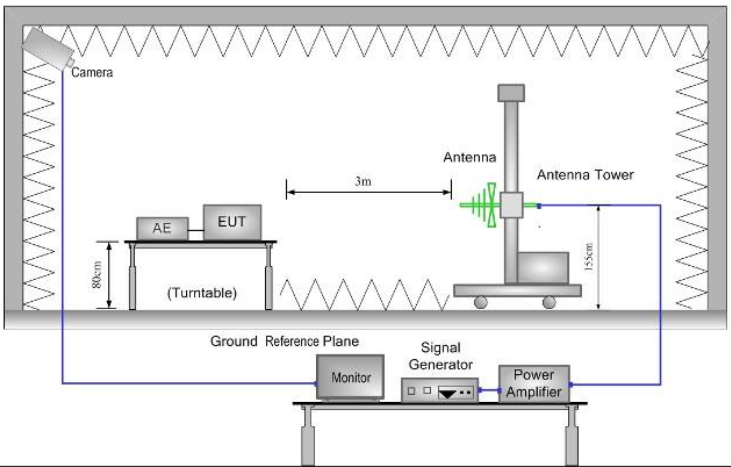
Test points:	I: Please refer to red rings as below plots			
	II: Please refer to yellow rings as below plots			
Air Discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observation s (Performanc e Criterion)	Result
$\pm 2, \pm 4$	Contact	II	N/A	N/A
$\pm 2, \pm 4, \pm 8$	Air	I	TT/TR	PASS
Indirect Discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observation Performance	Result
$\pm 2, \pm 4$	HCP-Bottom/Top/ Front/Back/Left/ Right	Edge of the HCP	TT/TR	PASS
$\pm 2, \pm 4$	VCP-Front/Back /Left/Right	Centre of the VCP	TT/TR	PASS

Test point as follows:



7.7. Radio-frequency Electromagnetic Field Amplitude Modulated (RS)

7.7.1. Test Specification

Test Requirement:	ETSI EN 301 489-1
Test Method:	EN 61000-4-3
Frequency Range:	80MHz to 6.0GHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Test Setup:	
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate centre of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceeding 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s.

	6. The test normally was performed with the generating antenna facing each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The EUT was performed in a configuration to actual installation conditions, a video camera and/or audio monitor were used to monitor the performance of the EUT.
Test Instrument:	Refer to Section 4.3 for Details
Test Mode:	Refer to Section 4.1 for Details
Test Result:	PASS

7.7.2. Test data

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)
80 MHz-6.0GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3 seconds	V	Front	CT/CR
			H		
			V	Rear	
			H		
			V	Left	
			H		
			V	Right	
			H		
			V	Top	
			H		
			V	Bottom	
			H		

8. Photographs of Test Configuration

Radiated Emission



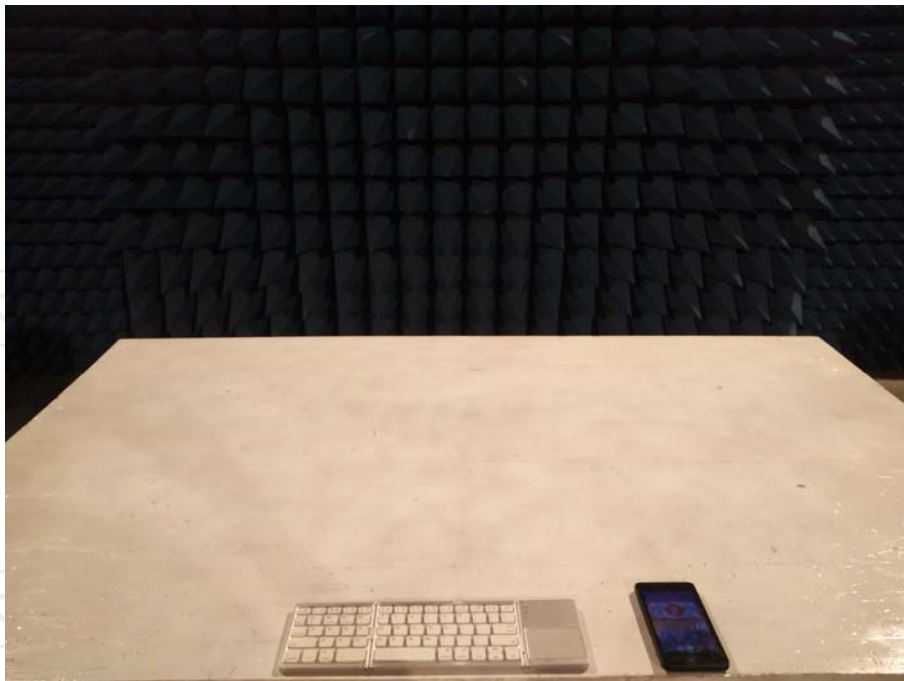
ESD



CE

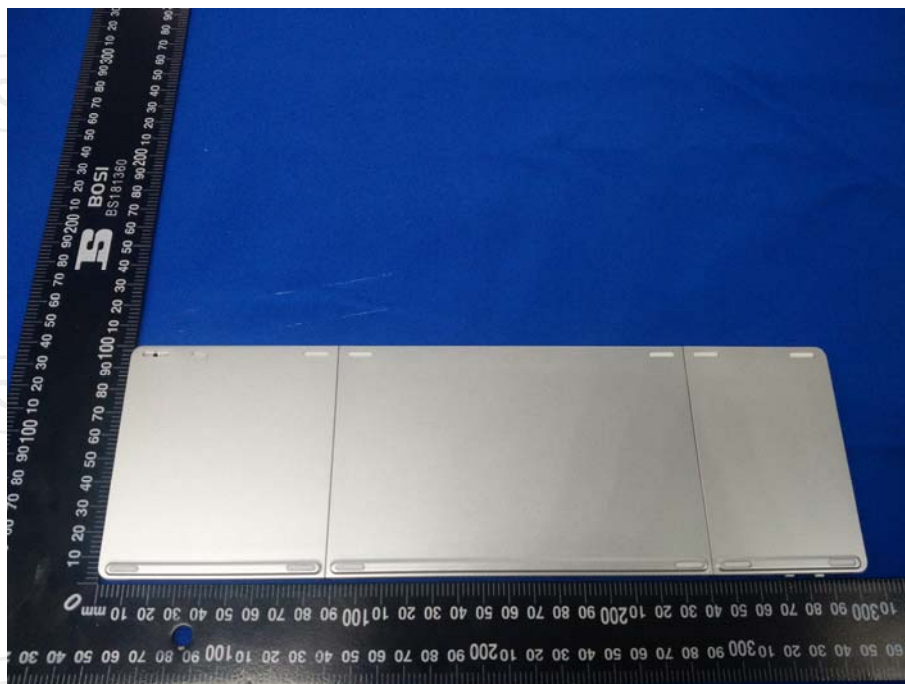


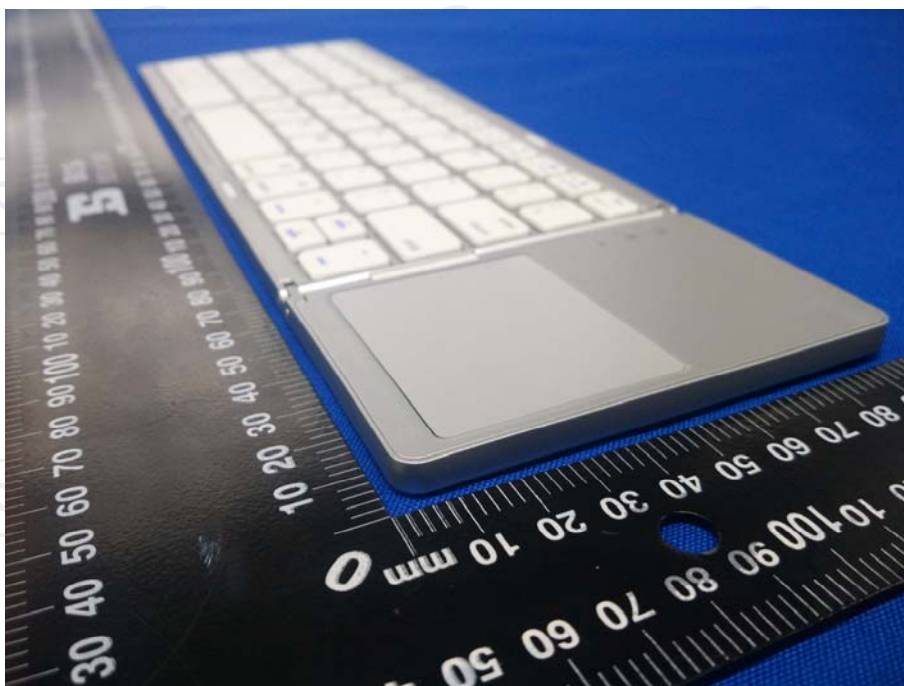
RS

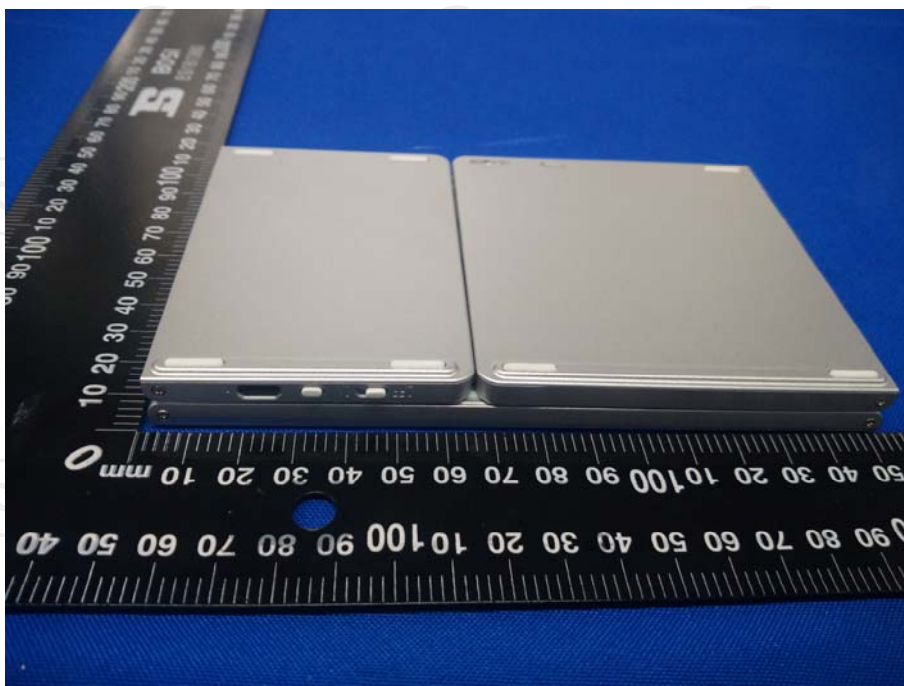
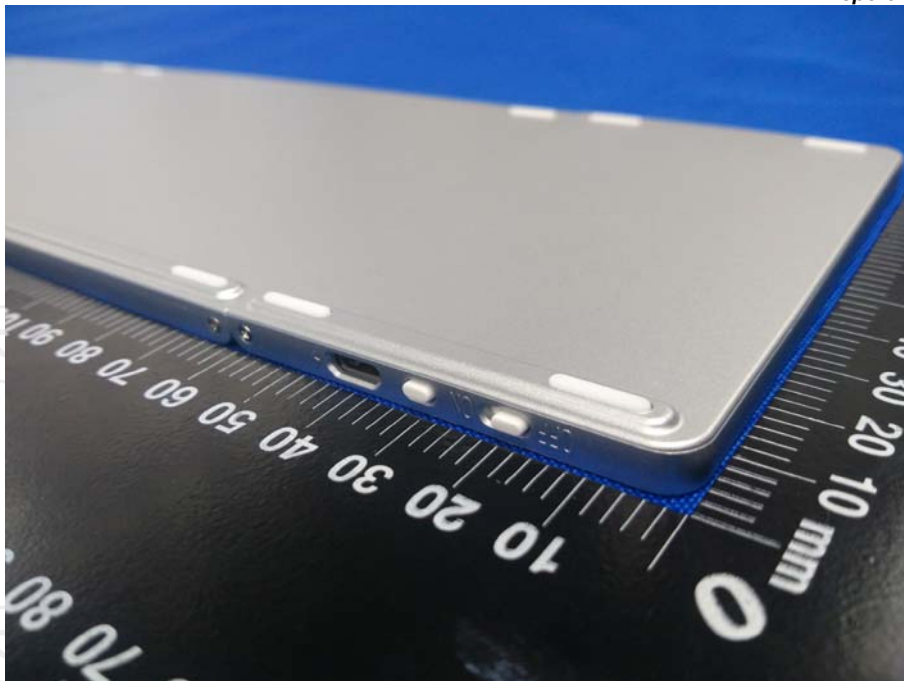


9. Photographs of EUT

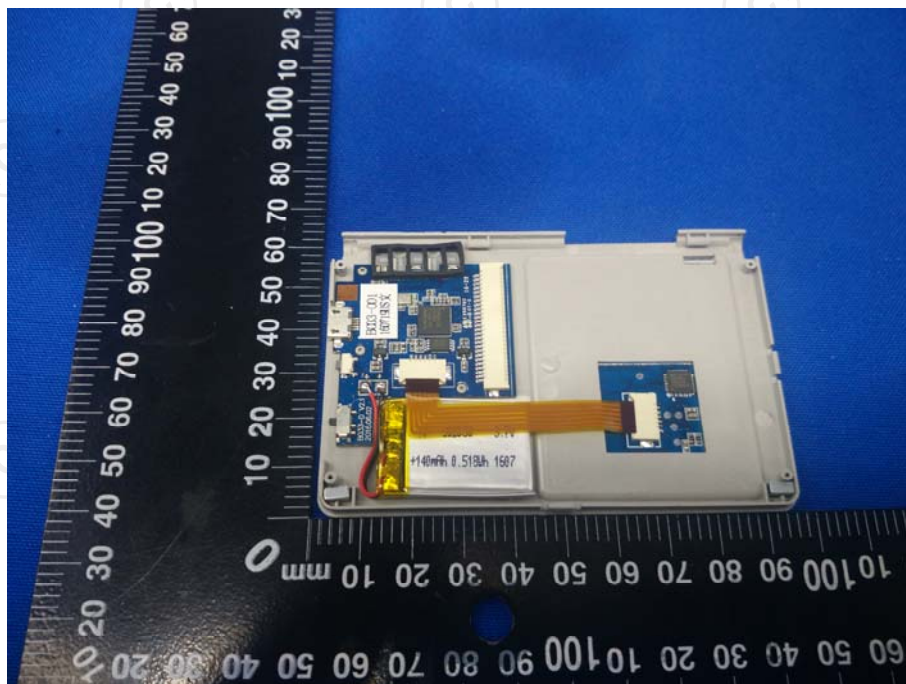
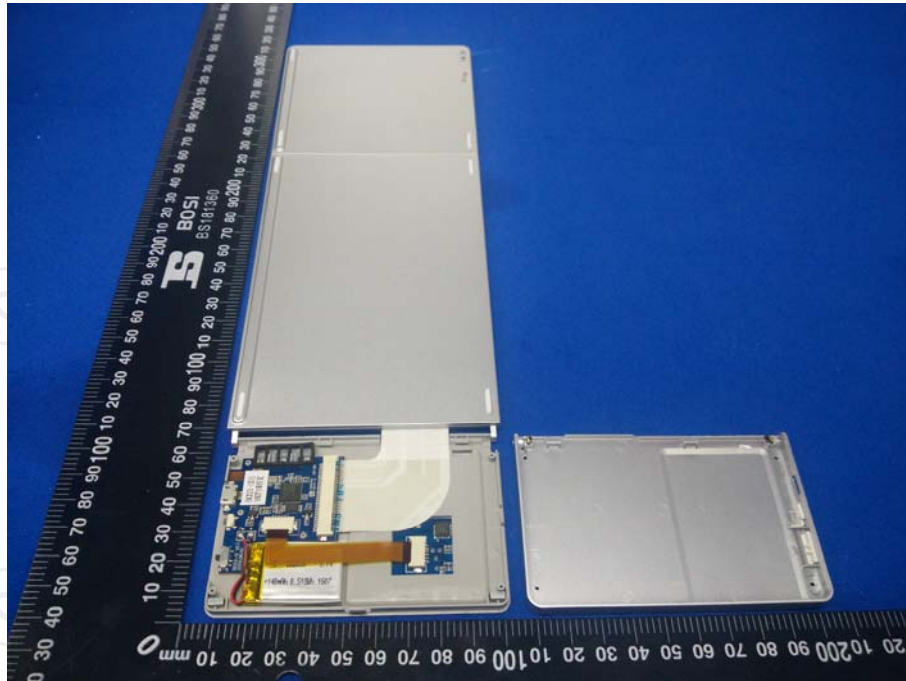
Outside View

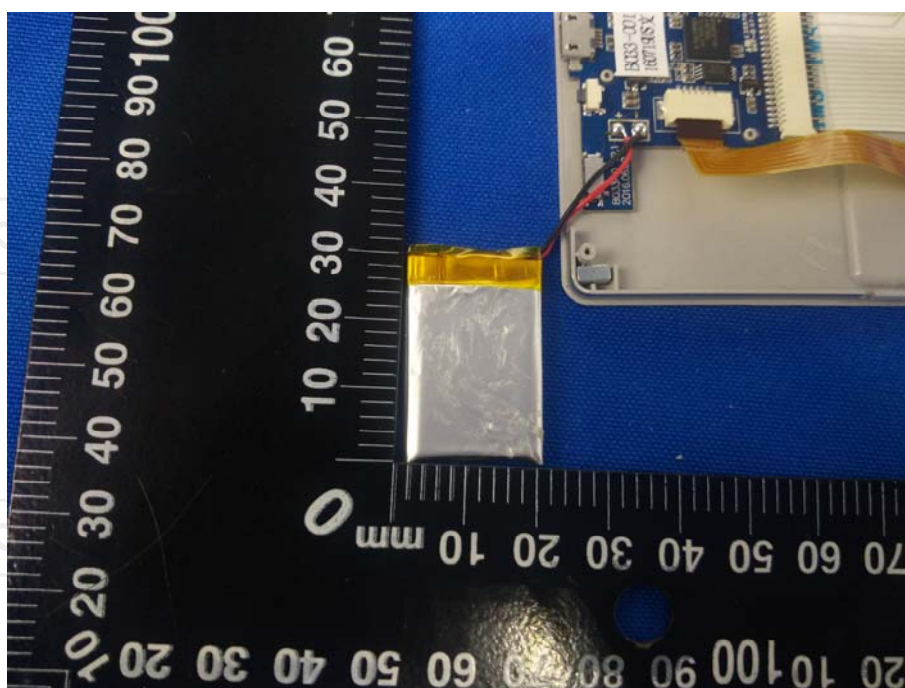
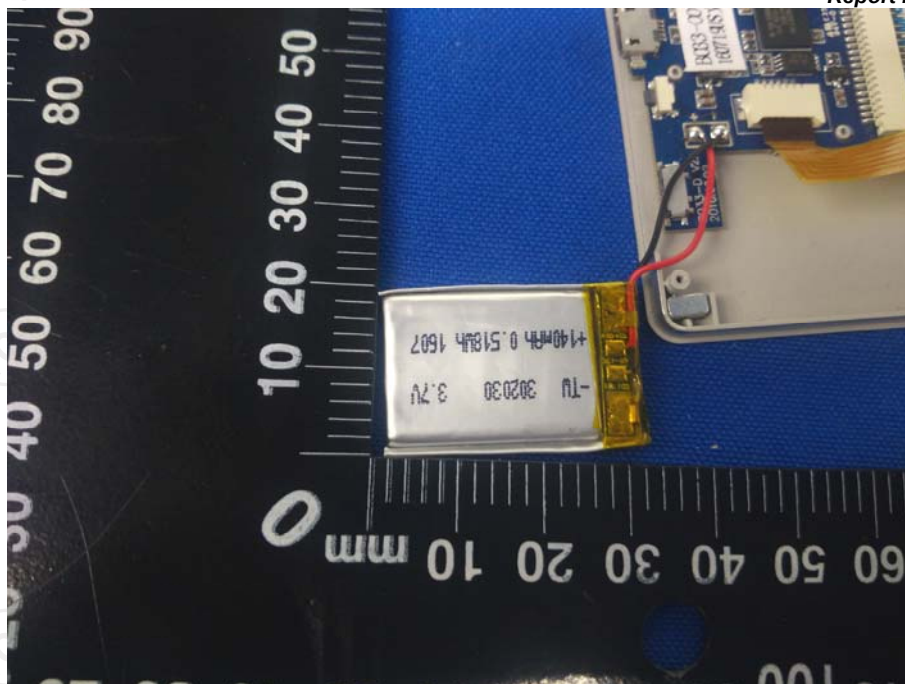


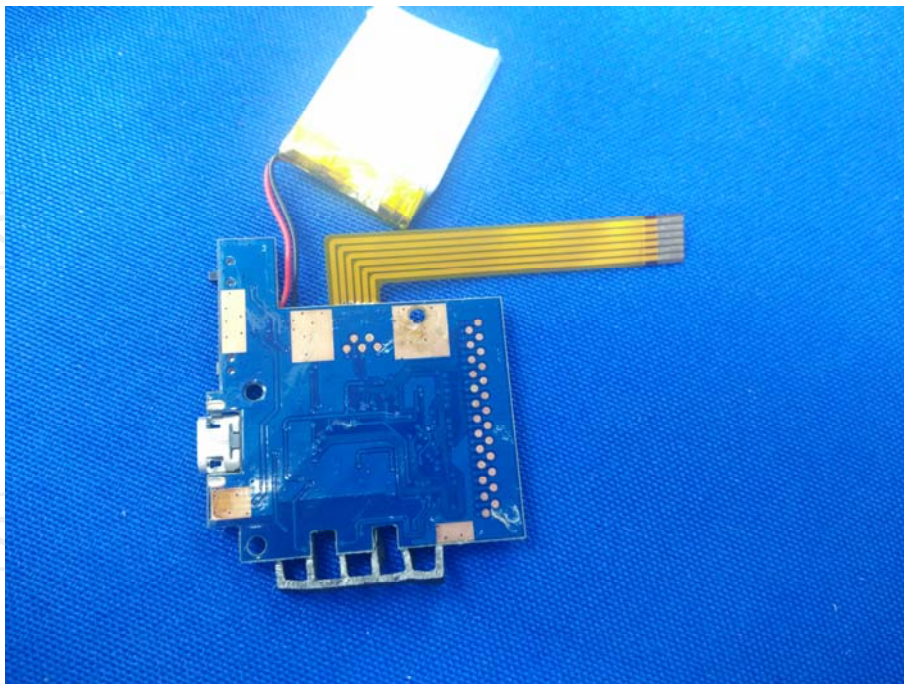
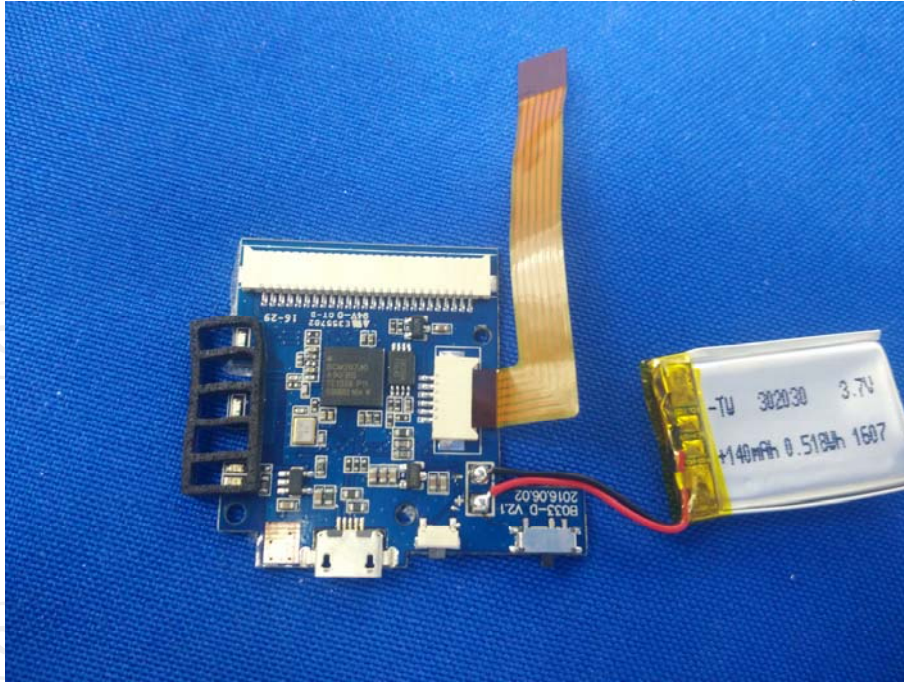


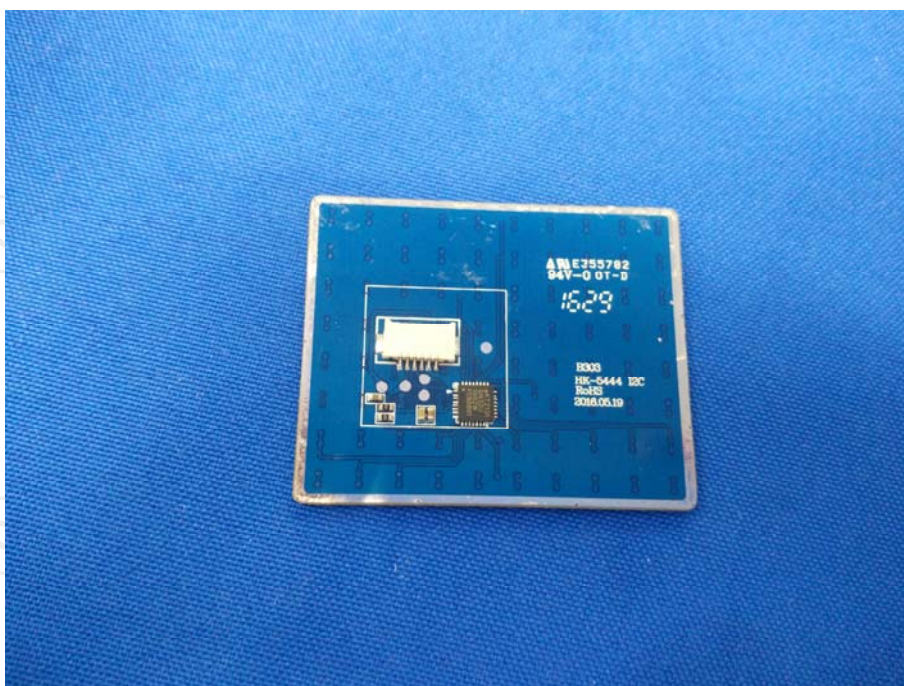
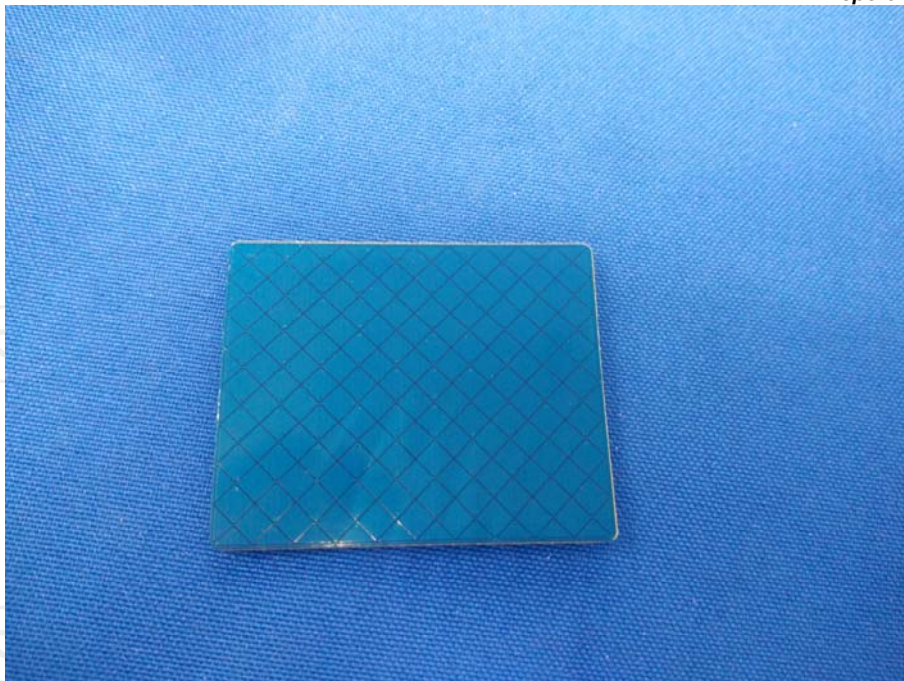


Inside View









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