


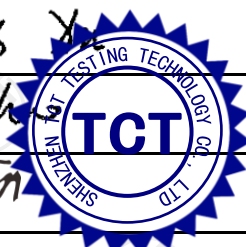


Test Report

Test Report No.:	TCT220422E064	
Date of issue	May 17, 2022	
Testing laboratory.....:	Shenzhen TCT Testing Technology Co., Ltd.	
Testing location/ address:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
Applicant's name	Shenzhen Huafului Technology Co., Ltd	
Address	Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China	
Manufacturer's name.....:	Shenzhen Huafului Technology Co., Ltd	
Address	Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China	
Standard(s)	ETSI EN 301 489-52 V1.2.1 (2021-11) Draft ETSI EN 301 489-19 V2.2.0 (2020-09) ETSI EN 301 489-17 V3.2.4 (2020-09) Final draft ETSI EN 301 489-3 V2.2.0 (2021-11) ETSI EN 301 489-1 V2.2.3 (2019-11)	
Product Name	Tablet	
Trade Mark.....:	CUBOT	
Model/Type reference	TAB 30	
Rating(s)	Refer to EUT description of page 4	
Date of receipt of test item	Apr. 22, 2022	
Date (s) of performance of test	Apr. 11, 2022 ~ May 17, 2022	
Tested by (+signature).....:	Brews XU	
Check by (+signature)	Beryl ZHAO	
Approved by (+signature):	Tomsin	



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1. General Product Information

1.1. EUT description

Product Name	Tablet
Model/Type reference	TAB 30
Hardware Version	T30-T618-V1.0
Software Version.....	CUBOT_TAB_30_P031C_V1.0_20220218
Operation Frequency.....	<p>For BT/BLE: 2402MHz~2480MHz</p> <p>For 2.4GWIFI:</p> <p>2412MHz~2472MHz (802.11b/802.11g/802.11n(HT20))</p> <p>2422MHz~2462MHz (802.11n(HT40))</p> <p>For 5G WIFI:</p> <p>5150MHz~5350MHz, 5725MHz~5875MHz</p> <p>For FM: 87.5MHz – 108MHz</p> <p>For GPS: 1.57542GHz</p> <p>For GSM:</p> <p>E-GSM 900/GPRS 900/EGPRS 900:</p> <p>TX: 880MHz~915MHz; RX: 925MHz~960MHz</p> <p>GSM 1800/GPRS 1800/EGPRS 1800:</p> <p>TX: 1710MHz~1785MHz; RX: 1805MHz~1880MHz</p> <p>For WCDMA:</p> <p>UTRA Band I: TX:1920MHz~1980MHz;</p> <p>RX: 2110MHz~2170MHz</p> <p>UTRA Band VIII: TX: 880MHz~915MHz;</p> <p>RX: 925MHz~960MHz</p> <p>LTE Band 1: (UL)1920MHz~1980MHz,</p> <p>(DL) 2110MHz~2170MHz</p> <p>LTE Band 3: (UL)1710MHz~1785MHz,</p> <p>(DL)1805MHz~1880MHz</p> <p>LTE Band 7: (UL)2500MHz~2570MHz,</p> <p>(DL)2620MHz~2690MHz</p> <p>LTE Band 8: (UL)880MHz~915MHz,</p> <p>(DL)925MHz~960MHz</p> <p>LTE Band 20: (UL)832MHz~862MHz,</p> <p>(DL) 791MHz~821MHz</p>
Modulation Type	<p>For BT: GFSK, $\pi/4$-DQPSK, 8DPSK</p> <p>For BLE: GFSK</p> <p>For 2.4GWIFI: DSSS(802.11b), OFDM (802.11g/802.11n)</p> <p>For 5GWIFI: 256QAM, 64QAM, 16QAM, BPSK, QPSK</p> <p>For FM: FM</p> <p>For GPS: BPSK</p> <p>For GSM:</p> <p>GSM/GPRS: GMSK</p>

	EGPRS: 8PSK For WCDMA: 16QAM for HSDPA and HSUPA For LTE: QPSK, 16-QAM
Antenna Type	For BT/BLE/2.4GWIFI/5GWIFI/GPS/GSM/WCDMA/LTE: PIFA Antenna For FM: Earphone Antenna
Antenna Gain	BT/BLE: 1.5dBi 2.4GWIFI: 1.5dBi 5GWIFI: 1dBi GPS: 1.5dBi E-GSM 900/GPRS 900/EGPRS 900: -1dBi GSM 1800/GPRS 1800/EGPRS 1800: 0.5dBi WCDMA Band I: 0.5dBi WCDMA Band VIII: -1dBi LTE band 1: 0.5dBi LTE band 3: 0.5dBi LTE band 7: 0.4dBi LTE band 8: -1dBi LTE band 20: -0.8dBi
Rating(s)	Adapter Information: Model: HJ-FC001K7-UK Input: AC 100-240V, 50/60Hz, 0.8A Output: DC 5.0V, 3.0A/ DC 9.0V, 2.0A/ DC 12.0V, 1.5A, 18.0W Rechargeable Li-ion Battery DC 3.8V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

2. Test Result Summary

EMI Test				
Test Item	Test Requirement	Test Method	Application	Result
Radiated Emission	ETSI EN301 489-1; EN 55032	EN 55032	Enclosure	PASS
Conducted Emission	ETSI EN301 489-1; EN 55032	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	PASS
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	PASS
Surge Immunity	ETSI EN301 489-1;	EN 61000-4-5	AC port	PASS
Injected Currents	ETSI EN301 489-1;	EN 61000-4-6	AC port	PASS
Voltage Dips and Interruptions	ETSI EN301 489-1;	EN 61000-4-11	AC port	PASS
transients and surges	ETSI EN301 489-1;	ISO 7637-2	DC 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. General Information

3.1. Test environment and mode

Item	Normal condition
Temperature	+25°C
Voltage	AC 230V/50Hz
Humidity	56%
Atmospheric Pressure:	1008 mbar
Test Mode:	
TM1	GSM 900 Link + BT Link + WIFI Link + GPS + Camera + Charging
TM2	GSM 1800 Link + BT Link + WIFI Link + GPS + Camera + Charging
TM3	GSM 900 Idle + BT Link + WIFI Link + GPS + FM
TM4	GSM 1800 Idle + BT Link + WIFI Link + GPS + FM
TM5	GSM 900 Idle + BT Link + WIFI Link + GPS + Data Transmission
TM6	GSM 1800 Idle + BT Link + WIFI Link + GPS + Data Transmission
TM7	WCDMA I Link + BT Link + WIFI Link + GPS + Camera + Charging
TM8	WCDMA VIII Link + BT Link + WIFI Link + GPS + Camera + Charging
TM9	WCDMA I Idle + BT Link + WIFI Link + GPS + FM
TM10	WCDMA VIII Idle + BT Link + WIFI Link + GPS + FM
TM11	WCDMA I Idle + BT Link + WIFI Link + GPS + Data Transmission
TM12	WCDMA VIII Idle + BT Link + WIFI Link + GPS + Data Transmission
TM13	LTE 1 Link + BT Link + WIFI Link + GPS + Camera + Charging
TM14	LTE 3 Link + BT Link + WIFI Link + GPS + Camera + Charging
TM15	LTE 7 Link + BT Link + WIFI Link + GPS + Camera + Charging
TM16	LTE 8 Link + BT Link + WIFI Link + GPS + Camera + Charging
TM17	LTE 20 Link + BT Link + WIFI Link + GPS + Camera + Charging

TM18	LTE 1 Idle + BT Link + WIFI Link + GPS + FM
TM19	LTE 3 Idle + BT Link + WIFI Link + GPS + FM
TM20	LTE 7 Idle + BT Link + WIFI Link + GPS + FM
TM21	LTE 8 Idle + BT Link + WIFI Link + GPS + FM
TM22	LTE 20 Idle + BT Link + WIFI Link + GPS + FM
TM23	LTE 1 Idle + BT Link + WIFI Link + GPS + Data Transmission
TM24	LTE 3 Idle + BT Link + WIFI Link + GPS + Data Transmission
TM25	LTE 7 Idle + BT Link + WIFI Link + GPS + Data Transmission
TM26	LTE 8 Idle + BT Link + WIFI Link + GPS + Data Transmission
TM27	LTE 20 Idle + BT Link + WIFI Link + GPS + Data Transmission
Remark	The worst mode TM1 reported only for emission test.

3.2. 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
PC	Inspiron 3668	CN-04T4P2-C1332 -26C-0013	/	Dell
Monitor	SE1918HV	CN-0YVJCX-FCC0 0-75D-AUAB-A00	/	Dell
Mouse	MS116p	CN-009NK2-73826 -74M-0QI9	/	Dell
Keyboard	KB216t	CN-0RKR0N-7161 6-75I-0CYQ-A03	/	Dell

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.

3.3. Test Instruments List

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Disturbance voltage at mains terminals				
EMI Test Receiver	R&S	ESCI3	100898	2022/07/07
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	2023/02/24
Attenuator	N/A	10 dB	164080	2022/07/07
Disturbance voltage at telecommunication terminals				
EMI Test Receiver	R&S	ESCI3	100898	2022/07/07
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	2023/02/24
ISN	Schwarzbeck	CAT5 8158	151	2023/02/24
Radiated emission (30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB9163	340	2022/09/04
EMI Test Receiver	R&S	ESIB7	100197	2022/07/07
Pre-amplifier	HP	8447D	2727A05017	2022/07/07
Radiated emission (1 GHz to 6 GHz)				
Horn Antenna	Schwarzbeck	BBHA 9120 D	02372	2023/03/06
EMI Test Receiver	R&S	ESIB7	100197	2022/07/07
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	2023/02/24
Harmonic current emissions & Voltage Fluctuations and Flicker				
AC Power Supply	KIKUSUI	PCR4000M	UC002552	2022/07/07
Harmonic/Flicker Analyzer	KIKUSUI	KHA1000	UD002324	2022/07/08
Line Impedance Network	KIKUSUI	LIN1020JF	UC001738	2022/07/07
Electrostatic discharge immunity (ESD)				
Electrostatic Discharge Generator	HAEFELY	PESD300	H012056	2022/07/08
Radiated, radio-frequency, electromagnetic field immunity (RS)				
Antenna	SKET	STLP 9129_Plus	/	/
Signal Generator	Agilent	N5182A	MY47070282	2022/07/18
Amplifier	SKET	HAP_80M01G-250W	/	2023/02/24

Amplifier	SKET	HAP_01G03G -75W	202104180	2022/07/07
Amplifier	SKET	HAP_03G06G -80W	202004044	2022/07/07
Field Probe	Narda	EP-601	611WX80256	2022/07/13
USB Power Sensor	Agilent	U2000A	MY53410013	2023/02/24
USB Power Sensor	Agilent	U2001A	MZ54330012	2023/02/24
Electrical fast transient/burst immunity (EFT/B)				
Fast Transient Burst Simulator	Prima	EFT61004BG	PR12074375	2022/07/07
Capacitive Coupling folder	Prima	EFT-CLAMP	N/A	2022/09/11
Surge immunity				
Lightning Surge Generator	Prima	SUG61005BG	PR12125534	2022/07/07
Immunity to conducted disturbances, induced by radio-frequency fields (CS)				
Conducted Immunity Test System	Schloder	CDG-6000-75	126B1290/201 4	2022/07/07
CDN	Schloder	CDN M2+M3-16	A2210281/201 4	2022/07/07
EM-Clamp	Schloder	EMCL-20	132A1194/201 4	2022/07/04
RF Attenuator	PE	75W 6dB	N/A	2022/07/07
Power frequency magnetic field immunity (PFMF)				
Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	G121941CS1 341114	2022/07/07
Adjustable Magnetic Field Coil	EVERFINE	MFC-4	G1242BBS13 41114	2022/07/07
Voltage dips, short interruptions and voltage variations immunity (DIPS)				
Cycle Sag Simulator	Prima	DRP61011AG	PR12106201	2022/07/07

4. Facilities and Accreditations

4.1. Facilities

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

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab 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

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

Shenzhen TCT Testing Technology Co., Ltd.

Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

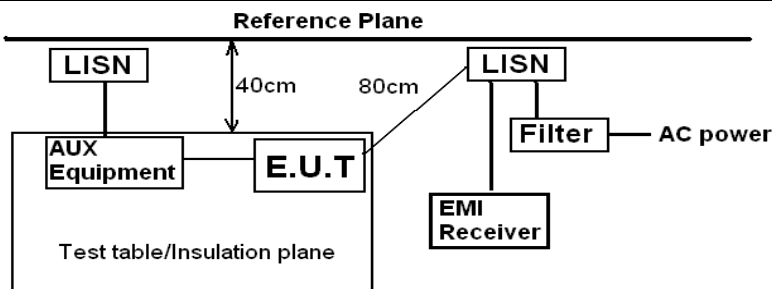
The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Temperature	$\pm 0.1^{\circ}\text{C}$
2	Humidity	$\pm 1.0 \%$
3	Spurious Emissions, Conducted	$\pm 3.10 \text{ dB}$
4	All Emissions, Radiated (30 MHz to 1 GHz)	$\pm 4.56 \text{ dB}$
5	All Emissions, Radiated (1 GHz to 6 GHz)	$\pm 4.22 \text{ dB}$

5. Emission Test

5.1. Conducted Emission

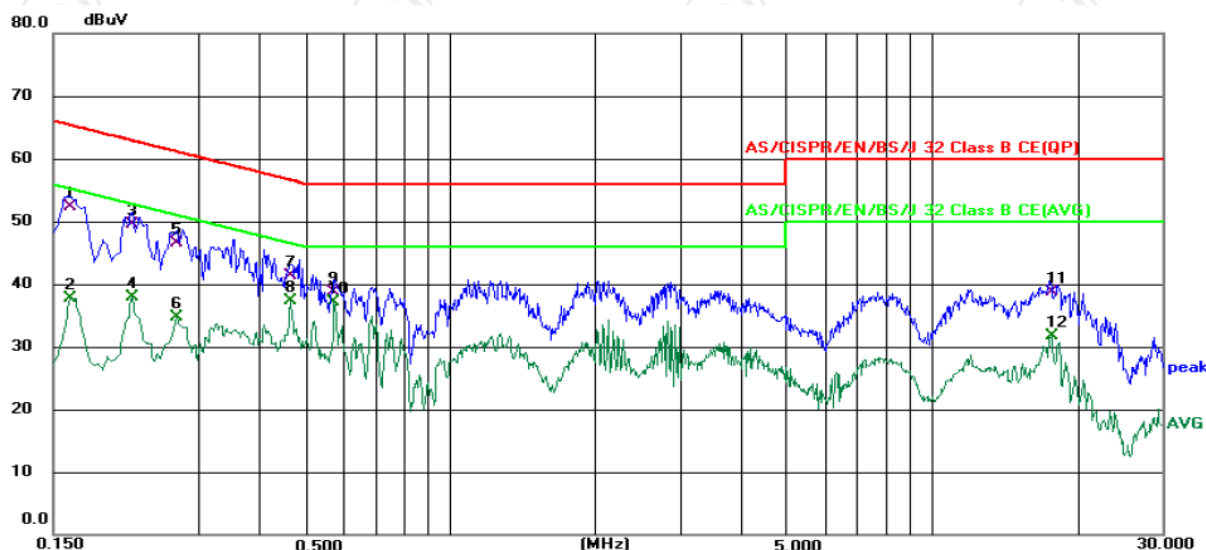
5.1.1. Test Specification

Test Requirement:	ETSI EN 301 489-1; EN 55032		
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:	 <p>Remark: E.U.T.: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>		
Test Procedure	<p>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.</p>		
Test Instrument:	Refer to section 3.3 for details		
Test Mode:	Refer to section 3.1 for details		
Test Results:	PASS		

5.1.2. Test Data

Please refer to following diagram for individual

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



Site 844 Shielding Room

Phase: L1

Temperature: 24.1 (°C)

Humidity: 47 %

Limit: AS/CISPR/EN/BS/J 32 Class B CE(QP)

Power: AC 230 V/50 Hz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	42.70	9.61	52.31	65.36	-13.05	QP	
2		0.1620	28.13	9.61	37.74	55.36	-17.62	AVG	
3		0.2179	40.01	9.55	49.56	62.90	-13.34	QP	
4		0.2179	28.45	9.55	38.00	52.90	-14.90	AVG	
5		0.2700	36.99	9.58	46.57	61.12	-14.55	QP	
6		0.2700	25.07	9.58	34.65	51.12	-16.47	AVG	
7		0.4660	31.61	9.67	41.28	56.58	-15.30	QP	
8		0.4660	27.67	9.67	37.34	46.58	-9.24	AVG	
9		0.5738	28.94	9.73	38.67	56.00	-17.33	QP	
10	*	0.5738	27.44	9.73	37.17	46.00	-8.83	AVG	
11		17.7259	29.03	9.73	38.76	60.00	-21.24	QP	
12		17.7259	21.88	9.73	31.61	50.00	-18.39	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

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

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

Limit (dBuV) = Limit stated in standard

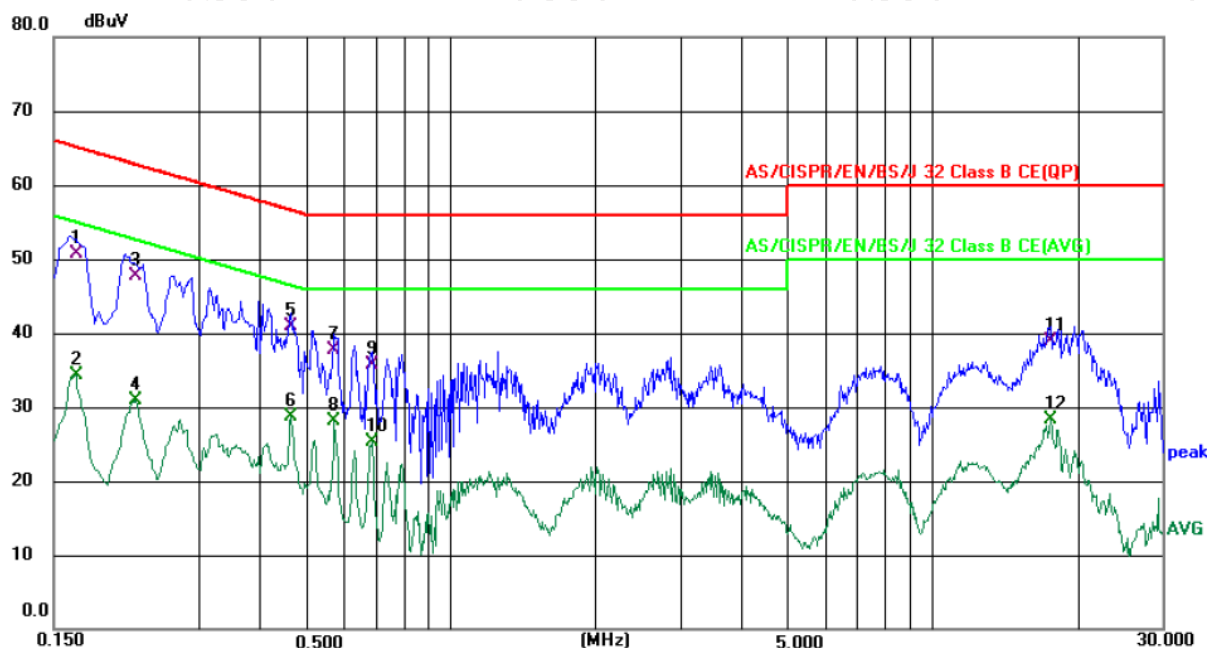
Margin (dB) = Measurement (dBuV) – Limits (dBuV)

Q.P. =Quasi-Peak

AVG =average

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

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



Site 844 Shielding Room

Phase: N

Temperature: 24.1 (°C)

Humidity: 47 %

Limit: AS/CISPR/EN/BS/J 32 Class B CE(QP)

Power: AC 230 V/50 Hz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1660	41.08	9.70	50.78	65.16	-14.38	QP	
2		0.1660	24.59	9.70	34.29	55.16	-20.87	AVG	
3		0.2220	38.07	9.55	47.62	62.74	-15.12	QP	
4		0.2220	21.40	9.55	30.95	52.74	-21.79	AVG	
5		0.4660	31.22	9.67	40.89	56.58	-15.69	QP	
6		0.4660	19.08	9.67	28.75	46.58	-17.83	AVG	
7		0.5738	27.92	9.73	37.65	56.00	-18.35	QP	
8		0.5738	18.42	9.73	28.15	46.00	-17.85	AVG	
9		0.6860	26.04	9.74	35.78	56.00	-20.22	QP	
10		0.6860	15.47	9.74	25.21	46.00	-20.79	AVG	
11		17.6060	29.24	9.68	38.92	60.00	-21.08	QP	
12		17.6060	18.70	9.68	28.38	50.00	-21.62	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

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

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

Limit (dBuV) = Limit stated in standard

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

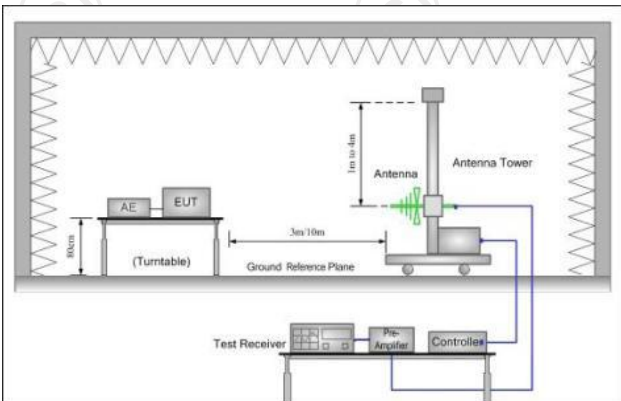
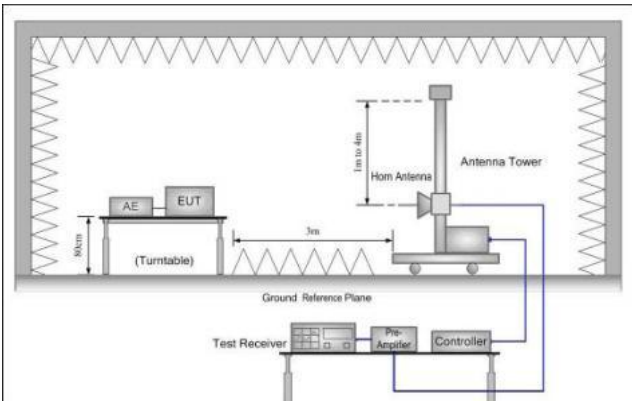
Q.P. =Quasi-Peak

AVG =average

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

5.2. Radiated Emission

5.2.1. Test Specification

Test Requirement:	ETSI EN 301 489-1; EN 55032				
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	120KHz	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-6GHz		54.0		Average Value
			74.0		Peak Value
Test Setup:	Below 1GHz				
					
	Above 1GHz				
Test Setup:					
	For 3m distance description:				

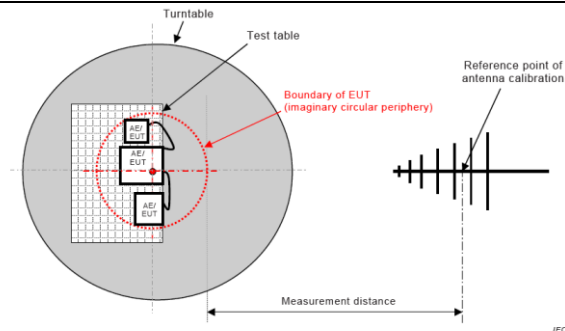


Figure C.1 – Measurement distance

Test Procedure:

From 30MHz to 1GHz:

1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. 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.
3. 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.
4. 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:

1. The radiated emissions test was conducted in a fully-anechoic chamber.
2. 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.
3. 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.
4. 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 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Results:	PASS

5.2.2. Test Data

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



Site #1 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 23.5(C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 32 Class B RE_3m

Power: AC 230 V/50 Hz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	45.6946	13.40	13.58	26.98	40.00	-13.02	QP	P	
2 *	81.2116	20.18	8.79	28.97	40.00	-11.03	QP	P	
3	144.3346	15.22	12.80	28.02	40.00	-11.98	QP	P	
4	166.0680	13.64	12.79	26.43	40.00	-13.57	QP	P	
5	249.4250	16.60	12.28	28.88	47.00	-18.12	QP	P	
6	321.0607	14.48	14.05	28.53	47.00	-18.47	QP	P	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

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

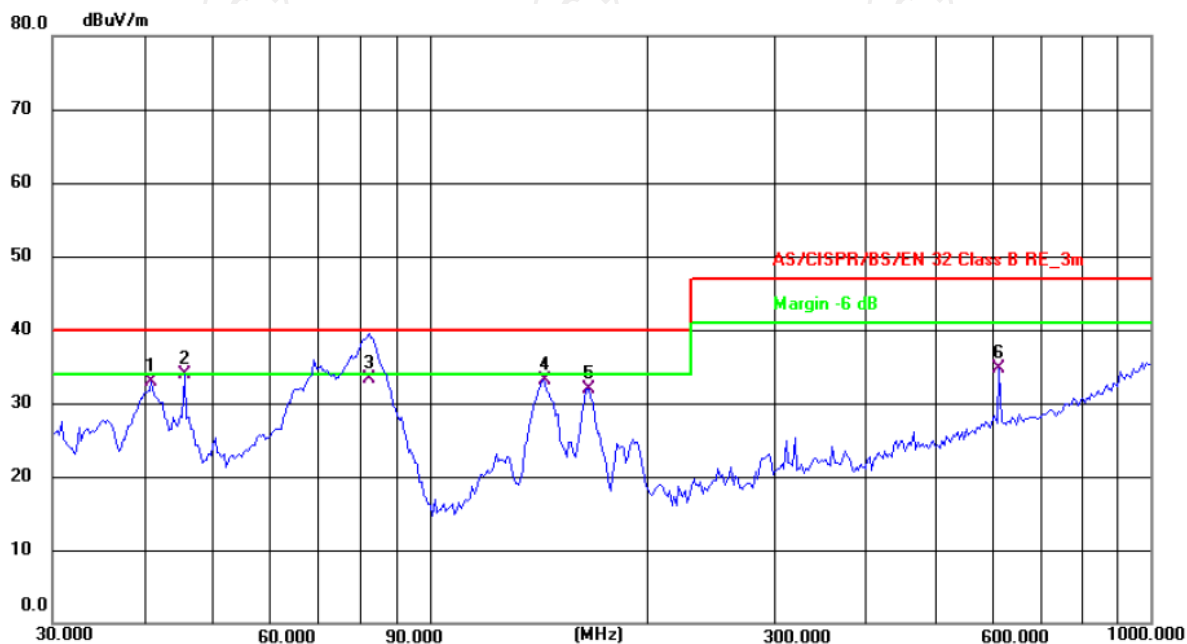
Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

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 (30MHz----1000MHz)



Site #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 23.5(C)

Humidity: 52 %

Limit: AS/CISPR/BS/EN 32 Class B RE_3m

Power: AC 230 V/50 Hz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	41.1319	19.19	13.70	32.89	40.00	-7.11	QP	P	
2 *	45.6946	20.33	13.58	33.91	40.00	-6.09	QP	P	
3	82.3588	24.54	8.76	33.30	40.00	-6.70	QP	P	
4	143.3259	20.42	12.77	33.19	40.00	-6.81	QP	P	
5	166.0680	19.14	12.79	31.93	40.00	-8.07	QP	P	
6	616.3716	13.81	20.98	34.79	47.00	-12.21	QP	P	

Note:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

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

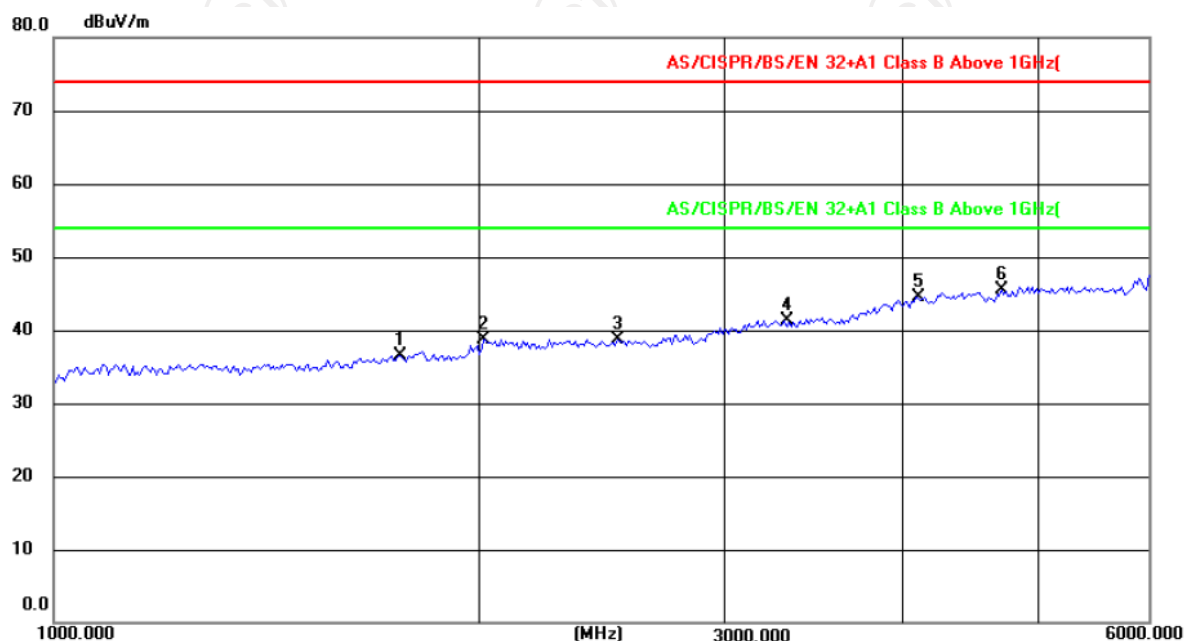
Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

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 Horizontal (1000MHz----6000MHz)



Site #1 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 23.5(C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 32+A1 Class B Above 1GHz(Power: AC 230 V/50 Hz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1763.553	48.77	-12.18	36.59	74.00	-37.41	peak	P	
2	2021.373	48.19	-9.50	38.69	74.00	-35.31	peak	P	
3	2516.351	45.48	-6.85	38.63	74.00	-35.37	peak	P	
4	3305.882	46.34	-4.94	41.40	74.00	-32.60	peak	P	
5	4100.649	42.07	2.49	44.56	74.00	-29.44	peak	P	
6 *	4717.045	41.43	4.05	45.48	74.00	-28.52	peak	P	

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



Site #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 23.5(C)

Humidity: 52 %

Limit: AS/CISPR/BS/EN 32+A1 Class B Above 1GHz(Power: AC 230 V/50 Hz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1327.988	48.04	-11.88	36.16	74.00	-37.84	peak	P	
2	1653.176	49.00	-11.99	37.01	74.00	-36.99	peak	P	
3	2021.373	49.19	-9.50	39.69	74.00	-34.31	peak	P	
4	3098.972	46.30	-5.64	40.66	74.00	-33.34	peak	P	
5	3899.606	43.54	1.02	44.56	74.00	-29.44	peak	P	
6 *	4550.675	43.37	3.32	46.69	74.00	-27.31	peak	P	

Note:

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

5.3. Harmonic Current Emissions

Test Result:	Not applicable (The Max rated power of EUT is less than 75W)
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5.4. Flicker and Voltage Fluctuation

5.4.1. Test Specification

Test Requirement:	ETSI EN 301 489-1
Test Method:	EN 61000-3-3
Test Mode:	Refer to section 3.3 for details
Test conclusion:	Refer to section 3.1 for details
Test result:	PASS

Test Plot as Following:

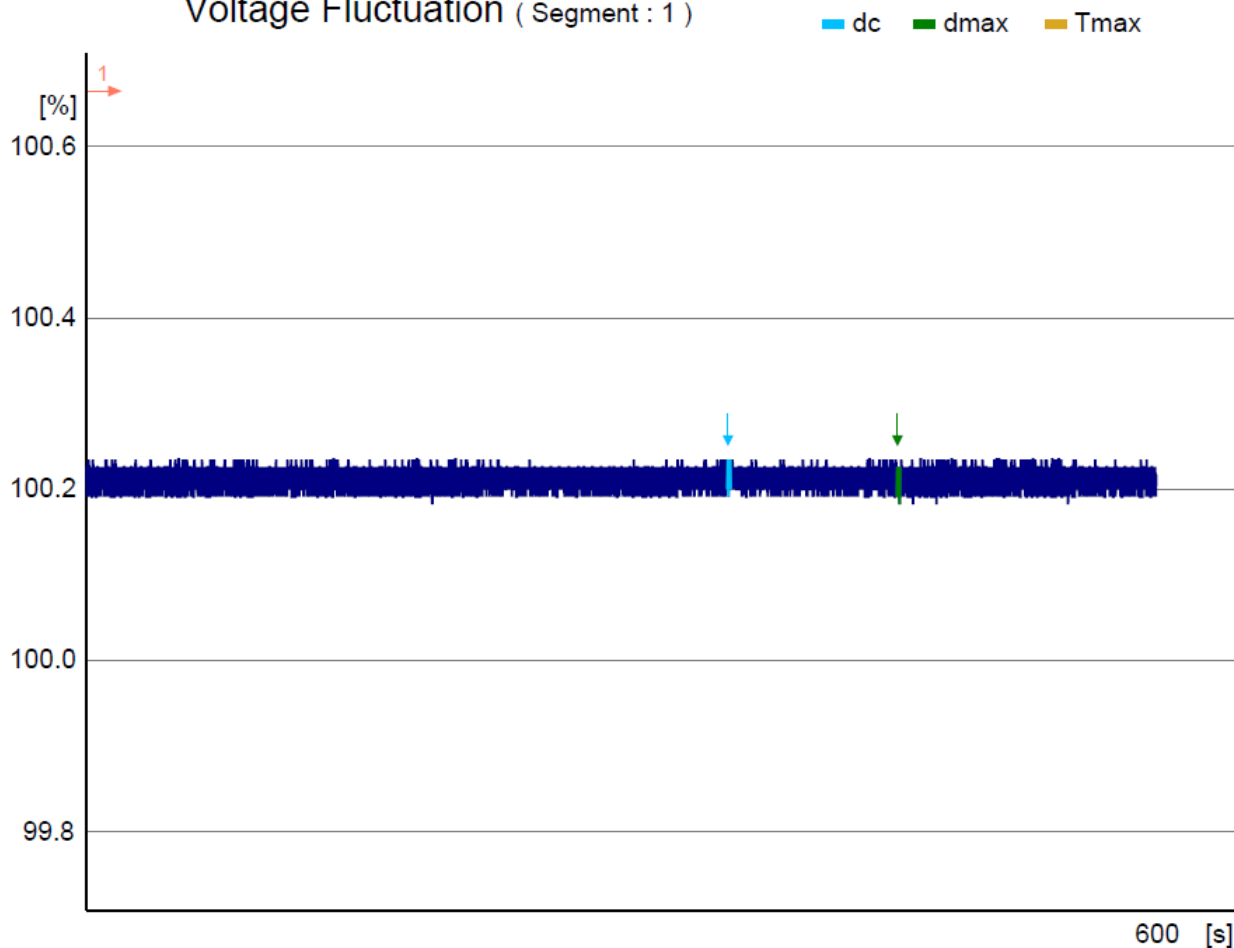
Test Data of Voltage Fluctuation and Flicker

Final Test Result **Pass**
 Nominal Voltage 230 V
 Nominal Frequency 50 Hz
 Plt Test Duration 600 s
 Flicker Margin 100 %
 d Measurement Margin 100 %

Segment	Pst	dmax(%)	dc(%)	Tmax(ms)	Judge
Limit	1.000	4.000	3.300	500	
Seg. 1	0.008	0.035	0.004	0	Pass

Plt	Value	Judge
Limit	0.650	
Measurement	0.003	Pass

Voltage Fluctuation (Segment : 1)



6. Immunity Test

6.1. 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 301 489-3, sub clause 6

Criteria	Performance Criteria
CT/CR	<p>For equipment with primary function type I or II including ancillary equipment tested on a stand alone basis, the performance criteria A of the applicable device type as given in clause 6.3 shall apply. For equipment with primary function type II or III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence.</p> <p>Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.</p> <p>Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.</p>
TT/TR	<p>For equipment with primary function type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria B of the applicable device type as given in clause 6.3 shall apply, except for power interruptions exceeding a certain time the performance criteria deviations are specified in clause 7.2.2.</p> <p>For equipment with primary function type II or III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence.</p> <p>Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.</p> <p>Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.</p>

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.

Performance Criteria of ETSI EN 301 489-19, sub clause 6

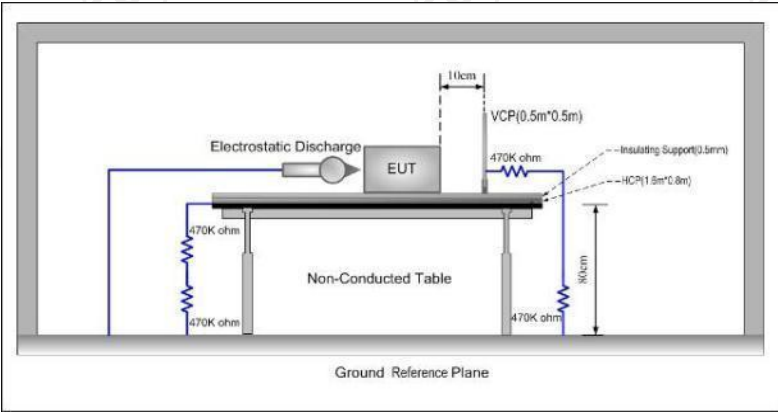
Criteria	Performance Criteria
CT/CR	The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or Not acknowledgement (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.

Performance Criteria of ETSI EN 301 489-52, sub clause 6

Criteria	Performance Criteria
CT/CR	<p>A communication link shall be established at the start of the test, and maintained during the test, see clauses 4.2.2 to 4.2.5. During the test, the uplink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check).</p> <p>NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz.</p> <p>At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.</p>
TT/TR	<p>A communications link shall be established at the start of the test, see clauses 4.2.2 to 4.2.5.</p> <p>At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.</p> <p>At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.</p> <p>In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.</p>

6.2. Electrostatic Discharge

6.2.1. 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:	<p>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</p> <p>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.</p> <p>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.</p>

	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 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Results:	PASS

6.2.2. Test data

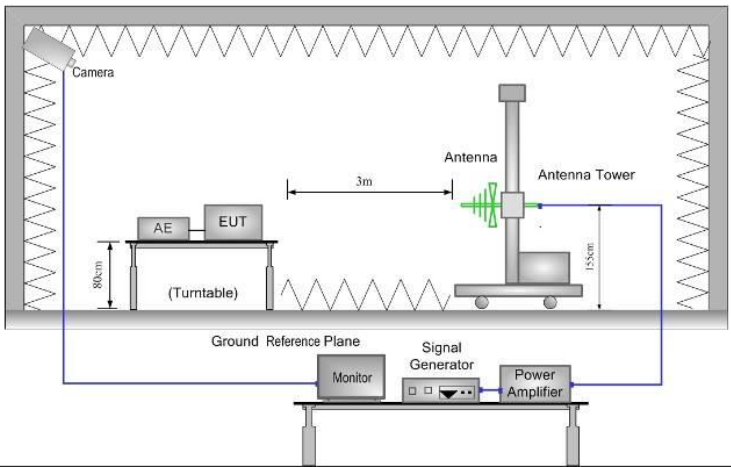
Test points:	I: Please refer to red arrows as below plots			
	II: Please refer to yellow arrows as below plots			
Air Discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observation Criterion	Result
$\pm 2, \pm 4$	Contact	II	A	PASS
$\pm 2, \pm 4, \pm 8$	Air	I	A	PASS
Indirect Discharge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

Test point as follows:



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

6.3.1. 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:	<ol style="list-style-type: none"> 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.

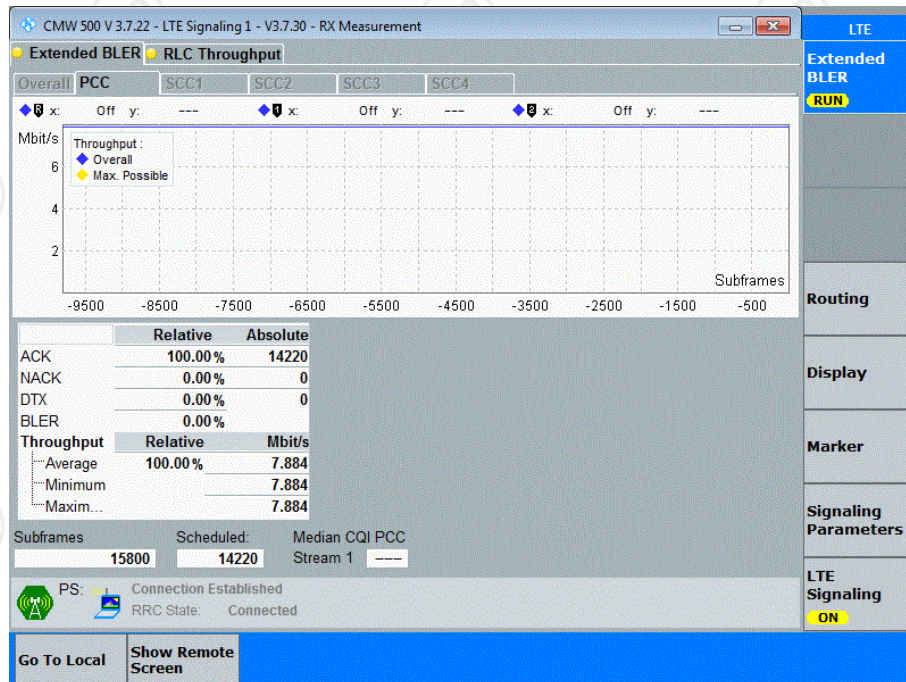
	<p>6. The test normally was performed with the generating antenna facing each side of the EUT.</p> <p>7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.</p> <p>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.</p>
Test Instrument:	Refer to section 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Result:	PASS

6.3.2. Test data

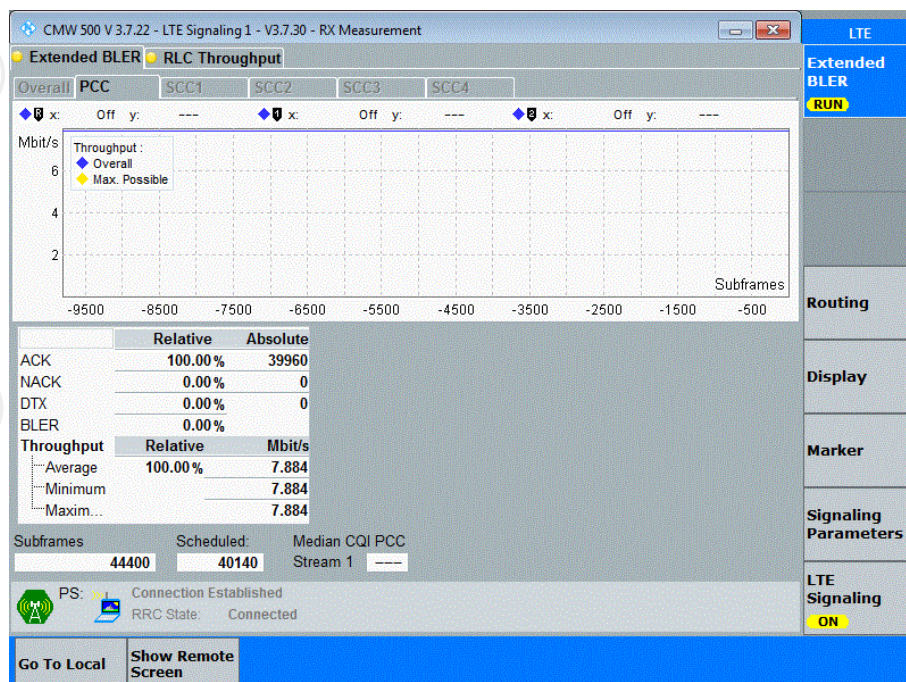
Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observation Criterion
80 MHz-6.0GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3 seconds	V	Front	A
			H		
			V	Rear	
			H		
			V	Left	
			H		
			V	Right	
			H		
			V	Top	
			H		
			V	Bottom	
			H		

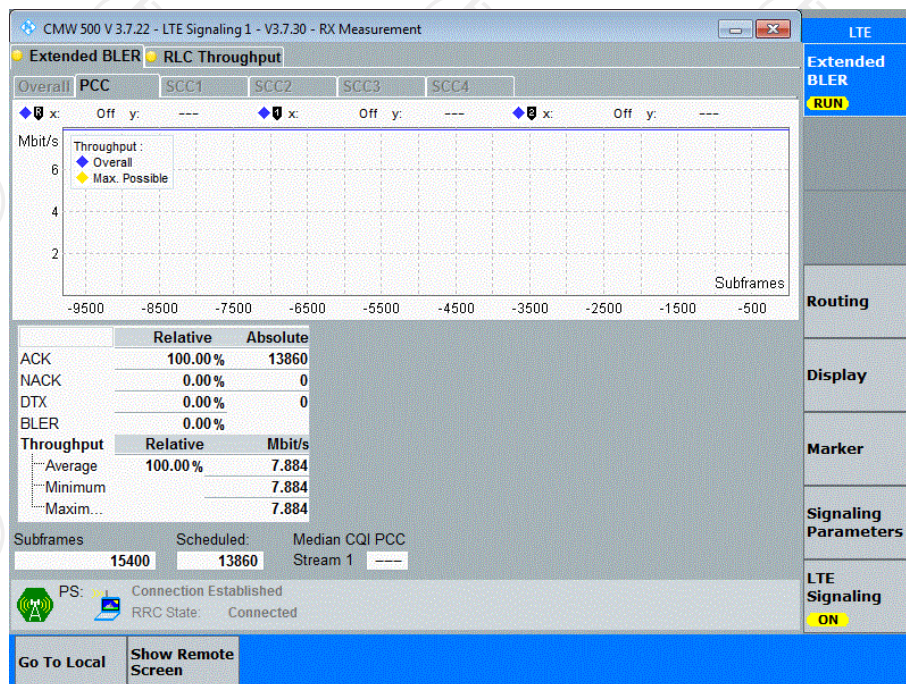
Remark: Only the worst mode plots are shown.

LTE Band 1

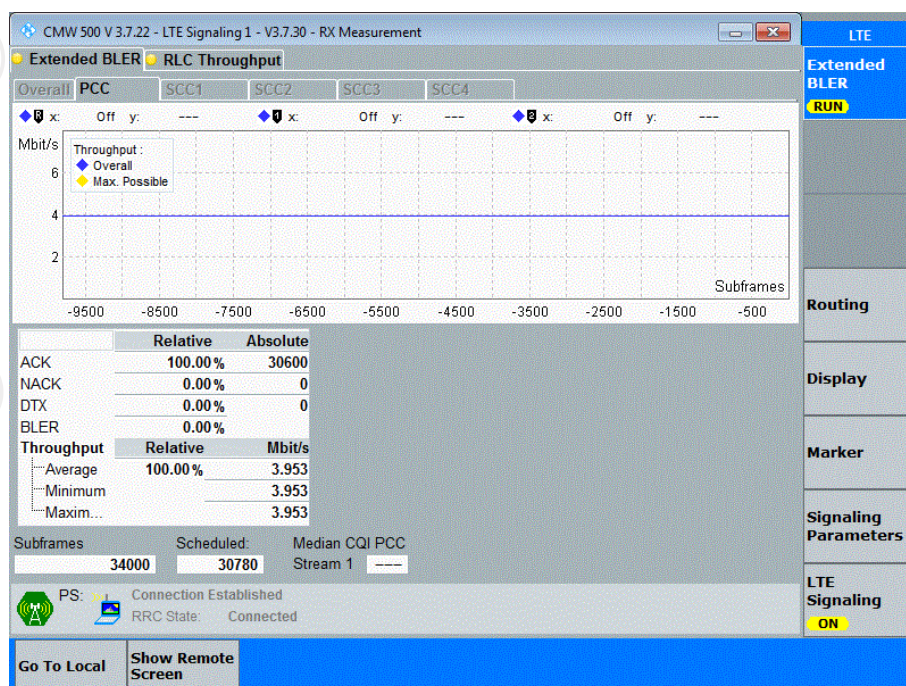


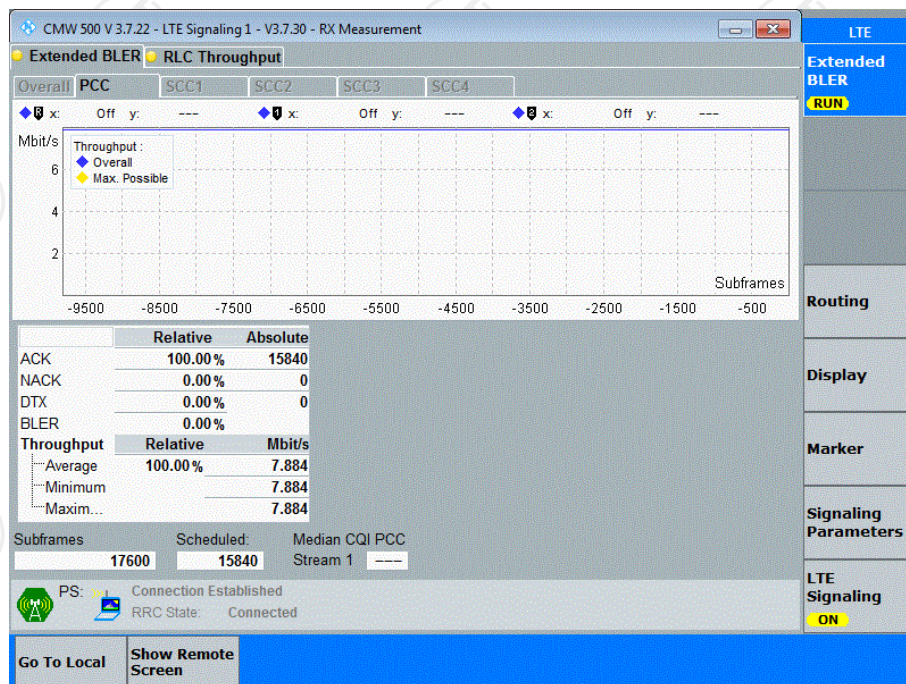
LTE Band 3





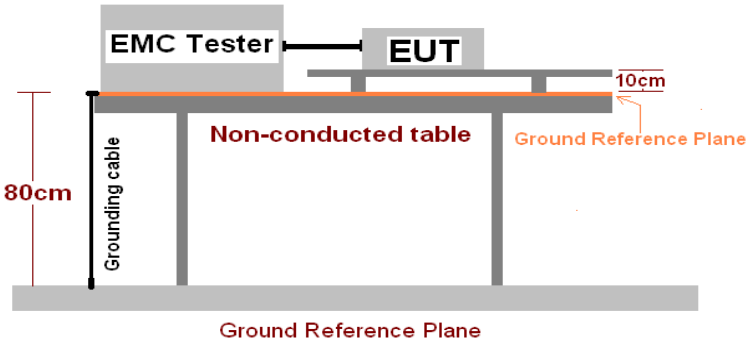
LTE Band 8





6.4. Surges

6.4.1. Test Specification

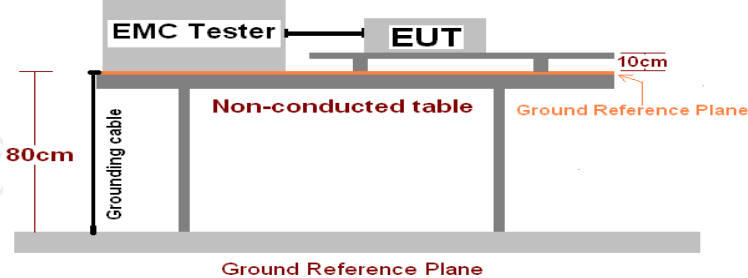
Test Requirement:	ETSI EN 301 489-1;
Test Method:	EN 61000-4-5
Test Level:	±1kV Live to Neutral: Differential mode ±2kV Live to Earth or Neutral to Earth: Common mode
Test Setup:	60s between each surge
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.
Performance Criterion:	B
Test Setup:	 <p>The diagram illustrates the test setup. An EMC Tester and the Equipment Under Test (EUT) are placed on a non-conducted table. The table is 80cm high and has a 10cm clearance from the ground reference plane. A grounding cable is connected to the table. The ground reference plane is shown at the bottom of the diagram.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV. 2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test. 3. Different phase angles are done individually. <p>Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.</p>
Test Instrument:	Refer to section 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Result:	PASS

6.4.2. Test Data

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observation Criterion	Result
L-N	± 1	5	60s	0°	A	PASS
				90°		
				180°		
				270°		

6.5. Electrical Fast Transient (EFT)

6.5.1. Test Specification

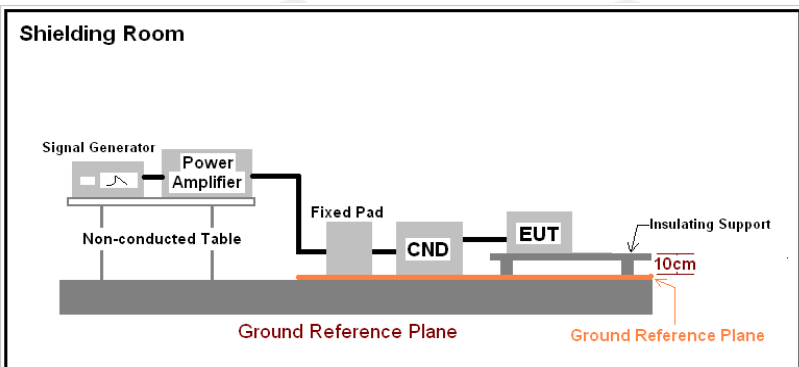
Test Requirement:	ETSI EN 301 489-1;
Test Method:	EN 61000-4-4
Test Level:	1.0kV on AC port
Polarity:	Positive & Negative
Repetition Frequency:	5kHz
Burst Duration:	15ms
Burst Period:	300ms
Test Duration:	2 minute per level & polarity
Test setup:	 <p>The diagram illustrates the test setup. An EMC Tester is connected to an EUT (Under Test) via a cable. Both are placed on a non-conducted table. The table is 80cm high and has a 10cm clearance from the ground reference plane. A grounding cable is connected to the table. The ground reference plane is shown as a metallic sheet on the floor.</p>
Test Procedure:	<p>The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.</p> <p>Test on Signal Ports, Telecommunication Ports and Control Ports: The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 2 minutes. Test on power supply ports: The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes. The length of the signal and power lines between the coupling device and the EUT is 0.5m</p>
Test Instrument:	Refer to section 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Result:	PASS

6.5.2. Test Data

Lead under Test	Level (±kV)	Coupling Direct/Clamp	Observation Criterion	Result
L	± 1.0	Direct	A	PASS
N	± 1.0	Direct	A	PASS
L-N	± 1.0	Direct	A	PASS

6.6. Radio-frequency Continuous Conducted (CS)

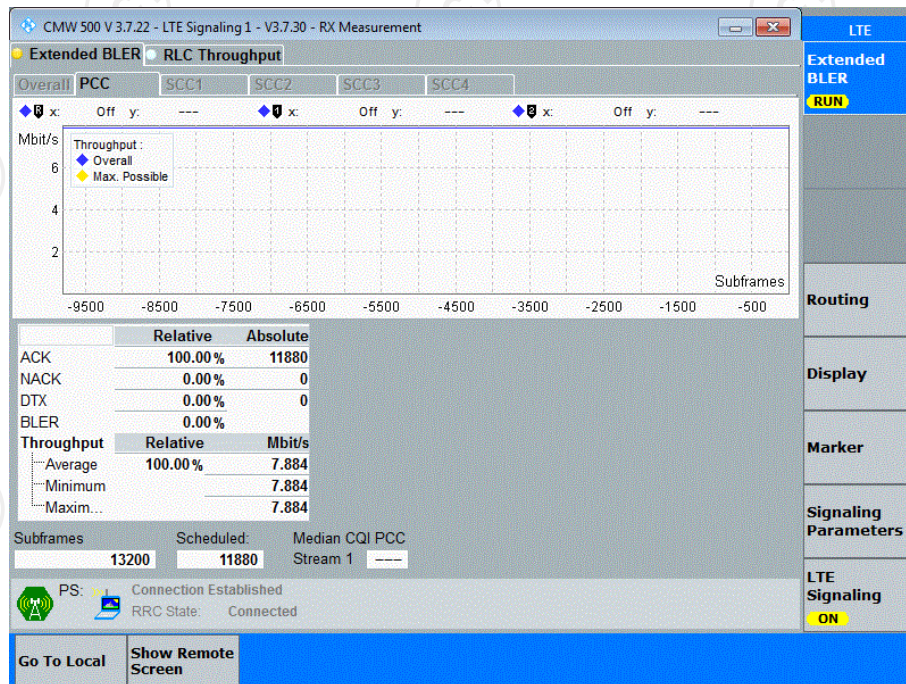
6.6.1. Test Specification

Test Requirement:	ETSI EN 301489-1;
Test Method:	EN 61000-4-6
Frequency Range:	0.15MHz to 80MHz
Test Level:	3V rms on AC Ports (unmodulated emf into 150 Ω)
Modulation	80%, 1kHz Amplitude Modulation
Test setup:	
Test Procedure:	<ol style="list-style-type: none"> 1. Let the EUT work in test mode and test it. 2. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). 3. The disturbance signal described below is injected to EUT through CDN. 4. The EUT operates within its operational mode(s) under intended climatic conditions after power on. 5. The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 Hz sine wave. 6. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. <p>Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.</p>
Test Instrument:	Refer to section 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Result:	PASS

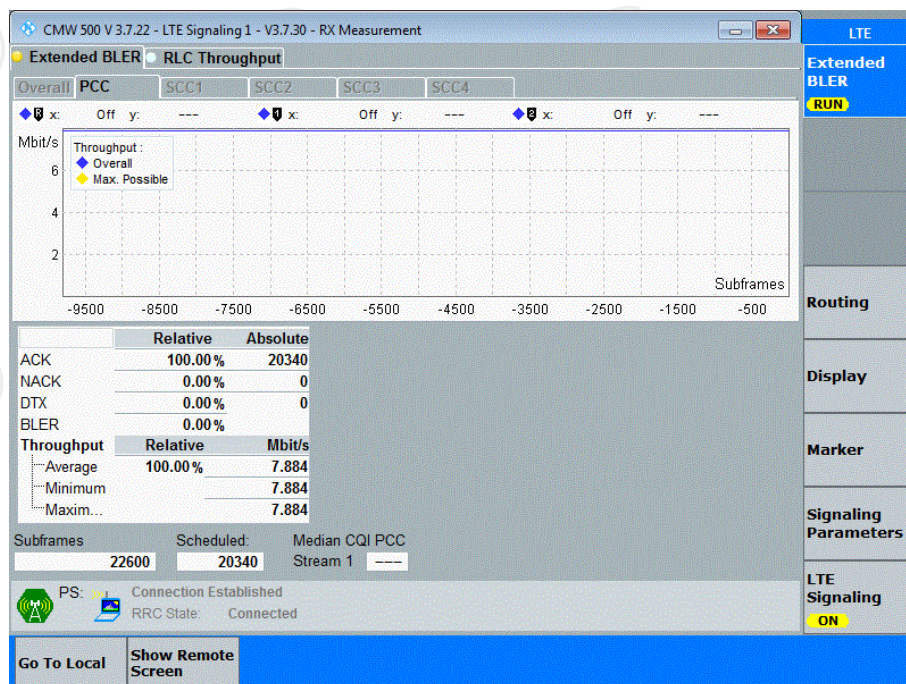
6.6.2. Test Data

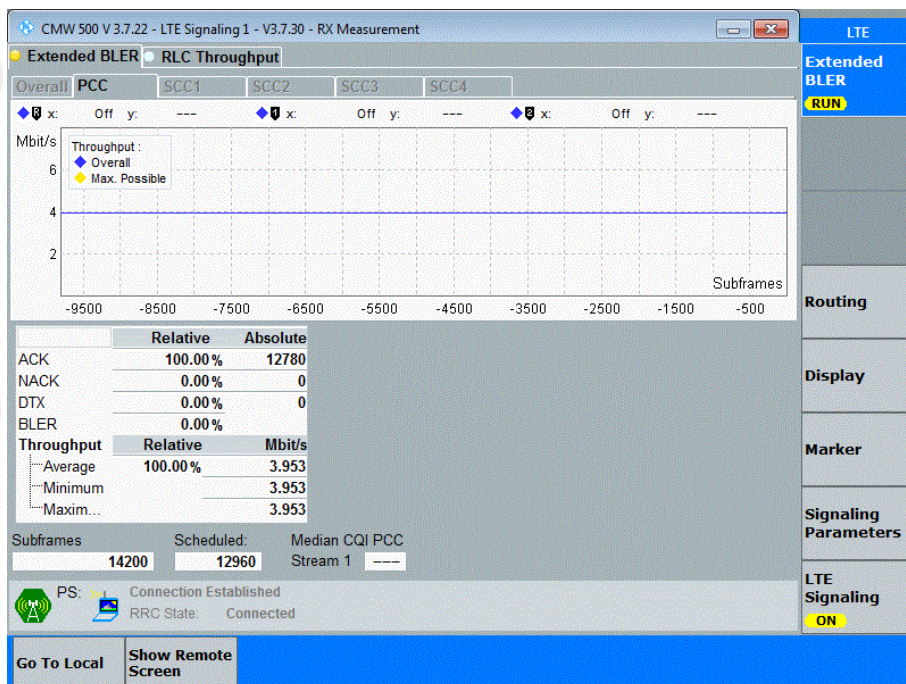
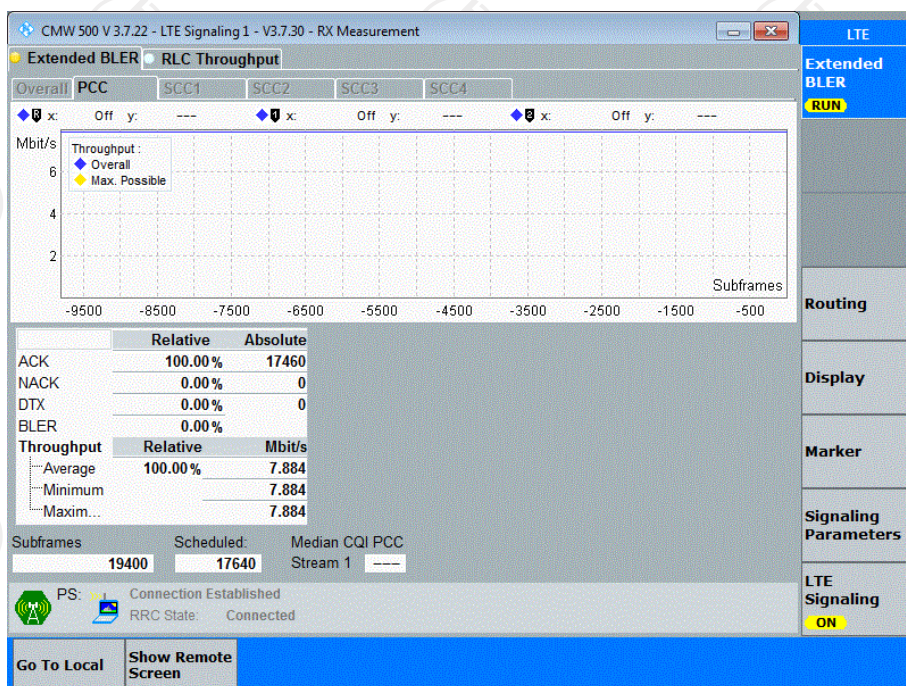
Frequency	Injected Position	Test Level	Modulation	Step Size	Dwell Time	Observation Criterion	Result
150kHz to 80MHz	AC Main	3Vrms	80%, 1kHz Amp. Mod.	1%	2s	A	PASS

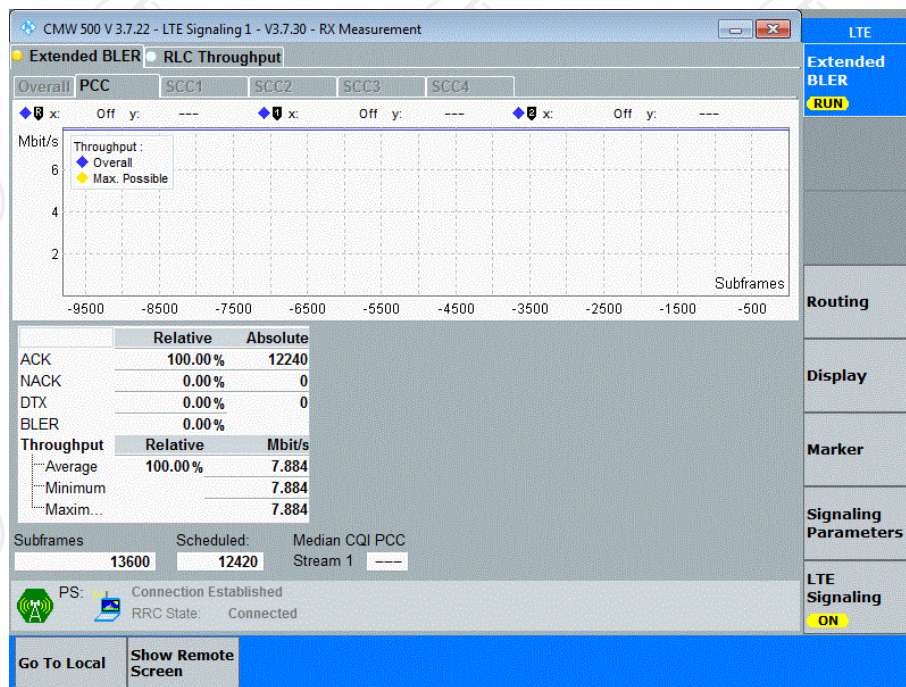
LTE Band 1



LTE Band 3

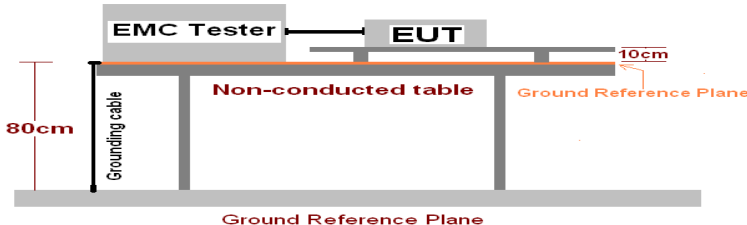






6.7. Voltage Dips and Voltage Interruption

6.7.1. Test Specification

Test Requirement:	ETSI EN 301489-1;
Test Method:	EN 61000-4-11
Test Level:	0% of VT(Supply Voltage) for 0.5 period 0% of VT(Supply Voltage) for 1.0 period 70% of VT(Supply Voltage) for 25 period 0% of VT(Supply Voltage) for 250 period
No. of Dips / Interruptions:	3 per Level
Test setup:	
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT and test generator were setup as shown on above setup photo. 2. The interruptions are introduced at selected phase angles with specified duration. 3. Record any degradation of performance.
Test Instrument:	Refer to section 3.3 for details
Test Mode:	Refer to section 3.1 for details
Test Result:	PASS

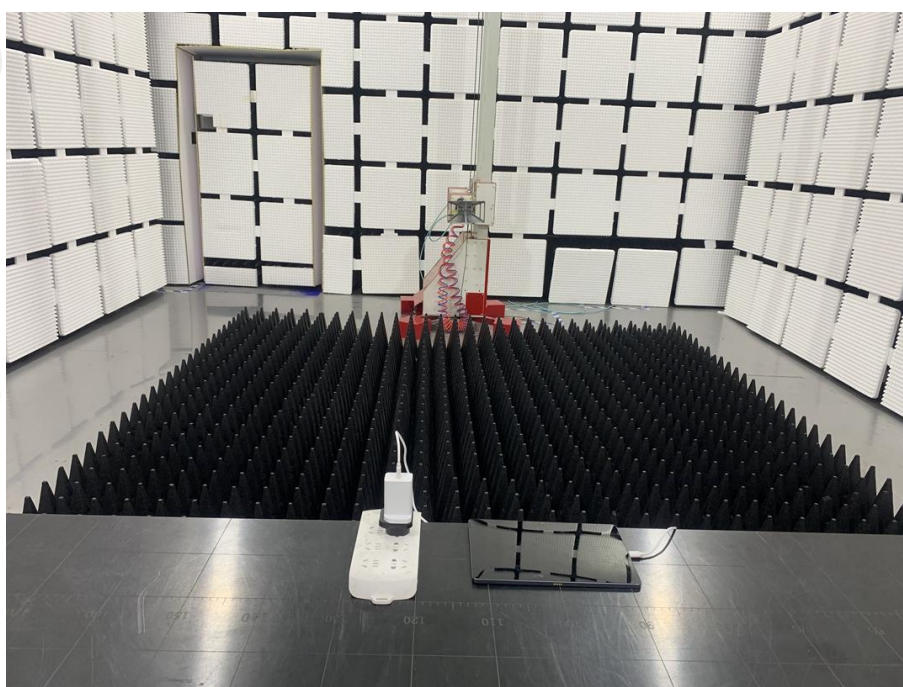
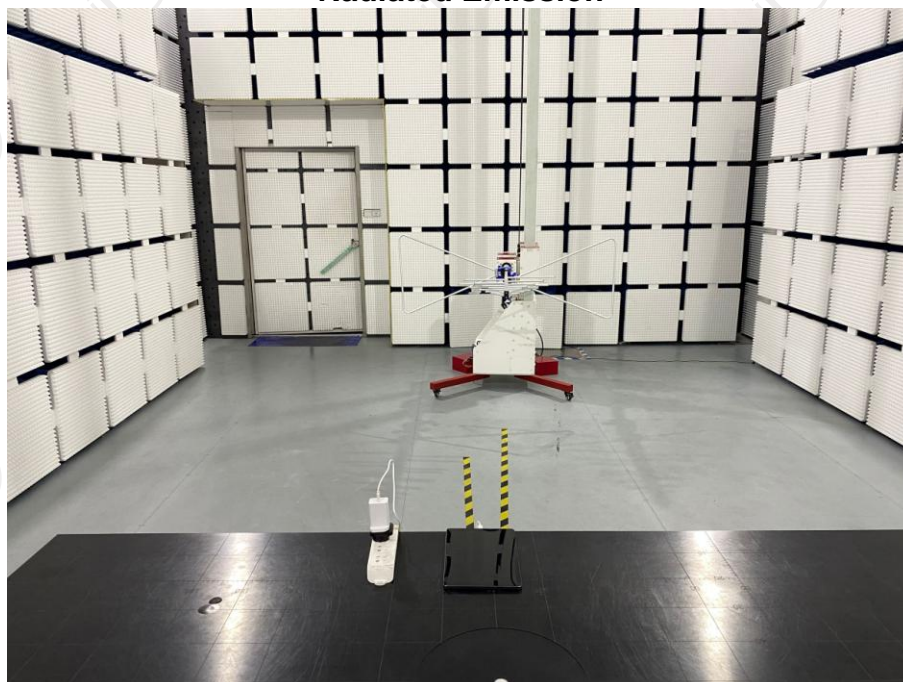
6.7.2. Test Data

Test Level % U_T	Duration (Periods)	Phase angle	No of dropout	Time between dropout	Observation Criterion	Result
0	0.5	0°, 90°, 180°, 270°	3	10s	B	PASS
0	1	0°, 90°, 180°, 270°	3	10s		
70	25	0°, 90°, 180°, 270°	3	10s		
0	250	0°, 90°, 180°, 270°	3	10s		

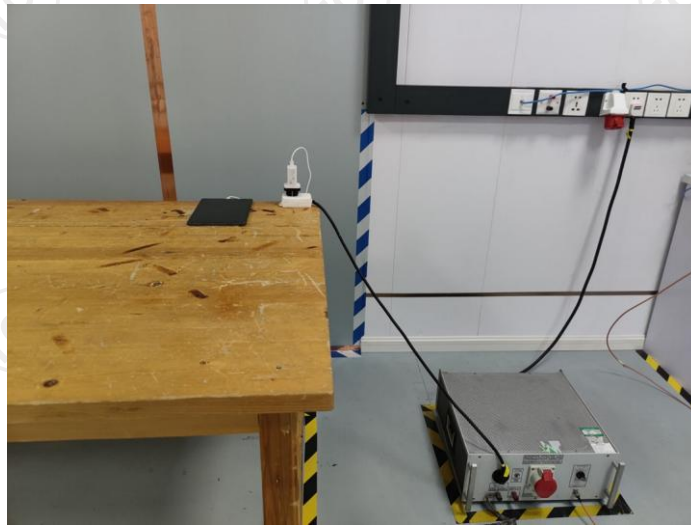
Note: When testing, the charging function had been interrupted. After testing, this function recovered automatically.

7. Photographs of Test Configuration

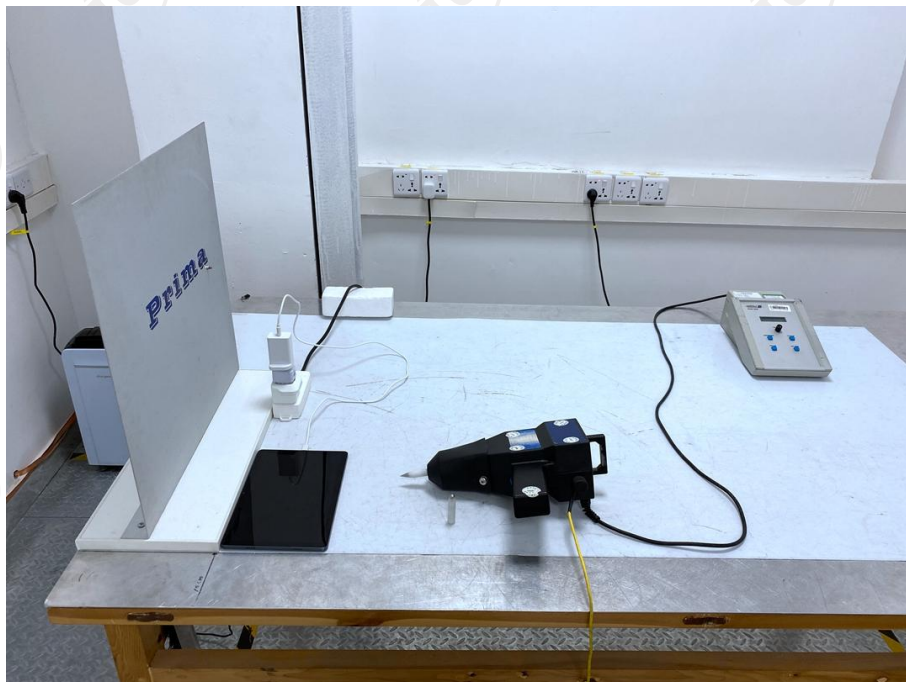
Radiated Emission



CE



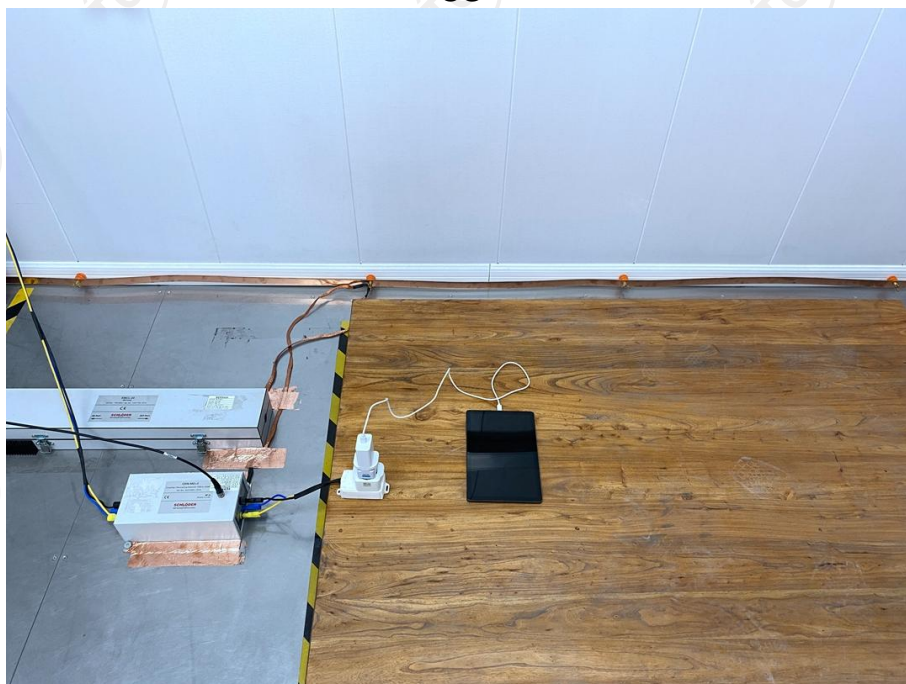
ESD



Flicker



CS



Surge



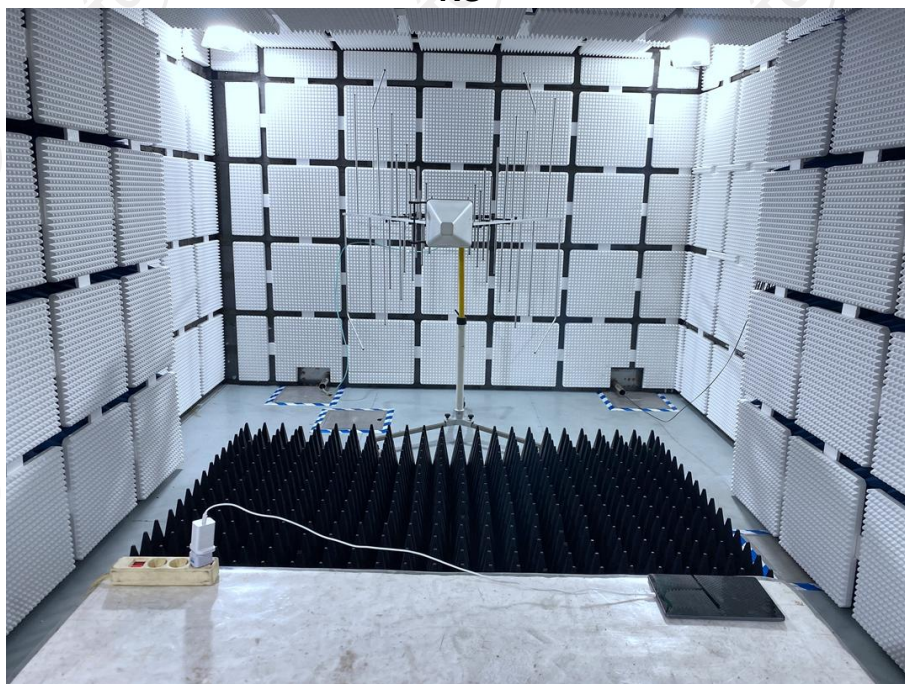
DIPS



EFT

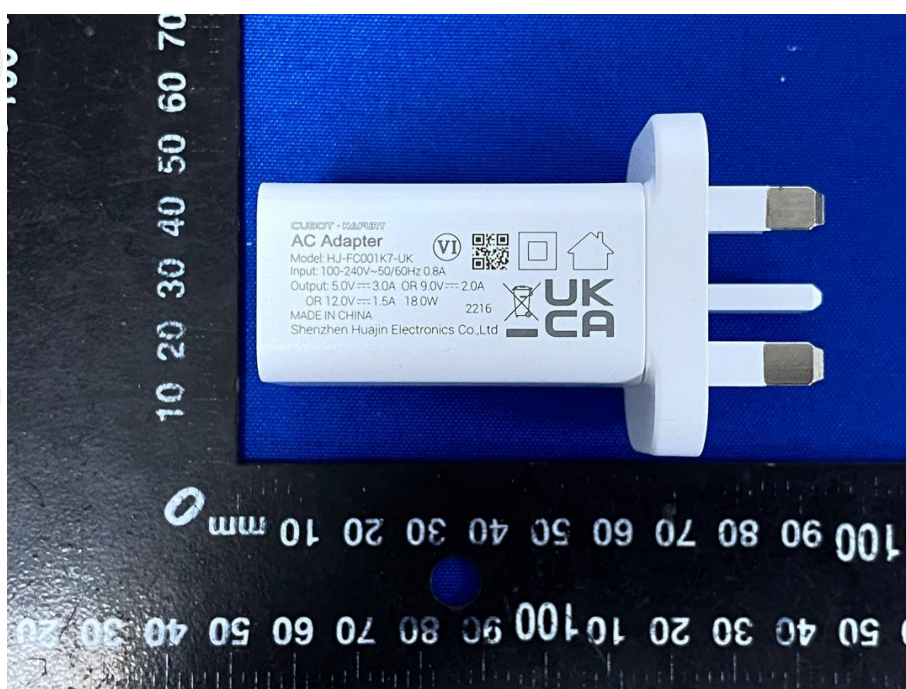


RS

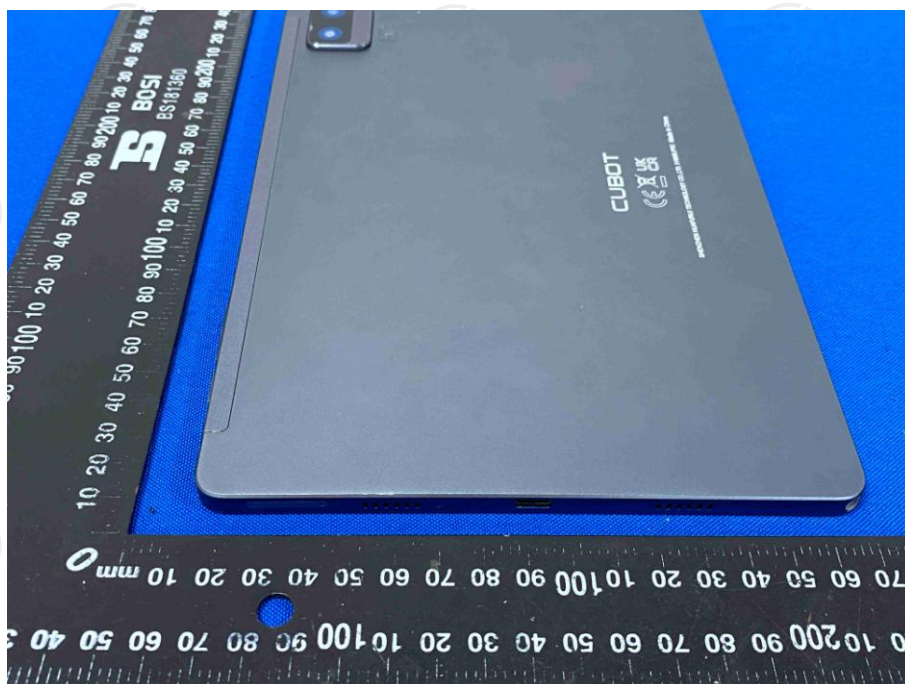


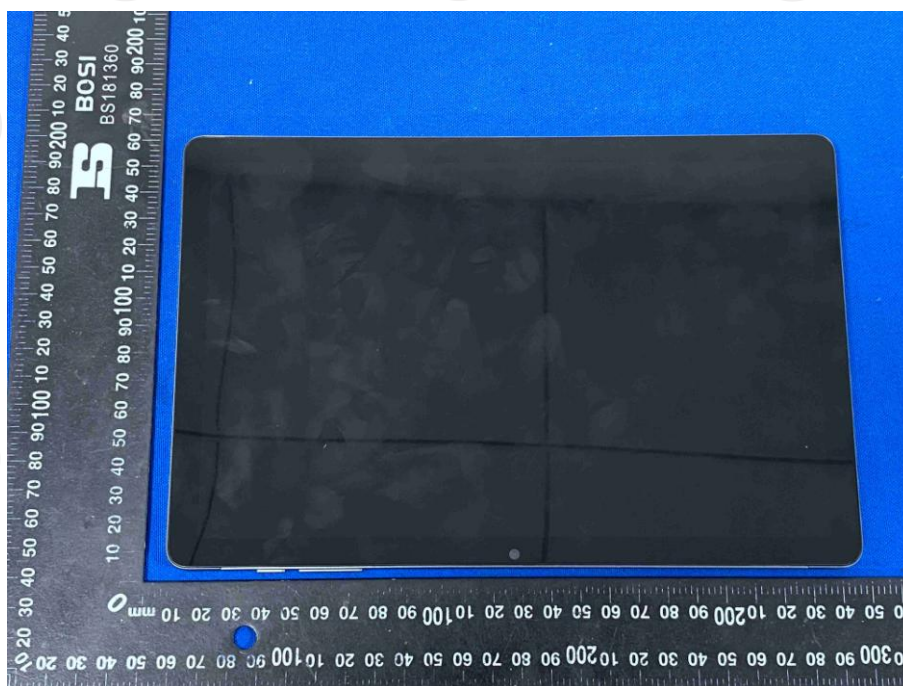
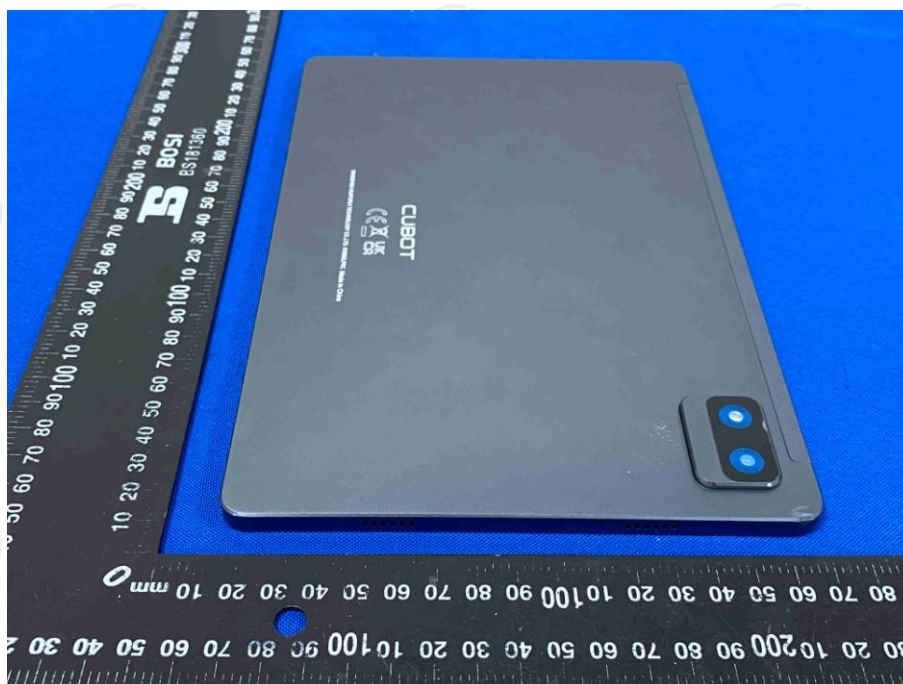
8. Photographs of EUT

Outside View

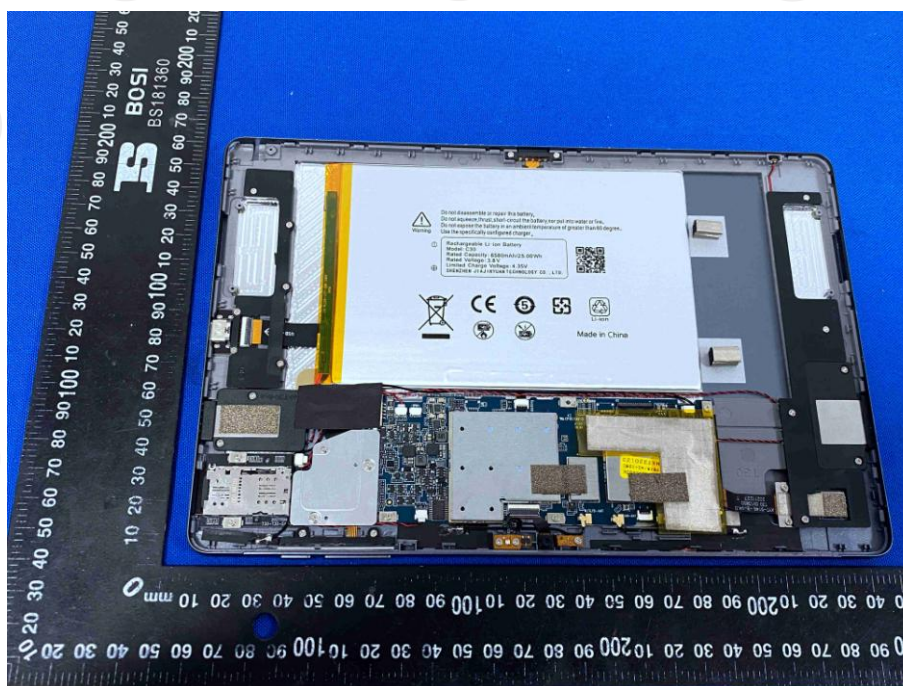
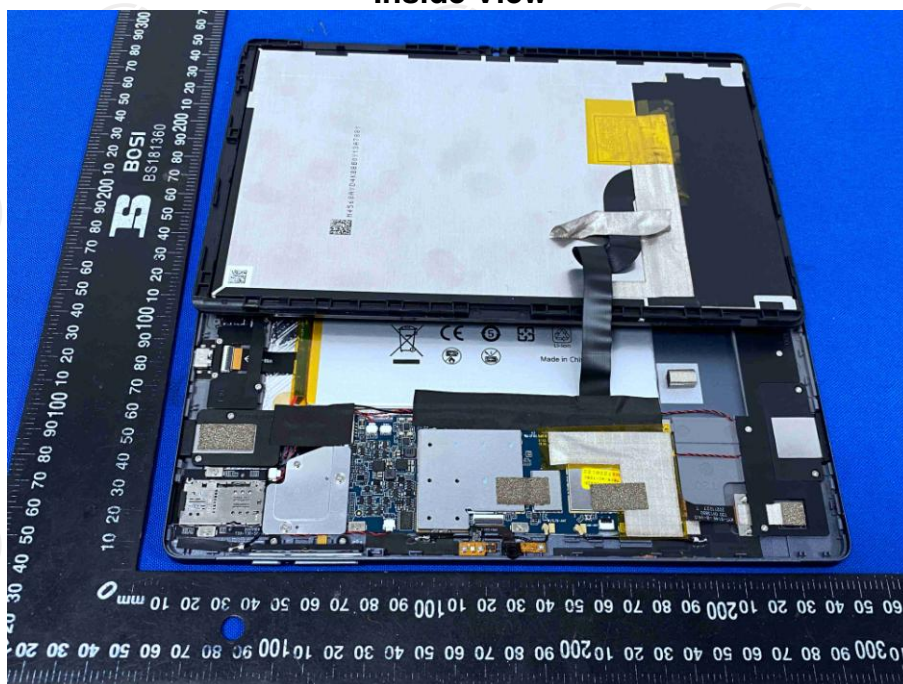


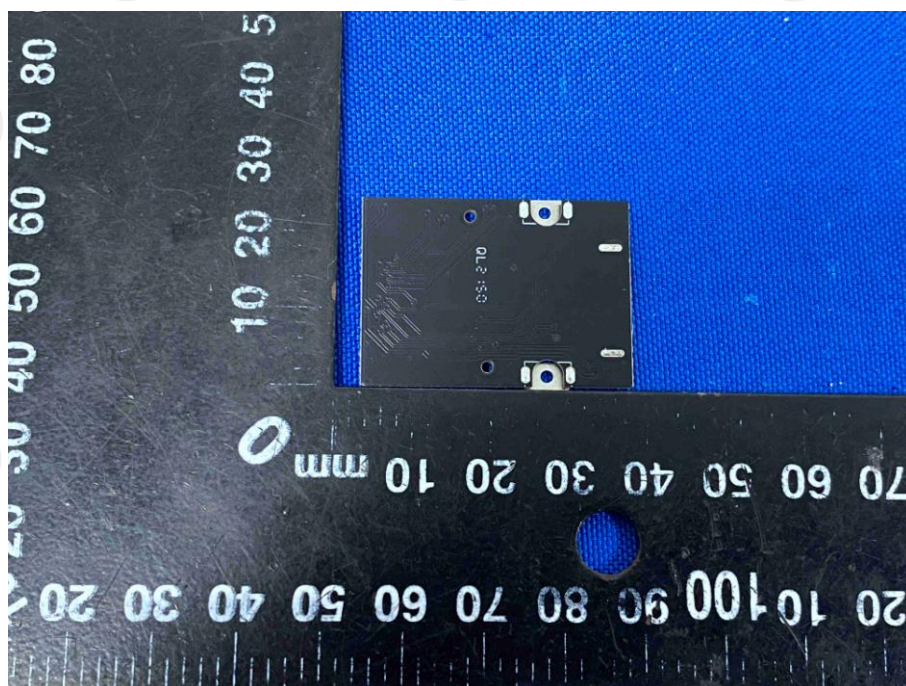
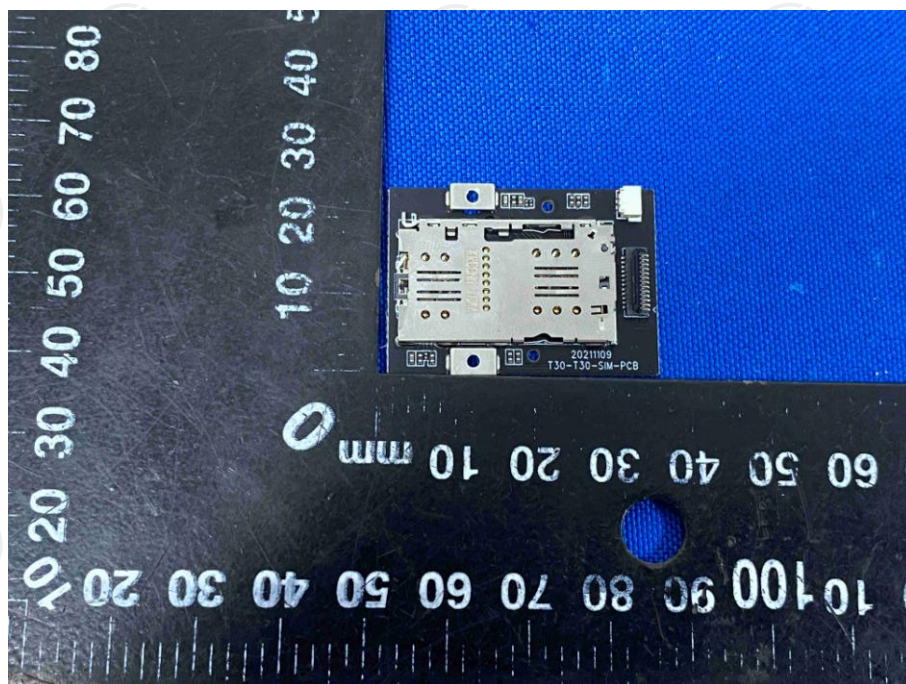


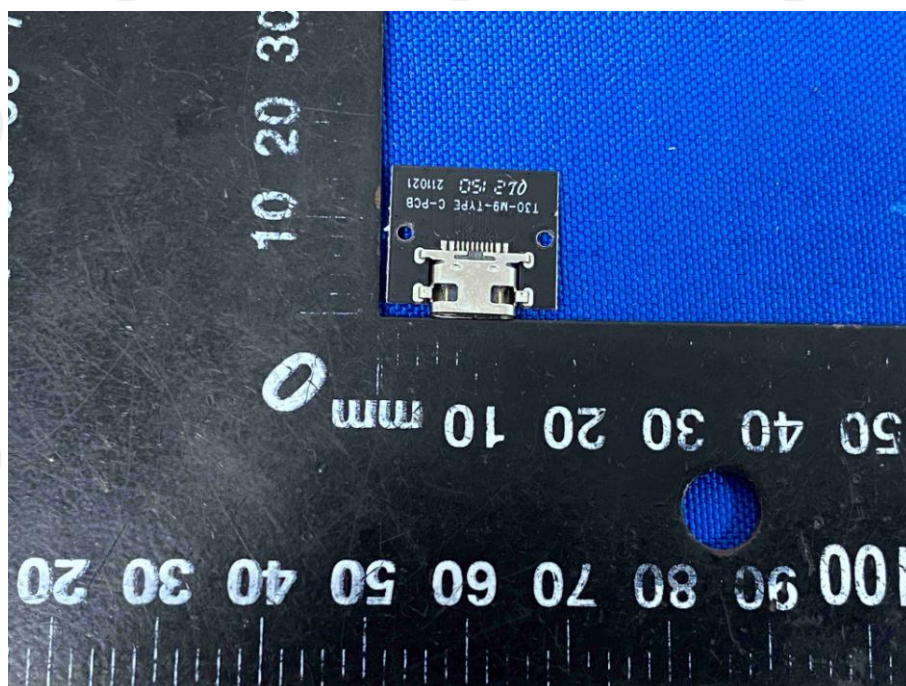
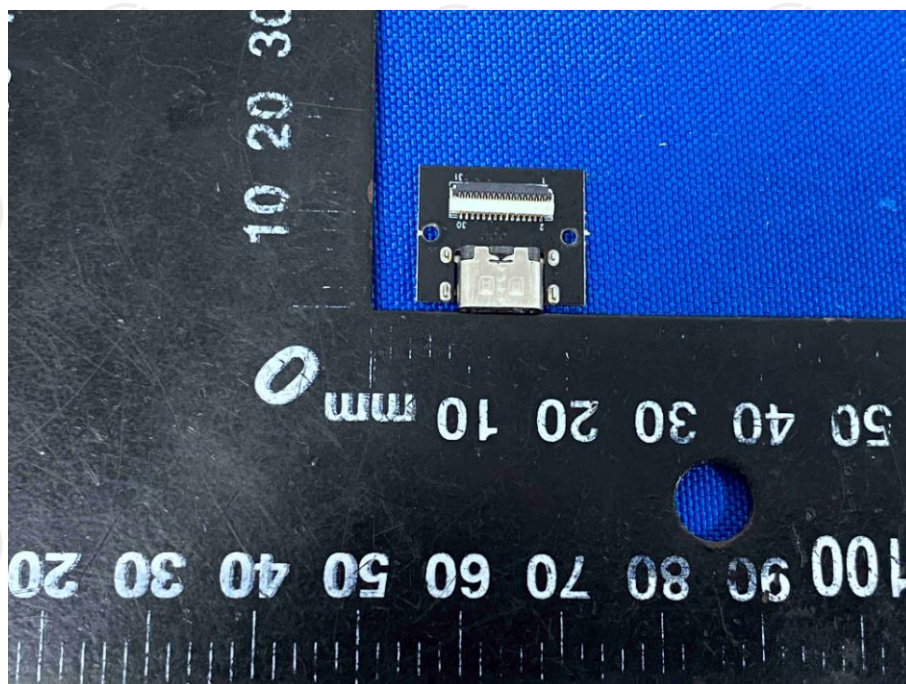


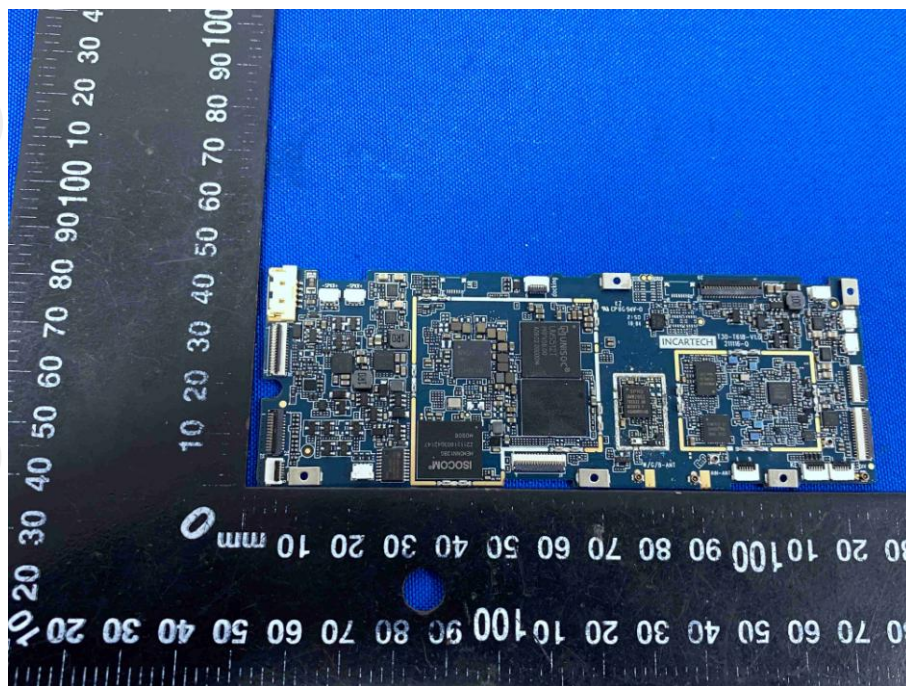
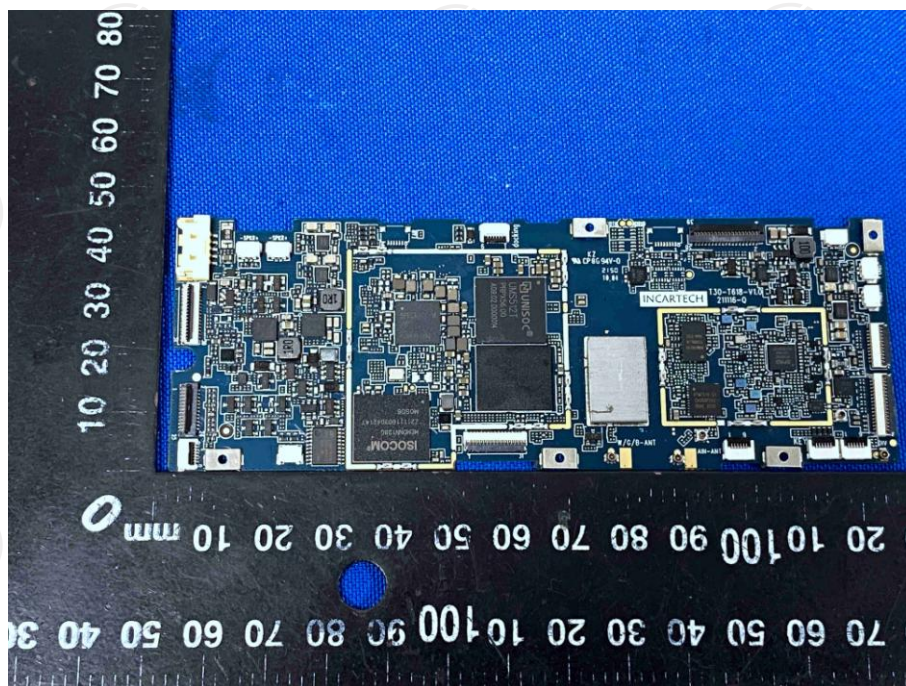


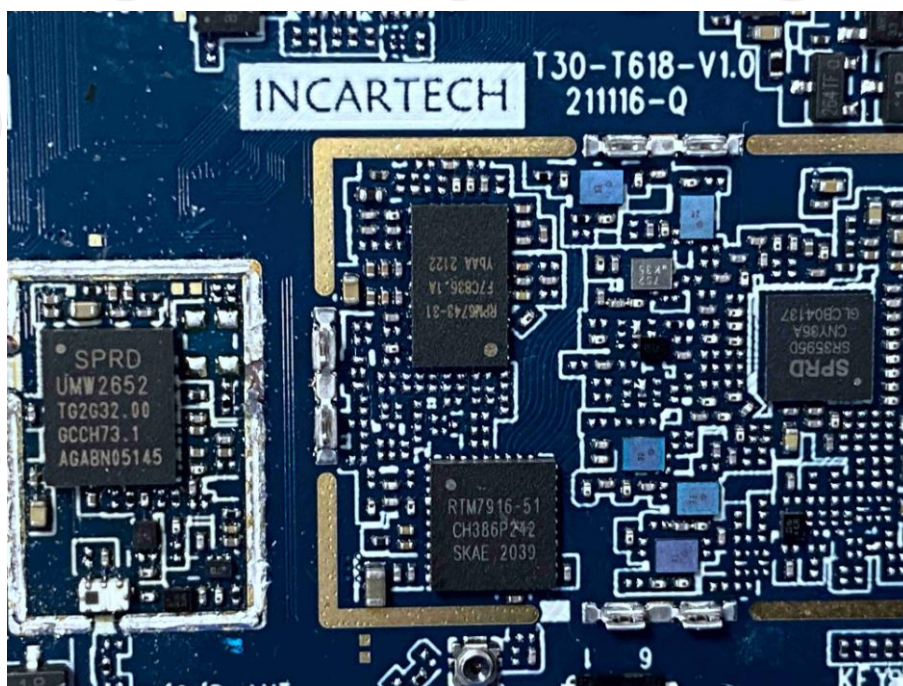
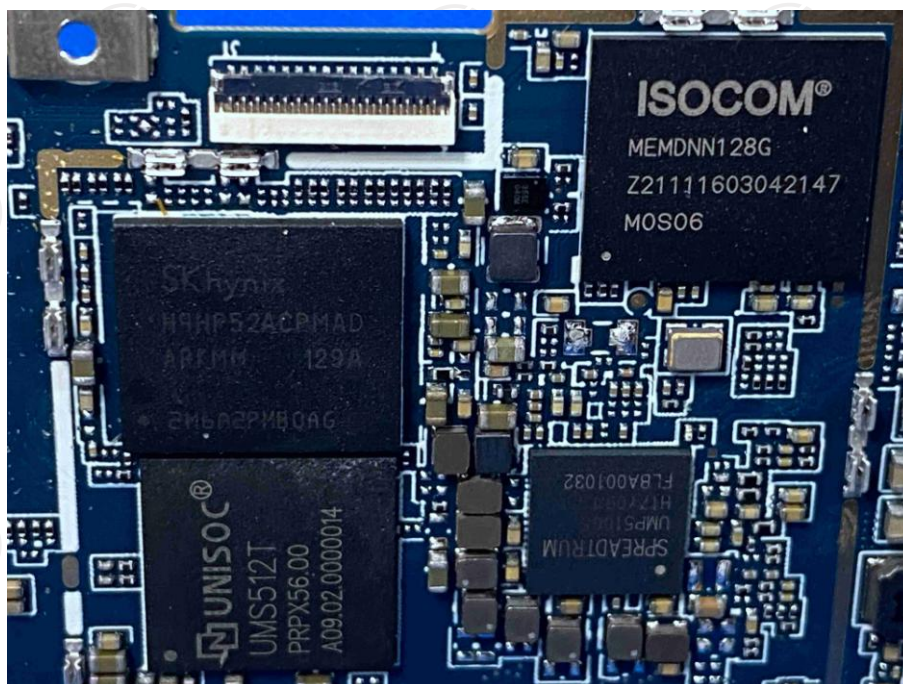
Inside View

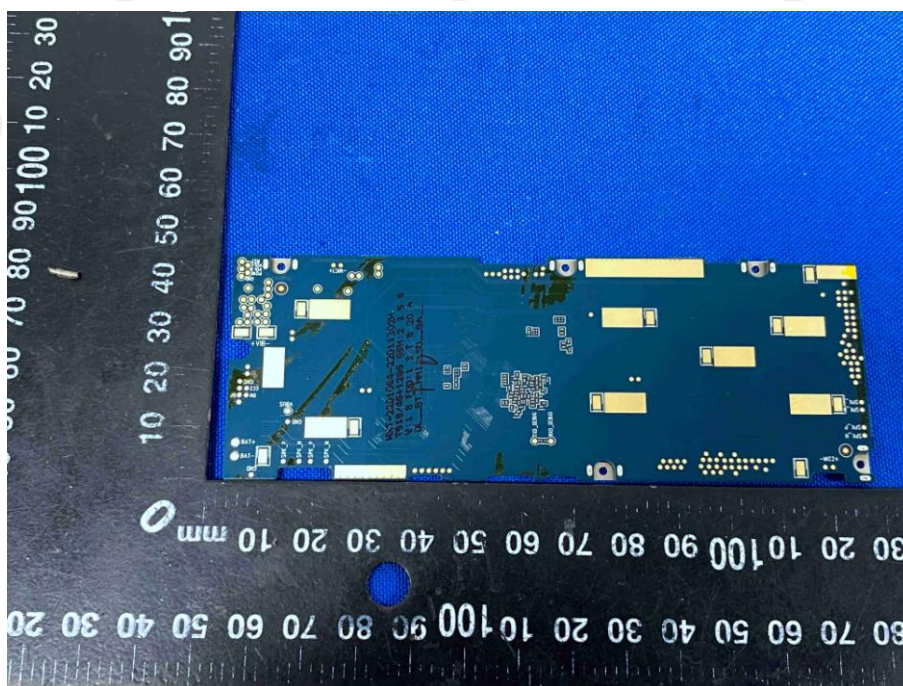
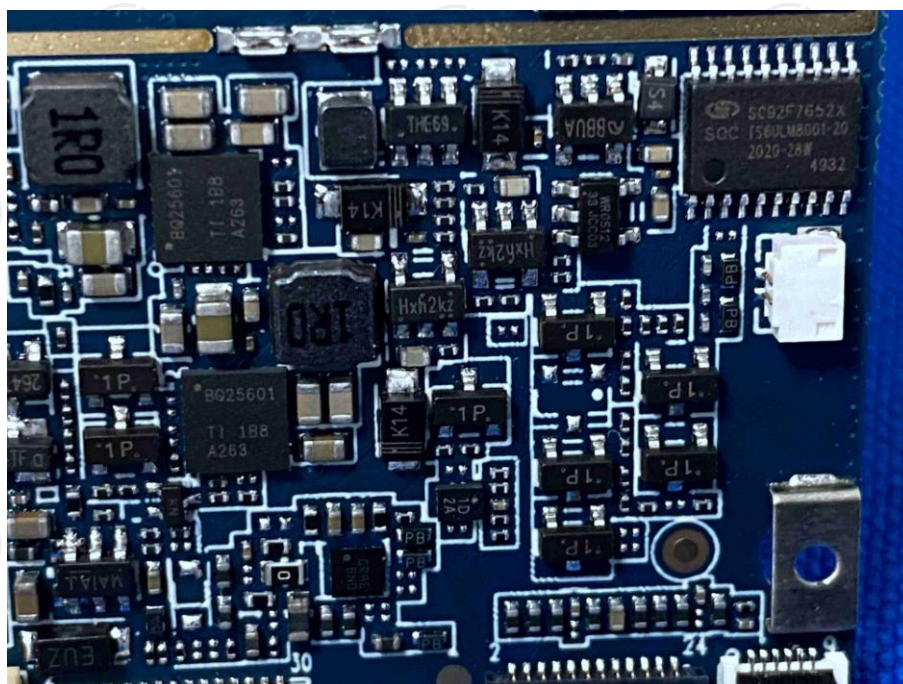


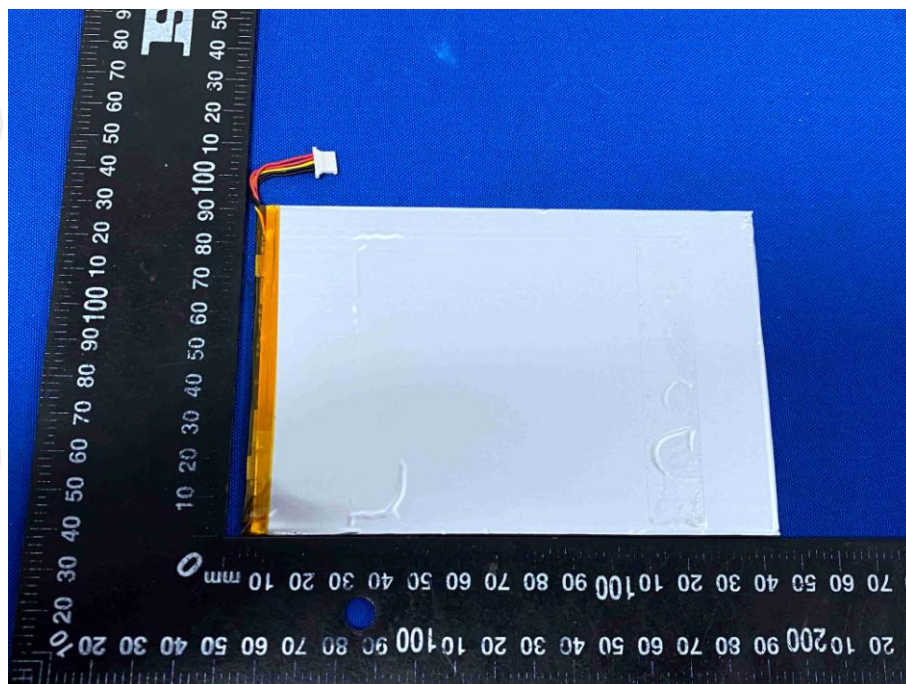
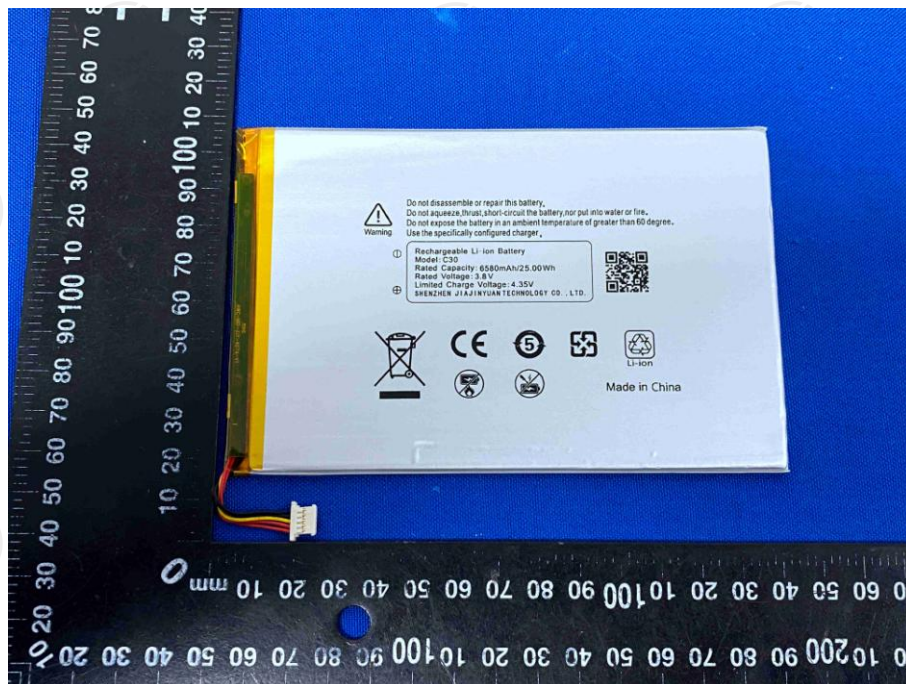












*****END OF REPORT*****