

ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-5 V2.2.1 (2019-04)

TEST REPORT

For

Quanshun Communication Technology Co., Ltd

Quanshun Bldg., Daxiamei, Nan'an, Quanzhou, Fujian, China

Tested Model: D30
Series Mode: D3X, D33, D35, D36, D37, D38, D39

Report Type: Original Report	Product Type: DMR Digital Portable Radio
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Report Number:	RXM210414051-02
Report Date:	2021-07-05
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FINAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	Quanshun Communication And Technology Co., Ltd
Test Model	D30
Series Model:	D3X, D33, D35, D36, D37, D38, D39
Product	DMR Digital Portable Radio
Power Supply	DC 7.4V from battery; DC 5V/12V charging by adapter
*Highest Operation Frequency	470 MHz

Adapter-1 Information:

Model: GQ24-120200-AG

Input: 100-240V,50/60Hz,1.0A

Output: 12.0V,2.0A,24.0W

Adapter-2 Information:

Model: GQ05A-050100-ZG

Input: AC100-240V,50/60Hz,0.15A

Output: DC5.0V,1.0A,5.0W

*Note1: The highest operation frequency was provided by the applicant.

*Note2: The difference between test model and series model were explained in the attached declaration letter.

*All measurement and test data in this report was gathered from production sample serial number:

RXM210414051-1.(Assigned by the BACL. The EUT supplied by the applicant was received on 2020-04-14.)

Objective

This test report is prepared on behalf of *Quanshun Communication Technology Co., Ltd* in accordance with:

ETSI EN 301 489-1 V2.2.3 (2019-11), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

ETSI EN 301489-5 V2.2.1 (2019-04), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 5: Specific conditions for Private land Mobile Radio (PMR) and ancillary equipment (speech and non-speech) and Terrestrial Trunked Radio (TETRA).

The objective is to determine compliance with ETSI EN 301489-1 V2.2.3 (2019-11) and ETSI EN 301489-5 V2.2.1 (2019-04).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11).

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

FINAL

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user)

Test mode 1: Charging by adapter 1(AC 230V/50Hz)

Test mode 2: Charging by adapter 2(AC 230V/50Hz)

Test mode 3: RX(Analog channel)+high power

Test mode 4: RX(Analog channel)+low power

Test mode 5: TX(Analog channel)+high power

Test mode 6: TX(Analog channel)+low power

Test mode 7: RX(Digital channel)+high power

Test mode 8: RX(Digital channel)+low power

Test mode 9: TX(Digital channel)+high power

Test mode 10: TX(Digital channel)+low power

EUT Exercise Software

No exercise software was used to test.

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

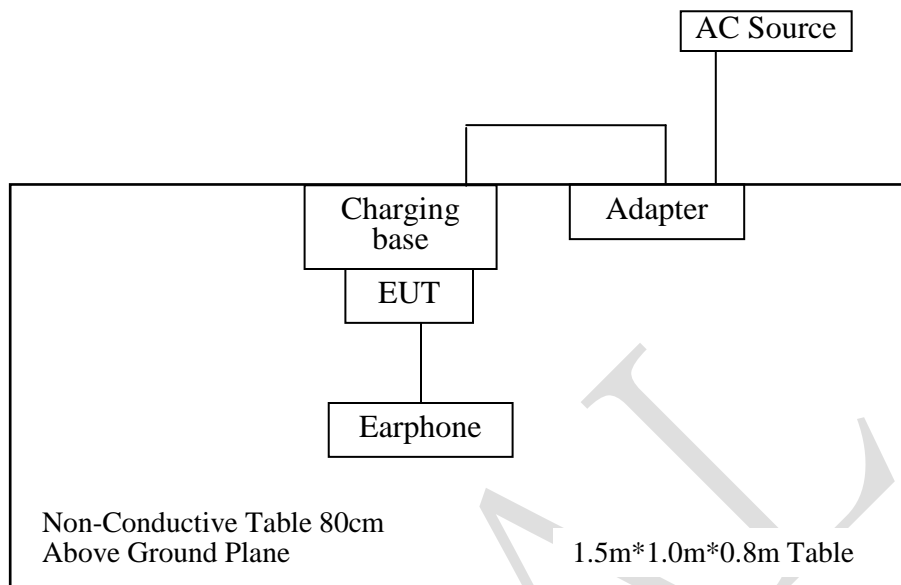
Manufacturer	Description	Model	Serial Number
HP	RF Communication Test SET	8920B	3325U00859
Aeroflex	Digital Radio tester	3920	100636779

External I/O Cable

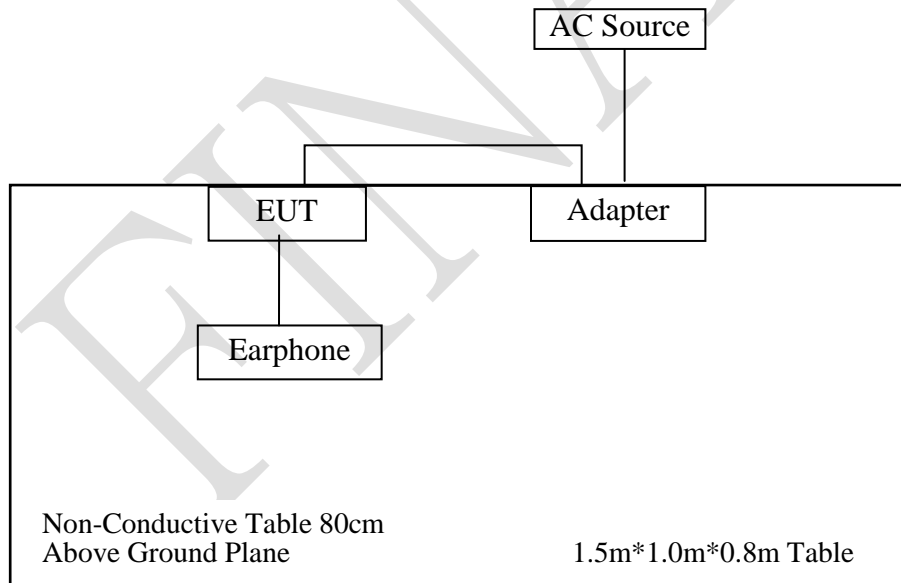
Cable Description	Length (m)	from	To
Audio Cable	1.0	EUT	Earphone
Power Cable	1.5	EUT	Adapter
Power Cable	1.0	Adapter	AC Source
Power Cable	1.5	Charging Base	Adapter

Configuration of Radiation Test Setup

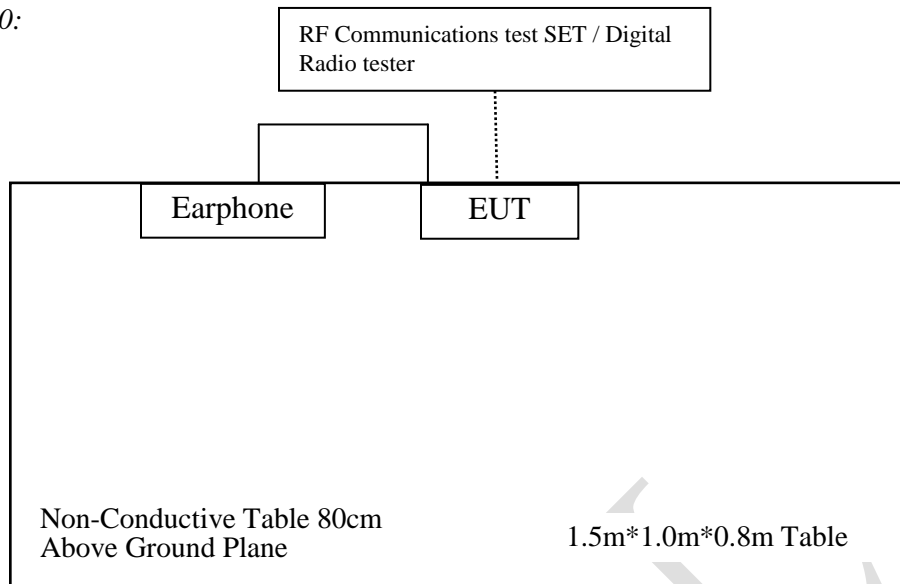
Test mode1:



Test mode2:



Test mode3~10:



SUMMARY OF TEST RESULTS

	Description of Test	Result
Reference to clauses EN 301 489-1 §7.1	Reference to clauses EN 301 489-1 §8.2 Enclosure port	Compliant
	Reference to clauses EN 301 489-1 §8.3 DC power input/output ports	Not Applicable (See Note1)
	Reference to clauses EN 301 489-1 §8.4 AC mains power input/output ports	Compliant
	Reference to clauses EN 301 489-1 §8.5 Harmonic current emissions (AC mains input port)	Not Applicable (See Note2)
	Reference to clauses EN 301 489-1 §8.6 Voltage fluctuations and flicker (AC mains input port)	Compliant
	Reference to clauses EN 301 489-1 §8.7 Wired network ports	Not Applicable (See Note3)
Reference to clauses EN 301 489-1 §7.2	Reference to clauses EN 301 489-1 §9.3 Electrostatic discharge	Compliant
	Reference to clauses EN 301 489-1 §9.2 Radio frequency electromagnetic field (80 MHz to 6000 MHz)	Compliant
	Reference to clauses EN 301 489-1 §9.4 Fast transients, common mode	Compliant
	Reference to clauses EN 301 489-1 §9.8 Surges	Compliant
	Reference to clauses EN 301 489-1 §9.5 Radio frequency, common mode	Compliant
	Reference to clauses EN 301 489-1 §9.7 Voltage dips and interruptions	Compliant
	Reference to clauses EN 301 489-1 §9.6 Transients and surges in the vehicular environment(ISO 7637-2)	Not Applicable (See Note4)

Note:

- 1: AC/DC power supply, then the measurement shall be performed on the AC power input port.
- 2: According to EN IEC 61000-3-2:2019 section 7.1, For equipment with a rated power of 75 W or less, other than lighting equipment, limits are not specified in this document
- 3: There are no wired network ports.
- 4: This equipment will not in vehicular environment.

Immunity test performance criteria:

“A” means : CT/CR Reference to clauses EN 301 489-1 §6.1/EN 301 489-5 §6.1

“B” means : TT/TR Reference to clauses EN 301 489-1 §6.2/EN 301 489-5 §6.2

§8.4 - AC Mains Power Input/Output Ports

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

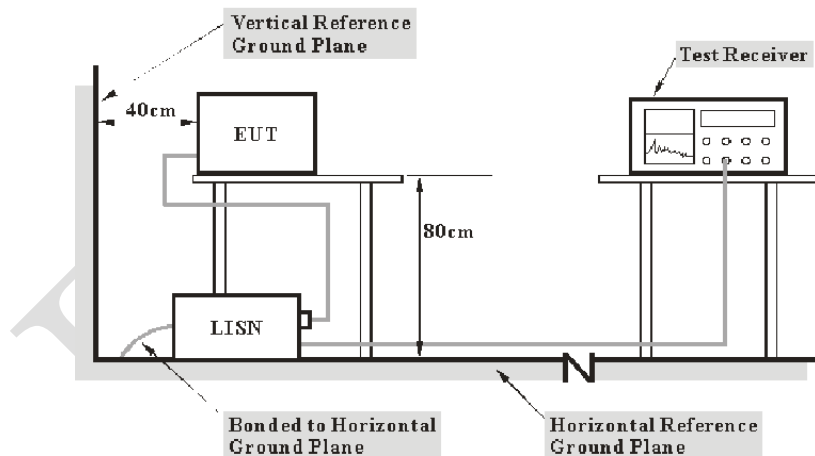
If U_{lab} is greater than U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Table 1 – Values of U_{cispr}

Item		Tereminal	Measurement Uncertainty	U_{cispr}
Conducted Emission	150kHz~30MHz	AC Mains	3.19 dB	3.4 dB

EUT Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per EN 301489-1 measurement procedures. The specification used was with the EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2020-07-28	2021-07-27
Rohde & Schwarz	LISN	ENV216	101115	2020-11-27	2021-11-26
Rohde & Schwarz	Pulse limiter	ESH3-Z2	100552	2020-08-10	2021-08-09
Audix	Test Software	e3	V9	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-15	015	2020-08-15	2021-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Factor & Over Limit Calculation

The Factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Attenuator (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of 7 dB means the emission is 7 dB above the limit. The equation for margin calculation is as follows:

$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

Test Data

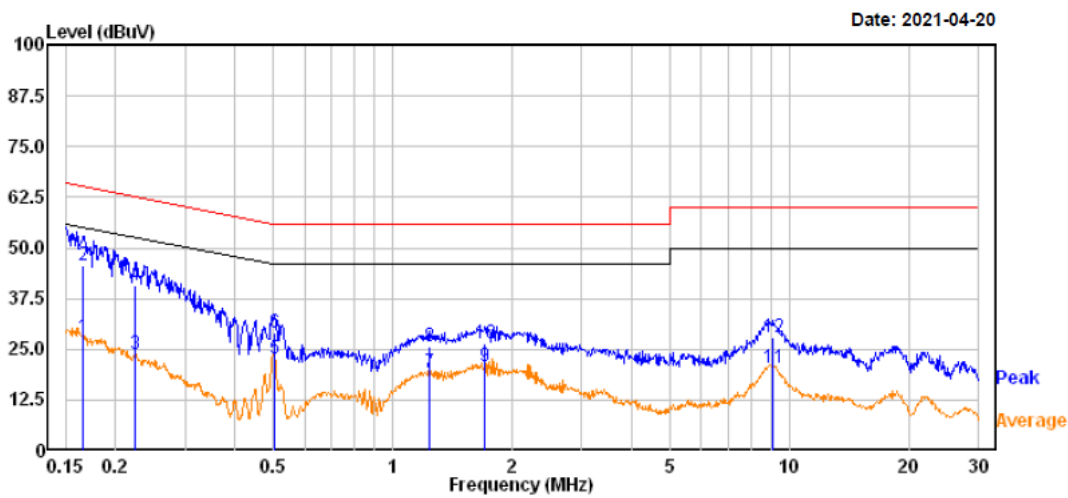
Environmental Conditions

Temperature:	24.5 °C
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Gerry Xing on 2021-04-20.

Test mode 1:

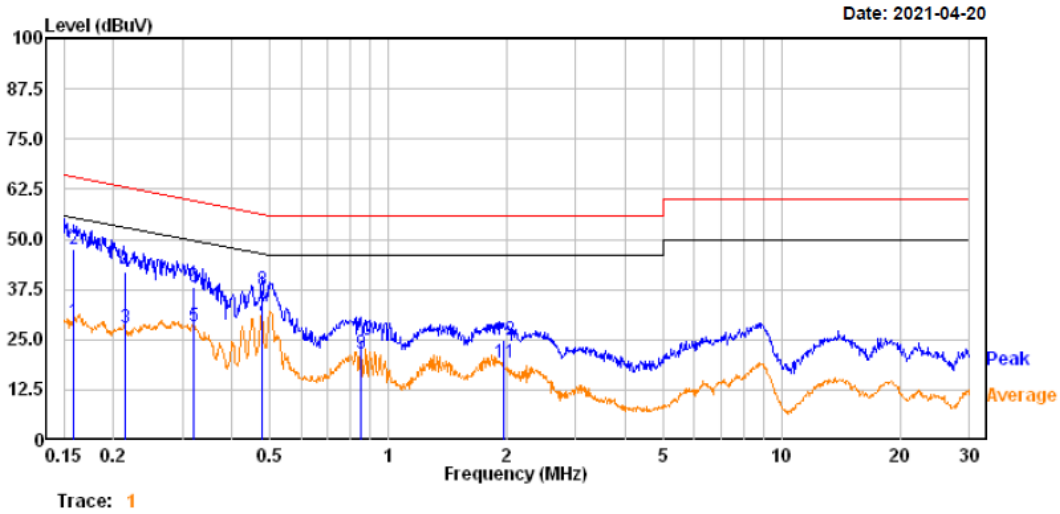
Line:



Trace: 1

	Read	Limit	Over				
Freq	Level	Factor	Level	Line	Limit	Remark	
MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.166	8.00	19.83	27.83	55.17	-27.34	Average
2	0.166	25.70	19.83	45.53	65.17	-19.64	QP
3	0.225	4.00	19.82	23.82	52.65	-28.83	Average
4	0.225	20.90	19.82	40.72	62.65	-21.93	QP
5	0.504	3.00	19.76	22.76	46.00	-23.24	Average
6	0.504	9.40	19.76	29.16	56.00	-26.84	QP
7	1.235	-0.39	19.81	19.42	46.00	-26.58	Average
8	1.235	5.71	19.81	25.52	56.00	-30.48	QP
9	1.708	0.80	19.84	20.64	46.00	-25.36	Average
10	1.708	6.60	19.84	26.44	56.00	-29.56	QP
11	9.115	0.89	19.55	20.44	50.00	-29.56	Average
12	9.115	8.19	19.55	27.74	60.00	-32.26	QP

Neutral:



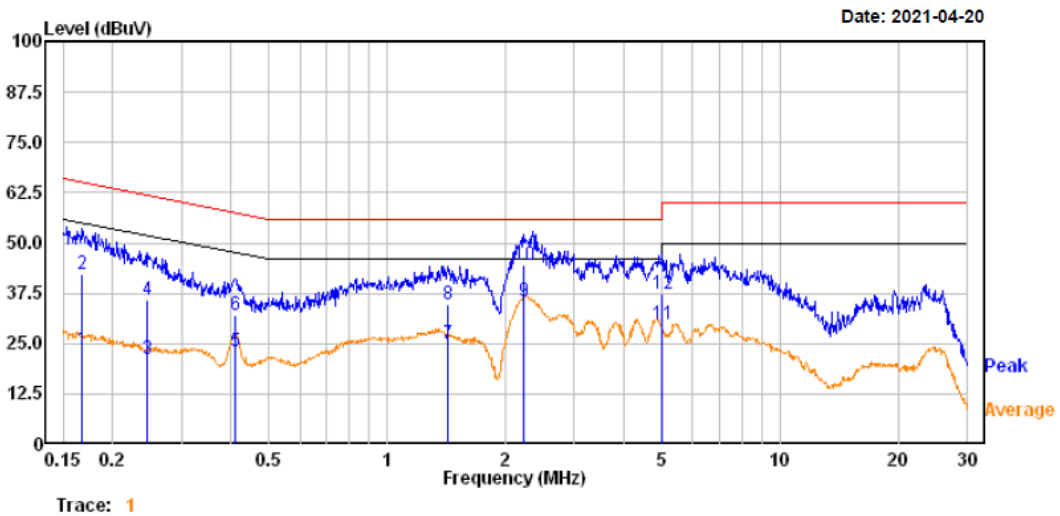
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.158	9.70	19.82	29.52	55.54	-26.02	Average
2	0.158	27.90	19.82	47.72	65.54	-17.82	QP
3	0.215	8.10	19.82	27.92	53.02	-25.10	Average
4	0.215	22.10	19.82	41.92	63.02	-21.10	QP
5	0.320	8.39	19.82	28.21	49.71	-21.50	Average
6	0.320	18.20	19.82	38.02	59.71	-21.69	QP
7	0.479	11.00	19.76	30.76	46.35	-15.59	Average
8	0.479	17.70	19.76	37.46	56.35	-18.89	QP
9	0.850	1.79	19.71	21.50	46.00	-24.50	Average
10	0.850	5.30	19.71	25.01	56.00	-30.99	QP
11	1.973	-0.77	19.83	19.06	46.00	-26.94	Average
12	1.973	5.00	19.83	24.83	56.00	-31.17	QP

Note:

- 1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
- 2) Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

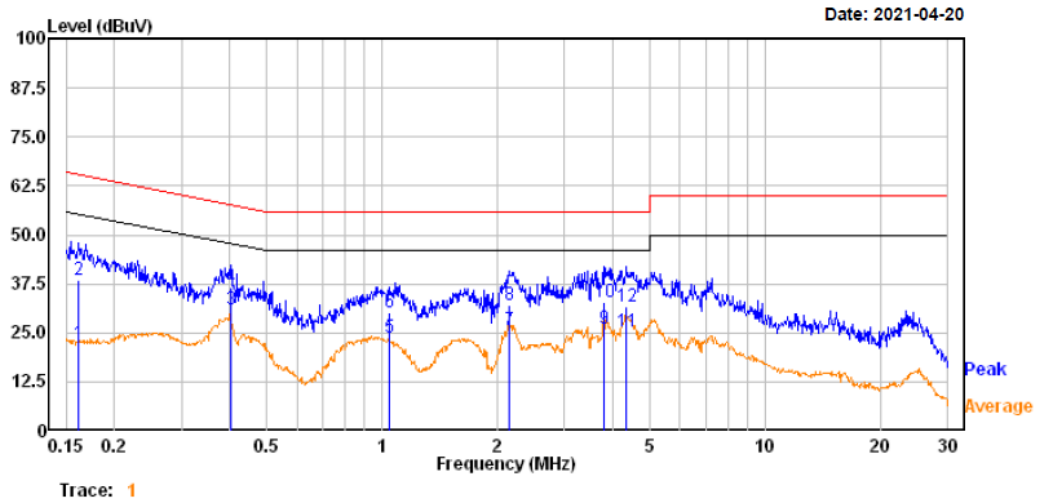
Test mode2:

Line:



	Read Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.167	3.50	19.83	23.33	55.09	-31.76	Average
2	0.167	22.40	19.83	42.23	65.09	-22.86	QP
3	0.246	1.40	19.82	21.22	51.90	-30.68	Average
4	0.246	16.20	19.82	36.02	61.90	-25.88	QP
5	0.411	3.20	19.74	22.94	47.64	-24.70	Average
6	0.411	12.50	19.74	32.24	57.64	-25.40	QP
7	1.427	5.01	19.83	24.84	46.00	-21.16	Average
8	1.427	14.71	19.83	34.54	56.00	-21.46	QP
9	2.224	15.90	19.66	35.56	46.00	-10.44	Average
10	2.224	24.80	19.66	44.46	56.00	-11.54	QP
11	5.012	10.30	19.49	29.79	50.00	-20.21	Average
12	5.012	17.90	19.49	37.39	60.00	-22.61	QP

Neutral:



	Read Freq	Read Level	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.162	2.30	19.83	22.13	55.38	-33.25	Average
2	0.162	18.50	19.83	38.33	65.38	-27.05	QP
3	0.402	11.30	19.74	31.04	47.80	-16.76	Average
4	0.402	16.80	19.74	36.54	57.80	-21.26	QP
5	1.043	4.00	19.82	23.82	46.00	-22.18	Average
6	1.043	10.20	19.82	30.02	56.00	-25.98	QP
7	2.148	5.91	19.71	25.62	46.00	-20.38	Average
8	2.148	12.31	19.71	32.02	56.00	-23.98	QP
9	3.791	6.50	19.47	25.97	46.00	-20.03	Average
10	3.791	13.40	19.47	32.87	56.00	-23.13	QP
11	4.359	5.71	19.47	25.18	46.00	-20.82	Average
12	4.359	12.31	19.47	31.78	56.00	-24.22	QP

Note:

- 1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
- 2) Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

§8.2 - Enclosure port

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

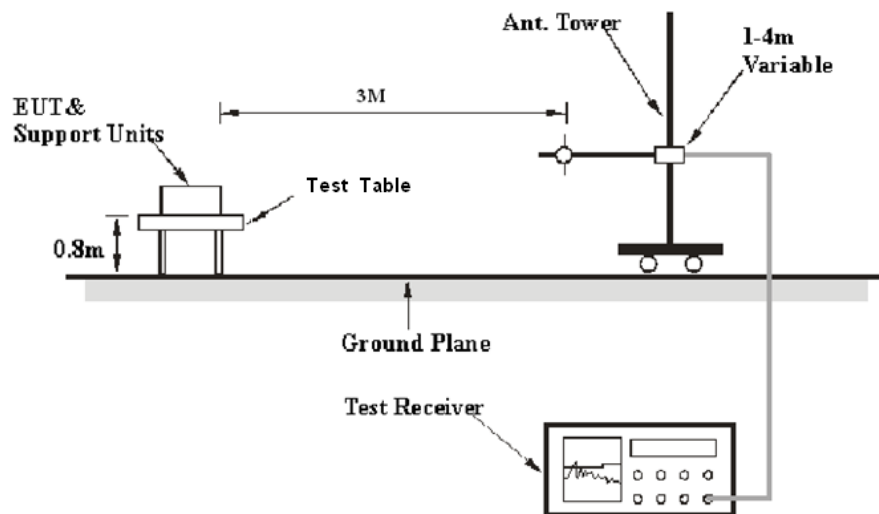
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Table 1 – Values of U_{cispr}

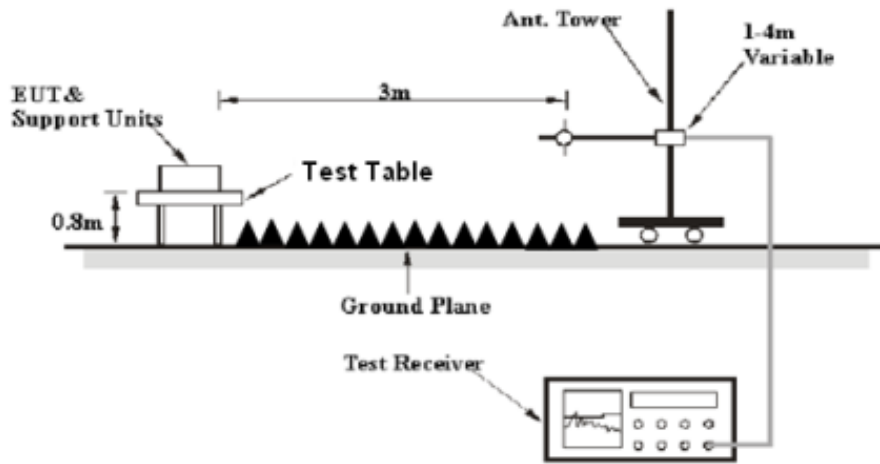
Item		Measurement Uncertainty	U_{cispr}
Radiated Emissions	30MHz~1GHz	6.11dB	6.3 dB
	1GHz~6GHz	4.45dB	5.2 dB

Test System Setup

Below 1GHz:



Above 1GHz:



Radiated Top View:

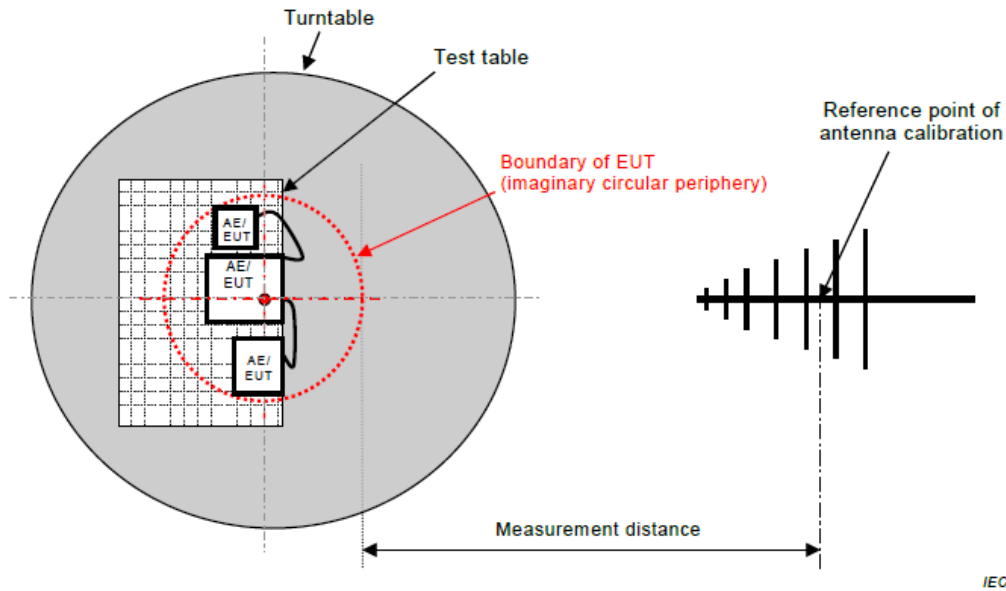


Figure C.1 – Measurement distance

The radiated emission tests were performed in the 3 meters, using the setup accordance with the ETSI EN 301 489-1 V2.2.3 (2019-11). The specification used was the ETSI EN 301 489-1 V2.2.3 (2019-11).

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 2 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	Detector Type
30MHz - 1000 MHz	120 kHz	300 kHz	QP
Above 1 GHz	1 MHz	3 MHz	Peak
	1MHz	3 MHz	AVG

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrument	Amplifier	310N	185700	2020-08-14	2021-08-13
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2020-11-27	2021-11-26
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2020-01-07	2023-01-06
Champrotek	Chamber 1#	3m-SAC 966	NA	2019-05-08	2022-05-07
Albatross	Chamber 2#	3m-SAC 966	NA	2019-05-08	2022-05-07
Rohde & Schwarz	CE Test Software	EMC32	100361	N/A	N/A
ETS	Horn Antenna	3115	9311-4159	2020-07-15	2023-07-14
Rohde & Schwarz	EMI Receiver	ESU40	100207	2021-03-16	2022-03-15
A.H.Systems,inc	Amplifier	PAM-0118P	512	2020-08-14	2021-08-13
MICRO-COAX	Coaxial Cable	Cable-8	008	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-4	004	2020-08-15	2021-08-14
MICRO-COAX	Coaxial Cable	Cable-5	005	2020-08-15	2021-08-14

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

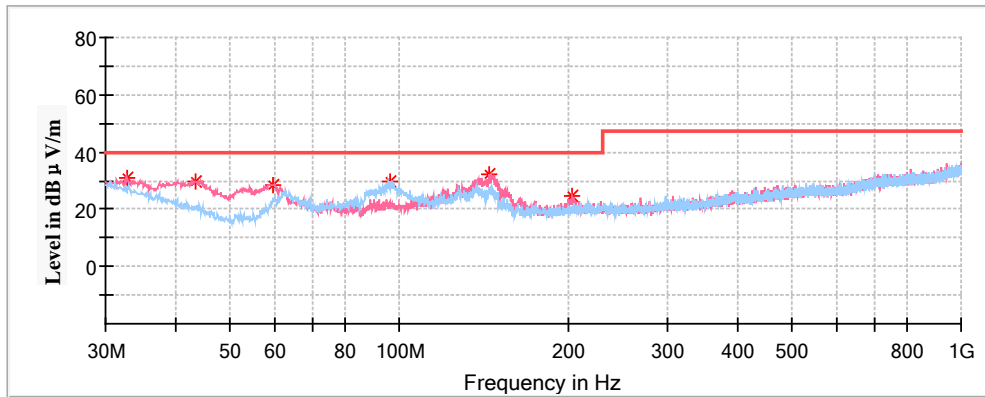
Environmental Conditions

Temperature:	24.5~24.9 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.7~102.3 kPa

The testing was performed by Gerry Xing on 2021-04-21.

Test model:

1) Below 1GHz:

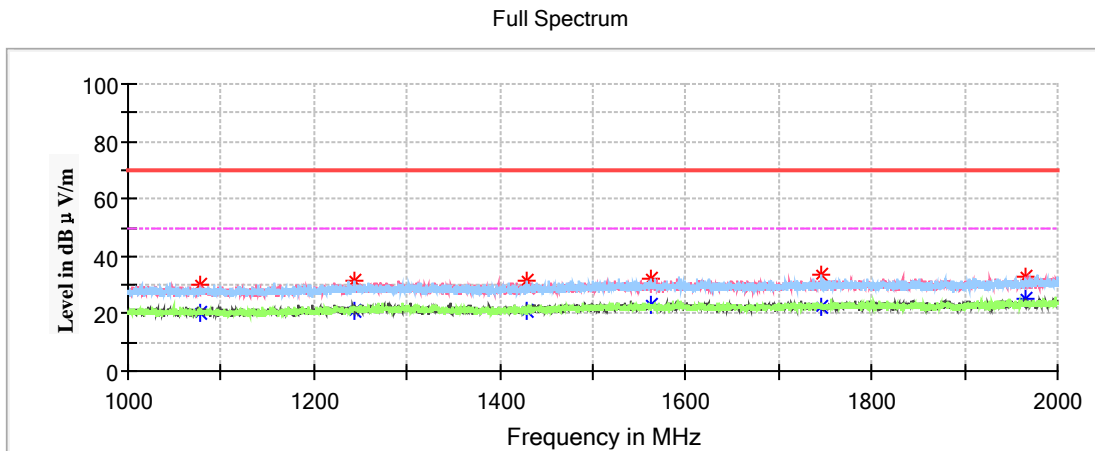


Frequency (MHz)	Corrected Amplitude	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	MaxPeak (dBμV/m)						
32.788750	29.86	40.00	10.14	100.0	V	2.0	-5.5
43.337500	29.88	40.00	10.12	100.0	V	62.0	-12.7
59.585000	28.63	40.00	11.37	100.0	V	110.0	-14.6
96.445000	29.95	40.00	10.05	200.0	H	97.0	-15.4
144.823750	31.97	40.00	8.03	100.0	V	243.0	-12.2
203.630000	24.74	40.00	15.26	100.0	V	0.0	-12.0

Note:

- 1) Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain
- 2) Margin = Limit - Corrected Amplitude
- 3) The PK values of the emissions are 6dB below the QP Limit, so the QP values of the emissions were not recorded.

2) Above 1 GHz:



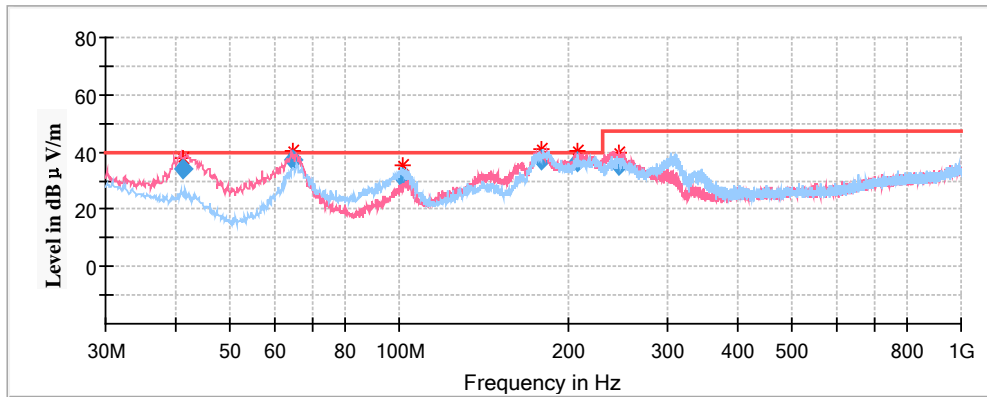
Frequency (MHz)	Corrected Amplitude		Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	MaxPeak (dBμV/m)	Average (dBμV/m)						
1078.100000	---	20.57	50.00	29.43	100.0	H	106.0	-18.6
1078.100000	30.23	---	70.00	39.77	100.0	H	106.0	-18.6
1243.800000	---	21.31	50.00	28.69	200.0	H	39.0	-17.7
1243.800000	31.70	---	70.00	38.30	200.0	H	39.0	-17.7
1428.600000	---	20.89	50.00	29.11	200.0	H	233.0	-16.7
1428.600000	31.55	---	70.00	38.45	200.0	H	233.0	-16.7
1561.800000	---	23.06	50.00	26.94	200.0	V	13.0	-16.1
1561.800000	31.82	---	70.00	38.18	200.0	V	13.0	-16.1
1745.100000	---	22.70	50.00	27.30	100.0	H	143.0	-15.4
1745.100000	33.33	---	70.00	36.67	100.0	H	143.0	-15.4
1966.400000	---	25.09	50.00	24.91	100.0	V	202.0	-14.6
1966.400000	32.77	---	70.00	37.23	100.0	V	202.0	-14.6

1)Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

2)Margin = Limit -Corrected Amplitude

Test mode2:

1) Below 1GHz:



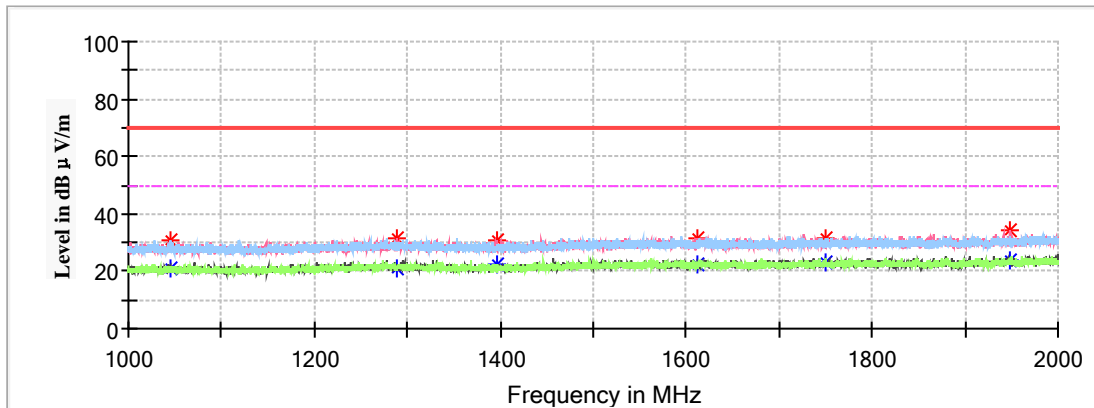
Frequency (MHz)	Corrected Amplitude	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	QuasiPeak (dBμV/m)						
41.138050	33.92	40.00	6.08	100.0	V	60.0	-11.2
64.884650	37.38	40.00	2.62	100.0	V	97.0	-15.6
101.790400	31.05	40.00	8.95	200.0	H	284.0	-14.2
179.426950	37.03	40.00	2.97	100.0	V	193.0	-13.4
208.058250	36.60	40.00	3.40	100.0	V	169.0	-12.0
246.600300	35.44	47.00	11.56	200.0	V	154.0	-11.9

1)Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

2)Margin = Limit -Corrected Amplitude

2) Above 1 GHz:

Full Spectrum



Frequency (MHz)	Corrected Amplitude		Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	MaxPeak (dBμV/m)	Average (dBμV/m)						
1045.000000	---	20.66	50.00	29.34	200.0	H	138.0	-18.8
1045.000000	30.92	---	70.00	39.08	100.0	H	292.0	-18.8
1289.200000	---	21.13	50.00	28.87	100.0	V	266.0	-17.5
1289.200000	31.17	---	70.00	38.83	200.0	V	38.0	-17.5
1395.800000	---	22.03	50.00	27.97	200.0	V	137.0	-16.9
1395.800000	30.85	---	70.00	39.15	200.0	V	137.0	-16.9
1611.600000	---	22.72	50.00	27.28	200.0	H	106.0	-15.9
1611.600000	31.57	---	70.00	27.28	200.0	H	106.0	-15.9
1750.700000	---	22.87	50.00	27.13	100.0	H	281.0	-15.4
1750.700000	31.67	---	70.00	38.33	200.0	H	299.0	-15.4
1949.000000	---	23.86	50.00	26.14	100.0	V	0.0	-14.7
1949.000000	33.96	---	70.00	36.04	100.0	V	0.0	-14.7

1)Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

2)Margin = Limit -Corrected Amplitude

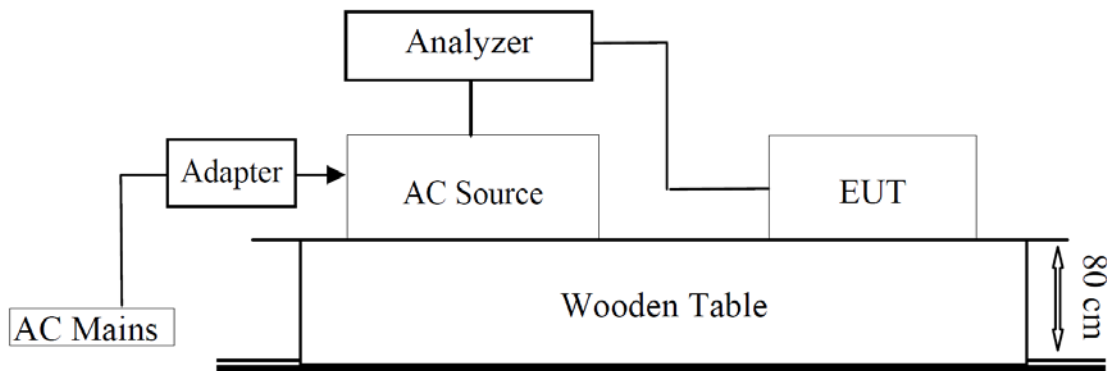
§8.6-VOLTAGE FLUCTUATION AND FLICKER

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Harmonic & Flicker Analyzer	DPA 500N	P1402129120	2020-11-27	2021-11-26
EM TEST	AC Power Source	ACS 500N	P1251107475	2020-11-27	2021-11-26
EM TEST	Test Software	net. control	N/A	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test System Setup



Test Standard

EN 61000-3-3:2013+A1:2019

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of Pst shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- the Tmax, the accumulated time value of d(t) with a deviation exceeding 3,3 % during a single voltage change at the EUT terminals, shall not exceed 500 ms;
- the relative steady-state voltage change, dc, shall not exceed 3,3 %;
- the maximum relative voltage change dmax, shall not exceed
 - a) 4 % without additional conditions;
 - b) 6 % for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0.65. c) 7 % for equipment which is– attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or– switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data

Environmental Conditions

Temperature:	22.3 °C
Relative Humidity:	50 %
ATM Pressure:	100.6 kPa

Date of test:	08:08 28.April 2021
Tester:	Gerry Xing
Standard used:	EN 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurement)
Flicker meter:	230V / 50Hz
Flicker Impedance:	Zref (IEC 60725)
Customer:	Quanshun Communication And Technology Co., Ltd
E. U. T.:	DMR Digital Portable Radio
Model:	D30
EUT operation mode	<i>Test mode1</i>

Maximum Flicker results

	EUT values	Limit	Result
Plt	0.032	0.65	PASS
Pst	0.074	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.202	4.00	PASS
Tmax [s]	0.000	0.50	PASS

Date of test:	11:08 28.April 2021
Tester:	Gerry Xing
Standard used:	EN 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurement)
Flicker meter:	230V / 50Hz
Flicker Impedance:	Zref (IEC 60725)
Customer:	Quanshun Communication And Technology Co., Ltd
E. U. T.:	DMR Digital Portable Radio
Model:	D30
EUT operation mode	<i>Test mode2</i>

Maximum Flicker results

	EUT values	Limit	Result
Plt	0.030	0.65	PASS
Pst	0.069	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.201	4.00	PASS
Tmax [s]	0.000	0.50	PASS

§9.3 - ELECTROSTATIC DISCHARGE

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-2) please refer to the following:

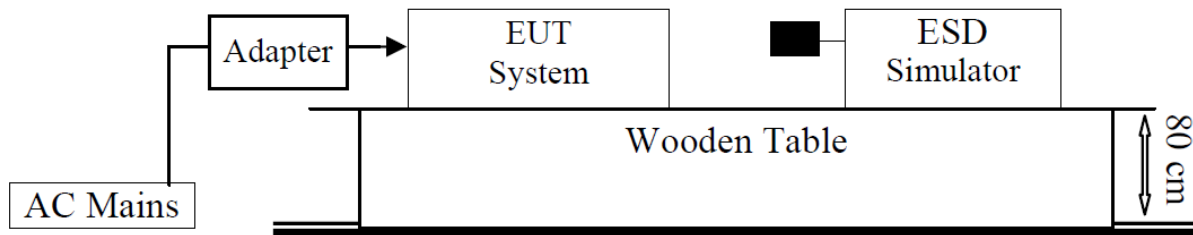
Parameter	U_{EN}	U_{lab}
Rise time t_r	$\leq 15\%$	15%
Peak current I_p	$\leq 7\%$	6.30%
Current at 30 ns	$\leq 7\%$	6.30%
Current at 60 ns	$\leq 7\%$	6.30%

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	ESD Simulator	NSG 438	1079	2021-03-16	2022-03-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test System Setup



Remark: ■ is the tip of the electrode

EN 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For EUTop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 kOhms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-2:2009

Test Level 3 for Air Discharge at ± 8 kV

Test Level 2 for Contact Discharge at ± 4 kV

Test Level

Level	Test Voltage Contact Discharge (\pm kV)	Test Voltage Air Discharge (\pm kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Performance criterion: B

Test Procedure

Air Discharge:

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

Contact Discharge:

All the procedure shall be same as Section 8.3.1 of EN 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m * 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Data**Environmental Conditions**

Temperature:	24.5 °C
Relative Humidity:	52 %
ATM Pressure:	101.1 kPa

The testing was performed by Gerry Xing on 2021-04-28.

Test mode 1:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV	X
1~44	A	A	A	A	A	A	/	/	/

Table 2: Electrostatic Discharge Immunity (Contact Discharge)

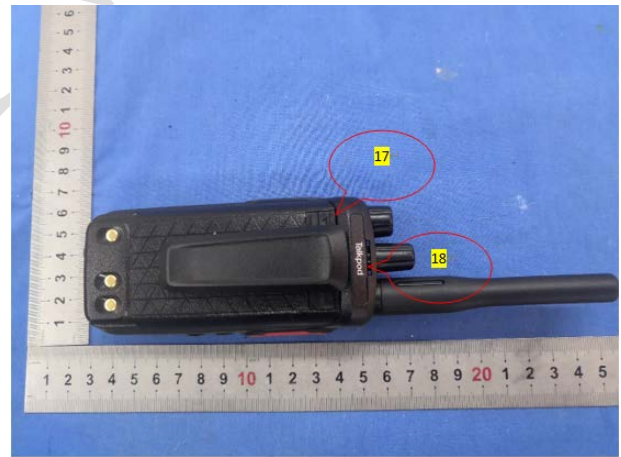
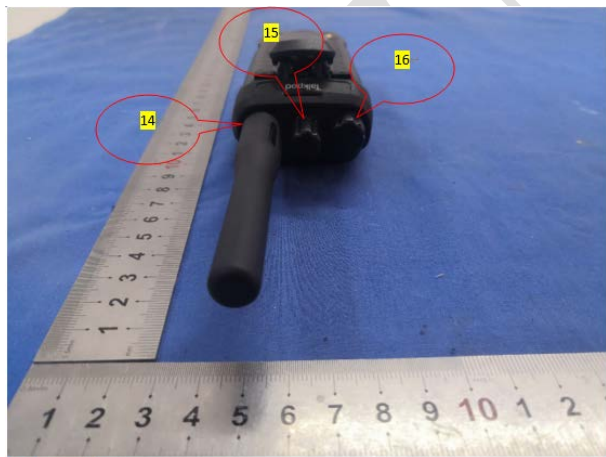
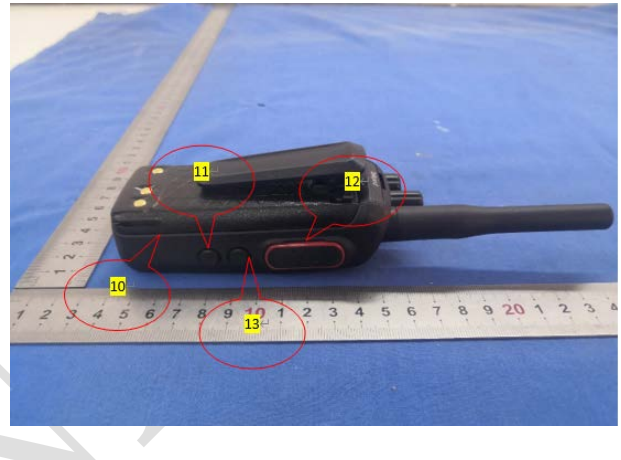
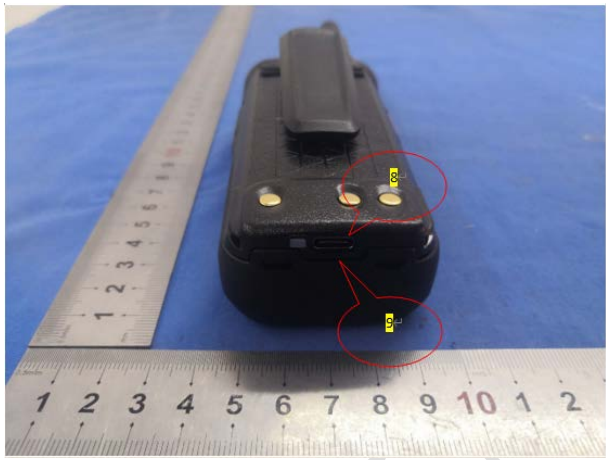
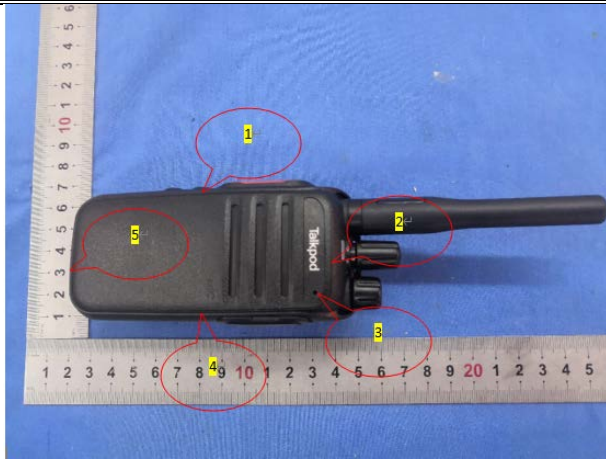
EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
/	/	/	/	/	/	/	/	/	/

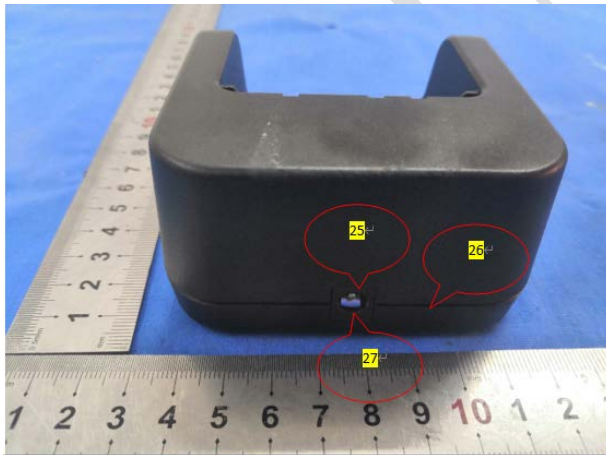
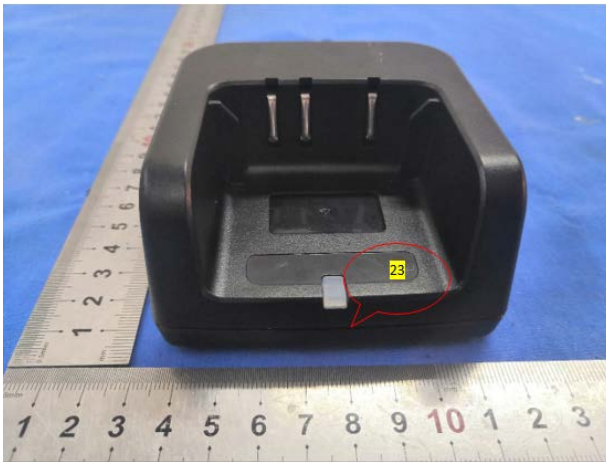
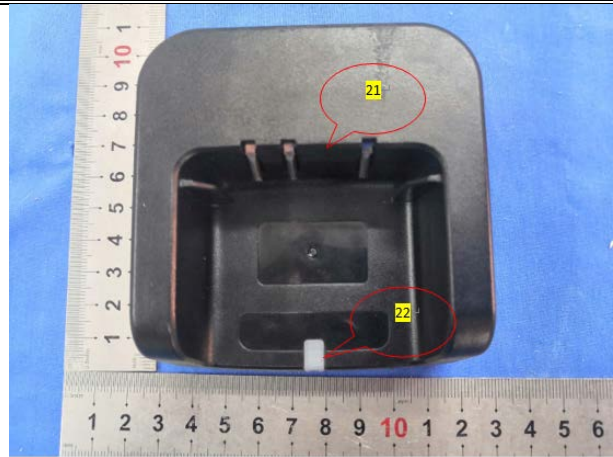
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

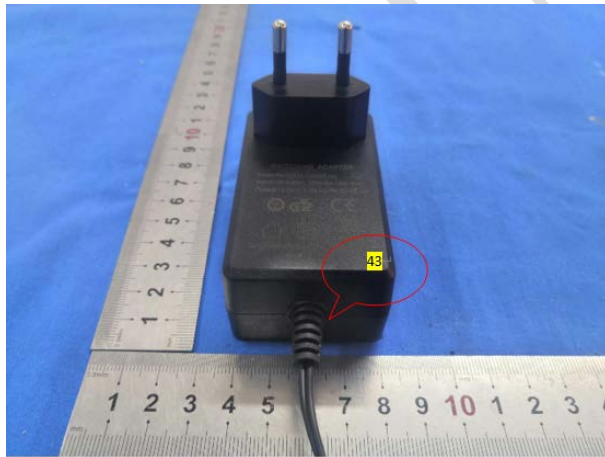
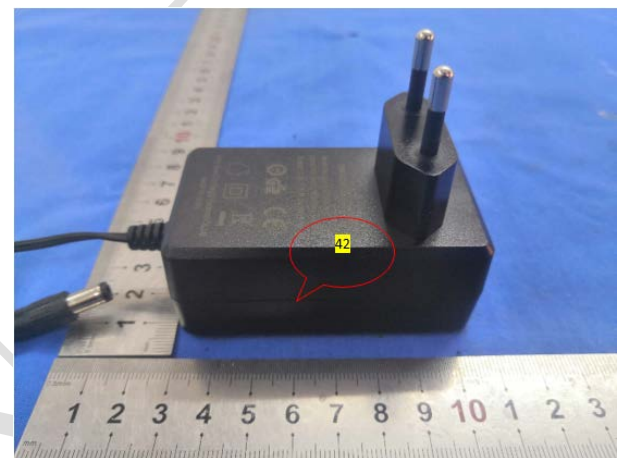
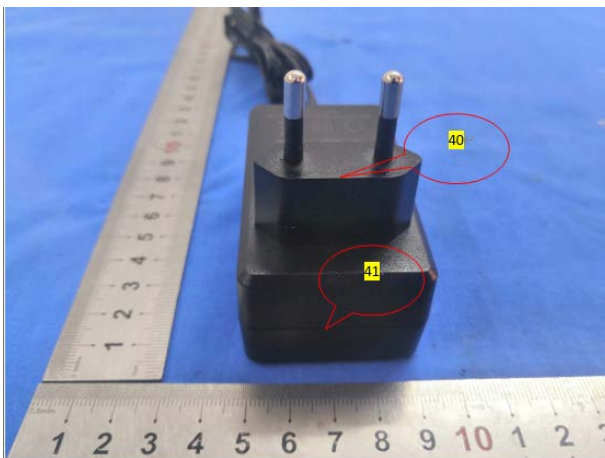
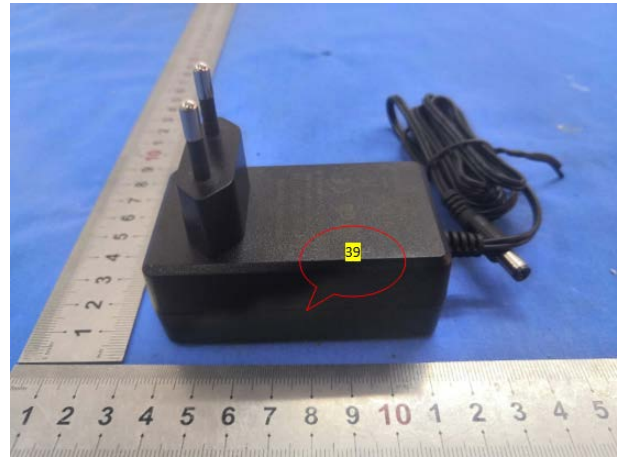
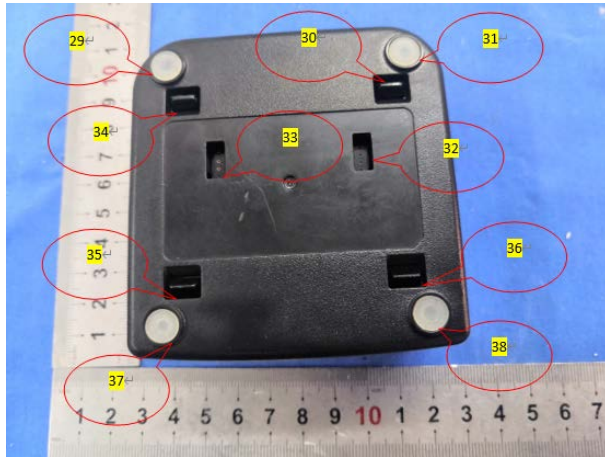
EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	A	A	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	A	A	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/







Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

Test mode2:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV	X
1~23	A	A	A	A	A	A	/	/	/

Table 2: Electrostatic Discharge Immunity (Contact Discharge)

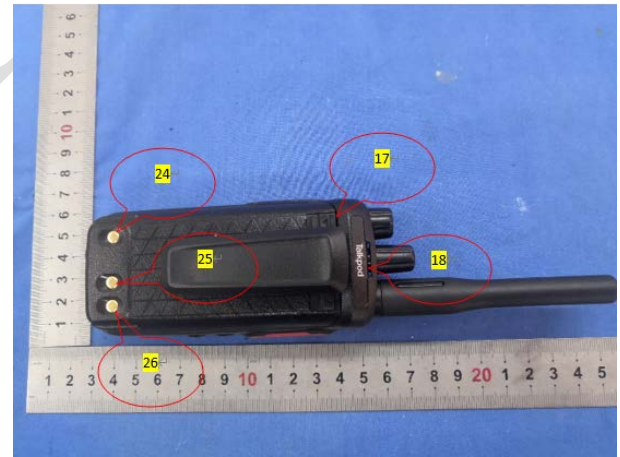
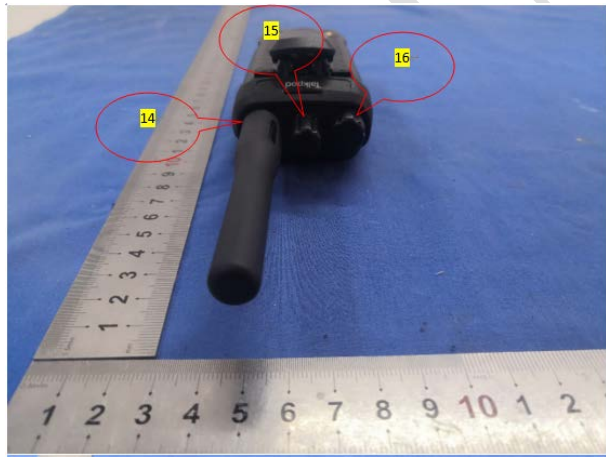
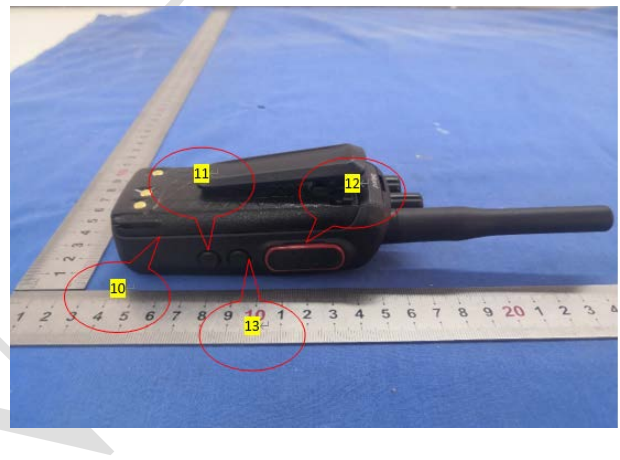
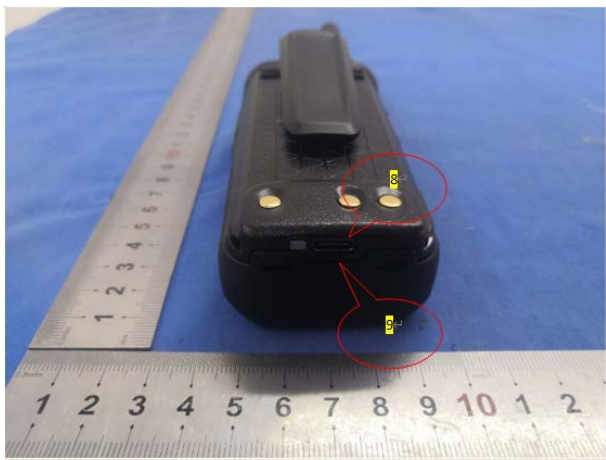
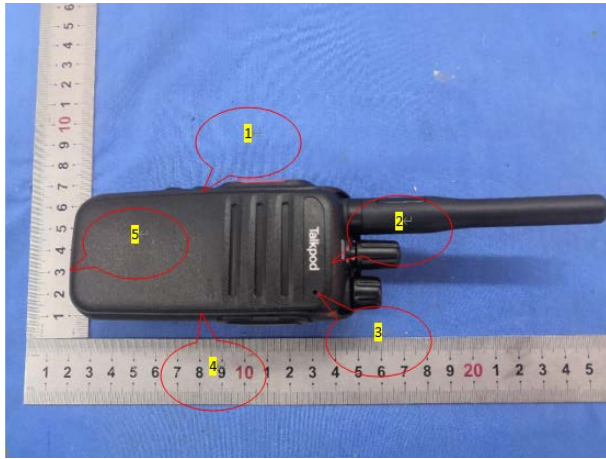
EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
24~26	A	A	A	A	/	/	/	/	/

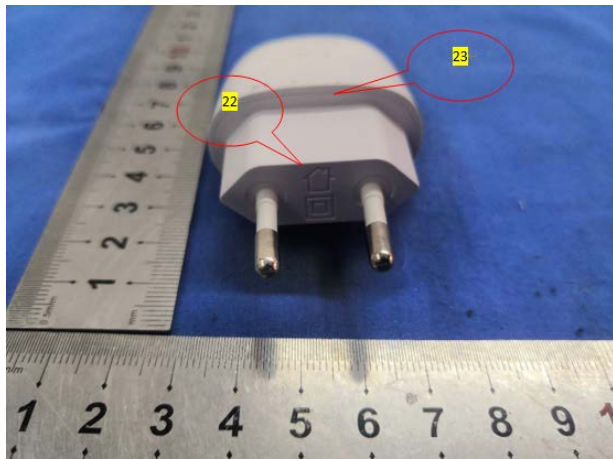
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	A	A	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	A	A	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/





Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

Test mode 3~10:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV	X
1~20	A	A	A	A	A	A	/	/	/

Table 2: Electrostatic Discharge Immunity (Contact Discharge)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
21~23	A	A	A	A	/	/	/	/	/

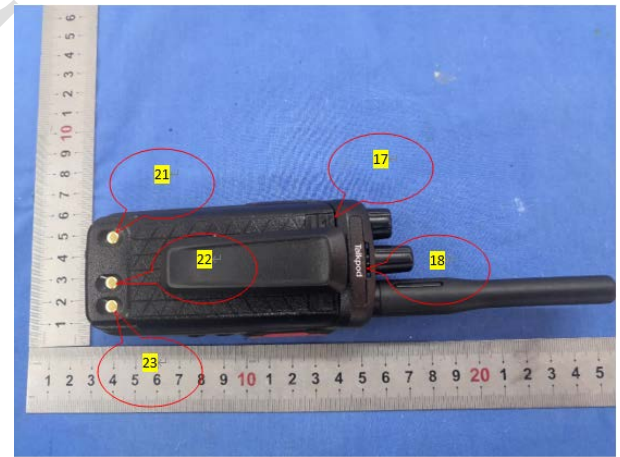
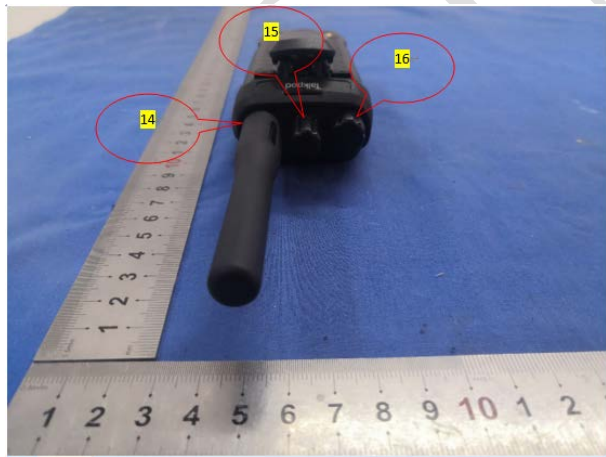
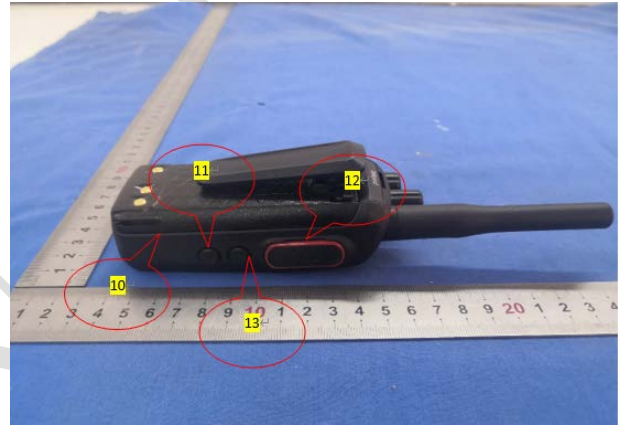
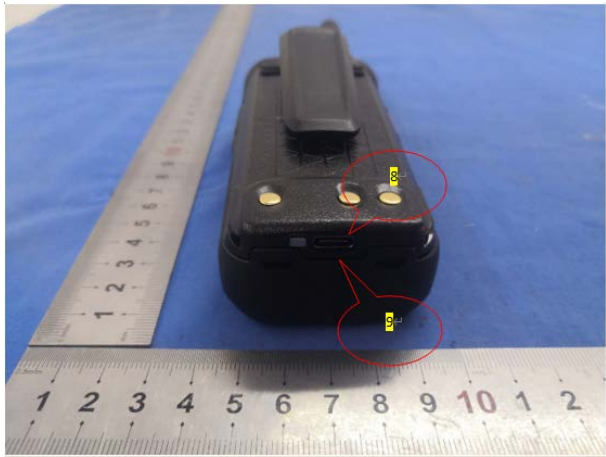
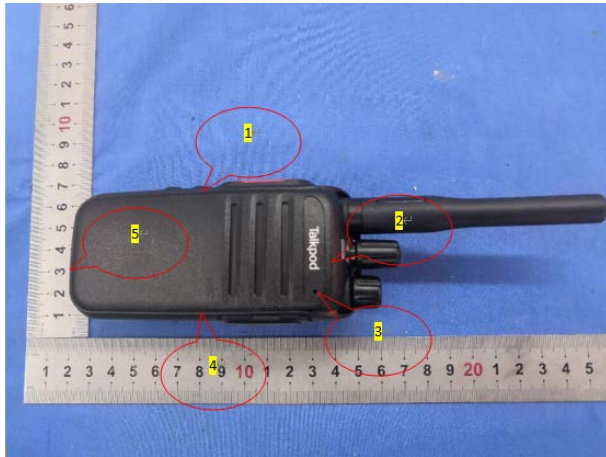
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	A	A	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

EN 61000-4-2 Test Points Location	Test Levels								
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	A	A	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/

Test point as follows:





Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

FINAL

§9.2 RADIO FREQUENCY ELECTROMAGNETIC FIELD (80 MHZ TO 6000 MHZ)

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-3) please refer to the following:

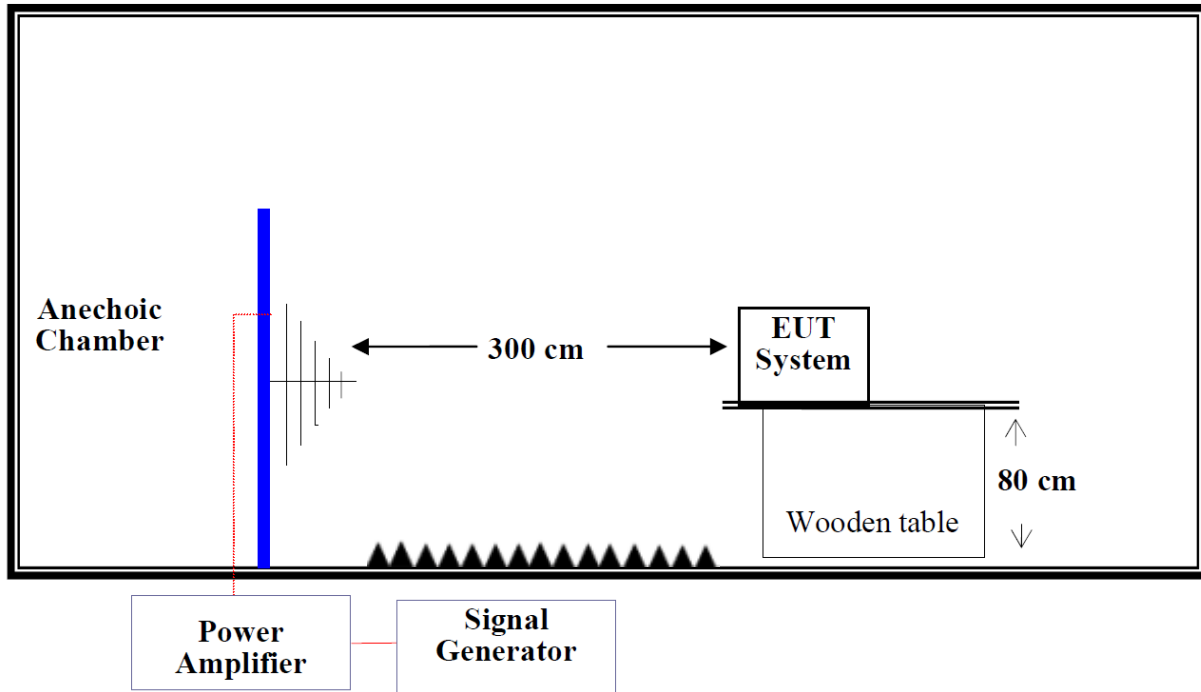
Parameter	U_{EN}	U_{lab}
Calibration process	1.88 dB	1.88 dB
Level setting	2.19 dB	2.19 dB

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Signal Generator	E4428C	MY49070179	2020-08-28	2021-08-27
AR	Power Amplifier	200W1000M3A	18062	N/A	N/A
AR	Broadband Antenna	ATL80M1G	0350122	N/A	N/A
AR	Power Amplifier	10S1GRM1	18060	N/A	N/A
AR	HornAntenna	ATT700M12G	350307	N/A	N/A
BK Precision	Sound Level meter	735	0735 0087 309110025	2020-05-16	2021-05-15
R&S	Audio Analyzer	UPV	1146.2003K02- 101782-XP	2020-07-11	2021-07-10
HP	RF Communications test SET.	8920B	3325U00859	2019-05-09	2021-05-08
Aeroflex	Digital Radio tester	3920	100636779	2020-06-24	2021-06-23
AR	Test Software	emcware	N/A	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN IEC 61000-4-3:2020
 Test Level 2 at 3V/m
 Test Levels and Performance Criterion

Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

Performance Criterion: A

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor EUT. and we put RF Communications Test SET and Audio Analyzer outside of the chamber, but EUT is connected to RF Communications Test SET and Audio Analyzer, we observe intentionally transmit signal by Signal Analyzer.

The level of the wanted RF input signal shall be set to a maximum of 40 dB above the minimum usable receiver signal level. For radiated immunity testing this input level is measured while the power amplifiers generating the EM disturbance are switched on, but without excitation.

NOTE: This increased level of the wanted RF input signal is expected to represent a signal level and is intended to avoid the broadband noise from the power amplifiers generating the EM disturbance from influencing the measurement.

All the scanning conditions are as follows:

Condition of Test Remarks	
1. Field Strength	3 V/m (Test Level 2)
2. Radiated Signal	1 kHz, 80% AM, sine wave
3. Scanning Frequency	80 MHz– 6000 MHz
4. Scanning Frequency Step	1%
5. Dwell Time	3 Sec.

Test Data**Environmental Conditions**

Temperature:	24.3 °C
Relative Humidity:	50 %
ATM Pressure:	100.6 kPa

The testing was performed by Gerry Xing on 2021-04-28.

Test mode 1-2:

Frequency Range (MHz)	Front Side (3 V/m)		Rear Side (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-6000	A	A	A	A	A	A	A	A

Note: "A" stand for during the test, the equipment shall continue to operate as intended, not unintentionally transmit, not unintentionally change its operating state, not unintentionally change critical stored data.

Test mode 3-10:

Frequency Range (MHz)	Front Side (3 V/m)		Rear Side (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-6000	A	A	A	A	A	A	A	A

Note:

1. "A" stand for, during the test, the distortion of the audio signal is less than 25%. For analogue (speech) communication, the SINAD of the audio output measured during each individual exposure in the test sequence is not deteriorate below a level of 12 dB,

For equipment which can be measured using continuous bit streams, a bit error shall not exceed 1×10^{-2} .

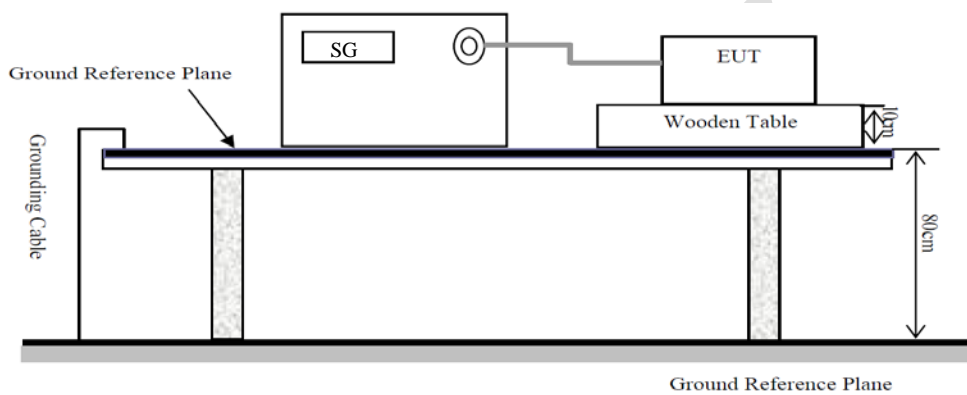
§9.4 - Fast transients, common mode

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Auto Transformer	MV 2616	0403-16	N/A	N/A
EM TEST	Ultra Compact Generator	UCS 500-M6 B	V0616101357	2020-07-06	2021-07-05

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/ EN 61000-4-4: 2012
AC Mains: Test level 2 at 1 kV

Test Level

Open Circuit Output Test Voltage $\pm 10\%$				
Level	Power ports, earth port (PE)		Signal and control ports	
	Voltage (kV)	Repetition frequency (kHz)	Voltage (kV)	Repetition frequency (kHz)
1	0.5	5 or 100	0.25	5 or 100
2	1		0.5	
3	2		1	
4	4		2	
X	Special	Special	Special	Special

Performance Criterion: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

Test Data

Environmental Conditions

Temperature:	24.5 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

The testing was performed by Gerry Xing on 2021-04-28.

Test mode 1 & 2:

EN 61000-4-4 Test Points		Test Levels (kV) Repetition frequency(5kHz)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Mains Power Input Ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L+PE	/	/	/	/	/	/	/	/
	N+PE	/	/	/	/	/	/	/	/
	L+N+PE	/	/	/	/	/	/	/	/
Signal Port	/	/	/	/	/	/	/	/	

Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

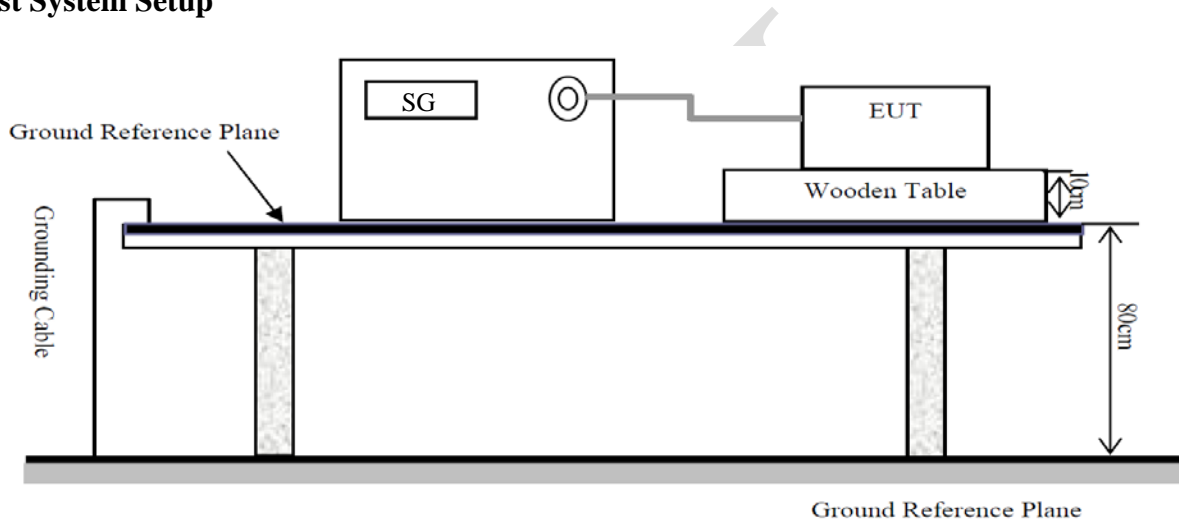
§9.8 - SURGES

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Auto Transformer	MV 2616	0403-16	N/A	N/A
EM TEST	Ultra Compact Generator	UCS 500-M6 B	V0616101357	2020-07-06	2021-07-05

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-5: 2014+A1:2017
 AC Mains: L+N: Test level 3 at 1 kV

Test Level

Level	Open Circuit Output Test Voltage $\pm 10\%$		Performance Criterion	
	Line - Line	Line - Ground	AC Mains	Signal Port
1	---	0.5 kV	---	---
2	0.5 kV	1 kV	---	---
3	1 kV	2 kV	B	---
4	2 kV	4 kV	---	---
X	Special	Special	---	---

Test Procedure

1. For line to line coupling mode, provide a 1.2/50 μ s voltage surge (at open-circuit condition) and an 8/20 μ s current surge into a short circuit.
2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
3. Different phase angles are done individually.
4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data and Setup Photo

Environmental Conditions

Temperature:	20.5 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

The testing was performed by Gerry Xing on 2021-04-28.

Test model &2:

EN61000-4-5 Test Points		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Mains power input ports	L+N	A	A	A	A	/	/	/	/
	L+PE	/	/	/	/	/	/	/	/
	N+PE	/	/	/	/	/	/	/	/
Signal port	/	/	/	/	/	/	/	/	/

Note:

“A” stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

§9.5 - Radio frequency, common mode

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-6) please refer to the following:

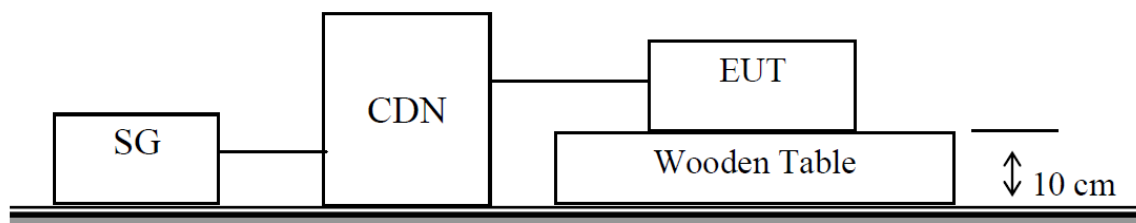
Parameter	U_{EN}	U_{lab}
CDN calibration process	1.27 dB	1.27 dB
CDN test process	1.36 dB	1.36 dB

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Signal Generator	8648C	3537A01810	2020-07-28	2021-07-27
R&S	Power Amplifier	500A100M2	18117	N/A	N/A
Dressler	Attenuator	ATT 6/75	510020010004	N/A	N/A
COM-POWER	CDN	CDN M225E	511098	2020-07-28	2021-07-27
BACL	Test Software	Main_CS_Test	N/A	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Test Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/EN 61000-4-6: 2014
 Test level 2 at 3 V (r.m.s.), 0.15 MHz ~ 80 MHz

Test Level

Level	Voltage Level (r.m.s.) (U ₀)
1	1
2	3
3	10
X	Special

Performance Criterion: A**Test Procedure**

- 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 50mm (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 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz 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.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

Test Data**Environmental Conditions**

Temperature:	25.3 °C
Relative Humidity:	50 %
ATM Pressure:	100.6 kPa

The testing was performed by Gerry Xing on 2021-04-28.

Test mode 1 & 2:

EN61000-4-6 Test Ports	Test Equipment	Frequency Range (MHz)	Voltage Level (e.m.f.) U ₀			
			1V	3V	10V	X
AC mains power input ports	M2	0.15-80	/	A	/	/
	/	/	/	/	/	/
Signal port	/	/	/	/	/	/

Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions.

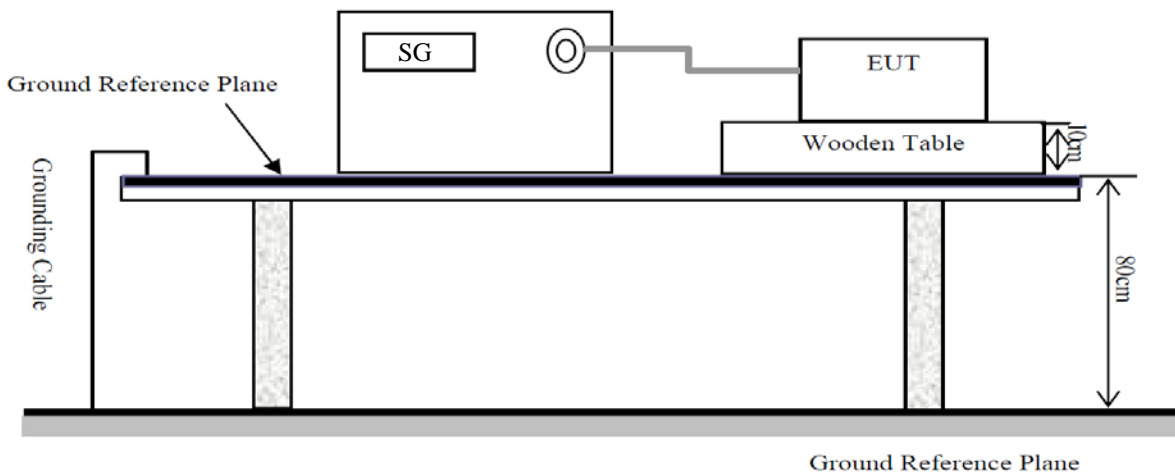
§9.7 - Voltage dips and interruptions

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EM TEST	Auto Transformer	MV 2616	0403-16	N/A	N/A
EM TEST	Ultra Compact Generator	UCS 500-M6 B	V0616101357	2020-07-06	2021-07-05

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN IEC 61000-4-11:2020

Test levels and Performance Criterion

Test Level	Test Level	Cycle	Performance criterion
1	Voltage dips : 0% residual voltage	0.5	B
2	Voltage dips : 0% residual voltage	1	B
3	Voltage dips : 70% residual voltage	25	C
4	Voltage interruptions : 0% residual voltage	250	C

Test Procedure

1. The interruption is introduced at selected phase angles with specified duration.
2. Record any degradation of performance.

Test Data**Environmental Conditions**

Temperature:	24.5 °C
Relative Humidity:	51 %
ATM Pressure:	101.2 kPa

The testing was performed by Gerry Xing on 2021-04-28.

Test mode 1&2:

Test Level	Cycle	Phase Angle	Result
Voltage dips : 0% residual voltage	0.5	0°/90°/180°/270°	A
Voltage dips : 0% residual voltage	1	0°/90°/180°/270°	A
Voltage dips : 70% residual voltage	25	0°/90°/180°/270°	A
Voltage interruptions : 0% residual voltage	250	0°/90°/180°/270°	B

Note:

1. "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.
2. "B" stands for, during test,, the EUT will stop charging, and after the test, it can work normally without loss of function.

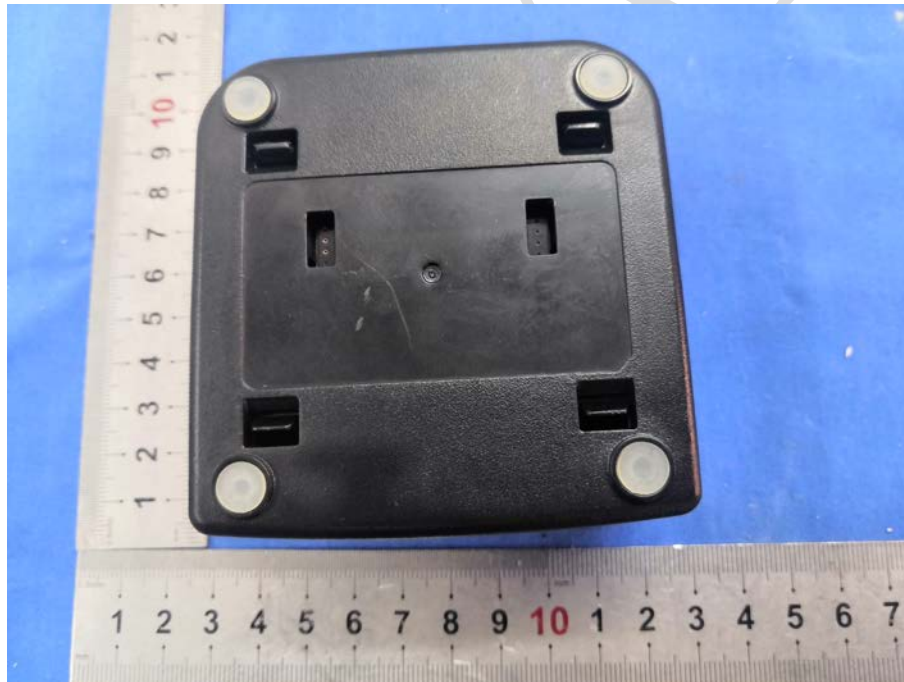
EXHIBIT A - EUT PHOTOGRAPHS

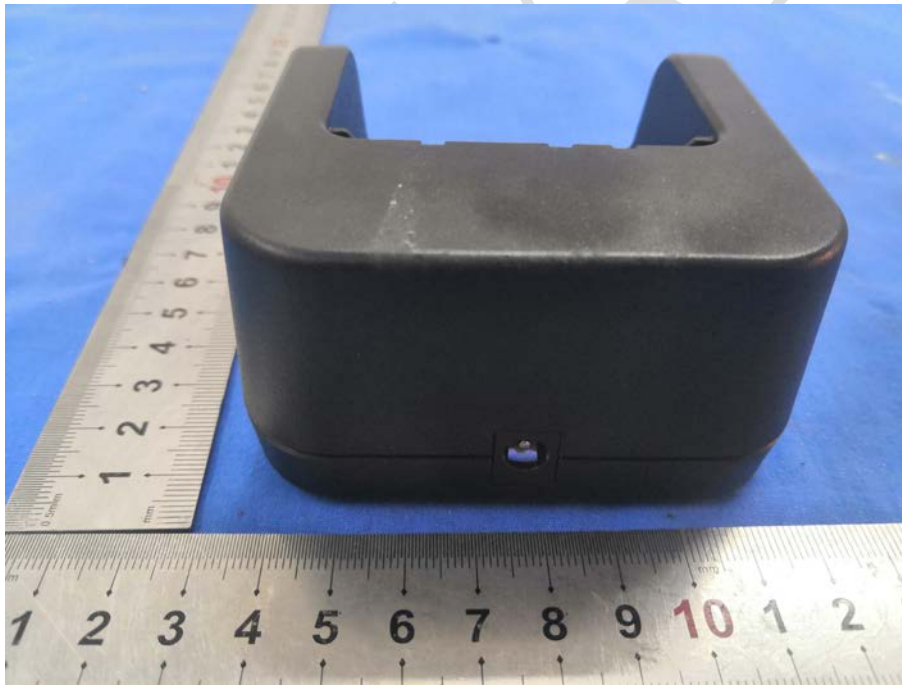
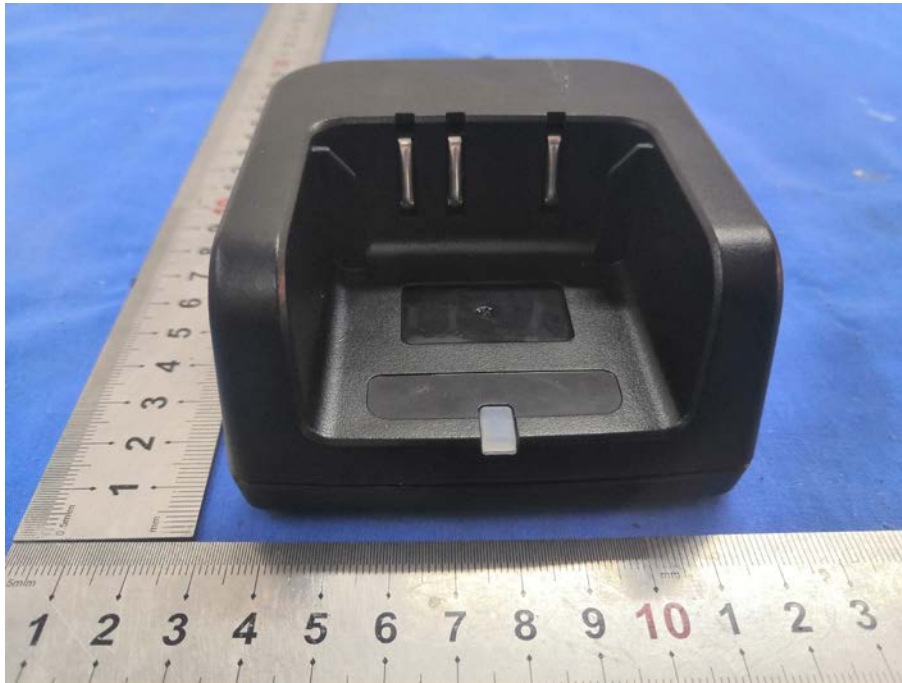








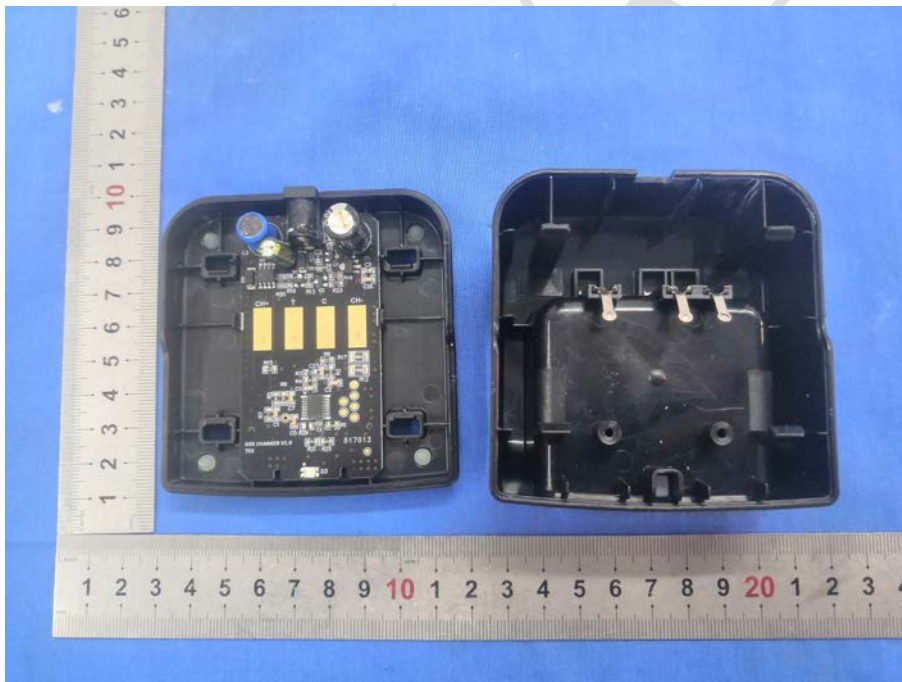
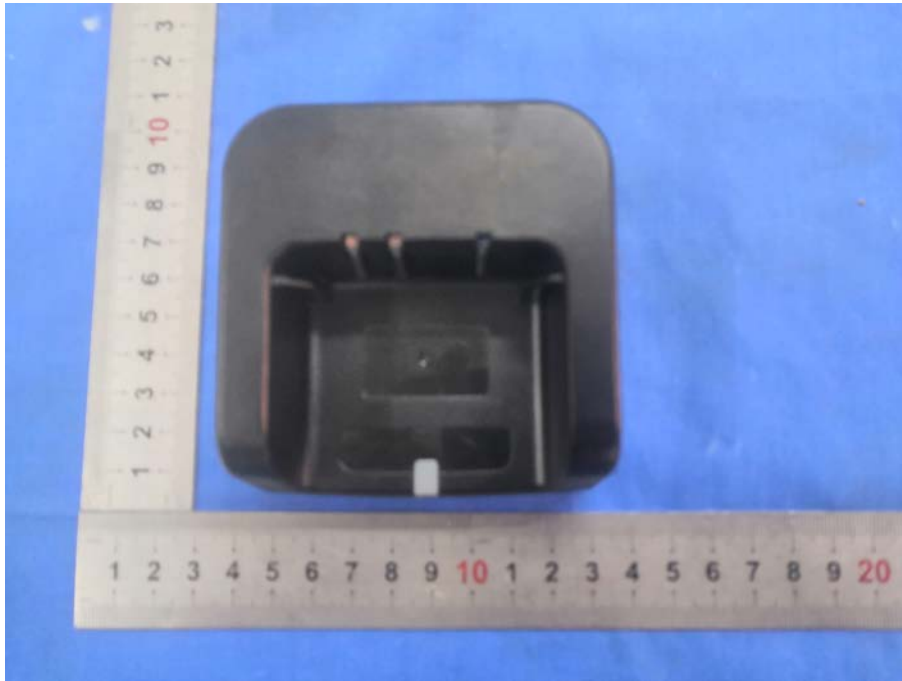


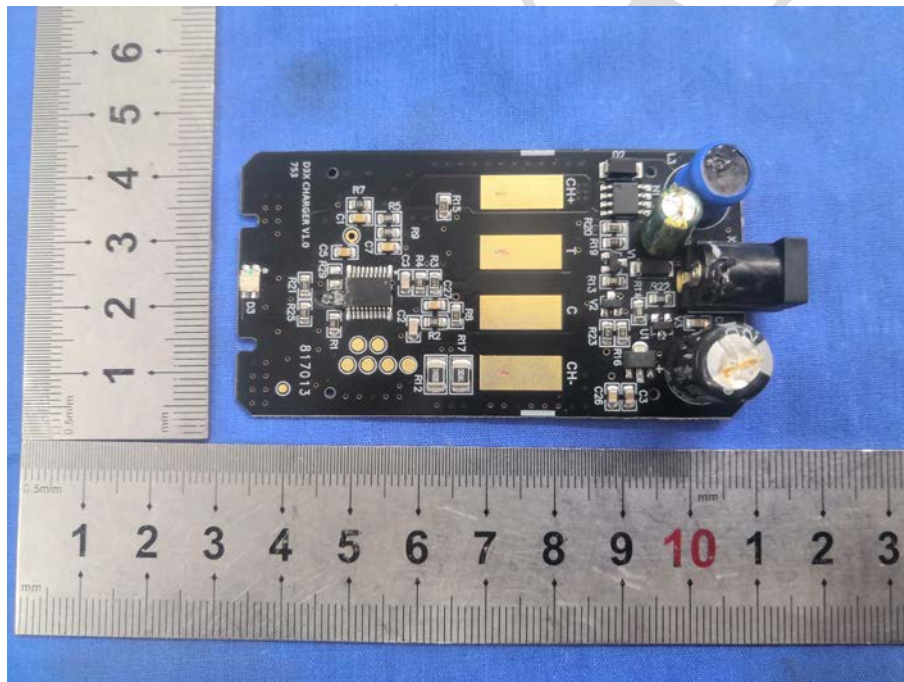
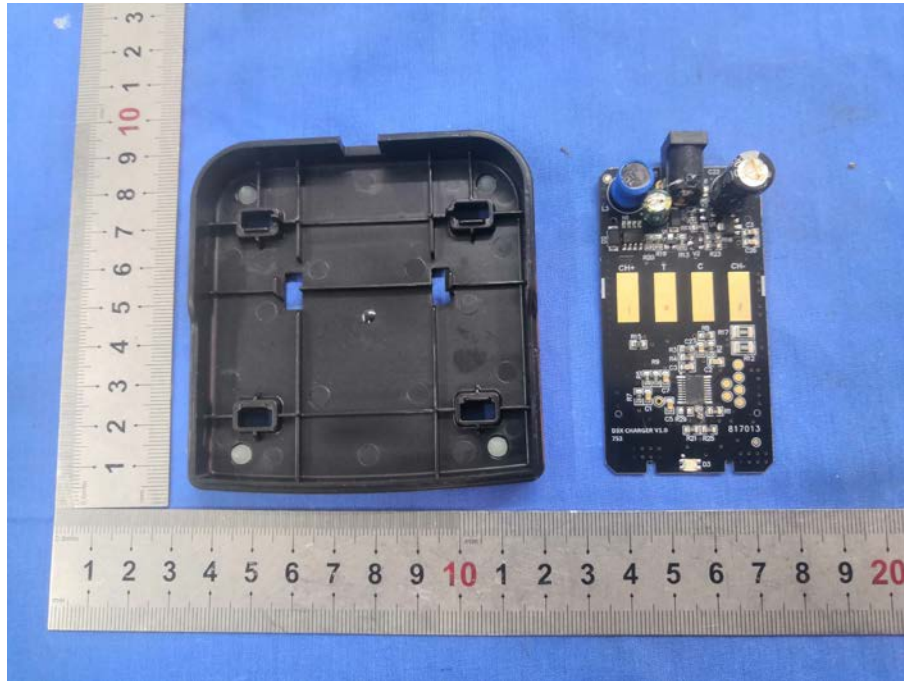


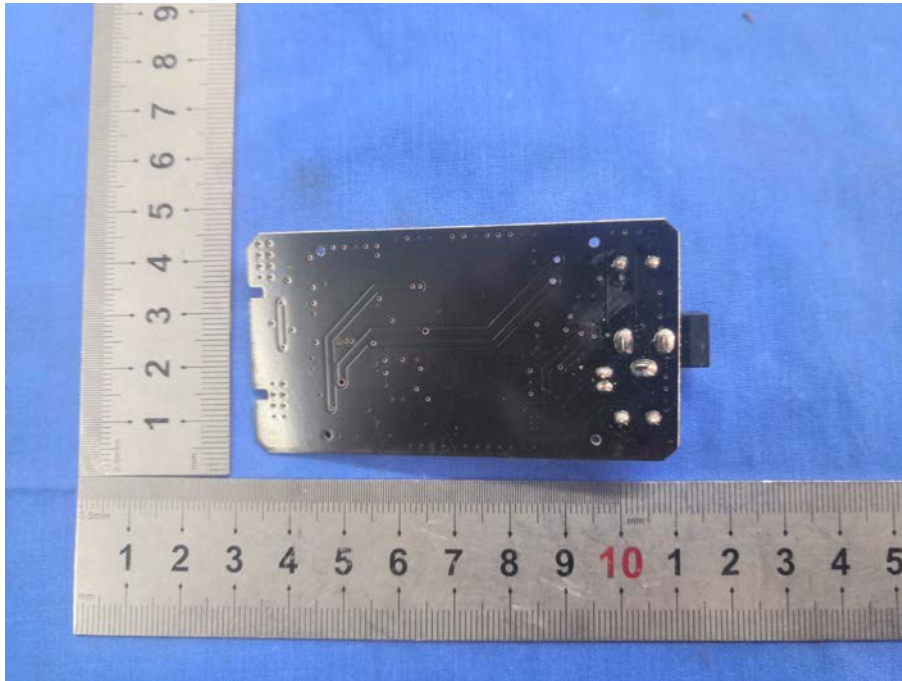




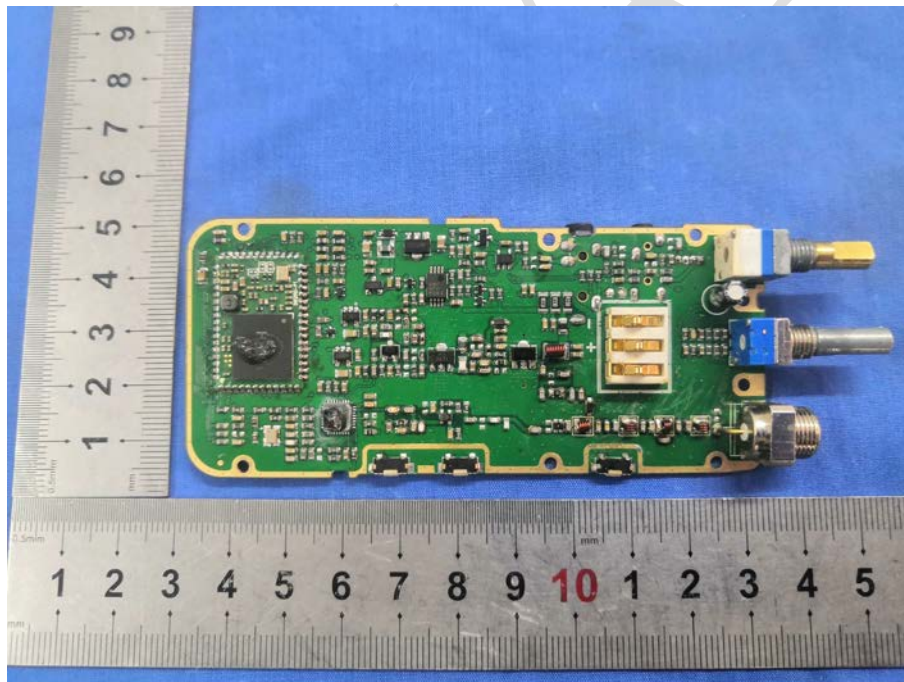


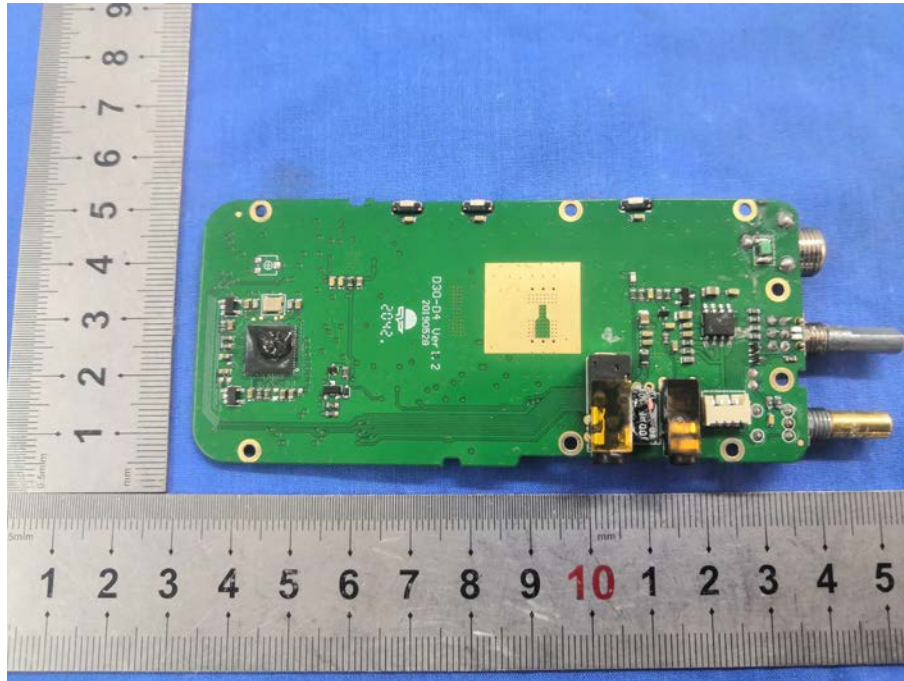












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EXHIBIT B – TEST SETUP PHOTOGRAPHS

Test mode 1:

Conducted Emissions - Front View



Conducted Emissions – Left View



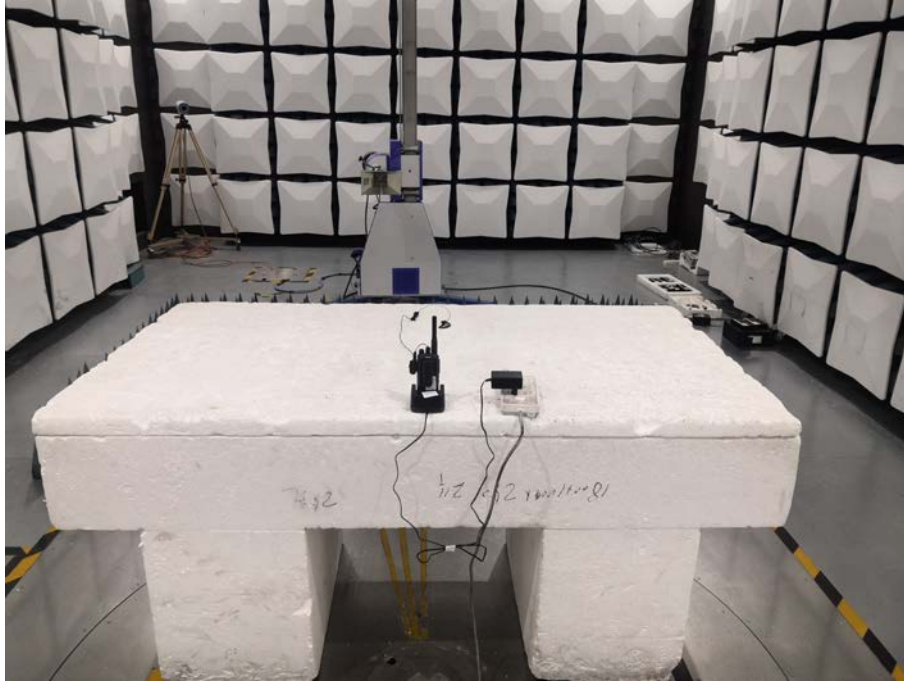
Radiated Emissions - Front View (Below 1GHz)



Radiated Emissions - Rear View (Below 1GHz)



Radiated Emissions - Rear View (Above 1GHz)



ESD Test Setup Photo



Flicker Test Setup Photo



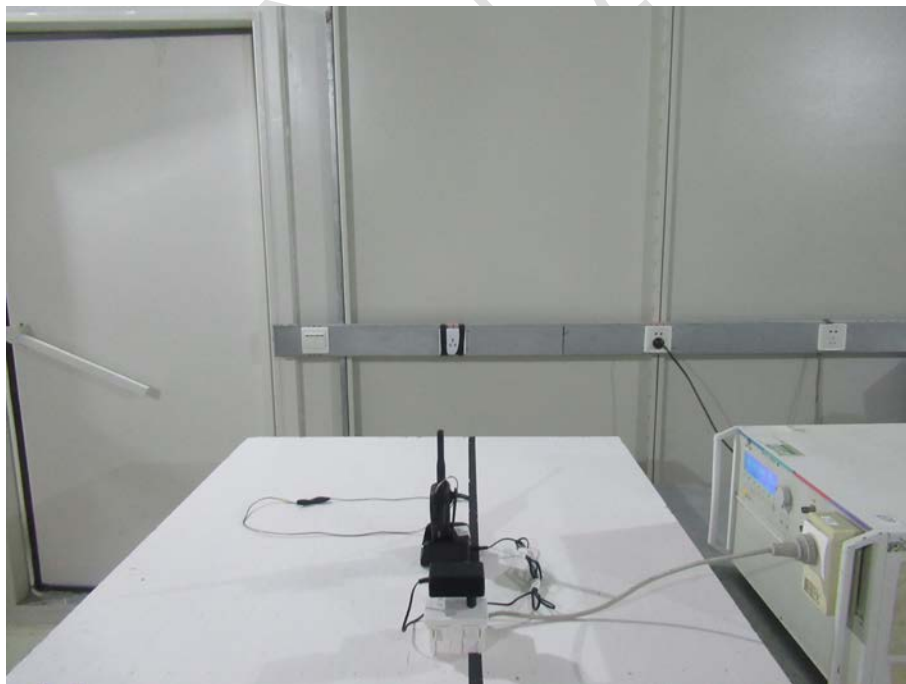
RS Test Setup Photo (Below 1GHz)



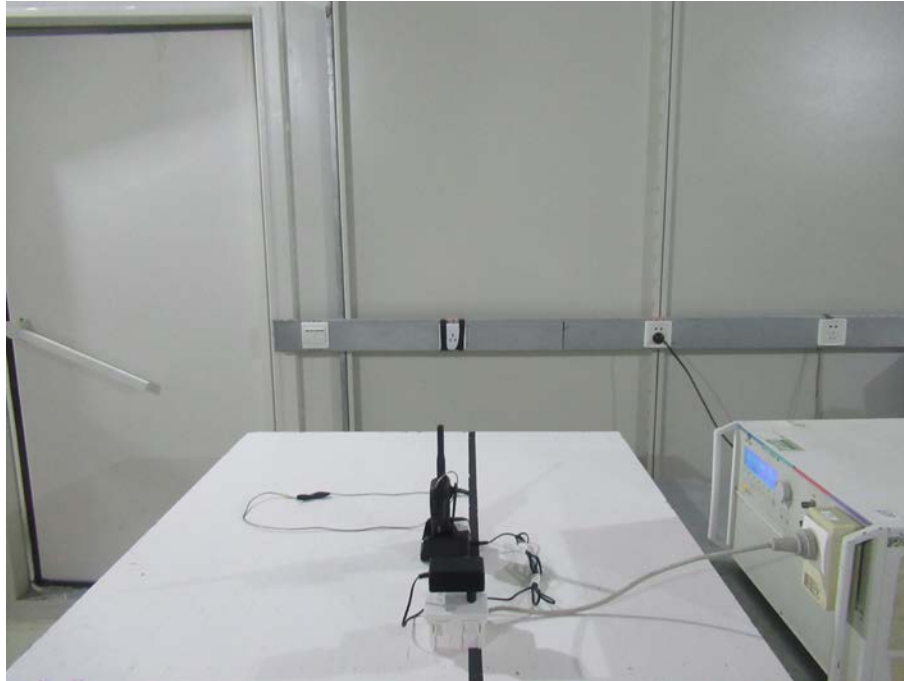
RS Test Setup Photo (Above 1GHz)



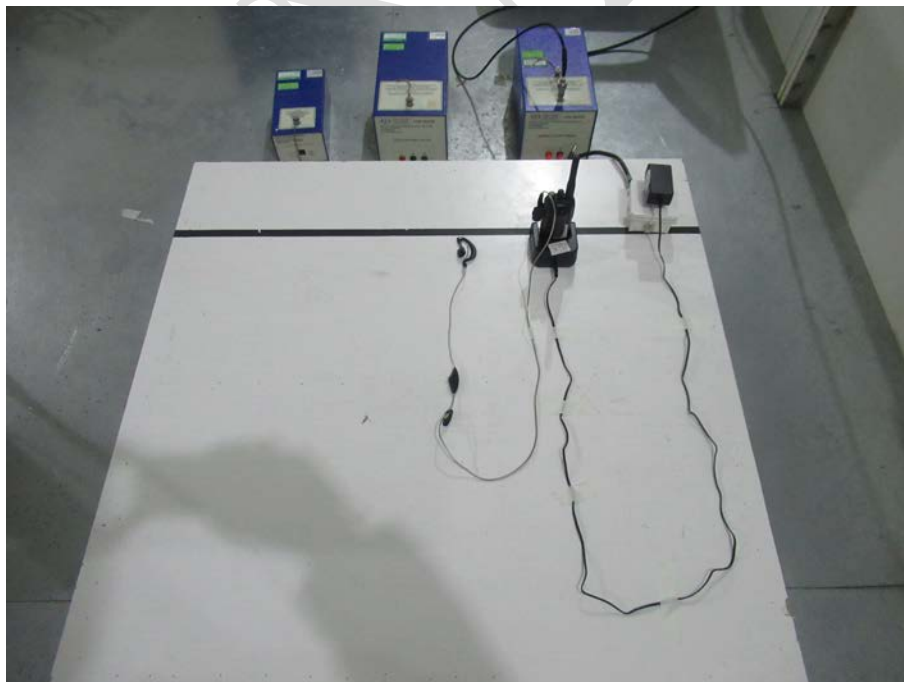
EFT Test Setup Photo



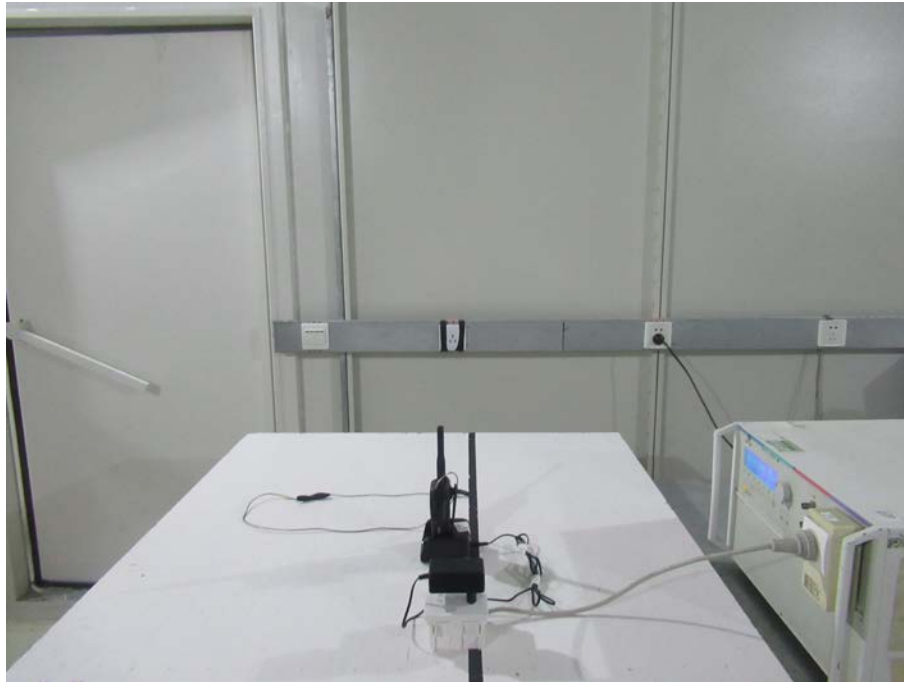
SURGE Test Setup Photo



CS Test Setup Photo



DIPS Test Setup Photo



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Test mode2:

Conducted Emissions - Front View



Conducted Emissions – Left View



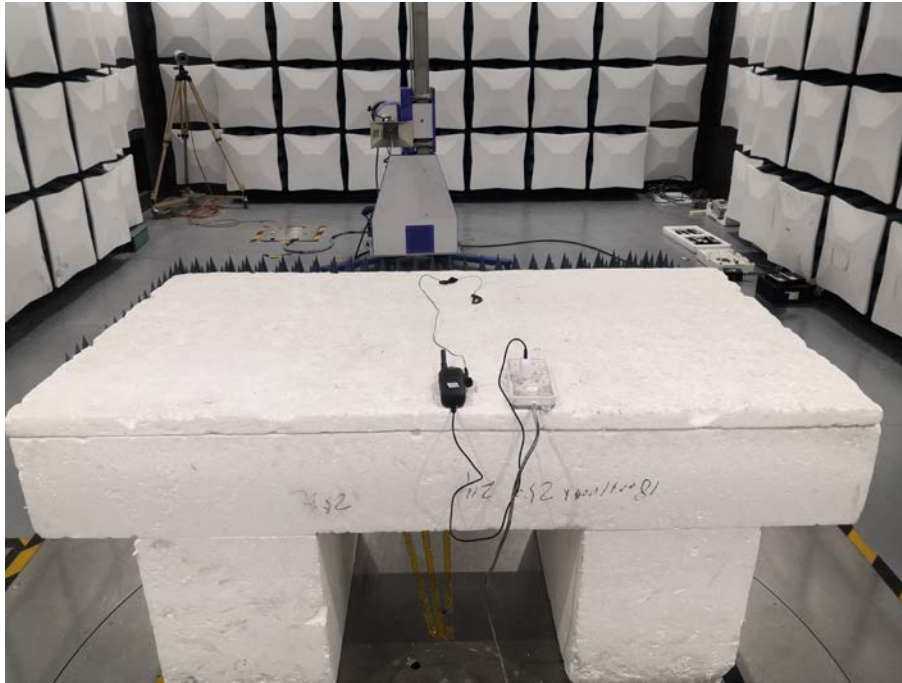
Radiated Emissions - Front View (Below 1GHz)



Radiated Emissions - Rear View (Below 1GHz)



Radiated Emissions - Rear View (Above 1GHz)



ESD Test Setup Photo



Flicker Test Setup Photo



RS Test Setup Photo (Below 1GHz)



RS Test Setup Photo (Above 1GHz)



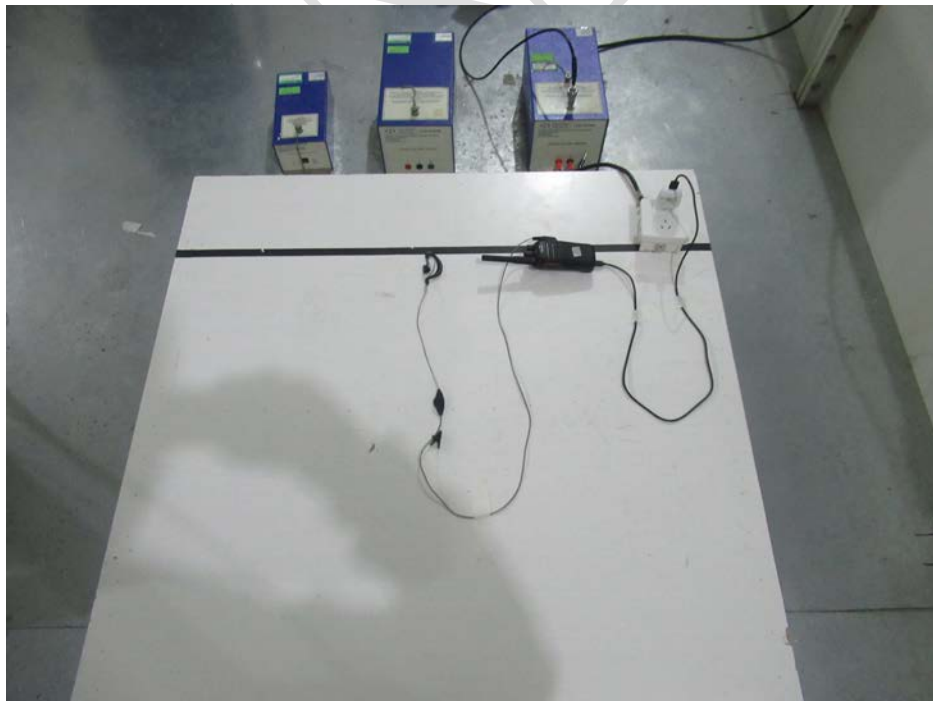
EFT Test Setup Photo



SURGE Test Setup Photo



CS Test Setup Photo



DIPS Test Setup Photo



Test Mode 3~10

ESD Test Setup Photo



RS Test Setup Photo (Below 1GHz)



RS Test Setup Photo (Above 1GHz)



FIM

Declarations

- 1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.
- 2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
- 3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
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