TEST REPORT

Application No.:	T32120250035EM
Applicant:	DESIGN INTERNATIONAL GROUP, INC
Address of Applicant:	755 EPPERSON DRIVE, CITY OF INDUSTRIAL, CA 91748
Equipment Under Test (EUT):	
EUT Name:	(C) LICENSED WALKIE TALKIE ASTD PDQ6, (C) LICENSED WALKIE TALKIE PRINCESS, (C) LICENSED WALKIE TALKIE SPIDERMAN
Model No.:	356669, 323061, 322626
FCC ID:	2APU635666949
Additional Model:	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) :	47 CFR Part 15 Subpart C, 2020
Date of Receipt:	2021-06-17
Date of Test:	2021-06-17 to 2021-06-18
Date of Issue:	2021-06-18
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Law Man Kit
EMC Manager

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record				
Version	***Chapter***	***Date***	***Modifier***	***Remark***
01		*2021-06-18*		*Original*

Authorized for issue by:				
		Leo Xu /Project Engineer		Date: 2021-06-18
		Law Man Kit /Reviewer		Date: 2021-06-18

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.235	N/A	47 CFR Part 15 Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Occupied Bandwidth	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15 Subpart C 15.215	Pass
Field Strength of the Fundamental Signal (15.235(a))	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15 Subpart C 15.235	Pass
Radiated Emissions(9kHz-30MHz)	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.4 & 6.5	47 CFR Part 15, Subpart C 15.235 & 15.209	Pass
Radiated Emissions(30MHz-1GHz)	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.4 & 6.5	47 CFR Part 15 Subpart C 15.235 & 15.209	Pass

Declaration of EUT Family Grouping:
Item no.: 356669, 323061, 322626

According to the confirmation from the applicant, the above models are identical in all electrical aspects in relating to the circuitry design, PCB layout, electrical components used, internal wiring and functions. The differences are only color.

Therefore, only the model 322626 was fully tested in this report.

Abbreviation:

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

N/A: In this whole report not application.

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 9 V ('6F22' size battery x 1)
Test voltage:	DC 9 V
Cable:	N/A
Antenna Type:	Integral antenna
Modulation Type:	ASK
Operation Frequency:	49.86MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Walkie Talkie	DESIGN INTERNATIONAL GROUP, INC	356669	N/A

4.3 Measurement Uncertainty

RF

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10^{-8}
2	Duty cycle	± 0.37%
3	Occupied Bandwidth	± 3%
4	RF conducted power (30MHz-40GHz)	1.5dB
5	RF power density	1.5dB
6	Conducted Spurious emissions	1.5dB
7	RF Radiated power & Radiated Spurious emission test	4.9dB (30MHz-1GHz)
		4.6dB (1GHz-6GHz)
		4.7dB (6GHz-18GHz)
		5.6dB (18GHz-40GHz)
8	Temperature test	± 1℃
9	Humidity test	± 3%
10	Supply voltages	± 1.5%
11	Time	± 3%

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1” and TR-100028-02 “Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2” and is documented in the test lab quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Test Location

All tests were performed at:

SGS Hong Kong Limited

Unit 2 and 3, G/F, Block A, Po Lung Centre,

11 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480

No tests were sub-contracted.

4.5 Test Facility

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

- **HOKLAS (Lab Code: 009)**

SGS Hong Kong Limited has been accepted by HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a HOKLAS Accredited Laboratory, this laboratory meets the requirements of ISO/IEC 17025:2017 an it has been accredited for performing specific test as listed in the scope of accreditation within the test category of Electrical and Electronic Products.

- **IAS Accreditation (Lab Code: TL-817)**

SGS Hong Kong Limited has met the requirements of AC89, IAS Accreditation Criteria for Testing Laboratories, and has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories. This organization is accredited to provide the services specified in the scope of accreditation maintained on the IAS website (www.iasonline.org).

The report must not be used by the client to claim product certification, approval, or endorsement by IAS, NIST, or any agency of the Federal Government.

- **FCC Recognized Accredited Test Firm(CAB Registration No.: 514599)**

SGS Hong Kong Limited has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: HK0015, Test Firm Registration Number: 514599.

- **Industry Canada (Site Registration No.: 26103; CAB Identifier No.: HK0015)**

SGS Hong Kong Limited has been recognized by Department of Innovation, Science and Economic Development (ISED) Canada as a wireless testing laboratory. The acceptance letter from the ISED is maintained in our files. CAB Identifier No: HK0015, Site Registration Number: 26103.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Radiated Emissions (30MHz-1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	ChamPro	N/A	E229	2020/08/09	2021/08/08
Coaxial Cable	SGS	N/A	E167	2020/07/20	2021/07/19
EMI Test Receiver 9kHz to 7GHz	Rohde & Schwarz	ESR7 / 102298	E314	2021/05/18	2022/05/17
TRILOG Super Broadb. Test Antenna, (25) 30-1000 MHz	Schwarzbeck	9168-1110	E311	2020/02/13	2022/02/12
EMC32 Test software	Rohde & Schwarz	Version 10	N/A	N/A	N/A
Boresight Mast Controller	ChamPro	AM-BS-4500-E	E237	N/A	N/A
Turntable with Controller	ChamPro	EM1000	E238	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Digital temperature & humidity data logger	SATO	SK-L200TH II	E232	2020/09/12	2021/09/11
Electronic Digital Thermometer with Hygrometer	nil	2074/2075	E159	2020/09/12	2021/09/11
Barometer with digital thermometer	SATO	7612-00	E218	2021/03/29	2022/03/28
Conditional Chamber	Zhong Zhi Testing Instruments	CZ-E-608D	E216	2020/08/31	2021/08/30

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

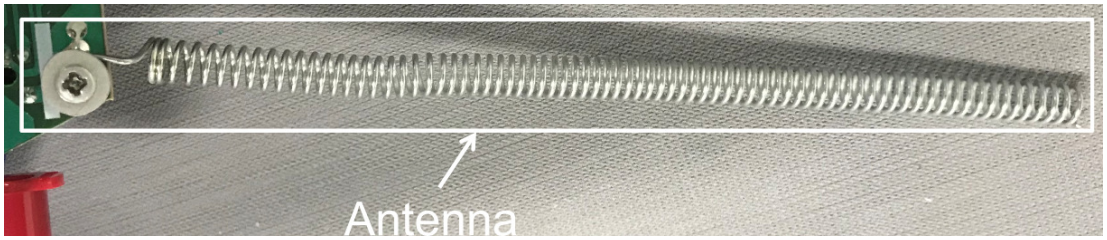
6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.



EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement.

7 Radio Spectrum Matter Test Results

7.1 Occupied Bandwidth

Test Requirement	47 CFR Part 15, Subpart C 15.215
Test Method:	ANSI C63.10 (2013) Section 6.9
Measurement Distance:	3m
Limit:	The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier.

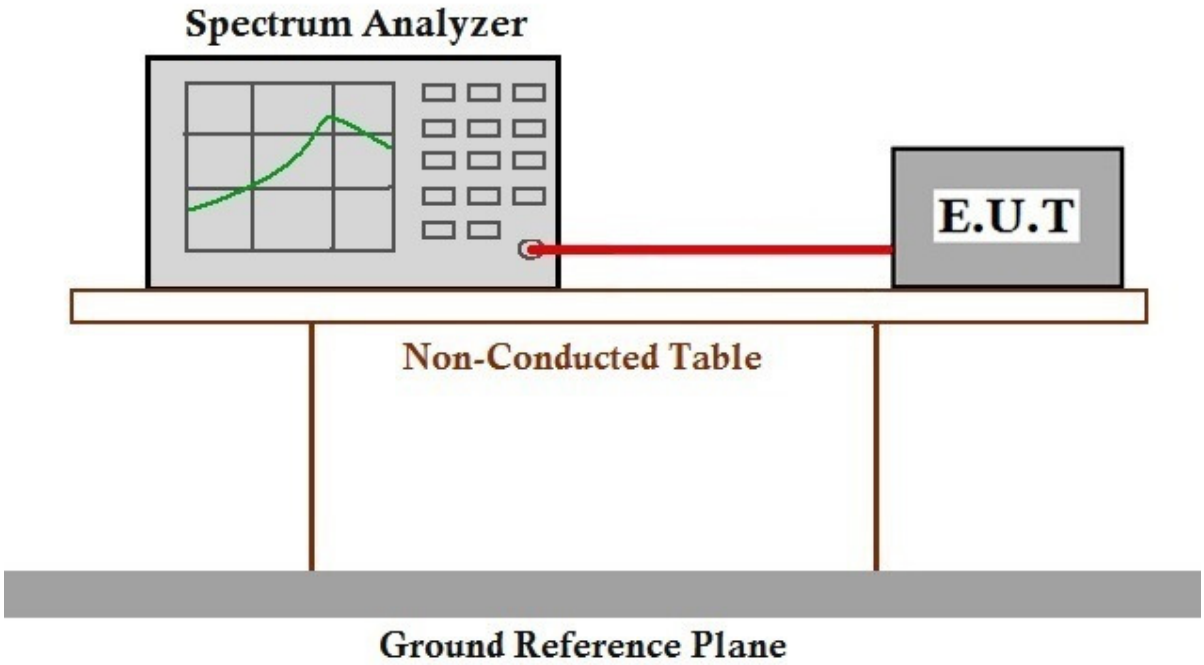
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 53.9 % RH :

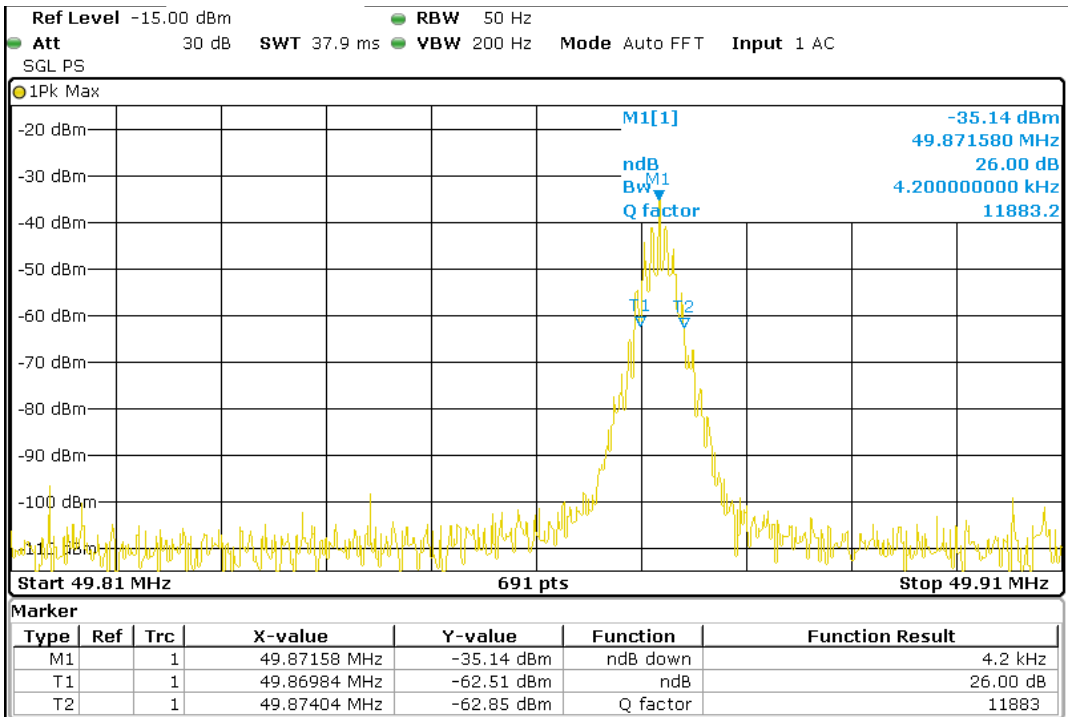
Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

Mode:a



Frequency	Result (MHz)	Limit (MHz)	Conclusion
26dB bandwidth lower frequency	49.869840	> 49.810000	PASS
26dB bandwidth upper frequency	49.874040	< 49.910000	PASS

7.2 Field Strength of the Fundamental Signal (15.235(a))

Test Requirement 47 CFR Part 15, Subpart C 15.235

Test Method: ANSI C63.10 (2013) Section 6.4

Measurement Distance: 3m

Limit: ≤ 10000 microvolts/meter at 3 meters, the emission limit is based on measurement instrumentation employing an average Detector:. The provisions in § 15.35 for limiting peak emissions apply.

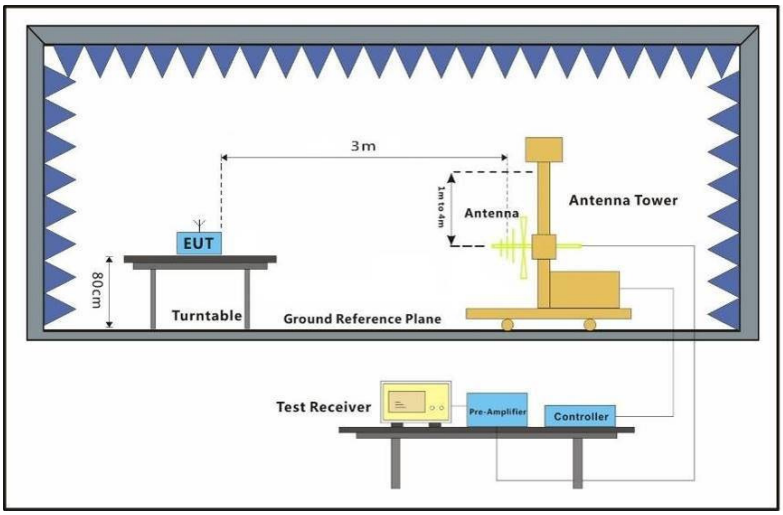
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.7 °C Humidity: 52.8 % RH :

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1Ghz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Mode:a

Frequency	Antenna	Emission Level (dBµV/m)		Limit (dBµV/m)		Remark
(MHz)	Polarization	Peak	Average	Peak	Average	
49.853	H	51.9	51.5	100.0	80.0	PASS
49.853	V	67.5	67.4	100.0	80.0	PASS

7.3 Radiated Emissions(9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.235 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4 & 6.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for above 1000MHz. Radiated emission limits above 1000MHz is based on measurements employing an average detector.		

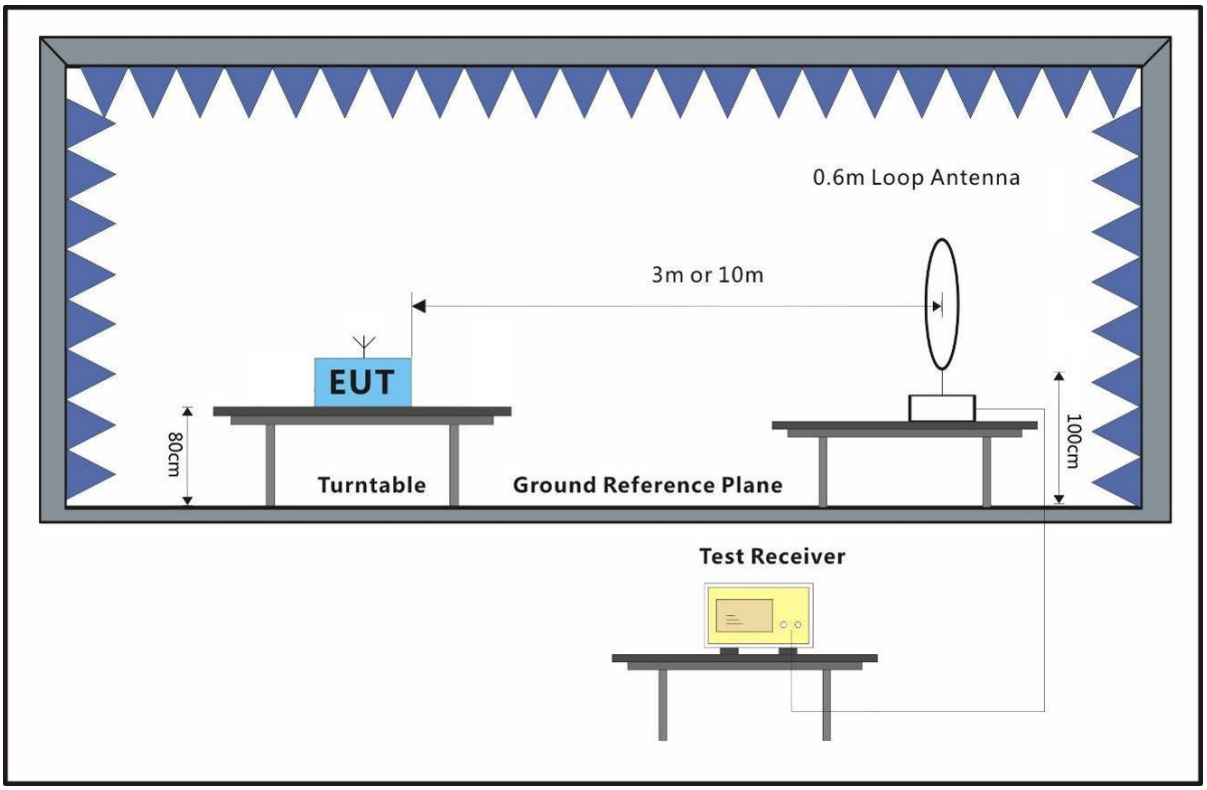
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 26.4 °C Humidity: 53.8 % RH :

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

7.4 Radiated Emissions(30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.235 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4 & 6.5

Measurement Distance: 3m

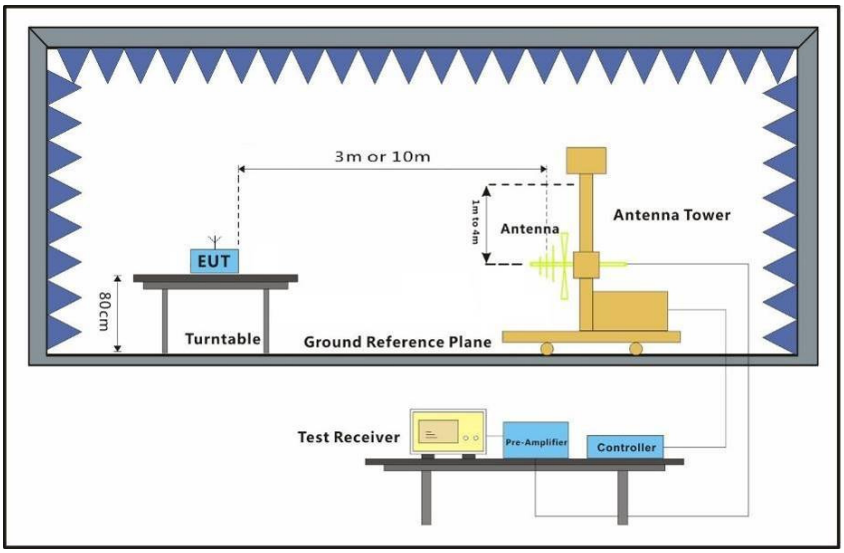
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 27.5 °C Humidity: 53.8 % RH :

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1Ghz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

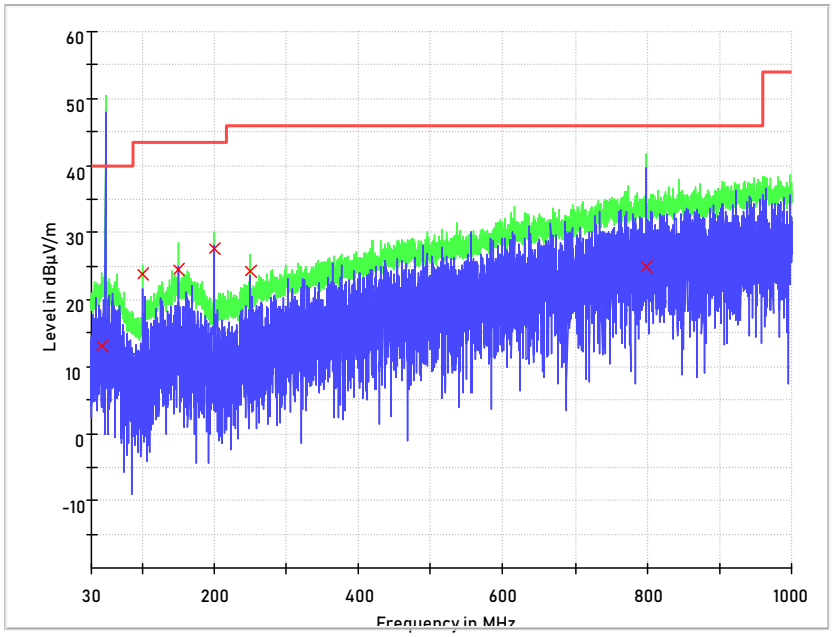
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

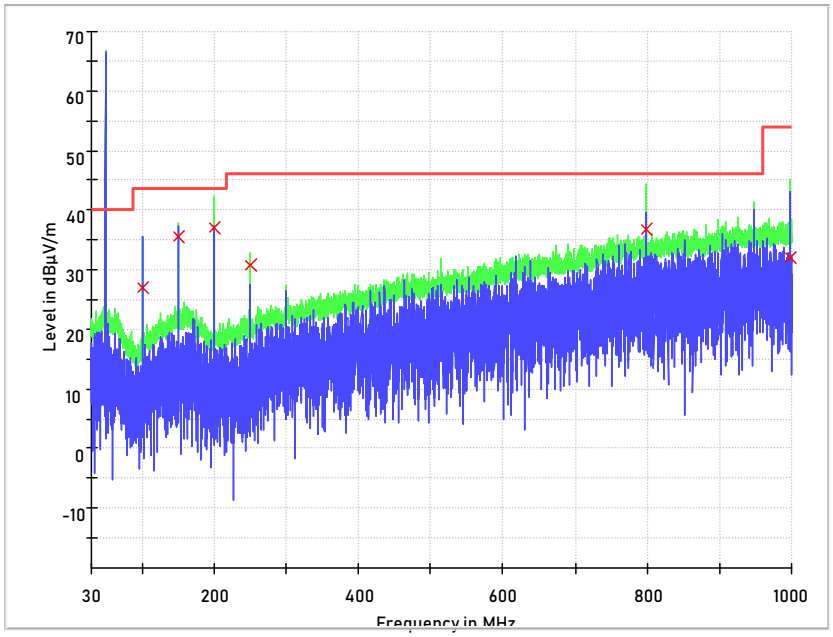
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Mode:a; Polarization:Horizontal



Frequency (MHz)	QuasiPeak (dBµV/m)	Pol.	Corr. (dB/m)	Margin (dB)	Limit (dBµV/m)	Result
44.917857	13.0	H	14.0	27.0	40.0	Pass
99.726786	23.8	H	9.2	19.7	43.5	Pass
149.730357	24.5	H	14.1	19.0	43.5	Pass
199.594643	27.5	H	10.6	16.0	43.5	Pass
249.458929	24.3	H	12.9	21.7	46.0	Pass
798.523214	25.0	H	24.8	21.0	46.0	Pass

Mode:a; Polarization:Vertical



Frequency (MHz)	QuasiPeak (dBµV/m)	Pol.	Corr. (dB/m)	Margin (dB)	Limit (dBµV/m)	Result
99.726786	27.1	V	9.2	16.4	43.5	Pass
149.660714	35.6	V	14.1	7.9	43.5	Pass
199.525000	37.0	V	10.6	6.6	43.5	Pass
249.458929	30.7	V	12.9	15.3	46.0	Pass
798.314286	36.9	V	24.8	9.1	46.0	Pass
997.910714	32.0	V	26.9	22.0	54.0	Pass

8 Photographs

8.1 Radiated Emissions (9kHz-30MHz) Test Setup

8.2 Radiated Emissions (30MHz-1GHz) Test Setup

8.3 EUT Constructional Details (EUT Photos)

Refer to the appendices external and internal photos.

- End of the Report -