



HUASHENG TEST

FCC TEST REPORT

Prepared for:

Zhongshan Kaile Technology Co., Ltd

One of the second floor, Building 8, Chengshi Industry, No. 45, Industrial Avenue, Baofeng Community, Xiaolan Town, Zhongshan City

Product: Smart locks

Trade Name: N/A

Model Name: F7, S320, X7, X9, X10, F5, 8, W1, W3, D1, D2, Q1

Date of Test: Mar. 01, 2024 – Mar. 07, 2024

Date of Report: Mar. 07, 2024

Report Number: HS202402045082-1ER

Prepared By:

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TEST REPORT VERIFICATION

Applicant : Zhongshan Kaile Technology Co., Ltd
 Address : One of the second floor, Building 8, Chengshi Industry, No. 45, Industrial Avenue, Baofeng Community, Xiaolan Town, Zhongshan City
 Manufacturer : Zhongshan Kaile Technology Co., Ltd
 Address : One of the second floor, Building 8, Chengshi Industry, No. 45, Industrial Avenue, Baofeng Community, Xiaolan Town, Zhongshan City
 EUT Description : Smart locks
 (A) Model No. : F7
 (B) Series Model : S320, X7, X9, X10, F5, 8, W1, W3, D1, D2, Q1
 (C) Power Supply : DC 6V, 2A

Standards..... FCC Part 15 Subpart B
 ANSI C63.4:2014

This device described above has been tested by HS, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Test Result..... **Pass**

Date of Test: Mar. 01, 2024 to Mar. 07, 2024

Testing Engineer: Rock Ren
 (Rock Ren)

Technical Manager: Snow Wu
 (Snow Wu)

Authorized Signatory: Smile Xu
 (Smile Xu)





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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2024/03/07	(Smile Xu)



1 TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part 15 Subpart B ANSI C63.4:2014	Conducted Emission	Class B	N/A	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.



1.1 TEST FACILITY

Shenzhen Huasheng Testing Technology Co., Ltd.
Address: 1 / F, Building B, wanliye science and Technology Park, Chongqing Road, Bao'an District, Shenzhen, Guangdong, China

1.2 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** %.

A. Conducted Measurement :

Measurement Frequency Range	Uncertainty	NOTE
150 KHz ~ 30MHz	±2.71dB	

B. Radiated Measurement :

Measurement Frequency Range	Uncertainty	NOTE
30MHz ~ 1000MHz	±3.90dB	
1GHz ~6GHz	±4.28dB	



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart locks				
Model Name	F7				
Series Model	S320, X7, X9, X10, F5, 8, W1, W3, D1, D2, Q1				
Model Difference	The principle of the circuit is the same, only the appearance and model name are different.				
Product Description	The EUT is a Smart locks.				
	<table border="1"><tr><td>Operating frequency:</td><td>N/A</td></tr><tr><td>Connecting I/O port:</td><td>N/A</td></tr></table>	Operating frequency:	N/A	Connecting I/O port:	N/A
	Operating frequency:	N/A			
Connecting I/O port:	N/A				
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an household Device. More details of EUT technical specification, please refer to the User's Manual.					
Power Source	DC Voltage				
Power Rating	DC 6V, 2A				



2.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	Running

For Conducted Test	
Final Test Mode	Description
N/A	N/A

For Radiated Test	
Final Test Mode	Description
Mode 1	Running



2.3 DESCRIPTION OF TEST SETUP

Mode 1:

E-1 EUT



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Smart locks	N/A	F7	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HSE-002	Oct. 17, 2024	1 Year
2.	Receiver	R&S	ESR-7	HSE-010	Oct. 17, 2024	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HSE-060	Oct. 17, 2024	1 Year
4.	Spectrum analyzer	R&S	FSP40	HSE-025	Oct. 17, 2024	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HSE-048	Oct. 17, 2024	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HSE-006	Oct. 17, 2024	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HSE-010	Oct. 17, 2024	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HSE-012	Oct. 17, 2024	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HSE-014	Oct. 17, 2024	1 Year
10.	Horn Antenna	Schwarzbeck	9120D	HSE-013	Oct. 17, 2024	1 Year
11.	Pre-amplifier	EMCI	EMC05184 5SE	HSE-015	Oct. 17, 2024	1 Year
12.	Pre-amplifier	Agilent	83051A	HSE-016	Oct. 17, 2024	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HSE-083	Oct. 17, 2024	1 Year
14.	Power Sensor	Agilent	E9300A	HSE-086	Oct. 17, 2024	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HSE-048	Oct. 17, 2024	1 Year
16.	Signal generator	Agilent	N5182A	HSE-029	Oct. 17, 2024	1 Year
17.	Signal Generator	Agilent	83630A	HSE-028	Oct. 17, 2024	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HSE-039	Oct. 17, 2024	1 Year

3 EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

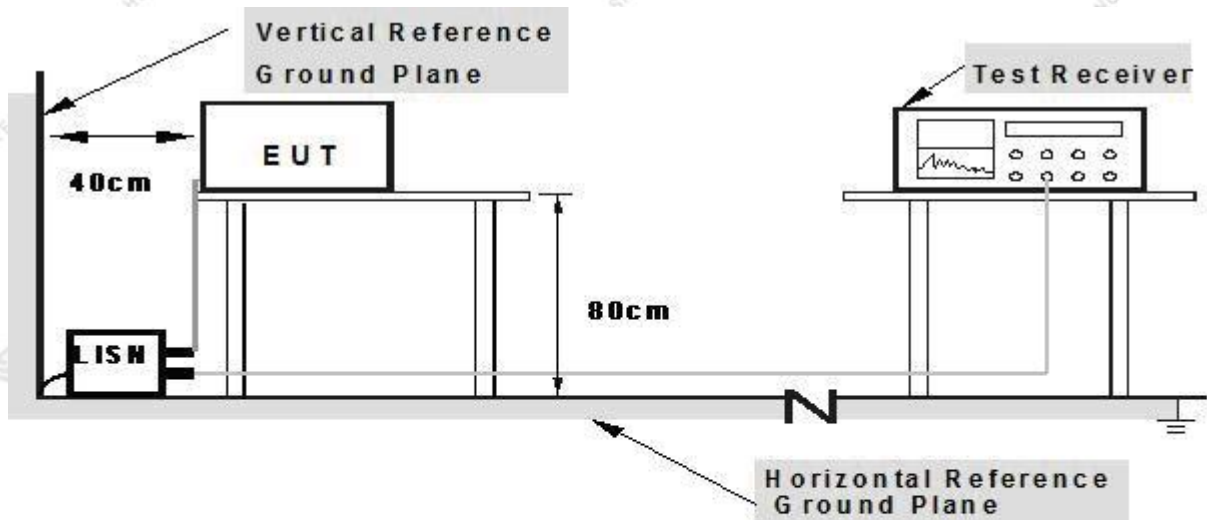
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



3.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.1.5 TEST RESULTS

EUT :	N/A	Model Name. :	N/A
Temperature :	N/A	Relative Humidity :	N/A
Pressure :	N/A	Test Date :	N/A
Test Mode :	N/A	Polarization :	N/A
Test Power :	N/A		

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

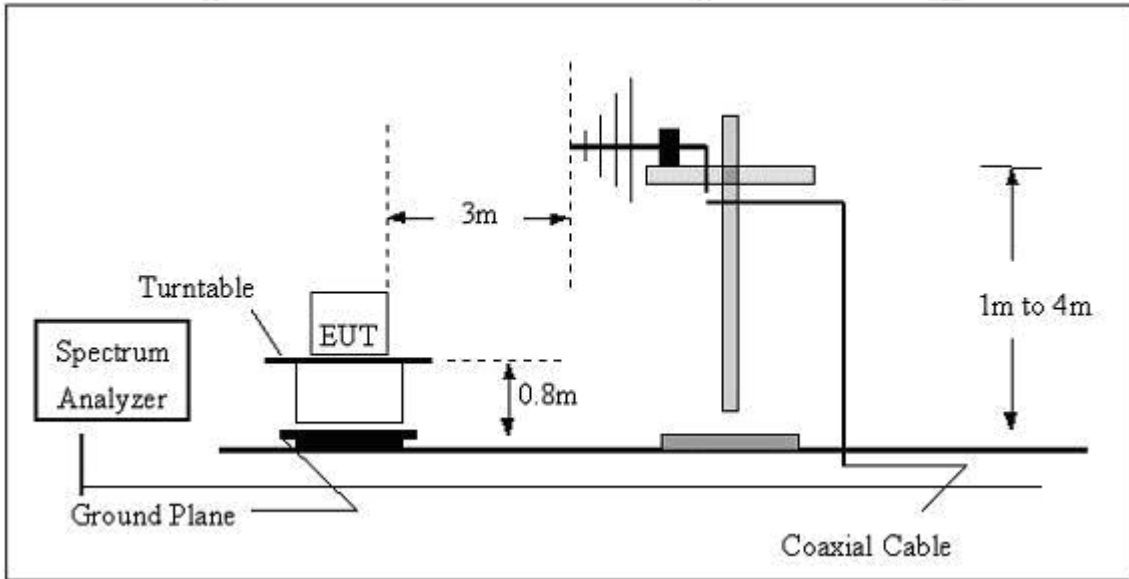
3.2.2 TEST PROCEDURE

- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

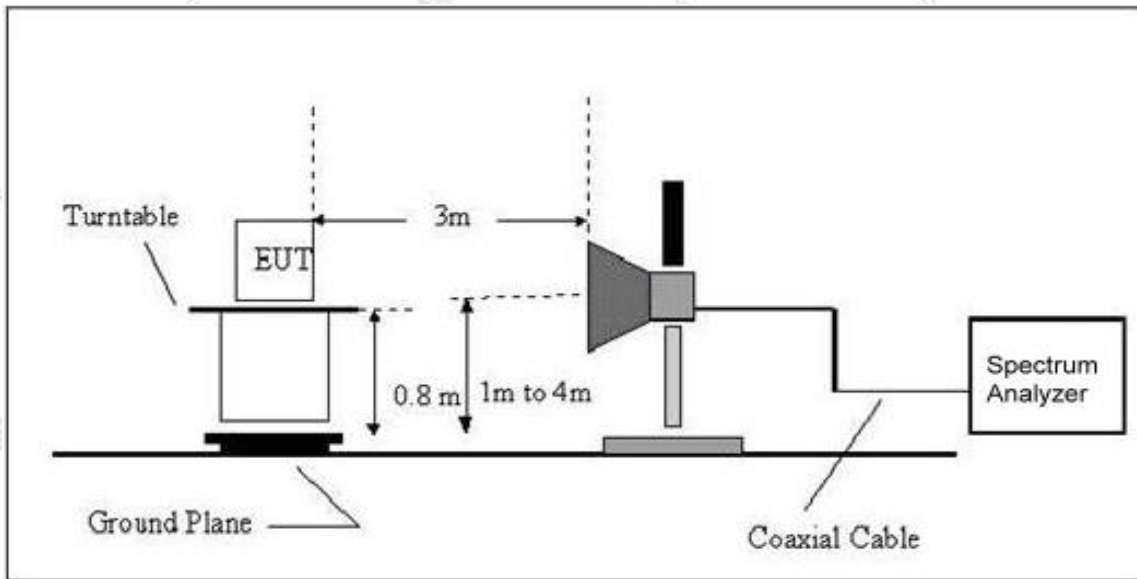


3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



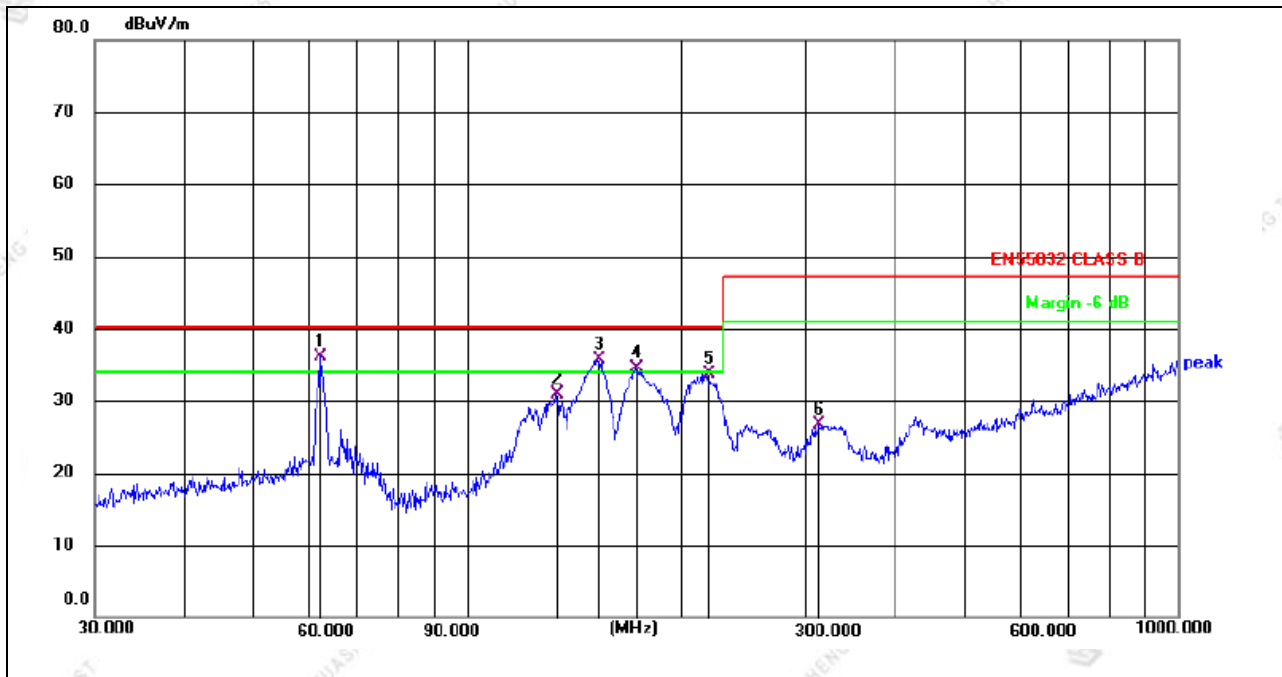
3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.5 TEST RESULTS

EUT :	Smart locks	Model Name. :	F7
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2024-03-06
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC 6V		



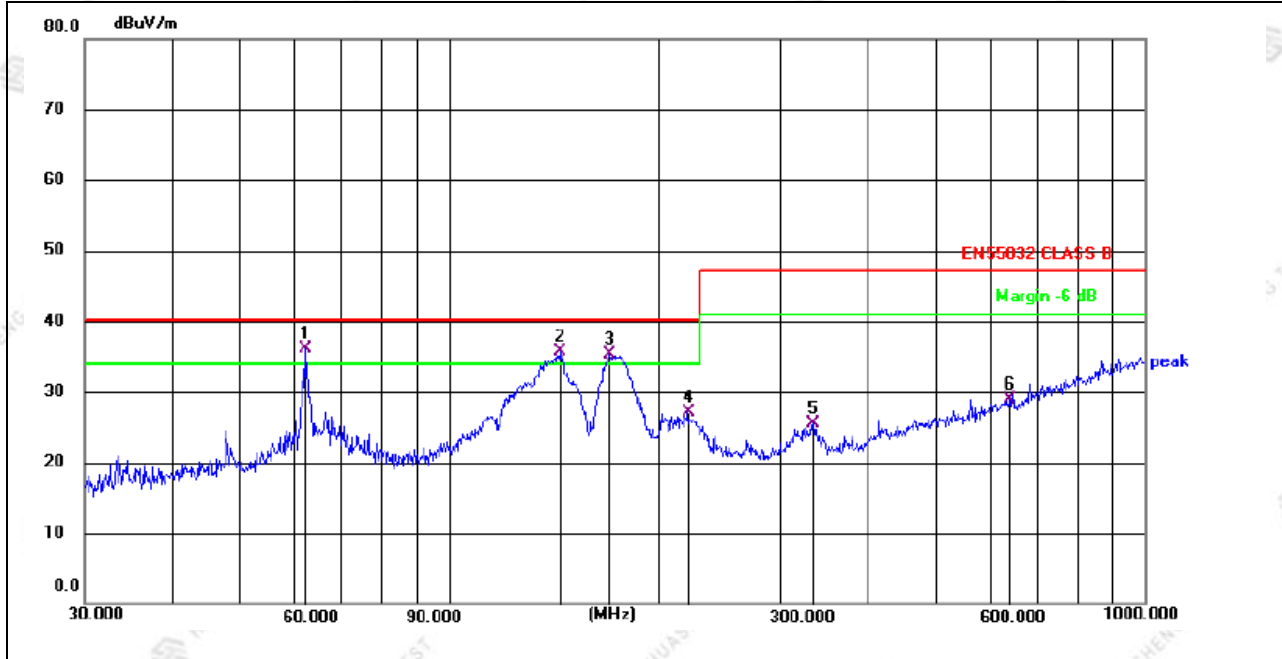
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	62.2128	50.90	-14.86	36.04	40.00	3.96	QP
2		133.6188	49.38	-18.51	30.87	40.00	9.13	QP
3	!	153.2004	54.61	-18.96	35.65	40.00	4.35	QP
4	!	172.5988	52.18	-17.76	34.42	40.00	5.58	QP
5		218.3085	48.91	-15.22	33.69	40.00	6.31	QP
6		313.2760	38.96	-12.28	26.68	47.00	20.32	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Antenna Factor + Cable Loss.
3. N/A means All Data have pass Limit



EUT :	Smart locks	Model Name. :	F7
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2024-03-06
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 6V		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	62.2128	51.01	-14.86	36.15	40.00	3.85	QP
2	!	144.3345	54.57	-18.93	35.64	40.00	4.36	QP
3	!	170.1947	53.28	-17.92	35.36	40.00	4.64	QP
4		220.6169	42.23	-15.14	27.09	40.00	12.91	QP
5		333.6865	37.37	-11.96	25.41	47.00	21.59	QP
6		638.3686	34.84	-5.87	28.97	47.00	18.03	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Antenna Factor + Cable Loss.
3. N/A means All Data have pass Limit



3.2.6 TEST RESULTS(Above 1GHz)

EUT :	N/A	Model Name. :	N/A
Temperature :	N/A	Relative Humidity :	N/A
Pressure :	N/A	Test Date :	N/A
Test Mode :	N/A		
Test Power :	N/A		

Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) There was not any unintentional transmission in standby mode



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1



.....End of Report.....