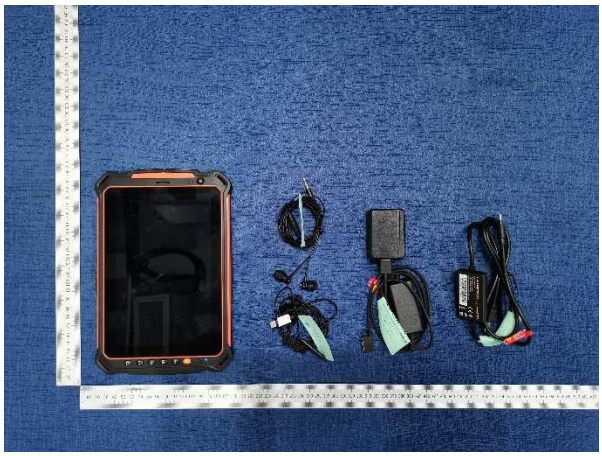
Prüfbericht-Nr.: *Test report no.:*	**60374756 005**	**Auftrags-Nr.:** *Order no.*:	**168264720**	Seite 1 von 23 *Page 1 of 23*
Kunden-Referenz-Nr.: *Client reference no.:*	**N/A**	**Auftragsdatum:** *Order date:*	2020-05-13	
Auftraggeber: *Client:*	i.safe MOBILE GmbH i_Park Tauberfranken 10, 97922 Lauda-Koenigshofen, Germany			
Prüfgegenstand: *Test item:*	Rugged tablet computer			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	M93A01			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart C Section 15.225 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209		RSS-210 Issue 10 RSS-Gen Issue 5	

Wareneingangsdatum: *Date of sample receipt:*	2020-05-13
Prüfmuster-Nr.: *Test sample no:*	A002024323-004
Prüfzeitraum: *Testing period:*	2020-05-24 – 2020-06-10
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass



geprüft von:
tested by: Lin Lin

Datum:
Date: 2020-10-09

Stellung / *Position:* Senior Project Manager

genehmigt von:
authorized by: Winnie Hou

Ausstellungsdatum:
Issue date: 2020-10-09

Stellung / *Position:* Technical Certifier

Sonstiges / *Other:*

FCC ID: 2AACZ-M93A01
IC: 11122A-M93A01
HVIN: M93A01

Zustand des Prüfgegenstandes bei Anlieferung:
Condition of the test item at delivery:
Prüfmuster vollständig und unbeschädigt
Test item complete and undamaged

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TÜV Rheinland (Shenzhen) Co., Ltd. 1601 R&D Room, 1602-1604, 17-18F, Building 7 Site C, Vanke Cloud City Phase I, Xingke First Street, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, P.R. China
Mail: service@de.tuv.com · Web: www.tuv.com

Test Summary

5.1.1 Antenna Requirement

RESULT: Pass

5.1.2 99% Bandwidth

RESULT: Pass

5.1.3 Radiated Spurious Emission

RESULT: Pass

5.1.4 Frequency Stability

RESULT: Pass

5.1.5 Conducted Emission on AC Mains

RESULT: Pass

Contents

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
None

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Registration No.: 694916
ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Radio Spectrum Testing (TS8997)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
Signal Analyzer	R&S	FSV 40	101441	20.08.2020
Humid & Temp Programmable Tester	BOST	NTH090-60	19040801	10.04.2021
Shielding Room 8#	Albatross	SR8	APC17151-SR8	23.07.2020
Radiated Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	19.08.2020
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	21.08.2020
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	20.08.2020
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	02.09.2020
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	02.09.2020
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	01.09.2020
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	06.07.2020

Conducted Emission on AC Mains				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cali. until**
EMI Test Receiver	R&S	ESR3	102428	03.09.2020
Artificial Mains Network	R&S	ENV216	102333	19.08.2020
Artificial Mains Network	R&S	ENV432	101411	19.08.2020
Attenuator	R&S	ESH2Z31	100300	19.08.2020
EMC32 test software	R&S	EMC32(Ver.10.50.01)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radio Frequency	±1 x 10-7
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB
Radiated Emission (3m SAC), Up to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 dB
Temperature	±1 °C
Humidity	±5 %
Voltage (DC)	±1 %
Voltage (AC, <10kHz)	±2 %

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached in this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a tablet which supports Bluetooth, 2.4G Wi-Fi 802.11 b/g/n, 5G Wi-Fi 802.11a/n/ac, NFC and GSM/WCDMA/LTE wireless technology. This Report is for NFC function.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	IS930.1
Type Designation	M93A01
Trade Mark	i.safe MOBILE
FCC ID	2AACZ-M93A01
IC	11122A-M93A01
HVIN	M93A01
Operating Voltage:	DC 5V@2A input via power adapter
Testing Voltage	Fully charged li-ion battery charged by power adapter (Adapter input AC 120V@60Hz)
Antenna Type	Integral Antenna
Power Adapter	Model: ICP12-050-2000B Input: AC 100-240V~50/60Hz, 0.3A Output: DC5V@2A
Other accessories	USB Cable Magnetic absorption charging cable 3.5mm Earphone
Technical Specification	
Operating Frequency	13.56MHz
Type of Modulation	ASK

3.3 Independent Operation Modes

The basic operation modes is:

A. On, Transmitting mode

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form

-

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013 and ANSI C63.4: 2014.

4.3 Special Accessories and Auxiliary Equipment

Table 3: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Rating
--	--	--	--	--

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

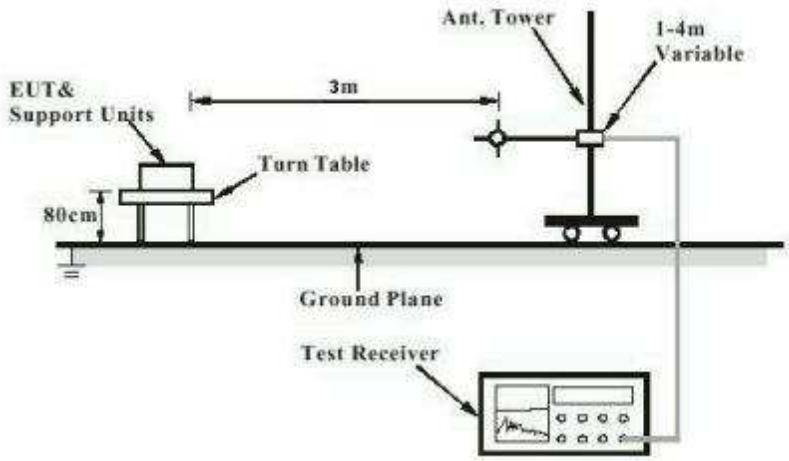


Diagram of Measurement Configuration for Mains Conduction Measurement

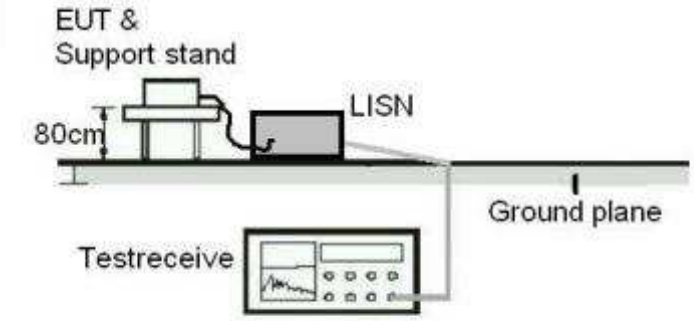
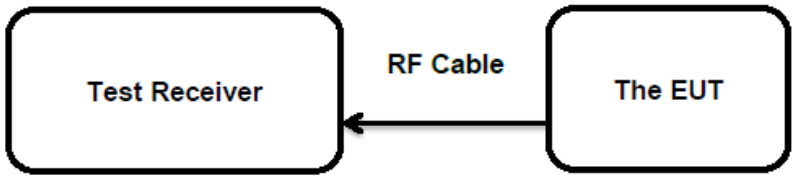


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

According to the manufacturer declared, the EUT has an internal antenna and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 99% and 20dB Bandwidth

RESULT: **Pass**

Test Specification

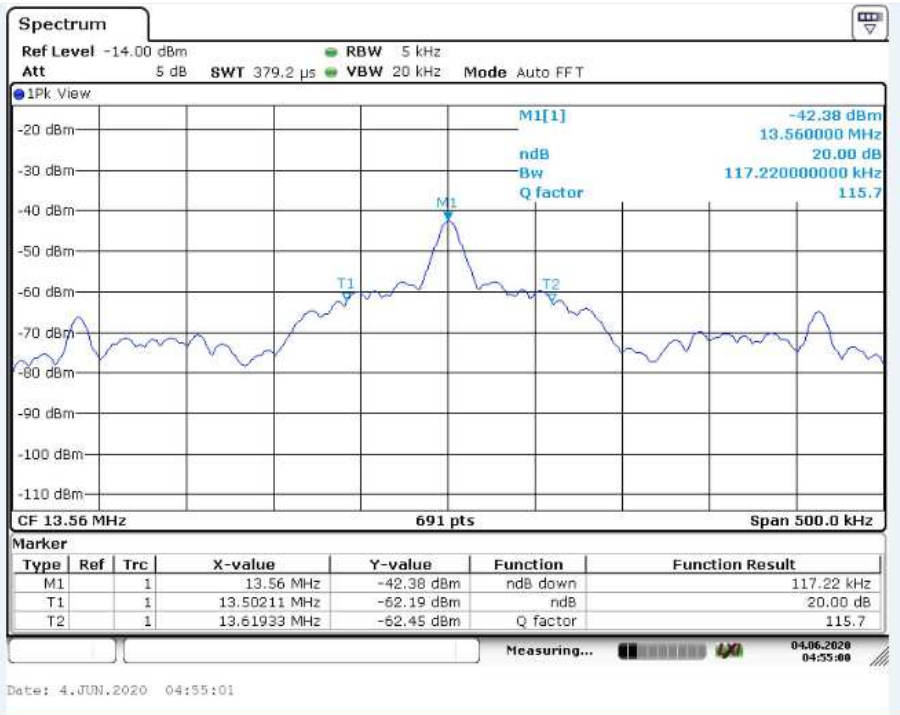
Test standard	:	FCC Part 15.215 & RSS-Gen Clause 6.6
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

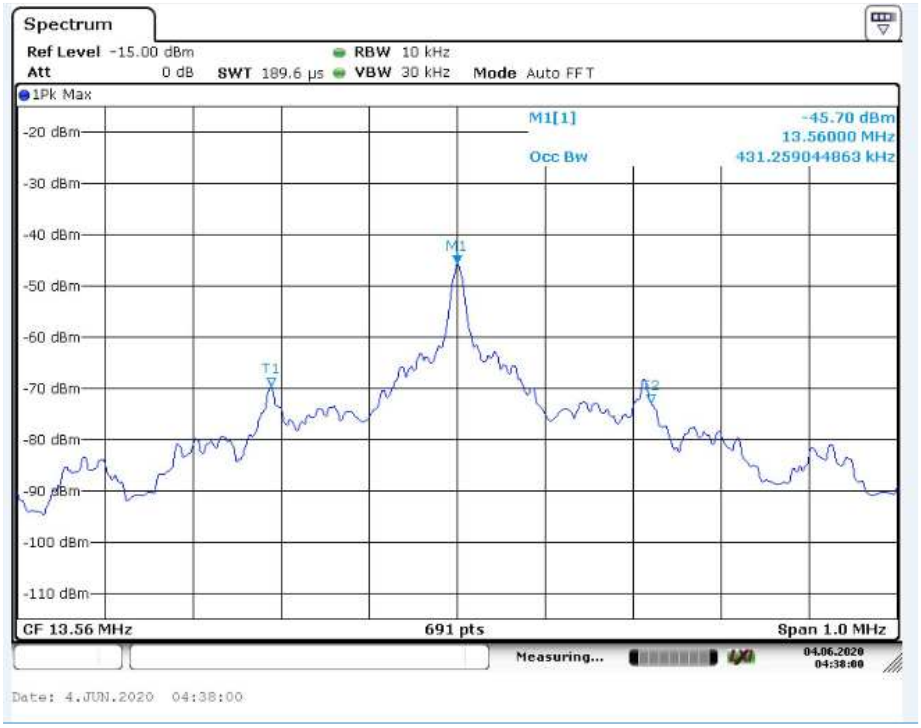
Date of testing	:	2020-06-04
Input voltage	:	Fully charged li-ion battery charged by power adapter (Adapter input AC 120V@60Hz)
Operation mode	:	A
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Refer to next page for the measurement records

20dB Bandwidth



99% OBW



5.1.3 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.225 (a) (b) (c) (d) & FCC Part 15.205 RSS-210 B.6 (a) & RSS-Gen 8.9
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) & 15.225 and RSS-210 B.6 (a) & RSS-Gen 8.9
Kind of test site	:	3m Semi-anechoic Chamber

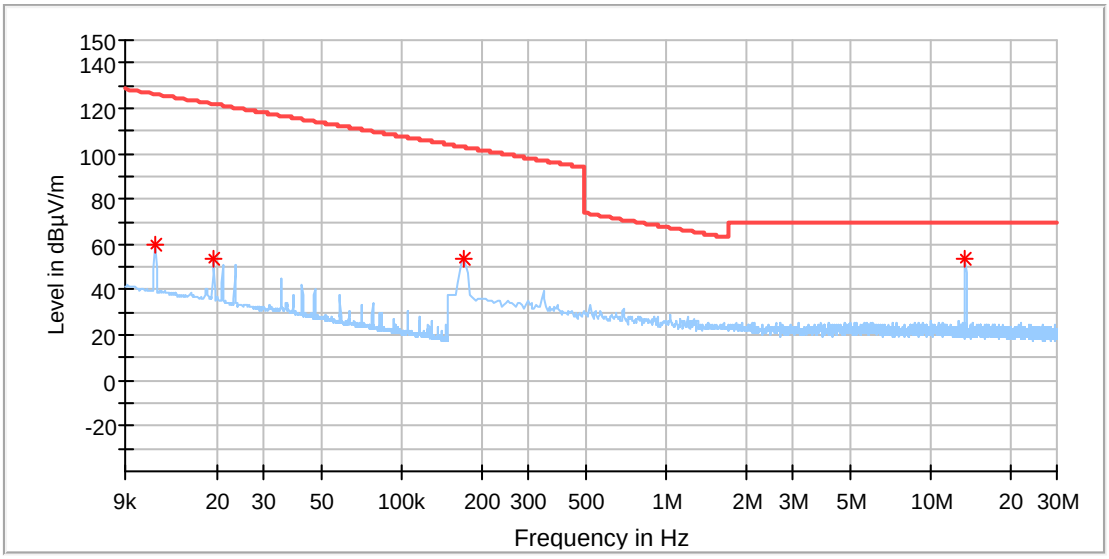
Test Setup

Date of testing	:	05.29.2020
Input voltage	:	Fully charged li-ion battery charged by power adapter (Adapter input AC 120V@60Hz)
Operation mode	:	A
Ambient temperature	:	25 ℃
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

Remark:
Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

Refer to next page for the measurement records

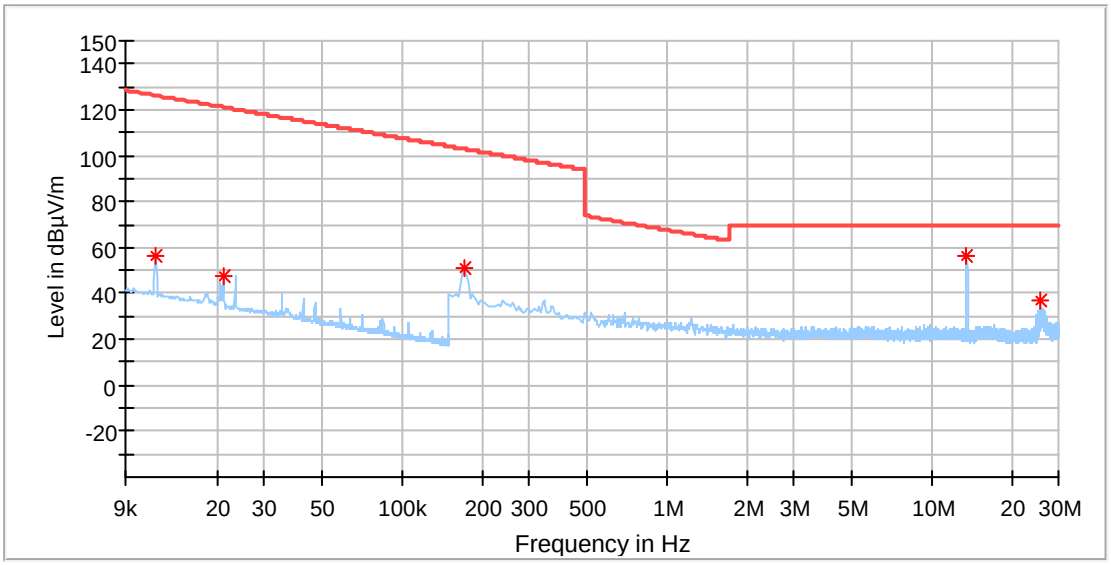
X AXIS



Critical_Freqs

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)	Trd Corr. (dB/m)
0.011719	59.60	126.21	66.61	100.0	V	89.0	20.0	0.0	20.0
0.019374	53.40	121.84	68.44	100.0	V	248.0	20.0	0.0	20.0
0.171949	54.02	102.89	48.87	100.0	V	172.0	20.0	0.0	20.0
13.560552	53.52	69.50	15.98	100.0	V	178.0	20.0	0.0	20.0

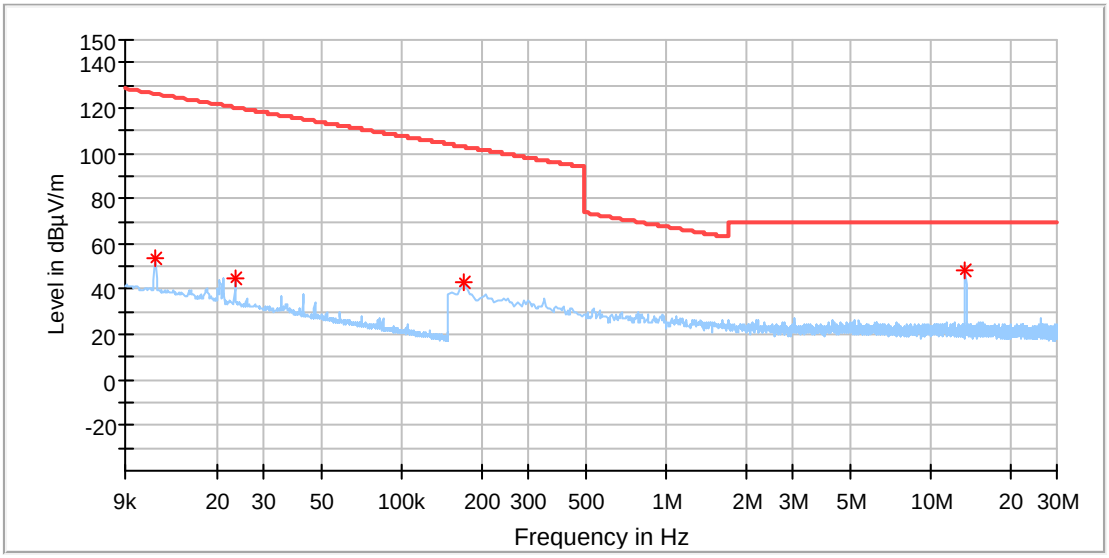
Y AXIS



Critical_Freqs

Frequency (MHz)	Max Peak (dB磧/m)	Limit (dB磧/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)	Trd Corr. (dB/m)
0.011619	55.99	126.28	70.29	100.0	V	0.0	20.0	0.0	20.0
0.021086	47.85	121.11	73.26	100.0	V	118.0	20.0	0.0	20.0
0.171949	50.86	102.89	52.03	100.0	V	244.0	20.0	0.0	20.0
13.560552	56.57	69.50	12.93	100.0	V	92.0	20.0	0.0	20.0
25.816610	36.94	69.50	32.56	100.0	V	322.0	20.0	0.0	20.0

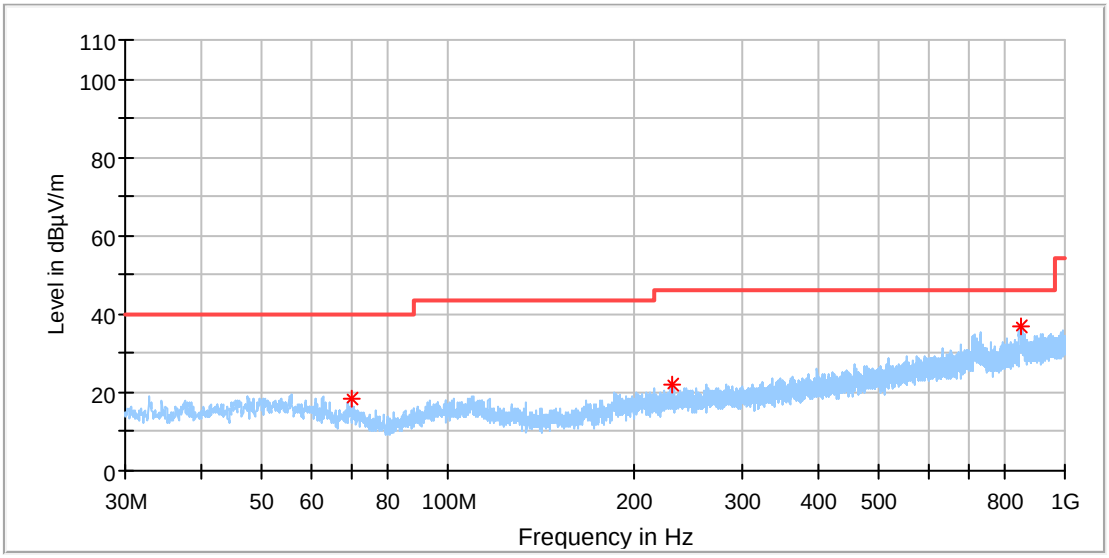
Z AXIS



Critical_Freqs

Frequency (MHz)	Max Peak (dB礦/m)	Limit (dB礦/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Preamp (dB)	Trd Corr. (dB/m)
0.011719	53.33	126.21	72.88	100.0	V	60.0	20.0	0.0	20.0
0.023402	44.54	120.20	75.66	100.0	V	43.0	20.0	0.0	20.0
0.171949	43.42	102.89	59.47	100.0	V	6.0	20.0	0.0	20.0
13.560552	48.52	69.50	20.98	100.0	V	297.0	20.0	0.0	20.0

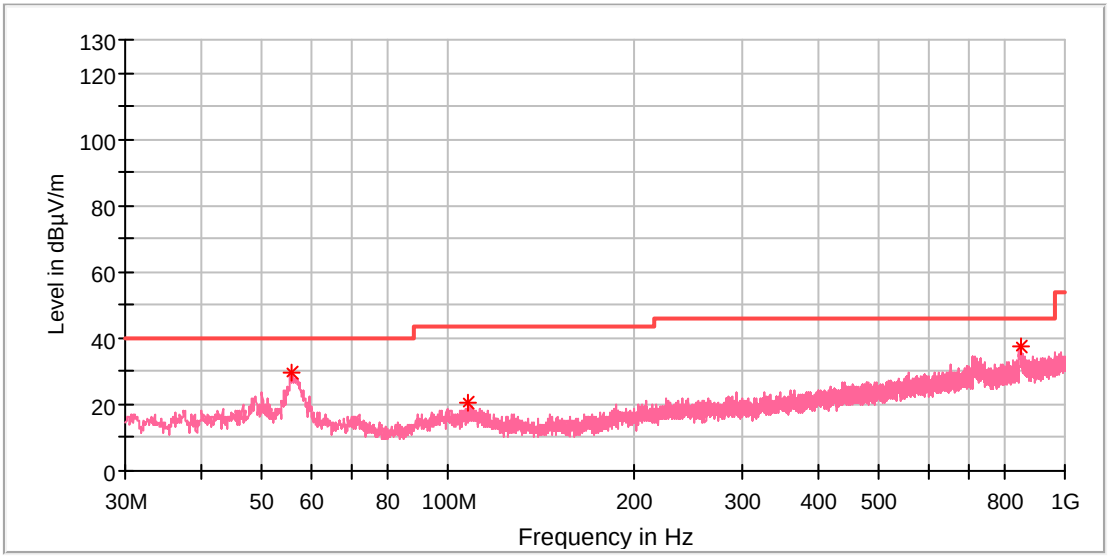
Horizontal



Critical_Freqs

Frequency (MHz)	MaxPeak (dB礦/m)	Limit (dB礦/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
69.673000	18.59	40.00	21.41	100.0	H	313.0	-22.0
231.808500	21.84	46.00	24.16	100.0	H	118.0	-18.3
845.576000	37.06	46.00	8.94	100.0	H	250.0	-6.0

Vertical



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
55.608000	29.60	40.00	10.40	100.0	V	356.0	-18.8
108.085000	20.78	43.50	22.72	100.0	V	185.0	-19.3
846.012500	37.73	46.00	8.27	100.0	V	0.0	-6.0

5.1.4 Frequency Stability

RESULT: **Pass**

Test Specification

Test standard : FCC Part 15.225(e) & RSS-210 B.6 (b)
Basic standard : ANSI C63.10:2013
Limits : 0.01% of Operating Frequency (100ppm)
Kind of test site : Shielded Room

Test Setup

Date of testing : 2020-06-10
Operation mode : A
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Test Mode：Transmitting					
Frequency（MHz）	Voltage（Vdc）	Temperature（℃）	Measurement Frequency (Hz)	Frequency deviation（Hz）	Max. Deviation (%)
13.56	3.7	-30	13559987	-13	-0.00014011
		-20	13559981	-19	
		-10	13560014	14	
		0	13560013	13	
		10	13560005	5	
		20	13560017	17	
		30	13560008	8	
		40	13559984	-16	
		50	13559983	-17	
		55	13559986	-14	
	3.33	25	13560007	7	
	4.07	25	13559992	-8	

5.1.5 Conducted Emission on AC Mains

RESULT: **Pass**

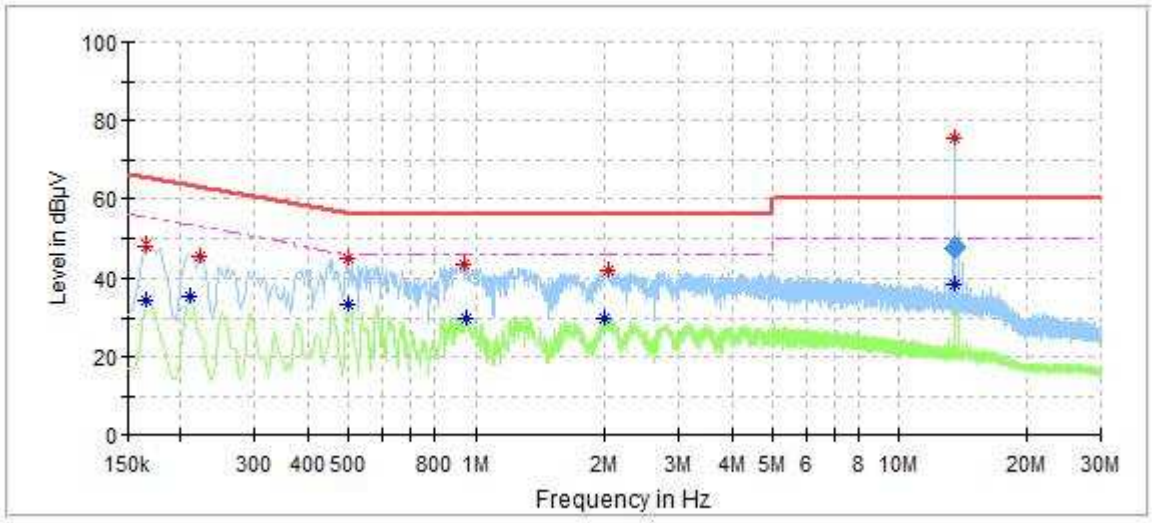
Test Specification

Test standard	:	FCC Part 15.207(a) RSS-Gen Clause 8.8
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a) RSS-Gen Table 3
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2020-06-09
Input voltage	:	AC 120V@60Hz
Operation mode	:	A
Earthing	:	Not connected
Ambient temperature	:	22 ℃
Relative humidity	:	64 %
Atmospheric pressure	:	101 kPa

Refer to next page for the measurement records

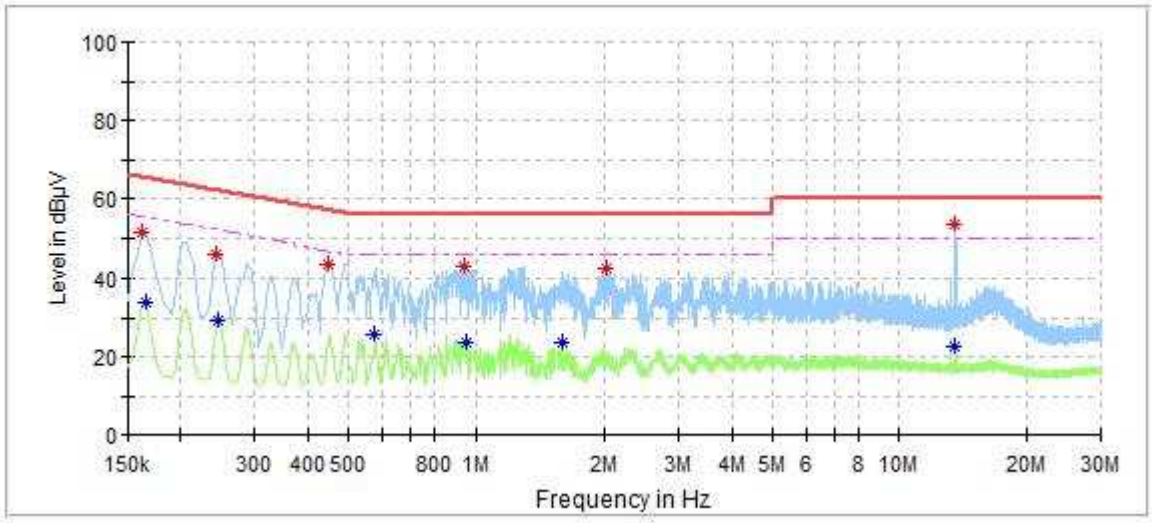


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.166000	48.27	---	65.16	16.89	L1	9.6
0.166000	---	34.57	55.16	20.59	L1	9.6
0.210000	---	35.16	53.21	18.05	L1	9.6
0.222000	45.50	---	62.74	17.24	L1	9.6
0.500000	---	33.28	46.00	12.72	L1	9.7
0.500000	45.29	---	56.00	10.71	L1	9.7
0.940000	43.64	---	56.00	12.36	L1	9.7
0.948000	---	29.90	46.00	16.10	L1	9.7
1.988000	---	29.65	46.00	16.35	L1	9.7
2.036000	41.99	---	56.00	14.01	L1	9.7
13.560000	---	38.39	50.00	11.61	L1	10.2
13.564500	75.52	---	60.00	-15.52	L1	10.2

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
13.564500	47.82	---	60.00	12.18	200.0	9.000	L1	10.2



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.162000	51.28	---	65.36	14.08	N	9.6
0.166000	---	33.93	55.16	21.23	N	9.6
0.242000	45.93	---	62.03	16.10	N	9.6
0.246000	---	29.25	51.89	22.64	N	9.6
0.446000	43.64	---	56.95	13.31	N	9.7
0.576000	---	25.76	46.00	20.24	N	9.7
0.944000	43.21	---	56.00	12.79	N	9.7
0.952000	---	23.71	46.00	22.29	N	9.7
1.596000	---	23.38	46.00	22.62	N	9.7
2.020000	42.71	---	56.00	13.29	N	9.7
13.580000	53.46	---	60.00	6.54	N	10.3
13.584000	---	22.72	50.00	27.28	N	10.3

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

7 List of Tables