



EMC TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-A2023PG
Product 5G NR Multi model smart phone
Model ZTE A2023PG
Report No. R2203A0249-E1V2
Issue Date June 1, 2022

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B/ ANSI C63.4-2014**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

Prepared by: Wei Liu

Guangchang Fan

Approved by: Guangchang Fan

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



Table of Contents

1	Test Laboratory.....	5
1.1	Notes of the Test Report.....	5
1.2	Test facility.....	5
1.3	Testing Location.....	5
2	General Description of Equipment under Test.....	6
2.1	Applicant and Manufacturer Information.....	6
2.2	General information.....	6
2.3	Applied Standards.....	8
2.4	Test Mode.....	9
3	Test Case Results.....	10
3.1	Radiated Emission.....	10
3.2	Conducted Emission.....	15
4	Main Test Instruments.....	18
	ANNEX A: The EUT Appearance.....	19
	ANNEX B: Test Setup Photos.....	20



Version	Revision description	Issue Date
Rev.0	Initial issue of report.	May 13, 2022
Rev.1	Update information in Page 7.	May 23, 2022
Rev.2	Update information.	June 1, 2022

Note: This revised report (Report No. R2203A0249-E1V2) supersedes and replaces the previously issued report (Report No. R2203A0249-E1V1). Please discard or destroy the previously issued report and dispose of it accordingly.



Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	FCC Part15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	FCC Part15.107, ANSI C63.4-2014	PASS
Date of Testing: March 17, 2022 and May 11, 2022 Date of Sample Received: March 17, 2022			
Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Fan Guangchang
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: fanguangchang@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Applicant and Manufacturer Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, #55 Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, #55 Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China

2.2 General information

EUT Description			
Device Type	Portable Device		
Model	ZTE A2023PG		
SN	327324440042		
HW Version	ZTE A2023PGHW1.0		
SW Version	MyOS12.0.2_A2023PG_GLB		
Power Rating	DC 3.89V from battery or DC 5V from Adapter.		
Connecting I/O Port(s)	Please refer to the User's Manual.		
Antenna Type	Internal Antenna		
Frequency	Band	Tx (MHz)	Rx (MHz)
	GSM 850	824 ~ 849	869 ~ 894
	GSM 1900	1850 ~ 1910	1930 ~ 1990
	WCDMA Band II	1850 ~ 1910	1930 ~ 1990
	WCDMA Band IV	1710 ~ 1755	2110 ~ 2155
	WCDMA Band V	824 ~ 849	869 ~ 894
	LTE Band 2	1850 ~ 1910	1930 ~ 1990
	LTE Band 4	1710 ~ 1755	2110 ~ 2155
	LTE Band 5	824 ~ 849	869 ~ 894
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	LTE Band 12	699 ~ 716	729 ~ 746
	LTE Band 17	704 ~ 716	734 ~ 746
	LTE Band 28 subset 1	703 ~ 733	758 ~ 788
	LTE Band 28 subset 2	718 ~ 748	773 ~ 803
	LTE Band 38	2570 ~ 2620	2570 ~ 2620
	LTE Band 40 subset 1	2305 ~ 2315	2305 ~ 2315
	LTE Band 40 subset 2	2350 ~ 2360	2350 ~ 2360
	LTE Band 41	2496 ~ 2690	2496 ~ 2690
LTE Band 66	1710 ~ 1780	2110 ~ 2180	
NR n2	1850 ~ 1910	1930 ~ 1990	



	NR n5	824 ~ 849	869 ~ 894
	NR n7	2500 ~ 2570	2620 ~ 2690
	NR n38	2570 ~ 2620	2570 ~ 2620
	NR n41	2496~2690	2496~2690
	NR n66	1710~1780	2110 ~ 2180
	NR n77 subset 1	3450 ~ 3550	3450 ~ 3550
	NR n77 subset 2	3700 ~ 3980	3700 ~ 3980
	NR n78 subset 1	3450 ~ 3550	3450 ~ 3550
	NR n78 subset 2	3700 ~ 3800	3700 ~ 3800
	Bluetooth	2400 ~ 2483.5	2400 ~ 2483.5
	Wi-Fi 2.4G	2400 ~ 2483.5	2400 ~ 2483.5
	Wi-Fi 5G(U-NII-1)	5150 ~ 5250	5150 ~ 5250
	Wi-Fi 5G(U-NII-2A)	5250 ~ 5350	5250 ~ 5350
	Wi-Fi 5G(U-NII-2C)	5470 ~ 5725	5470 ~ 5725
	Wi-Fi 5G(U-NII-3)	5725 ~ 5850	5725 ~ 5850
	NFC	13.56	13.56
CA Band	CA_7C, CA_41C		
EN-DC Band	DC_2A-n77,DC_5A-n77, DC_2A-n78,DC_7A-n78, DC_28A-n78,DC_66A-n5,DC_28A-n41,DC_2A-n66,DC_5A-n66		
EUT Accessory			
Adapter	Manufacturer: ShenZhen KunXing Technology Co., Ltd. Model: STC-A59152050AC-Z		
Battery	Manufacturer: Zhuhai Cosmx Battery Co., Ltd. Model: Li3949T44P8h806459		
Earphone 1	Manufacturer: JUWEI ELECTRONICS CO.,LTD Model: JWEP1092-Z01		
Earphone 2	Manufacturer: ShenZhen FDC Electronic Co.,Ltd Model: DEM-9A		
USB Cable 1	Manufacturer: King Power Electronics Co., Ltd Model: TC20-TC20-W-100-M-6A-HSF		
USB Cable 2	Manufacturer: Luxshare-ICT Co., Ltd Model: TC20-TC20-W-100-M-6A-HSF		
Type-C to 3.5 mm Headphone Jack	Manufacturer: HUIZHOU JUWEI ELECTRONICS CO., LTD Model: HMZ24		
Auxiliary test equipment			
PC	PC Manufacturer: Microsoft Corporation Model: L20170076		
<p>Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.</p> <p>2. There is more than one USB cable/ Earphone, each one should be applied throughout the compliance test respectively, and however, only the worst case (USB cable 1) will be recorded in this report.</p>			



2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B

ANSI C63.4-2014

2.4 Test Mode

Test Mode	
Mode 1:	Adapter +USB cable+ Front camera On + GSM/WCDMA/LTE/NR/ Bluetooth/WLAN/NFC receiver
Mode 2:	Adapter +USB cable+ Front camera On + GSM/WCDMA/LTE/NR/ Bluetooth/WLAN/NFC Traffic
Mode 3:	Adapter +USB cable+ Rear camera On + GSM/WCDMA/LTE/NR/ Bluetooth/WLAN/NFC receiver
Mode4:	Adapter +USB cable+ Rear camera On + GSM/WCDMA/LTE/NR/ Bluetooth/WLAN/NFC Traffic
Mode 5:	Adapter + USB cable + Mp4
Mode 6:	Adapter + USB cable + GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC receiver
Mode 7:	Adapter + USB cable + GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC Traffic
Mode 8:	USB Copy(EUT with PC) + USB cable + earphone
Mode 9:	Front Camera On + GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC receiver
Mode 10:	Front Camera On + GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC Traffic
Mode 11:	Rear camera On + GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC receiver
Mode 12:	Rear camera On + GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC Traffic
Mode 13:	MP4
Mode 14:	GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC receiver
Mode 15:	GSM/WCDMA/LTE/NR/Bluetooth/WLAN/NFC Traffic

During the test, the preliminary test was performed in all modes with all USB and batteries, mode 8 with USB cable 1 is selected as the worst condition. The test data of the worst-case condition was recorded in this report.

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
15°C~35°C	30%~60%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

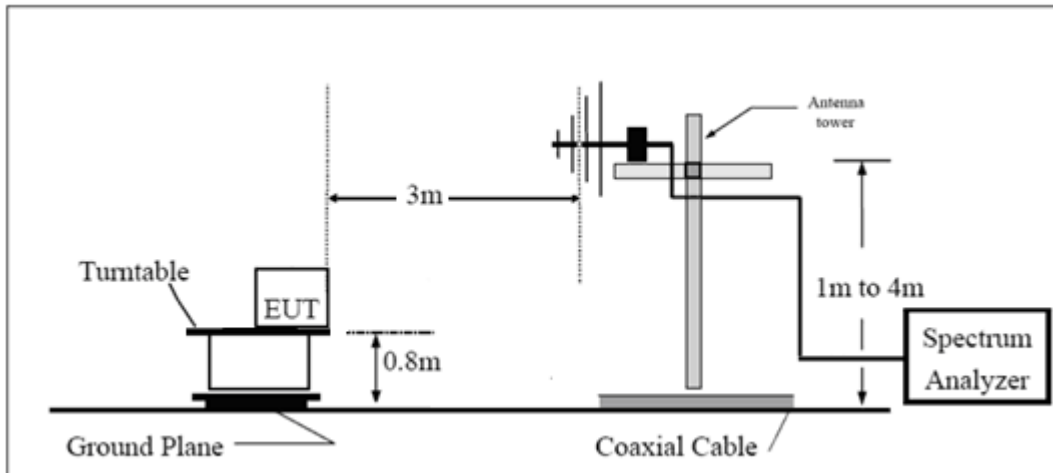
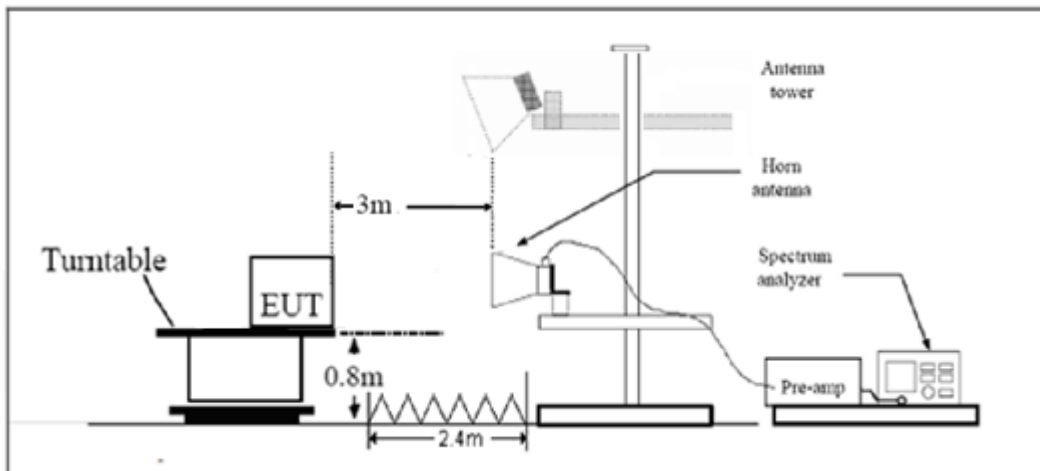
Above 1GHz:

(a) PEAK Detector: RBW=1MHz / VBW=3MHz / Sweep=AUTO

(b) AVERAGE Detector: RBW=1MHz / VBW=3MHz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup**Below 1GHz****Above 1GHz**

Note: Area side: 2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits**Class B**

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

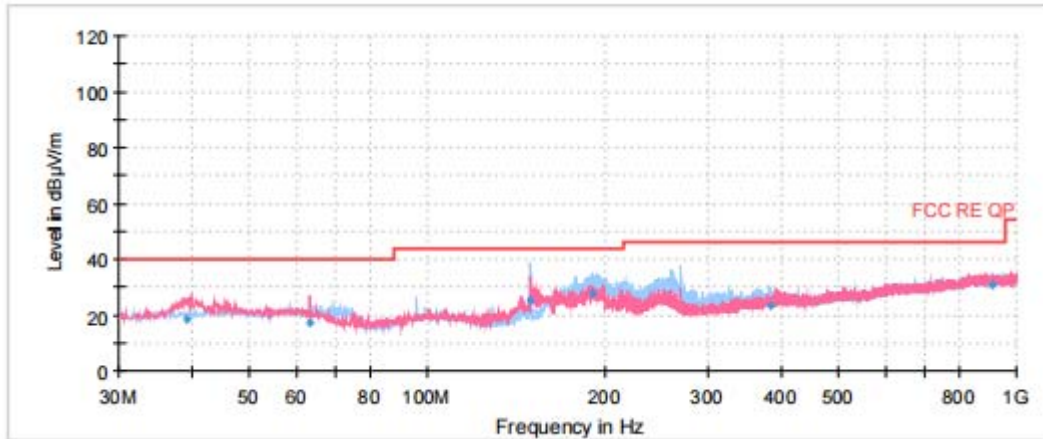
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
30MHz~200MHz	4.17 dB
200MHz~1000MHz	4.84 dB
1GHz~18GHz	4.35 dB
18GHz~26.5GHz	5.90 dB

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. The Emissions in the frequency band 18GHz – 26.5GHz is more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software. For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

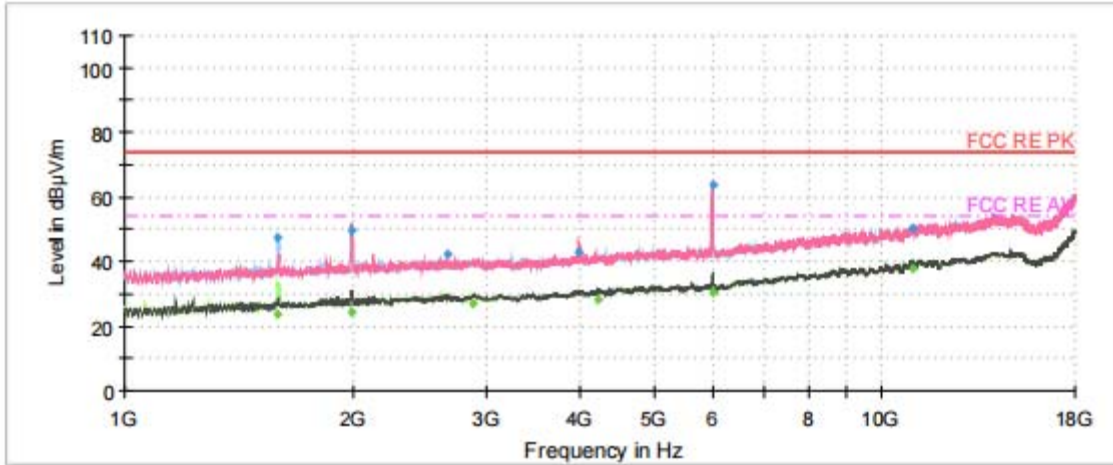


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
39.22	18.71	40.00	21.29	1000.00	105.0	V	254.00	13
63.34	17.16	40.00	22.84	1000.00	118.0	V	232.00	12
150.04	25.36	43.50	18.14	1000.00	179.0	H	222.00	9
191.02	27.62	43.50	15.88	1000.00	115.0	H	237.00	12
381.99	23.16	46.00	22.84	1000.00	100.0	H	292.00	17
911.73	30.66	46.00	15.34	1000.00	225.0	H	310.00	25

Remark: 1. Correction Factor = Antenna factor + Insertion loss(cable loss+amplifier gain)

2. Margin = Limit – Quasi-Peak



Radiated Emission from 1GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1592.88	47.35	---	74.00	26.65	1000.00	100.0	H	252.00	-16
1592.88	---	23.85	54.00	30.15	1000.00	125.0	H	253.00	-16
1990.25	49.87	---	74.00	24.13	1000.00	196.0	V	212.00	-15
1996.63	---	24.27	54.00	29.73	1000.00	195.0	V	209.00	-15
2661.75	42.09	---	74.00	31.91	1000.00	100.0	V	299.00	-13
2889.13	---	26.85	54.00	27.15	1000.00	125.0	H	0.00	-13
3985.63	42.91	---	74.00	31.09	1000.00	100.0	V	228.00	-11
4215.13	---	28.45	54.00	25.55	1000.00	210.0	V	230.00	-11
5998.00	63.49	---	74.00	10.51	1000.00	100.0	V	294.00	-5
5998.00	---	30.45	54.00	23.55	1000.00	125.0	V	294.00	-5
10974.75	---	37.76	54.00	16.24	1000.00	183.0	V	188.00	0
11004.50	50.16	---	74.00	23.84	1000.00	107.0	H	138.00	0

3.2 Conducted Emission

Ambient condition

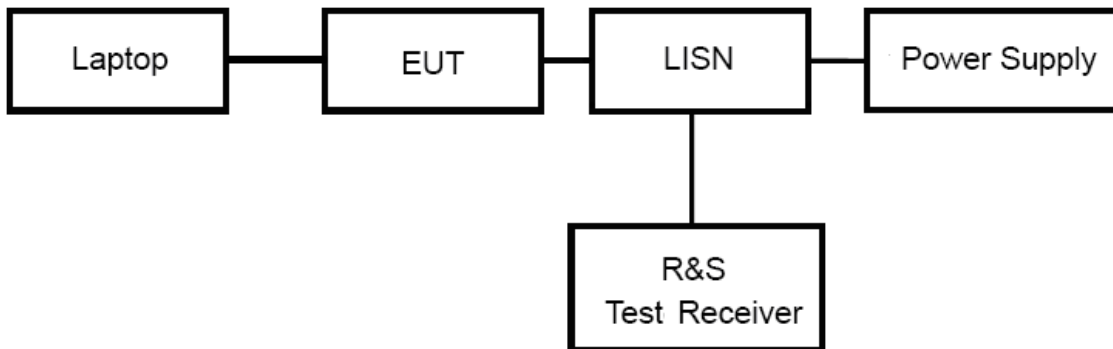
Temperature	Relative humidity	Pressure
15°C~35°C	30%~60%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

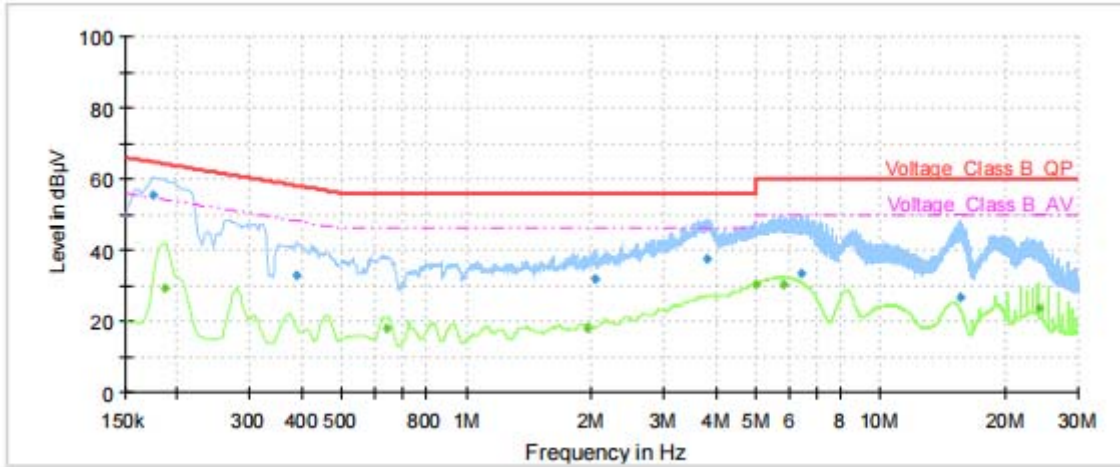
*: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.57$ dB.

Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.

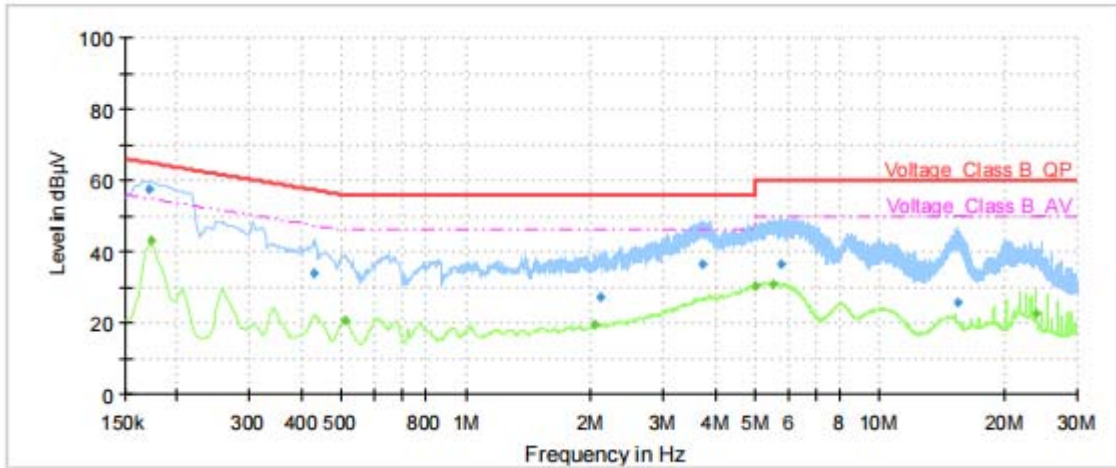


Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.17	55.32	---	64.73	9.41	1000.00	9.000	L1	ON	21
0.19	---	29.26	54.21	24.95	1000.00	9.000	L1	ON	21
0.39	32.85	---	58.10	25.25	1000.00	9.000	L1	ON	20
0.64	---	17.89	46.00	28.11	1000.00	9.000	L1	ON	20
1.95	---	17.86	46.00	28.14	1000.00	9.000	L1	ON	20
2.03	31.67	---	56.00	24.33	1000.00	9.000	L1	ON	20
3.80	37.64	---	56.00	18.36	1000.00	9.000	L1	ON	19
4.99	---	30.05	46.00	15.95	1000.00	9.000	L1	ON	19
5.81	---	30.50	50.00	19.50	1000.00	9.000	L1	ON	19
6.46	33.35	---	60.00	26.65	1000.00	9.000	L1	ON	19
15.62	26.49	---	60.00	33.51	1000.00	9.000	L1	ON	20
23.98	---	23.50	50.00	26.50	1000.00	9.000	L1	ON	20

Remark: Correct factor=cable loss + LISN factor

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.17	57.28	---	64.95	7.67	1000.00	9.000	N	ON	21
0.17	---	42.94	54.84	11.90	1000.00	9.000	N	ON	21
0.43	34.09	---	57.32	23.23	1000.00	9.000	N	ON	20
0.51	---	20.72	46.00	25.28	1000.00	9.000	N	ON	20
2.05	---	19.42	46.00	26.58	1000.00	9.000	N	ON	20
2.10	27.22	---	56.00	28.78	1000.00	9.000	N	ON	20
3.74	36.33	---	56.00	19.67	1000.00	9.000	N	ON	19
4.98	---	30.19	46.00	15.81	1000.00	9.000	N	ON	19
5.50	---	30.56	50.00	19.44	1000.00	9.000	N	ON	19
5.74	36.65	---	60.00	23.35	1000.00	9.000	N	ON	19
15.38	25.56	---	60.00	34.44	1000.00	9.000	N	ON	20
23.94	---	22.35	50.00	27.65	1000.00	9.000	N	ON	20

Remark: Correct factor=cable loss + LISN factor

N line

Conducted Emission from 150 KHz to 30 MHz



4 Main Test Instruments

Name of Equipment	Manufacturer	Type/Model	Serial Number	Calibration Date	Expiration Time
Radiated Emission					
EMI Test Receiver	R&S	ESR	102389	2021-06-04	2022-06-03
Signal Analyzer	R&S	FSV40	100815	2021-05-15	2022-05-14
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	1023	2021-06-07	2024-06-06
Horn Antenna	Schwarzbeck	BBHA 9120D	430	2019-12-16	2022-12-15
Horn Antenna	ETS-Lindgren	3160-09	00102643	2020-08-11	2023-08-10
Software	R&S	EMC32	9.26.01	/	/
Conducted Emission					
Artificial main network	R&S	ENV216	101171	2020-12-13	2022-12-12
EMI Test Receiver	R&S	ESR	101667	2021-05-15	2022-05-14
Software	R&S	EMC32	10.35.10	/	/

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



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.