MEASUREMENT REPORT

FCC PART 15.249

Report No.: S20230803196903
Issue Date: 09-26-2023

Applicant:	Targa Telematics spa
Address:	Via Reginato,87-31100 Treviso(TV)-Italy
FCC ID:	2AVLG-MTR2023
Product:	Multi-Technology Reader
Model No.:	MTR2023
FCC Classification:	FCC Part 15 Low Power Communication Device Transmitter
FCC Rule Part(s):	Part 15 Subpart C (15.249)
Test Procedure(s):	ANSI C63.10-2013
Result:	Pass
Item Receipt Date:	August 03, 2023
Test Date:	August 23 ~ September 06, 2023

Compiled By: Guangze Ding
(Guangze Ding)
Senior Test Engineer

Approved By: Line Chen
(Line Chen)
Engineer Manager

FANGGUANG INSPECTION & TESTING CO.,LTD. APPROVED(02)

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of Fangguang Inspection & Testing Co., Ltd. Wuxi Branch
The test report must not be used by the client to claim product certifications, approval, or endorsement by NVLAP, NIST or any agency of U.S. Government.

Revision History

Report No.	Version	Description	Issue Date
S20230803196903	Rev. 01	/	09-26-2023

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Description Page

§2.1033 General Information

Applicant:	Targa Telematics spa
Applicant Address:	Via Reginato,87-31100 Treviso(TV)-Italy
Manufacturer:	Queclink Wireless Solutions Co., Ltd.
Manufacturer Address:	No.30, Lane 500, Xinlong Road, Minhang District, Shanghai, China 201101
Test Site:	Fangguang Inspection & Testing Co., Ltd.
LAB ID:	CN5037
Test Site Address:	G9 Building, China Sensor Network International Innovation Park No.200, Linghu Avenue Wuxi, Jiangsu 214000 China
FCC Rule Part(s):	Part 15 Subpart C (15.249)
FCC ID:	2AVLG-MTR2023
Test Device Serial No.:	S/N.: / ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	FCC Part 15 Spread Spectrum Transmitter (DSS)

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2. FANGGUANG Test Location

These measurement tests were performed at the Fangguang Inspection and testing Co.,LTD located at 200 Linghu Avenue, Xinwu District, Wuxi City. The detailed description of the measurement facility was found to be in compliance with the requirements of ANSI C63.4-2014.

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	Multi-Technology Reader
Model Name:	MTR2023
Trade Mark:	TARGA TELEMATICS
Input Voltage Range:	DC 8V~32V,1A

2.2. Product Specification Subjective to this Standard

Operating Frequency:	5817MHz
Channel Number:	1
Type of modulation:	ASK
Antenna Type:	PCB Antenna
Antenna Gain:	-2dBi(Max)

2.3. Device Capabilities

This device contains the following capabilities: Radar (5817MHz).

2.4. Test Mode

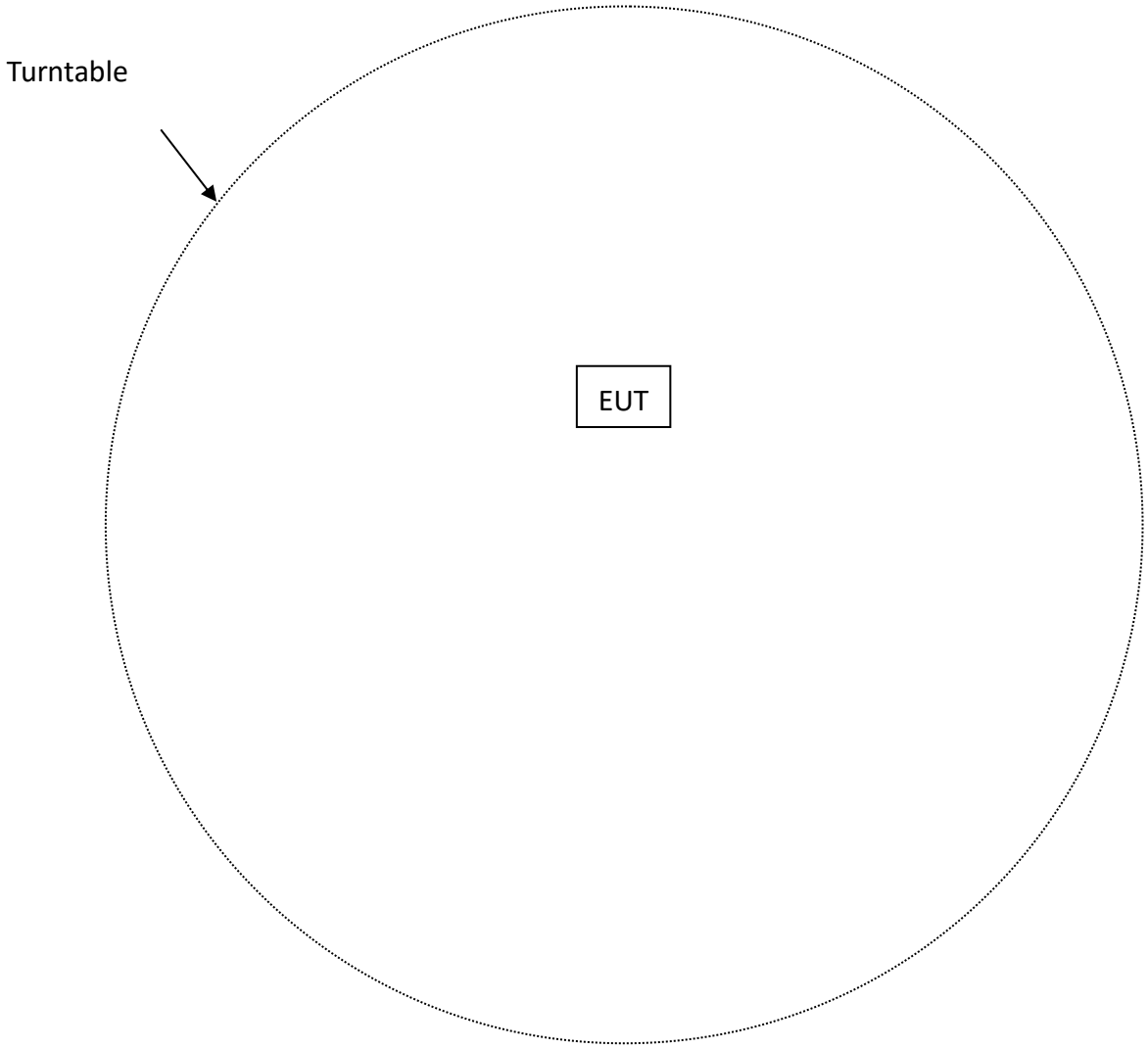
Test Mode	Mode 1: Transmit by Radar (5817MHz)

2.5. Description of Test Software

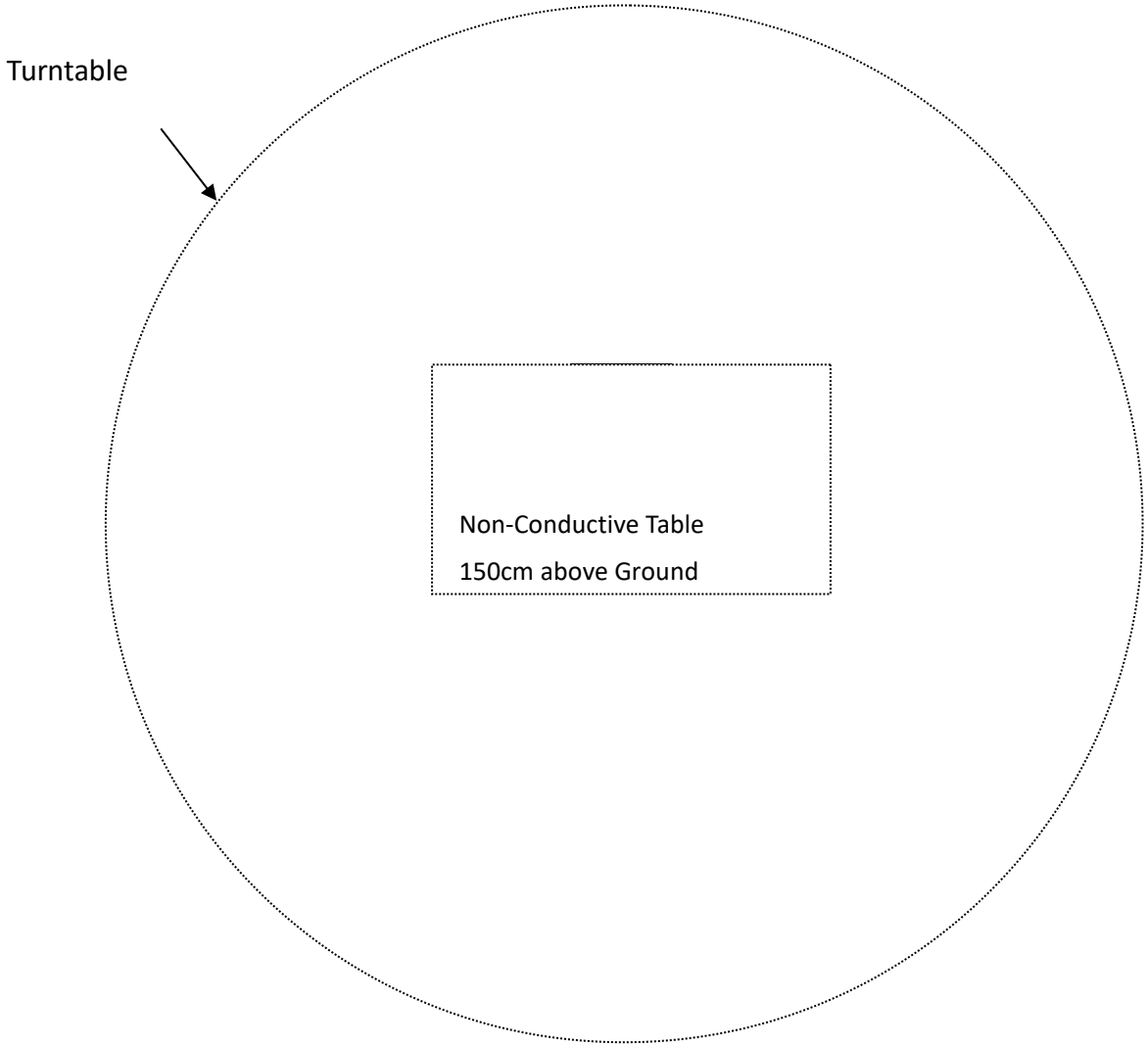
The EUT is tested in the engineering mode.

2.6. Test Configuration / Block Diagram of Test Setup

For Radiated Emissions (Below 1 GHz)：



For Radiated Emissions (Above 1 GHz):



2.7. Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.8. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.9. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

2.10. Calculation with all conversion and correction factors used

For AC Line Conducted Emissions Test:

Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

For Radiated Emissions Below 1GHz Test:

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

For Radiated Emissions Above 1GHz Test:

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB).

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the “Filing were used in the measurement of the EUT.

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 9'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. The turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beamwidth of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	FWXGJC-2016-181	1 year	2024/03/14
Two-Line V-Network	R&S	ENV 216	FWXGJC-2016-182	1 year	2023/06/01
Thermohygrometer	Yuhuaze	HTC-1	FWXDA-2016-385	1 year	2024/03/21

Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Loop Antenna	Schwarzbeck	FMZB 1519B	FWXGJC-2018-015	3 year	2024/08/13
Bi-Log Antenna	R&S	HL562E	FWXGJC-2016-267-06	1 year	2024/03/10
Broadband Horn Antenna	R&S	HF907	FWXGJC-2016-267-07	1 year	2024/03/02
Broadband Horn Antenna	Schwarzbeck	BBHA9170	FWXGJC-2018-016	1 year	2024/06/04
EMI Receiver	R&S	ESR26	FWXGJC-2016-267-01	1 year	2023/11/08
Pre-Amplifier	R&S	SCU-18D	FWXGJC-2016-267-05	1 year	2023/11/17
Pre-Amplifier	R&S	EMC184055 SE	FWXGJC-2018-018	3 year	2025/04/13
Thermohygrometer	Yuhuaze	HTC-1	FWXDA-2016-386	1 year	2023/11/21
Anechoic Chamber	Aimuke	EMCCT-3	FWXGJC-2016-270	1 year	2023/04/07

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.05dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 30MHz-1GHz: 3.06dB 1GHz-12.75GHz: 4.13dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 30MHz-1GHz: 1.00 dB 1GHz-26.5GHz: 1.30 dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.60dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.80dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.20MHz

6. TEST RESULT

6.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.203	Antenna Requirement	Must meet the antenna requirement in 15.203	Radiated	Pass	Section 6.2
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	N/A	Section 6.3
15.249 15.205 15.209	Field Strength of Fundamental& General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Fundamental must meet the radiated limits detailed in 15.249. Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 6.4
15.215(c)	20dB Emission Bandwidth	Must meet the requirement in 15.215(c)	Radiated	Pass	Section 6.5

Notes:

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

6.2. Antenna Requirement

6.2.1. Applicable Standard

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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

6.2.2. Antenna Connected Construction

The EUT has a PCB antenna for 5817 MHz which the antenna gain is -2 dBi, the antenna was permanently attached, fulfill the requirement of this section, please refer to the EUT photos.

Result: Pass.

6.3. AC Conducted Emissions Measurement

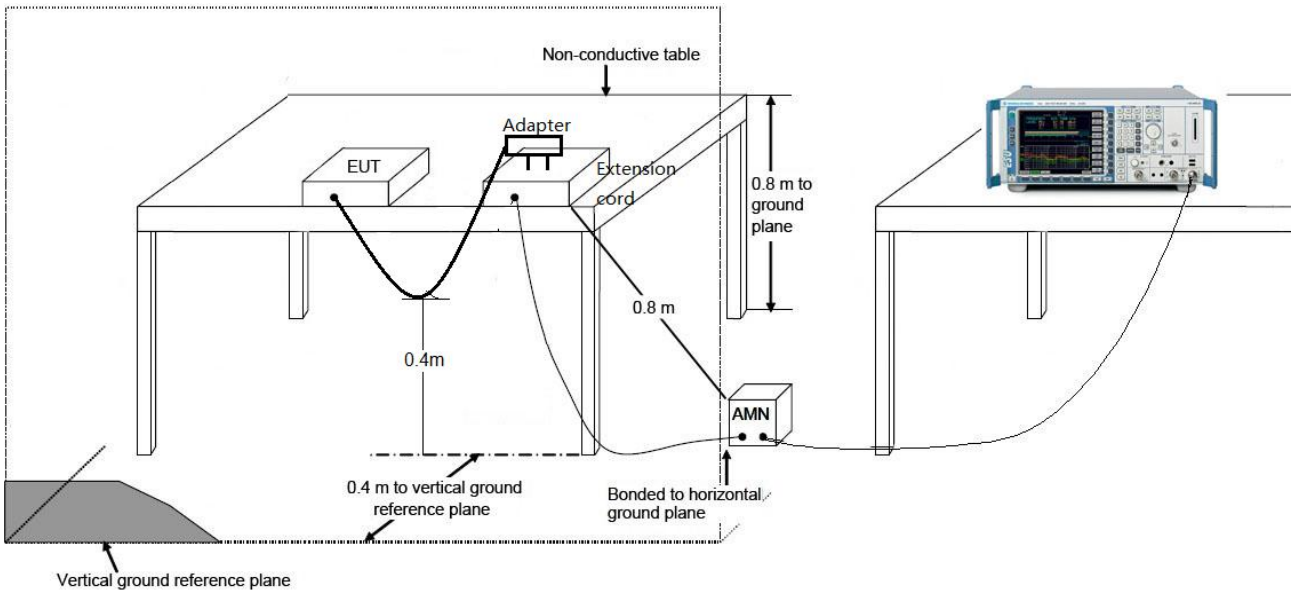
6.3.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBμV)	Average (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.3.2. Test Setup



6.3.3. Test Result

The product is DC powered. Not applicable.

6.4. Field Strength of Fundamental& General Field Strength Limits

6.4.1. Applicable Standard

FCC Part 15 Subpart C Paragraph 15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field Strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24GHz-24.25GHz	250	2500

(c) Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

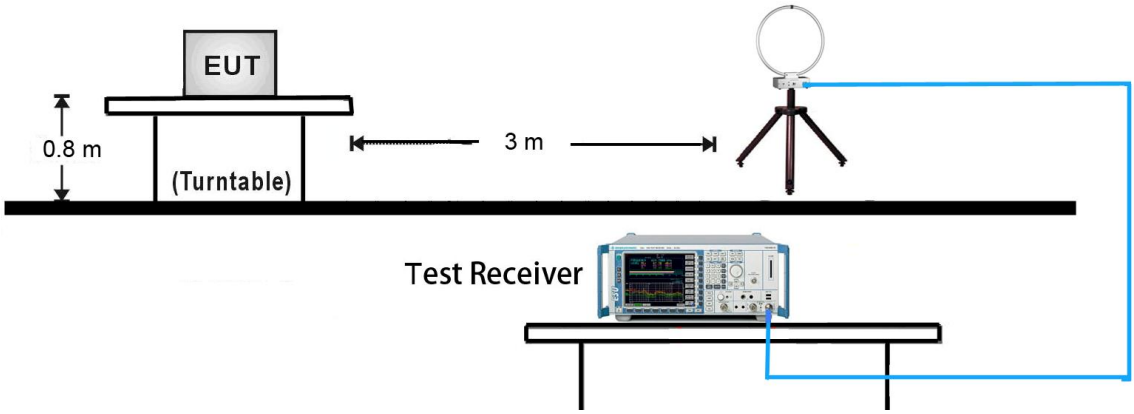
FCC Part 15 Subpart C Paragraph 15.209

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

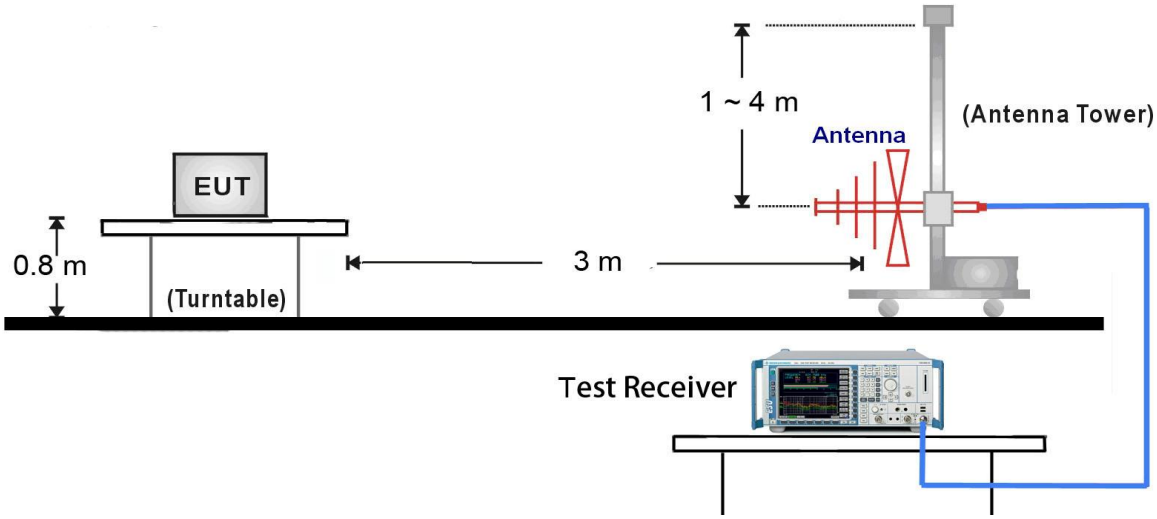
FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.4.2. Test Setup

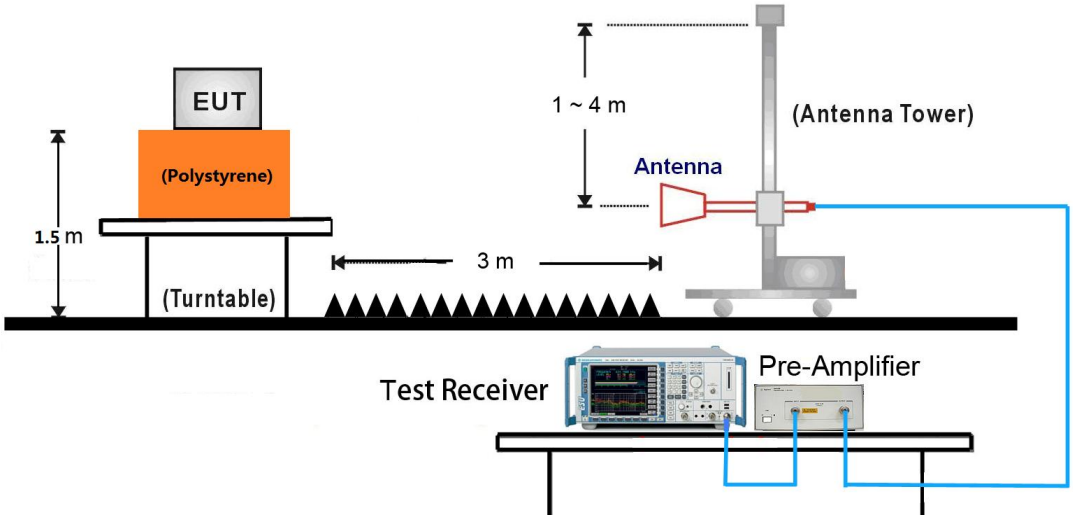
9kHz ~ 30MHz Test Setup:



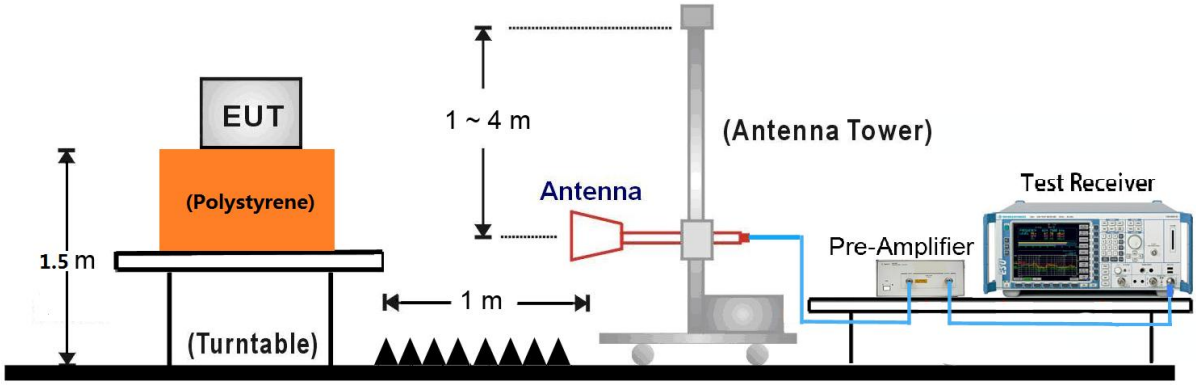
30MHz ~1GHz Test Setup:



1GHz ~18GHz Test Setup:



18GHz ~40GHz Test Setup:



6.4.3. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 Section 6.5 (Standard test method above 30MHz to 1GHz)

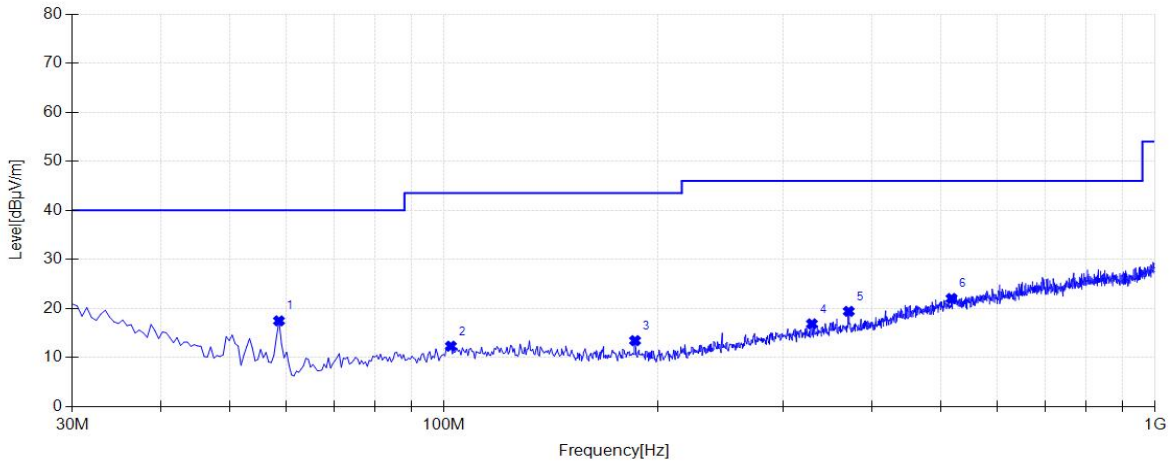
ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

6.4.4. Test Result

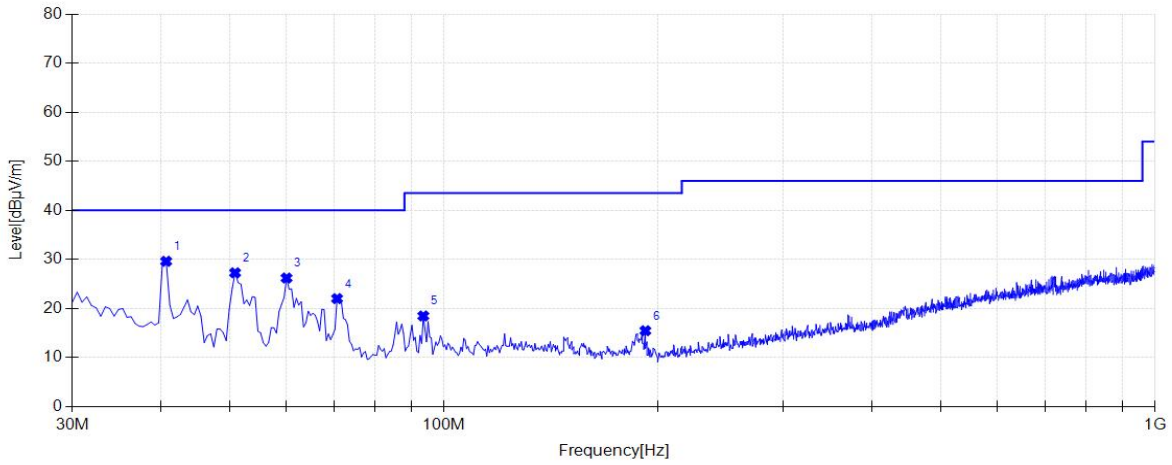
Test Model:	MTR2023	Test Mode:	Mode 1
Environment:	Temp: 24℃; Humi:52%	Engineer:	Guangze Ding
Test Result:	Pass		

6.4.4.1. Spurious Emission Test:

1) 30 MHz-1GHz:

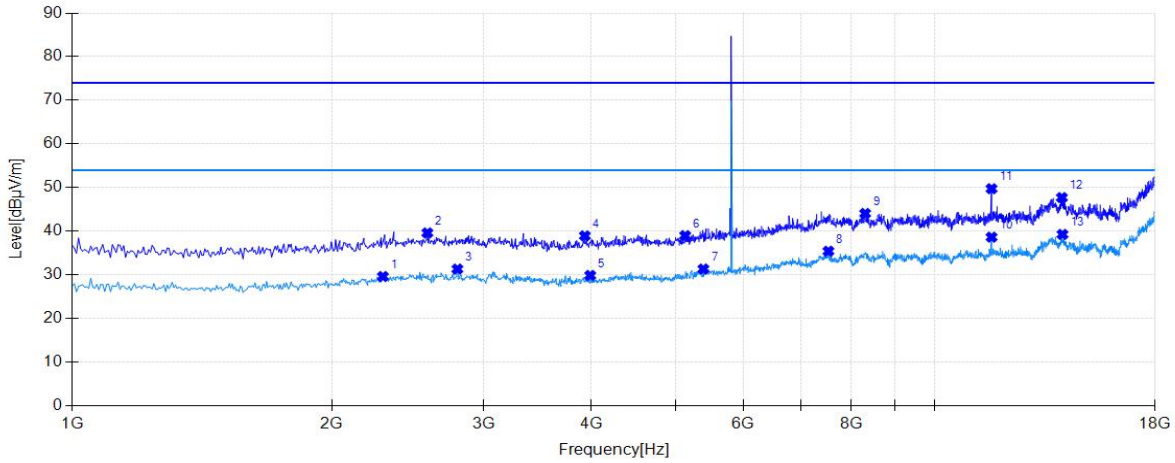


NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	58.6150	17.48	7.32	40.00	22.52	100	317	QP	Horizontal
2	102.2650	12.33	11.54	43.50	31.17	100	50	QP	Horizontal
3	185.6850	13.45	10.83	43.50	30.05	100	174	QP	Horizontal
4	329.2450	16.87	14.86	46.00	29.13	100	317	QP	Horizontal
5	370.9550	19.42	15.73	46.00	26.58	100	357	QP	Horizontal
6	517.4250	22.04	19.73	46.00	23.96	100	126	QP	Horizontal

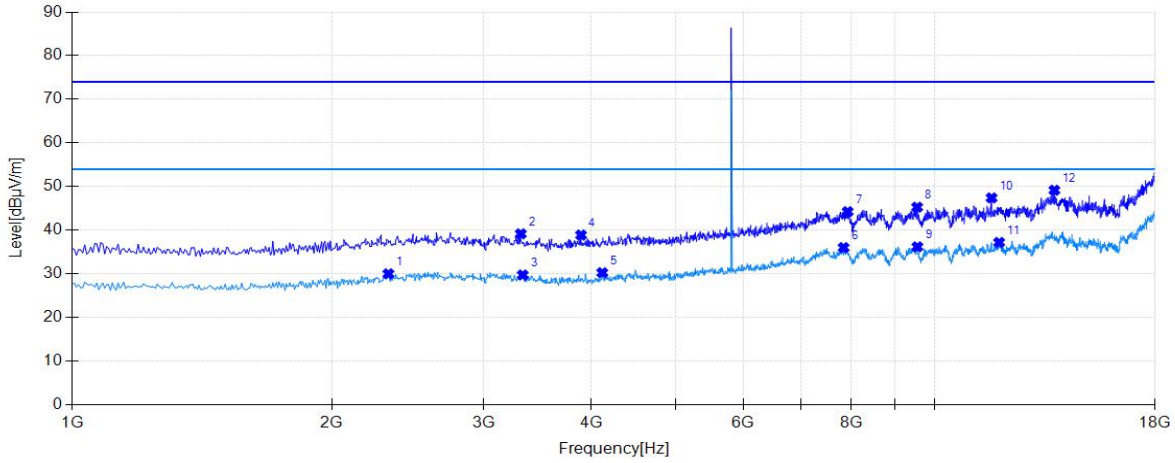


NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	40.6700	29.62	14.38	40.00	10.38	100	31	QP	Vertical
2	50.8550	27.27	9.41	40.00	12.73	100	50	QP	Vertical
3	60.0700	26.21	6.96	40.00	13.79	100	256	QP	Vertical
4	70.7400	22.02	8.82	40.00	17.98	100	168	QP	Vertical
5	93.5350	18.48	10.65	43.50	25.02	100	303	QP	Vertical
6	191.9900	15.47	10.48	43.50	28.03	100	112	QP	Vertical

2) 1 GHz-18 GHz

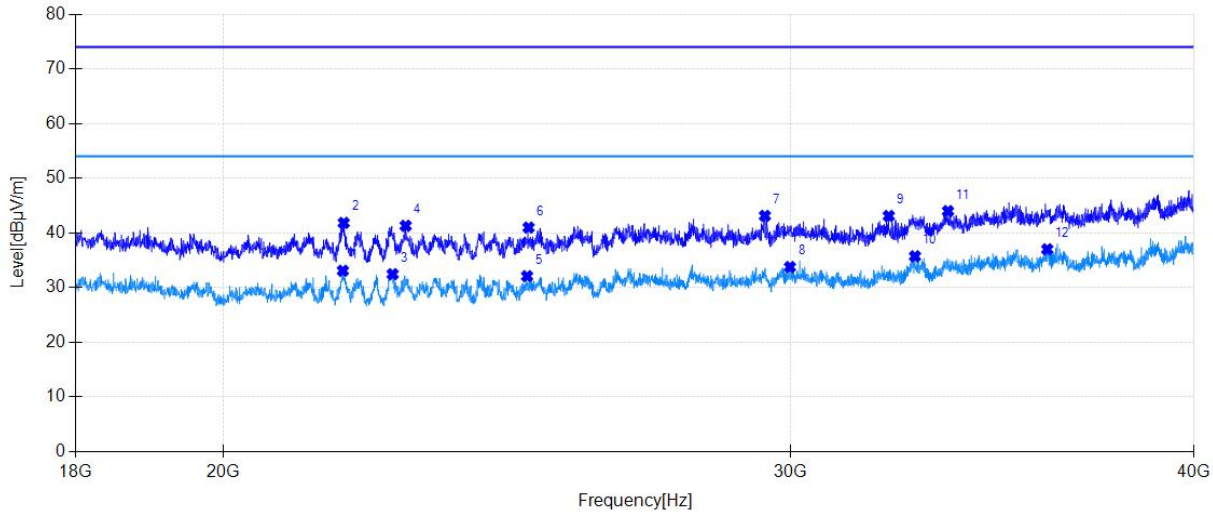


NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	2292.0000	29.60	-12.78	54.00	24.40	155	75	AV	Horizont
2	2581.0000	39.60	-11.42	74.00	34.40	155	223	PK	Horizont
3	2796.3333	31.31	-10.85	54.00	22.69	155	105	AV	Horizont
4	3929.6667	38.93	-9.43	74.00	35.07	155	68	PK	Horizont
5	3986.3333	29.85	-9.29	54.00	24.15	155	171	AV	Horizont
6	5136.6667	38.98	-6.99	74.00	35.02	155	75	PK	Horizont
7	5391.6667	31.32	-6.20	54.00	22.68	155	327	AV	Horizont
8	7528.0000	35.41	-3.02	54.00	18.59	155	16	AV	Horizont
9	8304.3333	44.06	-2.85	74.00	29.94	155	68	PK	Horizont
10	11636.3333	38.63	-1.25	54.00	15.37	155	39	AV	Horizont
11	11636.3333	49.73	-1.25	74.00	24.27	155	39	PK	Horizont
12	14039.0000	47.70	0.95	74.00	26.30	155	208	PK	Horizont
13	14061.6667	39.26	0.90	54.00	14.74	155	246	AV	Horizont

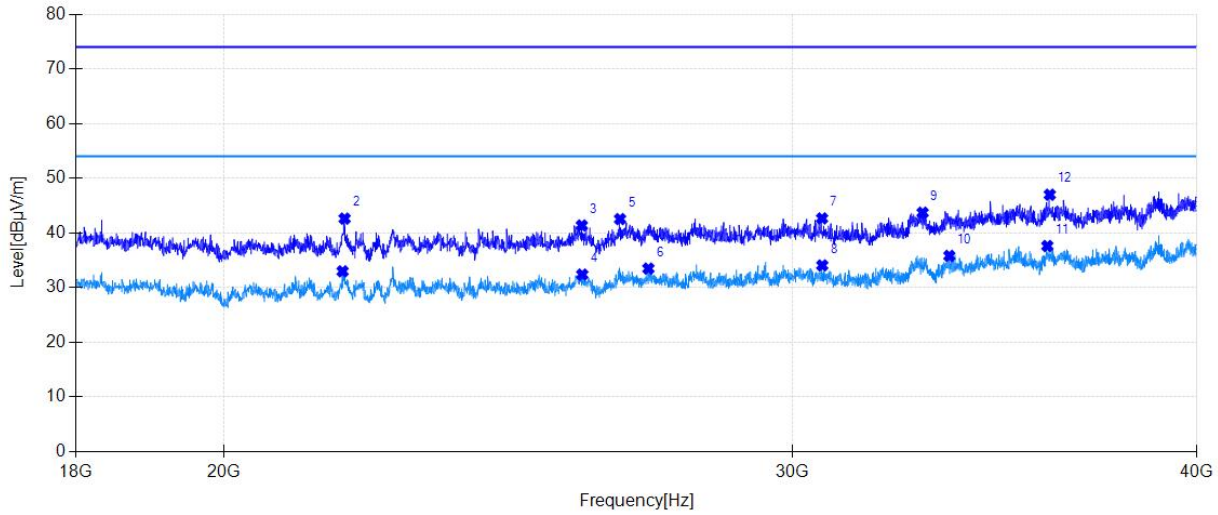


NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	2326.0000	29.99	-12.59	54.00	24.01	155	166	AV	Vertical
2	3312.0000	39.16	-10.42	74.00	34.84	155	337	PK	Vertical
3	3329.0000	29.73	-10.43	54.00	24.27	155	307	AV	Vertical
4	3890.0000	38.88	-9.53	74.00	35.12	155	181	PK	Vertical
5	4116.6667	30.24	-8.91	54.00	23.76	155	330	AV	Vertical
6	7839.6667	36.00	-3.18	54.00	18.00	155	256	AV	Vertical
7	7924.6667	44.24	-3.23	74.00	29.76	155	61	PK	Vertical
8	9539.6667	45.27	-0.99	74.00	28.73	155	337	PK	Vertical
9	9545.3333	36.18	-0.98	54.00	17.82	155	106	AV	Vertical
10	11636.3333	47.40	-1.25	74.00	26.60	155	33	PK	Vertical
11	11874.3333	37.18	-1.51	54.00	16.82	155	299	AV	Vertical
12	13761.3333	49.16	0.54	74.00	24.84	155	33	PK	Vertical

3) 18 GHz-40 GHz



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	21784.0000	33.08	-21.90	54.00	20.92	100	290	AV	Horizont
2	21797.2000	41.83	-21.86	74.00	32.17	100	50	PK	Horizont
3	22571.6000	32.45	-20.77	54.00	21.55	100	80	AV	Horizont
4	22782.8000	41.30	-20.45	74.00	32.70	100	310	PK	Horizont
5	24846.4000	32.08	-16.74	54.00	21.92	100	290	AV	Horizont
6	24872.8000	40.98	-16.68	74.00	33.02	100	140	PK	Horizont
7	29444.4000	43.12	-15.33	74.00	30.88	100	190	PK	Horizont
8	29976.8000	33.76	-14.84	54.00	20.24	100	310	AV	Horizont
9	32168.0000	43.09	-14.49	74.00	30.91	100	150	PK	Horizont
10	32775.2000	35.72	-13.98	54.00	18.28	100	300	AV	Horizont
11	33558.4000	43.98	-13.90	74.00	30.02	100	110	PK	Horizont
12	36022.4000	37.00	-13.69	54.00	17.00	100	350	AV	Horizont



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	21766.4000	32.97	-21.96	54.00	21.03	100	100	AV	Vertical
2	21797.2000	42.61	-21.86	74.00	31.39	100	240	PK	Vertical
3	25810.0000	41.35	-16.09	74.00	32.65	100	90	PK	Vertical
4	25818.8000	32.37	-16.08	54.00	21.63	100	20	AV	Vertical
5	26522.8000	42.53	-15.56	74.00	31.47	100	20	PK	Vertical
6	27064.0000	33.47	-15.28	54.00	20.53	100	210	AV	Vertical
7	30628.0000	42.65	-15.05	74.00	31.35	100	280	PK	Vertical
8	30632.4000	34.05	-15.05	54.00	19.95	100	100	AV	Vertical
9	32902.8000	43.69	-13.87	74.00	30.31	100	360	PK	Vertical
10	33536.4000	35.80	-13.91	54.00	18.20	100	70	AV	Vertical
11	35960.8000	37.60	-13.75	54.00	16.40	100	340	AV	Vertical
12	36022.4000	46.98	-13.69	74.00	27.02	100	110	PK	Vertical

6.4.4.2. Fundamental Test:

NO	Frequency [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	5187.0000	87.97	-5.80	94.00	6.03	150	108	AV	Horizont
2	5187.0000	88.61	-5.80	114.00	25.39	150	226	PK	Horizont
3	5187.0000	87.35	-5.80	94.00	6.65	150	157	AV	Vertical
4	5187.0000	88.37	-5.80	114.00	25.63	150	89	PK	Vertical

6.5. 20dB Emission Bandwidth

6.5.1. Applicable Standard

FCC Part 15 Subpart C Paragraph 15.215

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

6.5.2. Test Procedure Used

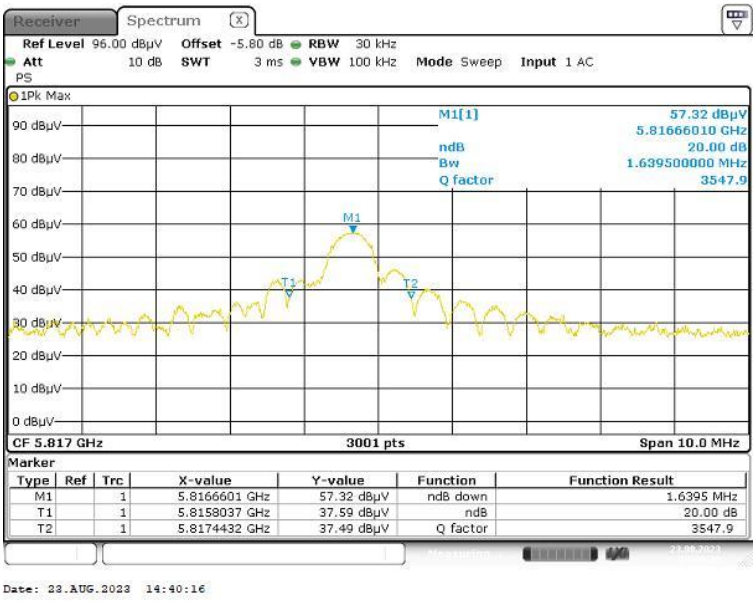
ANSI C63.10-2013 – Section 6.9.2

6.5.3. Test Result

Test Model:	MTR2023	Test Mode:	Mode 1
Environment:	Temp: 24℃; Humi:52%	Engineer:	Guangze Ding
Test Result:	Pass		

Frequency (MHz)	20 dB Bandwidth (MHz)
5817	1.6395

20 dB Emission Bandwidth-5817MHz



7. CONCLUSION

The data collected relate only the item(s) tested and show that the **Multi-Technology Reader** is in compliance with Part 15C of the FCC Rules.

The End