MEASUREMENT REPORT
FCC PART 15C

Report No.: S20230803196902
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.:	EMC3090-P
FCC Classification:	FCC Part 15 Low Power Communication Device Transmitter
FCC Rule Part(s):	Part 15 Subpart C
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

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 ANSI C63.4-2014. 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
S20230803196902	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
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 Report

Operating Frequency	125 kHz,13.56 MHz
Type of modulation	125 kHz: OOK,13.56 MHz: ASK
Antenna Type:	125 kHz: Coil Antenna,13.56 MHz: PCB Antenna
Antenna Gain:	125 kHz: 0dBi(Max),13.56 MHz: 0dBi(Max)

2.3. Device Capabilities

This device contains the following capabilities: 125 kHz and 13.56 MHz.

2.4. Description of EUT Test Software

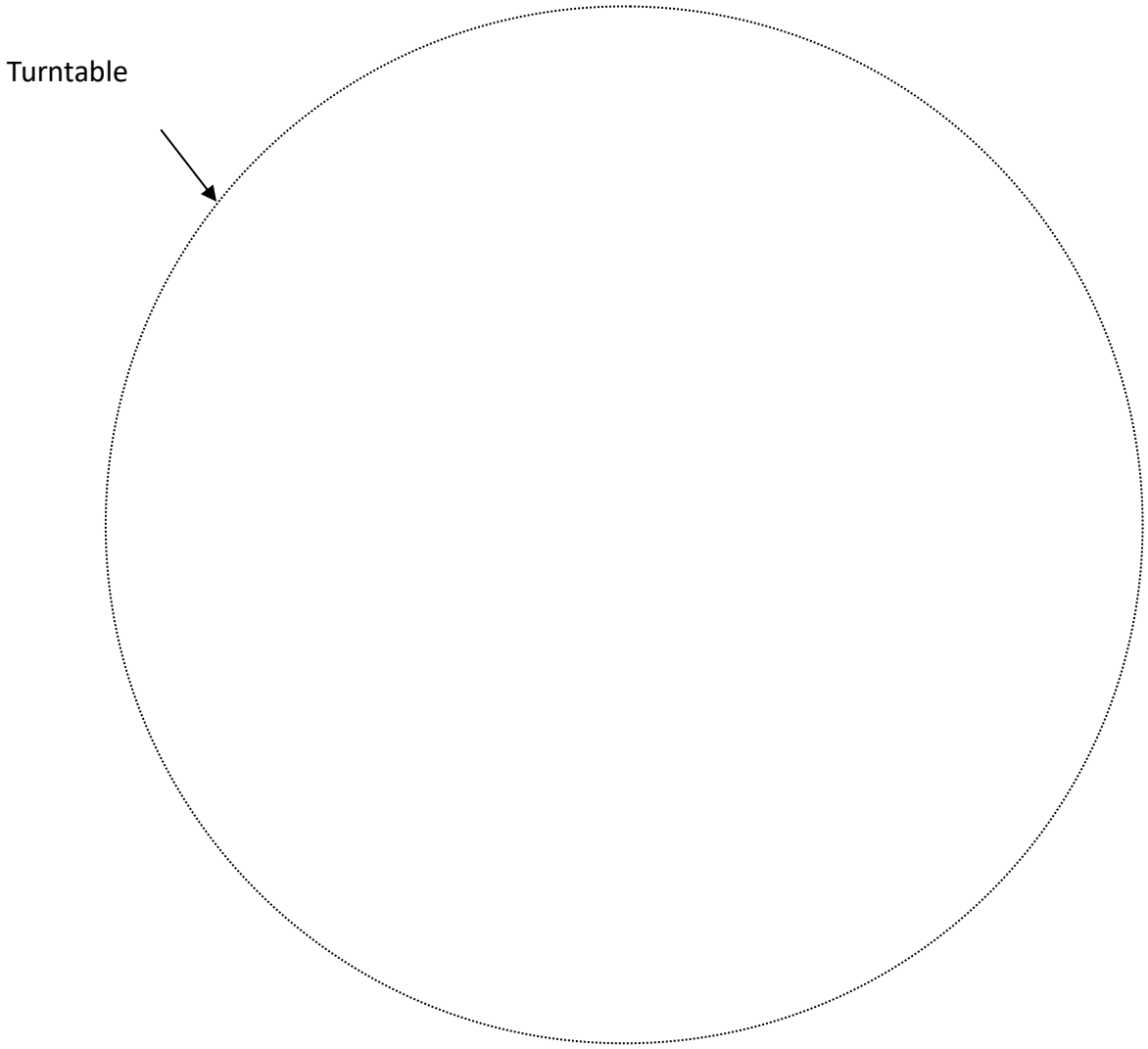
The EUT is tested in the engineering mode.

2.5. Test Mode

Test Mode	Mode 1: Transmit by 125kHz,13.56M

2.6. Test Configuration / Block Diagram of Test Setup

For Radiated Emissions (Below 30 MHz & Above 30 MHz)：



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) 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 8'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 are 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 1-25GHz 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 Beam-Width 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	3 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	3 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	2025/06/07

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
15.225	Field Strength of Fundamental	Fundamental must meet the radiated limits detailed in 15.225	Radiated	Pass	Section 6.4
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 6.5
15.225(e)	Frequency Tolerance	Must meet the requirement in 15.225(e)	Radiated	Pass	Section 6.6
15.215(c)	20dB Emission Bandwidth	Must meet the requirement in 15.215(c)	Radiated	Pass	Section 6.7

Notes:

1) 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.
2) 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.

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 an Coil antenna for 125 kHz which the antenna gain is 0.0 dBi, the antenna was permanently attached, fulfill the requirement of this section, please refer to the EUT photos.

The EUT has a PCB antenna for 13.56 MHz which the antenna gain is 0.0 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

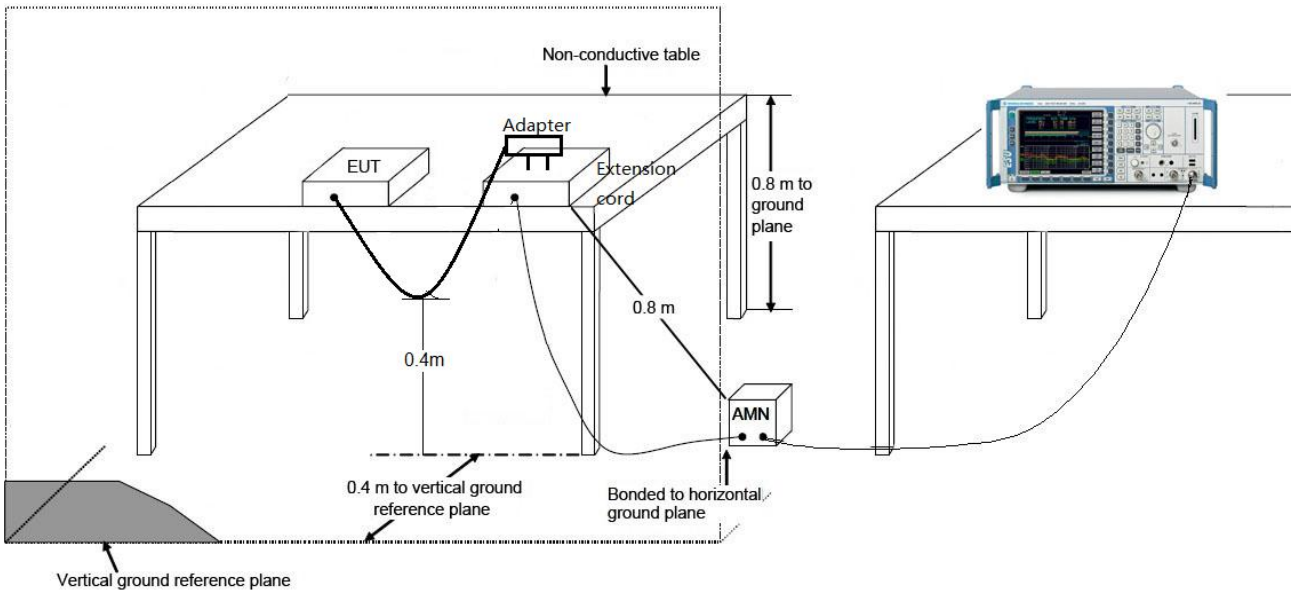
6.3.1. Test Limit

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

6.4.1. Applicable Standard

FCC Part 15 Subpart C Paragraph 15.225

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

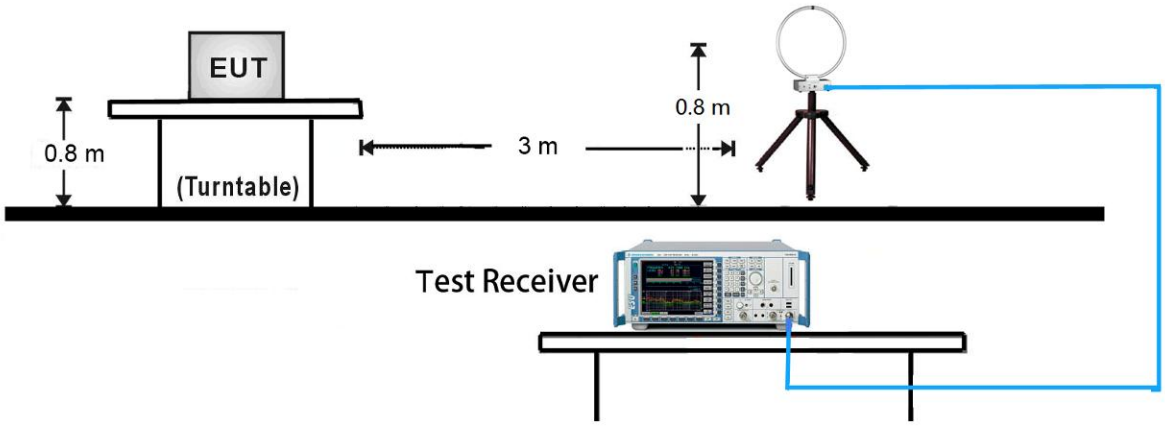
(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

6.4.2. Test Setup

9kHz ~ 30MHz Test Setup:



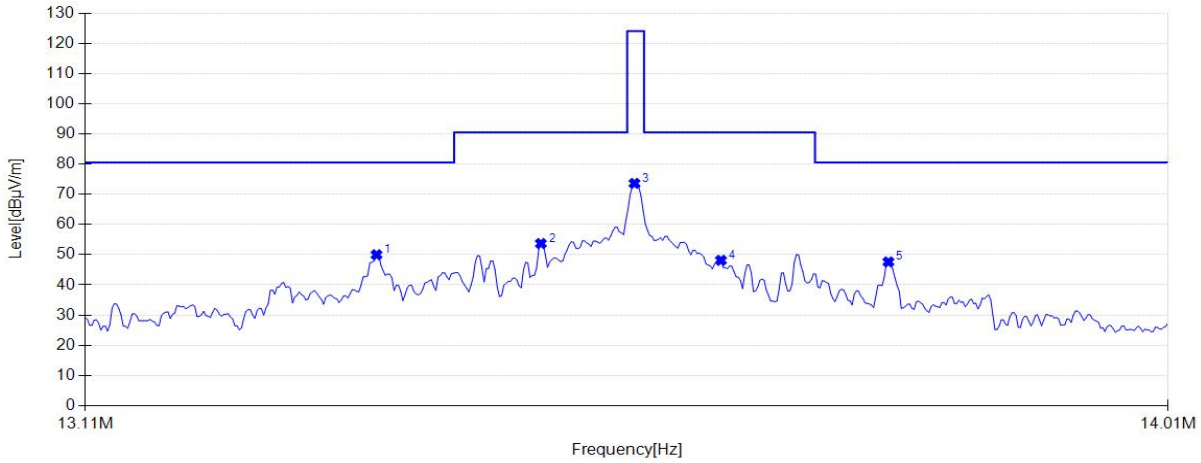
6.4.3. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

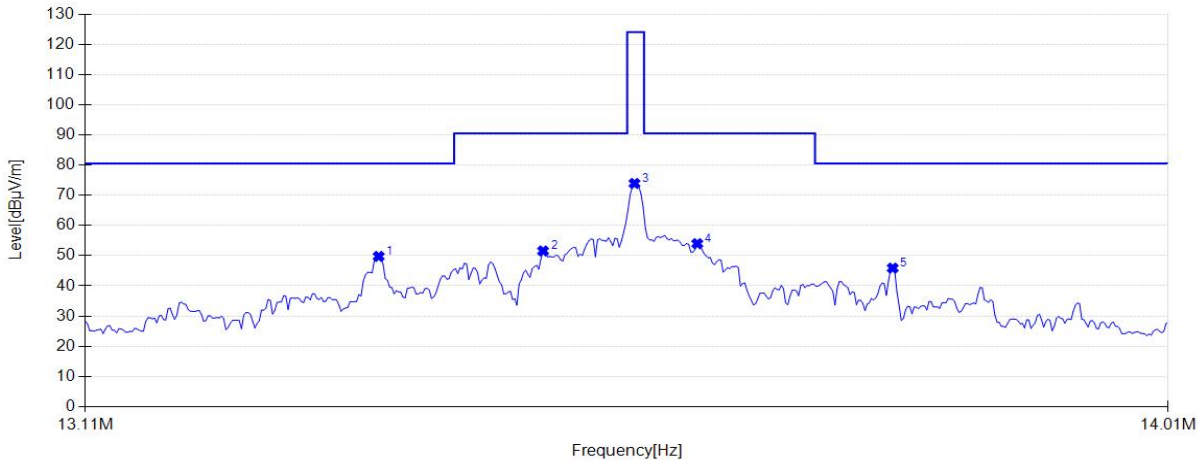
ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

6.4.4. Test Result

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



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	13.3463	49.97	20.81	80.51	30.54	100	181	PK	Horizont
2	13.4815	53.68	20.81	90.48	36.80	100	352	PK	Horizont
3	13.5591	73.60	20.81	124.00	50.40	100	356	PK	Horizont
4	13.6312	48.12	20.81	90.48	42.36	100	14	PK	Horizont
5	13.7719	47.60	20.82	80.51	32.91	100	213	PK	Horizont



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	13.3481	49.75	20.81	80.51	30.76	100	282	PK	Vertical
2	13.4833	51.55	20.81	90.48	38.93	100	228	PK	Vertical
3	13.5591	73.91	20.81	124.00	50.09	100	275	PK	Vertical
4	13.6114	53.97	20.81	90.48	36.51	100	261	PK	Vertical
5	13.7755	45.88	20.82	80.51	34.63	100	322	PK	Vertical

6.5. Radiated Emissions

6.5.1. Applicable Standard

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(note 1)
0.490 - 1.705	24000/F (kHz)	30(note 1)
1.705 - 30	30	30(note 1)
30 - 88	100	3(note 2)
88 - 216	150	3(note 2)
216 - 960	200	3(note 2)
Above 960	500	3(note 2)

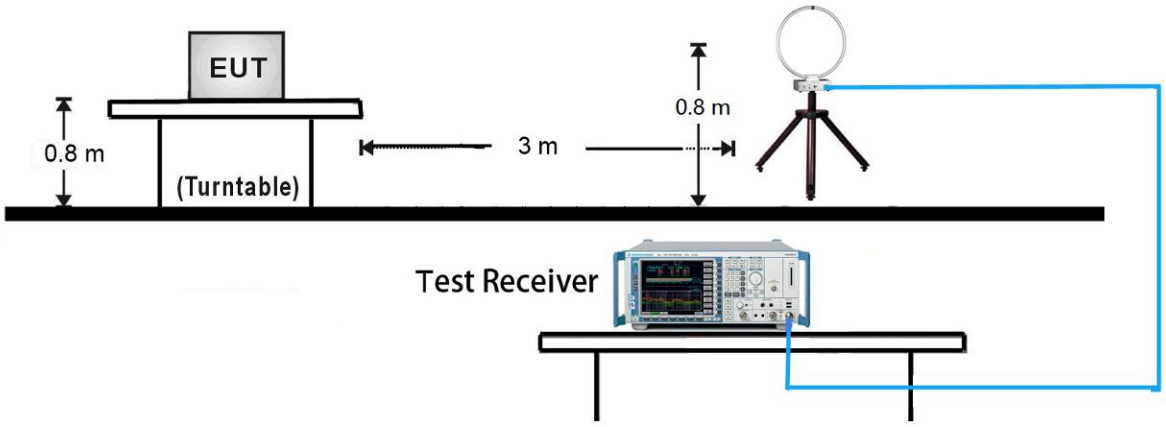
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device;

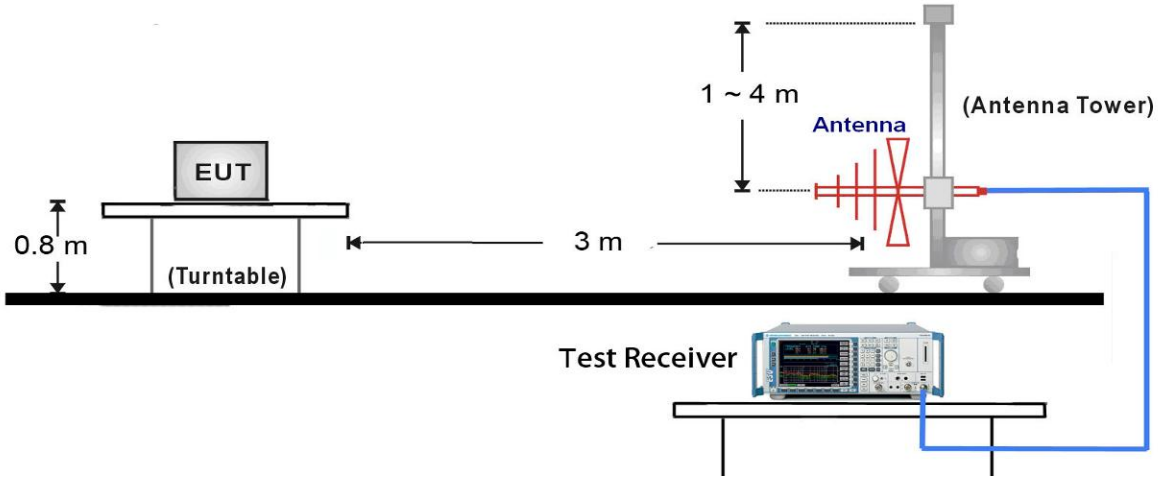
and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

6.5.2. Test Setup

9kHz ~ 30MHz Test Setup:



30MHz ~ 1GHz Test Setup:



6.5.3. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

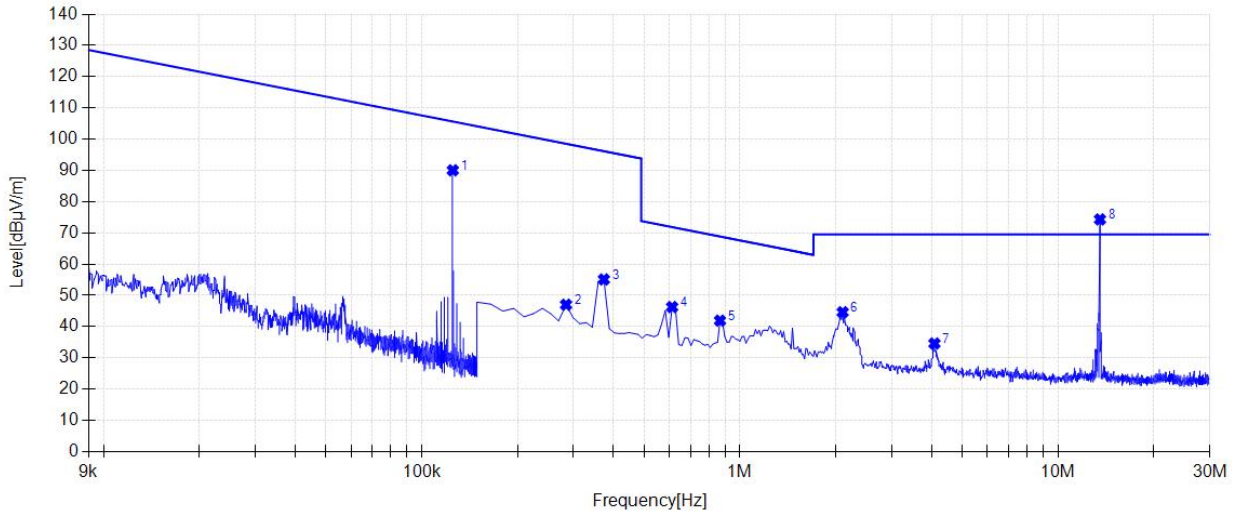
ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

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

6.5.4. Test Result

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

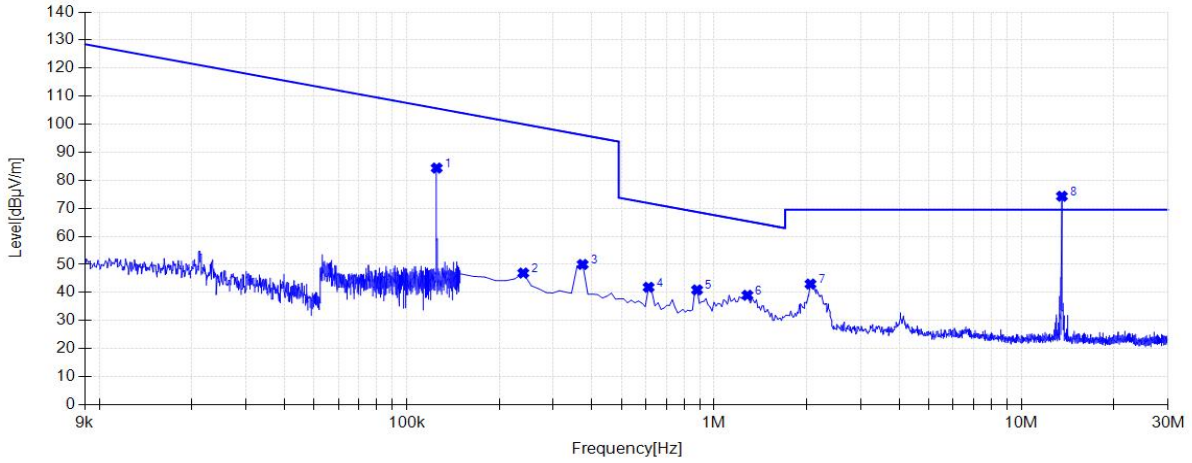
1) 9 kHz~30 MHz:



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	0.1250	90.03	20.81	105.38	15.35	100	351	PK	Horizontal
2	0.2843	47.01	20.53	98.53	51.52	100	2	PK	Horizontal
3	0.3739	55.10	20.61	96.15	41.05	100	344	PK	Horizontal
4	0.6127	46.28	20.80	71.86	25.58	100	1	PK	Horizontal
5	0.8664	41.92	20.77	68.85	26.93	100	330	PK	Horizontal
6	2.1052	44.62	20.71	69.54	24.92	100	188	PK	Horizontal
7	4.0902	34.60	20.80	69.54	34.94	100	221	PK	Horizontal
8	13.5600	73.16	20.81	/	/	100	1	PK	Horizont

Note 1: The Mark 1 is the 125 kHz fundamental emission.

Note 2: The Mark 8 is the 13.56 MHz fundamental emission.

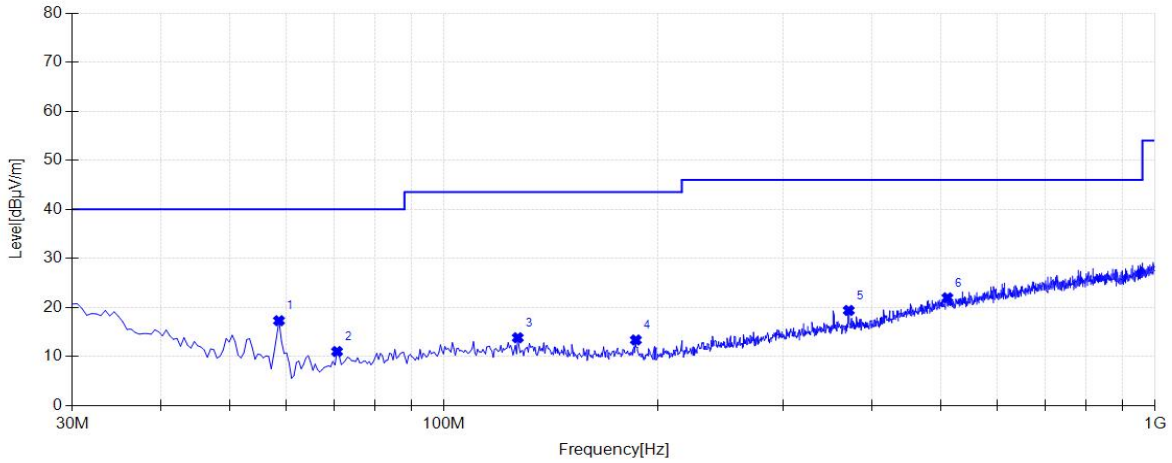


NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	0.1250	84.37	20.81	105.65	21.28	100	98	PK	Vertical
2	0.2396	46.92	20.62	100.02	53.10	100	172	PK	Vertical
3	0.3739	49.99	20.61	96.15	46.16	100	248	PK	Vertical
4	0.6127	41.86	20.80	71.86	30.00	100	303	PK	Vertical
5	0.8813	40.92	20.76	68.70	27.78	100	331	PK	Vertical
6	1.2843	39.01	20.70	65.43	26.42	100	139	PK	Vertical
7	2.0604	43.01	20.70	69.54	26.53	100	317	PK	Vertical
8	13.5600	74.31	20.81	/	/	100	248	PK	Vertical

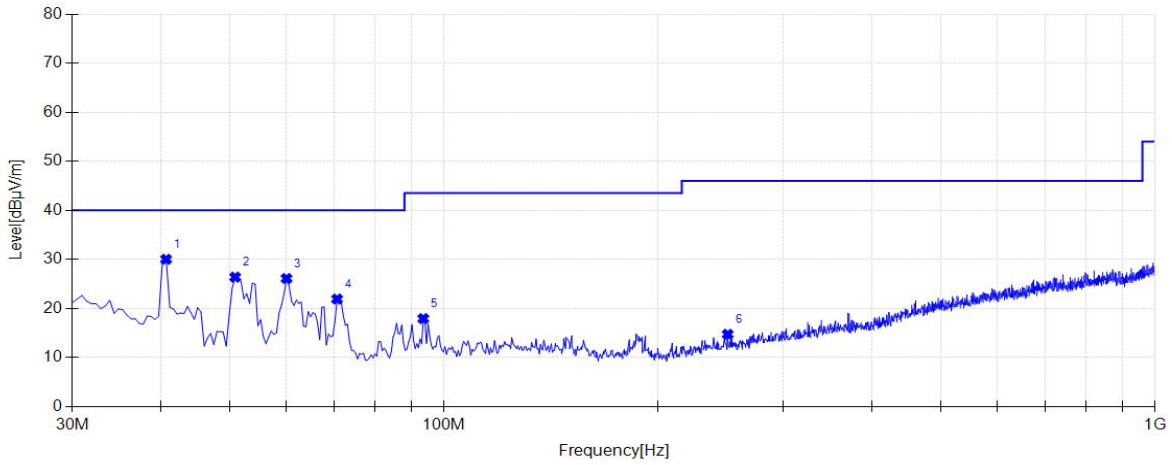
Note 1: The Mark 1 is the 125 kHz fundamental emission.

Note 2: The Mark 8 is the 13.56 MHz fundamental emission.

2) 30 MHz ~1 GHz:



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	58.6150	17.31	7.32	40.00	22.69	100	0	QP	Horizontal
2	70.7400	11.03	8.82	40.00	28.97	100	260	QP	Horizontal
3	127.0000	13.84	11.77	43.50	29.66	100	302	QP	Horizontal
4	186.1700	13.38	10.81	43.50	30.12	100	0	QP	Horizontal
5	370.9550	19.40	15.73	46.00	26.60	100	329	QP	Horizontal
6	510.6350	21.97	19.66	46.00	24.03	100	336	QP	Horizontal



NO	Frequency [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	40.6700	30.03	14.38	40.00	9.97	100	37	QP	Vertical
2	50.8550	26.39	9.41	40.00	13.61	100	66	QP	Vertical
3	60.0700	26.11	6.96	40.00	13.89	100	292	QP	Vertical
4	70.7400	21.92	8.82	40.00	18.08	100	155	QP	Vertical
5	93.5350	17.94	10.65	43.50	25.56	100	292	QP	Vertical
6	250.6750	14.74	12.03	46.00	31.26	100	107	QP	Vertical

6.6. Frequency Tolerance

6.6.1. Applicable Standard

FCC Part 15 Subpart C Paragraph 15.225

(e) The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

6.6.2. Test Procedure Used

ANSI C63.10-2013 – Section 6.8

6.6.3. Test Result

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

F_0 =13.56MHz				
Power Supply (V_{DC})	Temperature (℃)	Measured Frequency (MHz)	Frequency Error (%)	Part 15.225 Limit (%)
12	-20	13.5600872	0.00064	±0.01
	-10	13.5600772	0.00057	±0.01
	0	13.5600672	0.00050	±0.01
	10	13.5600572	0.00042	±0.01
	20	13.5600472	0.00035	±0.01
	30	13.5600486	0.00036	±0.01
	40	13.5600593	0.00044	±0.01
	50	13.5600697	0.00051	±0.01
8	20	13.5600889	0.00066	±0.01
32	20	13.5600891	0.00066	±0.01

6.7. 20dB Emission Bandwidth

6.7.1. 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.

6.7.2. Test Procedure Used

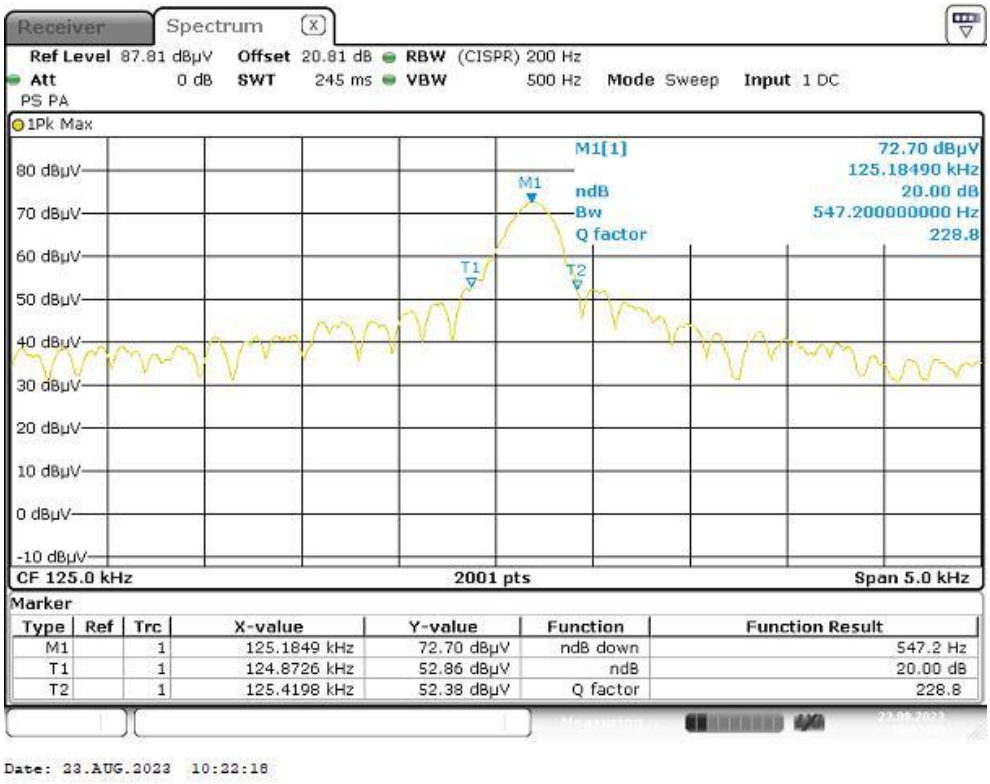
ANSI C63.10-2013 – Section 6.9.2

6.7.3. Test Result

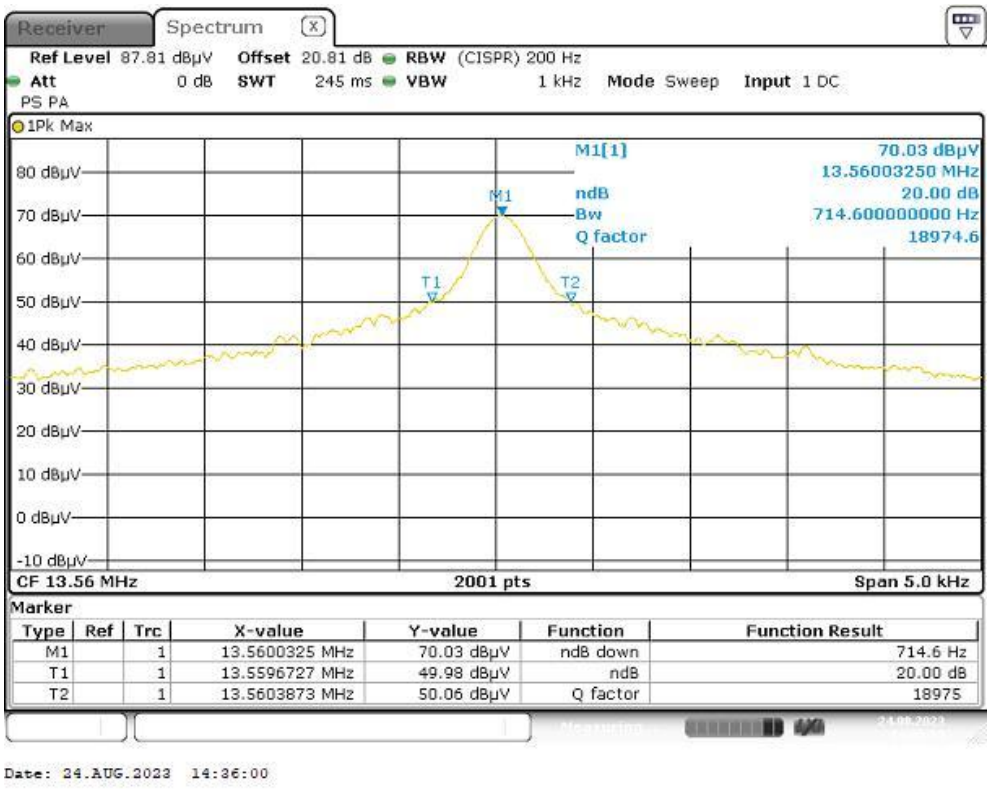
Test Model:	MTR2023	Test Mode:	Mode 1
Environment:	Temp: 24℃; Humi:52%	Engineer:	Guangze Ding
Test Result:	Pass		

Frequency (MHz)	20 dB Bandwidth (kHz)
0.125	0.547
13.56	0.715

20 dB Emission Bandwidth-125kHz



20 dB Emission Bandwidth-13.56MHz



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