



Global Product Certification  
EMC-EMF Safety Approvals

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## RADIO TEST REPORT

Report No.: M2501025-7

TESTED FOR:	ISSUED BY:
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<b>Product Name:</b>	CORIS Endoscope channel cleaner
<b>Model:</b>	N05515
<b>PCB Version:</b>	Main board R0-4, PCBA R0-97
<b>FCC ID:</b>	2AM5R-CORIS
<b>IC:</b>	22999-CORIS
<b>Test Date(s):</b>	24-26 February 2025, 3-4 March 2025
<b>Issue Date:</b>	28 May 2025
<b>Standard:</b>	<b>FCC PART 15, SUBPART C, SECTION 15.225</b> <b>ISED RSS-210, Issue 11</b>
<b>Result:</b>	<b><i>The test sample, under the condition and operating mode described in this test report, complies with the standard/s listed above.</i></b>
<b>Test Engineer:</b>	 _____ Ashish Nath
<b>Authorized Signatory:</b>	 _____ Ian Paul Ng Senior Test Engineer Radio and Wireless



Accreditation No.5292

NATA Accreditation No. 5292

Accredited for compliance with ISO/IEC 17025 – Testing.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

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## Revision History

Version	Issue Date	Reason / Comments
1	28 May 2025	Initial issue

## General Remarks

EMC Technologies Pty Ltd hereby certify that the device(s) described herein were tested as described in this report and that the data included is that which was obtained during such testing.

EMC Technologies Pty Ltd reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. EMC Technologies Pty Ltd shall have no liability for any deductions, inferences or generalisations drawn by the customer or others from EMC Technologies Pty Ltd issued reports. This report shall not be used to claim, constitute, or imply product endorsement by EMC Technologies Pty Ltd.

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## 1 Project Overview

### 1.1 Test Facility

Measurements were performed at the following location:

- Melbourne Laboratory 176 Harrick Road, Keilor Park, VIC 3042, Australia
- Sydney Laboratory Unit 3, 87 Station Road, Seven Hills, NSW 2147, Australia

EMC Technologies Pty. Ltd. is an independently owned Australian company that is NATA accredited to ISO 17025 for both testing and calibration and ISO 17020 for Inspection. – **Accreditation Number 5292.**

Country	Assessment Body	Lab Code / Member No.
Australia	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0001/AU0002
Canada	ISED Canada	CAB Identifier Number: AU0001/AU0002
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

### 1.2 Standards Applied

#### FCC PART 15, SUBPART C, SECTION 15.225

Operation within the band 13.110 – 14.010 MHz

#### ISED RSS-210, Issue 11

Licence-Exempt Radio Apparatus: Category I Equipment

#### ANSI C63.10 - 2013

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

#### ANSI C63.4 - 2014

American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

## 1.3 Results Summary

The test sample was provided by the customer. All results herein apply only to the test sample.

Sec.	Description	FCC	ISED	Results
3.1	Antenna Requirement	§15.203	RSS-Gen 6.8	Complied
3.2	Restricted Bands of Operation	§15.205	RSS-Gen 8.10	Complied
3.3	Conducted Limits	§15.207	RSS-Gen 8.8	Complied
3.4	Radiated emission limits; General requirements	§15.209	RSS-Gen 8.9	Complied
3.5	Field Strength of Emissions within the band 13.110 – 14.010 MHz	§15.225(a)(b)(c)	RSS-210 Annex B.6	Complied
3.6	Radiated Spurious Emissions	§15.225(d)	RSS-210 Annex B.6	Complied
3.7	Frequency Stability	§15.225(e)	RSS-210 Annex B.6	Complied
3.8	20dB Emission Bandwidth	§15.215(c)	RSS-Gen 6.7	Complied

## 1.4 Measurement Uncertainty

EMC Technologies has evaluated the equipment and the methods used to perform the EMC testing. The estimated measurement uncertainties for the various tests shown within this report are as follows:

EMC Testing	Range	Value
<b>Conducted Emission</b>		
• Mains Port	9kHz to 30 MHz	± 3.2 dB
<b>Radiated Emission</b>		
	9 kHz to 30 MHz	± 4.1 dB
	30 MHz to 300 MHz	± 5.1 dB
	300 MHz to 1000 MHz	± 4.7 dB
	1 GHz to 18 GHz	± 4.6 dB
	18 GHz to 40 GHz	± 4.6 dB
<b>Peak Output Power</b>		
		± 1.5 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

### Application of measurement uncertainty for this report:

The referenced uncertainty standard specifies that determination of compliance shall be based on measurements without taking into account measurement uncertainty. However, the measurement uncertainty shall appear in the test report.

## 1.5 Test Equipment

Measurement instrumentation and transducers were calibrated in accordance with the applicable standards by a NATA accredited laboratory or the National Measurement Institute (NMI).

<b>Conducted Emission</b>						
<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Asset No.</b>	<b>Description</b>	<b>Cal. Date</b>	<b>Cal. Due</b>
Huber+Suhner	Sucoflex 118	800175/118	C-537	RF Cable	03/06/2024	03/06/2025
Huber+Suhner	Sucoflex 106	501215/6P	C-484	RF Cable	27/11/2024	27/11/2025
Rojone	RG223/U	42681_1	C-591	RF Cable	23/02/2025	23/02/2026
Teseq	NNB 51	47439	L-077	LISN	04/09/2024	04/09/2025
Rohde & Schwarz	ESCI	101306	R-028	EMC Receiver	19/03/2024	19/03/2025

<b>Radiated Emission</b>						
<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Asset No.</b>	<b>Description</b>	<b>Cal. Date</b>	<b>Cal. Due</b>
Frankonia	SAC-3-2	-	R-144	Room 13 3m SAC	25/03/2024	25/03/2027
Rohde & Schwarz	ESW26	101306	R-143	EMI Receiver	06/08/2024	06/08/2025
EMCO	6502	2021	A-310	Active Loop Antenna	19/09/2024	19/09/2026
SunAR	JB1	A052518	A-434	Broadband Hybrid Antenna	14/03/2023	14/03/2025
EMCO	3115	9501-4398	A-406	Horn Antenna	10/01/2025	10/01/2028
ETS-Lindgren	3160-09	66032	A-307	Horn Antenna	18/01/2024	18/01/2027
ETS-Lindgren	3160-10	64179	A-306	Horn Antenna	18/01/2024	18/01/2027
Huber+Suhner	Sucoflex 104A	503061/4A	CL131125	RF Cable	01/11/2024	01/11/2025
Huber+Suhner	Sucoflex 102	27319/2	C-273	RF Cable	23/01/2025	23/01/2026
EDS	SG18-B3015	1	A-288	Pre-Amp	27/11/2024	27/11/2025

## 2 Equipment Under Test

### 2.1 EUT Details

(EUT details are supplied by the customer)

EUT Transmitter Details	
<b>Radio Module/Chip Manufacturer:</b>	Texas Instruments
<b>Radio Module/Chip Model:</b>	TRF7960ARHBR
<b>Type:</b>	NFC
<b>Operating Band/Frequency:</b>	13.56 MHz
<b>Number of Channels:</b>	1
<b>Modulation:</b>	OOK
<b>Antenna Manufacturer:</b>	Nanosonics
<b>Antenna Model / Type:</b>	Antenna 1: E03006 NFC inductive flex loop antenna Antenna 2: E05339 NFC inductive rigid loop antenna
<b>Antenna Maximum Gain:</b>	N/A

EUT Host Details	
<b>Product Name:</b>	CORIS Endoscope channel cleaner
<b>Model:</b>	N05515 (CORIS Device Body) N05516 (CORIS Device Engine)
<b>PCB / Hardware Version:</b>	Main board R0-4, PCBA R0-97
<b>Sample No / Identification:</b>	1464438-XA01
<b>Power Rating:</b>	AC/DC Adapter DELTA ELECTRONICS, INC.
	Model: MEA-250A24C (S/N: O08W9A700K8, C.C.: H-A, Rev.: 01)
	Input: 100-240VAC ~ 4-2A 50-60Hz
	Output: 24VDC 10.42A
<b>Operating Ambient Temperature:</b>	20°C to 25°C
<b>Description:</b>	The Nanosonics CORIS is a software controlled automated device designed to clean the internal channels of nominated endoscopes prior to high-level disinfection (HLD). The device is designed for use in hospital endoscope reprocessing areas. Its use is intended to replace the action of manual brushing and flushing of the endoscope in order to remove physical procedure-related debris.  <b>Note: EUT is an industrial use device and is declared as a "Class A" device under FCC Part 15 B.</b>

## 2.2 Test Configuration

Testing was performed with the EUT's 13.56MHz radio module set to transmit continuously.

**For 30-1000 MHz spurious emissions test both RFID ON and RFID OFF modes were tested to clearly identify spurious related to the intentional 13.56 MHz transmitter.**

Note: The 2 RFID antennas will only transmit one at a time.

Test Mode	Frequency [MHz]	RFID Antenna	Location
1	13.56	Antenna 1	Front Panel RFID
2	13.56	Antenna 2	Adaptor RFID
3	RFID OFF		

## 2.3 Modifications

No modifications were required to achieve compliance.

## 2.4 Additions to, Deviations and Exclusions from the Method/Standard

No additions to, deviations or exclusions from the method/standard were performed.

## 2.5 Reference Document

No.	Document Title	Issue No.
1	CORIS A3.0 EMC Test Plan – A923105	Ver 1.0

### 3 Evaluation of Test Results

#### 3.1 §15.203/ RSS-Gen 6.8 - Antenna Requirement

The transmitter incorporates 2 Inductive coil antennas which transmits one at a time and mounted on the device and cannot be replaced by another type.

##### RFID Antenna 1:

**Antenna Manufacturer:** Nanosonics

**Antenna Model/Type:** E03006 NFC Inductive flex loop Antenna

**Antenna Maximum Gain:** N/A

##### RFID Antenna 2:

**Antenna Manufacturer:** Nanosonics

**Antenna Model/Type:** E05339 NFC Inductive rigid loop Antenna

**Antenna Maximum Gain:** N/A

#### 3.2 §15.205/ RSS-Gen 8.10 - Restricted Bands of Operation

The provisions of the §15.205 restricted bands of operation and §15.209 radiated emissions limits have been met, refer to section 3.6.

#### 3.3 §15.207/ RSS-Gen 8.8 - Conducted Limits

The EUT is powered by an AC/DC Adapter.

**Manufacturer:** DELTA ELECTRONICS, INC.

**Model:** MEA-250A24C (S/N: O08W9A700K8, C.C.: H-A, Rev.: 01)

**Input:** 100-240VAC ~ 4-2A 50-60Hz

**Output:** 24VDC 10.42A

##### 3.3.1 Test Procedure

The EMI Receiver was operated under program control using the Max-Hold function and automatic frequency scanning, measurement, and data logging techniques. The specified 0.15 MHz to 30 MHz frequency range was sub-divided into sub-ranges to ensure that all short duration peaks were captured.

The various operating modes of the system were investigated. For each of the sub-ranges, the EMI receiver was set to continuous scan with the Peak detector set to Max-Hold mode. The Quasi-Peak detector and the Average detector were then invoked to measure the actual Quasi-Peak and Average level of the most significant peaks, which were detected.

##### Calculation of voltage level

The voltage levels were automatically measured in software and compared to the test limit. The method of calculation was as follows:

$$V_{emi} = V_{rx} + L$$

Where:  $V_{emi}$  = The Measured EMI voltage in dB $\mu$ V to be compared to the limit.

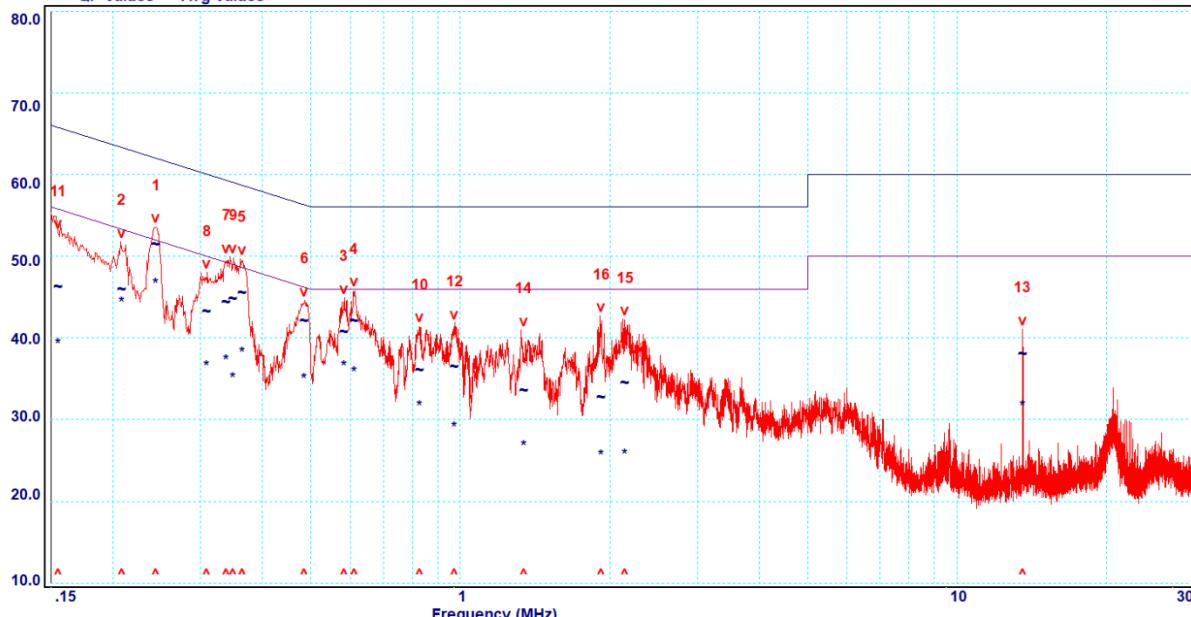
$V_{rx}$  = The Voltage in dB $\mu$ V read directly at the EMI receiver.

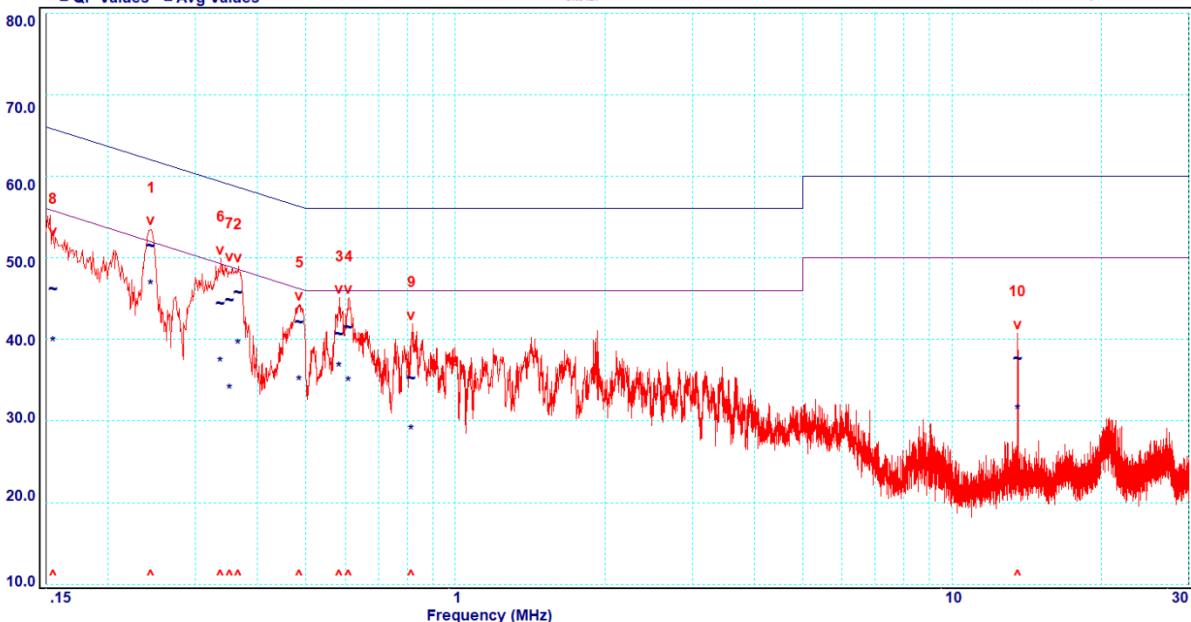
$L$  = The insertion loss in dB of the LISN, cables and transient Limiter

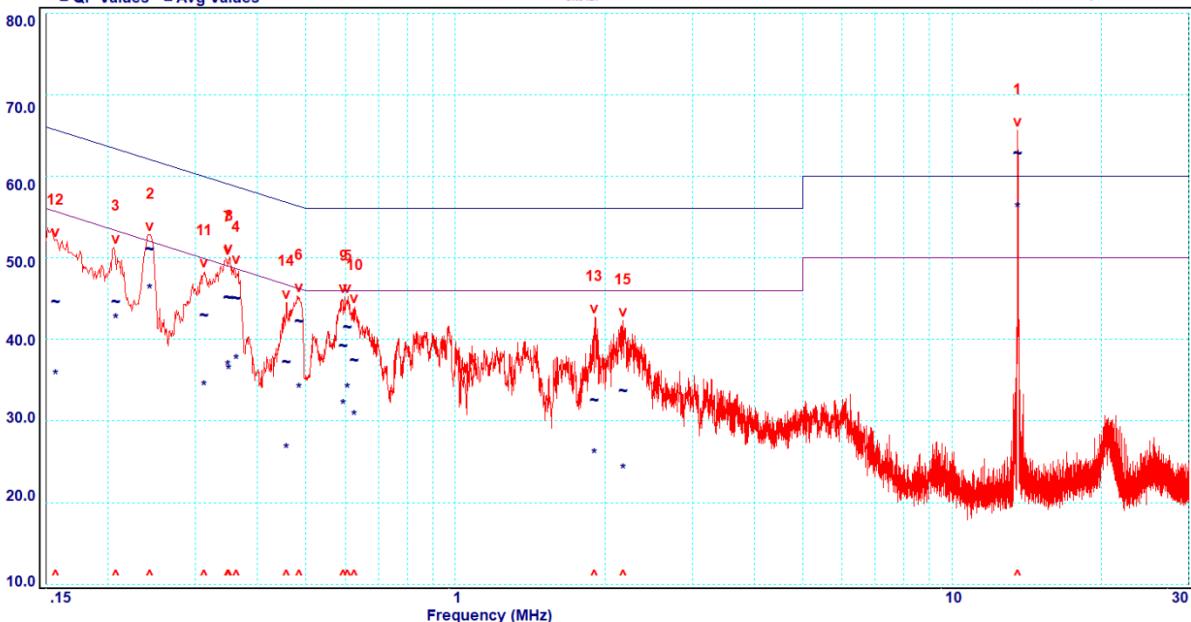
### 3.3.2 Limits

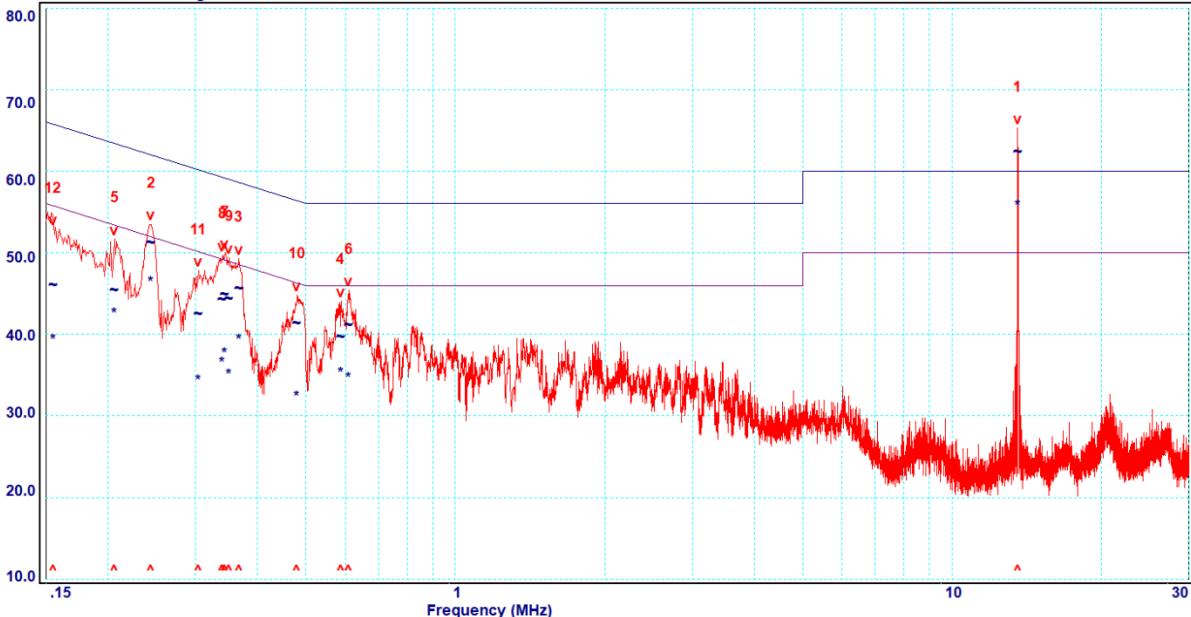
The limit applied was in accordance with the conducted limits defined in §15.207.

### 3.3.3 Results – 150kHz to 30 MHz

<b>Operating Mode:</b>	Mode 1	<b>Test Date:</b>	26/02/2025					
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	23.1 °C					
<b>Port:</b>	AC Mains Port (Active Line)	<b>Humidity:</b>	40%					
<b>Test Standard:</b>	FCC 15.207							
M2501025 RFID 13.56Mhz - Antenna 1								
Limit1: FCC_BQPN Limit2: FCC_BAVN								
FCC Part 15.107 Class B - Quasi-Peak Limit (Conducted) FCC Part 15.107 Class B - Average Limit (Conducted)								
Trace 2: Active Line								
Conducted Emissions (dBuV) ~ = QP Values * = Avg Values								
Job No: Test Date: Test Officer: Plot date: 04/03/2025 16:14:21 EL0770925 ct1:C4841125 c2:C5910226 c3:NONE p:NONE a:NONE IP:OFF CE Site ID: WintstRS:36.45-Wplt:164.77-Rx:R&S,ESW-26.1328.4100K26/101306.2 Graph No. 3								
								
<b>Peak</b>	<b>Frequency</b>	<b>Port</b>	<b>Quasi Peak</b>					
			<b>Level</b> <b>[dB<math>\mu</math>V]</b>	<b>Limit</b> <b>[dB<math>\mu</math>V]</b>	<b>Margin</b> <b>[dB]</b>	<b>Average</b> <b>Level</b> <b>[dB<math>\mu</math>V]</b>	<b>Limit</b> <b>[dB<math>\mu</math>V]</b>	<b>Margin</b> <b>[dB]</b>
1	0.244	Active	51.9	62	-10.1	46.6	52	-5.4
2	0.208	Active	46.4	63.3	-16.9	44.3	53.3	-9
3	0.583	Active	41.3	56	-14.7	36.6	46	-9.4
4	0.611	Active	42.6	56	-13.4	35.8	46	-10.2
5	0.364	Active	46	58.6	-12.6	38.2	48.6	-10.4
6	0.486	Active	42.6	56.2	-13.6	35	46.2	-11.2
7	0.338	Active	44.8	59.3	-14.5	37.3	49.3	-12
8	0.309	Active	43.7	60	-16.3	36.5	50	-13.5
9	0.349	Active	45.3	59	-13.7	35.1	49	-13.9
10	0.829	Active	36.5	56	-19.5	31.7	46	-14.3
11	0.155	Active	46.8	65.7	-18.9	39.3	55.7	-16.4
12	0.974	Active	37	56	-19	29.1	46	-16.9
13*	13.56	Active	N/A	N/A	N/A	N/A	N/A	N/A
14	1.342	Active	34.1	56	-21.9	26.8	46	-19.2
15	2.145	Active	35	56	-21	25.7	46	-20.3
16	1.922	Active	33.2	56	-22.8	25.6	46	-20.4
<b>Comment:</b>								
*Intentional transmission – not subject to unintentional radiated emission limits.								

<b>Operating Mode:</b>	Mode 1	<b>Test Date:</b>	26/02/2025					
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	23.1 °C					
<b>Port:</b>	AC Mains Port (Neutral Line)	<b>Humidity:</b>	40%					
<b>Test Standard:</b>	FCC 15.207							
M2501025 RFID 13.56Mhz - Antenna 1 Conducted Emissions (dB $\mu$ V) ~ = QP Values * = Avg Values								
Limit1: FCC_BQPN Limit2: FCC_BAVN FCC Part 15.107 Class B - Quasi-Peak Limit (Conducted) FCC Part 15.107 Class B - Average Limit (Conducted) Trace 2: Neutral Line								
Job No: Test Date: Test Officer: Plot date:04/03/2025 16:21:52 t:0770925 c1:C4841125 c2:C5910226 c3:NONE p:NONE a:NONE IP:OFF Site ID: WintstRS:36.45-Wplt:164.77-Rx:R&S,ESW-26,1328.4100K26/101306.2. CE Graph No. 4								
								
<b>Peak</b>	<b>Frequency</b>	<b>Port</b>	<b>Quasi Peak</b>	<b>Average</b>				
	[MHz]		Level [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]	Level [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]
1	0.244	Neutral	51.9	62	-10.1	46.6	52	-5.4
2	0.365	Neutral	46.2	58.6	-12.4	39.4	48.6	-9.2
3	0.585	Neutral	41.1	56	-14.9	36.5	46	-9.5
4	0.61	Neutral	41.9	56	-14.1	34.8	46	-11.2
5	0.486	Neutral	42.6	56.2	-13.6	34.9	46.2	-11.3
6	0.337	Neutral	44.8	59.3	-14.5	37.2	49.3	-12.1
7	0.351	Neutral	45.2	58.9	-13.7	33.8	48.9	-15.1
8	0.155	Neutral	46.6	65.7	-19.1	39.7	55.7	-16
9	0.815	Neutral	35.7	56	-20.3	28.9	46	-17.1
10*	13.56	Neutral	N/A	N/A	N/A	N/A	N/A	N/A
<b>Comment:</b>								
*Intentional transmission – not subject to unintentional radiated emission limits.								

<b>Operating Mode:</b>	Mode 2	<b>Test Date:</b>	26/02/2025					
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	23.1 °C					
<b>Port:</b>	AC Mains Port (Active Line)	<b>Humidity:</b>	40%					
<b>Test Standard:</b>	FCC 15.207							
M2501025 RFID 13.56Mhz - Antenna 2 Conducted Emissions (dB $\mu$ V) ~ = QP Values * = Avg Values								
Limit1: FCC_BQPN FCC Part 15.107 Class B - Quasi-Peak Limit (Conducted) Limit2: FCC_BAVN FCC Part 15.107 Class B - Average Limit (Conducted) Trace 2: Active Line								
Job No: Test Officer:-Plot date:04/03/2025 16:26:12 Test Date: t:0770925 c1:C4841125 c2:C5910226 c3:NONE p:NONE a:NONE IP:OFF Site ID: WintRS:36.45-Wpt:164.77-Rx:R&S,ESW-26,1328.4100K26/101306.2. CE Graph No. 1								
								
<b>Peak</b>	<b>Frequency</b>	<b>Port</b>	<b>Quasi Peak</b>	<b>Average</b>				
	[MHz]		Level [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]	Level [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]
1*	13.56	Active	N/A	N/A	N/A	N/A	N/A	N/A
2	0.243	Active	51.5	62	-10.5	46.1	52	-5.9
3	0.207	Active	45.1	63.3	-18.2	42.5	53.3	-10.8
4	0.362	Active	45.5	58.7	-13.2	37.5	48.7	-11.2
5	0.607	Active	42	56	-14	33.9	46	-12.1
6	0.485	Active	42.6	56.3	-13.7	34	46.3	-12.3
7	0.348	Active	45.6	59	-13.4	36.8	49	-12.2
8	0.35	Active	45.6	59	-13.4	36.2	49	-12.8
9	0.596	Active	39.6	56	-16.4	32	46	-14
10	0.627	Active	37.9	56	-18.1	30.6	46	-15.4
11	0.312	Active	43.4	59.9	-16.5	34.3	49.9	-15.6
12	0.157	Active	45	65.6	-20.6	35.6	55.6	-20
13	1.906	Active	33	56	-23	25.9	46	-20.1
14	0.457	Active	37.7	56.8	-19.1	26.6	46.8	-20.2
15	2.176	Active	34.2	56	-21.8	24.1	46	-21.9
<b>Comment:</b>								
*Intentional transmission – not subject to unintentional radiated emission limits.								

<b>Operating Mode:</b>	Mode 2	<b>Test Date:</b>	26/02/2025					
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	23.1 °C					
<b>Port:</b>	AC Mains Port (Neutral Line)	<b>Humidity:</b>	40%					
<b>Test Standard:</b>	FCC 15.207							
M2501025 RFID 13.56Mhz - Antenna 2								
Limit1: FCC_BQPN Limit2: FCC_BAVN FCC Part 15.107 Class B - Quasi-Peak Limit (Conducted) FCC Part 15.107 Class B - Average Limit (Conducted)								
Trace 2: Neutral Line								
Conducted Emissions (dB $\mu$ V) * = QP Values * = Avg Values								
								
<b>Peak</b>	<b>Frequency</b>	<b>Port</b>	<b>Quasi Peak</b>	<b>Average</b>	<b>Margin</b>			
	[MHz]		Level [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]	Level [dB $\mu$ V]	Limit [dB $\mu$ V]	Margin [dB]
1*	13.56	Neutral	N/A	N/A	N/A	N/A	N/A	N/A
2	0.244	Neutral	51.7	62	-10.3	46.4	52	-5.6
3	0.366	Neutral	46.1	58.6	-12.5	39.4	48.6	-9.2
4	0.588	Neutral	40.2	56	-15.8	35.3	46	-10.7
5	0.206	Neutral	45.9	63.4	-17.5	42.6	53.4	-10.8
6	0.61	Neutral	41.6	56	-14.4	34.7	46	-11.3
7	0.344	Neutral	45.4	59.1	-13.7	37.7	49.1	-11.4
8	0.34	Neutral	44.7	59.2	-14.5	36.5	49.2	-12.7
9	0.35	Neutral	44.9	59	-14.1	35.1	49	-13.9
10	0.48	Neutral	41.9	56.3	-14.4	32.4	46.3	-13.9
11	0.304	Neutral	43	60.1	-17.1	34.4	50.1	-15.7
12	0.155	Neutral	46.5	65.7	-19.2	39.4	55.7	-16.3
<b>Comment:</b>								
*Intentional transmission – not subject to unintentional radiated emission limits.								

### 3.4 §15.209/ RSS-Gen 8.9 - Radiated Emission Limits; General Requirements

The provisions of the §15.205 restricted bands of operation and §15.209 radiated emissions limits have been met, refer to section 3.6.

### 3.5 §15.225(a)(b)(c)/ RSS-210 Annex B.6 - Field Strength of Emissions within the band 13.110 – 14.010 MHz

#### 3.5.1 Test Procedure

The field strength of emissions within the band was measured inside a semi-anechoic chamber compliant with ANSI C63.4: 2014.

The EUT was positioned on a test turn-table and slowly rotated through 360° to determine the highest emissions with the spectrum analyser set to Max-hold using a Peak detector and a resolution bandwidth of 9 kHz. A calibrated active loop antenna was used for the measurements. Measurements were conducted in all polarisations (Parallel to EUT, Perpendicular to EUT and Ground Parallel).

All measurements were made at 3 metres. Final measurements on the fundamental emissions were done using a Peak detector.

#### 3.5.2 Limits

As per §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.

Frequency range [MHz]	Field Strength [ $\mu$ V/m] at 30m	Field Strength [dB $\mu$ V/m] at 30m	Field Strength [dB $\mu$ V/m] at 3m
13.110 to 13.410	106	40.5	80.5
13.410 to 13.553	334	50.5	90.5
13.553 to 13.567	15848	84.0	124.0
13.567 to 13.710	334	50.5	90.5
13.710 to 14.010	106	40.5	80.5

### 3.5.3 Results

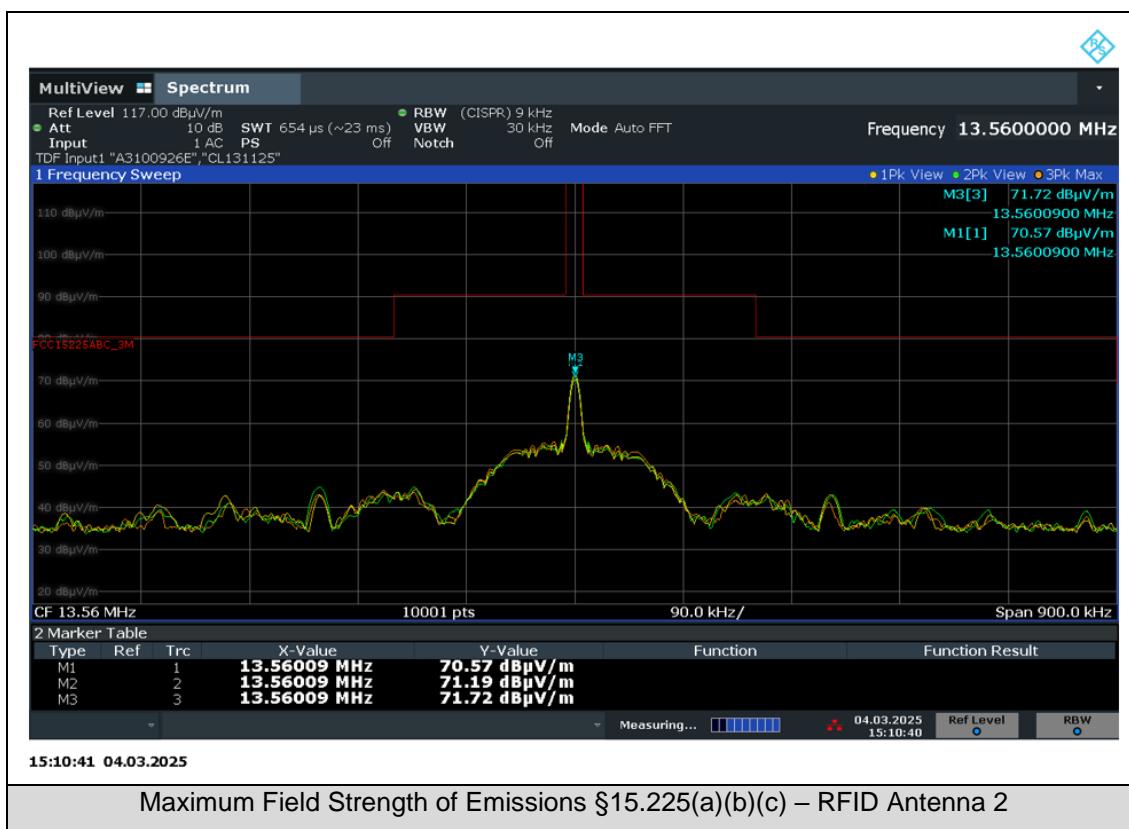
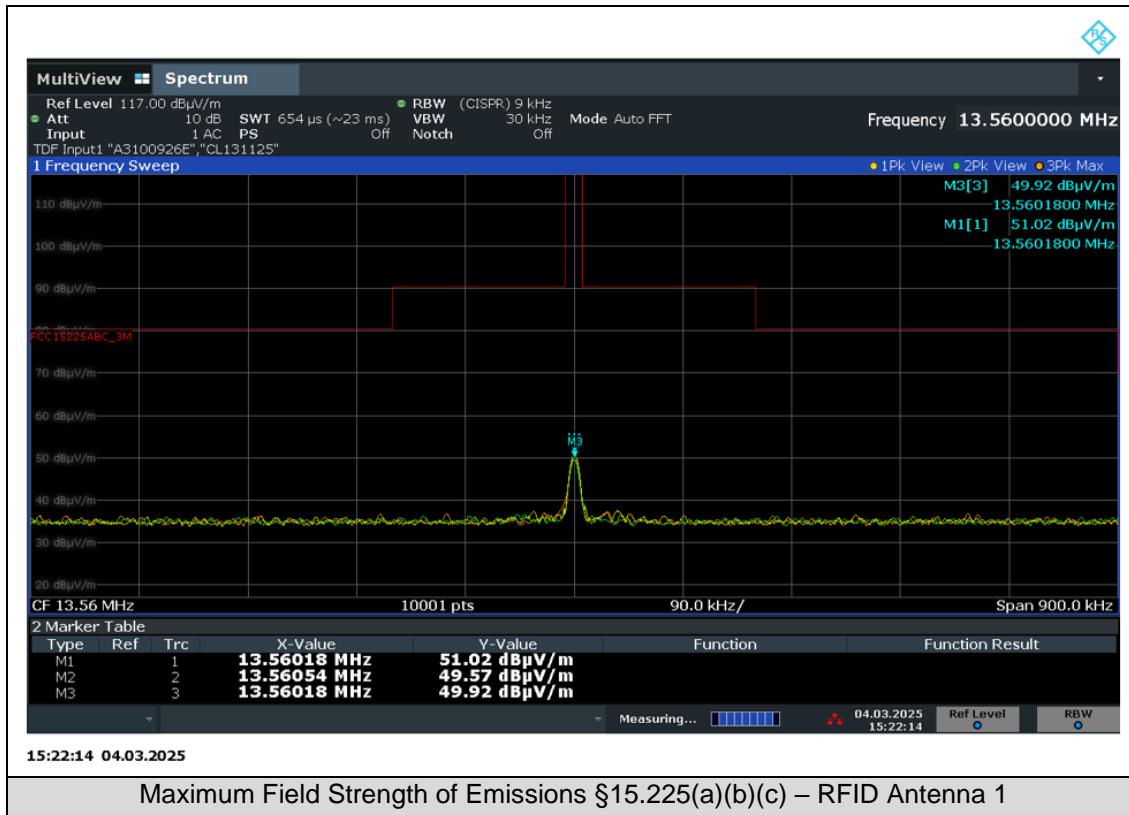
All emissions within the band 13.110 MHz to 14.010 MHz complied with requirement of the standard.

#### RFID Antenna 1 (Front Panel RFID):

Marker	Frequency [MHz]	Polarization	E-Field @ 3 m [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Results
M1	13.56	Parallel	51.02	124	Complied
M2	13.56	Perpendicular	49.57	124	Complied
M3	13.56	Ground	49.92	124	Complied

#### RFID Antenna 2 (Adaptor RFID):

Marker	Frequency [MHz]	Polarization	E-Field @ 3 m [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Results
M1	13.56	Parallel	70.57	124	Complied
M2	13.56	Perpendicular	71.19	124	Complied
M3	13.56	Ground	71.72	124	Complied



### 3.6 §15.225(d)/ RSS-210 Annex B.6 - Radiated Spurious Emissions

#### 3.6.1 Test Procedure

Radiated out-of-band/spurious emissions measurements were performed in a semi-anechoic chamber compliant with ANSI C63.4: 2014.

The test frequency range was sub-divided into smaller bands with the defined resolution bandwidths to permit reliable display and identification of emissions.

Frequency range [MHz]	Measurement Bandwidth [kHz]	Measurement Distance [m]	Antenna
0.009 to 0.150	0.2	3	0.6 metre Loop antenna
0.150 to 30	9	3	
30 to 1000	120	3	Biconilog antenna

The EUT was set at a height of 0.8 m for measurements.

The EUT was slowly rotated with the Peak Detector set to Max-Hold. This was performed for at least two antenna heights. Each significant peak was then investigated and maximized with the Quasi-Peak detector for measurements below 1 GHz.

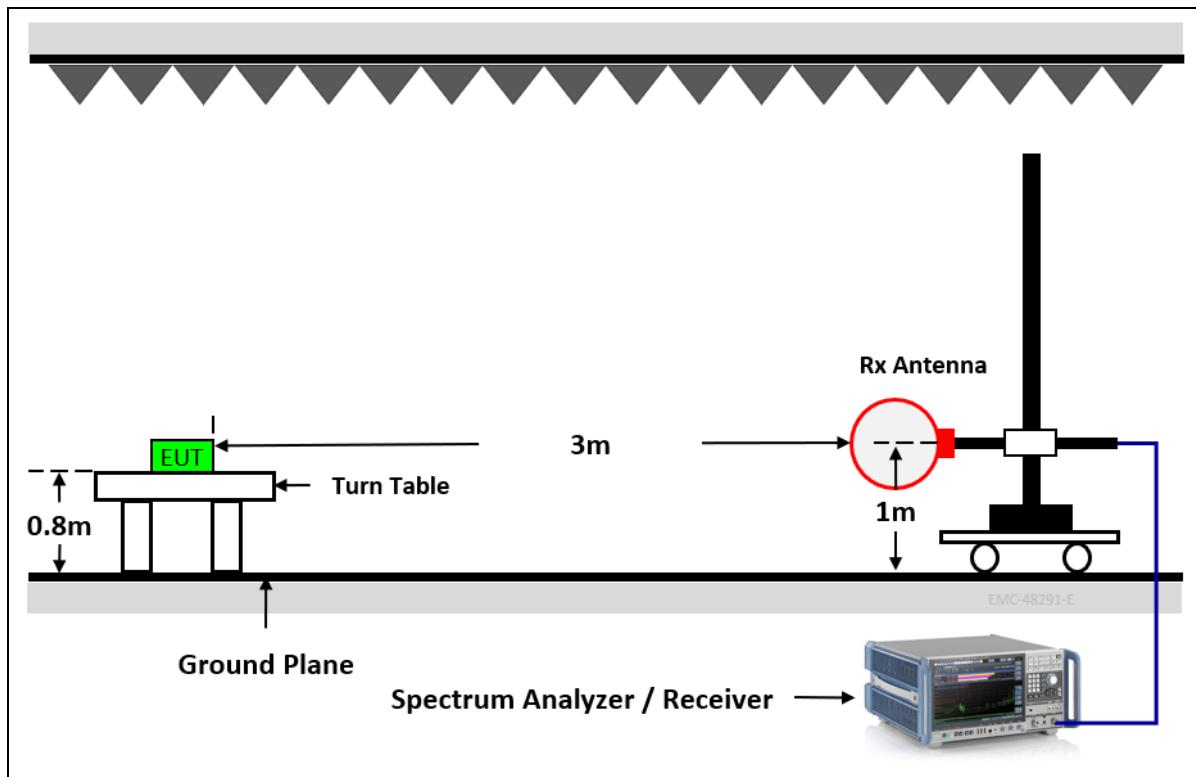
The measurement data for each frequency range was corrected for cable losses, antenna factors and preamplifier gain. This process was performed for both horizontal and vertical polarisations of the measurement antenna.

**Note: For 30-1000 MHz spurious emissions test both RFID ON and RFID OFF modes were tested to clearly identify spurious related to the intentional 13.56 MHz transmitter.**

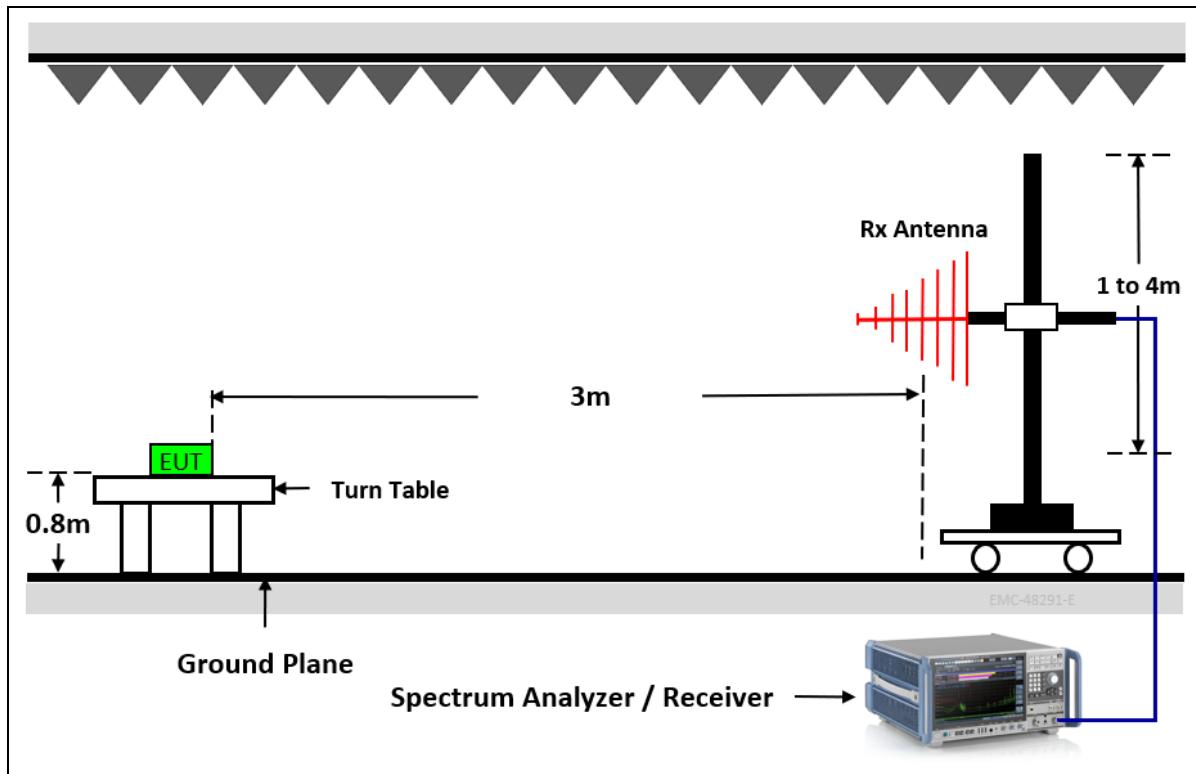
**Only RFID Antenna 2 (Adaptor RFID) data is presented as it is the worst case.**

### 3.6.2 Test Setup

9 kHz to 30 MHz:



30 - 1000 MHz:



### 3.6.3 Evaluation of field strength

Field strengths were calculated automatically by the software using pre-stored calibration data. The method of calculation is shown below:

$$E = V + AF - G + L$$

Where:  $E$  = Radiated Field Strength in dB $\mu$ V/m

$V$  = EMI Receiver Voltage in dB $\mu$ V

$AF$  = Antenna Factor in dB/m (stored as a data array)

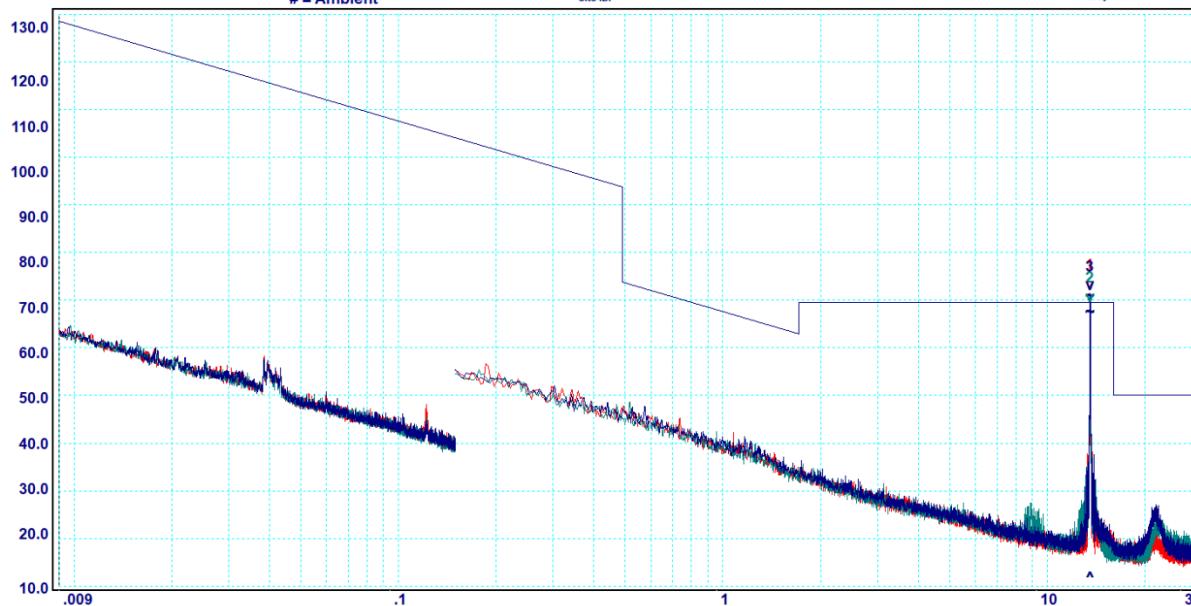
$G$  = Preamplifier Gain in dB (stored as a data array)

$L$  = Cable loss in dB (stored as a data array of Insertion Loss versus frequency)

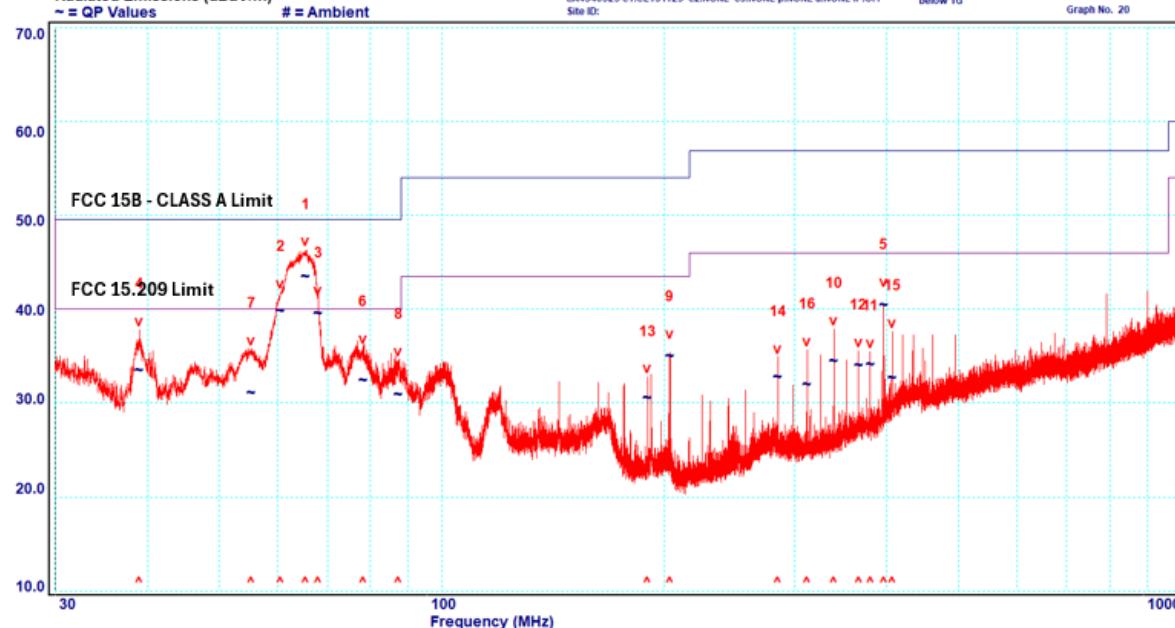
### 3.6.4 Limits

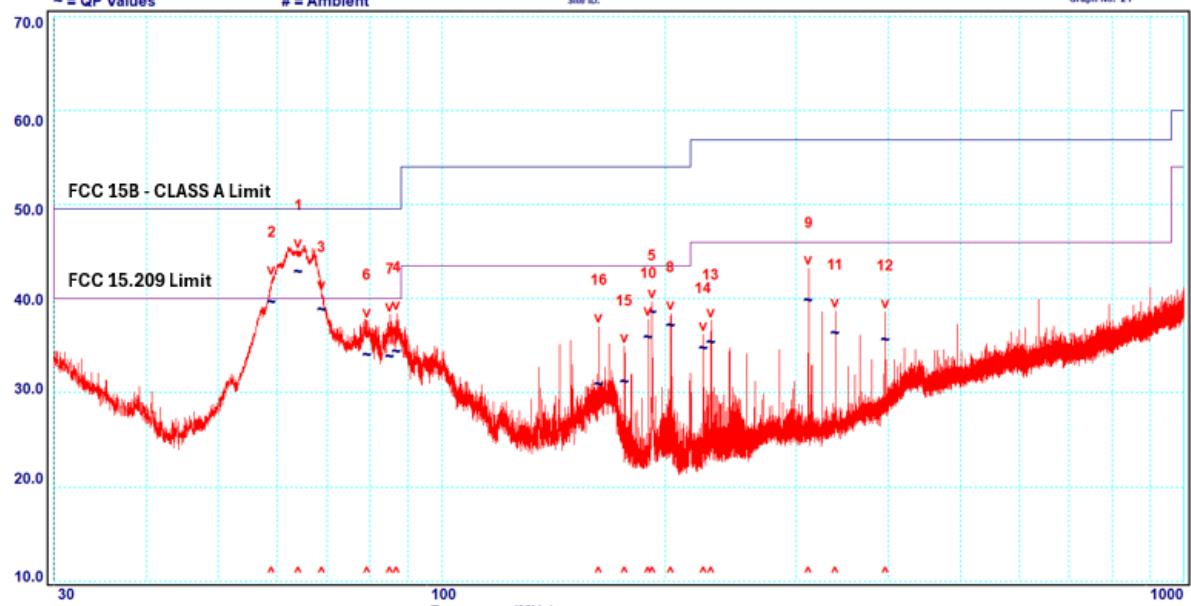
The limit applied is in accordance with the spurious emissions limit defined in §15.209 Radiated emissions limit; general requirements.

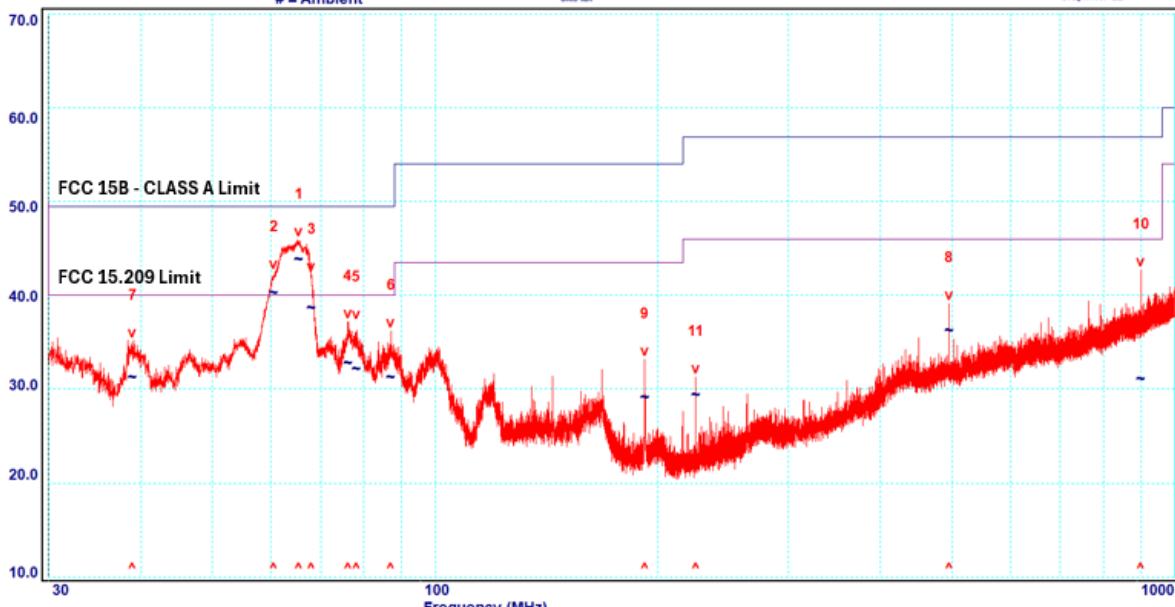
### 3.6.5 Transmitter Spurious Emissions – 9 kHz to 30 MHz

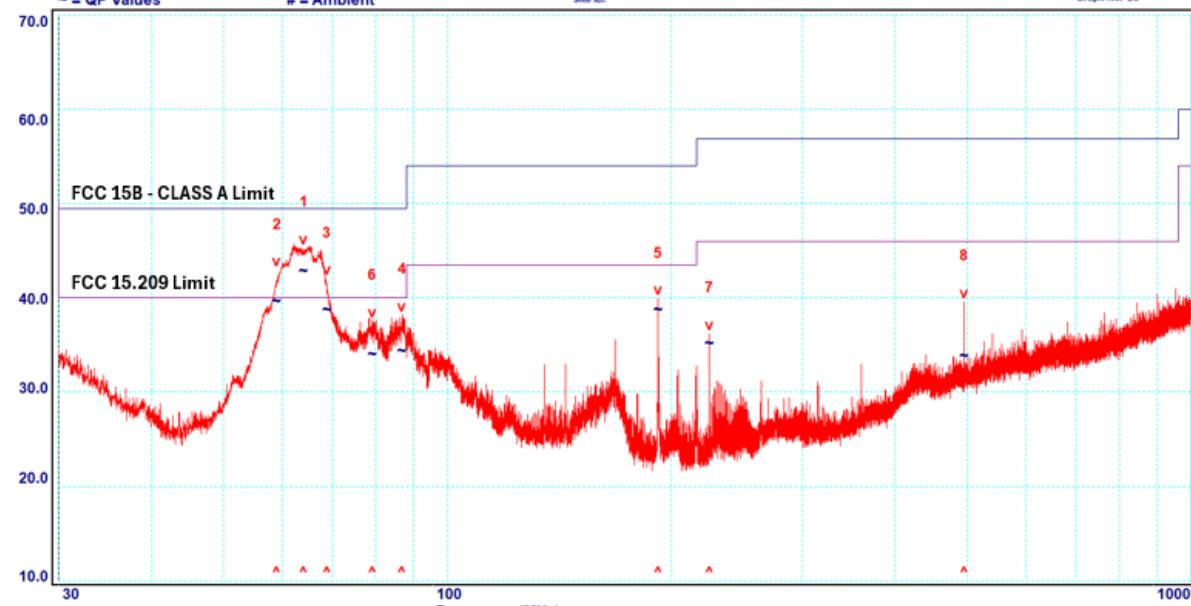
<b>Operating Mode:</b>	Mode 2	<b>Test Date:</b>	24/02/2025		
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	20.1 °C		
<b>Measurement Distance:</b>	3 m	<b>Humidity:</b>	48%		
<b>Test Standard:</b>	FCC 15.225				
M2501025 RFID 13.56MHz - Antenna 2 120V 60Hz		Limit1: FCC15209	FCC PART 15.209 3mtr LMTS		
Job No: Test Date: <b>Radiated Emissions (dB<math>\mu</math>V/m)</b> # = Ambient			<b>Trace 2: Parallel</b> <b>Trace 3: Perpendicular</b> <b>Trace 4: Gnd</b> Test Officer: Plot date:04/03/2025 11:29:52 t: A3100926E c1: CL131125 c2: NONE c3: NONE p: NONE a: NONE IP: OFF Site ID: WintIRS:36.45-Wplt:164.77-Rx&S,ESW-26.1328.4100K26/101306.2 Room 13 below 30MHz Loop Antenna Graph No. 4		
					
Peak	Frequency [MHz]	Polarisation	Level [dB $\mu$ V/m]	QP Limit [dB $\mu$ V/m]	Margin [dB]
1*	13.56	Parallel	N/A	N/A	N/A
2*	13.56	Perpendicular	N/A	N/A	N/A
3*	13.56	Ground	N/A	N/A	N/A
<b>Comment:</b>					
*13.56 MHz is the Intentional transmitter and not subject to the §15.209 spurious emissions limit.					

### 3.6.6 Transmitter Spurious Emissions – 30 MHz to 1000 MHz

<b>Operating Mode:</b>	Mode 2 (RFID ON)	<b>Test Date:</b>	24/02/2025				
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	20.1 °C				
<b>Measurement Distance:</b>	3 m	<b>Humidity:</b>	48%				
<b>Test Standard:</b>	FCC 15.225						
M2501025 RFID 13.56MHz - Antenna 2							
Limit1: FCC-A3 QP Limit2: FCC15209							
FCC 15.109 Class A 3 metre Quasi-Peak Limits Below FCC PART 15.209 3mtr LMTS							
Trace 2: Vertical Emissions							
Radiated Emissions (dBuV/m) ~ = QP Values      # = Ambient							
							
Test Officer: Plot date:04/03/2025 12:00:38 EA4340325 c1:CL131125 c2:None c3:None p:None a:None IP:Off Site ID: WinstRS:36.45-Wplt:164.77-RxR&S,ESW-29,1328.4100K26/101306.2. below 1G      Graph No. 20							
Peak	Frequency [MHz]	Polarisation	Level [dB $\mu$ V/m]	Limit Class A 15.109 [dB $\mu$ V/m]	Margin to Class A 15.109 [dB]	Limit 15.209 [dB $\mu$ V/m]	Margin to 15.209 [dB]
1*	65.44	Vertical	44	49.6	-5.6	40	N/A
2*	60.52	Vertical	40.3	49.6	-9.3	40	N/A
3*	68.08	Vertical	40	49.6	-9.6	40	N/A
4	38.99	Vertical	34	49.6	-15.6	46	-5
5	395.97	Vertical	41	56.9	-15.9	40	-6
6	78.23	Vertical	32.9	49.6	-16.7	40	-7.1
7	55.27	Vertical	31.6	49.6	-18	43.5	-8
8	87.41	Vertical	31.4	49.6	-18.2	40	-8.4
9	203.39	Vertical	35.5	54	-18.5	40	-8.6
10	338.98	Vertical	35	56.9	-21.9	46	-11
11	379.68	Vertical	34.6	56.9	-22.3	46	-11.4
12	366.1	Vertical	34.5	56.9	-22.4	46	-11.5
13	189.84	Vertical	31	54	-23	43.5	-12.5
14	284.75	Vertical	33.3	56.9	-23.6	46	-12.7
15	406.76	Vertical	33.2	56.9	-23.7	46	-12.8
16	311.85	Vertical	32.5	56.9	-24.4	46	-13.5
<b>Comment:</b>							
*Peaks 1 to 3 are identified unintentional emissions which are unrelated to the 13.56 MHz transmitter and not subject to the §15.209 spurious emissions limit.							

<b>Operating Mode:</b>	Mode 2 (RFID ON)	<b>Test Date:</b>	24/02/2025				
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	20.1 °C				
<b>Measurement Distance:</b>	3 m	<b>Humidity:</b>	48%				
<b>Test Standard:</b>	FCC 15.225						
<p>M2501025 RFID 13.56MHz - Antenna 2</p> <p>Limit1: FCC-A3 QP Limit2: FCC15209</p> <p>FCC 15.109 Class A 3 metre Quasi-Peak Limits Below FCC PART 15.209 3mtr LMTS</p> <p>Trace 2: Horizontal Emissions</p> <p>Radiated Emissions (dB<math>\mu</math>V/m) # = Ambient</p> <p>Job No: Test Date: Test Officer: Plot date:04/03/2025 12:27:58 EA4340325 c1:CL131125 c2:None c3:None p:None a:None IP:OFF Site ID: WinstRS:3645-Wplt:164.77-Rx:R&amp;S,ESW-26,1328.4100K26/101306.2, below 1G Graph No. 21</p> 							
Peak	Frequency [MHz]	Polarisation	Level [dB $\mu$ V/m]	Limit Class A 15.109 [dB $\mu$ V/m]	Margin to Class A 15.109 [dB]	Limit 15.209 [dB $\mu$ V/m]	Margin to 15.209 [dB]
1*	64.07	Horizontal	43.3	49.6	-6.3	40	N/A
2*	59.01	Horizontal	40.1	49.6	-9.5	40	N/A
3*	68.88	Horizontal	39.3	49.6	-10.3	40	N/A
4	86.92	Horizontal	34.8	49.6	-14.8	43.5	-4.5
5	191.98	Horizontal	39	54	-15	40	-5.2
6	79.25	Horizontal	34.5	49.6	-15.1	40	-5.5
7	85.13	Horizontal	34.3	49.6	-15.3	40	-5.7
8	203.39	Horizontal	37.6	54	-16.4	46	-5.7
9	311.85	Horizontal	40.3	56.9	-16.6	43.5	-5.9
10	189.84	Horizontal	36.4	54	-17.6	43.5	-7.1
11	338.98	Horizontal	36.8	56.9	-20.1	46	-9.2
12	395.97	Horizontal	36.1	56.9	-20.8	46	-9.9
13	230.5	Horizontal	35.9	56.9	-21	46	-10.1
14	224.98	Horizontal	35.2	56.9	-21.7	46	-10.8
15	176.25	Horizontal	31.7	54	-22.3	46	-11.8
16	162.67	Horizontal	31.4	54	-22.6	43.5	-11.8
<b>Comment:</b>							
*Peaks 1 to 3 are identified unintentional emissions which are unrelated to the 13.56 MHz transmitter and not subject to the §15.209 spurious emissions limit.							

<b>Operating Mode:</b>	Mode 3 (RFID OFF)	<b>Test Date:</b>	25/02/2025				
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	21.6 °C				
<b>Measurement Distance:</b>	3 m	<b>Humidity:</b>	52%				
<b>Test Standard:</b>	FCC 15.225						
<p>M2501025 RFID OFF</p> <p>Limit1: FCC-A3 Limit2: FCC15209</p> <p>FCC 15.109 Class A 3 metre Quasi-Peak and Average FCC PART 15.209 3mtr LMITS</p> <p>Trace 2: Vertical Emissions</p> <p>Radiated Emissions (dB<math>\mu</math>V/m) Job No: Test Date: Site ID: WinstRS:36.45-Wpt:164.77-Rx:R&amp;S,ESW-26,1328.4100K26/101306.2, below 1G Graph No. 22</p> <p># = Ambient</p> 							
Peak	Frequency [MHz]	Polarisation	Level [dB $\mu$ V/m]	Limit Class A 15.109 [dB $\mu$ V/m]	Margin to Class A 15.109 [dB]	Limit 15.209 [dB $\mu$ V/m]	Margin to 15.209 [dB]
1*	65.44	Vertical	44.3	49.5	-5.2	40	N/A
2*	60.52	Vertical	40.7	49.5	-8.8	40	N/A
3*	68.08	Vertical	39.2	49.5	-10.3	40	N/A
4	76.19	Vertical	33.3	49.5	-16.2	40	-6.7
5	78.23	Vertical	32.6	49.5	-16.9	40	-7.4
6	87.16	Vertical	31.7	49.5	-17.8	40	-8.3
7	38.99	Vertical	31.7	49.5	-17.8	40	-8.3
8	495.02	Vertical	36.7	56.9	-20.2	46	-9.3
9	191.95	Vertical	29.6	54	-24.4	43.5	-13.9
10	899.81	Vertical	31.5	56.9	-25.4	46	-14.5
11	225.01	Vertical	29.8	56.9	-27.1	46	-16.2
<b>Comment:</b>				*Peaks 1 to 3 are identified unintentional emissions which are unrelated to the 13.56 MHz transmitter and not subject to the §15.209 spurious emissions limit.			

<b>Operating Mode:</b>	Mode 3 (RFID OFF)	<b>Test Date:</b>	25/02/2025				
<b>Power Input:</b>	120V 60Hz	<b>Temperature:</b>	21.6 °C				
<b>Measurement Distance:</b>	3 m	<b>Humidity:</b>	52%				
<b>Test Standard:</b>	FCC 15.225						
M2501025 RFID OFF Limit1: FCC-A3 Limit2: FCC15209 FCC 15.109 Class A 3 metre Quasi-Peak and Average FCC PART 15.209 3mtr LMTS							
Trace 2: Horizontal Emissions Radiated Emissions (dB $\mu$ V/m) - = QP Values Job No: Test Date: Test Officer: Plot date:04/03/2025 17:13:01 Site ID: Site ID: WinstRS:36.45-Wpft:164.77-RxR&S,ESW-26,1328.4100K26/101306.2, below 1G Graph No. 23							
 <p>The graph plots Radiated Emissions in dB<math>\mu</math>V/m on the y-axis (10.0 to 70.0) against Frequency in MHz on a logarithmic x-axis (30, 100, 1000). Two horizontal lines represent the FCC 15.109 Class A Limit (50.0 dB<math>\mu</math>V/m) and the FCC 15.209 Limit (40.0 dB<math>\mu</math>V/m). A red line with vertical markers shows the measured emissions. Numbered points 1 through 8 indicate specific peaks. Small 'A' markers on the x-axis indicate ambient levels.</p>							
Peak	Frequency [MHz]	Polarisation	Level [dB $\mu$ V/m]	Limit Class A 15.109 [dB $\mu$ V/m]	Margin to Class A 15.109 [dB]	Limit 15.209 [dB $\mu$ V/m]	Margin to 15.209 [dB]
1*	64.07	Horizontal	43.4	49.5	-6.1	40	N/A
2*	59.01	Horizontal	40.1	49.5	-9.4	40	N/A
3*	68.88	Horizontal	39.2	49.5	-10.3	40	N/A
4	191.98	Horizontal	39.2	49.5	-14.6	43.5	-4.3
5	86.92	Horizontal	34.9	54	-14.8	40	-5.1
6	79.25	Horizontal	34.5	49.5	-15	40	-5.5
7	225	Horizontal	35.7	56.9	-21.2	46	-10.3
8	494.95	Horizontal	34.3	56.9	-22.6	46	-11.7
<b>Comment:</b>							
*Peaks 1 to 3 are identified unintentional emissions which are unrelated to the 13.56 MHz transmitter and not subject to the §15.209 spurious emissions limit.							

### 3.7 §15.225(e)/ RSS-210 Annex B.6 - Frequency Stability

#### 3.7.1 Test Procedure

The frequency stability was measured in accordance with ANSI C63.10: 2013 clause 6.8.

The frequency stability of the carrier signal was measured over

- a temperature variation from -5°C to 40°C at normal supply voltage and
- a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20°C

Note: The declared EUT operating ambient temperature is from 20°C to 25°C and tests were performed between -5°C to 40°C only.

#### 3.7.2 Limits

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency.

#### 3.7.3 Results

Voltage: 120V, 60Hz							
Temperature [°C]	Measured Frequency [MHz]				Max Frequency Deviation		Result
	Start up	2 min	5 min	10 min	MHz	%	
40	13.56010	13.56013	13.560225	13.56047	0.00017	0.00125	Complied
30	13.56017	13.56025	13.56030	13.56010	0.00000	0.00000	Complied
20	13.56030	13.56022	13.56030	13.56030*	0.00000	0.00000	Complied
10	13.56010	13.56050	13.56017	13.560175	0.00020	0.00147	Complied
0	13.56047	13.56010	13.560225	13.56015	0.00017	0.00125	Complied
-5	13.56010	13.560225	13.560275	13.56030	0.00000	0.00000	Complied

\*Reference operating frequency: 13.56030 MHz at 20°C, 10mins.

Temperature: 20°C				
Voltage [V]	Frequency [MHz]	Frequency Deviation [MHz]	Frequency Deviation [%]	Result
102 (85%)	13.55950	-0.00080	-0.00589	Complied
120	13.56030*	0.00000	0.00000	N/A
138 (115%)	13.55950	-0.00080	-0.00589	Complied

\*Reference operating frequency: 13.56030 MHz at 120V, 60Hz

### 3.8 §15.215(c)/ RSS-Gen 6.7 – 99% Emission Bandwidth

#### 3.8.1 Test Procedure

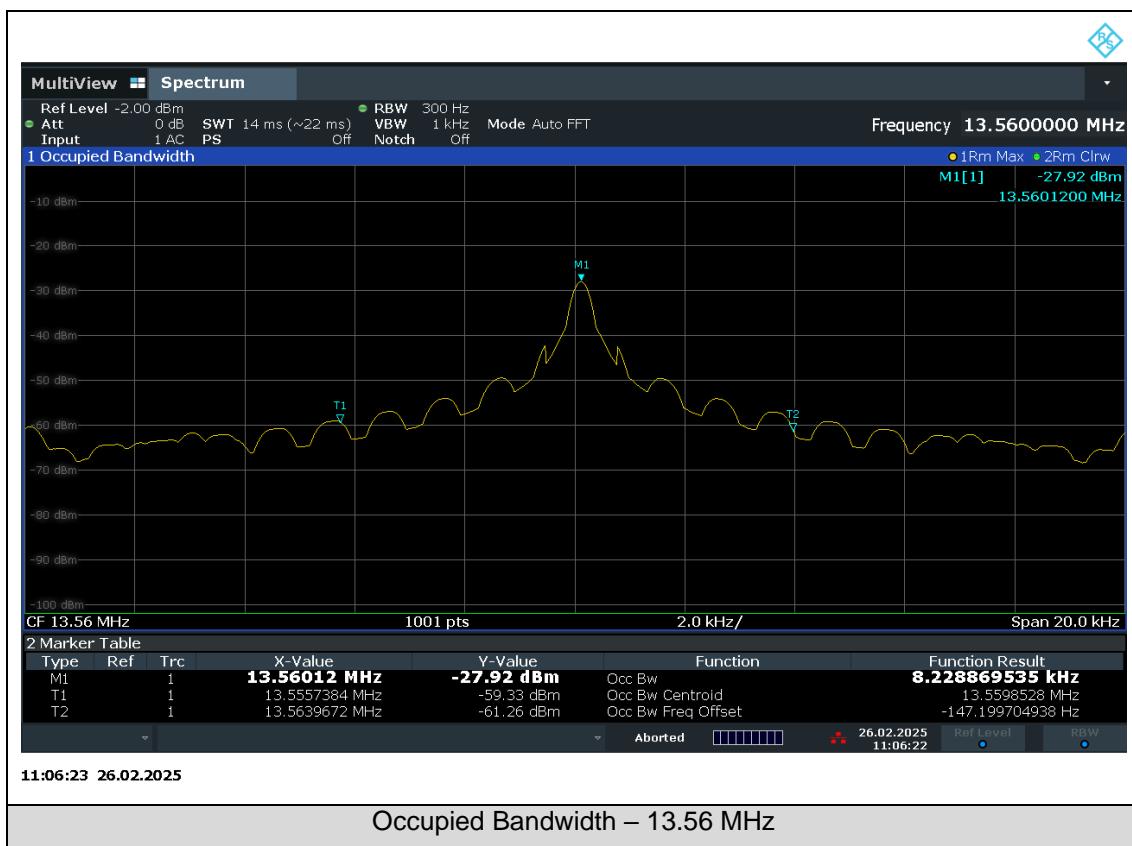
The 99% emission bandwidth of the total transmitted power of the fundamental emission was measured in accordance with ANSI C63.10: 2013 clause 6.9.

#### 3.8.2 Limits

The 99% emission bandwidth should be contained within the frequency band 13.110 – 14.010 MHz.

#### 3.8.3 Results

Frequency [MHz]	99% Bandwidth [kHz]	Lower Frequency [MHz]	Upper Frequency [MHz]	Result
13.56	8.228	13.55573	13.56396	Complied



-- End of Report --