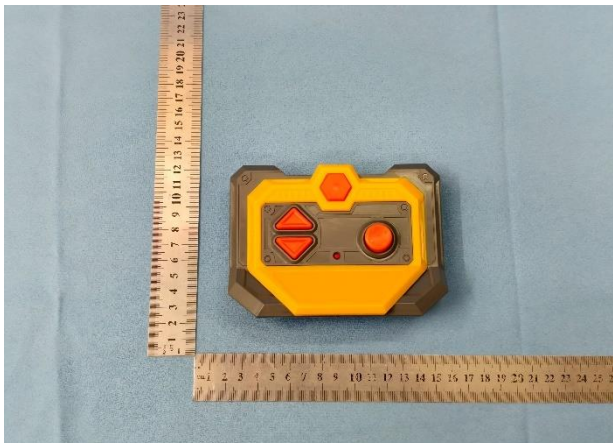


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Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-11-26		
Auftraggeber: <i>Client:</i>	Dickie Spielzeug GmbH & Co. KG Werkstrasse 1, D-90765 Fuerth, Germany				
Prüfgegenstand: <i>Test item:</i>	Short Range Device -Remote Control Toy Transmitter (2.4GHz)				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	24113				
Auftrags-Inhalt: <i>Order content:</i>	FCC Certification				
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15 Subpart C, ANSI C63.10-2013				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-11-26				
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003872607-001 to 002				
Prüfzeitraum: <i>Testing period:</i>	2024-11-26 to 2024-12-23				
Ort der Prüfung: <i>Place of testing:</i>	Hong Kong				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland Hong Kong Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by/ supervised by:</i>	 X <u>Monica Tai / Wooga Wu</u>		genehmigt von: <i>authorized by:</i>	 X <u>Billy Yip</u>	
Datum: <i>Date:</i>	2025-02-03		Ausstellungsdatum: <i>Issue date:</i>	2025-02-03	
Stellung / Position:	Assistant Test Engineer		Stellung / Position:	Laboratory Manager	
Sonstiges / <i>Other:</i>	"Decision Rule" document announced in our website (https://www.tuv.com/landingpage/en/qm-gcn/) describes the statement of conformity and its rule of enforcement for test results are applicable throughout this test report. FCC ID: NLB24113TX				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

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Anmerkungen Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

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Product Information

Manufacturers declarations

	Transmitter
Operating frequency range	2410-2475MHz
Type of modulation	GFSK
Number of channels	66
Type of antenna	Fixed Integral wire antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	3 V DC
Occupied bandwidth	Not available
Channel bandwidth	1MHz
Emission designator	F1D
Frequency stability	Not available

Product function and intended use

The equipment under test (EUT) is a radio control toy transmitter operating at 2.4GHz. It is powered by battery only.

FCC ID: NLB24113TX

Models	Product description
24113	Short Range Device -Remote Control Toy Transmitter (2.4GHz)

Submitted documents

Nil

Independent Operation Modes

The basic operation modes are:

- Transmitting mode.

For further information refer to User Manual

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

Remark

The test results in this test report are only relevant to the tested sample and does not involve any assessment in the production.

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Test Set-up and Operation Mode

Principle of Configuration Selection

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

Test Operation and Test Software

Test operation should refer to test methodology.

- Test mode samples with maximum RF output power and duty cycle and capable to transmit continuously at the lowest, middle and highest frequency channels is provided by the applicant for the testing.
-

Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

- None

Countermeasures to achieve EMC Compliance

- None

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Test Methodology

Radiated Emission

The radiated emission measurements of the transmitter part were performed according to the procedures in ANSI C63.10-2013.

For measurement below 1GHz - the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For measurement above 1GHz - the EUT was placed at the middle of the 1.5 m height turntable and RF absorbing material was placed on ground plane between turntable and measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where

- FS = Field Strength in dBuV/m at 3 meters.
- R = Reading of Spectrum Analyzer in dBuV.
- AF = Antenna Factor in dB.
- CF = Cable Attenuation Factor in dB.
- FA = Filter Attenuation Factor in dB.
- PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

Conducted Emission Calculation

Receiver reading R_r (dB μ V)

LISN insertion loss L_I (dB)

Cable loss C_I (dB)

$$\text{Result (dB}\mu\text{V)} = R_r + L_I + C_I$$

Sample: $R_r = 40.2$ dB μ V

$L_I = 10.2$ dB

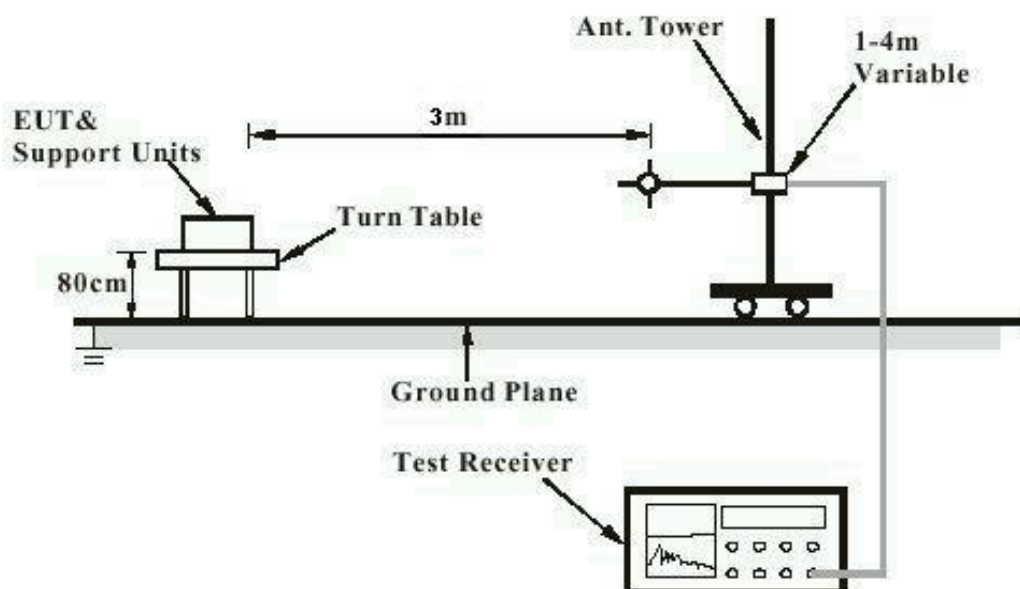
$C_I = 0.3$ dB

$$\text{Result} = 40.2 + 10.2 + 0.3 = 50.7 \text{ dB}\mu\text{V}$$

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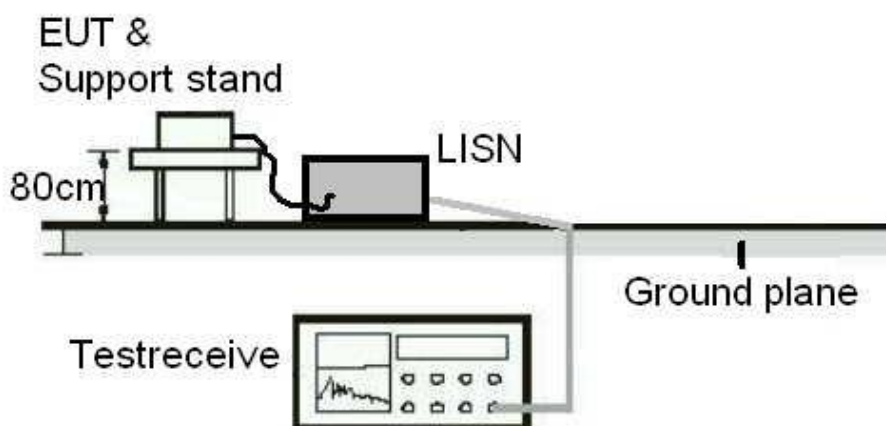
Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



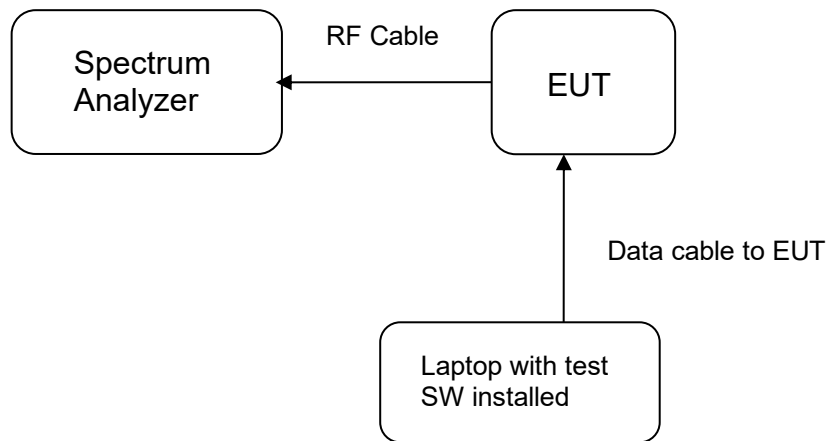
Note: Measurements above 1 GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



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Diagram of Equipment Configuration for Antenna-port Conducted Measurement (if applicable)



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Test Facility

Test Laboratory Information

TÜV Rheinland Hong Kong Ltd.

Address: 3-4/F, Fou Wah Industrial Building, 10-16 Pun Shan Street, Tsuen Wan, N.T., Hong Kong

Tel.: +852 2192 1000

Fax: +852 2192 1001

Email: service-gc@tuv.com

The test facility is recognized or accredited by the following organizations:

FCC

Designation Number : HK0013

ISED/IC

Company Number : 26152

Hong Kong Productivity Council

Address: LG1/F, HKPC Building 78 Tat Chee Avenue, Kowloon, Hong Kong

Tel.: +852 2788 6396

Fax: +852 2788 5405

Email: emc@hkpc.org

The test facility is recognized or accredited by the following organizations:

FCC

Designation Number : HK0012

ISED/IC

Company Number : 4780A

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List of Test and Measurement Instruments

Hong Kong Productivity Council

Radiated Emission

Equipment	Manufacturer	Type	Cal. Date	Due Date
Semi-anechoic Chamber	Frankonia	---	2024-03-04	2025-03-04
Test Receiver	Rohde & Schwarz	ESU40	2024-03-09	2025-03-09
Double-Ridged Waveguide Horn	EMCO	3117	2022-11-21	2025-05-21
Bi-conical Antenna	Rohde & Schwarz	HK116	2022-10-24	2025-04-24
Log Periodic Antenna	Rohde & Schwarz	HL223	2022-10-25	2025-04-25
Cable	SF118/11N/11 N/12000MM	Huber+Suhner	2024-01-06	2025-01-06
Microwave amplifier	COM-POWER Corporation	PAM-118A	2024-03-03	2025-03-03
High Pass Filter	Trilithic	23042	2023-10-29	2025-10-29

TÜV Rheinland Hong Kong Ltd.

Radio Test

Equipment	Manufacturer	Type	Cal. Date	Due Date
Spectrum Analyzer	R & S	FSV40	2024-08-07	2025-08-06

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Measurement Uncertainty

The estimated combined standard uncertainty for powerline conducted emissions measurements is $\pm 3.22\text{dB}$.

The estimated combined standard uncertainty for radiated emissions measurements is $\pm 2.44\text{dB}$ (9kHz to 30MHz) and $\pm 5.92\text{dB}$ (30MHz to 1000MHz) and is $\pm 4.92\text{dB}$ (1GHz to 18GHz).

The estimated combined standard uncertainty for antenna conducted emission is $\pm 1.94\text{dB}$

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for the level of confidence is approximately 95%.

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Results FCC Part 15 - Subpart C

FCC 15.203 – Antenna Requirement 1		Pass
FCC Requirements:	No antenna other than that furnished by the responsible party shall be used with the device	
Results:	a) Antenna type	Fixed Integral wire antenna
	b) Manufacturer and model no.:	N/A
	c) Peak Gain:	0 dBi
Verdict:	Pass	

FCC 15.204 – Antenna Requirement 2		Pass
FCC Requirements:	An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator.	
Results:	Only one integral antenna can be used.	
Verdict:	Pass	

FCC 15.207 – Conducted Emission on AC Mains		N/A
There is no AC power input or output ports on the EUT.		

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FCC 15.215 (c) – 20 dB Bandwidth

Pass

Test Specification : ANSI C63.10 – 2013
Test date : 2024-12-23
Mode of operation : Tx mode
Port of testing : Antenna port
Supply voltage : 3 V DC
Temperature : 22.4°C
Humidity : 40.8%

Requirement: The intentional radiators must be designed to ensure that the 20dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.

Results: Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.
For test protocols refer to Appendix 1.

Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2410	2409.848	> 2400	2411.266	< 2483.5
2443	2442.855	> 2400	2444.194	< 2483.5
2475	2474.855	> 2400	2476.158	< 2483.5

ANSI C63.10 – 6.9.3 – Occupied Bandwidth

N/A

Test Specification : ANSI C63.10 - 2013
Test date : 2024-12-23
Mode of operation : Tx mode
Port of testing : Antenna port
Supply voltage : 3 V DC
Temperature : 22.4°C
Humidity : 40.8 %

FCC Requirement : N/A

Results: Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.
For test protocols refer to Appendix 1.

Frequency (MHz)	Left (MHz)	Right (MHz)	99% bandwidth (MHz)
2410	2409.856	2411.288	1.433
2443	2442.863	2444.179	1.317
2475	2474.826	2476.129	1.020

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FCC 15.249 (a) – Field Strength of Fundamental and Harmonics

Pass

Test Specification : ANSI C63.10 – 2013
Test date : 2024-12-10
Mode of operation : Tx mode
Port of testing : Enclosure
Frequency range : 9kHz - 25GHz
Supply voltage : 3 V DC
Temperature : 21°C
Humidity : 59%

Requirement: The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limit.

Results:

Fundamental Frequency: 2410MHz Vertical Polarization

Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m
2410.705	101.6	114.0 / PK
2410.705	73.3	94.0 / AV

Fundamental Frequency: 2410MHz Horizontal Polarization

Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m
2410.701	93.9	114.0 / PK
2410.701	65.6	94.0 / AV

Harmonics: 2410MHz Vertical Polarization

Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m
4821.410	69.7	74.0 / PK
4821.410	40.3	54.0 / AV
No Peak Found	---	74.0 / PK
No Peak Found	---	54.0 / AV

Harmonics: 2410MHz Horizontal Polarization

Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m
4821.410	56.0	74.0 / PK
4821.410	29.1	54.0 / AV
No Peak Found	---	74.0 / PK
No Peak Found	---	54.0 / AV

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Fundamental Frequency: 2443MHz		Vertical Polarization	
Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m	
2443.339	100.6	114.0 / PK	
2443.339	73.4	94.0 / AV	
Fundamental Frequency: 2443MHz		Horizontal Polarization	
Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m	
2443.689	95.9	114.0 / PK	
2443.689	67.8	94.0 / AV	
Harmonics: 2443MHz		Vertical Polarization	
Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m	
4886.679	69.9	74.0 / PK	
4886.679	40.7	54.0 / AV	
No Peak Found	---	74.0 / PK	
No Peak Found	---	54.0 / AV	
Harmonics: 2443MHz		Horizontal Polarization	
Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m	
4887.426	61.5	74.0 / PK	
4887.426	33.6	54.0 / AV	
7331.115	52.8	74.0 / PK	
7331.115	27.6	54.0 / AV	

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Fundamental Frequency: 2475MHz			Vertical Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
2475.705		99.5		114.0 / PK	
2475.705		71.3		94.0 / AV	
Fundamental Frequency: 2475MHz			Horizontal Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
2475.705		96.7		114.0 / PK	
2475.705		68.4		94.0 / AV	
Harmonics: 2475MHz			Vertical Polarization		
Frequency MHz		Level dBuV/m		Limit / Detector dBµV/m	
4951.416		66.5		74.0 / PK	
4951.416		37.6		54.0 / AV	
No Peak Found		---		74.0 / PK	
No Peak Found		---		54.0 / AV	
Harmonics: 2475MHz			Horizontal Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
4951.426		59.0		74.0 / PK	
4951.426		31.5		54.0 / AV	
7427.035		52.0		74.0 / PK	
7427.035		27.2		54.0 / AV	

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FCC 15.249 (d) – Out of Band Radiated Emission		Pass
Test Specification	: ANSI C63.10 – 2013	
Test date	: 2024-12-10	
Mode of operation	: Tx mode	
Port of testing	: Enclosure	
Frequency range	: 9kHz - 25GHz	
Supply voltage	: 3 V DC	
Temperature	: 21°C	
Humidity	: 59%	
Requirement:	The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limit.	
Results:	All three transmit frequency modes comply with the field strength limit of section 15.209. There is no spurious found below 30MHz.	
TX Frequency: 2410MHz Vertical Polarization		
Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m
2400.000	48.9	74.0 / PK
2400.000	20.8	54.0 / AV
2390.000	45.5	74.0 / PK
2390.000	19.9	54.0 / AV
TX Frequency: 2410MHz Horizontal Polarization		
Frequency MHz	Level dBµV/m	Limit / Detector dBµV/m
2400.000	40.4	74.0 / PK
2400.000	20.1	54.0 / AV
2390.000	37.1	74.0 / PK
2390.000	19.4	54.0 / AV

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TX Frequency: 2443MHz			Vertical Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
No Peak Found		---		74.0 / PK	
No Peak Found		---		54.0 / AV	
TX Frequency: 2443MHz			Horizontal Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
No Peak Found		---		74.0 / PK	
No Peak Found		---		54.0 / AV	
TX Frequency: 2475MHz			Vertical Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
2483.500		49.9		74.0 / PK	
2483.500		19.4		54.0 / AV	
TX Frequency: 2475MHz			Horizontal Polarization		
Frequency MHz		Level dBµV/m		Limit / Detector dBµV/m	
2483.500		46.6		74.0 / PK	
2483.500		18.9		54.0 / AV	

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Appendix 1

Test Results

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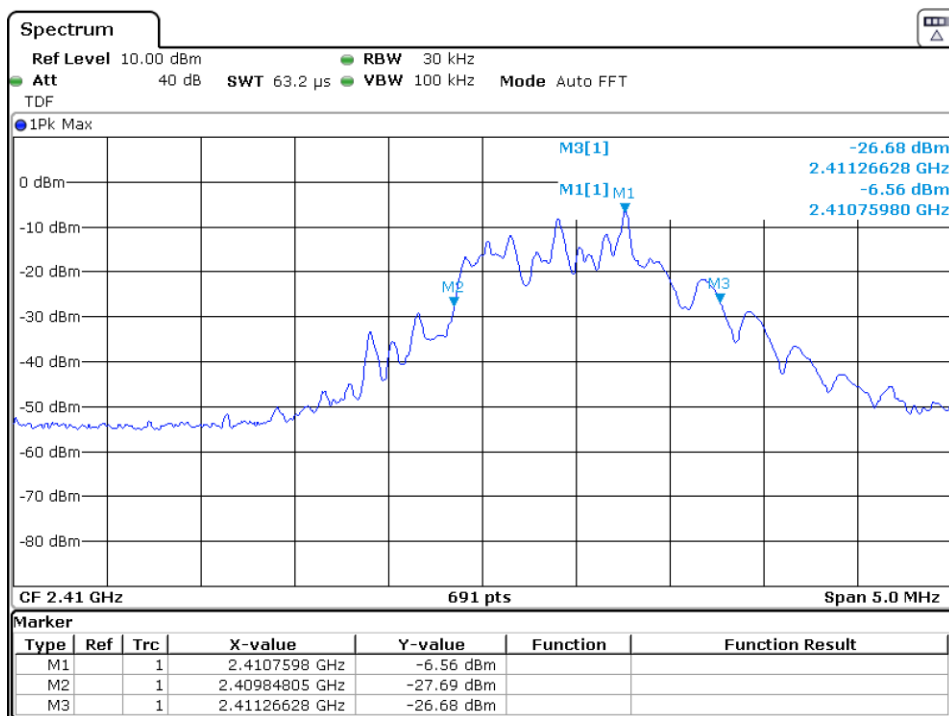
Absatz
Clause

Anforderungen - Prüfungen /
Requirements - Tests

Messergebnisse – Bemerkungen/
Measuring results - Remarks

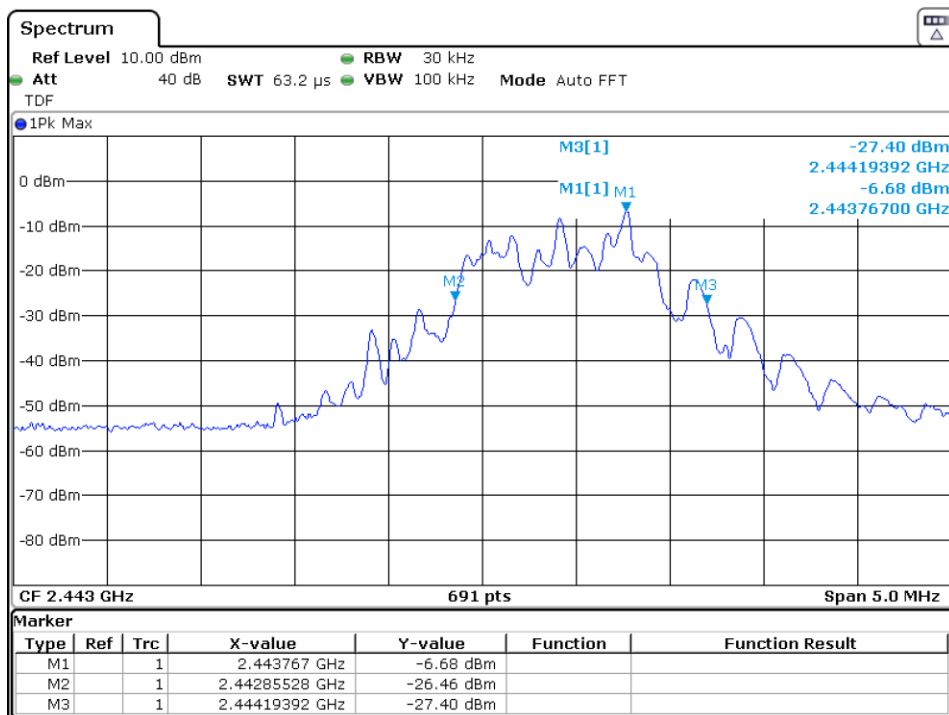
Ergebnis
Result

Test results of 20 dB Bandwidth



Date: 23.DEC.2024 10:31:25

Tx frequency: 2410MHz



Date: 23.DEC.2024 10:32:47

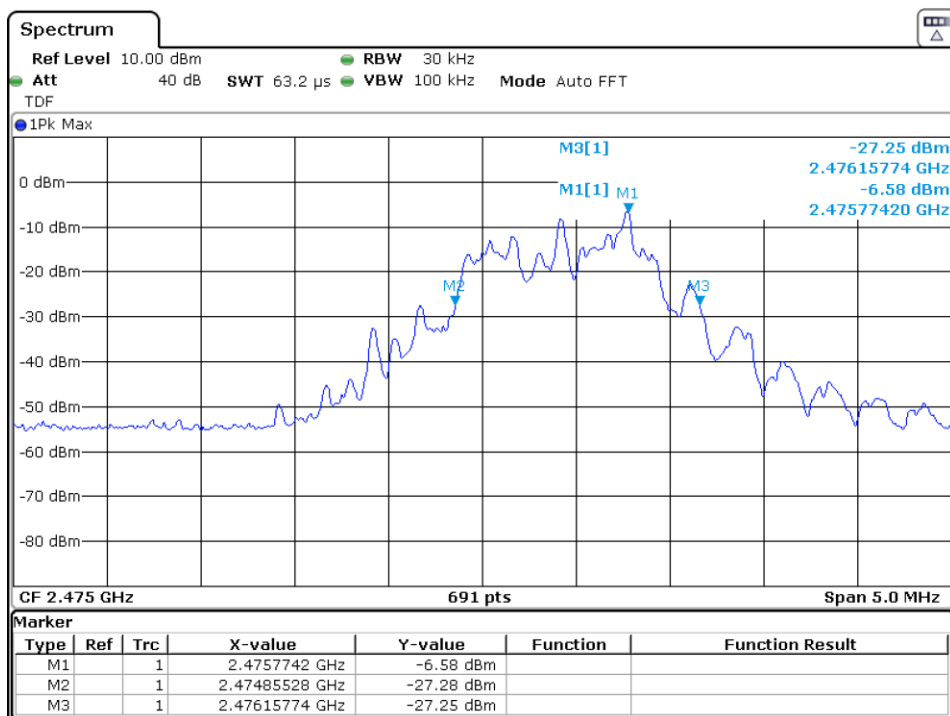
Tx frequency: 2443MHz

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Date: 23.DEC.2024 10:33:55

Tx frequency: 2475MHz

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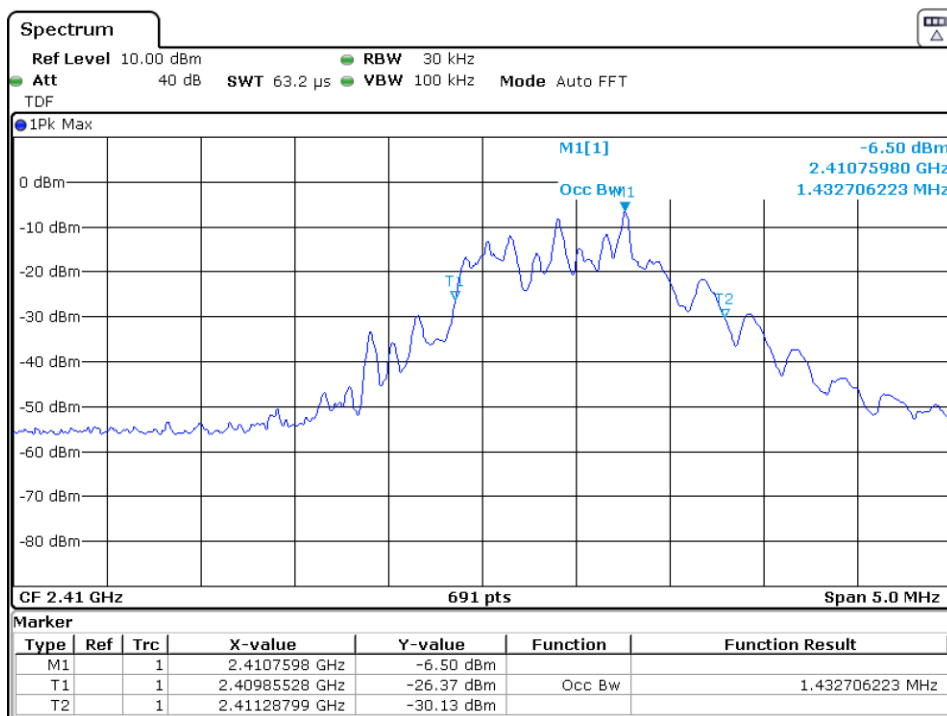
Absatz
Clause

Anforderungen - Prüfungen /
Requirements - Tests

Messergebnisse – Bemerkungen/
Measuring results - Remarks

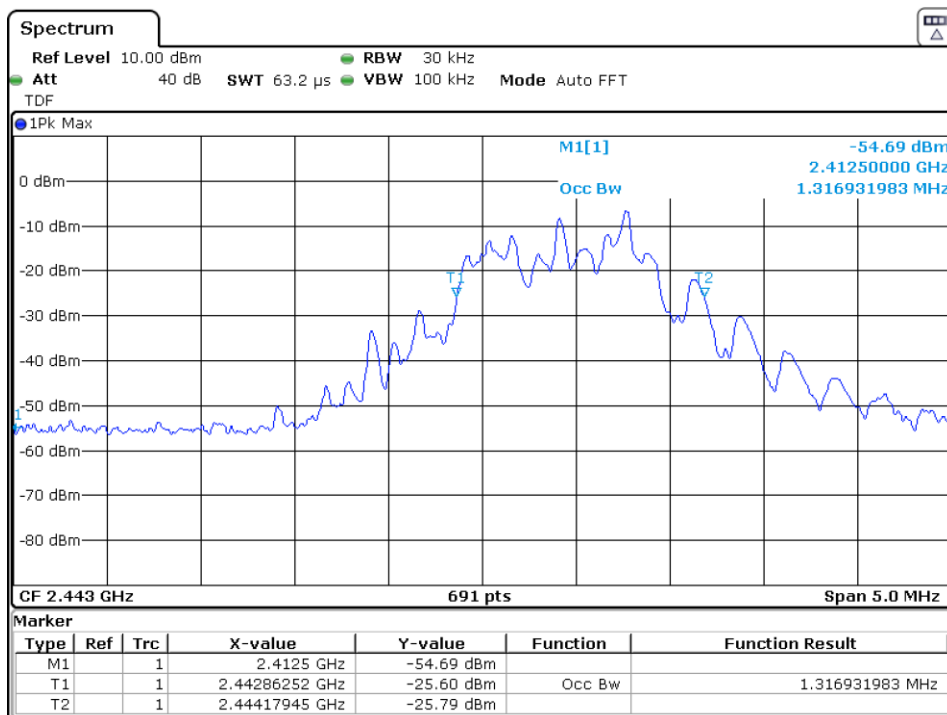
Ergebnis
Result

Test results of 99% Occupied Bandwidth



Date: 23.DEC.2024 10:30:12

Tx frequency: 2410MHz



Date: 23.DEC.2024 10:32:10

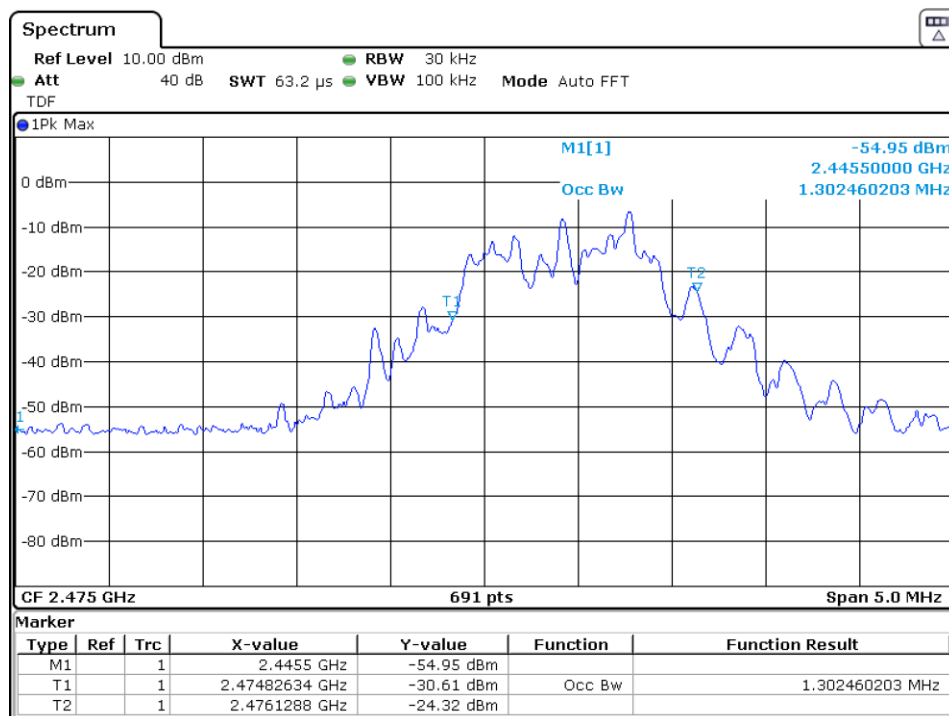
Tx frequency: 2443MHz

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Date: 23.DEC.2024 10:33:16

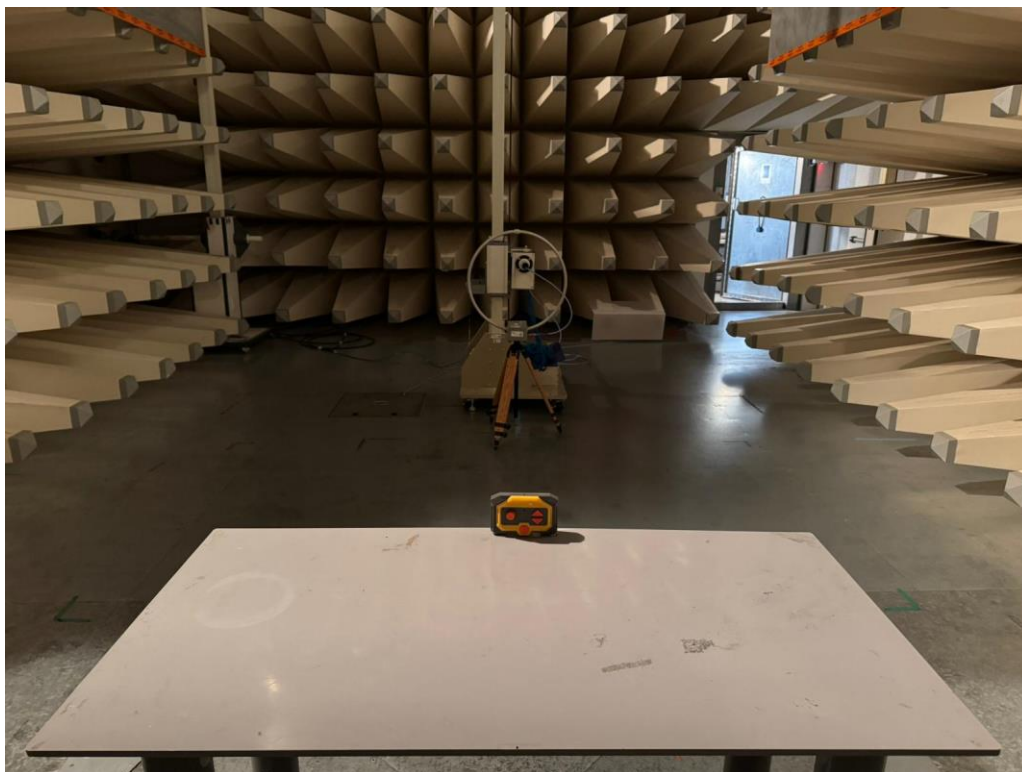
Tx frequency: 2475MHz

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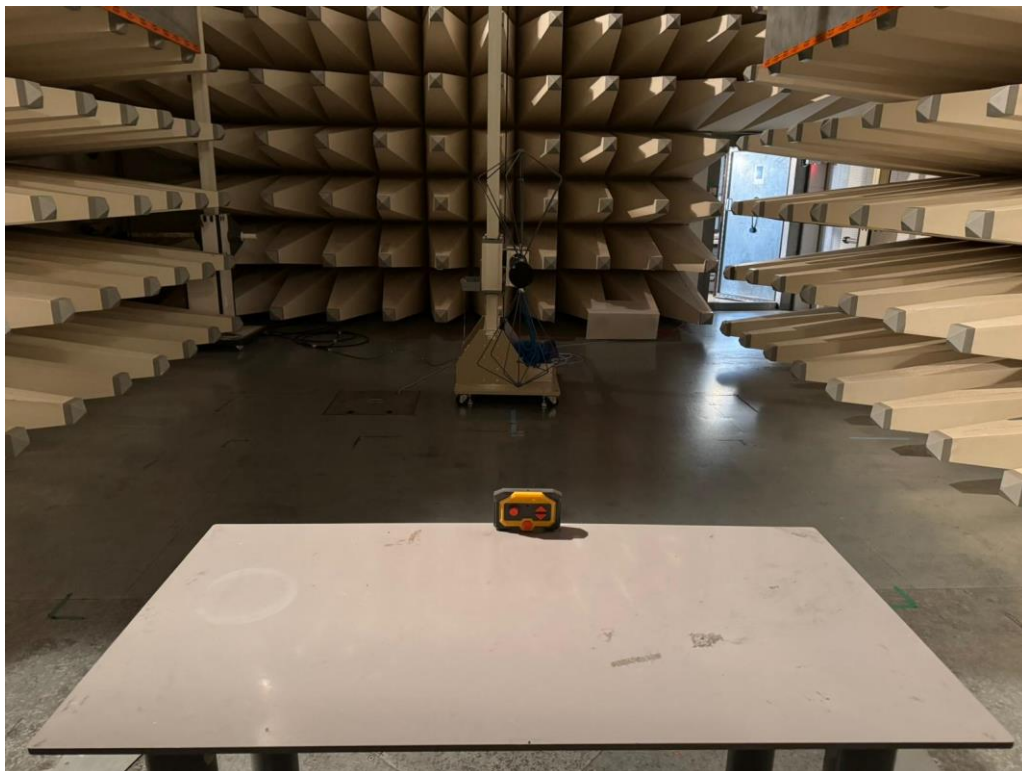
Appendix 2

Test Setup Photos

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Set-up for Radiated Emission (9 kHz-30 MHz)



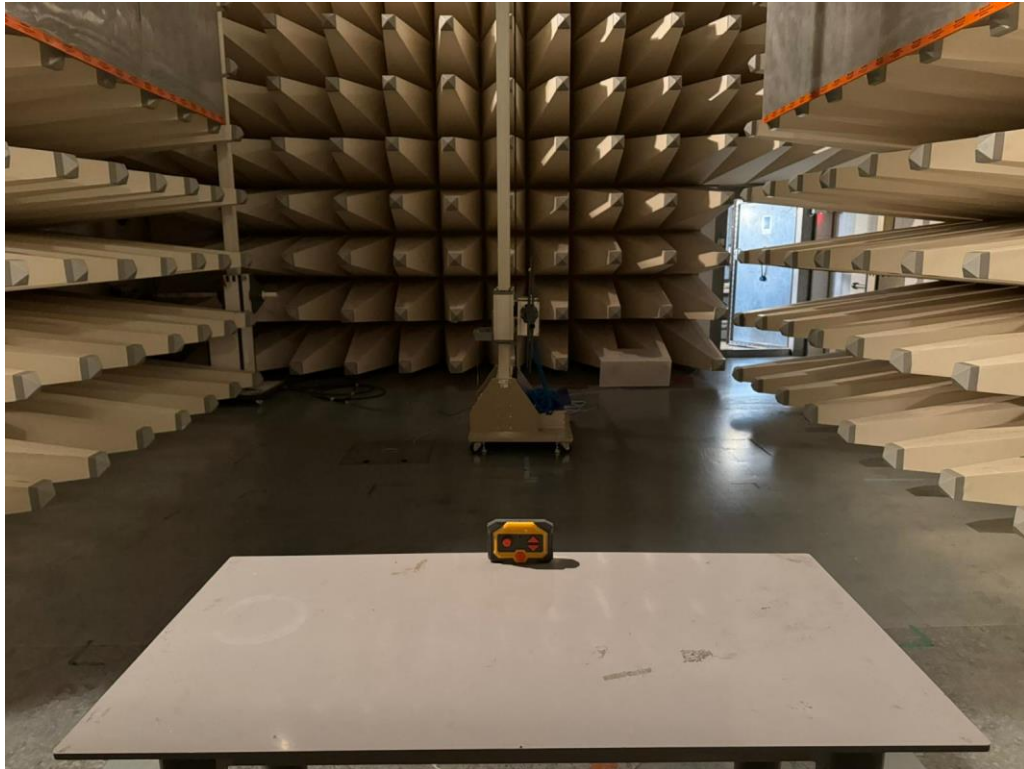
Set-up for Radiated Emission (30 MHz-200 MHz)

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Set-up for Radiated Emission (200 MHz-1000 MHz)



Set-up for Radiated Emission (1 GHz above)

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Appendix 3

EUT External Photos

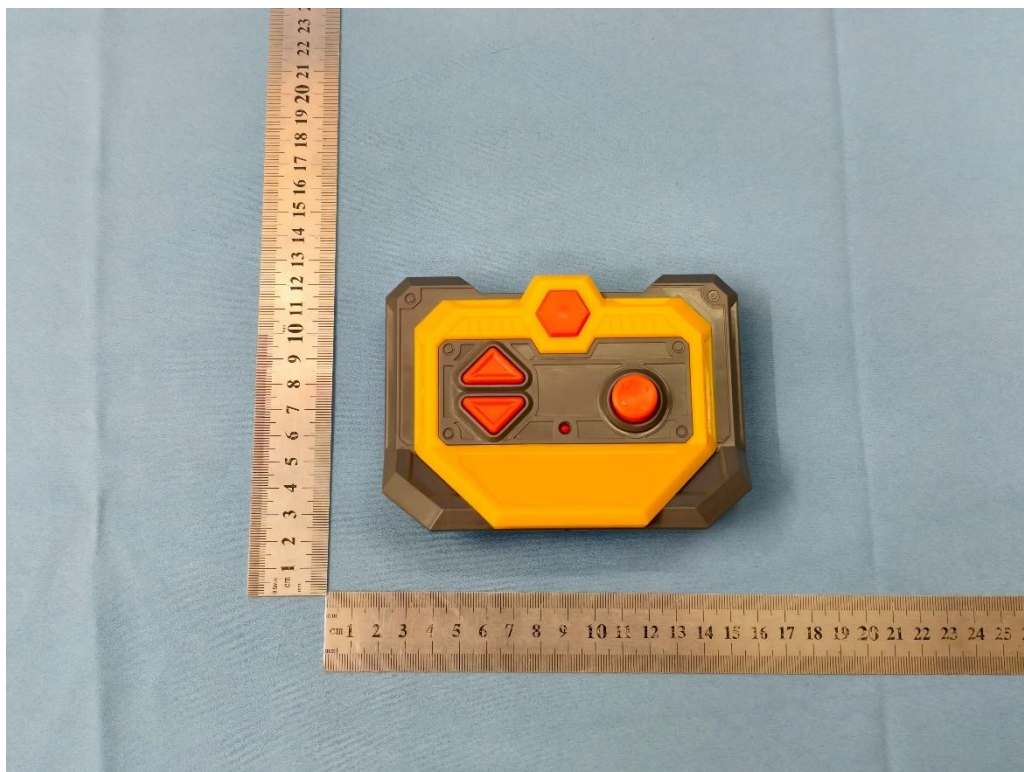
FCC ID: NLB24113TX

Prüfbericht-Nr.:
Test report no.:

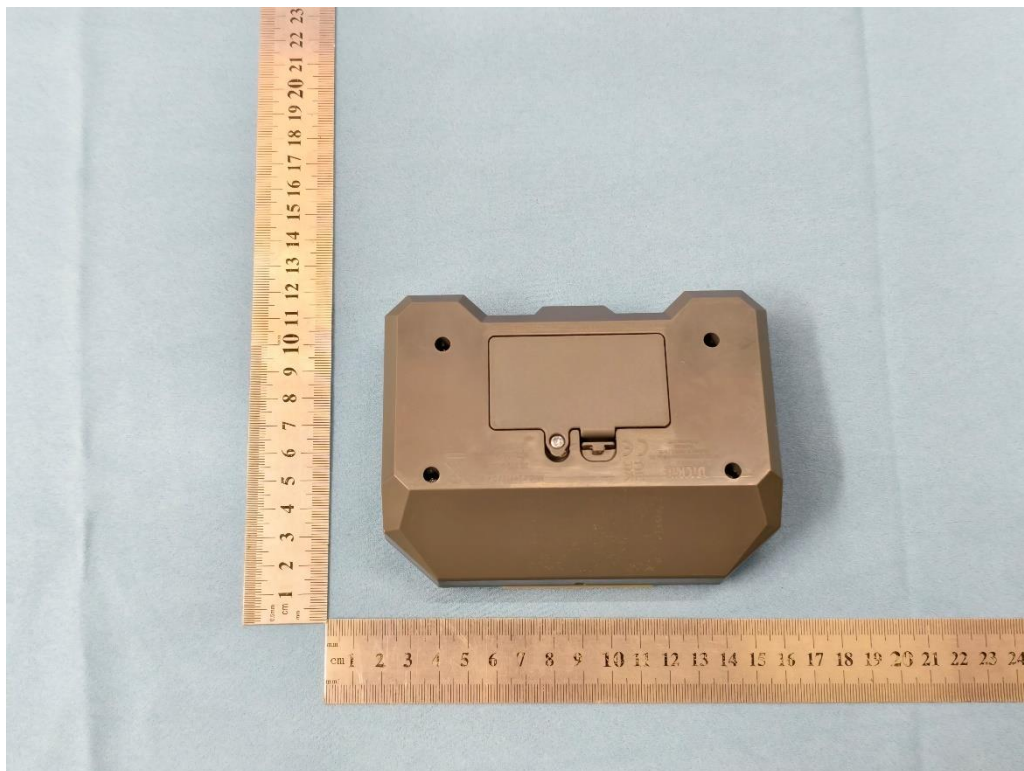
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External View



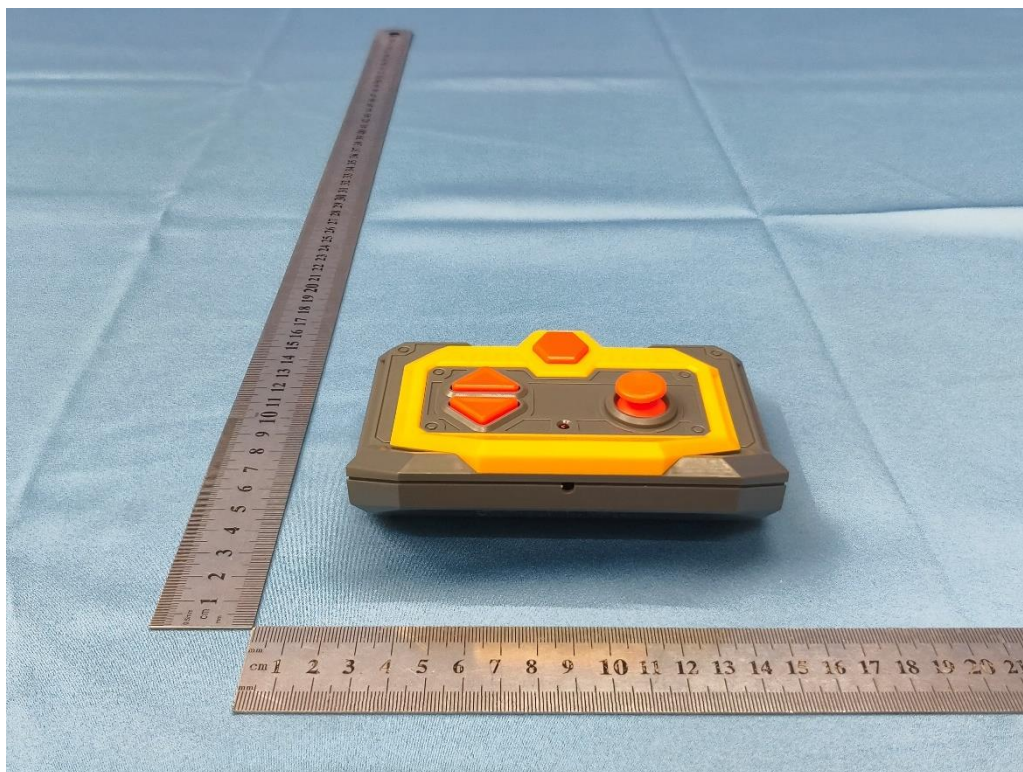
External View

Prüfbericht-Nr.:
Test report no.:

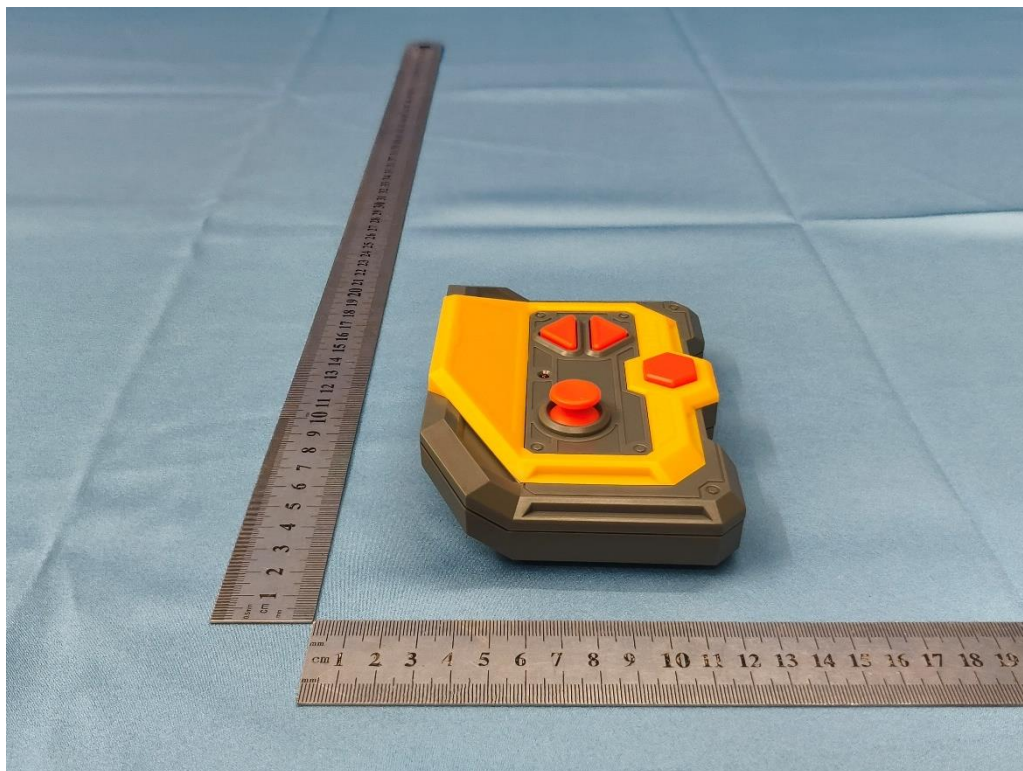
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External View



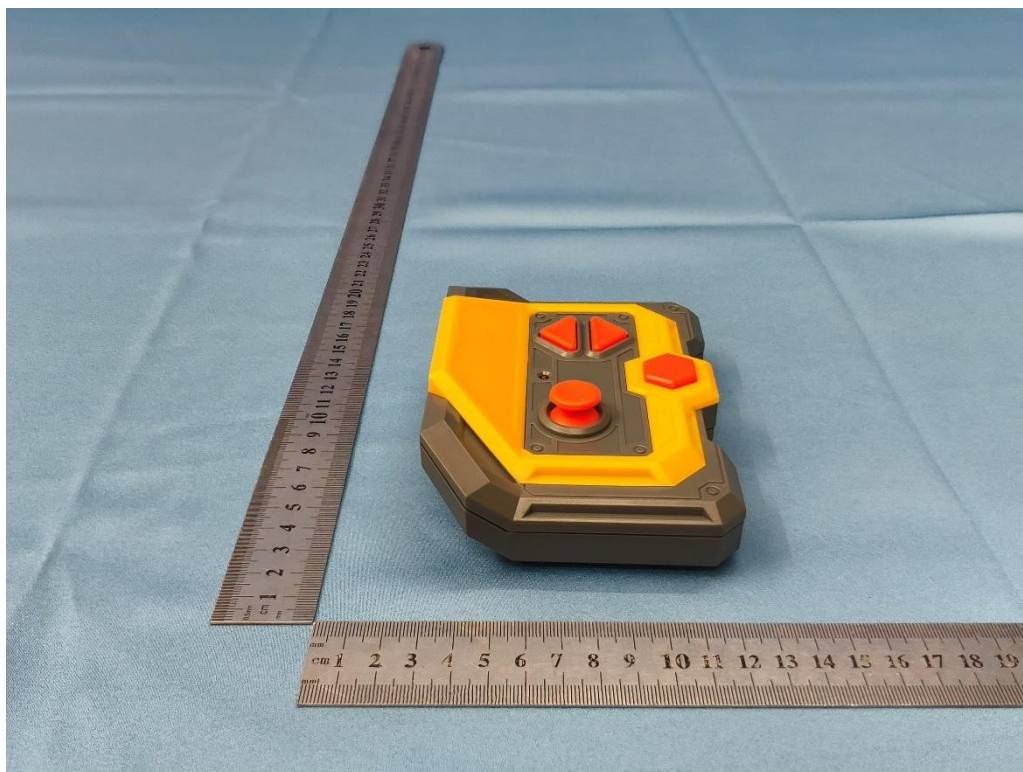
External View

Prüfbericht-Nr.:
Test report no.:

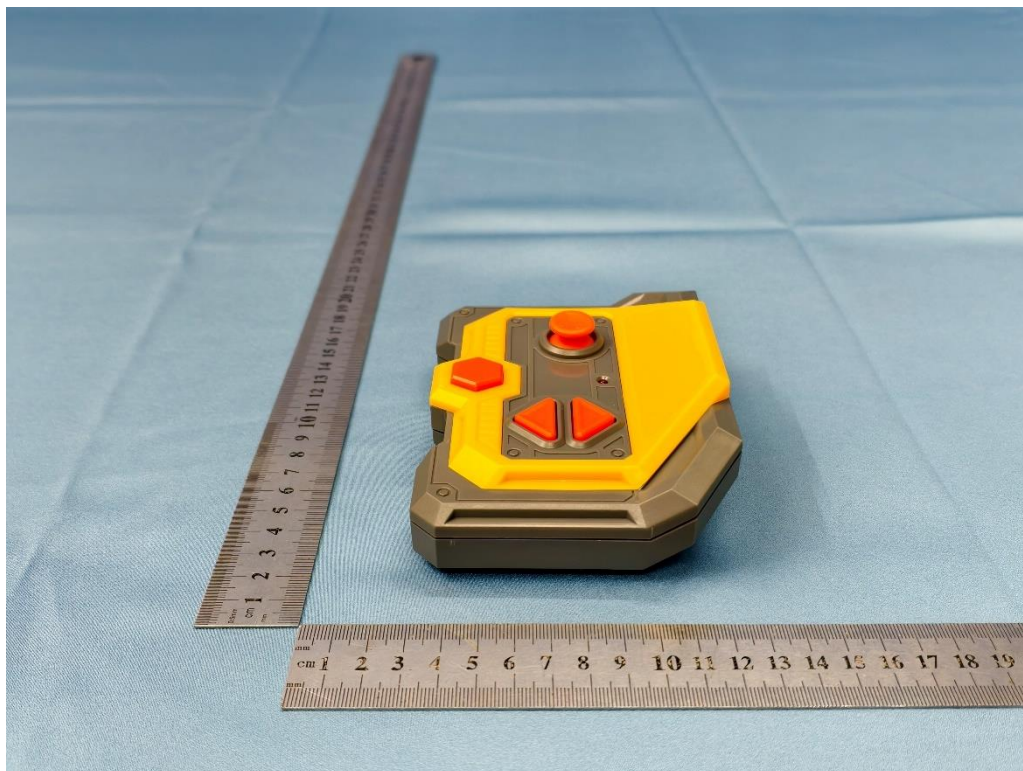
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External View



External View

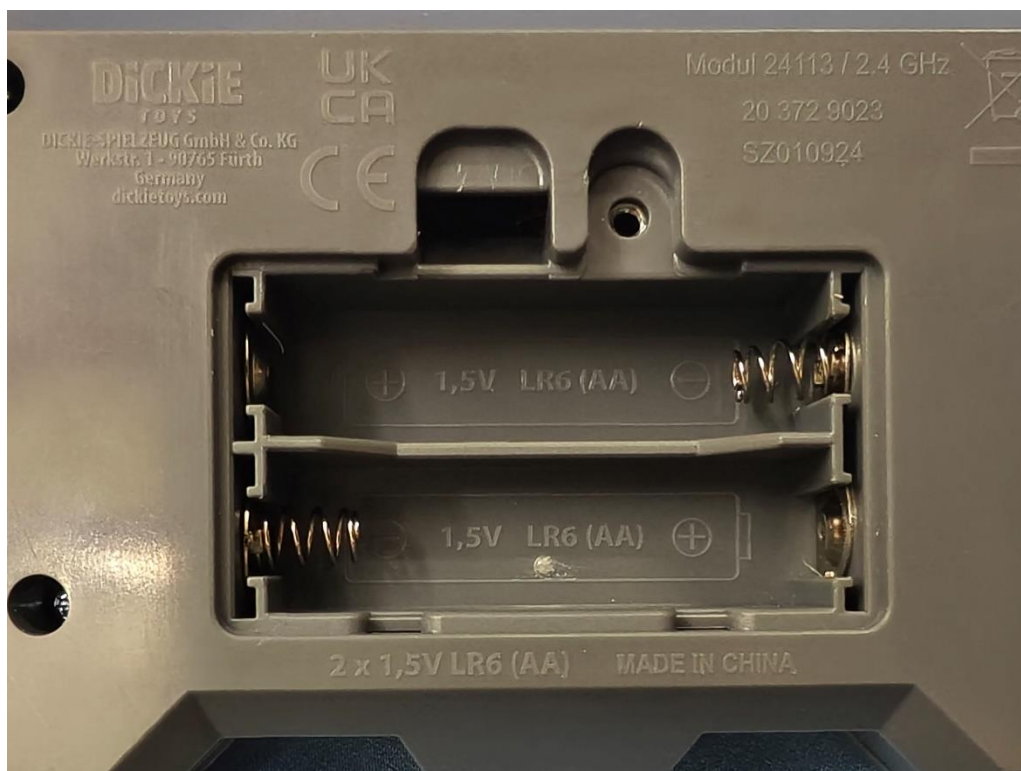
Prüfbericht-Nr.: <i>Test report no.:</i>		CN24U967 001		Seite 31 von 35 <i>Page 31 of 35</i>
Absatz <i>Clause</i>	Anforderungen - Prüfungen / <i>Requirements - Tests</i>	Messergebnisse – Bemerkungen/ <i>Measuring results - Remarks</i>	Ergebnis <i>Result</i>	

Appendix 4

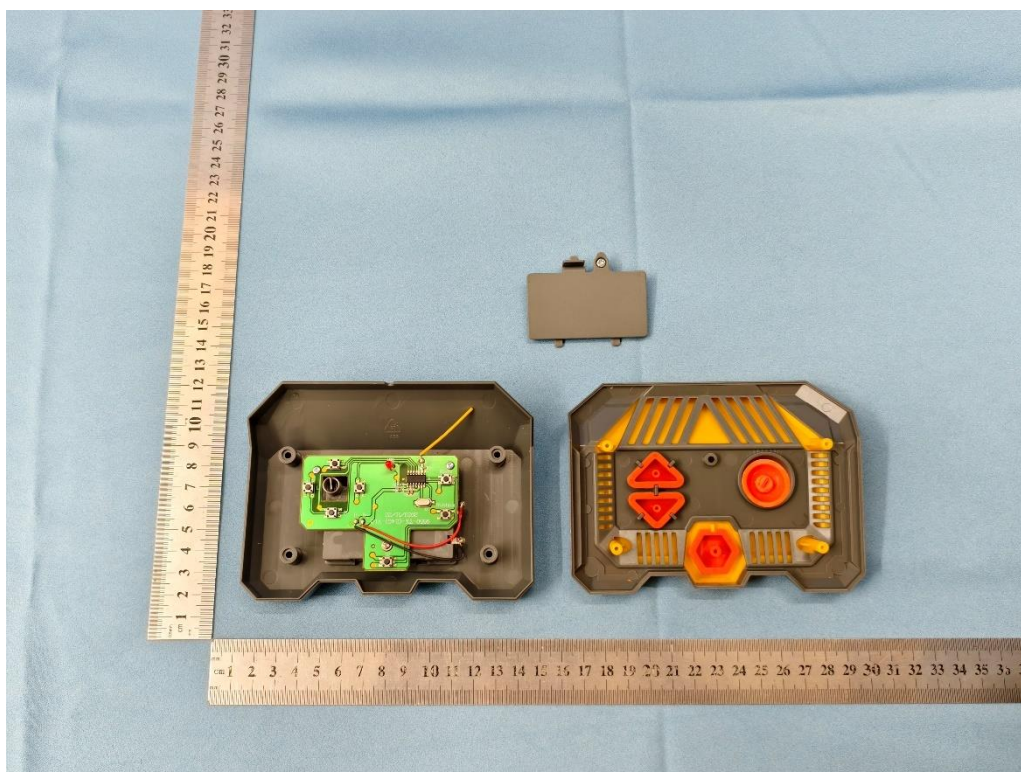
EUT Internal Photos

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Internal View



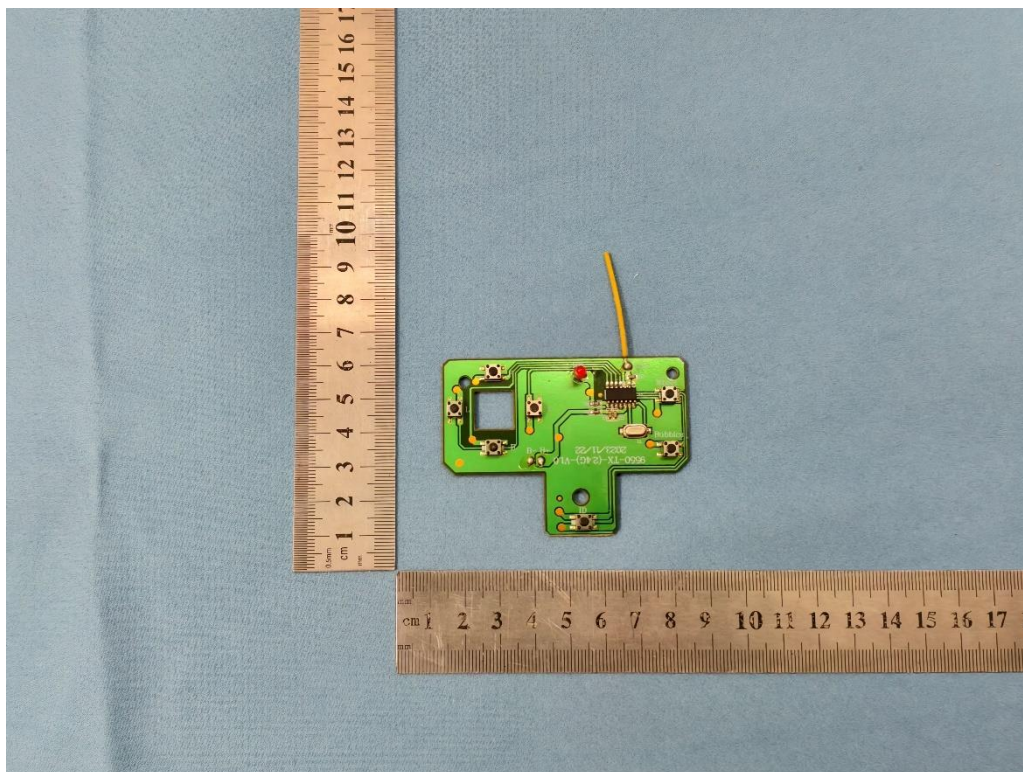
Internal View

Prüfbericht-Nr.:
Test report no.:

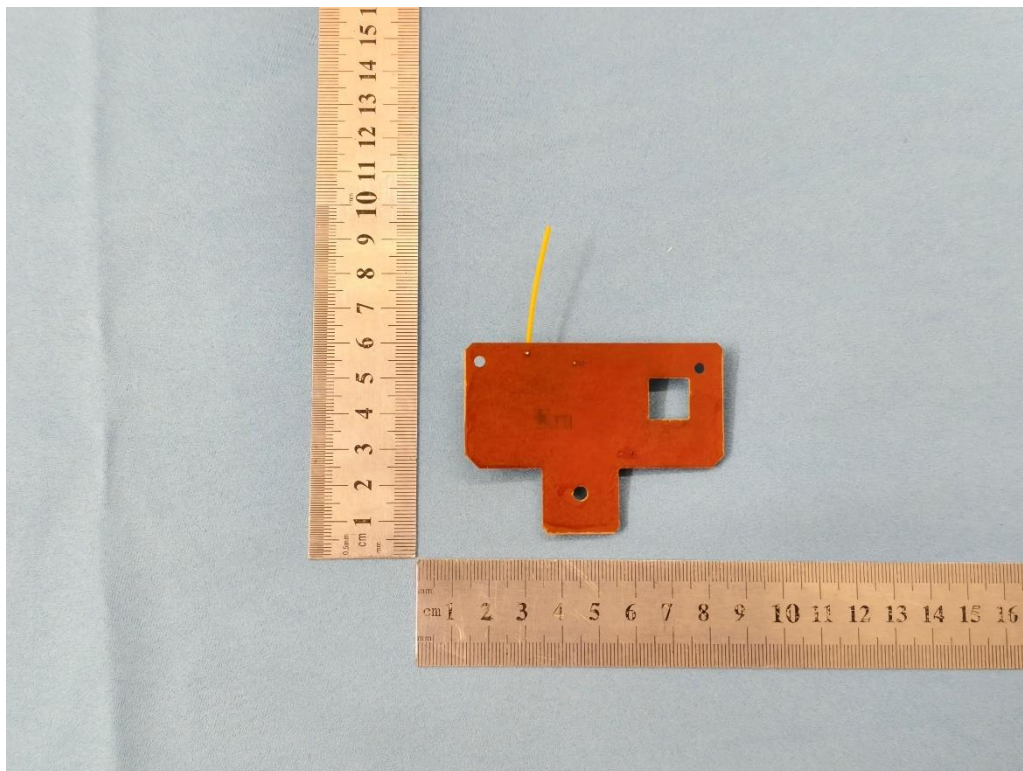
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Internal View



Internal View

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Appendix 5

RF Exposure Information

FCC ID: NLB24113TX

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Maximum Transmitter Power

Frequency (MHz)	Maximum peak field strength (dBμV/m)	Maximum transmitter power (mW)
2410	101.6	4.336
2443	100.6	3.444
2475	99.5	2.674

Note: The maximum peak field strength was taken from table of "Subclause 15.249(a) – Field Strength of Fundamental and Harmonics".

For FCC

According to KDB 447498 D01:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 5 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$
≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

Result:

$$(4.336/5) \cdot \sqrt{2.410} = 1.346 < 3.0$$

$$(3.444/5) \cdot \sqrt{2.443} = 1.077 < 3.0$$

$$(2.674/5) \cdot \sqrt{2.475} = 0.841 < 3.0$$

Conclusion: No SAR is required.