

Prüfbericht-Nr.: <i>Test report no.:</i>	CN25MG2F 001	Auftrags-Nr.: <i>Order no.:</i>	326109805	Seite 1 von 18 <i>Page 1 of 18</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2025-05-19	
Auftraggeber: <i>Client:</i>	Whetron Electronics (Suzhou) Co., Ltd. No. 457 Xiangjiang Road, High New District, Suzhou, Jiangsu, 215129, P.R. China			
Prüfgegenstand: <i>Test item:</i>	TPMS Sensor			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	2D000689 FCC ID: 2ALBS2D000689 IC:27971-S200235500S			
Auftrags-Inhalt: <i>Order content:</i>	Complete test			
Prüfgrundlage: <i>Test specification:</i>	FCC CFR47 Part 15, Subpart C Section 15.231 RSS-210 Issue 11, June 2024 RSS-Gen Issue 5, Amendment 2, February 2021 ANSI C63.10: 2013			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-06-03			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A004028419-001			
Prüfzeitraum: <i>Testing period:</i>	2025-06-19 to 2025-06-19			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	Ausstellungsdatum: <i>Issue date:</i>			
Stellung / Position:	Stellung / Position:			
Sonstiges / <i>Other:</i>	HVIN: HW:1.0 PMN: TPMS Sensor			
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				
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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. 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 115:2023, 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 115:2023, 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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TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 20dB & 99% BANDWIDTH

RESULT: Pass

5.1.3 TRANSMISSION TIME / SILENT PERIOD

RESULT: Pass

5.1.4 CONDUCTED EMISSION

RESULT: N/A

5.1.5 FIELD STRENGTH OF FUNDAMENTAL AND RADIATED SPURIOUS EMISSION

RESULT: Pass

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1. General Remarks

1.1 Complementary Materials

Null.

2. Test Sites

2.1 Test Facilities

TÜV Rheinland (Shanghai) Co., Ltd.
Workshop14, North Half of Workshop 10 and Workshop 16, Pingqian (Taicang) Modern Industrial Park, No.525, Yuewang Lingang South Road, Shaxi, Taicang, Jiangsu, China

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules. The description of the test facility is listed under FCC registration number 930979.

The Innovation, Science and Economic Development Canada has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance. The description of the test facility is listed under chambers filing number 33038.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Equip.	Description	Model	Manufacturer	Due Date
EMC-C-175	Preamplifier	EMC051845SE	Taiwan EMCI	2025-07-24
EMC-C-018	Double ridged horn antenna	BBHA 9120 D	Schwarzbeck	2026-03-24
EMC-C-161	Spectrum analyser	FSV40	Rohde & Schwarz	2025-07-15
EMC-C-001	3m semi-anechoic chamber	SAC3	Frankonia	2026-12-03
EMC-C-066	EMI test receiver	ESCI	Rohde & Schwarz	2025-10-17
EMC-C-155	Bilog antenna	CBL 6112D	Teseq	2026-09-24
EMC-C-317	Thermohygrometer	608-H1	Rohde & Schwarz	2026-06-10
Software				
EMC-S-032	EMI measurement software	EMC32-MEB (10.60.20)	Rohde & Schwarz	NA
EMC-S-036	RF measurement software	WMS32-WB (11.40.00)	Rohde & Schwarz	NA

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

Table 2: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Radiated Emission	30MHz - 1GHz	±5.34dB
	> 1GHz	±5.40dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (equipments under test) is a TPMS Sensor which is working on 433.92MHz.
For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Description of EUT	
Product Name:	TPMS Sensor
Model No.:	2D000689
Rated Voltage:	DC 3V (Built in button battery)
Technical Specification of Transmitter	
Frequency Range:	433.92 MHz
Modulation Type:	FSK
Antenna Type:	Planar antenna

3.3 Independent Operation Modes

Table 4: Independent Operation Modes

Test Mode	Channel Frequency	Mode
TM1	433.92 MHz	Transmitting continually
TM2	433.92 MHz	Normal operation

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Bill of Material
- PCB Layout
- Photo Document
- Circuit Diagram
- Instruction Manual
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Null.

4.3 Special Accessories and Auxiliary Equipment

Null.

4.4 Countermeasures to achieve EMC Compliance

Null.

5. Test Results

5.1 Conducted Testing at Antenna Port

5.1.1 Antenna Requirement

RESULT: **Pass**

According to the manufacturer declared, the EUT has one Internal antenna, the antenna is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Table 5: Antenna Requirement

FCC 15.203 – Antenna Requirement 1	
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device
Results:	Antenna type: Planar antenna
Verdict:	Pass

FCC 15.204 – Antenna Requirement 2	
Requirement:	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 antenna can be used
Verdict:	Pass

RSS-Gen 6.4 – External Control	
Requirement:	The device shall not have any external controls accessible to the user that enable it to be adjusted, selected or programmed to operate in violation of the regulatory requirements, including RSS-Gen and the applicable RSSs
Results:	The device does not have any transmitter external controls accessible to the user that can be adjusted and operated in violation of the limits of this standard.
Verdict:	Pass

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RSS-Gen 6.8 – Antenna Requirement

Requirement: When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

Results:

a) Antenna Type:	Planar Antenna
b) Manufacture:	N/A
c) Model No.:	N/A
d) Gain with reference to an isotropic radiator:	N/A

Verdict: Pass

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5.1.2 20dB & 99% Bandwidth

RESULT:

Pass

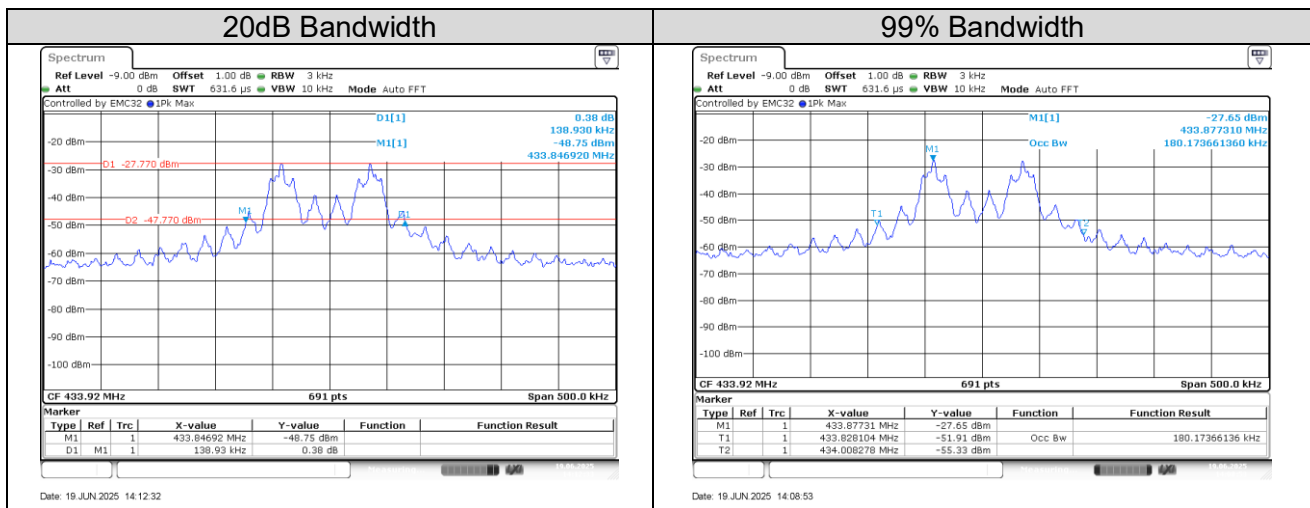
Date of testing : 2025-06-19
Ambient temperature : 22.3°C
Relative humidity : 52.2%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.231(c)
RSS-210 Issue 11, June 2024, A.1.4
RSS-Gen Issue 5, Amendment 2, February 2021, Clause 6.7
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3V
Test modes applied : TM1

Table 6: 20dB & 99% Bandwidth

Channel Frequency [MHz]	20dB Bandwidth [KHz]	Limit [KHz]	99% Bandwidth [KHz]	Result
433.92	138.93	≤ 1084.8	180.17	Pass

Note: Limit = 433920 KHz × 0.25% = 1084.8 KHz

Figure 1: 20dB & 99% Bandwidth



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5.1.3 Transmission Time / Silent Period

RESULT:

Pass

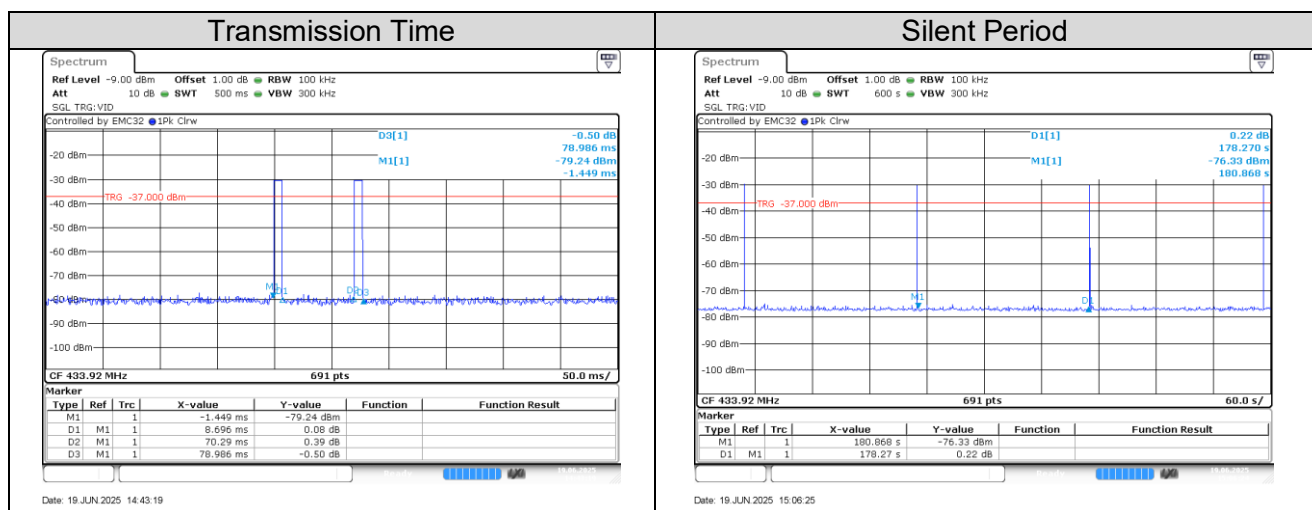
Date of testing : 2025-06-19
Ambient temperature : 22.5°C
Relative humidity : 52.2%
Atmospheric pressure : 101kPa
Test requirement : FCC Part 15.231(e)
RSS-210 Issue 11, June 2024, A.1.5(b)
Test procedure : ANSI C63.10: 2013
Test voltage : DC 3V
Test modes applied : TM2

Table 7: Transmission Time / Silent Period

Channel Frequency [MHz]	Transmission Time [s]	Limit [s]	Result
433.92	0.079	<1	Pass
Channel Frequency [MHz]	Silent Period [s]	Limit [s]	Result
433.92	178.27	>10	Pass

Limit: the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds

Figure 2: Transmission Time / Silent Period



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5.1.4 Conducted Emission

RESULT: **N/A**

Test requirement : FCC Part 15.207 (a)
RSS-Gen Issue 5, Amendment 2, February 2021, Clause 8.8
Test procedure : ANSI C63.10: 2013

Note:
This product is power by battery.
So, this test is not applicable.

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5.1.5 Field strength of fundamental and Radiated Spurious Emission

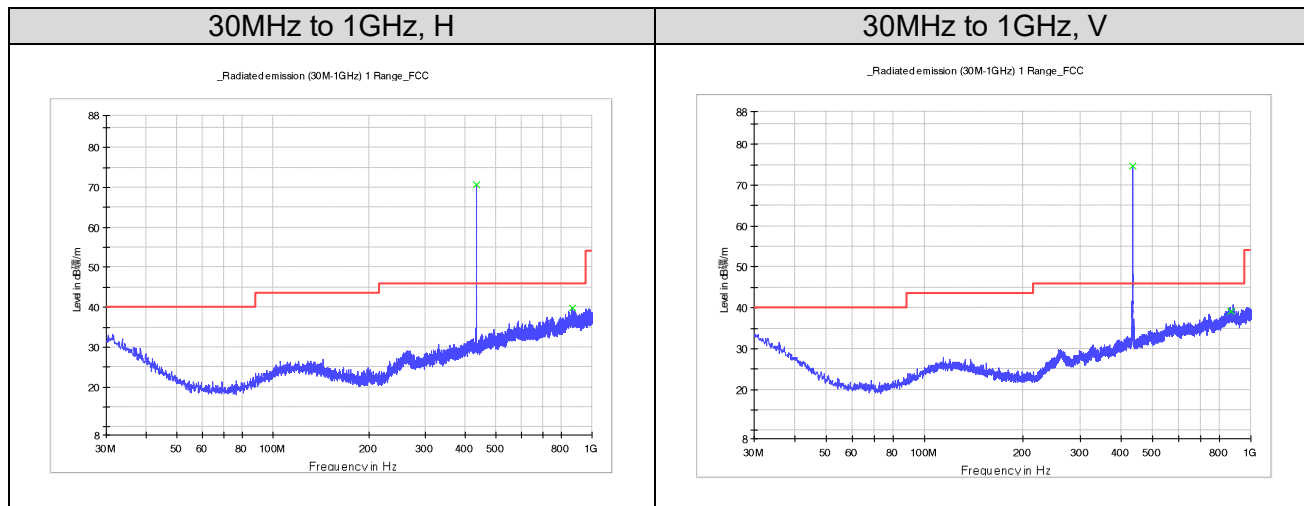
RESULT: **Pass**

Date of testing	:	2025-06-19
Ambient temperature	:	22.1°C
Relative humidity	:	52.6%
Atmospheric pressure	:	101kPa
Test requirement	:	FCC Part 15.205 FCC Part 15.209 FCC Part 15.231(e) RSS-210 Issue 11, June 2024, A.1.5(d) RSS-Gen Issue 5, Amendment 2, February 2021, Clause 8.9
Test procedure	:	ANSI C63.10: 2013
Test voltage	:	DC 3V
Test modes applied	:	TM1

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Figure 3: Field strength of fundamental and Radiated Spurious Emission, 30MHz to 1GHz



Limit and Margin

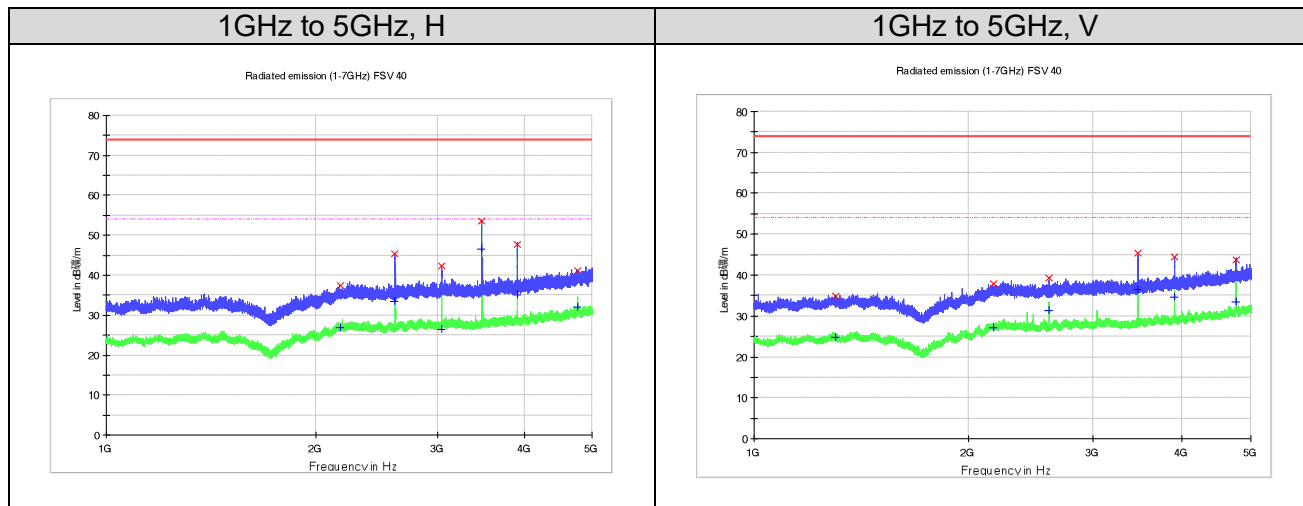
Frequency [MHz]	MaxPeak [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Type	Pol.
434.005000	70.9	92.86	21.96	PK	H
868.800000	39.8	72.86	33.06	PK	
433.880000	74.7	92.86	18.16	PK	V
867.835750	39.0	72.86	33.86	PK	

Frequency [MHz]	Average [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Type	Pol.
434.005000	70.1	72.86	2.76	AV	H
868.807500	32.2	52.86	20.66	AV	
433.880000	71.0	72.86	1.86	AV	V
868.357500	34.6	52.86	18.26	AV	

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Figure 4: Field strength of fundamental and Radiated Spurious Emission, 1GHz to 5GHz



Limit and Margin

Frequency [MHz]	MaxPeak [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Type	Pol.
2169.272727	37.5	72.86	35.36	PK	H
2603.636364	45.3	72.86	27.56	PK	
3038.181818	42.3	72.86	30.56	PK	
3471.090909	53.6	72.86	19.26	PK	
3905.818182	47.8	74.00	26.20	PK	
4774.181818	41.2	74.00	32.80	PK	
1301.636364	34.9	72.86	37.96	PK	V
2169.818182	37.8	72.86	35.06	PK	
2603.454546	39.4	72.86	33.46	PK	
3471.454546	45.4	72.86	27.46	PK	
3904.727273	44.5	74.00	29.50	PK	
4773.090909	43.8	74.00	30.20	PK	

Frequency [MHz]	Average [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Type	Pol.
2169.272727	26.9	52.86	25.96	AV	H
2603.636364	33.5	52.86	19.36	AV	
3038.181818	26.3	52.86	26.56	AV	
3471.090909	46.5	52.86	6.36	AV	
3905.818182	35.0	54.00	19.00	AV	
4774.181818	32.0	54.00	22.00	AV	
1301.636364	24.8	54.00	29.20	AV	V
2169.818182	27.2	52.86	25.66	AV	
2603.454546	31.3	52.86	21.56	AV	
3471.454546	36.4	52.86	16.46	AV	
3904.727273	34.6	54.00	19.40	AV	
4773.090909	33.5	54.00	20.50	AV	

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