Prüfbericht-Nr.: *Test report no.*:	**CN25OUFH 001**	**Auftrags-Nr.:** *Order no.*:	180333905	Seite 1 von 19 *Page 1 of 19*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date*:	2025.05.19	
Auftraggeber: *Client*:	Coulisse B.V. Vonderweg 48, 7468 DC Enter, The Netherlands			
Prüfgegenstand: *Test item*:	SMART FRAME MOTOR			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	CM-52			
Auftrags-Inhalt: *Order content*:	TÜV Rheinland – FCC Service			
Prüfgrundlage: *Test specification*:	**FCC Part 15.203** **FCC Part 15.231**			

Wareneingangsdatum: *Date of sample receipt*:	2025.05.19	Refer to Photo Documentation
Prüfmuster-Nr.: *Test sample no*:	A003979383-004	
Prüfzeitraum: *Testing period*:	2025.05.23 - 2025.06.17	
Ort der Prüfung: *Place of testing*:	Refer to section 1.1	
Prüflaboratorium: *Testing laboratory*:	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.	
Prüfergebnis*: *Test result**:	**Pass**	

geprüft von: *tested by*:	Keda Zhou	**genehmigt von:** *authorized by*:	Chonghai Liang
Datum: *Date*: 2025.07.14		**Ausstelldatum:** *Issue date*: 2025.07.14	
Stellung / Position:	Keda Zhou/PE	**Stellung** / Position:	Chonghai Liang/Authorizer

Sonstiges / *Other*: FCC ID: ZY4CM52B

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* 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*

Anmerkungen
Remarks

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.

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.

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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.

*Test clauses with remark of * are subcontracted to qualified subcontractors and descripted 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.

Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen 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 bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.

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.

Test Summary

4.1.1 ANTENNA REQUIREMENT
Result:
Pass
4.1.2 DEACTIVATION OF THE TRANSMISSION
Result:
Pass
4.1.3 20DB EMISSION BANDWIDTH
Result:
Pass
4.1.4 FIELD STRENGTH OF FUNDAMENTAL AND UNWANTED EMISSIONS
Result:
Pass

Contents

1. Test Sites

1.1 Test Facilities

Laboratory: TÜV Rheinland /CCIC (Ningbo) Co., Ltd.

1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 P.R. China

FCC Designation Number: CN1237
FCC Test Firm Registration Number: 647754
IC Company Number: 24297
CAB identifier: CN0047

The test equipment used is in accordance with CISPR 16-1 series standards.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment, Laboratory

Kind of Equipment	Type	Serial No.	Last cal. date	Cal. due date
EMI test receiver	ESR7	101929	2024.10.29	2025.10.22
Spectrum analyzer	FSV40	101412	2024.10.29	2025.10.22
Bilog Antenna	CBL6112D	49033	2024.03.17	2027.03.16
Horn antenna	HF907	102653	2023.07.20	2026.07.19
Pre-amplifier	SCU-18F	180051	2024.10.29	2025.10.22

1.3 Uncertainty of Measurement

Table 2: Measurement Uncertainty

Test Item	Expanded Measurement Uncertainty (k=2)
Conducted Emission (9-150kHz)	±3.70 dB
Conducted Emission (150k-30MHz)	±3.30 dB
Occupied Channel Bandwidth	±5 %
Radiated Emission (30-1000MHz)	±4.39 dB
Radiated Emission (1-18GHz)	±4.67 dB

2. General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is a SMART FRAME MOTOR operating at 433.05 - 434.79MHz.

For more detailed information, refer to the user's manual.

2.2 Ratings and System Details

Table 3: General Description of EUT

General Description of EUT	
Charging Voltage:	USB 5V
Internal Battery Voltage:	DC 7.2V
Protection Class:	Class III
Technical Specification of SRD (433MHz)	
Operating Frequency band	433.05 - 434.79MHz
Modulation	GFSK
Antenna Type	Chip Antenna
Antenna Gain	0.79 dBi
Technical Specification of Bluetooth (BLE)	
Frequency Range:	2402 - 2480MHz
Modulation Type:	GFSK
Data Rate:	1Mbps, 2Mbps, 125Kbps, 500Kbps
Channel:	0-39
Antenna Type:	Chip Antenna
Antenna Gain:	5.05 dBi

2.3 Independent Operation Modes

There are some modes:
Mode A: Transmitting on Operating Frequency Band: 433.05 - 434.79MHz
Mode B: Transmitting by 2.4GHz BLE module
Refer to the user's manual for further information.

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram for further information.

2.5 Submitted Documents

Circuit diagram, Schematics, PCB Layout, Label, User Manual etc.

3. Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

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.

3.2 Test Operation and Test Software

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power was selected according to the instruction given by the manufacturer. The setting of the RF output power expected by the customer shall be fixed on the firmware of the final end product.

All testing were performed according to the procedures in ANSI C63.10: 2020.

Test Software EMC32 V10.30 was used in the radiated emission test.

More details refer to the related paragraph of this report.

3.3 Special Accessories and Auxiliary Equipment

None.

3.4 Countermeasures to Achieve ERM Compliance

The test sample which has been tested contained the noise suppression parts as described in the Circuit Diagram. No additional measures were employed to achieve compliance.

3.5 Test set-up

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

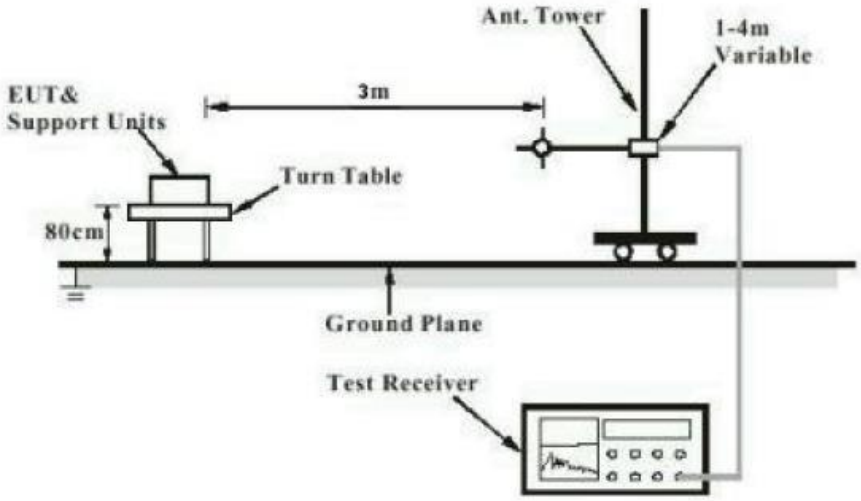


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

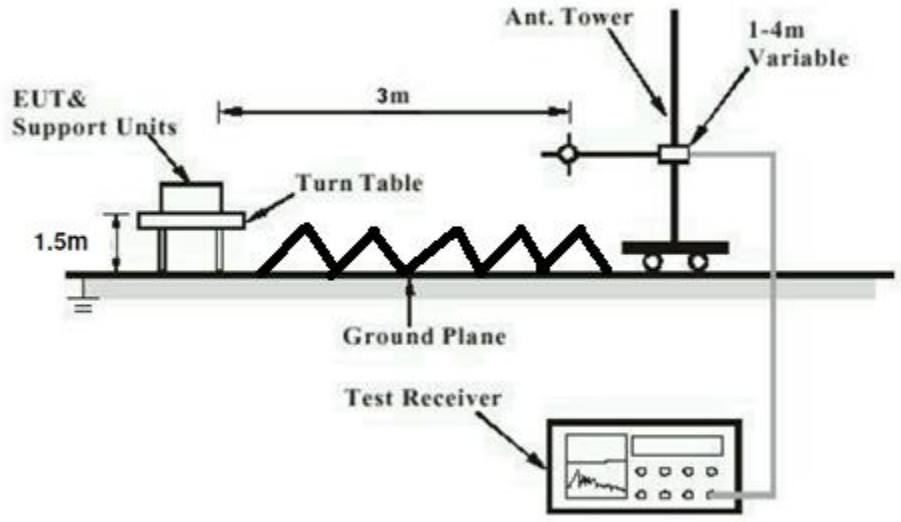
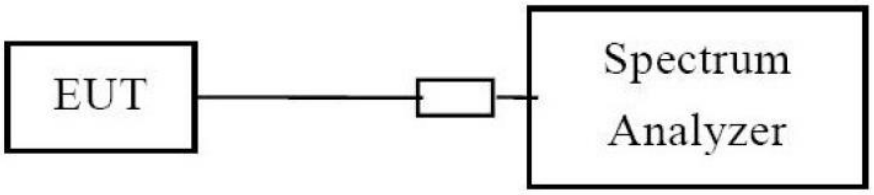


Diagram of Measurement Configuration for Conducted Transmitter Measurement



4. Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

Result: **Pass**

Test Specification
Test standard : FCC Part 15.203
Limit : the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an integral antenna (Chip antenna, Antenna Gain: 0.79 dBi), and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore, the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

4.1.2 Deactivation of the Transmission

Result: **Pass**

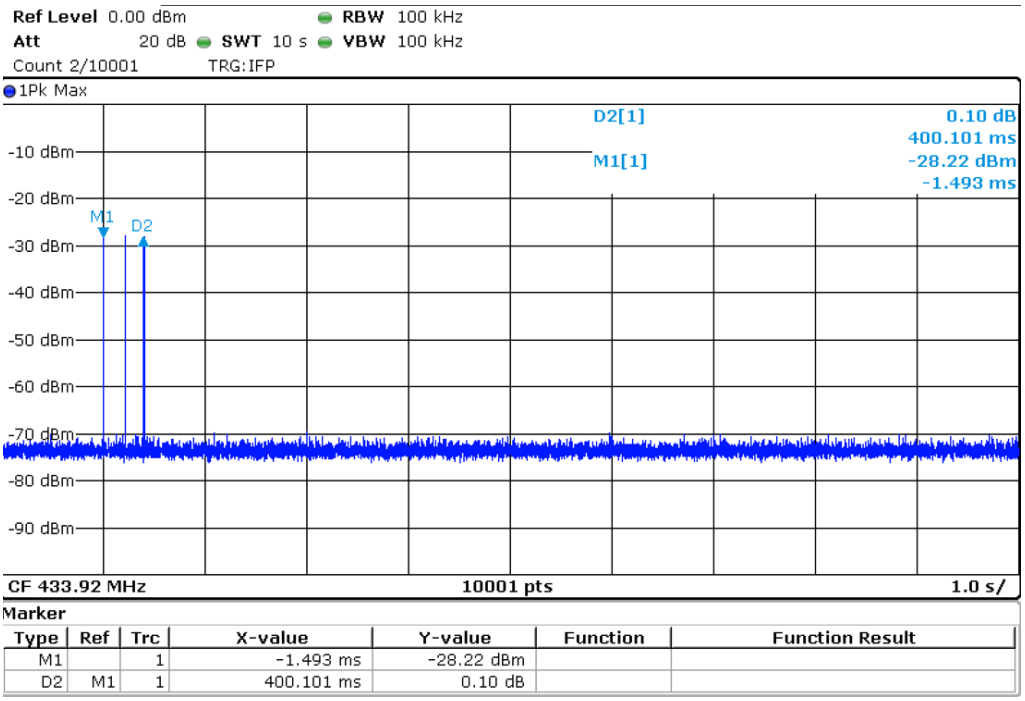
Test Specification		
Test standard	:	FCC Part 15.231
Basic standard	:	ANSI C63.10: 2020
Test requirement	:	CFR47 FCC Part 15.231 (a)(1)
Limits	:	A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. A transmitter activated automatically shall cease transmission within 5 seconds after activation.
Test suite	:	Shielded Room

Test Setup

Date of testing	:	2025.06.17
Test environment:	:	Normal test conditions
Operational mode	:	Mode A
Temperature	:	23°C
Relative humidity	:	56%
Atmospheric pressure	:	101.2 kPa

Figure 1: Test Results of Deactivation of the Transmission

Activated mode	Duration Time (S)	Limit (S)
Manually	0.4	≤5



4.1.3 20dB Emission Bandwidth

Result: **Pass**

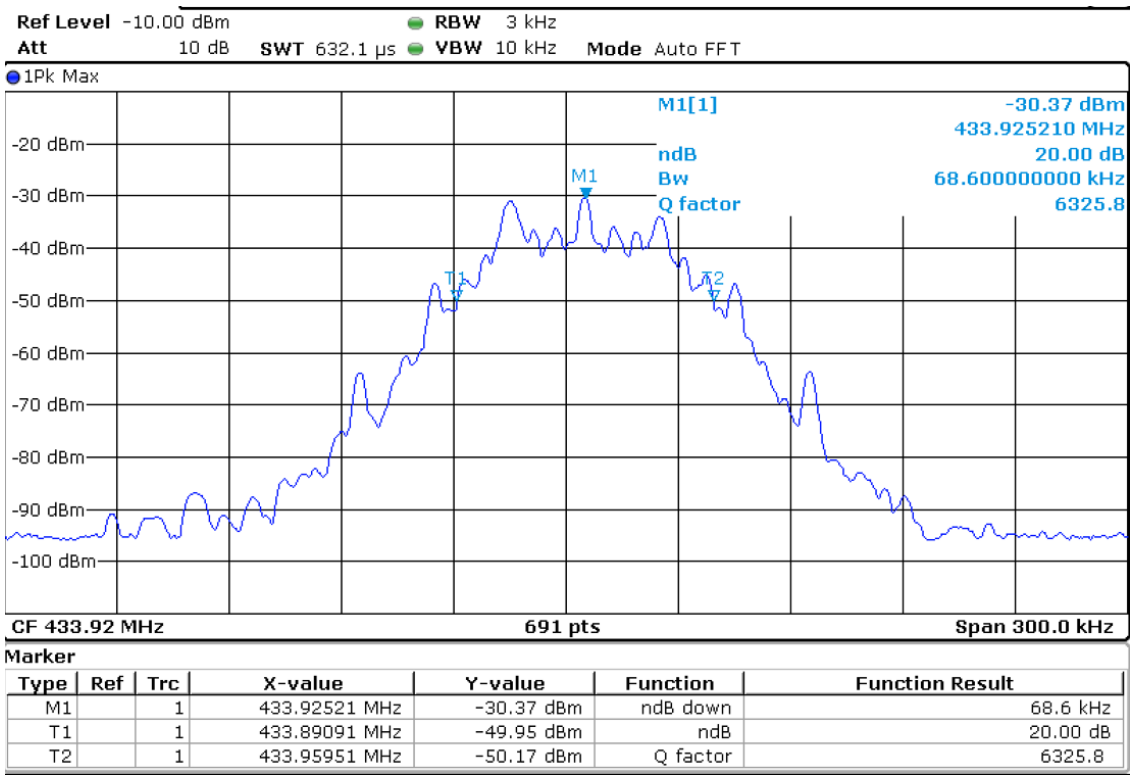
Test Specification		
Test standard	:	FCC Part 15.231
Basic standard	:	ANSI C63.10: 2020
Test requirement	:	CFR47 FCC Part 15.231 (c)
Limit	:	CFR47 FCC Part 15.231 (c)
Test suite	:	Shielded Room

Test Setup

Date of testing	:	2025.06.17
Test environment	:	Normal test conditions
Operational mode	:	Mode A
Temperature	:	23°C
Relative humidity	:	56%
Atmospheric pressure	:	101.2 kPa

Figure 2: Test Results of 20dB Emission Bandwidth

Bandwidth (kHz)	Limit (kHz)
68.6	≤1085



4.1.4 Field strength of fundamental and Unwanted Emissions

Result: **Pass**

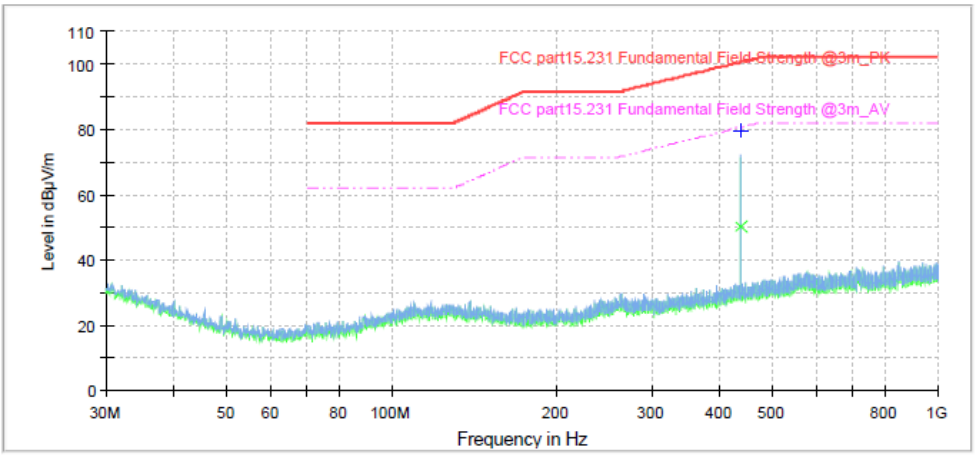
Test Specification		
Test standard	:	FCC Part 15.231 CFR47 FCC Part 15.205 CFR47 FCC Part 15.209
Basic standard	:	ANSI C63.10: 2020
Test requirement	:	CFR47 FCC Part 15.231 (b)(1)(2)(3)
Limits	:	CFR47 FCC Part 15.231 (b)
Test suite	:	3m Semi Anechoic Room

Test Setup

Date of testing	:	2025.05.23 - 2025.05.27
Test environment	:	Normal test conditions
Operational mode	:	Mode A, Mode A+Mode B
Temperature	:	21°C
Relative humidity	:	68%
Atmospheric pressure	:	101.2 kPa

Figure 3: Field strength of fundamental

Fundamental, Horizontal



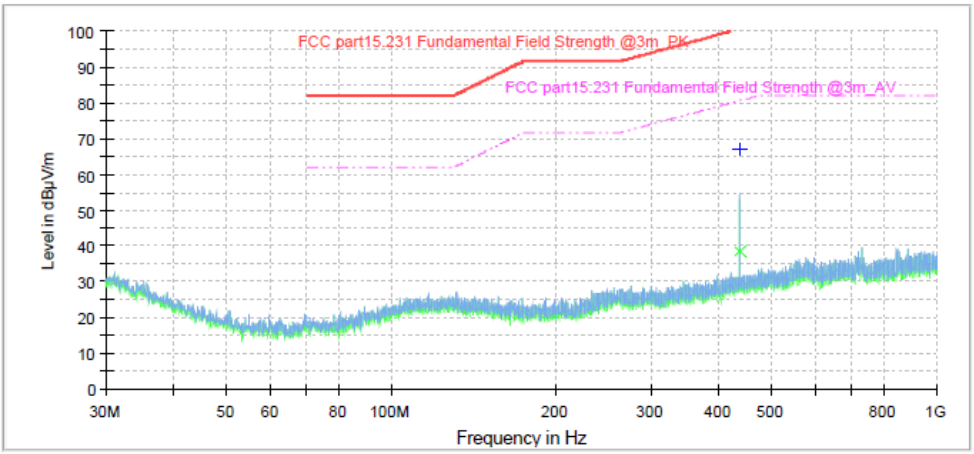
Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
433.950000	79.5	1000.0	120.000	100.0	H	11.0	24.2	21.0	100.6

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
433.950000	50.2	1000.0	120.000	100.0	H	11.0	24.2	30.3	80.6

Fundamental, Vertical



Limit and Margin-PK

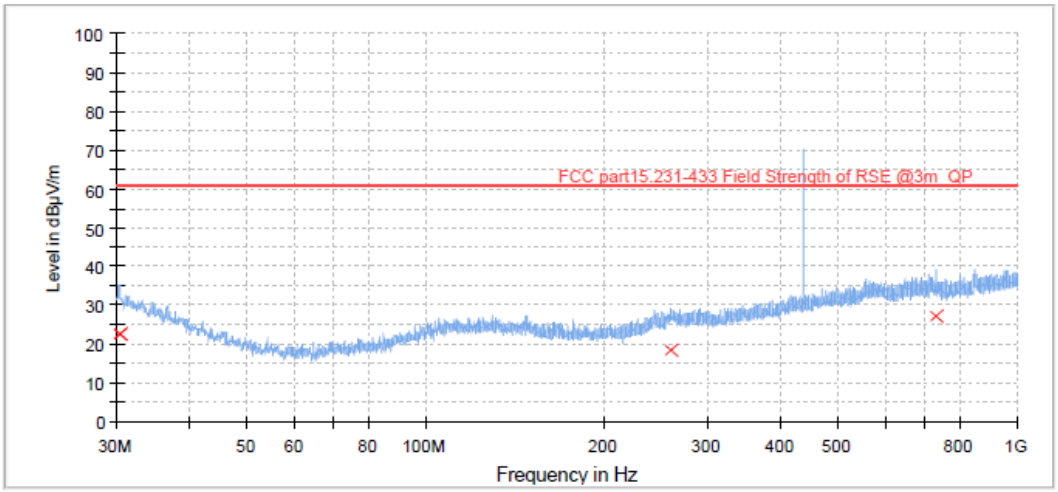
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
433.900000	66.9	1000.0	120.000	100.0	V	11.0	24.2	33.7	100.6

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
433.900000	38.6	1000.0	120.000	100.0	V	11.0	24.2	42.0	80.6

Figure 4: Spectral Diagrams, Radiated Spurious Emission, Mode A

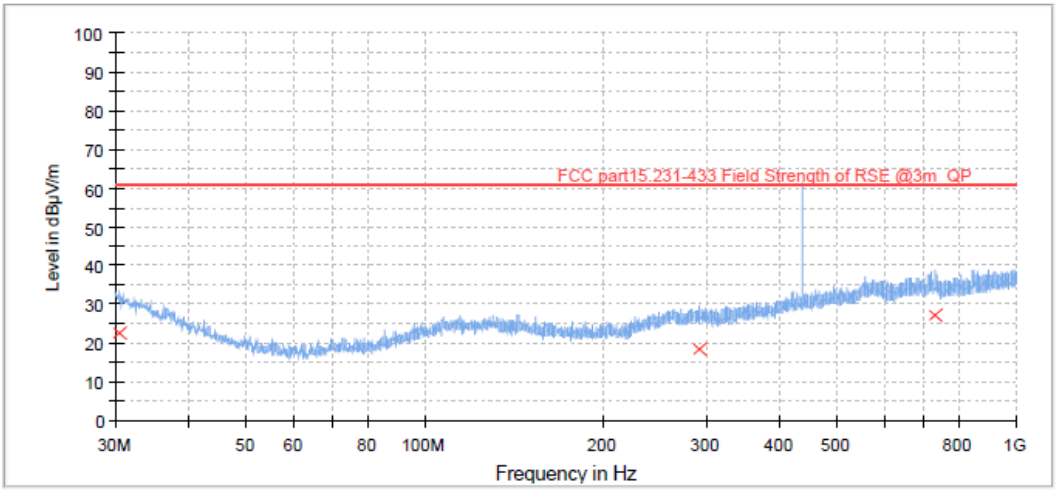
30MHz-1000MHz, Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.380000	22.5	1000.0	120.000	100.0	H	11.0	25.2	38.1	60.6
260.000000	18.6	1000.0	120.000	100.0	H	11.0	20.9	42.0	60.6
728.940000	27.3	1000.0	120.000	100.0	H	11.0	27.4	33.3	60.6

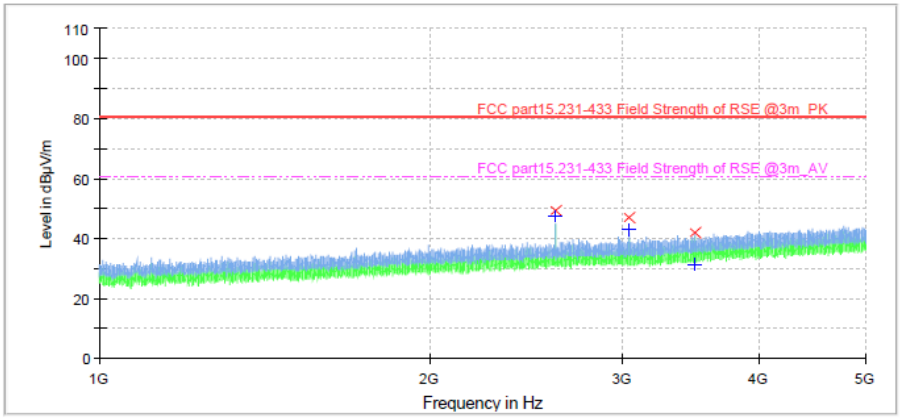
30MHz-1000MHz, Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.480000	22.4	1000.0	120.000	100.0	V	11.0	25.2	38.2	60.6
292.170000	18.3	1000.0	120.000	100.0	V	11.0	20.5	42.3	60.6
728.990000	27.2	1000.0	120.000	100.0	V	11.0	27.4	33.4	60.6

Above 1GHz, Horizontal



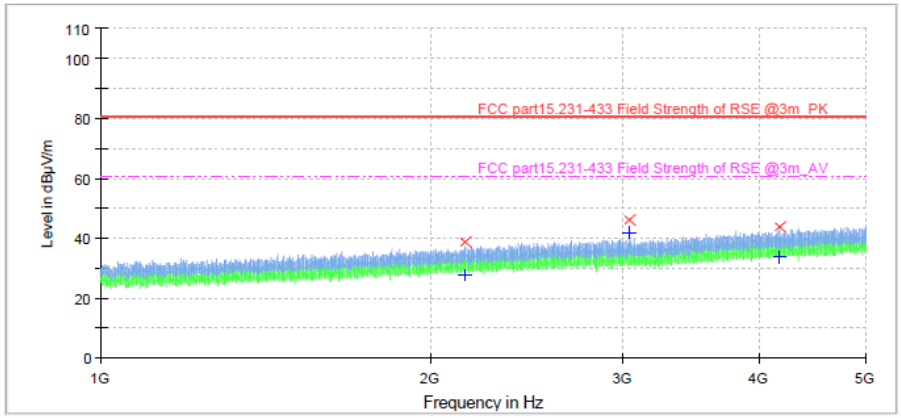
Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2603.625000	49.4	1000.0	1000.000	150.0	H	0.0	-3.7	31.2	80.6
3037.375000	46.7	1000.0	1000.000	150.0	H	0.0	-1.3	33.9	80.6
3488.750000	42.0	1000.0	1000.000	150.0	H	0.0	0.3	38.6	80.6

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2603.625000	47.2	1000.0	1000.000	150.0	H	0.0	-3.7	13.4	60.6
3037.375000	43.0	1000.0	1000.000	150.0	H	0.0	-1.3	17.6	60.6
3488.750000	31.4	1000.0	1000.000	150.0	H	0.0	0.3	29.2	60.6

Above 1GHz, Vertical



Limit and Margin-PK

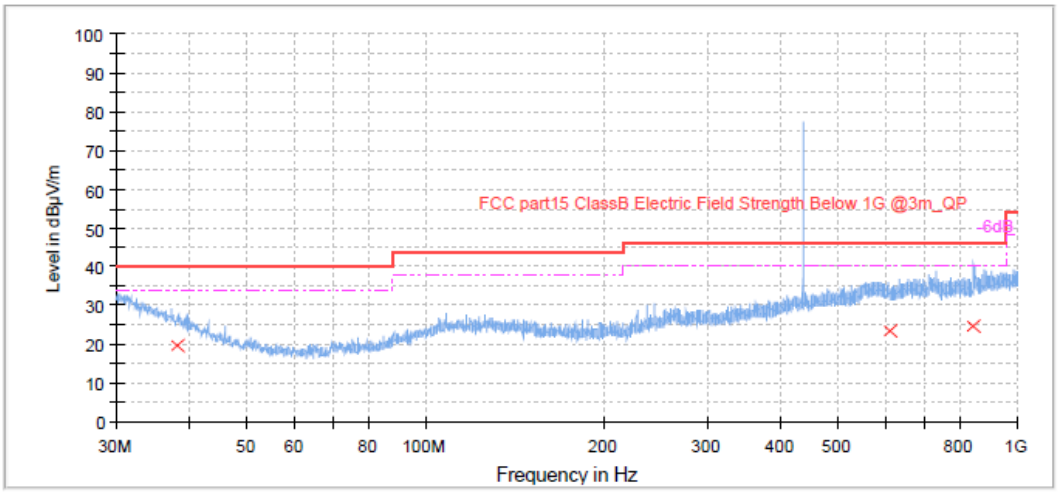
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2153.625000	38.6	1000.0	1000.000	150.0	V	0.0	-6.3	42.1	80.6
3037.500000	45.8	1000.0	1000.000	150.0	V	0.0	-1.3	34.8	80.6
4165.750000	43.8	1000.0	1000.000	150.0	V	0.0	2.1	36.8	80.6

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2153.625000	27.7	1000.0	1000.000	150.0	V	0.0	-6.3	32.9	60.6
3037.500000	41.8	1000.0	1000.000	150.0	V	0.0	-1.3	18.8	60.6
4165.750000	33.4	1000.0	1000.000	150.0	V	0.0	2.1	27.2	60.6

Figure 5: Spectral Diagrams, Radiated Spurious Emission, Mode A+ Mode B

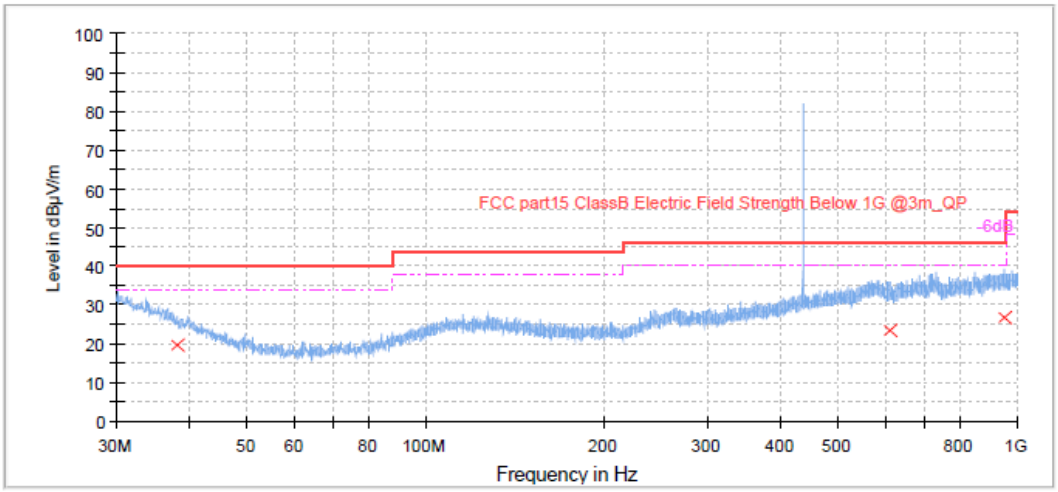
30MHz-1000MHz, Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
38.000000	19.7	1000.0	120.000	100.0	H	11.0	20.9	20.4	40.0
609.520000	23.3	1000.0	120.000	100.0	H	11.0	26.6	22.7	46.0
844.850000	24.7	1000.0	120.000	100.0	H	11.0	28.4	21.3	46.0

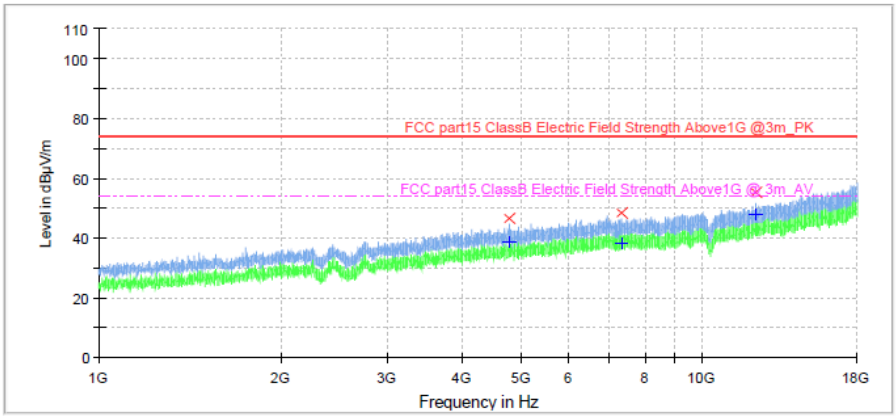
30MHz-1000MHz, Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
38.000000	19.7	1000.0	120.000	100.0	V	11.0	20.9	20.3	40.0
610.490000	23.3	1000.0	120.000	100.0	V	11.0	26.6	22.7	46.0
948.910000	26.6	1000.0	120.000	100.0	V	11.0	29.7	19.4	46.0

Above 1GHz, Horizontal



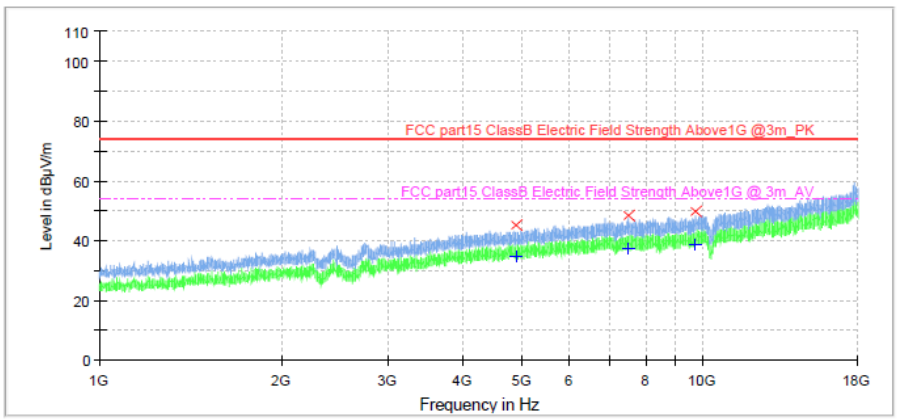
Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4772.935000	46.4	1000.0	1000.000	150.0	H	0.0	3.6	27.6	74.0
7319.750000	48.5	1000.0	1000.000	150.0	H	0.0	8.4	25.5	74.0
12199.280000	55.3	1000.0	1000.000	150.0	H	0.0	13.9	18.7	74.0

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4772.935000	38.6	1000.0	1000.000	150.0	H	0.0	3.6	15.4	54.0
7319.750000	38.2	1000.0	1000.000	150.0	H	0.0	8.4	15.8	54.0
12199.280000	47.6	1000.0	1000.000	150.0	H	0.0	13.9	6.4	54.0

Above 1GHz, Vertical



Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4880.000000	45.1	1000.0	1000.000	150.0	V	0.0	3.9	28.9	74.0
7505.155000	48.1	1000.0	1000.000	150.0	V	0.0	8.5	25.9	74.0
9681.685000	49.8	1000.0	1000.000	150.0	V	0.0	10.7	24.2	74.0

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4880.000000	34.4	1000.0	1000.000	150.0	V	0.0	3.9	19.6	54.0
7505.155000	37.2	1000.0	1000.000	150.0	V	0.0	8.5	16.9	54.0
9681.685000	38.8	1000.0	1000.000	150.0	V	0.0	10.7	15.3	54.0

5. List of Tables

6. List of Figures

-- The END --