FCC Test Firm Designation Number: FR0014
ISED Wireless Device Testing Laboratory CAB Number: FR0004

Matériel testé : *Equipment under test*:	**IDENTEC SOLUTIONS /** **iMARK EC (IDS1014), iMARK IC (IDS1015)** *(Trademark / Marketing name or product reference)*

Demandeur de certification :
Applicant for certification:
IDENTEC SOLUTIONS AG
Millennium Park 2
A-6890 Lustenau – Austria

Client :
Customer:
IDENTEC SOLUTIONS AG
Millennium Park 2
A-6890 Lustenau – Austria

Numéro d'affaire :
Work number :
10123

Référence de la proposition :
Proposal number:
DV-10212

Date de l'essai :
Date of test:
Du 29 février au 12 mars 2024
February 29th to March 12th, 2024

Objectif des essais :
Test purpose:
EMC qualification according to following standards:
- CFR 47, FCC Part 15, Subpart C
(Chapter 15.249 - Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz)
- Industry Canada, RSS-Gen Issue 5 & RSS-210 Issue 10, section B.10
(Bands 902–928, 2400–2483.5 and 5725–5875 MHz)
Measurement standards:
ANSI C63.10 (2013)

Lieu du test:
Test location:
SMEE, 385 rue René Rambaud
38500 VOIRON - France

Test réalisé par :
Test realized by:
Chemseddine KERMICHE

Conclusion :
Conclusion:
L'équipement satisfait aux prescriptions et essais des normes citées en référence.
The appliance complies with requirements and tests of above mentioned standards.

Ed.	Date	Modifications / Pages	Written by : Visa	Approved by: Visa
1	September 10th, 2024	Initial Edition	Chemseddine KERMICHE *Test operator*	Laurent Chapus *Technical Manager*

COORDONNEES
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Contents

1. Normative References

FCC qualification according to:		
Standards	**Applied**	**Title**
ANSI C63.10 (2013)	X	American National Standard for Testing Unlicensed Wireless Devices
CFR47, Part 15 (March 2024)	X	Telecommunication – Federal Communication Commission – Radio frequency devices, Sections 15.207 / 15.209 / 15.249

ISED Canada qualification according to:		
Standards	**Applied**	**Title**
RSS-Gen (Issue 5/2018, amendments 2019 and 2021)	X	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 (Issue10/2019+Amendment 2020)	X	Licence-exempt Radio Apparatus: Category I Equipment, Section B.10: Devices Operating in Frequency Bands for Any Application, Band 902-928 MHz

Deviation from standards: None.

2. Test synthesis

TEST	Paragraph number FCC Part 15 ISED RSS-210	Spec. FCC Part 15 ISED RSS-210	RESULTS (comments)
Conducted emissions test	15.207 (a) RSS-Gen: Issue 5, §8.8	15.207 (a) Table 4, §8.8	**PASS**
Field Strength of fundamental	15.249 (a) (c) RSS-210: Issue 10, §B.10 (a)	94dBµV/m @3m (50mV/m @ 3m)	**PASS**
Field Strength of harmonics	15.249 (a) (c) (e) RSS-210: Issue 10, §B.10 (a)	54dBµV/m @3m (0.5mV/m @ 3m)	**PASS**
Unwanted emissions outside the specified frequency band and harmonics	15.209 / 15.249 (d) (e) RSS-210: Issue 10, §B.10 (b) / RSS-Gen: Issue 5, §8.9	Whichever is less stringent, either: - 50dB below level of fundamental, or; - General field strength limits, as follow: Measure at 300m 9-490kHz: 2400µV/m/F(kHz) 6.370µA/m/F (kHz) Measure at 30m 0.490-1.705: 24000µV/m/F(kHz) 63.70µA/m/F (kHz) 1.705-30MHz: 30µV/m 0.08µA/m Measure at 3m 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m	**PASS**
Occupied Bandwidwth	FCC part 15.215 RSS-Gen: Issue 5, §6.7	BW at 99% and at -20dB	**PASS**
Antenna requirement	FCC 15.203 RSS-GEN § 6.8		**PASS**

- **General conclusion:**

Measures and tests performed on the sample of the product *IDENTEC SOLUTIONS / iMark EC&IC*, in configuration and description presented in this test report, show compliance with standards FCC CFR 47, PART 15, Subpart C and ISED-Canada RSS-Gen & RSS-210.

3. Equipment Under Test (EUT)

Nom / *Identification*	**IDENTEC SOLUTIONS / iMARK EC (IDS1014), iMARK IC (IDS1015)** *(Trademark / Marketing name or product reference)*	Sn: iMark EC 0.445.005.550 iMark IC 0.445.004.525

FCC ID: OO4-IDS1014
IC: IC: 3538A-IDS1014
Model / HVIN: IDS1014 and IDS1015
Product name / PMN: iMARK EC and iMARK IC
FVIN: IDS1014: V1.0-TagType18
IDS1015: V1.0-TagType21
Modular approval: No

Alimentation / *Power supply*: 24V DC

Auxiliaires / *Auxiliaries*:
- Laptop PC Hp pavillon g6
- IDENTEC reader: i-POINT Si, model : IDS1001
- Power supply adapter (Input 100-240V)
Model: ESC30-24 (for iMark-EC) and TRG30R240V (for iMark-IC)

Entrées-Sorties / *Input / Output*

	Câbles pour essai / *Cables for test*	Blindé / *Shielded*	Prévu pour >3m / *Intended for >3m*
DC input cable	1.5m	No	Yes
LF antenna connector (2 wires) (Only for iMark EC model)	1.5m to antenna coil	No	Yes

Mode de fonctionnement / *Running mode*:
Equipment running modes are:
The tested sample is able to be set in following modes:
- Transmit a modulated carrier frequency on low, middle and high channels (902.5/915/927.5MHz)

Programme de test / *Test program /*: PC test program "Gen3 Tag Certification tool Version : 1.0.1.29513"

Fréquence max interne EST / *Max internal EUT frequency*: 927.5 MHz for RF data transmission.

Informations supplémentaires / *Additional informations*:
Declaration of the applicant:
- Type of technology: Proprietary RF protocol.
- Emission bands: 902-928MHz.
- Frequency transmission band: 902.5 to 927.5MHz.
- Channel spacing 0.5MHz from 902.5 to 927.5MHz
- Modulation: (G)FSK ±20kHz.
- Antenna type: FPC antenna.
- Equipment intended for use as a mobile equipment.
- Equipment designed for continuous operation.
- Rated conducted output power setting software: 2dBm for IDS1014 and 5dBm for IDS1015.

Dimensions de l'EST / *Dimensions of EUT*: 100mm x 100mm x 40mm (Without LF external antenna)

All Information above is declared by the customer / applicant and are under his responsibility.

4. Test conditions

Power supply voltage:
Equipment under test: 24V DC from power supply adapter.
Auxiliaries: 120V AC 60Hz.

5. Modifications of the EUT

None.

6. Special accessories

None required for compliance with emission limits.

7. Measurement Uncertainty

Test Description	Expanded uncertainty
Conducted emissions test (150k-30MHz, AC mains)	± 3.5dB
Radiated emission test (9kHz-30MHz, electric field)	± 4.0dB
Radiated emission test (30-200MHz, SAC 3m)	± 5.6dB
Radiated emission test (200-1000MHz, SAC 3m)	± 5.3dB
Radiated emission test (1-18GHz, FAC 3m)	± 5.6dB
Radiated emission test (18-40GHz, FAC 3m)	± 5.6dB
Conducted RF output power at antenna port	± 1.6dB
Radiated RF output power (Peak, Power density)	± 5.6dB
DTS Bandwidth, 99% OBW	±4%
Temperature	± 1°C
Time and duty cycle calculation	±1%
AC and DC voltage	±1%

Note: Expended uncertainty at 95% confidence (k=2)

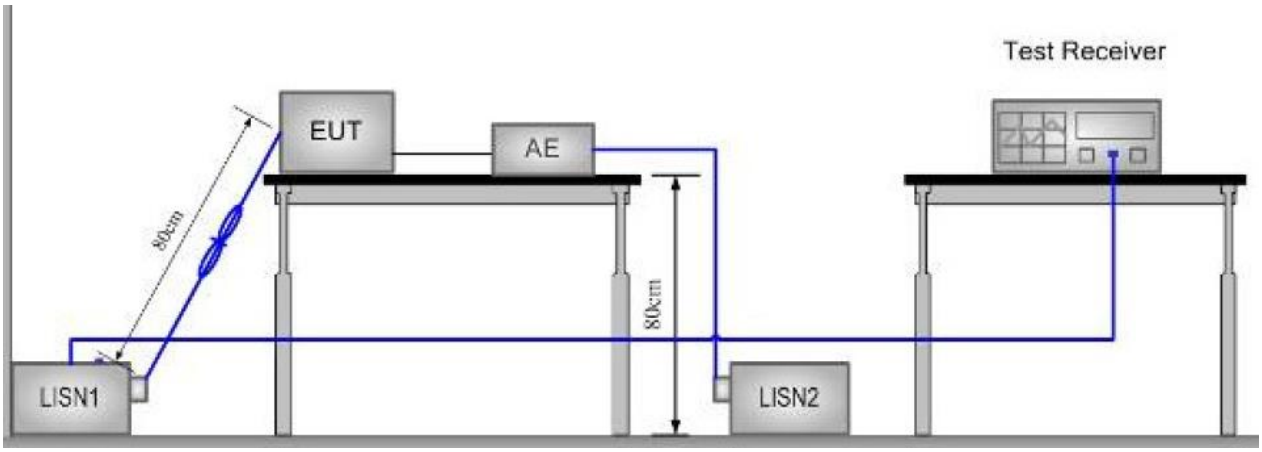
8. Field Strength Calculation

The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follow:
FS = RA + AF + CF – AG
Where FS = Field Strength (Level)
RA = Receiver Amplitude (Meter Reading)
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain
Margin value = Emission level – Limit value

Example:
RA: 14.0dBµV / AF: 16.5 dBm^{-1} / CF: 3.5dB / AG: 15dB
→ Total factor: $5dBm^{-1}$
→ Field level: 19.0dBµV/m (-21.0dB for margin if limit is 40dBµV/m)

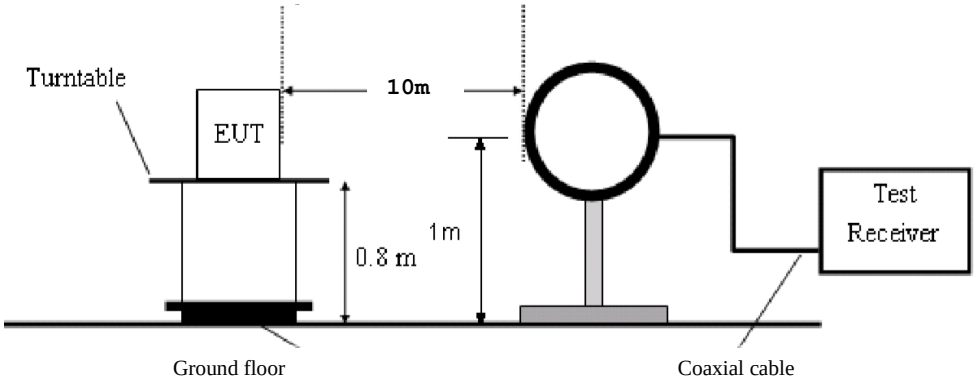
9. Test Setup Diagram

Test Setup for conducted emission

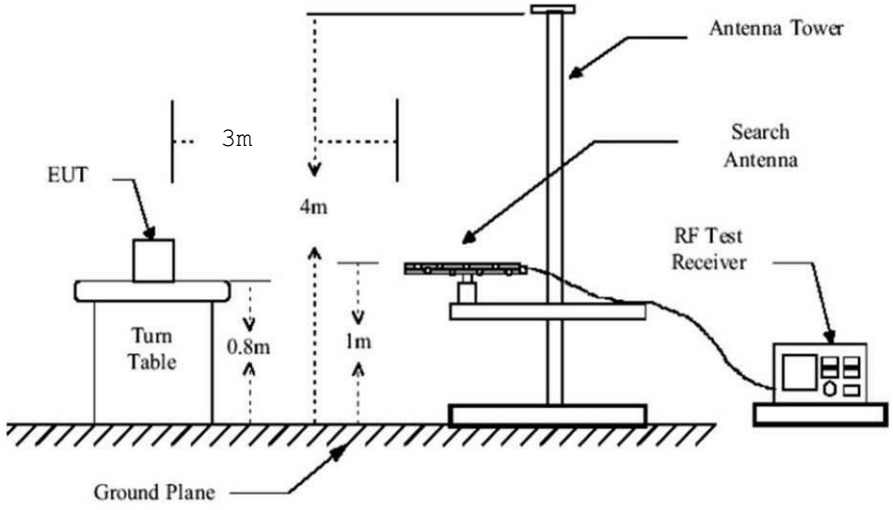


Ground reference plane

Test Setup for radiated emission

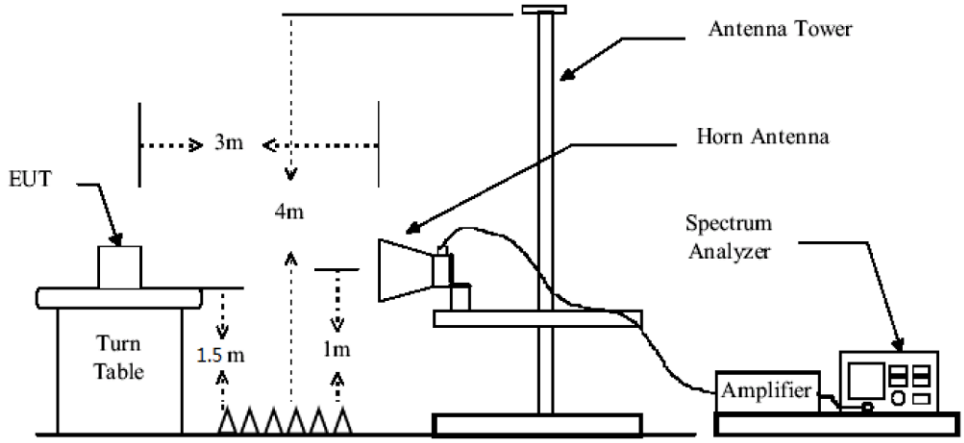


Test setup for 9k-30MHz (FS OATS)



Test setup for 30-1000MHz (SAC 3m)

Test Setup for radiated emission



Test setup for 1-10GHz (SAC 3m, tilt antenna mast used)

10. Conducted Emission Measurement (150 kHz-30MHz)

TEST: Limits for conducted disturbance 150kHz – 30MHz	**Verdict**
Method: The LISN is placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on lines were made at the output of the LISN. The EUT is 80cm above the ground reference plane and 40cm from the vertical ground plane. The AC power cable is 1m length.	**Pass**

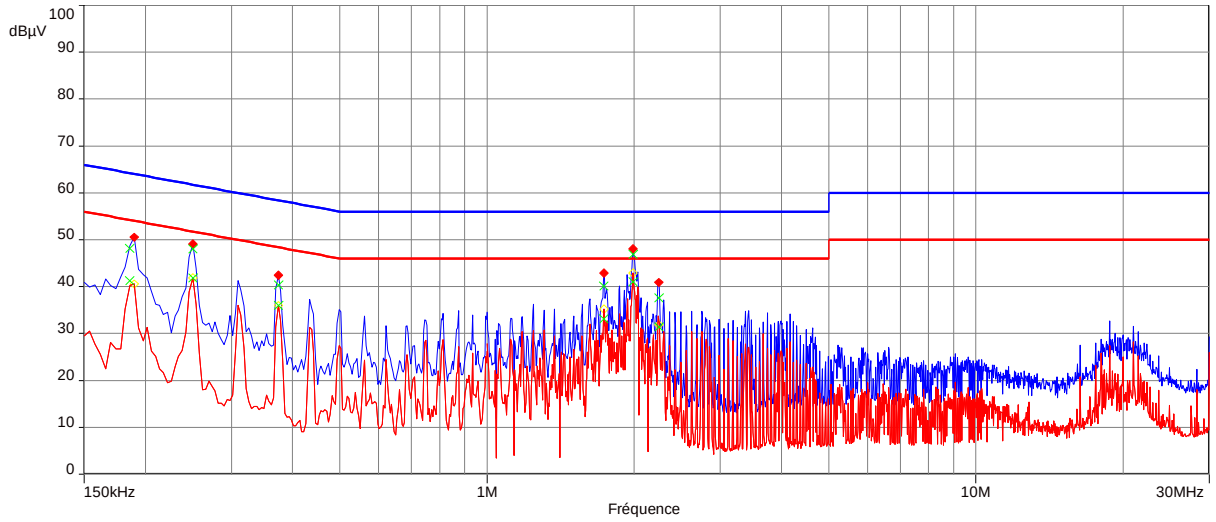
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	17 - 27 °C	21°C ± 2
Relative Humidity	25 - 65 %	48% ± 5
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point
	150kHz to 30MHz	AC input port (120V/60Hz)

Limits

Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result	Average	Result
0.15 – 0.50	66 \ 56	**PASS**	56 \ 46	**PASS**
0.50 - 5	56	**PASS**	46	**PASS**
5 – 30	60	**PASS**	50	**PASS**

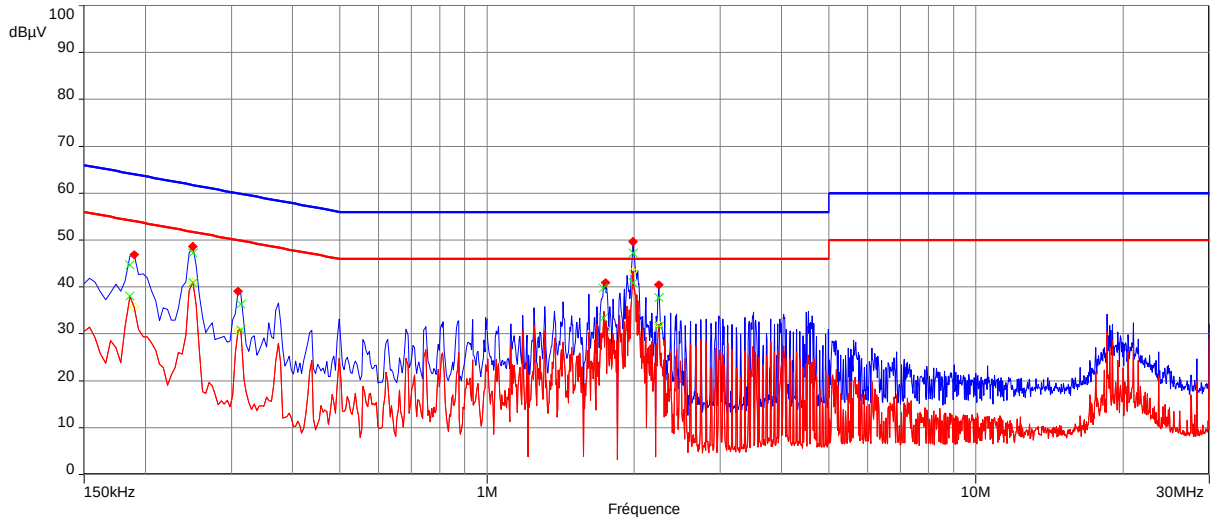
Supplementary information:
Test location: SMEE
Test date: March 12th, 2024. Tested by C. KERMICHE
Power supply voltage: 24V DC from power supply adapter 120V 60Hz.

IDS1014
Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line L1



Note : Same result for all transmit modes on all channels.

Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line Neutral



Note : Same result for all transmit modes on all channels.

^^^^: Peak	^^^^: Average

IDS1014								
Tabulated Results for Mains Terminal Disturbance Voltage on AC port								
FREQ	**Meas. PK**	**Mes. QP**	**LIMIT QP**	**Margin QP**	**Mes. AV**	**LIMIT AV**	**Margin AV**	Line
0.187916	51.87	48.12	64.21	-16.09	41.28	54.21	-12.93	
0.249219	51.18	48.01	61.76	-13.75	41.87	51.76	-9.89	L1
0.37209	43.47	40.43	58.41	-17.98	36.07	48.41	-12.35	L1
1.737042	43.63	40.12	56.00	-15.88	33.16	46.00	-12.84	L1
1.988087	49.70	46.96	56.00	-9.04	41.11	46.00	-4.89	L1
2.247907	41.71	37.66	56.00	-18.34	31.48	46.00	-14.52	L1
0.187308	49.08	44.76	64.21	-19.45	38.08	54.21	-16.13	N
0.248784	49.36	47.26	61.76	-14.50	40.98	51.76	-10.78	N
0.312692	39.96	36.35	59.86	-23.51	30.85	49.86	-19.02	N
1.733412	43.61	39.83	56.00	-16.17	33.44	46.00	-12.56	N
1.988608	49.78	47.31	56.00	-8.69	40.98	46.00	-5.02	N
2.248255	41.71	37.69	56.00	-18.31	31.68	46.00	-14.32	N
RBW:			9kHz					
Voltage:			120V/60Hz					
Limit:			FCC Part 15.207 a) / RSS-Gen: Issue 5, §8.8 Table 4					
Final measurement detector:			Quasi-Peak and CISPR Average (AV)					
RESULT:			PASS					
Measured value calculation:			The measured value (level) is calculated by adding the Cable Factor, the Transient suppressor attenuation and LISN attenuation from the receiver amplitude reading. The basic equation is as follow: Meas. = RA + CF + ATT_{TRAN} + ATT_{LISN} Where Meas. = Level (dBµV) RA = Receiver Amplitude CF = Cable Factor ATT_{TRAN} = Transient suppressor attenuation ATT_{LISN} = LISN attenuation Margin value = Emission level – Limit value (A negative margin shows compliance to limit)					

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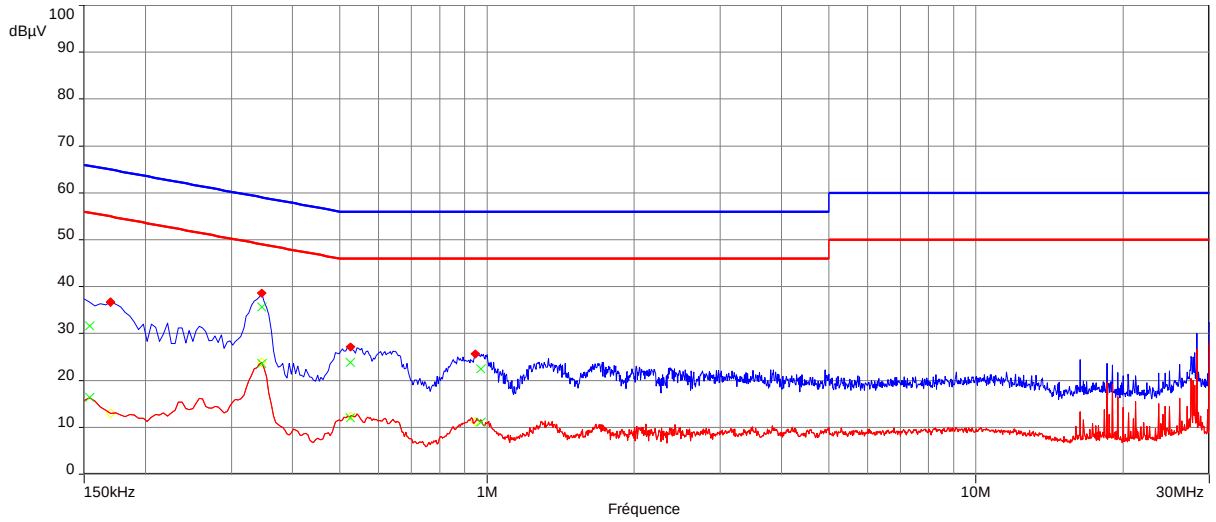
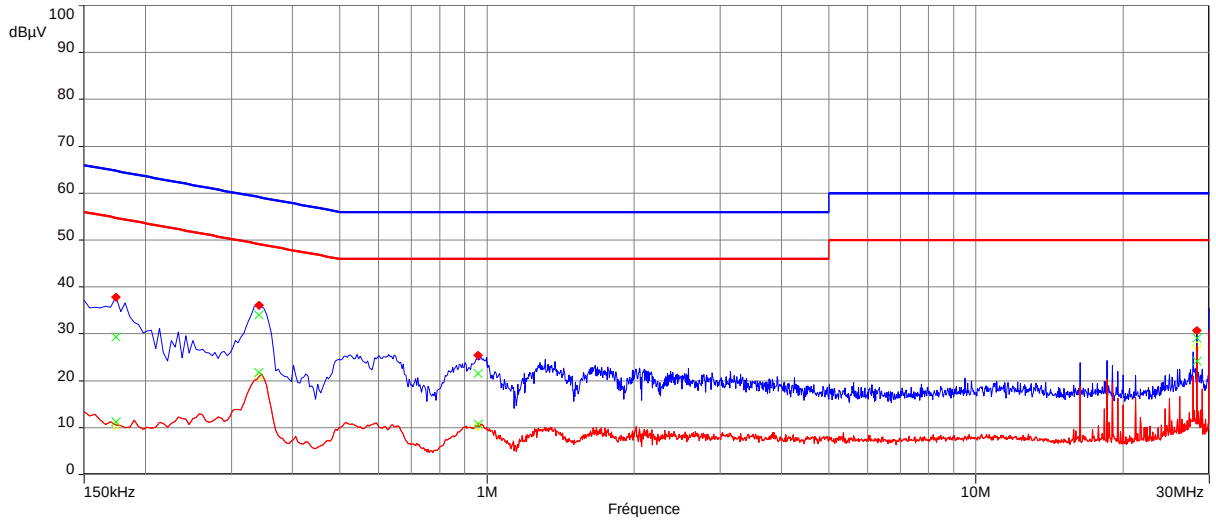
Graphical representation of Conducted Disturbance Measurement (Peak and Average detection)
AC port, Line L1



Note : Same result for all transmit modes on all channels.

Graphical representation of Conducted Disturbance Measurement (Peak and Average detection)
AC port, Line Neutral



Note : Same result for all transmit modes on all channels.

^^^^: Peak	^^^^: Average

IDS1015								
Tabulated Results for Mains Terminal Disturbance Voltage on AC port								
FREQ	**Meas. PK**	**Mes. QP**	**LIMIT QP**	**Margin QP**	**Mes. AV**	**LIMIT AV**	**Margin AV**	Line
(MHz)	(dBµV)	(dBµV)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	
0.152822	41.10	31.71	65.78	-34.07	16.41	55.78	-39.37	L1
0.344437	38.46	35.65	59.06	-23.41	23.61	49.06	-25.45	L1
0.524784	27.79	23.84	56.00	-32.16	12.00	46.00	-34.00	L1
0.969444	26.44	22.48	56.00	-33.52	11.09	46.00	-34.91	L1
0.174	38.22	29.36	64.77	-35.41	11.20	54.77	-43.57	N
0.342	37.98	34.05	59.15	-25.11	21.75	49.15	-27.40	N
0.958	25.57	21.52	56.00	-34.48	10.84	46.00	-35.16	N
28.292	31.99	29.11	60.00	-30.89	24.16	50.00	-25.84	N
RBW:			9kHz					
Voltage:			120V/60Hz					
Limit:			FCC Part 15.207 a) / RSS-Gen: Issue 5, §8.8 Table 4					
Final measurement detector:			Quasi-Peak and CISPR Average (AV)					
RESULT:			PASS					
Measured value calculation:			The measured value (level) is calculated by adding the Cable Factor, the Transient suppressor attenuation and LISN attenuation from the receiver amplitude reading. The basic equation is as follow: Meas. = RA + CF + ATT_{TRAN} + ATT_{LISN} Where Meas. = Level (dBµV) RA = Receiver Amplitude CF = Cable Factor ATT_{TRAN} = Transient suppressor attenuation ATT_{LISN} = LISN attenuation Margin value = Emission level – Limit value (A negative margin shows compliance to limit)					

11. Field Strength of fundamental

TEST: Field strength of fundamental / FCC part 15.249 – RSS 210 §B.10	**Verdict**
Method: Measurements were made in a 3-meter Semi anechoic chamber (SAC) that complies with ANSI C63.4 / C63.10. Measurements were performed with a peak detector using a 100kHz RBW. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (Peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. The tested equipment is set to transmit operation with modulation on lowest, middle and highest channels. Three orthogonal axis measurements on EUT are performed to obtain the maximum peak field strength.	**Pass**

Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	20 to 30 °C	24°C ± 2
Relative Humidity	30 to 70 %	45% ± 5

Limits – FCC Part 15.249 (a) (c) / RSS-210 §B.10 (a)		
Frequency (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Results
902 to 928 MHz	94dBµV/m / Quasi-peak / 3m	**Pass**

Supplementary information:
Test location: SMEE
Test date: February 29th, 2024. Tested by C. KERMICHE

Tabulated Results for Field Strength of fundamental / IDS1014					
FREQ	**Field Strength @ 3m**	**Detector**	**Limit**	**Margin**	**Result**
(MHz)	(dBµV/m)		(dBµV/m)	dB	
902.5	**90.8**	QP	94.0	-3,2	**Pass**
915.0	**92.9**	QP	94.0	-1,1	**Pass**
927.5	**93.9**	QP	94.0	-0,1	**Pass**
RBW:		100kHz			
Measurement distance:		3m			
Limit:		FCC Part 15.249 (a) (c) / RSS-210 §B.10			
Final measurement detector:		Quasi-Peak			
RESULT:		PASS			

Tabulated Results for Field Strength of fundamental / IDS1015					
FREQ	**Field Strength @ 3m**	**Detector**	**Limit**	**Margin**	**Result**
(MHz)	(dBµV/m)		(dBµV/m)	dB	
902.5	**92.0**	QP	94.0	-2	**Pass**
915.0	**92.7**	QP	94.0	-1,3	**Pass**
927.5	**93.5**	QP	94.0	-0,5	**Pass**
RBW:		100kHz			
Measurement distance:		3m			
Limit:		FCC Part 15.249 (a) (c) / RSS-210 §B.10			
Final measurement detector:		Quasi-Peak			
RESULT:		PASS			

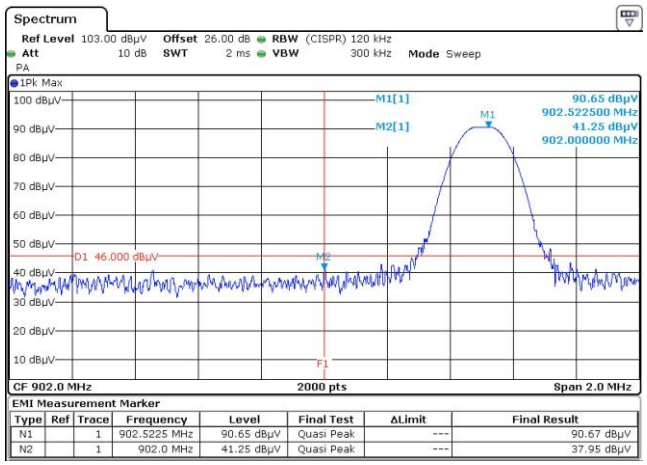
12. Unwanted emissions & Field Strength of harmonics

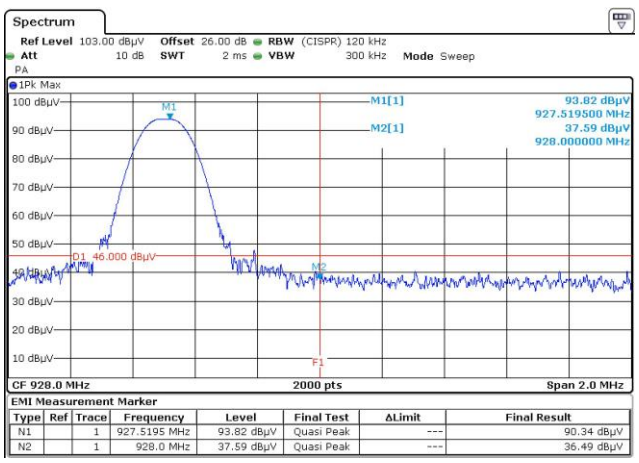
TEST: Unwanted emissions outside fundamental and harmonics bands / FCC part 15.209, 15.249 - RSS-210 §B.10 / RSS-Gen §8.9		**Verdict**
Method: Measurements were made in a 3-meter Semi Anechoic Room (SAR) for frequency 30MHz to 1GHz and in a 3-meter Full Anechoic environment (SAR with floor absorbers) above 1GHz. The Semi Anechoic Room complies with CISPR16-1-4 / ANSI C63.4 requirements. For frequency 9kHz to 30MHz, measurements are performed on a free-space open area test site at 10m distance. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (Peak, Quasi-peak, Average) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		**Pass**
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	20 to 30 °C	22°C ± 2
Relative Humidity	30 to 70 %	45% ± 5
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point
	9kHz – 30MHz	10 m measurement distance
	30MHz – 10GHz	3 m measurement distance
Limits – FCC Part 15.209, 15.249 (a) (c) (d) (e) / RSS-Gen §8.9, RSS-210 §B.10 (a) (b)		
Whichever is less stringent, either:		
Frequency (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Level / Detector / Distance
30 to 1000	50dB below the fundamental / QP / 3m	Not used
Above 1GHz	50dB below the fundamental / Av / 3m 30dB below the fundamental / Pk / 3m	Not used

Or		
Frequency (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Results
0.009 to 0.090	107.6 – 87.6 / AV / 10m 127.6 – 107.6 / PK / 10m	**Pass**
0.090 to 0.110	87.6 – 85.9 / QP / 10m	**Pass**
0.110 to 0.490	85.7 – 72.9 / AV / 10m 105.7 – 92.9 / PK / 10m	**Pass**
0.490 to 1.705	52.9 – 42.1 / QP / 10m	**Pass**
1.705 to 30	48.6 / QP / 10m	**Pass**
30 to 88	40.0 / QP / 3m	**Pass**
88 to 216	43.5 / QP / 3m	**Pass**
216 to 960	46.0 / QP / 3m	**Pass**
960-1000	54.0 / QP / 3m	**Pass**
Above 1GHz	54.0 / AV / 3m 74.0 / PK / 3m	**Pass**
Supplementary information: Test location: SMEE Test date: February 29th, 2024. Tested by C. KERMICHE		

IDS1014

Graphical representation of Band-edge compliance (Radiated)



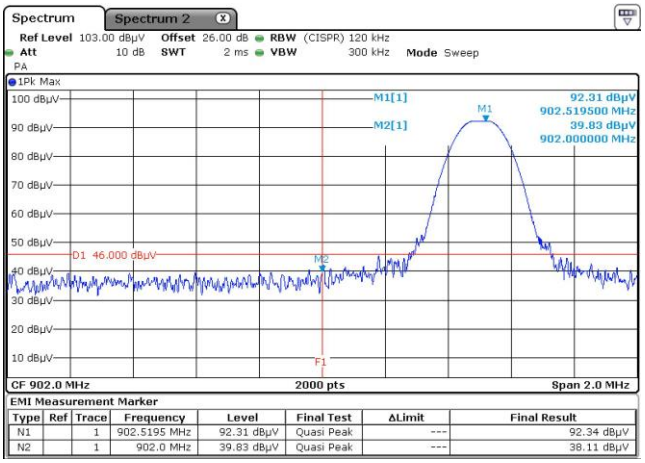
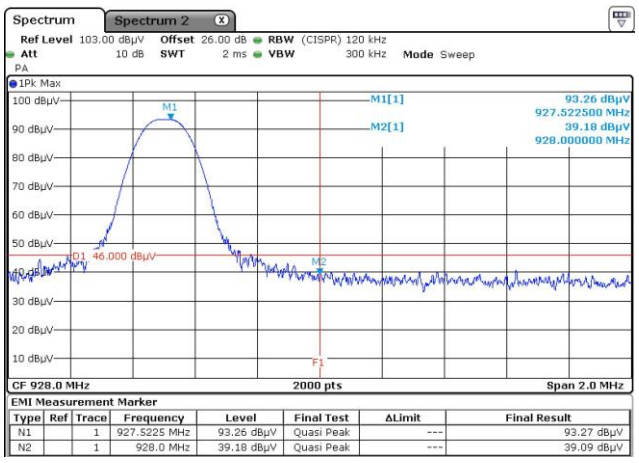


Low band-edge compliance

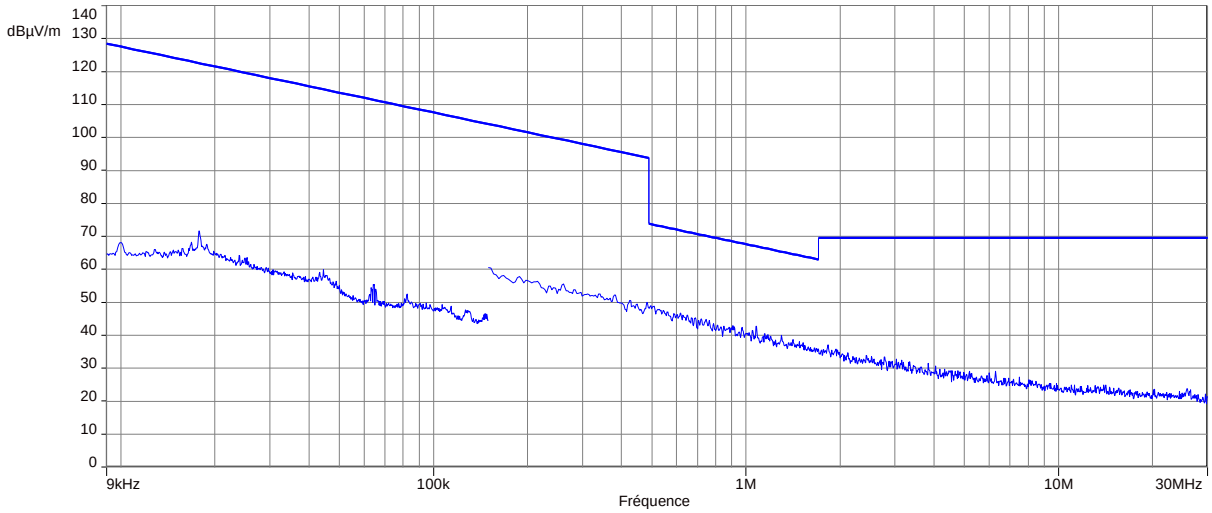
M2 = 902MHz
Quasi-Peak level below 902MHz is 37.95dBµV/m max at 3m (limit is 46dBµV/m)
RESULT: PASS
Note: Radiated measurement

High band-edge compliance

M2 = 928MHz
Quasi-Peak level above 928MHz is 36.49dBµV/m max at 3m (limit is 46dBµV/m)
RESULT: PASS
Note: Radiated measurement

IDS1015	
Graphical representation of Band-edge compliance (Radiated)	
	
Low band-edge compliance M2 = 902MHz Quasi-Peak level below 902MHz is 38.11dBµV/m max at 3m (limit is 46dBµV/m) RESULT: PASS Note: Radiated measurement	*High band-edge compliance* M2 = 928MHz Quasi-Peak level above 928MHz is 39.09dBµV/m max at 3m (limit is 46dBµV/m) RESULT: PASS Note: Radiated measurement

IDS1014
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-30MHz / 3m / Worst case Parallel & Perpendicular antenna position / Transmit mode)



Notes: Pre-scan graph only for identification purpose. Same result for transmit mode on all channels.

Tabulated Results for Unwanted emissions (9kHz-490kHz)

FREQ	RF field @ 300m	Limit @ 300m	Detector	Margin	Ant. angle	Table angle	Correc. Fact. (CF)
MHz	dBµV/m	dBµV/m	Pk / QP / AV	dB	Degree	Degree	dB
All levels are at least 20dB below applicable limits							

Supplementary information:
Frequency list measured has been created with pre-scan results.

Frequency band investigated:	9kHz-490kHz
RBW:	200Hz (9kHz-150kHz) 9kHz (150kHz-30MHz)
Measurement distance:	10m
Final measurement detector:	Peak / Quasi-Peak / Average
Limit:	FCC Part 15.209 / RSS-Gen
Note:	CF: Correction factor = Antenna factor + Cable loss (M@300m = M@10m-59.1dB) Loop antenna used and rotated about its axis to maximize any emission.

Tabulated Results for Unwanted emissions (490kHz-30MHz)

FREQ	RF field @ 30m	Limit @ 30m	Detector	Margin	Ant. angle	Table angle	Correc. Fact. (CF)
MHz	dBµV/m	dBµV/m	Pk / QP	dB	Degree	Degree	dB
All levels are at least 20dB below applicable limits							

Supplementary information:
Frequency list measured has been created with pre-scan results.

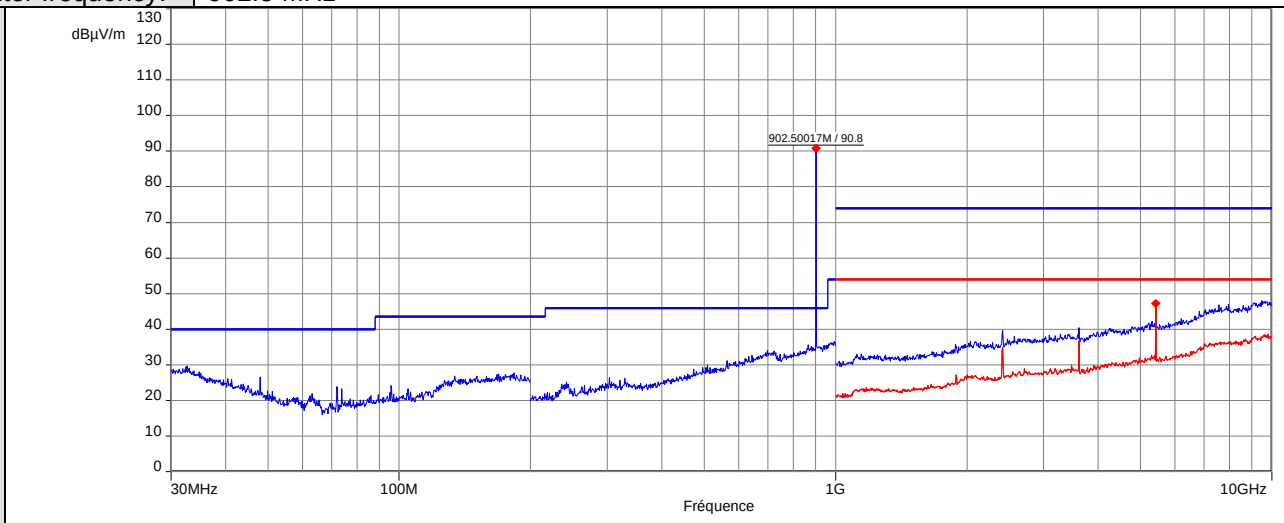
Frequency band investigated:	490kHz-30MHz
RBW:	9kHz (150kHz-30MHz)
Measurement distance:	10m
Final measurement detector:	Quasi-Peak
Limit:	FCC Part 15.209 / RSS-Gen
Note:	CF: Correction factor = Antenna factor + Cable loss (M@30m = M@10m-19.1dB) Loop antenna used and rotated about its axis to maximize any emission.

IDS1014

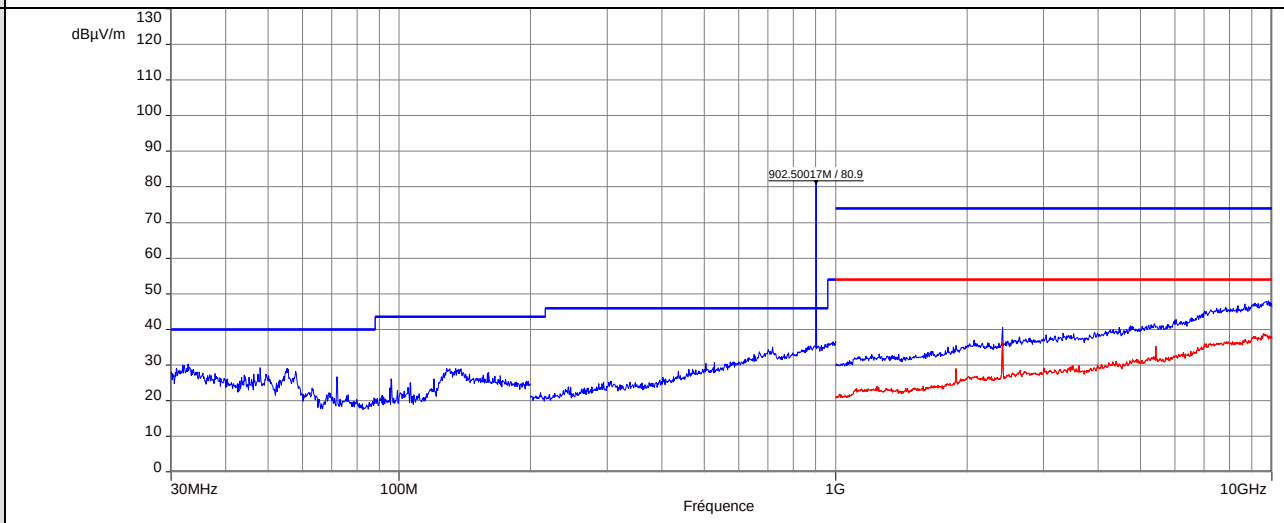
Graphical representation of Radiated Disturbance Measurement (Peak detection, Full Anechoic Chamber pre-scan, 30MHz-10GHz / 3m / Transmit mode / Worst position)

Center frequency: 902.5 MHz

HORIZONTAL POLARIZATION



VERTICAL POLARIZATION



Pre-scan graph only for identification purpose.

FREQ (MHz)	Field Strength 3m PK (dBµV/m)	Field Strength 3m QP or AV (dBµV/m)	Limit PK (dBµV/m)	Margin Peak (dBµV/m)	Limit QP or AV (dB)	Margin QP or AV (dBµV/m)	Table angle (°)	Ant height (m)	Total factor (dB)	Pol (H/V)	Detector & Limit QP
5414.87504	48.60	44.54	74.00	-25.40	54.00	-9.46	236.30	2.13	0.54	H	PK&AVG

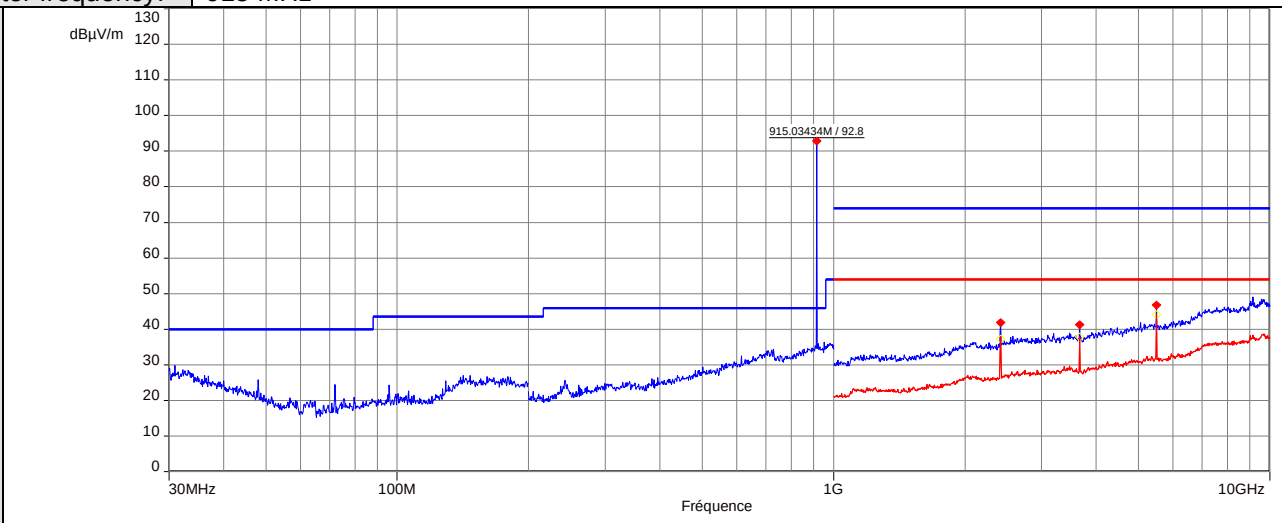
Frequency and Limit band:	30Mz-10GHz / FCC 15.209 / RSS-GEN
RBW and Limit detector:	Below 1GHz: RBW= 100kHz, Quasi-Peak Limit / above 1GHz: RBW= 1MHz, Peak and CISPR Average Limit
Results	PASS

IDS1014

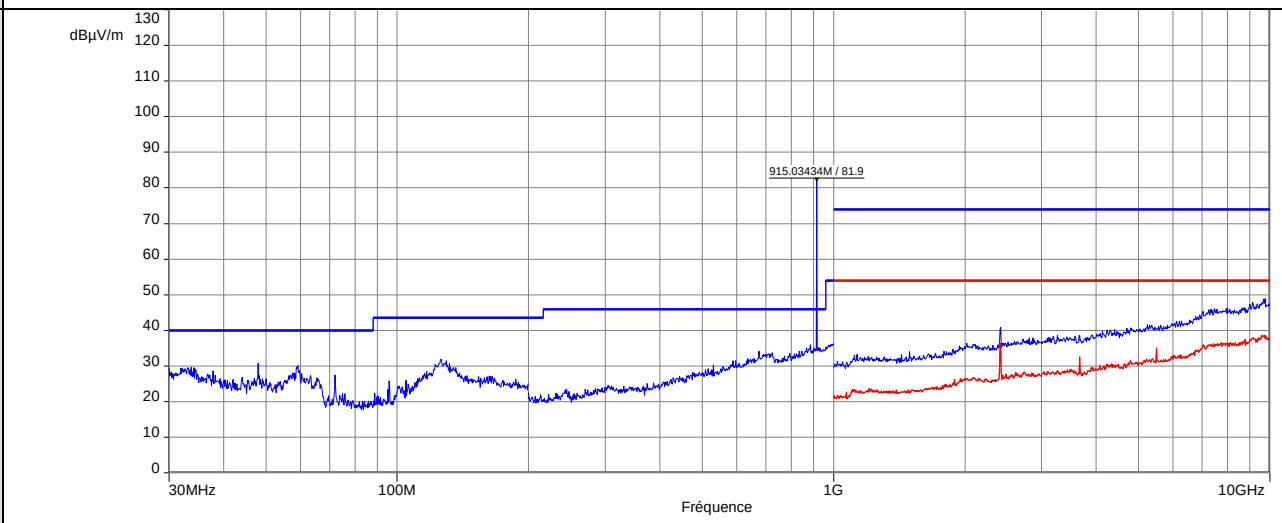
Graphical representation of Radiated Disturbance Measurement (Peak detection, Full Anechoic Chamber pre-scan, 30MHz-10GHz / 3m / Transmit mode / Worst position)

Center frequency: 915 MHz

HORIZONTAL POLARIZATION



VERTICAL POLARIZATION



Pre-scan graph only for identification purpose.

FREQ (MHz)	Field Strength 3m PK (dBµV/m)	Field Strength 3m QP or AV (dBµV/m)	Limit PK (dBµV/m)	Margin Peak (dBµV/m)	Limit QP or AV (dB)	Margin QP or AV (dBµV/m)	Table angle (°)	Ant height (m)	Total factor (dB)	Pol (H/V)	Detector & Limit QP
2413.0284	40.63	23.78	74.00	-33.37	54.00	-30.22	130.20	2.79	-7.86	H	PK&AVG
3660.1159	42.93	37.26	74.00	-31.07	54.00	-16.74	262.50	1.33	-5.25	H	PK&AVG
5490.16078	48.63	45.15	74.00	-25.37	54.00	-8.85	239.40	1.47	0.56	H	PK&AVG

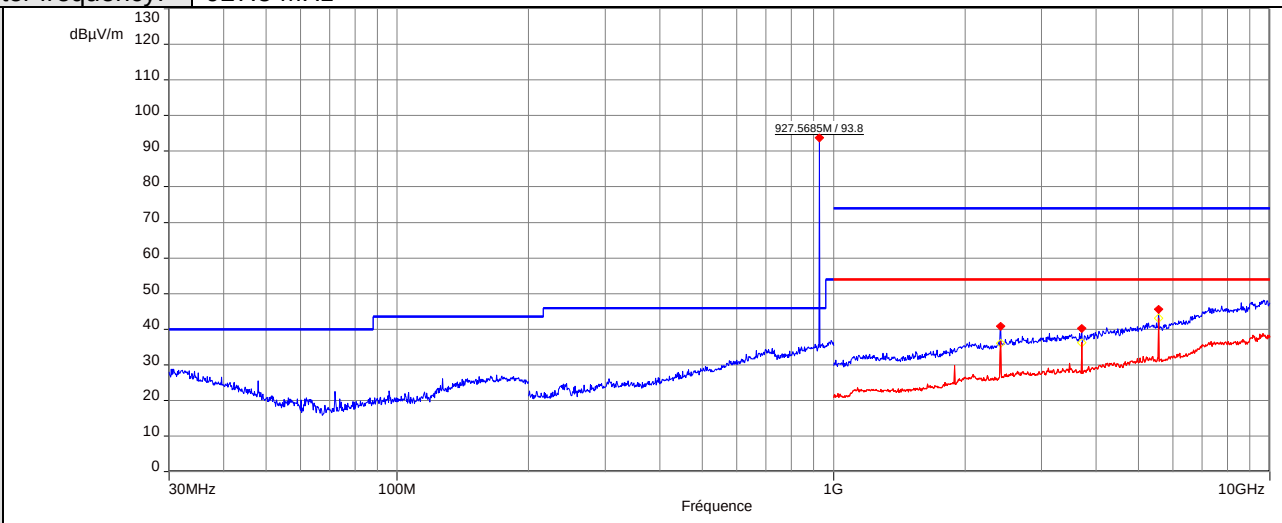
Frequency and Limit band:	30Mz-25GHz / FCC 15.209 / RSS-GEN
RBW and Limit detector:	Below 1GHz: RBW= 100kHz, Quasi-Peak Limit / above 1GHz: RBW= 1MHz, Peak and CISPR Average Limit
Results	PASS

IDS1014

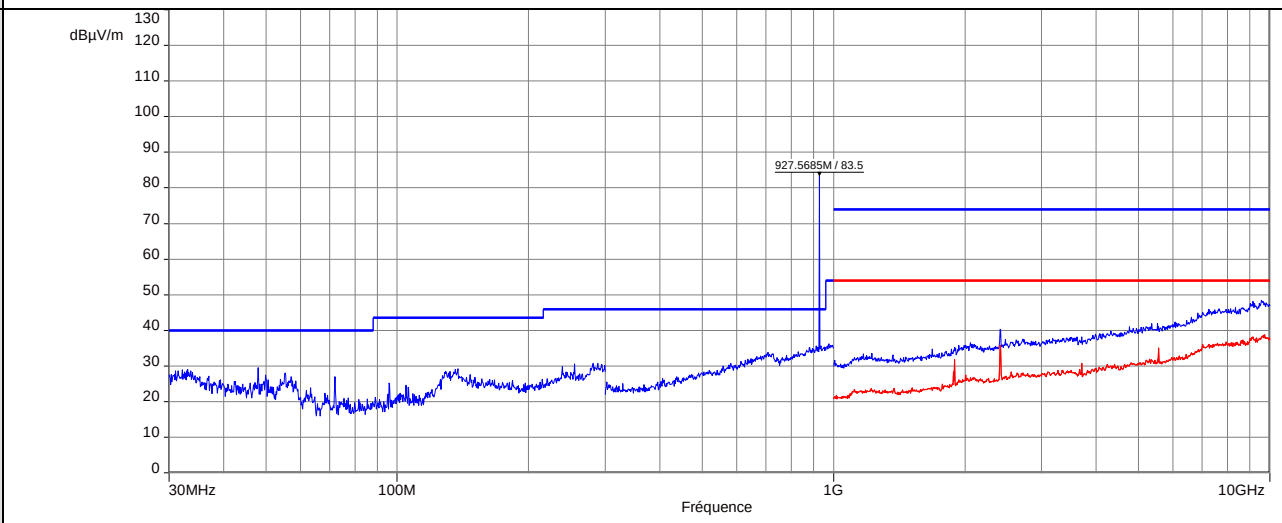
Graphical representation of Radiated Disturbance Measurement (Peak detection, Full Anechoic Chamber pre-scan, 30MHz-10GHz / 3m / Transmit mode / Worst position)

Center frequency: 927.5 MHz

HORIZONTAL POLARIZATION



VERTICAL POLARIZATION

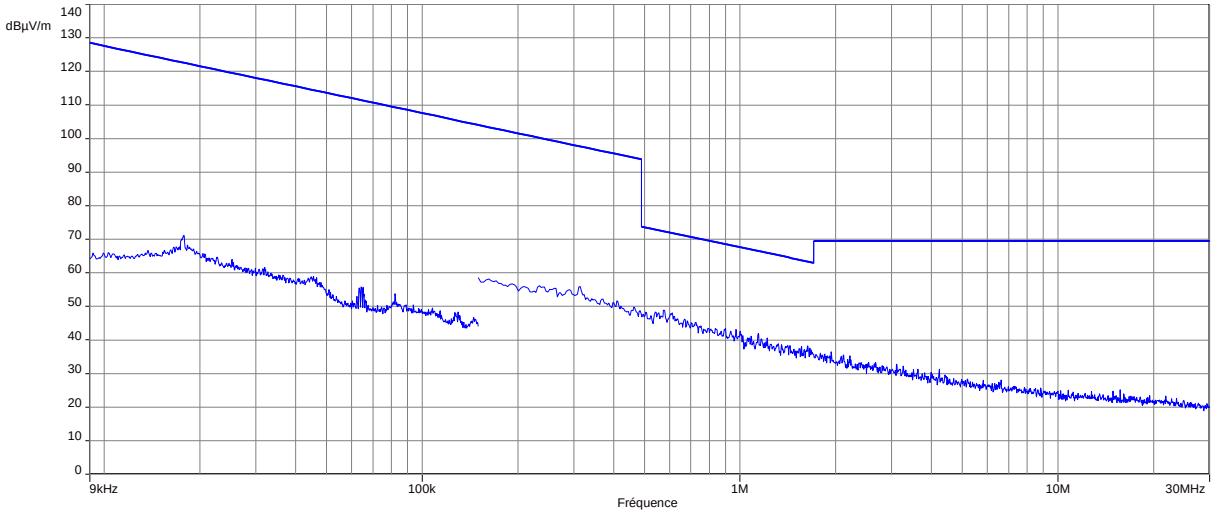


Pre-scan graph only for identification purpose.

FREQ (MHz)	Field Strength 3m PK (dBµV/m)	Field Strength 3m QP or AV (dBµV/m)	Limit PK (dBµV/m)	Margin Peak (dBµV/m)	Limit QP or AV (dB)	Margin QP or AV (dBµV/m)	Table angle (°)	Ant height (m)	Total factor (dB)	Pol (H/V)	Detector & Limit QP
2416.05149	40.55	23.74	74.00	-33.45	54.00	-30.26	79.70	1.11	-7.84	H	PK&AVG
3709.83522	41.11	34.58	74.00	-32.89	54.00	-19.42	279.50	1.26	-5.32	H	PK&AVG
5565.00071	47.81	42.83	74.00	-26.19	54.00	-11.17	235.60	1.50	0.66	H	PK&AVG

Frequency and Limit band:	30Mz-25GHz / FCC 15.209 / RSS-GEN
RBW and Limit detector:	Below 1GHz: RBW= 100kHz, Quasi-Peak Limit / above 1GHz: RBW= 1MHz, Peak and CISPR Average Limit
Results	PASS

IDS1015
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-30MHz / 3m / Worst case Parallel & Perpendicular antenna position / Transmit mode)



Notes: Pre-scan graph only for identification purpose. Same result for transmit mode on all channels.

Tabulated Results for Unwanted emissions (9kHz-490kHz)

FREQ	RF field @ 300m	Limit @ 300m	Detector	Margin	Ant. angle	Table angle	Correc. Fact. (CF)
MHz	dBµV/m	dBµV/m	Pk / QP / AV	dB	Degree	Degree	dB
All levels are at least 20dB below applicable limits							

Supplementary information:
Frequency list measured has been created with pre-scan results.

Frequency band investigated:	9kHz-490kHz
RBW:	200Hz (9kHz-150kHz) 9kHz (150kHz-30MHz)
Measurement distance:	10m
Final measurement detector:	Peak / Quasi-Peak / Average
Limit:	FCC Part 15.209 / RSS-Gen
Note:	CF: Correction factor = Antenna factor + Cable loss (M@300m = M@10m-59.1dB) Loop antenna used and rotated about its axis to maximize any emission.

Tabulated Results for Unwanted emissions (490kHz-30MHz)

FREQ	RF field @ 30m	Limit @ 30m	Detector	Margin	Ant. angle	Table angle	Correc. Fact. (CF)
MHz	dBµV/m	dBµV/m	Pk / QP	dB	Degree	Degree	dB
All levels are at least 20dB below applicable limits							

Supplementary information:
Frequency list measured has been created with pre-scan results.

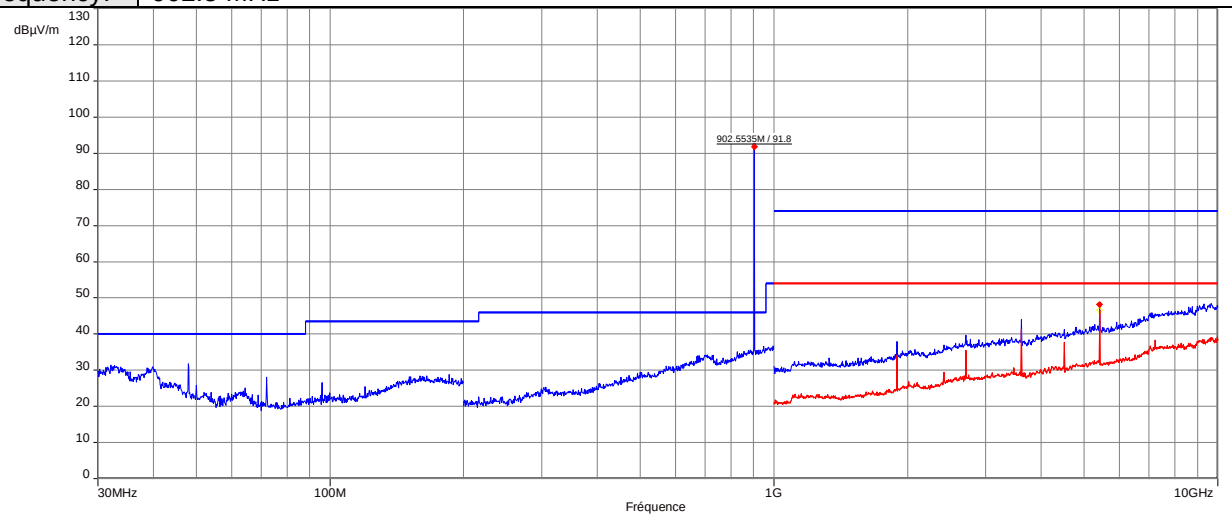
Frequency band investigated:	490kHz-30MHz
RBW:	9kHz (150kHz-30MHz)
Measurement distance:	10m
Final measurement detector:	Quasi-Peak
Limit:	FCC Part 15.209 / RSS-Gen
Note:	CF: Correction factor = Antenna factor + Cable loss (M@30m = M@10m-19.1dB) Loop antenna used and rotated about its axis to maximize any emission.

IDS1015

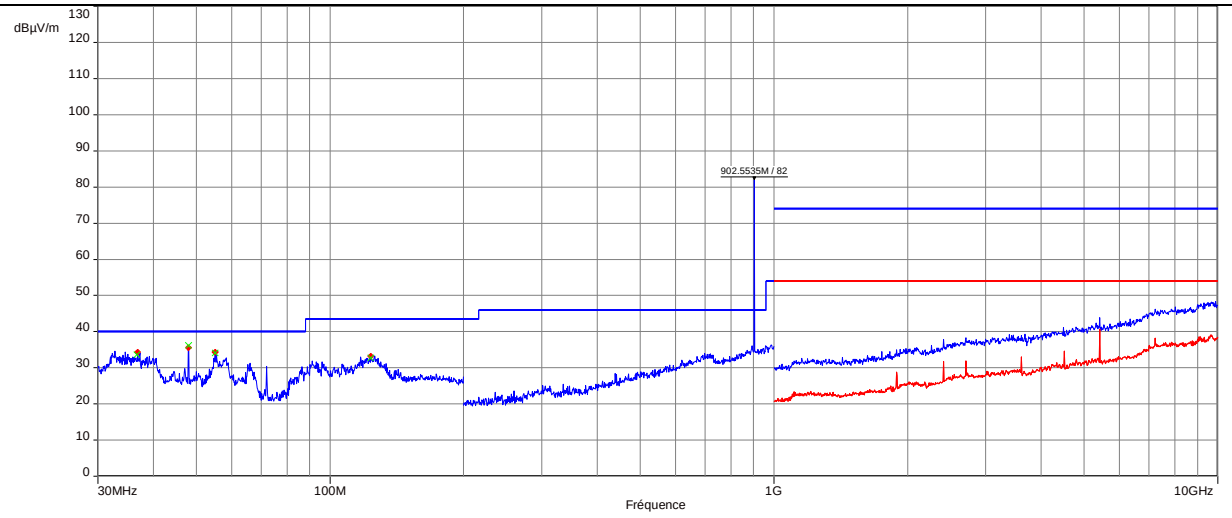
Graphical representation of Radiated Disturbance Measurement (Peak detection, Full Anechoic Chamber pre-scan, 30MHz-10GHz / 3m / Transmit mode / Worst position)

Center frequency: 902.5 MHz

HORIZONTAL POLARIZATION



VERTICAL POLARIZATION



Pre-scan graph only for identification purpose.

FREQ (MHz)	**Field Strength 3m PK** (dBµV/m)	**Field Strength 3m QP or AV** (dBµV/m)	**Limit PK** (dBµV/m)	**Margin Peak** (dBµV/m)	**Limit QP or AV** (dB)	**Margin QP or AV** (dBµV/m)	**Table angle** (°)	**Ant height** (m)	**Total factor** (dB)	**Pol** (H/V)	**Detector & Limit** QP
5415.06251	50.19	46.00	74.00	-23.81	54.00	-8.00	201.00	1.52	0.54	H	PK&AVG
36.717944	33.64	27.80	-	-	40.00	-12.20	352.60	1.07	17.08	V	QP
48.002649	36.24	33.42	-	-	40.00	-6.58	360.00	1.00	13.01	V	QP
55.135425	34.08	27.68	-	-	40.00	-12.32	360.00	1.00	9.88	V	QP
123.601623	32.76	26.41	-	-	43.50	-17.09	0.10	1.00	12.53	V	QP

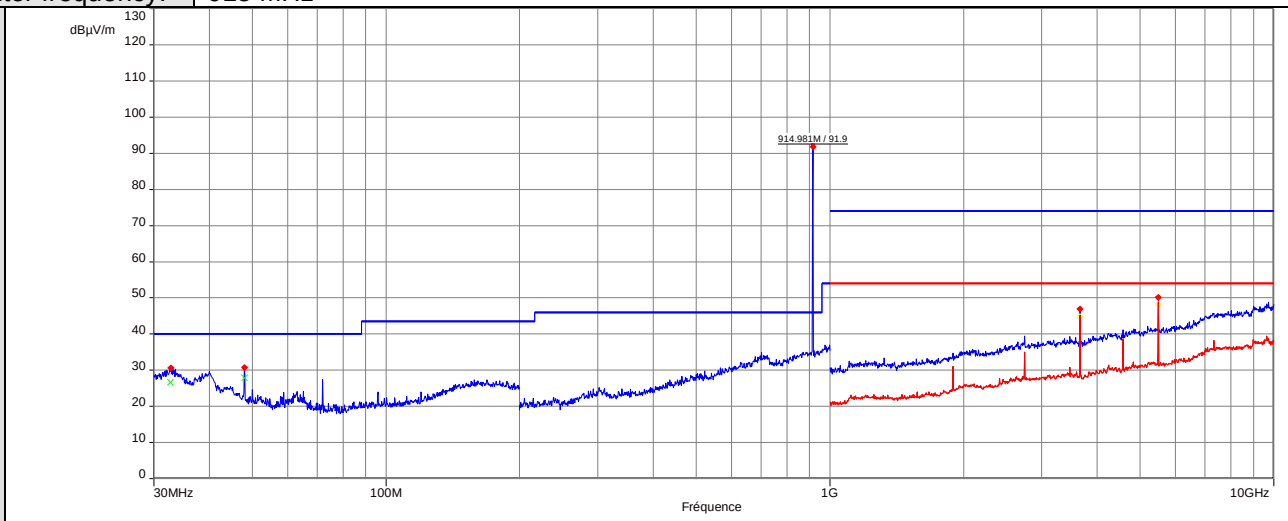
Frequency and Limit band:	30Mz-10GHz / FCC 15.209 / RSS-GEN
RBW and Limit detector:	Below 1GHz: RBW= 100kHz, Quasi-Peak Limit / above 1GHz: RBW= 1MHz, Peak and CISPR Average Limit
Results	PASS

IDS1015

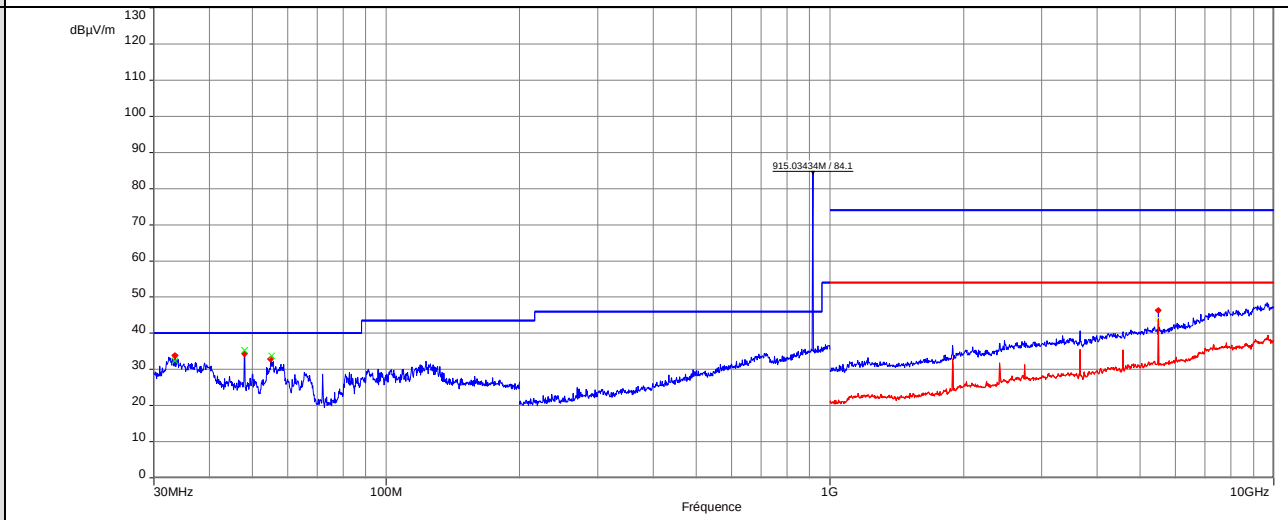
Graphical representation of Radiated Disturbance Measurement (Peak detection, Full Anechoic Chamber pre-scan, 30MHz-10GHz / 3m / Transmit mode / Worst position)

Center frequency: 915 MHz

HORIZONTAL POLARIZATION



VERTICAL POLARIZATION



Pre-scan graph only for identification purpose.

FREQ (MHz)	Field Strength 3m PK (dBµV/m)	Field Strength 3m QP or AV (dBµV/m)	Limit PK (dBµV/m)	Margin Peak (dBµV/m)	Limit QP or AV (dB)	Margin QP or AV (dBµV/m)	Table angle (°)	Ant height (m)	Total factor (dB)	Pol (H/V)	Detector & Limit QP
32.678635	26.64	22.47	-	-	40.00	-17.53	216.90	1.74	18.17	H	QP
47.99895	27.95	26.61	-	-	40.00	-13.39	0.00	2.89	13.01	H	QP
3660.20341	47.42	44.33	74.00	-26.58	54.00	-9.67	234.20	1.09	-5.25	H	PK&AVG
5490.1006	51.67	48.69	74.00	-22.33	54.00	-5.31	205.20	1.10	0.56	H	PK&AVG
33.456849	32.44	25.34	-	-	40.00	-14.66	354.70	1.00	17.99	V	QP
47.994682	35.39	32.72	-	-	40.00	-7.28	360.00	1.00	13.01	V	QP
55.19512	33.68	27.37	-	-	40.00	-12.63	360.00	1.00	9.86	V	QP
5489.90282	48.83	44.64	74.00	-25.17	54.00	-9.36	240.70	2.68	0.56	V	PK&AVG

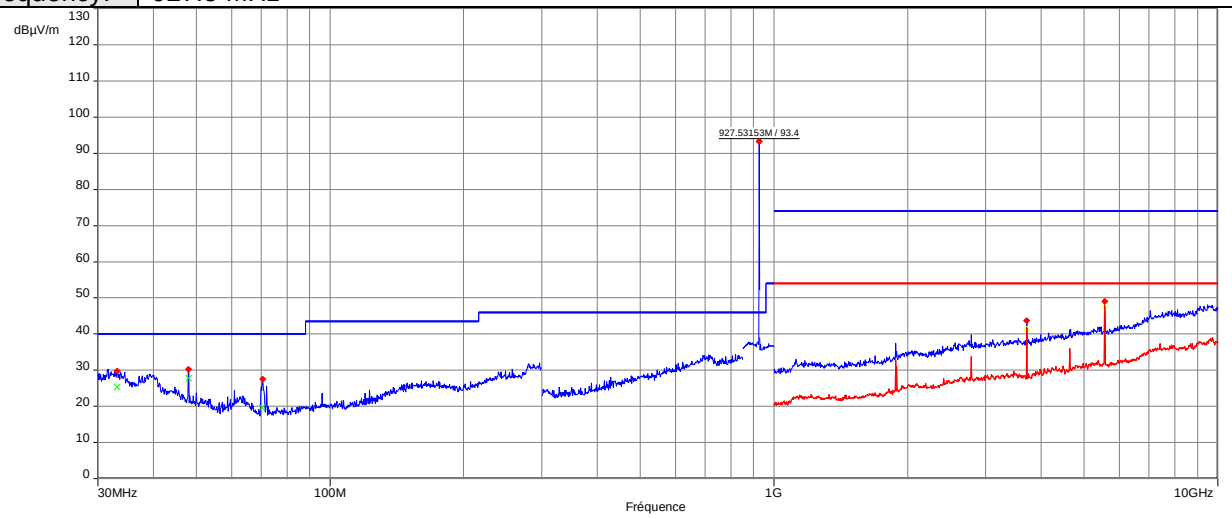
Frequency and Limit band:	30Mz-25GHz / FCC 15.209 / RSS-GEN
RBW and Limit detector:	Below 1GHz: RBW= 100kHz, Quasi-Peak Limit / above 1GHz: RBW= 1MHz, Peak and CISPR Average Limit
Results	PASS

IDS1015

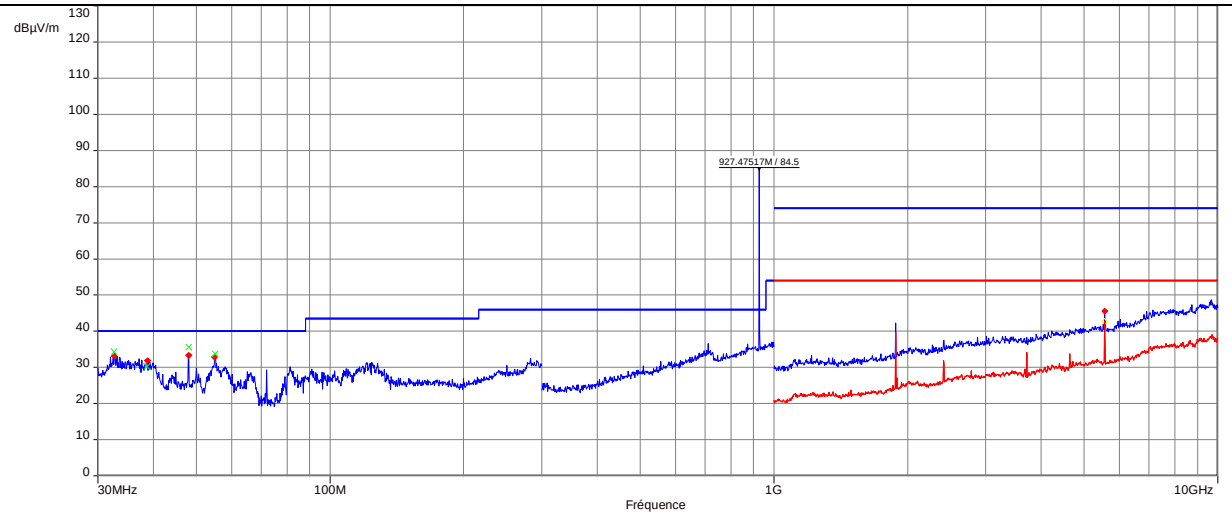
Graphical representation of Radiated Disturbance Measurement (Peak detection, Full Anechoic Chamber pre-scan, 30MHz-10GHz / 3m / Transmit mode / Worst position)

Center frequency: 927.5 MHz

HORIZONTAL POLARIZATION



VERTICAL POLARIZATION



Pre-scan graph only for identification purpose.

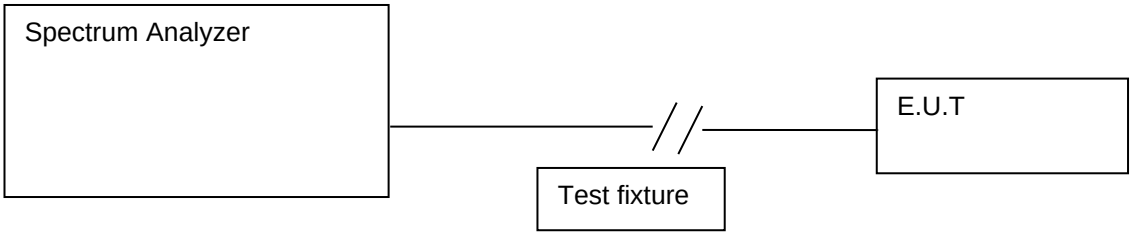
FREQ (MHz)	Field Strength 3m PK (dBµV/m)	Field Strength 3m QP or AV (dBµV/m)	Limit PK (dBµV/m)	Margin Peak (dBµV/m)	Limit QP or AV (dB)	Margin QP or AV (dBµV/m)	Table angle (°)	Ant height (m)	Total factor (dB)	Pol (H/V)	Detector & Limit QP
33.146962	25.31	21.40	-	-	40.00	-18.60	356.10	1.74	40.00	H	QP
48.002182	27.87	26.48	-	-	40.00	-13.52	0.00	2.89	40.00	H	QP
70.306721	19.70	11.30	-	-	40.00	-28.70	360.00	2.91	40.00	H	QP
3709.9619	41.16	33.91	74.00	-32.84	54.00	-20.09	135.50	1.09	-5.32	H	PK&AVG
5565.02291	51.08	47.62	74.00	-22.92	54.00	-6.38	200.50	1.28	0.66	H	PK&AVG
32.606561	34.36	27.13	-	-	40.00	-12.87	360.00	1.00	18.19	V	QP
38.675271	30.35	24.33	-	-	40.00	-15.67	211.10	1.00	16.48	V	QP
48.000517	35.58	32.73	-	-	40.00	-7.27	360.00	1.00	13.01	V	QP
55.089817	33.73	27.46	-	-	40.00	-12.54	360.00	1.00	9.90	V	QP
5565.15969	47.28	42.29	74.00	-26.72	54.00	-11.71	183.40	1.27	0.66	V	PK&AVG

Frequency and Limit band:	30Mz-25GHz / FCC 15.209 / RSS-GEN
RBW and Limit detector:	Below 1GHz: RBW= 100kHz, Quasi-Peak Limit / above 1GHz: RBW= 1MHz, Peak and CISPR Average Limit
Results	PASS

13. Occupied bandwidth (99%)

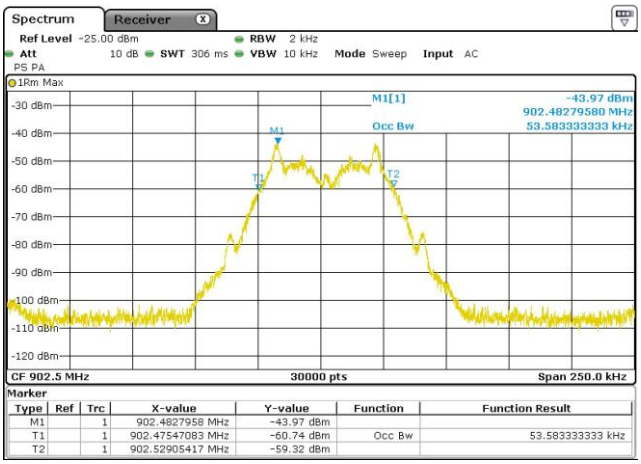
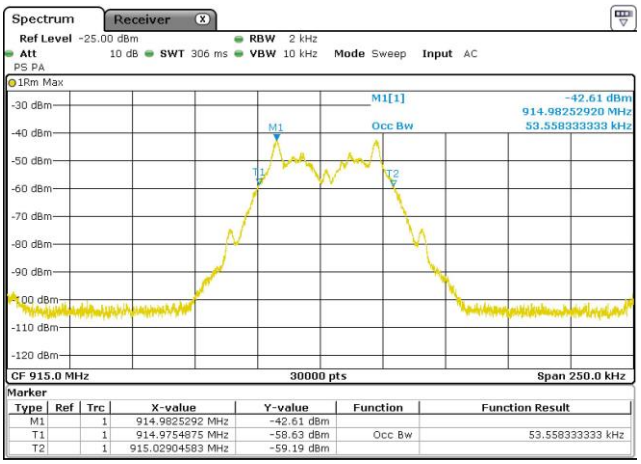
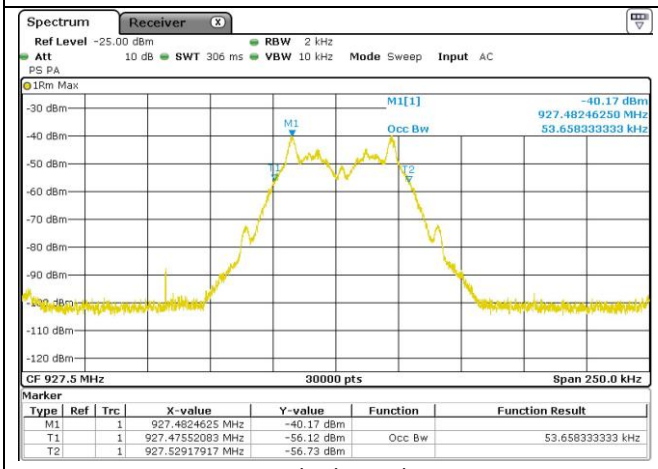
TEST: Occupied bandwidth (99%) / RSS-GEN		**Verdict**
Method: The setup is in an anechoic chamber. The spectrum analyzer is connected to the measuring antenna. A radiated measurement is performed. The RBW is set in the range of 1% to 5% of the occupied bandwidth, with VBW ≥ 3 x RBW. The SPAN is wide enough to capture all products of the modulation process. A Peak detector is used. Measure is performed with OBW 99% function of the spectrum analyser. The tested equipment is set to transmit operation with modulation on low, mid and high channels.		**Pass**
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	20 to 30 °C	22°C ± 2
Relative Humidity	30 to 70 %	45% ± 5
Supplementary information: Test location: SMEE Test date: March 8th, 2024. Tested by C. KERMICHE		

Test Setup for radiated emission (Test fixture)

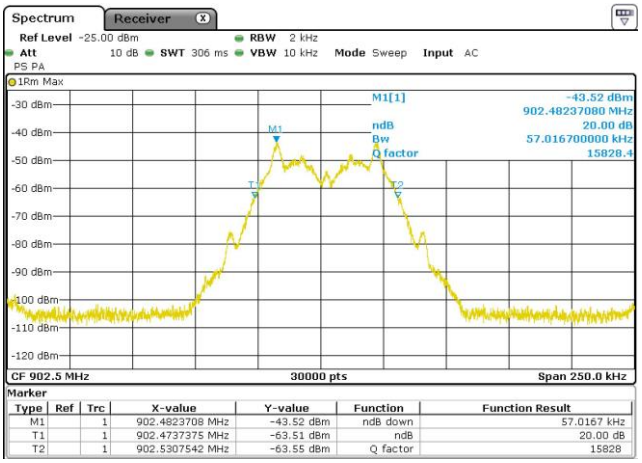
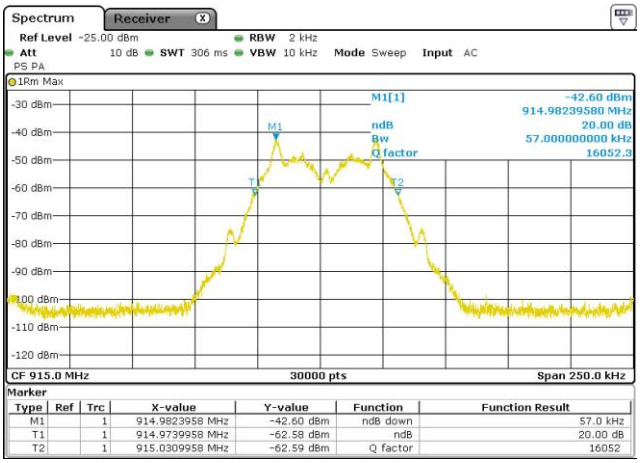
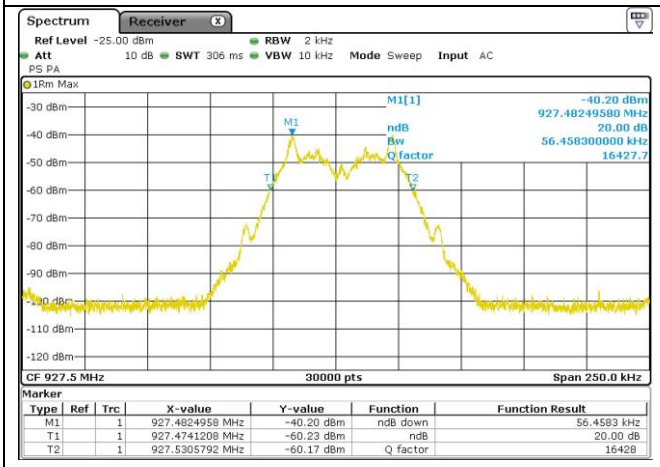


IDS1014	
Tabulated Results for 99% Occupied Bandwidth	
Frequency (MHz)	**Results** (kHz)
902.5	53.583
915.0	53.558
927.5	53.658
Tabulated Results for 20dB Bandwidth	
Frequency (MHz)	**Results** (kHz)
902.5	57.017
915.0	57.000
927.5	56.458

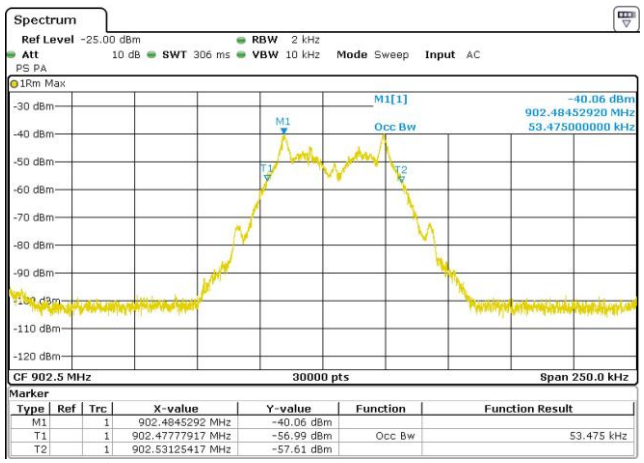
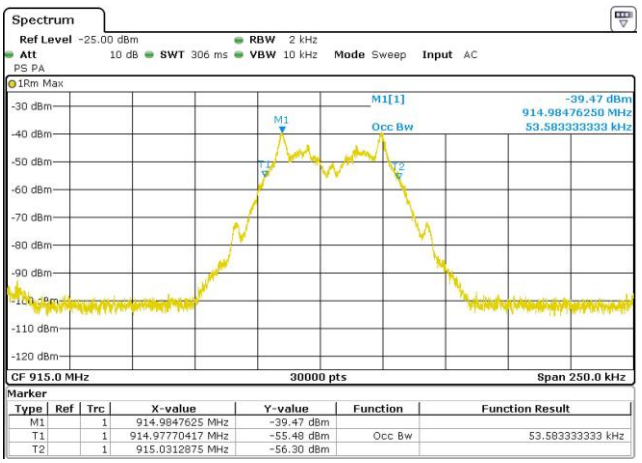
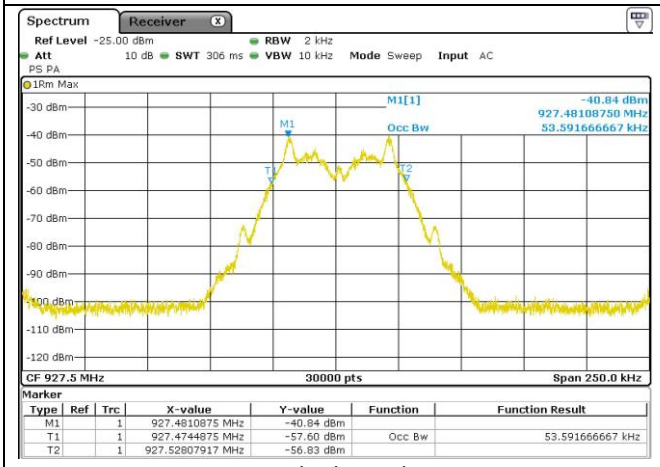
IDS1015	
Tabulated Results for 99% Occupied Bandwidth	
Frequency (MHz)	**Results** (kHz)
902.5	53.475
915.0	53.583
927.5	53.592
Tabulated Results for 20dB Bandwidth	
Frequency (MHz)	**Results** (kHz)
902.5	56.658
915.0	56.158
927.5	56.467

IDS1014	
Graphical representation of 99% Occupied Bandwidth	
 Low Channel	 Mid Channel
 High Channel	

Frequency band investigated:	902 to 928MHz
RBW / VBW :	2kHz / 10kHz
Measurement detector:	Peak / Max hold

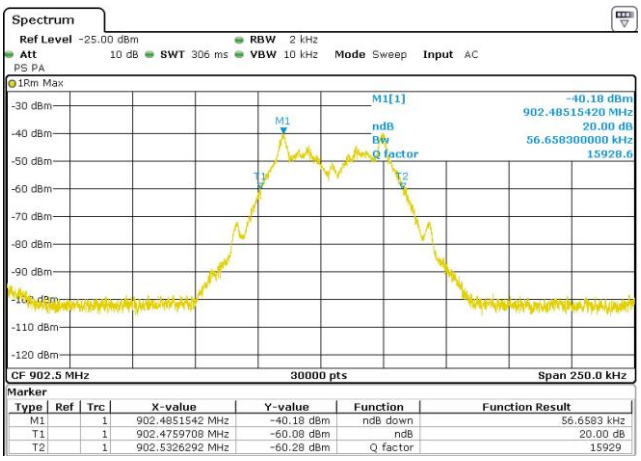
IDS1014	
Graphical representation of 20dB Occupied Bandwidth	
 Low Channel	 Mid Channel
 High Channel	

Frequency band investigated:	902 to 928MHz
RBW / VBW :	2kHz / 10kHz
Measurement detector:	Peak / Max hold

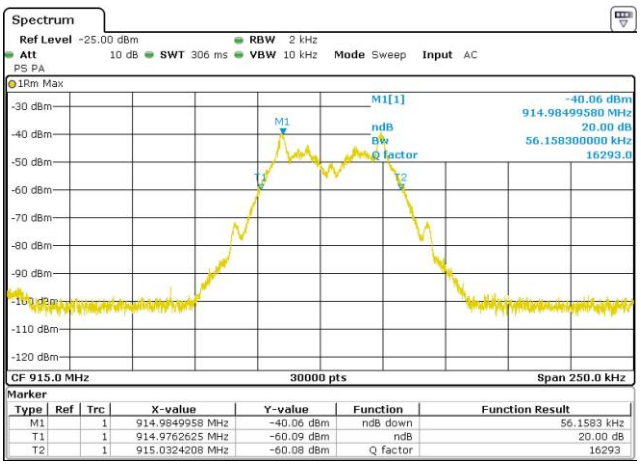
IDS1015	
Graphical representation of 99% Occupied Bandwidth	
 Low Channel	 Mid Channel
 High Channel	
Frequency band investigated:	902 to 928MHz
RBW / VBW :	2kHz / 10kHz
Measurement detector:	Peak / Max hold

IDS1015

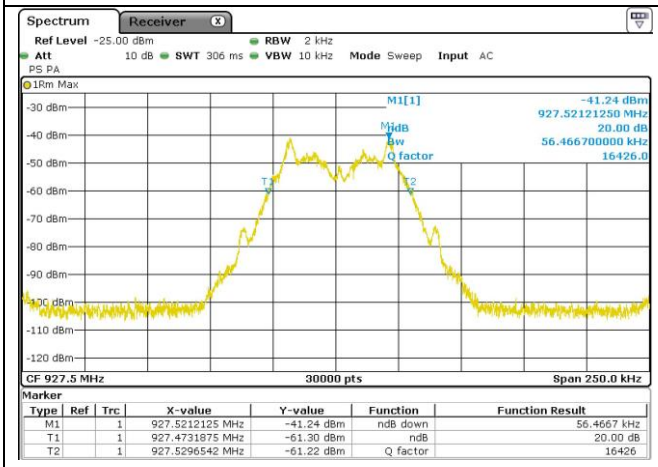
Graphical representation of 20dB Occupied Bandwidth



Low Channel



Mid Channel



High Channel

Frequency band investigated:	902 to 928MHz
RBW / VBW :	2kHz / 10kHz
Measurement detector:	Peak / Max hold

14. Test Equipment List

Description	Manufacturer	Model	ID	Date Cal.	Nxt. Cal.
Loop antenna	EMCO	6502	ANT-101-009	2023/9	2025/9
Log-periodic antenna	EMCO	3146	ANT-191-019	2024/3	2026/3
Biconnic antenna	COM-POWER	AB- 900A	ANT-201-021	2023/01	2025/1
Horn antenna	COM-POWER	AH-118	ANT-101-004	2021/7	2024/7
High-Pass filter	Wainwright Inst.	HK6-948-1200	FIL-141-004	2023/4	2024/4
RF cable	HUBER+SUHNER	SF126E / 2m	CAB-231-043	2023/4	2024/4
RF cable	HUBER+SUHNER	SF104E / 5.3m	CAB-231-044	2023/4	2024/4
RF cable	HUBER+SUHNER	SF126E / 7m	CAB-231-045	2023/4	2024/4
Semi anechoic room	COMTEST	218292	CAG-201-002	2022/4	2025/2
Antenna mast	Innco- Systems	MA4640-XP-ET	MAT-201-002	-	-
Turntable	Innco- Systems	CT0800	PLA-141-001	-	-
Turntable	Innco- Systems	DS1500-S-1t	PLA-201-003	-	-
Pre-amplifier	COM-POWER	1-18GHz	PRE-221-005	2023/4	2024/4
Measuring Rec	Rohde&Schwarz	ESRP	REC-151-002	2021/12	2024/6
Spectrum analyzer	Rohde&Schwarz	FSV40	ASP-171-004	2021/10	2024/4
EMC Software	NEXIO	BAT EMC	SOF-101-001	-	-
Ref. Comb generator	SMEE	EMR-10M	REF-111-002	-	-
Ref. Comb generator	SMEE	EMR 1-6GHz	REF-141-003	-	-

END OF REPORT.