

FCC Test Firm Registration Number: 171131
Industry Canada Test Firm Number: Site# 9545A-1

Matériel testé :
Equipment under test:

i-MARK S350 / i-MARK S350-ER

Constructeur:
Manufacturer: **IDENEC SOLUTIONS AG**
Millennium Park 2
A-6890 Lustenau - Austria

Rapport délivré à :
Issued to: **IDENEC SOLUTIONS AG**
Millennium Park 2
A-6890 Lustenau - Austria

Référence de la proposition : 062016-22037
Proposal number:

Date de l'essai : Du 8 au 19 août 2016
Date of test: August 8th to 19th, 2016

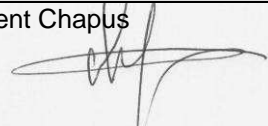
Objectif des essais : EMC qualification accordingly to following standards:
Test purpose: - CFR 47, FCC Part 15, Subpart C
- Industry Canada, RSS-Gen Issue 4 & RSS-210 Issue 9
(Low power transmitter below 1705KHz)

FCC ID: OO4-ILR-IMS350
IC ID : 3538A-IMS350
Model : i-MARK S350 / i-MARK S350-ER

Lieu du test: SMEE CE-Mesures
Test location: 38 VOIRON - France

Test réalisé par : Jérémy BLANCHER
Test realized by:

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

Ed.	Date	Modifications Pages	Written by:	Approved by: Visa
1	October 3 rd , 2016	Initial Edition	Jeremy Blancher	Laurent Chapus
2	November 21 st , 2016	TCB comments		

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COORDONNEES

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SAS au capital de 50 000 € / RC Grenoble B534 796 453 / SIRET 534 796 453 00015 / code APE 7490B / n° TVA : FR 59 534 796 453



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1. Normatives References

FCC qualification following:		
Standards	Applied	Title
ANSI C63.4 (2014)	X	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
ANSI C63.10 (2013)	X	American National Standard for Testing Unlicensed Wireless Devices
CFR47, Part 15	X	Telecommunication – Federal Communication Commission – Radio frequency devices, Sections 15.107 / 15.109 / 15.207 / 15.209

Industry Canada qualification following:		
Standards	Applied	Title
RSS-Gen (Issue 4/2014)	X	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 (Issue9/2016)	X	Licence-exempt Radio Apparatus: Category I Equipment

2. Test synthesis

TEST	Paragraph number FCC Part 15 IC RSS-210	Spec. FCC Part 15 IC RSS-210	RESULTS (comments)												
Conducted emissions test	15.107 (a) / 15.207 (a) RSS-Gen: Issue 4, §8.8	Table 15.107 (a) / 15.207 (a) Table 3 §8.8 <u>Limits:</u>	PASS												
		<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>Q-Peak (dBµV/m)</th> <th>Average (dBµV/m)</th> </tr> </thead> <tbody> <tr> <td>0.15 – 0.5</td> <td>66 \ 56</td> <td>56 \ 46</td> </tr> <tr> <td>0.5 – 5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5 – 30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>		Frequency (MHz)	Q-Peak (dBµV/m)	Average (dBµV/m)	0.15 – 0.5	66 \ 56	56 \ 46	0.5 – 5	56	46	5 – 30	60	50
		Frequency (MHz)		Q-Peak (dBµV/m)	Average (dBµV/m)										
		0.15 – 0.5		66 \ 56	56 \ 46										
0.5 – 5	56	46													
5 – 30	60	50													
Radiated emission test	15.109 (a) / 15.209 (a) RSS-Gen: Issue 4, §8.9 RSS-210, Issue 9	Table 15.209 (a) Table 4 & 5 §8.9 <u>Measure at 300m</u> 9-490kHz: 2400µV/m / F(kHz) <u>Measure at 30m</u> 0.490-1.705: 24000µV/m / F(kHz) 1.705-30MHz: 30µV/m <u>Measure at 3m</u> 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 Bandwidth	RSS-Gen: Issue 4, §6.6	BW at 99%	PASS												

- **General conclusion:**

Measures and tests performed on the sample of the products *i-MARK S350* & *i-MARK S350-ER*, in configuration and description presented in this test report, show compliance with standards FCC CFR 47, PART 15, Subpart C and Industry Canada RSS-Gen/RSS-210.

3. Equipment Under Test (EUT)

**Nom /
Identification**

i-MARK S350 / i-MARK S350-ER

Sn: 0.445.000.113 (S350-ER)
Sn: 0.445.000.105 (S350)

**Alimentation /
Power supply**

24V dc from external power source

**Auxiliaires /
Auxiliaries**

- i-PORT M350-2, IDENTEC SOLUTIONS product
(RF configuration and communication only)
(FCC ID: OO4-ILR-IPM350N / IC ID: 3538A-IPM350N)

Sn: 14288M3401

- Programmable linear power supply GOODWILL, model PPT-3615

Sn: A160095

**Entrées-Sorties /
Input / Output**

	Câbles pour essai / Cables for test	Blindé / Shielded	Prévu pour >3m / Intended for >3m
DC cable (24V)	2wires, 1m	No	Yes

**Version programme /
Firmware version**

S350 / S350-ER

**Mode de fonctionnement /
Running mode**

The tested sample is able to:

- Transmit a modulated carrier frequency at 125kHz
- Be in standby mode (no transmission)

**Programme de test /
Test program /**

Gen3 Tag Certification v1.0.0.24394

• Equipment information:

- Carrier frequency: 125kHz
- Antenna type: PCB Loop antenna
- Powered by 24V DC
- Equipment intended for use as a fixed station
- Equipment designed for continuous operation

4. Test conditions

Relative Humidity : 55%
Temperature : 20°C

Power supply voltage:

Equipment under test : 24V DC from external power source

5. Modifications of the EUT

None

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

TEST: Limits for conducted disturbance 150kHz – 30MHz / FCC part 15.207 - RSS-Gen				Verdict		
<p>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.</p>					Pass	
Laboratory Parameters:		Required prior to the test		During the test		
Ambient Temperature		10 to 40 °C		20°C		
Relative Humidity		10 to 90 %		55%		
Fully configured sample scanned over the following frequency range		Frequency range on each side of line		Measurement Point		
		150kHz to 30MHz		AC input ports (110V on linear power supply)		
Running mode		- No RF transmission (Standby mode) - RF Transmit at 125kHz (S350-ER version and S350 version)				
Limits – FCC Part 15.107 (a), 15.207 (a) / ICES-003 §6.1, RSS-Gen §8.8						
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 – CE Mesures Test date: August 19 th , 2016 Power supply voltage: 110V / 60Hz for 24V DC power supply						

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Attenuator / limiter	SMEE	ATT#1	ATT-101-004	2016/3	2017/3
Cable RF	Div	2m	CAB-101-007	2016/3	2017/3
LISN (50Ω / 50µH)	AFJ	LS16C	RSI-101-001	2016/3	2017/3
LISN (50Ω / 50µH)	AFJ	LS16C	RSI-101-002	2016/3	2017/3
Measuring Rec	Rohde&Schwarz	ESRP	REC-151-021	2015/7	2018/7
Ref. Comb generator	SMEE	EMC-250K	REF-111-001	-	-

Tabulated Results for Mains Terminal Disturbance Voltage on AC port

Standby mode

FREQ (MHz)	Meas. PK (dBμV)	Mes. QP (dBμV)	LIMIT QP (dBμV)	Margin QP (dB)	Mes. AV (dBμV)	LIMIT AV (dBμV)	Margin AV (dB)	Line
Margin > 20dB								

S350-ER Transmit mode

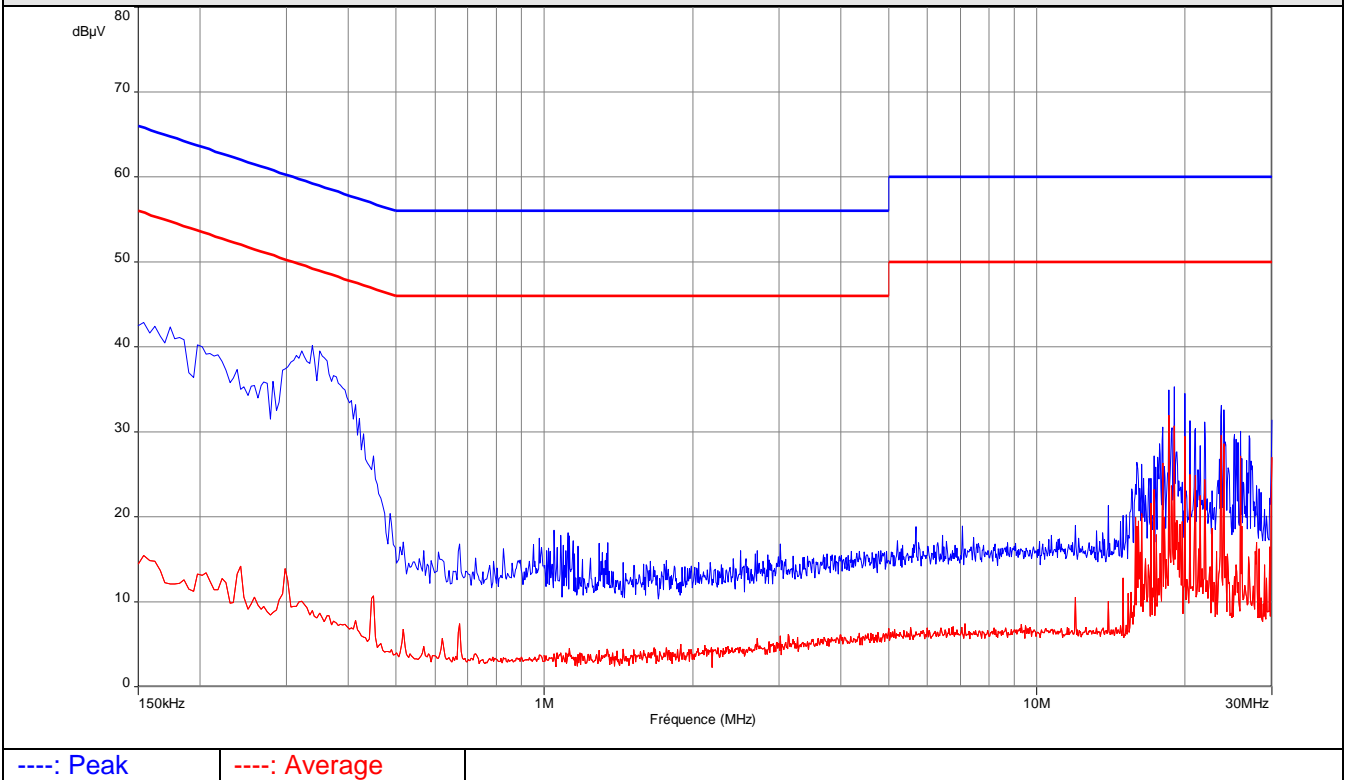
FREQ (MHz)	Meas. PK (dBμV)	Mes. QP (dBμV)	LIMIT QP (dBμV)	Margin QP (dB)	Mes. AV (dBμV)	LIMIT AV (dBμV)	Margin AV (dB)	Line
0.158	57.9	47.5	65.6	-18.0	20.8	55.6	-34.8	Line 1
0.342	54.5	44.3	59.2	-14.9	15.0	49.2	-34.1	Line 1
19.616	44.0	41.2	60.0	-18.8	31.9	50.0	-18.1	Line 1
20.120	44.2	42.1	60.0	-18.0	35.6	50.0	-14.4	Line 1
20.632	40.7	38.2	60.0	-21.8	32.0	50.0	-18.0	Line 1
28.616	26.4	16.7	60.0	-43.4	9.3	50.0	-40.7	Line 1
0.166	57.4	46.9	65.2	-18.3	19.2	55.2	-36.0	Neutral
0.338	54.8	44.3	59.3	-14.9	15.0	49.3	-34.2	Neutral
19.132	40.3	37.6	60.0	-22.4	29.4	50.0	-20.6	Neutral
19.632	41.2	39.0	60.0	-21.0	32.6	50.0	-17.4	Neutral
19.880	41.2	39.0	60.0	-21.1	31.2	50.0	-18.8	Neutral

S350 Transmit mode

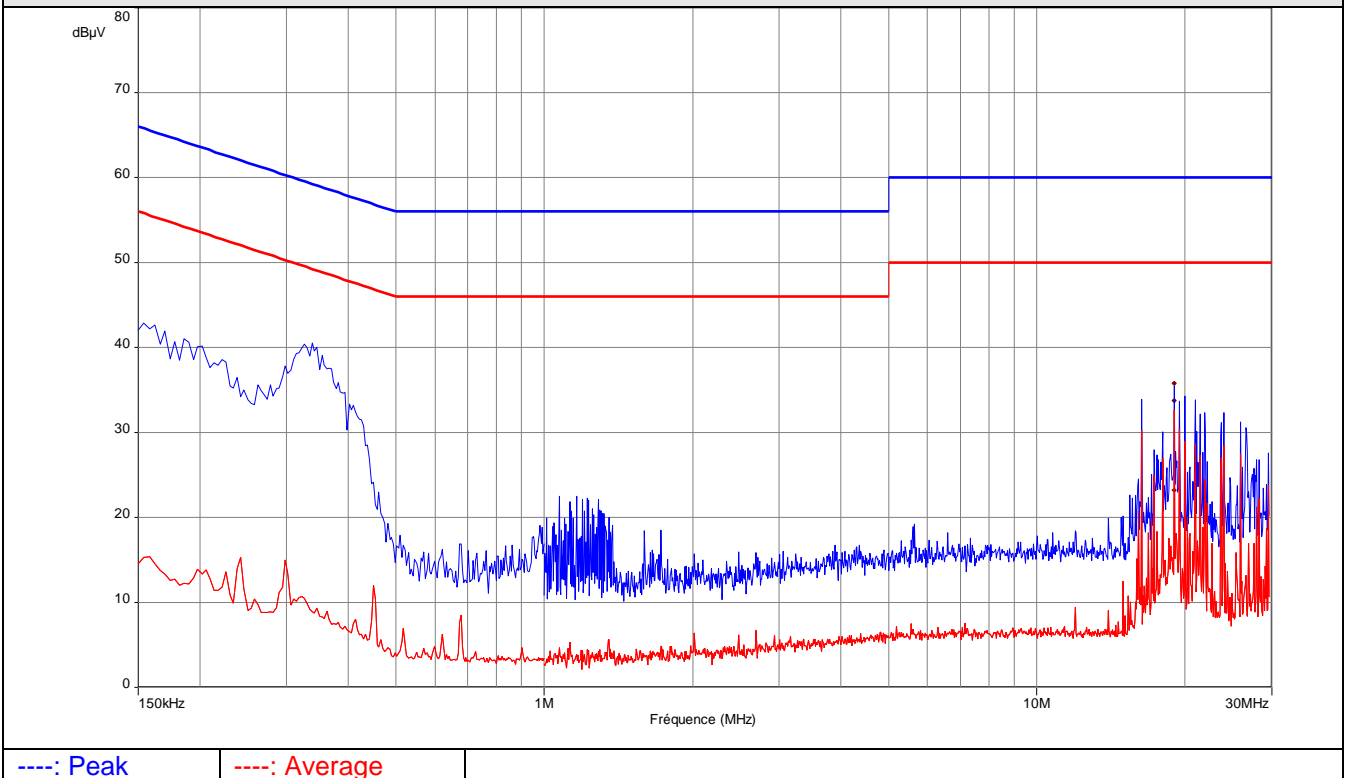
FREQ (MHz)	Meas. PK (dBμV)	Mes. QP (dBμV)	LIMIT QP (dBμV)	Margin QP (dB)	Mes. AV (dBμV)	LIMIT AV (dBμV)	Margin AV (dB)	Line
Margin > 20dB								

Frequency band investigated:	150kHz-30MHz
RBW:	9kHz
Voltage:	110V / 60Hz
Limit:	FCC Part 15.107 / 15.207 / ICES-003 / RSS-Gen
Final measurement detector:	Quasi-Peak and Average
Wide Measurement Uncertainty:	± 3.6dB (k=2)
RESULT:	PASS
Measured value calculation:	<p>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:</p> $\text{Meas.} = \text{RA} + \text{CF} + \text{ATT}_{\text{TRAN}} + \text{ATT}_{\text{LISN}}$ <p>Where Meas. = Level (dBμV)</p> <ul style="list-style-type: none"> RA = Receiver Amplitude CF = Cable Factor ATT_{TRAN} = Transient suppressor attenuation ATT_{LISN} = LISN attenuation <p>Margin value = Emission level – Limit value</p>

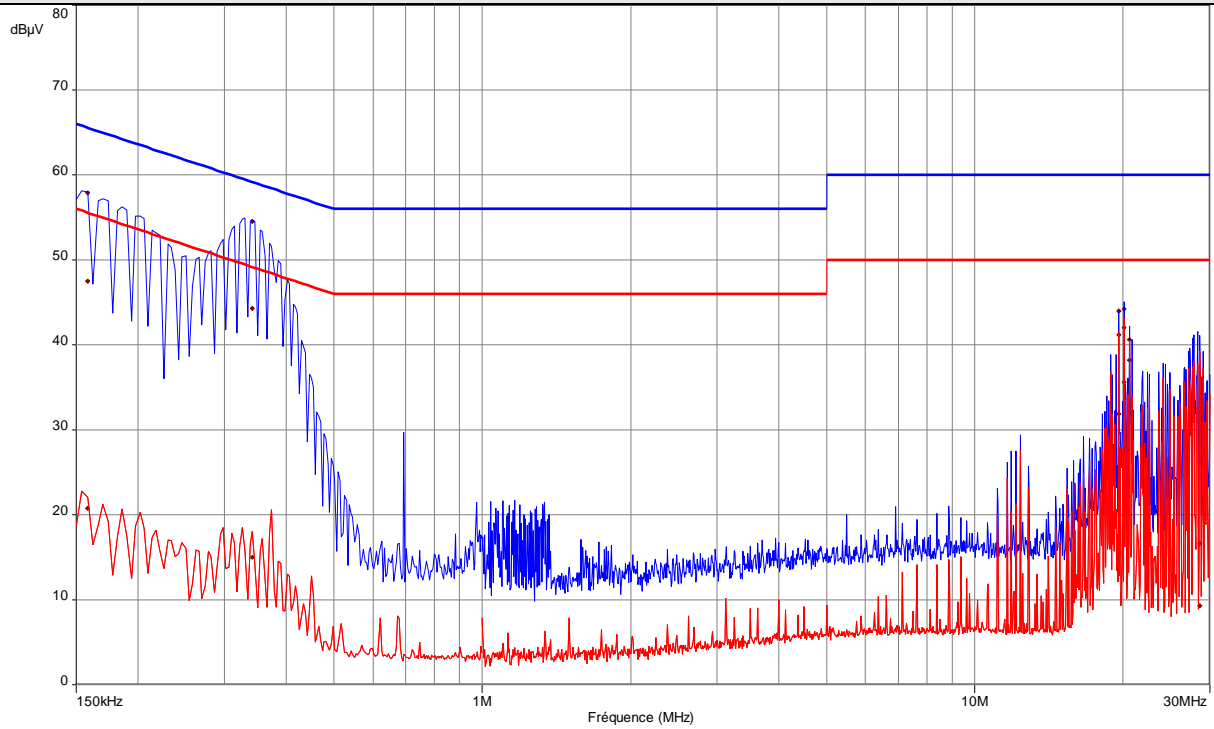
Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line L1 – Standby mode



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



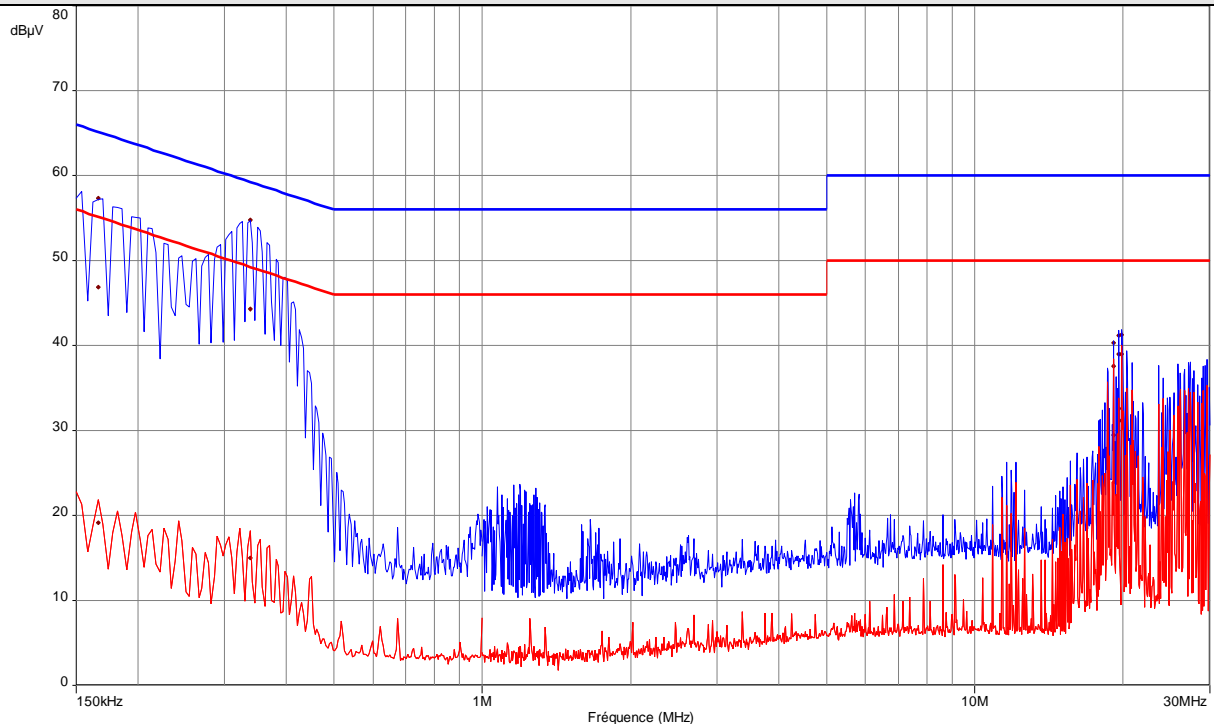
Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line L1 – S350-ER version transmit mode



---: Peak

---: Average

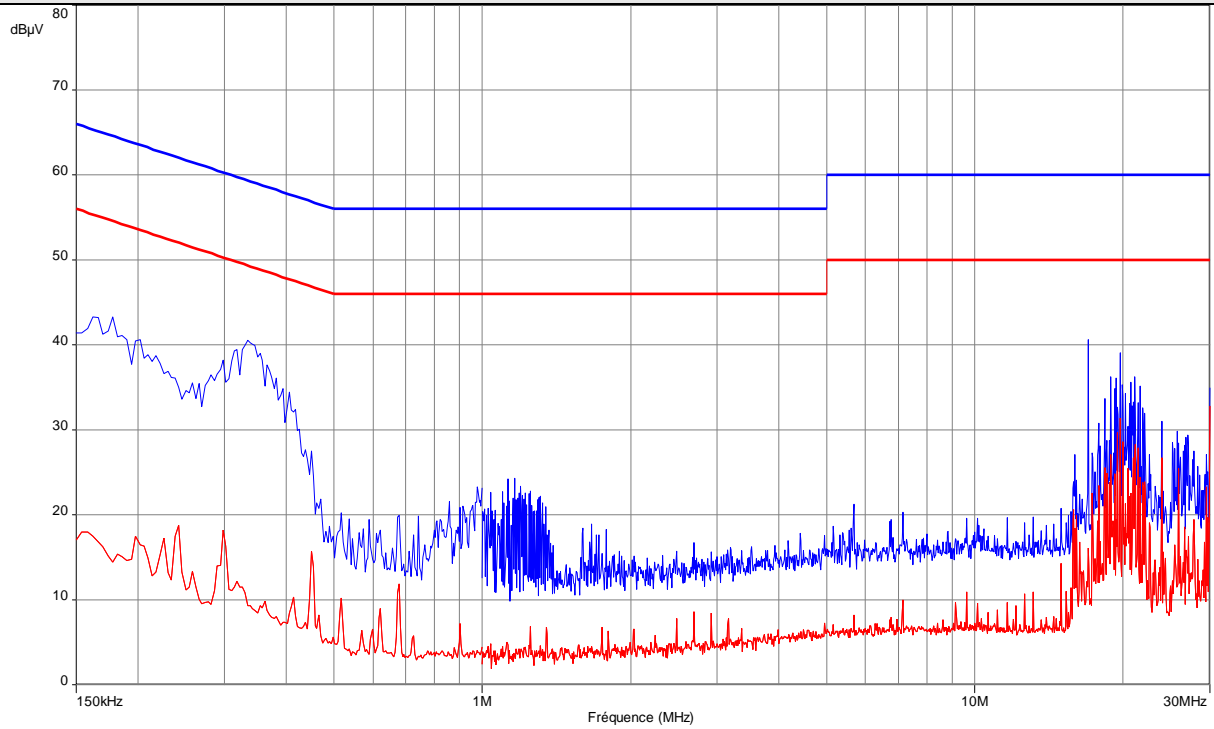
Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line Neutral S350-ER version transmit mode



---: Peak

---: Average

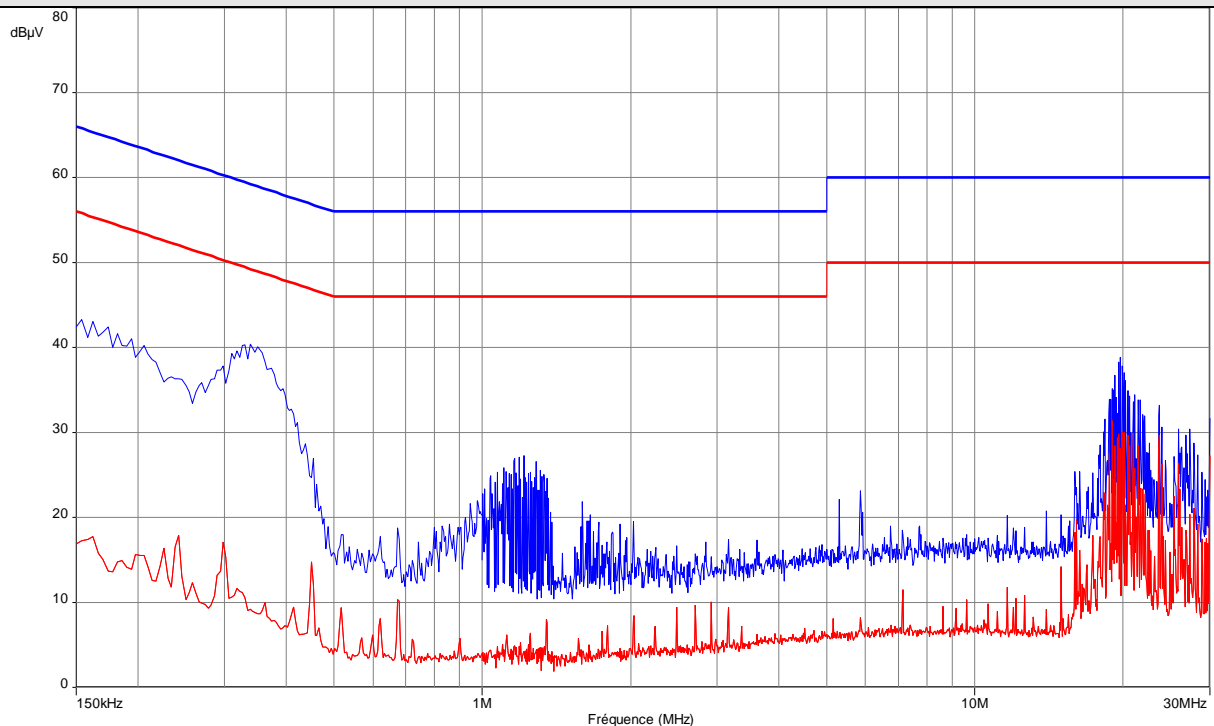
Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line L1 – S350 version transmit mode



---: Peak

---: Average

Graphical representation of Conducted Disturbance Measurement (Peak and Average detection) AC port, Line Neutral S350 version transmit mode



---: Peak

---: Average

7. Radiated Emission Measurement (9kHz-1GHz)

TEST: Unwanted emissions outside fundamental and harmonics bands / FCC part 15.209 - RSS-Gen / RSS-210		Verdict
<p><u>Method:</u> Measurements were made in a 10 or 3-meter Open Area Test Site (OATS) that complies to ANSI C63.4. 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.</p> <p>A pre-scan frequency identification of the EUT has been performed in full anechoic chamber. The measured radiated field of the EUT is realised at 3-meters of distance. Antenna is 1.25-meters high.</p>		Pass
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	10 to 40 °C	20°C
Relative Humidity	10 to 90 %	55%
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 – 1GHz	3 m measurement distance
Limits – FCC Part 15.209 / RSS-Gen §8.9 / RSS-210		
Frequency (MHz)	Limits (dBµV/m)	
	Level / Detector / Distance	Results
0.009 to 0.490	48.5 to 13.8 / QP / 300m	Pass
0.490 to 1.705	33.8 to 23.0 / QP / 30m	Pass
1.705 to 30	29.5 / 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 – CE Mesures / Test date: August 8 th , 2016 Power supply voltage: 24V DC via external power source		

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Log-periodic antenna	TDK	PLP3003	ANT-101-001	2015/8	2016/8
Biconnic antenna	COM-POWER	AB- 900	ANT-101-003	2015/8	2016/8
Loop antenna	EMCO	6502	ANT-101-009	2015/3	2017/3
BiConiLog antenna	EMCO	3142B	ANT-101-010	2015/8	2016/8
Horn antenna	ETS-LINDGREN	3115	ANT-141-013	2015/7	2018/7
RF cable	Div	OATS/25m	CAB-101-019	2016/3	2017/3
RF cable	Pasternack	PE302-120	CAB-131-024	2016/3	2017/3
RF cable	HUBER+SUHNER	RG214U	CAB-141-026	2016/3	2017/3
RF cable	HUBER+SUHNER	RG214U	CAB-141-029	2016/3	2017/3
RF cable	HUBER+SUHNER	SF104	CAB-141-030	2016/3	2017/3
High-pass filter	Mini-Circuit	VHF-3100+	FIL-151-006	2016/3	2017/3
Pre-amplifier	PE	PE1524	PRE-101-002	2016/3	2017/3
Anechoic chamber	COMTEST	214263	CAG-141-001	-	-
OATS	Div	10m	SIT-101-001	2015/8	2016/8
Antenna mast	Innco- Systems	MA4000EP	MAT-101-001	-	-
Turntable	Innco- Systems	DS1200S	PLA-101-001	-	-
Turntable	Innco- Systems	CT0800	PLA-141-001	-	-
Measuring Rec	Rohde&Schwarz	ESRP	REC-151-002	2015/7	2018/7
Spectrum analyzer	AGILENT HP	8563E	ASP-111-003	2013/9	2016/9

Tabulated Results for Unwanted emissions (9kHz-490kHz)						
On S350-ER version						
FREQ	RF field @ 300m	Limit @ 300m	Margin	Antenna angle	Table angle	Correc. Fact. (CF)
MHz	(QP) dB μ V/m	(QP) dB μ V/m	dB	Degree	Degree	dB
0,125	21,7* ¹	25,7	-4,0	0	90	11,0
On S350 version						
FREQ	RF field @ 300m	Limit @ 300m	Margin	Antenna angle	Table angle	Correc. Fact. (CF)
MHz	(QP) dB μ V/m	(QP) dB μ V/m	dB	Degree	Degree	dB
0,125	-13,5* ¹	25,7	-39,2	0	90	11,0
Supplementary information:						
Frequency list measured on the Open Area Test Site has been created with pre-scan results.						
Frequency band investigated:		9kHz-30MHz				
RBW:		200Hz (9kHz-150kHz)				
		9kHz (150kHz-30MHz)				
Measurement distance:		10m				
Limit:		FCC Part 15.209 / RSS-Gen §6.13				
Final measurement detector:		Quasi-Peak				
Wide Measurement Uncertainty:		± 5 dB (k=2)				
Note:		CF: Correction factor = Antenna factor + Cable loss *1: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (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)

On S350-ER version

FREQ	RF field @ 30m	Limit @ 30m	Margin	Antenna angle	Table angle	Correc. Fact. (CF)
MHz	(QP) dB μ V/m	(QP) dB μ V/m	dB	Degree	Degree	dB
0,675	25,1 ^{*1}	31,7	-6,6	0	270	10,7
0,875	16,1 ^{*1}	28,8	-12,7	0	270	10,8

On S350 version

FREQ	RF field @ 30m	Limit @ 30m	Margin	Antenna angle	Table angle	Correc. Fact. (CF)
MHz	(QP) dB μ V/m	(QP) dB μ V/m	dB	Degree	Degree	dB

Margin > 10dB

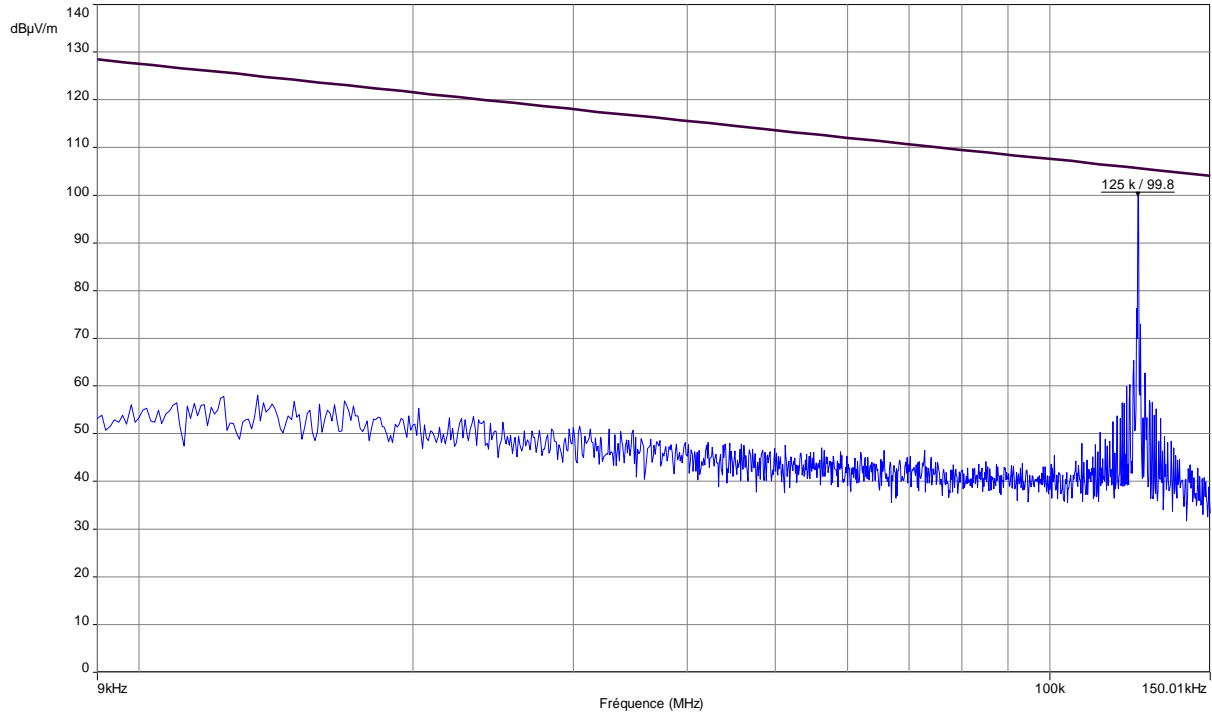
Supplementary information:

Frequency list measured on the Open Area Test Site has been created with pre-scan results.

Frequency band investigated:	9kHz-30MHz
RBW:	200Hz (9kHz-150kHz) 9kHz (150kHz-30MHz)
Measurement distance:	10m
Limit:	FCC Part 15.209 / RSS-Gen §6.13
Final measurement detector:	Quasi-Peak
Wide Measurement Uncertainty:	± 5 dB (k=2)
Note:	CF: Correction factor = Antenna factor + Cable loss *1: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@30m = M@10m-19.1dB)

Tabulated Results for Unwanted emissions (30MHz-1GHz)										
On S350-ER version										
FREQ	Meter reading	Meter reading	Total factor	Field level	Field level	Pol	Antenna height	Table angle	Limit	Margin
MHz	(QP) dB μ V	(Pk) dB μ V	dB	(QP) dB μ V/m	(Pk) dB μ V/m		cm	Degré	(QP) dB μ V/m	dB
30,900	24,0	31,1	14,1	38,1	45.2	V	100	300	40	-1,9
On S350 version										
FREQ	Meter reading	Meter reading	Total factor	Field level	Field level	Pol	Antenna height	Table angle	Limit	Margin
MHz	(QP) dB μ V	(Pk) dB μ V	dB	(QP) dB μ V/m	(Pk) dB μ V/m		cm	Degré	(QP) dB μ V/m	dB
Margin > 10dB										
Supplementary information: Frequency list measured on the Open Area Test Site has been created with pre-scan results.										
Frequency band investigated:			30MHz-1GHz							
RBW:			120kHz							
Measurement distance:			3m							
Limit:			FCC Part 15.209 / RSS-Gen §6.13							
Final measurement detector:			Quasi-Peak							
Wide Measurement Uncertainty:			± 5.2 dB (k=2)							
RESULT:			PASS							
Notes:			(1): 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 RA = Receiver Amplitude AF = Antenna Factor CF = Cable Factor AG = Amplifier Gain Total factor (dB) is AF + CF – AG Margin value = Emission level – Limit value							

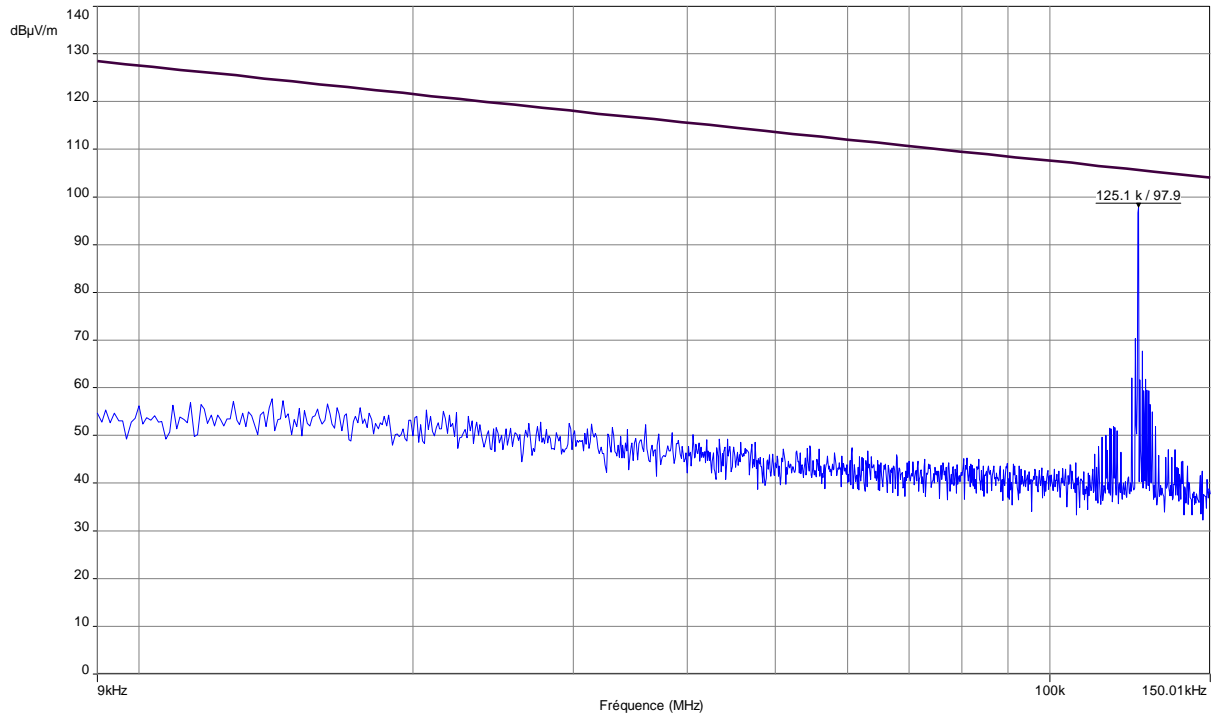
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-150kHz / 3m / 0° / Transmit mode on S350-ER version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	200Hz
Antenna polarization :	0°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

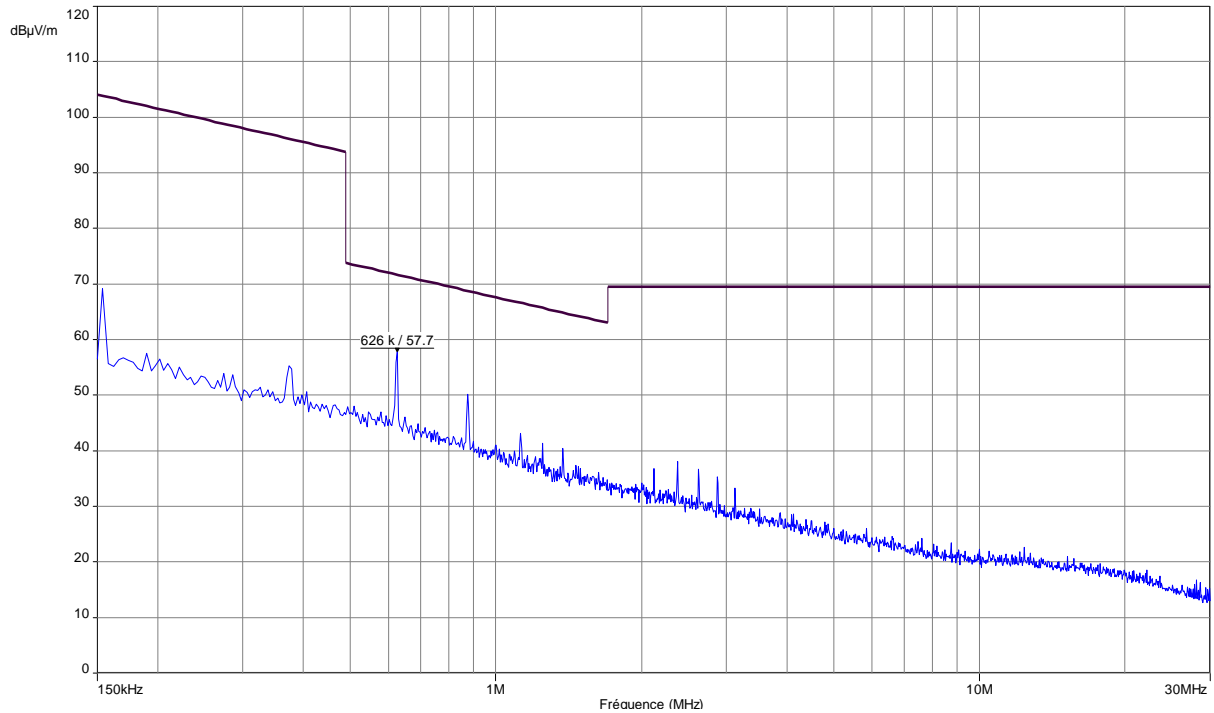
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-150kHz / 3m / 90° / Transmit mode on S350-ER version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	200Hz
Antenna polarization :	90°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

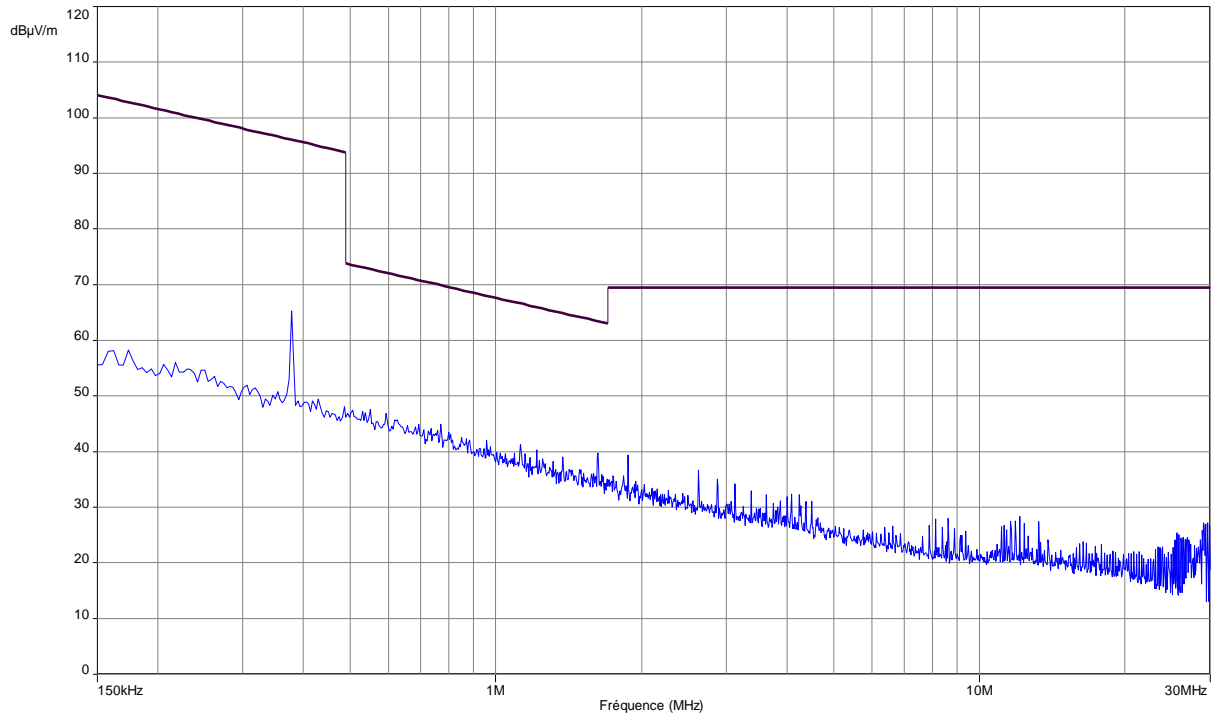
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 150kHz-30MHz / 3m / 0° / Transmit mode on S350-ER version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	9kHz
Antenna polarization :	0°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

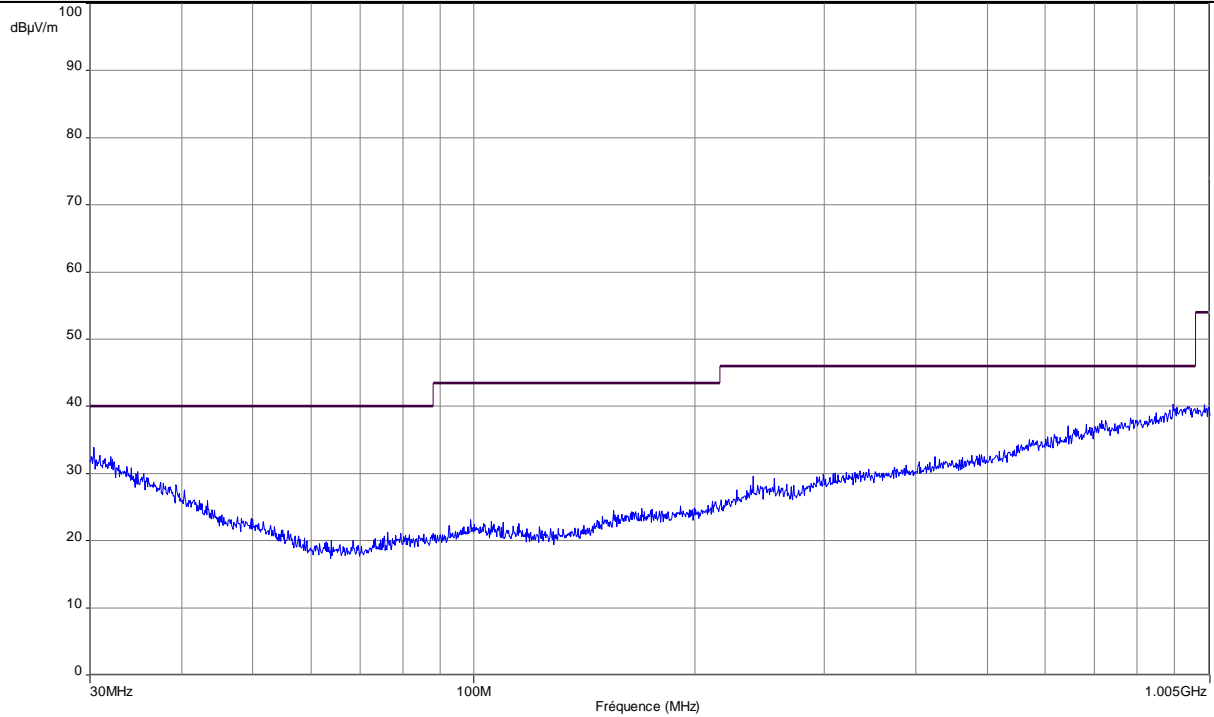
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 150kHz-30MHz / 3m / 90° / Transmit mode on S350-ER version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	9kHz
Antenna polarization :	90°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

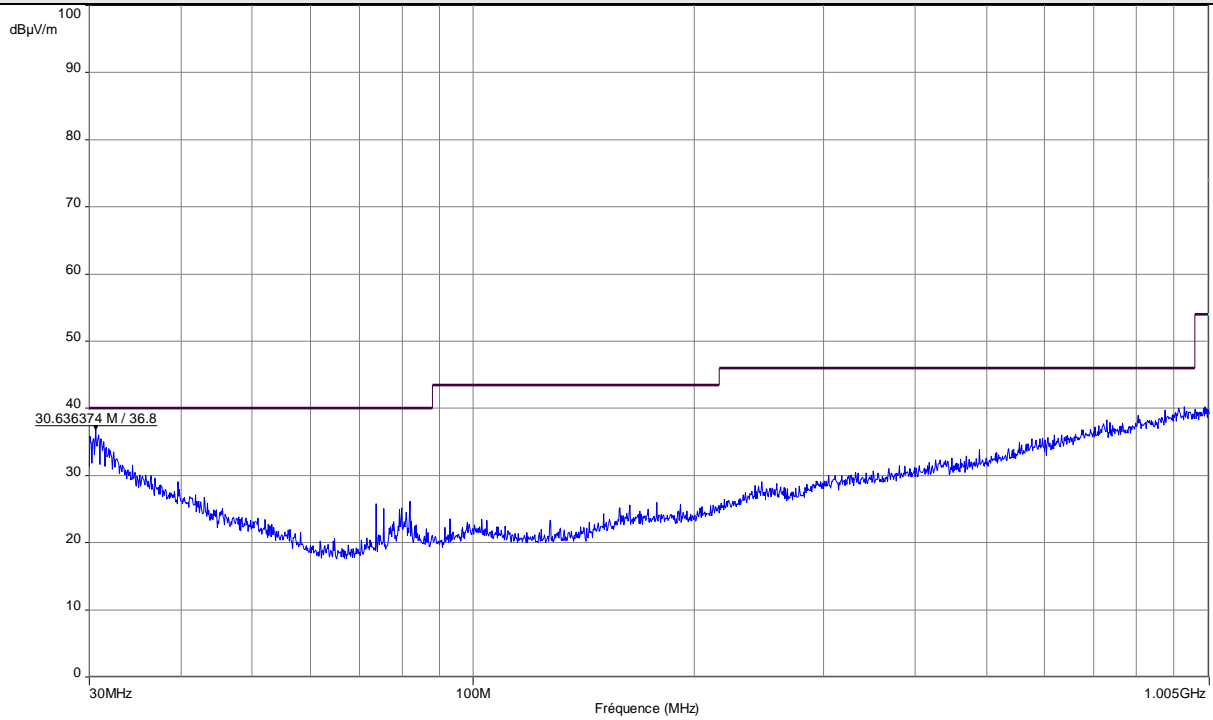
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Horizontal / Transmit mode on S350-ER version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Horizontal
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

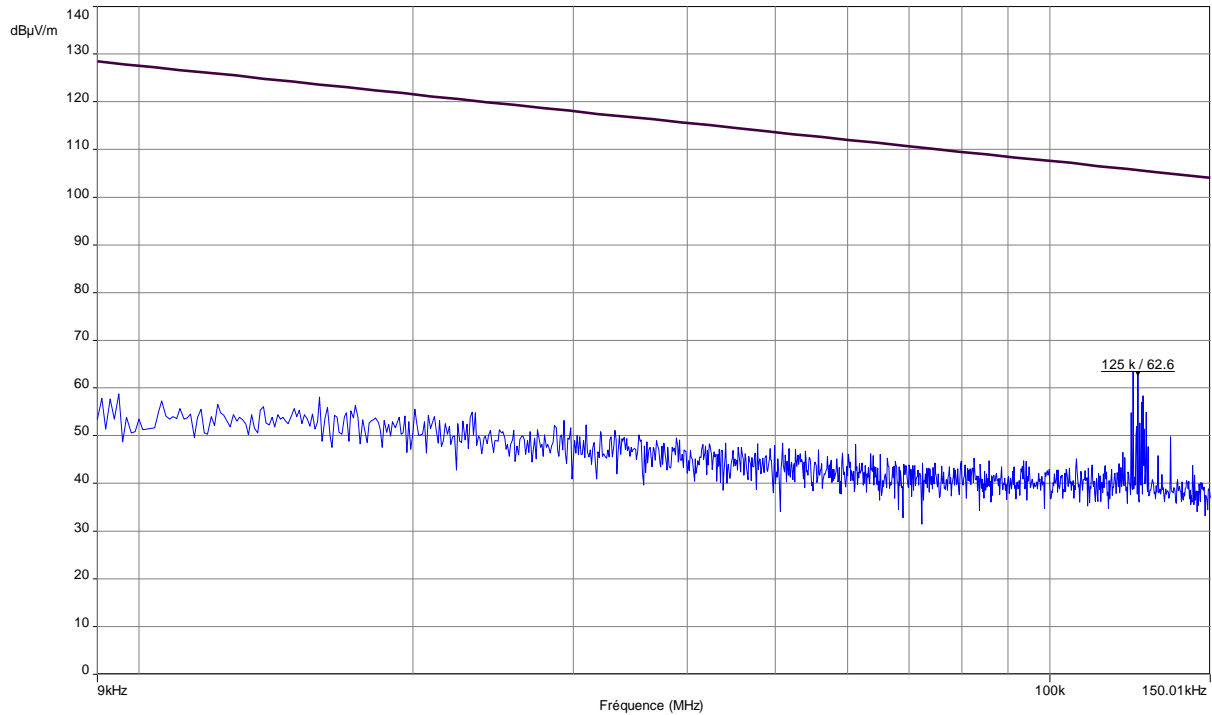
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Vertical / Transmit mode on S350-ER version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Vertical
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

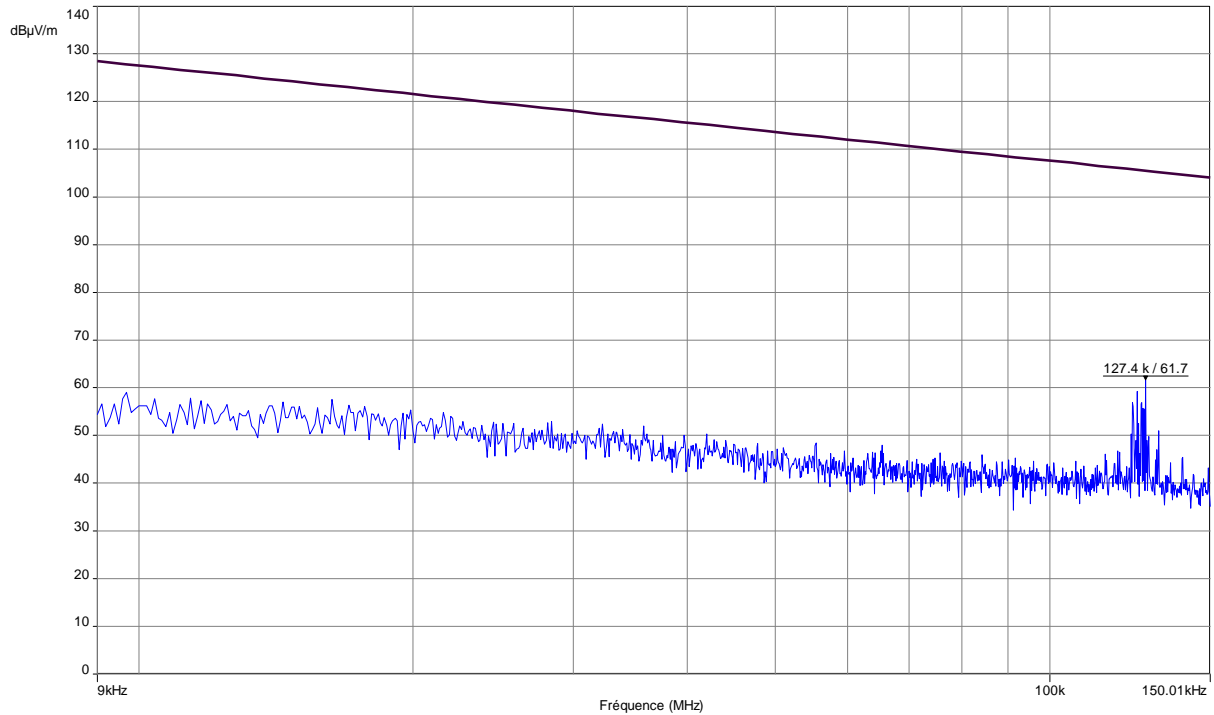
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-150kHz / 3m / 0° / Transmit mode on S350 version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	200Hz
Antenna polarization :	0°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

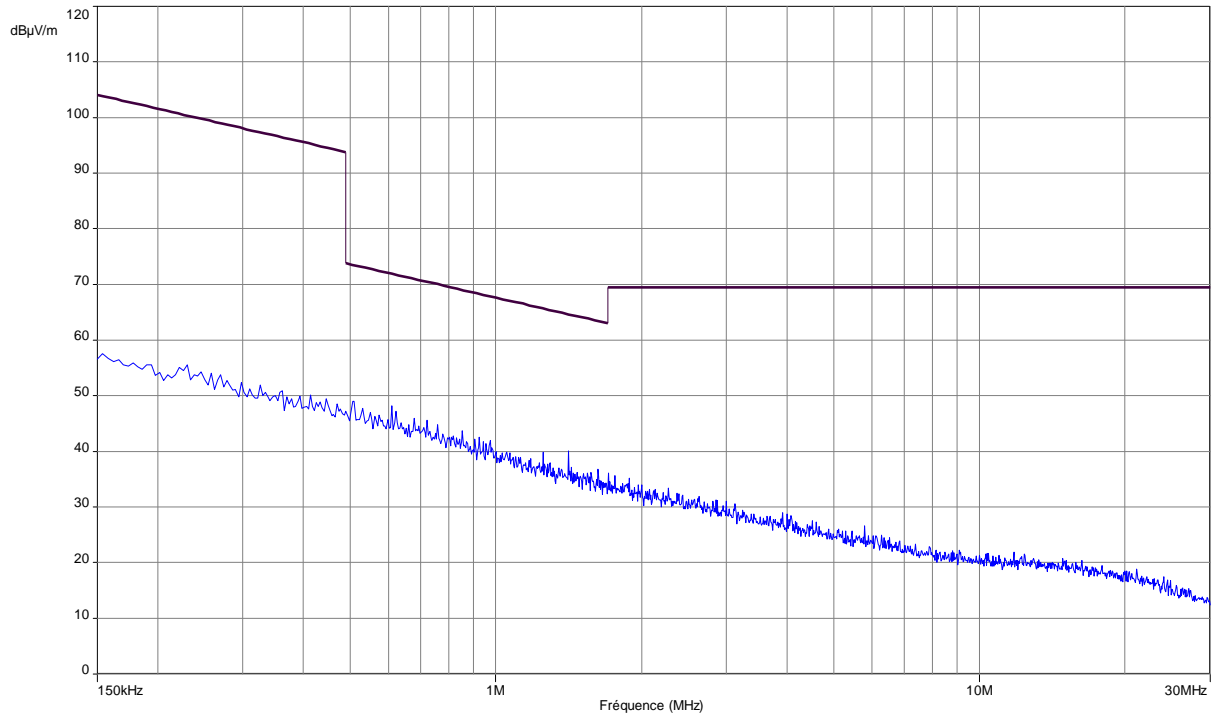
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-150kHz / 3m / 90° / Transmit mode on S350 version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	200Hz
Antenna polarization :	90°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

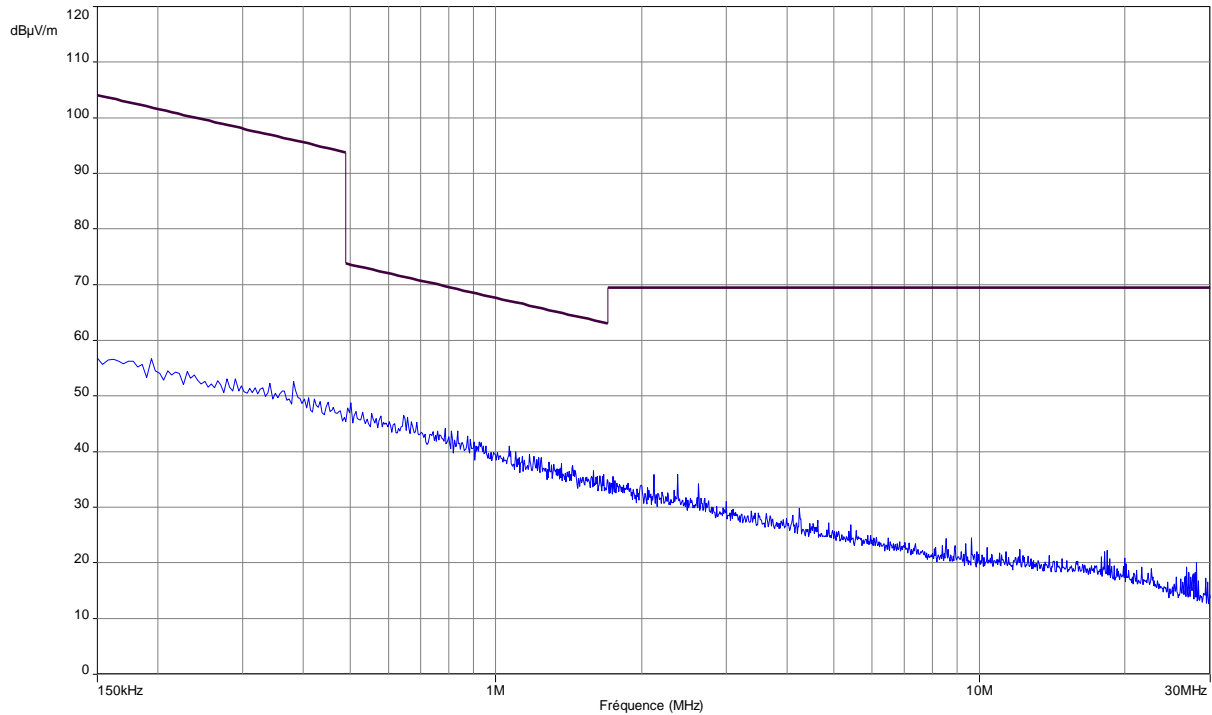
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 150kHz-30MHz / 3m / 0° / Transmit mode on S350 version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	9kHz
Antenna polarization :	0°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

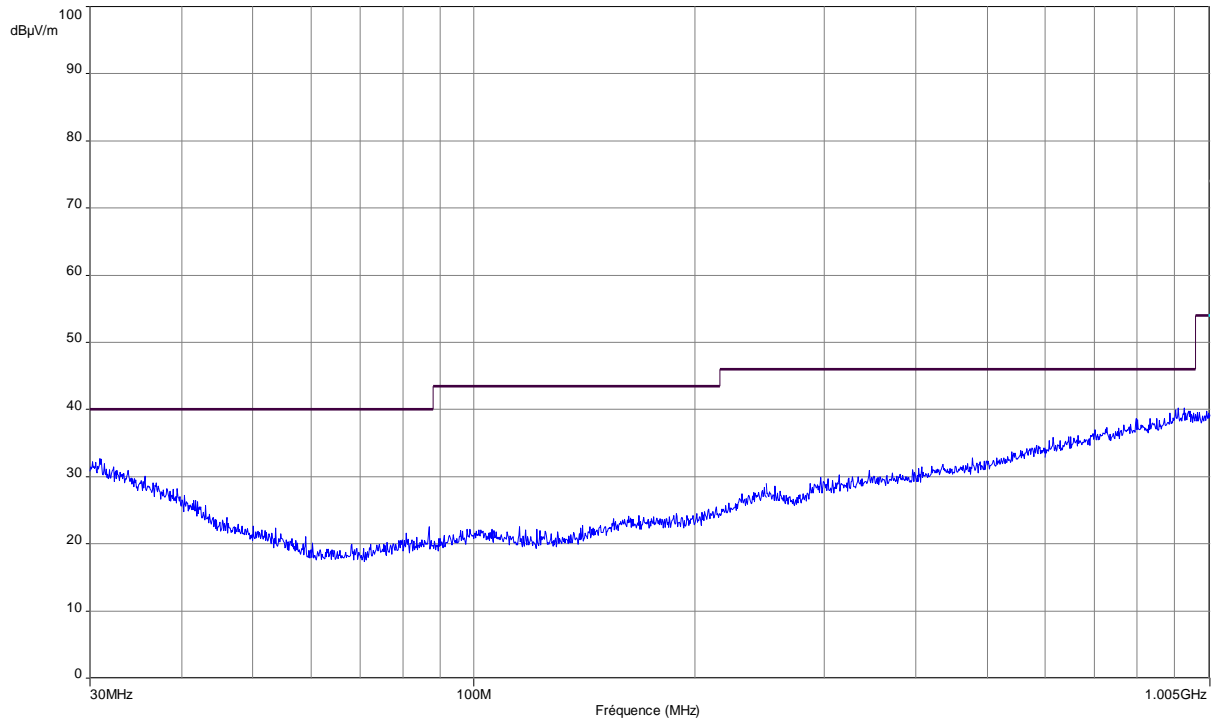
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 150kHz-30MHz / 3m / 90° / Transmit mode on S350 version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	9kHz
Antenna polarization :	90°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

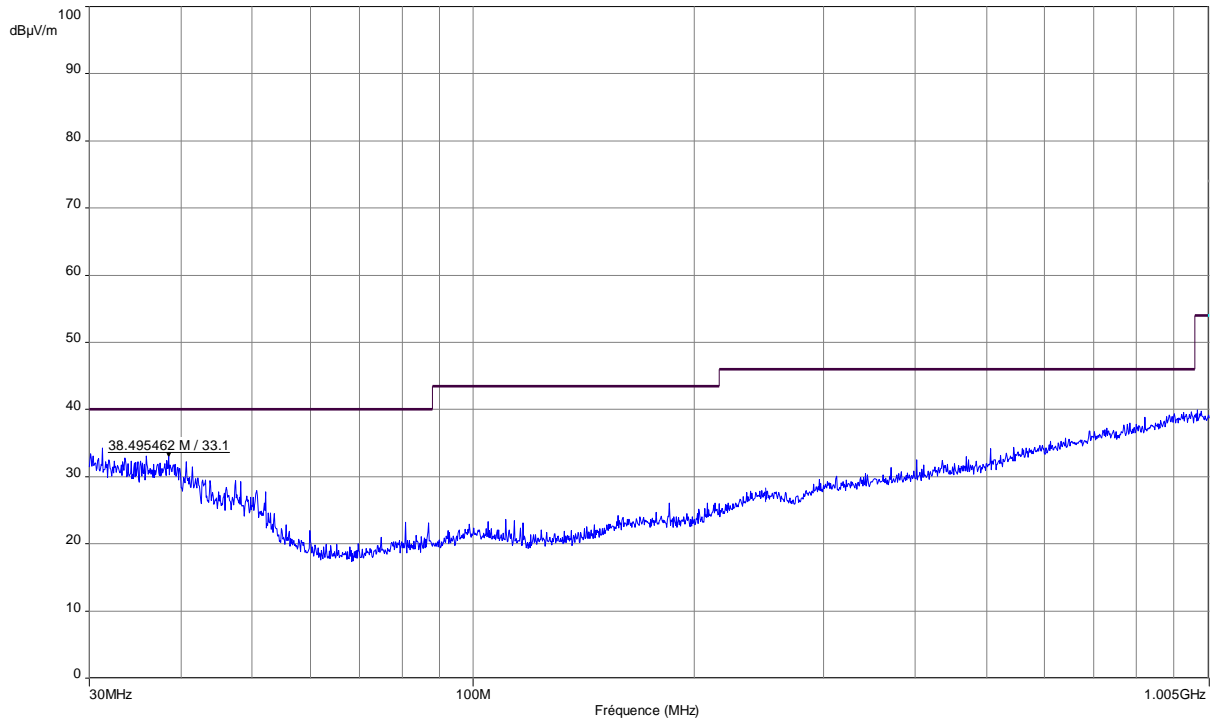
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Horizontal / Transmit mode on S350 version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Horizontal
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

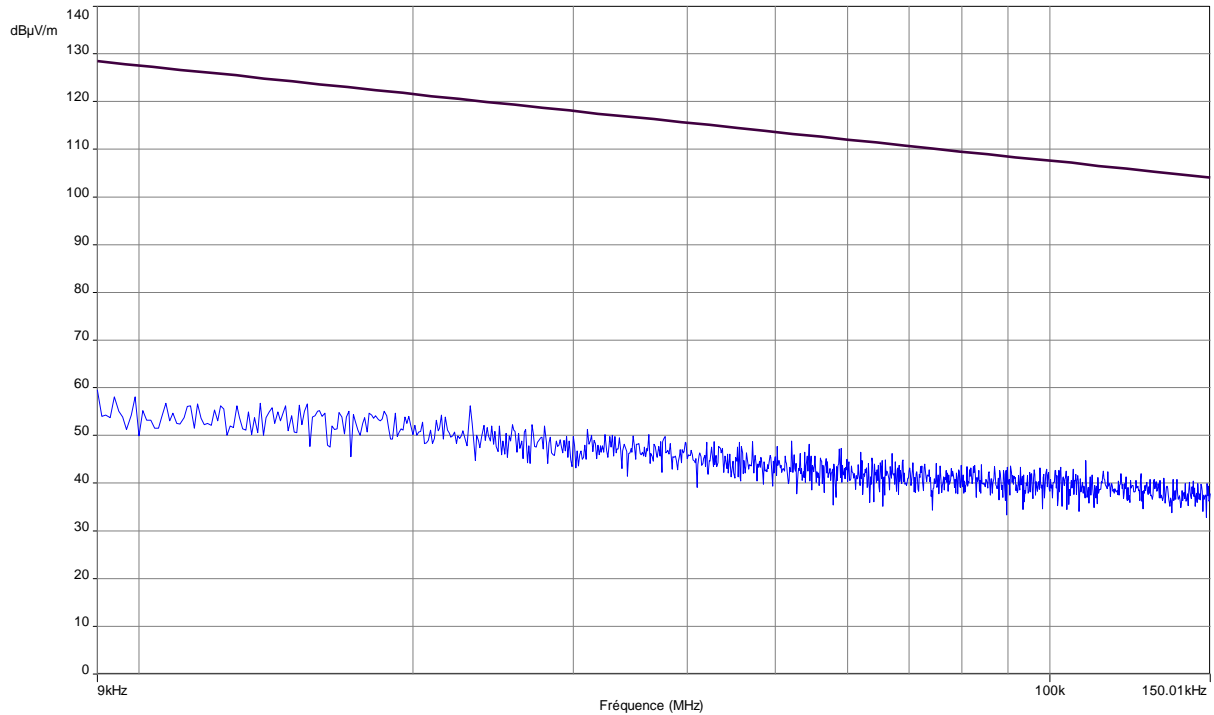
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Vertical / Transmit mode on S350 version)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Vertical
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

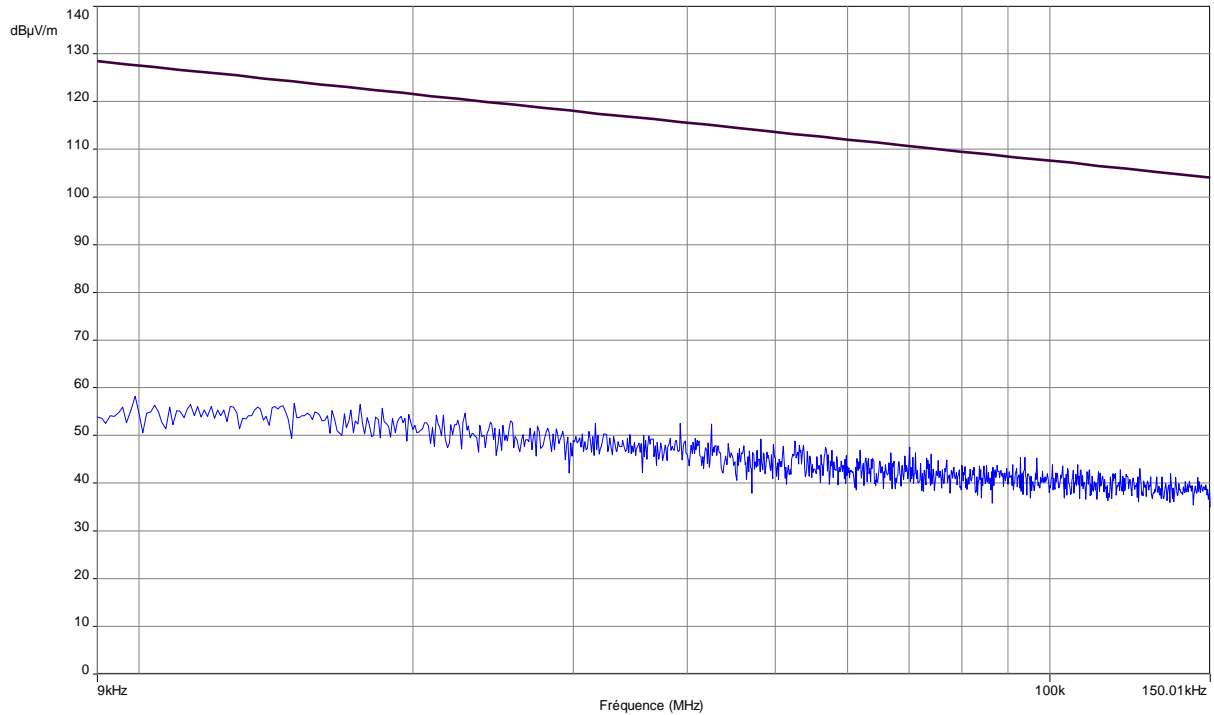
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-150kHz / 3m / 0° / Receive Mode)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	200Hz
Antenna polarization :	0°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

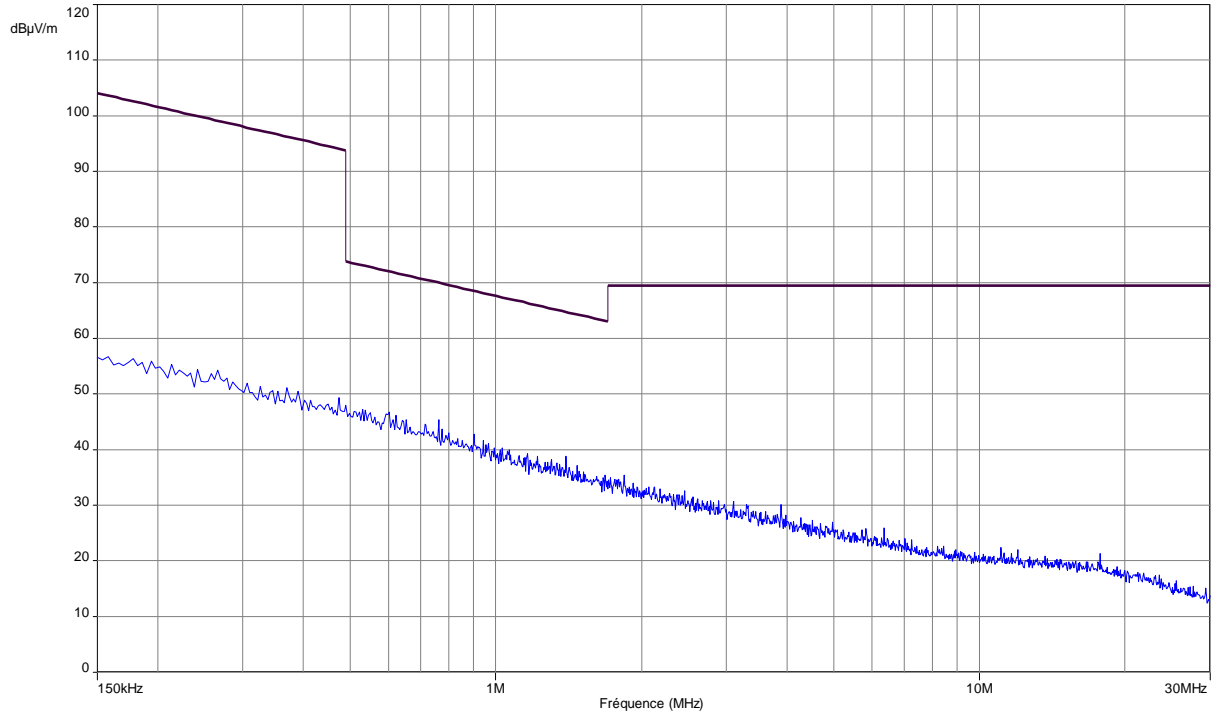
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 9kHz-150kHz / 3m / 90° / Receive Mode)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	200Hz
Antenna polarization :	90°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

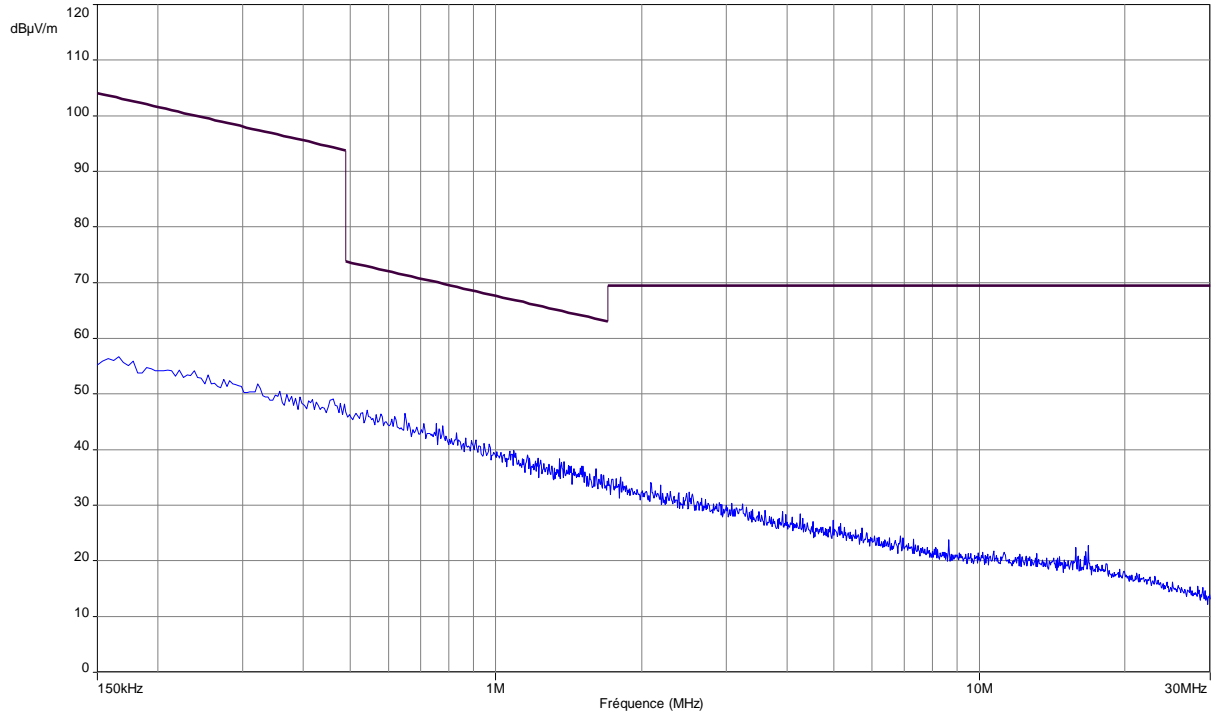
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 150kHz-30MHz / 3m / 0° / Receive Mode)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	9kHz
Antenna polarization :	0°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

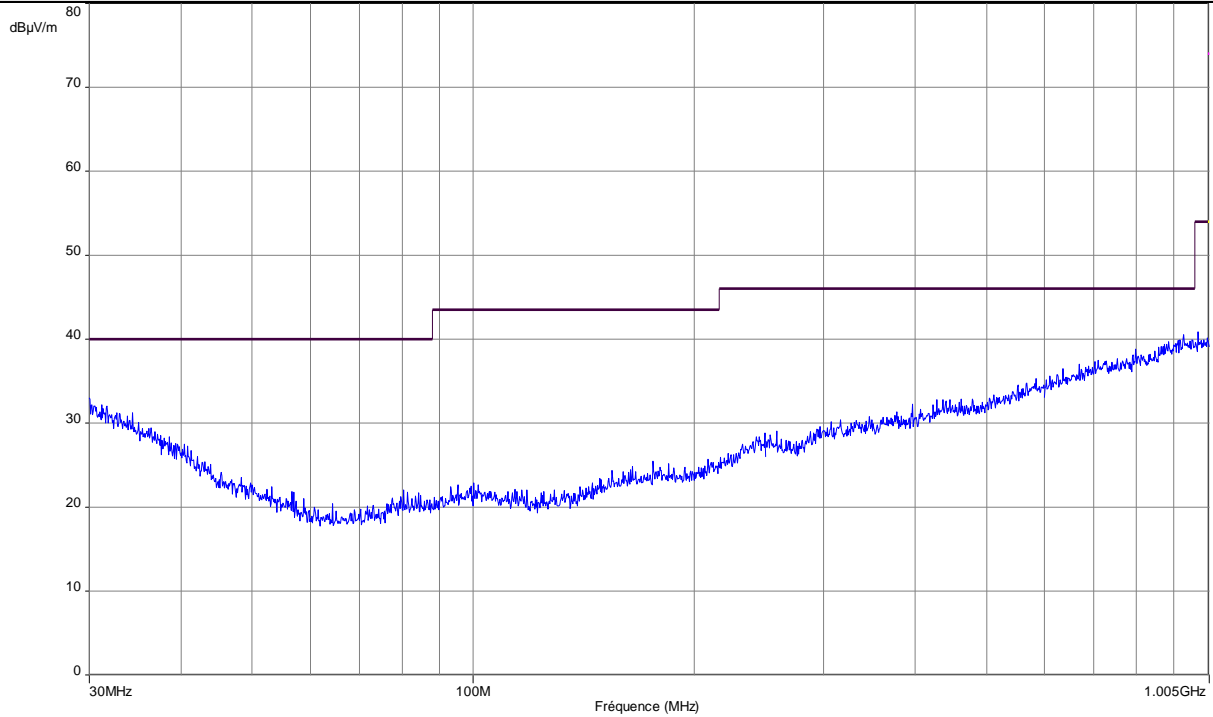
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 150kHz-30MHz / 3m / 90° / Receive Mode)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	9kHz-30MHz
Unit :	dBµV/m
RBW :	9kHz
Antenna polarization :	90°
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

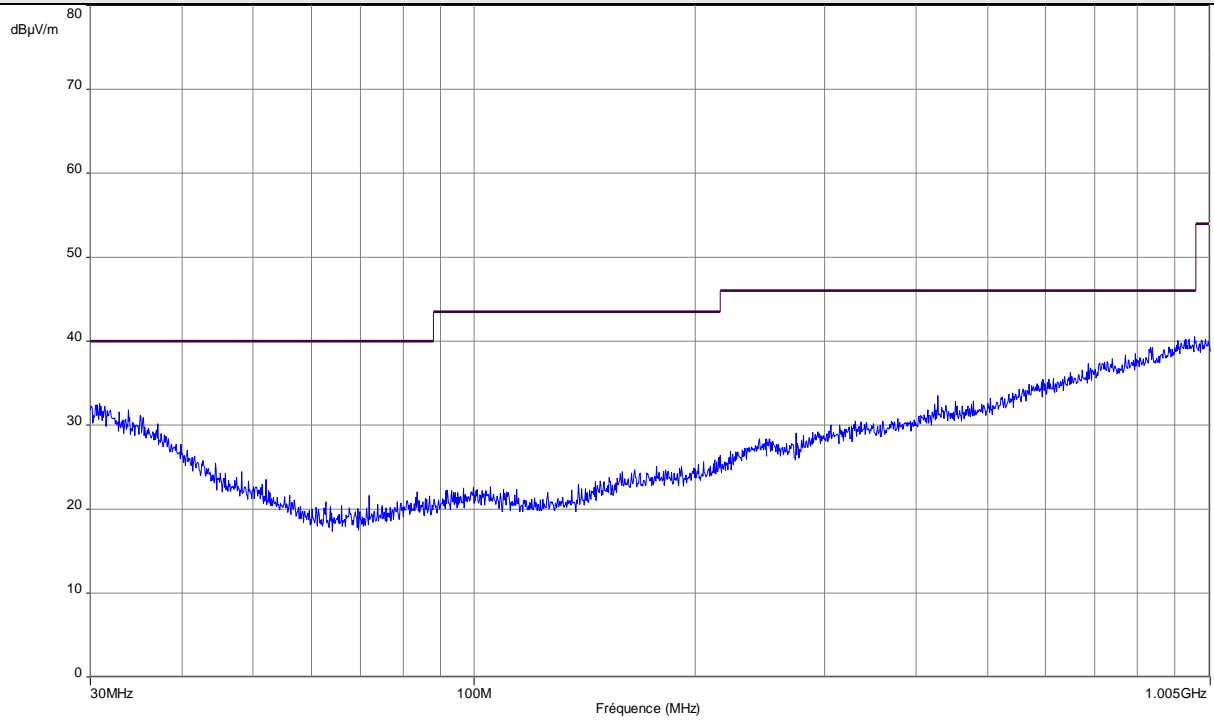
Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Horizontal / Receive Mode)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Horizontal
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

Graphical representation of Radiated Disturbance Measurement (Peak detection, Anechoic chamber pre-scan, 30MHz-1GHz / 3m / Vertical / Receive Mode)



Note: Pre-scan graph only for identification purpose.

Frequency band investigated:	30MHz-1GHz
Unit :	dBµV/m
RBW :	100kHz
Antenna polarization :	Vertical
Voltage:	24V DC
Limit:	15.209
Measurement detector:	Peak
Wide Measurement Uncertainty:	± 5dB (k=2)

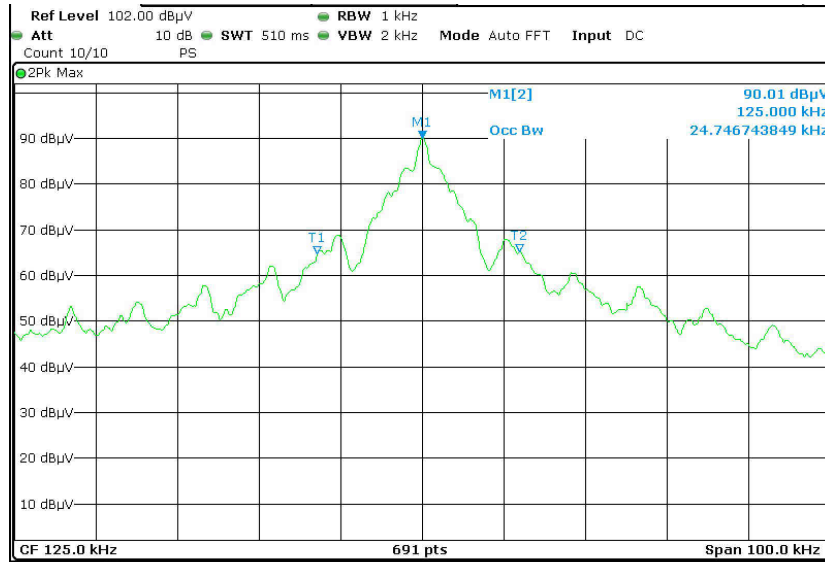
8. 99% Occupied Bandwidth

TEST: 99% Occupied Bandwidth / RSS-Gen			Verdict
<p><u>Method:</u> The setup is in an anechoic chamber. The spectrum analyzer is connected to the measuring antenna. The RBW is set in the range of 1% to 5% of the occupied bandwidth, with VBW $\geq 3 \times$ RBW. The SPAN is wide enough to capture all products of the modulation process. A MaxHold Peak detector is used. Measure is performed with OBW 99% function of the spectrum analyser. The tested equipment is set to transmit operation with modulations on lowest, middle and highest channel.</p>			Pass
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	20°C	
Relative Humidity	10 to 90 %	55%	
RSS-Gen Issue 4 (§6.6)			
Frequency (kHz)	Level for Bandwidth	Limit	
125.0	99% occupied bandwidth	No restriction	
Supplementary information: Test location: SMEE – CE Mesures / Test date: August 9 th , 2016 Power supply voltage: 24V DC			

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Measuring Rec.	Rohde&Schwarz	ESRP	REC-151-002	2015/7	2018/7
Horn antenna	ETS-LINDGREN	3115	ANT-141-013	2015/7	2018/7
RF cable	HUBER+SUHNER	SF104	CAB-141-030	2016/3	2017/3
RF cable	Pasternack	PE302-120	CAB-131-024	2016/3	2017/3
Anechoic chamber	COMTEST	214263	CAG-141-001	-	-
Turntable	Innco- Systems	CT0800	PLA-141-001	-	-

Tabulated Results for Occupied Bandwidth	
Frequency (kHz)	99% Bandwidth (kHz)
125.0	24.7 kHz

Graphical representation of 99% Occupied Bandwidth



Frequency investigated:	125kHz
RBW :	1kHz
Measurement detector:	Peak