



Test report issued under the responsibility of:
EMITECH MONTPELLIER laboratory
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RADIO TEST REPORT

FCC Part 15 :2018

ANSI C63.10 : 2013

RSS-Gen - Issue 5, April 2018

RSS-210-Issue 9, August 2016

Company: **DYNACO Entrematic**
Address.....: Waverstraat 21 B-9310
MOORSEL
BELGIUM

Test item description.: **Radio bridge transmitter**
Trade Mark.: DYNACO Entrematic
Manufacturer.: PRASTEL FRANCE
Model/Type reference.....: ELEDIVALL188
FCC ID......: 2AEHC-ELDV188
IC.: 24595-ELDV188
Ratings.....: 3.6 Vdc

Testing Laboratory: **EMITECH MONTPELLIER laboratory**
Address.....: 145 rue de Massacan
34740 VENDARGUES Cedex
FRANCE

Report Reference No.: **R410-18-101706-11A**
Test procedure.: FCC&IC Certification
Diffusion......: Mr JAUMES
Applicant's name.: PRASTEL FRANCE
Date of issue......: 20/05/2019
Total number of pages......: 23
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Modified page(s)......: Creation
Compiled by......: Morgan PATEY
Approved by (+ signature)......: Olivier HEYER (Laboratory Manager)

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the whole manufactured products of the tested sample.*



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2. REFERENCE DOCUMENT(S)

NORMATIVE REFERENCES:

The following referenced documents are necessary for the application of the present test report.

FCC Part 15 :2018

Code of Federal Regulations
Title 47 – Telecommunications
Chapter 1 – Federal Communications Commission
Part 15 – Radio frequency devices
Subpart C – Intentional Radiators

ANSI C63.10 : 2013

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

RSS-Gen - Issue 5, April 2018

General requirements and Information for the Certification of radio Apparatus

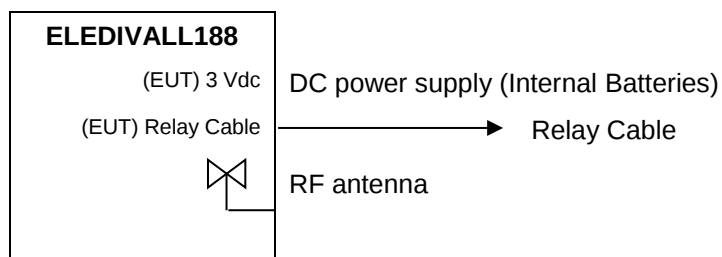
RSS-210-Issue 9, August 2016

Licence-exempt Radio Apparatus: Category I Equipment

INFORMATIVE REFERENCES:

The following referenced documents are not necessary for the application of the present test report but they assist the user with regard to a particular subject area.

3.3. EUT Input/Output ports



PORT	NAME	TYPE	LENGHT	CABLE TYPE	COMMENTS
1	DC power supply (Internal Battery)	DC	N/A	Internal battery	Remplaced by external power source (Emitech n°8496)
2	Relay Cable	I/O	40cm	Not shielded	
3	RF antenna	RF	433.92 MHz	RF Antenna	

AC/DC : AC/DC Converter port

I/O.....: Input or Output port

N/E: Non Electrical port

AC.....: Alternative current port

TP: Telecommunication port

DC: Discontinuous current port

RF.....: Radio frequency port

3.4. EUT Radio Specifications

a) GENERAL INFORMATIONS

According to manufacturer's declarations :

EUT type..... : Transmitter
 Technology..... : SRD
 Environmental profile..... : Light Industry – Residential
 Temperature range..... : -20°C to +60°C
 Antenna type..... : Integral
 Antenna Gain..... : Not communicated

Comments:

N/A

b) TRANSMITTER PARAMETERS (Tx)

Frequency bands..... : 433.92 MHz
 RF Power..... : 10 mW
 Number of channels / Separation..... : 1
 Modulation type..... : OOK
 Duty cycle..... : 0.002%
 Tested frequency..... : 433.92 MHz

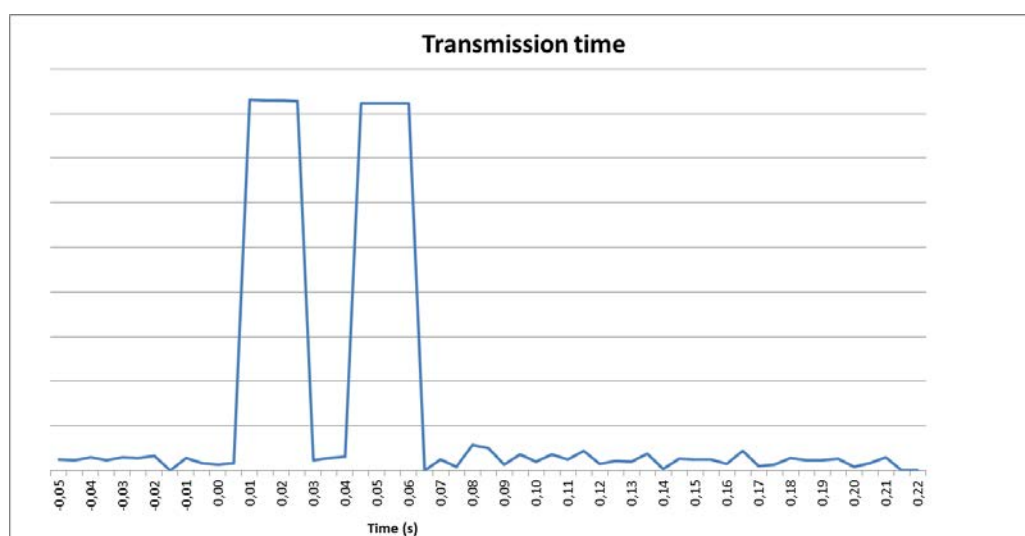
c) RECEIVER PARAMETERS (Rx)

Frequency bands..... : N/A
 Category/Class..... : N/A
 Bandwidth..... : N/A

d) TRANSMISSION TIME (Tx)

To comply with §15.231 (a) (1) or (2) it was verified that the emission of the product lasted less than 5 s after a key was pressed.

It was found that the transmission lasted no less than 10 ms after each activation (see below)



4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
Antenna requirement	-	PASS	Integrated antenna
Conducted voltage emission (measurement)		N/A	ANSI C63.10: 2013 //15.207 and RSS-Gen Powered by internal batteries
Radiated spurious emissions <30MHz			15.209 and RSS-Gen
- RNE_TX / 0°	Tx	PASS	
- RNE_TX / 45°	Tx	PASS	
- RNE_TX / 90°	Tx	PASS	
Radiated spurious emissions >30MHz			15.209 & 15.231 and RSS-Gen & RSS-210 Annex A1
- RNE / Tx Mode / ELEDIVALL188 / OOK	Tx	PASS	
- RNE / Tx Mode / ELEDIVALL188 / GFSK	Tx	PASS	
Radiated field strength of fundamental	a)	PASS	15.231 a) and RSS-210 Annex A1
Occupied bandwidth	-	PASS	RSS-Gen §6.7

Sample subject to the test complies with the requirements of the reference document(s) listed in §2 of this test report and, where applicable, with deviation(s) specified in this document.

To declare, or not, the compliance with the specifications, it was not explicitly taken account of uncertainty associated with the results.

Opinion(s) and interpretation(s): N/A

5. MEASUREMENT UNCERTAINTY

PARAMETER	MAXIMAL EMITECH UNCERTAINTY	MINIMAL STANDARD UNCERTAINTY
Conducted emission		
(Artificial Mains Network) 3kHz – 9kHz	± 3.8 dB	/
(Artificial Mains Network) 9kHz – 150kHz	± 3.6 dB	± 3.6 dB
(Artificial Mains Network) 150kHz – 30MHz	± 3.4 dB	± 3.4 dB
(Voltage probe) 9kHz – 30MHz	± 2.9 dB	± 2.9 dB
(Asymmetric Artificial Network) 150kHz – 30MHz	± 3.5 dB	± 5.0 dB
(Current measurement) 150kHz – 30MHz	± 2.9 dB	± 2.9 dB
(Capacitive Voltage Probe) 150kHz – 30MHz	± 3.6 dB	± 3.9 dB
(Discontinuous) 150kHz – 30MHz	± 3.4 dB	± 3.4 dB
(Van Veen) 9kHz – 30MHz	± 3.3 dB	/
(Coupling Decoupling Network) 30MHz – 300MHz	± 3.5 dB	± 3.8 dB
(Splitter) 30MHz – 2.15GHz	± 3.4 dB	/
Radio frequency	± 1 x 10 ⁻⁷	± 1 x 10 ⁻⁷
Occupied bandwidth		
RF power	± 1.2 %	± 5 %
Radiated emission (magnetic field)		
9kHz – 30MHz	± 2.7 dB	± 6 dB
Supply voltages	± 3 %	± 3 %
Temperature	± 1 °C	± 1°C
Humidity	± 5 %	± 5 %
Time / Duty cycle	± 4.4 %	± 5 %
Radiated emission (electric field for FCC standard)		
9kHz – 30MHz	± 2.7 dB	/
30MHz – 1GHz	± 5.2 dB	/
1GHz – 18GHz	± 5.3 dB	/
18GHz – 26GHz	± 5.5 dB	/
26GHz – 40GHz	± 5.5 dB	/

For the calcul of expanded uncertainty, the confidence interval is 95 % (k=2).

6. TEST CONDITIONS AND RESULTS

6.1. Radiated spurious emissions <30MHz

Reference standard:	CFR 47 FCC part 15 and RSS-Gen
Test method:	15.209
Test description: : Spurious domain emission limits are limits on emissions at frequencies other than those of the carrier and sidebands associated with normal test modulation. EUT is set on an insulating support at 80cm above the ground reference plane. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter in a anechoic chamber. The EUT was rotated 360° in order to maximize radiated levels. Test antenna was oriented in 3 axes (0°, 45° and 90°). Final measurements (quasi-peak) were then performed in a 10-meter Open Area Test Site that complies to CISPR 16 in the same measurement conditions. All frequencies were investigated, where applicable.	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
RNE_TX / 0°	9kHz-30MHz	Class Tx	EMI5797	PASS
RNE_TX / 45°	9kHz-30MHz	Class Tx	EMI5798	PASS
RNE_TX / 90°	9kHz-30MHz	Class Tx	EMI5799	PASS

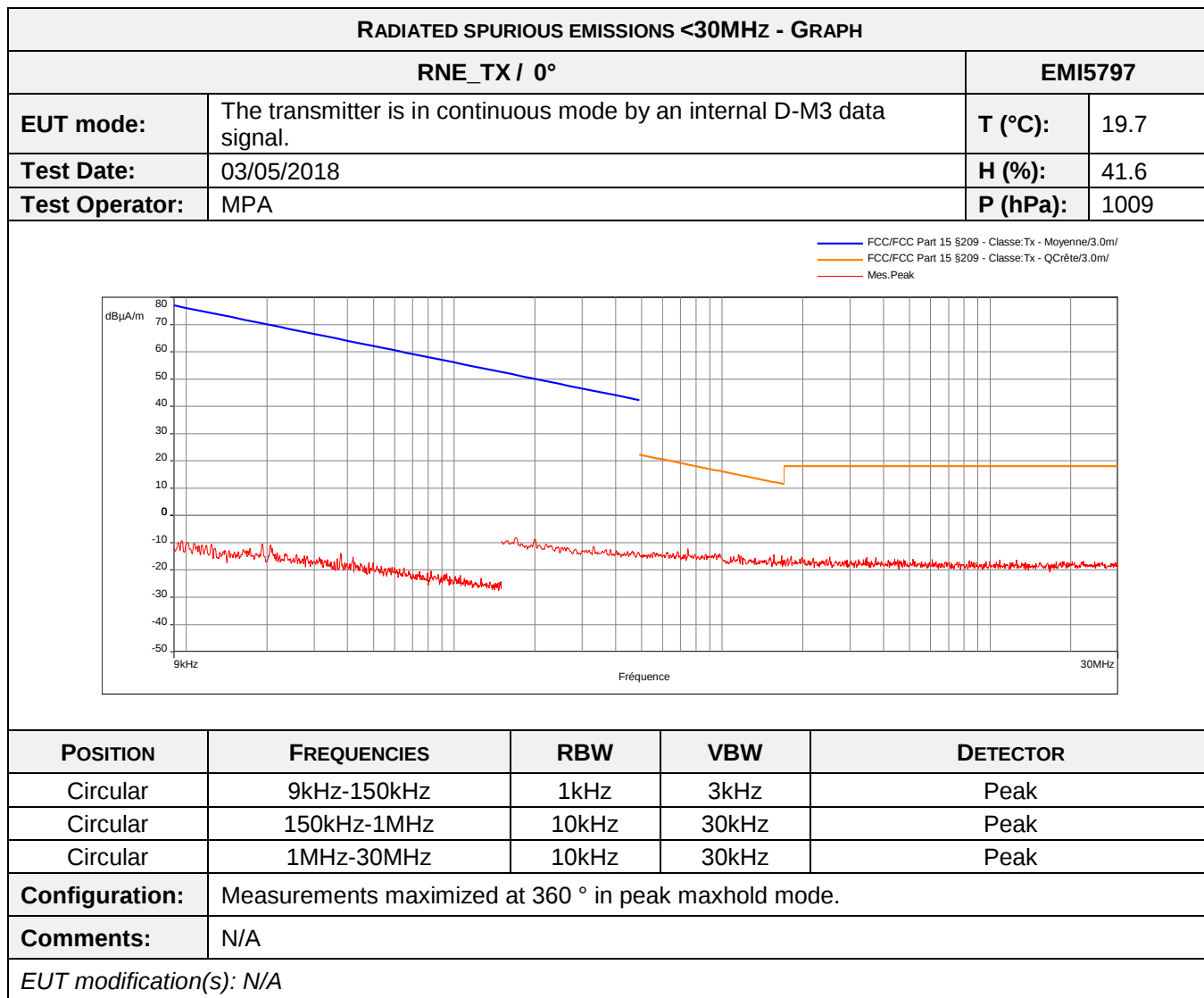
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	20 to 75 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
Test method deviation: N/A		
Supplementary information: limit indicated on the curves is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.		

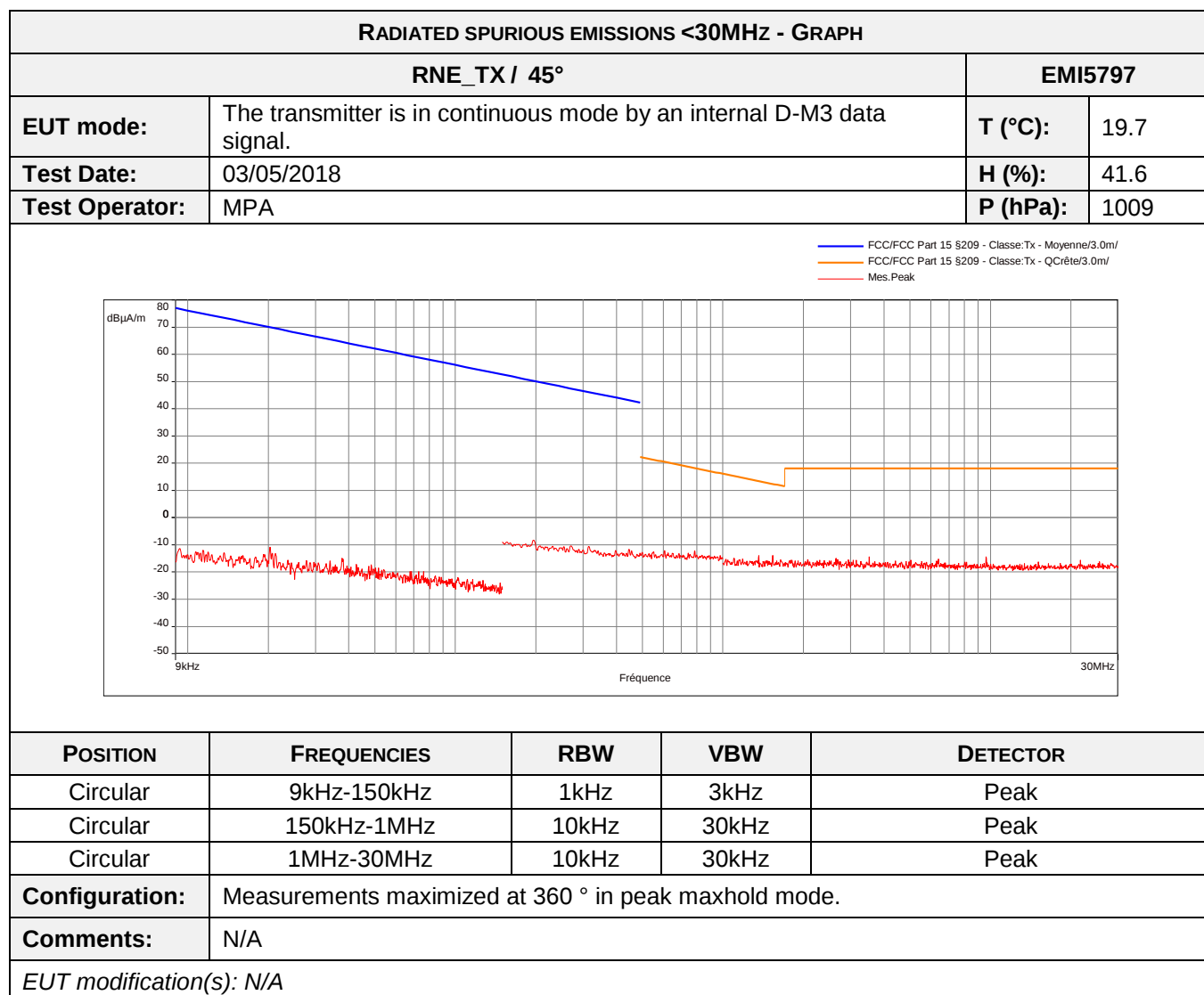
TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Cable	Huber Suhner	N-10m	8472	16/02/2017	16/04/2019
Cable	SUCOFLEX	N-3m	14378	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-6,5m	14380	18/01/2017	18/03/2019
Receiver	Agilent Technologies	E4440A	5824	18/04/2018	18/06/2020
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Software	Nexio	BAT EMC v3.16.0.64	0000		
Thermohygrometer	Testo	608-H2	12268	27/11/2017	27/01/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Turntable	Maturo	NCD	14657		

Blank cells = Permanent validity

TEST SETUP PHOTO(S) – RNE_TX / 0°







RADIATED SPURIOUS EMISSIONS <30MHz - GRAPH				
RNE_TX / 90°			EMI5797	
EUT mode:	The transmitter is in continuous mode by an internal D-M3 data signal.		T (°C):	19.7
Test Date:	03/05/2018		H (%):	41.6
Test Operator:	MPA		P (hPa):	1009
FCC/FCC Part 15 §209 - Classe:Tx - Moyenne/3.0m/ FCC/FCC Part 15 §209 - Classe:Tx - QCrête/3.0m/ Mes. Peak 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 9kHz <				

All unwanted radiated spurious (<30MHz) are at least 20 dB below specified limits.

6.2. Radiated spurious emissions >30MHz

Reference standard:	CFR 47 FCC part 15 and RSS-Gen
Test method:	15.209
Test description: : Test is done in fully anechoic shielded chamber at 3m. E.U.T. is set on a styrofoam table. Measurements are done in max-hold peak detection in hopping mode maximized at 360°.	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
RNE / Tx mode / ELEDIVALL188	30MHz-6GHz	Class Tx	EMI5797	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	20 to 75 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	ETS-Lindgren	3117	5456	16/03/2016	16/05/2019
Antenna	Electro Metrics	BIA-30HF	0824	25/04/2015	25/06/2018
Antenna	Rohde & Schwarz	HL223	3126	25/04/2015	25/06/2018
Cable	TechniWAVE	N-0.23m	14894	23/02/2018	23/04/2020
Cable	TechniWAVE	N-0.23m	14896	23/02/2018	23/04/2020
Cable	STORM MICROWAVE	N-0.2m	10265	05/10/2016	05/12/2018
Cable	Huber Suhner	N-10m	8472	16/02/2017	16/04/2019
Cable	SUCOFLEX	N-3m	14379	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-6,5m	14380	18/01/2017	18/03/2019
Filter	Micro-Tronics	HPM 11630	4392	05/10/2016	05/12/2018
Preamplifier	IMPULSE	CA118-546ACN	9169	13/10/2017	13/12/2018
Receiver	Agilent Technologies	E4440A	5824	18/04/2018	18/06/2020
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Software	Nexio	BAT EMC v3.6.0.32	0000		
Antenna mast	Maturo	NCD	14656		
Turntable	Maturo	NCD	14657		
Thermohygrometer	Testo	608-H1	12269	27/12/2016	27/02/2019
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019

Blank cells = Permanent validity

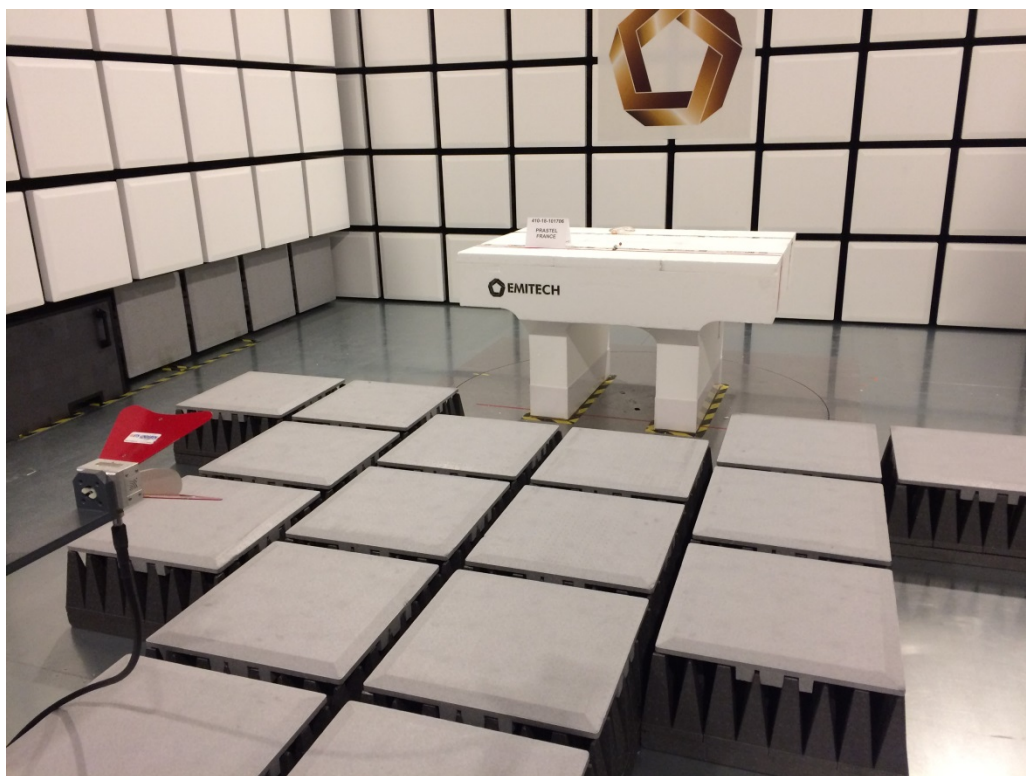
TEST SETUP PHOTO(S) -

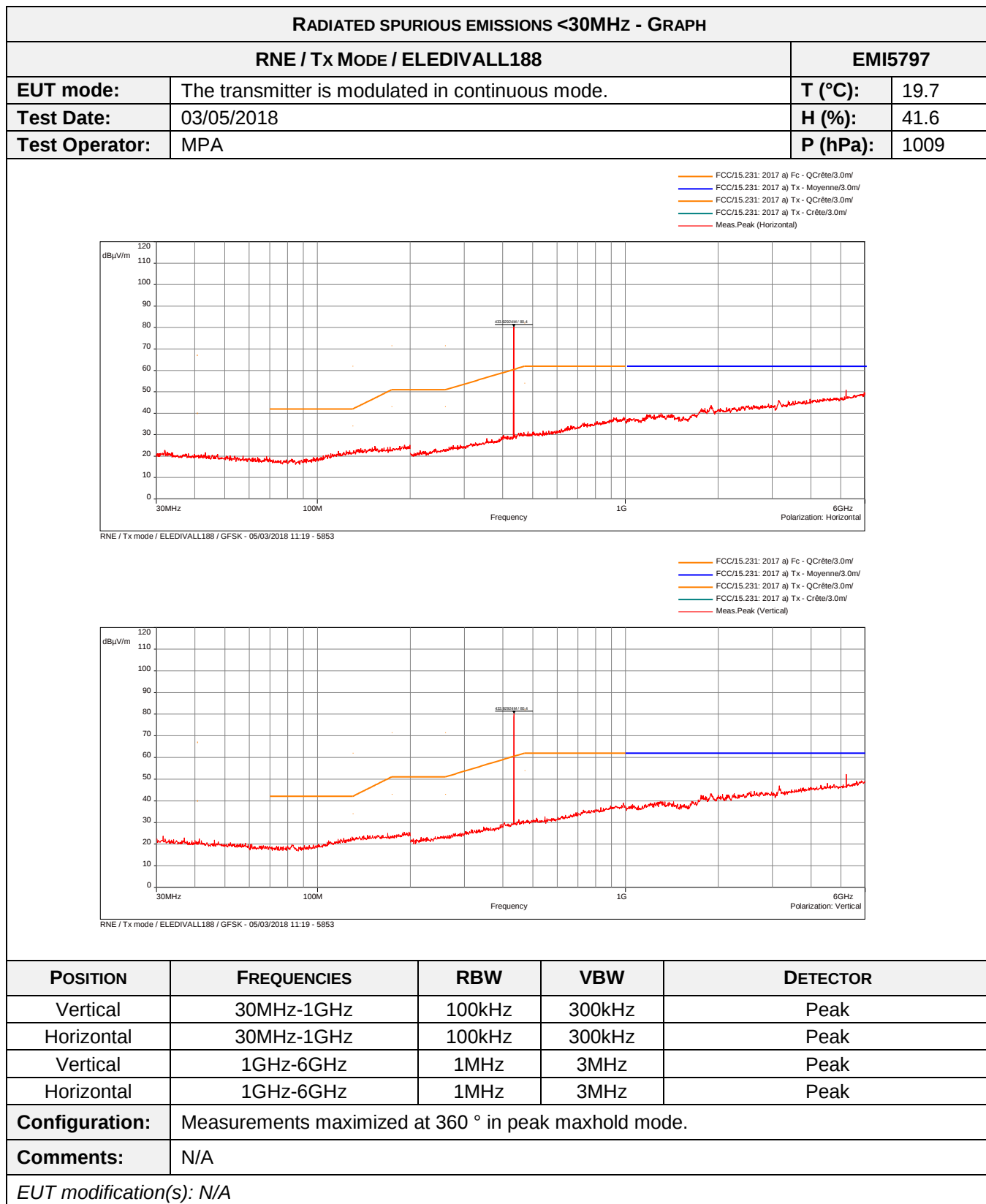


TEST SETUP PHOTO(S) -



TEST SETUP PHOTO(S) -





6.3. Radiated field strength of fundamental

Reference standard:	CFR 47 FCC part 15 and RSS-210
Test method:	15.231
Test description: : Test is done in fully anechoic shielded chamber at 3m. E.U.T. is set on a styrofoam table. Measurements are done in max-hold peak detection in hopping mode maximized at 360°.	

TESTED CONFIGURATION	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Tx / Vertical	100kHz	(b)	EMI5797	PASS
Tx / Horizontal	100kHz	(b)	EMI5798	PASS
Desactivate time	N/A	(a)(1)	EMI5799	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	See Graph(es)
Relative Humidity	20 to 75 %	See Graph(es)
Atmospheric pressure	N/A	See Graph(es)
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/09/2017	20/11/2019
Cable	Huber Suhner	N-10m	8472	16/02/2017	16/04/2019
Cable	SUCOFLEX	N-3m	14378	18/01/2017	18/03/2019
Cable	SUCOFLEX	N-6,5m	14380	18/01/2017	18/03/2019
Receiver	Agilent Technologies	E4440A	5824	18/04/2018	18/06/2020
Shielded enclosure	COMTEST	SAC 3m	14494	14/02/2017	14/04/2020
Software	Nexio	BAT EMC v3.16.0.64	0000		
Thermohygrometer	Testo	608-H2	12268	27/11/2017	27/01/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019
Turntable	Maturo	NCD	14657		

Blank cells = Permanent validity

TEST SETUP PHOTO(S) -

RADIATED FIELD STRENGTH OF FUNDAMENTAL - GRAPH

RNE / Tx Mode / ELEDIVALL188 / OOK				EMI5797	
EUT mode:	The transmitter is modulated (OOK) in continuous mode.			T (°C):	19.7
Test Date:	03/05/2018			H (%):	41.6
Test Operator:	MPA			P (hPa):	1009
POSITION	FREQUENCIES	QUASI PEAK LEVEL	LIMIT		
Vertical	433.92 MHz	6,026 µV/m	10,997 µV/m		
Horizontal	433.92 MHz	8,710 µV/m	10,997 µV/m		
Configuration:	Measurements maximized at 360°				
Comments:	N/A				
EUT modification(s): N/A					

6.4. Occupied Bandwidth 99% & 20 dB Bandwidth

Reference standard:	RSS-Gen § 6.7
Test method:	RSS-Gen § 6.7
General test setup: A near field probe detects field near equipment (relative measurement). The 99 % OBW function is used .	

TESTED	FREQUENCY	SEVERITY	RESULT TAB.	VERDICT
OBW 99%	433.92 MHz	NA	EMI5756	PASS
-20 dB Bandwidth	433.92 MHz	NA	EMI5797	PASS

LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	20.1 °C
Relative Humidity	20 to 75 %	42.5%
Atmospheric pressure	N/A	1015 hPa
Test method deviation: N/A		
Supplementary information: N/A		

TEST EQUIPMENT USED					
CATEGORY	BRAND	TYPE	IDENTIFIER	CAL. DATE	CAL. DUE
Attenuator	Radiall	R412720124	4391	01/02/2018	01/04/2020
Cable	MICRO-COAX	N-3m	10536	12/10/2017	12/12/2019
Cable	C&C	N-3m	14332	15/12/2016	15/02/2019
Cable	C&C	N-3m	14333	15/12/2016	15/02/2019
Climatic enclosure	Heraeus	UT6060	2116		
Multimeter	Agilent Technologies	U1252A	6138	24/01/2018	24/03/2020
Power supply	TTi	PL303QMD	8496		
Receiver	Agilent Technologies	E4440A	5824	18/04/2018	18/06/2020
Software	Nexio	BAT EMC v3.6.0.32	0000		
Thermohygrometer	Testo	608-H2	12268	27/11/2017	27/01/2020
Thermohygrometer	Bioblock Scientific	Météostar	0963	27/12/2016	27/02/2019

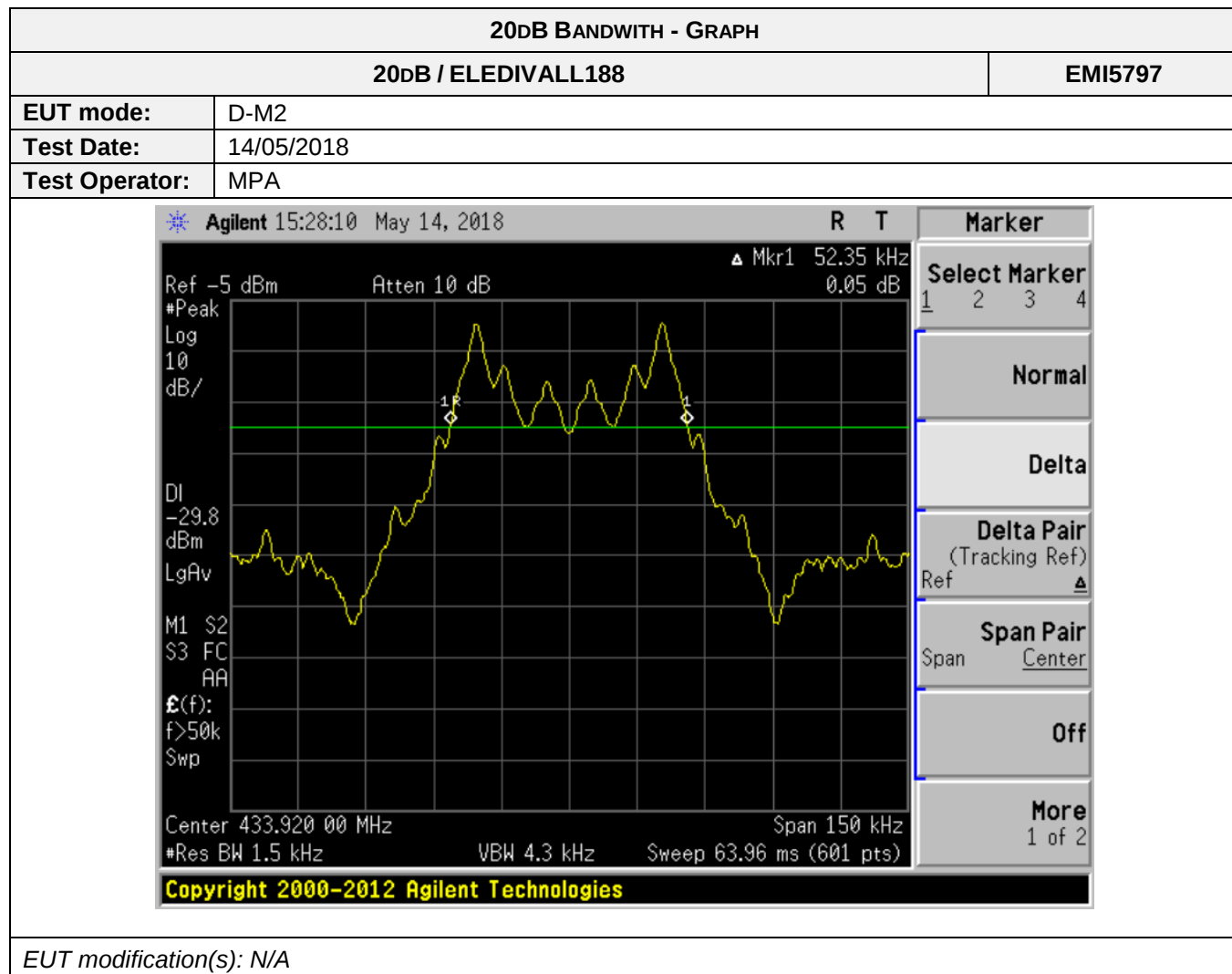
Blank cells = Permanent validity

OCCUPIED BANDWIDTH 99% - GRAPH	
OBW / ELEDIVALL188	
EMI5756	
EUT mode:	D-M2
Test Date:	14/05/2018
Test Operator:	MPA

Agilent 10:48:58 May 14, 2018 R T		Trace	
Ch Freq 433.92 MHz Trig Free		Trace 1 2 3	
Occupied Bandwidth		Clear Write	
Ref 0 dBm #Atten 10 dB		Max Hold	
#Avg Log 10 dB/		Min Hold	
Center 433.920 000 MHz Span 150 kHz		View	
#Res BW 1.5 kHz VBW 4.3 kHz Sweep 202.6 ms (8192 pts)		Blank	
Occupied Bandwidth 50.7964 kHz		More 1 of 2	
Occ BW % Pwr 99.00 %			
x dB -26.00 dB			
Transmit Freq Error 419.048 Hz			
x dB Bandwidth 59.478 kHz*			
Copyright 2000-2012 Agilent Technologies			

EUT modification(s): N/A

PERMITTED RANGE OF OPERATING FREQUENCIES - TABULATED RESULTS			
OBW / ELEDIVALL188			EMI5756
Center Frequency	RBW	OCCUPIED BANDWIDTH 99%	N/A
433.92 MHz	1.5 kHz	50.7964 kHz	N/A



PERMITTED RANGE OF OPERATING FREQUENCIES - TABULATED RESULTS			
20dB / ELEDIVALL188			EMI5797
Center Frequency	RBW	20DB BANDWIDTH	N/A
433.92 MHz	1.5 kHz	52.35 kHz	N/A

End of test report