



LCIE

WiFi 5GHz Template: Release March 21st, 2016

TEST REPORT

N°: 141267-684475A

Version : 01

Subject

Radio spectrum matters
tests according to standards:
47 CFR Part 15.407 & RSS 247 Issue 1 (DFS Client Only)

Issued to

u-blox AG
Zurcherstrasse 68
CH-8800 Thalwil,
Switzerland

Apparatus under test

Product Wireless Multiradio Module
Trade mark **u-blox**
Manufacturer **u-blox AG**
Model under test EMMY-W163-A, EMMY-W163, EMMY-W161-A, EMMY-W161
Serial number **632000011270100**

Conclusion

See Test Program chapter

Test date

: March 21, 2016 to March 23, 2016

Test location

Fontenay Aux Roses

Composition of document

35 pages

Document issued on

May 12, 2016

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	March 23, 2016	Stéphane PHOUDIAH	Creation of the document



SUMMARY

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1. TEST PROGRAM

References

- 47 CFR Part 15.407 (DFS requirements)
- RSS 247 Issue 1 (DFS requirements)
- KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
- KDB 905462 D04 Test Mode New Rules v01
- KDB 905462 D03 Client Without DFS New Rules v01r01
- KDB 905462 D06 802.11 Channel Plans New Rules v02
- KDB905462 D07 Overview UNII Rules v01

Radio requirement:

Clause (47CFR Part 15.407 & RSS 247 Issue 1) Test Description	Test result - Comments			
Channel Availability Check Time & DFS Detection Threshold P	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> NA(1)(2)	<input type="checkbox"/> NP(3)
U-NII Detection Bandwidth P	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> NA(1)	<input type="checkbox"/> NP(3)
Statistical Performance Check & DFS Detection Threshold P	<input type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> NA (1)	<input type="checkbox"/> NP(3)
Channel Closing Transmission Time & Channel Move Time P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(3)
Non-occupancy period P	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL	<input type="checkbox"/> NA	<input type="checkbox"/> NP(3)
This table is a summary of test report, see conclusion of each clause of this test report for detail.				

(1): Client without radar detection

(2): Client with radar detection

(3): Limited program



2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. INFORMATIONS

The **EMMY-W1 series** provides a complete short range transceiver solution that can easily be integrated into automotive and industrial applications. The modules are designed for both simultaneous and independent operation of the following technologies:

- IEEE 802.11a/b/g/n/ac payload data rates for Wi-Fi
- Dual-mode Bluetooth v4.2
- NFC

The EMMY-W1 series is a surface-mount device (SMD) component and can be used as a Wi-Fi micro-access point supporting up to 10 clients

-Tests are performed on the product "**EMMY-W163-A**". See Table below for difference between products.

Product type / model	Description	Product grade
EMMY-W163-A	WLAN 2.4 and 5 GHz on antenna port ANT1, Bluetooth / BT LE on antenna port ANT2	Automotive-grade
EMMY-W163	WLAN 2.4 and 5 GHz on antenna port ANT1, Bluetooth / BT LE on antenna port ANT2. Product is technically identical to EMMY-W163-A.	Professional-grade
EMMY-W161-A	WLAN 2.4 and 5 GHz, Bluetooth / BT LE on antenna port ANT1. 5 GHz WLAN TX/RX chain identical to EMMY-W163(-A)	Automotive-grade
EMMY-W161	WLAN 2.4 and 5 GHz, Bluetooth / BT LE on antenna port ANT1. 5 GHz WLAN TX/RX chain identical to EMMY-W163(-A) Product is technically identical to EMMY-W161-A.	Professional-grade

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
u-blox EMMY-W163-A

Serial Number: 632000011270100



(Model ELLA-W163-A)



(seen from an angle, soldered on carrier board)

Equipment Under Test

Inputs/outputs - Cable:

Type
- Input Power: 3.3 V nom. (2.97 V min, 3.63 V max)
- SDIO (for Wifi operation)
- UART (for Bluetooth operation only)

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Wireless AC1750 Dual Band Gigabit Cloud Router	DLINK DIR-868L	RZ641E8004888	FCC ID:RRK2012060056-1 IC ID: 4833A-WMCA01A1
Laptop	Lenovo X201	S/N R9-C2RAW 11/03	Use to set the EUT & the communication traffic
Laptop	Lenovo X201	S/N R9-C2V75 11/03	Use to set the EUT & the communication traffic
Laptop	DELL	LATITUDE E6420	Use to set the router
WGP DEV BOARD	Ublox	1516-0086 S: 425791	
WGP DEV BOARD	Ublox	1516-0013 S: 425791	



L C I E

Software identification:

- Software version: Marvell firmware version (for WLAN operation): 15.68.7.p62

Equipment information:

Type:	WIFI			
Frequency band:	<input checked="" type="checkbox"/> 5150MHz-5250MHz	<input checked="" type="checkbox"/> 5250MHz-5350MHz	<input checked="" type="checkbox"/> 5470MHz-5725MHz	
Standard:	<input checked="" type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n HT20	<input checked="" type="checkbox"/> 802.11n HT40	
	<input type="checkbox"/> 802.11ac VHT20	<input type="checkbox"/> 802.11ac VHT40	<input checked="" type="checkbox"/> 802.11ac VHT80	
	<input type="checkbox"/> 802.11ac VHT160			
Spectrum Modulation:	<input checked="" type="checkbox"/> OFDM			
Channel bandwidth:	<input checked="" type="checkbox"/> 20MHz	<input checked="" type="checkbox"/> 40MHz	<input checked="" type="checkbox"/> 80MHz	<input type="checkbox"/> 160MHz
Antenna Type:	<input type="checkbox"/> Integral	<input checked="" type="checkbox"/> External	<input type="checkbox"/> Dedicated	
Antenna connector:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Temporary for test	
Transmit chains:	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8
	<input checked="" type="checkbox"/> Single antenna	<input type="checkbox"/> Symmetrical	<input type="checkbox"/> Asymmetrical	
	Gain min: 2,5dBi			
Gain max: 4,6dBi				
Beam forming gain:	<input type="checkbox"/> Yes: X dB		<input checked="" type="checkbox"/> No	
TPC:	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
Receiver chains	<input checked="" type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8
Type of equipment:	<input type="checkbox"/> Stand-alone	<input checked="" type="checkbox"/> Plug-in	<input type="checkbox"/> Combined	
Ad-Hoc mode:	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No	
Operating temperature range:	Tmin:	<input type="checkbox"/> -20°C	<input type="checkbox"/> 0°C	<input checked="" type="checkbox"/> -40 °C
	Tnom:	20°C		
	Tmax:	<input type="checkbox"/> 35°C	<input type="checkbox"/> 55°C	<input checked="" type="checkbox"/> 85 °C
Type of power source:	<input type="checkbox"/> AC power supply	<input checked="" type="checkbox"/> DC power supply	<input type="checkbox"/> Battery Battery Type	
Operating voltage range:	Vmin:	<input type="checkbox"/> X V/60Hz	<input checked="" type="checkbox"/> 2,97 Vdc	
	Vnom:	<input type="checkbox"/> 120V/60Hz	<input checked="" type="checkbox"/> 3 Vdc	
	Vmax:	<input type="checkbox"/> X V/60Hz	<input checked="" type="checkbox"/> 3,63 Vdc	
Mode:	<input checked="" type="checkbox"/> Master	<input type="checkbox"/> Slave with radar detection	<input checked="" type="checkbox"/> Slave without radar detection	
	<input type="checkbox"/> Bridge		<input type="checkbox"/> Mesh	
System architectures:	<input checked="" type="checkbox"/> IP based		<input type="checkbox"/> Frame based	
Fixed outdoor P to P/M application:	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
User access restriction:	<input checked="" type="checkbox"/> Yes (The manufacturer declares that information regarding the parameters of the detected Radar Waveforms is not available to the end user)		<input type="checkbox"/> No	



L C I E

CHANNEL PLAN		
802.11a / 802.11n HT20/ 802.11ac VHT20		
Channel	Frequency (MHz)	Available Channel
36	5180	<input checked="" type="checkbox"/>
40	5200	<input checked="" type="checkbox"/>
44	5220	<input checked="" type="checkbox"/>
48	5240	<input checked="" type="checkbox"/>
52	5260	<input checked="" type="checkbox"/>
56	5280	<input checked="" type="checkbox"/>
60	5300	<input checked="" type="checkbox"/>
C1=64	5320	<input checked="" type="checkbox"/>
C2=100	5500	<input checked="" type="checkbox"/>
104	5520	<input checked="" type="checkbox"/>
108	5540	<input checked="" type="checkbox"/>
112	5560	<input checked="" type="checkbox"/>
116	5580	<input checked="" type="checkbox"/>
120	5600	<input type="checkbox"/>
124	5620	<input type="checkbox"/>
128	5640	<input type="checkbox"/>
132	5660	<input checked="" type="checkbox"/>
136	5680	<input checked="" type="checkbox"/>
140	5700	<input checked="" type="checkbox"/>
149	5745	<input checked="" type="checkbox"/>
153	5765	<input checked="" type="checkbox"/>
157	5785	<input checked="" type="checkbox"/>
161	5805	<input checked="" type="checkbox"/>
165	5825	<input checked="" type="checkbox"/>



L C I E

CHANNEL PLAN		
802.11n HT40/ 802.11ac VHT40		
Channel	Frequency (MHz)	Available Channel
36+40	5190	<input checked="" type="checkbox"/>
44+48	5230	<input checked="" type="checkbox"/>
52+56	5270	<input checked="" type="checkbox"/>
C3=60+64	5310	<input checked="" type="checkbox"/>
C4=100+104	5510	<input checked="" type="checkbox"/>
108+112	5550	<input checked="" type="checkbox"/>
116+120	5590	<input type="checkbox"/>
124+128	5630	<input type="checkbox"/>
132+136	5670	<input checked="" type="checkbox"/>
140+144	5710	<input checked="" type="checkbox"/>
149+153	5755	<input checked="" type="checkbox"/>
157+161	5795	<input checked="" type="checkbox"/>

CHANNEL PLAN		
802.11ac VHT80		
Channel	Frequency (MHz)	Available Channel
36+40+44+48	5210	<input checked="" type="checkbox"/>
C5=52+56+60+64	5290	<input checked="" type="checkbox"/>
C6=100+104+108+112	5530	<input checked="" type="checkbox"/>
116+120+124+128	5610	<input type="checkbox"/>
132+136+140+144	5690	<input checked="" type="checkbox"/>
149+153+157+161	5775	<input checked="" type="checkbox"/>

No DFS Channel
DFS Channel
Weather DFS Channel (Not Authorised for RSS-247)



L C I E

DATA RATE		
802.11a		
Data Rate (Mbps)	Modulation Type	Modulation Worst Case
6	BPSK	<input checked="" type="checkbox"/>
9	BPSK	<input type="checkbox"/>
12	QPSK	<input type="checkbox"/>
18	QPSK	<input type="checkbox"/>
24	16-QAM	<input type="checkbox"/>
36	16-QAM	<input type="checkbox"/>
48	64-QAM	<input type="checkbox"/>
54	64-QAM	<input type="checkbox"/>



L C I E

DATA RATE									
802.11n HT20									
Available for EUT	MCS Index	Spatial streams	Modulation				Data Rate (Mbps)		Worst Case Modulation
							(GI = 800ns)	(GI = 400ns)	
<input checked="" type="checkbox"/>	0	1	BPSK				6.5	7.2	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1	1	QPSK				13	14.4	<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	1	QPSK				19.5	21.7	<input type="checkbox"/>
<input checked="" type="checkbox"/>	3	1	16-QAM				26	28.9	<input type="checkbox"/>
<input checked="" type="checkbox"/>	4	1	16-QAM				39	43.3	<input type="checkbox"/>
<input checked="" type="checkbox"/>	5	1	64-QAM				52	57.8	<input type="checkbox"/>
<input checked="" type="checkbox"/>	6	1	64-QAM				58.5	65	<input type="checkbox"/>
<input checked="" type="checkbox"/>	7	1	64-QAM				65	72.2	<input type="checkbox"/>
<input type="checkbox"/>	8	2	BPSK				13	14.4	<input type="checkbox"/>
<input type="checkbox"/>	9	2	QPSK				26	28.9	<input type="checkbox"/>
<input type="checkbox"/>	10	2	QPSK				39	43.3	<input type="checkbox"/>
<input type="checkbox"/>	11	2	16-QAM				52	57.8	<input type="checkbox"/>
<input type="checkbox"/>	12	2	16-QAM				78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	13	2	64-QAM				104	115.6	<input type="checkbox"/>
<input type="checkbox"/>	14	2	64-QAM				117	130.3	<input type="checkbox"/>
<input type="checkbox"/>	15	2	64-QAM				130	144.4	<input type="checkbox"/>
<input type="checkbox"/>	16	3	BPSK				19.5	21.7	<input type="checkbox"/>
<input type="checkbox"/>	17	3	QPSK				39	43.3	<input type="checkbox"/>
<input type="checkbox"/>	18	3	QPSK				58.5	65	<input type="checkbox"/>
<input type="checkbox"/>	19	3	16-QAM				78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	20	3	16-QAM				117	130	<input type="checkbox"/>
<input type="checkbox"/>	21	3	64-QAM				156	173.3	<input type="checkbox"/>
<input type="checkbox"/>	22	3	64-QAM				175.5	195	<input type="checkbox"/>
<input type="checkbox"/>	23	3	64-QAM				195	216.7	<input type="checkbox"/>
<input type="checkbox"/>	24	4	BPSK				26	28.9	<input type="checkbox"/>
<input type="checkbox"/>	25	4	QPSK				52	57.8	<input type="checkbox"/>
<input type="checkbox"/>	26	4	QPSK				78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	27	4	16-QAM				104	115.6	<input type="checkbox"/>
<input type="checkbox"/>	28	4	16-QAM				156	173.3	<input type="checkbox"/>
<input type="checkbox"/>	29	4	64-QAM				208	231.1	<input type="checkbox"/>
<input type="checkbox"/>	30	4	64-QAM				234	260	<input type="checkbox"/>
<input type="checkbox"/>	31	4	64-QAM				260	288.9	<input type="checkbox"/>
<input type="checkbox"/>	32	1	BPSK	-	-	-	-	<input type="checkbox"/>	
<input type="checkbox"/>	33	2	16-QAM	QPSK	-	-	39	43.3	<input type="checkbox"/>
<input type="checkbox"/>	34	2	64-QAM	QPSK	-	-	52	57.8	<input type="checkbox"/>
<input type="checkbox"/>	35	2	64-QAM	16-QAM	-	-	65	72.2	<input type="checkbox"/>
<input type="checkbox"/>	36	2	16-QAM	QPSK	-	-	58.5	65	<input type="checkbox"/>
<input type="checkbox"/>	37	2	64-QAM	QPSK	-	-	78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	38	2	64-QAM	16-QAM	-	-	97.5	108.3	<input type="checkbox"/>
<input type="checkbox"/>	39	3	16-QAM	QPSK	QPSK	-	52	57.8	<input type="checkbox"/>
<input type="checkbox"/>	40	3	16-QAM	16-QAM	QPSK	-	65	72.2	<input type="checkbox"/>
<input type="checkbox"/>	41	3	64-QAM	QPSK	QPSK	-	65	72.2	<input type="checkbox"/>
<input type="checkbox"/>	42	3	64-QAM	16-QAM	QPSK	-	78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	43	3	64-QAM	16-QAM	16-QAM	-	91	101.1	<input type="checkbox"/>
<input type="checkbox"/>	44	3	64-QAM	64-QAM	QPSK	-	91	101.1	<input type="checkbox"/>
<input type="checkbox"/>	45	3	64-QAM	64-QAM	16-QAM	-	104	115.6	<input type="checkbox"/>
<input type="checkbox"/>	46	3	16-QAM	QPSK	QPSK	-	78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	47	3	16-QAM	16-QAM	QPSK	-	97.5	108.3	<input type="checkbox"/>
<input type="checkbox"/>	48	3	64-QAM	QPSK	QPSK	-	97.5	108.3	<input type="checkbox"/>
<input type="checkbox"/>	49	3	64-QAM	16-QAM	QPSK	-	117	130	<input type="checkbox"/>
<input type="checkbox"/>	50	3	64-QAM	16-QAM	16-QAM	-	136.5	151.7	<input type="checkbox"/>
<input type="checkbox"/>	51	3	64-QAM	64-QAM	QPSK	-	136.5	151.7	<input type="checkbox"/>
<input type="checkbox"/>	52	3	64-QAM	64-QAM	16-QAM	-	156	173.3	<input type="checkbox"/>
<input type="checkbox"/>	53	4	16-QAM	QPSK	QPSK	QPSK	65	72.2	<input type="checkbox"/>
<input type="checkbox"/>	54	4	16-QAM	16-QAM	QPSK	QPSK	78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	55	4	16-QAM	16-QAM	16-QAM	QPSK	91	101.1	<input type="checkbox"/>
<input type="checkbox"/>	56	4	64-QAM	QPSK	QPSK	QPSK	78	86.7	<input type="checkbox"/>
<input type="checkbox"/>	57	4	64-QAM	16-QAM	QPSK	QPSK	91	101.1	<input type="checkbox"/>
<input type="checkbox"/>	58	4	64-QAM	16-QAM	16-QAM	QPSK	104	115.6	<input type="checkbox"/>
<input type="checkbox"/>	59	4	64-QAM	16-QAM	16-QAM	16-QAM	117	130	<input type="checkbox"/>
<input type="checkbox"/>	60	4	64-QAM	QPSK	QPSK	QPSK	104	115.6	<input type="checkbox"/>
<input type="checkbox"/>	61	4	64-QAM	16-QAM	16-QAM	QPSK	117	130	<input type="checkbox"/>
<input type="checkbox"/>	62	4	64-QAM	16-QAM	16-QAM	16-QAM	130	144.4	<input type="checkbox"/>
<input type="checkbox"/>	63	4	64-QAM	64-QAM	64-QAM	QPSK	130	144.4	<input type="checkbox"/>
<input type="checkbox"/>	64	4	64-QAM	64-QAM	64-QAM	16-QAM	143	158.9	<input type="checkbox"/>
<input type="checkbox"/>	65	4	16-QAM	QPSK	QPSK	QPSK	97.5	108.3	<input type="checkbox"/>
<input type="checkbox"/>	66	4	16-QAM	16-QAM	QPSK	QPSK	117	130	<input type="checkbox"/>
<input type="checkbox"/>	67	4	16-QAM	16-QAM	16-QAM	QPSK	136.5	151.7	<input type="checkbox"/>
<input type="checkbox"/>	68	4	64-QAM	QPSK	QPSK	QPSK	117	130	<input type="checkbox"/>
<input type="checkbox"/>	69	4	64-QAM	16-QAM	QPSK	QPSK	136.5	151.7	<input type="checkbox"/>
<input type="checkbox"/>	70	4	64-QAM	16-QAM	16-QAM	QPSK	156	173.3	<input type="checkbox"/>
<input type="checkbox"/>	71	4	64-QAM	16-QAM	16-QAM	16-QAM	175.5	195	<input type="checkbox"/>
<input type="checkbox"/>	72	4	64-QAM	64-QAM	QPSK	QPSK	156	173.3	<input type="checkbox"/>
<input type="checkbox"/>	73	4	64-QAM	64-QAM	16-QAM	QPSK	175.5	195	<input type="checkbox"/>
<input type="checkbox"/>	74	4	64-QAM	64-QAM	16-QAM	16-QAM	195	216.7	<input type="checkbox"/>
<input type="checkbox"/>	75	4	64-QAM	64-QAM	64-QAM	QPSK	195	216.7	<input type="checkbox"/>
<input type="checkbox"/>	76	4	64-QAM	64-QAM	64-QAM	16-QAM	214.5	238.3	<input type="checkbox"/>



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DATA RATE									
802.11n HT40									
Available for EUT	MCS Index	Spatial streams	Modulation				Data Rate (Mbps)		Worst Case Modulation
							(GI = 800ns)	(GI = 400ns)	
<input checked="" type="checkbox"/>	0	1	BPSK				13	15	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1	1	QPSK				27	30	<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	1	QPSK				40.5	45	<input type="checkbox"/>
<input checked="" type="checkbox"/>	3	1	16-QAM				54	60	<input type="checkbox"/>
<input checked="" type="checkbox"/>	4	1	16-QAM				81	90	<input type="checkbox"/>
<input checked="" type="checkbox"/>	5	1	64-QAM				108	120	<input type="checkbox"/>
<input checked="" type="checkbox"/>	6	1	64-QAM				121.5	135	<input type="checkbox"/>
<input checked="" type="checkbox"/>	7	1	64-QAM				135	150	<input type="checkbox"/>
<input type="checkbox"/>	8	2	BPSK				27	30	<input type="checkbox"/>
<input type="checkbox"/>	9	2	QPSK				54	60	<input type="checkbox"/>
<input type="checkbox"/>	10	2	QPSK				81	90	<input type="checkbox"/>
<input type="checkbox"/>	11	2	16-QAM				108	120	<input type="checkbox"/>
<input type="checkbox"/>	12	2	16-QAM				162	180	<input type="checkbox"/>
<input type="checkbox"/>	13	2	64-QAM				216	240	<input type="checkbox"/>
<input type="checkbox"/>	14	2	64-QAM				243	270	<input type="checkbox"/>
<input type="checkbox"/>	15	2	64-QAM				270	300	<input type="checkbox"/>
<input type="checkbox"/>	16	3	BPSK				40.5	45	<input type="checkbox"/>
<input type="checkbox"/>	17	3	QPSK				81	90	<input type="checkbox"/>
<input type="checkbox"/>	18	3	QPSK				121.5	135	<input type="checkbox"/>
<input type="checkbox"/>	19	3	16-QAM				162	180	<input type="checkbox"/>
<input type="checkbox"/>	20	3	16-QAM				243	270	<input type="checkbox"/>
<input type="checkbox"/>	21	3	64-QAM				324	360	<input type="checkbox"/>
<input type="checkbox"/>	22	3	64-QAM				364.5	405	<input type="checkbox"/>
<input type="checkbox"/>	23	3	64-QAM				405	450	<input type="checkbox"/>
<input type="checkbox"/>	24	4	BPSK				54	60	<input type="checkbox"/>
<input type="checkbox"/>	25	4	QPSK				108	120	<input type="checkbox"/>
<input type="checkbox"/>	26	4	QPSK				162	180	<input type="checkbox"/>
<input type="checkbox"/>	27	4	16-QAM				216	240	<input type="checkbox"/>
<input type="checkbox"/>	28	4	16-QAM				324	360	<input type="checkbox"/>
<input type="checkbox"/>	29	4	64-QAM				432	480	<input type="checkbox"/>
<input type="checkbox"/>	30	4	64-QAM				486	540	<input type="checkbox"/>
<input type="checkbox"/>	31	4	64-QAM				540	600	<input type="checkbox"/>
<input type="checkbox"/>	32	1	BPSK	-	-	-	6.0	6.7	<input type="checkbox"/>
<input type="checkbox"/>	33	2	16-QAM	QPSK	-	-	81	90.0	<input type="checkbox"/>
<input type="checkbox"/>	34	2	64-QAM	QPSK	-	-	108	120	<input type="checkbox"/>
<input type="checkbox"/>	35	2	64-QAM	16-QAM	-	-	135	150	<input type="checkbox"/>
<input type="checkbox"/>	36	2	16-QAM	QPSK	-	-	121.5	135	<input type="checkbox"/>
<input type="checkbox"/>	37	2	64-QAM	QPSK	-	-	162	180	<input type="checkbox"/>
<input type="checkbox"/>	38	2	64-QAM	16-QAM	-	-	202.5	225	<input type="checkbox"/>
<input type="checkbox"/>	39	3	16-QAM	QPSK	QPSK	-	108	120	<input type="checkbox"/>
<input type="checkbox"/>	40	3	16-QAM	16-QAM	QPSK	-	135	150	<input type="checkbox"/>
<input type="checkbox"/>	41	3	64-QAM	QPSK	QPSK	-	135	150	<input type="checkbox"/>
<input type="checkbox"/>	42	3	64-QAM	16-QAM	QPSK	-	162	180	<input type="checkbox"/>
<input type="checkbox"/>	43	3	64-QAM	16-QAM	16-QAM	-	189	210	<input type="checkbox"/>
<input type="checkbox"/>	44	3	64-QAM	64-QAM	QPSK	-	189	210	<input type="checkbox"/>
<input type="checkbox"/>	45	3	64-QAM	64-QAM	16-QAM	-	216	240	<input type="checkbox"/>
<input type="checkbox"/>	46	3	16-QAM	QPSK	QPSK	-	162	180	<input type="checkbox"/>
<input type="checkbox"/>	47	3	16-QAM	16-QAM	QPSK	-	202.5	225	<input type="checkbox"/>
<input type="checkbox"/>	48	3	64-QAM	QPSK	QPSK	-	202.5	225	<input type="checkbox"/>
<input type="checkbox"/>	49	3	64-QAM	16-QAM	QPSK	-	243	270	<input type="checkbox"/>
<input type="checkbox"/>	50	3	64-QAM	16-QAM	16-QAM	-	283.5	315	<input type="checkbox"/>
<input type="checkbox"/>	51	3	64-QAM	64-QAM	QPSK	-	283.5	315	<input type="checkbox"/>
<input type="checkbox"/>	52	3	64-QAM	64-QAM	16-QAM	-	324	360	<input type="checkbox"/>
<input type="checkbox"/>	53	4	16-QAM	QPSK	QPSK	QPSK	135	150	<input type="checkbox"/>
<input type="checkbox"/>	54	4	16-QAM	16-QAM	QPSK	QPSK	162	180	<input type="checkbox"/>
<input type="checkbox"/>	55	4	16-QAM	16-QAM	16-QAM	QPSK	189	210	<input type="checkbox"/>
<input type="checkbox"/>	56	4	64-QAM	QPSK	QPSK	QPSK	162	180	<input type="checkbox"/>
<input type="checkbox"/>	57	4	64-QAM	16-QAM	QPSK	QPSK	189	210	<input type="checkbox"/>
<input type="checkbox"/>	58	4	64-QAM	16-QAM	16-QAM	QPSK	216	240	<input type="checkbox"/>
<input type="checkbox"/>	59	4	64-QAM	16-QAM	16-QAM	16-QAM	243	270	<input type="checkbox"/>
<input type="checkbox"/>	60	4	64-QAM	QPSK	QPSK	QPSK	216	240	<input type="checkbox"/>
<input type="checkbox"/>	61	4	64-QAM	16-QAM	16-QAM	QPSK	243	270	<input type="checkbox"/>
<input type="checkbox"/>	62	4	64-QAM	16-QAM	16-QAM	16-QAM	270	300	<input type="checkbox"/>
<input type="checkbox"/>	63	4	64-QAM	64-QAM	64-QAM	QPSK	270	300	<input type="checkbox"/>
<input type="checkbox"/>	64	4	64-QAM	64-QAM	64-QAM	16-QAM	297	330	<input type="checkbox"/>
<input type="checkbox"/>	65	4	16-QAM	QPSK	QPSK	QPSK	202.5	225	<input type="checkbox"/>
<input type="checkbox"/>	66	4	16-QAM	16-QAM	QPSK	QPSK	243	270	<input type="checkbox"/>
<input type="checkbox"/>	67	4	16-QAM	16-QAM	16-QAM	QPSK	283.5	315	<input type="checkbox"/>
<input type="checkbox"/>	68	4	64-QAM	QPSK	QPSK	QPSK	243	270	<input type="checkbox"/>
<input type="checkbox"/>	69	4	64-QAM	16-QAM	QPSK	QPSK	283.5	315	<input type="checkbox"/>
<input type="checkbox"/>	70	4	64-QAM	16-QAM	16-QAM	QPSK	324	360	<input type="checkbox"/>
<input type="checkbox"/>	71	4	64-QAM	16-QAM	16-QAM	16-QAM	364.5	405	<input type="checkbox"/>
<input type="checkbox"/>	72	4	64-QAM	64-QAM	QPSK	QPSK	324	360	<input type="checkbox"/>
<input type="checkbox"/>	73	4	64-QAM	64-QAM	16-QAM	QPSK	364.5	405	<input type="checkbox"/>
<input type="checkbox"/>	74	4	64-QAM	64-QAM	16-QAM	16-QAM	405	450	<input type="checkbox"/>
<input type="checkbox"/>	75	4	64-QAM	64-QAM	64-QAM	QPSK	405	450	<input type="checkbox"/>
<input type="checkbox"/>	76	4	64-QAM	64-QAM	64-QAM	16-QAM	445.5	495	<input type="checkbox"/>



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DATA RATE: 802.11ac VHT20							
Available for EUT	MCS Index	Nbr of spatial streams	Modulation (Stream 1/2/3/4)	Coding rate	GI = 800ns	GI = 400ns	Worst Case Modulation
<input checked="" type="checkbox"/>	0	1	BPSK	1/2	6,5	7,2	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1	1	QPSK	1/2	13	14,4	<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	1	QPSK	3/4	19,5	21,7	<input type="checkbox"/>
<input checked="" type="checkbox"/>	3	1	16-QAM	1/2	26	28,9	<input type="checkbox"/>
<input checked="" type="checkbox"/>	4	1	16-QAM	3/4	39	43,3	<input type="checkbox"/>
<input checked="" type="checkbox"/>	5	1	64-QAM	2/3	52	57,8	<input type="checkbox"/>
<input checked="" type="checkbox"/>	6	1	64-QAM	3/4	58,5	65	<input type="checkbox"/>
<input checked="" type="checkbox"/>	7	1	64-QAM	5/6	65	72,2	<input type="checkbox"/>
<input checked="" type="checkbox"/>	8	1	256-QAM	3/4	78	86,7	<input type="checkbox"/>
<input checked="" type="checkbox"/>	9	1	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	10	2	BPSK	1/2	13	14,4	<input type="checkbox"/>
<input type="checkbox"/>	11	2	QPSK	1/2	26	28,8	<input type="checkbox"/>
<input type="checkbox"/>	12	2	QPSK	3/4	39	43,4	<input type="checkbox"/>
<input type="checkbox"/>	13	2	16-QAM	1/2	52	57,8	<input type="checkbox"/>
<input type="checkbox"/>	14	2	16-QAM	3/4	78	86,6	<input type="checkbox"/>
<input type="checkbox"/>	15	2	64-QAM	2/3	104	115,6	<input type="checkbox"/>
<input type="checkbox"/>	16	2	64-QAM	3/4	117	130	<input type="checkbox"/>
<input type="checkbox"/>	17	2	64-QAM	5/6	130	144,4	<input type="checkbox"/>
<input type="checkbox"/>	18	2	256-QAM	3/4	156	173,4	<input type="checkbox"/>
<input type="checkbox"/>	19	2	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	20	3	BPSK	1/2	19,5	21,6	<input type="checkbox"/>
<input type="checkbox"/>	21	3	QPSK	1/2	39	43,2	<input type="checkbox"/>
<input type="checkbox"/>	22	3	QPSK	3/4	58,5	65,1	<input type="checkbox"/>
<input type="checkbox"/>	23	3	16-QAM	1/2	78	86,7	<input type="checkbox"/>
<input type="checkbox"/>	24	3	16-QAM	3/4	117	129,9	<input type="checkbox"/>
<input type="checkbox"/>	25	3	64-QAM	2/3	156	173,4	<input type="checkbox"/>
<input type="checkbox"/>	26	3	64-QAM	3/4	175,5	195	<input type="checkbox"/>
<input type="checkbox"/>	27	3	64-QAM	5/6	195	216,6	<input type="checkbox"/>
<input type="checkbox"/>	28	3	256-QAM	3/4	234	260,1	<input type="checkbox"/>
<input type="checkbox"/>	29	3	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	30	4	BPSK	1/2	26	28,8	<input type="checkbox"/>
<input type="checkbox"/>	31	4	QPSK	1/2	52	57,6	<input type="checkbox"/>
<input type="checkbox"/>	32	4	QPSK	3/4	78	86,8	<input type="checkbox"/>
<input type="checkbox"/>	33	4	16-QAM	1/2	104	115,6	<input type="checkbox"/>
<input type="checkbox"/>	34	4	16-QAM	3/4	156	173,2	<input type="checkbox"/>
<input type="checkbox"/>	35	4	64-QAM	2/3	208	231,2	<input type="checkbox"/>
<input type="checkbox"/>	36	4	64-QAM	3/4	234	260	<input type="checkbox"/>
<input type="checkbox"/>	37	4	64-QAM	5/6	260	288,8	<input type="checkbox"/>
<input type="checkbox"/>	38	4	256-QAM	3/4	312	346,8	<input type="checkbox"/>
<input type="checkbox"/>	39	4	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	40	5	BPSK	1/2	32,5	36	<input type="checkbox"/>
<input type="checkbox"/>	41	5	QPSK	1/2	65	72	<input type="checkbox"/>
<input type="checkbox"/>	42	5	QPSK	3/4	97,5	108,5	<input type="checkbox"/>
<input type="checkbox"/>	43	5	16-QAM	1/2	130	144,5	<input type="checkbox"/>
<input type="checkbox"/>	44	5	16-QAM	3/4	195	216,5	<input type="checkbox"/>
<input type="checkbox"/>	45	5	64-QAM	2/3	260	289	<input type="checkbox"/>
<input type="checkbox"/>	46	5	64-QAM	3/4	292,5	325	<input type="checkbox"/>
<input type="checkbox"/>	47	5	64-QAM	5/6	325	361	<input type="checkbox"/>
<input type="checkbox"/>	48	5	256-QAM	3/4	390	433,5	<input type="checkbox"/>
<input type="checkbox"/>	49	5	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	50	6	BPSK	1/2	39	43,2	<input type="checkbox"/>
<input type="checkbox"/>	51	6	QPSK	1/2	78	86,4	<input type="checkbox"/>
<input type="checkbox"/>	52	6	QPSK	3/4	117	130,2	<input type="checkbox"/>
<input type="checkbox"/>	53	6	16-QAM	1/2	156	173,4	<input type="checkbox"/>
<input type="checkbox"/>	54	6	16-QAM	3/4	234	259,8	<input type="checkbox"/>
<input type="checkbox"/>	55	6	64-QAM	2/3	312	346,8	<input type="checkbox"/>
<input type="checkbox"/>	56	6	64-QAM	3/4	351	390	<input type="checkbox"/>
<input type="checkbox"/>	57	6	64-QAM	5/6	390	433,2	<input type="checkbox"/>
<input type="checkbox"/>	58	6	256-QAM	3/4	468	520,2	<input type="checkbox"/>
<input type="checkbox"/>	59	6	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	60	7	BPSK	1/2	45,5	50,4	<input type="checkbox"/>
<input type="checkbox"/>	61	7	QPSK	1/2	91	100,8	<input type="checkbox"/>
<input type="checkbox"/>	62	7	QPSK	3/4	136,5	151,9	<input type="checkbox"/>
<input type="checkbox"/>	63	7	16-QAM	1/2	182	202,3	<input type="checkbox"/>
<input type="checkbox"/>	64	7	16-QAM	3/4	273	303,1	<input type="checkbox"/>
<input type="checkbox"/>	65	7	64-QAM	2/3	364	404,6	<input type="checkbox"/>
<input type="checkbox"/>	66	7	64-QAM	3/4	409,5	455	<input type="checkbox"/>
<input type="checkbox"/>	67	7	64-QAM	5/6	455	505,4	<input type="checkbox"/>
<input type="checkbox"/>	68	7	256-QAM	3/4	546	606,9	<input type="checkbox"/>
<input type="checkbox"/>	69	7	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>
<input type="checkbox"/>	70	8	BPSK	1/2	52	57,6	<input type="checkbox"/>
<input type="checkbox"/>	71	8	QPSK	1/2	104	115,2	<input type="checkbox"/>
<input type="checkbox"/>	72	8	QPSK	3/4	156	173,6	<input type="checkbox"/>
<input type="checkbox"/>	73	8	16-QAM	1/2	208	231,2	<input type="checkbox"/>
<input type="checkbox"/>	74	8	16-QAM	3/4	312	346,4	<input type="checkbox"/>
<input type="checkbox"/>	75	8	64-QAM	2/3	416	462,4	<input type="checkbox"/>
<input type="checkbox"/>	76	8	64-QAM	3/4	468	520	<input type="checkbox"/>
<input type="checkbox"/>	77	8	64-QAM	5/6	520	577,6	<input type="checkbox"/>
<input type="checkbox"/>	78	8	256-QAM	3/4	624	693,6	<input type="checkbox"/>
<input type="checkbox"/>	79	8	256-QAM	5/6	N/A	N/A	<input type="checkbox"/>



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DATA RATE: 802.11ac VHT40							
Available for EUT	MCS Index	Nbr of spatial streams	Modulation (Stream 1/2/3/4)	Coding rate	GI = 800ns	GI = 400ns	Worst Case Modulation
<input checked="" type="checkbox"/>	0	1	BPSK	1/2	13,5	15	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1	1	QPSK	1/2	27	30	<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	1	QPSK	3/4	40,5	45	<input type="checkbox"/>
<input checked="" type="checkbox"/>	3	1	16-QAM	1/2	54	60	<input type="checkbox"/>
<input checked="" type="checkbox"/>	4	1	16-QAM	3/4	81	90	<input type="checkbox"/>
<input checked="" type="checkbox"/>	5	1	64-QAM	2/3	108	120	<input type="checkbox"/>
<input checked="" type="checkbox"/>	6	1	64-QAM	3/4	121,5	135	<input type="checkbox"/>
<input checked="" type="checkbox"/>	7	1	64-QAM	5/6	135	150	<input type="checkbox"/>
<input checked="" type="checkbox"/>	8	1	256-QAM	3/4	162	180	<input type="checkbox"/>
<input checked="" type="checkbox"/>	9	1	256-QAM	5/6	180	200	<input type="checkbox"/>
<input type="checkbox"/>	10	2	BPSK	1/2	27	30	<input type="checkbox"/>
<input type="checkbox"/>	11	2	QPSK	1/2	54	60	<input type="checkbox"/>
<input type="checkbox"/>	12	2	QPSK	3/4	81	90	<input type="checkbox"/>
<input type="checkbox"/>	13	2	16-QAM	1/2	108	120	<input type="checkbox"/>
<input type="checkbox"/>	14	2	16-QAM	3/4	162	180	<input type="checkbox"/>
<input type="checkbox"/>	15	2	64-QAM	2/3	216	240	<input type="checkbox"/>
<input type="checkbox"/>	16	2	64-QAM	3/4	243	270	<input type="checkbox"/>
<input type="checkbox"/>	17	2	64-QAM	5/6	270	300	<input type="checkbox"/>
<input type="checkbox"/>	18	2	256-QAM	3/4	324	360	<input type="checkbox"/>
<input type="checkbox"/>	19	2	256-QAM	5/6	360	400	<input type="checkbox"/>
<input type="checkbox"/>	20	3	BPSK	1/2	40,5	45	<input type="checkbox"/>
<input type="checkbox"/>	21	3	QPSK	1/2	81	90	<input type="checkbox"/>
<input type="checkbox"/>	22	3	QPSK	3/4	121,5	135	<input type="checkbox"/>
<input type="checkbox"/>	23	3	16-QAM	1/2	162	180	<input type="checkbox"/>
<input type="checkbox"/>	24	3	16-QAM	3/4	243	270	<input type="checkbox"/>
<input type="checkbox"/>	25	3	64-QAM	2/3	324	360	<input type="checkbox"/>
<input type="checkbox"/>	26	3	64-QAM	3/4	364,5	405	<input type="checkbox"/>
<input type="checkbox"/>	27	3	64-QAM	5/6	405	450	<input type="checkbox"/>
<input type="checkbox"/>	28	3	256-QAM	3/4	486	540	<input type="checkbox"/>
<input type="checkbox"/>	29	3	256-QAM	5/6	540	600	<input type="checkbox"/>
<input type="checkbox"/>	30	4	BPSK	1/2	54	60	<input type="checkbox"/>
<input type="checkbox"/>	31	4	QPSK	1/2	108	120	<input type="checkbox"/>
<input type="checkbox"/>	32	4	QPSK	3/4	162	180	<input type="checkbox"/>
<input type="checkbox"/>	33	4	16-QAM	1/2	216	240	<input type="checkbox"/>
<input type="checkbox"/>	34	4	16-QAM	3/4	324	360	<input type="checkbox"/>
<input type="checkbox"/>	35	4	64-QAM	2/3	432	480	<input type="checkbox"/>
<input type="checkbox"/>	36	4	64-QAM	3/4	486	540	<input type="checkbox"/>
<input type="checkbox"/>	37	4	64-QAM	5/6	540	600	<input type="checkbox"/>
<input type="checkbox"/>	38	4	256-QAM	3/4	648	720	<input type="checkbox"/>
<input type="checkbox"/>	39	4	256-QAM	5/6	720	800	<input type="checkbox"/>
<input type="checkbox"/>	40	5	BPSK	1/2	67,5	75	<input type="checkbox"/>
<input type="checkbox"/>	41	5	QPSK	1/2	135	150	<input type="checkbox"/>
<input type="checkbox"/>	42	5	QPSK	3/4	202,5	225	<input type="checkbox"/>
<input type="checkbox"/>	43	5	16-QAM	1/2	270	300	<input type="checkbox"/>
<input type="checkbox"/>	44	5	16-QAM	3/4	405	450	<input type="checkbox"/>
<input type="checkbox"/>	45	5	64-QAM	2/3	540	600	<input type="checkbox"/>
<input type="checkbox"/>	46	5	64-QAM	3/4	607,5	675	<input type="checkbox"/>
<input type="checkbox"/>	47	5	64-QAM	5/6	675	750	<input type="checkbox"/>
<input type="checkbox"/>	48	5	256-QAM	3/4	810	900	<input type="checkbox"/>
<input type="checkbox"/>	49	5	256-QAM	5/6	900	1000	<input type="checkbox"/>
<input type="checkbox"/>	50	6	BPSK	1/2	81	90	<input type="checkbox"/>
<input type="checkbox"/>	51	6	QPSK	1/2	162	180	<input type="checkbox"/>
<input type="checkbox"/>	52	6	QPSK	3/4	243	270	<input type="checkbox"/>
<input type="checkbox"/>	53	6	16-QAM	1/2	324	360	<input type="checkbox"/>
<input type="checkbox"/>	54	6	16-QAM	3/4	486	540	<input type="checkbox"/>
<input type="checkbox"/>	55	6	64-QAM	2/3	648	720	<input type="checkbox"/>
<input type="checkbox"/>	56	6	64-QAM	3/4	729	810	<input type="checkbox"/>
<input type="checkbox"/>	57	6	64-QAM	5/6	810	900	<input type="checkbox"/>
<input type="checkbox"/>	58	6	256-QAM	3/4	972	1080	<input type="checkbox"/>
<input type="checkbox"/>	59	6	256-QAM	5/6	1080	1200	<input type="checkbox"/>
<input type="checkbox"/>	60	7	BPSK	1/2	94,5	105	<input type="checkbox"/>
<input type="checkbox"/>	61	7	QPSK	1/2	189	210	<input type="checkbox"/>
<input type="checkbox"/>	62	7	QPSK	3/4	283,5	315	<input type="checkbox"/>
<input type="checkbox"/>	63	7	16-QAM	1/2	378	420	<input type="checkbox"/>
<input type="checkbox"/>	64	7	16-QAM	3/4	567	630	<input type="checkbox"/>
<input type="checkbox"/>	65	7	64-QAM	2/3	756	840	<input type="checkbox"/>
<input type="checkbox"/>	66	7	64-QAM	3/4	850,5	945	<input type="checkbox"/>
<input type="checkbox"/>	67	7	64-QAM	5/6	945	1050	<input type="checkbox"/>
<input type="checkbox"/>	68	7	256-QAM	3/4	1134	1260	<input type="checkbox"/>
<input type="checkbox"/>	69	7	256-QAM	5/6	1260	1400	<input type="checkbox"/>
<input type="checkbox"/>	70	8	BPSK	1/2	108	120	<input type="checkbox"/>
<input type="checkbox"/>	71	8	QPSK	1/2	216	240	<input type="checkbox"/>
<input type="checkbox"/>	72	8	QPSK	3/4	324	360	<input type="checkbox"/>
<input type="checkbox"/>	73	8	16-QAM	1/2	432	480	<input type="checkbox"/>
<input type="checkbox"/>	74	8	16-QAM	3/4	648	720	<input type="checkbox"/>
<input type="checkbox"/>	75	8	64-QAM	2/3	864	960	<input type="checkbox"/>
<input type="checkbox"/>	76	8	64-QAM	3/4	972	1080	<input type="checkbox"/>
<input type="checkbox"/>	77	8	64-QAM	5/6	1080	1200	<input type="checkbox"/>
<input type="checkbox"/>	78	8	256-QAM	3/4	1296	1440	<input type="checkbox"/>
<input type="checkbox"/>	79	8	256-QAM	5/6	1440	1600	<input type="checkbox"/>



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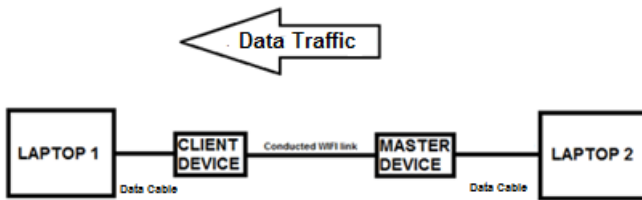
DATA RATE: 802.11ac VHT80								
Available for EUT	MCS Index	Nbr of spatial streams	Modulation (Stream 1/2/3/4)	Coding rate	GI = 800ns	GI = 400ns	Worst Case Modulation	
<input checked="" type="checkbox"/>	0	1	BPSK	1/2	29.3	32.5		<input type="checkbox"/>
<input checked="" type="checkbox"/>	1	1	QPSK	1/2	58.5	65		<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	1	QPSK	3/4	87.8	97.5		<input type="checkbox"/>
<input checked="" type="checkbox"/>	3	1	16-QAM	1/2	117	130		<input type="checkbox"/>
<input checked="" type="checkbox"/>	4	1	16-QAM	3/4	175.5	195		<input type="checkbox"/>
<input checked="" type="checkbox"/>	5	1	64-QAM	2/3	234	260		<input type="checkbox"/>
<input checked="" type="checkbox"/>	6	1	64-QAM	3/4	263.3	292.5		<input type="checkbox"/>
<input checked="" type="checkbox"/>	7	1	64-QAM	5/6	292.5	325		<input type="checkbox"/>
<input checked="" type="checkbox"/>	8	1	256-QAM	3/4	351	390		<input type="checkbox"/>
<input checked="" type="checkbox"/>	9	1	256-QAM	5/6	390	433.3		<input checked="" type="checkbox"/>
<input type="checkbox"/>	10	2	BPSK	1/2	58.6	65		<input type="checkbox"/>
<input type="checkbox"/>	11	2	QPSK	1/2	117	130		<input type="checkbox"/>
<input type="checkbox"/>	12	2	QPSK	3/4	175.6	195		<input type="checkbox"/>
<input type="checkbox"/>	13	2	16-QAM	1/2	234	260		<input type="checkbox"/>
<input type="checkbox"/>	14	2	16-QAM	3/4	351	390		<input type="checkbox"/>
<input type="checkbox"/>	15	2	64-QAM	2/3	468	520		<input type="checkbox"/>
<input type="checkbox"/>	16	2	64-QAM	3/4	526.6	585		<input type="checkbox"/>
<input type="checkbox"/>	17	2	64-QAM	5/6	585	650		<input type="checkbox"/>
<input type="checkbox"/>	18	2	256-QAM	3/4	702	780		<input type="checkbox"/>
<input type="checkbox"/>	19	2	256-QAM	5/6	780	866.6		<input type="checkbox"/>
<input type="checkbox"/>	20	3	BPSK	1/2	87.9	97.5		<input type="checkbox"/>
<input type="checkbox"/>	21	3	QPSK	1/2	175.5	195		<input type="checkbox"/>
<input type="checkbox"/>	22	3	QPSK	3/4	263.4	292.5		<input type="checkbox"/>
<input type="checkbox"/>	23	3	16-QAM	1/2	351	390		<input type="checkbox"/>
<input type="checkbox"/>	24	3	16-QAM	3/4	526.5	585		<input type="checkbox"/>
<input type="checkbox"/>	25	3	64-QAM	2/3	702	780		<input type="checkbox"/>
<input type="checkbox"/>	26	3	64-QAM	3/4	789.9	877.5		<input type="checkbox"/>
<input type="checkbox"/>	27	3	64-QAM	5/6	877.5	975		<input type="checkbox"/>
<input type="checkbox"/>	28	3	256-QAM	3/4	1053	1170		<input type="checkbox"/>
<input type="checkbox"/>	29	3	256-QAM	5/6	1170	1299.9		<input type="checkbox"/>
<input type="checkbox"/>	30	4	BPSK	1/2	117.2	130		<input type="checkbox"/>
<input type="checkbox"/>	31	4	QPSK	1/2	234	260		<input type="checkbox"/>
<input type="checkbox"/>	32	4	QPSK	3/4	351.2	390		<input type="checkbox"/>
<input type="checkbox"/>	33	4	16-QAM	1/2	468	520		<input type="checkbox"/>
<input type="checkbox"/>	34	4	16-QAM	3/4	702	780		<input type="checkbox"/>
<input type="checkbox"/>	35	4	64-QAM	2/3	936	1040		<input type="checkbox"/>
<input type="checkbox"/>	36	4	64-QAM	3/4	1053.2	1170		<input type="checkbox"/>
<input type="checkbox"/>	37	4	64-QAM	5/6	1170	1300		<input type="checkbox"/>
<input type="checkbox"/>	38	4	256-QAM	3/4	1404	1560		<input type="checkbox"/>
<input type="checkbox"/>	39	4	256-QAM	5/6	1560	1733.2		<input type="checkbox"/>
<input type="checkbox"/>	40	5	BPSK	1/2	146.5	162.5		<input type="checkbox"/>
<input type="checkbox"/>	41	5	QPSK	1/2	292.5	325		<input type="checkbox"/>
<input type="checkbox"/>	42	5	QPSK	3/4	439	487.5		<input type="checkbox"/>
<input type="checkbox"/>	43	5	16-QAM	1/2	585	650		<input type="checkbox"/>
<input type="checkbox"/>	44	5	16-QAM	3/4	877.5	975		<input type="checkbox"/>
<input type="checkbox"/>	45	5	64-QAM	2/3	1170	1300		<input type="checkbox"/>
<input type="checkbox"/>	46	5	64-QAM	3/4	1316.5	1462.5		<input type="checkbox"/>
<input type="checkbox"/>	47	5	64-QAM	5/6	1462.5	1625		<input type="checkbox"/>
<input type="checkbox"/>	48	5	256-QAM	3/4	1755	1950		<input type="checkbox"/>
<input type="checkbox"/>	49	5	256-QAM	5/6	1950	2166.5		<input type="checkbox"/>
<input type="checkbox"/>	50	6	BPSK	1/2	175.8	195		<input type="checkbox"/>
<input type="checkbox"/>	51	6	QPSK	1/2	351	390		<input type="checkbox"/>
<input type="checkbox"/>	52	6	QPSK	3/4	526.8	585		<input type="checkbox"/>
<input type="checkbox"/>	53	6	16-QAM	1/2	702	780		<input type="checkbox"/>
<input type="checkbox"/>	54	6	16-QAM	3/4	1053	1170		<input type="checkbox"/>
<input type="checkbox"/>	55	6	64-QAM	2/3	1404	1560		<input type="checkbox"/>
<input type="checkbox"/>	56	6	64-QAM	3/4	1579.8	1755		<input type="checkbox"/>
<input type="checkbox"/>	57	6	64-QAM	5/6	1755	1950		<input type="checkbox"/>
<input type="checkbox"/>	58	6	256-QAM	3/4	2106	2340		<input type="checkbox"/>
<input type="checkbox"/>	59	6	256-QAM	5/6	2340	2599.8		<input type="checkbox"/>
<input type="checkbox"/>	60	7	BPSK	1/2	205.1	227.5		<input type="checkbox"/>
<input type="checkbox"/>	61	7	QPSK	1/2	409.5	455		<input type="checkbox"/>
<input type="checkbox"/>	62	7	QPSK	3/4	614.6	682.5		<input type="checkbox"/>
<input type="checkbox"/>	63	7	16-QAM	1/2	819	910		<input type="checkbox"/>
<input type="checkbox"/>	64	7	16-QAM	3/4	1228.5	1365		<input type="checkbox"/>
<input type="checkbox"/>	65	7	64-QAM	2/3	1638	1820		<input type="checkbox"/>
<input type="checkbox"/>	66	7	64-QAM	3/4	1843.1	2047.5		<input type="checkbox"/>
<input type="checkbox"/>	67	7	64-QAM	5/6	2047.5	2275		<input type="checkbox"/>
<input type="checkbox"/>	68	7	256-QAM	3/4	2457	2730		<input type="checkbox"/>
<input type="checkbox"/>	69	7	256-QAM	5/6	2730	3033.1		<input type="checkbox"/>
<input type="checkbox"/>	70	8	BPSK	1/2	234.4	260		<input type="checkbox"/>
<input type="checkbox"/>	71	8	QPSK	1/2	468	520		<input type="checkbox"/>
<input type="checkbox"/>	72	8	QPSK	3/4	702.4	780		<input type="checkbox"/>
<input type="checkbox"/>	73	8	16-QAM	1/2	936	1040		<input type="checkbox"/>
<input type="checkbox"/>	74	8	16-QAM	3/4	1404	1560		<input type="checkbox"/>
<input type="checkbox"/>	75	8	64-QAM	2/3	1872	2080		<input type="checkbox"/>
<input type="checkbox"/>	76	8	64-QAM	3/4	2106.4	2340		<input type="checkbox"/>
<input type="checkbox"/>	77	8	64-QAM	5/6	2340	2600		<input type="checkbox"/>
<input type="checkbox"/>	78	8	256-QAM	3/4	2808	3120		<input type="checkbox"/>
<input type="checkbox"/>	79	8	256-QAM	5/6	3120	3466.4		<input type="checkbox"/>

2.3. RUNNING MODE

The EUT is set in the following modes during tests:

- Emission-reception with a duty cycle above 17% in the data rate that produced the highest output power

The Ublox test configuration software is used to set the communication traffic & to set RF parameters



2.4. EQUIPMENT LABELLING



2.5. EQUIPMENT MODIFICATION

- None Modification:

3. DFS DETECTION THRESHOLDS DETERMINATION, REFERENCE NOISE LEVEL & CHANNEL LOADING

3.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : March 21, 2016
 Ambient temperature : 24 °C
 Relative humidity : 32 %

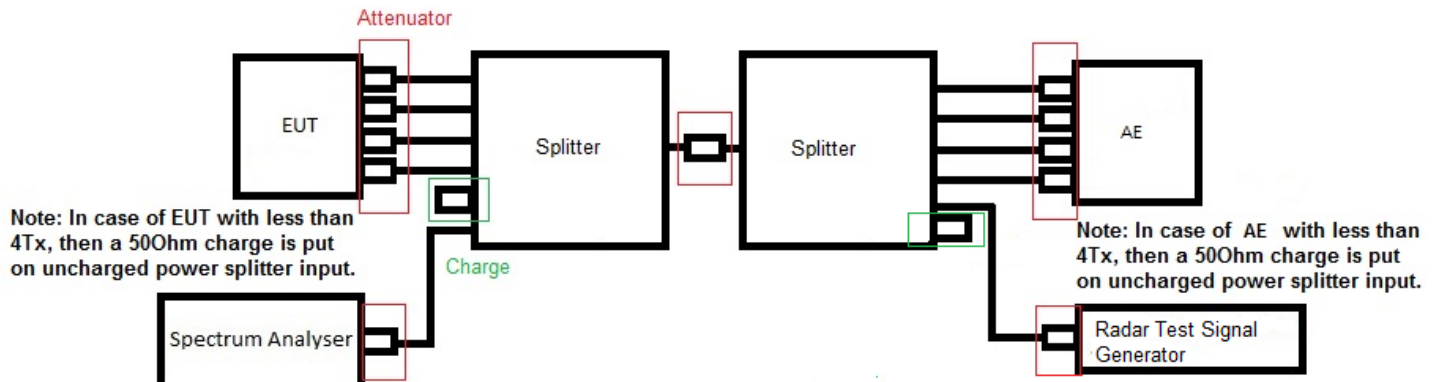
3.2. TEST SETUP

- The Equipment Under Test is:

- On a table
- In an anechoic chamber

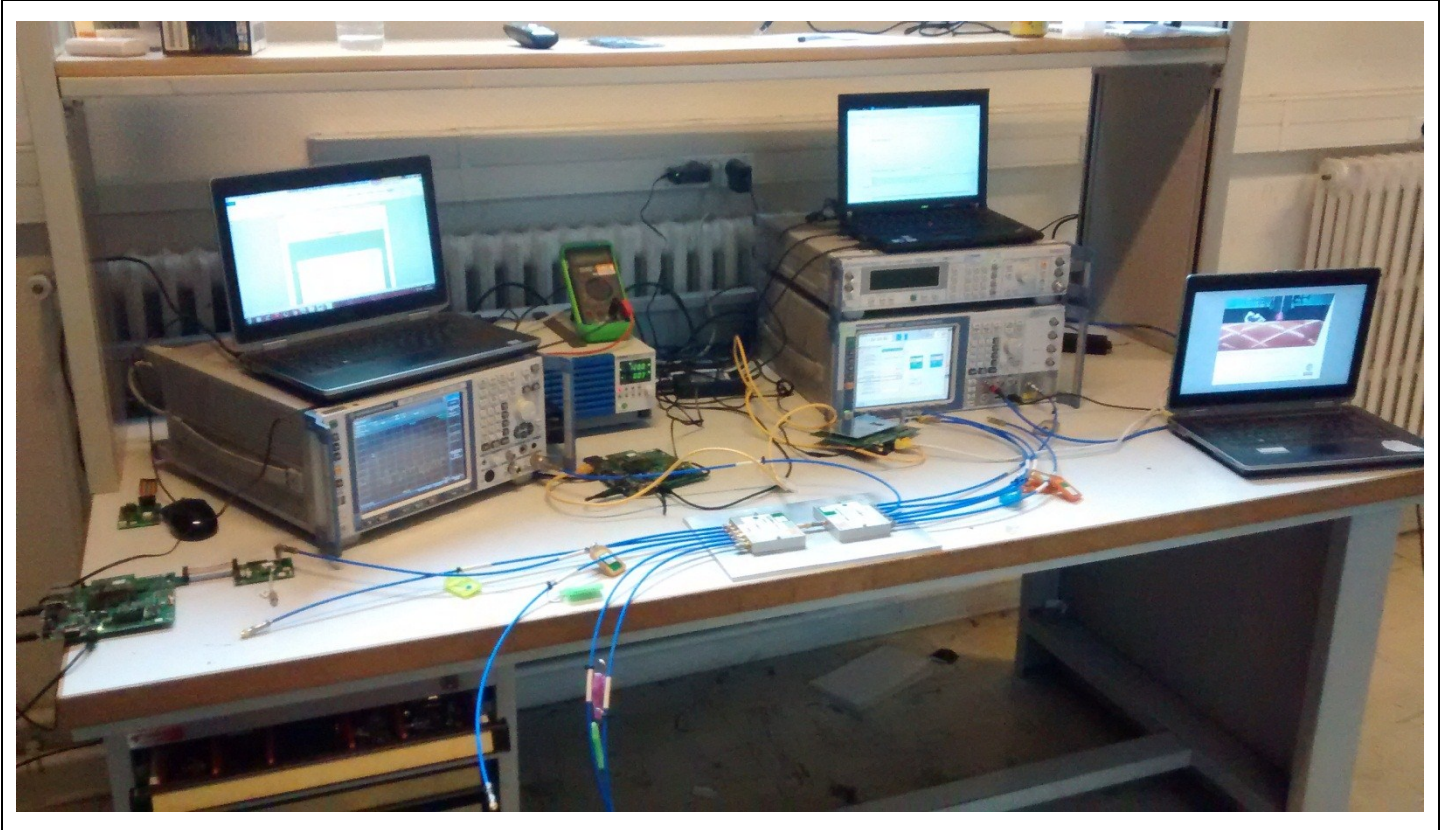
- Measurement is performed with a spectrum analyzer:

- On the EUT conducted access
- On the EUT with a test fixture





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Photograph for DFS Detection Thresholds Determination, Reference Noise Level, Channel Loading



3.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	ISOTECH	IDM 91E	A1240253	2015/08	2016/08
EMI receiver/ Spectrum analyzer	ROHDE & SCHWARZ	ESR 7	A2642023	2015/03	2016/03
RF cable	Télédyne	920-0202-024	A5329663	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329664	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329665	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329668	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329670	2014/04	2016/04
RF cable	Télédyne				
RF cable	Télédyne	920-0202-024	A5329672	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329673	2014/04	2016/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	Verified with calibrated EMI receiver/ Spectrum analyzer before testing	
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	Verified with calibrated multimeter before testing	
Attenuator 10dB	MINI CIRCUITS	BW-S10W2+	A7122229	2014/04	2016/04
Attenuator 10dB	MINI CIRCUITS	BW-S10W2+	A7122230	2014/04	2016/04
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329661	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329676	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329674	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329675	2014/10	2016/10
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122238	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122239	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122240	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122241	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122242	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122243	2014/04	2016/04
Power splitter	Mini-Circuits	ZN6PD-63W-S+	A7132040	2014/04	2016/04
Power splitter	Mini-Circuits	ZN6PD-63W-S+	A7132041	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152075	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152076	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152077	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152078	2014/04	2016/04

3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

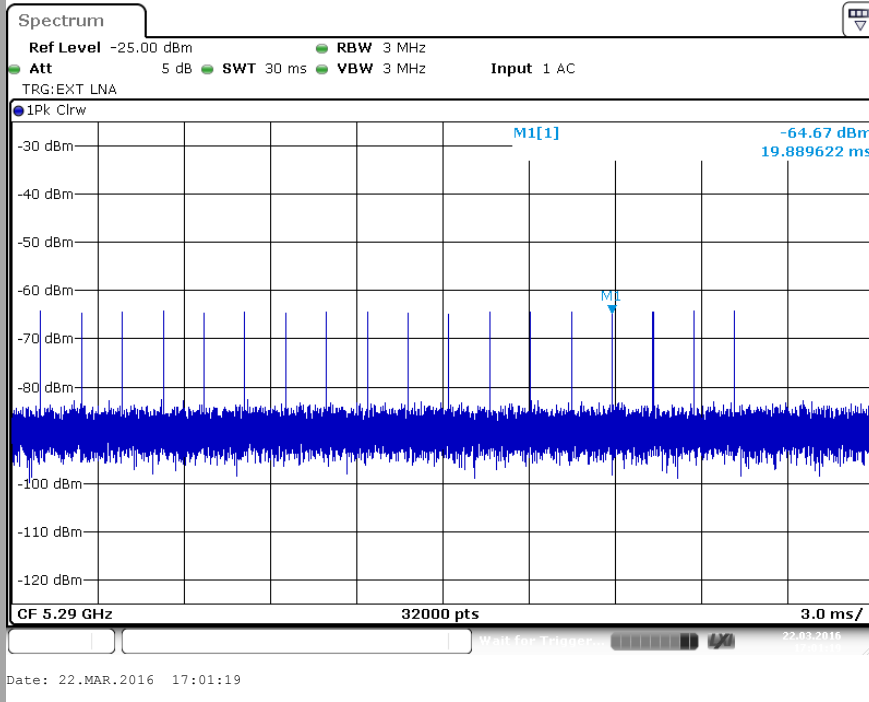
None Divergence:



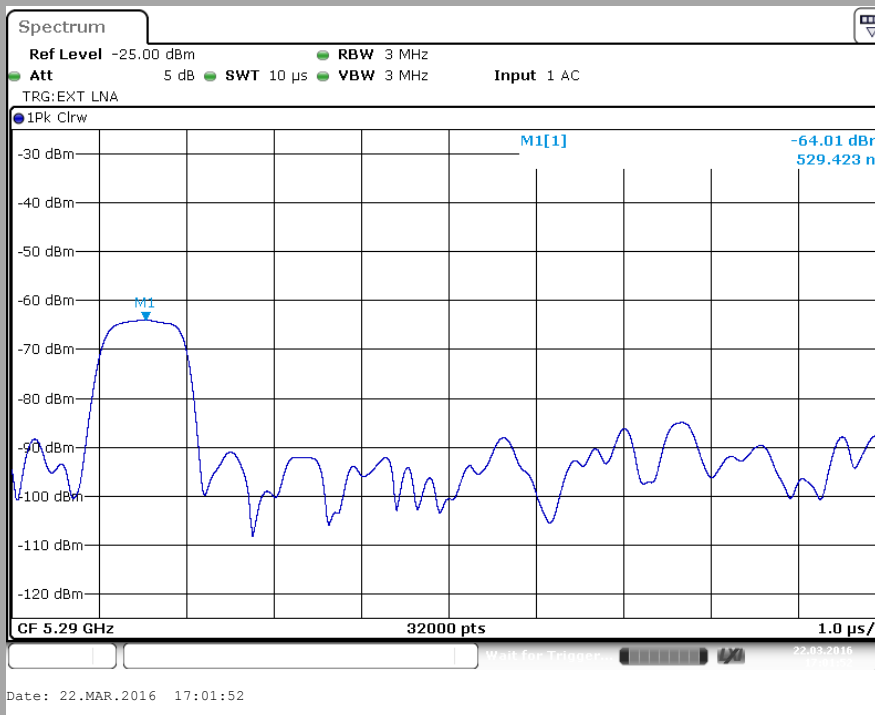
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3.5. RESULTS

DFS Detection Thresholds Calibration Channel C1 Type 0

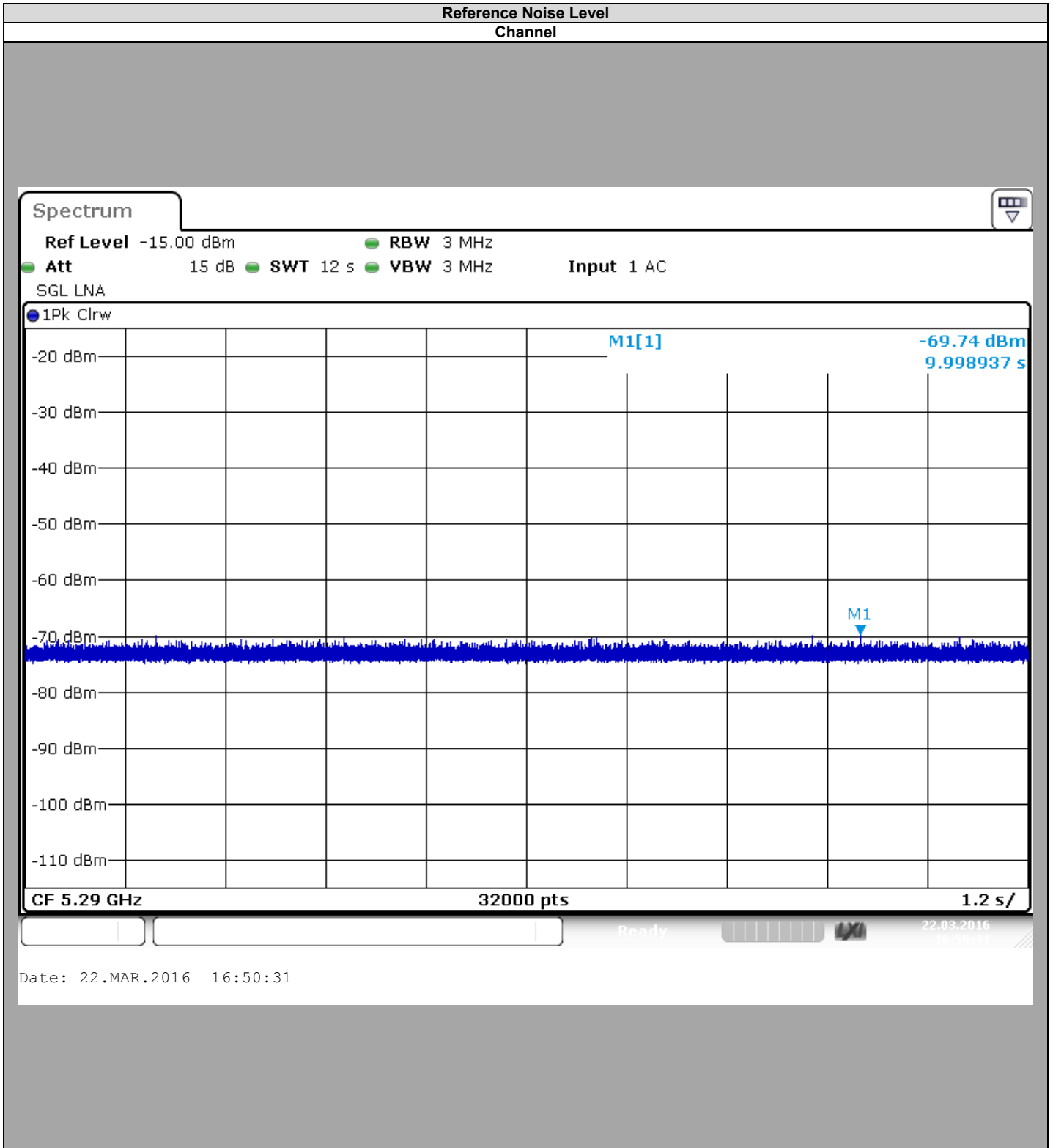


Type 0





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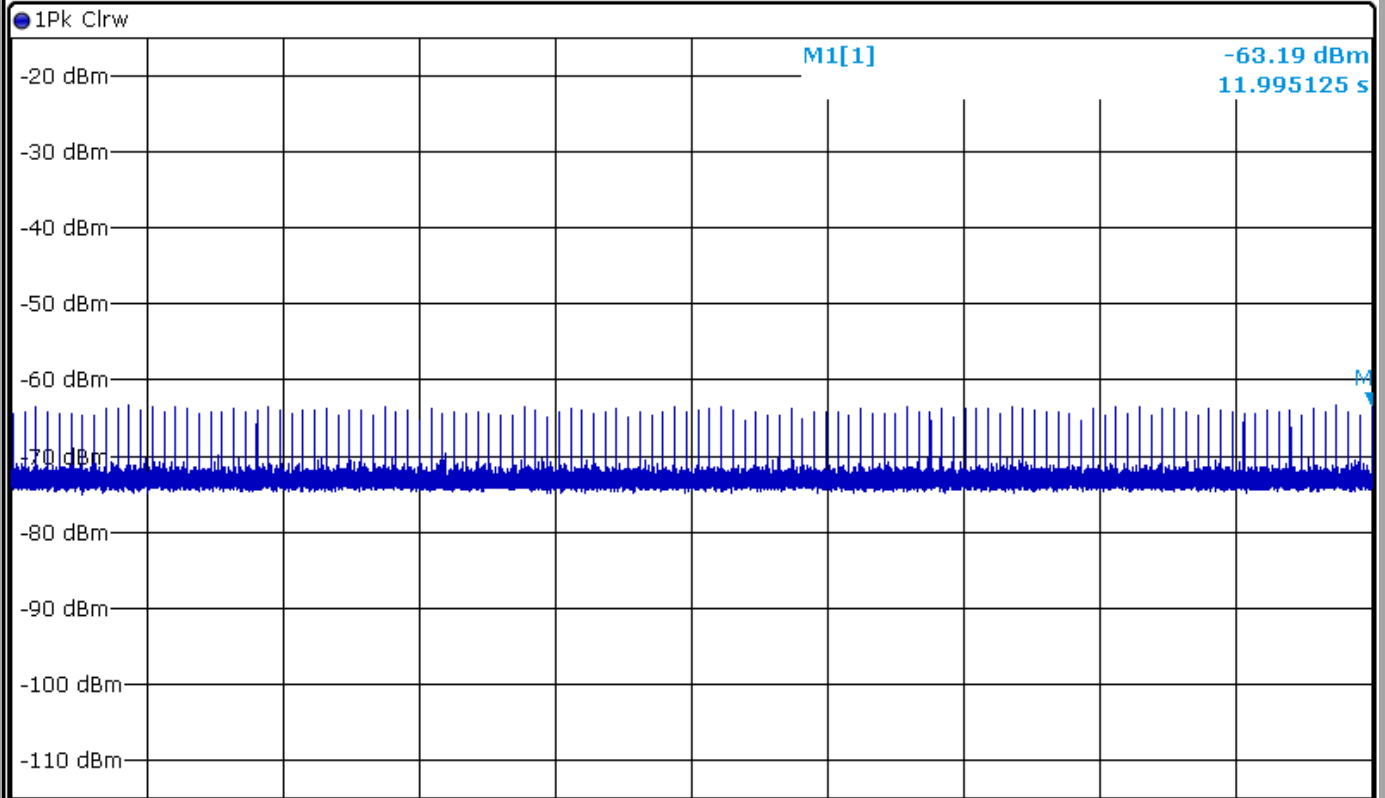
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Master Level
Channel

Spectrum



Ref Level -15.00 dBm RBW 3 MHz
Att 15 dB SWT 12 s VBW 3 MHz Input 1 AC
SGL LNA



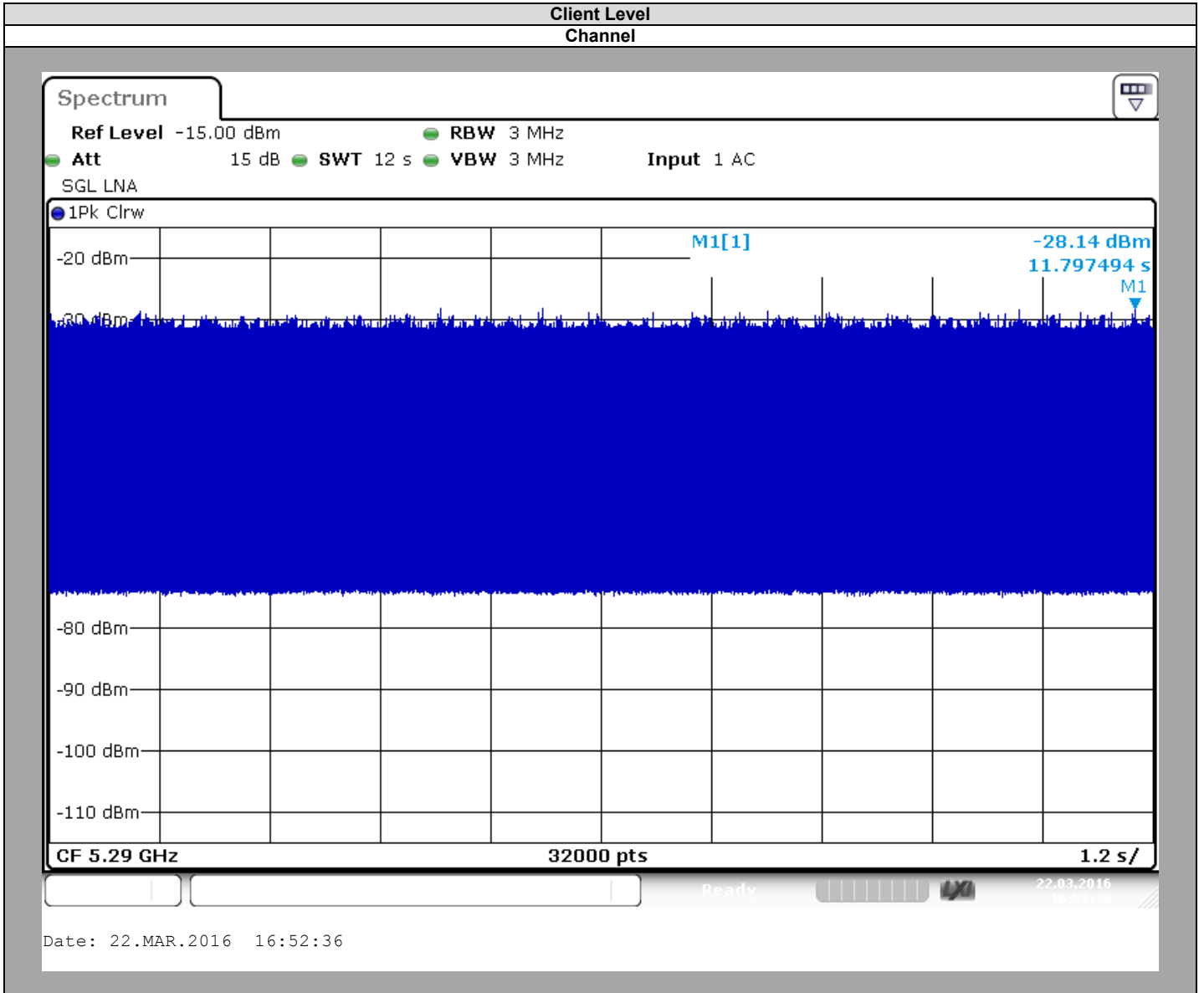
CF 5.29 GHz 32000 pts 1.2 s/

Ready 22.03.2016 16:49:40

Date: 22.MAR.2016 16:49:40

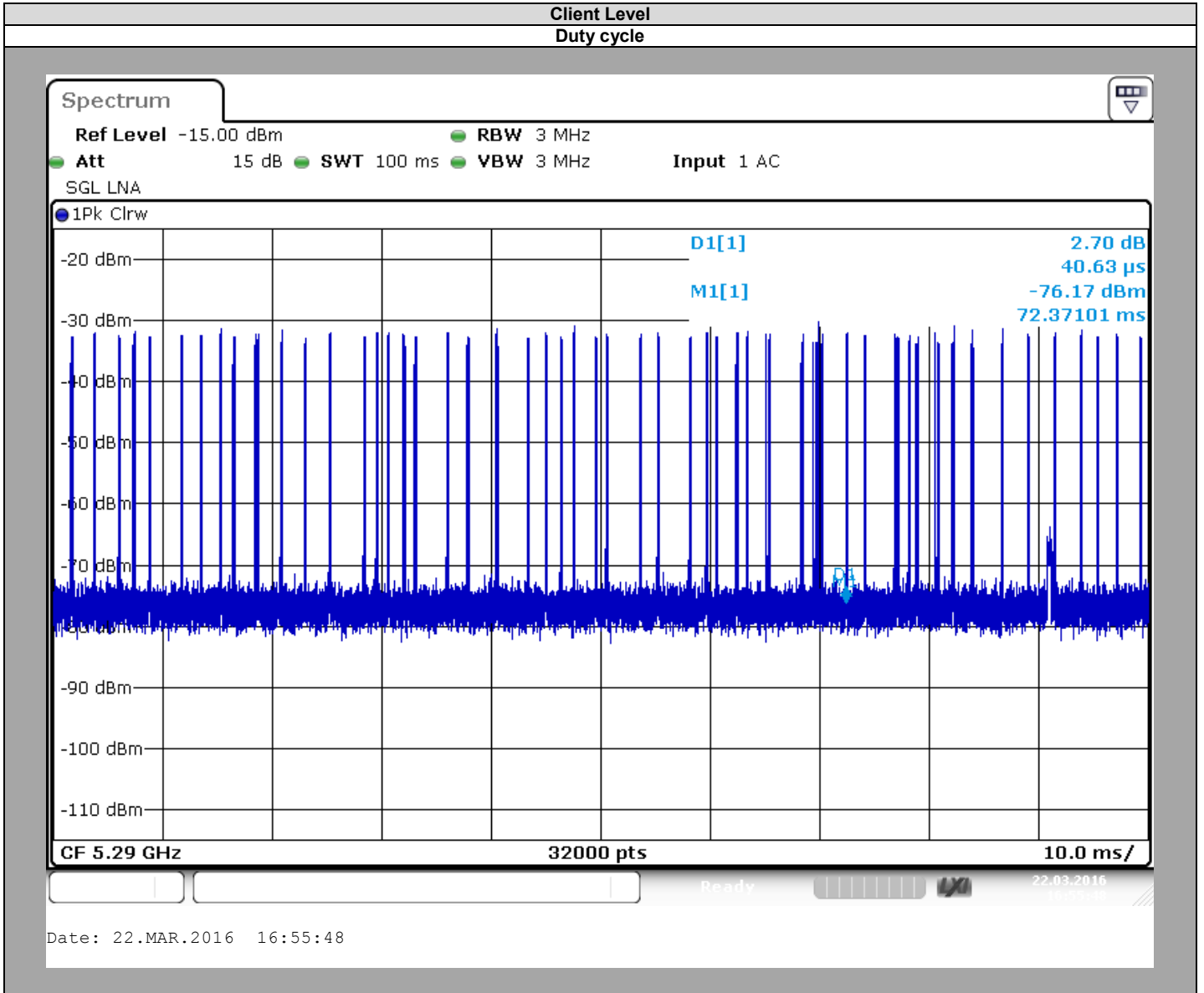


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L C I E



Temperature	Tnom
Voltage	Vnom
Channel	C1
Duty Cycle (%)	Over 17

Temperature	Tnom
Voltage	Vnom
Channel	C1
EIRP (See test report from FCC ID: RRK2012060056-1)	338,065mW
DFS Detection thresholds applied	-64dBm

4. DYNAMIC FREQUENCY SELECTION (DFS): CHANNEL SHUTDOWN

4.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : March 23, 2016
 Ambient temperature : 24 °C
 Relative humidity : 42 %

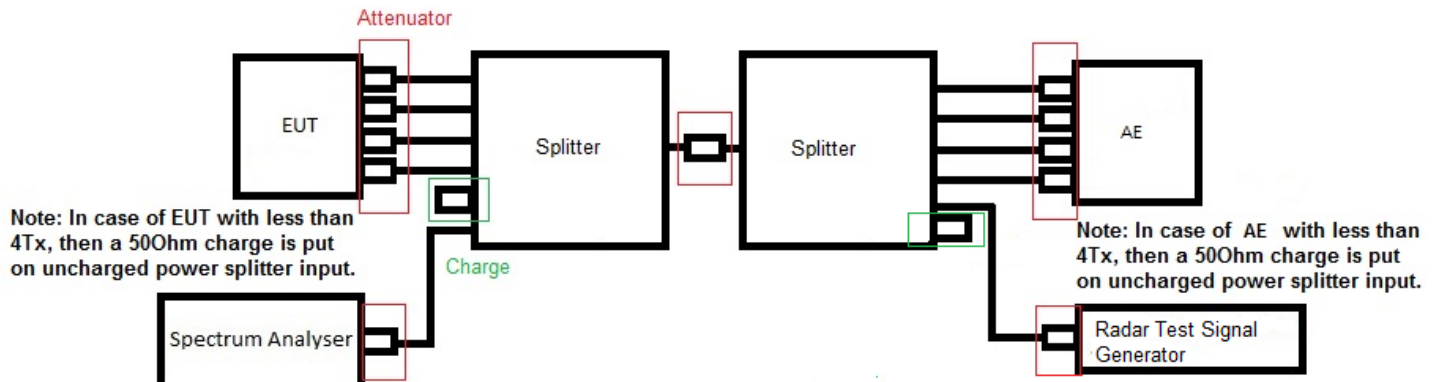
4.2. TEST SETUP

- The Equipment Under Test is:

- On a table
- In an anechoic chamber

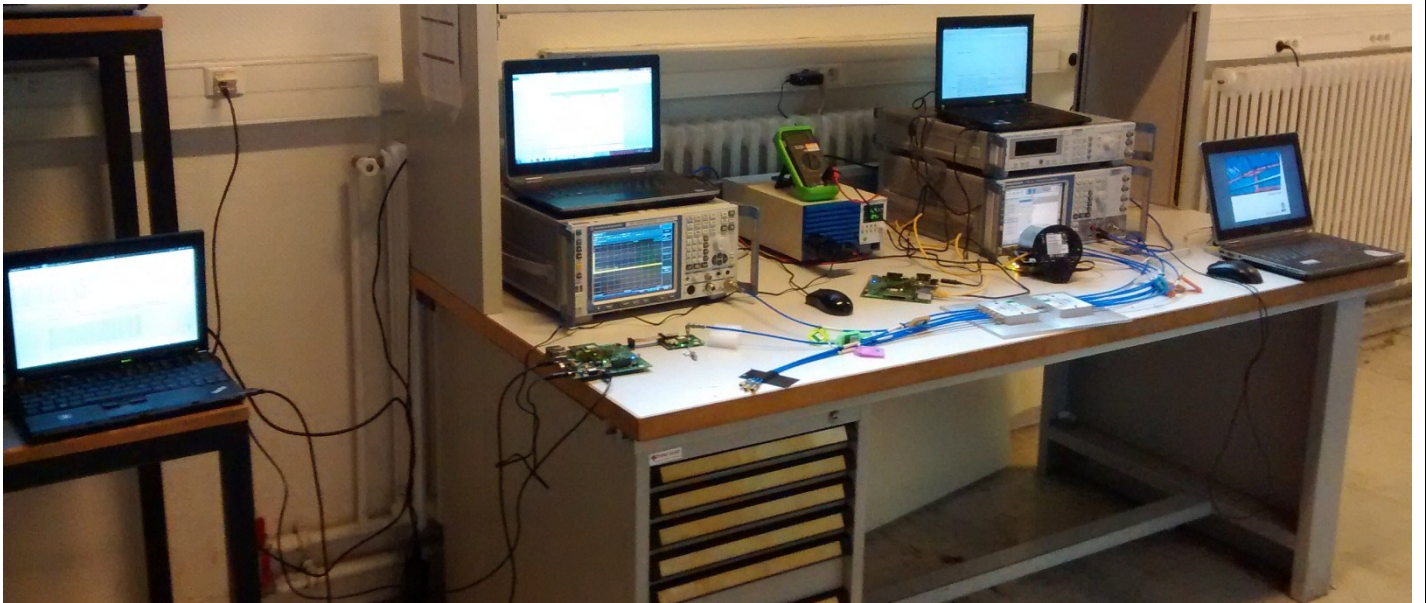
- Measurement is performed with a spectrum analyzer:

- On the EUT conducted access
- On the EUT with a test fixture





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Photograph for DFS Channel Shutdown



4.3. LIMIT

Channel Closing Transmission Time shall not exceed 1second
 Channel Move Time shall not exceed 10seconds

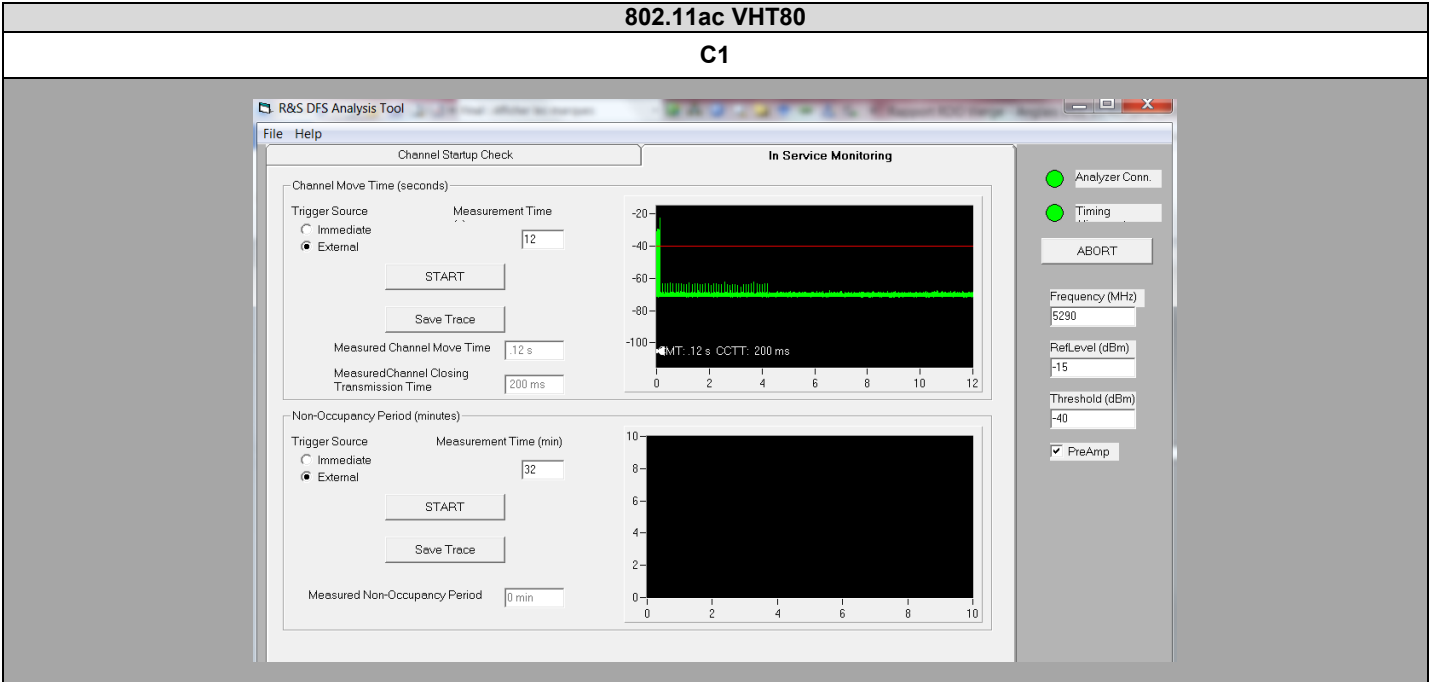
4.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	ISOTECH	IDM 91E	A1240253	2015/08	2016/08
EMI receiver/ Spectrum analyzer	ROHDE & SCHWARZ	ESR 7	A2642023	2015/03	2016/03
RF cable	Télédyné	920-0202-024	A5329663	2014/04	2016/04
RF cable	Télédyné	920-0202-024	A5329664	2014/04	2016/04
RF cable	Télédyné	920-0202-024	A5329665	2014/04	2016/04
RF cable	Télédyné	920-0202-024	A5329668	2014/04	2016/04
RF cable	Télédyné	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédyné	920-0202-024	A5329670	2014/04	2016/04
RF cable	Télédyné				
RF cable	Télédyné	920-0202-024	A5329672	2014/04	2016/04
RF cable	Télédyné	920-0202-024	A5329673	2014/04	2016/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	Verified with calibrated EMI receiver/ Spectrum analyzer before testing	
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	Verified with calibrated multimeter before testing	
Attenuator 10dB	MINI CIRCUITS	BW-S10W2+	A7122229	2014/04	2016/04
Attenuator 10dB	MINI CIRCUITS	BW-S10W2+	A7122230	2014/04	2016/04
RF cable & Attenuator 20dB	Télédyné & MINI CIRCUITS	920-0202-024 & FW-20+	A5329661	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyné & MINI CIRCUITS	920-0202-024 & FW-20+	A5329676	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyné & MINI CIRCUITS	920-0202-024 & FW-20+	A5329674	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyné & MINI CIRCUITS	920-0202-024 & FW-20+	A5329675	2014/10	2016/10
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122238	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122239	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122240	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122241	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122242	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122243	2014/04	2016/04
Power splitter	Mini-Circuits	ZN6PD-63W-S+	A7132040	2014/04	2016/04
Power splitter	Mini-Circuits	ZN6PD-63W-S+	A7132041	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152075	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152076	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152077	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152078	2014/04	2016/04

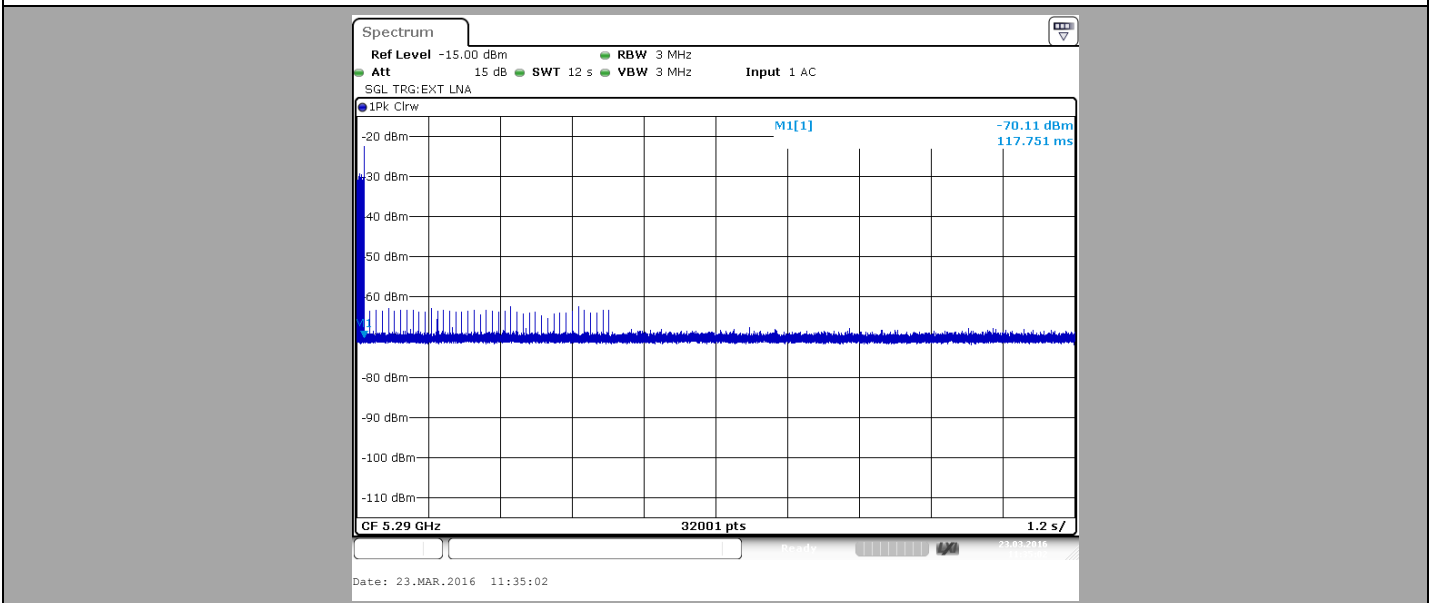
4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:

4.6. RESULTS



C1



Temperature	Tnom
Voltage	Vnom
Channel	C1
Channel Closing Transmission Time (s)	Less than 0,2
Channel Move Time (s)	0,12



4.7. CONCLUSION

Channel Shutdown measurement performed on the sample of the product **u-blox EMMY-W163-A**, SN: **632000011270100**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.407 & RSS 247 ISSUE 1 limits.

5. DYNAMIC FREQUENCY SELECTION (DFS): NON-OCCUPANCY PERIOD

5.1. TEST CONDITIONS

Test performed by : Stéphane PHOUDIAH
 Date of test : March 23, 2016
 Ambient temperature : 24 °C
 Relative humidity : 42 %

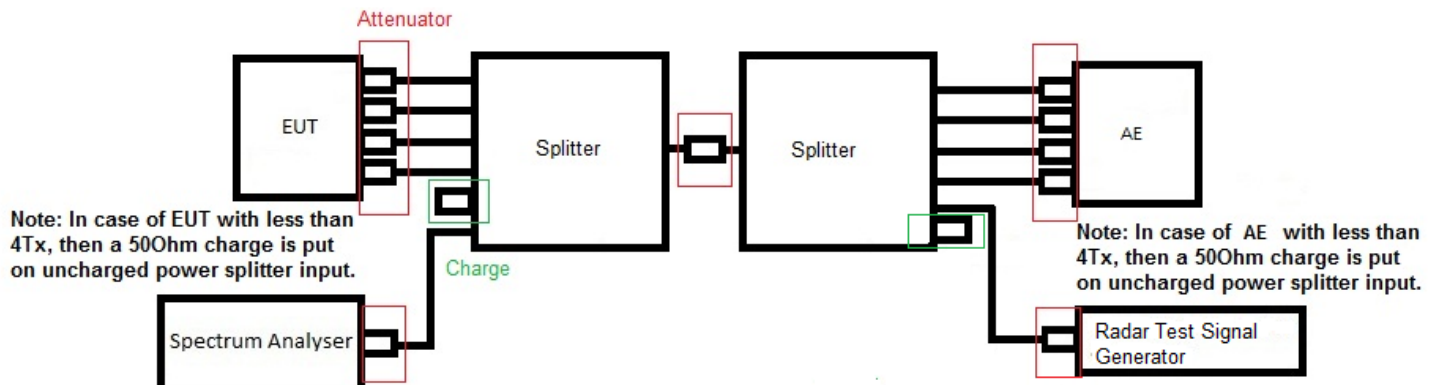
5.2. TEST SETUP

- The Equipment Under Test is:

- On a table
- In an anechoic chamber

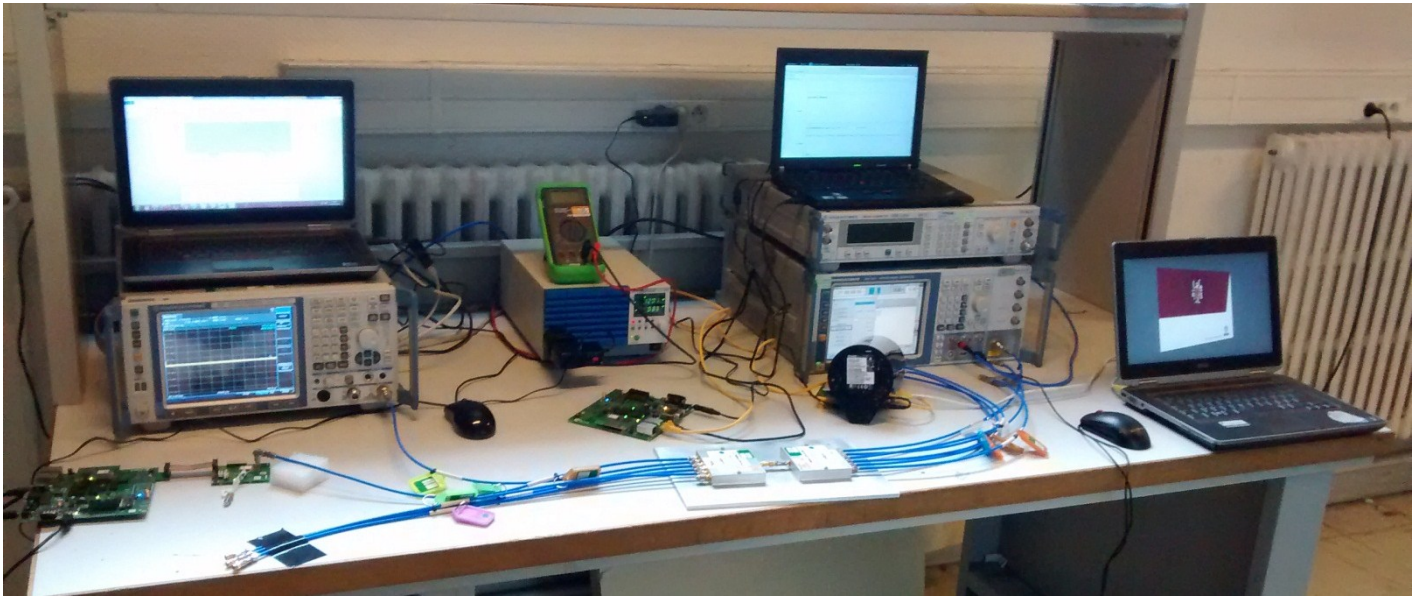
- Measurement is performed with a spectrum analyzer:

- On the EUT conducted access
- On the EUT with a test fixture





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Photograph for DFS Non-Occupancy Period

5.3. LIMIT

Non-Occupancy Period shall exceed 1800 seconds



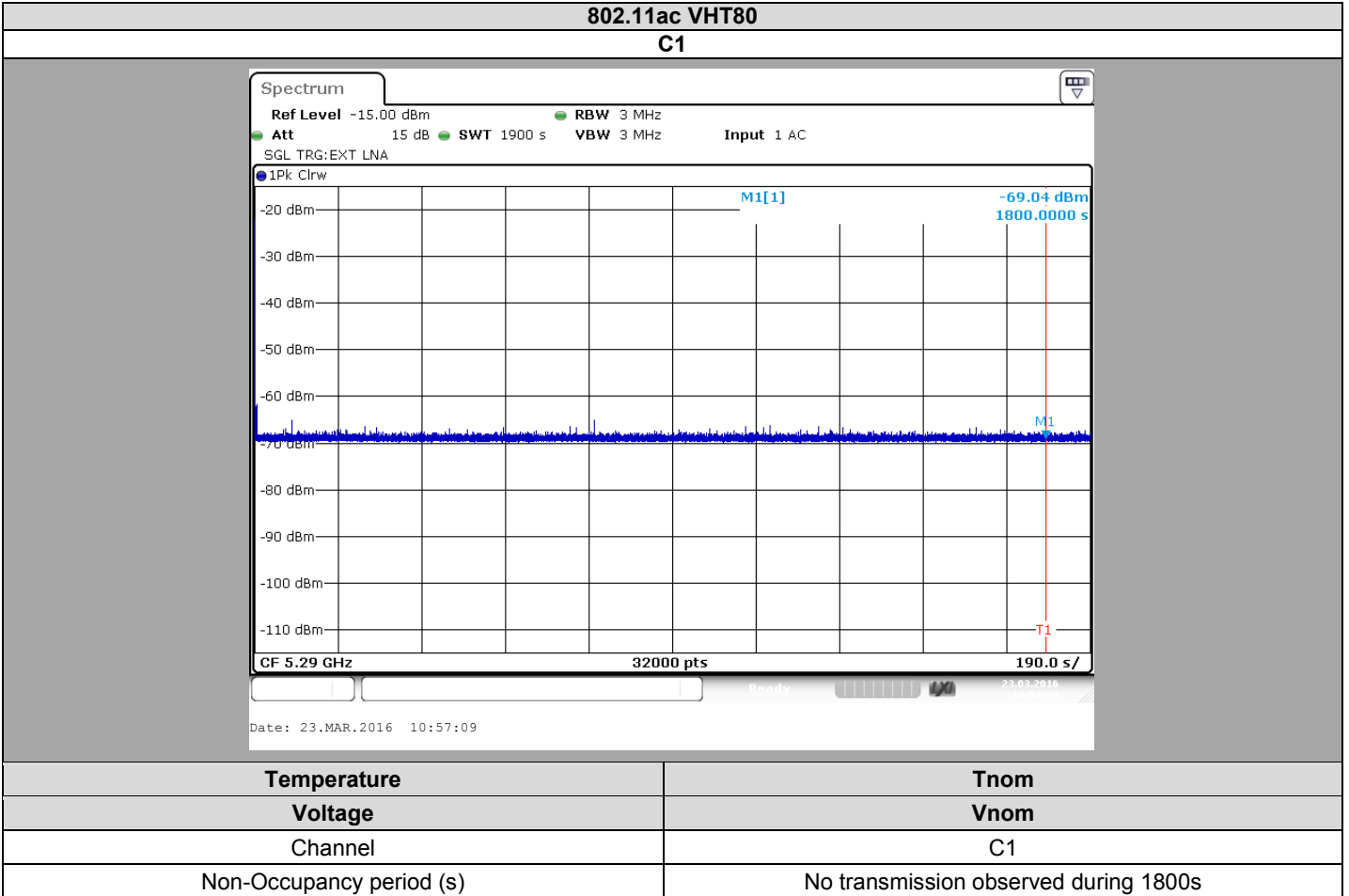
5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Multi-meter	ISOTECH	IDM 91E	A1240253	2015/08	2016/08
EMI receiver/ Spectrum analyzer	ROHDE & SCHWARZ	ESR 7	A2642023	2015/03	2016/03
RF cable	Télédyne	920-0202-024	A5329663	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329664	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329665	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329668	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329669	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329670	2014/04	2016/04
RF cable	Télédyne				
RF cable	Télédyne	920-0202-024	A5329672	2014/04	2016/04
RF cable	Télédyne	920-0202-024	A5329673	2014/04	2016/04
Vector signal generator	ROHDE & SCHWARZ	SMJ100A	A5444007	Verified with calibrated EMI receiver/ Spectrum analyzer before testing	
Programmable AC/DC power supply	KIKUSUI	PCR500M	A7040079	Verified with calibrated multimeter before testing	
Attenuator 10dB	MINI CIRCUITS	BW-S10W2+	A7122229	2014/04	2016/04
Attenuator 10dB	MINI CIRCUITS	BW-S10W2+	A7122230	2014/04	2016/04
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329661	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329676	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329674	2014/10	2016/10
RF cable & Attenuator 20dB	Télédyne & MINI CIRCUITS	920-0202-024 & FW-20+	A5329675	2014/10	2016/10
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122238	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122239	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122240	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122241	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122242	2014/04	2016/04
Attenuator 3dB	MINI CIRCUITS	BW-S3W2+	A7122243	2014/04	2016/04
Power splitter	Mini-Circuits	ZN6PD-63W-S+	A7132040	2014/04	2016/04
Power splitter	Mini-Circuits	ZN6PD-63W-S+	A7132041	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152075	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152076	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152077	2014/04	2016/04
Load 50 ohms	Fairview Microwave	ST0635F	A7152078	2014/04	2016/04

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None Divergence:

5.6. RESULTS



5.7. CONCLUSION

Non-Occupancy period measurement performed on the sample of the product **u-blox EMMY-W163-A**, SN: **63200011270100**, in configuration and description presented in this test report, show levels **compliant** to the 47 CFR PART 15.407 & RSS 247 ISSUE 1 limits.



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6. RADAR TEST SIGNALS

TEST SIGNAL 0

Pulses per Burst	Pulse Width (μsec)	PRI (μs)
18	1	1428



7. UNCERTAINTIES CHART

47 CFR Part 15.407 & RSS 247 Kind of test	Wide uncertainty laboratory (k=2) $\pm x(\text{dB}) / (\text{Hz}) /$ ms	Uncertainty limit
RF power, conducted	$\pm 0.6 \text{ dB}$	$\pm 1.5 \text{ dB}$
RF power, radiated	$\pm 3.1 \text{ dB}$	$\pm 1.5 \text{ dB}$
Temperature	$\pm 0.5^\circ \text{C}$	$\pm 1^\circ \text{C}$

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report