



JAPAN DFS TEST REPORT

Equipment : LTE Indoor Unit
Brand Name : SoftBank
Model Name : J18W162
Applicant : Hon Lin Technology Co.,Ltd.
11F., No.32, Jihu Rd., Neihu District, Taipei City 114,
Taiwan
Manufacturer : Nanning Fu Gui Precision Industrial Co., Ltd
Factory B Foxconn Nanning Technology Industry Park
No.51,Tongle Road Nanning Guangxi 530033 China
Standard : MIC Certification Rule, Article 2 Paragraph 1 Item 19-3
MIC Certification Rule, Article 2 Paragraph 1 Item 19-3-2

The product was received on Jun. 18, 2019 , and testing was started from Jun. 25, 2019 and completed on Jul. 12, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.45 and shown compliance with the applicable MIC Ordinance Regulating Radio Equipment Article 49.20 and ARIB STD-T71 technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	NT No.368,2011	Channel Availability Check (CAC)	PASS	-
3.3	NT No.368,2011	In-service Monitoring	PASS	-
3.4	NT No.368,2011	Channel Shutdown and Non-Occupancy Period	PASS	-
RLE: Radio Law Enforcement Regulations ORE: Ordinance Regulating Radio Equipment TR: Terminal and Other Equipment Regulations NT: Notification of the Ministry of Internal Affairs and Communications				

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Wendy Pan

1 General Description

1.1 Information

1.1.1 DFS General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5250-5350	a, n (HT20), ac (VHT20)	5260-5320	52-64 [4]
5470-5725		5500-5700	100-140 [11]
5250-5350	n (HT40), ac (VHT40)	5270-5310	54-62 [2]
5470-5725		5510-5670	102-134 [5]
5250-5350	ac (VHT80)	5290	58 [1]
5470-5725		5530-5610	106-122 [2]

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.

1.1.2 Frequency Band

Frequency Band	
<input checked="" type="checkbox"/>	W53:
<input checked="" type="checkbox"/>	(20MHz) - 5260, 5280, 5300, 5320MHz
<input checked="" type="checkbox"/>	(40MHz) - 5270, 5310MHz
<input checked="" type="checkbox"/>	(80MHz) - 5290MHz
<input type="checkbox"/>	W52+W53:
<input type="checkbox"/>	(160MHz) contiguous – 5250MHz
<input checked="" type="checkbox"/>	W56:
<input checked="" type="checkbox"/>	(20MHz) - 5500, 5520, 5540, 5560, 5580, 5600, 5620, 5640, 5660, 5680, 5700MHz
<input checked="" type="checkbox"/>	(40MHz) - 5510, 5550, 5590, 5630, 5670MHz
<input checked="" type="checkbox"/>	(80MHz) - 5530, 5610MHz
<input type="checkbox"/>	(160MHz) contiguous - 5570MHz
<input type="checkbox"/>	W52+W56: (80+80 MHz) non-contiguous - 5210, 5530MHz or 5210, 5610MHz
<input type="checkbox"/>	W53+W56: (80+80 MHz) non-contiguous - 5290, 5530MHz or 5290, 5610MHz
Note: The EUT supports 802.11a/n/ac.	

1.1.3 Antenna Information

Ant.	Port		Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
	2.4GHz	5GHz					2.4GHz	5GHz
1	1	1	Foxconn	98PE7PIPF000	PIFA Antenna	I-PEX	1.10	4.78
2	-	3	Foxconn	98PE7PIPF001	PIFA Antenna	I-PEX	-	5.08
3	2	2	Foxconn	98PE8UIPF000	PIFA Antenna	I-PEX	3.35	3.93
4	-	4	Foxconn	98PE8UIPF001	PIFA Antenna	I-PEX	-	4.68

Note: The above information was declared by manufacturer.

For 2.4GHz function:

For IEEE 802.11b/g/n mode (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac mode (4TX/4RX):

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

1.2 Accessories

Accessories				
No.	Equipment Name	Brand Name	Model Name	Rating
1	Adapter	Ktec	KSA06B1200250M2-01	INPUT: AC100V, 50/60Hz, 0.7A OUTPUT: DC12V, 2.5A
2	Adapter	DVE	DSA-30PFM-12 2 120250	INPUT: AC100V, 50/60Hz, 0.8A OUTPUT: DC12V, 2.5A

1.3 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A
B	Notebook	DELL	E4300	N/A
Q	WLAN Dongle	Abocom	AU7520	2AA9A-AU7520

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ MIC Ordinance Regulating Radio Equipment Article 49.20
- ♦ MIC Notice No.88 Appendix No.45

1.5 Testing Location Information

Testing Location				
<input type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973		
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085		
Test Condition		Test Site No.	Test Engineer	Test Environment
DFS Site		DF01-CB	Kevin Huang	22~23°C / 47~54%
		Test Date		
		Jun. 25, 2019 ~ Jul. 12, 2019		

2 Test Configuration of EUT

2.1 EUT Information

EUT Information				
Operating Mode	<input checked="" type="checkbox"/>	Master		
	<input type="checkbox"/>	Slave with radar detection		
	<input type="checkbox"/>	Slave without radar detection		
Software / Firmware Version	0.0.5_20190612			
Communication Mode	<input checked="" type="checkbox"/>	IP Based (Load Based)	<input type="checkbox"/>	Frame Based
TPC Function	<input checked="" type="checkbox"/>	With TPC	<input type="checkbox"/>	Without TPC

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration		
Frequency Range (MHz)	IEEE Std. 802.11	Test Channel Freq. (MHz)
5250-5350MHz	ac (VHT20)	5300
5470-5725MHz	ac (VHT20)	5500
5250-5350MHz	ac (VHT40)	5310
5470-5725MHz	ac (VHT40)	5510
5250-5350MHz	ac (VHT80)	5290
5470-5725MHz	ac (VHT80)	5530

2.3 The Worst Case Measurement Configuration

Tests Item	Dynamic Frequency Selection (DFS)
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11ac (VHT20), 11ac (VHT40), 11ac (VHT80)
<input checked="" type="checkbox"/>	For conducted tests, antenna ports are used for the tests and Master lowest antenna gain that was used to set the DFS Detection Threshold level during calibration of the test setup.
<input type="checkbox"/>	For radiated tests, the DFS test should be performed with lowest antenna gain (regardless of antenna type).
Modulation modes consist of below configuration: 11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac	

3 Dynamic Frequency Selection (DFS) Test Result

3.1 General DFS Information

3.1.1 DFS Parameters

DFS requirement values	
Parameter	Value
Channel Availability Check Time	60 sec
Channel Move Time	10 sec
Channel Closing Transmission Time	260 ms
Non-occupancy period	Minimum 30 minutes

W53: Parameters DFS radar test signal				
Test Signal (#)	Pulse width [μs]	Pulse repetition frequency PRF [Hz]	Pulses per burst [PPB]	Detection Probability (%)
1	1	700	18	≥60
2	2.5	260	18	≥60

W56: Un-modulation Parameters DFS radar test signal				
Test Signal (#)	Pulse width [μs]	Pulse repetition frequency PRF [Hz]	Pulses per burst [PPB]	Detection Probability (%)
1	0.5	720	18	≥60
2	1.0	700	18	≥60
3	2.0	250	18	≥60
4	1~5 (step 1)	200-500 (step 1)	23~29	≥60
5	6~10 (step 1)	2000-5000 (step 1)	16~18	≥60
6	11~20 (step 1)	2000-5000 (step 1)	12~16	≥60
Aggregate (Radar Types 1-6)				≥80

W56: Chirp Modulation (5~20MHz) Parameters DFS radar test signal					
Test Signal (#)	Pulse width [μs]	Pulse repetition frequency PRF [Hz]	Number of Pulses per Burst	Number of Bursts	Detection Probability (%)
7	50-100 (step 1)	500-1000 (step 1)	1-3	8-20	≥80

W56: 5250-5724 MHz Frequency Hopping Modulation Parameters DFS radar test signal					
Test Signal (#)	Pulse width [μs]	Pulse repetition frequency PRF [Hz]	Number of Pulses per Burst	Hopping Length (ms)	Detection Probability (%)
8	1	3000	9 (3ms)	300	≥70

3.1.2 DFS Threshold Level

DFS Threshold Level	
DFS Threshold level: -64 dBm	<input checked="" type="checkbox"/> at the antenna connector
	<input type="checkbox"/> in front of the antenna
Note 1: The DFS Detection Threshold Level is chosen the worse Interference Detection Threshold level (-64dBm) as the test parameter. Note 2: maximum EIRP < 200mW (23dBm). DFS Detection Threshold Level is (-62dBm) + G_{ANT} maximum EIRP \geq 200mW (23dBm). DFS Detection Threshold Level is (-64dBm) + G_{ANT}	

3.1.3 User Access Restrictions

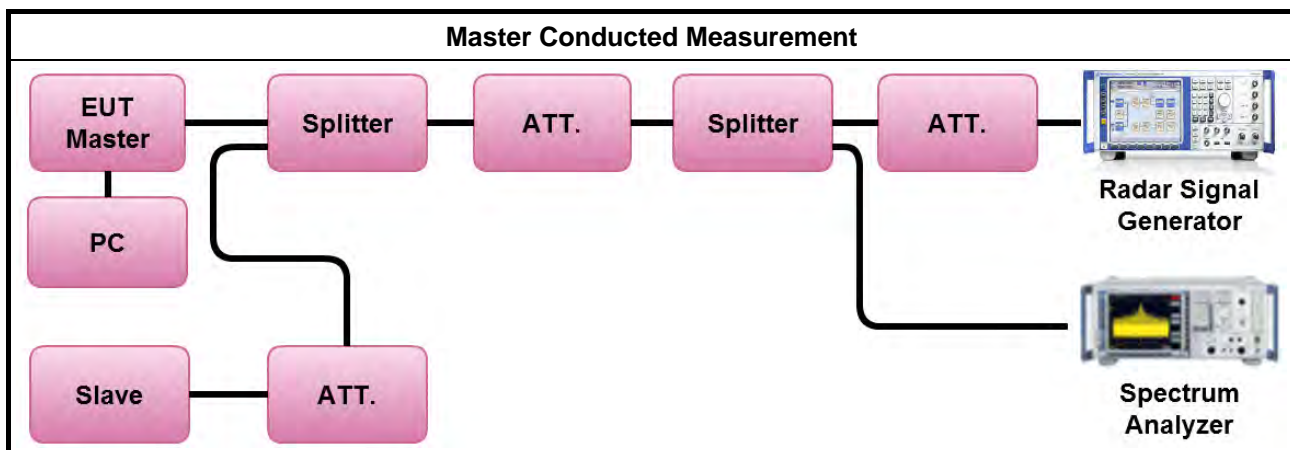
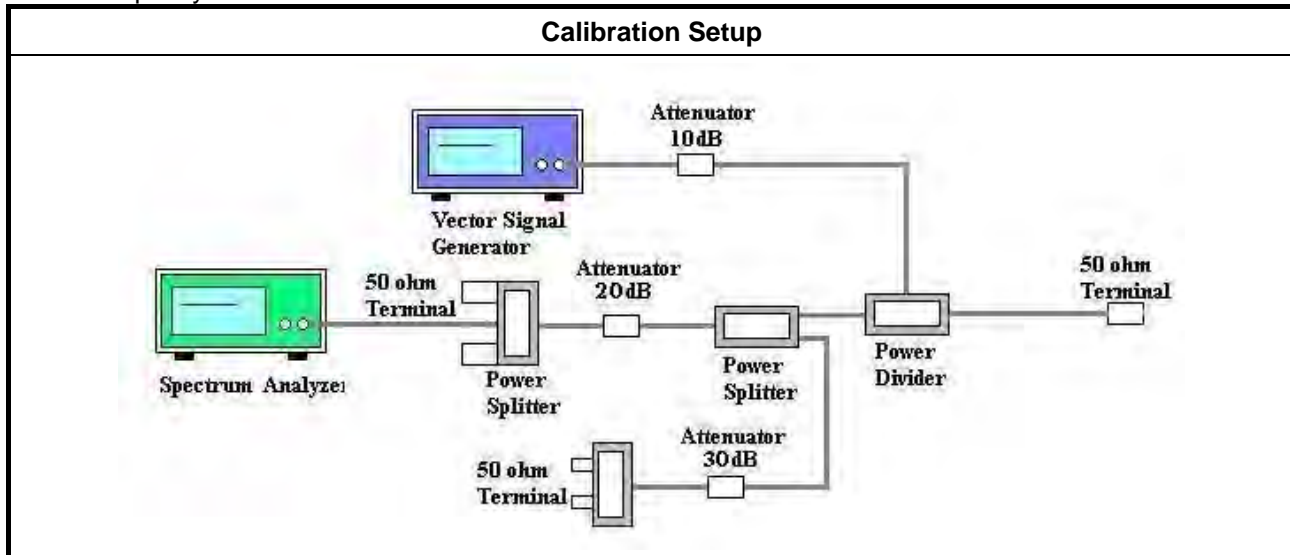
User Access Restrictions
<input checked="" type="checkbox"/> DFS controls (hardware or software) related to radar detection are NOT accessible to the user

3.1.4 Channel Loading/Data Streaming

<input checked="" type="checkbox"/> Test transmission sequence is from the Master to the Slave.
<input checked="" type="checkbox"/> For W53 band (5250-5350 MHz) Monitoring of operating channel with about 50% loading over maximum signal transmission speed.
<input checked="" type="checkbox"/> For W56 band (5470-5725 MHz) Monitoring of operating channel with about 17% loading over maximum signal transmission speed.
<input checked="" type="checkbox"/> No transmissions on channels being checked during a Channel Availability Check and Confirming Available Channels.

3.1.5 Test Setup and Calibration Setup

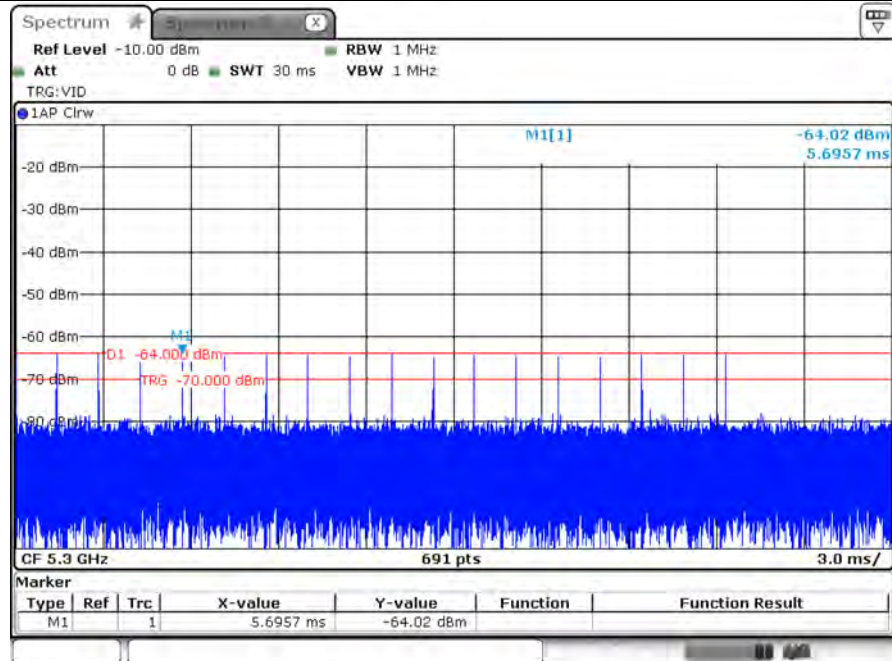
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.



3.1.6 Radar Waveform calibration Plot

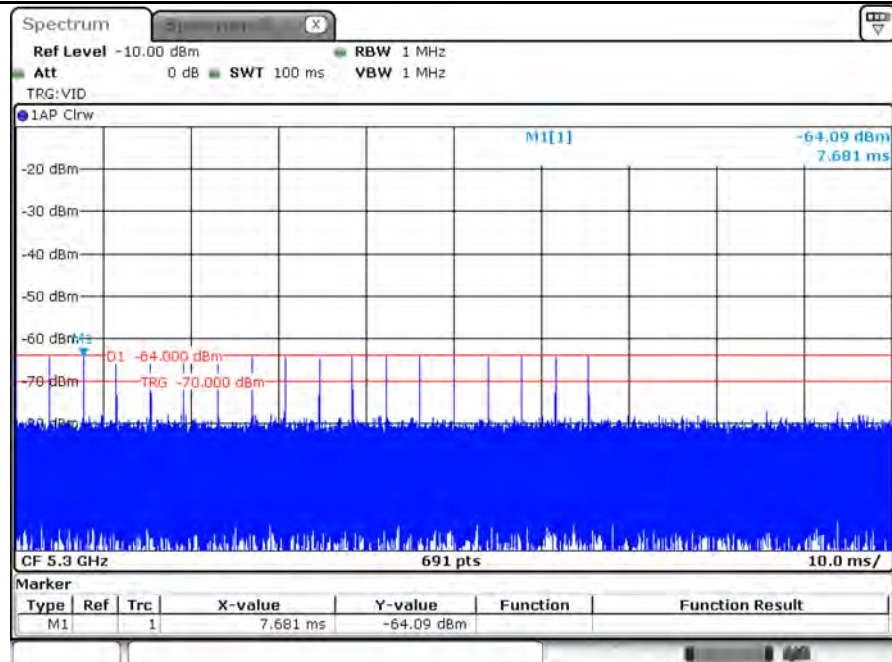
W53 band (5250-5350 MHz)

Radar #1 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 2.JUL.2019 05:05:07

Radar #2 DFS detection threshold level and the burst of pulses on the Channel frequency

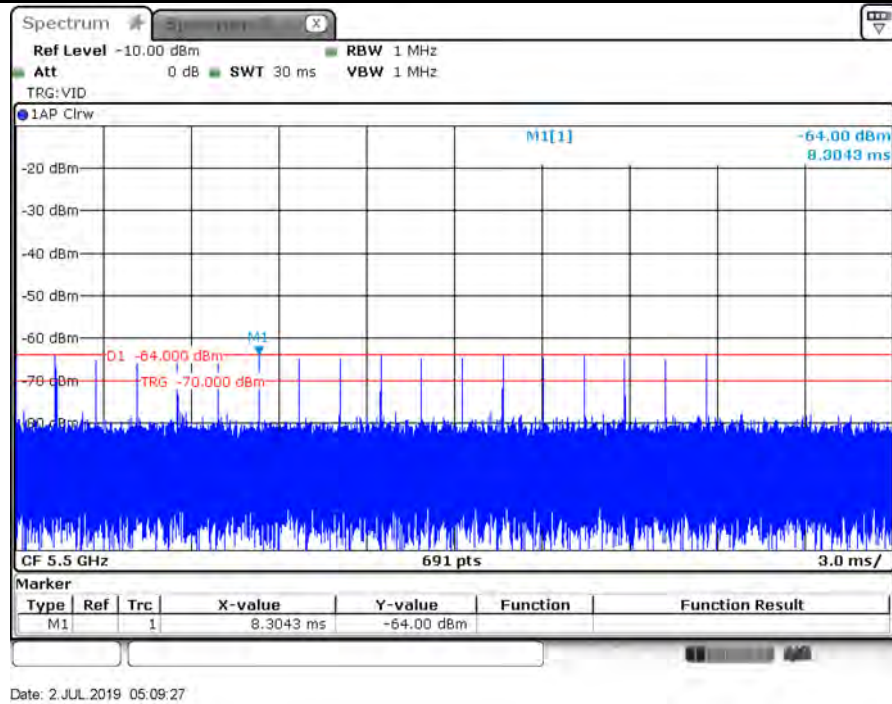


Date: 2.JUL.2019 05:07:23

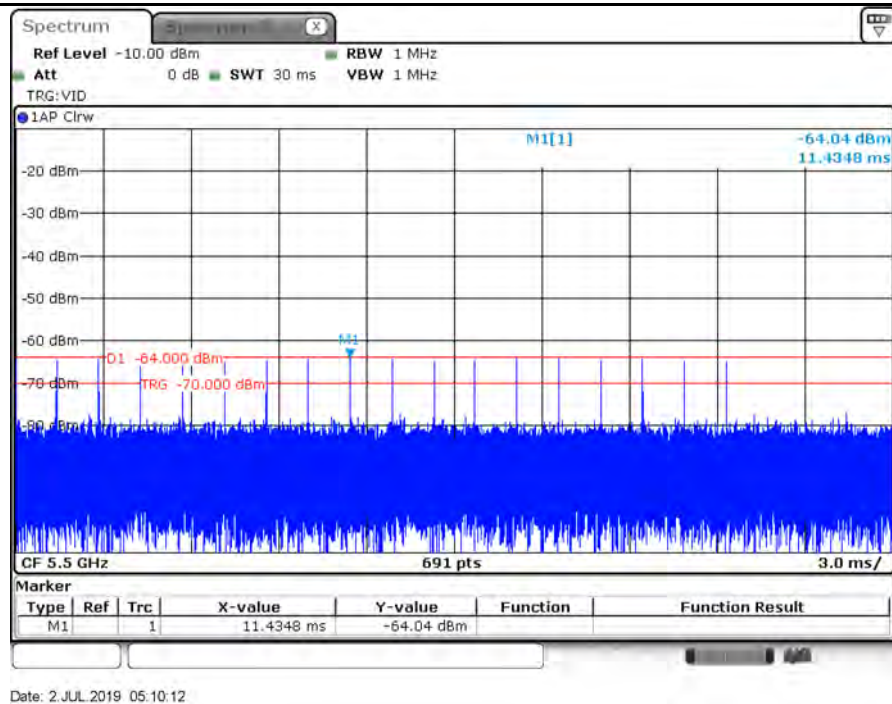


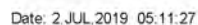
W56 band (5470-5725 MHz)

Radar #1 DFS detection threshold level and the burst of pulses on the Channel frequency

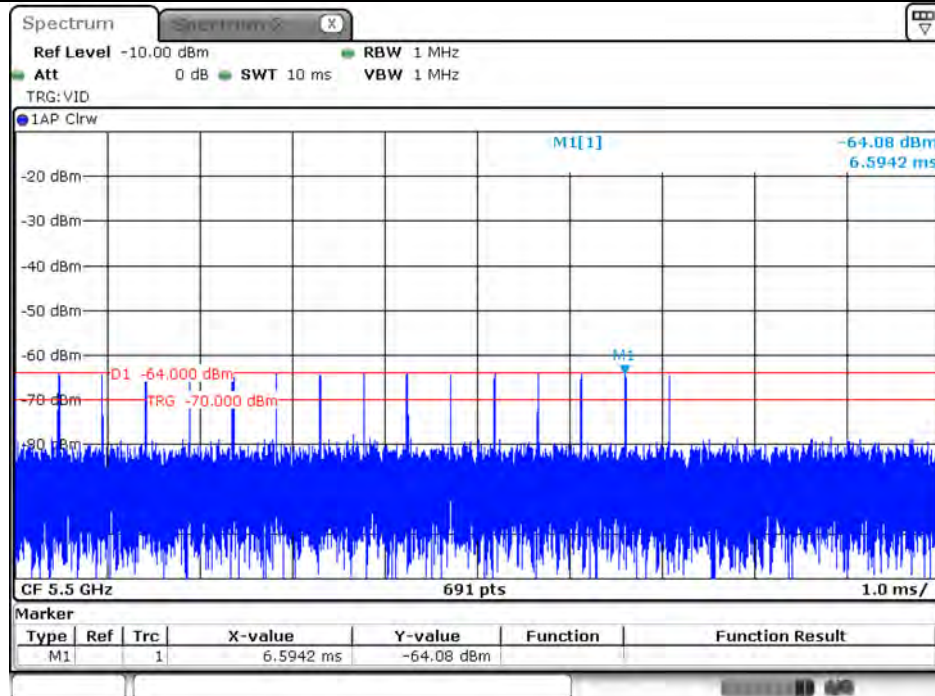


Radar #2 DFS detection threshold level and the burst of pulses on the Channel frequency

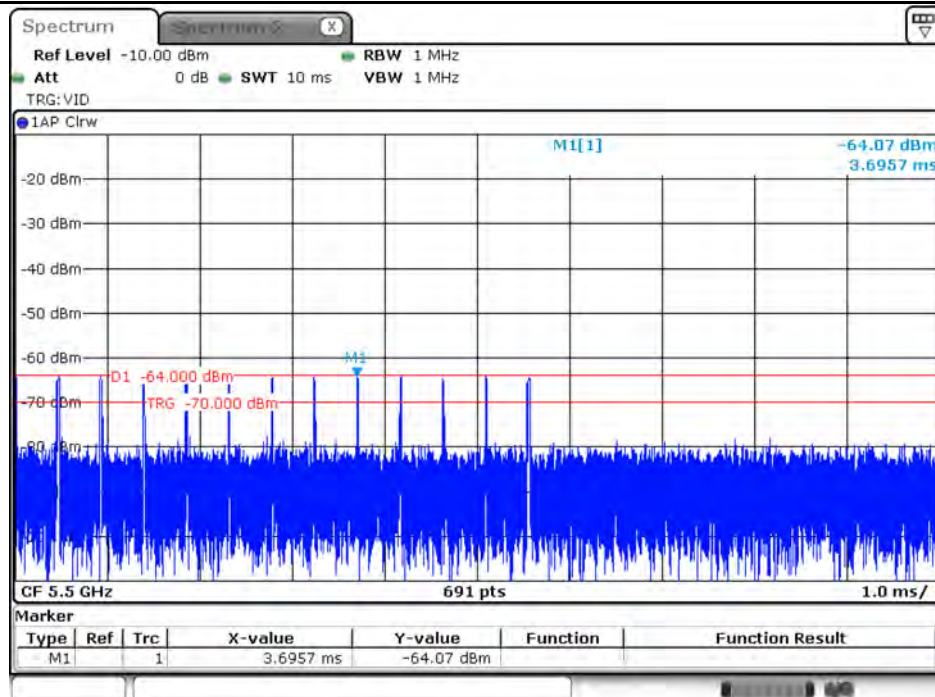




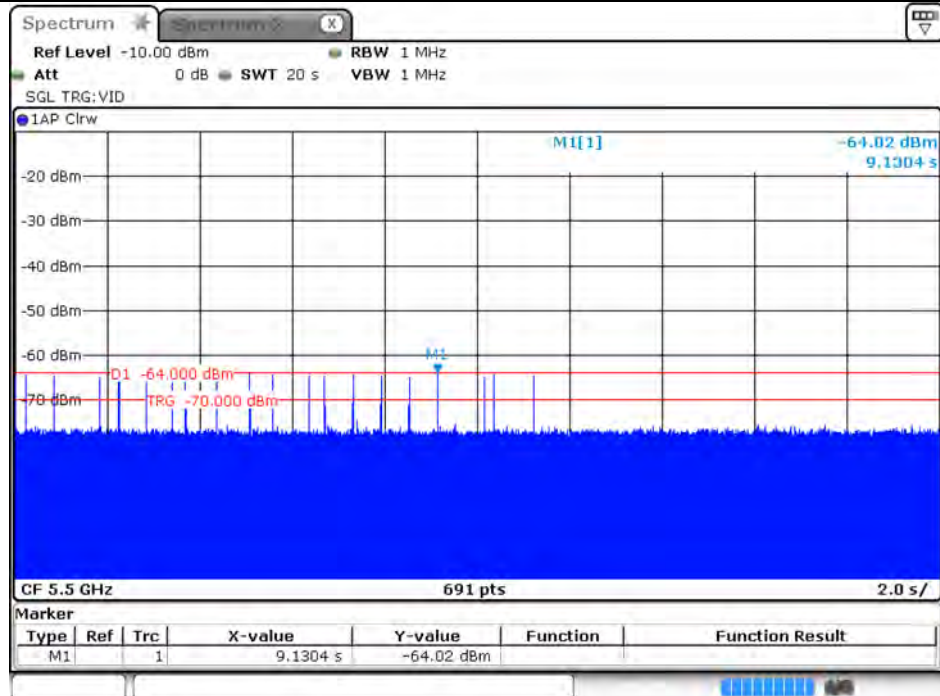
Date: 2 JUL 2019 05:12:23

Radar #5 DFS detection threshold level and the burst of pulses on the Channel frequency


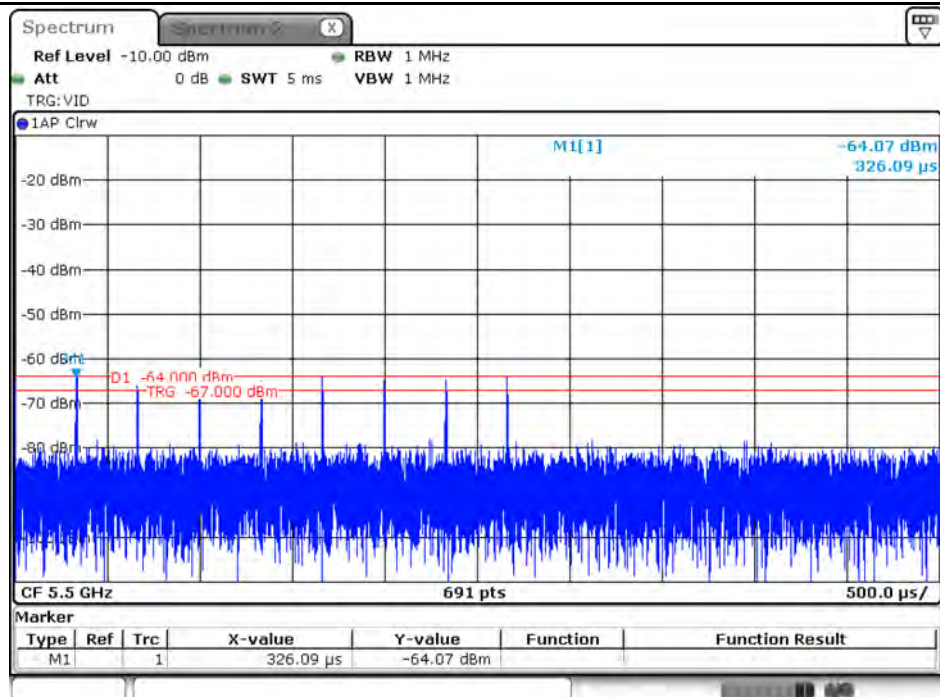
Date: 2 JUL 2019 05:13:48

Radar #6 DFS detection threshold level and the burst of pulses on the Channel frequency


Date: 2 JUL 2019 05:14:41

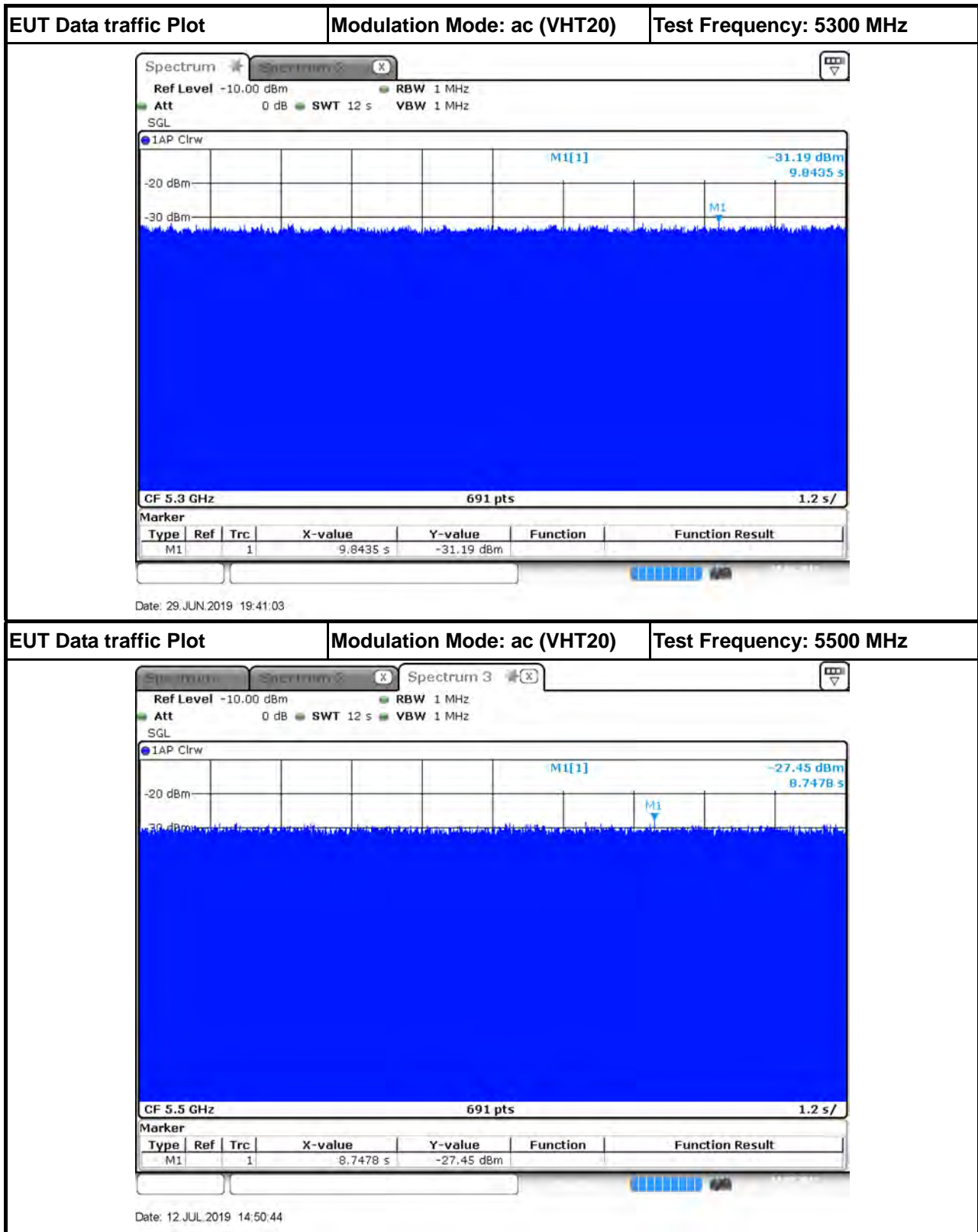
Radar #7 DFS detection threshold level and the burst of pulses on the Channel frequency


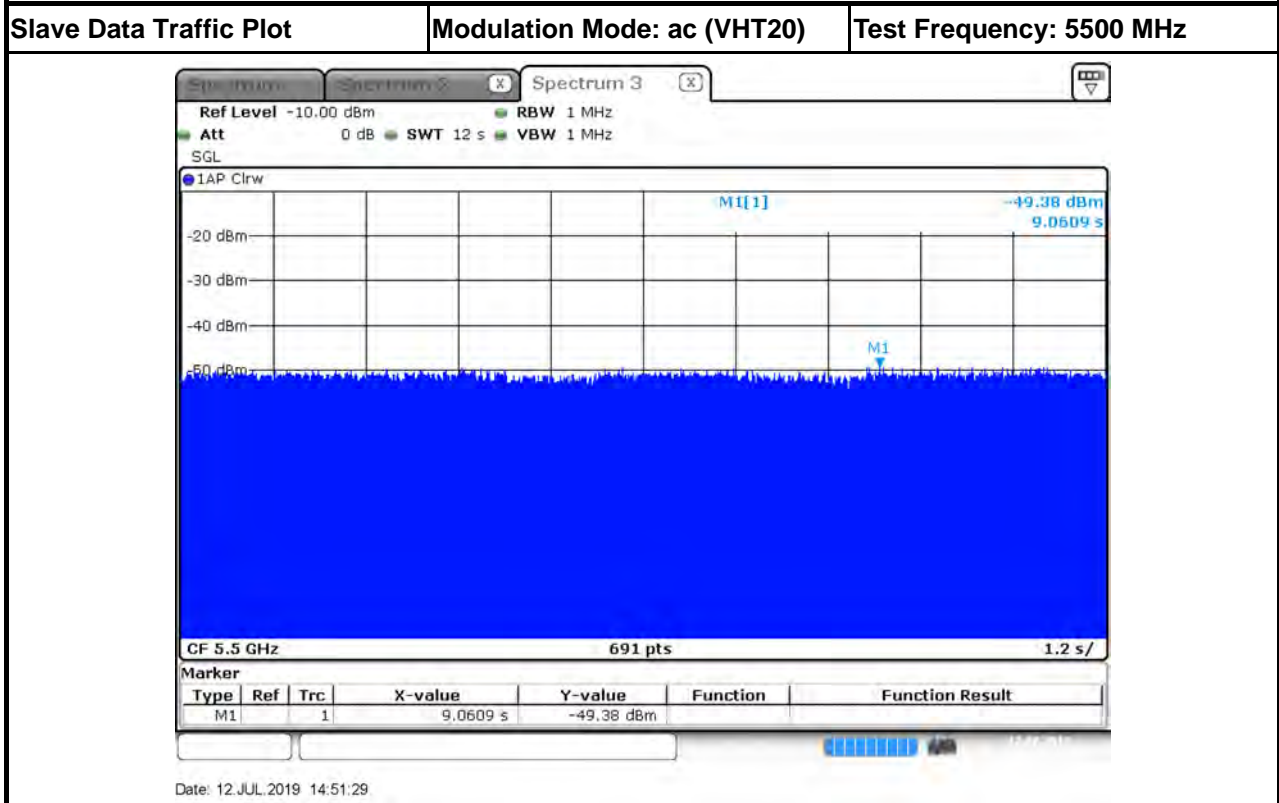
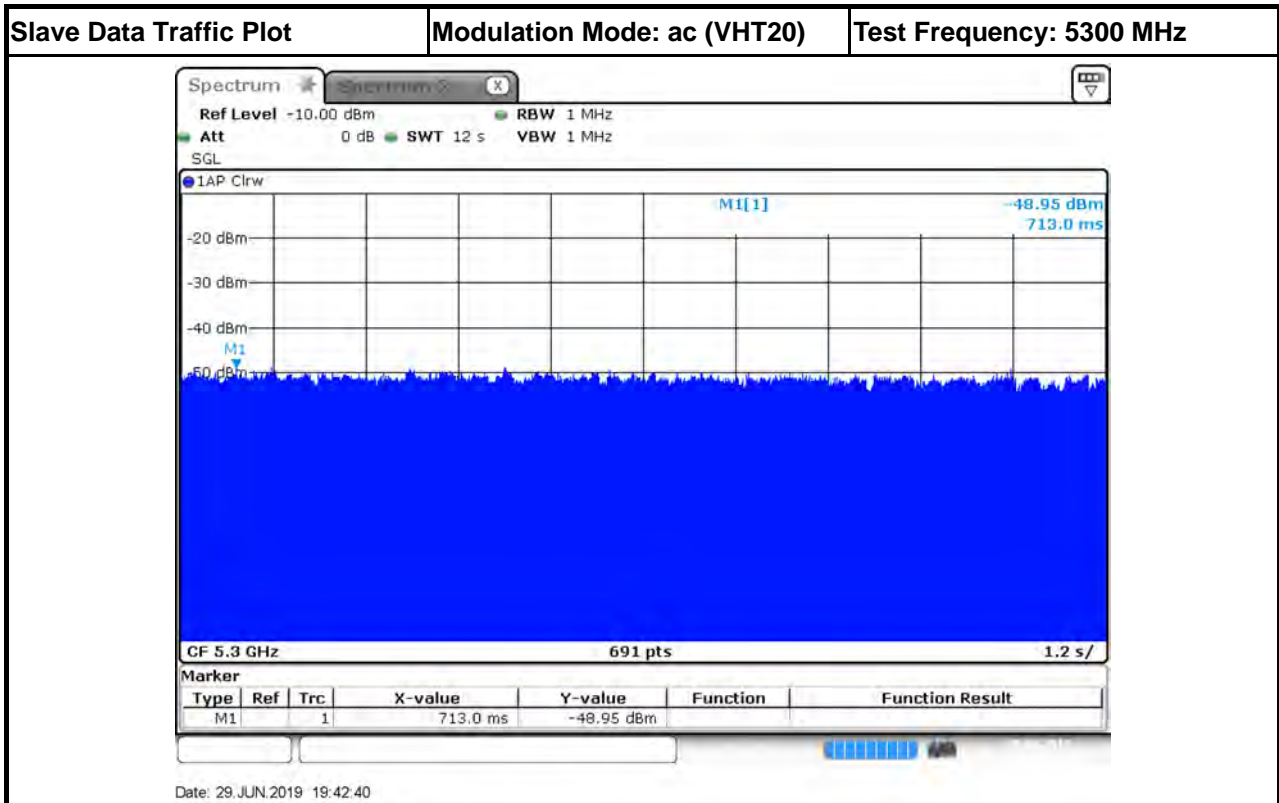
Date: 2.JUL.2019 05:23:00

Radar #8 DFS detection threshold level and a single hop (9 pulses) on the Channel frequency within UNII detection bandwidth.


Date: 2.JUL.2019 05:51:18

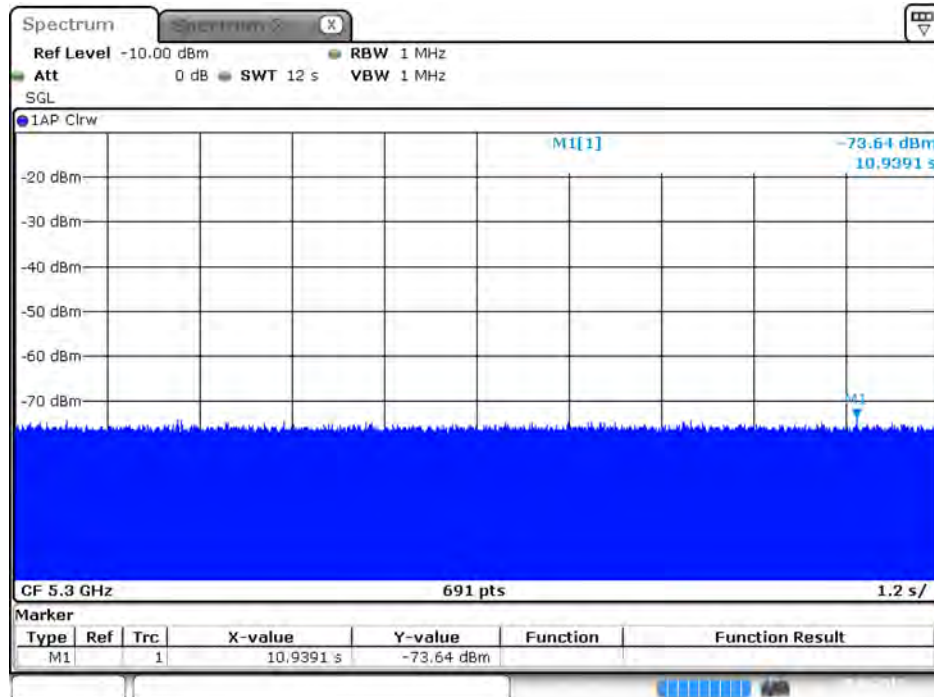
3.1.7 Data traffic Plot





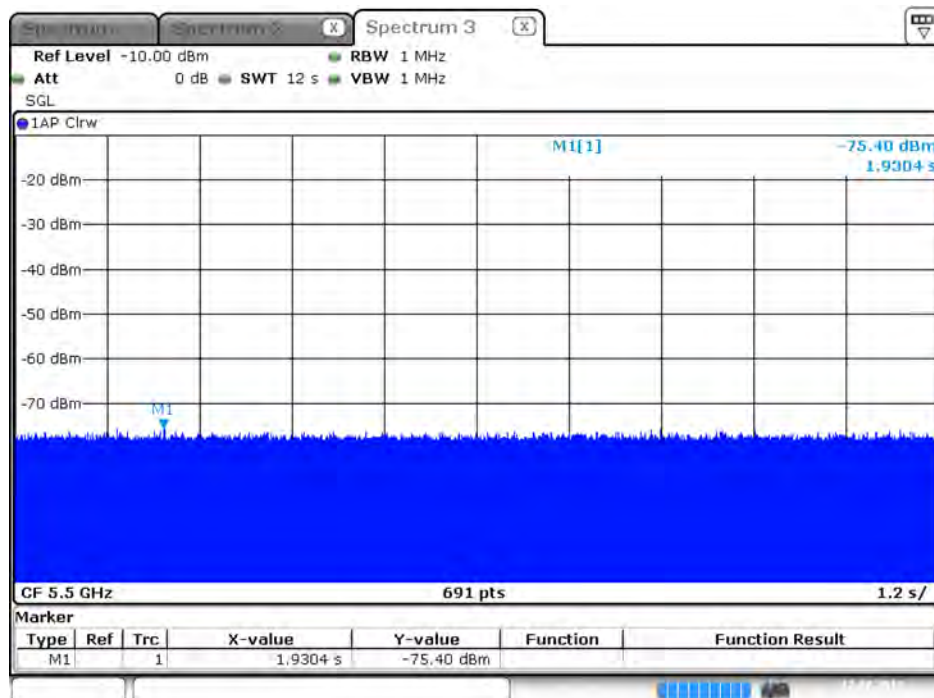


Without Data Traffic Plot Modulation Mode: ac (VHT20) Test Frequency: 5300 MHz



Date: 29 JUN 2019 19:43:09

Without Data Traffic Plot Modulation Mode: ac (VHT20) Test Frequency: 5500 MHz



Date: 12 JUL 2019 14:48:56

3.2 Channel Availability Check (CAC)

3.2.1 Channel Availability Check Limit

Channel Availability Check Limit	
<input checked="" type="checkbox"/>	The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute (60 sec) on the intended operating frequency.

3.2.2 Measuring Instruments

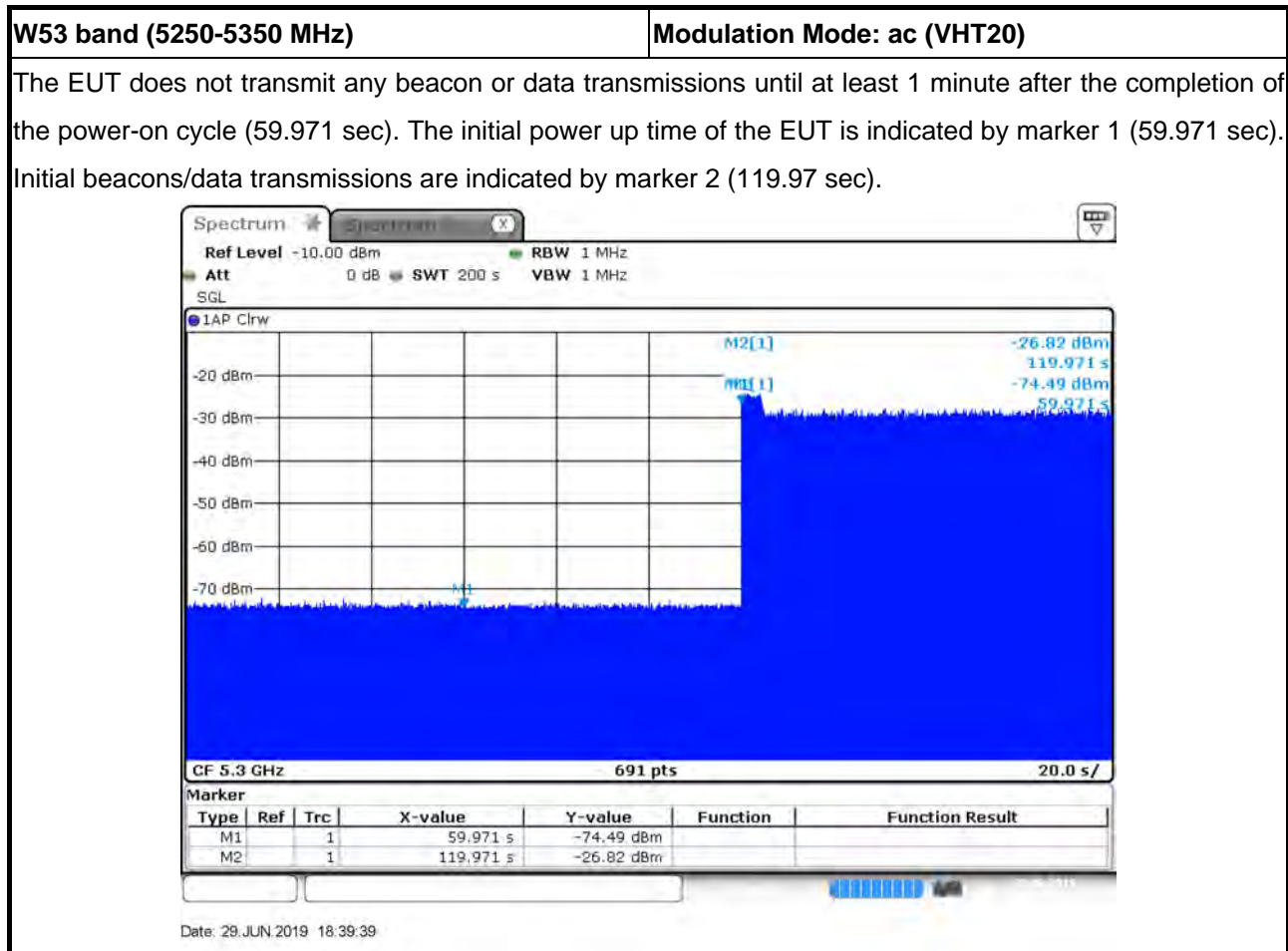
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method for W53	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/26.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/26.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/26.4
Presentation of Results	MIC Notice No.88 Appendix No.45, clause 13.5/26.5
Other Conditions	MIC Notice No.88 Appendix No.45, clause 13.6/26.6

Test Method for W56	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/27.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/27.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/27.4
Presentation of Results	MIC Notice No.88 Appendix No.45, clause 13.5/27.5
Other Conditions	MIC Notice No.88 Appendix No.45, clause 13.6/27.6

3.2.4 Radar Detection Threshold (Initial Channel Availability Check) Result

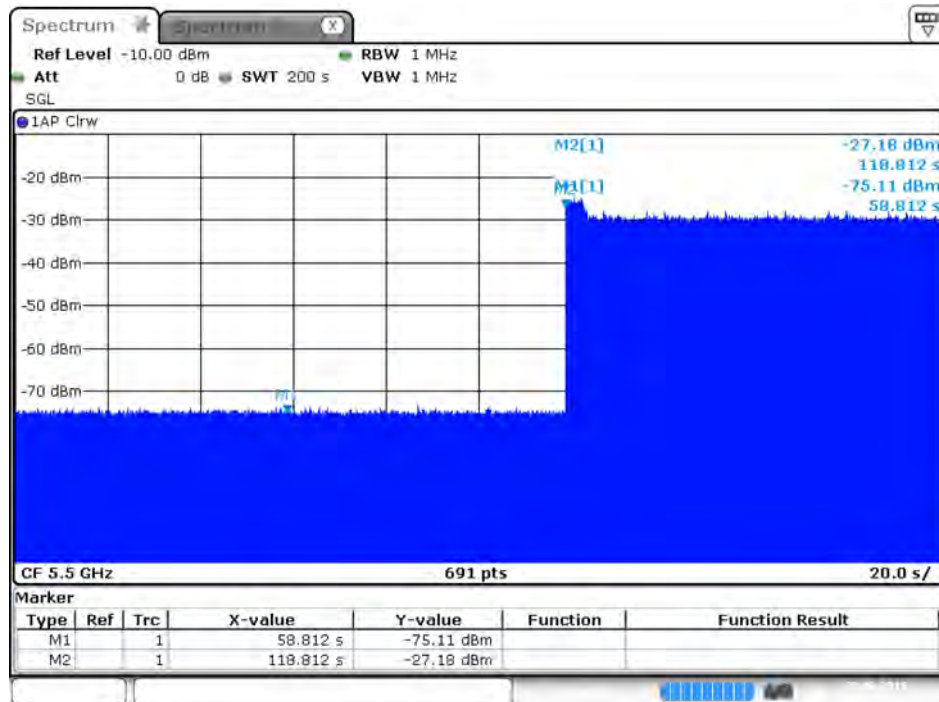




W56 band (5470-5725 MHz)

Modulation Mode: ac (VHT20)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.812 sec). The initial power up time of the EUT is indicated by marker 1 (58.812 sec). Initial beacons/data transmissions are indicated by marker 2 (118.812 sec).



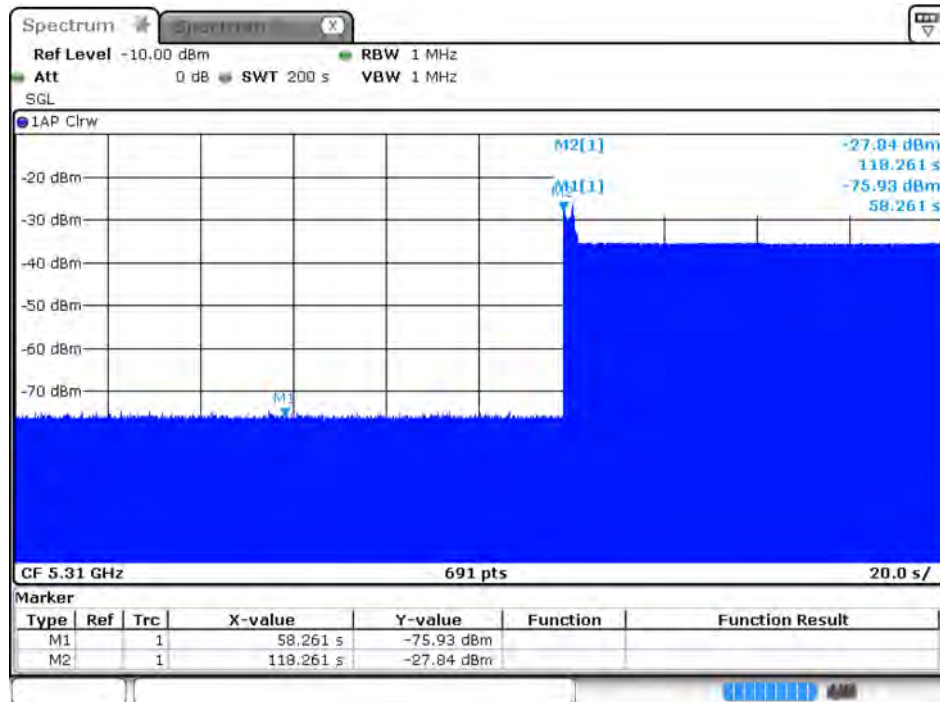
Date: 29 JUN 2019 19:57:31



W53 band (5250-5350 MHz)

Modulation Mode: ac (VHT40)

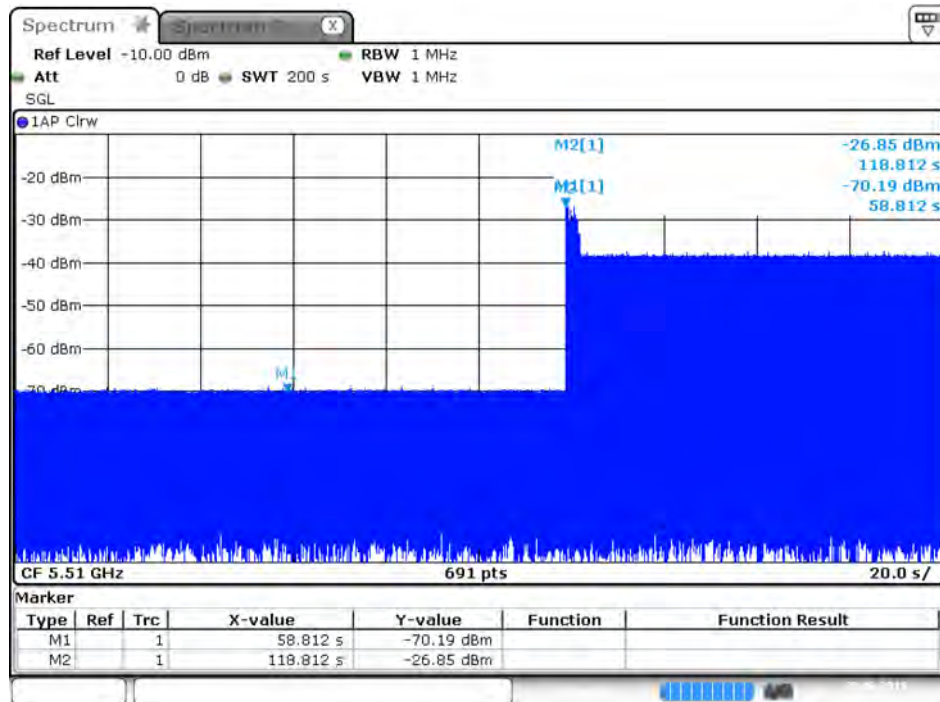
The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.261 sec). The initial power up time of the EUT is indicated by marker 1 (58.261 sec). Initial beacons/data transmissions are indicated by marker 2 (118.261 sec).



Date: 2 JUL 2019 03:06:40

W56 band (5470-5725 MHz)
Modulation Mode: ac (VHT40)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.812 sec). The initial power up time of the EUT is indicated by marker 1 (58.812 sec). Initial beacons/data transmissions are indicated by marker 2 (118.812 sec).



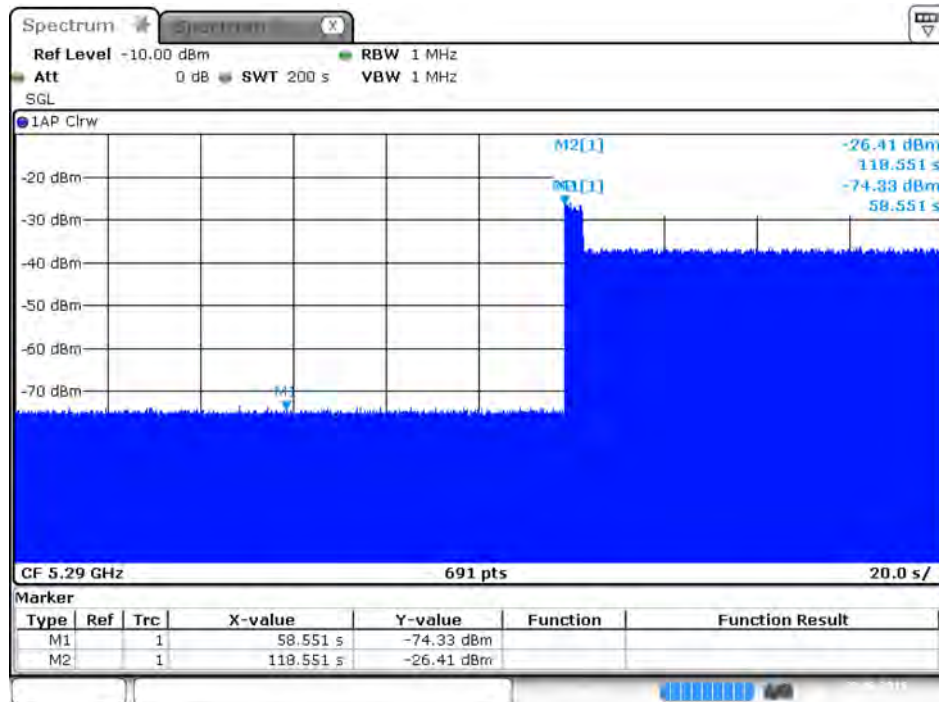
Date: 29 JUN 2019 20:48:44



W53 band (5250-5350 MHz)

Modulation Mode: ac (VHT80)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.551 sec). The initial power up time of the EUT is indicated by marker 1 (58.551 sec). Initial beacons/data transmissions are indicated by marker 2 (118.551 sec).



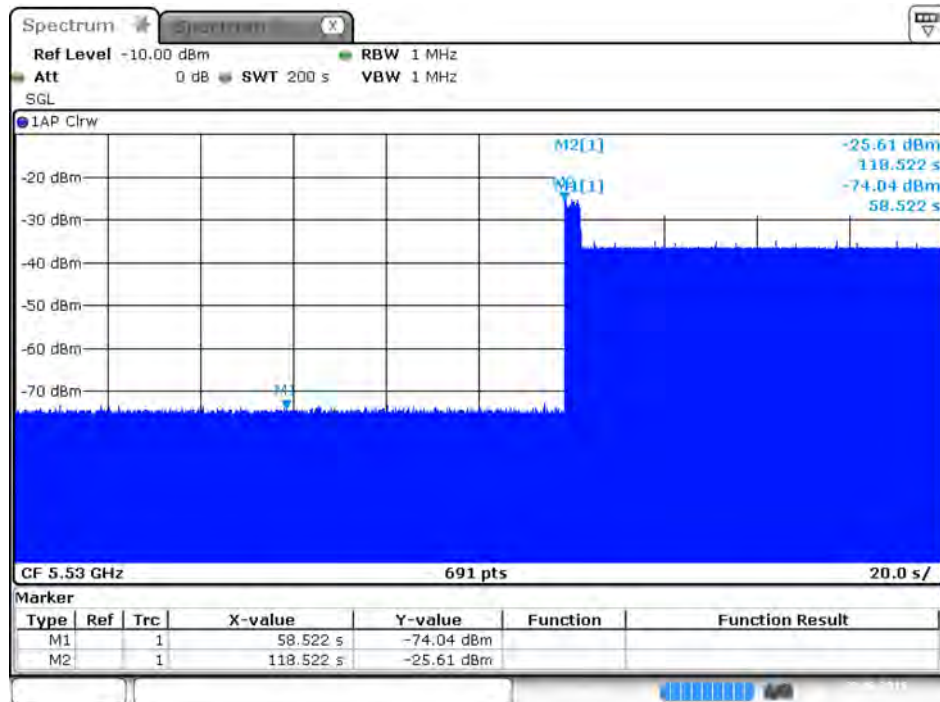
Date: 29 JUN 2019 18:26:27



W56 band (5470-5725 MHz)

Modulation Mode: ac (VHT80)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.522 sec). The initial power up time of the EUT is indicated by marker 1 (58.522 sec). Initial beacons/data transmissions are indicated by marker 2 (118.522 sec).



Date: 29 JUN 2019 17:42:24

3.2.5 Radar Detection Threshold (during the Channel Availability Check) Result

Radar Detection Threshold (during the Channel Availability Check) Result					
Detection Threshold Level (dBm)			-64		
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Nr of Times Triggered (# out of 4)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT20)	5300	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
ac (VHT20)	5500	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
		3 - Fixed	4	100	100
		4 - Variable	4	100	100
		5 - Variable	4	100	100
		6 - Variable	4	100	100
		7 - Chirp	4	100	100
		8 - Hopping	4	100	100
Result		PASS			

Radar Detection Threshold (during the Channel Availability Check) Result					
Detection Threshold Level (dBm)			-64		
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Nr of Times Triggered (# out of 4)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT40)	5310	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
ac (VHT40)	5510	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
		3 - Fixed	4	100	100
		4 - Variable	4	100	100
		5 - Variable	4	100	100
		6 - Variable	4	100	100
		7 - Chirp	4	100	100
		8 - Hopping	4	100	100
Result		PASS			

Radar Detection Threshold (during the Channel Availability Check) Result					
Detection Threshold Level (dBm)			-64		
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Nr of Times Triggered (# out of 4)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT80)	5290	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
ac (VHT80)	5530	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
		3 - Fixed	4	100	100
		4 - Variable	4	100	100
		5 - Variable	4	100	100
		6 - Variable	4	100	100
		7 - Chirp	4	100	100
		8 - Hopping	4	100	100
Result		PASS			

3.3 In-service Monitoring

3.3.1 In-service Monitoring Limit

In-service Monitoring Limit	
<input checked="" type="checkbox"/>	The <i>In-Service Monitoring</i> shall be used to monitor an <i>Operating Channel</i> .
<input checked="" type="checkbox"/>	The <i>In-Service-Monitoring</i> shall start immediately after the EUT has started transmissions on a channel. During the <i>In-Service Monitoring</i> , the EUT shall be capable of detecting any of the radar test signals that fall within the started transmissions ranges and with a level above the <i>Radar Detection Threshold</i> .
<input checked="" type="checkbox"/>	The minimum required detection probability is defined in clause 3.1.1 DFS Parameters.

3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method for W53	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/26.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/26.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/26.4
Presentation of Results	MIC Notice No.88 Appendix No.45, clause 13.5/26.5
Other Conditions	MIC Notice No.88 Appendix No.45, clause 13.6/26.6

Test Method for W56	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/27.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/27.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/27.4
Presentation of Results	MIC Notice No.88 Appendix No.45, clause 13.5/27.5
Other Conditions	MIC Notice No.88 Appendix No.45, clause 13.6/27.6

3.3.4 Test Result of In-service Monitoring

In-service Monitoring Result					
Detection Threshold Level (dBm)			-64 (DFS Detection Threshold)		
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Nr of Times Triggered (# out of 20)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT20)	5300	1 - Fixed	18	90	60
		2 - Fixed	19	95	60
ac (VHT20)	5500	1 - Fixed	19	95	60
		2 - Fixed	18	90	60
		3 - Fixed	18	90	60
		4 - Variable	16	80	60
		5 - Variable	14	70	60
		6 - Variable	17	85	60
		7 - Chirp	19	95	80
		8 - Hopping	19	95	70
Result		PASS			

In-service Monitoring Result					
Detection Threshold Level (dBm)			-64 (DFS Detection Threshold)		
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Nr of Times Triggered (# out of 20)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT40)	5310	1 - Fixed	18	90	60
		2 - Fixed	18	90	60
ac (VHT40)	5510	1 - Fixed	19	95	60
		2 - Fixed	18	90	60
		3 - Fixed	19	95	60
		4 - Variable	15	75	60
		5 - Variable	16	80	60
		6 - Variable	16	80	60
		7 - Chirp	18	90	80
		8 - Hopping	19	95	70
Result		PASS			



In-service Monitoring Result					
Detection Threshold Level (dBm)			-64 (DFS Detection Threshold)		
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Nr of Times Triggered (# out of 20)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT80)	5290	1 - Fixed	17	85	60
		2 - Fixed	18	90	60
ac (VHT80)	5530	1 - Fixed	18	90	60
		2 - Fixed	19	95	60
		3 - Fixed	18	90	60
		4 - Variable	16	80	60
		5 - Variable	17	85	60
		6 - Variable	17	85	60
		7 - Chirp	16	80	80
		8 - Hopping	20	100	70
Result		PASS			

In-service Monitoring Result				
Detection Threshold Level (dBm)			-64 (DFS Detection Threshold)	
Modulation Mode	Freq. (MHz)	Radar Test Signal (#)	Detection Probability (%)	Detection Probability Limit (%)
ac (VHT20)	5500	1 - Fixed	95	60
		2 - Fixed	90	
		3 - Fixed	90	
		4 - Variable	80	
		5 - Variable	70	
		6 - Variable	85	
		Total	85	80
ac (VHT40)	5510	1 - Fixed	95	60
		2 - Fixed	90	
		3 - Fixed	95	
		4 - Variable	75	
		5 - Variable	80	
		6 - Variable	80	
		Total	86	80
ac (VHT80)	5530	1 - Fixed	90	60
		2 - Fixed	95	
		3 - Fixed	90	
		4 - Variable	80	
		5 - Variable	85	
		6 - Variable	85	
		Total	88	80
Result		PASS		

3.4 Channel Shutdown and Non-Occupancy Period

3.4.1 Channel Shutdown and Non-Occupancy Period Limit

Channel Shutdown and Non-Occupancy Period Limit	
Channel Move Time	10 sec
Channel Closing Transmission Time	260 ms in Channel Move Time 10 sec period.
Non-occupancy period	Minimum 30 minutes

3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

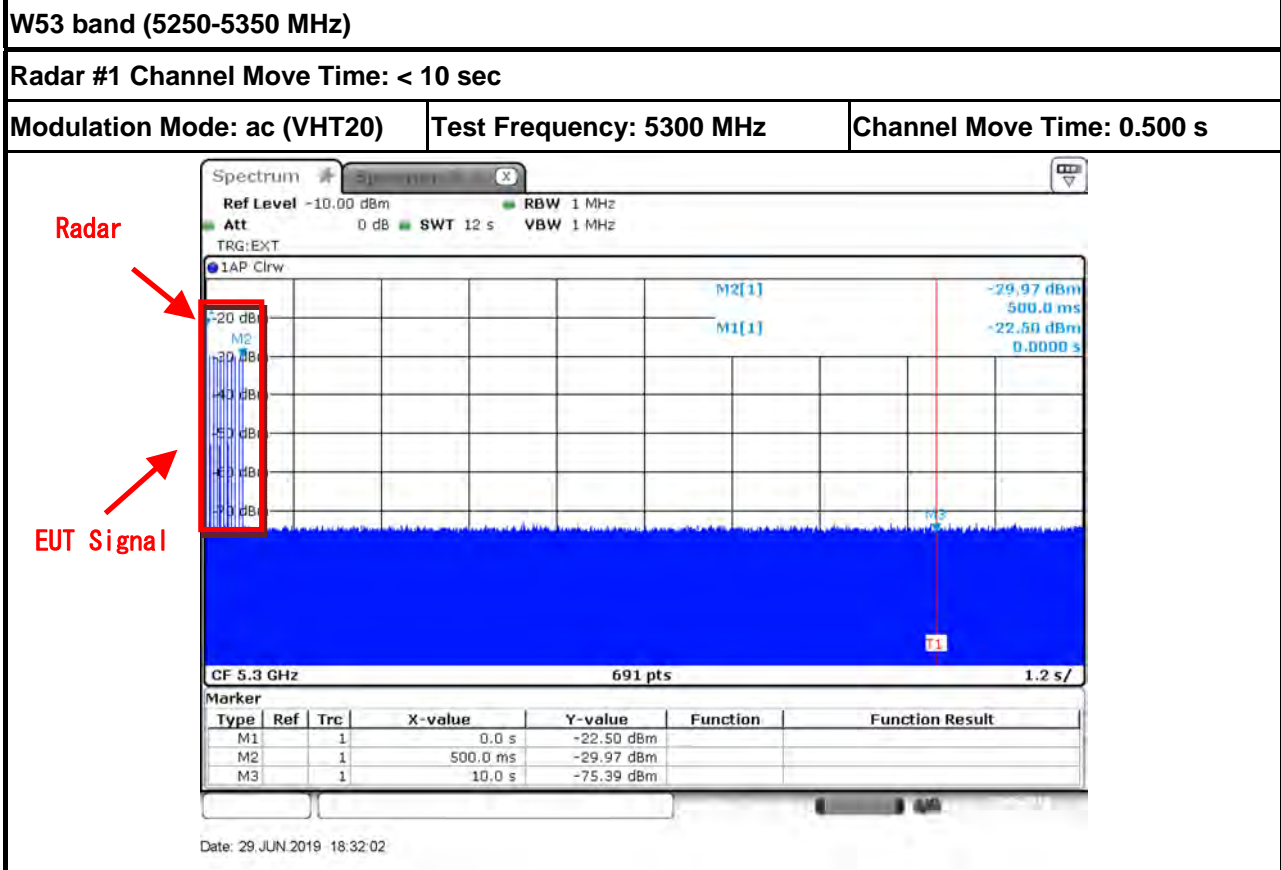
Test Method for W53	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/26.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/26.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/26.4
Presentation of Results	MIC Notice No.88 Appendix No.45, clause 13.5/26.5
Other Conditions	MIC Notice No.88 Appendix No.45, clause 13.6/26.6

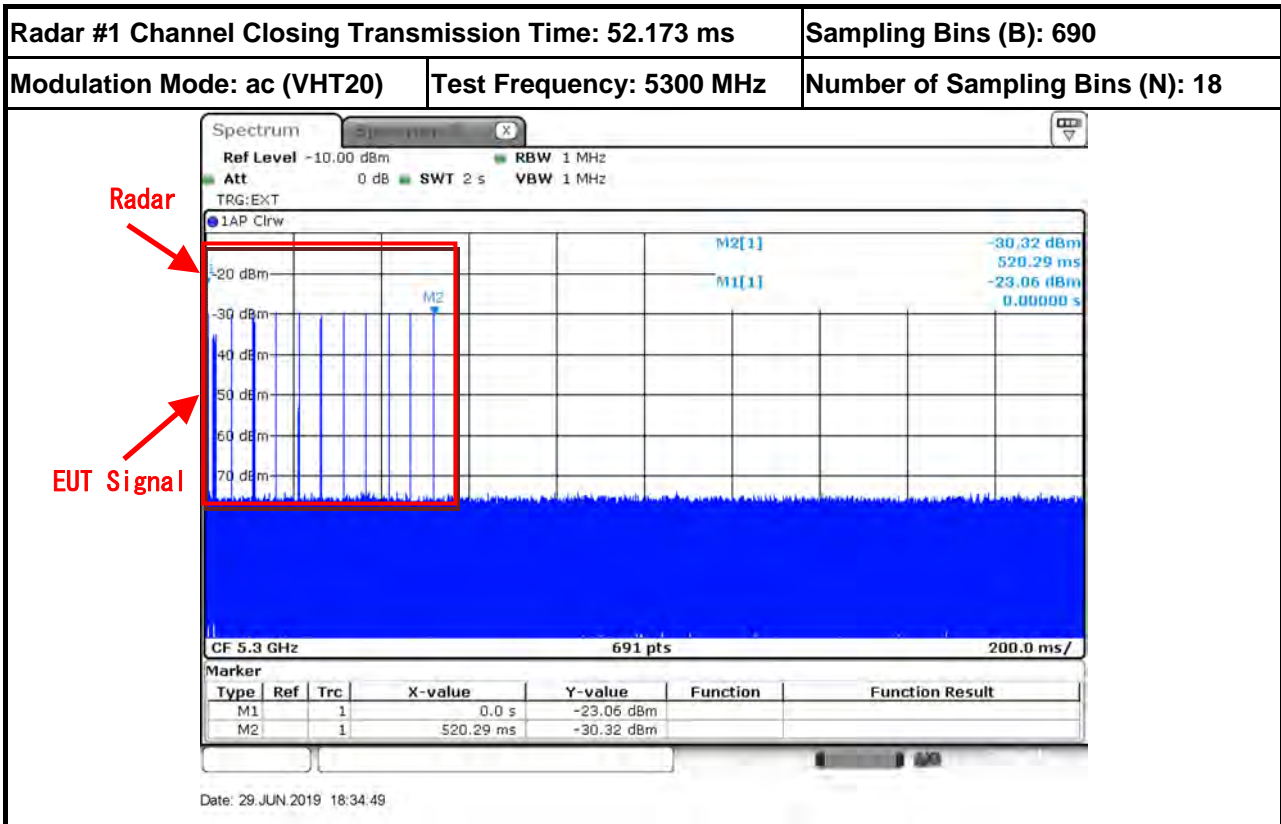
Test Method for W56	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/27.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/27.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/27.4
Presentation of Results	MIC Notice No.88 Appendix No.45, clause 13.5/27.5
Other Conditions	MIC Notice No.88 Appendix No.45, clause 13.6/27.6

**3.4.4 Test Result of Channel Shutdown**

Channel Shutdown and Non-Occupancy Period Result				
Detection Threshold Level (dBm)			-64	
Modulation Mode	Freq. (MHz)	Radar Test Signal	Channel Closing Transmission Time (ms)	Channel Move Time (s)
ac (VHT20)	5300	1 - Fixed	52.173	0.500
ac (VHT20)	5500	2 - Fixed	60.869	0.469
ac (VHT40)	5310	1 - Fixed	37.681	0.478
ac (VHT40)	5510	2 - Fixed	46.376	0.573
ac (VHT80)	5290	1 - Fixed	63.768	0.521
ac (VHT80)	5530	2 - Fixed	55.072	0.413
Limit			260 ms	10 sec
Result			PASS	

3.4.5 Channel Shutdown Plots





R&S | Agilent

VISA session GPIB0::20	Threshold (dBm) -60	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 18
	Mean Level (dBm) -31.29	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 52.173913m
	RMS Level (dBm) -30.92	Total Trace of Points 691	Mark 2 Point 691	Duty (%) 2.61

Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=18 x 2.89855ms=52.173 ms

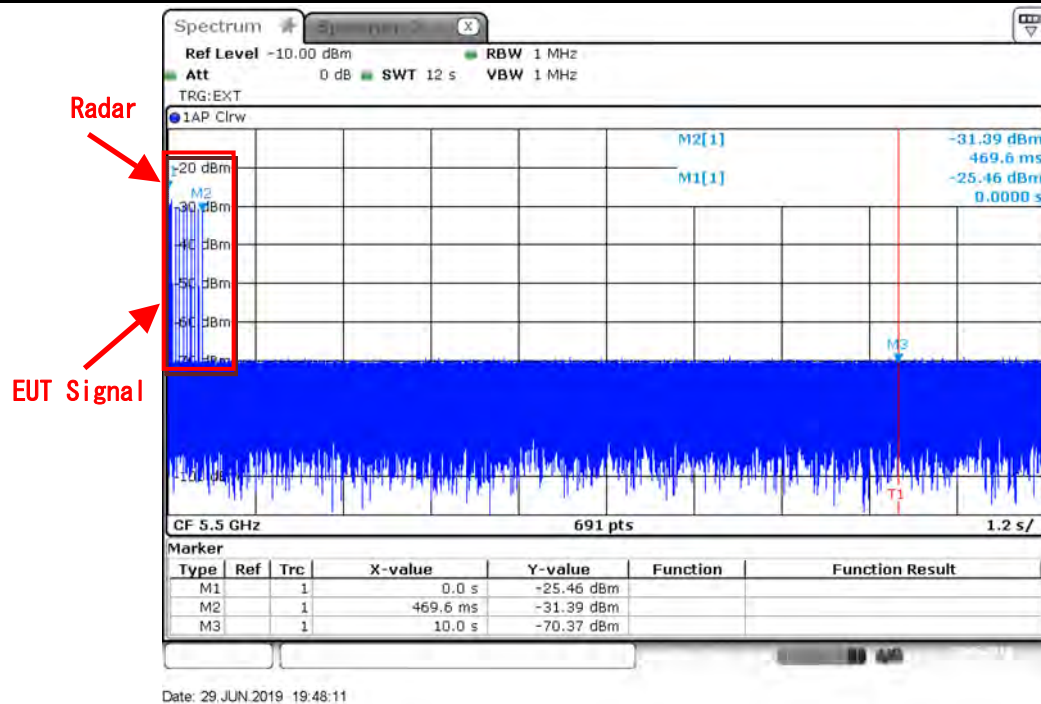
Note: The first sweep point of spectrum analyzer is occupied by radar signal, therefore, the number "Sweep Point-1" should be used for Channel Closing Transmission Time calculation.
The Channel Closing Transmission Time is calculated by Closing Time = N*(Sweep time/Sweep Point-1)
where N is the number of spectrum analyzer sampling bins.



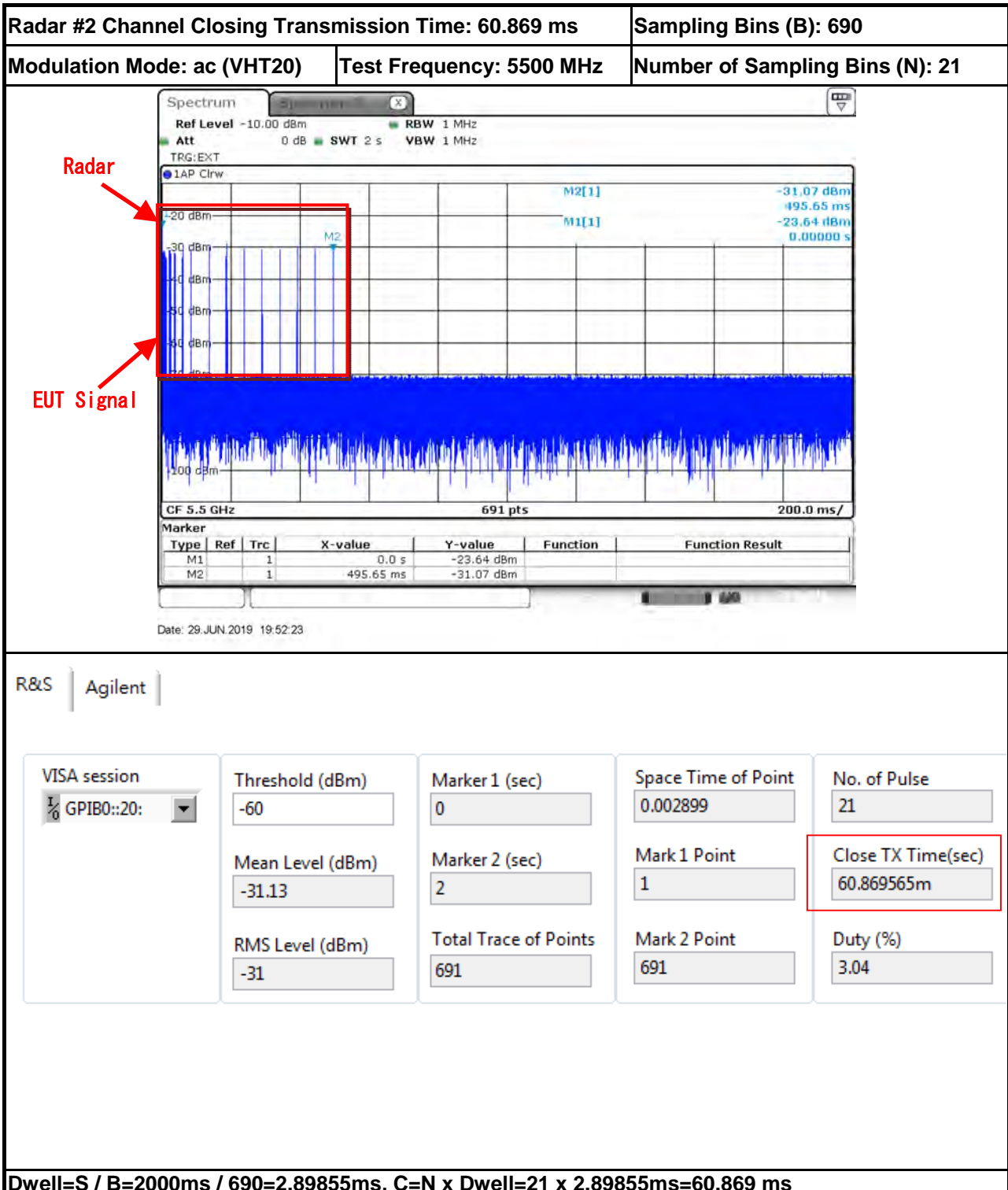
Modulation Mode: ac (VHT20)

Test Frequency: 5500 MHz

Channel Move Time: 0.469 s

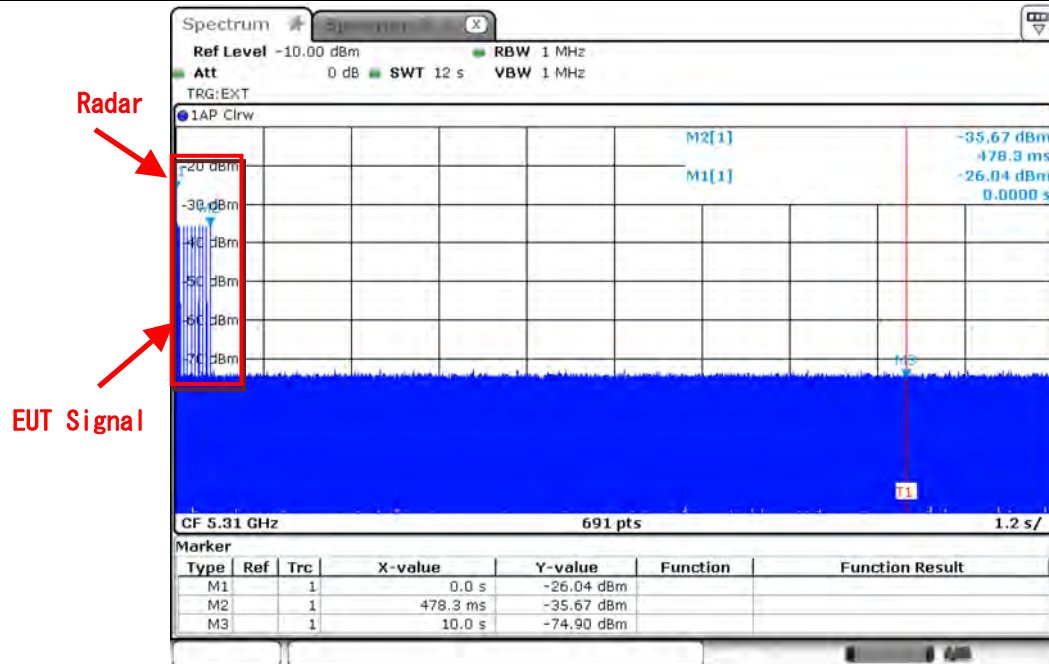


Date: 29 JUN 2019 19:48:11

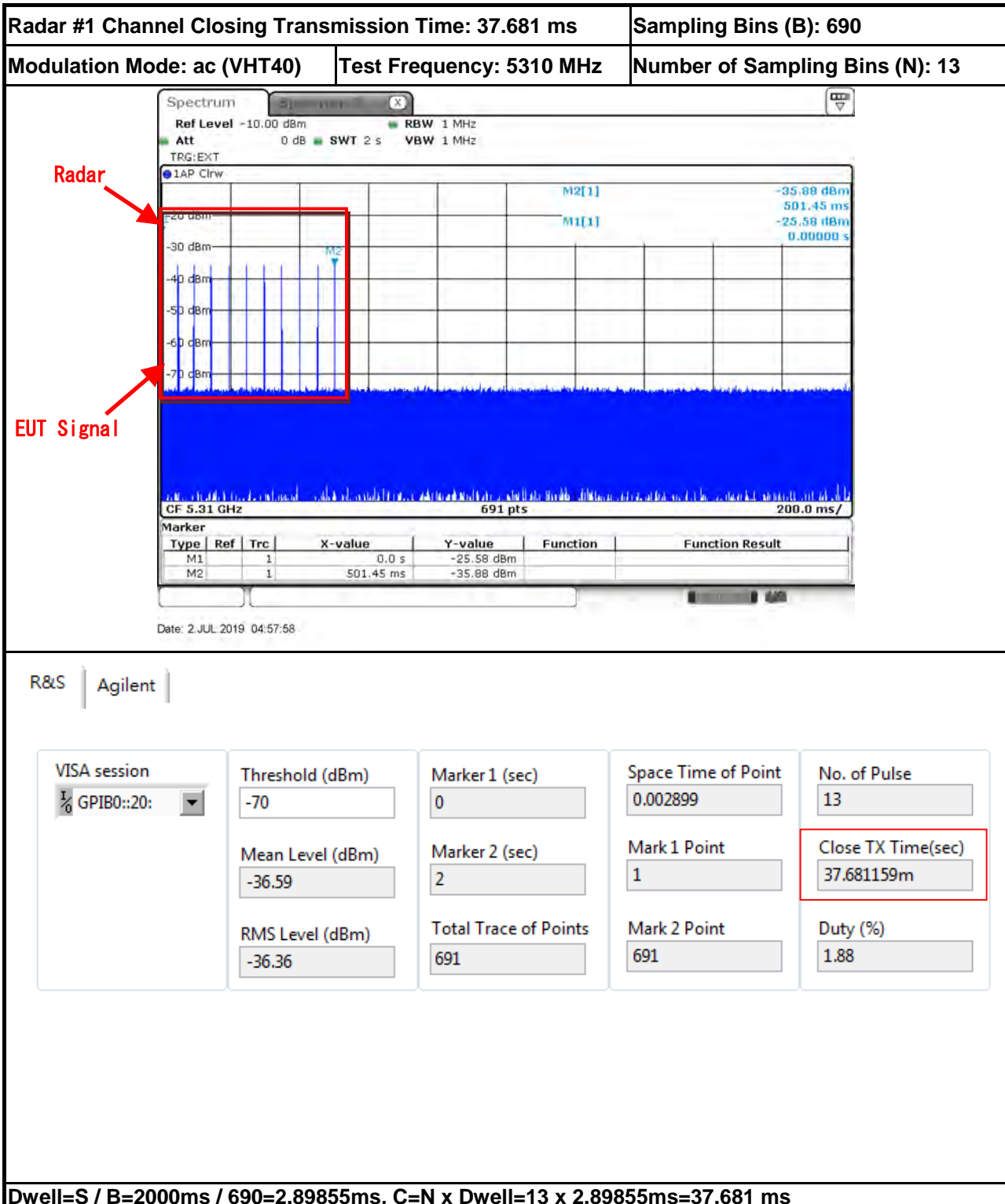


Note: The first sweep point of spectrum analyzer is occupied by radar signal, therefore, the number "Sweep Point-1" should be used for Channel Closing Transmission Time calculation.

The Channel Closing Transmission Time is calculated by Closing Time = N*(Sweep time/Sweep Point-1) where N is the number of spectrum analyzer sampling bins.

W53 band (5250-5350 MHz)
Radar #1 Channel Move Time: < 10 sec
Modulation Mode: ac (VHT40)
Test Frequency: 5310 MHz
Channel Move Time: 0.478 s


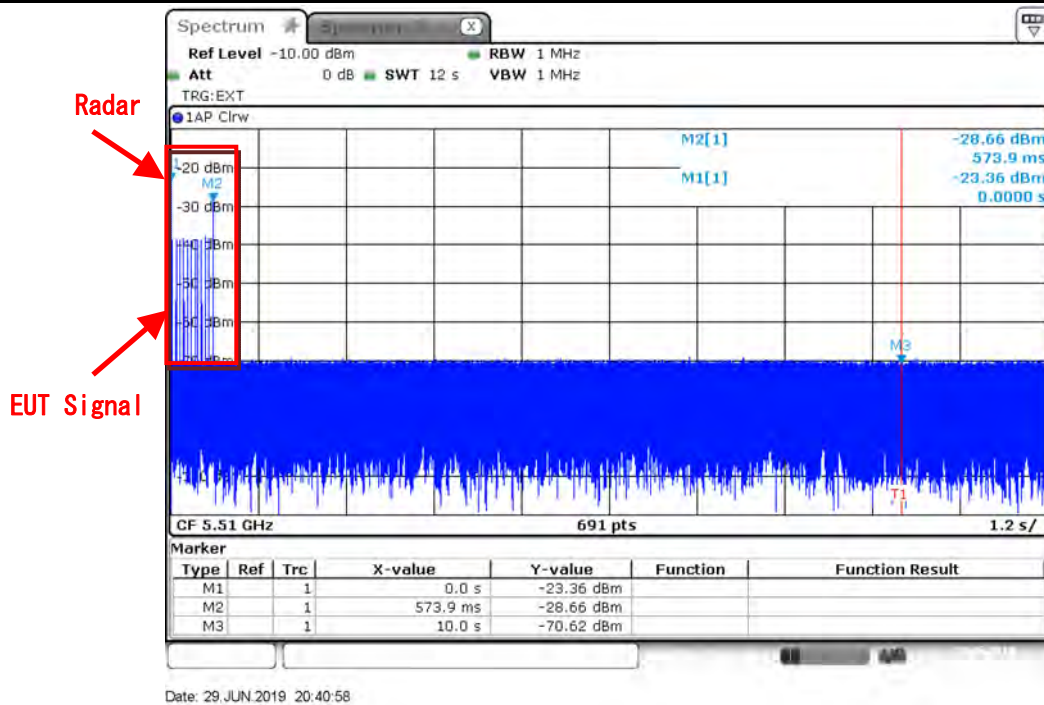
Date: 2 JUL 2019 04:51:14



Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=13 x 2.89855ms=37.681 ms

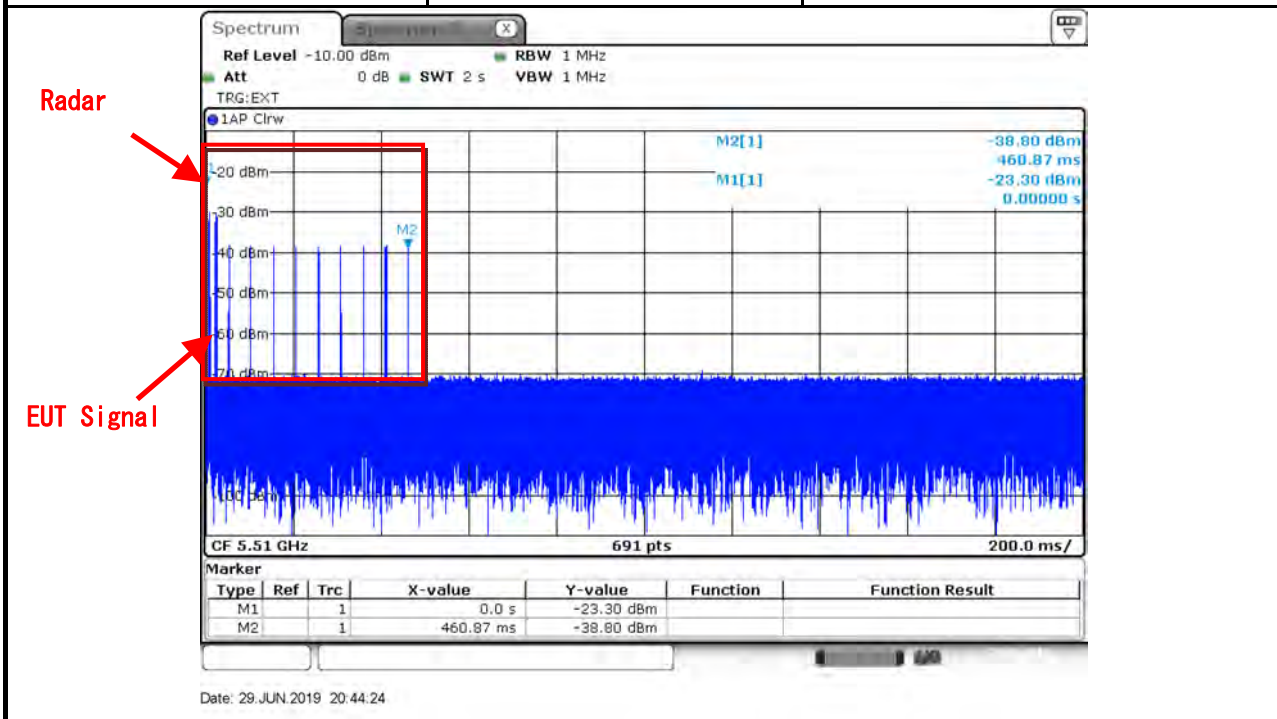
Note: The first sweep point of spectrum analyzer is occupied by radar signal, therefore, the number "Sweep Point-1" should be used for Channel Closing Transmission Time calculation.

The Channel Closing Transmission Time is calculated by Closing Time = N*(Sweep time/Sweep Point-1)
where N is the number of spectrum analyzer sampling bins.

W56 band (5470-5725 MHz)
Radar #2 Channel Move Time: < 10 sec
Modulation Mode: ac (VHT40)
Test Frequency: 5510 MHz
Channel Move Time: 0.573 s




Radar #2 Channel Closing Transmission Time: 46.376 ms		Sampling Bins (B): 690
Modulation Mode: ac (VHT40)	Test Frequency: 5510 MHz	Number of Sampling Bins (N): 16



R&S Agilent

VISA session
1 GPIB0::20

Threshold (dBm)
-60

Mean Level (dBm)
-34.89

RMS Level (dBm)
-33.57

Marker 1 (sec)
0

Marker 2 (sec)
2

Total Trace of Points
691

Space Time of Point
0.002899

Mark 1 Point
1

Mark 2 Point
691

No. of Pulse
16

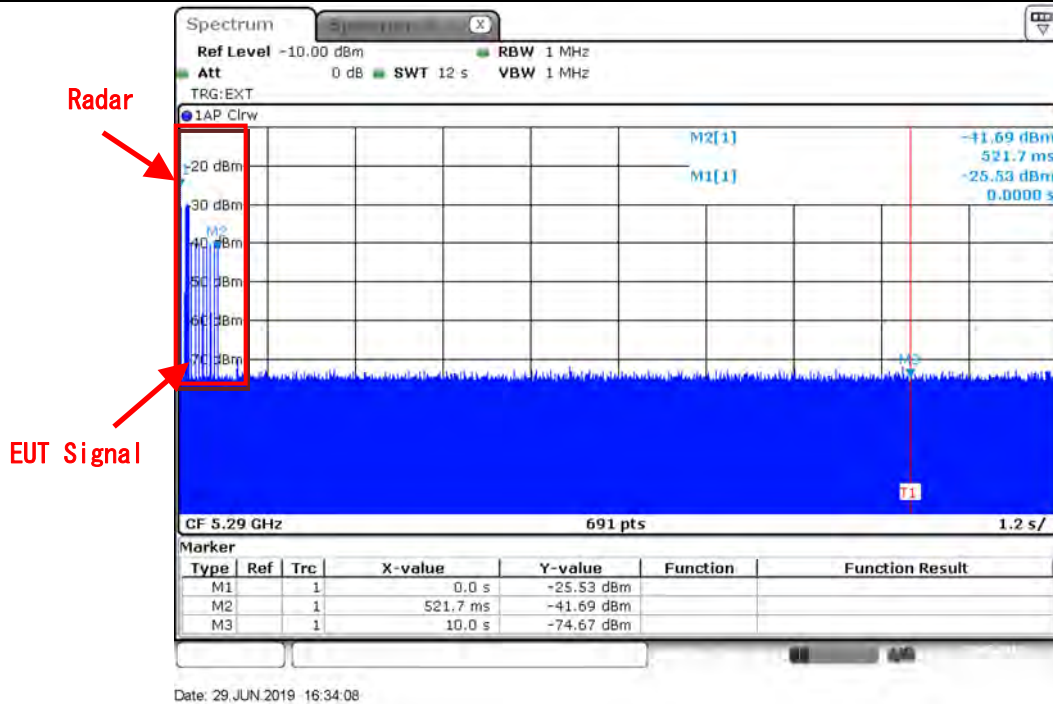
Close TX Time(sec)
46.376812m

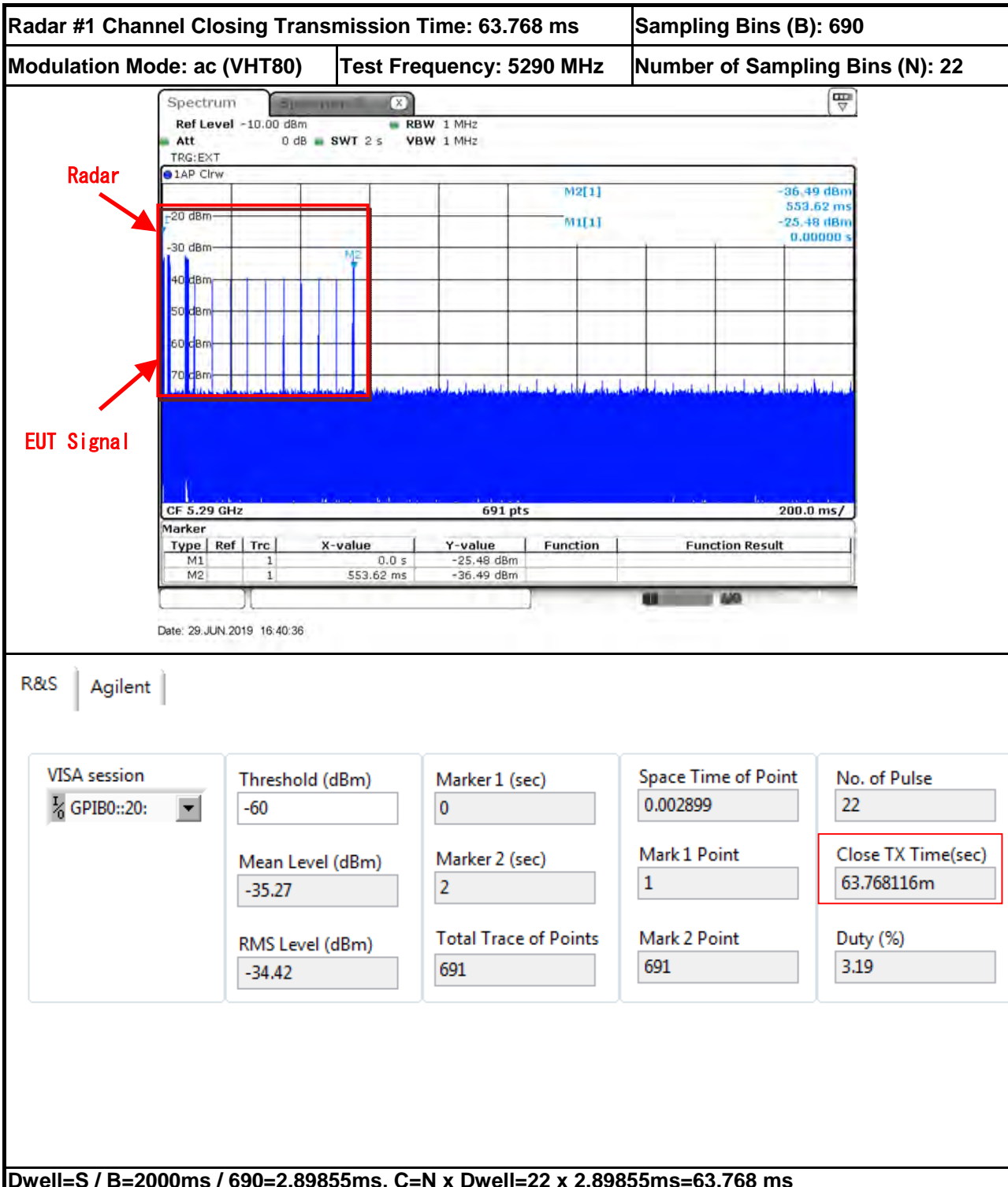
Duty (%)
2.32

Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=16 x 2.89855ms=46.376 ms

Note: The first sweep point of spectrum analyzer is occupied by radar signal, therefore, the number "Sweep Point-1" should be used for Channel Closing Transmission Time calculation.

The Channel Closing Transmission Time is calculated by Closing Time = N*(Sweep time/Sweep Point-1) where N is the number of spectrum analyzer sampling bins.

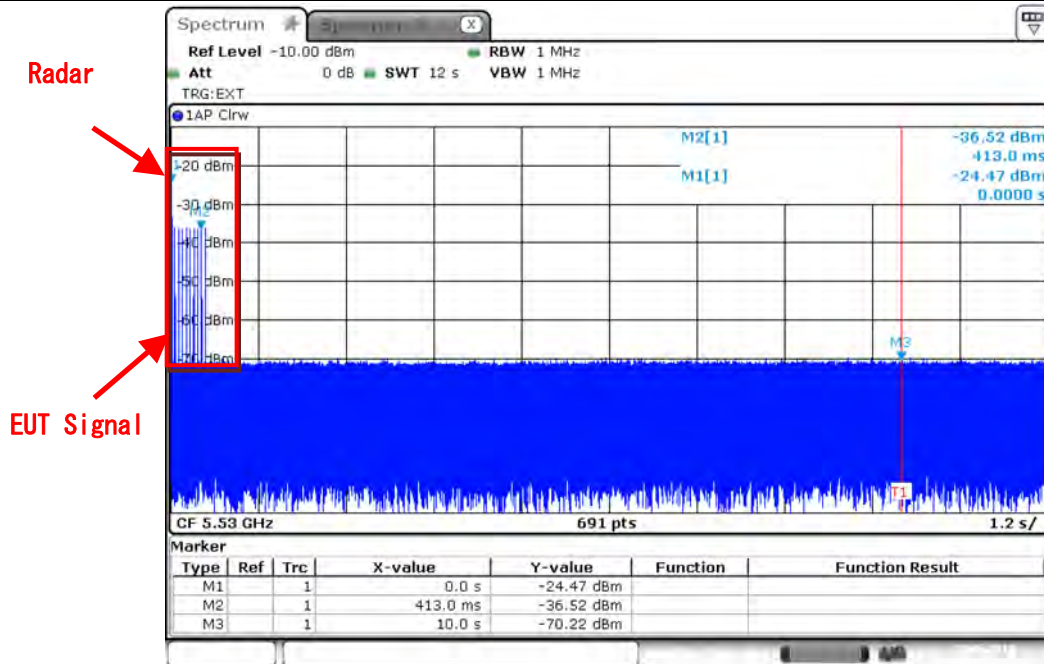
W53 band (5250-5350 MHz)
Radar #1 Channel Move Time: < 10 sec
Modulation Mode: ac (VHT80)
Test Frequency: 5290 MHz
Channel Move Time: 0.521 s




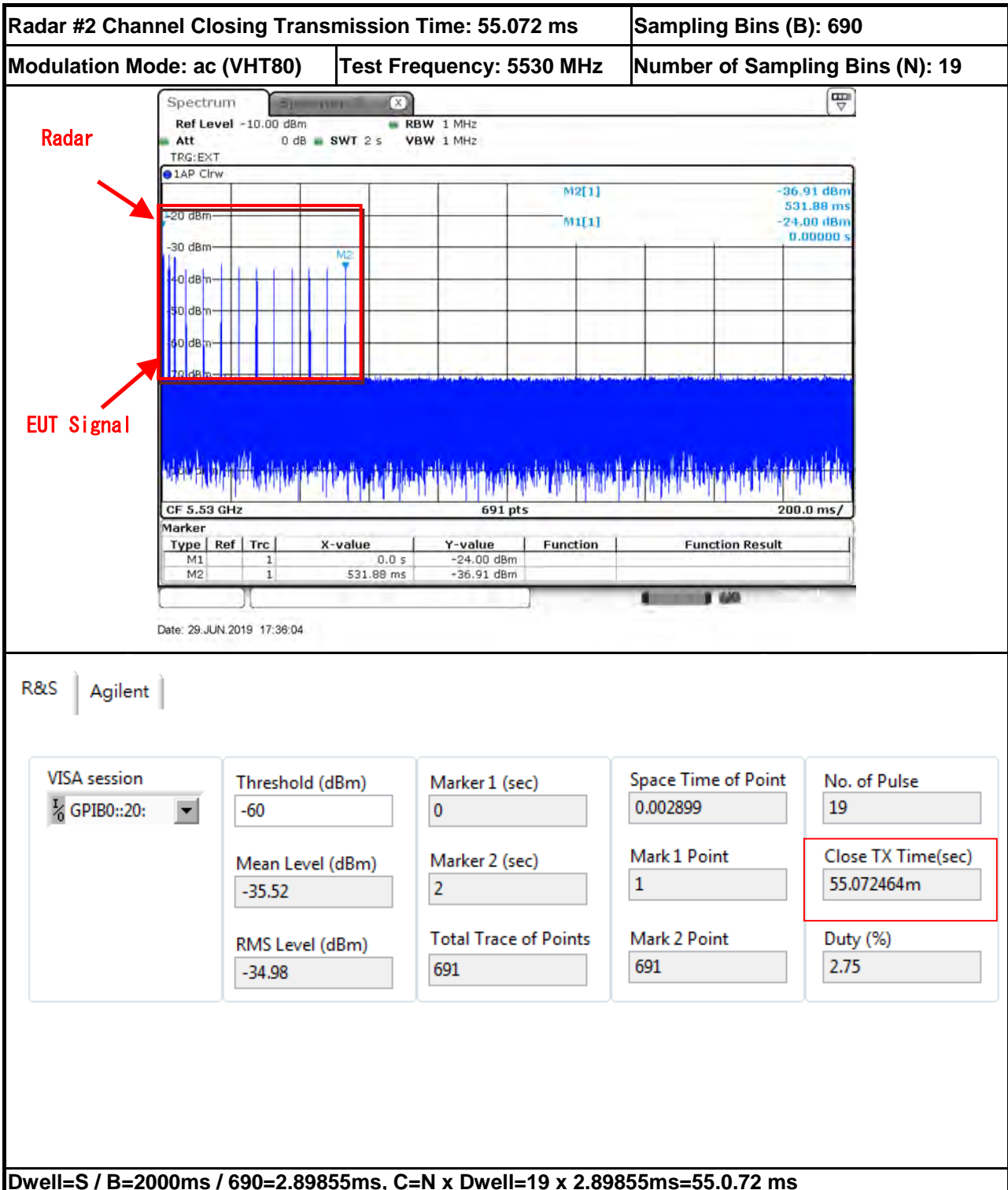
Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=22 x 2.89855ms=63.768 ms

Note: The first sweep point of spectrum analyzer is occupied by radar signal, therefore, the number "Sweep Point-1" should be used for Channel Closing Transmission Time calculation.

The Channel Closing Transmission Time is calculated by Closing Time = N*(Sweep time/Sweep Point-1) where N is the number of spectrum analyzer sampling bins.

W56 band (5470-5725 MHz)
Radar #2 Channel Move Time: < 10 sec
Modulation Mode: ac (VHT80)
Test Frequency: 5530 MHz
Channel Move Time: 0.413 s


Date: 29 JUN 2019 17:32:19



Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=19 x 2.89855ms=55.072 ms

Note: The first sweep point of spectrum analyzer is occupied by radar signal, therefore, the number "Sweep Point-1" should be used for Channel Closing Transmission Time calculation.

The Channel Closing Transmission Time is calculated by Closing Time = N*(Sweep time/Sweep Point-1) where N is the number of spectrum analyzer sampling bins.

3.4.6 Test Result of Non-Occupancy Period

Non-Occupancy Period Result			
Detection Threshold Level (dBm)			-64
Modulation Mode	Freq. (MHz)	Radar Test Signal	Non-Occupancy Period (min)
ac (VHT20)	5300	1 - Fixed	>30
ac (VHT20)	5500	2 - Fixed	>30
ac (VHT40)	5310	1 - Fixed	>30
ac (VHT40)	5510	2 - Fixed	>30
ac (VHT80)	5290	1 - Fixed	>30
ac (VHT80)	5530	2 - Fixed	>30
Limit			30 min
Result			PASS

3.4.7 Non-Occupancy Period Plots

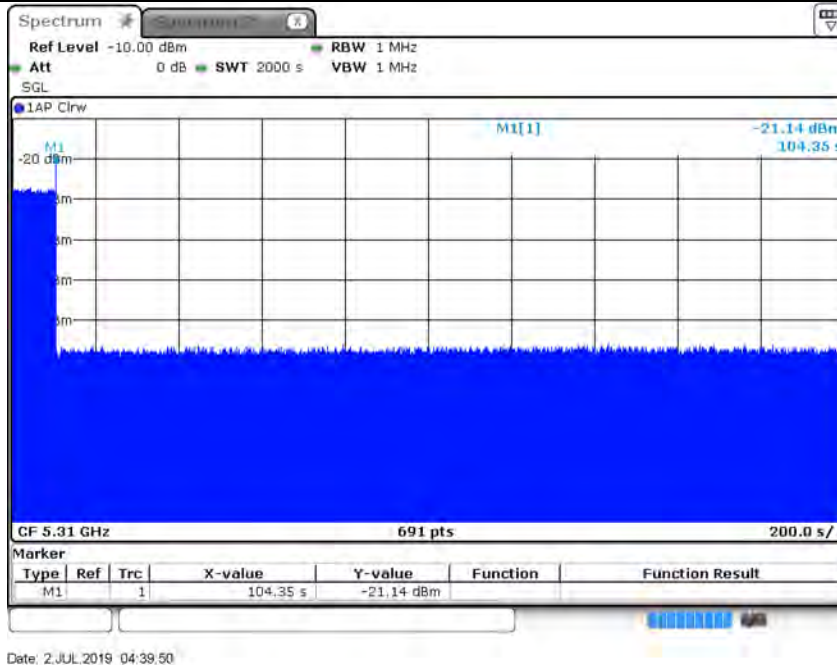




W53 band (5250-5350 MHz)

Modulation Mode: ac (VHT40)

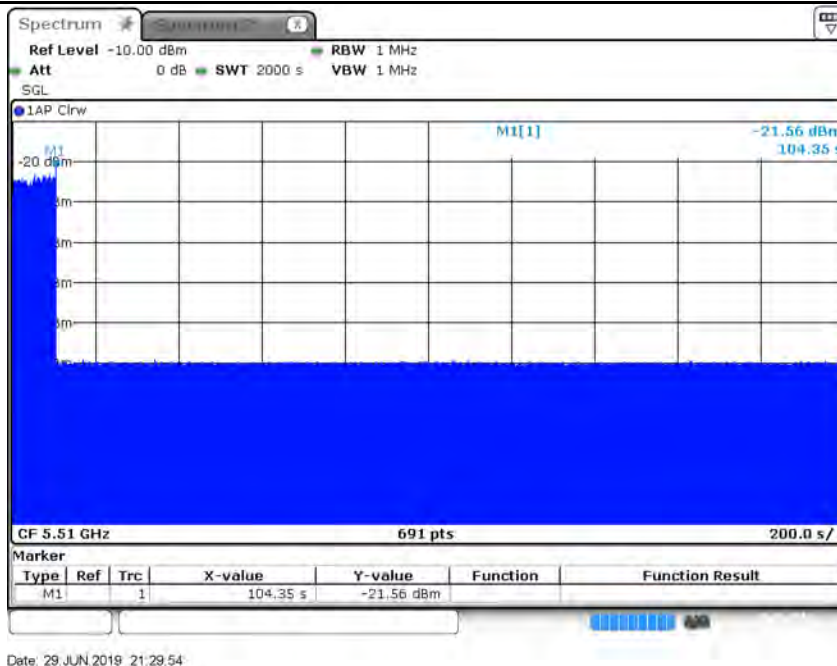
Radar #1 Non-Occupancy Period / Non-Occupancy Period is more than 30 min.



W56 band (5470-5725 MHz)

Modulation Mode: ac (VHT40)

Radar #2 Non-Occupancy Period / Non-Occupancy Period is more than 30 min.

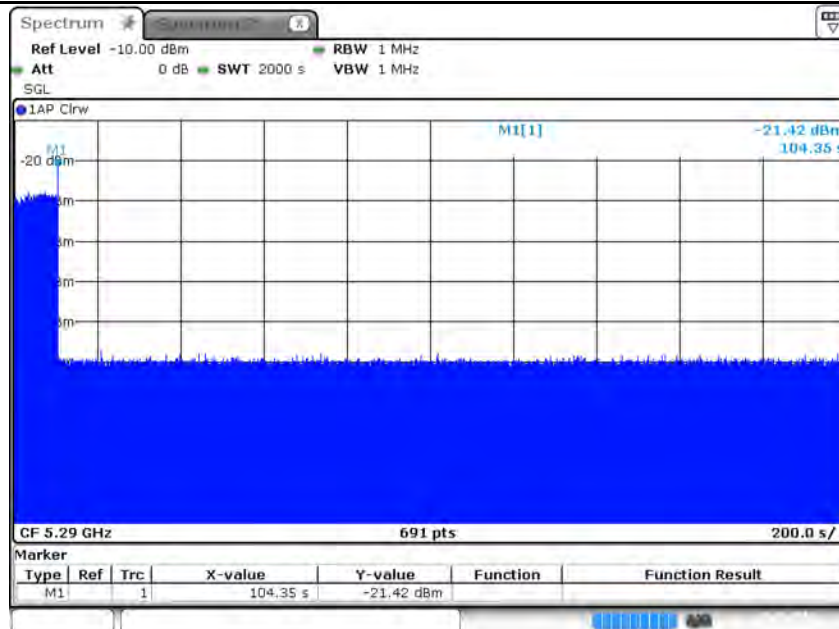




W53 band (5250-5350 MHz)

Modulation Mode: ac (VHT80)

Radar #1 Non-Occupancy Period / Non-Occupancy Period is more than 30 min.

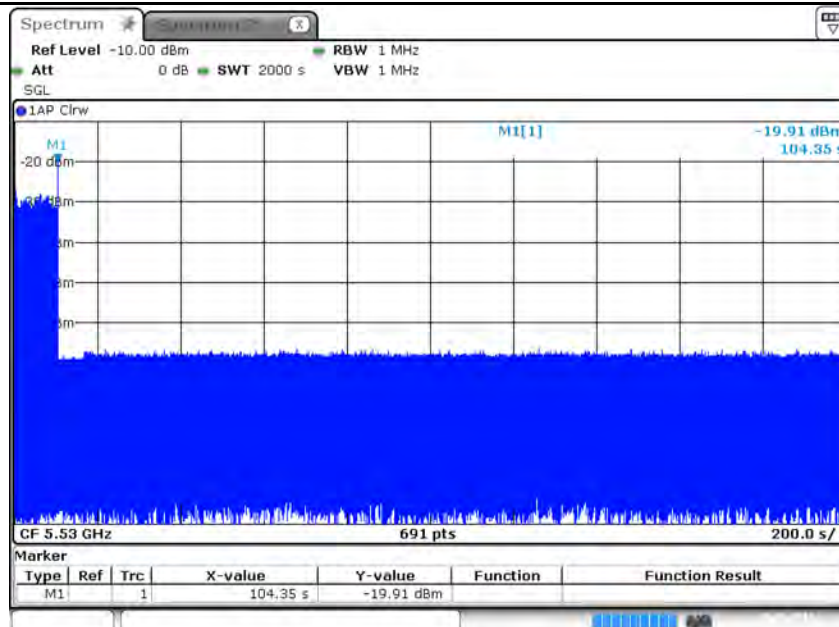


Date: 29 JUN 2019 17:20:18

W56 band (5470-5725 MHz)

Modulation Mode: ac (VHT80)

Radar #2 Non-Occupancy Period / Non-Occupancy Period is more than 30 min.



Date: 29 JUN 2019 18:19:32

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Calibration Method	Calibration Agent Name	Remark
Spectrum Analyzer	R&S	FSV40	101026	9kHz~40GHz	Sep. 28, 2018	Sep. 27, 2019	c)	C	Conducted (DF01-CB)
Vector Signal generator	R&S	SMU200A	102782	100kHz-6GHz	Jan. 16, 2019	Jan. 15, 2020	c)	A	Conducted (DF01-CB)
RF Power Divider	ANAREN	2 Way	DFS-01-DV-02	1GHz ~ 6GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Power Divider	MTJ	2 Way	DFS-01-DV-03	1GHz ~ 6GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Power Divider	ANAREN	4 Way	DFS-01-DV-01	1GHz ~ 6GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-53	1 GHz ~18 GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-54	1 GHz ~18 GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-56	1 GHz ~18 GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Cable-high	Woken	RG402	High Cable-60	1 GHz ~18 GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)

Note:

- Calibration Interval of instruments listed above is one year.
- N.C.R. means Non-Calibration required.
- Calibration Agent Name: Describe calibration agent name with its country name, and symbols in "Calibration Agent Name" shows the agent names as follows,
A: Electronics Testing Center, Taiwan.
B: Sporton International Inc., Taiwan.
C: ROHDE&SCHWARZ, Taiwan.
- Calibration Method
a) : Calibration conducted by the National Institute of Information and Communications Technology or a designated calibration agency under Article 102-18 paragraph (1)
b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)
c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)
d) : Calibration conducted by using other equipment that listed above from a) to c)



5 Measurement Uncertainty

Test Items	Uncertainty	Remark
Conducted Emission	2.4 dB	Confidence levels of 95%