



JAPAN DFS TEST REPORT

Equipment : AX6600 Tri Band WiFi Router
Brand Name : ASUS
Model Name : XT8
Applicant : ASUSTeK COMPUTER INC.
No. 15, Li-Te Rd., Peitou District, Taipei 112, Taiwan, R.O.C.
Manufacturer : Compal Networking (KunShan) Co., LTD.
No. 520, Nanbang Rd., Economic & Technical
Development Zone Kunshan, Jiangsu Province 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 May 15, 2019, and testing was started from Sep. 16, 2019 and completed on Sep. 22, 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: Sam Chen

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



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Appendix A. Test Photos

Photographs of EUT v01



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: **Cindy Peng**



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), ax (HEW20)	5260-5320	52-64 [4]
5470-5725		5500-5700	100-140 [11]
5250-5350	n (HT40), ac (VHT40), ax (HEW40)	5270-5310	54-62 [2]
5470-5725		5510-5670	102-134 [5]
5250-5350	ac (VHT80), ax (HEW80)	5290	58 [1]
5470-5725		5530-5610	106-122 [2]
5470-5725	ac (VHT160), ax (HEW160)	5570	114 [1]

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40, VHT80 and VHT160 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- HEW20, HEW40, HEW80 and HEW160 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM 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 checked="" 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/ax	



1.1.3 Antenna Information

Set	Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	1	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	Note 1
	2	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	3	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	4	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	5	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	6	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
2	1	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	2	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	3	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	4	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	5	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	6	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
3	7	YAGEO	ANT3216A063R2400A	Chip Antenna	N/A	

Note 1:

Gain (dBi)										
Set	Ant.	Port				2.4GHz	5GHz W52	5GHz W53	5GHz W56	Bluetooth
		2.4G 2TX	5G 2TX	5G 4TX	Bluetooth 1TX					
1	1	1	1	-	-	1.82	3.08	3.16	-	-
	2	2	2	-	-	1.82	3.08	3.16	-	-
	3	-	-	2	-	-	-	-	2.22	-
	4	-	-	3	-	-	-	-	2.22	-
	5	-	-	1	-	-	-	-	2.22	-
	6	-	-	4	-	-	-	-	2.22	-
2	1	-	-	-	-	1.82	3.08	3.16	-	-
	2	-	-	-	-	1.82	3.08	3.16	-	-
	3	-	-	-	-	-	-	-	2.22	-
	4	-	-	-	-	-	-	-	2.22	-
	5	-	-	-	-	-	-	-	2.22	-
	6	-	-	-	-	-	-	-	2.22	-
3	1	-	-	-	1	-	-	-	-	2.02



Note 2: The above information was declared by manufacturer.

Note 3: The EUT has three sets of antennas and there are six antennas for set 1 and set 2.

Set 1~2 are the same antenna type. Only Set 1 antenna was selected to test and record in this report.

For 2.4GHz WLAN function (Radio 1)

IEEE 802.11b/g/n/VHT/ax 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 W52, W53 Band WLAN function (Radio 1)

IEEE 802.11a/n/ac/ax 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 W56 WLAN function (Radio 2)

IEEE 802.11a/n/ac/ax 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.

For Bluetooth function (Radio 3)

Only Port 1 can be used as transmitting/receiving antenna.

1.1.4 Table for SKU Information

EUT	SKU	LAN Transformer	
		Brand Name	P/N
1	1	NETSWAP	NS773602 / NS771802
2	2	Mingtek	HN36201CG / HN18101CG

1.1.5 Table for Radio Information

Radio	2.4GHz	5GHz	Bluetooth
1	V	V (W52, W53 Band)	X
2	X	V (W56 Band)	X
3	X	X	V

1.1.6 Table for EUT Supports Functions

Function	Support Type
AP Router	Master
Bridge	Slave without radar detection
Repeater	Master
Mesh	Master



1.2 Accessories

Accessories					
No.	Equipment Name	Brand Name	Model Name	Type	Rating
1	Adapter 1	PI	AD2088320	010-5LF	INPUT: 100-240V~50/60Hz 0.8A OUTPUT: 19V, 1.75A
2	Adapter 2	DELTA	ADP-33AW B	-	INPUT: 100-240V ~ 1A, 50-60Hz OUTPUT: 19V, 1.75A
No.	Other				
3	RJ-45 cable*1: Non-shielded, 1.5m				

Note: Adapter does not affect the DFS tests, there is only one adapter 2 tested and recorded in this report.

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
C	WLAN AP	ASUS	RT-AX88U	MSQ-RTAXHP00

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	Test Date
DFS Site	DF01-CB	Brian Su	25.6~26.7°C / 58~62%	Sep. 16, 2019~Sep. 22, 2019

2 Test Configuration of EUT

2.1 EUT Information

EUT Information			
Operating Mode	<input checked="" type="checkbox"/>	Master (AP Router, Mesh, Repeater)	
	<input type="checkbox"/>	Slave with radar detection	
	<input checked="" type="checkbox"/>	Slave without radar detection (Bridge)	
Software / Firmware Version	3.0.0.4.384_7300-g88ef0bf		
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	ax (HEW20)	5300
5470-5725MHz	ax (HEW20)	5500
5250-5350MHz	ax (HEW40)	5310
5470-5725MHz	ax (HEW40)	5510
5250-5350MHz	ax (HEW80)	5290
5470-5725MHz	ax (HEW80)	5530
5470-5725MHz	ax (HEW160)	5570

2.3 The Worst Case Measurement Configuration

Tests Item	Dynamic Frequency Selection (DFS)
Test Condition	Conducted measurement at transmit chains.
Modulation Mode	11ax (HEW20), 11ax (HEW40), 11ax (HEW80), 11ax (HEW160)
Test Mode	Master (AP Router)
<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/VHT160: IEEE 802.11ac, HEW20/HEW40/HEW80/HEW160: IEEE 802.11ax	



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 ≥ 200mW (23dBm). DFS Detection Threshold Level is (-64dBm) + G _{ANT}	

3.1.3 User Access Restrictions

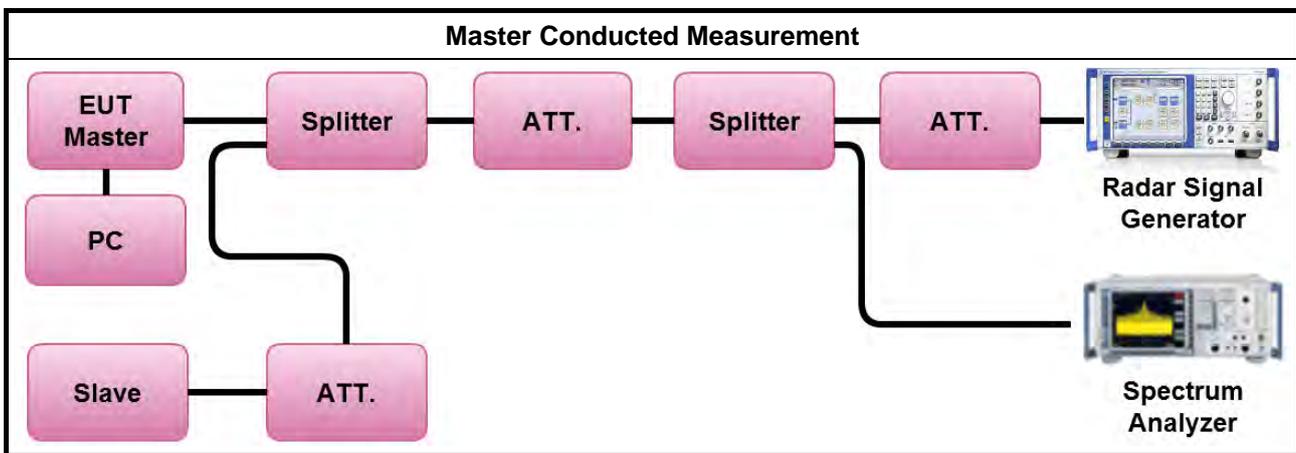
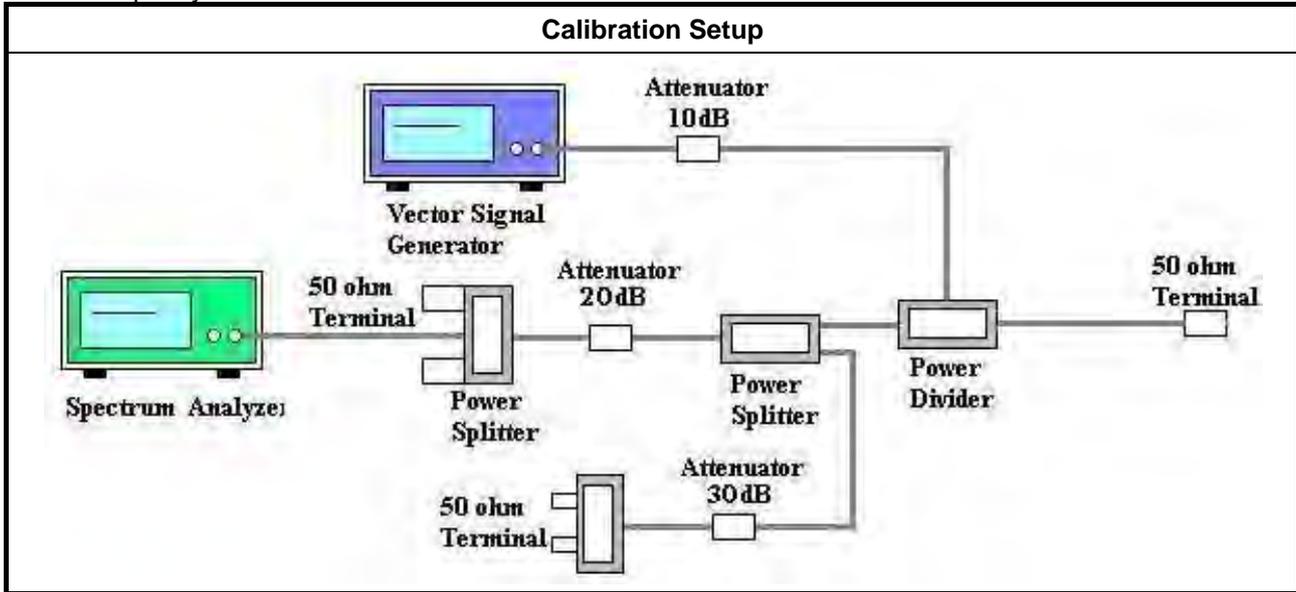
User Access Restrictions
<input checked="" type="checkbox"/> DFS controls (hardware or software) related to radar detection are NOT accessible to the user

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.

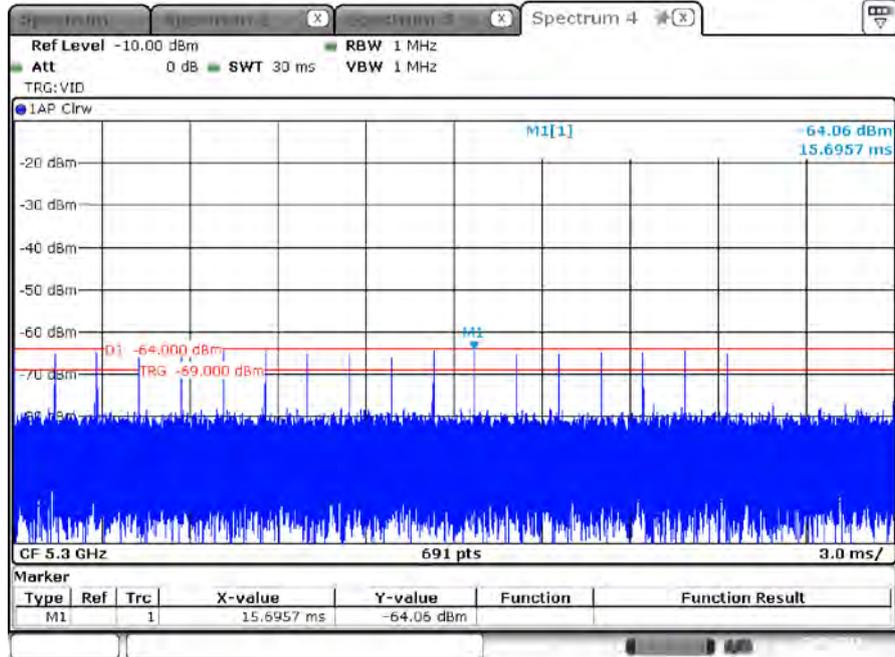




3.1.6 Radar Waveform calibration Plot

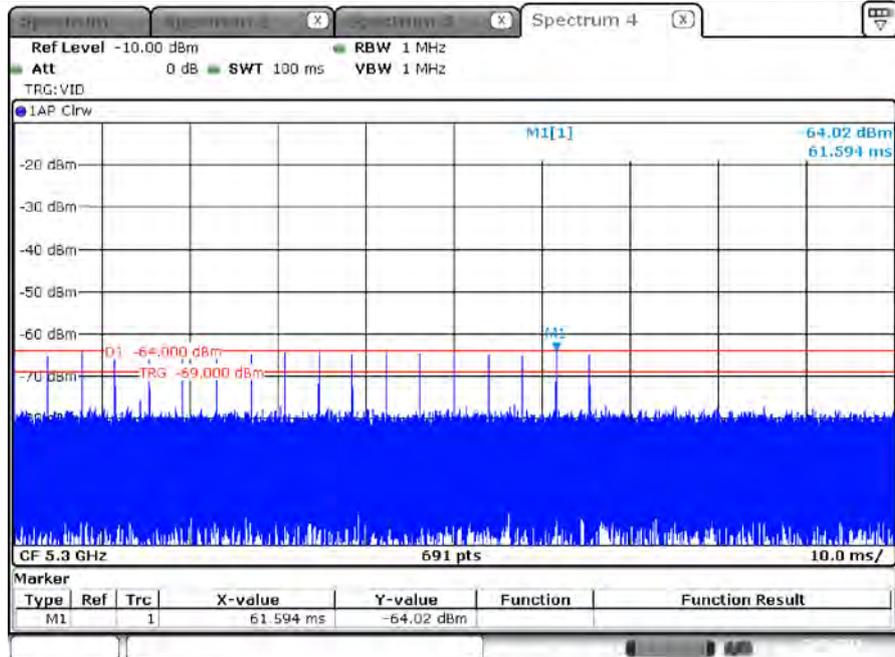
W53 band (5250-5350 MHz)

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



Date: 22 SEP 2019 06:42:08

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

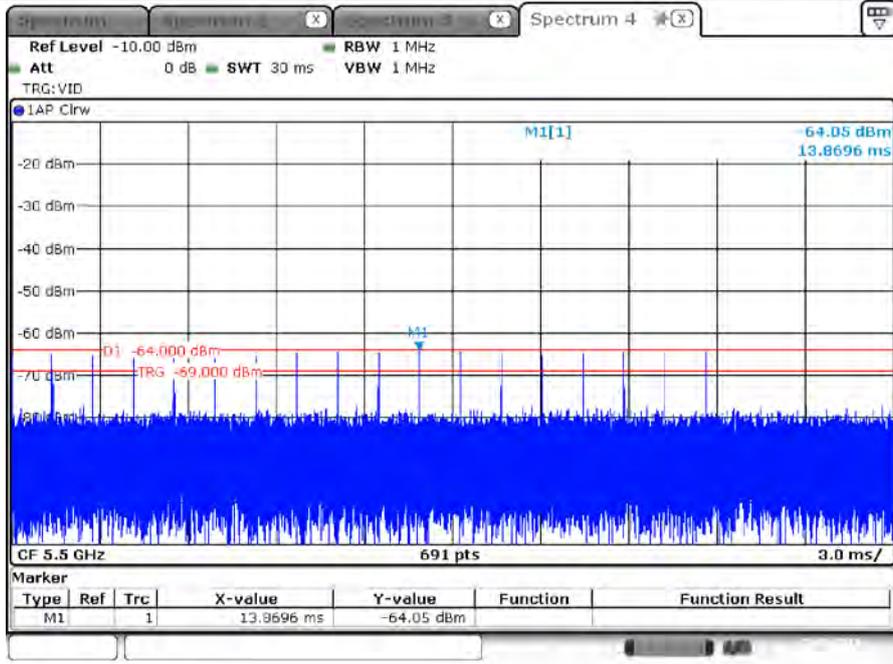


Date: 22 SEP 2019 06:42:50



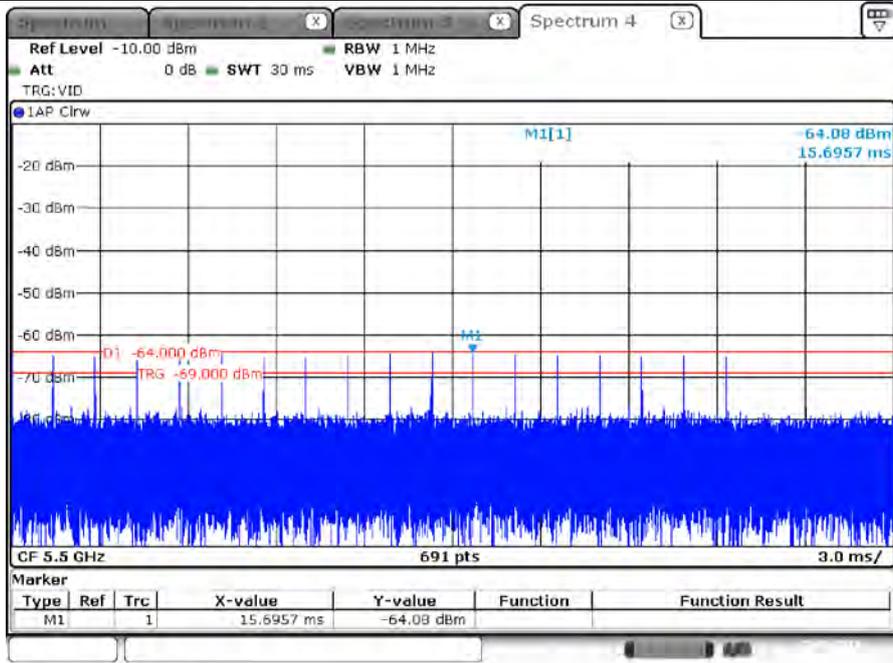
W56 band (5470-5725 MHz)

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



Date: 22 SEP 2019 06:44:10

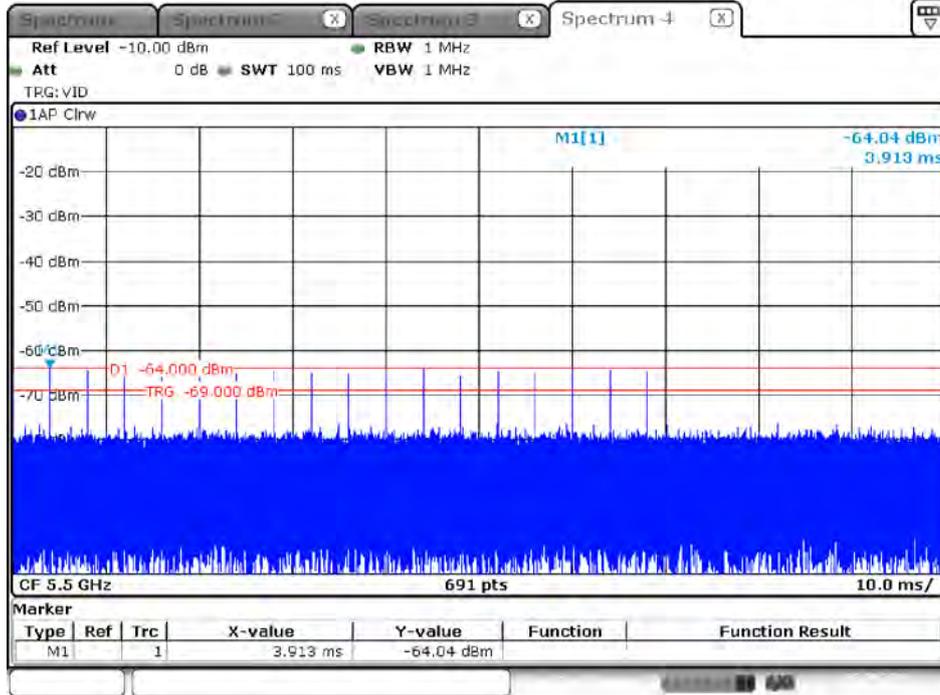
Radar #2 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 22 SEP 2019 06:45:00

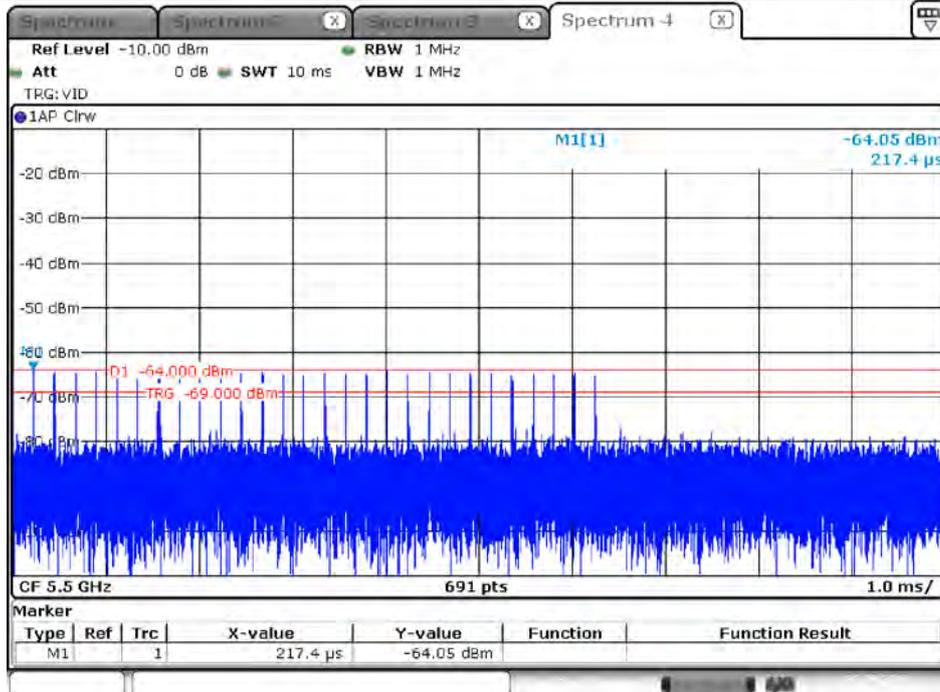


Radar #3 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 22.SEP.2019 06:45:41

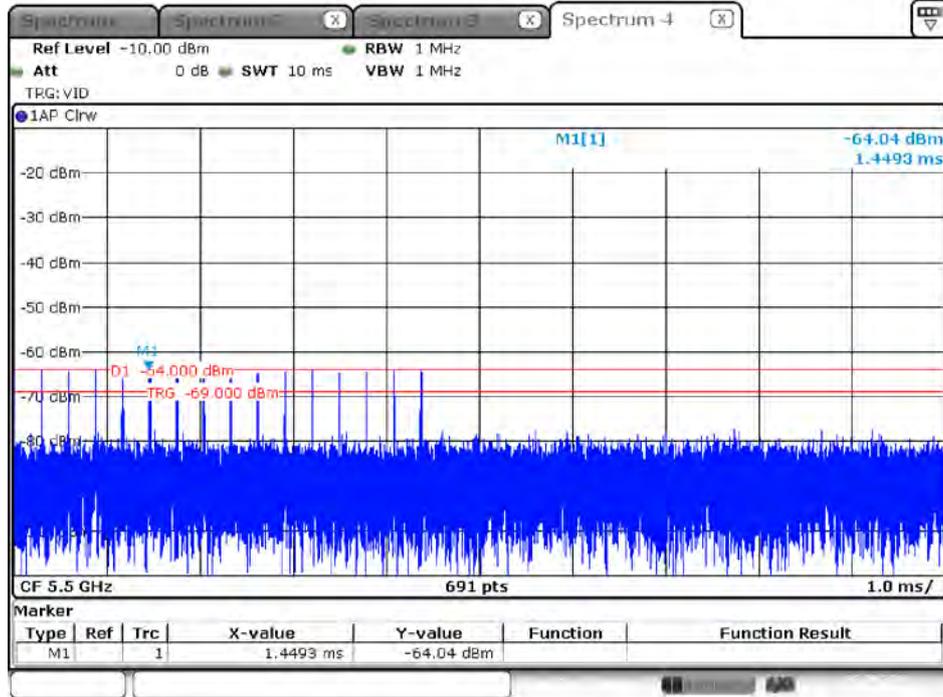
Radar #4 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 22.SEP.2019 06:46:37

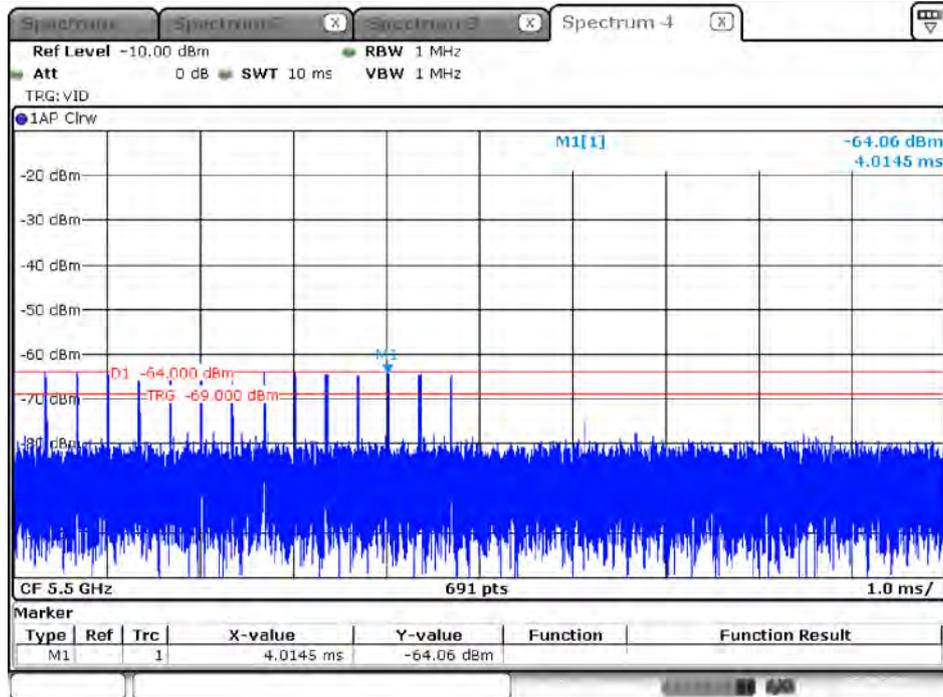


Radar #5 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 22.SEP.2019 06:47:26

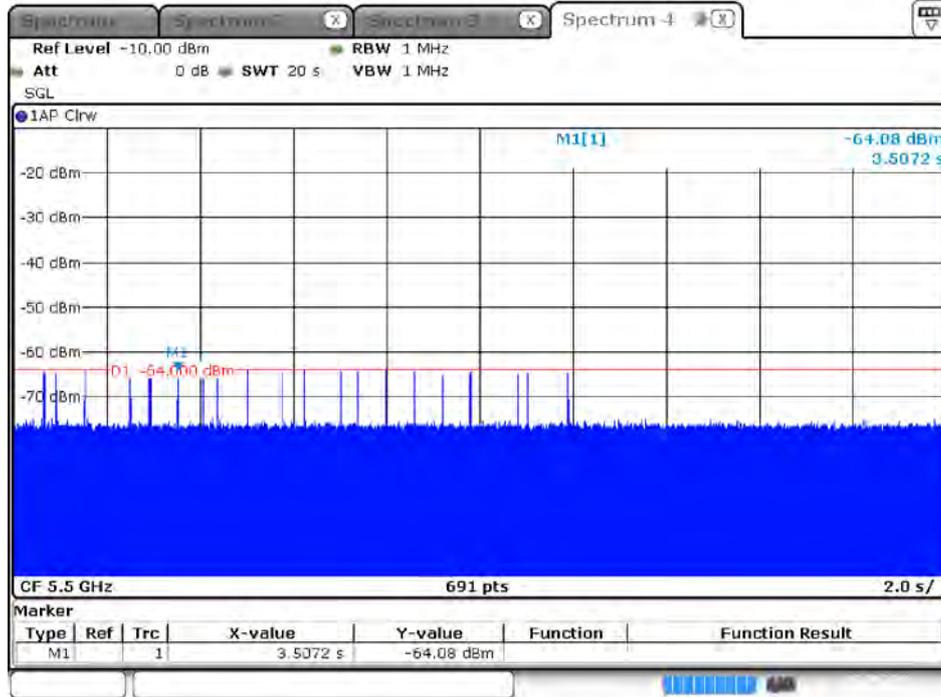
Radar #6 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 22.SEP.2019 06:47:55

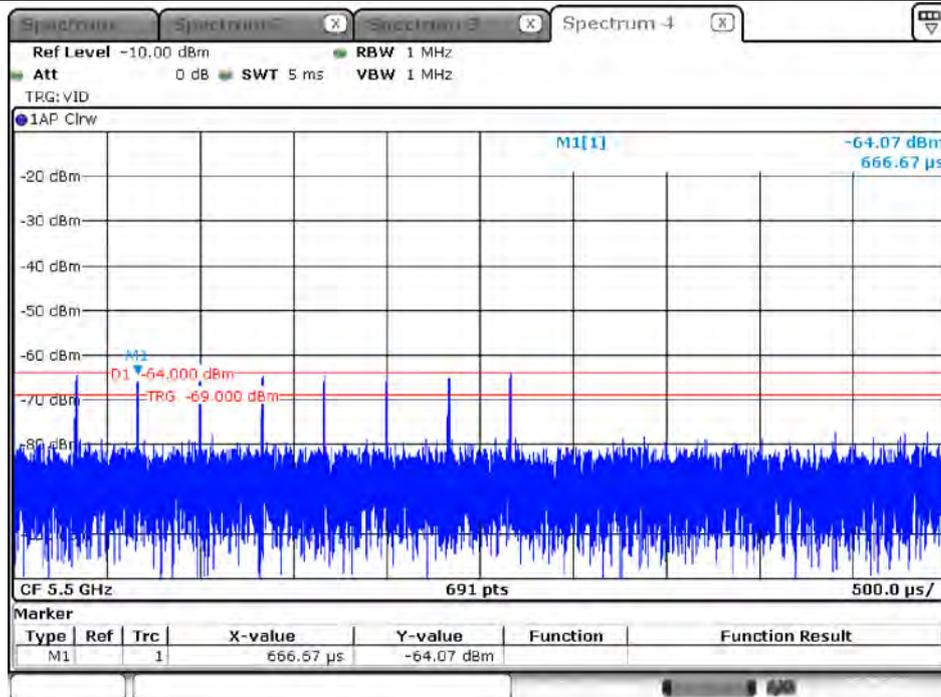


Radar #7 DFS detection threshold level and the burst of pulses on the Channel frequency



Date: 22.SEP.2019 06:55:35

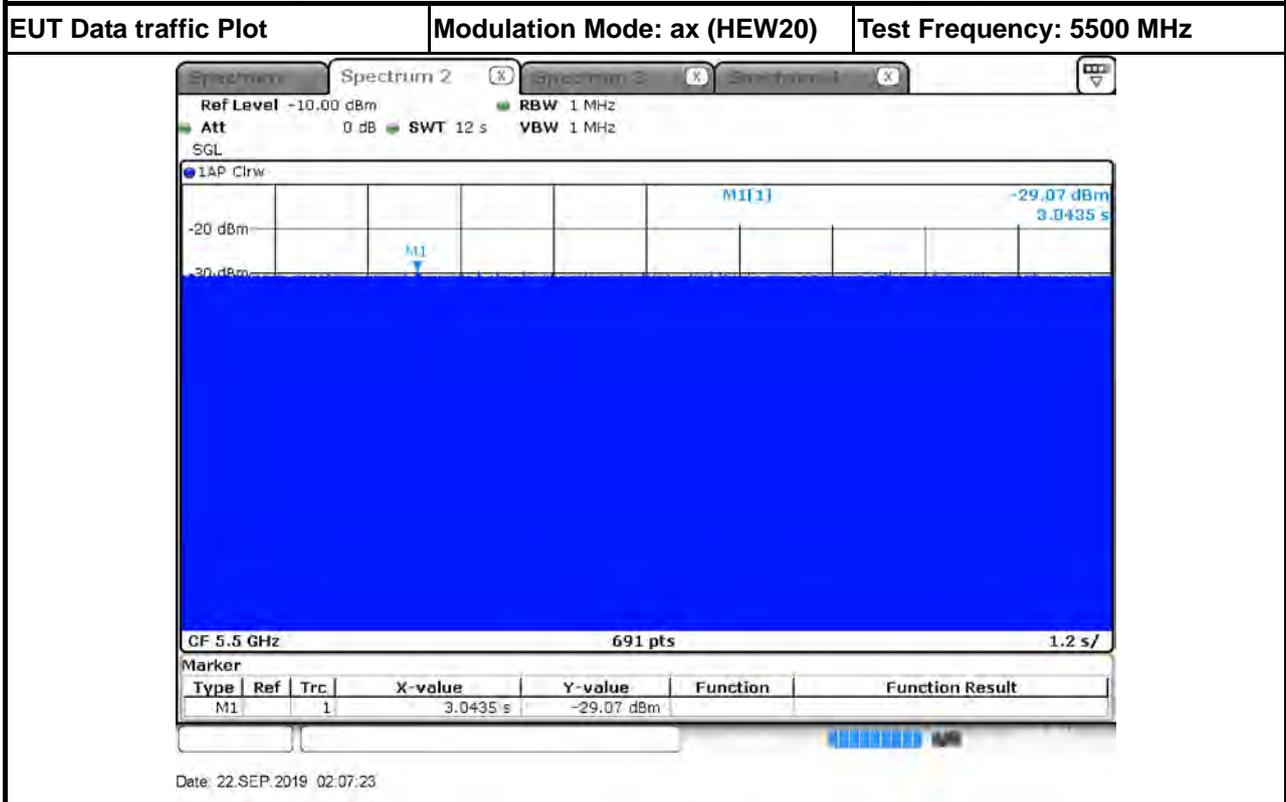
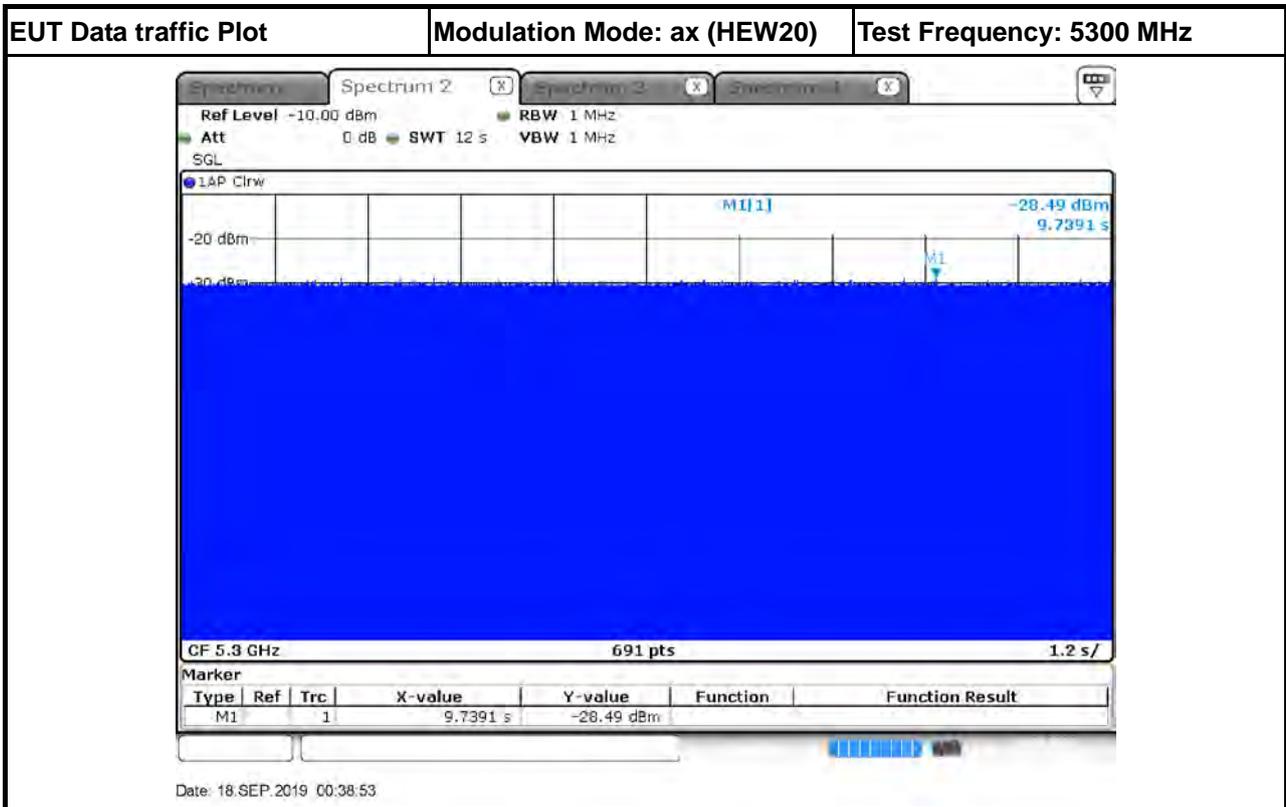
Radar #8 DFS detection threshold level and a single hop (9 pulses) on the Channel frequency within UNII detection bandwidth.

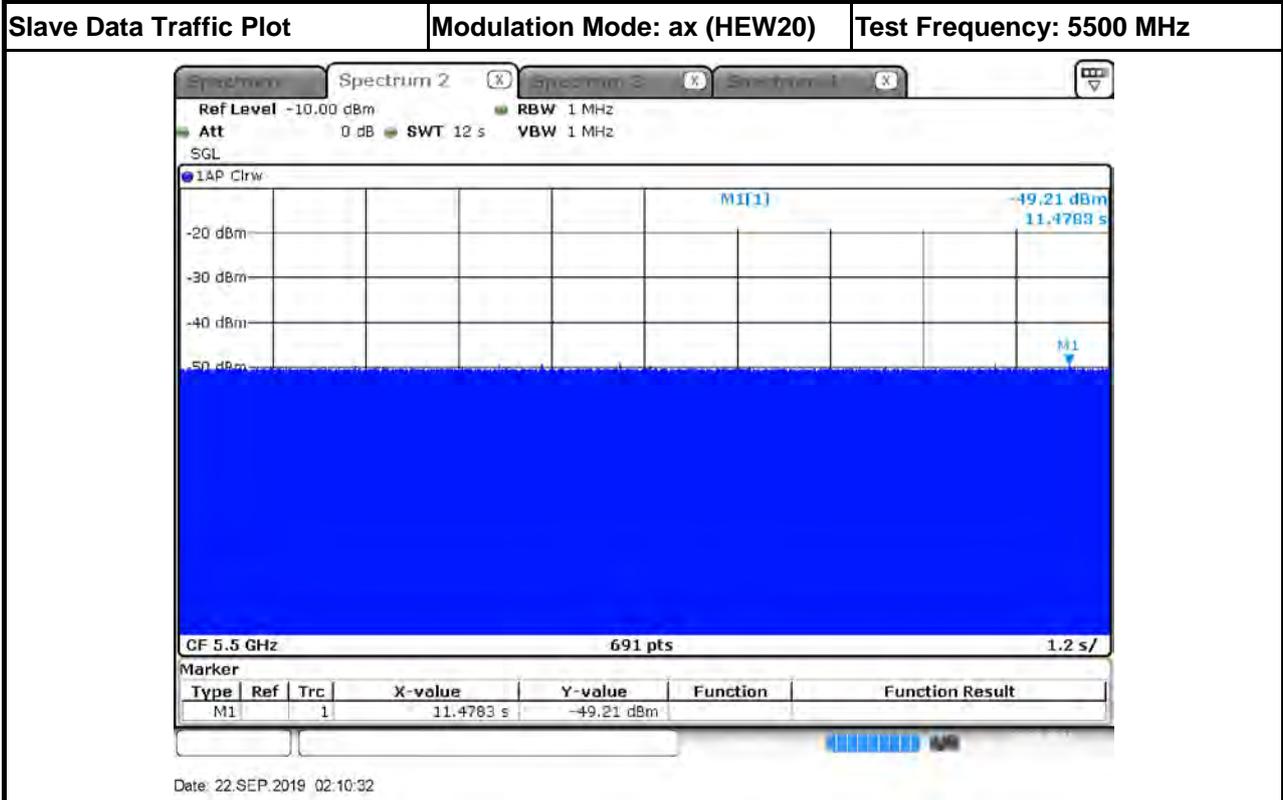
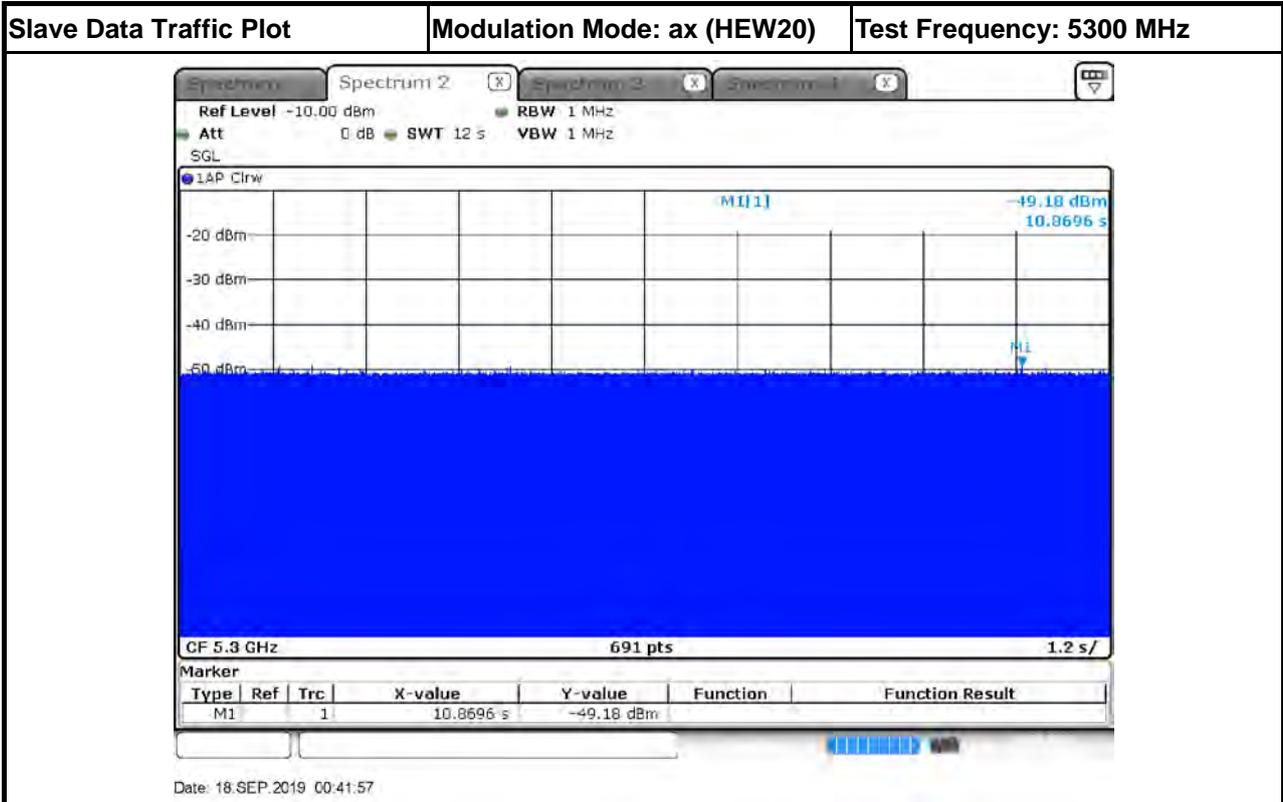


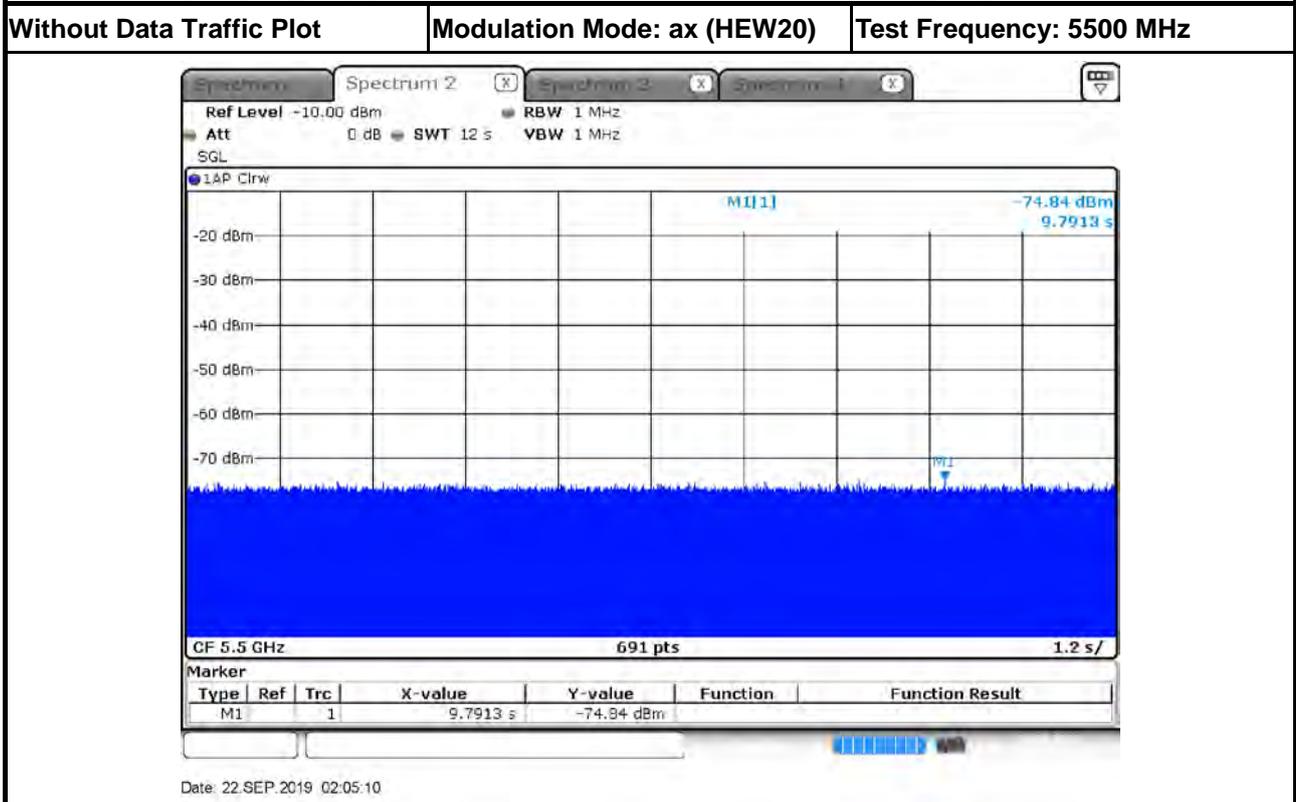
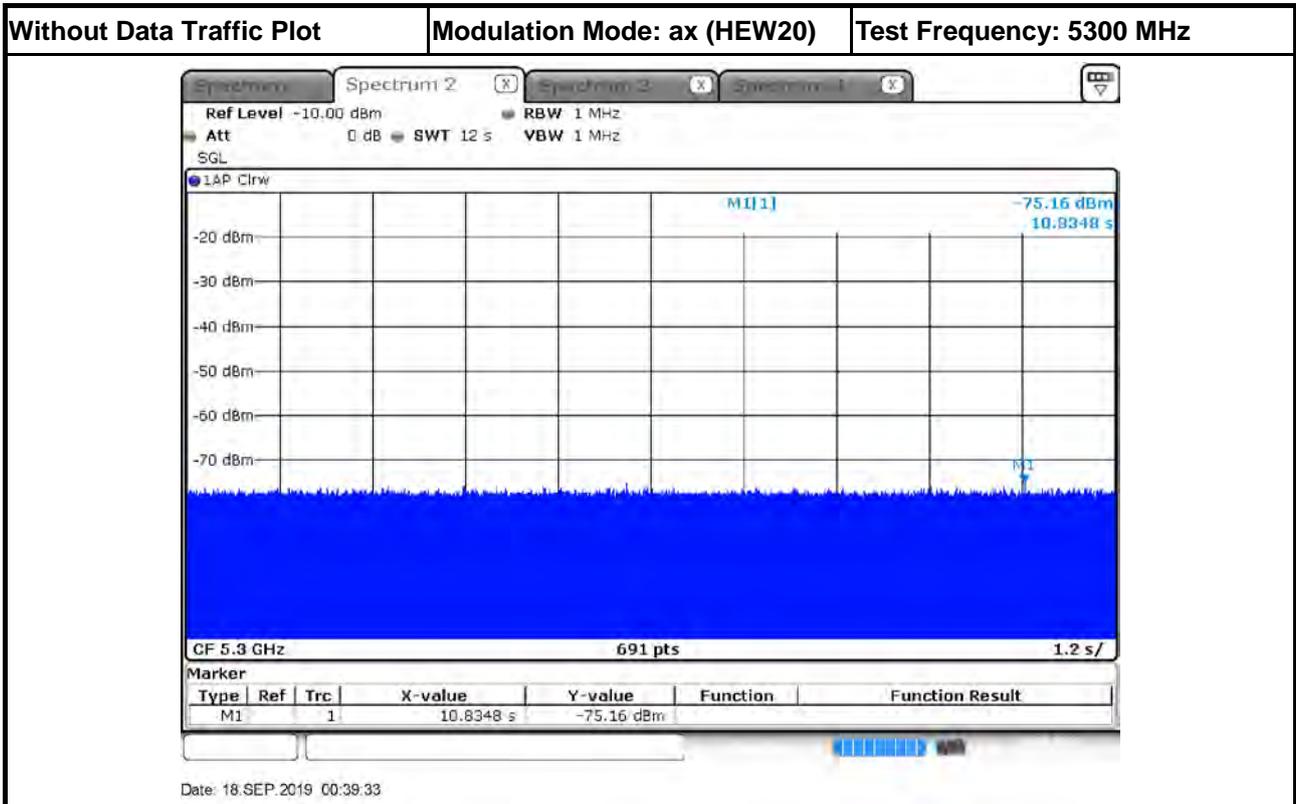
Date: 22.SEP.2019 06:52:38



3.1.7 Data traffic Plot







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

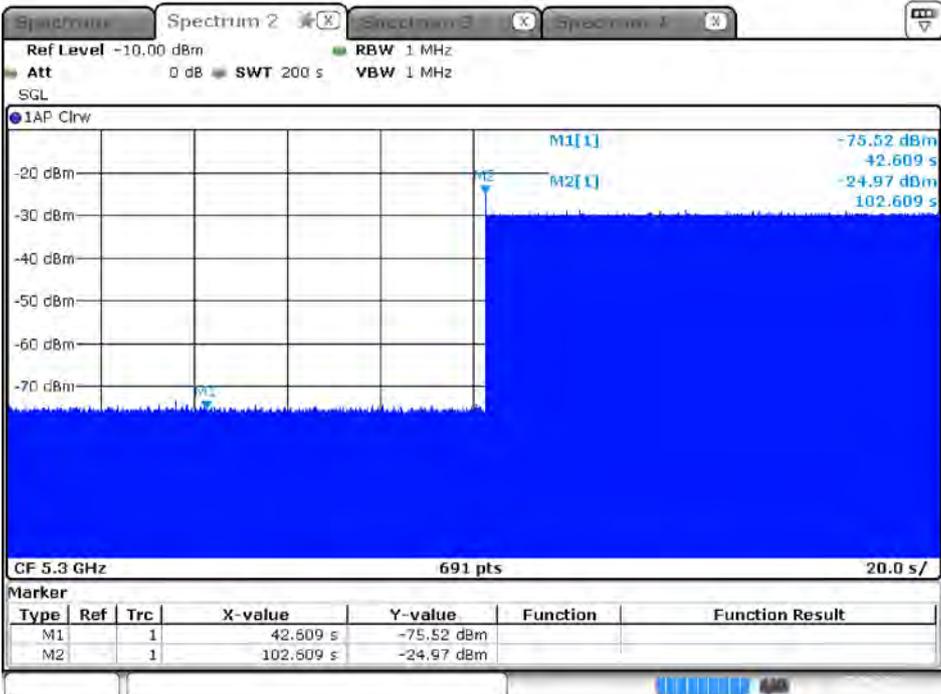
Test Method for W53	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/26.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/26.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/26.4
Presentation of Results	MIC Notice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

W53 band (5250-5350 MHz)	Modulation Mode: ax (HEW20)
---------------------------------	------------------------------------

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.609 sec). The initial power up time of the EUT is indicated by marker 1 (42.609 sec). Initial beacons/data transmissions are indicated by marker 2 (102.609 sec).



Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	42.609 s	-75.52 dBm		
M2		1	102.609 s	-24.97 dBm		

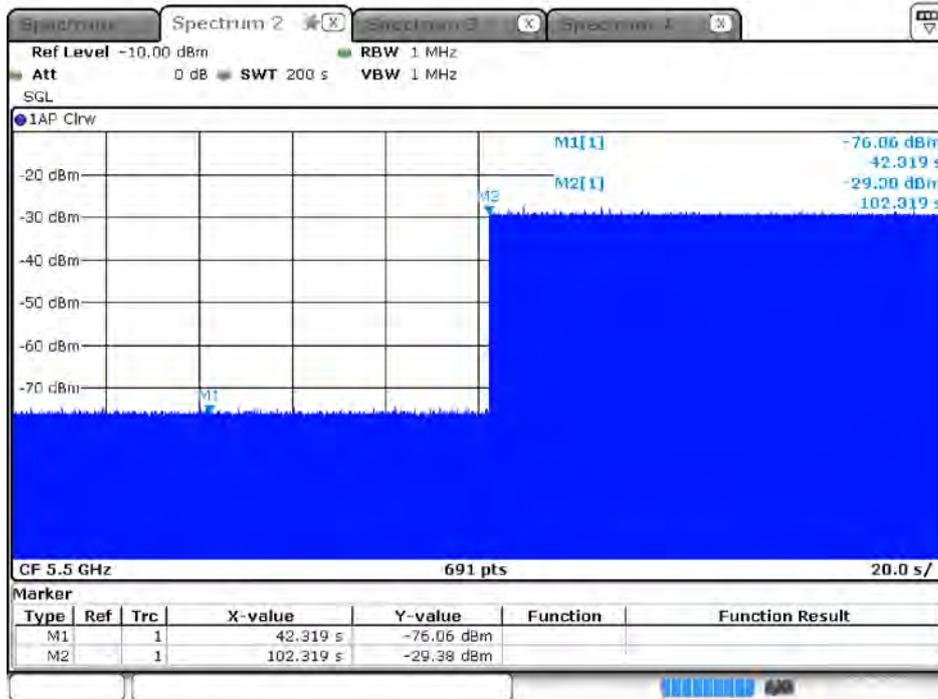
Date: 17.SEP.2019 01:41:23



W56 band (5470-5725 MHz)

Modulation Mode: ax (HEW20)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.319 sec). The initial power up time of the EUT is indicated by marker 1 (42.319 sec). Initial beacons/data transmissions are indicated by marker 2 (102.319 sec).



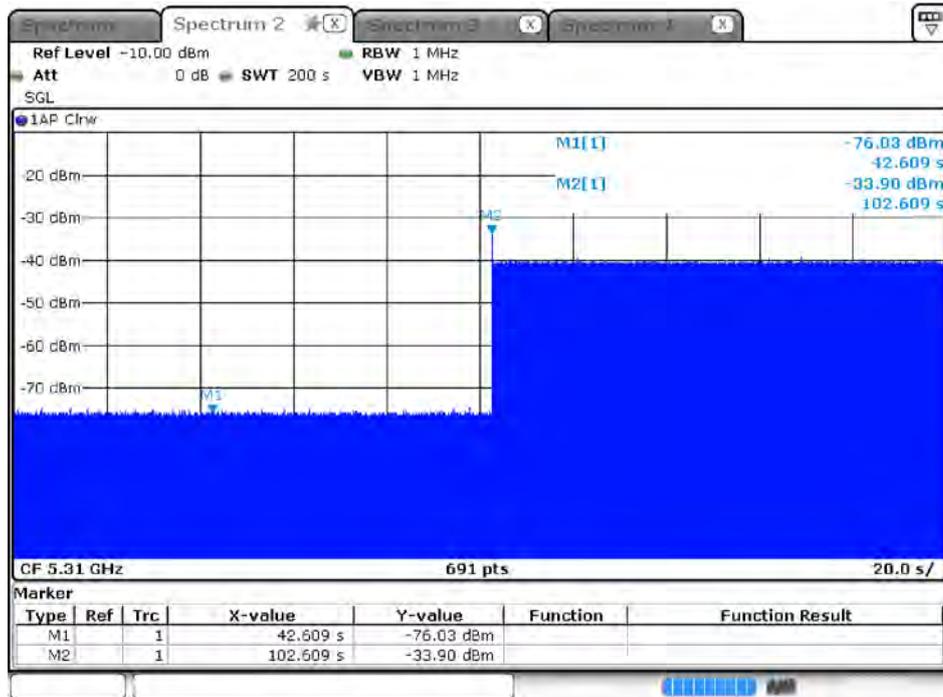
Date: 22.SEP.2019 00:56:12



W53 band (5250-5350 MHz)

Modulation Mode: ax (HEW40)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.609 sec). The initial power up time of the EUT is indicated by marker 1 (42.609 sec). Initial beacons/data transmissions are indicated by marker 2 (102.609 sec).



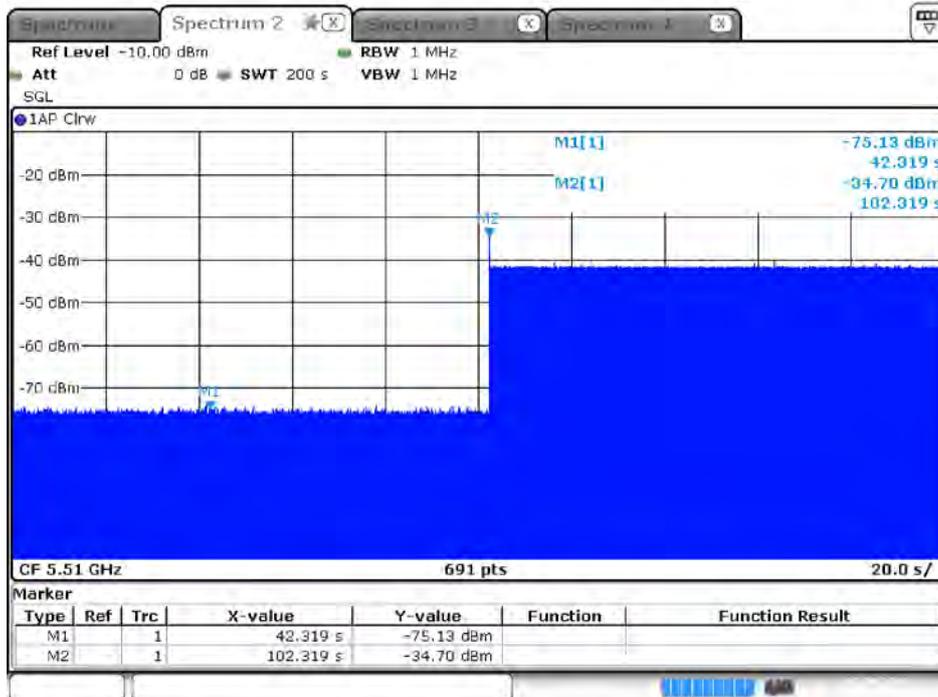
Date: 22.SEP.2019 06:37:56



W56 band (5470-5725 MHz)

Modulation Mode: ax (HEW40)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.319 sec). The initial power up time of the EUT is indicated by marker 1 (42.319 sec). Initial beacons/data transmissions are indicated by marker 2 (102.319 sec).



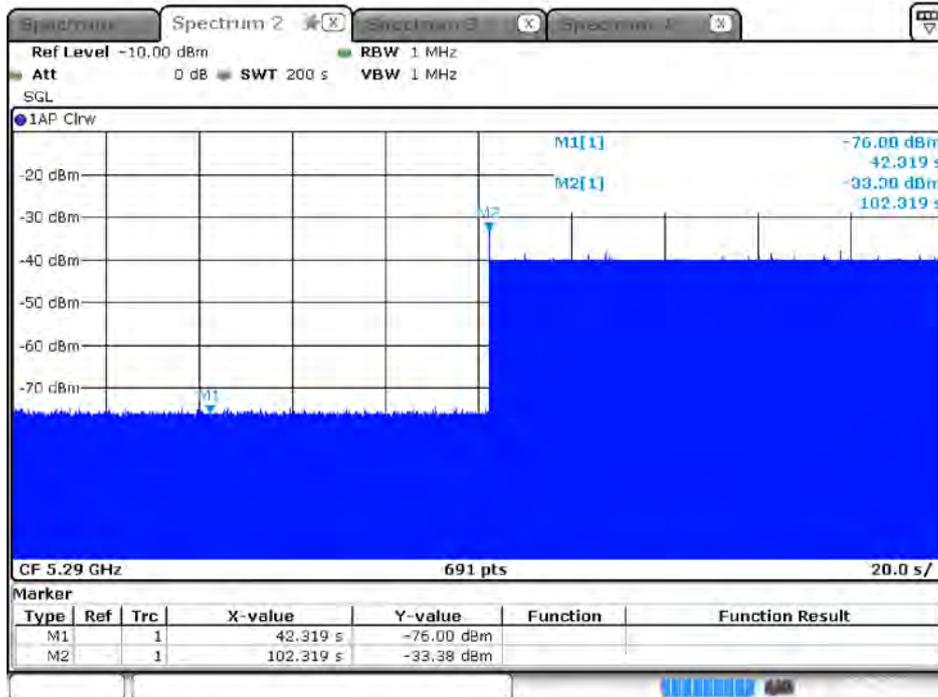
Date: 22.SEP.2019 00:29:55



W53 band (5250-5350 MHz)

Modulation Mode: ax (HEW80)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.319 sec). The initial power up time of the EUT is indicated by marker 1 (42.319 sec). Initial beacons/data transmissions are indicated by marker 2 (102.319 sec).



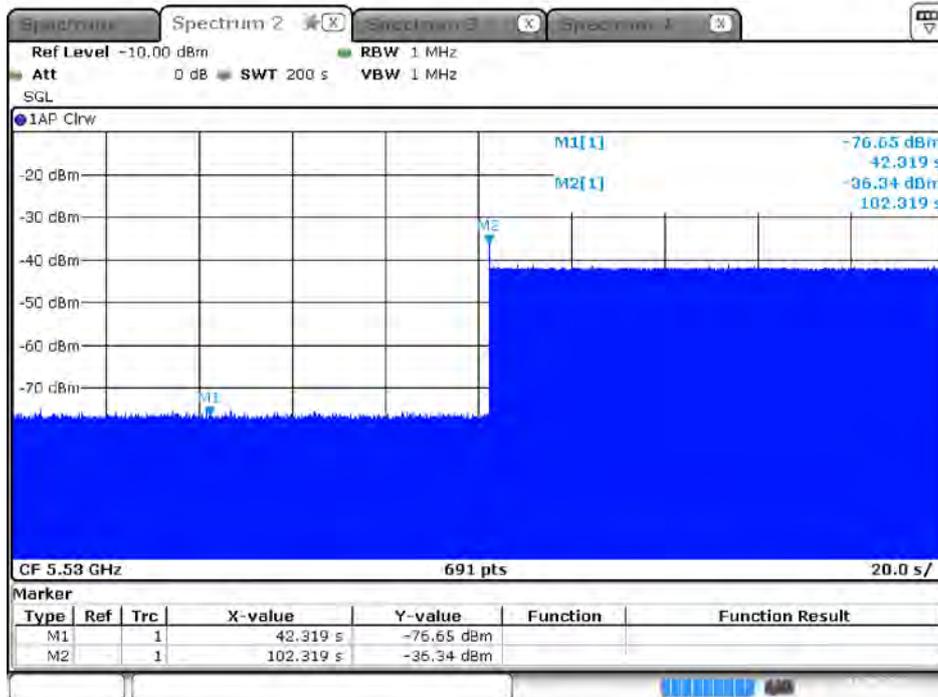
Date: 22.SEP.2019 05:36:47



W56 band (5470-5725 MHz)

Modulation Mode: ax (HEW80)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.319 sec). The initial power up time of the EUT is indicated by marker 1 (42.319 sec). Initial beacons/data transmissions are indicated by marker 2 (102.319 sec).



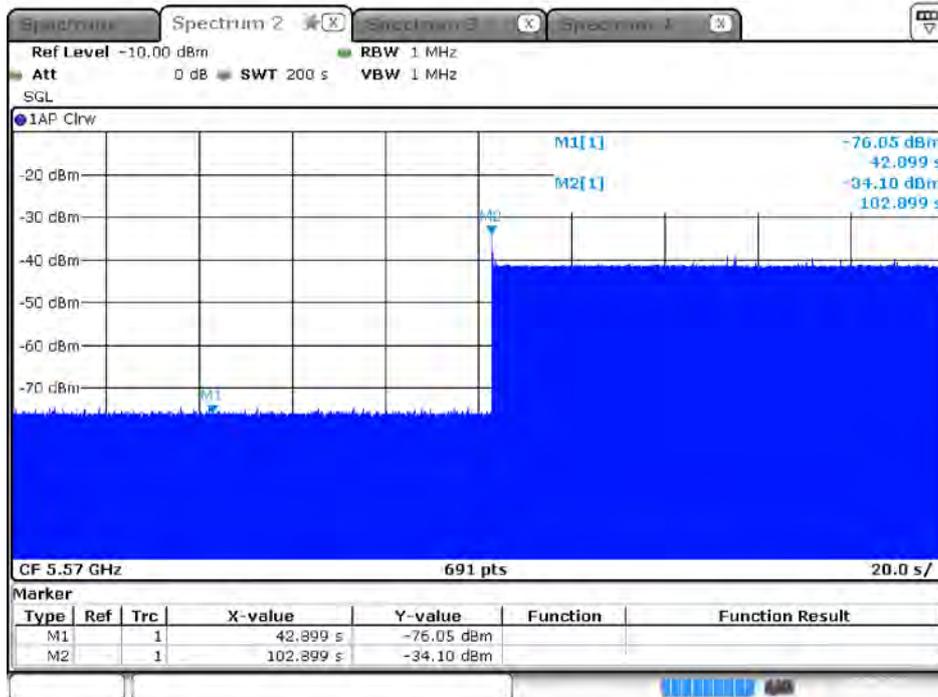
Date: 21.SEP 2019 21:54:17



W56 band (5470-5725 MHz)

Modulation Mode: ax (HEW160)

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (42.899 sec). The initial power up time of the EUT is indicated by marker 1 (42.899 sec). Initial beacons/data transmissions are indicated by marker 2 (102.899 sec).



Date: 18.SEP.2019 01:29:24



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 (%)
ax (HEW20)	5300	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
ax (HEW20)	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 (%)
ax (HEW40)	5310	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
ax (HEW40)	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 (%)
ax (HEW80)	5290	1 - Fixed	4	100	100
		2 - Fixed	4	100	100
ax (HEW80)	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			

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 (%)
ax (HEW160)	5570	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 (%)
ax (HEW20)	5300	1 - Fixed	17	85	60
		2 - Fixed	18	90	60
ax (HEW20)	5500	1 - Fixed	18	90	60
		2 - Fixed	17	85	60
		3 - Fixed	18	90	60
		4 - Variable	18	90	60
		5 - Variable	17	85	60
		6 - Variable	16	80	60
		7 - Chirp	18	90	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 (#)	Nr of Times Triggered (# out of 20)	Detection Probability (%)	Detection Probability Limit (%)
ax (HEW40)	5310	1 - Fixed	16	80	60
		2 - Fixed	17	85	60
ax (HEW40)	5510	1 - Fixed	18	90	60
		2 - Fixed	19	95	60
		3 - Fixed	18	90	60
		4 - Variable	17	85	60
		5 - Variable	18	90	60
		6 - Variable	16	80	60
		7 - Chirp	18	90	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 (#)	Nr of Times Triggered (# out of 20)	Detection Probability (%)	Detection Probability Limit (%)
ax (HEW80)	5290	1 - Fixed	16	80	60
		2 - Fixed	15	75	60
ax (HEW80)	5530	1 - Fixed	18	90	60
		2 - Fixed	17	85	60
		3 - Fixed	18	90	60
		4 - Variable	18	90	60
		5 - Variable	16	80	60
		6 - Variable	15	75	60
		7 - Chirp	18	90	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 (#)	Nr of Times Triggered (# out of 20)	Detection Probability (%)	Detection Probability Limit (%)
ax (HEW160)	5570	1 - Fixed	18	90	60
		2 - Fixed	19	95	60
		3 - Fixed	18	90	60
		4 - Variable	19	95	60
		5 - Variable	19	95	60
		6 - Variable	18	90	60
		7 - Chirp	18	90	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 (%)
ax (HEW20)	5500	1 - Fixed	90	60
		2 - Fixed	85	
		3 - Fixed	90	
		4 - Variable	90	
		5 - Variable	85	
		6 - Variable	80	
		Total	87	80
ax (HEW40)	5510	1 - Fixed	90	60
		2 - Fixed	95	
		3 - Fixed	90	
		4 - Variable	85	
		5 - Variable	90	
		6 - Variable	80	
		Total	88	80
ax (HEW80)	5530	1 - Fixed	90	60
		2 - Fixed	85	
		3 - Fixed	90	
		4 - Variable	90	
		5 - Variable	80	
		6 - Variable	75	
		Total	85	80
ax (HEW160)	5570	1 - Fixed	90	60
		2 - Fixed	95	
		3 - Fixed	90	
		4 - Variable	95	
		5 - Variable	95	
		6 - Variable	90	
		Total	93	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

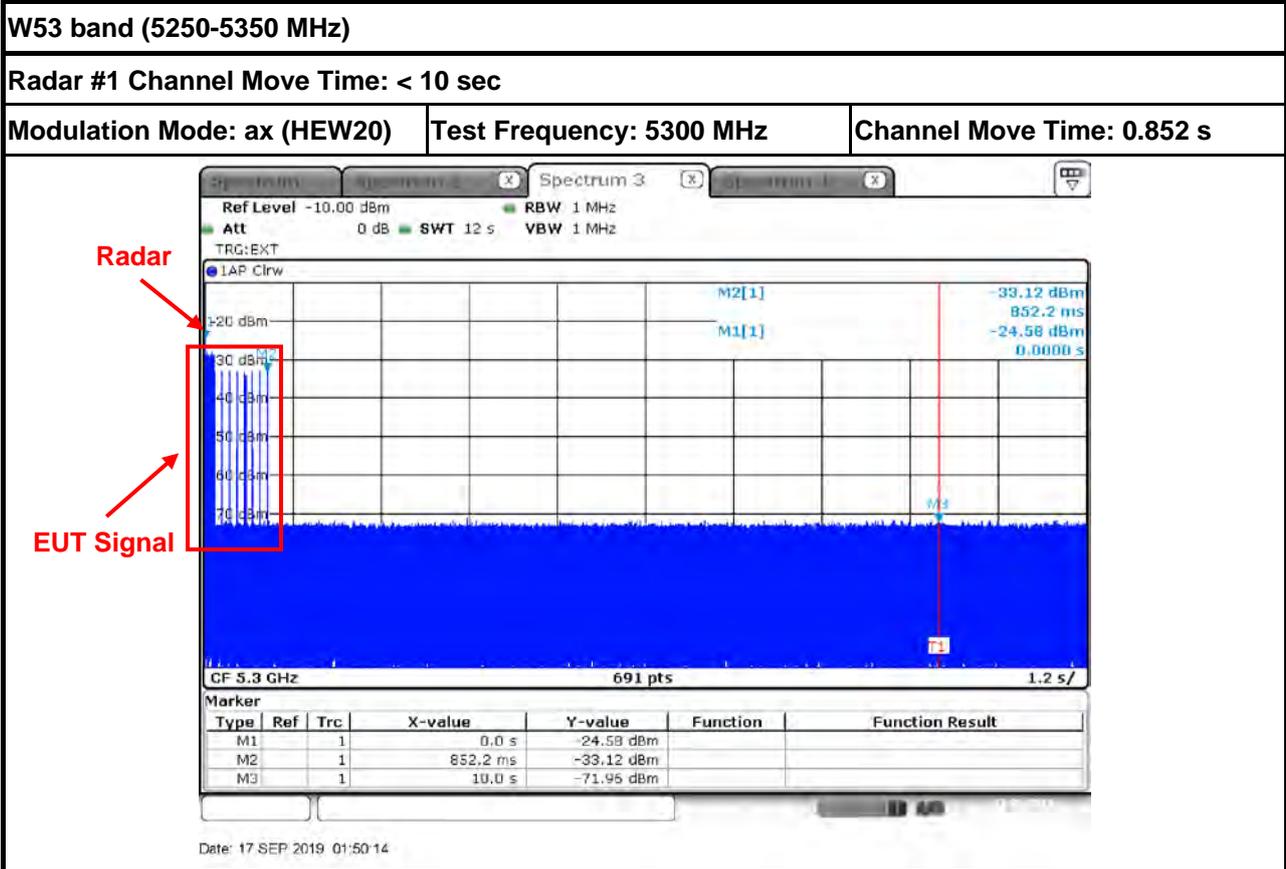
Test Method for W56	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.45, clause 13.2/27.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.45, clause 13.3/27.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.45, clause 13.4/27.4
Presentation of Results	MIC Notice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

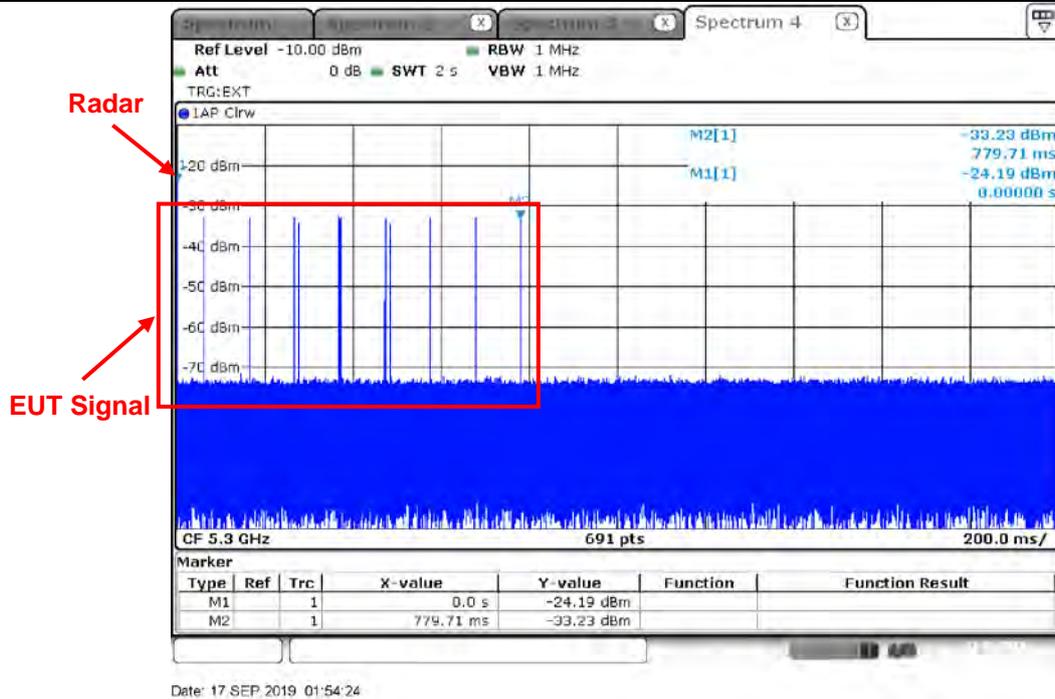
Channel Shutdown and Non-Occupancy Period Result				
Detection Threshold Level (dBm)			-64	
Modulation Mode	Freq. (MHz)	Radar Test Signal	Channel Closing Transmission Time (ms)	Channel Move Time (s)
ax (HEW20)	5300	1 - Fixed	31.884	0.852
ax (HEW20)	5500	2 - Fixed	86.956	0.956
ax (HEW40)	5310	1 - Fixed	55.072	0.921
ax (HEW40)	5510	2 - Fixed	57.971	0.887
ax (HEW80)	5290	1 - Fixed	66.666	0.834
ax (HEW80)	5530	2 - Fixed	72.463	0.834
ax (HEW160)	5570	2 - Fixed	72.463	0.782
Limit			260 ms	10 sec
Result			PASS	

3.4.5 Channel Shutdown Plots





Radar #1 Channel Closing Transmission Time: 31.884 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW20)	Test Frequency: 5300 MHz	Number of Sampling Bins (N): 11



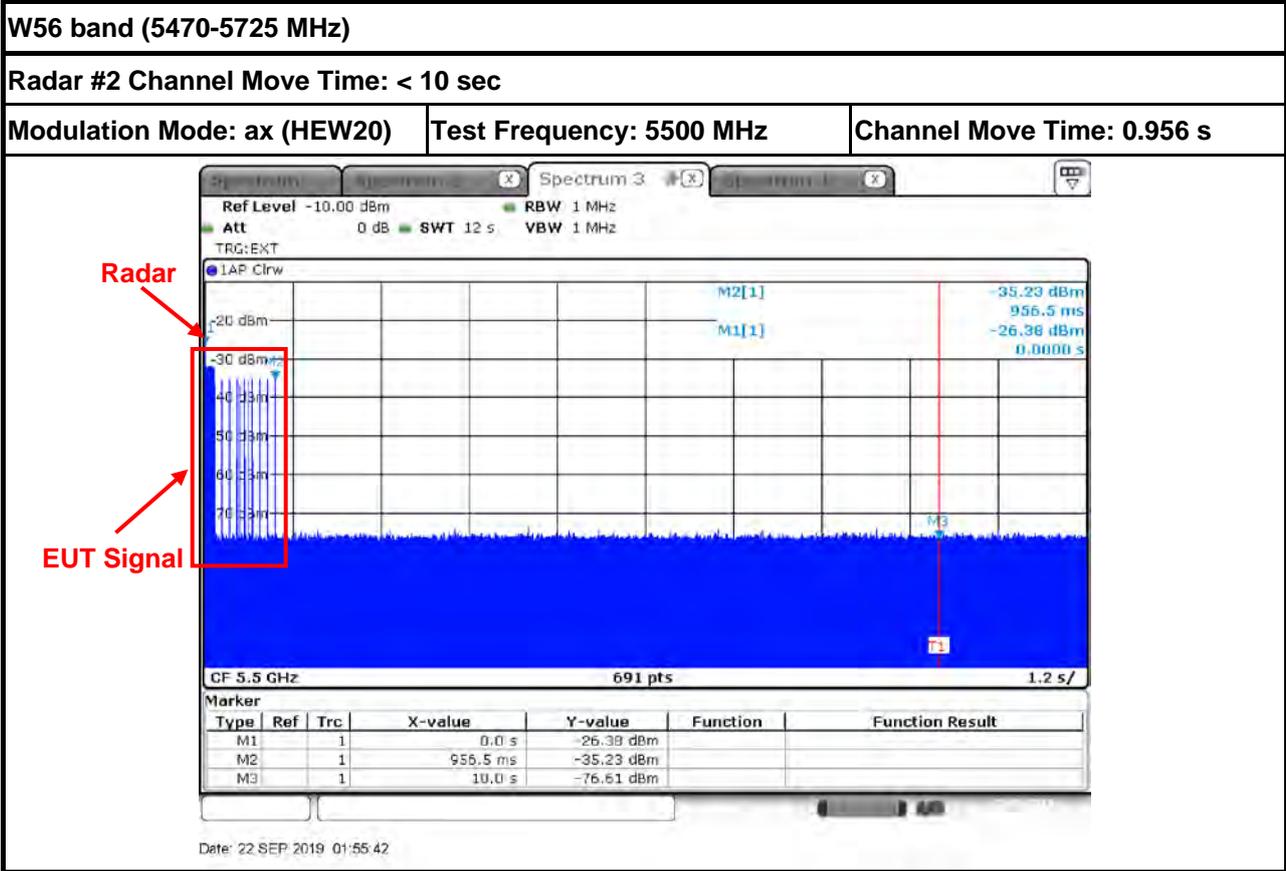
Date: 17 SEP 2019 01:54:24

R&S | Agilent

VISA session GPIB0::20	Threshold (dBm) -60	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 11
	Mean Level (dBm) -33.27	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 31.884058m
	RMS Level (dBm) -33.24	Total Trace of Points 691	Mark 2 Point 691	Duty (%) 1.59

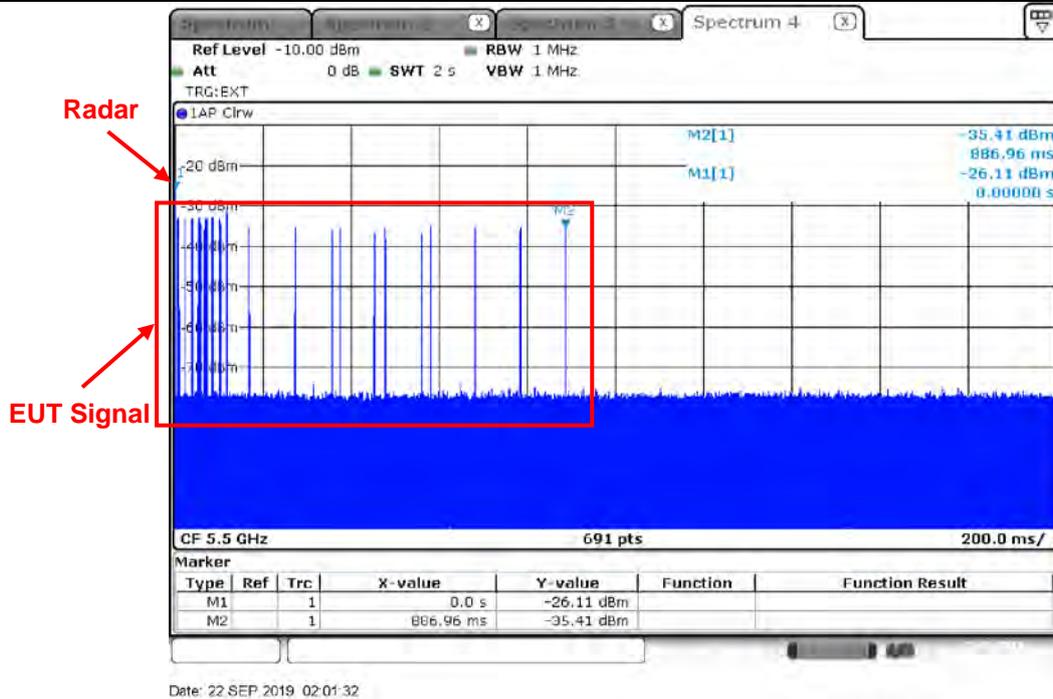
Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=11 x 2.89855ms=31.884ms

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.





Radar #2 Channel Closing Transmission Time: 86.956 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW20)	Test Frequency: 5500 MHz	Number of Sampling Bins (N): 30



R&S | Agilent

VISA session GPIB0::20	Threshold (dBm) -60	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 30
Mean Level (dBm) -34.23	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 86.956522m	
RMS Level (dBm) -33.97	Total Trace of Points 691	Mark 2 Point 691	Duty (%) 4.35	

Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=30 x 2.89855ms=86.956ms

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.



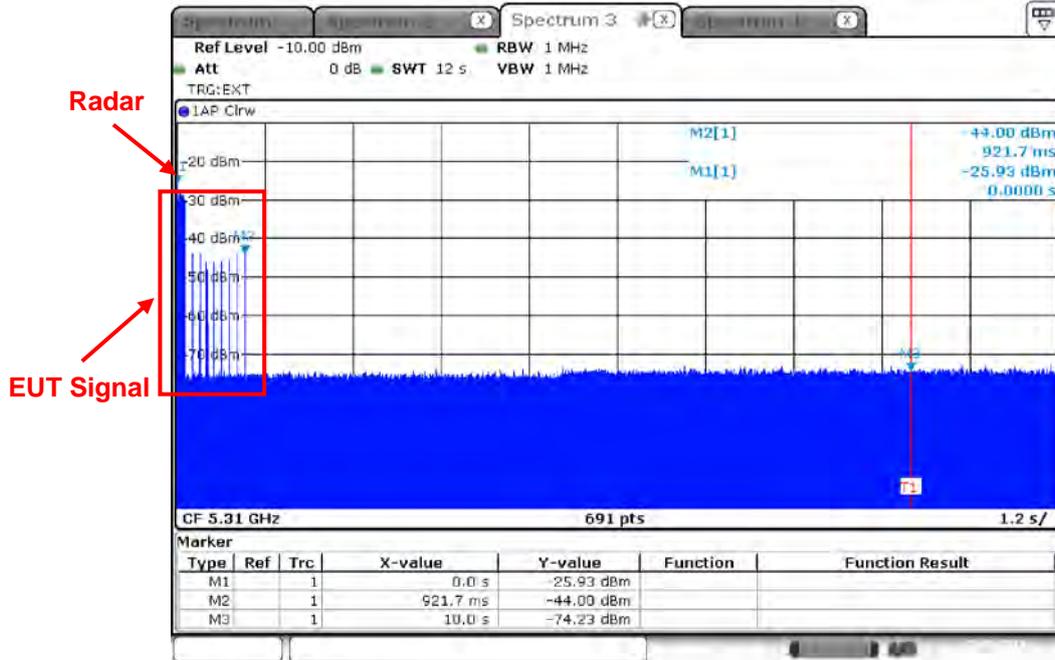
W53 band (5250-5350 MHz)

Radar #1 Channel Move Time: < 10 sec

Modulation Mode: ax (HEW40)

Test Frequency: 5310 MHz

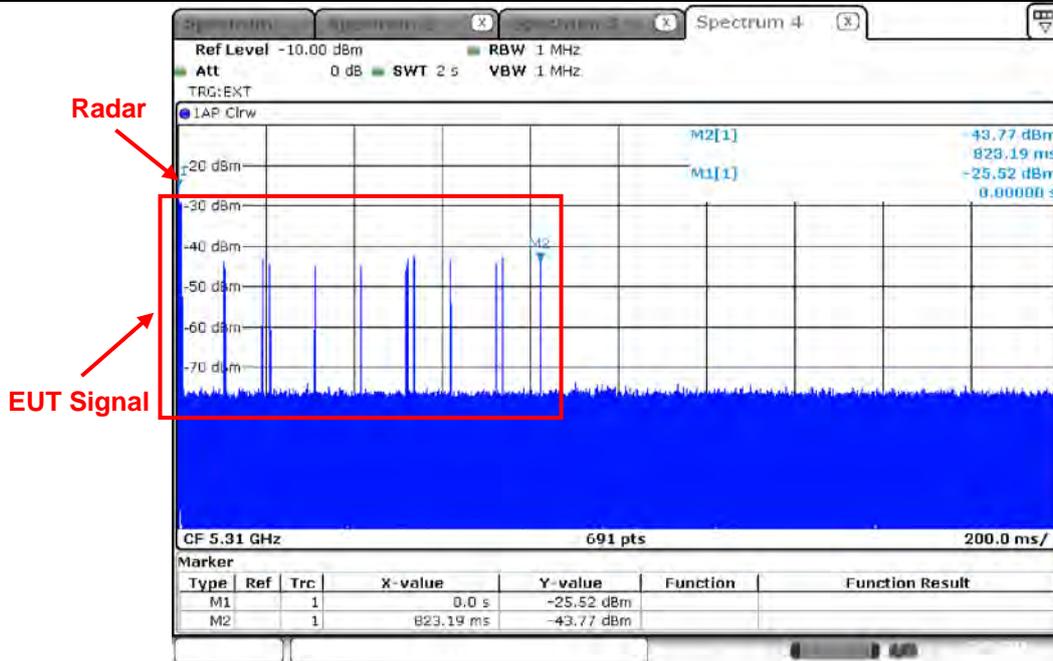
Channel Move Time: 0.921 s



Date: 22 SEP 2019 04:37:05



Radar #1 Channel Closing Transmission Time: 55.072 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW40)	Test Frequency: 5310 MHz	Number of Sampling Bins (N): 19



Date: 22 SEP 2019 04:42:32

R&S | Agilent

VISA session GPIB0::20	Threshold (dBm) -70	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 19
Mean Level (dBm) -36.57	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 55.072464m	Duty (%) 2.75
RMS Level (dBm) -33.19	Total Trace of Points 691	Mark 2 Point 691		

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

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.



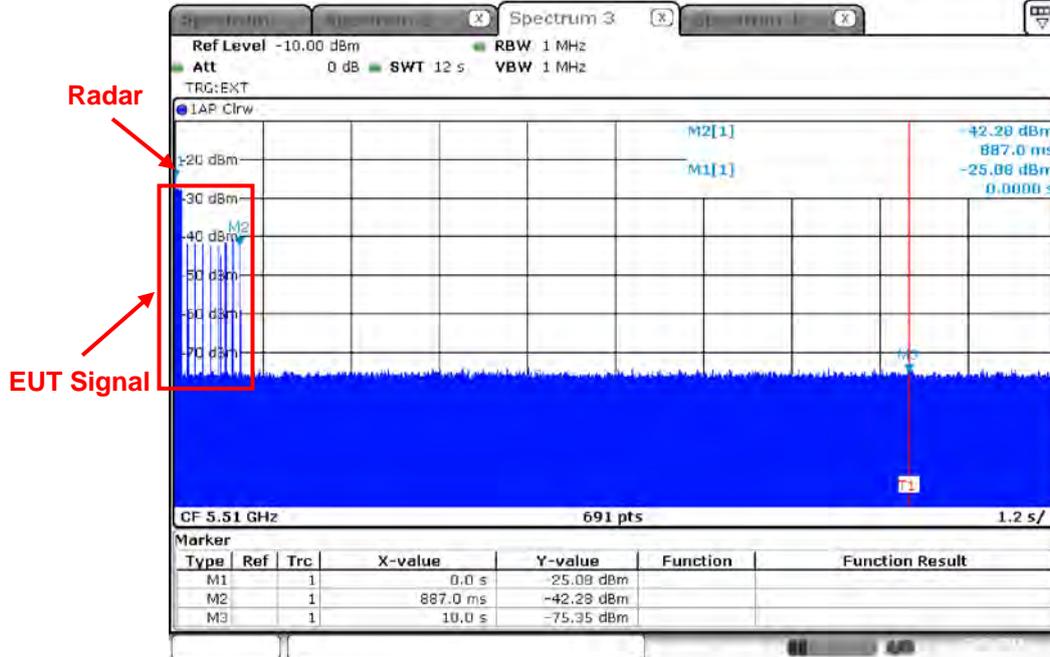
W56 band (5470-5725 MHz)

Radar #2 Channel Move Time: < 10 sec

Modulation Mode: ax (HEW40)

Test Frequency: 5510 MHz

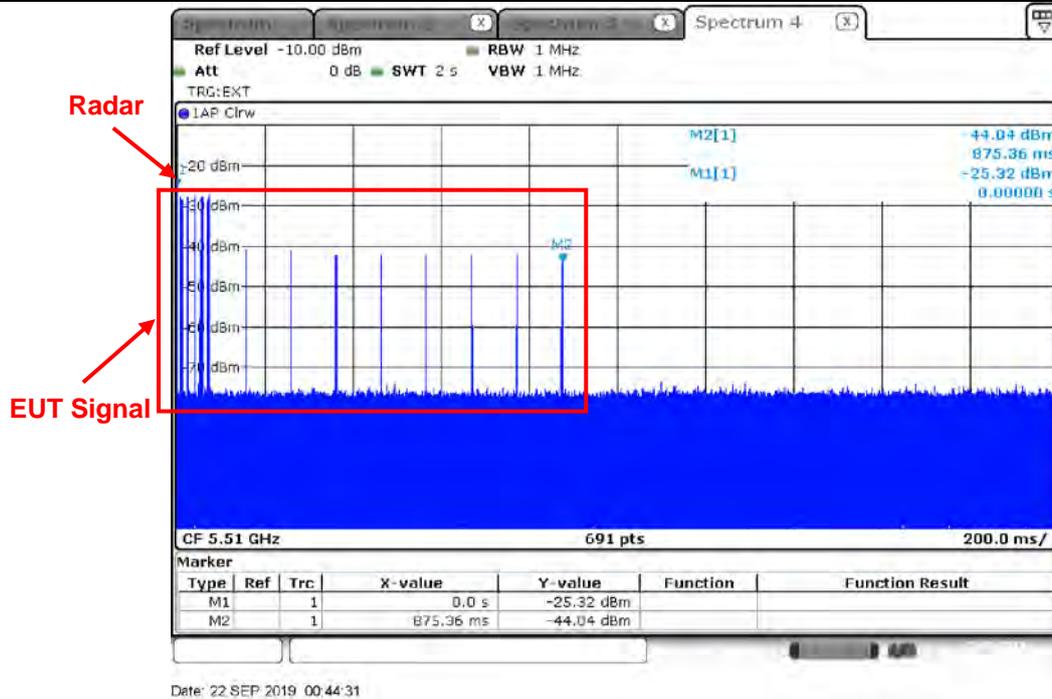
Channel Move Time: 0.887 s



Date: 22 SEP 2019 00:36:12



Radar #2 Channel Closing Transmission Time: 57.971 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW40)	Test Frequency: 5510 MHz	Number of Sampling Bins (N): 20



Date: 22 SEP 2019 00:44:31

R&S Agilent

VISA session 1/0 GPIB0::20:	Threshold (dBm) -60	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 20
Mean Level (dBm) -30.09	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 57.971014m	Duty (%) 2.9
RMS Level (dBm) -28.47	Total Trace of Points 691	Mark 2 Point 691		

Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=20 x 2.89855ms=57.971ms

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.

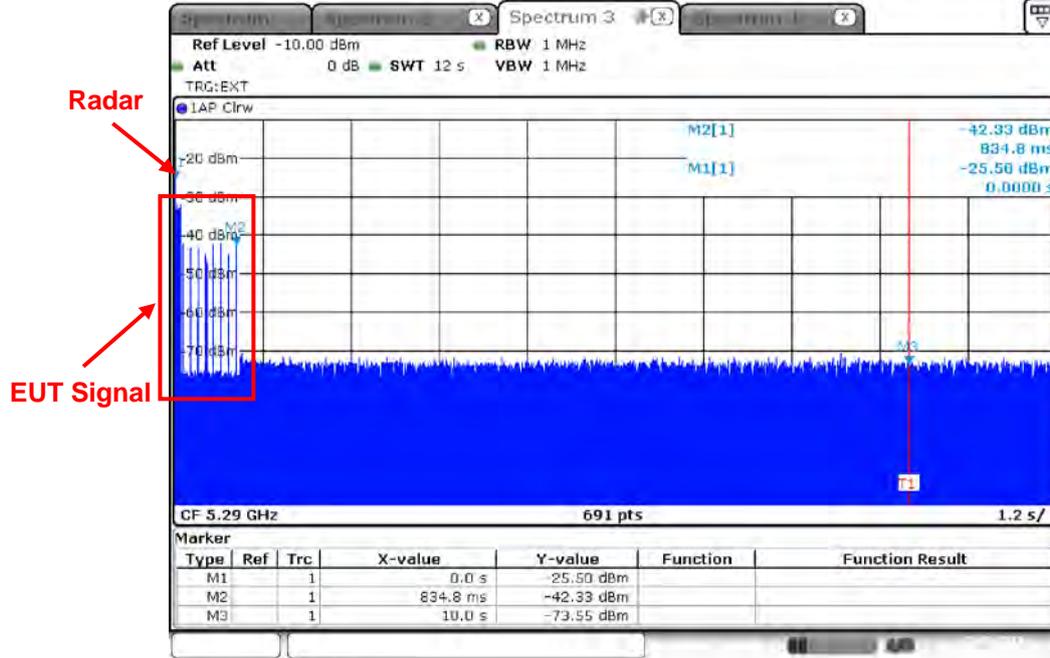
W53 band (5250-5350 MHz)

Radar #1 Channel Move Time: < 10 sec

Modulation Mode: ax (HEW80)

Test Frequency: 5290 MHz

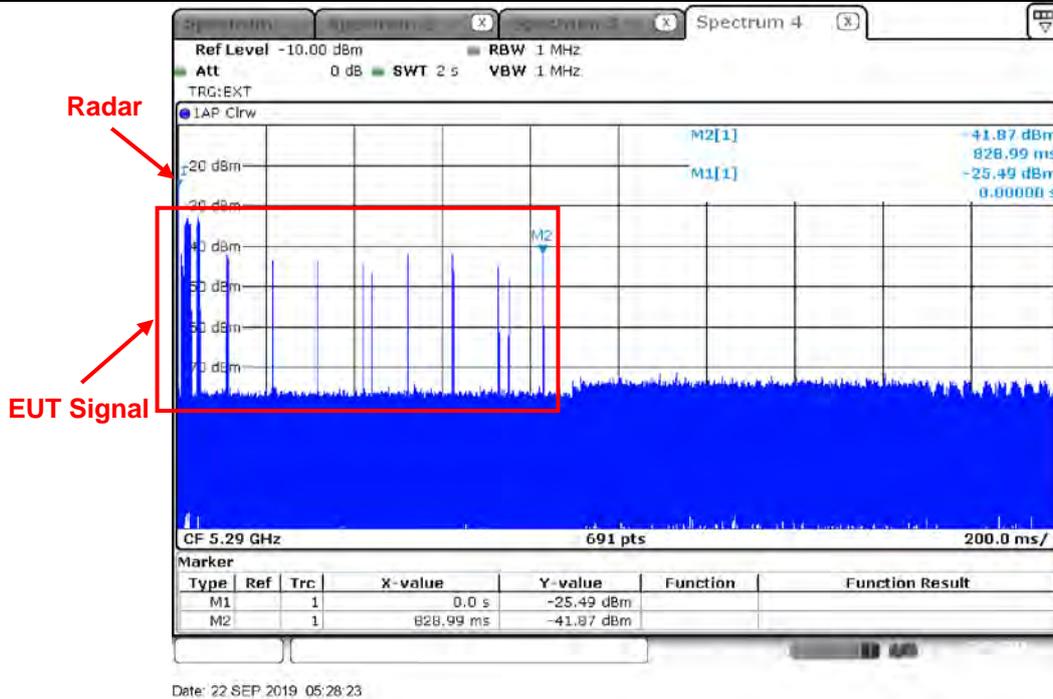
Channel Move Time: 0.834 s



Date: 22.SEP.2019 05:22:01



Radar #1 Channel Closing Transmission Time: 66.666 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW80)	Test Frequency: 5290 MHz	Number of Sampling Bins (N): 23



Date: 22 SEP 2019 05:28:23

R&S Agilent

VISA session GPIB0::20	Threshold (dBm) -70	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 23
	Mean Level (dBm) -37.57	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 66.66667m
	RMS Level (dBm) -36.09	Total Trace of Points 691	Mark 2 Point 691	Duty (%) 3.33

Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=23 x 2.89855ms=66.666ms

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.

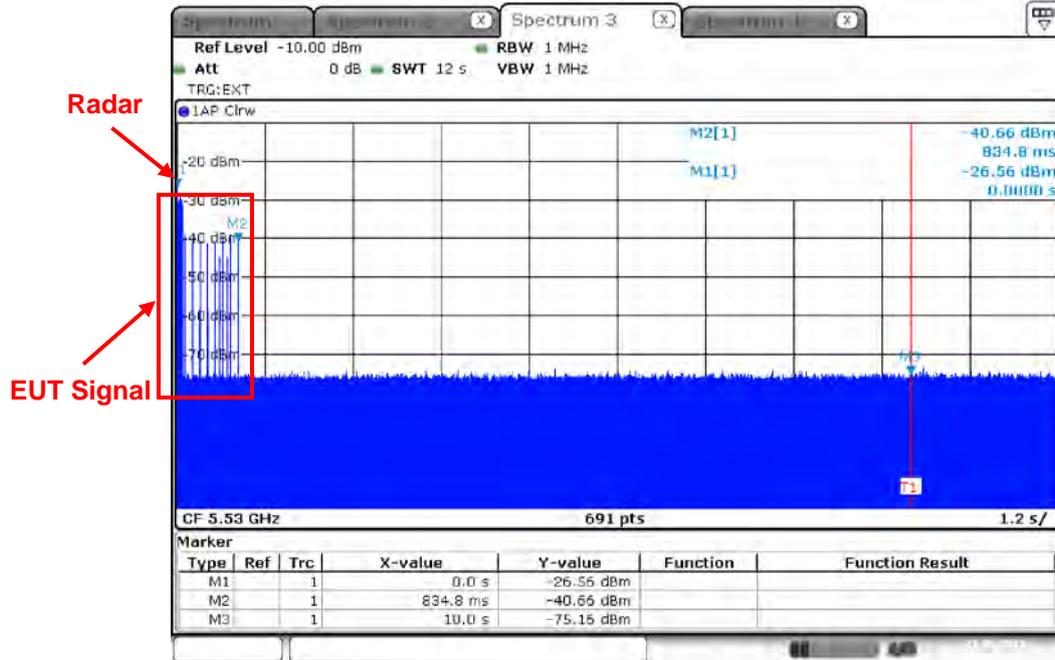
W56 band (5470-5725 MHz)

Radar #2 Channel Move Time: < 10 sec

Modulation Mode: ax (HEW80)

Test Frequency: 5530 MHz

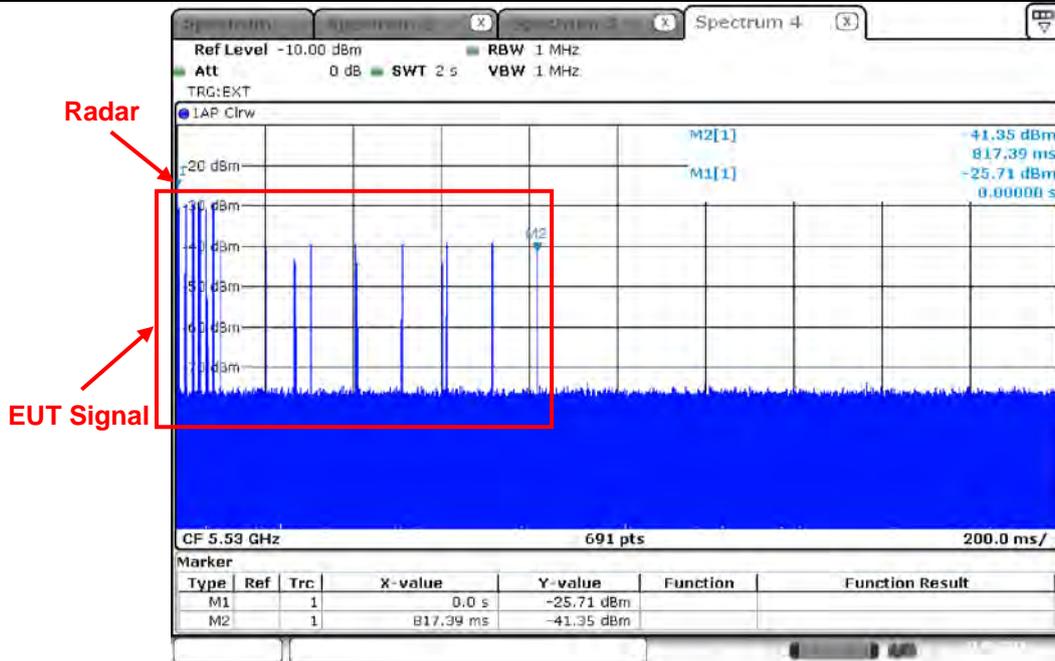
Channel Move Time: 0.834 s



Date: 21 SEP 2019 22:33:47



Radar #2 Channel Closing Transmission Time: 72.463 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW80)	Test Frequency: 5530 MHz	Number of Sampling Bins (N): 25



Date: 21 SEP 2019 22:58:54

R&S | Agilent

VISA session GPIB0::20	Threshold (dBm) -70	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 25
	Mean Level (dBm) -33.59	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 72.463768m
	RMS Level (dBm) -31.99	Total Trace of Points 691	Mark 2 Point 691	Duty (%) 3.62

Dwell=S / B=2000ms / 690=2.89855ms, C=N x Dwell=25 x 2.89855ms=72.463ms

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.

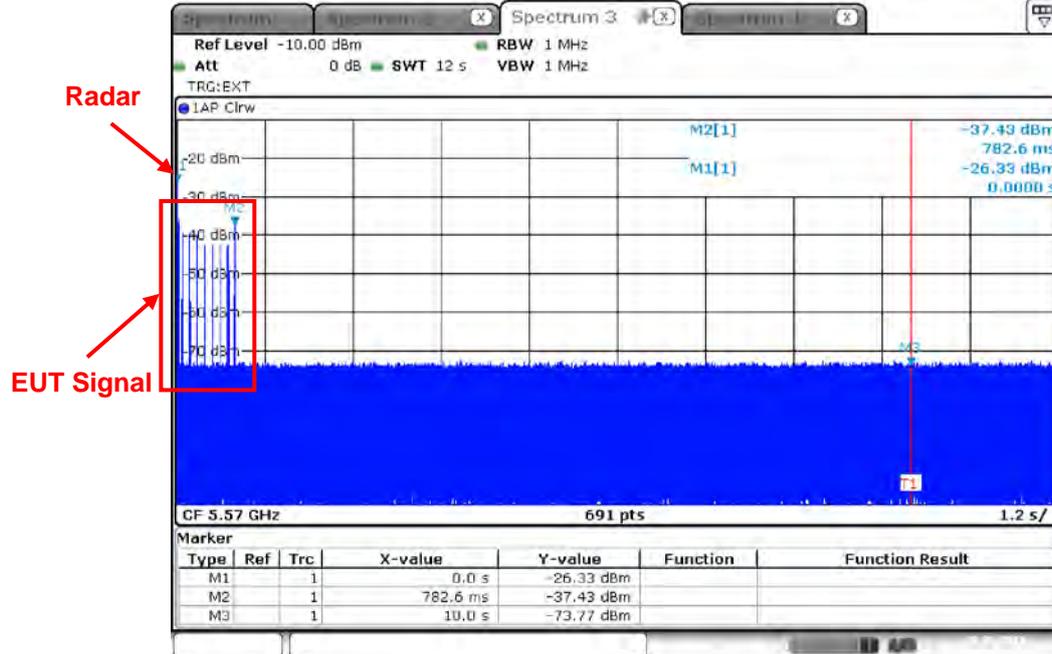
W56 band (5470-5725 MHz)

Radar #1 Channel Move Time: < 10 sec

Modulation Mode: ax (HEW160)

Test Frequency: 5570 MHz

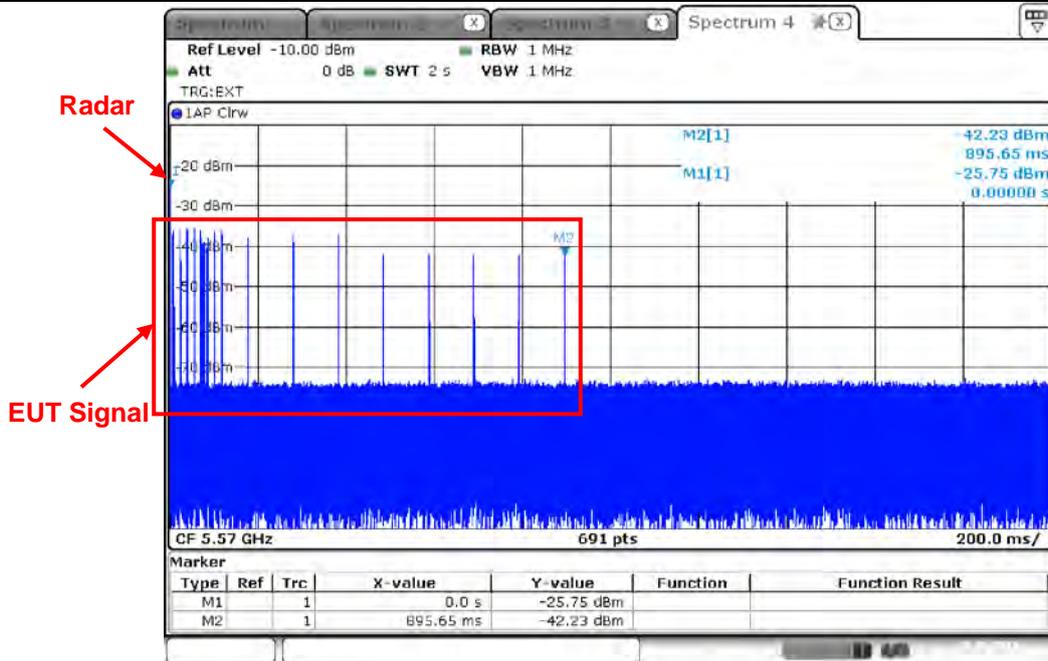
Channel Move Time: 0.782 s



Date: 18.SEP.2019 01:34:40



Radar #1 Channel Closing Transmission Time: 72.463 ms		Sampling Bins (B): 690
Modulation Mode: ax (HEW160)	Test Frequency: 5570 MHz	Number of Sampling Bins (N): 25



Date: 18.SEP.2019 01:38:15

R&S Agilent

VISA session GPIB0::20	Threshold (dBm) -60	Marker 1 (sec) 0	Space Time of Point 0.002899	No. of Pulse 25
Mean Level (dBm) -38.02	Marker 2 (sec) 2	Mark 1 Point 1	Close TX Time(sec) 72.463768m	Duty (%) 3.62
RMS Level (dBm) -37.59	Total Trace of Points 691	Mark 2 Point 691		

$Dwell = S / B = 2000ms / 690 = 2.89855ms, C = N \times Dwell = 25 \times 2.89855ms = 72.463ms$

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.

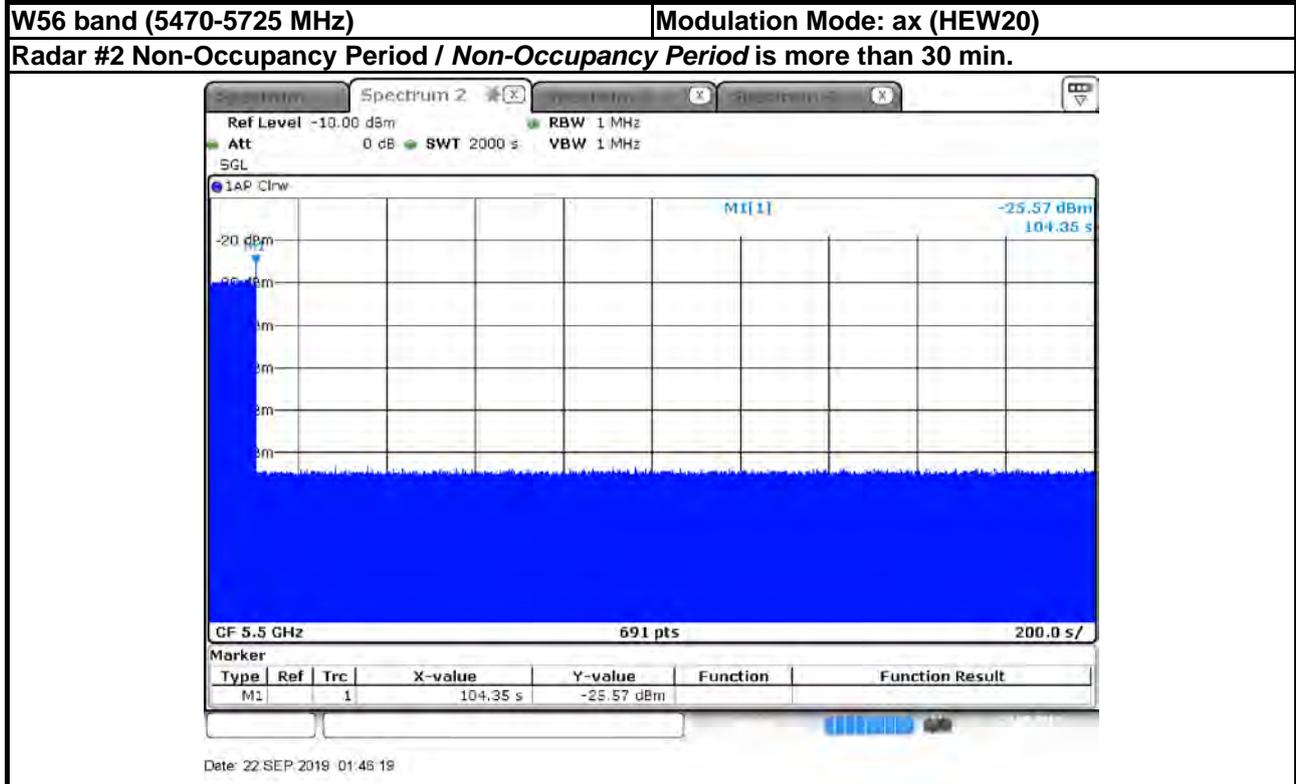
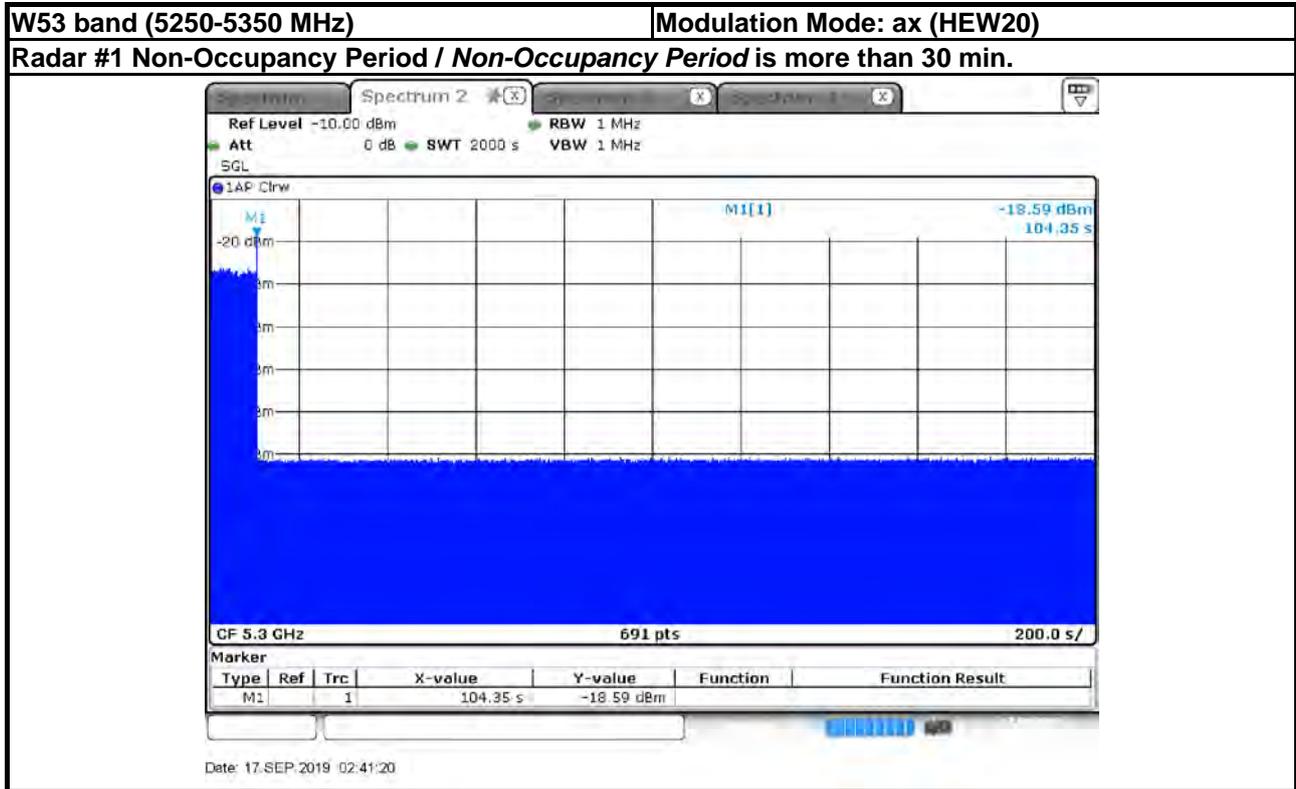


3.4.6 Test Result of Non-Occupancy Period

Non-Occupancy Period Result			
Detection Threshold Level (dBm)			-64
Modulation Mode	Freq. (MHz)	Radar Test Signal	Non-Occupancy Period (min)
ax (HEW20)	5300	1 - Fixed	>30
ax (HEW20)	5500	2 - Fixed	>30
ax (HEW40)	5310	1 - Fixed	>30
ax (HEW40)	5510	2 - Fixed	>30
ax (HEW80)	5290	1 - Fixed	>30
ax (HEW80)	5530	2 - Fixed	>30
ax (HEW160)	5570	2 - Fixed	>30
Limit			30 min
Result			PASS



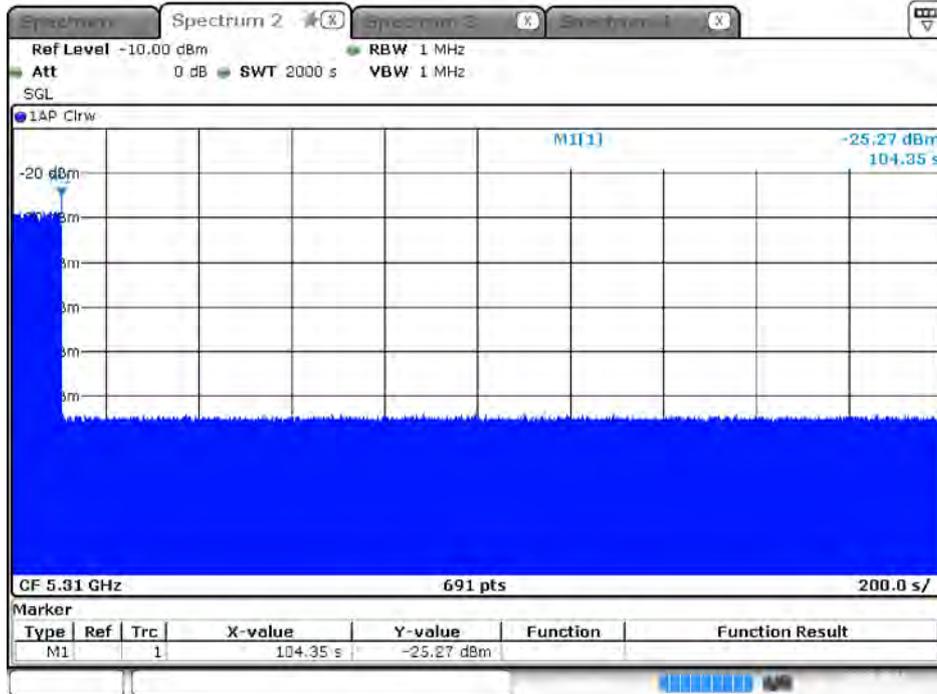
3.4.7 Non-Occupancy Period Plots





W53 band (5250-5350 MHz) | Modulation Mode: ax (HEW40)

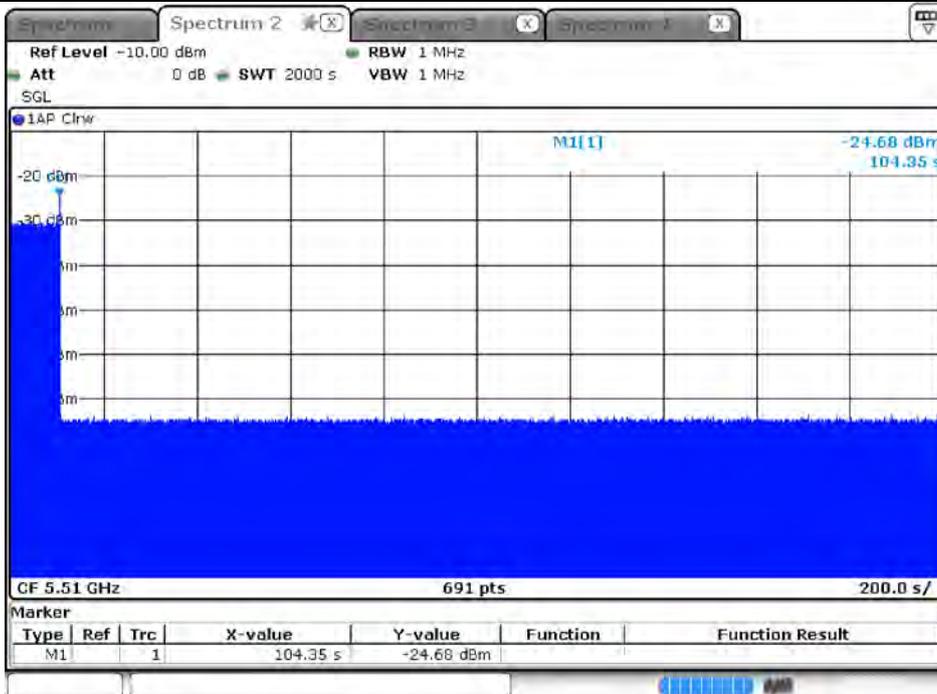
Radar #1 Non-Occupancy Period / Non-Occupancy Period is more than 30 min.



Date: 22.SEP.2019 03:59:11

W56 band (5470-5725 MHz) | Modulation Mode: ax (HEW40)

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

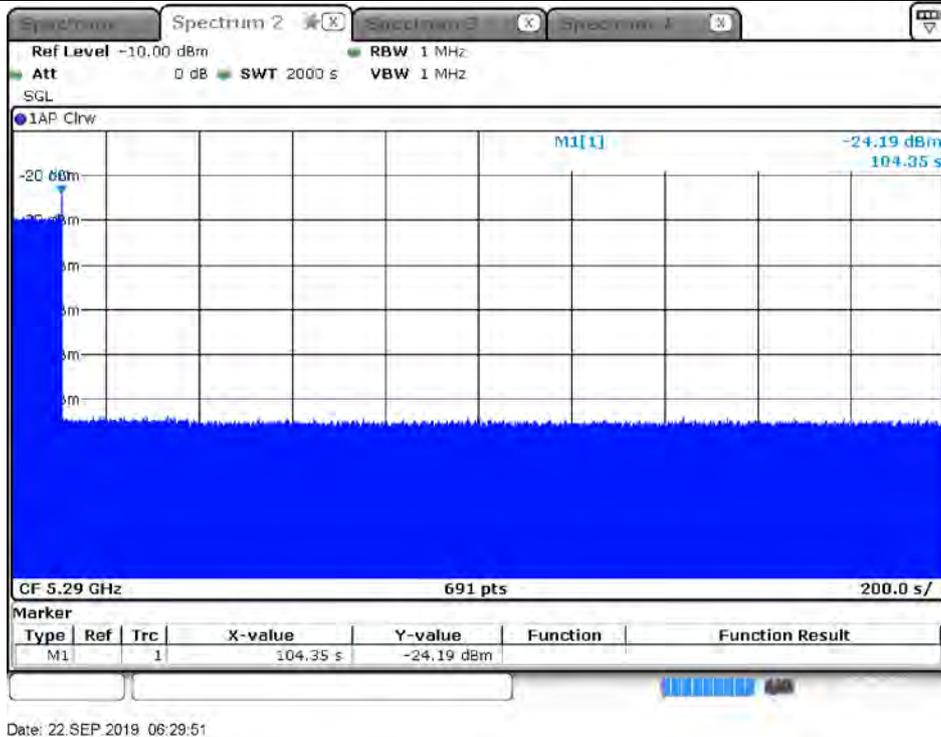


Date: 22.SEP.2019 00:22:35



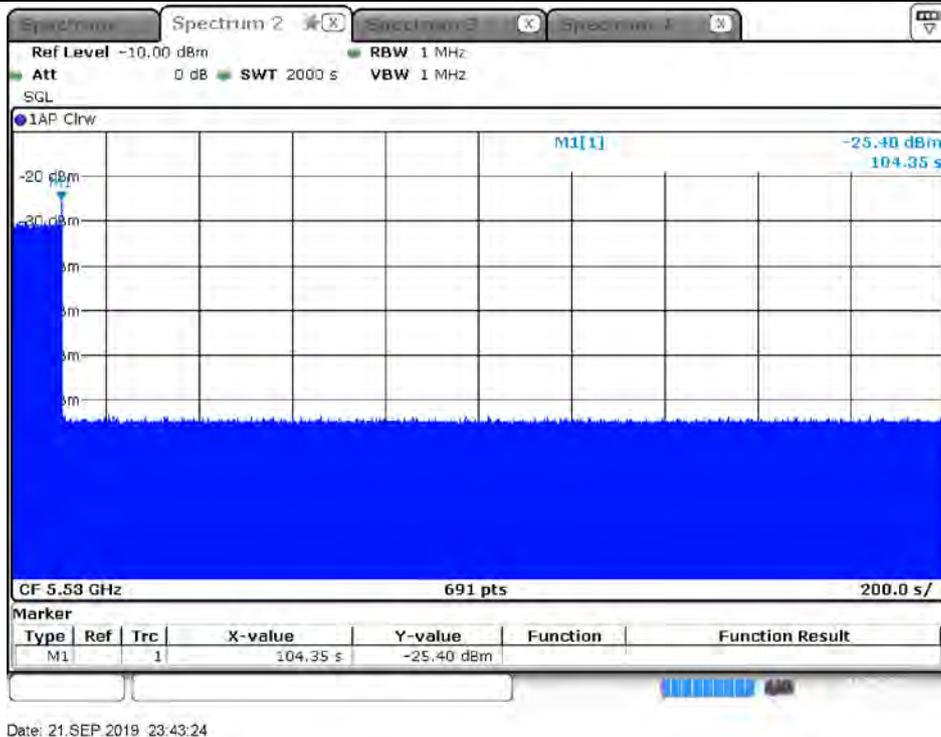
W53 band (5250-5350 MHz) Modulation Mode: ax (HEW80)

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



W56 band (5470-5725 MHz) Modulation Mode: ax (HEW80)

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

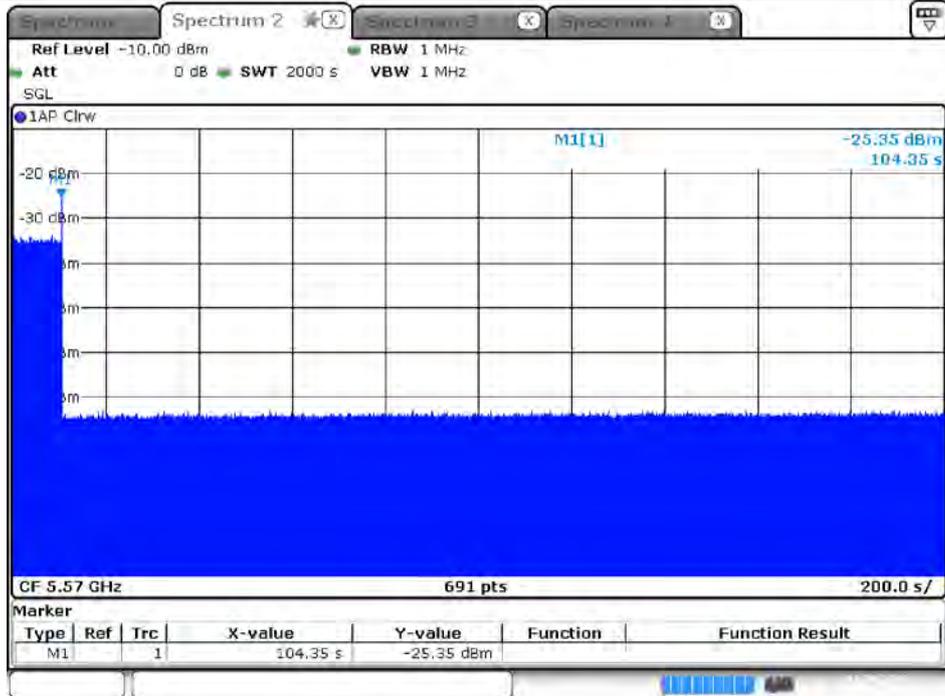




W56 band (5470-5725 MHz)

Modulation Mode: ax (HEW160)

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



Date: 21.SEP.2019 21:42:06



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-D V-02	1GHz ~ 6GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Power Divider	MTJ	2 Way	DFS-01-D V-03	1GHz ~ 6GHz	Oct. 08, 2018	Oct. 07, 2019	c)	B	Conducted (DF01-CB)
RF Power Divider	ANAREN	4 Way	DFS-01-D V-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:

1. Calibration Interval of instruments listed above is one year.
2. N.C.R. means Non-Calibration required.
3. 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.
4. 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%