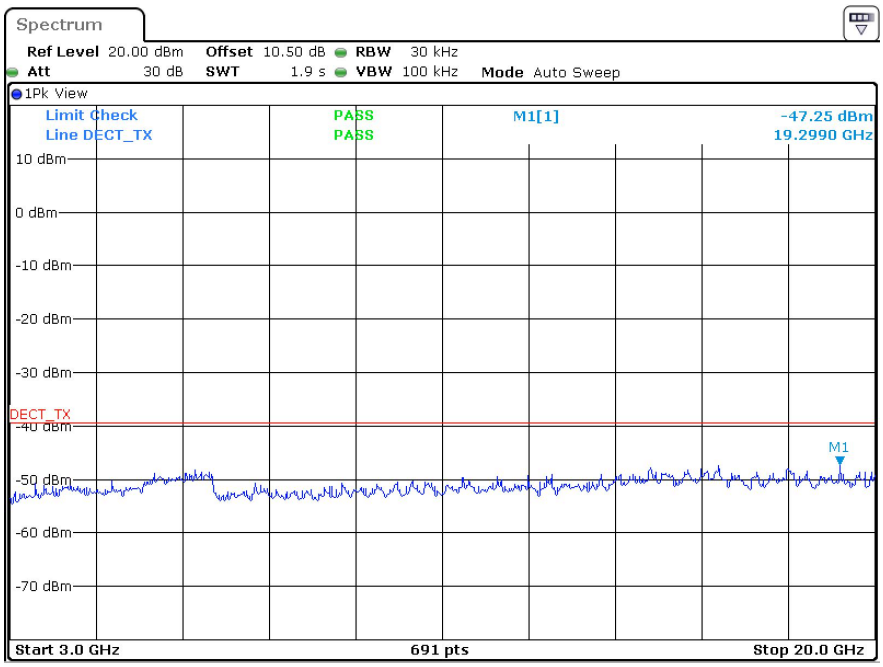
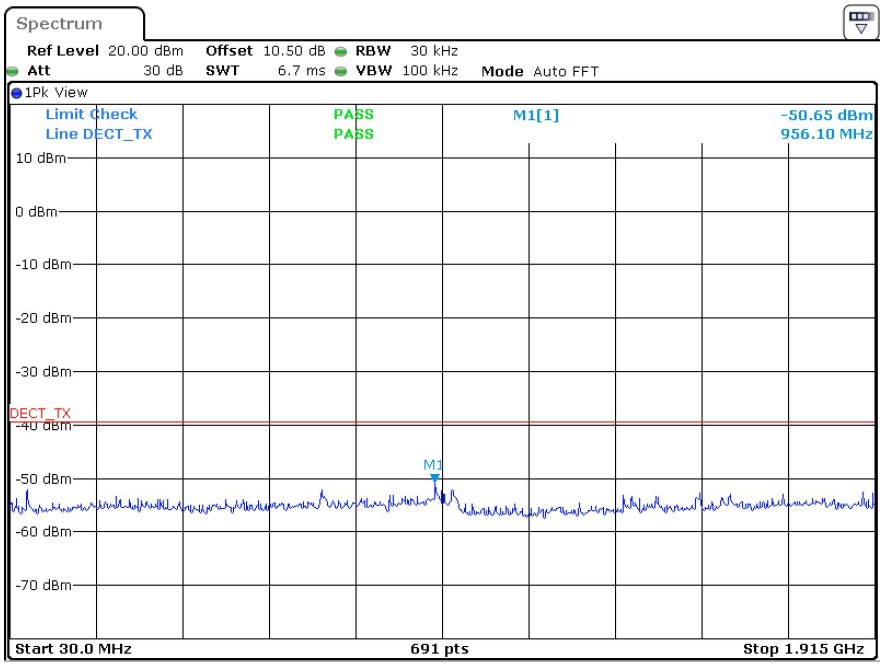


ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 13:30:59

High Channel (Unwanted Emission outside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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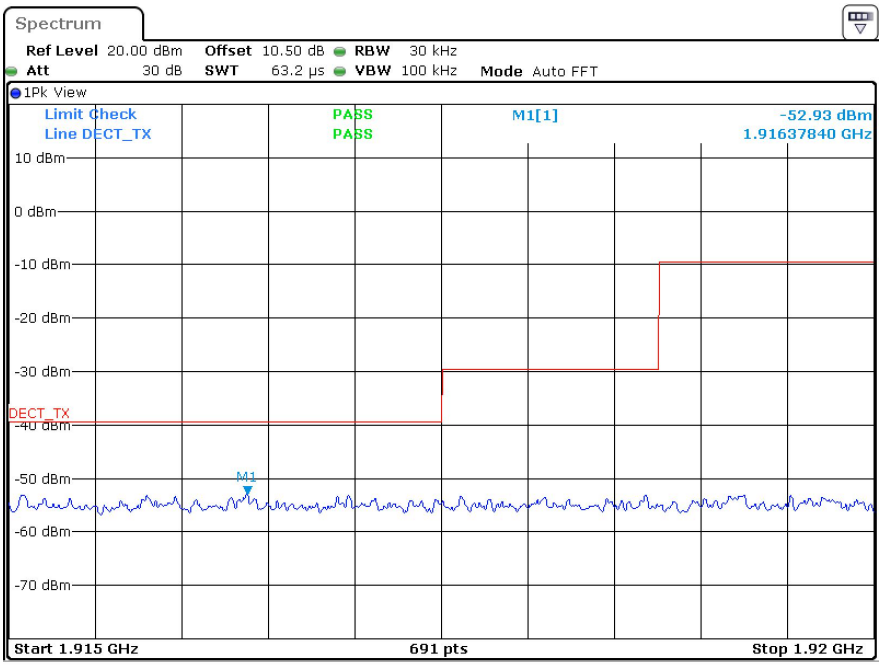

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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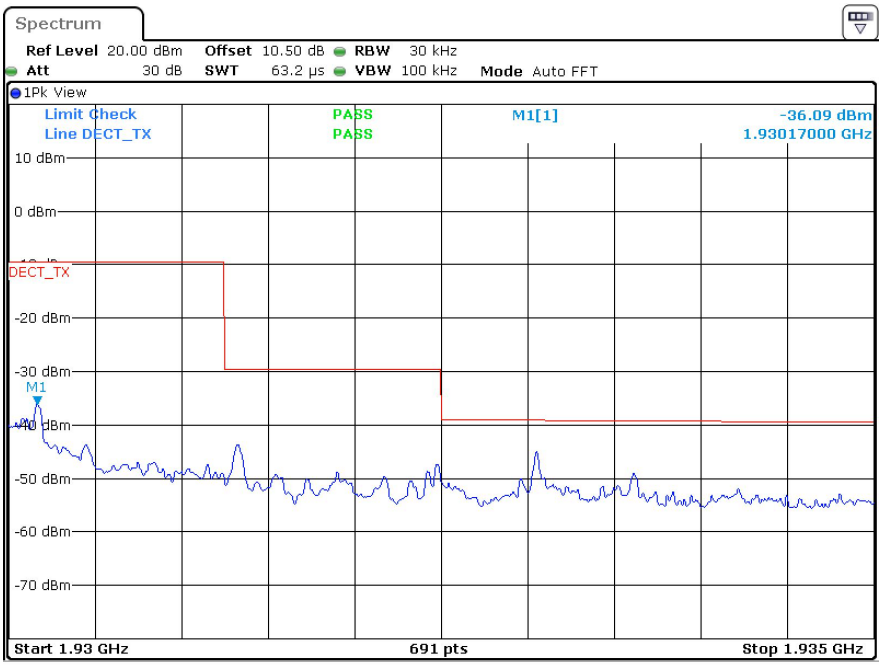

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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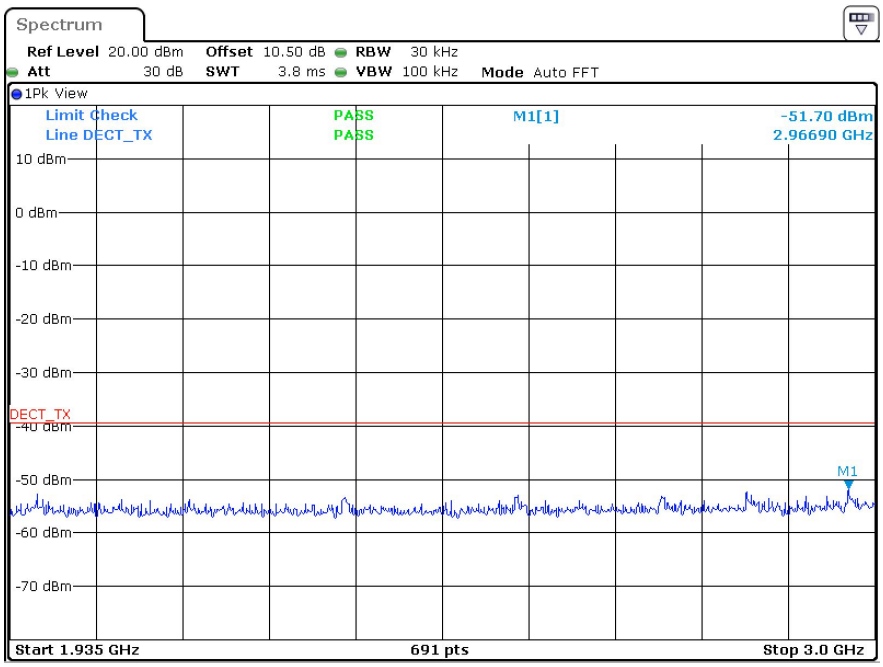

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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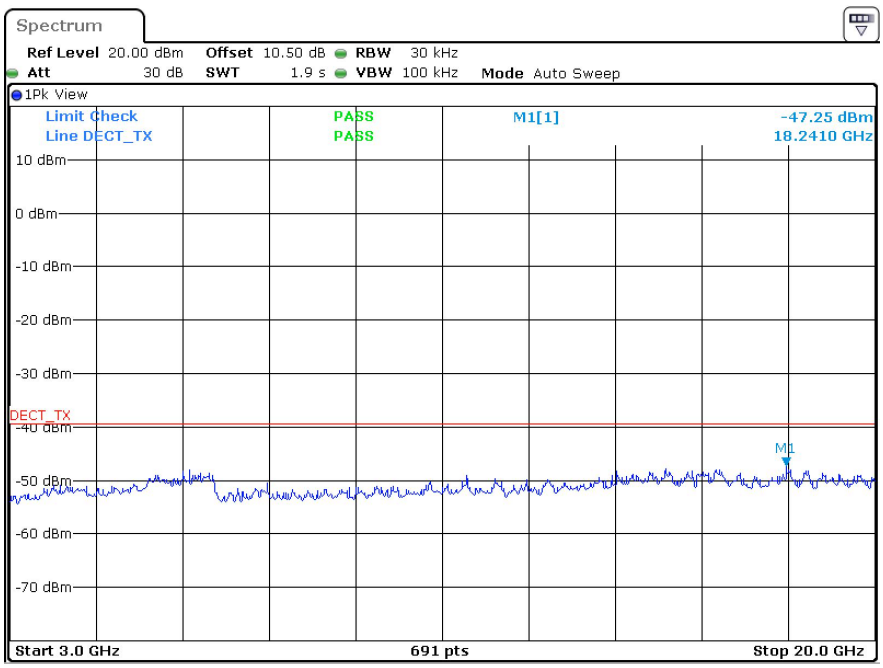
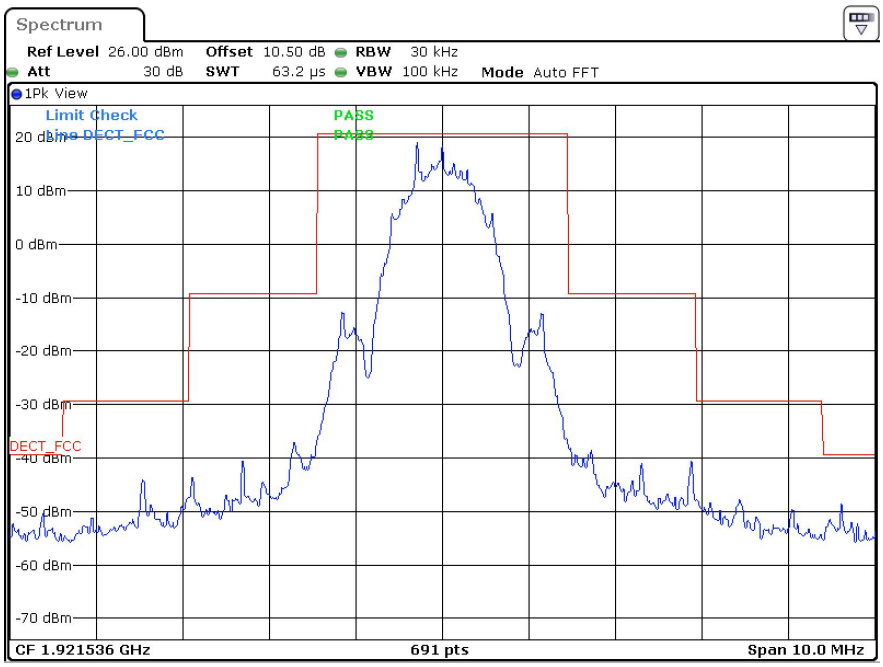


ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 13:18:14

Module 2

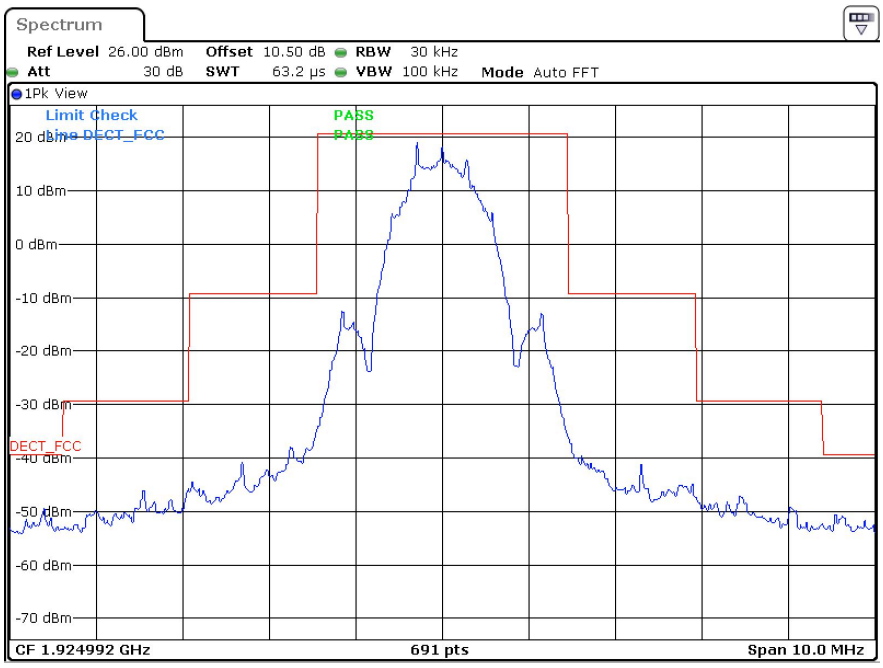
Low Channel (Unwanted Emission inside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 17:30:38

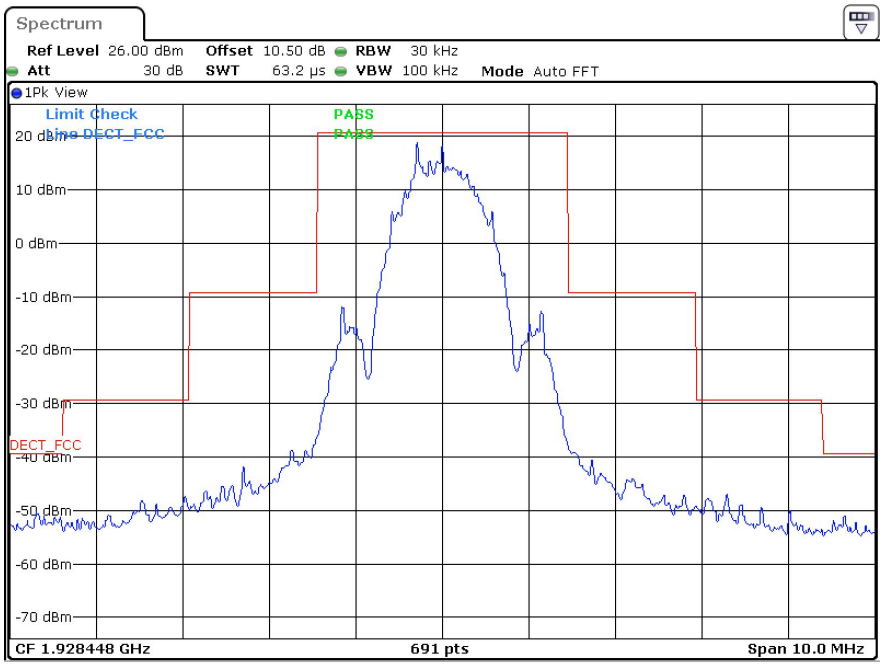
Middle Channel (Unwanted Emission inside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 17:29:47

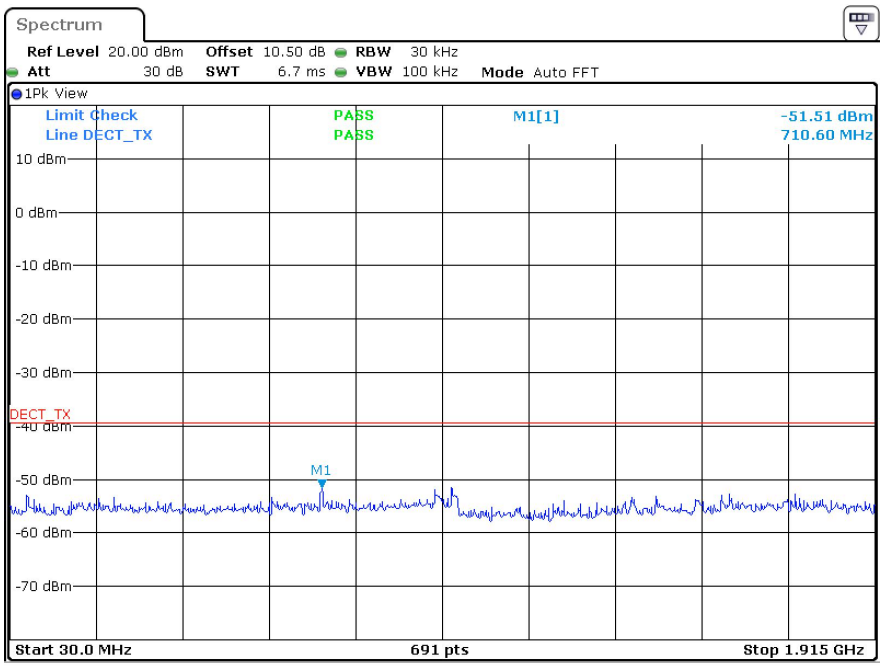
High Channel (Unwanted Emission inside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 17:24:50

Low Channel (Unwanted Emission outside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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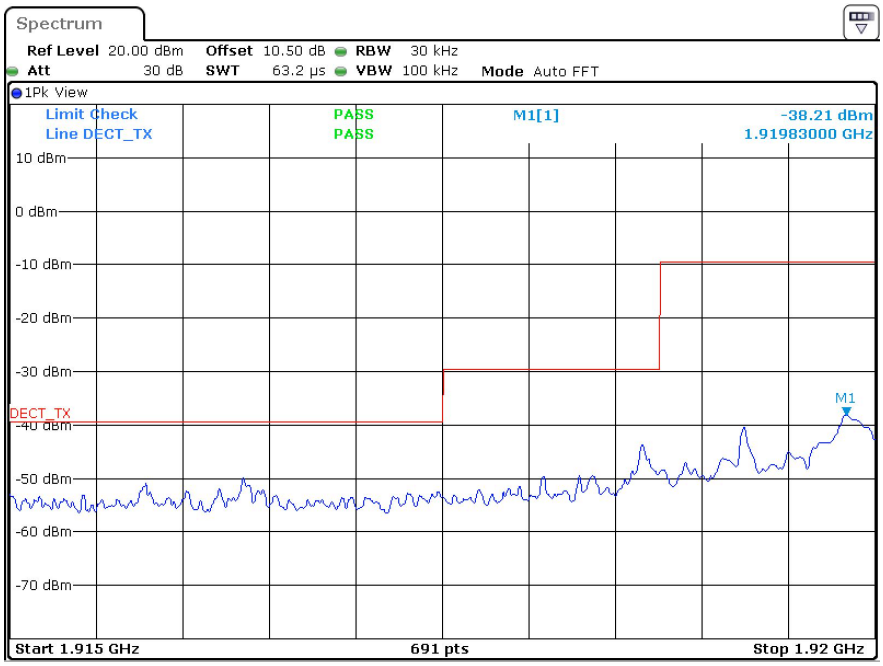

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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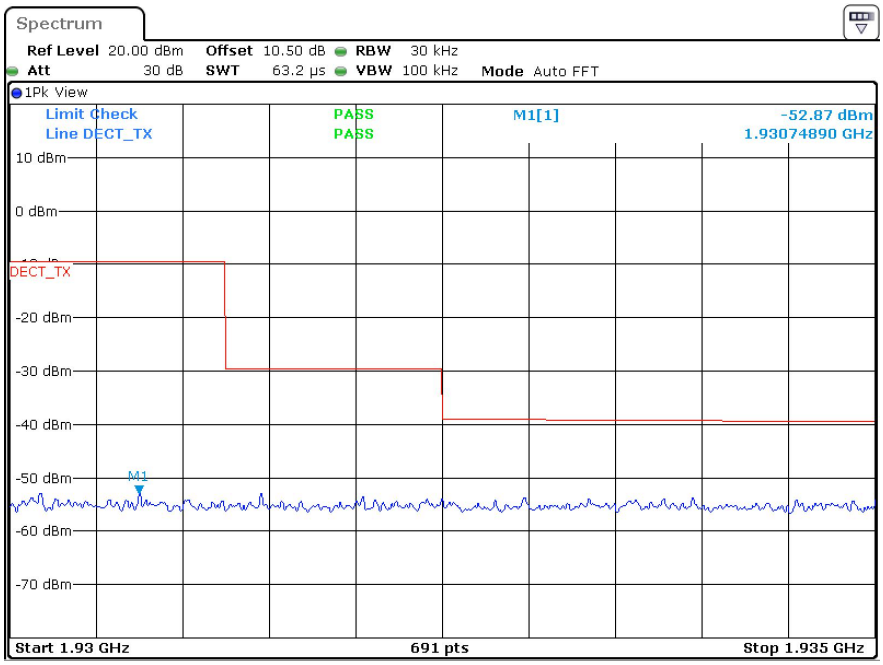

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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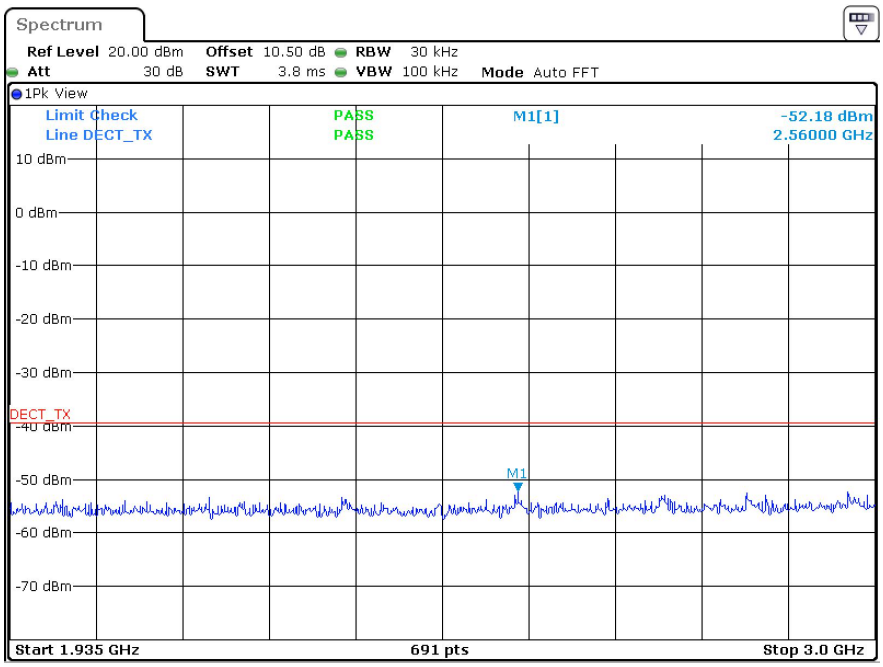
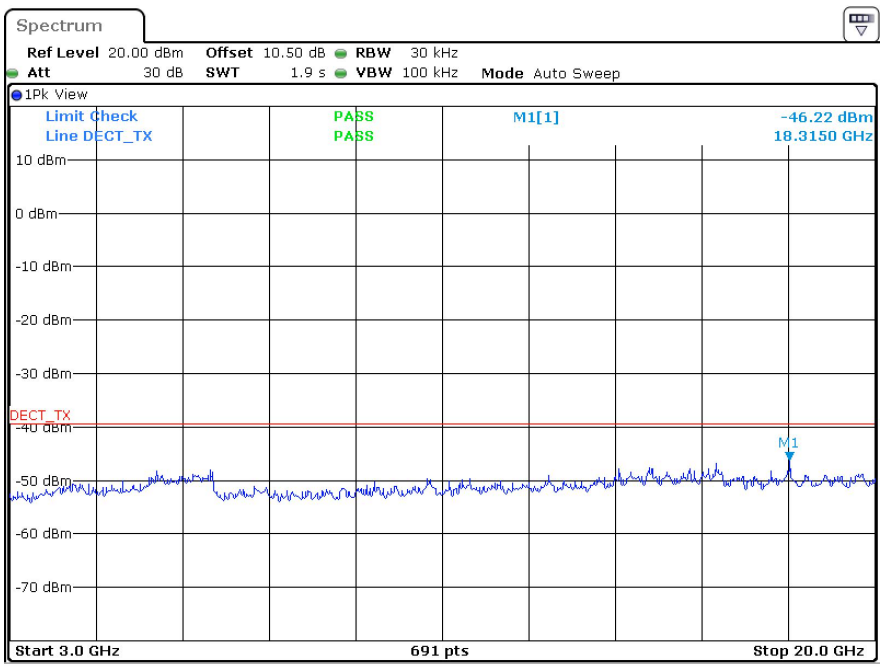


ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

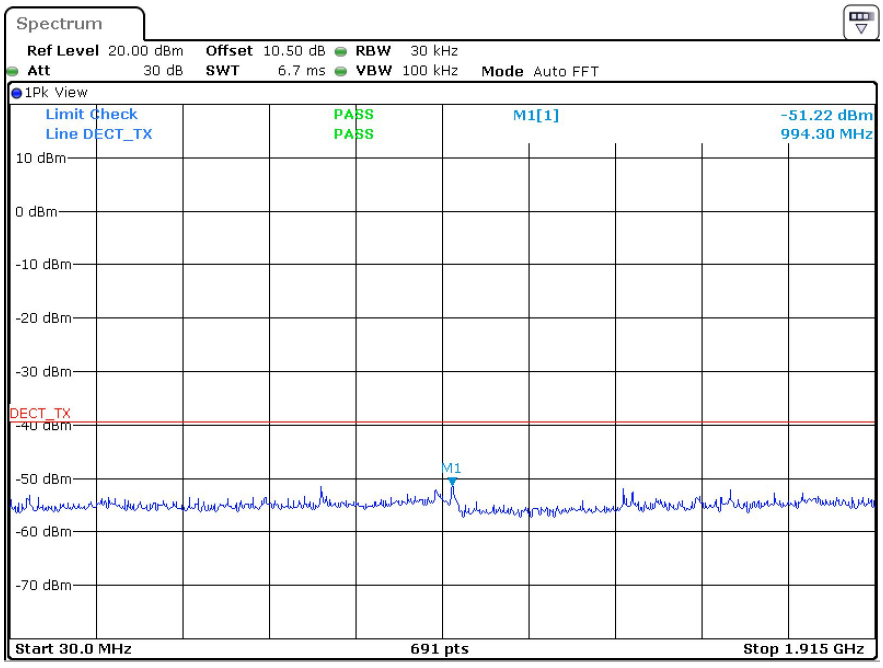
Date: 21.MAY.2025 17:21:02



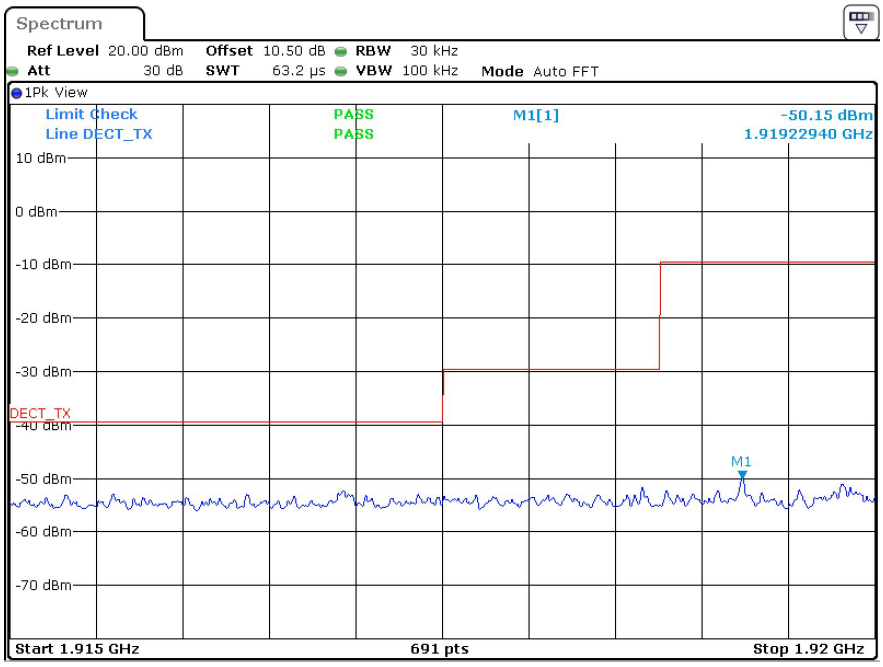
ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 17:22:12

Middle Channel (Unwanted Emission outside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu
Date: 21.MAY.2025 17:10:06



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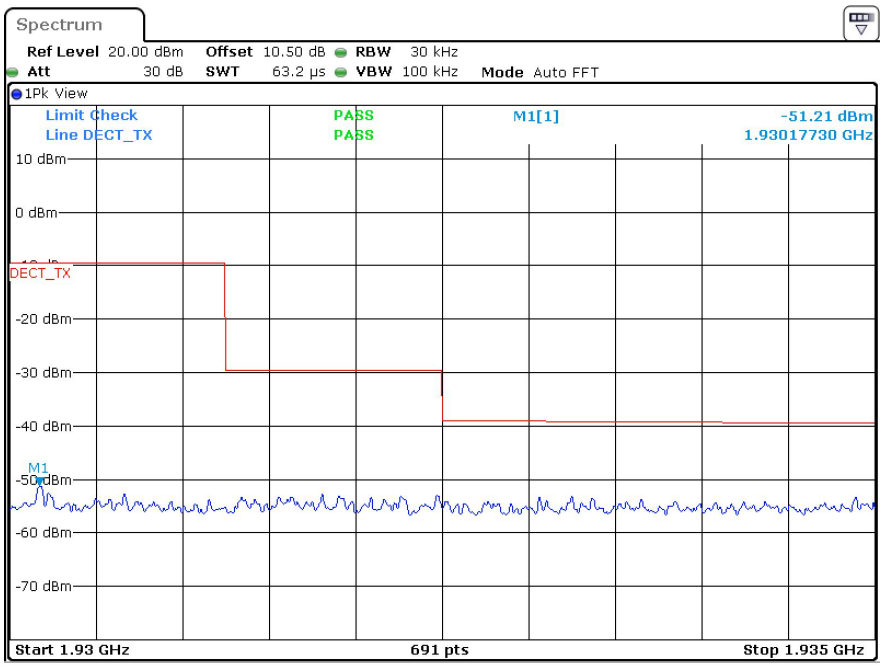
Date: 21.MAY.2025 17:11:28



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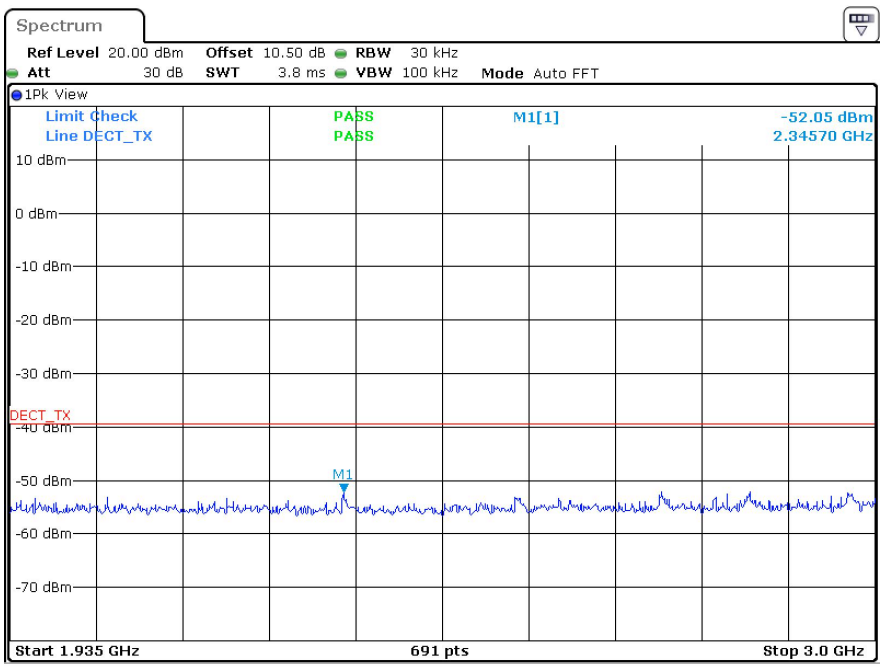

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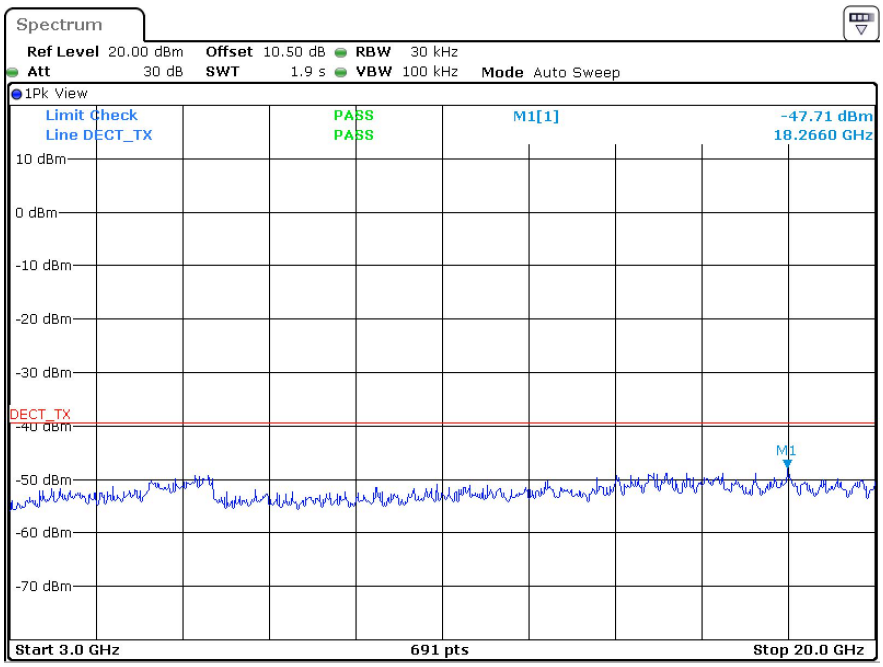
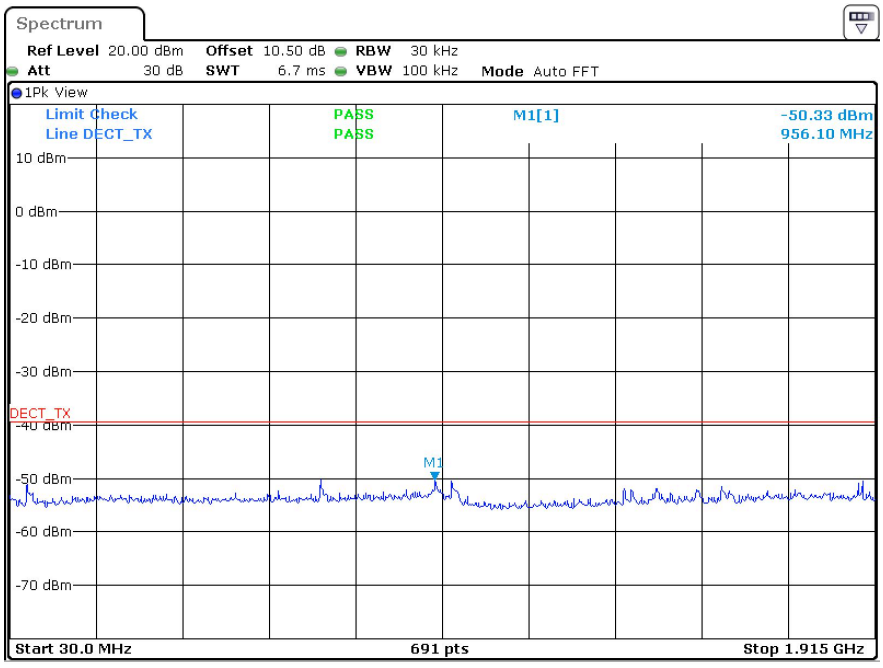


ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 17:16:17

High Channel (Unwanted Emission outside the Sub-band)



ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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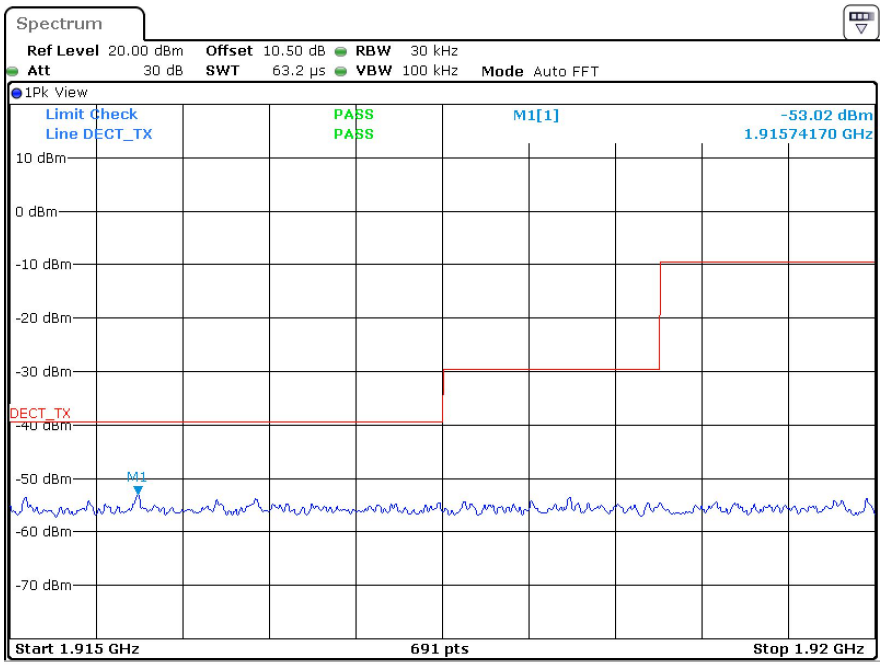

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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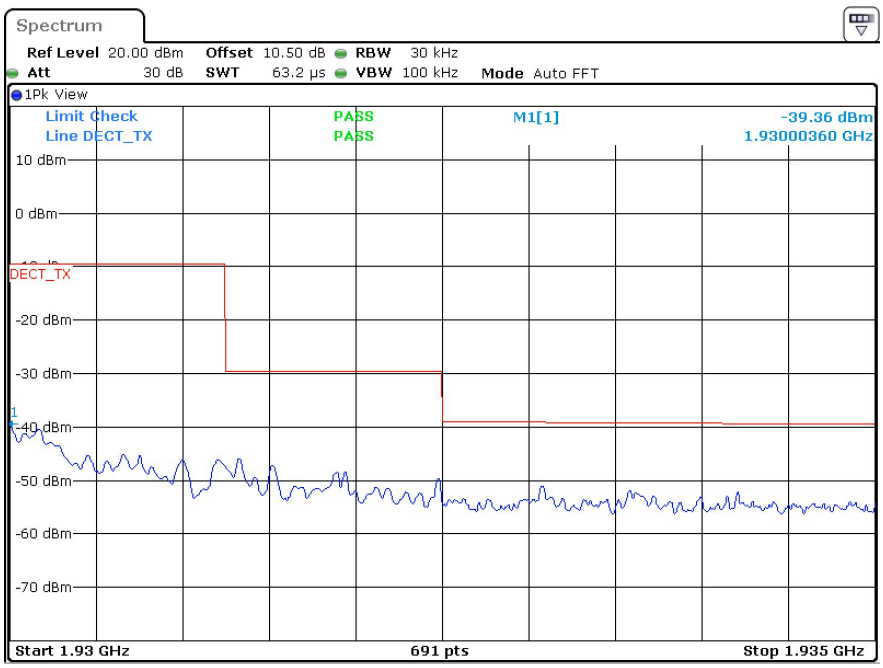

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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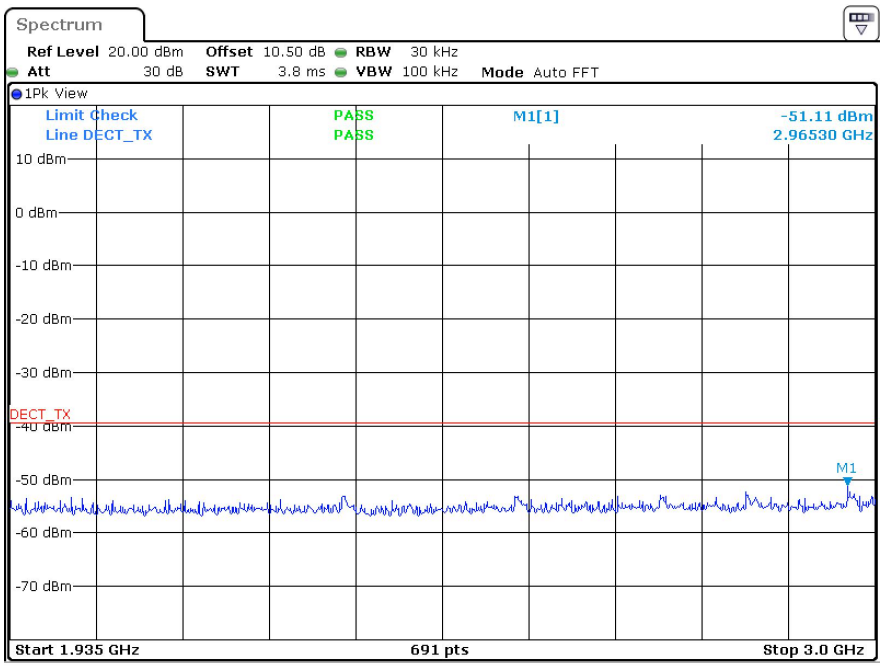

ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

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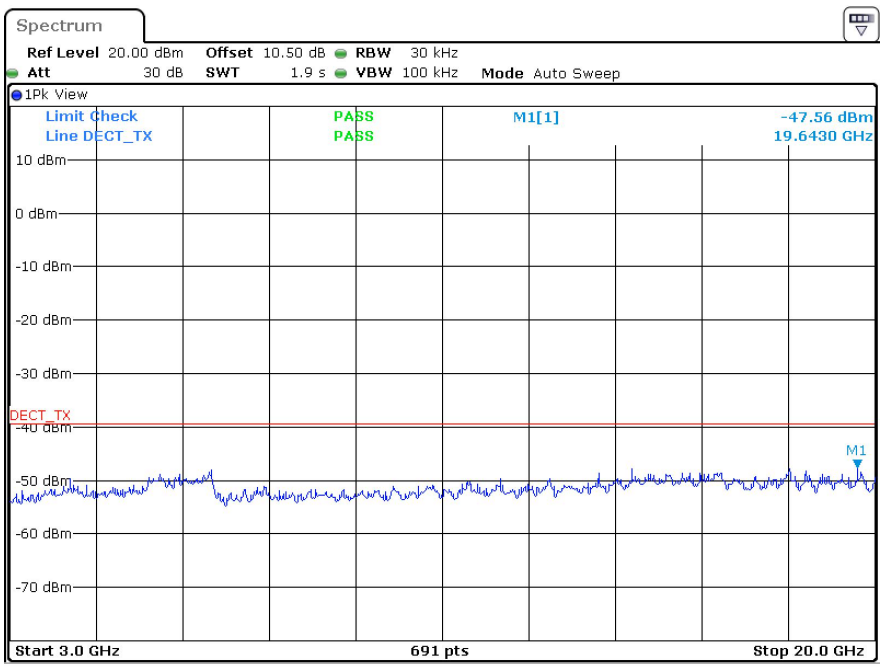


ProjectNo.:2501S11852E-RF-FP Tester:Rainbow Zhu

Date: 21.MAY.2025 17:07:58

FCC§15.323 (f) - FREQUENCY STABILITY

Applicable Standard

Per §15.323(f) & ANSI C63.17-2013 Clause 6.2.1, the frequency stability of the carrier frequency of the intentional radiator shall be maintained within ±10 ppm over 1 hour or the interval between channel access monitoring, whichever is shorter. The frequency stability shall be maintained over a temperature variation of −20℃ to +50℃ or as declared by the manufacturer at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20 ℃. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage

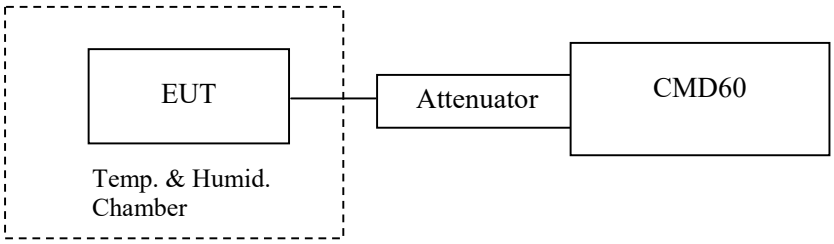
Test Procedure

This procedure should be carried out for each of the following test cases:

Temperature	Supply Voltage
20℃	85-115% or new batteries
-20℃	Normal
+50℃	Normal

During test, the equipment shall be placed in the boxes and set the temperature to the specified requirement until the thermal balance has been reached.

Using the mean carrier frequency at 20℃ and at nominal supply voltage as the reference, the mean carrier frequency shall be maintained within ±10 ppm at the two extreme temperatures (or as declared by the manufacturer) and at normal temperature (typically 20℃) at the two extreme supply voltages.
This test does not apply to a EUT that is capable only of operating from a battery.



Test Data

Environmental Conditions

Temperature:	25.1~25.8 ℃
Relative Humidity:	47~50 %
ATM Pressure:	100.0~100.2 kPa

The testing was performed by Rainbow Zhu on 2025-05-20 and 2025-05-21.

Test mode: Transmitting

Test Result: Compliant

Module 1

AC Power:

Temperature (℃)	Voltage (V_{AC})	Channel Frequency (MHz)	Measured Frequency Offset (kHz)	Measured Frequency Offset (ppm)	Limit (ppm)
-20	120	1924.992	-3	-1.56	±10
20	102	1924.992	-1	-0.52	±10
	138	1924.992	-2	-1.04	±10
50	120	1924.992	-4	-2.08	±10

DC Power Supply:

Temperature (℃)	Voltage (V_{DC})	Channel Frequency (MHz)	Measured Frequency Offset (kHz)	Measured Frequency Offset (ppm)	Limit (ppm)
-20	14.8	1924.992	-3	-1.56	±10
20	12.8	1924.992	-7	-3.64	±10
	16.8	1924.992	-5	-2.60	±10
50	14.8	1924.992	-2	-1.04	±10

Module 2

AC Power:

Temperature (℃)	Voltage (V_{AC})	Channel Frequency (MHz)	Measured Frequency Offset (kHz)	Measured Frequency Offset (ppm)	Limit (ppm)
-20	120	1924.992	-5	-2.60	±10
20	102	1924.992	-3	-1.56	±10
	138	1924.992	-4	-2.08	±10
50	120	1924.992	-7	-3.64	±10

DC Power Supply:

Temperature (℃)	Voltage (V_{DC})	Channel Frequency (MHz)	Measured Frequency Offset (kHz)	Measured Frequency Offset (ppm)	Limit (ppm)
-20	14.8	1924.992	-4	-2.08	±10
20	12.8	1924.992	-8	-4.16	±10
	16.8	1924.992	-3	-1.56	±10
50	14.8	1924.992	-2	-1.04	±10

FCC§15.323 (c) (e) & §15.319(f) - SPECIFIC REQUIREMENTS FOR UPCS DEVICE

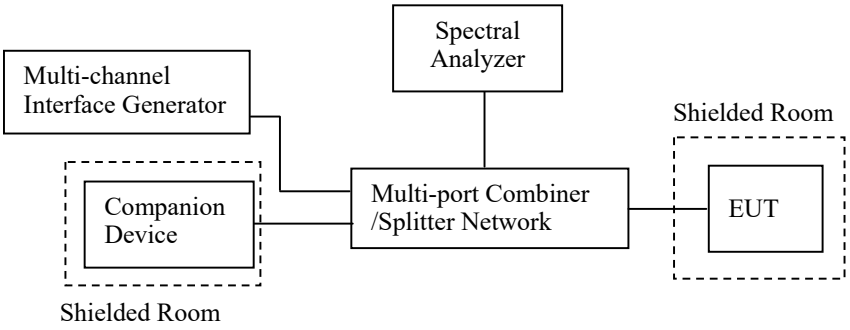
Applicable Standard

FCC§15.323(c)(e) & §15.319(f) Specific Requirements for UPCS device.
ANSI C63.17 2013 §6.2 Frequency and time stability and §7.Monitoring tests and §8.Time and spectrum window access procedure.

Test Procedure

Measurement method according to ANSI C63.17 -2013

Test configuration as below



Test Data

Environmental Conditions

Temperature:	25.1~25.8 ℃
Relative Humidity:	47~50 %
ATM Pressure:	100.0~100.2 kPa

The testing was performed by Rainbow Zhu on 2025-05-20 and 2025-05-21.

Test Result: Compliant

For module 1:

1) Automatic Discontinuation of Transmission

Test result:

The following tests were performed after a connection had been established with companion device.

Test condition	Reaction of EUT	Pass/Fail
Power removed from EUT	Connection break down	Pass
Power removed from companion device	Connection break down	Pass

2) Monitoring Time

Test result:

This requirement is covered by the results of Least Interfered Channel (LIC).

Interference (Refer to ANSI C63.17 clause 7.3.3)	Reaction of EUT	Results
a) Apply the interference on f_1 at level T_L+U_M+20dB and no interference on f_2. Initiate transmission and verify the transmission only on f_2. Then terminate it.	EUT transmits on f_2	Pass
b) Apply the interference on f_2 at level T_L+U_M+20dB and immediately remove all interference from *f*1. The EUT should immediately attempt transmission on *f*1 (but at least 20 ms after the interference on *f*2 is applied), verify the transmission only on f_1.	EUT transmission f_1	Pass

3) Lower Monitoring Threshold

Test result:

Not applicable because the EUT has more 40 defined duplex system access channels and meet the provision of the Least Interfered Channel (LIC).

4) Maximum Transmit Period

Test result:

Measured Maximum Transmission Time (Minutes)	Limit (Minutes)	Results
452	480	Pass

5) System Acknowledgement

Test result:

Test	Time taken (second)	Limit (second)	Result
Initial Connection acknowledgement	0.41	1	Pass
Change of access criteria for control information	N/A	30	N/A
Transmission cease time	5.8	30	Pass

Note: N/A=Not Applicable

6) Least Interfered Channel (LIC)

Calculation of monitoring threshold limits for isochroous devices:
Lower threshold: TL = $-174+10Log_{10}B + ML + P_{MAX}-P_{EUT}$ (dBm)
Where: B=Emission bandwidth (Hz)
ML = dB the threshold may exceed thermal noise (30 for T_L)
$P_{MAX} = 5Log_{10}B-10$(dBm)
P_{EUT} = Transmitted power (dBm)

Calculated thresholds:

Monitor Threshold	B(MHz)	M_L(dB)	P_{MAX} (dBm)	P_{EUT} (dBm)	Threshold (dBm)
Lower threshold	1.467	30	20.83	19.69	-81.20

Note: 1. The upper threshold is applicable as the EUT utilizes more than 20 duplex system channels

Test result:
LIC procedure test:

Interference (Refer to ANSI C63.17 clause 7.3.3)	Reaction of EUT	Results
a) Apply the interference on f_1 at level T_L+U_M+7dB and the interference on f_2 at level T_L+U_M. Initiate transmission and verify the transmission only on f_2. Repeat 5 times.	EUT transmits on f_2	Pass
b) Apply the interference on f_1 at level T_L+U_M and the interference on f_2 at level T_L+U_M+7dB. Initiate transmission and verify the transmission only on f_1. Repeat 5 times.	EUT transmits on f_1	Pass
c) Apply the interference on f_1 at level T_L+U_M+1dB the interference on f_2 at level T_L+U_M-6dB. Initiate transmission and verify the transmission only on f_2. Repeat 5 times.	EUT transmits on f_2	Pass
d) Apply the interference on f_1 at level T_L+U_M-6dB and the interference on f_2 at level T_L+U_M+1dB. Initiate transmission and verify the transmission only on f_1. Repeat 5 times.	EUT transmits on f_1	Pass

Selected channel confirmation:

Interference (Refer to ANSI C63.17 clause 7.3.4)	Reaction of EUT	Results
a) Apply the interference on f_1 at level T_U+U_M and no interference on f_2. Initiate transmission and verify the transmission only on f_2. Then terminate it.	EUT transmits on f_2	Pass
b) Apply the interference on f_2 at level T_L+U_M and immediately remove all interference from $f1$. The EUT should immediately attempt transmission on $f1$ (but at least 20 ms after the interference on $f2$ is applied), verify the transmission only on f_1.	EUT transmission f_1	Pass

7) Random waiting

Note: This is Not Applicable

8) Monitoring Bandwidth and Reaction Time

Test result:
Monitoring Bandwidth:

The antenna of the EUT used for monitoring is the same interior antenna that used for transmission, so the monitoring system bandwidth is equal to the emission bandwidth of the intended transmission

Reaction Time Test:

No.	Interference Pulse width (μs)	Reaction of EUT	Result
1	Apply Interference Pulse 50μs on f1 at pulsed level $T_L + U_m$, then apply a CW signal on f_2 at the level T_L	EUT transmission f_2	Pass
2	Change Interference Pulse to 35μs on f_1 at pulsed level $T_L + U_m + 6dB$	EUT transmission f_2	Pass

9) Monitoring Antenna

Test result:
The antenna of the EUT used for transmission is the same interior antenna that used for monitoring.

10) Monitoring threshold relaxation

Test result:
This requirement is covered by the results of Least Interfered Channel (LIC).

11) Duplex Connections

Test result:

Interference (Refer to ANSI C63.17 § 8.3& § 8.3.2)	Reaction of EUT	Results
a) Only a single carrier f1 for EUT TDMA systems and on *f*1 and *f*2 and corresponding duplex carriers for FDMA systems.	EUT can transmit	Pass
b) All Tx windows with level TL+UM except one & Rx windows with level TL+UM+7dB except one, which are not the duplex mate.	Connected on the target Rx window and its duplex mate.	Pass
c) All Tx windows with level TL+UM+7dB except one & Rx windows with level TL+UM except one, which are not duplex mate.	Connected on the target Tx window and its duplex mate.	Pass
d) All Tx & Rx windows with level TU+UM, except one for Tx window & one for Rx window, which are not duplex mate.	No connection possible	Pass

12) Alternative monitoring interval

Test result:

Interference (Refer to ANSI C63.17 § 8.4)	Reaction of EUT	Results
a) Only a single carrier f1 for EUT TDMA systems and on *f*1 and *f*2 and corresponding duplex carriers for FDMA systems.	EUT can transmit	Pass
b) Apply interference with same parameters as EUT transmissions on all Tx windows with level TL+UM on the enabled carrier(s) and no interference on the Rx windows on the enabled carriers.	No connection is established	Pass

13) Fair Access

Test result:

The manufacturer declares that this device does not use any mechanisms as provided by FCC §15.323(c)(10) or (11) & IC RSS-213 5.2(10) and (11) to extend the range of spectrum occupied over space or time for the purpose of denying fail access to spectrum to other device.

14) Frame Repetition Stability Frame Period and Jitter

Test result:

Frame Period and Jitter:

Max. pos. Jitter (µs)	Max. neg. Jitter (µs)	Frame period (ms)	Limit	
			Frame Period (ms)	Jitter (µs)
0	-0.01	10.79	20 or10/X	25

Note: X is a positive whole number.

For module 2:

1) Automatic Discontinuation of Transmission

Test result:

The following tests were performed after a connection had been established with companion device.

Test condition	Reaction of EUT	Pass/Fail
Power removed from EUT	Connection break down	Pass
Power removed from companion device	Connection break down	Pass

2) Monitoring Time

Test result:

This requirement is covered by the results of Least Interfered Channel (LIC).

Interference (Refer to ANSI C63.17 clause 7.3.3)	Reaction of EUT	Results
a) Apply the interference on f_1 at level T_L+U_M+20dB and no interference on f_2. Initiate transmission and verify the transmission only on f_2. Then terminate it.	EUT transmits on f_2	Pass
b) Apply the interference on f_2 at level T_L+U_M+20dB and immediately remove all interference from *f*1. The EUT should immediately attempt transmission on *f*1 (but at least 20 ms after the interference on *f*2 is applied), verify the transmission only on f_1.	EUT transmission f_1	Pass

3) Lower Monitoring Threshold

Test result:

Not applicable because the EUT has more 40 defined duplex system access channels and meet the provision of the Least Interfered Channel (LIC).

4) Maximum Transmit Period

Test result:

Measured Maximum Transmission Time (Minutes)	Limit (Minutes)	Results
463	480	Pass

5) System Acknowledgement

Test result:

Test	Time taken (second)	Limit (second)	Result
Initial Connection acknowledgement	0.48	1	Pass
Change of access criteria for control information	N/A	30	N/A
Transmission cease time	5.2	30	Pass

Note: N/A=Not Applicable

6) Least Interfered Channel (LIC)

Calculation of monitoring threshold limits for isochroous devices:
Lower threshold: $TL = -174+10Log_{10}B + ML + P_{MAX}-P_{EUT}$ (dBm)
Where: B=Emission bandwidth (Hz)
ML = dB the threshold may exceed thermal noise (30 for T_L)
$P_{MAX} = 5Log_{10}B-10$(dBm)
P_{EUT} = Transmitted power (dBm)

Calculated thresholds:

Monitor Threshold	B(MHz)	M_L(dB)	P_{MAX} (dBm)	P_{EUT} (dBm)	Threshold (dBm)
Lower threshold	1.459	30	20.82	19.42	-80.96

Note: 1. The upper threshold is applicable as the EUT utilizes more than 20 duplex system channels

Test result:
LIC procedure test:

Interference (Refer to ANSI C63.17 clause 7.3.3)	Reaction of EUT	Results
a) Apply the interference on f_1 at level T_L+U_M+7dB and the interference on f_2 at level T_L+U_M. Initiate transmission and verify the transmission only on f_2. Repeat 5 times.	EUT transmits on f_2	Pass
b) Apply the interference on f_1 at level T_L+U_M and the interference on f_2 at level T_L+U_M+7dB. Initiate transmission and verify the transmission only on f_1. Repeat 5 times.	EUT transmits on f_1	Pass
c) Apply the interference on f_1 at level T_L+U_M+1dB the interference on f_2 at level T_L+U_M-6dB. Initiate transmission and verify the transmission only on f_2. Repeat 5 times.	EUT transmits on f_2	Pass
d) Apply the interference on f_1 at level T_L+U_M-6dB and the interference on f_2 at level T_L+U_M+1dB. Initiate transmission and verify the transmission only on f_1. Repeat 5 times.	EUT transmits on f_1	Pass

Selected channel confirmation:

Interference (Refer to ANSI C63.17 clause 7.3.4)	Reaction of EUT	Results
a) Apply the interference on f_1 at level T_U+U_M and no interference on f_2. Initiate transmission and verify the transmission only on f_2. Then terminate it.	EUT transmits on f_2	Pass
b) Apply the interference on f_2 at level T_L+U_M and immediately remove all interference from *f*1. The EUT should immediately attempt transmission on *f*1 (but at least 20 ms after the interference on *f*2 is applied), verify the transmission only on f_1.	EUT transmission f_1	Pass

7) Random waiting

Note: This is Not Applicable

8) Monitoring Bandwidth and Reaction Time

Test result:
Monitoring Bandwidth:

The antenna of the EUT used for monitoring is the same interior antenna that used for transmission, so the monitoring system bandwidth is equal to the emission bandwidth of the intended transmission

Reaction Time Test:

No.	Interference Pulse width (μs)	Reaction of EUT	Result
1	Apply Interference Pulse 50μs on f1 at pulsed level $T_L + U_m$, then apply a CW signal on f_2 at the level T_L	EUT transmission f_2	Pass
2	Change Interference Pulse to 35μs on f_1 at pulsed level $T_L + U_m$ + 6dB	EUT transmission f_2	Pass

9) Monitoring Antenna

Test result:
The antenna of the EUT used for transmission is the same interior antenna that used for monitoring.

10) Monitoring threshold relaxation

Test result:
This requirement is covered by the results of Least Interfered Channel (LIC).

11) Duplex Connections

Test result:

Interference (Refer to ANSI C63.17 § 8.3& § 8.3.2)	Reaction of EUT	Results
a) Only a single carrier f1 for EUT TDMA systems and on *f*1 and *f*2 and corresponding duplex carriers for FDMA systems.	EUT can transmit	Pass
b) All Tx windows with level TL+UM except one & Rx windows with level TL+UM+7dB except one, which are not the duplex mate.	Connected on the target Rx window and its duplex mate.	Pass
c) All Tx windows with level TL+UM+7dB except one & Rx windows with level TL+UM except one, which are not duplex mate.	Connected on the target Tx window and its duplex mate.	Pass
d) All Tx & Rx windows with level TU+UM, except one for Tx window & one for Rx window, which are not duplex mate.	No connection possible	Pass

12) Alternative monitoring interval

Test result:

Interference (Refer to ANSI C63.17 § 8.4)	Reaction of EUT	Results
a) Only a single carrier f1 for EUT TDMA systems and on *f*1 and *f*2 and corresponding duplex carriers for FDMA systems.	EUT can transmit	Pass
b) Apply interference with same parameters as EUT transmissions on all Tx windows with level TL+UM on the enabled carrier(s) and no interference on the Rx windows on the enabled carriers.	No connection is established	Pass

13) Fair Access

Test result:

The manufacturer declares that this device does not use any mechanisms as provided by FCC §15.323(c)(10) or (11) & IC RSS-213 5.2(10) and (11) to extend the range of spectrum occupied over space or time for the purpose of denying fail access to spectrum to other device.

14) Frame Repetition Stability Frame Period and Jitter

Test result:

Frame Period and Jitter:

Max. pos. Jitter (µs)	Max. neg. Jitter (µs)	Frame period (ms)	Limit	
			Frame Period (ms)	Jitter (µs)
0	-0.01	10.79	20 or10/X	25

Note: X is a positive whole number.

EUT PHOTOGRAPHS

Please refer to the attachment 2501S11852E-RF External photo and 2501S11852E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2501S11852E-RF-00D Test Setup photo.

******* END OF REPORT *******