



TEST REPORT

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Report Number : 2504R03308E-RF-00A
FCC ID: 2A3OORT29D

Test Standard (s)

FCC PART 90

Sample Description

Product Type: Two Way Radio
Model No.: RT29D, RT29
Trade Mark: RETEVIS
Date Received: 2025-03-21
Date of Test: 2025-04-17 to 2025-06-10
Report Date: 2025-06-10

Test Result:	The EUT complied with the standards above.
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Prepared and Checked By:

Roger Ling

Roger Ling
EMC Engineer

Approved By:

Bob. Liao

Bob.Liao
EMC Engineer

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
Rev.00	2504R03308E-RF-00A	Original Report	2025-06-10

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Type	Two Way Radio
Tested Model	RT29D
Multiple Model	RT29
Model Difference [#]	The difference among two model is model name and sales channels. Please refer to DOS letter for details. The applicant provided "RT29D" for testing.
Frequency Range	400-480MHz
Rated Output Power [#]	High Power: 5Watts Low Power: 1Watt
Modulation Technique	4FSK, FM
Channel Separation	12.5kHz
Antenna Specification [#]	2 dBi (It is provided by the manufacturer.)
Voltage Range [#]	DC 7.4V from battery
Sample Serial Number	2ZZ8-1 (RF Radiated Test & RF Conducted Test) (Assigned by ATC, Shenzhen)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2, and Part 90 of the Federal Communication Commissions rules.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part J as well as the following individual parts:

Part 90 – Private Land Mobile Radio Service

Applicable Standards: TIA 603-E, ANSI C63.26-2015.

Unless otherwise stated there are no any additions to, deviations, or exclusions from the method.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

Accredited by American Association for Laboratory Accreditation (A2LA).The Certificate Number is 4297.01.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		0.064×10^{-7}
RF output power, conducted		0.3 dB
Unwanted Emission, conducted		1.2 dB
AC Power Lines Conducted Emissions		2.7 dB
Audio Frequency Response		0.1 dB
Low Pass Filter Response		1.2 dB
Modulation Limiting		1.5 %
Emissions, Radiated	30MHz - 1GHz	4.3 dB
	1GHz - 18GHz	4.9 dB
	18GHz - 26.5GHz	5.2 dB
	26.5GHz - 40GHz	4.6 dB
Temperature		1°C
Humidity		7%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured to testing mode which is provided by the manufacturer.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

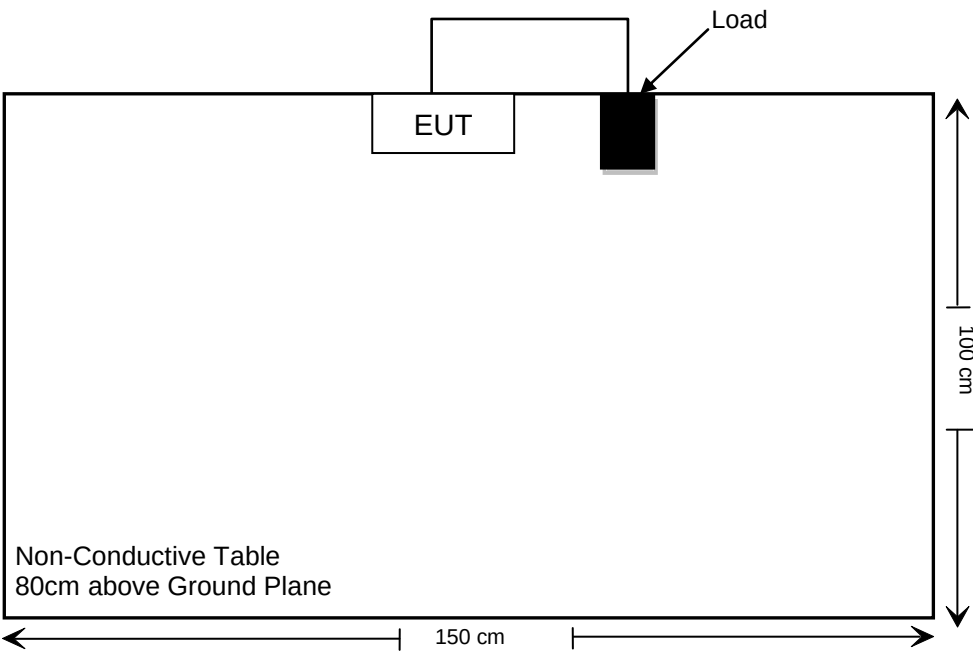
Manufacturer	Description	Model	Serial Number
UNKNOWN	Load	UNKNOWN	UNKNOWN

External I/O Cable

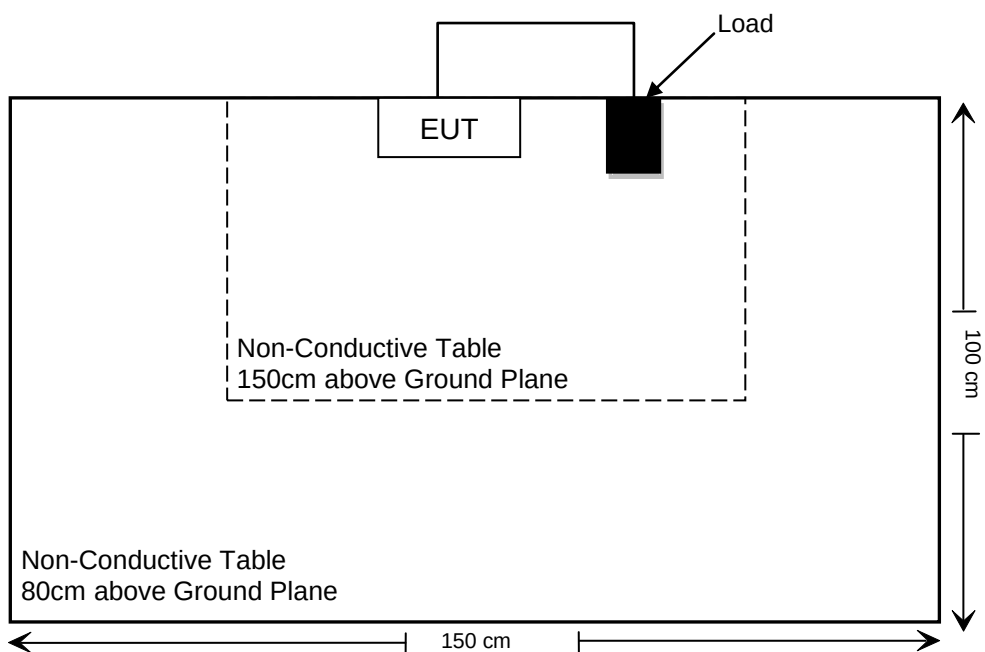
Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

Below 1GHz:



Above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure (SAR)	Compliance
§2.1046; §90.205	RF Output Power	Compliance
§2.1047; §90.207	Modulation Characteristic	Compliance
§2.1049; §90.209; §90.210	Occupied Bandwidth & Emission Mask	Compliance
§2.1051;§90.210	Spurious Emission at Antenna Terminal	Compliance
§2.1053;§90.210	Spurious Radiated Emissions	Compliance
§2.1055;§90.213	Frequency Stability	Compliance
§90.214	Transient Frequency Behavior	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Spurious Emission Test (Below 1GHz)					
Rohde & Schwarz	Test Receiver	ESR	102725	2024/11/08	2025/11/07
SONOMA INSTRUMENT	Amplifier	310N	186131	2024/05/24	2025/05/23
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2024/08/08	2027/08/07
Unknown	RF Coaxial Cable	No.12	N040	2024/10/08	2025/10/07
Unknown	RF Coaxial Cable	No.13	N300	2024/10/08	2025/10/07
Unknown	RF Coaxial Cable	No.14	N800	2024/10/08	2025/10/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2023/02/14	2026/02/13
Agilent	Signal Generator	N5183A	MY47420360	2024/09/02	2025/09/01
Radiated Emission Test Software: e3 191218 (V9)					
Radiated Spurious Emission Test (Above 1GHz)					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101949	2024/10/08	2025/10/07
A.H. Systems, inc.	Preamplifier	PAM-0118	226	2024/05/24	2025/05/23
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Unknown	RF Coaxial Cable	No.10	N050	2024/10/08	2025/10/07
Unknown	RF Coaxial Cable	No.11	N1000	2024/10/08	2025/10/07
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2022/12/26	2025/12/25
Agilent	Signal Generator	N5183A	MY47420360	2024/09/02	2025/09/01
Unknown	RF Coaxial Cable	No.16	N200	2024/10/08	2025/10/07
Radiated Emission Test Software: e3 191218 (V9)					
RF Conducted test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2024/10/08	2025/10/07
AGILENT	Vector Signal Generator	N5182A	MY50143401	2024/10/08	2025/10/07
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2024/12/04	2025/12/03
Aeroflex/Weinschel	30dB Attenuator (Input 250W/ Output 50W)	58-30-33	PS467	2024/10/08	2025/10/07
Mini-Circuits	High Pass Filter	NHP-600+	15542	2024/10/08	2025/10/07
BACL	Temp. & Humid. Chamber	BTH-150-40	30192	2024/10/08	2025/10/07
HP Agilent	RF Communication test set	8920A	3325U00859	2024/05/24	2025/05/23
HP Agilent	RF Communication test set	8920A	3325U00859	2025/05/23	2026/05/22
Rohde & Schwarz	Audio Analyzer	UPV	101782	2025/01/15	2026/01/14
WEINSCHTEL	10dB Attenuator	5324	AU 3842	2025/03/26	2026/03/25
UNI-T	DC Power Supply	UTP1306S	2109D0903324	2025/03/26	2026/03/25

* Statement of Traceability: Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report[#]: 2502R03308E-20.

FCC §2.1046, §90.205-RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.205

Test Procedure

Conducted RF Output Power:

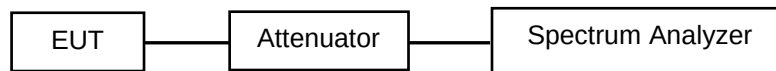
The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

Spectrum Analyzer Setting:

R B/W	Video B/W
100 kHz	300 kHz

Test Method: ANSI C63.26-2015, Clause 5.2.3.3

Setup Block Diagram



Test Data

Environmental Conditions

Temperature:	23.8-26.4 °C
Relative Humidity:	51.2-55 %
ATM Pressure:	100.2-101.3 kPa

The testing was performed by Cayde Hou from 2025-04-29 to 2025-05-02.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the Appendix.

FCC §2.1047, §90.207-MODULATION CHARACTERISTIC

Applicable Standard

FCC§2.1047 and §90.207:

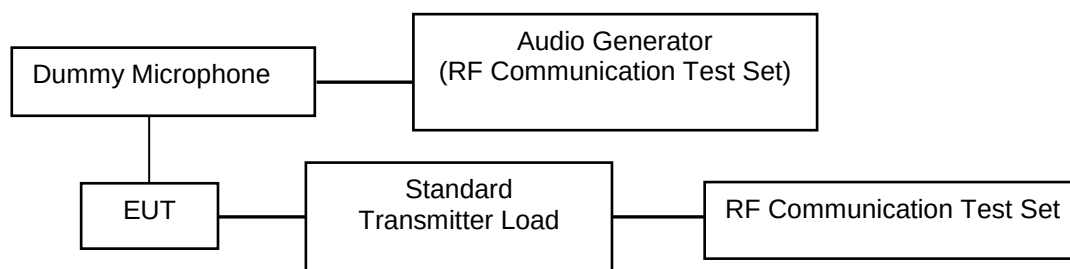
- (a) Equipment which utilizes voice modulated communication shall show the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz. for equipment which is required to have a low pass filter, the frequency response of the filter, or all of the circuitry installed between the modulation limited and the modulated stage shall be supplied.
- (b) Equipment which employs modulation limiting, a curve showing the percentage of modulation versus the modulation input voltage shall be supplied.

Test Procedure

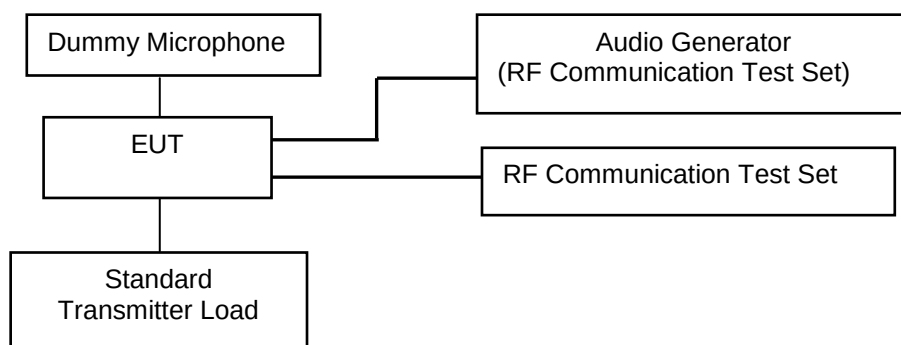
Test Method: ANSI C63.26-2015 Section 5.3.2 & 5.3.3, ANSI/TIA 603-E-2016 Section 2.2.15

Setup Block Diagram

For Modulation type:



For Audio Frequency filter:



Test Data

Environmental Conditions

Temperature:	23.5-26.8 °C
Relative Humidity:	50.4-56 %
ATM Pressure:	100.2-101.3 kPa

The testing was performed by Cayde Hou from 2025-05-01 to 2025-06-04.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the Appendix.

FCC §2.1049, §90.209, §90.210-OCCUPIED BANDWIDTH & EMISSION MASK

Applicable Standard

FCC §2.1049 and §90.210

Emission Mask D - 12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 , 0dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least 7.27 ($f_d - 2.88$ kHz) dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz at least: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

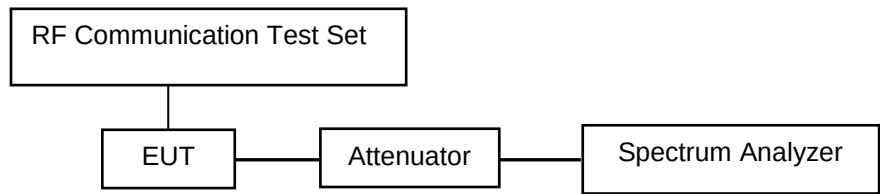
Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 Hz and the spectrum was recorded in the frequency band ± 50 kHz from the carrier frequency.

Test Method: ANSI C63.26-2015, Clause 5.4.4

Setup Block Diagram



Test Data

Environmental Conditions

Temperature:	25.9-26.8 °C
Relative Humidity:	56 %
ATM Pressure:	99.7-101.3 kPa

The testing was performed by Cayde Hou from 2025-05-01 to 2025-06-04.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the Appendix.

Note:

Emission bandwidth was based on calculation method instead of measurement.

Emission Designator: Per CFR 47 §2.201& §2.202, $BW = 2M + 2D$

For FM Mode (Channel Spacing: 12.5 kHz) Emission Designator 11K0F3E

In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.

$BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} = 11K0$

F3E portion of the designator represents an FM voice transmission

Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

For Digital Mode (Channel Spacing: 12.5 kHz) Emission Designator 7K60F1D and 7K60F1E

The 99% energy rule (title 47CFR 2.1049) was used for digital mode. It basically states that 99% of the modulation energy falls within X kHz, in this case, 7.60 kHz. The emission mask was obtained from 47CFR 90.210(d).

F1D and F1E portion of the designator indicates digital information.

Therefore, the entire designator for 12.5 kHz channel spacing digital mode is 7K60F1D and 7K60F1E.

FCC §2.1051, §90.210-SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

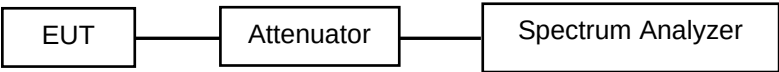
- 1) For any frequency removed from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 , 0 dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.626 kHz but no more than 12.5 kHz, at least 7.27 ($f_d - 2.88$ kHz) dB.
- 3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Method: ANSI C63.26-2015 Section 5.7.4

Setup Block Diagram



Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	48 %
ATM Pressure:	99.7 kPa

The testing was performed by Cayde Hou on 2025-06-10.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the Appendix.

FCC §2.1053, §90.210-RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §90.210

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB = 50 + 10 Log₁₀ (power out in Watts) for EUT with a 12.5 kHz channel bandwidth.

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54-55 %
ATM Pressure:	100.4-101.3 kPa

The Below 1GHz testing was performed by Jim Zheng on 2025-04-19.

The Above 1GHz testing was performed by Jim Zheng on 2025-04-17.

EUT operation mode: Transmitting

Test Result: Compliance, please refer to the below data.

For Analog:

Frequency (MHz)	Receiver	Rx Antenna	Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	Polar (H/V)				
400.0125 MHz						
800.03	-58.26	H	10.68	-47.58	-20	-27.58
800.03	-60.1	V	7.97	-52.13	-20	-32.13
2800.088	-33.26	H	1.89	-31.37	-20	-11.37
2800.088	-24.15	V	1.88	-22.27	-20	-2.27
3200.1	-25.05	H	2.59	-22.46	-20	-2.46
3200.1	-24.78	V	3.25	-21.53	-20	-1.53
3600.113	-40.88	H	3.01	-37.87	-20	-17.87
3600.113	-40.14	V	2.85	-37.29	-20	-17.29
440 MHz						
880	-55.01	H	8.11	-46.9	-20	-26.9
880	-57.18	V	10.92	-46.26	-20	-26.26
2640	-35.36	H	1.34	-34.02	-20	-14.02
2640	-32.73	V	1.42	-31.31	-20	-11.31
3080	-25.06	H	2.86	-22.2	-20	-2.2
3080	-24.16	V	2.59	-21.57	-20	-1.57
3520	-37.07	H	2.97	-34.1	-20	-14.1
3520	-34.98	V	2.9	-32.08	-20	-12.08
479.9875 MHz						
959.98	-57.5	H	11.12	-46.38	-20	-26.38
959.98	-54.85	V	10.03	-44.82	-20	-24.82
2879.925	-33.49	H	2.31	-31.18	-20	-11.18
2879.925	-28.95	V	2.14	-26.81	-20	-6.81
3359.913	-27.04	H	1.88	-25.16	-20	-5.16
3359.913	-24.57	V	2.01	-22.56	-20	-2.56

For Digital:

Frequency (MHz)	Receiver	Rx Antenna	Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	Polar (H/V)				
400.0125 MHz						
800.03	-58.12	H	10.68	-47.44	-20	-27.44
800.03	-59.43	V	7.97	-51.46	-20	-31.46
2800.088	-34.21	H	1.89	-32.32	-20	-12.32
2800.088	-25.13	V	1.88	-23.25	-20	-3.25
3200.1	-25.16	H	2.59	-22.57	-20	-2.57
3200.1	-24.83	V	3.25	-21.58	-20	-1.58
3600.113	-40.56	H	3.01	-37.55	-20	-17.55
3600.113	-40.03	V	2.85	-37.18	-20	-17.18
440 MHz						
880	-54.62	H	8.11	-46.51	-20	-26.51
880	-56.23	V	10.92	-45.31	-20	-25.31
2640	-35.41	H	1.34	-34.07	-20	-14.07
2640	-32.45	V	1.42	-31.03	-20	-11.03
3080	-25.07	H	2.86	-22.21	-20	-2.21
3080	-24.53	V	2.59	-21.94	-20	-1.94
3520	-36.21	H	2.97	-33.24	-20	-13.24
3520	-33.65	V	2.9	-30.75	-20	-10.75
479.9875 MHz						
959.98	-56.62	H	11.12	-45.5	-20	-25.5
959.98	-55.23	V	10.03	-45.2	-20	-25.2
2879.925	-33.53	H	2.31	-31.22	-20	-11.22
2879.925	-28.42	V	2.14	-26.28	-20	-6.28
3359.913	-27.52	H	1.88	-25.64	-20	-5.64
3359.913	-24.36	V	2.01	-22.35	-20	-2.35

Note 1: Factor = Antenna factor (RX) + Cable Loss - Amplifier Factor

Note 2: Absolute Level = Substituted Factor + Reading

Note 3: Margin = Absolute Level – Limit

FCC §2.1055, §90.213-FREQUENCY STABILITY

Applicable Standard

FCC §2.1055 and §90.213

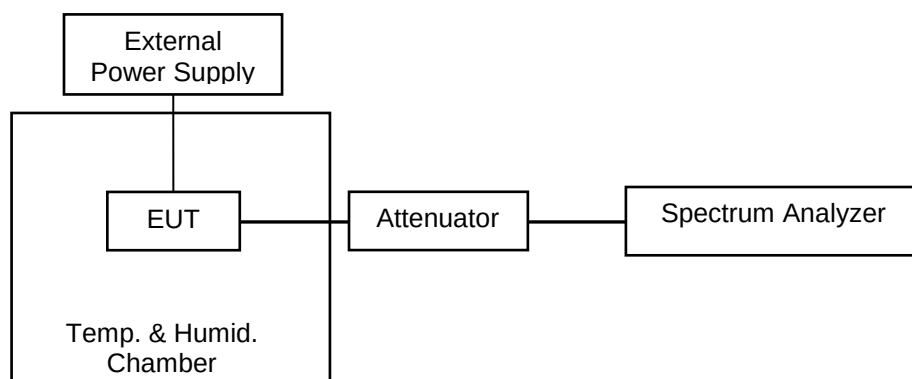
Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC/DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The power cable and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Test Method: ANSI C63.26-2015 Section 5.6

Setup Block Diagram



Test Data

Environmental Conditions

Temperature:	25.4-26.4 °C
Relative Humidity:	54.9-55.0 %
ATM Pressure:	100.2-101.3 kPa

The testing was performed by Cayde Hou from 2025-04-29 to 2025-05-08.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the Appendix.

FCC §90.214-TRANSIENT FREQUENCY BEHAVIOR

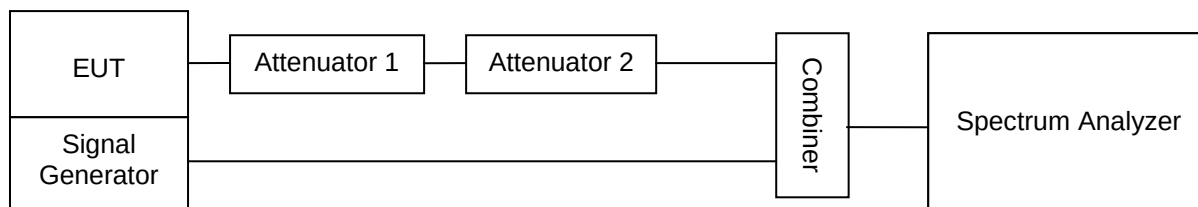
Applicable Standard

Regulations: FCC §90.214

Test Procedure

Test method: ANSI C63.26-2015, Section 6.5.2.2:

- Connect the EUT and test equipment as shown on the following block diagram.
- Set the Spectrum Analyzer to measure FM deviation, and tune the RF frequency to the transmitter assigned frequency.
- Set the signal generator to the assigned transmitter frequency and modulate it with a 1 kHz tone at ± 12.5 kHz deviation and set its output level to -100dBm.
- Turn on the transmitter.
- Supply sufficient attenuation via the RF attenuator to provide an input level to the Spectrum Analyzer that is 40 dB below the maximum allowed input power when the transmitter is operating at its rated power level. Note this power level on the Spectrum Analyzer as P_0 .
- Turn off the transmitter.
- Adjust the RF level of the signal generator to provide RF power equal to P_0 . This signal generator RF level shall be maintained throughout the rest of the measurement.
- Remove the attenuation 1, so the input power to the Spectrum Analyzer is increased by 30 dB when the transmitter is turned on.
- Adjust the vertical amplitude control of the spectrum analyzer to display the 1000 Hz at ± 4 divisions vertically centered on the display. Set trigger mode of the Spectrum Analyzer to "Video", and tune the "trigger level" on suitable level. Then set the "trigger offset" to -10ms for turn on and -15ms for turn off.
- Turn on the transmitter and the transient wave will be captured on the screen of Spectrum Analyzer. Observe the stored display. The instant when the 1 kHz test signal is completely suppressed is considered to be t_{on} . The trace should be maintained within the allowed divisions during the period t_1 and t_2 .
- Then turn off the transmitter, and another transient wave will be captured on the screen of Spectrum Analyzer. The trace should be maintained within the allowed divisions during the period t_3 .



Test Data

Environmental Conditions

Temperature:	23.5 °C
Relative Humidity:	50.4 %
ATM Pressure:	100.2 kPa

The testing was performed by Cayde Hou on 2025-05-15.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the Appendix.

APPENDIX

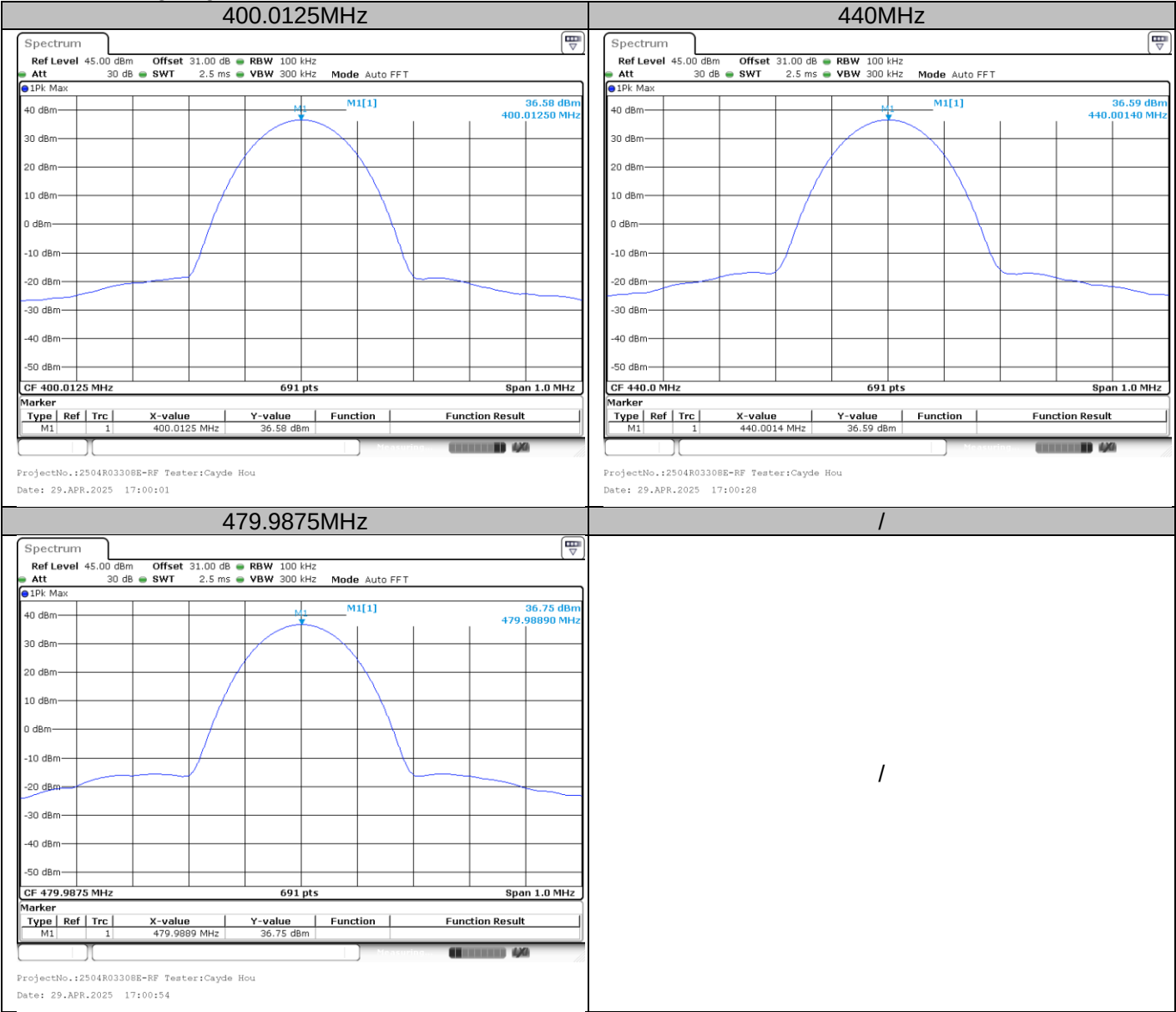
RF Output Power

Test Data:

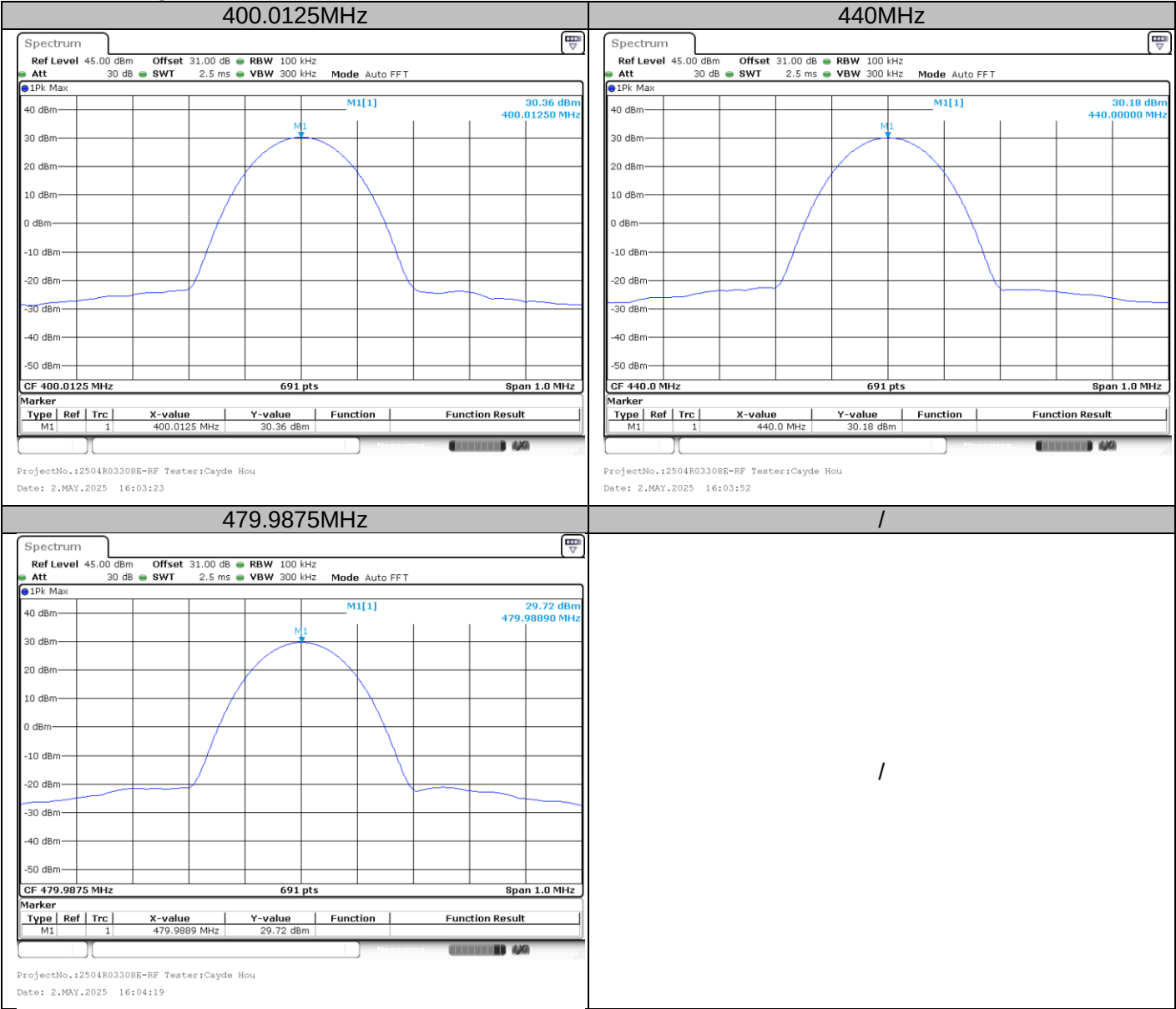
Mode	Frequency Spacing (kHz)	Frequency (MHz)	Power level	Output Power (dBm)	Output Power (W)	Limit (W)
Analog	12.5	400.0125	High	36.58	4.550	6
			Low	30.36	1.086	1.2
		440	High	36.59	4.560	6
			Low	30.18	1.042	1.2
		479.9875	High	36.75	4.732	6
			Low	29.72	0.938	1.2
Digital	12.5	400.0125	High	36.46	4.426	6
			Low	30.15	1.035	1.2
		440	High	36.29	4.256	6
			Low	29.51	0.893	1.2
		479.9875	High	36.72	4.699	6
			Low	29.61	0.914	1.2

Note:
The high rated power level is 5W(37dBm), and low rated power level is 1W(30dBm).
The output power shall not exceed by more than 20 percent the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

For Analog, High Power:

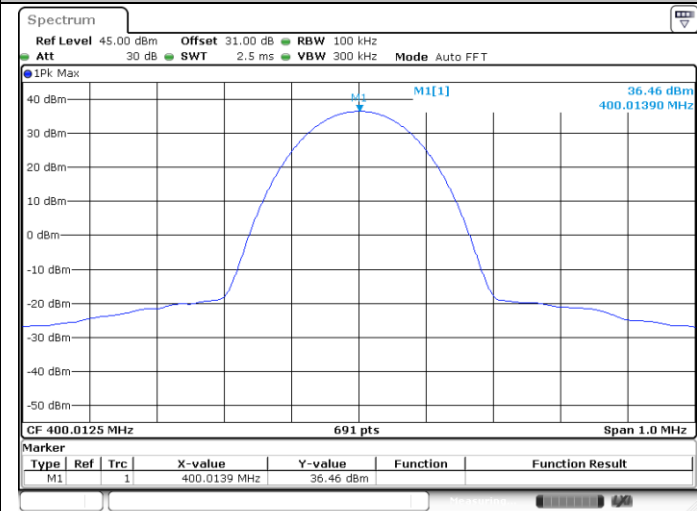


For Analog, Low Power:



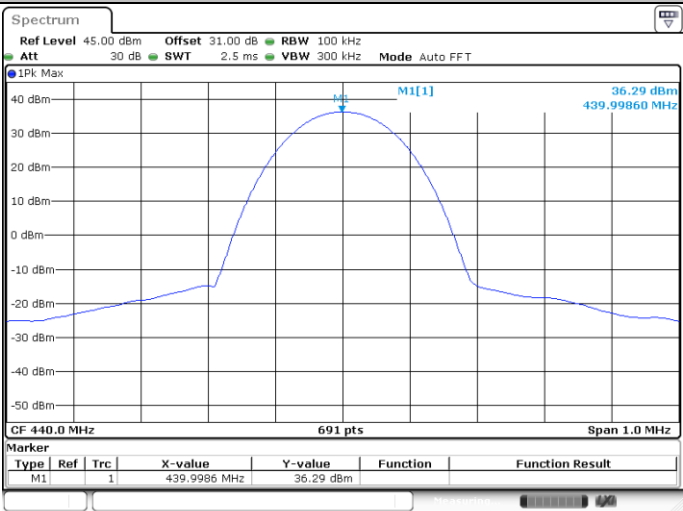
For Digital, High Power:

400.0125MHz



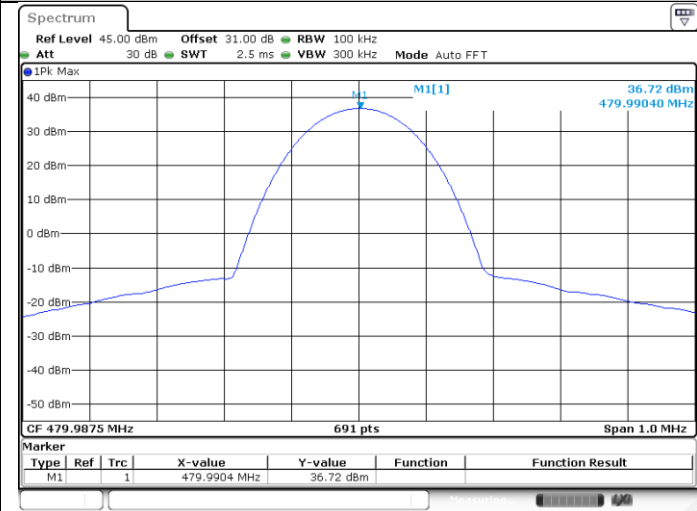
ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 29.APR.2025 17:04:50

440MHz



ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 29.APR.2025 17:05:17

479.9875MHz

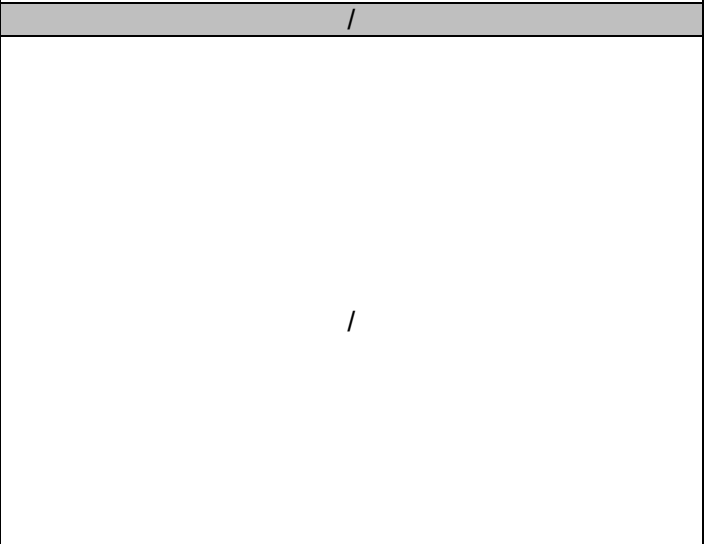
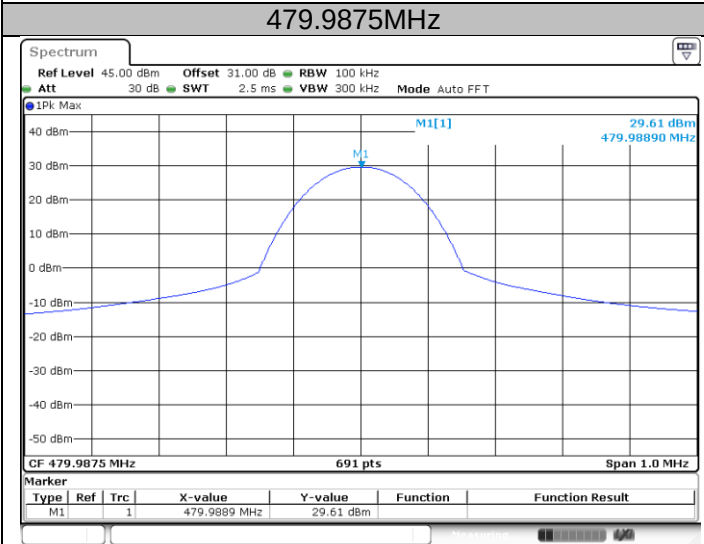
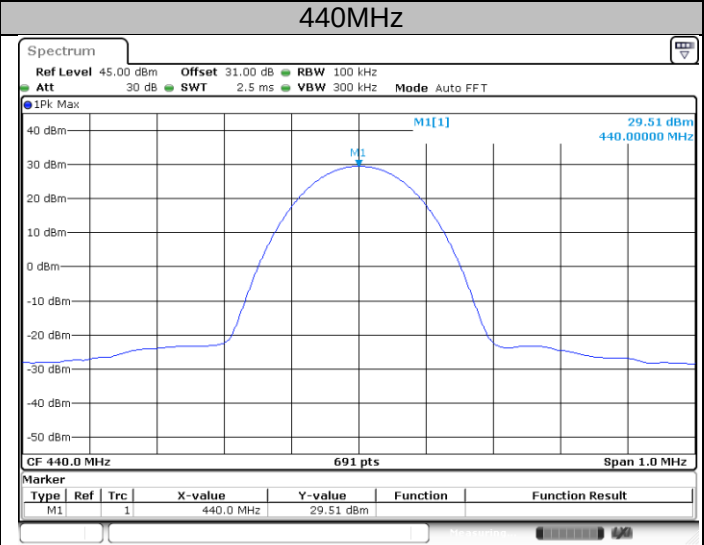
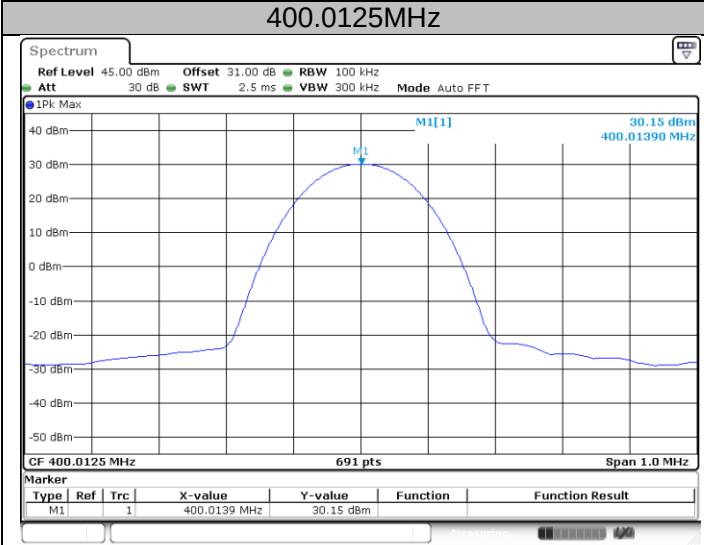


ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 29.APR.2025 17:05:44

/

/

For Digital, Low Power:



Frequency Stability

Test Data:

Analog Modulation, 12.5kHz Reference Frequency: 440MHz, Limit: ± 2.5 ppm			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Voltage Supplied (V _{DC})	Measured Frequency (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	7.4	440.000692	1.57
40	7.4	440.000224	0.51
30	7.4	440.000294	0.67
20	7.4	440.000316	0.72
10	7.4	440.000356	0.81
0	7.4	440.000248	0.56
-10	7.4	440.000491	1.12
-20	7.4	440.000265	0.60
-30	7.4	440.000531	1.21
Frequency Stability versus Input Voltage			
20	6.4	440.000543	1.23
20	8.4	440.000577	1.31

Digital Modulation, 12.5kHz, Reference Frequency: 440MHz, Limit: ± 2.5 ppm			
Test Environment		Frequency Measure with Time Elapsed	
Temperature (°C)	Voltage Supplied (V _{DC})	Measured Frequency (MHz)	Frequency Error (ppm)
Frequency Stability versus Input Temperature			
50	7.4	440.000960	2.18
40	7.4	440.000601	1.37
30	7.4	440.000541	1.23
20	7.4	440.000737	1.68
10	7.4	440.000699	1.59
0	7.4	440.000785	1.79
-10	7.4	440.000671	1.52
-20	7.4	440.000776	1.76
-30	7.4	440.000661	1.50
Frequency Stability versus Input Voltage			
20	6.4	440.000540	1.23
20	8.4	440.000803	1.83

Note: The Operation Voltage range was provided by manufacturer.

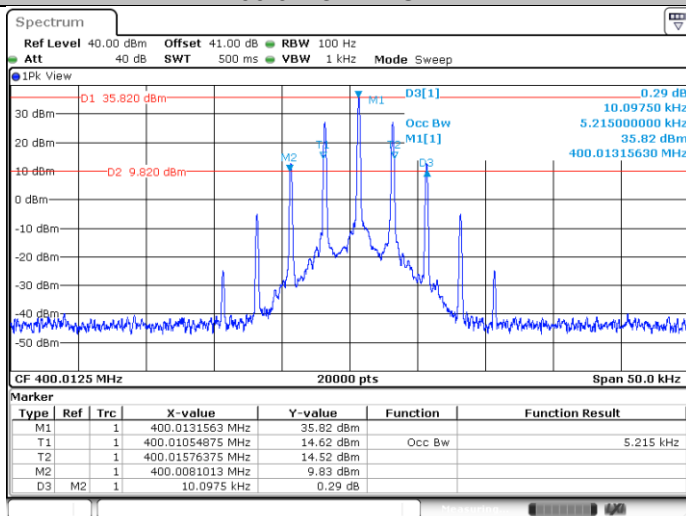
Occupied Bandwidth & Emission Mask

Test Data:

Modulation	Channel Separation (kHz)	Frequency (MHz)	Power Level	99% Occupied Bandwidth (kHz)	26 dB Emissions Bandwidth (kHz)
Analog	12.5	400.0125	High	5.215	10.0975
			Low	9.915	10.13
		440	High	5.2425	10.1125
			Low	9.9175	10.1275
		479.9875	High	5.2325	10.11
			Low	9.9075	10.13
Digital	12.5	400.0125	High	7.7125	9.9975
			Low	7.8075	9.6025
		440	High	7.745	9.695
			Low	7.685	9.5925
		479.9875	High	7.9875	9.52
			Low	7.755	9.53

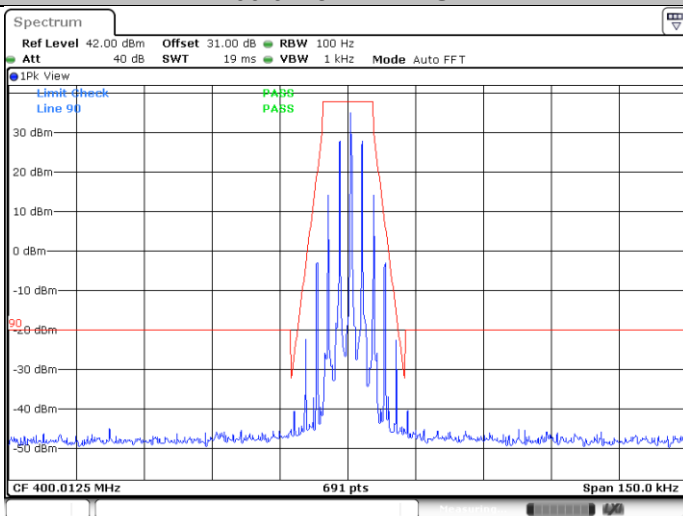
For Analog, High Power:

400.0125MHz-OBW



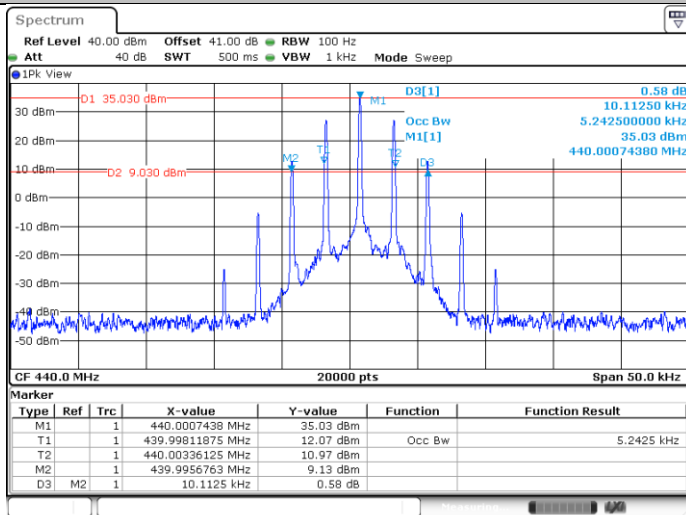
ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 4.JUN.2025 11:57:14

400.0125MHz-MASK



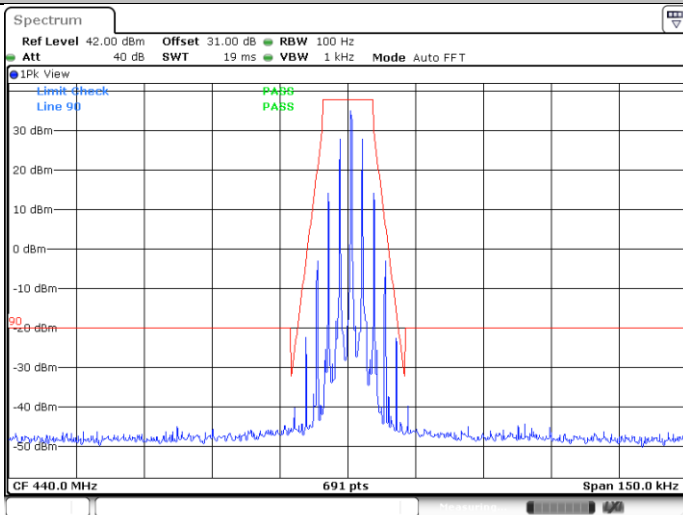
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Date: 1.MAY.2025 11:45:10

440MHz-OBW



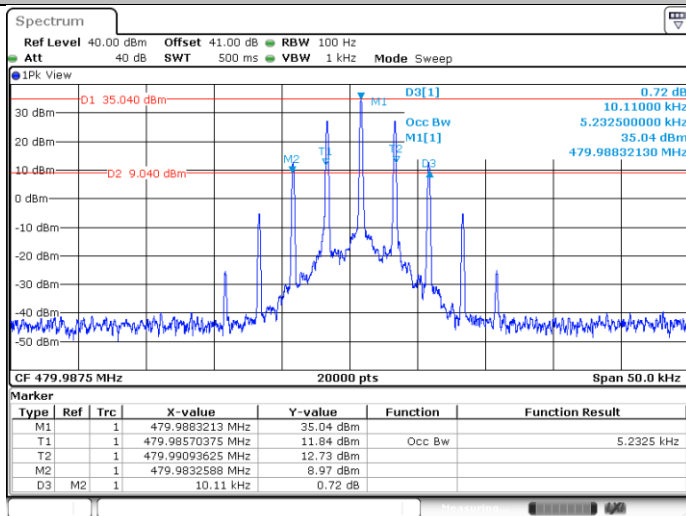
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440MHz-MASK



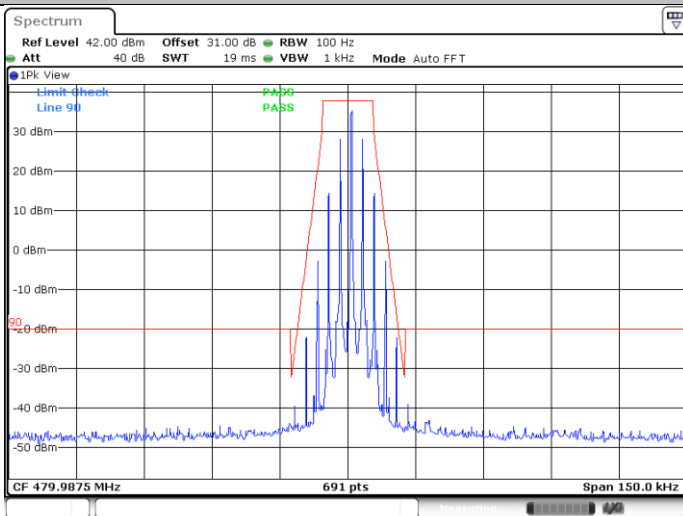
ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 1.MAY.2025 11:57:01

479.9875MHz-OBW



ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 4.JUN.2025 13:05:13

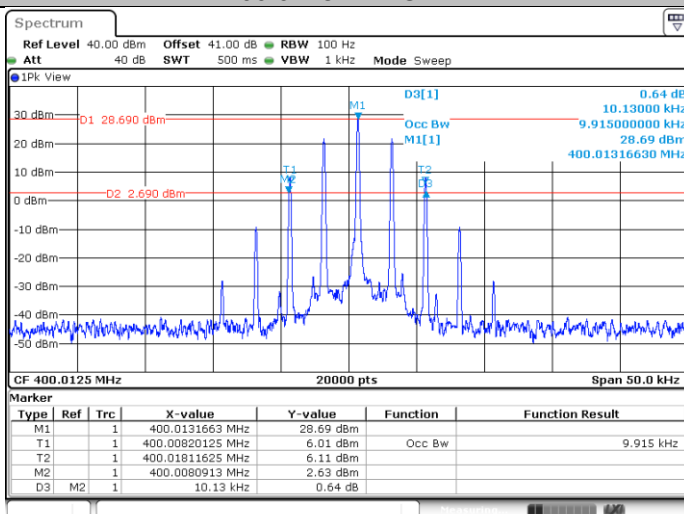
479.9875MHz-MASK



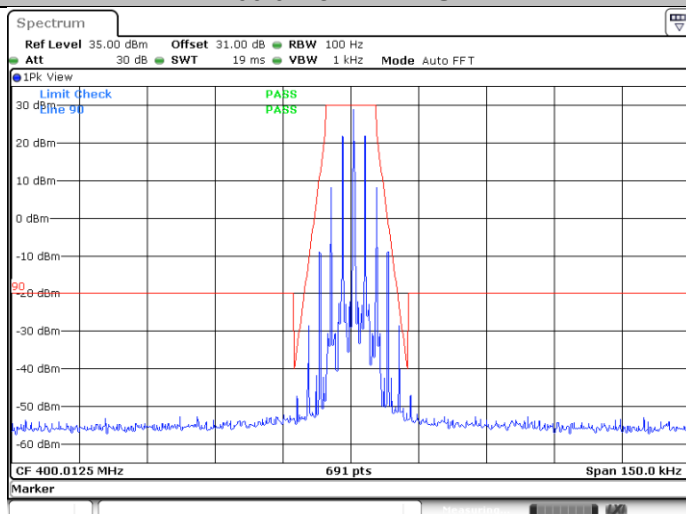
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Date: 1.MAY.2025 13:08:08

For Analog Low Power:

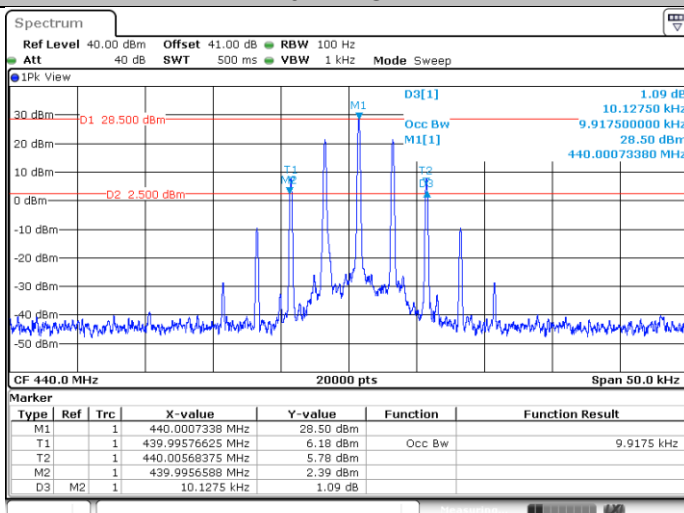
400.0125MHz-OBW



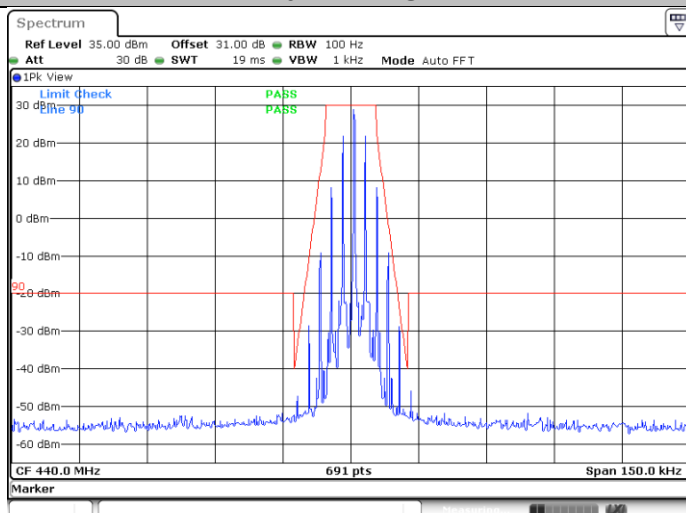
400.0125MHz-MASK



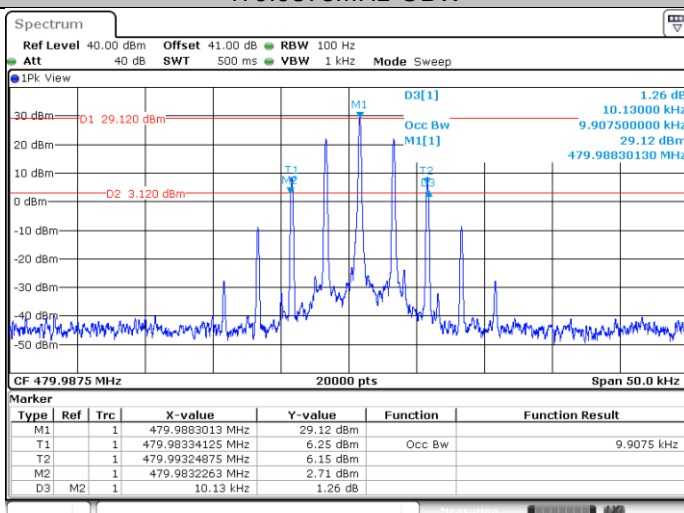
440MHz-OBW



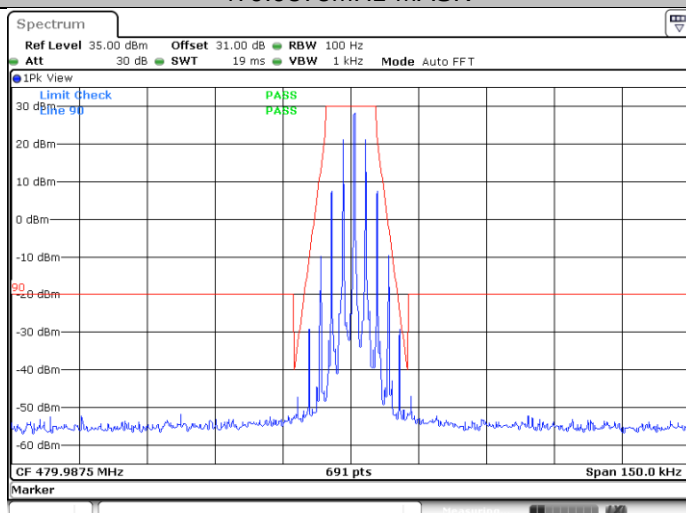
440MHz-MASK



479.9875MHz-OBW

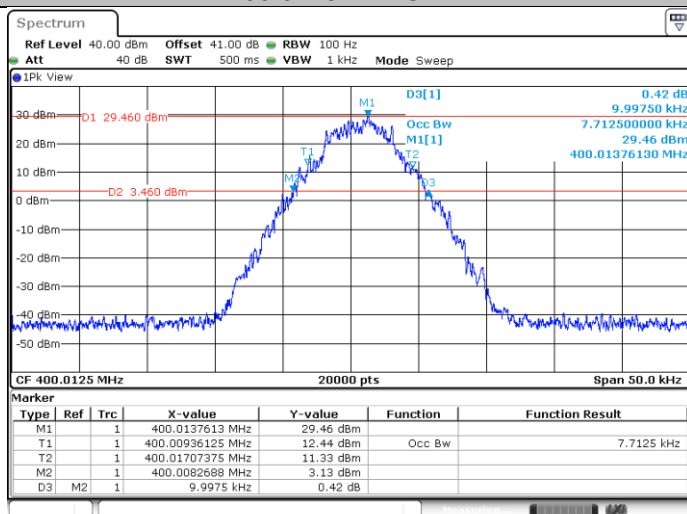


479.9875MHz-MASK

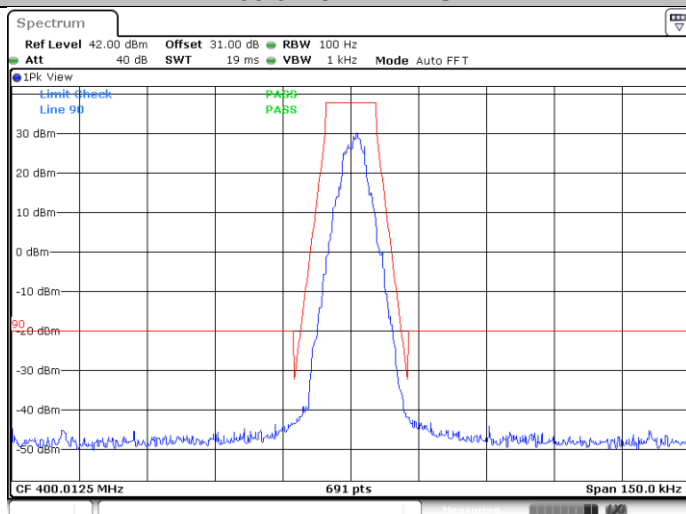


For Digital High Power:

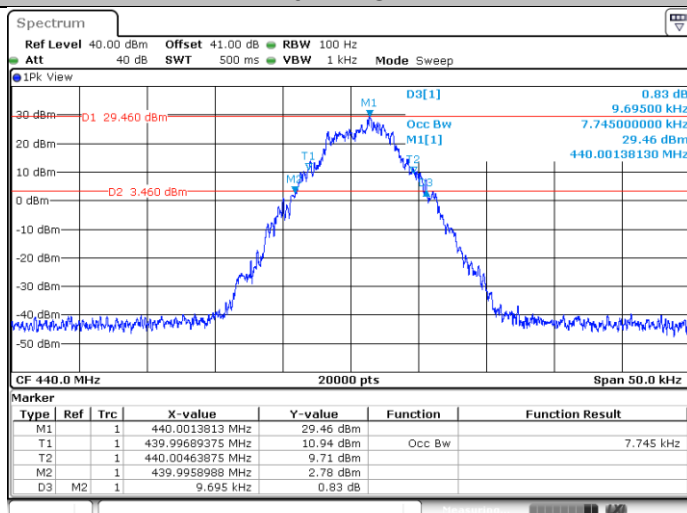
400.0125MHz-OBW



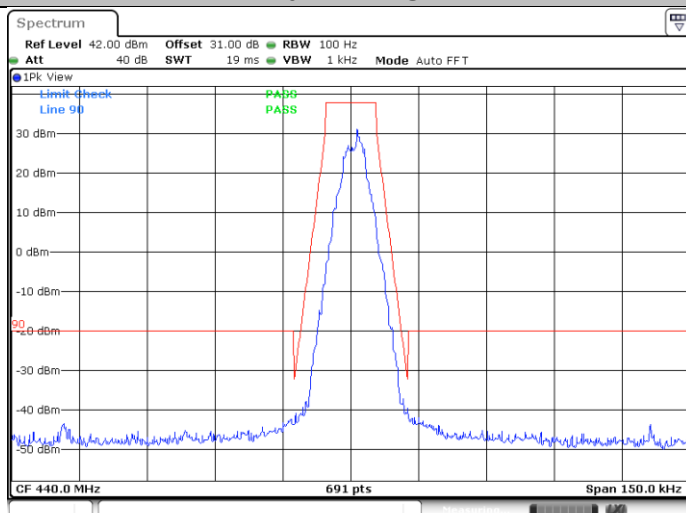
400.0125MHz-MASK



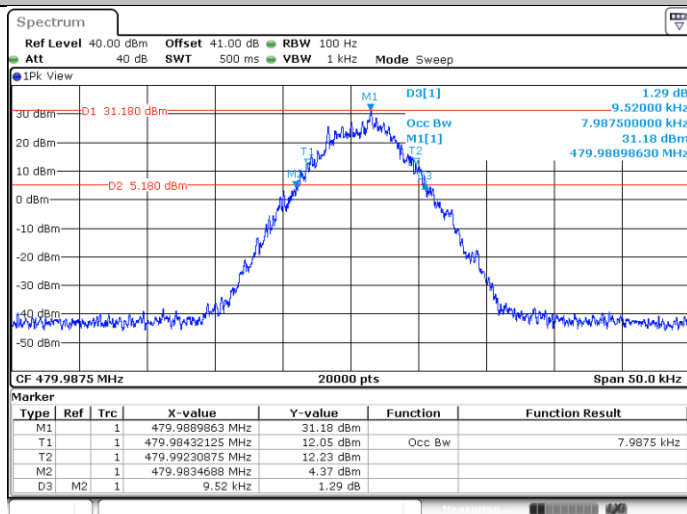
440MHz-OBW



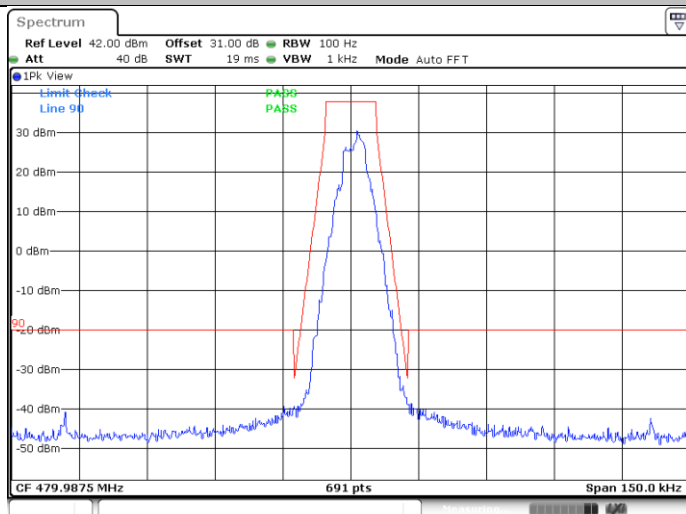
440MHz-MASK



479.9875MHz-OBW

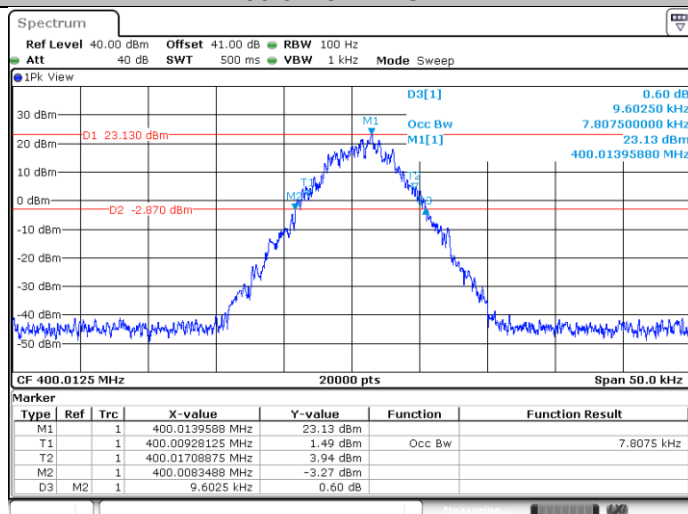


479.9875MHz-MASK



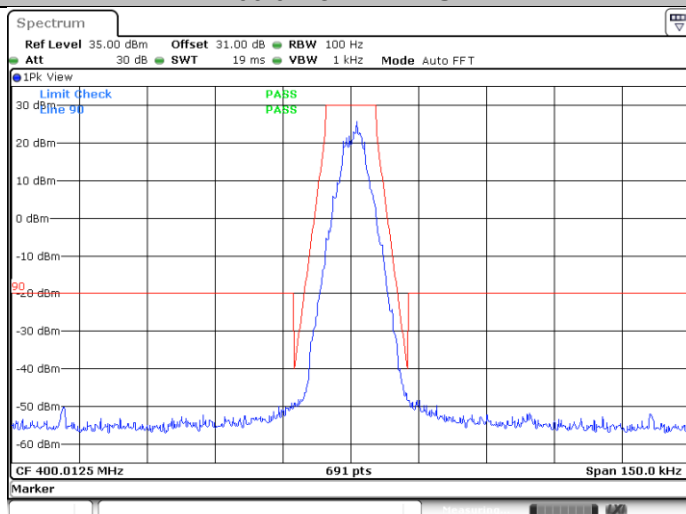
For Digital Low Power:

400.0125MHz-OBW



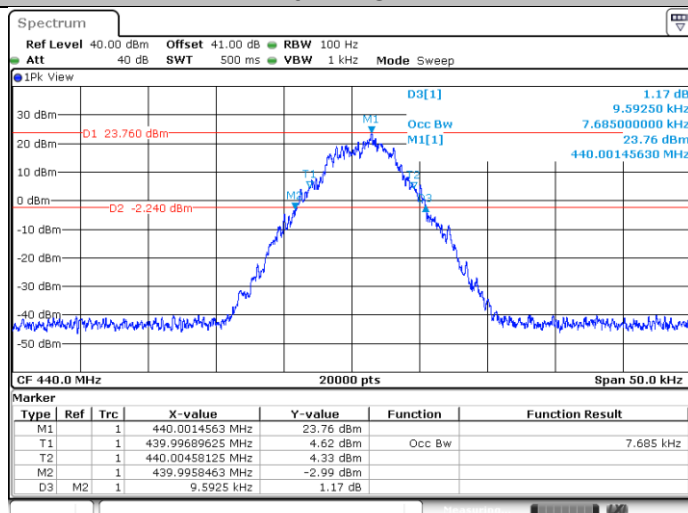
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Date: 4.JUN.2025 13:34:36

400.0125MHz-MASK



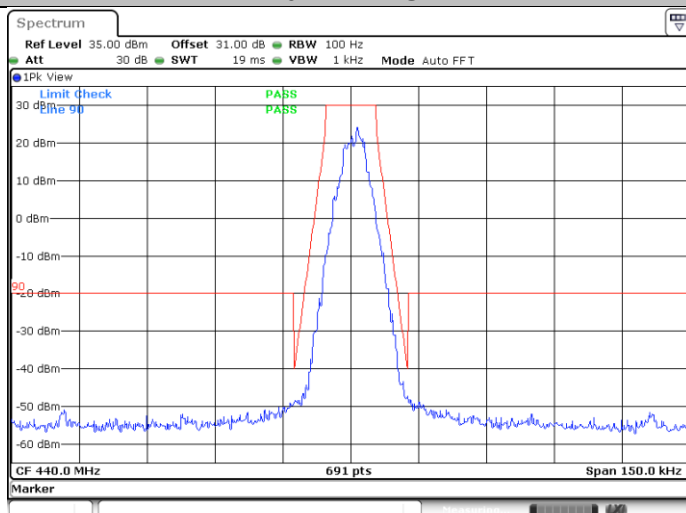
ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 2.MAY.2025 17:36:53

440MHz-OBW



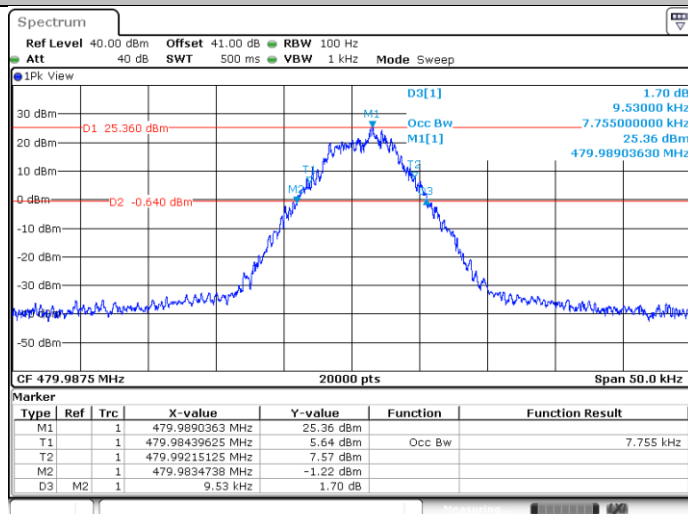
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Date: 4.JUN.2025 13:36:57

440MHz-MASK



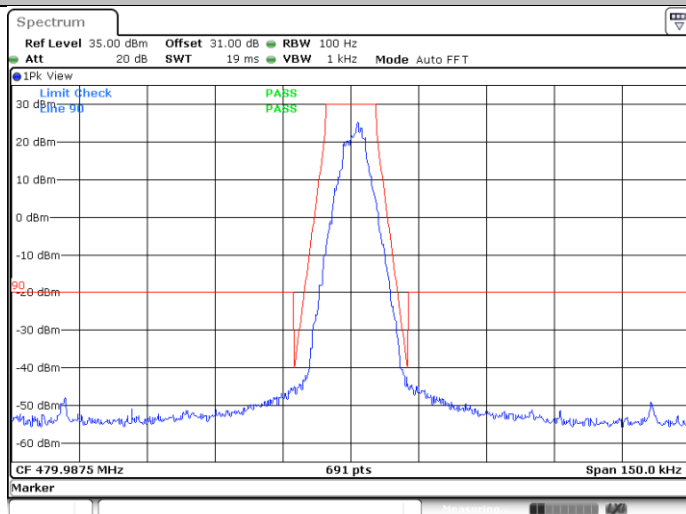
ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 2.MAY.2025 17:38:13

479.9875MHz-OBW



ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 4.JUN.2025 13:39:14

479.9875MHz-MASK

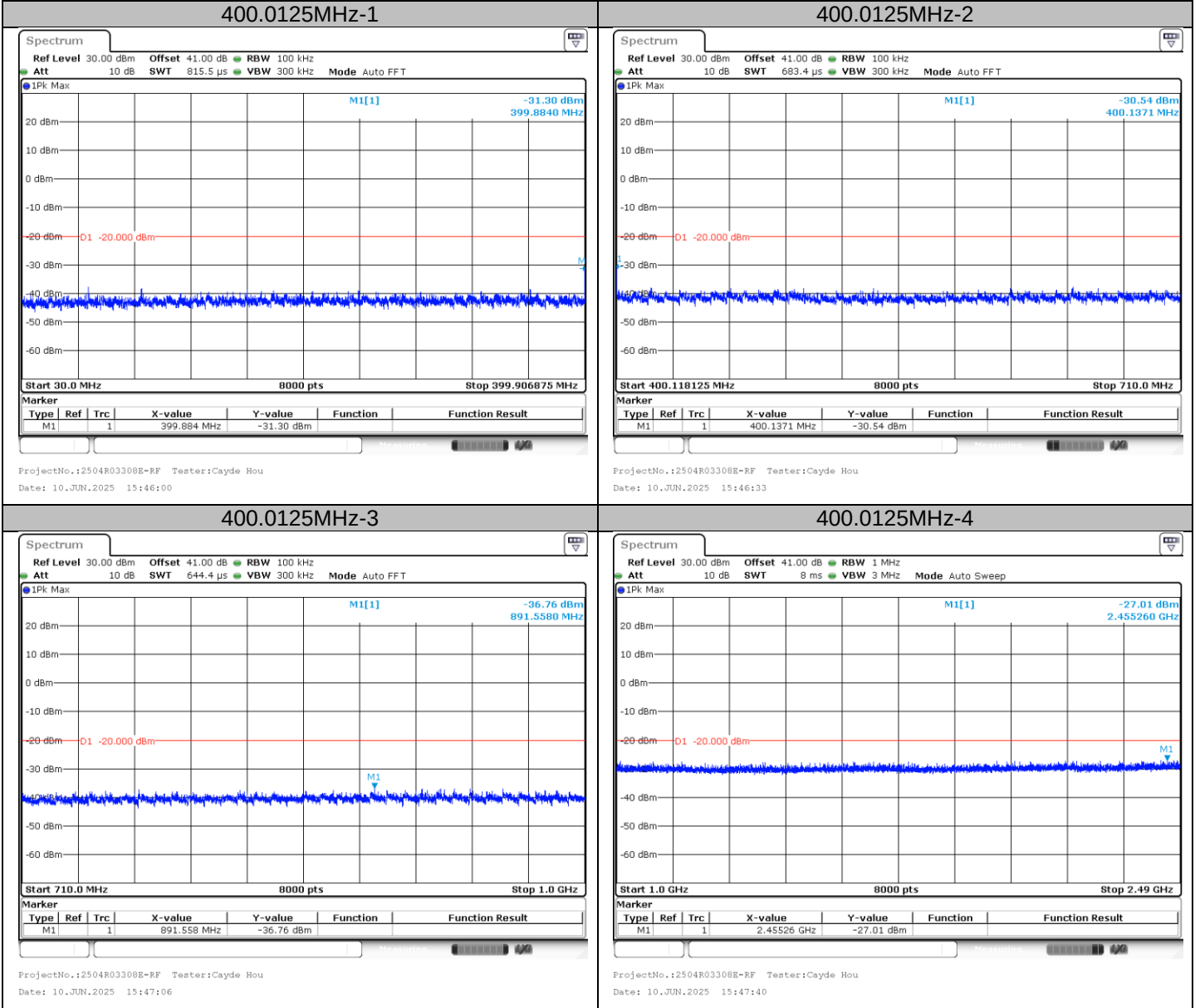


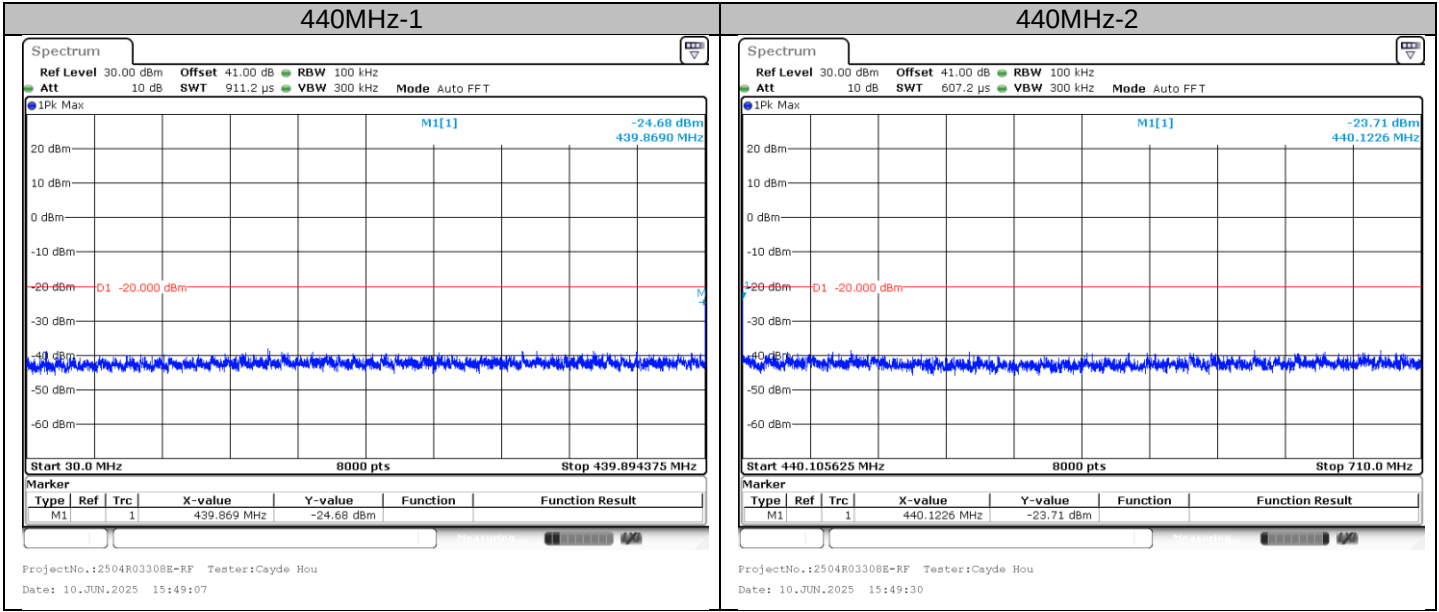
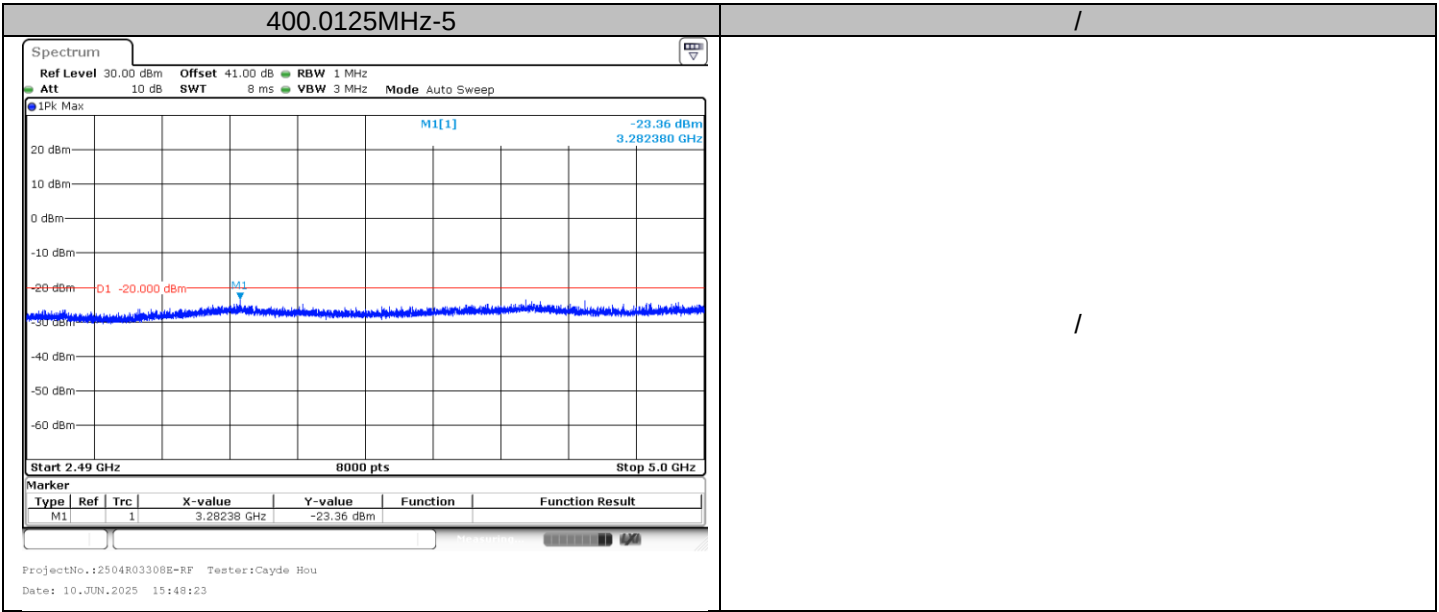
ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 8.MAY.2025 10:31:47

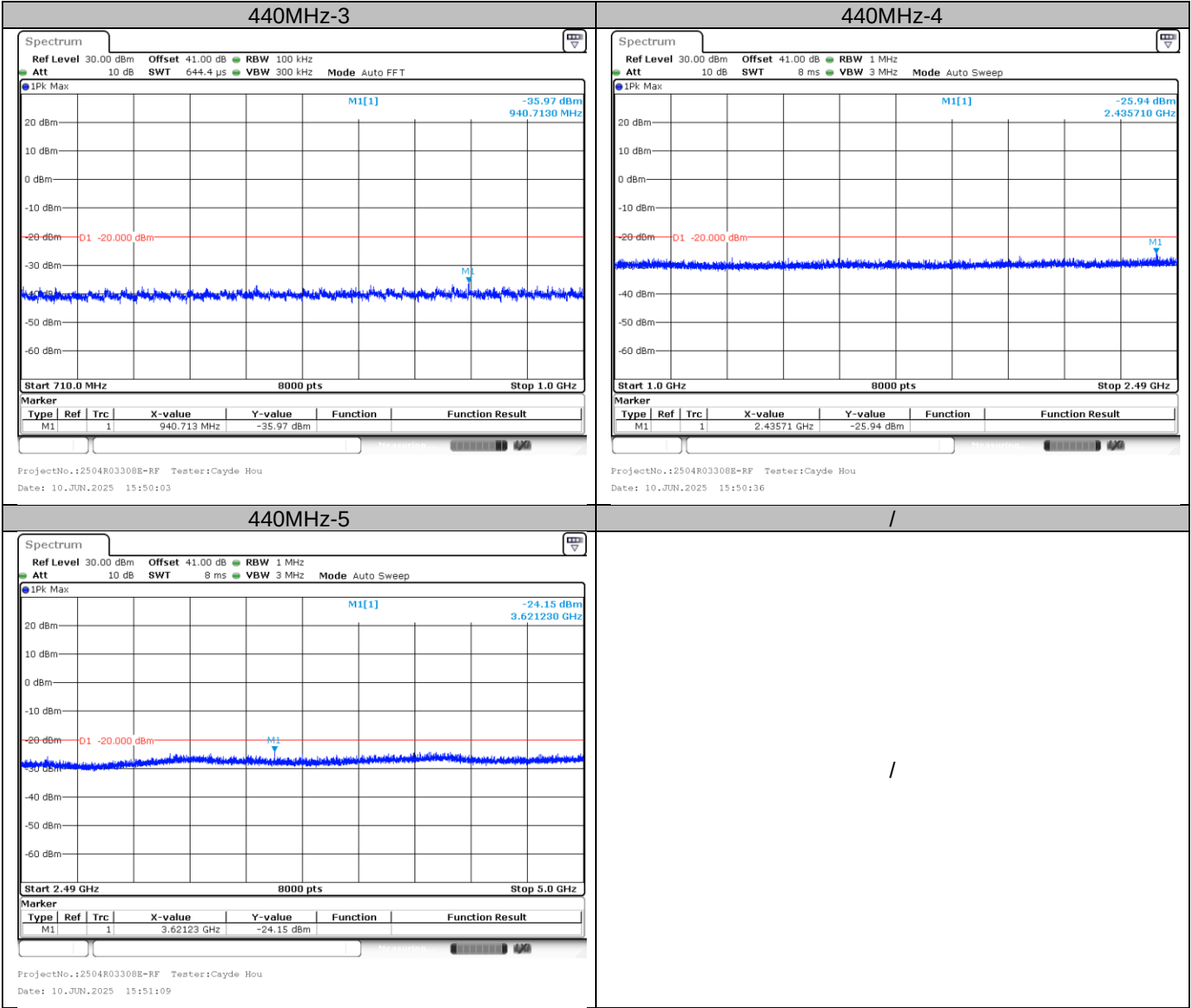
Spurious Emission at Antenna Terminal

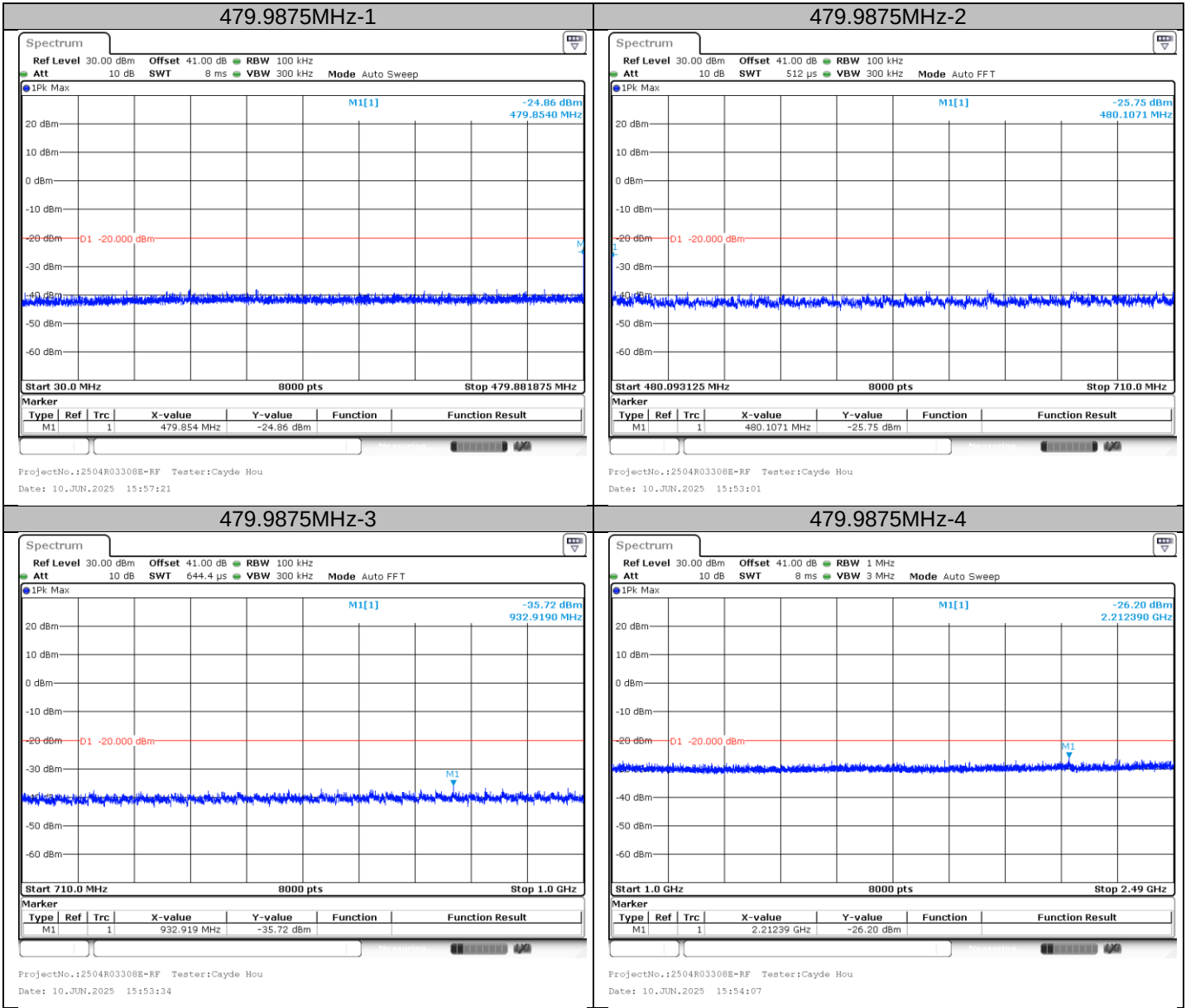
Test Data:

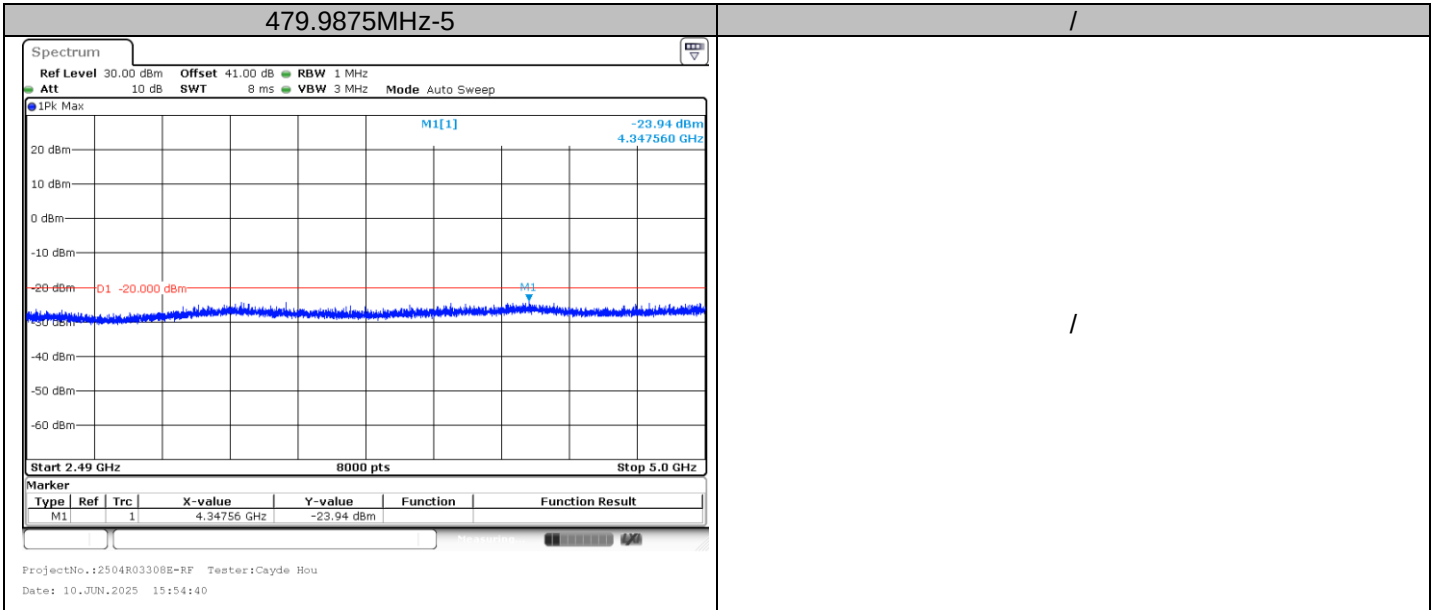
For Analog, High Power:



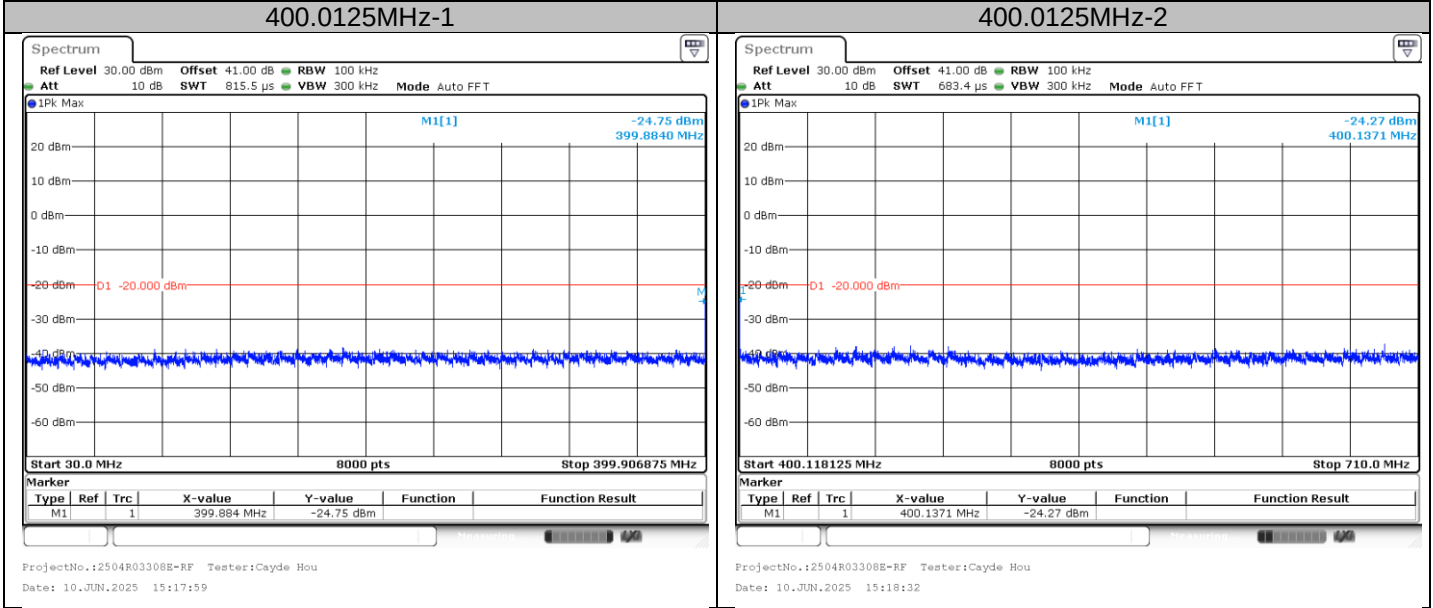


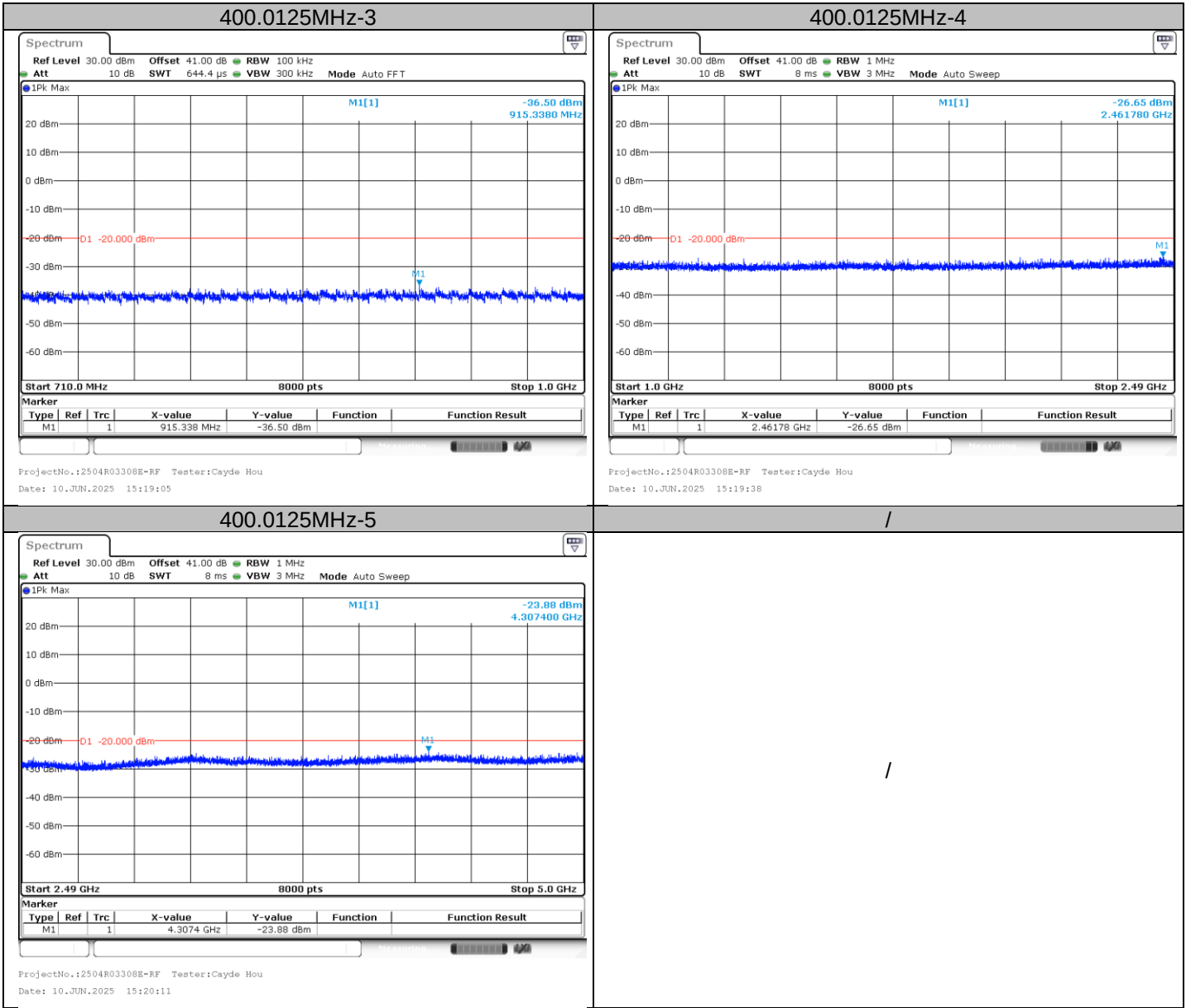


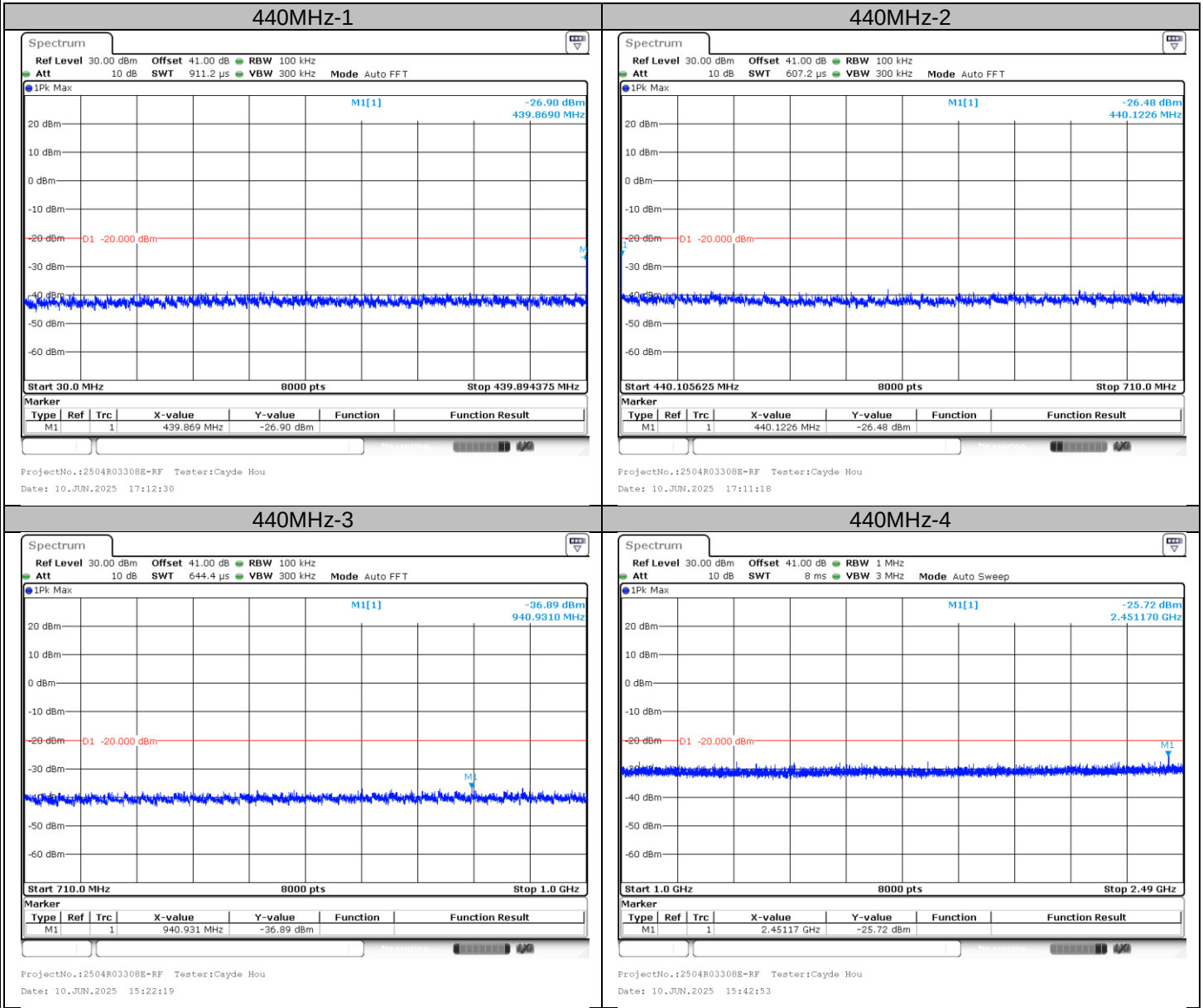


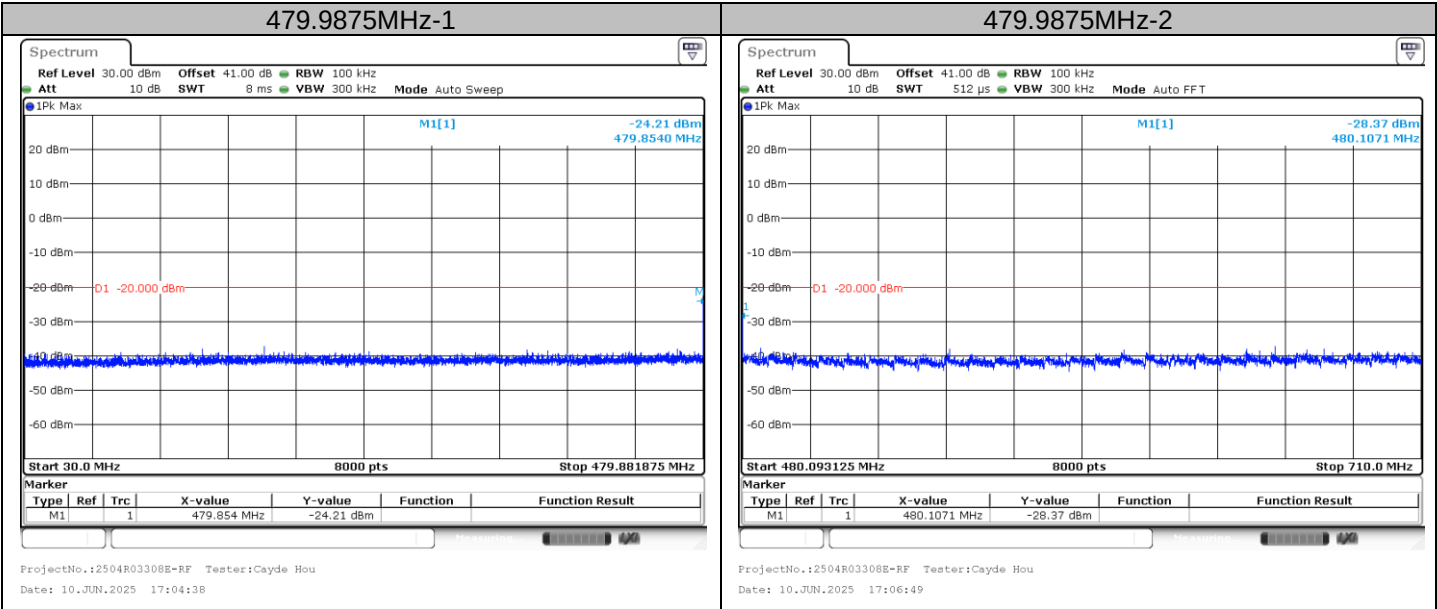
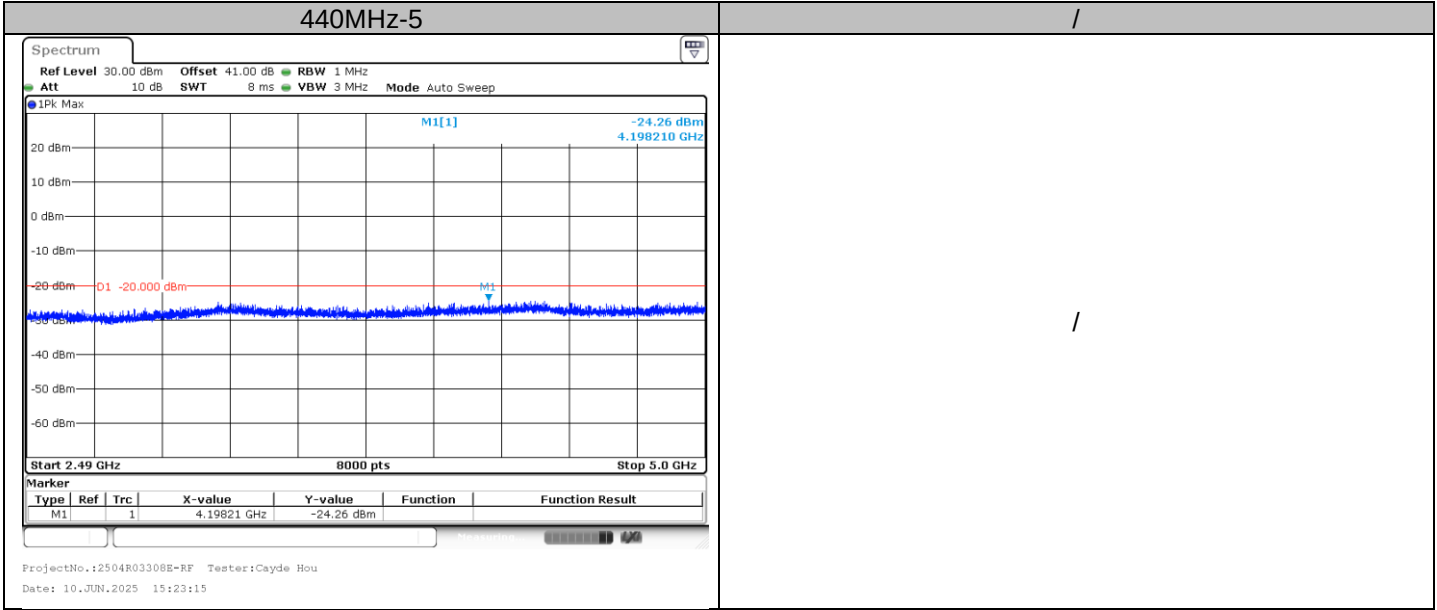


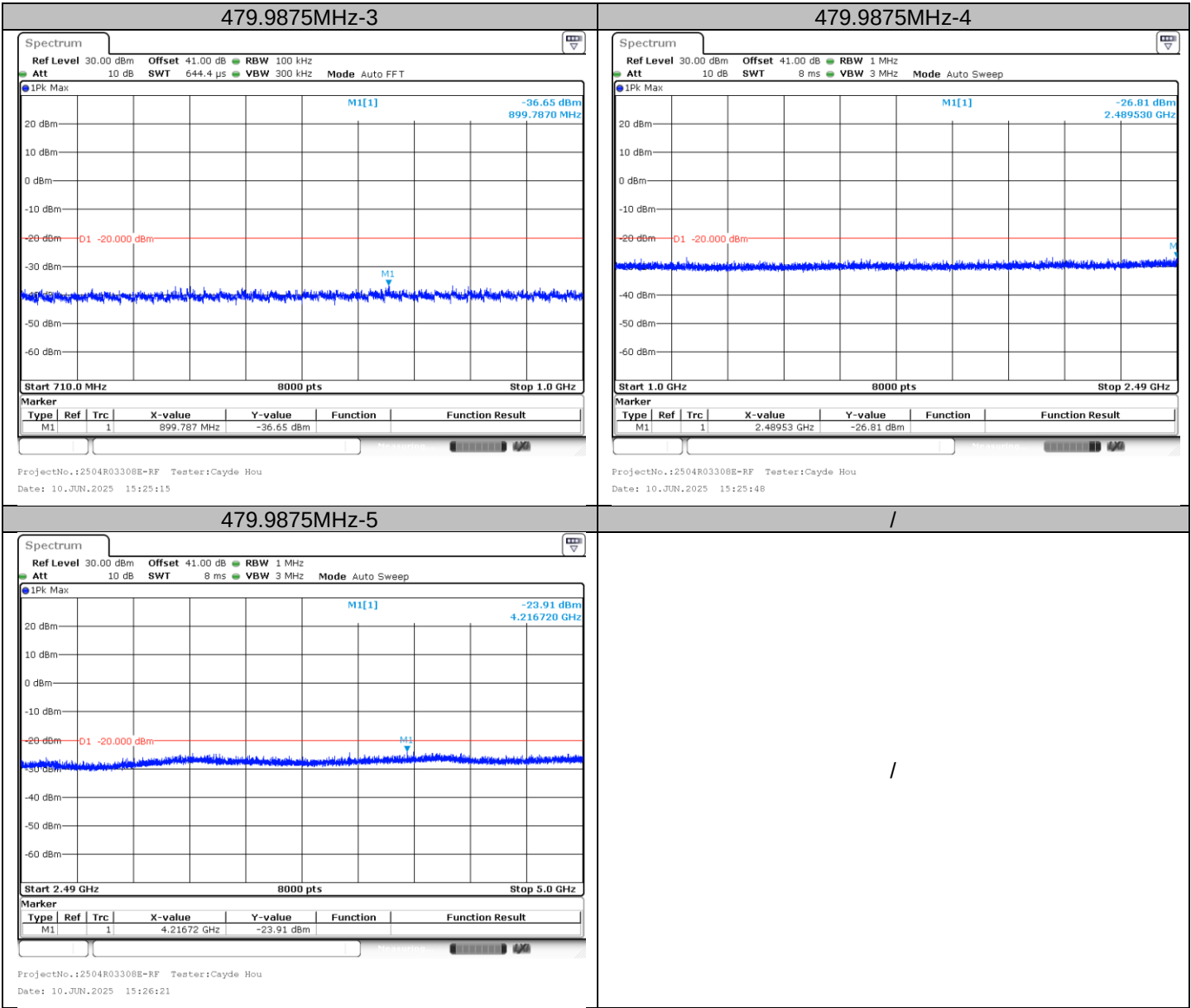
For Digital, High Power:











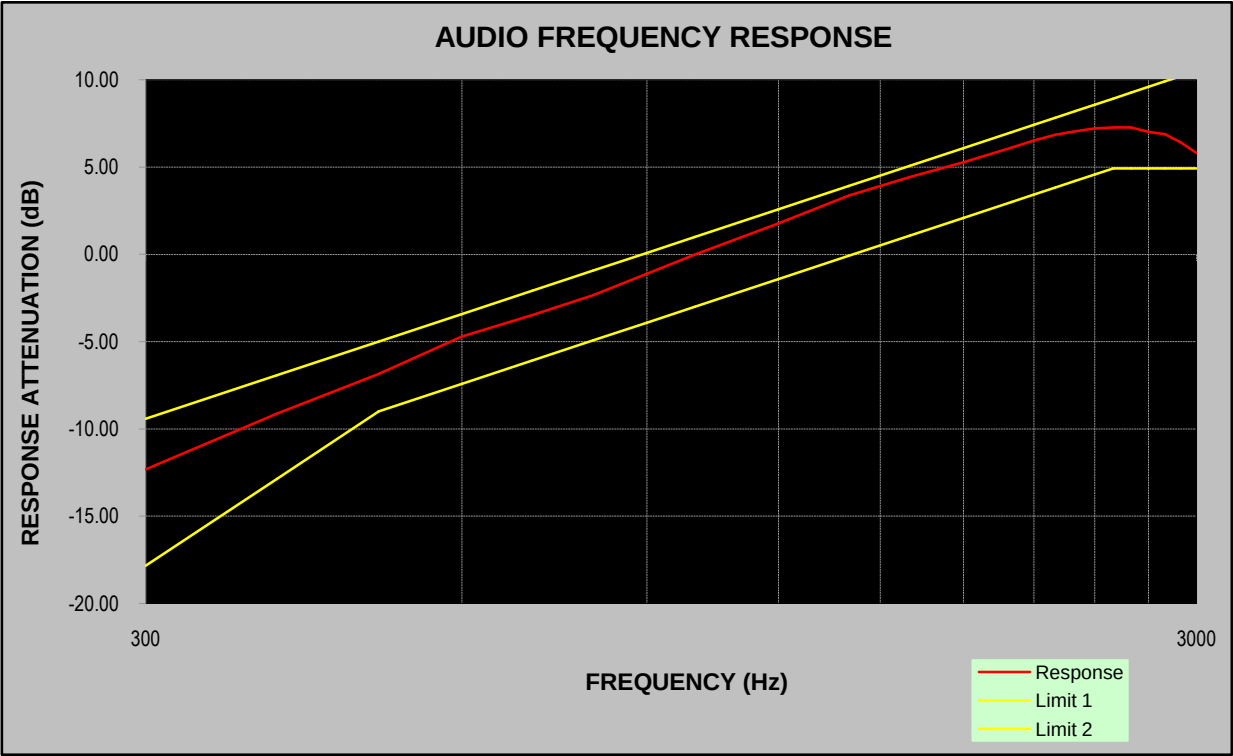
Modulation Characteristic

Test Data:

Audio Frequency Response – High Power

Carrier Frequency: 440MHz,Channel Separetion:12.5kHz

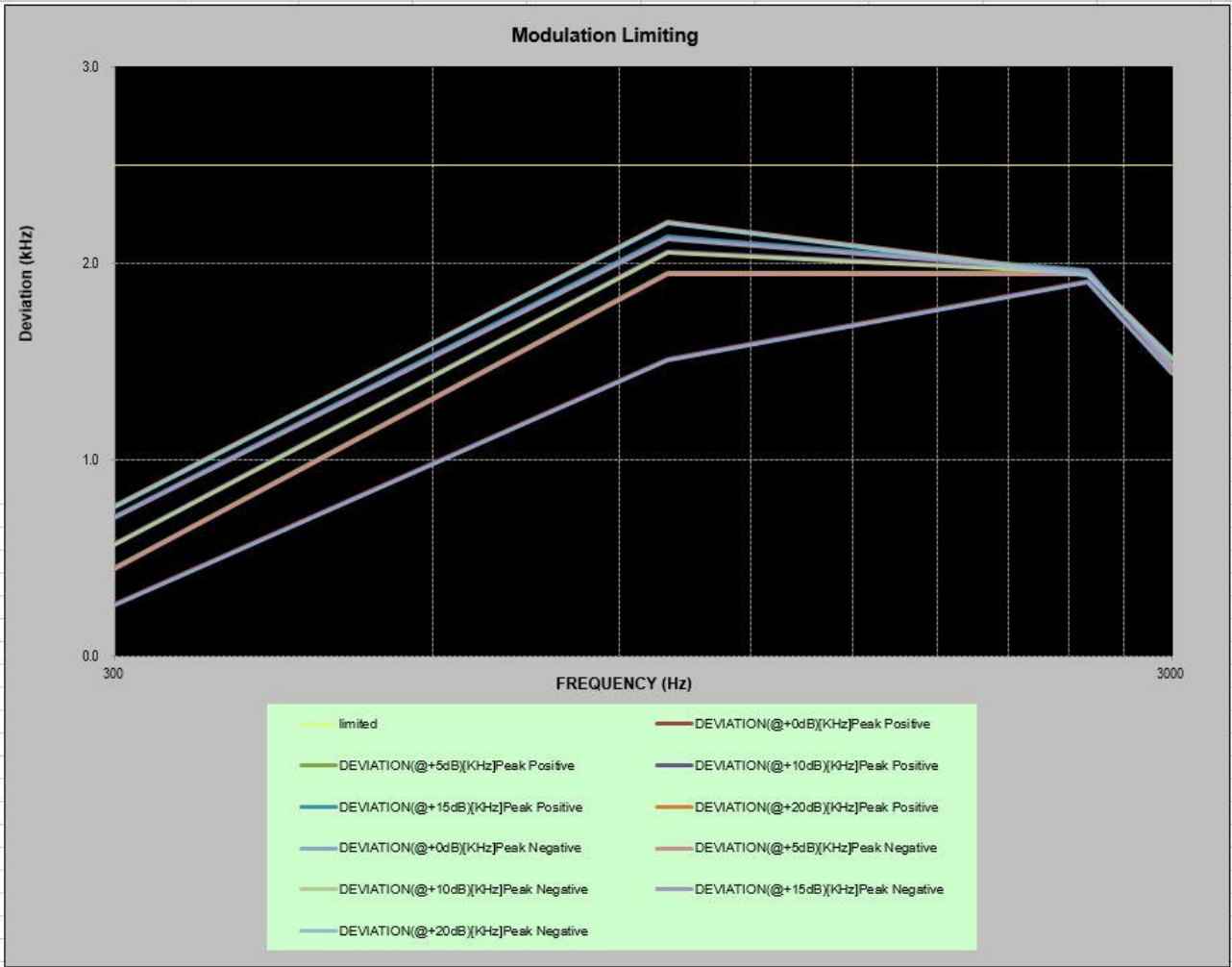
Audio Frequency (Hz)	Response Attenuation (dB)
300	-12.32
400	-9.12
500	-6.86
600	-4.70
700	-3.48
800	-2.34
900	-1.11
1000	0.00
1200	1.77
1400	3.36
1600	4.42
1800	5.28
2000	6.12
2100	6.53
2200	6.85
2300	7.04
2400	7.21
2500	7.28
2600	7.26
2700	7.01
2800	6.88
2900	6.40
3000	5.81



Modulation Limiting – High Power

Carrier Frequency: 440MHz,Channel Separation:12.5kHz

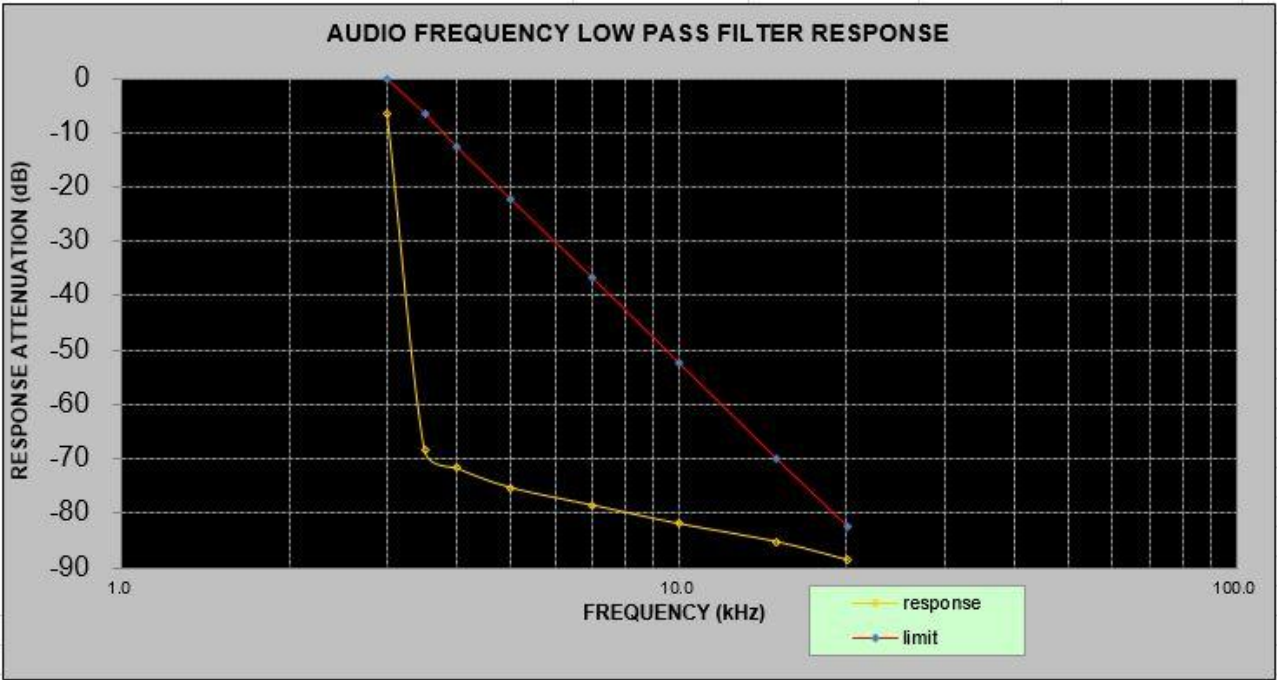
Audio Frequency (Hz)	DEVIATION (@+0dB) [kHz]		DEVIATION (@+5dB) [kHz]		DEVIATION (@+10dB) [kHz]		DEVIATION (@+15dB) [kHz]		DEVIATION (@+20dB) [kHz]		FCC Limit [kHz]
	Peak Positive	Peak Negative	Peak Positive	Peak Negative	Peak Positive	Peak Negative	Peak Positive	Peak Negative	Peak Positive	Peak Negative	
300	0.263	0.255	0.452	0.444	0.570	0.564	0.712	0.704	0.764	0.754	2.500
1000	1.511	1.505	1.953	1.947	2.062	2.053	2.132	2.125	2.211	2.204	2.500
2500	1.909	1.901	1.952	1.944	1.960	1.952	1.967	1.959	1.946	1.937	2.500
3000	1.444	1.438	1.484	1.478	1.479	1.473	1.468	1.460	1.517	1.510	2.500



Audio Frequency Low Pass Filter Response – High Power

Carrier Frequency: 440MHz,Channel Separetion:12.5kHz

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
3.0	-6.5	0.0
3.5	-68.5	-6.7
4.0	-71.7	-12.5
5.0	-75.3	-22.2
7.0	-78.5	-36.8
10.0	-81.9	-52.3
15.0	-85.3	-69.9
20.0	-88.5	-82.5



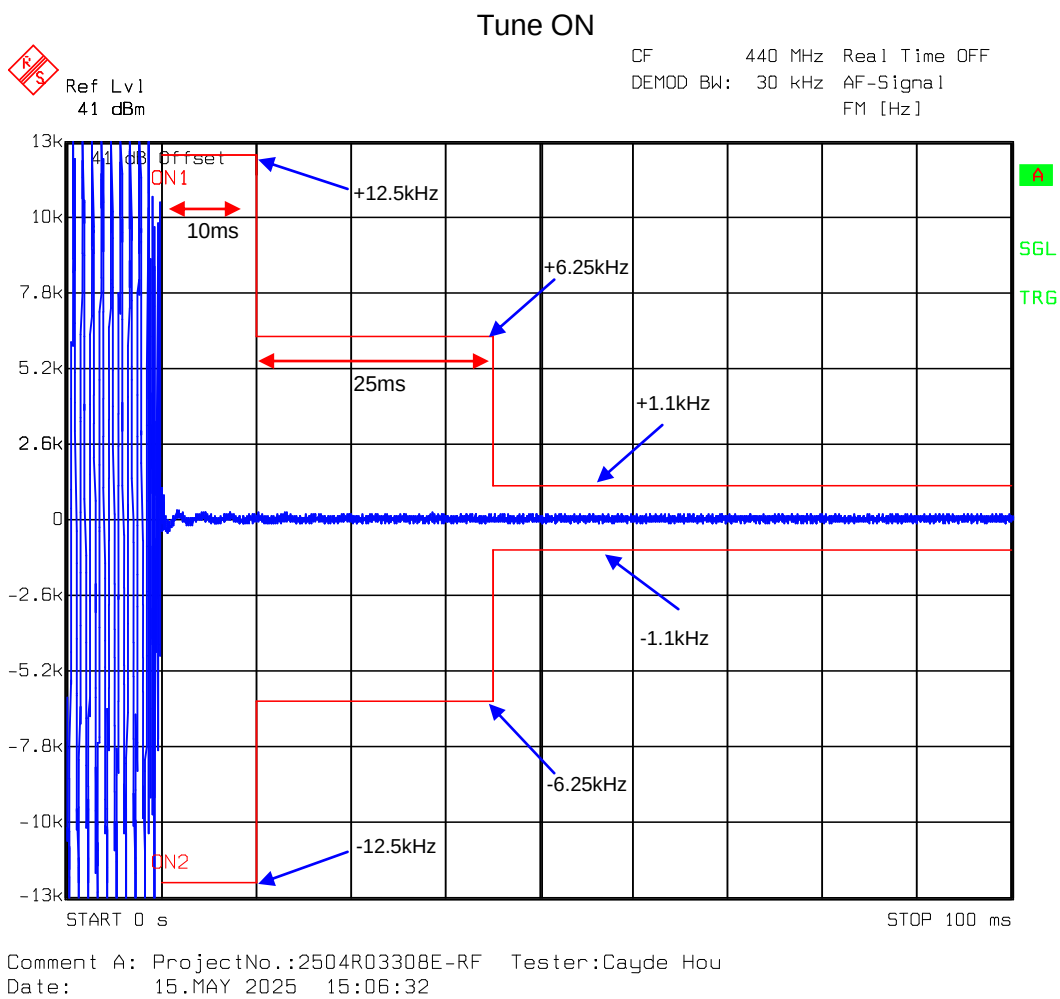
TRANSIENT FREQUENCY BEHAVIOR

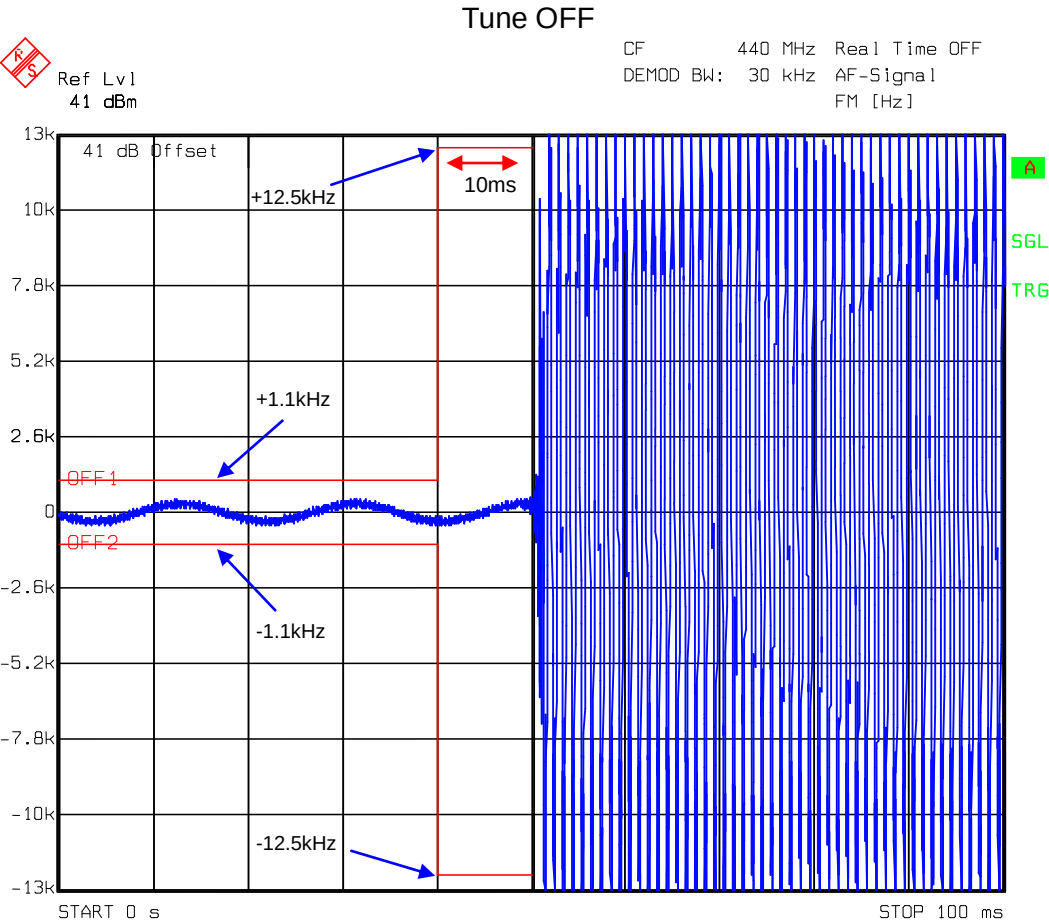
Test Data:

Channel Separation (kHz)	Transient Period (ms)	Transient Frequency	Result
12.5	10 (t1)	<+/-12.5 kHz	Pass
	25(t2)	<+/-6.25 kHz	
	10 (t3)	<+/-12.5 kHz	

Note: During the time from the end of t2 to the beginning of t3, the frequency difference must not exceed the limits specified in §90.213:

For 440MHz 12.5kHz mode, limit is: $440\text{MHz} \times 2.5\text{ppm} = 1.1\text{kHz}$





Comment A: ProjectNo.:2504R03308E-RF Tester:Cayde Hou
Date: 15.MAY 2025 15:09:08

EXHIBIT A-EUT PHOTOGRAPHS

Please refer to the Attachment No.1 2504R03308E-RF EUT External Photos and Attachment No.2 2504R03308E-RF EUT Internal Photos

EXHIBIT B-TEST SETUP PHOTOGRAPHS

Please refer to the Attachment No.3 2504R03308E-RF-00A Test Photos.

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