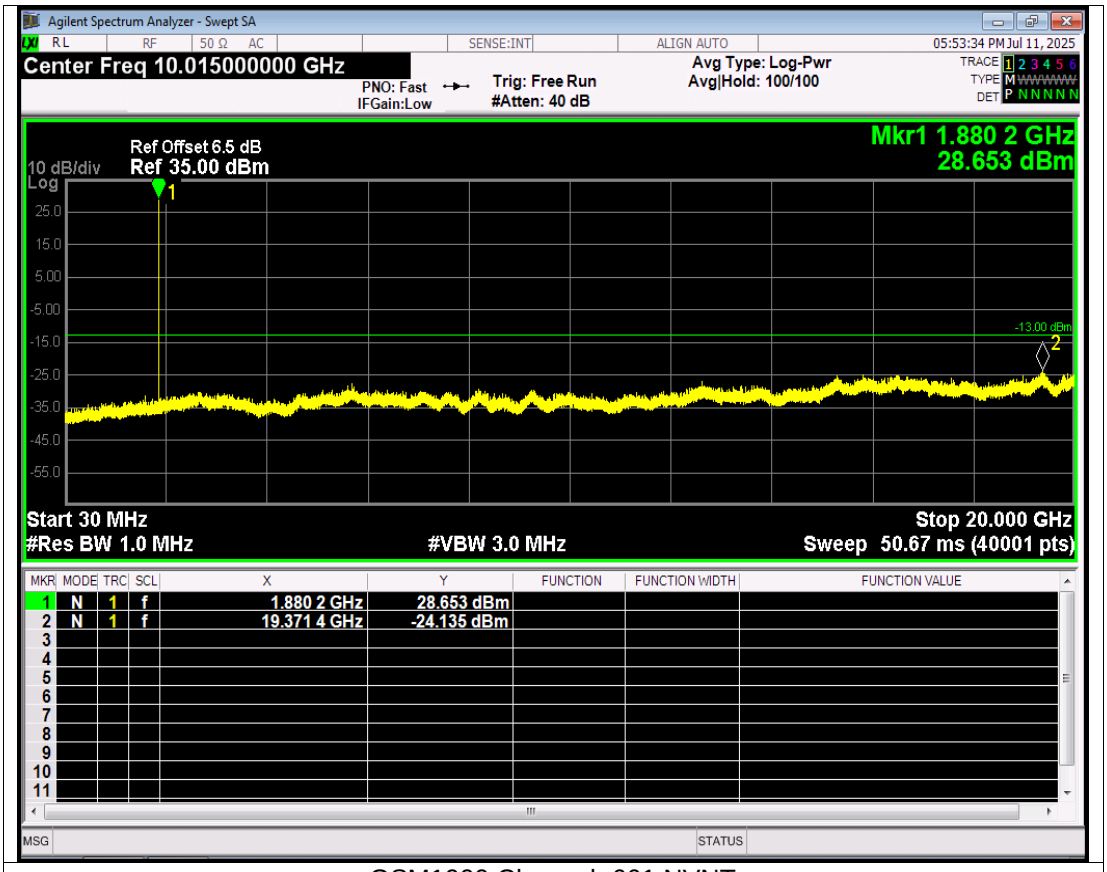
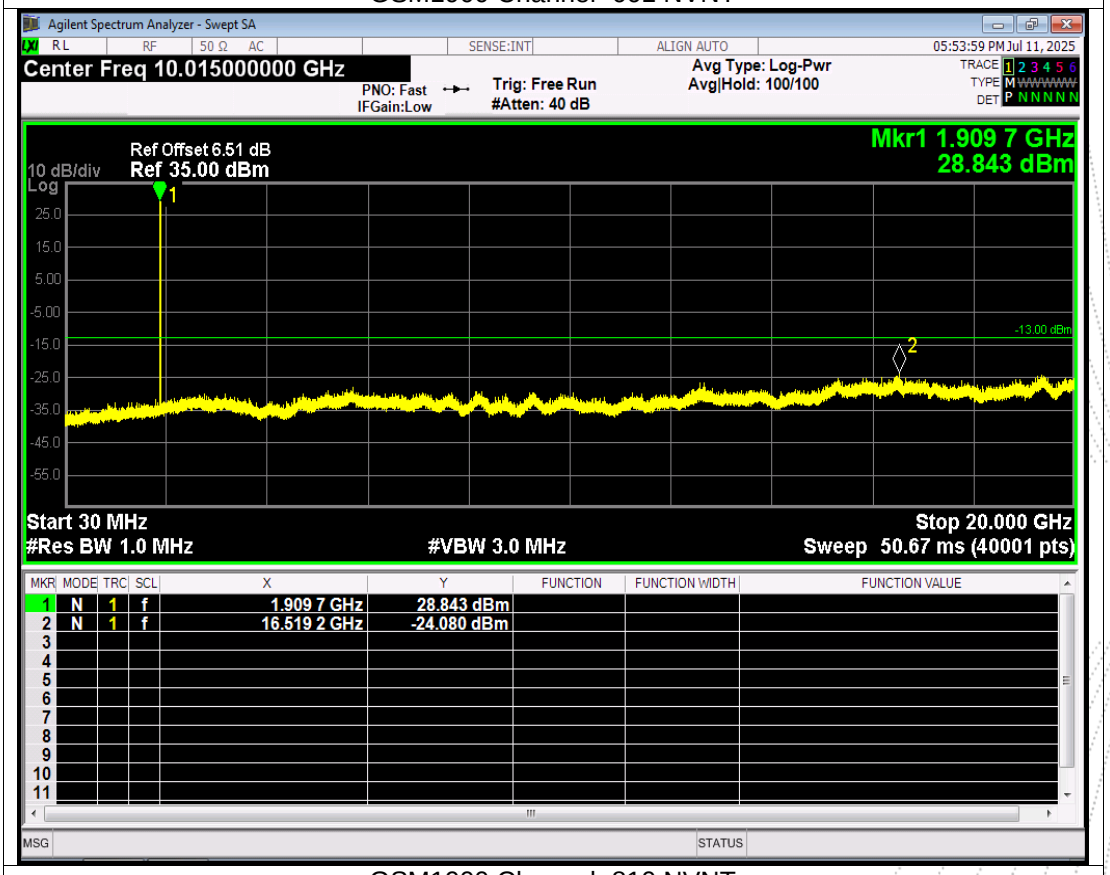
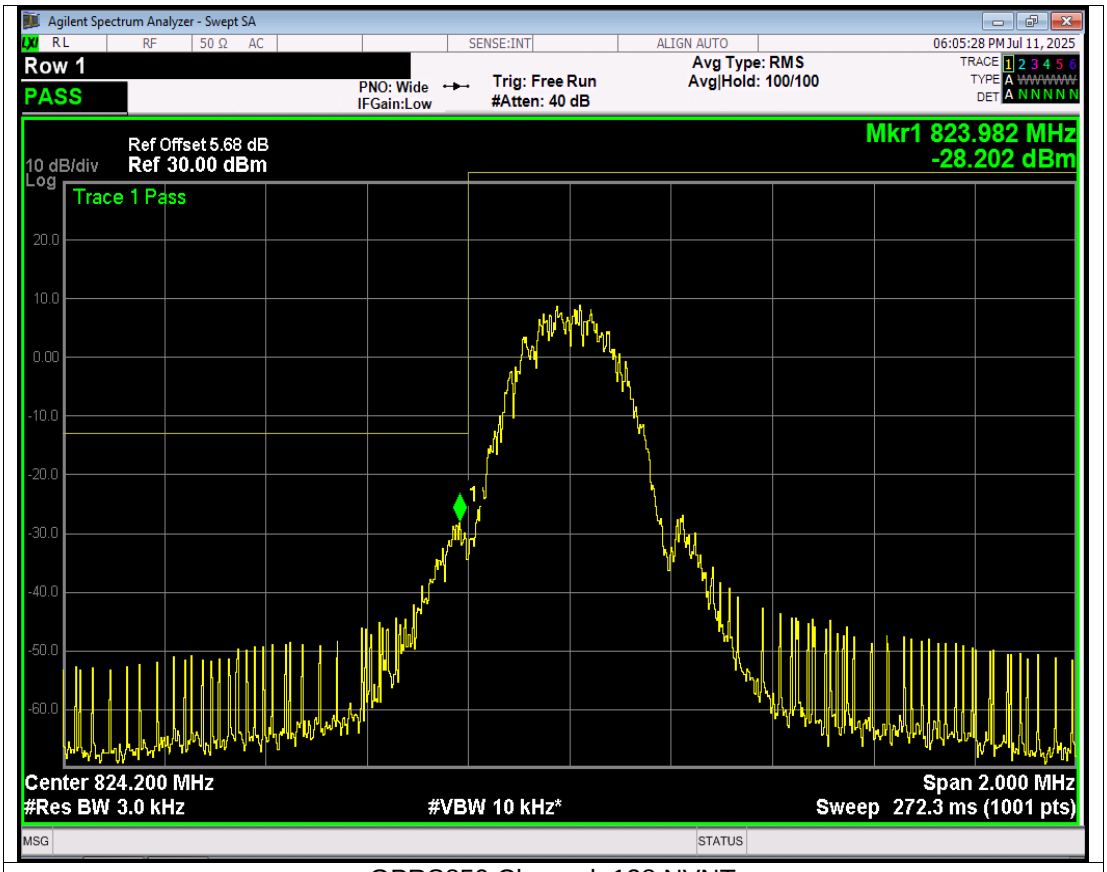


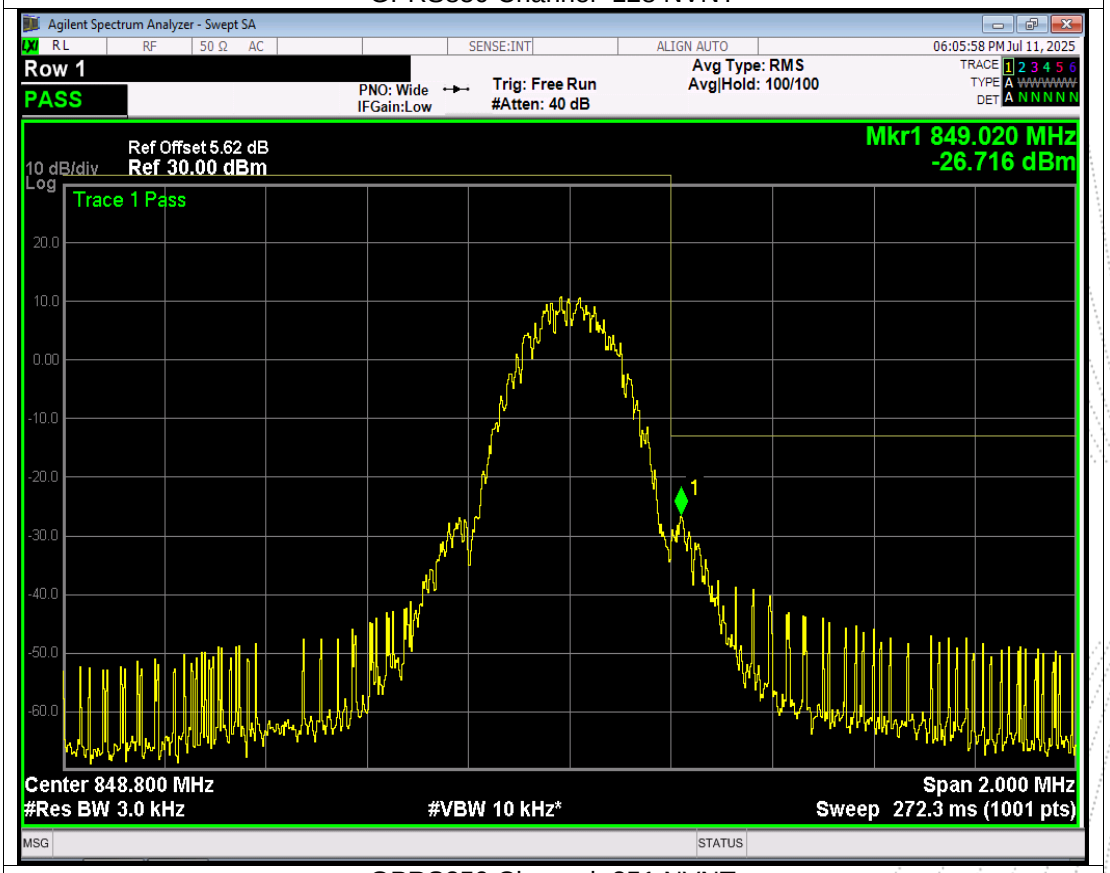
GSM1900 Channel=661 NVNT



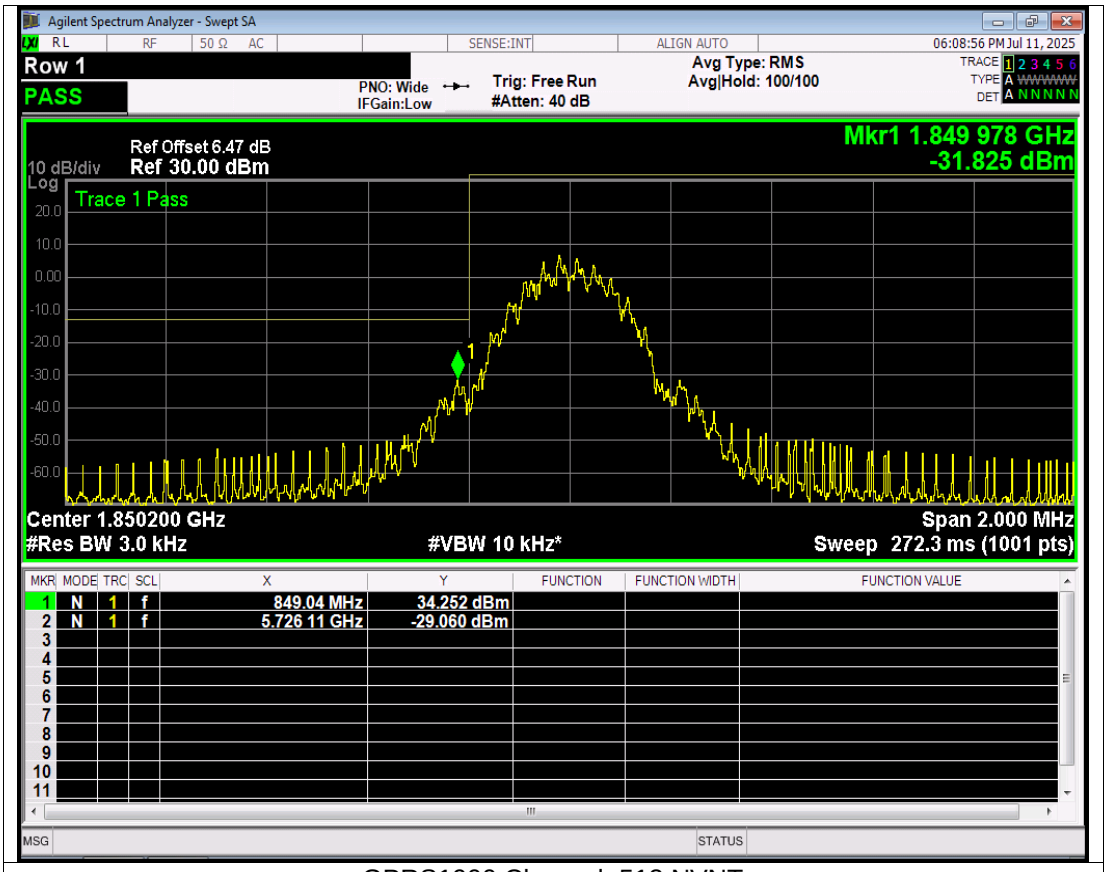
GSM1900 Channel=810 NVNT



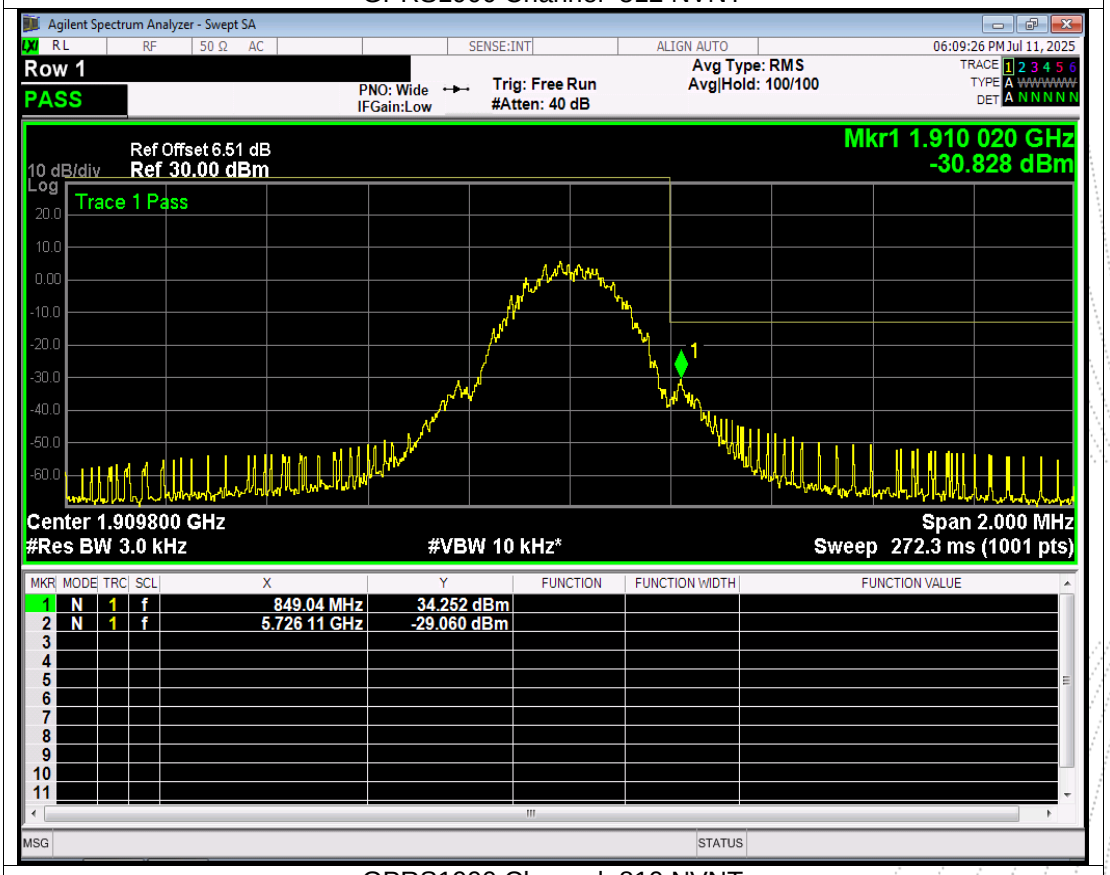
GPRS850 Channel=128 NVNT



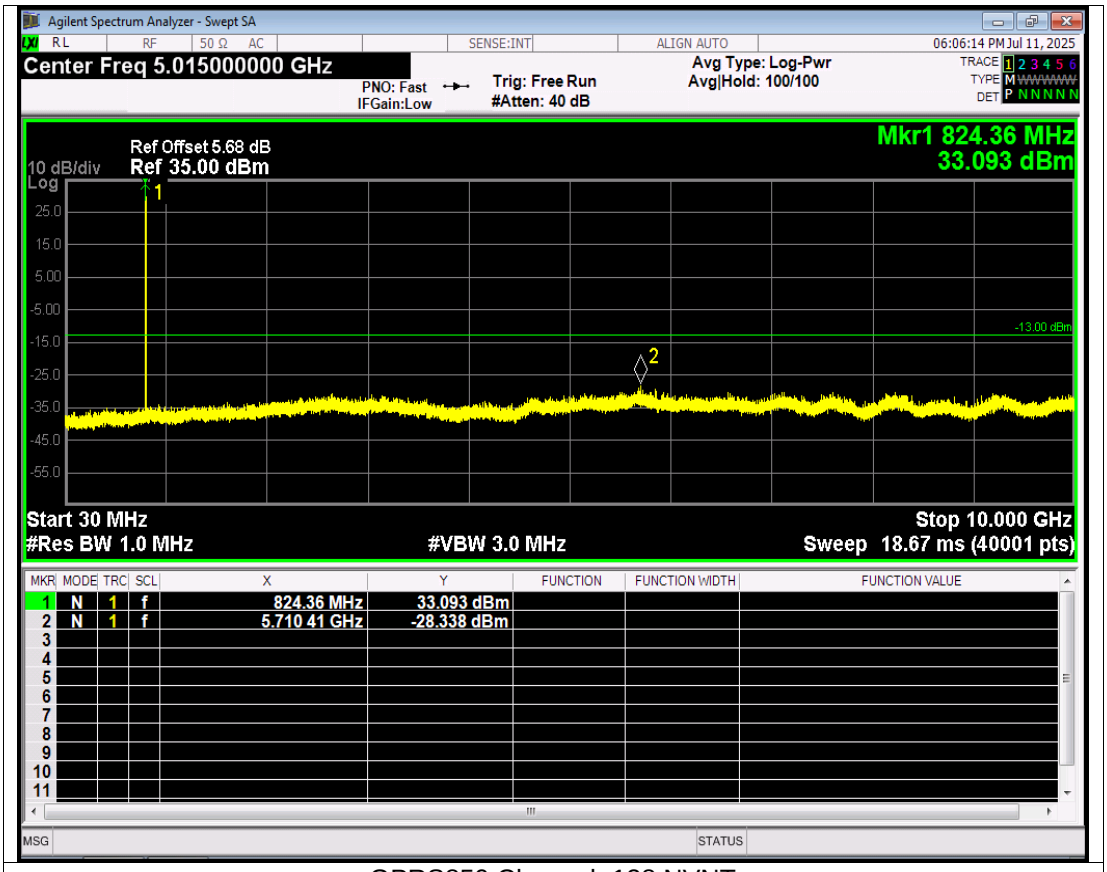
GPRS850 Channel=251 NVNT



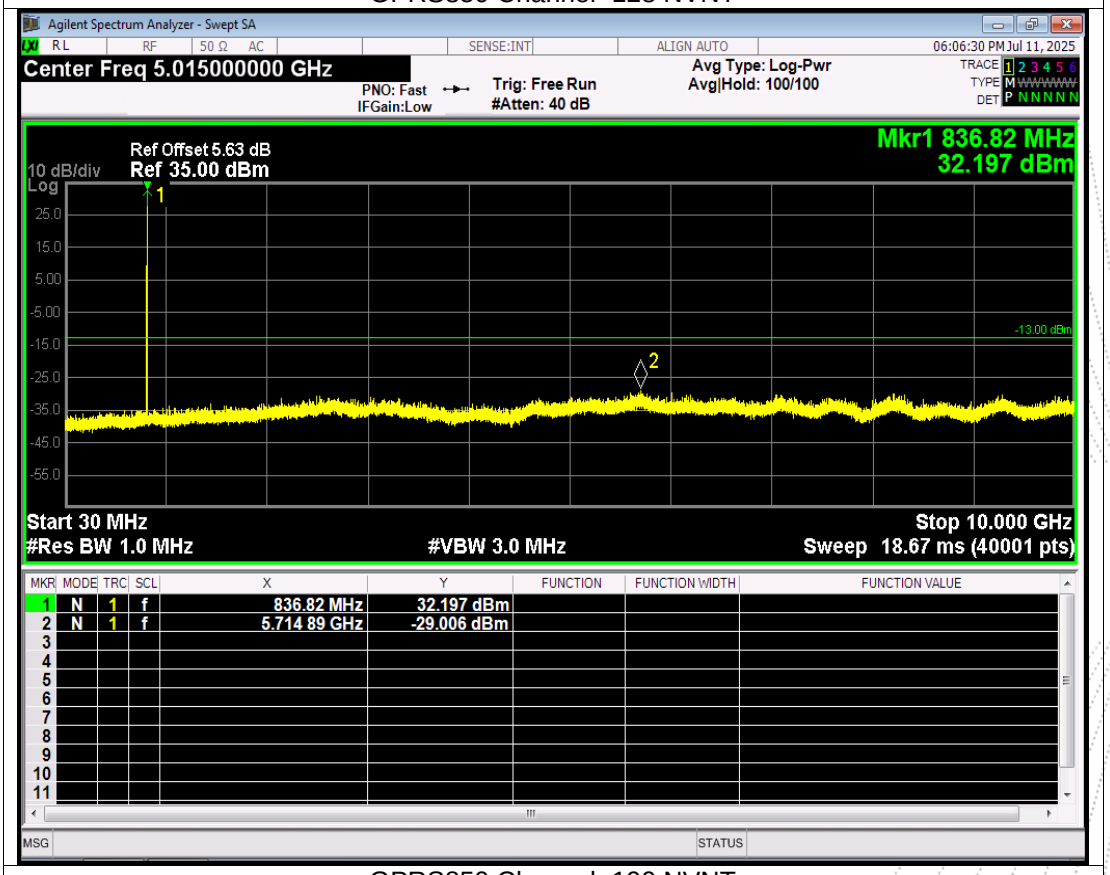
GPRS1900 Channel=512 NVNT



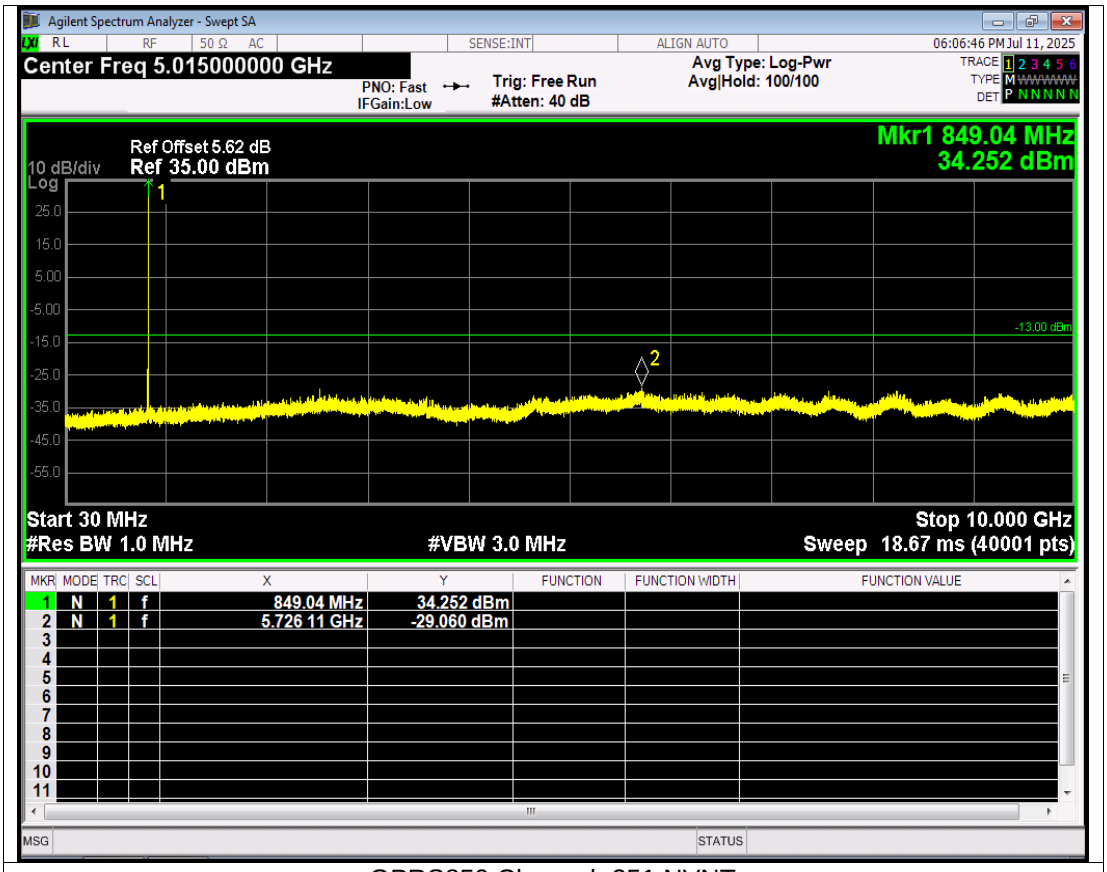
GPRS1900 Channel=810 NVNT



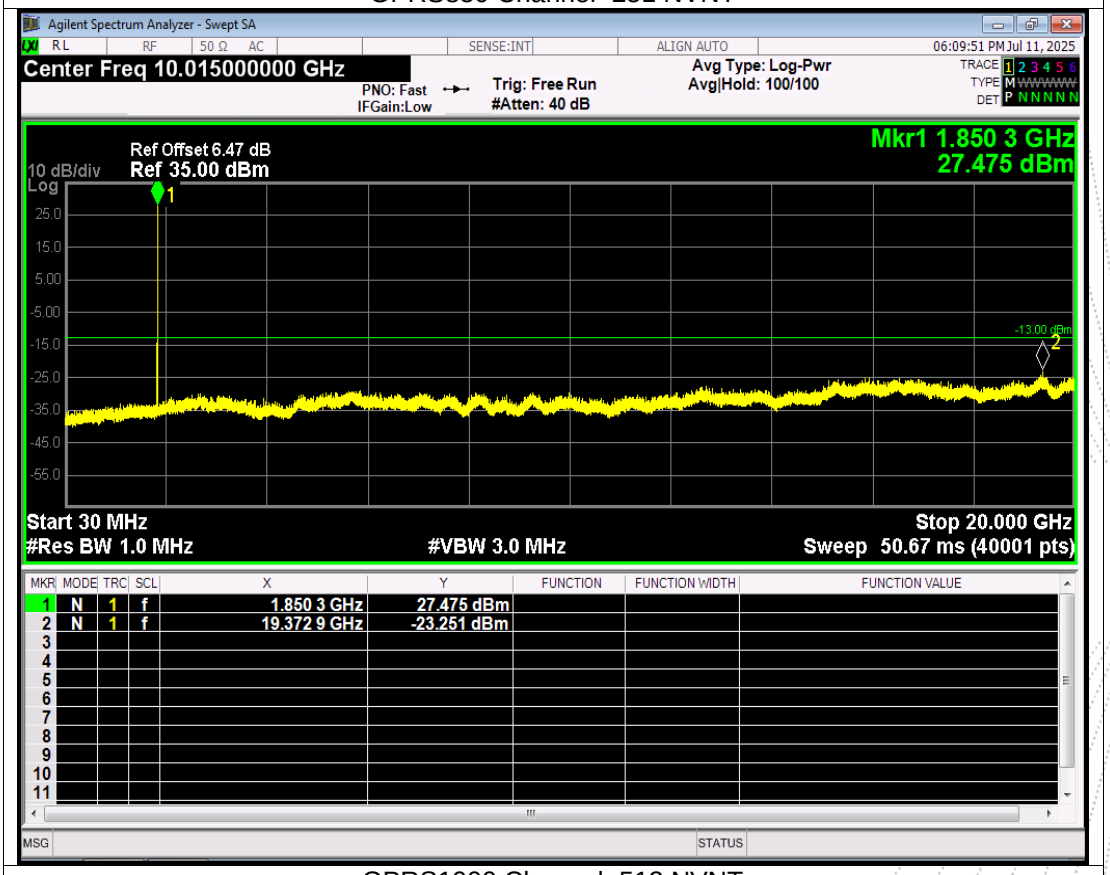
GPRS850 Channel=128 NVNT



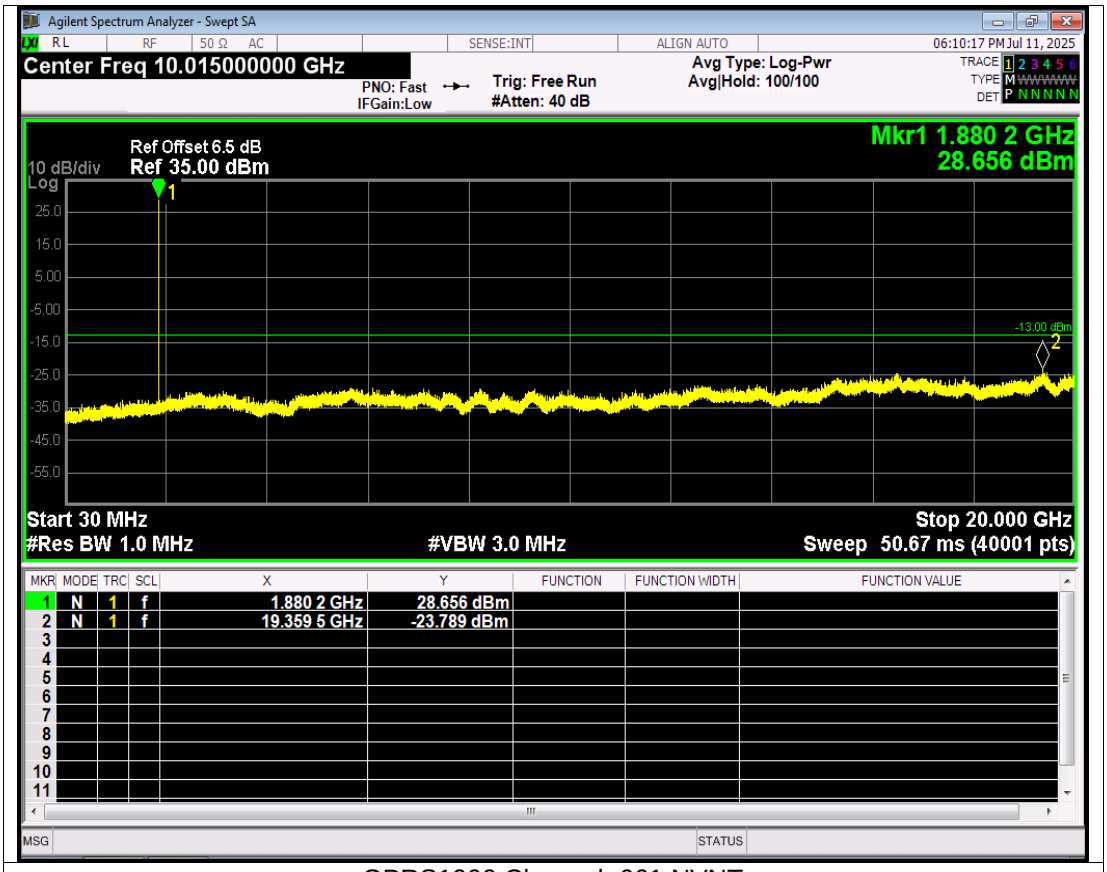
GPRS850 Channel=190 NVNT



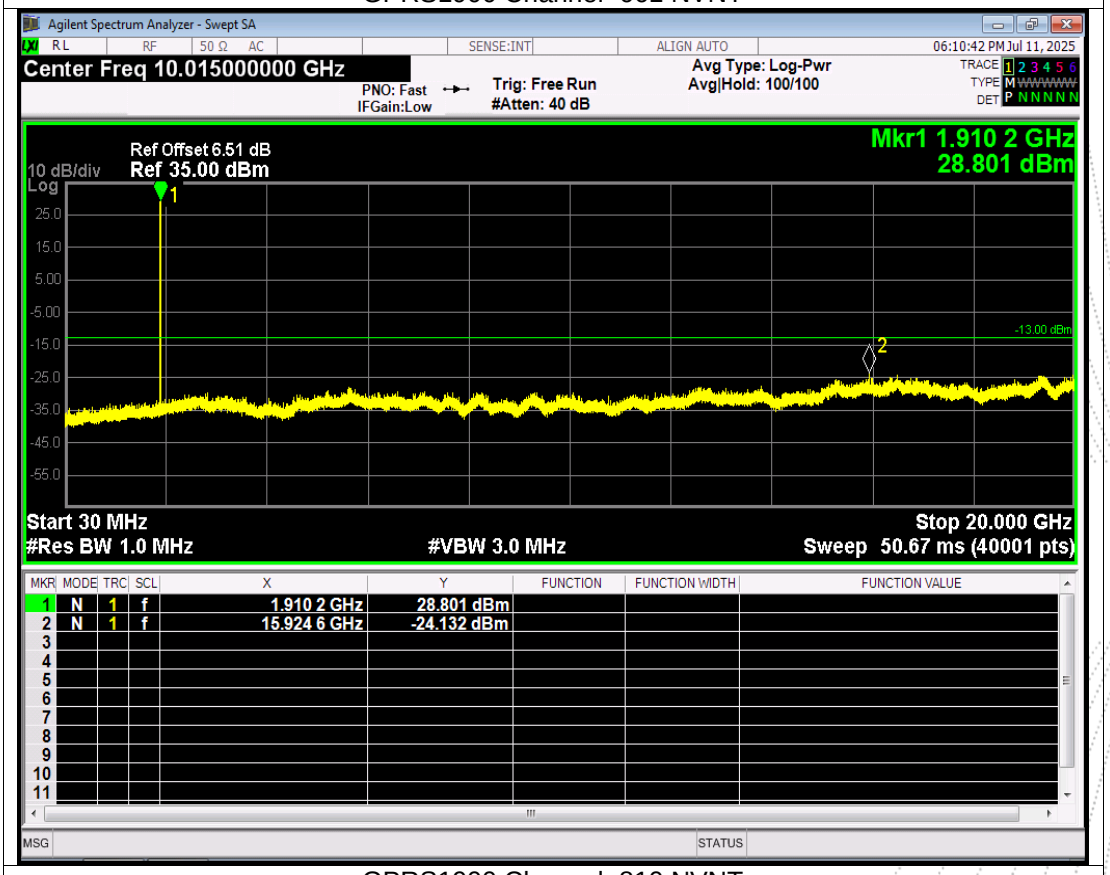
GPRS850 Channel=251 NVNT



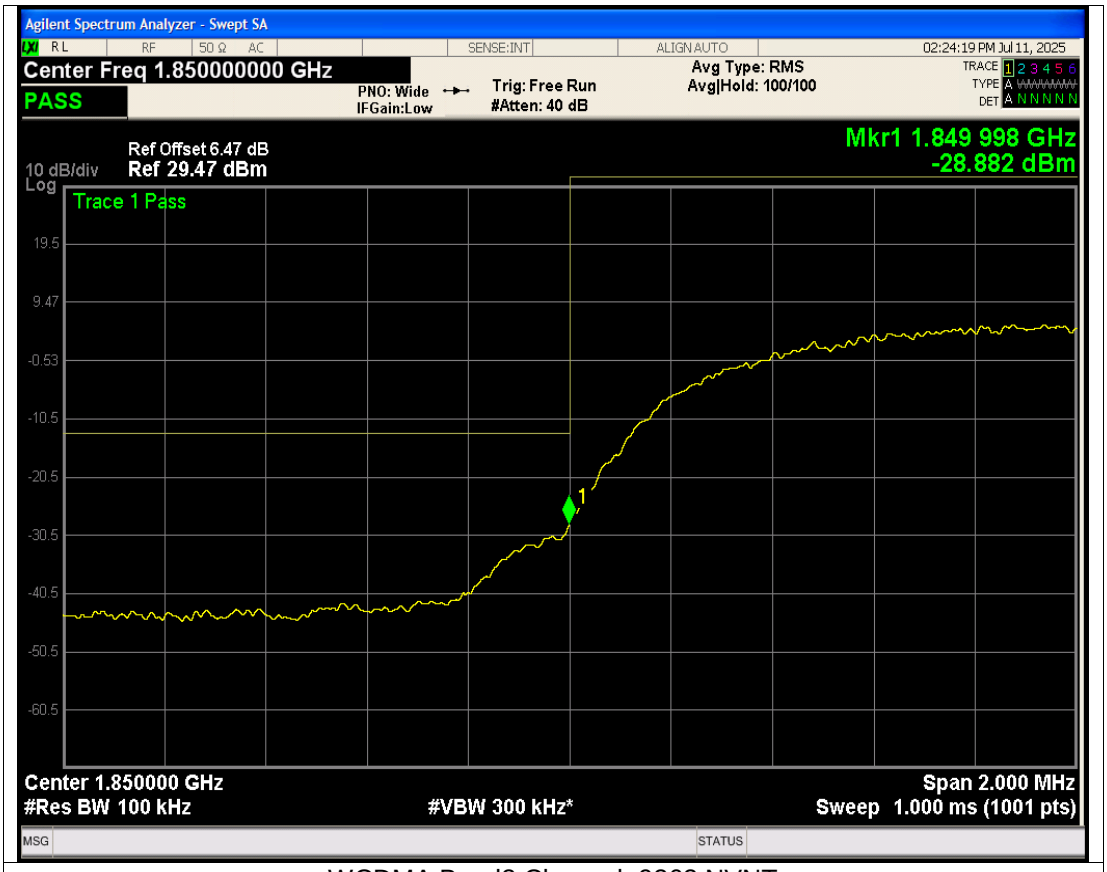
GPRS1900 Channel=512 NVNT



GPRS1900 Channel=661 NVNT

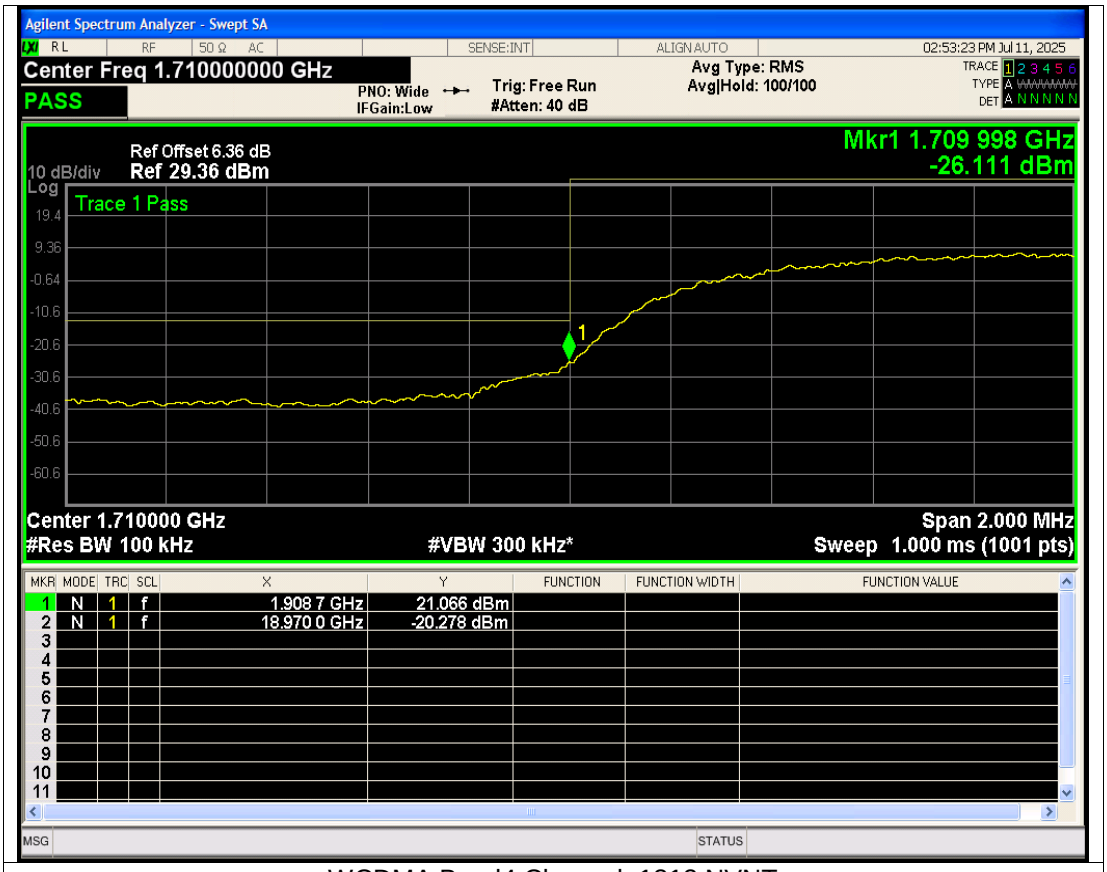


GPRS1900 Channel=810 NVNT

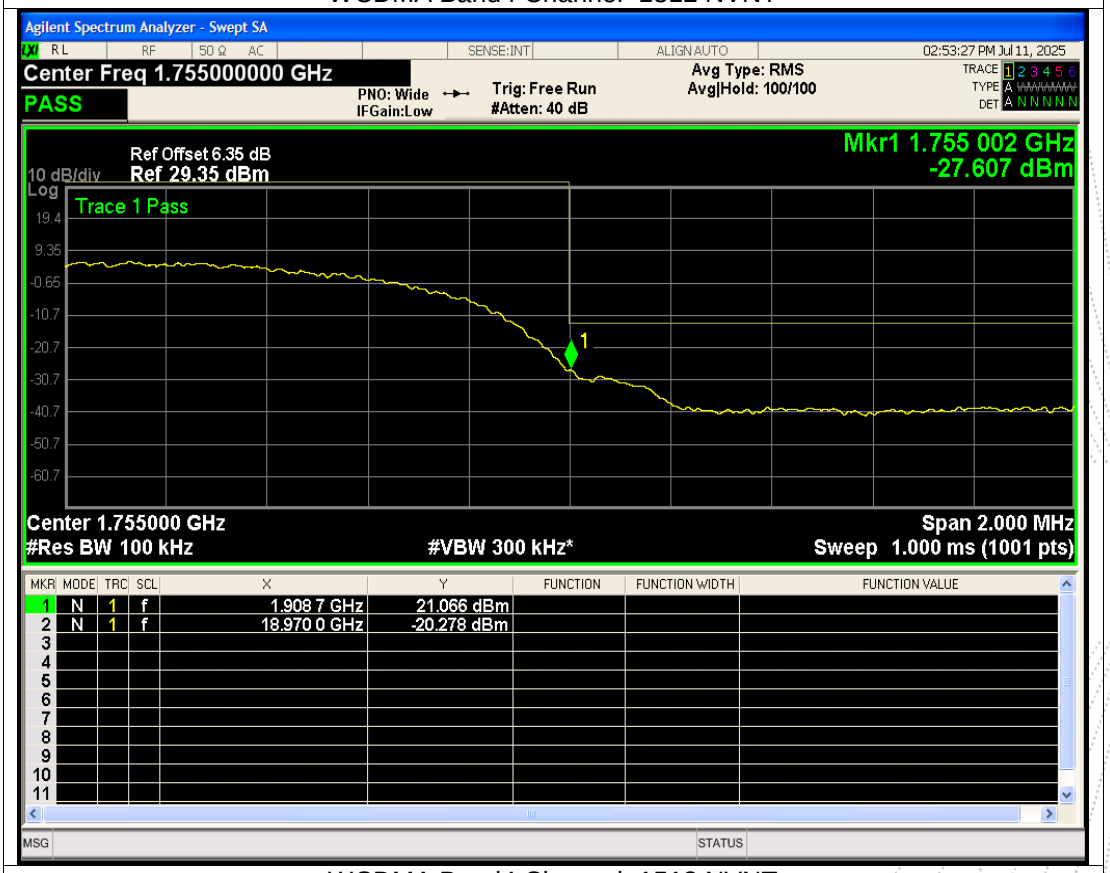


WCDMA Band2 Channel=9262 NVNT

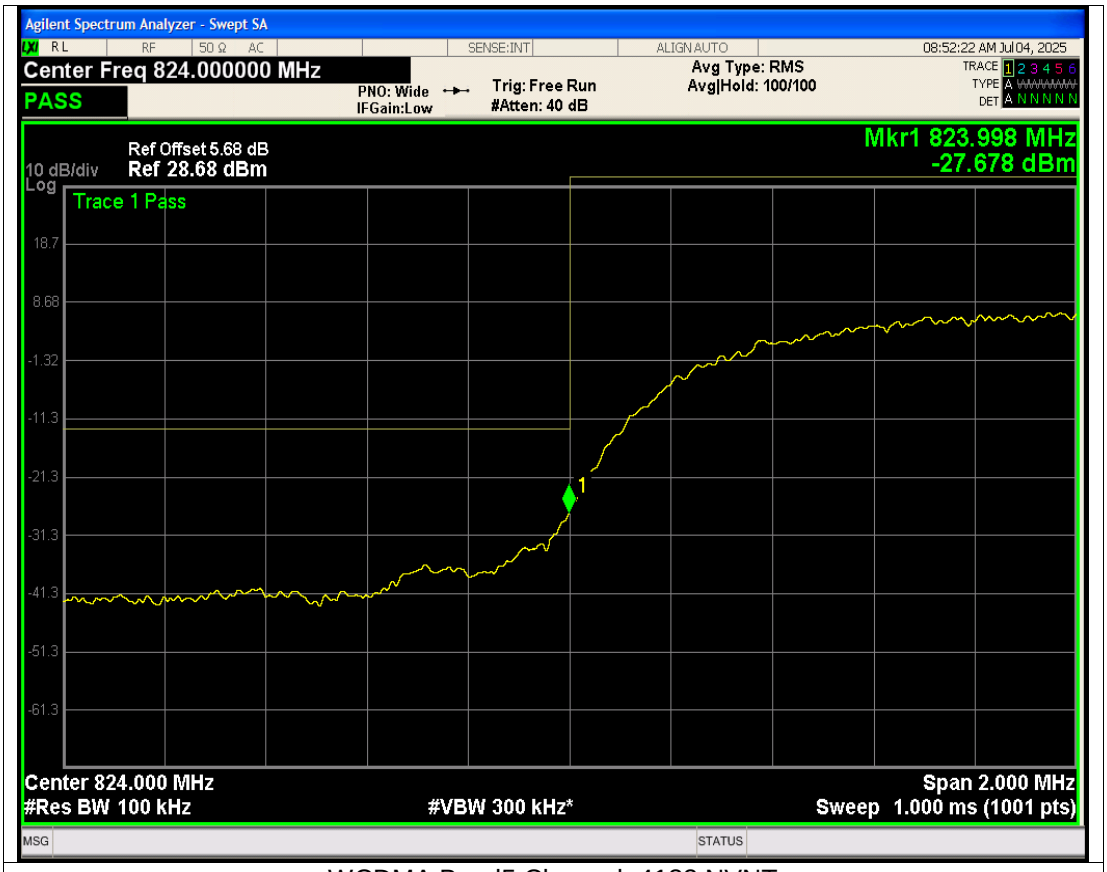
WCDMA Band2 Channel=9538 NVNT



WCDMA Band4 Channel=1312 NVNT

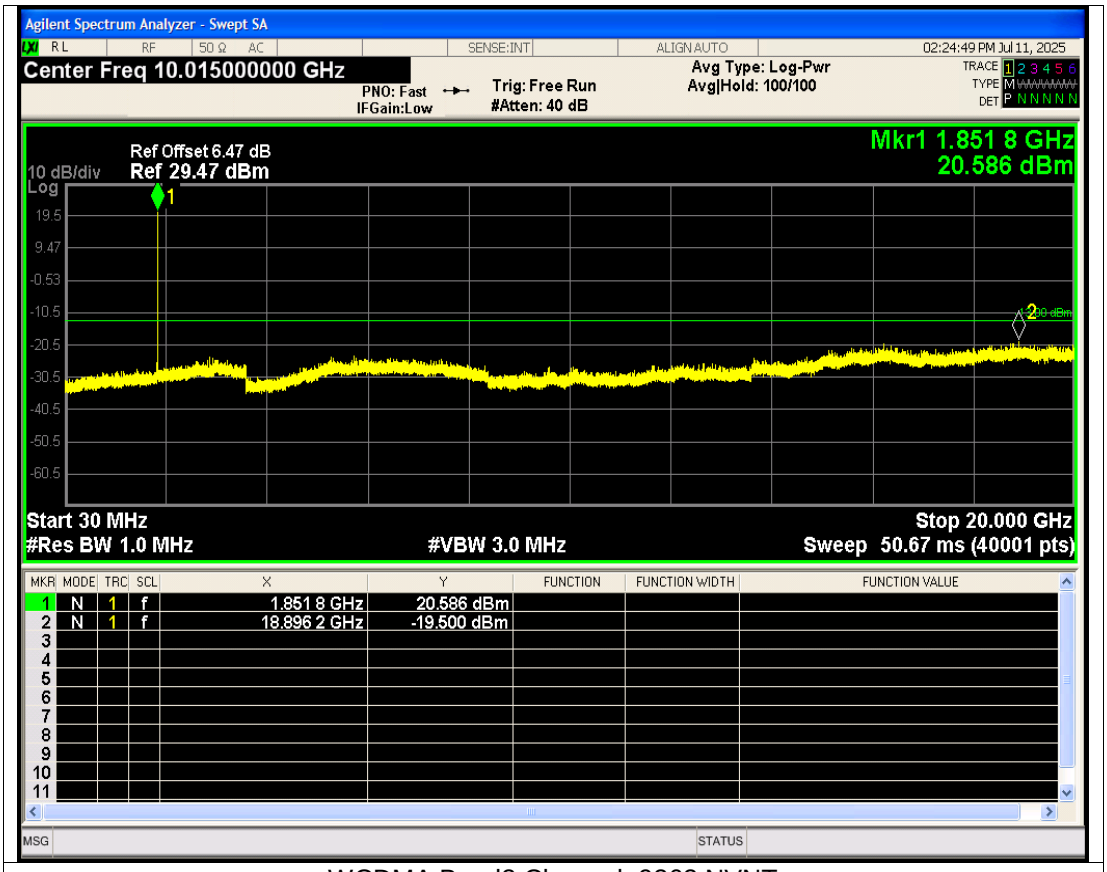


WCDMA Band4 Channel=1513 NVNT

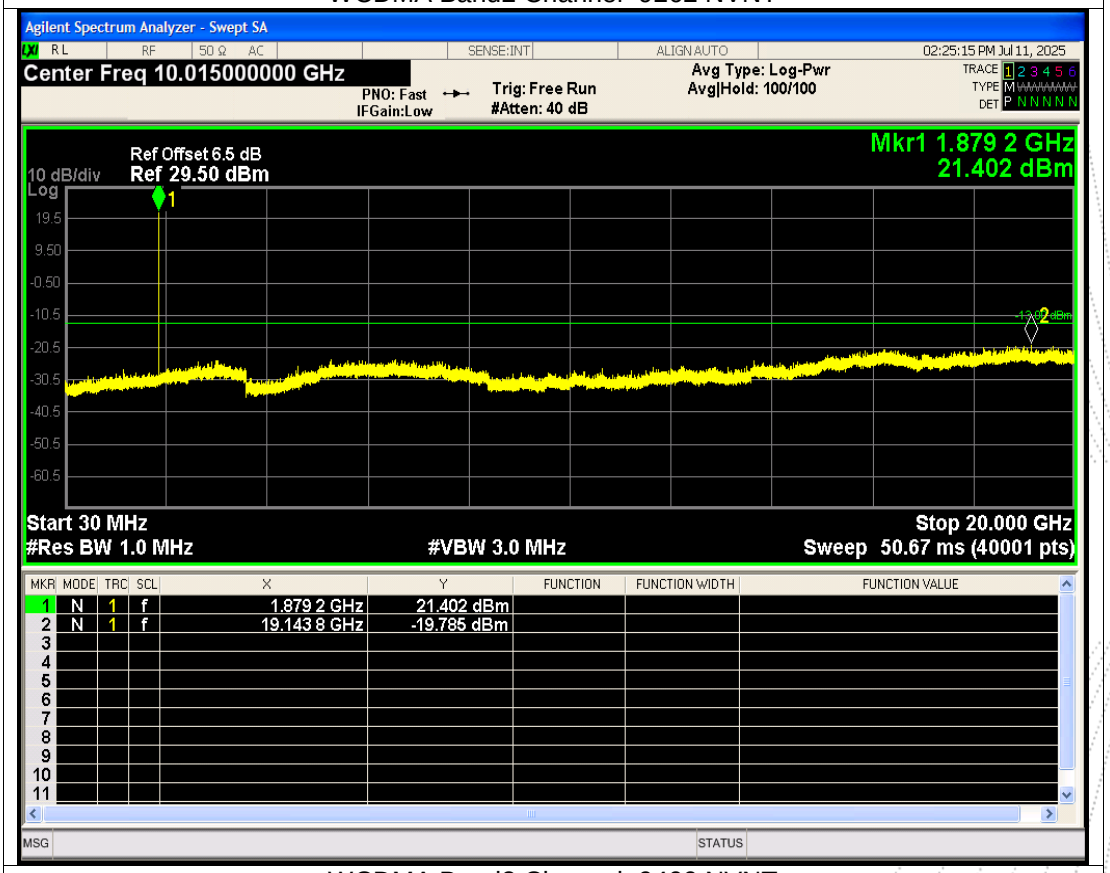


WCDMA Band5 Channel=4132 NVNT

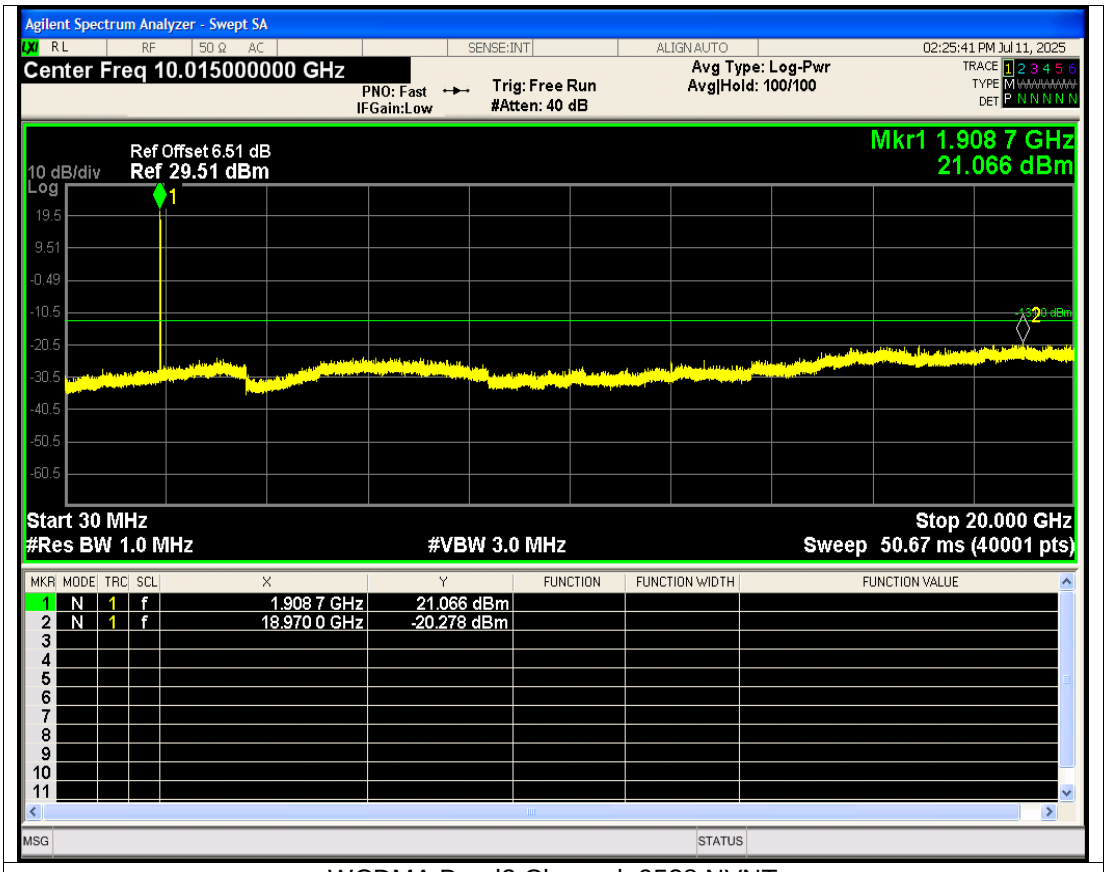
WCDMA Band5 Channel=4233 NVNT



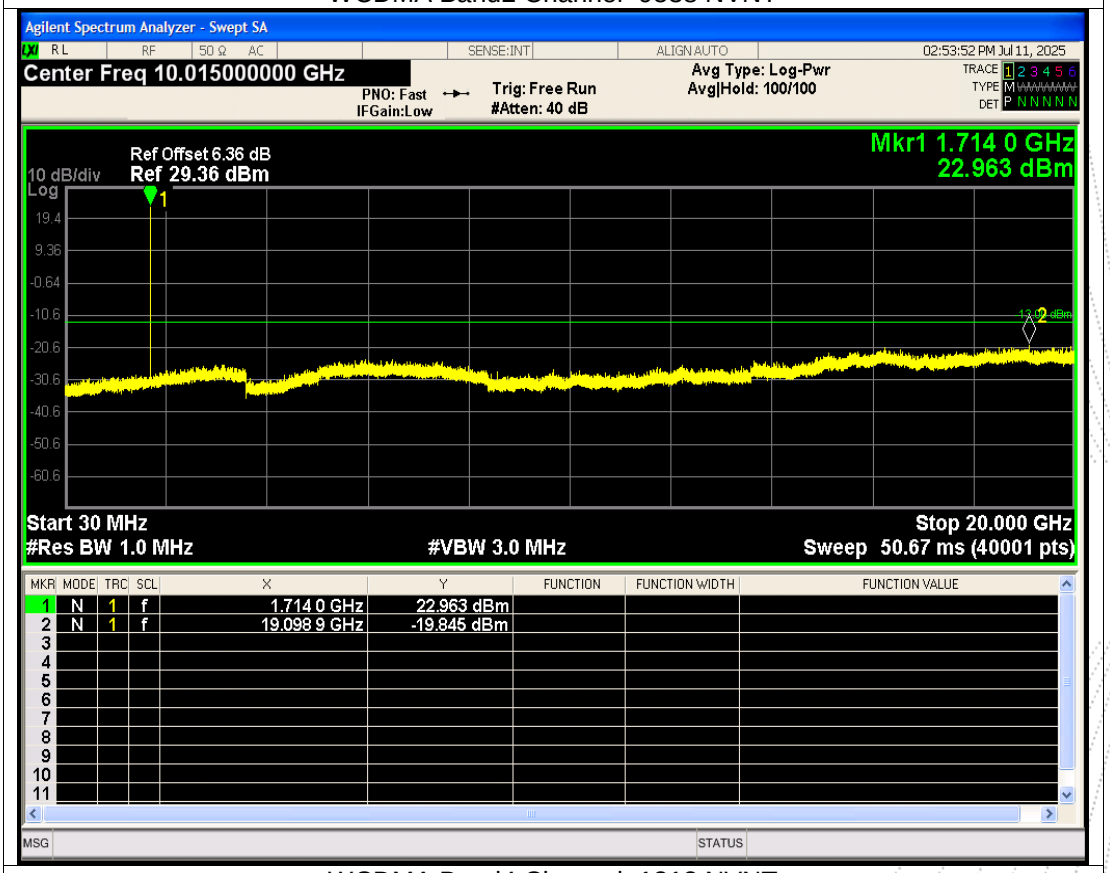
WCDMA Band2 Channel=9262 NVNT



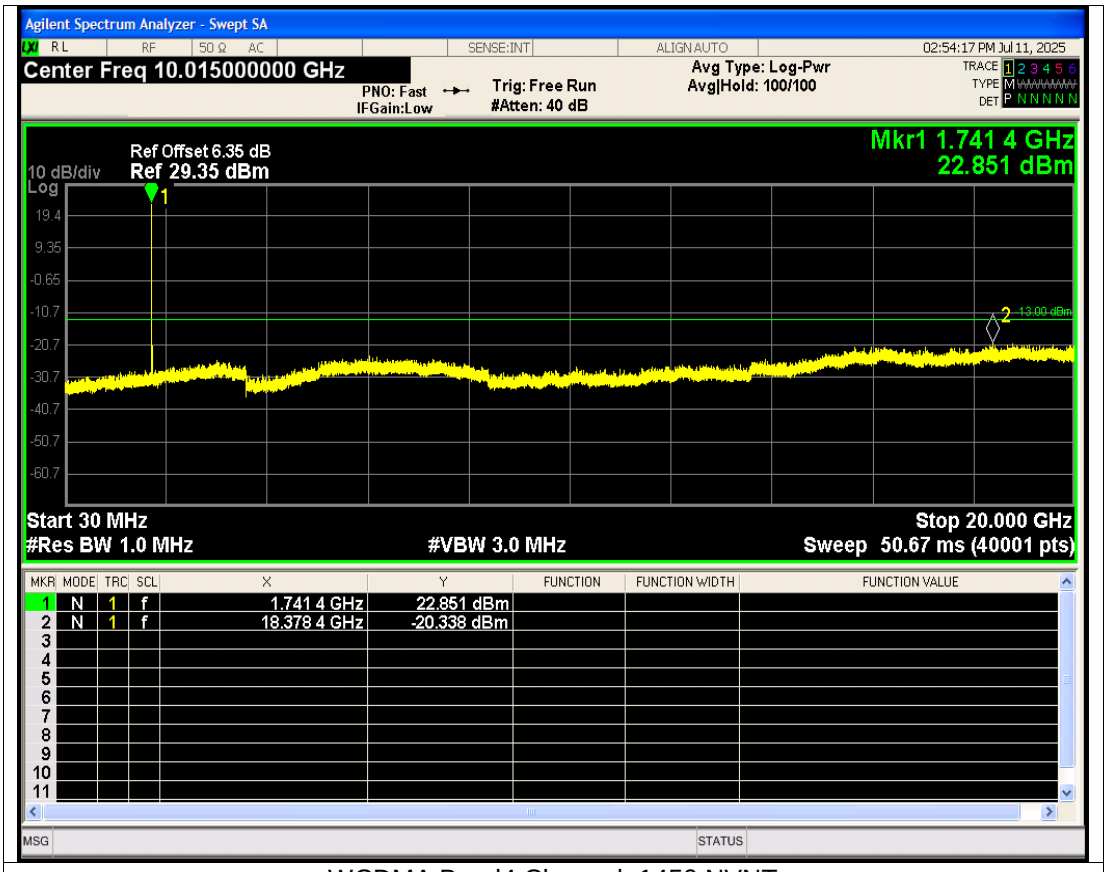
WCDMA Band2 Channel=9400 NVNT



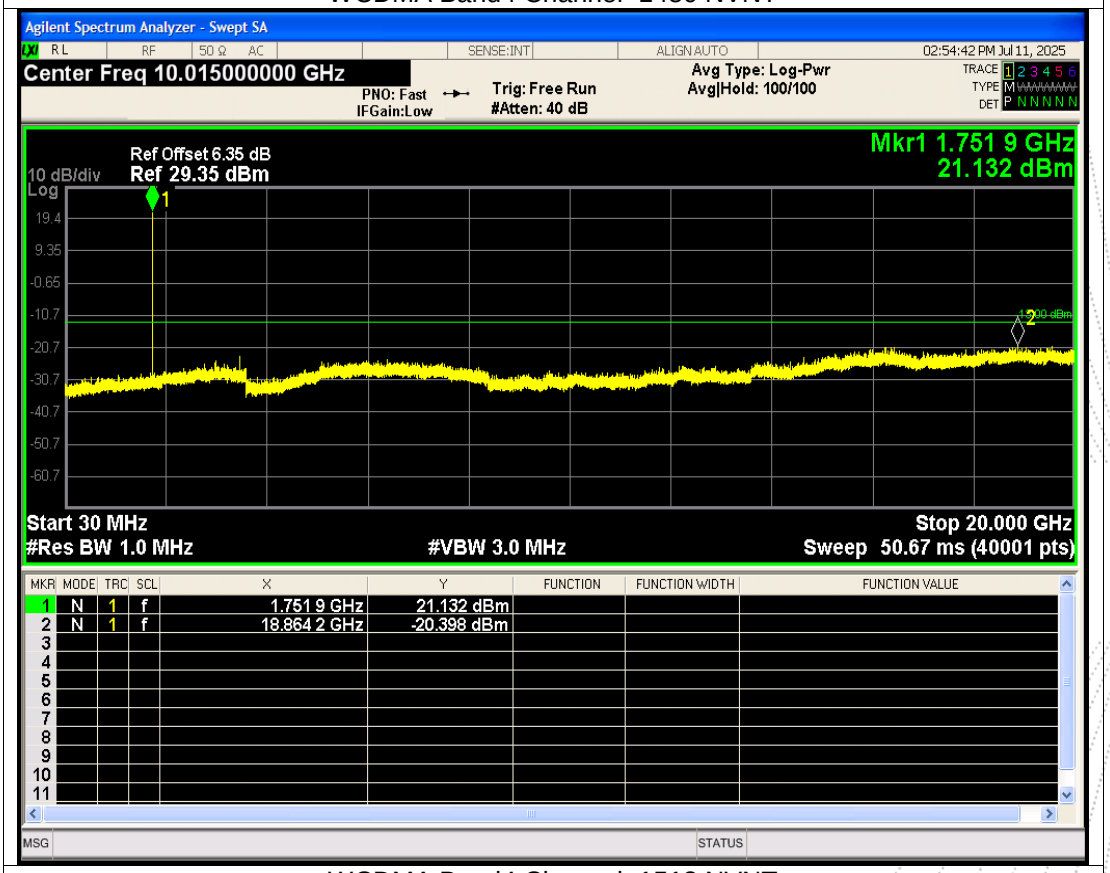
WCDMA Band2 Channel=9538 NVNT



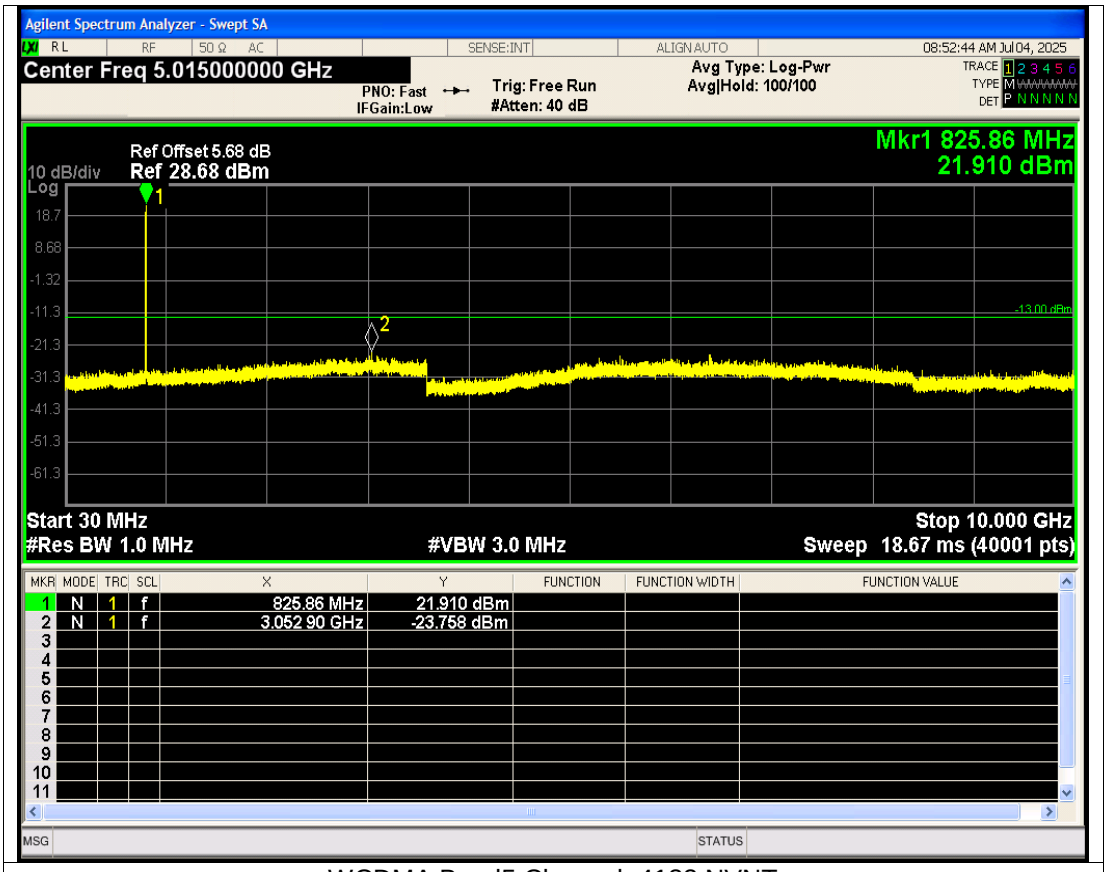
WCDMA Band4 Channel=1312 NVNT



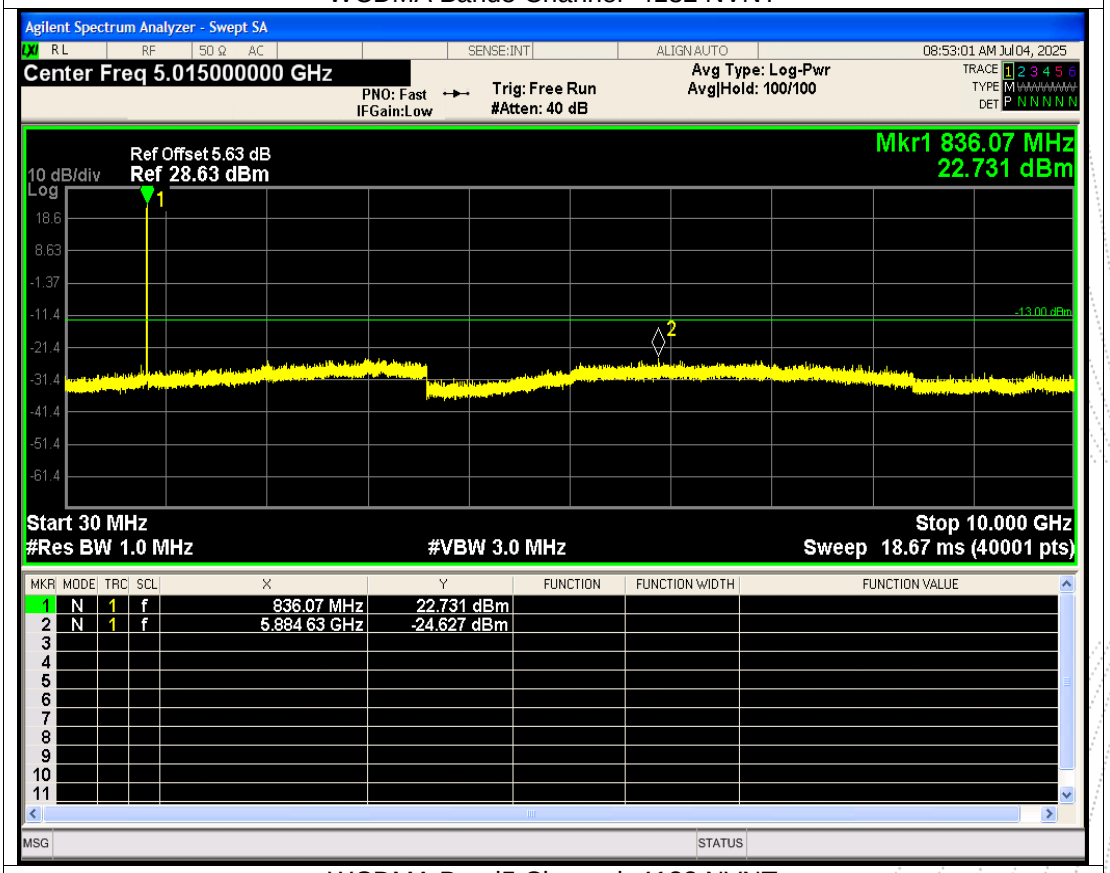
WCDMA Band4 Channel=1450 NVNT



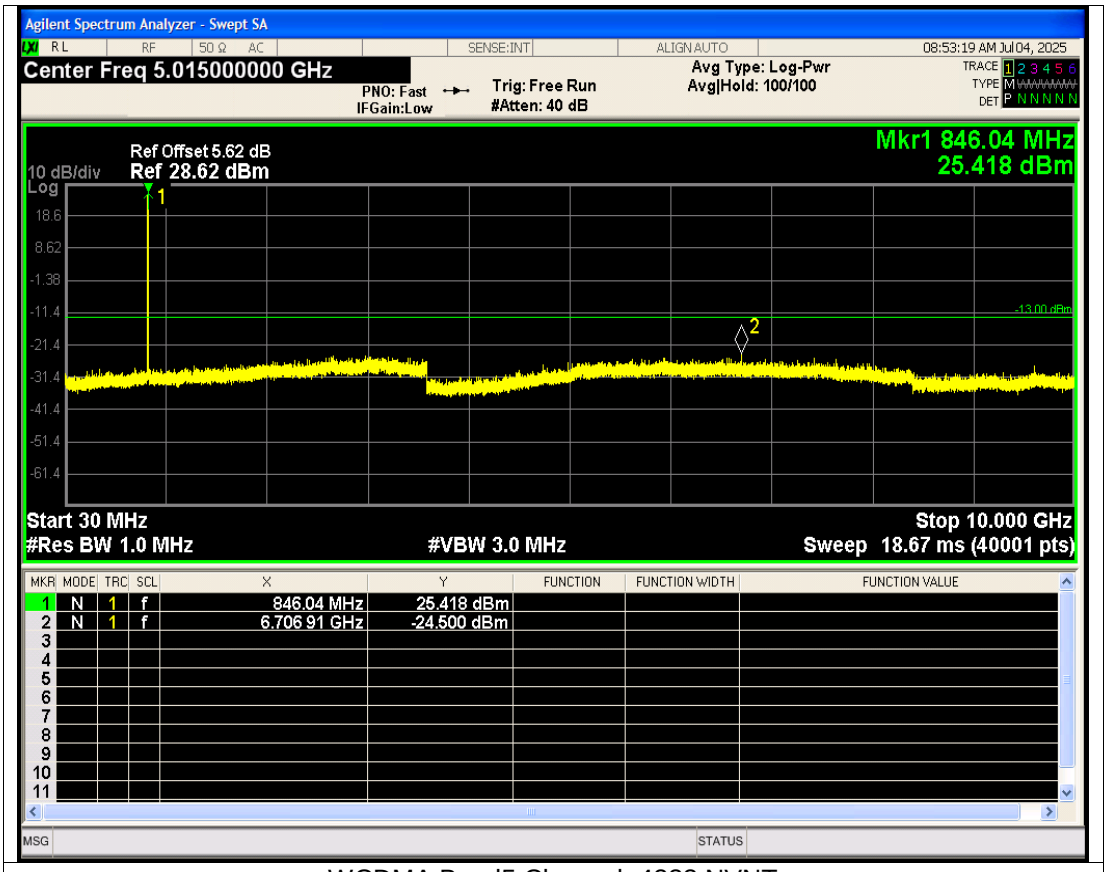
WCDMA Band4 Channel=1513 NVNT



WCDMA Band5 Channel=4132 NVNT



WCDMA Band5 Channel=4182 NVNT

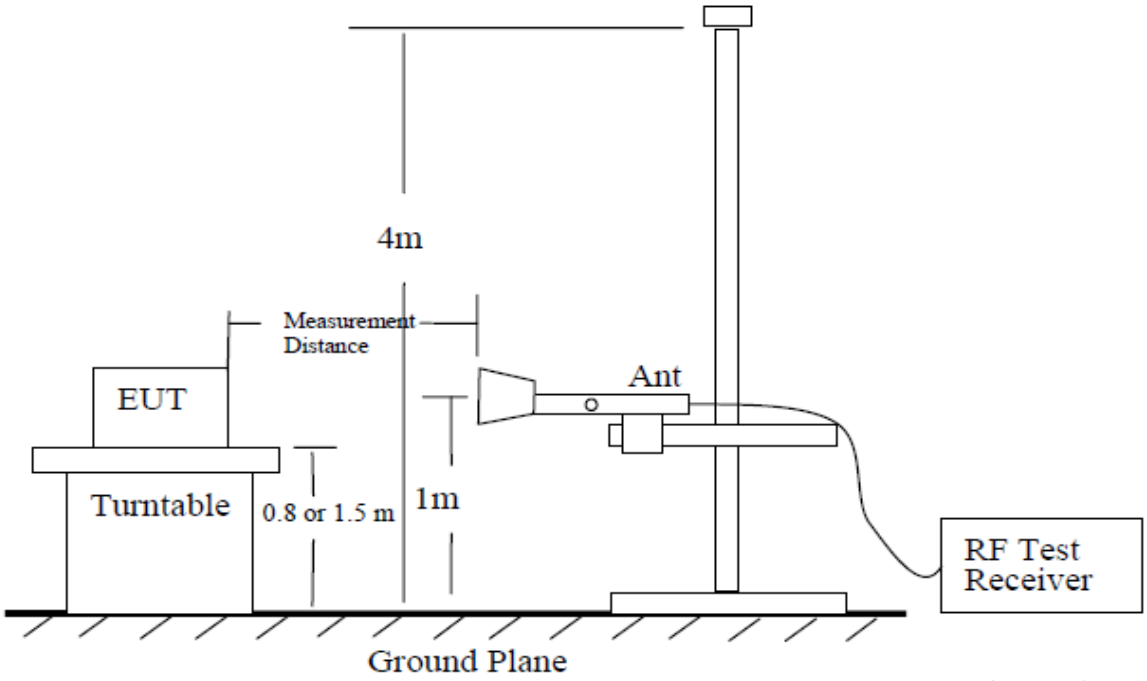


WCDMA Band5 Channel=4233 NVNT

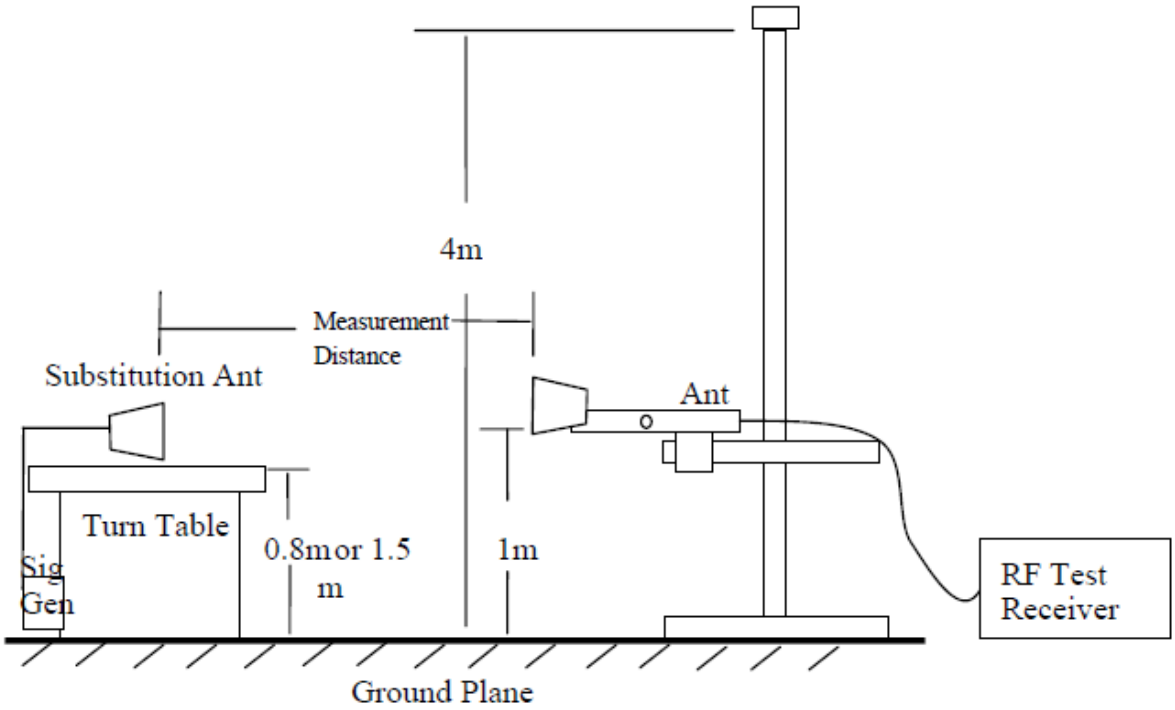
10. Spurious Radiated Emissions

10.1 Block Diagram Of Test Setup

（A）Test site-up for radiated ERP and/or EIRP measurements



（B）Substitution method set-up for radiated emission



10.2 Limit

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to §27.53 (h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

10.3 Test procedure

1. The setup of EUT is according with per ANSI/TIA-603-E-2016 and ANSI C63.4-2014 measurement procedure.
2. 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.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. 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 attenuation limit in dB =43+10 Log_{10} (power out in Watts)

10.4 Test Result

For Cellular Band_GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
89.97	-14.89	-30.61	-45.50	-13.00	-32.50	H
1648.40	-13.18	-27.29	-40.47	-13.00	-27.47	H
2472.60	-14.96	-25.18	-40.14	-13.00	-27.14	H
89.97	-11.80	-30.61	-42.41	-13.00	-29.41	V
1648.40	-10.40	-27.29	-37.69	-13.00	-24.69	V
2472.60	-12.54	-25.18	-37.72	-13.00	-24.72	V
Middle Channel (836.6MHz)						
89.97	-10.29	-30.61	-40.90	-13.00	-27.90	H
1673.20	-10.65	-27.32	-37.97	-13.00	-24.97	H
2509.80	-8.39	-25.07	-33.46	-13.00	-20.46	H
89.97	-10.49	-30.61	-41.10	-13.00	-28.10	V
1673.20	-9.96	-27.32	-37.28	-13.00	-24.28	V
2509.80	-12.65	-25.07	-37.72	-13.00	-24.72	V
High Channel (848.8MHz)						
89.97	-14.27	-30.61	-44.88	-13.00	-31.88	H
1697.60	-11.18	-27.27	-38.45	-13.00	-25.45	H
2546.40	-13.98	-24.96	-38.94	-13.00	-25.94	H
89.97	-8.04	-30.61	-38.65	-13.00	-25.65	V
1697.60	-9.87	-27.27	-37.14	-13.00	-24.14	V
2546.40	-12.07	-24.96	-37.03	-13.00	-24.03	V

For PCS Band_GSM1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
89.97	-10.40	-30.61	-41.01	-13.00	-28.01	H
3700.40	-9.98	-22.20	-32.18	-13.00	-19.18	H
5550.60	-15.16	-19.32	-34.48	-13.00	-21.48	H
89.97	-11.19	-30.61	-41.80	-13.00	-28.80	V
3700.40	-10.23	-22.20	-32.43	-13.00	-19.43	V
5550.60	-11.92	-19.32	-31.24	-13.00	-18.24	V
Middle Channel (1880MHz)						
89.97	-13.34	-30.61	-43.95	-13.00	-30.95	H
3760.00	-9.65	-22.08	-31.73	-13.00	-18.73	H
5640.00	-12.72	-19.28	-32.00	-13.00	-19.00	H
89.97	-10.09	-30.61	-40.70	-13.00	-27.70	V
3760.00	-10.29	-22.08	-32.37	-13.00	-19.37	V
5640.00	-12.54	-19.28	-31.82	-13.00	-18.82	V
High Channel (1909.8MHz)						
89.97	-12.46	-30.61	-43.07	-13.00	-30.07	H
3819.60	-14.21	-21.96	-36.17	-13.00	-23.17	H
5729.40	-9.84	-19.24	-29.08	-13.00	-16.08	H
89.97	-11.04	-30.61	-41.65	-13.00	-28.65	V
3819.60	-9.31	-21.96	-31.27	-13.00	-18.27	V
5729.40	-11.96	-19.24	-31.20	-13.00	-18.20	V

Note: The worst data mode is GSM.

For Band WCDMA Band II Mode(RMC)

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
89.97	-13.92	-30.61	-44.53	-13.00	-31.53	H
3704.80	-14.96	-22.19	-37.15	-13.00	-24.15	H
5557.20	-15.53	-19.32	-34.85	-13.00	-21.85	H
89.97	-12.55	-30.61	-43.16	-13.00	-30.16	V
3704.80	-8.35	-22.19	-30.54	-13.00	-17.54	V
5557.20	-10.64	-19.32	-29.96	-13.00	-16.96	V
Middle Channel (1880MHz)						
89.97	-11.29	-30.61	-41.90	-13.00	-28.90	H
3760.00	-12.16	-22.08	-34.24	-13.00	-21.24	H
5640.00	-13.50	-19.28	-32.78	-13.00	-19.78	H
89.97	-8.24	-30.61	-38.85	-13.00	-25.85	V
3760.00	-6.37	-22.08	-28.45	-13.00	-15.45	V
5640.00	-12.30	-19.28	-31.58	-13.00	-18.58	V
High Channel (1907.6MHz)						
89.97	-14.15	-30.61	-44.76	-13.00	-31.76	H
3815.20	-14.05	-21.97	-36.02	-13.00	-23.02	H
5722.80	-10.55	-19.24	-29.79	-13.00	-16.79	H
89.97	-13.14	-30.61	-43.75	-13.00	-30.75	V
3815.20	-5.51	-21.97	-27.48	-13.00	-14.48	V
5722.80	-9.27	-19.24	-28.51	-13.00	-15.51	V

Note: Result=Reading+ Correct, Margin= Result- Limit

For Band WCDMA Band IV Mode(RMC)

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1712.4MHz)						
89.97	-10.15	-30.61	-40.76	-13.00	-27.76	H
3424.80	-10.38	-22.75	-33.13	-13.00	-20.13	H
5137.20	-12.83	-19.53	-32.36	-13.00	-19.36	H
89.97	-11.21	-30.61	-41.82	-13.00	-28.82	V
3424.80	-9.12	-22.75	-31.87	-13.00	-18.87	V
5137.20	-9.29	-19.53	-28.82	-13.00	-15.82	V
Middle Channel (1740MHz)						
89.97	-12.21	-30.61	-42.82	-13.00	-29.82	H
3480.00	-9.51	-22.64	-32.15	-13.00	-19.15	H
5220.00	-9.92	-19.49	-29.41	-13.00	-16.41	H
89.97	-13.06	-30.61	-43.67	-13.00	-30.67	V
3480.00	-6.86	-22.64	-29.50	-13.00	-16.50	V
5220.00	-10.80	-19.49	-30.29	-13.00	-17.29	V
High Channel (1752.6MHz)						
89.97	-13.74	-30.61	-44.35	-13.00	-31.35	H
3505.20	-14.09	-22.59	-36.68	-13.00	-23.68	H
5257.80	-12.65	-19.47	-32.12	-13.00	-19.12	H
89.97	-10.42	-30.61	-41.03	-13.00	-28.03	V
3505.20	-7.00	-22.59	-29.59	-13.00	-16.59	V
5257.80	-9.52	-19.47	-28.99	-13.00	-15.99	V

Note: Result=Reading+ Correct, Margin= Result- Limit

For Band WCDMA Band V Mode (RMC)

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
89.97	-11.15	-30.61	-41.76	-13.00	-28.76	H
1652.80	-11.85	-27.36	-39.21	-13.00	-26.21	H
2479.20	-14.08	-25.16	-39.24	-13.00	-26.24	H
89.97	-10.54	-30.61	-41.15	-13.00	-28.15	V
1652.80	-9.72	-27.36	-37.08	-13.00	-24.08	V
2479.20	-7.32	-25.16	-32.48	-13.00	-19.48	V
Middle Channel (836.4MHz)						
89.97	-10.95	-30.61	-41.56	-13.00	-28.56	H
1672.80	-12.59	-27.32	-39.91	-13.00	-26.91	H
2509.20	-13.42	-25.07	-38.49	-13.00	-25.49	H
89.97	-8.31	-30.61	-38.92	-13.00	-25.92	V
1672.80	-5.28	-27.32	-32.60	-13.00	-19.60	V
2509.20	-10.56	-25.07	-35.63	-13.00	-22.63	V
High Channel (846.6MHz)						
89.97	-10.32	-30.61	-40.93	-13.00	-27.93	H
1693.20	-15.34	-27.27	-42.61	-13.00	-29.61	H
2539.80	-13.50	-24.98	-38.48	-13.00	-25.48	H
89.97	-8.12	-30.61	-38.73	-13.00	-25.73	V
1693.20	-5.37	-27.27	-32.64	-13.00	-19.64	V
2539.80	-7.31	-24.98	-32.29	-13.00	-19.29	V

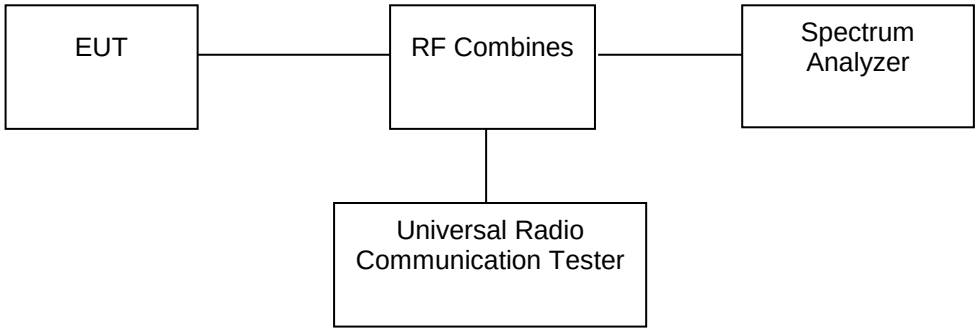
Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Note: All modes have been tested and only the worst mode is represented, with the worst data being Subtest1.

11. Frequency Stability

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part 22.355: ±2.5 ppm
FCC Part 24.235:
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
FCC Part 27.54
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

11.3 Test procedure

1. The testing follows FCC KDB 971168 D01v03r01 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01v03r01 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

11.4 Test Result

Operation Mode	Channel Number	Test Condition		Channel Frequency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (℃)				
GSM850	190	VN	-30	836.60	7.24	0.0087	2.5
			-20	836.60	7.16	0.0086	2.5
			-10	836.60	0.88	0.0011	2.5
			0	836.60	1.84	0.0022	2.5
			10	836.60	0.59	0.0007	2.5
			20	836.60	-0.68	-0.0008	2.5
			30	836.60	1.72	0.0021	2.5
			40	836.60	3.91	0.0047	2.5
			50	836.60	1.68	0.0020	2.5
		VL	20	836.60	0.74	0.0009	2.5
		VH	20	836.60	-1.99	-0.0024	2.5
VERDICT				PASS			

Operation Mode	Channel Number	Test Condition		Channel Frequency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (℃)				
GSM1900	512	VN	-30	1850.20	13.66	0.0074	Note 3
			-20	1850.20	16.93	0.0092	Note 3
			-10	1850.20	11.54	0.0062	Note 3
			0	1850.20	16.35	0.0088	Note 3
			10	1850.20	10.61	0.0057	Note 3
			20	1850.20	15.43	0.0083	Note 3
			30	1850.20	19.24	0.0104	Note 3
			40	1850.20	14.37	0.0078	Note 3
			50	1850.20	11.16	0.0060	Note 3
		VL	20	1850.20	12.11	0.0065	Note 3
		VH	20	1850.20	19.35	0.0105	Note 3
VERDICT				PASS			

All modes have been tested, and the worst result recorded was report as below

Operation Mode	Channel Number	Test Condition		Channel Fre-quency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (℃)				
WCDMA850	4132	VN	-30	836.40	17.02	0.0204	2.5
			-20	836.40	18.82	0.0225	2.5
			-10	836.40	16.90	0.0202	2.5
			0	836.40	18.02	0.0215	2.5
			10	836.40	14.33	0.0171	2.5
			20	836.40	10.48	0.0125	2.5
			30	836.40	11.61	0.0139	2.5
			40	836.40	18.29	0.0219	2.5
			50	836.40	17.67	0.0211	2.5
		VL	20	836.40	18.38	0.0220	2.5
		VH	20	836.40	10.72	0.0128	2.5
VERDICT				PASS			

Operation Mode	Channel Number	Test Condition		Channel Fre-quency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (℃)				
WCDMA1700	1312	VN	-30	1712.40	17.33	0.0101	Note 4
			-20	1712.40	19.92	0.0116	Note 4
			-10	1712.40	16.06	0.0094	Note 4
			0	1712.40	12.29	0.0072	Note 4
			10	1712.40	14.66	0.0086	Note 4
			20	1712.40	18.86	0.0110	Note 4
			30	1712.40	19.22	0.0112	Note 4
			40	1712.40	14.39	0.0084	Note 4
			50	1712.40	19.22	0.0112	Note 4
		VL	20	1712.40	14.95	0.0087	Note 4
		VH	20	1712.40	13.89	0.0081	Note 4
VERDICT				PASS			

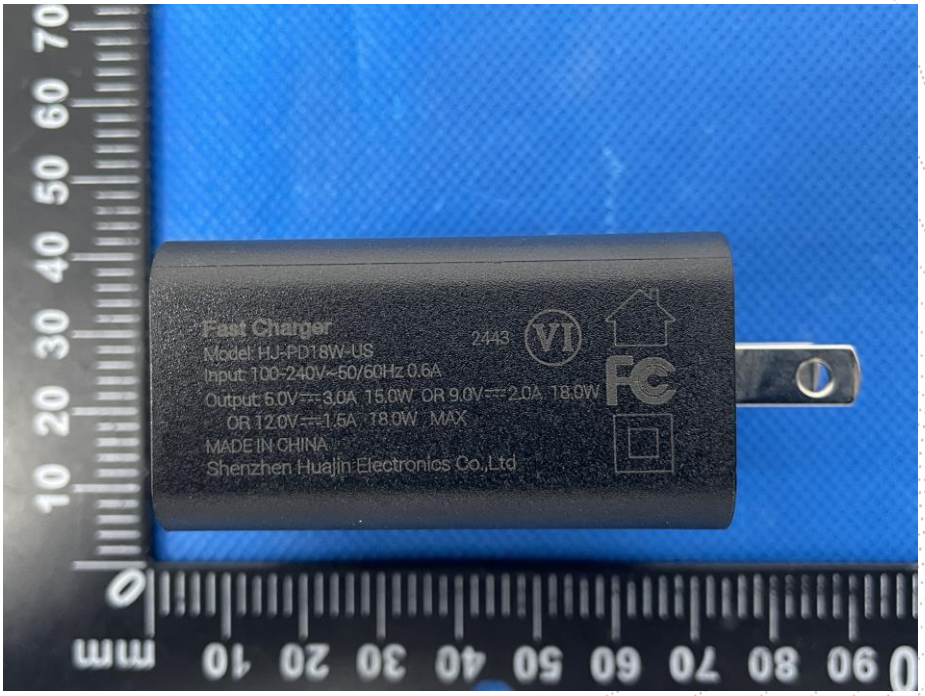
Operation Mode	Channel Number	Test Condition		Channel Fre-quency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (℃)				
WCDMA1 900	9262	VN	-30	1852.40	12.50	0.0067	Note 4
			-20	1852.40	19.01	0.0103	Note 4
			-10	1852.40	16.71	0.0090	Note 4
			0	1852.40	11.37	0.0061	Note 4
			10	1852.40	15.37	0.0083	Note 4
			20	1852.40	18.42	0.0099	Note 4
			30	1852.40	10.21	0.0055	Note 4
			40	1852.40	17.96	0.0097	Note 4
			50	1852.40	10.01	0.0054	Note 4
		VL	20	1852.40	14.18	0.0077	Note 4
		VH	20	1852.40	13.36	0.0072	Note 4
VERDICT				PASS			

Note 1: All modes have been tested with GSM.
Note 2: All modes have been tested, and the worst result recorded was report as below
Note 3: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
Note 4: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

12. EUT Photographs

EUT Photo 1

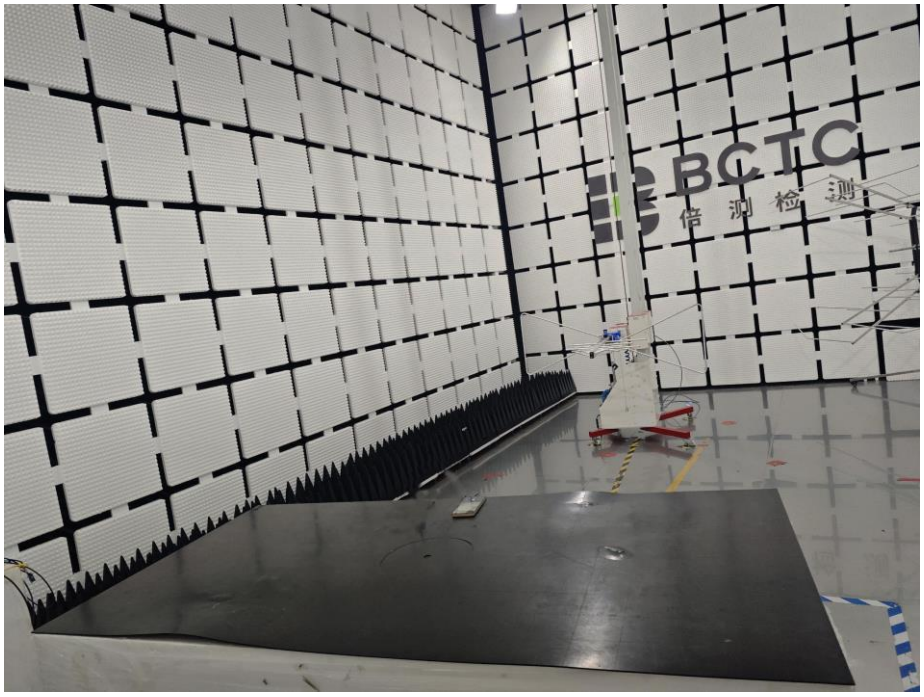
EUT Photo 2



NOTE: Appendix-Photographs Of EUT Constructional Details.

13. EUT Test Setup Photographs

Radiated Measurement Photos



MWRFtest 迈测 MW100-7UD
MWRFtest 迈测 MW100-RFCB
MWRFtest 迈测 MW200-RFCB

STATEMENT

1. The equipment lists are traceable to the national reference standards.

2. The test report can not be partially copied unless prior written approval is issued from our lab.

3. The test report is invalid without the "special seal for inspection and testing".

4. The test report is invalid without the signature of the approver.

5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

7. The quality system of our laboratory is in accordance with ISO/IEC17025.

8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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