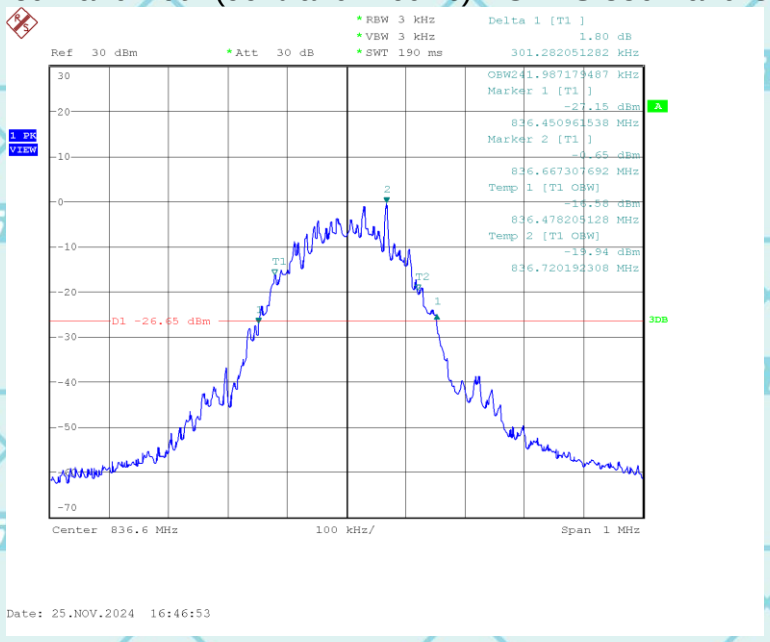
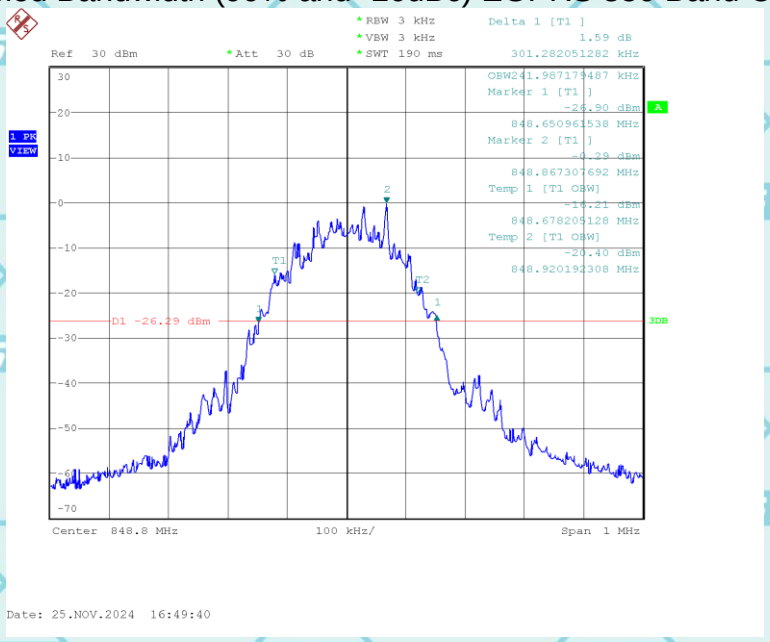
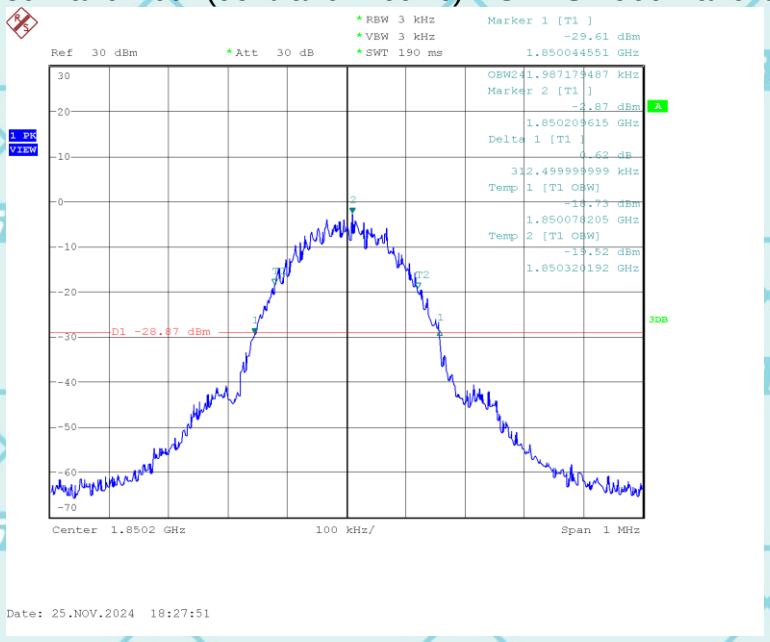
Occupied Bandwidth (99% and -26dBc) EGPRS 850 Band CH 190



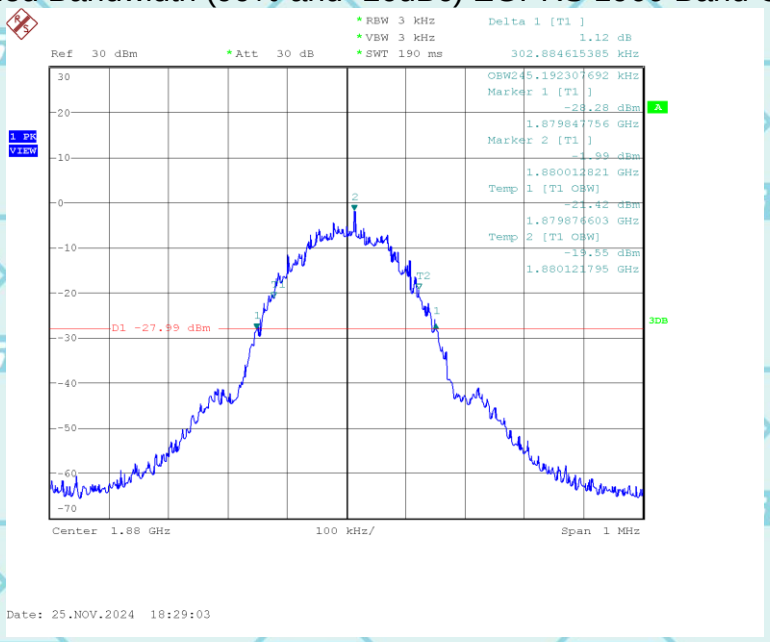
Occupied Bandwidth (99% and -26dBc) EGPRS 850 Band CH 251



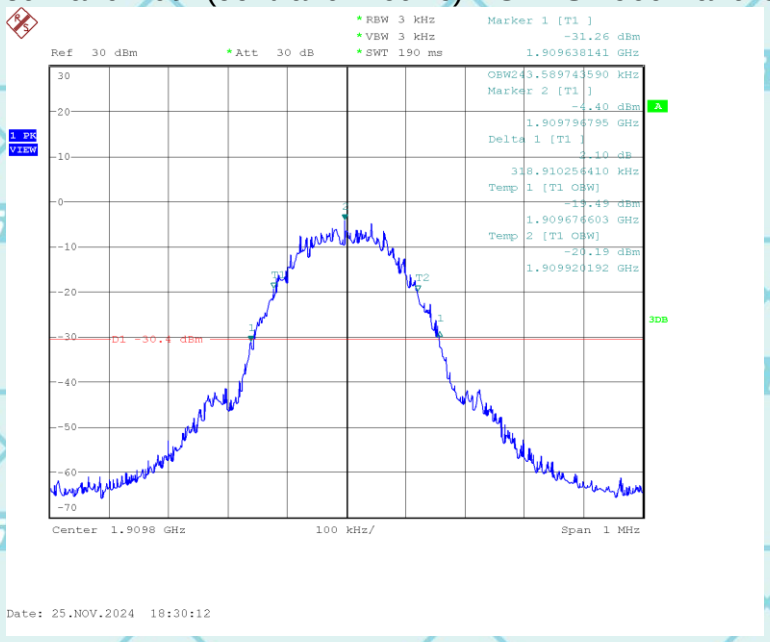
Occupied Bandwidth (99% and -26dBc) EGPRS 1900 Band CH 512



Occupied Bandwidth (99% and -26dBc) EGPRS 1900 Band CH 661

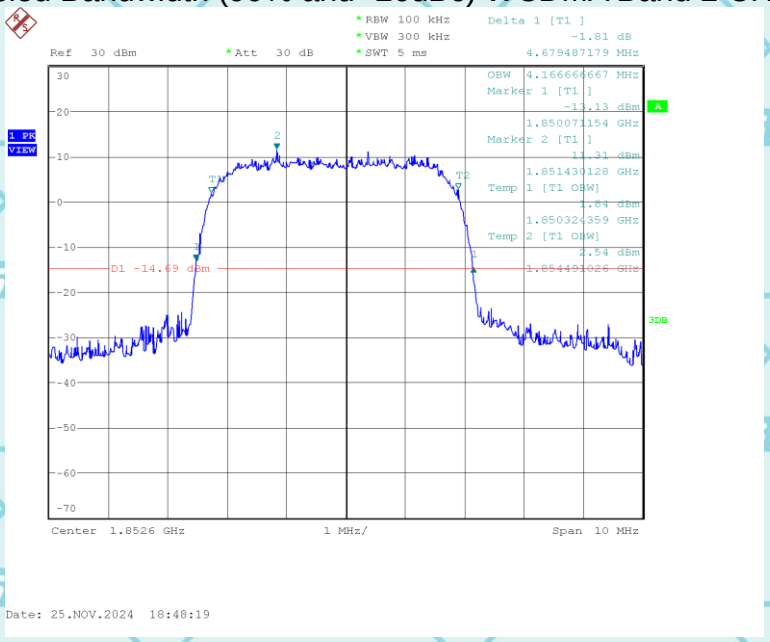


Occupied Bandwidth (99% and -26dBc) EGPRS 1900 Band CH 810

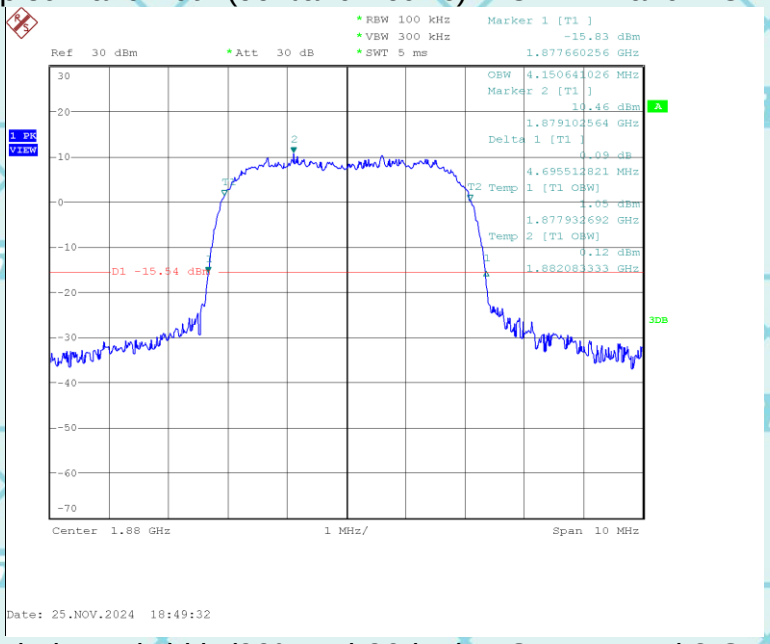


UTRA BANDS

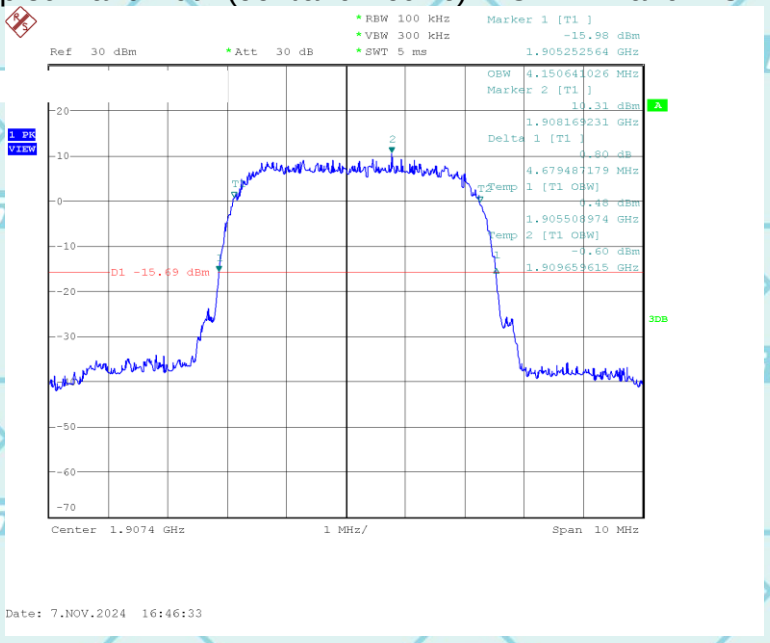
Occupied Bandwidth (99% and -26dBc) WCDMA Band 2 CH 9262



Occupied Bandwidth (99%and-26dBc) WCDMA Band 2 CH 9400

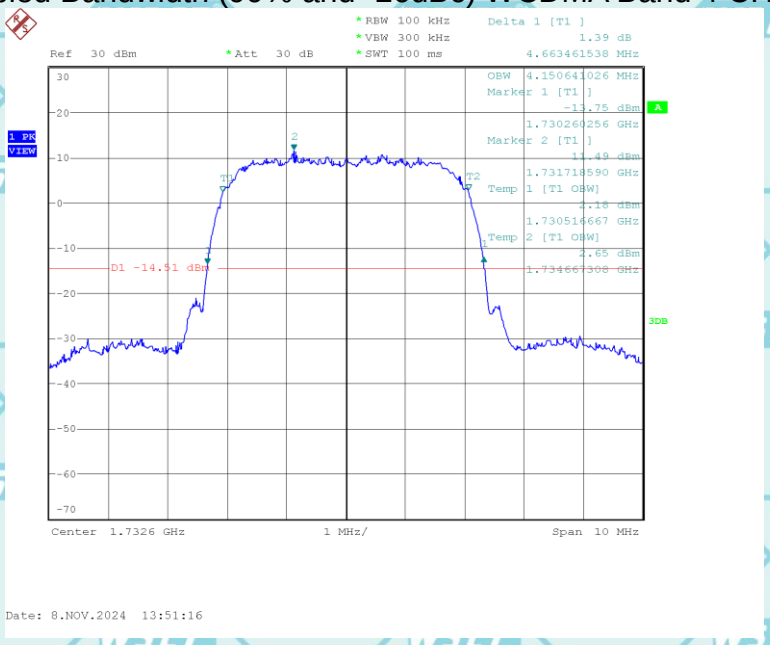


Occupied Bandwidth (99%and-26dBc) WCDMA Band 2 CH 9538

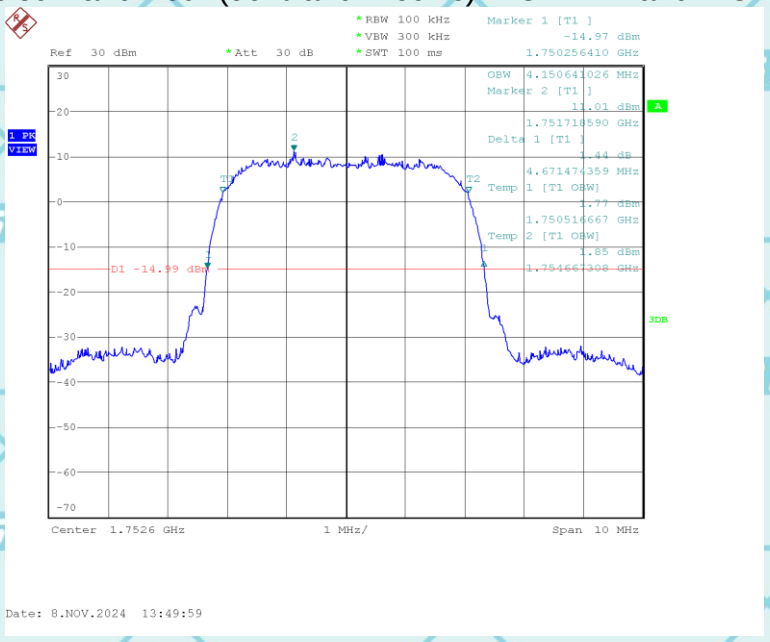


Occupied Bandwidth (99% and -26dBc) WCDMA Band 4 CH 1312

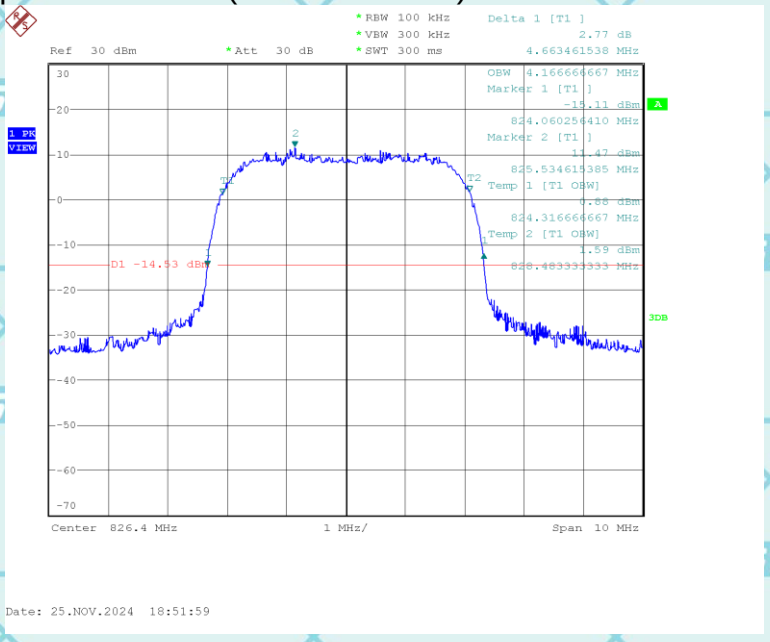
Occupied Bandwidth (99% and -26dBc) WCDMA Band 4 CH 1413



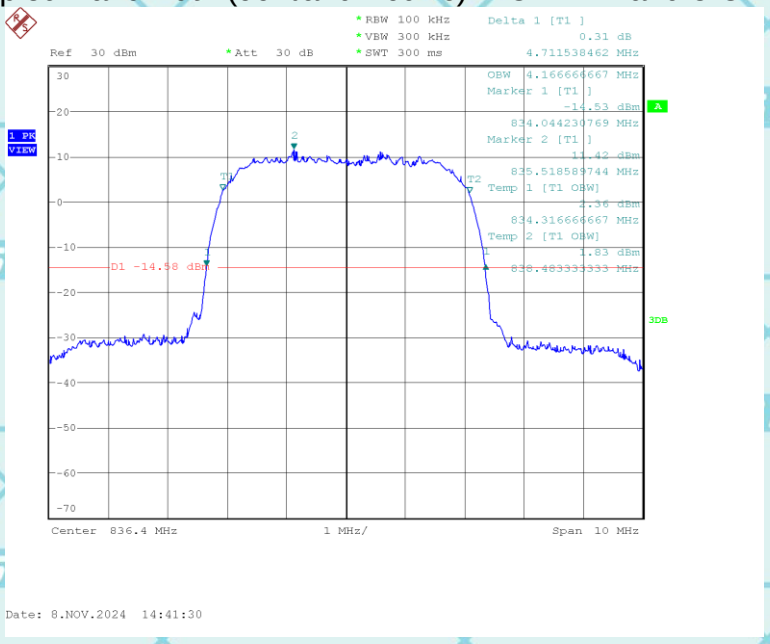
Occupied Bandwidth (99% and -26dBc) WCDMA Band 4 CH 1513



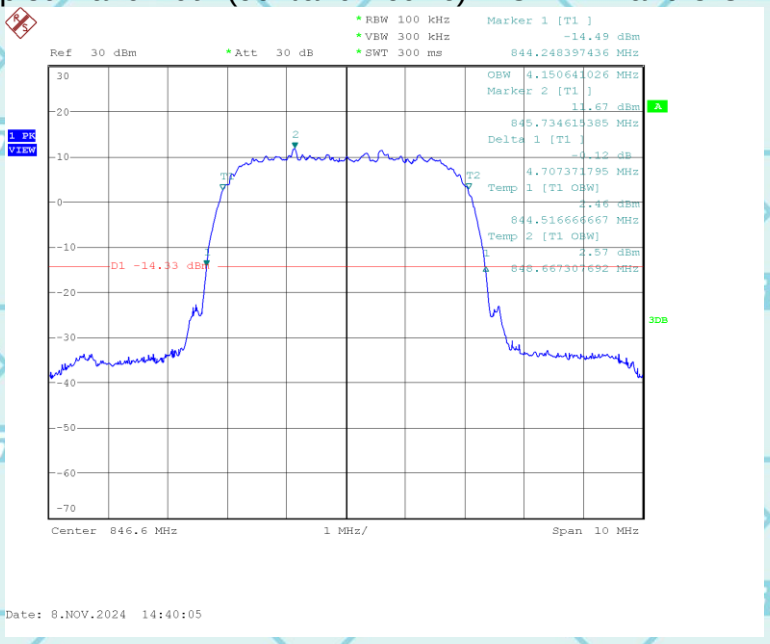
Occupied Bandwidth (99%and-26dBc) WCDMA Band 5 CH 4132



Occupied Bandwidth (99%and-26dBc) WCDMA Band 5 CH 4182



Occupied Bandwidth (99%and-26dBc) WCDMA Band 5 CH 4233



Note: Please refer to Annex（LTE&NR Occupied Bandwidth） for more test data

10. BAND EDGE

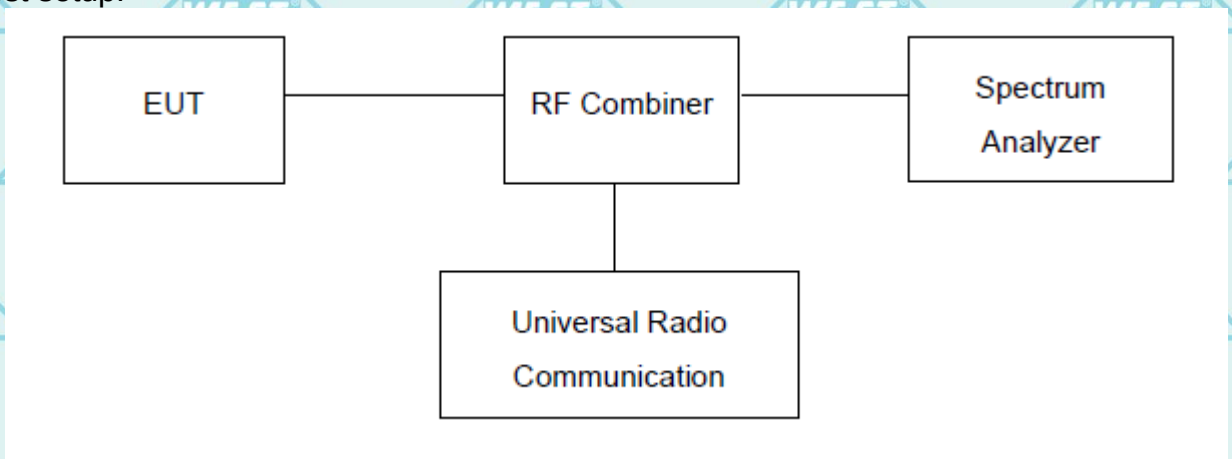
Test Limit:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified. See section 4.

Test procedure:

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

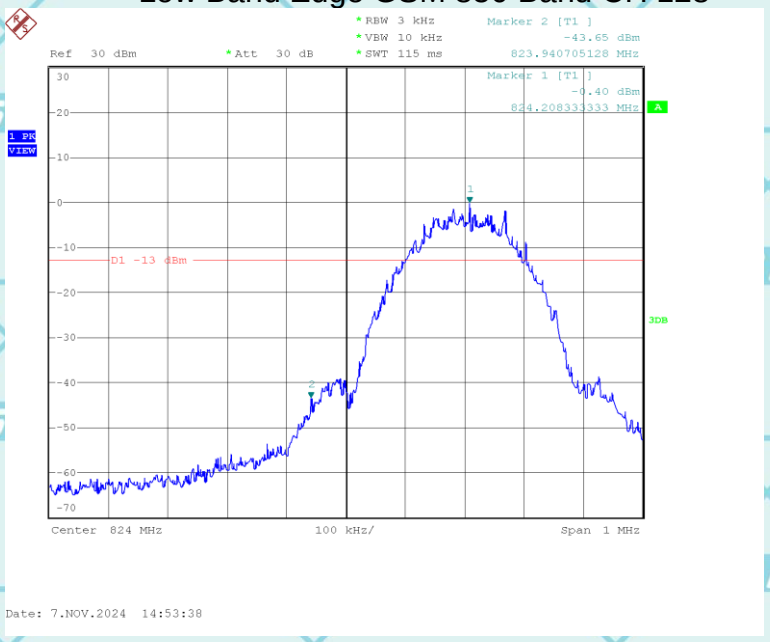
Test setup:



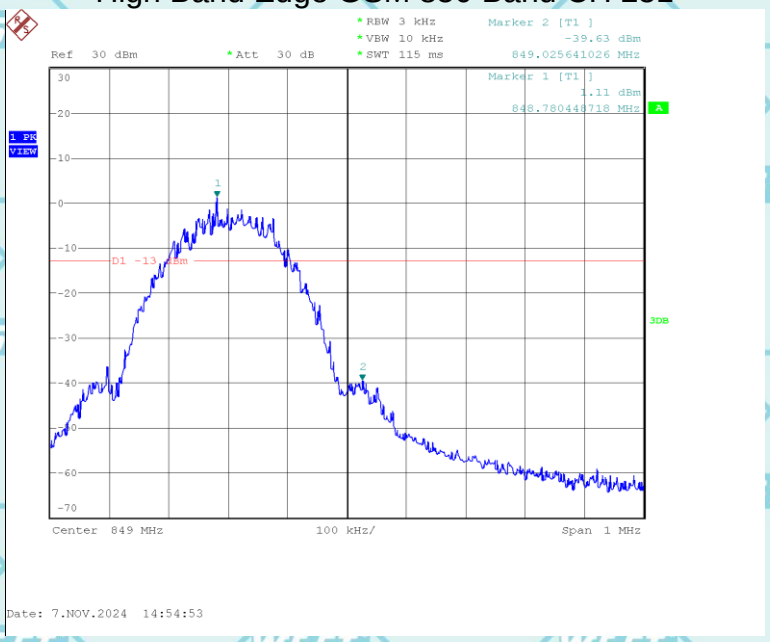
10.1. Measurement Result

Test Plot(s)

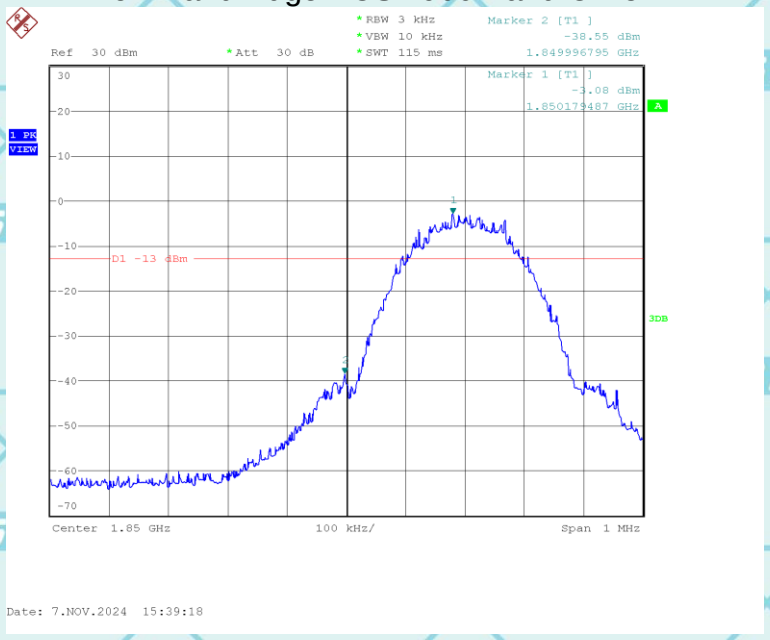
Low Band Edge GSM 850 Band CH 128



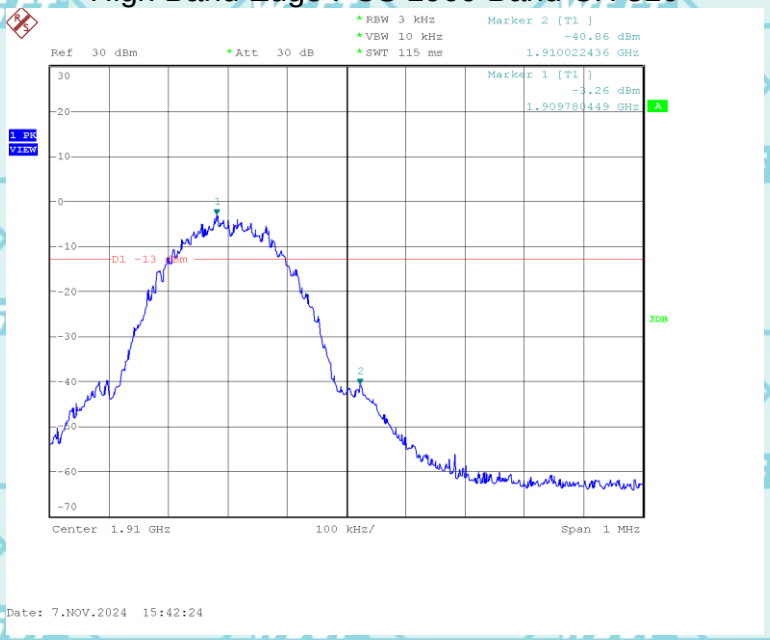
High Band Edge GSM 850 Band CH 251



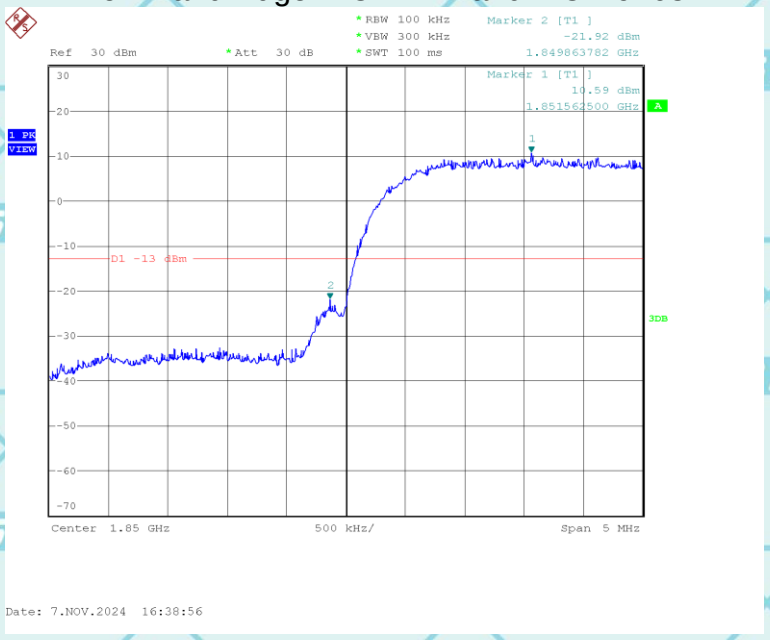
Low Band Edge PCS 1900 Band CH 512



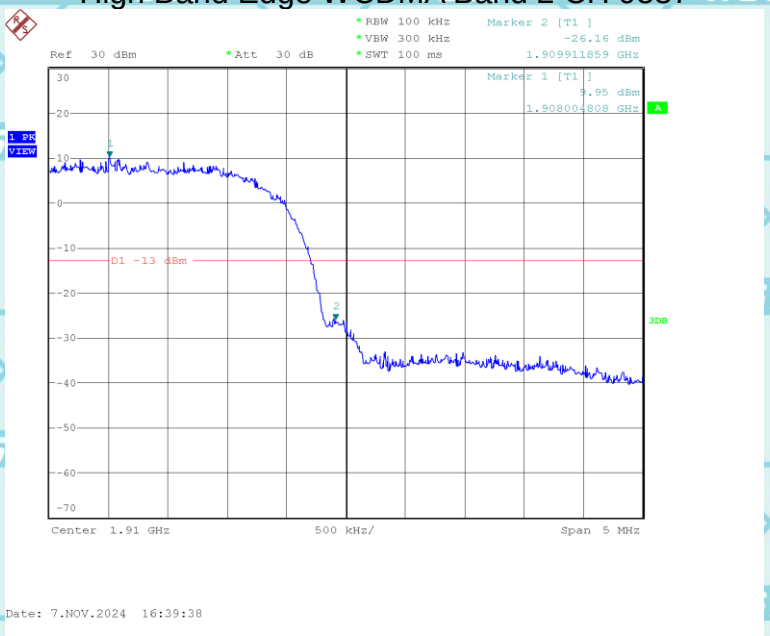
High Band Edge PCS 1900 Band CH 810



Low Band Edge WCDMA Band 2 CH 9263

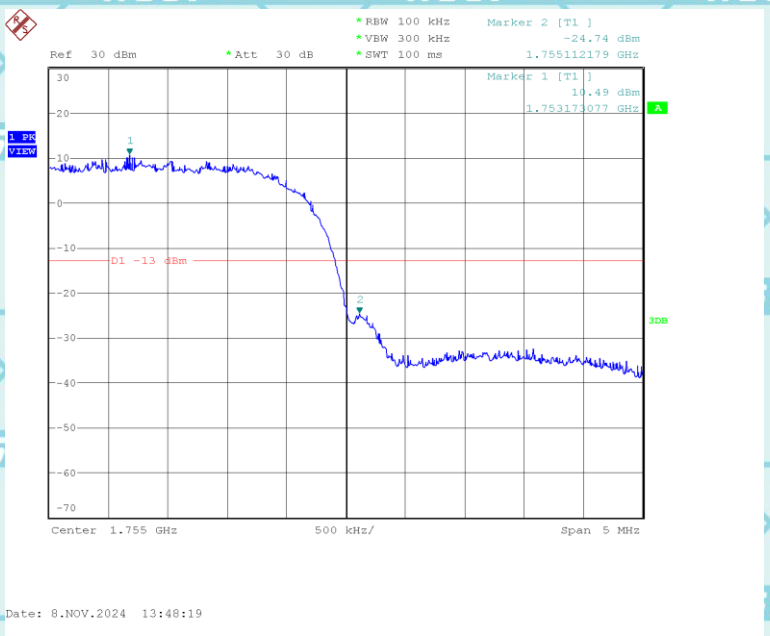


High Band Edge WCDMA Band 2 CH 9537

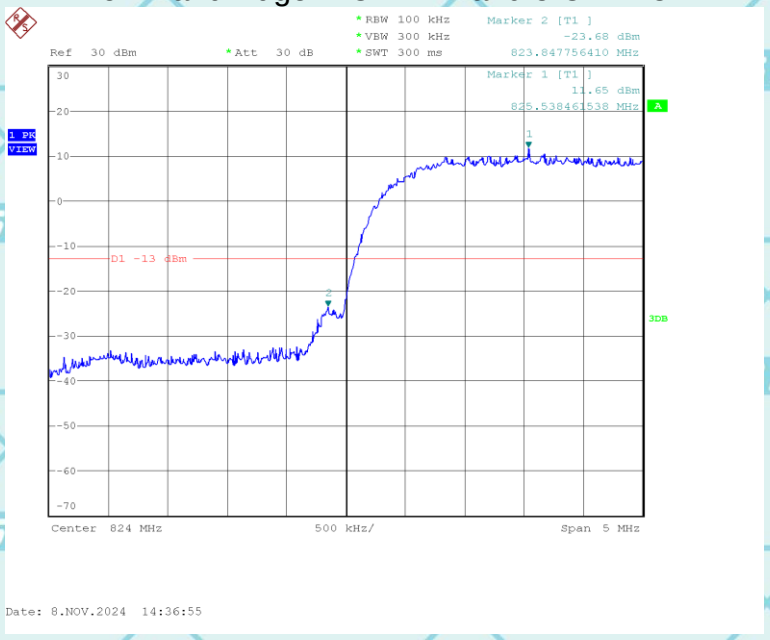


Low Band Edge WCDMA Band 4 CH 1312

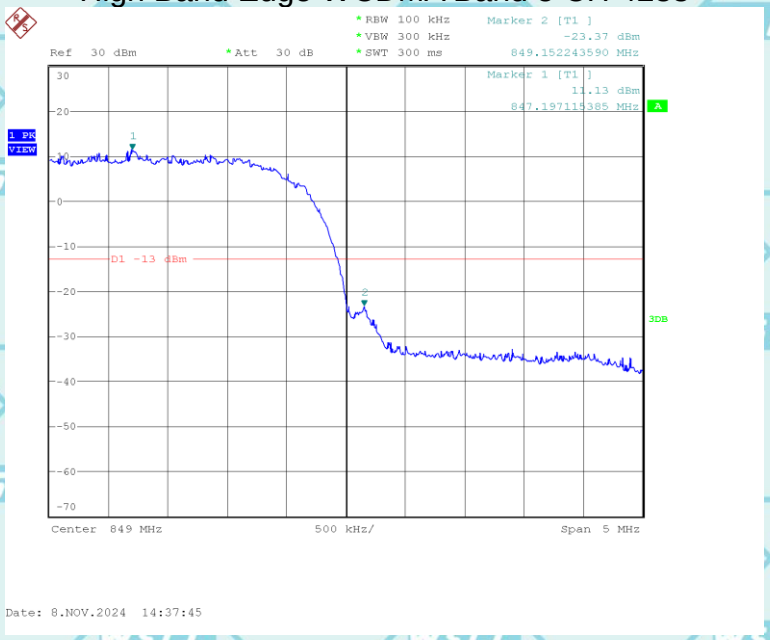
Low Band Edge WCDMA Band 4 CH 1513



Low Band Edge WCDMA Band 5 CH 4132



High Band Edge WCDMA Band 5 CH 4233



Note: Please refer to Annex（LTE&NR Band Edge） for more test data

11. SPURIOUS EMISSION (Conducted and Radiated)

11.1. Measurement Result (Pre-measurement)

GSM850:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	128	824.2	Pass
Middle Range	0.2	190	836.6	Pass
High Range	0.2	251	848.8	Pass

PCS 1900：

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	512	1850.2	Pass
Middle Range	0.2	661	1880.0	Pass
High Range	0.2	810	1909.8	Pass

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Band 2:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	5	9262	1852.4	Pass
Middle Range	5	9400	1880.0	Pass
High Range	5	9538	1907.6	Pass

Band 4:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	5	1312	1712.4	Pass
Middle Range	5	1413	1732.6	Pass
High Range	5	1513	1752.6	Pass

Band 5:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	5	4132	826.4	Pass
Middle Range	5	4182	836.4	Pass
High Range	5	4233	846.6	Pass

Test Plot(s)
Conducted method

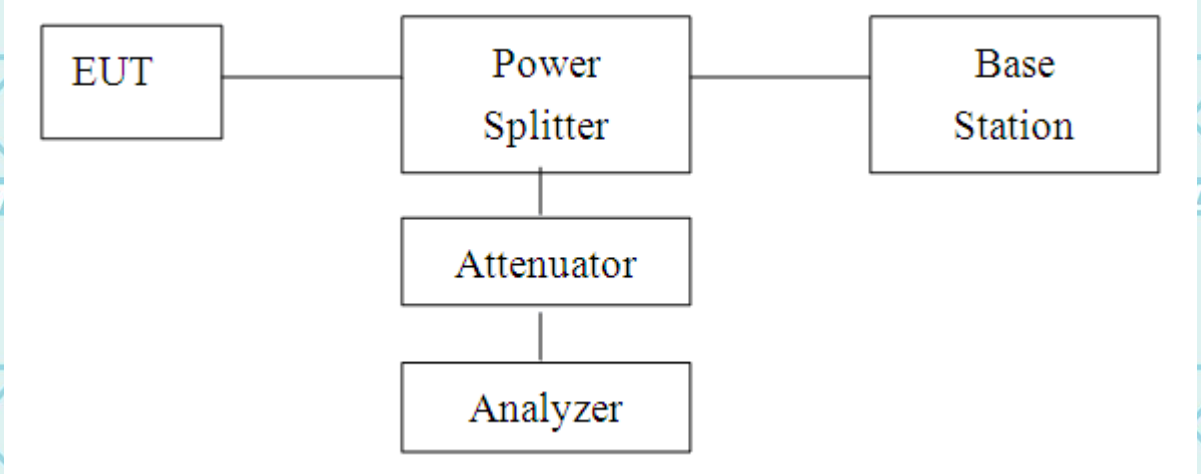
Test limit:

The spurious (unwanted) emission limits specified in the individual FCC rule parts applicable to licensed digital transmitters (typically referred to under the heading ‘emission limits’) normally apply to any and all emissions that are present outside of the authorized frequency band/block and apply to emissions in both the out-of-band and spurious domains. In some rule parts, the unwanted emission limits are specified by an emission mask that defines the applicable limit as a function of the frequency range relative to the authorized frequency block.
Typically, unwanted emissions are required by the licensed rule parts to be attenuated below the transmitter power by a factor of at least X + 10log(P) dB, where P represents the transmitter power expressed in watts and X is a specified scalar value (e.g., 43). This specification can be interpreted in one of two equivalent ways. First, the required attenuation can be construed to be relative to the mean carrier power, with the resultant of the equation X + 10log(P) being expressed in dBc (dB relative to the maximum carrier power). Alternatively, the specification can be interpreted as an absolute limit when the specified attenuation is actually subtracted from the maximum permissible transmitter power [i.e., 10log(P) – {X + 10log(P)}], resulting in an absolute level of -X dBW [or (-X + 30) dBm]. See section 4.

Test procedure:

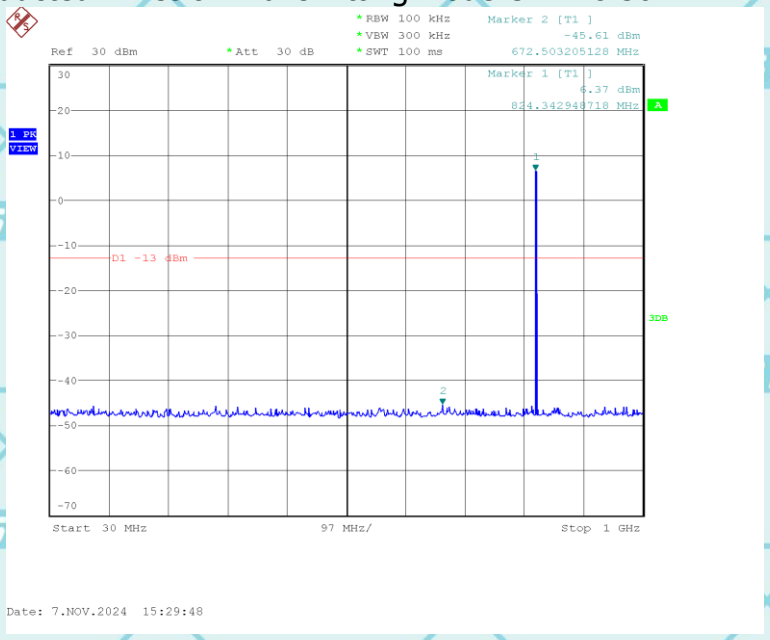
The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz below 1 GHz and 1 MHz above 1 GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.

Conducted Emission Test-Up:

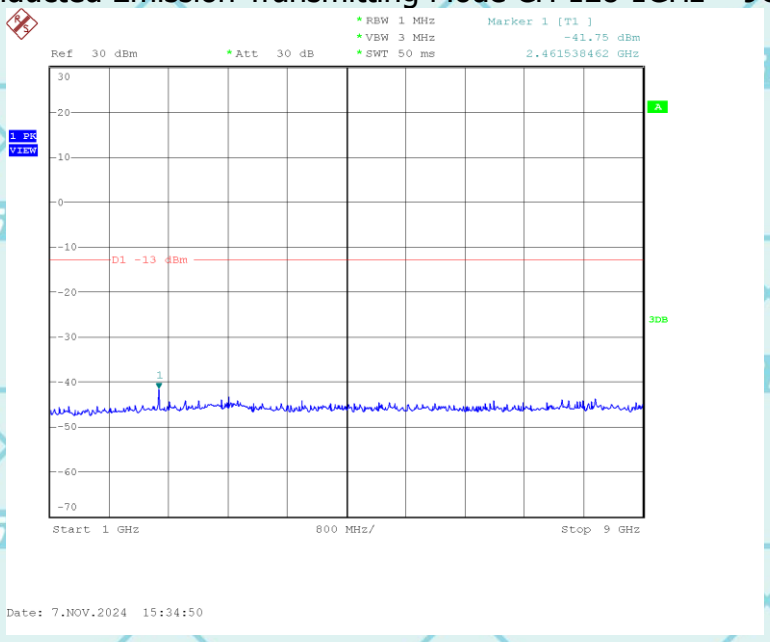


CONDUCTED EMISSION IN GSM850 Band

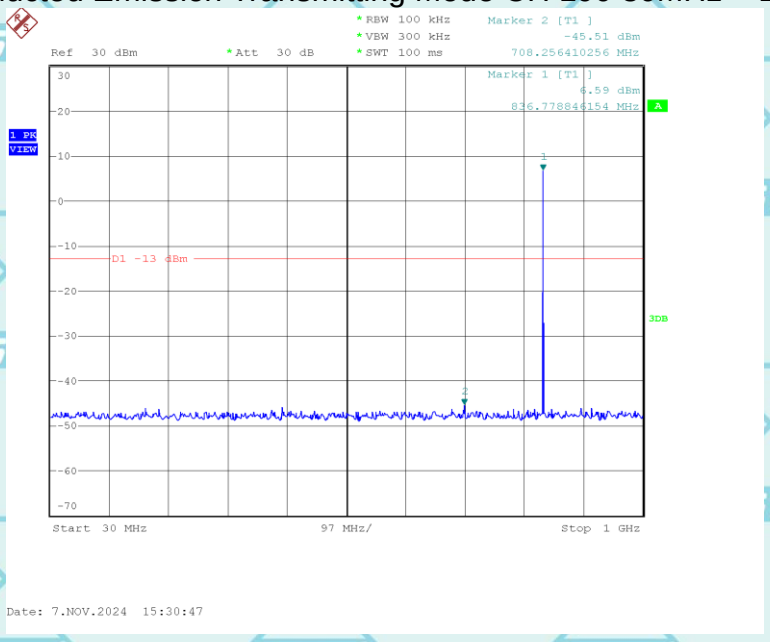
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



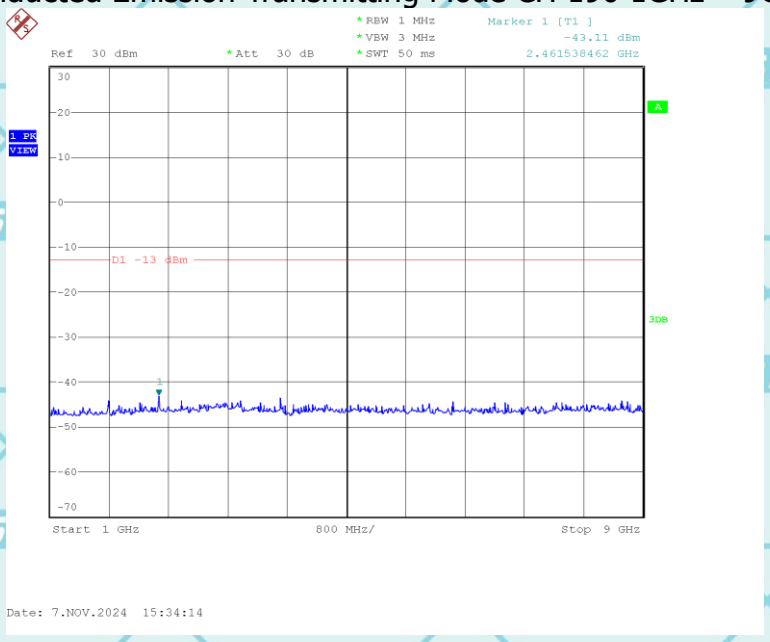
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



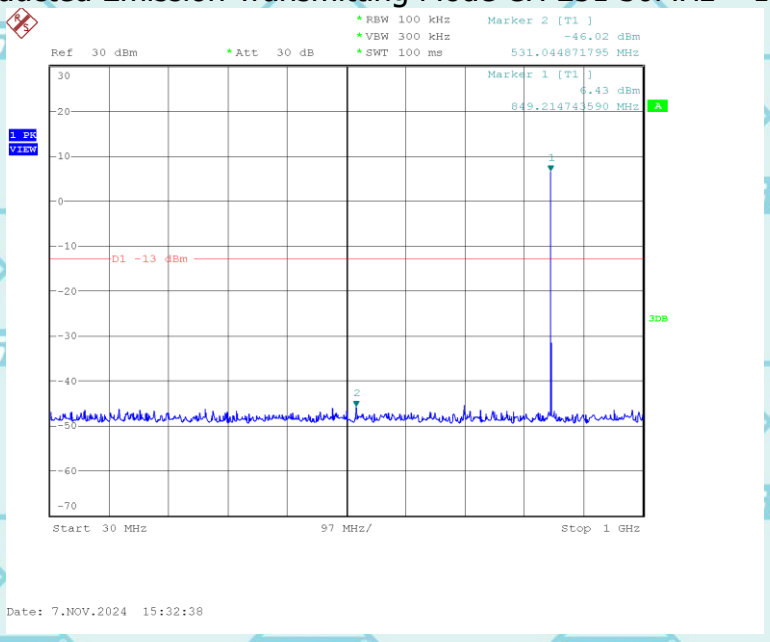
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



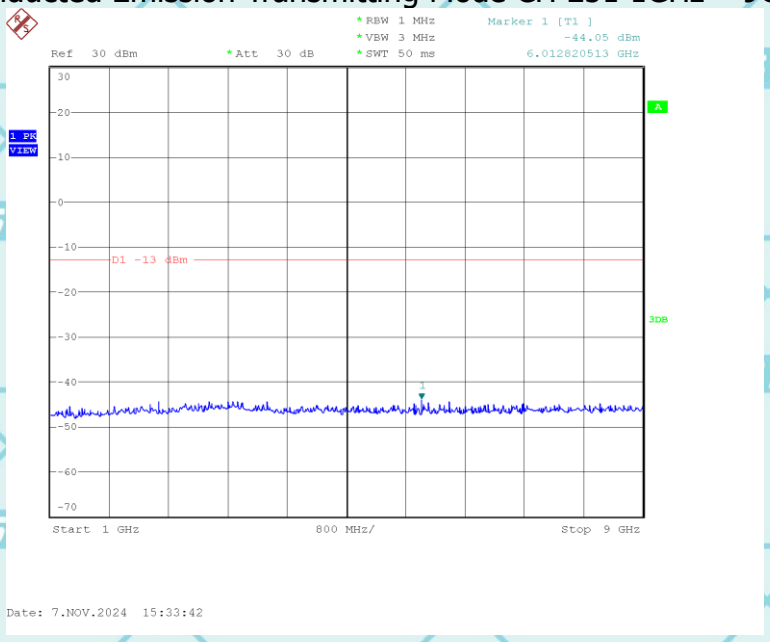
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

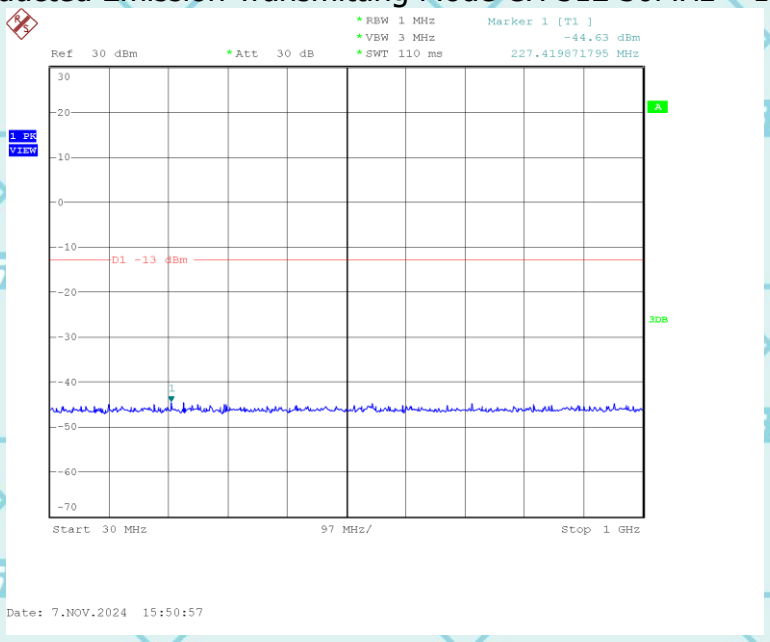


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

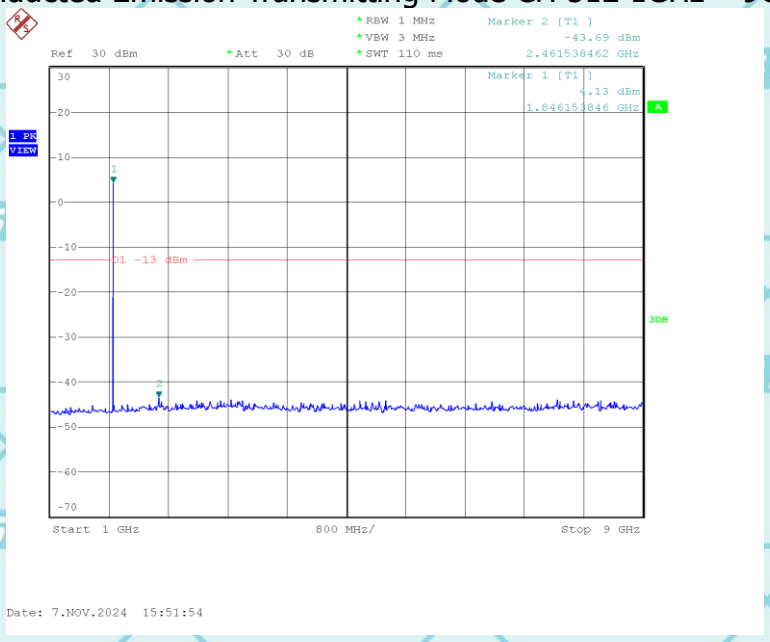


CONDUCTED EMISSION IN PCS1900 BAND

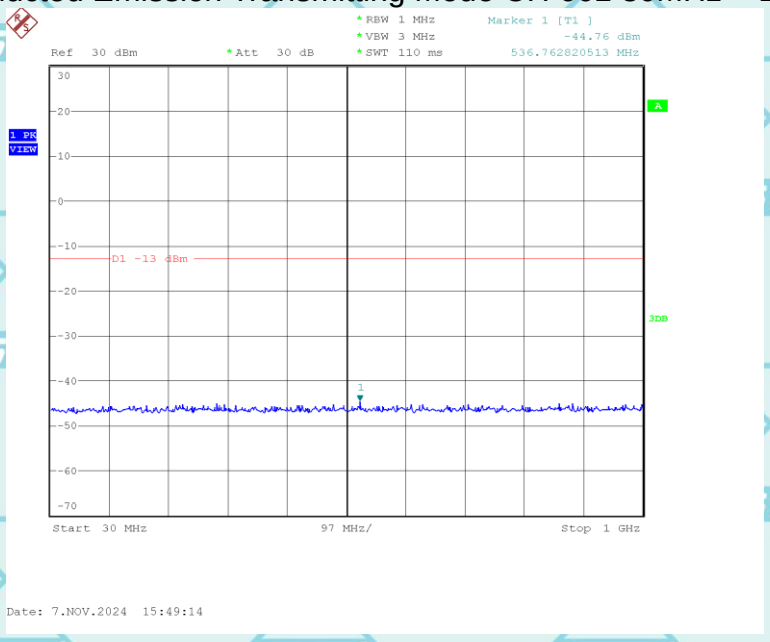
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



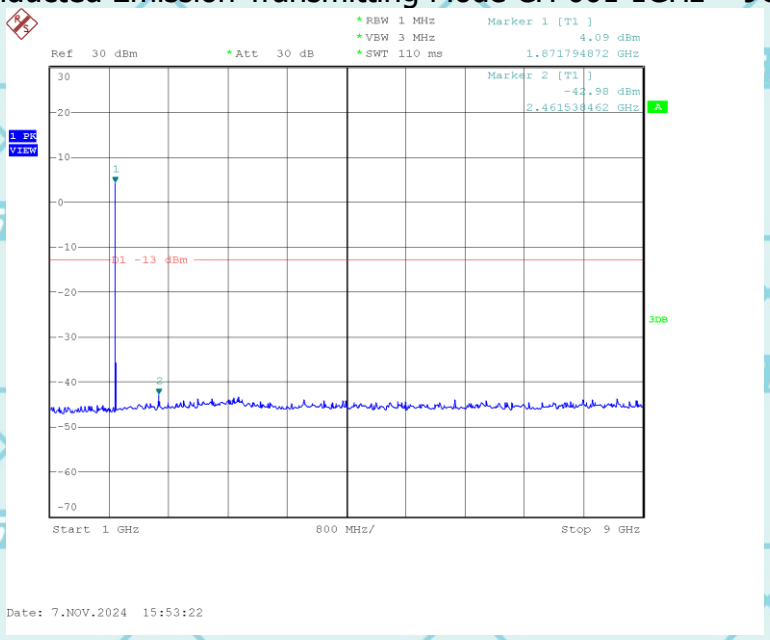
Conducted Emission Transmitting Mode CH 512 1GHz – 9GHz



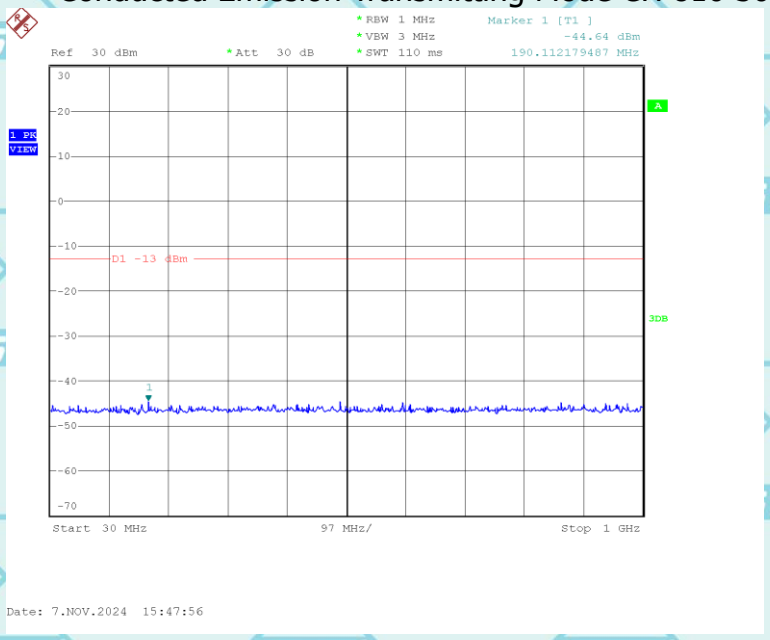
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



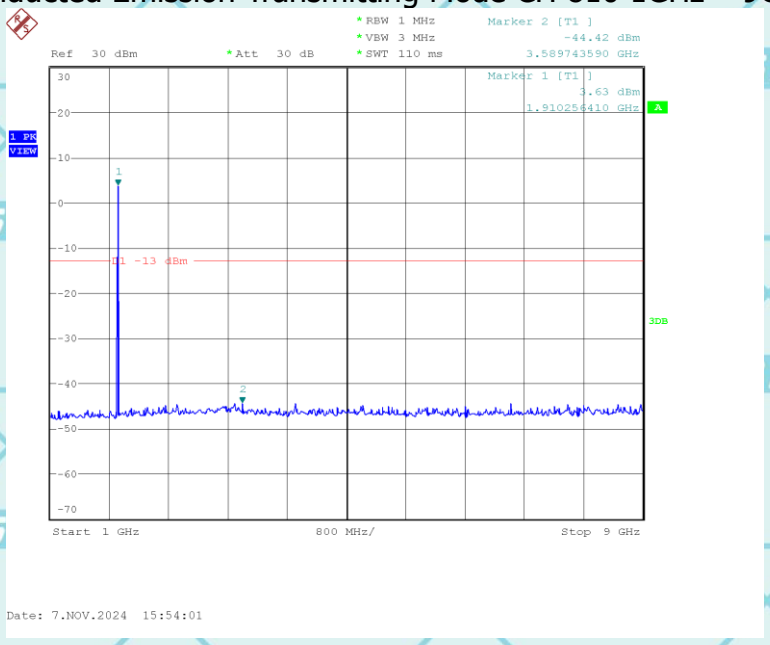
Conducted Emission Transmitting Mode CH 661 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz

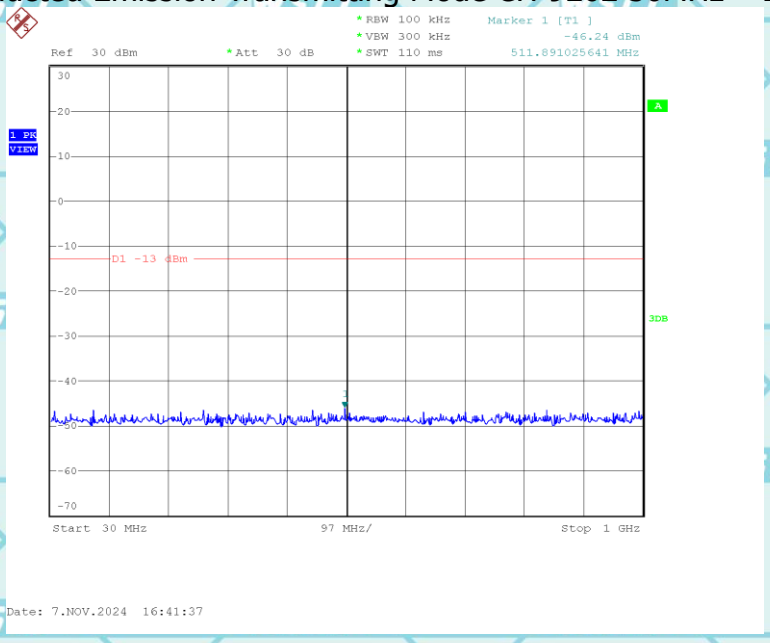


Conducted Emission Transmitting Mode CH 810 1GHz – 9GHz

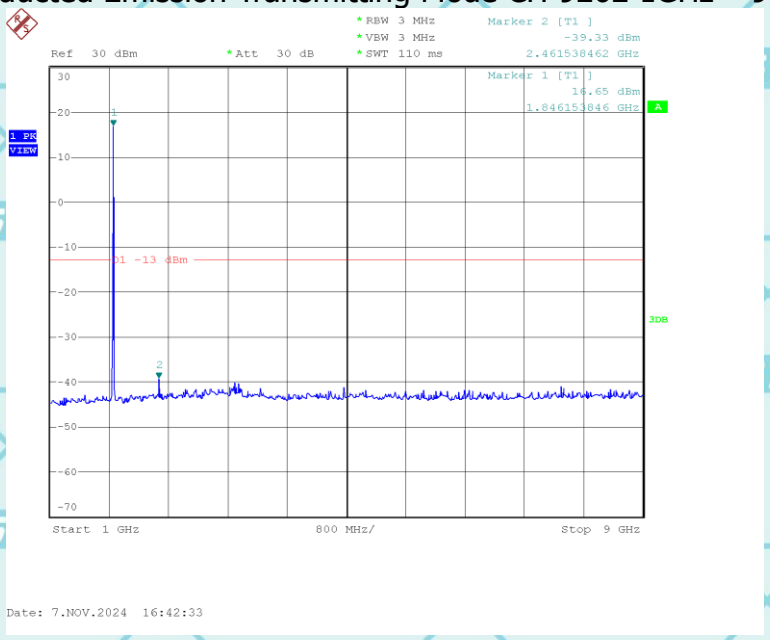


CONDUCTED EMISSION IN WCDMA Band 2

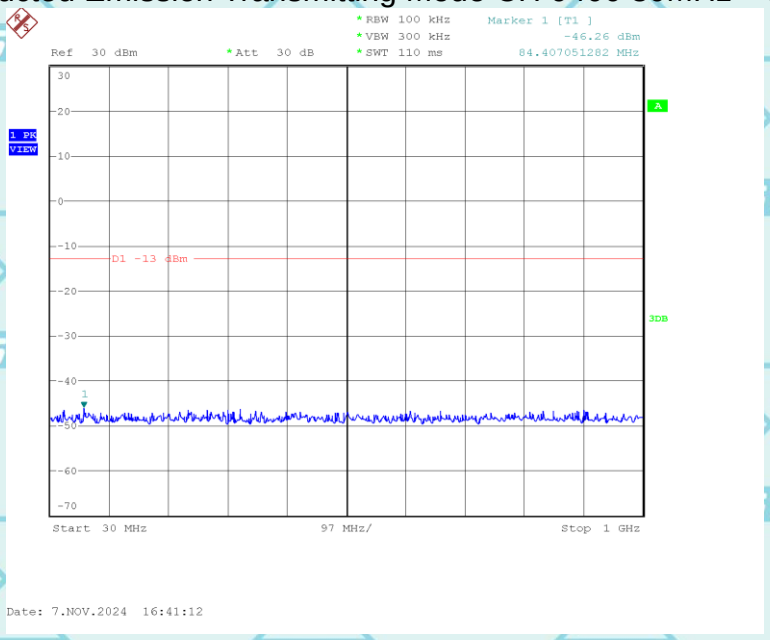
Conducted Emission Transmitting Mode CH 9262 30MHz – 1GHz



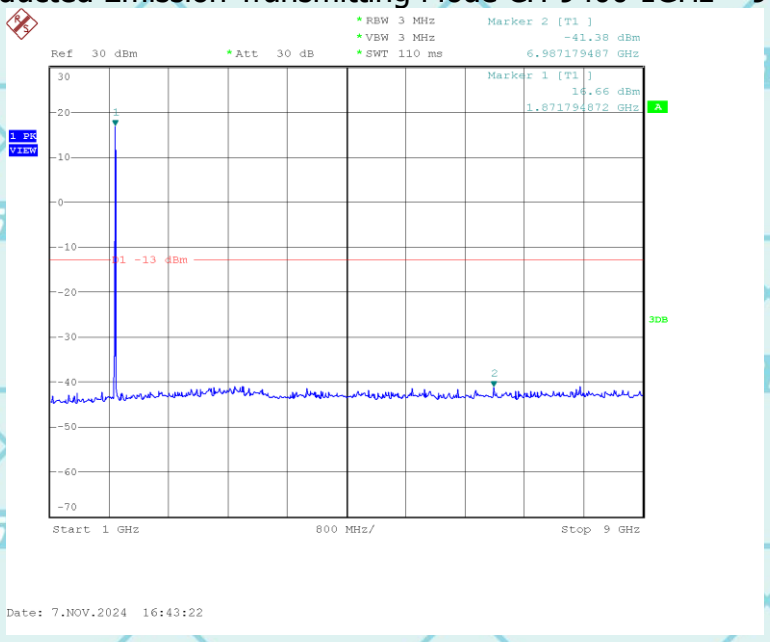
Conducted Emission Transmitting Mode CH 9262 1GHz – 9GHz



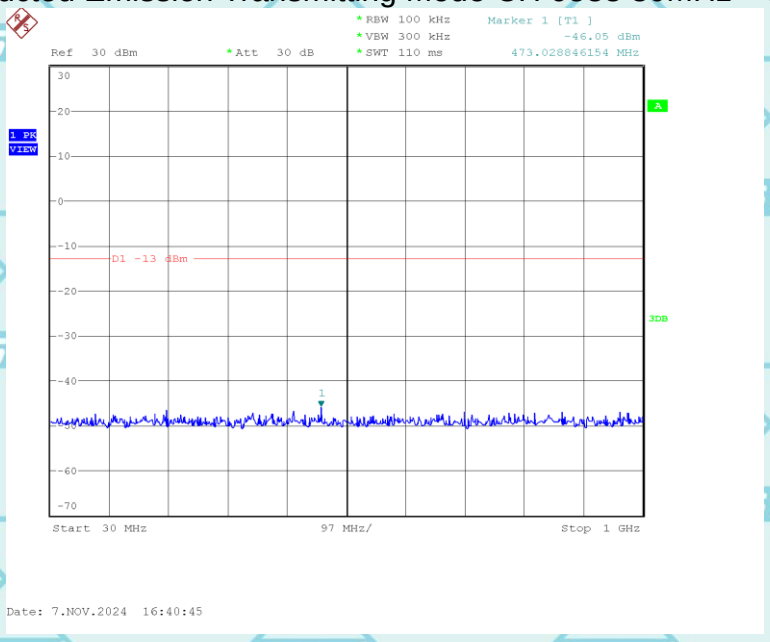
Conducted Emission Transmitting Mode CH 9400 30MHz – 1GHz



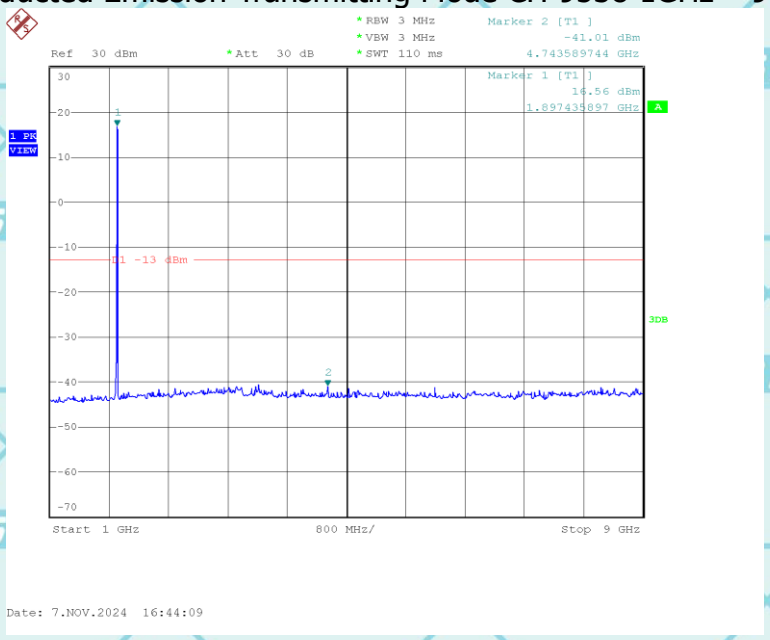
Conducted Emission Transmitting Mode CH 9400 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 9538 30MHz – 1GHz

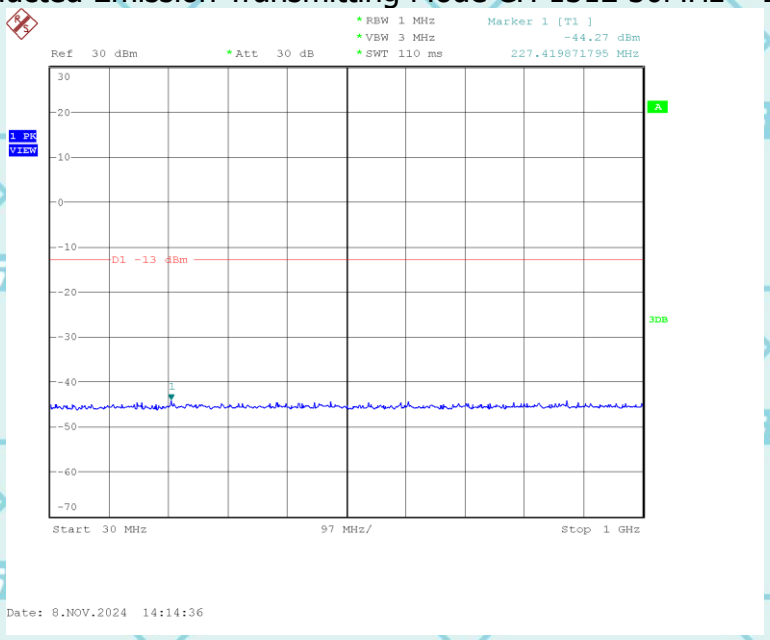


Conducted Emission Transmitting Mode CH 9538 1GHz – 9GHz

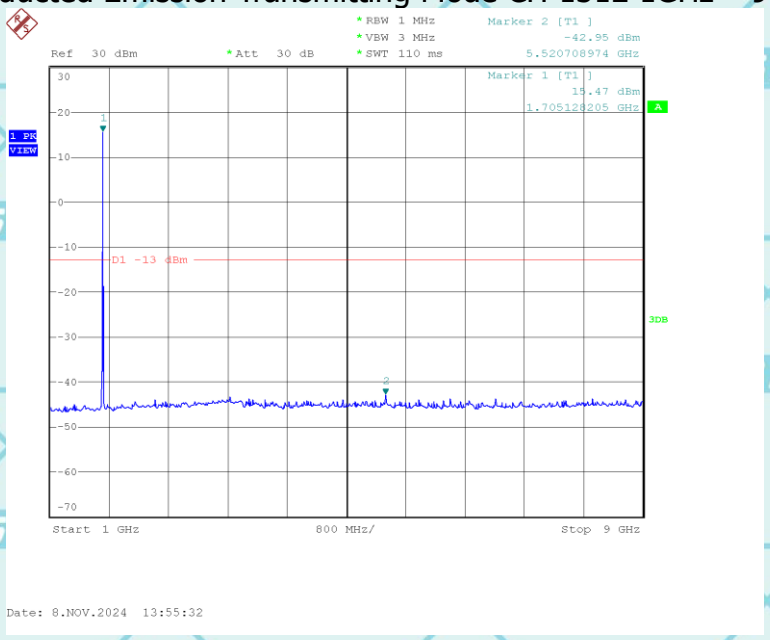


CONDUCTED EMISSION IN WCDMA Band 4

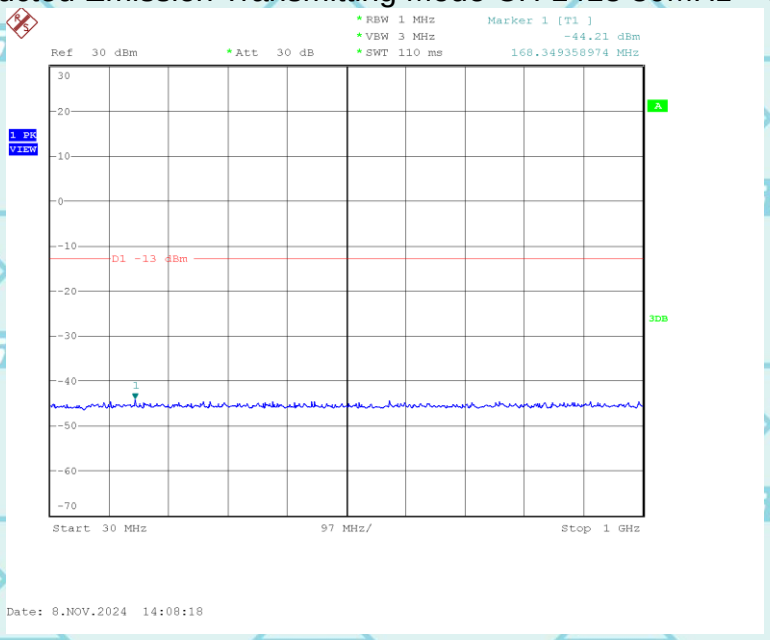
Conducted Emission Transmitting Mode CH 1312 30MHz – 1GHz



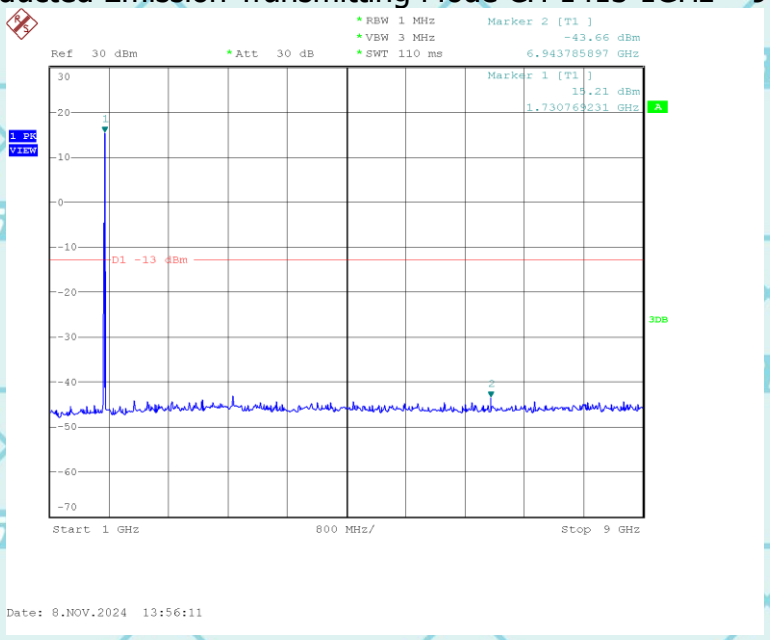
Conducted Emission Transmitting Mode CH 1312 1GHz – 9GHz



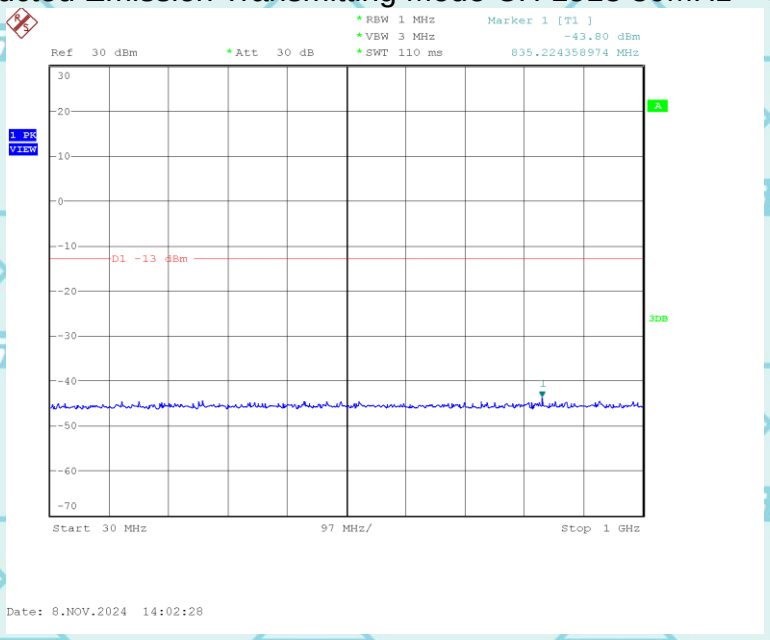
Conducted Emission Transmitting Mode CH 1413 30MHz – 1GHz



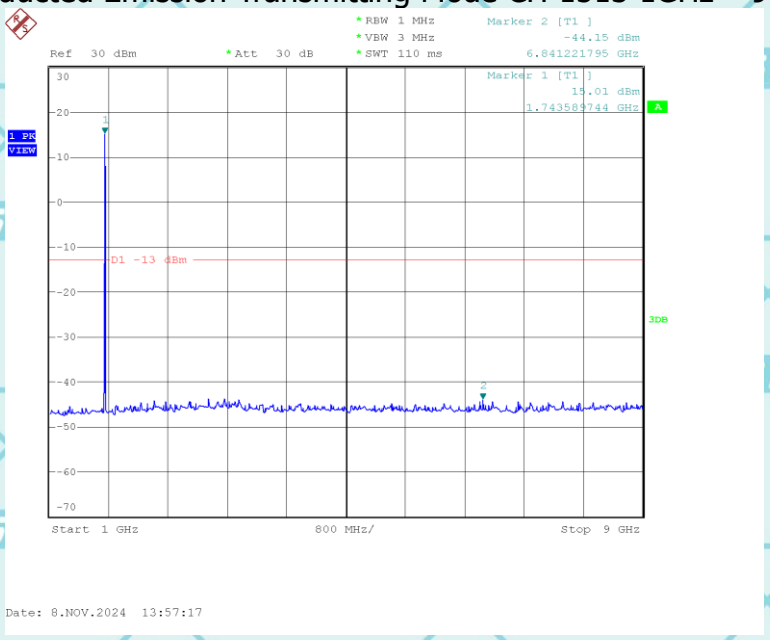
Conducted Emission Transmitting Mode CH 1413 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 1513 30MHz – 1GHz

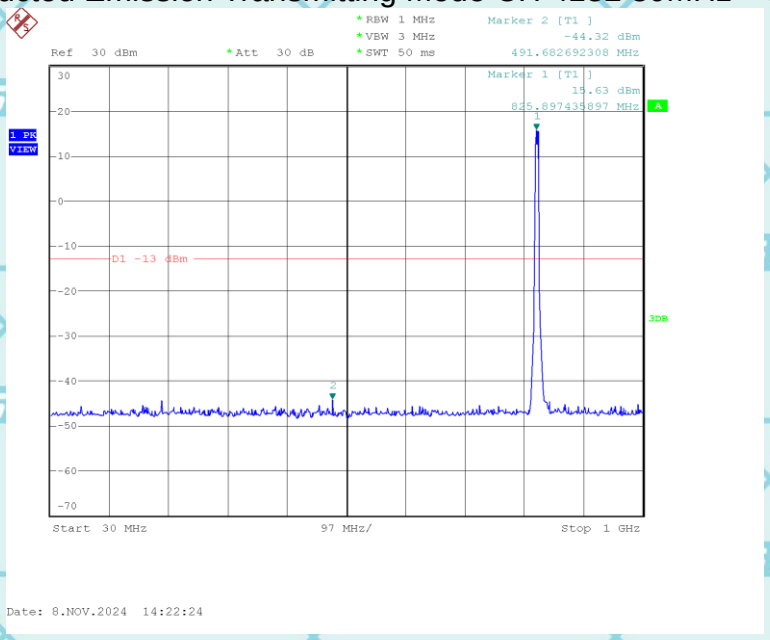


Conducted Emission Transmitting Mode CH 1513 1GHz – 9GHz

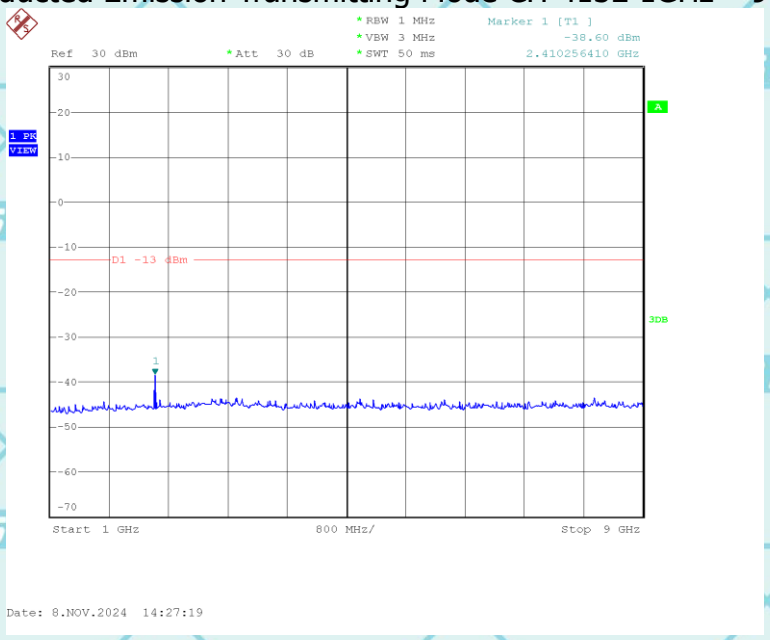


CONDUCTED EMISSION IN WCDMA Band 5

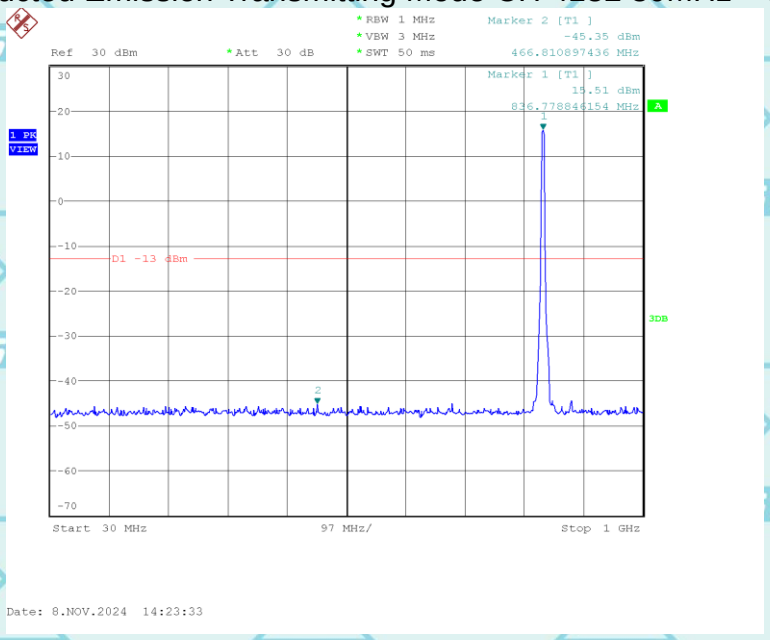
Conducted Emission Transmitting Mode CH 4132 30MHz – 1GHz



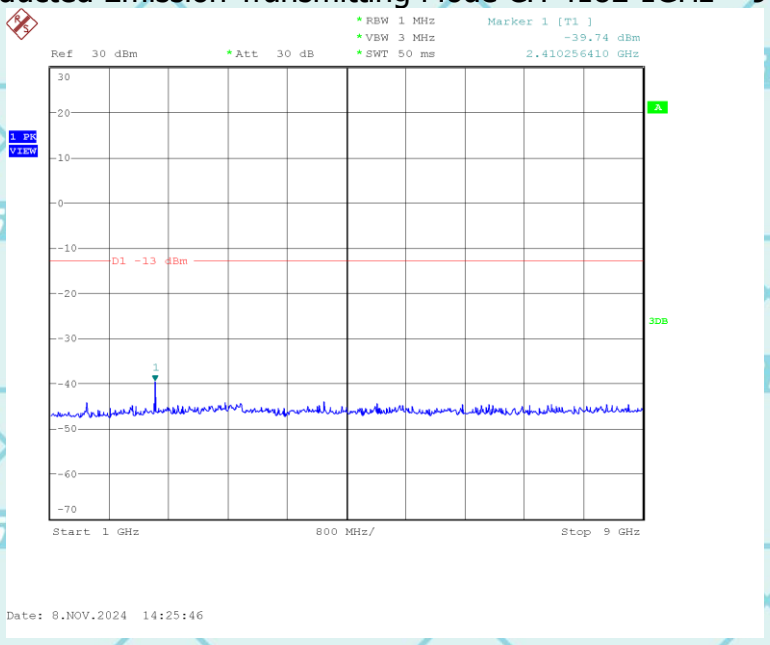
Conducted Emission Transmitting Mode CH 4132 1GHz – 9GHz



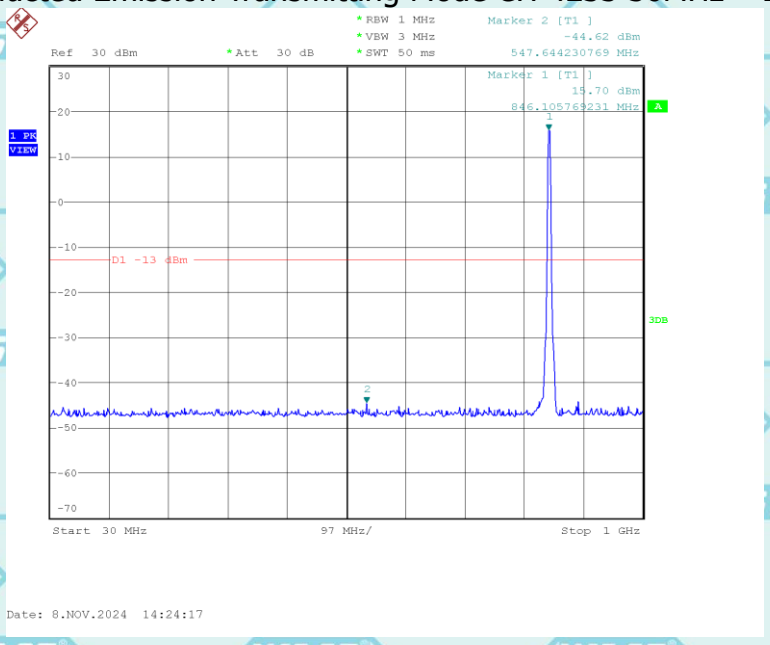
Conducted Emission Transmitting Mode CH 4182 30MHz – 1GHz



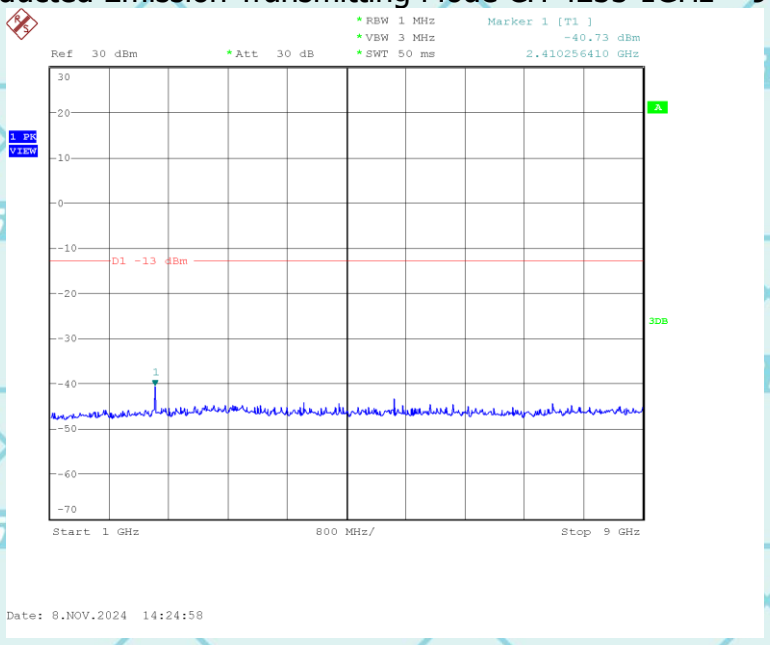
Conducted Emission Transmitting Mode CH 4182 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 4233 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 4233 1GHz – 9GHz



Note: Please refer to Annex（LTE&NR Out-of-band emissions） for more test data

12. FREQUENCY STABILITY

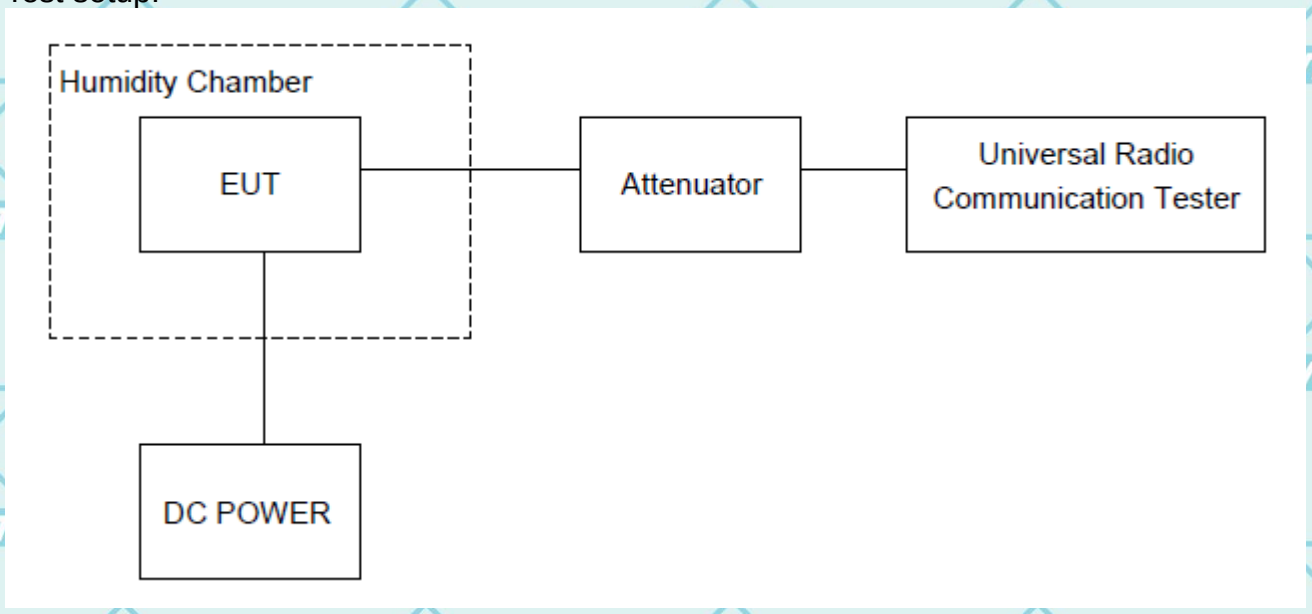
Test limit:

The frequency stability of the transmitter shall be measured while varying the ambient temperatures and supply voltages over the ranges specified in §2.1055. The specific frequency stability limits are provided in the relevant rules section(s). see section 4.

Test procedure:

Frequency Stability vs. Temperature: The equipment under test was connected to an external 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 DC leads and RF output cable exited the chamber through an opening made for the purpose.

Test setup:



12.1. Measurement Result (Worst)

Frequency Error against Voltage for GSM 850 band (836.6MHz)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	29	0.035
3.87	40	0.048
4.45	34	0.041

Frequency Error against Temperature for GSM 850 band (836.6MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	37	0.044
0	39	0.047
10	35	0.042
20	36	0.043
30	40	0.048
40	37	0.044
50	30	0.036
65	36	0.044

Frequency Error against Voltage for PCS 1900 band (1880MHz)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	30	0.016
3.87	30	0.016
4.45	36	0.019

Frequency Error against Temperature for PCS 1900 band (1880MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	41	0.022
0	32	0.017
10	37	0.020
20	31	0.016
30	30	0.016
40	37	0.020
50	38	0.020
65	40	0.021

Frequency Error against Voltage for GPRS 850 band (836.6MHz)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	30	0.036
3.87	36	0.043
4.45	32	0.038

Frequency Error against Temperature for GPRS 850 band (836.6MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	38	0.045
0	33	0.039
10	37	0.044
20	37	0.045
30	37	0.044
40	33	0.040
50	33	0.040
65	37	0.044

Frequency Error against Voltage for GPRS 1900 band (1880MHz)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	40	0.021
3.87	32	0.017
4.45	39	0.021

Frequency Error against Temperature for GPRS 1900 band (1880MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	41	0.022
0	31	0.016
10	29	0.015
20	34	0.018
30	37	0.020
40	29	0.015
50	32	0.017
65	36	0.019

Frequency Error against Voltage for EGPRS 850 band (836.6MHz)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	39	0.047
3.87	38	0.046
4.45	31	0.038

Frequency Error against Temperature for EGPRS 850 band (836.6MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	34	0.040
0	30	0.035
10	29	0.035
20	39	0.046
30	41	0.049
40	29	0.034
50	32	0.038
65	29	0.035

Frequency Error against Voltage for EGPRS 1900 band (1880MHz)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	35	0.019
3.87	37	0.020
4.45	31	0.017

Frequency Error against Temperature for EGPRS 1900 band (1880MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	39	0.021
0	34	0.018
10	38	0.020
20	40	0.021
30	36	0.019
40	40	0.021
50	36	0.019
65	32	0.017

UTRA BANDS

Frequency Error against Voltage for WCDMA Band 2 (1880MHz)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	39	0.021
3.87	33	0.018
4.45	30	0.016

Frequency Error against Temperature for WCDMA Band 2 (1880MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	35	0.019
0	33	0.017
10	32	0.017
20	29	0.015
30	32	0.017
40	29	0.016
50	41	0.022
65	38	0.020

Frequency Error against Voltage for WCDMA Band 4 (1732.6MHz)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	39	0.023
3.87	38	0.022
4.45	40	0.023

Frequency Error against Temperature for WCDMA Band 4 (1732.6MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	32	0.018
0	31	0.018
10	30	0.017
20	33	0.019
30	35	0.020
40	28	0.016
50	41	0.024
65	30	0.017

Frequency Error against Voltage for WCDMA Band 5 (836.4MHz)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	37	0.045
3.87	31	0.037
4.45	33	0.039

Frequency Error against Temperature for WCDMA Band 5 (836.4MHz)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	36	0.043
0	38	0.046
10	32	0.038
20	36	0.043
30	39	0.047
40	41	0.049
50	31	0.037
65	31	0.037

Note: Please refer to Annex（LTE&NR Frequency Error against） for more test data

13. Test Setup Photographs

Please refer to Annex "Set Up Photos-RF" for test setup photos

---END OF REPORT---