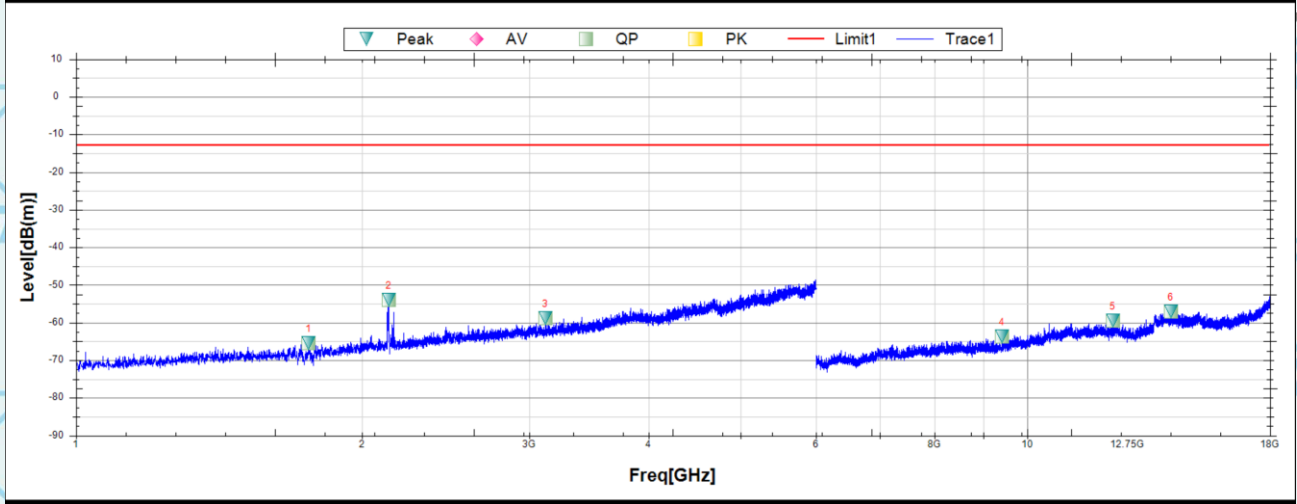
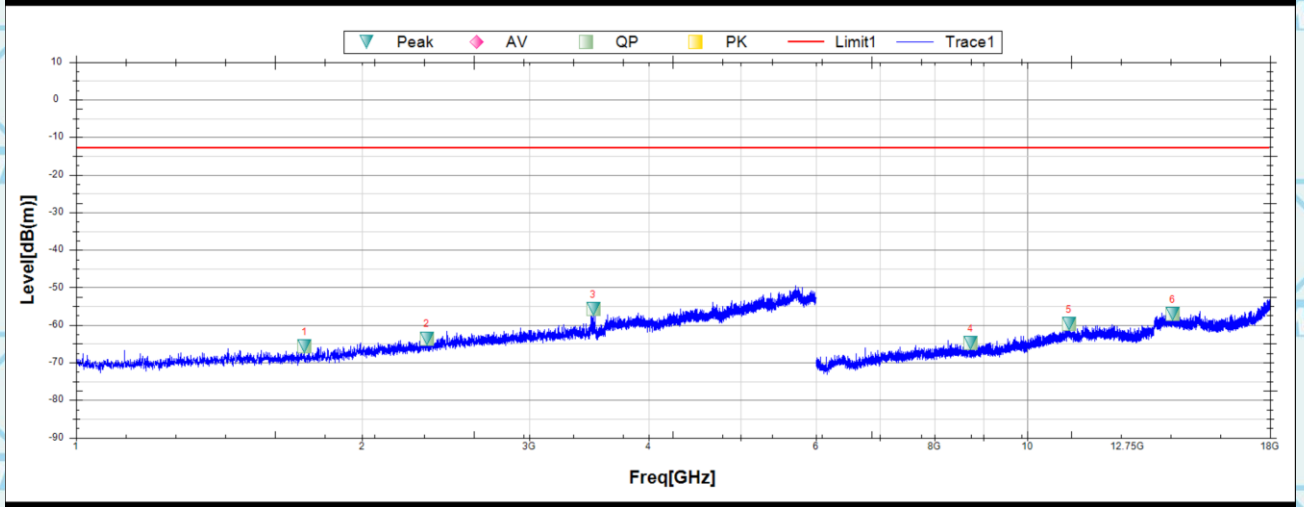
Vertical：



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1756.8750	-65.4	24.98	-90.38	-13	-52.4	210.9	Vertical	PK	Pass
2	2133.7500	-54.01	26.35	-80.36	-13	-41.01	360.1	Vertical	PK	Pass
3	3116.8750	-58.75	28.27	-87.02	-13	-45.75	14.9	Vertical	PK	Pass
4	9412.5000	-63.78	10.85	-74.63	-13	-50.78	67.4	Vertical	PK	Pass
5	12307.5000	-59.54	16.47	-76.01	-13	-46.54	177.4	Vertical	PK	Pass
6	14161.5000	-57.04	18.96	-76	-13	-44.04	325.6	Vertical	PK	Pass

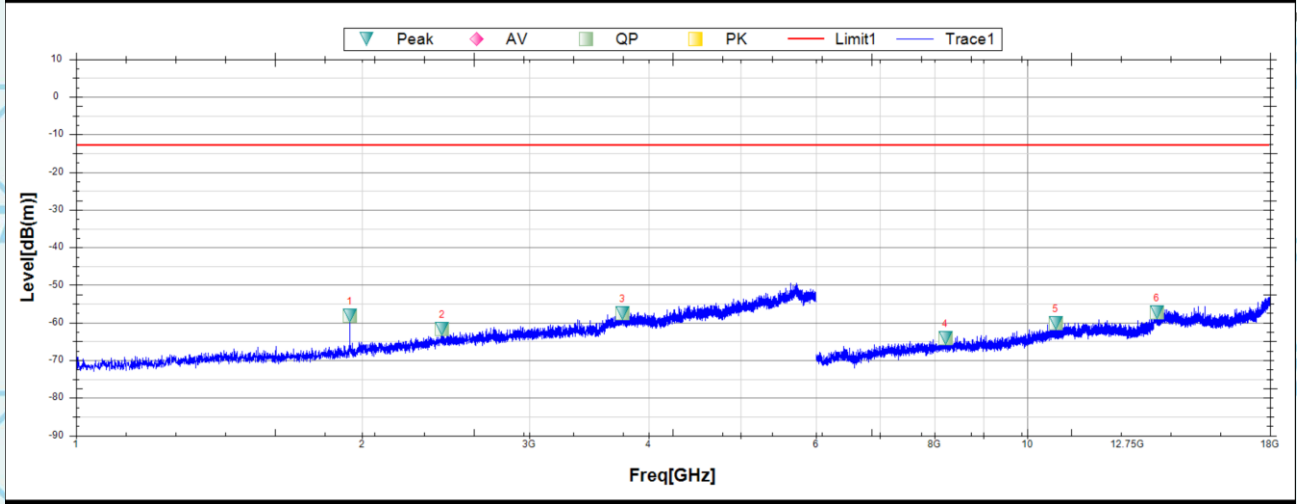
n77(3450-3550Mhz):
Horizontal：



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1739.3750	-65.63	24.97	-90.6	-13	-52.63	344.7	Horizontal	PK	Pass
2	2338.1250	-63.59	27.05	-90.64	-13	-50.59	356.5	Horizontal	PK	Pass
3	3498.7500	-55.72	28.5	-84.22	-13	-42.72	116.5	Horizontal	PK	Pass
4	8724.0000	-64.76	9.33	-74.09	-13	-51.76	231.6	Horizontal	PK	Pass
5	11067.0000	-59.7	15.83	-75.53	-13	-46.7	106.1	Horizontal	PK	Pass
6	14223.0000	-57	18.9	-75.9	-13	-44	205.3	Horizontal	PK	Pass

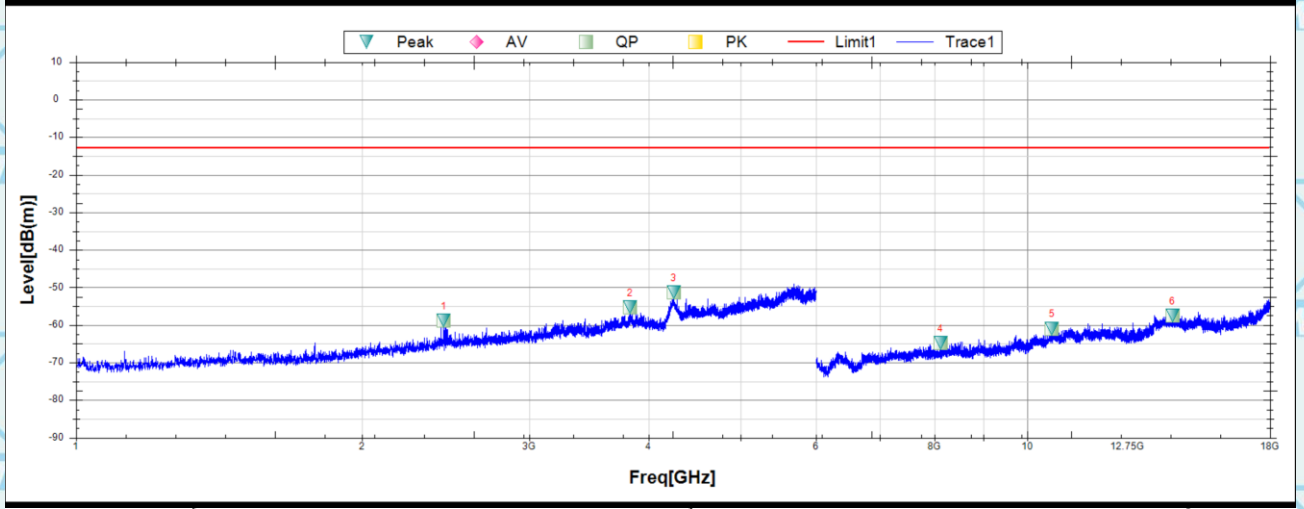
Vertical：



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1941.2500	-58.22	25.64	-83.86	-13	-45.22	127.1	Vertical	PK	Pass
2	2428.1250	-61.69	27.36	-89.05	-13	-48.69	238.4	Vertical	PK	Pass
3	3757.5000	-57.58	29.12	-86.7	-13	-44.58	45.9	Vertical	PK	Pass
4	8205.0000	-64.11	8.76	-72.87	-13	-51.11	359.5	Vertical	PK	Pass
5	10714.5000	-60.09	14.63	-74.72	-13	-47.09	359	Vertical	PK	Pass
6	13684.5000	-57.34	18.21	-75.55	-13	-44.34	351.2	Vertical	PK	Pass

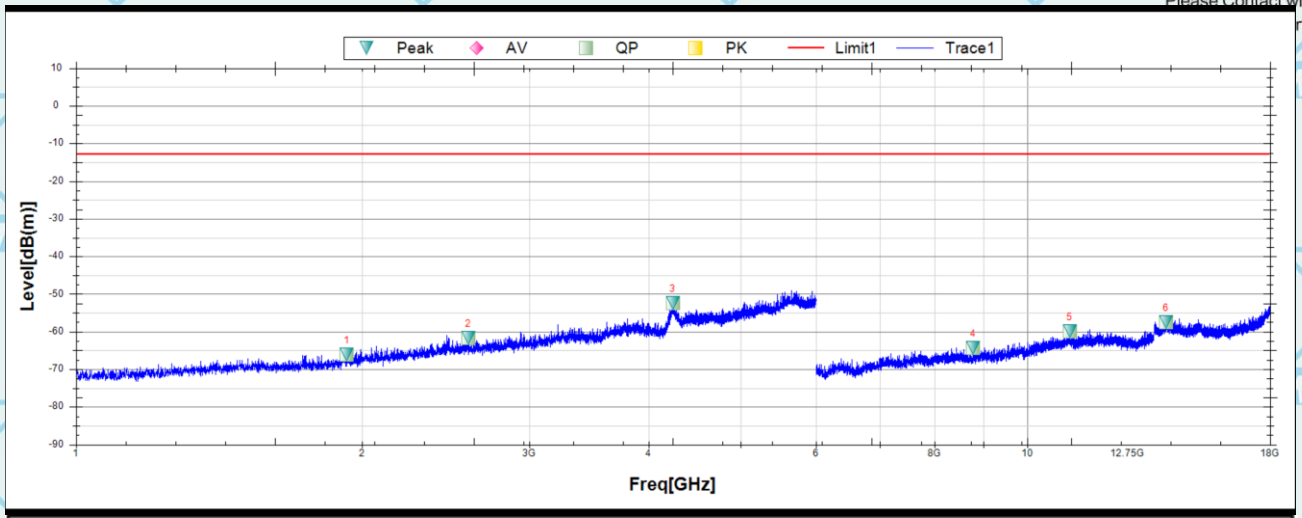
n77(3700-3980Mhz):
Horizontal：



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	2437.5000	-58.78	27.39	-86.17	-13	-45.78	-0.1	Horizontal	PK	Pass
2	3827.5000	-55.23	29.29	-84.52	-13	-42.23	103.8	Horizontal	PK	Pass
3	4253.7500	-51.38	30.16	-81.54	-13	-38.38	313	Horizontal	PK	Pass
4	8110.5000	-64.74	8.51	-73.25	-13	-51.74	80.6	Horizontal	PK	Pass
5	10626.0000	-60.95	14.42	-75.37	-13	-47.95	37.6	Horizontal	PK	Pass
6	14217.0000	-57.43	18.91	-76.34	-13	-44.43	17.3	Horizontal	PK	Pass

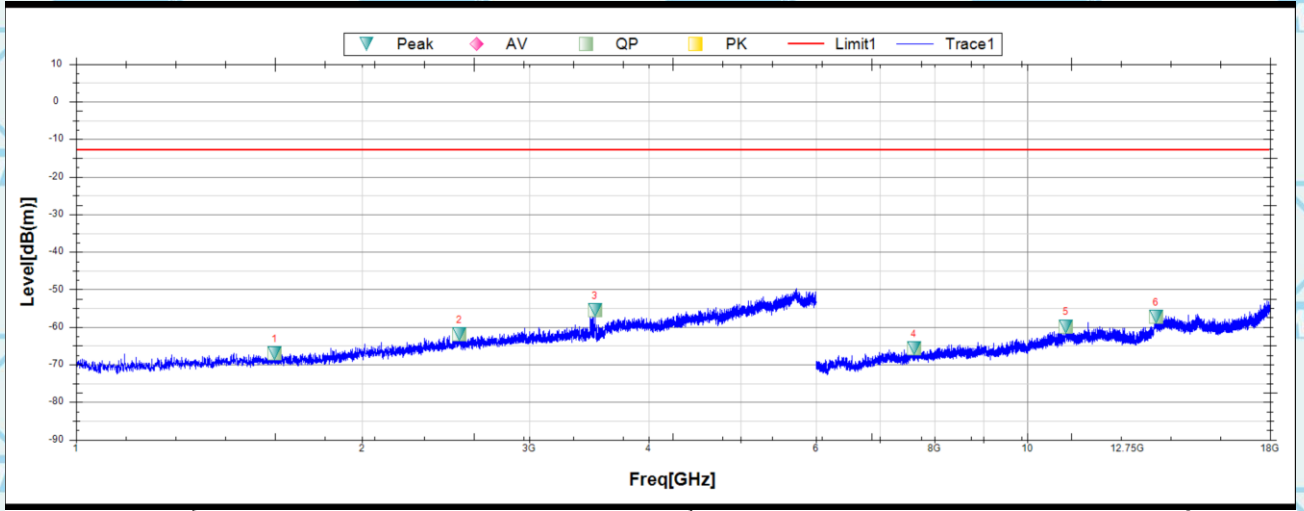
Vertical:



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1927.5000	-66.14	25.57	-91.71	-13	-53.14	232.9	Vertical	PK	Pass
2	2586.8750	-61.66	27.7	-89.36	-13	-48.66	146.8	Vertical	PK	Pass
3	4242.5000	-52.42	30.14	-82.56	-13	-39.42	8.9	Vertical	PK	Pass
4	8778.0000	-64.34	9.43	-73.77	-13	-51.34	127.1	Vertical	PK	Pass
5	11086.5000	-60.04	15.89	-75.93	-13	-47.04	196.5	Vertical	PK	Pass
6	13998.0000	-57.52	19.11	-76.63	-13	-44.52	240.7	Vertical	PK	Pass

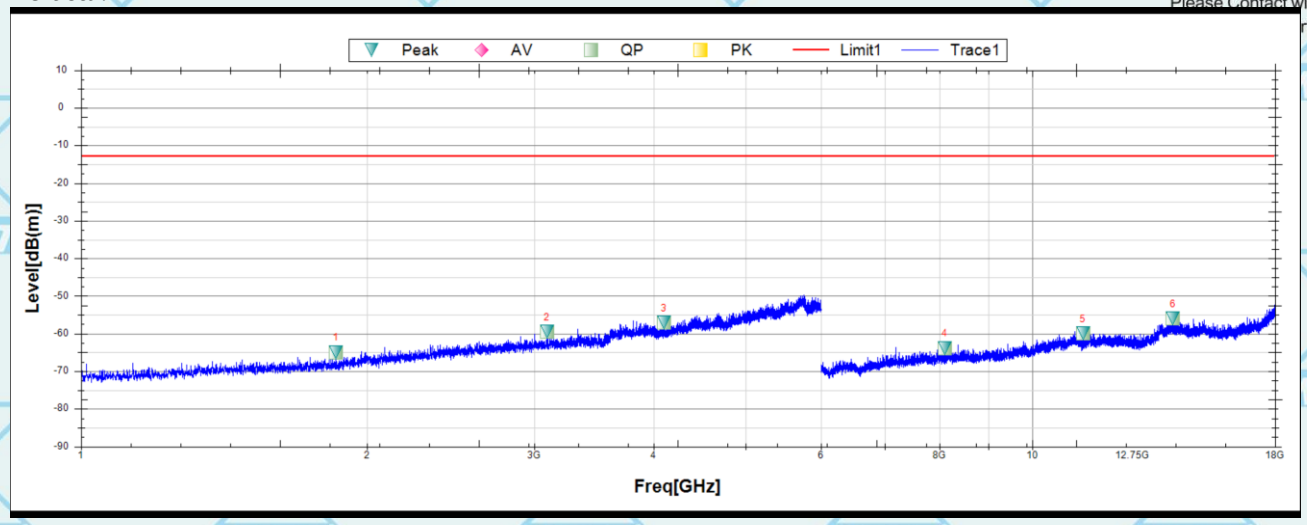
n78(3450-3550Mhz):
Horizontal：



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1618.1250	-67.05	24.91	-91.96	-13	-54.05	289	Horizontal	PK	Pass
2	2531.2500	-61.92	27.64	-89.56	-13	-48.92	99	Horizontal	PK	Pass
3	3514.3750	-55.62	28.53	-84.15	-13	-42.62	118	Horizontal	PK	Pass
4	7605.0000	-65.77	7.94	-73.71	-13	-52.77	236	Horizontal	PK	Pass
5	10987.5000	-59.85	15.54	-75.39	-13	-46.85	360	Horizontal	PK	Pass
6	13657.5000	-57.35	18.14	-75.49	-13	-44.35	318.5	Horizontal	PK	Pass

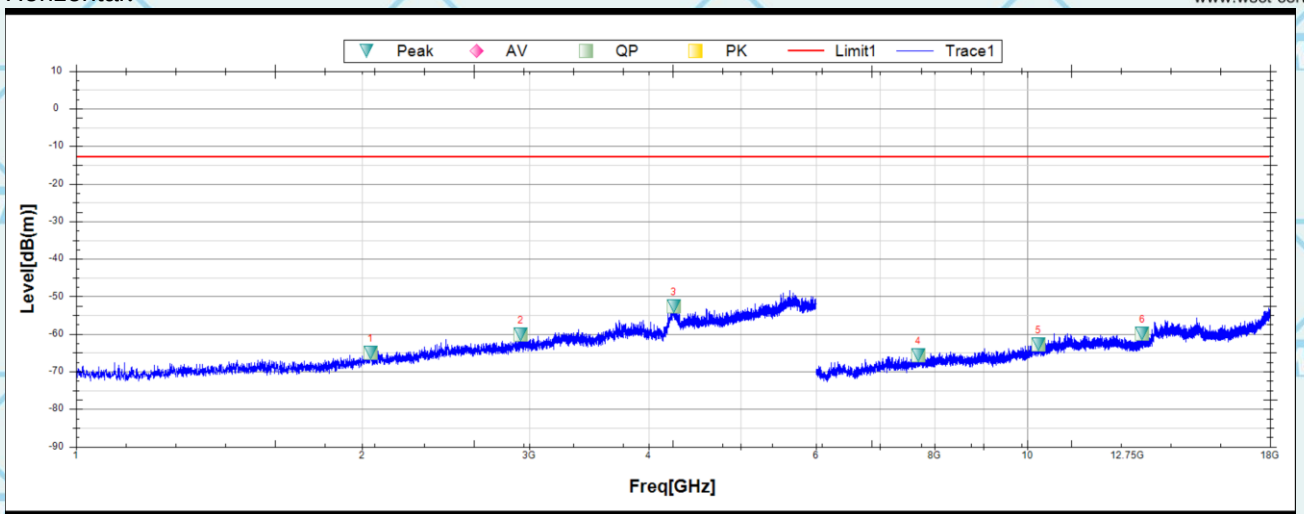
Vertical:



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1854.3750	-64.92	25.24	-90.16	-13	-51.92	359.3	Vertical	PK	Pass
2	3090.6250	-59.55	28.25	-87.8	-13	-46.55	240.1	Vertical	PK	Pass
3	4104.3750	-57.16	29.89	-87.05	-13	-44.16	189.8	Vertical	PK	Pass
4	8098.5000	-63.82	8.48	-72.3	-13	-50.82	95	Vertical	PK	Pass
5	11310.0000	-59.86	15.6	-75.46	-13	-46.86	145.1	Vertical	PK	Pass
6	14065.5000	-55.98	19.06	-75.04	-13	-42.98	248	Vertical	PK	Pass

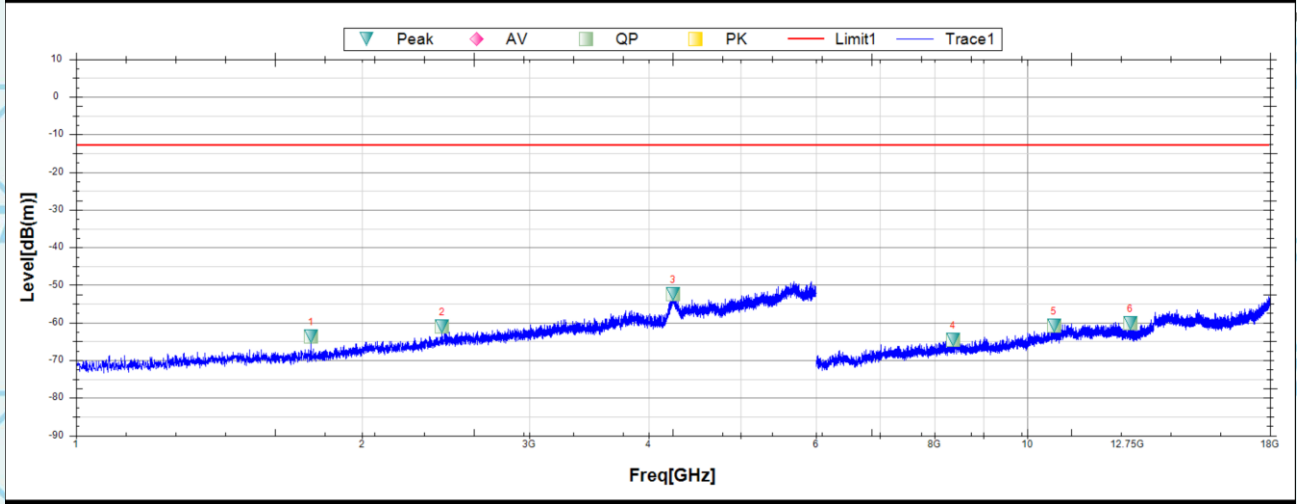
n78(3700-3800Mhz):
Horizontal：



Susputed Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	2040.6250	-65.1	26.04	-91.14	-13	-52.1	247.1	Horizontal	PK	Pass
2	2936.8750	-60.24	28.12	-88.36	-13	-47.24	94.2	Horizontal	PK	Pass
3	4253.1250	-52.67	30.16	-82.83	-13	-39.67	18.8	Horizontal	PK	Pass
4	7687.5000	-65.63	7.96	-73.59	-13	-52.63	204.1	Horizontal	PK	Pass
5	10281.0000	-62.87	13.23	-76.1	-13	-49.87	66.6	Horizontal	PK	Pass
6	13221.0000	-59.94	16.79	-76.73	-13	-46.94	359.3	Horizontal	PK	Pass

Vertical:



Suspuited Data List

NO.	Freq. [MHz]	Reading [dB(m)]	Factor [dB]	Level [dB(m)]	Limit [dB]	Margin [dB]	Deg [°]	Polarity	Trace	Verdict
1	1766.8750	-63.75	24.98	-88.73	-13	-50.75	275.4	Vertical	PK	Pass
2	2428.1250	-61.03	27.36	-88.39	-13	-48.03	244.4	Vertical	PK	Pass
3	4246.2500	-52.36	30.14	-82.5	-13	-39.36	61.4	Vertical	PK	Pass
4	8358.0000	-64.52	9.02	-73.54	-13	-51.52	32.6	Vertical	PK	Pass
5	10669.5000	-60.91	14.55	-75.46	-13	-47.91	219.1	Vertical	PK	Pass
6	12837.0000	-60.19	16.08	-76.27	-13	-47.19	51.8	Vertical	PK	Pass

9. OCCUPIED BANDWIDTH& EMISSION BANDWIDTH

Test limit:

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission, shall be measured when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user. [¡ì2.1049(h)]

Many of the individual rule parts specify a relative OBW in lieu of the 99% OBW. In such cases, the OBW is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated by at least X dB below the transmitter power, where the value of X is typically specified as 26.

The relative OBW must be measured and reported when it is specified in the applicable rule part; otherwise, the 99% OBW shall be measured and reported. The test report shall specify which OBW is reported.

A spectrum/signal analyzer or other instrument providing a spectral display is recommended for these measurements and the video bandwidth shall be set to a value at least three times greater than the IF/resolution bandwidth to avoid any amplitude smoothing. Video filtering shall not be used during occupied bandwidth tests.

The OBW shall be measured for all operating conditions that will affect the bandwidth results (e.g. variable modulations, coding, or channel bandwidth settings). See section 4.

Test procedure:

Occupied bandwidth – relative measurement procedure

The reference value is the highest level of the spectral envelope of the modulated signal.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.

b) The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to prevent the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

e) The dynamic range of the spectrum analyzer at the selected RBW shall be at least 10 dB below the target “-X dB down” requirement (i.e., if the requirement calls for measuring the –26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference value).

f) Set the detection mode to peak, and the trace mode to max hold.

g) Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

h) Determine the “-X dB down amplitude” as equal to (Reference Value – X). Alternatively, this calculation can be performed by the analyzer by using the marker-delta function.

i) Place two markers, one at the lowest and the other at the highest frequency of the

envelope of the spectral display such that each marker is at or slightly below the "–X dB down amplitude" determined in step g). If a marker is below this "-X dB down amplitude" value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

j) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Occupied bandwidth – power bandwidth (99%) measurement procedure

The following procedure shall be used for measuring (99 %) power bandwidth

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

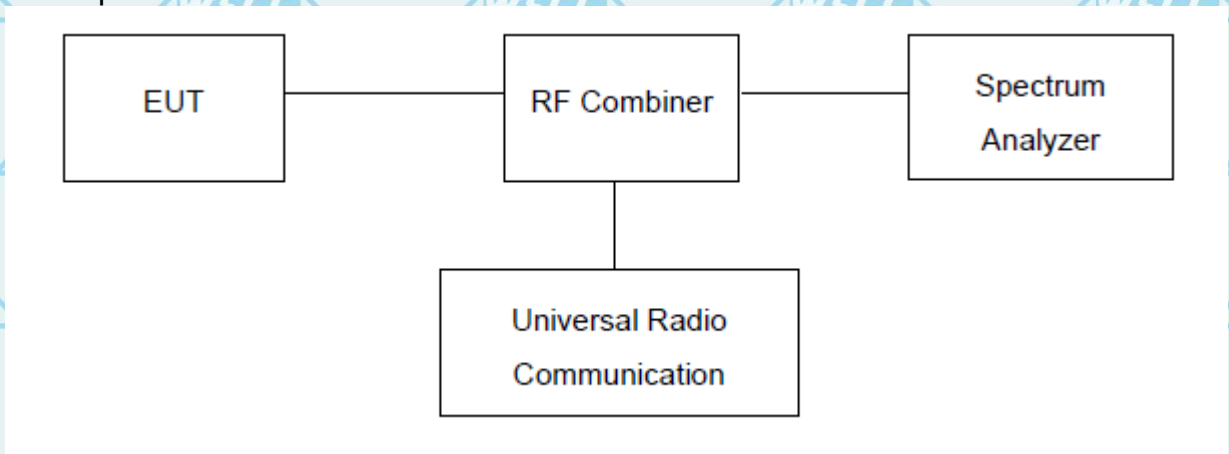
e) Set the detection mode to peak, and the trace mode to max hold..

f) Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

g) If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.

h) The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Test setup:



9.1. Measurement Result

GSM850:

Frequency	OBW(99%)	26dB BW
824.2	246.79KHz	315.71KHz
836.6	245.19KHz	315.71KHz
848.8	245.19KHz	314.10KHz

PCS1900:

Frequency	OBW(99%)	26dB BW
1850.2	246.79KHz	318.91KHz
1880	245.19KHz	318.91KHz
1909.8	245.19KHz	312.50KHz

GPRS850:

Frequency	OBW(99%)	26dB BW
824.2	246.79KHz	315.71KHz
836.6	245.19KHz	317.31KHz
848.8	245.19KHz	315.71KHz

GPRS 1900:

Frequency	OBW(99%)	26dB BW
1850.2	245.19KHz	318.91KHz
1880	246.79KHz	315.71KHz
1909.8	243.59KHz	310.90KHz

EGPRS 850:

Frequency	OBW(99%)	26dB BW
824.2	245.19KHz	312.50KHz
836.6	246.79KHz	315.71KHz
848.8	246.79KHz	318.91KHz

EGPRS 1900:

Frequency	OBW(99%)	26dB BW
1850.2	245.19KHz	315.71KHz
1880	245.19KHz	318.91KHz
1909.8	245.19KHz	320.83KHz

UTRA BANDS

Band 2:

Frequency	OBW(99%)	26dB BW
1852.4	4.183MHz	4.679MHz
1880	4.167MHz	4.712MHz
1907.6	4.151MHz	4.728MHz

Band 4:

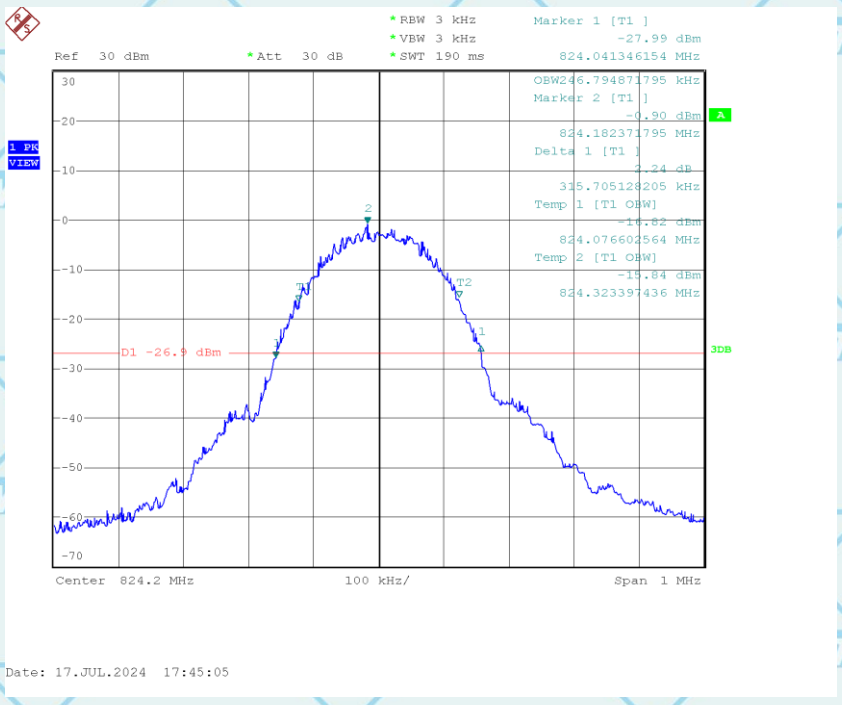
Frequency	OBW(99%)	26dB BW
1712.4	4.167MHz	4.679MHz
1732.6	4.167MHz	4.696MHz
1752.6	4.167MHz	4.696MHz

Band 5:

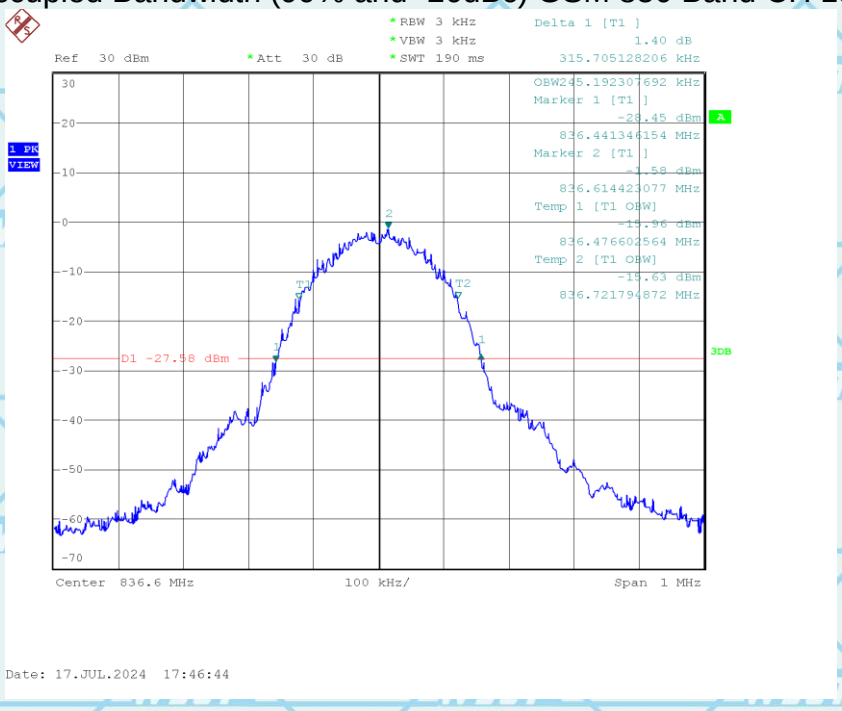
Frequency	OBW(99%)	26dB BW
826.4	4.167MHz	4.712MHz
836.4	4.167MHz	4.712MHz
846.6	4.151MHz	4.151MHz

Test Plot(s)

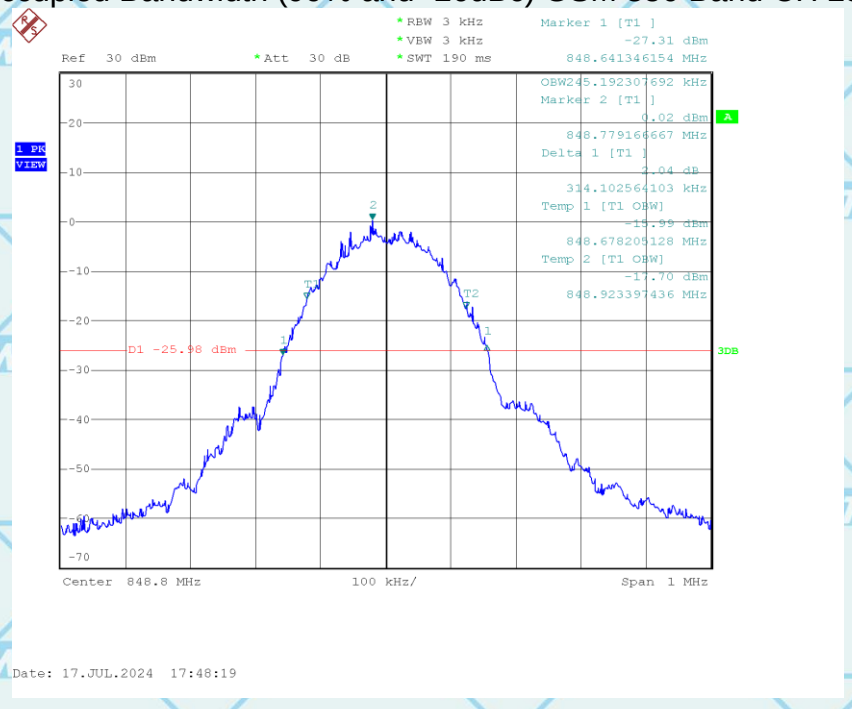
Occupied Bandwidth (99% and -26dBc) GSM 850 Band CH 128



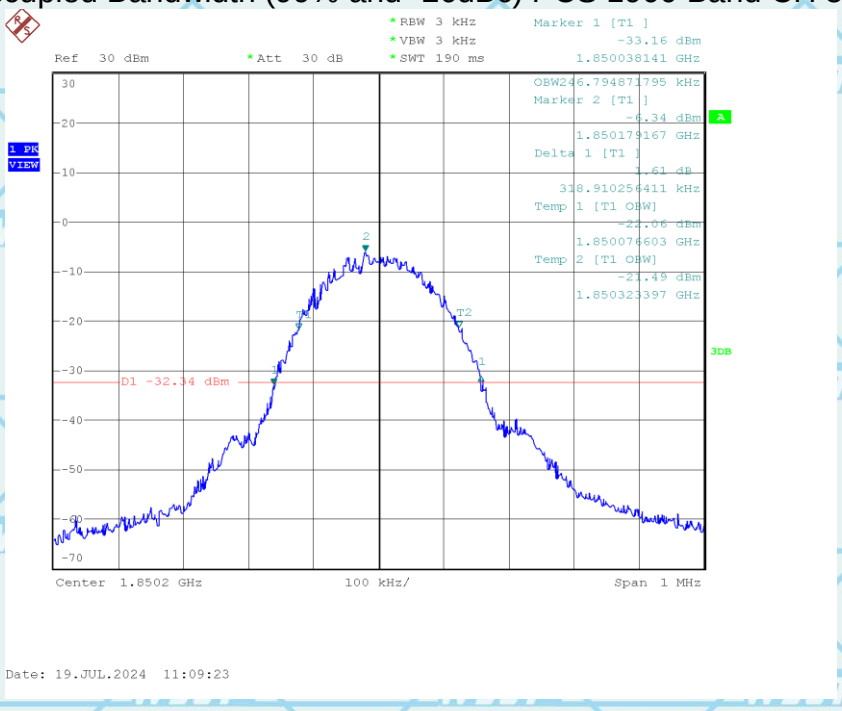
Occupied Bandwidth (99% and -26dBc) GSM 850 Band CH 190



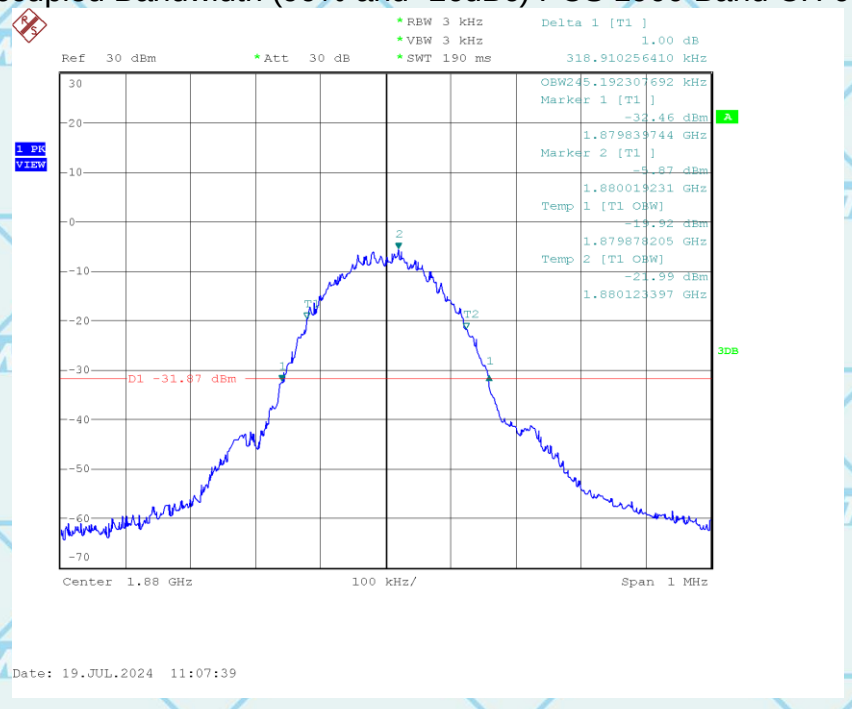
Occupied Bandwidth (99% and -26dBc) GSM 850 Band CH 251



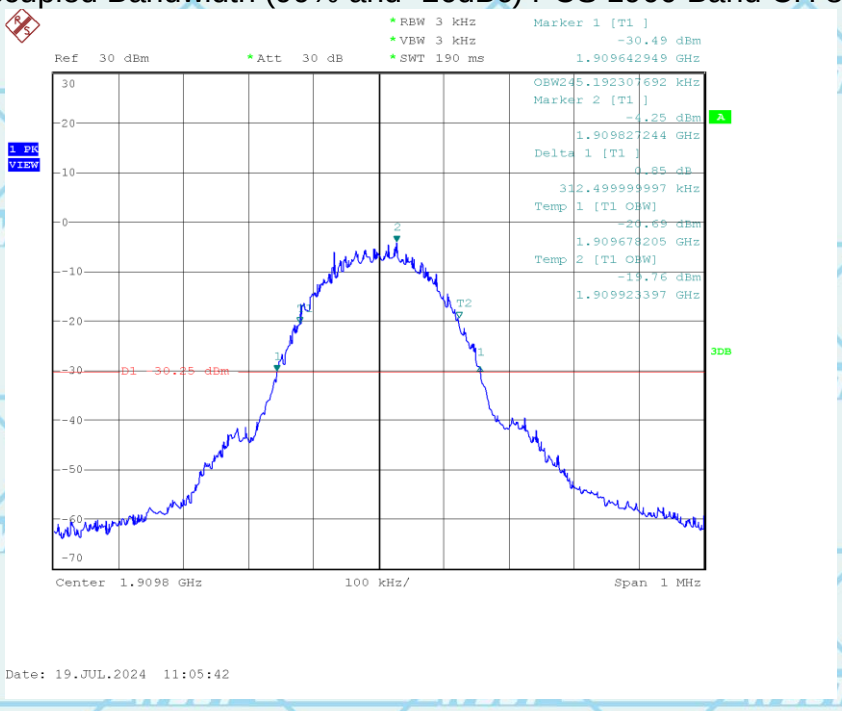
Occupied Bandwidth (99% and -26dBc) PCS 1900 Band CH 512



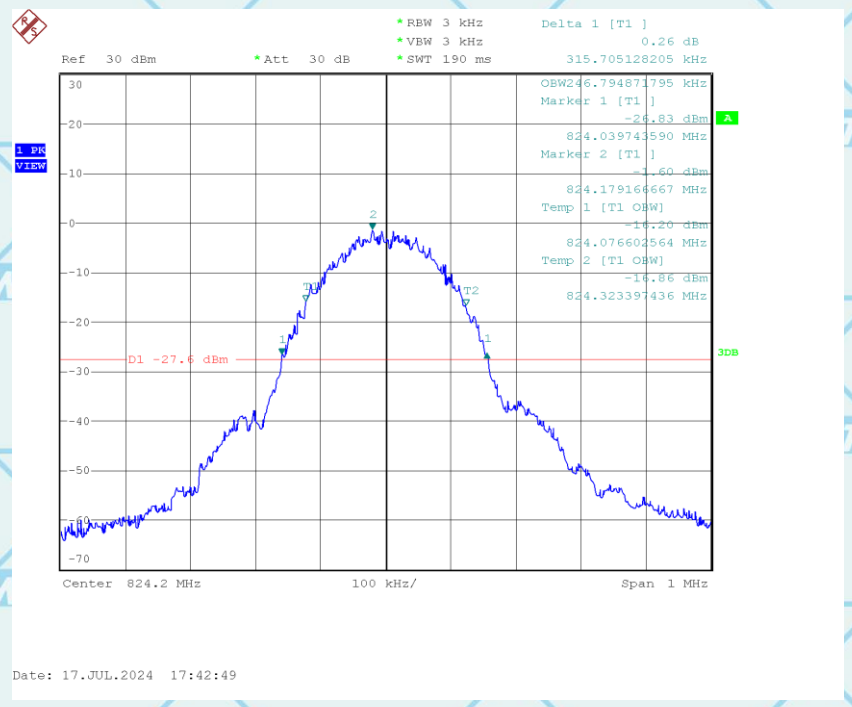
Occupied Bandwidth (99% and -26dBc) PCS 1900 Band CH 661



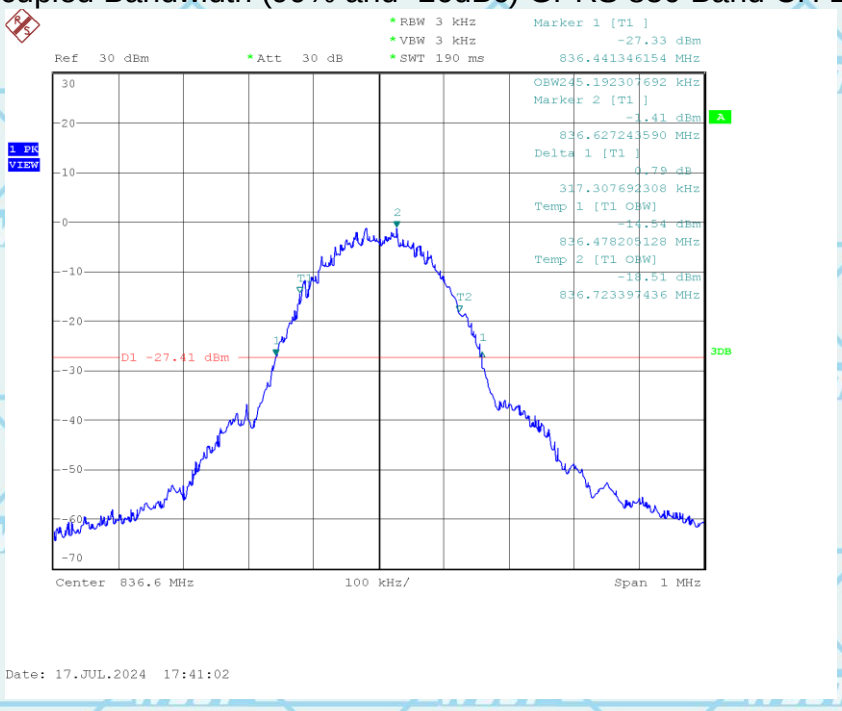
Occupied Bandwidth (99% and -26dBc) PCS 1900 Band CH 810



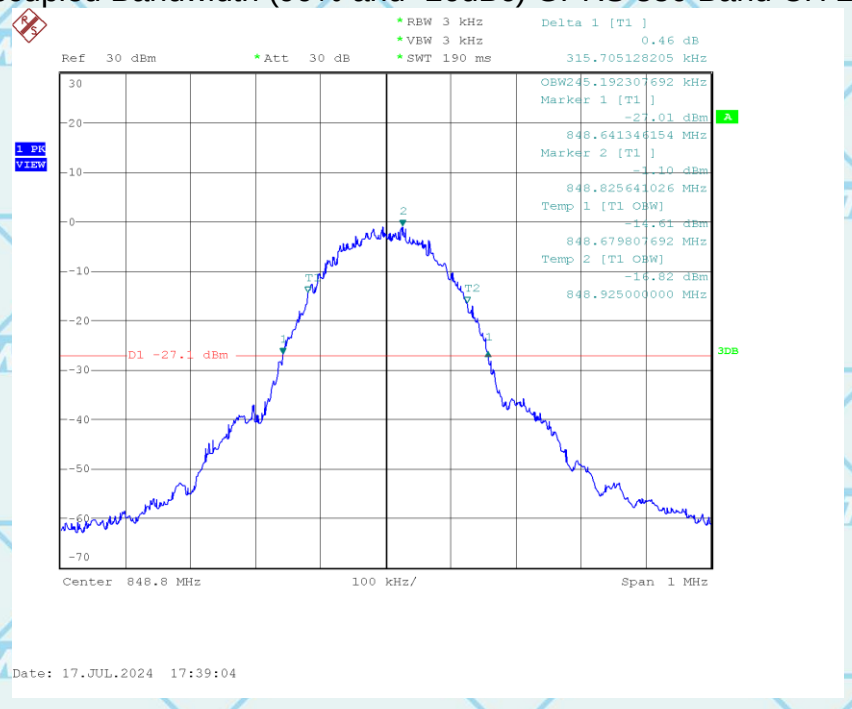
Occupied Bandwidth (99% and -26dBc) GPRS 850 Band CH 128



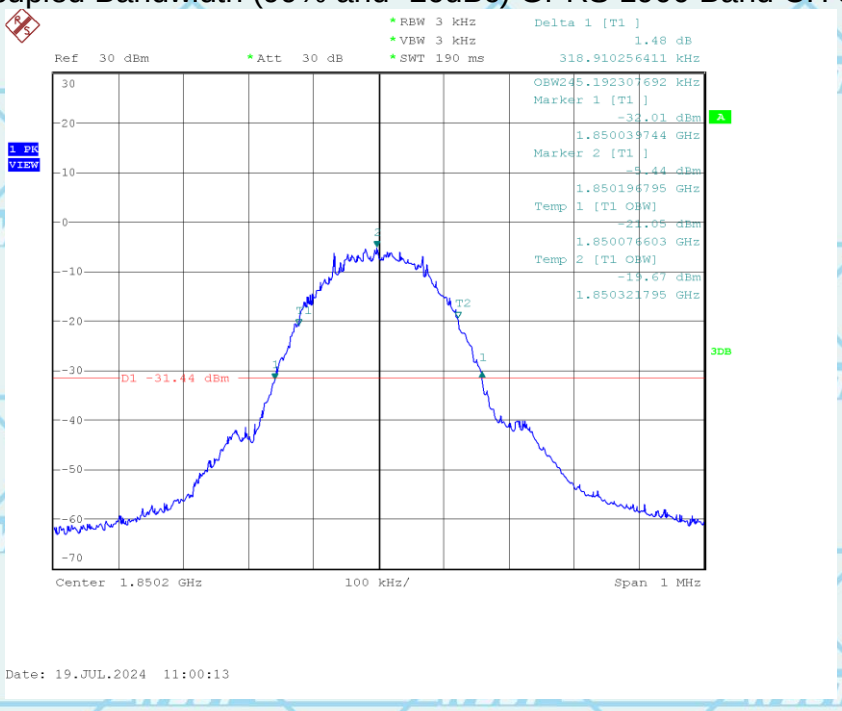
Occupied Bandwidth (99% and -26dBc) GPRS 850 Band CH 190



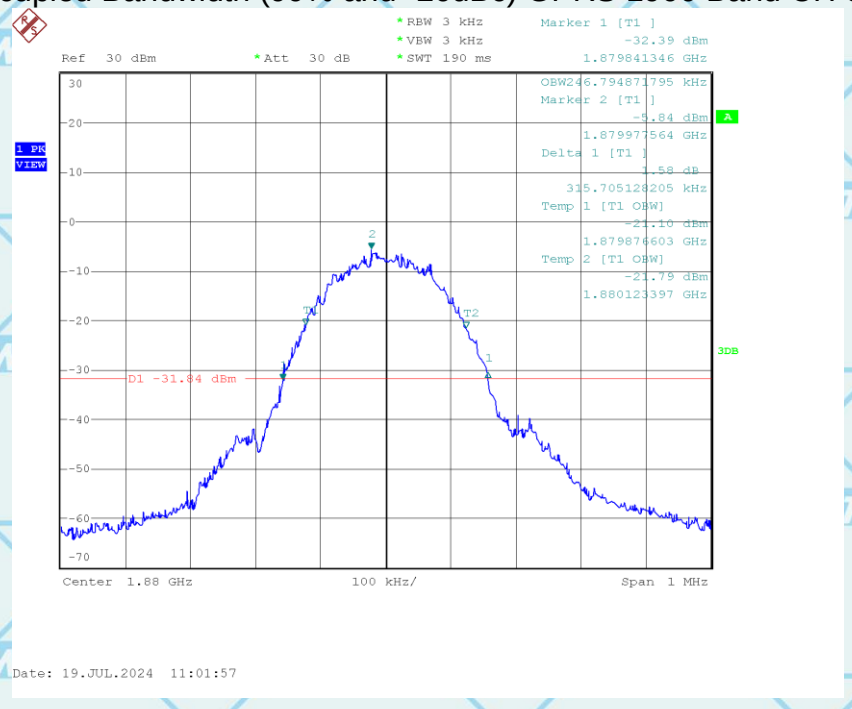
Occupied Bandwidth (99% and -26dBc) GPRS 850 Band CH 251



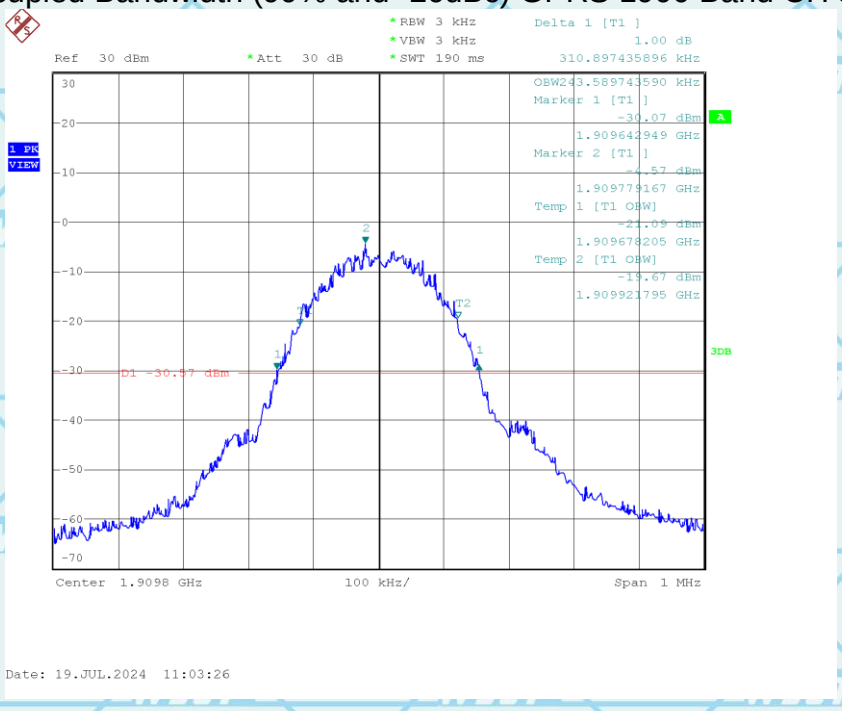
Occupied Bandwidth (99% and -26dBc) GPRS 1900 Band CH 512



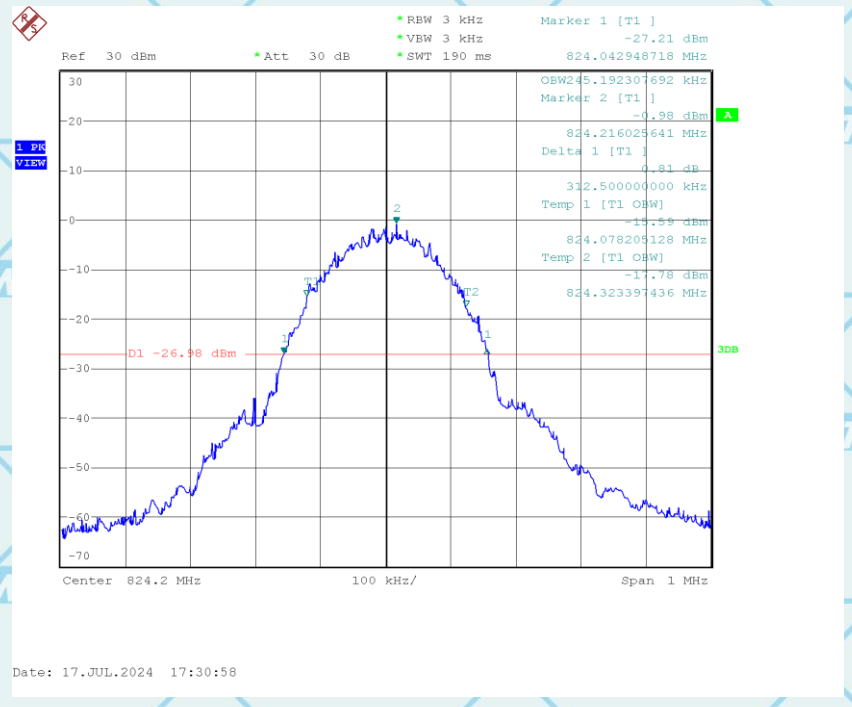
Occupied Bandwidth (99% and -26dBc) GPRS 1900 Band CH 661



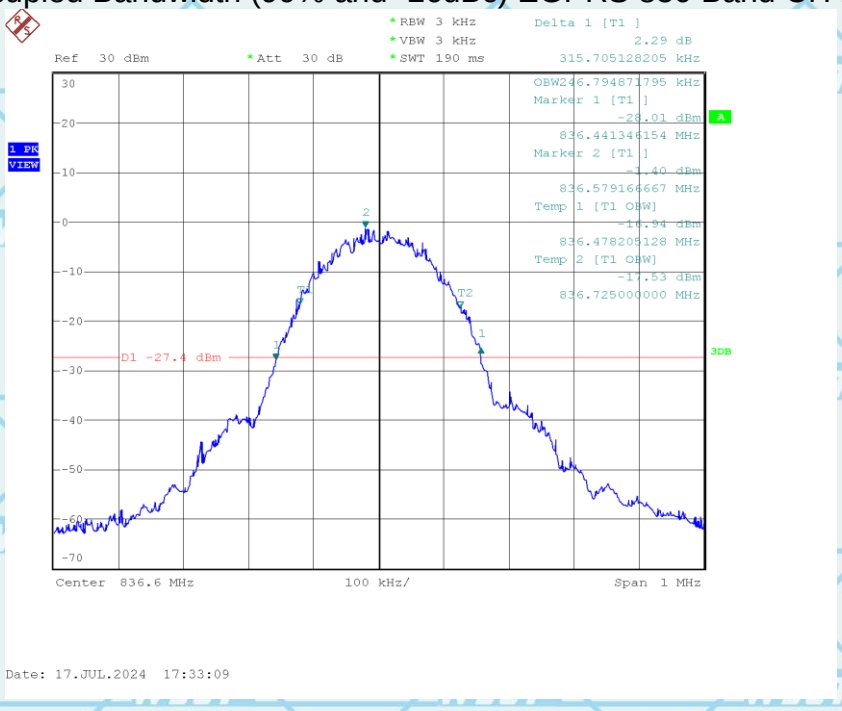
Occupied Bandwidth (99% and -26dBc) GPRS 1900 Band CH 810



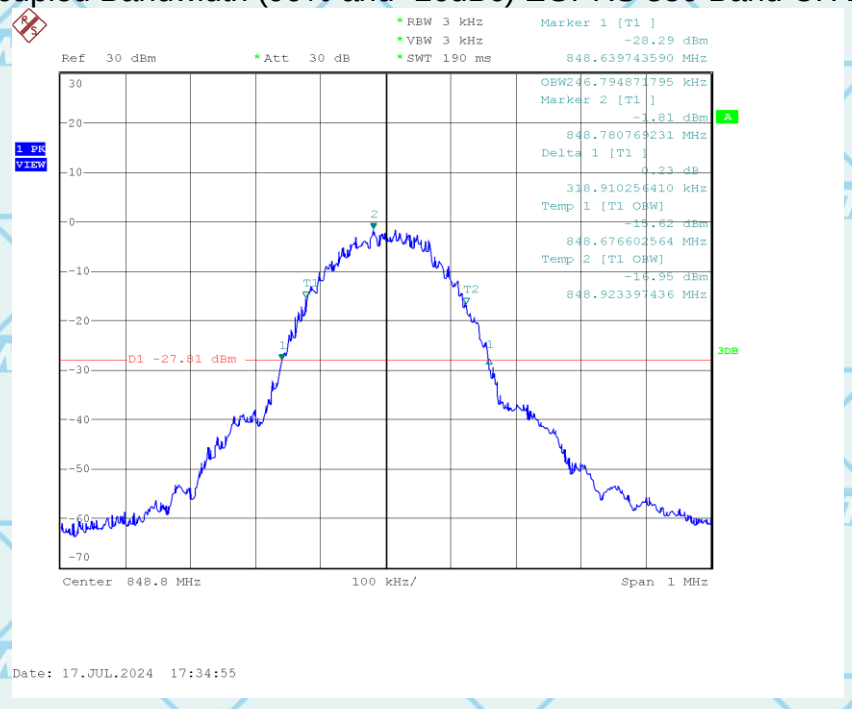
Occupied Bandwidth (99% and -26dBc) EGPRS 850 Band CH 128



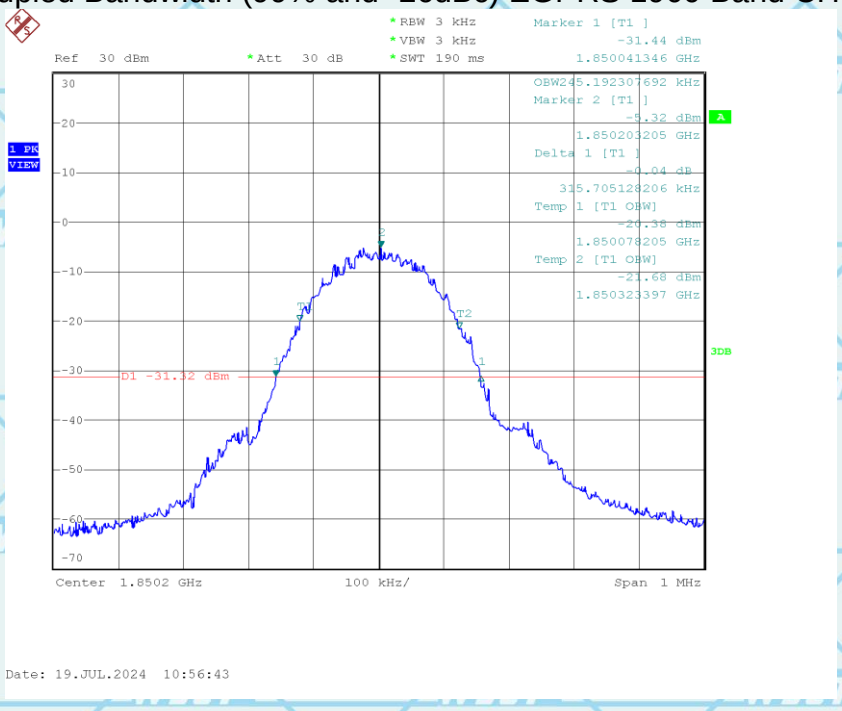
Occupied Bandwidth (99% and -26dBc) EGPRS 850 Band CH 190



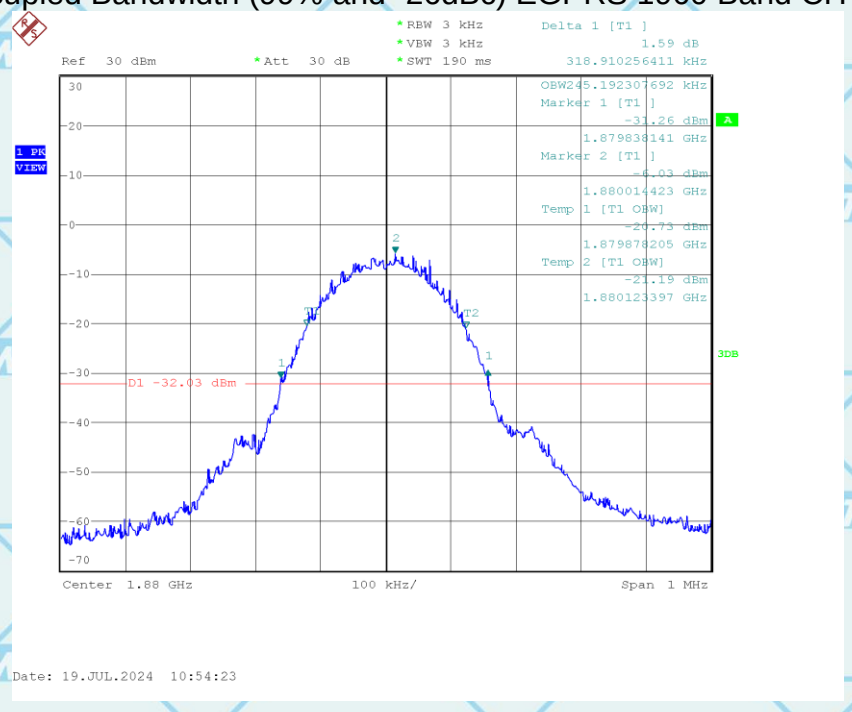
Occupied Bandwidth (99% and -26dBc) EGPRS 850 Band CH 251



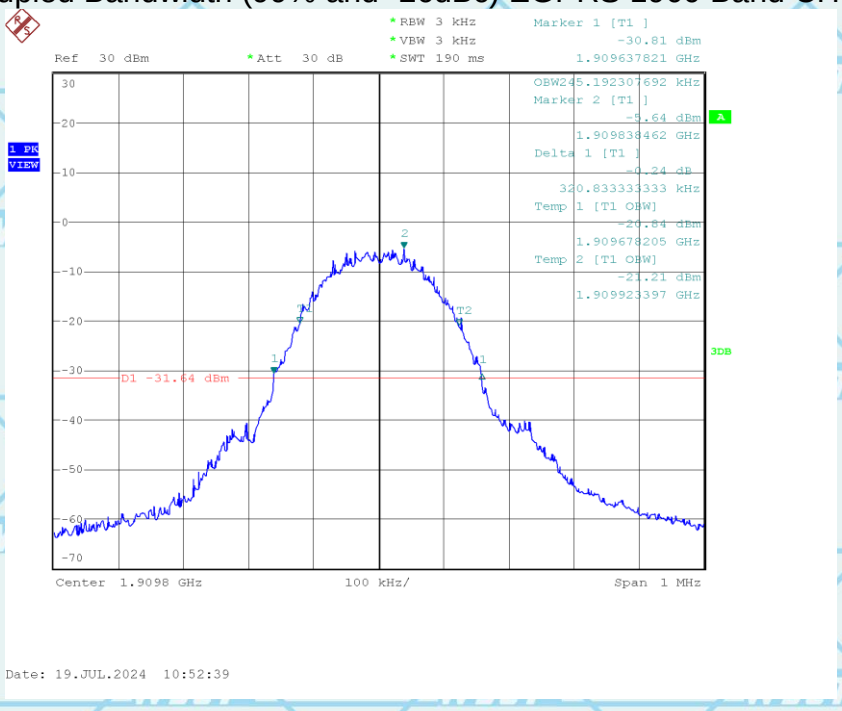
Occupied Bandwidth (99% and -26dBc) EGPRS 1900 Band CH 512



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

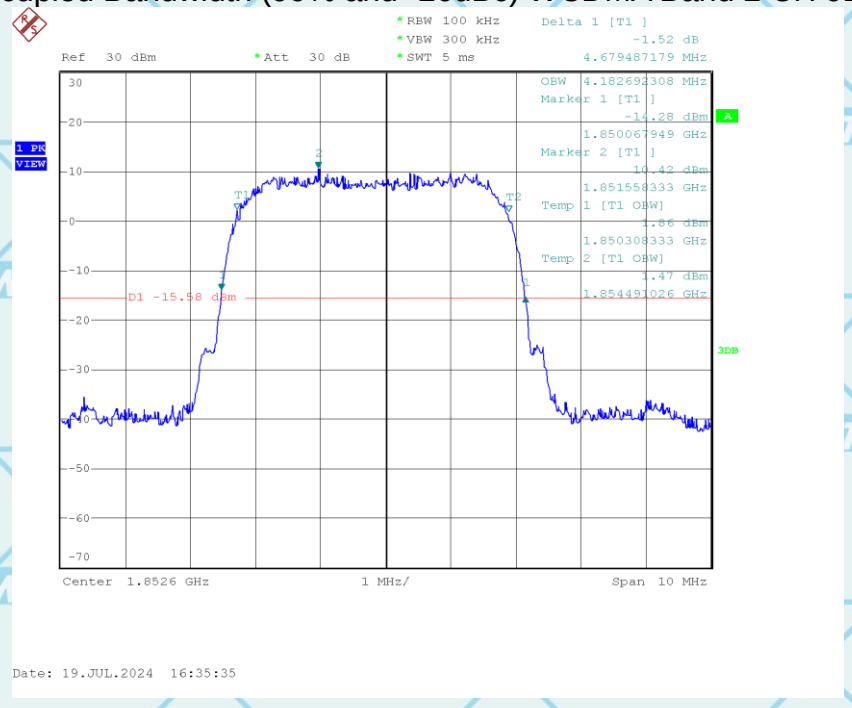


Occupied Bandwidth (99% and -26dBc) EGPRS 1900 Band CH 810

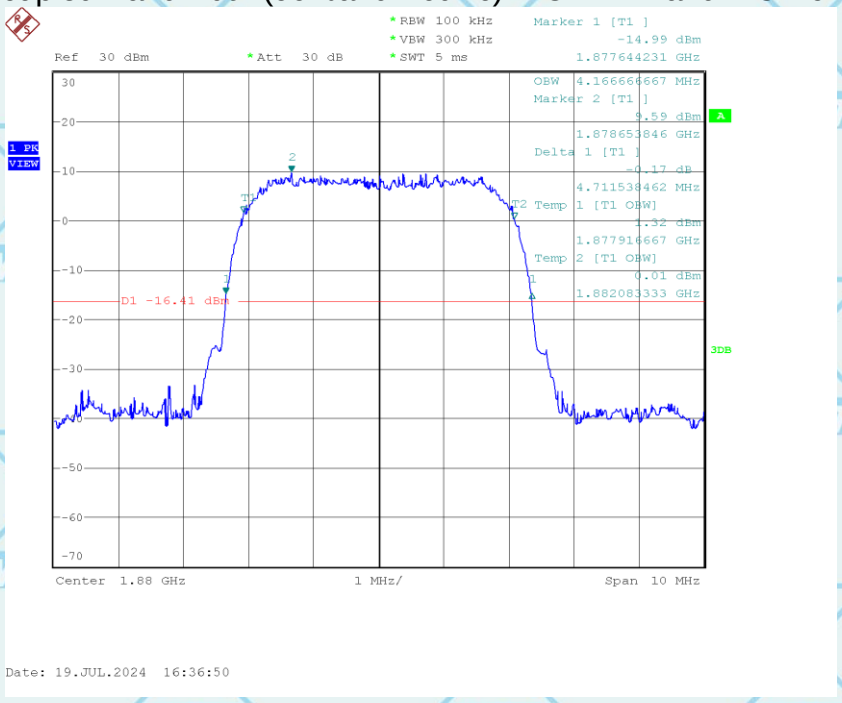


UTRA BANDS

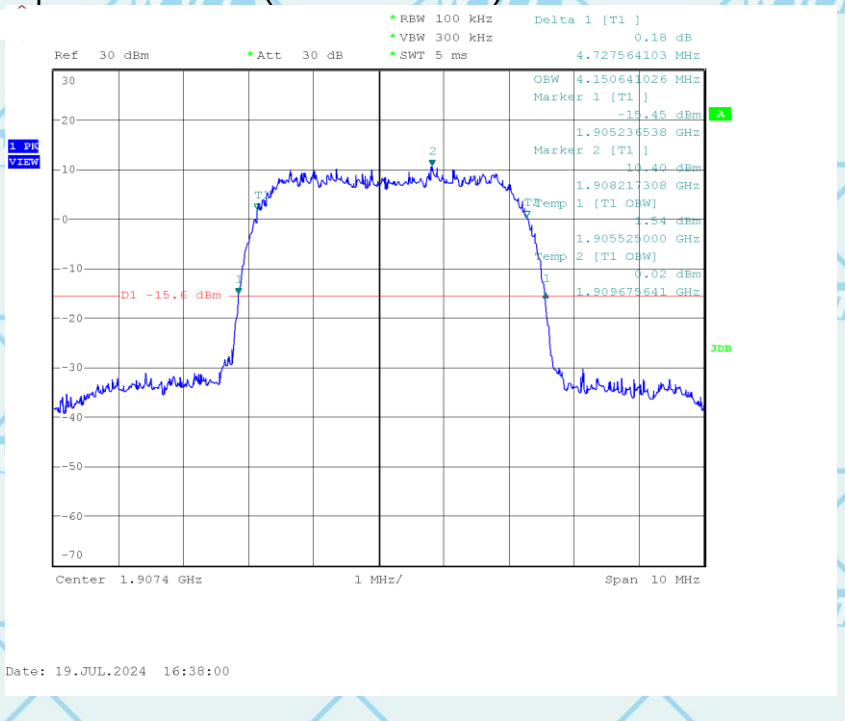
Occupied Bandwidth (99% and -26dBc) WCDMA Band 2 CH 9262



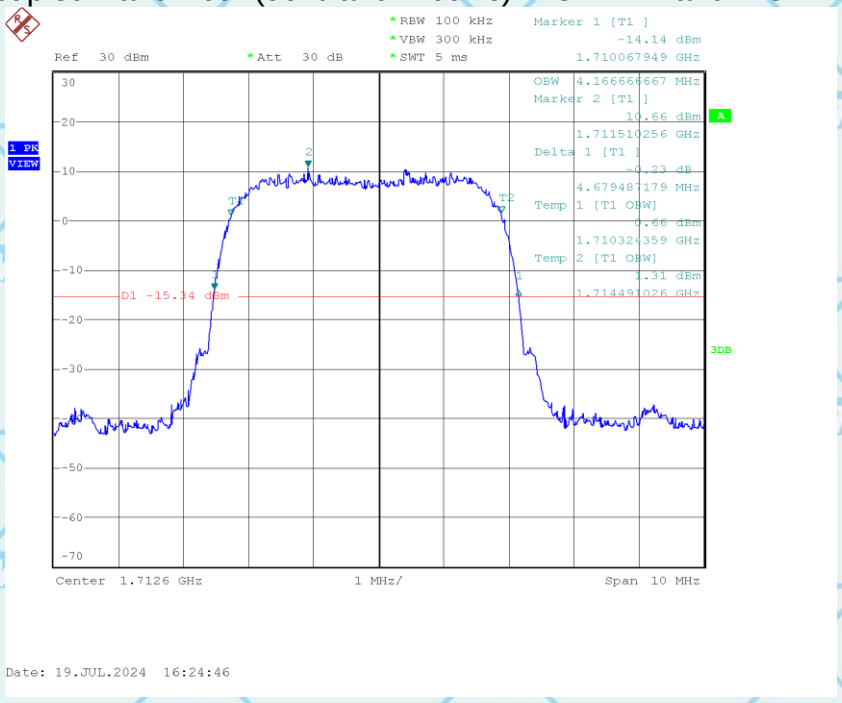
Occupied Bandwidth (99%and-26dBc) WCDMA Band 2 CH 9400



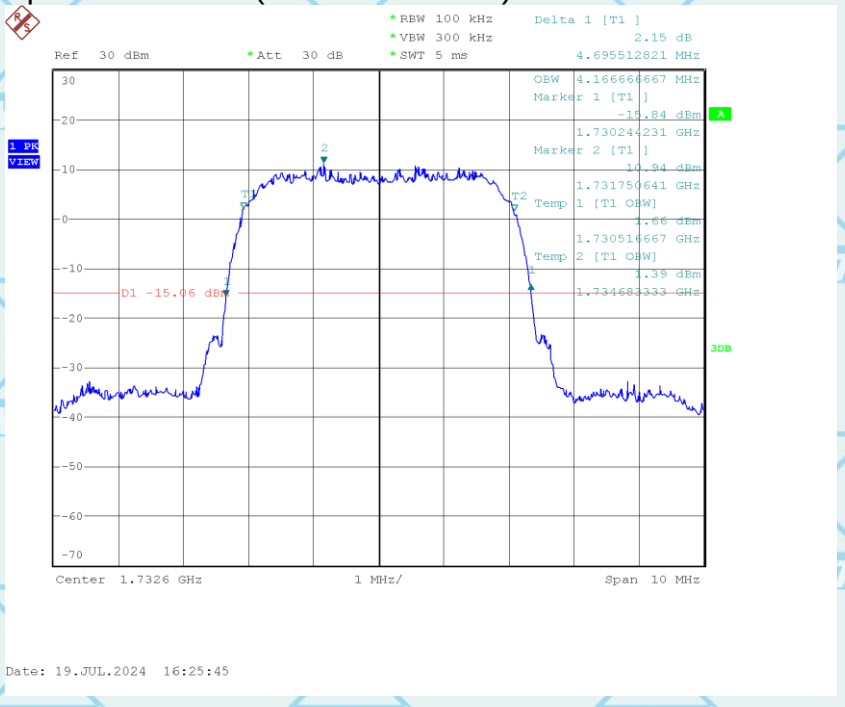
Occupied Bandwidth (99%and-26dBc) WCDMA Band 2 CH 9538



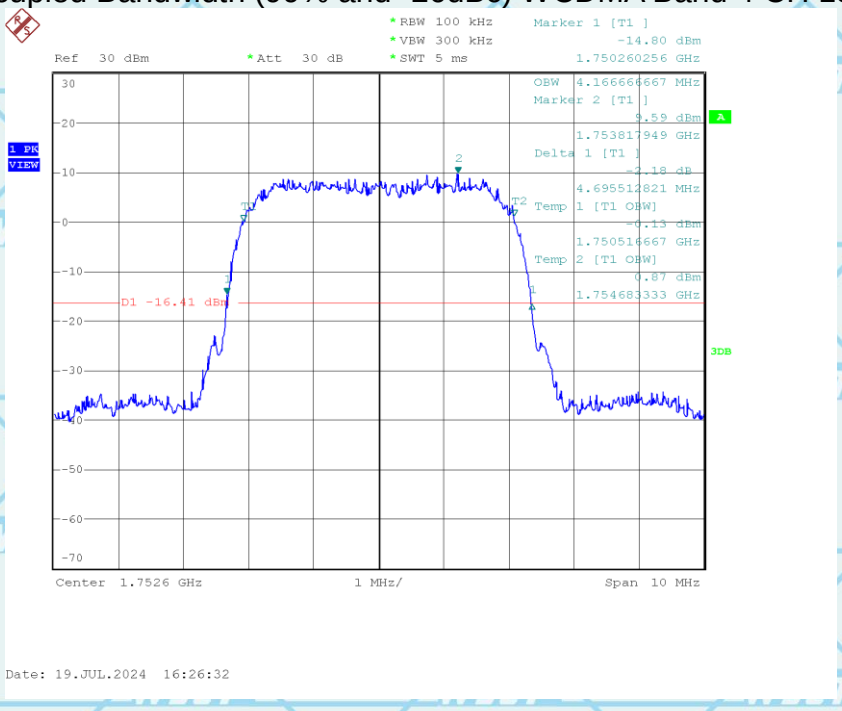
Occupied Bandwidth (99% and -26dBc) WCDMA Band 4 CH 1312



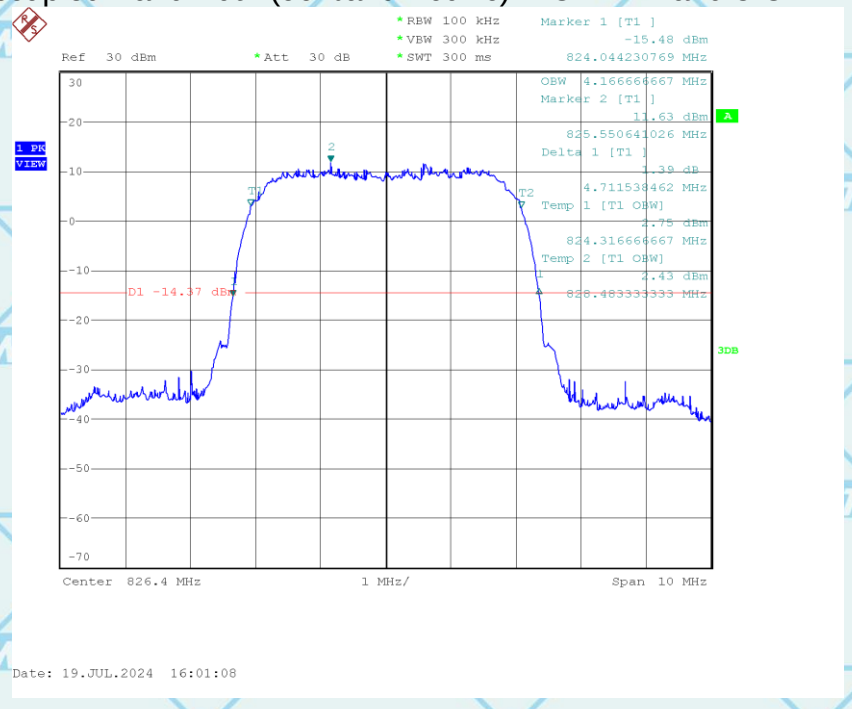
Occupied Bandwidth (99% and -26dBc) WCDMA Band 4 CH 1413



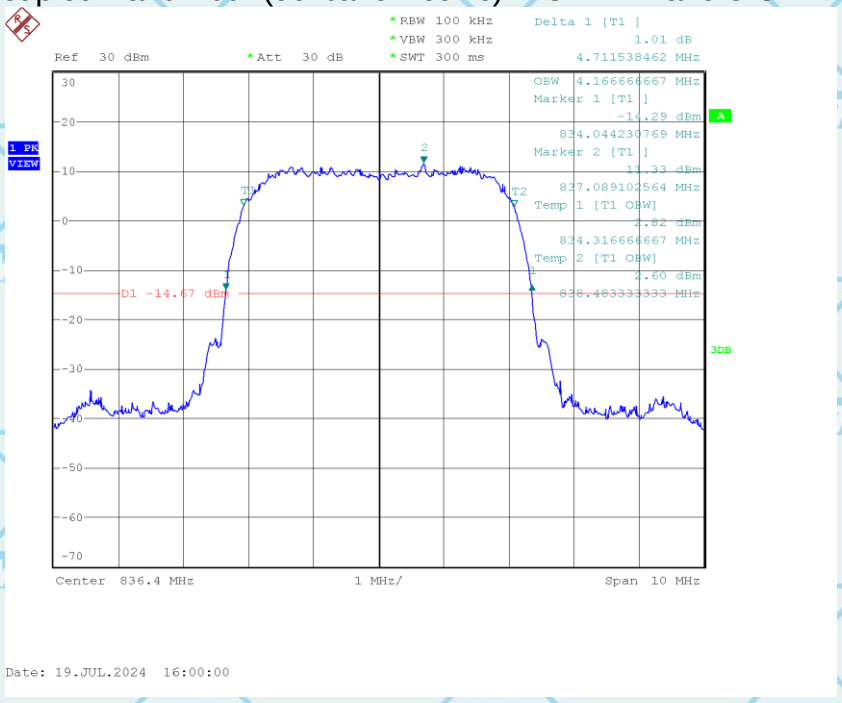
Occupied Bandwidth (99% and -26dBc) WCDMA Band 4 CH 1513



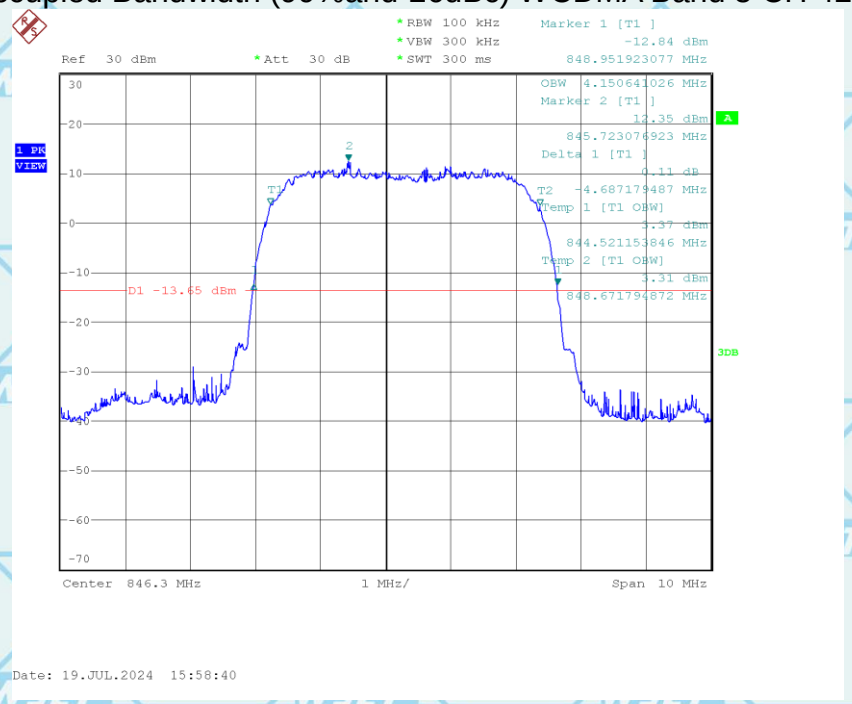
Occupied Bandwidth (99%and-26dBc) WCDMA Band 5 CH 4132



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

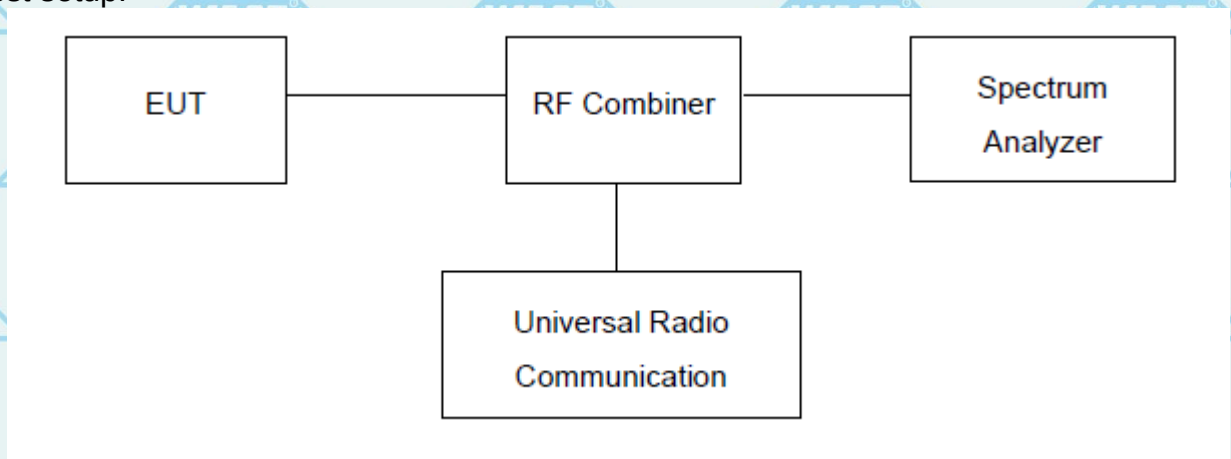
Test Limit:

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.

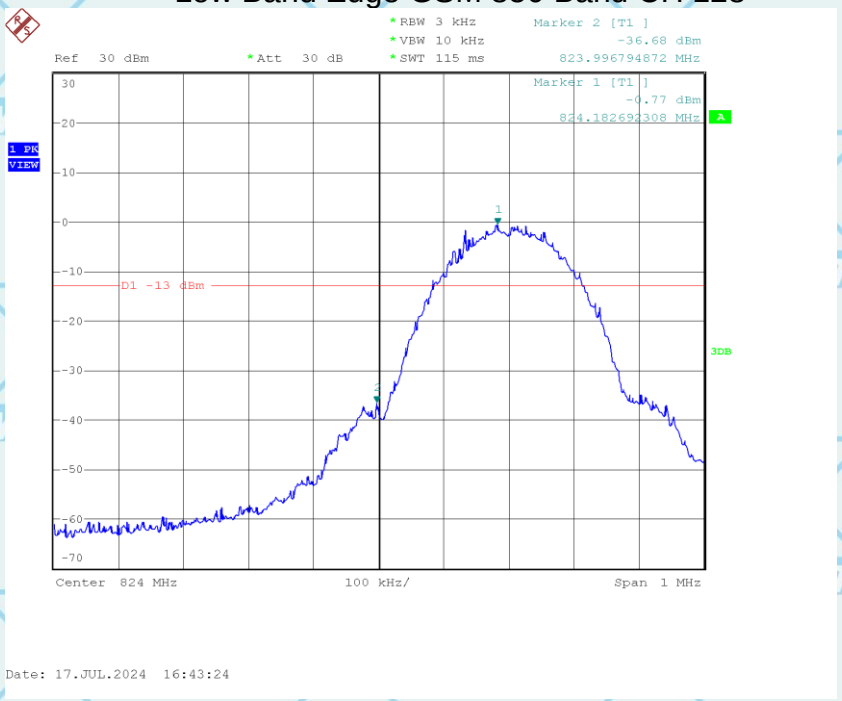
Test setup:



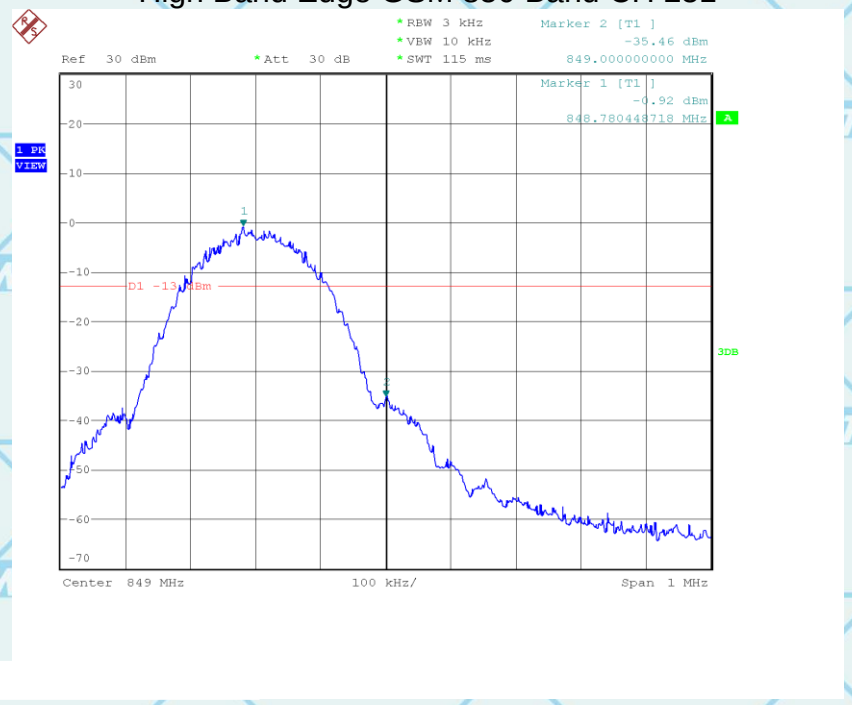
10.1. Measurement Result

Test Plot(s)

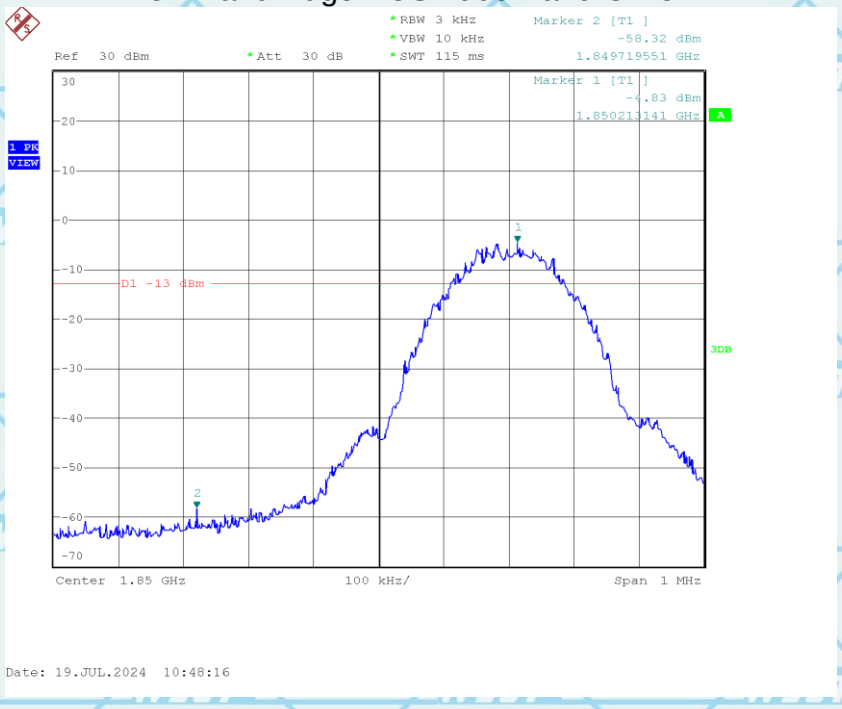
Low Band Edge GSM 850 Band CH 128



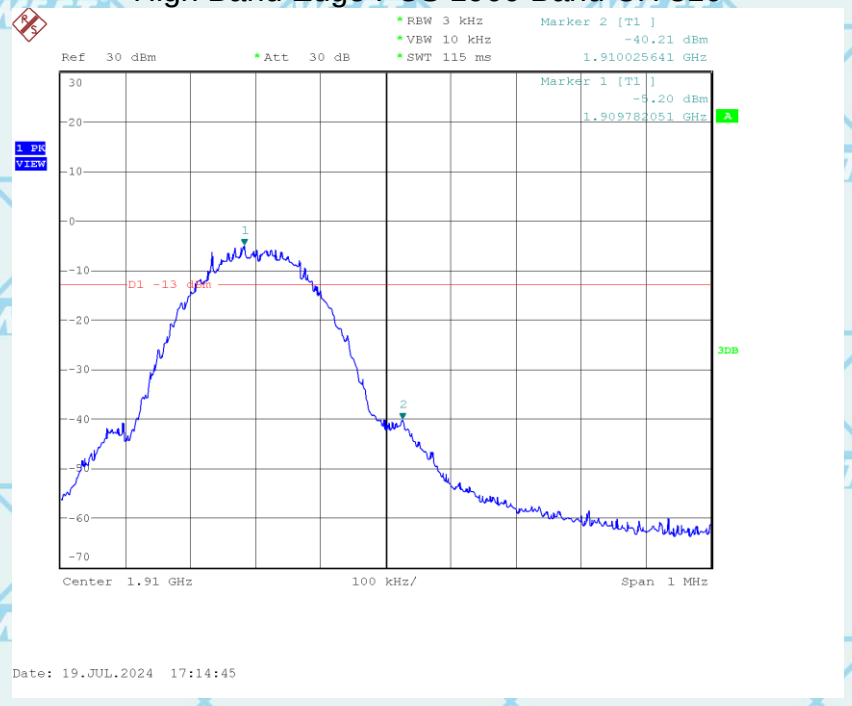
High Band Edge GSM 850 Band CH 251



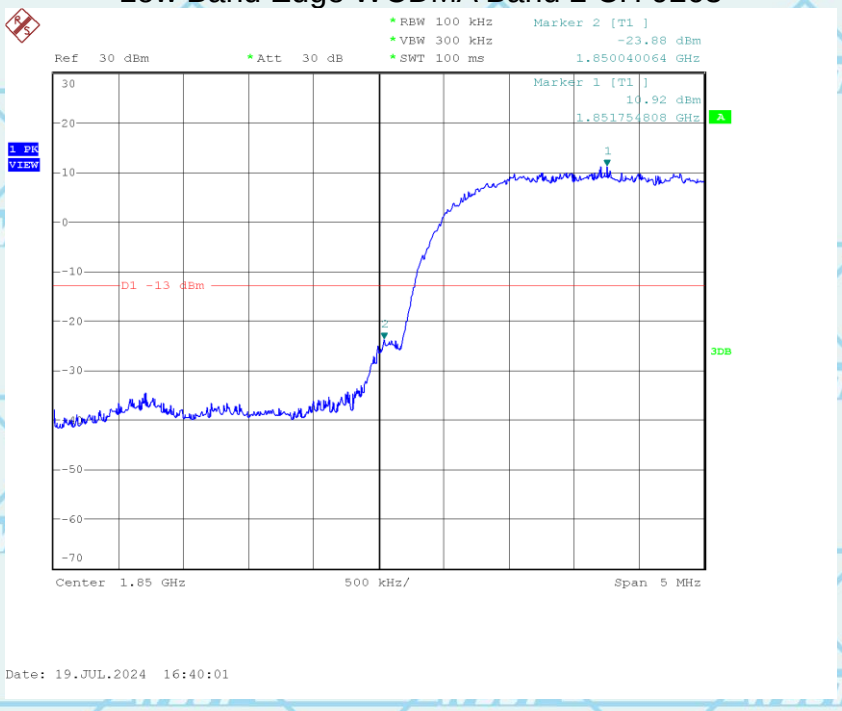
Low Band Edge PCS 1900 Band CH 512



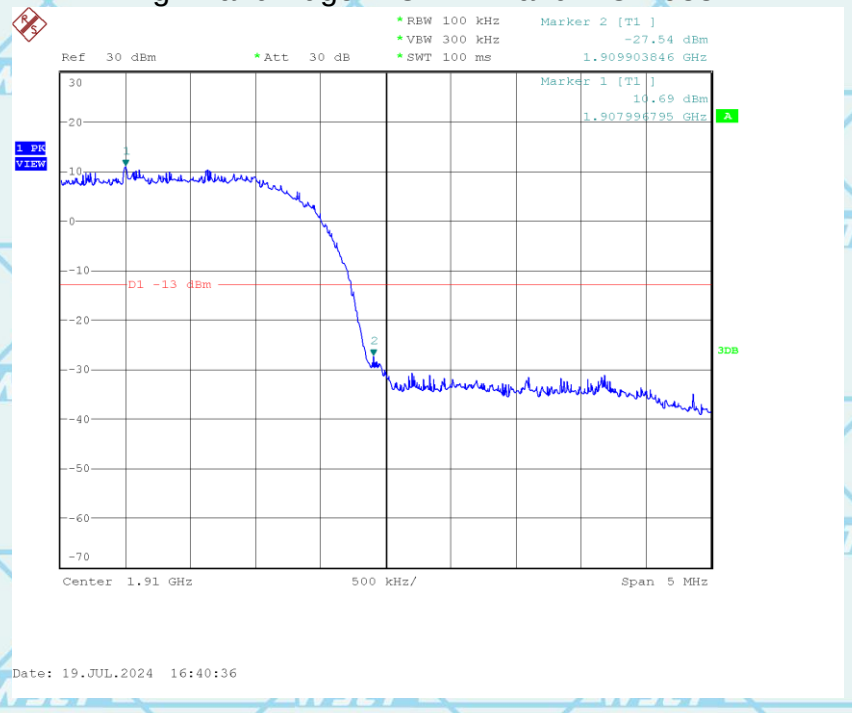
High Band Edge PCS 1900 Band CH 810



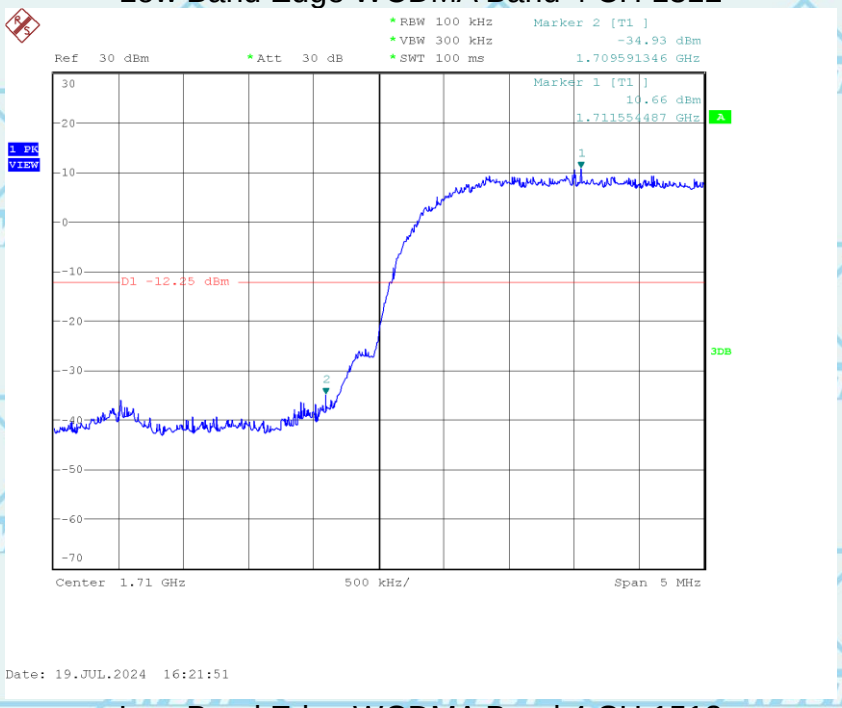
Low Band Edge WCDMA Band 2 CH 9263



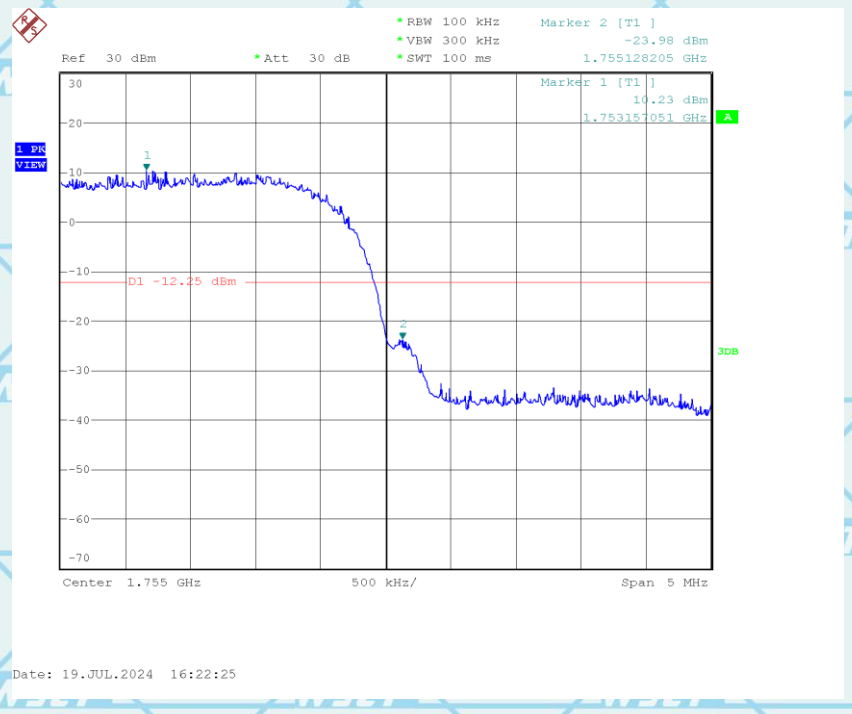
High Band Edge WCDMA Band 2 CH 9537



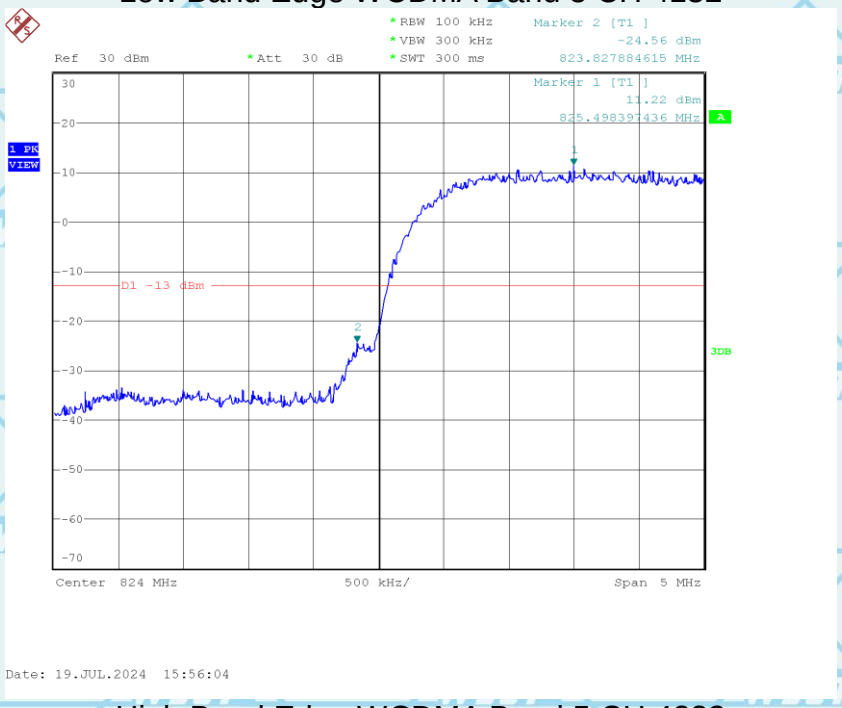
Low Band Edge WCDMA Band 4 CH 1312



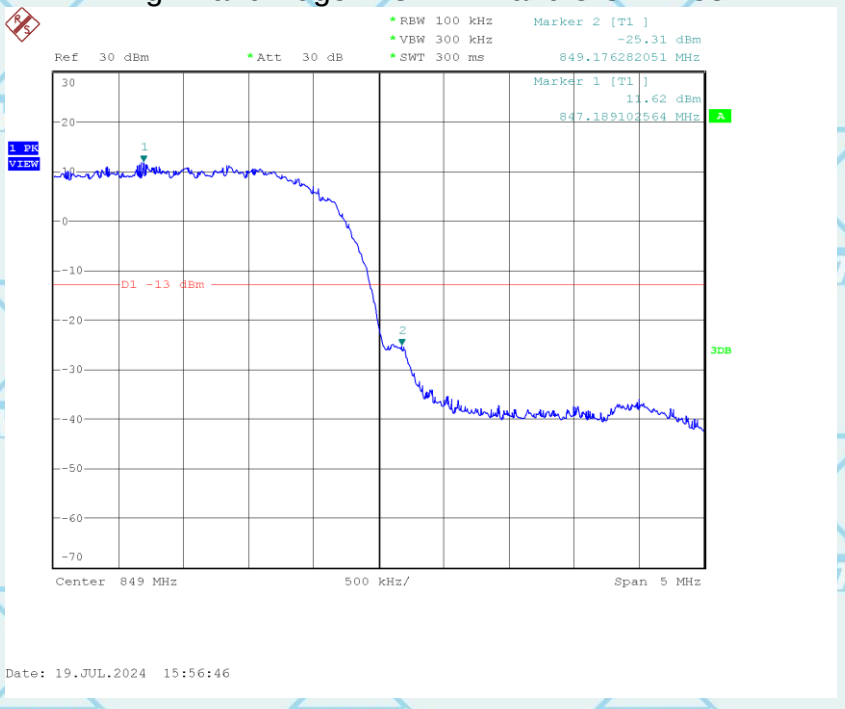
Low Band Edge WCDMA Band 4 CH 1513



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

UTRA BANDS

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

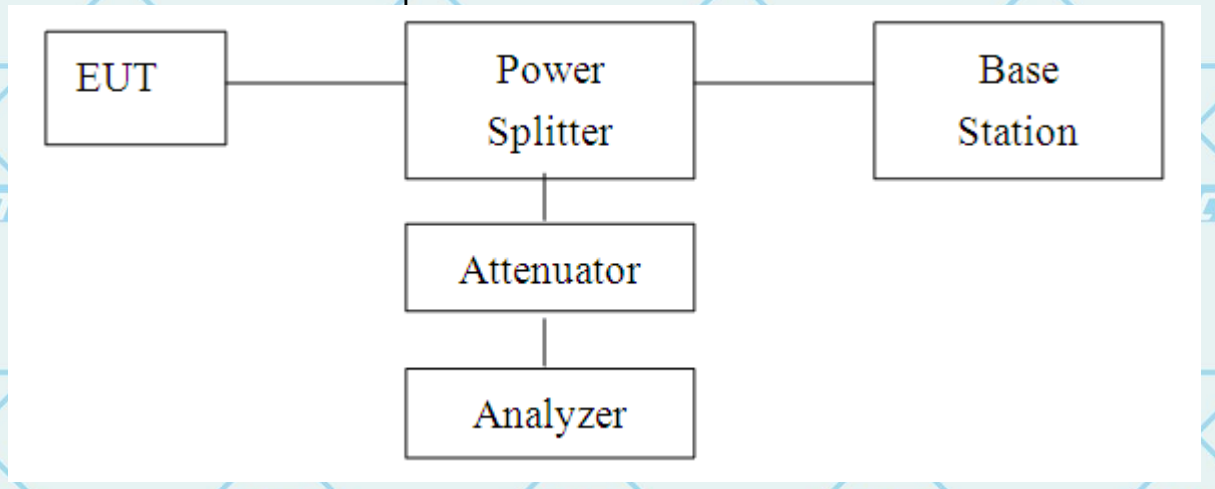
Test limit:

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.

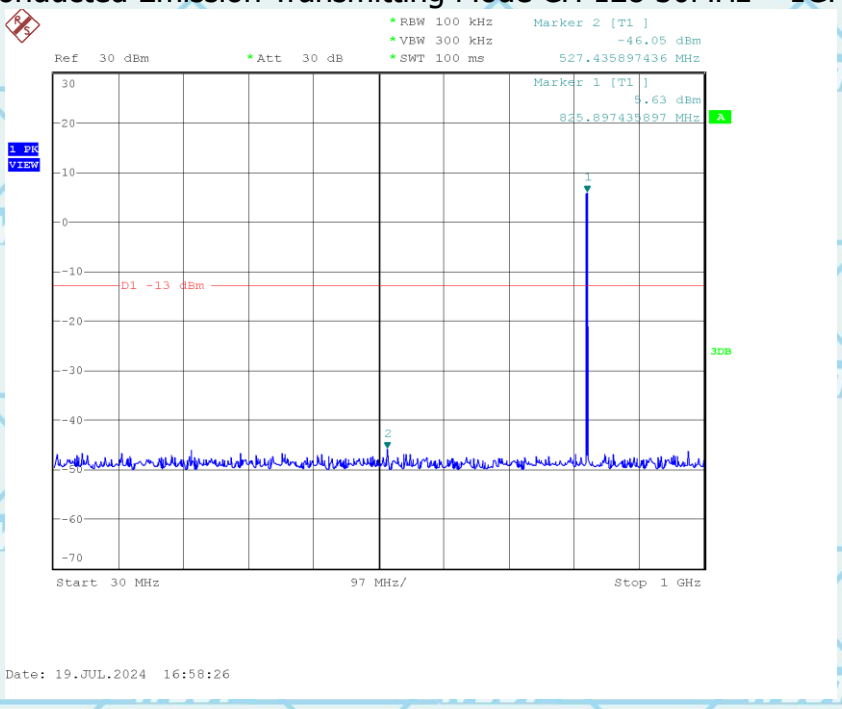
Test procedure:

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.

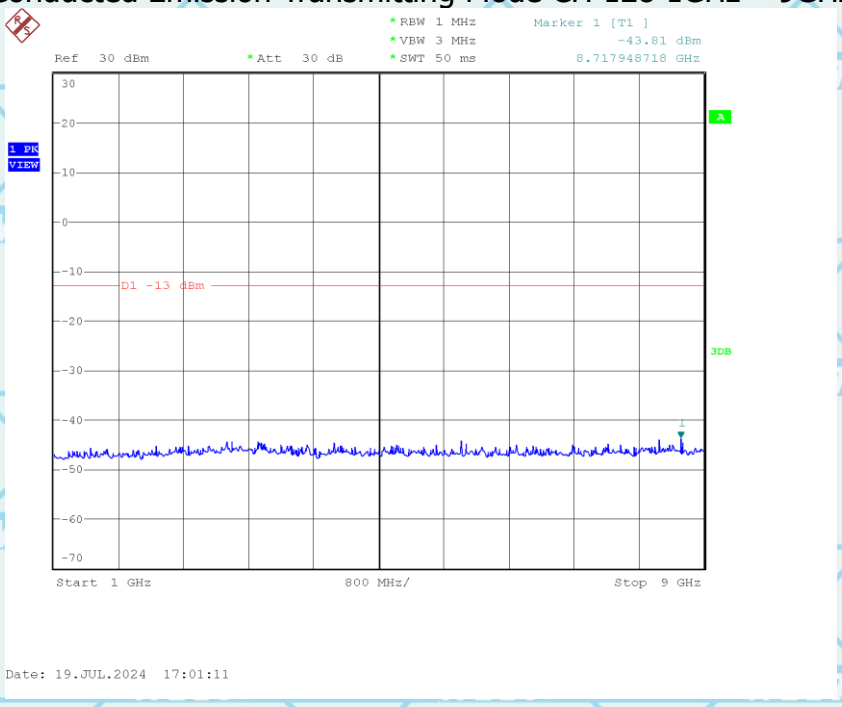
Conducted Emission Test-Up:



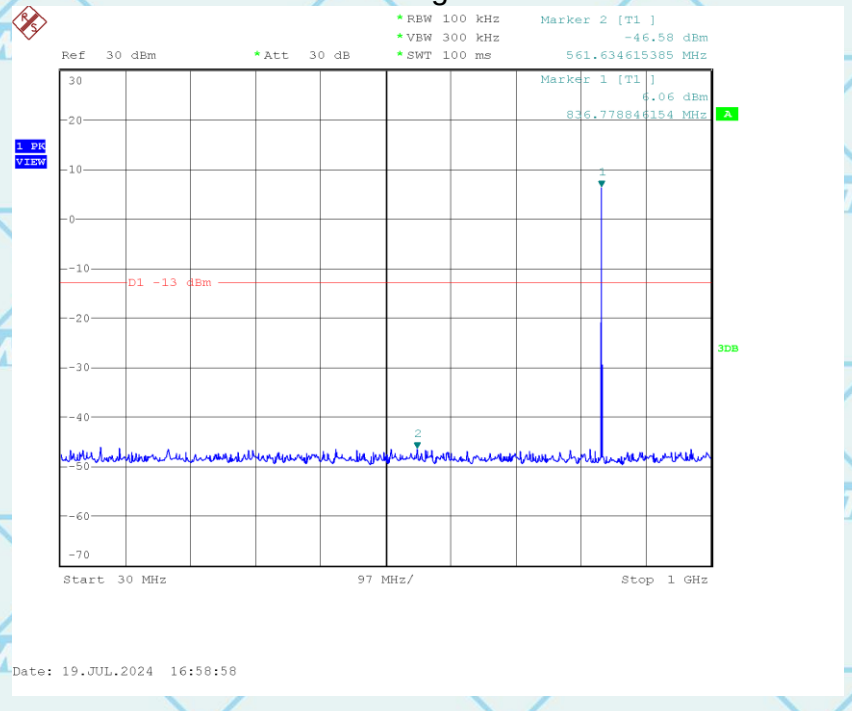
CONDUCTED EMISSION IN GSM850 Band
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



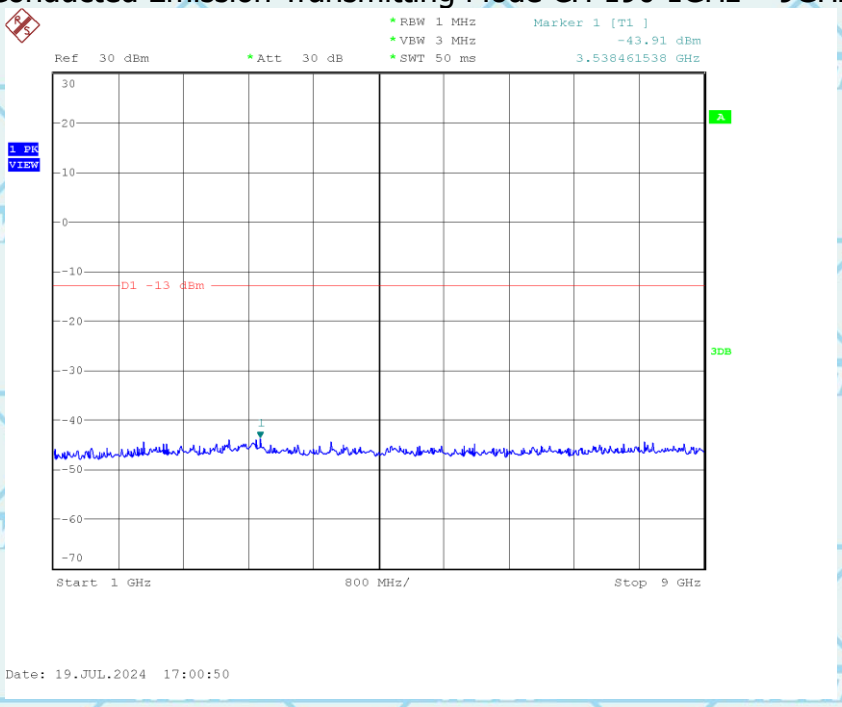
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



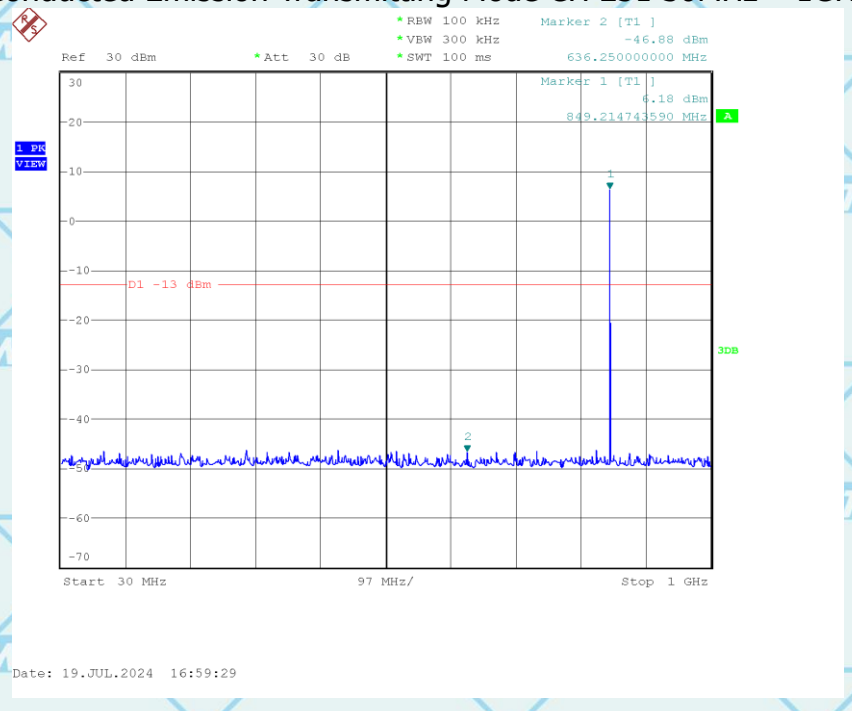
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



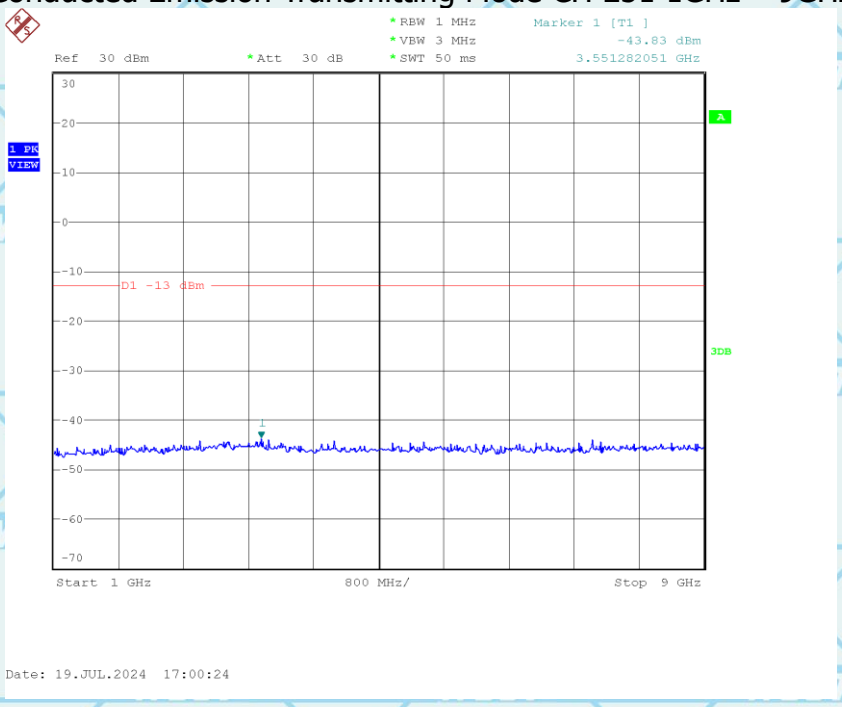
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

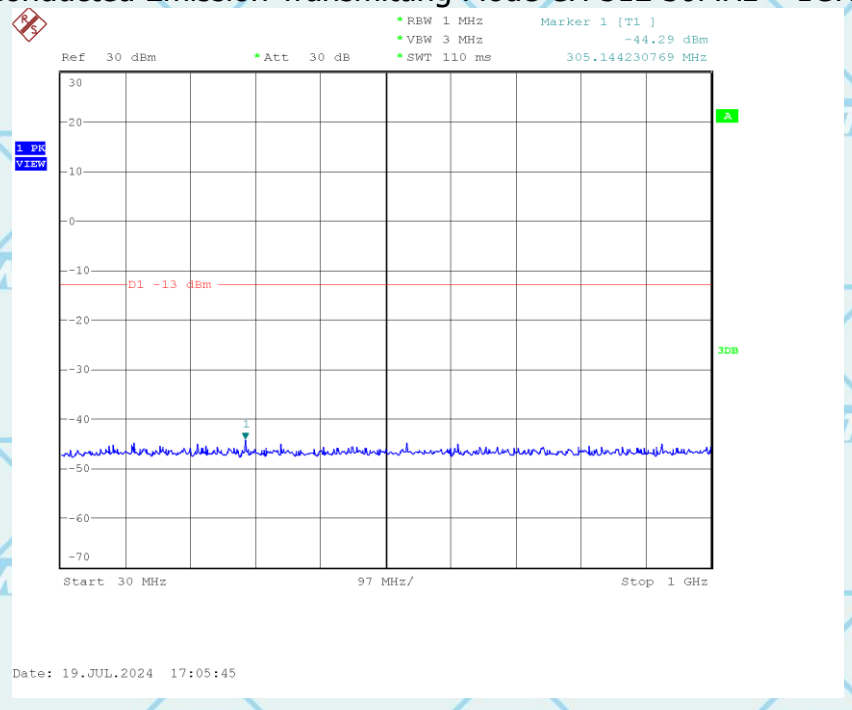


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

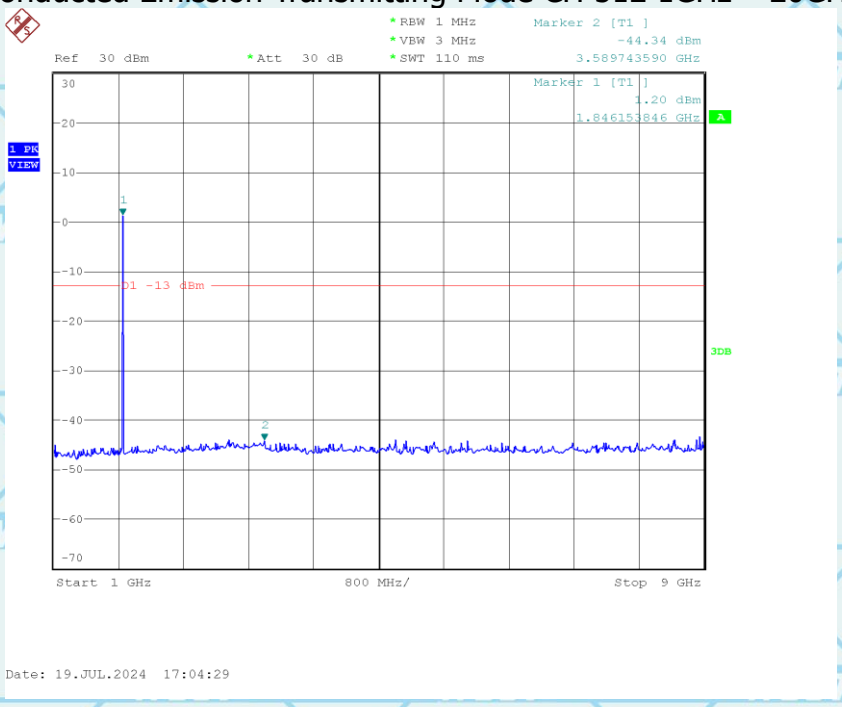


CONDUCTED EMISSION IN PCS1900 BAND

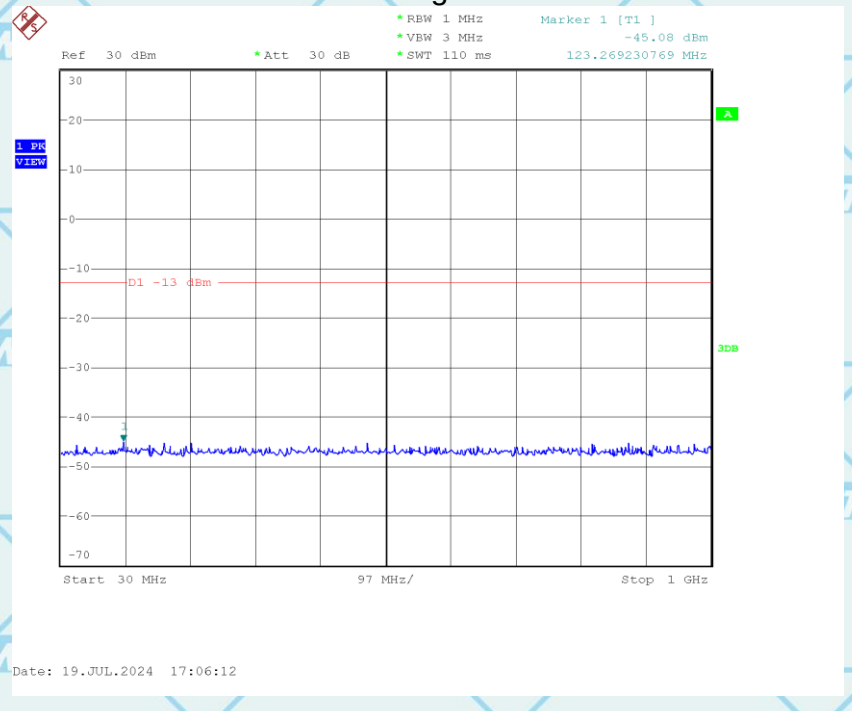
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



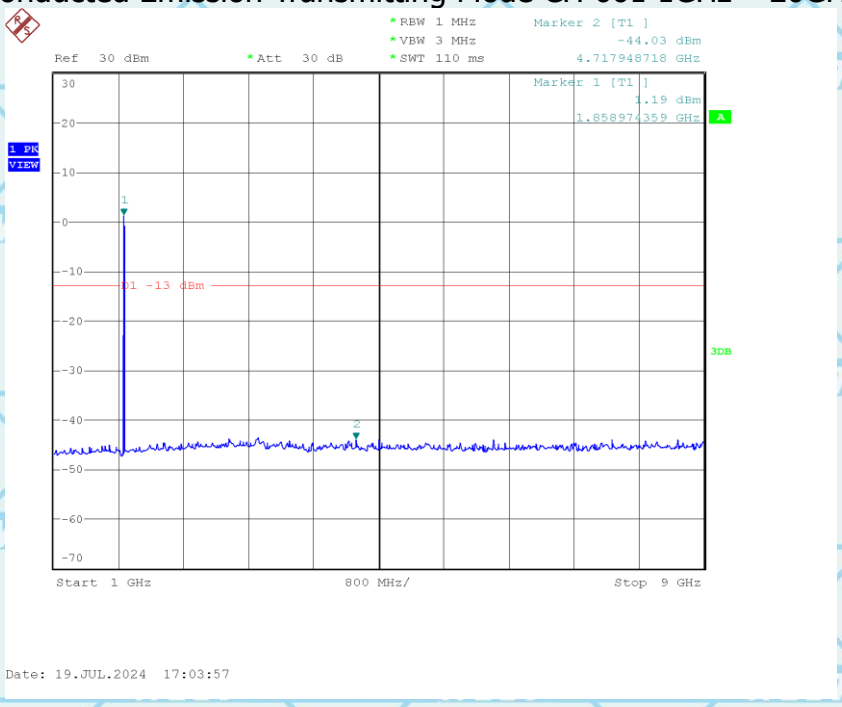
Conducted Emission Transmitting Mode CH 512 1GHz – 20GHz



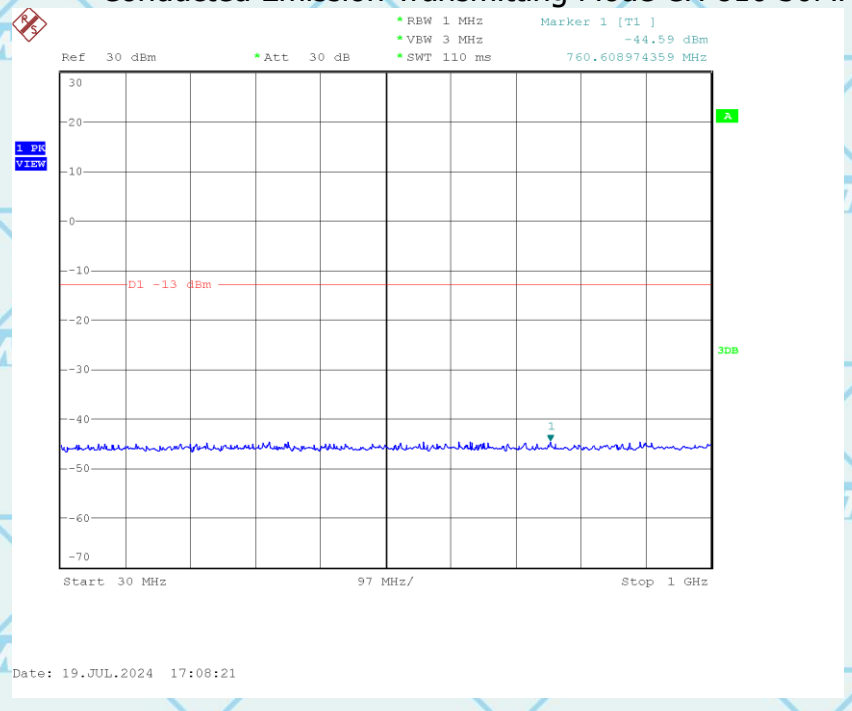
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



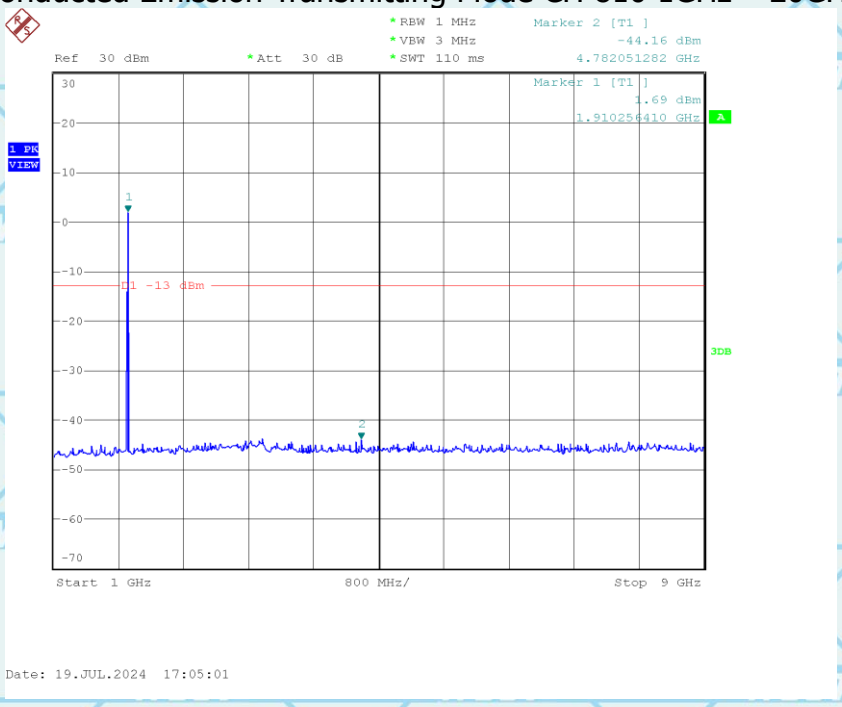
Conducted Emission Transmitting Mode CH 661 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz

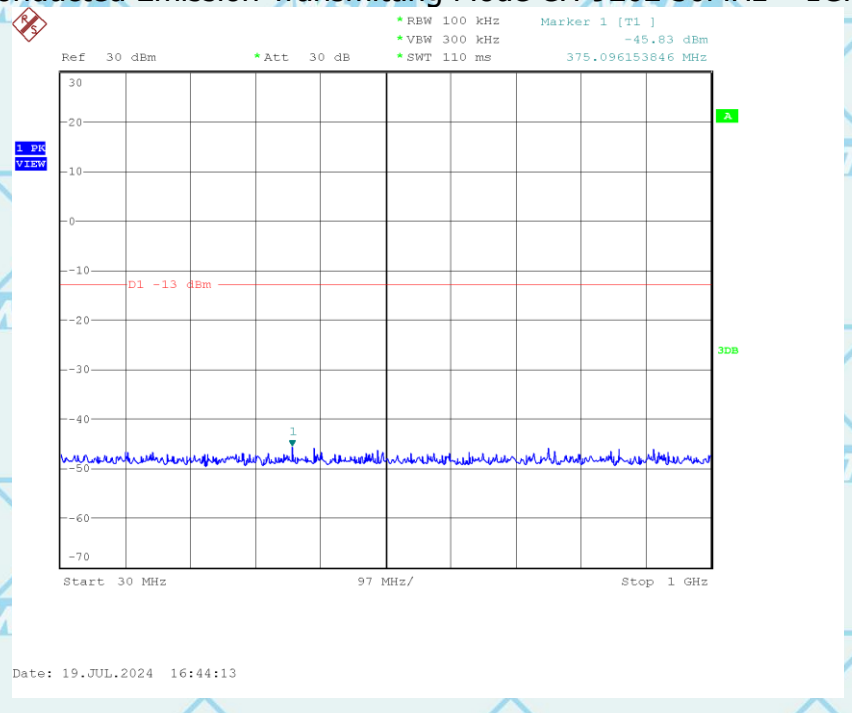


Conducted Emission Transmitting Mode CH 810 1GHz – 20GHz

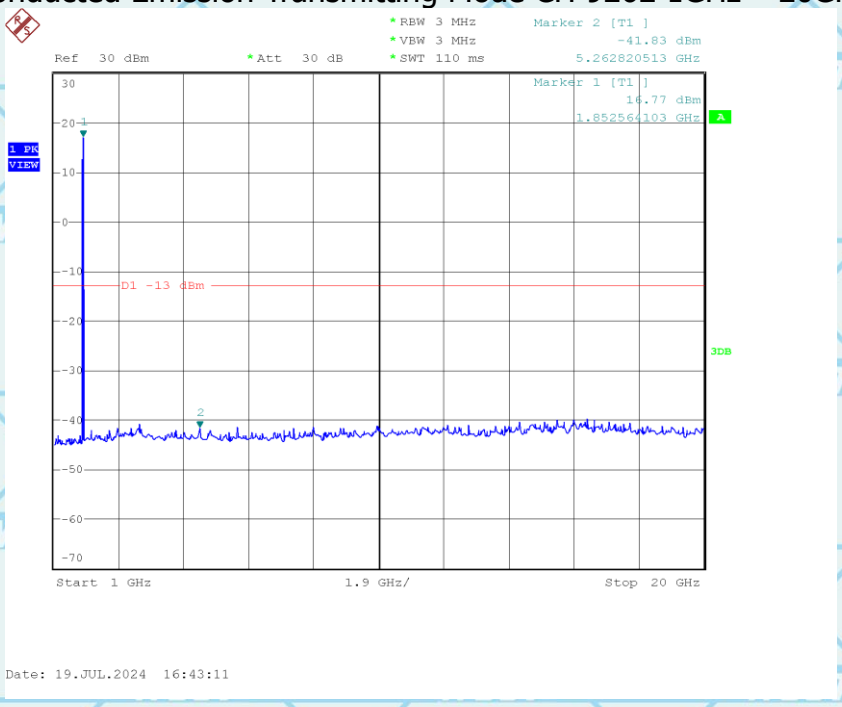


CONDUCTED EMISSION IN WCDMA Band 2

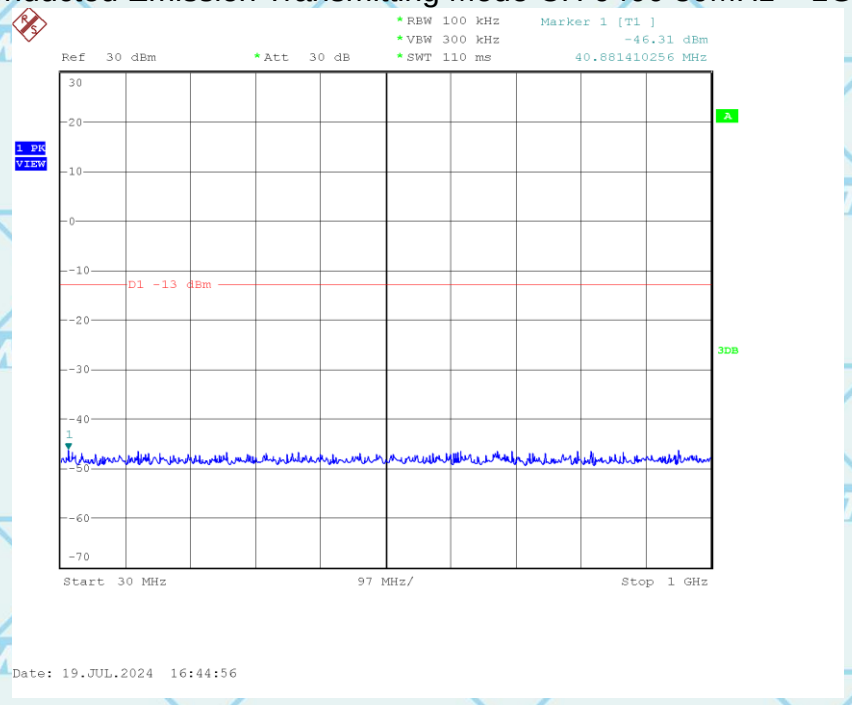
Conducted Emission Transmitting Mode CH 9262 30MHz – 1GHz



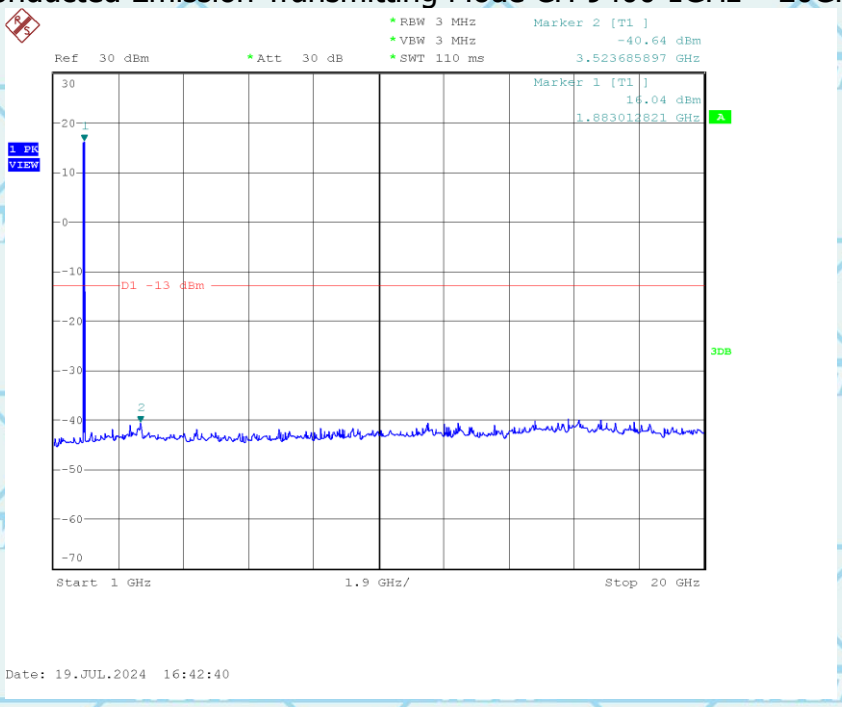
Conducted Emission Transmitting Mode CH 9262 1GHz – 20GHz



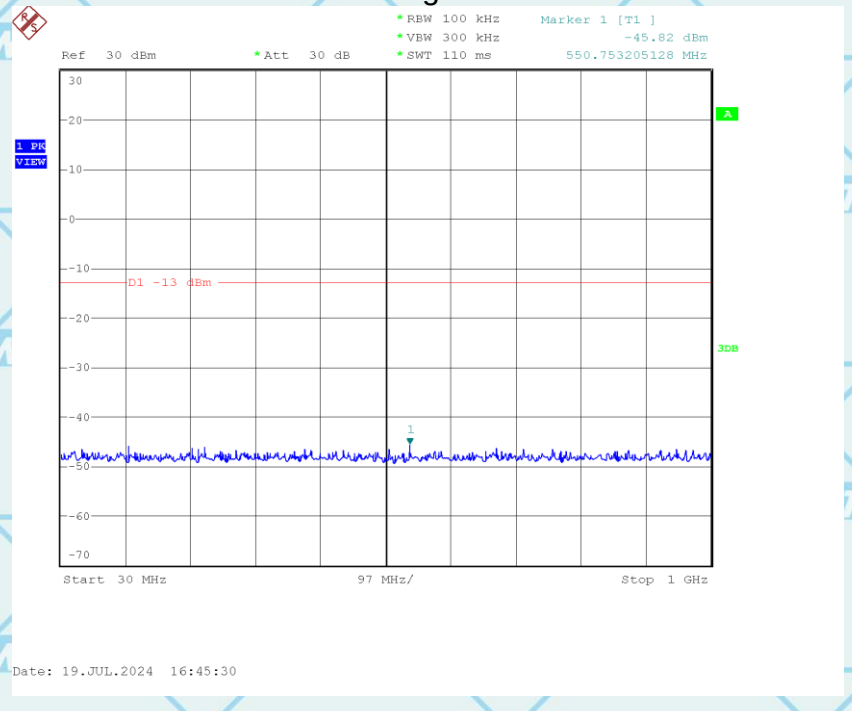
Conducted Emission Transmitting Mode CH 9400 30MHz – 1GHz



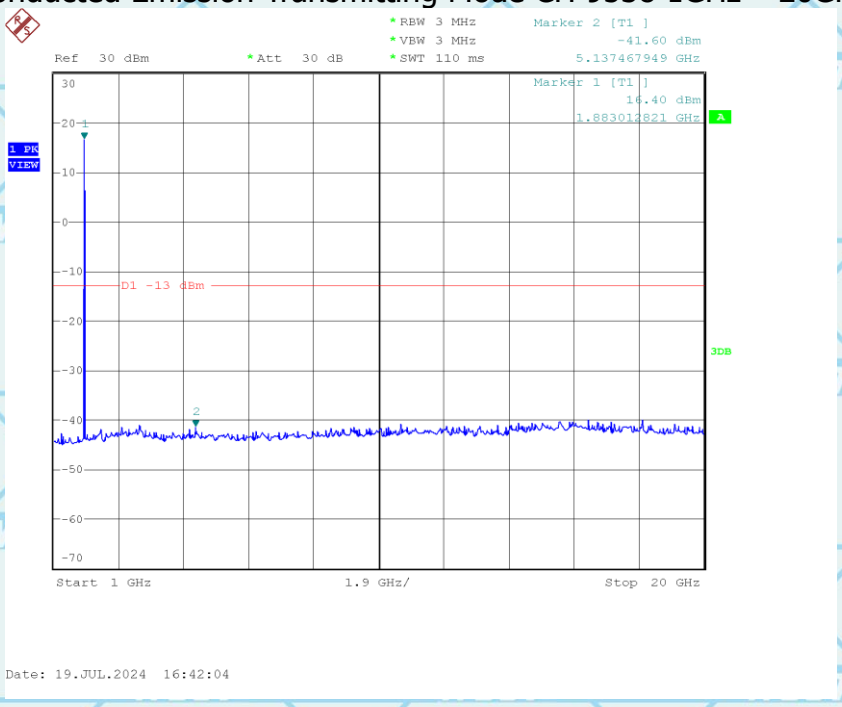
Conducted Emission Transmitting Mode CH 9400 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 9538 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 9538 1GHz – 20GHz



CONDUCTED EMISSION IN WCDMA Band 4

Conducted Emission Transmitting Mode CH 1312 30MHz – 1GHz