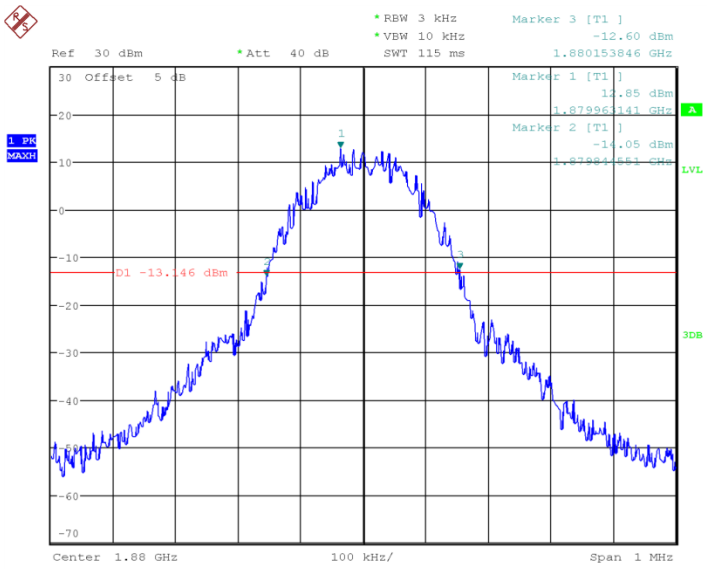
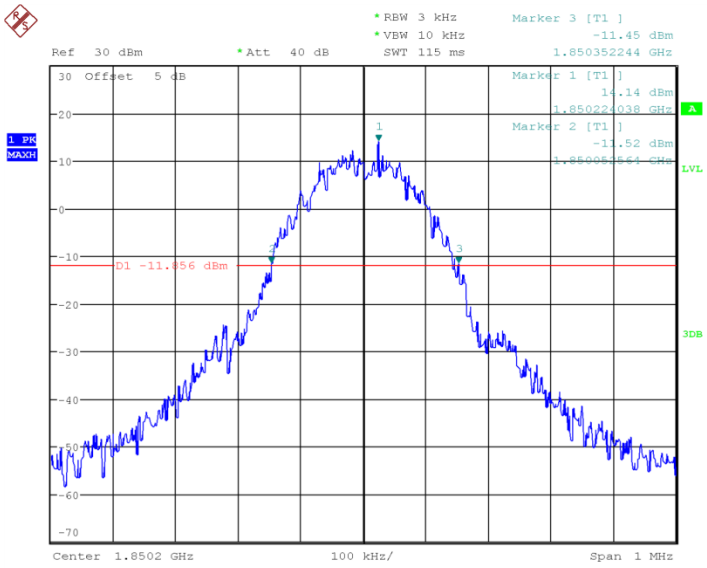
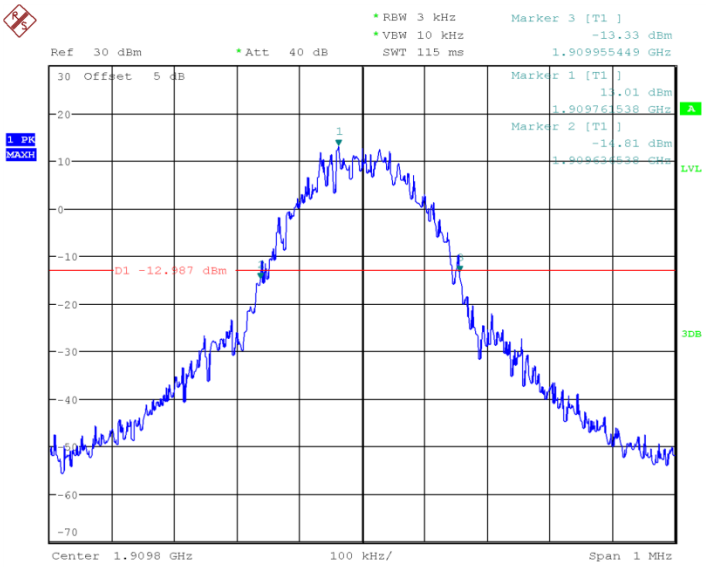


Channel 661- Emission Bandwidth (-26dBc BW)



Channel512- Emission Bandwidth (-26dBc BW)

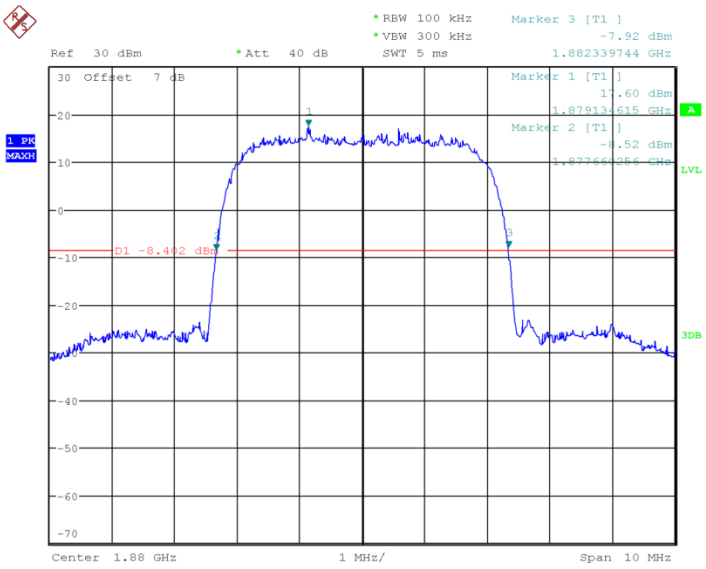


Channel 810- Emission Bandwidth (-26dBc BW)

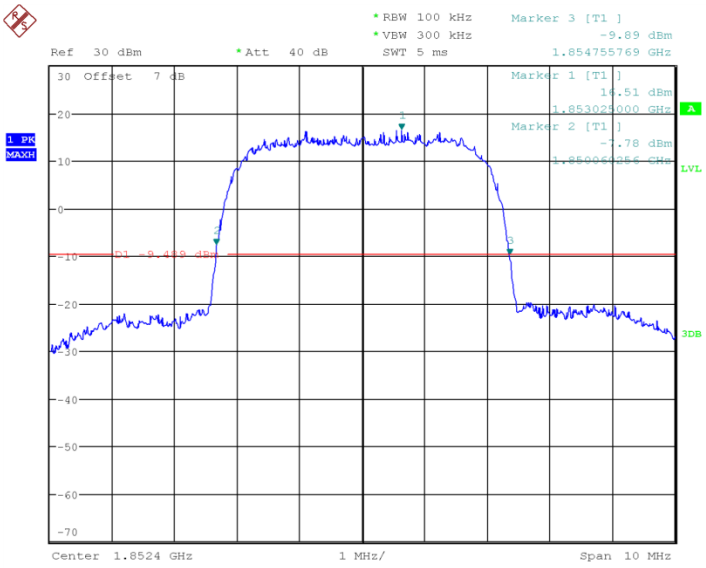
WCDMA BAND II		
Test channel	Frequency (MHz)	–26dBc Emission Bandwidth(MHz)
Mid 9400	1880	4.679
Low 9262	1852.4	4.696
High 9538	1907.6	4.696

Conclusion: PASS

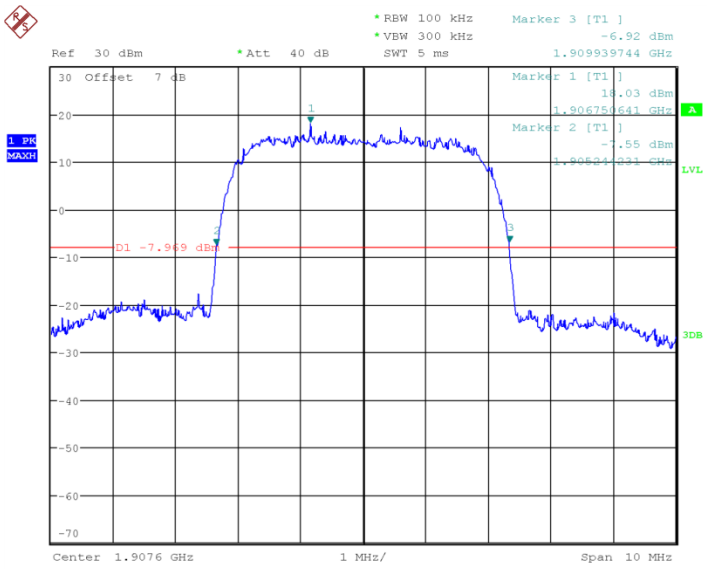
WCDMA BAND II



Channel 9400- Emission Bandwidth (-26dBc BW)

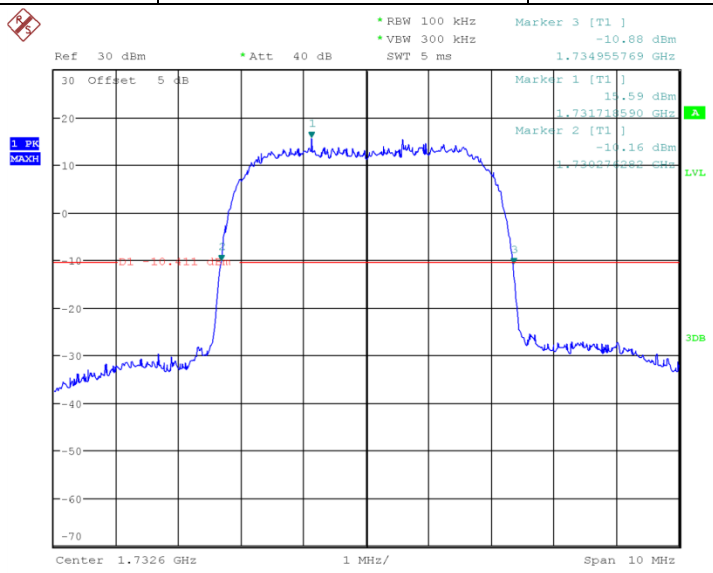


Channel 9262- Emission Bandwidth (-26dBc BW)

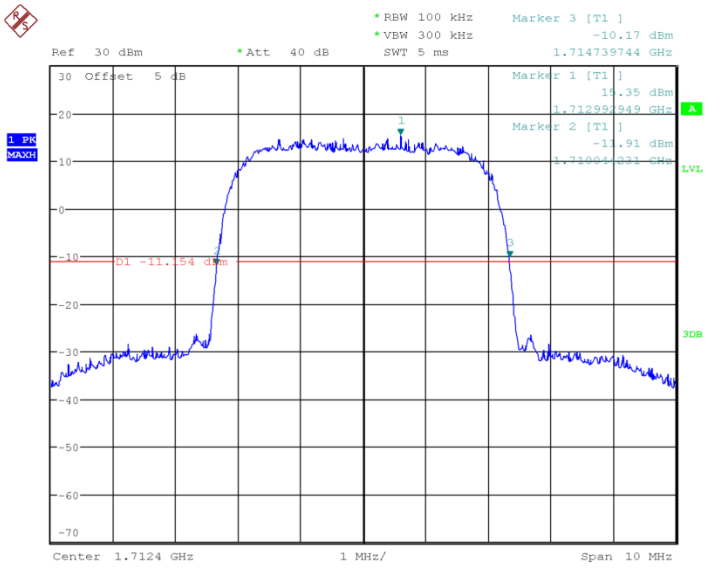


Channel 9538- Emission Bandwidth (-26dBc BW)

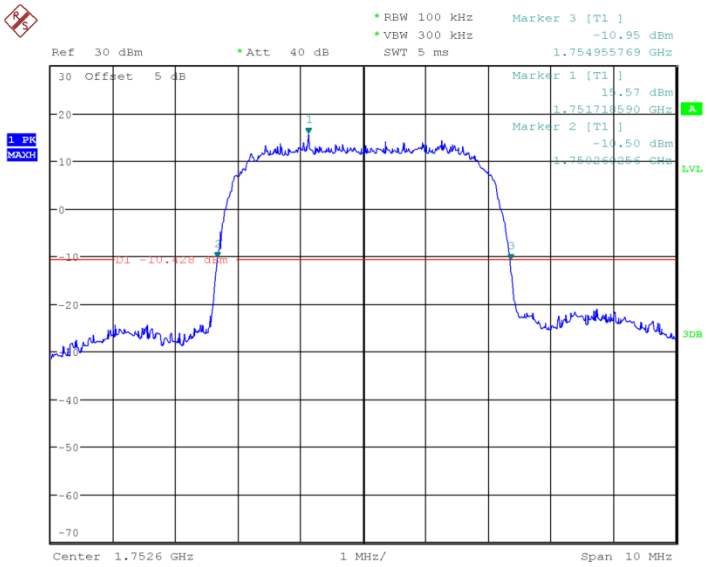
WCDMA BAND IV		
Test channel	Frequency (MHz)	–26dBc Emission Bandwidth(MHz)
Mid 1413	1732.6	4.679
Low 1312	1712.4	4.696
High 1513	1752.6	4.696



Channel 1413- Emission Bandwidth (-26dBc BW)



Channel 1312- Emission Bandwidth (-26dBc BW)

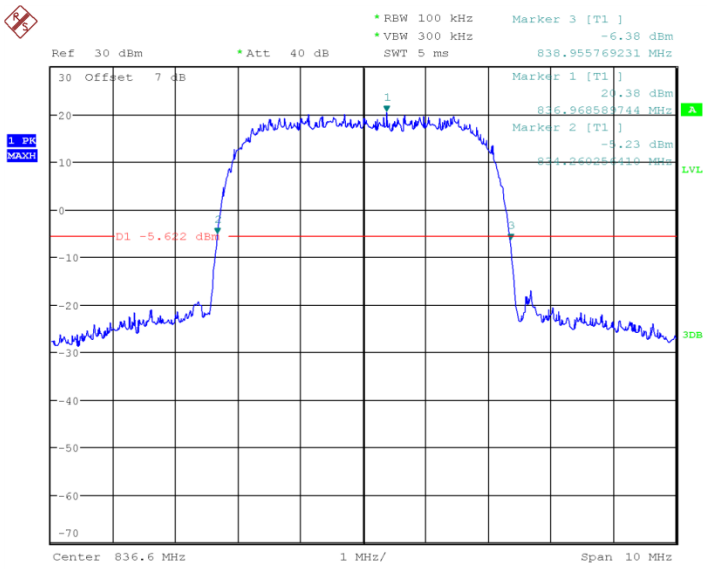


Channel 1513- Emission Bandwidth (-26dBc BW)

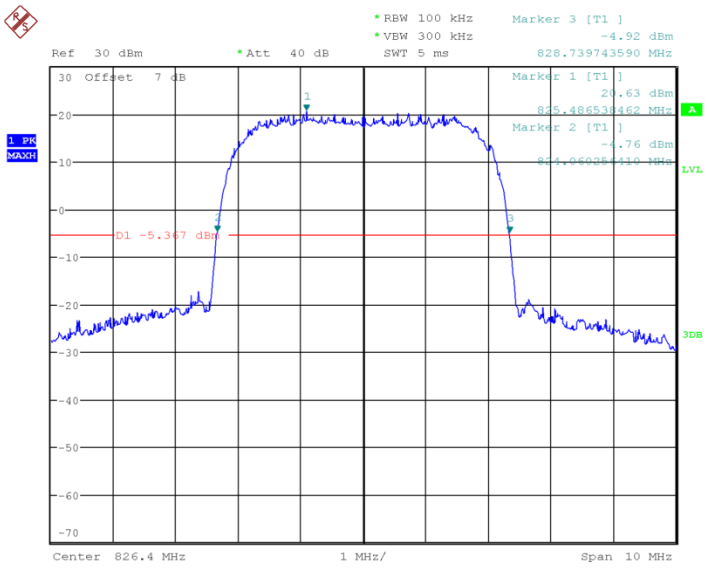
WCDMA BAND V		
Test channel	Frequency (MHz)	–26dBc Emission Bandwidth(MHz)
Mid 4183	836.6	4.696
Low 4132	826.4	4.679
High 4233	846.6	4.712

Conclusion: PASS

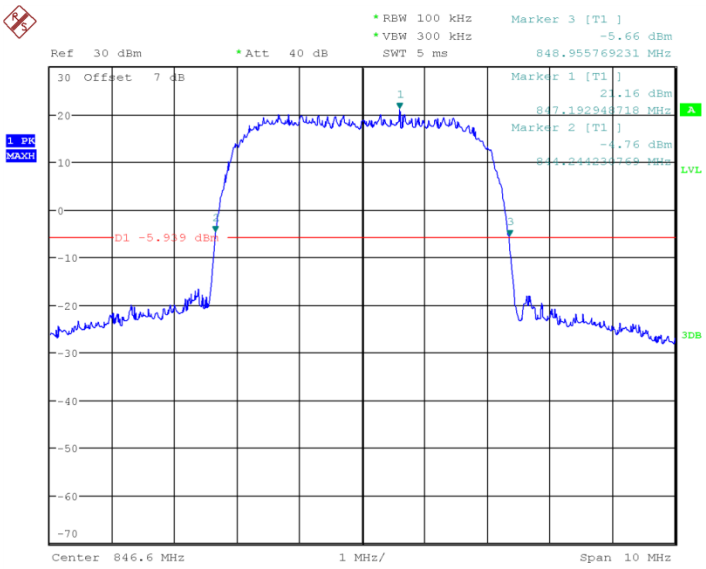
WCDMA BAND V



Channel 4183- Emission Bandwidth (-26dBc BW)



Channel4132- Emission Bandwidth (-26dBc BW)

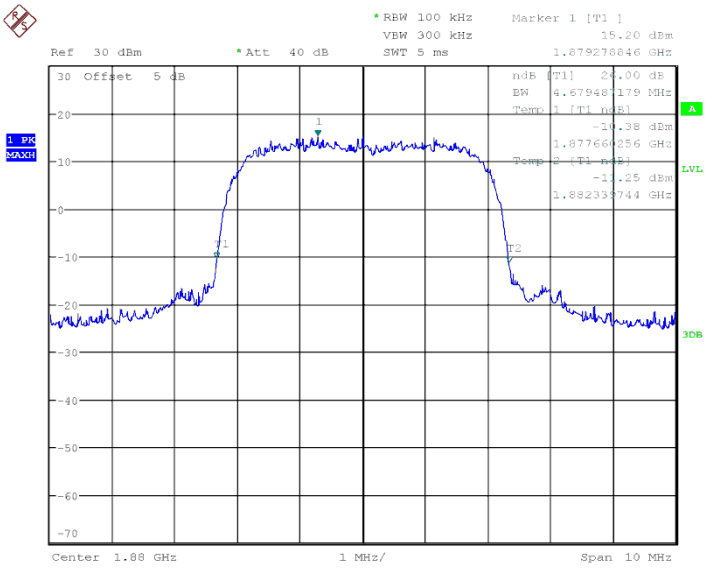


Channel 4233- Emission Bandwidth (-26dBc BW)

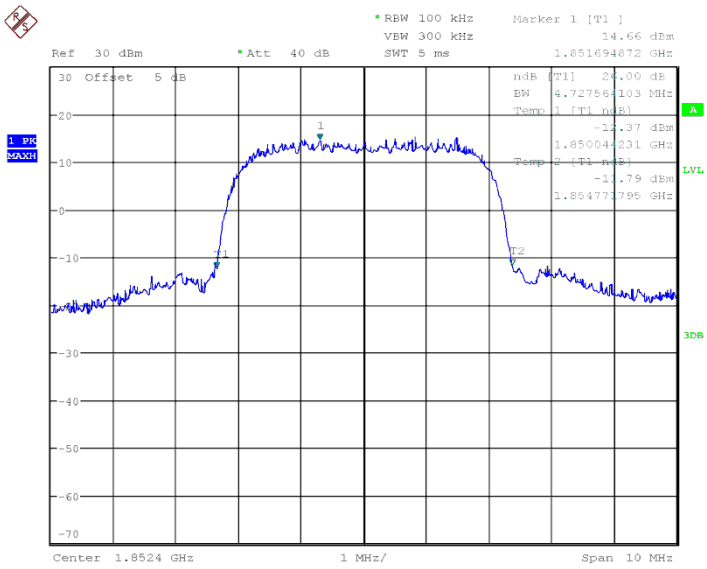
16QAM BAND II		
Test channel	Frequency (MHz)	–26dBc Emission Bandwidth(MHz)
Mid 9400	1880	4.67
Low 9262	1852.4	4.72
High 9538	1907.6	4.74

Conclusion: PASS

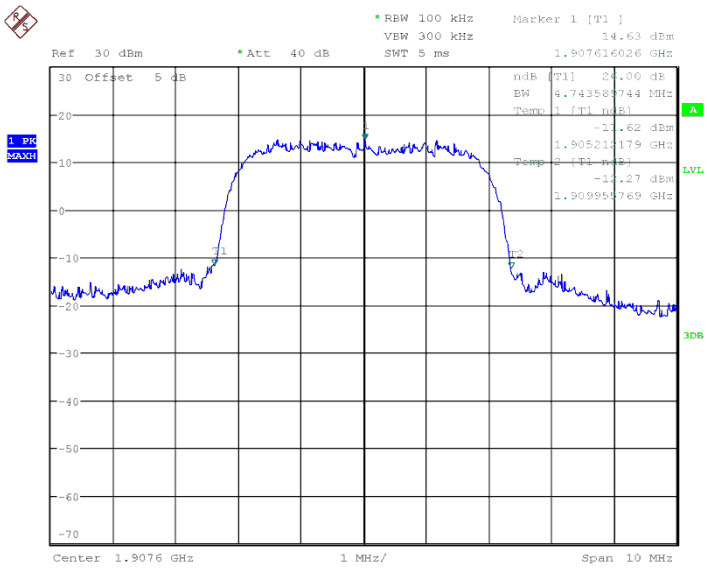
16QAM BAND II



Channel9400- Emission Bandwidth (-26dBc BW)



Channel9262- Emission Bandwidth (-26dBc BW)



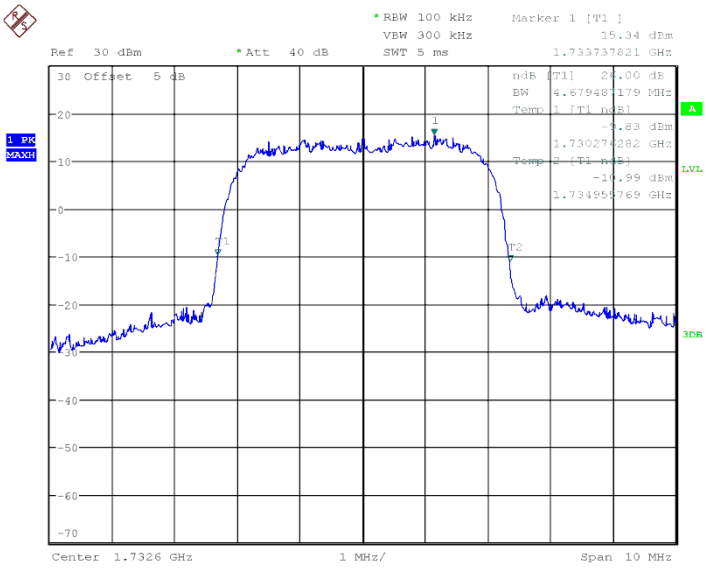
Channel9538- Emission Bandwidth (-26dBc BW)

16QAM BAND IV		
Test channel	Frequency (MHz)	–26dBc Emission Bandwidth(MHz)
Mid 1413	1732.4	4.67
Low 1312	1712.4	4.67

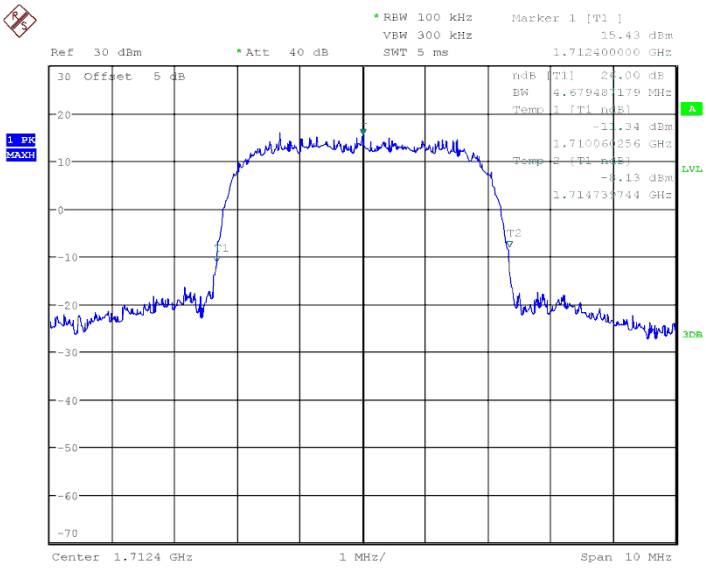
High 1513	1752.6	4.69

Conclusion: PASS

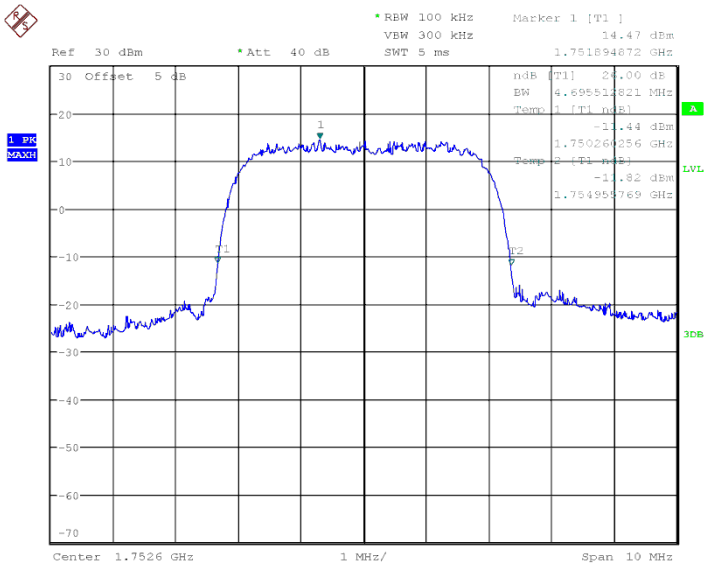
16QAM BAND IV



Channel1413- Emission Bandwidth (-26dBc BW)



Channel1312- Emission Bandwidth (-26dBc BW)

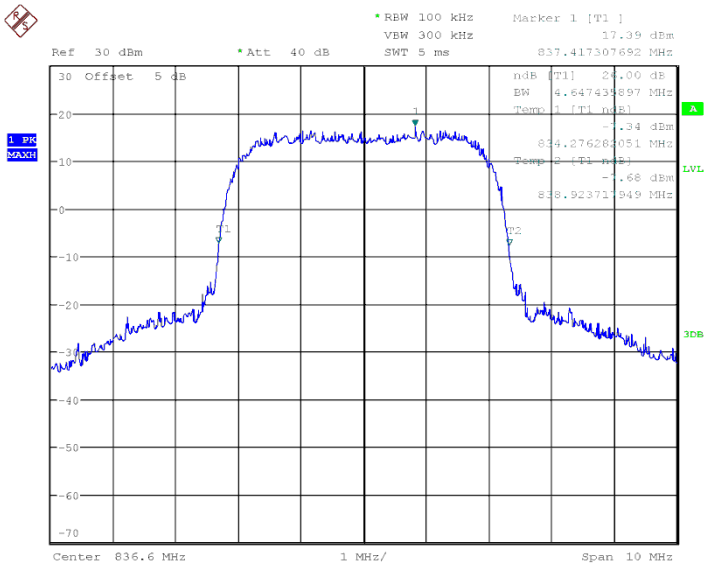


Channel1513- Emission Bandwidth (-26dBc BW)

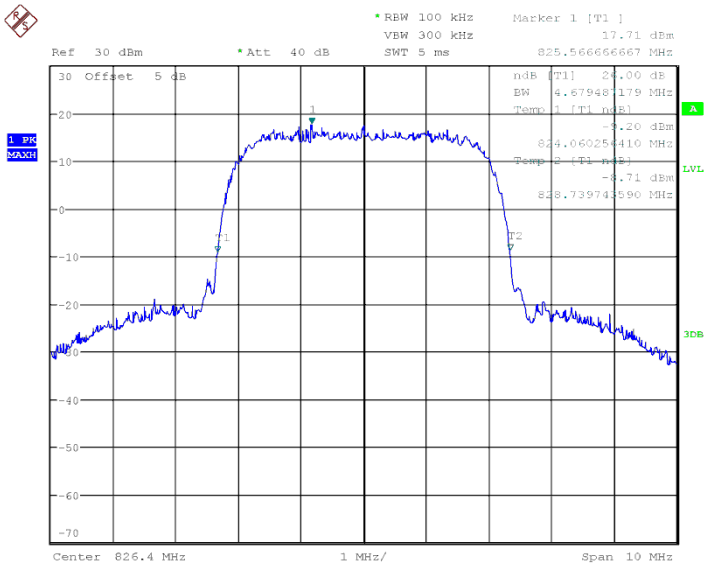
16QAM BAND V		
Test channel	Frequency (MHz)	–26dBc Emission Bandwidth(MHz)
Mid 4183	836.6	4.64
Low 4132	826.4	4.67
High 4233	846.6	4.67

Conclusion: PASS

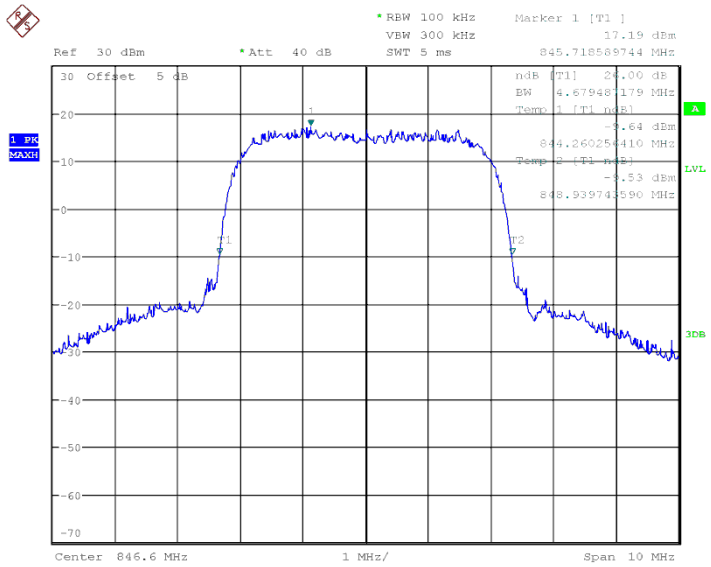
16QAM BAND V



Channel4183- Emission Bandwidth (-26dBc BW)



Channel4132- Emission Bandwidth (-26dBc BW)



Channel4233- Emission Bandwidth (-26dBc BW)

ANNEX A.5. Band Edge at antenna terminals

Method of test measurements please refer to KDB971168 D01 v02r02 clause 3.5

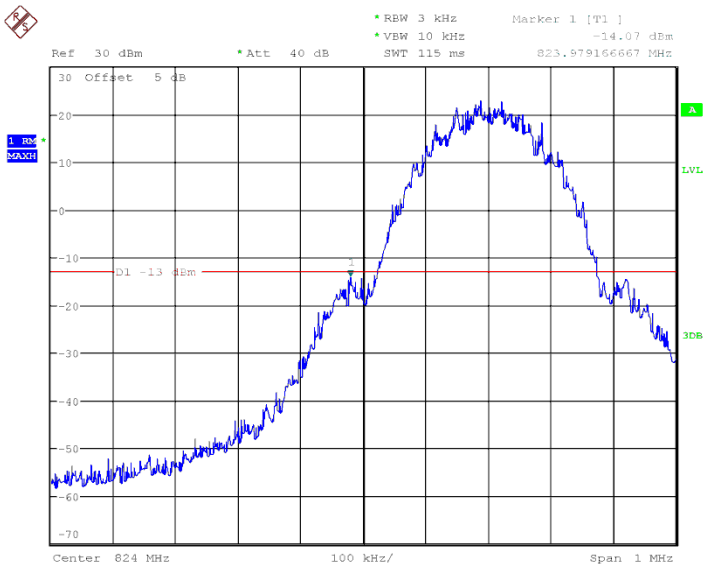
A.5.1 Limit:

The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than 43+10log (Mean power in watts) dBc below the mean power output outside a license's frequency block(-13dBm).

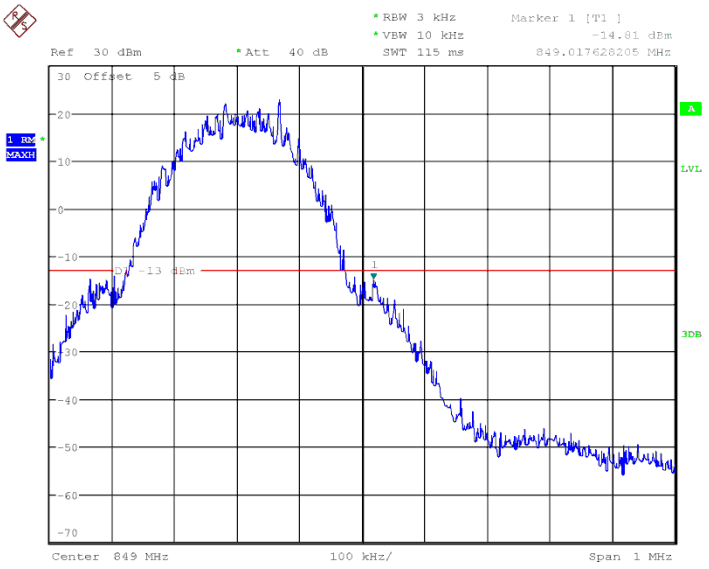
A.5.2 Test procedure:

1. The RF output of the transceiver was connected to a signal analyzer through appropriate attenuation.
2. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
3. The RF fundamental frequency should be excluded against the limit line in the operating frequency band
4. The limit line is derived from 43+10log(P) Db below the transmitter power P(Watts)
   =P(W)-[43+10log(P)](Db)
   =[30+10log(P)](dBm)-[43+10log(P)](Db)
   =-13dBm

GSM 850

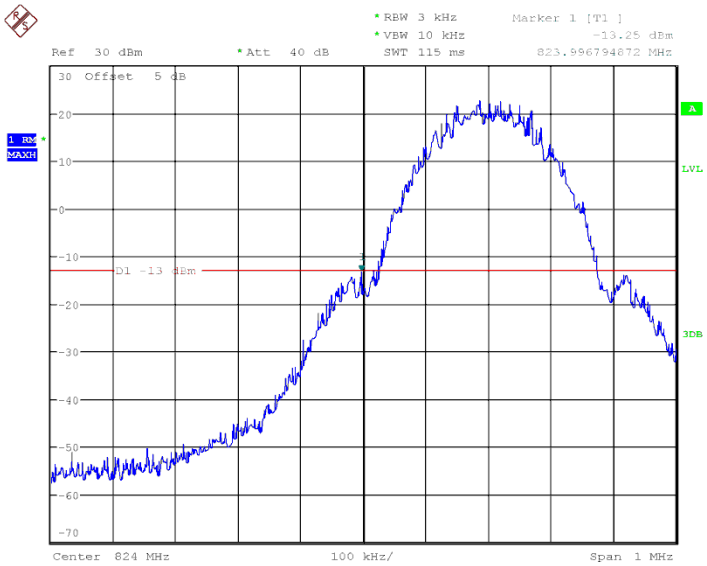


Channel 128- LOW BAND EDGE BLOCK

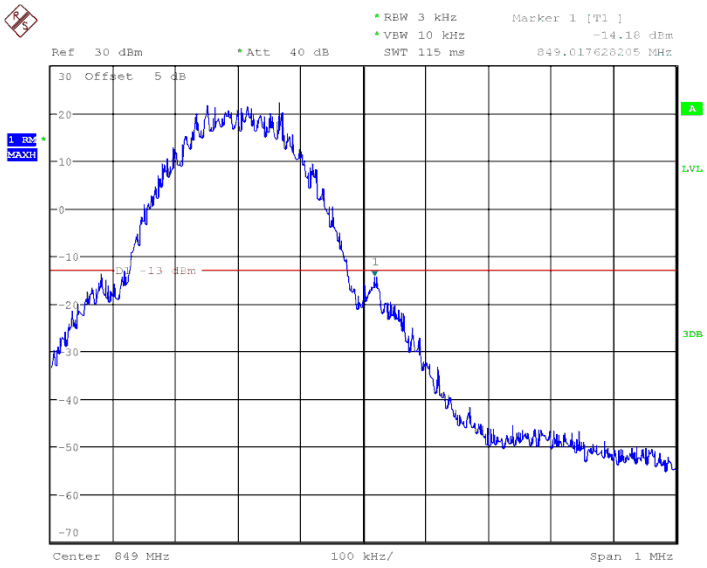


Channel 251- HIGH BAND EDGE BLOCK

GPRS 850

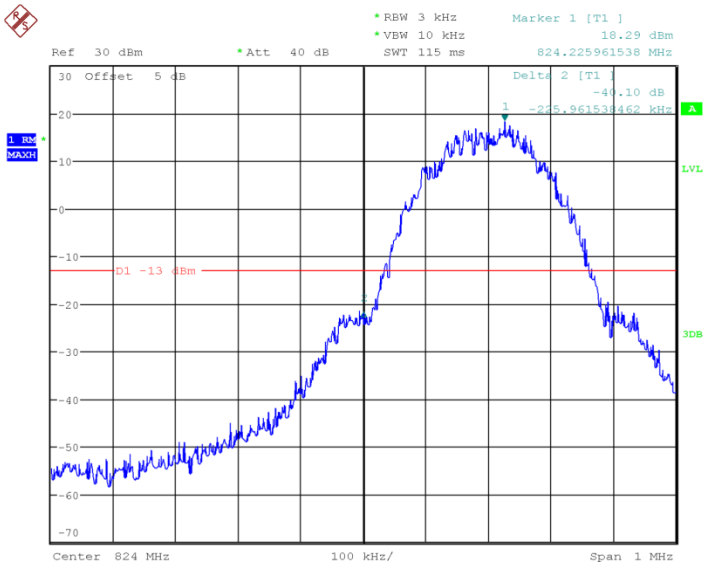


Channel 128- LOW BAND EDGE BLOCK

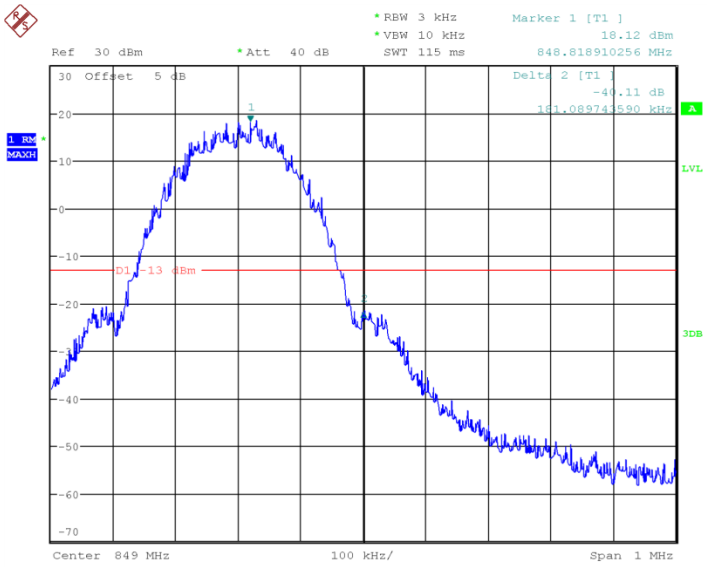


Channel 251- HIGH BAND EDGE BLOCK

EDGE 850

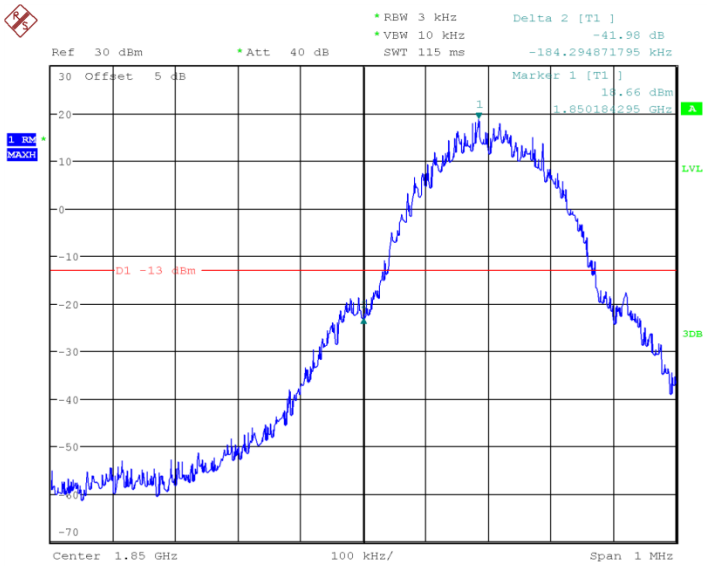


Channel 128- LOW BAND EDGE BLOCK

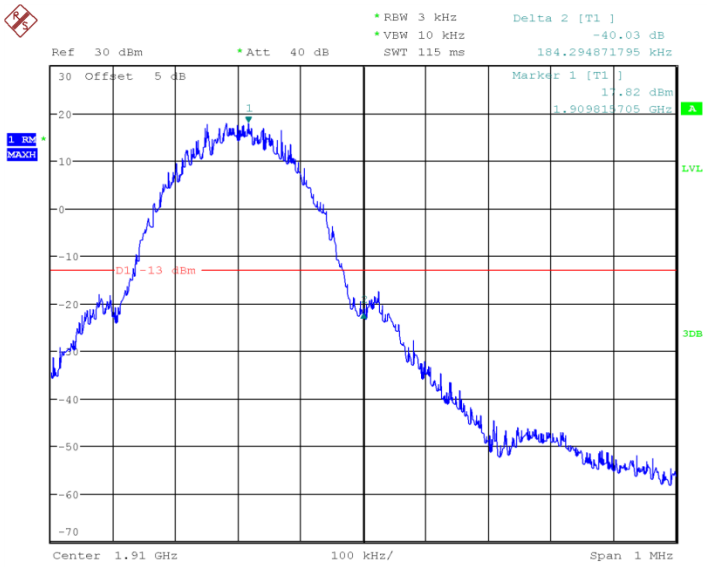


Channel 251- HIGH BAND EDGE BLOCK

GSM 1900

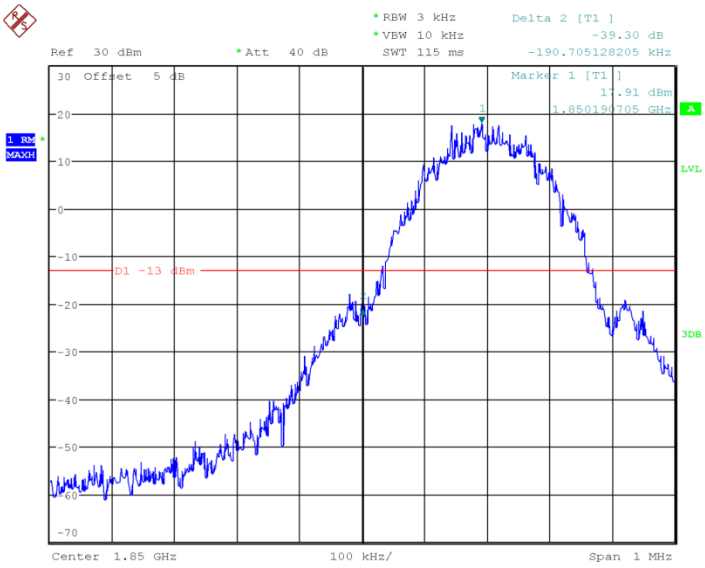


Channel 512- LOW BAND EDGE BLOCK

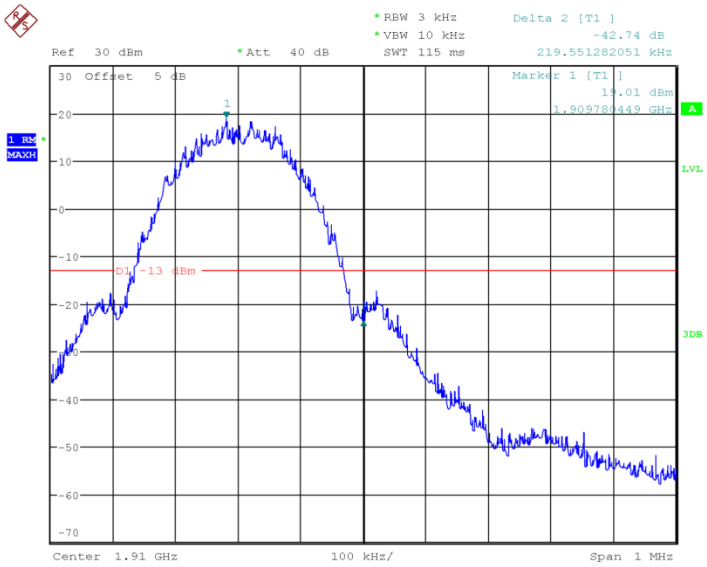


Channel 810- HIGH BAND EDGE BLOCK

GPRS 1900

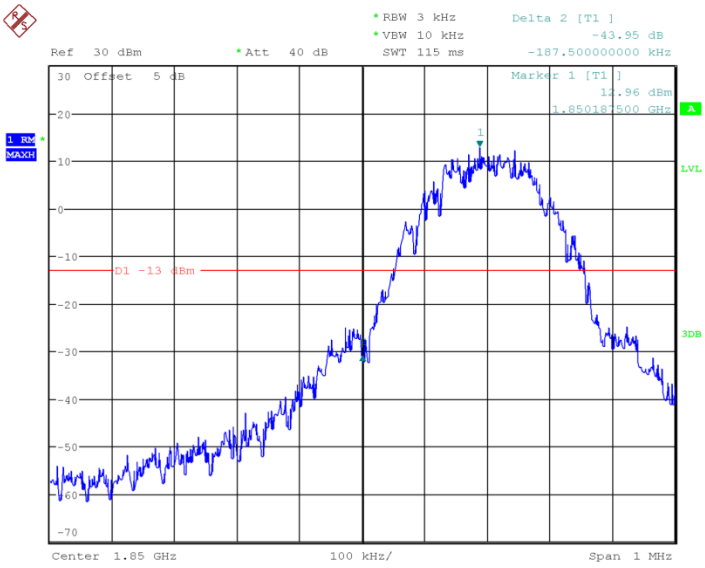


Channel 512- LOW BAND EDGE BLOCK

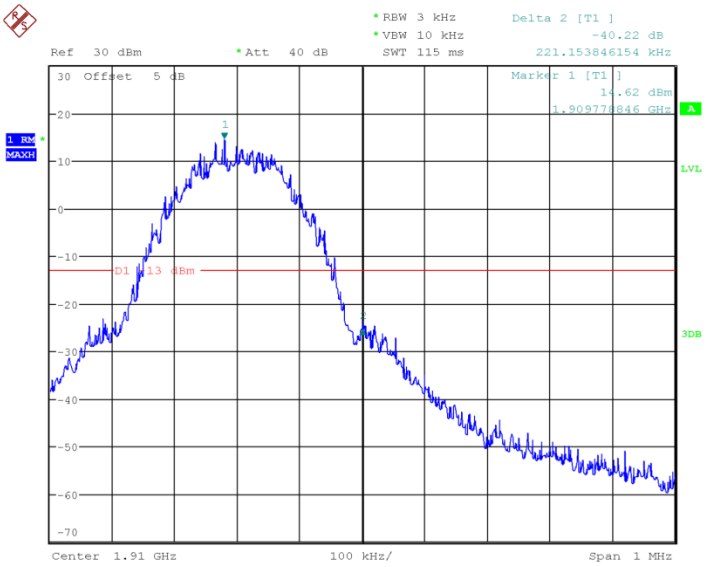


Channel 810- HIGH BAND EDGE BLOCK

EDGE 1900

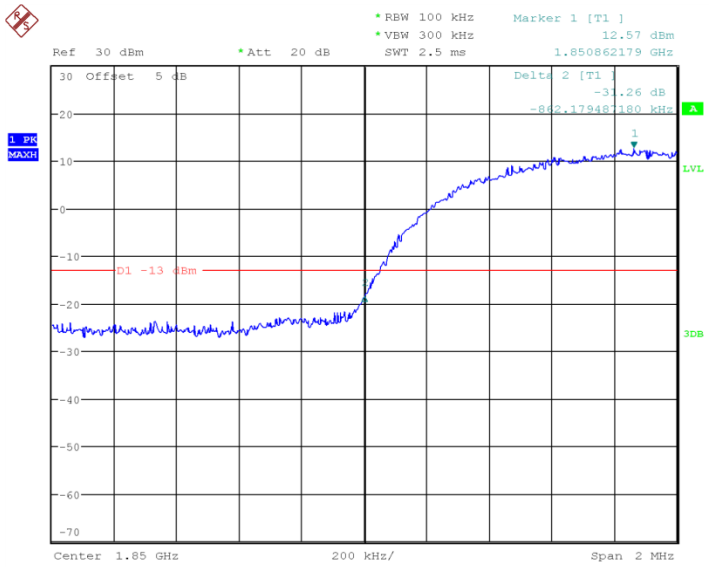


Channel 512- LOW BAND EDGE BLOCK

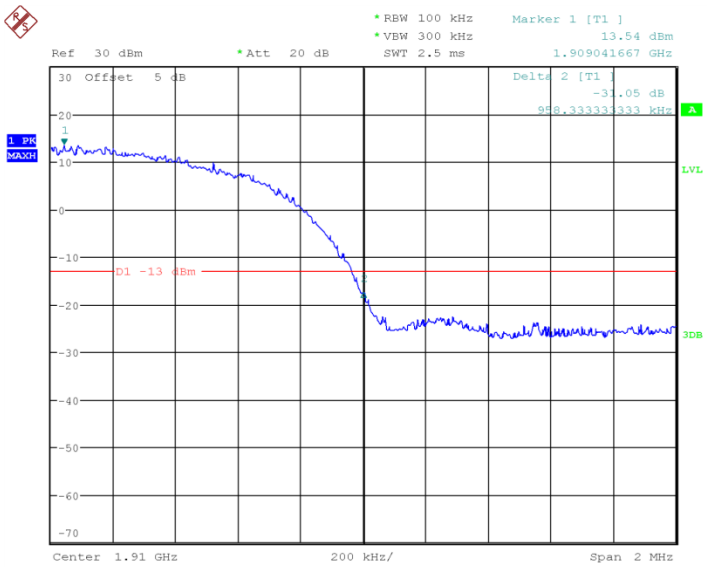


Channel 810- HIGH BAND EDGE BLOCK

WCDMA BAND II



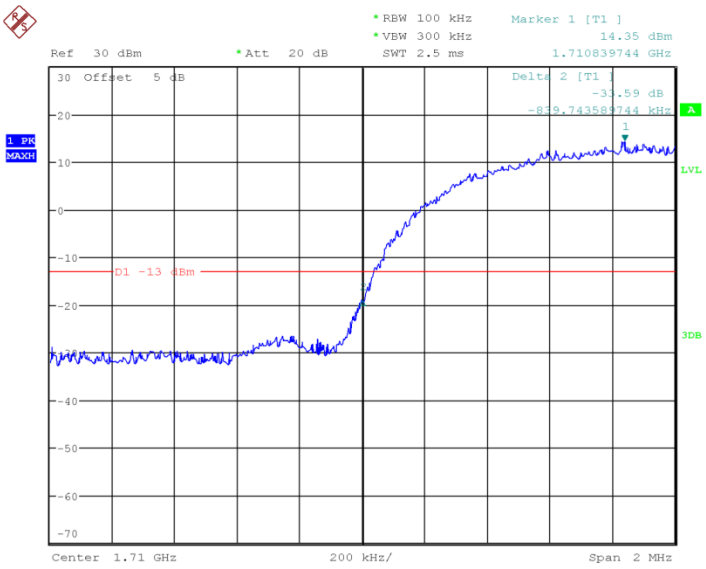
Channel 9262- LOW BAND EDGE BLOCK



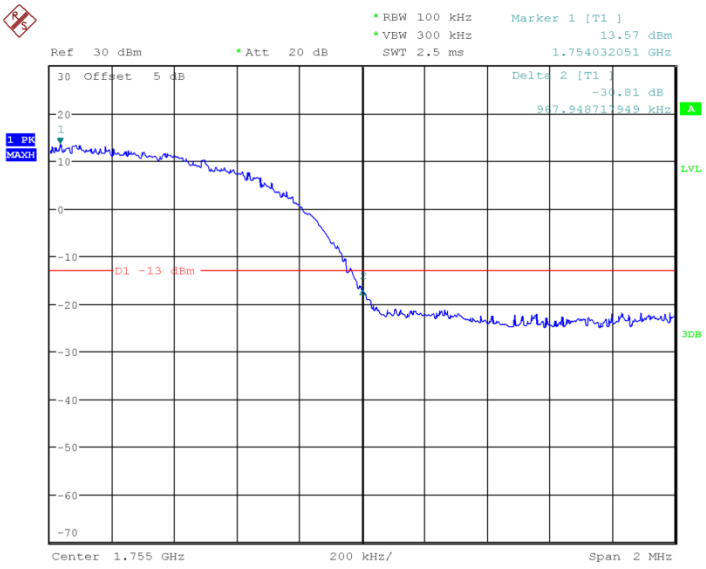
Channel 9538- HIGH BAND EDGE BLOCK

Conclusion: PASS

WCDMA BAND IV



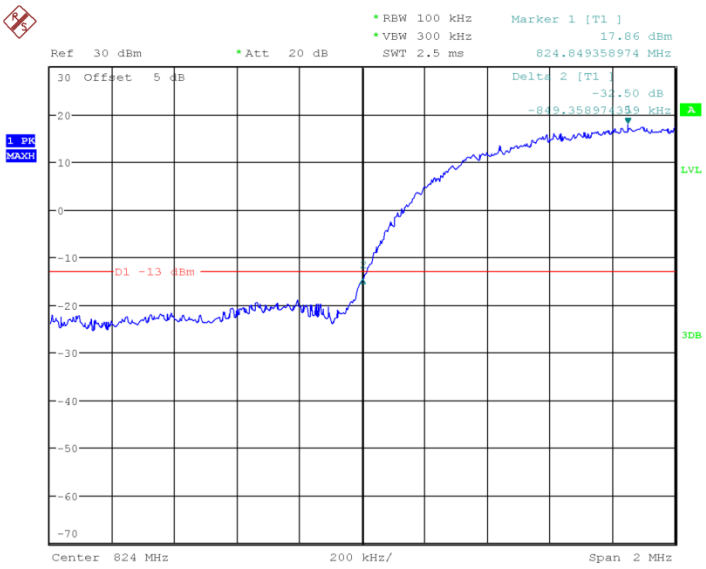
Channel 1312- LOW BAND EDGE BLOCK



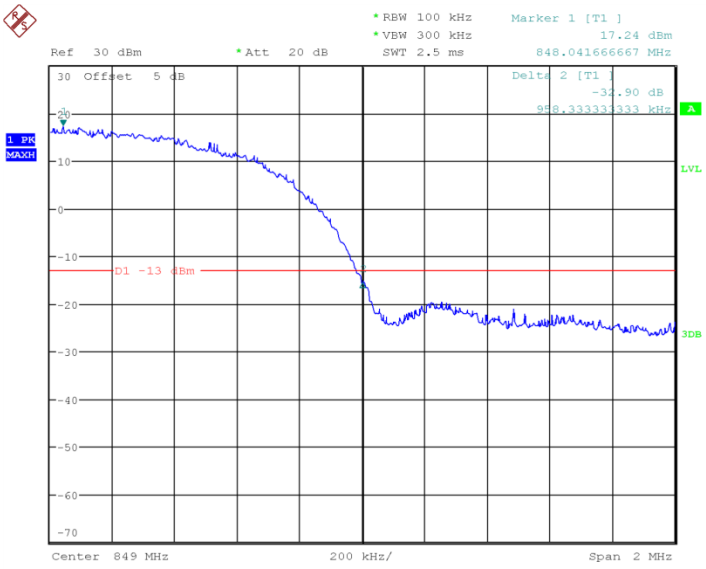
Channel 1513- HIGH BAND EDGE BLOCK

Conclusion: PASS

WCDMA BAND V



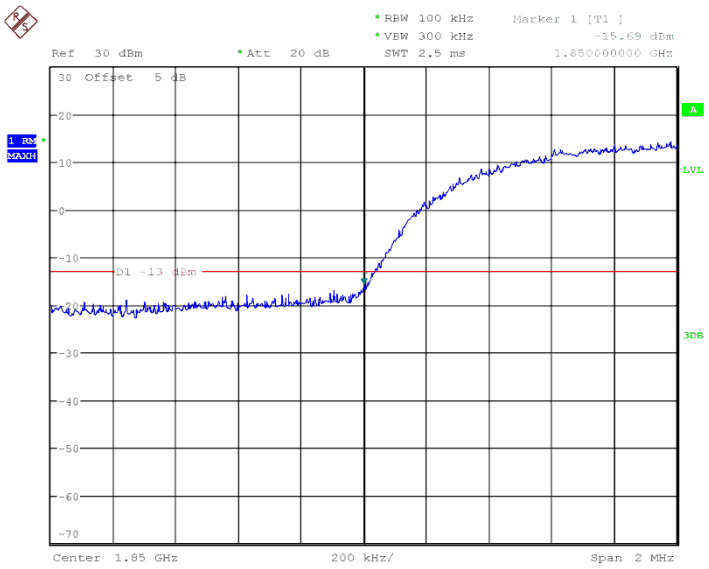
Channel 4132- LOW BAND EDGE BLOCK



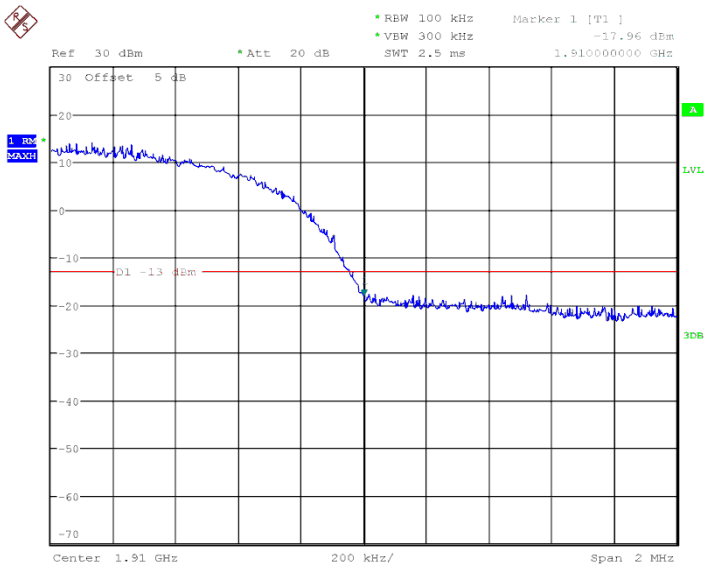
Channel 4233- HIGH BAND EDGE BLOCK

Conclusion: PASS

16QAM BANDII



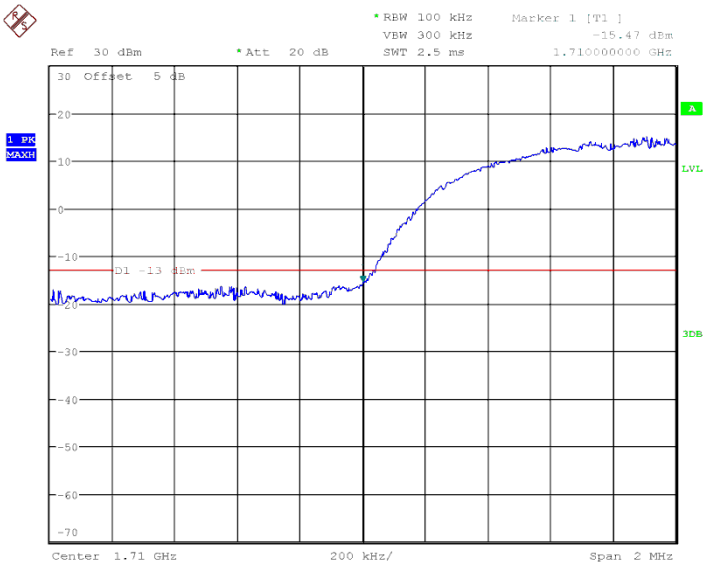
16QAM-Channel 9262- LOW BAND EDGE



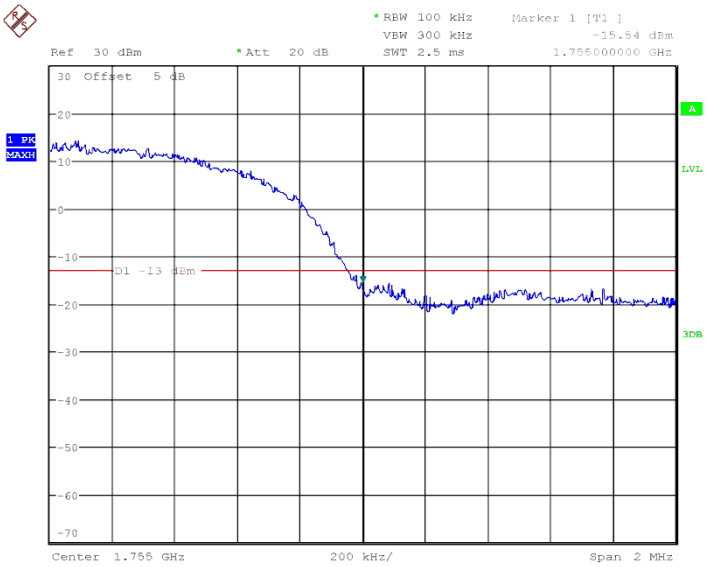
16QAM-Channel 9538- HIGH BAND EDGE

Conclusion: PASS

16QAM BAND IV



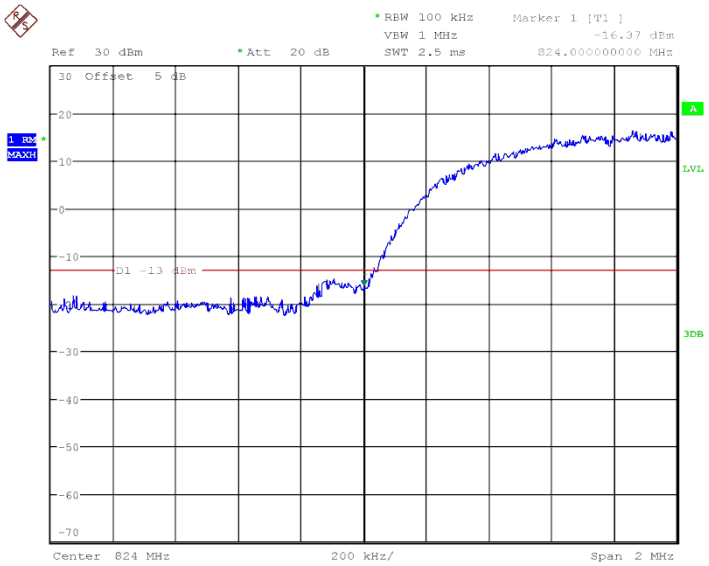
16QAM-Channel 1312- LOW BAND EDGE



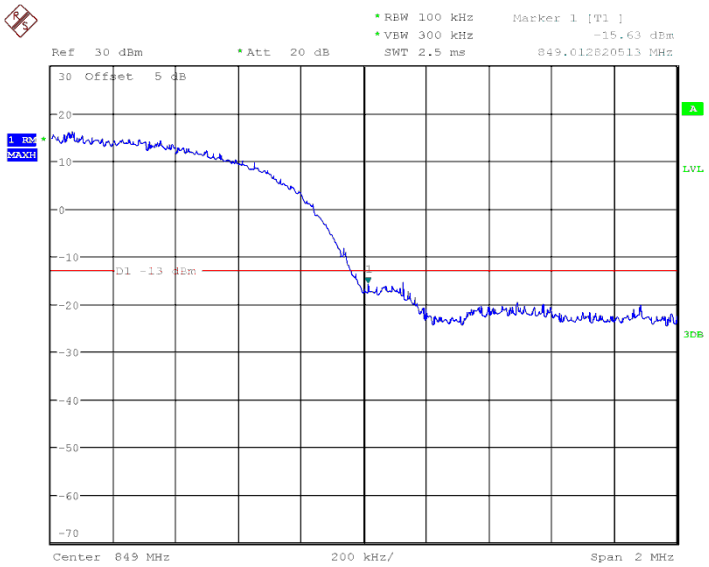
16QAM-Channel 1513- HIGH BAND EDGE

Conclusion: PASS

16QAM BAND V



16QAM-Channel 4132- LOW BAND EDGE



16QAM-Channel 4233- HIGH BAND EDGE

Conclusion: PASS

ANNEX A.6. FREQUENCY STABILITY

Method of test measurements please refer to KDB971168 D01 v02r02 clause 3.8

A.5.1.Method of Measurement and test procedures

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on mid channel of GSM850, PCS1900, WCDMA BANDII, WCDMA BANDIV and WCDMA BANDV, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50℃ to -30℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

A.5.2. Measurement Limit

A.5.2.1. For Hand carried battery powered equipment

According to the JTC standard the GSM frequency stability of the carrier shall be accurate to within 0.1ppm of the received frequency from the base station. And the WCDMA is 2.5ppm. This accuracy is sufficient to meet Sec.24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.35VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages was varied from 85% to 115%.

A.5.2.2. For equipment powered by primary supply voltage

According to the JTC standard the GSM frequency stability of the carrier shall be accurate to within 0.1ppm of the received frequency from the base station. And the WCDMA is 2.5ppm. This accuracy is sufficient to meet Sec.24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

A.5.3 Test results

GSM850Mid Channel/fc(MHz) 189/836.4

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	0.9	2091
3.8	-20	2.13	2091
3.8	-10	3.29	2091
3.8	0	3.36	2091
3.8	10	3.29	2091
3.8	20	3.55	2091
3.8	30	3.1	2091
3.8	40	4.78	2091
3.8	50	4.33	2091

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	6.33	2091
3.8	25	3.1	2091
4.35	25	3.1	2091

PCS1900 Mid Channel/fc(MHz) 661/1880

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	5.4	4700
3.8	-20	2.11	4700
3.8	-10	-3.34	4700
3.8	0	-3.56	4700
3.8	10	5.12	4700
3.8	20	11.54	4700
3.8	30	-2.98	4700
3.8	40	18.19	4700
3.8	50	-6.55	4700

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	-14.4	4700
3.8	25	4.2	4700
4.35	25	2.9	4700

WCDMA BAND II Mid Channel/fc(MHz) 9400 /1880

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	-6.09	4700
3.8	-20	-4.18	4700
3.8	-10	-10.89	4700
3.8	0	-9.05	4700
3.8	10	-4.76	4700
3.8	20	-6.04	4700
3.8	30	-6.1	4700
3.8	40	-6.62	4700
3.8	50	-3.11	4700

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	5.11	4700
3.8	25	4.85	4700
4.35	25	1.01	4700

WCDMA BAND IV Mid Channel/fc(MHz) 9400 /1880

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	-17.32	4331.5
3.8	-20	5.55	4331.5
3.8	-10	-0.54	4331.5
3.8	0	0.33	4331.5
3.8	10	-7.22	4331.5
3.8	20	0.45	4331.5

3.8	30	-6.03	4331.5
3.8	40	0.55	4331.5
3.8	50	-5.45	4331.5

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	11.98	4331.5
3.8	25	-0.56	4331.5
4.35	25	1.32	4331.5

WCDMA BAND V Mid Channel/fc(MHz) 4183/836.6

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	0.53	2091.5
3.8	-20	-1.98	2091.5
3.8	-10	-0.27	2091.5
3.8	0	1.04	2091.5
3.8	10	0.12	2091.5
3.8	20	0.47	2091.5
3.8	30	0.96	2091.5
3.8	40	-0.09	2091.5
3.8	50	0.82	2091.5

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	2.41	2091.5
3.8	25	0.61	2091.5
4.35	25	1.11	2091.5

Conclusion: PASS

16QAM BANDII Mid Channel/fc(MHz) 9400 /1880

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	-5.13	4700
3.8	-20	-4.27	4700
3.8	-10	-10.68	4700
3.8	0	-9.39	4700
3.8	10	-4.26	4700
3.8	20	-6.17	4700
3.8	30	-6.07	4700
3.8	40	-6.83	4700
3.8	50	-3.27	4700

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	5.31	4700
3.8	25	5.82	4700
4.35	25	2.15	4700

16QAM BANDIV Mid Channel/fc(MHz) 1413 /1732.6

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	-15.98	4331.5
3.8	-20	4.7	4331.5
3.8	-10	-5.08	4331.5
3.8	0	0.84	4331.5
3.8	10	-7.03	4331.5
3.8	20	0.73	4331.5
3.8	30	-6.88	4331.5

3.8	40	0.68	4331.5
3.8	50	-4.73	4331.5

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	12.01	4331.5
3.8	25	-0.78	4331.5
4.35	25	1.39	4331.5

16QAM BANDV Mid Channel/fc(MHz) 4183/836.6

Frequency Error VS Temperature

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.8	-30	0.63	2091.5
3.8	-20	-2.05	2091.5
3.8	-10	-0.39	2091.5
3.8	0	1.12	2091.5
3.8	10	0.56	2091.5
3.8	20	1.12	2091.5
3.8	30	0.88	2091.5
3.8	40	-0.14	2091.5
3.8	50	0.89	2091.5

Frequency Error VS Voltage

Power Supply (VDc)	Environment Temperature(℃)	Frequency error(Hz)	Limit (Hz)
3.5	25	2.48	2091.5
3.8	25	0.57	2091.5
4.35	25	1.32	2091.5

Conclusion: PASS

ANNEX A.7. CONDUCTED SPURIOUS EMISSION

A.7.1. GSM Measurement Method and test procedures

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 10 GHz.

2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.

3. The procedure to get the conducted spurious emission is as follows:
The trace mode is set to MaxHold to get the highest signal at each frequency;
Wait 25 seconds;Get the result.

4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

GSM 850 Transmitter

Channel	Frequency(MHz)
128	824.2
189	836.4
251	848.8

PCS 1900 Transmitter

Channel	Frequency(MHz)
512	1850.2
661	1880.0
810	1909.8

A.7.1.1. Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission 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.

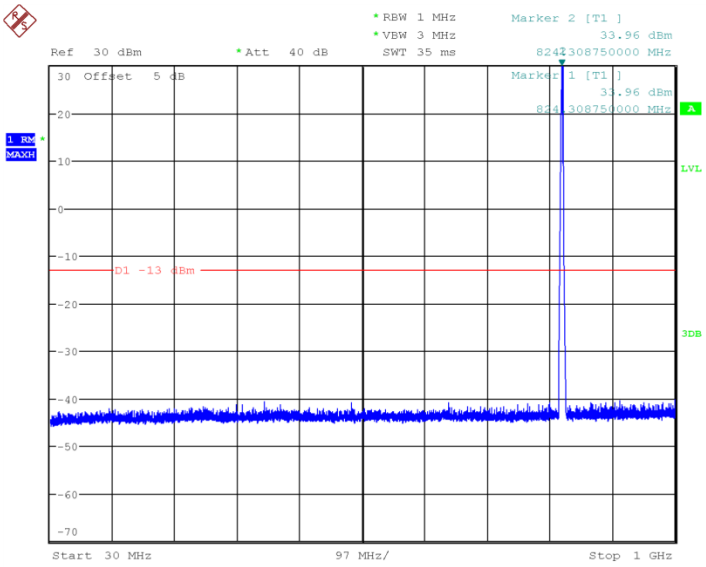
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A7.1.2. Measurement result

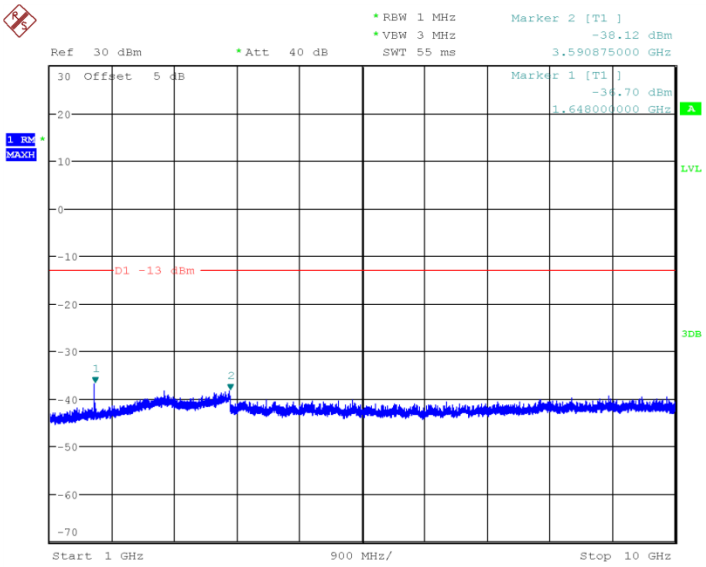
Spurious emission limit -13dBm.

Note: peak above the limit line is the carrier frequency.

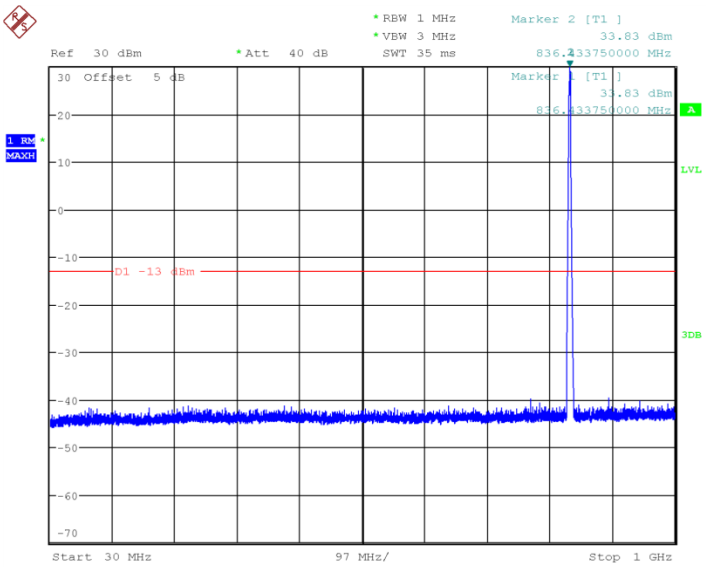
A7.1.2.1. GSM850



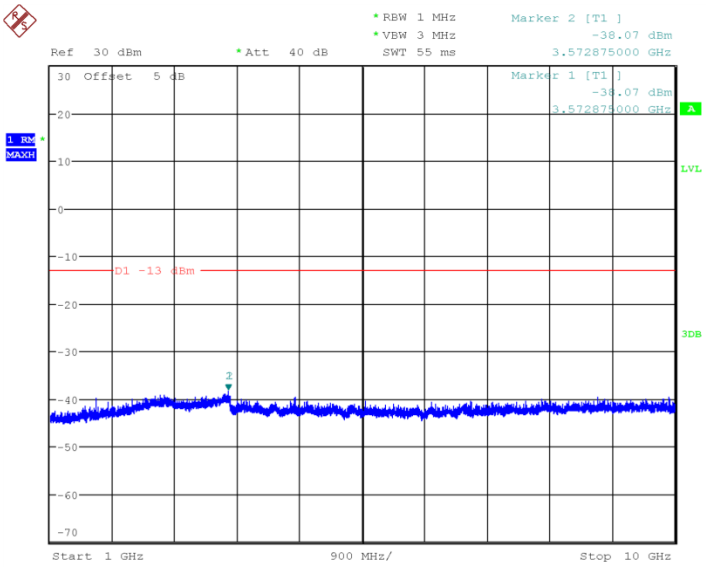
Channel 128: 30MHz~1GHz



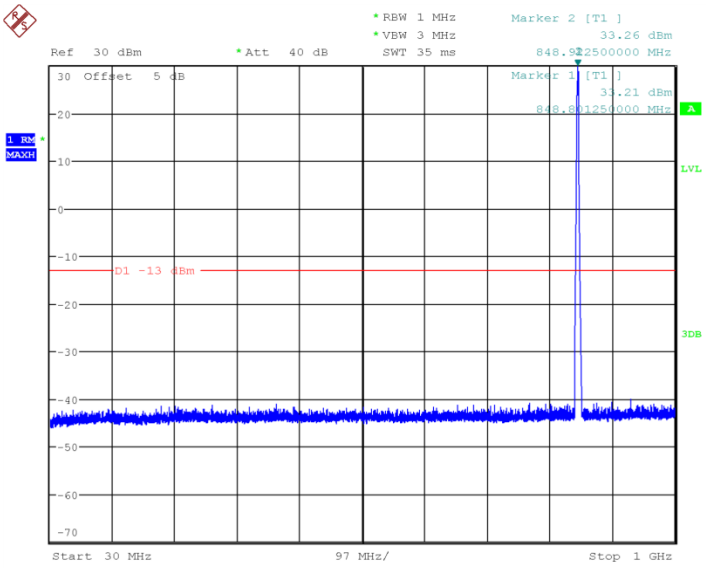
Channel 128: 1GHz~10GHz



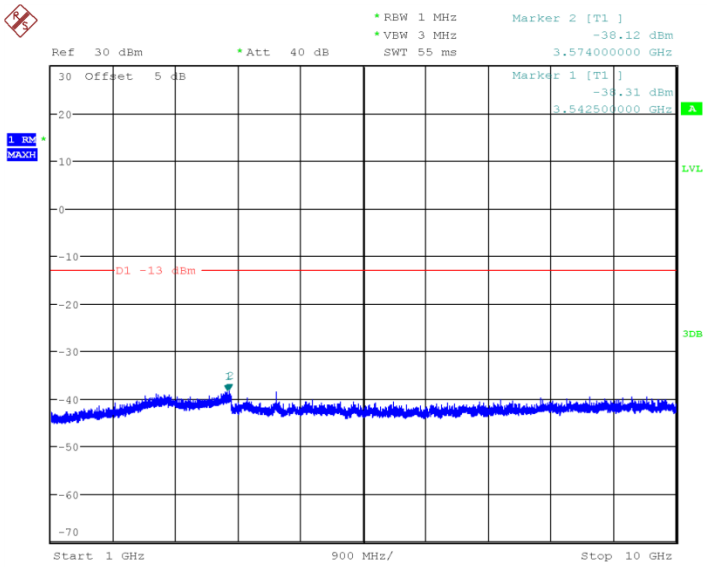
Channel 189: 30MHz~1GHz



Channel 189: 1GHz~10GHz

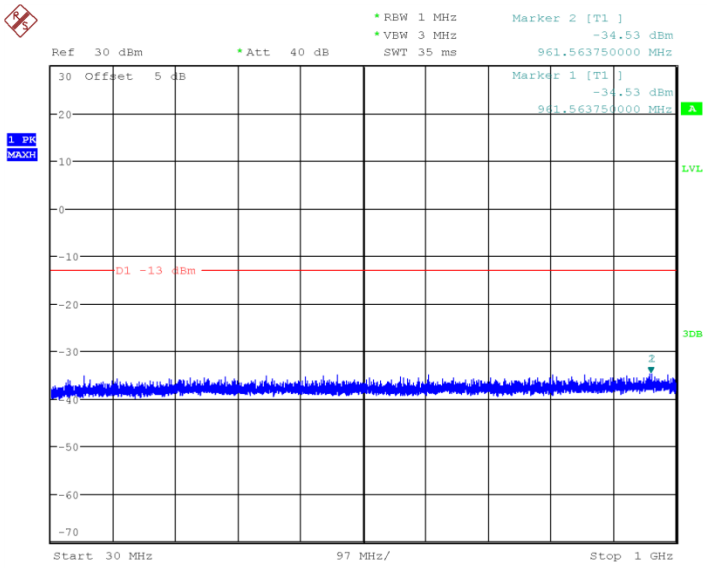


Channel 251: 30MHz~1GHz

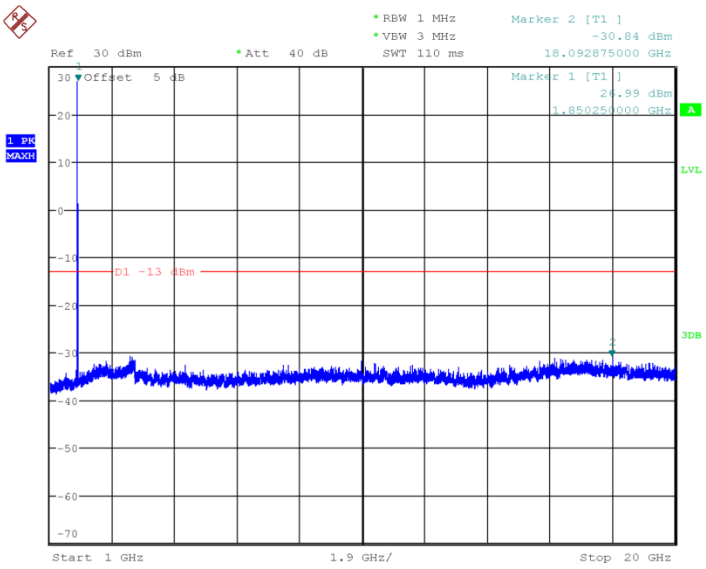


Channel 251: 1GHz~10GHz

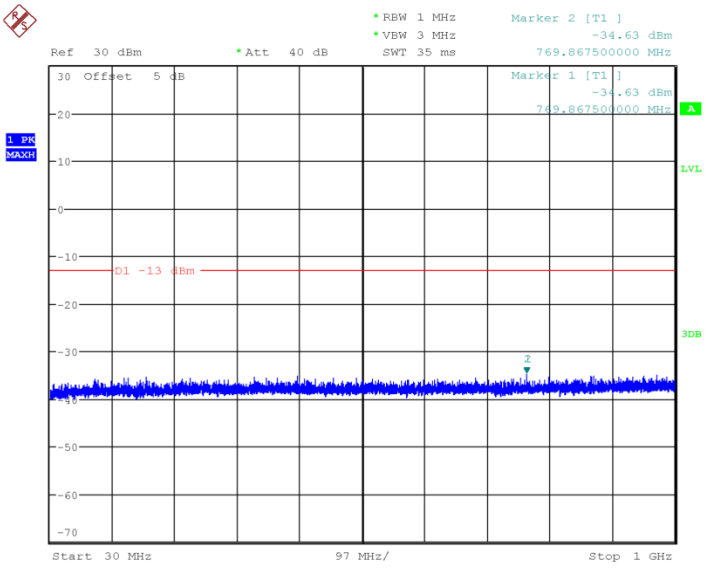
A7.1.2.2. GSM1900



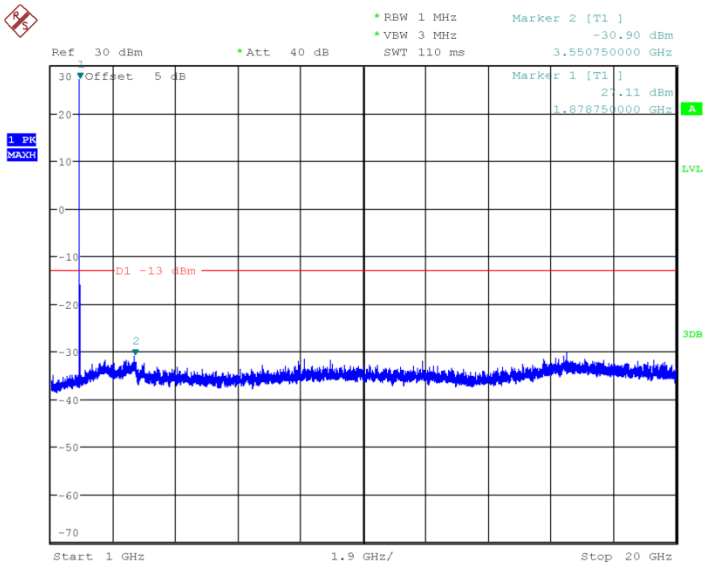
Channel 512: 30MHz~1GHz



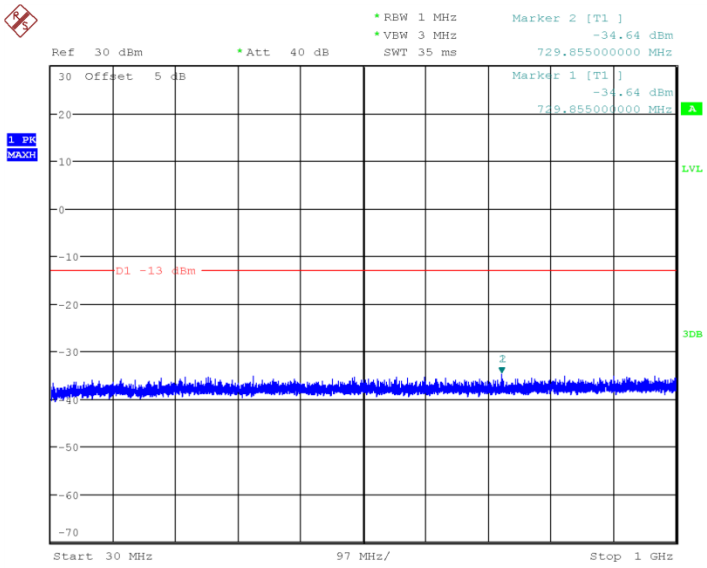
Channel 512: 1GHz~20GHz



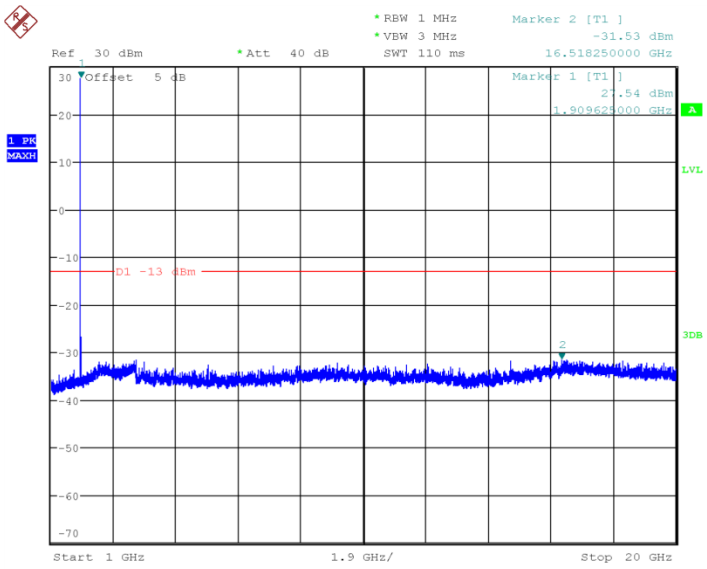
Channel 661: 30MHz~1GHz



Channel 661: 1GHz~20GHz



Channel 810: 30MHz~1GHz



Channel 810: 1GHz~20GHz

Conclusion: PASS

A7.2. WCDMA Measurement Method and test procedures

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of WCDMA Band II, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For WCDMA Band V, data taken from 30 MHz to 10GHz.

2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.

3. The procedure to get the conducted spurious emission is as follows:

The trace mode is set to MaxHold to get the highest signal at each frequency;

Wait 25 seconds;

Get the result.

4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

WCDMA Band II Transmitter

Channel	Frequency (MHz)
9262	1852.40
9400	1880.00

9538	1907.60

WCDMA Band IV Transmitter

Channel	Frequency (MHz)
1312	1712.4
1413	1732.6
1513	1752.6

WCDMA Band V Transmitter

Channel	Frequency (MHz)
4132	826.40
4183	836.60
4233	846.60

A 7.2.1. Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission 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.

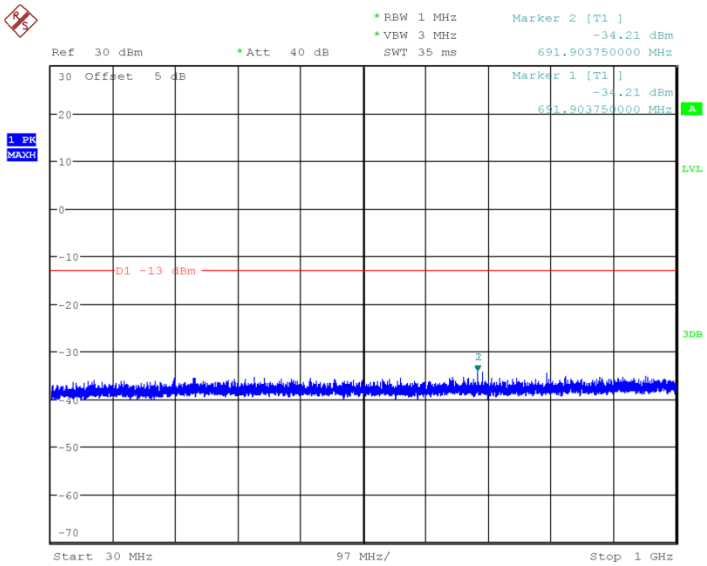
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A 7.2.2. Measurement result

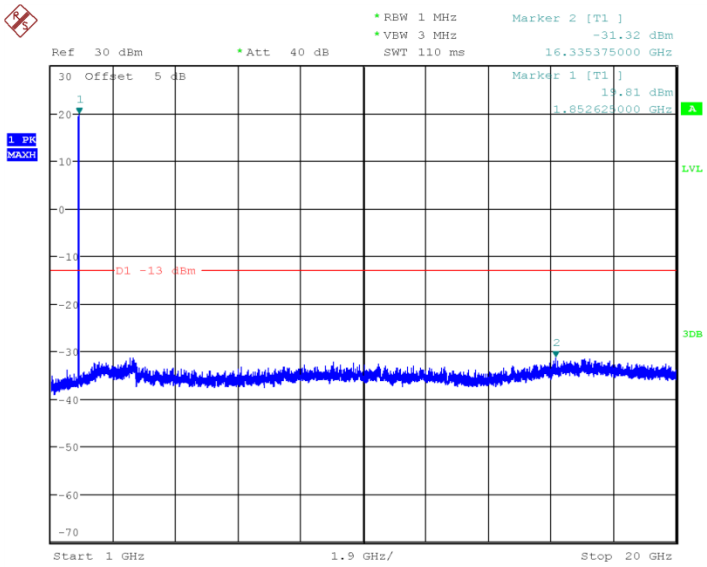
Spurious emission limit -13dBm.

Note: peak above the limit line is the carrier frequency.

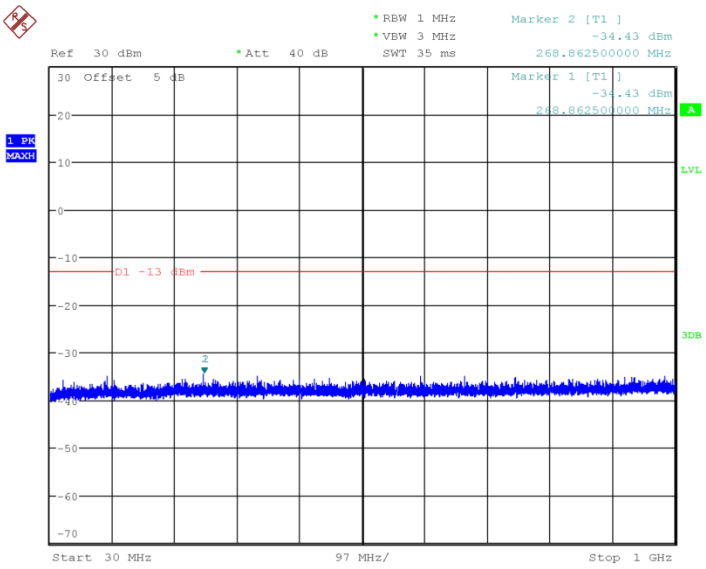
A 7.2.2.1. WCDMA Band II



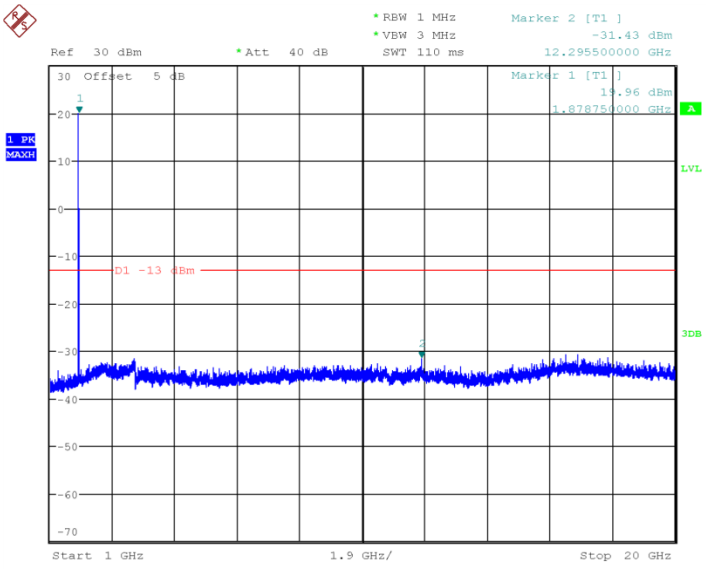
Channel 9262: 30MHz~1GHz



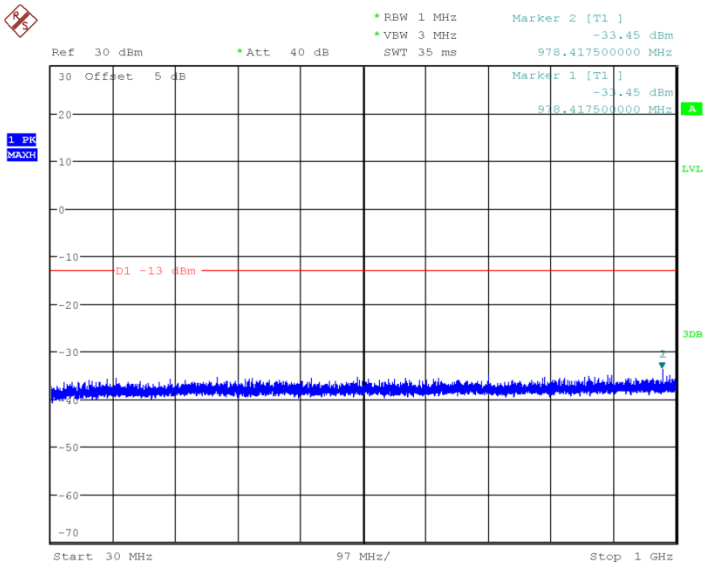
Channel 9262:1GHz~20GHz



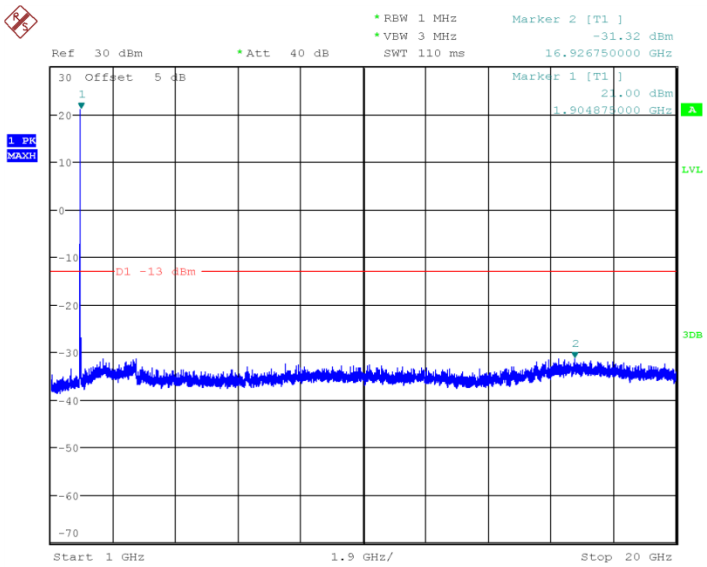
Channel 9400: 30MHz~1GHz



Channel 9400:1GHz~20GHz

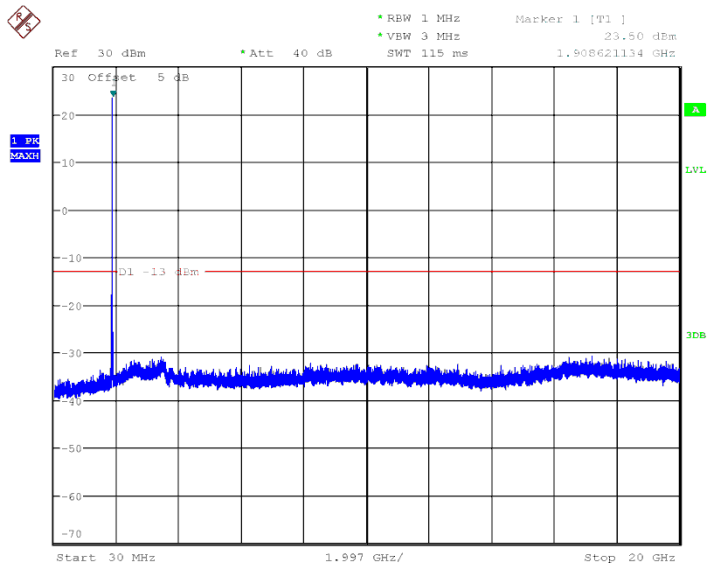


Channel 9538: 30MHz~1GHz



Channel 9538:1GHz~20GHz

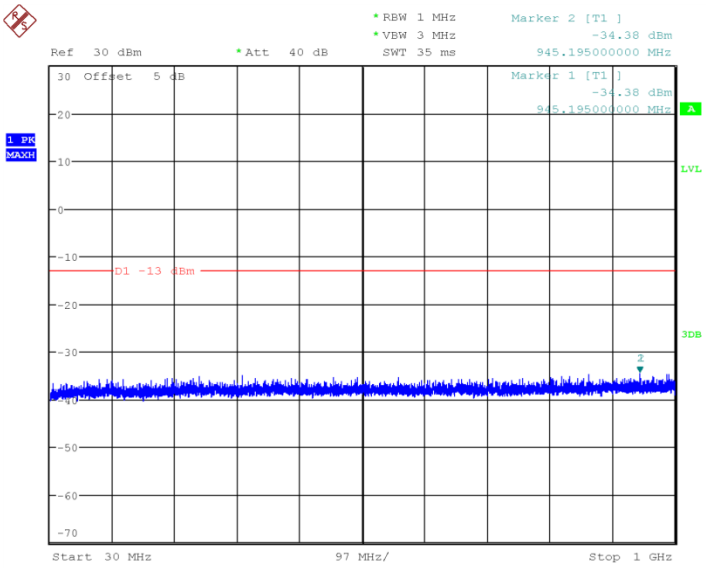
NOTE： We only test the worst case



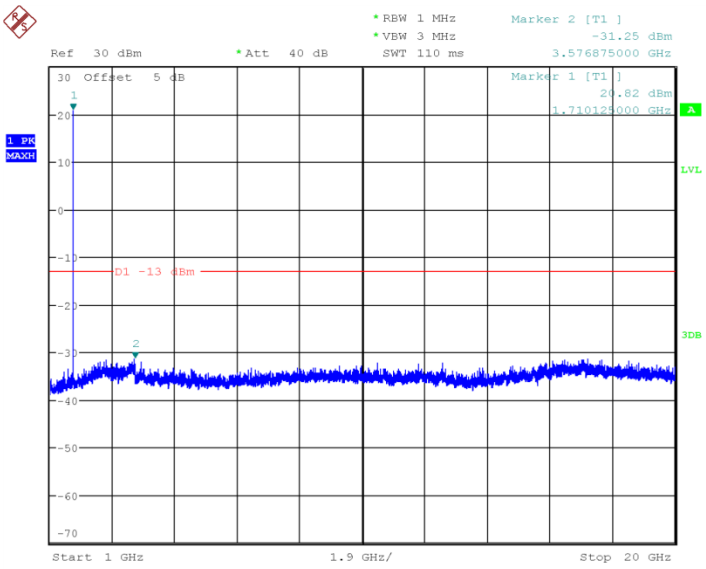
16QAM 30MHz~20GHz

Conclusion: PASS

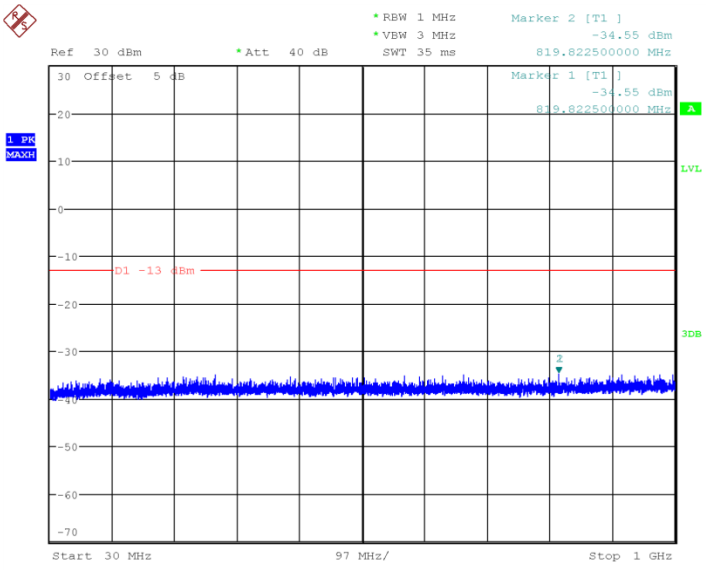
A 7.2.2.1. WCDMA Band IV



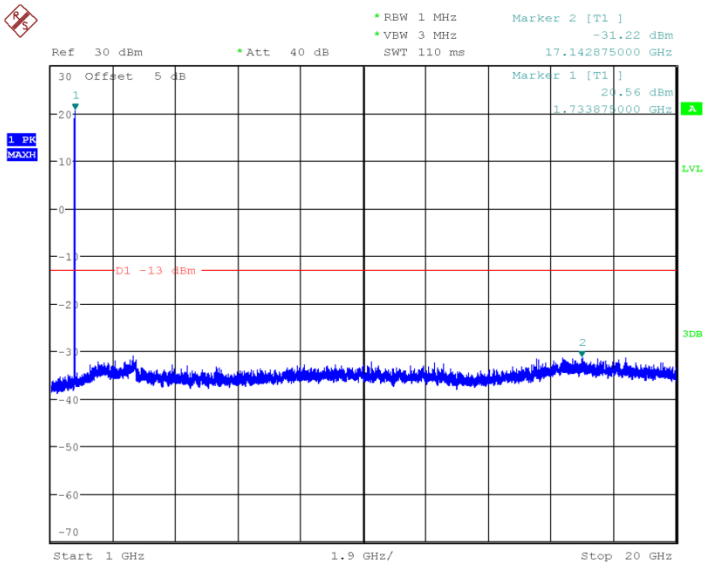
Channel 1312: 30MHz~1GHz



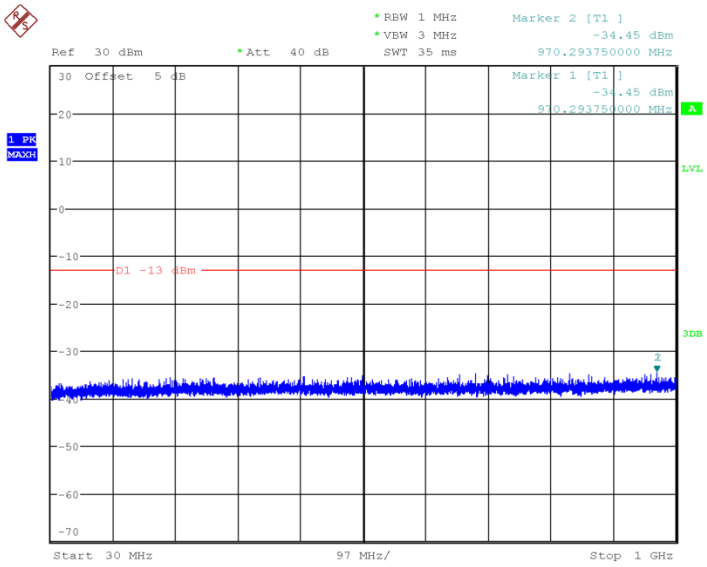
Channel 1312:1GHz~20GHz



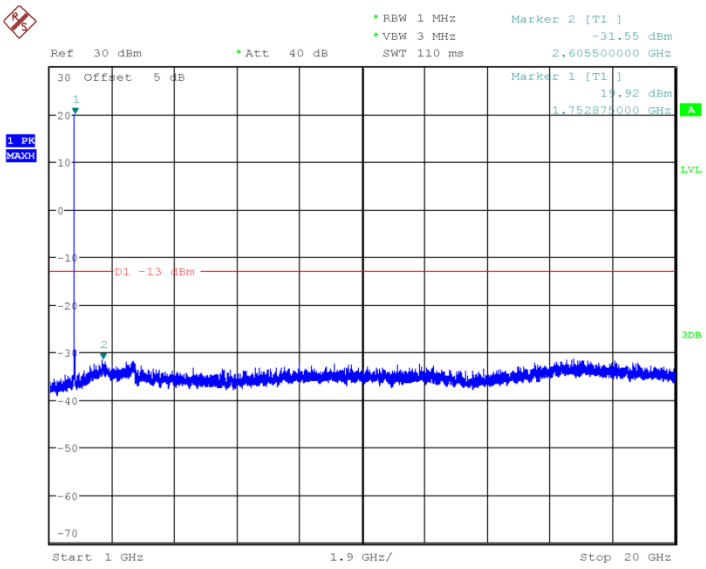
Channel 1413: 30MHz~1GHz



Channel 1413:1GHz~20GHz

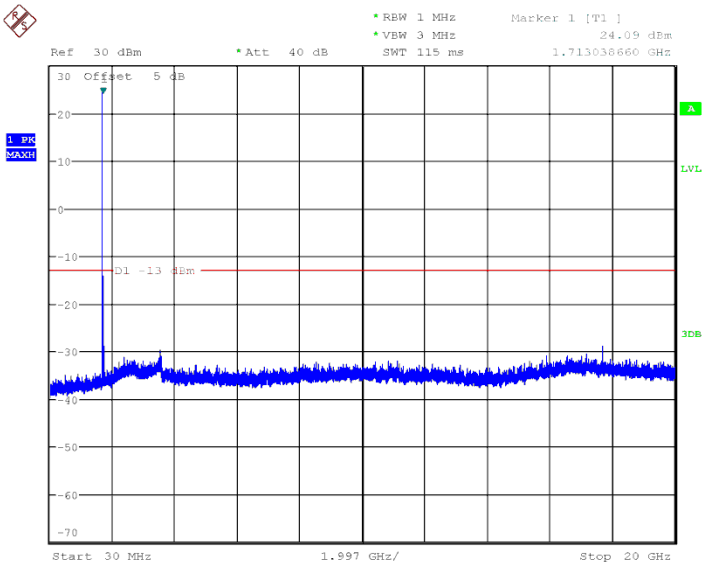


Channel 1513: 30MHz~1GHz



Channel 1513:1GHz~20GHz

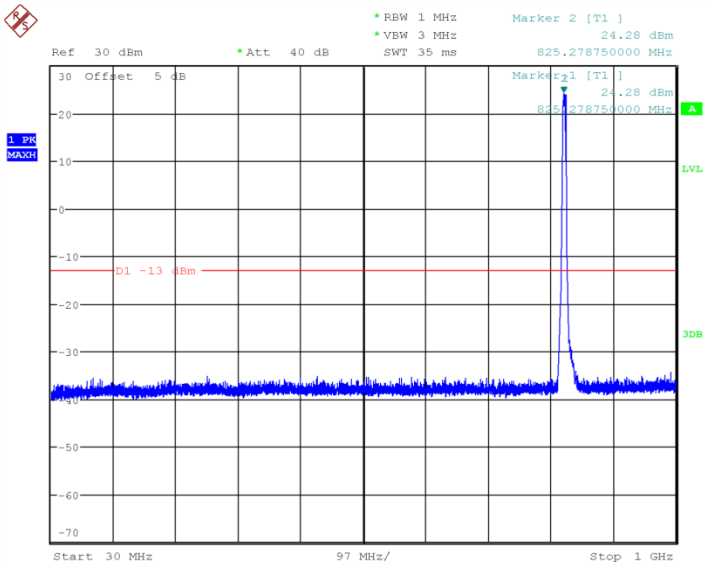
NOTE： We only test the worst case



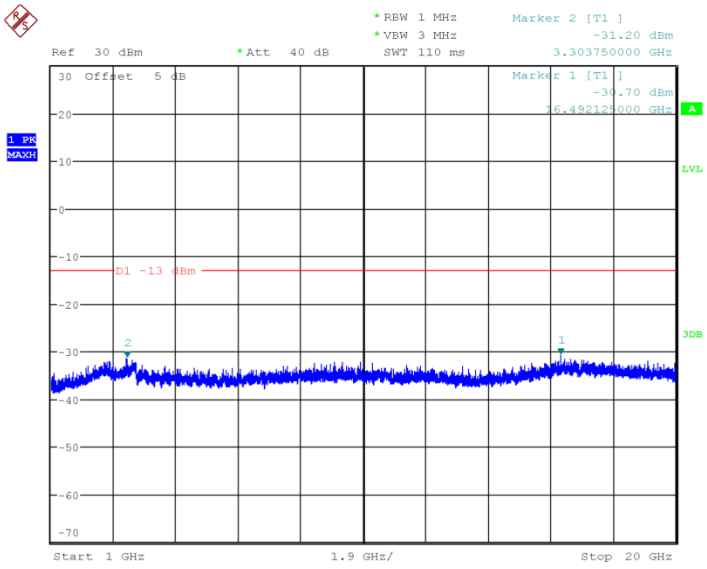
16QAM 30MHz~20GHz

Conclusion: PASS

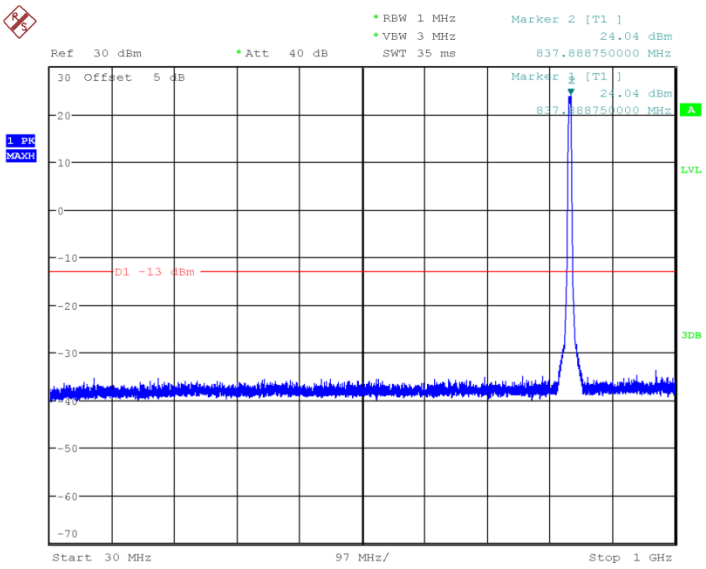
A 7.2.2.1. WCDMA Band V



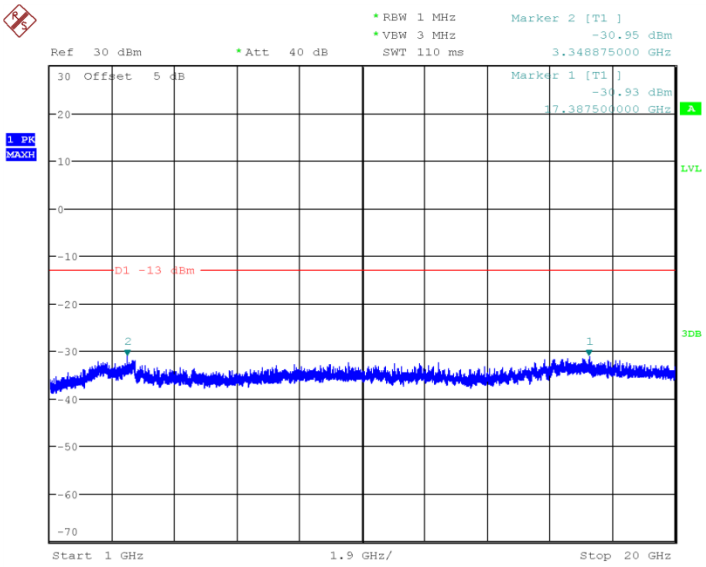
Channel 4132: 30MHz~1GHz



Channel 4132:1GHz~20GHz



Channel 4183: 30MHz~1GHz



Channel 4183:1GHz~20GHz