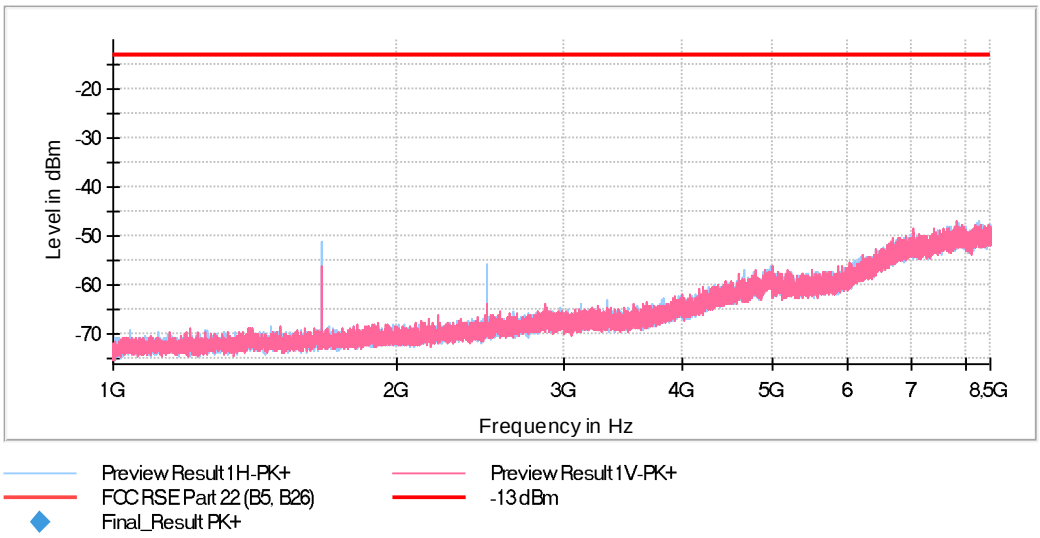
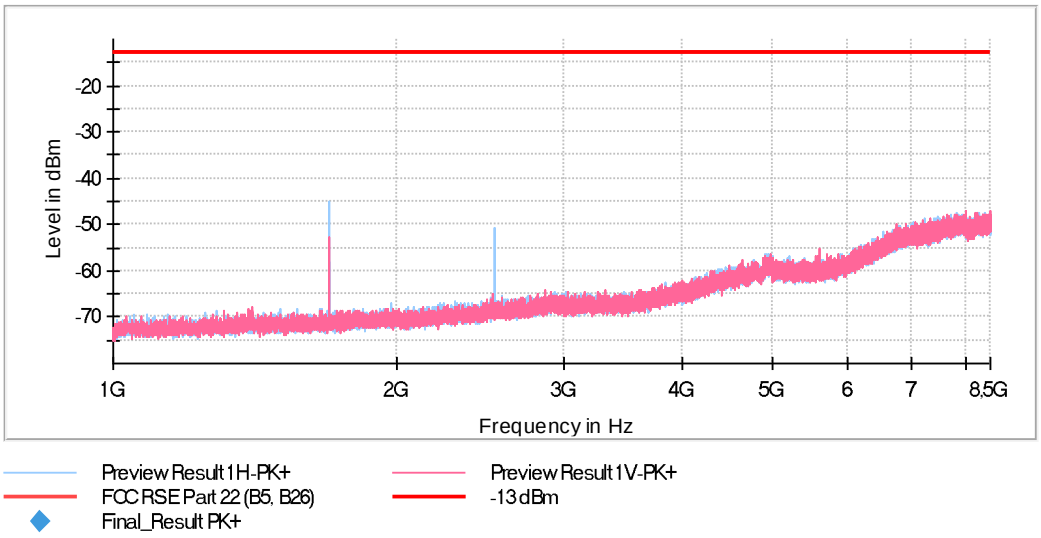
- MIDDLE CHANNEL:



- HIGH CHANNEL:



Appendix B: Test results for FCC 22 / RSS-132: LTE Cat NB2 Bands 5, 26

INDEX

TEST CONDITIONS

(*): Data provided by the Applicant.

POWER SUPPLY (*):

Vnormal: 3.8 Vdc.
Vminimum: 3 Vdc
Vmaximum: 5.5 Vdc

Type of Power Supply: Internal DC.

ANTENNA (*):

Bands	Gain (dBi)	Type
LTE Cat NB2 Band 5	+2.7	SMD
LTE Cat NB2 Band 26	+2.7	SMD

TEST FREQUENCIES:

LTE Cat NB2 Band 5. Pi/2-BPSK, Pi/4-QPSK, QPSK modulations:

Channel. Number (Frequency, MHz)		
Low	Middle	High
20402 (824.20)*	20525 (836.50)	20648 (848.80)*
*The outermost channel which is in compliance with Block edge testing.		

NOTE: The 824-849 MHz sub-band of the LTE Cat-NB2 Band 5 is completely included in the LTE Cat-NB2 Band 26, so the LTE Cat- NB2 Band 26 channels were tested to give conformity to the assigned block.

LTE Cat NB2 Band 26. Pi/2-BPSK, Pi/4-QPSK, QPSK modulations:

Channel. Number (Frequency, MHz)		
Low	Middle	High
26792 (824.2)*	26915 (836.5)	27038 (848.8)*
*The outermost channel which is in compliance with Block edge testing.		

RF Output Power

Limits

* FCC §2.1046 and FCC §22.913. The Effective Radiated Power (E.R.P) of mobile transmitter and auxiliary test transmitter must not exceed 7 Watts (38.45 dBm E.R.P.).

* RSS-132 Issue 4. Clause 5.4. The transmitter output power shall be measured in terms of average power. The equivalent radiated power (e.r.p.) shall not exceed 7 watts for mobile equipment and 3 watts for portable equipment.

The effective isotropic radiated power (e.i.r.p.) shall not exceed the limits specified in SRSP-503 for base station equipment.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the High PAPR during periods of continuous transmission.

Method

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The peak-to-average power ratio (PAPR) is measured using an attenuator, power splitter and spectrum analyser with a Complementary Cumulative Distribution Function implemented.

The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

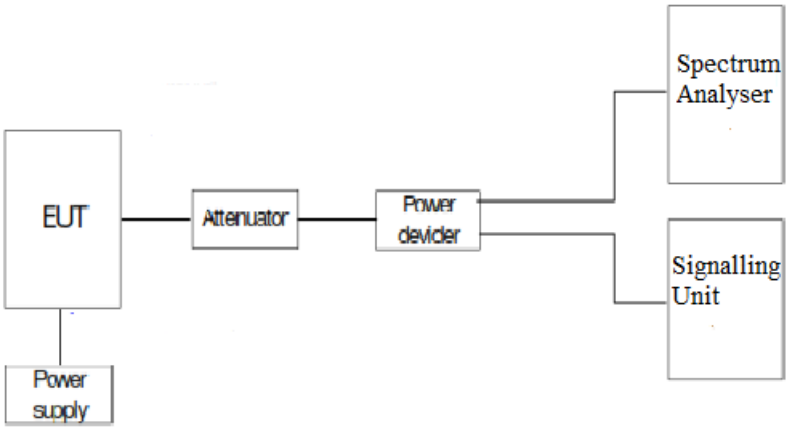
The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

E.R.P. = E.I.R.P. - 2.15 dB

Test Setup

1. CONDUCTED AVERAGE POWER:

2. PEAK-TO-AVERAGE POWER RATIO (PAPR) and Conducted Average power:


Spectrum Analyser
EUT
Attenuator
Power devicler
Signalling Unit
Power supply

Results

1. CONDUCTED AVERAGE POWER

LTE Cat NB2 Band 26:

Preliminary measurements determined the worst case of RF Power is Middle Channel, Pi/4-QPSK, BW=15 kHz, Tone Number=1, Tone Offset=0, MSC/TBS=3.

CHANNEL	FREQUENCY (MHz)	MODULATION	BW	Tone Number	Tone Offset (Start SubCarrier)	MCS / TBS	AVERAGE POWER (dBm)
Low 26792	824.2 MHz	Pi/2-BPSK	3.75 kHz	1	0	0	22.3
				1	47	0	22.34
			15 kHz	1	0	0	22.33
				1	11	0	22.34
		Pi/4-QPSK	3.75 kHz	1	0	3	22.41
				1	47	3	22.4
			15 kHz	1	0	3	22.4
				1	11	3	22.38
		QPSK	15 kHz	3	0	5	22.28
				3	6	5	22.34
				6	0	5	21.51
				6	6	5	21.43
				12	0	5	20.42
Middle 26915	836.50 MHz	Pi/2-BPSK	3.75 kHz	1	0	0	22.35
				1	47	0	22.32
			15 kHz	1	0	0	22.39
				1	11	0	22.41
		Pi/4-QPSK	3.75 kHz	1	0	3	22.39
				1	47	3	22.43
			15 kHz	1	0	3	22.44
				1	11	3	22.43
		QPSK	15 kHz	3	0	5	22.3
				3	6	5	22.32
				6	0	5	22.41
				6	6	5	21.47
				12	0	5	20.48
High 27038	848.8 MHz	Pi/2-BPSK	3.75 kHz	1	0	0	22.39
				1	47	0	22.32
			15 kHz	1	0	0	22.41
				1	11	0	22.42
		Pi/4-QPSK	3.75 kHz	1	0	3	22.41
				1	47	3	22.31
			15 kHz	1	0	3	22.39
				1	11	3	22.4
		QPSK	15 kHz	3	0	5	22.28
				3	6	5	22.42
				6	0	5	21.5
				6	6	5	21.44
				12	0	5	20.38

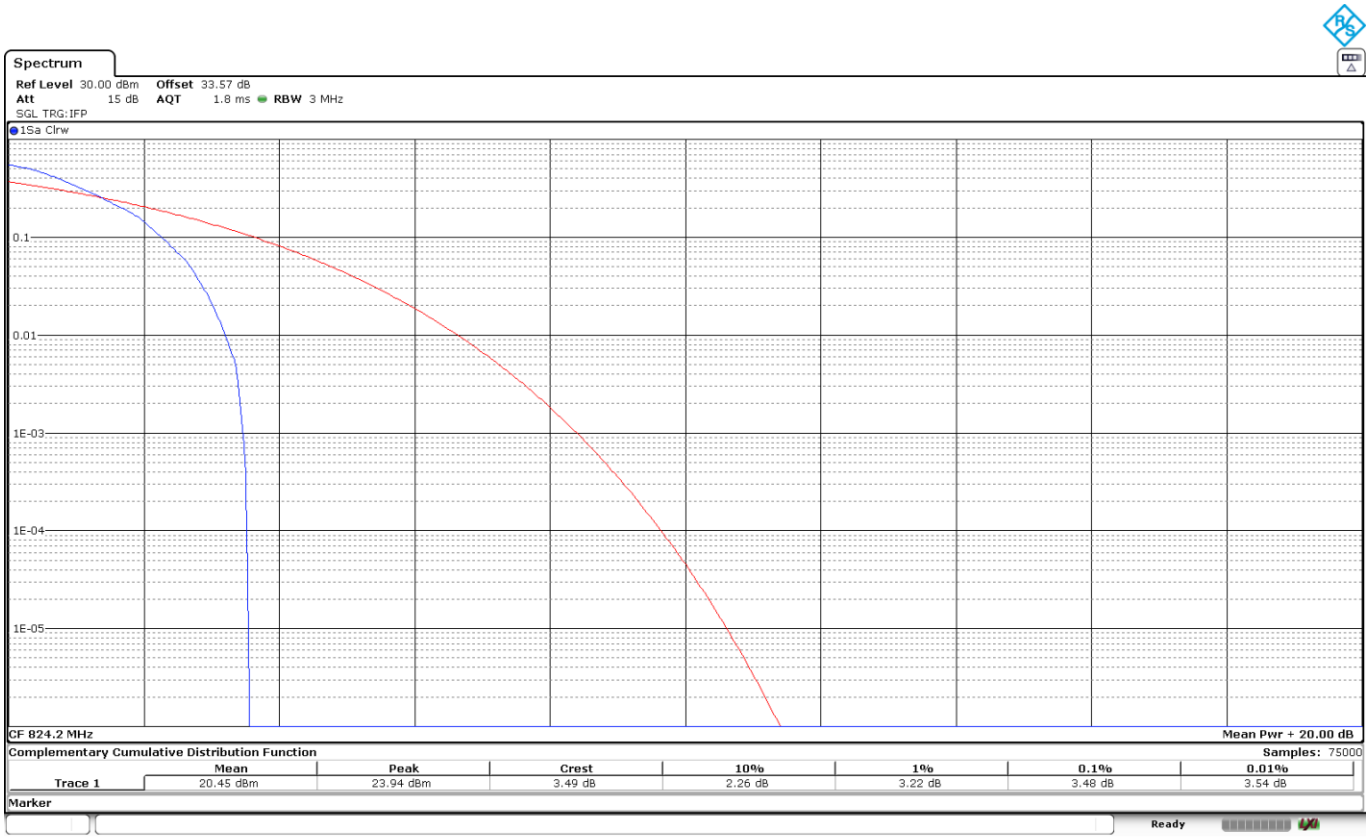
MAX POWER	COND. POWER AVG (dBm)	ANTENNA GAIN (dBi)	RAD. POWER AVG EIRP (dBm)	RAD. POWER AVG ERP (dBm)
LOW	22.41	2.7	25.11	22.96
MIDDLE	22.44	2.7	25.14	22.99
HIGH	22.42	2.7	25.12	22.97
MAX:	22.44		25.14	22.99

2. PEAK-TO-AVERAGE POWER RATIO (PAPR)

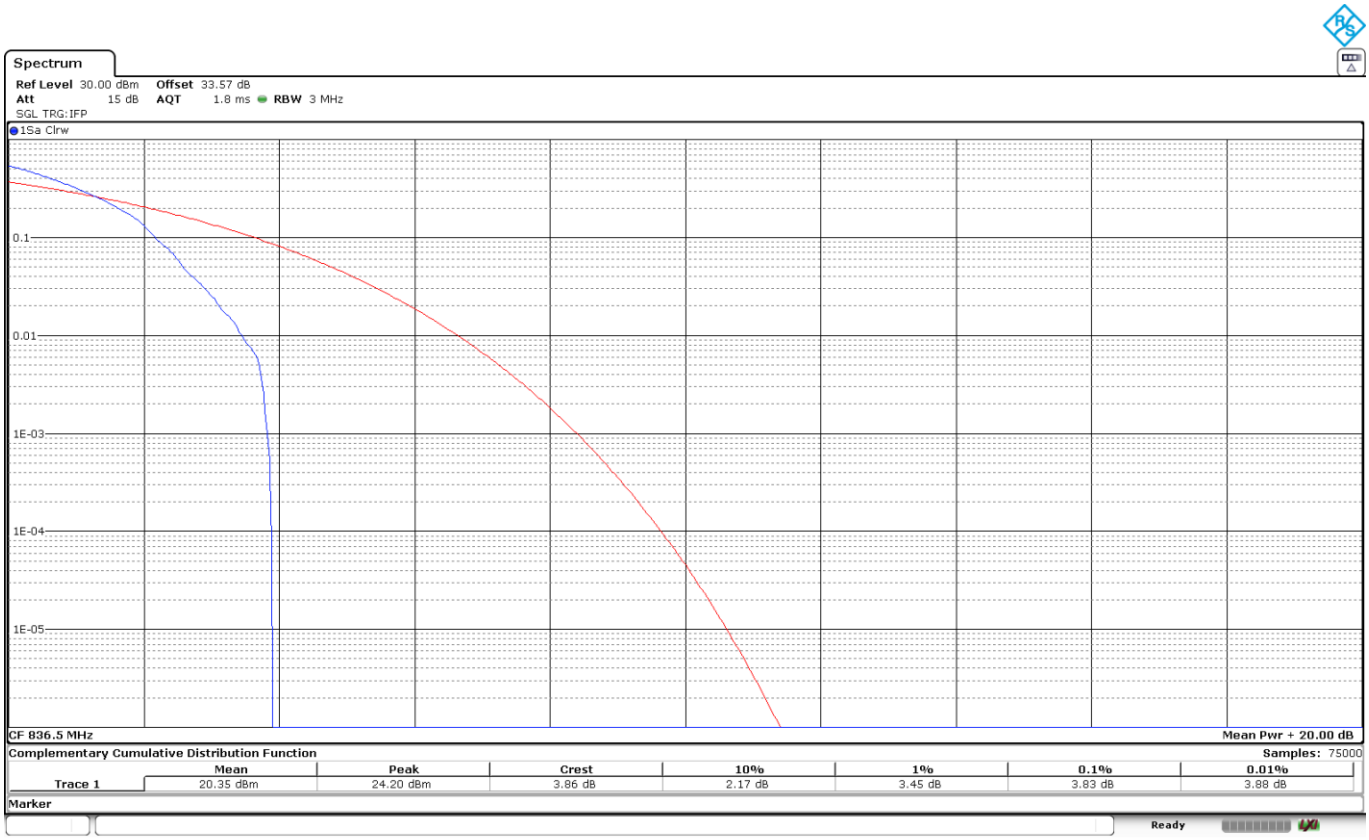
LTE Cat NB2 Band 26:

Preliminary measurements determined the worst-case of PAPR is High Channel, QPSK, BW=15 kHz, Tone Number=12, Tone Offset=0, MSC/TBS=5.

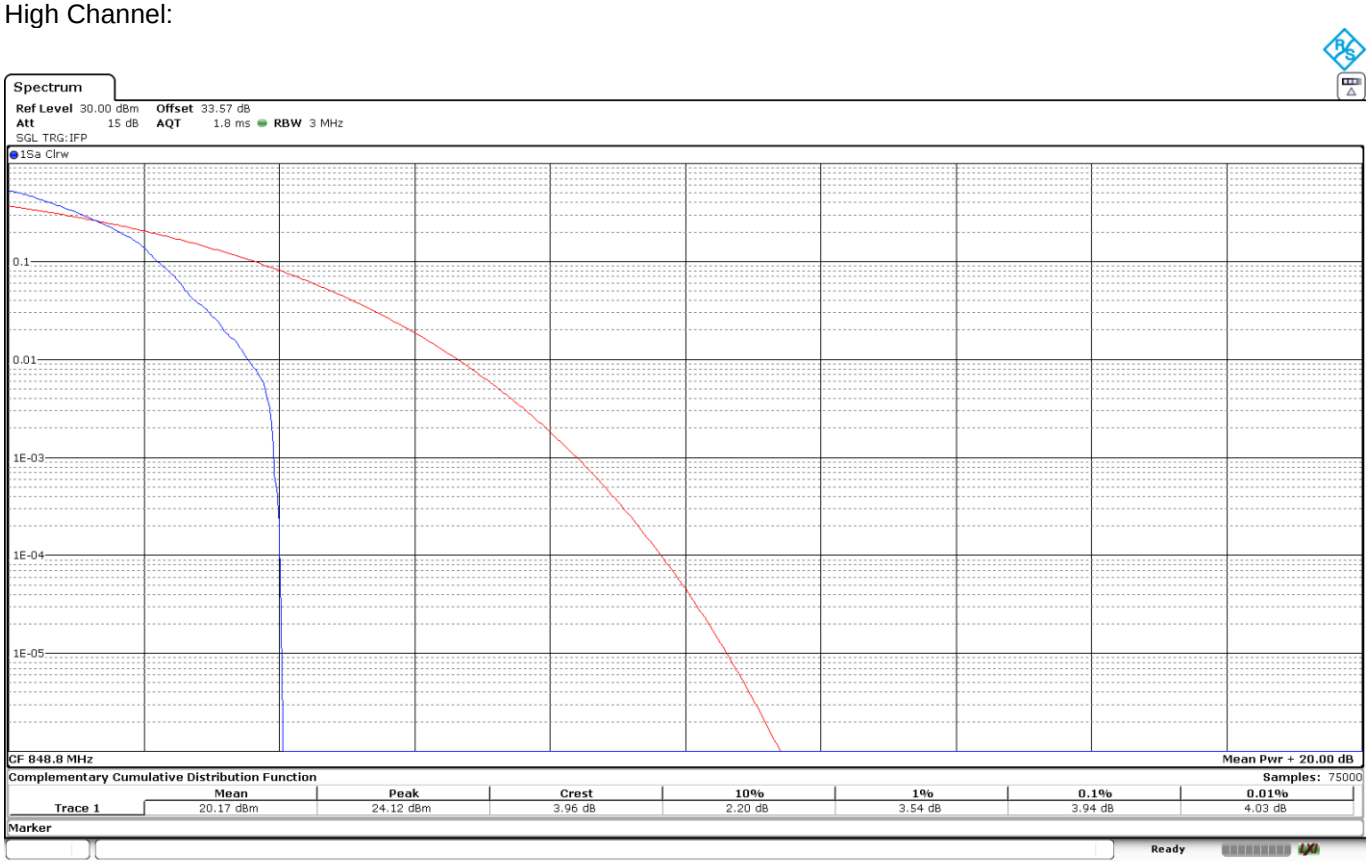
Low Channel:



Middle Channel:



High Channel:



16QAM	Low	Middle	High
PAPR (dB)	3.48	3.83	3.94

Measurement uncertainty (dB) <±1.11

Verdict

Pass

Frequency Stability

Limits

* FCC §2.1055 and §22.355. ±2.5 ppm for mobile stations operating in the range 821 to 896 MHz.

* RSS-132 Issue 4. Clause 5.3. The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within each of the sub-bands when tested at the temperature and supply voltage variations specified in RSS-Gen.

Method

The frequency tolerance measurements over temperature variations were made over the temperature range of -40ºC to +85ºC. The EUT was placed inside a climatic chamber and the temperature was raised hourly in 10ºC steps from -40ºC up to +85ºC.
The supply voltage was varied between 85% and 115% of nominal voltage.

Temperature and voltage range of testing has been extended to the maximum and minimum values declared by customer.

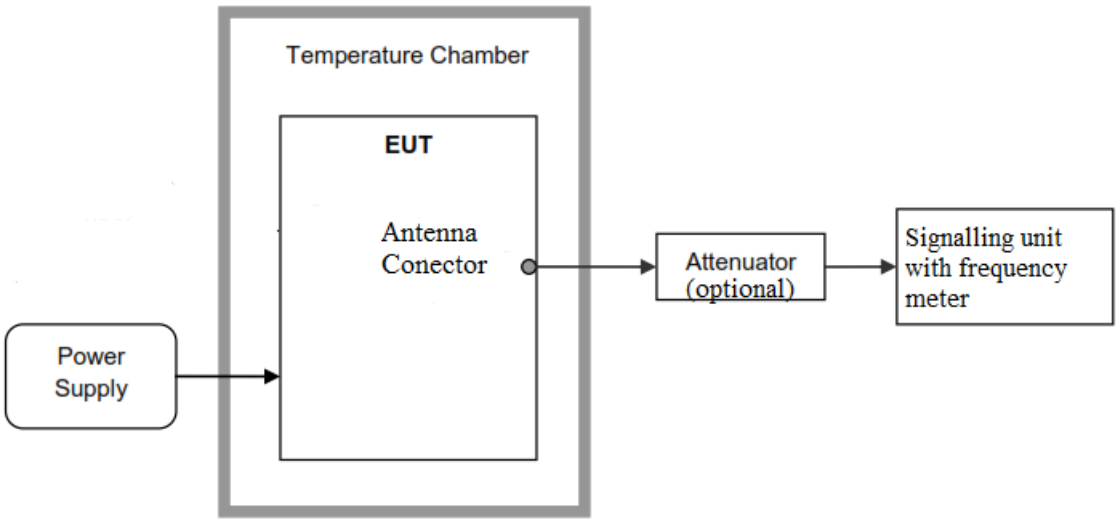
The EUT was set in “Radio Resource Control (RRC) mode” on the middle channel using the Universal Radio Communication tester R&S CMW500 and the maximum frequency error was measured using the built-in calibrated frequency meter.
The worst-case LTE mode for conducted power was used for the test.

In order to check that the frequency stability is sufficient such that the fundamental emissions stay within the authorized bands of operation, a reference point is established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the Low and High channels of operation are identified as fL and fH respectively. The worst-case frequency offset determined in the above methods is added or subtracted from the values of fL and fH to check that the resulting frequencies remain within the band.

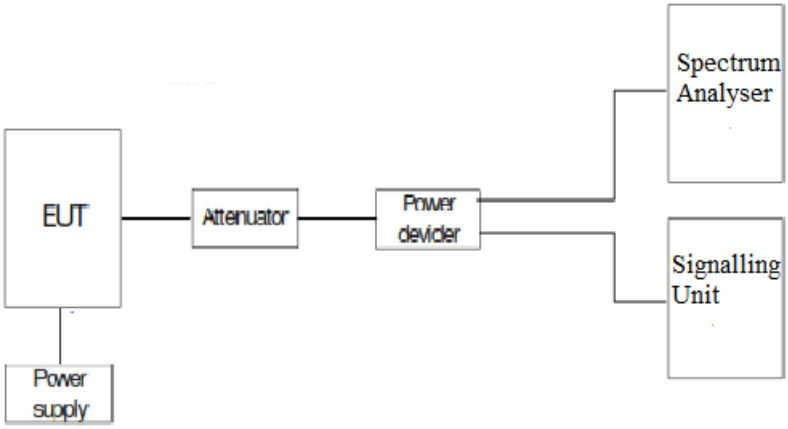
The reference point measurements were made at the RF output terminals of the EUT using an attenuator, power splitter and spectrum analyser. The EUT was controlled via the Universal Radio Communication tester R&S CMW500 selecting maximum transmission power of the EUT and different modes of modulation.

Test Setup

Frequency tolerance:



Reference points *f*L and *f*H:



Results

LTE Cat NB2 Band 26:

The worst case modulation in terms of Frequency Stability is QPSK, BW=15 kHz, Tone Number=3, Tone Offset=6, MSC/TBS=5.

1. Frequency Tolerance:

- **Frequency Stability over Temperature Variations:**

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)
+85	-10.81	-0.012922893
+80	-1.77	-0.002115959
+70	0.93	0.001111775
+60	18.01	0.021530185
+50	-18.64	-0.022283323
+40	-8.88	-0.01061566
+30	-20.53	-0.024542738
+20	-10.04	-0.012002391
+10	-6.44	-0.007698745
0	-14.39	-0.01720263
-10	-7.55	-0.009025702
-20	1.87	0.002235505
-30	-8.75	-0.010460251
-40	24.65	0.029468022

- **Frequency Stability over Voltage Variations.**

Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
Vmax	5.5	-7.32	-0.008750747
Vmin	3.0	-6.88	-0.008224746

2. Reference Frequency Points fL and fH:

The worst-case frequency offsets added or subtracted per band and bandwidth:

*f*L (MHz)	824.0214
*f*H (MHz)	848.9375

The reference frequency points fL and fH stay within the authorized blocks for the band above.

Measurement uncertainty (Hz) <± 249.55

Verdict: PASS

Modulation Characteristics

Limits

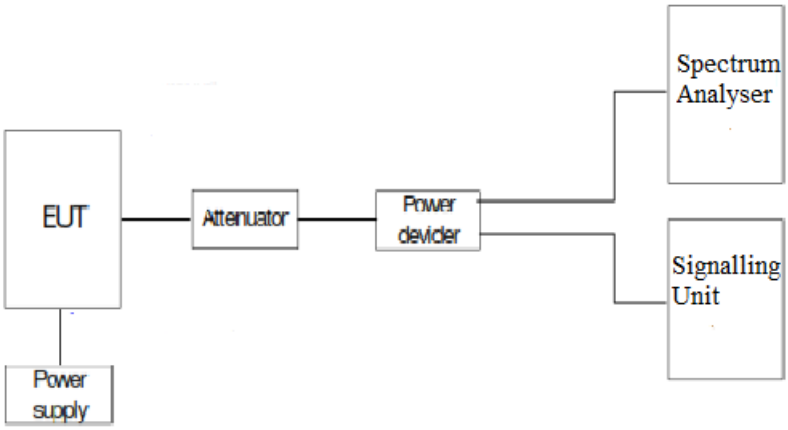
FCC §2.1047.

RSS-132. Clause 5.2: Equipment certified under this standard shall use digital modulation.

Method

For LTE NB2 the EUT operates with PI/2-BPSK, Pi/4-QPSK, QPSK modulations in which the information is digitized and coded into a bit stream.

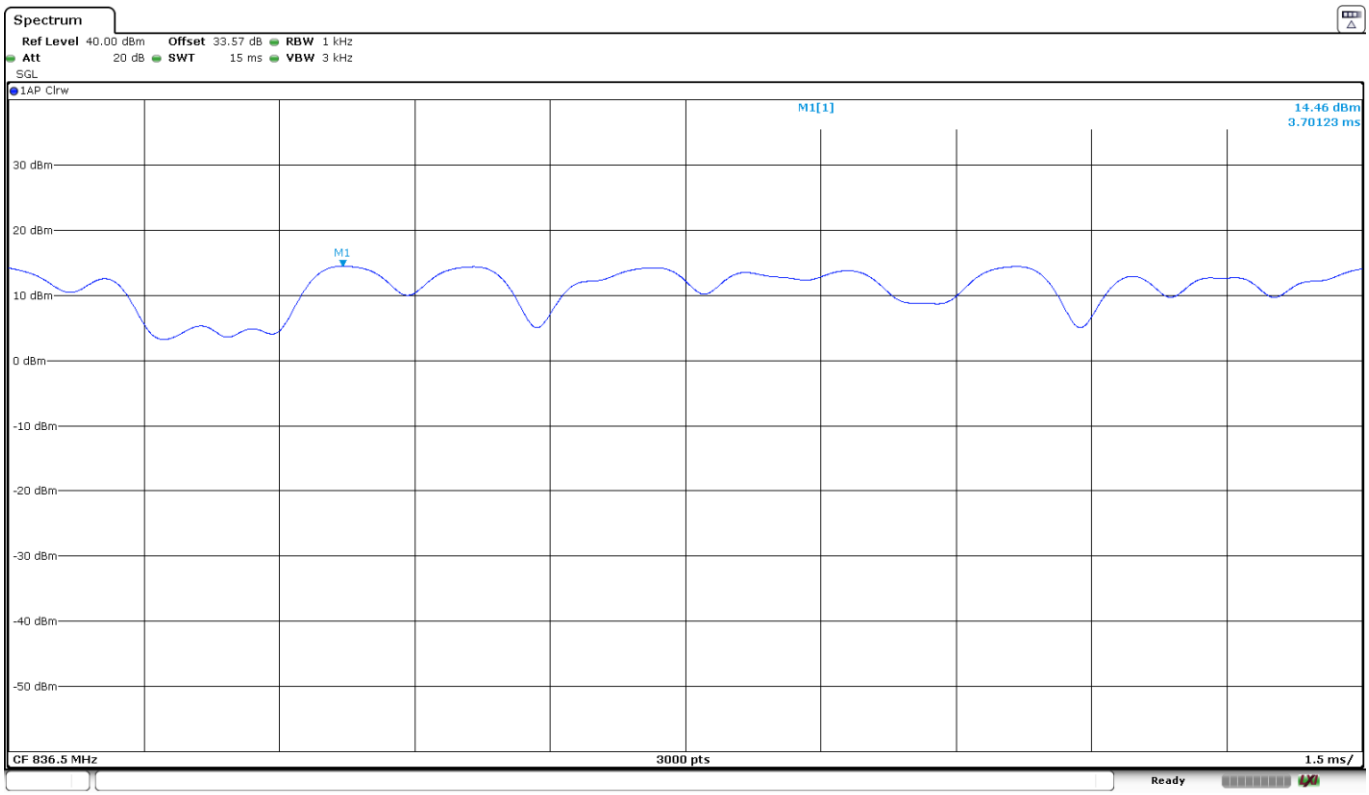
Test Setup



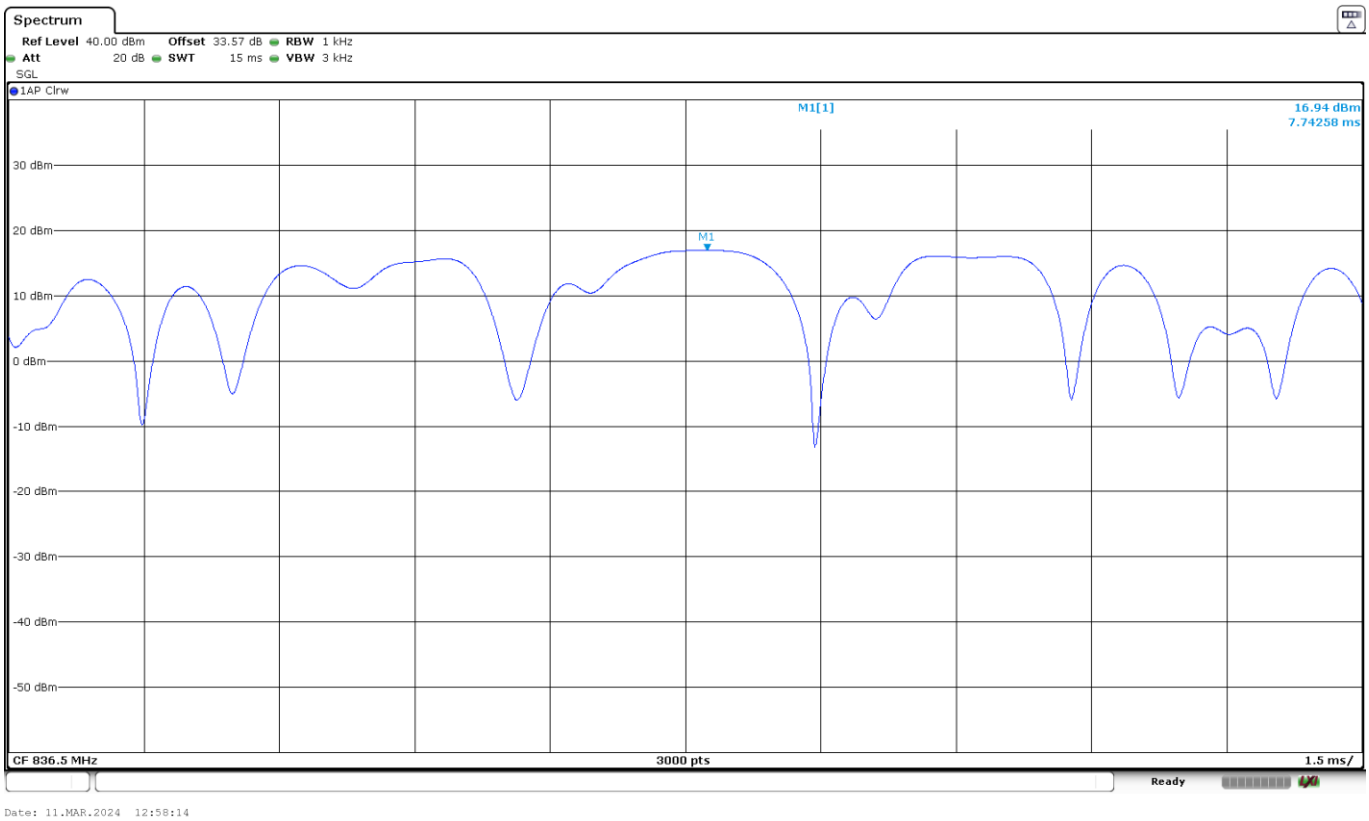
Results

The following plots show the modulation schemes in the EUT.

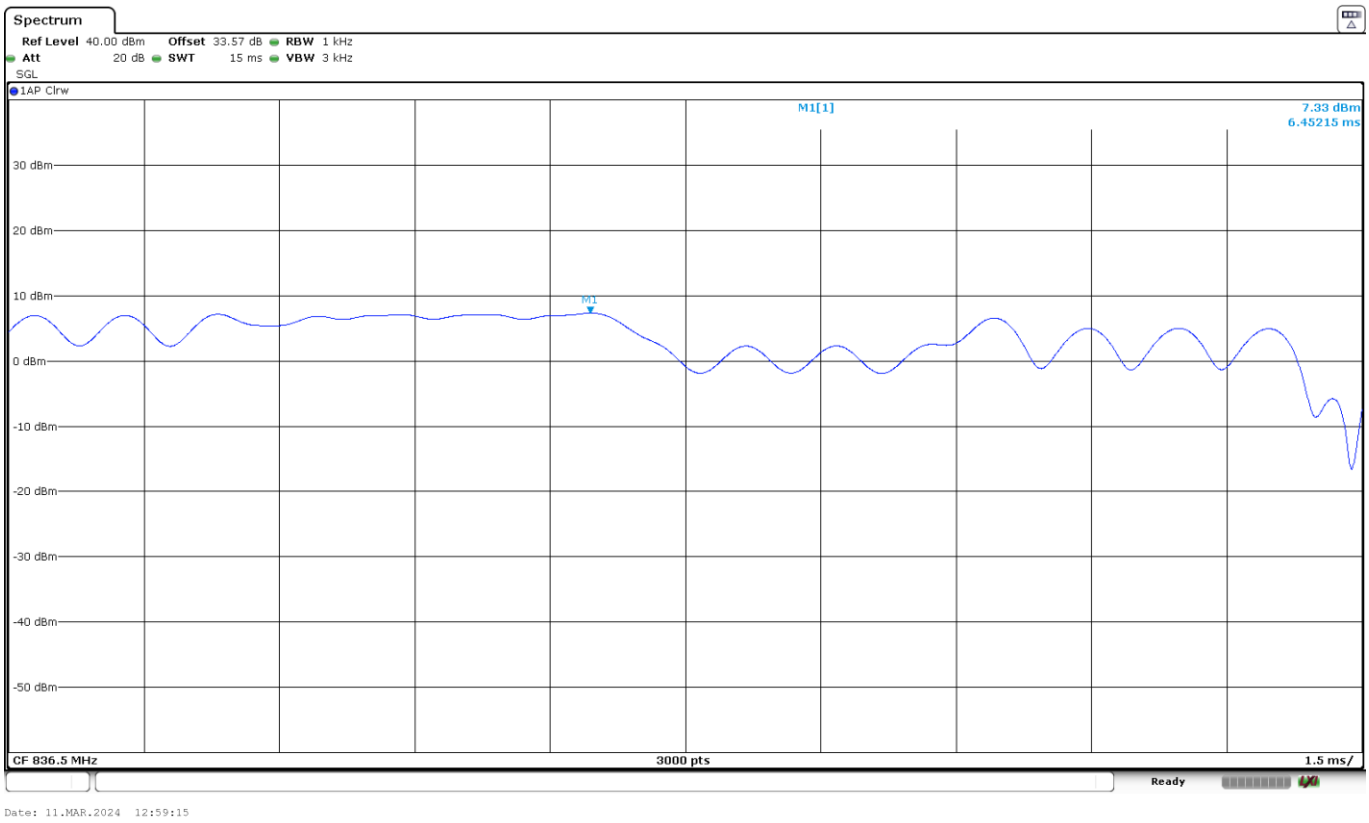
LTE Cat NB2 Band 26: Pi/2-BPSK. Middle Channel. BW=3.75 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=0.



LTE Cat NB2 Band 26: Pi/4-QPSK. Middle Channel. BW=3.75 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=3.



LTE Cat NB2 Band 26: QPSK. Middle Channel. BW=15 kHz. Tone Number=3. Tone Offset=0. MSC/TBS=5.



Occupied Bandwidth

Limits

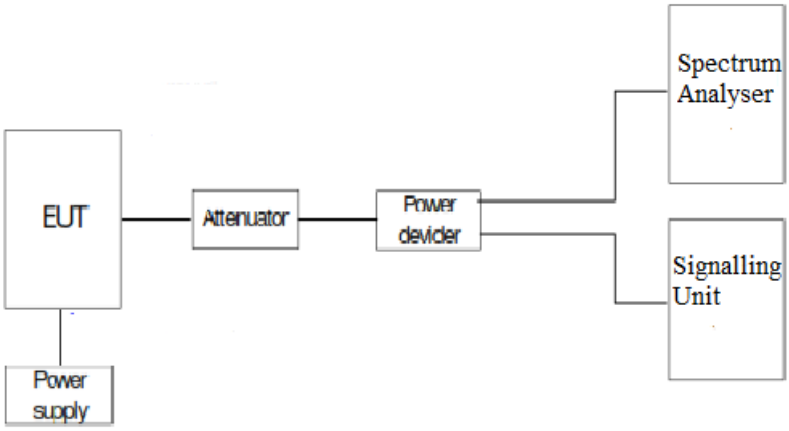
FCC §2.1049. Measurements required: Occupied bandwidth.

RSS-Gen, Clause 6.7.

Method

The occupied bandwidth measurement was performed at the output terminals of the EUT using an attenuator, power splitter and spectrum analyser. The EUT was controlled via the Universal Radio Communication tester R&S CMW500 selecting maximum transmission power of the EUT and different modes of modulation. The 99% occupied bandwidth and the -26 dBc bandwidth were measured directly using the built-in bandwidth measuring option of spectrum analyser.

Test Setup



Results

The worst case per modulation is:

<u>LTE Cat NB2 Band 26</u>:

LTE Cat NB2 Band 26. Pi/2-BPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=23. MSC/TBS=0.

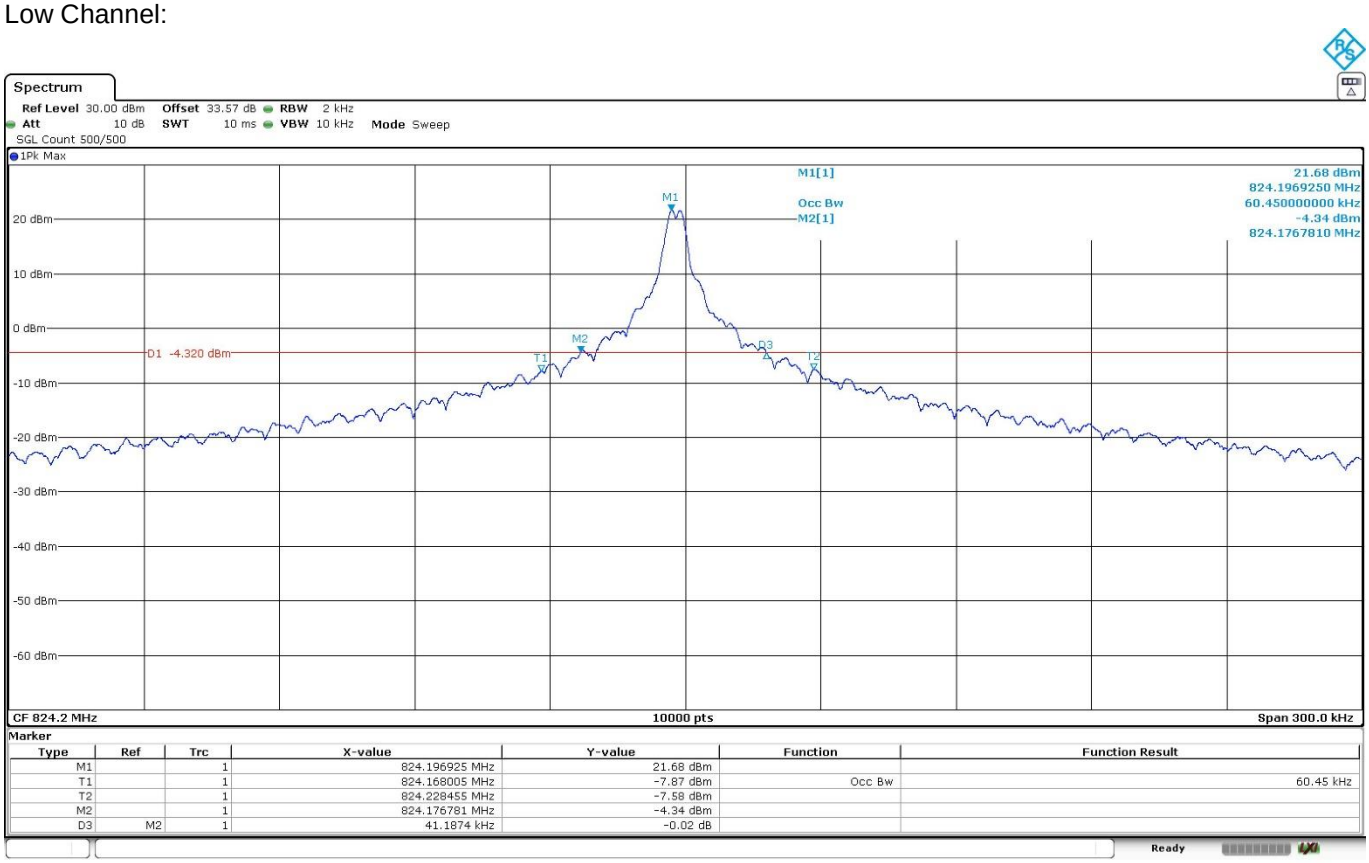
	Low Channel	Middle Channel	High Channel
99% Occupied Bandwidth (kHz)	60.45000	60.39000	61.02000
-26 dBc Bandwidth (kHz)	41.18740	41.06450	41.08730
Measurement uncertainty (kHz)	<±3.75		

LTE Cat NB2 Band 26. Pi/4-QPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=23. MSC/TBS=3.

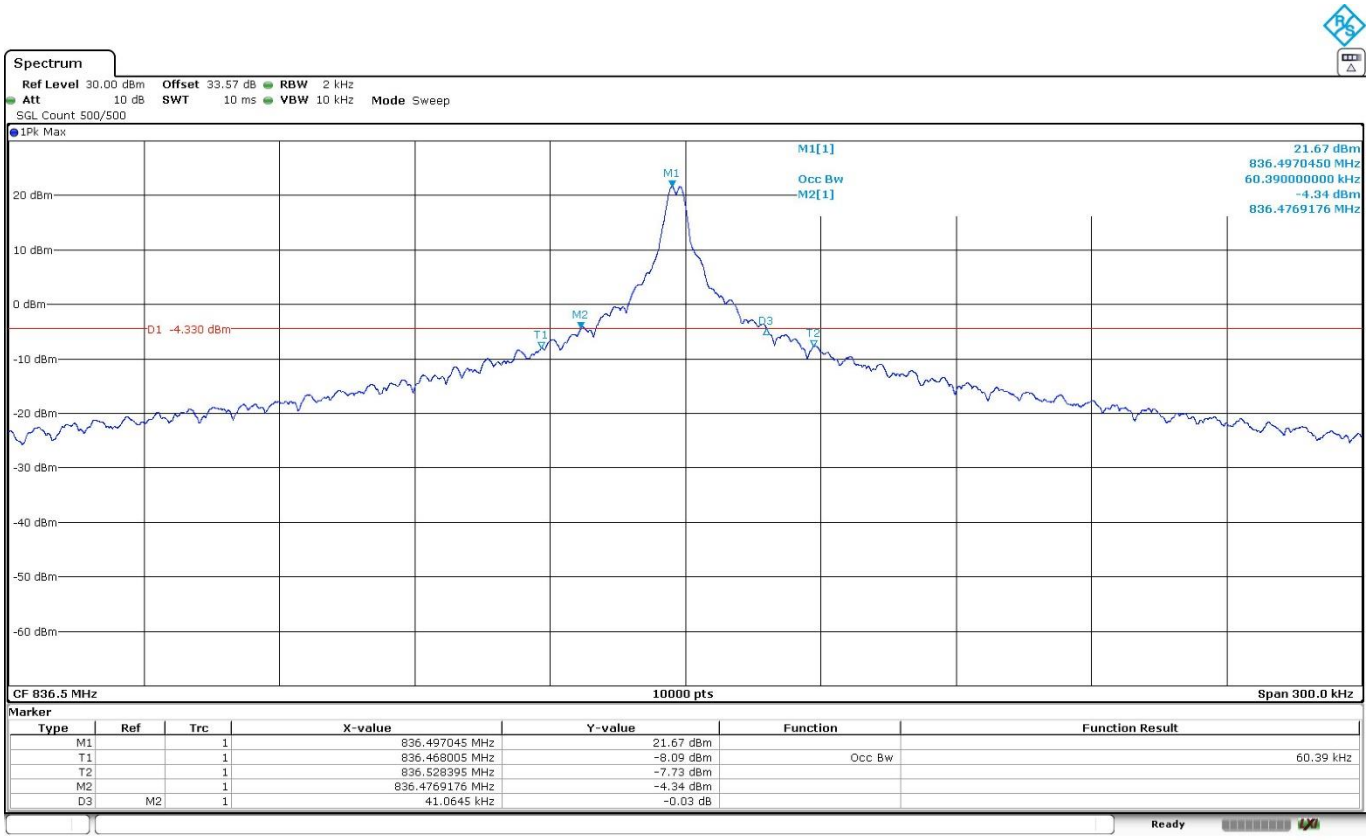
	Low Channel	Middle Channel	High Channel
99% Occupied Bandwidth (kHz)	64.68000	64.20000	65.13000
-26 dBc Bandwidth (kHz)	41.78700	41.92510	41.92730
Measurement uncertainty (kHz)	<±3.75		

LTE Cat NB2 Band 26. Pi/2-BPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=23. MSC/TBS=0.

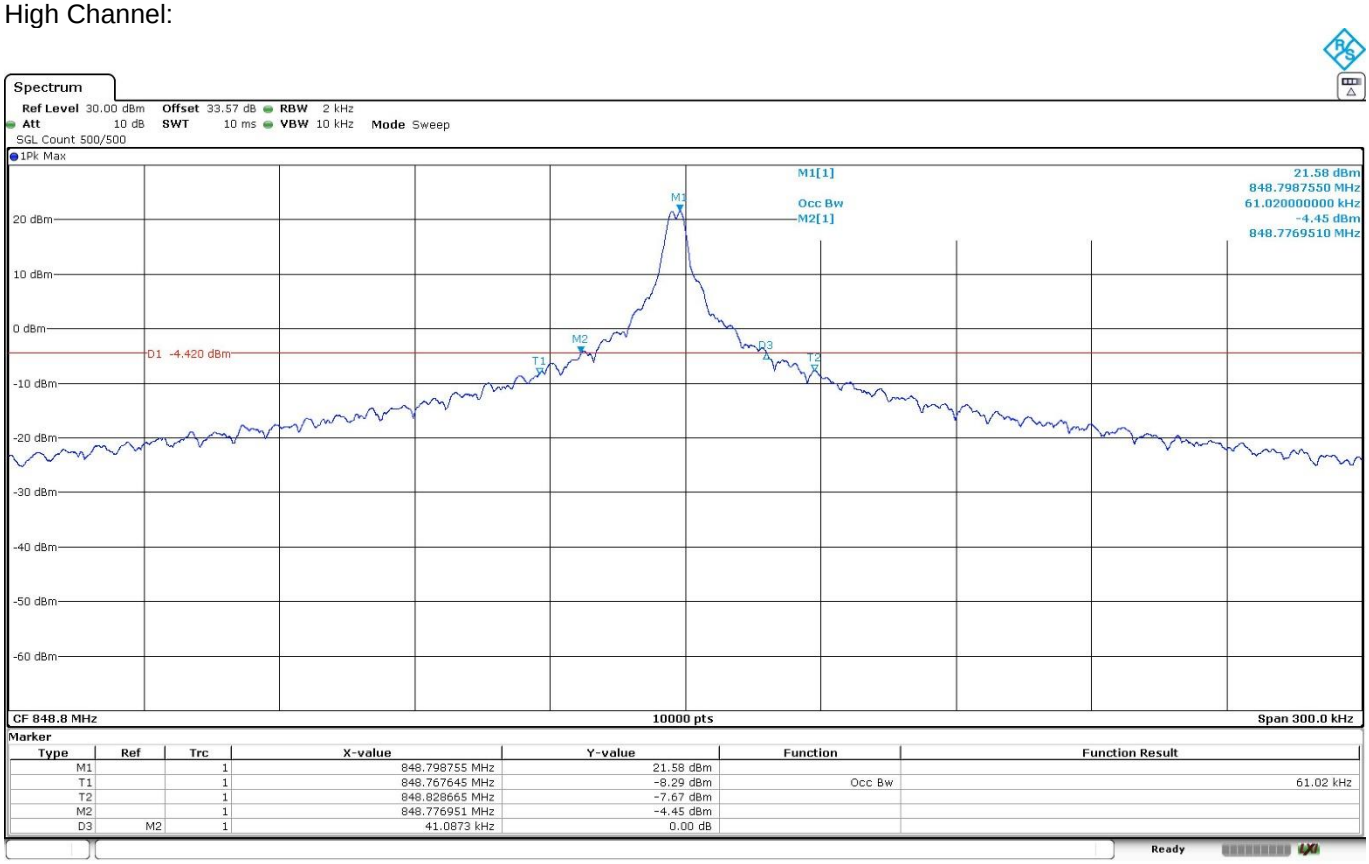
Low Channel:



Middle Channel:

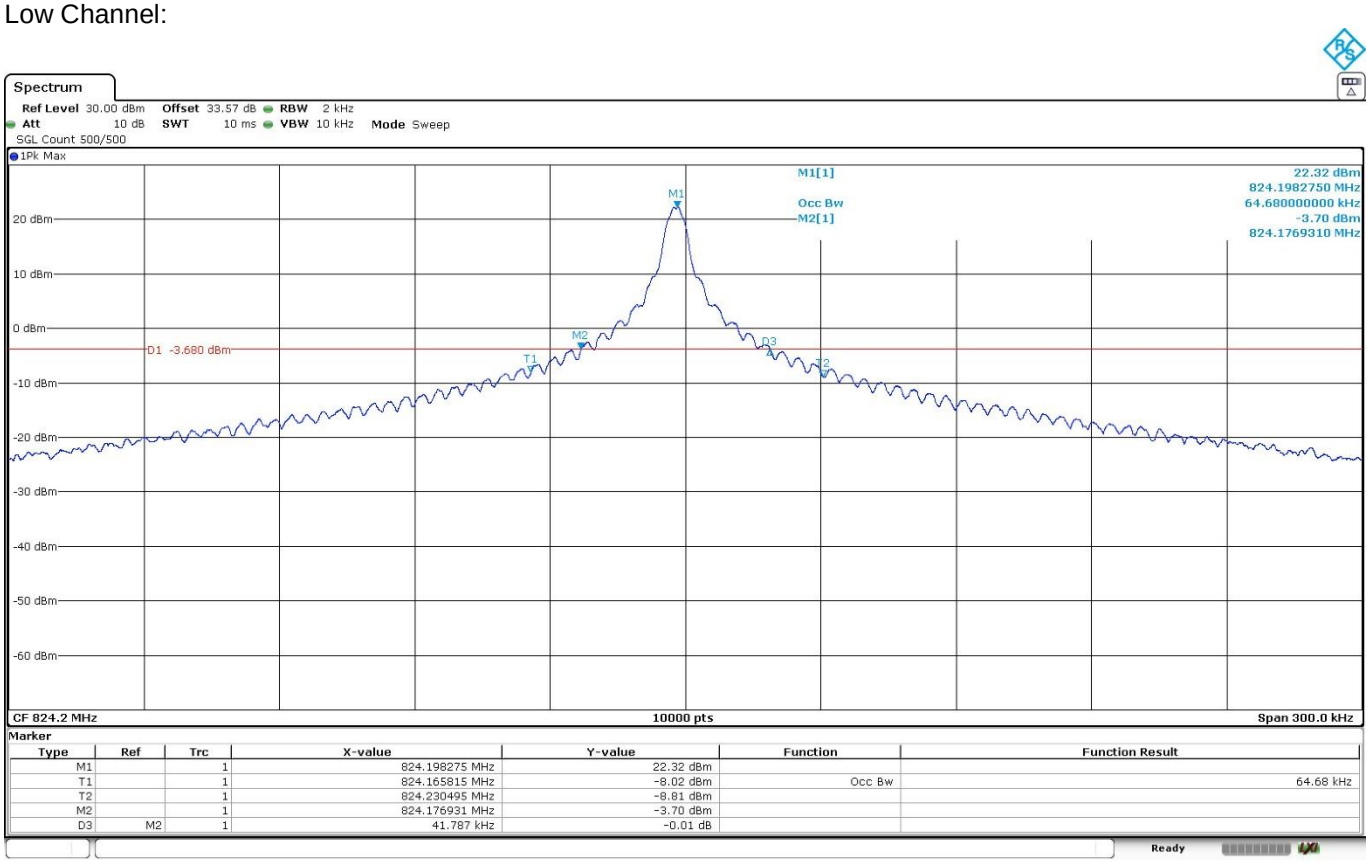


High Channel:

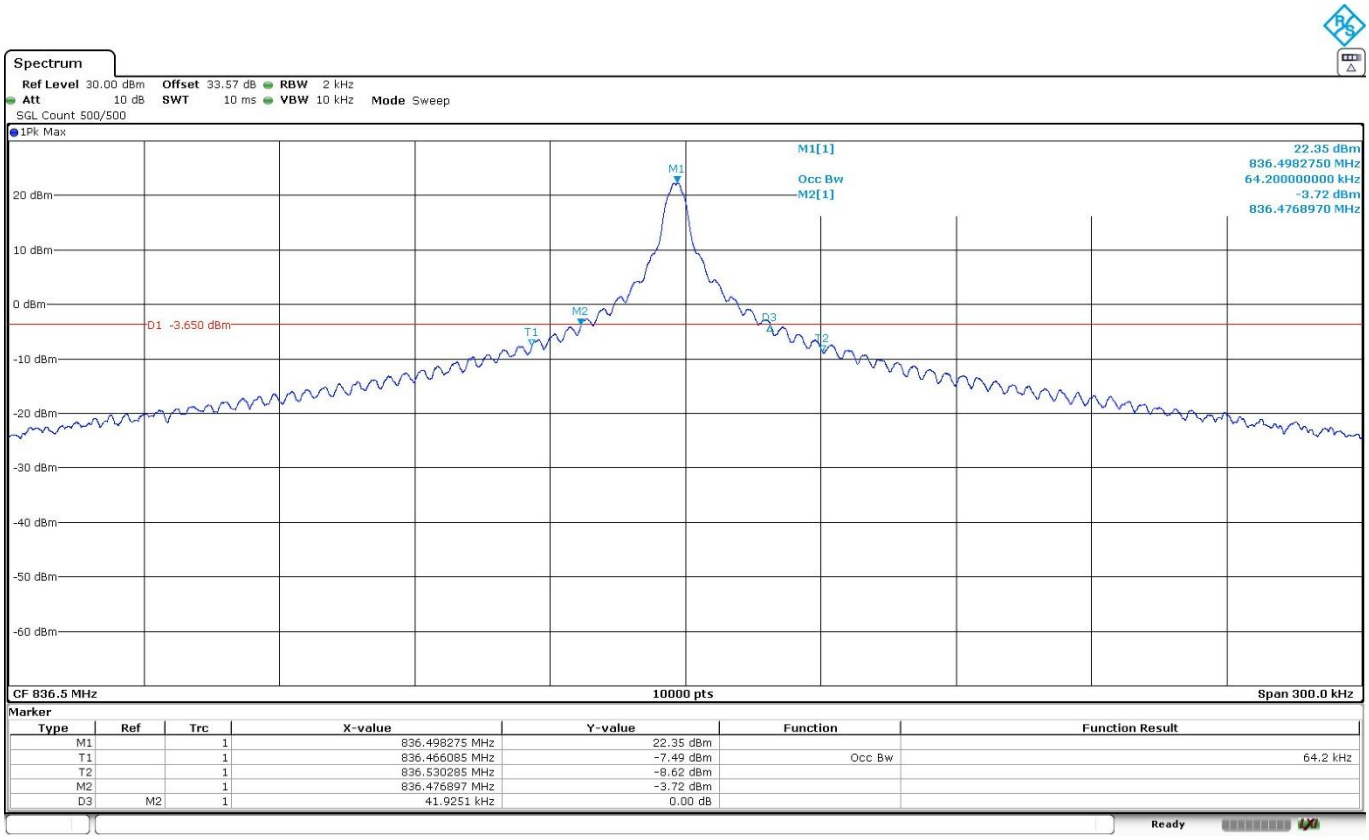


LTE Cat NB2 Band 26. Pi/4-QPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=23. MSC/TBS=3.

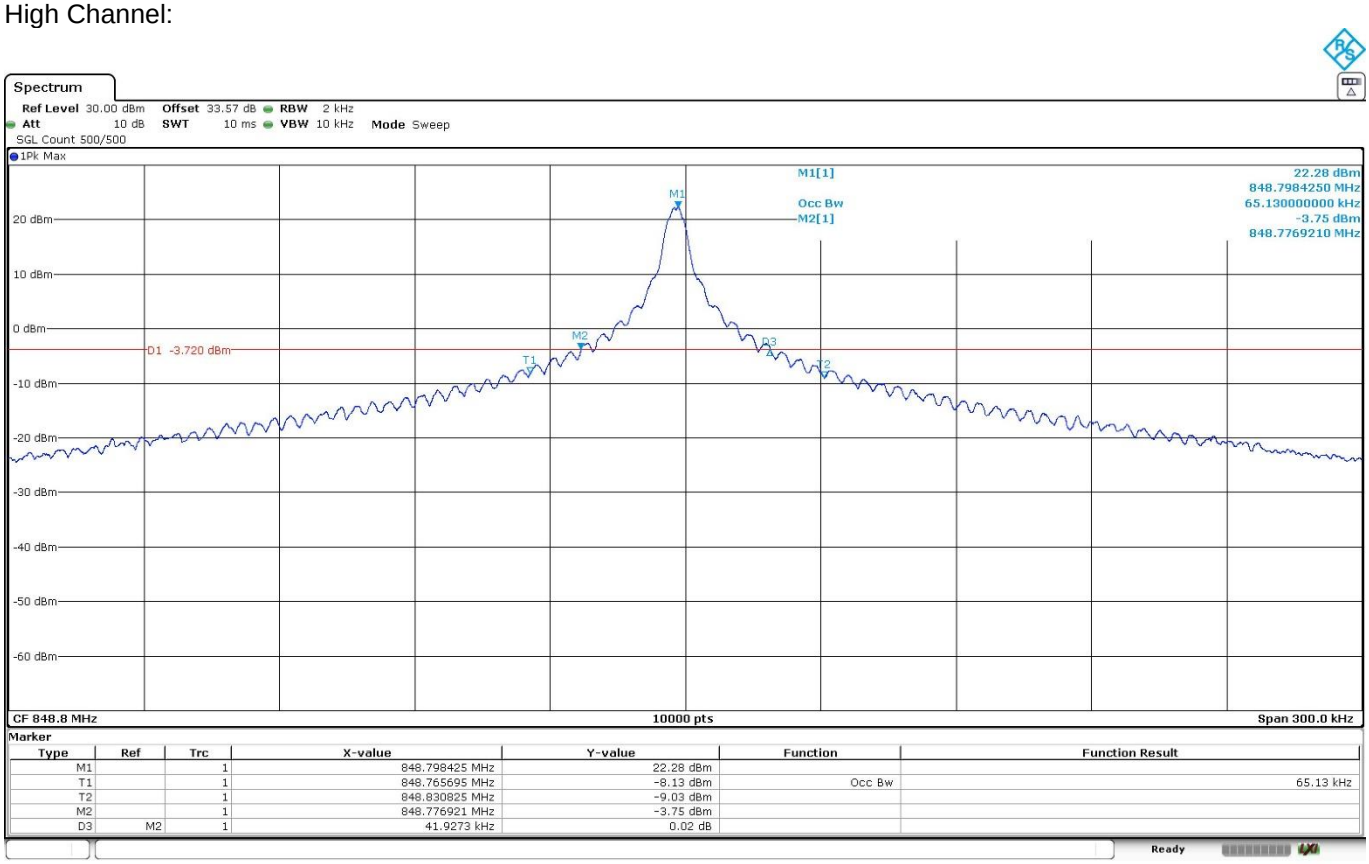
Low Channel:



Middle Channel:



High Channel:



LTE Cat NB2 Band 26. Pi/2-BPSK. BW=15 kHz. Tone Number=1. Tone Offset=5. MSC/TBS=0.

	Low Channel	Middle Channel	High Channel
99% Occupied Bandwidth (kHz)	126.00000	125.61000	124.71000
-26 dBc Bandwidth (kHz)	126.70230	120.12840	126.75670
Measurement uncertainty (kHz)	<±3.75		

LTE Cat NB2 Band 26. Pi/4-QPSK. BW=15 kHz. Tone Number=1. Tone Offset=5. MSC/TBS=3.

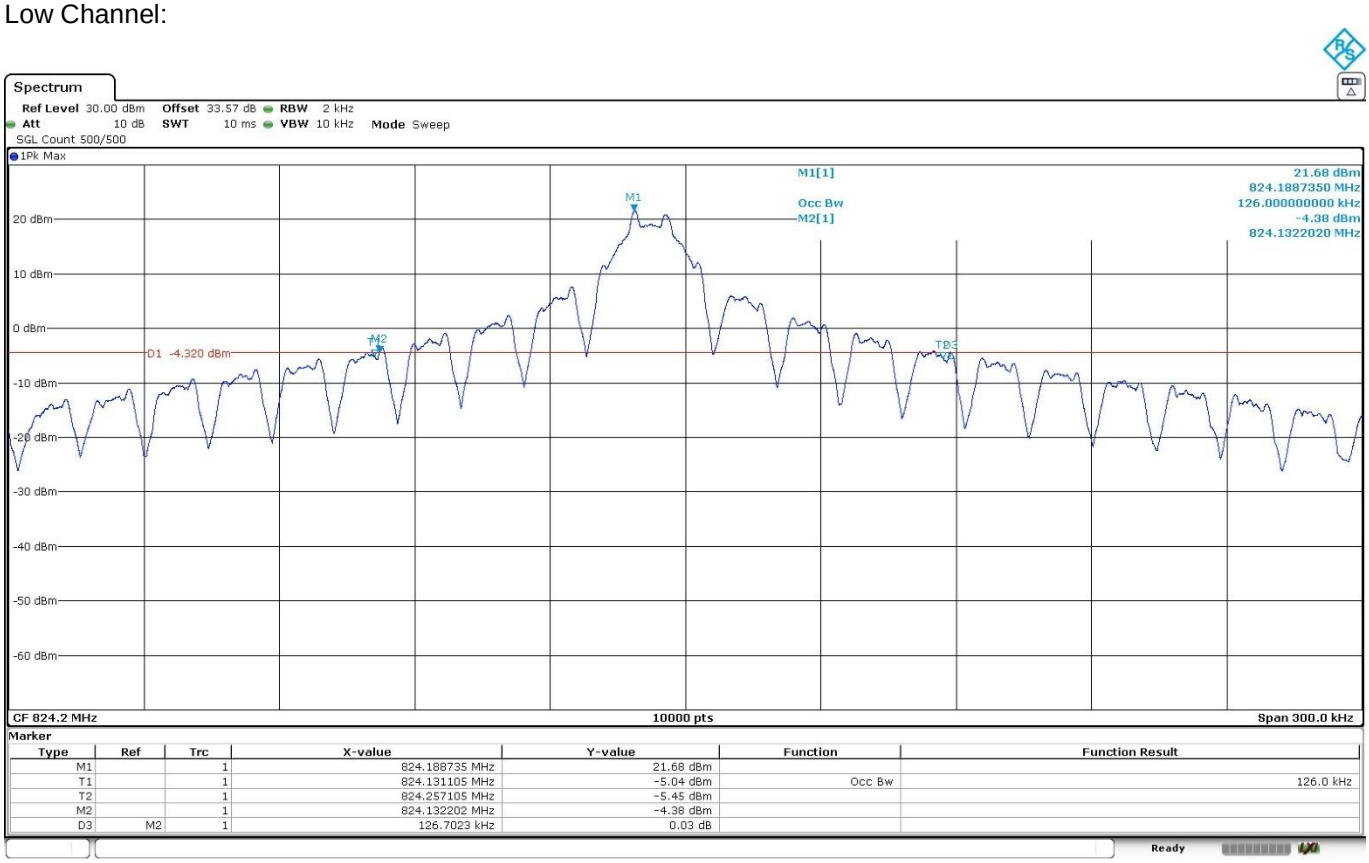
	Low Channel	Middle Channel	High Channel
99% Occupied Bandwidth (kHz)	126.48000	126.90000	125.97000
-26 dBc Bandwidth (kHz)	155.12170	145.11300	130.50670
Measurement uncertainty (kHz)	<±3.75		

LTE Cat NB2 Band 26. QPSK. BW=15 kHz. Tone Number=12. Tone Offset=0. MSC/TBS=5.

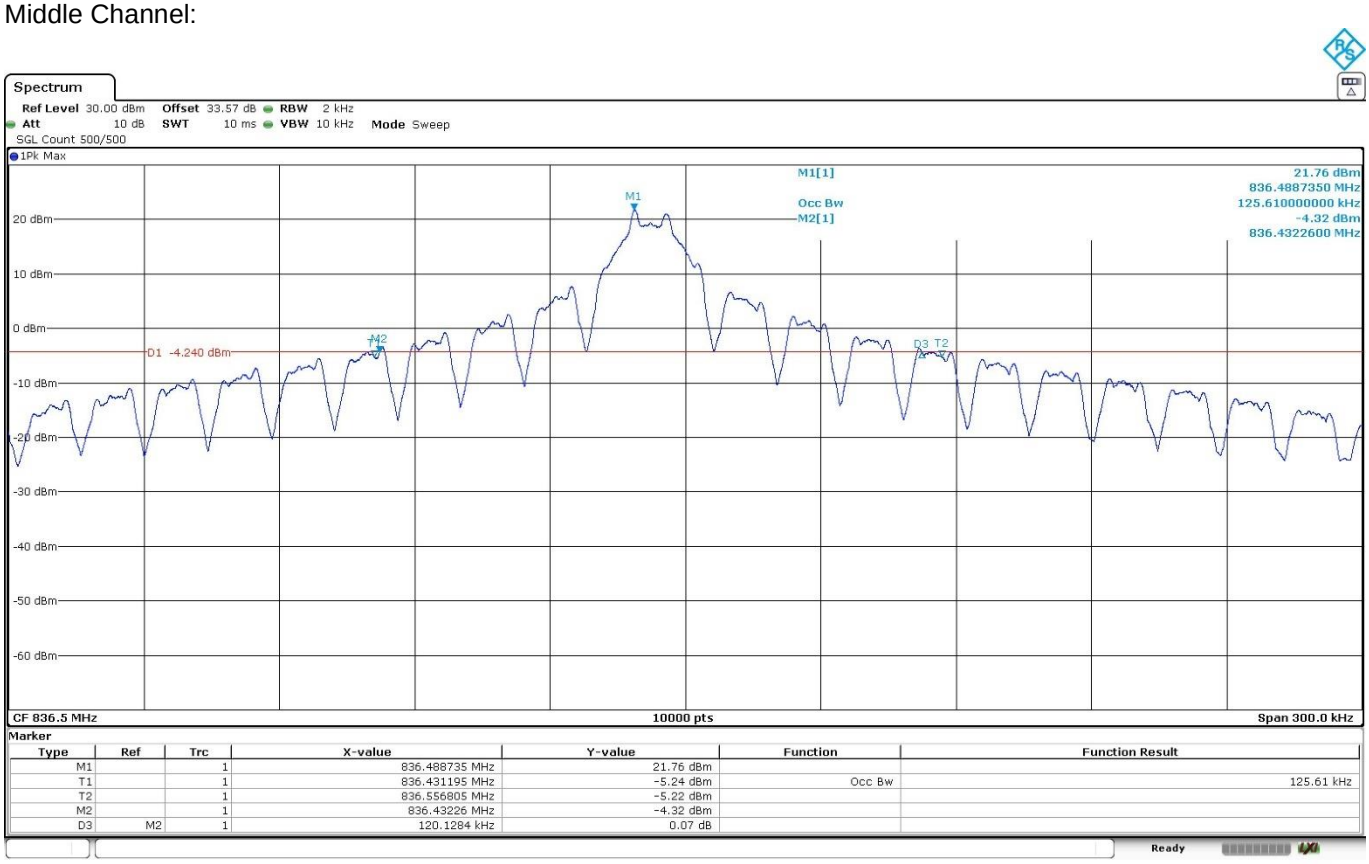
	Low Channel	Middle Channel	High Channel
99% Occupied Bandwidth (kHz)	188.30000	187.20000	188.60000
-26 dBc Bandwidth (kHz)	308.38320	290.87140	289.78600
Measurement uncertainty (kHz)	<±3.75		

LTE Cat NB2 Band 26. Pi/2-BPSK. BW=15 kHz. Tone Number=1. Tone Offset=5. MSC/TBS=0.

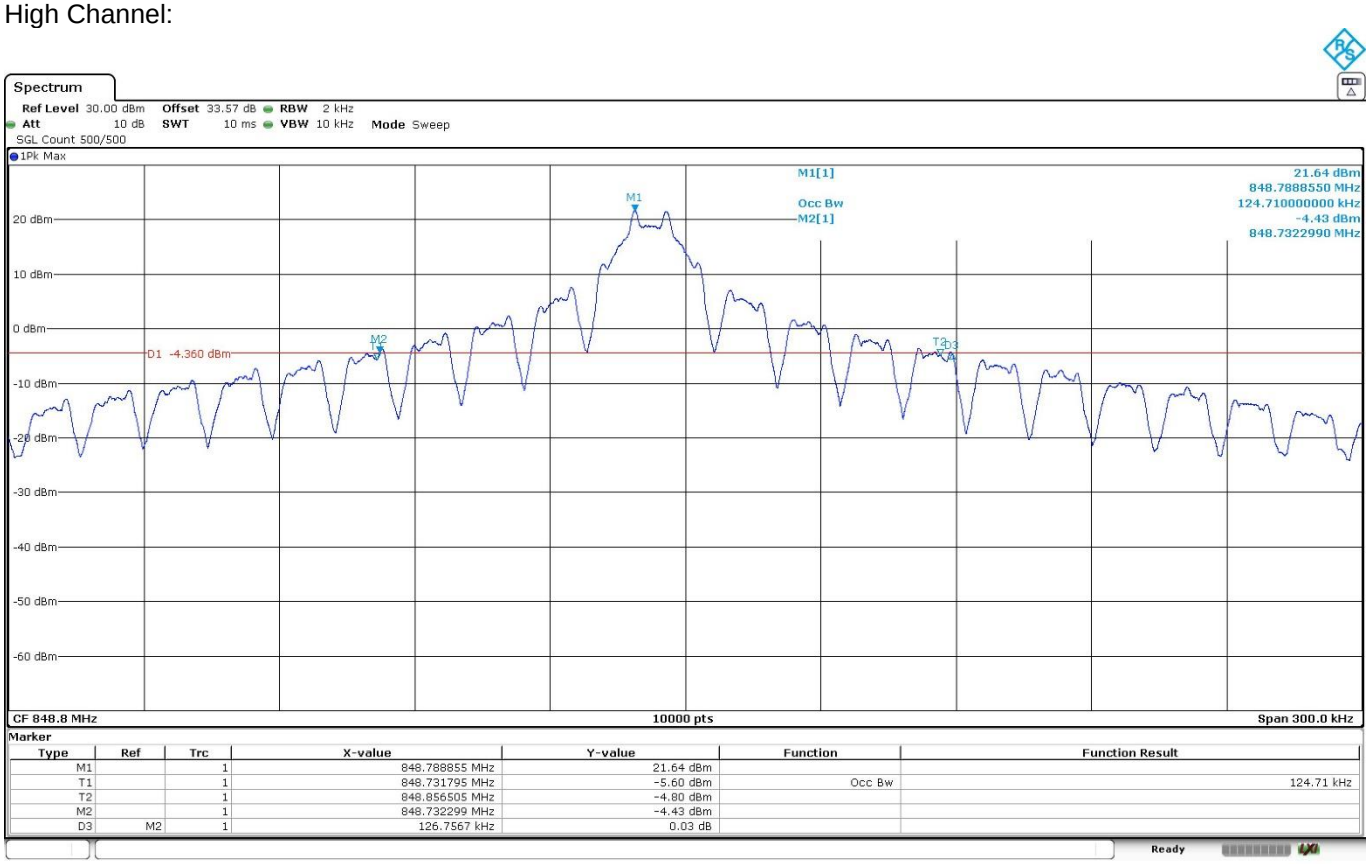
Low Channel:



Middle Channel:

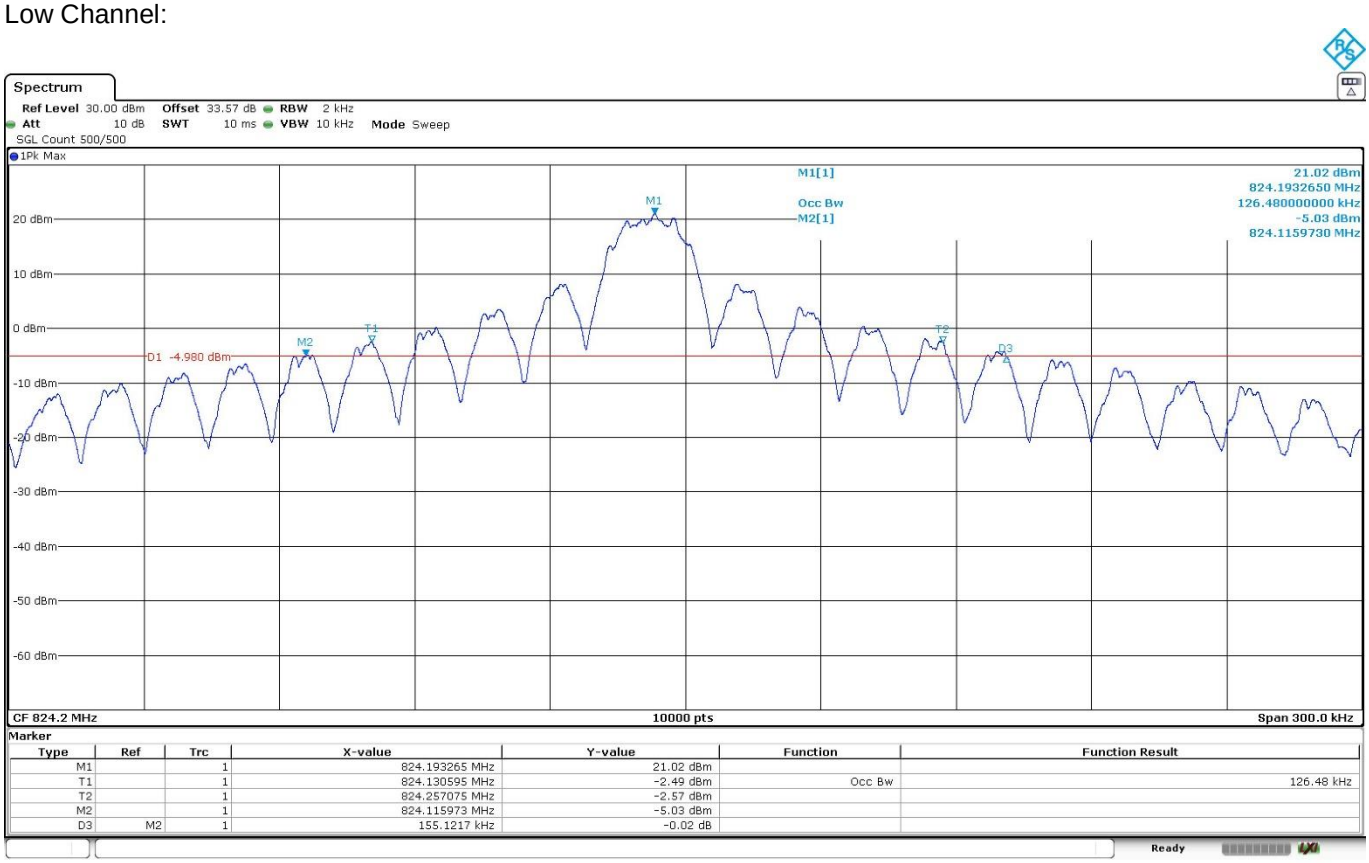


High Channel:

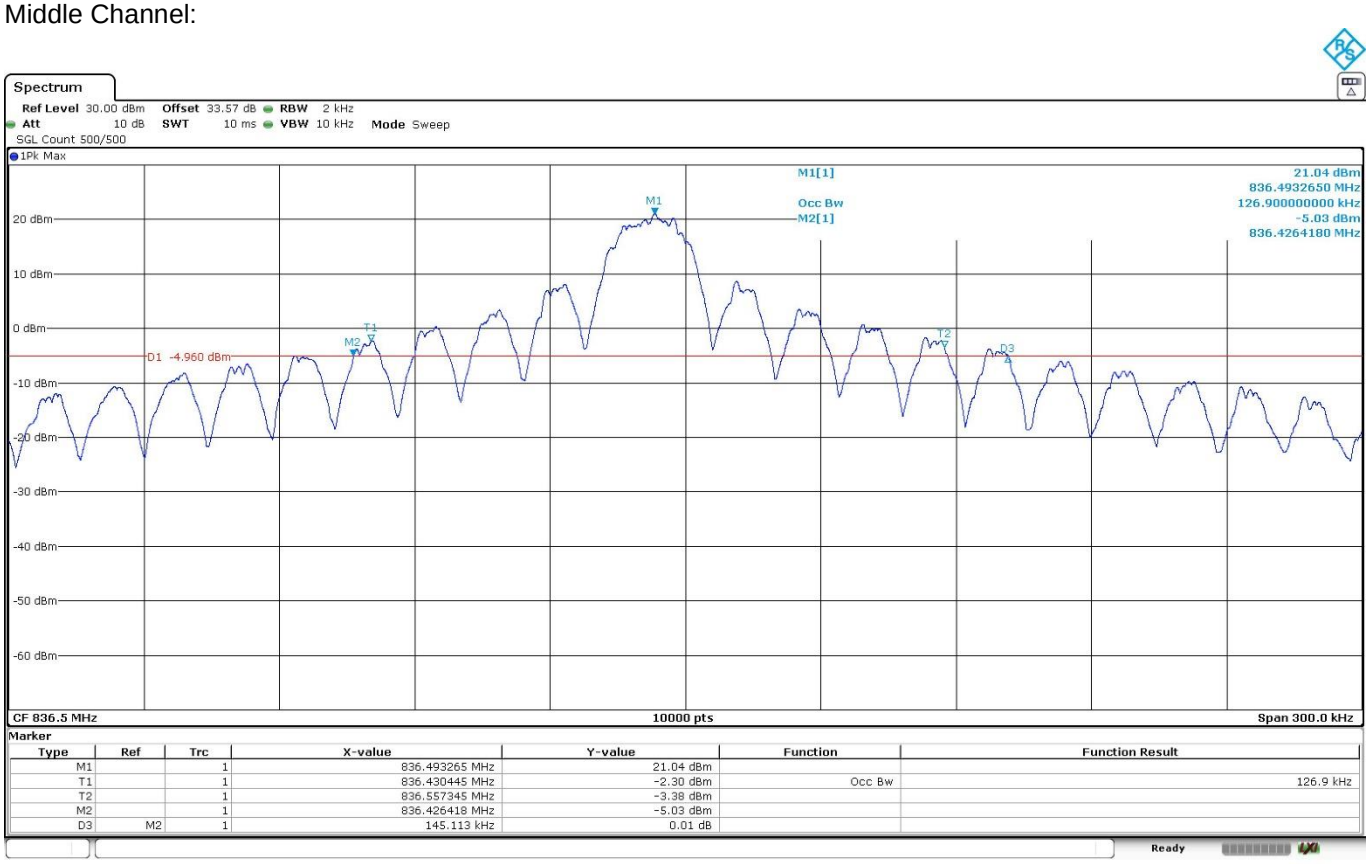


LTE Cat NB2 Band 26. Pi/4-QPSK. BW=15 kHz. Tone Number=1. Tone Offset=5. MSC/TBS=3.

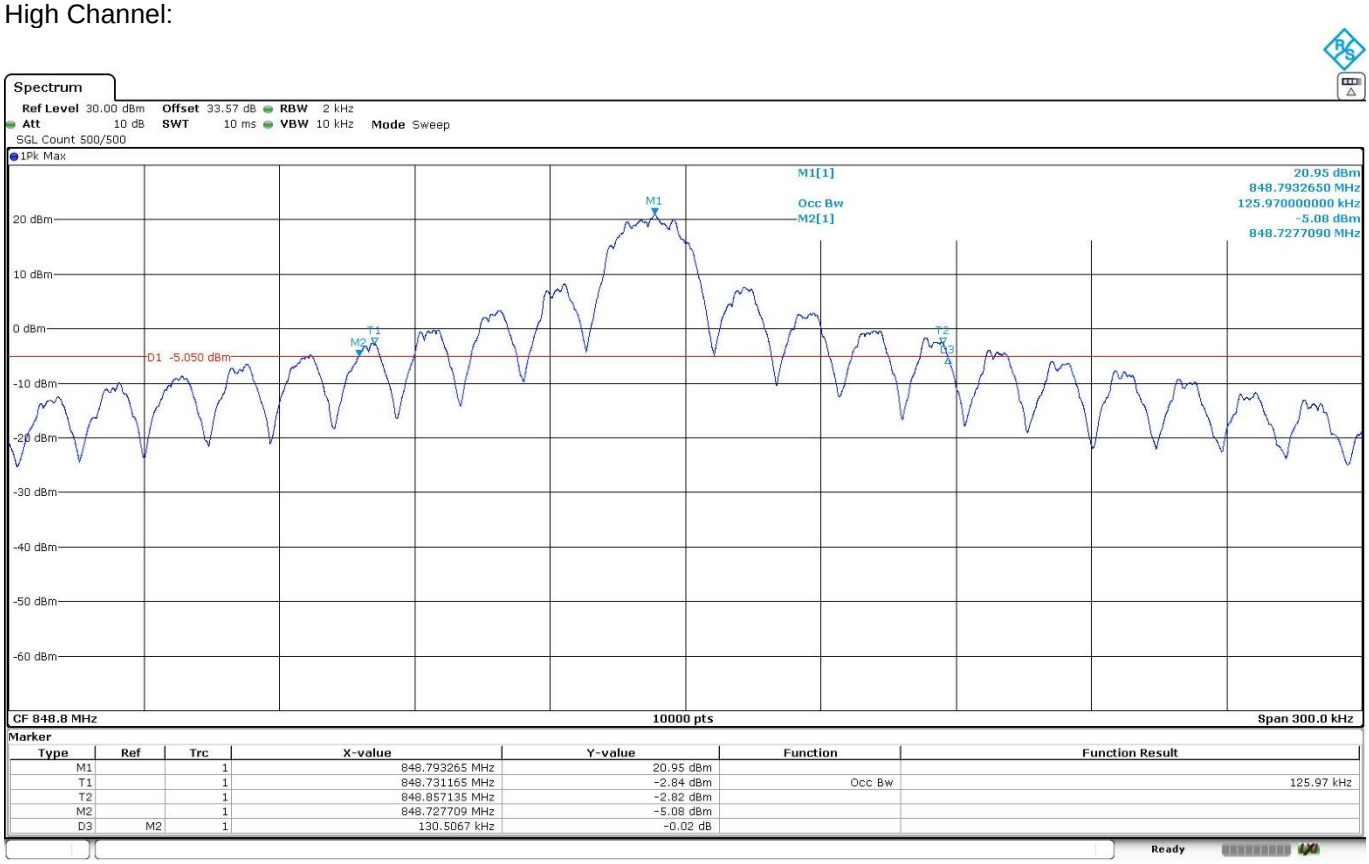
Low Channel:



Middle Channel:

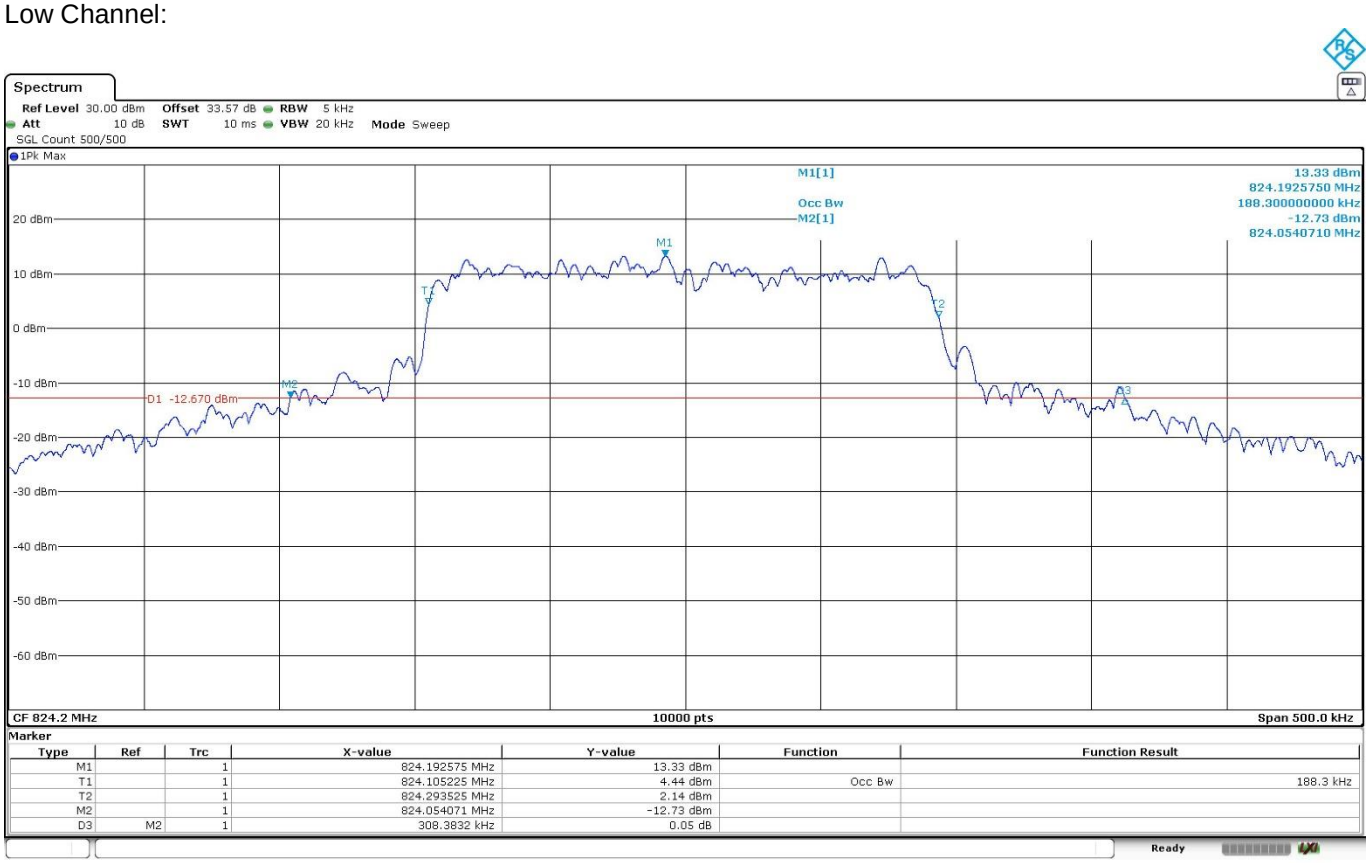


High Channel:

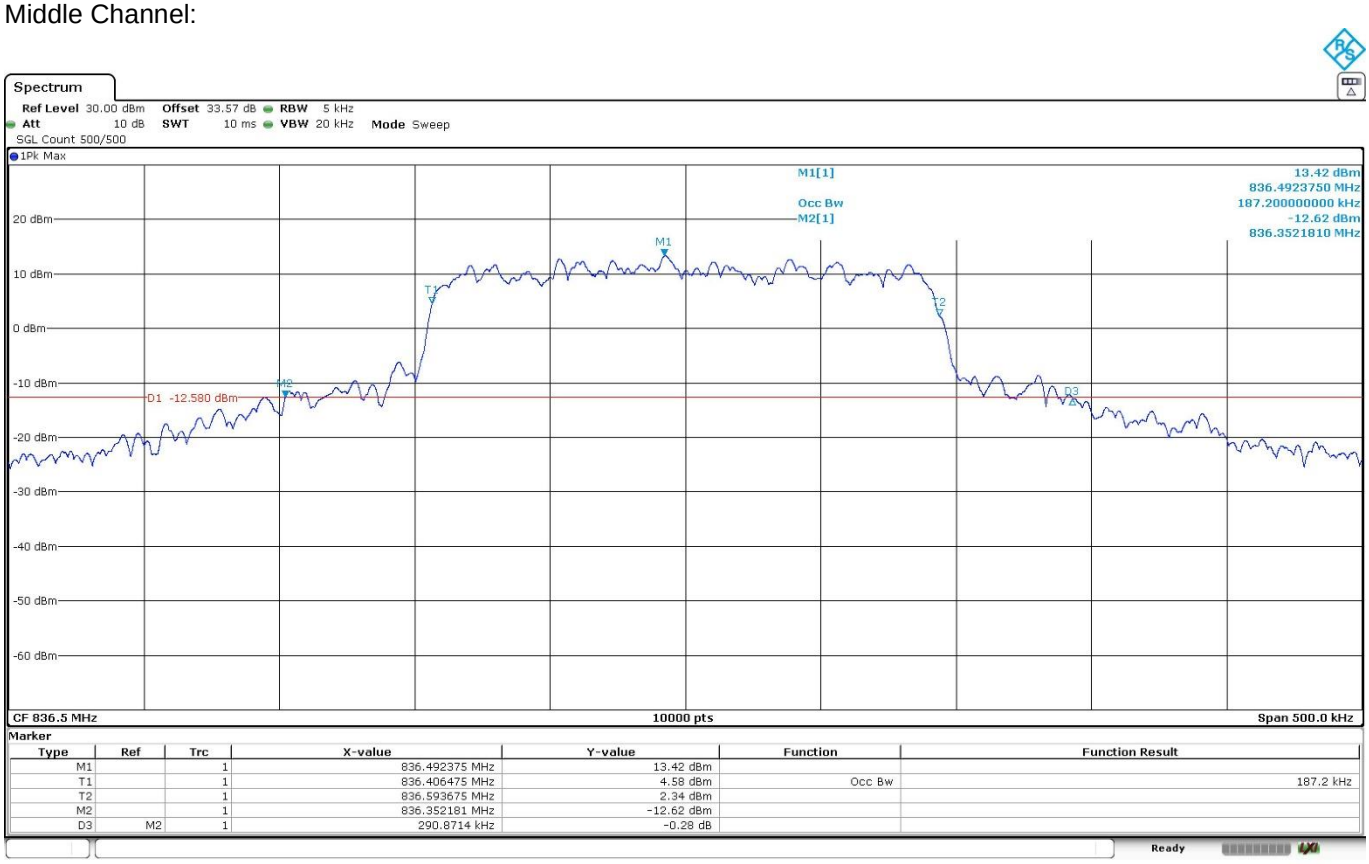


LTE Cat NB2 Band 26. QPSK. BW=15 kHz. Tone Number=12. Tone Offset=0. MSC/TBS=5.

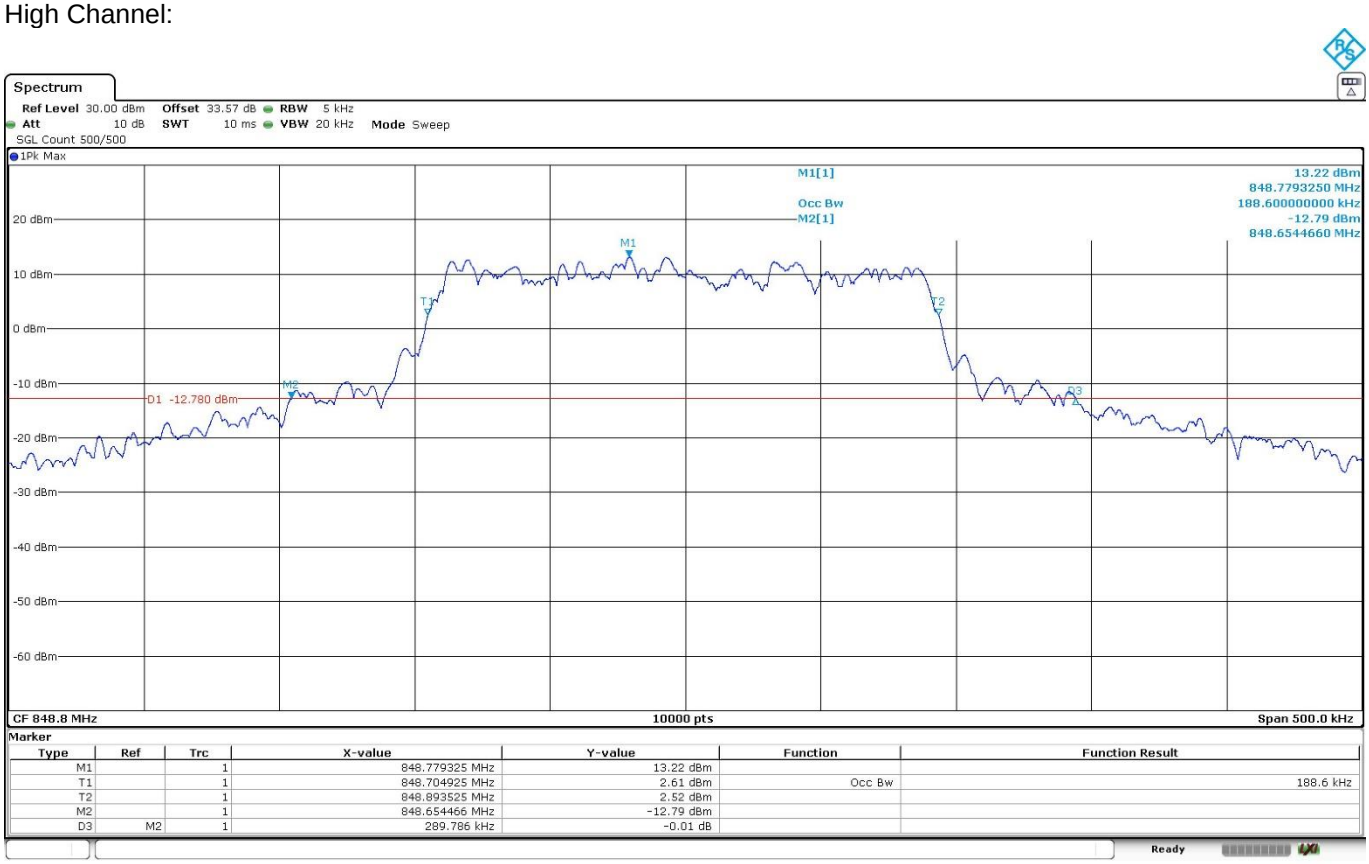
Low Channel:



Middle Channel:



High Channel:



Spurious Emissions at Antenna Terminals

Limits

FCC §2.1051 and §22.917. RSS-132 Clause 5.5.

> The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
>
> In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz.

At Po transmitting power, the specified minimum attenuation becomes 43+10 log (Po), and the level in dBm relative to Po becomes:

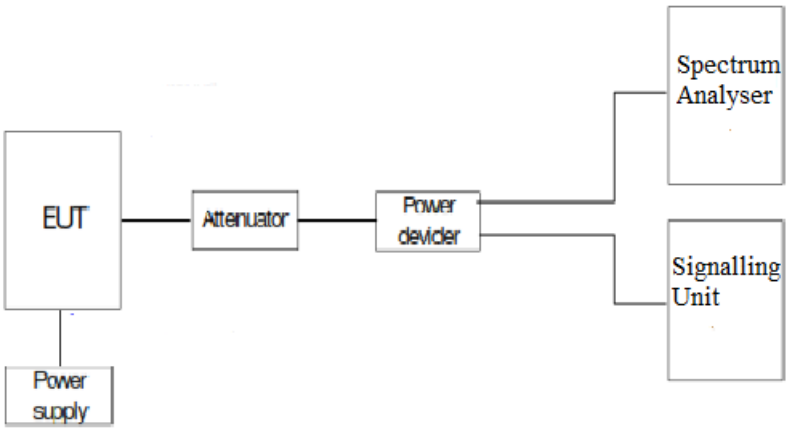
Po (dBm) – [43 + 10 log (Po in mW) - 30] = -13 dBm

Method

The EUT RF output connector was connected to a spectrum analyser and to the Universal Radio Communication tester R&S CMW500 (selecting maximum transmission power of the EUT and different modes of modulation) using a 50-Ohm attenuator and a power divider.

The reading of the spectrum analyser is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyser.

Test Setup



Results

LTE Cat NB2 Band 26:

A preliminary scan determined the worst-case:

Pi/4-QPSK. BW=15 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=3.

The next results are for this worst-case configuration,

Frequency range 9 KHz - 10 GHz:

- Low Channel: No spurious frequencies at less than 20 dB below the limit.
- Middle Channel: No spurious frequencies at less than 20 dB below the limit.
- High Channel: No spurious frequencies at less than 20 dB below the limit.

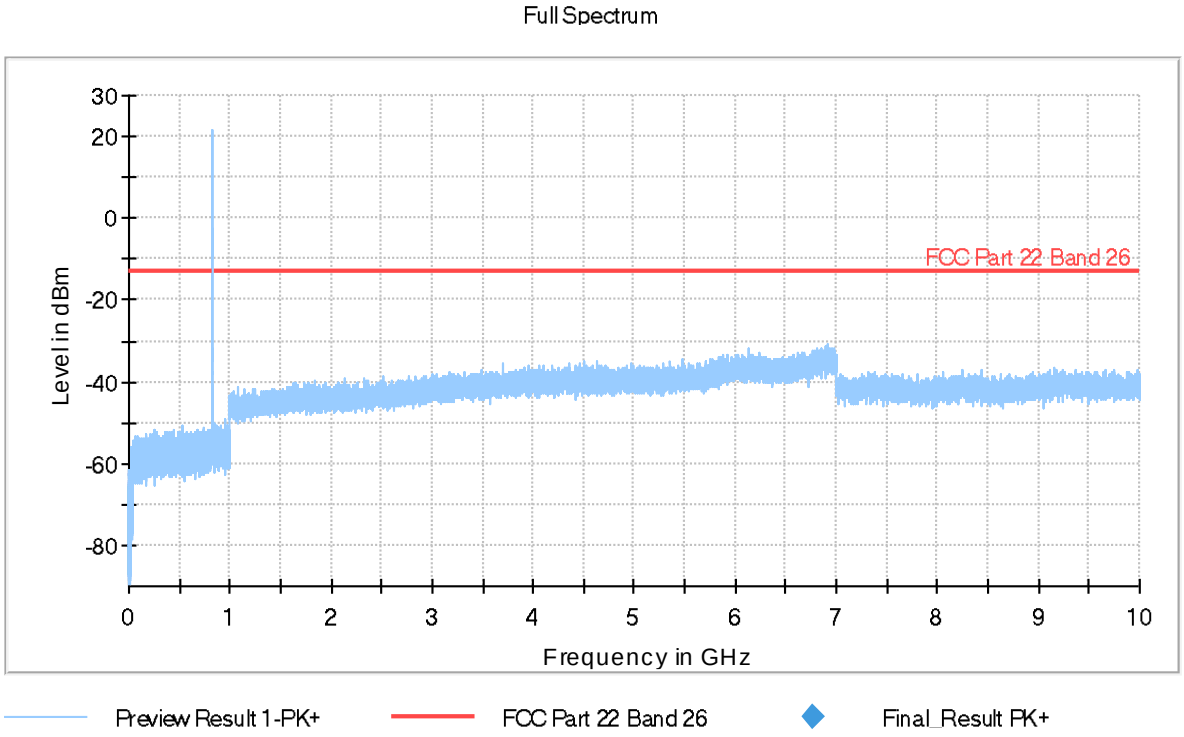
Measurement uncertainty (dB): <±2.76

Verdict: PASS

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
Receiver: [FSV 40]					
9 kHz - 150 kHz	14,1 Hz	PK+	300 Hz	Coupled	0 dB
150 kHz - 30 MHz	932,812 Hz	PK+	10 kHz	Coupled	0 dB
30 MHz - 1 GHz	30,312 kHz	PK+	100 kHz	Coupled	0 dB
1 GHz - 10 GHz	281,25 kHz	PK+	1 MHz	Coupled	0 dB

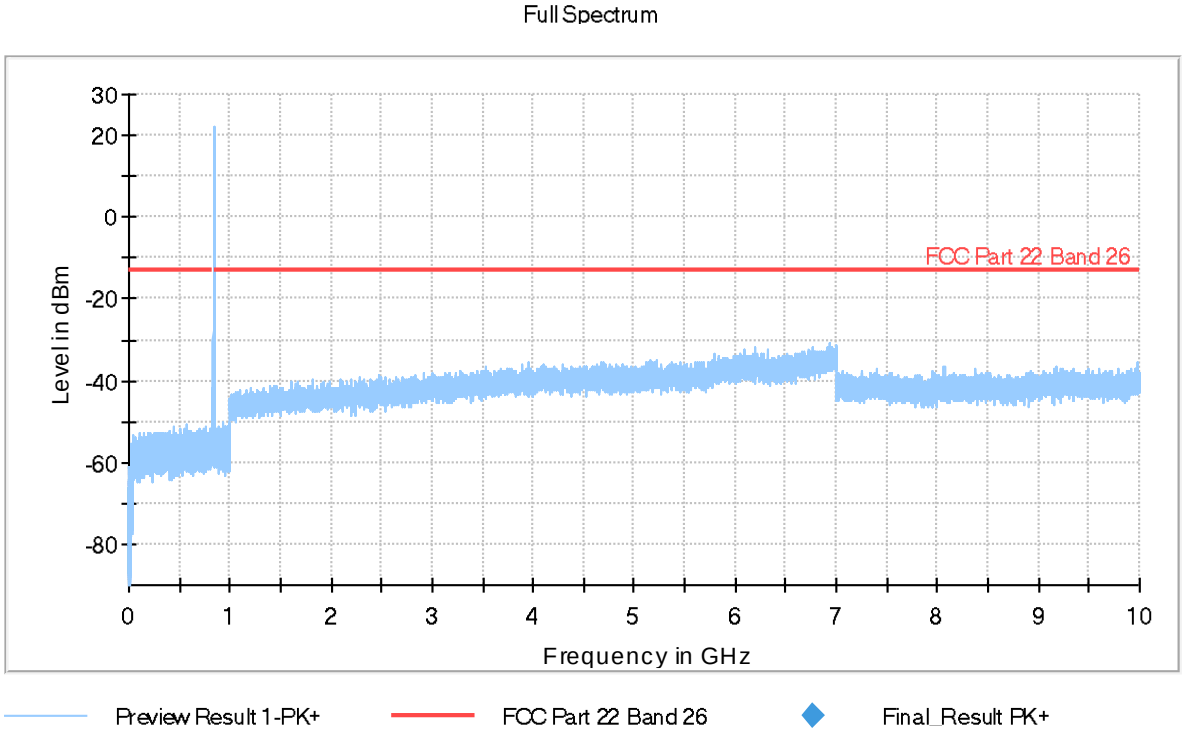
LTE Cat-NB2 Band 26: Pi/4-QPSK. BW=15 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=3.

Low Channel:



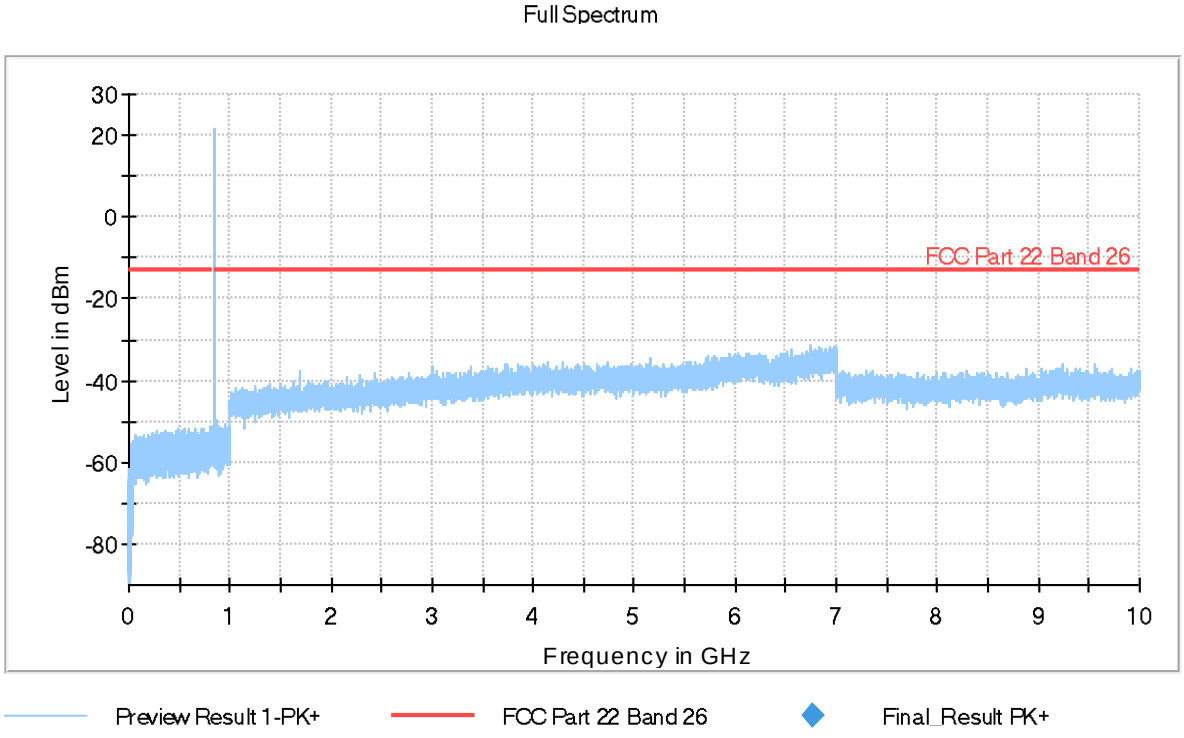
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

High Channel:



The peak above the limit is the carrier frequency.

Spurious Emissions at Antenna Terminals at Block Edges

Limits

FCC § 2.1051 and § 22.917:

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.

Compliance with these rules is based on the use of measurement instrumentation employing a reference bandwidth as follows:

In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. In the 1 MHz 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.

RSS-132. Clause 5.5:

Mobile and base station equipment shall comply with the limits below.

In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log 10 p (watts).

Method

The EUT RF output connector was connected to a spectrum analyzer and to the Universal Radio Communication tester R&S CMW500 (selecting maximum transmission power of the EUT and different modes of modulation) using a 50-Ohm attenuator and a power splitter.

The reading of the spectrum analyser is corrected with the path loss of the connection between the output terminal of the EUT and the input of the spectrum analyzer.

The configuration of modulation which is the worst case for conducted power was used.

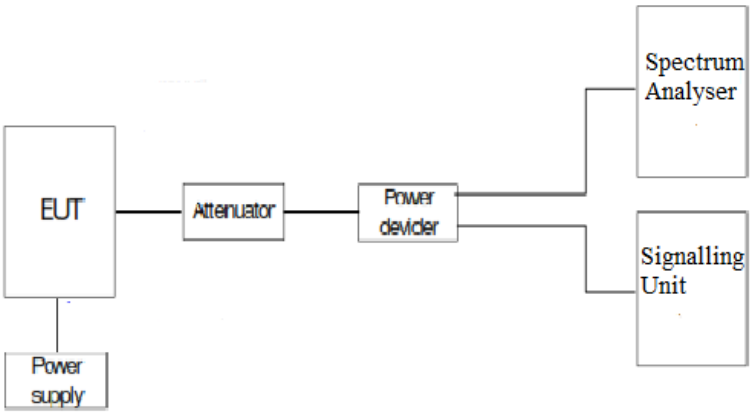
As stated in FCC part 22.917 / RSS-132 Clause 5.5, in the 1 MHz bands immediately outside and adjacent to the frequency block or band a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Measurement Limit:

At Po transmitting power, the specified minimum attenuation 43 + 10 log10 p (watts) becomes:

$$Po\ (dBm) - [43 + 10 \log (Po\ in\ mwatts) - 30] = -13\ dBm$$

Test Setup



Results

LTE Cat NB2 Band 26:

Preliminary measurements determined the worst-case. Results attached are for this worst-case configuration.

LTE Cat NB2 Band 26	Pi/4-QPSK BW=3.75 kHz Tone Number=1 Tone Offset=0 MSC/TBS=3	Pi/4-QPSK BW=15 kHz Tone Number=1 Tone Offset=0 MSC/TBS=3	QPSK BW=15 kHz Tone Number=12 Tone Offset=0 MSC/TBS=5
Maximum measured level at Low Block Edge at antenna port (dBm)	-22.99	-20.61	-21.82

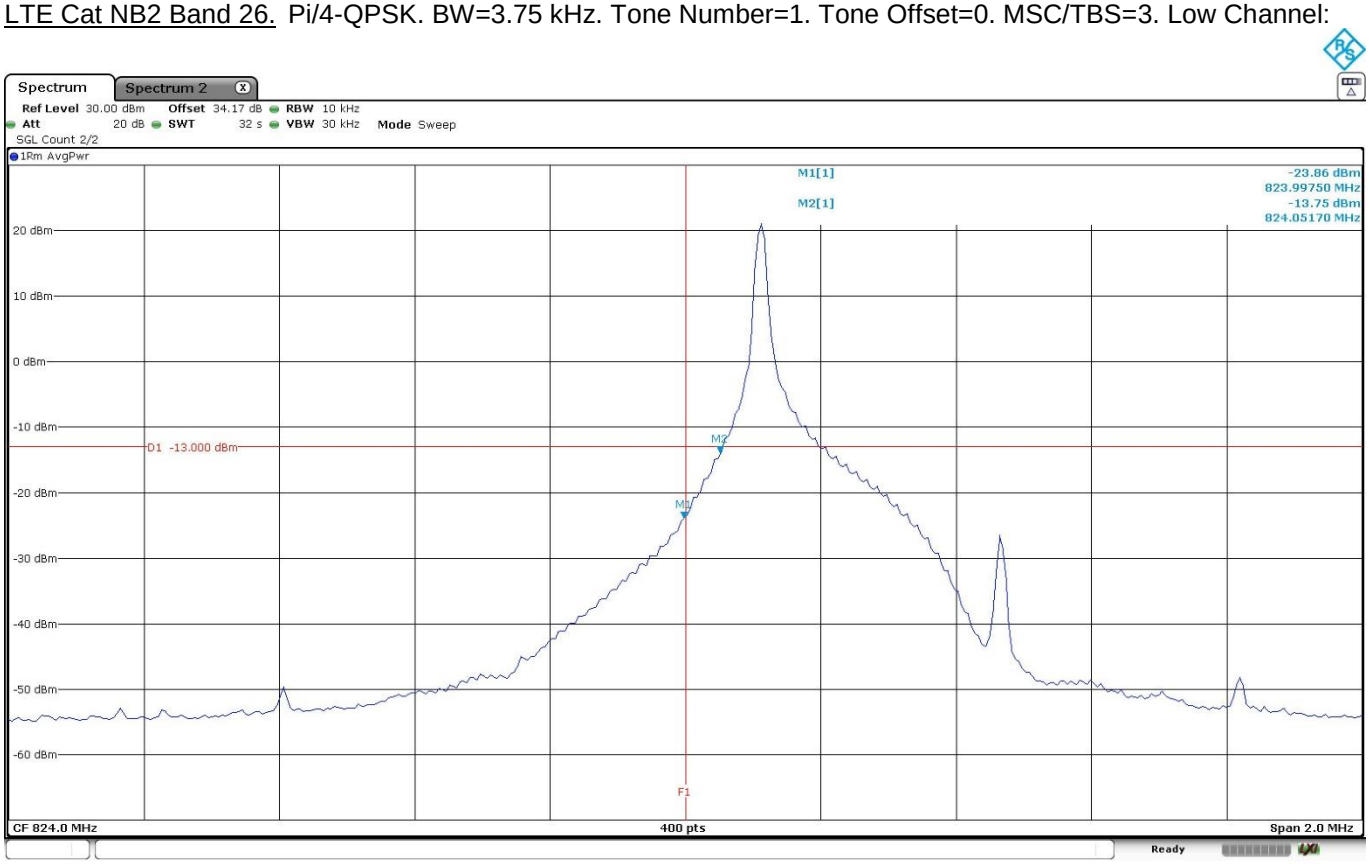
LTE Cat NB2 Band 26	Pi/4-QPSK BW=3.75 kHz Tone Number=1 Tone Offset=47 MSC/TBS=3	Pi/4-QPSK BW=15 kHz Tone Number=1 Tone Offset=11 MSC/TBS=3	QPSK BW=15 kHz Tone Number=12 Tone Offset=0 MSC/TBS=5
Maximum measured level at High Block Edge at antenna port (dBm)	-25.81	-23.34	-23.61

Measurement uncertainty (dB): <±2.76

Verdict

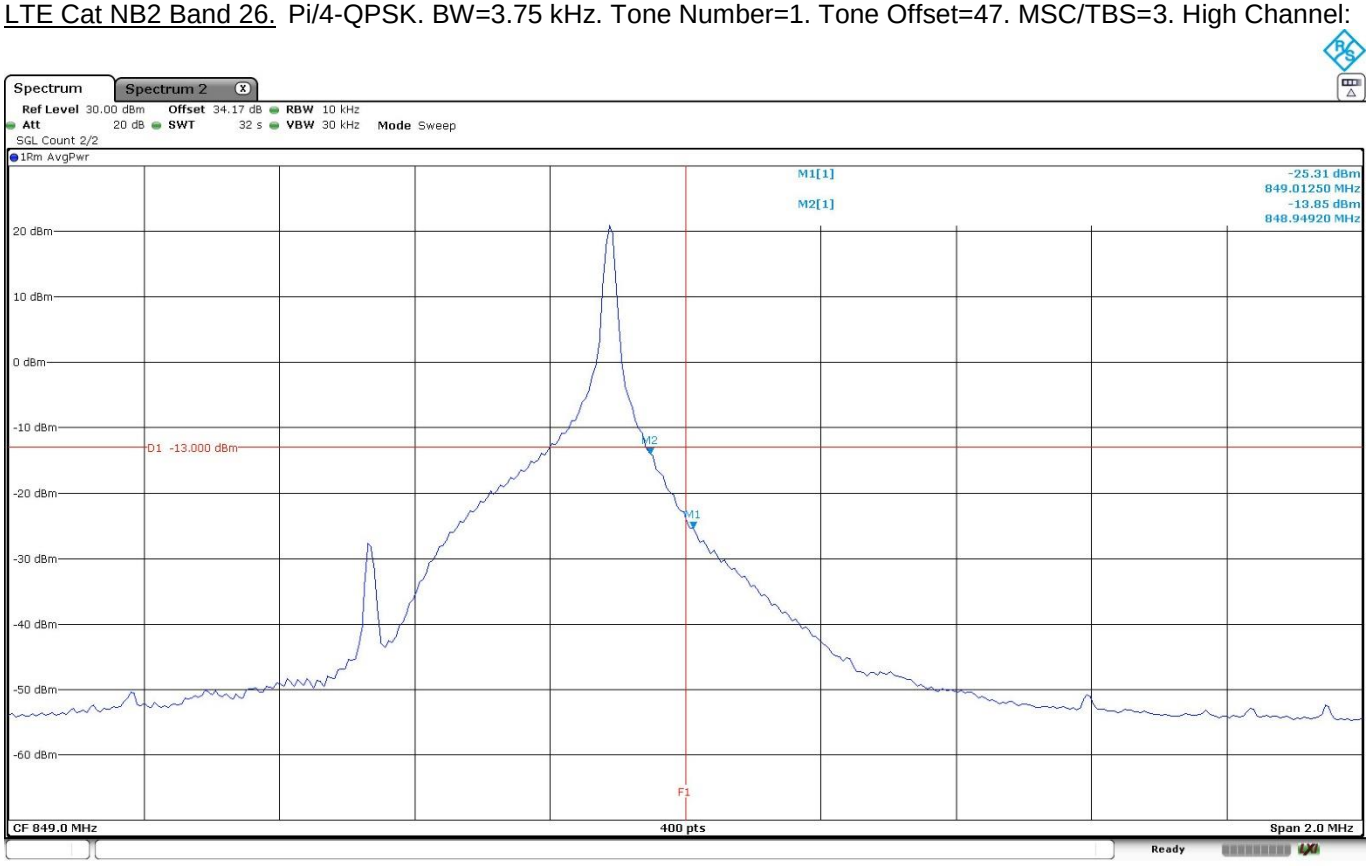
Pass

LTE Cat NB2 Band 26. Pi/4-QPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=3. Low Channel:



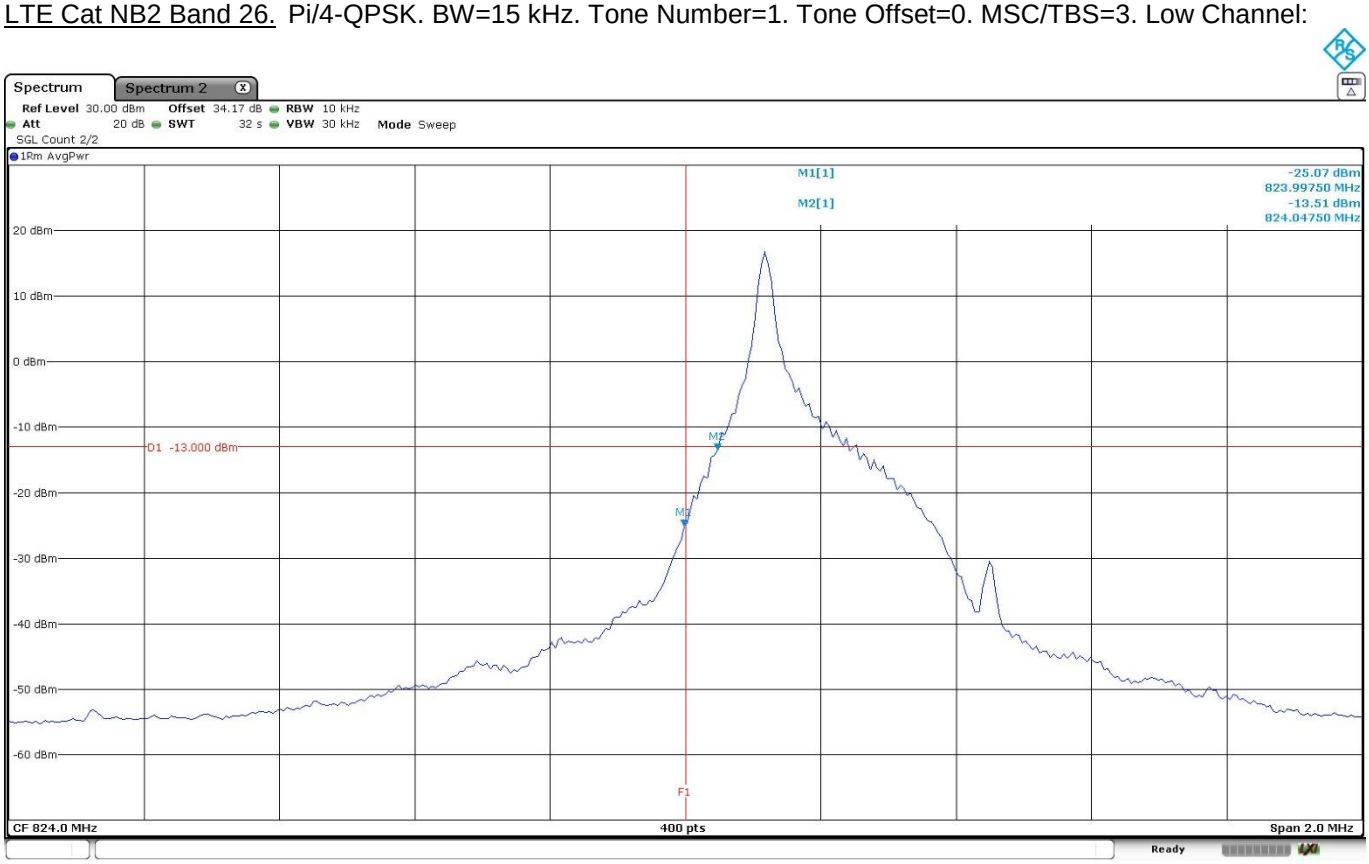
The equipment transmits at the maximum output power

LTE Cat NB2 Band 26. Pi/4-QPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=47. MSC/TBS=3. High Channel:



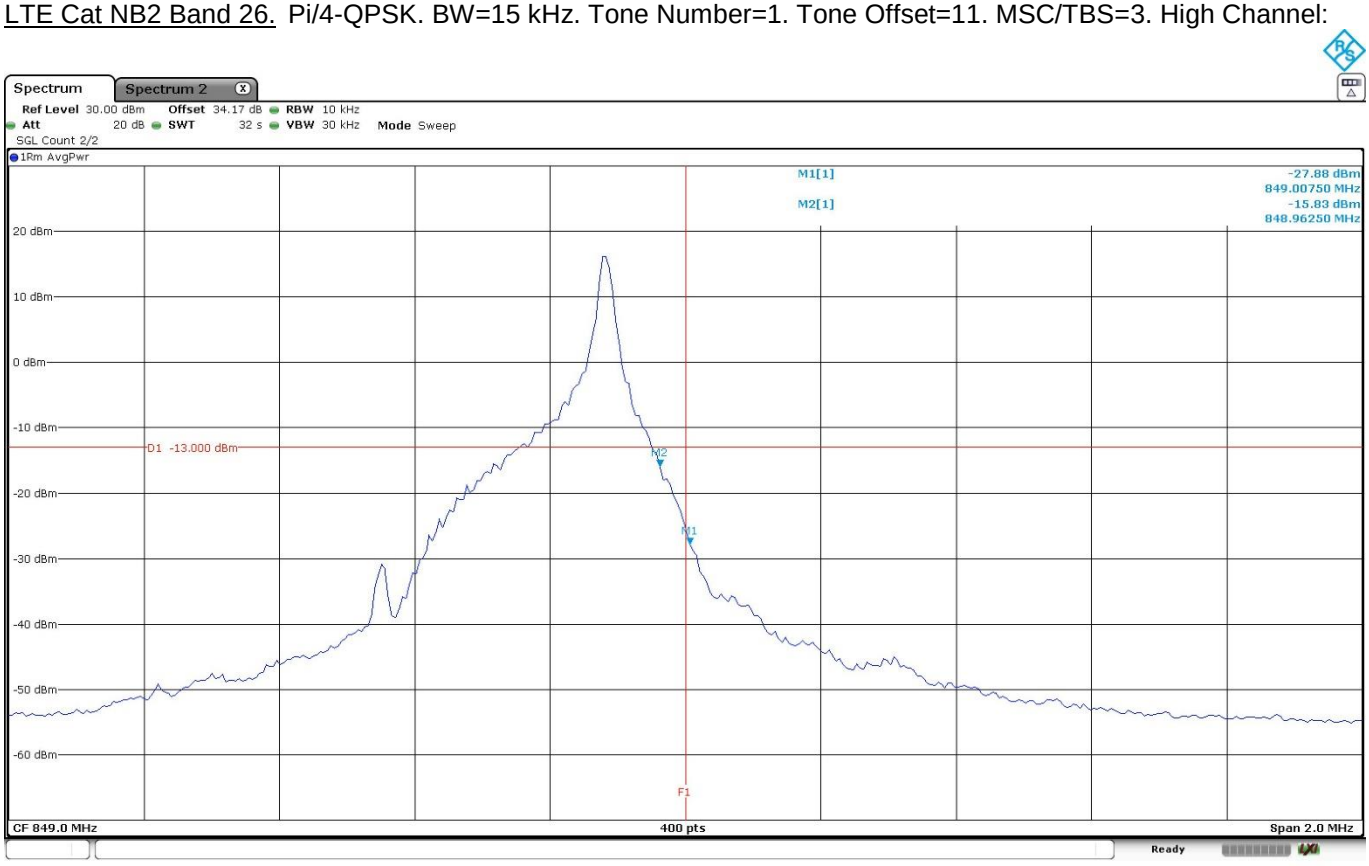
The equipment transmits at the maximum output power

LTE Cat NB2 Band 26. Pi/4-QPSK. BW=15 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=3. Low Channel:



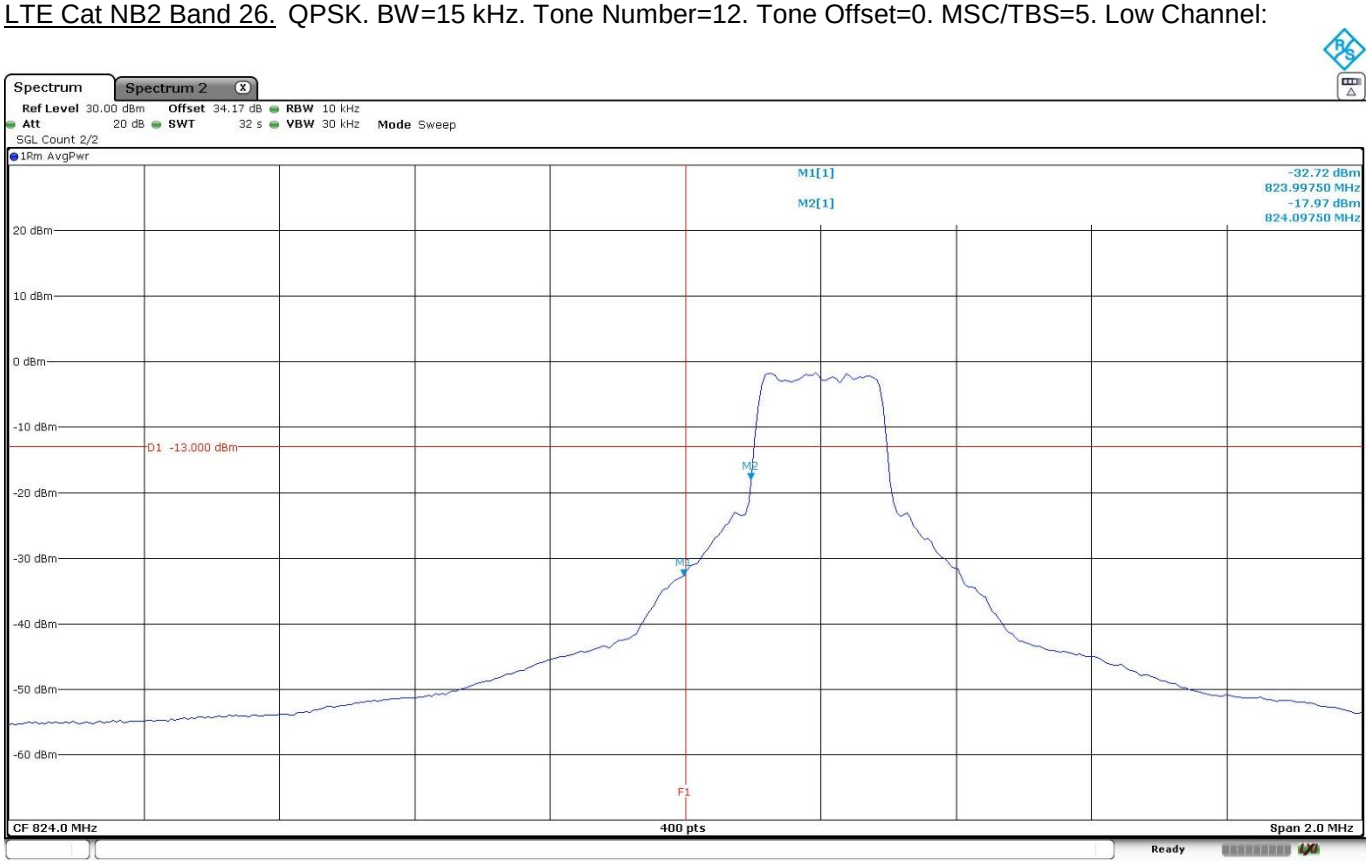
The equipment transmits at the maximum output power

LTE Cat NB2 Band 26. Pi/4-QPSK. BW=15 kHz. Tone Number=1. Tone Offset=11. MSC/TBS=3. High Channel:



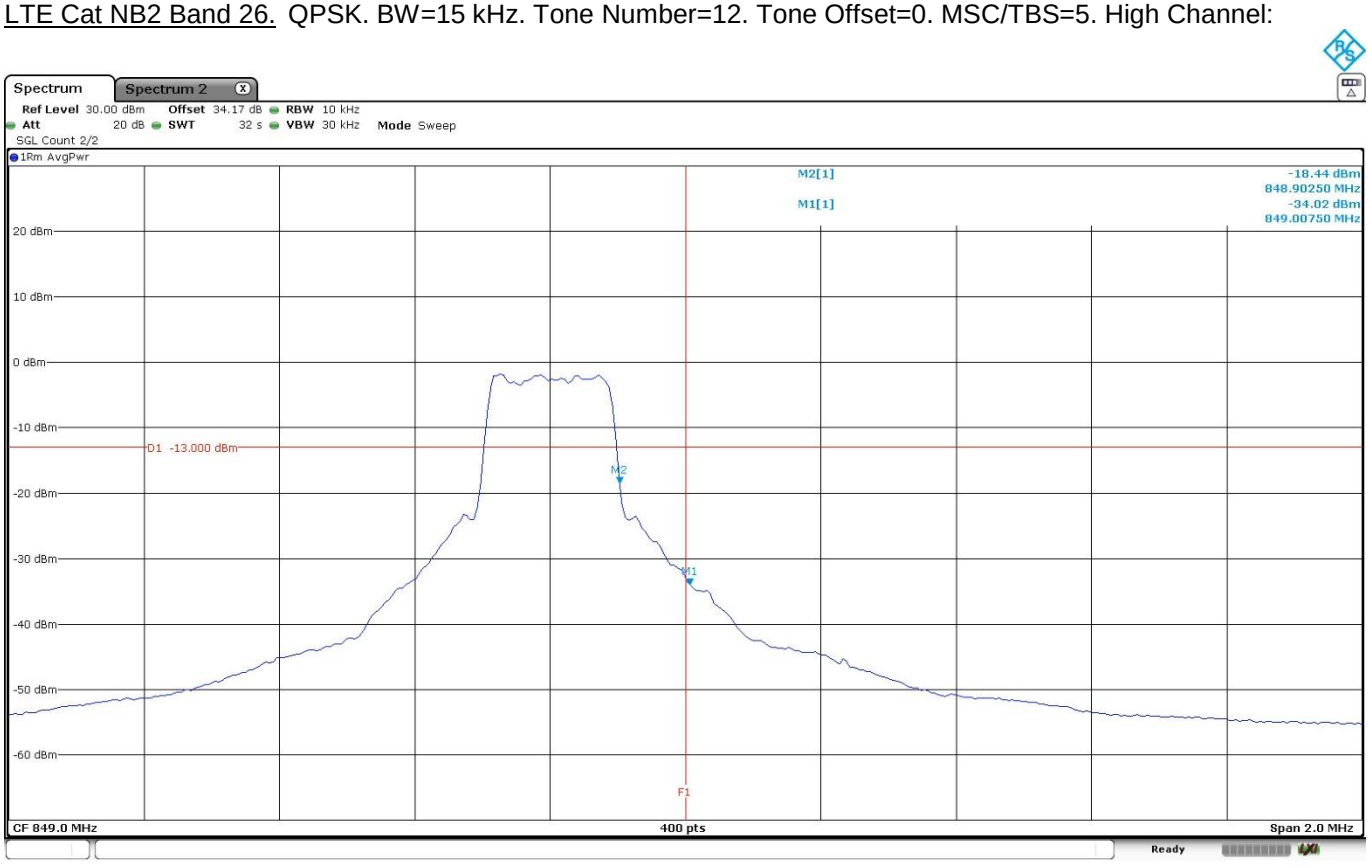
The equipment transmits at the maximum output power

LTE Cat NB2 Band 26. QPSK. BW=15 kHz. Tone Number=12. Tone Offset=0. MSC/TBS=5. Low Channel:



The equipment transmits at the maximum output power

LTE Cat NB2 Band 26. QPSK. BW=15 kHz. Tone Number=12. Tone Offset=0. MSC/TBS=5. High Channel:



The equipment transmits at the maximum output power

Radiated Emissions

Limits

* FCC §2.1051 and §22.917: 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.

* RSS-132. 5.5: Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

iii. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 P (watts).

iv. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 P (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Method

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the High frequency generated within the equipment.

The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the height and polarization of the measuring antenna. The maximum meter reading was recorded.

Measurement Limit:

According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB, P in watts.
At Po transmitting power, the specified minimum attenuation becomes 43+10log (Po), and the level in dBm relative Po becomes:

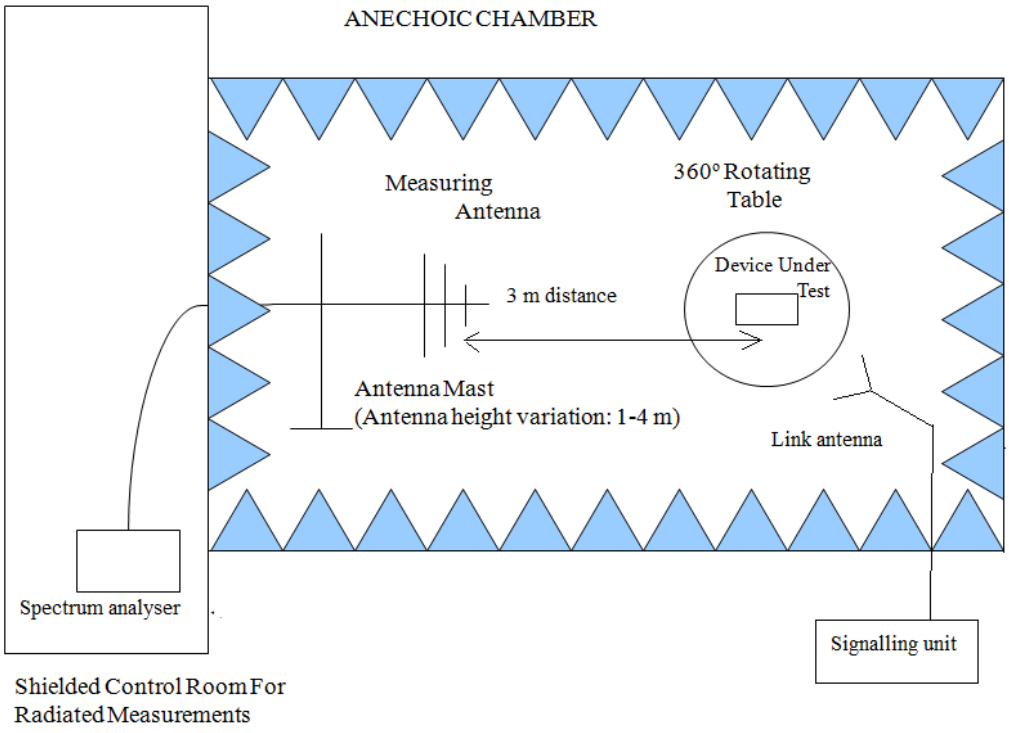
$$Po\ (dBm) – [43 + 10 \log (Po\ in\ mwatts) - 30] = - 13\ dBm$$

The maximum field strength (dBµV/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

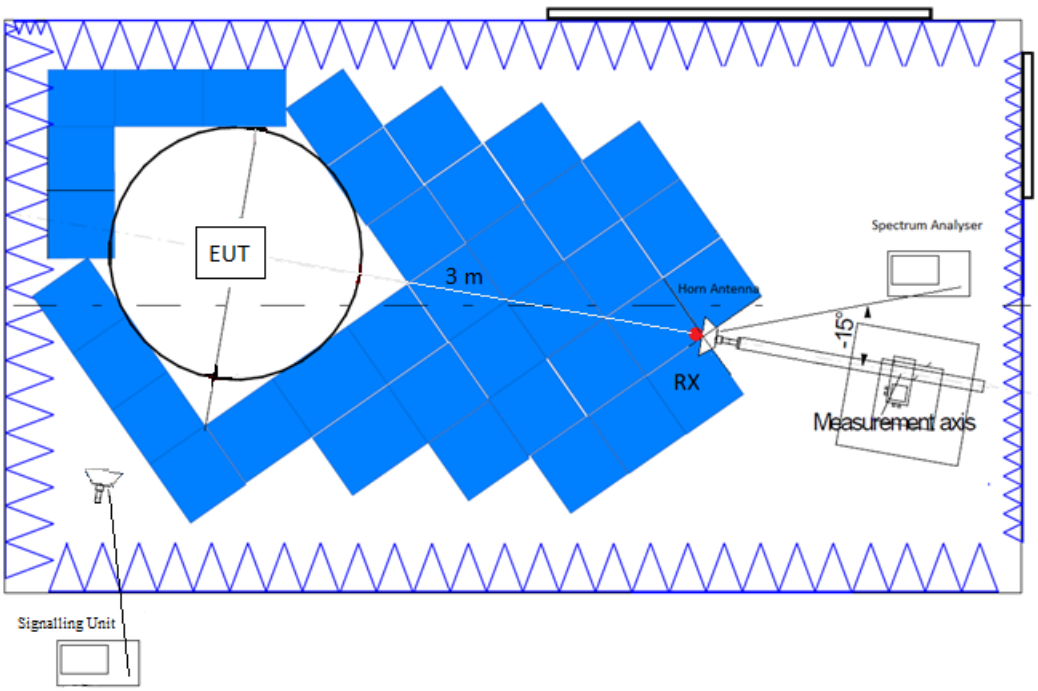
EIRP (dBm) = E (dBµV/m) + 20 log(D) - 104.8; where D is the measurement distance (in the far field region) in m. D = 3 m

Test Setup

Radiated measurements below 1 GHz:



Radiated measurements above 1 GHz:



Results

LTE Cat NB2 Band 26:

A preliminary scan determined the QPSK, BW=15 kHz, Tone Number=1, Tone Offset=0, MSC/TBS=3 as the worst case. The following results are for this worst-case configuration.

Frequency range 30 MHz - 1 GHz:

- LOW CHANNEL:

No spurious frequencies at less than 20 dB below the limit.

- MIDDLE CHANNEL:

No spurious frequencies at less than 20 dB below the limit.

- HIGH CHANNEL:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 GHz - 8.5 GHz:

- LOW CHANNEL:

No spurious frequencies at less than 20 dB below the limit.

- MIDDLE CHANNEL:

No spurious frequencies at less than 20 dB below the limit.

- HIGH CHANNEL:

No spurious frequencies at less than 20 dB below the limit.

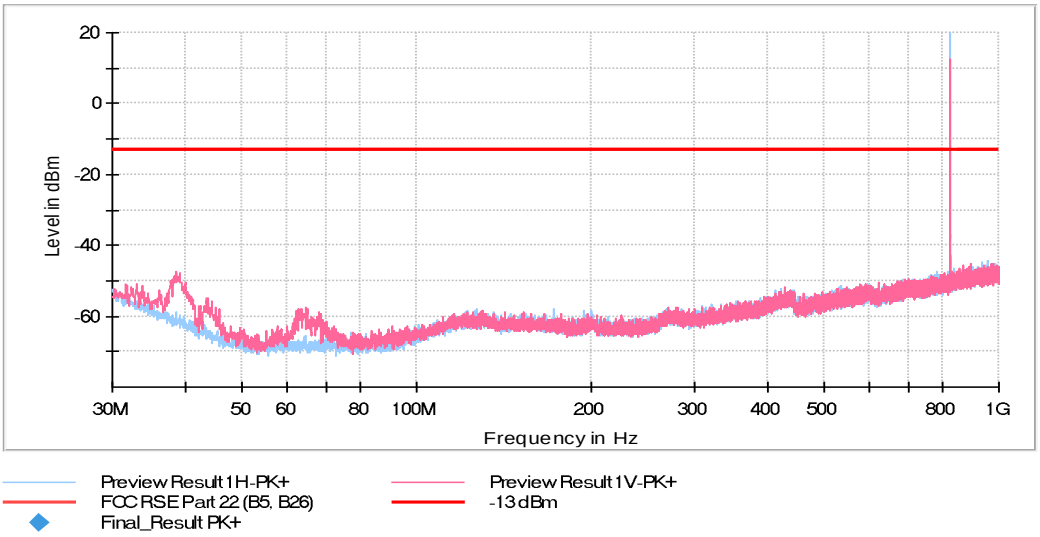
Measurement Uncertainty (dB):	<± 4.68 for f ≥ 30 MHz up to 1 GHz <± 4.99 for f ≥ 1 GHz up to 8.5 GHz

Verdict: PASS

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	30.312 kHz	PK+	100 kHz	Coupled	0 dB
1 GHz - 8.5 GHz	234.375 kHz	PK+	100 kHz	1 s	0 dB

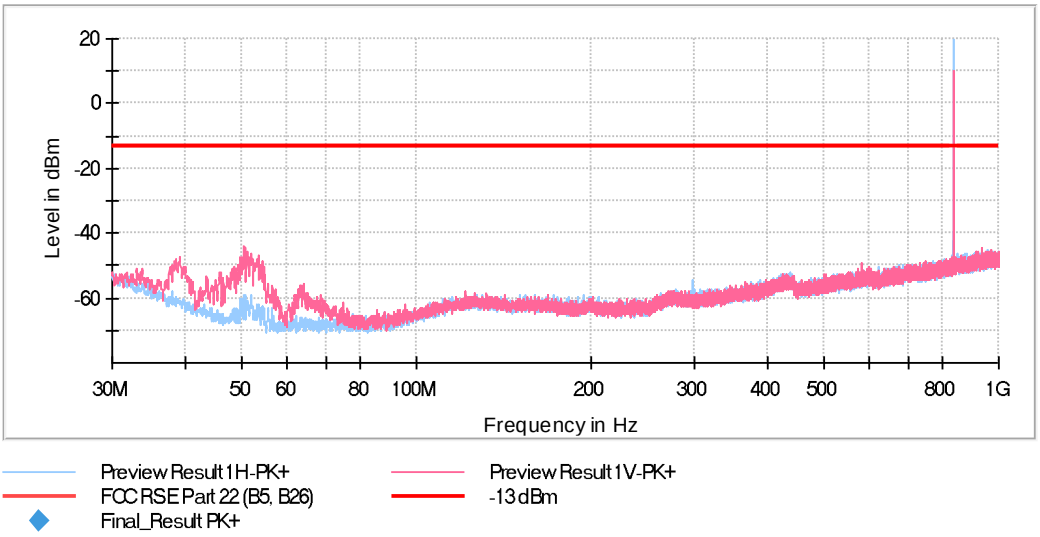
FREQUENCY RANGE 30 MHz - 1 GHz:

- LOW CHANNEL:



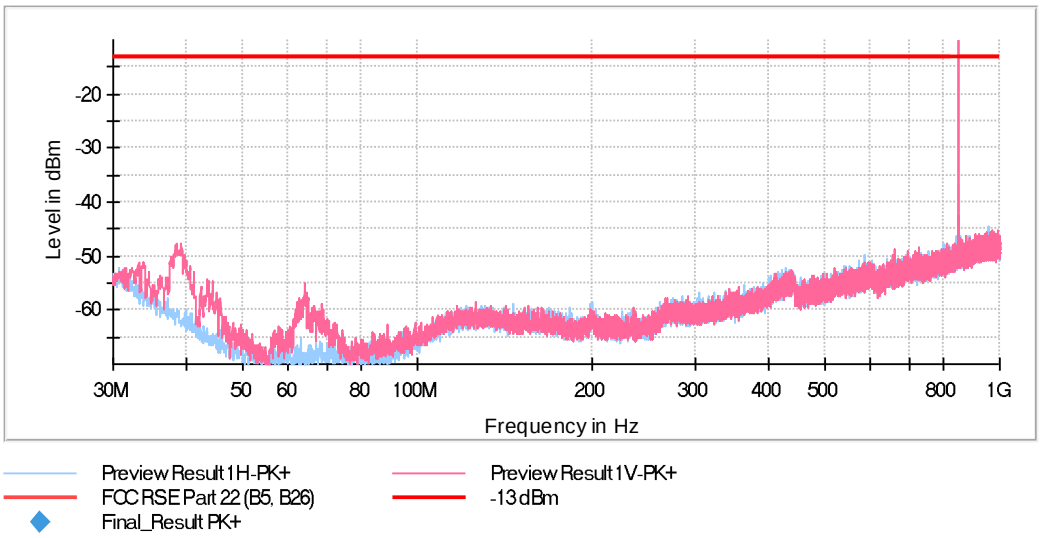
The peak above the limit is the carrier frequency.

- MIDDLE CHANNEL:



The peak above the limit is the carrier frequency.

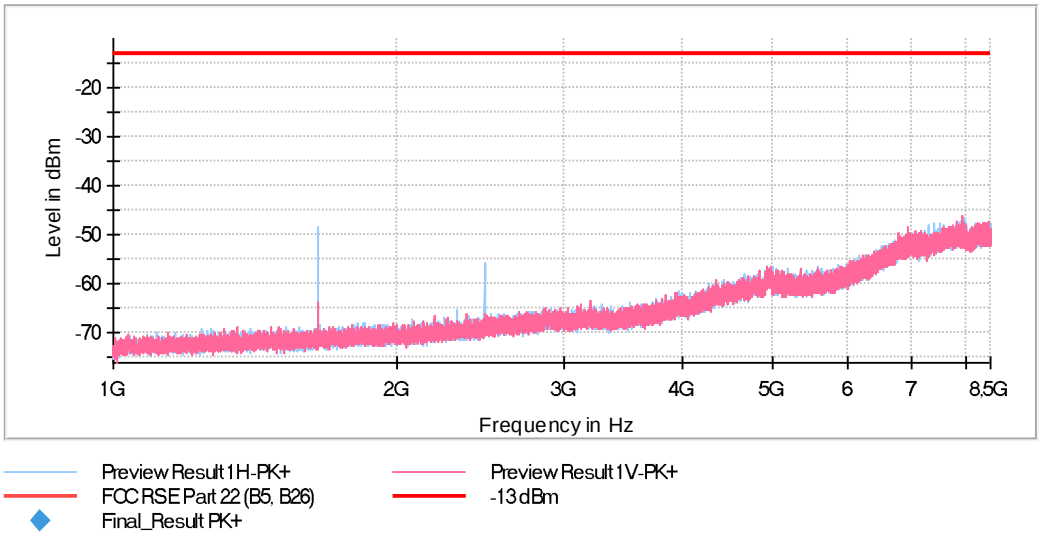
- HIGH CHANNEL:



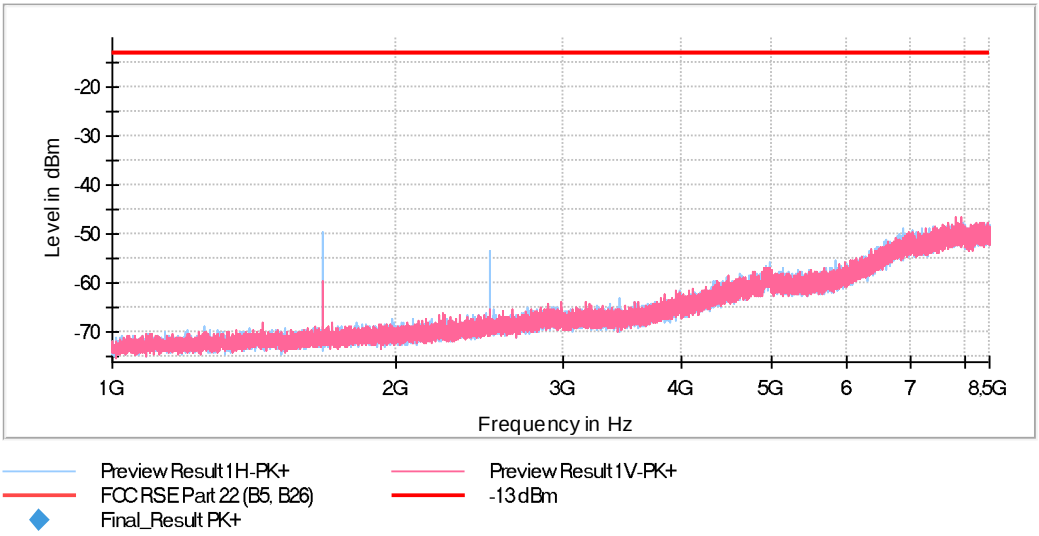
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 GHz - 8.5 GHz:

- LOW CHANNEL:



- MIDDLE CHANNEL:



- HIGH CHANNEL: