

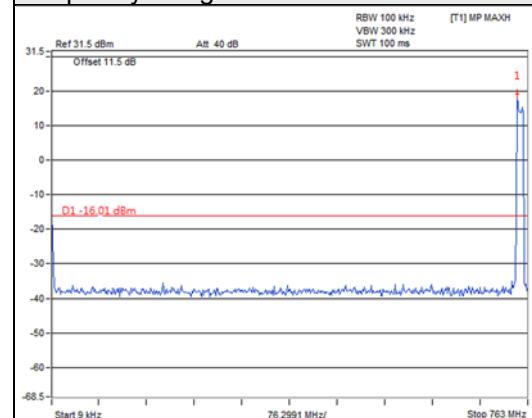
4.7.4.2 NB-IoT data

**For LTE Band 13 Guard Band:
QPSK_NB-IoT Signal at Bottom**

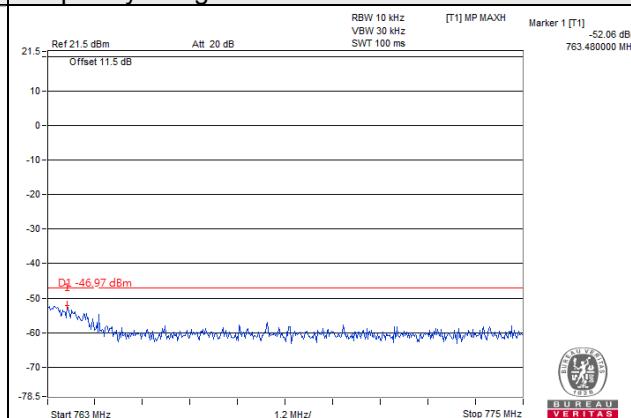
Channel Bandwidth: 10MHz, Chain 0

751.0MHz

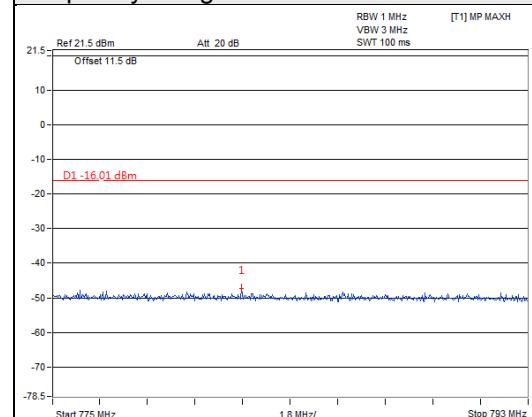
Frequency Range : 9kHz~763MHz



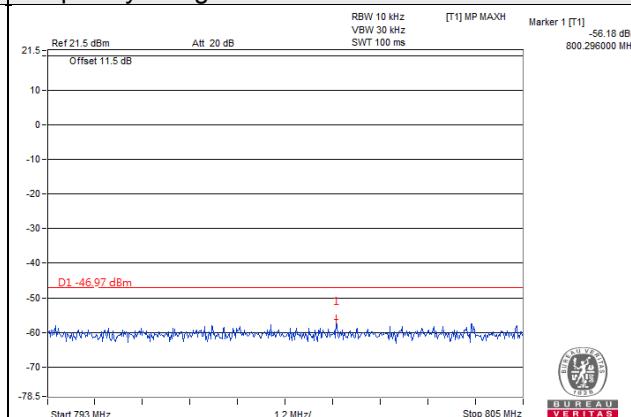
Frequency Range : 763MHz~775MHz



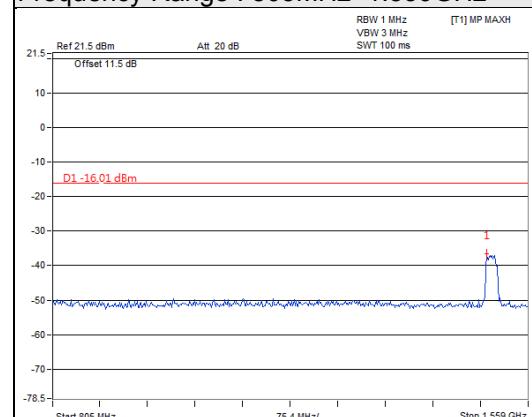
Frequency Range : 775MHz~793MHz



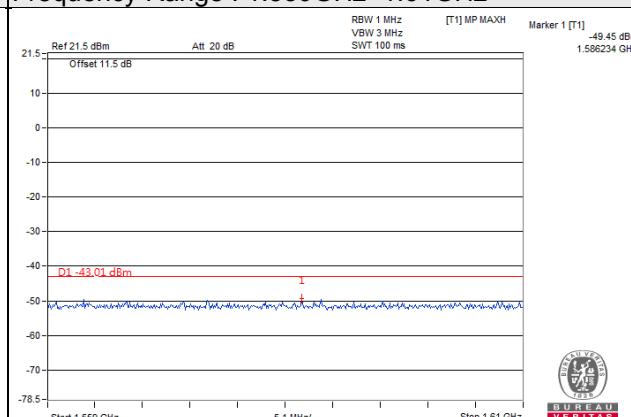
Frequency Range : 793MHz~805MHz



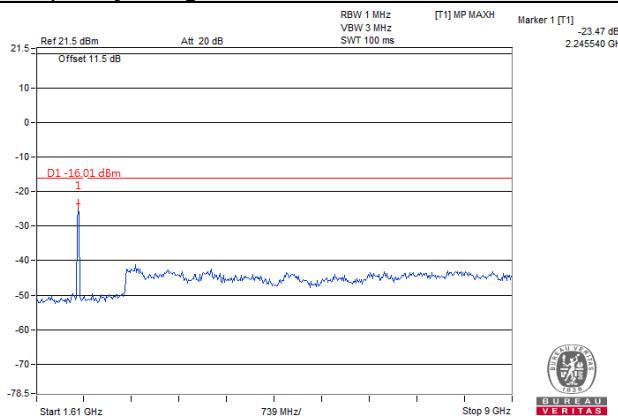
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz

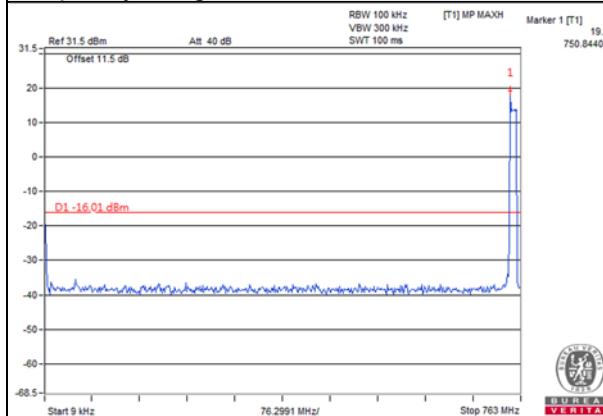


Note: For 9kHz, the signal is from spectrum analyzer.

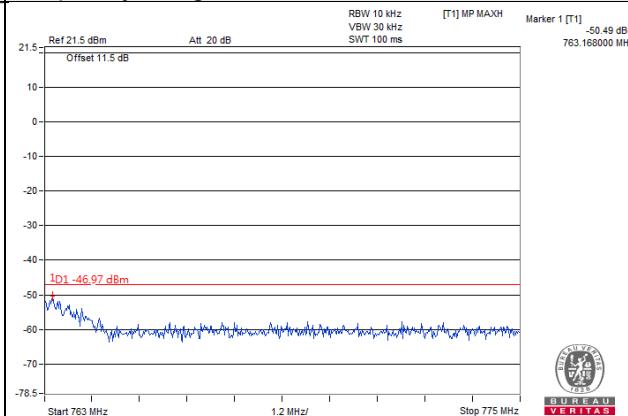
Channel Bandwidth: 10MHz, Chain 1

751.0MHz

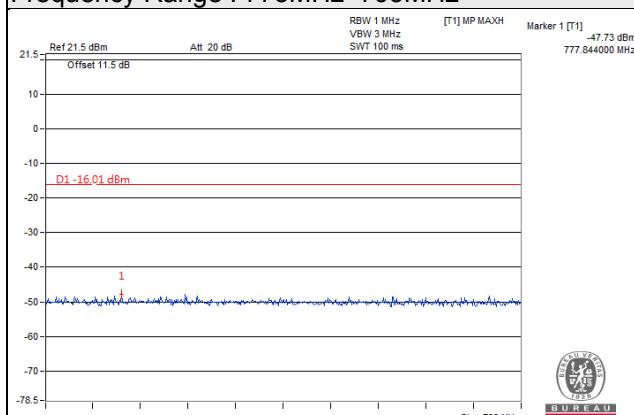
Frequency Range : 9kHz~763MHz



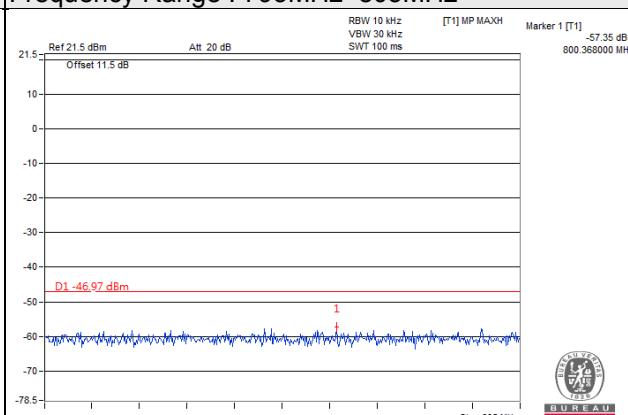
Frequency Range : 763MHz~775MHz



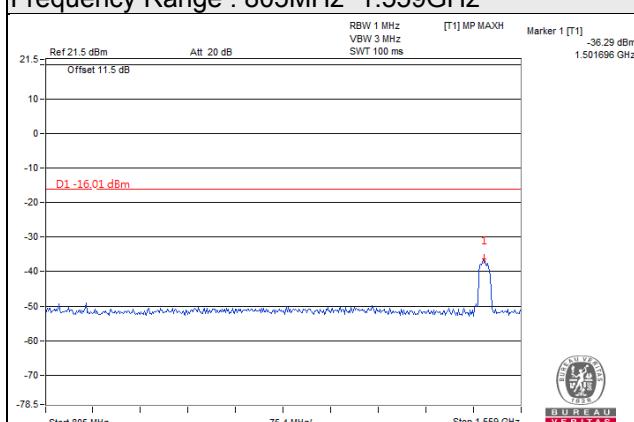
Frequency Range : 775MHz~793MHz



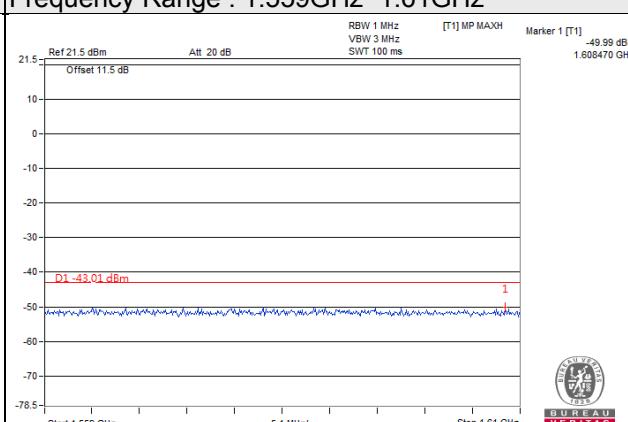
Frequency Range : 793MHz~805MHz



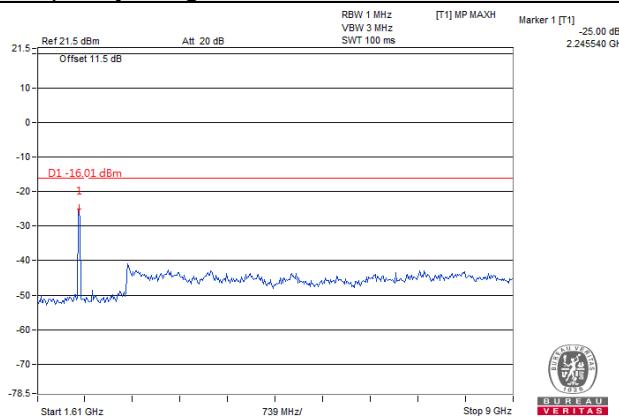
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz



Note: For 9kHz, the signal is from spectrum analyzer.



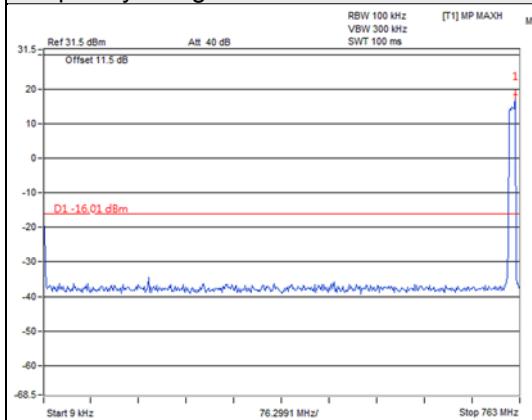
BUREAU
VERITAS

QPSK_NB-IoT Signal at Top

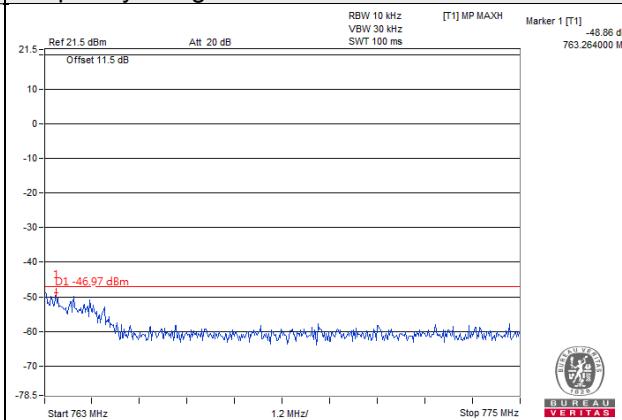
Channel Bandwidth: 10MHz, Chain 0

751.0MHz

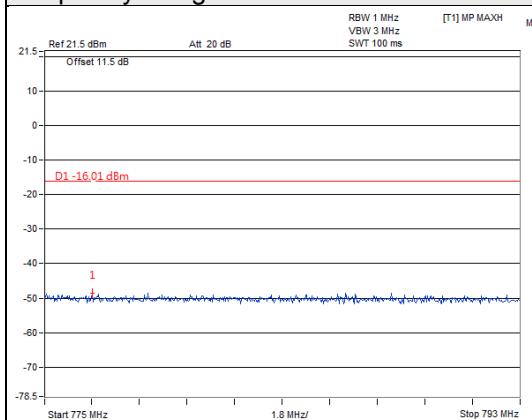
Frequency Range : 9kHz~763MHz



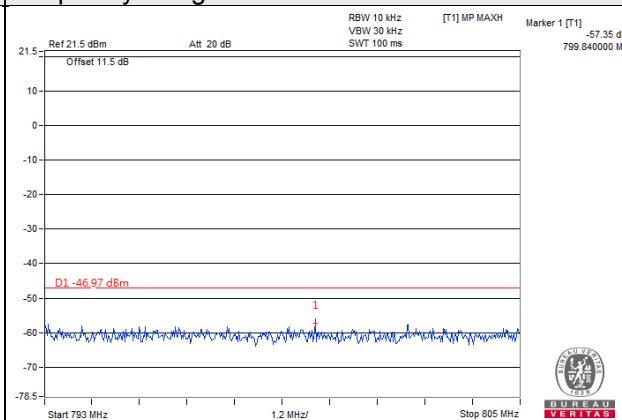
Frequency Range : 763MHz~775MHz



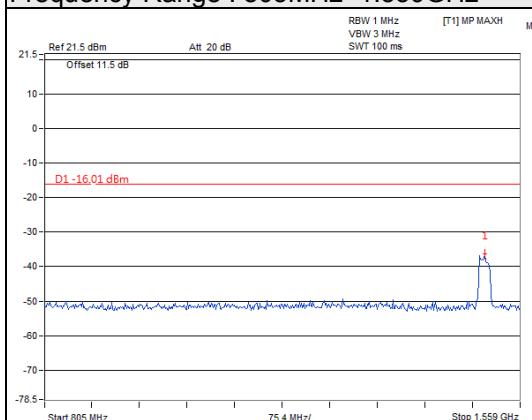
Frequency Range : 775MHz~793MHz



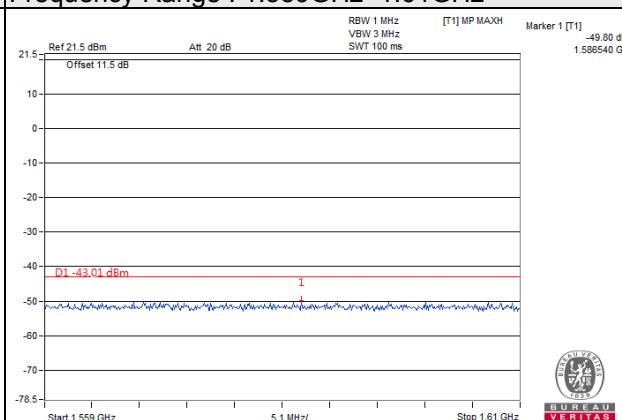
Frequency Range : 793MHz~805MHz



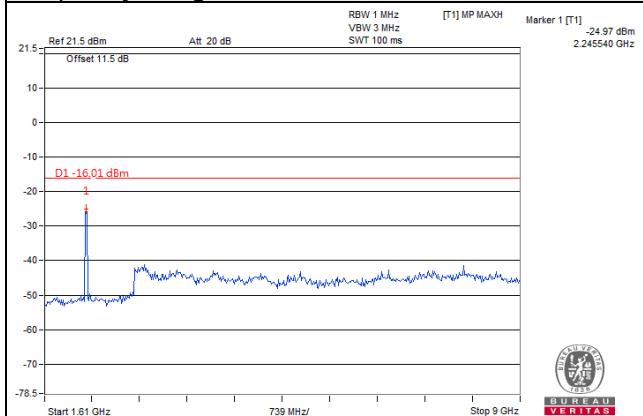
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz

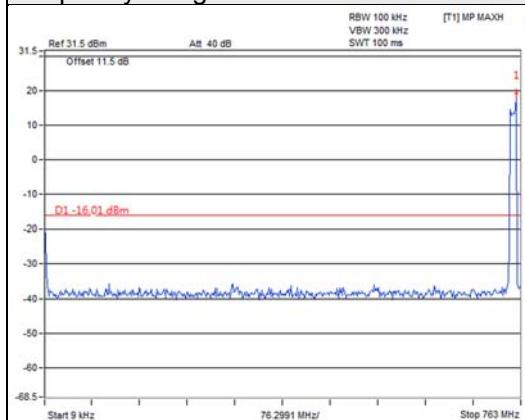


Note: For 9kHz, the signal is from spectrum analyzer.

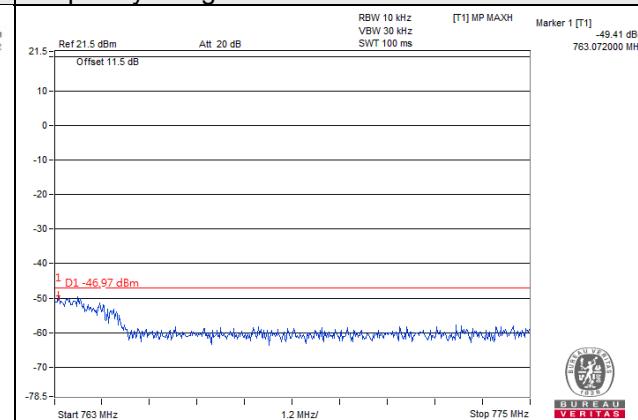
Channel Bandwidth: 10MHz, Chain 1

751.0MHz

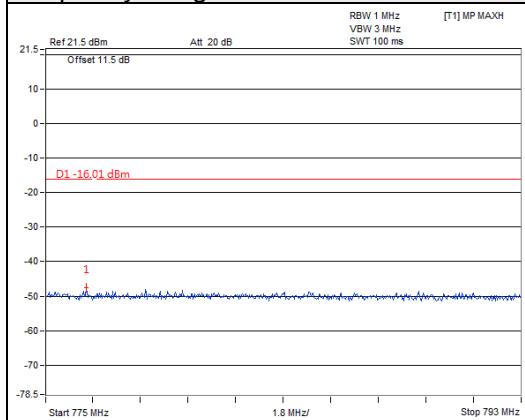
Frequency Range : 9kHz~763MHz



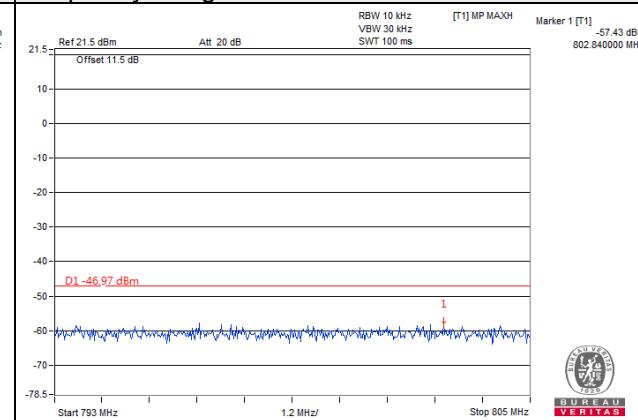
Frequency Range : 763MHz~775MHz



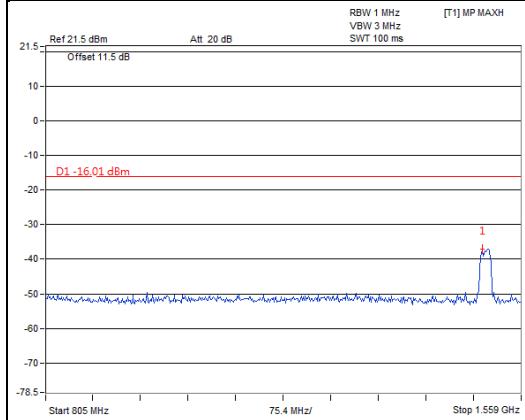
Frequency Range : 775MHz~793MHz



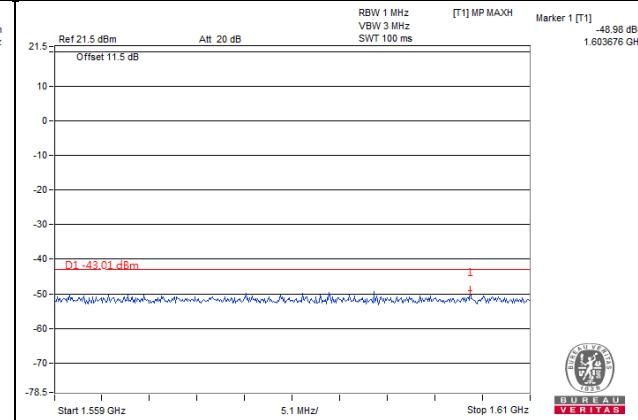
Frequency Range : 793MHz~805MHz



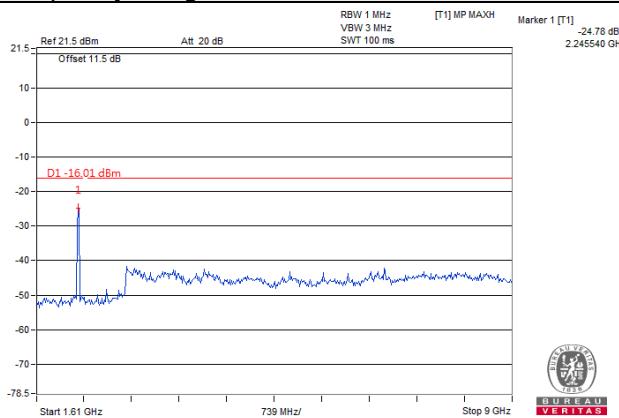
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz



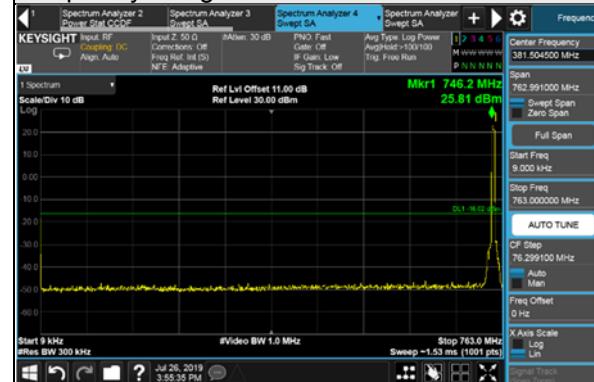
Note: For 9kHz, the signal is from spectrum analyzer.

**For NB-IoT In-Band:
QPSK_NB-IoT Signal at Bottom**

Channel Bandwidth: 5MHz, Chain 0

748.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz



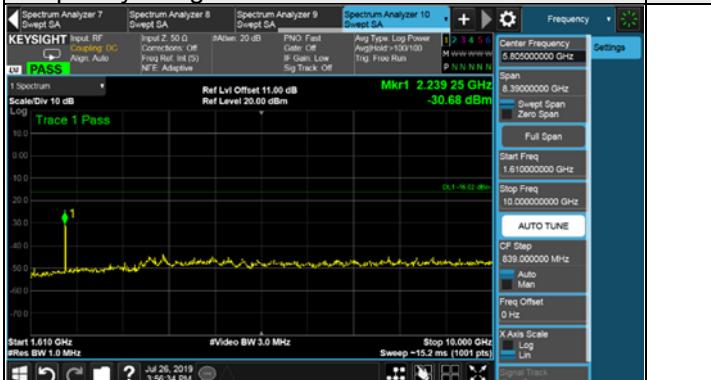
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz

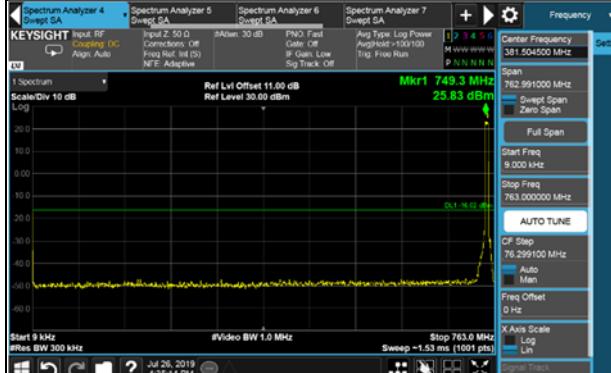


Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 0

751.0MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz



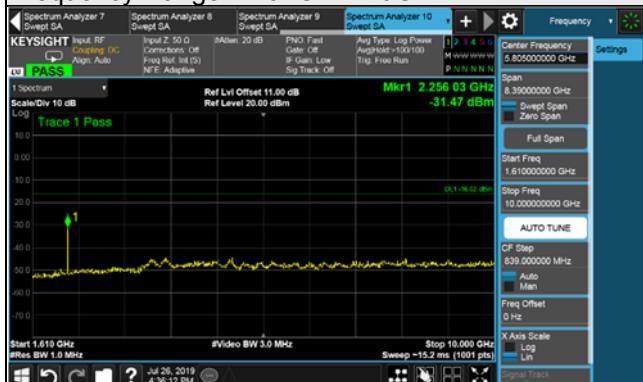
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz

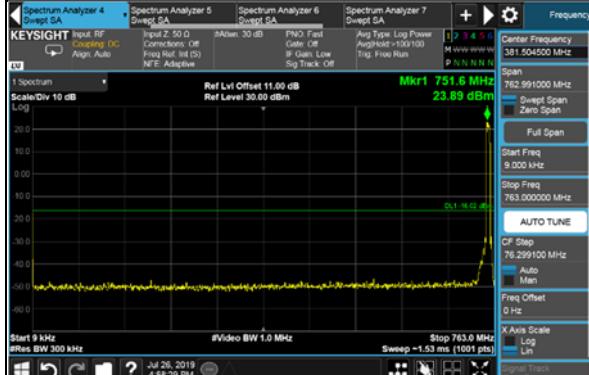


Note: For 9kHz, the signal is from spectrum analyzer.

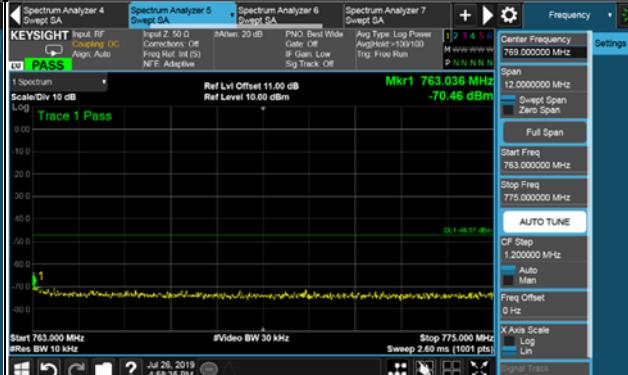
Channel Bandwidth: 5MHz, Chain 0

753.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz



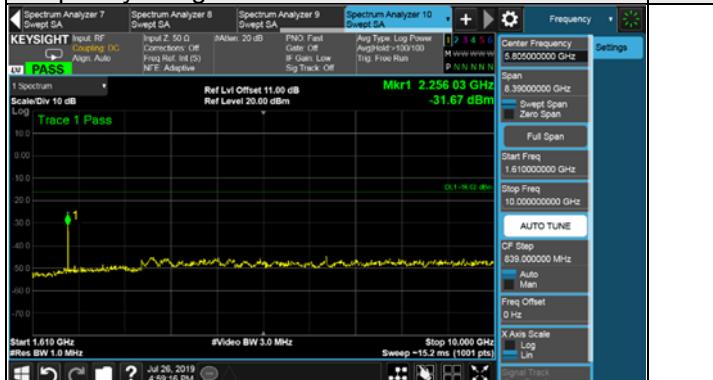
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz

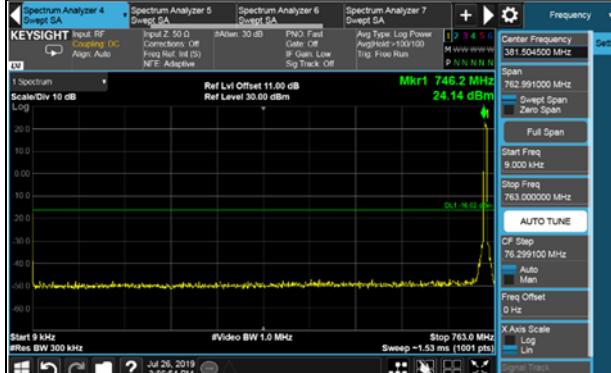


Note: For 9kHz, the signal is from spectrum analyzer.

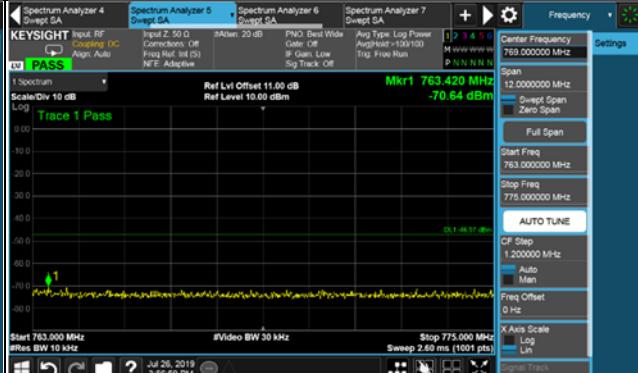
Channel Bandwidth: 5MHz, Chain 1

748.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



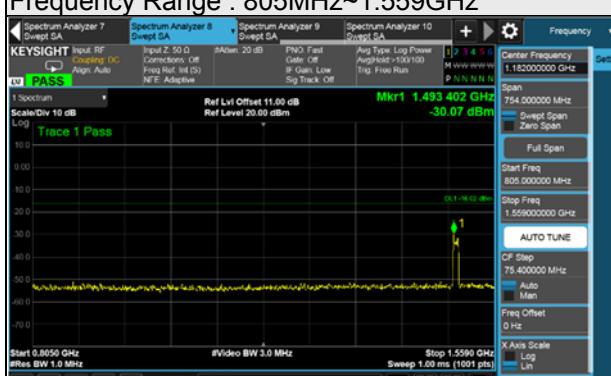
Frequency Range : 775MHz~793MHz



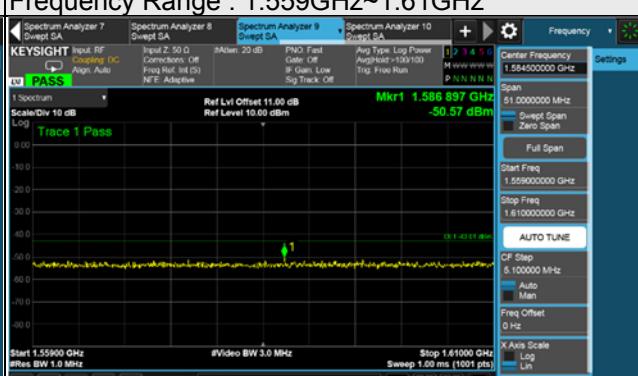
Frequency Range : 793MHz~805MHz



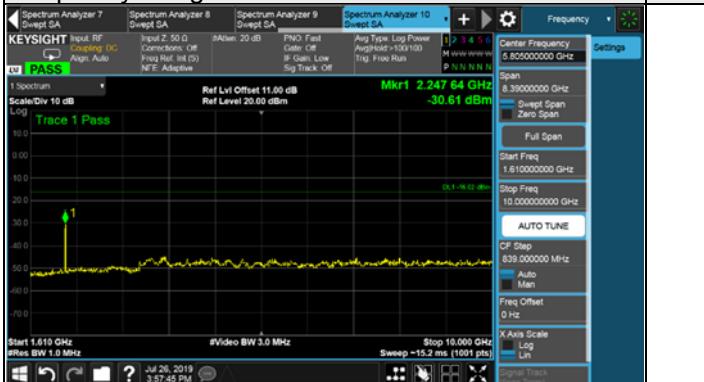
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz

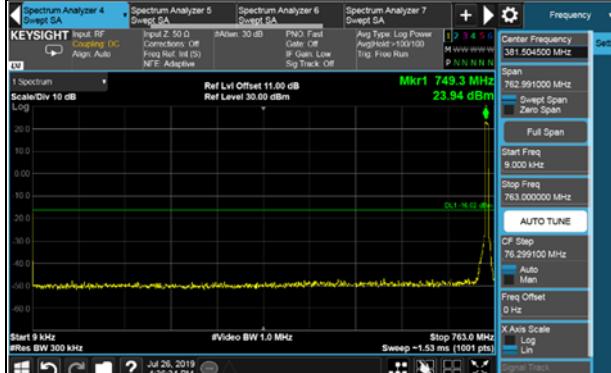


Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 1

751.0MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



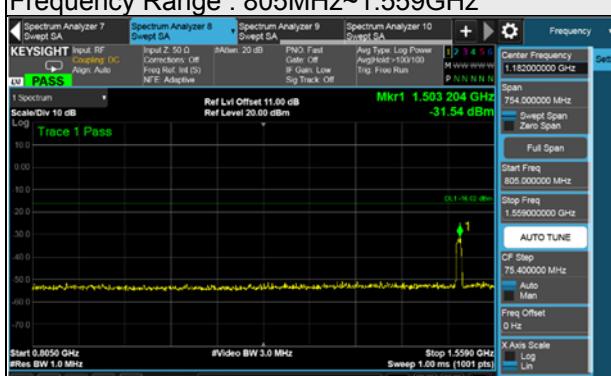
Frequency Range : 775MHz~793MHz



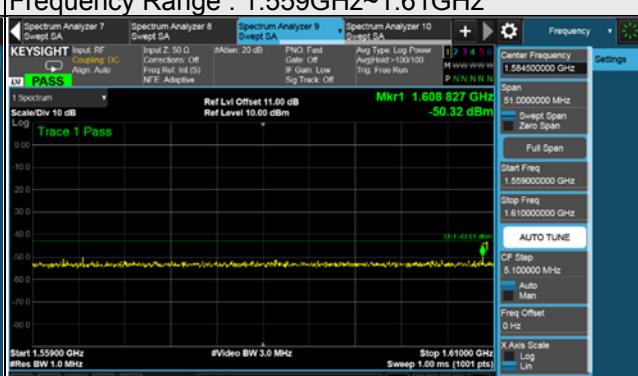
Frequency Range : 793MHz~805MHz



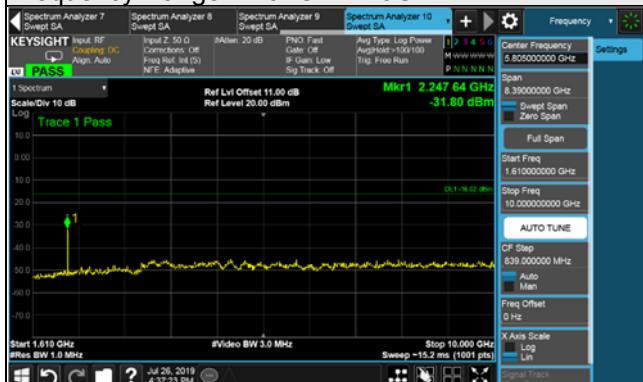
Frequency Range : 805MHz~1.559GHz



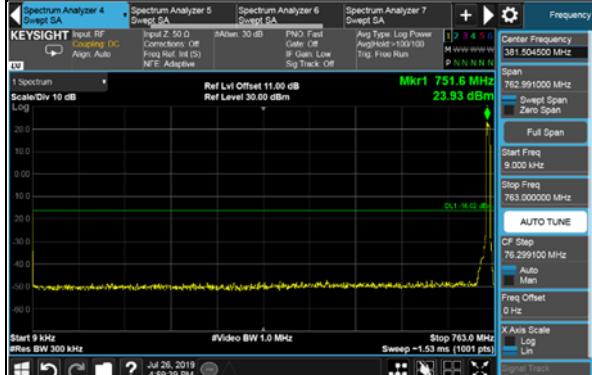
Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz



Note: For 9kHz, the signal is from spectrum analyzer.

Channel Bandwidth: 5MHz, Chain 1
753.5MHz
Frequency Range : 9kHz~763MHz

Frequency Range : 763MHz~775MHz

Frequency Range : 775MHz~793MHz

Frequency Range : 793MHz~805MHz

Frequency Range : 805MHz~1.559GHz

Frequency Range : 1.559GHz~1.61GHz


Frequency Range : 1.61GHz~10GHz



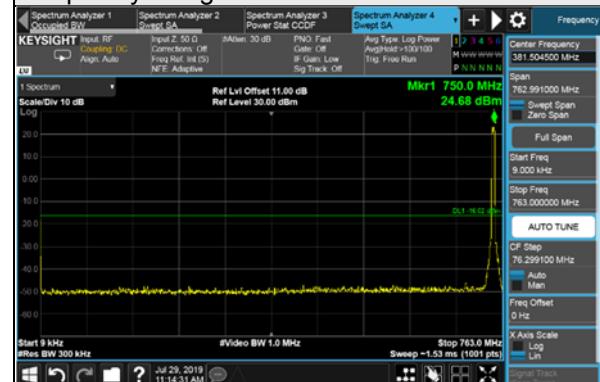
Note: For 9kHz, the signal is from spectrum analyzer.

QPSK_NB-IoT Signal at Top

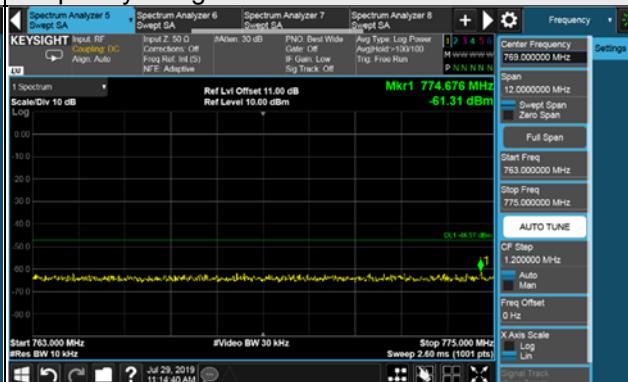
Channel Bandwidth: 5MHz, Chain 0

748.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz

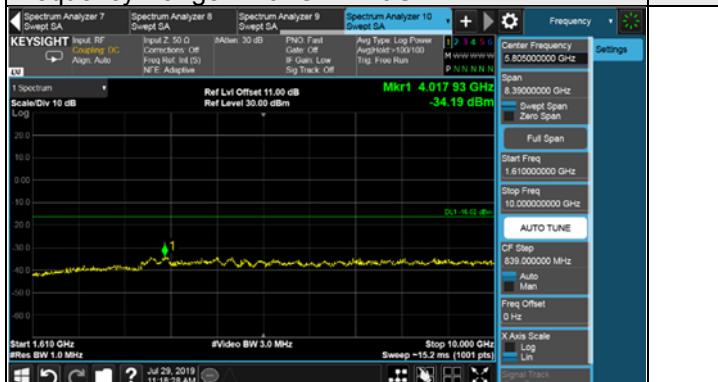
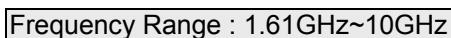


Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



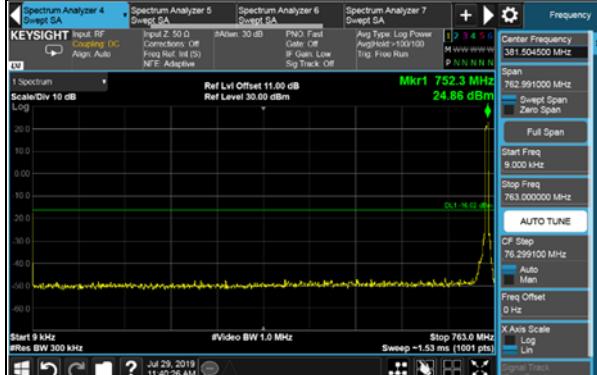


Note: For 9kHz, the signal is from spectrum analyzer.

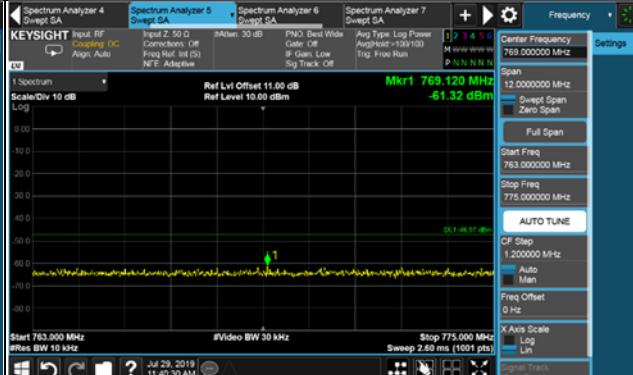
Channel Bandwidth: 5MHz, Chain 0

751.0MHz

Frequency Range : 9kHz~763MHz



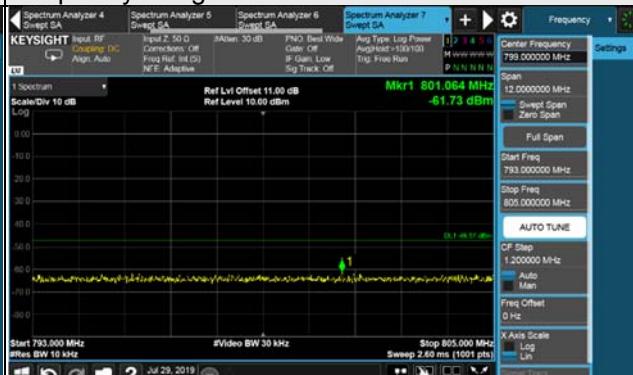
Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz

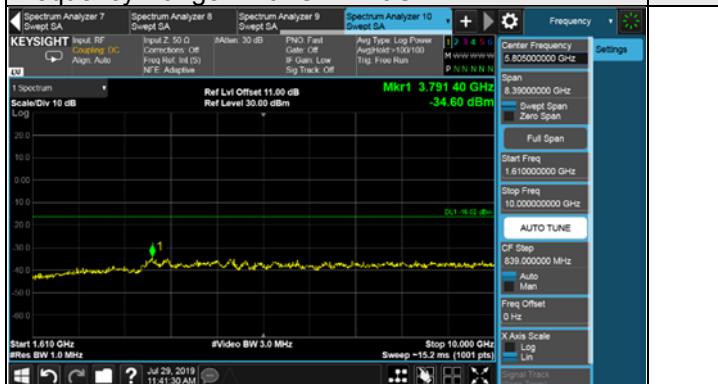
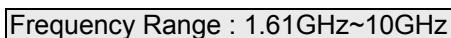


Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



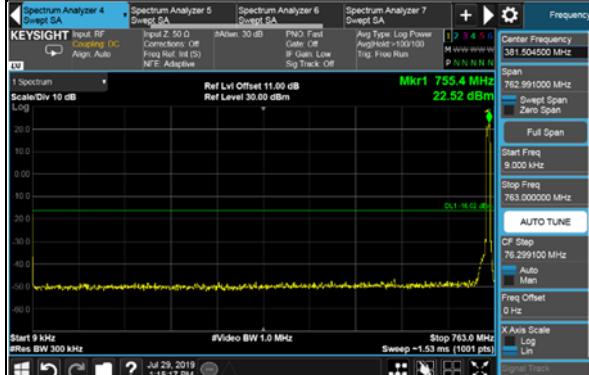


Note: For 9kHz, the signal is from spectrum analyzer.

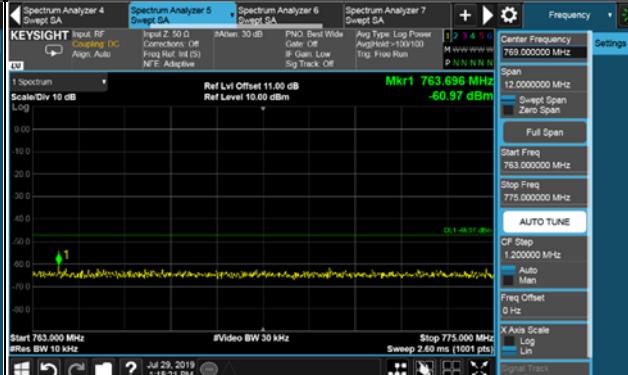
Channel Bandwidth: 5MHz, Chain 0

753.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz

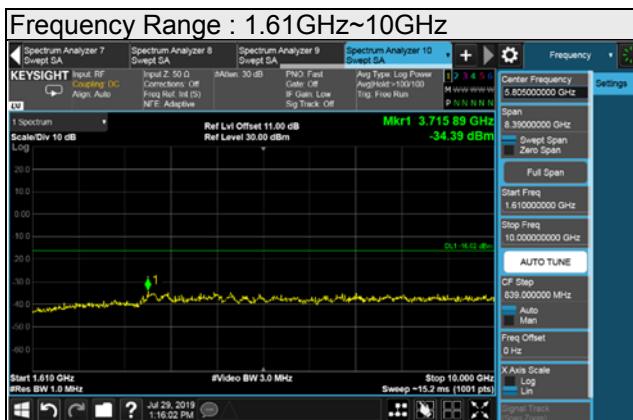


Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz





Note: For 9kHz, the signal is from spectrum analyzer.

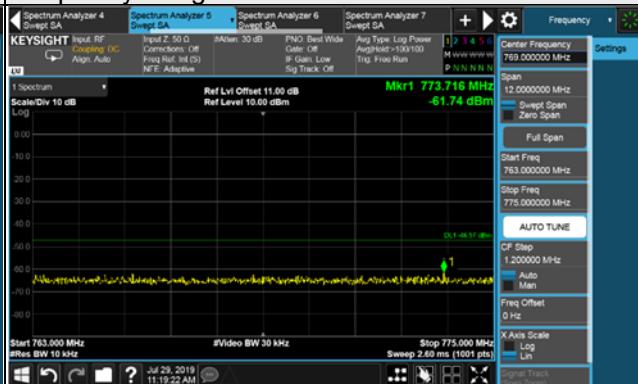
Channel Bandwidth: 5MHz, Chain 1

748.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



Frequency Range : 775MHz~793MHz



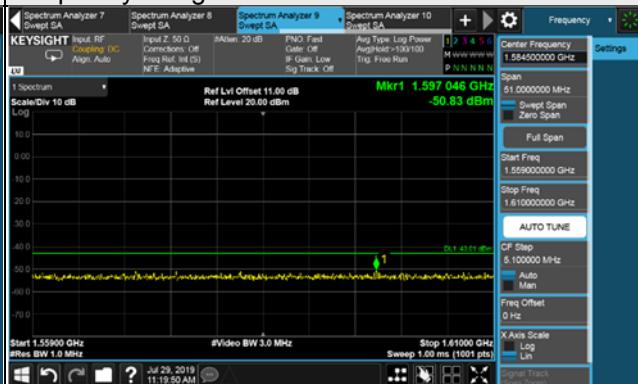
Frequency Range : 793MHz~805MHz



Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz

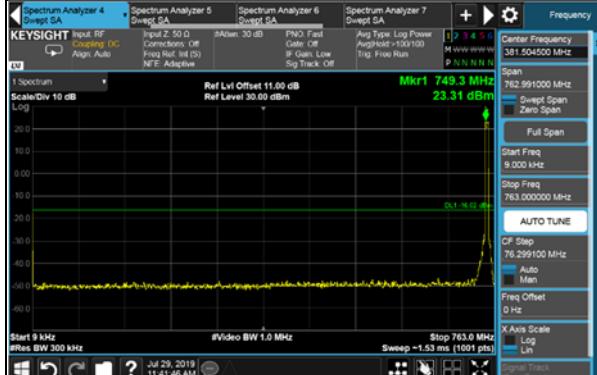


Note: For 9kHz, the signal is from spectrum analyzer.

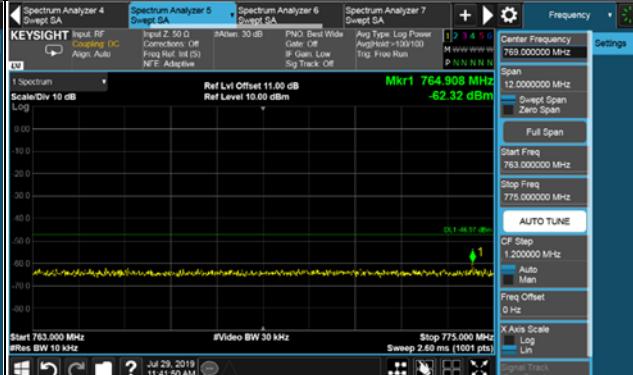
Channel Bandwidth: 5MHz, Chain 1

751.0MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



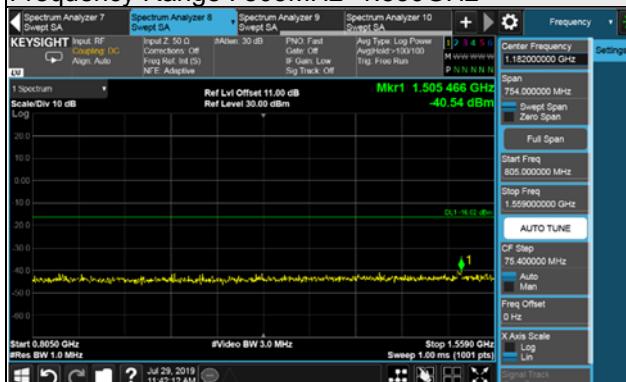
Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz



Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~10GHz

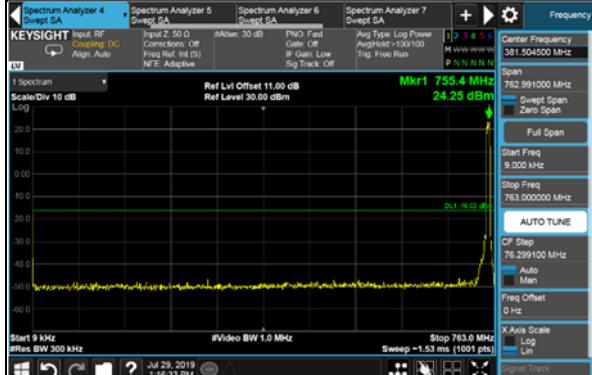


Note: For 9kHz, the signal is from spectrum analyzer.

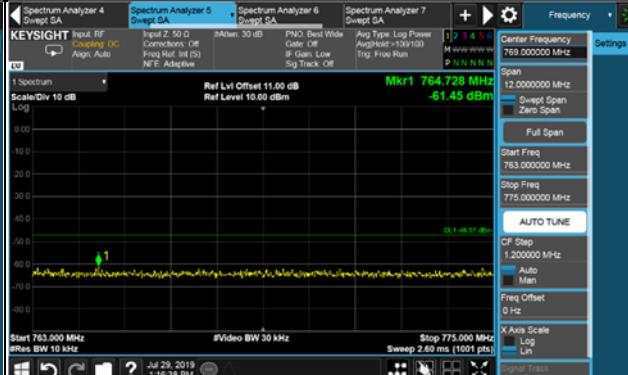
Channel Bandwidth: 5MHz, Chain 1

753.5MHz

Frequency Range : 9kHz~763MHz



Frequency Range : 763MHz~775MHz



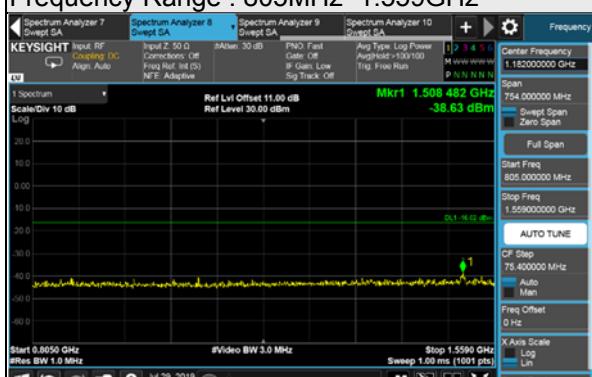
Frequency Range : 775MHz~793MHz



Frequency Range : 793MHz~805MHz

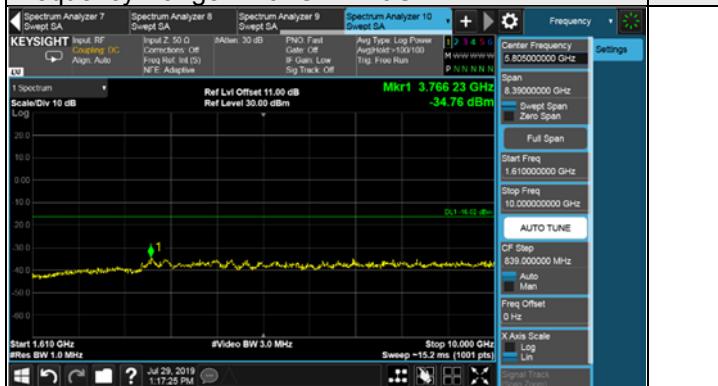
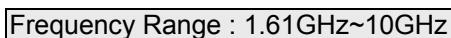


Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz





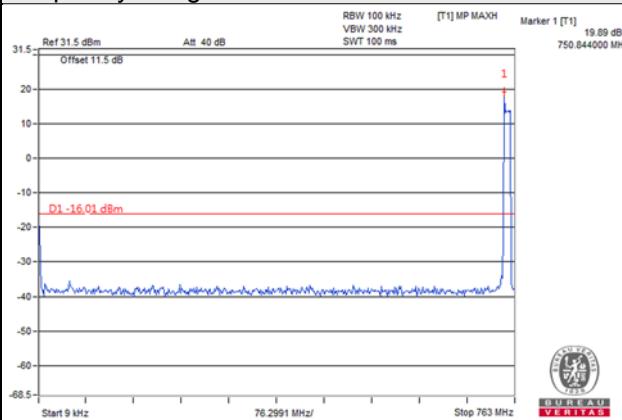
Note: For 9kHz, the signal is from spectrum analyzer.

QPSK_NB-IoT Signal at Bottom

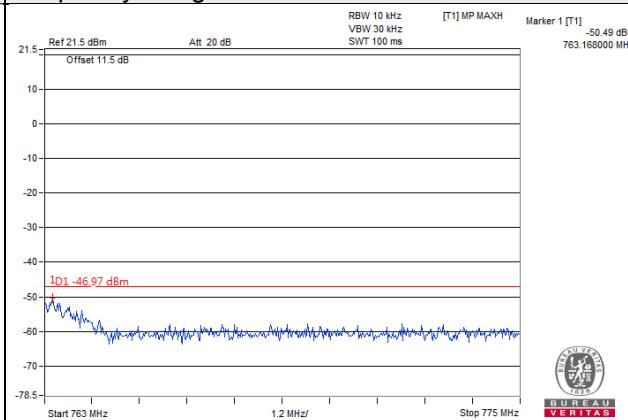
Channel Bandwidth: 10MHz, Chain 0

751.0MHz

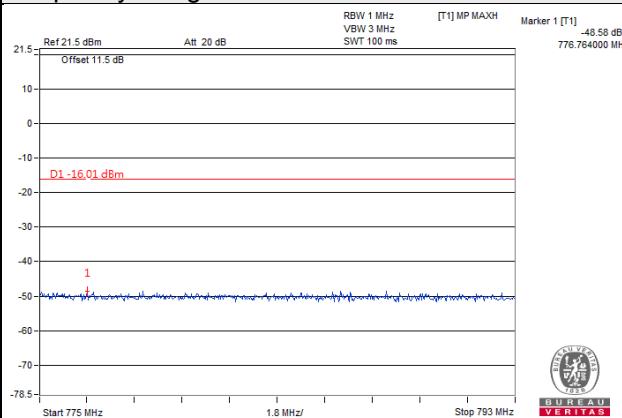
Frequency Range : 9kHz~763MHz



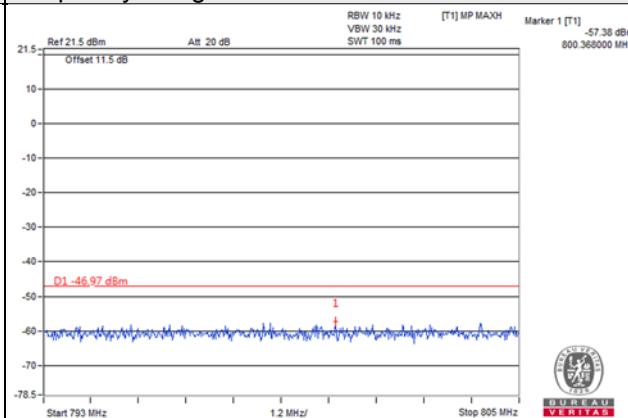
Frequency Range : 763MHz~775MHz



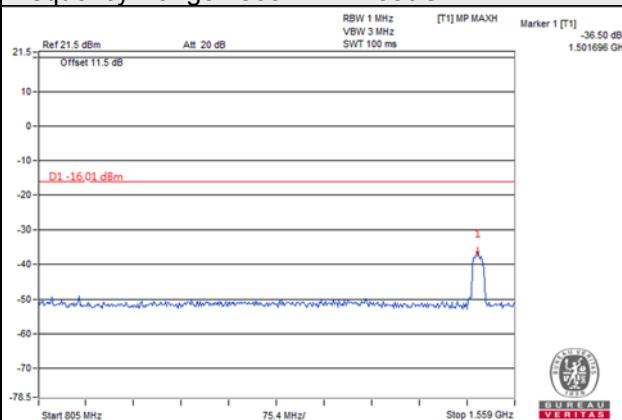
Frequency Range : 775MHz~793MHz



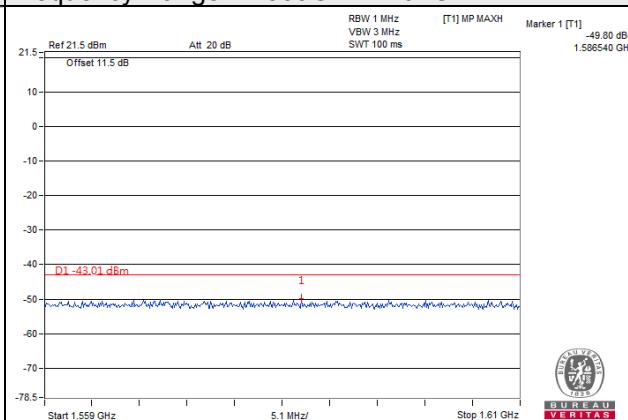
Frequency Range : 793MHz~805MHz



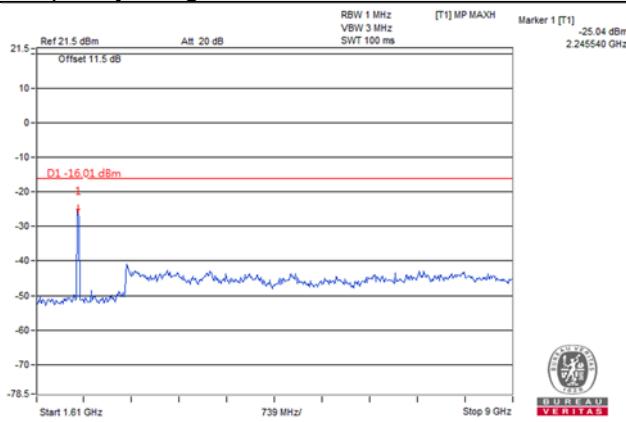
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz

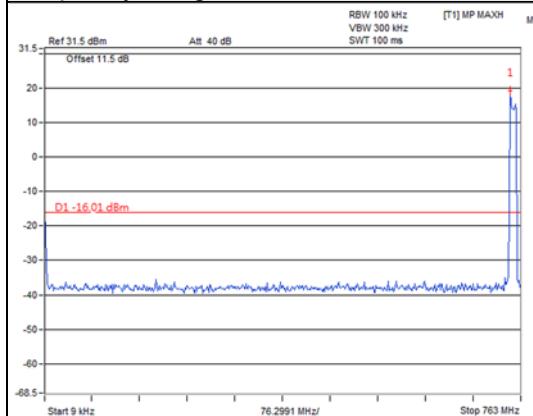


Note: For 9kHz, the signal is from spectrum analyzer.

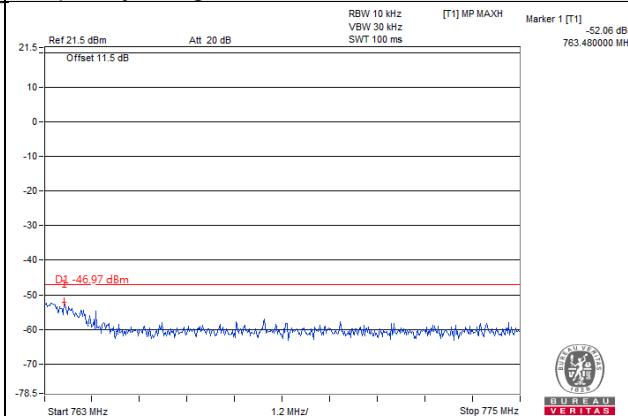
Channel Bandwidth: 10MHz, Chain 1

751.0MHz

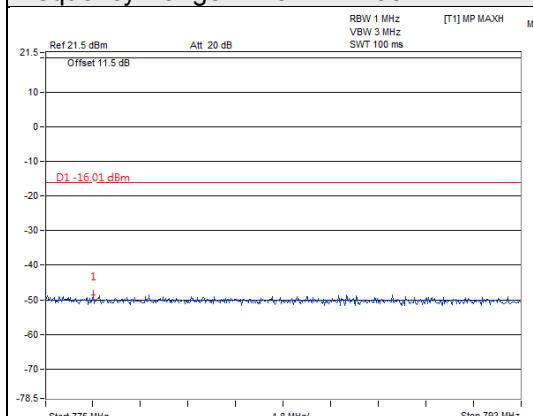
Frequency Range : 9kHz~763MHz



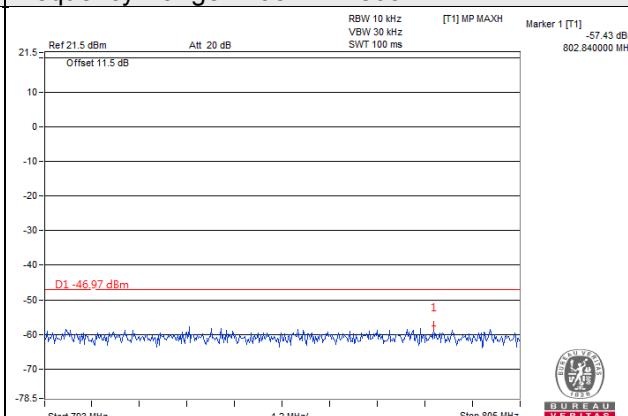
Frequency Range : 763MHz~775MHz



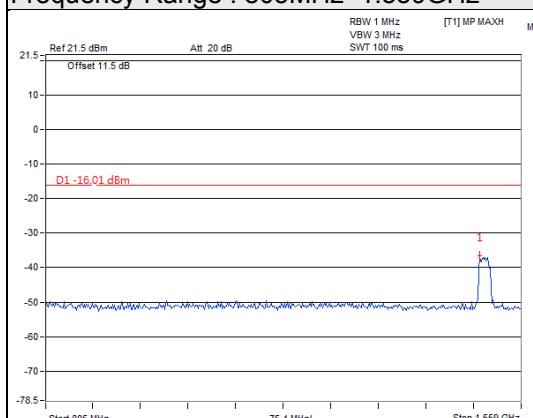
Frequency Range : 775MHz~793MHz



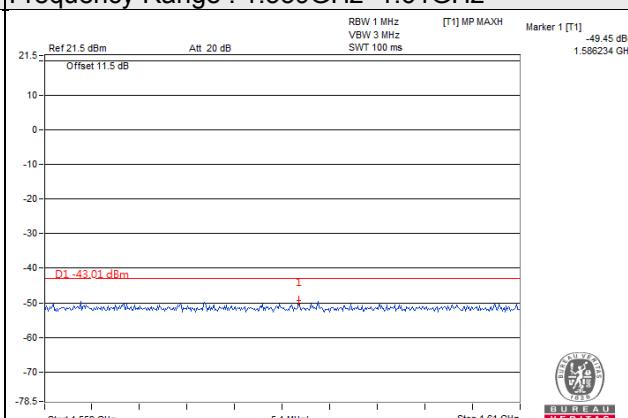
Frequency Range : 793MHz~805MHz



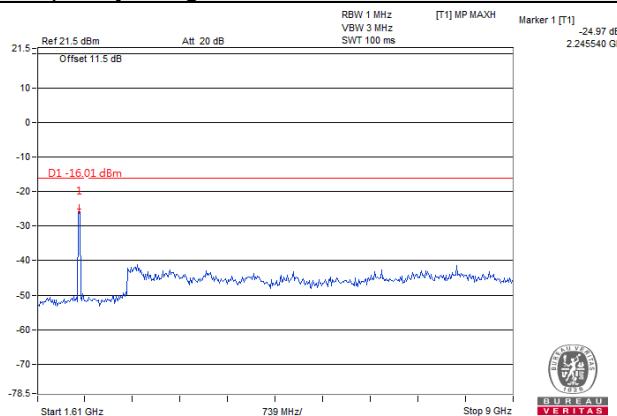
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz



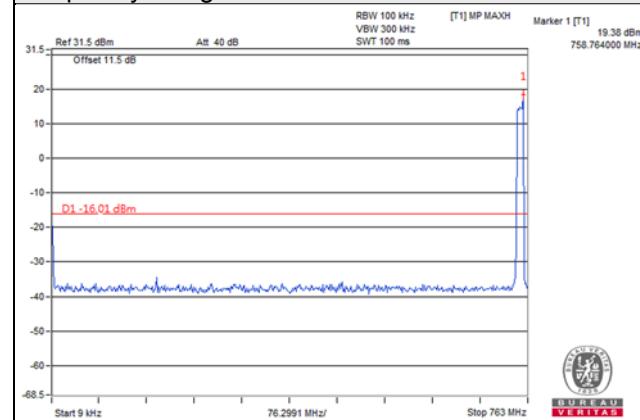
Note: For 9kHz, the signal is from spectrum analyzer.

QPSK_NB-IoT Signal at Top

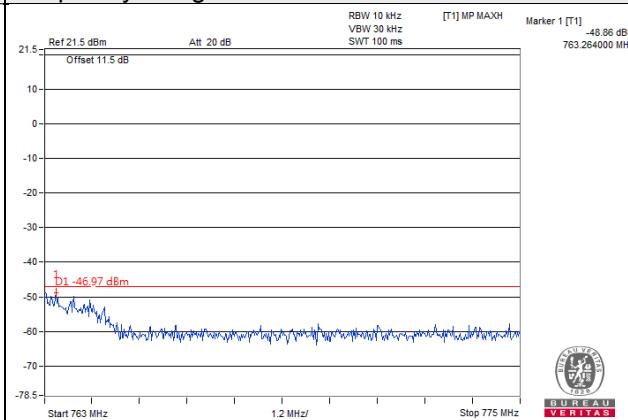
Channel Bandwidth: 10MHz, Chain 0

751.0MHz

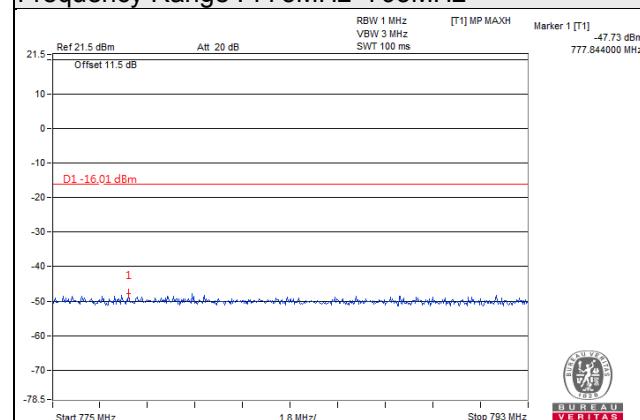
Frequency Range : 9kHz~763MHz



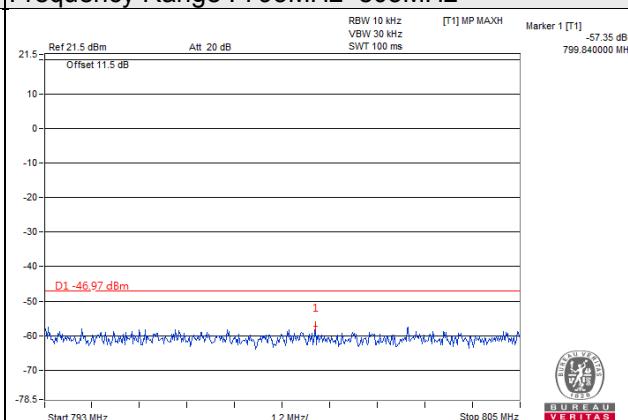
Frequency Range : 763MHz~775MHz



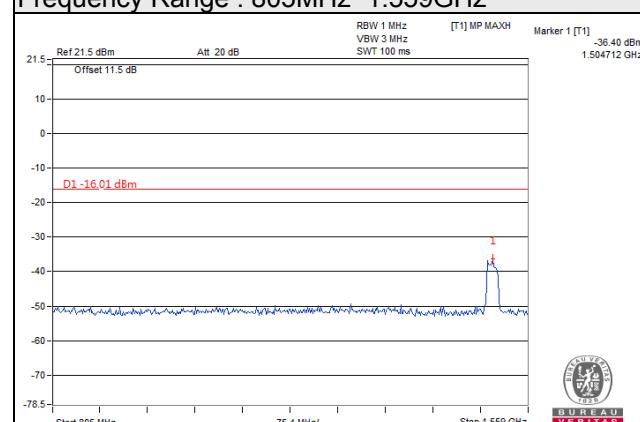
Frequency Range : 775MHz~793MHz



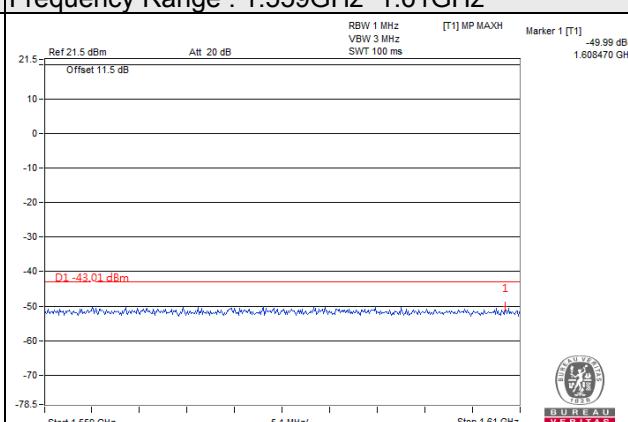
Frequency Range : 793MHz~805MHz



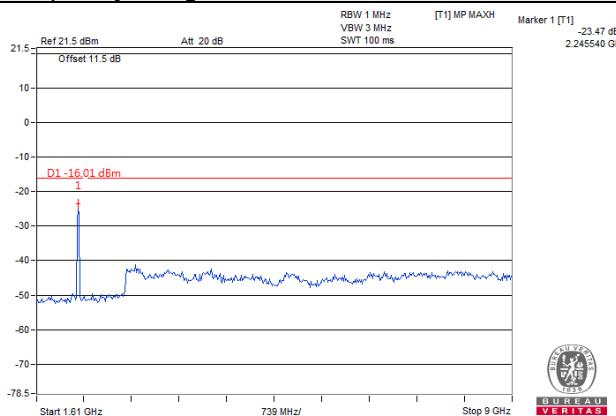
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz

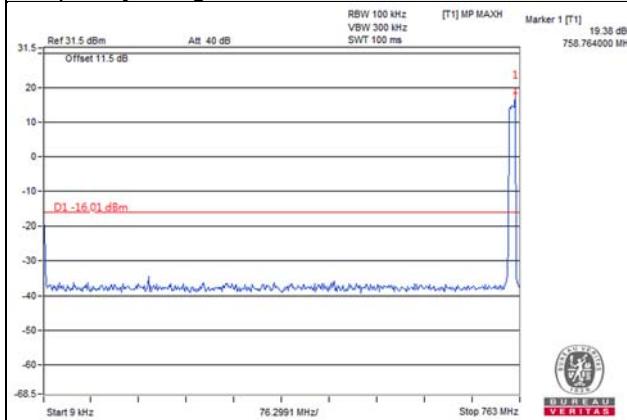


Note: For 9kHz, the signal is from spectrum analyzer.

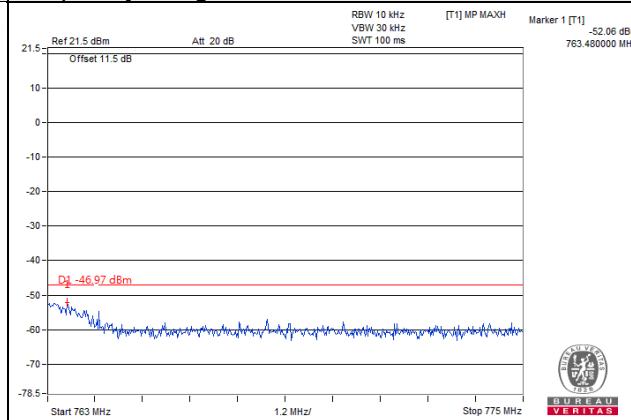
Channel Bandwidth: 10MHz, Chain 1

751.0MHz

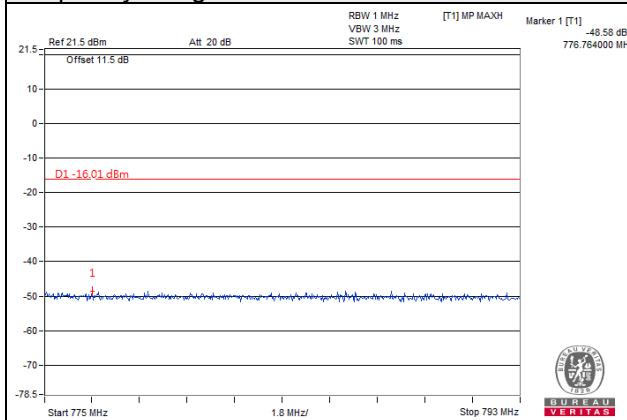
Frequency Range : 9kHz~763MHz



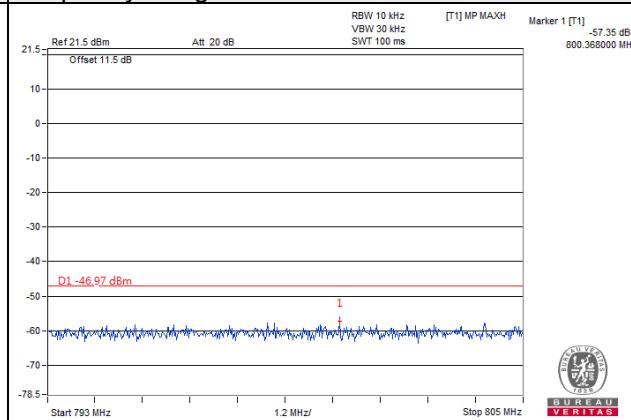
Frequency Range : 763MHz~775MHz



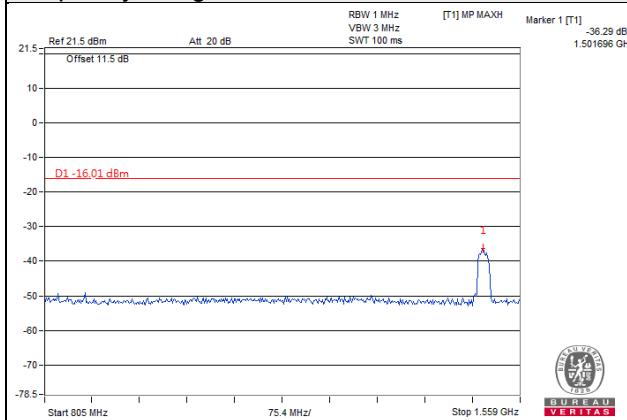
Frequency Range : 775MHz~793MHz



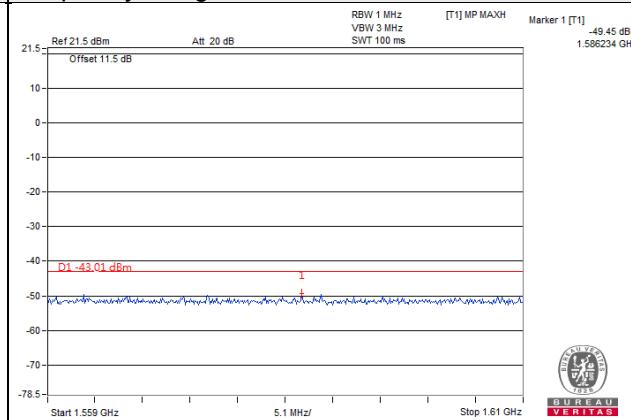
Frequency Range : 793MHz~805MHz



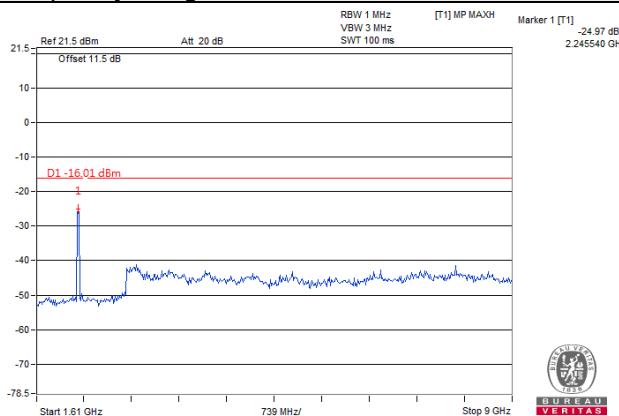
Frequency Range : 805MHz~1.559GHz



Frequency Range : 1.559GHz~1.61GHz



Frequency Range : 1.61GHz~9GHz



Note: For 9kHz, the signal is from spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

4.8.2 Test Procedure

- a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)
- b. Substitution method is used for EIRP measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step b. Record the power level of S.G
- d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.
- e. ERP power can be calculated form EIRP power by subtracting the gain of dipole, ERP power = EIRP power - 2.15dBi
- f. S.A. setting: RBW=1MHz, VBW=3MHz, Detector=RMS (Power average)

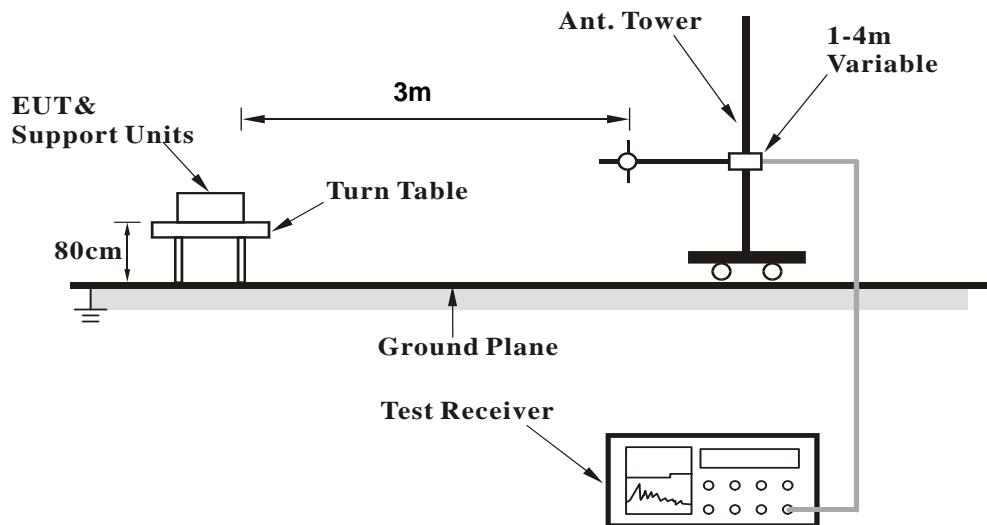
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.8.3 Deviation from Test Standard

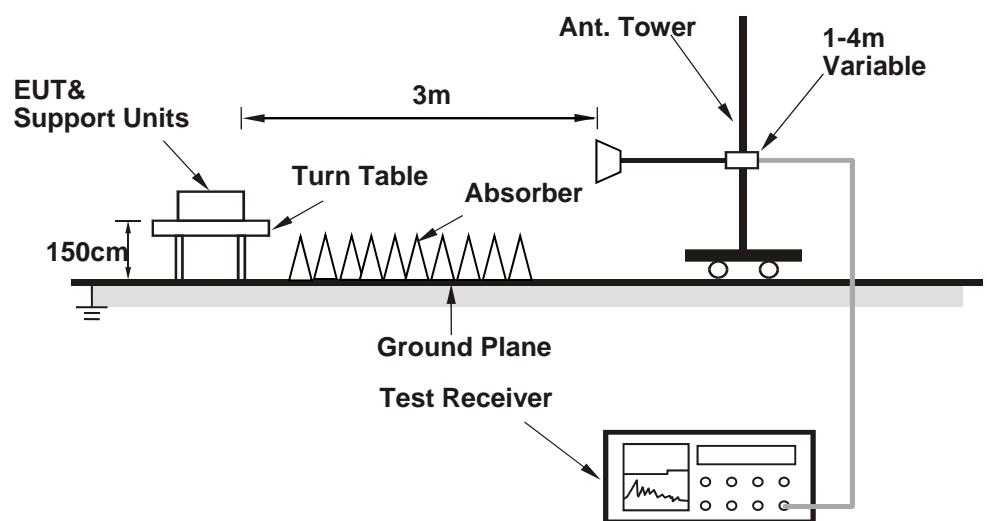
No deviation.

4.8.4 Test Setup

For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.8.5 Test Results

Below 1GHz

For LTE Band 13 Guard Band:

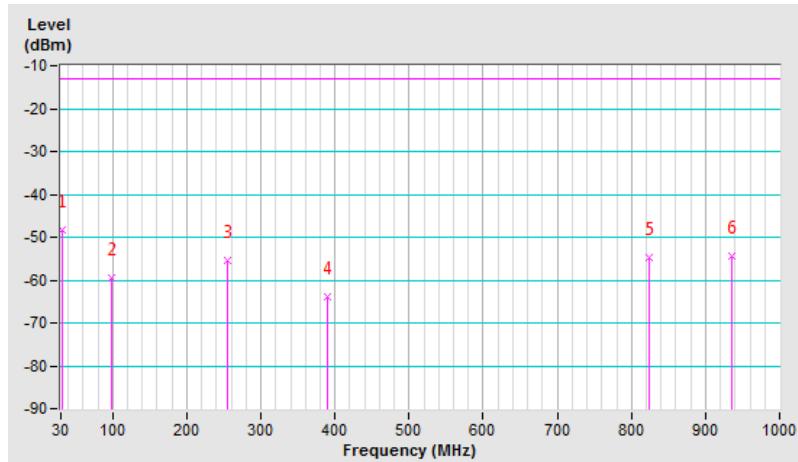
Channel Bandwidth: 10MHz

Test Frequency	751.0 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-49.5	-30.0	-18.3	-48.3	-13.0	-35.3
2	98.87	-48.6	-58.0	-1.4	-59.4	-13.0	-46.4
3	255.04	-47.8	-54.0	-1.4	-55.4	-13.0	-42.4
4	389.87	-61.2	-67.4	3.4	-64.0	-13.0	-51.0
5	823.46	-59.2	-58.6	3.9	-54.7	-13.0	-41.7
6	935.98	-60.5	-58.2	3.7	-54.5	-13.0	-41.5

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

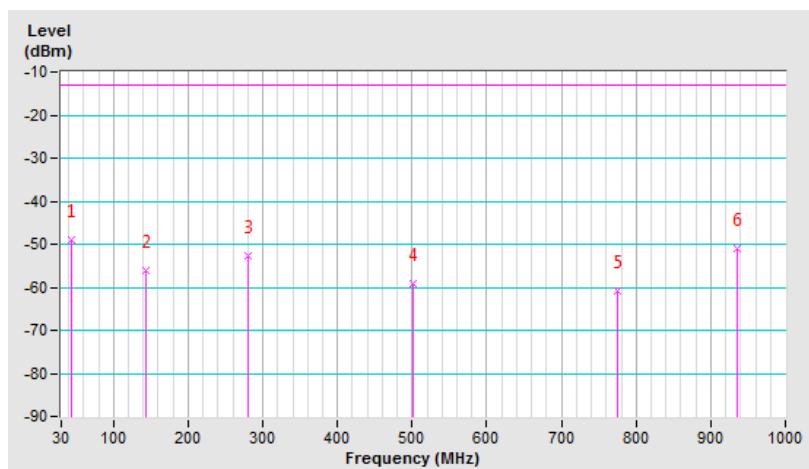


Test Frequency	751.0 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	44.55	-38.5	-38.1	-10.9	-49.0	-13.0	-36.0
2	143.49	-51.8	-53.0	-3.1	-56.1	-13.0	-43.1
3	281.23	-53.6	-51.0	-1.7	-52.7	-13.0	-39.7
4	500.45	-57.0	-63.0	3.8	-59.2	-13.0	-46.2
5	775.93	-65.8	-64.8	4.0	-60.8	-13.0	-47.8
6	935.01	-57.6	-54.6	3.7	-50.9	-13.0	-37.9

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



For NB-IoT In-Band:

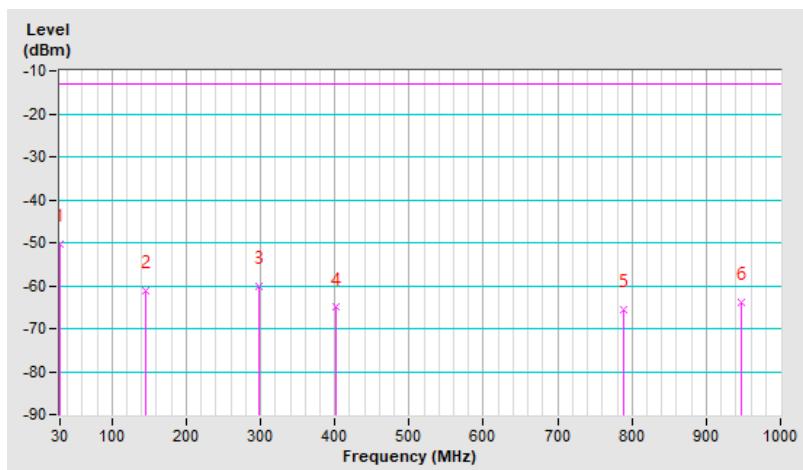
Channel Bandwidth: 5MHz

Test Frequency	751.0 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-52.1	-30.9	-19.4	-50.3	-13.0	-37.3
2	145.43	-54.2	-58.1	-3.1	-61.2	-13.0	-48.2
3	298.69	-54.8	-60.3	0.0	-60.3	-13.0	-47.3
4	402.48	-62.2	-68.4	3.3	-65.1	-13.0	-52.1
5	789.51	-68.8	-69.6	4.0	-65.6	-13.0	-52.6
6	947.62	-70.0	-67.7	3.8	-63.9	-13.0	-50.9

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

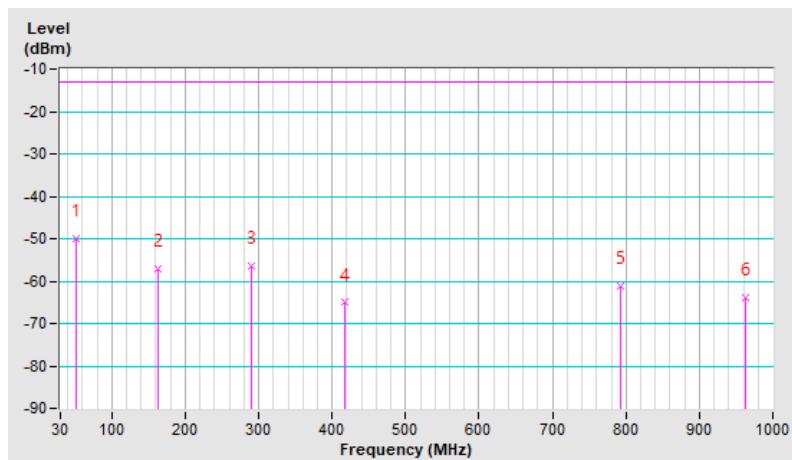


Test Frequency	751.0 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	51.34	-40.5	-42.6	-7.3	-49.9	-13.0	-36.9
2	162.89	-52.0	-54.2	-2.9	-57.1	-13.0	-44.1
3	290.93	-54.9	-54.5	-1.9	-56.4	-13.0	-43.4
4	417.03	-62.5	-68.5	3.4	-65.1	-13.0	-52.1
5	792.42	-66.0	-65.3	4.0	-61.3	-13.0	-48.3
6	962.17	-70.8	-67.6	3.7	-63.9	-13.0	-50.9

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



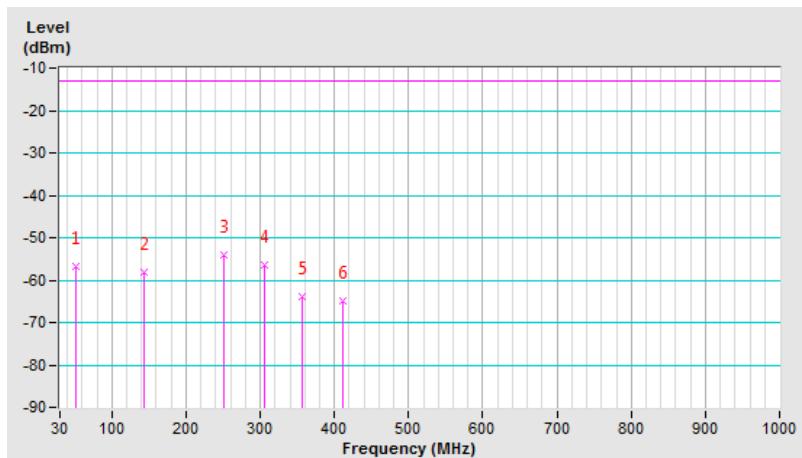
Channel Bandwidth: 10MHz

Test Frequency	751.0 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	51.34	-55.5	-49.4	-7.3	-56.7	-13.0	-43.7
2	143.49	-52.9	-55.0	-3.1	-58.1	-13.0	-45.1
3	251.16	-47.9	-52.7	-1.4	-54.1	-13.0	-41.1
4	306.45	-52.0	-60.2	3.9	-56.3	-13.0	-43.3
5	356.89	-61.1	-68.0	4.0	-64.0	-13.0	-51.0
6	411.21	-64.8	-68.3	3.3	-65.0	-13.0	-52.0

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

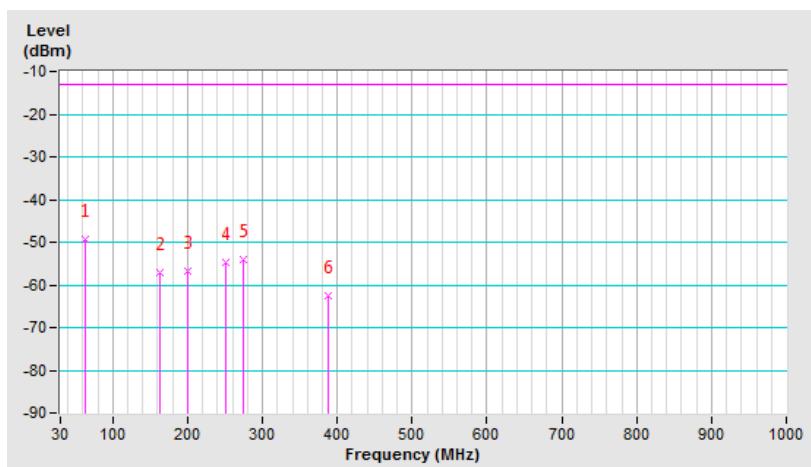


Test Frequency	751.0 MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	62.98	-40.5	-47.0	-2.4	-49.4	-13.0	-36.4
2	162.89	-52.0	-54.2	-2.9	-57.1	-13.0	-44.1
3	199.75	-53.5	-54.3	-2.4	-56.7	-13.0	-43.7
4	250.19	-52.6	-53.4	-1.3	-54.7	-13.0	-41.7
5	274.44	-54.6	-52.4	-1.6	-54.0	-13.0	-41.0
6	386.96	-60.0	-66.2	3.5	-62.7	-13.0	-49.7

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



Above 1GHz

For LTE Band 13 Guard Band:

Channel Bandwidth: 10MHz

QPSK_NB-IoT Signal at Bottom

Test Frequency	751.0 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-61.2	-53.7	1.5	-52.2	-13.0	-39.2
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-59.2	-52.9	1.5	-51.4	-13.0	-38.4

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

QPSK_NB-IoT Signal at Top

Test Frequency	751.0 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-60.8	-53.3	1.5	-51.8	-13.0	-38.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-58.8	-52.4	1.5	-50.9	-13.0	-37.9

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

For NB-IoT In-Band:

Channel Bandwidth: 5MHz

QPSK_NB-IoT Signal at Bottom

Test Frequency	748.5 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1497.00	-61.6	-54.3	1.5	-52.8	-13.0	-39.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1497.00	-59.4	-53.1	1.5	-51.6	-13.0	-38.6

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	751.0 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-61.2	-53.8	1.5	-52.3	-13.0	-39.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-59.1	-52.7	1.5	-51.2	-13.0	-38.2

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	753.5 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1507.00	-61.7	-54.2	1.5	-52.7	-13.0	-39.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1507.00	-59.5	-53.1	1.5	-51.6	-13.0	-38.6

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

BUREAU
VERITAS**QPSK_NB-IoT Signal at Top**

Test Frequency	748.5 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1497.00	-60.4	-53.0	1.5	-51.5	-13.0	-38.5

Antenna Polarity & Test Distance: Vertical at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1497.00	-58.2	-52.0	1.5	-50.5	-13.0	-37.5

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	751.0 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-60.7	-53.2	1.5	-51.7	-13.0	-38.7

Antenna Polarity & Test Distance: Vertical at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-58.5	-52.1	1.5	-50.6	-13.0	-37.6

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Test Frequency	753.5 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1507.00	-60.5	-53.1	1.5	-51.6	-13.0	-38.6

Antenna Polarity & Test Distance: Vertical at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1507.00	-58.4	-52.0	1.5	-50.5	-13.0	-37.5

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Channel Bandwidth: 10MHz

QPSK_NB-IoT Signal at Bottom

Test Frequency	751.0 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-61.8	-54.3	1.5	-52.8	-13.0	-39.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-61.5	-55.1	1.5	-53.6	-13.0	-40.6

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

QPSK_NB-IoT Signal at Top

Test Frequency	751.0 MHz	Frequency Range	1GHz~18GHz
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Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-61.7	-54.2	1.5	-52.7	-13.0	-39.7
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1502.00	-61.6	-55.3	1.5	-53.8	-13.0	-40.8

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab/Telecom Lab

Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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