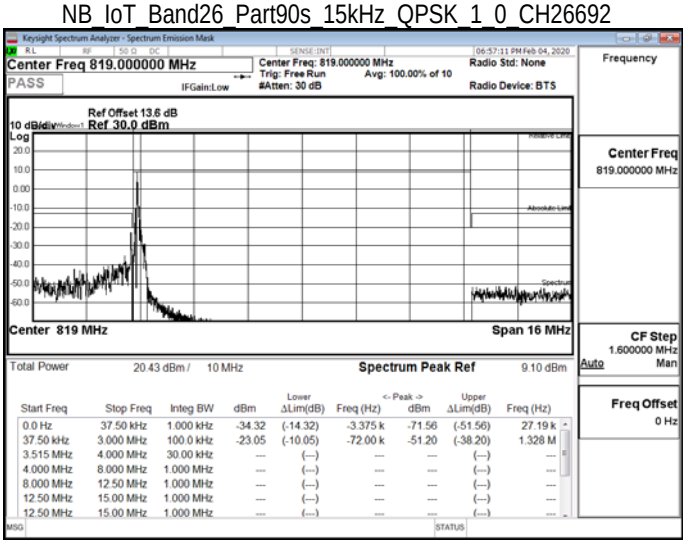
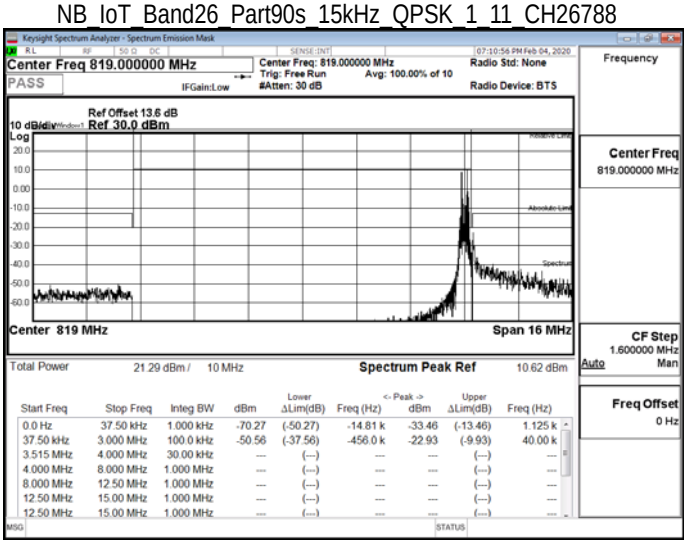
NB_IoT_Band26_Part90s_15kHz_QPSK_1_0_CH26692



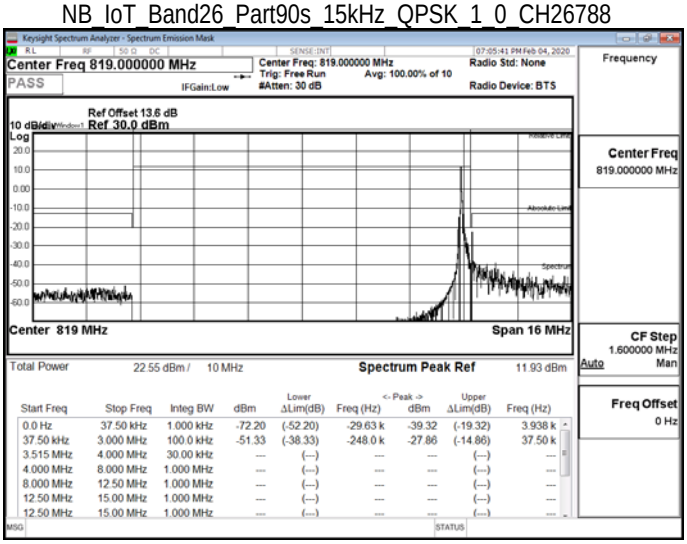
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	37.50 kHz	1.000 kHz	-34.32	(-14.32)	-3.375 k	-71.56	(-51.56)	27.19 k
37.50 kHz	3.000 MHz	100.0 kHz	-23.05	(-10.05)	-72.00 k	-51.20	(-38.20)	1.328 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

NB_IoT_Band26_Part90s_15kHz_QPSK_1_11_CH26788



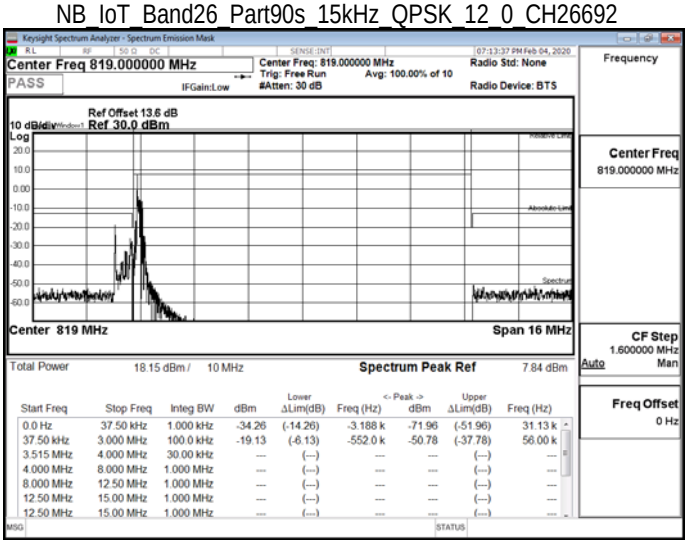
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	37.50 kHz	1.000 kHz	-70.27	(-50.27)	-14.81 k	-33.46	(-13.46)	1.125 k
37.50 kHz	3.000 MHz	100.0 kHz	-50.56	(-37.56)	-456.0 k	-22.93	(-9.93)	40.00 k
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

NB_IoT_Band26_Part90s_15kHz_QPSK_1_0_CH26788



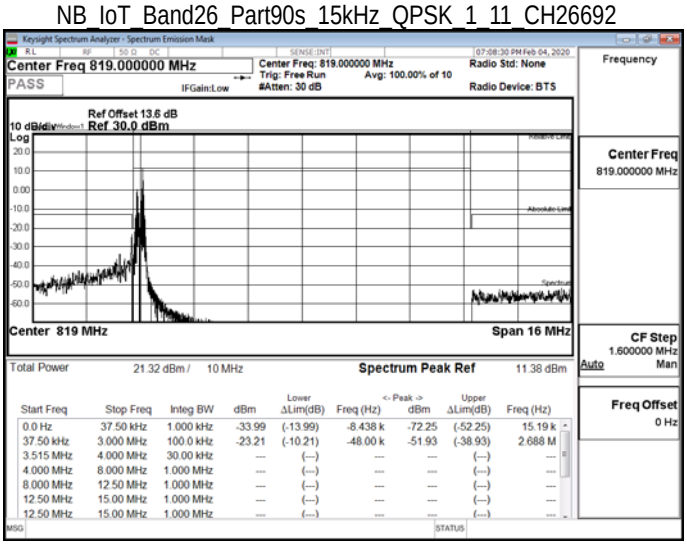
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	37.50 kHz	1.000 kHz	-72.20	(-52.20)	-29.63 k	-39.32	(-19.32)	3.938 k
37.50 kHz	3.000 MHz	100.0 kHz	-51.33	(-38.33)	-248.0 k	-27.86	(-14.86)	37.50 k
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

NB_IoT_Band26_Part90s_15kHz_QPSK_12_0_CH26692



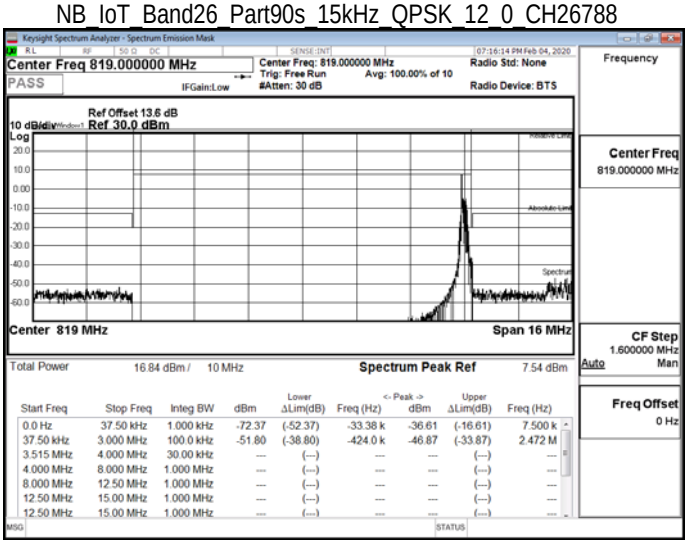
Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	37.50 kHz	1.000 kHz	-34.26	(-14.26)	-3.188 k	-71.96	(-51.96)	31.13 k
37.50 kHz	3.000 MHz	100.0 kHz	-19.13	(-6.13)	-552.0 k	-50.78	(-37.78)	56.00 k
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

NB_IoT_Band26_Part90s_15kHz_QPSK_1_11_CH26692



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	37.50 kHz	1.000 kHz	-33.99	(-13.99)	-8.438 k	-72.25	(-52.25)	15.19 k
37.50 kHz	3.000 MHz	100.0 kHz	-23.21	(-10.21)	-48.00 k	-51.93	(-38.93)	2.688 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

NB_IoT_Band26_Part90s_15kHz_QPSK_12_0_CH26788



Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Freq (Hz)
0.0 Hz	37.50 kHz	1.000 kHz	-72.37	(-52.37)	-33.38 k	-36.61	(-16.61)	7.500 k
37.50 kHz	3.000 MHz	100.0 kHz	-51.80	(-38.80)	-424.0 k	-46.87	(-33.87)	2.472 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

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9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

9.1 Standard Applicable

According to FCC §2.1053,

FCC §22.917(a), §24.238(a), §27.53(h)

RSS-130 §4.7, RSS-132 §5.5, RSS-139 §6.5, RSS-139 §6.6

Out of band emissions.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.

FCC §27.53(c) for B13

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(2) 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 (-13dBm)

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC §27.53 (f) for B13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC §27.53(c) (5) & FCC §27.53(g) for B12, 13

Compliance for operations in the 600 MHz, 698-746 MHz, 746-758 MHz and the 776-788 MHz band with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130 §4.7.1 for B12, 13

Compliance for operations in the 617-652 MHz, 663-698 MHz, 698-756 MHz and the 777-787 MHz band, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130 §4.7.2 for B13

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:
the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

76 + 10 log10 p (watts), dB, for base and fixed equipment and
65 + 10 log10 p (watts), dB, for mobile and portable equipment

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the e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

FCC §27.53(h)(3) for B4

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

§90.691 Emission mask requirements for EA-based systems for B26

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

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Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber Equipment

Frequency (MHz)	Attenuation (dB)
<2200	$43 + 10 \log_{10}(p)$
2200 - 2288	$70 + 10 \log_{10}(p)$
2288 - 2292	$67 + 10 \log_{10}(p)$
2292 - 2296	$61 + 10 \log_{10}(p)$
2296 - 2300	$55 + 10 \log_{10}(p)$
2300 - 2305	$43 + 10 \log_{10}(p)$
2305 - 2320	$43 + 10 \log_{10}(p)$ Note
2320 - 2324	$55 + 10 \log_{10}(p)$
2324 - 2328	$61 + 10 \log_{10}(p)$
2328 - 2337	$67 + 10 \log_{10}(p)$
2337 - 2341	$61 + 10 \log_{10}(p)$
2341 - 2345	$55 + 10 \log_{10}(p)$
2345 - 2360	$43 + 10 \log_{10}(p)$ Note
2360 - 2365	$43 + 10 \log_{10}(p)$
2365 - 2395	$70 + 10 \log_{10}(p)$
>2395	$43 + 10 \log_{10}(p)$

Note: Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 1.2 for the permitted frequency ranges for various equipment types.

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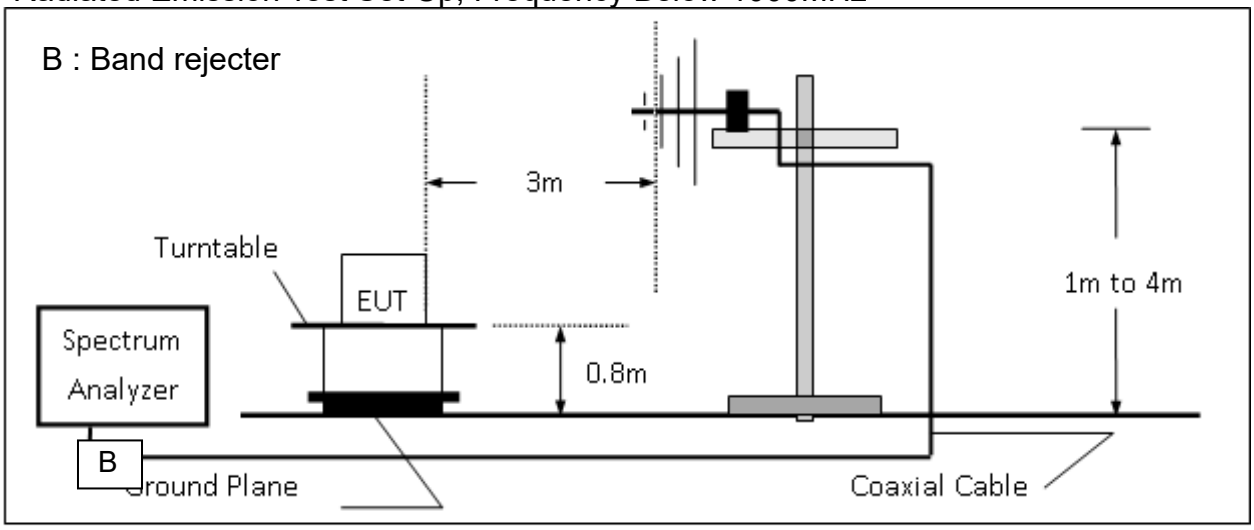
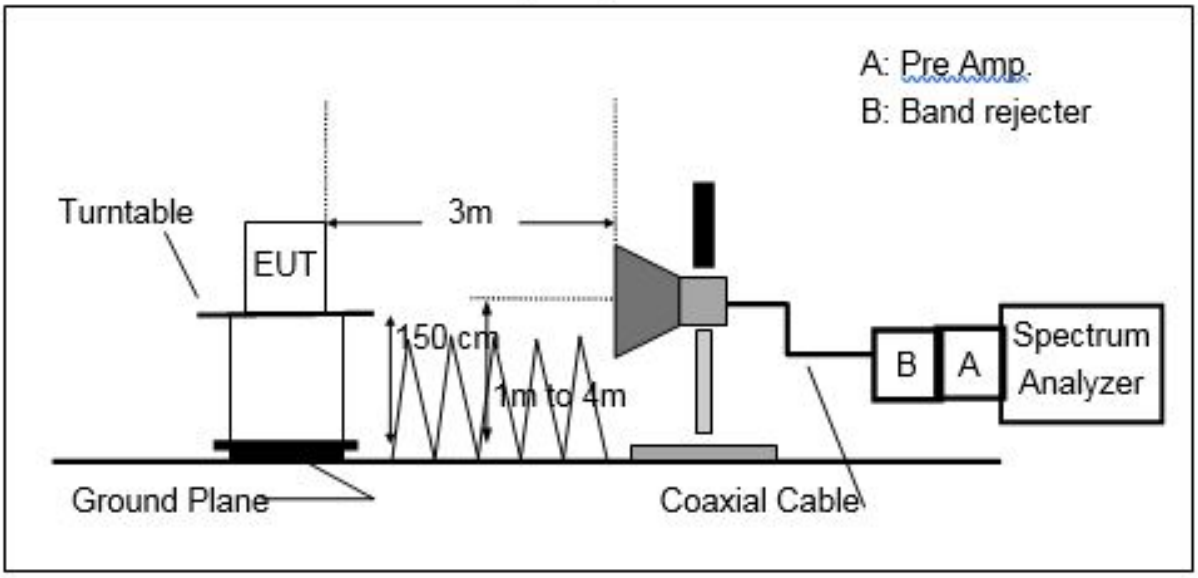
9.2 EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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9.3 Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP (dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

EIRP (dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

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9.4 Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	TESEQ	CBL 6112D	35240	09/09/2019	09/08/2020
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/09/2019	01/08/2020
Horn Antenna	SCHWAZBECK	BBHA9170	184	12/27/2018	12/26/2019
EMI Test Receiver	R&S	ESU 40	100363	04/15/2019	04/14/2020
Radio Communica-tion Analyer	Anritsu	MT8820C	6201107337	07/17/2019	07/16/2020
Radio Communica-tion Analyer	Anritsu	MT8821C	6261786084	01/09/2019	01/09/2020
Pre-Amplifier	EMC Instruments	EMC330	980096	11/20/2019	11/19/2020
Pre-Amplifier	EMC Instruments	EMC0011830	980199	11/20/2019	11/19/2020
Pre-Amplifier	EMC Instruments	EMC184045B	980135	11/20/2019	11/19/2020
Notch Filter	Woken	EWT-54-0037	RF54	11/20/2019	11/19/2020
Notch Filter	Woken	EWT-54-0038	RF55	11/20/2019	11/19/2020
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	11/20/2019	11/19/2020
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	11/20/2019	11/19/2020
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17413/4	11/20/2019	11/19/2020

Note: The measurement was taken place with the long duration of the time, and additional equipment list as shown blow indicate those equipment of which has been subject to undertake the calibration in intermediate period of time of the measurement.

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/10/2020	01/09/2021
Horn Antenna	Schwarzbeck	BBHA9170	185	08/07/2019	08/06/2020
Radio Communication Analyer	Anritsu	MT8821C	6262044739	12/06/2019	12/05/2020

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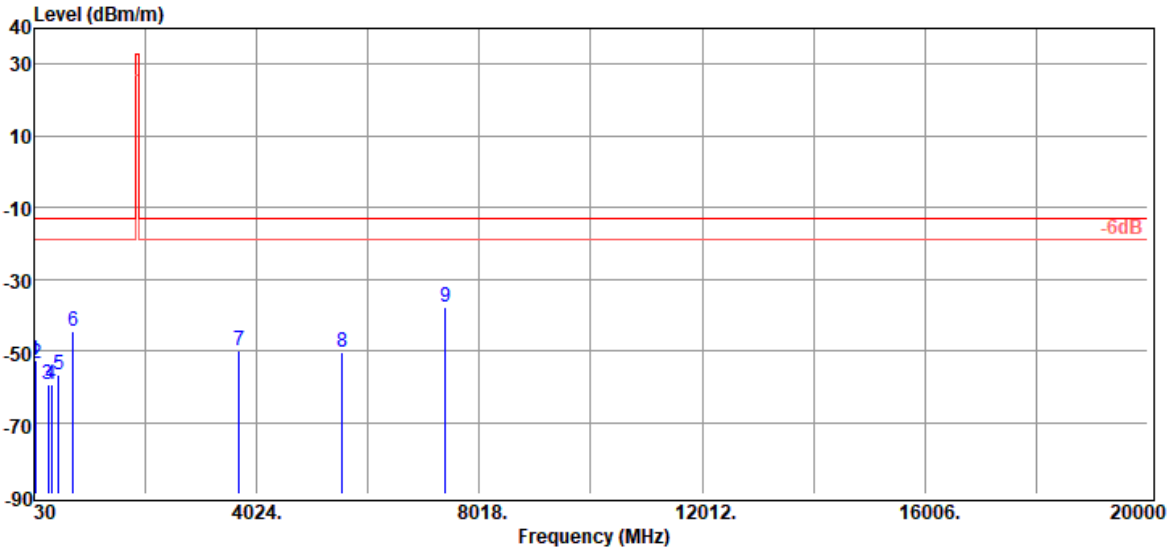
9.5 Measurement Result:

9.5.1 Radiated Spurious Emission

NB IOT Band 2

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B2	Temp./Humi.	:19.5/71
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1850.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
48.43	-52.63	-33.88	-17.89	-0.86	-13.00	-39.63
70.74	-53.53	-40.80	-11.72	-1.01	-13.00	-40.53
284.14	-59.36	-55.26	-1.65	-2.45	-13.00	-46.36
344.28	-59.41	-55.31	-1.48	-2.62	-13.00	-46.41
465.53	-56.72	-52.19	-1.29	-3.24	-13.00	-43.72
731.31	-44.69	-38.95	-1.45	-4.29	-13.00	-31.69
3700.40	-49.91	-50.88	12.30	-11.33	-13.00	-36.91
5550.60	-50.62	-52.53	13.30	-11.39	-13.00	-37.62
7400.80	-37.70	-36.13	11.20	-12.77	-13.00	-24.70

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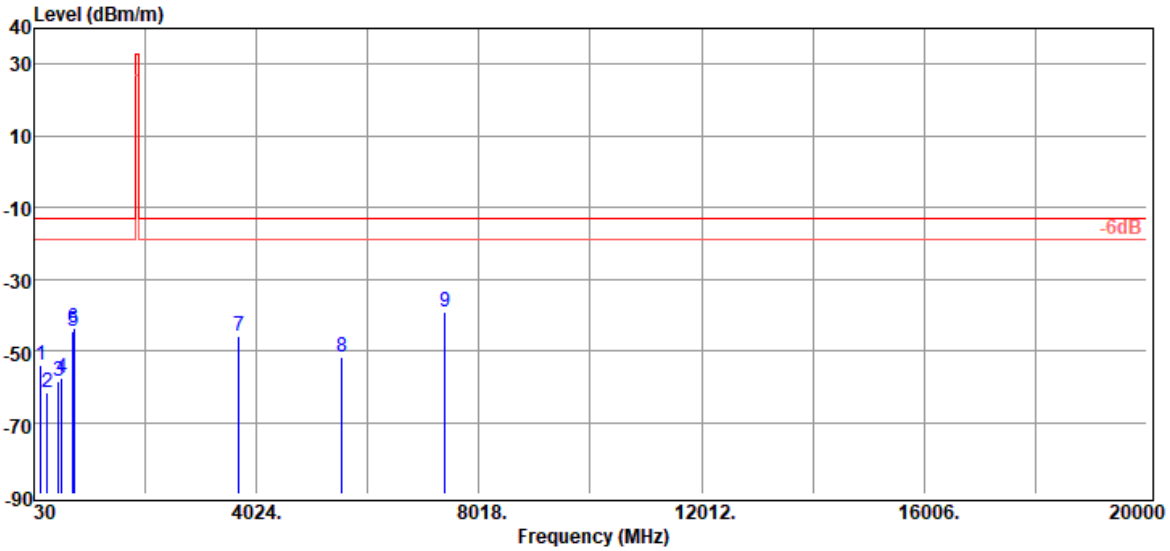
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B2	Temp./Humi.	:19.8/71
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1850.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
156.10	-54.19	-45.44	-7.07	-1.68	-13.00	-41.19
274.44	-61.62	-57.64	-1.65	-2.33	-13.00	-48.62
471.35	-58.53	-54.12	-1.30	-3.11	-13.00	-45.53
529.55	-57.40	-52.89	-1.26	-3.25	-13.00	-44.40
730.34	-44.74	-38.96	-1.47	-4.31	-13.00	-31.74
740.04	-43.73	-37.98	-1.56	-4.19	-13.00	-30.73
3700.40	-45.76	-46.73	12.30	-11.33	-13.00	-32.76
5550.60	-51.94	-53.85	13.30	-11.39	-13.00	-38.94
7400.80	-39.37	-37.80	11.20	-12.77	-13.00	-26.37

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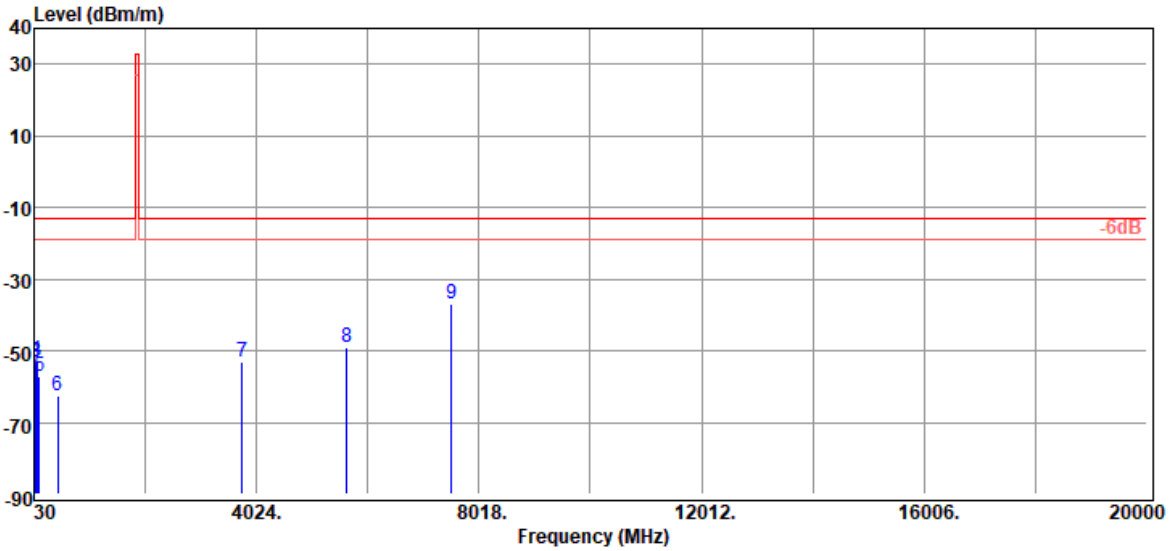
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT B2	Temp./Humi.	:22.9/56
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1880 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
36.79	-63.20	-42.99	-19.43	-0.78	-13.00	-50.20
49.40	-63.42	-44.83	-17.73	-0.86	-13.00	-50.42
70.74	-53.06	-40.33	-11.72	-1.01	-13.00	-40.06
78.50	-52.67	-42.69	-8.84	-1.14	-13.00	-39.67
128.94	-57.27	-48.40	-7.23	-1.64	-13.00	-44.27
461.65	-62.37	-57.74	-1.28	-3.35	-13.00	-49.37
3760.00	-52.91	-54.25	12.42	-11.08	-13.00	-39.91
5640.00	-49.14	-51.07	13.50	-11.57	-13.00	-36.14
7520.00	-37.07	-35.57	11.38	-12.88	-13.00	-24.07

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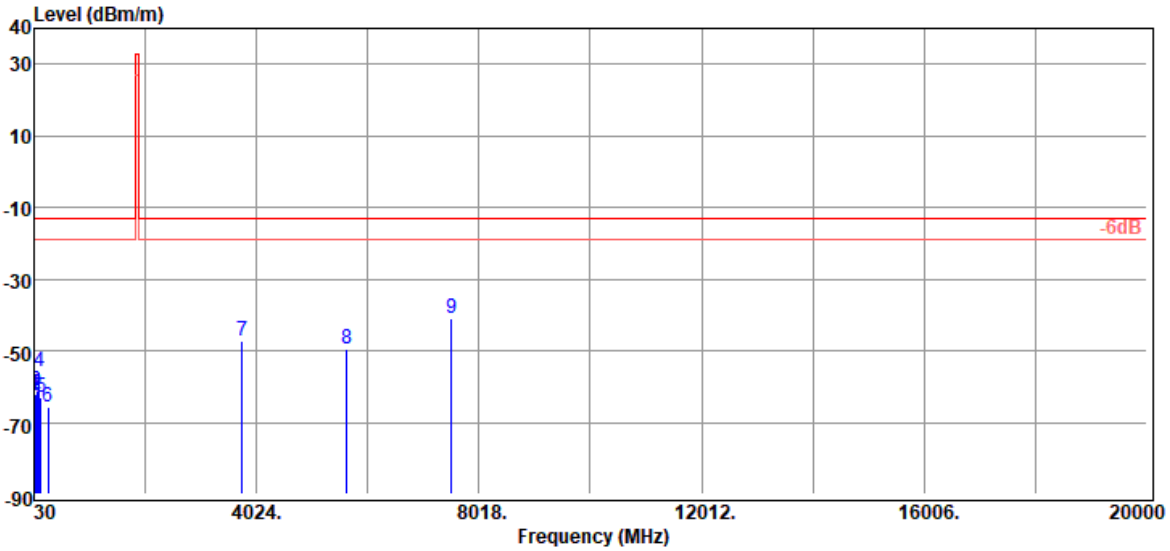
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT B2	Temp./Humi.	:22.9/56
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1880 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
39.70	-62.48	-42.49	-19.14	-0.85	-13.00	-49.48
68.80	-62.28	-48.83	-12.45	-1.00	-13.00	-49.28
86.26	-61.27	-53.44	-6.67	-1.16	-13.00	-48.27
129.91	-55.71	-46.79	-7.26	-1.66	-13.00	-42.71
150.28	-62.84	-53.76	-7.40	-1.68	-13.00	-49.84
279.29	-65.68	-61.59	-1.69	-2.40	-13.00	-52.68
3760.00	-47.08	-48.42	12.42	-11.08	-13.00	-34.08
5640.00	-49.67	-51.60	13.50	-11.57	-13.00	-36.67
7520.00	-40.99	-39.49	11.38	-12.88	-13.00	-27.99

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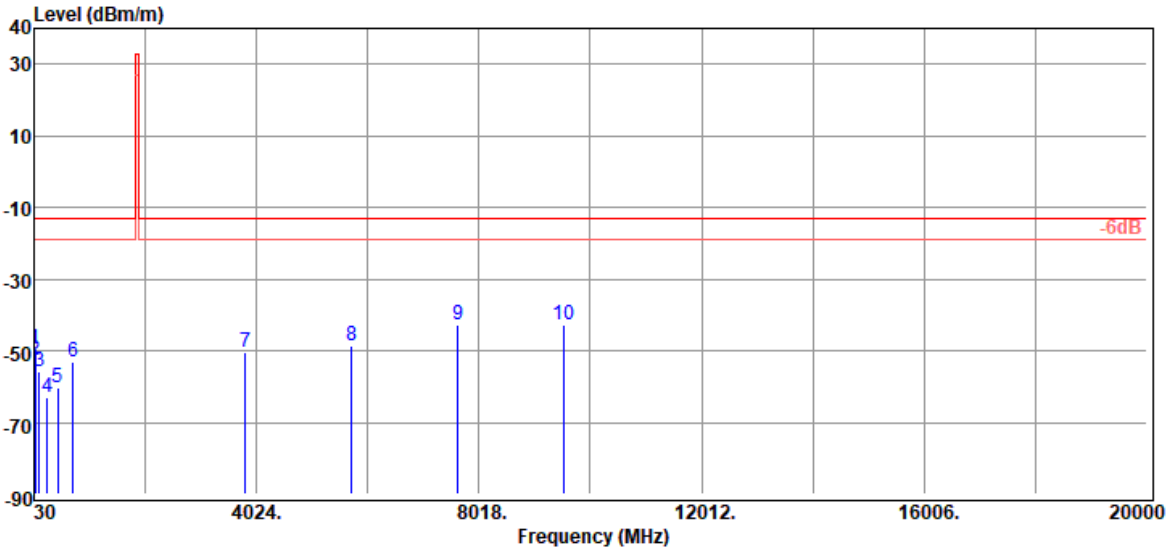
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B2	Temp./Humi.	:20.0/71
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1909.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
49.40	-49.34	-30.75	-17.73	-0.86	-13.00	-36.34
58.13	-52.74	-36.03	-15.74	-0.97	-13.00	-39.74
126.03	-55.96	-47.25	-7.13	-1.58	-13.00	-42.96
273.47	-63.06	-59.10	-1.64	-2.32	-13.00	-50.06
455.83	-60.53	-55.97	-1.36	-3.20	-13.00	-47.53
736.16	-53.27	-47.59	-1.44	-4.24	-13.00	-40.27
3819.60	-50.57	-52.20	12.50	-10.87	-13.00	-37.57
5729.40	-48.63	-50.27	13.34	-11.70	-13.00	-35.63
7639.20	-42.77	-41.41	11.66	-13.02	-13.00	-29.77
9549.00	-42.61	-39.76	11.20	-14.05	-13.00	-29.61

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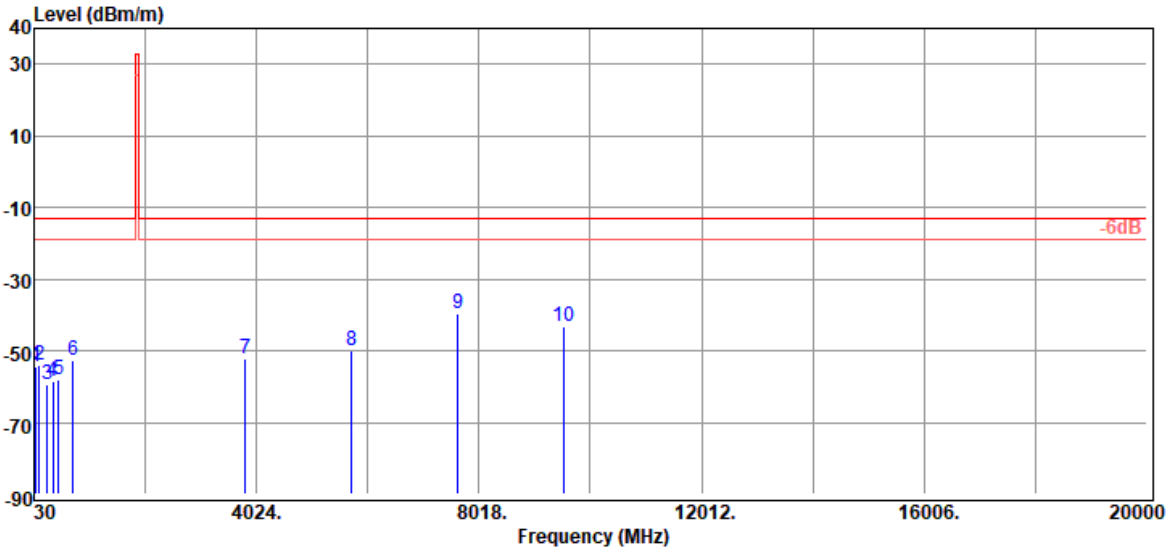
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B2	Temp./Humi.	:21.9/64
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1909.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
62.98	-54.28	-39.02	-14.26	-1.00	-13.00	-41.28
127.97	-54.14	-45.32	-7.20	-1.62	-13.00	-41.14
271.53	-59.38	-55.47	-1.62	-2.29	-13.00	-46.38
362.71	-58.42	-54.30	-1.45	-2.67	-13.00	-45.42
465.53	-58.28	-53.75	-1.29	-3.24	-13.00	-45.28
736.16	-52.53	-46.85	-1.44	-4.24	-13.00	-39.53
3819.60	-52.36	-53.99	12.50	-10.87	-13.00	-39.36
5729.40	-50.16	-51.80	13.34	-11.70	-13.00	-37.16
7639.20	-39.72	-38.36	11.66	-13.02	-13.00	-26.72
9549.00	-43.07	-40.22	11.20	-14.05	-13.00	-30.07

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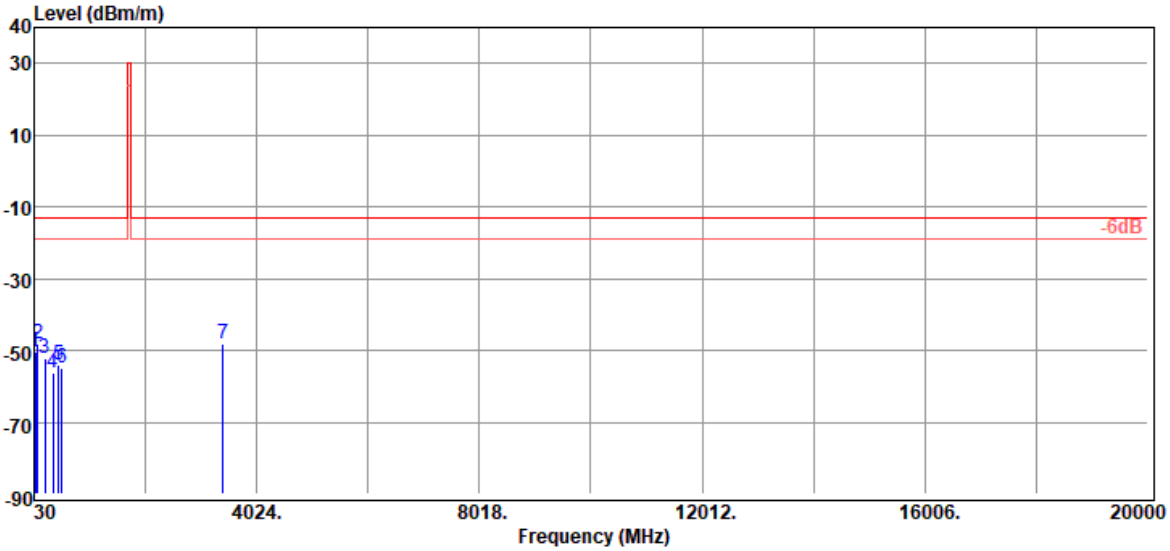
NB IOT Band 4

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B4	Temp./Humi.	:21.9/64
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1710.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-50.52	-31.37	-18.29	-0.86	-13.00	-37.52
97.90	-48.17	-40.87	-6.01	-1.29	-13.00	-35.17
225.94	-52.23	-48.80	-1.24	-2.19	-13.00	-39.23
373.38	-56.07	-51.65	-1.53	-2.89	-13.00	-43.07
476.20	-54.06	-49.66	-1.29	-3.11	-13.00	-41.06
533.43	-55.00	-50.56	-1.20	-3.24	-13.00	-42.00
3420.40	-48.34	-49.68	12.66	-11.32	-13.00	-35.34

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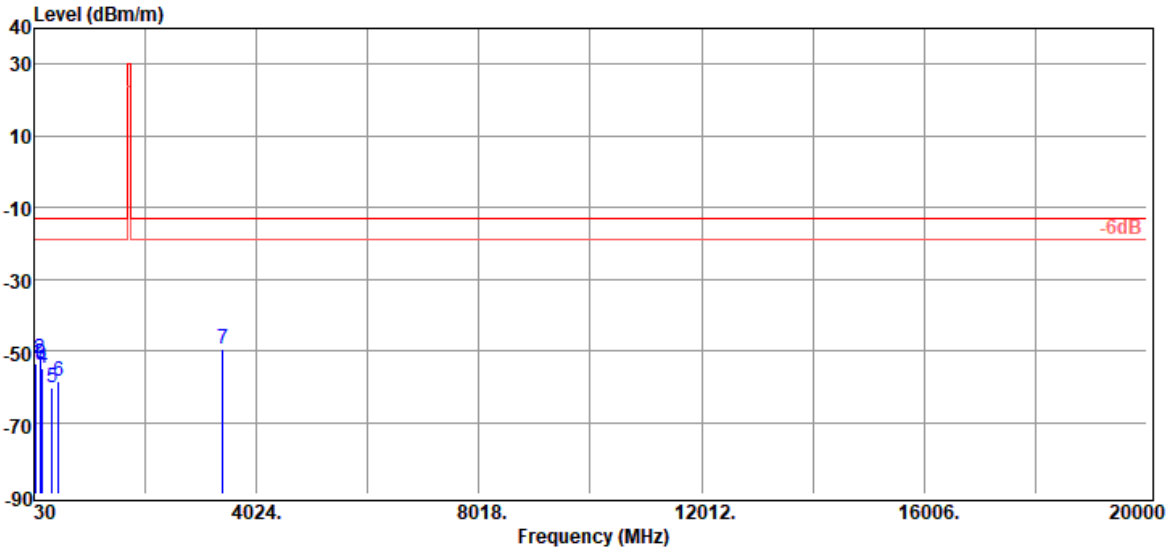
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B4	Temp./Humi.	:21.9/64
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1710.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-53.58	-40.13	-12.45	-1.00	-13.00	-40.58
133.79	-52.24	-43.19	-7.39	-1.66	-13.00	-39.24
157.07	-53.43	-44.73	-7.02	-1.68	-13.00	-40.43
175.50	-54.84	-47.84	-5.26	-1.74	-13.00	-41.84
352.04	-60.10	-56.17	-1.35	-2.58	-13.00	-47.10
463.59	-58.42	-53.83	-1.29	-3.30	-13.00	-45.42
3420.40	-49.70	-51.04	12.66	-11.32	-13.00	-36.70

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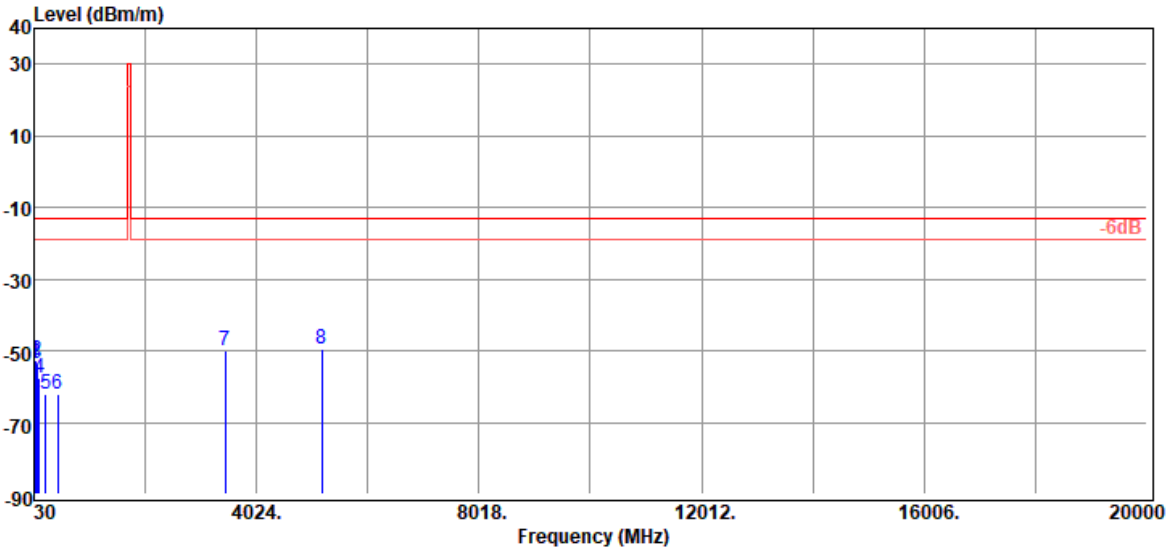
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT B4	Temp./Humi.	:23.1/55
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1732.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
55.22	-53.09	-35.68	-16.48	-0.93	-13.00	-40.09
70.74	-52.77	-40.04	-11.72	-1.01	-13.00	-39.77
77.53	-53.71	-43.44	-9.15	-1.12	-13.00	-40.71
127.97	-57.44	-48.62	-7.20	-1.62	-13.00	-44.44
238.55	-61.97	-57.94	-1.81	-2.22	-13.00	-48.97
461.65	-62.04	-57.41	-1.28	-3.35	-13.00	-49.04
3465.00	-49.91	-51.39	12.51	-11.03	-13.00	-36.91
5197.50	-49.54	-50.24	12.69	-11.99	-13.00	-36.54

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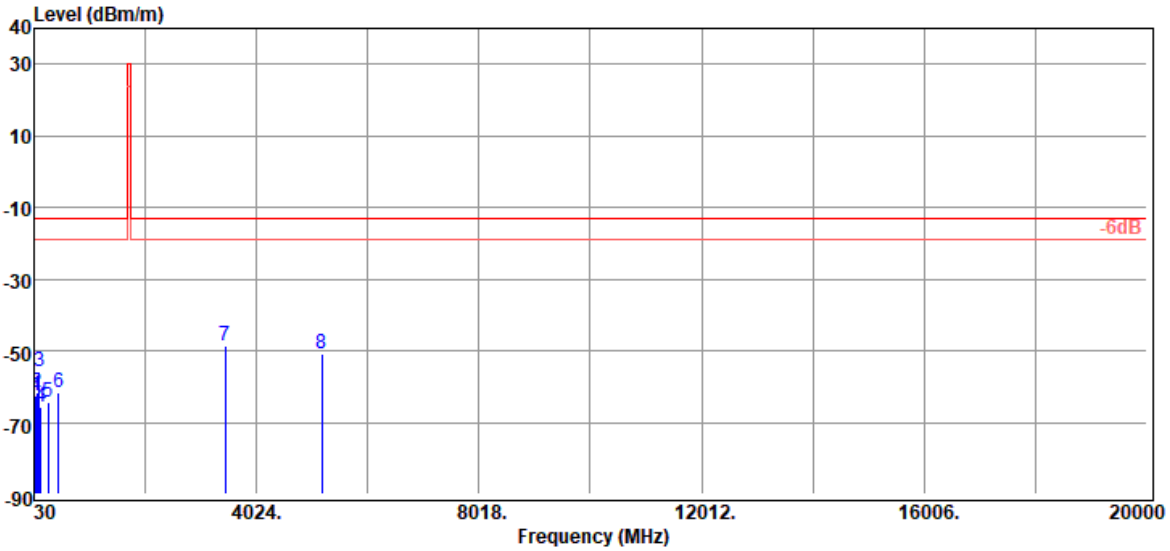
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT B4	Temp./Humi.	:23.1/55
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1732.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
69.77	-62.63	-49.52	-12.11	-1.00	-13.00	-49.63
86.26	-61.73	-53.90	-6.67	-1.16	-13.00	-48.73
127.97	-56.03	-47.21	-7.20	-1.62	-13.00	-43.03
155.13	-65.57	-56.68	-7.21	-1.68	-13.00	-52.57
276.38	-64.31	-60.29	-1.66	-2.36	-13.00	-51.31
468.44	-61.46	-57.00	-1.30	-3.16	-13.00	-48.46
3465.00	-48.72	-50.20	12.51	-11.03	-13.00	-35.72
5197.50	-51.06	-51.76	12.69	-11.99	-13.00	-38.06

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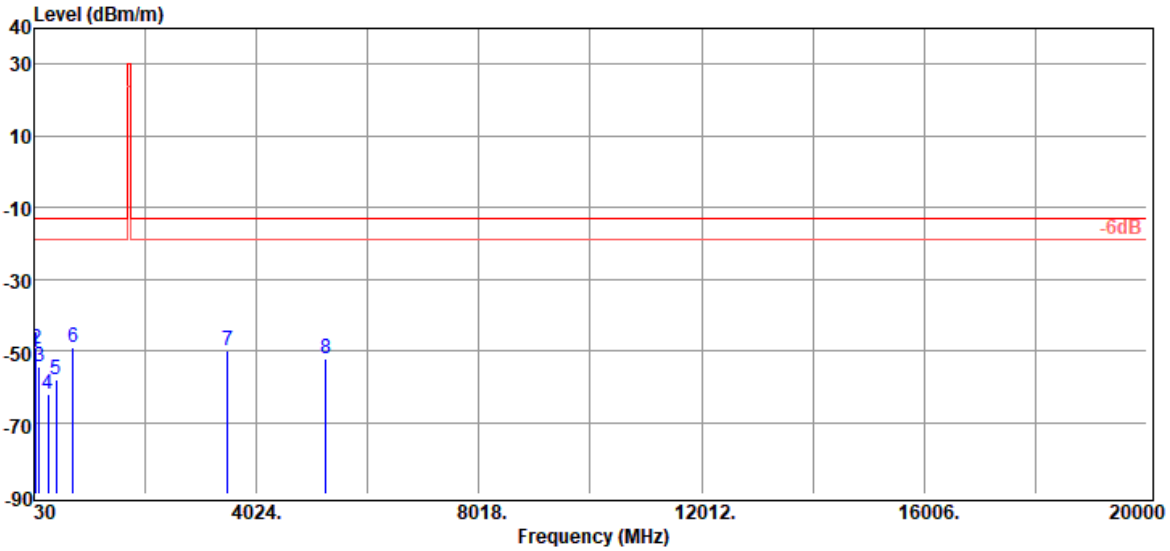
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B4	Temp./Humi.	:21.1/65
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1754.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
48.43	-50.27	-31.52	-17.89	-0.86	-13.00	-37.27
64.92	-49.53	-34.82	-13.71	-1.00	-13.00	-36.53
127.97	-54.50	-45.68	-7.20	-1.62	-13.00	-41.50
277.35	-62.24	-58.20	-1.67	-2.37	-13.00	-49.24
433.52	-58.01	-53.55	-1.40	-3.06	-13.00	-45.01
734.22	-48.93	-43.25	-1.42	-4.26	-13.00	-35.93
3509.60	-49.83	-51.28	12.30	-10.85	-13.00	-36.83
5264.40	-52.16	-53.49	13.16	-11.83	-13.00	-39.16

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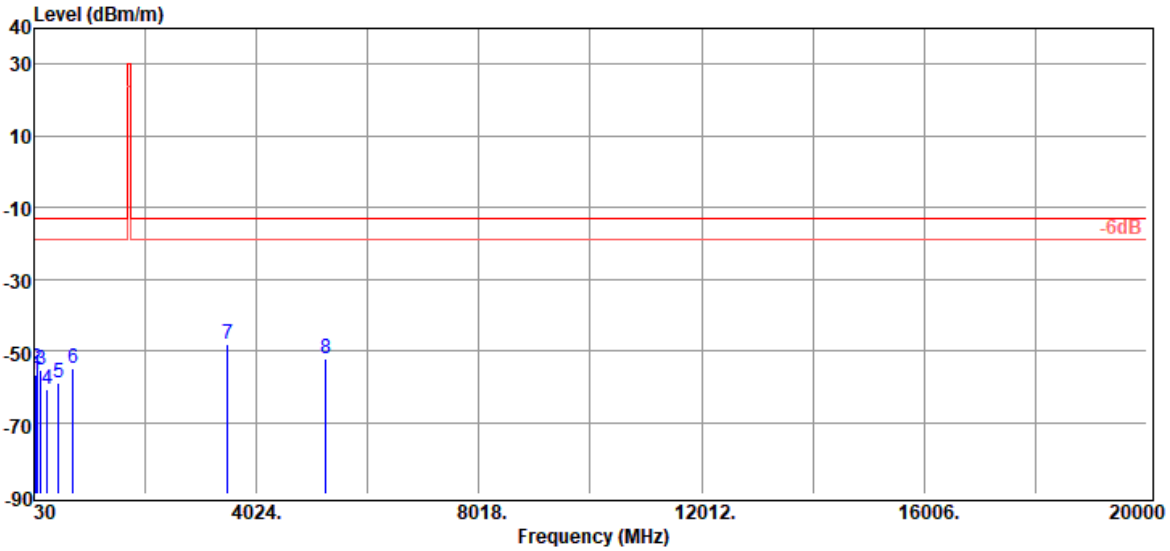
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B4	Temp./Humi.	:21.1/66
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1754.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
66.86	-56.79	-42.74	-13.05	-1.00	-13.00	-43.79
84.32	-54.91	-46.56	-7.19	-1.16	-13.00	-41.91
153.19	-55.39	-46.47	-7.24	-1.68	-13.00	-42.39
271.53	-60.92	-57.01	-1.62	-2.29	-13.00	-47.92
474.26	-58.84	-54.42	-1.31	-3.11	-13.00	-45.84
730.34	-54.83	-49.05	-1.47	-4.31	-13.00	-41.83
3509.60	-48.03	-49.48	12.30	-10.85	-13.00	-35.03
5264.40	-52.14	-53.47	13.16	-11.83	-13.00	-39.14

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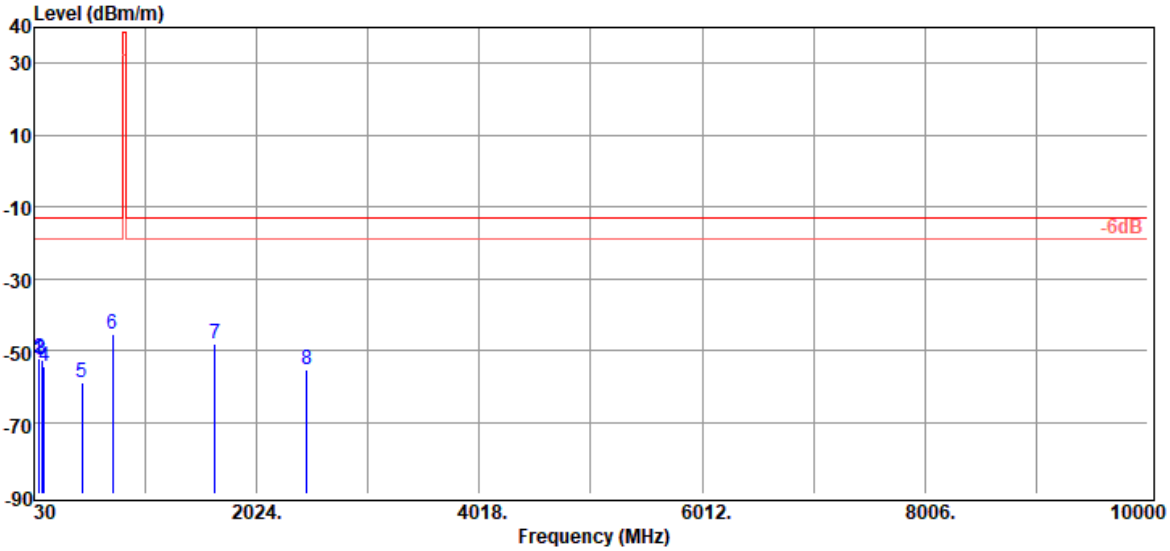
NB IOT Band 5

Report Number	:E2/2019/A0028	Test Date	:2020-02-04
Operation Mode	:NB IOT B5	Temp./Humi.	:22.8/53
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:824.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-52.52	-39.07	-12.45	-1.00	-13.00	-39.52
76.56	-52.36	-41.77	-9.49	-1.10	-13.00	-39.36
99.84	-52.55	-45.00	-6.22	-1.33	-13.00	-39.55
123.12	-54.52	-45.96	-7.04	-1.52	-13.00	-41.52
461.65	-59.05	-54.42	-1.28	-3.35	-13.00	-46.05
731.31	-45.61	-39.87	-1.45	-4.29	-13.00	-32.61
1648.40	-48.36	-50.13	9.29	-7.52	-13.00	-35.36
2472.60	-55.46	-57.00	10.54	-9.00	-13.00	-42.46

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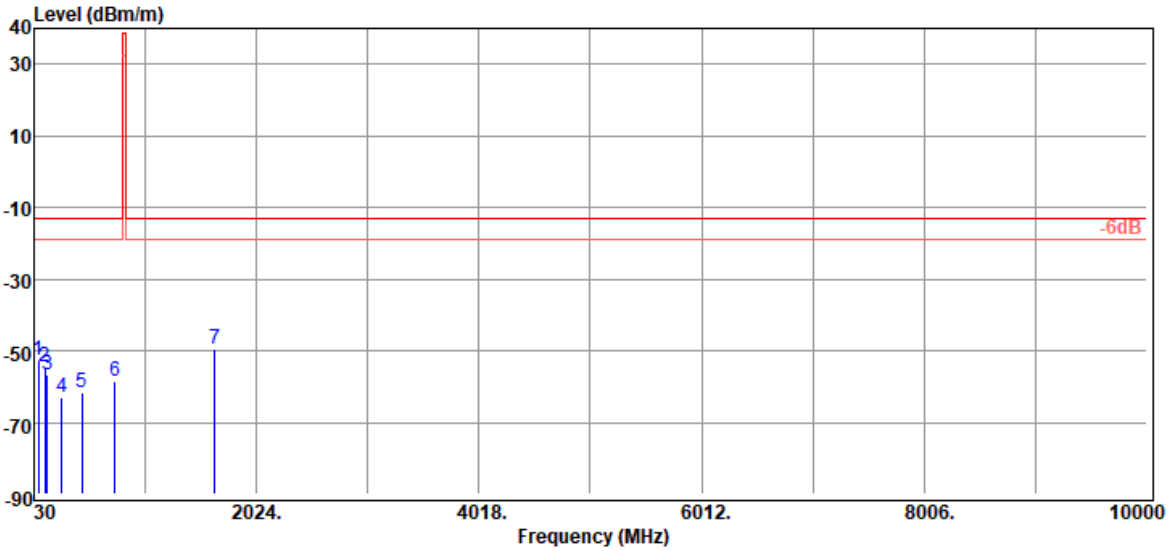
Report Number	:E2/2019/A0028	Test Date	:2020-02-04
Operation Mode	:NB IOT B5	Temp./Humi.	:22.8/53
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:824.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-52.70	-39.25	-12.45	-1.00	-13.00	-39.70
129.91	-54.41	-45.49	-7.26	-1.66	-13.00	-41.41
149.31	-56.77	-47.63	-7.46	-1.68	-13.00	-43.77
280.26	-62.79	-58.68	-1.70	-2.41	-13.00	-49.79
461.65	-61.75	-57.12	-1.28	-3.35	-13.00	-48.75
753.62	-58.45	-52.49	-1.74	-4.22	-13.00	-45.45
1648.40	-49.34	-51.11	9.29	-7.52	-13.00	-36.34

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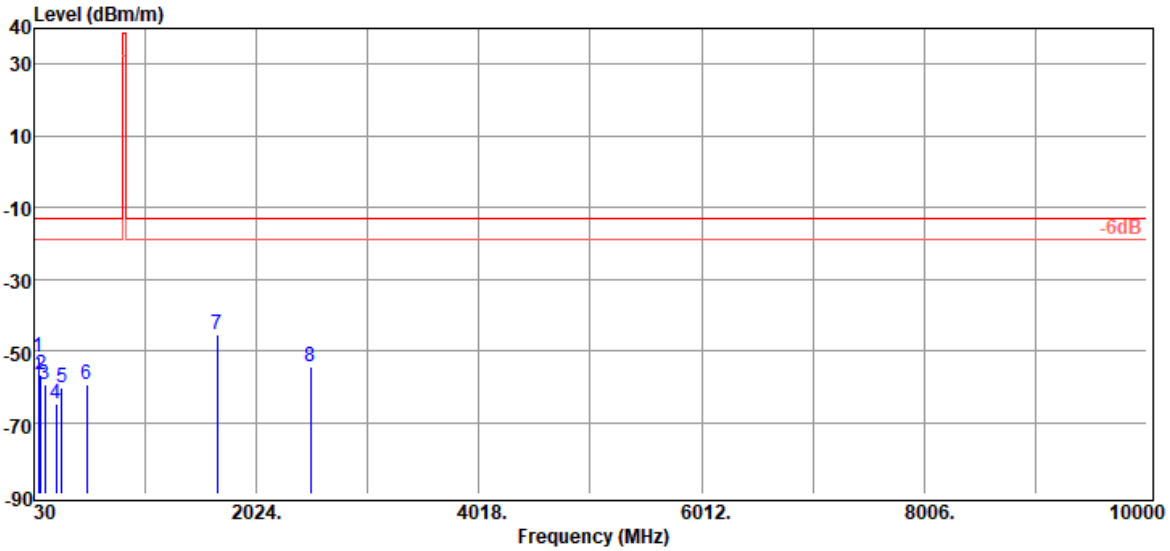
Report Number	:E2/2019/A0028	Test Date	:2020-02-04
Operation Mode	:NB IOT B5	Temp./Humi.	:22.8/53
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:836.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
69.77	-51.63	-38.52	-12.11	-1.00	-13.00	-38.63
92.08	-56.53	-49.57	-5.76	-1.20	-13.00	-43.53
127.00	-59.31	-50.55	-7.16	-1.60	-13.00	-46.31
227.88	-64.59	-61.08	-1.32	-2.19	-13.00	-51.59
280.26	-60.39	-56.28	-1.70	-2.41	-13.00	-47.39
503.36	-59.26	-54.57	-1.17	-3.52	-13.00	-46.26
1673.00	-45.32	-47.17	9.53	-7.68	-13.00	-32.32
2509.50	-54.31	-55.88	10.62	-9.05	-13.00	-41.31

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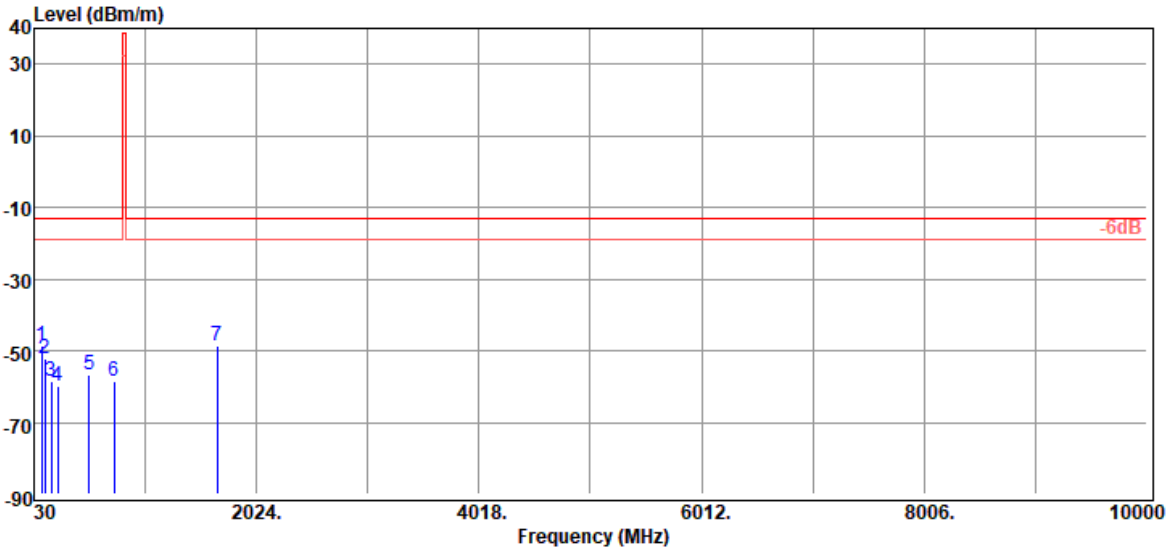
Report Number	:E2/2019/A0028	Test Date	:2020-02-04
Operation Mode	:NB IOT B5	Temp./Humi.	:22.8/53
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:836.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
96.93	-48.71	-41.54	-5.89	-1.28	-13.00	-35.71
127.00	-52.32	-43.56	-7.16	-1.60	-13.00	-39.32
187.14	-58.65	-53.54	-3.28	-1.83	-13.00	-45.65
244.37	-59.80	-55.80	-1.77	-2.23	-13.00	-46.80
522.76	-56.67	-51.86	-1.33	-3.48	-13.00	-43.67
746.83	-58.54	-52.74	-1.61	-4.19	-13.00	-45.54
1673.00	-48.62	-50.47	9.53	-7.68	-13.00	-35.62

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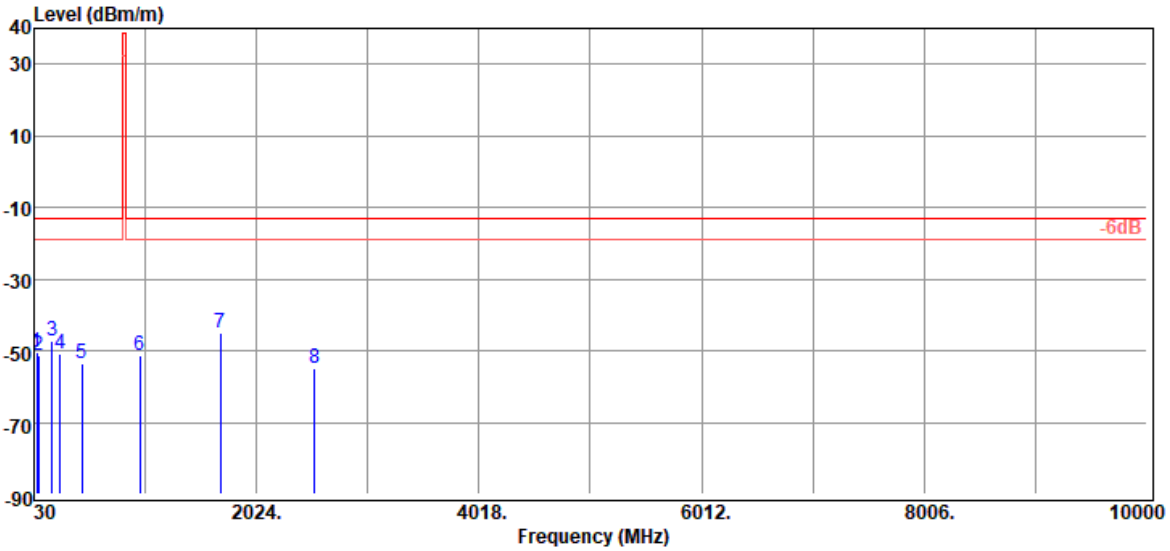
Report Number	:E2/2019/A0028	Test Date	:2020-02-04
Operation Mode	:NB IOT B5	Temp./Humi.	:22.8/53
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:848.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
55.22	-50.45	-33.04	-16.48	-0.93	-13.00	-37.45
67.83	-51.37	-37.54	-12.83	-1.00	-13.00	-38.37
191.99	-47.22	-42.54	-2.77	-1.91	-13.00	-34.22
267.65	-50.82	-46.95	-1.60	-2.27	-13.00	-37.82
457.77	-53.58	-48.97	-1.32	-3.29	-13.00	-40.58
980.60	-51.50	-45.08	-1.51	-4.91	-13.00	-38.50
1697.60	-44.88	-46.82	9.78	-7.84	-13.00	-31.88
2546.40	-54.85	-56.45	10.69	-9.09	-13.00	-41.85

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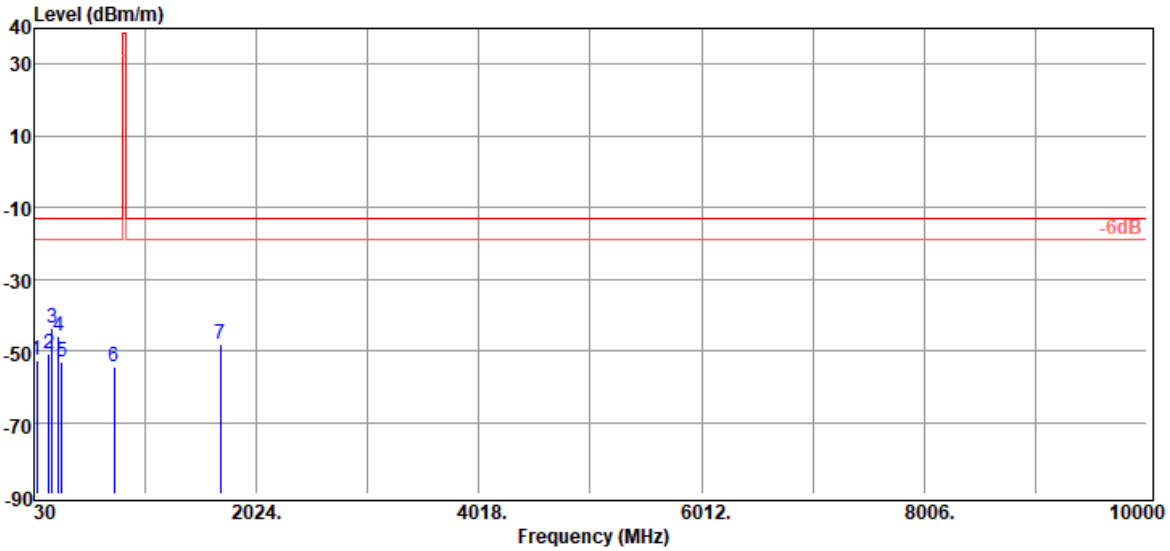
Report Number	:E2/2019/A0028	Test Date	:2020-02-04
Operation Mode	:NB IOT B5	Temp./Humi.	:22.8/53
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:848.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
57.16	-52.80	-35.78	-16.06	-0.96	-13.00	-39.80
162.89	-50.92	-42.41	-6.81	-1.70	-13.00	-37.92
195.87	-43.82	-39.43	-2.40	-1.99	-13.00	-30.82
248.25	-46.07	-42.20	-1.64	-2.23	-13.00	-33.07
281.23	-52.94	-48.83	-1.69	-2.42	-13.00	-39.94
746.83	-54.62	-48.82	-1.61	-4.19	-13.00	-41.62
1697.60	-48.07	-50.01	9.78	-7.84	-13.00	-35.07

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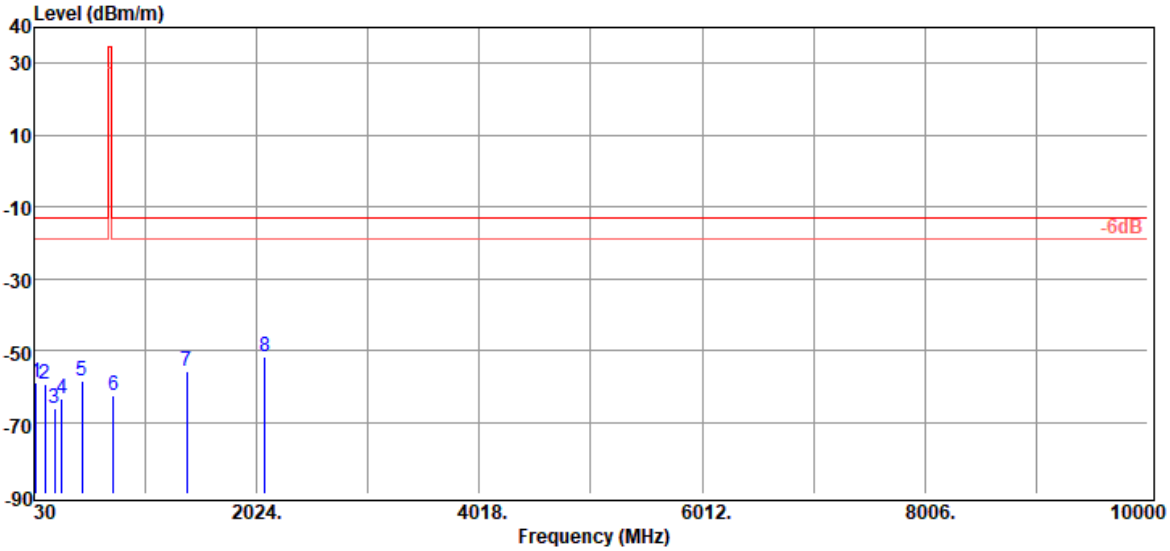
NB IOT Band 12

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B12	Temp./Humi.	:19.7/68
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:699.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
51.34	-58.80	-40.59	-17.33	-0.88	-13.00	-45.80
129.91	-59.36	-50.44	-7.26	-1.66	-13.00	-46.36
211.39	-66.01	-62.37	-1.54	-2.10	-13.00	-53.01
277.35	-63.45	-59.41	-1.67	-2.37	-13.00	-50.45
461.65	-58.29	-53.66	-1.28	-3.35	-13.00	-45.29
740.04	-62.39	-56.64	-1.56	-4.19	-13.00	-49.39
1398.40	-55.88	-56.35	6.98	-6.51	-13.00	-42.88
2097.60	-51.97	-53.10	9.71	-8.58	-13.00	-38.97

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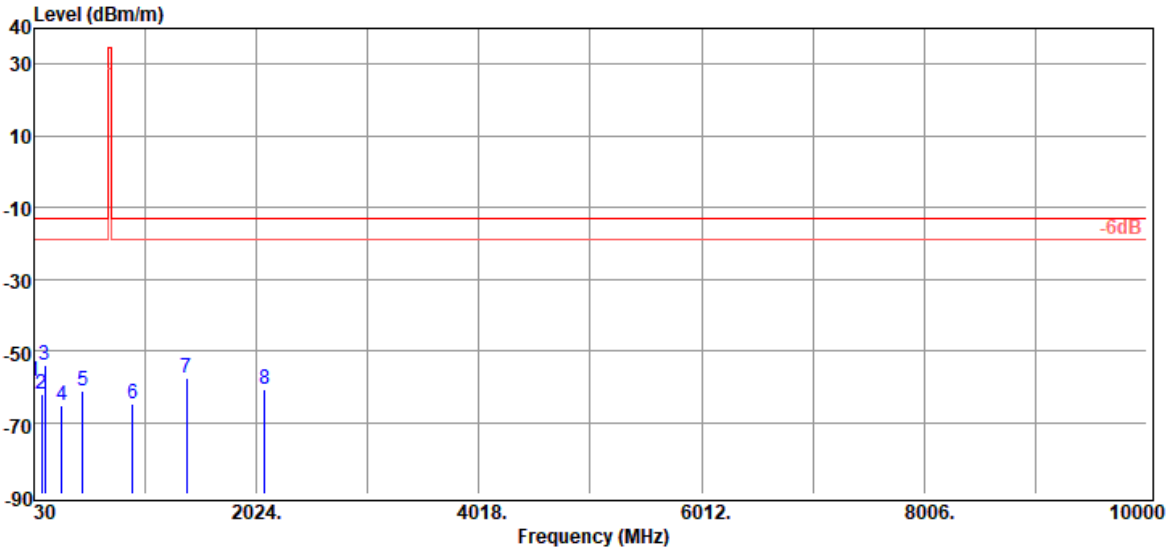
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B12	Temp./Humi.	:19.7/68
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:699.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
33.88	-58.55	-38.00	-19.84	-0.71	-13.00	-45.55
95.96	-62.25	-55.20	-5.79	-1.26	-13.00	-49.25
127.97	-54.02	-45.20	-7.20	-1.62	-13.00	-41.02
282.20	-65.10	-61.00	-1.67	-2.43	-13.00	-52.10
466.50	-61.34	-56.84	-1.29	-3.21	-13.00	-48.34
912.70	-64.94	-58.61	-1.59	-4.74	-13.00	-51.94
1398.40	-57.50	-57.96	6.96	-6.50	-13.00	-44.50
2097.60	-60.90	-62.03	9.71	-8.58	-13.00	-47.90

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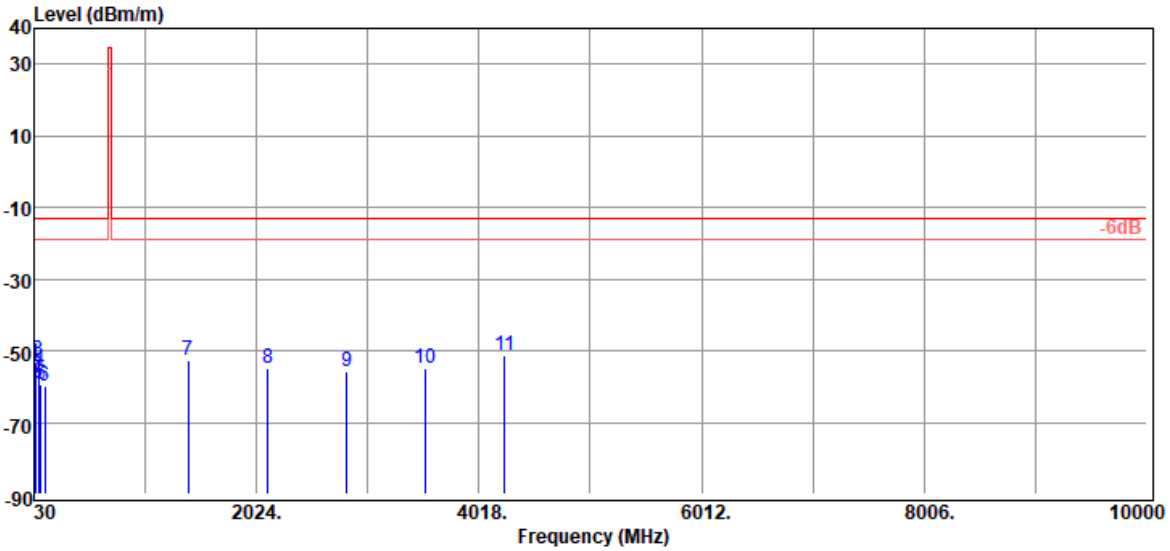
Report Number	:E2/2019/A0028	Test Date	:2019-12-04
Operation Mode	:NB IOT B12	Temp./Humi.	:23.3/40
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:707.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
38.73	-53.60	-33.52	-19.25	-0.83	-13.00	-40.60
47.46	-56.62	-37.69	-18.07	-0.86	-13.00	-43.62
68.80	-52.63	-39.18	-12.45	-1.00	-13.00	-39.63
74.62	-55.42	-44.19	-10.16	-1.07	-13.00	-42.42
94.02	-59.21	-52.20	-5.78	-1.23	-13.00	-46.21
127.97	-59.80	-50.98	-7.20	-1.62	-13.00	-46.80
1415.00	-52.50	-53.07	7.12	-6.55	-13.00	-39.50
2122.50	-54.79	-55.64	9.47	-8.62	-13.00	-41.79
2830.00	-56.00	-57.16	10.90	-9.74	-13.00	-43.00
3537.50	-54.98	-56.30	12.30	-10.98	-13.00	-41.98
4245.00	-51.32	-53.18	12.70	-10.84	-13.00	-38.32

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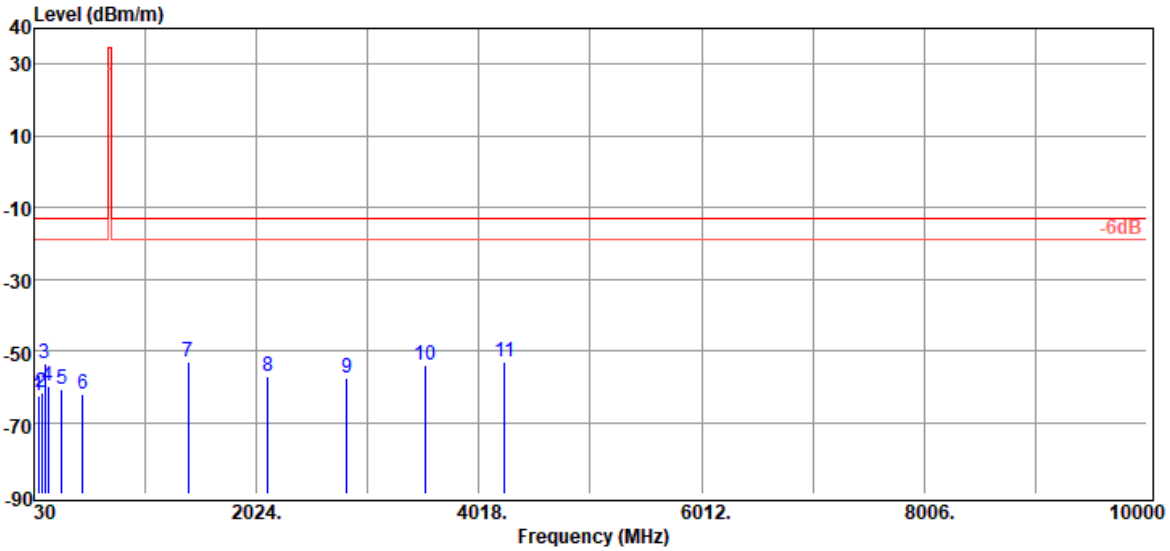
Report Number	:E2/2019/A0028	Test Date	:2019-12-04
Operation Mode	:NB IOT B12	Temp./Humi.	:23.3/40
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:707.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
69.77	-62.50	-49.39	-12.11	-1.00	-13.00	-49.50
95.96	-61.52	-54.47	-5.79	-1.26	-13.00	-48.52
127.00	-53.52	-44.76	-7.16	-1.60	-13.00	-40.52
159.01	-59.72	-51.03	-7.01	-1.68	-13.00	-46.72
279.29	-60.82	-56.73	-1.69	-2.40	-13.00	-47.82
463.59	-62.14	-57.55	-1.29	-3.30	-13.00	-49.14
1415.00	-53.29	-53.86	7.12	-6.55	-13.00	-40.29
2122.50	-57.21	-58.06	9.47	-8.62	-13.00	-44.21
2830.00	-57.54	-58.70	10.90	-9.74	-13.00	-44.54
3537.50	-54.19	-55.51	12.30	-10.98	-13.00	-41.19
4245.00	-53.06	-54.92	12.70	-10.84	-13.00	-40.06

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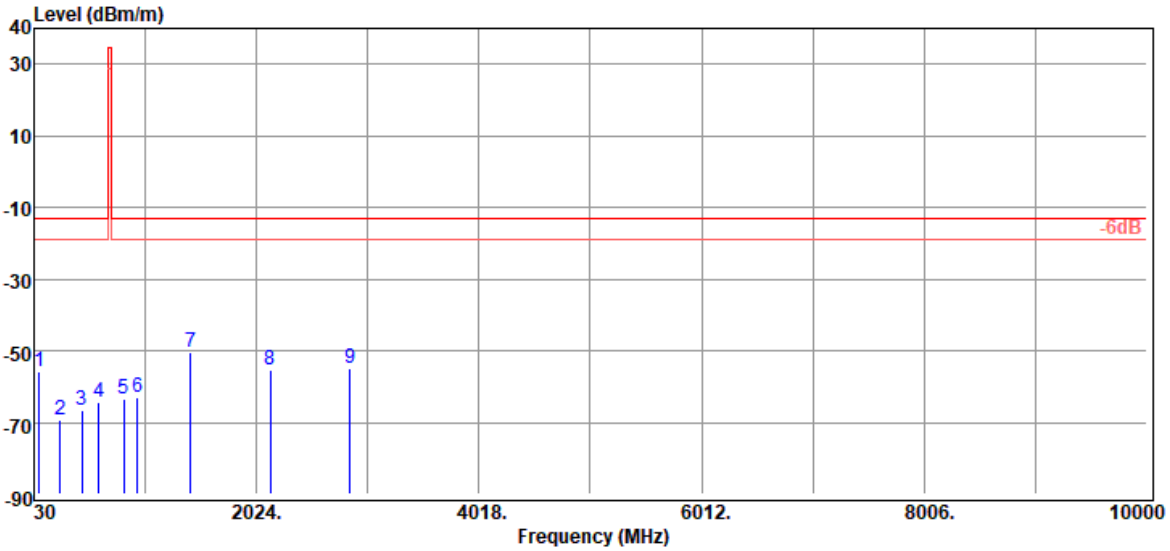
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B12	Temp./Humi.	:19.5/67
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:715.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
75.59	-55.71	-44.77	-9.85	-1.09	-13.00	-42.71
260.86	-69.53	-65.71	-1.55	-2.27	-13.00	-56.53
455.83	-66.60	-62.04	-1.36	-3.20	-13.00	-53.60
613.94	-64.45	-58.96	-1.67	-3.82	-13.00	-51.45
832.19	-63.61	-57.63	-1.44	-4.54	-13.00	-50.61
953.44	-62.83	-56.22	-1.66	-4.95	-13.00	-49.83
1431.60	-50.52	-51.20	7.26	-6.58	-13.00	-37.52
2147.40	-55.33	-55.93	9.27	-8.67	-13.00	-42.33
2863.20	-55.06	-56.20	10.93	-9.79	-13.00	-42.06

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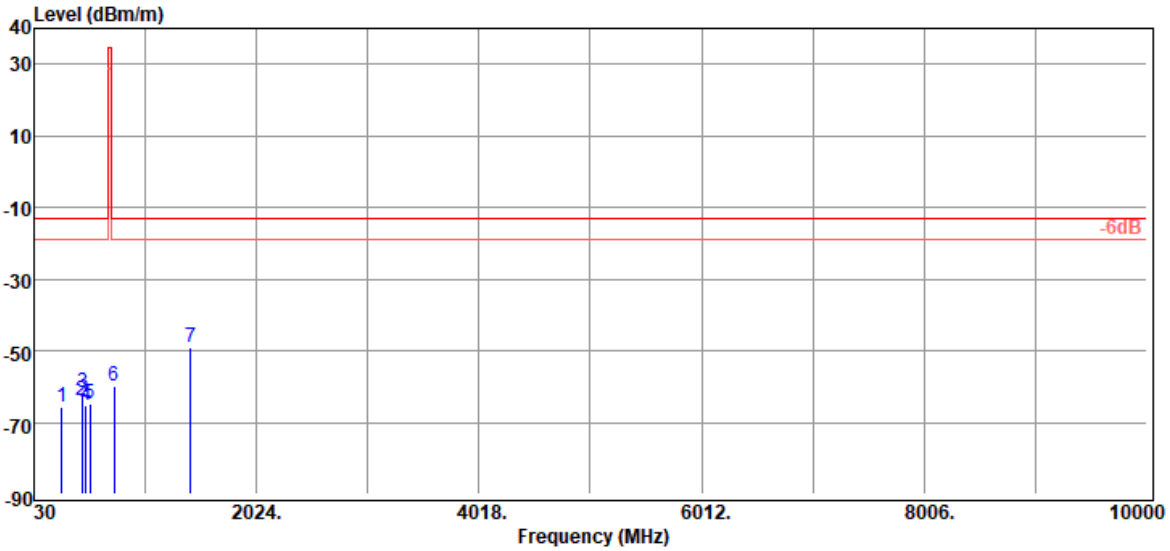
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B12	Temp./Humi.	:19.5/69
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:715.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
280.26	-65.83	-61.72	-1.70	-2.41	-13.00	-52.83
458.74	-64.00	-59.35	-1.31	-3.34	-13.00	-51.00
465.53	-61.54	-57.01	-1.29	-3.24	-13.00	-48.54
495.60	-65.15	-60.60	-1.06	-3.49	-13.00	-52.15
533.43	-64.88	-60.44	-1.20	-3.24	-13.00	-51.88
746.83	-59.77	-53.97	-1.61	-4.19	-13.00	-46.77
1431.60	-49.05	-49.72	7.25	-6.58	-13.00	-36.05

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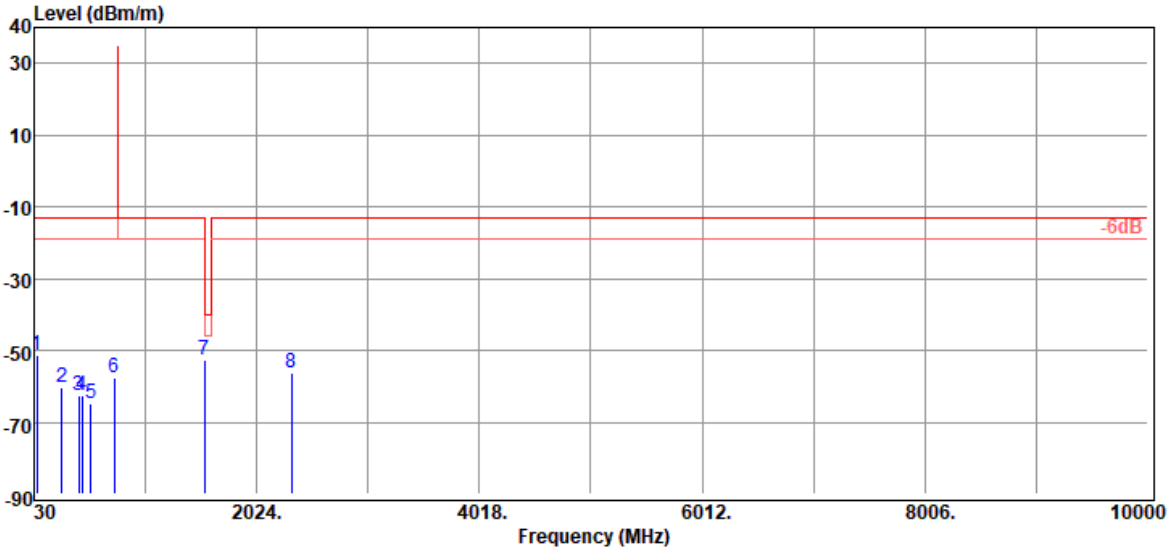
NB IOT Band 13

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:19.5/70
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:777.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
56.19	-51.42	-34.22	-16.25	-0.95	-13.00	-38.42
280.26	-60.30	-56.19	-1.70	-2.41	-13.00	-47.30
431.58	-62.67	-58.13	-1.44	-3.10	-13.00	-49.67
458.74	-62.60	-57.95	-1.31	-3.34	-13.00	-49.60
537.31	-64.59	-60.17	-1.18	-3.24	-13.00	-51.59
744.89	-57.59	-51.80	-1.60	-4.19	-13.00	-44.59
1554.40	-52.74	-54.40	8.64	-6.98	-13.00	-39.74
2331.60	-56.44	-57.38	9.79	-8.85	-13.00	-43.44

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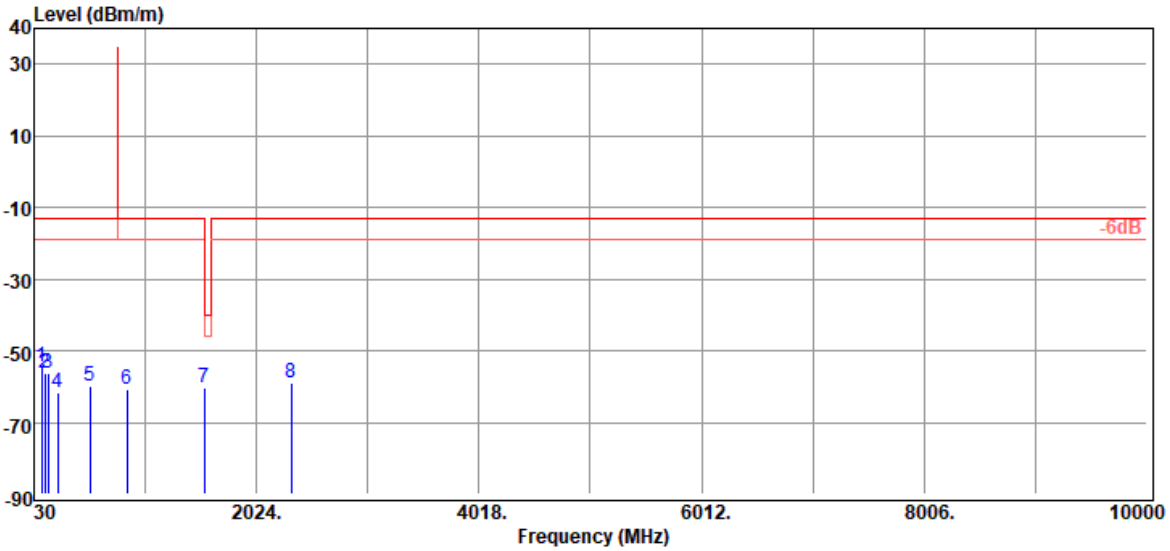
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:19.5/68
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:777.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
95.96	-54.36	-47.31	-5.79	-1.26	-13.00	-41.36
128.94	-56.45	-47.58	-7.23	-1.64	-13.00	-43.45
153.19	-56.48	-47.56	-7.24	-1.68	-13.00	-43.48
244.37	-61.68	-57.68	-1.77	-2.23	-13.00	-48.68
534.40	-59.78	-55.36	-1.18	-3.24	-13.00	-46.78
860.32	-60.94	-55.07	-1.35	-4.52	-13.00	-47.94
1554.40	-60.21	-61.87	8.64	-6.98	-13.00	-47.21
2331.60	-59.08	-60.02	9.79	-8.85	-13.00	-46.08

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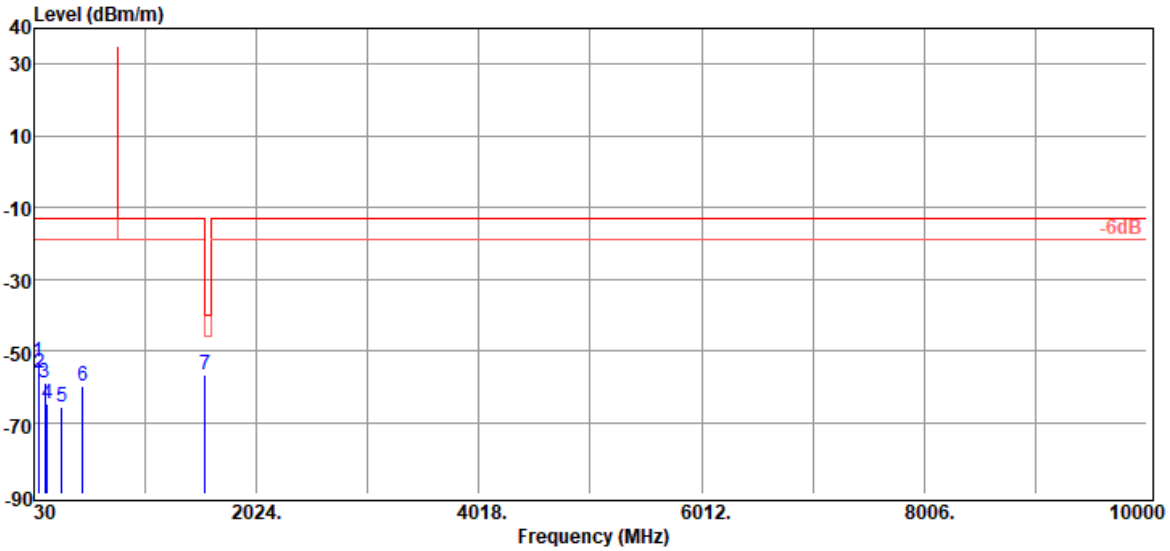
Report Number	:E2/2019/A0028	Test Date	:2019-12-04
Operation Mode	:NB IOT B13	Temp./Humi.	:23.4/43
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-53.21	-39.76	-12.45	-1.00	-13.00	-40.21
76.56	-56.33	-45.74	-9.49	-1.10	-13.00	-43.33
129.91	-58.99	-50.07	-7.26	-1.66	-13.00	-45.99
151.25	-64.66	-55.63	-7.35	-1.68	-13.00	-51.66
280.26	-65.88	-61.77	-1.70	-2.41	-13.00	-52.88
467.47	-59.84	-55.37	-1.29	-3.18	-13.00	-46.84
1564.00	-56.78	-58.49	8.74	-7.03	-40.00	-16.78

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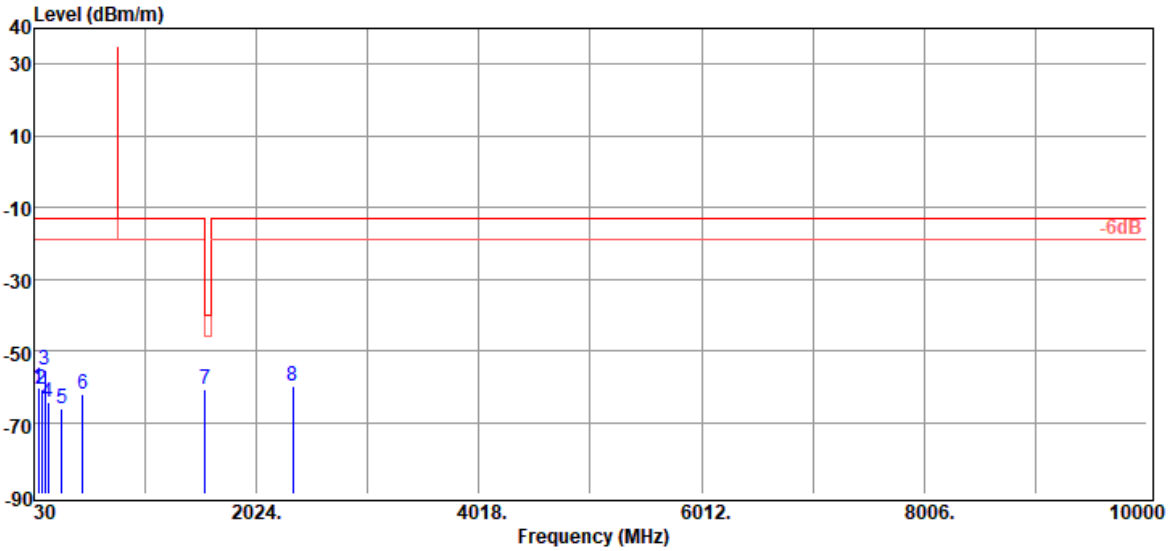
Report Number	:E2/2019/A0028	Test Date	:2019-12-04
Operation Mode	:NB IOT B13	Temp./Humi.	:23.4/43
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
67.83	-60.12	-46.29	-12.83	-1.00	-13.00	-47.12
94.99	-60.89	-53.96	-5.69	-1.24	-13.00	-47.89
127.00	-55.55	-46.79	-7.16	-1.60	-13.00	-42.55
155.13	-64.24	-55.35	-7.21	-1.68	-13.00	-51.24
282.20	-66.11	-62.01	-1.67	-2.43	-13.00	-53.11
463.59	-62.27	-57.68	-1.29	-3.30	-13.00	-49.27
1564.00	-60.70	-62.41	8.74	-7.03	-40.00	-20.70
2346.00	-59.69	-60.71	9.88	-8.86	-13.00	-46.69

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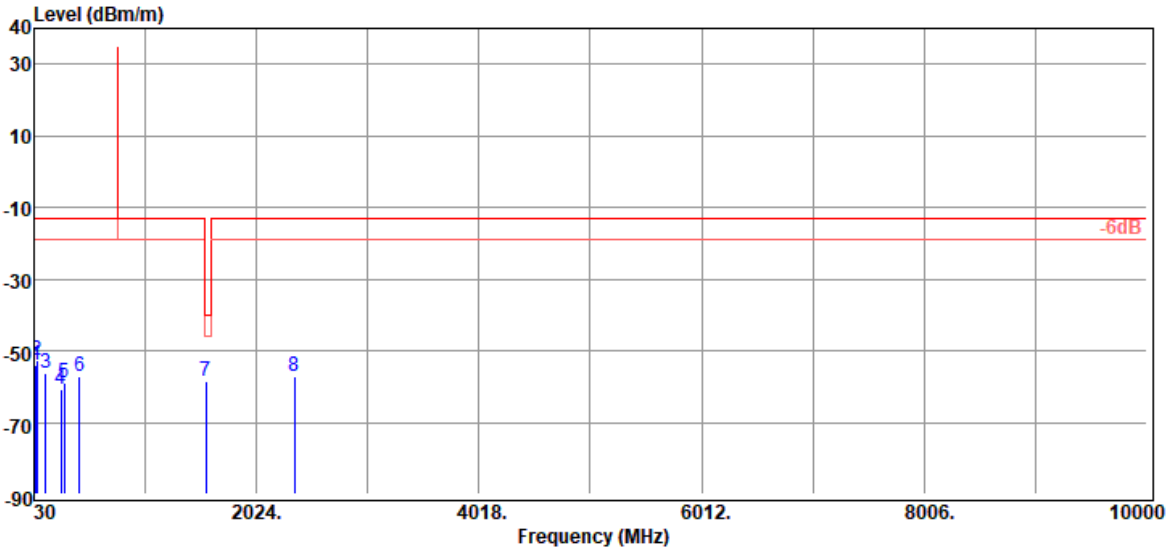
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:19.4/70
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:786.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-53.98	-34.83	-18.29	-0.86	-13.00	-40.98
57.16	-52.89	-35.87	-16.06	-0.96	-13.00	-39.89
132.82	-56.08	-47.07	-7.35	-1.66	-13.00	-43.08
274.44	-60.60	-56.62	-1.65	-2.33	-13.00	-47.60
299.66	-59.17	-55.16	-1.50	-2.51	-13.00	-46.17
435.46	-57.27	-52.88	-1.37	-3.02	-13.00	-44.27
1573.60	-58.63	-60.39	8.84	-7.08	-40.00	-18.63
2360.40	-57.21	-58.30	9.96	-8.87	-13.00	-44.21

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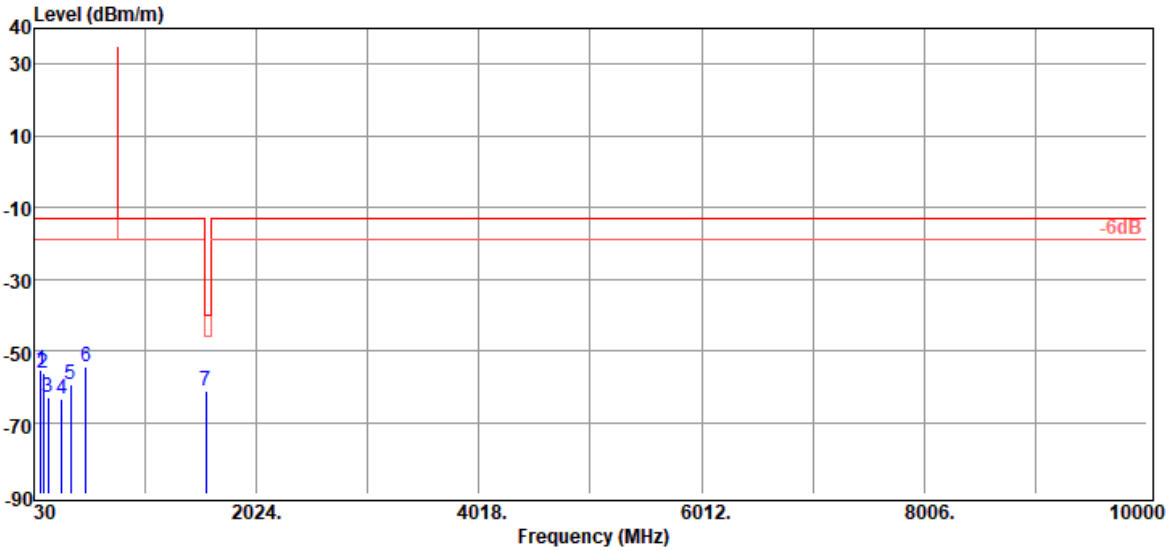
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:19.4/71
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:786.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
93.05	-55.54	-48.56	-5.77	-1.21	-13.00	-42.54
111.48	-56.35	-47.81	-7.09	-1.45	-13.00	-43.35
159.01	-62.86	-54.17	-7.01	-1.68	-13.00	-49.86
279.29	-63.57	-59.48	-1.69	-2.40	-13.00	-50.57
355.92	-59.20	-55.27	-1.35	-2.58	-13.00	-46.20
496.57	-54.29	-49.72	-1.08	-3.49	-13.00	-41.29
1573.60	-61.25	-63.01	8.84	-7.08	-40.00	-21.25

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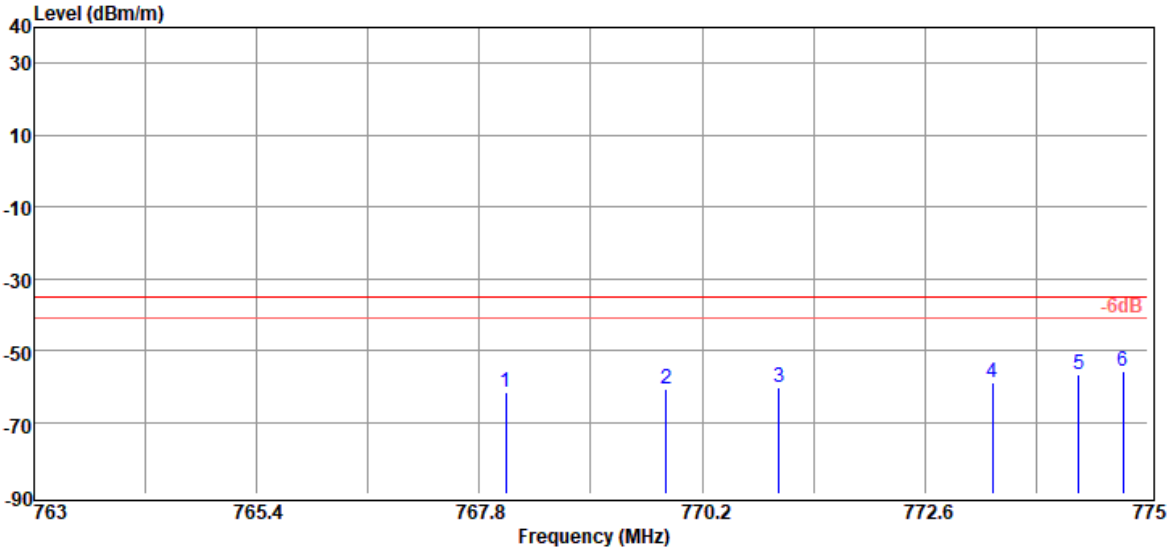
NB IOT Band 13 (763-775MHz)

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:777.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
768.09	-61.62	-55.72	-1.63	-4.27	-35.00	-26.62
769.82	-60.55	-54.67	-1.61	-4.27	-35.00	-25.55
771.03	-60.12	-54.21	-1.60	-4.31	-35.00	-25.12
773.33	-58.95	-52.99	-1.57	-4.39	-35.00	-23.95
774.26	-56.65	-50.66	-1.56	-4.43	-35.00	-21.65
774.74	-55.94	-49.94	-1.55	-4.45	-35.00	-20.94

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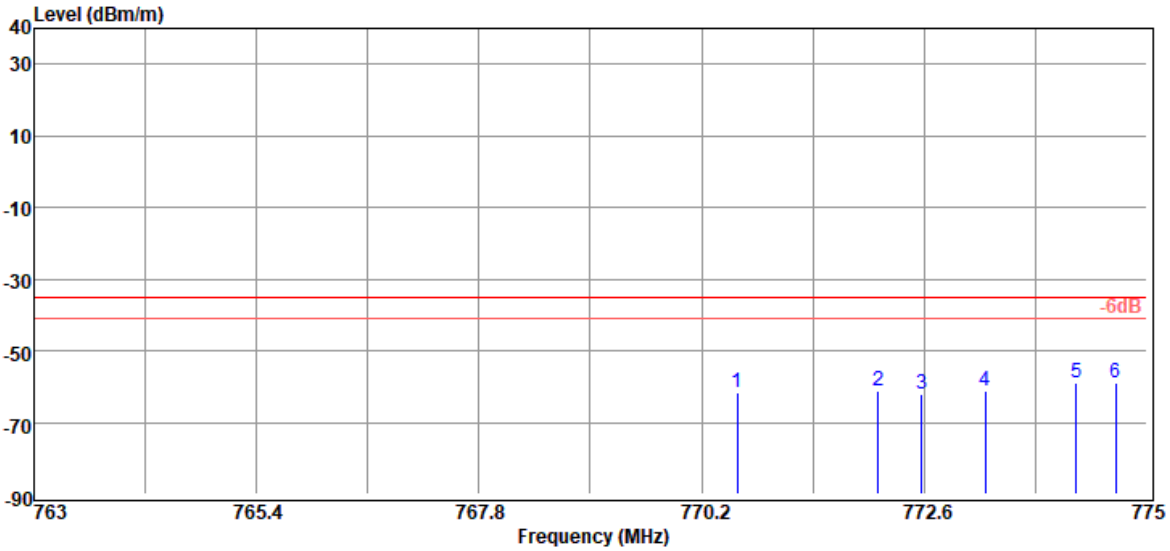
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:777.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
770.58	-61.86	-55.97	-1.60	-4.29	-35.00	-26.86
772.11	-61.25	-55.32	-1.58	-4.35	-35.00	-26.25
772.58	-62.21	-56.26	-1.58	-4.37	-35.00	-27.21
773.26	-61.00	-55.04	-1.57	-4.39	-35.00	-26.00
774.24	-58.85	-52.86	-1.56	-4.43	-35.00	-23.85
774.66	-59.13	-53.14	-1.55	-4.44	-35.00	-24.13

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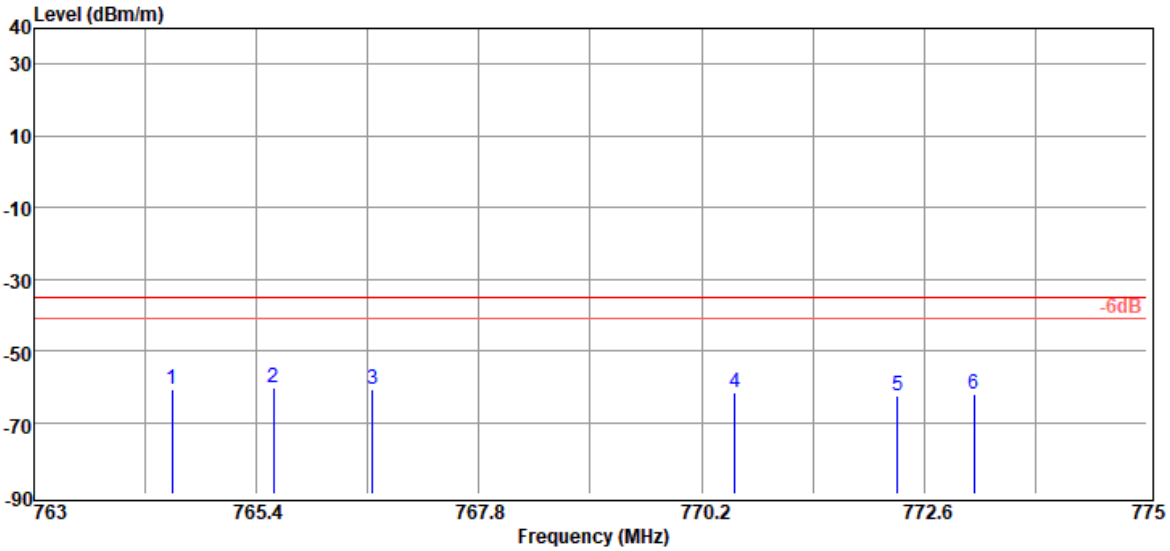
Report Number	:E2/2019/A0028	Test Date	:2019-12-06
Operation Mode	:NB IOT B13	Temp./Humi.	:24.2/51
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
764.49	-60.64	-54.69	-1.68	-4.27	-35.00	-25.64
765.58	-60.52	-54.59	-1.66	-4.27	-35.00	-25.52
766.65	-60.76	-54.84	-1.65	-4.27	-35.00	-25.76
770.56	-61.71	-55.82	-1.60	-4.29	-35.00	-26.71
772.31	-62.38	-56.44	-1.58	-4.36	-35.00	-27.38
773.14	-62.25	-56.29	-1.57	-4.39	-35.00	-27.25

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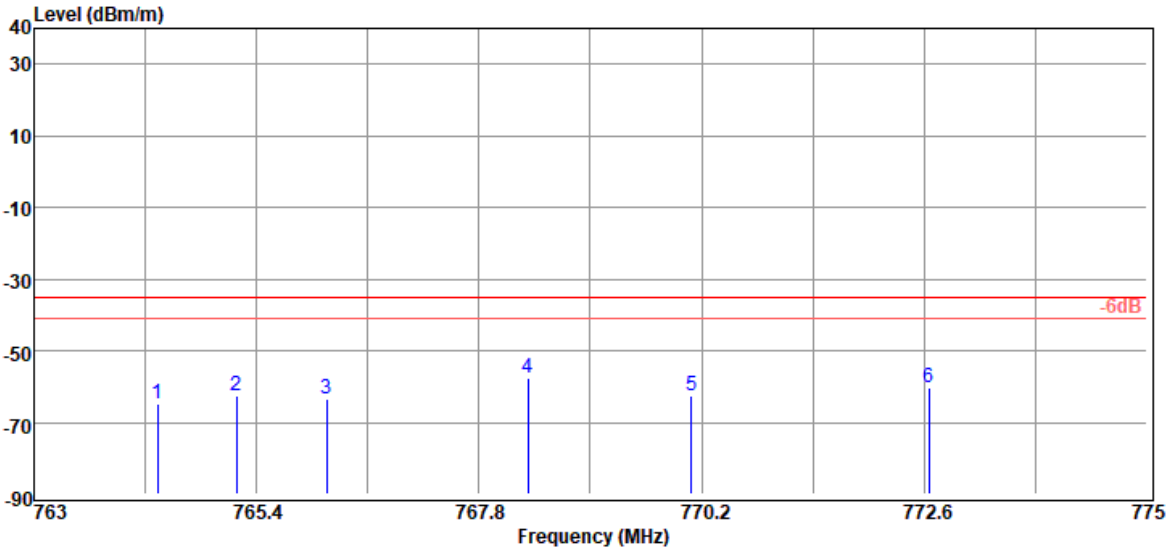
Report Number	:E2/2019/A0028	Test Date	:2019-12-06
Operation Mode	:NB IOT B13	Temp./Humi.	:24.2/51
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
764.33	-64.86	-58.91	-1.68	-4.27	-35.00	-29.86
765.18	-62.43	-56.49	-1.67	-4.27	-35.00	-27.43
766.16	-63.41	-57.48	-1.66	-4.27	-35.00	-28.41
768.33	-57.60	-51.70	-1.63	-4.27	-35.00	-22.60
770.09	-62.51	-56.63	-1.61	-4.27	-35.00	-27.51
772.65	-60.41	-54.46	-1.58	-4.37	-35.00	-25.41

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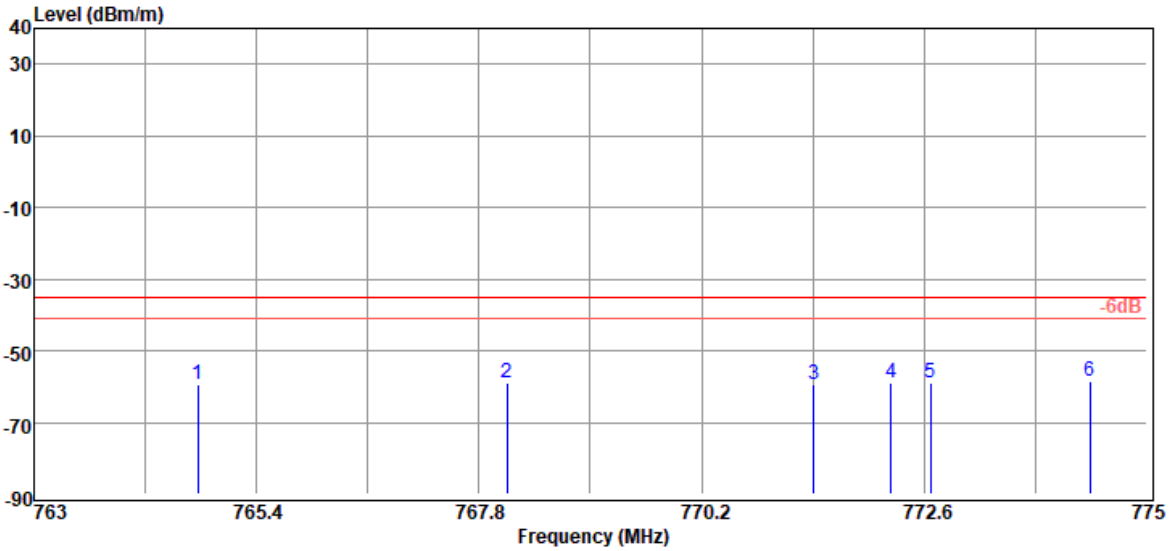
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:786.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
764.76	-59.38	-53.44	-1.67	-4.27	-35.00	-24.38
768.10	-59.16	-53.26	-1.63	-4.27	-35.00	-24.16
771.41	-59.32	-53.41	-1.59	-4.32	-35.00	-24.32
772.24	-58.83	-52.90	-1.58	-4.35	-35.00	-23.83
772.67	-59.10	-53.15	-1.58	-4.37	-35.00	-24.10
774.39	-58.58	-52.59	-1.56	-4.43	-35.00	-23.58

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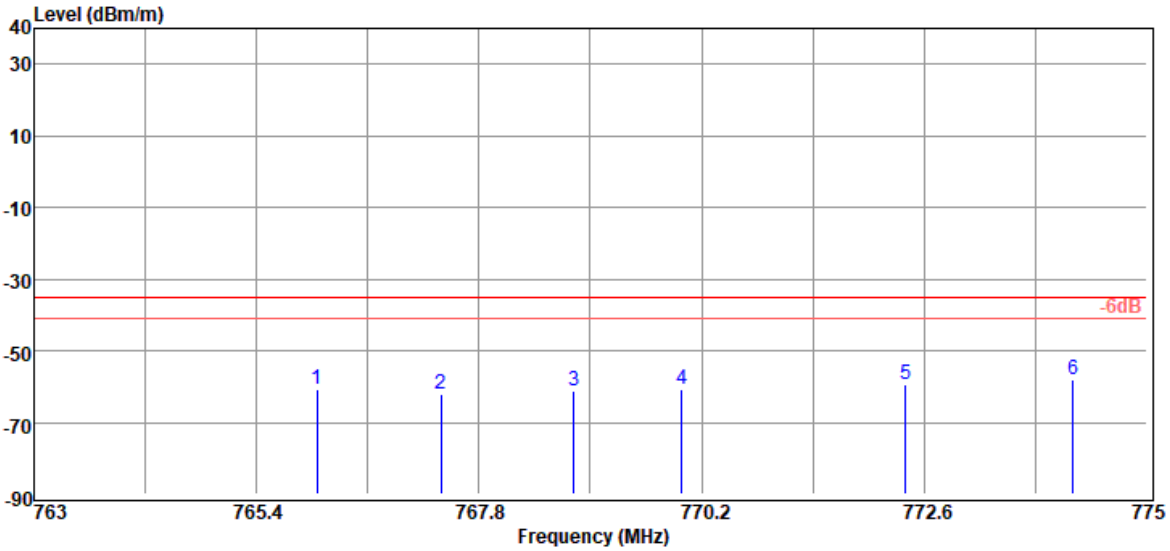
Member of SGS Group

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:786.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
766.05	-60.56	-54.63	-1.66	-4.27	-35.00	-25.56
767.39	-61.99	-56.08	-1.64	-4.27	-35.00	-26.99
768.82	-61.32	-55.43	-1.62	-4.27	-35.00	-26.32
769.98	-60.64	-54.76	-1.61	-4.27	-35.00	-25.64
772.40	-59.56	-53.62	-1.58	-4.36	-35.00	-24.56
774.21	-57.92	-51.93	-1.56	-4.43	-35.00	-22.92

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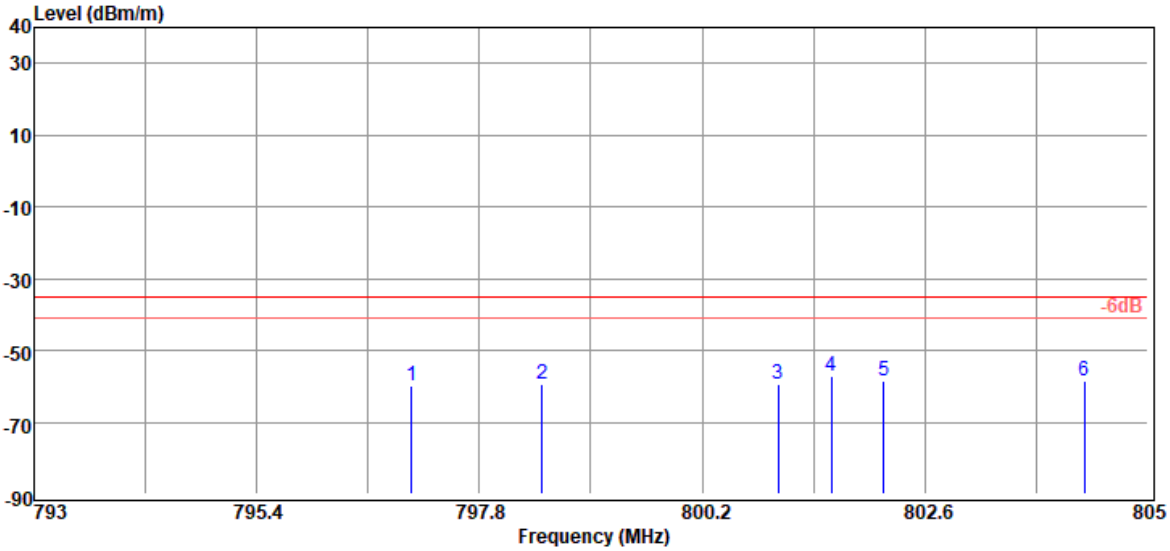
NB IOT Band 13 (793-805MHz)

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:777.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
797.07	-59.79	-53.78	-1.67	-4.34	-35.00	-24.79
798.47	-59.21	-53.30	-1.63	-4.28	-35.00	-24.21
801.02	-59.40	-53.61	-1.57	-4.22	-35.00	-24.40
801.59	-57.15	-51.37	-1.56	-4.22	-35.00	-22.15
802.16	-58.63	-52.86	-1.55	-4.22	-35.00	-23.63
804.32	-58.48	-52.73	-1.53	-4.22	-35.00	-23.48

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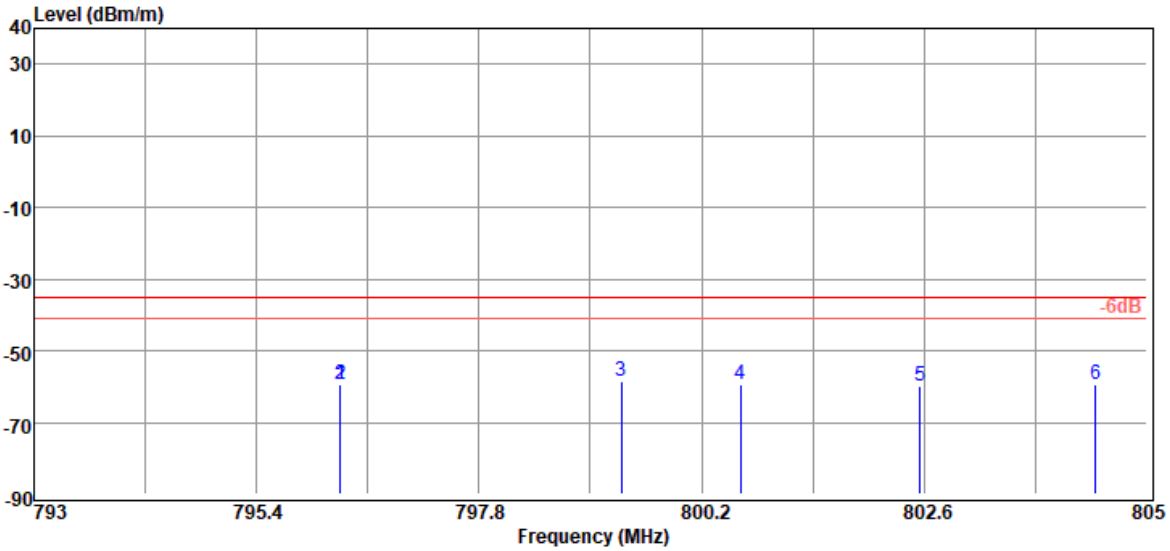
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:777.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
796.30	-59.29	-53.22	-1.69	-4.38	-35.00	-24.29
796.30	-59.29	-53.22	-1.69	-4.38	-35.00	-24.29
799.34	-58.57	-52.72	-1.60	-4.25	-35.00	-23.57
800.62	-59.31	-53.52	-1.57	-4.22	-35.00	-24.31
802.55	-60.01	-54.24	-1.55	-4.22	-35.00	-25.01
804.45	-59.31	-53.56	-1.53	-4.22	-35.00	-24.31

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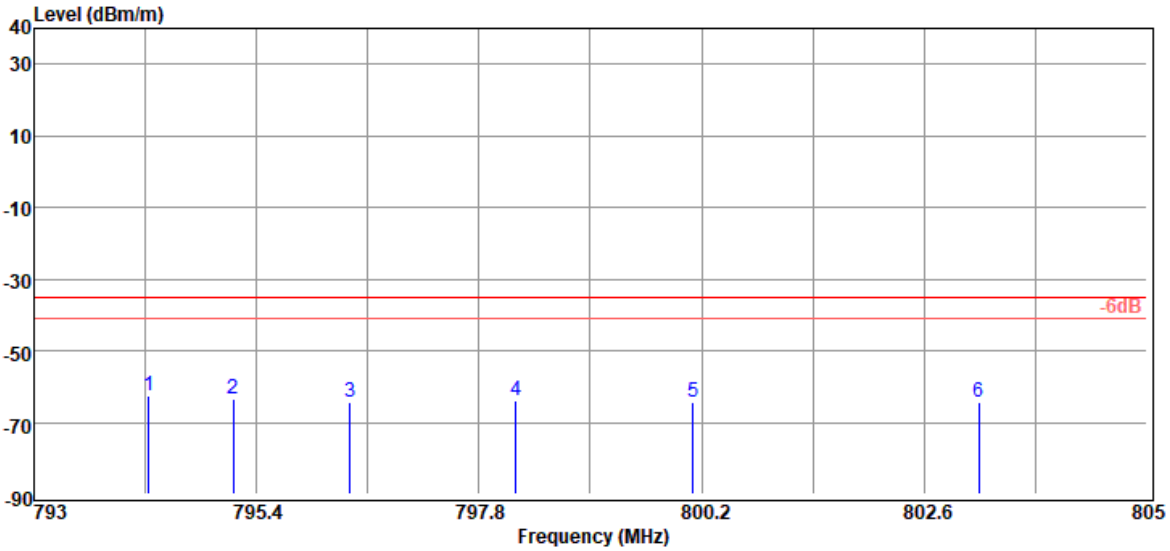
Report Number	:E2/2019/A0028	Test Date	:2019-12-06
Operation Mode	:NB IOT B13	Temp./Humi.	:23.3/52
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
794.24	-62.65	-56.47	-1.72	-4.46	-35.00	-27.65
795.15	-63.62	-57.47	-1.73	-4.42	-35.00	-28.62
796.41	-64.52	-58.46	-1.69	-4.37	-35.00	-29.52
798.20	-64.12	-58.19	-1.63	-4.30	-35.00	-29.12
800.10	-64.44	-58.64	-1.58	-4.22	-35.00	-29.44
803.19	-64.28	-58.52	-1.54	-4.22	-35.00	-29.28

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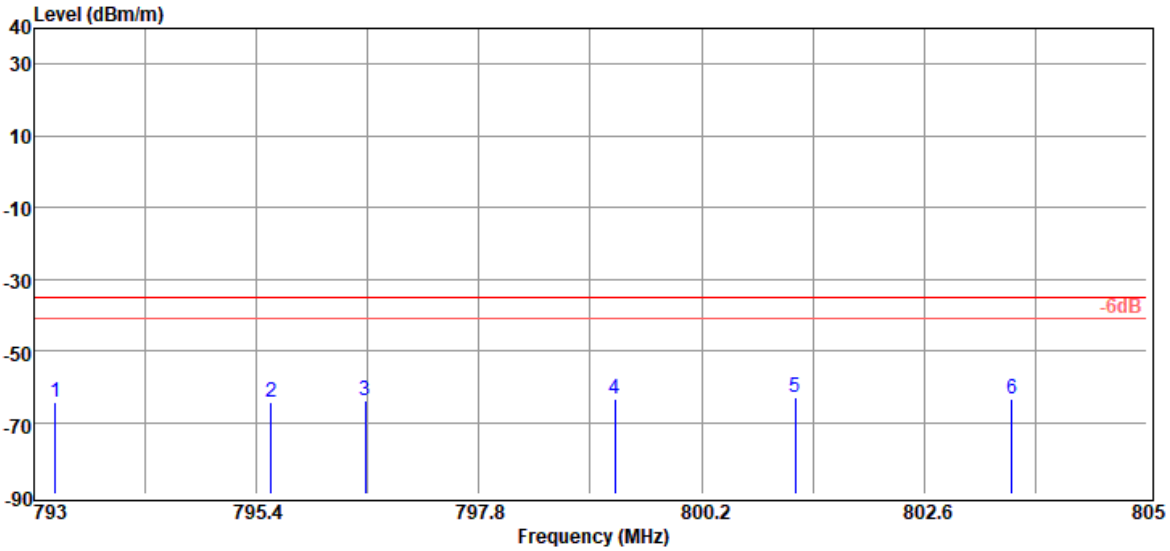
Report Number	:E2/2019/A0028	Test Date	:2019-12-06
Operation Mode	:NB IOT B13	Temp./Humi.	:23.3/52
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
793.23	-64.42	-58.20	-1.72	-4.50	-35.00	-29.42
795.56	-64.38	-58.26	-1.71	-4.41	-35.00	-29.38
796.58	-63.71	-57.67	-1.68	-4.36	-35.00	-28.71
799.26	-63.67	-57.82	-1.60	-4.25	-35.00	-28.67
801.21	-63.15	-57.36	-1.57	-4.22	-35.00	-28.15
803.55	-63.28	-57.52	-1.54	-4.22	-35.00	-28.28

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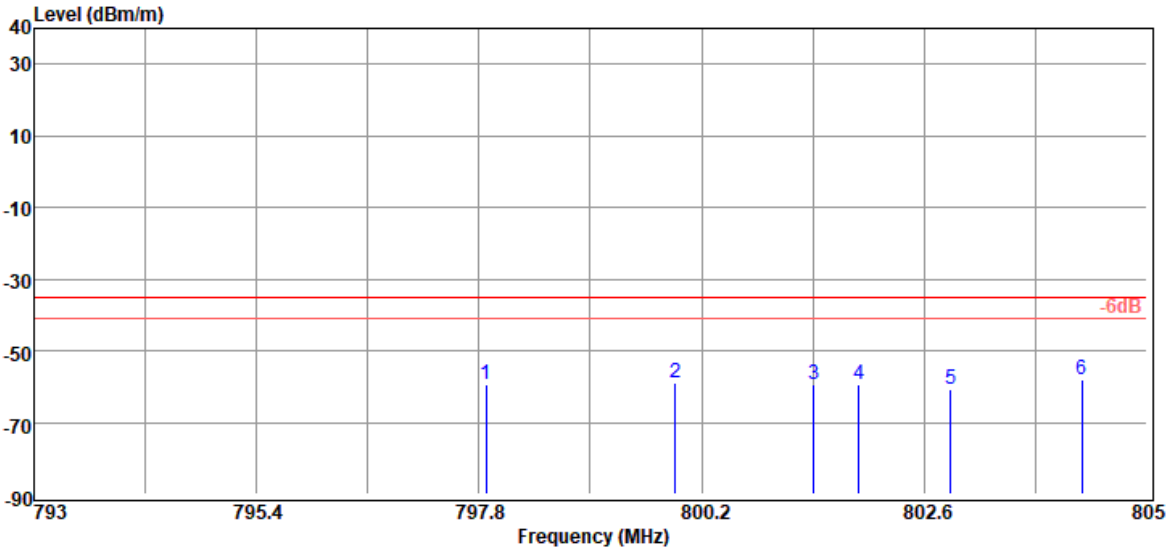
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:786.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
797.87	-59.27	-53.32	-1.64	-4.31	-35.00	-24.27
799.91	-58.88	-53.08	-1.58	-4.22	-35.00	-23.88
801.41	-59.33	-53.55	-1.56	-4.22	-35.00	-24.33
801.89	-59.40	-53.62	-1.56	-4.22	-35.00	-24.40
802.89	-60.76	-54.99	-1.55	-4.22	-35.00	-25.76
804.30	-58.00	-52.25	-1.53	-4.22	-35.00	-23.00

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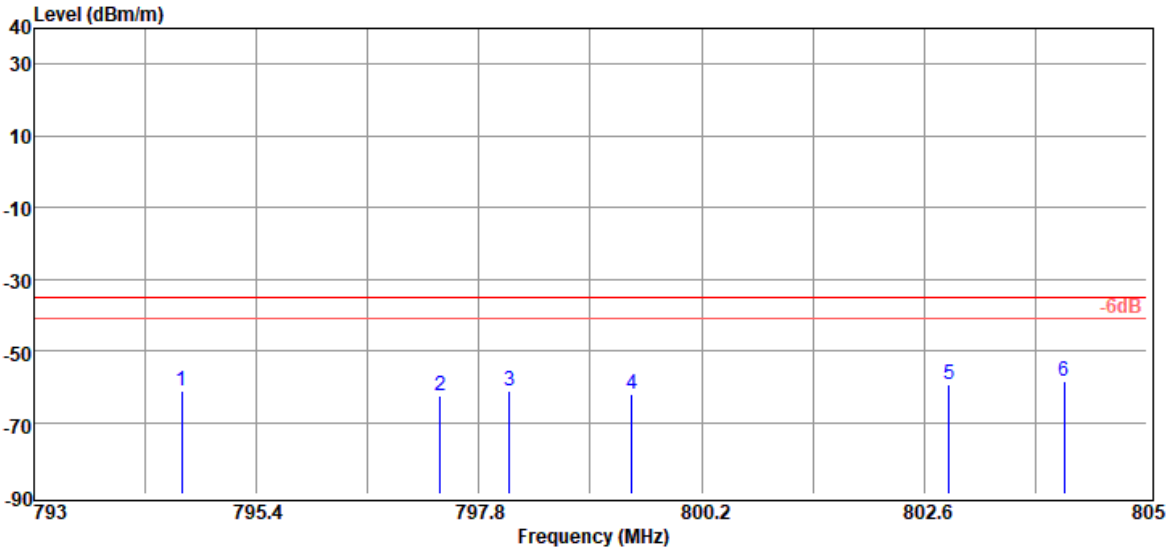
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B13	Temp./Humi.	:21.1/67
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:786.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
794.60	-61.05	-54.87	-1.73	-4.45	-35.00	-26.05
797.38	-62.49	-56.50	-1.66	-4.33	-35.00	-27.49
798.12	-61.21	-55.27	-1.64	-4.30	-35.00	-26.21
799.44	-62.24	-56.40	-1.60	-4.24	-35.00	-27.24
802.86	-59.60	-53.83	-1.55	-4.22	-35.00	-24.60
804.11	-58.53	-52.78	-1.53	-4.22	-35.00	-23.53

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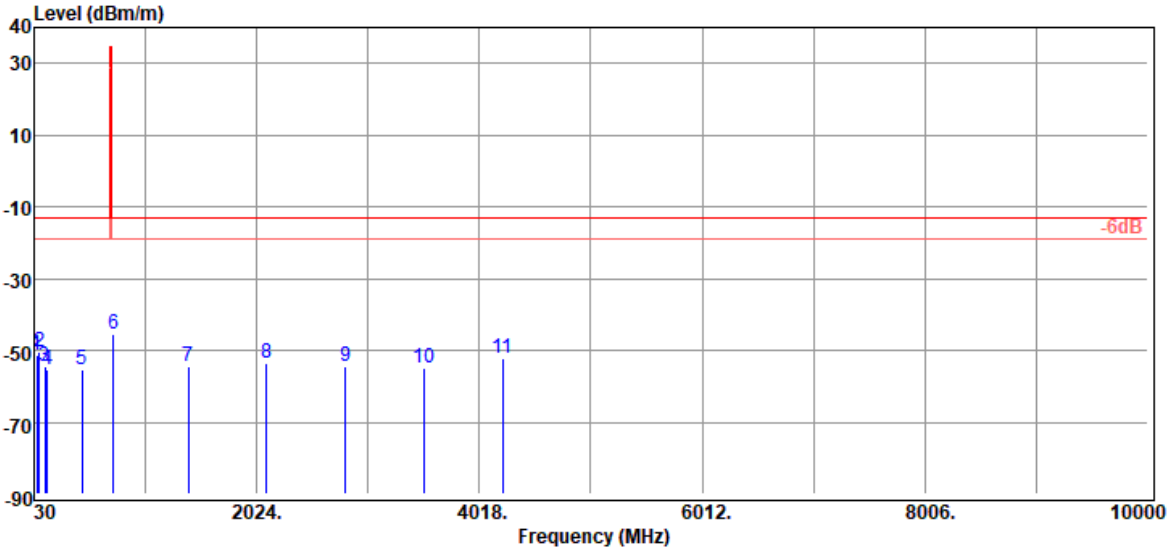
NB IOT Band 17

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B17	Temp./Humi.	:19.4/71
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:704.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
56.19	-51.46	-34.26	-16.25	-0.95	-13.00	-38.46
76.56	-50.38	-39.79	-9.49	-1.10	-13.00	-37.38
127.97	-54.34	-45.52	-7.20	-1.62	-13.00	-41.34
150.28	-55.32	-46.24	-7.40	-1.68	-13.00	-42.32
457.77	-55.24	-50.63	-1.32	-3.29	-13.00	-42.24
743.92	-45.66	-39.88	-1.59	-4.19	-13.00	-32.66
1408.40	-54.54	-55.07	7.07	-6.54	-13.00	-41.54
2112.60	-53.67	-54.65	9.58	-8.60	-13.00	-40.67
2816.80	-54.39	-55.57	10.90	-9.72	-13.00	-41.39
3521.00	-55.02	-56.42	12.30	-10.90	-13.00	-42.02
4225.20	-52.30	-54.15	12.70	-10.85	-13.00	-39.30

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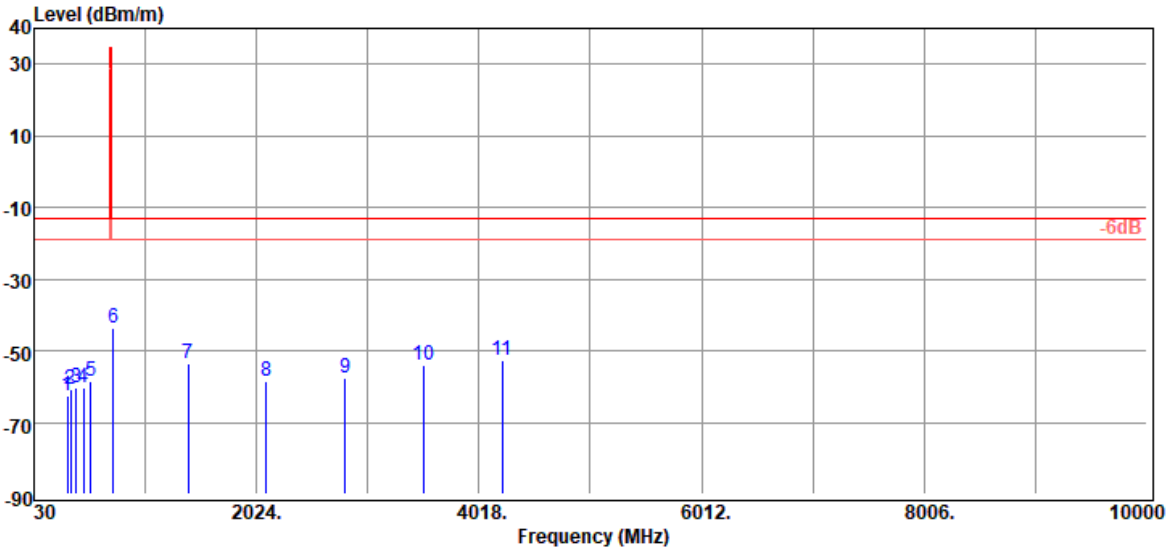
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B17	Temp./Humi.	:19.4/69
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:704.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
327.79	-62.44	-58.19	-1.58	-2.67	-13.00	-49.44
355.92	-60.64	-56.71	-1.35	-2.58	-13.00	-47.64
407.33	-60.48	-55.87	-1.39	-3.22	-13.00	-47.48
471.35	-60.35	-55.94	-1.30	-3.11	-13.00	-47.35
541.19	-58.56	-54.03	-1.22	-3.31	-13.00	-45.56
741.98	-43.72	-37.95	-1.58	-4.19	-13.00	-30.72
1408.40	-53.54	-54.07	7.07	-6.54	-13.00	-40.54
2112.60	-58.65	-59.61	9.57	-8.61	-13.00	-45.65
2816.80	-57.42	-58.60	10.90	-9.72	-13.00	-44.42
3521.00	-53.94	-55.34	12.30	-10.90	-13.00	-40.94
4225.20	-52.65	-54.51	12.70	-10.84	-13.00	-39.65

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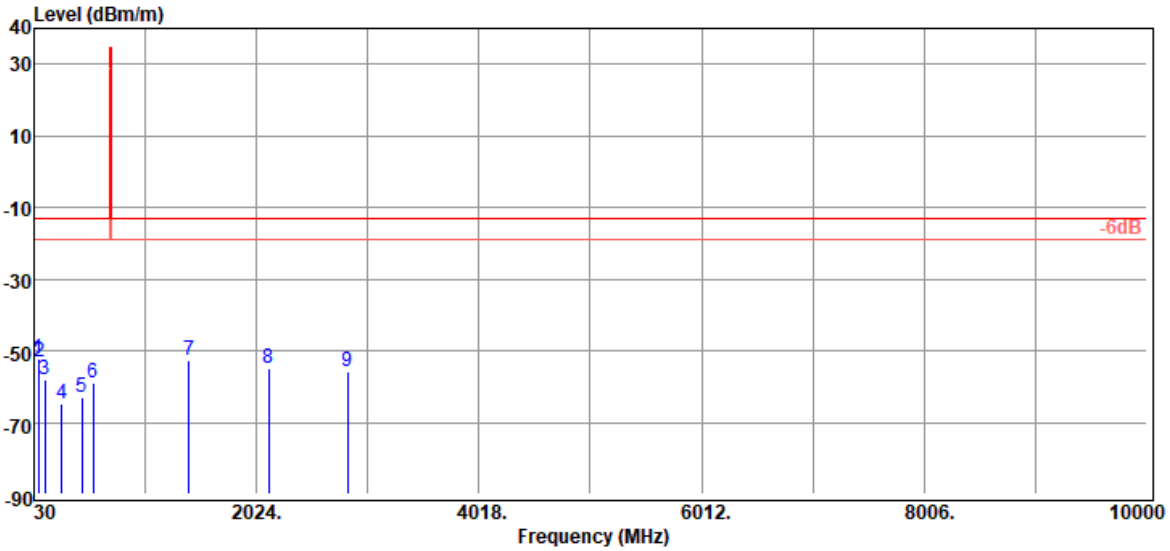
Report Number	:E2/2019/A0028	Test Date	:2019-12-04
Operation Mode	:NB IOT B17	Temp./Humi.	:23.2/42
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:710 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
69.77	-52.44	-39.33	-12.11	-1.00	-13.00	-39.44
77.53	-53.31	-43.04	-9.15	-1.12	-13.00	-40.31
127.00	-57.85	-49.09	-7.16	-1.60	-13.00	-44.85
277.35	-64.99	-60.95	-1.67	-2.37	-13.00	-51.99
458.74	-62.84	-58.19	-1.31	-3.34	-13.00	-49.84
561.56	-59.09	-54.35	-1.29	-3.45	-13.00	-46.09
1420.00	-52.77	-53.37	7.16	-6.56	-13.00	-39.77
2130.00	-54.96	-55.72	9.40	-8.64	-13.00	-41.96
2840.00	-55.75	-56.89	10.90	-9.76	-13.00	-42.75

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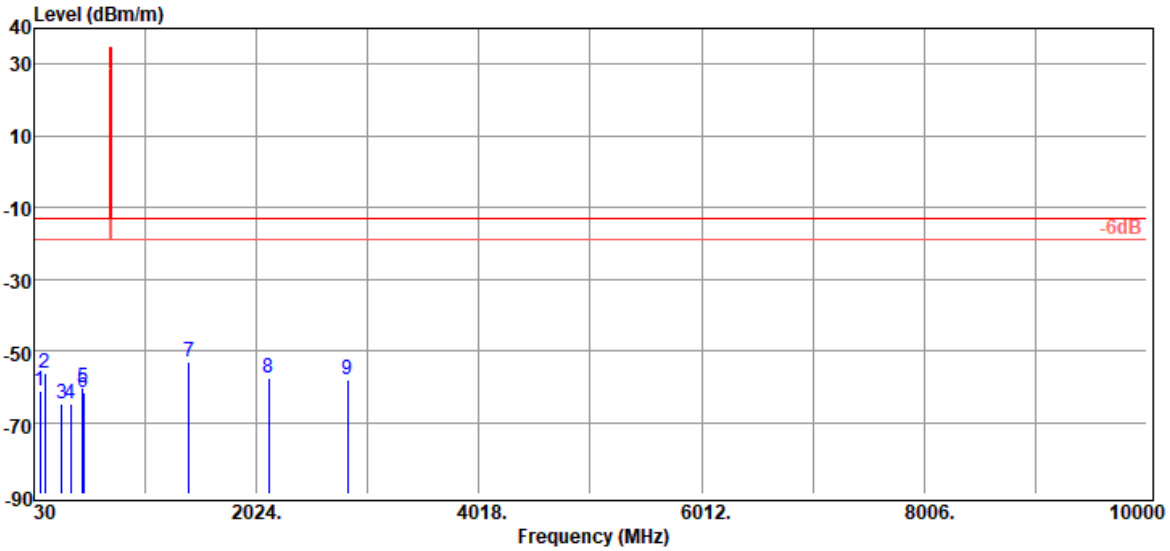
Report Number	:E2/2019/A0028	Test Date	:2019-12-04
Operation Mode	:NB IOT B17	Temp./Humi.	:23.2/42
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:710 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
87.23	-61.39	-53.80	-6.43	-1.16	-13.00	-48.39
126.03	-56.06	-47.35	-7.13	-1.58	-13.00	-43.06
279.29	-64.90	-60.81	-1.69	-2.40	-13.00	-51.90
357.86	-65.03	-61.07	-1.38	-2.58	-13.00	-52.03
463.59	-60.21	-55.62	-1.29	-3.30	-13.00	-47.21
472.32	-61.83	-57.42	-1.30	-3.11	-13.00	-48.83
1420.00	-53.22	-53.82	7.16	-6.56	-13.00	-40.22
2130.00	-57.76	-58.52	9.40	-8.64	-13.00	-44.76
2840.00	-57.87	-59.01	10.90	-9.76	-13.00	-44.87

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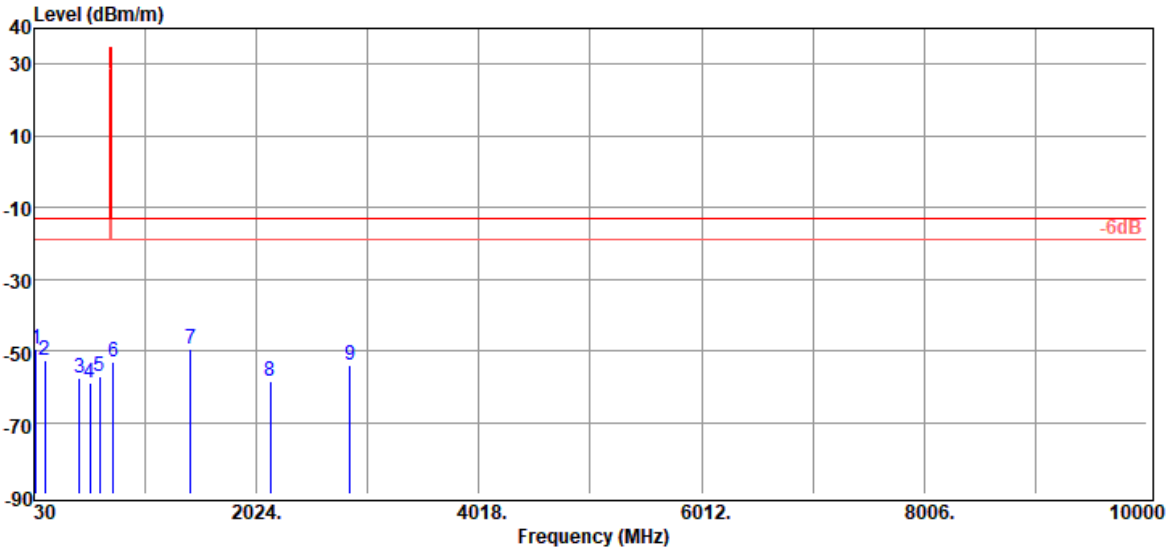
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B17	Temp./Humi.	:19.4/70
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:715.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
50.37	-49.56	-31.19	-17.50	-0.87	-13.00	-36.56
126.03	-52.72	-44.01	-7.13	-1.58	-13.00	-39.72
437.40	-57.62	-53.28	-1.37	-2.97	-13.00	-44.62
533.43	-59.04	-54.60	-1.20	-3.24	-13.00	-46.04
616.85	-57.15	-51.82	-1.63	-3.70	-13.00	-44.15
743.92	-52.99	-47.21	-1.59	-4.19	-13.00	-39.99
1431.60	-49.42	-50.09	7.25	-6.58	-13.00	-36.42
2147.40	-58.37	-58.93	9.23	-8.67	-13.00	-45.37
2863.20	-54.12	-55.26	10.93	-9.79	-13.00	-41.12

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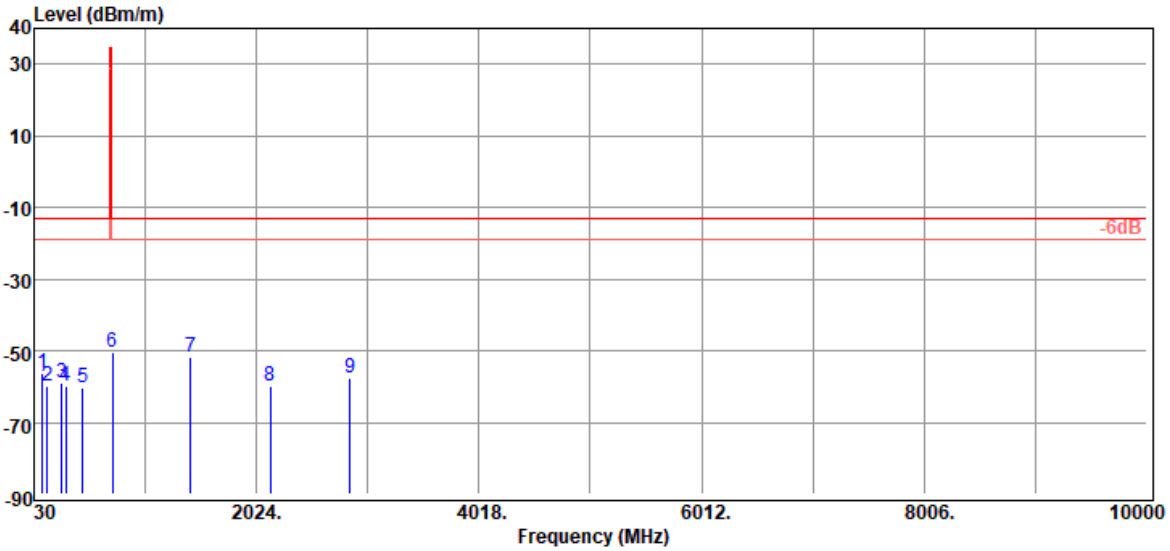
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B17	Temp./Humi.	:19.4/70
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:715.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
104.69	-56.37	-48.20	-6.78	-1.39	-13.00	-43.37
145.43	-59.74	-50.44	-7.63	-1.67	-13.00	-46.74
281.23	-59.07	-54.96	-1.69	-2.42	-13.00	-46.07
315.18	-60.04	-55.82	-1.47	-2.75	-13.00	-47.04
463.59	-60.44	-55.85	-1.29	-3.30	-13.00	-47.44
734.22	-50.48	-44.80	-1.42	-4.26	-13.00	-37.48
1431.60	-51.99	-52.66	7.25	-6.58	-13.00	-38.99
2147.40	-60.08	-60.64	9.23	-8.67	-13.00	-47.08
2863.20	-57.57	-58.71	10.93	-9.79	-13.00	-44.57

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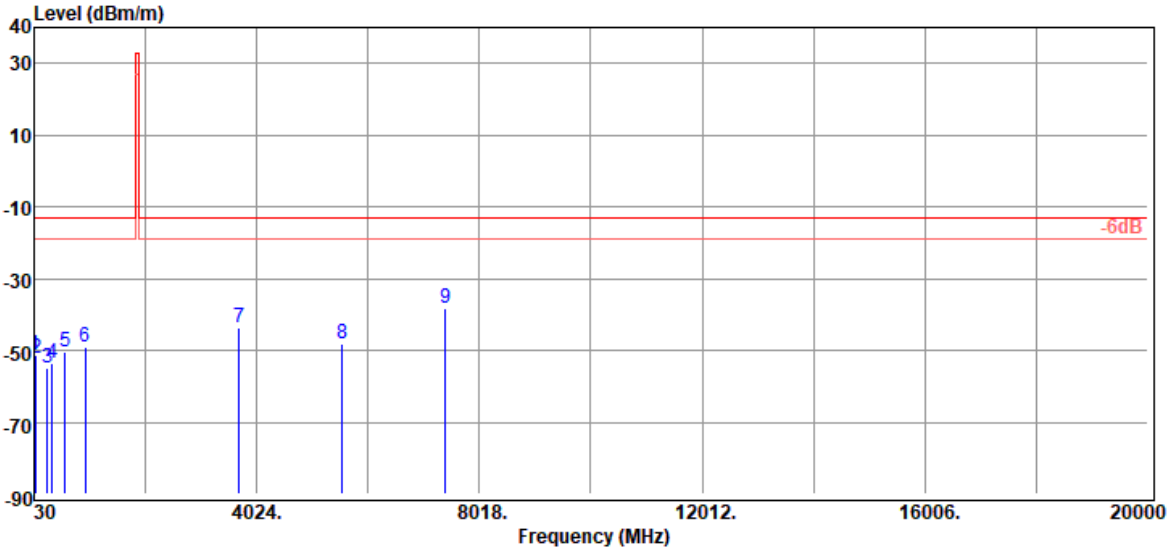
NB IOT Band 25

Report Number	:E2/2019/A0028	Test Date	:2020-02-06
Operation Mode	:NB IOT B25	Temp./Humi.	:21.8/64
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1850.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
47.46	-51.09	-32.16	-18.07	-0.86	-13.00	-38.09
67.83	-52.37	-38.54	-12.83	-1.00	-13.00	-39.37
265.71	-54.90	-51.05	-1.58	-2.27	-13.00	-41.90
360.77	-53.44	-49.41	-1.42	-2.61	-13.00	-40.44
579.99	-50.48	-45.26	-1.47	-3.75	-13.00	-37.48
952.47	-49.09	-42.51	-1.67	-4.91	-13.00	-36.09
3700.40	-43.75	-44.72	12.30	-11.33	-13.00	-30.75
5550.60	-48.18	-50.09	13.30	-11.39	-13.00	-35.18
7400.80	-38.43	-36.86	11.20	-12.77	-13.00	-25.43

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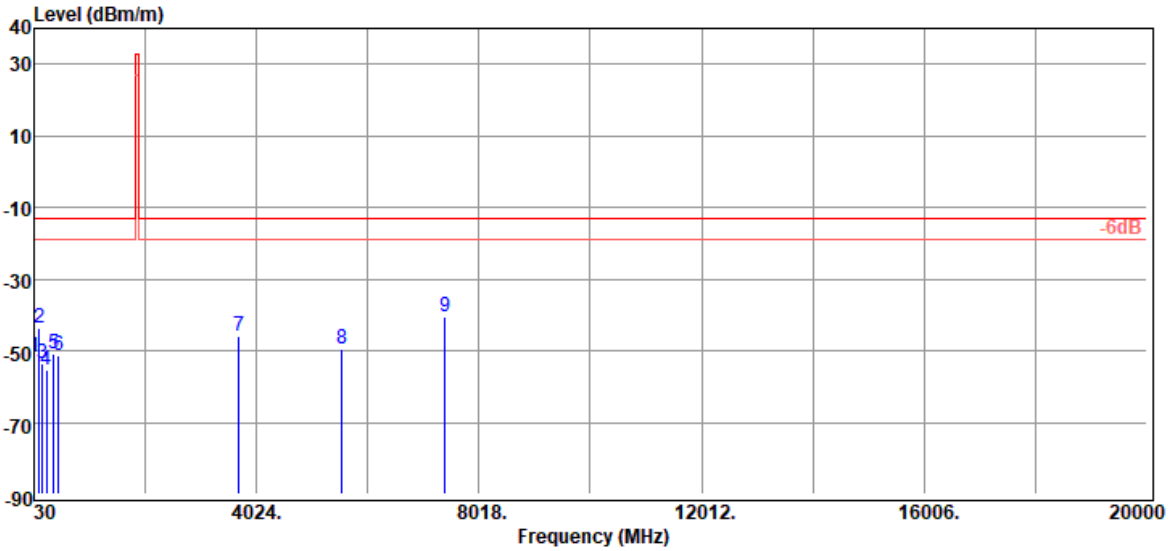
Report Number	:E2/2019/A0028	Test Date	:2020-02-06
Operation Mode	:NB IOT B25	Temp./Humi.	:21.8/64
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1850.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
38.73	-51.71	-31.63	-19.25	-0.83	-13.00	-38.71
123.12	-43.46	-34.90	-7.04	-1.52	-13.00	-30.46
175.50	-53.47	-46.47	-5.26	-1.74	-13.00	-40.47
254.07	-55.31	-51.54	-1.52	-2.25	-13.00	-42.31
385.99	-50.92	-46.55	-1.53	-2.84	-13.00	-37.92
468.44	-51.19	-46.73	-1.30	-3.16	-13.00	-38.19
3700.40	-45.75	-46.72	12.30	-11.33	-13.00	-32.75
5550.60	-49.41	-51.32	13.30	-11.39	-13.00	-36.41
7400.80	-40.37	-38.80	11.20	-12.77	-13.00	-27.37

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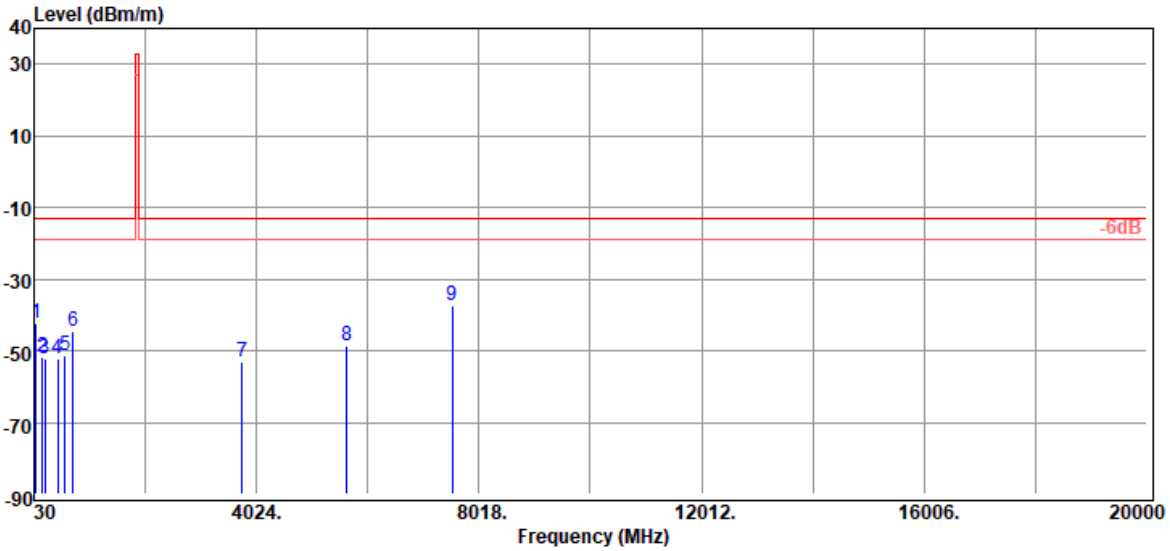
Report Number	:E2/2019/A0028	Test Date	:2020-02-06
Operation Mode	:NB IOT B25	Temp./Humi.	:21.7/64
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1882.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-42.47	-29.02	-12.45	-1.00	-13.00	-29.47
176.47	-51.73	-44.93	-5.06	-1.74	-13.00	-38.73
219.15	-52.04	-48.55	-1.31	-2.18	-13.00	-39.04
458.74	-52.40	-47.75	-1.31	-3.34	-13.00	-39.40
592.60	-51.16	-45.86	-1.49	-3.81	-13.00	-38.16
735.19	-44.58	-38.91	-1.42	-4.25	-13.00	-31.58
3765.00	-53.33	-54.70	12.43	-11.06	-13.00	-40.33
5647.50	-48.57	-50.48	13.50	-11.59	-13.00	-35.57
7530.00	-37.20	-35.75	11.42	-12.87	-13.00	-24.20

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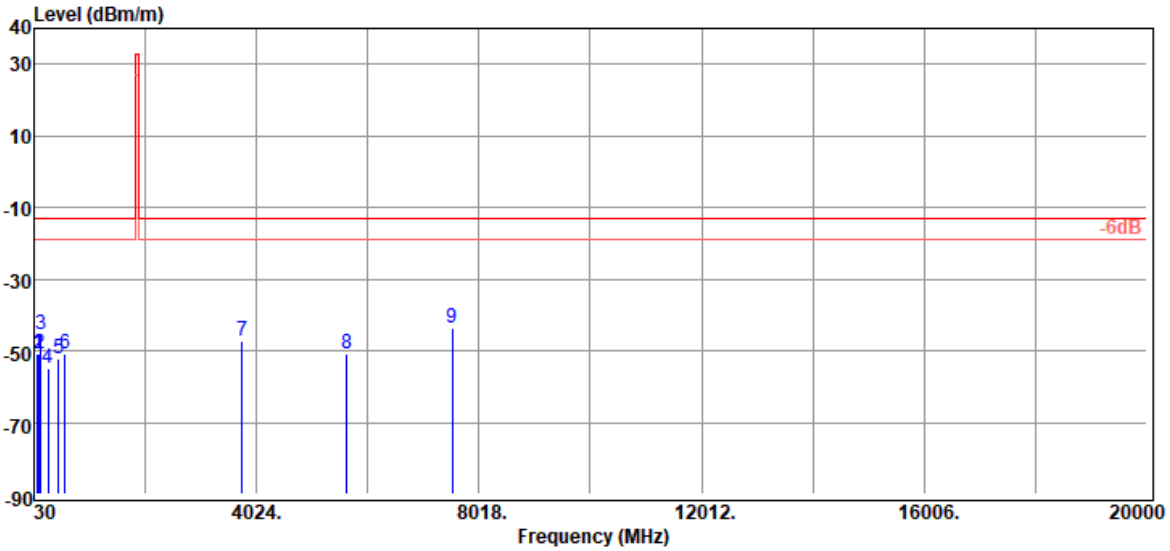
Report Number	:E2/2019/A0028	Test Date	:2020-02-06
Operation Mode	:NB IOT B25	Temp./Humi.	:21.7/64
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1882.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
97.90	-50.89	-43.59	-6.01	-1.29	-13.00	-37.89
122.15	-50.83	-42.32	-7.01	-1.50	-13.00	-37.83
157.07	-45.37	-36.67	-7.02	-1.68	-13.00	-32.37
280.26	-54.79	-50.68	-1.70	-2.41	-13.00	-41.79
471.35	-52.20	-47.79	-1.30	-3.11	-13.00	-39.20
583.87	-50.71	-45.54	-1.42	-3.75	-13.00	-37.71
3765.00	-47.18	-48.55	12.43	-11.06	-13.00	-34.18
5647.50	-51.04	-52.95	13.50	-11.59	-13.00	-38.04
7530.00	-43.61	-42.16	11.42	-12.87	-13.00	-30.61

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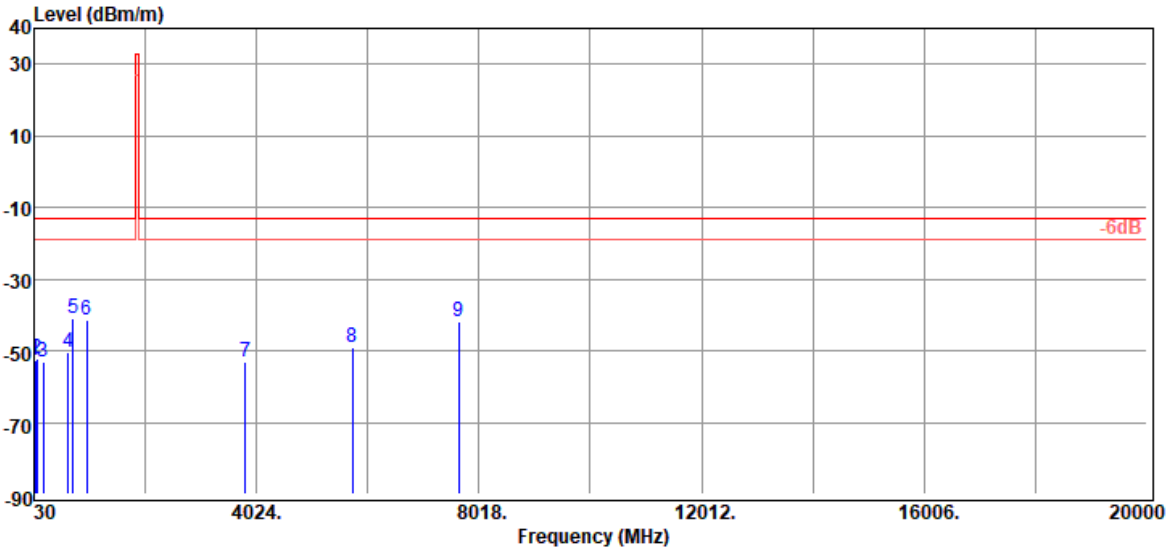
Report Number	:E2/2019/A0028	Test Date	:2020-02-06
Operation Mode	:NB IOT B25	Temp./Humi.	:21.7/64
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1914.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
49.40	-52.74	-34.15	-17.73	-0.86	-13.00	-39.74
87.23	-52.26	-44.67	-6.43	-1.16	-13.00	-39.26
191.99	-52.90	-48.22	-2.77	-1.91	-13.00	-39.90
639.16	-50.25	-44.75	-1.43	-4.07	-13.00	-37.25
734.22	-41.19	-35.51	-1.42	-4.26	-13.00	-28.19
976.72	-41.37	-34.80	-1.55	-5.02	-13.00	-28.37
3829.60	-53.26	-54.91	12.50	-10.85	-13.00	-40.26
5744.40	-48.91	-50.53	13.31	-11.69	-13.00	-35.91
7659.20	-41.79	-40.39	11.70	-13.10	-13.00	-28.79

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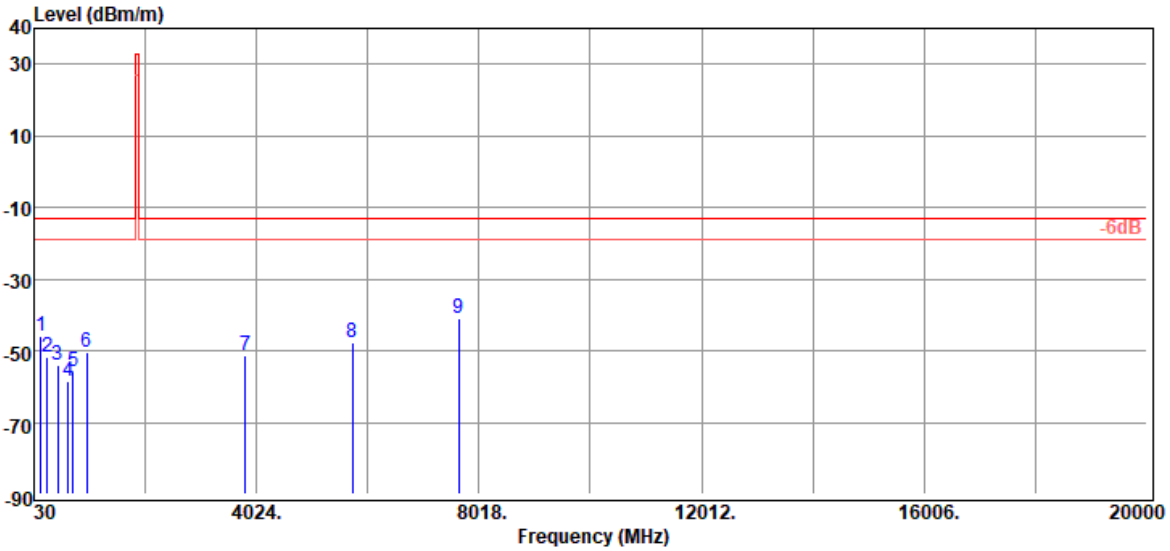
Report Number	:E2/2019/A0028	Test Date	:2020-02-06
Operation Mode	:NB IOT B25	Temp./Humi.	:21.7/64
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:1914.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
154.16	-45.94	-37.06	-7.20	-1.68	-13.00	-32.94
274.44	-51.65	-47.67	-1.65	-2.33	-13.00	-38.65
461.65	-53.91	-49.28	-1.28	-3.35	-13.00	-40.91
643.04	-58.63	-53.23	-1.38	-4.02	-13.00	-45.63
734.22	-55.81	-50.13	-1.42	-4.26	-13.00	-42.81
970.90	-50.56	-43.67	-1.67	-5.22	-13.00	-37.56
3829.60	-51.36	-52.95	12.50	-10.91	-13.00	-38.36
5744.40	-47.69	-49.31	13.31	-11.69	-13.00	-34.69
7659.20	-40.97	-39.57	11.70	-13.10	-13.00	-27.97

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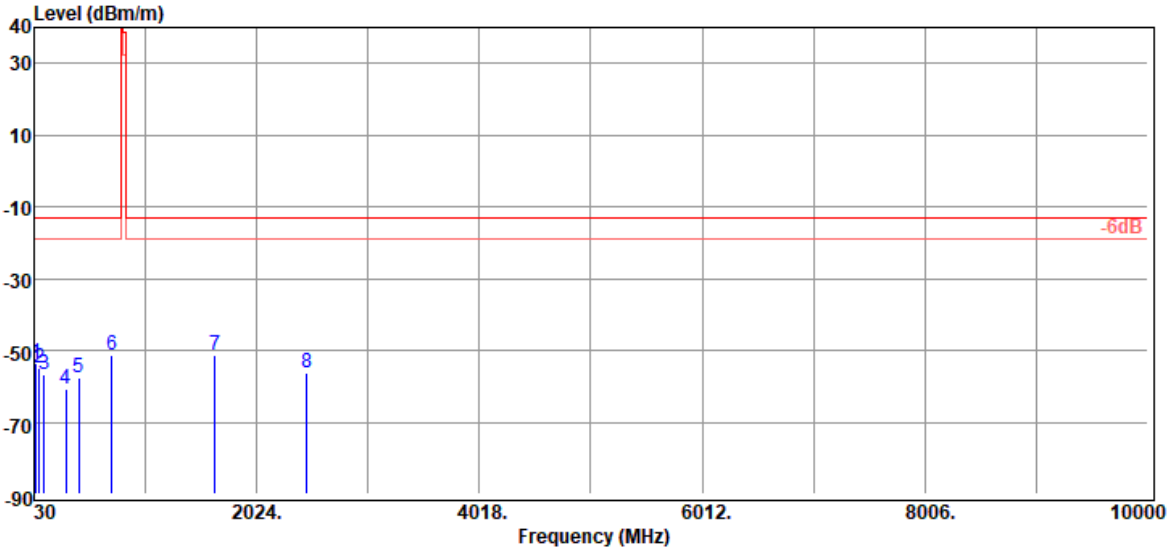
NB IOT Band 26

Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B26	Temp./Humi.	:19.4/69
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:824.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
49.40	-53.74	-35.15	-17.73	-0.86	-13.00	-40.74
76.56	-55.13	-44.54	-9.49	-1.10	-13.00	-42.13
122.15	-56.55	-48.04	-7.01	-1.50	-13.00	-43.55
316.15	-60.84	-56.63	-1.46	-2.75	-13.00	-47.84
430.61	-57.52	-52.94	-1.46	-3.12	-13.00	-44.52
729.37	-51.28	-45.54	-1.46	-4.28	-13.00	-38.28
1648.40	-51.21	-52.98	9.29	-7.52	-13.00	-38.21
2472.60	-56.29	-57.84	10.55	-9.00	-13.00	-43.29

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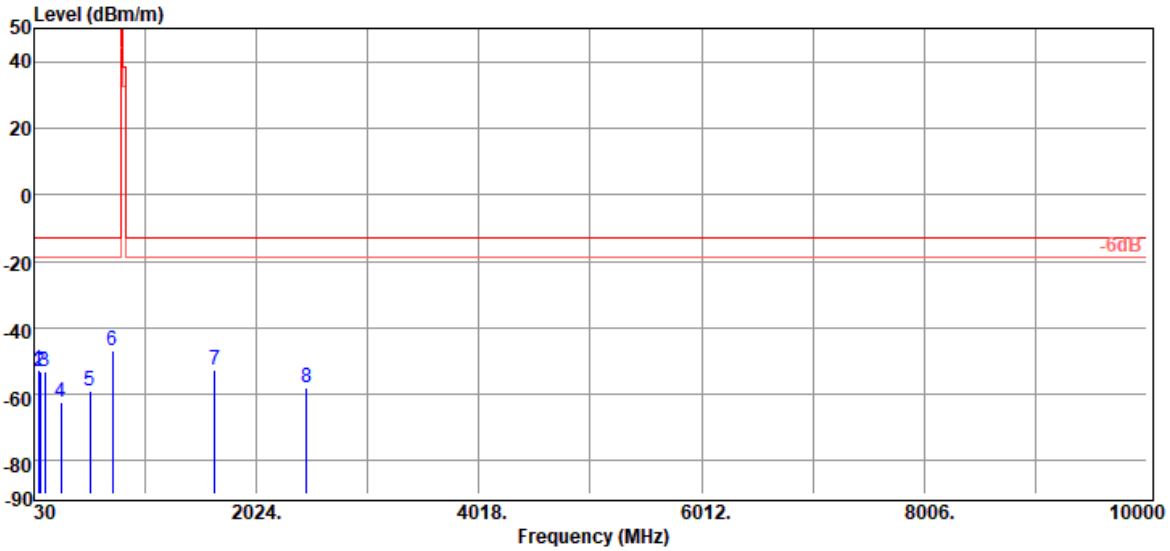
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B26	Temp./Humi.	:19.4/69
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:824.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-52.91	-39.46	-12.45	-1.00	-13.00	-39.91
86.26	-52.95	-45.12	-6.67	-1.16	-13.00	-39.95
127.97	-53.22	-44.40	-7.20	-1.62	-13.00	-40.22
274.44	-62.37	-58.39	-1.65	-2.33	-13.00	-49.37
528.58	-59.13	-54.56	-1.28	-3.29	-13.00	-46.13
732.28	-46.92	-41.20	-1.44	-4.28	-13.00	-33.92
1648.40	-52.54	-54.31	9.29	-7.52	-13.00	-39.54
2472.60	-57.98	-59.53	10.55	-9.00	-13.00	-44.98

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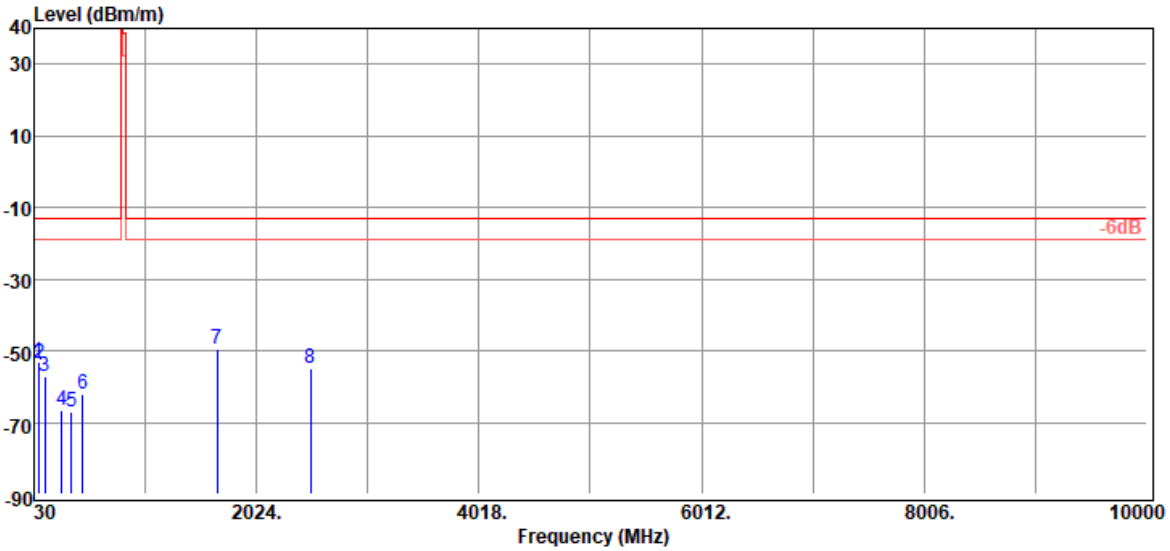
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT B26	Temp./Humi.	:21.4/53
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:836.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
71.71	-53.31	-40.90	-11.38	-1.03	-13.00	-40.31
80.44	-53.57	-44.17	-8.24	-1.16	-13.00	-40.57
127.97	-57.05	-48.23	-7.20	-1.62	-13.00	-44.05
277.35	-66.69	-62.65	-1.67	-2.37	-13.00	-53.69
366.59	-66.88	-62.59	-1.49	-2.80	-13.00	-53.88
466.50	-61.95	-57.45	-1.29	-3.21	-13.00	-48.95
1673.00	-49.64	-51.49	9.53	-7.68	-13.00	-36.64
2509.50	-55.00	-56.57	10.61	-9.04	-13.00	-42.00

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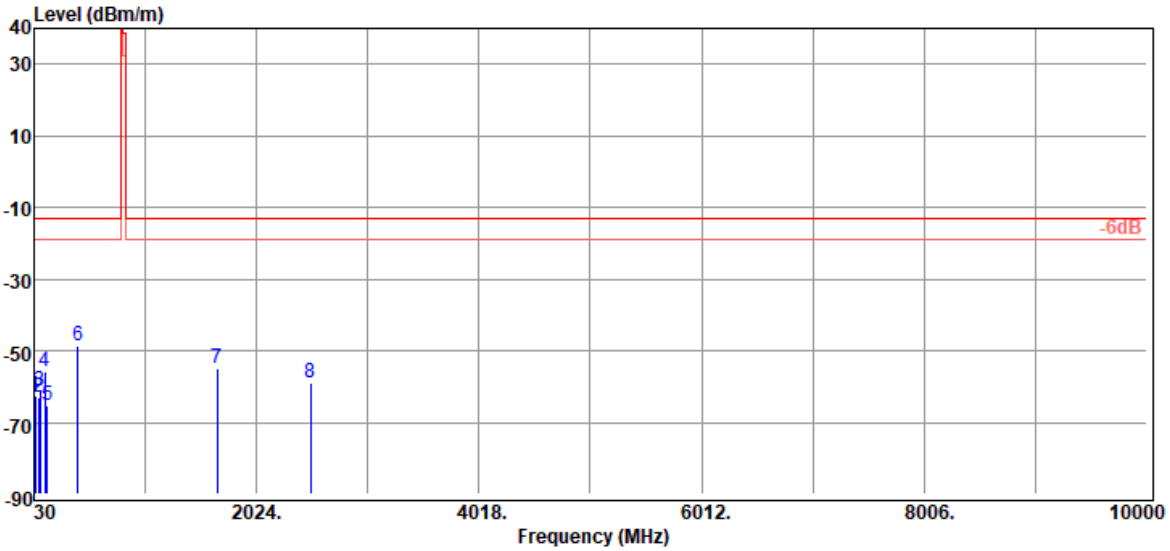
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT B26	Temp./Humi.	:21.4/53
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:836.5 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
38.73	-62.67	-42.59	-19.25	-0.83	-13.00	-49.67
68.80	-62.96	-49.51	-12.45	-1.00	-13.00	-49.96
86.26	-61.38	-53.55	-6.67	-1.16	-13.00	-48.38
128.94	-55.70	-46.83	-7.23	-1.64	-13.00	-42.70
150.28	-65.11	-56.03	-7.40	-1.68	-13.00	-52.11
424.79	-48.60	-44.10	-1.37	-3.13	-13.00	-35.60
1673.00	-54.78	-56.63	9.53	-7.68	-13.00	-41.78
2509.50	-59.04	-60.61	10.62	-9.05	-13.00	-46.04

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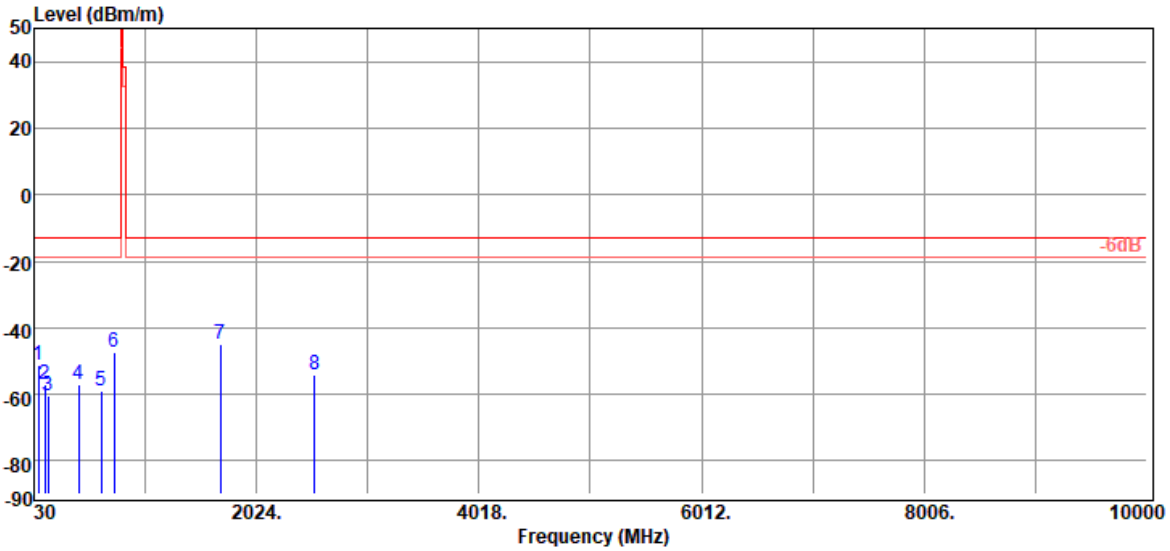
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B26	Temp./Humi.	:19.4/70
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:848.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
69.77	-51.43	-38.32	-12.11	-1.00	-13.00	-38.43
128.94	-56.88	-48.01	-7.23	-1.64	-13.00	-43.88
159.01	-60.28	-51.59	-7.01	-1.68	-13.00	-47.28
431.58	-57.23	-52.69	-1.44	-3.10	-13.00	-44.23
634.31	-58.78	-53.48	-1.49	-3.81	-13.00	-45.78
746.83	-47.21	-41.41	-1.61	-4.19	-13.00	-34.21
1697.60	-44.93	-46.88	9.78	-7.83	-13.00	-31.93
2546.40	-54.15	-55.75	10.69	-9.09	-13.00	-41.15

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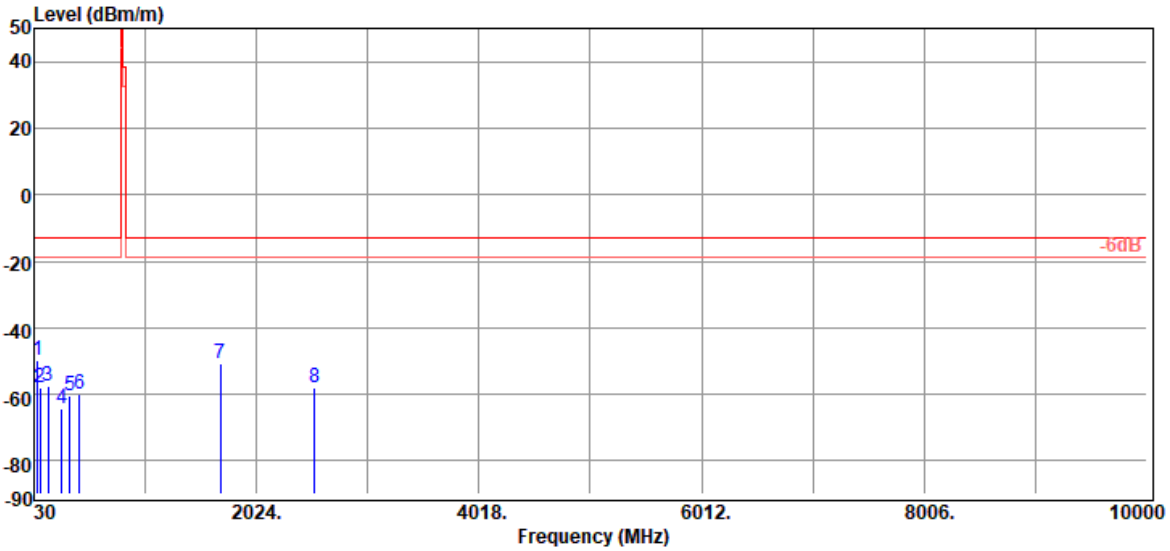
Report Number	:E2/2019/A0028	Test Date	:2020-01-16
Operation Mode	:NB IOT B26	Temp./Humi.	:19.4/71
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:848.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
64.92	-49.61	-34.90	-13.71	-1.00	-13.00	-36.61
86.26	-57.97	-50.14	-6.67	-1.16	-13.00	-44.97
154.16	-57.39	-48.51	-7.20	-1.68	-13.00	-44.39
280.26	-64.10	-59.99	-1.70	-2.41	-13.00	-51.10
353.01	-60.21	-56.28	-1.35	-2.58	-13.00	-47.21
434.49	-60.09	-55.67	-1.38	-3.04	-13.00	-47.09
1697.60	-50.81	-52.76	9.78	-7.83	-13.00	-37.81
2546.40	-57.84	-59.44	10.69	-9.09	-13.00	-44.84

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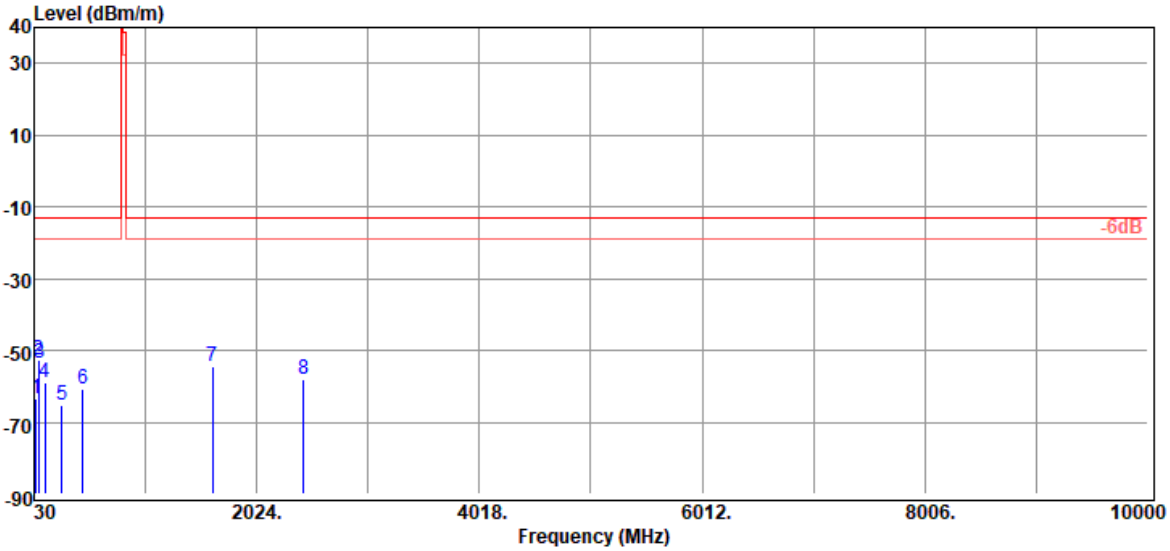
NB IOT Band 26 (Part 90s)

Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT Part90 B26	Temp./Humi.	:21.4/54
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:814.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
48.43	-63.59	-44.84	-17.89	-0.86	-13.00	-50.59
70.74	-52.69	-39.96	-11.72	-1.01	-13.00	-39.69
78.50	-53.41	-43.43	-8.84	-1.14	-13.00	-40.41
127.97	-59.06	-50.24	-7.20	-1.62	-13.00	-46.06
282.20	-65.38	-61.28	-1.67	-2.43	-13.00	-52.38
463.59	-60.83	-56.24	-1.29	-3.30	-13.00	-47.83
1628.40	-54.36	-56.20	9.18	-7.34	-13.00	-41.36
2442.60	-58.12	-59.62	10.45	-8.95	-13.00	-45.12

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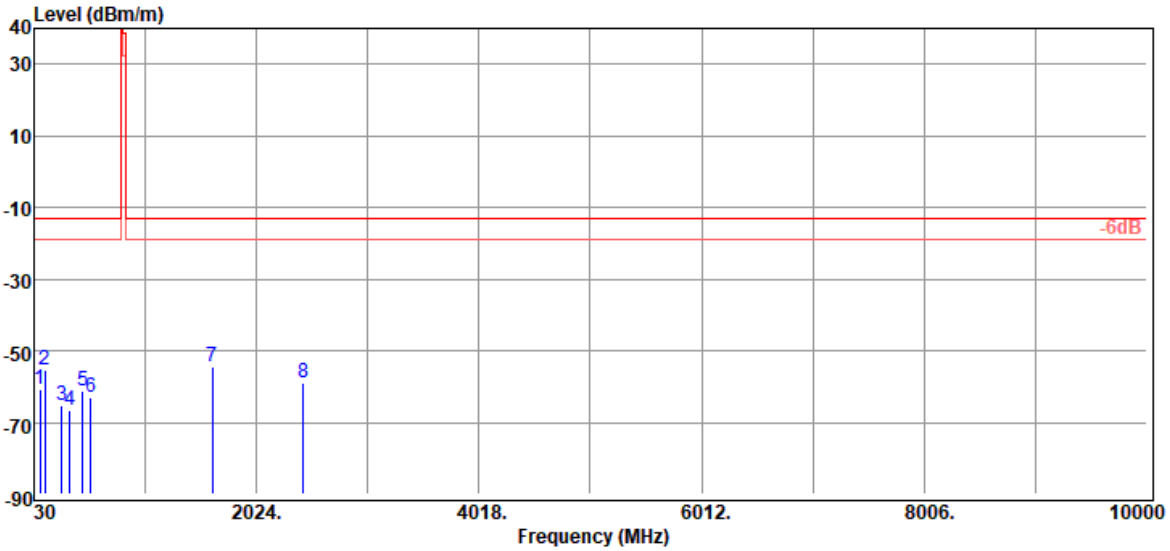
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT Part90 B26	Temp./Humi.	:21.4/54
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:814.2 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
86.26	-60.70	-52.87	-6.67	-1.16	-13.00	-47.70
127.97	-55.51	-46.69	-7.20	-1.62	-13.00	-42.51
280.26	-65.17	-61.06	-1.70	-2.41	-13.00	-52.17
351.07	-66.72	-62.78	-1.36	-2.58	-13.00	-53.72
464.56	-61.15	-56.59	-1.29	-3.27	-13.00	-48.15
535.37	-62.93	-58.52	-1.17	-3.24	-13.00	-49.93
1628.40	-54.68	-56.50	9.21	-7.39	-13.00	-41.68
2442.60	-58.82	-60.32	10.45	-8.95	-13.00	-45.82

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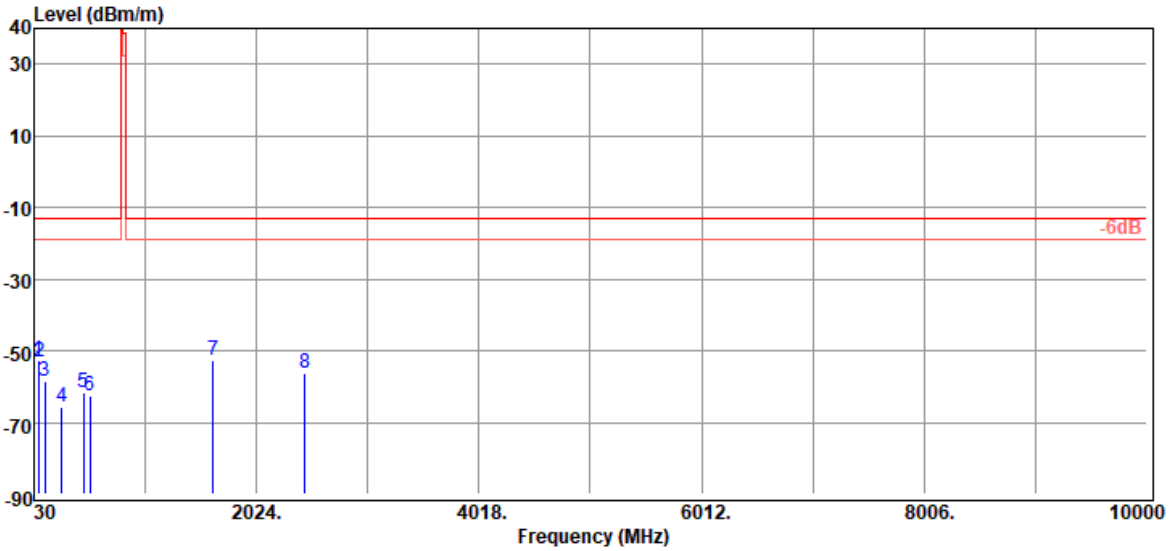
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT Part90 B26	Temp./Humi.	:21.6/56
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:819 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
68.80	-52.79	-39.34	-12.45	-1.00	-13.00	-39.79
77.53	-52.94	-42.67	-9.15	-1.12	-13.00	-39.94
128.94	-58.40	-49.53	-7.23	-1.64	-13.00	-45.40
280.26	-65.77	-61.66	-1.70	-2.41	-13.00	-52.77
477.17	-61.56	-57.18	-1.27	-3.11	-13.00	-48.56
530.52	-62.76	-58.28	-1.24	-3.24	-13.00	-49.76
1638.00	-52.88	-54.68	9.25	-7.45	-13.00	-39.88
2457.00	-56.42	-57.95	10.51	-8.98	-13.00	-43.42

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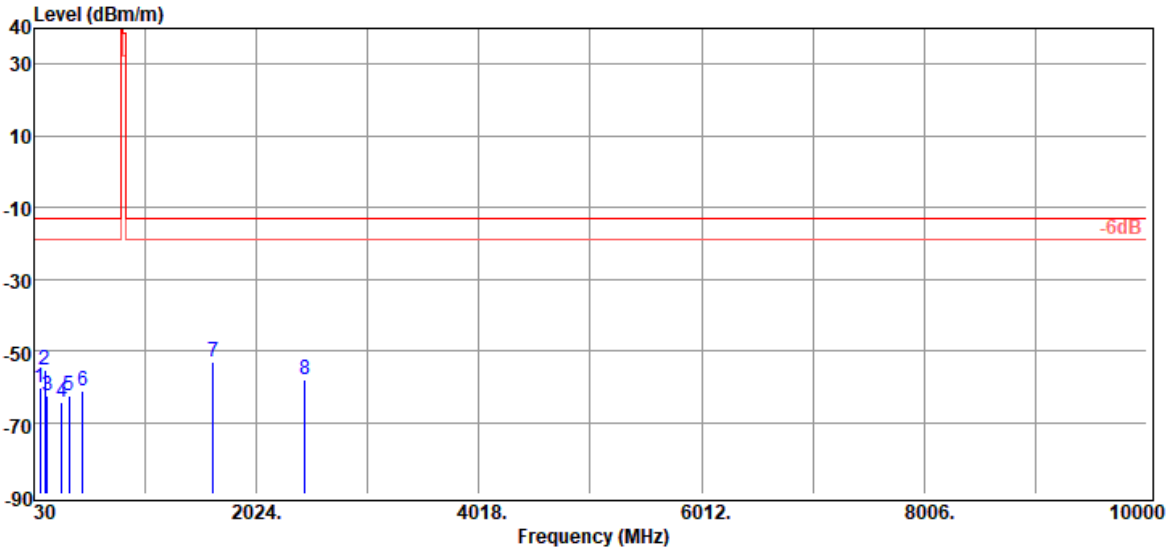
Operation Mode	:NB IOT Part90 B26	Temp./Humi.	:21.6/56
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:819 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
85.29	-60.30	-52.18	-6.96	-1.16	-13.00	-47.30
129.91	-55.17	-46.25	-7.26	-1.66	-13.00	-42.17
152.22	-62.72	-53.75	-7.29	-1.68	-13.00	-49.72
276.38	-64.40	-60.38	-1.66	-2.36	-13.00	-51.40
345.25	-62.60	-58.52	-1.47	-2.61	-13.00	-49.60
468.44	-61.13	-56.67	-1.30	-3.16	-13.00	-48.13
1638.00	-52.90	-54.70	9.25	-7.45	-13.00	-39.90
2457.00	-58.24	-59.77	10.51	-8.98	-13.00	-45.24

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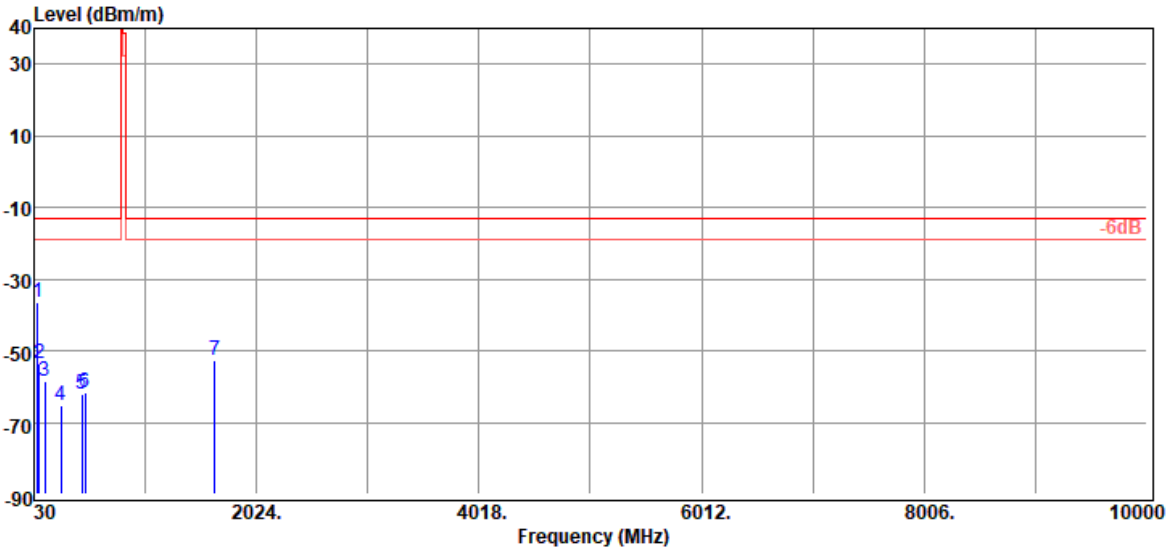
Member of SGS Group

Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT Part90 B26	Temp./Humi.	:21.5/54
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:823.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
64.92	-36.31	-21.60	-13.71	-1.00	-13.00	-23.31
78.50	-53.62	-43.64	-8.84	-1.14	-13.00	-40.62
128.94	-58.68	-49.81	-7.23	-1.64	-13.00	-45.68
272.50	-65.07	-61.13	-1.63	-2.31	-13.00	-52.07
459.71	-62.09	-57.41	-1.29	-3.39	-13.00	-49.09
486.87	-61.77	-57.30	-1.10	-3.37	-13.00	-48.77
1647.60	-52.59	-54.36	9.29	-7.52	-13.00	-39.59

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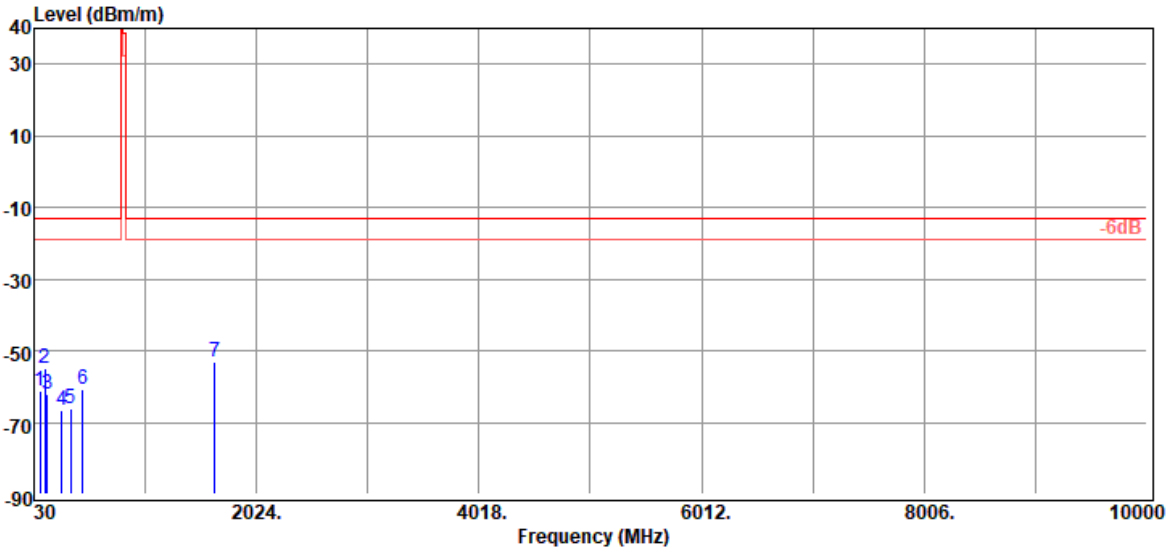
Report Number	:E2/2019/A0028	Test Date	:2019-12-05
Operation Mode	:NB IOT Part90 B26	Temp./Humi.	:21.5/54
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plan	Engineer	:Ashton
Test Channel	:823.8 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
85.29	-61.26	-53.14	-6.96	-1.16	-13.00	-48.26
130.88	-54.80	-45.85	-7.29	-1.66	-13.00	-41.80
151.25	-62.13	-53.10	-7.35	-1.68	-13.00	-49.13
277.35	-66.73	-62.69	-1.67	-2.37	-13.00	-53.73
359.80	-66.33	-62.34	-1.41	-2.58	-13.00	-53.33
463.59	-60.59	-56.00	-1.29	-3.30	-13.00	-47.59
1647.60	-53.17	-54.94	9.29	-7.52	-13.00	-40.17

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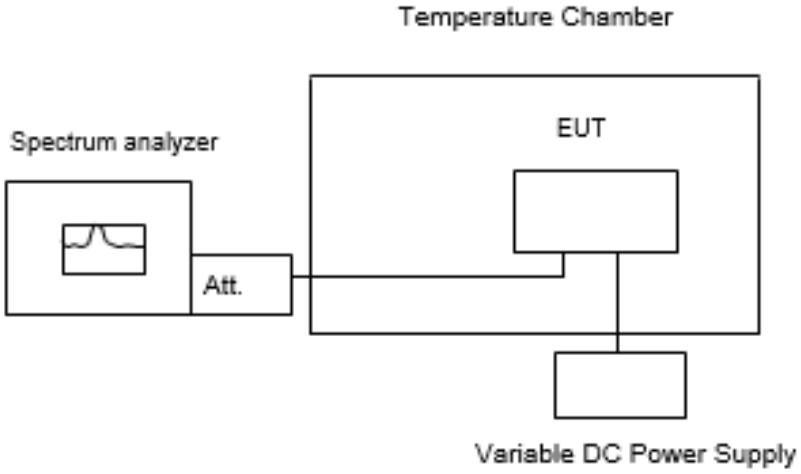
10 FREQUENCY STABILITY MEASUREMENT

10.1 Standard Applicabl

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

10.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

10.3 Measurement Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

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10.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
DC Power Supply	Agilent	E3640A	MY53140006	05/31/2019	05/30/2020
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/09/2019	01/09/2020
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/15/2019	07/14/2020
Splitter	Marvelous	MVE8586	RF265	11/20/2019	11/19/2020
DC Block	PASTERNACK	PE8210	RF256	11/20/2019	11/19/2020
Attenuator	Marvelous	WATT-218FS-10	RF268	11/20/2019	11/19/2020
Coaxial Cables	Woken	00100A1F1A185C	RF220	11/20/2019	11/19/2020
Coaxial Cables	Woken	00100A1F1A185C	RF229	11/20/2019	11/19/2020

Note: The measurement was taken place with the long duration of the time, and additional equipment list as shown blow indicate those equipment of which has been subject to undertake the calibration in intermediate period of time of the measurement.

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8821C	6262044739	12/06/2019	12/05/2020

10.5 Measurement Result

Note: The battery is rated 3.6V dc.

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10.5.1 NB IoT

LTE NB IoT Band 2 1880 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	1879.9999	100	-0.053
3.60	20	1879.99999	10	-0.005
3.11	20	1879.99995	50	-0.027
3.2(End point)	20	1879.99995	50	-0.027
FREQUENCY ERROR vs. Temp.				
3.60	50	1879.99989	110	-0.059
3.60	40	1879.99992	80	-0.043
3.60	30	1879.99994	60	-0.032
3.60	20	1879.99999	10	-0.005
3.60	10	1879.99996	40	-0.021
3.60	0	1880.00001	10	0.005
3.60	-10	1879.99998	20	-0.011
3.60	-20	1880.00003	30	0.016
3.60	-30	1880.00006	60	0.032

LTE NB IoT Band 4 1732.5 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	1732.49992	80	-0.046
3.60	20	1732.49996	40	-0.023
3.11	20	1732.50001	10	0.006
3.2(End point)	20	1732.50001	10	0.006
FREQUENCY ERROR vs. Temp.				
3.60	50	1732.49991	90	-0.052
3.60	40	1732.49994	60	-0.035
3.60	30	1732.49996	40	-0.023
3.60	20	1732.49996	40	-0.023
3.60	10	1732.49998	20	-0.012
3.60	0	1732.50002	20	0.012
3.60	-10	1732.49999	10	-0.006
3.60	-20	1732.50004	40	0.023
3.60	-30	1732.50003	30	0.017

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LTE NB IoT Band 5 836.5 MHz				
Limit: +/- 2.5 ppm				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	836.49989	110	-0.132
3.60	20	836.49993	70	-0.132
3.11	20	836.49996	40	-0.132
3.2(End point)	20	836.49996	40	-0.132
FREQUENCY ERROR vs. Temp.				
3.60	50	836.49991	90	-0.108
3.60	40	836.49988	120	-0.143
3.60	30	836.49994	60	-0.072
3.60	20	836.49993	70	-0.084
3.60	10	836.49997	30	-0.036
3.60	0	836.50002	20	0.024
3.60	-10	836.50006	60	0.072
3.60	-20	836.50001	10	0.012
3.60	-30	836.49998	20	-0.024

LTE NB IoT Band 12 707.5 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	707.49987	130	-0.184
3.60	20	707.49996	40	-0.057
3.11	20	707.49998	20	-0.028
3.2(End point)	20	707.49998	20	-0.028
FREQUENCY ERROR vs. Temp.				
3.60	50	707.49989	110	-0.155
3.60	40	707.49992	80	-0.113
3.60	30	707.49995	50	-0.071
3.60	20	707.49996	40	-0.057
3.60	10	707.49999	10	-0.014
3.60	0	707.50002	20	0.028
3.60	-10	707.50004	40	0.057
3.60	-20	707.49997	30	-0.042
3.60	-30	707.50001	10	0.014

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LTE NB IoT Band 13 782 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	781.9999	100	-0.128
3.60	20	781.99993	70	-0.090
3.11	20	781.99995	50	-0.064
3.2(End point)	20	781.99995	50	-0.064
FREQUENCY ERROR vs. Temp.				
3.60	50	781.99992	80	-0.102
3.60	40	781.99994	60	-0.077
3.60	30	781.99997	30	-0.038
3.60	20	781.99993	70	-0.090
3.60	10	782.00001	10	0.013
3.60	0	782.00004	40	0.051
3.60	-10	781.99998	20	-0.026
3.60	-20	781.99995	50	-0.064
3.60	-30	782.00002	20	0.026

LTE NB IoT Band 17 710 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	709.99988	120	-0.169
3.60	20	709.99992	80	-0.113
3.11	20	709.99995	50	-0.070
3.2(End point)	20	709.99995	50	-0.070
FREQUENCY ERROR vs. Temp.				
3.60	50	709.99990	100	-0.141
3.60	40	709.99993	70	-0.099
3.60	30	709.99996	40	-0.056
3.60	20	709.99992	80	-0.113
3.60	10	709.99999	10	-0.014
3.60	0	710.00002	20	0.028
3.60	-10	710.00004	40	0.056
3.60	-20	710.00001	10	0.014
3.60	-30	709.99997	30	-0.042

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LTE NB IoT Band 25 1882.5 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	1882.49988	120	-0.064
3.60	20	1882.49994	60	-0.032
3.11	20	1882.49997	30	-0.016
3.2(End point)	20	1882.49997	30	-0.016
FREQUENCY ERROR vs. Temp.				
3.60	50	1882.49991	90	-0.048
3.60	40	1882.49995	50	-0.027
3.60	30	1882.49998	20	-0.011
3.60	20	1882.49994	60	-0.032
3.60	10	1882.50001	10	0.005
3.60	0	1882.50005	50	0.027
3.60	-10	1882.50002	20	0.011
3.60	-20	1882.49999	10	-0.005
3.60	-30	1882.50003	30	0.016

LTE NB IoT Band 26 836.5 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	836.49989	110	-0.132
3.60	20	836.49993	70	-0.084
3.11	20	836.49995	50	-0.060
3.2(End point)	20	836.49995	50	-0.060
FREQUENCY ERROR vs. Temp.				
3.60	50	836.49988	120	-0.143
3.60	40	836.49991	90	-0.108
3.60	30	836.49994	60	-0.072
3.60	20	836.49993	70	-0.084
3.60	10	836.49998	20	-0.024
3.60	0	836.50003	30	0.036
3.60	-10	836.50007	70	0.084
3.60	-20	836.50005	50	0.060
3.60	-30	836.49999	10	-0.012

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LTE NB IoT Band 26_Part90 819 MHz				
Limit: within freqeuncy block				
Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Frequency error
FREQUENCY ERROR vs. VOLTAGE				
4.09	20	818.99989	110	-0.134
3.60	20	818.99994	60	-0.073
3.11	20	818.99997	30	-0.037
3.2(End point)	20	818.99997	30	-0.037
FREQUENCY ERROR vs. Temp.				
3.60	50	818.99990	100	-0.122
3.60	40	818.99993	70	-0.085
3.60	30	818.99991	90	-0.110
3.60	20	818.99994	60	-0.073
3.60	10	818.99998	20	-0.024
3.60	0	819.00001	10	0.012
3.60	-10	819.00004	40	0.049
3.60	-20	819.00007	70	0.085
3.60	-30	819.00002	20	0.024

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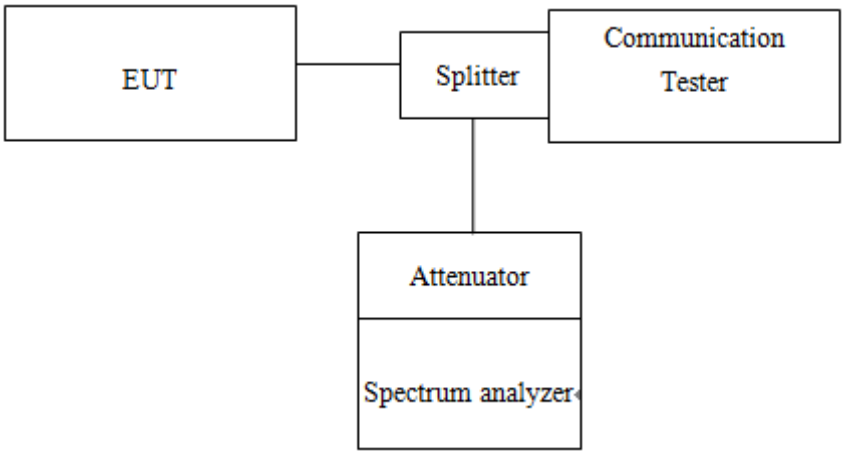
11 PEAK TO AVERAGE RATIO

11.1 Standard Applicable

The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

11.2 Test SET-UP



11.3 Measurement Procedure

1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth; & internal =1ms
3. Set the number of counts to a value that stabilizes the measured CCDF curve.

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11.4 Measurement Equipment Used

Conducted Emission (measured at antenna port) Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
DC Power Supply	Agilent	E3640A	MY53140006	05/31/2019	05/30/2020
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/09/2019	01/09/2020
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/15/2019	07/14/2020
Splitter	Marvelous	MVE8586	RF265	11/20/2019	11/19/2020
DC Block	PASTERNACK	PE8210	RF256	11/20/2019	11/19/2020
Attenuator	Marvelous	WATT-218FS-10	RF268	11/20/2019	11/19/2020
Coaxial Cables	Woken	00100A1F1A185C	RF220	11/20/2019	11/19/2020
Coaxial Cables	Woken	00100A1F1A185C	RF229	11/20/2019	11/19/2020

Note: The measurement was taken place with the long duration of the time, and additional equipment list as shown blow indicate those equipment of which has been subject to undertake the calibration in intermediate period of time of the measurement.

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8821C	6262044739	12/06/2019	12/05/2020

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11.5 Measurement Result

11.5.1 NB IoT

LTE NB-IoT Band 2					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
18602	1850.2	BPSK	15	1@0	8.21
		QPSK	15	12@0	8.52
18900	1880	BPSK	15	1@0	8.21
		QPSK	15	12@0	8.19
19198	1909.8	BPSK	15	1@0	8.58
		QPSK	15	12@0	8.58
LTE NB-IoT Band 4					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
19952	1710.2	BPSK	15	1@0	8.4
		QPSK	15	12@0	8.31
20175	1732.5	BPSK	15	1@0	8.2
		QPSK	15	12@0	8.11
20398	1754.8	BPSK	15	1@0	8.45
		QPSK	15	12@0	8.26
LTE NB-IoT Band 5					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
20401	824.2	BPSK	15	1@0	7.9
		QPSK	15	12@0	7.87
20525	836.5	BPSK	15	1@0	8.1
		QPSK	15	12@0	8.3
20649	848.8	BPSK	15	1@0	8.26
		QPSK	15	12@0	7.84
LTE NB-IoT Band 12					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
23012	699.2	BPSK	15	1@0	8.32
		QPSK	15	12@0	8.3
23095	707.5	BPSK	15	1@0	7.92
		QPSK	15	12@0	8.06
23178	718.5	BPSK	15	1@0	8.29
		QPSK	15	12@0	8.18

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LTE NB-IoT Band 13					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
23182	777.2	BPSK	15	1@0	8.42
		QPSK	15	12@0	8.17
23230	782	BPSK	15	1@0	8.06
		QPSK	15	12@0	8.14
23278	786.8	BPSK	15	1@0	8.56
		QPSK	15	12@0	8.25
LTE NB-IoT Band 17					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
23732	704.2	BPSK	15	1@0	8.2
		QPSK	15	12@0	8.14
23790	710	BPSK	15	1@0	8.45
		QPSK	15	12@0	8.43
23848	715.8	BPSK	15	1@0	8.23
		QPSK	15	12@0	8.09
LTE NB-IoT Band 25					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
26042	1850.2	BPSK	15	1@0	7.75
		QPSK	15	12@0	8.18
26365	1882.5	BPSK	15	1@0	7.82
		QPSK	15	12@0	8.37
26688	1914.8	BPSK	15	1@0	8.42
		QPSK	15	12@0	8.07
LTE NB-IoT Band 26					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
26792	824.2	BPSK	15	1@0	8.06
		QPSK	15	12@0	8.22
26915	836.5	BPSK	15	1@0	8.16
		QPSK	15	12@0	8.39
27038	848.9	BPSK	15	1@0	8.24
		QPSK	15	12@0	8.37

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LTE NB-IoT Band 26_Part90					
Channel	Freq. (MHz)	Modulation	Subcarrier Spacing (kHz)	N_{tones}	Peak-to-Average Power Ratio(dB)
26692	814.2	BPSK	15	1@0	8.07
		QPSK	15	12@0	8.2
26740	819	BPSK	15	1@0	7.83
		QPSK	15	12@0	8.21
26788	823.8	BPSK	15	1@0	8.28
		QPSK	15	12@0	8.33

Please refer to next page for test plots.

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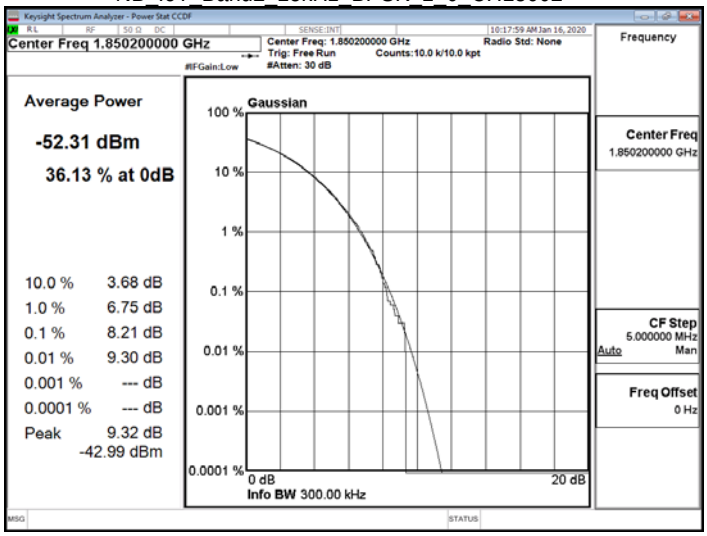
NB_IoT_Band2_15kHz_BPSK_1_0_CH18602



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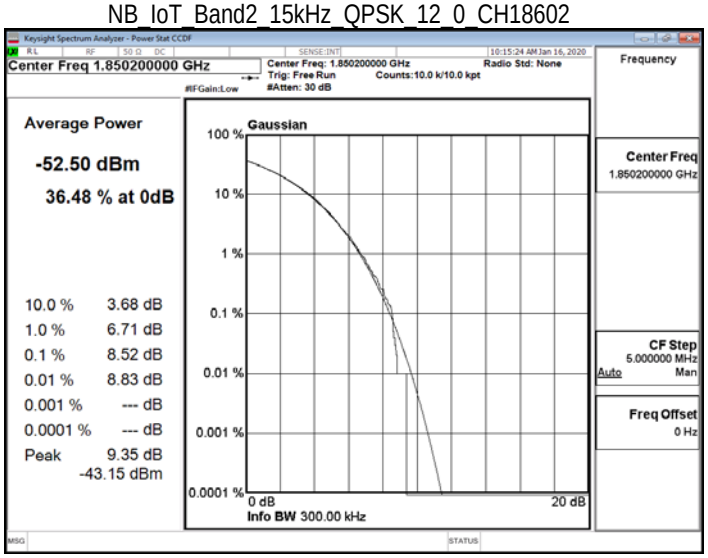

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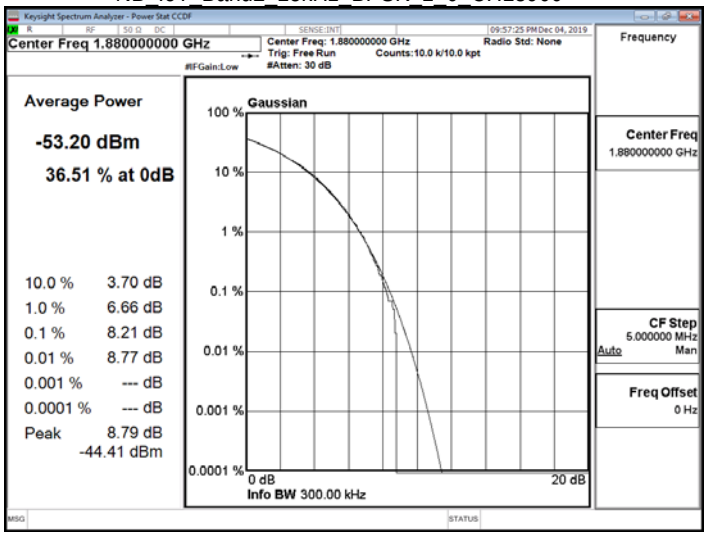

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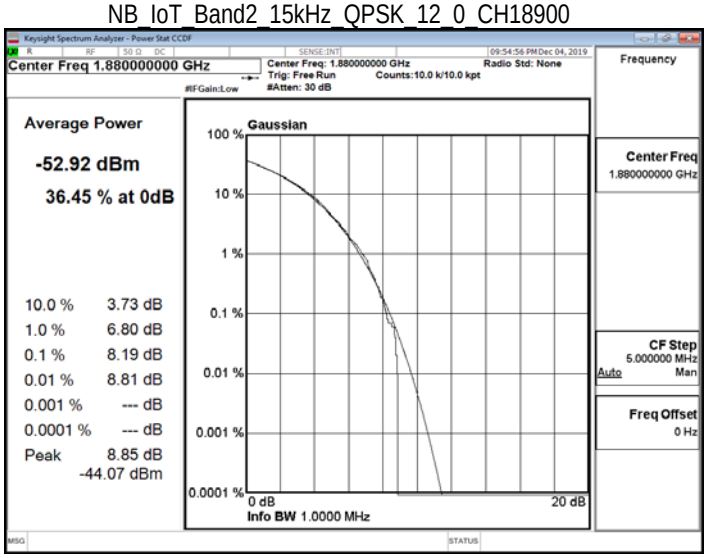
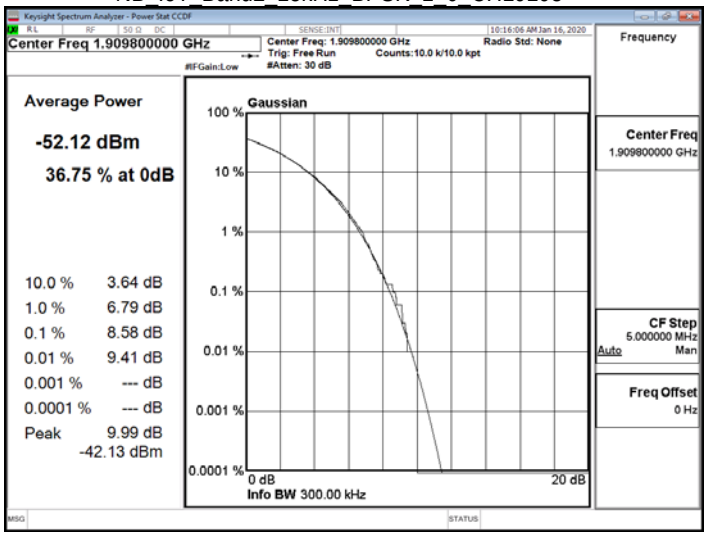
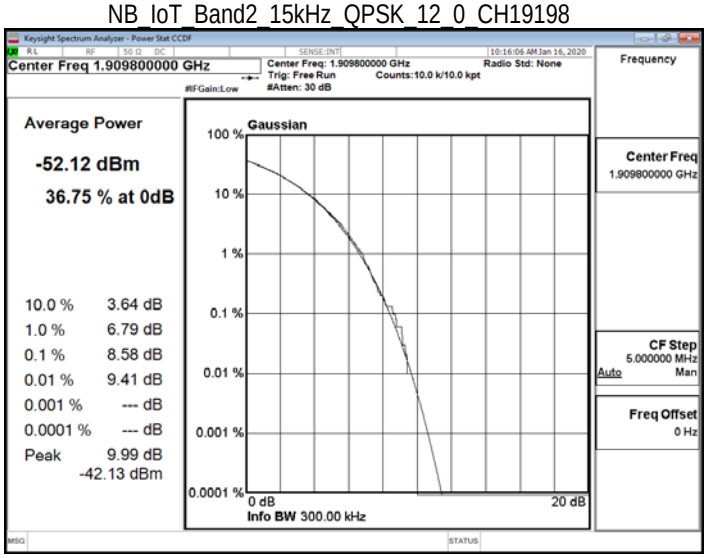


NB_IoT_Band2_15kHz_BPSK_1_0_CH19198



NB_IoT_Band2_15kHz_QPSK_12_0_CH19198



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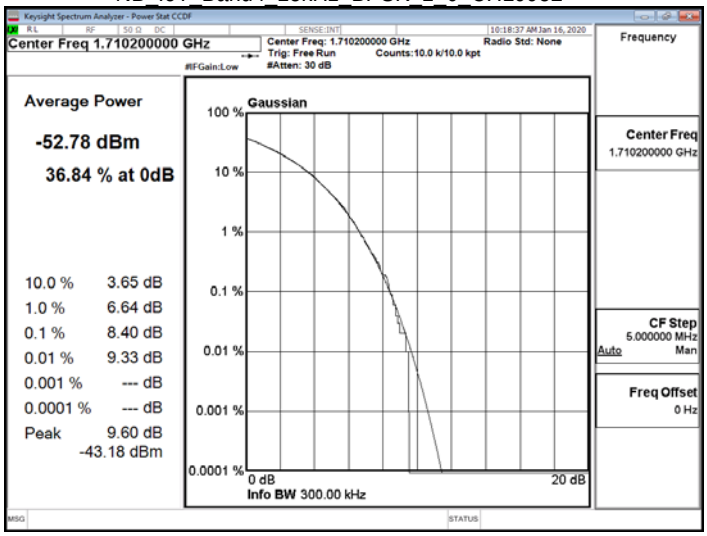
NB_IoT_Band4_15kHz_BPSK_1_0_CH19952



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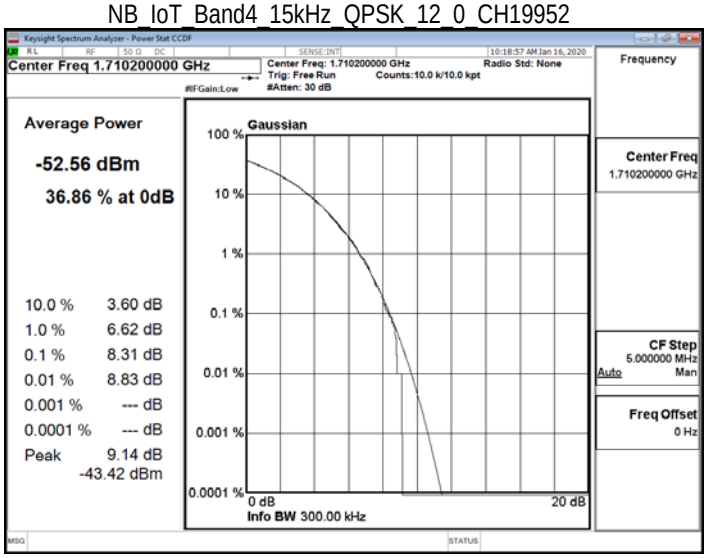

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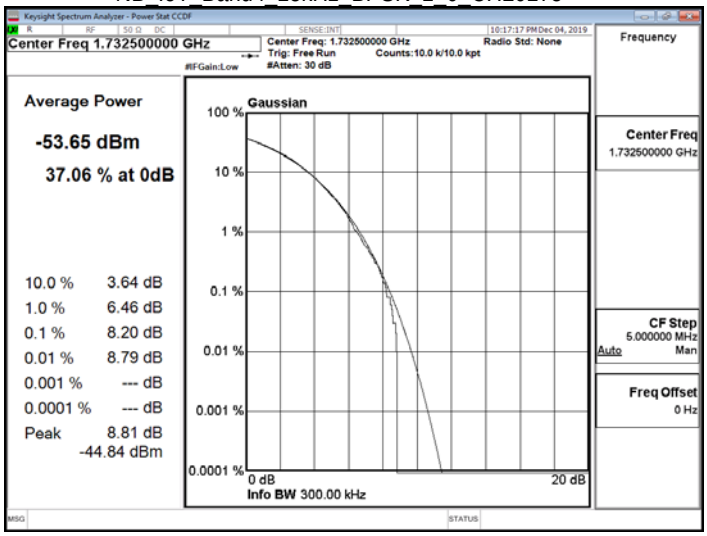

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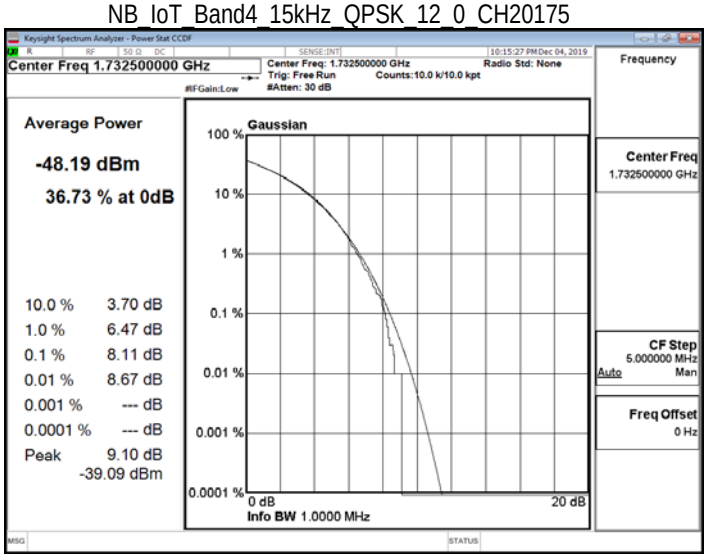

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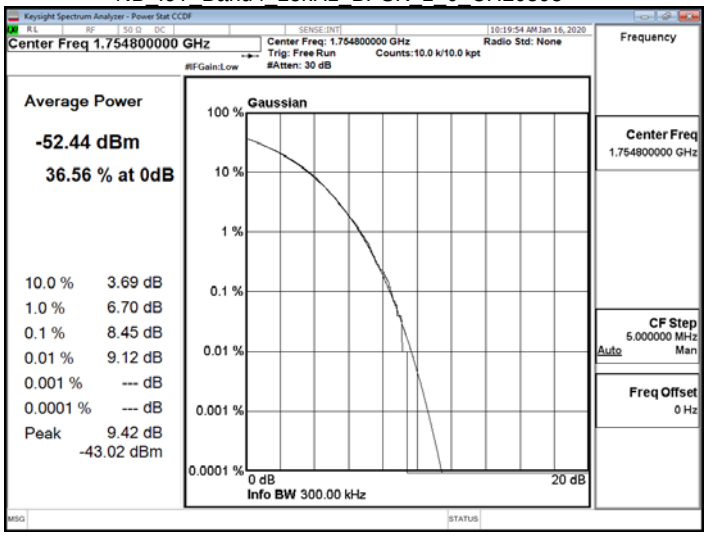
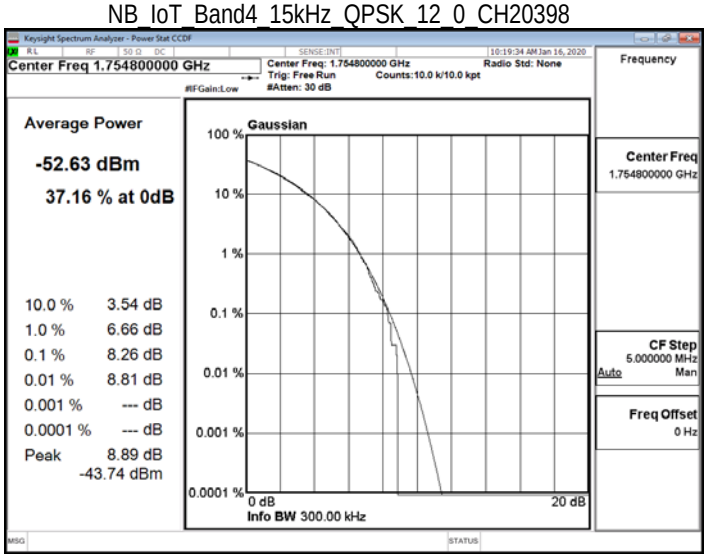


NB_IoT_Band4_15kHz_QPSK_12_0_CH20398



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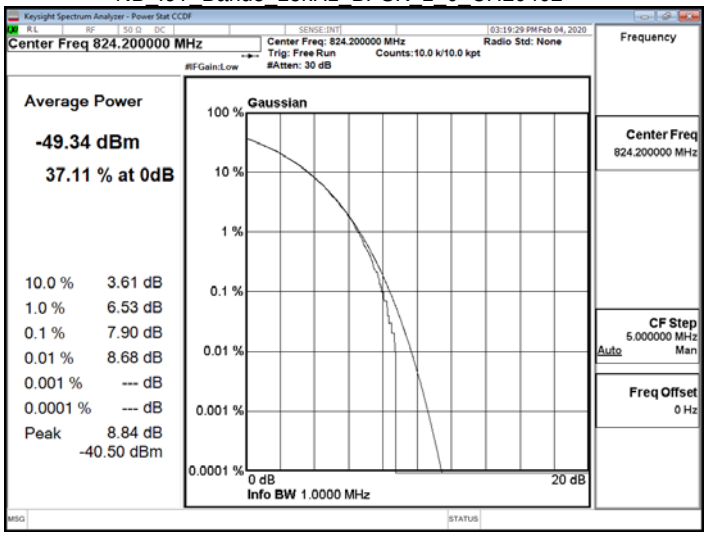
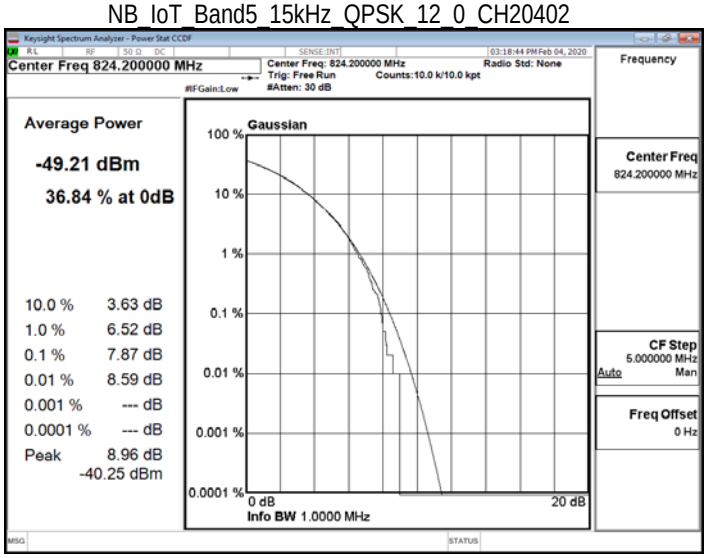
NB_IoT_Band5_15kHz_BPSK_1_0_CH20402



NB_IoT_Band5_15kHz_QPSK_12_0_CH20402



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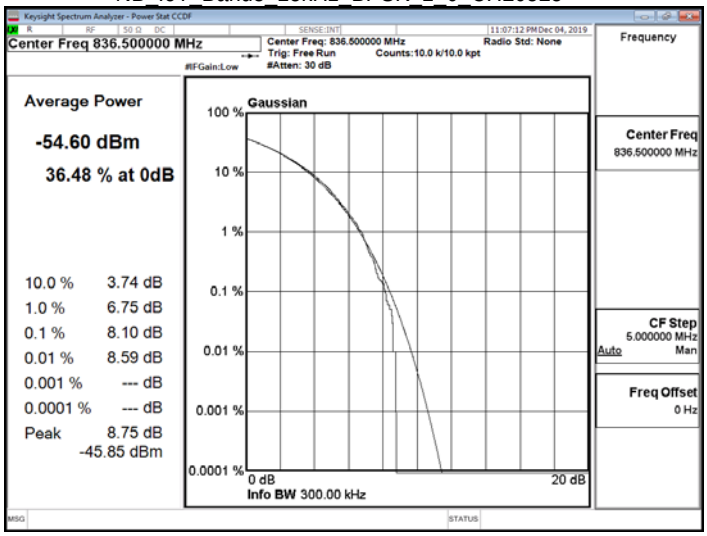
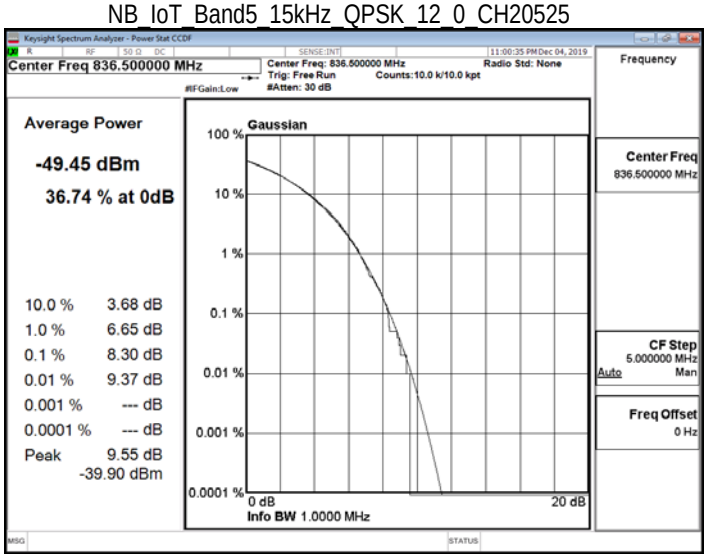


NB_IoT_Band5_15kHz_QPSK_12_0_CH20525



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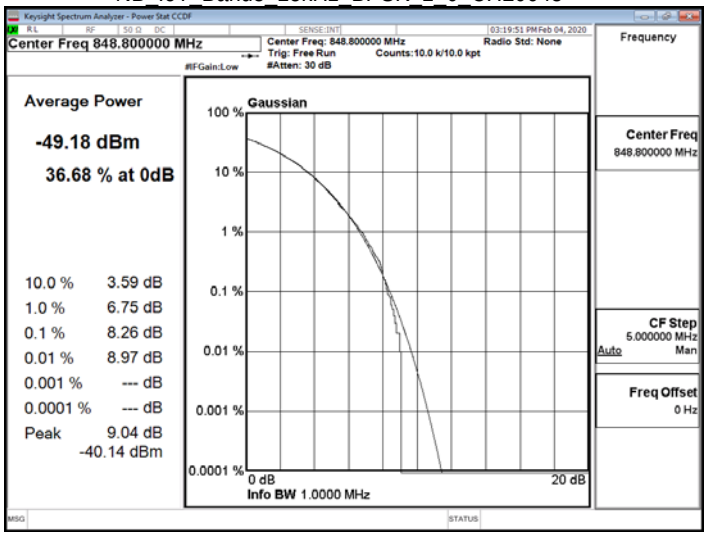

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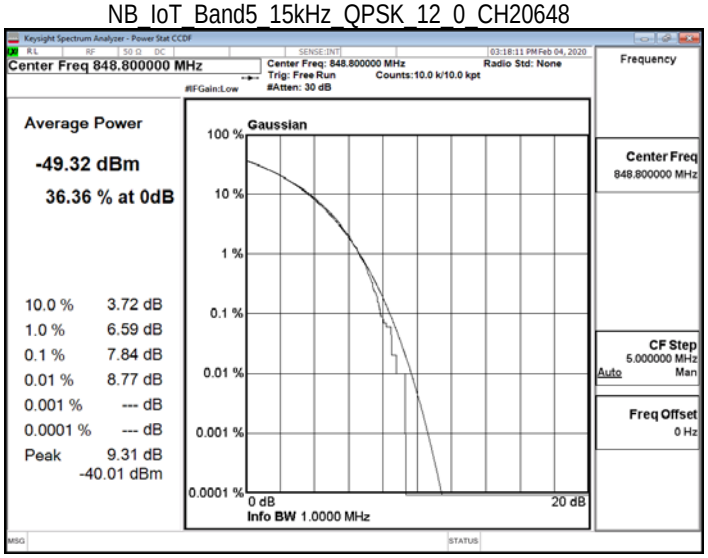

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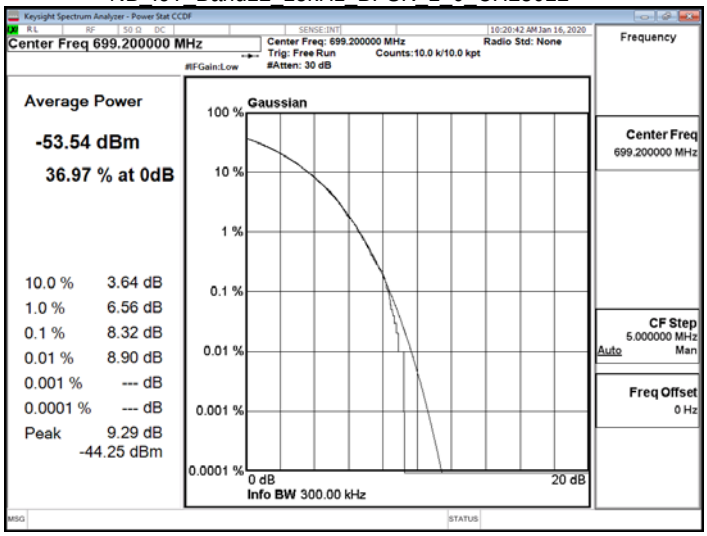
NB_IoT_Band12_15kHz_BPSK_1_0_CH23012



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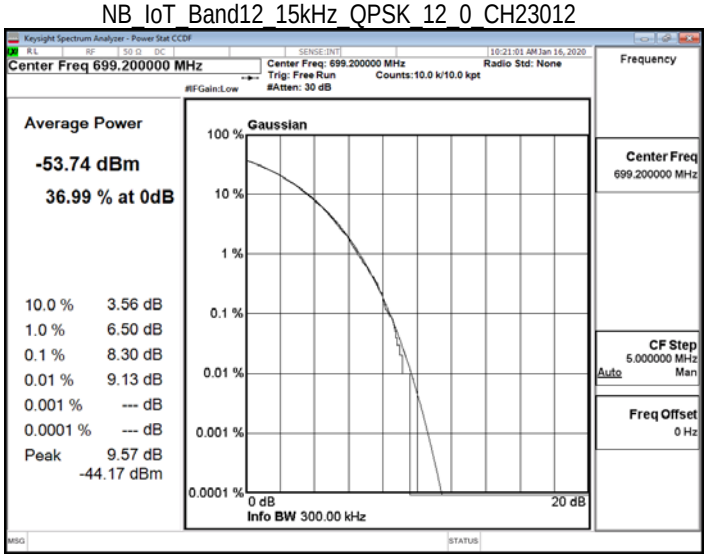

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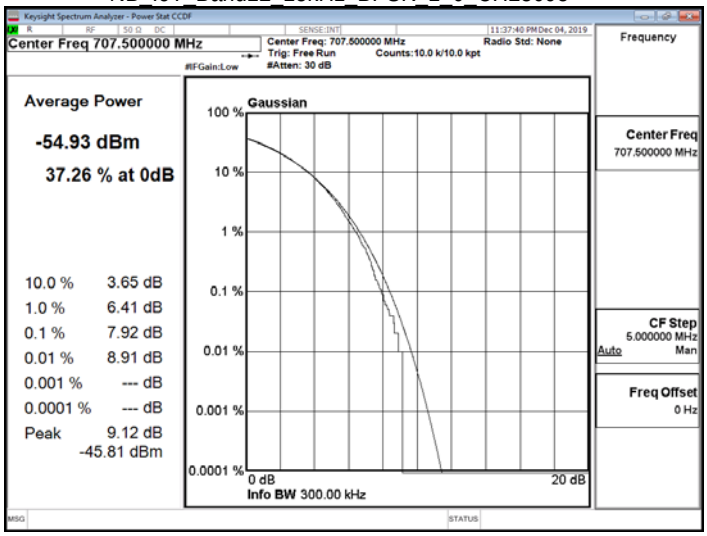

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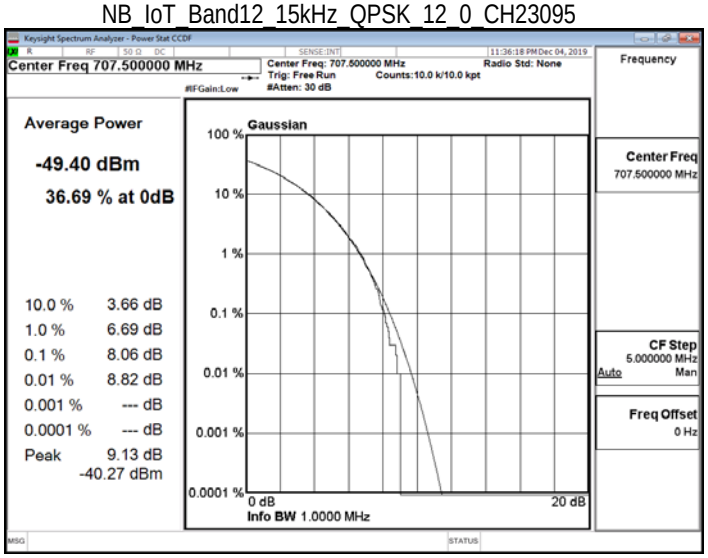

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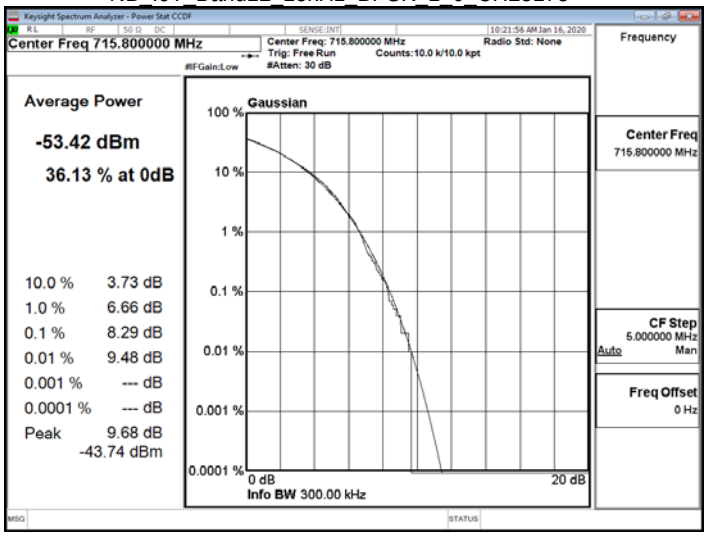
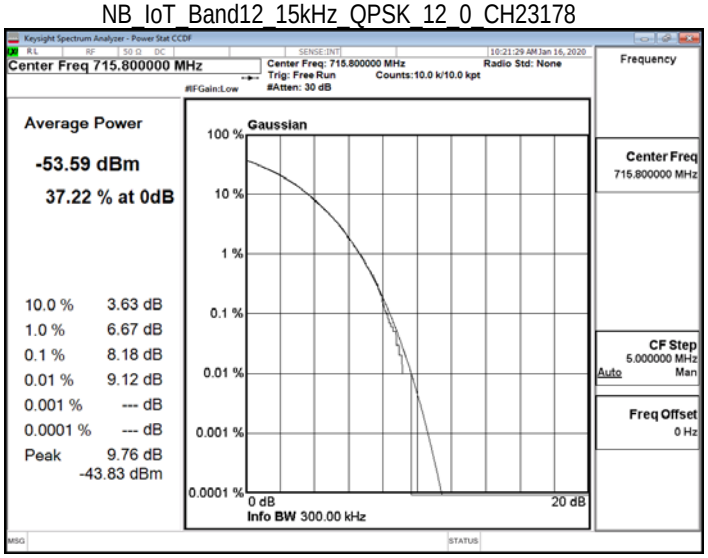


NB_IoT_Band12_15kHz_QPSK_12_0_CH23178



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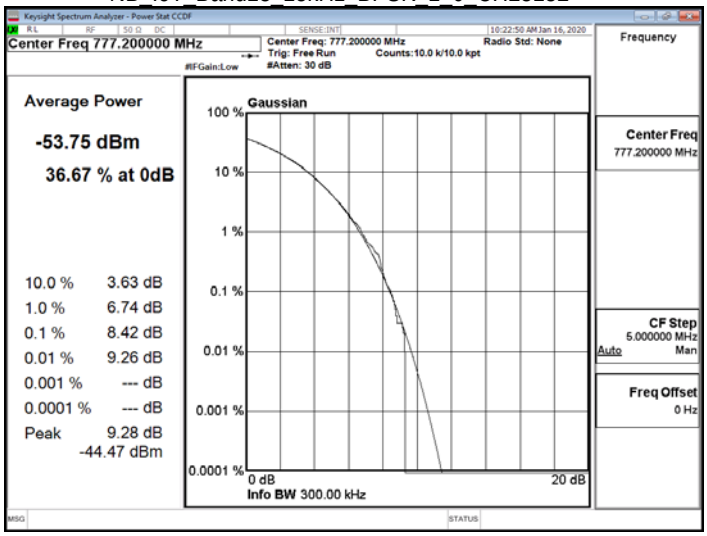
NB_IoT_Band13_15kHz_BPSK_1_0_CH23182



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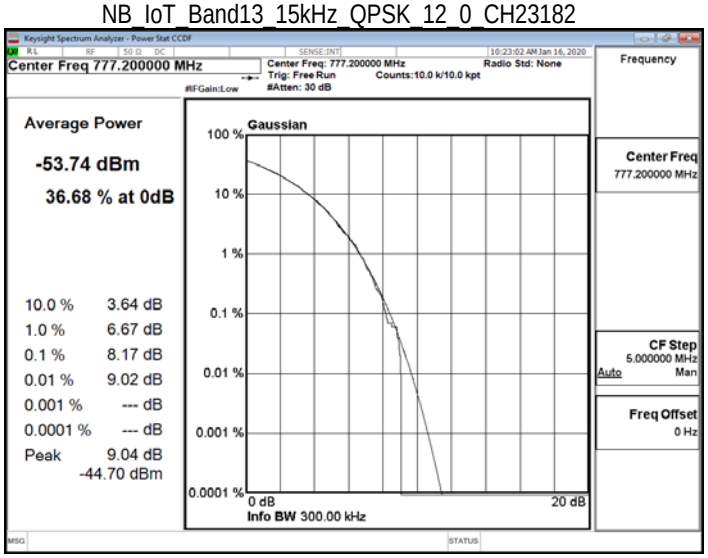

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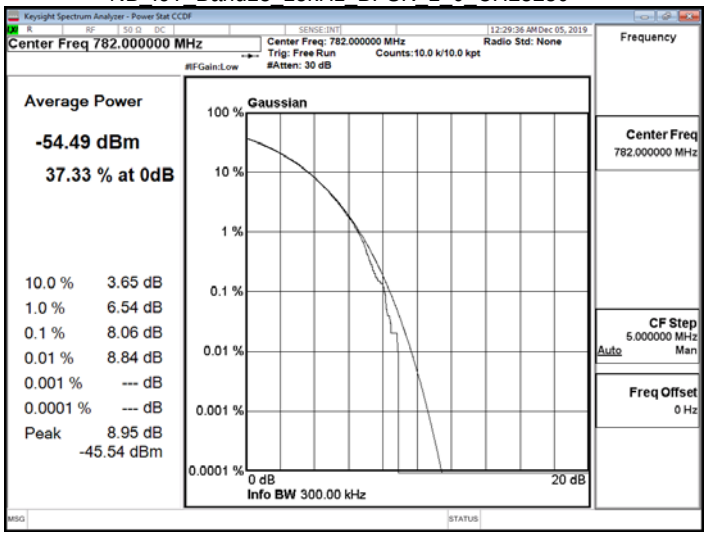

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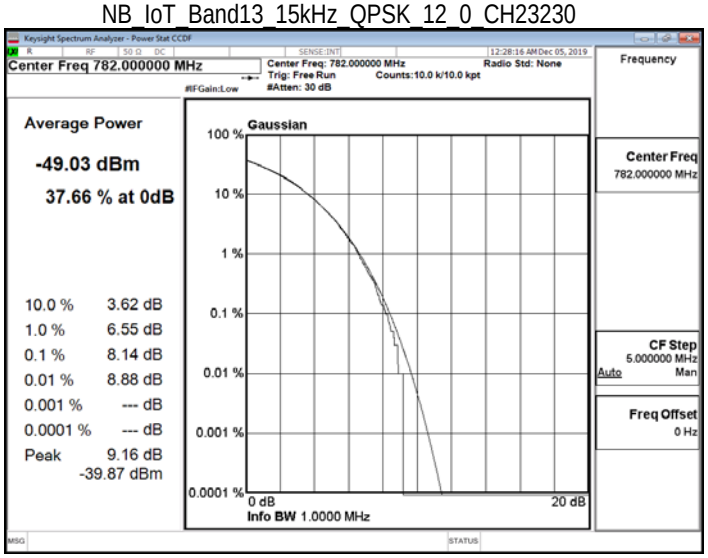

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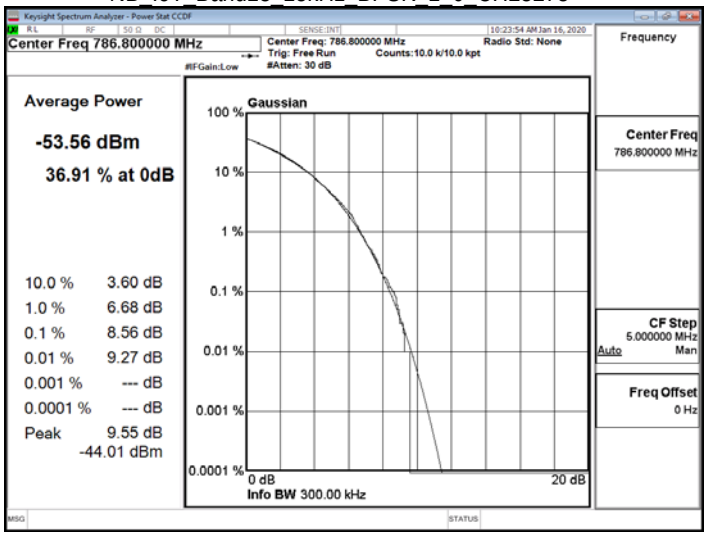

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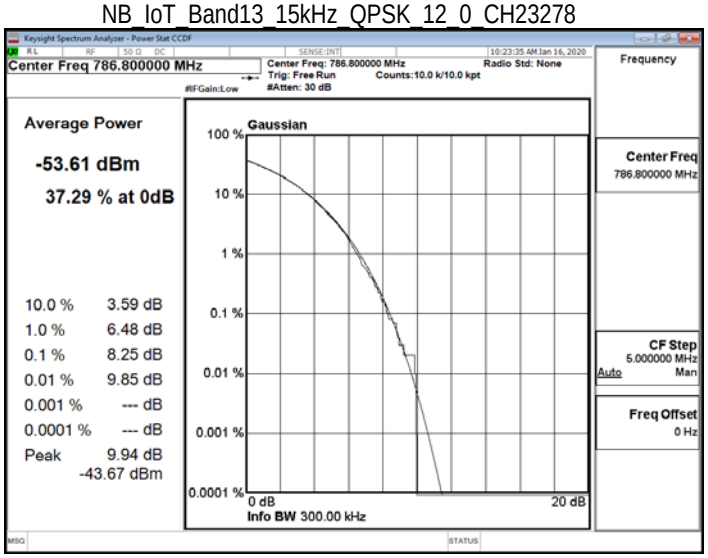

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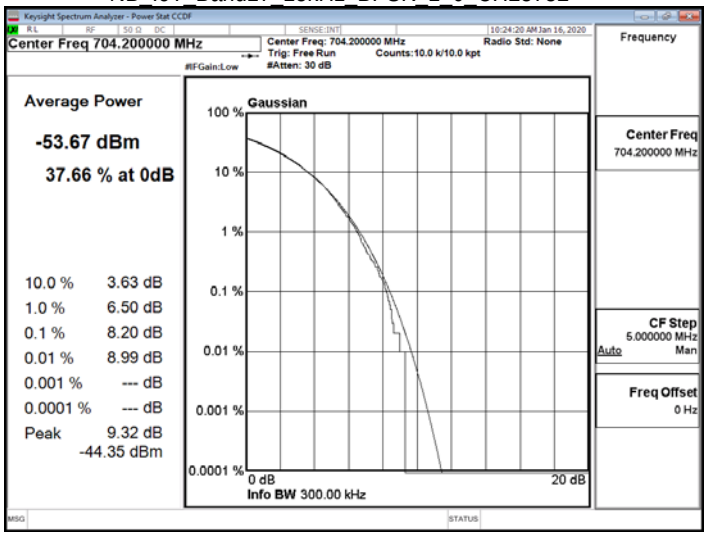
NB_IoT_Band17_15kHz_BPSK_1_0_CH23732



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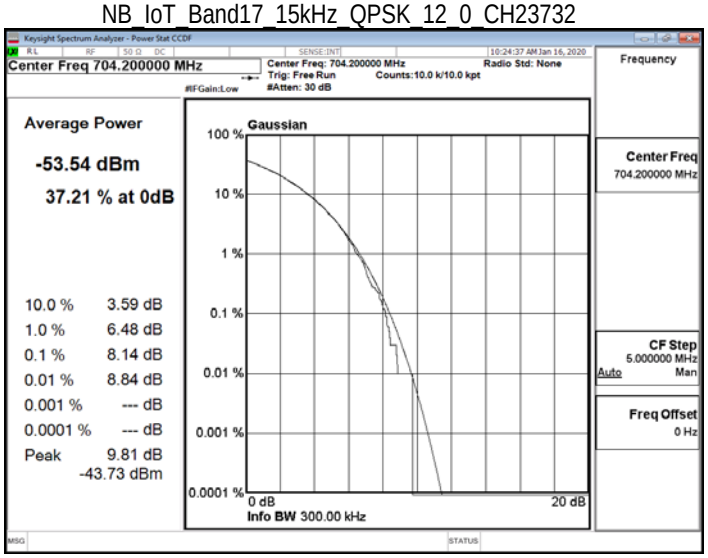

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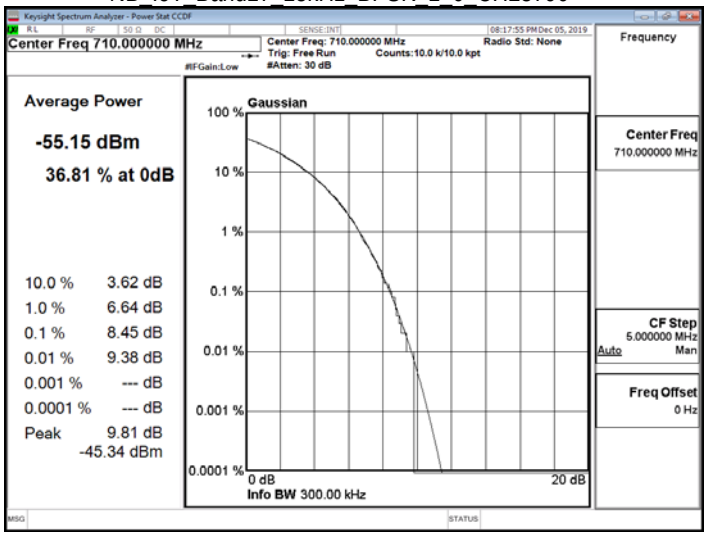

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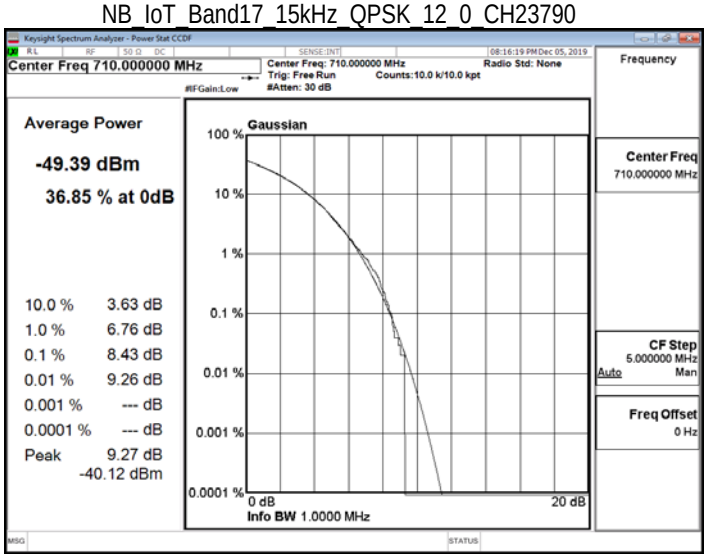

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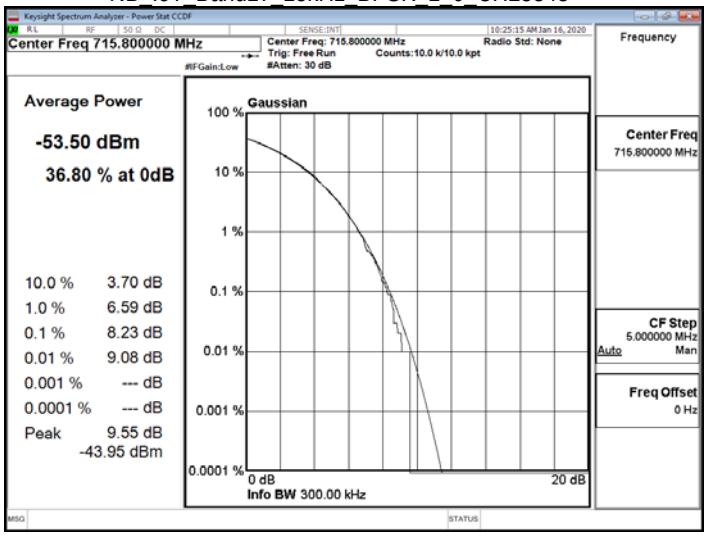

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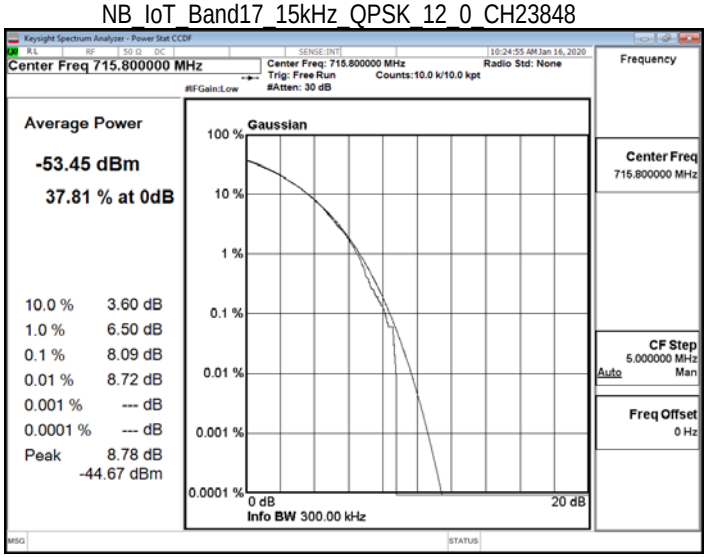

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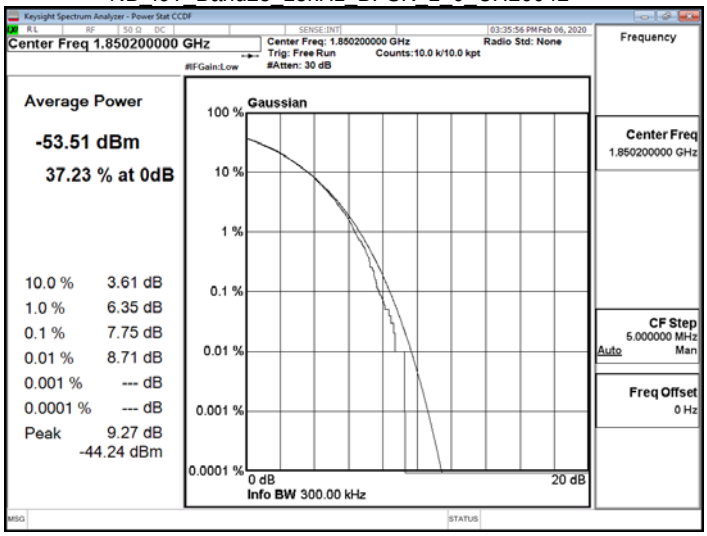
NB_IoT_Band25_15kHz_BPSK_1_0_CH26042



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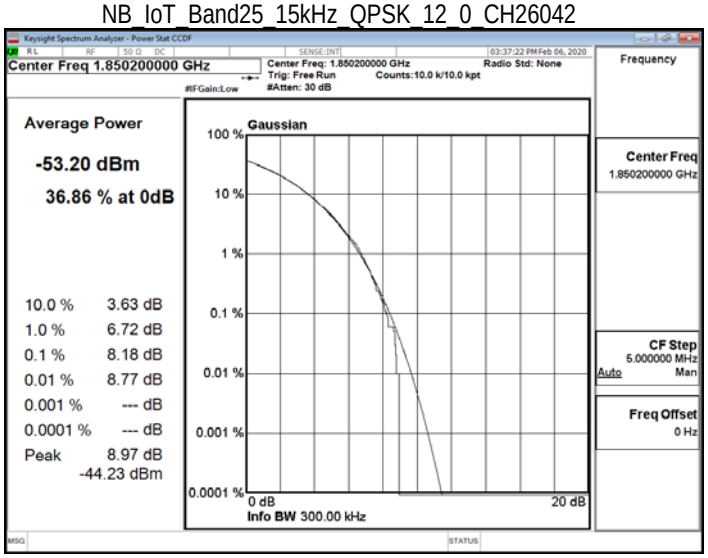

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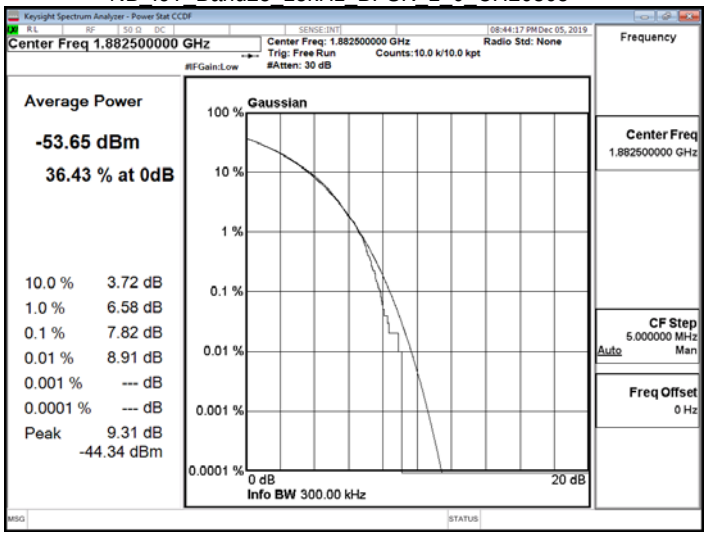
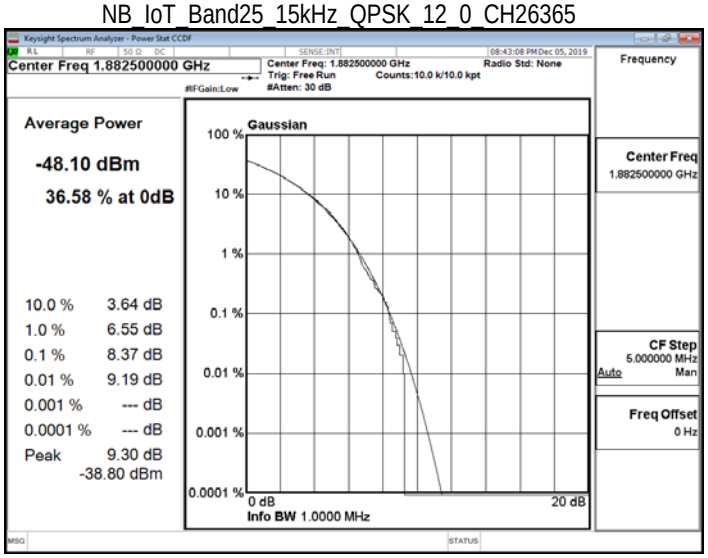


NB_IoT_Band25_15kHz_QPSK_12_0_CH26365



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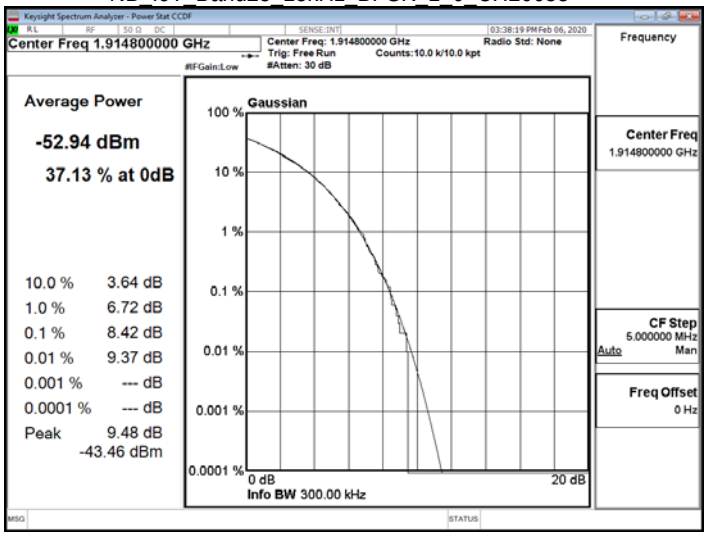
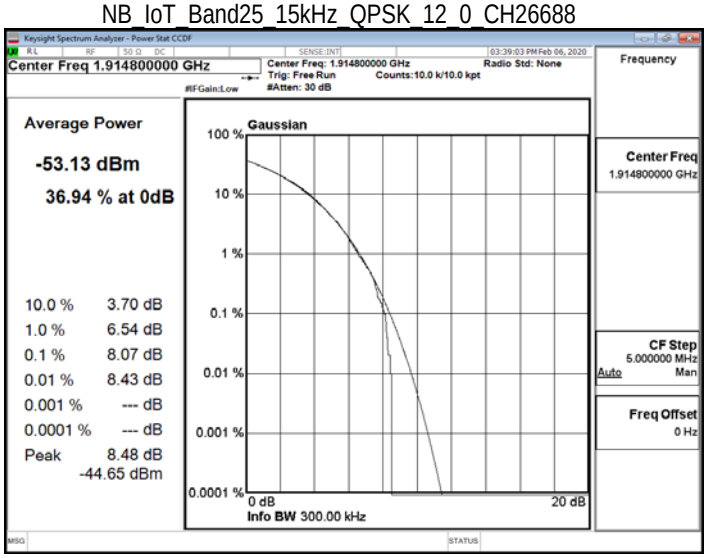


NB_IoT_Band25_15kHz_QPSK_12_0_CH26688



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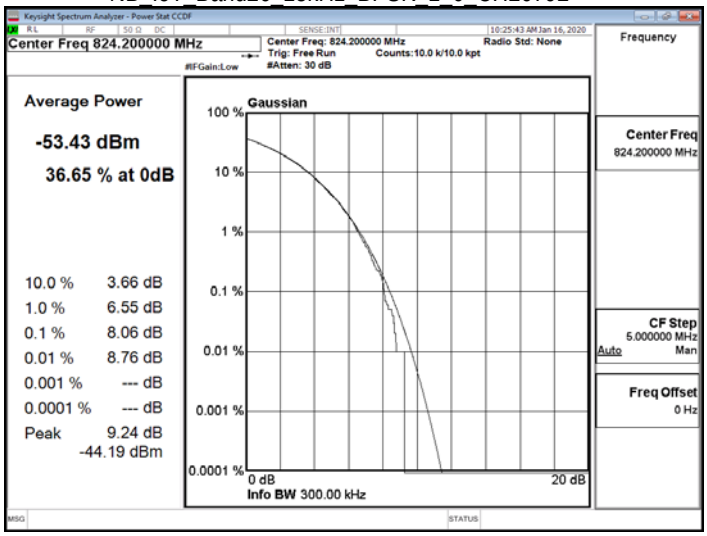
NB_IoT_Band26_15kHz_BPSK_1_0_CH26792



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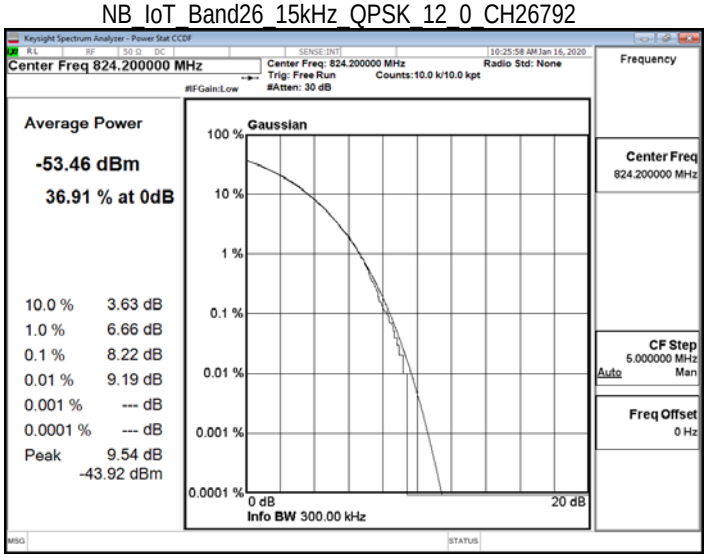

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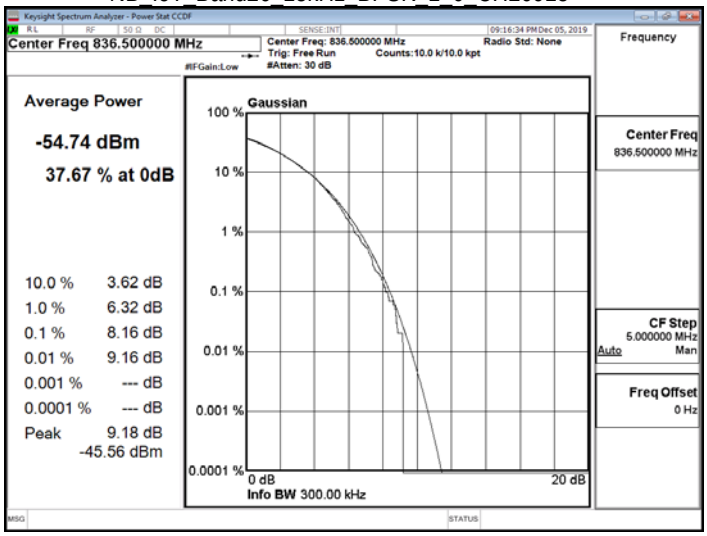

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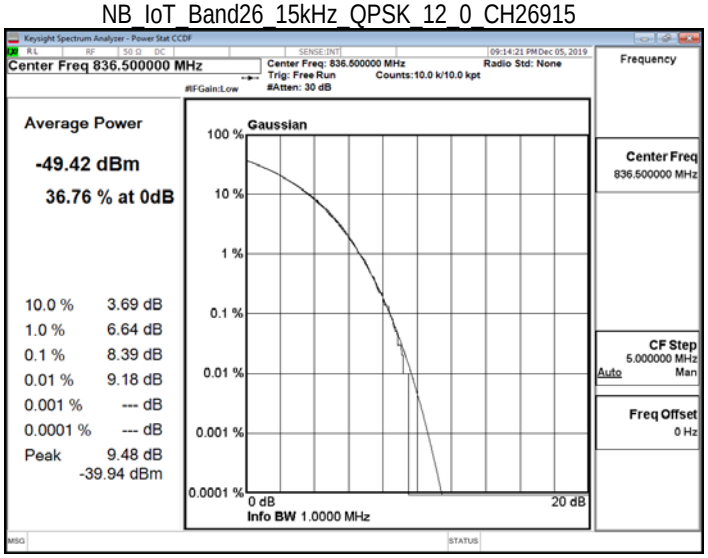
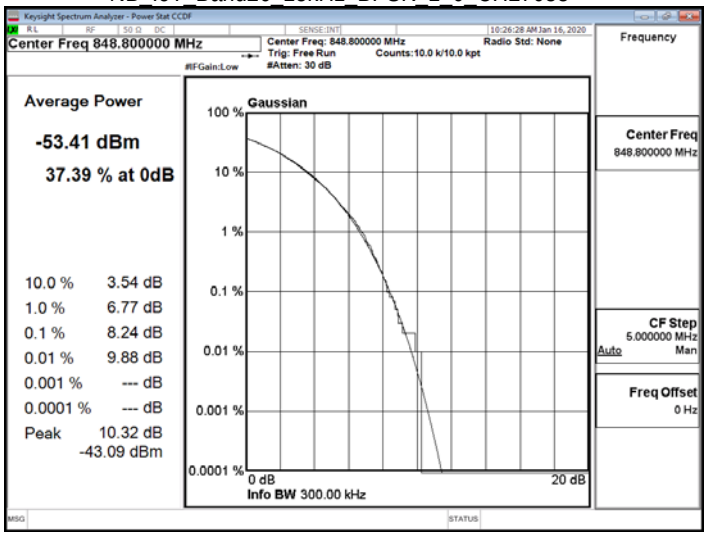


NB_IoT_Band26_15kHz_BPSK_1_0_CH27038



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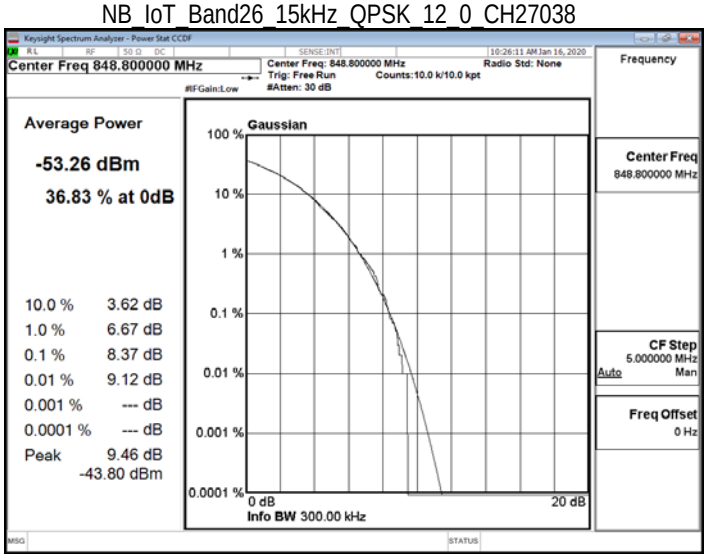

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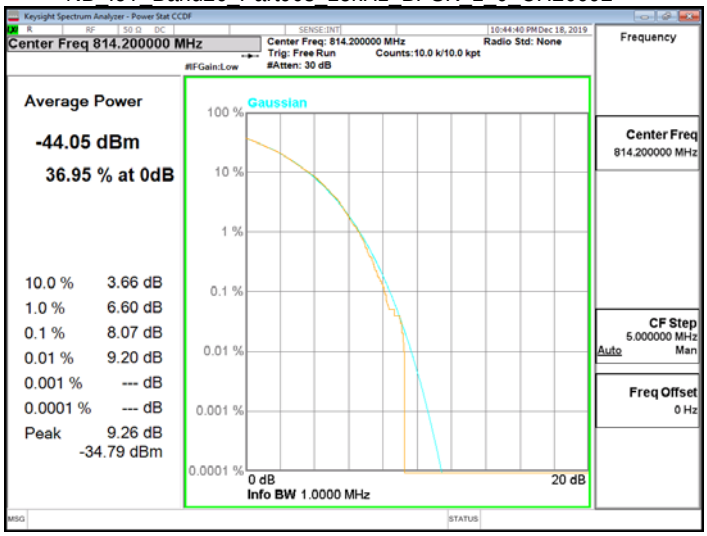
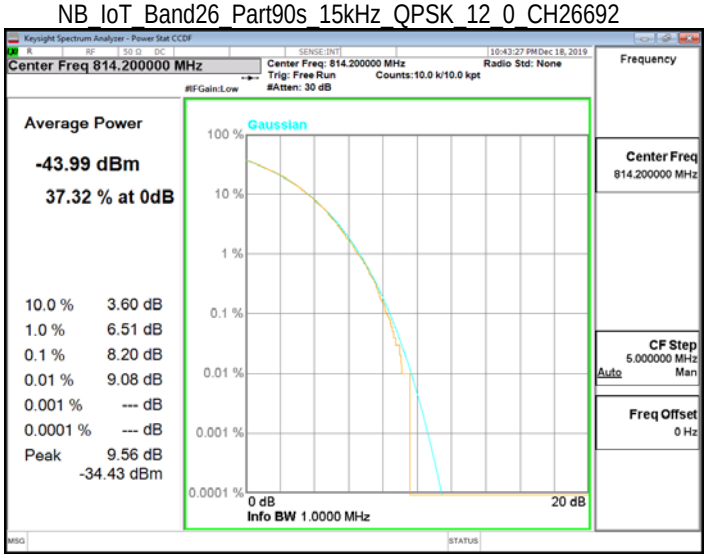
NB_IoT_Band26_Part90s_15kHz_BPSK_1_0_CH26692



NB_IoT_Band26_Part90s_15kHz_QPSK_12_0_CH26692



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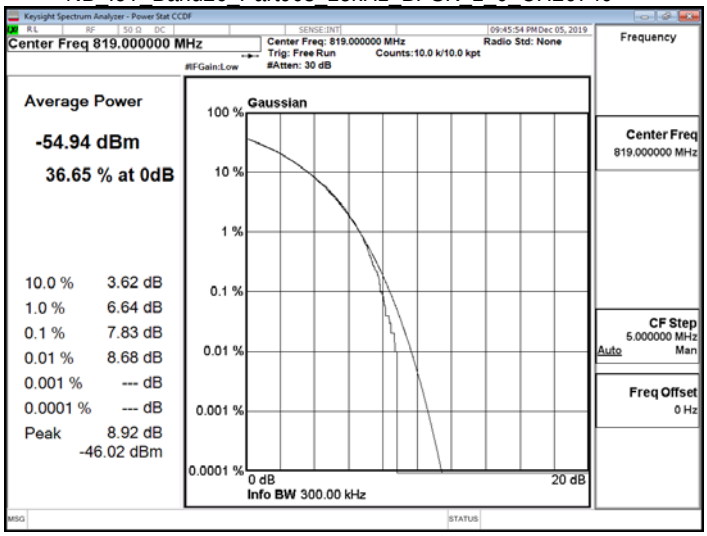

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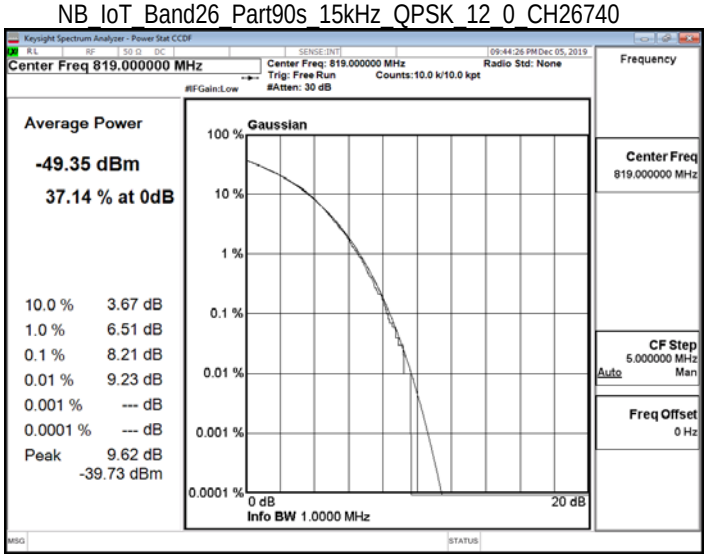

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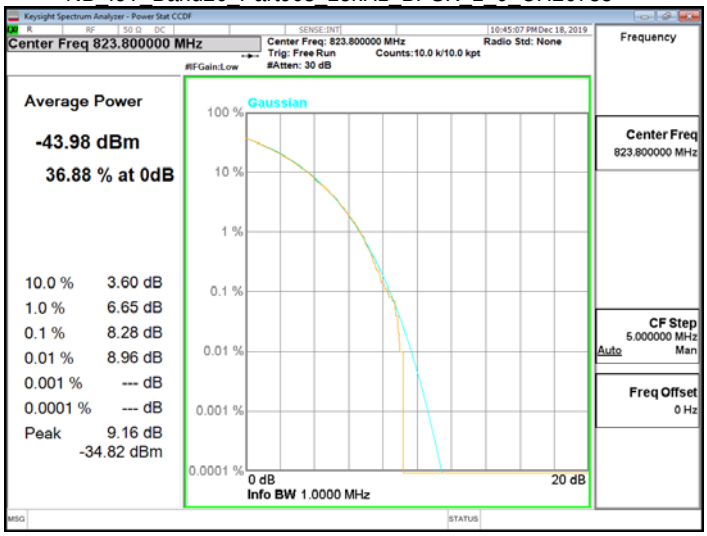

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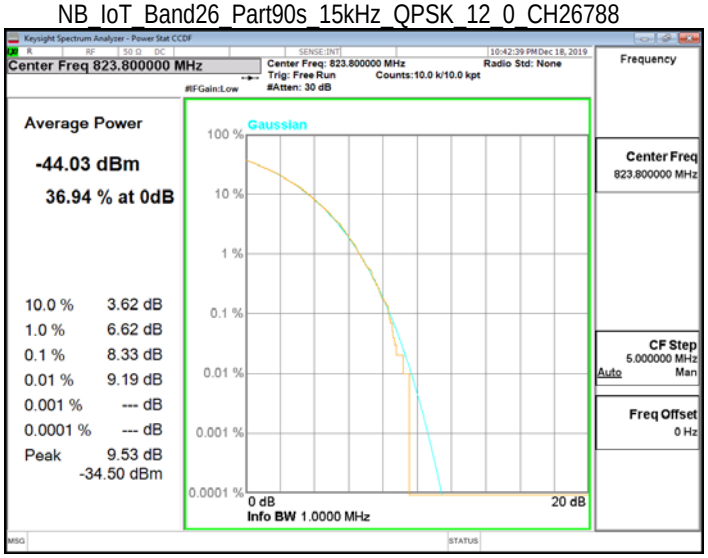

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~ End of Report ~

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