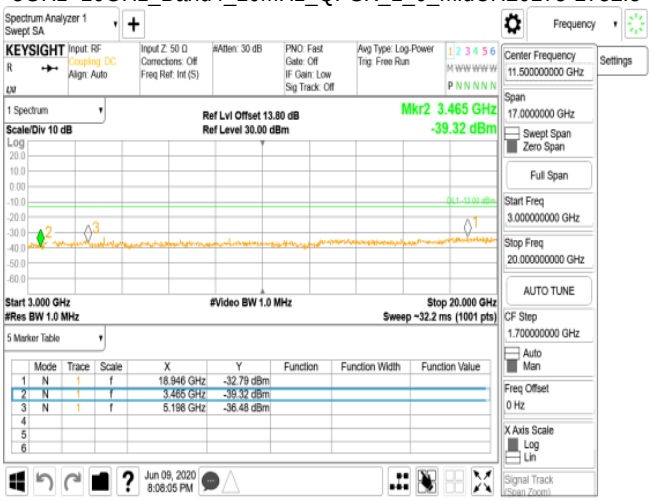
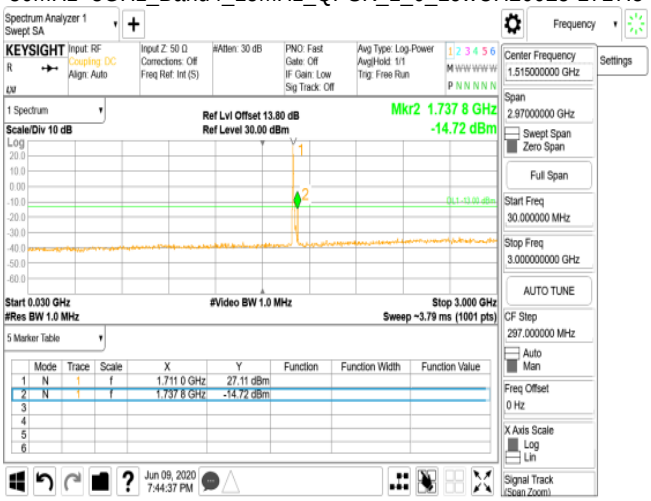
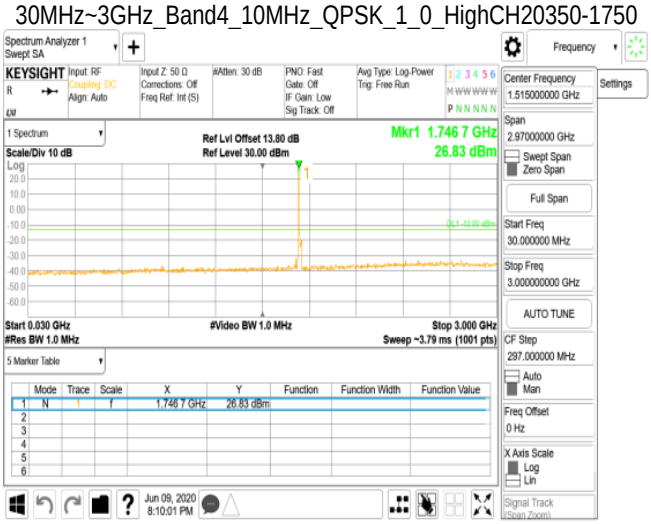
3GHz~10GHz_Band4_10MHz_QPSK_1_0_MidCH20175-1732.5



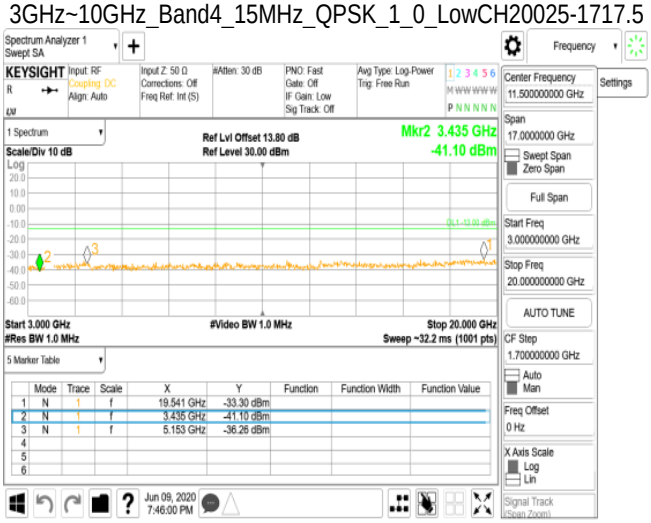
30MHz~3GHz_Band4_15MHz_QPSK_1_0_LowCH20025-1717.5



30MHz~3GHz_Band4_10MHz_QPSK_1_0_HighCH20350-1750



3GHz~10GHz_Band4_15MHz_QPSK_1_0_LowCH20025-1717.5



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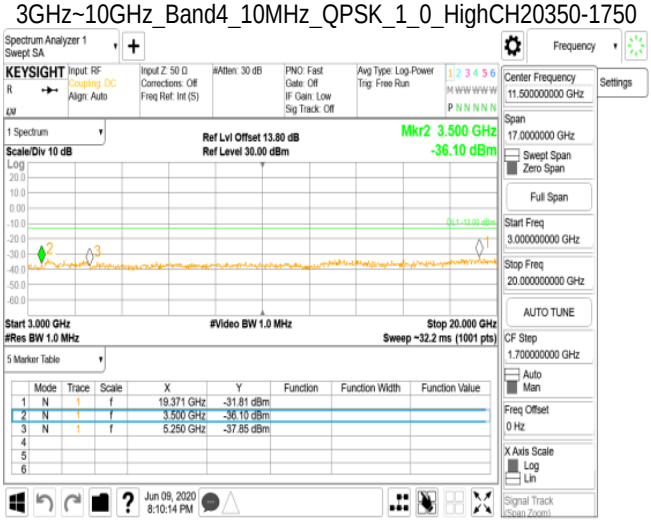
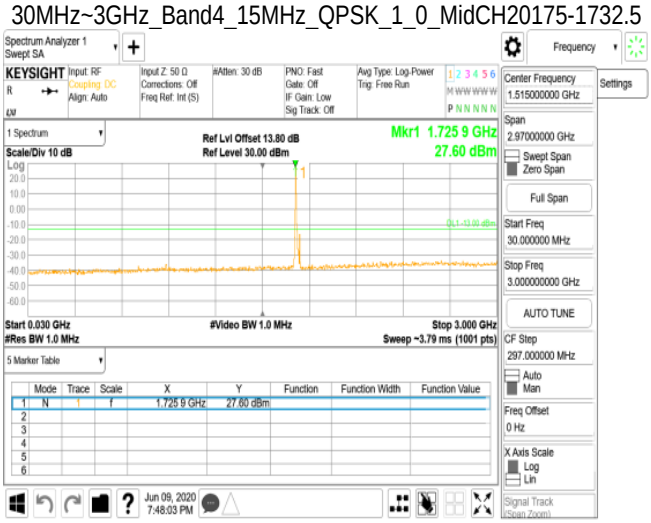


30MHz~3GHz_Band4_15MHz_QPSK_1_0_MidCH20175-1732.5



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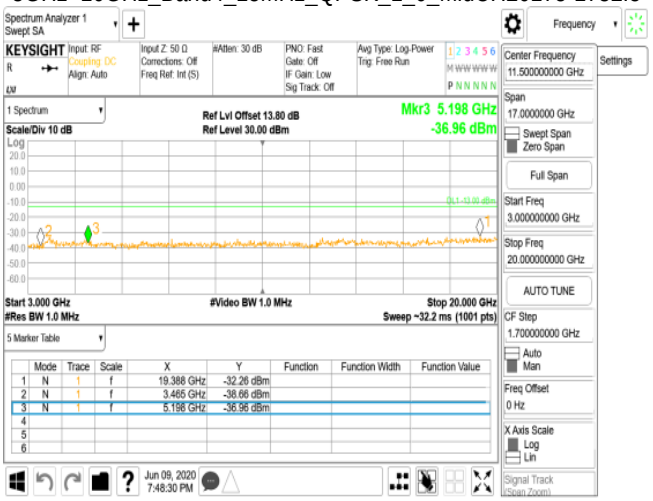
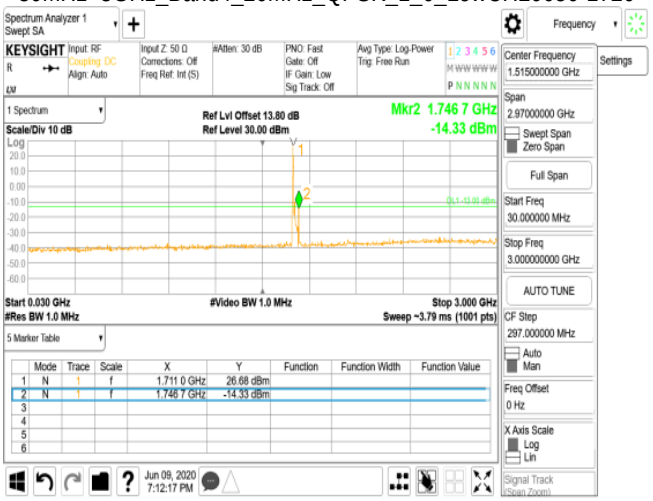
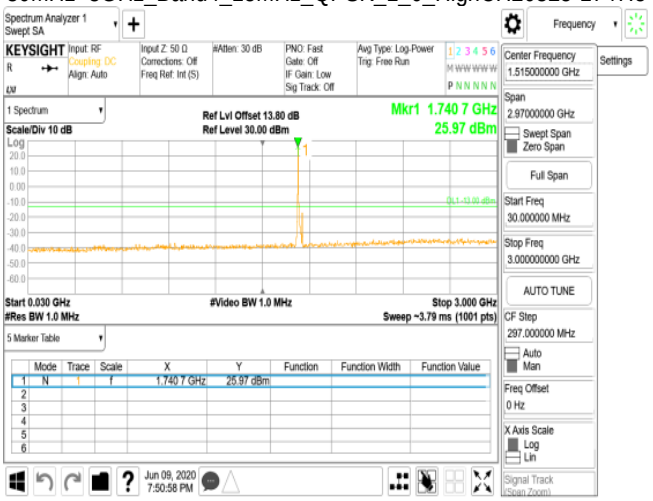


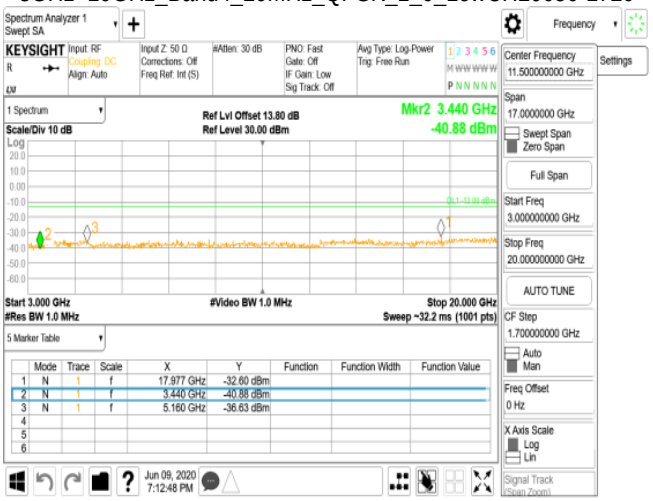
30MHz~3GHz_Band4_20MHz_QPSK_1_0_LowCH20050-1720



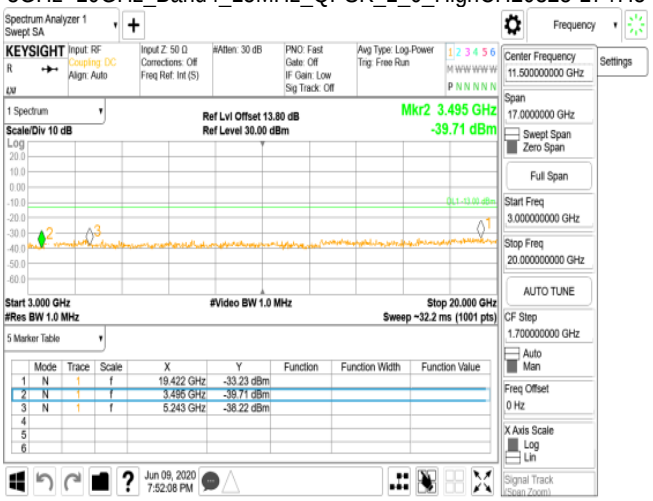
30MHz~3GHz_Band4_15MHz_QPSK_1_0_HighCH20325-1747.5



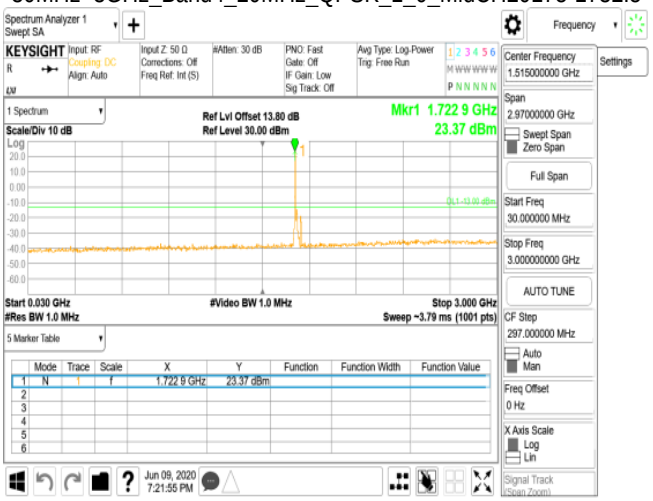
3GHz~10GHz_Band4_20MHz_QPSK_1_0_LowCH20050-1720



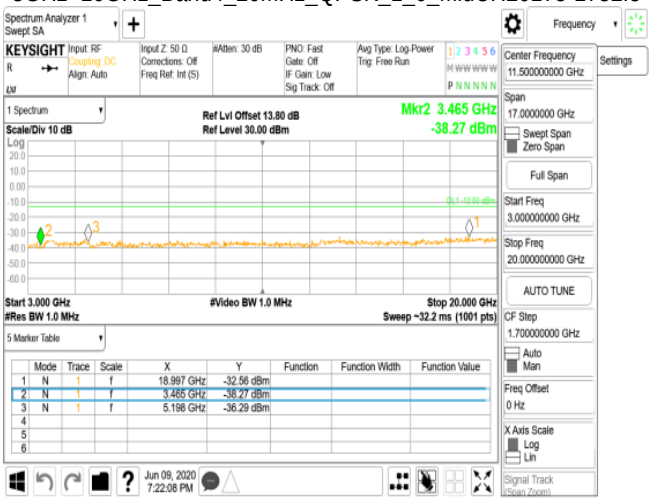
3GHz~10GHz_Band4_15MHz_QPSK_1_0_HighCH20325-1747.5



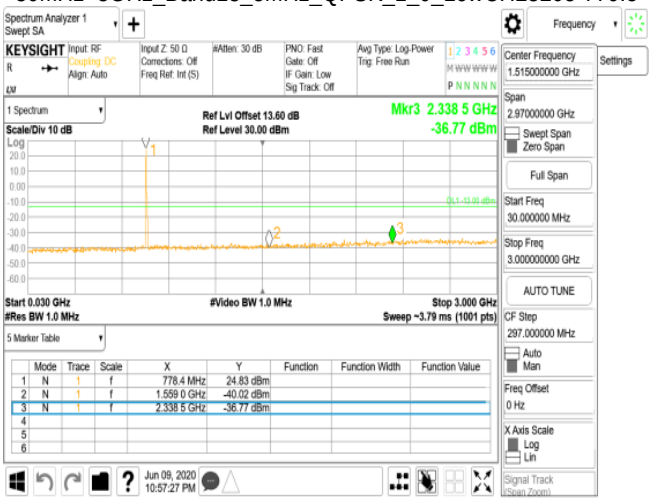
30MHz~3GHz_Band4_20MHz_QPSK_1_0_MidCH20175-1732.5



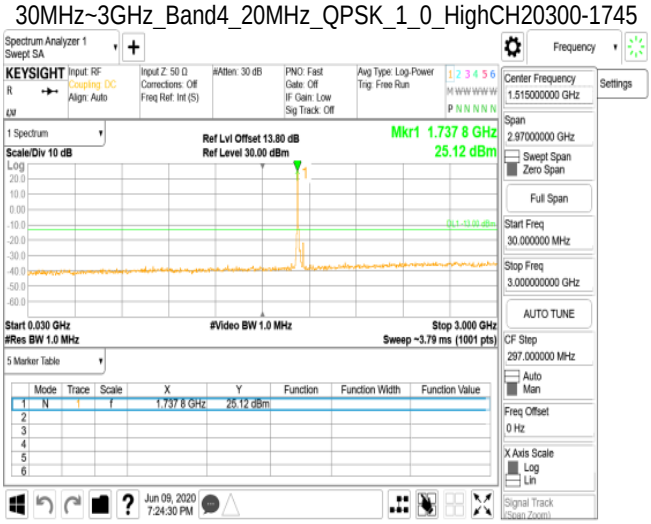
3GHz~10GHz_Band4_20MHz_QPSK_1_0_MidCH20175-1732.5



30MHz~3GHz_Band13_5MHz_QPSK_1_0_LowCH23205-779.5

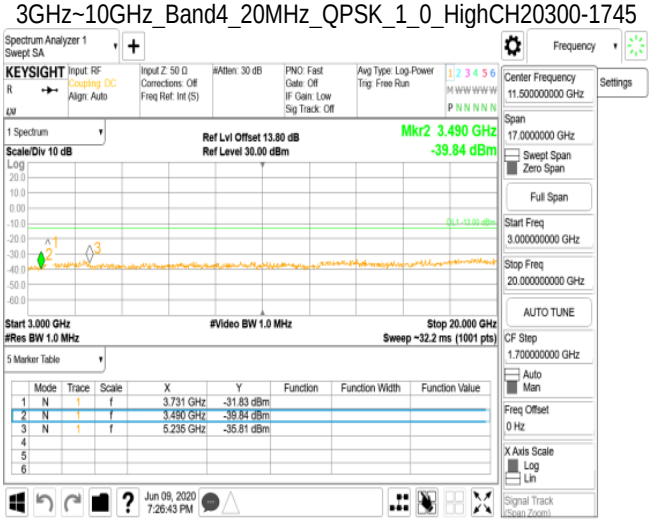


30MHz~3GHz_Band4_20MHz_QPSK_1_0_HighCH20300-1745

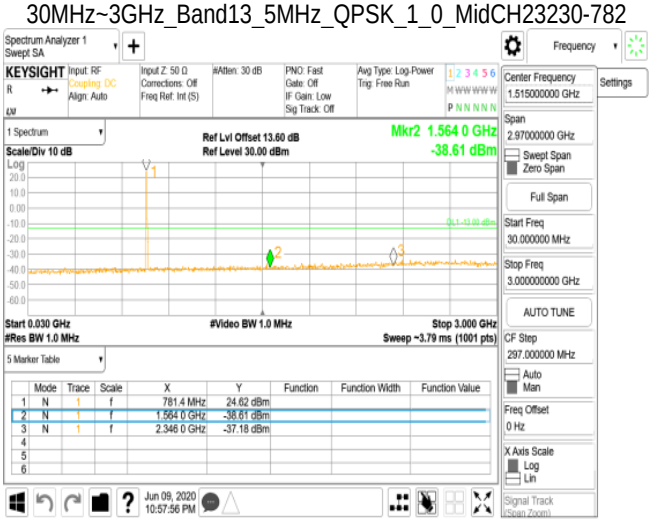


3GHz~10GHz_Band13_5MHz_QPSK_1_0_LowCH23205-779.5

3GHz~10GHz_Band4_20MHz_QPSK_1_0_HighCH20300-1745

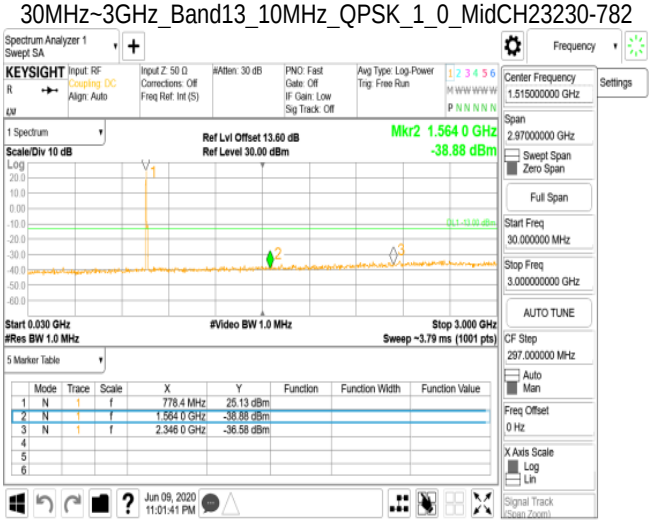


30MHz~3GHz_Band13_5MHz_QPSK_1_0_MidCH23230-782

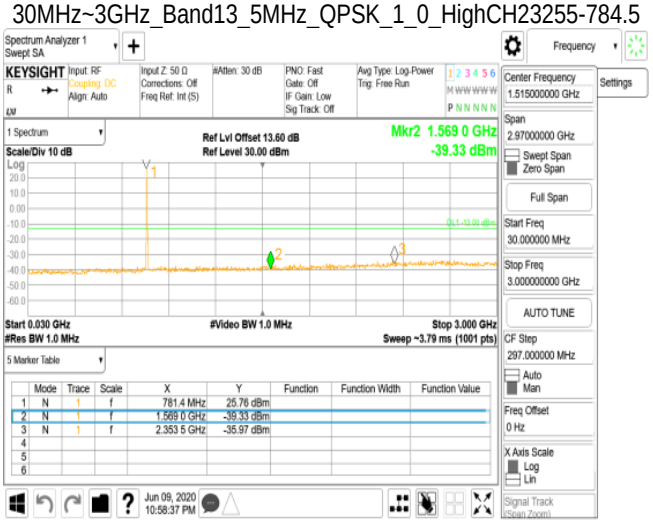


3GHz~10GHz_Band13_5MHz_QPSK_1_0_MidCH23230-782

30MHz~3GHz_Band13_10MHz_QPSK_1_0_MidCH23230-782



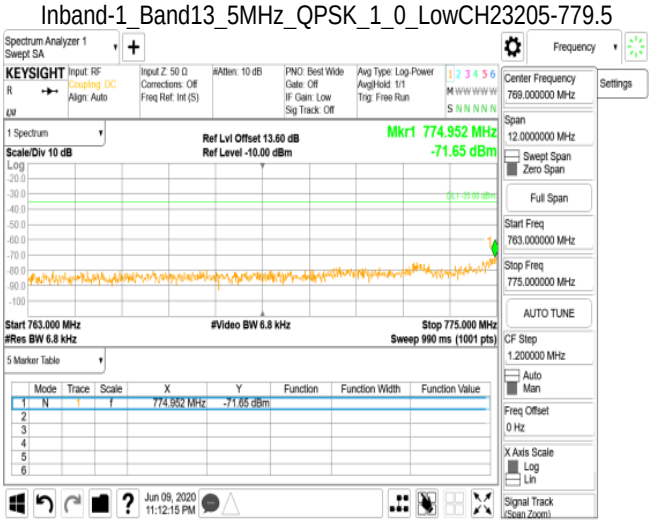
30MHz~3GHz_Band13_5MHz_QPSK_1_0_HighCH23255-784.5



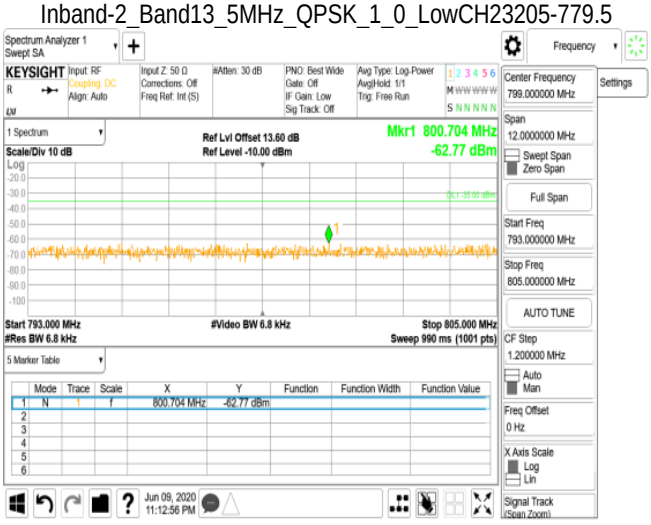
3GHz~10GHz_Band13_10MHz_QPSK_1_0_MidCH23230-782

3GHz~10GHz_Band13_5MHz_QPSK_1_0_HighCH23255-784.5

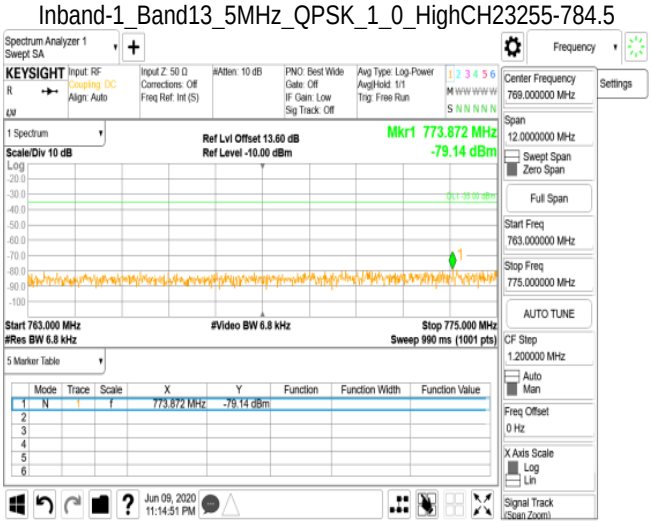
Inband-1_Band13_5MHz_QPSK_1_0_LowCH23205-779.5



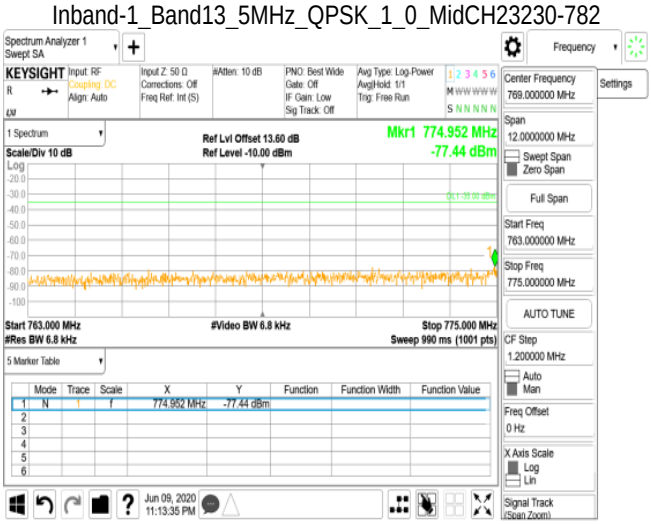
Inband-2_Band13_5MHz_QPSK_1_0_LowCH23205-779.5



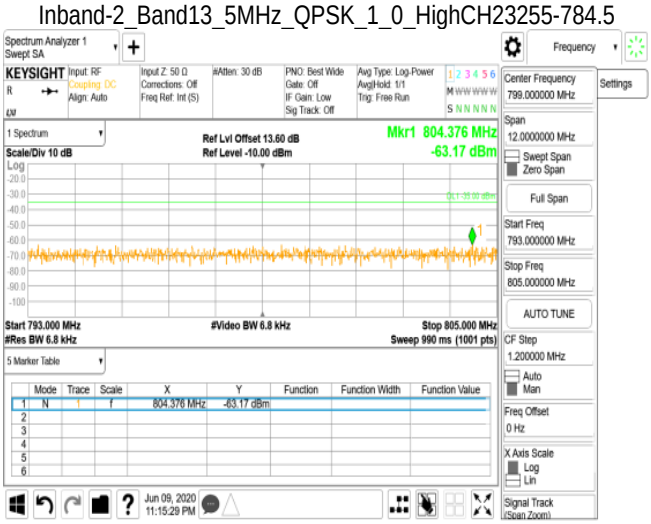
Inband-1_Band13_5MHz_QPSK_1_0_HighCH23255-784.5



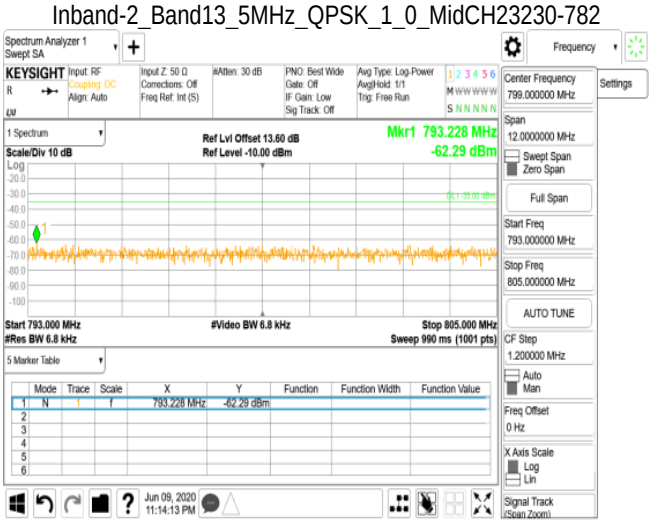
Inband-1_Band13_5MHz_QPSK_1_0_MidCH23230-782



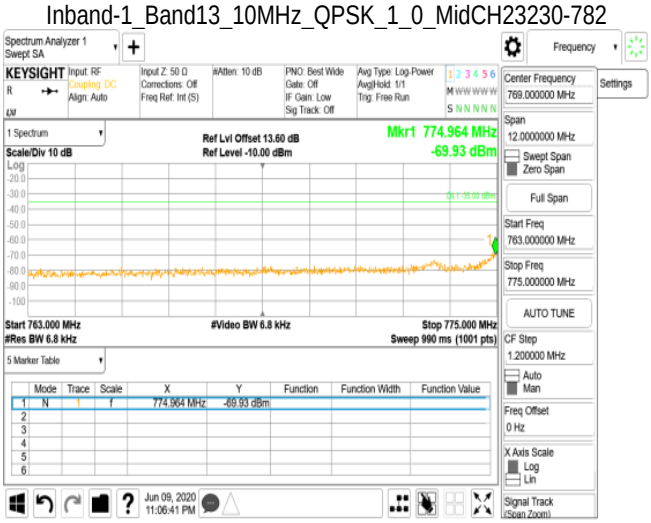
Inband-2_Band13_5MHz_QPSK_1_0_HighCH23255-784.5



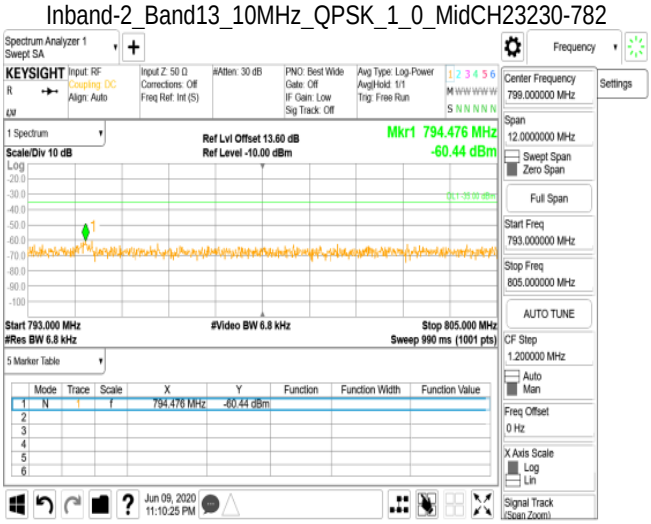
Inband-2_Band13_5MHz_QPSK_1_0_MidCH23230-782



Inband-1_Band13_10MHz_QPSK_1_0_MidCH23230-782



Inband-2_Band13_10MHz_QPSK_1_0_MidCH23230-782



9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

9.1 Standard Applicable

According to FCC §2.1053,

FCC §27.53(h), §27.53(c) (f)

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 LTE 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 LTE 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 LTE 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.

FCC §27.53(h)(3) for LTE 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.

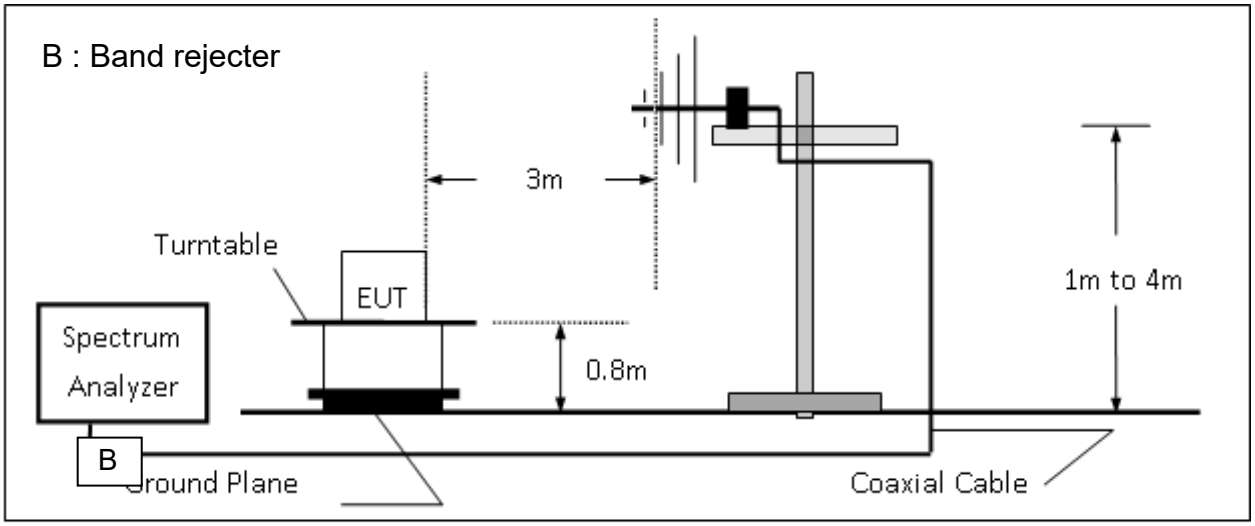
Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber Equipment

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	$43 + 10 \log_{10}(p)$

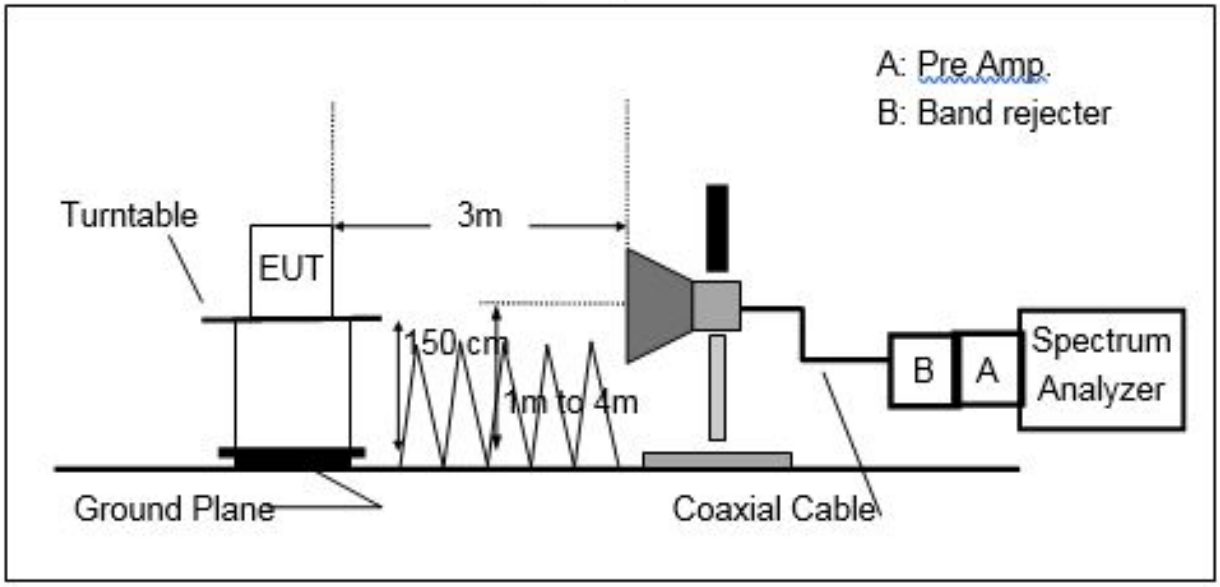
Note: Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 1.2 for the permitted frequency ranges for various equipment types.

9.2 EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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)

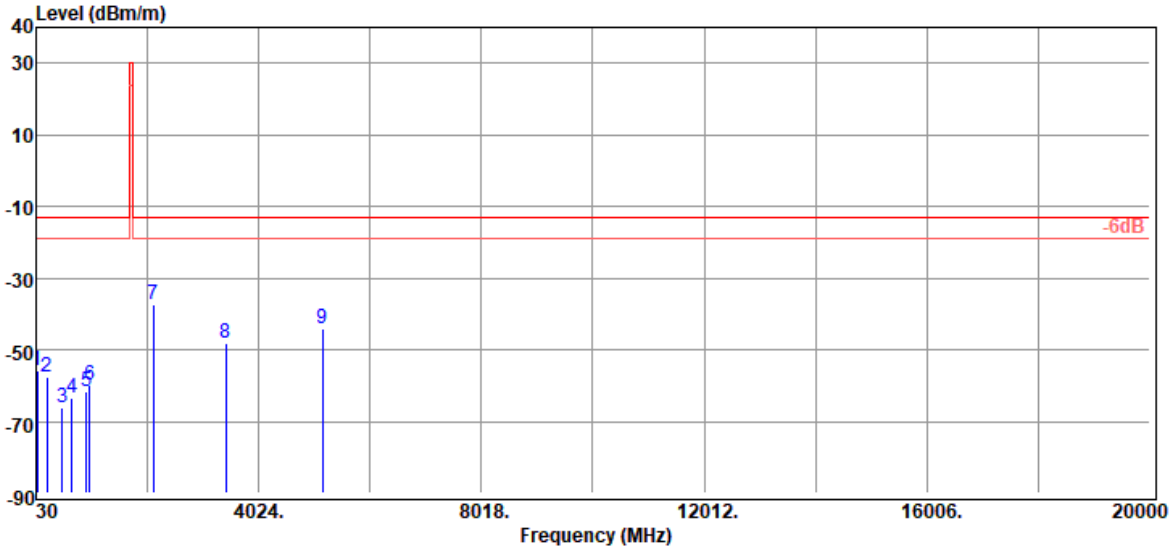
EIRP (dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

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	SCHWAZBECK	VULB 9168	9168-617	11/04/2019	11/03/2020
Broadband Antenna	TESEQ	CBL 6112D	35240	09/09/2019	09/08/2020
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/10/2020	01/09/2021
Horn Antenna	Schwarzbeck	BBHA9170	185	08/07/2019	08/06/2020
Horn Antenna	Schwarzbeck	BBHA9120D	1341	06/12/2019	06/11/2020
3m Site NSA	SGS	966 chamber D	N/A	07/12/2019	07/11/2020
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/15/2019	07/14/2020
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
Pre-Amplifier	EMC Instruments	EMC9135	980234	11/20/2019	11/19/2020
Pre-Amplifier	EMC Instruments	EMC12630SE	980271	11/20/2019	11/19/2020
Highpass Filter	Micro Tronics	BRM50701-01	G008	11/20/2019	11/19/2020
High Pass Filter	Micro-Tronics	G003	RF99	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
Lowpass Filter	Woken	EWT-56-0019	RF46	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

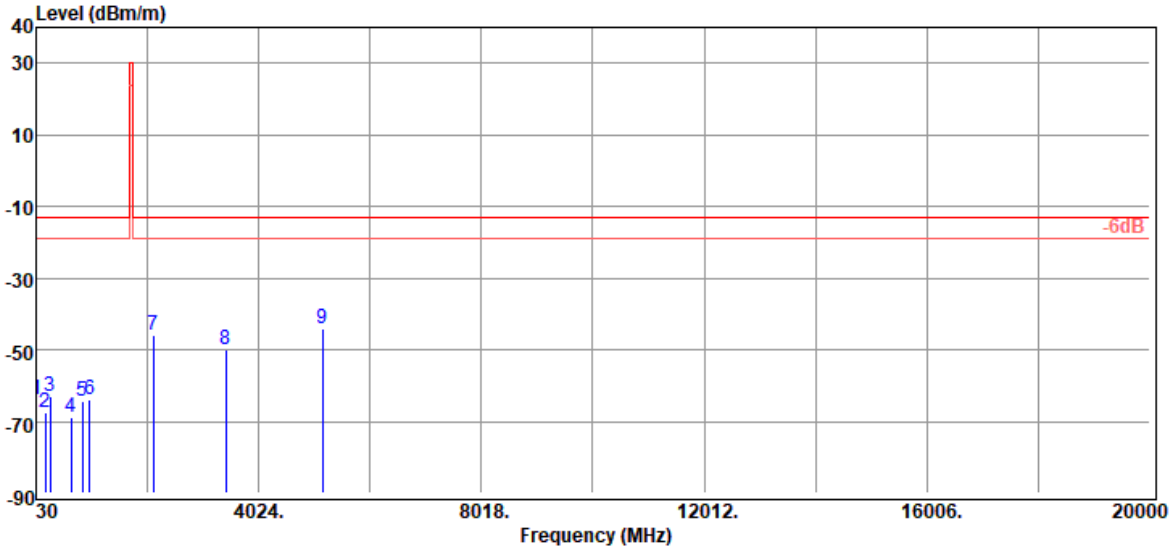
9.5 Measurement Result:

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B4	Temp./Humi.	:21.7/71
Test Mode	:TX CH LOW	Antenna Pol.	:VERTICAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:1720 MHz		



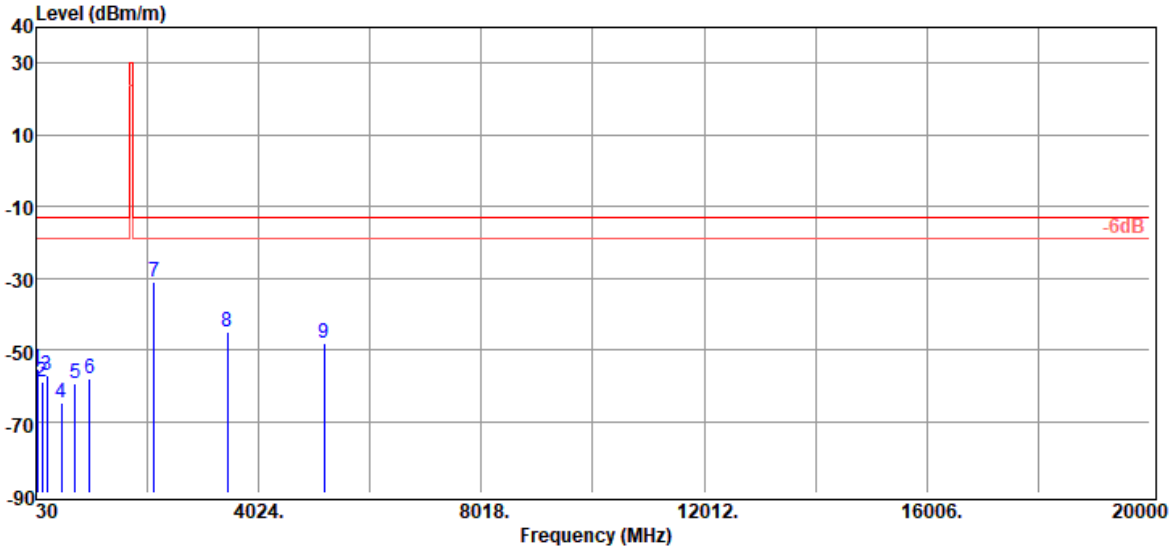
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
49.40	-55.75	-41.42	-13.59	-0.74	-13.00	-42.75
225.94	-57.66	-55.75	0.04	-1.95	-13.00	-44.66
498.51	-66.02	-62.81	-0.69	-2.52	-13.00	-53.02
667.29	-63.28	-61.30	0.35	-2.33	-13.00	-50.28
928.22	-61.86	-60.33	1.78	-3.31	-13.00	-48.86
994.18	-59.80	-58.10	1.68	-3.38	-13.00	-46.80
2128.90	-37.55	-42.60	9.37	-4.32	-13.00	-24.55
3440.00	-48.34	-55.61	12.50	-5.23	-13.00	-35.34
5160.00	-44.30	-50.41	12.66	-6.55	-13.00	-31.30

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B4	Temp./Humi.	:21.7/71
Test Mode	:TX CH LOW	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:1720 MHz		



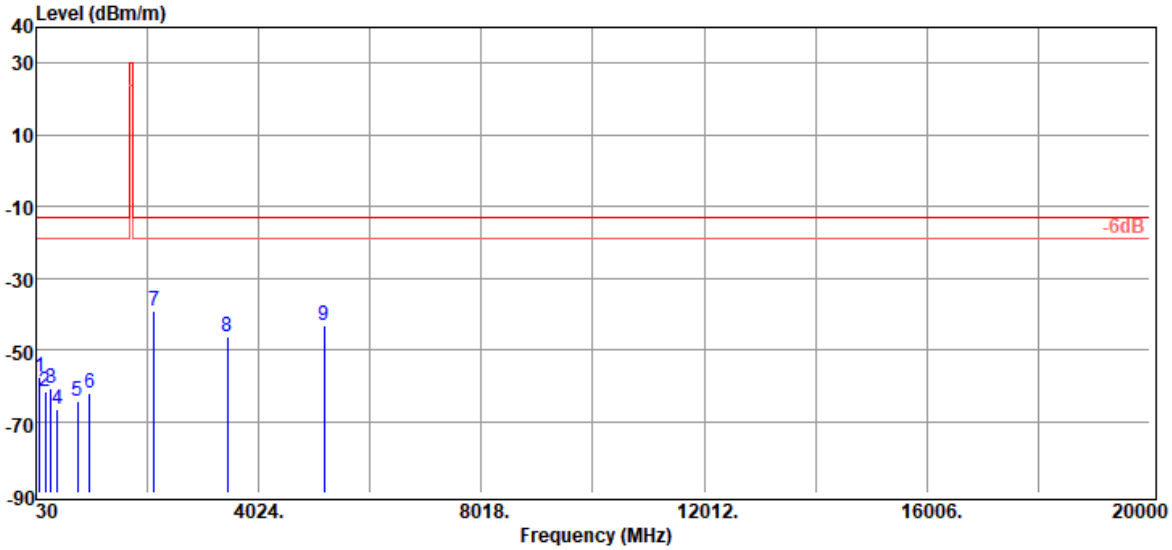
Freq.	EIRP/ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Margin
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
39.70	-63.76	-40.15	-22.88	-0.73	-13.00	-50.76
192.96	-67.49	-65.28	-0.43	-1.78	-13.00	-54.49
282.20	-63.22	-59.80	-1.23	-2.19	-13.00	-50.22
651.77	-68.79	-66.62	0.04	-2.21	-13.00	-55.79
868.08	-64.55	-62.61	1.33	-3.27	-13.00	-51.55
995.15	-63.83	-62.15	1.72	-3.40	-13.00	-50.83
2128.90	-45.88	-50.93	9.37	-4.32	-13.00	-32.88
3440.00	-50.09	-57.36	12.50	-5.23	-13.00	-37.09
5160.00	-44.23	-50.34	12.66	-6.55	-13.00	-31.23

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B4	Temp./Humi.	:21.7/71
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:1732.5 MHz		



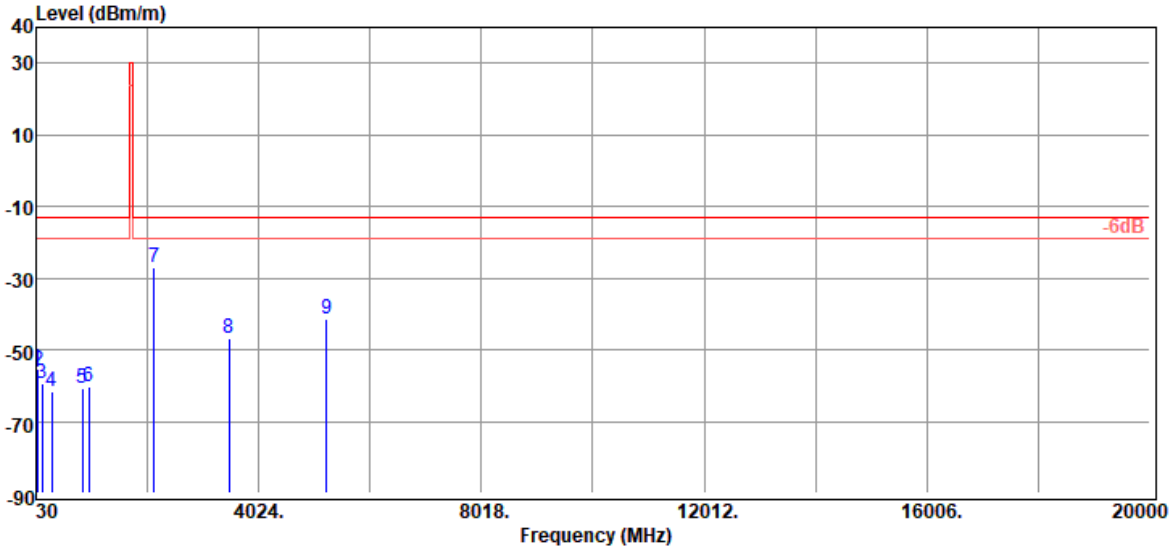
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
49.40	-55.37	-41.04	-13.59	-0.74	-13.00	-42.37
142.52	-58.82	-51.36	-5.91	-1.55	-13.00	-45.82
226.91	-57.38	-55.41	-0.02	-1.95	-13.00	-44.38
485.90	-64.66	-61.19	-0.81	-2.66	-13.00	-51.66
729.37	-59.31	-57.35	0.74	-2.70	-13.00	-46.31
993.21	-58.13	-56.39	1.63	-3.37	-13.00	-45.13
2143.10	-30.91	-35.82	9.26	-4.35	-13.00	-17.91
3465.00	-45.10	-52.24	12.44	-5.30	-13.00	-32.10
5197.50	-48.12	-54.33	12.88	-6.67	-13.00	-35.12

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B4	Temp./Humi.	:21.7/71
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:1732.5 MHz		



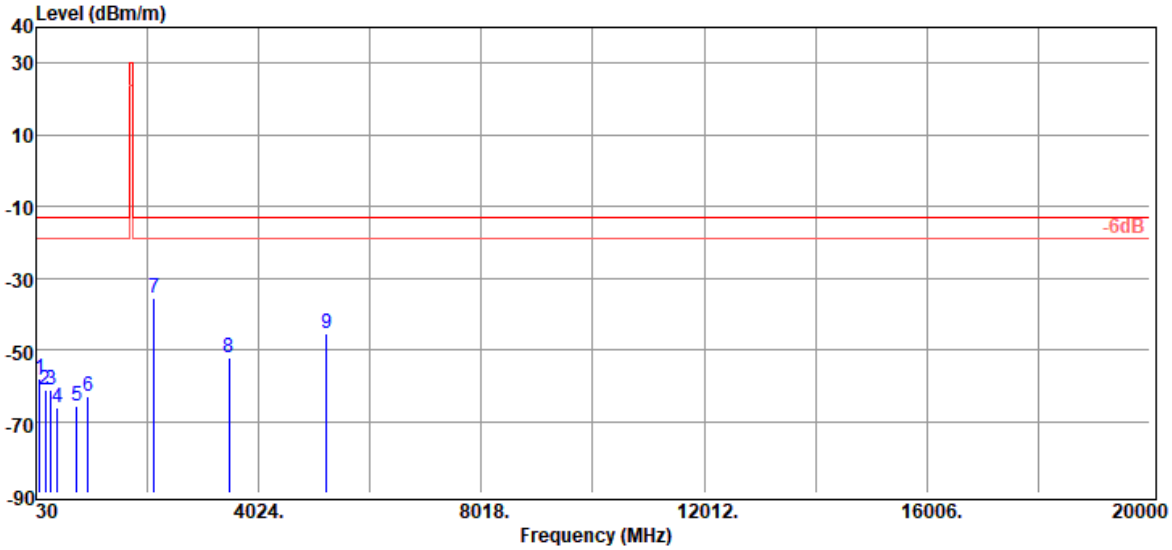
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
89.17	-57.55	-49.94	-6.57	-1.04	-13.00	-44.55
191.99	-61.77	-59.53	-0.47	-1.77	-13.00	-48.77
299.66	-60.78	-57.70	-0.81	-2.27	-13.00	-47.78
410.24	-66.69	-62.63	-1.08	-2.98	-13.00	-53.69
773.99	-64.15	-61.99	0.68	-2.84	-13.00	-51.15
997.09	-62.09	-60.36	1.69	-3.42	-13.00	-49.09
2143.10	-39.37	-44.28	9.26	-4.35	-13.00	-26.37
3465.00	-46.15	-53.29	12.44	-5.30	-13.00	-33.15
5197.50	-43.20	-49.41	12.88	-6.67	-13.00	-30.20

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B4	Temp./Humi.	:21.6/71
Test Mode	:TX CH HIGH	Antenna Pol.	:VERTICAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:1745 MHz		



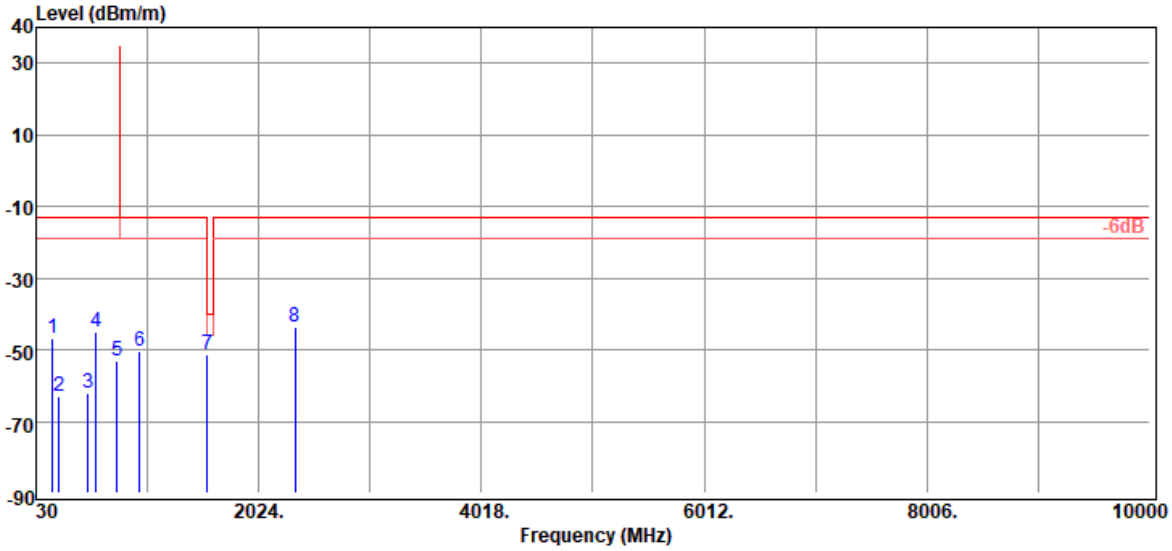
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
48.43	-55.49	-40.19	-14.56	-0.74	-13.00	-42.49
62.01	-55.91	-48.04	-6.99	-0.88	-13.00	-42.91
141.55	-59.30	-51.69	-6.07	-1.54	-13.00	-46.30
318.09	-61.76	-58.54	-0.71	-2.51	-13.00	-48.76
857.41	-60.98	-59.37	1.32	-2.93	-13.00	-47.98
978.66	-60.20	-58.32	1.50	-3.38	-13.00	-47.20
2150.20	-27.18	-32.02	9.20	-4.36	-13.00	-14.18
3490.00	-46.80	-53.78	12.34	-5.36	-13.00	-33.80
5235.00	-41.57	-48.17	13.18	-6.58	-13.00	-28.57

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B4	Temp./Humi.	:21.6/71
Test Mode	:TX CH HIGH	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:1745 MHz		



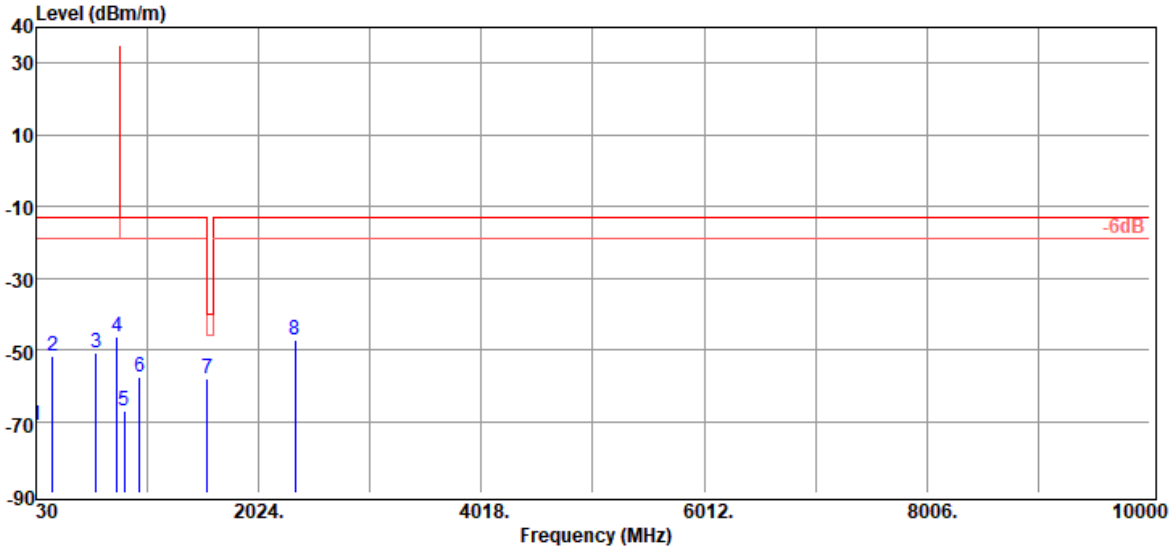
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
88.20	-58.26	-50.67	-6.55	-1.04	-13.00	-45.26
191.02	-61.42	-59.24	-0.42	-1.76	-13.00	-48.42
295.78	-61.19	-58.00	-0.92	-2.27	-13.00	-48.19
415.09	-66.34	-62.23	-1.18	-2.93	-13.00	-53.34
764.29	-65.72	-63.85	0.82	-2.69	-13.00	-52.72
958.29	-63.14	-61.18	1.63	-3.59	-13.00	-50.14
2150.20	-35.45	-40.29	9.20	-4.36	-13.00	-22.45
3490.00	-52.25	-59.23	12.34	-5.36	-13.00	-39.25
5235.00	-45.47	-52.07	13.18	-6.58	-13.00	-32.47

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B13	Temp./Humi.	:21.8/72
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:782 MHz		



Freq.	EIRP/ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Margin
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
175.50	-46.91	-43.84	-1.45	-1.62	-13.00	-33.91
234.67	-62.99	-60.52	-0.50	-1.97	-13.00	-49.99
495.60	-62.32	-59.06	-0.74	-2.52	-13.00	-49.32
567.38	-44.86	-41.40	-0.86	-2.60	-13.00	-31.86
751.68	-53.18	-51.31	0.75	-2.62	-13.00	-40.18
958.29	-50.56	-48.60	1.63	-3.59	-13.00	-37.56
1564.00	-51.49	-56.59	8.84	-3.74	-40.00	-11.49
2346.00	-43.83	-48.96	9.67	-4.54	-13.00	-30.83

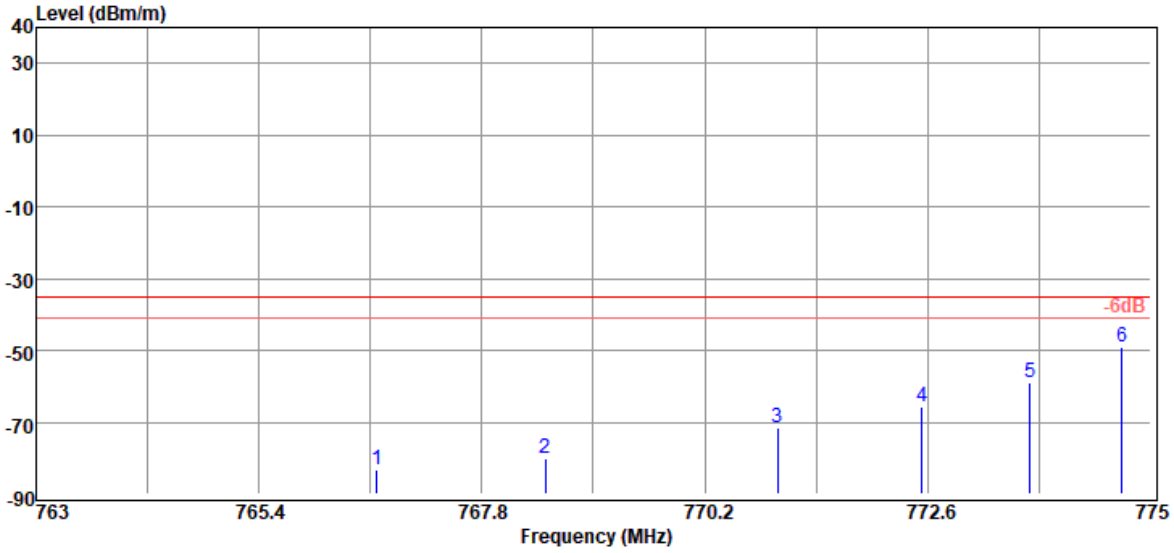
Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B13	Temp./Humi.	:21.8/72
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:782 MHz		



Freq.	EIRP/ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Margin
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
34.85	-70.91	-43.12	-27.17	-0.62	-13.00	-57.91
176.47	-51.84	-48.81	-1.41	-1.62	-13.00	-38.84
567.38	-51.00	-47.54	-0.86	-2.60	-13.00	-38.00
752.65	-46.50	-44.61	0.74	-2.63	-13.00	-33.50
817.64	-66.94	-65.42	1.36	-2.88	-13.00	-53.94
958.29	-57.56	-55.60	1.63	-3.59	-13.00	-44.56
1564.00	-58.18	-63.28	8.84	-3.74	-40.00	-18.18
2346.00	-47.29	-52.42	9.67	-4.54	-13.00	-34.29

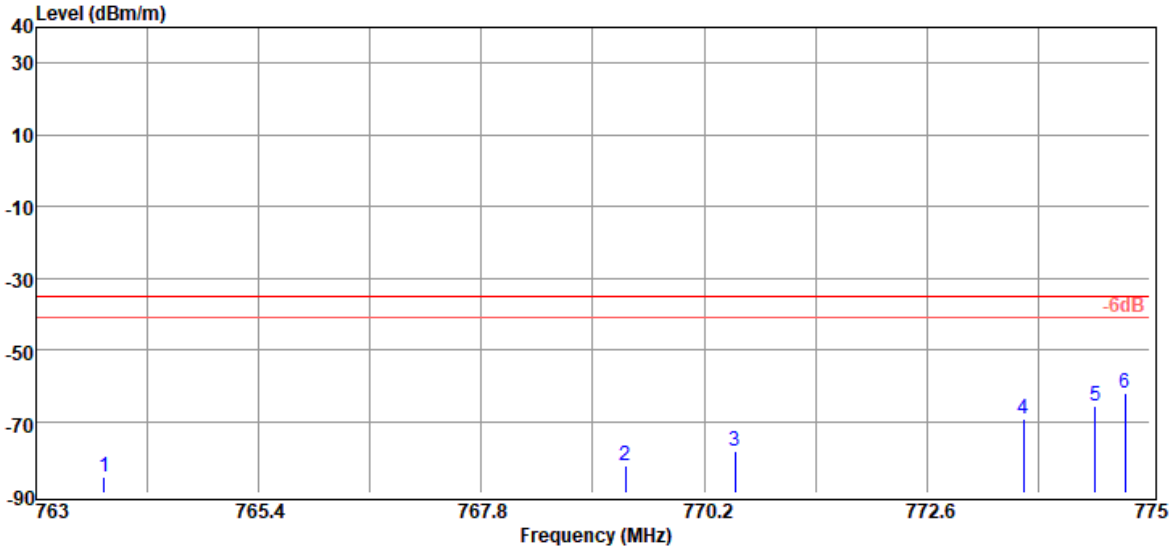
(763MHz~775MHz)

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B13	Temp./Humi.	:21.8/72
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:782 MHz		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
766.67	-83.23	-81.36	0.82	-2.69	-35.00	-48.23
768.48	-80.29	-78.40	0.80	-2.69	-35.00	-45.29
770.98	-71.71	-69.74	0.76	-2.73	-35.00	-36.71
772.54	-65.76	-63.70	0.72	-2.78	-35.00	-30.76
773.70	-59.15	-57.01	0.69	-2.83	-35.00	-24.15
774.69	-49.28	-47.08	0.66	-2.86	-35.00	-14.28

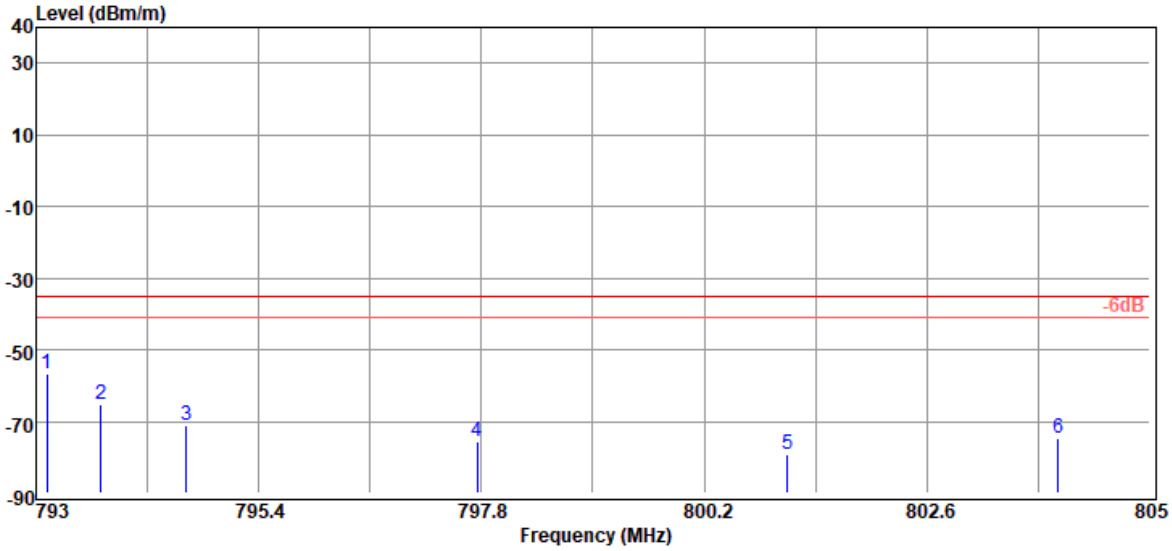
Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B13	Temp./Humi.	:21.8/72
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:782 MHz		



Freq.	EIRP/ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Margin
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
763.73	-85.39	-83.52	0.82	-2.69	-35.00	-50.39
769.35	-82.18	-80.29	0.80	-2.69	-35.00	-47.18
770.54	-78.17	-76.23	0.77	-2.71	-35.00	-43.17
773.64	-69.38	-67.24	0.69	-2.83	-35.00	-34.38
774.41	-65.62	-63.44	0.67	-2.85	-35.00	-30.62
774.74	-61.98	-59.77	0.66	-2.87	-35.00	-26.98

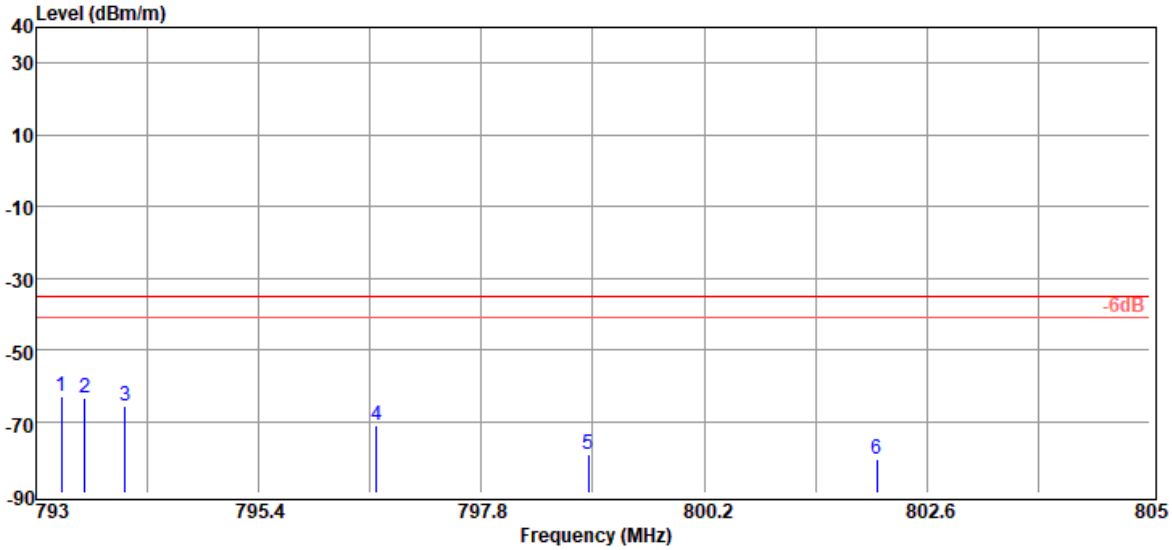
(793MHz~805MHz)

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B13	Temp./Humi.	:21.8/72
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:782 MHz		



Freq.	EIRP/ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Margin
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
793.12	-56.63	-54.59	0.89	-2.93	-35.00	-21.63
793.70	-65.34	-63.32	0.88	-2.90	-35.00	-30.34
794.62	-71.15	-69.15	0.87	-2.87	-35.00	-36.15
797.75	-75.53	-73.75	0.95	-2.73	-35.00	-40.53
801.10	-79.36	-77.75	1.03	-2.64	-35.00	-44.36
804.02	-74.62	-73.05	1.07	-2.64	-35.00	-39.62

Report Number	:E2/2020/50040	Test Date	:2020-06-02
Operation Mode	:LTE B13	Temp./Humi.	:21.8/72
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plan	Engineer	:Kailin
Test Frequency	:782 MHz		



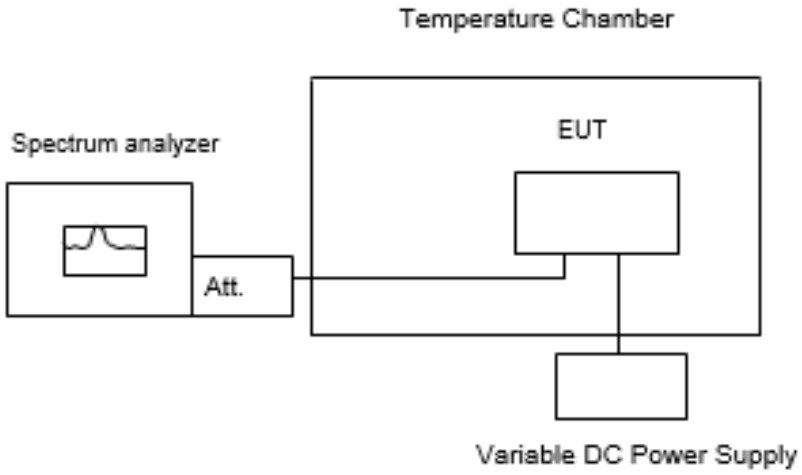
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
793.28	-62.98	-60.94	0.88	-2.92	-35.00	-27.98
793.53	-63.61	-61.58	0.88	-2.91	-35.00	-28.61
793.96	-65.65	-63.64	0.88	-2.89	-35.00	-30.65
796.67	-71.01	-69.15	0.92	-2.78	-35.00	-36.01
798.95	-79.14	-77.45	0.99	-2.68	-35.00	-44.14
802.06	-80.64	-79.04	1.04	-2.64	-35.00	-45.64

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.

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 Block	PASTERNACK	PE8210	RF32	11/20/2019	11/19/2020
Spectrum Analyzer	KEYSIGHT	N9010B	MY59070240	04/14/2019	04/13/2021
Temperature Chamber	TERCHY	MHK-120LK	1020582	07/09/2019	07/08/2020
Splitter	Marvelous	MVE8586	RF265	11/20/2019	11/19/2020
Attenuator	Marvelous	MVE2213-10	RF31	11/20/2019	11/19/2020
Radio Communication Analyer	Anritsu	MT8820C	6201107337	07/17/2019	07/16/2020

10.5 Measurement Result

Note: *The battery is rated 12Vdc.*

Reference Freq.:	LTE B4 Mid Channel	1732.5	MHz 20M QPSK CH 20175	
Power Supply Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Limit = +/- 2.5 ppm (Hz)
Freq. ERROR vs. VOLTAGE				
13.3	25	1732.500008	8	4331
12	25	1732.499997	-3	4331
11.6	25	1732.499996	-4	4331
11.5 (End Point)	25	1732.499999	-1	4331
Freq. ERROR vs. Temp.				
12	-30	1732.500007	7	4331
12	-20	1732.499997	-3	4331
12	-10	1732.500008	8	4331
12	0	1732.500003	3	4331
12	10	1732.499997	-3	4331
12	20	1732.500005	5	4331
12	30	1732.499997	-3	4331
12	40	1732.500007	7	4331
12	50	1732.499997	-3	4331

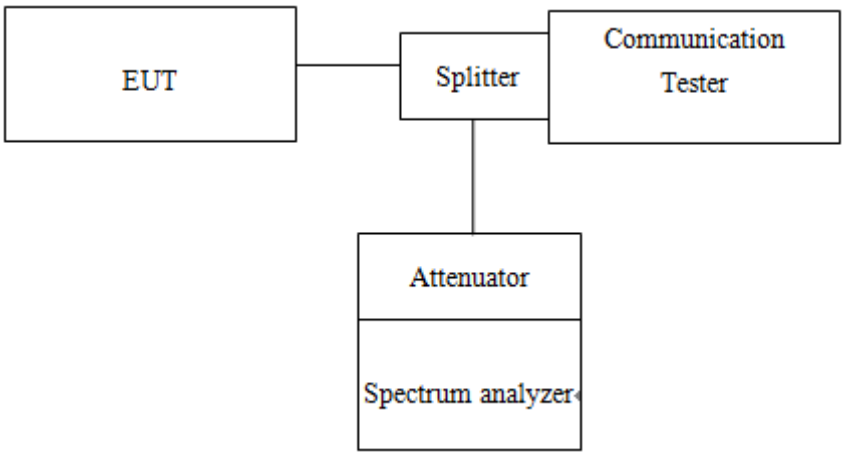
Reference Freq.:	LTE B13 Mid Channel		782	MHz 10M QPSK CH 23230
Power Supply Vdc	Temp. (℃)	Freq. (MHz)	Delta (Hz)	Limit = +/- 2.5 ppm (Hz)
Freq. ERROR vs. VOLTAGE				
13.3	25	782.000008	8	1955
12	25	781.999997	-3	1955
11.6	25	781.999996	-4	1955
11.5 (End Point)	25	781.999995	-5	1955
Freq. ERROR vs. Temp.				
12	-30	781.999995	-5	1955
12	-20	782.000008	8	1955
12	-10	782.000006	6	1955
12	0	782.000004	4	1955
12	10	782.000001	1	1955
12	20	781.999999	-1	1955
12	30	782.000002	2	1955
12	40	781.999997	-3	1955
12	50	782.000006	6	1955

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.

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 Block	PASTERNACK	PE8210	RF32	11/20/2019	11/19/2020
Spectrum Analyzer	KEYSIGHT	N9010B	MY59070240	04/14/2019	04/13/2021
Temperature Chamber	TERCHY	MHK-120LK	1020582	07/09/2019	07/08/2020
Splitter	Marvelous	MVE8586	RF265	11/20/2019	11/19/2020
Attenuator	Marvelous	MVE2213-10	RF31	11/20/2019	11/19/2020
Radio Communication Analyer	Anritsu	MT8820C	6201107337	07/17/2019	07/16/2020

11.5 Measurement Result

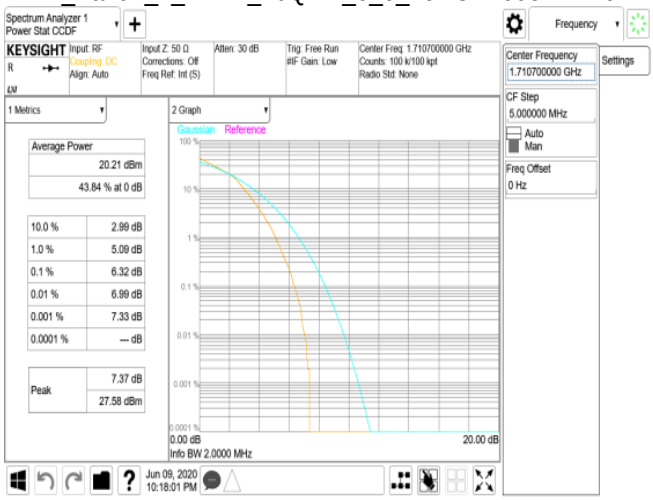
LTE BAND 4							
Channel bandwidth: 1.4MHz				Channel bandwidth: 3MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
1710.7	19957	6.32	13	1711.5	19965	6.45	13
1732.5	20175	6.49	13	1732.5	20175	6.45	13
1754.3	20393	6.42	13	1753.5	20385	6.50	13

LTE BAND 4							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
1712.5	19957	6.20	13	1715.0	20000	6.42	13
1732.5	20175	6.36	13	1732.5	20175	6.40	13
1752.5	20375	6.41	13	1750.0	20350	6.30	13

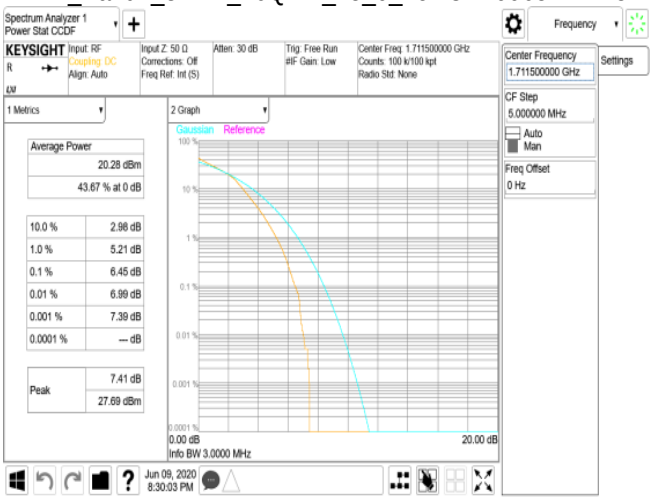
LTE BAND 4							
Channel bandwidth: 15MHz				Channel bandwidth: 20MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
1717.5	20025	6.32	13	1720.0	20050	6.44	13
1732.5	20175	6.28	13	1732.5	20175	6.41	13
1747.5	20325	6.30	13	1745.0	20300	6.37	13

LTE BAND 13							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
779.5	23205	6.74	13	782.0	23230	6.46	13
782.0	23230	6.59	13				
784.5	23255	6.91	13				

LTE_Band4_1_4MHz_16QAM_6_0_LowCH19957-1710.7



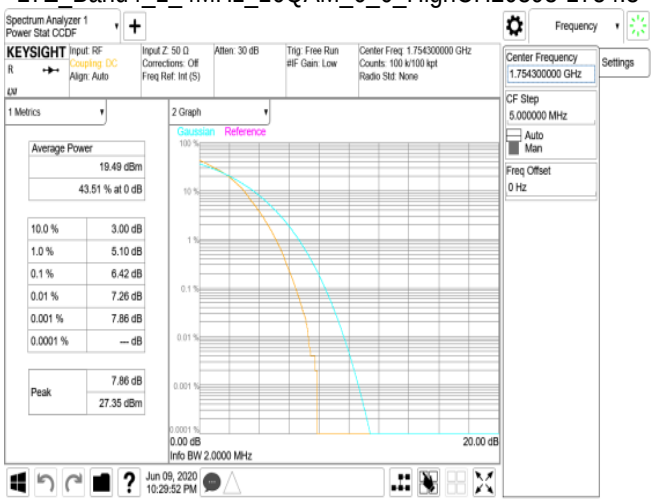
LTE_Band4_3MHz_16QAM_15_0_LowCH19965-1711.5



LTE_Band4_1_4MHz_16QAM_6_0_MidCH20175-1732.5

LTE_Band4_3MHz_16QAM_15_0_MidCH20175-1732.5

LTE_Band4_1_4MHz_16QAM_6_0_HighCH20393-1754.3



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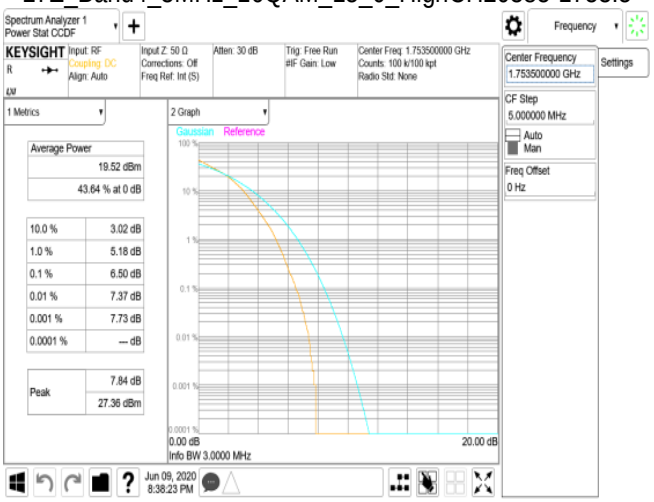
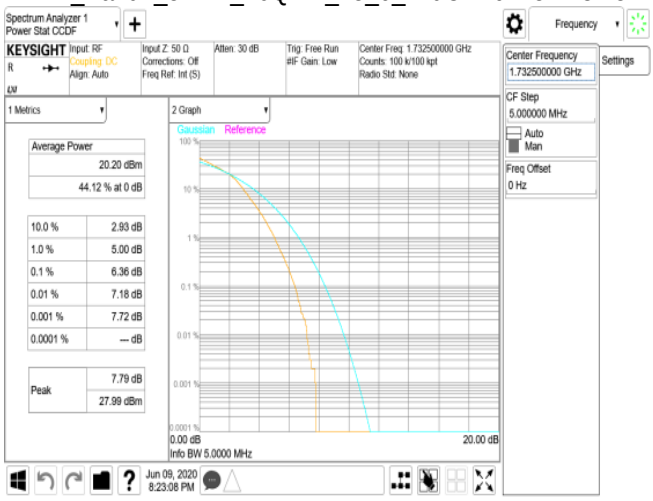


LTE_Band4_5MHz_16QAM_25_0_LowCH19975-1712.5

LTE_Band4_10MHz_16QAM_50_0_LowCH20000-1715

LTE_Band4_5MHz_16QAM_25_0_MidCH20175-1732.5



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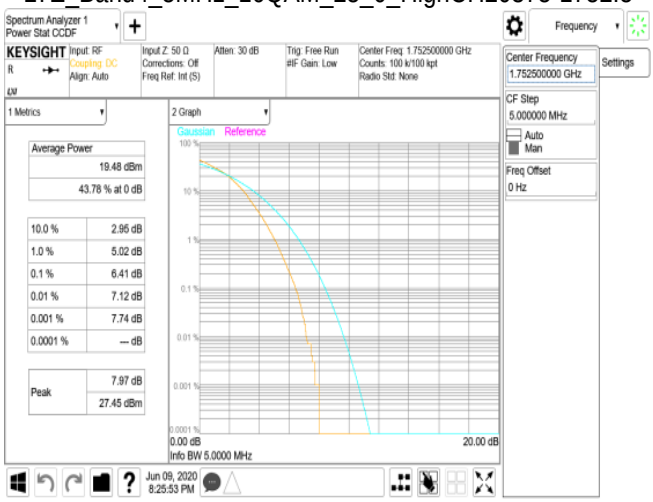

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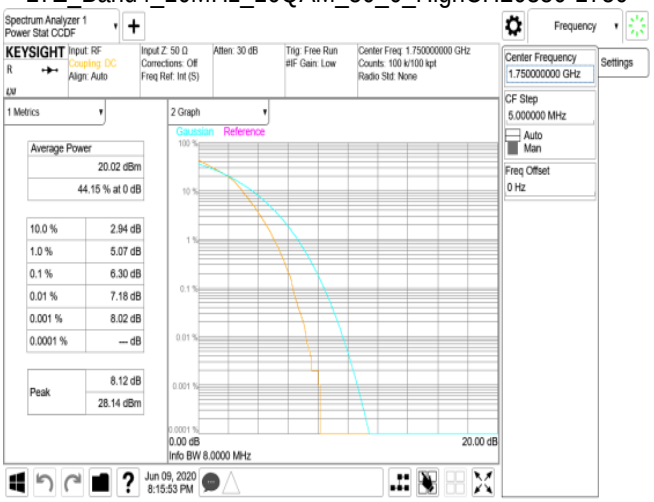

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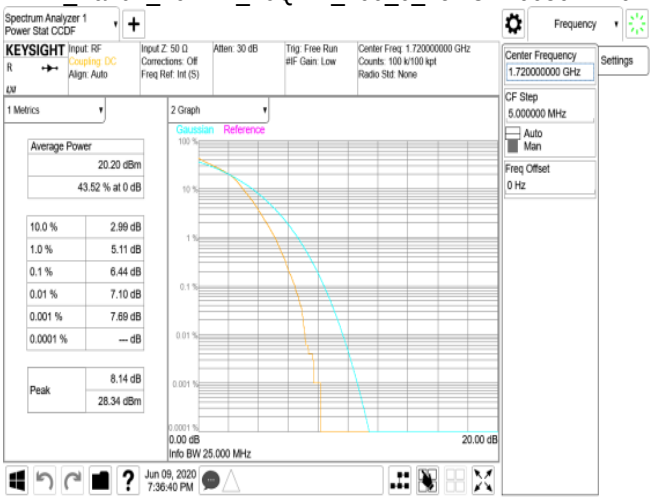

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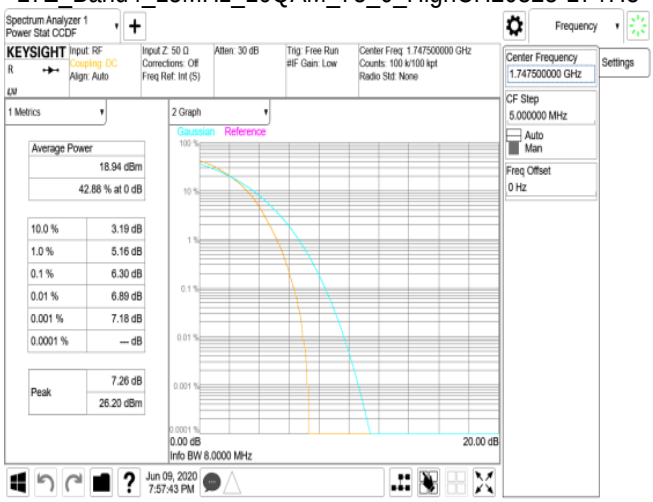
LTE_Band4_20MHz_16QAM_100_0_MidCH20175-1732.5

LTE_Band4_15MHz_16QAM_75_0_HighCH20325-1747.5



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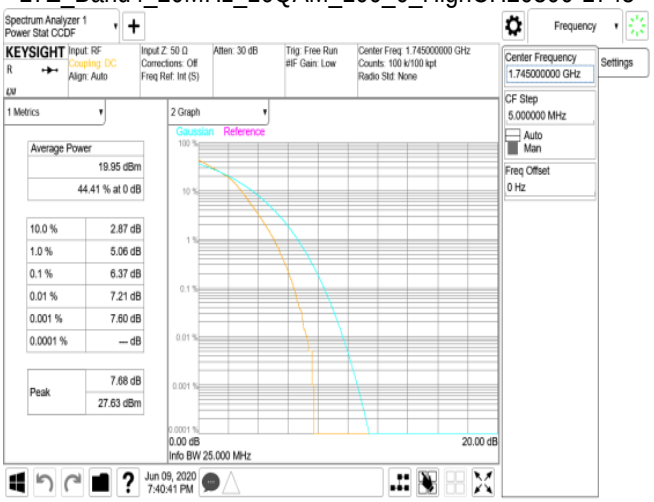

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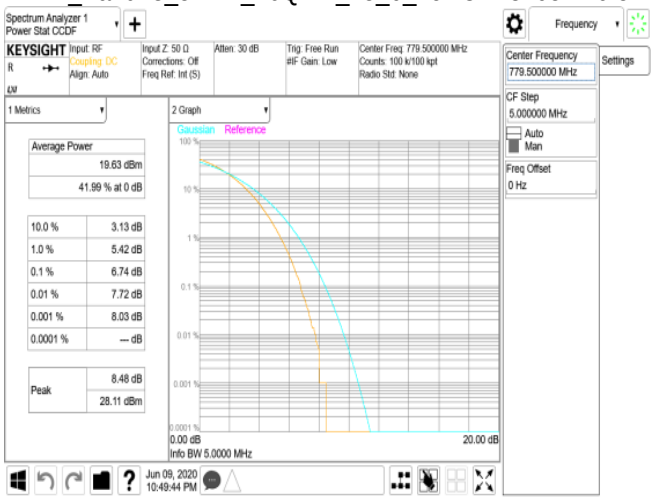

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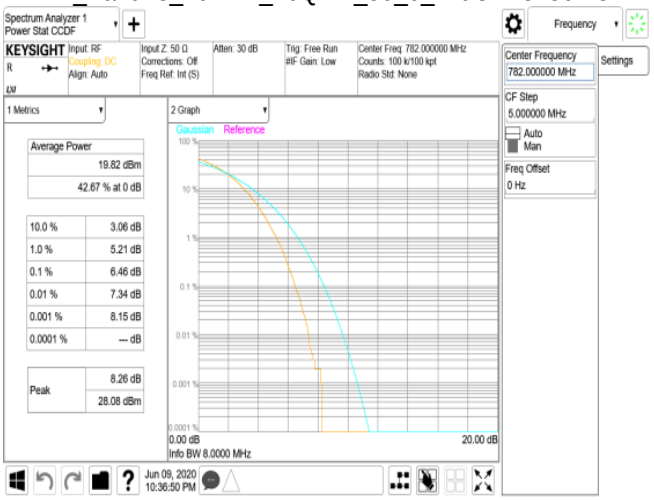

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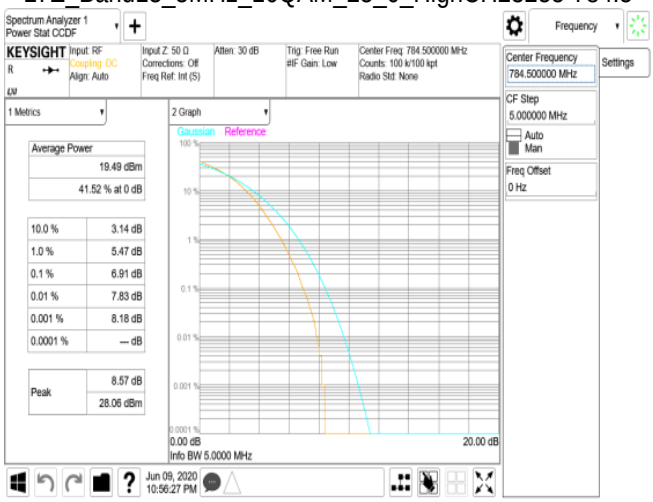
LTE_Band13_5MHz_16QAM_25_0_HighCH23255-784.5



~ End of Report ~