QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	1317915
Date:	7/8/2020
Test Engineer:	30606
Configuration:	EUT only
Mode	LTE Band 2 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.72639	39.53	Pk	33.4	-27.2	-95.2	-49.47	-13	-36.47	H
3.74352	40.19	Pk	33.4	-27.1	-95.2	-48.71	-13	-35.71	V
5.57112	38.19	Pk	34.9	-26.4	-95.2	-48.51	-13	-35.51	V
5.60476	37.87	Pk	34.9	-26.4	-95.2	-48.83	-13	-35.83	H
7.42108	35.45	Pk	35.8	-23.6	-95.2	-47.55	-13	-34.55	V
7.44021	35.93	Pk	35.8	-23.8	-95.2	-47.27	-13	-34.27	H
Mid Channel, 1880MHz									
3.73496	39.86	Pk	33.4	-27.1	-95.2	-49.04	-13	-36.04	H
3.7801	40.55	Pk	33.6	-27.2	-95.2	-48.25	-13	-35.25	V
5.55405	38.54	Pk	34.8	-26.6	-95.2	-48.46	-13	-35.46	V
5.61147	38.11	Pk	34.9	-26.4	-95.2	-48.59	-13	-35.59	H
7.51384	36.43	Pk	35.8	-23.4	-95.2	-46.37	-13	-33.37	H
7.52828	36.55	Pk	35.8	-23.1	-95.2	-45.95	-13	-32.95	V
High Channel, 1900MHz									
3.79298	39.96	Pk	33.7	-27.4	-95.2	-48.94	-13	-35.94	H
3.79775	41.14	Pk	33.7	-27.4	-95.2	-47.76	-13	-34.76	V
5.67953	38.84	Pk	34.8	-26.6	-95.2	-48.16	-13	-35.16	V
5.68542	38.61	Pk	34.8	-26.7	-95.2	-48.49	-13	-35.49	H
7.61445	35.05	Pk	35.7	-21.3	-95.2	-45.75	-13	-32.75	H
7.61519	35.51	Pk	35.7	-21.3	-95.2	-45.29	-13	-32.29	V

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9.3.2. LTE BAND 5 AND 5G NR Band n5

LIMITS

FCC: §22.917(a)
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.

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QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/14/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE Band 5 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 829MHz									
1.6652	41.66	Pk	28.7	-32.8	-95.2	-57.64	-13	-44.64	V
1.67552	41.75	Pk	28.9	-32.8	-95.2	-57.35	-13	-44.35	H
2.49822	41.46	Pk	32.6	-31.9	-95.2	-53.04	-13	-40.04	V
2.50251	41.35	Pk	32.6	-31.8	-95.2	-53.05	-13	-40.05	H
3.36078	40.46	Pk	32.8	-30.7	-95.2	-52.64	-13	-39.64	H
3.38328	40.29	Pk	32.8	-30.7	-95.2	-52.81	-13	-39.81	V
Mid Channel, 836.5MHz									
1.6652	41.66	Pk	28.7	-32.8	-95.2	-57.64	-13	-44.64	V
1.67552	41.75	Pk	28.9	-32.8	-95.2	-57.35	-13	-44.35	H
2.49822	41.46	Pk	32.6	-31.9	-95.2	-53.04	-13	-40.04	V
2.50251	41.35	Pk	32.6	-31.8	-95.2	-53.05	-13	-40.05	H
3.36078	40.46	Pk	32.8	-30.7	-95.2	-52.64	-13	-39.64	H
3.38328	40.29	Pk	32.8	-30.7	-95.2	-52.81	-13	-39.81	V
High Channel, 844MHz									
1.68569	41.43	Pk	28.9	-32.7	-95.2	-57.57	-13	-44.57	H
1.69428	41.8	Pk	28.8	-32.7	-95.2	-57.3	-13	-44.3	V
2.51869	43.82	Pk	32.6	-31.8	-95.2	-50.58	-13	-37.58	H
2.53489	41.14	Pk	32.6	-31.7	-95.2	-53.16	-13	-40.16	V
3.3878	39.94	Pk	32.7	-30.8	-95.2	-53.36	-13	-40.36	H
3.40806	40.9	Pk	32.8	-30.6	-95.2	-52.1	-13	-39.1	V

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QPSK 5G NR Band n5 (20.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/18/2020
Test Engineer:	19497
Configuration:	EUT only
Mode	5G NR Band n5 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 834MHz									
1.66215	38.49	Pk	29	-32.3	-95.2	-59.21	-13	-46.21	V
1.67079	41.29	Pk	29	-32.2	-95.2	-56.41	-13	-43.41	H
2.4952	41.78	Pk	33.5	-31.3	-95.2	-50.62	-13	-37.62	H
2.49591	40.88	Pk	33.5	-31.3	-95.2	-51.52	-13	-38.52	V
3.35102	40.92	Pk	33	-30.1	-95.2	-50.78	-13	-37.78	V
3.35299	40.26	Pk	33	-30.1	-95.2	-51.44	-13	-38.44	H
Mid Channel, 836.5MHz									
1.67178	42.16	Pk	29	-32.2	-95.2	-55.54	-13	-42.54	H
1.67943	42.29	Pk	28.9	-32.2	-95.2	-55.51	-13	-42.51	V
2.5056	40.63	Pk	33.5	-31.4	-95.2	-51.77	-13	-38.77	V
2.51059	41.1	Pk	33.5	-31.4	-95.2	-51.3	-13	-38.3	H
3.34568	40.33	Pk	33	-30.1	-95.2	-51.37	-13	-38.37	V
3.35008	41.04	Pk	33	-30.1	-95.2	-50.66	-13	-37.66	H
High Channel, 839MHz									
1.68194	41.52	Pk	28.9	-32.2	-95.2	-56.28	-13	-43.28	V
1.68194	37.32	Pk	28.9	-32.2	-95.2	-60.48	-13	-47.48	V
1.6838	41.97	Pk	29	-32.2	-95.2	-55.73	-13	-42.73	H
2.51649	40.88	Pk	33.5	-31.4	-95.2	-51.42	-13	-38.42	H
2.51924	40.98	Pk	33.5	-31.3	-95.2	-51.22	-13	-38.22	V
3.35395	40.24	Pk	33	-30.1	-95.2	-51.46	-13	-38.46	V

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9.3.3. LTE BAND 7

LIMITS

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

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QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/14/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE Band 7 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
5.02667	39.54	Pk	34.3	-28.8	-95.2	-50.16	-25	-25.16	V
5.0339	39.77	Pk	34.3	-28.9	-95.2	-50.03	-25	-25.03	H
7.51376	36.01	Pk	35.8	-24.4	-95.2	-47.79	-25	-22.79	H
7.52386	36.86	Pk	35.7	-24.5	-95.2	-47.14	-25	-22.14	V
9.99203	34.88	Pk	37	-21.9	-95.2	-45.22	-25	-20.22	V
10.10644	36.21	Pk	37.1	-22.1	-95.2	-43.99	-25	-18.99	H
Mid Channel, 2535MHz									
5.06554	39.1	Pk	34.3	-28.7	-95.2	-50.5	-25	-25.5	H
5.0984	38.75	Pk	34.5	-28.6	-95.2	-50.55	-25	-25.55	V
7.57095	36.44	Pk	35.8	-24.4	-95.2	-47.36	-25	-22.36	V
7.60275	37.27	Pk	35.8	-24.6	-95.2	-46.73	-25	-21.73	H
10.157	35.51	Pk	37.2	-21.9	-95.2	-44.39	-25	-19.39	H
10.19012	35.32	Pk	37.2	-21.9	-95.2	-44.58	-25	-19.58	V
High Channel, 2560MHz									
5.09392	-68.01	Pk	34.5	-28.7	11	-51.21	-25	-26.21	144
5.15012	-67.47	Pk	34.6	-28.6	11.2	-50.27	-25	-25.27	300
7.66589	-70.03	Pk	35.8	-24.2	11.2	-47.23	-25	-22.23	213
7.68393	-71.16	Pk	35.8	-23.8	11.2	-47.96	-25	-22.96	102
10.09029	-71.73	Pk	37.1	-22.1	10.5	-46.23	-25	-21.23	289
10.09267	-71.41	Pk	37.1	-22.1	10.4	-46.01	-25	-21.01	308

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9.3.4. LTE BAND 12 AND 5G NR Band n12

LIMITS

FCC: §27.53 (g)
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.

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QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/20/2020
Test Engineer:	31300
Configuration:	EUT only
Mode	5G NR Band n12 QPSK 15MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 704MHz									
1.4039	42.45	Pk	28.8	-33.1	-95.2	-57.05	-13	-44.05	V
1.40967	41.6	Pk	28.7	-33.1	-95.2	-58	-13	-45	H
2.12091	41.58	Pk	31.7	-32.2	-95.2	-54.12	-13	-41.12	H
2.13926	41.7	Pk	31.7	-32.1	-95.2	-53.9	-13	-40.9	V
2.82447	40.53	Pk	32.4	-31.3	-95.2	-53.57	-13	-40.57	H
2.85929	40.56	Pk	32.5	-31.1	-95.2	-53.24	-13	-40.24	V
Mid Channel, 707.5MHz									
1.42359	41.97	Pk	28.5	-33.1	-95.2	-57.83	-13	-44.83	V
1.42396	42.56	Pk	28.5	-33.1	-95.2	-57.24	-13	-44.24	H
2.13313	40.94	Pk	31.7	-32.1	-95.2	-54.66	-13	-41.66	H
2.13675	41.66	Pk	31.7	-32.1	-95.2	-53.94	-13	-40.94	V
2.84353	40.85	Pk	32.4	-31.1	-95.2	-53.05	-13	-40.05	H
2.84694	41.01	Pk	32.4	-31.1	-95.2	-52.89	-13	-39.89	V
High Channel, 711MHz									
1.41566	-64.95	Pk	28.6	-33.1	10.9	-58.55	-13	-45.55	158
1.42046	-64.69	Pk	28.6	-33	10.7	-58.39	-13	-45.39	56
2.12906	-66.08	Pk	31.7	-32.2	13.4	-53.18	-13	-40.18	301
2.14431	-65.6	Pk	31.6	-32	12	-54	-13	-41	290
3.04098	-67.04	Pk	33.1	-30.8	11.8	-52.94	-13	-39.94	115
3.05973	-66.62	Pk	33.4	-30.8	11.7	-52.32	-13	-39.32	161

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QPSK 5G NR Band n12 (15.0MHZ BANDWIDTH)

Project #:	13179116
Date:	7/29/2020
Test Engineer:	50820
Configuration:	EUT only
Mode	5G NR Band n12 QPSK 15MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 706.5MHz									
1.40992	41.79	Pk	29.1	-32.7	-95.2	-56.11	-13	-43.11	V
1.41297	41.63	Pk	29.1	-32.7	-95.2	-56.27	-13	-43.27	H
2.10728	42.02	Pk	31.7	-31.9	-95.2	-52.88	-13	-39.88	V
2.11542	41.95	Pk	31.7	-31.8	-95.2	-52.85	-13	-39.85	H
2.82323	40.05	Pk	32.6	-30.7	-95.2	-52.55	-13	-39.55	V
2.82584	40.04	Pk	32.6	-30.6	-95.2	-52.46	-13	-39.46	H
Mid Channel, 707.5MHz									
1.42551	41.54	Pk	29	-32.6	-95.2	-56.36	-13	-43.36	V
1.42861	41.37	Pk	29	-32.6	-95.2	-56.53	-13	-43.53	H
2.1332	41.11	Pk	31.5	-31.5	-95.2	-53.59	-13	-40.59	V
2.13634	40.93	Pk	31.6	-31.5	-95.2	-53.67	-13	-40.67	H
2.81567	40.34	Pk	32.6	-30.7	-95.2	-52.36	-13	-39.36	V
2.81726	41.1	Pk	32.6	-30.7	-95.2	-51.6	-13	-38.6	H
High Channel, 708.5MHz									
1.40911	41.81	Pk	29.2	-32.7	-95.2	-55.99	-13	-42.99	V
1.41113	42.31	Pk	29.1	-32.7	-95.2	-55.59	-13	-42.59	H
2.13632	41.29	Pk	31.6	-31.5	-95.2	-53.31	-13	-40.31	V
2.13723	40.76	Pk	31.6	-31.5	-95.2	-53.84	-13	-40.84	H
2.8361	39.71	Pk	32.5	-30.6	-95.2	-52.89	-13	-39.89	H
2.83702	39.88	Pk	32.5	-30.6	-95.2	-52.72	-13	-39.72	V

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9.3.5. LTE BAND 13

LIMITS

FCC: §27.53
(c) 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.
(f) 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.

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/14/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE Band 13 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 782MHz									
1.56079	42.16	Pk	28	-33	-95.2	-58.04	-40	-18.04	V
1.56106	41.58	Pk	28	-33	-95.2	-58.62	-40	-18.62	H
2.33037	41.37	Pk	31.9	-31.9	-95.2	-53.83	-13	-40.83	H
2.33806	41.33	Pk	31.8	-31.9	-95.2	-53.97	-13	-40.97	V
3.1239	40.76	Pk	33.1	-31	-95.2	-52.34	-13	-39.34	H
3.154	40.17	Pk	32.9	-31	-95.2	-53.13	-13	-40.13	V

*** Emissions in the GPS band were wideband emissions therefore the -40dBm/MHz limit was used.**

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9.3.6. LTE BAND 14

LIMITS

FCC: §90.543 Emission Limitations. (Band 14)
(e) For operations in the 758-768 MHz and the 788-798 MHz bands, 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:
(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics 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

QPSK LTE BAND 14 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/22/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode	LTE Band 14 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 793MHz									
1.58403	41.66	Pk	28.1	-32.9	-95.2	-58.34	-40	-18.34	V
1.58532	42.23	Pk	28.1	-32.9	-95.2	-57.77	-40	-17.77	H
2.38024	41.36	Pk	32.2	-31.8	-95.2	-53.44	-13	-40.44	V
2.38094	40.96	Pk	32.2	-31.8	-95.2	-53.84	-13	-40.84	H
3.1719	40.65	Pk	32.9	-30.9	-95.2	-52.55	-13	-39.55	H
3.17344	40.61	Pk	32.9	-30.9	-95.2	-52.59	-13	-39.59	V

*** Emissions in the GPS band were wideband emissions therefore the -40dBm/MHz limit was used.**

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9.3.7. LTE BAND 17

LIMITS

FCC: §27.53 (g)
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.

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/16/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE Band 17 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 710MHz									
1.44538	41.78	Pk	28.3	-33	-95.2	-58.12	-13	-45.12	V
1.44629	41.61	Pk	28.3	-33	-95.2	-58.29	-13	-45.29	H
2.12975	42.38	Pk	31.7	-32.2	-95.2	-53.32	-13	-40.32	H
2.13265	41.35	Pk	31.7	-32.1	-95.2	-54.25	-13	-41.25	V
2.8219	40.82	Pk	32.5	-31.3	-95.2	-53.18	-13	-40.18	V
2.84294	41.27	Pk	32.4	-31.1	-95.2	-52.63	-13	-39.63	H

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9.3.8. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

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QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/15/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE Band 25 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.71057	41.57	Pk	33.3	-29.9	-95.2	-50.23	-13	-37.23	H
3.71776	40.84	Pk	33.3	-29.9	-95.2	-50.96	-13	-37.96	V
5.55317	40.69	Pk	34.8	-27.8	-95.2	-47.51	-13	-34.51	H
5.55357	43.78	Pk	34.8	-27.8	-95.2	-44.42	-13	-31.42	V
7.41188	36.2	Pk	35.7	-24.7	-95.2	-48	-13	-35	V
7.44584	37.03	Pk	35.7	-24.8	-95.2	-47.27	-13	-34.27	H
Mid Channel, 1882.5MHz									
3.77261	41.15	Pk	33.6	-30.1	-95.2	-50.55	-13	-37.55	H
3.77434	41.23	Pk	33.6	-30.1	-95.2	-50.47	-13	-37.47	V
5.62064	42.45	Pk	34.8	-27.7	-95.2	-45.65	-13	-32.65	V
5.62089	41.34	Pk	34.8	-27.7	-95.2	-46.76	-13	-33.76	H
7.53435	37.26	Pk	35.8	-24.6	-95.2	-46.74	-13	-33.74	H
7.55682	37.1	Pk	35.7	-24.7	-95.2	-47.1	-13	-34.1	V
High Channel, 1905MHz									
3.77775	41.1	Pk	33.6	-30.1	-95.2	-50.6	-13	-37.6	V
3.82742	40.93	Pk	33.7	-29.9	-95.2	-50.47	-13	-37.47	H
5.66219	38.9	Pk	34.8	-27.9	-95.2	-49.4	-13	-36.4	V
5.68788	39.98	Pk	34.8	-28.1	-95.2	-48.52	-13	-35.52	H
7.63253	37.1	Pk	35.8	-24.1	-95.2	-46.4	-13	-33.4	V
7.63504	36.48	Pk	35.8	-24.1	-95.2	-47.02	-13	-34.02	H

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9.3.9. LTE BAND 26 (PART 90S)

LIMITS

FCC: §90.691
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.

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/15/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE Band 26 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 819MHz									
1.67311	41.62	Pk	28.9	-32.8	-95.2	-57.48	-13	-44.48	H
1.67348	42.8	Pk	28.9	-32.8	-95.2	-56.3	-13	-43.3	V
2.44339	42.17	Pk	32.5	-31.8	-95.2	-52.33	-13	-39.33	V
2.44373	46.04	Pk	32.5	-31.8	-95.2	-48.46	-13	-35.46	H
3.2704	40.26	Pk	32.9	-30.7	-95.2	-52.74	-13	-39.74	V
3.29442	41.01	Pk	32.9	-30.7	-95.2	-51.99	-13	-38.99	H

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9.3.10. LTE BAND 30

LIMITS

FCC: §27.53 (a)
For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/22/2020
Test Engineer:	20792
Configuration:	EUT Only
Mode:	LTE Band 30 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.61856	40.14	Pk	34.3	-29.5	-95.2	-50.26	-40	-10.26	H
4.62018	40.57	Pk	34.3	-29.5	-95.2	-49.83	-40	-9.83	V
6.9298	36.02	Pk	36	-25.5	-95.2	-48.68	-40	-8.68	V
6.93033	35.89	Pk	36	-25.5	-95.2	-48.81	-40	-8.81	H
9.24141	35.9	Pk	36.3	-23	-95.2	-46	-40	-6	V
9.24185	35.18	Pk	36.3	-23	-95.2	-46.72	-40	-6.72	H

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9.3.11. LTE BAND 41 AND 5G NR Band n41

LIMITS

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

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QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/15/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE Band 41 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
4.95999	39.36	Pk	34.2	-29.2	-95.2	-50.84	-25	-25.84	V
4.97163	40.35	Pk	34.3	-29.2	-95.2	-49.75	-25	-24.75	H
7.53325	36.18	Pk	35.8	-24.6	-95.2	-47.82	-25	-22.82	H
7.56781	36.49	Pk	35.8	-24.5	-95.2	-47.41	-25	-22.41	V
10.14989	35.27	Pk	37.2	-22	-95.2	-44.73	-25	-19.73	V
10.18319	35.77	Pk	37.2	-21.9	-95.2	-44.13	-25	-19.13	H
Mid Channel, 2593MHz									
4.78971	39.53	Pk	34.3	-29.1	-95.2	-50.47	-25	-25.47	H
4.80321	40.75	Pk	34.3	-29.2	-95.2	-49.35	-25	-24.35	V
7.13342	36.58	Pk	36.1	-25.2	-95.2	-47.72	-25	-22.72	V
7.75222	37.54	Pk	35.9	-24.1	-95.2	-45.86	-25	-20.86	H
10.28953	35.34	Pk	37.4	-21.5	-95.2	-43.96	-25	-18.96	V
10.34752	35.27	Pk	37.4	-21.3	-95.2	-43.83	-25	-18.83	H
High Channel, 2680MHz									
5.34275	39.07	Pk	35	-28.9	-95.2	-50.03	-25	-25.03	V
5.37454	39.31	Pk	34.9	-28.7	-95.2	-49.69	-25	-24.69	H
8.04134	36.28	Pk	35.8	-23.8	-95.2	-46.92	-25	-21.92	V
8.04276	36.51	Pk	35.8	-23.8	-95.2	-46.69	-25	-21.69	H
10.60691	35.63	Pk	37.9	-21.2	-95.2	-42.87	-25	-17.87	V
10.70383	35.69	Pk	37.9	-21.2	-95.2	-42.81	-25	-17.81	H

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QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/17/2020
Test Engineer:	19169
Configuration:	EUT Only
Mode	5G NR Band n41 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
4.99013	39.14	Pk	34.1	-28.4	-95.2	-50.36	-25	-25.36	H
4.99239	39.39	Pk	34.1	-28.4	-95.2	-50.11	-25	-25.11	V
7.48763	37.3	Pk	36	-23.8	-95.2	-45.7	-25	-20.7	V
7.4893	36.58	Pk	36	-23.8	-95.2	-46.42	-25	-21.42	H
9.98269	35.11	Pk	37.2	-20.9	-95.2	-43.79	-25	-18.79	V
9.9828	35.42	Pk	37.2	-20.9	-95.2	-43.48	-25	-18.48	H
Mid Channel, 2593MHz									
5.18578	39.48	Pk	34.6	-27.7	-95.2	-48.82	-25	-23.82	H
5.18799	38.85	Pk	34.6	-27.7	-95.2	-49.45	-25	-24.45	V
7.77832	36.2	Pk	35.9	-23.4	-95.2	-46.5	-25	-21.5	V
7.78083	36.18	Pk	35.9	-23.4	-95.2	-46.52	-25	-21.52	H
10.37314	34.74	Pk	37.7	-20.2	-95.2	-42.96	-25	-17.96	V
10.3735	34.68	Pk	37.7	-20.2	-95.2	-43.02	-25	-18.02	H
High Channel, 2640MHz									
5.37908	38.69	Pk	34.8	-27.8	-95.2	-49.51	-25	-24.51	V
5.37948	38.48	Pk	34.8	-27.8	-95.2	-49.72	-25	-24.72	H
8.06832	36.26	Pk	36.2	-23.2	-95.2	-45.94	-25	-20.94	H
8.06964	36.06	Pk	36.2	-23.2	-95.2	-46.14	-25	-21.14	V
10.7604	35.6	Pk	37.8	-20.2	-95.2	-42	-25	-17	V
10.76075	35.77	Pk	37.8	-20.2	-95.2	-41.83	-25	-16.83	H

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9.3.12. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

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QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/15/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE Band 66 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
2.11722	46.5	Pk	31.7	-32.2	-95.2	-49.2	-13	-36.2	H
2.12016	46.96	Pk	31.7	-32.2	-95.2	-48.74	-13	-35.74	V
5.13299	39.32	Pk	34.5	-28.6	-95.2	-49.98	-13	-36.98	V
5.16735	39.07	Pk	34.5	-28.6	-95.2	-50.23	-13	-37.23	H
6.80902	38.1	Pk	35.8	-25.5	-95.2	-46.8	-13	-33.8	H
6.87689	37.84	Pk	35.9	-25.1	-95.2	-46.56	-13	-33.56	V
Mid Channel, 1745MHz									
3.50567	40.42	Pk	34.1	-30.4	-95.2	-51.08	-13	-38.08	H
3.51167	41.09	Pk	33.5	-30.5	-95.2	-51.11	-13	-38.11	V
5.19143	39	Pk	34.6	-28.4	-95.2	-50	-13	-37	V
5.20849	39.23	Pk	34.6	-28.5	-95.2	-49.87	-13	-36.87	H
6.98645	37.62	Pk	36	-25.4	-95.2	-46.98	-13	-33.98	V
7.01355	36.57	Pk	35.9	-25.5	-95.2	-48.23	-13	-35.23	H
High Channel, 1770MHz									
2.17121	44.55	Pk	31.6	-31.9	-95.2	-50.95	-13	-37.95	H
2.17748	48.68	Pk	31.6	-32	-95.2	-46.92	-13	-33.92	V
5.28306	40.43	Pk	34.9	-28.9	-95.2	-48.77	-13	-35.77	V
5.35442	38.85	Pk	35	-28.8	-95.2	-50.15	-13	-37.15	H
7.05549	37.19	Pk	36	-25.4	-95.2	-47.41	-13	-34.41	V
7.13355	36.72	Pk	36.1	-25.2	-95.2	-47.58	-13	-34.58	H

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9.3.13. LTE BAND 71

LIMITS

FCC: §27.53 (g)
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.

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QPSK LTE BAND 71 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/16/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	LTE Band 71 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 673.0MHz									
1.35614	-65.14	Pk	29.6	-33.1	11.6	-57.04	-13	-44.04	200
1.46058	-65.1	Pk	28.4	-32.9	12.3	-57.3	-13	-44.3	112
1.72017	-65.58	Pk	29.5	-32.6	13.9	-54.78	-13	-41.78	345
2.02178	-65.48	Pk	31.7	-32.4	11.8	-54.38	-13	-41.38	47
2.63538	-66.05	Pk	32.6	-31.6	13	-52.05	-13	-39.05	210
2.72135	-66.05	Pk	32.4	-31.5	11.4	-53.75	-13	-40.75	35
Mid Channel, 680.5MHz									
1.37334	42.32	Pk	29.4	-33.2	-95.2	-56.68	-13	-43.68	H
1.39762	41.75	Pk	28.9	-33.2	-95.2	-57.75	-13	-44.75	V
2.04299	41.1	Pk	31.6	-32.3	-95.2	-54.8	-13	-41.8	H
2.05252	41.55	Pk	31.6	-32.3	-95.2	-54.35	-13	-41.35	V
2.73705	41.5	Pk	32.5	-31.3	-95.2	-52.5	-13	-39.5	V
2.74244	40.8	Pk	32.5	-31.3	-95.2	-53.2	-13	-40.2	H
High Channel, 688.0MHz									
1.33757	-65.56	Pk	29.3	-33.3	12.1	-57.46	-13	-44.46	230
1.35261	-65.11	Pk	29.6	-33.1	12	-56.61	-13	-43.61	25
2.02655	-62.24	Pk	31.6	-32.3	11.1	-51.84	-13	-38.84	178
2.13226	-65.74	Pk	31.7	-32.1	13.4	-52.74	-13	-39.74	201
2.53936	-65.94	Pk	32.6	-31.7	12	-53.04	-13	-40.04	190
2.57344	-66.24	Pk	32.6	-31.5	12.6	-52.54	-13	-39.54	52

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9.4. FIELD STRENGTH OF SPURIOUS RADIATION, ANT3

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
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9.4.1. LTE BAND 2

LIMITS

FCC: §24.238(a)
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.

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QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/8/2020
Test Engineer:	30606
Configuration:	EUT only
Mode	LTE Band 2 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.72879	39.46	Pk	33.4	-27.2	-95.2	-49.54	-13	-36.54	V
3.75108	40.21	Pk	33.5	-27	-95.2	-48.49	-13	-35.49	H
5.56665	38.7	Pk	34.9	-26.5	-95.2	-48.1	-13	-35.1	V
5.58678	37.26	Pk	34.9	-26.4	-95.2	-49.44	-13	-36.44	H
7.41511	36.01	Pk	35.7	-23.4	-95.2	-46.89	-13	-33.89	V
7.46671	35.44	Pk	35.7	-23.8	-95.2	-47.86	-13	-34.86	H
Mid Channel, 1880MHz									
3.77652	39.93	Pk	33.6	-27.2	-95.2	-48.87	-13	-35.87	H
3.78125	39.46	Pk	33.6	-27.3	-95.2	-49.44	-13	-36.44	V
5.63583	37.32	Pk	34.8	-26.4	-95.2	-49.48	-13	-36.48	V
5.64886	37.64	Pk	34.8	-26.4	-95.2	-49.16	-13	-36.16	H
7.53035	36.04	Pk	35.8	-23	-95.2	-46.36	-13	-33.36	H
7.53068	35.72	Pk	35.8	-23	-95.2	-46.68	-13	-33.68	V
High Channel, 1900MHz									
3.7761	39.97	Pk	33.6	-27.2	-95.2	-48.83	-13	-35.83	V
3.80274	39.77	Pk	33.7	-27.5	-95.2	-49.23	-13	-36.23	H
5.68389	38.38	Pk	34.8	-26.7	-95.2	-48.72	-13	-35.72	H
5.69804	37.83	Pk	34.8	-26.9	-95.2	-49.47	-13	-36.47	V
7.59251	36.1	Pk	35.7	-21.8	-95.2	-45.2	-13	-32.2	H
7.59731	36.02	Pk	35.7	-21.6	-95.2	-45.08	-13	-32.08	V

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9.4.2. LTE BAND 7

LIMITS

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

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QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/21/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
4.97909	39.44	Pk	34.3	-29.2	-95.2	-50.66	-25	-25.66	V
5.01477	39.11	Pk	34.4	-29	-95.2	-50.69	-25	-25.69	H
7.51152	36.22	Pk	35.8	-24.5	-95.2	-47.68	-25	-22.68	V
7.5303	36.32	Pk	35.8	-24.5	-95.2	-47.58	-25	-22.58	H
10.03736	35.02	Pk	37	-22.1	-95.2	-45.28	-25	-20.28	V
10.05994	34.75	Pk	37.1	-22.1	-95.2	-45.45	-25	-20.45	H
Mid Channel, 2535MHz									
4.99936	38.65	Pk	34.3	-29.1	-95.2	-51.35	-25	-26.35	V
5.02617	39.68	Pk	34.3	-28.9	-95.2	-50.12	-25	-25.12	H
7.53365	36.49	Pk	35.8	-24.6	-95.2	-47.51	-25	-22.51	H
7.5399	36.91	Pk	35.7	-24.7	-95.2	-47.29	-25	-22.29	V
10.03676	34.79	Pk	37	-22.1	-95.2	-45.51	-25	-20.51	V
10.04193	35.28	Pk	37.1	-22.1	-95.2	-44.92	-25	-19.92	H
High Channel, 2560MHz									
5.11684	38.5	Pk	34.5	-28.8	-95.2	-51	-25	-26	H
5.1242	39.27	Pk	34.6	-28.7	-95.2	-50.03	-25	-25.03	V
7.67572	36.25	Pk	35.8	-24	-95.2	-47.15	-25	-22.15	H
7.70281	35.61	Pk	35.8	-23.9	-95.2	-47.69	-25	-22.69	V
10.24181	34.88	Pk	37.3	-21.6	-95.2	-44.62	-25	-19.62	H
10.26933	35.11	Pk	37.4	-21.7	-95.2	-44.39	-25	-19.39	V

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9.4.3. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

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QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/17/2020
Test Engineer:	50822
Configuration:	EUT only
Mode	LTE Band 25 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.73081	40.37	Pk	33.4	-30.1	-95.2	-51.53	-13	-38.53	H
3.74705	40.59	Pk	33.5	-30.2	-95.2	-51.31	-13	-38.31	V
5.58792	38.91	Pk	34.9	-28	-95.2	-49.39	-13	-36.39	H
5.63244	38.16	Pk	34.8	-27.9	-95.2	-50.14	-13	-37.14	V
7.42058	36.82	Pk	35.8	-24.8	-95.2	-47.38	-13	-34.38	V
7.44737	36.84	Pk	35.7	-24.7	-95.2	-47.36	-13	-34.36	H
Mid Channel, 1882.5MHz									
3.76074	40.38	Pk	33.6	-30.1	-95.2	-51.32	-13	-38.32	V
3.77515	40.65	Pk	33.6	-30.1	-95.2	-51.05	-13	-38.05	H
5.66038	38.56	Pk	34.8	-28	-95.2	-49.84	-13	-36.84	H
5.69013	38.5	Pk	34.8	-28.2	-95.2	-50.1	-13	-37.1	V
7.53533	36.39	Pk	35.8	-24.7	-95.2	-47.71	-13	-34.71	H
7.58697	36.78	Pk	35.8	-24.5	-95.2	-47.12	-13	-34.12	V
High Channel, 1905MHz									
3.80694	40.22	Pk	33.7	-30.3	-95.2	-51.58	-13	-38.58	V
3.81546	41.07	Pk	33.7	-30.1	-95.2	-50.53	-13	-37.53	H
5.72152	38.44	Pk	34.9	-28.1	-95.2	-49.96	-13	-36.96	H
5.78743	38.81	Pk	35.1	-27.9	-95.2	-49.19	-13	-36.19	V
7.62609	36.34	Pk	35.8	-24.2	-95.2	-47.26	-13	-34.26	H
7.62611	36.48	Pk	35.8	-24.2	-95.2	-47.12	-13	-34.12	V

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9.4.4. LTE BAND 30

LIMITS

FCC: §27.53 (a)
For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/21/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE Band 30 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.63477	39.26	Pk	34.3	-29.3	-95.2	-50.94	-40	-10.94	H
4.6391	39.5	Pk	34.3	-29.3	-95.2	-50.7	-40	-10.7	V
6.93721	37.23	Pk	36	-25.4	-95.2	-47.37	-40	-7.37	H
6.97716	36.56	Pk	36	-25.5	-95.2	-48.14	-40	-8.14	V
9.24005	35.7	Pk	36.3	-23	-95.2	-46.2	-40	-6.2	H
9.3896	35.24	Pk	36.4	-22.9	-95.2	-46.46	-40	-6.46	V

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9.4.5. LTE BAND 41 AND 5G NR Band n41

LIMITS

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

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QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	6/26/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE Band 41 QPSK 20MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
5.0212	38.36	Pk	33.7	-25.9	-95.2	-48.34	-25	-23.34	H
5.14177	37.48	Pk	33.8	-26.2	-95.2	-49.32	-25	-24.32	V
7.18962	36.12	Pk	37	-24	-95.2	-45.68	-25	-20.68	V
7.22167	35.64	Pk	37.1	-23.5	-95.2	-45.66	-25	-20.66	H
9.71608	34.59	Pk	38.7	-20	-95.2	-41.11	-25	-16.11	V
9.82231	35.17	Pk	38.6	-20.3	-95.2	-41.13	-25	-16.13	H
Mid Channel, 2593MHz									
5.01236	37.57	Pk	33.7	-26	-95.2	-49.13	-25	-24.13	H
5.1063	37.86	Pk	34	-26.4	-95.2	-48.94	-25	-23.94	V
7.82386	34.5	Pk	37.3	-23.1	-95.2	-46.1	-25	-21.1	H
8.02327	35.42	Pk	37.1	-22.8	-95.2	-45.18	-25	-20.18	V
10.58271	34.55	Pk	39.5	-19.5	-95.2	-39.75	-25	-14.75	V
11.41539	34.6	Pk	39.2	-19.7	-95.2	-40.2	-25	-15.2	H
High Channel, 2680MHz									
5.01502	38.36	Pk	33.7	-26	-95.2	-48.34	-25	-23.34	H
5.17437	37.27	Pk	33.7	-26.4	-95.2	-49.93	-25	-24.93	V
7.90039	35.6	Pk	37.3	-22.6	-95.2	-44.4	-25	-19.4	V
7.98243	34.96	Pk	37.1	-22.9	-95.2	-45.74	-25	-20.74	H
10.38227	34.59	Pk	39.2	-19.3	-95.2	-39.91	-25	-14.91	V
10.44006	33.74	Pk	39.4	-19.3	-95.2	-40.56	-25	-15.56	H

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QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	6/26/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode	5G NR Band n41 QPSK 100MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
4.99274	39.22	Pk	34.1	-28.4	-95.2	-50.28	-25	-25.28	H
4.99374	39.28	Pk	34.1	-28.4	-95.2	-50.22	-25	-25.22	V
7.45751	36.76	Pk	36.2	-24	-95.2	-46.24	-25	-21.24	V
7.45931	36.53	Pk	36.2	-24	-95.2	-46.47	-25	-21.47	H
9.9843	35.01	Pk	37.2	-20.9	-95.2	-43.89	-25	-18.89	H
9.98464	35.72	Pk	37.2	-20.9	-95.2	-43.18	-25	-18.18	V
Mid Channel, 2593MHz									
5.18442	38.71	Pk	34.6	-27.7	-95.2	-49.59	-25	-24.59	V
5.18708	38.36	Pk	34.6	-27.7	-95.2	-49.94	-25	-24.94	H
7.77909	35.88	Pk	35.9	-23.4	-95.2	-46.82	-25	-21.82	H
7.7792	36.46	Pk	35.9	-23.4	-95.2	-46.24	-25	-21.24	V
10.36982	34.58	Pk	37.7	-20.2	-95.2	-43.12	-25	-18.12	H
10.37104	34.49	Pk	37.7	-20.2	-95.2	-43.21	-25	-18.21	V
High Channel, 2640MHz									
5.37942	-67.99	Pk	34.8	-27.8	10.5	-50.49	-25	-25.49	197
5.38203	-68.4	Pk	34.8	-27.8	10.6	-50.8	-25	-25.8	12
8.06898	-70.85	Pk	36.2	-23.2	11.2	-46.65	-25	-21.65	324
8.0694	-70.06	Pk	36.2	-23.2	11.4	-45.66	-25	-20.66	212
10.76057	-71.62	Pk	37.8	-20.2	10.3	-43.72	-25	-18.72	204
10.76138	-71.3	Pk	37.8	-20.2	10.6	-43.1	-25	-18.1	40

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9.4.6. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

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QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13259315
Date:	8/11/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode	LTE Band 66 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
3.38039	38.38	Pk	33	-27.8	-95.2	-51.62	-13	-38.62	V
3.42213	38.78	Pk	33	-28.2	-95.2	-51.62	-13	-38.62	H
5.09297	37.37	Pk	34.5	-24.6	-95.2	-47.93	-13	-34.93	H
5.13395	37.98	Pk	34.6	-25.6	-95.2	-48.22	-13	-35.22	V
6.76826	35.29	Pk	36.7	-21.8	-95.2	-45.01	-13	-32.01	H
6.84847	36.71	Pk	36.4	-23.4	-95.2	-45.49	-13	-32.49	V
Mid Channel, 1745MHz									
3.49541	-67.03	Pk	33.4	-30.2	11.9	-51.93	-13	-38.93	H
3.49547	-66.88	Pk	33.4	-30.2	11.8	-51.88	-13	-38.88	V
5.23856	-68.64	Pk	34.7	-28.8	11.1	-51.64	-13	-38.64	H
5.24576	-68.18	Pk	34.8	-28.7	11.3	-50.78	-13	-37.78	V
6.98254	-70.07	Pk	36	-25.4	10.1	-49.37	-13	-36.37	H
6.99051	-69.91	Pk	35.9	-25.3	11	-48.31	-13	-35.31	V
High Channel, 1770MHz									
3.77458	39.72	Pk	33.6	-26.9	-95.2	-48.78	-13	-35.78	V
3.78872	38.96	Pk	33.6	-27	-95.2	-49.64	-13	-36.64	H
4.79225	37.65	Pk	34.1	-25.2	-95.2	-48.65	-13	-35.65	H
5.63095	37.63	Pk	35.1	-24.2	-95.2	-46.67	-13	-33.67	V
8.42828	35.34	Pk	36.1	-20.7	-95.2	-44.46	-13	-31.46	H
8.51747	35.13	Pk	36.1	-21	-95.2	-44.97	-13	-31.97	V

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9.5. FIELD STRENGTH OF SPURIOUS RADIATION, ANT4

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
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9.5.1. LTE BAND 2

LIMITS

FCC: §24.238(a)
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.

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QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/17/2020
Test Engineer:	10641
Configuration:	EUT only
Mode	LTE Band 2 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1860MHz									
3.71815	41.55	Pk	33.3	-29.9	-95.2	-50.25	-13	-37.25	H
3.71967	40.81	Pk	33.3	-29.9	-95.2	-50.99	-13	-37.99	V
5.57842	39.16	Pk	34.9	-28	-95.2	-49.14	-13	-36.14	H
5.58123	38.33	Pk	34.9	-28	-95.2	-49.97	-13	-36.97	V
7.43857	37.45	Pk	35.8	-24.9	-95.2	-46.85	-13	-33.85	V
7.43946	36.52	Pk	35.8	-24.9	-95.2	-47.78	-13	-34.78	H
Mid Channel, 1880MHz									
3.75783	40.34	Pk	33.5	-30.2	-95.2	-51.56	-13	-38.56	V
3.75997	40.48	Pk	33.5	-30.2	-95.2	-51.42	-13	-38.42	H
5.63974	39.14	Pk	34.8	-28	-95.2	-49.26	-13	-36.26	V
5.64056	38.57	Pk	34.9	-28	-95.2	-49.73	-13	-36.73	H
7.51901	36.72	Pk	35.7	-24.4	-95.2	-47.18	-13	-34.18	H
7.51941	36.86	Pk	35.7	-24.4	-95.2	-47.04	-13	-34.04	V
High Channel, 1900MHz									
3.80113	-66.88	Pk	33.7	-30.3	11.4	-52.08	-13	-39.08	272
3.80237	-66.14	Pk	33.7	-30.3	11.3	-51.44	-13	-38.44	327
5.69893	-67.72	Pk	34.8	-28.3	10.4	-50.82	-13	-37.82	298
5.69928	-68.2	Pk	34.9	-28.3	10.5	-51.1	-13	-38.1	291
7.59917	-70.68	Pk	35.7	-24.5	10.6	-48.88	-13	-35.88	260
7.60131	-70.39	Pk	35.8	-24.6	11	-48.19	-13	-35.19	301

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9.5.2. LTE BAND 7

LIMITS

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

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QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/17/2020
Test Engineer:	10641
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 2510MHz									
5.01998	39.8	Pk	34.3	-28.9	-95.2	-50	-25	-25	V
5.02232	40.16	Pk	34.3	-28.9	-95.2	-49.64	-25	-24.64	H
7.52898	36.56	Pk	35.8	-24.5	-95.2	-47.34	-25	-22.34	V
7.53105	36.83	Pk	35.8	-24.6	-95.2	-47.17	-25	-22.17	H
10.04032	34.82	Pk	37.1	-22.2	-95.2	-45.48	-25	-20.48	V
10.04081	35.47	Pk	37.1	-22.2	-95.2	-44.83	-25	-19.83	H
Mid Channel, 2535MHz									
5.06317	38.72	Pk	34.4	-28.7	-95.2	-50.78	-25	-25.78	V
5.06449	39.25	Pk	34.4	-28.7	-95.2	-50.25	-25	-25.25	H
7.60518	36.97	Pk	35.8	-24.6	-95.2	-47.03	-25	-22.03	V
7.60642	36.45	Pk	35.8	-24.6	-95.2	-47.55	-25	-22.55	H
10.13948	35.75	Pk	37.2	-22	-95.2	-44.25	-25	-19.25	V
10.13981	35.82	Pk	37.2	-22	-95.2	-44.18	-25	-19.18	H
High Channel, 2560MHz									
5.11891	39.57	Pk	34.5	-28.8	-95.2	-49.93	-25	-24.93	H
5.11942	39.14	Pk	34.6	-28.8	-95.2	-50.26	-25	-25.26	V
7.67915	36.06	Pk	35.8	-23.9	-95.2	-47.24	-25	-22.24	V
7.67992	35.93	Pk	35.8	-23.9	-95.2	-47.37	-25	-22.37	H
10.24172	35.89	Pk	37.3	-21.6	-95.2	-43.61	-25	-18.61	V
10.24274	35.5	Pk	37.3	-21.6	-95.2	-44	-25	-19	H

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9.5.3. LTE BAND 25

LIMITS

FCC: §24.238(a)
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.

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QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/17/2020
Test Engineer:	10641
Configuration:	EUT only
Mode	LTE Band 25 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1860MHz									
3.71846	33.66	Pk	33.3	-29.9	-95.2	-58.14	-13	-45.14	V
3.72174	40.57	Pk	33.3	-29.9	-95.2	-51.23	-13	-38.23	H
5.57882	38.36	Pk	34.9	-28	-95.2	-49.94	-13	-36.94	H
5.58083	31.52	Pk	34.9	-28	-95.2	-56.78	-13	-43.78	V
7.44098	28.96	Pk	35.7	-24.8	-95.2	-55.34	-13	-42.34	V
7.44139	35.72	Pk	35.7	-24.8	-95.2	-48.58	-13	-35.58	H
Mid Channel, 1882.5MHz									
3.76606	41	Pk	33.6	-30.1	-95.2	-50.7	-13	-37.7	V
3.76703	40.55	Pk	33.6	-30.1	-95.2	-51.15	-13	-38.15	H
5.64595	38.32	Pk	34.9	-28	-95.2	-49.98	-13	-36.98	V
5.64704	38.36	Pk	34.9	-28	-95.2	-49.94	-13	-36.94	H
7.53112	36.69	Pk	35.8	-24.6	-95.2	-47.31	-13	-34.31	H
7.53134	36.59	Pk	35.8	-24.6	-95.2	-47.41	-13	-34.41	V
High Channel, 1905MHz									
3.81087	-66.21	Pk	33.7	-30.2	11.2	-51.51	-13	-38.51	96
3.81093	-66.49	Pk	33.7	-30.2	11	-51.99	-13	-38.99	164
5.71399	-68.25	Pk	34.9	-28.2	10.5	-51.05	-13	-38.05	129
5.7145	-68.06	Pk	34.9	-28.2	10.6	-50.76	-13	-37.76	206
7.62066	-70.75	Pk	35.8	-24.3	10.9	-48.35	-13	-35.35	80
7.62172	-70.53	Pk	35.8	-24.2	11.4	-47.53	-13	-34.53	181

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9.5.4. LTE BAND 30

LIMITS

FCC: §27.53 (a)
For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/17/2020
Test Engineer:	10641
Configuration:	EUT Only
Mode:	LTE Band 30 QPSK 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Mid Channel, 2310MHz									
4.61892	39.74	Pk	34.3	-29.5	-95.2	-50.66	-40	-10.66	V
4.62096	40.08	Pk	34.3	-29.5	-95.2	-50.32	-40	-10.32	H
6.93126	36.93	Pk	36	-25.5	-95.2	-47.77	-40	-7.77	V
6.93155	36.82	Pk	36	-25.5	-95.2	-47.88	-40	-7.88	H
9.23951	36.22	Pk	36.3	-23	-95.2	-45.68	-40	-5.68	H
9.24047	36.23	Pk	36.3	-23	-95.2	-45.67	-40	-5.67	V

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9.5.5. LTE BAND 41 AND 5G NR Band n41

LIMITS

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

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QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	6/27/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE Band 41 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2506MHz									
5.01363	37.97	Pk	33.7	-26	-95.2	-48.73	-25	-23.73	H
5.03231	38.14	Pk	33.7	-26	-95.2	-48.66	-25	-23.66	V
7.27474	36.35	Pk	37.1	-23.3	-95.2	-44.65	-25	-19.65	V
7.2768	35.76	Pk	37.1	-23.2	-95.2	-45.14	-25	-20.14	H
9.66702	34.72	Pk	38.7	-20.2	-95.2	-41.28	-25	-16.28	V
9.67807	34.1	Pk	38.7	-20.1	-95.2	-41.7	-25	-16.7	H
Mid Channel, 2593MHz									
5.02067	37.85	Pk	33.7	-25.9	-95.2	-48.85	-25	-23.85	V
5.12603	37.43	Pk	33.8	-26.3	-95.2	-49.47	-25	-24.47	H
7.58578	36.08	Pk	36.9	-23.9	-95.2	-45.62	-25	-20.62	V
7.61962	35.81	Pk	37	-23.6	-95.2	-45.59	-25	-20.59	H
9.86068	34.71	Pk	38.6	-20.2	-95.2	-41.39	-25	-16.39	V
10.1378	34.08	Pk	38.5	-19.9	-95.2	-41.82	-25	-16.82	H
High Channel, 2680MHz									
5.5341	37.34	Pk	33.2	-26	-95.2	-49.76	-25	-24.76	H
5.54242	37.18	Pk	33.2	-26.1	-95.2	-50.22	-25	-25.22	V
8.16736	35.72	Pk	37.3	-22.9	-95.2	-44.78	-25	-19.78	V
8.18638	36	Pk	37.3	-23	-95.2	-44.6	-25	-19.6	H
10.96967	34.04	Pk	39.4	-19.5	-95.2	-40.46	-25	-15.46	V
10.974	33.87	Pk	39.5	-19.6	-95.2	-40.63	-25	-15.63	H

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QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	07/17/2020
Test Engineer:	19169
Configuration:	EUT Only
Mode	5G NR Band n41 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 2546MHz									
4.99272	39.66	Pk	34.1	-28.4	-95.2	-49.84	-25	-24.84	V
4.99357	39.59	Pk	34.1	-28.4	-95.2	-49.91	-25	-24.91	H
7.48906	36.87	Pk	36	-23.8	-95.2	-46.13	-25	-21.13	H
7.48974	36.82	Pk	36	-23.8	-95.2	-46.18	-25	-21.18	V
9.98309	35.13	Pk	37.2	-20.9	-95.2	-43.77	-25	-18.77	H
9.98568	35.41	Pk	37.3	-20.9	-95.2	-43.39	-25	-18.39	V
Mid Channel, 2593MHz									
5.1863	38.55	Pk	34.6	-27.7	-95.2	-49.75	-25	-24.75	V
5.18724	38.49	Pk	34.6	-27.7	-95.2	-49.81	-25	-24.81	H
7.77913	36.58	Pk	35.9	-23.4	-95.2	-46.12	-25	-21.12	H
7.78032	36.35	Pk	35.9	-23.4	-95.2	-46.35	-25	-21.35	V
10.36972	34.6	Pk	37.7	-20.2	-95.2	-43.1	-25	-18.1	V
10.37129	34.22	Pk	37.7	-20.2	-95.2	-43.48	-25	-18.48	H
High Channel, 2640MHz									
5.37913	38.77	Pk	34.8	-27.8	-95.2	-49.43	-25	-24.43	H
5.3806	38.91	Pk	34.8	-27.8	-95.2	-49.29	-25	-24.29	V
8.06958	36.4	Pk	36.2	-23.2	-95.2	-45.8	-25	-20.8	H
8.07046	37.13	Pk	36.2	-23.2	-95.2	-45.07	-25	-20.07	V
10.76133	35.42	Pk	37.8	-20.2	-95.2	-42.18	-25	-17.18	H
10.76186	35.73	Pk	37.7	-20.2	-95.2	-41.97	-25	-16.97	V

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9.5.6. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

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QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	9/14/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode:	LTE Band 48 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3560MHz									
5.97867	25.24	RMS	35.8	-24.6	-95.2	-58.36	-40	-18.36	V
6.43052	25.26	RMS	36.4	-24	-95.2	-57.04	-40	-17.04	H
7.88038	23.74	RMS	36.1	-22.4	-95.2	-56.76	-40	-16.76	V
8.06559	23.2	RMS	36.1	-22.3	-95.2	-57.4	-40	-17.4	H
10.13824	22.76	RMS	37.5	-20.4	-95.2	-54.74	-40	-14.74	H
10.22508	22.06	RMS	37.6	-20	-95.2	-55.04	-40	-15.04	V
Mid Channel, 3625MHz									
5.51242	26.12	RMS	35	-25.5	-95.2	-58.98	-40	-18.98	H
5.6889	26.16	RMS	35.2	-25.5	-95.2	-58.84	-40	-18.84	V
7.36128	23.89	RMS	36.1	-22.9	-95.2	-57.51	-40	-17.51	H
7.76333	23.96	RMS	35.9	-22.4	-95.2	-57.14	-40	-17.14	V
9.72313	23.02	RMS	37.1	-21	-95.2	-55.48	-40	-15.48	H
9.97374	21.97	RMS	37.3	-20.1	-95.2	-55.33	-40	-15.33	V
High Channel, 3690MHz									
6.25047	24.71	RMS	36	-24.6	-95.2	-58.59	-40	-18.59	V
6.43845	25.28	RMS	36.4	-23.9	-95.2	-56.92	-40	-16.92	H
7.70479	24.02	RMS	35.9	-22.2	-95.2	-56.78	-40	-16.78	V
8.10761	24.17	RMS	36.1	-22.2	-95.2	-56.53	-40	-16.53	H
9.73258	23.07	RMS	37.2	-21.1	-95.2	-55.43	-40	-15.43	H
10.40992	22.02	RMS	37.7	-19.4	-95.2	-54.28	-40	-14.28	V

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9.5.7. LTE BAND 66

LIMITS

FCC: §27.53 (h)
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.

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QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	4/20/2020
Test Engineer:	10641
Configuration:	EUT Only
Mode	LTE Band 66 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 1720MHz									
3.43865	40.72	Pk	32.8	-30.4	-95.2	-52.08	-13	-39.08	H
3.44148	42.1	Pk	32.8	-30.4	-95.2	-50.7	-13	-37.7	V
5.15895	38.87	Pk	34.5	-28.6	-95.2	-50.43	-13	-37.43	H
5.16193	38.8	Pk	34.5	-28.6	-95.2	-50.5	-13	-37.5	V
6.8781	36.59	Pk	35.9	-25.1	-95.2	-47.81	-13	-34.81	V
6.88098	37.15	Pk	35.9	-25.1	-95.2	-47.25	-13	-34.25	H
Mid Channel, 1745MHz									
3.48805	-67.14	Pk	33	-30.1	11.5	-52.74	-13	-39.74	248
3.49126	-66.53	Pk	33.1	-30.1	12	-51.53	-13	-38.53	290
5.23317	-68.46	Pk	34.7	-28.9	11.3	-51.36	-13	-38.36	272
5.23426	-67.78	Pk	34.7	-28.9	11.3	-50.68	-13	-37.68	270
6.97806	-70.65	Pk	36	-25.5	10.5	-49.65	-13	-36.65	246
6.9791	-70.65	Pk	36	-25.5	10	-50.15	-13	-37.15	225
High Channel, 1770MHz									
3.53873	-66.71	Pk	33.2	-30.4	11.1	-52.81	-13	-39.81	321
3.54101	-66.76	Pk	33.1	-30.4	11.4	-52.66	-13	-39.66	250
5.30905	-68.16	Pk	35	-28.9	10.8	-51.26	-13	-38.26	273
5.31046	-67.9	Pk	35	-28.9	10.8	-51	-13	-38	262
7.07932	-70.97	Pk	36	-25.2	10.7	-49.47	-13	-36.47	265
7.07975	-70.59	Pk	36	-25.2	10.8	-48.99	-13	-35.99	276

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9.5.8. 5G NR Band n77

LIMITS

FCC: §27.53
(I) 3.7 GHz Service.The following emission limits apply to stations transmitting in the 3700-3980 MHz band:
(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

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QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/19/2020
Test Engineer:	19497
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.49853	36.02	Pk	36	-23.1	-95.2	-46.28	-13	-33.28	H
7.49902	36.46	Pk	36	-23.1	-95.2	-45.84	-13	-32.84	V
11.24907	34.14	Pk	38	-19.6	-95.2	-42.66	-13	-29.66	V
11.24972	34.38	Pk	38	-19.6	-95.2	-42.42	-13	-29.42	H
14.99943	34.55	Pk	39.9	-19.5	-95.2	-40.25	-13	-27.25	H
15.00099	34.14	Pk	39.9	-19.5	-95.2	-40.66	-13	-27.66	V
Mid Channel, 3840MHz									
7.67918	35.38	Pk	35.9	-22.9	-95.2	-46.82	-13	-33.82	V
7.68073	35.71	Pk	35.9	-22.9	-95.2	-46.49	-13	-33.49	H
11.52063	34.87	Pk	38.4	-19.6	-95.2	-41.53	-13	-28.53	V
11.52087	34.5	Pk	38.4	-19.6	-95.2	-41.9	-13	-28.9	H
15.35991	35.87	Pk	41	-20.1	-95.2	-38.43	-13	-25.43	V
15.3605	35.08	Pk	41	-20.1	-95.2	-39.22	-13	-26.22	H
High Channel, 3930MHz									
7.8692	36.86	Pk	36.1	-23.5	-95.2	-45.74	-13	-32.74	H
7.8702	36.97	Pk	36.1	-23.5	-95.2	-45.63	-13	-32.63	V
11.71018	34.64	Pk	38.7	-19.8	-95.2	-41.66	-13	-28.66	V
11.71581	34.84	Pk	38.7	-19.9	-95.2	-41.56	-13	-28.56	H
15.73765	34.81	Pk	40.6	-18.8	-95.2	-38.59	-13	-25.59	V
15.75214	34.92	Pk	40.7	-19.4	-95.2	-38.98	-13	-25.98	H

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9.6. FIELD STRENGTH OF SPURIOUS RADIATION, ANT7

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

RESULTS

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9.6.1. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

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QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13259315
Date:	7/28/2020
Test Engineer:	19206
Configuration:	EUT Only
Mode	LTE Band 48 QPSK 20MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3560MHz									
4.93832	31.37	RMS	33.4	-26.1	-95.2	-56.13	-40	-16.13	V
5.00173	32.06	RMS	33.6	-26	-95.2	-54.94	-40	-14.94	H
7.27386	30.02	RMS	37.1	-23.3	-95.2	-50.88	-40	-10.88	H
7.27693	29.79	RMS	37.1	-23.2	-95.2	-51.01	-40	-11.01	V
9.31214	28.85	RMS	38.7	-20.9	-95.2	-47.95	-40	-7.95	H
9.63154	27.83	RMS	38.8	-20.4	-95.2	-48.27	-40	-8.27	V
Mid Channel, 3625MHz									
4.80754	32.7	RMS	33	-27	-95.2	-56	-40	-16	H
4.93613	31.57	RMS	33.4	-26.1	-95.2	-55.83	-40	-15.83	V
6.31851	30.71	RMS	34.6	-24.5	-95.2	-53.89	-40	-13.89	V
6.32346	30.2	RMS	34.5	-24.5	-95.2	-54.5	-40	-14.5	H
7.83912	28.72	RMS	37.2	-22.7	-95.2	-51.38	-40	-11.38	V
7.90129	28.75	RMS	37.3	-22.6	-95.2	-50.85	-40	-10.85	H
High Channel, 3690MHz									
5.05637	31.82	RMS	33.8	-26.2	-95.2	-55.38	-40	-15.38	H
5.06041	32.43	RMS	33.8	-26.1	-95.2	-54.57	-40	-14.57	V
7.08048	29.83	RMS	36.7	-23.7	-95.2	-51.77	-40	-11.77	H
7.27245	29.72	RMS	37.2	-23.3	-95.2	-51.08	-40	-11.08	V
9.12895	28.62	RMS	38.7	-21.2	-95.2	-48.28	-40	-8.28	H
9.28101	28.1	RMS	38.7	-21	-95.2	-48.6	-40	-8.6	V

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9.6.18. 5G NR Band n77

LIMITS

FCC: §27.53
(I) 3.7 GHz Service.The following emission limits apply to stations transmitting in the 3700-3980 MHz band:
(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

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QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/19/2020
Test Engineer:	19497
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.49871	36.16	Pk	36	-23.1	-95.2	-46.14	-13	-33.14	V
7.49951	36.28	Pk	36	-23.2	-95.2	-46.12	-13	-33.12	H
11.25009	35.09	Pk	38	-19.6	-95.2	-41.71	-13	-28.71	H
11.25038	34.37	Pk	38	-19.6	-95.2	-42.43	-13	-29.43	V
14.99853	34.28	Pk	39.9	-19.5	-95.2	-40.52	-13	-27.52	V
14.99878	34.34	Pk	39.9	-19.5	-95.2	-40.46	-13	-27.46	H
Mid Channel, 3840MHz									
7.68042	35.82	Pk	35.9	-22.9	-95.2	-46.38	-13	-33.38	H
7.68047	36.75	Pk	35.9	-22.9	-95.2	-45.45	-13	-32.45	V
11.51834	34.82	Pk	38.4	-19.6	-95.2	-41.58	-13	-28.58	V
11.52134	35.05	Pk	38.4	-19.6	-95.2	-41.35	-13	-28.35	H
15.35973	35.77	Pk	41	-20.1	-95.2	-38.53	-13	-25.53	H
15.36008	35.54	Pk	41	-20.1	-95.2	-38.76	-13	-25.76	V
High Channel, 3930MHz									
7.85934	35.89	Pk	36	-23.6	-95.2	-46.91	-13	-33.91	V
7.86527	36.39	Pk	36	-23.5	-95.2	-46.31	-13	-33.31	H
11.75472	34.36	Pk	38.8	-19.7	-95.2	-41.74	-13	-28.74	V
11.80495	35.11	Pk	38.8	-19.3	-95.2	-40.59	-13	-27.59	H
15.66673	34.82	Pk	40.8	-19.4	-95.2	-38.98	-13	-25.98	H
15.71421	34.62	Pk	40.7	-18.7	-95.2	-38.58	-13	-25.58	V

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9.7. FIELD STRENGTH OF SPURIOUS RADIATION, ANT8

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

RESULTS

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9.7.1. LTE BAND 48

LIMITS

FCC: §96.41

(b) 3.5 GHz Emissions and Interference Limits—

(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

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QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	9/14/2020
Test Engineer:	30606
Configuration:	EUT Only
Mode:	LTE Band 48 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3560MHz									
5.97332	25.5	RMS	35.7	-24.5	-95.2	-58.1	-40	-18.1	H
6.37734	25.16	RMS	36.3	-24.3	-95.2	-57.44	-40	-17.44	V
7.77146	23.73	RMS	35.9	-22.5	-95.2	-57.47	-40	-17.47	H
8.58366	23.25	RMS	36.1	-21.7	-95.2	-56.95	-40	-16.95	V
9.78726	23.09	RMS	37.2	-21	-95.2	-55.01	-40	-15.01	H
10.76477	22.46	RMS	37.8	-19.2	-95.2	-53.54	-40	-13.54	V
Mid Channel, 3625MHz									
5.22779	26.51	RMS	34.6	-26.1	-95.2	-59.89	-40	-19.89	V
5.51601	25.94	RMS	35	-25.6	-95.2	-59.16	-40	-19.16	H
6.43688	25.06	RMS	36.4	-23.9	-95.2	-57.14	-40	-17.14	V
6.83693	24.43	RMS	36.4	-23.4	-95.2	-57.27	-40	-17.27	H
7.76444	23.87	RMS	35.9	-22.4	-95.2	-57.23	-40	-17.23	V
8.45934	23.66	RMS	36.2	-22	-95.2	-56.54	-40	-16.54	H
High Channel, 3690MHz									
5.57995	26.09	RMS	35	-25.7	-95.2	-59.41	-40	-19.41	V
5.96916	25.49	RMS	35.7	-24.5	-95.2	-58.21	-40	-18.21	H
7.75798	23.8	RMS	35.9	-22.4	-95.2	-57.3	-40	-17.3	V
7.81924	23.75	RMS	36	-22.3	-95.2	-57.05	-40	-17.05	H
9.43898	23.29	RMS	36.7	-21.2	-95.2	-55.51	-40	-15.51	V
10.18626	22.6	RMS	37.5	-20.4	-95.2	-54.9	-40	-14.9	H

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9.7.2. 5G NR Band n77

LIMITS

FCC: §27.53
(I) 3.7 GHz Service.The following emission limits apply to stations transmitting in the 3700-3980 MHz band:
(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

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QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/18/2020
Test Engineer:	19497
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750MHz									
7.49841	35.61	Pk	36	-23.1	-95.2	-46.69	-13	-33.69	H
7.49887	35.46	Pk	36	-23.1	-95.2	-46.84	-13	-33.84	V
11.25062	34.85	Pk	38	-19.6	-95.2	-41.95	-13	-28.95	V
11.2508	34.17	Pk	38	-19.6	-95.2	-42.63	-13	-29.63	H
14.99897	34.9	Pk	39.8	-19.5	-95.2	-40	-13	-27	H
15.00115	34.67	Pk	39.9	-19.5	-95.2	-40.13	-13	-27.13	V
Mid Channel, 3840MHz									
7.67897	36.01	Pk	35.9	-22.9	-95.2	-46.19	-13	-33.19	V
7.68209	35.86	Pk	35.9	-22.8	-95.2	-46.24	-13	-33.24	H
11.51924	34.69	Pk	38.4	-19.6	-95.2	-41.71	-13	-28.71	V
11.52086	34.79	Pk	38.4	-19.6	-95.2	-41.61	-13	-28.61	H
15.35827	35.05	Pk	41	-20.1	-95.2	-39.25	-13	-26.25	V
15.36045	35.21	Pk	41	-20.1	-95.2	-39.09	-13	-26.09	H
High Channel, 3930MHz									
7.83117	37.4	Pk	36	-23.6	-95.2	-45.4	-13	-32.4	V
7.86656	35.98	Pk	36	-23.5	-95.2	-46.72	-13	-33.72	H
11.65481	35.08	Pk	38.6	-19.7	-95.2	-41.22	-13	-28.22	V
11.71368	34.86	Pk	38.7	-19.9	-95.2	-41.54	-13	-28.54	H
15.66718	35.05	Pk	40.8	-19.4	-95.2	-38.75	-13	-25.75	V
15.72085	34.68	Pk	40.7	-18.7	-95.2	-38.52	-13	-25.52	H

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9.8. FIELD STRENGTH OF SPURIOUS RADIATION, ANT9

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
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9.8.1. LTE BAND 48

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

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QPSK LTE BAND 48 (20.0MHZ BANDWIDTH)

Project #:	13179115
Date:	5/10/2020
Test Engineer:	50822
Configuration:	EUT Only
Mode:	LTE Band 48 QPSK 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T348 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3560MHz									
5.0562	32.27	RMS	33.8	-26.2	-95.2	-54.93	-40	-14.93	H
5.06384	32.5	RMS	33.9	-26.1	-95.2	-54.4	-40	-14.4	V
6.31319	31.58	RMS	34.6	-24.8	-95.2	-53.32	-40	-13.32	V
6.31609	30.69	RMS	34.6	-24.7	-95.2	-54.11	-40	-14.11	H
7.27304	30.25	RMS	37.2	-23.3	-95.2	-50.55	-40	-10.55	V
7.33654	30.16	RMS	36.9	-23.7	-95.2	-51.34	-40	-11.34	H
Mid Channel, 3625MHz									
4.79621	31.91	RMS	32.9	-27.1	-95.2	-56.89	-40	-16.89	H
5.12272	32.07	RMS	33.9	-26.4	-95.2	-55.13	-40	-15.13	V
6.44947	30.77	RMS	34.9	-24.8	-95.2	-53.83	-40	-13.83	H
6.50681	30.78	RMS	35.3	-24.4	-95.2	-53.02	-40	-13.02	V
8.03242	29.34	RMS	37.1	-22.7	-95.2	-50.66	-40	-10.66	H
8.03578	29.13	RMS	37.1	-22.6	-95.2	-50.77	-40	-10.77	V
High Channel, 3690MHz									
5.0672	31.42	RMS	33.8	-26.1	-95.2	-55.58	-40	-15.58	H
5.11748	31.78	RMS	33.9	-26.4	-95.2	-55.42	-40	-15.42	V
6.37822	30.5	RMS	34.6	-24.8	-95.2	-54.3	-40	-14.3	V
6.38492	30.74	RMS	34.7	-24.8	-95.2	-53.96	-40	-13.96	H
7.71444	29.89	RMS	37.1	-23.4	-95.2	-50.91	-40	-10.91	V
7.7168	29.82	RMS	37.1	-23.4	-95.2	-51.08	-40	-11.08	H

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9.8.2. 5G NR Band n77

LIMITS

FCC: §27.53
(I) 3.7 GHz Service.The following emission limits apply to stations transmitting in the 3700-3980 MHz band:
(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

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QPSK 5G NR Band n77 (100.0MHZ BANDWIDTH)

Project #:	13179115
Date:	7/19/2020
Test Engineer:	19497
Configuration:	EUT Only
Mode	5G NR Band n77 QPSK 100MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	PK Margin (dB)	Polarity
Low Channel, 3750Mz									
7.49844	35.72	Pk	36	-23.1	-95.2	-46.58	-13	-33.58	H
7.49875	36.21	Pk	36	-23.1	-95.2	-46.09	-13	-33.09	V
11.24876	34.53	Pk	38	-19.6	-95.2	-42.27	-13	-29.27	H
11.2506	34.33	Pk	38	-19.6	-95.2	-42.47	-13	-29.47	V
14.99909	34.3	Pk	39.9	-19.5	-95.2	-40.5	-13	-27.5	V
15.00065	34.5	Pk	39.9	-19.5	-95.2	-40.3	-13	-27.3	H
Mid Channel, 3840MHz									
7.68039	35.76	Pk	35.9	-22.9	-95.2	-46.44	-13	-33.44	V
7.68106	36.15	Pk	35.9	-22.9	-95.2	-46.05	-13	-33.05	H
11.51799	35.22	Pk	38.4	-19.6	-95.2	-41.18	-13	-28.18	V
11.51805	35.03	Pk	38.4	-19.6	-95.2	-41.37	-13	-28.37	H
15.36047	35.07	Pk	41	-20.1	-95.2	-39.23	-13	-26.23	V
15.36174	36.03	Pk	41	-20	-95.2	-38.17	-13	-25.17	H
High Channel, 3930MHz									
7.85438	36.47	Pk	36	-23.6	-95.2	-46.33	-13	-33.33	H
7.85825	36.73	Pk	36	-23.6	-95.2	-46.07	-13	-33.07	V
11.79305	34.8	Pk	38.8	-19.4	-95.2	-41	-13	-28	H
11.8013	34.52	Pk	38.8	-19.3	-95.2	-41.18	-13	-28.18	V
15.69119	34.87	Pk	40.7	-19.4	-95.2	-39.03	-13	-26.03	V
15.70401	35.38	Pk	40.7	-19.2	-95.2	-38.32	-13	-25.32	H

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10. SETUP PHOTOS

Please refer to 13259315-EP1V1 for setup photos

END OF REPORT

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