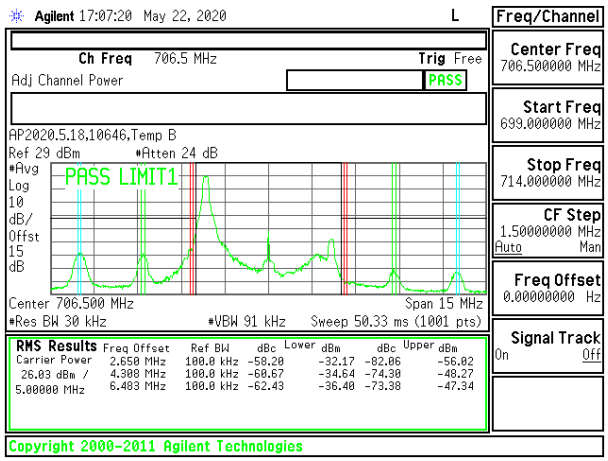
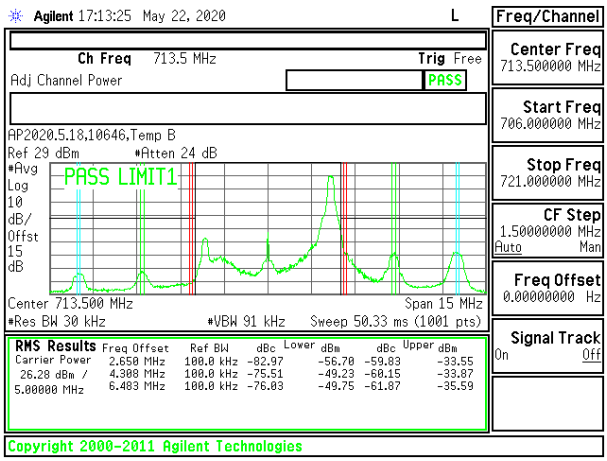
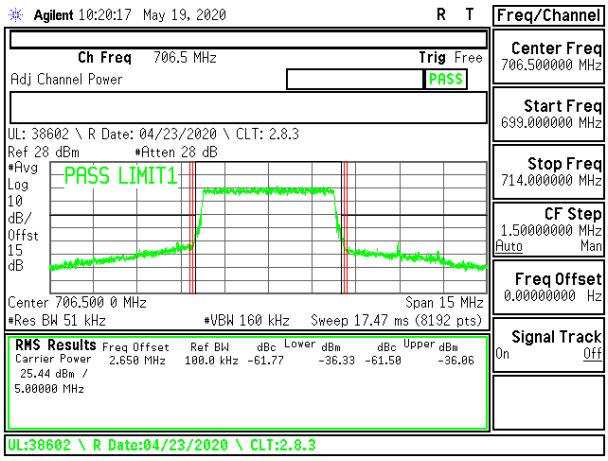


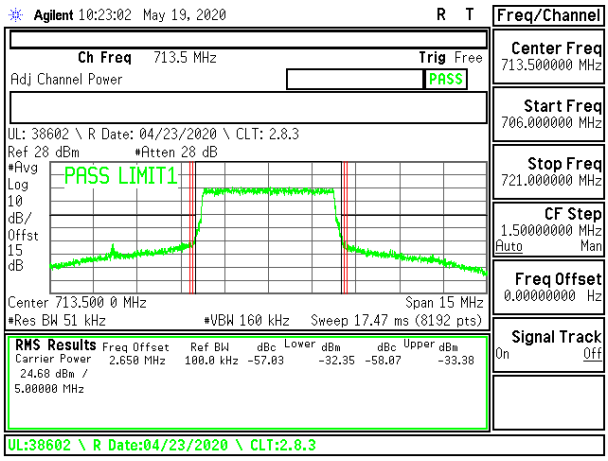
LTE B17 5MHz QPSK Low Channel RB1-0



LTE B17 5MHz QPSK High Channel RB1-24

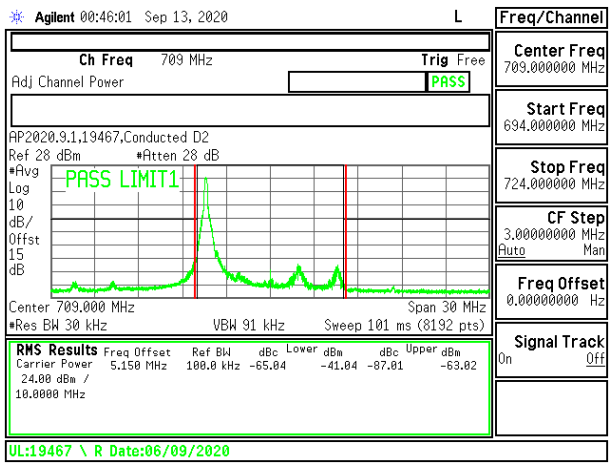


LTE B17 5MHz QPSK Low Channel RB25-0

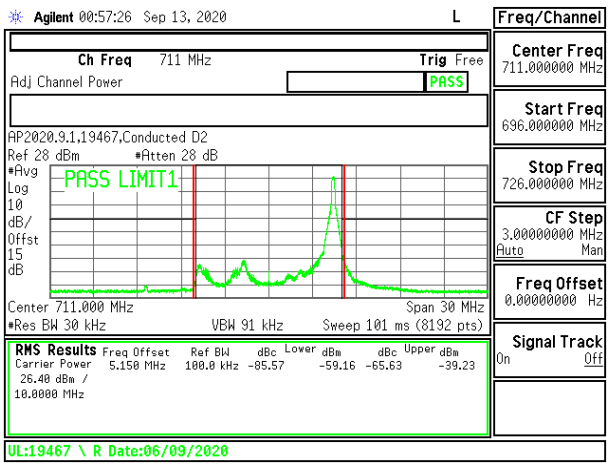


LTE B17 5MHz QPSK High Channel RB25-0

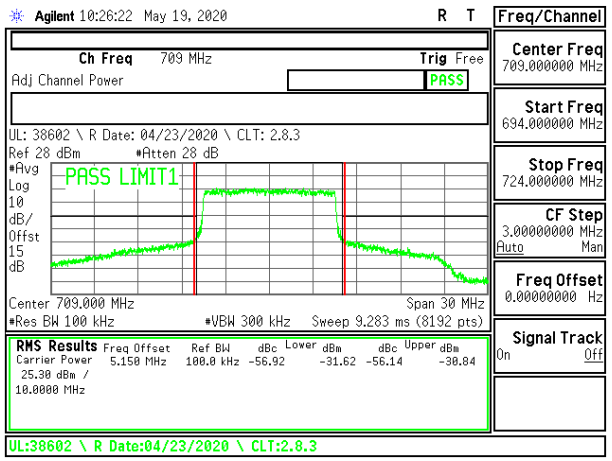
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



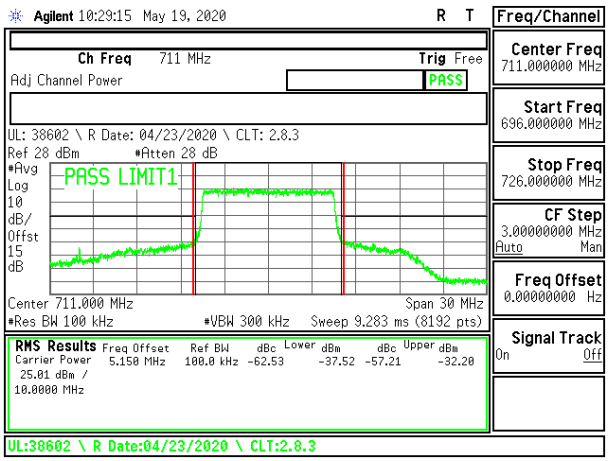
LTE B17 10MHz QPSK Low Channel RB1-0



LTE B17 10MHz QPSK High Channel RB1-49



LTE B17 10MHz QPSK Low Channel RB50-0



LTE B17 10MHz QPSK High Channel RB50-0

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

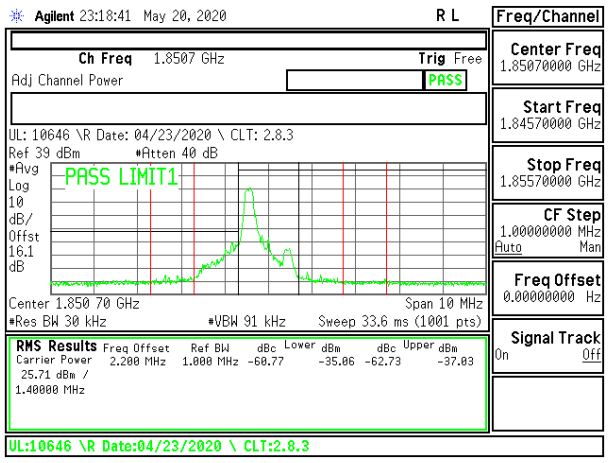
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.8. LTE BAND 25 BANDEDGE

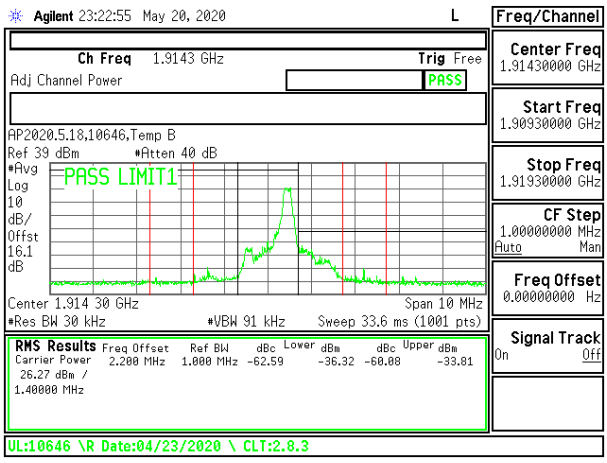
LIMITS

FCC: §24.238
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.

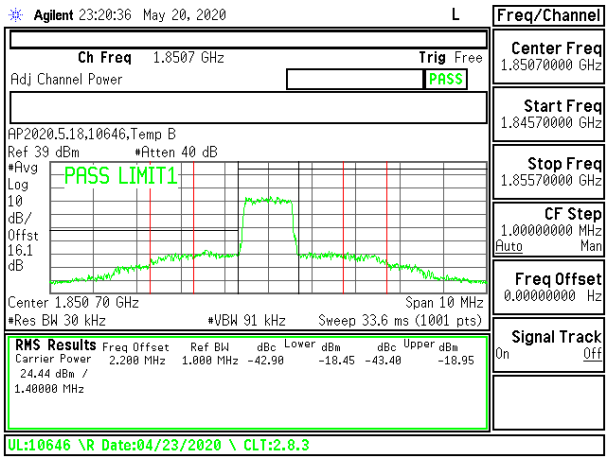
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



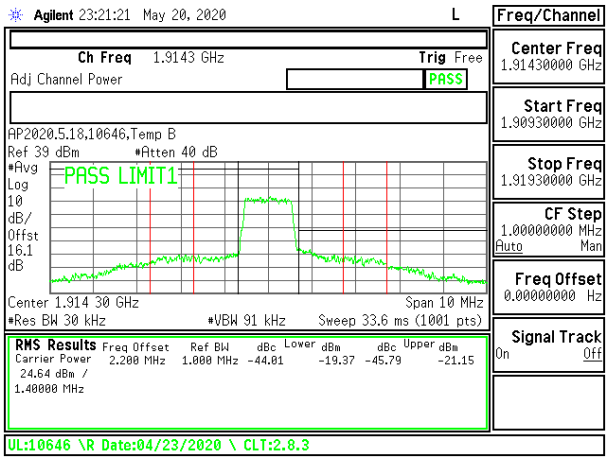
LTE B25 1.4MHz QPSK Low Channel RB1-0



LTE B25 1.4MHz QPSK High Channel RB1-5

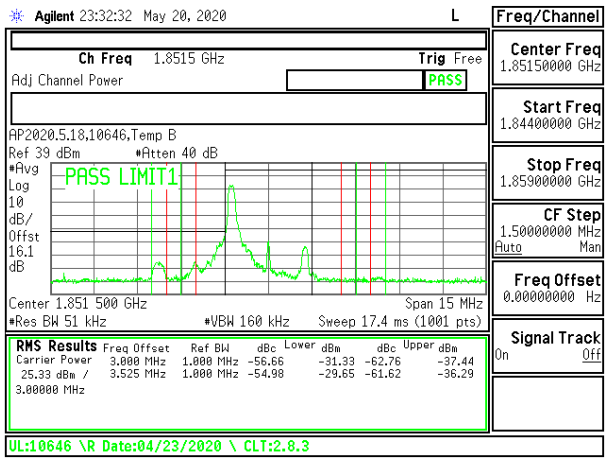


LTE B25 1.4MHz QPSK Low Channel RB6-0

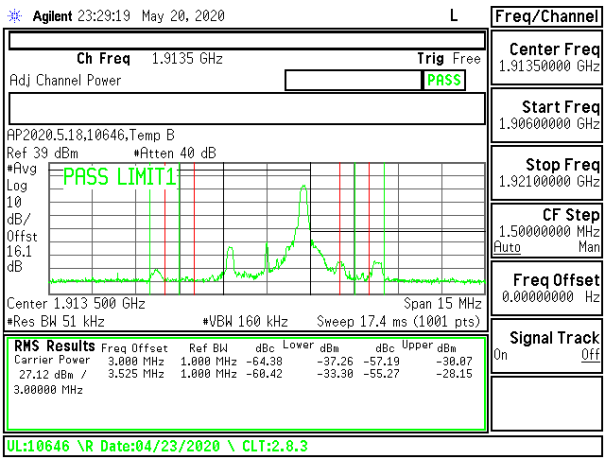


LTE B25 1.4MHz QPSK High Channel RB6-0

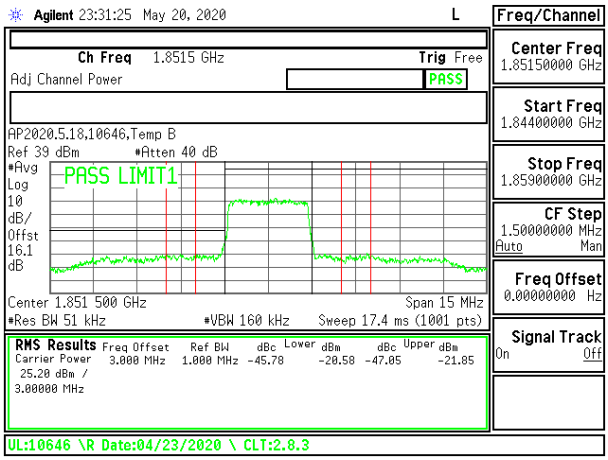
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



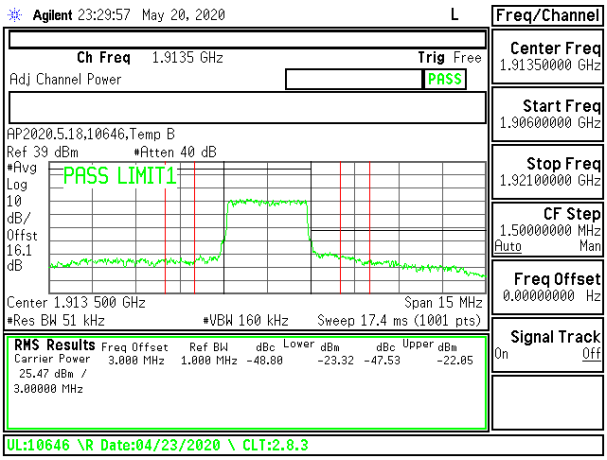
LTE B25 3MHz QPSK Low Channel RB1-0



LTE B25 3MHz QPSK High Channel RB1-14

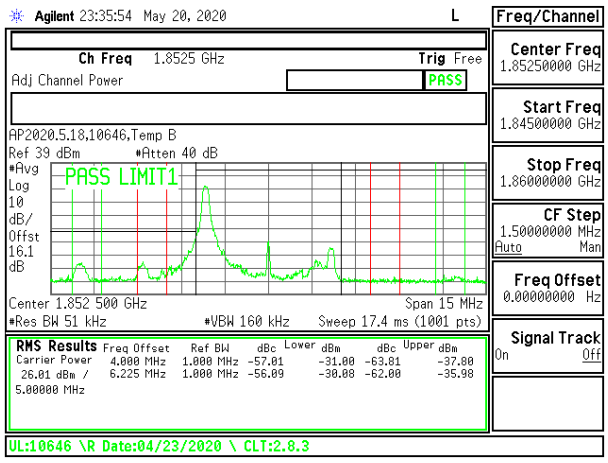


LTE B25 3MHz QPSK Low Channel RB15-0

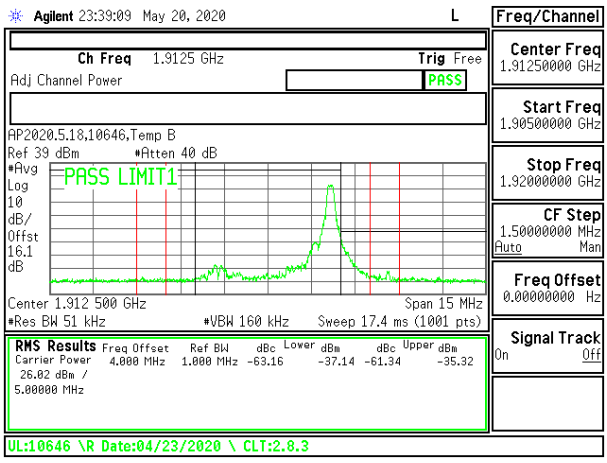


LTE B25 3MHz QPSK High Channel RB15-0

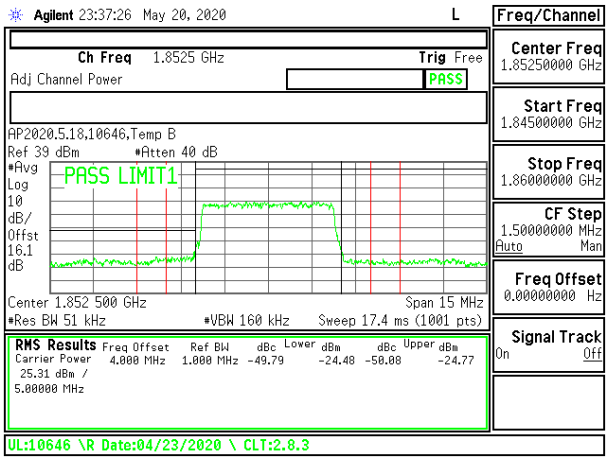
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



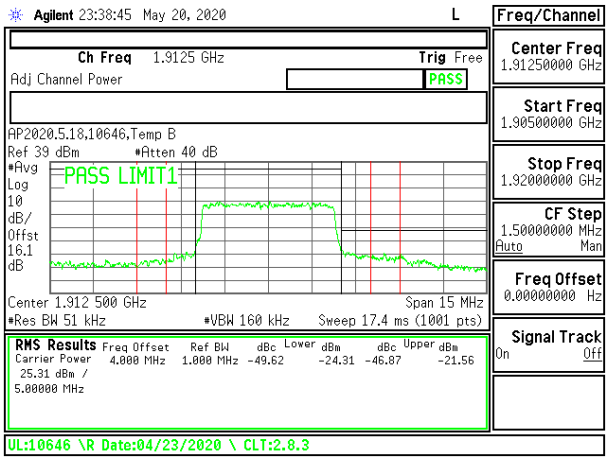
LTE B25 5MHz QPSK Low Channel RB1-0



LTE B25 5MHz QPSK High Channel RB1-24

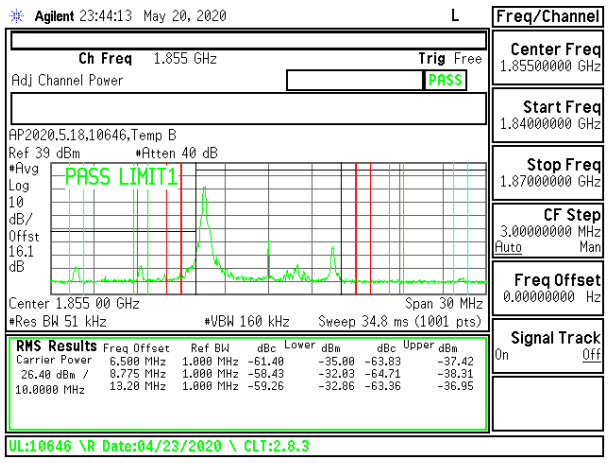


LTE B25 5MHz QPSK Low Channel RB25-0

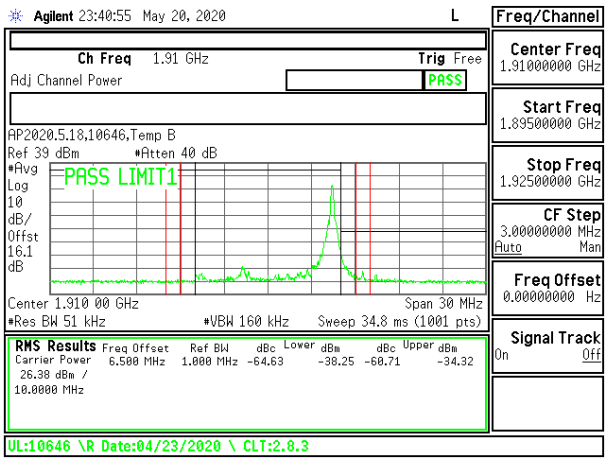


LTE B25 5MHz QPSK High Channel RB25-0

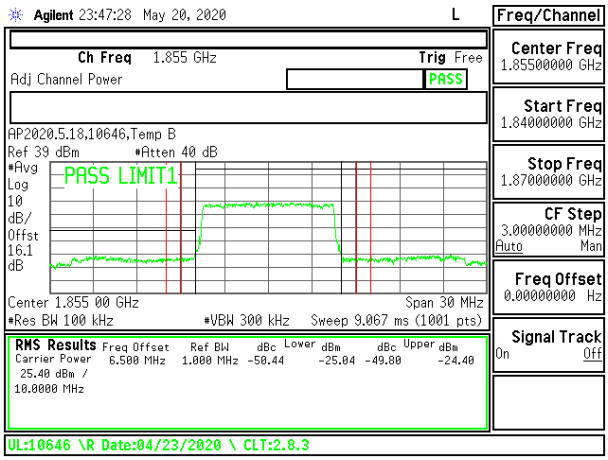
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



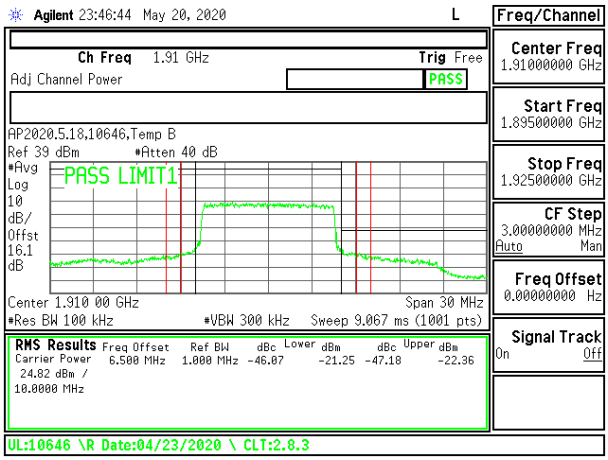
LTE B25 10MHz QPSK Low Channel RB1-0



LTE B25 10MHz QPSK High Channel RB1-49

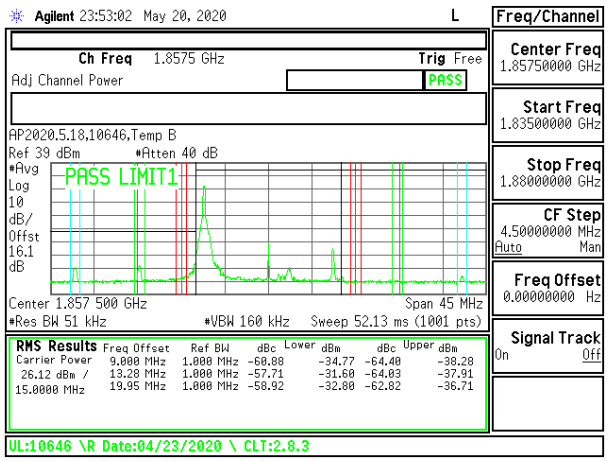


LTE B25 10MHz QPSK Low Channel RB50-0

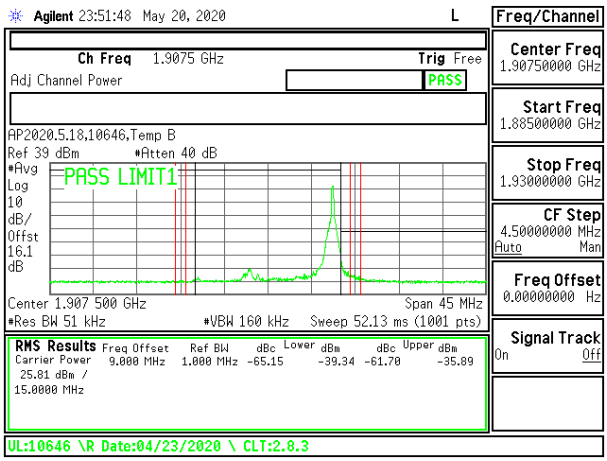


LTE B25 10MHz QPSK High Channel RB50-0

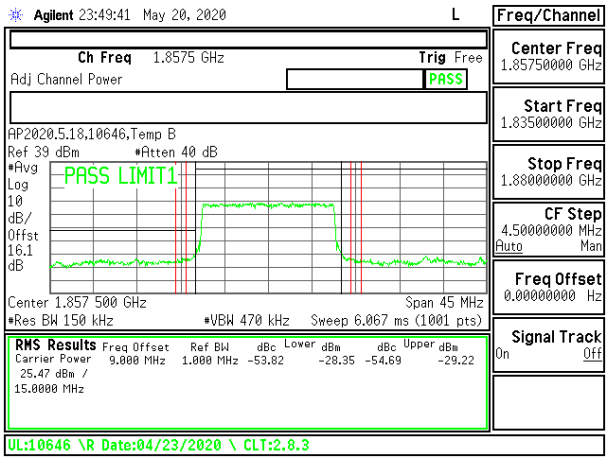
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



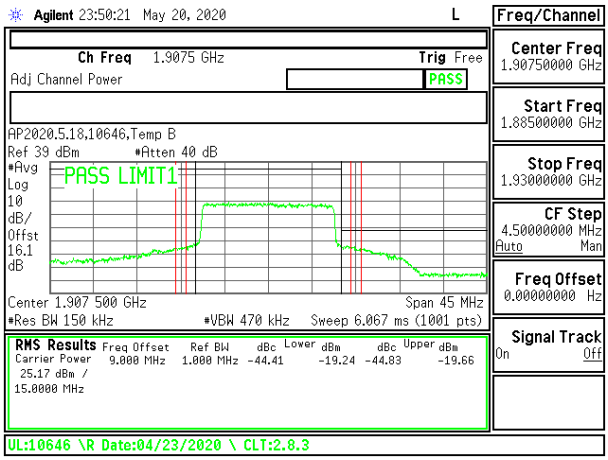
LTE B25 15MHz QPSK Low Channel RB1-0



LTE B25 15MHz QPSK High Channel RB1-74

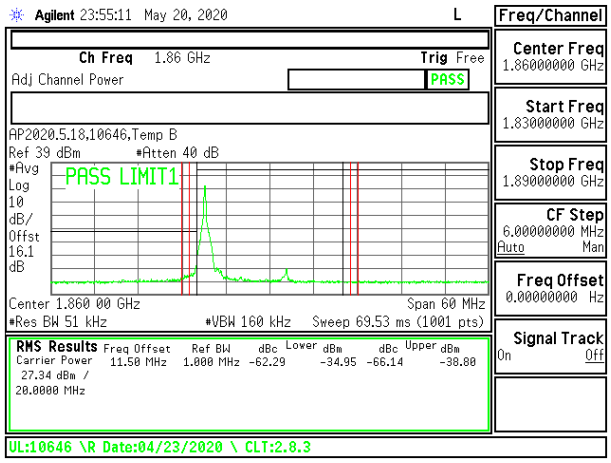


LTE B25 15MHz QPSK Low Channel RB75-0

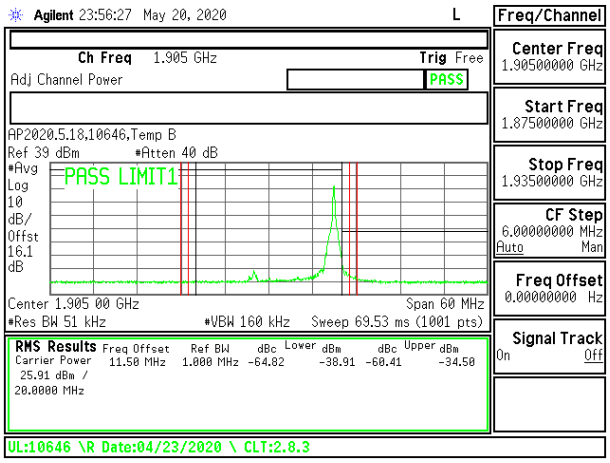


LTE B25 15MHz QPSK High Channel RB75-0

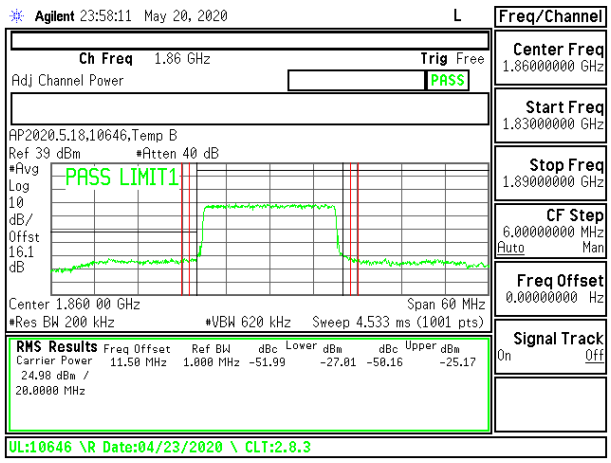
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



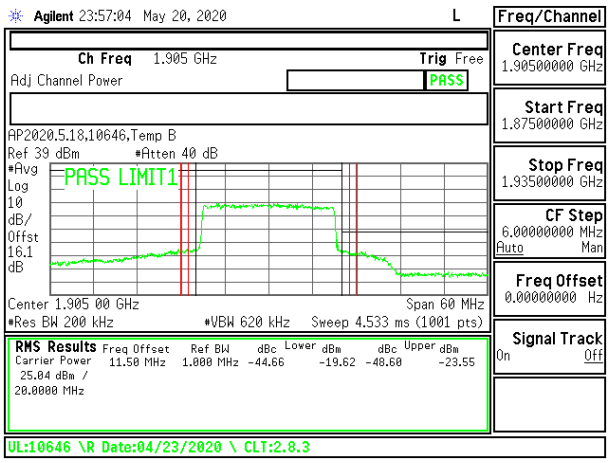
LTE B25 20MHz QPSK Low Channel RB1-0



LTE B25 20MHz QPSK High Channel RB1-99



LTE B25 20MHz QPSK Low Channel RB100-0



LTE B25 20MHz QPSK High Channel RB100-0

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.9. LTE BAND 26 EMISSION MASK (PART 90S)

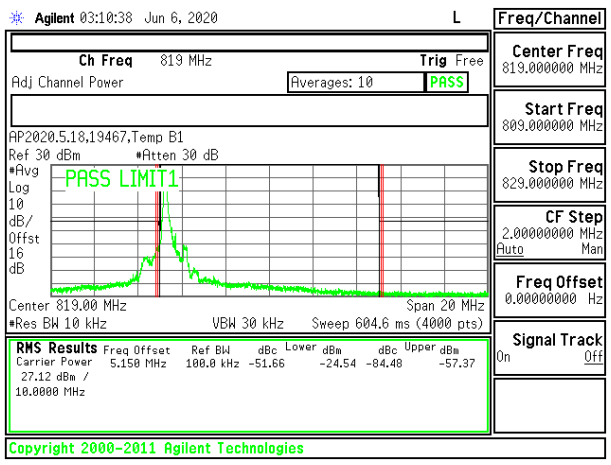
LIMITS

FCC: §90.691 Emission mask requirements for EA-based systems.
(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

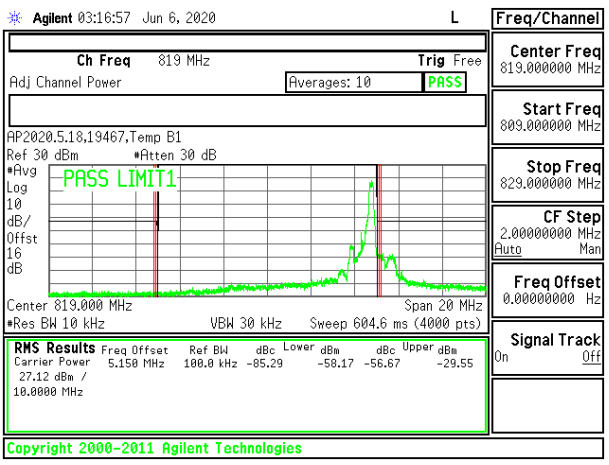
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation,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

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

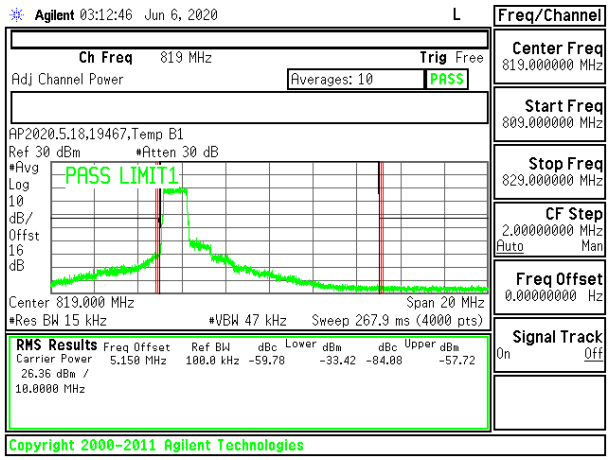
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



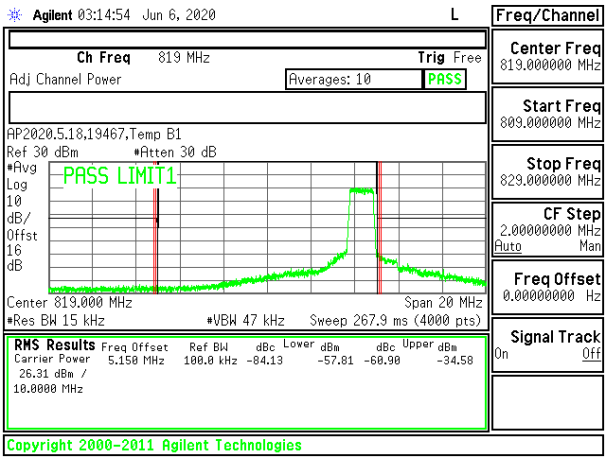
LTE B26 1.4MHz QPSK Low Channel RB1-0



LTE B26 1.4MHz QPSK High Channel RB1-5

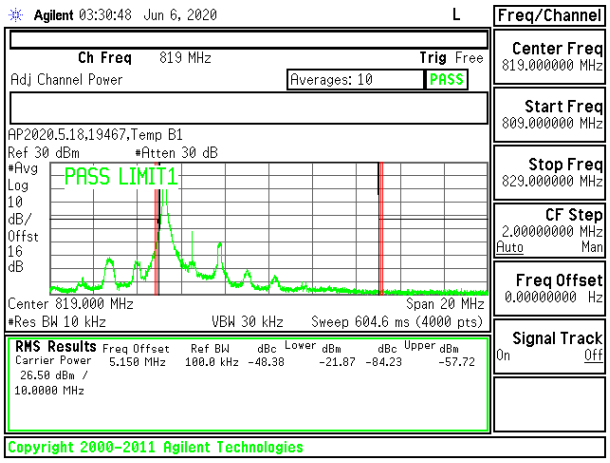


LTE B26 1.4MHz QPSK Low Channel RB6-0

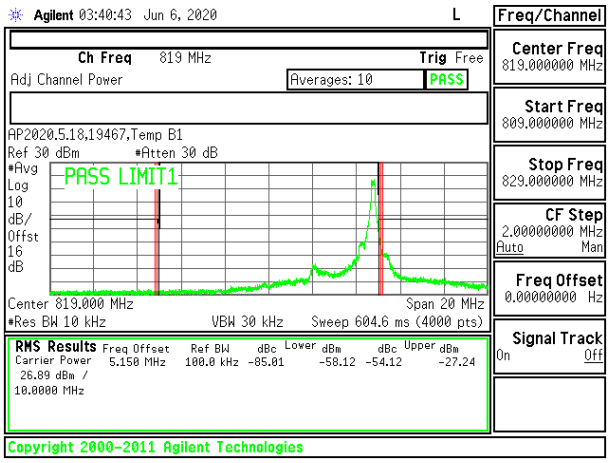


LTE B26 1.4MHz QPSK High Channel RB6-0

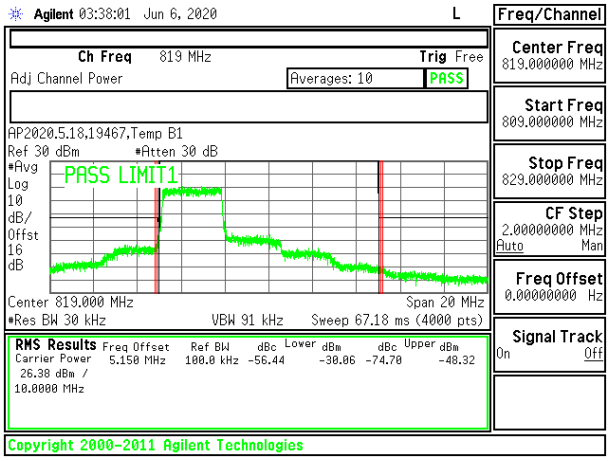
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



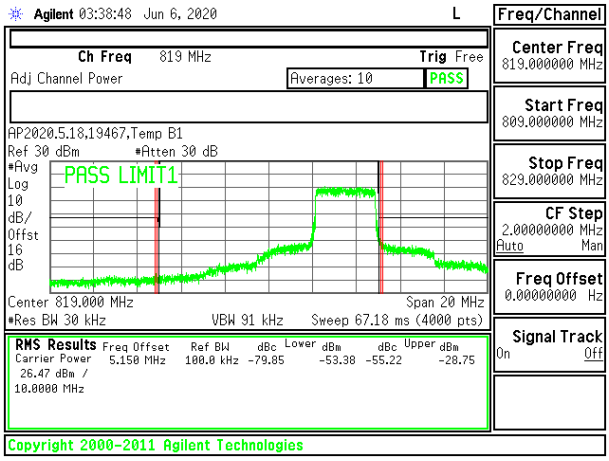
LTE B26 3MHz QPSK Low Channel RB1-0



LTE B26 3MHz QPSK High Channel RB1-14



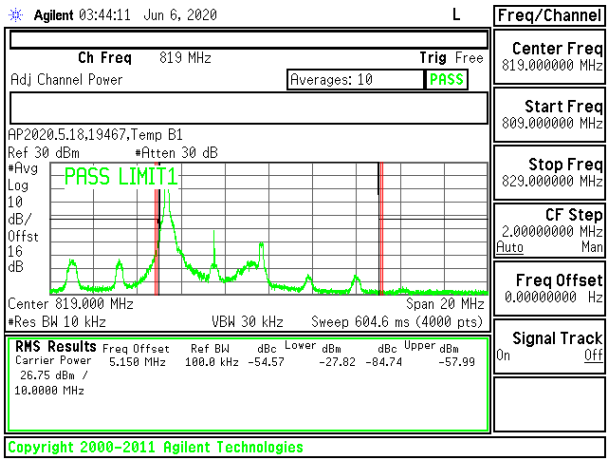
LTE B26 3MHz QPSK Low Channel RB15-0



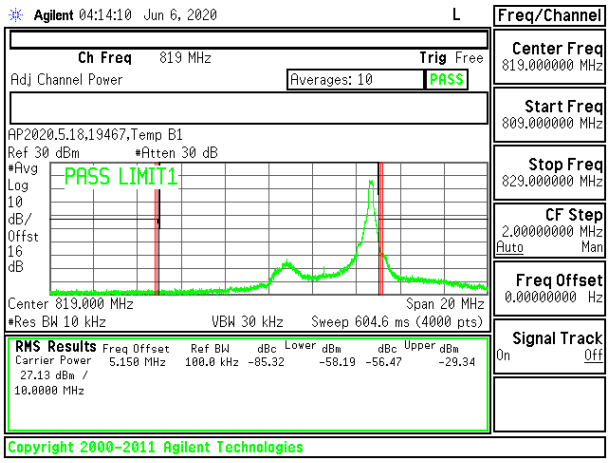
LTE B26 3MHz QPSK High Channel RB15-0

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

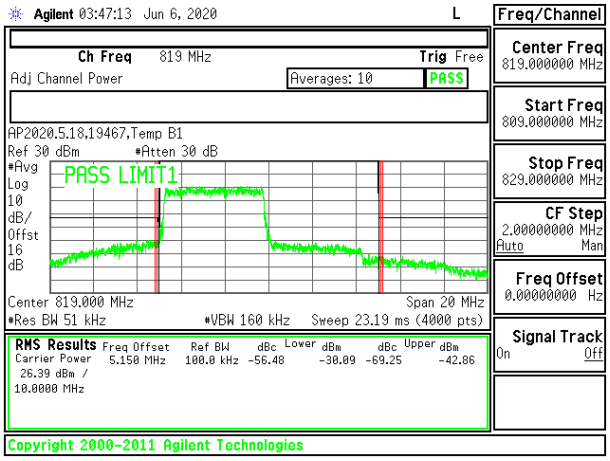
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



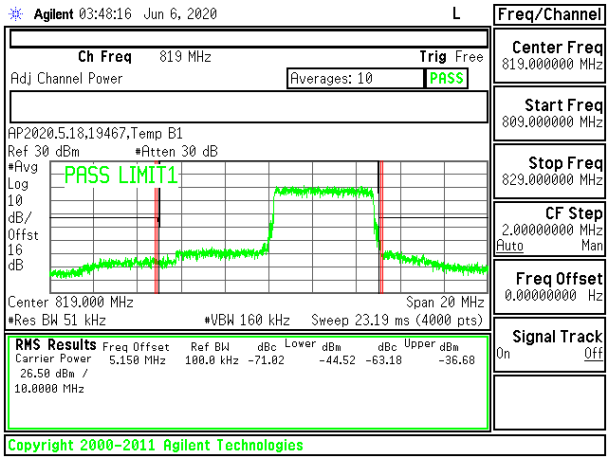
LTE B26 5MHz QPSK Low Channel RB1-0



LTE B26 5MHz QPSK High Channel RB1-24

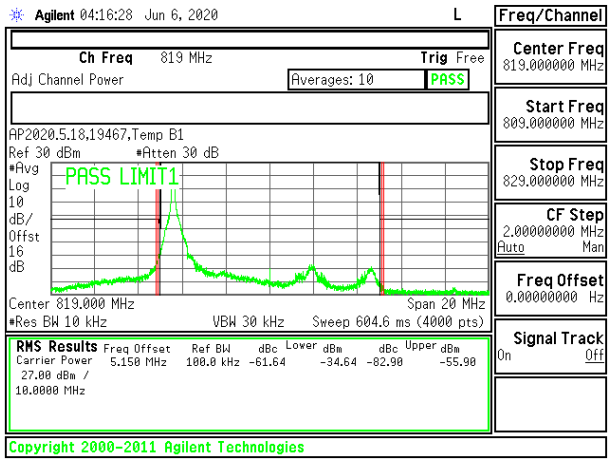


LTE B26 5MHz QPSK Low Channel RB25-0

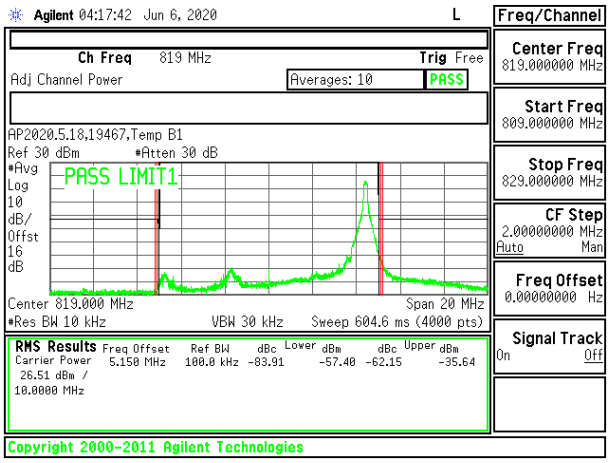


LTE B26 5MHz QPSK High Channel RB25-0

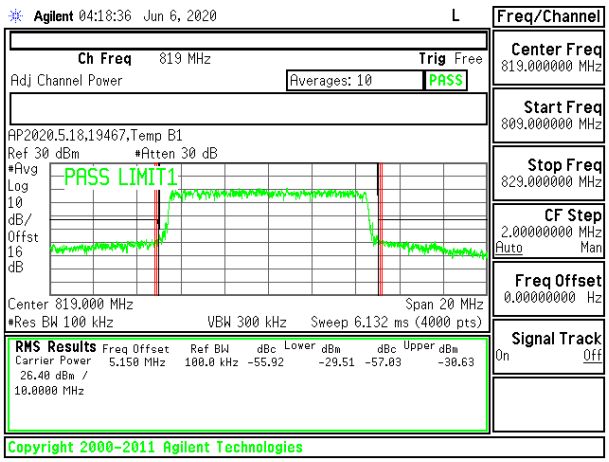
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B26 10MHz QPSK Middle Channel RB1-0



LTE B26 10MHz QPSK Middle Channel RB1-49



LTE B26 10MHz QPSK Middle Channel RB50-0

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.10. LTE BAND 30 ADJACENT CHANNEL POWER

LIMITS

FCC: §27.53
(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

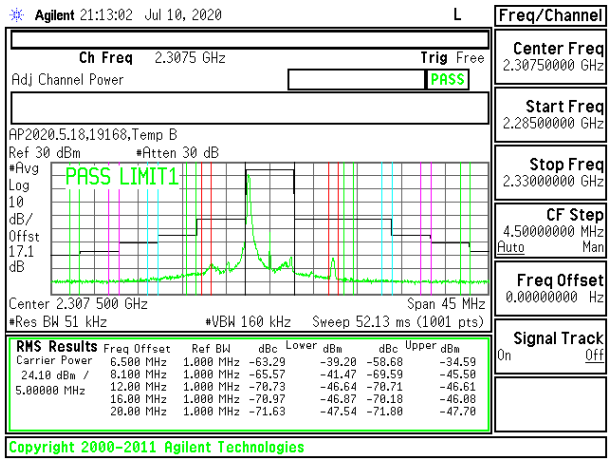
(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

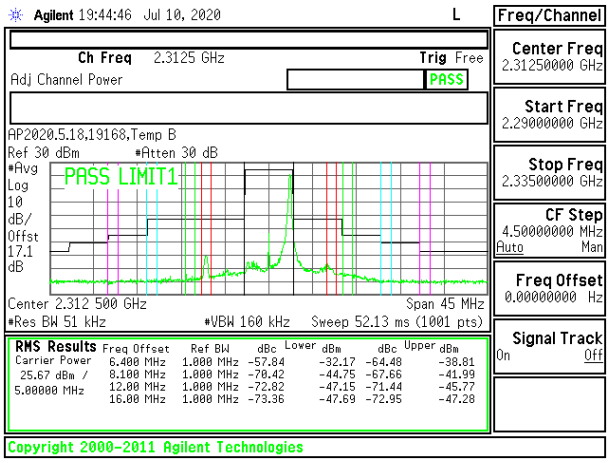
(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) 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.

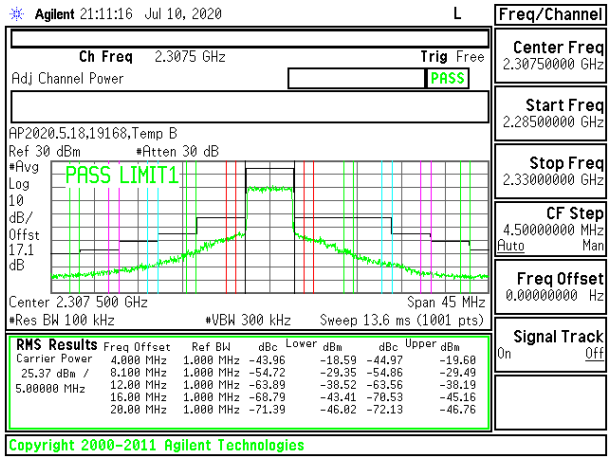
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



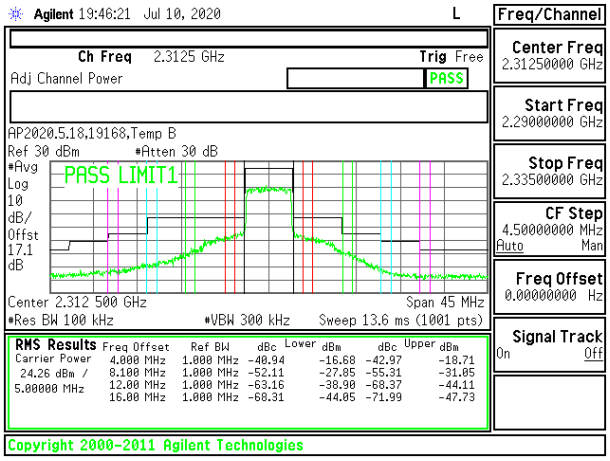
LTE B30 5MHz QPSK Low Channel RB1-0



LTE B30 5MHz QPSK High Channel RB1-24

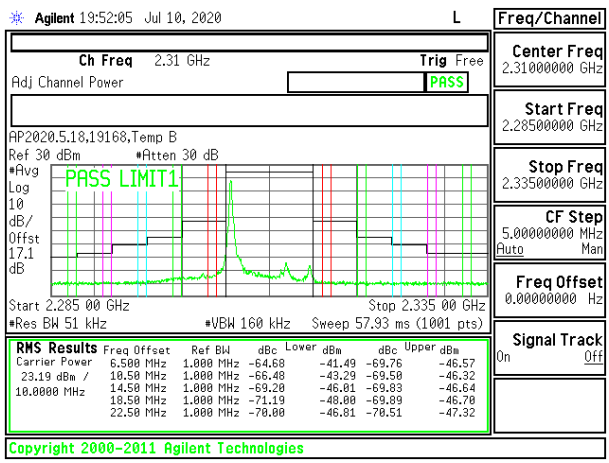


LTE B30 5MHz QPSK Low Channel RB25-0

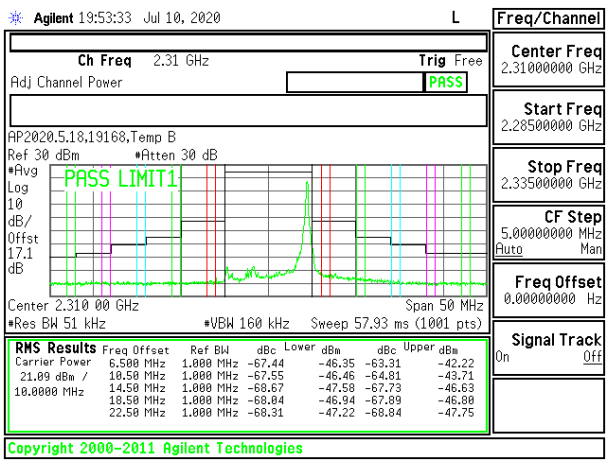


LTE B30 5MHz QPSK High Channel RB25-0

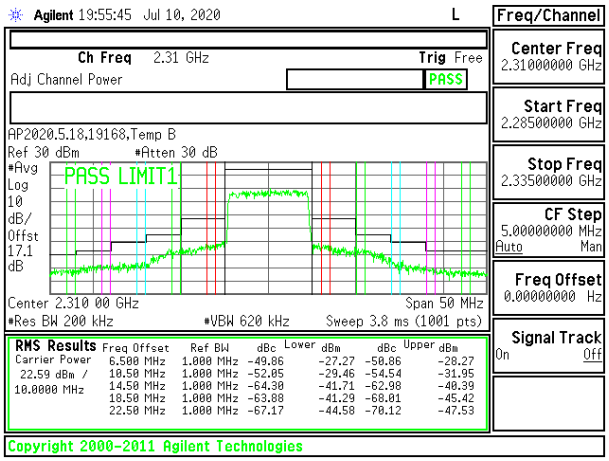
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B30 10MHz QPSK Middle Channel RB1-0



LTE B30 10MHz QPSK Middle Channel RB1-49



LTE B30 10MHz QPSK Middle Channel RB50-0

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

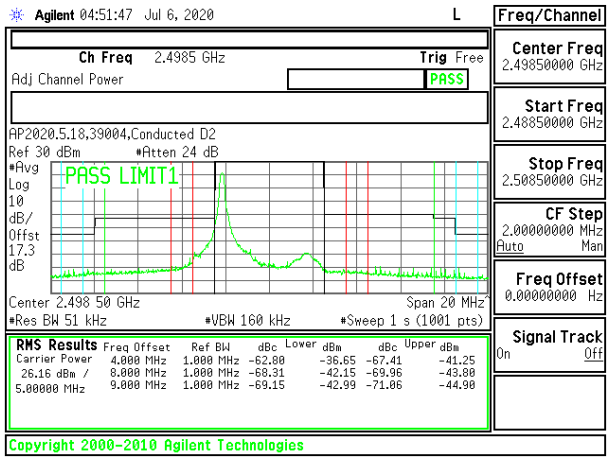
8.2.11. LTE BAND 41 AND 5G NR Band n41 ADJACENT CHANNEL POWER

LIMITS

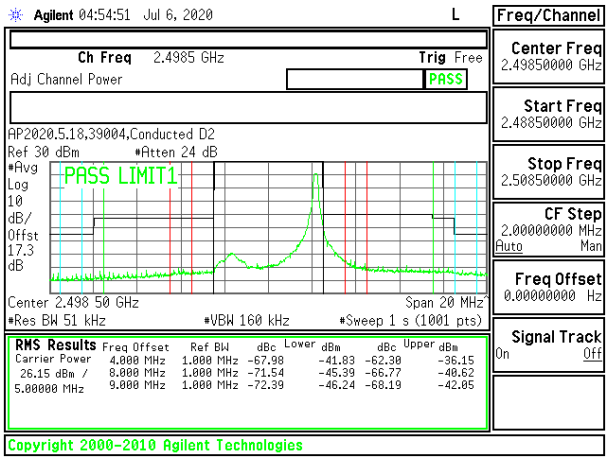
FCC: §27.53
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 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. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

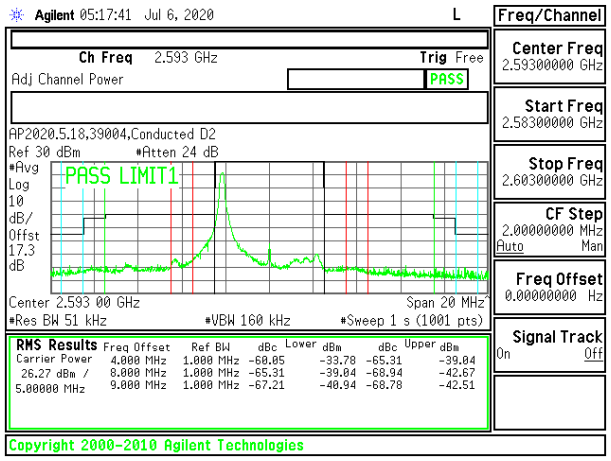
LTE BAND 41 ADJACENT CHANNEL POWER (FCC)



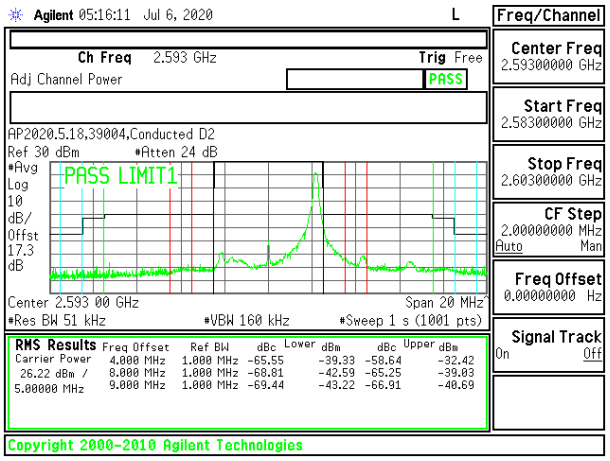
LTE B41 5MHz QPSK Low Channel RB1-0



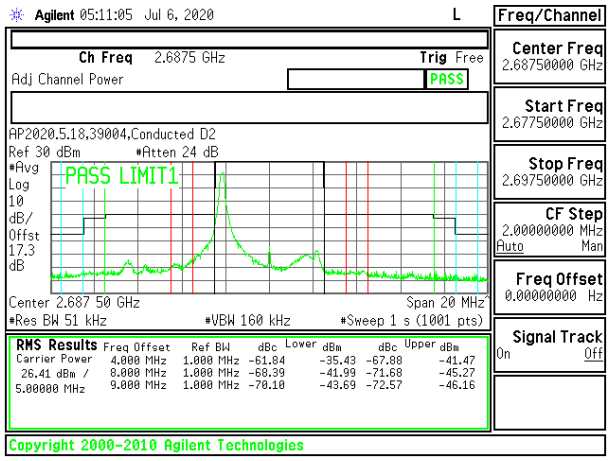
LTE B41 5MHz QPSK Low Channel RB1-24



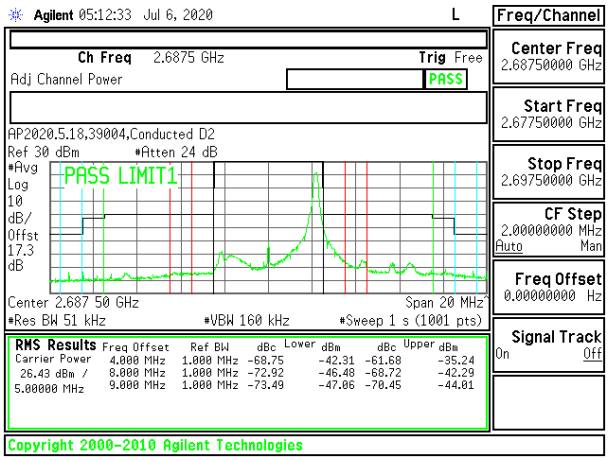
LTE B41 5MHz QPSK Middle Channel RB1-0



LTE B41 5MHz QPSK Middle Channel RB1-24

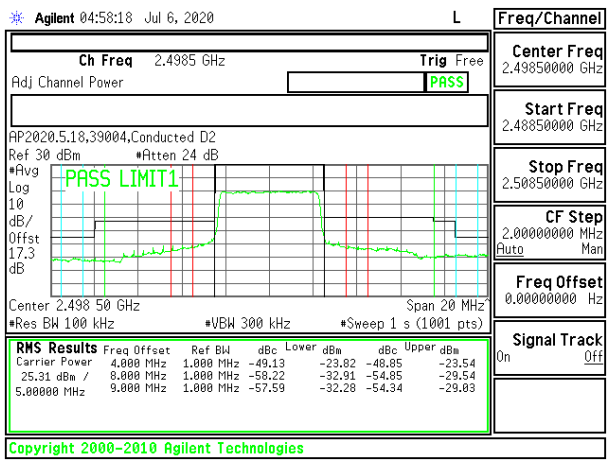


LTE B41 5MHz QPSK High Channel RB1-0

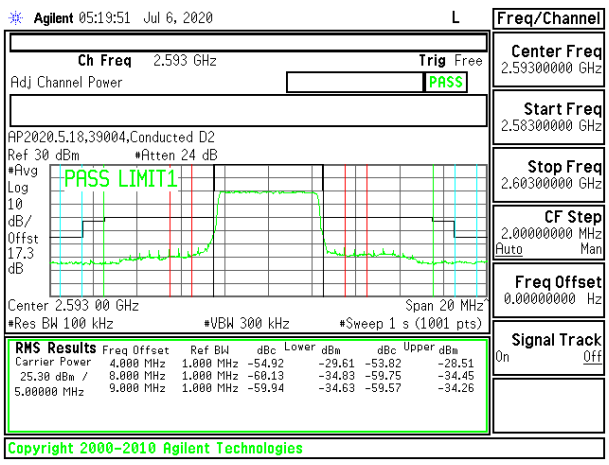


LTE B41 5MHz QPSK High Channel RB1-24

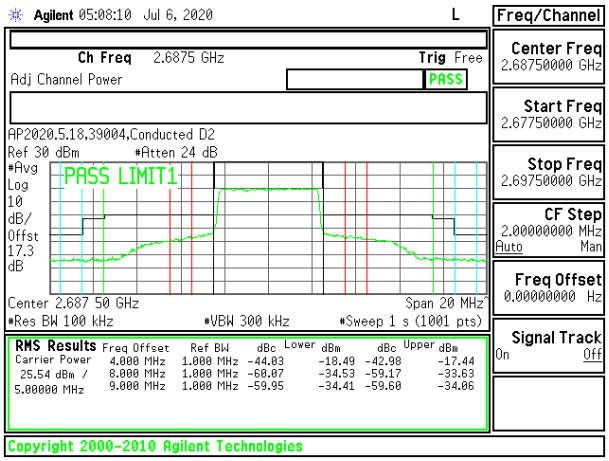
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B41 5MHz QPSK Low Channel RB25-0

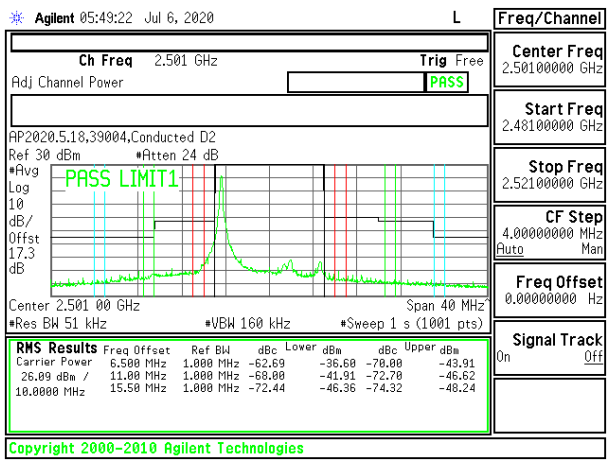


LTE B41 5MHz QPSK Middle Channel RB25-0

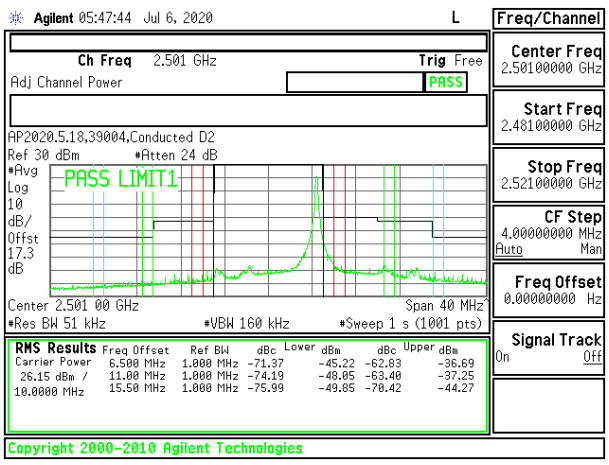


LTE B41 5MHz QPSK High Channel RB25-0

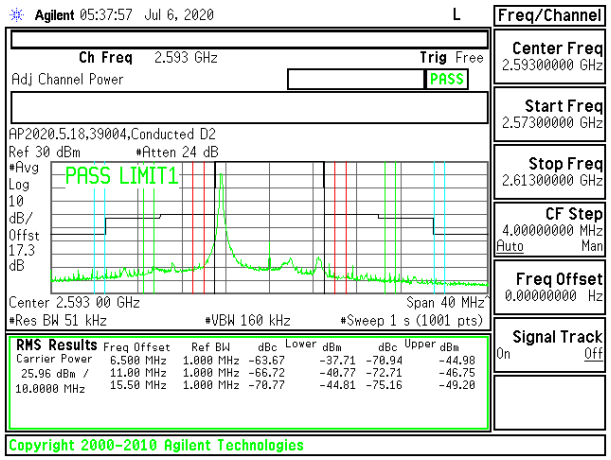
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



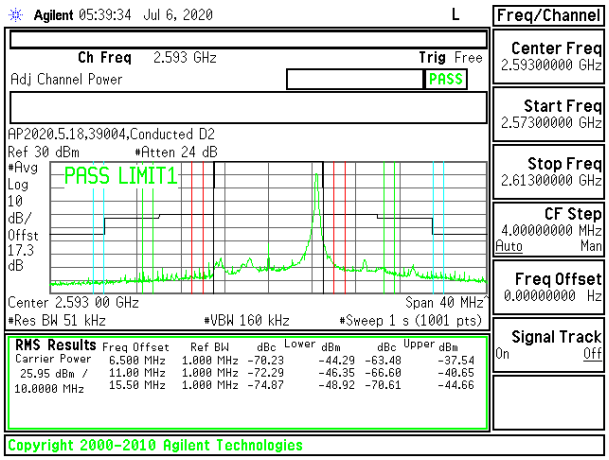
LTE B41 10MHz QPSK Low Channel RB1-0



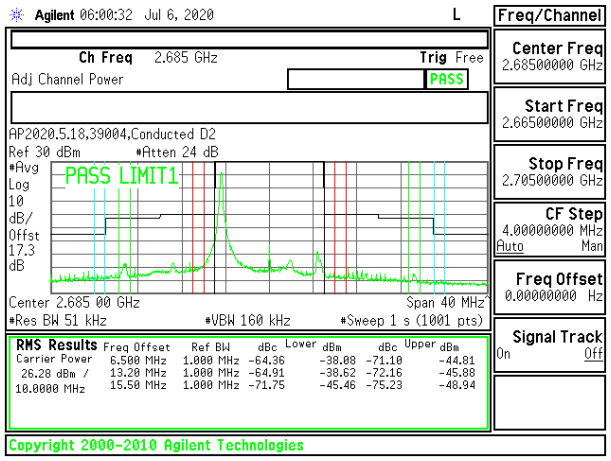
LTE B41 10MHz QPSK Low Channel RB1-49



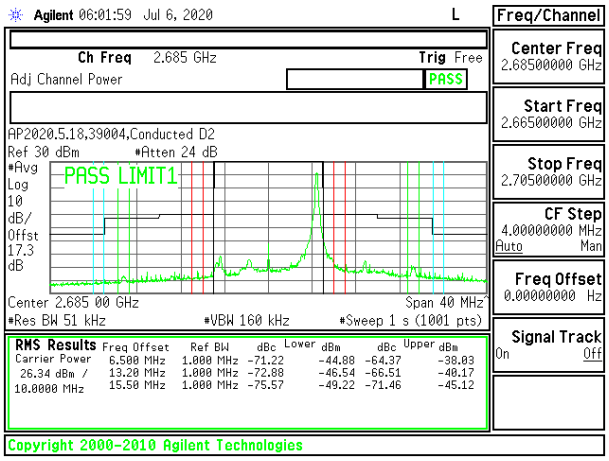
LTE B41 10MHz QPSK Middle Channel RB1-0



LTE B41 10MHz QPSK Middle Channel RB1-49

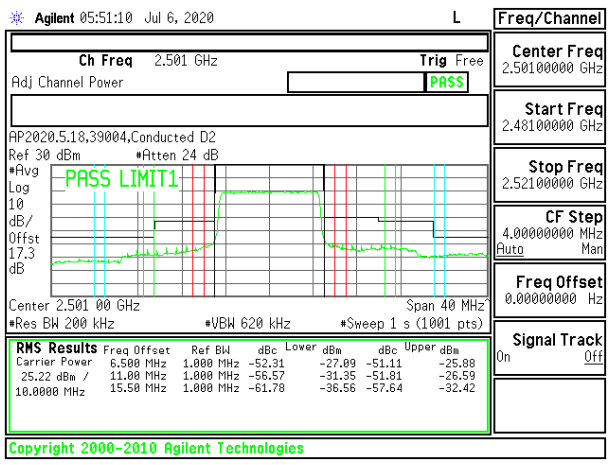


LTE B41 10MHz QPSK High Channel RB1-0

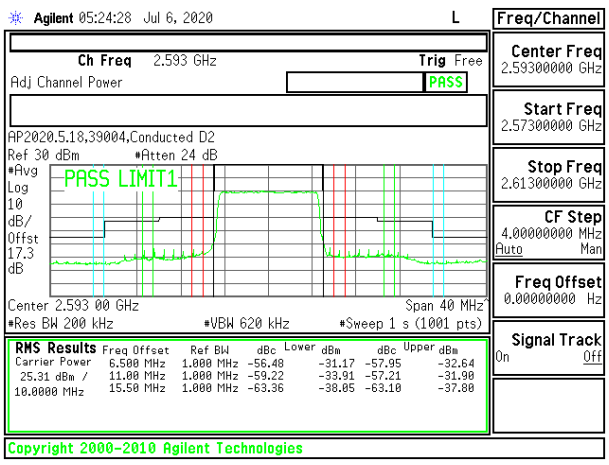


LTE B41 10MHz QPSK High Channel RB1-49

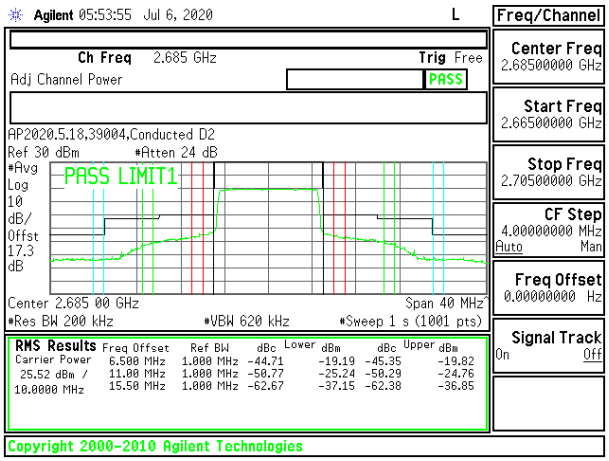
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B41 10MHz QPSK Low Channel RB50-0 Low RBW

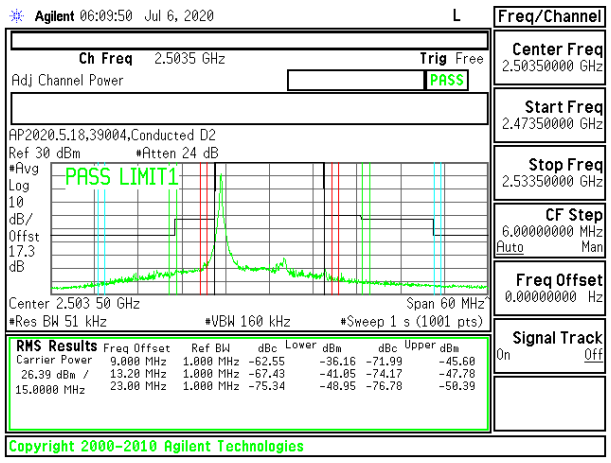


LTE B41 10MHz QPSK Middle Channel RB50-0

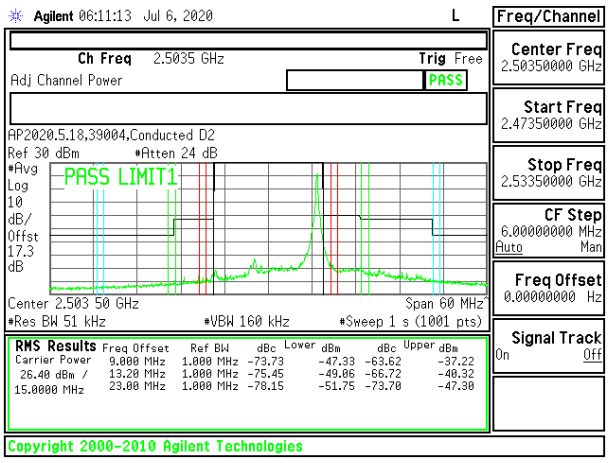


LTE B41 10MHz QPSK High Channel RB50-0

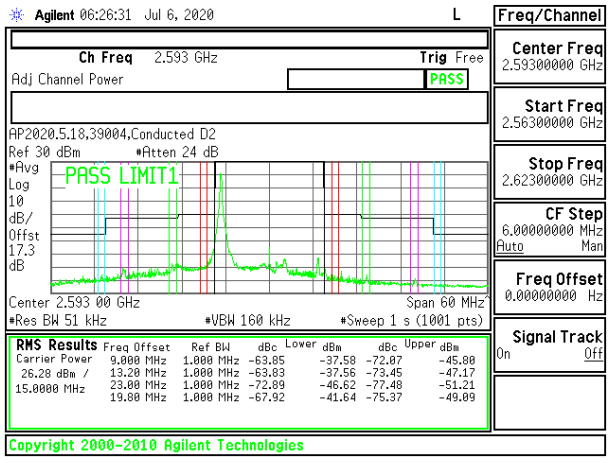
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



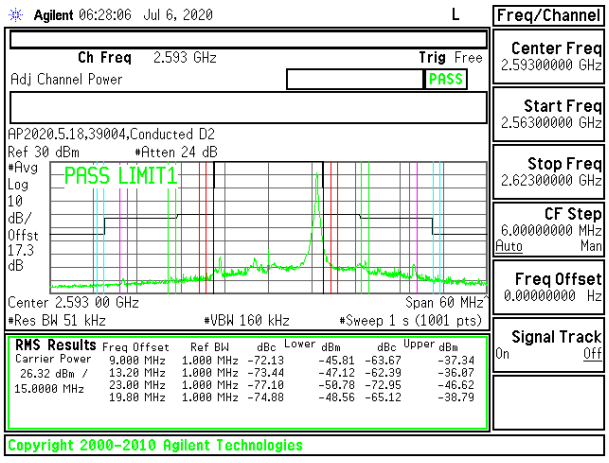
LTE B41 15MHz QPSK Low Channel RB1-0



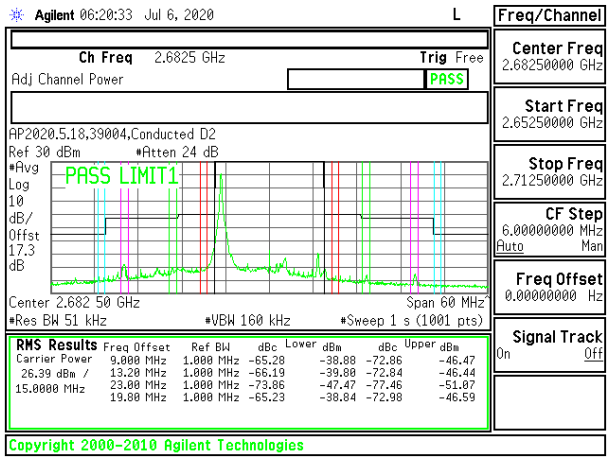
LTE B41 15MHz QPSK Low Channel RB1-74



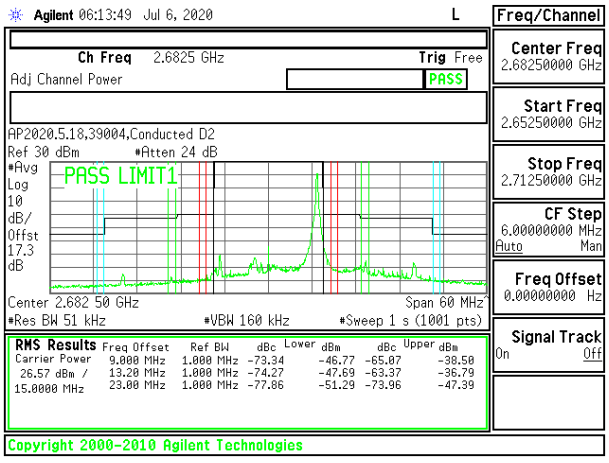
LTE B41 15MHz QPSK Middle Channel RB1-0



LTE B41 15MHz QPSK Middle Channel RB1-74

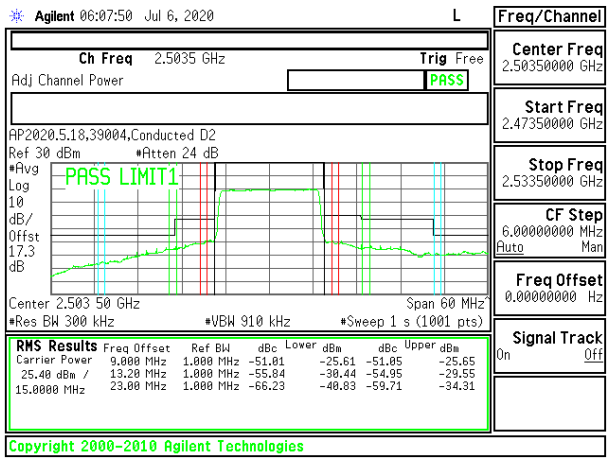


LTE B41 15MHz QPSK High Channel RB1-0

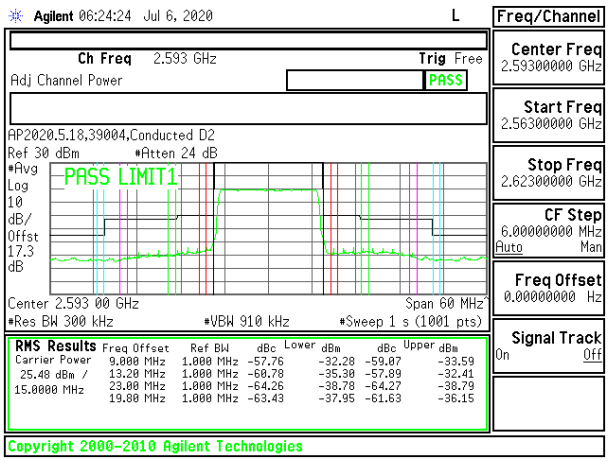


LTE B41 15MHz QPSK High Channel RB1-74

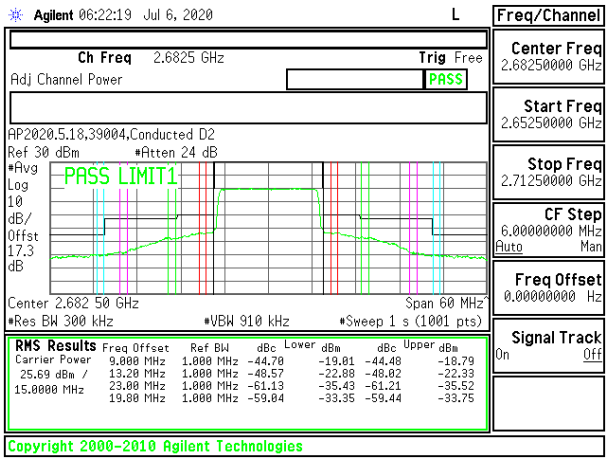
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B41 15MHz QPSK Low Channel RB75-0

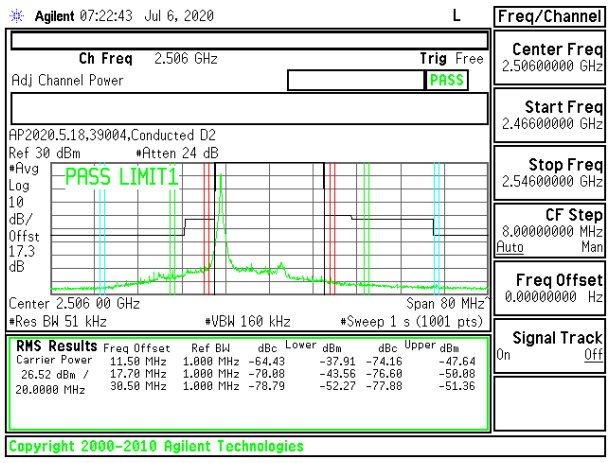


LTE B41 15MHz QPSK Middle Channel RB75-0

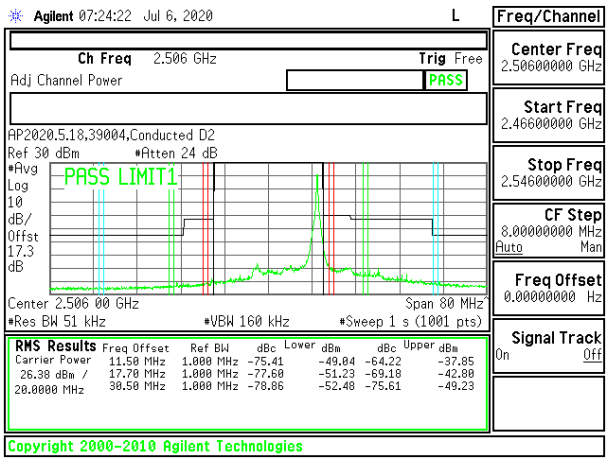


LTE B41 15MHz QPSK High Channel RB75-0

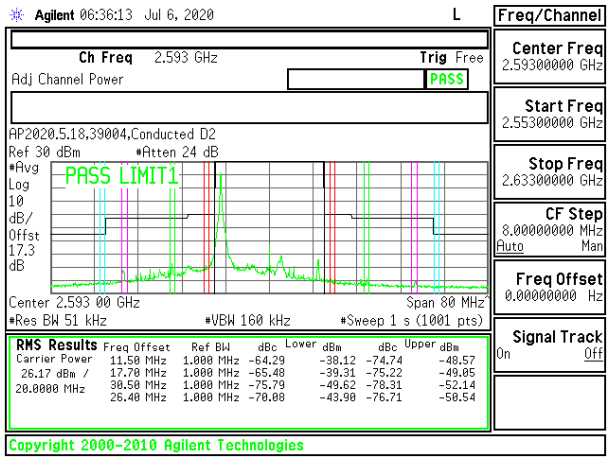
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



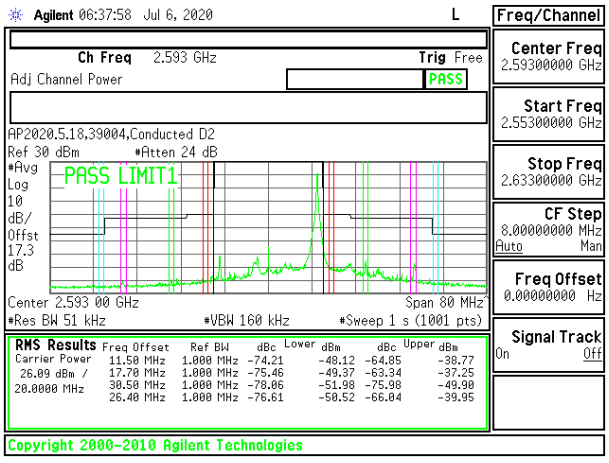
LTE B41 20MHz QPSK Low Channel RB1-0



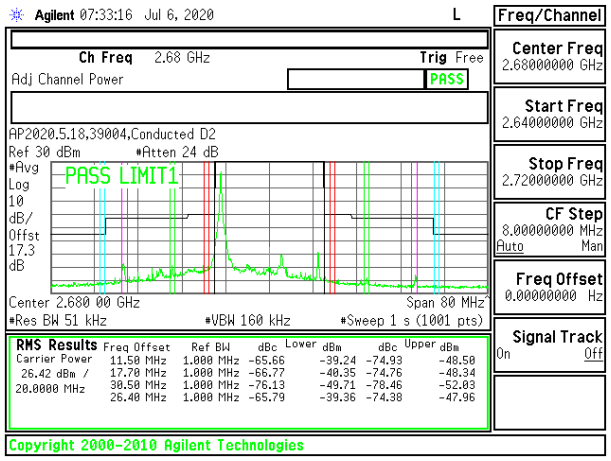
LTE B41 20MHz QPSK Low Channel RB1-99



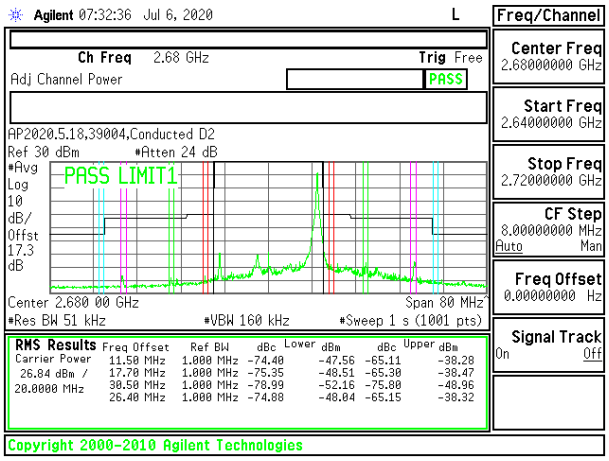
LTE B41 20MHz QPSK Middle Channel RB1-0



LTE B41 20MHz QPSK Middle Channel RB1-99

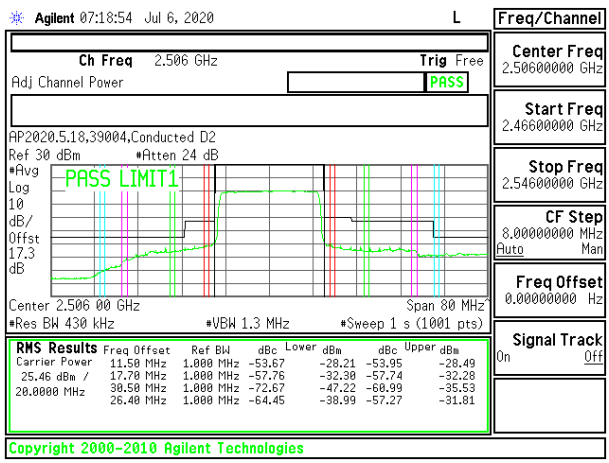


LTE B41 20MHz QPSK High Channel RB1-0

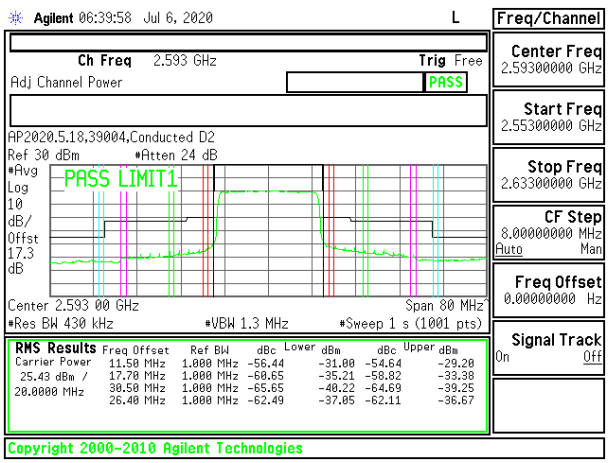


LTE B41 20MHz QPSK High Channel RB1-99

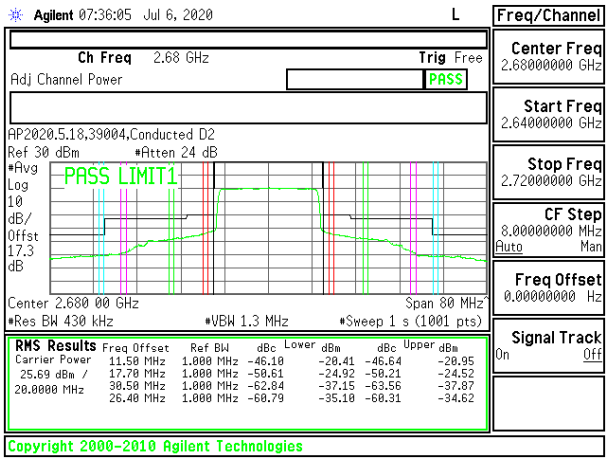
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B41 20MHz QPSK Low Channel RB100-0



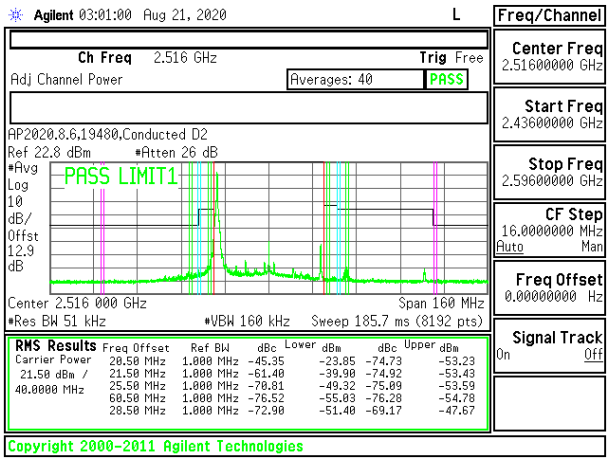
LTE B41 20MHz QPSK Middle Channel RB100-0



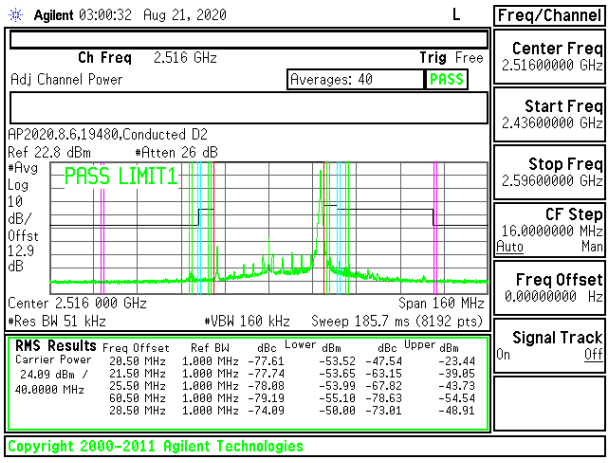
LTE B41 20MHz QPSK High Channel RB100-0

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

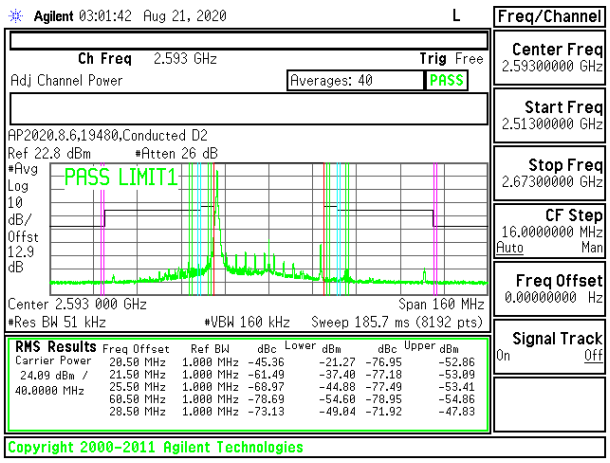
5G NR Band n41 ADJACENT CHANNEL POWER (FCC)



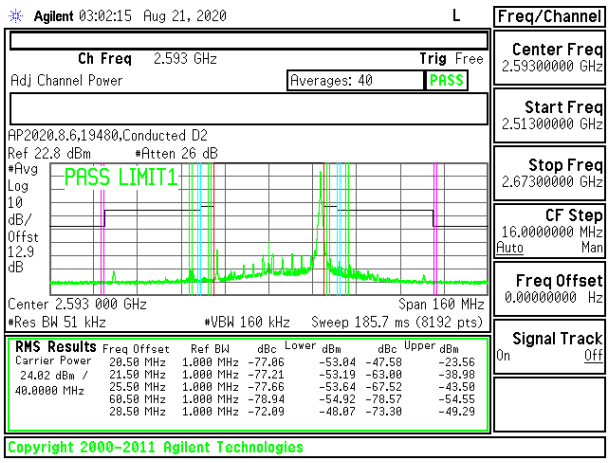
5G NR Band n41 40MHz QPSK Low Channel RB1-0



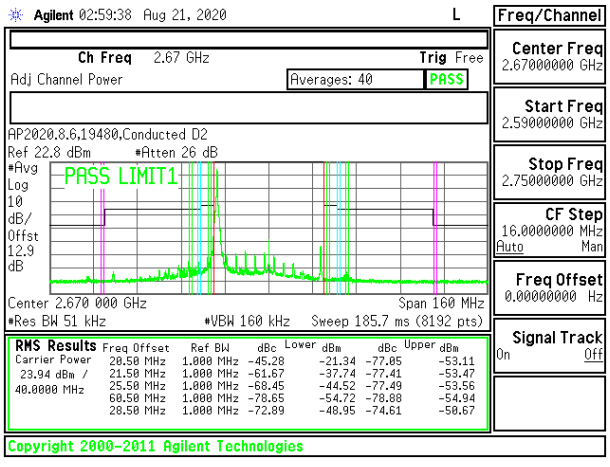
5G NR Band n41 40MHz QPSK Low Channel RB1-105



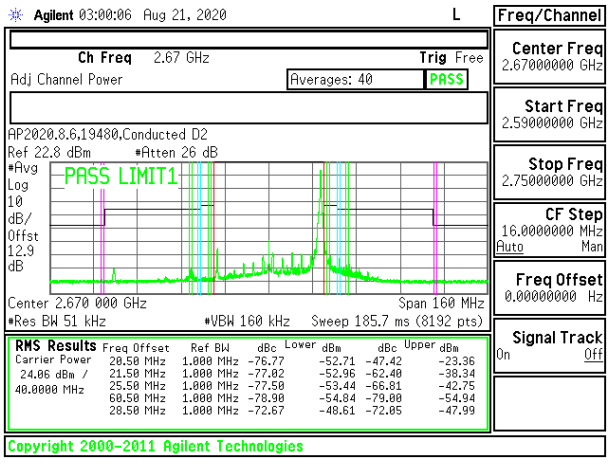
5G NR Band n41 40MHz QPSK Middle Channel RB1-0



5G NR Band n41 40MHz QPSK Middle Channel RB1-105

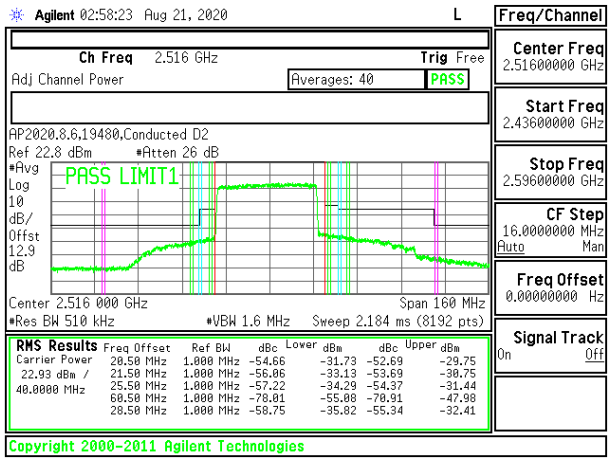


5G NR Band n41 40MHz QPSK High Channel RB1-0

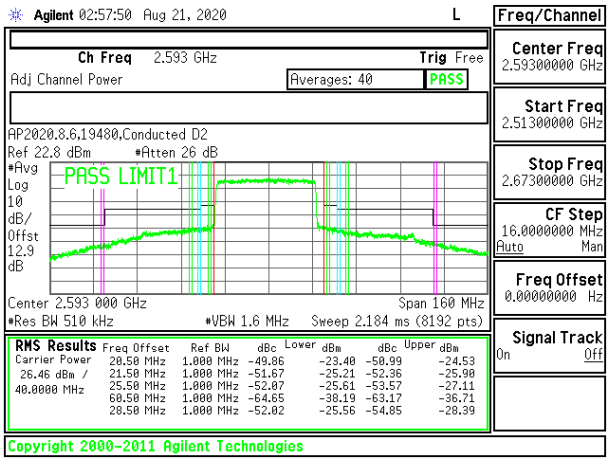


5G NR Band n41 40MHz QPSK High Channel RB1-105

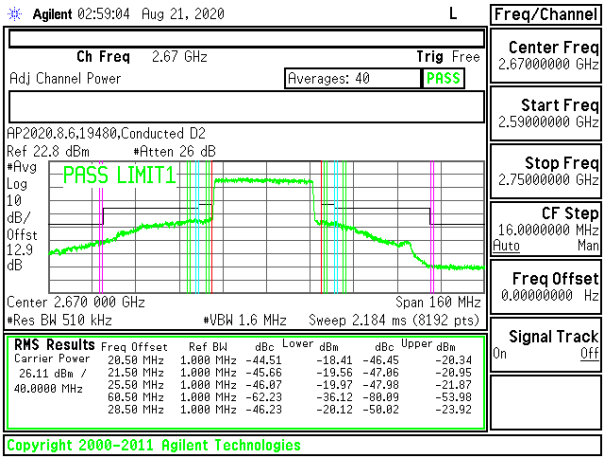
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n41 40MHz QPSK Low Channel RB100-0

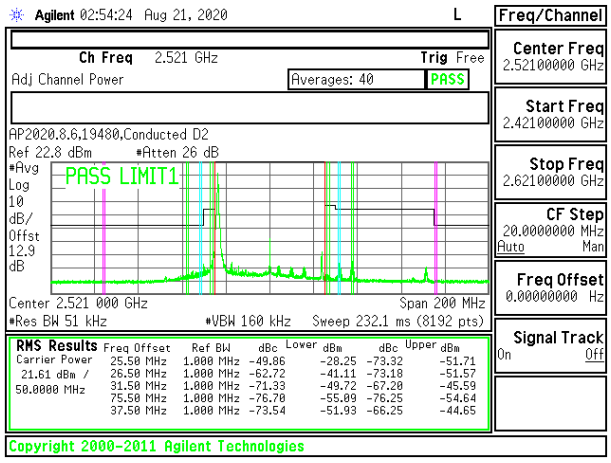


5G NR Band n41 40MHz QPSK Middle Channel RB100-0

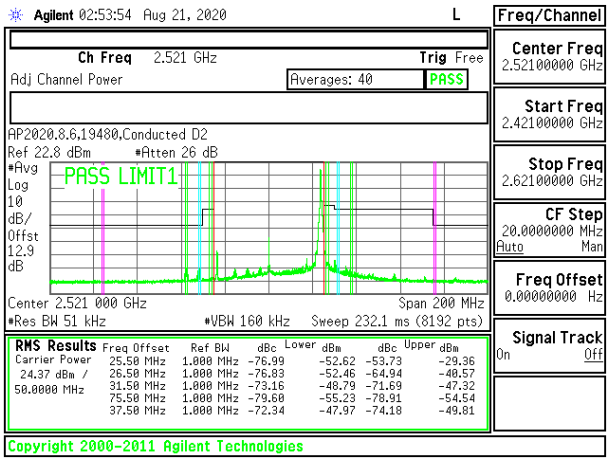


5G NR Band n41 40MHz QPSK High Channel RB100-0

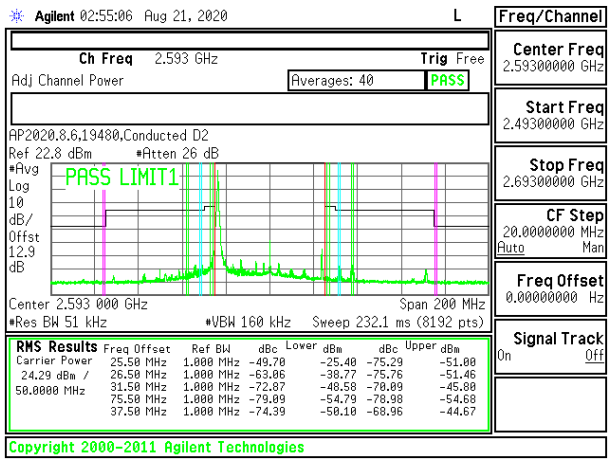
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



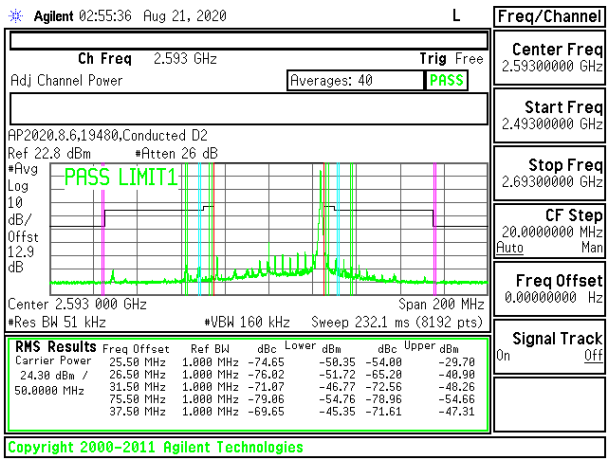
5G NR Band n41 50MHz QPSK Low Channel RB1-0



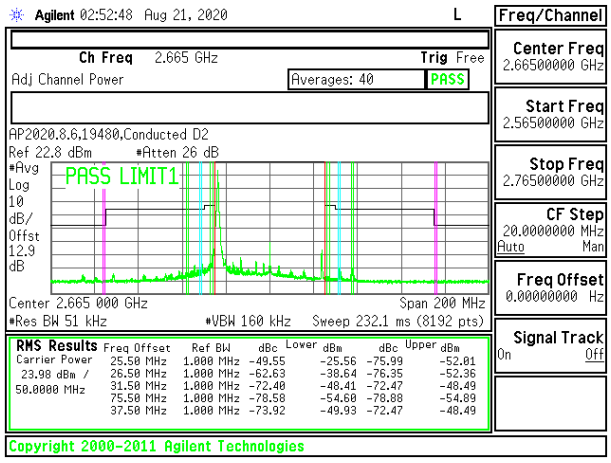
5G NR Band n41 50MHz QPSK Low Channel RB1-132



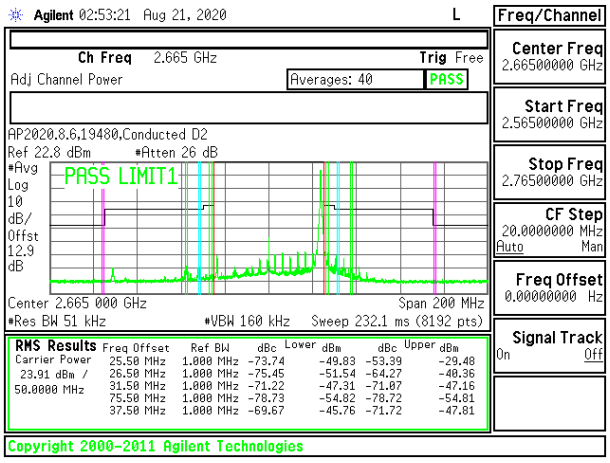
5G NR Band n41 50MHz QPSK Middle Channel RB1-0



5G NR Band n41 50MHz QPSK Middle Channel RB1-132

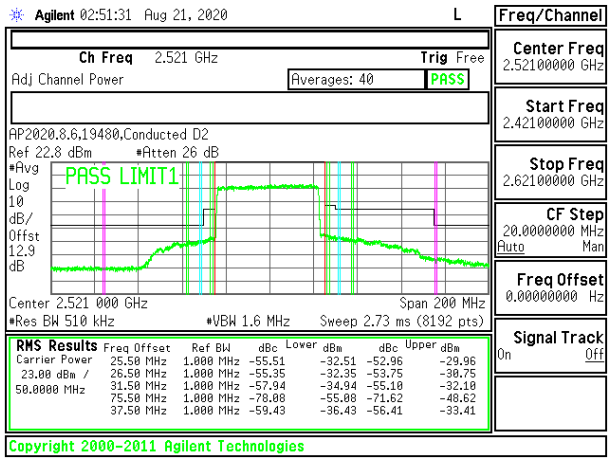


5G NR Band n41 50MHz QPSK High Channel RB1-0

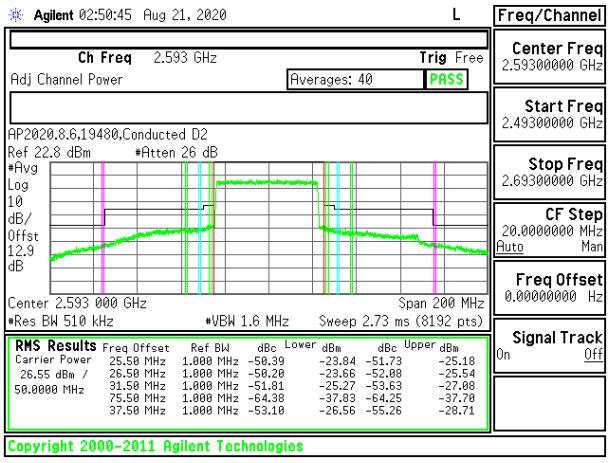


5G NR Band n41 50MHz QPSK High Channel RB1-132

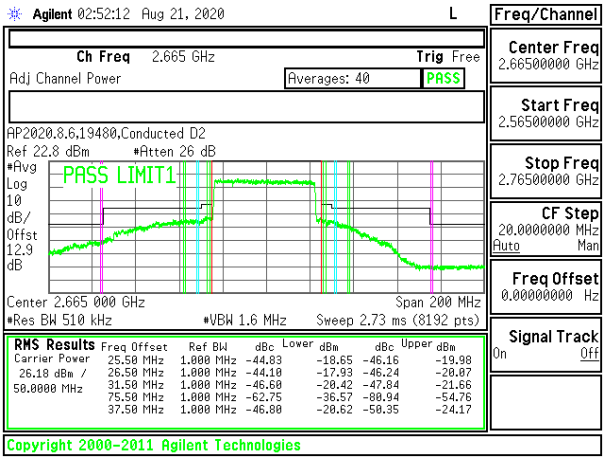
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n41 50MHz QPSK Low Channel RB128-0

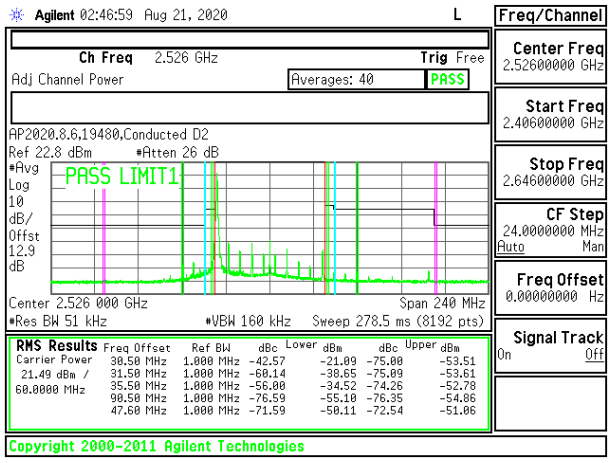


5G NR Band n41 50MHz QPSK Middle Channel RB128-0

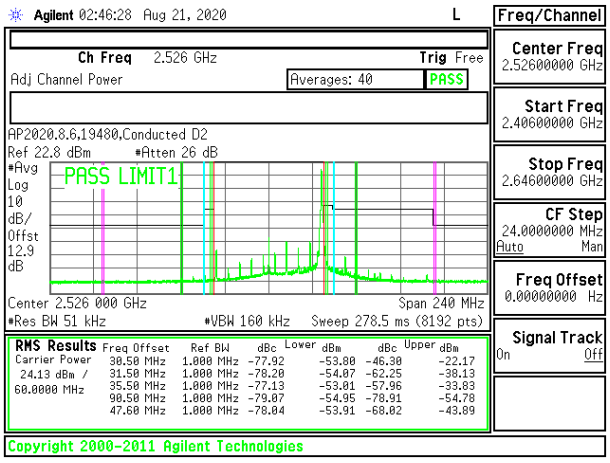


5G NR Band n41 50MHz QPSK High Channel RB128-0

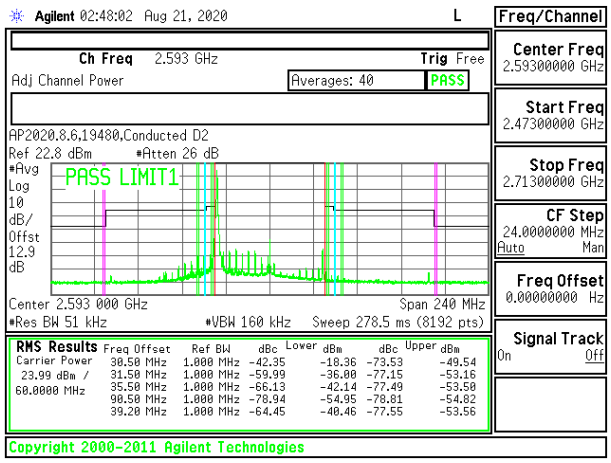
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



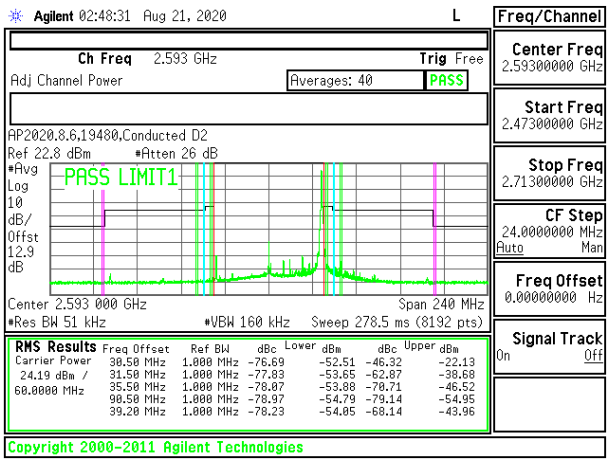
5G NR Band n41 60MHz QPSK Low Channel RB1-0



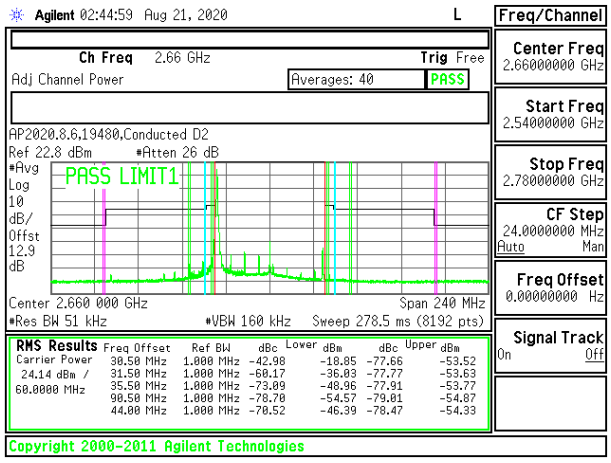
5G NR Band n41 60MHz QPSK Low Channel RB1-161



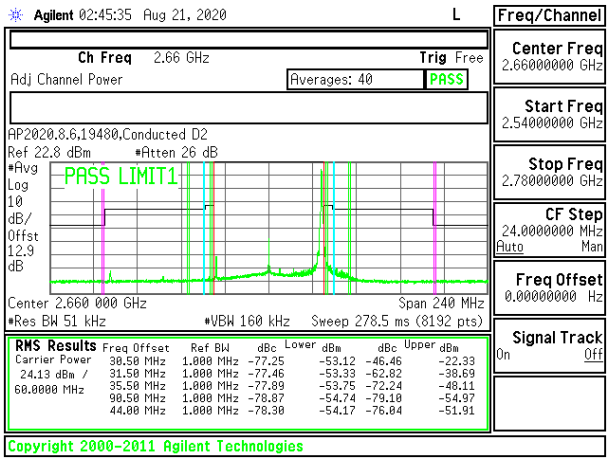
5G NR Band n41 60MHz QPSK Middle Channel RB1-0



5G NR Band n41 60MHz QPSK Middle Channel RB1-161

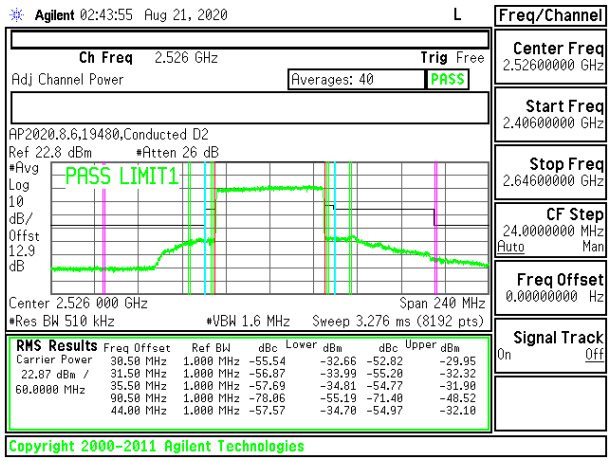


5G NR Band n41 60MHz QPSK High Channel RB1-0

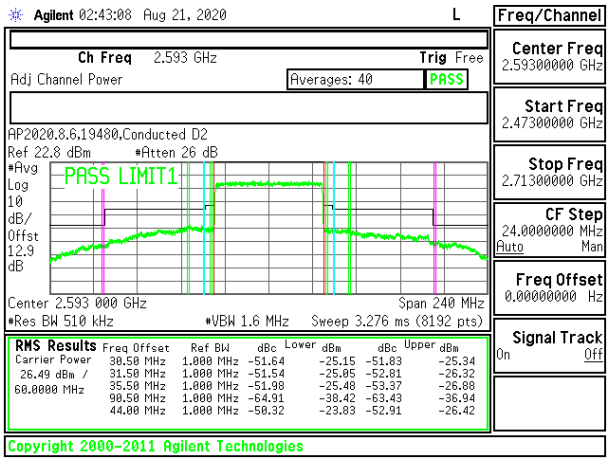


5G NR Band n41 60MHz QPSK High Channel RB1-161

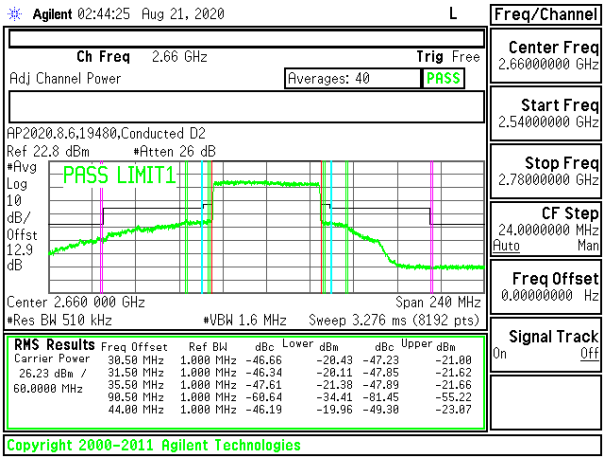
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n41 60MHz QPSK Low Channel RB162-0

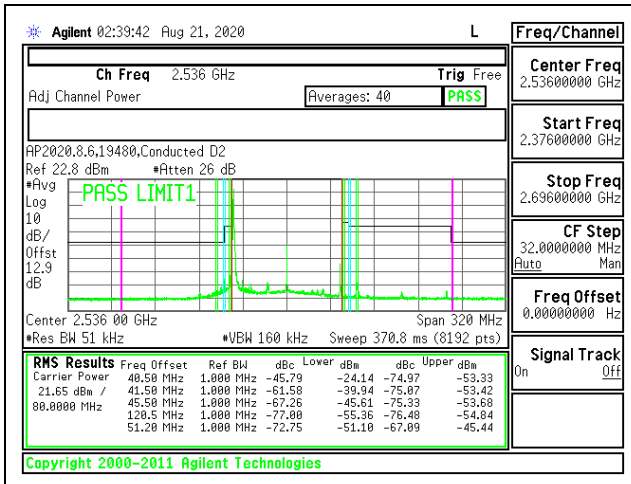


5G NR Band n41 60MHz QPSK Middle Channel RB162-0

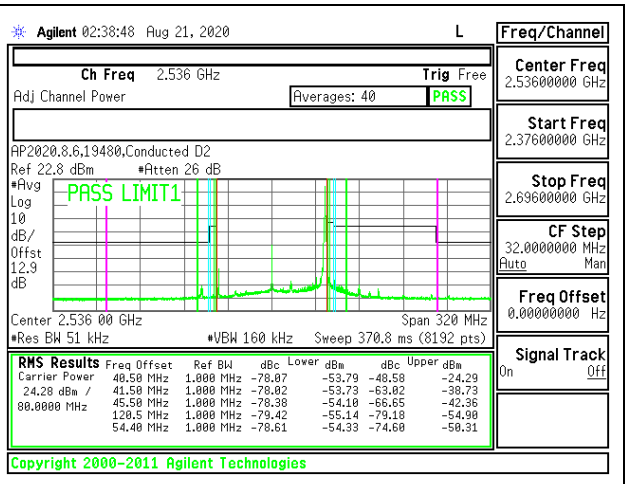


5G NR Band n41 60MHz QPSK High Channel RB162-0

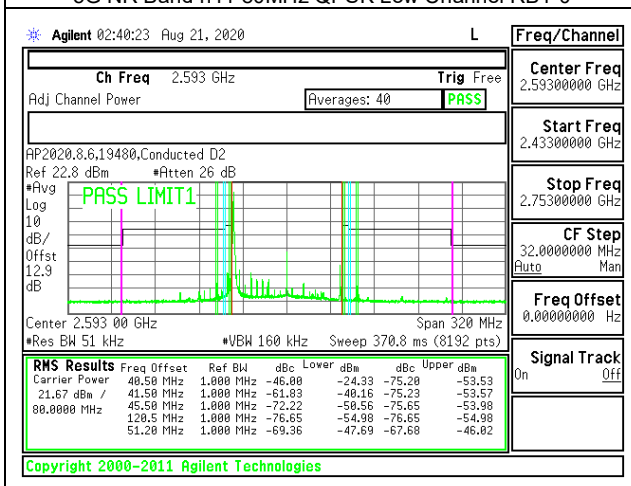
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



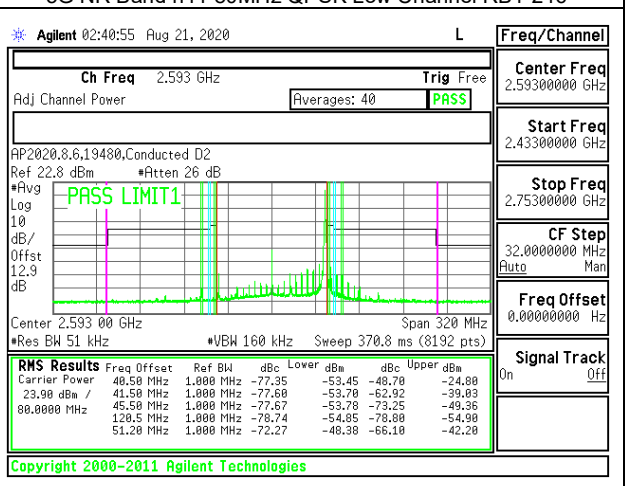
5G NR Band n41 80MHz QPSK Low Channel RB1-0



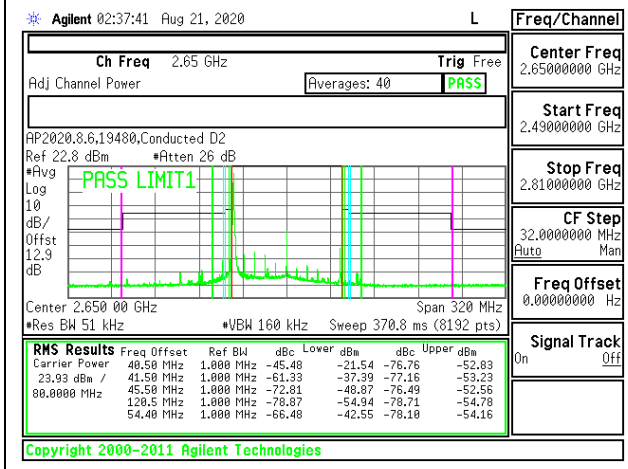
5G NR Band n41 80MHz QPSK Low Channel RB1-216



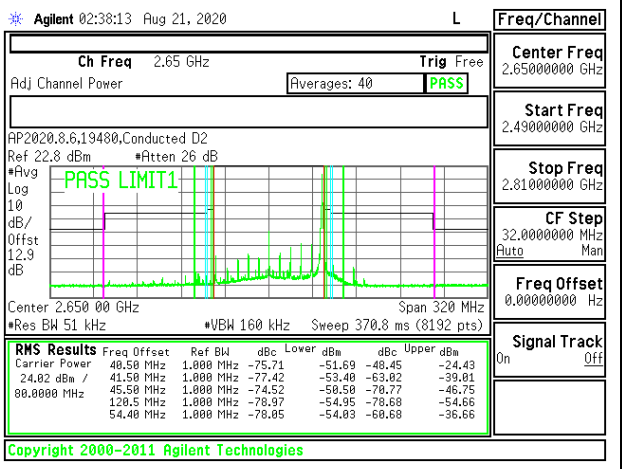
5G NR Band n41 80MHz QPSK Middle Channel RB1-0



5G NR Band n41 80MHz QPSK Middle Channel RB1-216

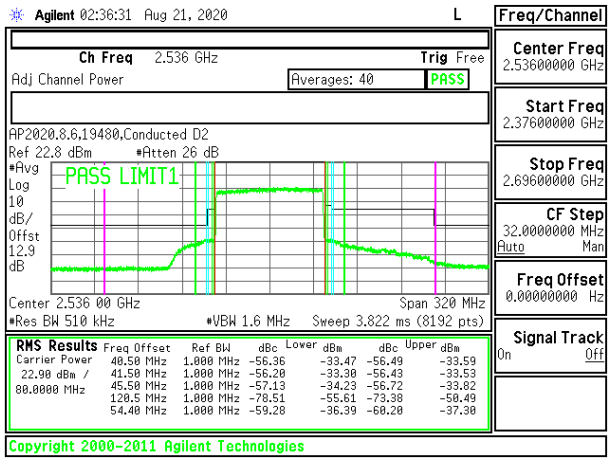


5G NR Band n41 80MHz QPSK High Channel RB1-0

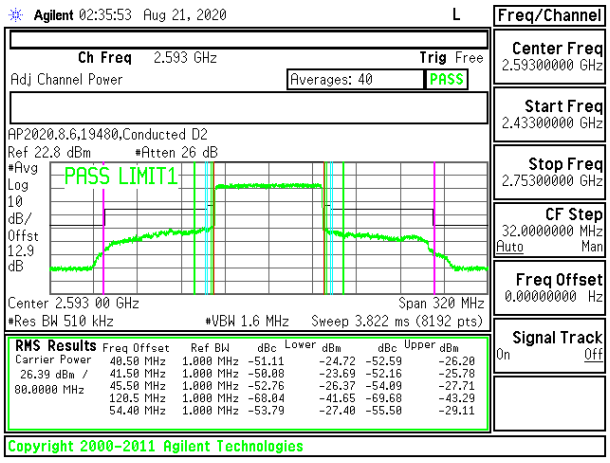


5G NR Band n41 80MHz QPSK High Channel RB1-216

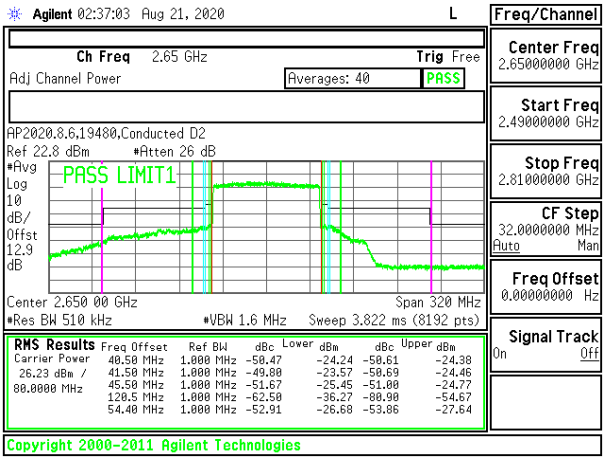
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n41 80MHz QPSK Low Channel RB216-0

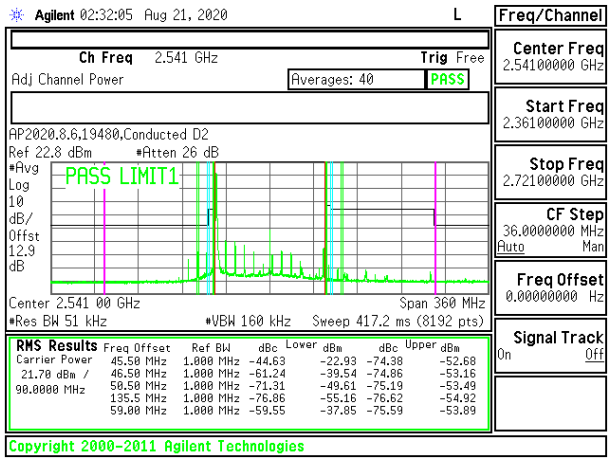


5G NR Band n41 80MHz QPSK Middle Channel RB216-0

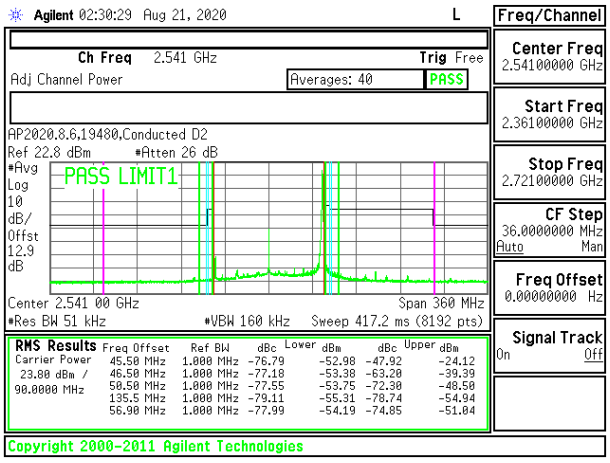


5G NR Band n41 80MHz QPSK High Channel RB216-0

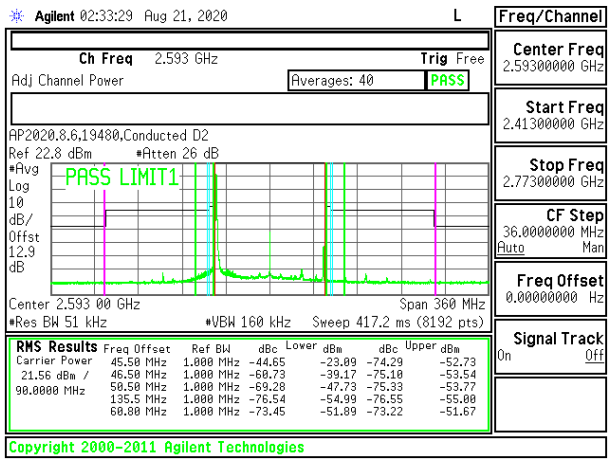
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



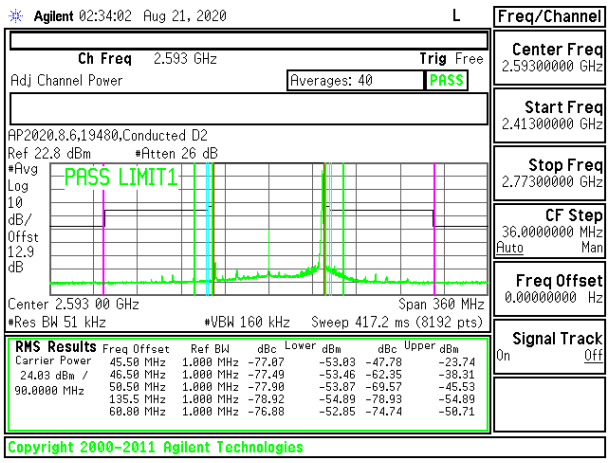
5G NR Band n41 90MHz QPSK Low Channel RB1-0



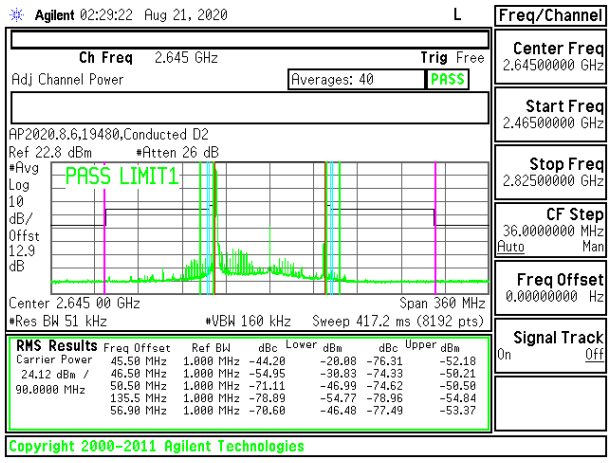
5G NR Band n41 90MHz QPSK Low Channel RB1-244



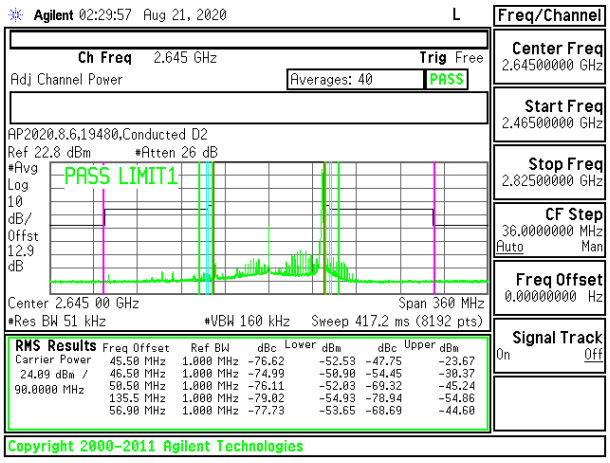
5G NR Band n41 90MHz QPSK Middle Channel RB1-0



5G NR Band n41 90MHz QPSK Middle Channel RB1-244

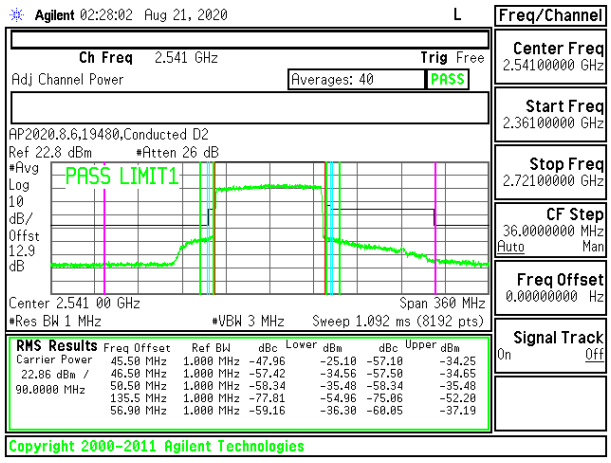


5G NR Band n41 90MHz QPSK High Channel RB1-0

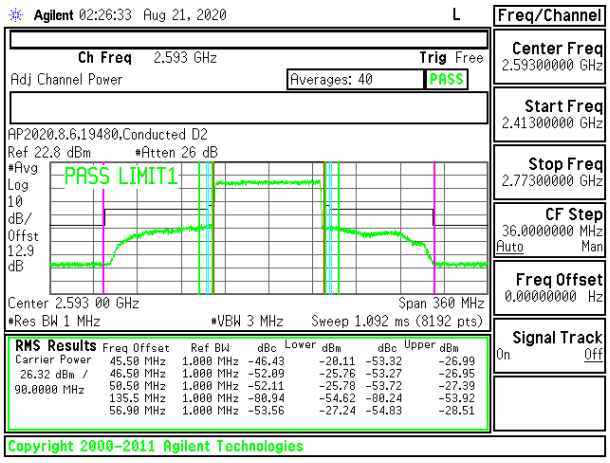


5G NR Band n41 90MHz QPSK High Channel RB1-244

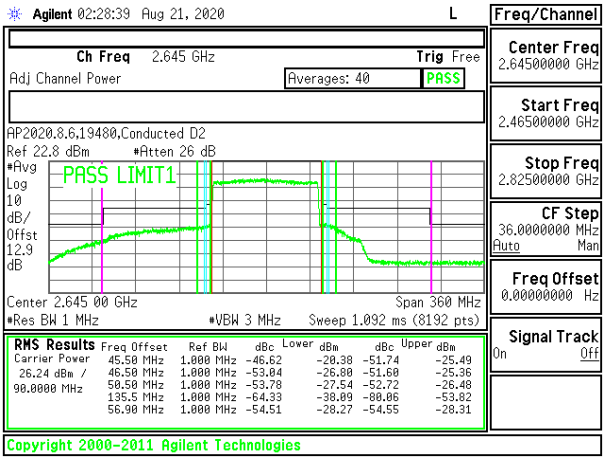
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n41 90MHz QPSK Low Channel RB240-0

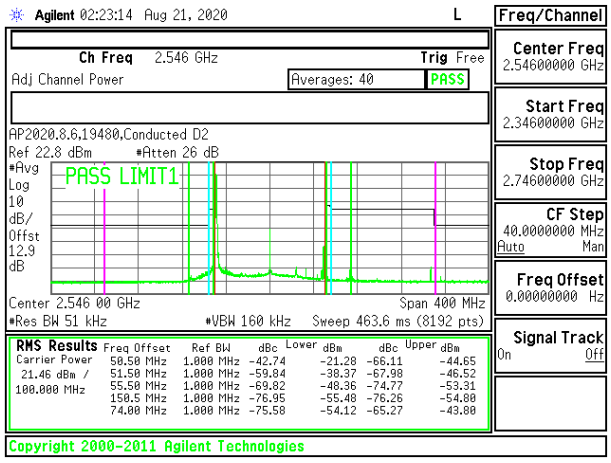


5G NR Band n41 90MHz QPSK Middle Channel RB240-0

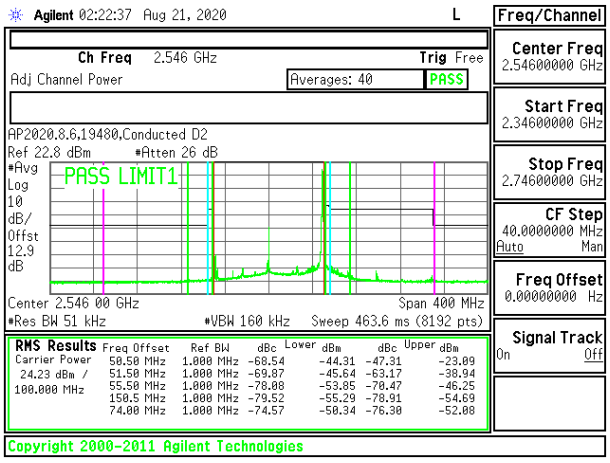


5G NR Band n41 90MHz QPSK High Channel RB240-0

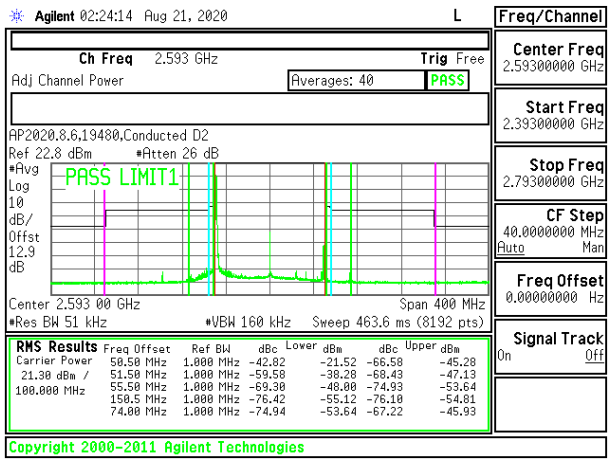
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



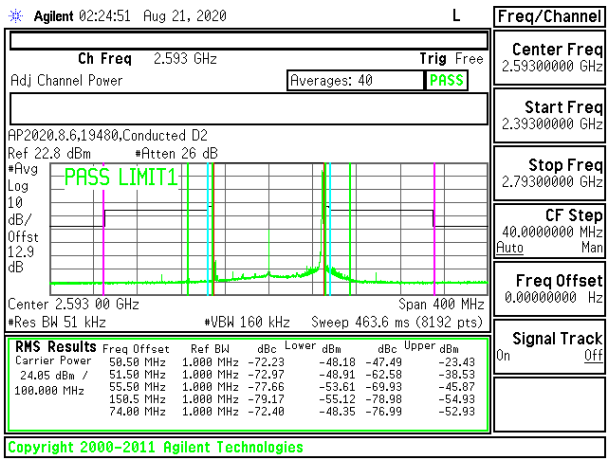
5G NR Band n41 100MHz QPSK Low Channel RB1-0



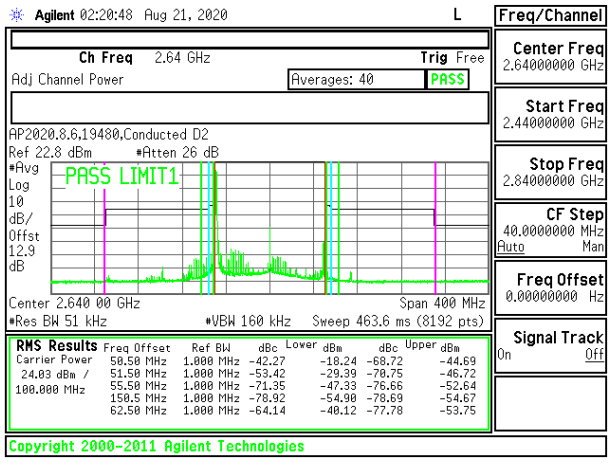
5G NR Band n41 100MHz QPSK Low Channel RB1-272



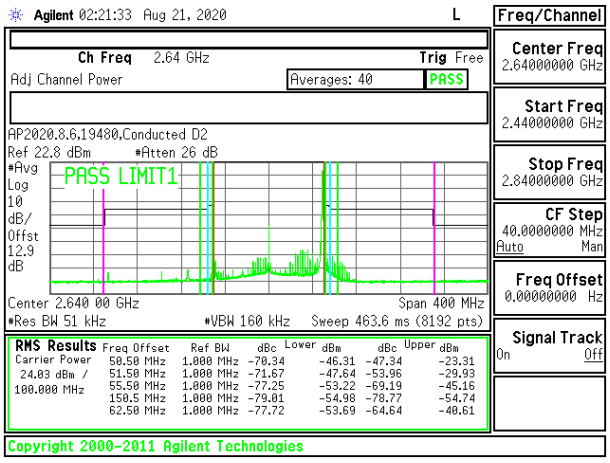
5G NR Band n41 100MHz QPSK Middle Channel RB1-0



5G NR Band n41 100MHz QPSK Middle Channel RB1-272

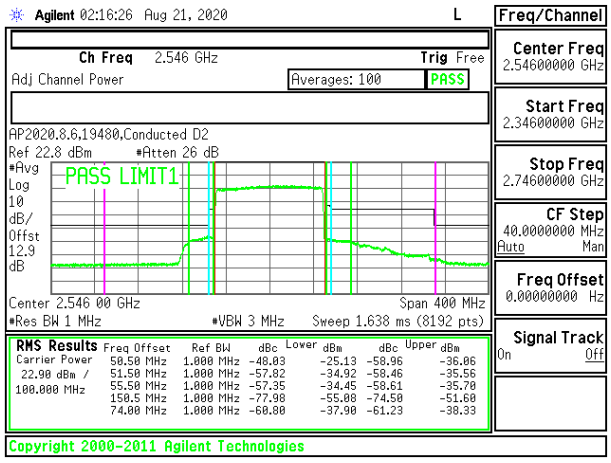


5G NR Band n41 100MHz QPSK High Channel RB1-0

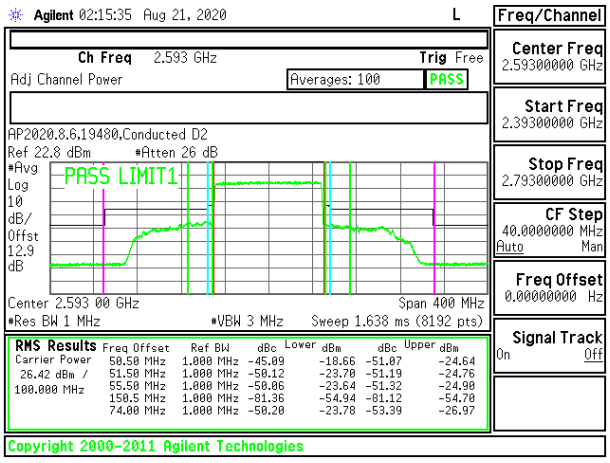


5G NR Band n41 100MHz QPSK High Channel RB1-272

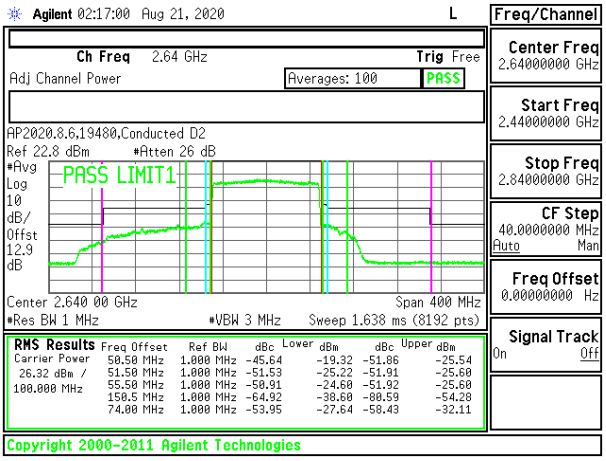
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n41 100MHz QPSK Low Channel RB270-0



5G NR Band n41 100MHz QPSK Middle Channel RB270-0



5G NR Band n41 100MHz QPSK High Channel RB270-0

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.12. LTE BAND 48 ADJACENT CHANNEL POWER

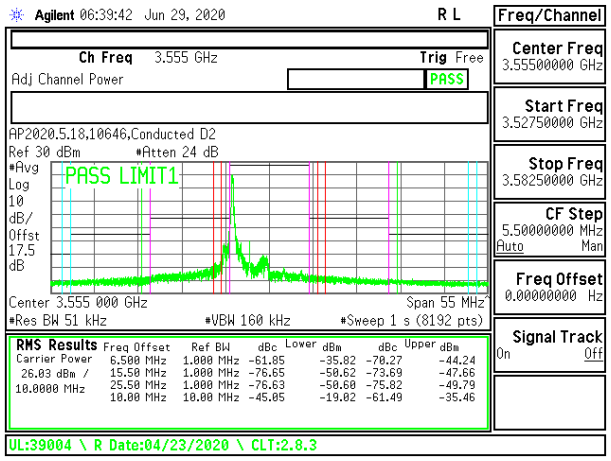
LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(1) General protection levels
(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

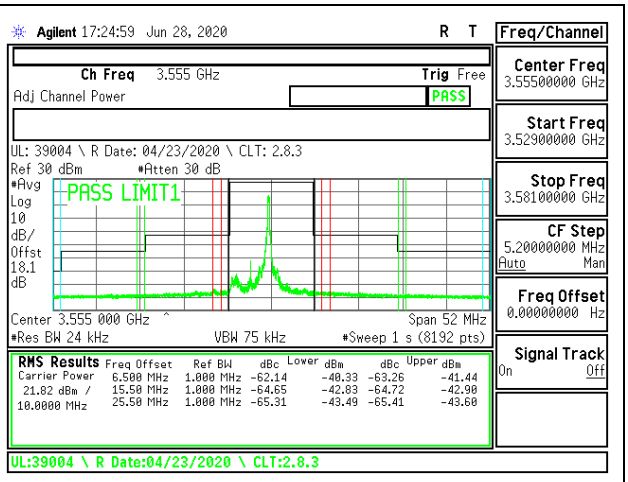
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

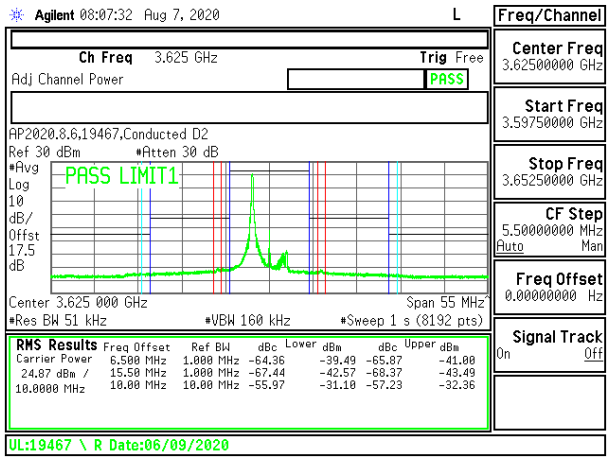
LTE BAND 48 ADJACENT CHANNEL POWER (FCC)



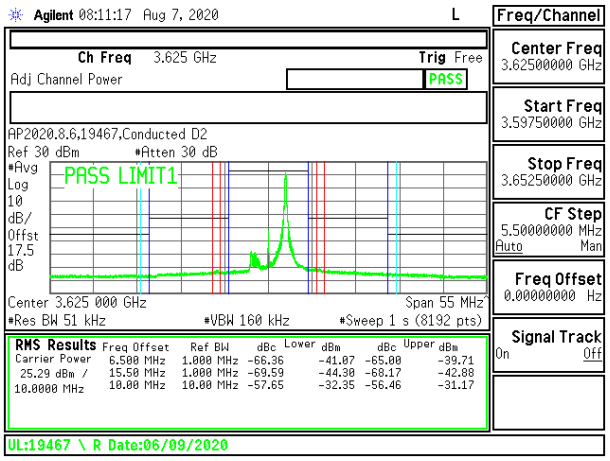
LTE B48 5MHz QPSK Low Channel RB1-0



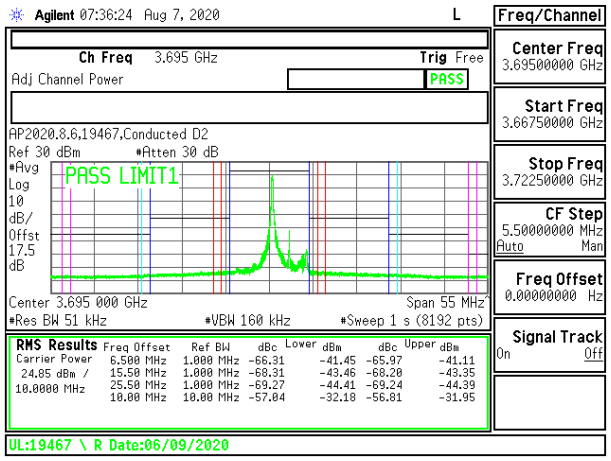
LTE B48 5MHz QPSK Low Channel RB1-24



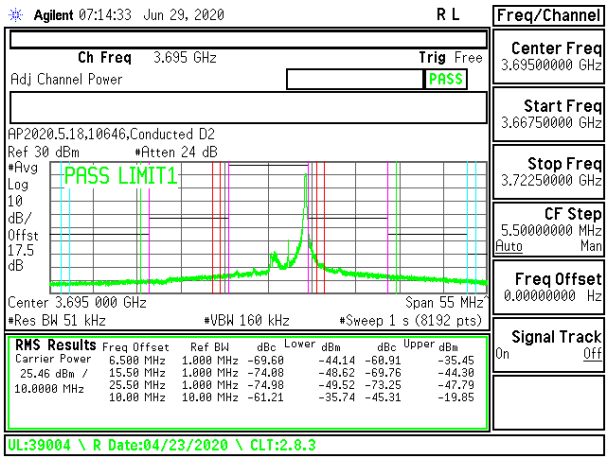
LTE B48 5MHz QPSK Middle Channel RB1-0



LTE B48 5MHz QPSK Middle Channel RB1-24

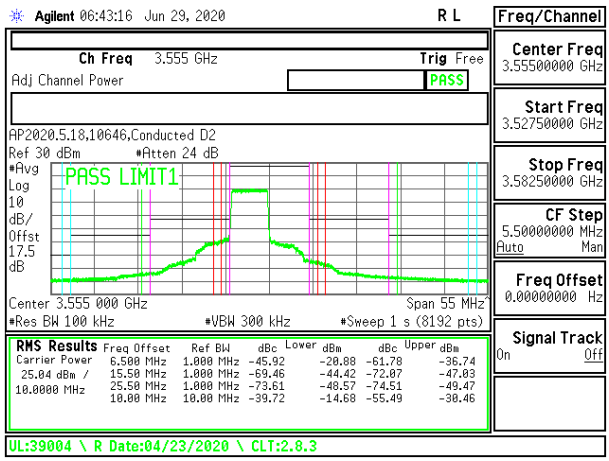


LTE B48 5MHz QPSK High Channel RB1-0

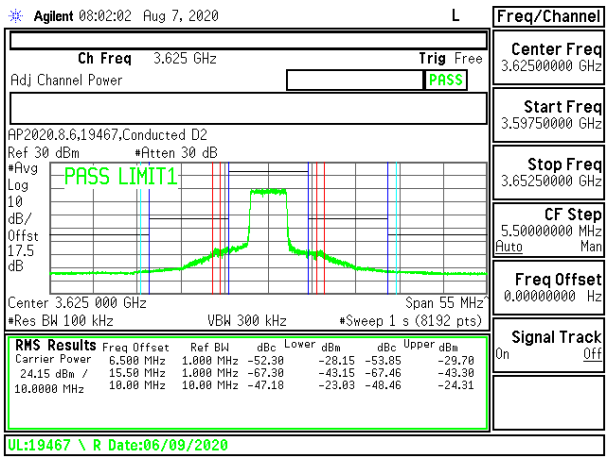


LTE B48 5MHz QPSK High Channel RB1-24

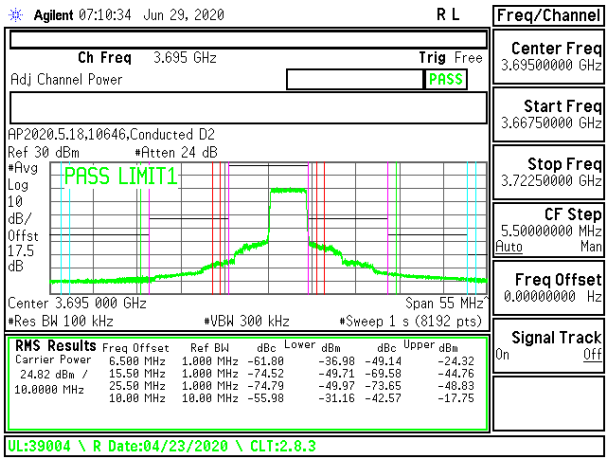
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B48 5MHz QPSK Low Channel RB25-0

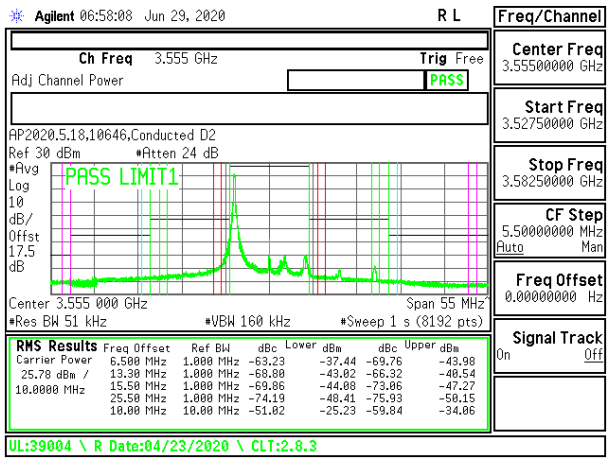


LTE B48 5MHz QPSK Middle Channel RB25-0

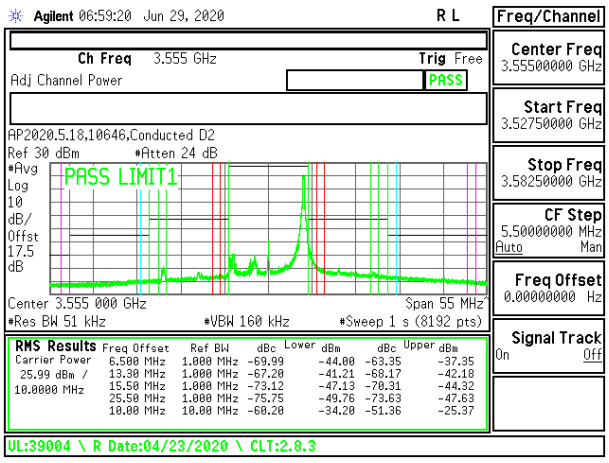


LTE B48 5MHz QPSK High Channel RB25-0

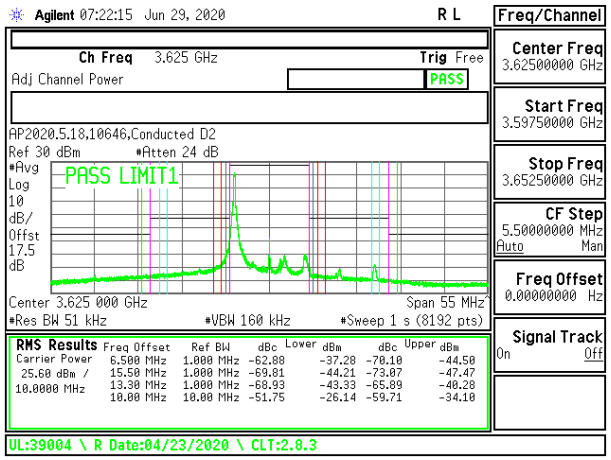
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



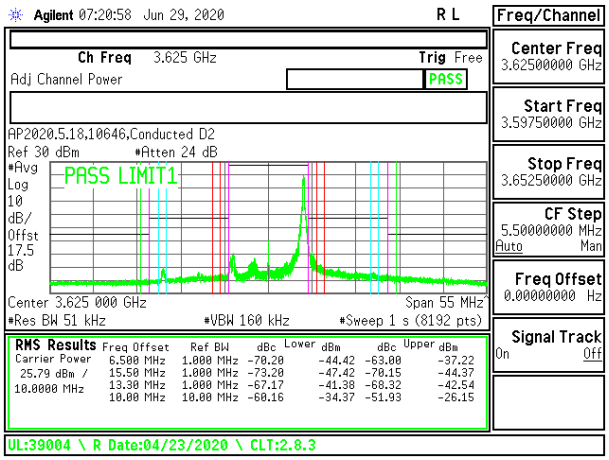
LTE B48 10MHz QPSK Low Channel RB1-0



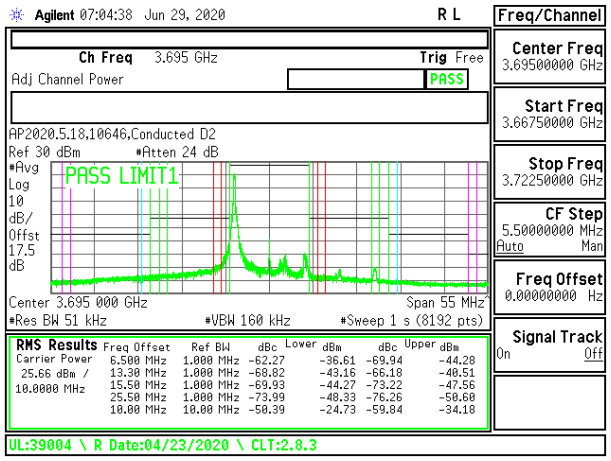
LTE B48 10MHz QPSK Low Channel RB1-49



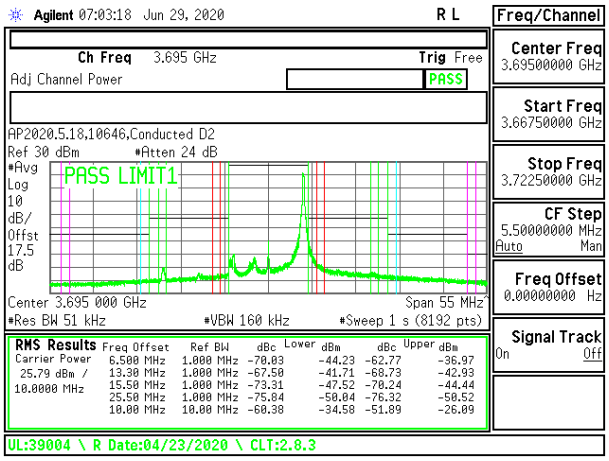
LTE B48 10MHz QPSK Middle Channel RB1-0



LTE B48 10MHz QPSK Middle Channel RB1-49



LTE B48 10MHz QPSK High Channel RB1-0

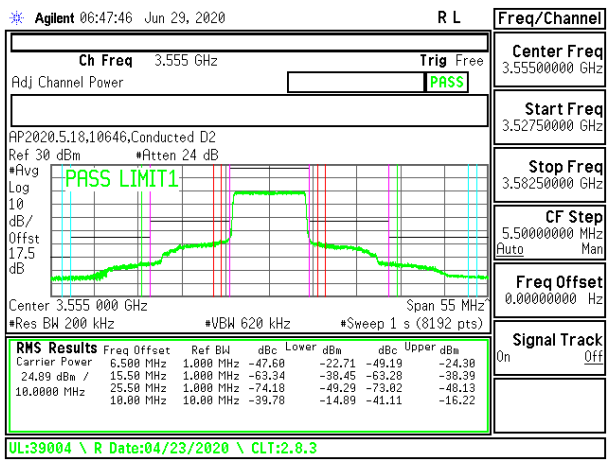


LTE B48 10MHz QPSK High Channel RB1-49

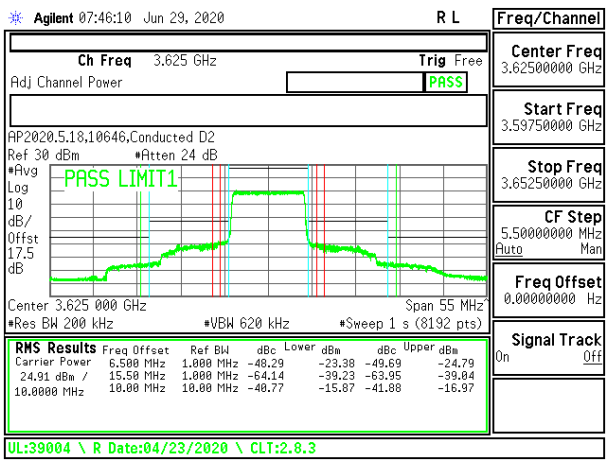
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

FORM NO: CCSUP4031B
FAX: (510) 661-0888

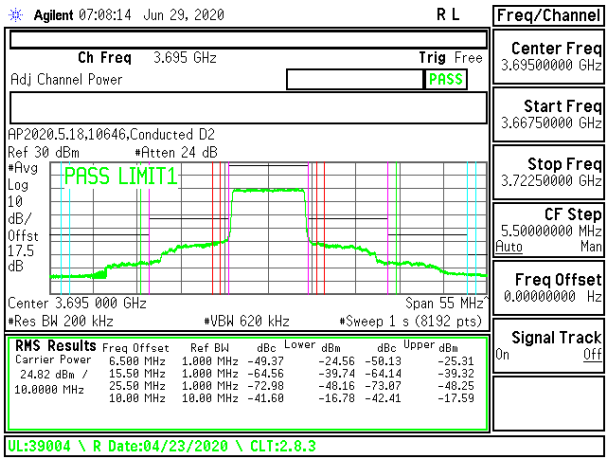
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B48 10MHz QPSK Low Channel RB50-0

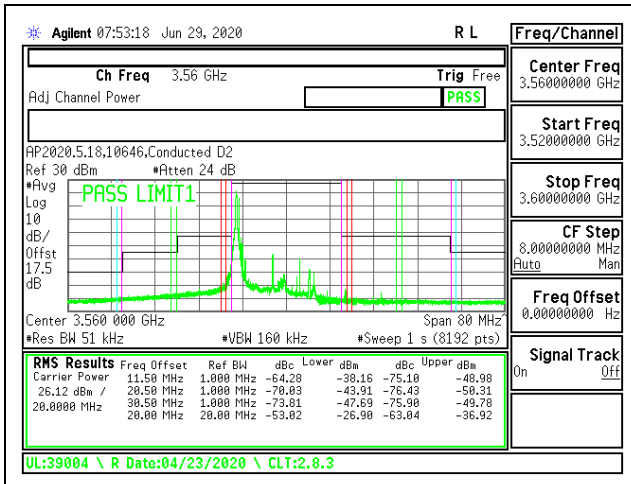


LTE B48 10MHz QPSK Middle Channel RB50-0

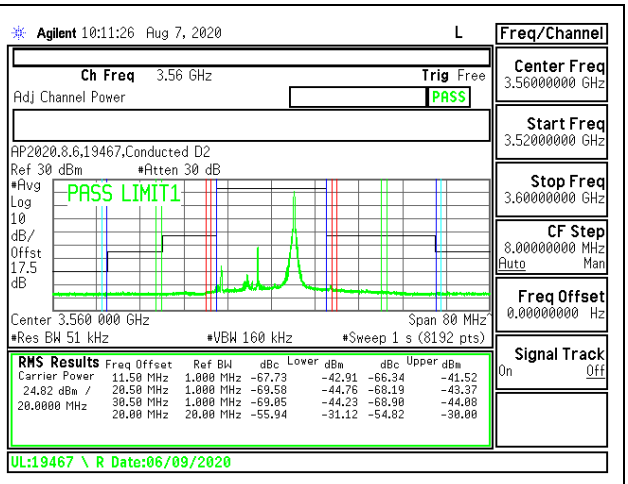


LTE B48 10MHz QPSK High Channel RB50-0

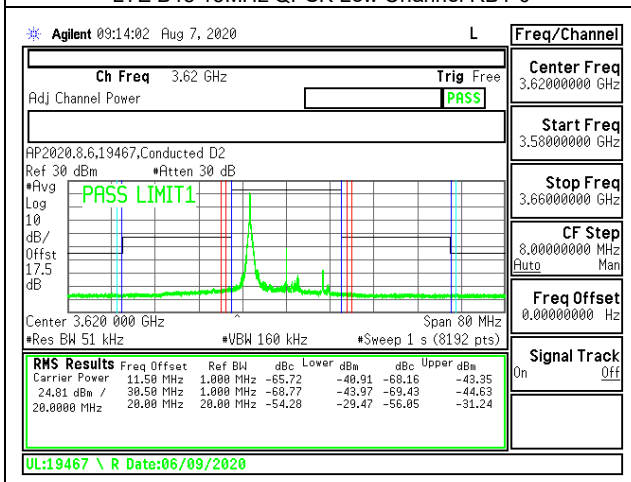
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



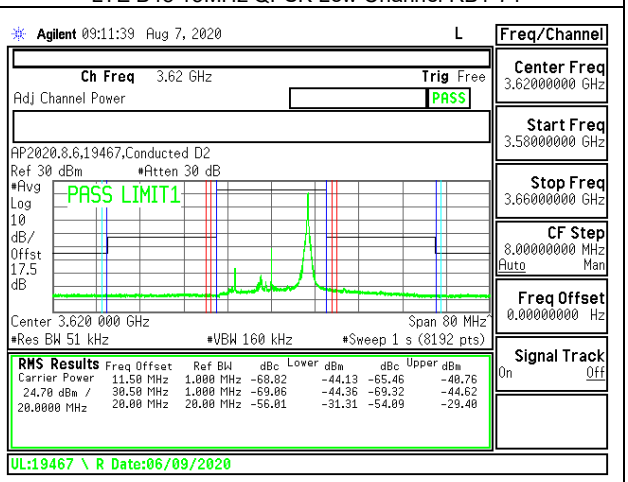
LTE B48 15MHz QPSK Low Channel RB1-0



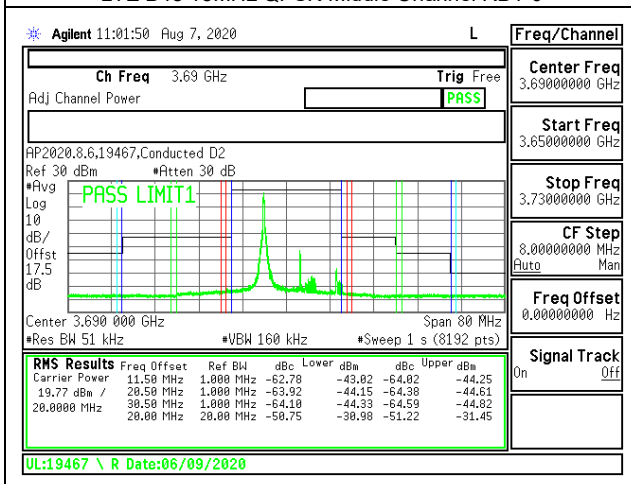
LTE B48 15MHz QPSK Low Channel RB1-74



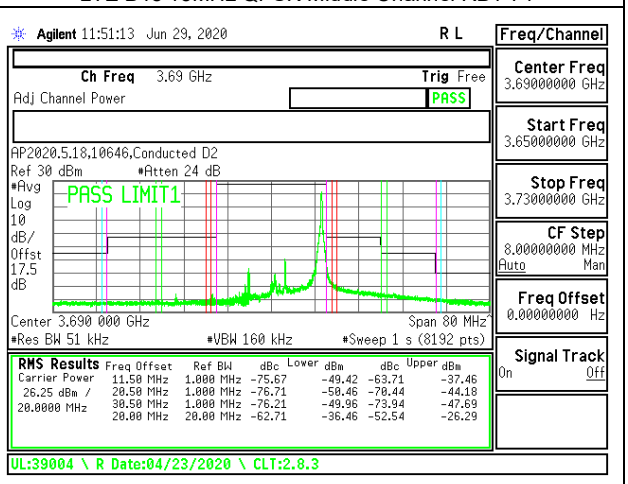
LTE B48 15MHz QPSK Middle Channel RB1-0



LTE B48 15MHz QPSK Middle Channel RB1-74



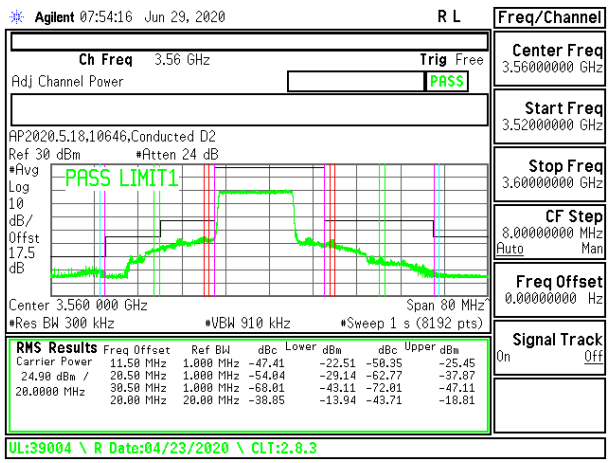
LTE B48 15MHz QPSK High Channel RB1-0



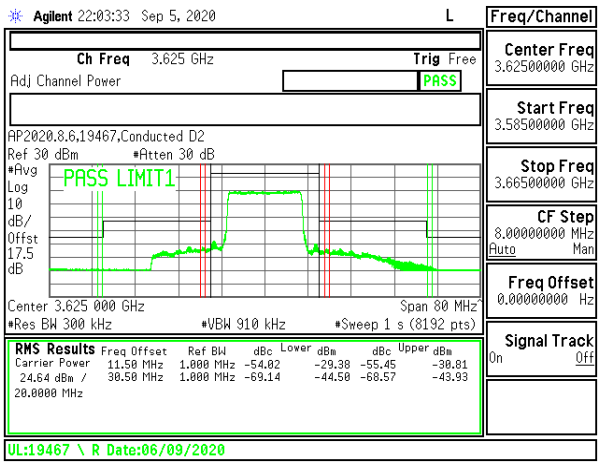
LTE B48 15MHz QPSK High Channel RB1-74

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

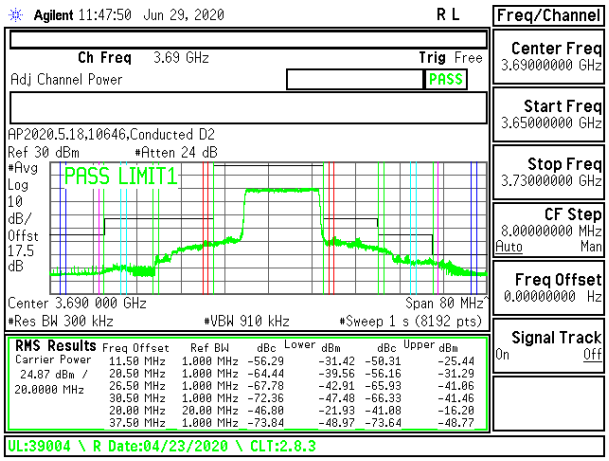
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B48 15MHz QPSK Low Channel RB75-0

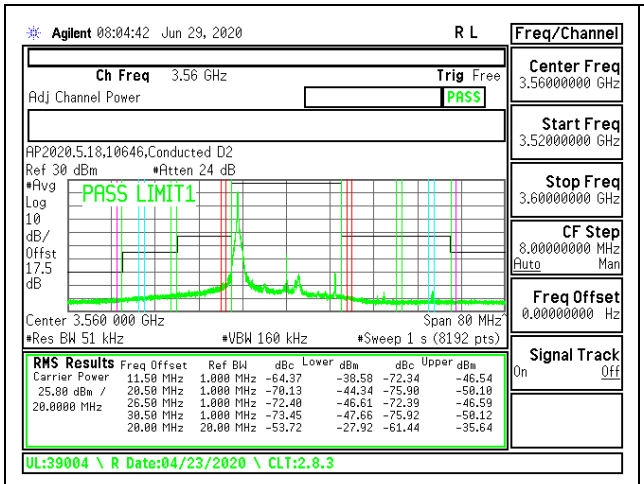


LTE B48 15MHz QPSK Middle Channel RB75-0

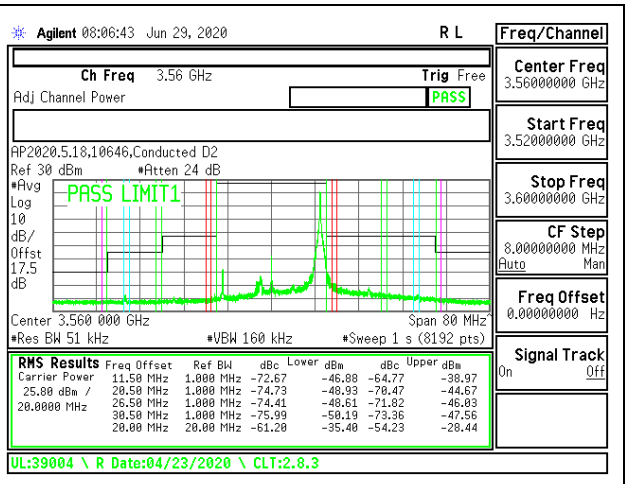


LTE B48 15MHz QPSK High Channel RB75-0

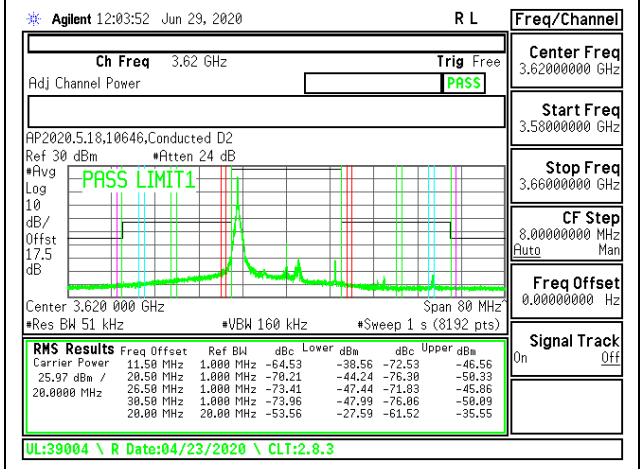
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



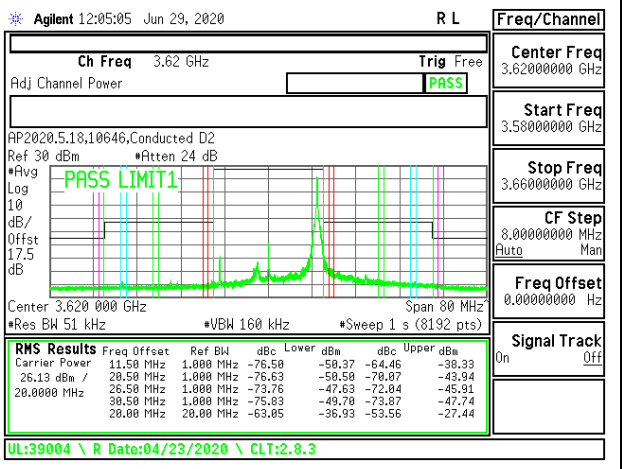
LTE B48 20MHz QPSK Low Channel RB1-0



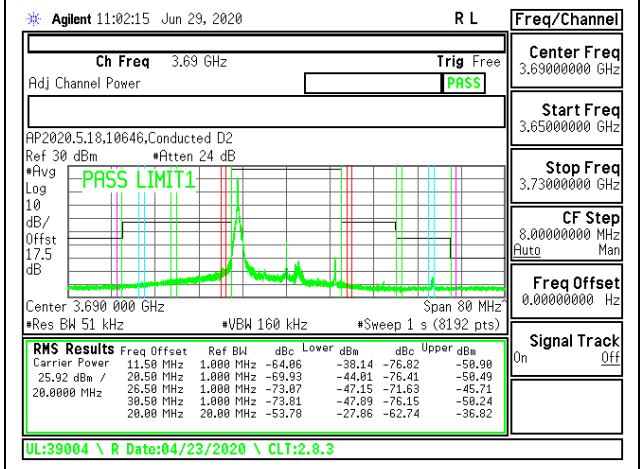
LTE B48 20MHz QPSK Low Channel RB1-99



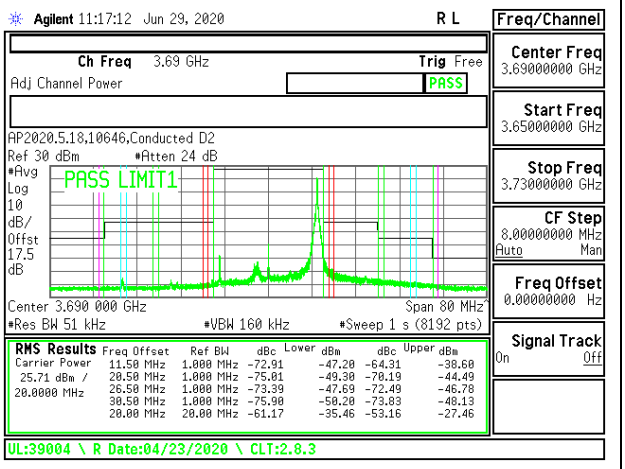
LTE B48 20MHz QPSK Middle Channel RB1-0



LTE B48 20MHz QPSK Middle Channel RB1-99



LTE B48 20MHz QPSK High Channel RB1-0

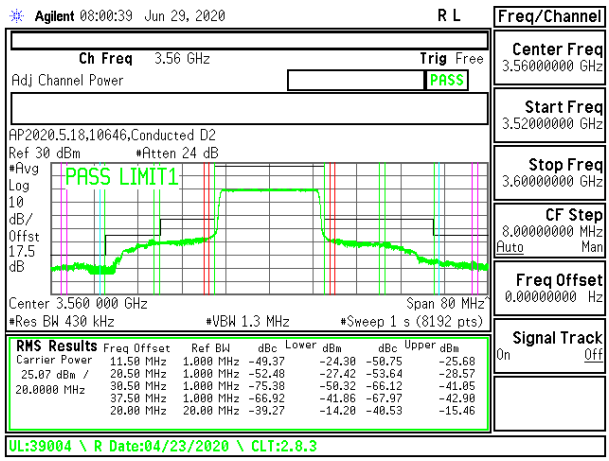


LTE B48 20MHz QPSK High Channel RB1-99

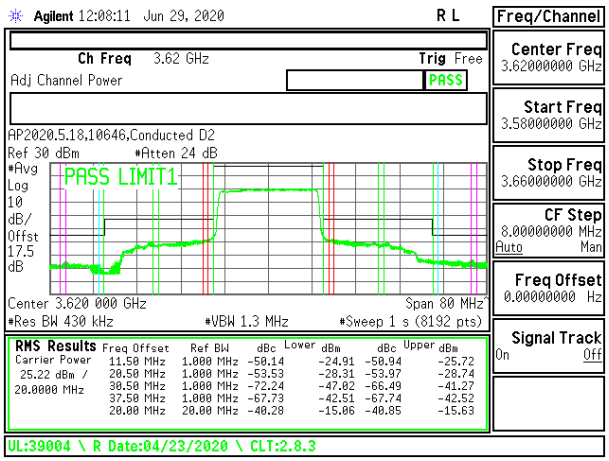
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

FORM NO: CCSUP4031B
FAX: (510) 661-0888

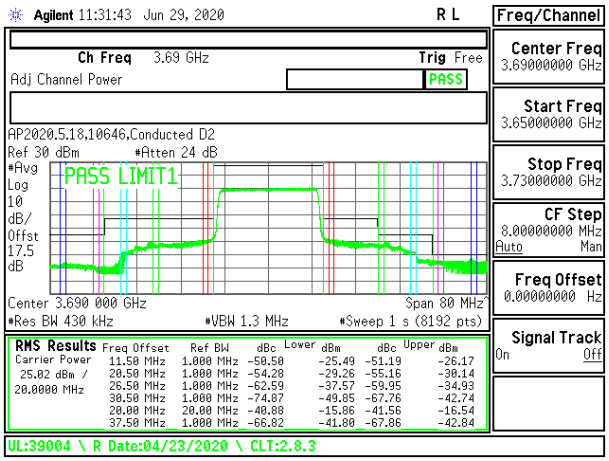
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B48 20MHz QPSK Low Channel RB100-0



LTE B48 20MHz QPSK Middle Channel RB100-0



LTE B48 20MHz QPSK High Channel RB100-0

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

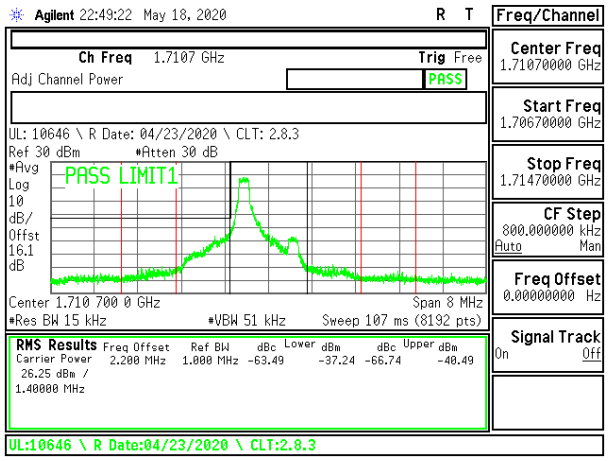
8.2.13. LTE BAND 66 BANDEDGE

LIMITS

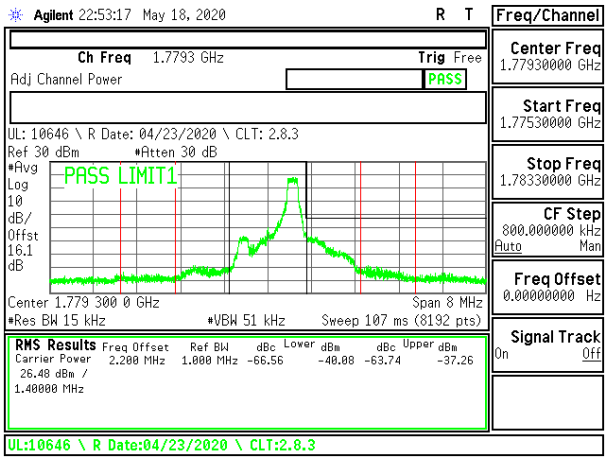
FCC: §27.53(h)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

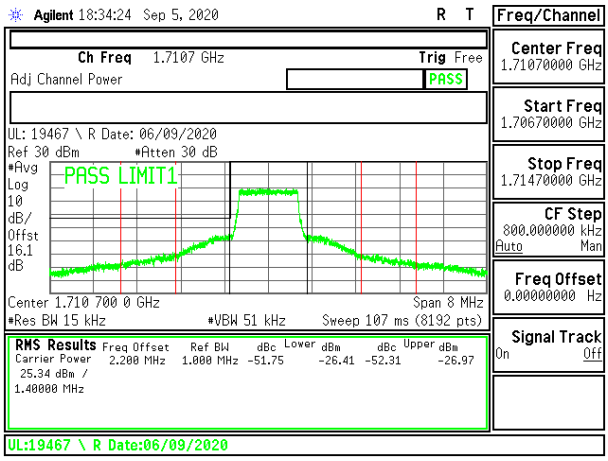
LTE BAND 66 BANDEDGE



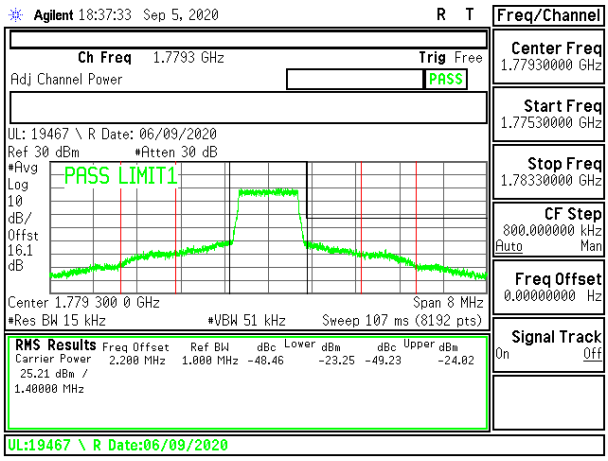
LTE B66 1.4MHz QPSK Low Channel RB1-0



LTE B66 1.4MHz QPSK High Channel RB1-5

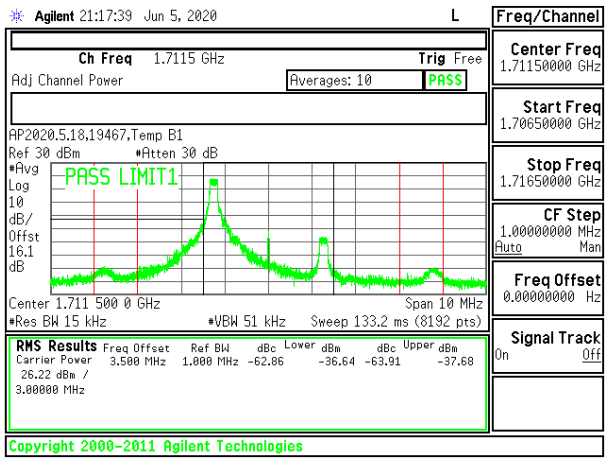


LTE B66 1.4MHz QPSK Low Channel RB6-0

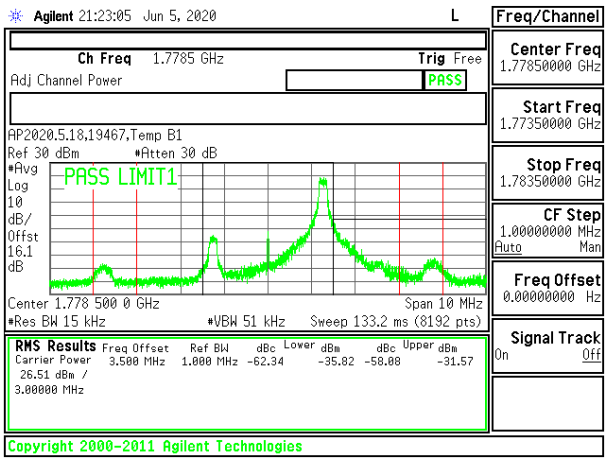


LTE B66 1.4MHz QPSK High Channel RB6-0

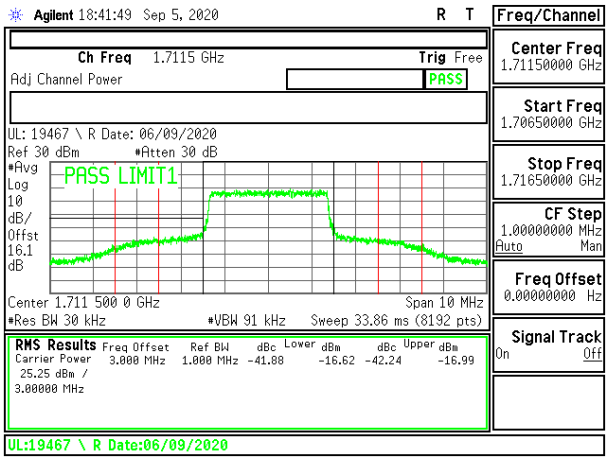
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



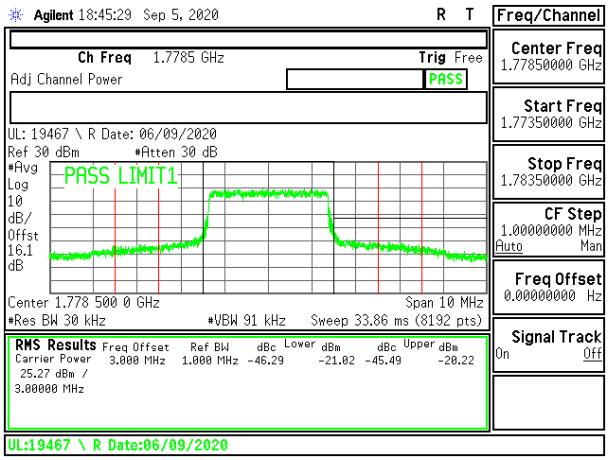
LTE B66 3MHz QPSK Low Channel RB1-0



LTE B66 3MHz QPSK High Channel RB1-14



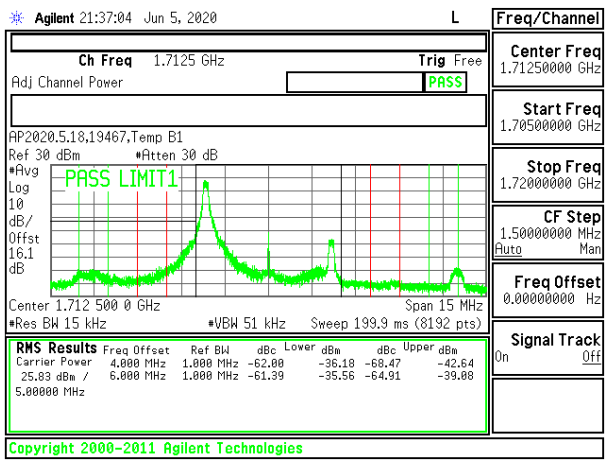
LTE B66 3MHz QPSK Low Channel RB15-0



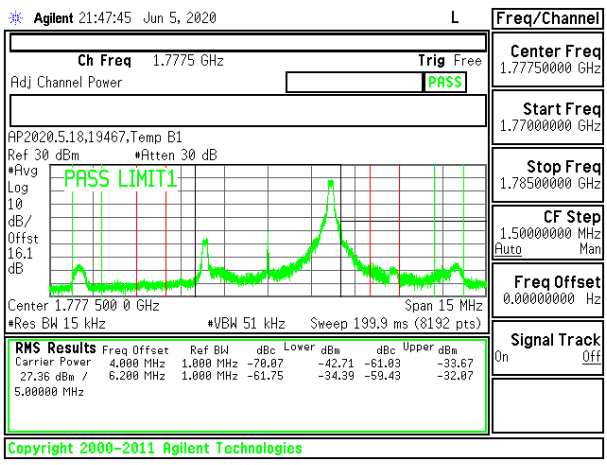
LTE B66 3MHz QPSK High Channel RB15-0

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

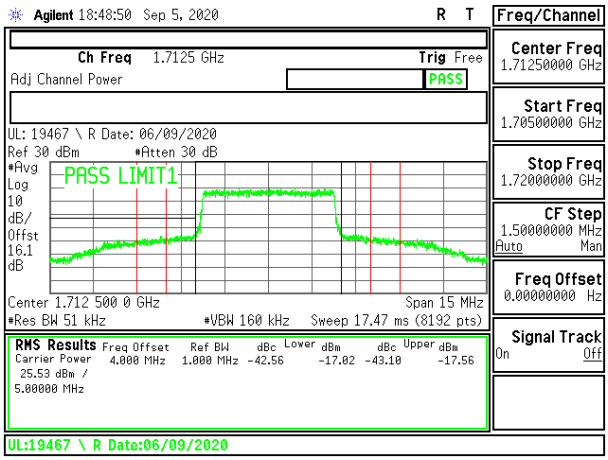
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



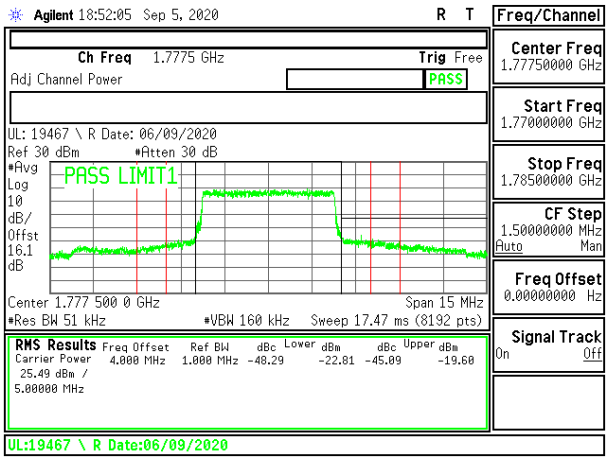
LTE B66 5MHz QPSK Low Channel RB1-0



LTE B66 5MHz QPSK High Channel RB1-24

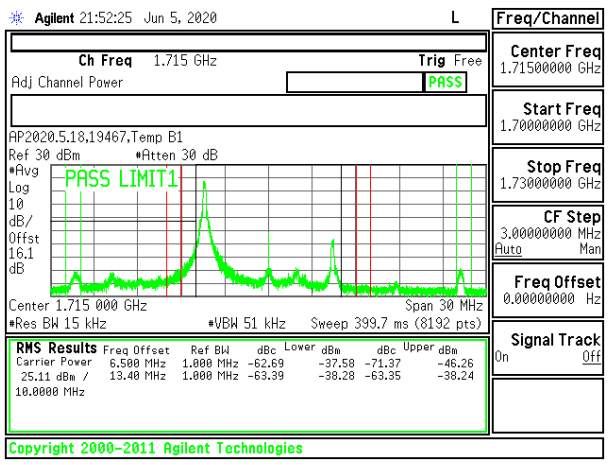


LTE B66 5MHz QPSK Low Channel RB25-0

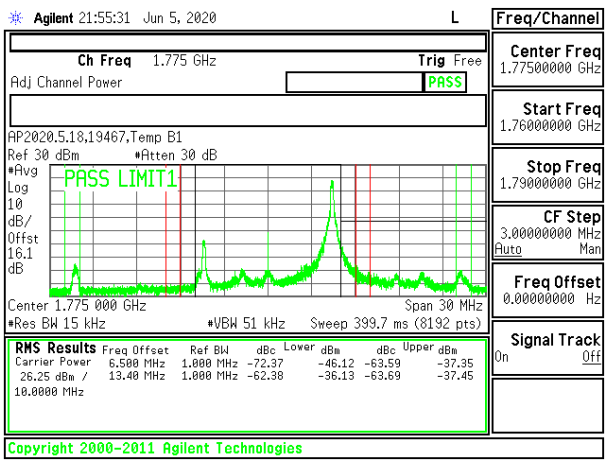


LTE B66 5MHz QPSK High Channel RB25-0

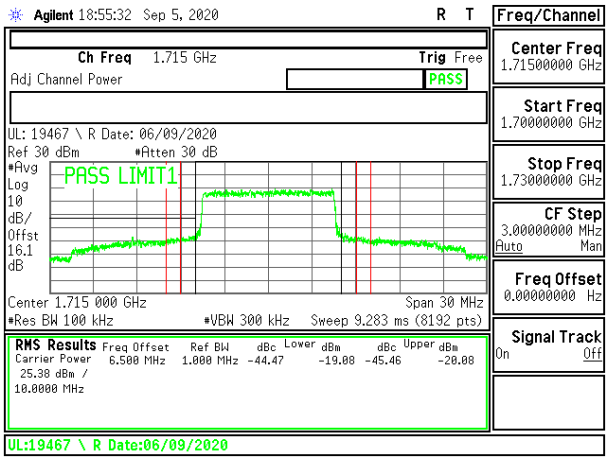
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



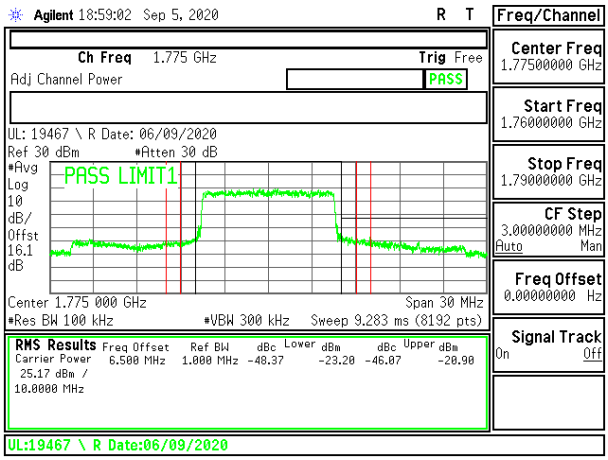
LTE B66 10MHz QPSK Low Channel RB1-0



LTE B66 10MHz QPSK High Channel RB1-49

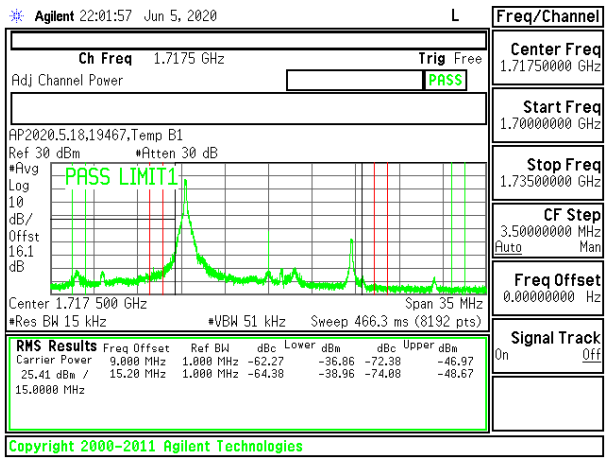


LTE B66 10MHz QPSK Low Channel RB50-0

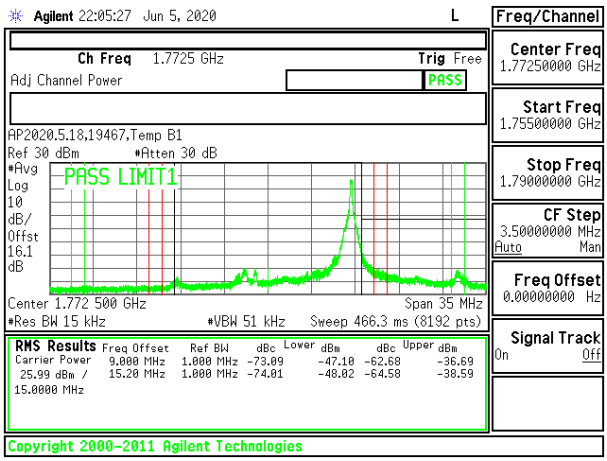


LTE B66 10MHz QPSK High Channel RB50-0

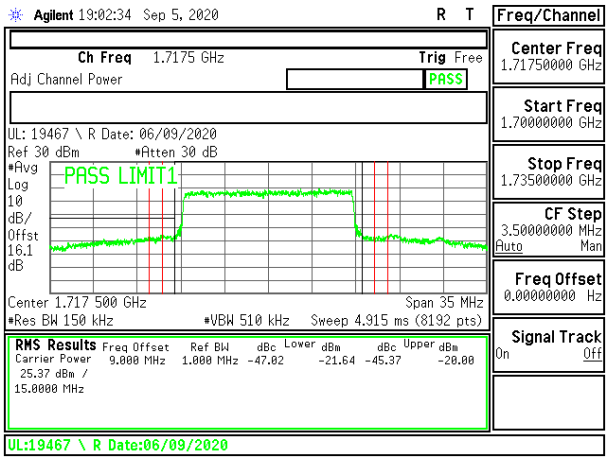
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



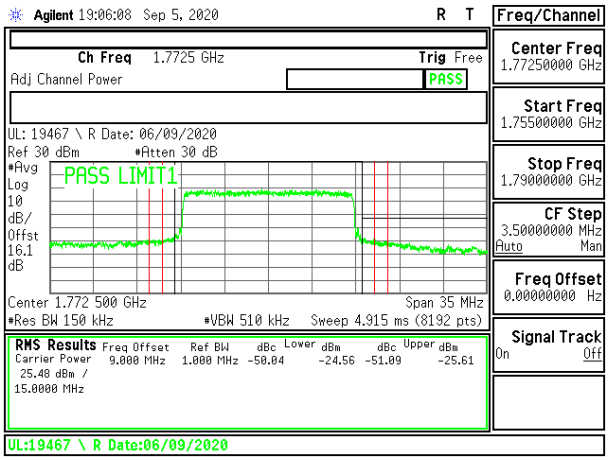
LTE B66 15MHz QPSK Low Channel RB1-0



LTE B66 15MHz QPSK High Channel RB1-74

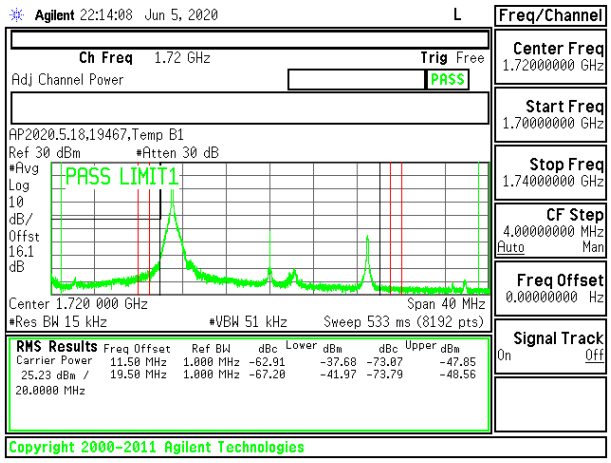


LTE B66 15MHz QPSK Low Channel RB75-0

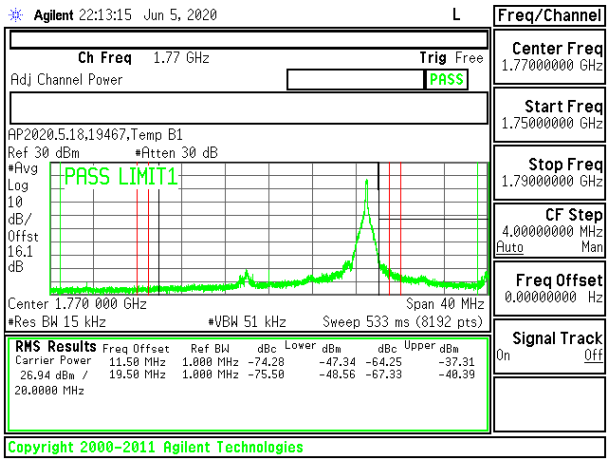


LTE B66 15MHz QPSK High Channel RB75-0

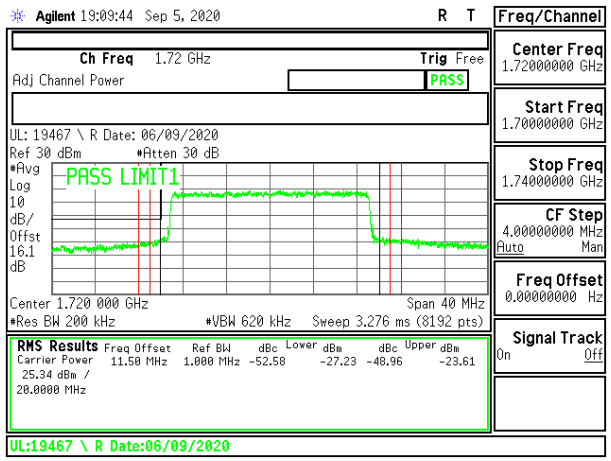
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



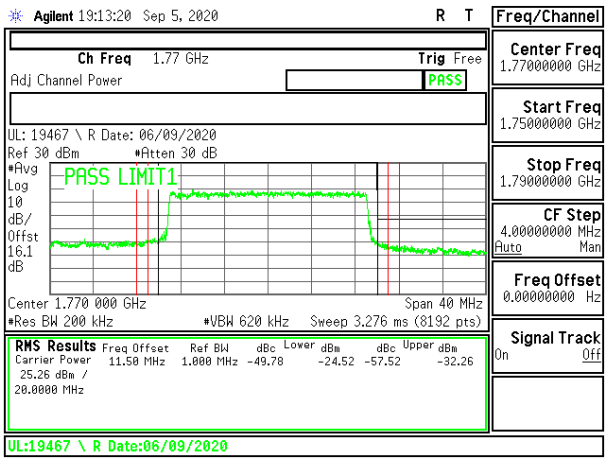
LTE B66 20MHz QPSK Low Channel RB1-0



LTE B66 20MHz QPSK High Channel RB1-99



LTE B66 20MHz QPSK Low Channel RB100-0



LTE B66 20MHz QPSK High Channel RB100-0

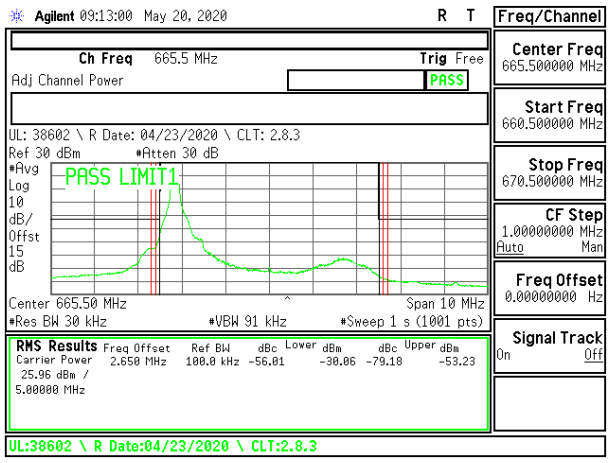
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.14. LTE BAND 71 ADJACENT CHANNEL POWER

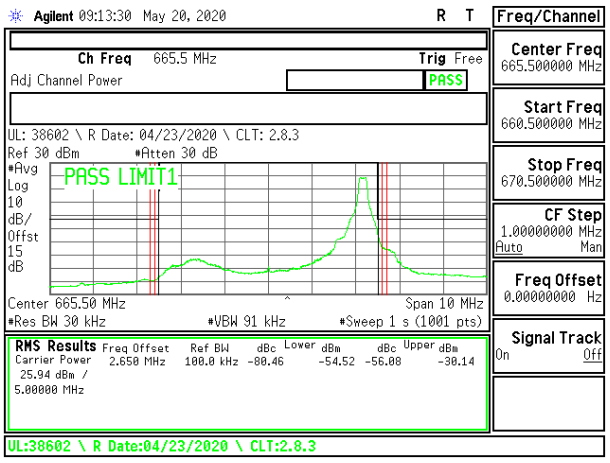
LIMITS

FCC: §27.53
(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a 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, by at least 43 + 10 log (P) dB. Compliance 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.

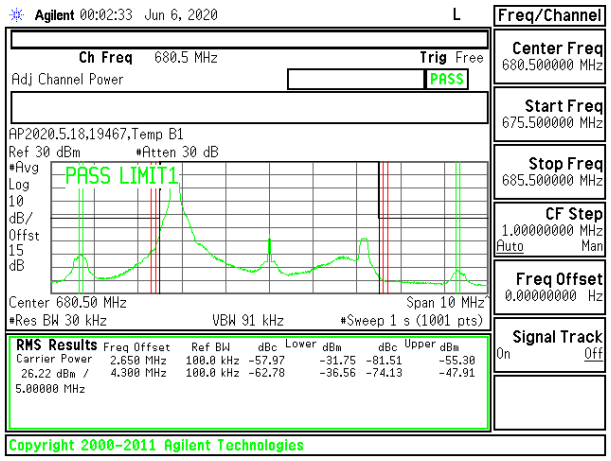
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



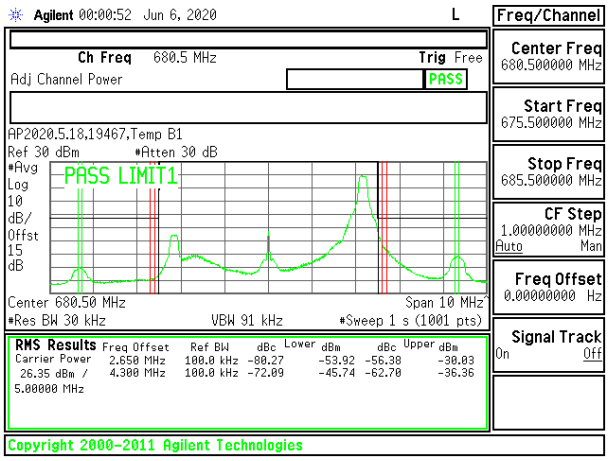
LTE B71 5MHz QPSK Low Channel RB1-0



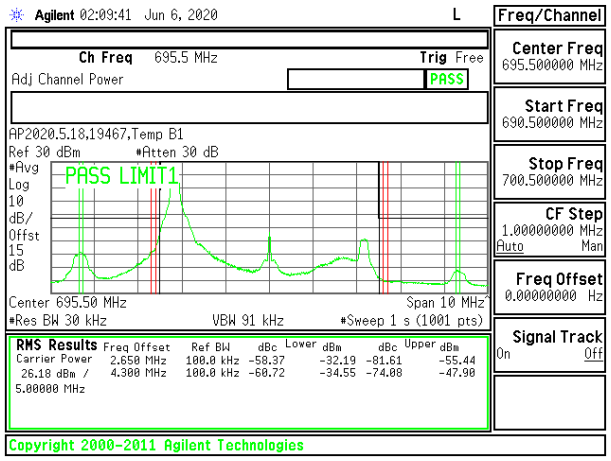
LTE B71 5MHz QPSK Low Channel RB1-24



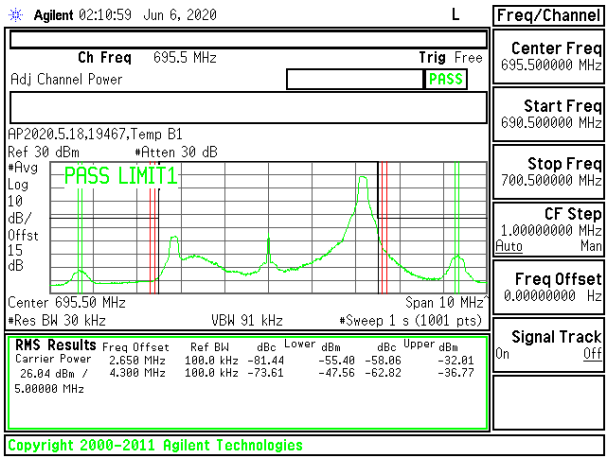
LTE B71 5MHz QPSK Middle Channel RB1-0



LTE B71 5MHz QPSK Middle Channel RB1-24

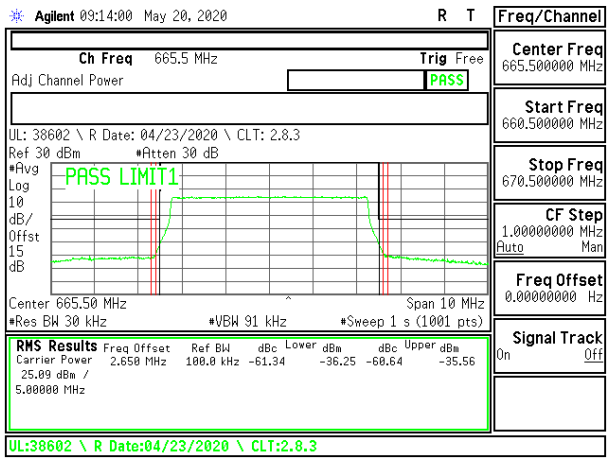


LTE B71 5MHz QPSK High Channel RB1-0

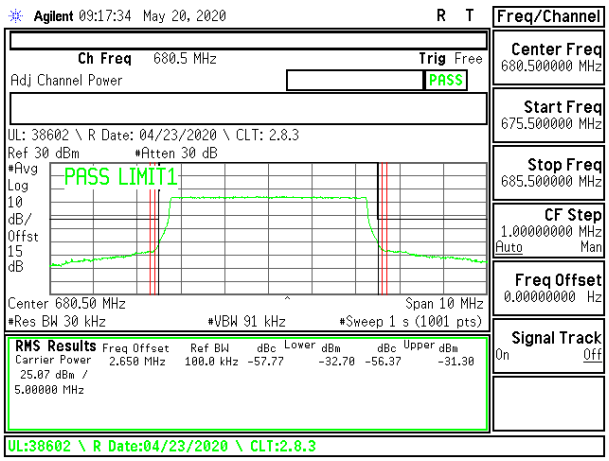


LTE B71 5MHz QPSK High Channel RB1-24

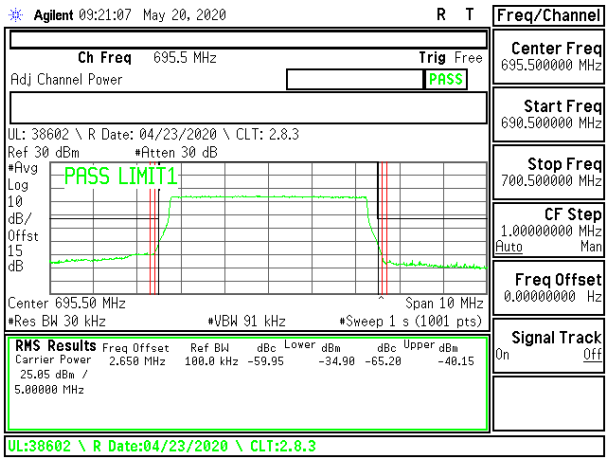
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B71 5MHz QPSK Low Channel RB25-0

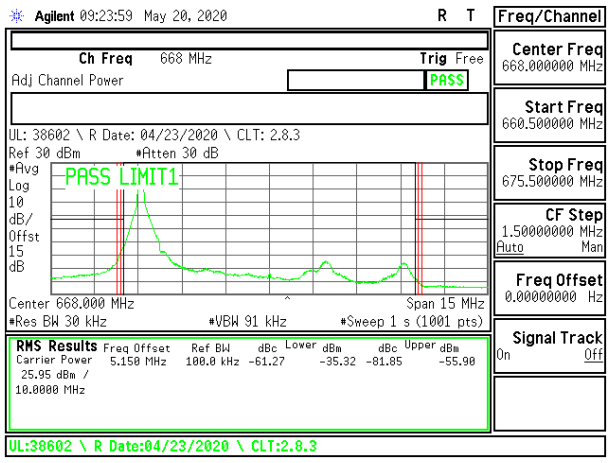


LTE B71 5MHz QPSK Middle Channel RB25-0

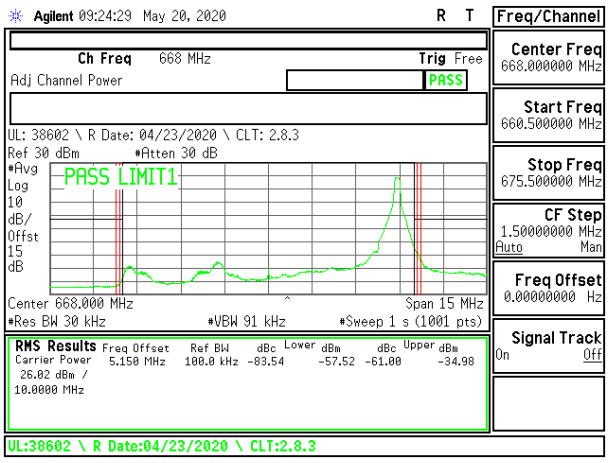


LTE B71 5MHz QPSK High Channel RB25-0

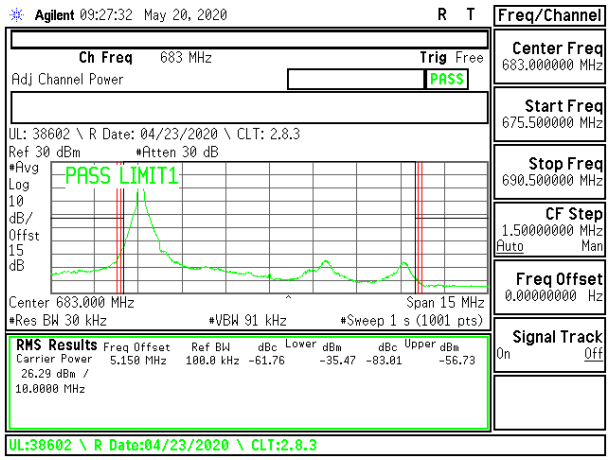
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



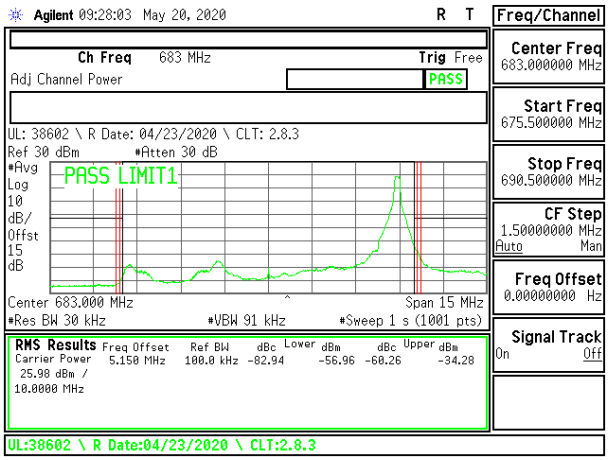
LTE B71 10MHz QPSK Low Channel RB1-0



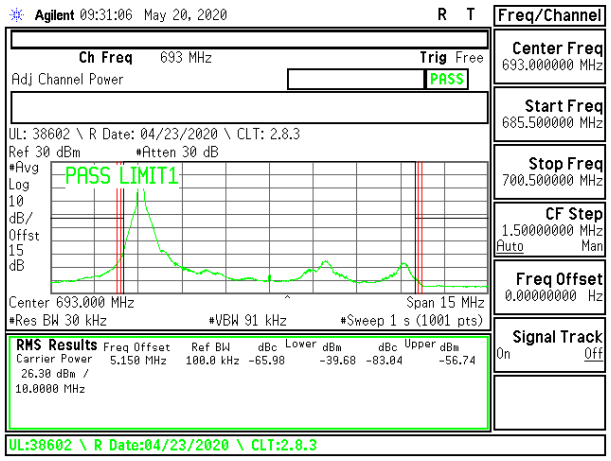
LTE B71 10MHz QPSK Low Channel RB1-49



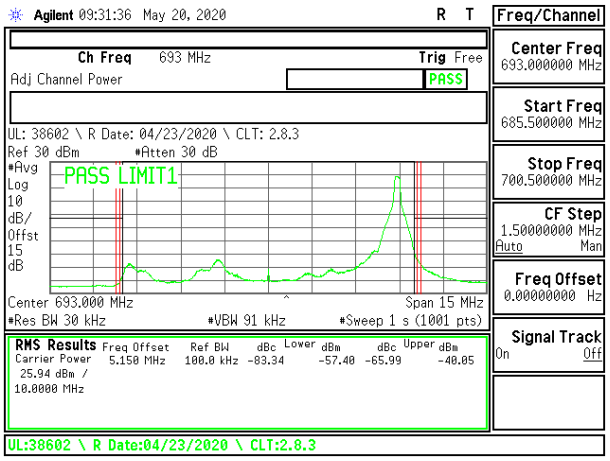
LTE B71 10MHz QPSK Middle Channel RB1-0



LTE B71 10MHz QPSK Middle Channel RB1-49

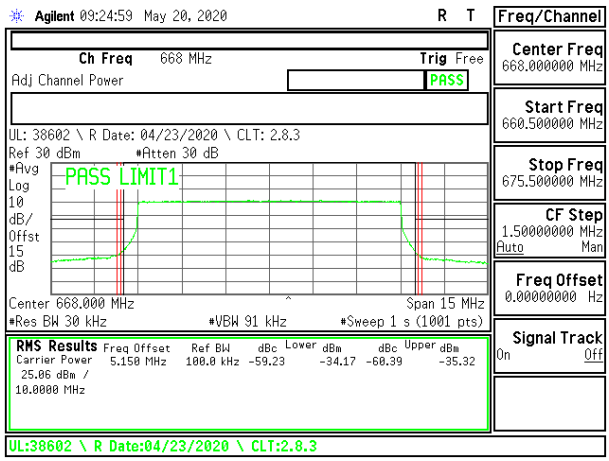


LTE B71 10MHz QPSK High Channel RB1-0

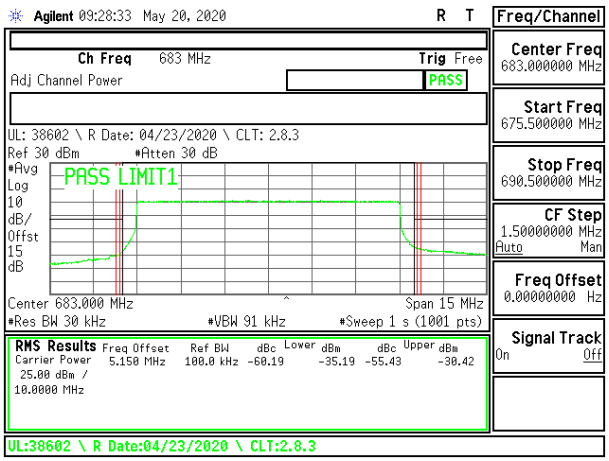


LTE B71 10MHz QPSK High Channel RB1-49

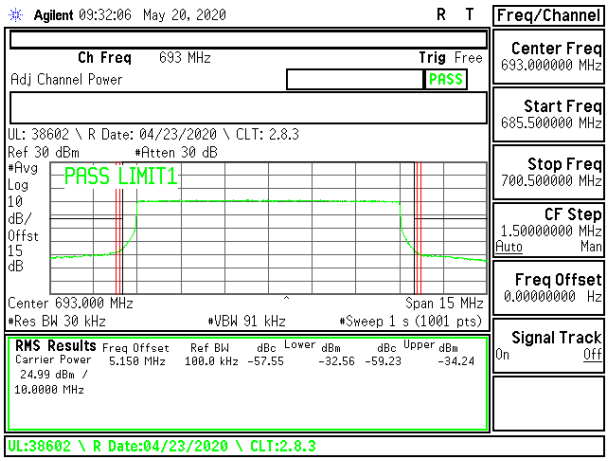
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B71 10MHz QPSK Low Channel RB50-0

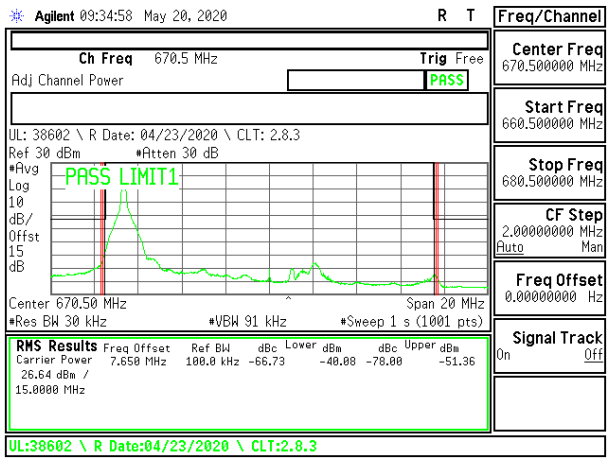


LTE B71 10MHz QPSK Middle Channel RB50-0

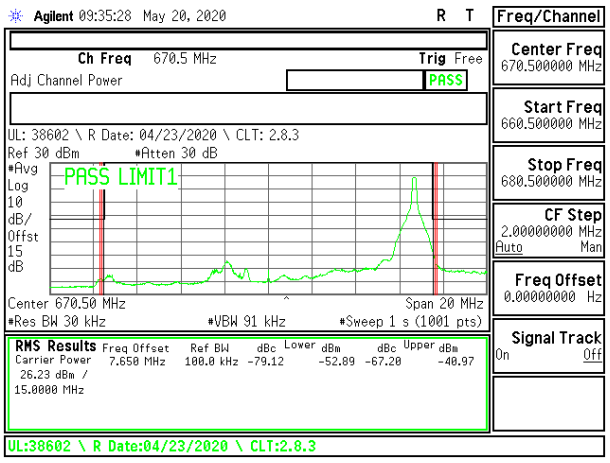


LTE B71 10MHz QPSK High Channel RB50-0

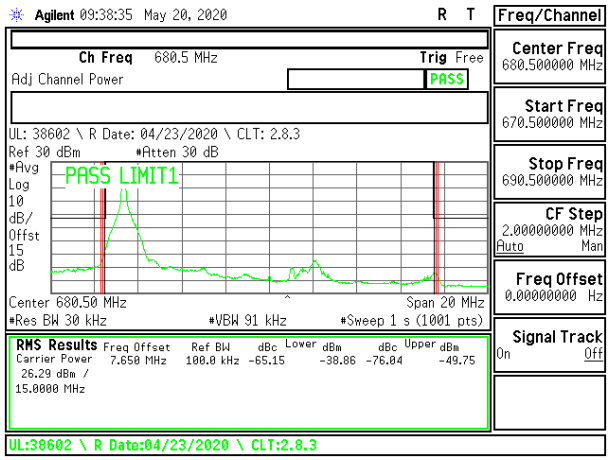
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



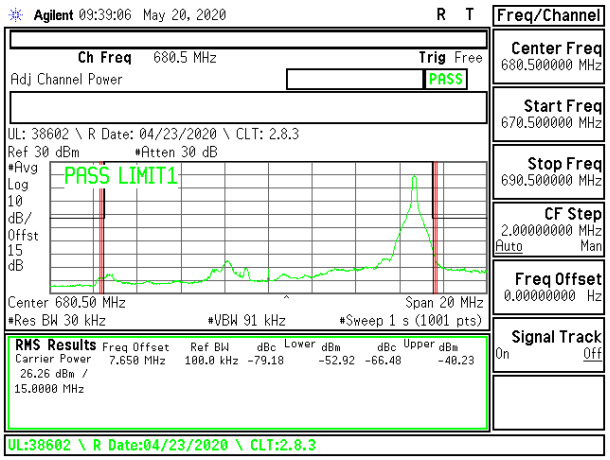
LTE B71 15MHz QPSK Low Channel RB1-0



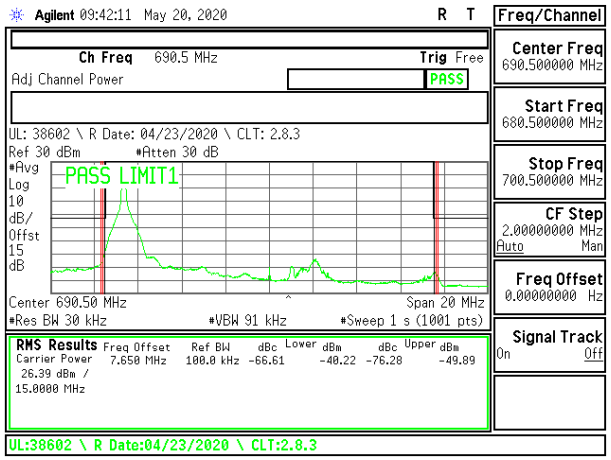
LTE B71 15MHz QPSK Low Channel RB1-74



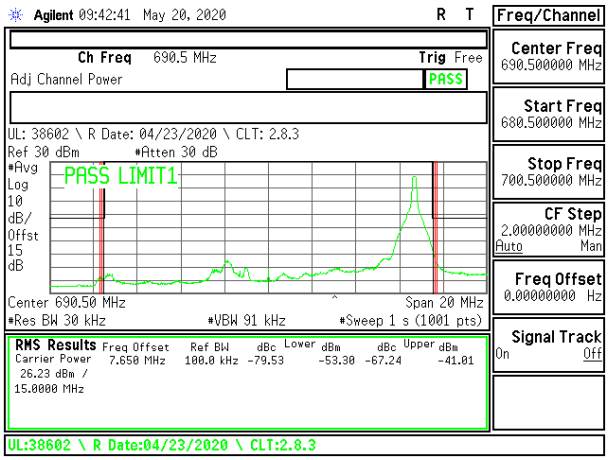
LTE B71 15MHz QPSK Middle Channel RB1-0



LTE B71 15MHz QPSK Middle Channel RB1-74



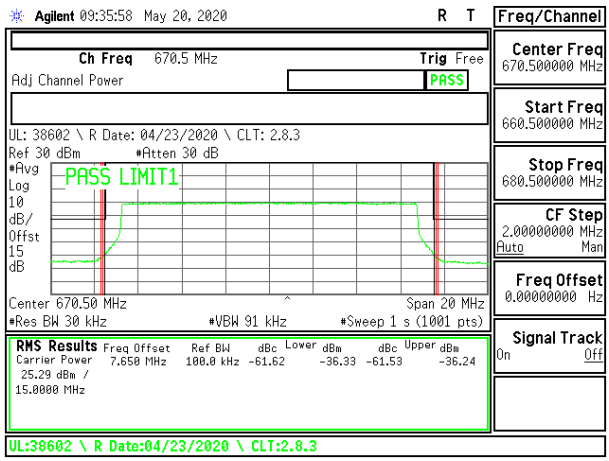
LTE B71 15MHz QPSK High Channel RB1-0



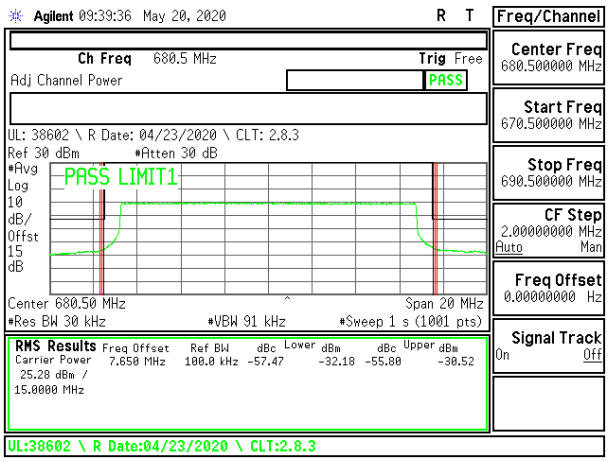
LTE B71 15MHz QPSK High Channel RB1-74

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

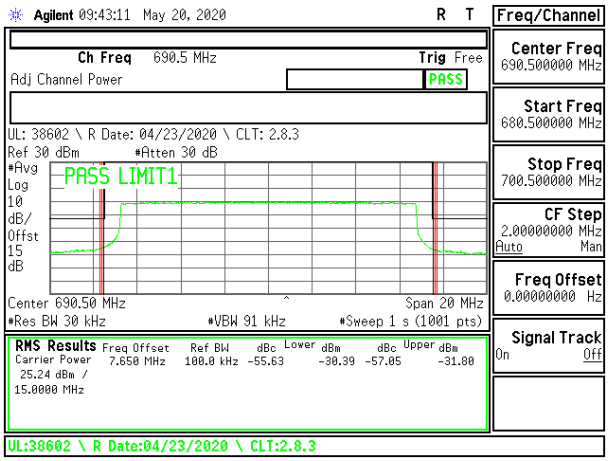
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B71 15MHz QPSK Low Channel RB75-0



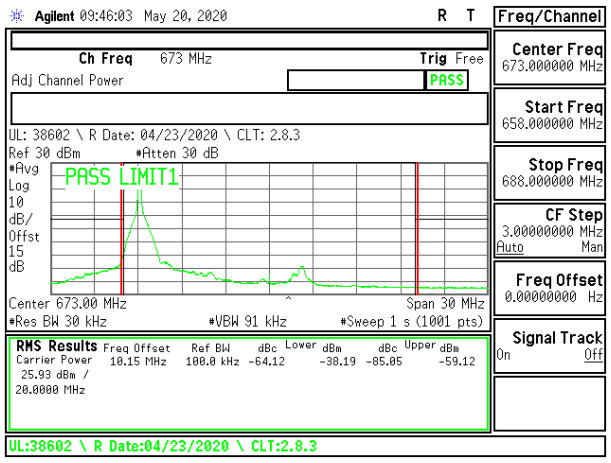
LTE B71 15MHz QPSK Middle Channel RB75-0



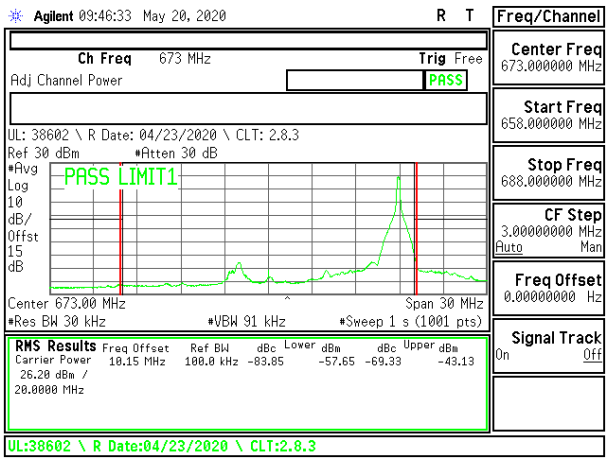
LTE B71 15MHz QPSK High Channel RB75-0

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

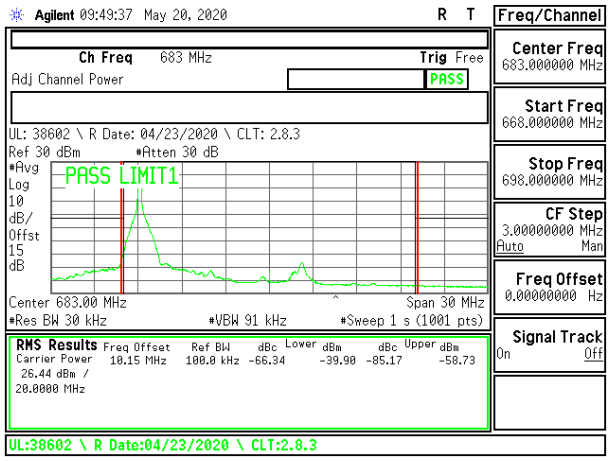
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



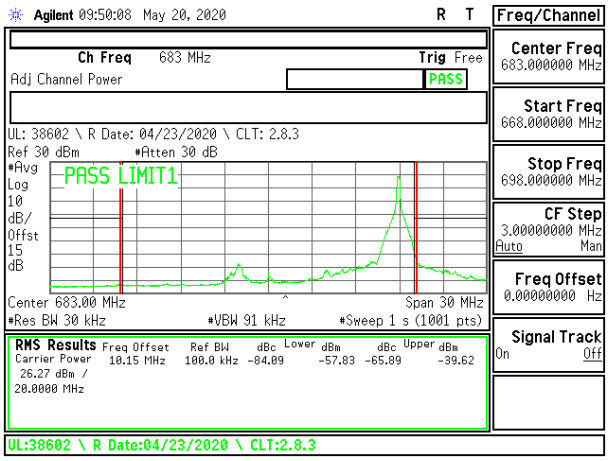
LTE B71 20MHz QPSK Low Channel RB1-0



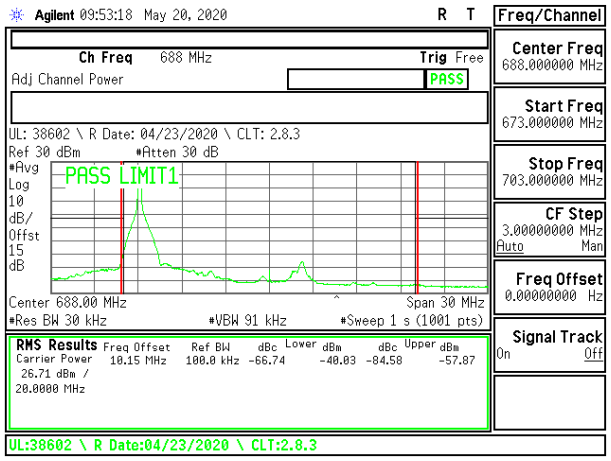
LTE B71 20MHz QPSK Low Channel RB1-99



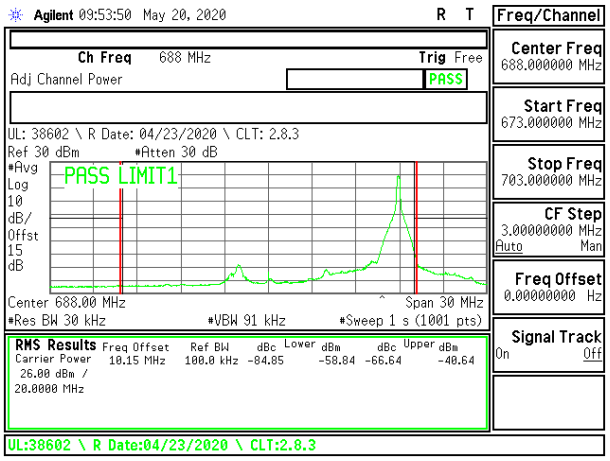
LTE B71 20MHz QPSK Middle Channel RB1-0



LTE B71 20MHz QPSK Middle Channel RB1-99



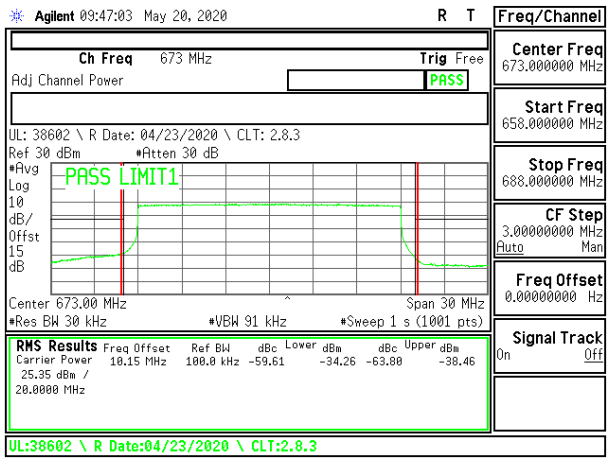
LTE B71 20MHz QPSK High Channel RB1-0



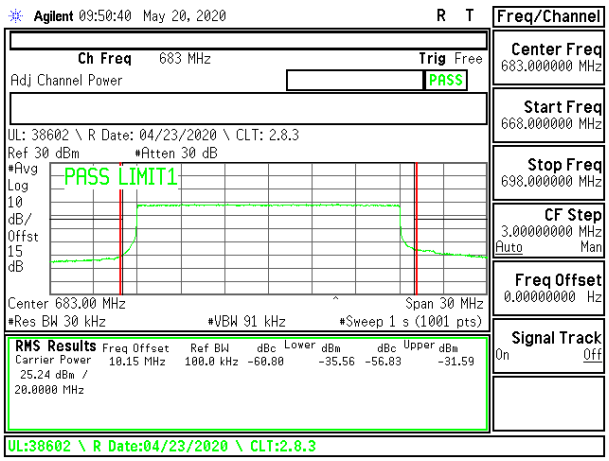
LTE B71 20MHz QPSK High Channel RB1-99

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000

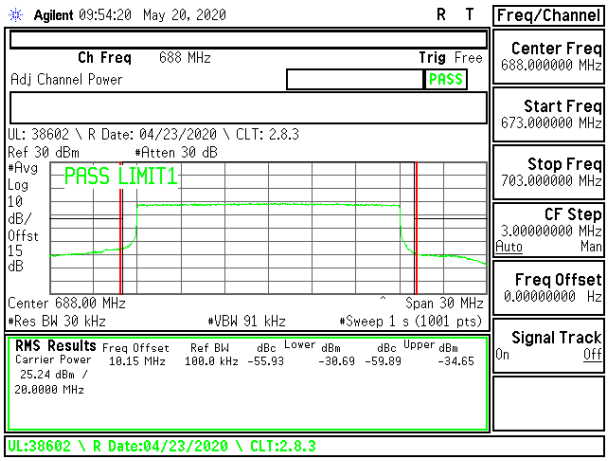
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B71 20MHz QPSK Low Channel RB100-0



LTE B71 20MHz QPSK Middle Channel RB100-0



LTE B71 20MHz QPSK High Channel RB100-0

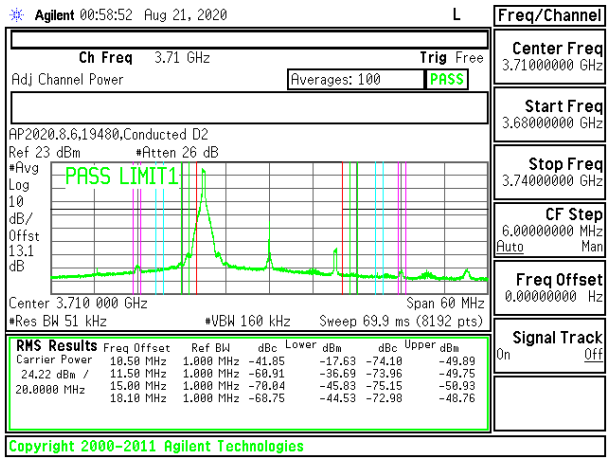
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.2.15. 5G NR Band n77 ADJACENT CHANNEL POWER

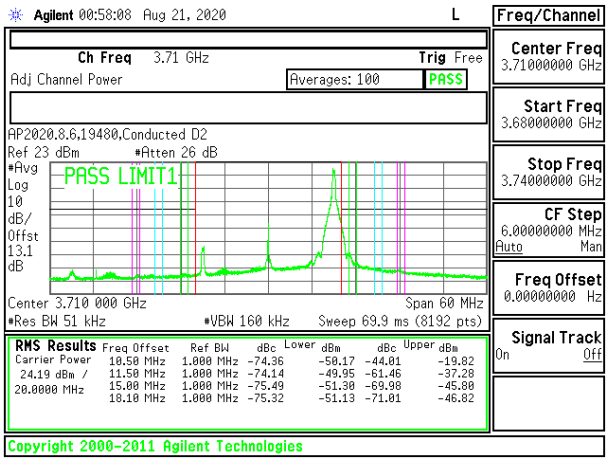
LIMITS

FCC: §27.53
(l) 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. Compliance with this paragraph (l)(2) 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, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

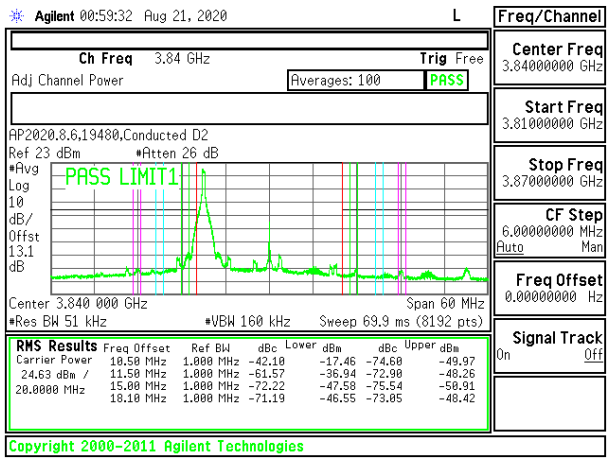
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



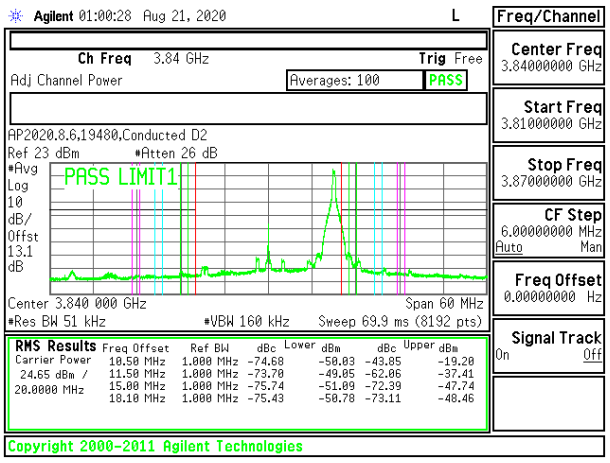
5G NR Band n77 20MHz QPSK Low Channel RB1-0



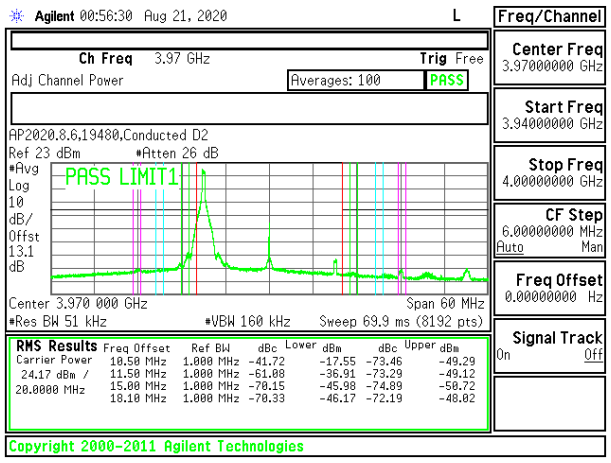
5G NR Band n77 20MHz QPSK Low Channel RB1-50



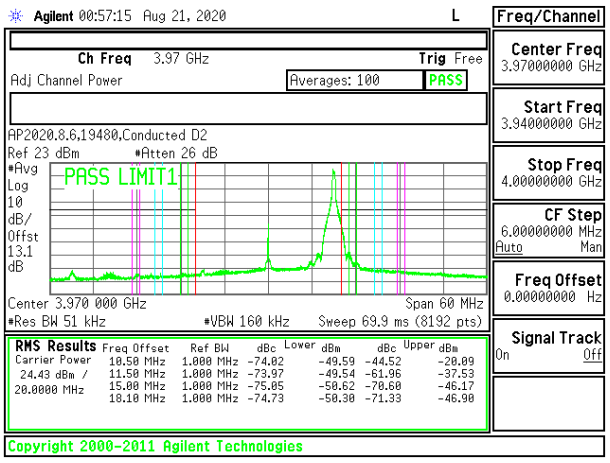
5G NR Band n77 20MHz QPSK Middle Channel RB1-0



5G NR Band n77 20MHz QPSK Middle Channel RB1-50

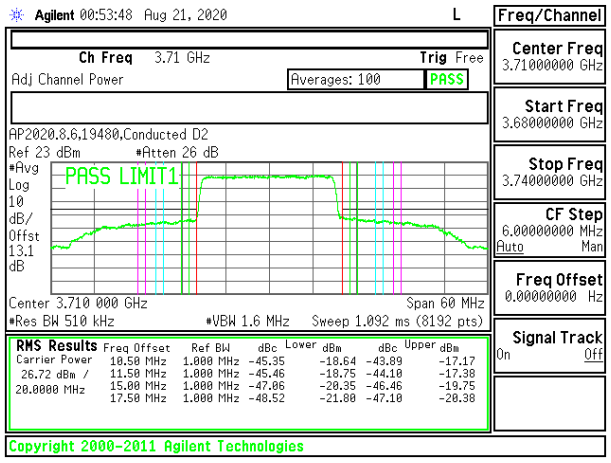


5G NR Band n77 20MHz QPSK High Channel RB1-0

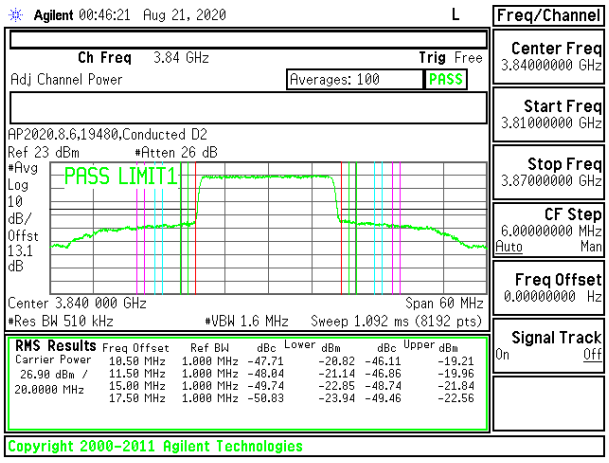


5G NR Band n77 20MHz QPSK High Channel RB1-50

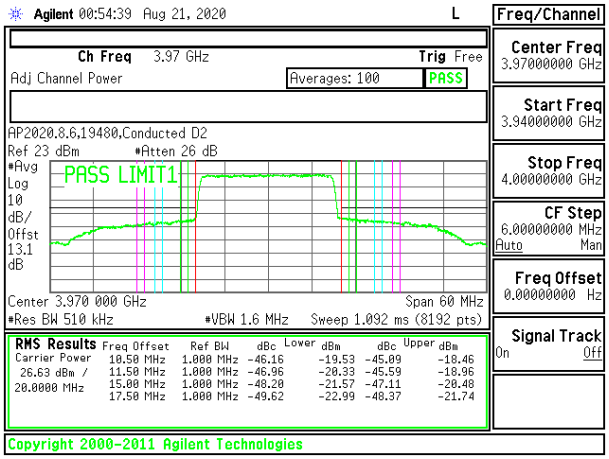
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 20MHz QPSK Low Channel RB50-0

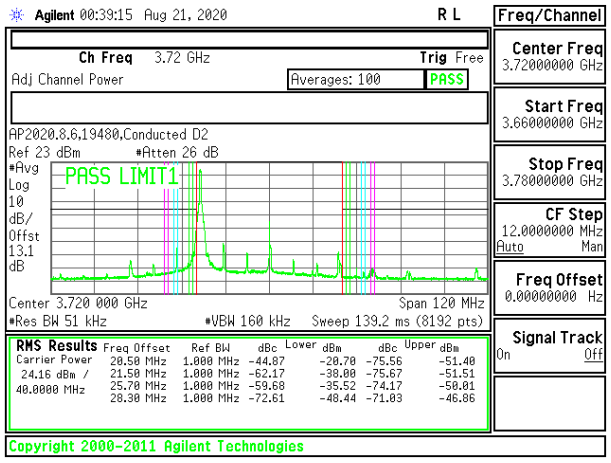


5G NR Band n77 20MHz QPSK Middle Channel RB50-0

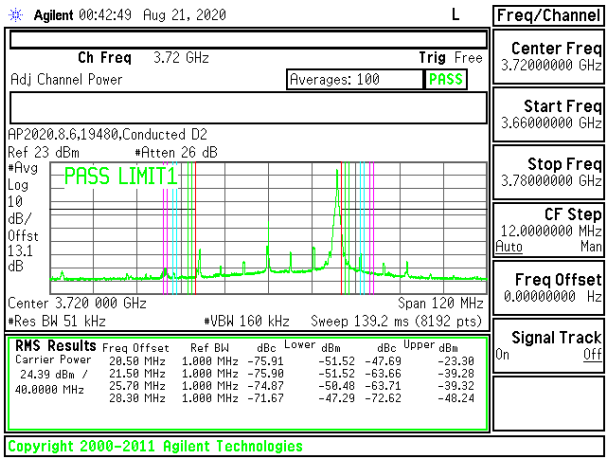


5G NR Band n77 20MHz QPSK High Channel RB50-0

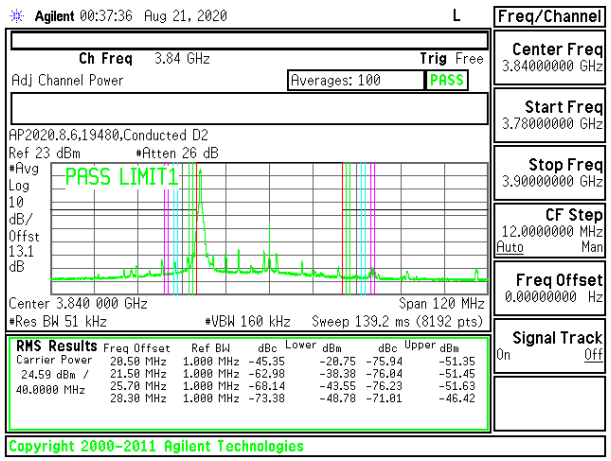
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



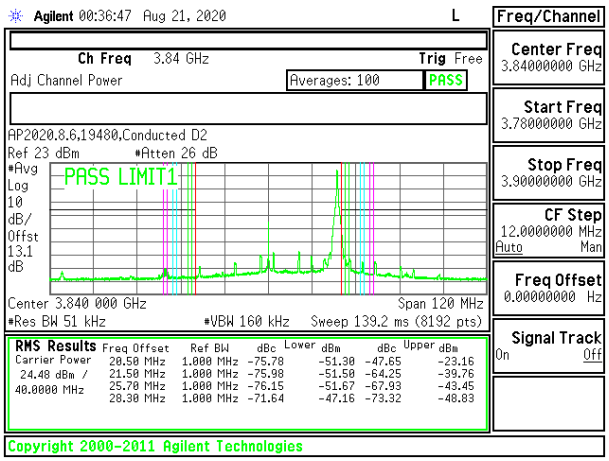
5G NR Band n77 40MHz QPSK Low Channel RB1-0



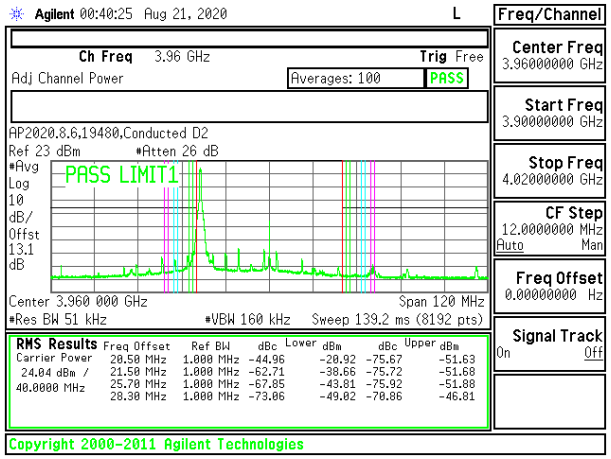
5G NR Band n77 40MHz QPSK Low Channel RB1-105



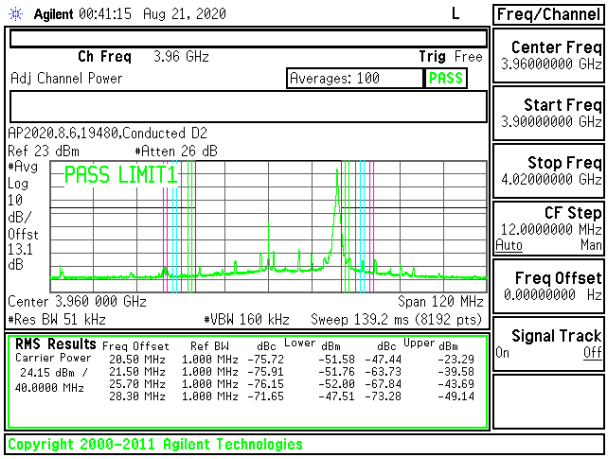
5G NR Band n77 40MHz QPSK Middle Channel RB1-0



5G NR Band n77 40MHz QPSK Middle Channel RB1-105

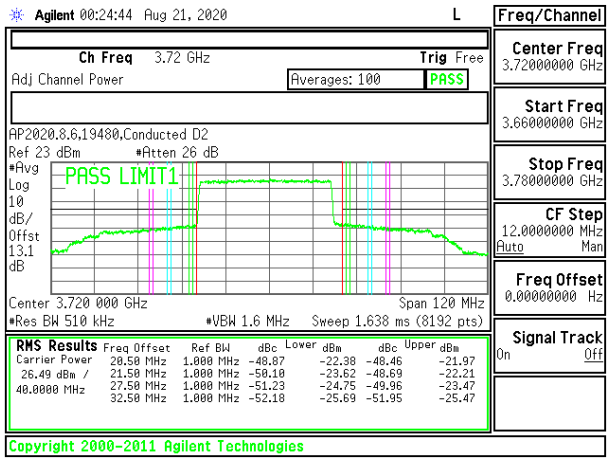


5G NR Band n77 40MHz QPSK High Channel RB1-0

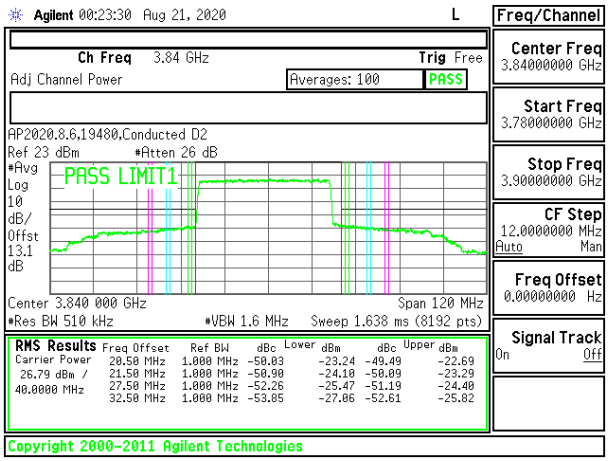


5G NR Band n77 40MHz QPSK High Channel RB1-105

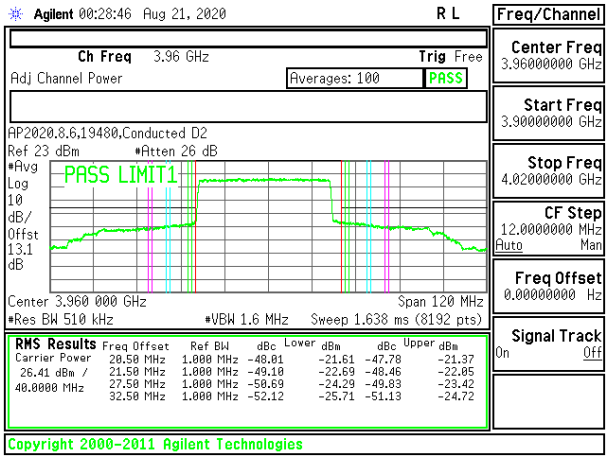
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 40MHz QPSK Low Channel RB100-0

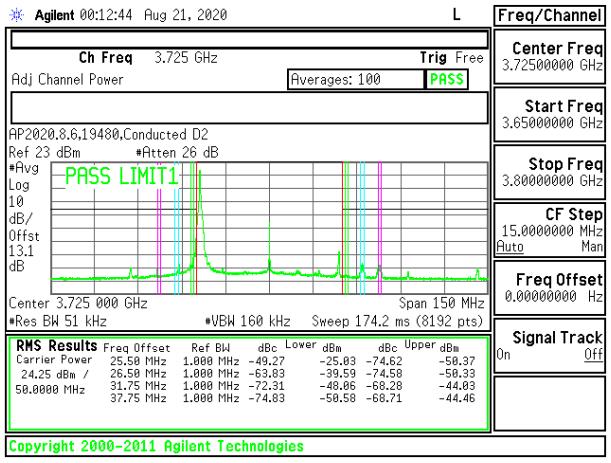


5G NR Band n77 40MHz QPSK Middle Channel RB100-0

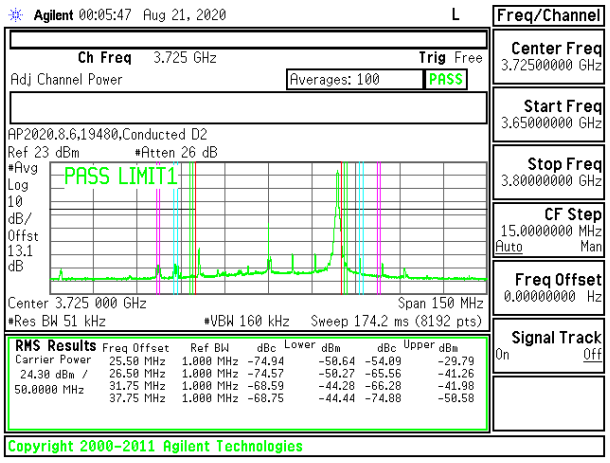


5G NR Band n77 40MHz QPSK High Channel RB100-0

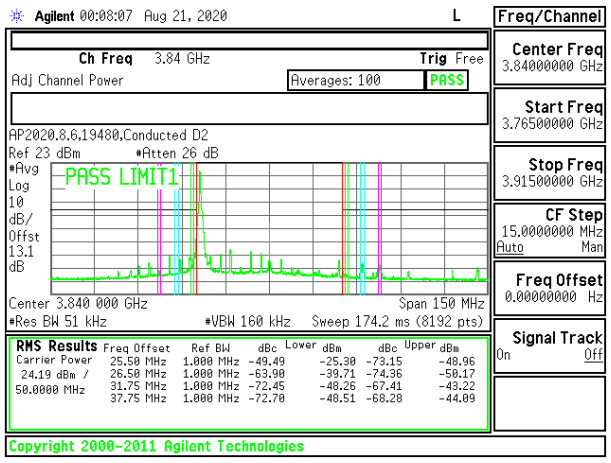
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



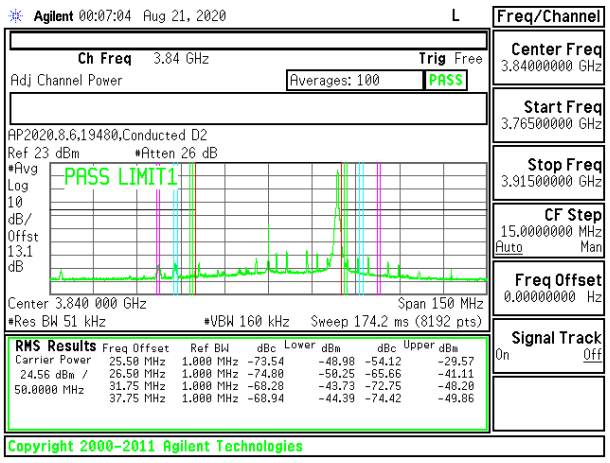
5G NR Band n77 50MHz QPSK Low Channel RB1-0



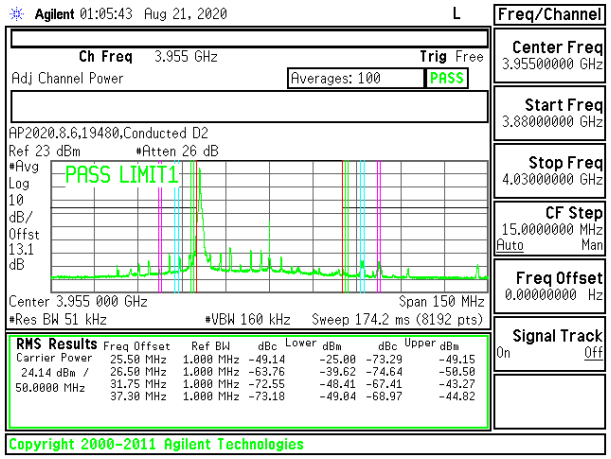
5G NR Band n77 50MHz QPSK Low Channel RB1-132



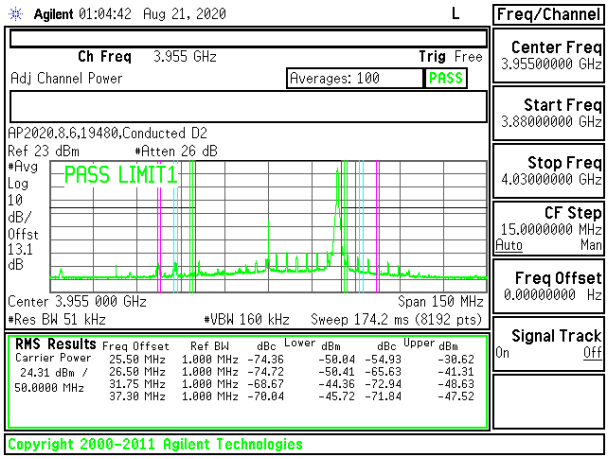
5G NR Band n77 50MHz QPSK Middle Channel RB1-0



5G NR Band n77 50MHz QPSK Middle Channel RB1-132

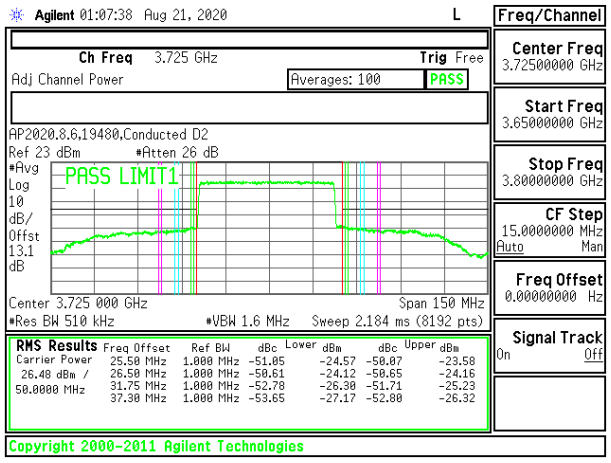


5G NR Band n77 50MHz QPSK High Channel RB1-0

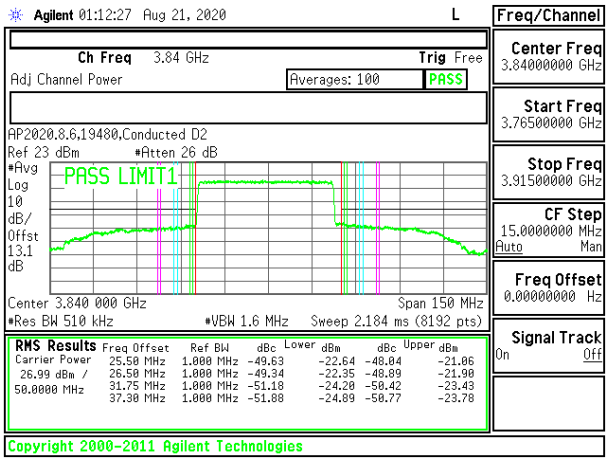


5G NR Band n77 50MHz QPSK High Channel RB1-132

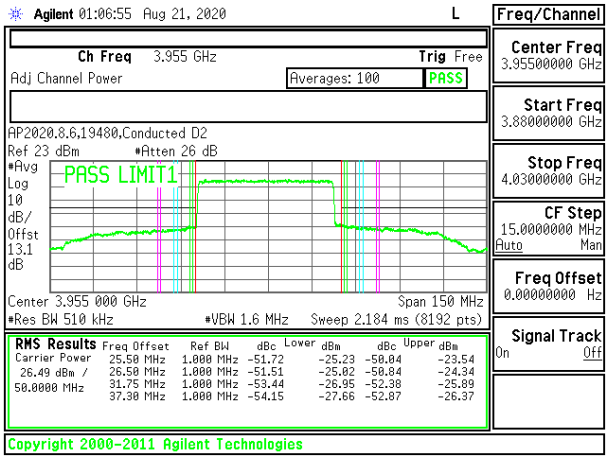
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 50MHz QPSK Low Channel RB128-0

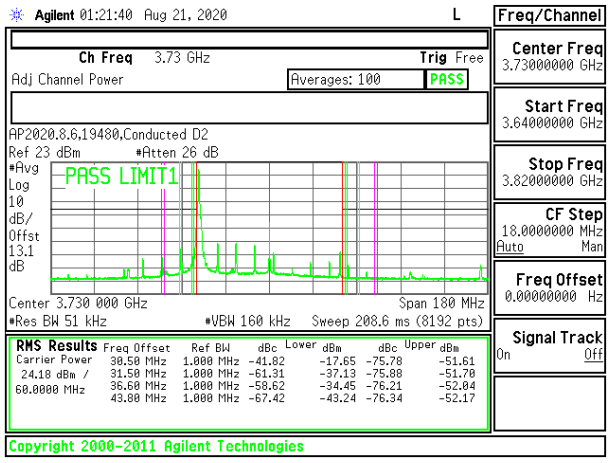


5G NR Band n77 50MHz QPSK Middle Channel RB128-0

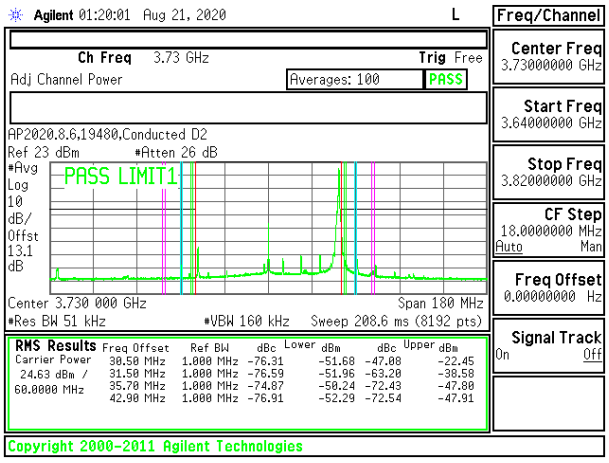


5G NR Band n77 50MHz QPSK High Channel RB128-0

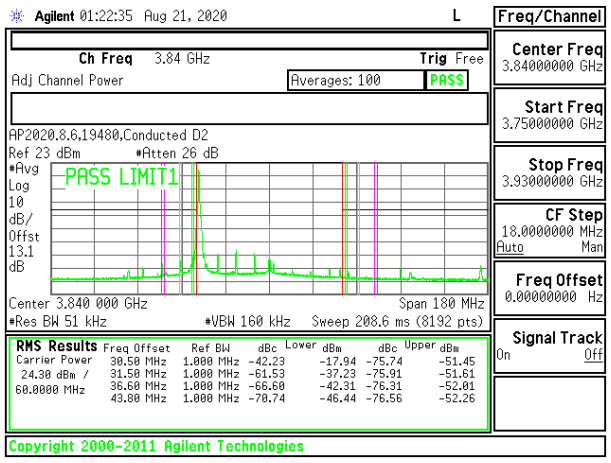
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



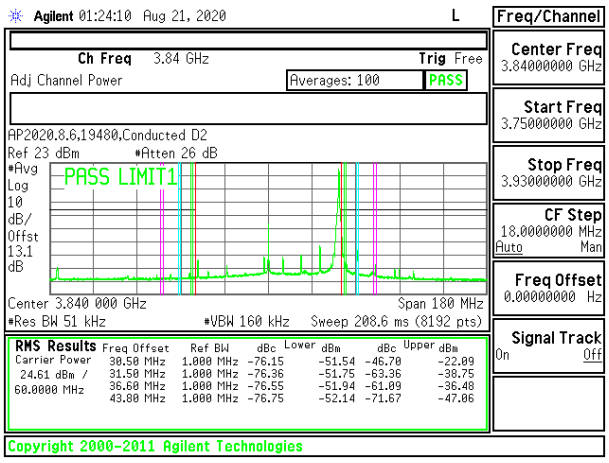
5G NR Band n77 60MHz QPSK Low Channel RB1-0



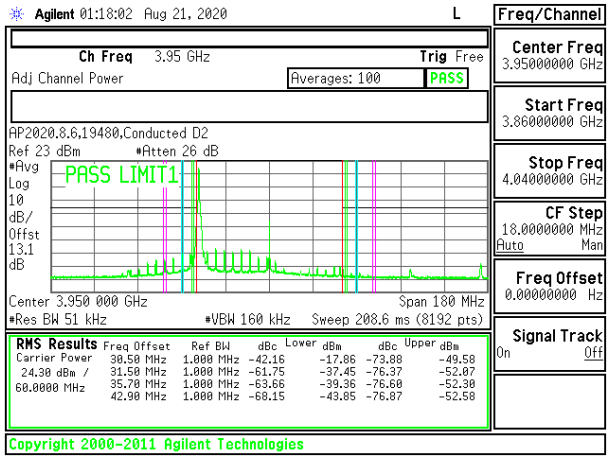
5G NR Band n77 60MHz QPSK Low Channel RB1-161



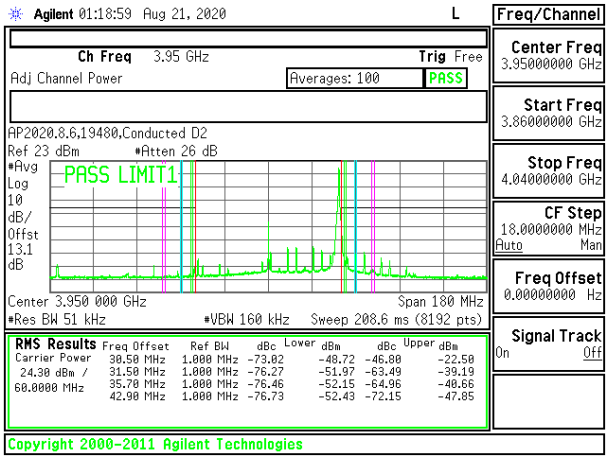
5G NR Band n77 60MHz QPSK Middle Channel RB1-0



5G NR Band n77 60MHz QPSK Middle Channel RB1-161

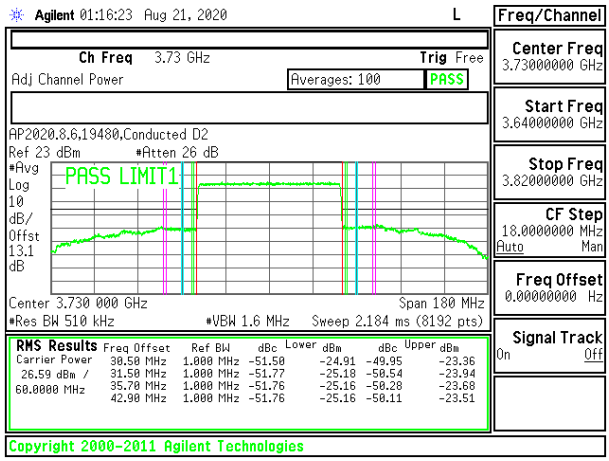


5G NR Band n77 60MHz QPSK High Channel RB1-0

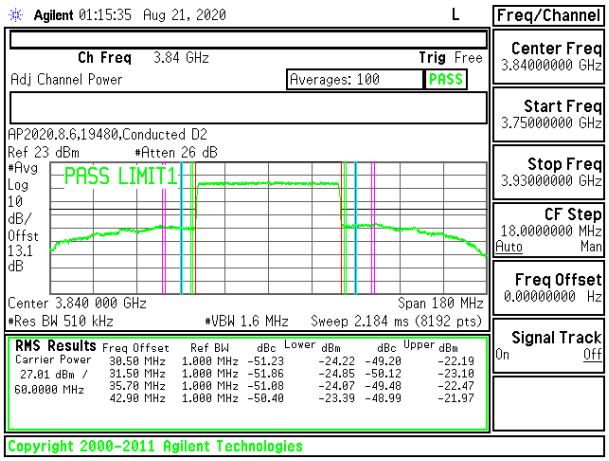


5G NR Band n77 60MHz QPSK High Channel RB1-161

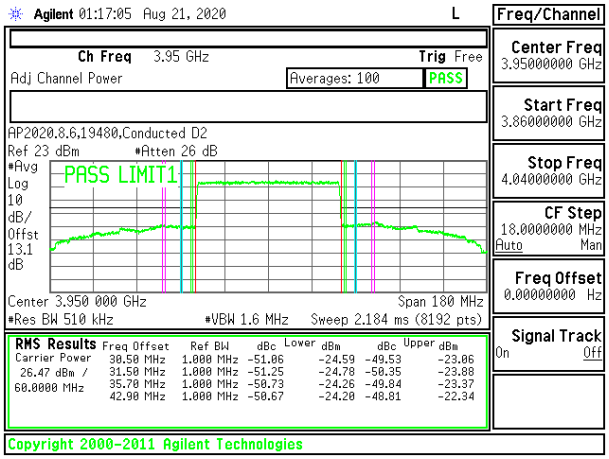
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 60MHz QPSK Low Channel RB162-0

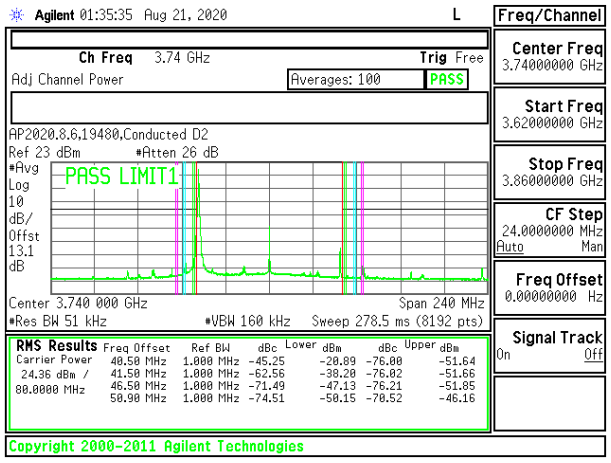


5G NR Band n77 60MHz QPSK Middle Channel RB162-0

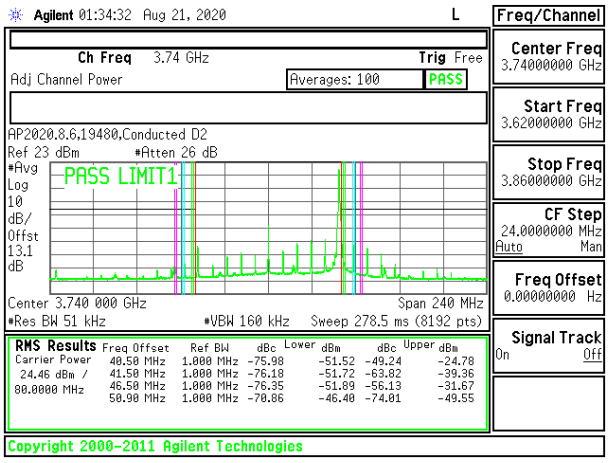


5G NR Band n77 60MHz QPSK High Channel RB162-0

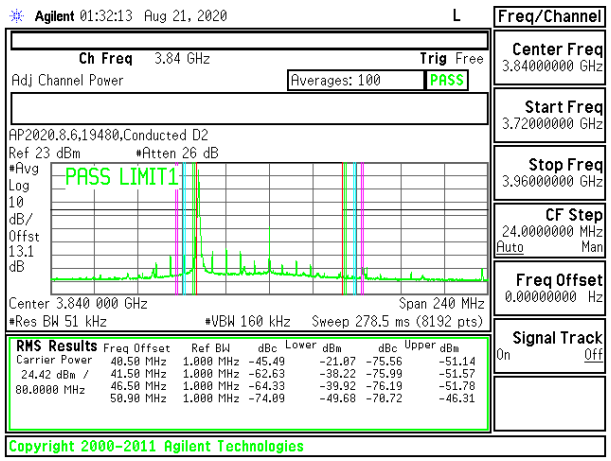
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



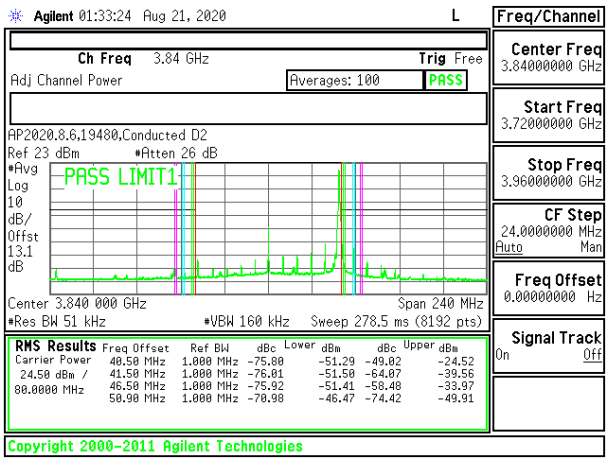
5G NR Band n77 80MHz QPSK Low Channel RB1-0



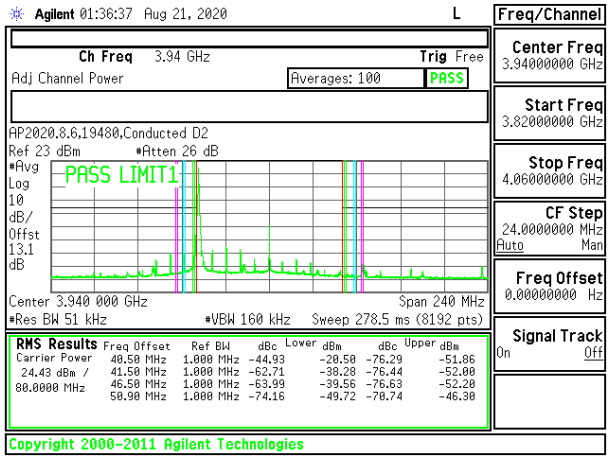
5G NR Band n77 80MHz QPSK Low Channel RB1-216



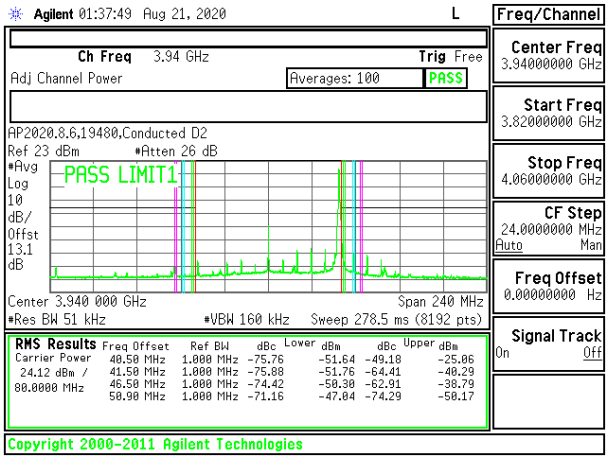
5G NR Band n77 80MHz QPSK Middle Channel RB1-0



5G NR Band n77 80MHz QPSK Middle Channel RB1-216

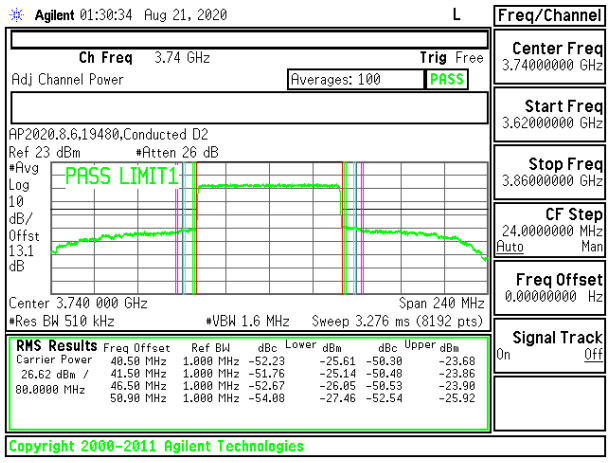


5G NR Band n77 80MHz QPSK High Channel RB1-0

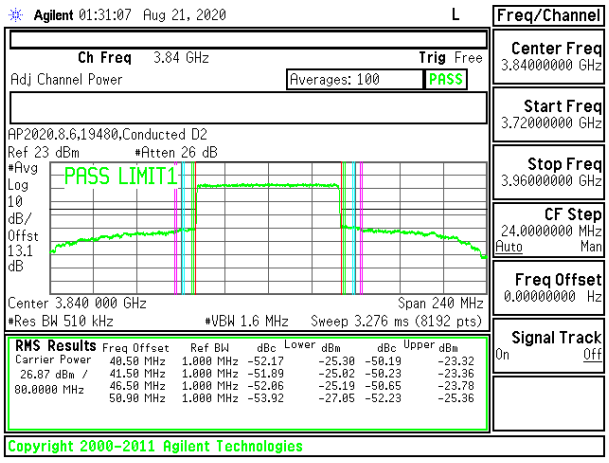


5G NR Band n77 80MHz QPSK High Channel RB1-216

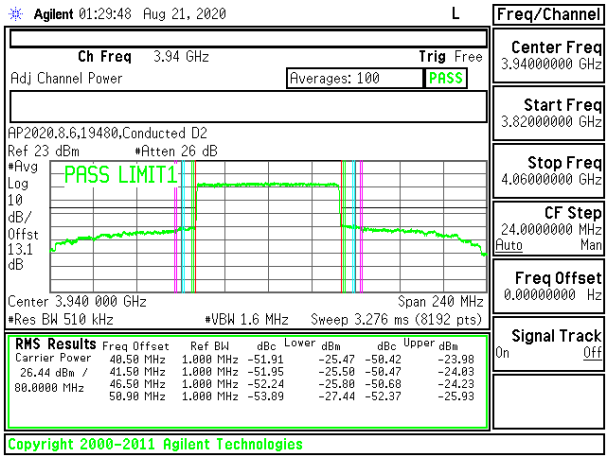
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 80MHz QPSK Low Channel RB216-0

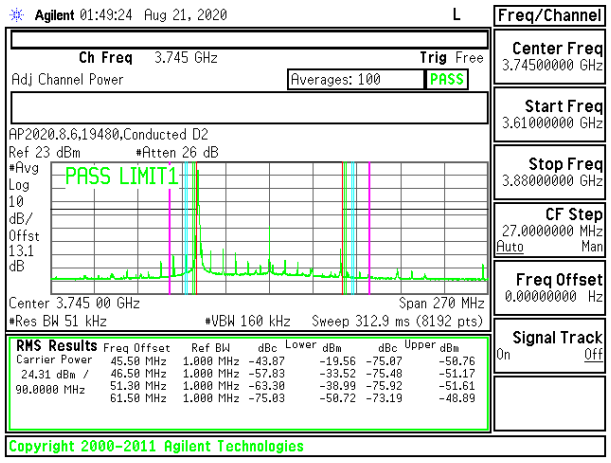


5G NR Band n77 80MHz QPSK Middle Channel RB216-0

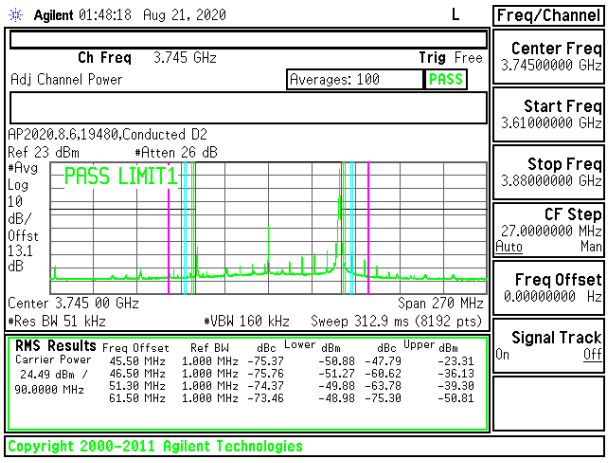


5G NR Band n77 80MHz QPSK High Channel RB216-0

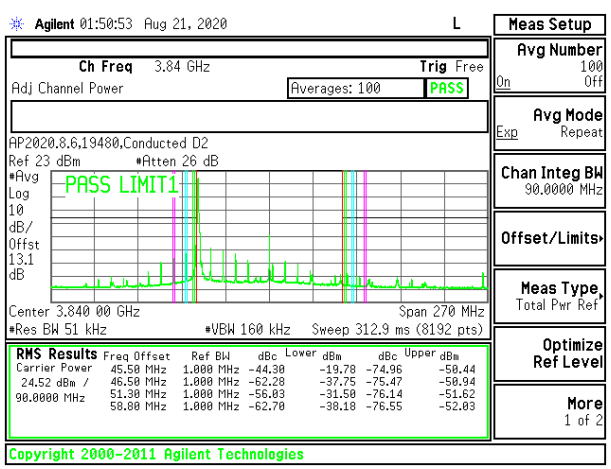
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



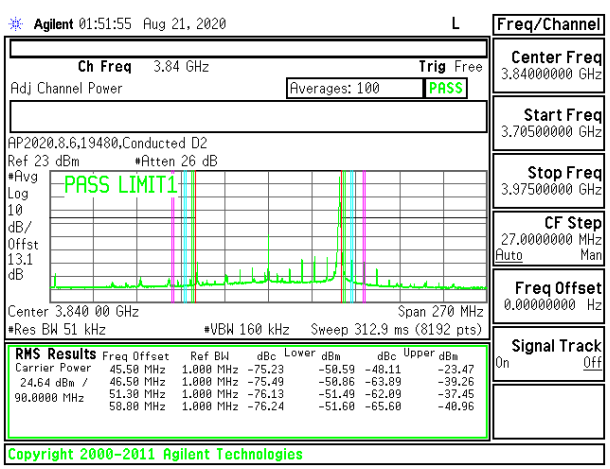
5G NR Band n77 90MHz QPSK Low Channel RB1-0



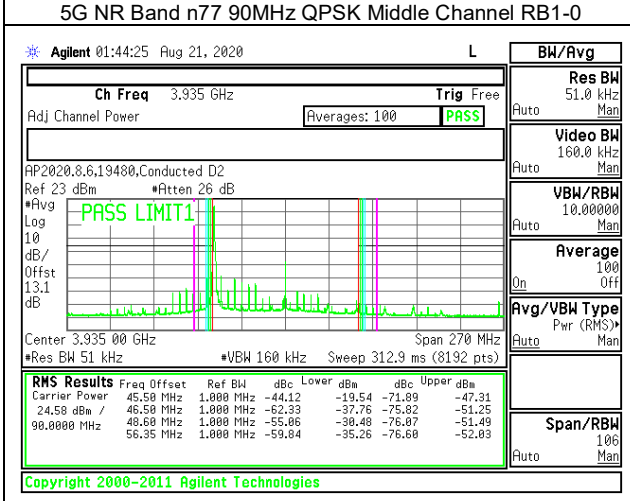
5G NR Band n77 90MHz QPSK Low Channel RB1-244



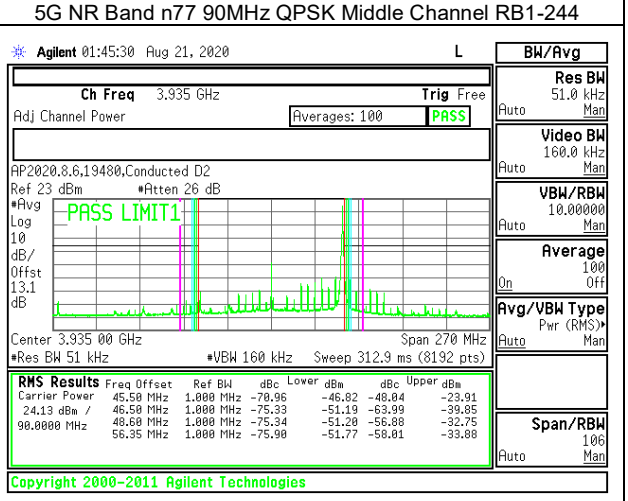
5G NR Band n77 90MHz QPSK Middle Channel RB1-0



5G NR Band n77 90MHz QPSK Middle Channel RB1-244

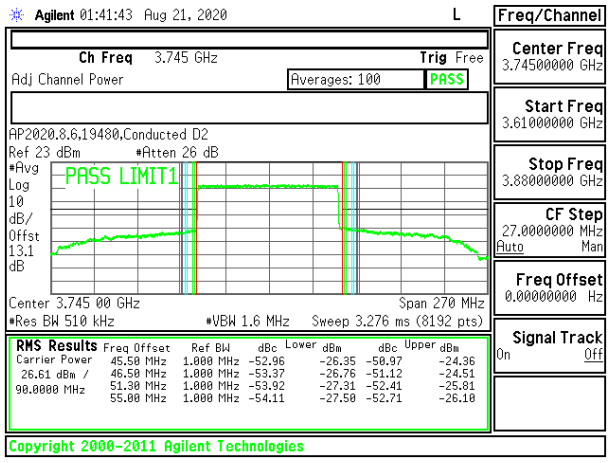


5G NR Band n77 90MHz QPSK High Channel RB1-0

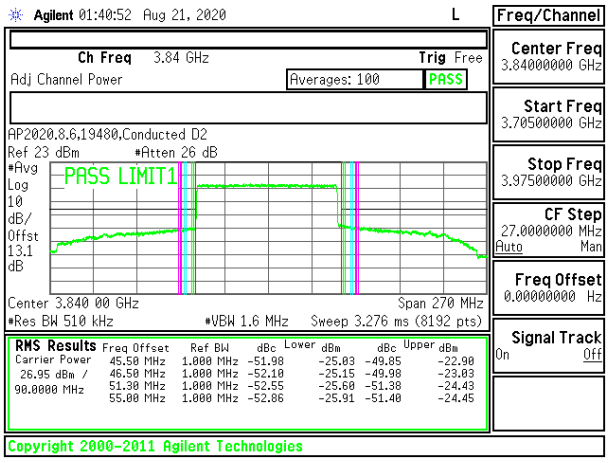


5G NR Band n77 90MHz QPSK High Channel RB1-244

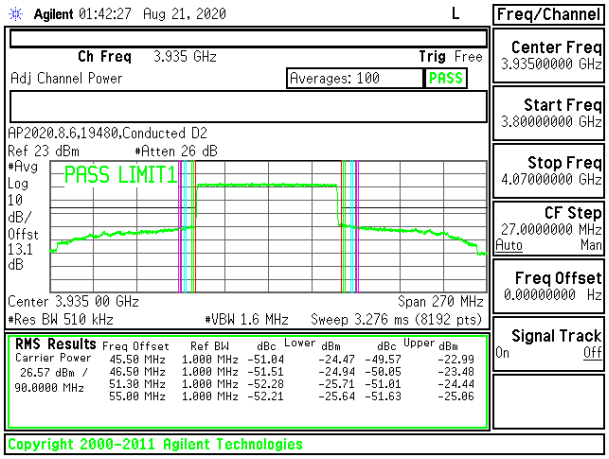
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 90MHz QPSK Low Channel RB240-0

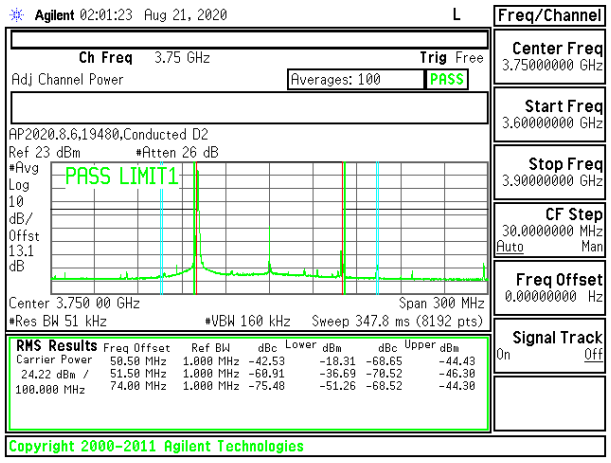


5G NR Band n77 90MHz QPSK Middle Channel RB240-0

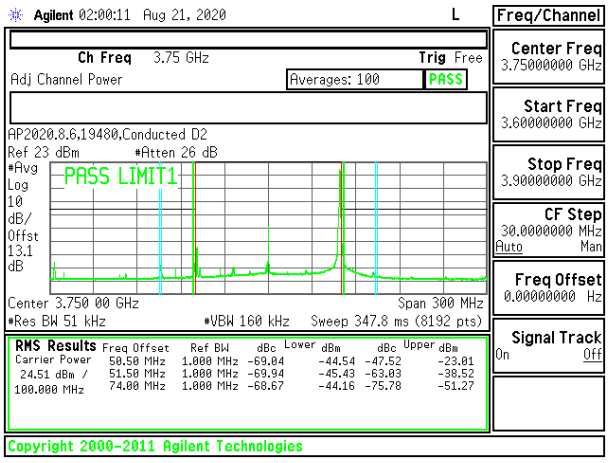


5G NR Band n77 90MHz QPSK High Channel RB240-0

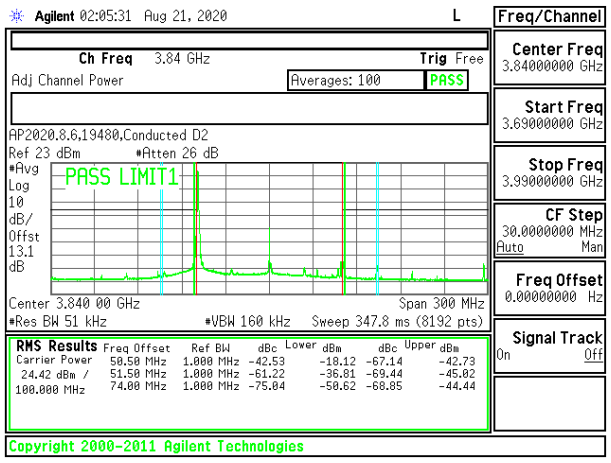
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



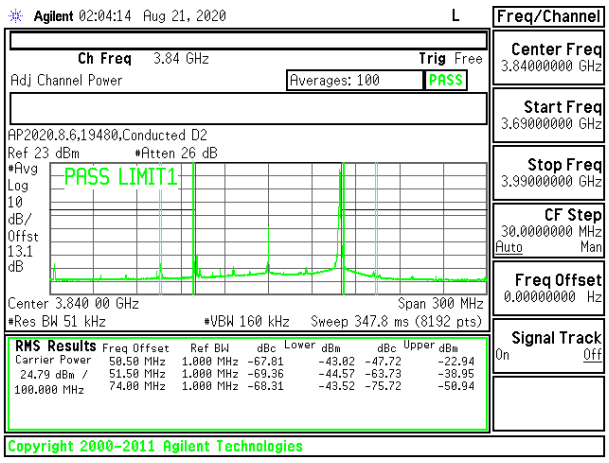
5G NR Band n77 100MHz QPSK Low Channel RB1-0



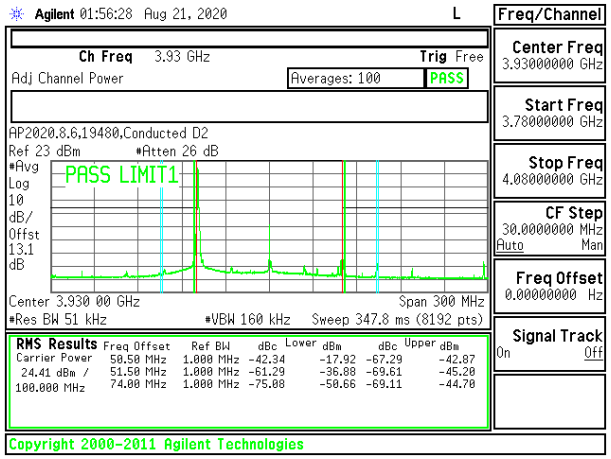
5G NR Band n77 100MHz QPSK Low Channel RB1-270



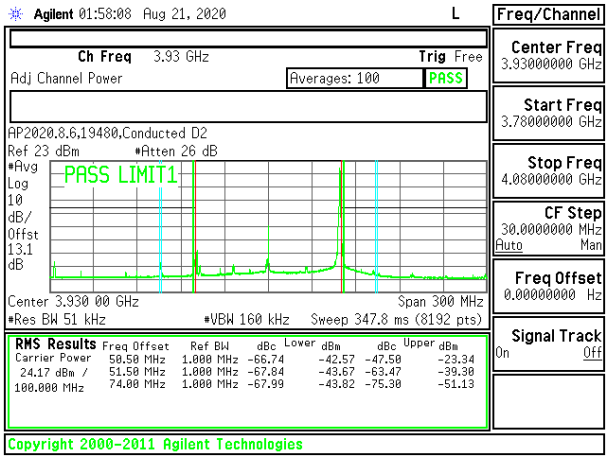
5G NR Band n77 100MHz QPSK Middle Channel RB1-0



5G NR Band n77 100MHz QPSK Middle Channel RB1-270

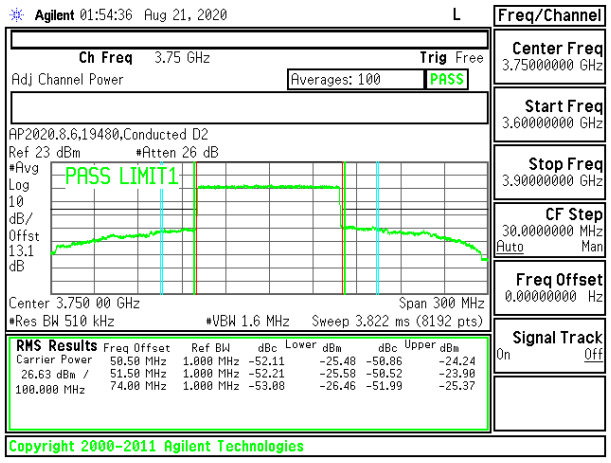


5G NR Band n77 100MHz QPSK High Channel RB1-0

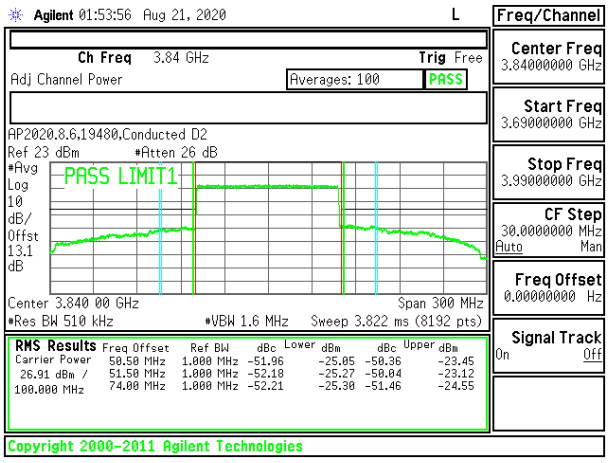


5G NR Band n77 100MHz QPSK High Channel RB1-270

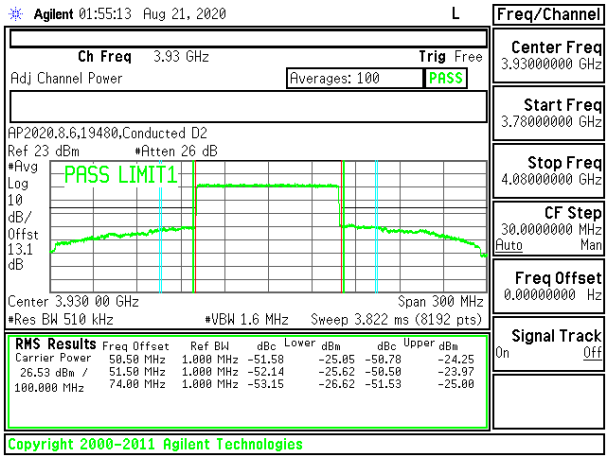
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



5G NR Band n77 100MHz QPSK Low Channel RB270-0



5G NR Band n77 100MHz QPSK Middle Channel RB270-0



5G NR Band n77 100MHz QPSK High Channel RB270-0

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.3. OUT OF BAND EMISSIONS

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm, -25dBm and -40dBm according to the band Limit
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

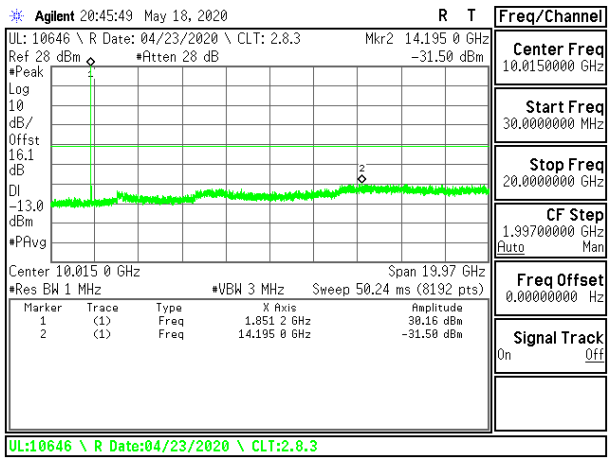
RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

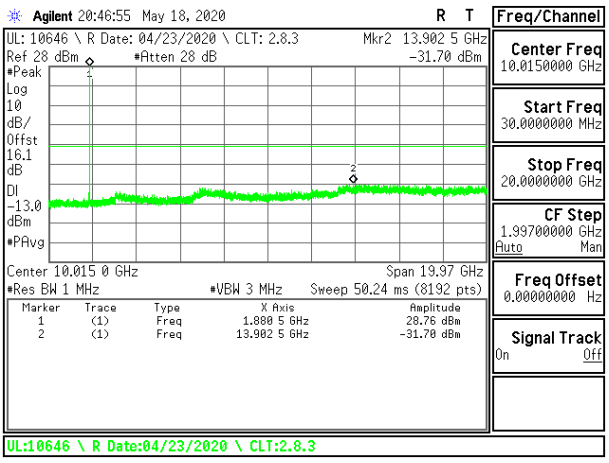
8.3.1. LTE BAND 2

LIMITS

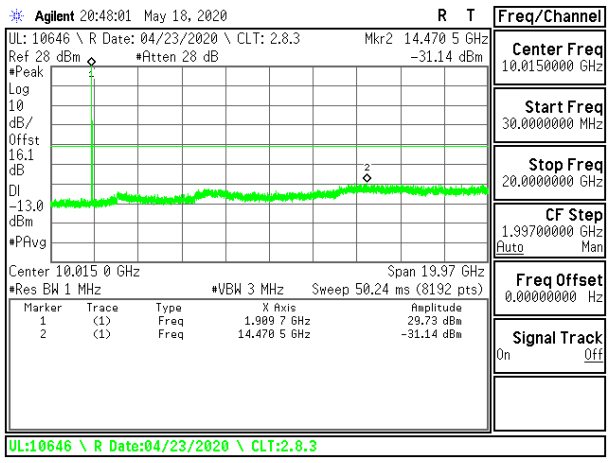
FCC: §24.238
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.



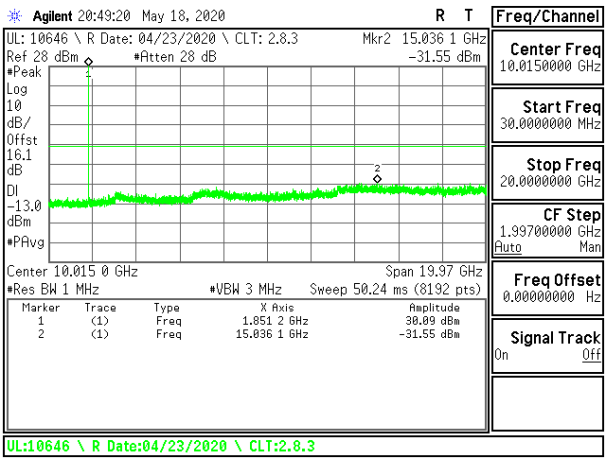
LTE B2 1.4MHz QPSK Low Channel RB1-0



LTE B2 1.4MHz QPSK Middle Channel RB1-0

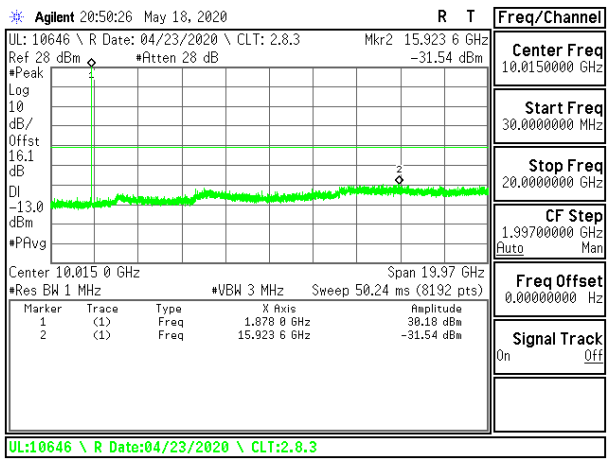


LTE B2 1.4MHz QPSK High Channel RB1-0

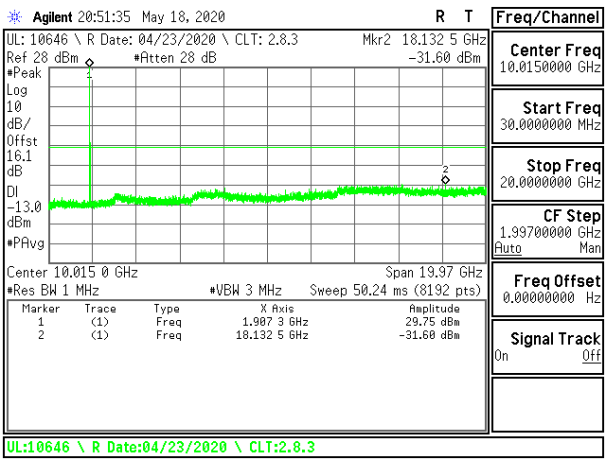


LTE B2 3MHz QPSK Low Channel RB1-0

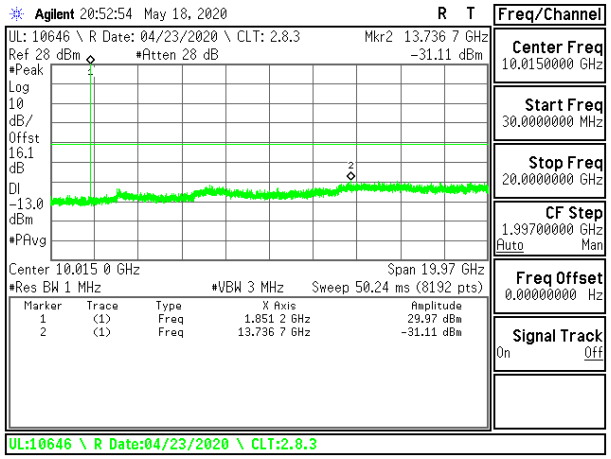
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



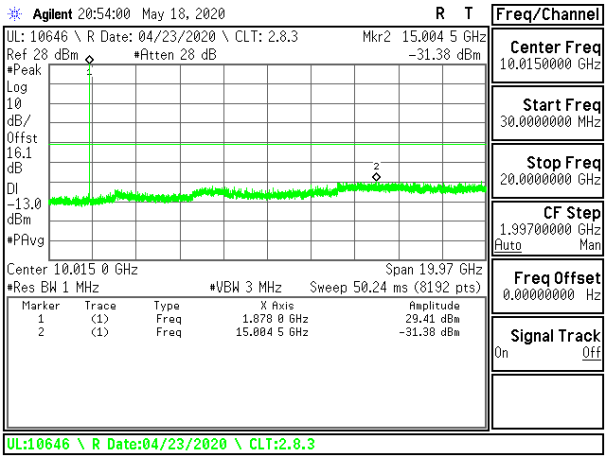
LTE B2 3MHz QPSK Middle Channel RB1-0



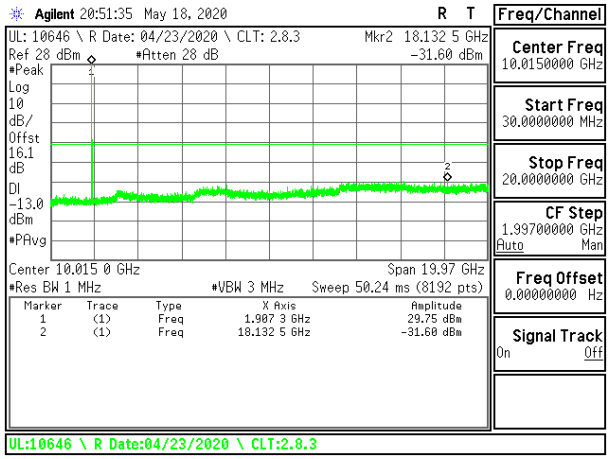
LTE B2 3MHz QPSK High Channel RB1-0



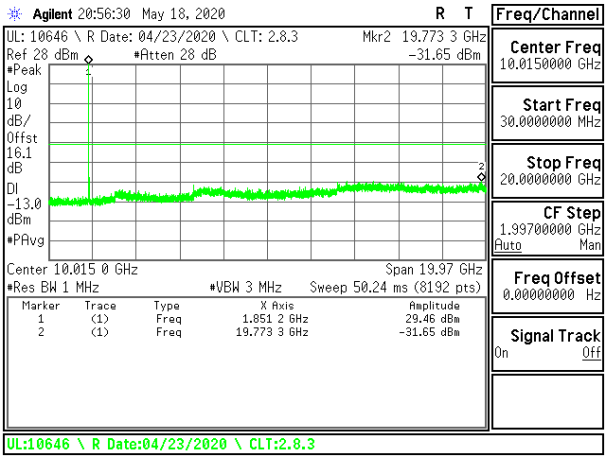
LTE B2 5MHz QPSK Low Channel RB1-0



LTE B2 5MHz QPSK Middle Channel RB1-0

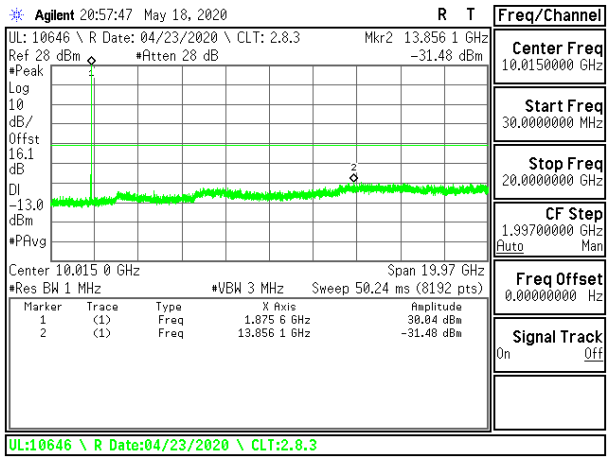


LTE B2 5MHz QPSK High Channel RB1-0

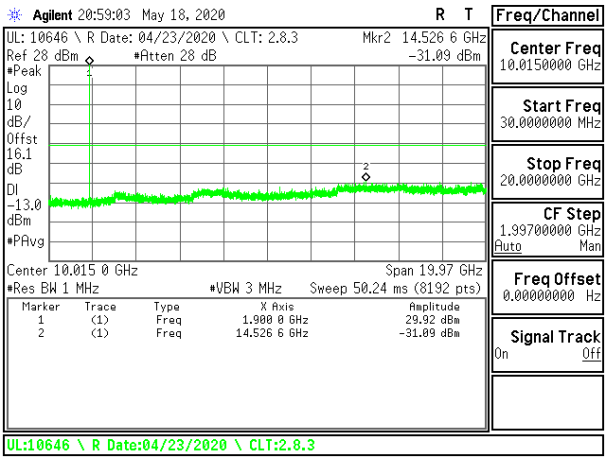


LTE B2 10MHz QPSK Low Channel RB1-0

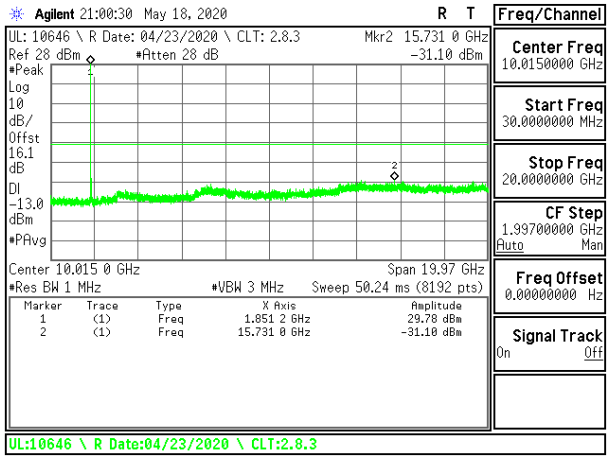
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



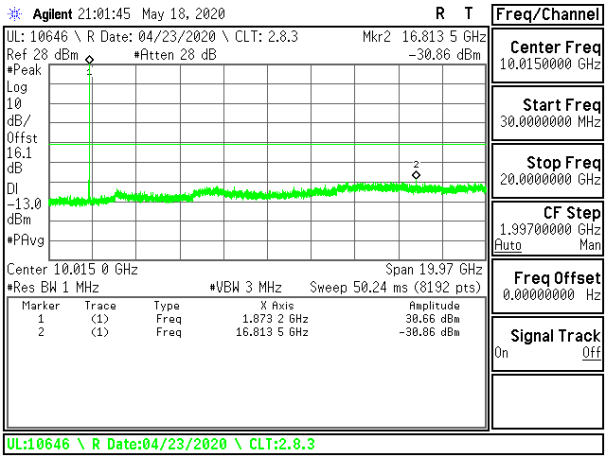
LTE B2 10MHz QPSK Middle Channel RB1-0



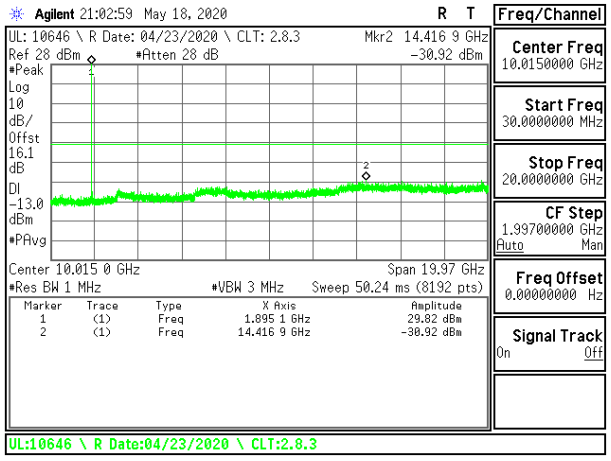
LTE B2 10MHz QPSK High Channel RB1-0



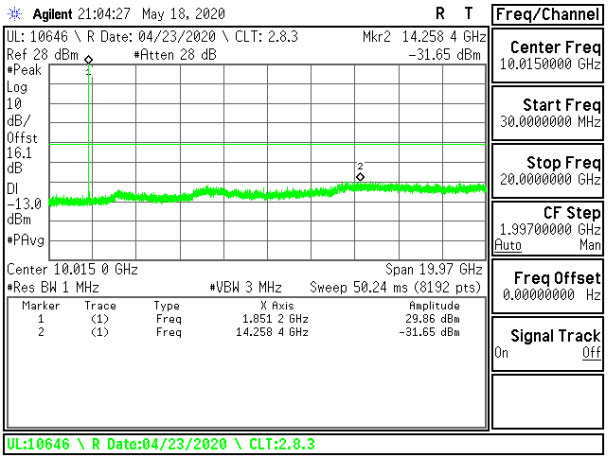
LTE B2 15MHz QPSK Low Channel RB1-0



LTE B2 15MHz QPSK Middle Channel RB1-0

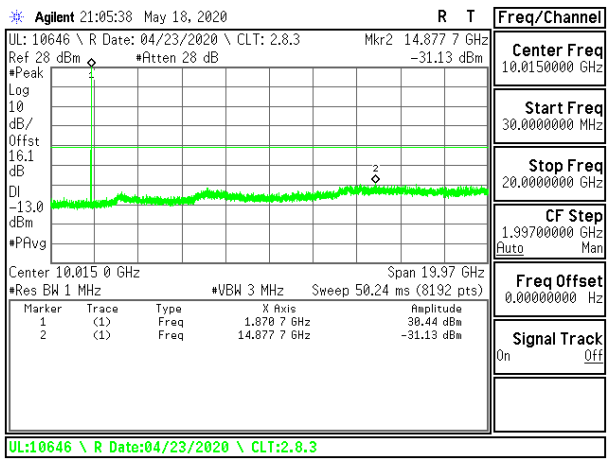


LTE B2 15MHz QPSK High Channel RB1-0

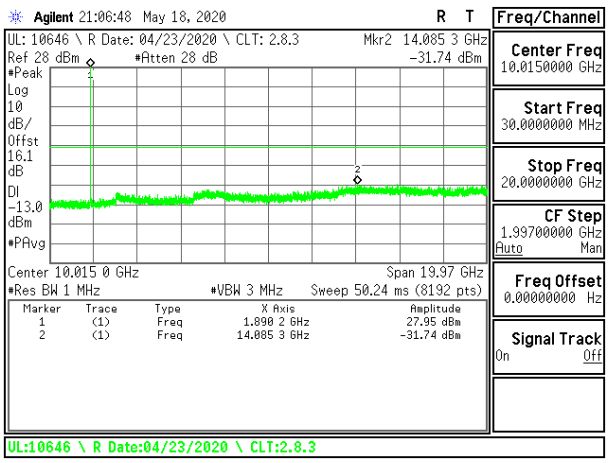


LTE B2 20MHz QPSK Low Channel RB1-0

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000
FORM NO: CCSUP4031B
FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B2 20MHz QPSK Middle Channel RB1-0



LTE B2 20MHz QPSK High Channel RB1-0

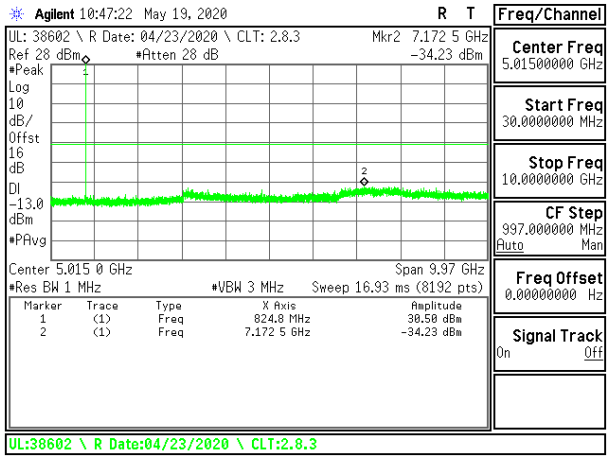
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

8.3.2. LTE BAND 5 AND 5G NR Band n5

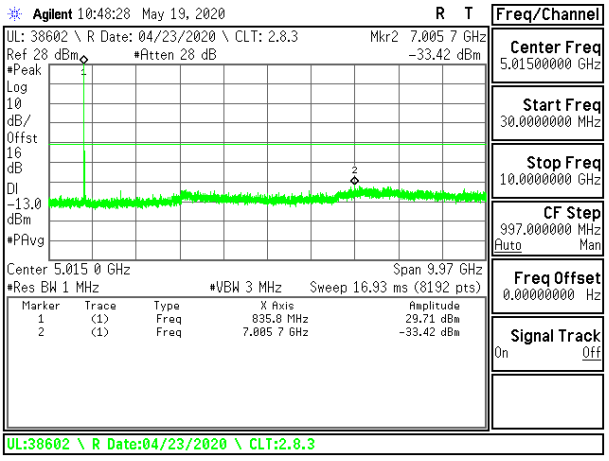
LIMITS

FCC: §22.917
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

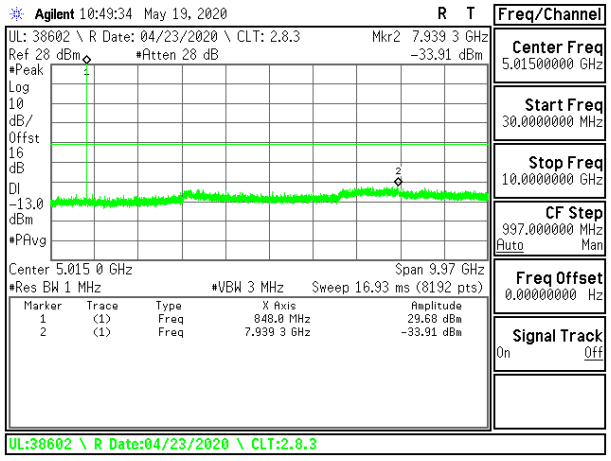
LTE BAND 5



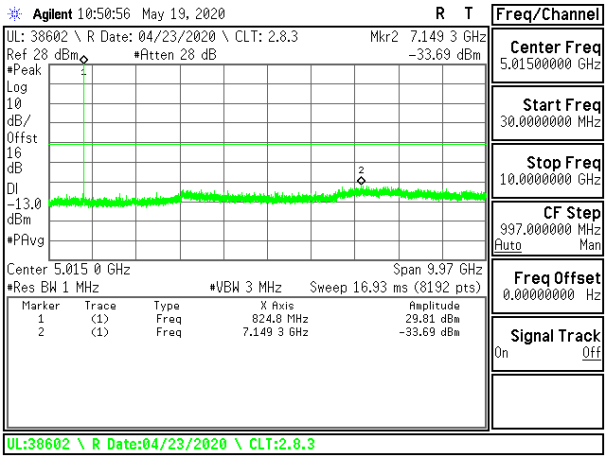
LTE B5 1.4MHz QPSK Low Channel RB1-0



LTE B5 1.4MHz QPSK Middle Channel RB1-0

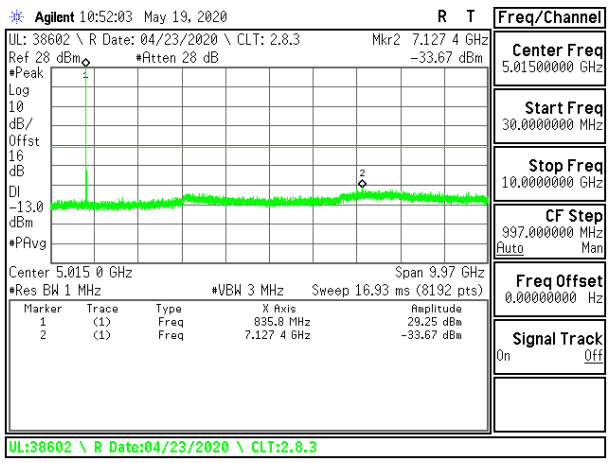


LTE B5 1.4MHz QPSK High Channel RB1-0

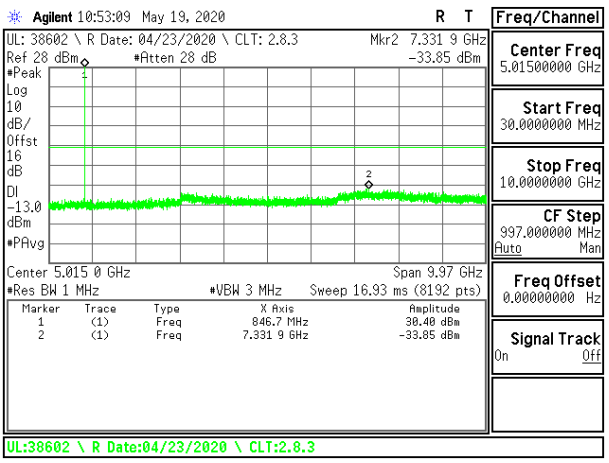


LTE B5 3MHz QPSK Low Channel RB1-0

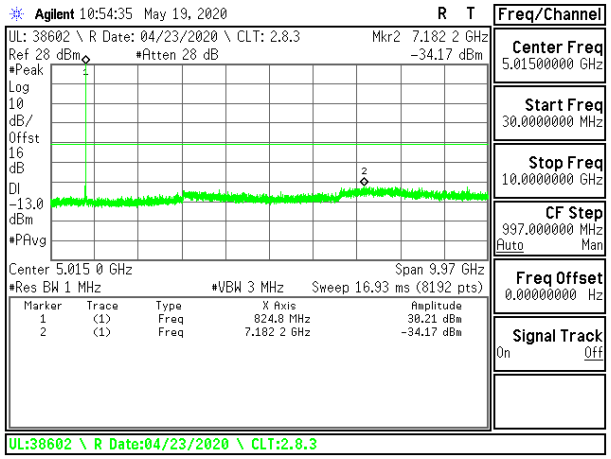
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



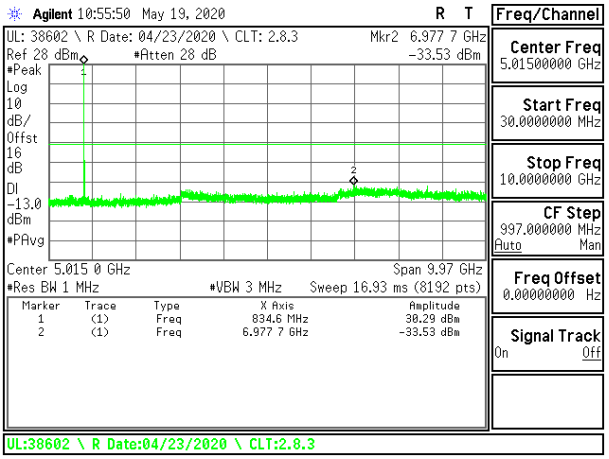
LTE B5 3MHz QPSK Middle Channel RB1-0



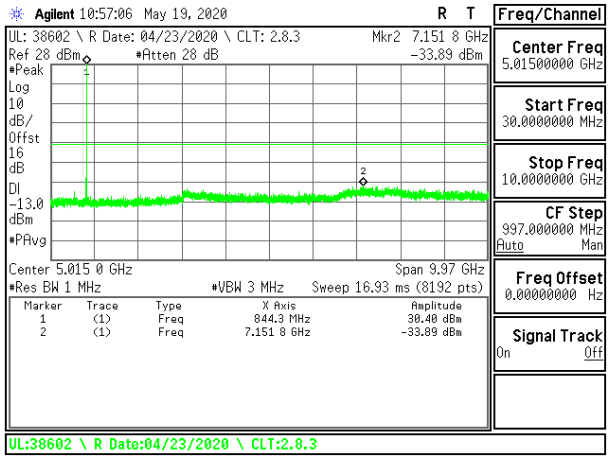
LTE B5 3MHz QPSK High Channel RB1-0



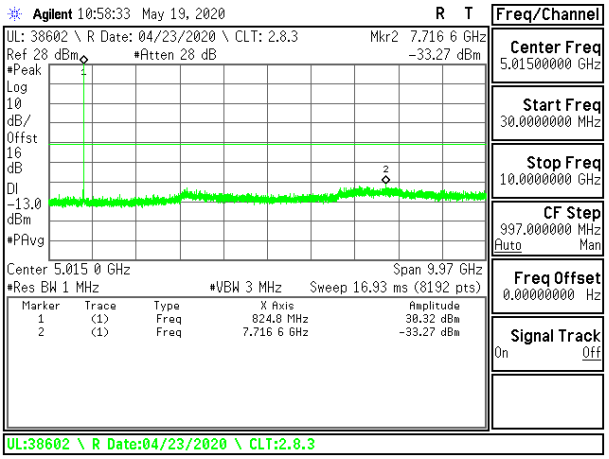
LTE B5 5MHz QPSK Low Channel RB1-0



LTE B5 5MHz QPSK Middle Channel RB1-0



LTE B5 5MHz QPSK High Channel RB1-0



LTE B5 10MHz QPSK Low Channel RB1-0

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 319-4000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.