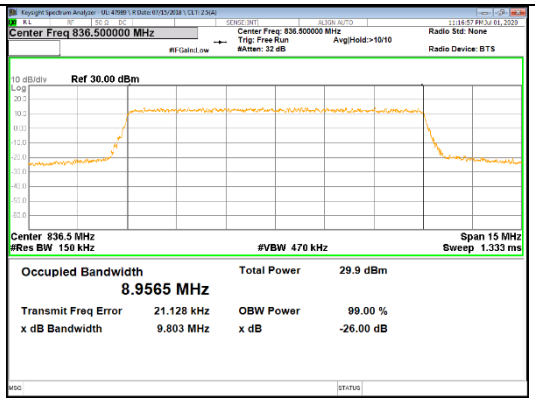
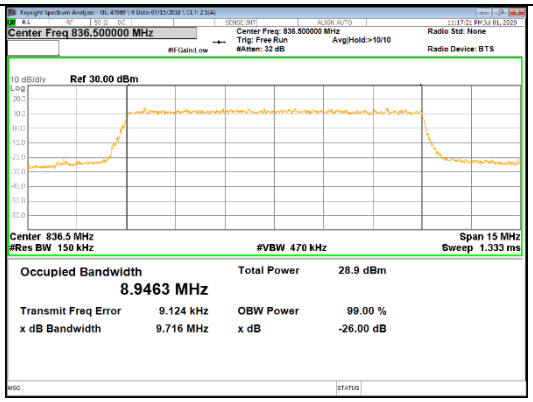
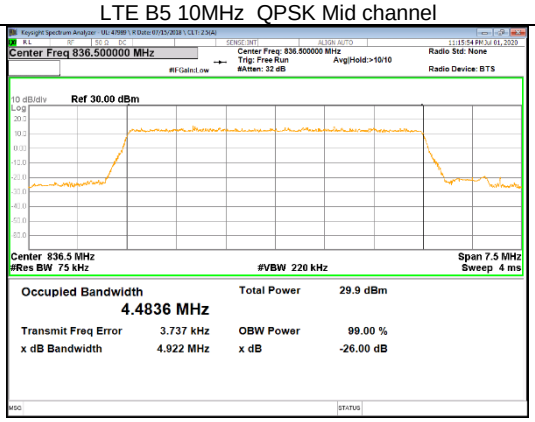
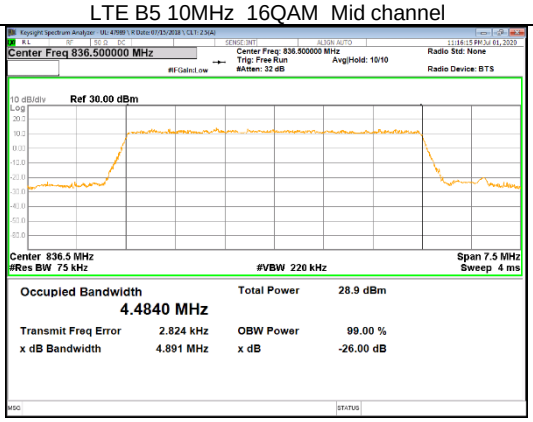
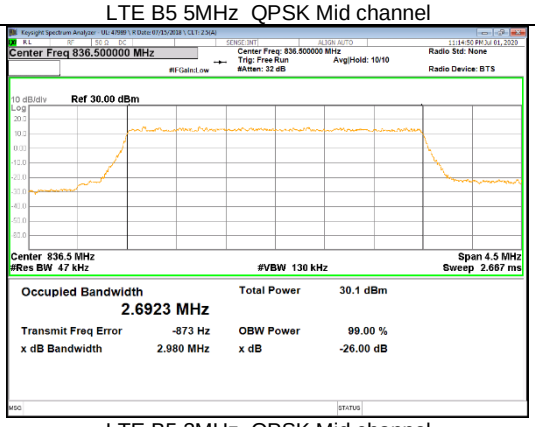
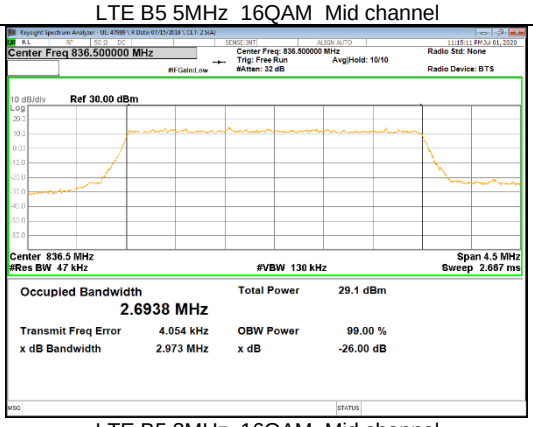
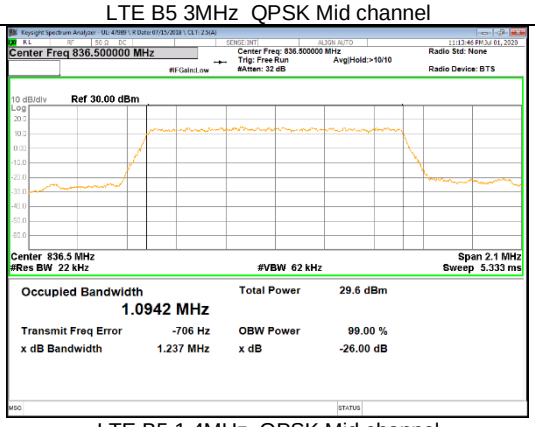
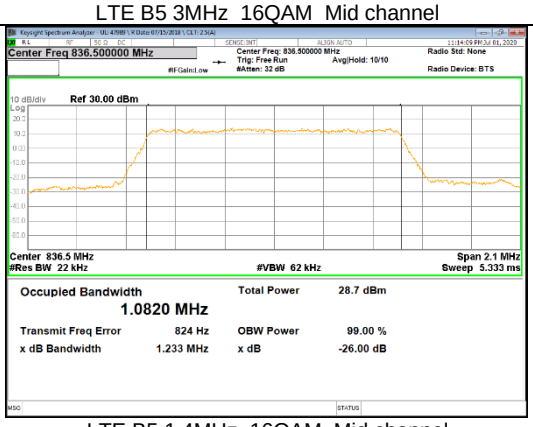
LTE Band 5 10MHz M2	 LTE B5 10MHz QPSK Mid channel	 LTE B5 10MHz 16QAM Mid channel
LTE Band 5 5MHz M2	 LTE B5 5MHz QPSK Mid channel	 LTE B5 5MHz 16QAM Mid channel
LTE Band 5 3MHz M2	 LTE B5 3MHz QPSK Mid channel	 LTE B5 3MHz 16QAM Mid channel
LTE Band 5 1.4MHz M2	 LTE B5 1.4MHz QPSK Mid channel	 LTE B5 1.4MHz 16QAM Mid channel

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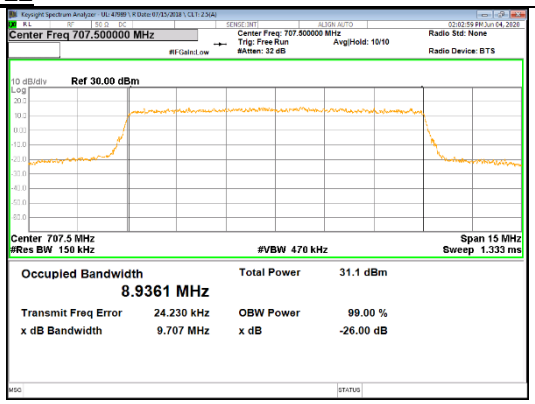
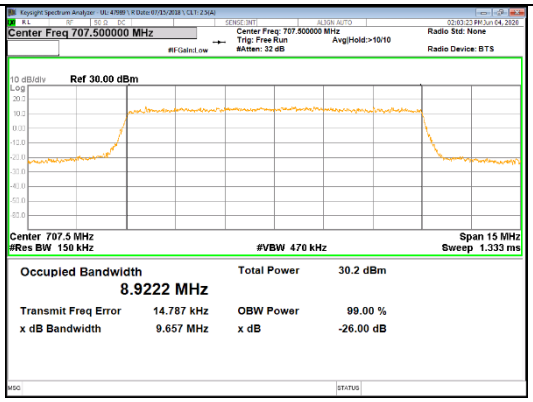
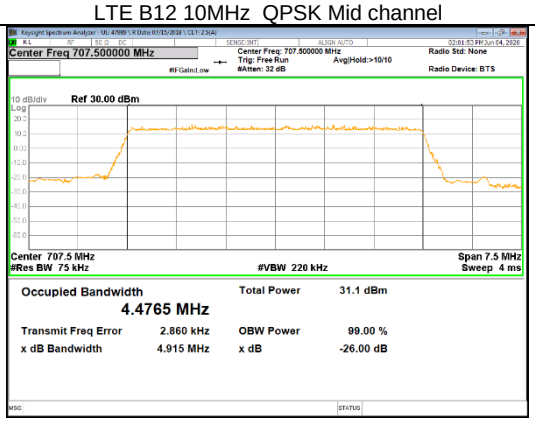
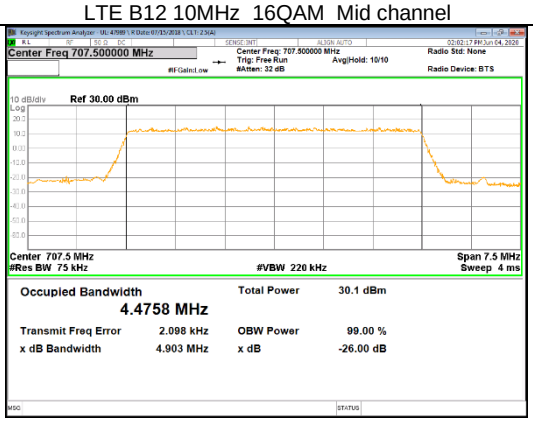
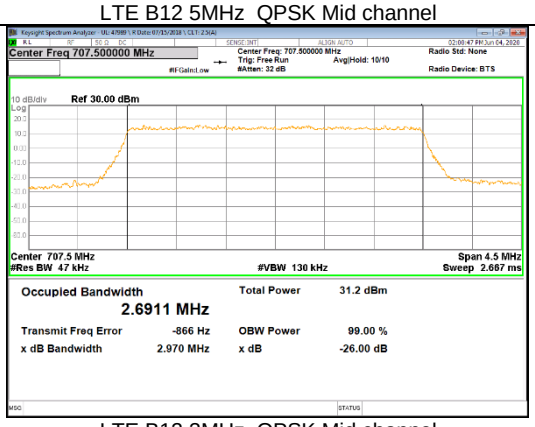
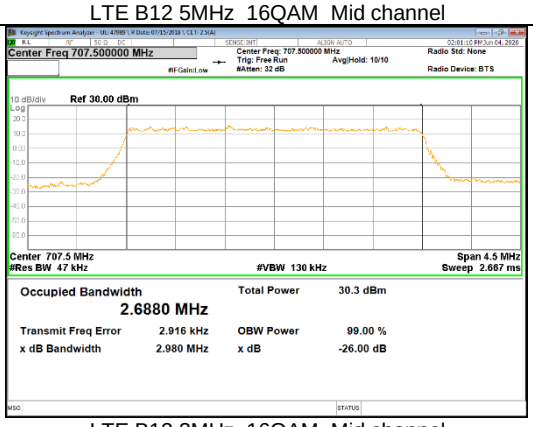
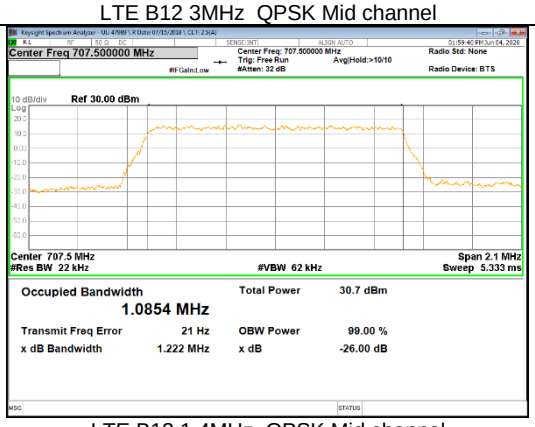
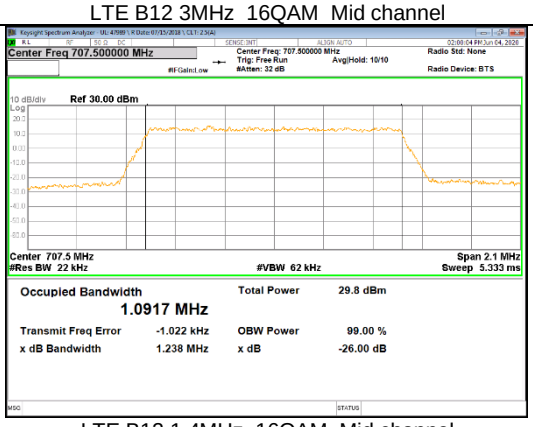
LTE Band 12

LTE Band 12 10MHz	 LTE B12 10MHz QPSK Mid channel	 LTE B12 10MHz 16QAM Mid channel
LTE Band 12 5MHz	 LTE B12 5MHz QPSK Mid channel	 LTE B12 5MHz 16QAM Mid channel
LTE Band 12 3MHz	 LTE B12 3MHz QPSK Mid channel	 LTE B12 3MHz 16QAM Mid channel
LTE Band 12 1.4MHz	 LTE B12 1.4MHz QPSK Mid channel	 LTE B12 1.4MHz 16QAM Mid channel

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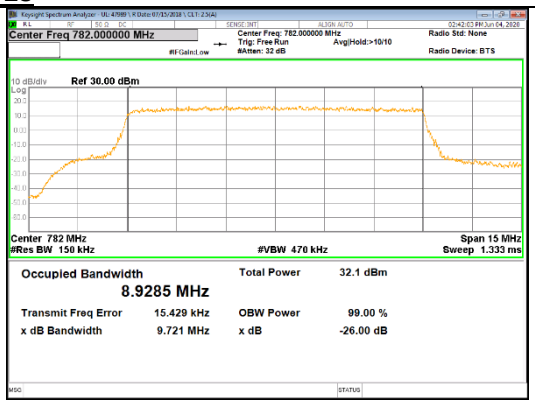
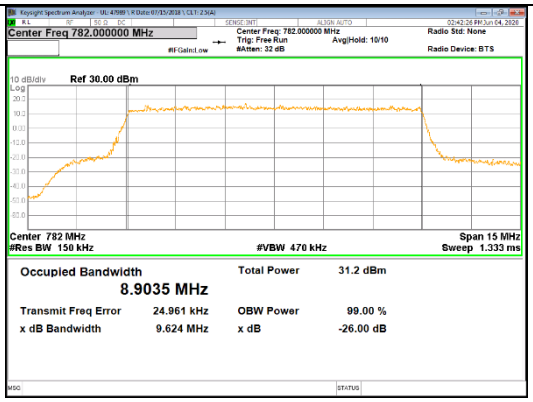
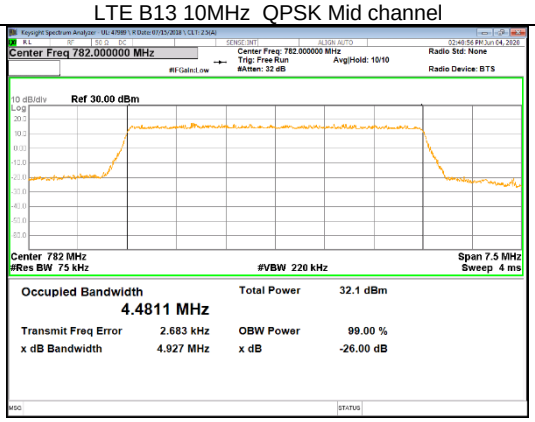
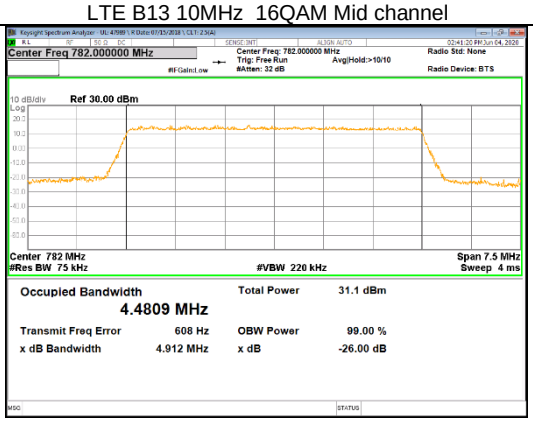
LTE Band 13

LTE Band 13 10MHz	 LTE B13 10MHz QPSK Mid channel	 LTE B13 10MHz 16QAM Mid channel
LTE Band 13 5MHz	 LTE B13 5MHz QPSK Mid channel	 LTE B13 5MHz 16QAM Mid channel

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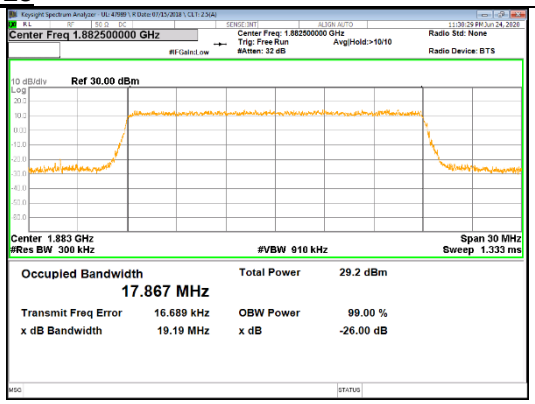
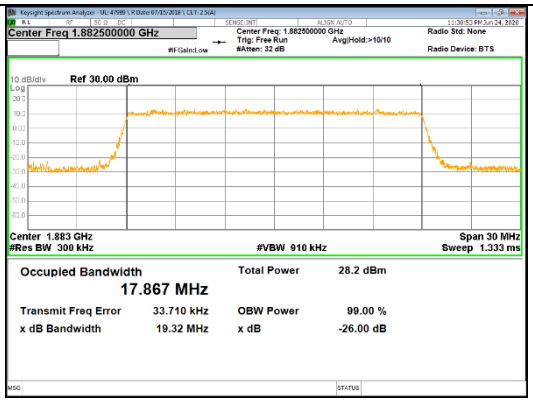
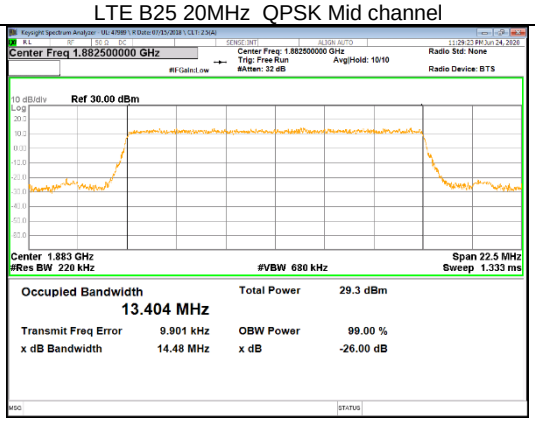
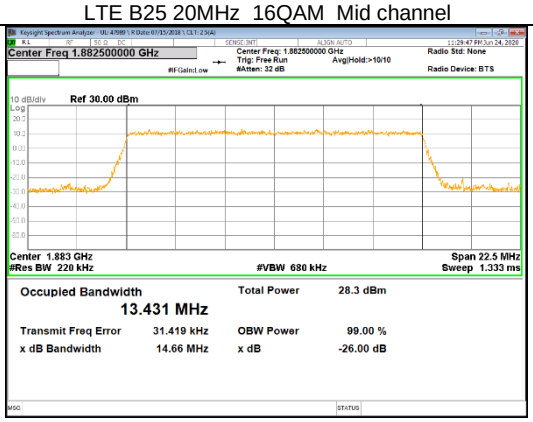
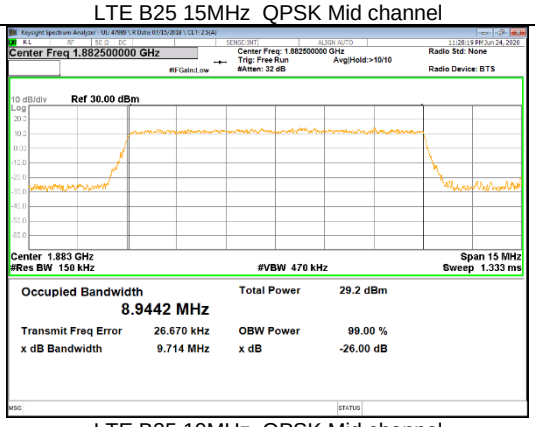
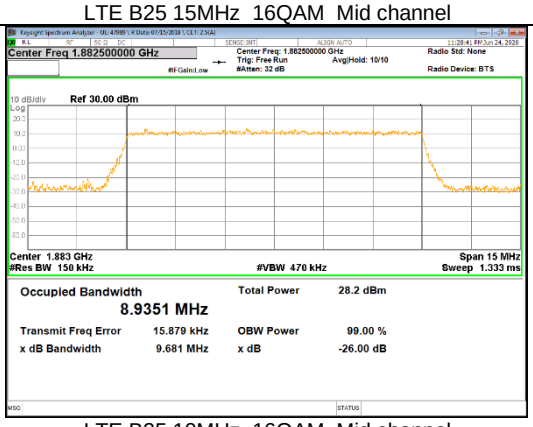
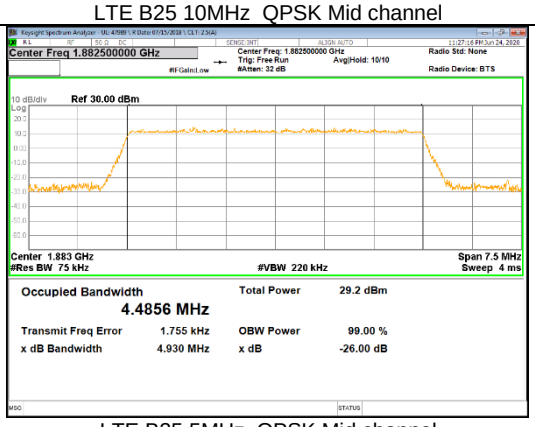
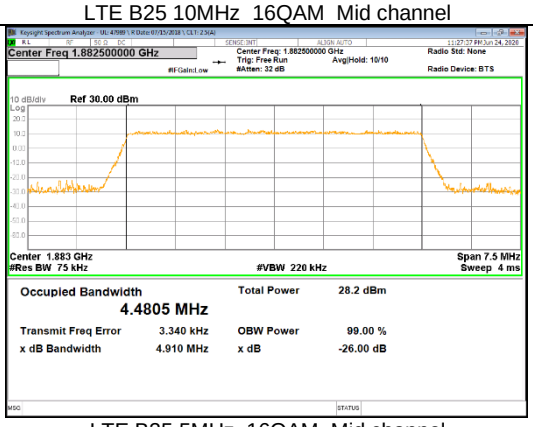
LTE Band 25

LTE Band 25 20MHz	 LTE B25 20MHz QPSK Mid channel	 LTE B25 20MHz 16QAM Mid channel
LTE Band 25 15MHz	 LTE B25 15MHz QPSK Mid channel	 LTE B25 15MHz 16QAM Mid channel
LTE Band 25 10MHz	 LTE B25 10MHz QPSK Mid channel	 LTE B25 10MHz 16QAM Mid channel
LTE Band 25 5MHz	 LTE B25 5MHz QPSK Mid channel	 LTE B25 5MHz 16QAM Mid channel

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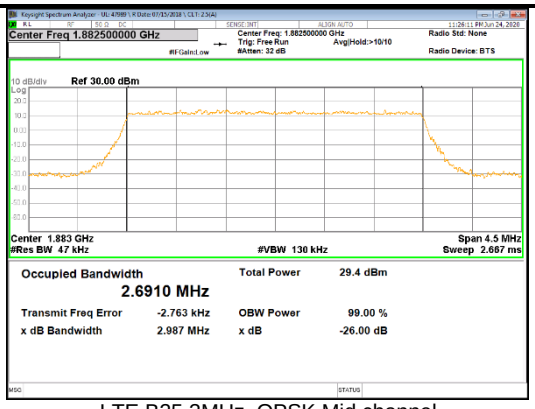
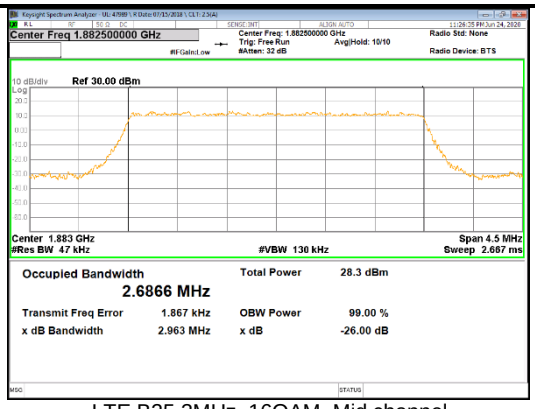
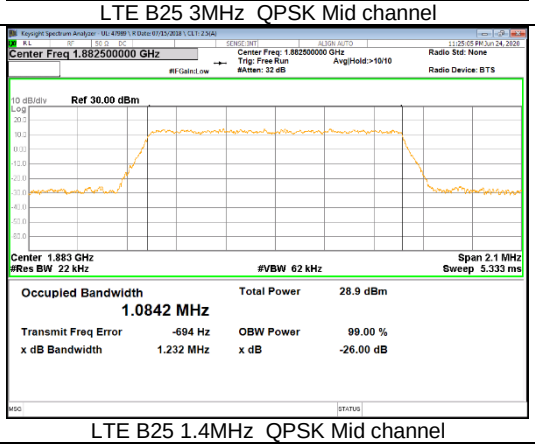
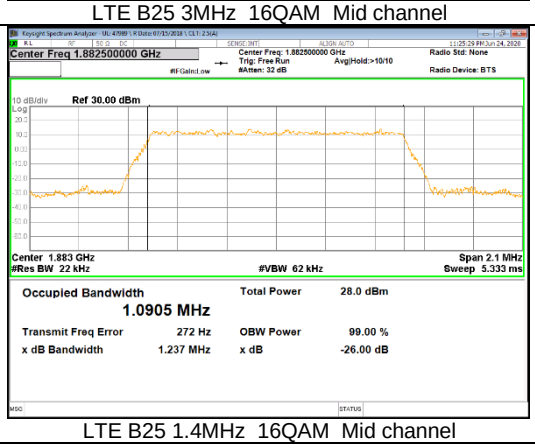
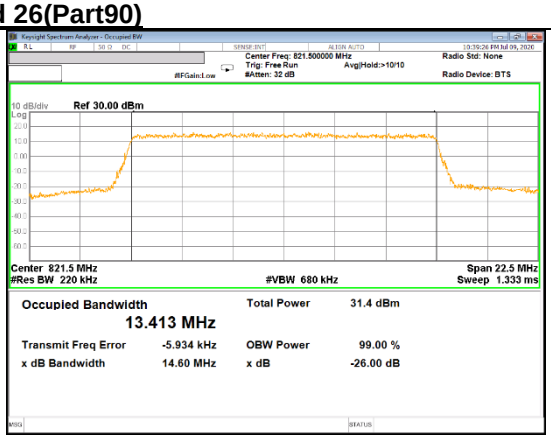
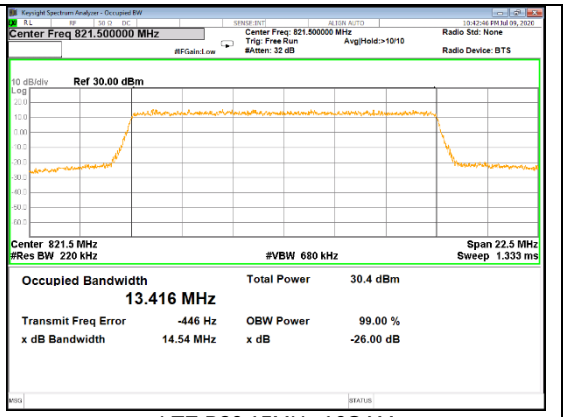
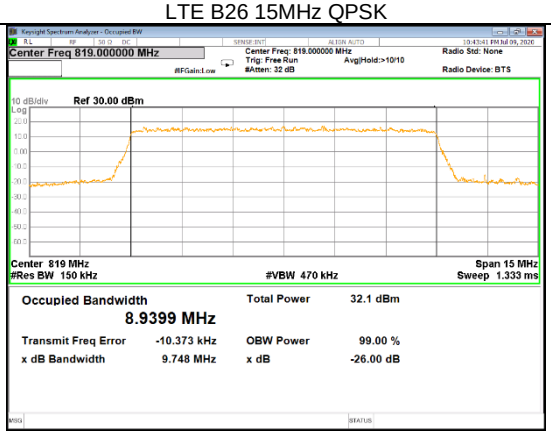
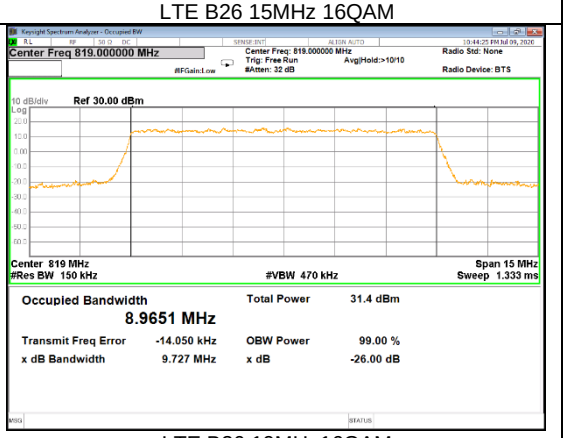
LTE Band 25 3MHz	 LTE B25 3MHz QPSK Mid channel	 LTE B25 3MHz 16QAM Mid channel
LTE Band 25 1.4MHz	 LTE B25 1.4MHz QPSK Mid channel	 LTE B25 1.4MHz 16QAM Mid channel

LTE Band 26(Part90)

LTE Band 26 15MHz	 LTE B26 15MHz QPSK	 LTE B26 15MHz 16QAM
LTE Band 26 10MHz	 LTE B26 10MHz QPSK	 LTE B26 10MH 16QAM

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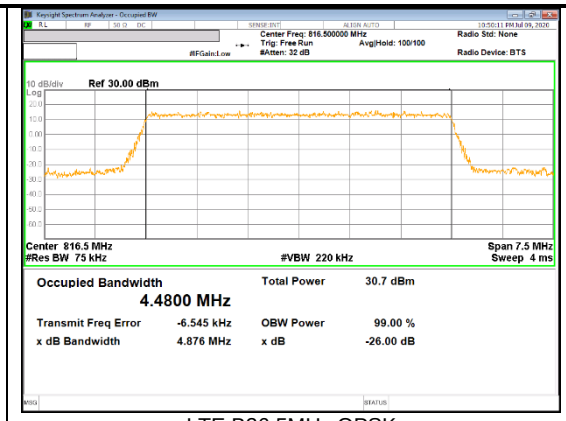
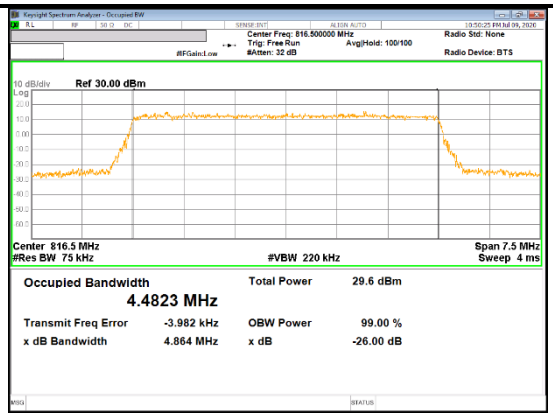
LTE Band 26 5MHz

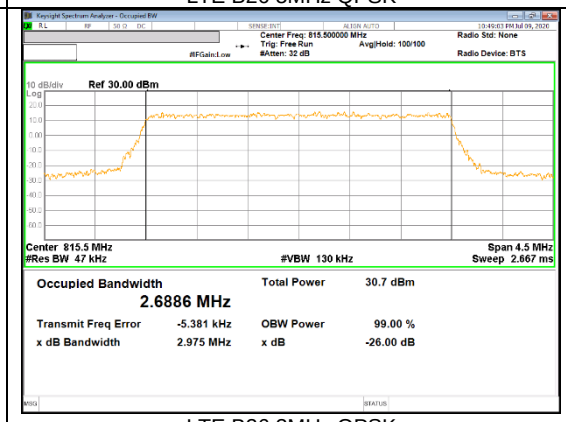


LTE B26 5MHz QPSK

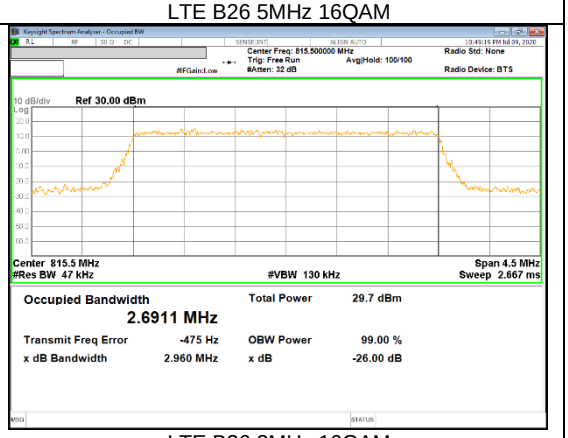


LTE B26 5MHz 16QAM

LTE Band 26 3MHz

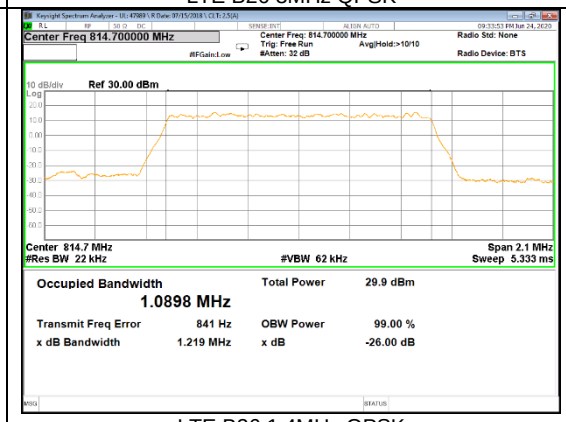


LTE B26 3MHz QPSK

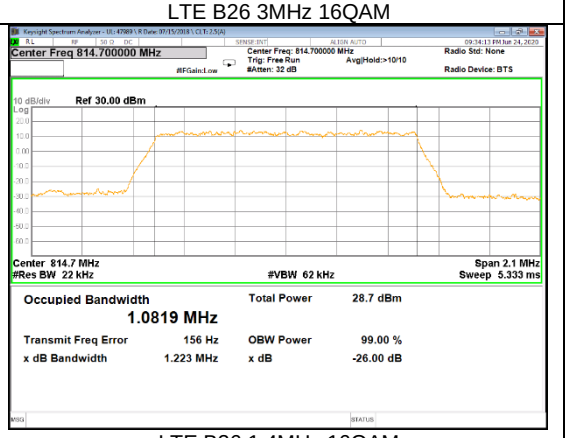


LTE B26 3MHz 16QAM

LTE Band 26 1.4MHz



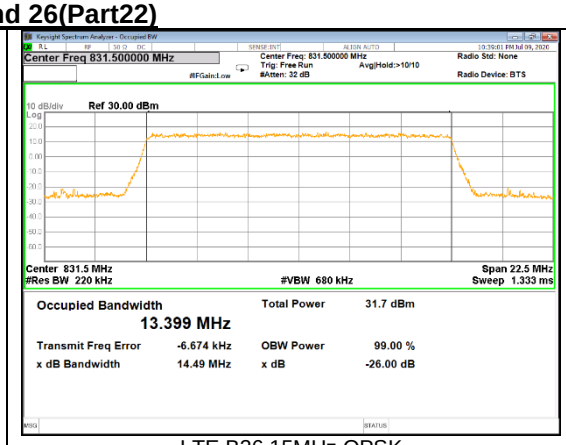
LTE B26 1.4MHz QPSK



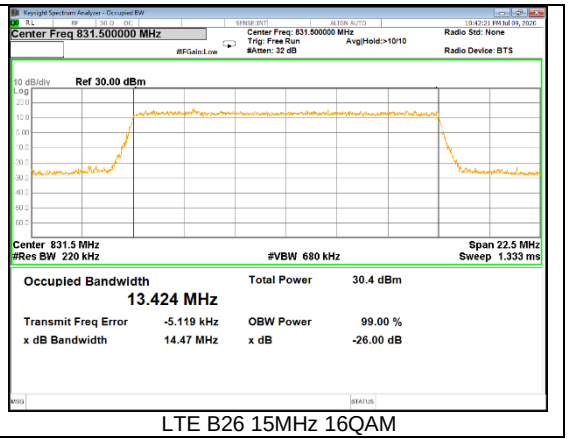
LTE B26 1.4MHz 16QAM

LTE Band 26(Part22)

LTE Band 26 15MHz



LTE B26 15MHz QPSK



LTE B26 15MHz 16QAM

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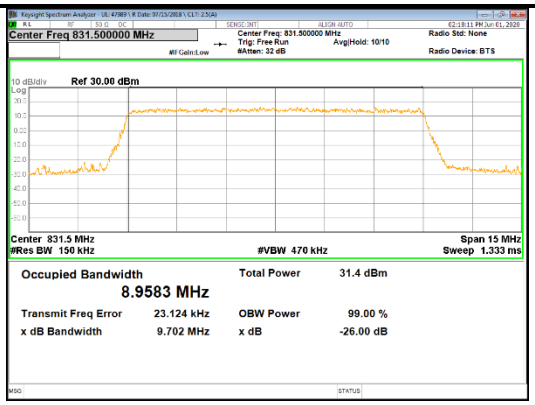
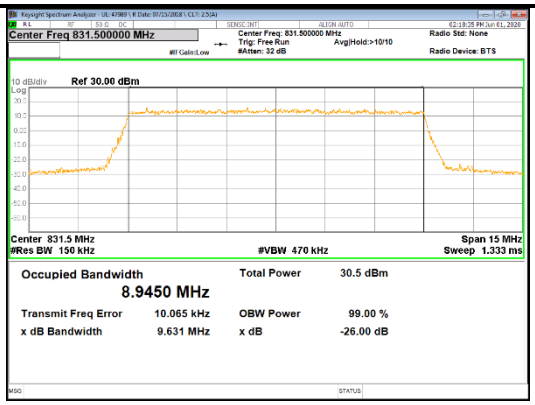
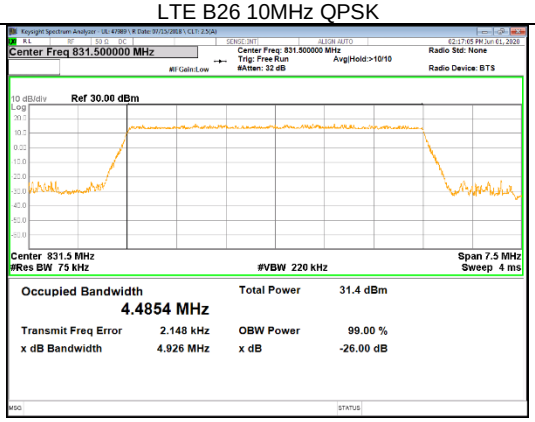
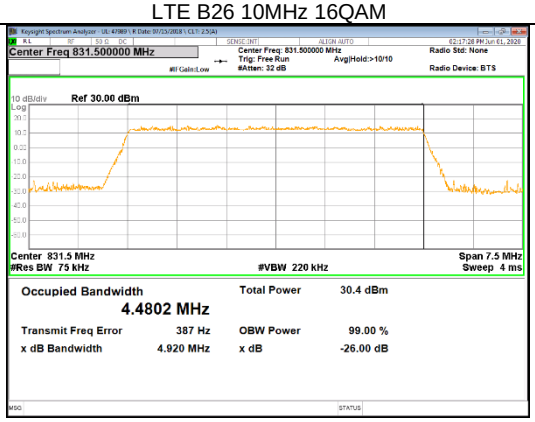
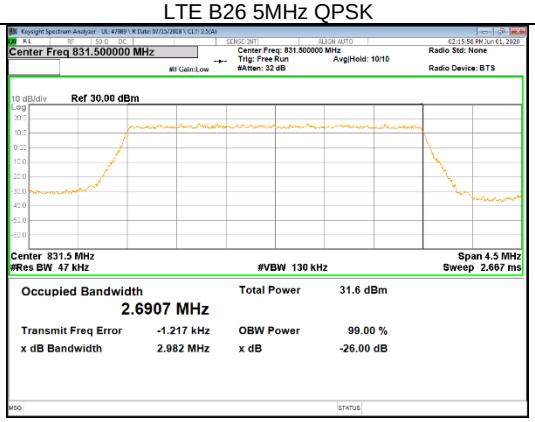
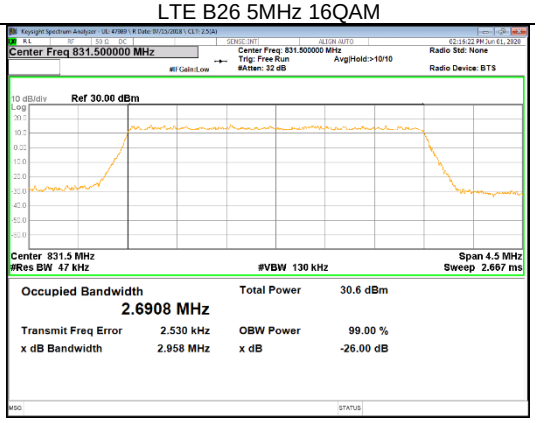
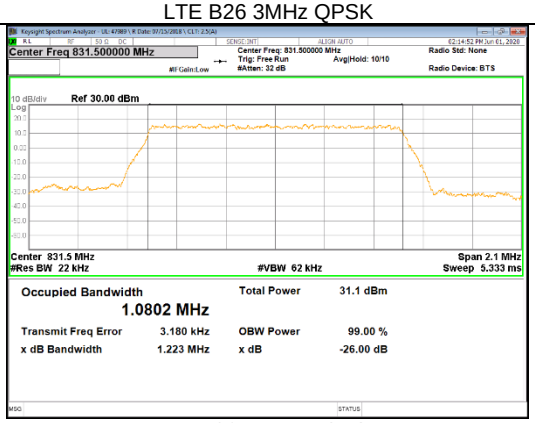
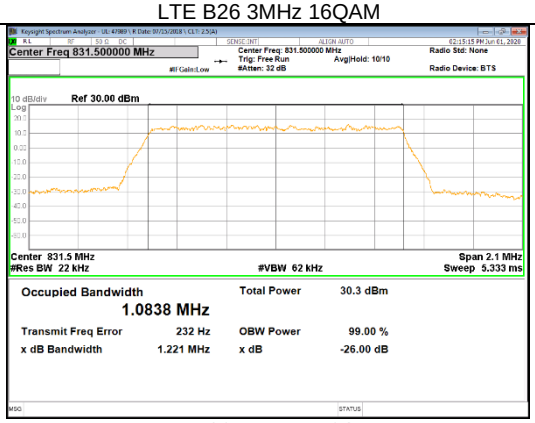
LTE Band 26 10MHz	 LTE B26 10MHz QPSK	 LTE B26 10MHz 16QAM
LTE Band 26 5MHz	 LTE B26 5MHz QPSK	 LTE B26 5MHz 16QAM
LTE Band 26 3MHz	 LTE B26 3MHz QPSK	 LTE B26 3MHz 16QAM
LTE Band 26 1.4MHz	 LTE B26 1.4MHz QPSK	 LTE B26 1.4MHz 16QAM

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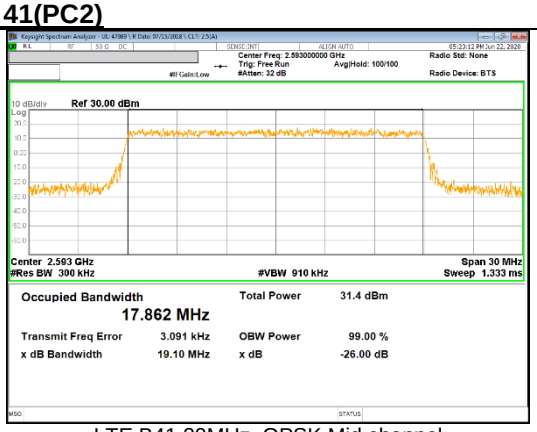
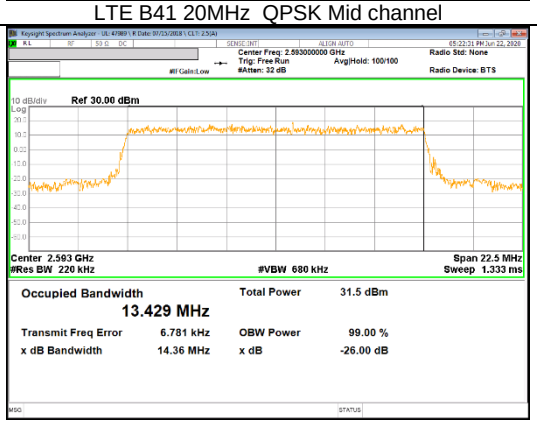
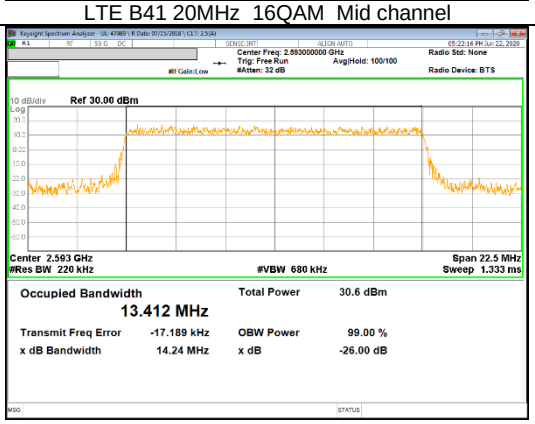
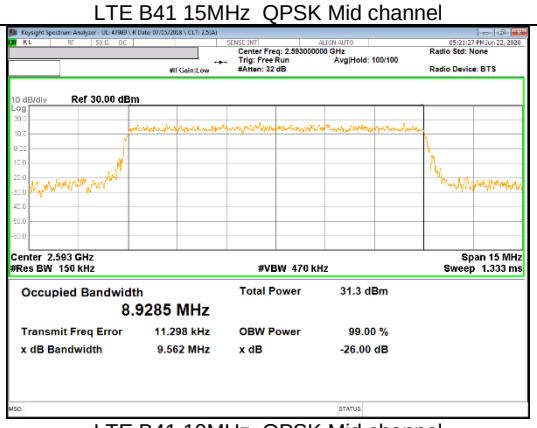
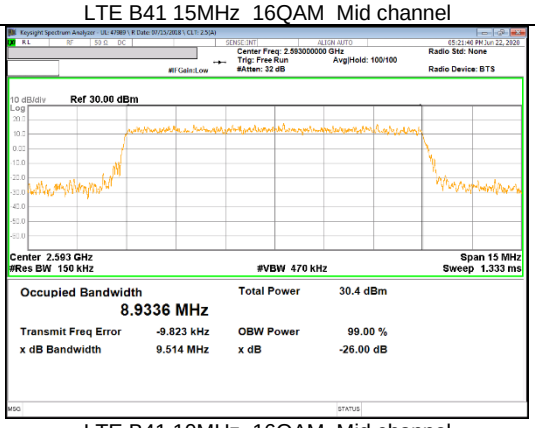
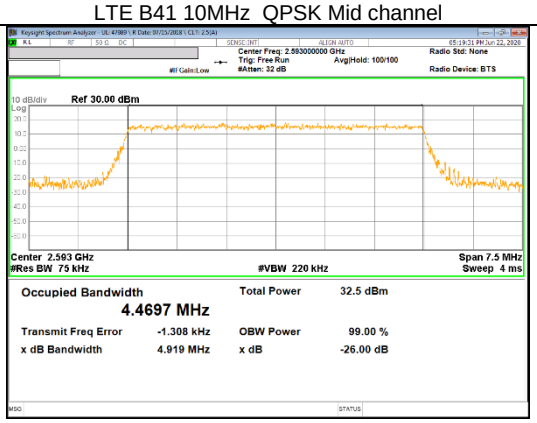
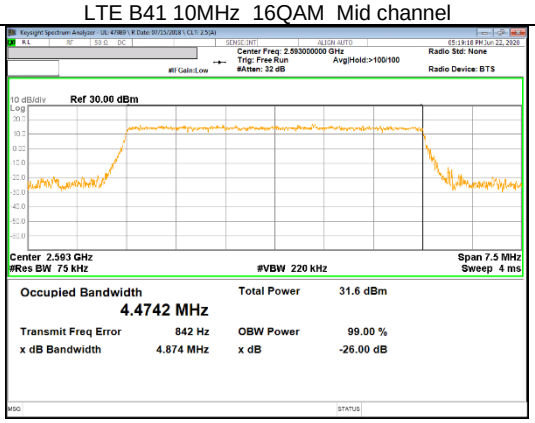
LTE Band 41(PC2)

LTE Band 41 20MHz	 LTE B41 20MHz QPSK Mid channel	 LTE B41 20MHz 16QAM Mid channel
LTE Band 41 15MHz	 LTE B41 15MHz QPSK Mid channel	 LTE B41 15MHz 16QAM Mid channel
LTE Band 41 10MHz	 LTE B41 10MHz QPSK Mid channel	 LTE B41 10MHz 16QAM Mid channel
LTE Band 41 5MHz	 LTE B41 5MHz QPSK Mid channel	 LTE B41 5MHz 16QAM Mid channel

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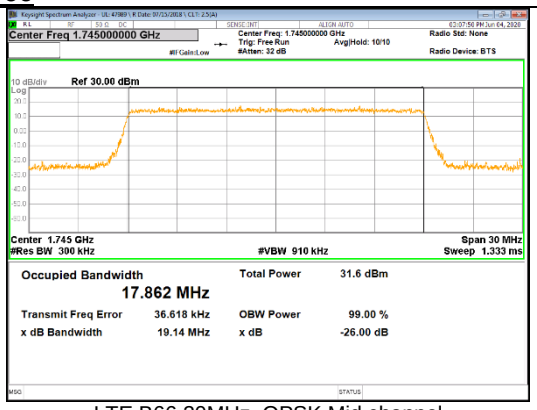
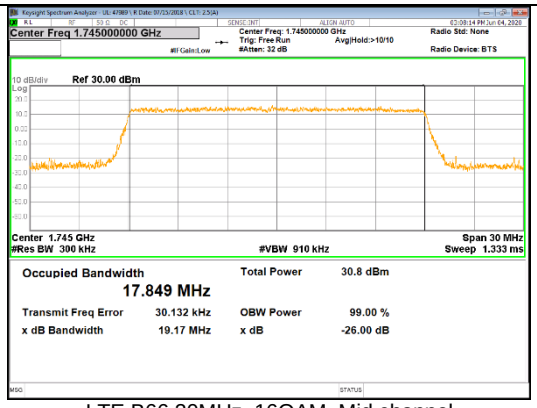
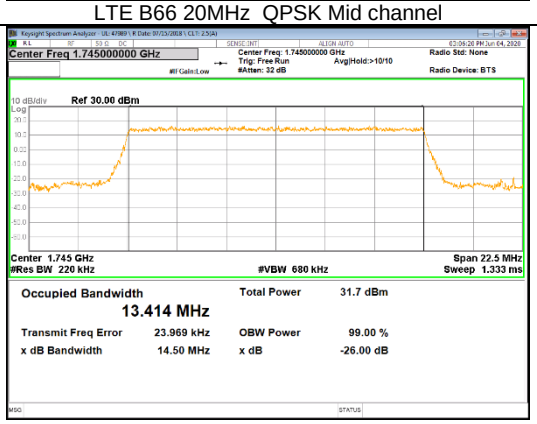
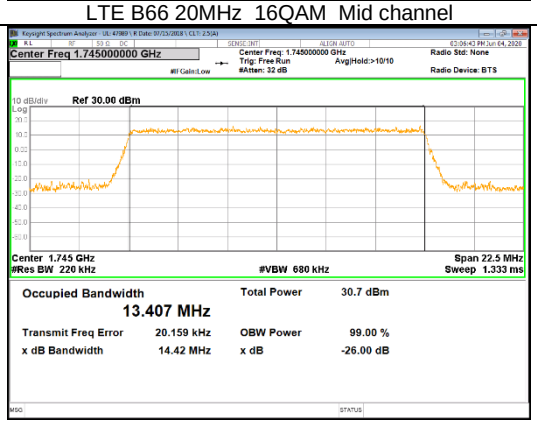
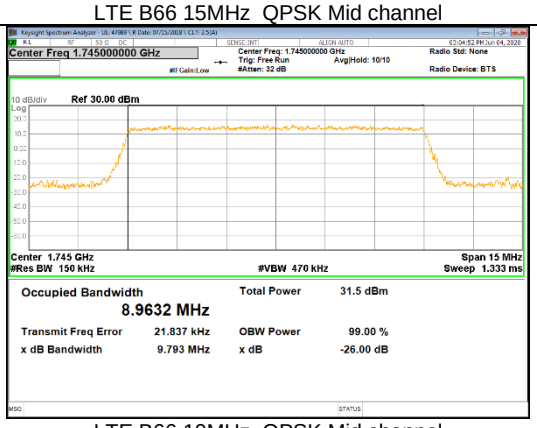
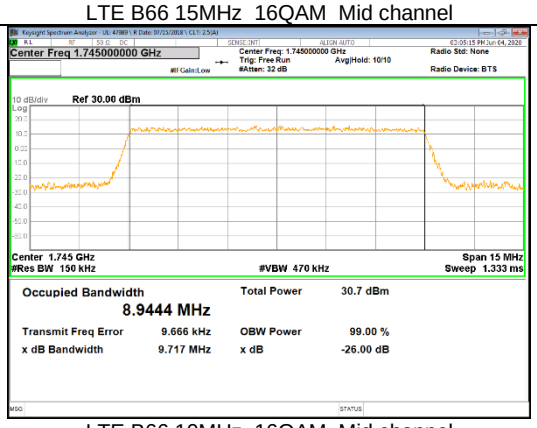
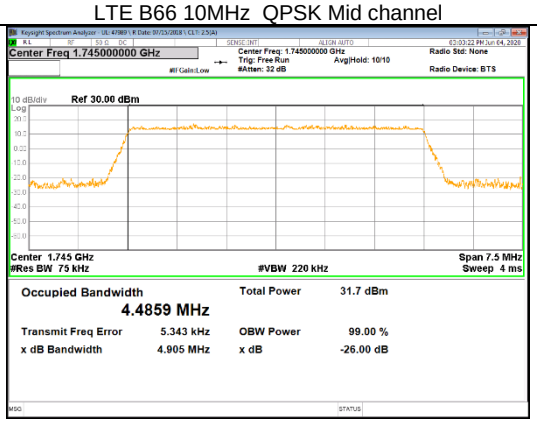
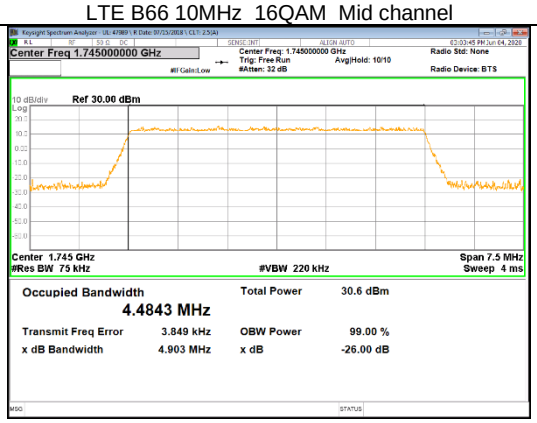
LTE Band 66

LTE Band 66 20MHz	 LTE B66 20MHz QPSK Mid channel	 LTE B66 20MHz 16QAM Mid channel
LTE Band 66 15MHz	 LTE B66 15MHz QPSK Mid channel	 LTE B66 15MHz 16QAM Mid channel
LTE Band 66 10MHz	 LTE B66 10MHz QPSK Mid channel	 LTE B66 10MHz 16QAM Mid channel
LTE Band 66 5MHz	 LTE B66 5MHz QPSK Mid channel	 LTE B66 5MHz 16QAM Mid channel

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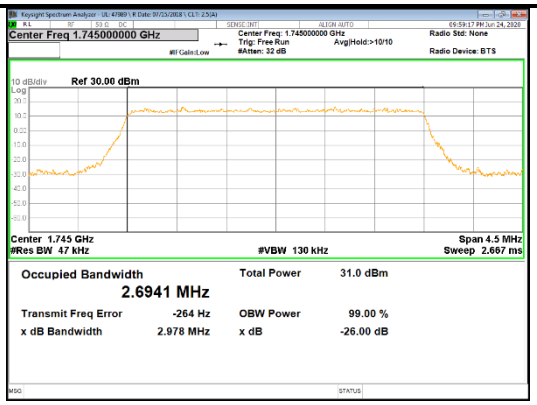
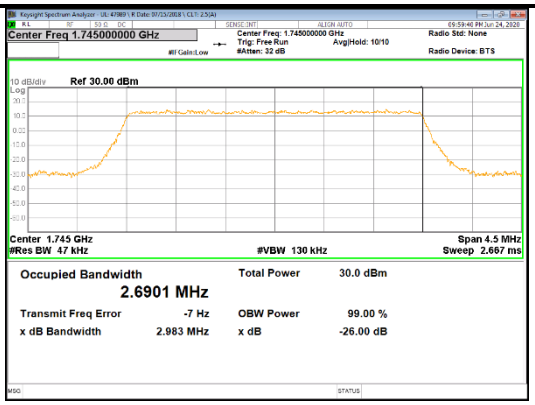
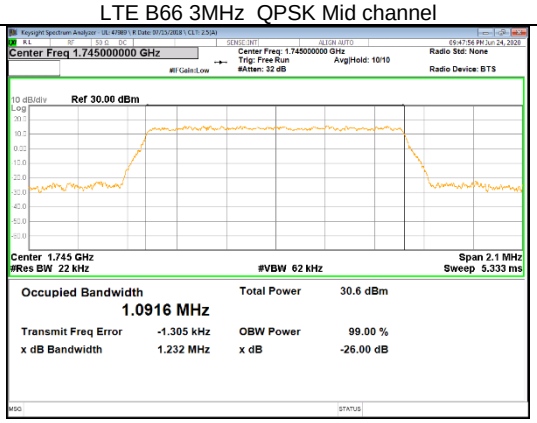
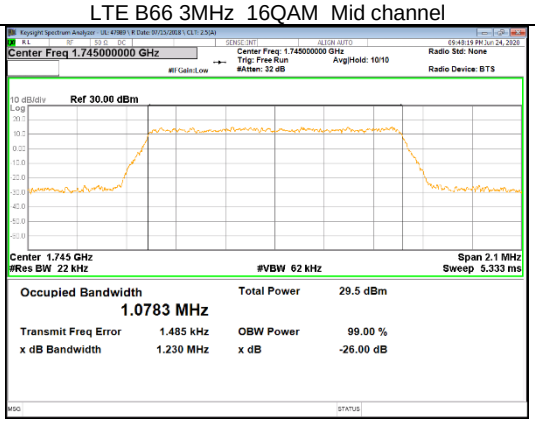
LTE Band 66 3MHz	 LTE B66 3MHz QPSK Mid channel	 LTE B66 3MHz 16QAM Mid channel
LTE Band 66 1.4MHz	 LTE B66 1.4MHz QPSK Mid channel	 LTE B66 1.4MHz 16QAM Mid channel

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LTE Band 2

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band41(PC3)

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

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9.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §22.917, §24.238, §27. 53 and 90.691

LIMITS

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.

Part 27.53:
(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(4) On all frequencies between 763-775 MHz and 793-806 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(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.

(h) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

(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.

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

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

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

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TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01
The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

GSM

a) Set the RBW = 1 ~ 5% of OBW(GSM850 – 8.2KHz, GSM1900 – 9.1KHz)
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = 1S ;
e) Detector = RMS;
f) Ensure that the number of measurement points ≥ 2*Span/RBW;
g) Trace mode = Average(100);
h) Add duty cycle correction factor (9dB)

WCDMA/LTE

a) Set the RBW = 1 ~ 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = Auto;
e) Detector = RMS;
f) Ensure that the number of measurement points ≥ 2*Span/RBW;
g) Trace mode = Average (100);

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NOTE1: For frequency range of 763-775 MHz and 793-806 MHz.(LTE Band 13)

a) Set the RBW = 6.2kHz

b) Set VBW ≥ 3 × RBW;

c) Sweep time = 1 second ;

d) Detector = RMS;

e) Ensure that the number of measurement points ≥ 2*Span/RBW;

f) Trace mode = Average;

NOTE2

Note that the spurious emissions outside of the channel include narrowband signals. These signals are all below the -13dBm / -25dBm limits. Although the measurement bandwidth is less than the reference bandwidth of 1MHz no addental correction is applied as ANSI C63.26 section 4.2.3 only requires the correction to be applied when the OBW of the emission being measured is wider than the measurement bandwidth (Where the OBW of the signal under measurement is less than the RBW of the measuring instrument, no bandwidth correction or integration will be required.) Plots for low and high channels show the level of the emission measured with the reduced bandwidth and the level of the same emission measured using the integration method over the 1MHz reference bandwidth are very close, indicating the emissions are narrowband.

RESULTS

See the following pages.

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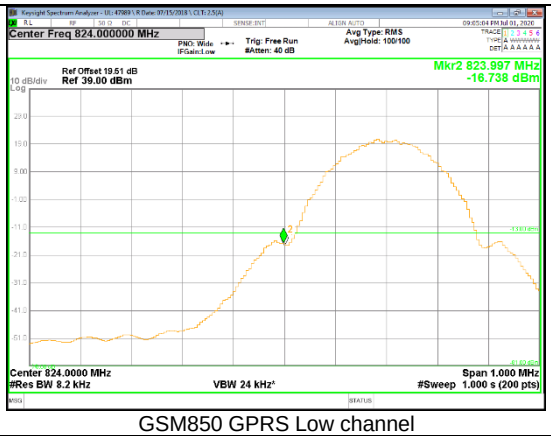
9.2.1. BAND EDGE RESULT

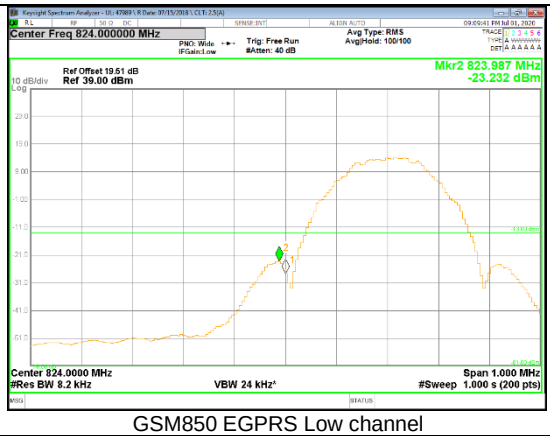
GSM 850

GSM 850

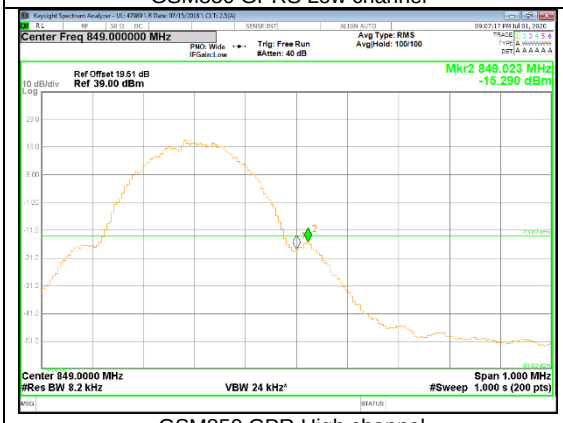
M1



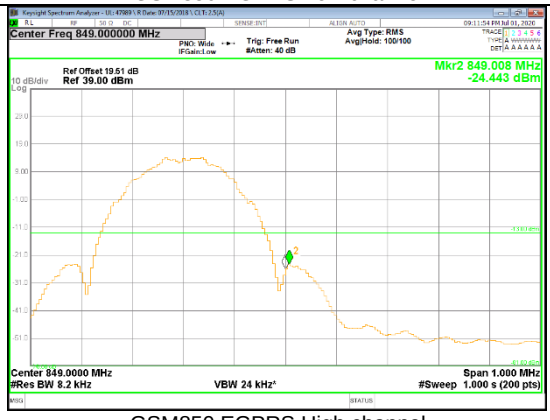
GSM850 GPRS Low channel



GSM850 EGPRS Low channel



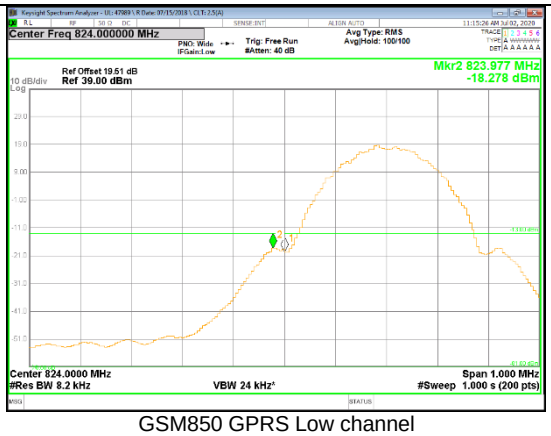
GSM850 GPR High channel



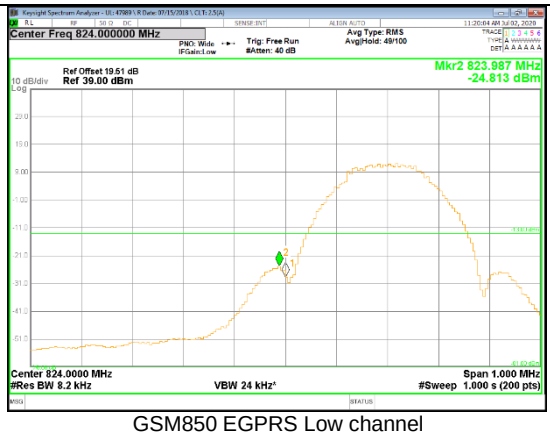
GSM850 EGPRS High channel

GSM 850

M2



GSM850 GPRS Low channel



GSM850 EGPRS Low channel

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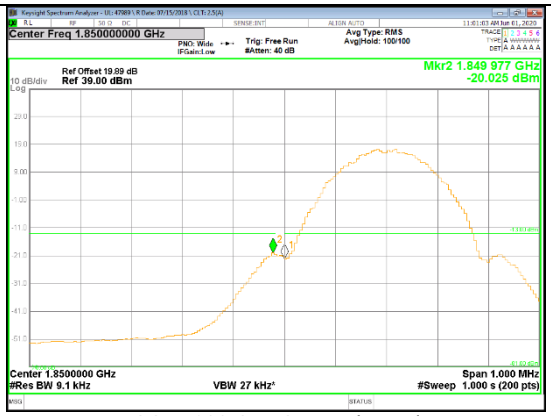
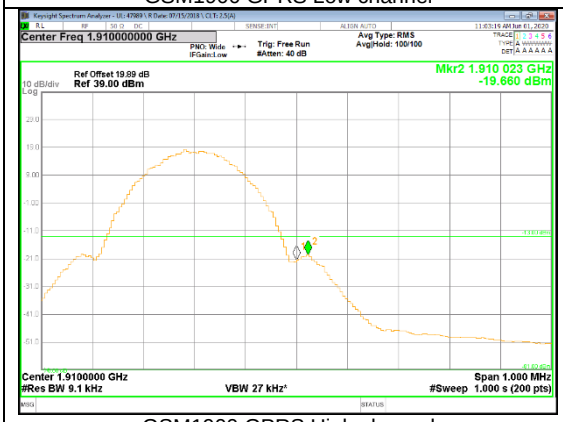
GSM 850 M2	 GSM850 GPR High channel	 GSM850 EGPRS High channel

GSM 1900

GSM 1900	 GSM1900 GPRS Low channel	 GSM1900 EGPRS Low channel
	 GSM1900 GPRS High channel	 GSM1900 EGPRS High channel

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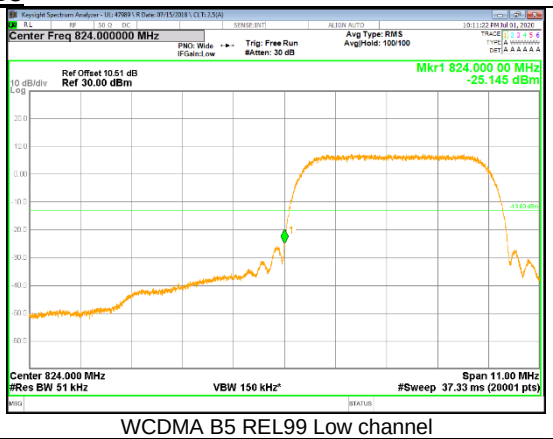
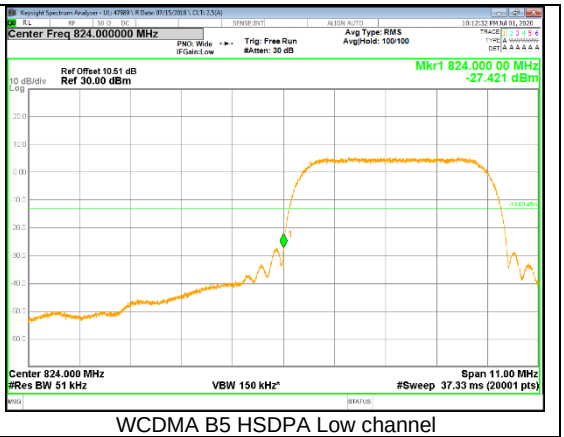
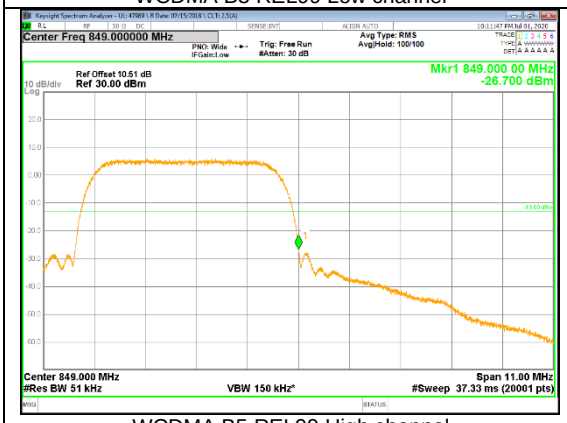
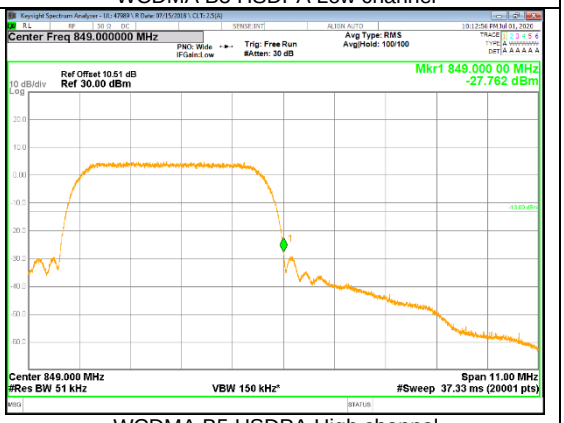
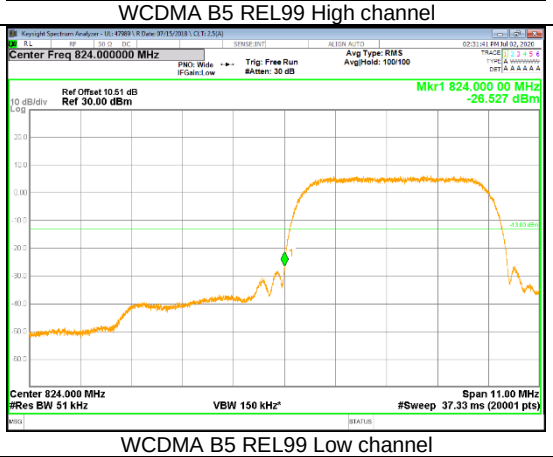
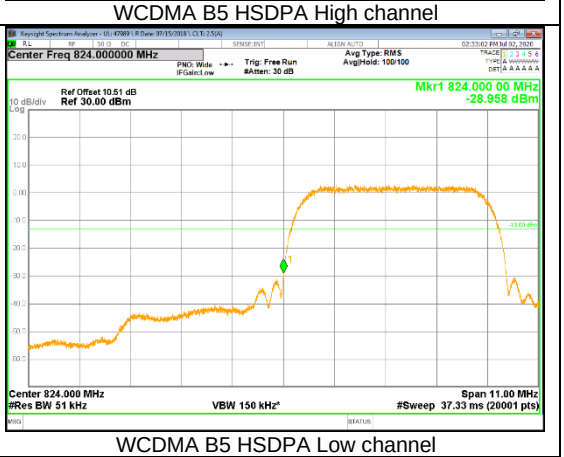
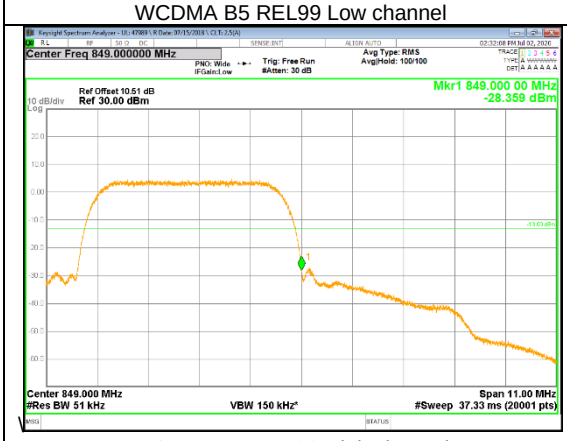
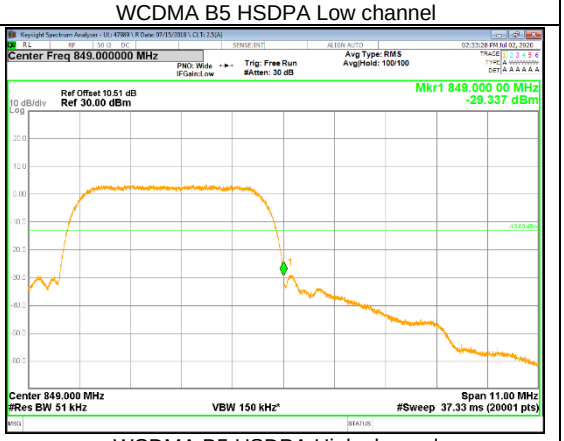
WCDMA B5

WCDMA Band 5 M1	 WCDMA B5 REL99 Low channel	 WCDMA B5 HSDPA Low channel
	 WCDMA B5 REL99 High channel	 WCDMA B5 HSDPA High channel
WCDMA Band 5 M2	 WCDMA B5 REL99 Low channel	 WCDMA B5 HSDPA Low channel
	 WCDMA B5 REL99 High channel	 WCDMA B5 HSDPA High channel

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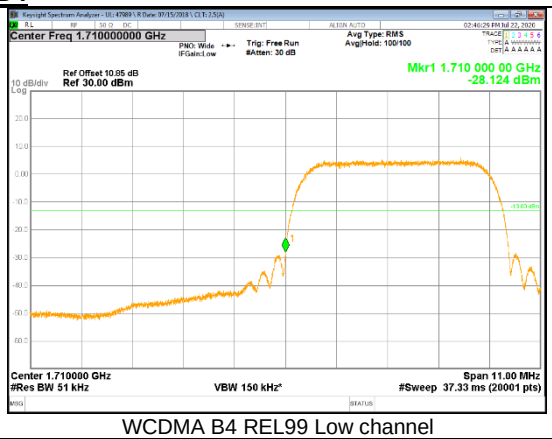
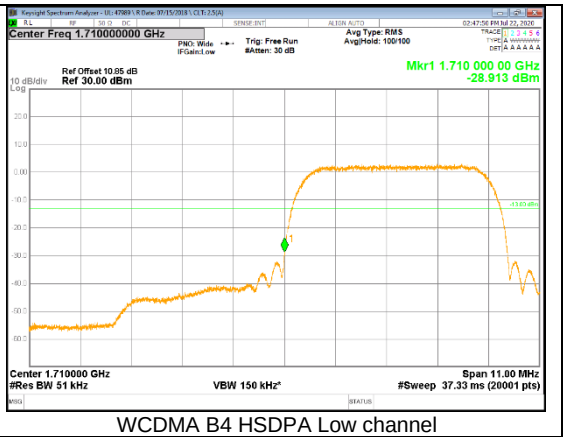
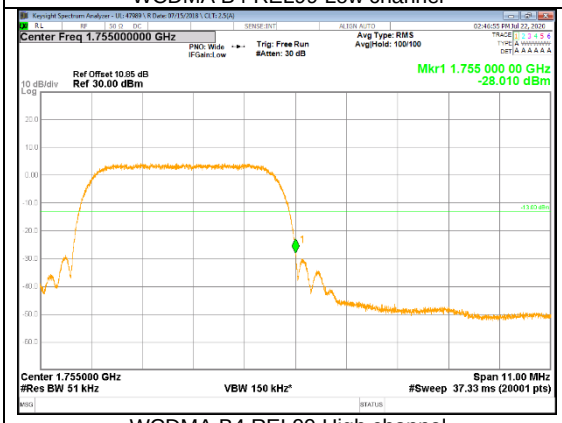
WCDMA B4

WCDMA Band 4	 WCDMA B4 REL99 Low channel	 WCDMA B4 HSDPA Low channel
	 WCDMA B4 REL99 High channel	 WCDMA B4 HSDPA High channel

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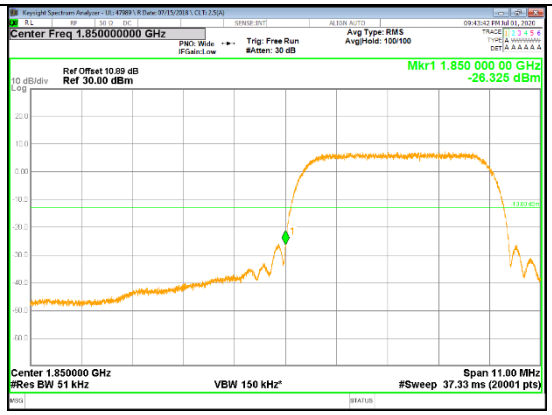
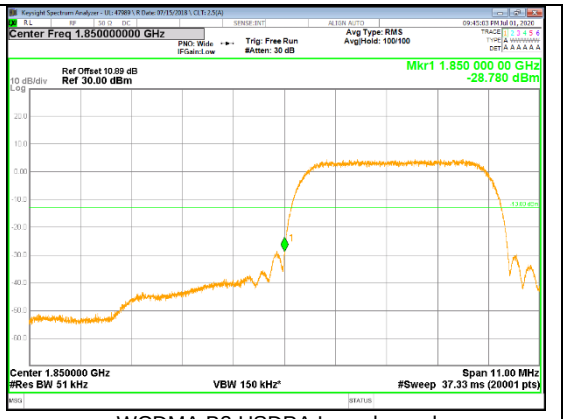
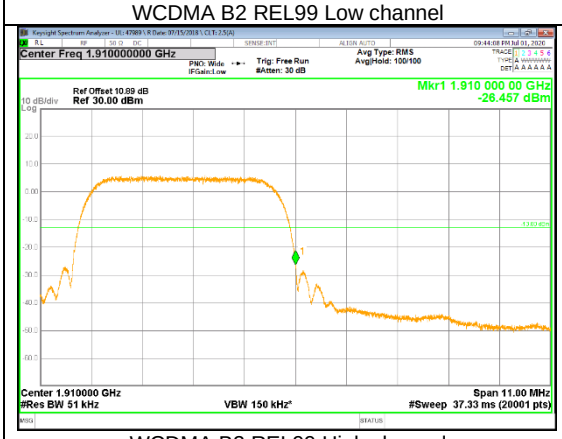
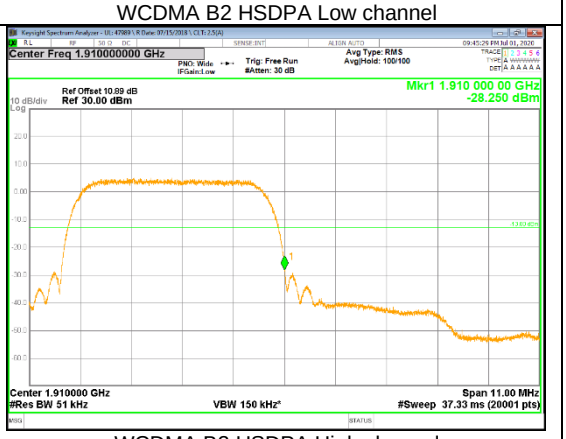
WCDMA B2

WCDMA Band 2	 WCDMA B2 REL99 Low channel	 WCDMA B2 HSDPA Low channel
	 WCDMA B2 REL99 High channel	 WCDMA B2 HSDPA High channel

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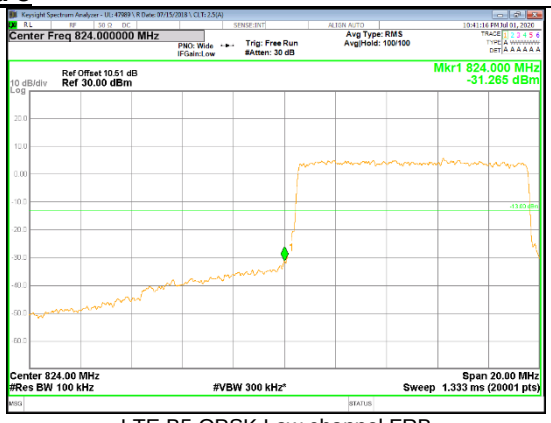
LTE Band 5

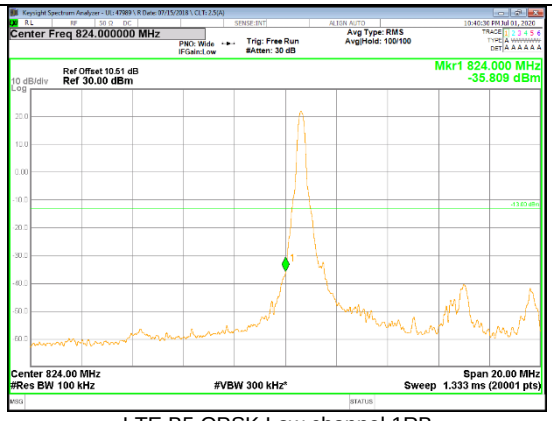
LTE Band 5

10MHz

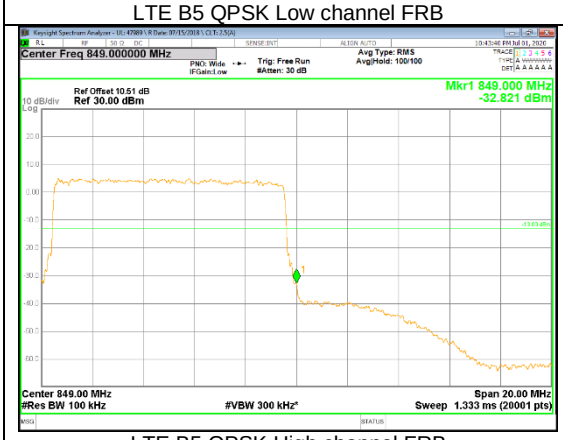
M1



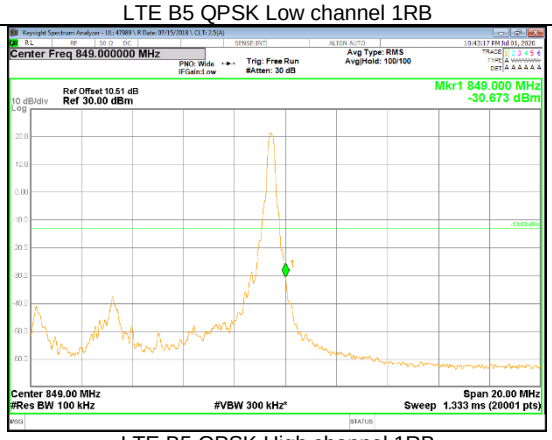
LTE B5 QPSK Low channel FRB



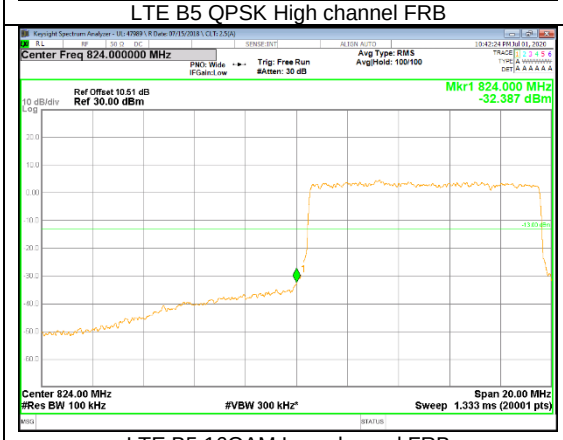
LTE B5 QPSK Low channel 1RB



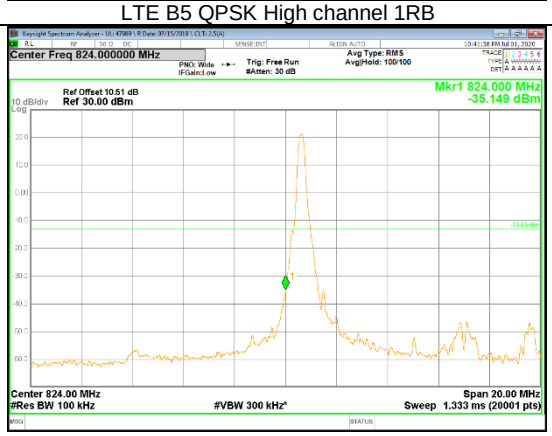
LTE B5 QPSK High channel FRB



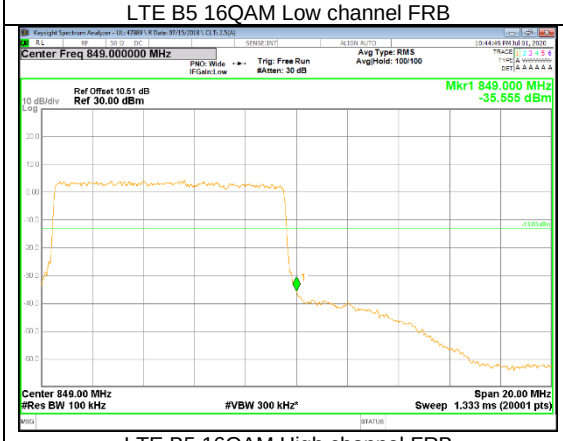
LTE B5 QPSK High channel 1RB



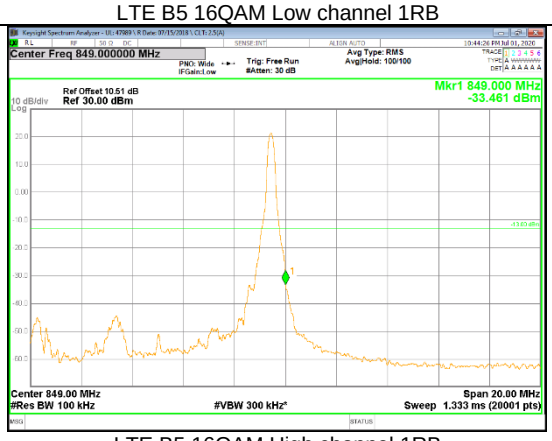
LTE B5 16QAM Low channel FRB



LTE B5 16QAM Low channel 1RB



LTE B5 16QAM High channel FRB



LTE B5 16QAM High channel 1RB

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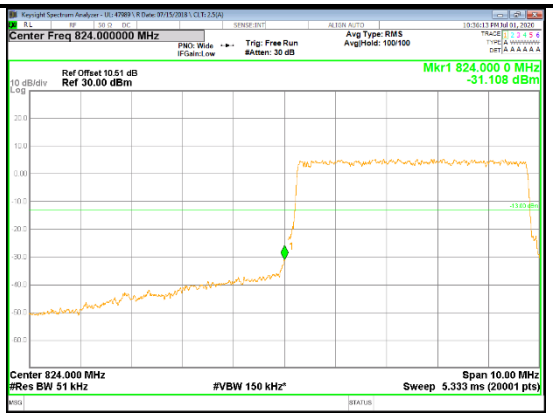
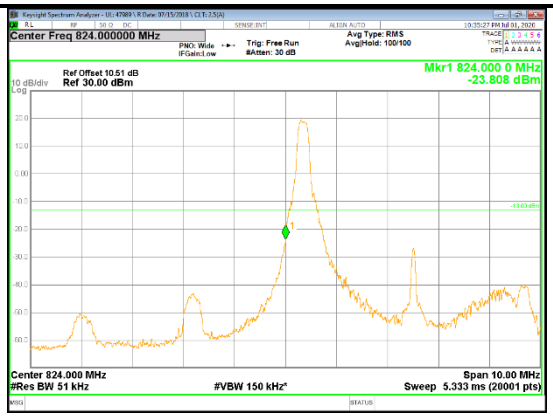
LTE Band 5

5MHz

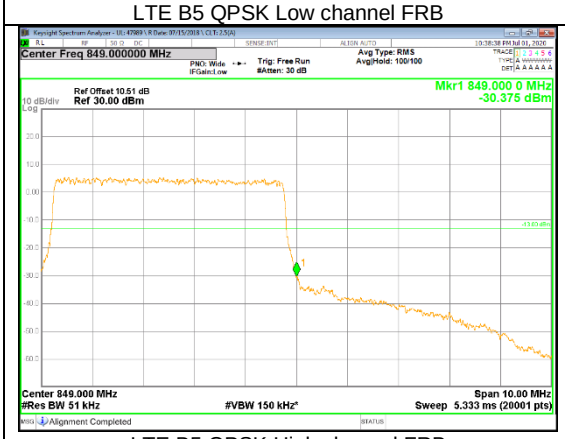
M1



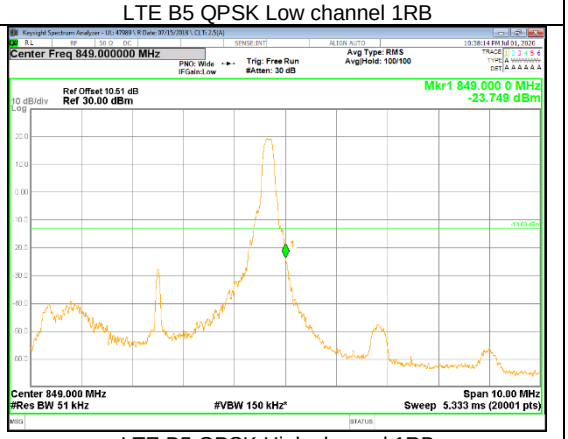
LTE B5 QPSK Low channel FRB



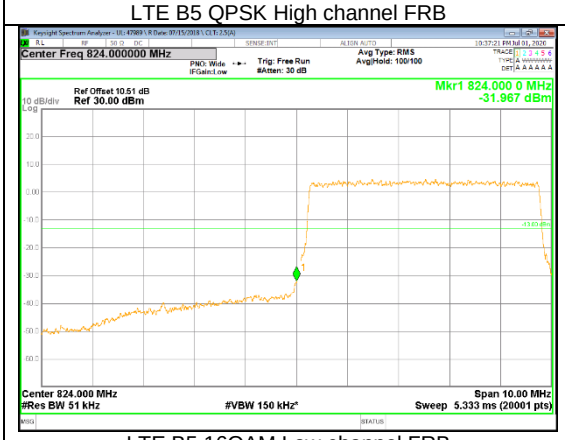
LTE B5 QPSK Low channel 1RB



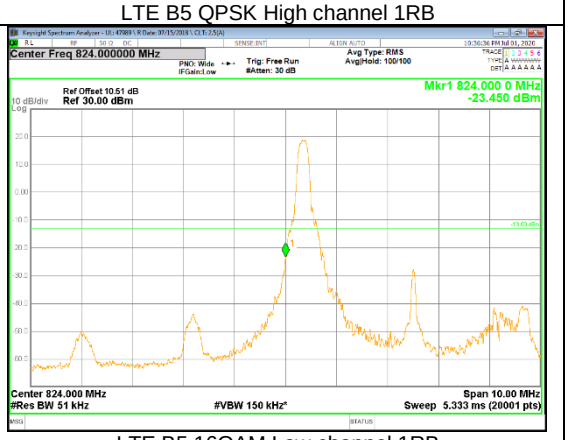
LTE B5 QPSK High channel FRB



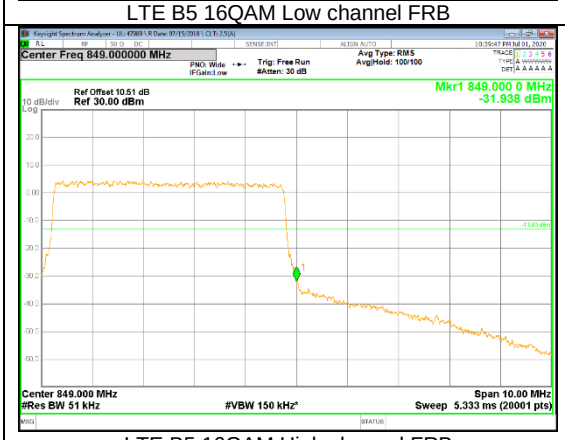
LTE B5 QPSK High channel 1RB



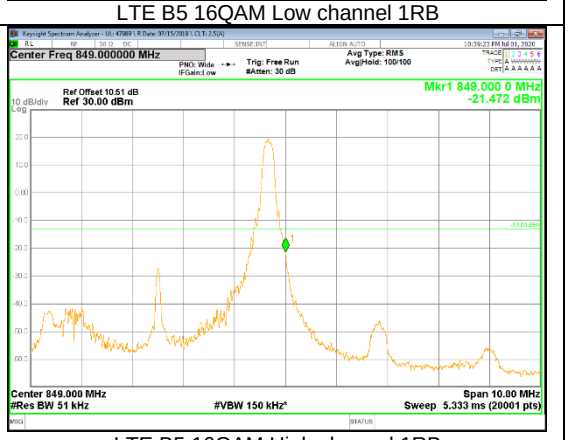
LTE B5 16QAM Low channel FRB



LTE B5 16QAM Low channel 1RB



LTE B5 16QAM High channel FRB



LTE B5 16QAM High channel 1RB

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