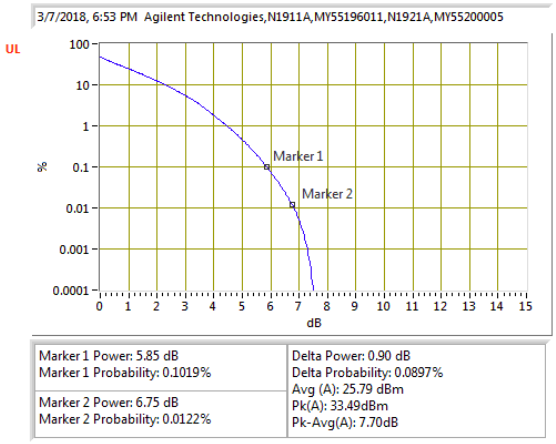
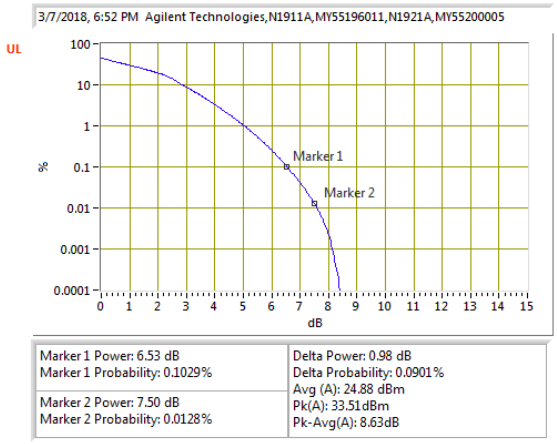


LTE B5 10MHz QPSK Middle Channel



LTE B5 10MHz 16QAM Middle Channel

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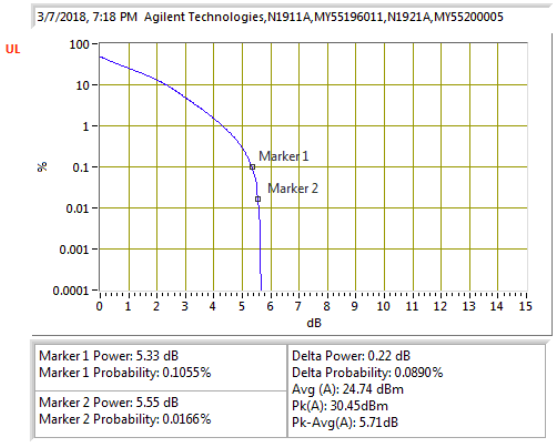
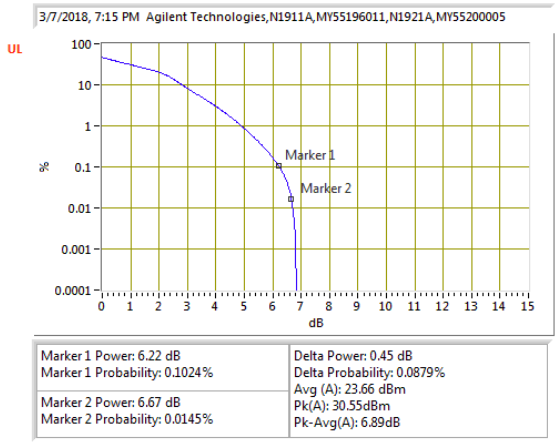
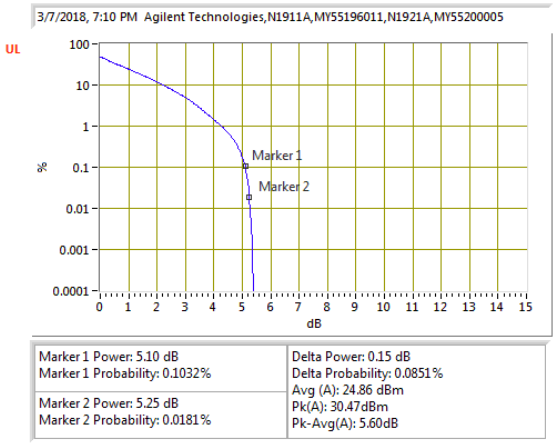
8.5.3. LTE BAND 7



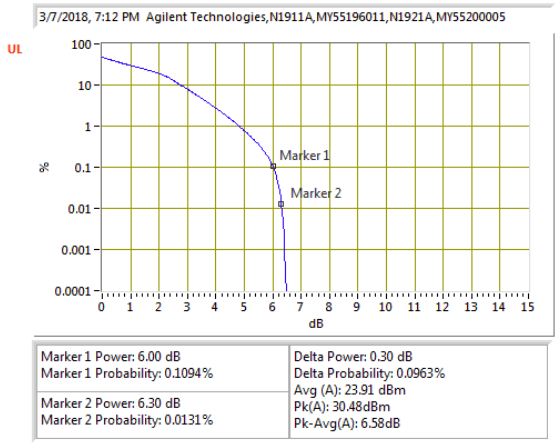
LTE B7 5MHz QPSK Middle Channel



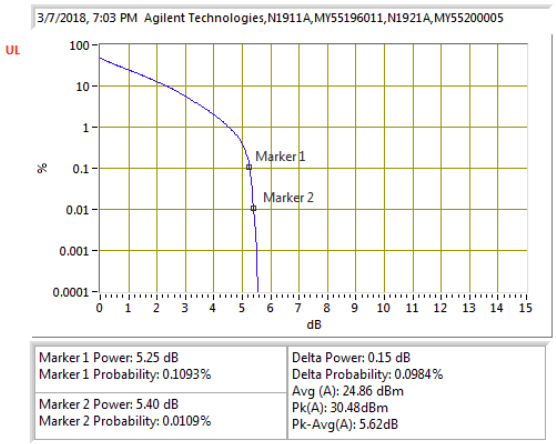
LTE B7 5MHz 16QAM Middle Channel



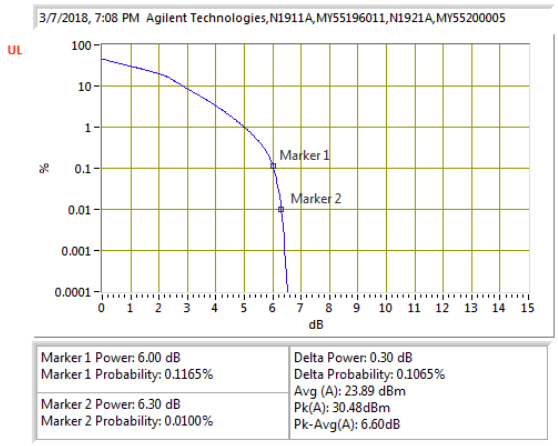
LTE B7 10MHz QPSK Middle Channel



LTE B7 10MHz 16QAM Middle Channel



LTE B7 15MHz QPSK Middle Channel



LTE B7 15MHz 16QAM Middle Channel

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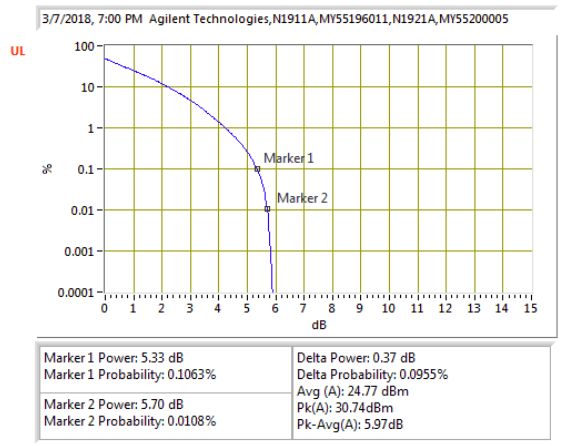
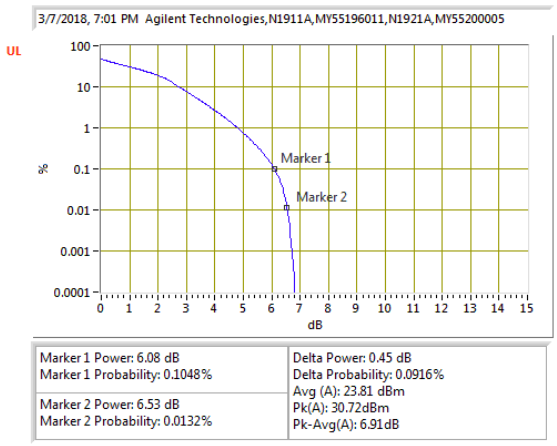


LTE B7 20MHz QPSK Middle Channel



LTE B7 20MHz 16QAM Middle Channel

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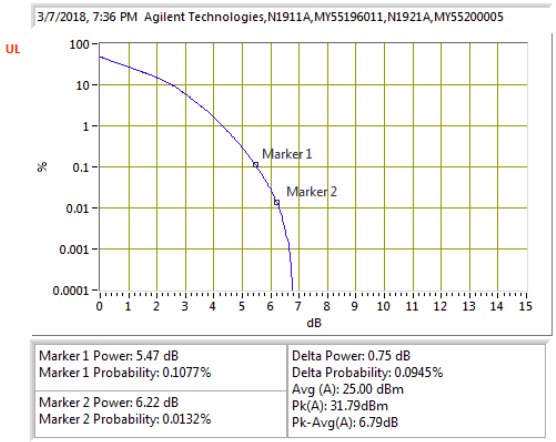
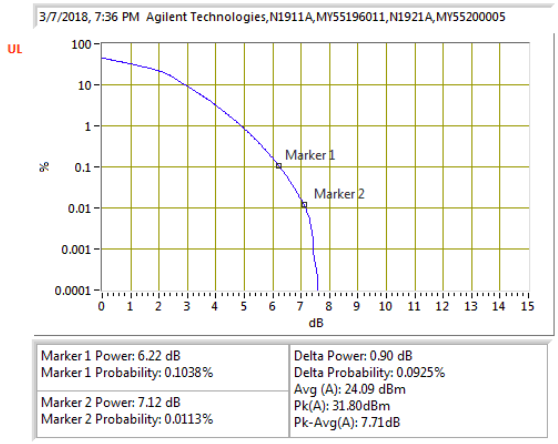
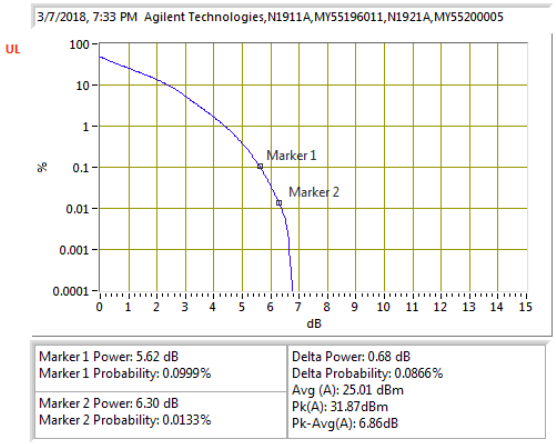
8.5.4. LTE BAND 12



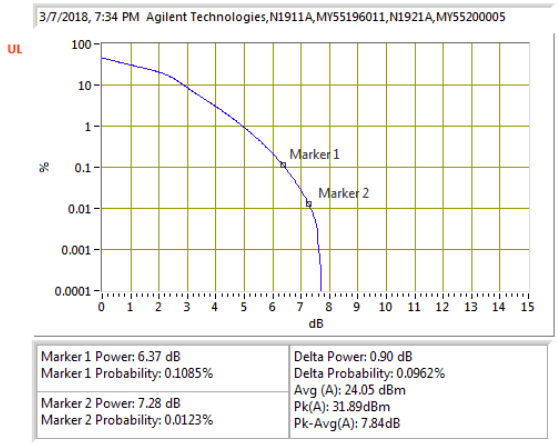
LTE B12 1.4MHz QPSK Middle Channel



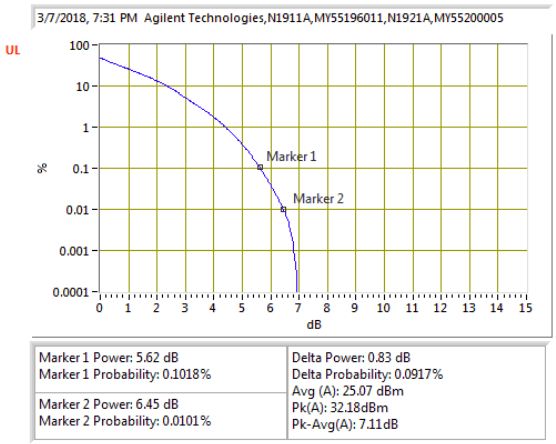
LTE B12 1.4MHz 16QAM Middle Channel



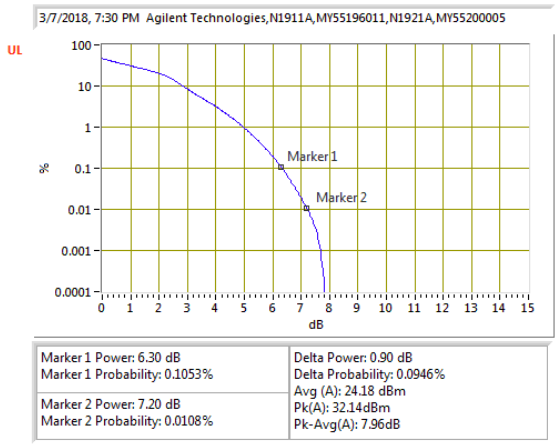
LTE B12 3MHz QPSK Middle Channel



LTE B12 3MHz 16QAM Middle Channel



LTE B12 5MHz QPSK Middle Channel



LTE B12 5MHz 16QAM Middle Channel

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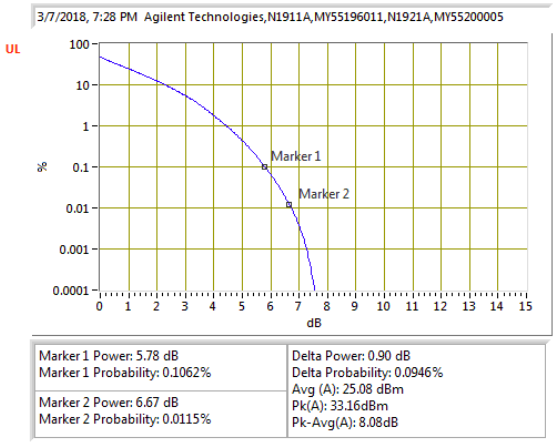
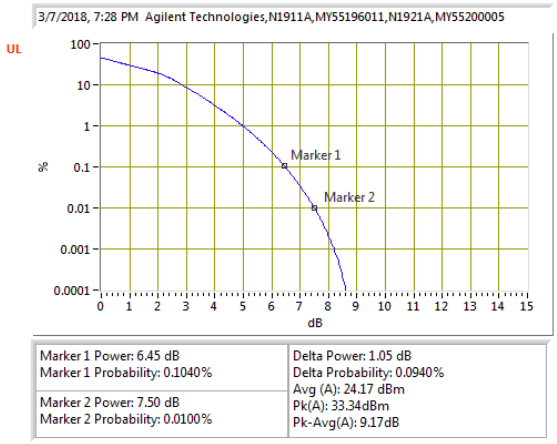


LTE B12 10MHz QPSK Middle Channel



LTE B12 10MHz 16QAM Middle Channel

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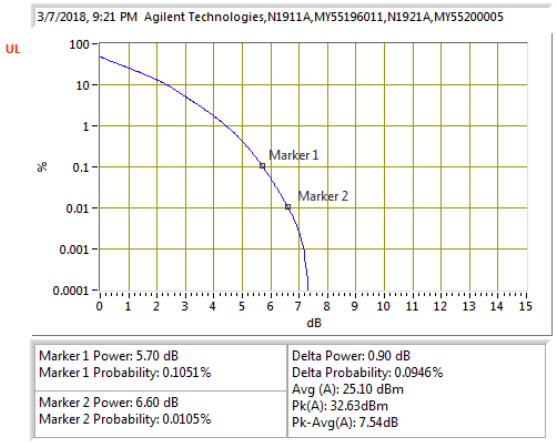
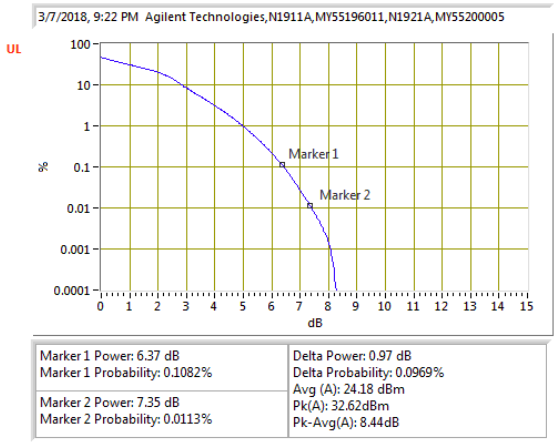
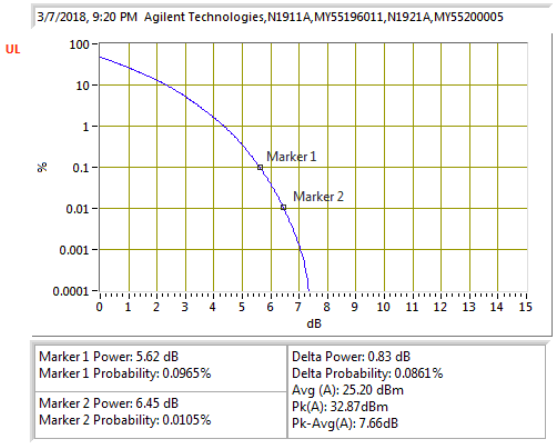
8.5.5. LTE BAND 13



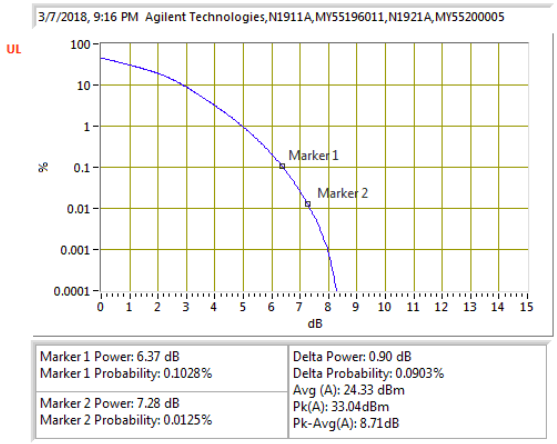
LTE B13 5MHz QPSK Middle Channel



LTE B13 5MHz 16QAM Middle Channel



LTE B13 10MHz QPSK Middle Channel



LTE B13 10MHz 16QAM Middle Channel

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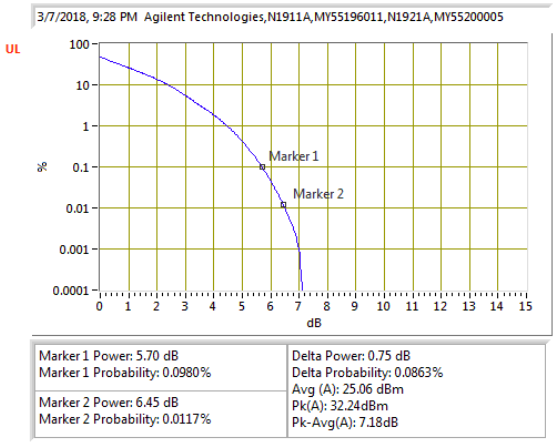
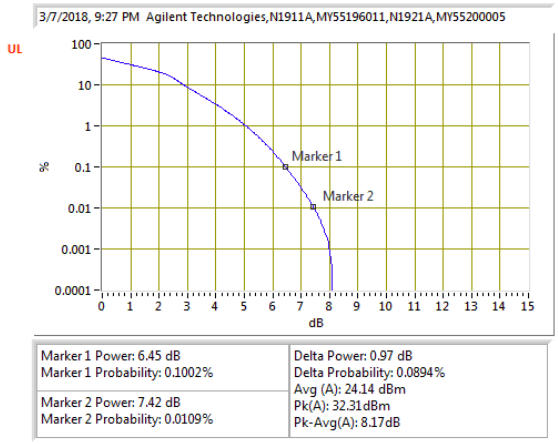
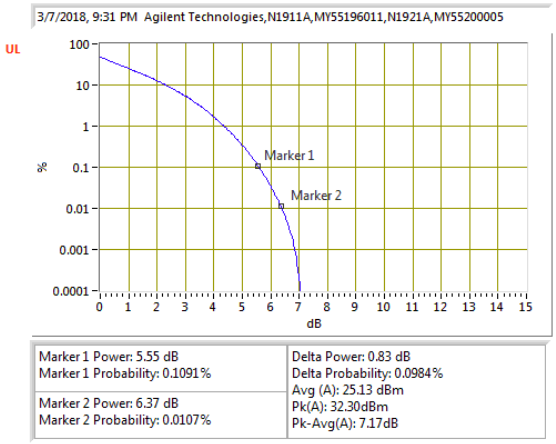
8.5.6. LTE BAND 14



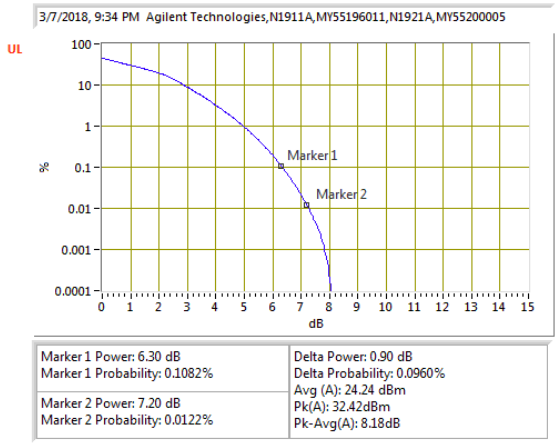
LTE B14 5MHz QPSK Middle Channel



LTE B14 5MHz 16QAM Middle Channel



LTE B14 10MHz QPSK Middle Channel



LTE B14 10MHz 16QAM Middle Channel

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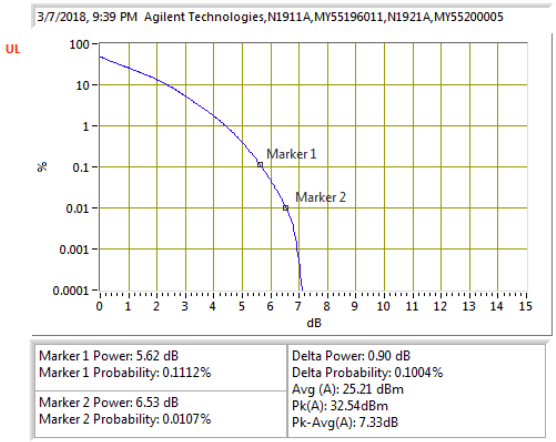
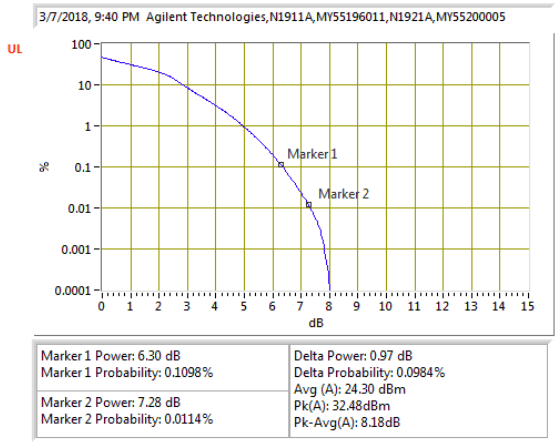
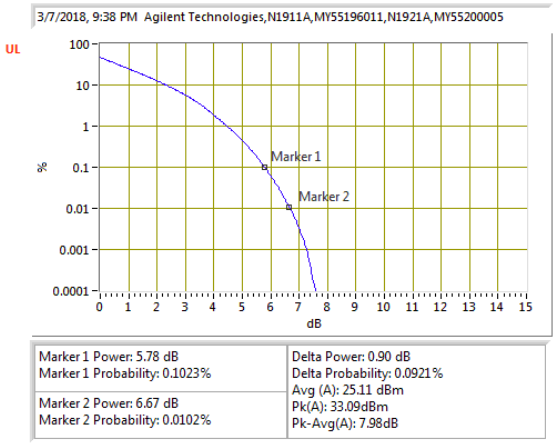
8.5.7. LTE BAND 17



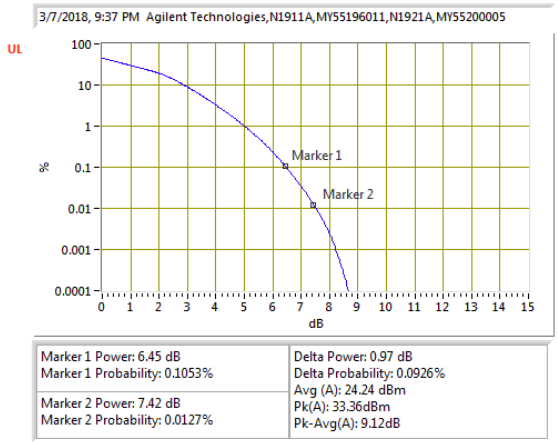
LTE B17 5MHz QPSK Middle Channel



LTE B17 5MHz 16QAM Middle Channel



LTE B17 10MHz QPSK Middle Channel



LTE B17 10MHz 16QAM Middle Channel

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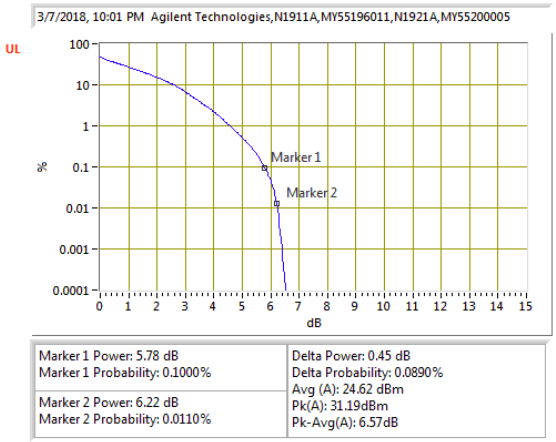
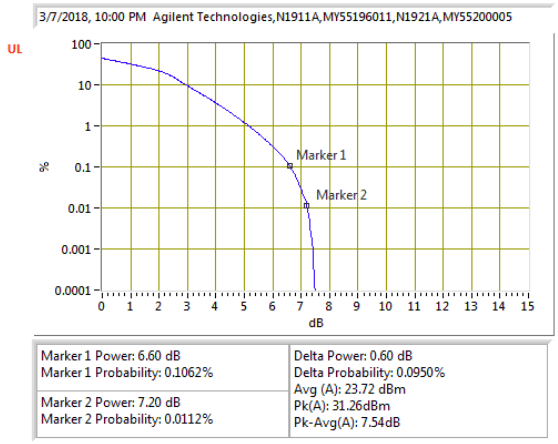
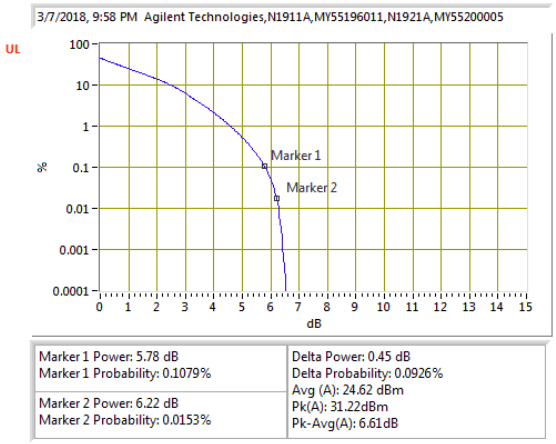
8.5.8. LTE BAND 25



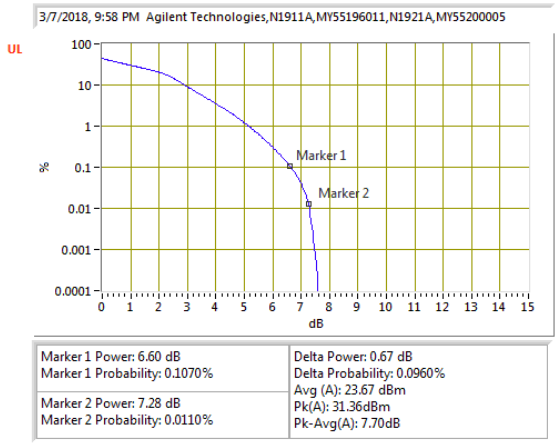
LTE B25 1.4MHz QPSK Middle Channel



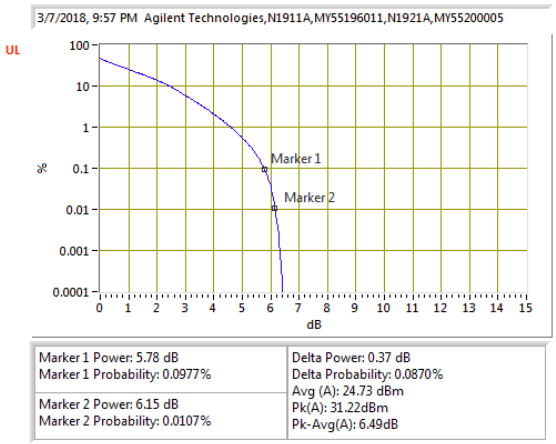
LTE B25 1.4MHz 16QAM Middle Channel



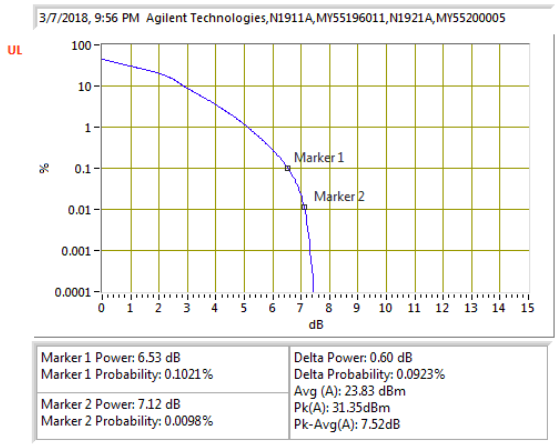
LTE B25 3MHz QPSK Middle Channel



LTE B25 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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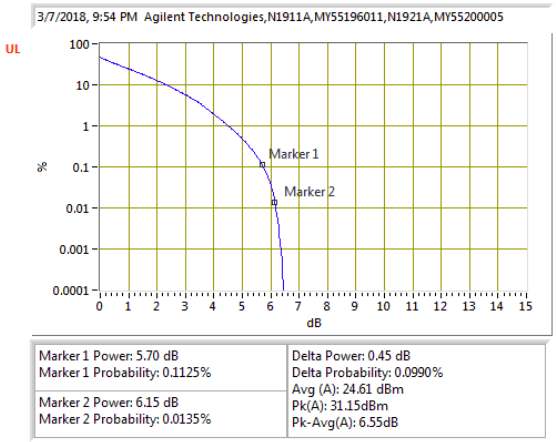
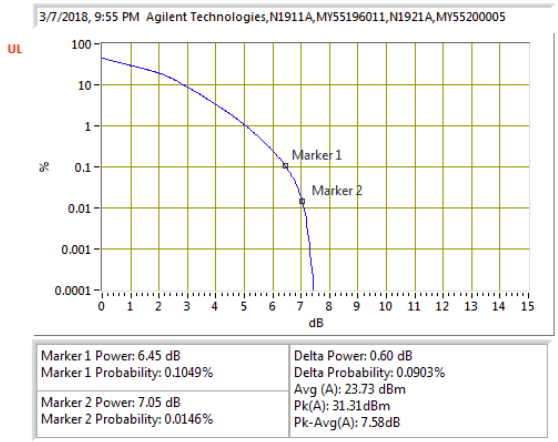
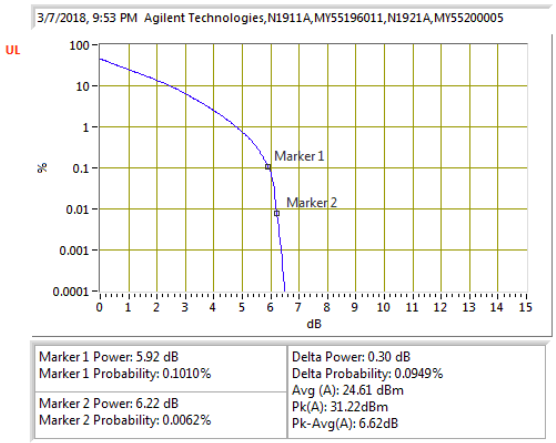


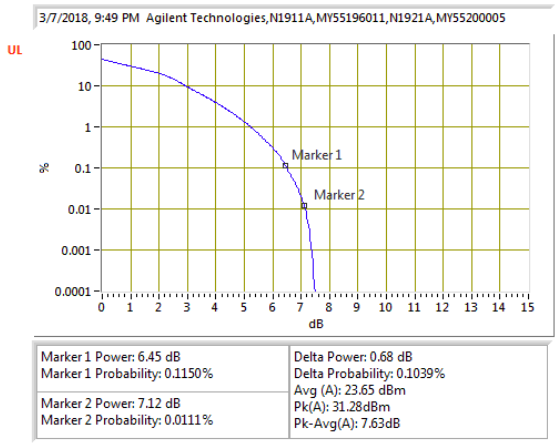
LTE B25 10MHz QPSK Middle Channel



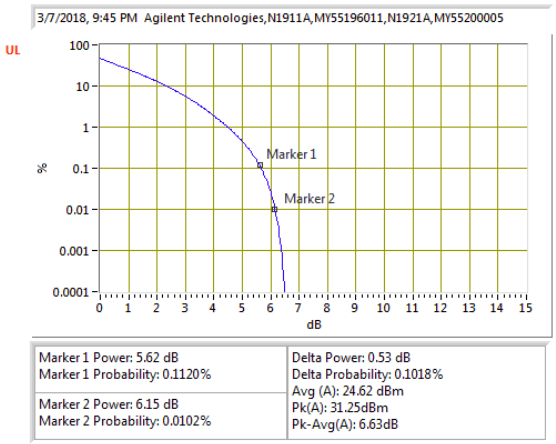
LTE B25 10MHz 16QAM Middle Channel



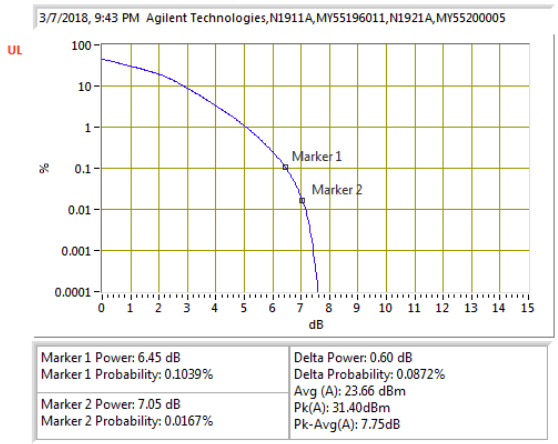
LTE B25 15MHz QPSK Middle Channel



LTE B25 15MHz 16QAM Middle Channel



LTE B25 20MHz QPSK Middle Channel



LTE B25 20MHz 16QAM Middle Channel

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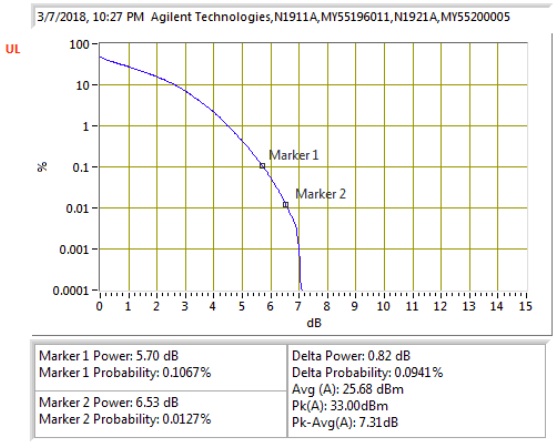
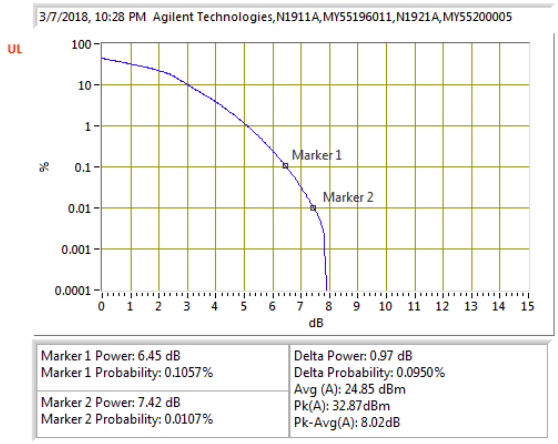
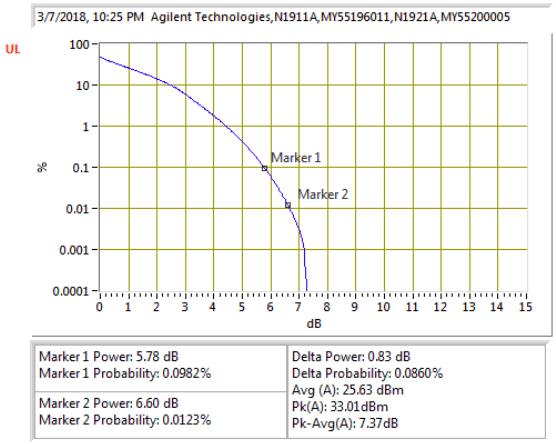
8.5.9. LTE BAND 26 (PART 90S)



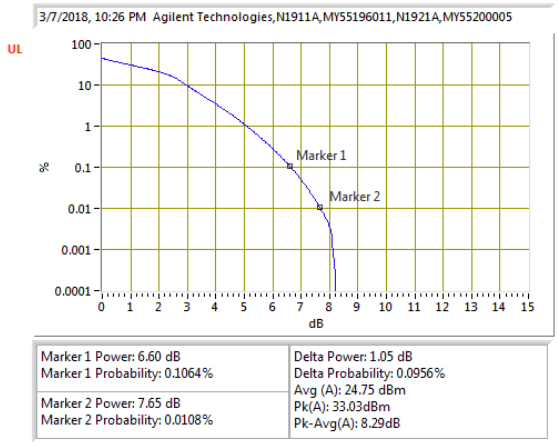
LTE B26 1.4MHz QPSK Middle Channel



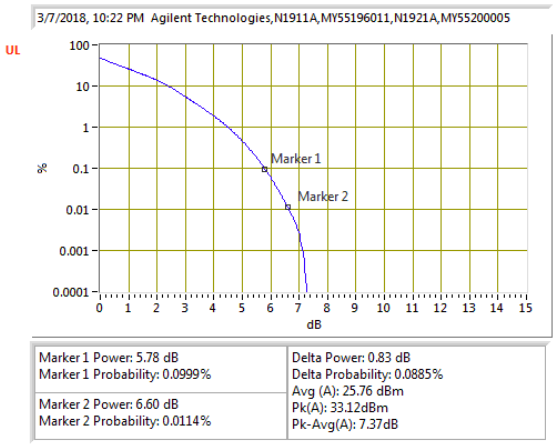
LTE B26 1.4MHz 16QAM Middle Channel



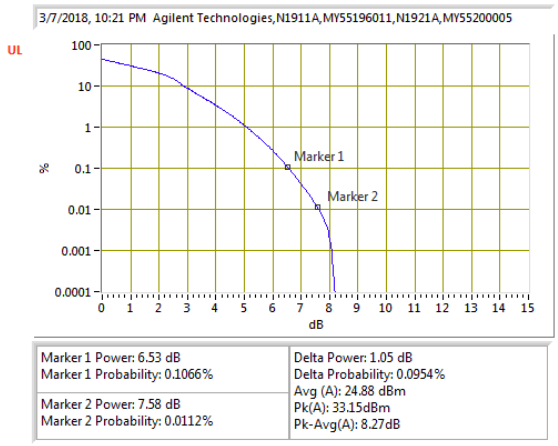
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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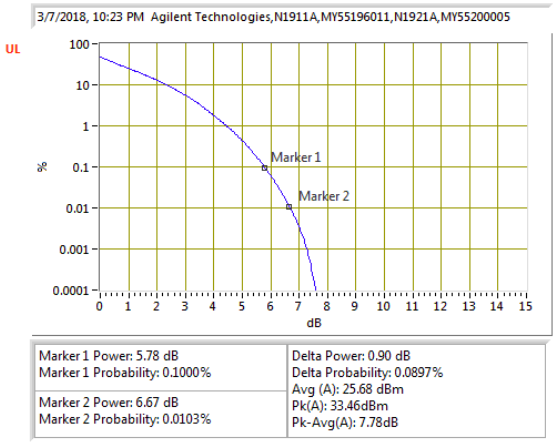
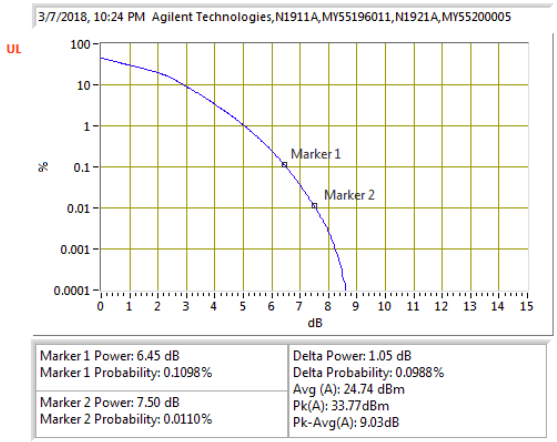


LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

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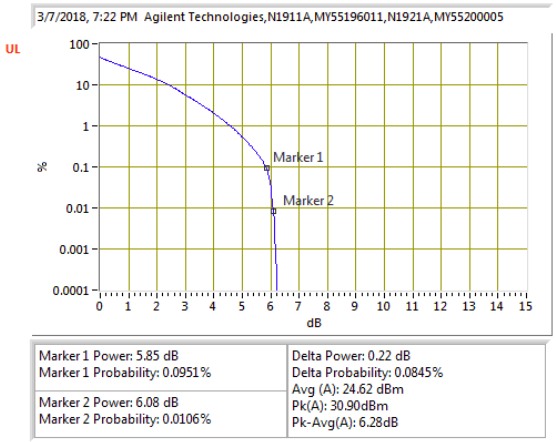
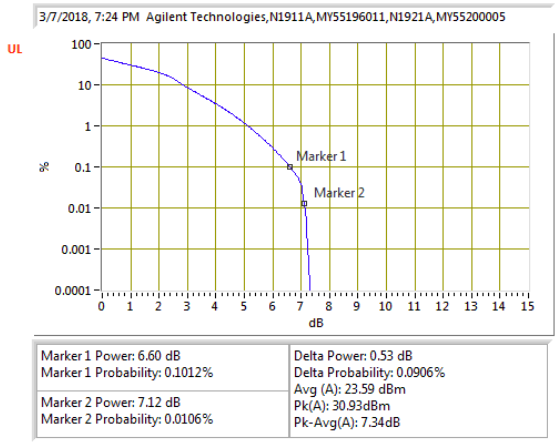
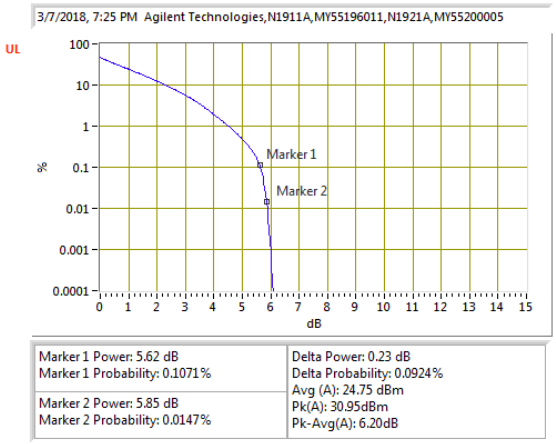
8.5.10. LTE BAND 30



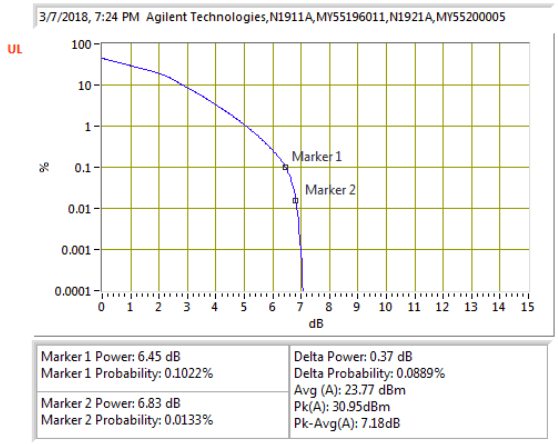
LTE B30 5MHz QPSK Middle Channel



LTE B30 5MHz 16QAM Middle Channel



LTE B30 10MHz QPSK Middle Channel



LTE B30 10MHz 16QAM Middle Channel

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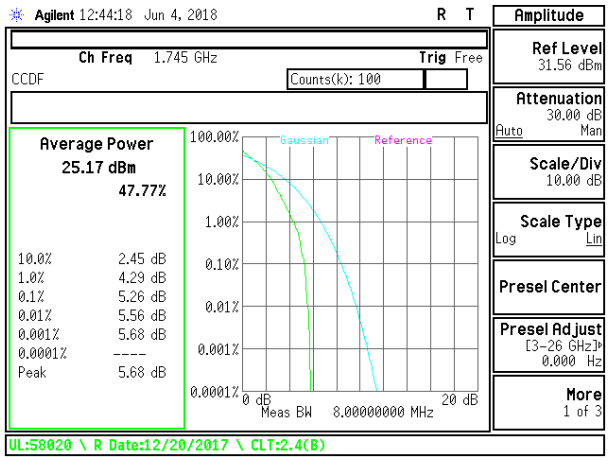
8.5.11. LTE BAND 41

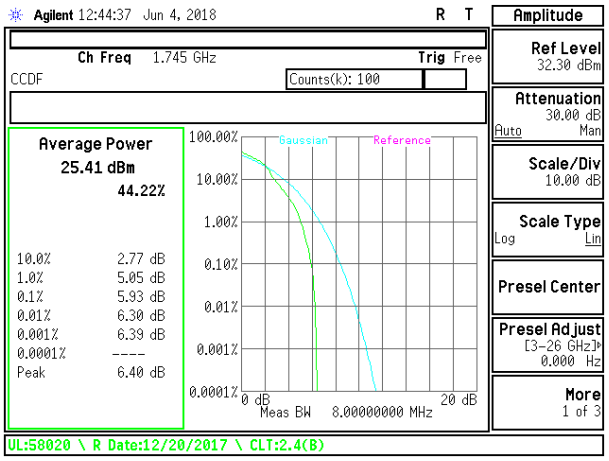
ID:	39004	Date:	3/8/18

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
Band 41	5MHz	2593.0	25	0	QPSK	32.32	22.21	3.12
					16QAM	32.29	21.21	4.09
	10MHz		50	0	QPSK	32.32	22.24	3.09
					16QAM	32.39	21.31	4.09
	15MHz		75	0	QPSK	32.44	22.25	3.20
					16QAM	32.44	21.34	4.11
	20MHz		100	0	QPSK	32.51	22.27	3.25
					16QAM	32.52	21.32	4.21
Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

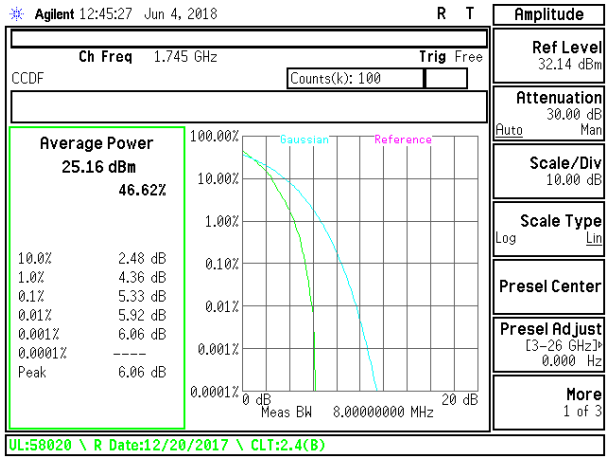
8.5.12. LTE BAND 66



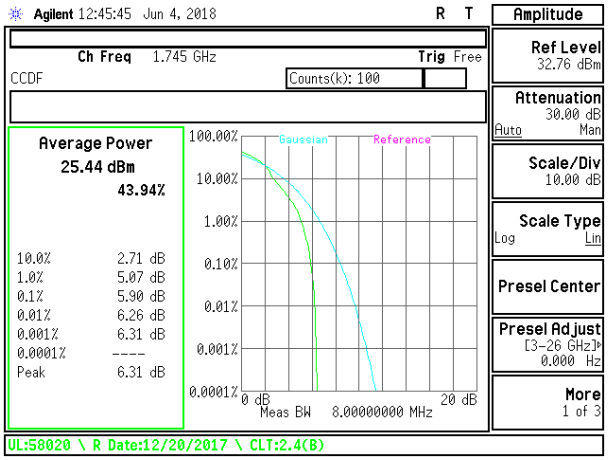
LTE B66 1.4MHz QPSK Middle Channel



LTE B66 1.4MHz 16QAM Middle Channel



LTE B66 3MHz QPSK Middle Channel



LTE B66 3MHz 16QAM Middle Channel

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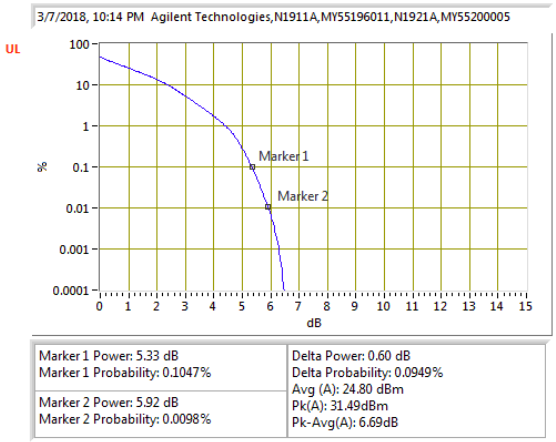
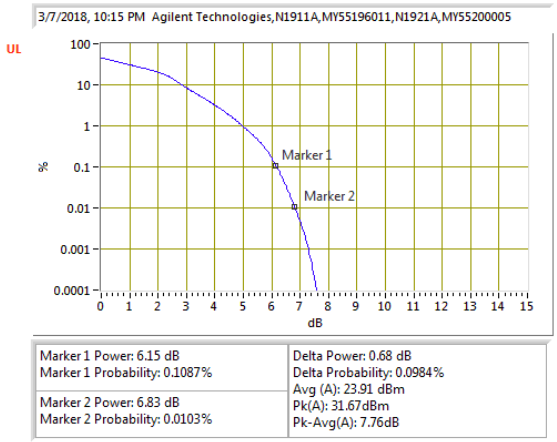
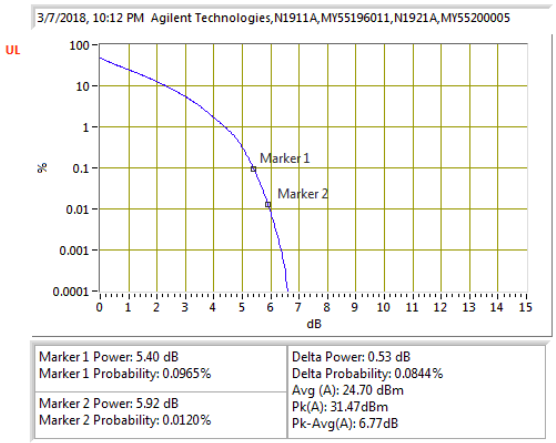


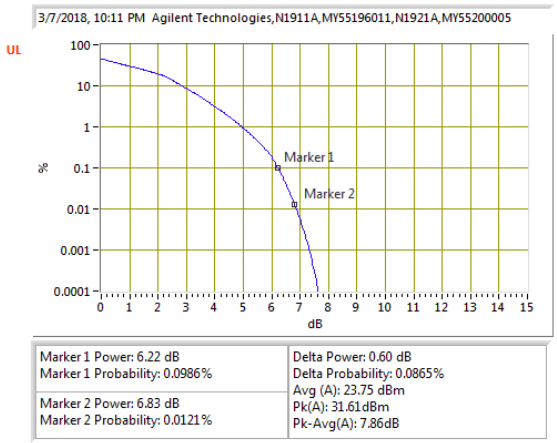
LTE B66 5MHz QPSK Middle Channel



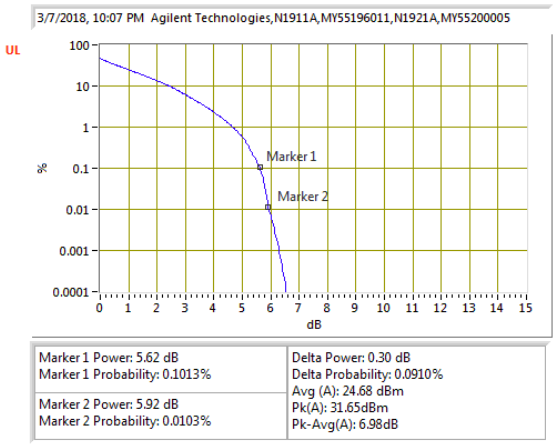
LTE B66 5MHz 16QAM Middle Channel



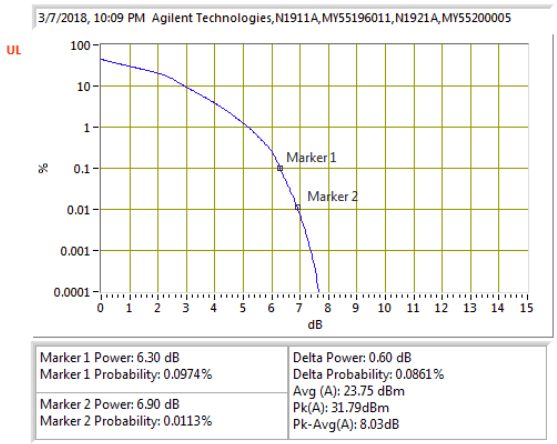
LTE B66 10MHz QPSK Middle Channel



LTE B66 10MHz 16QAM Middle Channel



LTE B66 15MHz QPSK Middle Channel



LTE B66 15MHz 16QAM Middle Channel

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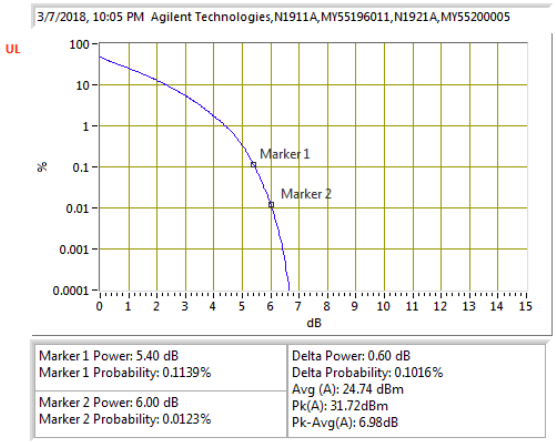
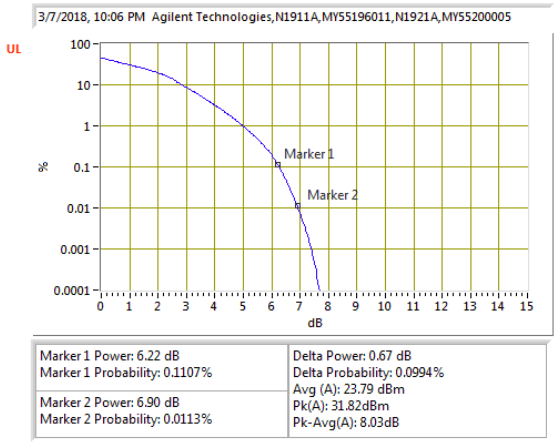


LTE B66 20MHz QPSK Middle Channel



LTE B66 20MHz 16QAM Middle Channel

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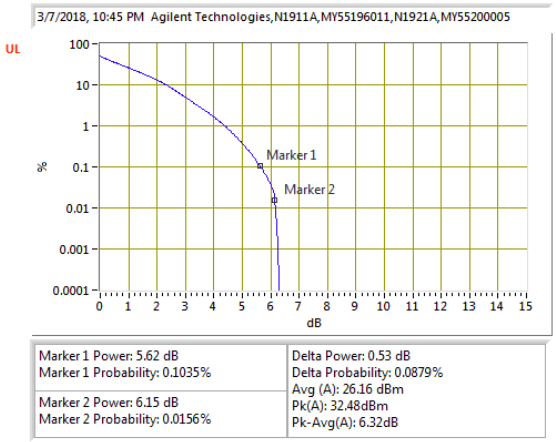
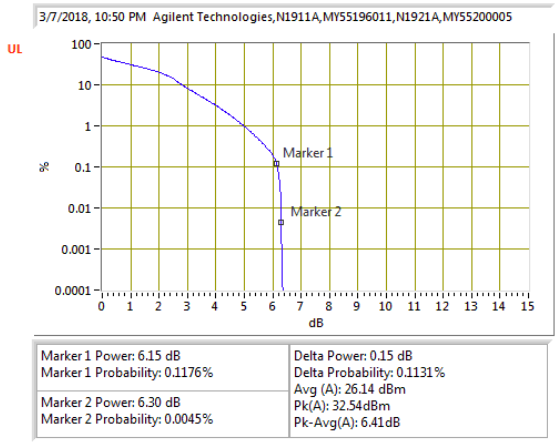
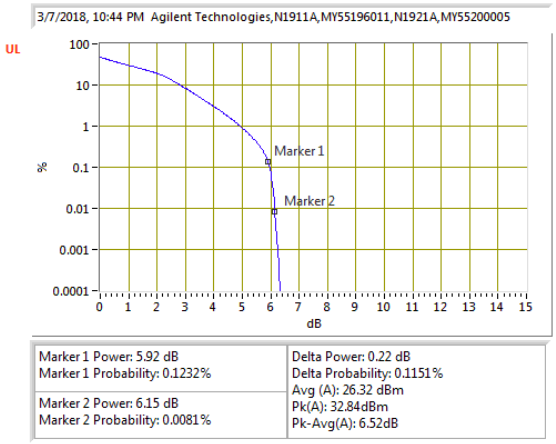
8.5.13. LTE BAND 71



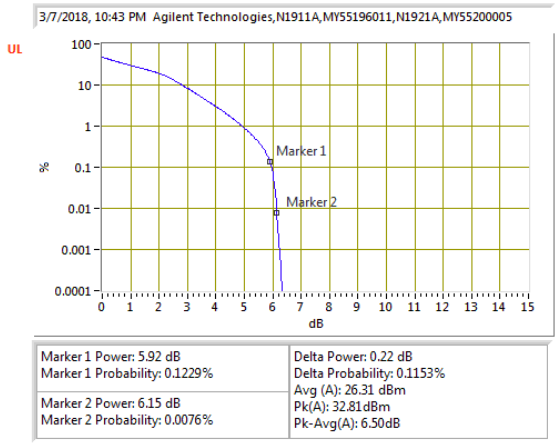
LTE B71 5MHz QPSK Middle Channel



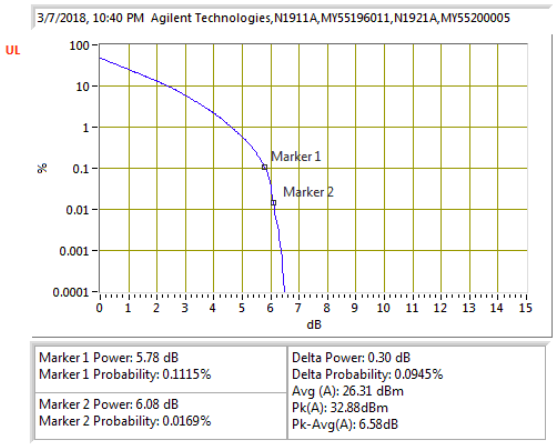
LTE B71 5MHz 16QAM Middle Channel



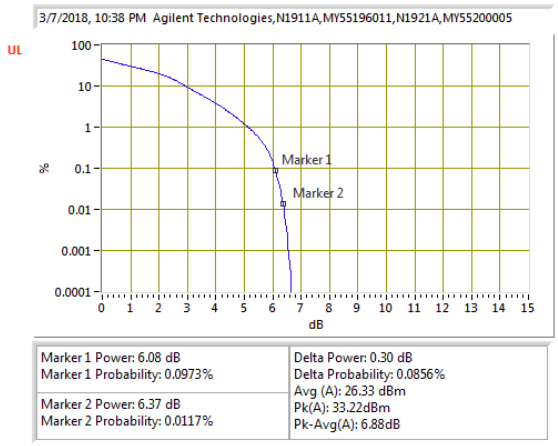
LTE B71 10MHz QPSK Middle Channel



LTE B71 10MHz 16QAM Middle Channel



LTE B71 15MHz QPSK Middle Channel



LTE B71 15MHz 16QAM Middle Channel

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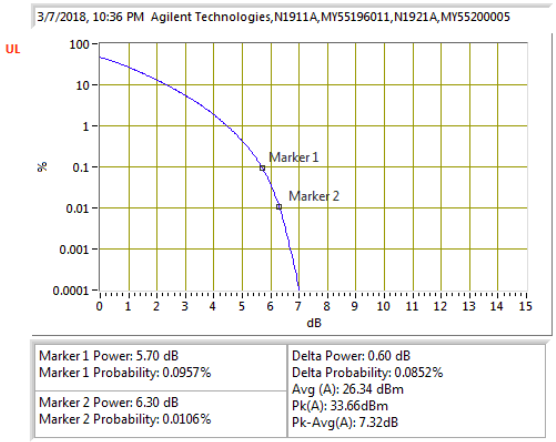
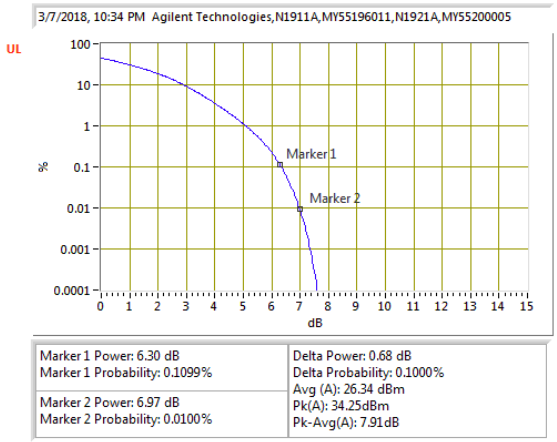


LTE B71 20MHz QPSK Middle Channel



LTE B71 20MHz 16QAM Middle Channel

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9. RADIATED TEST RESULTS

RULE PART(S)

§2.1053, §22.917, §24.238, §27.53, §90.691 and §90.543

LIMIT

§22.917(a), §24.238(a), §27.53 (g), (h), §90.691
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

§27.53 (Band 13)
(c) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
(f) Emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. (-70 dBW/MHz = -40dBm/MHz).

§90.543(Band 14)
(e) (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

§27.53 (a) (Band 30, Band 40)
For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

§27.53 (m) (Band 7, 41)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

TEST PROCEDURE

KDB 971168 v03r01/ D02 v02r01

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66
- LTE Band 71

RESULTS

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9.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 1

9.1.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 02/20/18
Test Engineer: 10641
Configuration: EUT ONLY
Mode: LTE Band 2, 20MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-62.1	H	3.0	-12.1	38.6	1.0	-49.7	-13.0	-36.7	
5.58	-64.5	H	3.0	-10.4	38.6	1.0	-48.0	-13.0	-35.0	
7.44	-66.5	H	3.0	-8.8	37.8	1.0	-45.6	-13.0	-32.6	
3.72	-61.9	V	3.0	-11.9	38.6	1.0	-49.5	-13.0	-36.5	
5.58	-64.1	V	3.0	-10.3	38.6	1.0	-47.9	-13.0	-34.9	
7.44	-67.2	V	3.0	-9.7	37.8	1.0	-46.4	-13.0	-33.4	
Mid Channel (1880MHz)										
3.76	-62.7	H	3.0	-12.6	38.6	1.0	-50.2	-13.0	-37.2	
5.64	-63.7	H	3.0	-9.4	38.5	1.0	-47.0	-13.0	-34.0	
7.52	-65.7	H	3.0	-7.9	37.7	1.0	-44.7	-13.0	-31.7	
3.76	-61.6	V	3.0	-11.5	38.6	1.0	-49.2	-13.0	-36.2	
5.64	-63.2	V	3.0	-9.3	38.5	1.0	-46.8	-13.0	-33.8	
7.52	-66.4	V	3.0	-8.8	37.7	1.0	-45.6	-13.0	-32.6	
High Channel (1900MHz)										
3.80	-62.7	H	3.0	-12.5	38.6	1.0	-50.2	-13.0	-37.2	
5.70	-64.6	H	3.0	-10.2	38.5	1.0	-47.7	-13.0	-34.7	
7.60	-66.9	H	3.0	-9.0	37.7	1.0	-45.7	-13.0	-32.7	
3.80	-62.1	V	3.0	-11.9	38.6	1.0	-49.6	-13.0	-36.6	
5.70	-64.0	V	3.0	-10.0	38.5	1.0	-47.5	-13.0	-34.5	
7.60	-65.6	V	3.0	-7.9	37.7	1.0	-44.6	-13.0	-31.6	

Rev. 05.21.15

LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 2/20/2018
Test Engineer: 10641
Configuration: EUT ONLY
Mode: LTE Band 2, 20MHz 16QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-62.6	H	3.0	-12.6	38.6	1.0	-50.2	-13.0	-37.2	
5.58	-64.7	H	3.0	-10.6	38.6	1.0	-48.2	-13.0	-35.2	
7.44	-66.5	H	3.0	-8.8	37.8	1.0	-45.5	-13.0	-32.5	
3.72	-61.8	V	3.0	-11.8	38.6	1.0	-49.5	-13.0	-36.5	
5.58	-65.2	V	3.0	-11.4	38.6	1.0	-48.9	-13.0	-35.9	
7.44	-65.9	V	3.0	-8.3	37.8	1.0	-45.1	-13.0	-32.1	
Mid Channel (1880MHz)										
3.76	-62.3	H	3.0	-12.2	38.6	1.0	-49.9	-13.0	-36.9	
5.64	-64.2	H	3.0	-9.9	38.5	1.0	-47.5	-13.0	-34.5	
7.52	-67.2	H	3.0	-9.3	37.7	1.0	-46.1	-13.0	-33.1	
3.76	-62.3	V	3.0	-12.3	38.6	1.0	-49.9	-13.0	-36.9	
5.64	-64.8	V	3.0	-10.9	38.5	1.0	-48.5	-13.0	-35.5	
7.52	-66.6	V	3.0	-9.0	37.7	1.0	-45.7	-13.0	-32.7	
High Channel (1900MHz)										
3.80	-62.9	H	3.0	-12.7	38.6	1.0	-50.3	-13.0	-37.3	
5.70	-65.0	H	3.0	-10.7	38.5	1.0	-48.2	-13.0	-35.2	
7.60	-65.7	H	3.0	-7.8	37.7	1.0	-44.5	-13.0	-31.5	
3.80	-62.5	V	3.0	-12.4	38.6	1.0	-50.0	-13.0	-37.0	
5.70	-63.8	V	3.0	-9.8	38.5	1.0	-47.3	-13.0	-34.3	
7.60	-66.5	V	3.0	-8.8	37.7	1.0	-45.5	-13.0	-32.5	

Rev. 05.21.15

LTE B2 20MHz 16QAM

9.1.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 02/19/18
Test Engineer: 10649
Configuration: EUT
Mode: LTE Band 5, 10MHz QPSK

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-63.7	H	3.0	-21.2	37.8	1.0	-58.1	-13.0	-45.1	
2.49	-55.4	H	3.0	-10.3	38.5	1.0	-47.8	-13.0	-34.8	
3.32	-64.7	H	3.0	-15.7	38.5	1.0	-53.2	-13.0	-40.2	
1.66	-64.4	V	3.0	-22.2	37.8	1.0	-59.0	-13.0	-46.0	
2.49	-58.5	V	3.0	-13.2	38.5	1.0	-50.8	-13.0	-37.8	
3.32	-64.8	V	3.0	-16.1	38.5	1.0	-53.6	-13.0	-40.6	
Mid Channel (836.5MHz)										
1.67	-61.8	H	3.0	-19.3	37.8	1.0	-56.1	-13.0	-43.1	
2.51	-55.6	H	3.0	-10.4	38.6	1.0	-48.0	-13.0	-35.0	
3.35	-65.1	H	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
1.67	-64.6	V	3.0	-22.4	37.8	1.0	-59.2	-13.0	-46.2	
2.51	-60.0	V	3.0	-14.6	38.6	1.0	-52.2	-13.0	-39.2	
3.35	-65.4	V	3.0	-16.5	38.5	1.0	-54.0	-13.0	-41.0	
High Channel (844MHz)										
1.69	-64.0	H	3.0	-21.4	37.9	1.0	-58.3	-13.0	-45.3	
2.53	-65.3	H	3.0	-20.0	38.6	1.0	-57.5	-13.0	-44.5	
3.38	-65.0	H	3.0	-15.8	38.5	1.0	-53.3	-13.0	-40.3	
1.69	-63.8	V	3.0	-21.5	37.9	1.0	-58.4	-13.0	-45.4	
2.53	-59.7	V	3.0	-14.2	38.6	1.0	-51.8	-13.0	-38.8	
3.38	-65.0	V	3.0	-16.1	38.5	1.0	-53.6	-13.0	-40.6	

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LTE B5 10MHz QPSK

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UL Fremont Radiated Chamber

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Mode: LTE Band 5, 10MHz 16-QAM

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-64.5	H	3.0	-23.0	37.8	1.0	-59.9	-13.0	-46.9	
2.49	-58.1	H	3.0	-15.0	38.5	1.0	-52.5	-13.0	-39.5	
3.32	-65.9	H	3.0	-19.0	38.5	1.0	-56.5	-13.0	-43.5	
1.66	-64.5	V	3.0	-22.8	37.8	1.0	-59.6	-13.0	-46.6	
2.49	-55.6	V	3.0	-11.5	38.5	1.0	-49.0	-13.0	-36.0	
3.32	-65.9	V	3.0	-20.0	38.5	1.0	-57.5	-13.0	-44.5	
Mid Channel (836.5MHz)										
1.67	-63.9	H	3.0	-22.4	37.8	1.0	-59.2	-13.0	-46.2	
2.51	-59.3	H	3.0	-16.1	38.6	1.0	-53.7	-13.0	-40.7	
3.35	-65.1	H	3.0	-19.1	38.5	1.0	-56.6	-13.0	-43.6	
1.67	-63.9	V	3.0	-22.1	37.8	1.0	-58.9	-13.0	-45.9	
2.51	-59.3	V	3.0	-15.1	38.6	1.0	-52.7	-13.0	-39.7	
3.35	-65.1	V	3.0	-19.1	38.5	1.0	-56.6	-13.0	-43.6	
High Channel (844MHz)										
1.69	-64.3	H	3.0	-22.8	37.9	1.0	-59.6	-13.0	-46.6	
2.53	-61.1	H	3.0	-17.8	38.6	1.0	-55.4	-13.0	-42.4	
3.38	-64.9	H	3.0	-18.8	38.5	1.0	-56.3	-13.0	-43.3	
1.69	-63.8	V	3.0	-22.0	37.9	1.0	-58.9	-13.0	-45.9	
2.53	-52.0	V	3.0	-7.7	38.6	1.0	-45.3	-13.0	-32.3	
3.38	-64.9	V	3.0	-18.7	38.5	1.0	-56.2	-13.0	-43.2	

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LTE B5 10MHz 16QAM

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