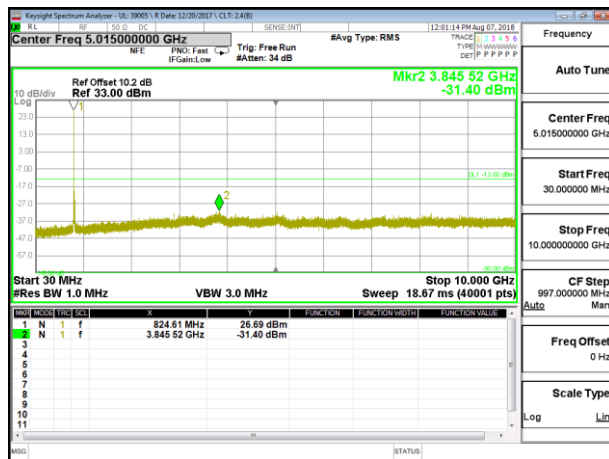
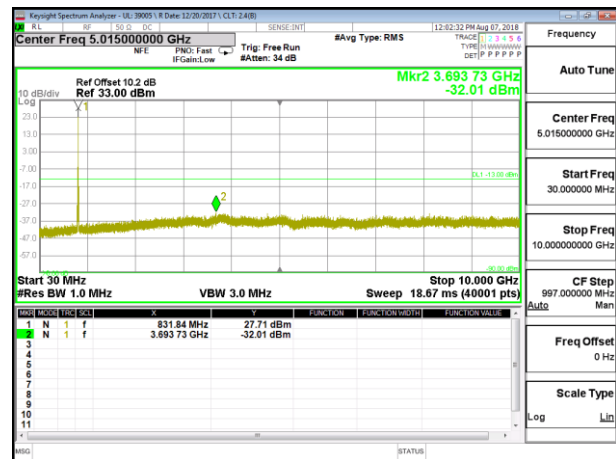
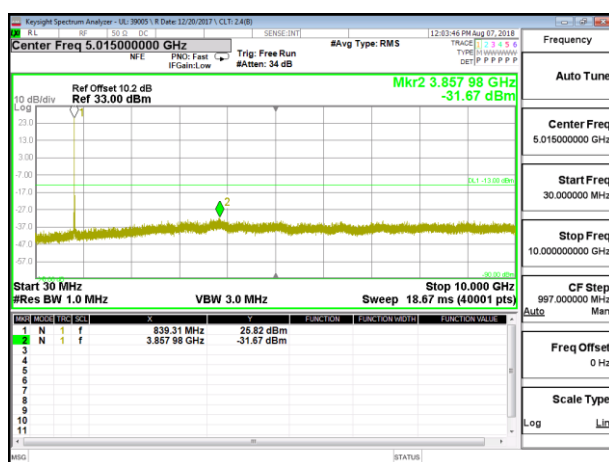




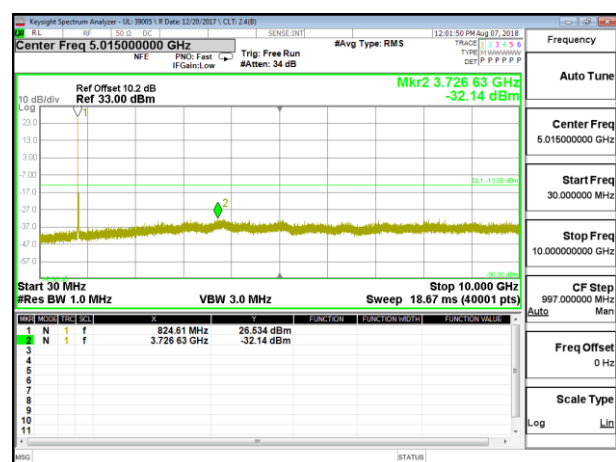
LTE B5 10MHz QPSK Low Channel RB1-0



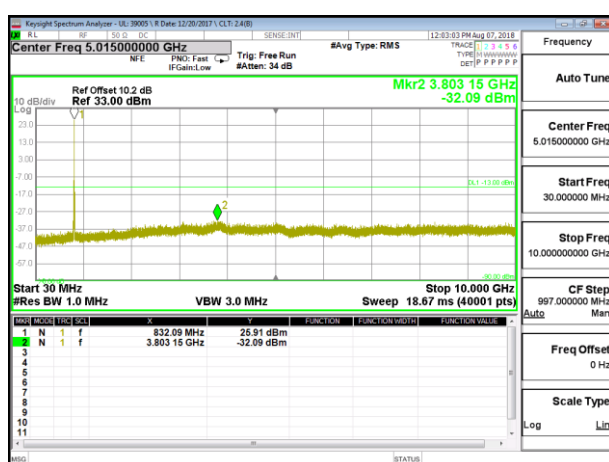
LTE B5 10MHz QPSK Mid Channel RB1-0



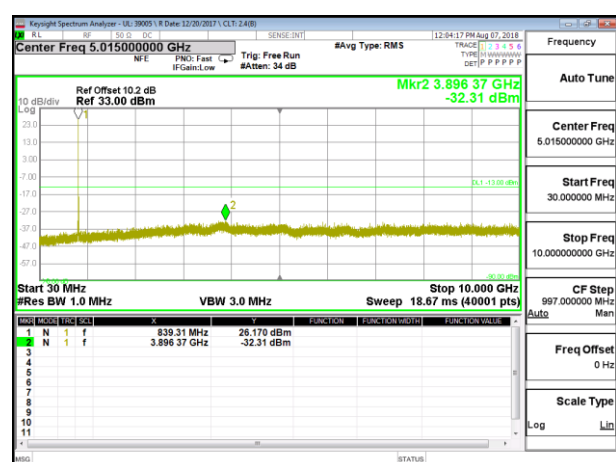
LTE B5 10MHz QPSK High Channel RB1-0



LTE B5 10MHz 16QAM Low Channel RB1-0

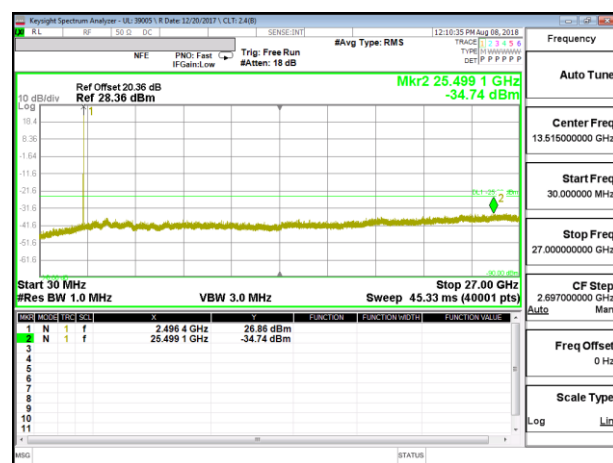


LTE B5 10MHz 16QAM Mid Channel RB1-0

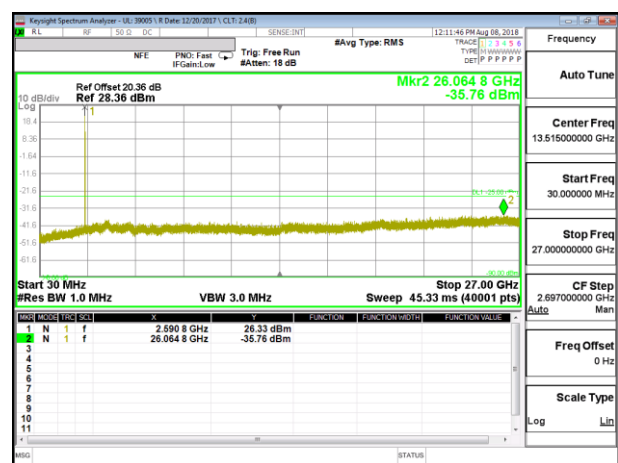


LTE B5 10MHz 16QAM High Channel RB1-0

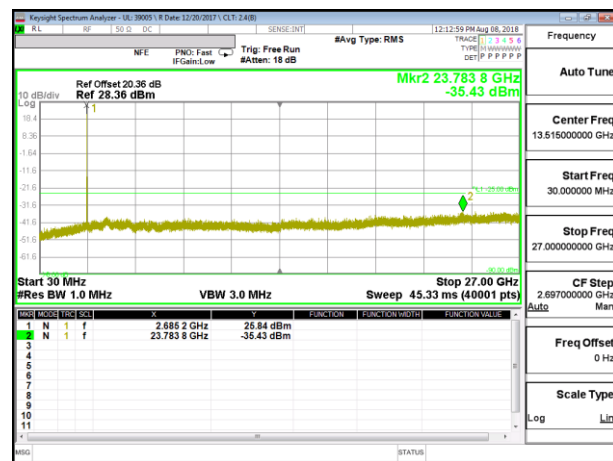
10.3.6. LTE BAND 41



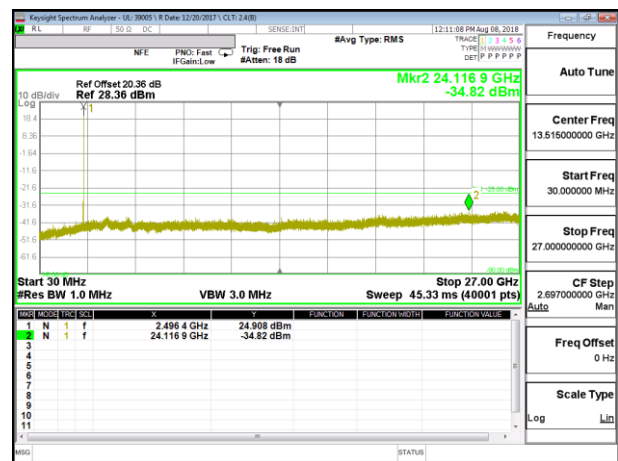
LTE B41 5MHz QPSK Low Channel RB1-0



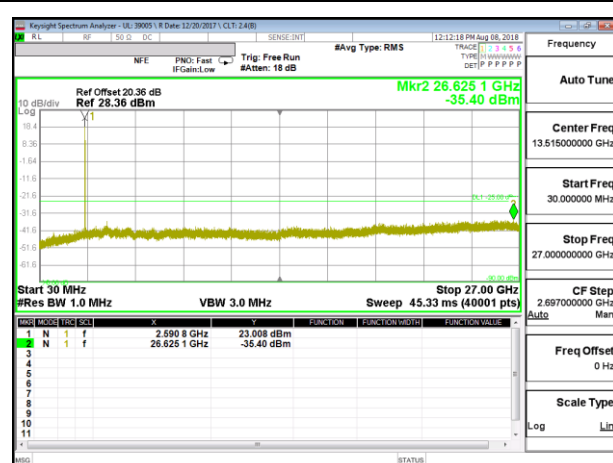
LTE B41 5MHz QPSK Mid Channel RB1-0



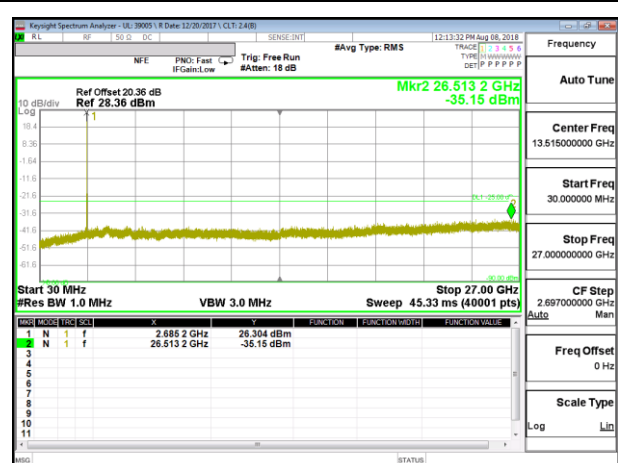
LTE B41 5MHz QPSK High Channel RB1-0



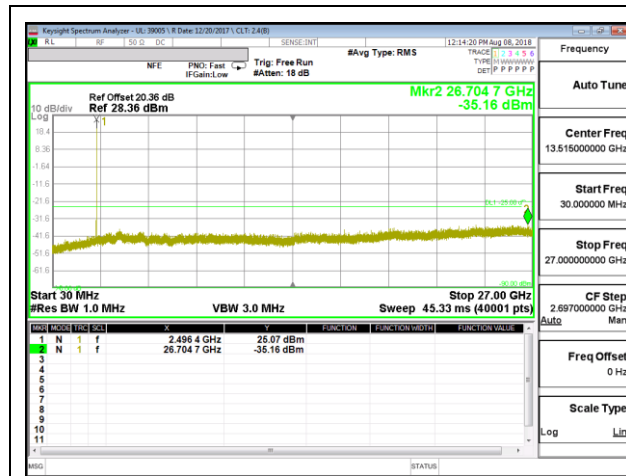
LTE B41 5MHz 16QAM Low Channel RB1-0



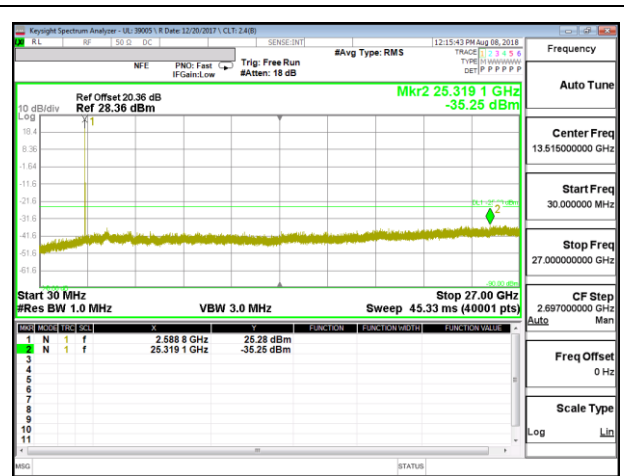
LTE B41 5MHz 16QAM Mid Channel RB1-0



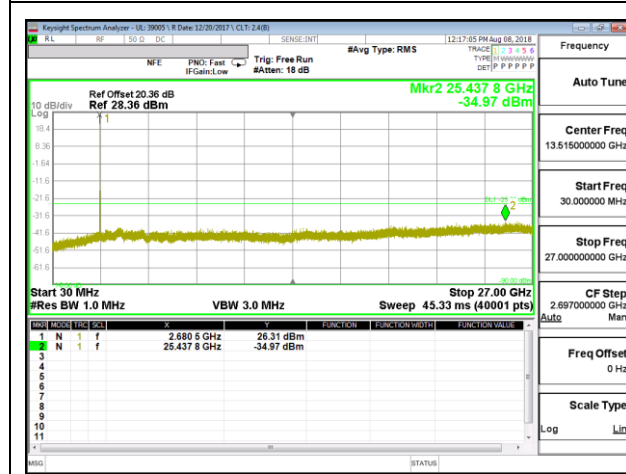
LTE B41 5MHz 16QAM High Channel RB1-0



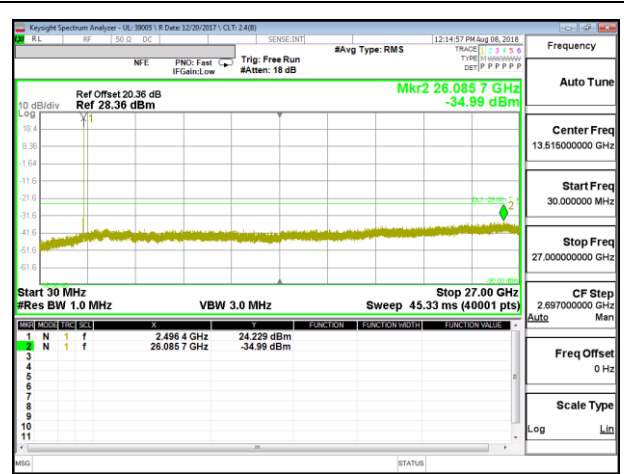
LTE B41 10MHz QPSK Low Channel RB1-0



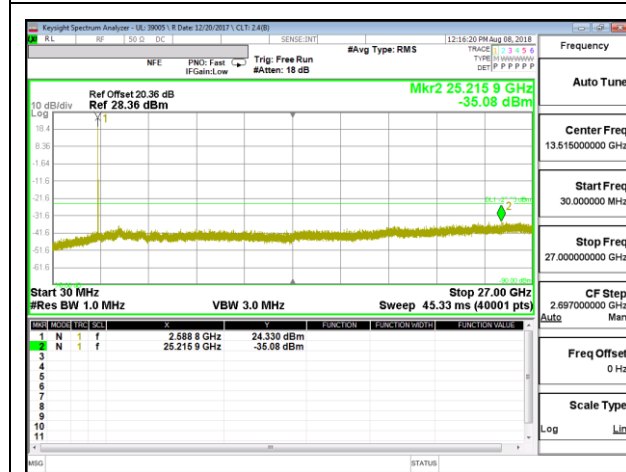
LTE B41 10MHz QPSK Mid Channel RB1-0



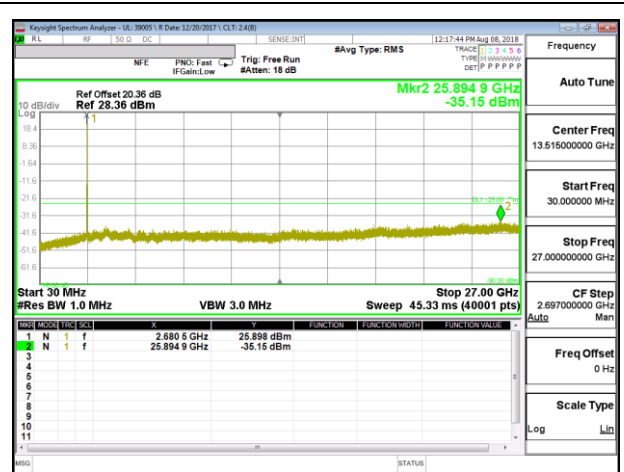
LTE B41 10MHz QPSK High Channel RB1-0



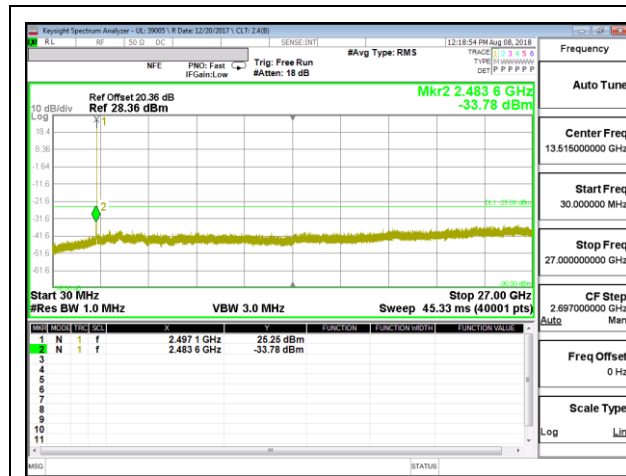
LTE B41 10MHz 16QAM Low Channel RB1-0



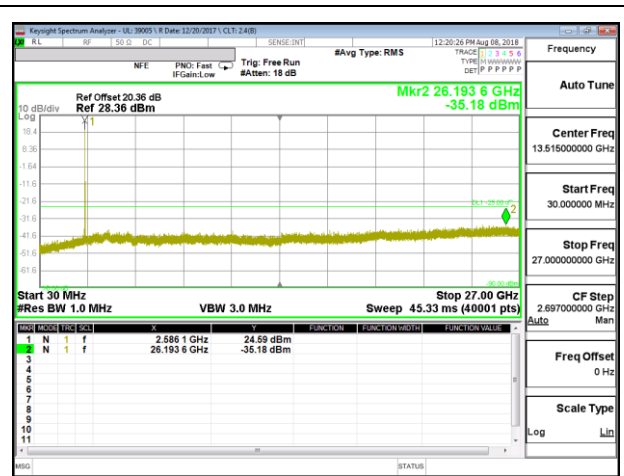
LTE B41 10MHz 16QAM Mid Channel RB1-0



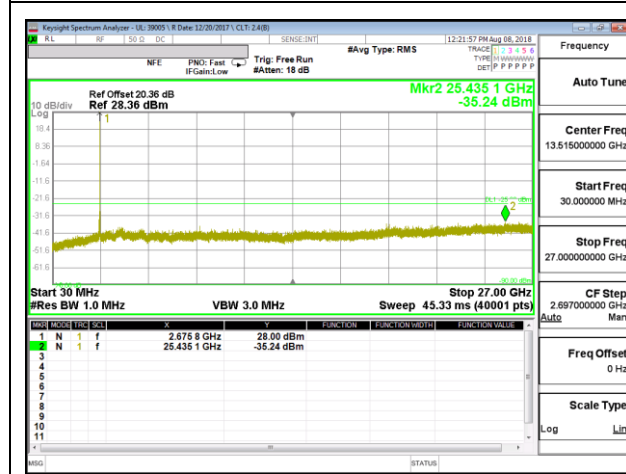
LTE B41 10MHz 16QAM High Channel RB1-0



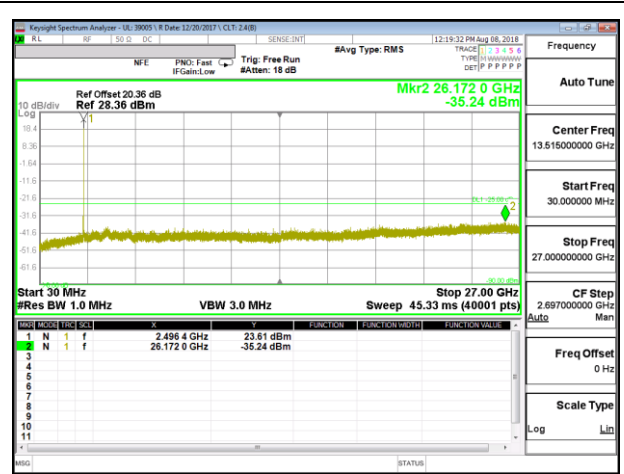
LTE B41 15MHz QPSK Low Channel RB1-0



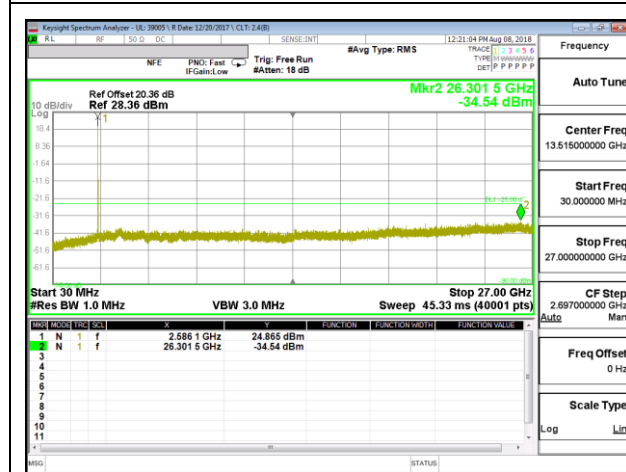
LTE B41 15MHz QPSK Mid Channel RB1-0



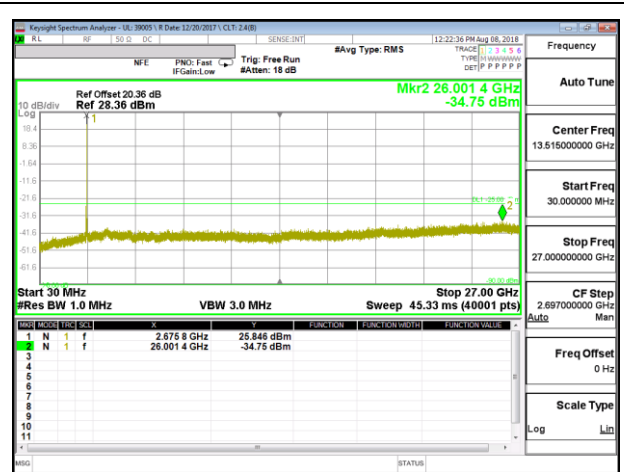
LTE B41 15MHz QPSK High Channel RB1-0



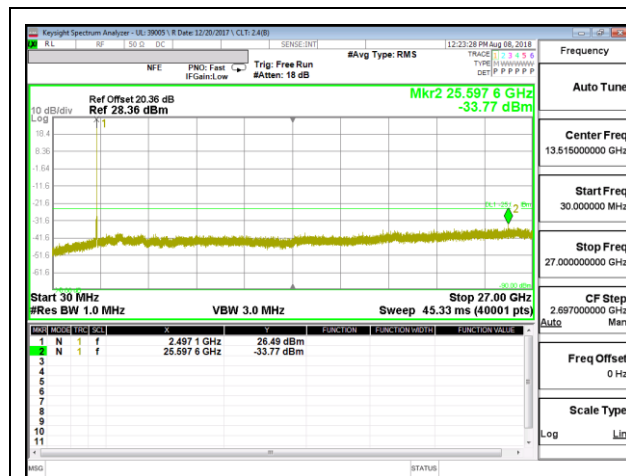
LTE B41 15MHz 16QAM Low Channel RB1-0



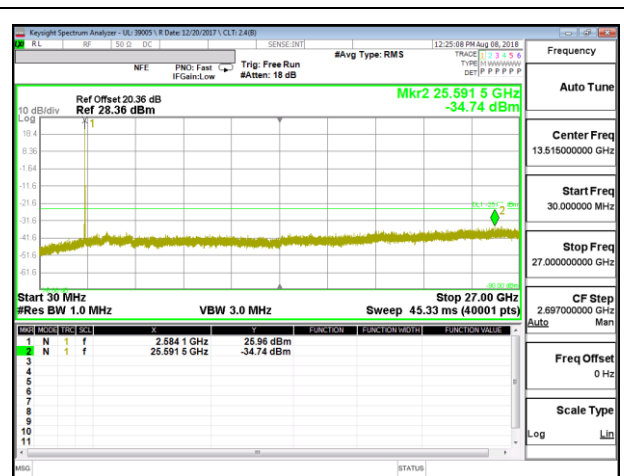
LTE B41 15MHz 16QAM Mid Channel RB1-0



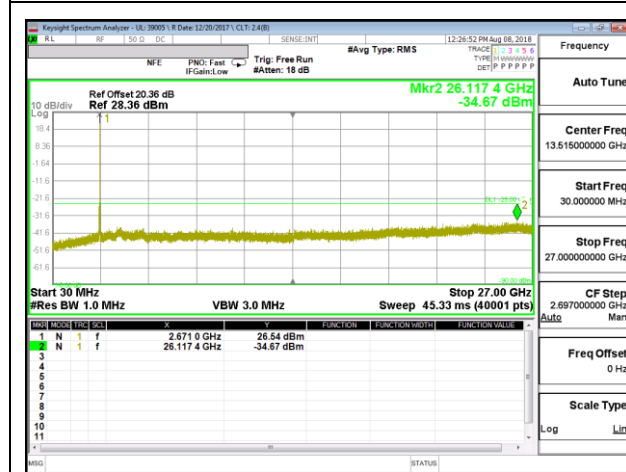
LTE B41 15MHz 16QAM High Channel RB1-0



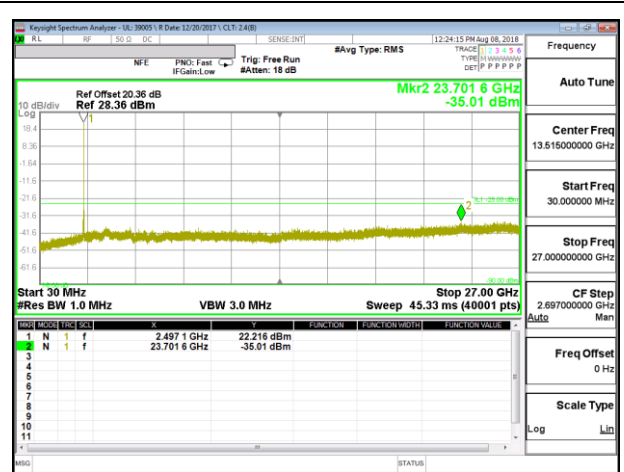
LTE B41 20MHz QPSK Low Channel RB1-0



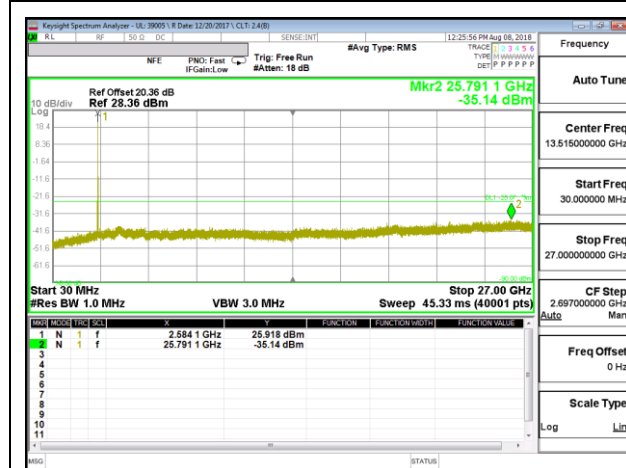
LTE B41 20MHz QPSK Mid Channel RB1-0



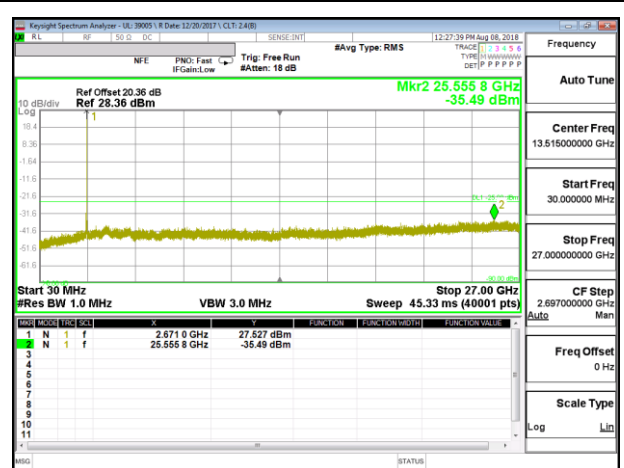
LTE B41 20MHz QPSK High Channel RB1-0



LTE B41 20MHz 16QAM Low Channel RB1-0



LTE B41 20MHz 16QAM Mid Channel RB1-0



LTE B41 20MHz 16QAM High Channel RB1-0

10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54 and §90.213

LIMITS

FCC: §22.355, §90.213

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

FCC: §24.235 & §27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = -30°C to $+50^{\circ}\text{C}$
- Voltage = (85% - 115%)
Low voltage, 3.3VDC, Normal, 3.85VDC and High voltage, 4.43VDC.
End Voltage, 3.2VDC.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

- GSM 850
- GSM 1900
- WCDM Band 5
- WCDM Band 2
- LTE Band 5
- LTE Band 41

RESULTS

10.4.1. GSM 850MHz

ID:	39004	Date:	8/10/18
------------	-------	--------------	---------

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.0638	848.9481		
Extreme (50C)		824.0638	848.9481	-14.0	-0.017
Extreme (40C)		824.0638	848.9481	-15.7	-0.019
Extreme (30C)		824.0638	848.9481	-16.8	-0.020
Extreme (10C)		824.0638	848.9481	-15.6	-0.019
Extreme (0C)		824.0638	848.9481	-19.9	-0.024
Extreme (-10C)		824.0638	848.9481	-14.7	-0.018
Extreme (-20C)		824.0638	848.9481	-14.2	-0.017
Extreme (-30C)		824.0638	848.9481	-13.8	-0.016
20C	15%	824.0638	848.9481	-15.2	-0.018
	-15%	824.0638	848.9481	-15.1	-0.018
	End Point	824.0638	848.9481	-15.0	-0.018

10.4.2. GSM 1900MHz

ID:	39004	Date:	8/10/18
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Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.0680	1909.9270		
Extreme (50C)		1850.0680	1909.9270	15.0	0.008
Extreme (40C)		1850.0680	1909.9270	15.3	0.008
Extreme (30C)		1850.0680	1909.9270	14.6	0.008
Extreme (10C)		1850.0680	1909.9270	15.2	0.008
Extreme (0C)		1850.0680	1909.9270	17.6	0.009
Extreme (-10C)		1850.0680	1909.9270	16.8	0.009
Extreme (-20C)		1850.0680	1909.9270	17.2	0.009
Extreme (-30C)		1850.0680	1909.9270	17.3	0.009
20C	15%	1850.0680	1909.9270	16.6	0.009
	-15%	1850.0680	1909.9270	16.8	0.009
	End Point	1850.0680	1909.9270	17.2	0.009

10.4.3. WCDMA BAND 5

ID:	39004	Date:	8/10/18
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Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.1010	848.9030		
Extreme (50C)		824.1010	848.9030	-2.8	-0.0033
Extreme (40C)		824.1010	848.9030	-3.3	-0.0039
Extreme (30C)		824.1010	848.9030	-3.2	-0.0038
Extreme (10C)		824.1010	848.9030	-3.4	-0.0041
Extreme (0C)		824.1010	848.9030	-3.5	-0.0042
Extreme (-10C)		824.1010	848.9030	-3.1	-0.0037
Extreme (-20C)		824.1010	848.9030	-2.6	-0.0031
Extreme (-30C)		824.1010	848.9030	-3.1	-0.0037
20C	15%	824.1010	848.9030	-3.0	-0.0035
	-15%	824.1010	848.9030	-3.7	-0.0044
	End Point	824.1010	848.9030	-3.2	-0.0039

10.4.4. WCDMA BAND 2

ID:	39004	Date:	8/10/18
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Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.1260	1909.8650		
Extreme (50C)		1850.1260	1909.8650	-4.0	-0.0021
Extreme (40C)		1850.1260	1909.8650	-3.9	-0.0021
Extreme (30C)		1850.1260	1909.8650	-4.2	-0.0022
Extreme (10C)		1850.1260	1909.8650	-3.4	-0.0018
Extreme (0C)		1850.1260	1909.8650	-3.2	-0.0017
Extreme (-10C)		1850.1260	1909.8650	-3.5	-0.0019
Extreme (-20C)		1850.1260	1909.8650	-4.2	-0.0023
Extreme (-30C)		1850.1260	1909.8650	-4.1	-0.0022
20C	15%	1850.1260	1909.8650	-3.8	-0.0020
	-15%	1850.1260	1909.8650	-3.5	-0.0018
	End Point	1850.1260	1909.8650	-3.5	-0.0018

10.4.5. LTE BAND 5

ID:	39004	Date:	8/10/18
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Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.2940	848.6960		
Extreme (50C)		824.2940	848.6960	3.7	0.004
Extreme (40C)		824.2940	848.6960	3.2	0.004
Extreme (30C)		824.2940	848.6960	3.2	0.004
Extreme (10C)		824.2940	848.6960	4.2	0.005
Extreme (0C)		824.2940	848.6960	3.2	0.004
Extreme (-10C)		824.2940	848.6960	3.6	0.004
Extreme (-20C)		824.2940	848.6960	2.6	0.003
Extreme (-30C)		824.2940	848.6960	4.2	0.005
20C	15%	824.2940	848.6960	4.0	0.005
	-15%	824.2940	848.6960	3.8	0.004
	End Point	824.2940	848.6960	3.3	0.004

10.4.6. LTE BAND 41

ID:	39005	Date:	8/13/18
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Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2496.8160	2689.1840		
Extreme (50C)		2496.8160	2689.1840	-5.9	-0.002
Extreme (40C)		2496.8160	2689.1840	-7.5	-0.003
Extreme (30C)		2496.8160	2689.1840	-8.6	-0.003
Extreme (10C)		2496.8160	2689.1840	-8.2	-0.003
Extreme (0C)		2496.8160	2689.1840	-6.5	-0.002
Extreme (-10C)		2496.8160	2689.1840	-5.2	-0.002
Extreme (-20C)		2496.8160	2689.1840	-5.8	-0.002
Extreme (-30C)		2496.8160	2689.1840	-5.4	-0.002
20C	15%	2496.8160	2689.1840	-7.2	-0.003
	-15%	2496.8160	2689.1840	-7.5	-0.003
	End Point	2496.8160	2689.1840	-6.9	-0.003

10.1. PEAK TO AVERAGE RATIO

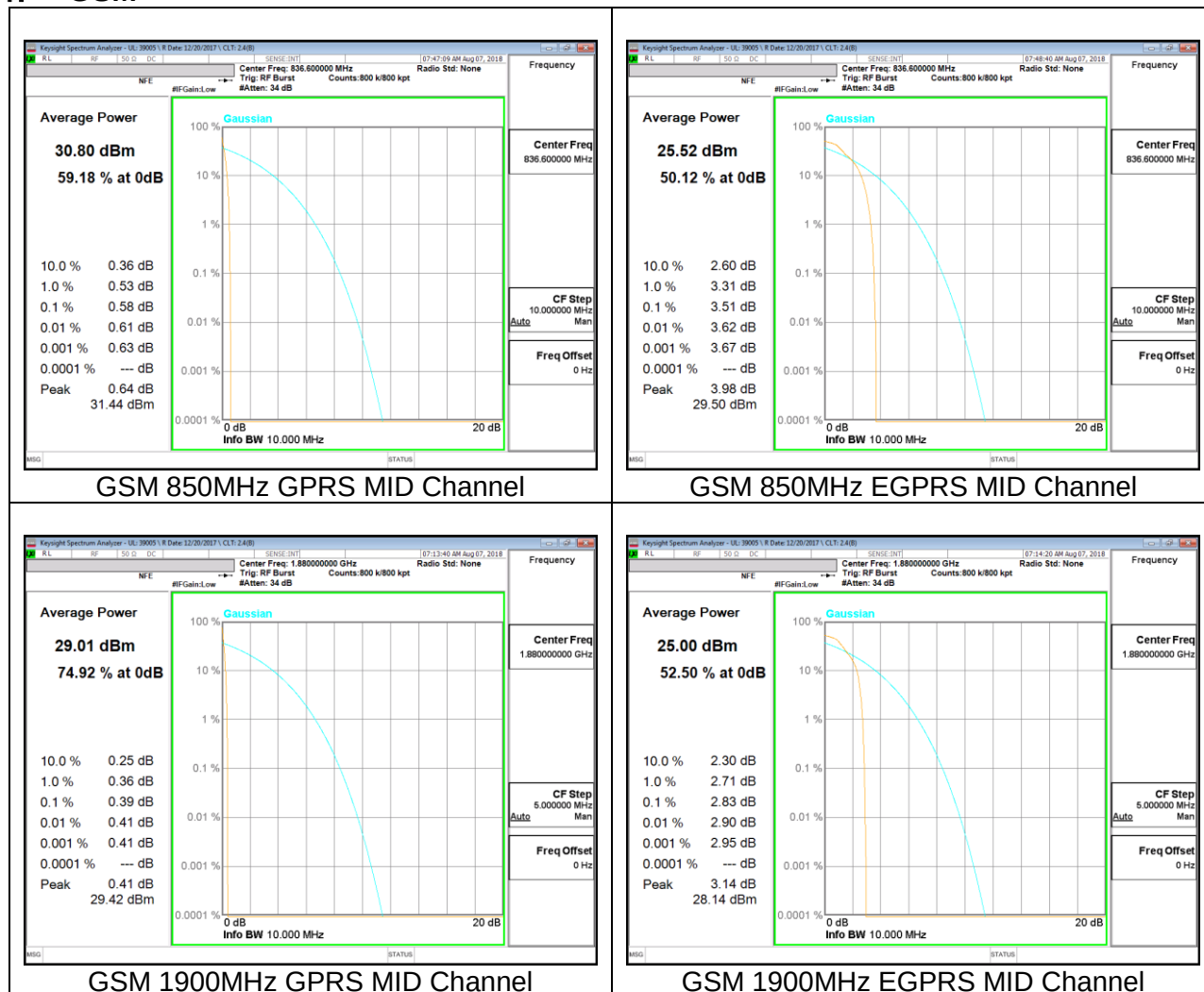
LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

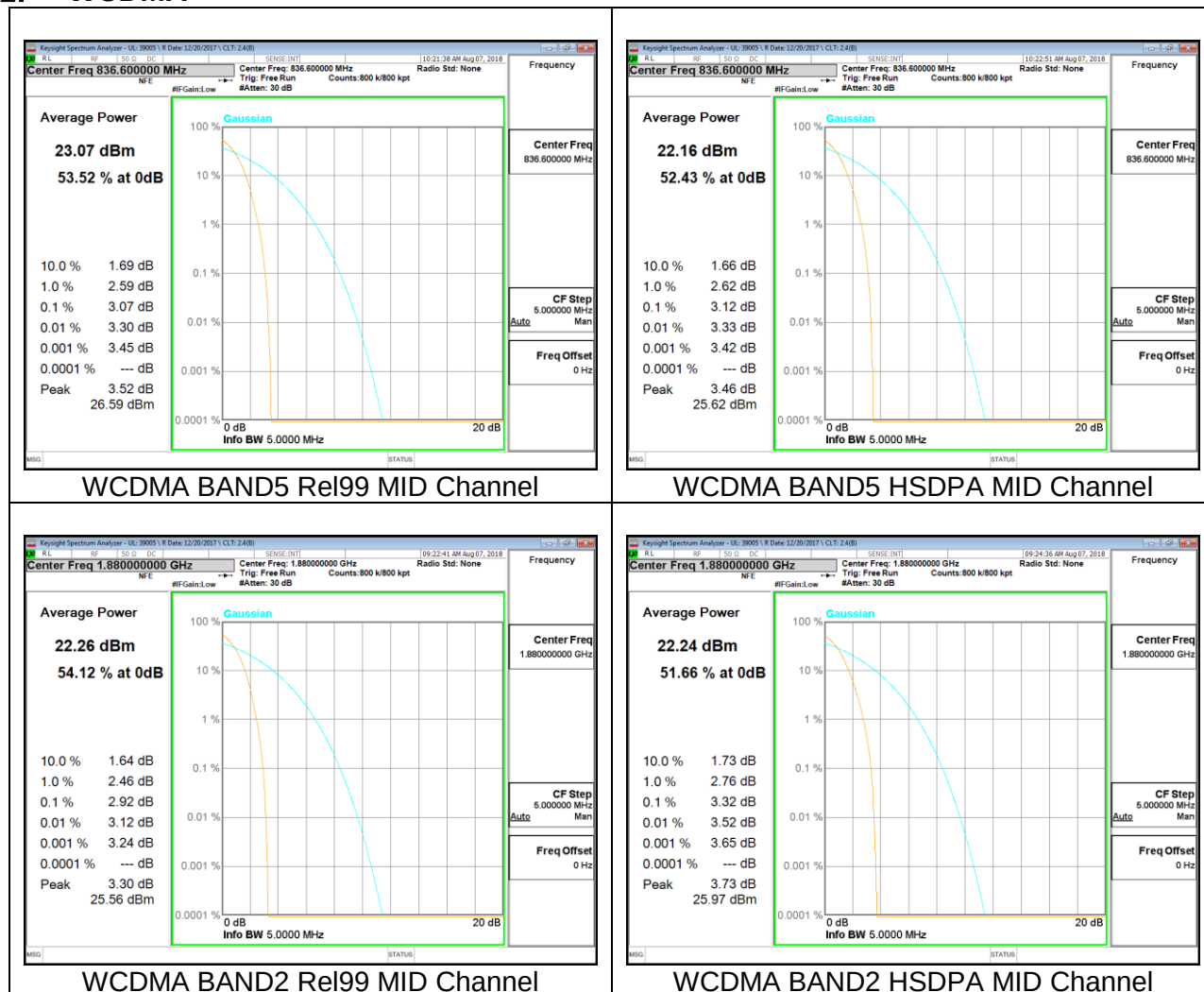
RESULT

Full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average power ratio criteria.

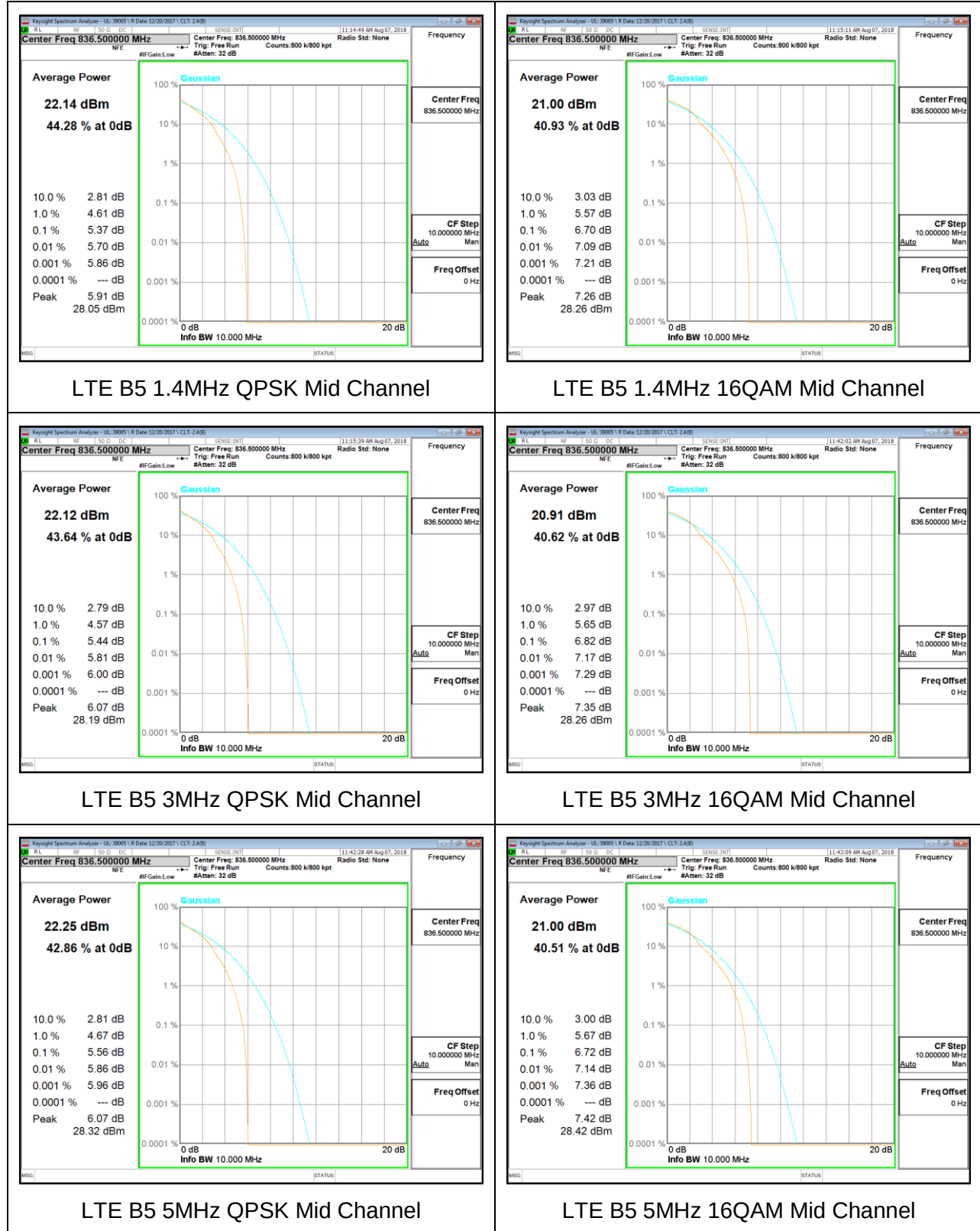
10.1.1. GSM

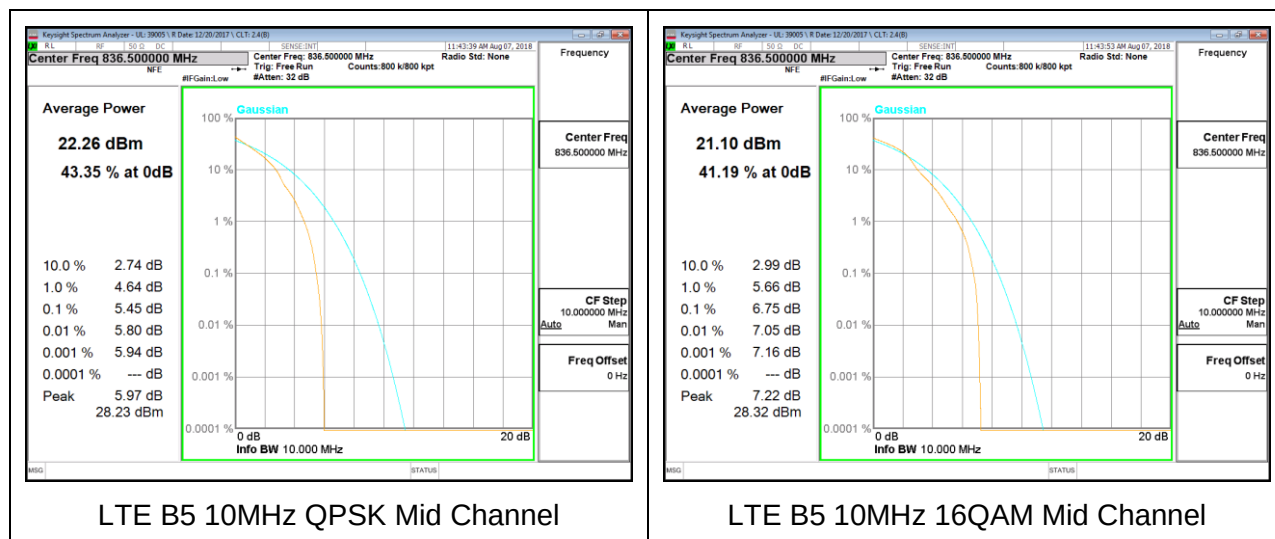


10.1.2. WCDMA

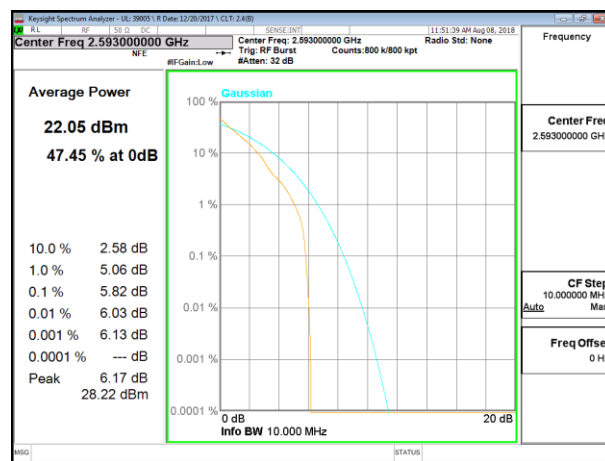


10.1.3. LTE BAND 5

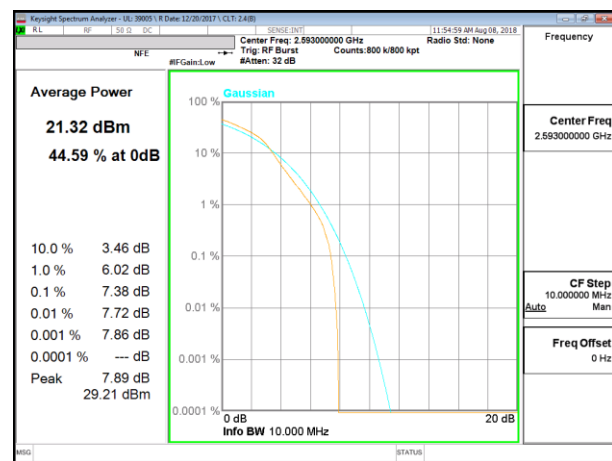




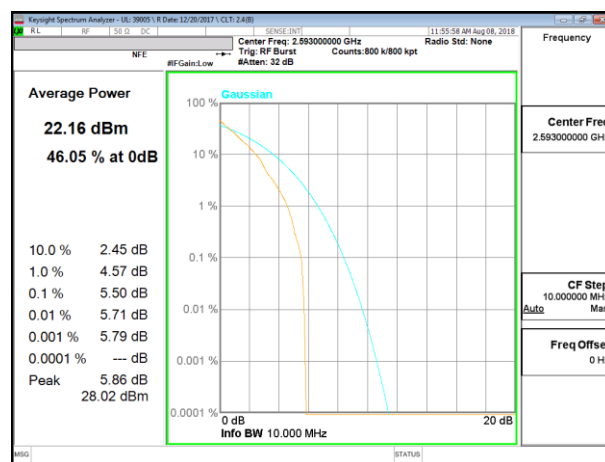
10.1.4. LTE BAND 41



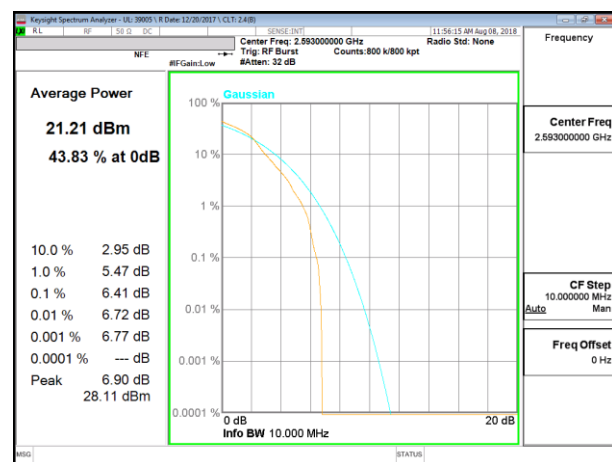
LTE B41 5MHz QPSK Middle Channel



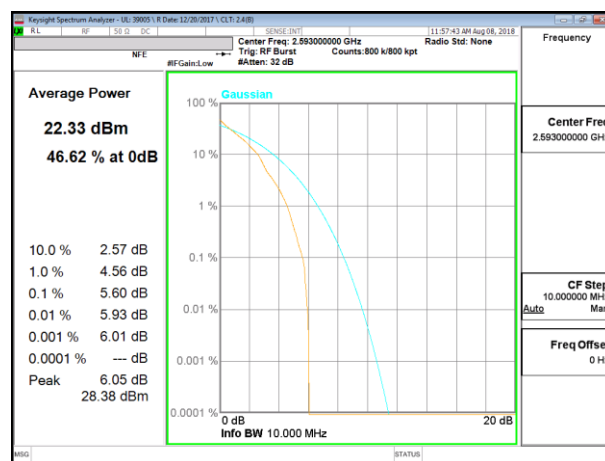
LTE B41 5MHz 16QAM Middle Channel



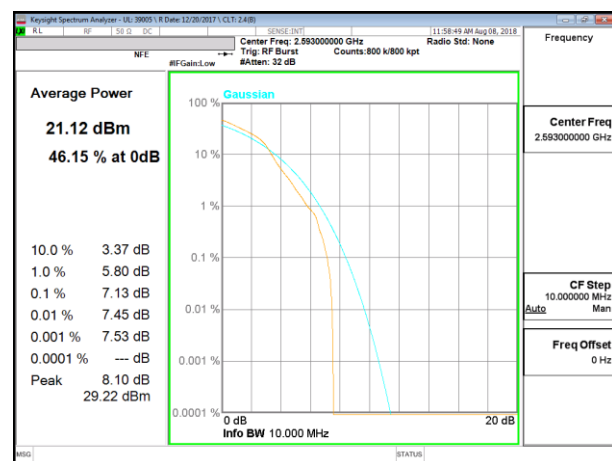
LTE B41 10MHz QPSK Middle Channel



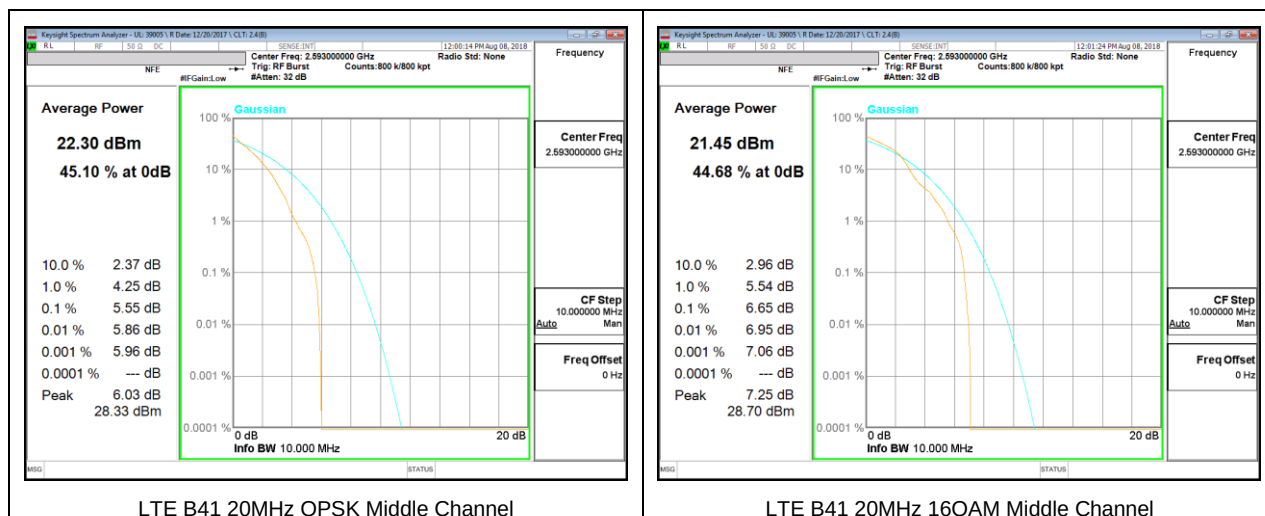
LTE B41 10MHz 16QAM Middle Channel



LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel



11. RADIATED TEST RESULTS

11.1. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

LIMIT

FCC: §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.

FCC: §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 D01 v02r02/D02 v01

TIA-603-E, Section 2.2.12.

MODES TESTED

- GSM 850
- GSM 1900
- WCDM Band 5
- WCDM Band 2
- LTE Band 5
- LTE Band 41

NOTE: All bandwidths were tested but only highest bandwidth recorded on the report as worst case.

RESULTS

11.1.1. GSM

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			GPRS 850MHz								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
1.648	-60.5	Pk	28.5	-35.5	10.1	-57.4	-13	-44.4	0-360	150	H
2.472	-65.95	Pk	32.2	-35.4	11	-58.15	-13	-45.15	0-360	150	H
3.291	-67.28	Pk	32.8	-33.6	10.8	-57.28	-13	-44.28	0-360	150	H
1.648	-65.97	Pk	28.5	-35.5	10.9	-62.07	-13	-49.07	0-360	150	V
2.476	-66.55	Pk	32.3	-35.3	10.9	-58.65	-13	-45.65	0-360	150	V
3.292	-67.57	Pk	32.8	-33.6	10.9	-57.47	-13	-44.47	0-360	150	V
Mid Channel											
* 1.673	-62.66	Pk	28.6	-35.5	9.9	-59.66	-13	-46.66	0-360	150	H
2.507	-64.99	Pk	32.3	-35.3	10	-57.99	-13	-44.99	0-360	150	H
* 3.338	-67.83	Pk	32.8	-33.4	10.7	-57.73	-13	-44.73	0-360	150	H
* 1.672	-65.54	Pk	28.6	-35.5	11.3	-61.14	-13	-48.14	0-360	150	V
2.51	-64.64	Pk	32.3	-35.3	11.5	-56.14	-13	-43.14	0-360	150	V
* 3.35	-67.96	Pk	32.8	-33.5	10.7	-57.96	-13	-44.96	0-360	150	V
High Channel											
* 1.697	-61.61	Pk	28.7	-35.5	11.5	-56.91	-13	-43.91	0-360	150	H
2.548	-65.31	Pk	32.3	-35.3	10.1	-58.21	-13	-45.21	0-360	150	H
3.391	-67.64	Pk	32.6	-33.3	11.1	-57.24	-13	-44.24	0-360	150	H
* 1.7	-65.67	Pk	28.7	-35.5	11.7	-60.77	-13	-47.77	0-360	150	V
2.55	-66.46	Pk	32.3	-35.3	11	-58.46	-13	-45.46	0-360	150	V
3.391	-67.57	Pk	32.6	-33.3	11.1	-57.17	-13	-44.17	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			EGPRS 850MHz								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
1.648	-62.82	Pk	28.5	-35.5	10.1	-59.72	-13	-46.72	0-360	150	H
2.473	-63.62	Pk	32.2	-35.3	10.9	-55.82	-13	-42.82	0-360	150	H
3.304	-68.28	Pk	32.8	-33.5	10.7	-58.28	-13	-45.28	0-360	150	H
1.645	-65.12	Pk	28.5	-35.5	10.9	-61.22	-13	-48.22	0-360	150	V
2.472	-66.55	Pk	32.2	-35.4	11.1	-58.65	-13	-45.65	0-360	150	V
3.301	-67.46	Pk	32.8	-33.4	11.1	-56.96	-13	-43.96	0-360	150	V
Mid Channel											
1.673	-63.29	Pk	28.6	-35.5	9.9	-60.29	-13	-47.29	0-360	150	H
2.503	-65.58	Pk	32.3	-35.2	10	-58.48	-13	-45.48	0-360	150	H
3.354	-67.43	Pk	32.8	-33.5	10.6	-57.53	-13	-44.53	0-360	150	H
1.678	-65.29	Pk	28.6	-35.5	11.2	-60.99	-13	-47.99	0-360	150	V
2.51	-65.84	Pk	32.3	-35.3	11.5	-57.34	-13	-44.34	0-360	150	V
3.343	-68.05	Pk	32.8	-33.4	10.8	-57.85	-13	-44.85	0-360	150	V
High Channel											
1.698	-62.65	Pk	28.7	-35.5	11.5	-57.95	-13	-44.95	0-360	150	H
2.544	-65.75	Pk	32.3	-35.3	10	-58.75	-13	-45.75	0-360	150	H
3.389	-66.47	Pk	32.6	-33.4	11	-56.27	-13	-43.27	0-360	150	H
1.692	-65.1	Pk	28.7	-35.5	11.9	-60	-13	-47	0-360	150	V
2.55	-66.14	Pk	32.3	-35.3	11	-58.14	-13	-45.14	0-360	150	V
3.406	-67.34	Pk	32.6	-33.4	11.1	-57.04	-13	-44.04	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			GPRS1900MHz								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
3.699	-66.94	Pk	33.2	-32.5	10.8	-55.44	-13	-42.44	0-360	150	H
5.549	-70.07	Pk	34.6	-29.9	10.7	-54.67	-13	-41.67	0-360	150	H
7.383	-72.87	Pk	35.5	-27	10.4	-53.97	-13	-40.97	0-360	150	H
3.701	-67.96	Pk	33.2	-32.5	11.1	-56.16	-13	-43.16	0-360	150	V
5.551	-69.92	Pk	34.6	-29.9	10.9	-54.32	-13	-41.32	0-360	150	V
7.392	-73.15	Pk	35.5	-27	10.9	-53.75	-13	-40.75	0-360	150	V
Mid Channel											
3.76	-67.46	Pk	33.3	-32.5	10.4	-56.26	-13	-43.26	0-360	150	H
5.636	-71.04	Pk	34.6	-29.5	10.5	-55.44	-13	-42.44	0-360	150	H
7.515	-73.25	Pk	35.6	-26.8	10.5	-53.95	-13	-40.95	0-360	150	H
3.764	-67.12	Pk	33.4	-32.5	10.5	-55.72	-13	-42.72	0-360	150	V
5.65	-69.96	Pk	34.6	-29.4	10.6	-54.16	-13	-41.16	0-360	150	V
7.518	-73.76	Pk	35.6	-26.8	10.7	-54.26	-13	-41.26	0-360	150	V
High Channel											
3.828	-68.41	Pk	33.4	-32	10.4	-56.61	-13	-43.61	0-360	150	H
5.72	-70.52	Pk	34.9	-29.4	10.1	-54.92	-13	-41.92	0-360	150	H
7.623	-73.19	Pk	35.6	-26.5	10.4	-53.69	-13	-40.69	0-360	150	H
3.822	-68.45	Pk	33.4	-32.2	10.4	-56.85	-13	-43.85	0-360	150	V
5.73	-71.5	Pk	34.9	-29.4	10.6	-55.4	-13	-42.4	0-360	150	V
7.636	-74.03	Pk	35.6	-26.6	10.6	-54.43	-13	-41.43	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			EGPRS1900MHz								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
3.697	-67.92	Pk	33.2	-32.5	10.9	-56.32	-13	-43.32	0-360	150	H
5.549	-70.57	Pk	34.6	-29.9	10.7	-55.17	-13	-42.17	0-360	150	H
7.393	-72.34	Pk	35.5	-27	10.7	-53.14	-13	-40.14	0-360	150	H
3.696	-68.51	Pk	33.2	-32.5	11.2	-56.61	-13	-43.61	0-360	150	V
5.551	-71.06	Pk	34.6	-29.9	10.9	-55.46	-13	-42.46	0-360	150	V
7.394	-73.34	Pk	35.6	-27	10.9	-53.84	-13	-40.84	0-360	150	V
Mid Channel											
3.778	-68.35	Pk	33.4	-32.5	10.8	-56.65	-13	-43.65	0-360	150	H
5.653	-69.94	Pk	34.6	-29.4	10.2	-54.54	-13	-41.54	0-360	150	H
7.52	-72.76	Pk	35.6	-26.8	10.5	-53.46	-13	-40.46	0-360	150	H
3.766	-68.59	Pk	33.4	-32.5	10.4	-57.29	-13	-44.29	0-360	150	V
5.662	-69.6	Pk	34.7	-29.4	10.7	-53.6	-13	-40.6	0-360	150	V
7.538	-73.88	Pk	35.6	-26.8	10.5	-54.58	-13	-41.58	0-360	150	V
High Channel											
3.821	-67.74	Pk	33.4	-32.2	10.1	-56.44	-13	-43.44	0-360	150	H
5.716	-70.72	Pk	34.9	-29.3	10	-55.12	-13	-42.12	0-360	150	H
7.63	-73.63	Pk	35.6	-26.6	10.5	-54.13	-13	-41.13	0-360	150	H
3.826	-68.92	Pk	33.4	-32.1	10.5	-57.12	-13	-44.12	0-360	150	V
5.727	-70.54	Pk	34.9	-29.4	10.6	-54.44	-13	-41.44	0-360	150	V
7.646	-73.5	Pk	35.6	-26.6	10.4	-54.1	-13	-41.1	0-360	150	V

11.1.2. WCDMA

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			REL99 B5								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
1.654	-61.57	Pk	28.5	-35.5	10.2	-58.37	-13	-45.37	0-360	150	H
2.482	-63.94	Pk	32.3	-35.3	10.4	-56.54	-13	-43.54	0-360	150	H
3.299	-65.97	Pk	32.8	-33.4	10.6	-55.97	-13	-42.97	0-360	150	H
1.655	-65.84	Pk	28.5	-35.5	11.1	-61.74	-13	-48.74	0-360	150	V
2.476	-66.15	Pk	32.3	-35.3	10.9	-58.25	-13	-45.25	0-360	150	V
3.307	-67.98	Pk	32.8	-33.5	11.3	-57.38	-13	-44.38	0-360	150	V
Mid Channel											
1.67	-62.82	Pk	28.6	-35.5	10	-59.72	-13	-46.72	0-360	150	H
2.518	-65.76	Pk	32.3	-35.4	10.5	-58.36	-13	-45.36	0-360	150	H
3.343	-67.77	Pk	32.8	-33.4	10.6	-57.77	-13	-44.77	0-360	150	H
1.675	-65.67	Pk	28.6	-35.5	11.3	-61.27	-13	-48.27	0-360	150	V
2.507	-66.14	Pk	32.3	-35.3	11.3	-57.84	-13	-44.84	0-360	150	V
3.348	-67.17	Pk	32.8	-33.5	10.7	-57.17	-13	-44.17	0-360	150	V
High Channel											
1.691	-59.87	Pk	28.7	-35.4	11	-55.57	-13	-42.57	0-360	150	H
2.531	-65.85	Pk	32.3	-35.3	9.9	-58.95	-13	-45.95	0-360	150	H
3.389	-66.82	Pk	32.6	-33.4	11	-56.62	-13	-43.62	0-360	150	H
1.692	-65	Pk	28.7	-35.5	12	-59.8	-13	-46.8	0-360	150	V
2.54	-66.76	Pk	32.3	-35.3	10.5	-59.26	-13	-46.26	0-360	150	V
3.387	-67.41	Pk	32.6	-33.4	11.1	-57.11	-13	-44.11	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			HSDPA B5								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
1.654	-61.93	Pk	28.5	-35.5	10.2	-58.73	-13	-45.73	0-360	150	H
2.476	-63.47	Pk	32.3	-35.3	10.8	-55.67	-13	-42.67	0-360	150	H
3.314	-67.06	Pk	32.8	-33.4	10.9	-56.76	-13	-43.76	0-360	150	H
1.651	-65.17	Pk	28.5	-35.5	11	-61.17	-13	-48.17	0-360	150	V
2.476	-66.37	Pk	32.3	-35.3	10.9	-58.47	-13	-45.47	0-360	150	V
3.311	-68.44	Pk	32.8	-33.4	11.2	-57.84	-13	-44.84	0-360	150	V
Mid Channel											
1.67	-63.67	Pk	28.6	-35.5	10	-60.57	-13	-47.57	0-360	150	H
2.511	-64.67	Pk	32.3	-35.3	10.2	-57.47	-13	-44.47	0-360	150	H
3.341	-67.59	Pk	32.8	-33.3	10.6	-57.49	-13	-44.49	0-360	150	H
1.675	-65.89	Pk	28.6	-35.5	11.3	-61.49	-13	-48.49	0-360	150	V
2.509	-66.59	Pk	32.3	-35.3	11.5	-58.09	-13	-45.09	0-360	150	V
3.348	-67.77	Pk	32.8	-33.5	10.7	-57.77	-13	-44.77	0-360	150	V
High Channel											
1.694	-63.07	Pk	28.7	-35.5	11.4	-58.47	-13	-45.47	0-360	150	H
2.532	-64.47	Pk	32.3	-35.3	9.9	-57.57	-13	-44.57	0-360	150	H
3.378	-68.24	Pk	32.7	-33.4	10.9	-58.04	-13	-45.04	0-360	150	H
1.695	-65.96	Pk	28.7	-35.5	11.9	-60.86	-13	-47.86	0-360	150	V
2.543	-66	Pk	32.3	-35.3	10.6	-58.4	-13	-45.4	0-360	150	V
3.386	-68.54	Pk	32.7	-33.4	11.1	-58.14	-13	-45.14	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			REL99 B2								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
3.683	-67.68	Pk	33.1	-32.6	11.1	-56.08	-13	-43.08	0-360	150	H
5.524	-69.59	Pk	34.6	-29.9	10.6	-54.29	-13	-41.29	0-360	150	H
7.376	-72.64	Pk	35.5	-26.9	10.4	-53.64	-13	-40.64	0-360	150	H
3.706	-67.09	Pk	33.2	-32.6	11	-55.49	-13	-42.49	0-360	150	V
5.547	-69.79	Pk	34.6	-29.9	11	-54.09	-13	-41.09	0-360	150	V
7.408	-72.97	Pk	35.6	-26.9	10.7	-53.57	-13	-40.57	0-360	150	V
Mid Channel											
3.758	-66.31	Pk	33.3	-32.5	10.4	-55.11	-13	-42.11	0-360	150	H
5.667	-69.08	Pk	34.7	-29.4	10.6	-53.18	-13	-40.18	0-360	150	H
7.559	-72.85	Pk	35.6	-26.7	10.5	-53.45	-13	-40.45	0-360	150	H
3.766	-67.26	Pk	33.4	-32.5	10.4	-55.96	-13	-42.96	0-360	150	V
5.646	-69.27	Pk	34.6	-29.4	10.5	-53.57	-13	-40.57	0-360	150	V
7.531	-72.21	Pk	35.6	-26.8	10.6	-52.81	-13	-39.81	0-360	150	V
High Channel											
3.831	-68.94	Pk	33.4	-32.1	10.5	-57.14	-13	-44.14	0-360	150	H
5.734	-70.94	Pk	34.9	-29.3	10.4	-54.94	-13	-41.94	0-360	150	H
7.645	-73.24	Pk	35.6	-26.6	10.2	-54.04	-13	-41.04	0-360	150	H
3.823	-68.82	Pk	33.4	-32.2	10.4	-57.22	-13	-44.22	0-360	150	V
5.705	-70.92	Pk	34.9	-29.2	10.2	-55.02	-13	-42.02	0-360	150	V
7.612	-73.78	Pk	35.6	-26.6	10.6	-54.18	-13	-41.18	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/15/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			HSDPA B2								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
3.707	-66.06	Pk	33.2	-32.6	10.5	-54.96	-13	-41.96	0-360	150	H
5.554	-71	Pk	34.6	-29.9	10.8	-55.5	-13	-42.5	0-360	150	H
7.401	-73.52	Pk	35.6	-26.9	10.4	-54.42	-13	-41.42	0-360	150	H
3.705	-67.8	Pk	33.2	-32.6	11	-56.2	-13	-43.2	0-360	150	V
5.557	-70.87	Pk	34.6	-29.9	10.9	-55.27	-13	-42.27	0-360	150	V
7.416	-74.16	Pk	35.6	-26.9	10.6	-54.86	-13	-41.86	0-360	150	V
Mid Channel											
3.758	-64.82	Pk	33.3	-32.5	10.4	-53.62	-13	-40.62	0-360	150	H
5.644	-70.25	Pk	34.6	-29.4	10.1	-54.95	-13	-41.95	0-360	150	H
7.518	-72.73	Pk	35.6	-26.8	10.5	-53.43	-13	-40.43	0-360	150	H
3.763	-67.21	Pk	33.3	-32.5	10.5	-55.91	-13	-42.91	0-360	150	V
5.636	-70.74	Pk	34.6	-29.5	10.7	-54.94	-13	-41.94	0-360	150	V
7.513	-73.73	Pk	35.6	-26.8	10.8	-54.13	-13	-41.13	0-360	150	V
High Channel											
3.816	-66.23	Pk	33.4	-32.2	10.1	-54.93	-13	-41.93	0-360	150	H
5.724	-70.73	Pk	34.9	-29.3	10.4	-54.73	-13	-41.73	0-360	150	H
7.606	-73.49	Pk	35.5	-26.6	10.3	-54.29	-13	-41.29	0-360	150	H
3.819	-68.77	Pk	33.4	-32.2	10.3	-57.27	-13	-44.27	0-360	150	V
5.729	-70.4	Pk	34.9	-29.4	10.6	-54.3	-13	-41.3	0-360	150	V
7.636	-73.03	Pk	35.6	-26.6	10.6	-53.43	-13	-40.43	0-360	150	V

11.1.3. LTE BAND 5

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/10/18								
Test Engineer:			39004								
Configuration:			EUT+ Support Equipment								
Mode:			LTE 5 QPSK 10MHz								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
1.656	-62.26	Pk	28.5	-35.5	10.3	-58.96	-13	-45.96	0-360	150	H
2.467	-65.21	Pk	32.2	-35.3	10.8	-57.51	-13	-44.51	0-360	150	H
3.281	-65.02	Pk	32.9	-33.7	10.8	-55.02	-13	-42.02	0-360	150	H
1.661	-64.84	Pk	28.5	-35.4	10.9	-60.84	-13	-47.84	0-360	150	V
2.522	-64.41	Pk	32.3	-35.4	11.2	-56.31	-13	-43.31	0-360	150	V
3.313	-67.4	Pk	32.8	-33.4	11.2	-56.8	-13	-43.8	0-360	150	V
Mid Channel											
1.771	-65.34	Pk	29.8	-35.4	12.6	-58.34	-13	-45.34	0-360	150	H
2.437	-65.27	Pk	32.2	-35.3	11.3	-57.07	-13	-44.07	0-360	150	H
3.4	-66.11	Pk	32.6	-33.4	10.8	-56.11	-13	-43.11	0-360	150	H
1.761	-64.54	Pk	29.7	-35.4	11.9	-58.34	-13	-45.34	0-360	150	V
2.525	-64.9	Pk	32.3	-35.4	11	-57	-13	-44	0-360	150	V
3.326	-66.25	Pk	32.8	-33.3	11	-55.75	-13	-42.75	0-360	150	V
High Channel											
1.695	-64.96	Pk	28.7	-35.5	11.5	-60.26	-13	-47.26	0-360	150	H
2.571	-64.77	Pk	32.3	-35.2	10.8	-56.87	-13	-43.87	0-360	150	H
3.349	-66.06	Pk	32.8	-33.5	10.5	-56.26	-13	-43.26	0-360	150	H
1.71	-64.86	Pk	28.9	-35.5	12.2	-59.26	-13	-46.26	0-360	150	V
2.55	-65.21	Pk	32.3	-35.3	11	-57.21	-13	-44.21	0-360	150	V
3.349	-67.09	Pk	32.8	-33.5	10.7	-57.09	-13	-44.09	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/10/18								
Test Engineer:			39004								
Configuration:			EUT+ Support Equipment								
Mode:			LTE 5 16QAM 10MHZ								
Chamber #:			Chamber K								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
1.659	-62.12	Pk	28.5	-35.4	10.3	-58.72	-13	-45.72	0-360	150	H
2.445	-64.95	Pk	32.2	-35.3	11	-57.05	-13	-44.05	0-360	150	H
3.271	-65.78	Pk	32.9	-33.4	10.7	-55.58	-13	-42.58	0-360	150	H
1.629	-64.83	Pk	28.3	-35.5	12.3	-59.73	-13	-46.73	0-360	150	V
2.47	-65.37	Pk	32.2	-35.4	11.1	-57.47	-13	-44.47	0-360	150	V
3.291	-66.99	Pk	32.8	-33.6	10.9	-56.89	-13	-43.89	0-360	150	V
Mid Channel											
1.724	-64.23	Pk	29.2	-35.4	12	-58.43	-13	-45.43	0-360	150	H
2.425	-65.1	Pk	32.1	-35.3	11.4	-56.9	-13	-43.9	0-360	150	H
3.449	-65.63	Pk	32.6	-33.2	11.1	-55.13	-13	-42.13	0-360	150	H
1.732	-66.2	Pk	29.3	-35.5	12.6	-59.8	-13	-46.8	0-360	150	V
2.443	-64.34	Pk	32.2	-35.3	10.4	-57.04	-13	-44.04	0-360	150	V
3.409	-65.73	Pk	32.6	-33.4	11.1	-55.43	-13	-42.43	0-360	150	V
High Channel											
1.63	-63.54	Pk	28.3	-35.5	11.3	-59.44	-13	-46.44	0-360	150	H
2.477	-65.48	Pk	32.3	-35.3	10.8	-57.68	-13	-44.68	0-360	150	H
3.456	-66.65	Pk	32.6	-33.2	11.2	-56.05	-13	-43.05	0-360	150	H
1.635	-64.96	Pk	28.3	-35.5	12.1	-60.06	-13	-47.06	0-360	150	V
2.506	-65.22	Pk	32.3	-35.2	11.2	-56.92	-13	-43.92	0-360	150	V
3.474	-67.56	Pk	32.6	-33.2	10.8	-57.36	-13	-44.36	0-360	150	V

11.1.4. LTE BAND 41

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/14/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			LTE 41 QPSK 20MHz								
Chamber #:			Chamber L								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
5.001	-72.03	Pk	34.4	-28.7	10.4	-55.93	-25	-30.93	0-360	150	H
7.506	-74.94	Pk	35.7	-25.4	10.6	-54.04	-25	-29.04	0-360	150	H
10.02	-77.38	Pk	37.2	-21.7	10.5	-51.38	-25	-26.38	0-360	150	H
5.006	-72.56	Pk	34.4	-28.8	10.7	-56.26	-25	-31.26	0-360	150	V
7.511	-74.1	Pk	35.7	-25.4	10.8	-53	-25	-28	0-360	150	V
10.02	-77.69	Pk	37.2	-21.7	10.6	-51.59	-25	-26.59	0-360	150	V
Mid Channel											
5.186	-69.97	Pk	34.4	-29.1	10.5	-54.17	-25	-29.17	0-360	151	H
7.786	-75.76	Pk	35.8	-25.3	10.4	-54.86	-25	-29.86	0-360	151	H
10.372	-75.48	Pk	37.5	-21.3	10.3	-48.98	-25	-23.98	0-360	151	H
5.186	-71.59	Pk	34.4	-29.1	10.6	-55.69	-25	-30.69	0-360	151	V
7.778	-72.47	Pk	35.8	-25.3	10.4	-51.57	-25	-26.57	0-360	151	V
10.373	-76.87	Pk	37.5	-21.3	10.5	-50.17	-25	-25.17	0-360	151	V
High Channel											
5.366	-71.97	Pk	34.5	-28.7	10.6	-55.57	-25	-30.57	0-360	150	H
8.04	-74	Pk	35.8	-24.8	10.5	-52.5	-25	-27.5	0-360	150	H
10.7	-77.13	Pk	37.6	-21.9	9.9	-51.53	-25	-26.53	0-360	150	H
5.36	-73.29	Pk	34.5	-28.6	10.9	-56.49	-25	-31.49	0-360	150	V
8.04	-73.49	Pk	35.8	-24.8	10.7	-51.79	-25	-26.79	0-360	150	V
10.724	-77.42	Pk	37.7	-22	10.2	-51.52	-25	-26.52	0-360	150	V

Company:			SAMSUNG ELECTRONICS CO., LTD.								
Project #:			12440598								
Date:			8/14/18								
Test Engineer:			43575								
Configuration:			EUT+ Support Equipment								
Mode:			LTE 41 16QAM 20MHz								
Chamber #:			Chamber L								
Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	ETSI 417 TX Below 1GHz	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
Low Channel											
5.012	-71.55	Pk	34.4	-29	10.5	-55.65	-25	-30.65	0-360	150	H
7.517	-75.37	Pk	35.7	-25.4	10.5	-54.57	-25	-29.57	0-360	150	H
10.036	-77.26	Pk	37.2	-21.8	10.5	-51.36	-25	-26.36	0-360	150	H
5.012	-69.91	Pk	34.4	-29	10.7	-53.81	-25	-28.81	0-360	150	V
7.51	-73.8	Pk	35.7	-25.4	10.8	-52.7	-25	-27.7	0-360	150	V
10.019	-78	Pk	37.2	-21.7	10.6	-51.9	-25	-26.9	0-360	150	V
Mid Channel											
5.186	-71.15	Pk	34.4	-29.1	10.5	-55.35	-25	-30.35	0-360	150	H
7.779	-74.53	Pk	35.8	-25.3	10.2	-53.83	-25	-28.83	0-360	150	H
10.372	-75.51	Pk	37.5	-21.3	10.3	-49.01	-25	-24.01	0-360	150	H
5.186	-72.01	Pk	34.4	-29.1	10.6	-56.11	-25	-31.11	0-360	150	V
7.779	-73.52	Pk	35.8	-25.3	10.4	-52.62	-25	-27.62	0-360	150	V
10.372	-75.97	Pk	37.5	-21.3	10.5	-49.27	-25	-24.27	0-360	150	V
High Channel											
5.36	-72.38	Pk	34.5	-28.6	10.7	-55.78	-25	-30.78	0-360	150	H
8.048	-74.72	Pk	35.8	-24.8	10.5	-53.22	-25	-28.22	0-360	150	H
10.717	-77.52	Pk	37.7	-21.9	9.8	-51.92	-25	-26.92	0-360	150	H
5.36	-73.29	Pk	34.5	-28.6	10.9	-56.49	-25	-31.49	0-360	150	V
8.04	-73.9	Pk	35.8	-24.8	10.7	-52.2	-25	-27.2	0-360	150	V
10.728	-76.19	Pk	37.7	-22	10.1	-50.39	-25	-25.39	0-360	150	V