9.4. 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°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 place inside a temperature chamber. The temperature is set to 20ºC 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 +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

MODES TESTED

- GSM 850
- GSM 1900
- WCDMA Band 5
- WCDMA Band 2
- WCDMA Band 4
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 41
- LTE Band 66

RESULTS

See the following pages.

9.4.1. GSM

ID:	39004	Date:	11/1/18

GPRS 850MHz

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.0475	848.9518		
Extreme (50C)		824.0474	848.9518	-16.9	-0.020
Extreme (40C)		824.0474	848.9518	-17.9	-0.021
Extreme (30C)		824.0474	848.9518	-16.8	-0.020
Extreme (10C)		824.0474	848.9518	-18.0	-0.022
Extreme (0C)		824.0474	848.9518	-18.3	-0.022
Extreme (-10C)		824.0474	848.9518	-18.5	-0.022
Extreme (-20C)		824.0474	848.9518	-19.0	-0.023
Extreme (-30C)		824.0474	848.9518	-17.9	-0.021
20C	15%	824.0474	848.9518	-18.6	-0.022
	-15%	824.0474	848.9518	-18.0	-0.022
	End Point	824.0474	848.9518	-19.6	-0.023

GPRS 1900MHz

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0609	1909.9392		
Extreme (50C)		1850.0609	1909.9392	-7.9	-0.004
Extreme (40C)		1850.0609	1909.9392	-8.6	-0.005
Extreme (30C)		1850.0609	1909.9392	-8.5	-0.005
Extreme (10C)		1850.0609	1909.9392	-9.1	-0.005
Extreme (0C)		1850.0609	1909.9392	-11.0	-0.006
Extreme (-10C)		1850.0609	1909.9392	-9.9	-0.005
Extreme (-20C)		1850.0609	1909.9392	-10.9	-0.006
Extreme (-30C)		1850.0609	1909.9392	-11.0	-0.006
20C	15%	1850.0609	1909.9392	-12.0	-0.006
	-15%	1850.0609	1909.9392	-11.9	-0.006
	End Point	1850.0609	1909.9392	-11.5	-0.006

9.4.2. WCDMA

ID:	39004	Date:	11/2/18

UMTS REL99 BAND 5

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.0189	848.9701		
Extreme (50C)		824.0189	848.9701	3.0	0.0036
Extreme (40C)		824.0189	848.9701	2.7	0.0032
Extreme (30C)		824.0189	848.9701	2.9	0.0035
Extreme (10C)		824.0189	848.9701	2.4	0.0029
Extreme (0C)		824.0189	848.9701	2.8	0.0033
Extreme (-10C)		824.0189	848.9701	2.6	0.0031
Extreme (-20C)		824.0189	848.9701	2.5	0.0030
Extreme (-30C)		824.0189	848.9701	2.4	0.0029
20C	15%	824.0189	848.9701	2.5	0.0030
	-15%	824.0189	848.9701	2.7	0.0032
	End Point	824.0189	848.9701	2.6	0.0031

UMTS REL99 BAND 2

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0092	1909.9799		
Extreme (50C)		1850.0092	1909.9799	5.1	0.0027
Extreme (40C)		1850.0092	1909.9799	4.9	0.0026
Extreme (30C)		1850.0092	1909.9799	5.2	0.0028
Extreme (10C)		1850.0092	1909.9799	4.6	0.0024
Extreme (0C)		1850.0092	1909.9799	3.9	0.0021
Extreme (-10C)		1850.0092	1909.9799	3.6	0.0019
Extreme (-20C)		1850.0092	1909.9799	4.0	0.0021
Extreme (-30C)		1850.0092	1909.9799	3.8	0.0020
20C	15%	1850.0092	1909.9799	4.7	0.0025
	-15%	1850.0092	1909.9799	4.2	0.0022
	End Point	1850.0092	1909.9799	3.9	0.0020

UMTS REL99 BAND 4

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.0165	1754.9872		
Extreme (50C)		1710.0165	1754.9872	6.2	0.0036
Extreme (40C)		1710.0165	1754.9872	5.4	0.0031
Extreme (30C)		1710.0165	1754.9872	5.8	0.0033
Extreme (10C)		1710.0165	1754.9872	6.0	0.0035
Extreme (0C)		1710.0165	1754.9872	5.0	0.0029
Extreme (-10C)		1710.0165	1754.9872	5.6	0.0032
Extreme (-20C)		1710.0165	1754.9872	5.4	0.0031
Extreme (-30C)		1710.0165	1754.9872	5.9	0.0034
20C	15%	1710.0165	1754.9872	6.1	0.0035
	-15%	1710.0165	1754.9872	5.6	0.0032
	End Point	1710.0165	1754.9872	5.7	0.0033

9.4.3. LTE BAND 2

ID:	43575 OS	Date:	11/7/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.3270	1909.1650		
Extreme (50C)		1850.3270	1909.1650	-6.1	-0.003
Extreme (40C)		1850.3270	1909.1650	-8.2	-0.004
Extreme (30C)		1850.3270	1909.1650	-6.9	-0.004
Extreme (10C)		1850.3270	1909.1650	-6.4	-0.003
Extreme (0C)		1850.3270	1909.1650	6.7	0.004
Extreme (-10C)		1850.3270	1909.1650	7.7	0.004
Extreme (-20C)		1850.3270	1909.1650	-8.5	-0.005
Extreme (-30C)		1850.3270	1909.1650	-7.7	-0.004
20C	15%	1850.3270	1909.1650	-7.2	-0.004
	-15%	1850.3270	1909.1650	-6.0	-0.003
	End Point	1850.3270	1909.1650	-4.6	-0.002

9.4.4. LTE BAND 4

ID:	43575 OS	Date:	11/7/18

QPSK, (20MHz BANDWIDTH)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.3570	1754.6310		
Extreme (50C)		1710.3570	1754.6310	-8.4	-0.005
Extreme (40C)		1710.3570	1754.6310	-7.2	-0.004
Extreme (30C)		1710.3570	1754.6310	-7.3	-0.004
Extreme (10C)		1710.3570	1754.6310	-5.1	-0.003
Extreme (0C)		1710.3570	1754.6310	7.2	0.004
Extreme (-10C)		1710.3570	1754.6310	7.0	0.004
Extreme (-20C)		1710.3570	1754.6310	-7.2	-0.004
Extreme (-30C)		1710.3570	1754.6310	-5.6	-0.003
20C	15%	1710.3570	1754.6310	-6.6	-0.004
	-15%	1710.3570	1754.6310	-5.1	-0.003
	End Point	1710.3570	1754.6310	-5.9	-0.003

9.4.5. LTE BAND 5

ID:	43575 OS	Date:	11/7/18

QPSK, (10MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.3040	848.6820		
Extreme (50C)		824.3040	848.6820	3.7	0.004
Extreme (40C)		824.3040	848.6820	4.0	0.005
Extreme (30C)		824.3040	848.6820	3.1	0.004
Extreme (10C)		824.3040	848.6820	3.9	0.005
Extreme (0C)		824.3040	848.6820	4.4	0.005
Extreme (-10C)		824.3040	848.6820	5.6	0.007
Extreme (-20C)		824.3040	848.6820	3.1	0.004
Extreme (-30C)		824.3040	848.6820	-3.4	-0.004
20C	15%	824.3040	848.6820	-3.9	-0.005
	-15%	824.3040	848.6820	4.0	0.005
	End Point	824.3040	848.6820	3.8	0.004

9.4.6. LTE BAND 12

ID:	43575 OS	Date:	11/7/18

QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.3186	715.7000		
Extreme (50C)		699.3186	715.7000	7.3	0.01
Extreme (40C)		699.3186	715.7000	-11.8	-0.02
Extreme (30C)		699.3186	715.7000	11.4	0.02
Extreme (10C)		699.3186	715.7000	-5.5	-0.01
Extreme (0C)		699.3186	715.7000	8.2	0.01
Extreme (-10C)		699.3186	715.7000	7.0	0.01
Extreme (-20C)		699.3186	715.7000	7.4	0.01
Extreme (-30C)		699.3186	715.7000	6.3	0.01
20C	15%	699.3186	715.7000	-3.6	-0.01
	-15%	699.3186	715.7000	4.4	0.01
	End Point	699.3186	715.7000	4.5	0.01

9.4.7. LTE BAND 13

ID:	43575 OS	Date:	11/7/18

QPSK, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	777.0330	786.9780		
Extreme (50C)		777.0330	786.9780	7.6	0.010
Extreme (40C)		777.0330	786.9780	-9.1	-0.012
Extreme (30C)		777.0330	786.9780	-4.3	-0.006
Extreme (10C)		777.0330	786.9780	-4.2	-0.005
Extreme (0C)		777.0330	786.9780	4.7	0.006
Extreme (-10C)		777.0330	786.9780	4.4	0.006
Extreme (-20C)		777.0330	786.9780	-6.0	-0.008
Extreme (-30C)		777.0330	786.9780	5.7	0.007
20C	15%	777.0330	786.9780	5.0	0.006
	-15%	777.0330	786.9780	3.7	0.005
	End Point	777.0330	786.9780	-2.9	-0.004

9.4.8. LTE BAND 17

ID:	43575 OS	Date:	11/7/18

QPSK, (10MHz BANDWIDTH)

Limit		704	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	704.4200	715.5840		
Extreme (50C)		704.4200	715.5840	-8.9	-0.013
Extreme (40C)		704.4200	715.5840	14.3	0.020
Extreme (30C)		704.4200	715.5840	5.1	0.007
Extreme (10C)		704.4200	715.5840	-4.9	-0.007
Extreme (0C)		704.4200	715.5840	7.4	0.010
Extreme (-10C)		704.4200	715.5840	-15.7	-0.022
Extreme (-20C)		704.4200	715.5840	14.6	0.021
Extreme (-30C)		704.4200	715.5840	3.5	0.005
20C	15%	704.4200	715.5840	-3.2	-0.005
	-15%	704.4200	715.5840	3.0	0.004
	End Point	704.4200	715.5840	3.5	0.005

9.4.9. LTE BAND 25

ID:	43575 OS	Date:	11/9/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.8280	1914.1560		
Extreme (50C)		1850.8280	1914.1560	-11.4	-0.006
Extreme (40C)		1850.8280	1914.1560	-9.6	-0.005
Extreme (30C)		1850.8280	1914.1560	-7.2	-0.004
Extreme (10C)		1850.8280	1914.1560	-5.7	-0.003
Extreme (0C)		1850.8280	1914.1560	-6.7	-0.004
Extreme (-10C)		1850.8280	1914.1560	5.0	0.003
Extreme (-20C)		1850.8280	1914.1560	-6.3	-0.003
Extreme (-30C)		1850.8280	1914.1560	-6.6	-0.004
20C	15%	1850.8280	1914.1560	-7.0	-0.004
	-15%	1850.8280	1914.1560	-7.1	-0.004
	End Point	1850.8280	1914.1560	-7.5	-0.004

9.4.10. LTE BAND 26 (FCC PART 90S)

ID:	43575 OS	Date:	11/7/18

QPSK, (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	814.0030	823.9670		
Extreme (50C)		814.0030	823.9670	5.5	0.007
Extreme (40C)		814.0030	823.9670	-3.9	-0.005
Extreme (30C)		814.0030	823.9670	-4.7	-0.006
Extreme (10C)		814.0030	823.9670	-4.9	-0.006
Extreme (0C)		814.0030	823.9670	4.9	0.006
Extreme (-10C)		814.0030	823.9670	4.4	0.005
Extreme (-20C)		814.0030	823.9670	-3.8	-0.005
Extreme (-30C)		814.0030	823.9670	4.6	0.006
20C	15%	814.0030	823.9670	3.7	0.005
	-15%	814.0030	823.9670	3.8	0.005
	End Point	814.0030	823.9670	-3.9	-0.005

9.4.11. LTE BAND 26 (FCC PART 22)

ID:	43575 OS	Date:	11/7/18

QPSK, (15MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.3660	848.4150		
Extreme (50C)		824.3660	848.4150	-8.1	-0.010
Extreme (40C)		824.3660	848.4150	-4.5	-0.005
Extreme (30C)		824.3660	848.4150	3.6	0.004
Extreme (10C)		824.3660	848.4150	4.3	0.005
Extreme (0C)		824.3660	848.4150	4.9	0.006
Extreme (-10C)		824.3660	848.4150	4.4	0.005
Extreme (-20C)		824.3660	848.4150	-3.7	-0.004
Extreme (-30C)		824.3660	848.4150	-3.9	-0.005
20C	15%	824.3660	848.4150	-3.4	-0.004
	-15%	824.3660	848.4150	4.0	0.005
	End Point	824.3660	848.4150	3.7	0.004

9.4.12. LTE BAND 41 (FCC)

ID:	43575 OS	Date:	11/7/18

QPSK, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.8840	2689.1040		
Extreme (50C)		2496.8840	2689.1040	-9.8	-0.004
Extreme (40C)		2496.8840	2689.1040	-8.8	-0.003
Extreme (30C)		2496.8840	2689.1040	-7.5	-0.003
Extreme (10C)		2496.8840	2689.1040	7.0	0.003
Extreme (0C)		2496.8840	2689.1040	-7.6	-0.003
Extreme (-10C)		2496.8840	2689.1040	7.6	0.003
Extreme (-20C)		2496.8840	2689.1040	-8.8	-0.003
Extreme (-30C)		2496.8840	2689.1040	-10.8	-0.004
20C	15%	2496.8840	2689.1040	-9.0	-0.003
	-15%	2496.8840	2689.1040	-9.2	-0.004
	End Point	2496.8840	2689.1040	-10.3	-0.004

9.4.13. LTE BAND 66

ID:	43575 OS	Date:	11/7/18

QPSK, (20MHz BANDWIDTH)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.8280	1779.1760		
Extreme (50C)		1710.8280	1779.1760	-7.1	-0.004
Extreme (40C)		1710.8280	1779.1760	-7.3	-0.004
Extreme (30C)		1710.8280	1779.1760	-5.0	-0.003
Extreme (10C)		1710.8280	1779.1760	-5.9	-0.003
Extreme (0C)		1710.8280	1779.1760	8.7	0.005
Extreme (-10C)		1710.8280	1779.1760	5.6	0.003
Extreme (-20C)		1710.8280	1779.1760	-5.1	-0.003
Extreme (-30C)		1710.8280	1779.1760	-6.3	-0.004
20C	15%	1710.8280	1779.1760	-5.6	-0.003
	-15%	1710.8280	1779.1760	-3.8	-0.002
	End Point	1710.8280	1779.1760	-5.7	-0.003

9.5. PEAK TO AVERAGE RATIO

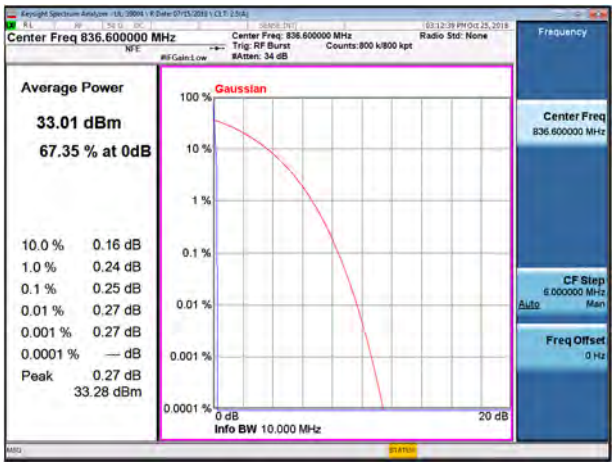
LIMITS

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.

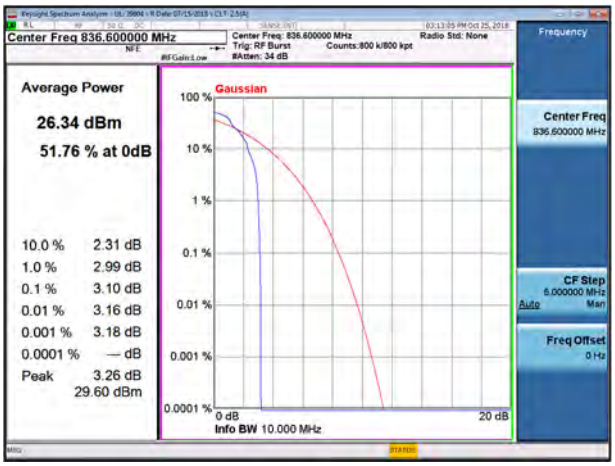
RESULT

LAT 1 antenna was used to measure as the worst case. The results from all CCDF plots are passed with 13dB peak-to-average power ratio criteria.

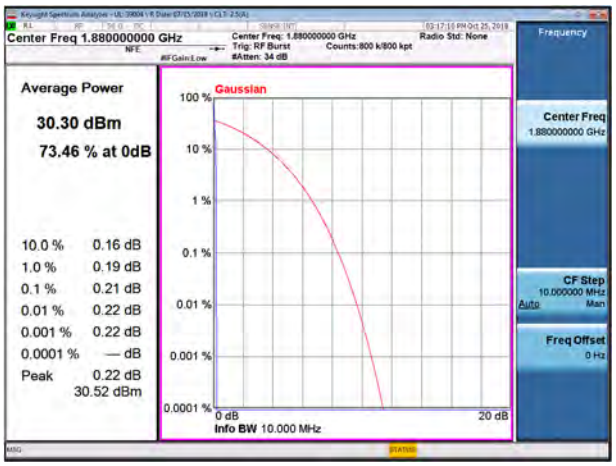
9.5.1. GSM



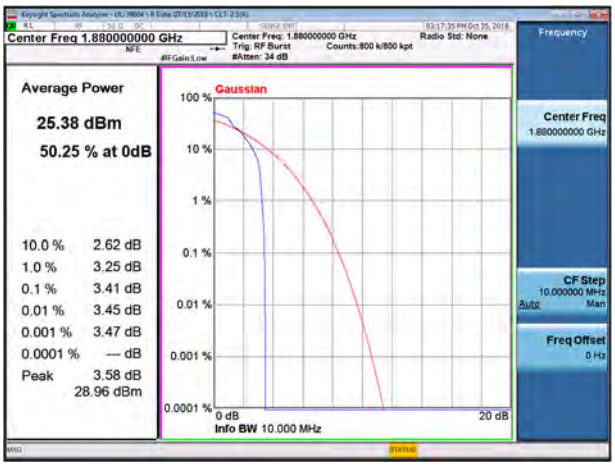
GSM 850MHz GPRS MID Channel



GSM 850MHz EGPRS MID Channel

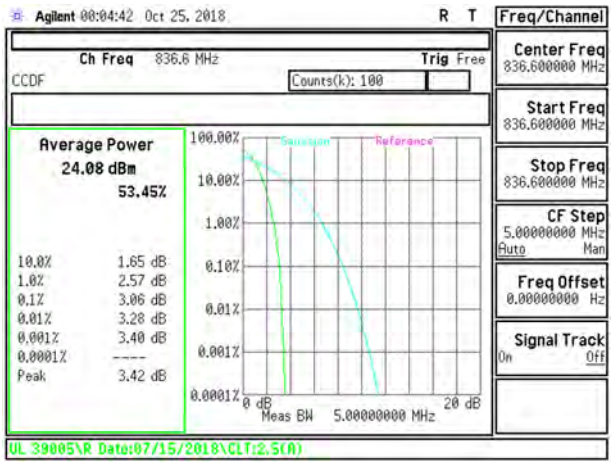


GSM 1900MHz GPRS MID Channel

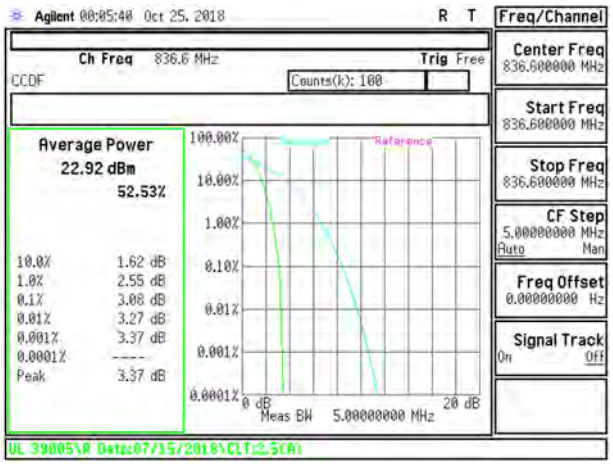


GSM 1900MHz EGPRS MID Channel

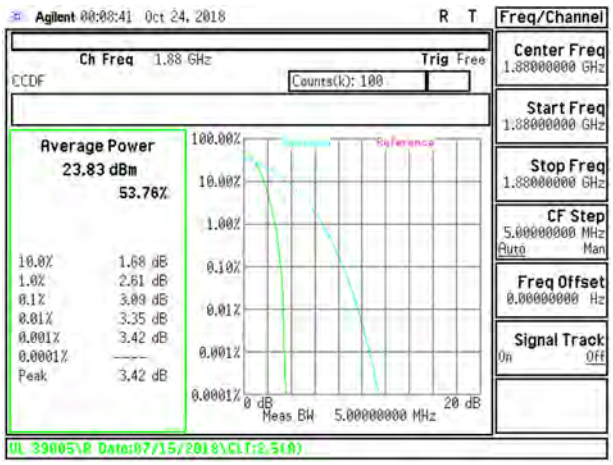
9.5.2. WCDMA



WCDMA BAND5 Rel99 MID Channel



WCDMA BAND5 HSDPA MID Channel



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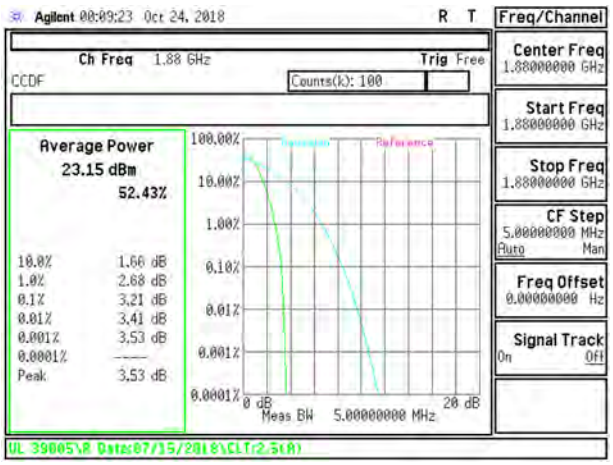

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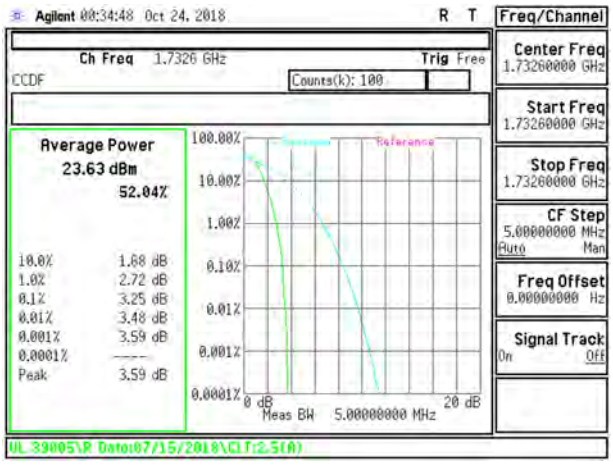
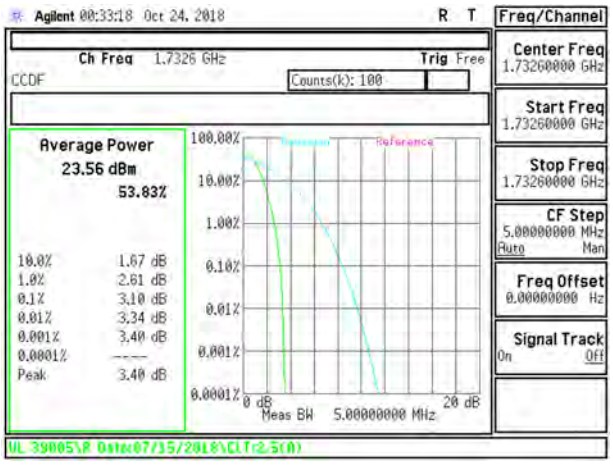
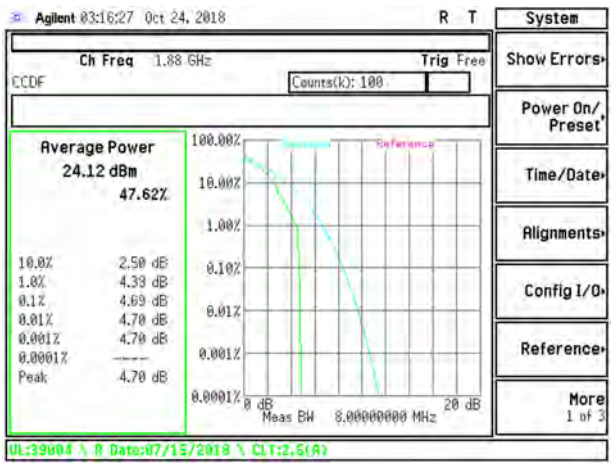


WCDMA BAND4 Rel99 MID Channel

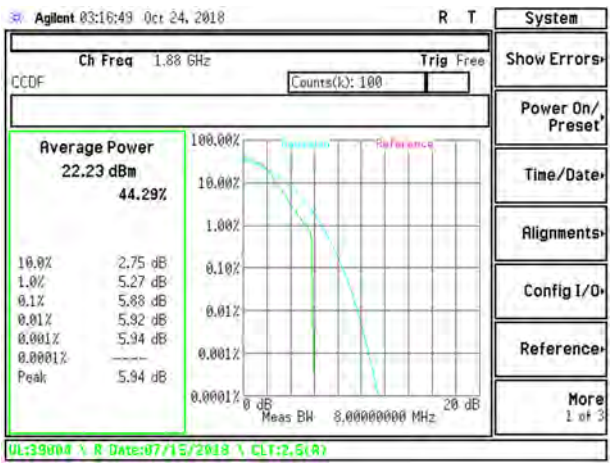


WCDMA BAND4 HSDPA MID Channel

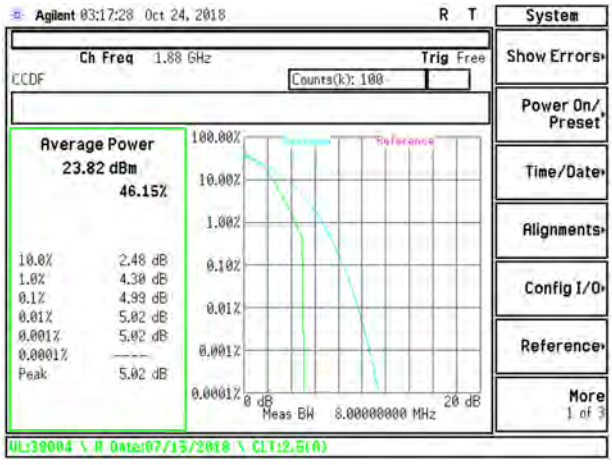
9.5.3. LTE BAND 2



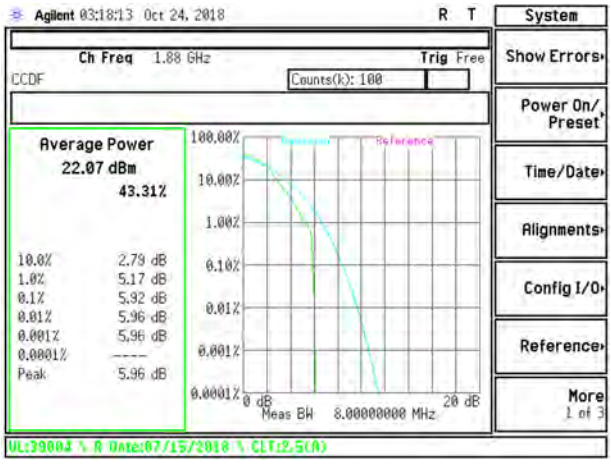
LTE B2 1.4MHz QPSK Mid Channel



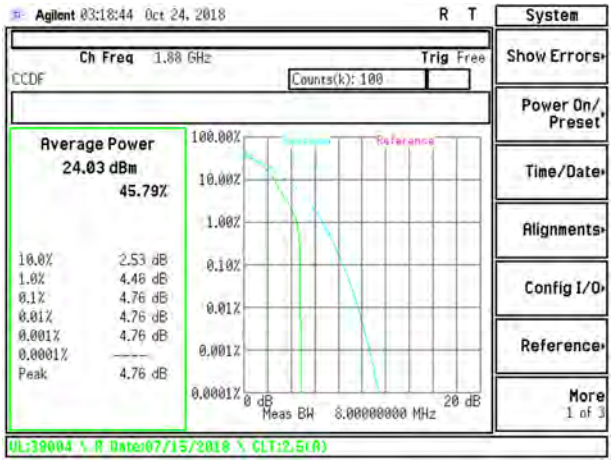
LTE B2 1.4MHz 16QAM Mid Channel



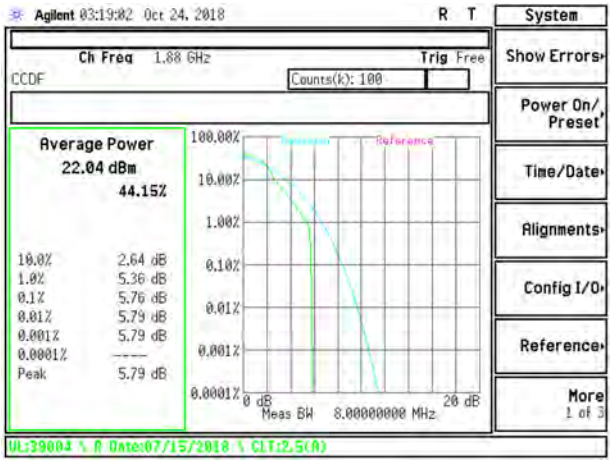
LTE B2 3MHz QPSK Mid Channel



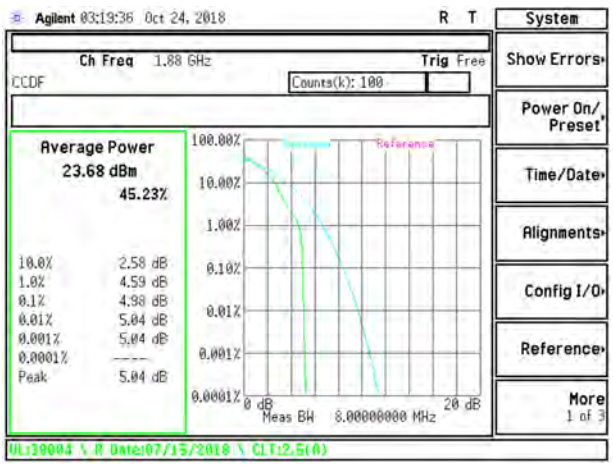
LTE B2 3MHz 16QAM Mid Channel



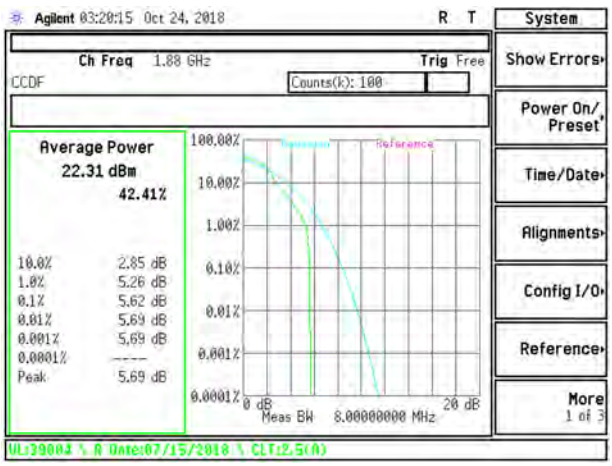
LTE B2 5MHz QPSK Mid Channel



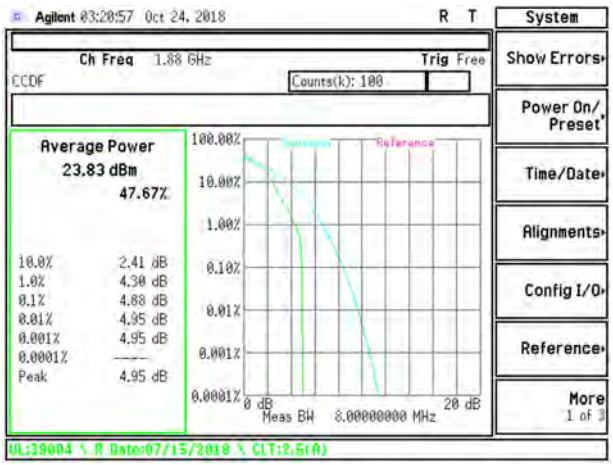
LTE B2 5MHz 16QAM Mid Channel



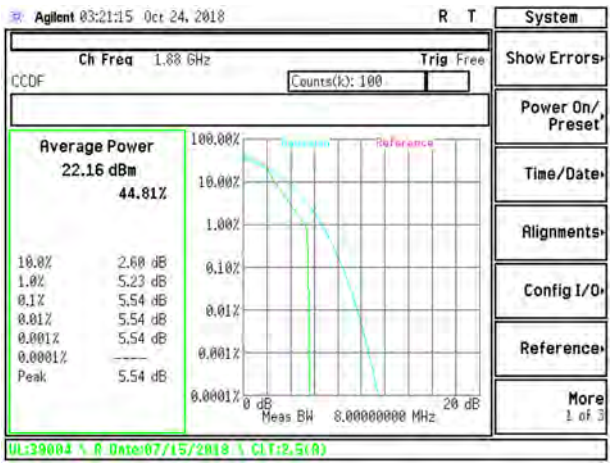
LTE B2 10MHz QPSK Mid Channel



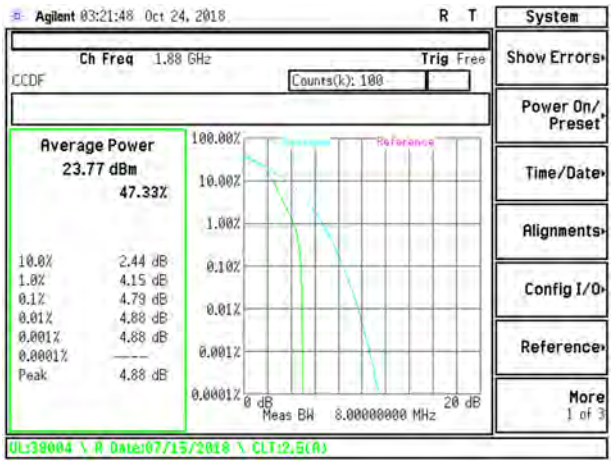
LTE B2 10MHz 16QAM Mid Channel



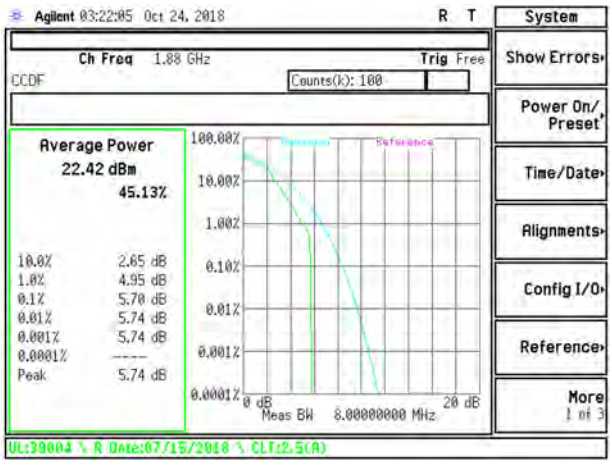
LTE B2 15MHz QPSK Mid Channel



LTE B2 15MHz 16QAM Mid Channel

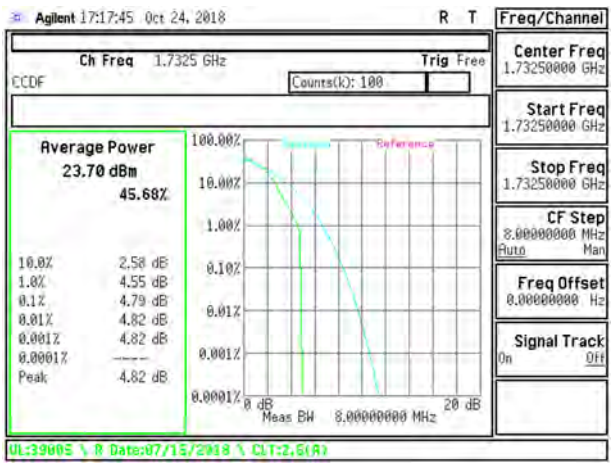


LTE B2 20MHz QPSK Mid Channel

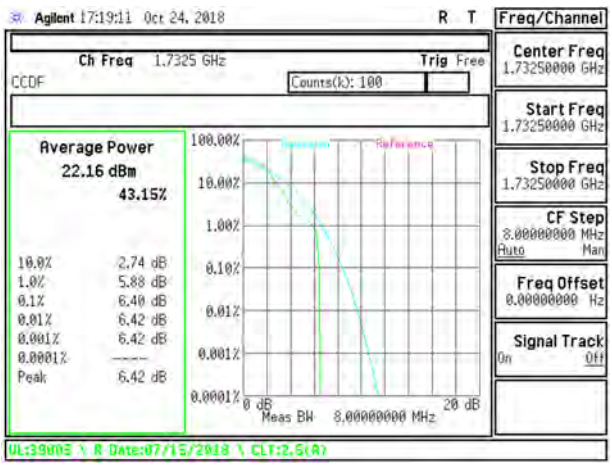


LTE B2 20MHz 16QAM Mid Channel

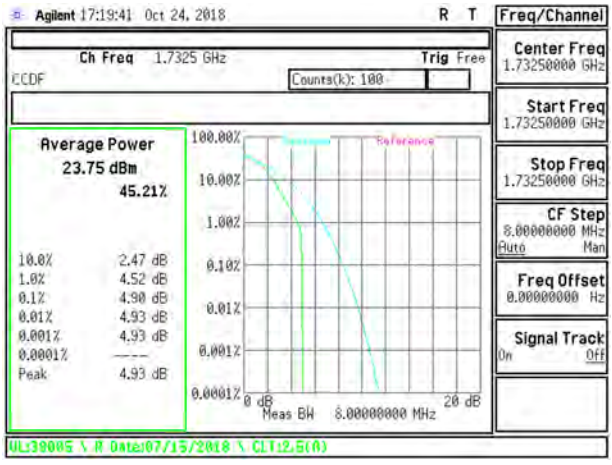
9.5.4. LTE BAND 4



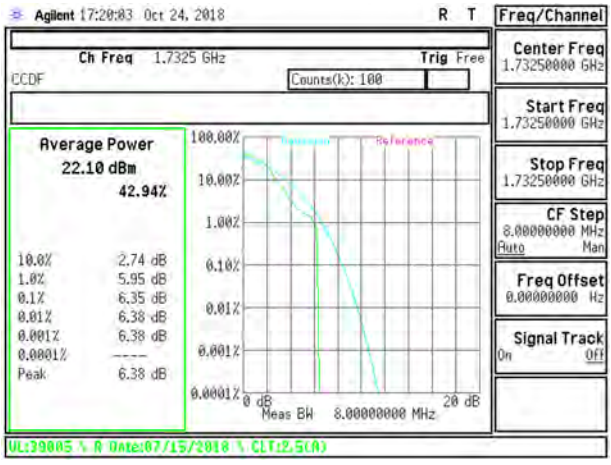
LTE B4 1.4MHz QPSK Mid Channel



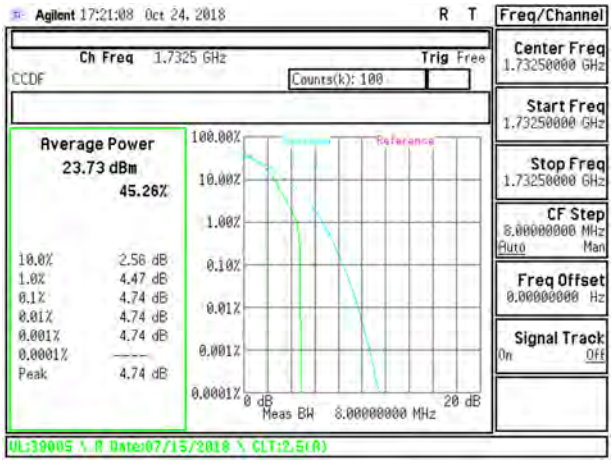
LTE B4 1.4MHz 16QAM Mid Channel



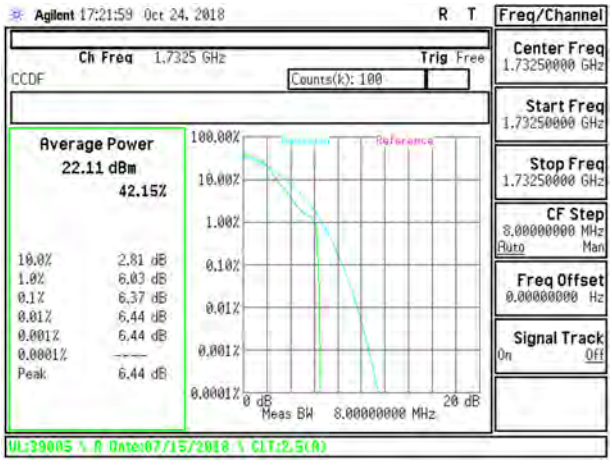
LTE B4 3MHz QPSK Mid Channel



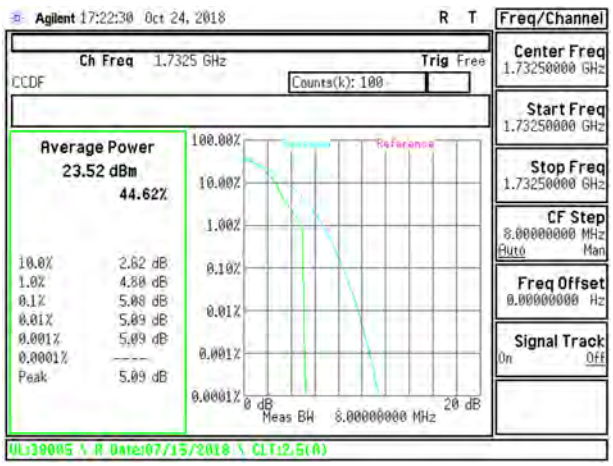
LTE B4 3MHz 16QAM Mid Channel



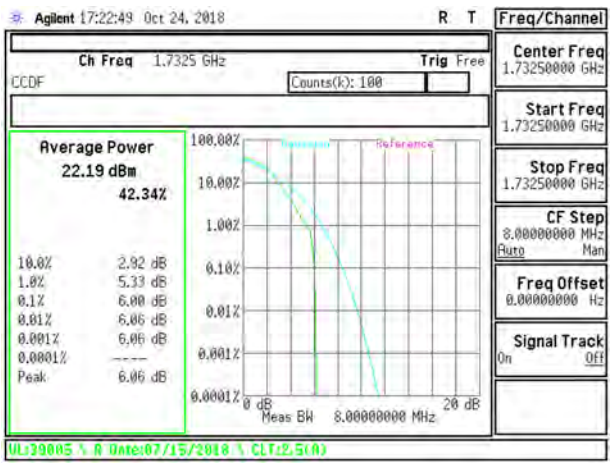
LTE B4 5MHz QPSK Mid Channel



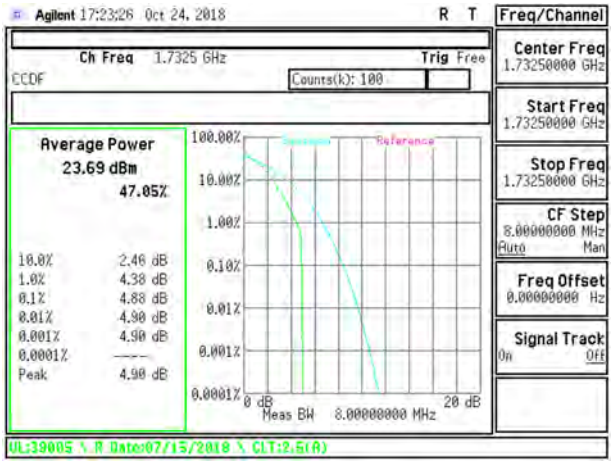
LTE B4 5MHz 16QAM Mid Channel



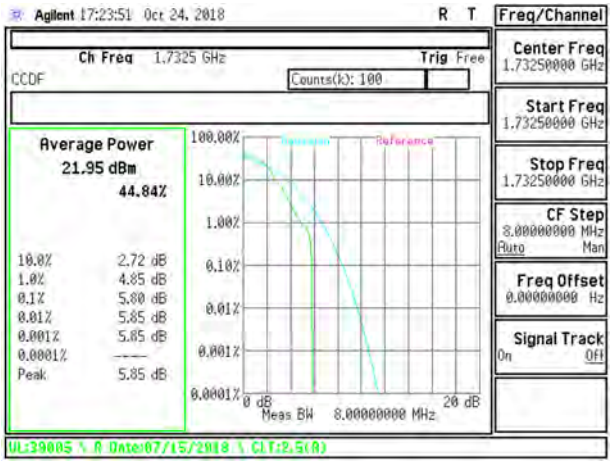
LTE B4 10MHz QPSK Mid Channel



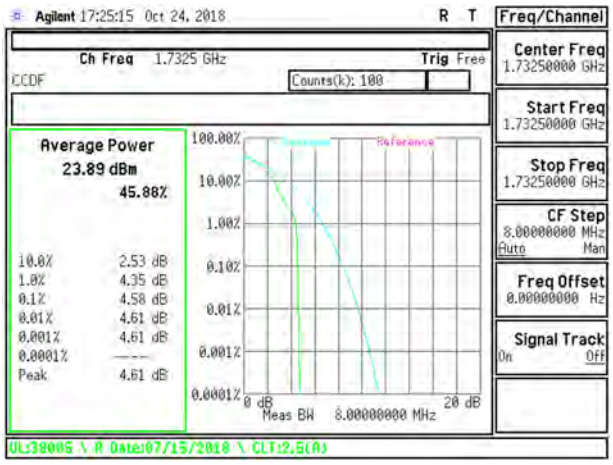
LTE B4 10MHz 16QAM Mid Channel



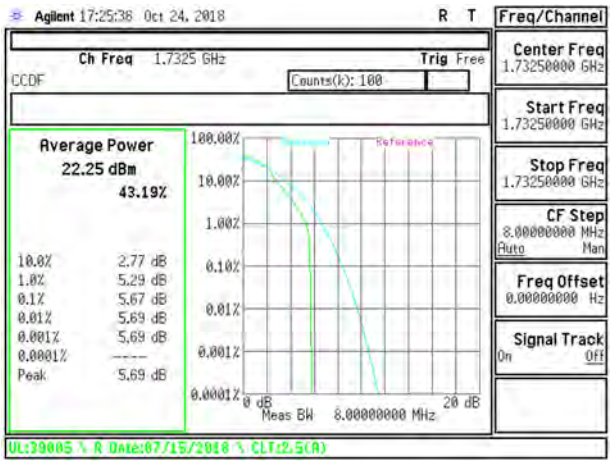
LTE B4 15MHz QPSK Mid Channel



LTE B4 15MHz 16QAM Mid Channel

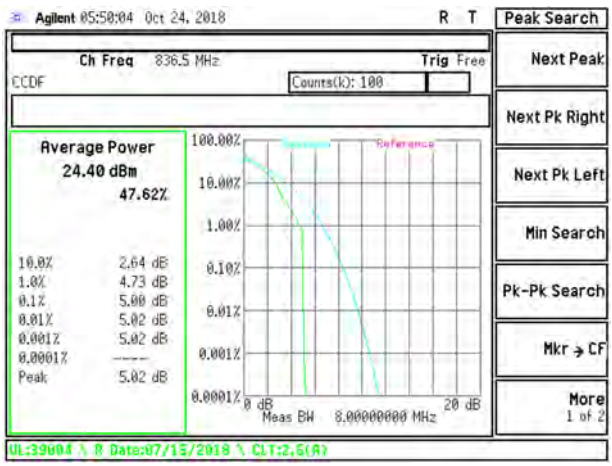


LTE B4 20MHz QPSK Mid Channel

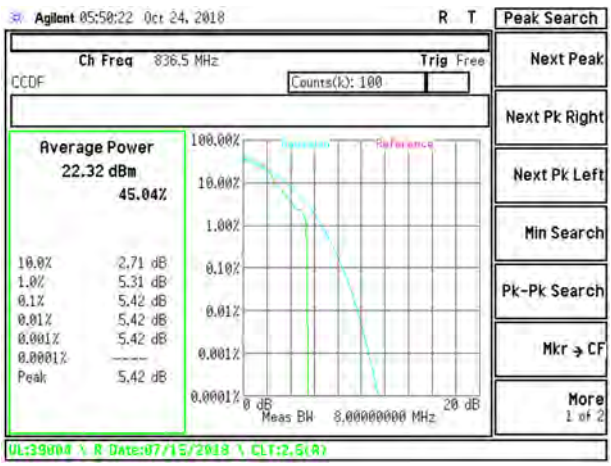


LTE B4 20MHz 16QAM Mid Channel

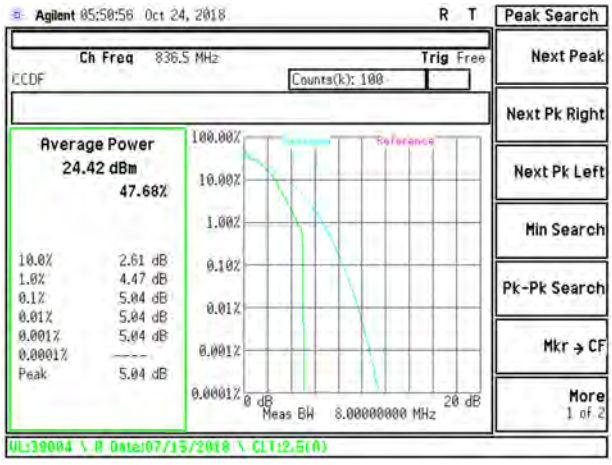
9.5.5. LTE BAND 5



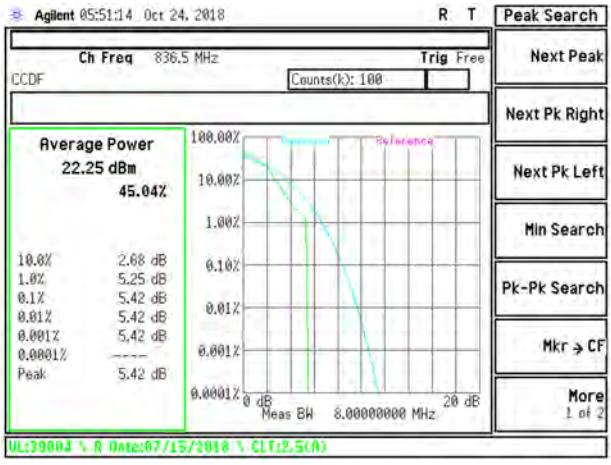
LTE B5 1.4MHz QPSK Mid Channel



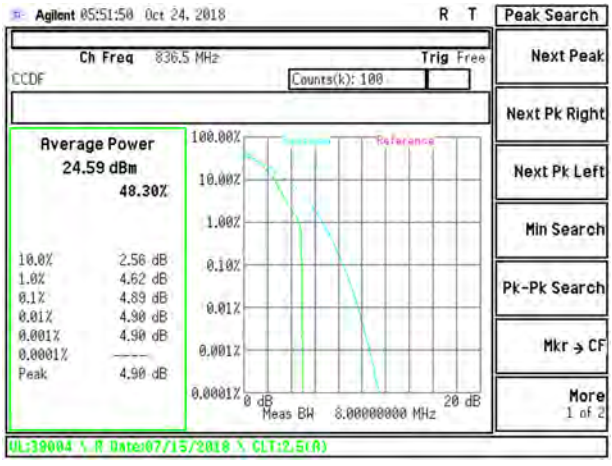
LTE B5 1.4MHz 16QAM Mid Channel



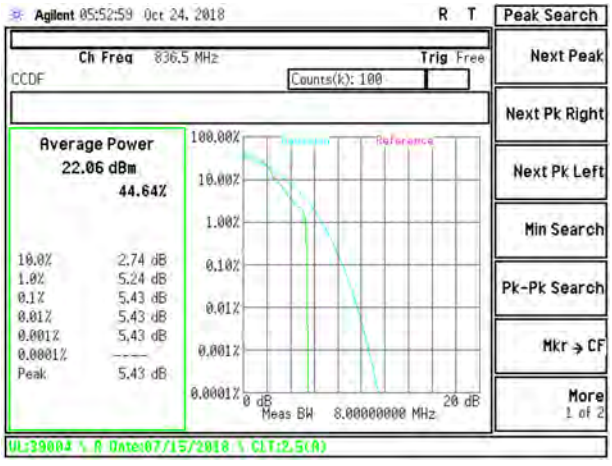
LTE B5 3MHz QPSK Mid Channel



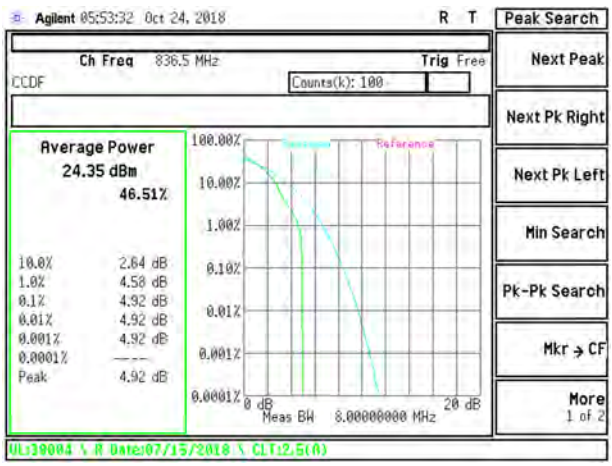
LTE B5 3MHz 16QAM Mid Channel



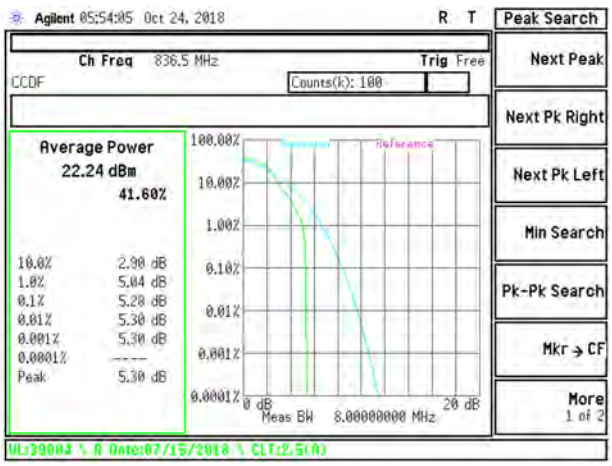
LTE B5 5MHz QPSK Mid Channel



LTE B5 5MHz 16QAM Mid Channel

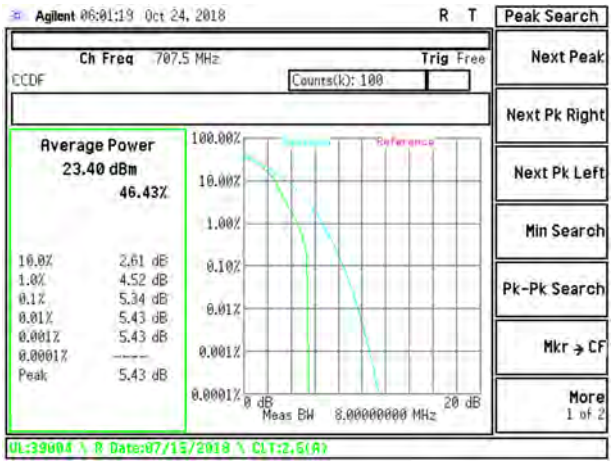


LTE B5 10MHz QPSK Mid Channel

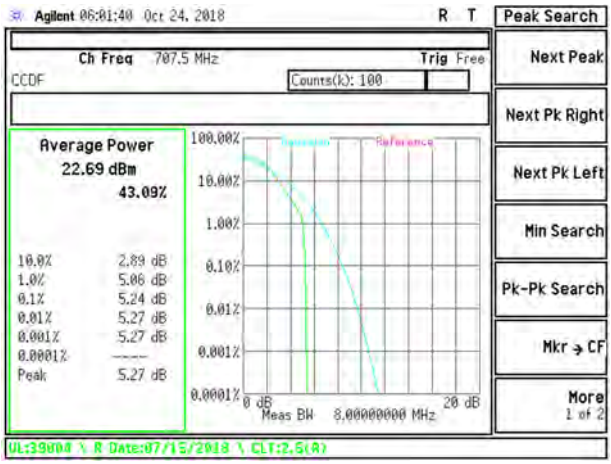


LTE B5 10MHz 16QAM Mid Channel

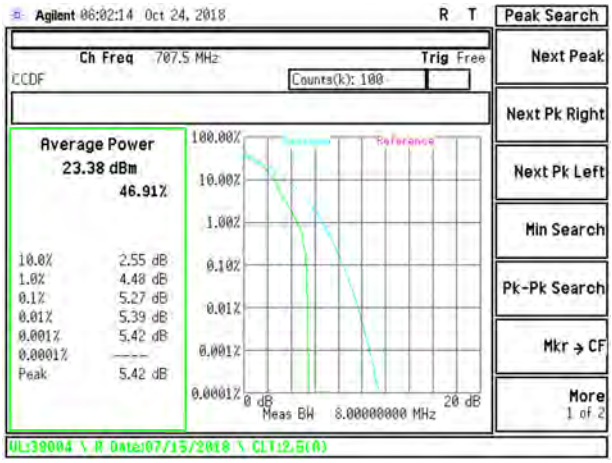
9.5.6. LTE BAND 12



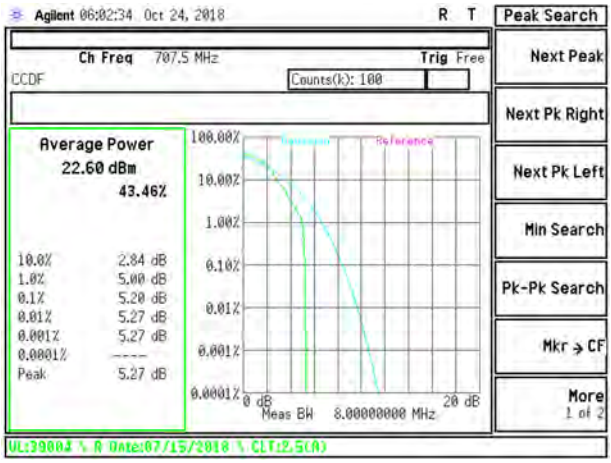
LTE B12 1.4MHz QPSK Mid Channel



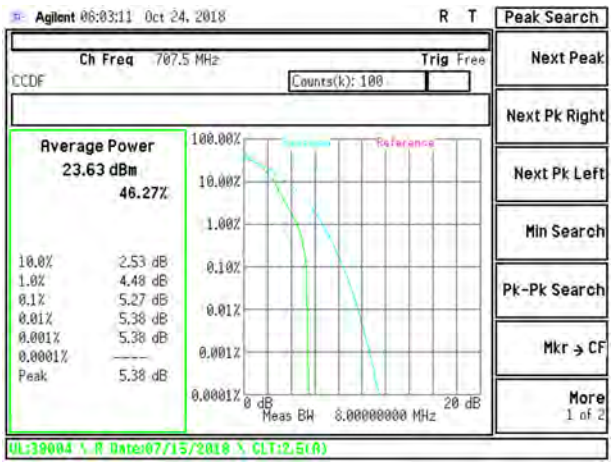
LTE B12 1.4MHz 16QAM Mid Channel



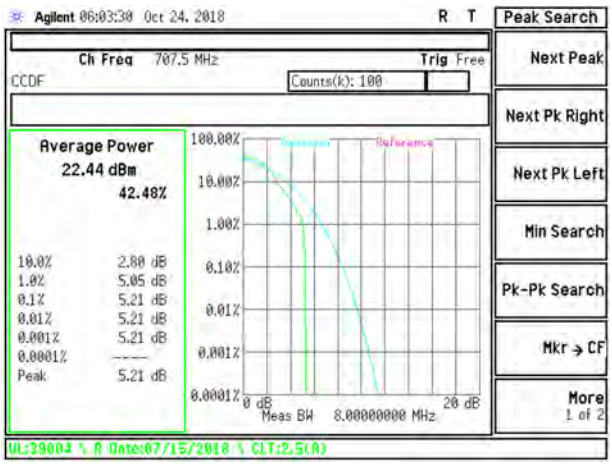
LTE B12 3MHz QPSK Mid Channel



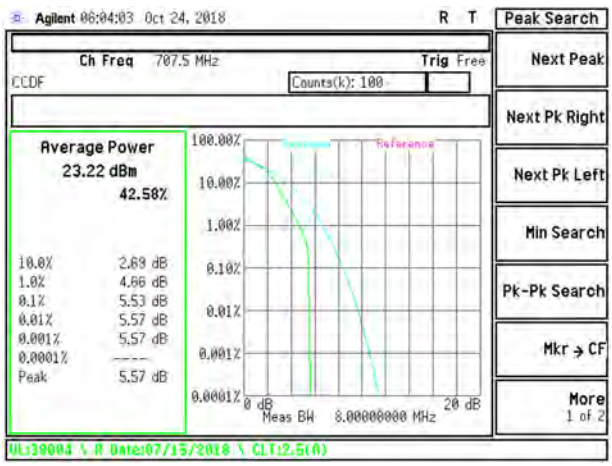
LTE B12 3MHz 16QAM Mid Channel



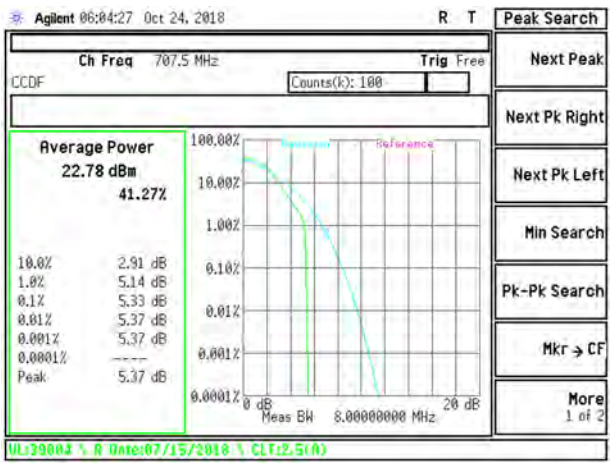
LTE B12 5MHz QPSK Mid Channel



LTE B12 5MHz 16QAM Mid Channel

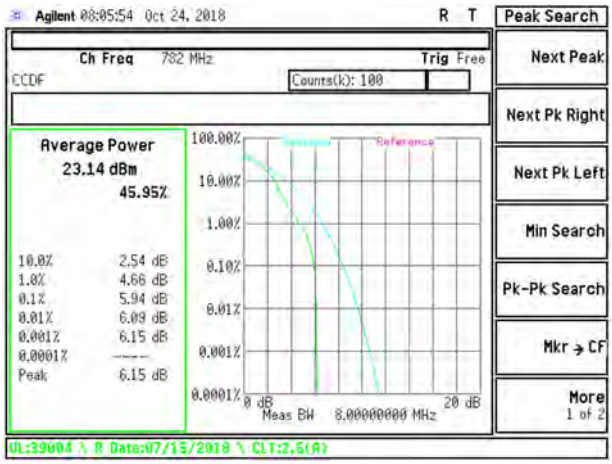


LTE B12 10MHz QPSK Mid Channel

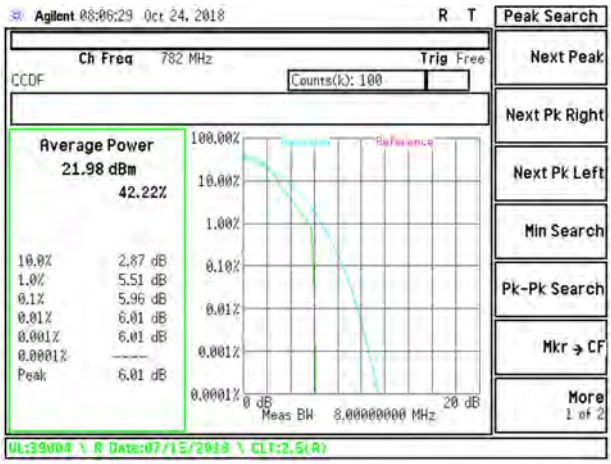


LTE B12 10MHz 16QAM Mid Channel

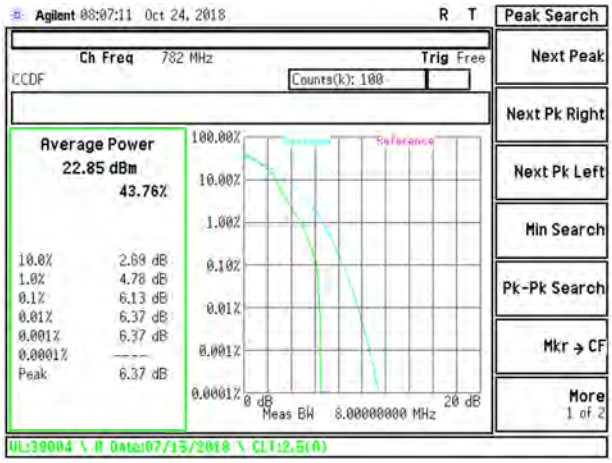
9.5.7. LTE BAND 13



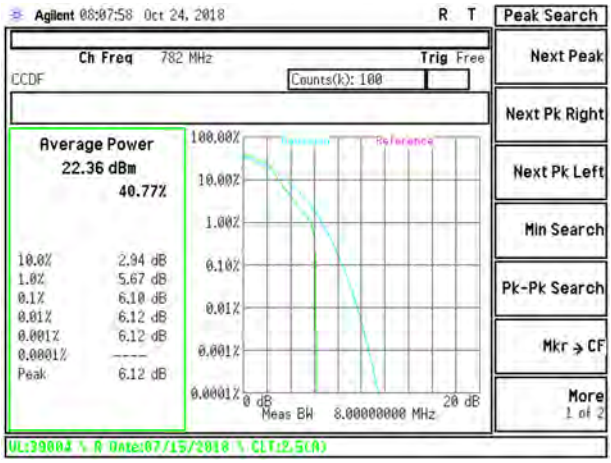
LTE B13 5MHz QPSK Mid Channel



LTE B13 5MHz 16QAM Mid Channel

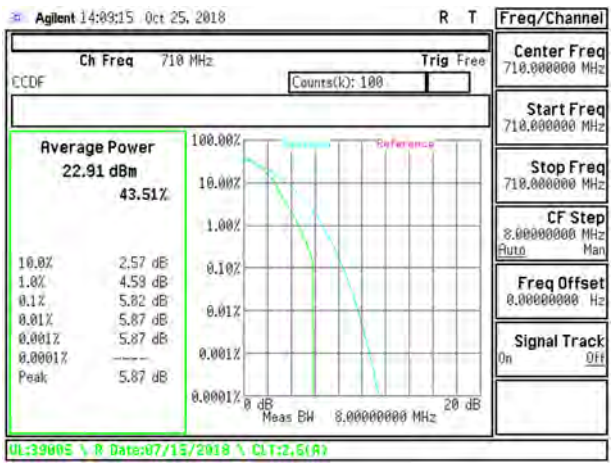


LTE B13 10MHz QPSK Mid Channel

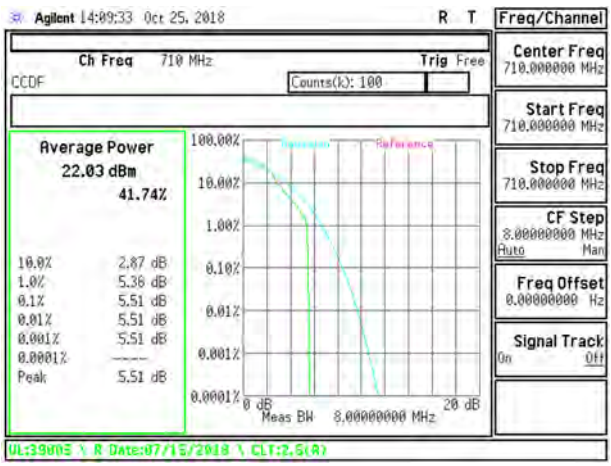


LTE B13 10MHz 16QAM Mid Channel

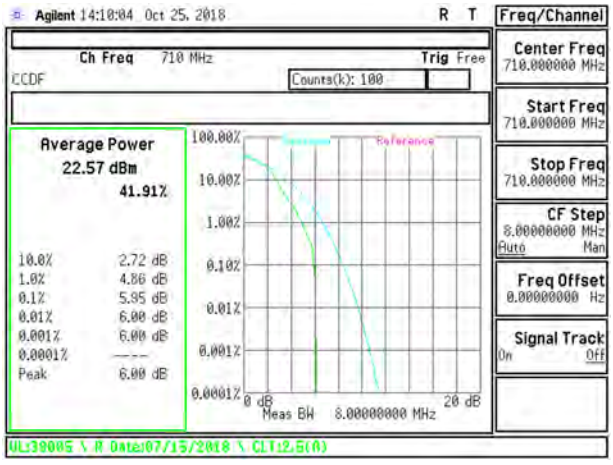
9.5.8. LTE BAND 17



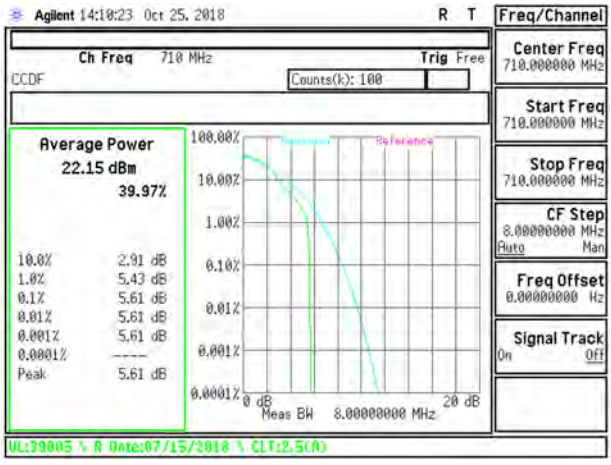
LTE B17 5MHz QPSK Mid Channel



LTE B17 5MHz 16QAM Mid Channel

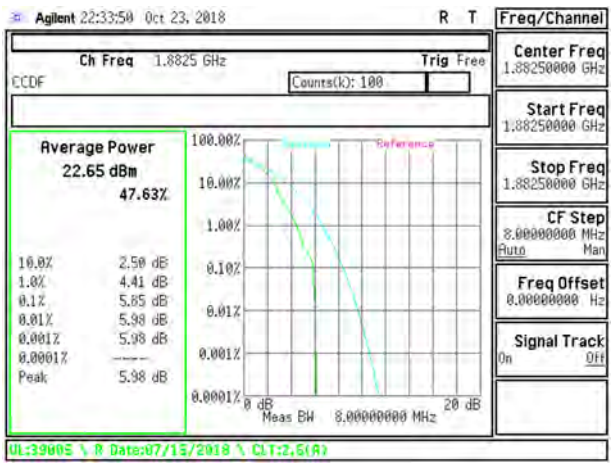


LTE B17 10MHz QPSK Mid Channel

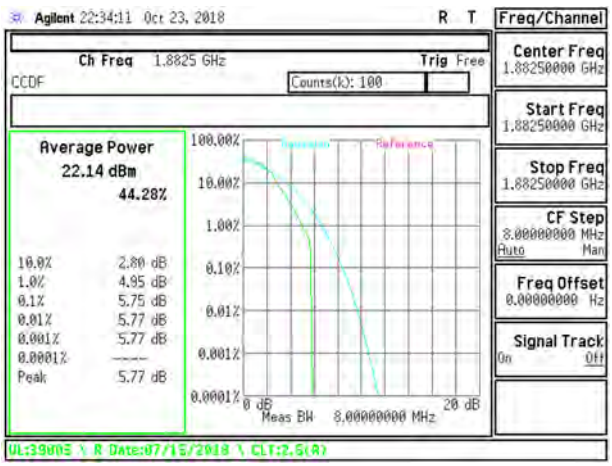


LTE B17 10MHz 16QAM Mid Channel

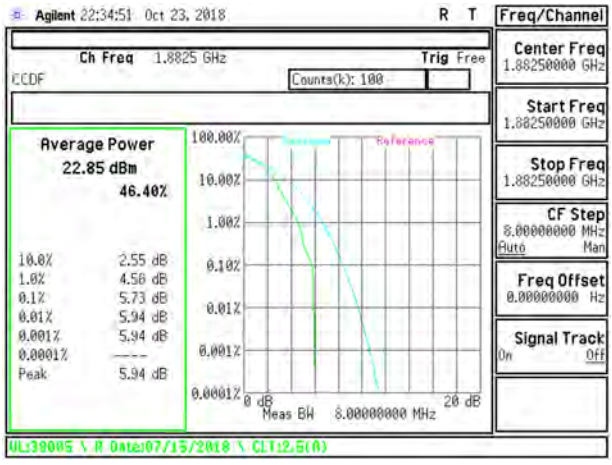
9.5.9. LTE BAND 25



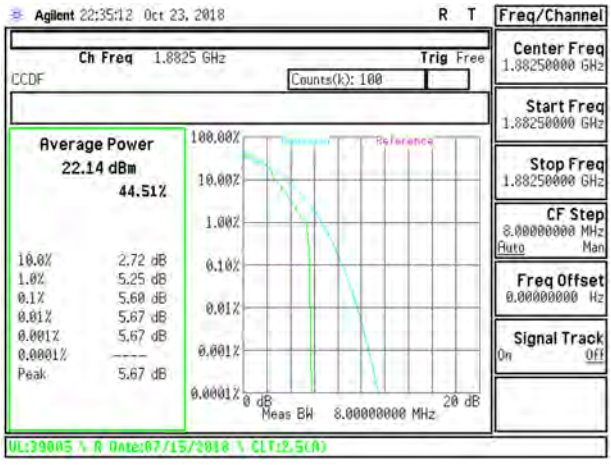
LTE B25 1.4MHz QPSK Mid Channel



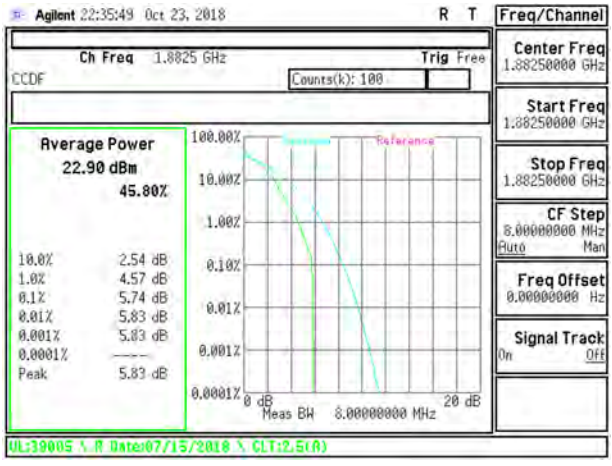
LTE B25 1.4MHz 16QAM Mid Channel



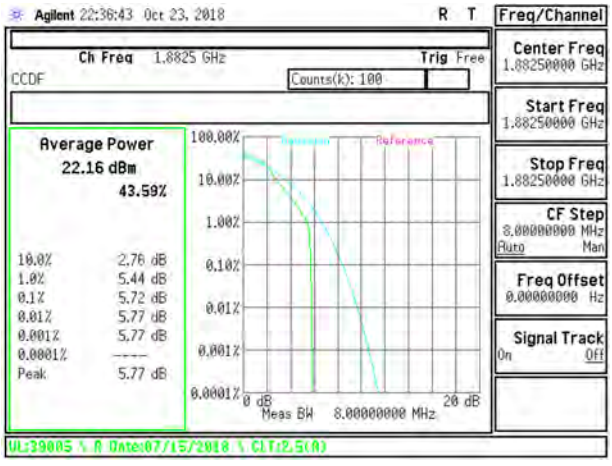
LTE B25 3MHz QPSK Mid Channel



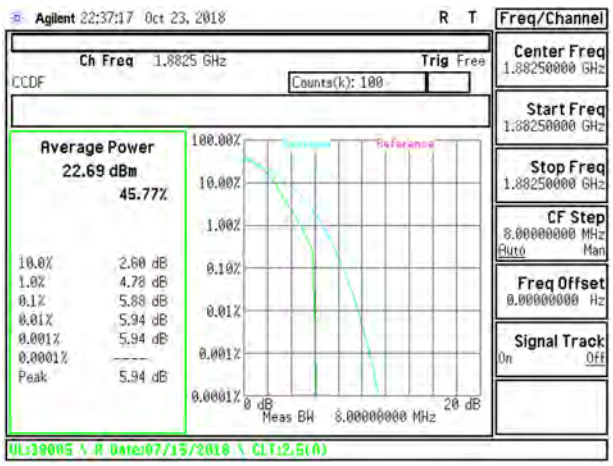
LTE B25 3MHz 16QAM Mid Channel



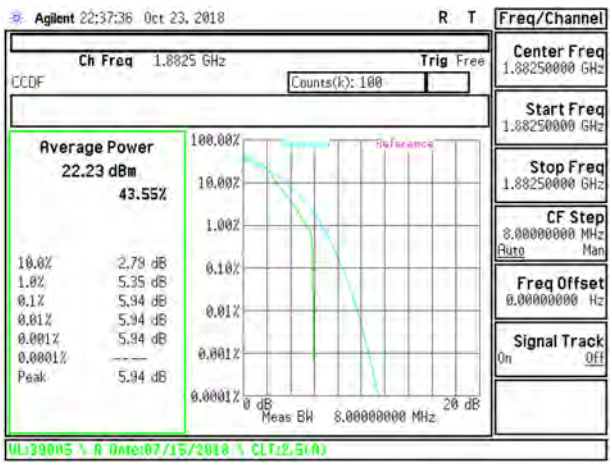
LTE B25 5MHz QPSK Mid Channel



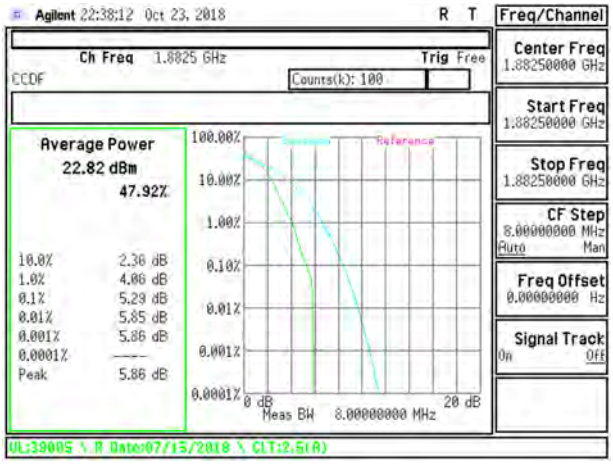
LTE B25 5MHz 16QAM Mid Channel



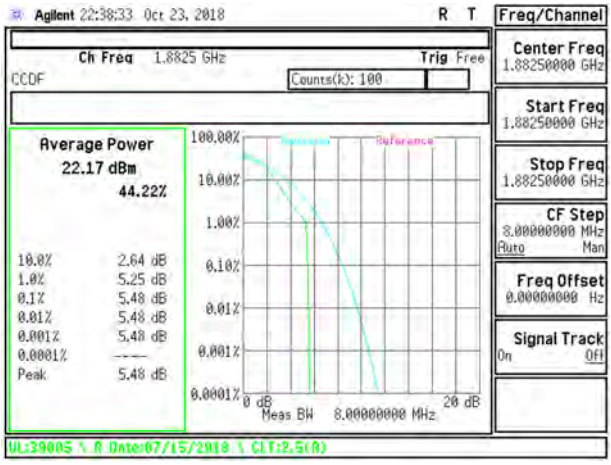
LTE B25 10MHz QPSK Mid Channel



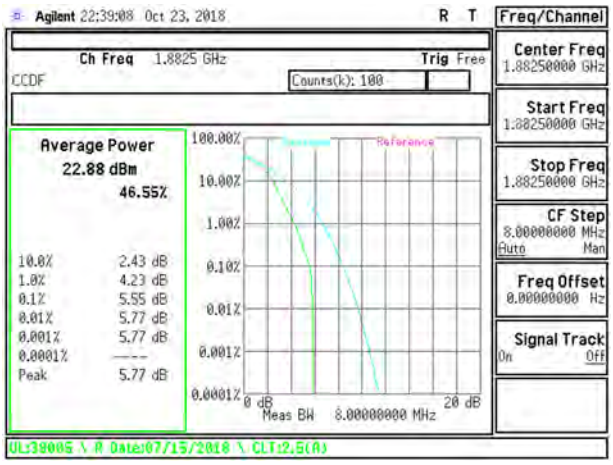
LTE B25 10MHz 16QAM Mid Channel



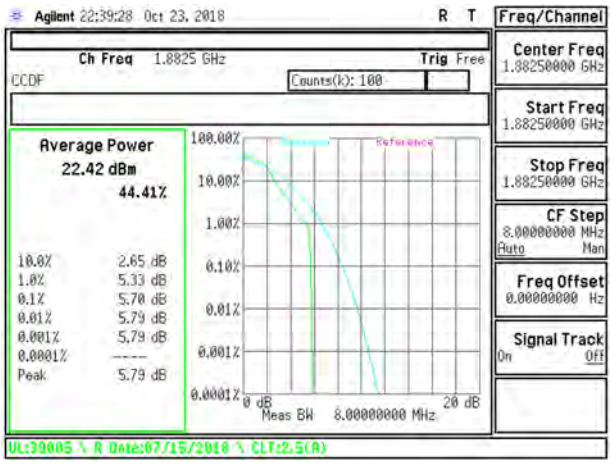
LTE B25 15MHz QPSK Mid Channel



LTE B25 15MHz 16QAM Mid Channel

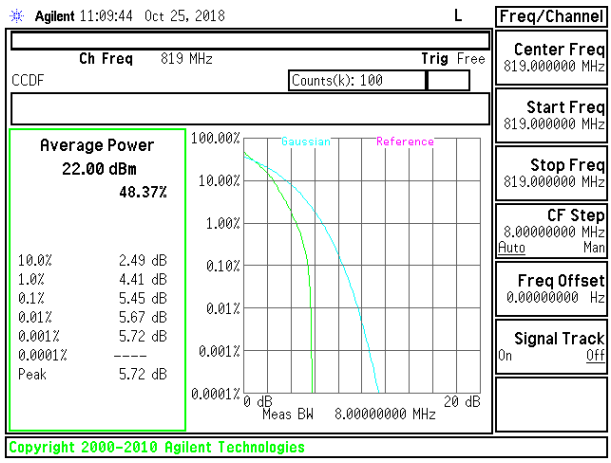


LTE B25 20MHz QPSK Mid Channel

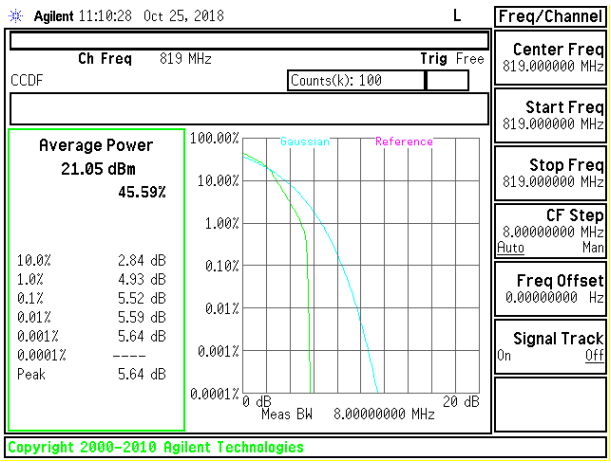


LTE B25 20MHz 16QAM Mid Channel

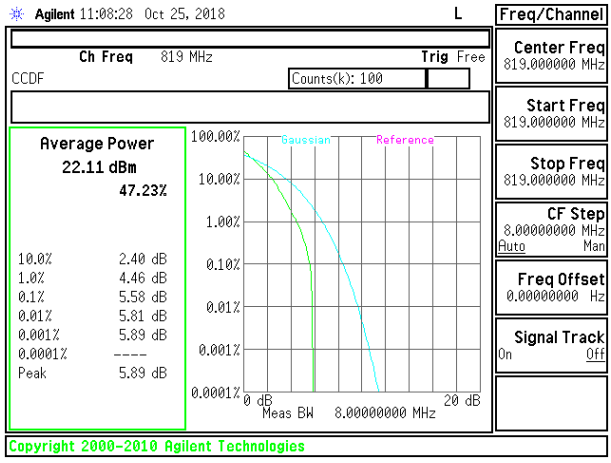
9.5.10. LTE BAND 26 (FCC PART 90S)



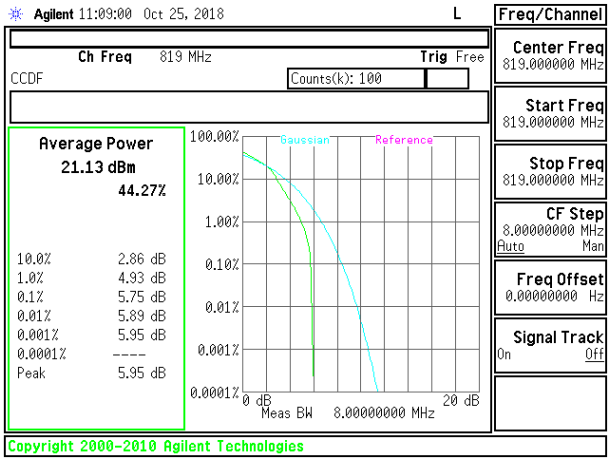
LTE B26 1.4MHz QPSK Mid Channel



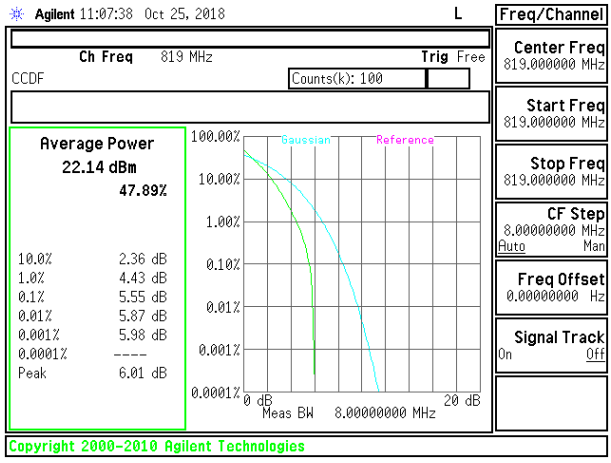
LTE B26 1.4MHz 16QAM Mid Channel



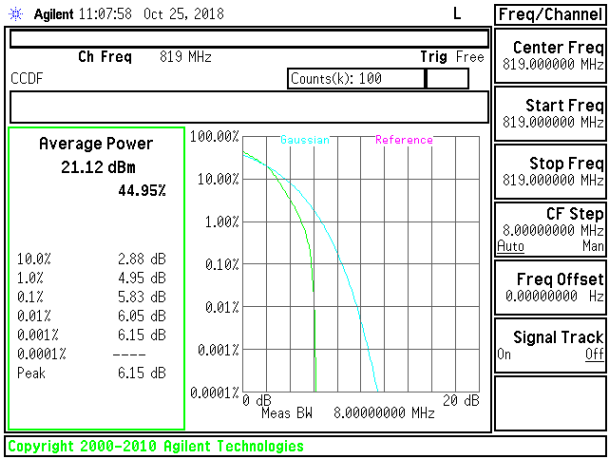
LTE B26 3MHz QPSK Mid Channel



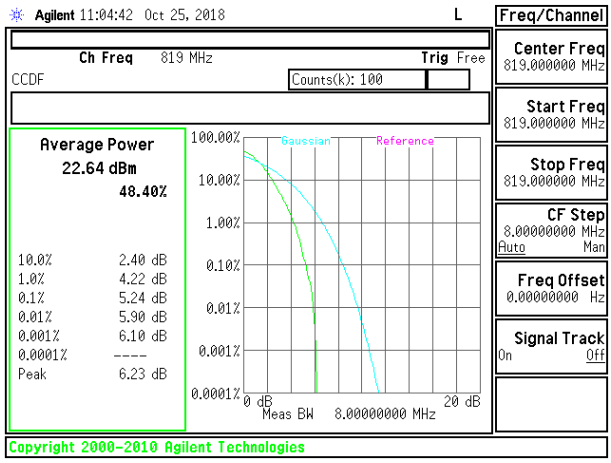
LTE B26 3MHz 16QAM Mid Channel



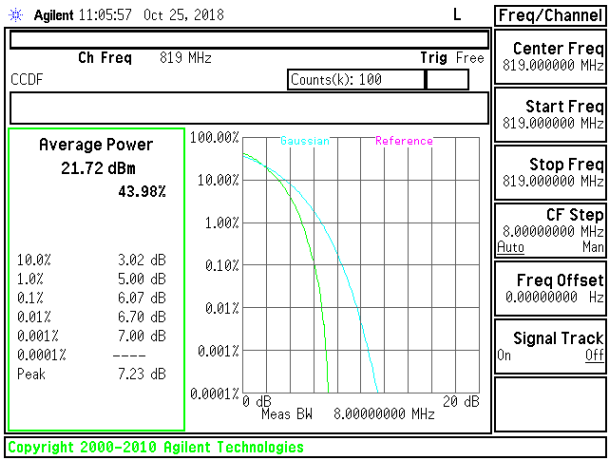
LTE B26 5MHz QPSK Mid Channel



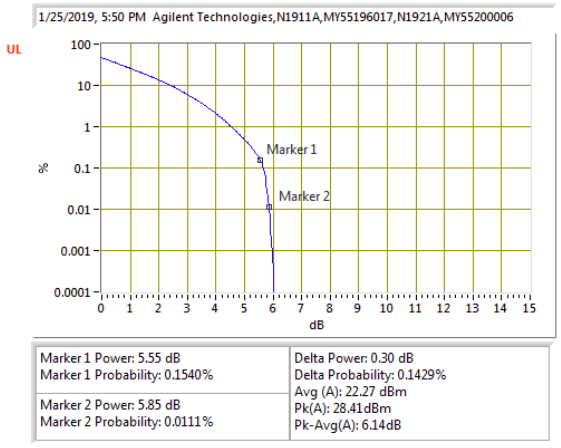
LTE B26 5MHz 16QAM Mid Channel



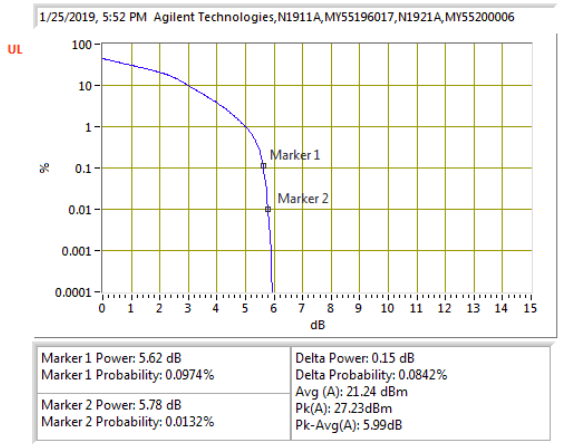
LTE B26 10MHz QPSK Mid Channel



LTE B26 10MHz 16QAM Mid Channel

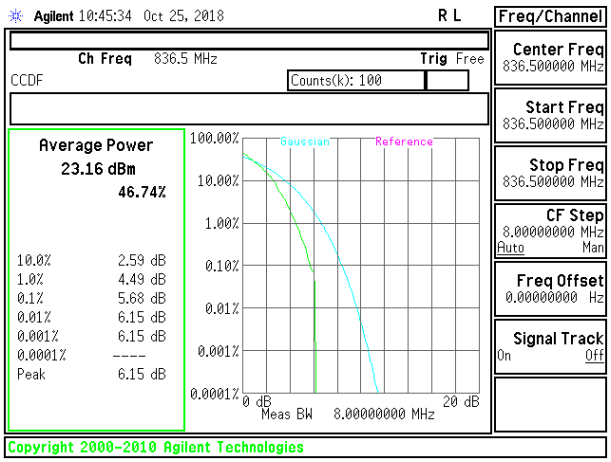


LTE B26 15MHz QPSK Mid Channel

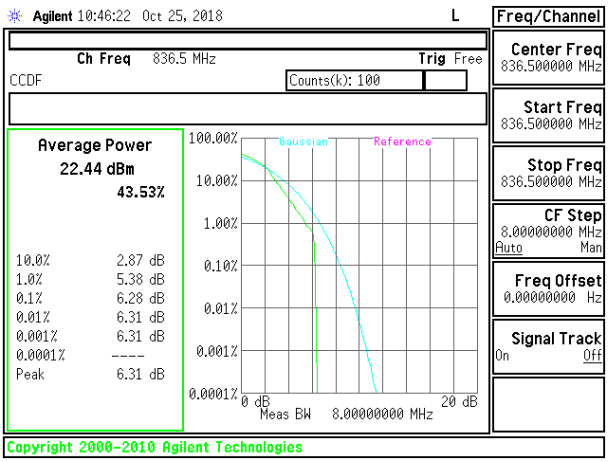


LTE B26 15MHz 16QAM Mid Channel

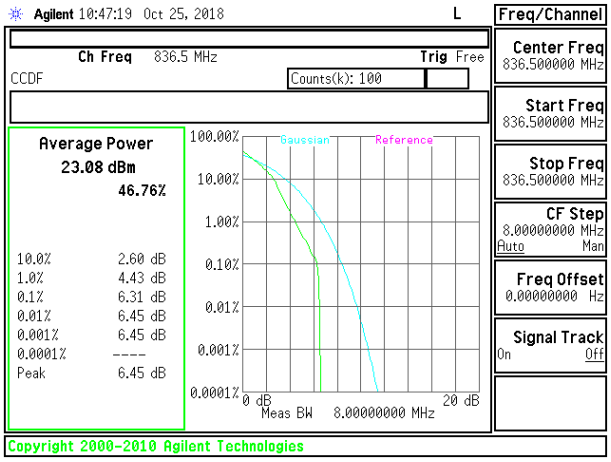
9.5.11. LTE BAND 26 (FCC PART 22)



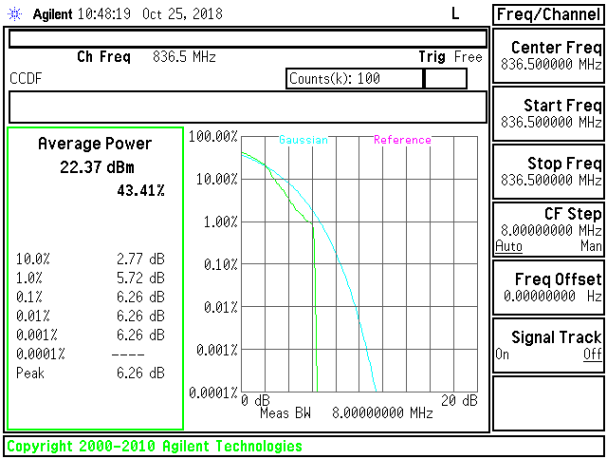
LTE B26 1.4MHz QPSK Mid Channel



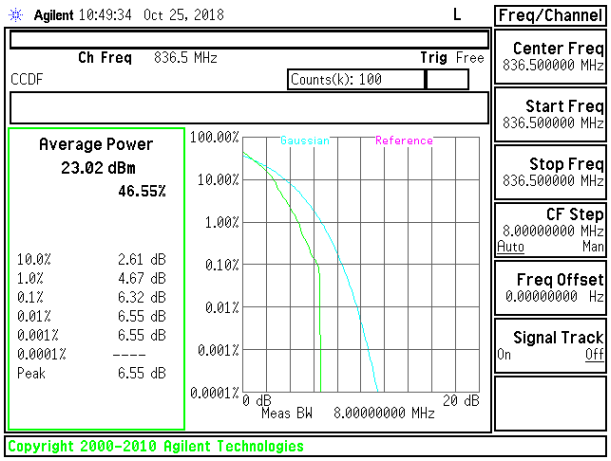
LTE B26 1.4MHz 16QAM Mid Channel



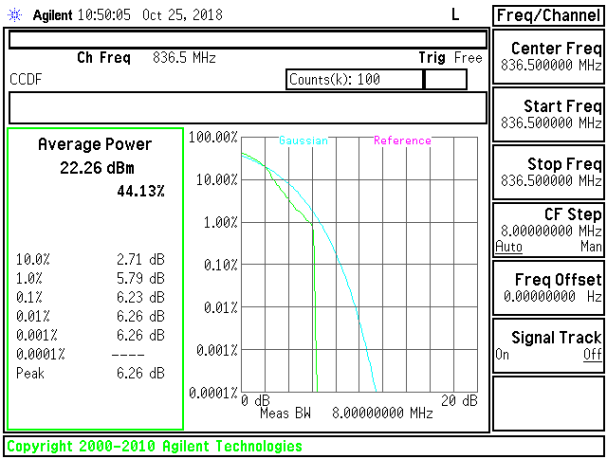
LTE B26 3MHz QPSK Mid Channel



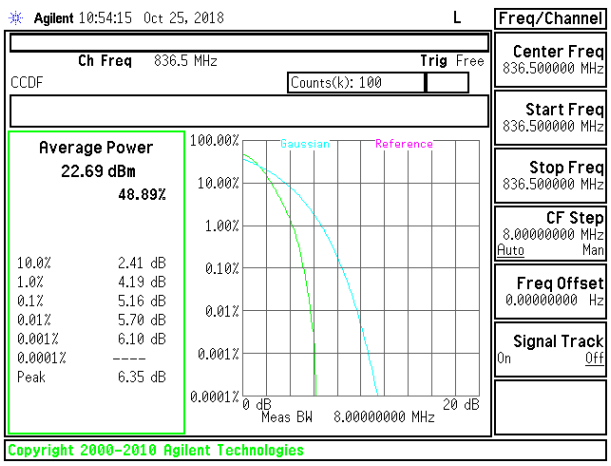
LTE B26 3MHz 16QAM Mid Channel



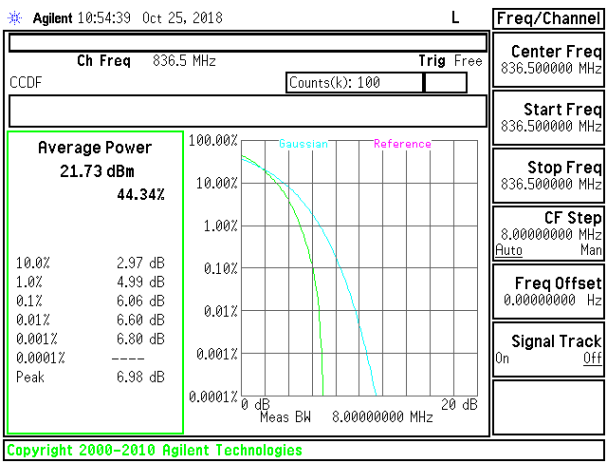
LTE B26 5MHz QPSK Mid Channel



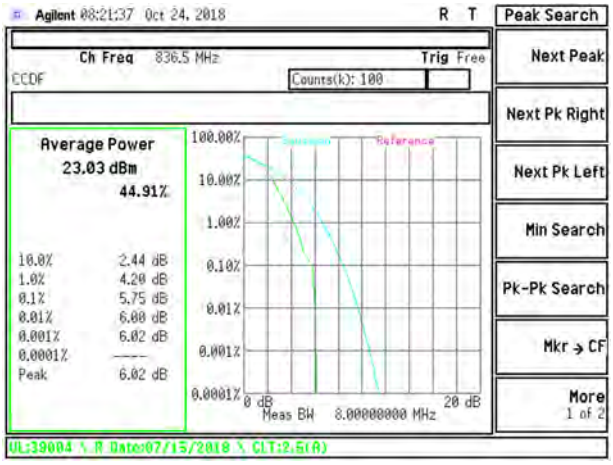
LTE B26 5MHz 16QAM Mid Channel



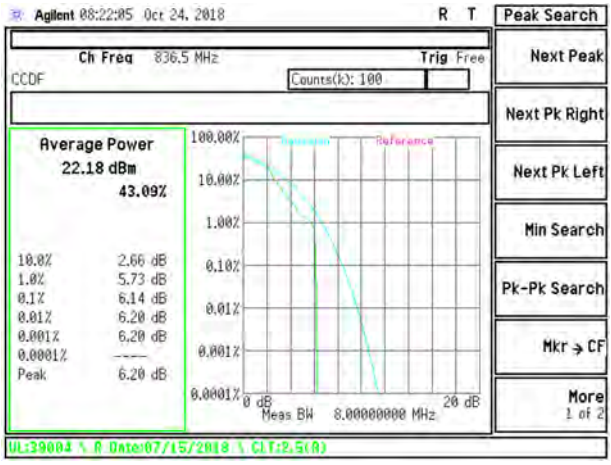
LTE B26 10MHz QPSK Mid Channel



LTE B26 10MHz 16QAM Mid Channel

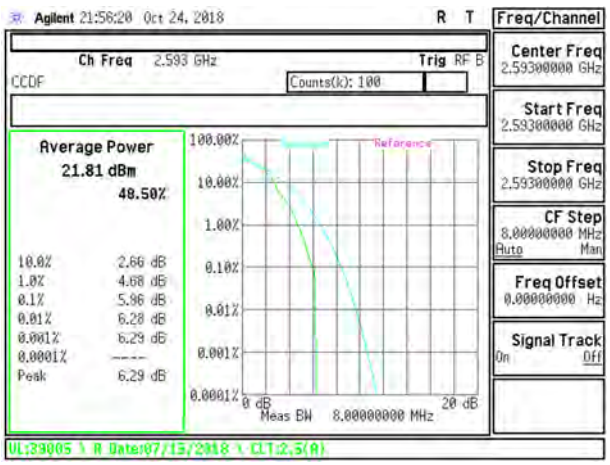


LTE B26 15MHz QPSK Mid Channel

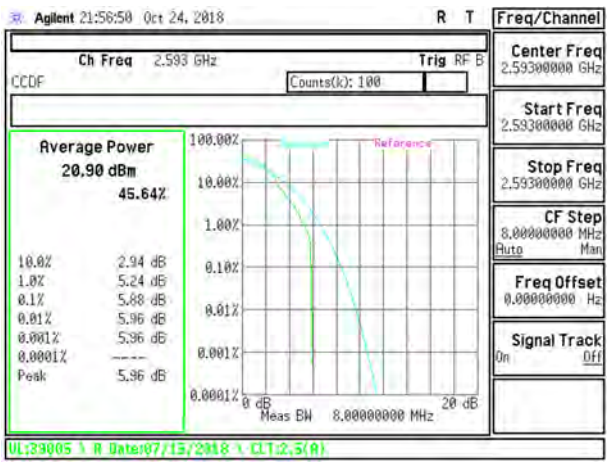


LTE B26 15MHz 16QAM Mid Channel

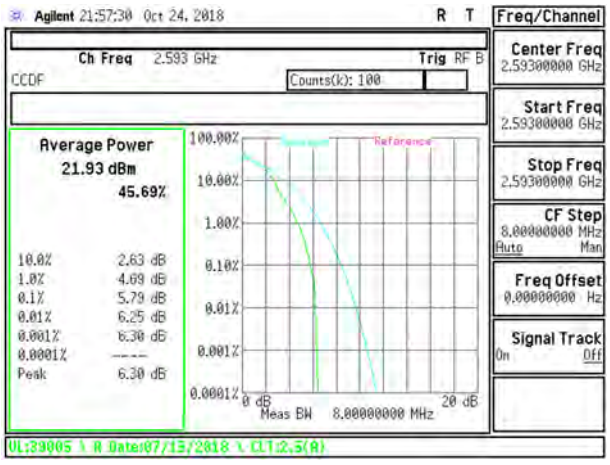
9.5.12. LTE BAND 41



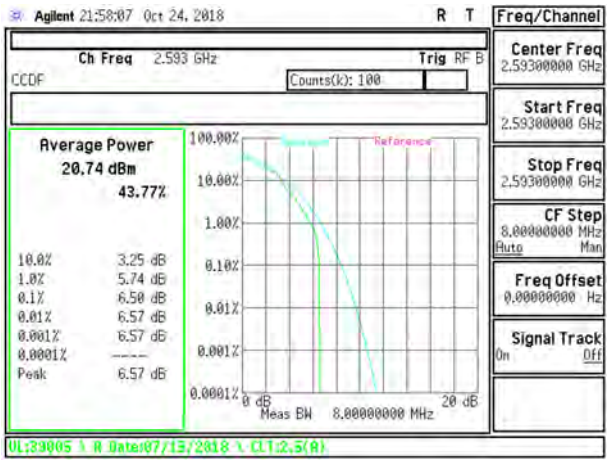
LTE B41 5MHz QPSK Middle Channel



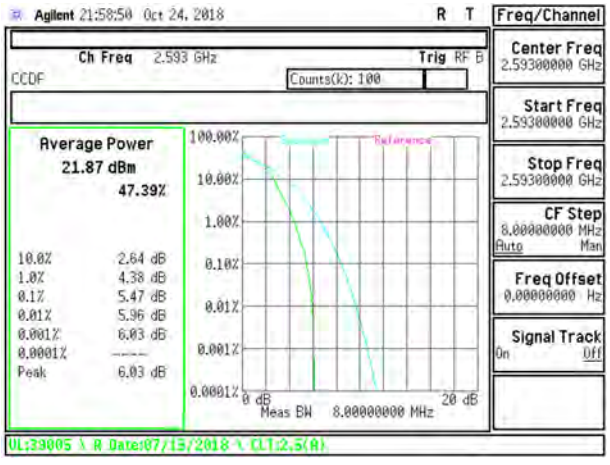
LTE B41 5MHz 16QAM Middle Channel



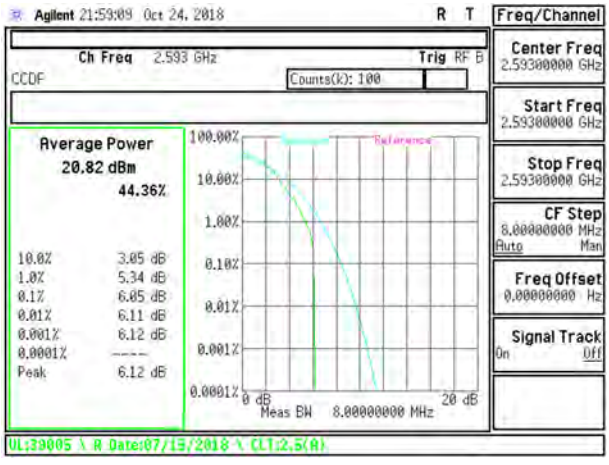
LTE B41 10MHz QPSK Middle Channel



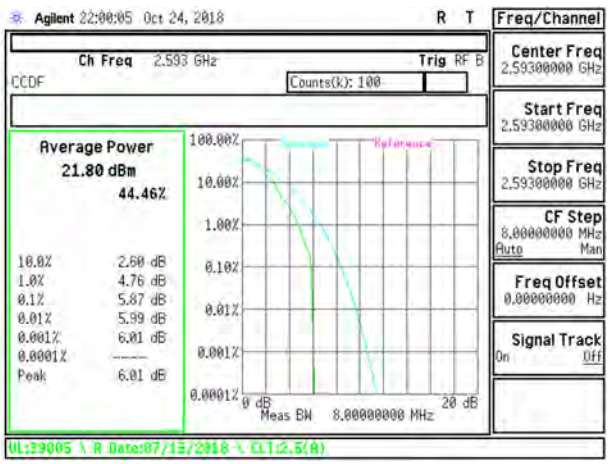
LTE B41 10MHz 16QAM Middle Channel



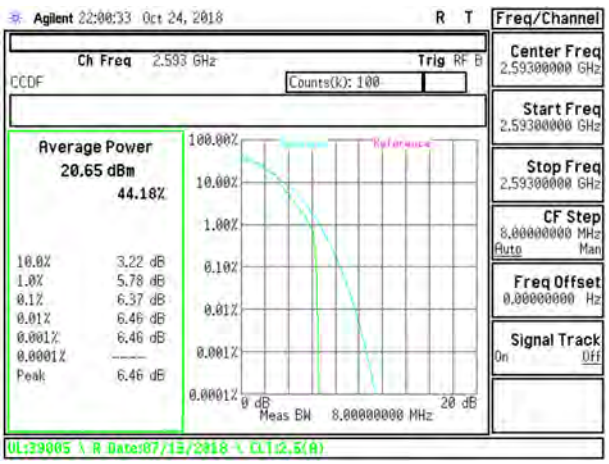
LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel

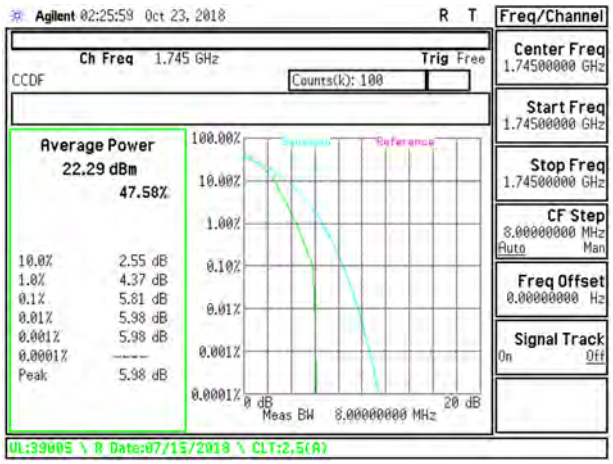


LTE B41 20MHz QPSK Middle Channel

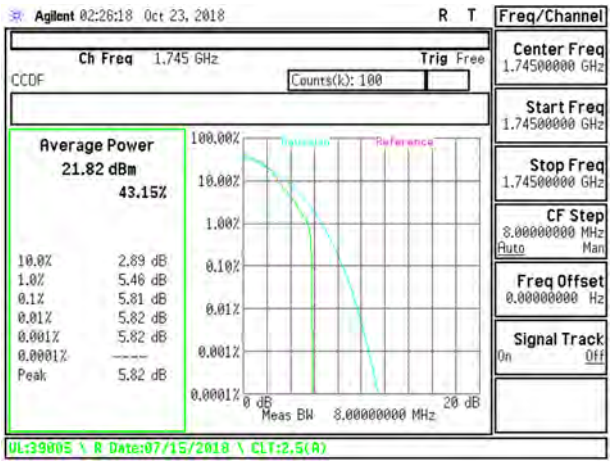


LTE B41 20MHz 16QAM Middle Channel

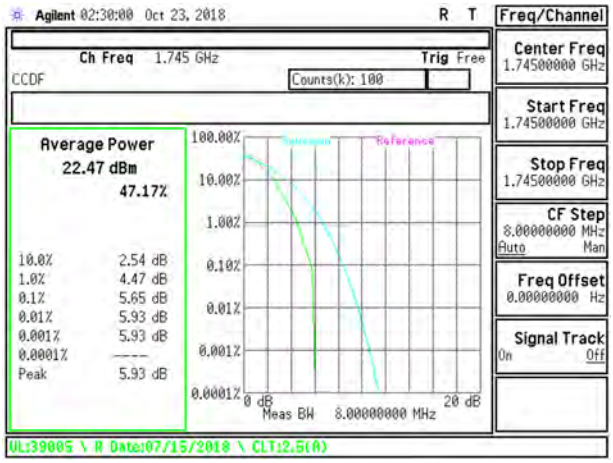
9.5.13. LTE BAND 66



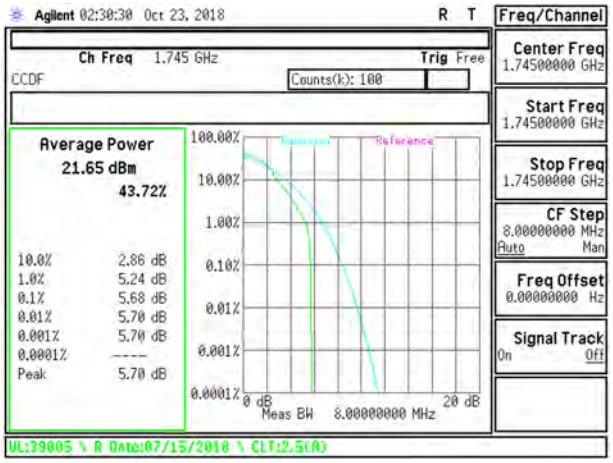
LTE B66 1.4MHz QPSK Mid Channel



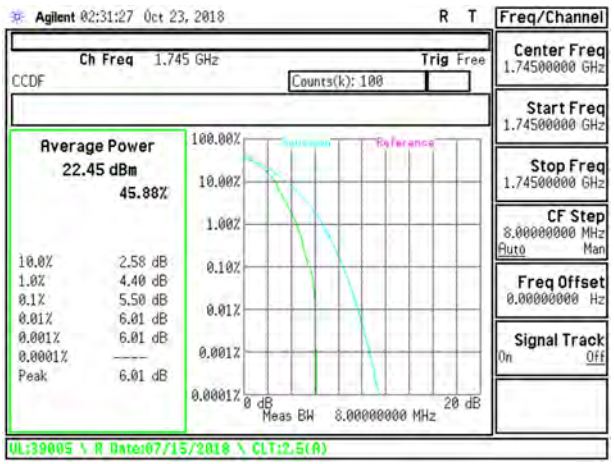
LTE B66 1.4MHz 16QAM Mid Channel



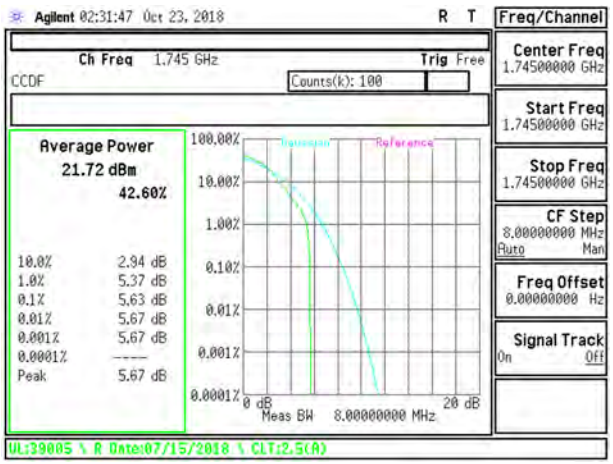
LTE B66 3MHz QPSK Mid Channel



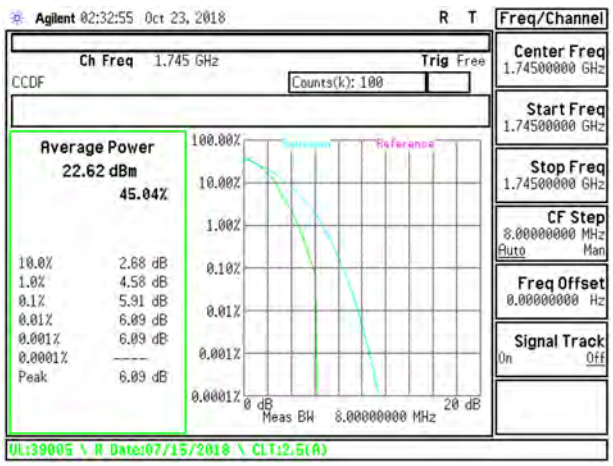
LTE B66 3MHz 16QAM Mid Channel



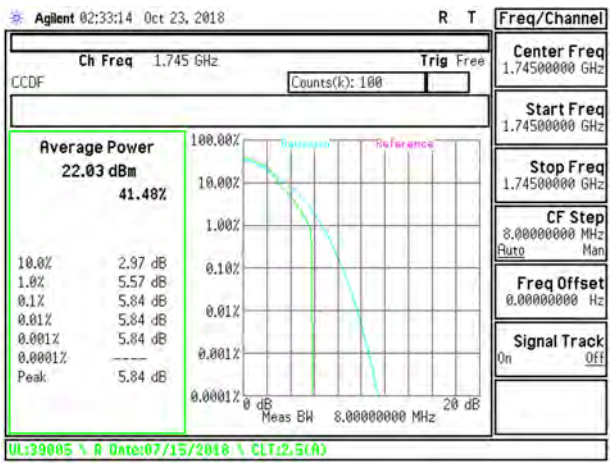
LTE B66 5MHz QPSK Mid Channel



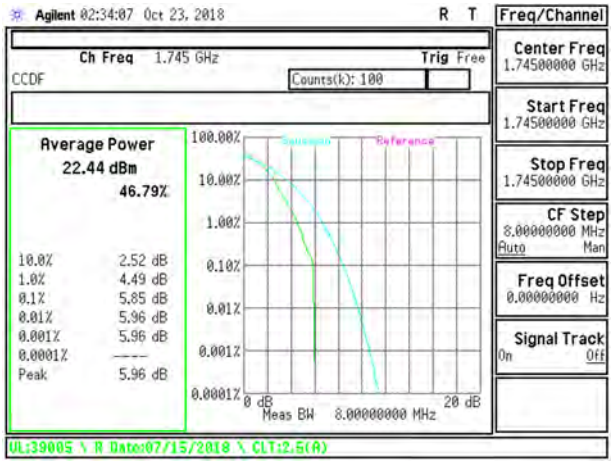
LTE B66 5MHz 16QAM Mid Channel



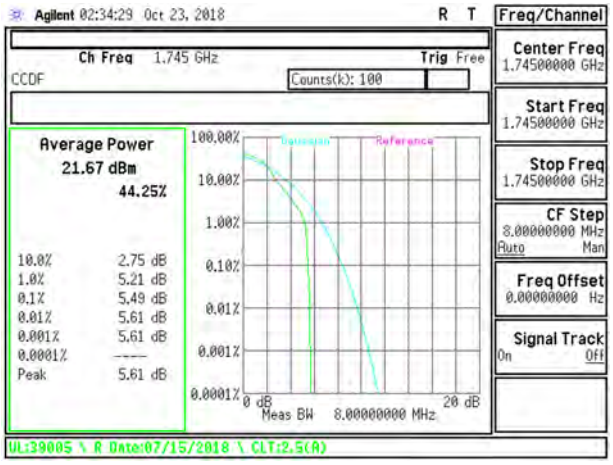
LTE B66 10MHz QPSK Mid Channel



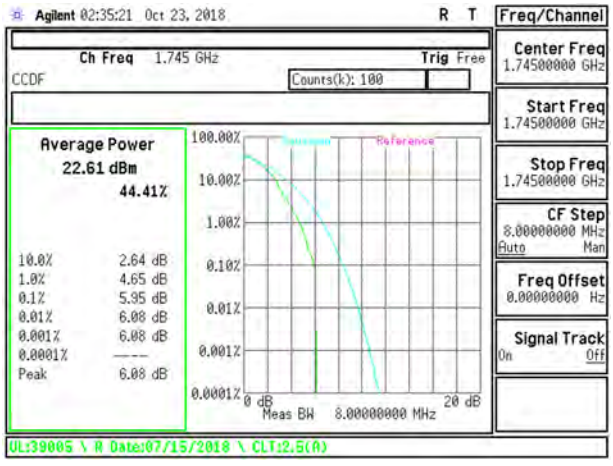
LTE B66 10MHz 16QAM Mid Channel



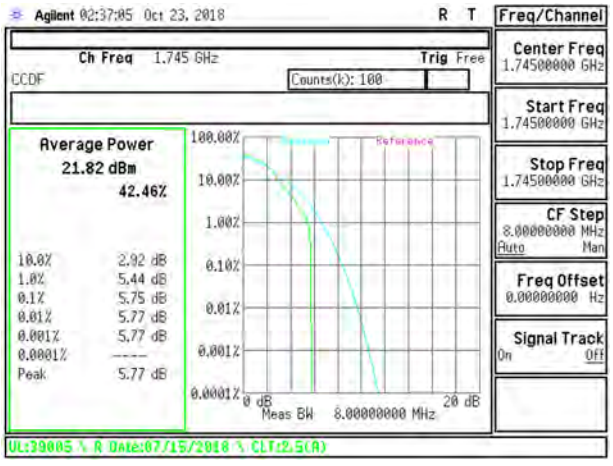
LTE B66 15MHz QPSK Mid Channel



LTE B66 15MHz 16QAM Mid Channel



LTE B66 20MHz QPSK Mid Channel



LTE B66 20MHz 16QAM Mid Channel

10. RADIATED TEST RESULTS

10.1. EFFECTIVE RADIATED POWER ERP/EIRP

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50(c) - (10) Portable stations (hand-held devices) are limited to 3 watts ERP; (LTE B12)

27.50(d) - (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.(Band 66)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

a) Set the RBW ≥ OBW; b) Set VBW ≥ 3 × RBW; c) Set span ≥ 2 x RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points ≥ span/RBW; g) Trace mode = max hold;

For average power measurement with a PSA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW ≥ 3 x RBW; d) Set number of points in sweep ≥ 2 × span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 98; h) Use trigger to capture bursts If burst duty cycle < 98; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

MODES TESTED

GSM, WCMDA, and LTE

Note: This testing was performed to confirm that the measured radiated powers were consistent with the calculated ERP/EIRP test data given device-to-device variations in output power and the measurement uncertainties associated with the radiated tests. Measured ERP/EIRP test results are for reference only. Please refer to Section 6.2 for the final ERP/EIRP results.

TEST RESULTS

GSM

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
GSM 850	GPRS	128	824.2	30.24	1056.82
		190	836.6	30.50	1122.02
		251	848.8	29.90	977.24
	EGPRS	128	824.2	28.17	656.15
		190	836.6	28.42	695.02
		251	848.8	27.78	599.79
GSM 1900	GPRS	512	1850.2	29.58	907.82
		661	1880.0	30.45	1109.17
		810	1909.8	30.81	1205.04
	EGPRS	512	1850.2	27.60	575.44
		661	1880.0	26.74	472.06
		810	1909.8	28.30	676.08

WCDMA

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	24.31	269.77
		9400	1880	25.13	325.84
		9538	1907.6	23.10	204.17
	HSDPA	9262	1852.4	23.72	235.50
		9400	1880.0	25.41	347.54
		9538	1907.6	23.27	212.32
Band 5	REL99	4132	826.4	19.19	82.99
		4183	836.6	19.42	87.50
		4233	846.6	19.36	86.30
	HSDPA	4132	826.4	19.00	79.43
		4183	836.6	19.46	88.31
		4233	846.6	19.29	84.92
Band 4	REL99	1312	1712.4	22.81	190.99
		1413	1732.6	22.25	167.88
		1513	1752.6	24.54	284.45
	HSDPA	1312	1712.4	22.95	197.24
		1413	1732.6	22.54	179.47
		1513	1752.6	24.67	293.09

LTE Band 2

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
20	QPSK	1/0	1860	24.27	267.30
		1/0	1880	23.23	210.38
		1/0	1900	24.17	261.22
	16QAM	1/0	1860	21.83	152.41
		1/0	1880	21.52	141.91
		1/0	1900	22.36	172.19
15	QPSK	1/0	1857.5	24.84	304.79
		1/0	1880	25.74	374.97
		1/0	1902.5	26.04	401.79
3	16QAM	1/0	1851.5	22.20	165.96
		1/0	1880	24.10	257.04
		1/0	1908.5	23.84	242.10

LTE Band 4

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
20	QPSK	1/0	1720	21.99	158.12
		1/0	1732.5	20.89	122.74
		1/0	1745	22.84	192.31
	16QAM	1/0	1720	20.23	105.44
		1/0	1732.5	19.31	85.31
		1/0	1745	20.78	119.67
5	QPSK	1/0	1712.5	21.89	154.53
		1/0	1732.5	21.60	144.54
		1/0	1752.5	24.19	262.42
15	16QAM	1/0	1717.5	19.85	96.61
		1/0	1732.5	20.95	124.45
		1/0	1747.5	21.96	157.04

LTE Band 5

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
10	QPSK	1/0	829	18.32	67.92
		1/0	836.5	18.58	72.11
		1/0	844	19.19	82.99
	16QAM	1/0	829	18.32	67.92
		1/0	836.5	18.58	72.11
		1/0	844	18.52	71.12
3	QPSK	1/0	825.5	18.30	67.61
		1/0	836.5	18.40	69.18
		1/0	847.5	19.09	81.10
	16QAM	1/0	825.5	18.29	67.45
		1/0	836.5	18.17	65.61
		1/0	847.5	18.45	69.98

LTE Band 12

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
10	QPSK	1/0	704	22.07	161.06
		1/0	707.5	21.29	134.59
		1/0	711	20.32	107.65
	16QAM	1/0	704	21.31	135.21
		1/0	707.5	20.38	109.14
		1/0	711	19.80	95.50
5	QPSK	1/0	701.5	20.27	106.41
		1/0	707.5	21.40	138.04
		1/0	713.5	22.71	186.64
	16QAM	1/0	701.5	19.50	89.13
		1/0	707.5	20.47	111.43
		1/0	713.5	22.11	162.55

LTE Band 13

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
10	QPSK				
		1/0	782	20.73	118.30
	16QAM				
		1/0	782	19.35	86.10
5	QPSK	1/0	779.5	20.87	122.18
		1/0	782	20.53	112.98
		1/0	784.5	20.10	102.33
	16QAM	1/0	779.5	19.19	82.99

		1/0	782	18.83	76.38
		1/0	784.5	18.34	68.23

LTE Band 17

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
10	QPSK	1/0	709	22.17	164.82
		1/0	710	21.90	154.88
		1/0	711	22.54	179.47
	16QAM	1/0	709	21.39	137.72
		1/0	710	21.24	133.05
		1/0	711	21.90	154.88
5	QPSK	1/0	706.5	20.05	101.16
		1/0	710	22.09	161.81
		1/0	713.5	20.05	101.16
	16QAM	1/0	706.5	19.40	87.10
		1/0	710	21.37	137.09
		1/0	713.5	19.55	90.16

LTE Band 25

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
20	QPSK	1/0	1860	21.05	127.35
		1/0	1882.5	21.17	130.92
		1/0	1905	22.42	174.58
	16QAM	1/0	1860	20.71	117.76
		1/0	1882.5	20.36	108.64
		1/0	1905	21.57	143.55
15	QPSK	1/0	1857.5	23.07	202.77
		1/0	1882.5	22.16	164.44
		1/0	1907.5	22.26	168.27
3	16QAM	1/0	1851.5	21.50	141.25
		1/0	1882.5	21.65	146.22
		1/0	1913.5	22.87	193.64

LTE Band 26 (FCC PART 90S)

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
15	QPSK				
		1/0	821.5	19.67	92.68
	16QAM				
		1/0	821.5	17.90	61.66
10	QPSK				
		1/0	819	20.56	113.76
	16QAM				
		1/0	819	18.29	67.45

LTE Band 26 (FCC PART 22)

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
15	QPSK	1/0	831.5	18.91	77.80
		1/0	836.5	19.93	98.40
		1/0	841.5	21.86	153.46
	16QAM	1/0	831.5	16.51	44.77
		1/0	836.5	17.53	56.62
		1/0	841.5	19.46	88.31
3	QPSK	1/0	815.5	18.08	64.27
		1/0	831.5	18.80	75.86
		1/0	847.5	19.17	82.60
5	16QAM	1/0	816.5	17.30	53.70
		1/0	831.5	18.63	72.95
		1/0	846.5	18.14	65.16

LTE Band 41

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
20	QPSK	1/0	2506	21.10	128.82
		1/0	2593	21.34	136.14
		1/0	2680	21.14	130.02
	16QAM	1/0	2506	20.52	112.72
		1/0	2593	20.48	111.69
		1/0	2680	20.11	102.57
15	QPSK	1/0	2503.5	21	125.89
		1/0	2593	20.34	108.14
		1/0	2682.5	18.34	68.23
10	16QAM	1/0	2501	19.08	80.91
		1/0	2593	18.78	75.51
		1/0	2685	17.16	52.00

LTE Band 66

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
20	QPSK	1/0	1720	22.04	159.96
		1/0	1745	22.85	192.75
		1/0	1770	23.53	225.42
	16QAM	1/0	1720	20.48	111.69
		1/0	1745	21.24	133.05
		1/0	1770	22.63	183.23
15	QPSK	1/0	1717.5	20.56	113.76
		1/0	1745	21.56	143.22
		1/0	1772.5	22.96	197.70
15	16QAM	1/0	1717.5	19.74	94.19
		1/0	1745	20.77	119.40
		1/0	1772.5	22.20	165.96

10.1.1. GSM

GPRS 850

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: GPRS 850 MHz Fundamentals

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	24.86	V	2.9	0.1	22.11	38.5	-16.4	
824.20	32.90	H	2.9	0.2	30.24	38.5	-8.3	
Mid Ch								
836.60	26.29	V	2.9	0.1	23.45	38.5	-15.1	
836.60	33.25	H	2.9	0.2	30.50	38.5	-8.0	
High Ch								
848.80	26.14	V	2.9	0.0	23.24	38.5	-15.3	
848.80	32.70	H	2.9	0.1	29.90	38.5	-8.6	

EGPRS 850

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: EGPRS 850 MHz Fundamentals

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	22.75	V	2.9	0.1	20.00	38.5	-18.5	
824.20	30.83	H	2.9	0.2	28.17	38.5	-10.3	
Mid Ch								
836.60	24.14	V	2.9	0.1	21.30	38.5	-17.2	
836.60	31.17	H	2.9	0.2	28.42	38.5	-10.1	
High Ch								
848.80	24.14	V	2.9	0.0	21.24	38.5	-17.3	
848.80	30.58	H	2.9	0.1	27.78	38.5	-10.7	

GPRS 1900

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 10/31/2018
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber B
Mode: GPRS 1900 MHz Fundamentals

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	25.39	V	5.1	9.3	29.58	33.0	-3.4	
1850.20	21.01	H	5.1	9.3	25.21	33.0	-7.8	
Mid Ch								
1880.00	26.52	V	5.1	9.1	30.45	33.0	-2.5	
1880.00	20.28	H	5.1	9.1	24.21	33.0	-8.8	
High Ch								
1909.80	27.13	V	5.2	8.8	30.81	33.0	-2.2	
1909.80	19.60	H	5.2	8.8	23.28	33.0	-9.7	

EGPRS 1900

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 10/31/2018
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber B
Mode: EGPRS 1900 MHz Fundamentals

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	23.41	V	5.1	9.3	27.60	33.0	-5.4	
1850.20	18.60	H	5.1	9.3	22.80	33.0	-10.2	
Mid Ch								
1880.00	22.81	V	5.1	9.1	26.74	33.0	-6.3	
1880.00	18.14	H	5.1	9.1	22.07	33.0	-10.9	
High Ch								
1909.80	24.63	V	5.2	8.8	28.30	33.0	-4.7	
1909.80	15.76	H	5.2	8.8	19.43	33.0	-13.6	

10.1.2. WCDMA

B2 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: Rel99 Band 2 Fundamentals

Test Equpment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	20.14	V	5.1	9.3	24.31	33.0	-8.7	
1852.40	12.27	H	5.1	9.3	16.45	33.0	-16.5	
Mid Ch								
1880.00	21.20	V	5.1	9.1	25.13	33.0	-7.9	
1880.00	15.79	H	5.1	9.1	19.72	33.0	-13.3	
High Ch								
1907.60	19.40	V	5.2	8.9	23.10	33.0	-9.9	
1907.60	13.48	H	5.2	8.9	17.18	33.0	-15.8	

B2 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: HSDPA Band 2 Fundamentals

Test Equpment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	19.54	V	5.1	9.3	23.72	33.0	-9.3	
1852.40	12.00	H	5.1	9.3	16.18	33.0	-16.8	
Mid Ch								
1880.00	21.48	V	5.1	9.1	25.41	33.0	-7.6	
1880.00	15.75	H	5.1	9.1	19.68	33.0	-13.3	
High Ch								
1907.60	19.57	V	5.2	8.9	23.27	33.0	-9.7	
1907.60	13.28	H	5.2	8.9	16.98	33.0	-16.0	

B5 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: Rel99 Band 5 Fundamentals

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	16.15	V	2.9	0.1	13.38	38.5	-25.1	
826.40	21.87	H	2.9	0.2	19.19	38.5	-19.3	
Mid Ch								
836.60	15.57	V	2.9	0.1	12.73	38.5	-25.8	
836.60	22.16	H	2.9	0.2	19.42	38.5	-19.1	
High Ch								
846.60	14.83	V	2.9	0.0	11.94	38.5	-26.6	
846.60	22.15	H	2.9	0.1	19.36	38.5	-19.1	

B5 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: HSDPA Band 5 Fundamentals

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	15.81	V	2.9	0.1	13.04	38.5	-25.5	
826.40	21.67	H	2.9	0.2	19.00	38.5	-19.5	
Mid Ch								
836.60	16.29	V	2.9	0.1	13.44	38.5	-25.1	
836.60	22.20	H	2.9	0.2	19.46	38.5	-19.0	
High Ch	0.00							
846.60	15.10	V	2.9	0.0	12.21	38.5	-26.3	
846.60	22.08	H	2.9	0.1	19.29	38.5	-19.2	

B4 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: Rel99 Band 4 Fundamentals

Test Equpment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	19.31	V	4.9	8.4	22.81	30.0	-7.2	
1712.40	10.92	H	4.9	8.4	14.43	30.0	-15.6	
Mid Ch								
1732.60	18.46	V	4.9	8.7	22.25	30.0	-7.7	
1732.60	14.35	H	4.9	8.7	18.13	30.0	-11.9	
High Ch								
1752.60	20.46	V	4.9	9.0	24.54	30.0	-5.5	
1752.60	11.55	H	4.9	9.0	15.63	30.0	-14.4	

B4 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: HSDPA Band 4 Fundamentals

Test Equpment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	19.44	V	4.9	8.4	22.95	30.0	-7.1	
1712.40	10.77	H	4.9	8.4	14.27	30.0	-15.7	
Mid Ch								
1732.60	18.76	V	4.9	8.7	22.54	30.0	-7.5	
1732.60	14.51	H	4.9	8.7	18.29	30.0	-11.7	
High Ch								
1752.60	20.59	V	4.9	9.0	24.67	30.0	-5.3	
1752.60	11.51	H	4.9	9.0	15.59	30.0	-14.4	

10.1.3. LTE Band 2

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	20.16	V	5.1	9.2	24.27	33.0	-8.7	
1860.00	11.54	H	5.1	9.2	15.66	33.0	-17.3	
Mid Ch								
1880.00	19.30	V	5.1	9.1	23.23	33.0	-9.8	
1880.00	8.25	H	5.1	9.1	12.18	33.0	-20.8	
High Ch								
1900.00	20.43	V	5.2	8.9	24.17	33.0	-8.8	
1900.00	14.06	H	5.2	8.9	17.80	33.0	-15.2	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	17.72	V	5.1	9.2	21.83	33.0	-11.2	
1860.00	9.68	H	5.1	9.2	13.80	33.0	-19.2	
Mid Ch								
1880.00	17.59	V	5.1	9.1	21.52	33.0	-11.5	
1880.00	6.57	H	5.1	9.1	10.50	33.0	-22.5	
High Ch								
1900.00	18.62	V	5.2	8.9	22.36	33.0	-10.6	
1900.00	12.18	H	5.2	8.9	15.92	33.0	-17.1	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	20.01	V	4.4	9.2	24.84	33.0	-8.2	
1857.50	11.67	H	4.4	9.2	16.50	33.0	-16.5	
Mid Ch								
1880.00	21.11	V	4.4	9.1	25.74	33.0	-7.3	
1880.00	11.03	H	4.4	9.1	15.66	33.0	-17.3	
High Ch								
1902.50	21.62	V	4.5	8.9	26.04	33.0	-7.0	
1902.50	10.74	H	4.5	8.9	15.16	33.0	-17.8	

3MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	17.32	V	4.4	9.3	22.20	33.0	-10.8	
1851.50	10.76	H	4.4	9.3	15.64	33.0	-17.4	
Mid Ch								
1880.00	19.47	V	4.4	9.1	24.10	33.0	-8.9	
1880.00	9.68	H	4.4	9.1	14.31	33.0	-18.7	
High Ch								
1908.50	19.45	V	4.5	8.9	23.84	33.0	-9.2	
1908.50	9.78	H	4.5	8.9	14.17	33.0	-18.8	

10.1.4. LTE Band 4

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 4 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	18.36	V	4.9	8.5	21.99	30.0	-8.0	
1720.00	13.41	H	4.9	8.5	17.04	30.0	-13.0	
Mid Ch								
1732.50	17.11	V	4.9	8.7	20.89	30.0	-9.1	
1732.50	11.40	H	4.9	8.7	15.19	30.0	-14.8	
High Ch								
1745.00	18.88	V	4.9	8.9	22.84	30.0	-7.2	
1745.00	12.35	H	4.9	8.9	16.30	30.0	-13.7	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 4 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	16.60	V	4.9	8.5	20.23	30.0	-9.8	
1720.00	11.55	H	4.9	8.5	15.18	30.0	-14.8	
Mid Ch								
1732.50	15.53	V	4.9	8.7	19.31	30.0	-10.7	
1732.50	9.80	H	4.9	8.7	13.59	30.0	-16.4	
High Ch								
1745.00	16.82	V	4.9	8.9	20.78	30.0	-9.2	
1745.00	10.41	H	4.9	8.9	14.36	30.0	-15.6	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 4 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	18.38	V	4.9	8.4	21.89	30.0	-8.1	
1712.50	8.59	H	4.9	8.4	12.10	30.0	-17.9	
Mid Ch								
1732.50	17.82	V	4.9	8.7	21.60	30.0	-8.4	
1732.50	10.11	H	4.9	8.7	13.90	30.0	-16.1	
High Ch								
1752.50	20.11	V	4.9	9.0	24.19	30.0	-5.8	
1752.50	11.22	H	4.9	9.0	15.29	30.0	-14.7	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 4 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	15.54	V	4.2	8.5	19.85	30.0	-10.1	
1717.50	9.59	H	4.2	8.5	13.90	30.0	-16.1	
Mid Ch								
1732.50	16.45	V	4.2	8.7	20.94	30.0	-9.1	
1732.50	10.28	H	4.2	8.7	14.77	30.0	-15.2	
High Ch								
1747.50	17.30	V	4.3	8.9	21.96	30.0	-8.0	
1747.50	11.30	H	4.3	8.9	15.96	30.0	-14.0	

10.1.5. LTE Band 5

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	16.99	V	2.9	0.1	14.20	38.5	-24.3	
829.00	21.01	H	2.9	0.2	18.32	38.5	-20.2	
Mid Ch								
836.50	16.82	V	2.9	0.1	13.97	38.5	-24.5	
836.50	21.32	H	2.9	0.2	18.58	38.5	-19.9	
High Ch								
844.00	15.96	V	2.9	0.0	13.09	38.5	-25.4	
844.00	21.95	H	2.9	0.1	19.19	38.5	-19.3	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	15.72	V	2.9	0.1	12.93	38.5	-25.6	
829.00	21.01	H	2.9	0.2	18.32	38.5	-20.2	
Mid Ch								
836.50	15.89	V	2.9	0.1	13.04	38.5	-25.5	
836.50	21.32	H	2.9	0.2	18.58	38.5	-19.9	
High Ch								
844.00	14.96	V	2.9	0.0	12.09	38.5	-26.4	
844.00	21.28	H	2.9	0.1	18.52	38.5	-20.0	

3MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	16.85	V	2.9	0.1	14.08	38.5	-24.4	
825.50	20.96	H	2.9	0.2	18.30	38.5	-20.2	
Mid Ch								
836.50	16.82	V	2.9	0.1	13.97	38.5	-24.5	
836.50	21.14	H	2.9	0.2	18.40	38.5	-20.1	
High Ch								
847.50	15.88	V	2.9	0.0	12.98	38.5	-25.5	
847.50	21.88	H	2.9	0.1	19.09	38.5	-19.4	

3MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	15.31	V	2.9	0.1	12.54	38.5	-26.0	
825.50	20.95	H	2.9	0.2	18.29	38.5	-20.2	
Mid Ch								
836.50	15.63	V	2.9	0.1	12.78	38.5	-25.7	
836.50	20.91	H	2.9	0.2	18.17	38.5	-20.3	
High Ch								
847.50	14.89	V	2.9	0.0	11.99	38.5	-26.5	
847.50	21.24	H	2.9	0.1	18.45	38.5	-20.1	

10.1.6. LTE Band 12

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/1/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	14.54	V	2.6	1.2	13.08	34.8	-21.7	
704.00	23.14	H	2.6	1.6	22.07	34.8	-12.7	
Mid Ch								
707.50	14.19	V	2.7	1.1	12.67	34.8	-22.1	
707.50	22.44	H	2.7	1.5	21.29	34.8	-13.5	
High Ch								
711.00	15.51	V	2.6	1.1	13.98	34.8	-20.8	
711.00	21.50	H	2.6	1.5	20.32	34.8	-14.5	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/1/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	13.80	V	2.6	1.2	12.34	34.8	-22.5	
704.00	22.38	H	2.6	1.6	21.31	34.8	-13.5	
Mid Ch								
707.50	13.60	V	2.7	1.1	12.08	34.8	-22.7	
707.50	21.53	H	2.7	1.5	20.38	34.8	-14.4	
High Ch								
711.00	14.87	V	2.6	1.1	13.34	34.8	-21.5	
711.00	20.98	H	2.6	1.5	19.80	34.8	-15.0	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	14.44	V	2.6	1.2	13.00	34.8	-21.8	
701.50	21.31	H	2.6	1.6	20.27	34.8	-14.5	
Mid Ch								
707.50	14.88	V	2.7	1.1	13.36	34.8	-21.4	
707.50	22.55	H	2.7	1.5	21.40	34.8	-13.4	
High Ch								
713.50	15.24	V	2.6	1.1	13.69	34.8	-21.1	
713.50	23.92	H	2.6	1.4	22.71	34.8	-12.1	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	13.63	V	2.6	1.2	12.19	34.8	-22.6	
701.50	20.54	H	2.6	1.6	19.50	34.8	-15.3	
Mid Ch								
707.50	14.15	V	2.7	1.1	12.63	34.8	-22.2	
707.50	21.62	H	2.7	1.5	20.47	34.8	-14.3	
High Ch								
713.50	14.60	V	2.6	1.1	13.05	34.8	-21.8	
713.50	23.32	H	2.6	1.4	22.11	34.8	-12.7	

10.1.7. LTE Band 13

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
782.00	0.00	V	2.8	0.3	0.00	34.8	0.0	
782.00	0.00	H	2.8	0.5	0.00	34.8	0.0	
Mid Ch								
782.00	14.18	V	2.8	0.3	11.75	34.8	-23.0	
782.00	23.03	H	2.8	0.5	20.73	34.8	-14.0	
High Ch								
782.00	0.00	V	2.8	0.3	0.00	34.8	0.0	
782.00	0.00	H	2.8	0.5	0.00	34.8	0.0	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
782.00	0.00	V	2.8	0.3	0.00	34.8	0.0	
782.00	0.00	H	2.8	0.5	0.00	34.8	0.0	
Mid Ch								
782.00	12.81	V	2.8	0.3	10.38	34.8	-24.4	
782.00	21.65	H	2.8	0.5	19.35	34.8	-15.4	
High Ch								
782.00	0.00	V	2.8	0.3	0.00	34.8	0.0	
782.00	0.00	H	2.8	0.5	0.00	34.8	0.0	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
779.50	14.03	V	2.8	0.4	11.62	34.8	-23.1	
779.50	23.12	H	2.8	0.5	20.87	34.8	-13.9	
Mid Ch								
782.00	12.48	V	2.8	0.3	10.05	34.8	-24.7	
782.00	22.83	H	2.8	0.5	20.53	34.8	-14.2	
High Ch								
784.50	13.82	V	2.8	0.3	11.35	34.8	-23.4	
784.50	22.45	H	2.8	0.4	20.10	34.8	-14.7	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
779.50	12.37	V	2.8	0.4	9.96	34.8	-24.8	
779.50	21.44	H	2.8	0.5	19.19	34.8	-15.6	
Mid Ch								
782.00	10.81	V	2.8	0.3	8.38	34.8	-26.4	
782.00	21.13	H	2.8	0.5	18.83	34.8	-15.9	
High Ch								
784.50	12.06	V	2.8	0.3	9.59	34.8	-25.2	
784.50	20.69	H	2.8	0.4	18.34	34.8	-16.4	

10.1.8. LTE Band 17

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	15.48	V	2.7	1.1	13.94	34.8	-20.8	
709.00	23.35	H	2.7	1.5	22.17	34.8	-12.6	
Mid Ch								
710.00	14.91	V	2.7	1.1	13.37	34.8	-21.4	
710.00	23.08	H	2.7	1.5	21.90	34.8	-12.9	
High Ch								
711.00	15.90	V	2.6	1.1	14.37	34.8	-20.4	
711.00	23.72	H	2.6	1.5	22.54	34.8	-12.2	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	14.79	V	2.7	1.1	13.25	34.8	-21.5	
709.00	22.57	H	2.7	1.5	21.39	34.8	-13.4	
Mid Ch								
710.00	14.23	V	2.7	1.1	12.69	34.8	-22.1	
710.00	22.42	H	2.7	1.5	21.24	34.8	-13.5	
High Ch								
711.00	15.31	V	2.6	1.1	13.78	34.8	-21.0	
711.00	23.08	H	2.6	1.5	21.90	34.8	-12.9	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 17 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	15.54	V	2.6	1.1	14.05	34.8	-20.7	
706.50	21.17	H	2.6	1.5	20.05	34.8	-14.7	
Mid Ch								
710.00	14.60	V	2.7	1.1	13.06	34.8	-21.7	
710.00	23.27	H	2.7	1.5	22.09	34.8	-12.7	
High Ch								
713.50	16.35	V	2.6	1.1	14.80	34.8	-20.0	
713.50	21.26	H	2.6	1.4	20.05	34.8	-14.7	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 17 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	14.88	V	2.6	1.1	13.39	34.8	-21.4	
706.50	20.52	H	2.6	1.5	19.40	34.8	-15.4	
Mid Ch								
710.00	13.89	V	2.7	1.1	12.35	34.8	-22.4	
710.00	22.55	H	2.7	1.5	21.37	34.8	-13.4	
High Ch								
713.50	15.69	V	2.6	1.1	14.14	34.8	-20.6	
713.50	20.76	H	2.6	1.4	19.55	34.8	-15.2	

10.1.9. LTE Band 25

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 25 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	16.94	V	5.1	9.2	21.05	33.0	-12.0	
1860.00	11.80	H	5.1	9.2	15.92	33.0	-17.1	
Mid Ch								
1882.50	17.26	V	5.1	9.0	21.17	33.0	-11.8	
1882.50	11.71	H	5.1	9.0	15.62	33.0	-17.4	
High Ch								
1905.00	18.71	V	5.2	8.9	22.42	33.0	-10.6	
1905.00	8.84	H	5.2	8.9	12.56	33.0	-20.4	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 25 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	16.60	V	5.1	9.2	20.71	33.0	-12.3	
1860.00	11.14	H	5.1	9.2	15.26	33.0	-17.7	
Mid Ch								
1882.50	16.45	V	5.1	9.0	20.36	33.0	-12.6	
1882.50	10.79	H	5.1	9.0	14.70	33.0	-18.3	
High Ch								
1905.00	17.86	V	5.2	8.9	21.57	33.0	-11.4	
1905.00	7.95	H	5.2	8.9	11.67	33.0	-21.3	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 25 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	18.94	V	5.1	9.2	23.07	33.0	-9.9	
1857.50	10.73	H	5.1	9.2	14.87	33.0	-18.1	
Mid Ch								
1882.50	18.25	V	5.1	9.0	22.16	33.0	-10.8	
1882.50	11.63	H	5.1	9.0	15.54	33.0	-17.5	
High Ch								
1907.50	18.56	V	5.2	8.9	22.26	33.0	-10.7	
1907.50	13.24	H	5.2	8.9	16.94	33.0	-16.1	

3MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 25 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	17.32	V	5.1	9.3	21.50	33.0	-11.5	
1851.50	12.00	H	5.1	9.3	16.19	33.0	-16.8	
Mid Ch								
1882.50	17.74	V	5.1	9.0	21.65	33.0	-11.4	
1882.50	6.43	H	5.1	9.0	10.34	33.0	-22.7	
High Ch								
1913.50	19.22	V	5.2	8.8	22.87	33.0	-10.1	
1913.50	10.92	H	5.2	8.8	14.58	33.0	-18.4	

10.1.10. LTE Band 26 (FCC PART 90S)

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 1/17/2019
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
821.50	9.98	V	2.9	0.1	7.24	38.5	-31.3	
821.50	22.32	H	2.9	0.2	19.67	38.5	-18.8	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 1/17/2019
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
821.50	9.73	V	2.9	0.1	6.99	38.5	-31.5	
821.50	20.55	H	2.9	0.2	17.90	38.5	-20.6	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/27/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	15.44	V	2.8	0.1	12.71	50.0	-37.3	Part 90
819.00	23.21	H	2.8	0.2	20.56	50.0	-29.4	Part 90

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/27/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	13.22	V	2.8	0.1	10.49	50.0	-39.5	Part 90
819.00	20.94	H	2.8	0.2	18.29	50.0	-31.7	Part 90

10.1.11. LTE Band 26 (FCC PART 22)

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	14.21	V	2.9	0.1	11.39	38.5	-27.1	
831.50	21.63	H	2.9	0.2	18.91	38.5	-19.6	
Mid Ch								
836.50	13.79	V	2.9	0.1	10.94	38.5	-27.6	
836.50	22.67	H	2.9	0.2	19.93	38.5	-18.6	
High Ch								
841.50	14.46	V	2.9	0.0	11.60	38.5	-26.9	
841.50	24.61	H	2.9	0.1	21.86	38.5	-16.6	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/17/2018
Test Engineer: 19480 BS
Configuration: EUT only
Location: Chamber B
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	11.81	V	2.9	0.1	8.99	38.5	-29.5	
831.50	19.23	H	2.9	0.2	16.51	38.5	-22.0	
Mid Ch								
836.50	11.39	V	2.9	0.1	8.54	38.5	-30.0	
836.50	20.27	H	2.9	0.2	17.53	38.5	-21.0	
High Ch								
841.50	12.06	V	2.9	0.0	9.20	38.5	-29.3	
841.50	22.21	H	2.9	0.1	19.46	38.5	-19.0	

3MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	15.46	V	2.8	0.1	12.75	50.0	-37.2	Part 90
815.50	20.73	H	2.8	0.2	18.08	50.0	-31.9	Part 90
Mid Ch								
831.50	16.90	V	2.9	0.1	14.08	38.5	-24.4	
831.50	21.52	H	2.9	0.2	18.80	38.5	-19.7	
High Ch								
847.50	16.45	V	2.9	0.0	13.56	38.5	-24.9	
847.50	21.96	H	2.9	0.1	19.17	38.5	-19.3	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T407, and Chamber B SMA Cables
Substitution: Dipole T416, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	13.49	V	2.8	0.1	10.78	50.0	-39.2	Part 90
816.50	19.95	H	2.8	0.2	17.30	50.0	-32.7	Part 90
Mid Ch								
831.50	15.83	V	2.9	0.1	13.01	38.5	-25.5	
831.50	21.35	H	2.9	0.2	18.63	38.5	-19.9	
High Ch								
846.50	13.50	V	2.9	0.0	10.61	38.5	-27.9	
846.50	20.92	H	2.9	0.1	18.14	38.5	-20.4	

10.1.12. LTE Band 41

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 41(FCC) Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	16.72	V	5.2	9.6	21.10	33.0	-11.9	
2506.00	14.95	H	5.2	9.6	19.33	33.0	-13.7	
Mid Ch								
2593.00	17.16	V	5.3	9.5	21.34	33.0	-11.7	
2593.00	16.91	H	5.3	9.5	21.09	33.0	-11.9	
High Ch								
2680.00	16.75	V	5.4	9.8	21.14	33.0	-11.9	
2680.00	15.72	H	5.4	9.8	20.10	33.0	-12.9	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 41(FCC) Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	16.14	V	5.2	9.6	20.52	33.0	-12.5	
2506.00	13.96	H	5.2	9.6	18.34	33.0	-14.7	
Mid Ch								
2593.00	16.30	V	5.3	9.5	20.48	33.0	-12.5	
2593.00	16.28	H	5.3	9.5	20.46	33.0	-12.5	
High Ch								
2680.00	15.72	V	5.4	9.8	20.11	33.0	-12.9	
2680.00	15.07	H	5.4	9.8	19.45	33.0	-13.6	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 41(FCC) Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	14.27	V	5.2	9.6	18.65	33.0	-14.3	
2503.50	16.61	H	5.2	9.6	21.00	33.0	-12.0	
Mid Ch								
2593.00	14.47	V	5.3	9.5	18.65	33.0	-14.4	
2593.00	16.16	H	5.3	9.5	20.34	33.0	-12.7	
High Ch								
2682.50	13.46	V	5.4	9.8	17.84	33.0	-15.2	
2682.50	13.97	H	5.4	9.8	18.34	33.0	-14.7	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/16/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 41(FCC) Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	13.27	V	5.2	9.6	17.67	33.0	-15.3	
2501.00	14.68	H	5.2	9.6	19.08	33.0	-13.9	
Mid Ch								
2593.00	14.60	V	5.3	9.5	18.78	33.0	-14.2	
2593.00	13.17	H	5.3	9.5	17.35	33.0	-15.7	
High Ch								
2685.00	11.53	V	5.4	9.8	15.90	33.0	-17.1	
2685.00	12.80	H	5.4	9.8	17.16	33.0	-15.8	

10.1.13. LTE Band 66

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	17.71	V	4.2	8.5	22.04	30.0	-8.0	
1720.00	9.94	H	4.2	8.5	14.27	30.0	-15.7	
Mid Ch								
1745.00	18.20	V	4.2	8.9	22.85	30.0	-7.2	
1745.00	9.00	H	4.2	8.9	13.66	30.0	-16.3	
High Ch								
1770.00	18.55	V	4.3	9.3	23.53	30.0	-6.5	
1770.00	10.17	H	4.3	9.3	15.14	30.0	-14.9	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/15/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	16.85	V	4.9	8.5	20.48	30.0	-9.5	
1720.00	9.16	H	4.9	8.5	12.79	30.0	-17.2	
Mid Ch								
1745.00	17.29	V	4.9	8.9	21.24	30.0	-8.8	
1745.00	8.15	H	4.9	8.9	12.11	30.0	-17.9	
High Ch								
1770.00	18.35	V	5.0	9.3	22.63	30.0	-7.4	
1770.00	9.28	H	5.0	9.3	13.55	30.0	-16.5	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 66 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	16.25	V	4.2	8.5	20.56	30.0	-9.4	
1717.50	9.80	H	4.2	8.5	14.11	30.0	-15.9	
Mid Ch								
1745.00	16.91	V	4.2	8.9	21.56	30.0	-8.4	
1745.00	11.43	H	4.2	8.9	16.08	30.0	-13.9	
High Ch								
1772.50	17.95	V	4.3	9.3	22.96	30.0	-7.0	
1772.50	11.71	H	4.3	9.3	16.72	30.0	-13.3	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Lions
Project #: 12563708
Date: 11/20/2018
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 66 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T863, and Chamber B SMA Cables
Substitution: Horn T60, Chamber B Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	15.43	V	4.2	8.5	19.74	30.0	-10.3	
1717.50	8.98	H	4.2	8.5	13.29	30.0	-16.7	
Mid Ch								
1745.00	16.12	V	4.2	8.9	20.77	30.0	-9.2	
1745.00	10.61	H	4.2	8.9	15.26	30.0	-14.7	
High Ch								
1772.50	17.19	V	4.3	9.3	22.20	30.0	-7.8	
1772.50	10.93	H	4.3	9.3	15.94	30.0	-14.1	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53, and §90.691

LIMITS

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 (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).

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
- WCDMA Band 5
- WCDMA Band 2
- WCDMA Band 4
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 41
- LTE Band 66

RESULTS

No spurious emissions were detected above system noise floor from 18-26GHz.

10.2.1. GSM

Company:	Samsung
Project #:	12563708
Date:	10/23/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	GPRS 850
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	824.2MHz											
4	1.643	-70.6	Pk	28.4	-31.5	11.5	-62.2	-13	-49.2	0-360	149	V
1	1.648	-63.24	Pk	28.5	-31.5	12.1	-54.14	-13	-41.14	0-360	149	H
5	2.476	-71.27	Pk	32.3	-30.4	11.6	-57.77	-13	-44.77	0-360	149	V
2	2.477	-70.34	Pk	32.3	-30.4	11.6	-56.84	-13	-43.84	0-360	149	H
3	3.289	-71.58	Pk	32.8	-29.2	11.1	-56.88	-13	-43.88	0-360	149	H
6	3.296	-72.04	Pk	32.8	-29.2	11.2	-57.24	-13	-44.24	0-360	149	V
	836.6MHz											
4	1.666	-68.84	Pk	28.6	-31.6	11.6	-60.24	-13	-47.24	0-360	149	V
1	1.669	-71	Pk	28.7	-31.5	12.7	-61.1	-13	-48.1	0-360	149	H
5	2.508	-70.55	Pk	32.4	-30.4	11.4	-57.15	-13	-44.15	0-360	149	V
2	2.515	-70.77	Pk	32.4	-30.4	11.5	-57.27	-13	-44.27	0-360	149	H
6	3.342	-72.08	Pk	32.7	-29	11	-57.38	-13	-44.38	0-360	149	V
3	3.351	-71.76	Pk	32.7	-29.1	10.7	-57.46	-13	-44.46	0-360	149	H
	848.8MHz											
1	1.698	-65.45	Pk	28.9	-31.2	12.5	-55.25	-13	-42.25	0-360	149	H
4	1.698	-57.64	Pk	28.9	-31.2	12.9	-47.04	-13	-34.04	0-360	149	V
5	2.533	-71.38	Pk	32.4	-30.3	12	-57.28	-13	-44.28	0-360	149	V
2	2.542	-70.05	Pk	32.3	-30.3	11.8	-56.25	-13	-43.25	0-360	149	H
6	3.373	-69.95	Pk	32.6	-29.1	11.9	-54.55	-13	-41.55	0-360	149	V
3	3.389	-70.9	Pk	32.6	-29.1	11.1	-56.3	-13	-43.3	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/23/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 850
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	824.2MHz											
4	1.645	-71	Pk	28.5	-31.5	11.5	-62.5	-13	-49.5	0-360	149	V
1	1.648	-70.01	Pk	28.5	-31.5	12.1	-60.91	-13	-47.91	0-360	149	H
2	2.466	-71.53	Pk	32.2	-30.5	11.9	-57.93	-13	-44.93	0-360	149	H
5	2.467	-72.67	Pk	32.2	-30.5	11.1	-59.87	-13	-46.87	0-360	149	V
6	3.287	-72.07	Pk	32.8	-29.2	11.1	-57.37	-13	-44.37	0-360	149	V
3	3.298	-71.18	Pk	32.8	-29.2	11.4	-56.18	-13	-43.18	0-360	149	H
	836.6MHz											
4	1.669	-71.58	Pk	28.7	-31.5	11.6	-62.78	-13	-49.78	0-360	149	V
1	1.674	-69.78	Pk	28.7	-31.5	12.5	-60.08	-13	-47.08	0-360	149	H
5	2.494	-70.91	Pk	32.4	-30.4	11.8	-57.11	-13	-44.11	0-360	149	V
2	2.505	-71.08	Pk	32.4	-30.4	11.3	-57.78	-13	-44.78	0-360	149	H
6	3.337	-71.68	Pk	32.7	-29	11	-56.98	-13	-43.98	0-360	149	V
3	3.343	-71.68	Pk	32.7	-29	10.4	-57.58	-13	-44.58	0-360	149	H
	848.8MHz											
1	1.694	-72.23	Pk	28.9	-31.2	12.6	-61.93	-13	-48.93	0-360	149	H
4	1.695	-71.26	Pk	28.9	-31.2	12.6	-60.96	-13	-47.96	0-360	149	V
5	2.537	-71.94	Pk	32.4	-30.3	12	-57.84	-13	-44.84	0-360	149	V
2	2.542	-70.86	Pk	32.3	-30.3	11.8	-57.06	-13	-44.06	0-360	149	H
6	3.376	-72.37	Pk	32.6	-29.1	12	-56.87	-13	-43.87	0-360	149	V
3	3.387	-71.28	Pk	32.6	-29	11.1	-56.58	-13	-43.58	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/24/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	GPRS 1900
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1852.2MHz											
4	3.693	-72.72	Pk	33	-28.8	11.6	-56.92	-13	-43.92	0-360	149	V
1	3.702	-70.93	Pk	33.1	-28.9	11.2	-55.53	-13	-42.53	0-360	149	H
5	5.524	-72.67	Pk	34.9	-26.7	11.3	-53.17	-13	-40.17	0-360	149	V
2	5.544	-73.79	Pk	35	-26.8	11	-54.59	-13	-41.59	0-360	149	H
6	7.384	-75.4	Pk	35.6	-23	11.2	-51.6	-13	-38.6	0-360	149	V
3	7.398	-75.89	Pk	35.6	-23	10.6	-52.69	-13	-39.69	0-360	149	H
	1880MHz											
4	3.743	-70.62	Pk	33.1	-28.8	11.4	-54.92	-13	-41.92	0-360	149	V
1	3.756	-71.14	Pk	33.2	-28.7	11.5	-55.14	-13	-42.14	0-360	149	H
2	5.628	-71.68	Pk	35.1	-26.7	10.5	-52.78	-13	-39.78	0-360	149	H
5	5.63	-73.05	Pk	35.1	-26.8	10.7	-54.05	-13	-41.05	0-360	149	V
6	7.487	-74.37	Pk	35.7	-23	10.9	-50.77	-13	-37.77	0-360	149	V
3	7.515	-74.9	Pk	35.7	-23	10.5	-51.7	-13	-38.7	0-360	149	H
	1909.8MHz											
4	3.797	-71.09	Pk	33.2	-28.5	11.3	-55.09	-13	-42.09	0-360	149	V
1	3.812	-71.41	Pk	33.2	-28.5	11.2	-55.51	-13	-42.51	0-360	149	H
5	5.706	-72.53	Pk	35	-26.3	10.7	-53.13	-13	-40.13	0-360	149	V
2	5.716	-73.71	Pk	35	-26.2	10.5	-54.41	-13	-41.41	0-360	149	H
6	7.616	-75.12	Pk	35.7	-22.9	11.3	-51.02	-13	-38.02	0-360	149	V
3	7.629	-75.18	Pk	35.7	-22.9	10.7	-51.68	-13	-38.68	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/24/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 1900
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1852.2MHz											
4	3.676	-71.58	Pk	33	-28.7	11.2	-56.08	-13	-43.08	0-360	149	V
1	3.692	-72.73	Pk	33	-28.8	11.3	-57.23	-13	-44.23	0-360	149	H
5	5.535	-73.81	Pk	35	-26.8	11.5	-54.11	-13	-41.11	0-360	149	V
2	5.541	-73.77	Pk	35	-26.8	11.2	-54.37	-13	-41.37	0-360	149	H
6	7.348	-73.64	Pk	35.7	-23.2	11	-50.14	-13	-37.14	0-360	149	V
3	7.384	-73.9	Pk	35.6	-23	10.9	-50.4	-13	-37.4	0-360	149	H
	1880MHz											
1	3.76	-70.99	Pk	33.2	-28.7	11.6	-54.89	-13	-41.89	0-360	149	H
4	3.763	-72.15	Pk	33.2	-28.7	11.2	-56.45	-13	-43.45	0-360	149	V
5	5.617	-73.83	Pk	35.1	-26.7	10.7	-54.73	-13	-41.73	0-360	149	V
2	5.626	-72.21	Pk	35.1	-26.7	10.4	-53.41	-13	-40.41	0-360	149	H
6	7.515	-74.38	Pk	35.7	-23	10.8	-50.88	-13	-37.88	0-360	149	V
3	7.516	-75.18	Pk	35.7	-23	10.5	-51.98	-13	-38.98	0-360	149	H
	1909.8MHz											
4	3.809	-71.09	Pk	33.2	-28.5	11.1	-55.29	-13	-42.29	0-360	149	V
1	3.817	-71.85	Pk	33.1	-28.5	11.6	-55.65	-13	-42.65	0-360	149	H
5	5.689	-72.83	Pk	35	-26.5	10.4	-53.93	-13	-40.93	0-360	149	V
2	5.713	-71.96	Pk	35	-26.2	10.6	-52.56	-13	-39.56	0-360	149	H
6	7.607	-74.98	Pk	35.7	-22.8	11.2	-50.88	-13	-37.88	0-360	149	V
3	7.63	-74.84	Pk	35.7	-22.9	10.7	-51.34	-13	-38.34	0-360	149	H

10.2.2. WCDMA

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	REL99 B5
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	826.4MHz											
1	1.654	-71.23	Pk	28.7	-33.3	10.8	-65.03	-13	-52.03	0-360	149	H
2	1.654	-70.33	Pk	28.7	-33.3	9.7	-65.23	-13	-52.23	0-360	149	V
3	2.48	-70.82	Pk	32.6	-32.3	8.7	-61.82	-13	-48.82	0-360	149	H
4	2.48	-70.8	Pk	32.6	-32.3	8.8	-61.7	-13	-48.7	0-360	149	V
6	3.306	-70.93	Pk	32.9	-31	9.9	-59.13	-13	-46.13	0-360	149	V
5	3.308	-70.58	Pk	32.9	-30.9	9.6	-58.98	-13	-45.98	0-360	149	H
	836.6MHz											
1	1.673	-69.57	Pk	29.1	-33.2	10.6	-63.07	-13	-50.07	0-360	149	H
2	1.675	-69.9	Pk	29.1	-33.1	9	-64.9	-13	-51.9	0-360	149	V
3	2.511	-70.86	Pk	32.7	-32.2	9.1	-61.26	-13	-48.26	0-360	149	H
4	2.511	-70.32	Pk	32.7	-32.2	9.4	-60.42	-13	-47.42	0-360	149	V
5	3.344	-70.83	Pk	32.9	-31	9	-59.93	-13	-46.93	0-360	149	H
6	3.345	-70.46	Pk	32.9	-31	9.3	-59.26	-13	-46.26	0-360	149	V
	846.6MHz											
2	1.692	-68.34	Pk	29.4	-33.2	9.7	-62.44	-13	-49.44	0-360	149	V
1	1.695	-69.8	Pk	29.5	-33.3	10.3	-63.3	-13	-50.3	0-360	149	H
3	2.539	-70.48	Pk	32.7	-32	8.9	-60.88	-13	-47.88	0-360	149	H
4	2.539	-70.87	Pk	32.7	-32	9.1	-61.07	-13	-48.07	0-360	149	V
5	3.383	-70.69	Pk	32.8	-31.2	8.5	-60.59	-13	-47.59	0-360	149	H
6	3.384	-70.7	Pk	32.8	-31.3	8.8	-60.4	-13	-47.4	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B5
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	826.4MHz											
1	1.653	-69.28	Pk	28.7	-33.4	10.8	-63.18	-13	-50.18	0-360	149	H
2	1.654	-69.97	Pk	28.7	-33.3	9.7	-64.87	-13	-51.87	0-360	149	V
3	2.48	-70.32	Pk	32.6	-32.3	8.7	-61.32	-13	-48.32	0-360	149	H
4	2.48	-70.09	Pk	32.6	-32.3	8.8	-60.99	-13	-47.99	0-360	149	V
5	3.306	-72.24	Pk	32.9	-31	9.7	-60.64	-13	-47.64	0-360	149	H
6	3.31	-69.44	Pk	32.9	-31	9.8	-57.74	-13	-44.74	0-360	149	V
	836.6MHz											
1	1.672	-69.56	Pk	29	-33.3	10.7	-63.16	-13	-50.16	0-360	149	H
2	1.674	-68.57	Pk	29.1	-33.2	9	-63.67	-13	-50.67	0-360	149	V
3	2.51	-69.99	Pk	32.7	-32.2	9.1	-60.39	-13	-47.39	0-360	149	H
4	2.511	-71.32	Pk	32.7	-32.2	9.4	-61.42	-13	-48.42	0-360	149	V
5	3.347	-69.97	Pk	32.9	-31	9.1	-58.97	-13	-45.97	0-360	149	H
6	3.348	-71.01	Pk	32.9	-31	9.4	-59.71	-13	-46.71	0-360	149	V
	846.6MHz											
1	1.694	-69.94	Pk	29.5	-33.3	10.4	-63.34	-13	-50.34	0-360	149	H
2	1.694	-70.28	Pk	29.5	-33.3	9.7	-64.38	-13	-51.38	0-360	149	V
4	2.54	-70.39	Pk	32.7	-32	9	-60.69	-13	-47.69	0-360	149	V
3	2.541	-71.92	Pk	32.7	-32	8.8	-62.42	-13	-49.42	0-360	149	H
6	3.286	-70.65	Pk	32.9	-31.3	9.2	-59.85	-13	-46.85	0-360	149	V
5	3.287	-72.56	Pk	32.9	-31.3	9.7	-61.26	-13	-48.26	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	REL99 B2
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1852.4MHz											
4	3.702	-70.18	Pk	33.2	-30.8	9.7	-58.08	-13	-45.08	0-360	149	V
3	3.703	-68.81	Pk	33.2	-30.8	10.2	-56.21	-13	-43.21	0-360	149	H
5	5.558	-72.08	Pk	35.4	-29.7	8.9	-57.48	-13	-44.48	0-360	149	H
6	5.558	-71.36	Pk	35.4	-29.7	8.8	-56.86	-13	-43.86	0-360	149	V
7	7.408	-70.36	Pk	36.2	-27.5	6.8	-54.86	-13	-41.86	0-360	149	H
8	7.41	-73.12	Pk	36.2	-27.5	7.1	-57.32	-13	-44.32	0-360	149	V
	1880MHz											
4	3.759	-70.33	Pk	33.3	-31.1	9.6	-58.53	-13	-45.53	0-360	149	V
3	3.763	-69.8	Pk	33.3	-31	9.3	-58.2	-13	-45.2	0-360	149	H
6	5.641	-71.81	Pk	35.5	-29.4	8.1	-57.61	-13	-44.61	0-360	149	V
5	5.642	-72.05	Pk	35.5	-29.4	8.1	-57.85	-13	-44.85	0-360	149	H
7	7.516	-68.43	Pk	36.2	-27.3	7.6	-51.93	-13	-38.93	0-360	149	H
8	7.516	-72.38	Pk	36.2	-27.3	7.5	-55.98	-13	-42.98	0-360	149	V
	1907.6MHz											
3	3.814	-68.73	Pk	33.4	-30.5	9.4	-56.43	-13	-43.43	0-360	149	H
4	3.817	-70.09	Pk	33.4	-30.6	9.8	-57.49	-13	-44.49	0-360	149	V
5	5.72	-70.83	Pk	35.5	-29.7	7.6	-57.43	-13	-44.43	0-360	149	H
6	5.72	-69.47	Pk	35.5	-29.7	7.7	-55.97	-13	-42.97	0-360	149	V
7	7.631	-73.85	Pk	36.4	-27	7.4	-57.05	-13	-44.05	0-360	149	H
8	7.631	-73.27	Pk	36.4	-27	7.4	-56.47	-13	-43.47	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B2
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1852.4MHz											
3	3.704	-70.62	Pk	33.2	-30.9	10.2	-58.12	-13	-45.12	0-360	149	H
4	3.706	-70.67	Pk	33.2	-30.9	10	-58.37	-13	-45.37	0-360	149	V
5	5.556	-72.07	Pk	35.4	-29.7	8.9	-57.47	-13	-44.47	0-360	149	H
6	5.557	-72.22	Pk	35.4	-29.7	8.8	-57.72	-13	-44.72	0-360	149	V
7	7.408	-71.95	Pk	36.2	-27.5	6.9	-56.35	-13	-43.35	0-360	149	H
8	7.41	-73.26	Pk	36.2	-27.5	7.1	-57.46	-13	-44.46	0-360	149	V
	1880MHz											
3	3.759	-69.77	Pk	33.3	-31.1	9.3	-58.27	-13	-45.27	0-360	149	H
4	3.76	-69.33	Pk	33.3	-31.1	9.7	-57.43	-13	-44.43	0-360	149	V
5	5.638	-71.49	Pk	35.5	-29.4	8.4	-56.99	-13	-43.99	0-360	149	H
6	5.642	-71.32	Pk	35.5	-29.4	8	-57.22	-13	-44.22	0-360	149	V
8	7.519	-73.58	Pk	36.2	-27.3	7.5	-57.18	-13	-44.18	0-360	149	V
7	7.521	-72.6	Pk	36.2	-27.3	7.5	-56.2	-13	-43.2	0-360	149	H
	1907.6MHz											
3	3.815	-69.98	Pk	33.4	-30.5	9.4	-57.68	-13	-44.68	0-360	149	H
4	3.815	-69.84	Pk	33.4	-30.5	9.7	-57.24	-13	-44.24	0-360	149	V
5	5.722	-71.03	Pk	35.5	-29.7	7.7	-57.53	-13	-44.53	0-360	149	H
6	5.722	-70.83	Pk	35.5	-29.7	7.7	-57.33	-13	-44.33	0-360	149	V
7	7.63	-72.02	Pk	36.4	-27	7.5	-55.12	-13	-42.12	0-360	149	H
8	7.631	-73.02	Pk	36.4	-27	7.4	-56.22	-13	-43.22	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	REL99 B4
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1712.4MHz											
4	3.423	-70.54	Pk	32.8	-31.4	9.3	-59.84	-13	-46.84	0-360	149	V
3	3.424	-70.11	Pk	32.8	-31.4	8.9	-59.81	-13	-46.81	0-360	149	H
5	5.137	-71.13	Pk	34.6	-30.1	8.3	-58.33	-13	-45.33	0-360	149	H
6	5.138	-71.43	Pk	34.6	-30.1	8.2	-58.73	-13	-45.73	0-360	149	V
8	6.85	-72	Pk	35.8	-28.1	6.7	-57.6	-13	-44.6	0-360	149	V
7	6.851	-71.8	Pk	35.8	-28	6.7	-57.3	-13	-44.3	0-360	149	H
	1732.6MHz											
3	3.465	-70.67	Pk	32.9	-31.3	9.7	-59.37	-13	-46.37	0-360	149	H
4	3.467	-71.06	Pk	32.9	-31.3	9.3	-60.16	-13	-47.16	0-360	149	V
5	5.197	-71.59	Pk	34.7	-29.8	9.2	-57.49	-13	-44.49	0-360	149	H
6	5.197	-69.35	Pk	34.7	-29.8	9.2	-55.25	-13	-42.25	0-360	149	V
7	6.929	-72.68	Pk	35.8	-27.9	6.8	-57.98	-13	-44.98	0-360	149	H
8	6.93	-72.1	Pk	35.8	-28	6.8	-57.5	-13	-44.5	0-360	149	V
	1752.6MHz											
3	3.505	-72.91	Pk	32.9	-31	9.7	-61.31	-13	-48.31	0-360	149	H
4	3.505	-71.22	Pk	32.9	-31	9.8	-59.52	-13	-46.52	0-360	149	V
5	5.257	-71.45	Pk	34.8	-29.8	8.7	-57.75	-13	-44.75	0-360	149	H
6	5.258	-72.17	Pk	34.8	-29.8	8.6	-58.57	-13	-45.57	0-360	149	V
7	7.01	-72.46	Pk	35.9	-27.8	7.1	-57.26	-13	-44.26	0-360	149	H
8	7.01	-73.42	Pk	35.9	-27.8	7.1	-58.22	-13	-45.22	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B4
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1712.4MHz											
4	3.421	-69.74	Pk	32.8	-31.4	9.3	-59.04	-13	-46.04	0-360	149	V
3	3.424	-69.05	Pk	32.8	-31.4	9	-58.65	-13	-45.65	0-360	149	H
5	5.137	-70.46	Pk	34.6	-30.1	8.3	-57.66	-13	-44.66	0-360	149	H
6	5.138	-70.23	Pk	34.6	-30.1	8.2	-57.53	-13	-44.53	0-360	149	V
7	6.849	-71.68	Pk	35.8	-28.2	6.6	-57.48	-13	-44.48	0-360	149	H
8	6.85	-72.43	Pk	35.8	-28.1	6.7	-58.03	-13	-45.03	0-360	149	V
	1732.6MHz											
3	3.467	-69.08	Pk	32.9	-31.3	9.7	-57.78	-13	-44.78	0-360	149	H
4	3.468	-71.7	Pk	32.9	-31.2	9.3	-60.7	-13	-47.7	0-360	149	V
6	5.198	-70.27	Pk	34.7	-29.8	9.3	-56.07	-13	-43.07	0-360	149	V
5	5.201	-71.18	Pk	34.7	-29.8	9.4	-56.88	-13	-43.88	0-360	149	H
7	6.932	-72.09	Pk	35.8	-28	6.6	-57.69	-13	-44.69	0-360	149	H
8	6.933	-72.46	Pk	35.8	-28	6.7	-57.96	-13	-44.96	0-360	149	V
	1752.6MHz											
3	3.505	-69.94	Pk	32.9	-31	9.7	-58.34	-13	-45.34	0-360	149	H
4	3.505	-71.46	Pk	32.9	-31	9.8	-59.76	-13	-46.76	0-360	149	V
5	5.255	-71.01	Pk	34.8	-29.8	8.9	-57.11	-13	-44.11	0-360	149	H
6	5.255	-70.97	Pk	34.8	-29.8	8.7	-57.27	-13	-44.27	0-360	149	V
8	7.01	-73.43	Pk	35.9	-27.8	7.1	-58.23	-13	-45.23	0-360	149	V
7	7.011	-73.67	Pk	35.9	-27.8	7.1	-58.47	-13	-45.47	0-360	149	H

10.2.3. LTE BAND 2

Company:	Samsung
Project #:	12563708
Date:	10/24/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 2 QPSK 20MHz
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1860MHz											
4	3.782	-68.12	Pk	33.2	-28.5	11.4	-52.02	-13	-39.02	0-360	149	V
1	4.131	-69.96	Pk	33.4	-28	11.3	-53.26	-13	-40.26	0-360	149	H
2	4.437	-70.08	Pk	33.7	-27.9	11.7	-52.58	-13	-39.58	0-360	149	H
5	6.313	-71.55	Pk	35.7	-25	11.2	-49.65	-13	-36.65	0-360	149	V
6	10.854	-73.81	Pk	37.9	-18.8	11.2	-43.51	-13	-30.51	0-360	149	V
3	10.865	-73.14	Pk	37.9	-18.7	10.9	-43.04	-13	-30.04	0-360	149	H
	1880MHz											
4	3.743	-70.84	Pk	33.1	-28.8	11.4	-55.14	-13	-42.14	0-360	149	V
1	3.752	-72.02	Pk	33.1	-28.7	11.7	-55.92	-13	-42.92	0-360	149	H
5	5.631	-73.37	Pk	35.1	-26.8	10.6	-54.47	-13	-41.47	0-360	149	V
2	5.639	-72.99	Pk	35.1	-26.8	10.8	-53.89	-13	-40.89	0-360	149	H
6	7.486	-74.21	Pk	35.7	-23	10.8	-50.71	-13	-37.71	0-360	149	V
3	7.499	-75.29	Pk	35.7	-23.1	10.7	-51.99	-13	-38.99	0-360	149	H
	1900MHz											
1	3.3	-69.76	Pk	32.8	-29.1	11.5	-54.56	-13	-41.56	0-360	149	H
4	3.655	-70.21	Pk	32.9	-28.6	10.7	-55.21	-13	-42.21	0-360	149	V
5	5.05	-70.09	Pk	34.4	-27.3	11.2	-51.79	-13	-38.79	0-360	149	V
2	5.482	-71.46	Pk	34.8	-26.7	10.9	-52.46	-13	-39.46	0-360	149	H
6	7.203	-73.33	Pk	35.7	-23.4	10.9	-50.13	-13	-37.13	0-360	149	V
3	7.564	-71.7	Pk	35.7	-22.9	10.9	-48	-13	-35	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/24/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 2 16QAM 20MHz
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1860MHz											
4	3.042	-69.81	Pk	32.7	-29.7	11.9	-54.91	-13	-41.91	0-360	149	V
1	3.047	-70.42	Pk	32.7	-29.6	11.9	-55.42	-13	-42.42	0-360	149	H
5	5.961	-71.4	Pk	35.3	-25.9	11.1	-50.9	-13	-37.9	0-360	149	V
2	6.001	-70.76	Pk	35.3	-25.9	11.4	-49.96	-13	-36.96	0-360	149	H
3	6.381	-70.94	Pk	35.8	-25	11	-49.14	-13	-36.14	0-360	149	H
6	6.495	-72.46	Pk	35.7	-24.7	11.3	-50.16	-13	-37.16	0-360	149	V
	1880MHz											
4	2.397	-69.62	Pk	31.8	-30.4	13.1	-55.12	-13	-42.12	0-360	149	V
1	3.442	-70.33	Pk	32.7	-28.9	11.7	-54.83	-13	-41.83	0-360	149	H
5	4.112	-70.71	Pk	33.4	-28.1	11.7	-53.71	-13	-40.71	0-360	149	V
2	5.928	-71.73	Pk	35.2	-25.8	10.8	-51.53	-13	-38.53	0-360	149	H
6	8.415	-74.83	Pk	35.8	-22.5	11.2	-50.33	-13	-37.33	0-360	149	V
3	9.497	-72.17	Pk	36.8	-21.2	11	-45.57	-13	-32.57	0-360	149	H
	1900MHz											
1	3.475	-69.75	Pk	32.8	-29.1	11.5	-54.55	-13	-41.55	0-360	149	H
2	5.332	-71.49	Pk	34.6	-26.6	10.8	-52.69	-13	-39.69	0-360	149	H
3	6.745	-72.03	Pk	35.5	-24.3	10.7	-50.13	-13	-37.13	0-360	149	H
4	7.564	-73.18	Pk	35.7	-22.9	11.3	-49.08	-13	-36.08	0-360	149	V
5	8.518	-72.65	Pk	35.8	-22.1	11	-47.95	-13	-34.95	0-360	149	V
6	12.697	-73.82	Pk	39.2	-18.8	10.9	-42.52	-13	-29.52	0-360	149	V

10.2.4. LTE BAND 4

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 4 QPSK 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1720MHz											
1	3.447	-69	Pk	32.9	-31.6	9.2	-58.5	-13	-45.5	0-360	149	H
2	3.448	-69.87	Pk	32.9	-31.5	9	-59.47	-13	-46.47	0-360	149	V
4	5.161	-71.39	Pk	34.6	-29.7	9.4	-57.09	-13	-44.09	0-360	149	V
3	5.163	-71.07	Pk	34.6	-29.6	9.3	-56.77	-13	-43.77	0-360	149	H
5	6.88	-71.24	Pk	35.8	-28.4	6.7	-57.14	-13	-44.14	0-360	149	H
6	6.882	-72.55	Pk	35.8	-28.4	6.8	-58.35	-13	-45.35	0-360	149	V
	1732.5MHz											
1	3.47	-69.65	Pk	32.9	-31.2	9.6	-58.35	-13	-45.35	0-360	149	H
2	3.47	-68.88	Pk	32.9	-31.2	9.2	-57.98	-13	-44.98	0-360	149	V
3	5.203	-70.33	Pk	34.7	-29.8	9.3	-56.13	-13	-43.13	0-360	149	H
4	5.208	-70.71	Pk	34.7	-29.6	9.2	-56.41	-13	-43.41	0-360	149	V
5	6.946	-70.79	Pk	35.8	-27.9	6.8	-56.09	-13	-43.09	0-360	149	H
6	6.95	-70.87	Pk	35.9	-28	6.8	-56.17	-13	-43.17	0-360	149	V
	1745MHz											
2	3.501	-69.41	Pk	32.9	-31.1	9.7	-57.91	-13	-44.91	0-360	149	V
1	3.505	-70.44	Pk	32.9	-31	9.7	-58.84	-13	-45.84	0-360	149	H
4	5.237	-71.64	Pk	34.8	-29.5	8.9	-57.44	-13	-44.44	0-360	149	V
3	5.238	-71.69	Pk	34.8	-29.6	9.1	-57.39	-13	-44.39	0-360	149	H
5	6.988	-71.82	Pk	35.9	-28	6.8	-57.12	-13	-44.12	0-360	149	V
6	6.991	-72.32	Pk	35.9	-28	6.8	-57.62	-13	-44.62	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 4 16QAM 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1720MHz											
1	3.401	-70.3	Pk	32.8	-31.4	8.8	-60.1	-13	-47.1	0-360	149	H
2	3.401	-68.68	Pk	32.8	-31.3	8.8	-58.38	-13	-45.38	0-360	149	V
4	5.167	-71.37	Pk	34.6	-29.5	9.4	-56.87	-13	-43.87	0-360	149	V
3	5.168	-70.27	Pk	34.6	-29.5	9.5	-55.67	-13	-42.67	0-360	149	H
5	6.883	-72.13	Pk	35.8	-28.4	6.7	-58.03	-13	-45.03	0-360	149	H
6	6.884	-72.05	Pk	35.8	-28.3	6.8	-57.75	-13	-44.75	0-360	149	V
	1732.5MHz											
2	3.467	-70.4	Pk	32.9	-31.3	9.3	-59.5	-13	-46.5	0-360	149	V
1	3.47	-70.31	Pk	32.9	-31.2	9.6	-59.01	-13	-46.01	0-360	149	H
3	5.196	-70.41	Pk	34.7	-29.8	9.2	-56.31	-13	-43.31	0-360	149	H
4	5.197	-71.28	Pk	34.7	-29.8	9.2	-57.18	-13	-44.18	0-360	149	V
6	6.928	-71.48	Pk	35.8	-27.9	6.9	-56.68	-13	-43.68	0-360	149	V
5	6.934	-71.92	Pk	35.8	-28	6.6	-57.52	-13	-44.52	0-360	149	H
	1745MHz											
1	3.481	-70.06	Pk	32.9	-31.1	9.4	-58.86	-13	-45.86	0-360	149	H
2	3.486	-70.41	Pk	32.9	-30.9	9.5	-58.91	-13	-45.91	0-360	149	V
3	5.225	-69.68	Pk	34.7	-29.4	9	-55.38	-13	-42.38	0-360	149	H
4	5.235	-70.04	Pk	34.8	-29.6	8.8	-56.04	-13	-43.04	0-360	149	V
5	6.978	-71.42	Pk	35.9	-27.9	6.9	-56.52	-13	-43.52	0-360	149	H
6	6.98	-72.33	Pk	35.9	-27.9	6.9	-57.43	-13	-44.43	0-360	149	V

10.2.5. LTE BAND 5

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 QPSK 10MHz
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	829MHz											
4	1.67	-70.82	Pk	28.7	-31.6	11.6	-62.12	-13	-49.12	0-360	149	V
1	1.678	-69.84	Pk	28.8	-31.5	12	-60.54	-13	-47.54	0-360	149	H
2	2.513	-71.09	Pk	32.4	-30.5	11.5	-57.69	-13	-44.69	0-360	149	H
5	2.515	-71.29	Pk	32.4	-30.5	11.7	-57.69	-13	-44.69	0-360	149	V
3	3.342	-70.74	Pk	32.7	-29	10.5	-56.54	-13	-43.54	0-360	149	H
6	3.346	-71.15	Pk	32.7	-29	11	-56.45	-13	-43.45	0-360	149	V
	836.5MHz											
4	1.848	-70.03	Pk	30.9	-31.3	12.9	-57.53	-13	-44.53	0-360	149	V
1	2.066	-69.68	Pk	31.3	-31	12.7	-56.68	-13	-43.68	0-360	149	H
2	3.288	-69.45	Pk	32.8	-29.2	11.1	-54.75	-13	-41.75	0-360	149	H
3	4.43	-70.49	Pk	33.7	-28	11.6	-53.19	-13	-40.19	0-360	149	H
5	4.776	-70.72	Pk	34.1	-27.2	10.9	-52.92	-13	-39.92	0-360	149	V
6	6.28	-71.65	Pk	35.7	-25	11	-49.95	-13	-36.95	0-360	149	V
	844MHz											
1	1.668	-70.15	Pk	28.7	-31.6	12.6	-60.45	-13	-47.45	0-360	149	H
4	1.669	-70.98	Pk	28.7	-31.6	11.6	-62.28	-13	-49.28	0-360	149	V
5	2.51	-71.39	Pk	32.4	-30.5	11.6	-57.89	-13	-44.89	0-360	149	V
2	2.512	-70.2	Pk	32.4	-30.5	11.5	-56.8	-13	-43.8	0-360	149	H
6	3.343	-70.85	Pk	32.7	-29	11	-56.15	-13	-43.15	0-360	149	V
3	3.348	-71.64	Pk	32.7	-29.1	10.5	-57.54	-13	-44.54	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 16QAM 10MHz
Chamber #:	Chamber A

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	829MHz											
4	1.67	-69.46	Pk	28.7	-31.6	11.6	-60.76	-13	-47.76	0-360	149	V
1	1.671	-70.33	Pk	28.7	-31.6	12.7	-60.53	-13	-47.53	0-360	149	H
2	2.507	-70.43	Pk	32.4	-30.4	11.3	-57.13	-13	-44.13	0-360	149	H
5	2.508	-69.99	Pk	32.4	-30.4	11.4	-56.59	-13	-43.59	0-360	149	V
3	3.351	-71.22	Pk	32.7	-29.1	10.7	-56.92	-13	-43.92	0-360	149	H
6	3.351	-71.35	Pk	32.7	-29.1	11.4	-56.35	-13	-43.35	0-360	149	V
	836.5MHz											
1	1.672	-70.97	Pk	28.7	-31.6	12.7	-61.17	-13	-48.17	0-360	149	H
4	1.673	-70.67	Pk	28.7	-31.6	11.4	-62.17	-13	-49.17	0-360	149	V
5	2.501	-70.12	Pk	32.4	-30.5	11.6	-56.62	-13	-43.62	0-360	149	V
2	2.512	-70.32	Pk	32.4	-30.5	11.5	-56.92	-13	-43.92	0-360	149	H
6	3.33	-69.35	Pk	32.7	-29	11	-54.65	-13	-41.65	0-360	149	V
3	3.344	-71.32	Pk	32.7	-29	10.4	-57.22	-13	-44.22	0-360	149	H
	844MHz											
1	1.671	-70.2	Pk	28.7	-31.6	12.7	-60.4	-13	-47.4	0-360	149	H
4	1.672	-70.16	Pk	28.7	-31.6	11.5	-61.56	-13	-48.56	0-360	149	V
2	2.505	-71.17	Pk	32.4	-30.4	11.3	-57.87	-13	-44.87	0-360	149	H
5	2.51	-70.98	Pk	32.4	-30.5	11.6	-57.48	-13	-44.48	0-360	149	V
6	3.34	-71.18	Pk	32.7	-29	11	-56.48	-13	-43.48	0-360	149	V
3	3.343	-71.53	Pk	32.7	-29	10.4	-57.43	-13	-44.43	0-360	149	H

10.2.6. LTE BAND 12

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 12 QPSK 10MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	704MHz											
2	1.409	-68.92	Pk	28.4	-33.6	9.7	-64.42	-13	-51.42	0-360	149	V
1	1.41	-70.71	Pk	28.4	-33.7	10.5	-65.51	-13	-52.51	0-360	149	H
3	2.109	-69.72	Pk	31.1	-32.6	10.3	-60.92	-13	-47.92	0-360	149	H
4	2.111	-70.21	Pk	31.1	-32.5	9.5	-62.11	-13	-49.11	0-360	149	V
5	2.813	-70.12	Pk	32.5	-31.7	9.6	-59.72	-13	-46.72	0-360	149	H
6	2.815	-70.82	Pk	32.5	-31.7	9	-61.02	-13	-48.02	0-360	149	V
	707.5MHz											
2	1.416	-69.94	Pk	28.4	-33.5	9	-66.04	-13	-53.04	0-360	149	V
1	1.42	-69.65	Pk	28.4	-33.5	9.1	-65.65	-13	-52.65	0-360	149	H
4	2.123	-70.4	Pk	31.2	-32.8	10.2	-61.8	-13	-48.8	0-360	149	V
3	2.124	-69.6	Pk	31.2	-32.8	10.3	-60.9	-13	-47.9	0-360	149	H
6	2.829	-71.8	Pk	32.5	-31.8	9.6	-61.5	-13	-48.5	0-360	149	V
5	2.83	-68.26	Pk	32.5	-31.8	9.7	-57.86	-13	-44.86	0-360	149	H
	711MHz											
1	1.419	-70.02	Pk	28.4	-33.5	9.1	-66.02	-13	-53.02	0-360	149	H
2	1.421	-70.68	Pk	28.3	-33.6	8.9	-67.08	-13	-54.08	0-360	149	V
3	2.129	-70.65	Pk	31.2	-32.8	10.5	-61.75	-13	-48.75	0-360	149	H
4	2.129	-70.74	Pk	31.2	-32.8	10.2	-62.14	-13	-49.14	0-360	149	V
5	2.841	-69.91	Pk	32.5	-32.1	9.3	-60.21	-13	-47.21	0-360	149	H
6	2.843	-69.77	Pk	32.5	-32.1	9.2	-60.17	-13	-47.17	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 12 16QAM 10MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	704MHz											
1	1.407	-70.14	Pk	28.5	-33.6	10.5	-64.74	-13	-51.74	0-360	149	H
2	1.408	-69.5	Pk	28.4	-33.6	9.8	-64.9	-13	-51.9	0-360	149	V
4	2.11	-70.29	Pk	31.1	-32.5	9.5	-62.19	-13	-49.19	0-360	149	V
3	2.116	-70.38	Pk	31.2	-32.7	10.3	-61.58	-13	-48.58	0-360	149	H
5	2.817	-69.18	Pk	32.5	-31.8	9.6	-58.88	-13	-45.88	0-360	149	H
6	2.818	-69.08	Pk	32.5	-31.8	9.1	-59.28	-13	-46.28	0-360	149	V
	707.5MHz											
1	1.412	-69.9	Pk	28.4	-33.7	10.1	-65.1	-13	-52.1	0-360	149	H
2	1.416	-69.75	Pk	28.4	-33.5	9	-65.85	-13	-52.85	0-360	149	V
3	2.12	-70.03	Pk	31.2	-32.8	10.4	-61.23	-13	-48.23	0-360	149	H
4	2.124	-69.45	Pk	31.2	-32.8	10.3	-60.75	-13	-47.75	0-360	149	V
6	2.829	-70.01	Pk	32.5	-31.8	9.6	-59.71	-13	-46.71	0-360	149	V
5	2.83	-70.05	Pk	32.5	-31.8	9.7	-59.65	-13	-46.65	0-360	149	H
	711MHz											
1	1.418	-71.24	Pk	28.4	-33.4	9.3	-66.94	-13	-53.94	0-360	149	H
2	1.422	-69.68	Pk	28.3	-33.7	8.8	-66.28	-13	-53.28	0-360	149	V
4	2.134	-70.39	Pk	31.2	-32.8	10.4	-61.59	-13	-48.59	0-360	149	V
3	2.135	-69.34	Pk	31.2	-32.8	11.6	-59.34	-13	-46.34	0-360	149	H
5	2.843	-70.72	Pk	32.5	-32.1	8.9	-61.42	-13	-48.42	0-360	149	H
6	2.846	-70.72	Pk	32.5	-32.1	9.1	-61.22	-13	-48.22	0-360	149	V

10.2.7. LTE BAND 13

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 13 QPSK 10MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	782MHz											
2	1.565	-69.83	Pk	27.7	-33.5	10.2	-65.43	-40	-25.43	0-360	149	V
1	1.567	-70.43	Pk	27.7	-33.6	9.5	-66.83	-40	-26.83	0-360	149	H
3	2.346	-71.13	Pk	32.2	-32.5	10	-61.43	-13	-48.43	0-360	149	H
4	2.347	-70.78	Pk	32.2	-32.5	9.3	-61.78	-13	-48.78	0-360	149	V
6	3.129	-69.93	Pk	33.2	-31	10	-57.73	-13	-44.73	0-360	149	V
5	3.132	-71.7	Pk	33.2	-31	9.6	-59.9	-13	-46.9	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 13 16QAM 10MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	782MHz											
1	1.563	-70.02	Pk	27.7	-33.5	9.1	-66.72	-40	-26.72	0-360	149	H
2	1.565	-69.49	Pk	27.7	-33.5	10.2	-65.09	-40	-25.09	0-360	149	V
3	2.344	-70.67	Pk	32.2	-32.5	10	-60.97	-13	-47.97	0-360	149	H
4	2.345	-70.54	Pk	32.2	-32.5	9.2	-61.64	-13	-48.64	0-360	149	V
6	3.127	-71.61	Pk	33.2	-31	9.9	-59.51	-13	-46.51	0-360	149	V
5	3.132	-70.54	Pk	33.2	-31	9.6	-58.74	-13	-45.74	0-360	149	H

10.2.8. LTE BAND 17

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 17 QPSK 10MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	709MHz											
1	1.419	-70.67	Pk	28.4	-33.4	9.2	-66.47	-13	-53.47	0-360	149	H
2	1.419	-69.81	Pk	28.4	-33.4	9	-65.81	-13	-52.81	0-360	149	V
3	2.123	-70.76	Pk	31.2	-32.8	10.3	-62.06	-13	-49.06	0-360	149	H
4	2.13	-71.45	Pk	31.2	-32.8	10.2	-62.85	-13	-49.85	0-360	149	V
5	2.833	-69.94	Pk	32.5	-31.9	9.5	-59.84	-13	-46.84	0-360	149	H
6	2.835	-71.33	Pk	32.5	-31.9	9.3	-61.43	-13	-48.43	0-360	149	V
	710MHz											
1	1.416	-71.19	Pk	28.4	-33.5	9.5	-66.79	-13	-53.79	0-360	149	H
2	1.42	-70.9	Pk	28.4	-33.5	9	-67	-13	-54	0-360	149	V
4	2.131	-70.29	Pk	31.2	-32.8	10.3	-61.59	-13	-48.59	0-360	149	V
3	2.132	-70.1	Pk	31.2	-32.8	11.1	-60.6	-13	-47.6	0-360	149	H
6	2.88	-70.45	Pk	32.6	-31.9	9	-60.75	-13	-47.75	0-360	149	V
5	2.883	-71.14	Pk	32.6	-32	8.9	-61.64	-13	-48.64	0-360	149	H
	711MHz											
2	1.42	-70.43	Pk	28.4	-33.5	9	-66.53	-13	-53.53	0-360	149	V
1	1.422	-70.82	Pk	28.3	-33.7	8.8	-67.42	-13	-54.42	0-360	149	H
3	2.135	-70.89	Pk	31.2	-32.8	11.6	-60.89	-13	-47.89	0-360	149	H
4	2.135	-71.44	Pk	31.2	-32.8	10.4	-62.64	-13	-49.64	0-360	149	V
5	2.845	-69.24	Pk	32.5	-32.1	8.8	-60.04	-13	-47.04	0-360	149	H
6	2.845	-69.96	Pk	32.5	-32.1	9.2	-60.36	-13	-47.36	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 17 16QAM 10MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	709MHz											
1	1.414	-69.36	Pk	28.4	-33.6	9.8	-64.76	-13	-51.76	0-360	149	H
2	1.419	-69.63	Pk	28.4	-33.4	9	-65.63	-13	-52.63	0-360	149	V
3	2.12	-70.39	Pk	31.2	-32.8	10.4	-61.59	-13	-48.59	0-360	149	H
4	2.125	-69.55	Pk	31.2	-32.8	10.3	-60.85	-13	-47.85	0-360	149	V
5	2.837	-69.69	Pk	32.5	-32	9.5	-59.69	-13	-46.69	0-360	149	H
6	2.837	-70.12	Pk	32.5	-32	9.2	-60.42	-13	-47.42	0-360	149	V
	710MHz											
1	1.416	-70.68	Pk	28.4	-33.5	9.5	-66.28	-13	-53.28	0-360	149	H
2	1.421	-68.74	Pk	28.3	-33.6	8.9	-65.14	-13	-52.14	0-360	149	V
3	2.123	-69.75	Pk	31.2	-32.8	10.3	-61.05	-13	-48.05	0-360	149	H
4	2.126	-70.65	Pk	31.2	-32.8	10.2	-62.05	-13	-49.05	0-360	149	V
6	2.839	-70.73	Pk	32.5	-32	9.2	-61.03	-13	-48.03	0-360	149	V
5	2.84	-70.89	Pk	32.5	-32	9.3	-61.09	-13	-48.09	0-360	149	H
	711MHz											
1	1.42	-70.64	Pk	28.4	-33.5	9	-66.74	-13	-53.74	0-360	149	H
2	1.42	-70.27	Pk	28.4	-33.5	9	-66.37	-13	-53.37	0-360	149	V
4	2.132	-70.11	Pk	31.2	-32.8	10.4	-61.31	-13	-48.31	0-360	149	V
3	2.136	-70.46	Pk	31.2	-32.8	11.7	-60.36	-13	-47.36	0-360	149	H
5	2.838	-71.1	Pk	32.5	-32	9.4	-61.2	-13	-48.2	0-360	149	H
6	2.845	-70	Pk	32.5	-32.1	9.2	-60.4	-13	-47.4	0-360	149	V

10.2.9. LTE BAND 25

Company:	Samsung
Project #:	12563708
Date:	10/24/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 25 QPSK 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1860MHz											
1	3.695	-69.51	Pk	33.2	-30.8	9.9	-57.21	-13	-44.21	0-360	149	V
2	3.721	-69.42	Pk	33.3	-31.1	9.9	-57.32	-13	-44.32	0-360	149	H
3	5.555	-70.25	Pk	35.4	-29.6	8.8	-55.65	-13	-42.65	0-360	149	V
4	5.576	-69.3	Pk	35.5	-30	8.2	-55.6	-13	-42.6	0-360	149	H
5	7.44	-69.27	Pk	36.1	-27.1	7	-53.27	-13	-40.27	0-360	149	H
6	7.446	-73.12	Pk	36.1	-27.2	7.1	-57.12	-13	-44.12	0-360	149	V
	1882.5MHz											
1	3.748	-69.84	Pk	33.3	-31	9.8	-57.74	-13	-44.74	0-360	149	V
2	3.759	-69.32	Pk	33.3	-31.1	9.3	-57.82	-13	-44.82	0-360	149	H
3	5.634	-70.67	Pk	35.5	-29.4	8.6	-55.97	-13	-42.97	0-360	149	V
4	5.647	-70.29	Pk	35.5	-29.4	8	-56.19	-13	-43.19	0-360	149	H
6	7.53	-68.24	Pk	36.2	-27.2	7.5	-51.74	-13	-38.74	0-360	149	H
5	7.53	-70.14	Pk	36.2	-27.2	7.3	-53.84	-13	-40.84	0-360	149	V
	1905MHz											
1	3.804	-70.05	Pk	33.4	-30.5	9.7	-57.45	-13	-44.45	0-360	149	H
2	3.806	-69.75	Pk	33.4	-30.5	9.2	-57.65	-13	-44.65	0-360	149	V
4	5.715	-69.07	Pk	35.5	-29.4	7.9	-55.07	-13	-42.07	0-360	149	H
3	5.715	-69.51	Pk	35.5	-29.4	7.9	-55.51	-13	-42.51	0-360	149	V
5	7.619	-68.09	Pk	36.4	-26.9	7.6	-50.99	-13	-37.99	0-360	149	H
6	7.62	-71.75	Pk	36.4	-27	7.4	-54.95	-13	-41.95	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/24/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 25 16QAM 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1860MHz											
1	3.717	-69.37	Pk	33.3	-31.1	9.8	-57.37	-13	-44.37	0-360	149	H
2	3.717	-70.44	Pk	33.3	-31	9.6	-58.54	-13	-45.54	0-360	149	V
3	5.58	-68.62	Pk	35.5	-29.7	8.3	-54.52	-13	-41.52	0-360	149	H
4	5.58	-70.89	Pk	35.5	-29.7	8.3	-56.79	-13	-43.79	0-360	149	V
5	7.44	-68.66	Pk	36.1	-27.1	6.9	-52.76	-13	-39.76	0-360	149	H
6	7.453	-72.54	Pk	36.1	-27.1	7.5	-56.04	-13	-43.04	0-360	149	V
	1882.5MHz											
1	3.749	-70.33	Pk	33.3	-31	9.8	-58.23	-13	-45.23	0-360	149	V
2	3.758	-69.84	Pk	33.3	-31.1	9.3	-58.34	-13	-45.34	0-360	149	H
3	5.647	-69.42	Pk	35.5	-29.4	7.8	-55.52	-13	-42.52	0-360	149	V
4	5.648	-71.09	Pk	35.5	-29.4	8.1	-56.89	-13	-43.89	0-360	149	H
6	7.53	-67.29	Pk	36.2	-27.2	7.5	-50.79	-13	-37.79	0-360	149	H
5	7.549	-72.44	Pk	36.2	-27	7.3	-55.94	-13	-42.94	0-360	149	V
	1905MHz											
1	3.794	-69.81	Pk	33.4	-30.6	9.6	-57.41	-13	-44.41	0-360	149	V
2	3.807	-70.13	Pk	33.4	-30.5	9.4	-57.83	-13	-44.83	0-360	149	H
4	5.709	-71.6	Pk	35.5	-29.4	7.6	-57.9	-13	-44.9	0-360	149	V
3	5.714	-70.91	Pk	35.5	-29.3	7.9	-56.81	-13	-43.81	0-360	149	H
5	7.62	-68.48	Pk	36.4	-27	7.5	-51.58	-13	-38.58	0-360	149	H
6	7.637	-72.51	Pk	36.4	-26.9	7.2	-55.81	-13	-42.81	0-360	149	V

10.2.10. LTE BAND 26 Part 90S

Company:	Samsung
Project #:	12563708
Date:	1/17/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 QPSK 15MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	821.5MHz											
2	1.63	-66.37	Pk	28.2	-33.4	10.3	-61.27	-13	-48.27	0-360	149	V
1	1.634	-67.94	Pk	28.3	-33.4	10.5	-62.54	-13	-49.54	0-360	149	H
4	2.443	-68.57	Pk	32.5	-32	9.4	-58.67	-13	-45.67	0-360	149	V
3	2.444	-67.64	Pk	32.5	-32	8.7	-58.44	-13	-45.44	0-360	149	H
6	3.259	-70.15	Pk	33	-31	9.8	-58.35	-13	-45.35	0-360	149	V
5	3.26	-68.32	Pk	33	-31	10.4	-55.92	-13	-42.92	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	1/17/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 16QAM 15MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	821.5MHz											
2	1.63	-68.41	Pk	28.2	-33.4	10.3	-63.31	-13	-50.31	0-360	149	V
1	1.633	-67.96	Pk	28.3	-33.4	10.6	-62.46	-13	-49.46	0-360	149	H
3	2.444	-68.15	Pk	32.5	-32	8.7	-58.95	-13	-45.95	0-360	149	H
4	2.445	-68.57	Pk	32.5	-32.1	9.4	-58.77	-13	-45.77	0-360	149	V
6	3.26	-69.94	Pk	33	-31	9.9	-58.04	-13	-45.04	0-360	149	V
5	3.264	-69.24	Pk	33	-30.8	10.4	-56.64	-13	-43.64	0-360	149	H

10.2.11. LTE BAND 26 Part 22

Company:	Samsung
Project #:	12563708
Date:	12/21/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 QPSK 15MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	831.5MHz											
1	1.644	-68.12	Pk	28.5	-33.4	11	-62.02	-13	-49.02	0-360	149	H
2	1.645	-67.82	Pk	28.5	-33.4	10.6	-62.12	-13	-49.12	0-360	149	V
3	2.461	-69.31	Pk	32.6	-32.3	9	-60.01	-13	-47.01	0-360	149	V
4	2.464	-69.48	Pk	32.6	-32.3	8.9	-60.28	-13	-47.28	0-360	149	V
5	3.283	-69.38	Pk	32.9	-31.3	9	-58.78	-13	-45.78	0-360	149	V
6	3.284	-69.51	Pk	32.9	-31.3	9.6	-58.31	-13	-45.31	0-360	149	H
	836.5MHz											
2	1.658	-69.04	Pk	28.8	-33.1	9.4	-63.94	-13	-50.94	0-360	149	V
1	1.659	-67.77	Pk	28.8	-33.1	10.6	-61.47	-13	-48.47	0-360	149	H
3	2.5	-68.37	Pk	32.7	-32.1	9.4	-58.37	-13	-45.37	0-360	149	V
4	2.503	-68.8	Pk	32.7	-32.2	8.9	-59.4	-13	-46.4	0-360	149	H
6	3.326	-69.48	Pk	32.9	-31	9.2	-58.38	-13	-45.38	0-360	149	V
5	3.328	-69.41	Pk	32.9	-30.9	9	-58.41	-13	-45.41	0-360	149	H
	841.5MHz											
1	1.686	-67.08	Pk	29.3	-33.1	10.7	-60.18	-13	-47.18	0-360	149	H
2	1.696	-66.81	Pk	29.5	-33.3	9.6	-61.01	-13	-48.01	0-360	149	V
4	2.569	-68.26	Pk	32.7	-31.9	10.4	-57.06	-13	-44.06	0-360	149	H
3	2.574	-68.46	Pk	32.7	-32	9.8	-57.96	-13	-44.96	0-360	149	V
5	3.371	-69.42	Pk	32.9	-31	9.5	-58.02	-13	-45.02	0-360	149	H
6	3.371	-68.67	Pk	32.9	-31	9.9	-56.87	-13	-43.87	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/21/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 16QAM 15MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	831.5MHz											
1	1.647	-67.38	Pk	28.6	-33.4	11	-61.18	-13	-48.18	0-360	149	H
2	1.647	-65.97	Pk	28.6	-33.4	10.4	-60.37	-13	-47.37	0-360	149	V
4	2.467	-68.29	Pk	32.6	-32.4	8.8	-59.29	-13	-46.29	0-360	149	V
3	2.468	-67.65	Pk	32.6	-32.4	8.9	-58.55	-13	-45.55	0-360	149	H
5	3.281	-69.19	Pk	32.9	-31.4	9	-58.69	-13	-45.69	0-360	149	V
6	3.286	-69.46	Pk	32.9	-31.3	9.6	-58.26	-13	-45.26	0-360	149	H
	836.5MHz											
2	1.664	-68.1	Pk	28.9	-33.1	8.5	-63.8	-13	-50.8	0-360	149	V
1	1.672	-68.51	Pk	29	-33.3	10.7	-62.11	-13	-49.11	0-360	149	H
3	2.494	-67.62	Pk	32.7	-32.2	8.7	-58.42	-13	-45.42	0-360	149	V
4	2.501	-67.34	Pk	32.7	-32.1	8.9	-57.84	-13	-44.84	0-360	149	H
5	3.324	-70.02	Pk	32.9	-31	9.1	-59.02	-13	-46.02	0-360	149	H
6	3.326	-68.4	Pk	32.9	-31	9.2	-57.3	-13	-44.3	0-360	149	V
	841.5MHz											
1	1.678	-66.52	Pk	29.2	-33.1	10.7	-59.72	-13	-46.72	0-360	149	H
5	1.684	-66.9	Pk	29.3	-33.2	9.8	-61	-13	-48	0-360	149	V
2	2.511	-68.41	Pk	32.7	-32.2	9.1	-58.81	-13	-45.81	0-360	149	H
6	2.517	-69.13	Pk	32.7	-32	9.5	-58.93	-13	-45.93	0-360	149	V
3	3.359	-70.55	Pk	32.9	-30.8	9.5	-58.95	-13	-45.95	0-360	149	H
4	3.359	-69.95	Pk	32.9	-30.7	9.9	-57.85	-13	-44.85	0-360	149	V

10.2.12. LTE BAND 41

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 QPSK 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2506MHz											
4	5	-71.86	Pk	34.6	-29.6	9.6	-57.26	-25	-32.26	0-360	149	V
1	5.009	-72.21	Pk	34.6	-30	9.2	-58.41	-25	-33.41	0-360	149	H
5	7.466	-72.08	Pk	36.1	-27.1	7.5	-55.58	-25	-30.58	0-360	149	V
2	7.509	-73.05	Pk	36.2	-27	7.7	-56.15	-25	-31.15	0-360	149	H
3	9.988	-66.91	Pk	37.4	-23.7	8.1	-45.11	-25	-20.11	0-360	149	H
6	9.988	-67.49	Pk	37.4	-23.7	8	-45.79	-25	-20.79	0-360	149	V
	2593MHz											
4	5.168	-72.1	Pk	34.6	-29.5	9.4	-57.6	-25	-32.6	0-360	149	V
1	5.178	-71.04	Pk	34.7	-29.8	8.9	-57.24	-25	-32.24	0-360	149	H
5	7.758	-73.46	Pk	36.4	-26.5	7.8	-55.76	-25	-30.76	0-360	149	V
2	7.771	-73.1	Pk	36.4	-26.5	7.8	-55.4	-25	-30.4	0-360	149	H
6	10.358	-75.64	Pk	37.8	-22.8	7.2	-53.44	-25	-28.44	0-360	149	V
3	10.372	-74.78	Pk	37.8	-22.8	7.8	-51.98	-25	-26.98	0-360	149	H
	2680MHz											
1	5.367	-70.84	Pk	35.1	-29.6	8.8	-56.54	-25	-31.54	0-360	149	H
4	5.377	-71.15	Pk	35.1	-29	8.9	-56.15	-25	-31.15	0-360	149	V
5	8.016	-72.97	Pk	36.4	-26.6	7.4	-55.77	-25	-30.77	0-360	149	V
2	8.041	-72.35	Pk	36.4	-26.3	8.2	-54.05	-25	-29.05	0-360	149	H
3	10.716	-74.53	Pk	37.8	-22.8	7.9	-51.63	-25	-26.63	0-360	149	H
6	10.719	-74.66	Pk	37.8	-22.8	7.8	-51.86	-25	-26.86	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	10/25/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 16QAM 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2506MHz											
4	5.008	-71.21	Pk	34.6	-30	9.3	-57.31	-25	-32.31	0-360	149	V
1	5.01	-72.07	Pk	34.6	-30	9	-58.47	-25	-33.47	0-360	149	H
2	7.507	-72.66	Pk	36.1	-27	7.8	-55.76	-25	-30.76	0-360	149	H
5	7.507	-72.73	Pk	36.1	-26.9	7.9	-55.63	-25	-30.63	0-360	149	V
6	9.988	-72.68	Pk	37.4	-23.7	8	-50.98	-25	-25.98	0-360	149	V
3	9.989	-69.5	Pk	37.4	-23.7	8.2	-47.6	-25	-22.6	0-360	149	H
	2593MHz											
1	5.182	-71.14	Pk	34.7	-29.8	8.9	-57.34	-25	-32.34	0-360	149	H
4	5.195	-71.83	Pk	34.7	-29.8	8.9	-58.03	-25	-33.03	0-360	149	V
5	7.768	-70.72	Pk	36.4	-26.6	7.8	-53.12	-25	-28.12	0-360	149	V
2	7.772	-73.18	Pk	36.4	-26.5	7.8	-55.48	-25	-30.48	0-360	149	H
6	10.336	-66.78	Pk	37.8	-23	6.8	-45.18	-25	-20.18	0-360	149	V
3	10.374	-75.06	Pk	37.8	-22.8	7.8	-52.26	-25	-27.26	0-360	149	H
	2680MHz											
4	5.374	-70.51	Pk	35.1	-29.2	9	-55.61	-25	-30.61	0-360	149	V
1	5.379	-69.88	Pk	35.1	-29.1	8.8	-55.08	-25	-30.08	0-360	149	H
5	8.014	-72.19	Pk	36.4	-26.7	7.3	-55.19	-25	-30.19	0-360	149	V
2	8.037	-73.19	Pk	36.4	-26.2	8.2	-54.79	-25	-29.79	0-360	149	H
6	10.717	-75.92	Pk	37.8	-22.8	7.8	-53.12	-25	-28.12	0-360	149	V
3	10.735	-74.14	Pk	37.9	-22.9	8	-51.14	-25	-26.14	0-360	149	H

10.2.13. LTE BAND 66

Company:	Samsung
Project #:	12563708
Date:	10/23/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 66 QPSK 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1720MHz											
1	3.435	-70.02	Pk	32.8	-31.6	8.8	-60.02	-13	-47.02	0-360	149	H
2	3.436	-69.85	Pk	32.8	-31.6	8.9	-59.75	-13	-46.75	0-360	149	V
3	5.127	-70.29	Pk	34.6	-30	8.2	-57.49	-13	-44.49	0-360	149	V
4	5.157	-70.82	Pk	34.6	-29.8	9.1	-56.92	-13	-43.92	0-360	149	H
5	6.837	-70.75	Pk	35.8	-28.3	7.1	-56.15	-13	-43.15	0-360	149	V
6	6.869	-72.43	Pk	35.8	-28.4	6.5	-58.53	-13	-45.53	0-360	149	H
	1745MHz											
1	3.487	-70.69	Pk	32.9	-30.9	9.5	-59.19	-13	-46.19	0-360	149	H
2	3.49	-71.02	Pk	32.9	-31.2	9.6	-59.72	-13	-46.72	0-360	149	V
3	5.231	-69.85	Pk	34.8	-29.7	8.6	-56.15	-13	-43.15	0-360	149	V
4	5.234	-70.86	Pk	34.8	-29.7	9	-56.76	-13	-43.76	0-360	149	H
5	6.98	-71.42	Pk	35.9	-27.9	6.9	-56.52	-13	-43.52	0-360	149	H
6	6.98	-71.84	Pk	35.9	-27.9	6.9	-56.94	-13	-43.94	0-360	149	V
	1770MHz											
1	3.539	-70.98	Pk	33.1	-31	9.4	-59.48	-13	-46.48	0-360	149	H
2	3.54	-69.47	Pk	33.1	-31.1	9.3	-58.17	-13	-45.17	0-360	149	V
3	5.31	-71.07	Pk	34.9	-29.7	8.4	-57.47	-13	-44.47	0-360	149	V
4	5.312	-71.65	Pk	34.9	-29.8	8.1	-58.45	-13	-45.45	0-360	149	H
5	7.08	-72.59	Pk	36	-27.7	7.4	-56.89	-13	-43.89	0-360	149	V
6	7.082	-71.55	Pk	36	-27.7	7.4	-55.85	-13	-42.85	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	10/23/18
Test Engineer:	19497
Configuration:	EUT+ Support Equipment
Mode:	LTE 66 16QAM 20MHz
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1720MHz											
1	3.424	-70.3	Pk	32.8	-31.4	9.3	-59.6	-13	-46.6	0-360	149	V
2	3.435	-70.53	Pk	32.8	-31.6	8.8	-60.53	-13	-47.53	0-360	149	H
3	5.154	-69.93	Pk	34.6	-29.9	9.1	-56.13	-13	-43.13	0-360	149	H
4	5.156	-69.87	Pk	34.6	-29.8	9.2	-55.87	-13	-42.87	0-360	149	V
5	6.875	-73.16	Pk	35.8	-28.4	6.7	-59.06	-13	-46.06	0-360	149	V
6	6.879	-72.49	Pk	35.8	-28.5	6.7	-58.49	-13	-45.49	0-360	149	H
	1745MHz											
1	3.488	-71.8	Pk	32.9	-31	9.5	-60.4	-13	-47.4	0-360	149	H
2	3.488	-70.64	Pk	32.9	-31.1	9.5	-59.34	-13	-46.34	0-360	149	V
3	5.237	-69.82	Pk	34.8	-29.5	9.2	-55.32	-13	-42.32	0-360	149	H
4	5.238	-69.97	Pk	34.8	-29.6	8.8	-55.97	-13	-42.97	0-360	149	V
5	6.979	-72.57	Pk	35.9	-27.9	6.9	-57.67	-13	-44.67	0-360	149	V
6	6.981	-72.13	Pk	35.9	-27.9	6.8	-57.33	-13	-44.33	0-360	149	H
	1770MHz											
1	3.537	-69.92	Pk	33	-31	9.5	-58.42	-13	-45.42	0-360	149	V
2	3.54	-69.99	Pk	33.1	-31.1	9.4	-58.59	-13	-45.59	0-360	149	H
3	5.305	-70.32	Pk	34.9	-30	8.3	-57.12	-13	-44.12	0-360	149	V
4	5.308	-71.86	Pk	34.9	-29.7	8.5	-58.16	-13	-45.16	0-360	149	H
5	7.082	-72.06	Pk	36	-27.7	7.4	-56.36	-13	-43.36	0-360	149	V
6	7.084	-70.88	Pk	36	-27.8	7.5	-55.18	-13	-42.18	0-360	149	H

10.2.14. SPOT CHECK DATA HARMONICS AND SPURIOUS EMISSIONS (CERAMIC)

GSM

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 850 High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	848.8MHz											
1	1.698	-60.81	Pk	29.5	-33.3	10	-54.61	-13	-41.61	0-360	149	H
2	1.698	-57.26	Pk	29.5	-33.3	9.3	-51.76	-13	-38.76	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 1900 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1880MHz											
1	7.487	-73.28	Pk	36.1	-26.9	7.4	-56.68	-13	-43.68	0-360	149	H
2	7.487	-73.65	Pk	36.1	-26.9	7.4	-57.05	-13	-44.05	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 850 High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	848.8MHz											
1	3.298	-71.91	Pk	32.9	-31.1	9.8	-60.31	-13	-47.31	0-360	149	H
2	3.298	-71.79	Pk	32.9	-31.1	9.9	-60.09	-13	-47.09	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 1900 Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1850.2MHz											
1	7.348	-72.91	Pk	36	-27.3	7.5	-56.71	-13	-43.71	0-360	149	H
2	7.348	-73.33	Pk	36	-27.3	7.6	-57.03	-13	-44.03	0-360	149	V

WCDMA

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B5 Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	826.4MHz											
1	3.308	-71.21	Pk	32.9	-30.9	9.6	-59.61	-13	-46.61	0-360	149	H
2	3.308	-70.04	Pk	32.9	-30.9	9.9	-58.14	-13	-45.14	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B4 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1732.6MHz											
1	5.197	-71.99	Pk	34.7	-29.8	9.2	-57.89	-13	-44.89	0-360	149	H
2	5.197	-73.38	Pk	34.7	-29.8	9.2	-59.28	-13	-46.28	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B2 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1880MHz											
1	7.516	-73.79	Pk	36.2	-27.3	7.6	-57.29	-13	-44.29	0-360	149	H
2	7.516	-73.75	Pk	36.2	-27.3	7.5	-57.35	-13	-44.35	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B2 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1880MHz											
1	7.516	-73.79	Pk	36.2	-27.3	7.6	-57.29	-13	-44.29	0-360	149	H
2	7.516	-73.75	Pk	36.2	-27.3	7.5	-57.35	-13	-44.35	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B5 Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	826.4MHz											
1	3.31	-71.43	Pk	32.9	-31	9.6	-59.93	-13	-46.93	0-360	149	H
2	3.31	-71.47	Pk	32.9	-31	9.8	-59.77	-13	-46.77	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B4 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1732.6MHz											
1	5.198	-71.97	Pk	34.7	-29.8	9.3	-57.77	-13	-44.77	0-360	149	H
2	5.198	-71.35	Pk	34.7	-29.8	9.2	-57.25	-13	-44.25	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B2 High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1907.6MHz											
1	7.629	-72.73	Pk	36.4	-27	7.4	-55.93	-13	-42.93	0-360	149	H
2	7.629	-72.51	Pk	36.4	-27	7.4	-55.71	-13	-42.71	0-360	149	V

LTE BAND 2

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 2 QPSK 20MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1860MHz											
1	10.865	-74.82	Pk	38	-22.9	7.3	-52.42	-13	-39.42	0-360	149	H
2	10.865	-75.81	Pk	38	-22.9	7.3	-53.41	-13	-40.41	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 2 16QAM 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1900MHz											
1	12.697	-77.3	Pk	39.2	-22.1	9.2	-51	-13	-38	0-360	149	H
2	12.697	-77.76	Pk	39.2	-22.1	9.4	-51.26	-13	-38.26	0-360	149	V

LTE BAND 4

Company:	Samsung
Project #:	12563708
Date:	12/11/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 4 QPSK 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1745MHz											
4	5.236	-70.97	Pk	34.8	-29.5	8.8	-56.87	-13	-43.87	0-360	149	V
3	5.237	-70.98	Pk	34.8	-29.6	9.1	-56.68	-13	-43.68	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	12/11/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 4 16QAM 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1745MHz											
1	5.238	-71.62	Pk	34.8	-29.6	9.1	-57.32	-13	-44.32	0-360	149	H
2	5.239	-71.37	Pk	34.8	-29.7	8.7	-57.57	-13	-44.57	0-360	149	V

LTE BAND 5

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 QPSK 10MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	836.5MHz											
1	6.28	-73.6	Pk	35.6	-29.2	6.8	-60.4	-13	-47.4	0-360	149	H
2	6.28	-72.33	Pk	35.6	-29.2	6.8	-59.13	-13	-46.13	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 16QAM 10MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	836.5MHz											
1	3.333	-72.31	Pk	32.9	-31.1	8.6	-61.91	-13	-48.91	0-360	149	H
2	3.333	-71.99	Pk	32.9	-31.1	8.9	-61.29	-13	-48.29	0-360	149	V

LTE BAND 12

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 12 QPSK 10MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	707.5MHz											
1	2.83	-70.55	Pk	32.5	-31.8	9.7	-60.15	-13	-47.15	0-360	149	H
2	2.83	-68.78	Pk	32.5	-31.8	9.5	-58.58	-13	-45.58	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 12 16QAM 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	704MHz											
1	2.818	-69.38	Pk	32.5	-31.8	9.6	-59.08	-13	-46.08	0-360	149	H
2	2.818	-69.35	Pk	32.5	-31.8	9.1	-59.55	-13	-46.55	0-360	149	V

LTE BAND 13

Company:	Samsung
Project #:	12563708
Date:	12/11/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 13 QPSK 5MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	782MHz											
1	3.128	-71.24	Pk	33.2	-31	9.4	-59.64	-13	-46.64	0-360	149	H
2	3.129	-70.44	Pk	33.2	-30.9	10	-58.14	-13	-45.14	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/11/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 13 16QAM 5MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	782MHz											
2	3.129	-70.23	Pk	33.2	-30.9	10	-57.93	-13	-44.93	0-360	149	V
1	3.134	-71.06	Pk	33.2	-31	9.8	-59.06	-13	-46.06	0-360	149	H

LTE BAND 17

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 17 QPSK 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	709MHz											
1	2.833	-70.68	Pk	32.5	-31.9	9.5	-60.58	-13	-47.58	0-360	149	H
2	2.833	-70.78	Pk	32.5	-31.9	9.4	-60.78	-13	-47.78	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 17 16QAM 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	709MHz											
1	2.837	-70.36	Pk	32.5	-32	9.5	-60.36	-13	-47.36	0-360	149	H
2	2.837	-69	Pk	32.5	-32	9.2	-59.3	-13	-46.3	0-360	149	V

LTE BAND 25

Company:	Samsung
Project #:	12563708
Date:	12/10/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 25 QPSK 20MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1882.5MHz											
1	7.401	-69.23	Pk	36.2	-27.4	7.2	-53.23	-13	-40.23	0-360	102	H
2	7.401	-63.82	Pk	36.2	-27.4	7.2	-47.82	-13	-34.82	0-360	299	V

Company:	Samsung
Project #:	12563708
Date:	12/10/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 25 16QAM 20MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1882.5MHz											
1	7.401	-68.54	Pk	36.2	-27.4	7.2	-52.54	-13	-39.54	0-360	249	H
2	7.401	-65.13	Pk	36.2	-27.4	7.2	-49.13	-13	-36.13	0-360	400	V

LTE BAND 26

Company:	Samsung
Project #:	12563708
Date:	12/21/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 QPSK 15MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	841.5MHz											
2	3.37	-68.31	Pk	32.9	-31	9.9	-56.51	-13	-43.51	0-360	149	V
1	3.373	-68.93	Pk	32.8	-31.2	9.3	-58.03	-13	-45.03	0-360	149	H

Company:	Samsung
Project #:	12563708
Date:	12/21/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 16QAM 15MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	836.5MHz											
1	3.325	-70.25	Pk	32.9	-31	9.1	-59.25	-13	-46.25	0-360	149	H
2	3.328	-70.3	Pk	32.9	-30.9	9.2	-59.1	-13	-46.1	0-360	149	V

LTE BAND 41

Company:	Samsung
Project #:	12563708
Date:	12/11/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 QPSK 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2501MHz											
1	9.988	-75.46	Pk	37.4	-23.7	8.1	-53.66	-25	-28.66	0-360	149	H
2	9.989	-75.42	Pk	37.4	-23.7	8	-53.72	-25	-28.72	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/11/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 16QAM 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2501MHz											
1	9.986	-74.81	Pk	37.4	-23.7	8.2	-52.91	-25	-27.91	0-360	149	H
2	9.989	-75.15	Pk	37.4	-23.7	8	-53.45	-25	-28.45	0-360	149	V

LTE BAND 66

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 66 QPSK 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1770MHz											
1	7.082	-71.86	Pk	36	-27.7	7.4	-56.16	-13	-43.16	0-360	149	H
2	7.082	-71.75	Pk	36	-27.7	7.5	-55.95	-13	-42.95	0-360	149	V

Company:	Samsung
Project #:	12563708
Date:	12/20/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 66 16QAM 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1770MHz											
1	7.08	-72.92	Pk	36	-27.7	7.3	-57.32	-13	-44.32	0-360	149	H
2	7.08	-72.99	Pk	36	-27.7	7.4	-57.29	-13	-44.29	0-360	149	V

10.2.15. SPOT CHECK DATA HARMONICS AND SPURIOUS EMISSIONS – SM-G975N (CERAMIC)

HARMONICS AND SPURIOUS EMISSIONS

GSM

Company:	Samsung
Project #:	12563988
Date:	12/28/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 850 High Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
848.8 MHz												
1	1.698	-61.7	Pk	29.5	-33.3	10	-55.5	-13	-42.5	0-360	149	H
2	1.698	-62.85	Pk	29.5	-33.3	9.3	-57.35	-13	-44.35	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/31/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 1900 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1880 MHz												
1	7.348	-73.45	Pk	36	-27.3	7.5	-57.25	-13	-44.25	0-360	149	H
2	7.348	-73	Pk	36	-27.3	7.6	-56.7	-13	-43.7	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/28/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 850 High Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
848.8 MHz												
1	3.298	-70.99	Pk	32.9	-31.1	9.8	-59.39	-13	-46.39	0-360	149	H
2	3.298	-71.11	Pk	32.9	-31.1	9.9	-59.41	-13	-46.41	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/31/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 1900 Low Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1850.2 MHz												
1	7.348	-73.45	Pk	36	-27.3	7.5	-57.25	-13	-44.25	0-360	149	H
2	7.348	-73	Pk	36	-27.3	7.6	-56.7	-13	-43.7	0-360	149	V

WCDMA

Company:	Samsung
Project #:	12563988
Date:	01/07/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B5 Low Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
826.4 MHz												
3	3.309	-70.76	Pk	32.9	-30.9	9.8	-58.96	-13	-45.96	0-360	149	V
4	3.31	-69.01	Pk	32.9	-31	9.6	-57.51	-13	-44.51	0-360	149	H

Company:	Samsung
Project #:	12563988
Date:	12/21/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B4 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1732.6 MHz												
1	5.197	-70.32	Pk	34.7	-29.8	9.2	-56.22	-13	-43.22	0-360	149	H
2	5.197	-72	Pk	34.7	-29.8	9.1	-58	-13	-45	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/21/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL 99 B2 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1880 MHz												
1	7.516	-71.64	Pk	36.2	-27.3	7.6	-55.14	-13	-42.14	0-360	149	H
2	7.516	-69.97	Pk	36.2	-27.3	7.5	-53.57	-13	-40.57	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	01/07/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B5 Low Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
826.4 MHz												
3	3.314	-70.11	Pk	32.9	-31	9.6	-58.61	-13	-45.61	0-360	149	H
4	3.314	-68.79	Pk	32.9	-31	9.8	-57.09	-13	-44.09	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/21/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B4 Mid Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1732.6 MHz												
1	5.198	-71.83	Pk	34.7	-29.8	9.3	-57.63	-13	-44.63	0-360	149	H
2	5.198	-71.63	Pk	34.7	-29.8	9.3	-57.43	-13	-44.43	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/21/18
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B2 High Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1907.6 MHz												
1	7.63	-73.86	Pk	36.4	-27	7.5	-56.96	-13	-43.96	0-360	149	H
2	7.63	-72.1	Pk	36.4	-27	7.4	-55.3	-13	-42.3	0-360	149	V

LTE BAND 2

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 2 QPSK 20MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1860 MHz												
2	10.87	-73.25	Pk	38	-22.7	7.5	-50.45	-13	-37.45	0-360	149	V
1	10.872	-74.62	Pk	38	-22.7	7.6	-51.72	-13	-38.72	0-360	149	H

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 2 16QAM 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1900 MHz												
1	12.686	-75.65	Pk	39.2	-21.9	9.4	-48.95	-13	-35.95	0-360	149	H
2	12.691	-75.77	Pk	39.2	-22	9.6	-48.97	-13	-35.97	0-360	149	V

LTE BAND 4

Company:	Samsung
Project #:	12563988
Date:	12/17/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	LTE 4 QPSK 20MHz High Channel
Chamber #:	Chamber A

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1745 MHz												
1	5.235	-72.51	Pk	34.3	-27	11.3	-53.91	-13	-40.91	0-360	149	H
2	5.239	-72.63	Pk	34.3	-27	11.2	-54.13	-13	-41.13	0-360	150	V

Company:	Samsung
Project #:	12563988
Date:	12/17/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	LTE 4 16QAM 20MHz High Channel
Chamber #:	Chamber A

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1745 MHz												
1	5.237	-73.23	Pk	34.3	-27	11.2	-54.73	-13	-41.73	0-360	149	H
2	5.238	-73.29	Pk	34.3	-27	11.3	-54.69	-13	-41.69	0-360	149	V

LTE BAND 5

Company:	Samsung
Project #:	12563988
Date:	01/07/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 QPSK 10MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
836.5 MHz												
1	6.275	-71.46	Pk	35.6	-29.3	7	-58.16	-13	-45.16	0-360	149	H
2	6.283	-71.01	Pk	35.6	-29.2	6.9	-57.71	-13	-44.71	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	01/07/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 16QAM 10MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T863 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	LTE Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
836.5 MHz												
1	3.33	-69.43	Pk	32.9	-31	8.8	-58.73	-13	-45.73	0-360	149	H
2	3.33	-69.96	Pk	32.9	-31	9.2	-58.86	-13	-45.86	0-360	149	V

LTE BAND 12

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 12 QPSK 10MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	707.5MHz											
2	2.83	-68.92	Pk	32.5	-31.8	9.5	-58.72	-13	-45.72	0-360	149	V
1	2.831	-68.76	Pk	32.5	-31.9	9.6	-58.56	-13	-45.56	0-360	149	H

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 12 16QAM 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	704MHz											
1	2.817	-69.65	Pk	32.5	-31.8	9.6	-59.35	-13	-46.35	0-360	149	H
2	2.818	-70.21	Pk	32.5	-31.8	9.1	-60.41	-13	-47.41	0-360	149	V

LTE BAND 13

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 13 QPSK 5MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	782MHz											
1	3.13	-69.79	Pk	33.2	-30.9	9.5	-57.99	-13	-44.99	0-360	149	H
2	3.13	-69.28	Pk	33.2	-30.9	10	-56.98	-13	-43.98	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 13 16QAM 5MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	782MHz											
2	3.129	-69.08	Pk	33.2	-31	10	-56.88	-13	-43.88	0-360	149	V
1	3.134	-69.2	Pk	33.2	-31	9.8	-57.2	-13	-44.2	0-360	149	H

LTE BAND 17

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 17 QPSK 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	709MHz											
1	2.83	-68.75	Pk	32.5	-31.8	9.7	-58.35	-13	-45.35	0-360	149	H
2	2.838	-67.39	Pk	32.5	-32	9.2	-57.69	-13	-44.69	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/26/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 17 16QAM 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	709MHz											
2	2.834	-68.37	Pk	32.5	-31.9	9.3	-58.47	-13	-45.47	0-360	149	V
1	2.836	-68.91	Pk	32.5	-31.9	9.5	-58.81	-13	-45.81	0-360	149	H

LTE BAND 25

Company:	Samsung
Project #:	12563988
Date:	12/17/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	LTE 25 QPSK 20MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1882.5MHz											
1	7.397	-74.14	Pk	35.7	-23.1	10.6	-50.94	-13	-37.94	0-360	149	H
2	7.401	-71.2	Pk	35.7	-23	10.8	-47.7	-13	-34.7	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/17/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	LTE 25 16QAM 20MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1882.5MHz											
1	7.401	-74.24	Pk	35.7	-23	10.5	-51.04	-13	-38.04	0-360	149	H
2	7.401	-70.21	Pk	35.7	-23	10.8	-46.71	-13	-33.71	0-360	149	V

LTE BAND 26 Part 90

Company:	Samsung
Project #:	12563988
Date:	01/24/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 QPSK 15MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	821.5MHz											
1	3.258	-68.24	Pk	33	-31.1	10.3	-56.04	-13	-43.04	0-360	149	H
2	3.259	-69.22	Pk	33	-31	9.8	-57.42	-13	-44.42	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	01/24/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 16QAM 15MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	821.5MHz											
1	3.264	-69.89	Pk	33	-30.9	10.3	-57.49	-13	-44.49	0-360	149	H
2	3.264	-70.84	Pk	33	-30.8	9.7	-58.94	-13	-45.94	0-360	149	V

LTE BAND 26 Part 22

Company:	Samsung
Project #:	12563988
Date:	12/27/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 QPSK 15MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	836.5MHz											
1	3.365	-69.44	Pk	32.9	-30.9	9.5	-57.94	-13	-44.94	0-360	149	H
2	3.37	-69.17	Pk	32.9	-31	9.9	-57.37	-13	-44.37	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/27/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 26 16QAM 15MHz Mid Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	841.5MHz											
1	3.311	-70.08	Pk	32.9	-31	9.6	-58.58	-13	-45.58	0-360	149	H
2	3.313	-69.79	Pk	32.9	-31	9.8	-58.09	-13	-45.09	0-360	149	V

LTE BAND 41

Company:	Samsung
Project #:	12563988
Date:	12/17/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 QPSK 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2501MHz											
2	9.988	-75.69	Pk	37.1	-20.3	10.7	-48.19	-25	-23.19	0-360	149	V
1	9.989	-74.7	Pk	37.1	-20.3	10.7	-47.2	-25	-22.2	0-360	149	H

Company:	Samsung
Project #:	12563988
Date:	12/17/18
Test Engineer:	16069
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 16QAM 10MHz Low Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2501MHz											
1	9.986	-74.81	Pk	37.4	-23.7	8.2	-52.91	-25	-27.91	0-360	149	H
2	9.989	-75.15	Pk	37.4	-23.7	8	-53.45	-25	-28.45	0-360	149	V

LTE BAND 66

Company:	Samsung
Project #:	12563988
Date:	12/21/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 66 QPSK 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1770MHz											
1	7.078	-71.95	Pk	36	-27.7	7.2	-56.45	-13	-43.45	0-360	149	H
2	7.079	-71.91	Pk	36	-27.7	7.3	-56.31	-13	-43.31	0-360	149	V

Company:	Samsung
Project #:	12563988
Date:	12/21/18
Test Engineer:	19498
Configuration:	EUT+ Support Equipment
Mode:	LTE 66 16QAM 20MHz High Channel
Chamber #:	Chamber B

Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1770MHz											
2	7.083	-72.82	Pk	36	-27.7	7.5	-57.02	-13	-44.02	0-360	149	V
1	7.084	-71.25	Pk	36	-27.8	7.5	-55.55	-13	-42.55	0-360	149	H