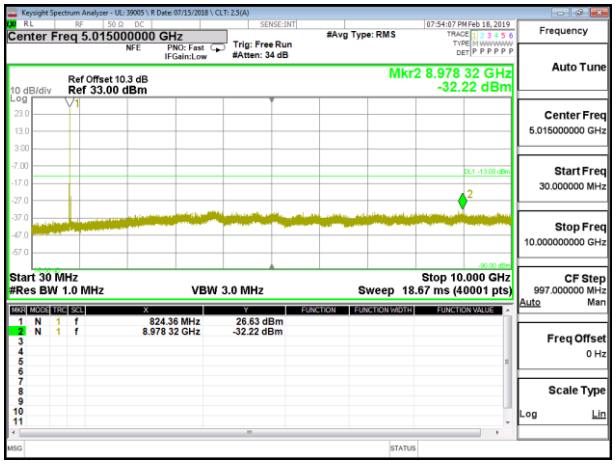
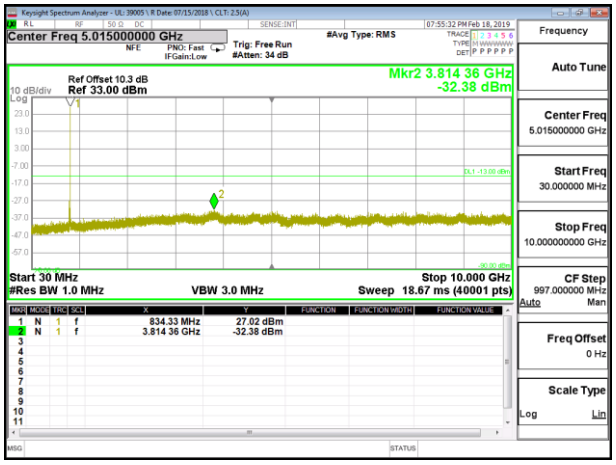
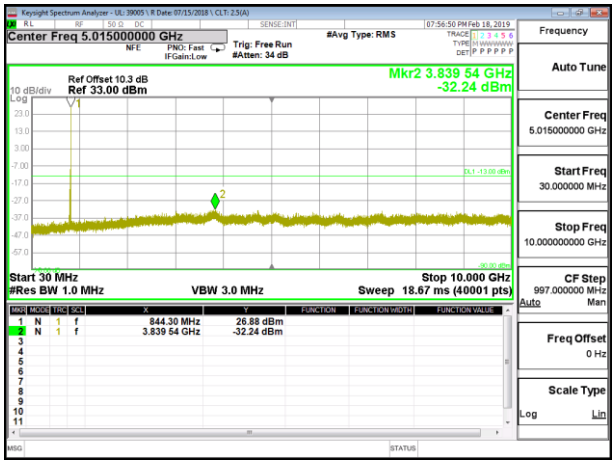


LTE B5 5MHz QPSK Low Channel RB1-0



LTE B5 5MHz QPSK Mid Channel RB1-0



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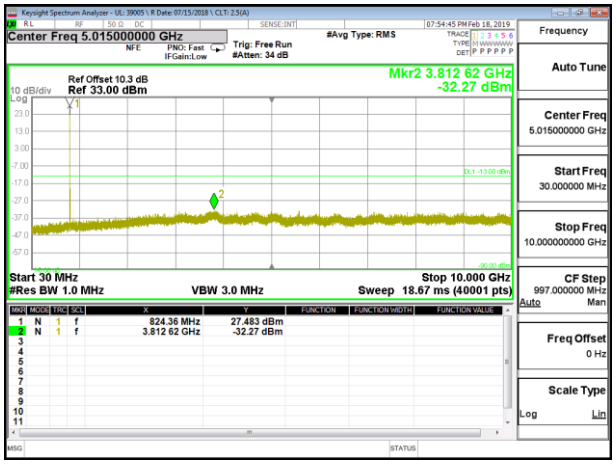
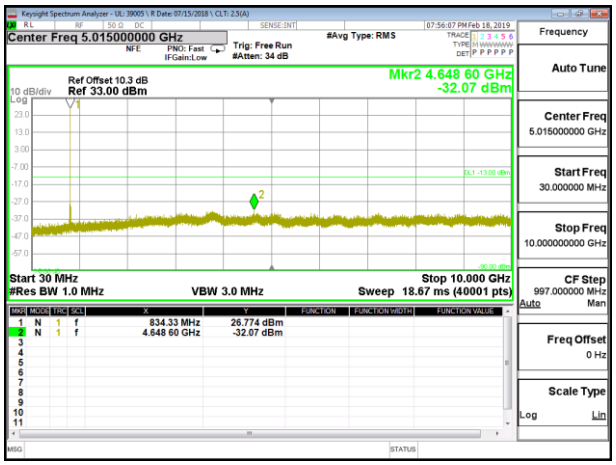
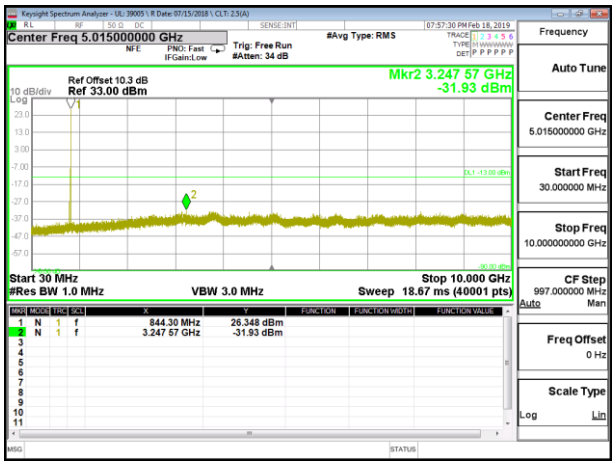


LTE B5 5MHz 16QAM Low Channel RB1-0



LTE B5 5MHz 16QAM Mid Channel RB1-0



LTE B5 5MHz 16QAM High Channel RB1-0

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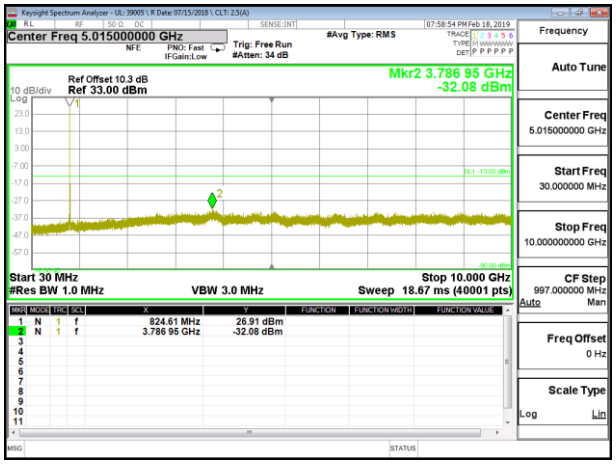
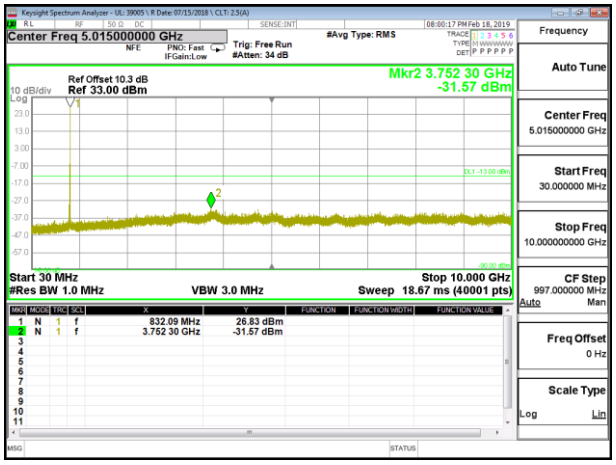
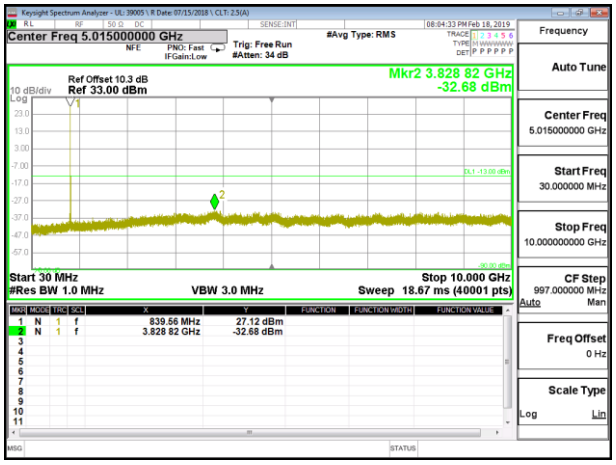


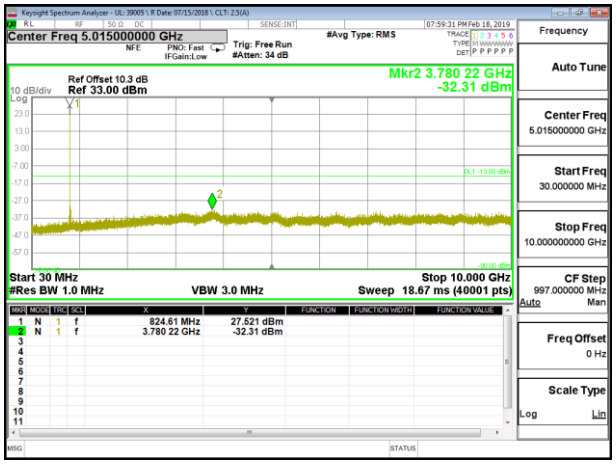
LTE B5 10MHz QPSK Low Channel RB1-0



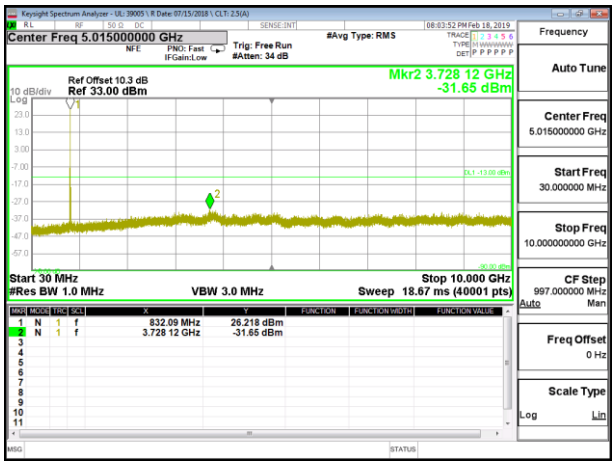
LTE B5 10MHz QPSK Mid Channel RB1-0



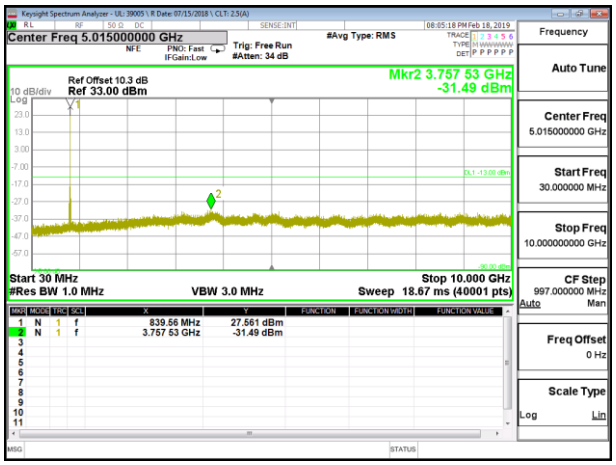
LTE B5 10MHz QPSK High Channel RB1-0



LTE B5 10MHz 16QAM Low Channel RB1-0



LTE B5 10MHz 16QAM Mid Channel RB1-0



LTE B5 10MHz 16QAM High Channel RB1-0

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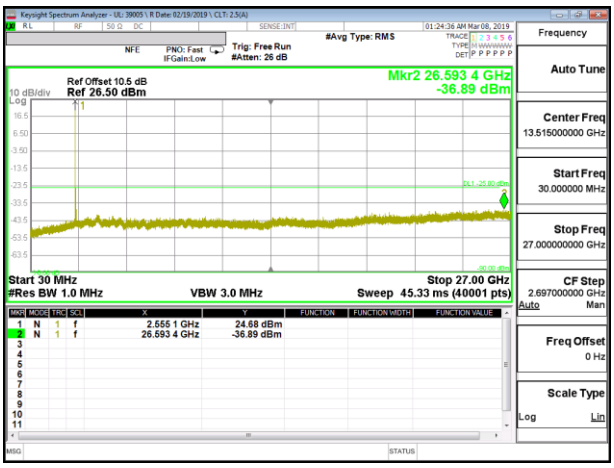
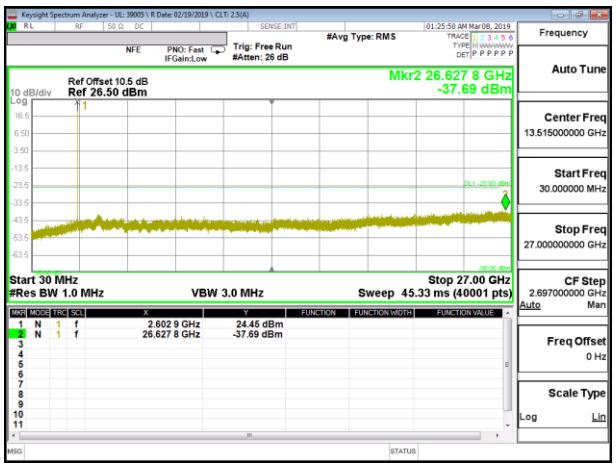
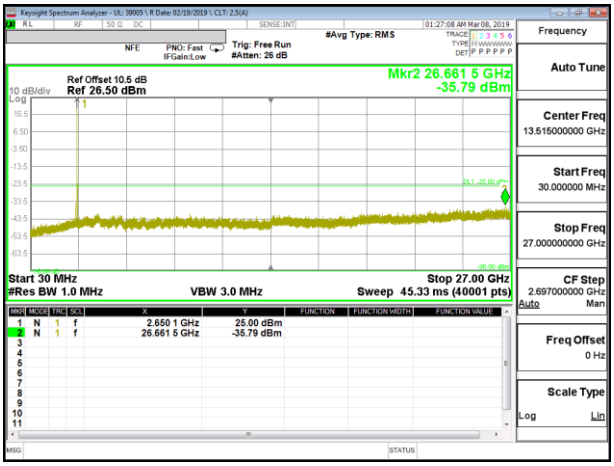
9.3.7. LTE BAND 41



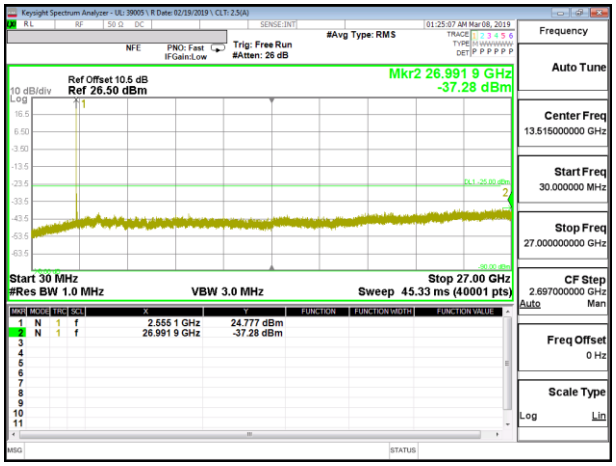
LTE B41 5MHz QPSK Low Channel RB1-0



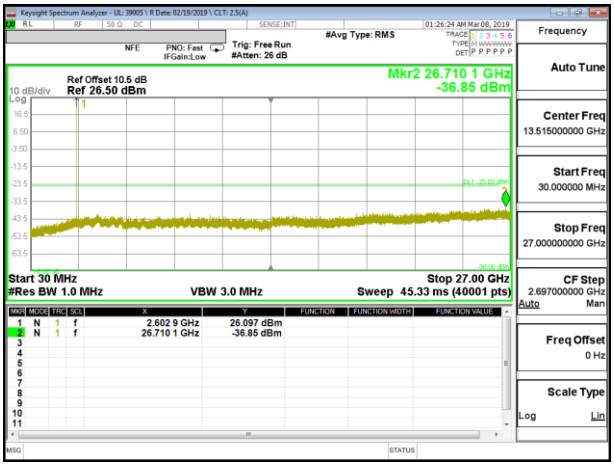
LTE B41 5MHz QPSK Mid Channel RB1-0



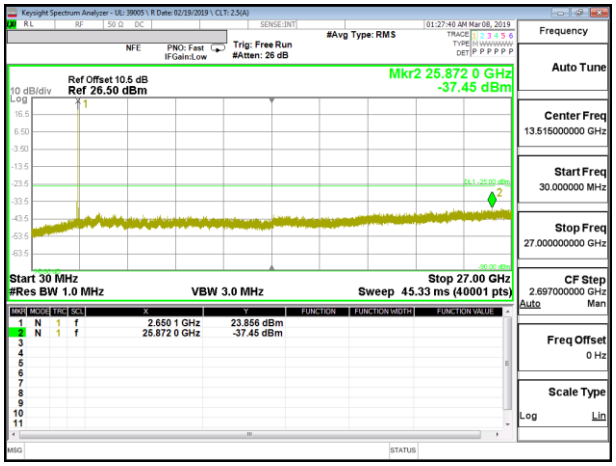
LTE B41 5MHz QPSK High Channel RB1-0



LTE B41 5MHz 16QAM Low Channel RB1-0



LTE B41 5MHz 16QAM Mid Channel RB1-0



LTE B41 5MHz 16QAM High Channel RB1-0

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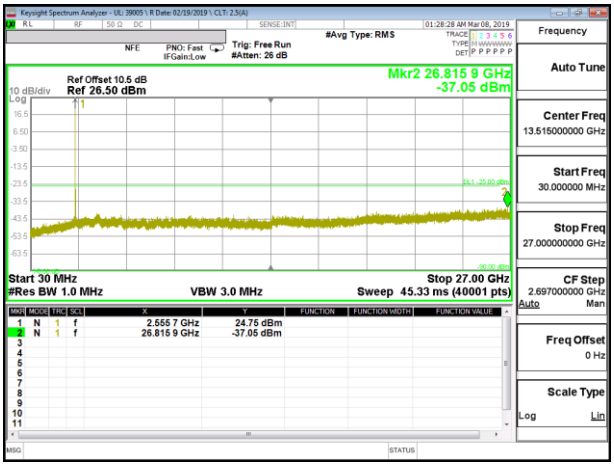
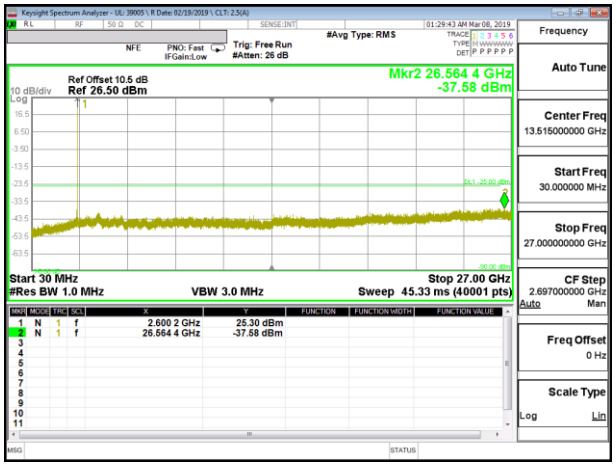
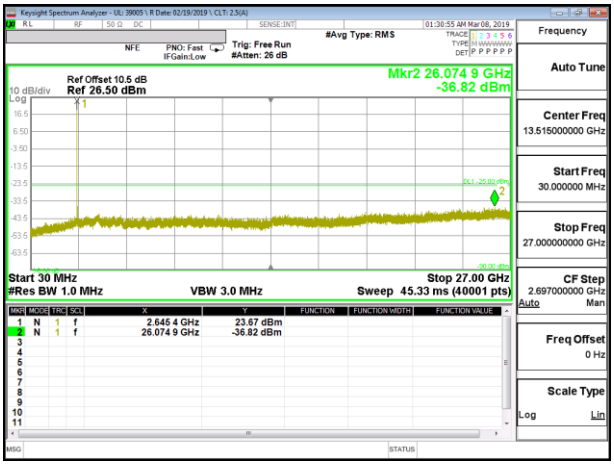


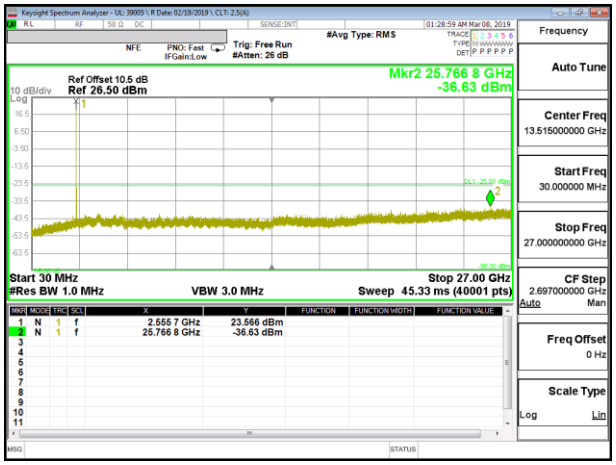
LTE B41 10MHz QPSK Low Channel RB1-0



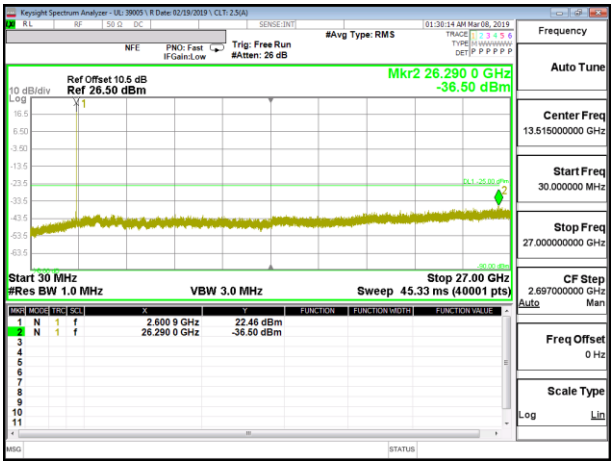
LTE B41 10MHz QPSK Mid Channel RB1-0



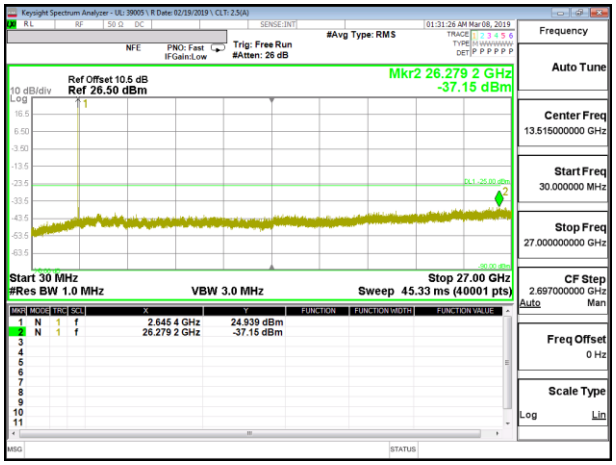
LTE B41 10MHz QPSK High Channel RB1-0



LTE B41 10MHz 16QAM Low Channel RB1-0



LTE B41 10MHz 16QAM Mid Channel RB1-0



LTE B41 10MHz 16QAM High Channel RB1-0

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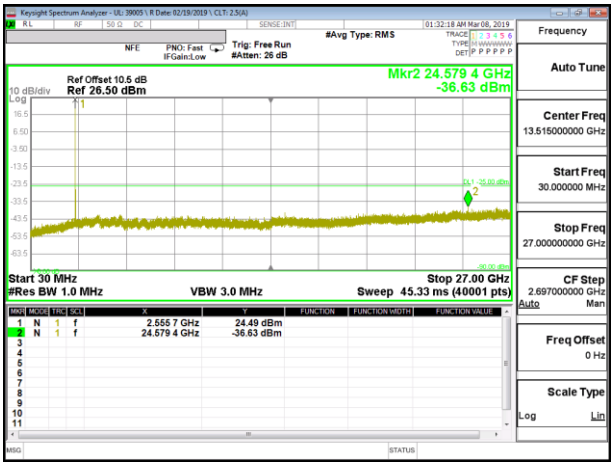
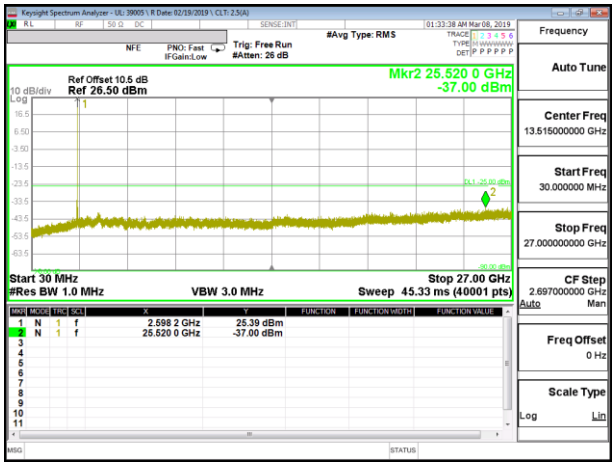
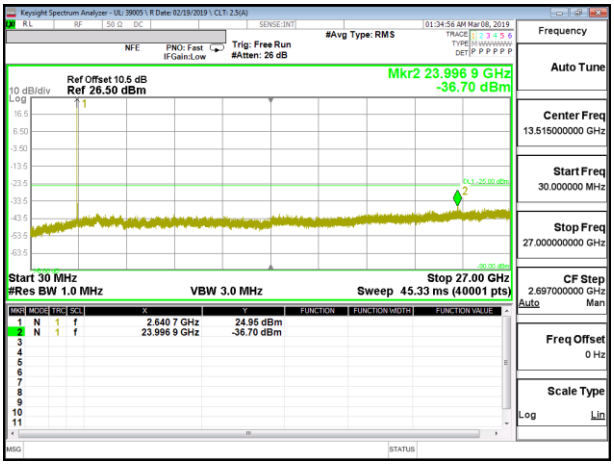


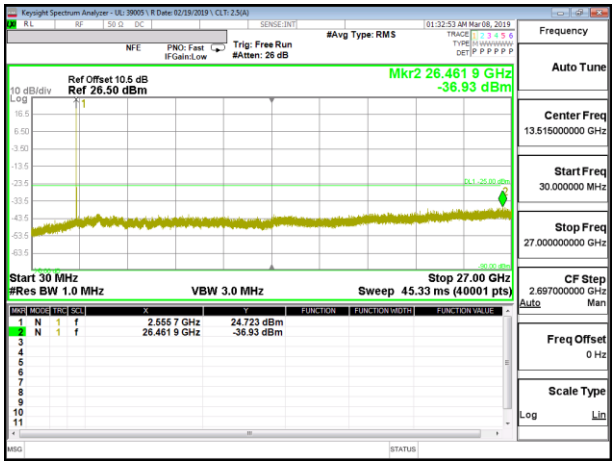
LTE B41 15MHz QPSK Low Channel RB1-0



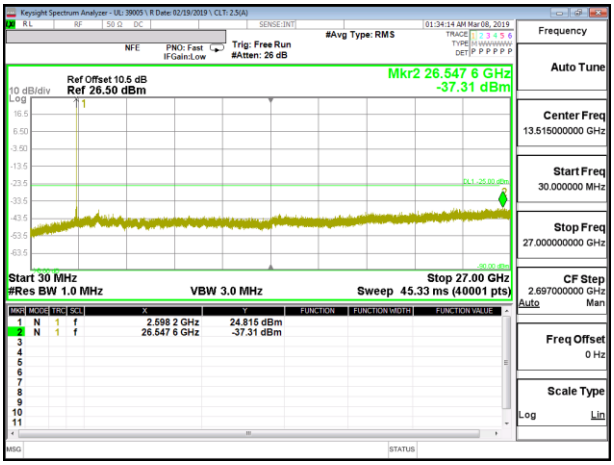
LTE B41 15MHz QPSK Mid Channel RB1-0



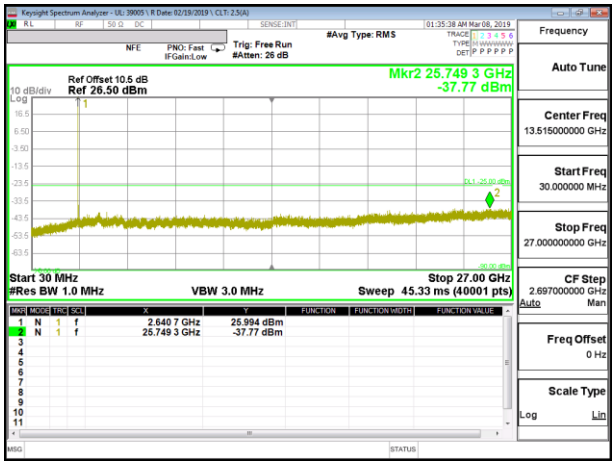
LTE B41 15MHz QPSK High Channel RB1-0



LTE B41 15MHz 16QAM Low Channel RB1-0



LTE B41 15MHz 16QAM Mid Channel RB1-0



LTE B41 15MHz 16QAM High Channel RB1-0

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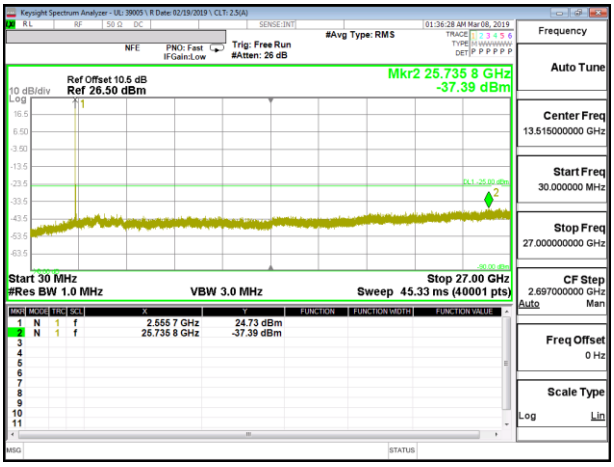
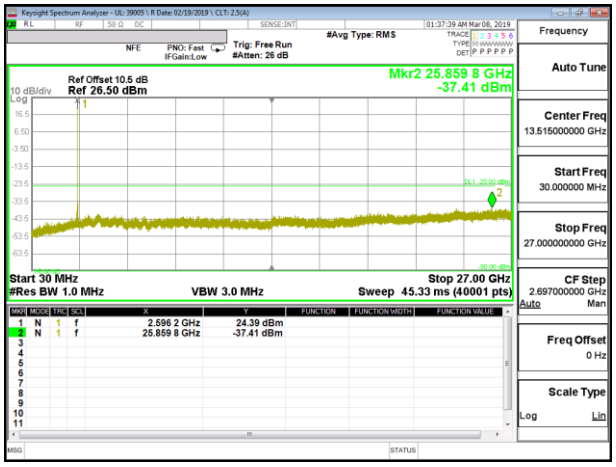
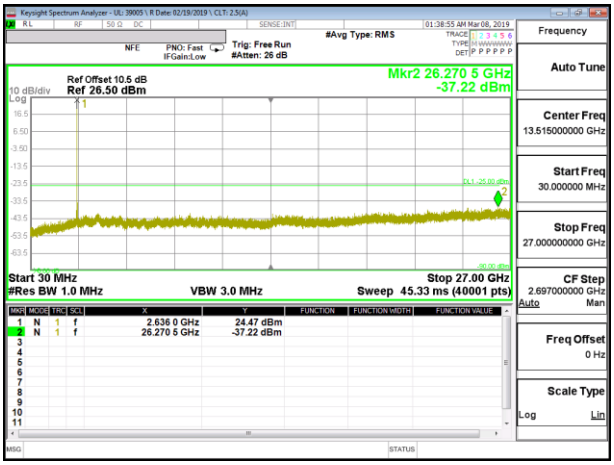


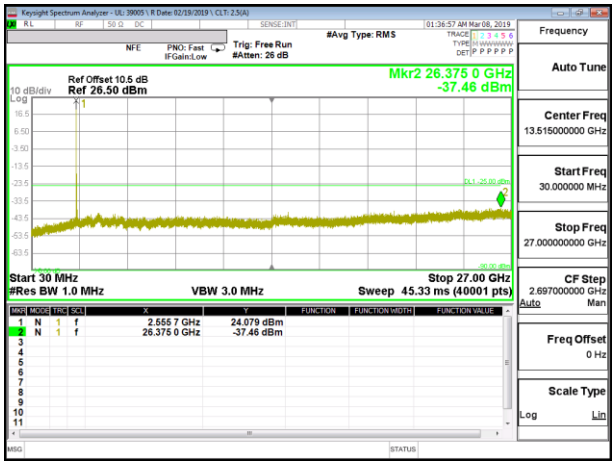
LTE B41 20MHz QPSK Low Channel RB1-0



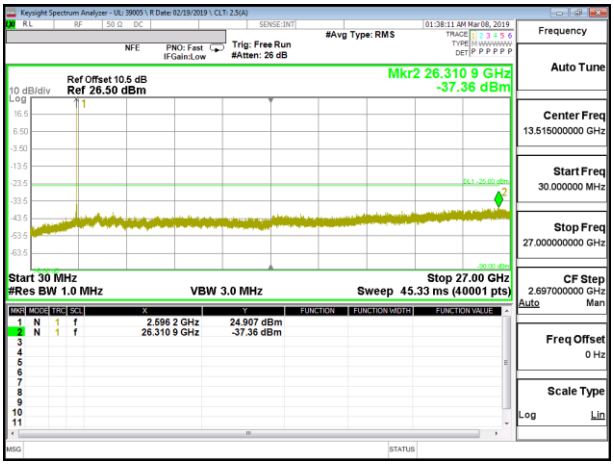
LTE B41 20MHz QPSK Mid Channel RB1-0



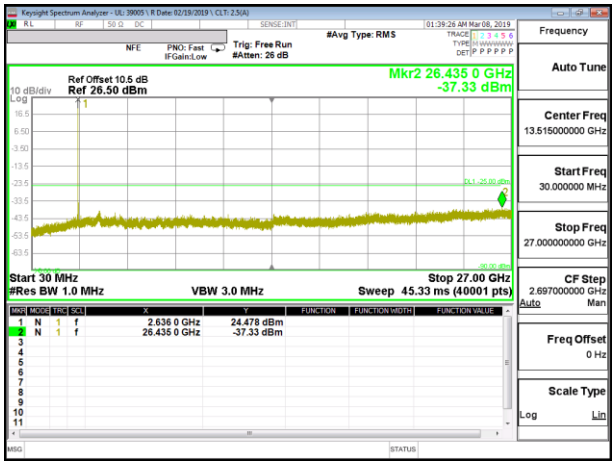
LTE B41 20MHz QPSK High Channel RB1-0



LTE B41 20MHz 16QAM Low Channel RB1-0



LTE B41 20MHz 16QAM Mid Channel RB1-0



LTE B41 20MHz 16QAM High Channel RB1-0

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9.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

FCC: §22.355
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
- CDMA BC0
- WCDMA Band 5
- WCDMA Band 2
- LTE Band 5
- LTE Band 41
-

RESULTS

See the following pages.

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9.4.1. GSM

ID:	43575	Date:	2/20/19

GPRS 850MHz

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.0149	848.9743		
Extreme (50C)		824.0148	848.9743	-12.3	-0.015
Extreme (40C)		824.0148	848.9743	-12.3	-0.015
Extreme (30C)		824.0148	848.9743	-9.9	-0.012
Extreme (10C)		824.0148	848.9743	-10.3	-0.012
Extreme (0C)		824.0149	848.9743	8.5	0.010
Extreme (-10C)		824.0148	848.9743	-8.7	-0.010
Extreme (-20C)		824.0149	848.9743	8.4	0.010
Extreme (-30C)		824.0149	848.9743	8.3	0.010
20C	15%	824.0148	848.9743	-8.9	-0.011
	-15%	824.0148	848.9743	-8.6	-0.010
	End Point	824.0148	848.9743	-14.0	-0.017

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GPRS 1900MHz

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.0279	1909.9763		
Extreme (50C)		1850.0280	1909.9763	40.1	0.021
Extreme (40C)		1850.0279	1909.9763	17.1	0.009
Extreme (30C)		1850.0279	1909.9763	16.5	0.009
Extreme (10C)		1850.0279	1909.9763	21.6	0.011
Extreme (0C)		1850.0279	1909.9763	23.8	0.013
Extreme (-10C)		1850.0279	1909.9763	25.5	0.014
Extreme (-20C)		1850.0279	1909.9763	24.2	0.013
Extreme (-30C)		1850.0279	1909.9763	22.9	0.012
20C	15%	1850.0279	1909.9763	30.8	0.016
	-15%	1850.0279	1909.9763	25.2	0.013
	End Point	1850.0279	1909.9763	23.0	0.012

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9.4.2. CDMA

ID:	43575	Date:	3/6/19

CDMA 1xRTT BCO

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.022	848.984		
Extreme (50C)		824.021	848.983	-8.0	-0.01
Extreme (40C)		824.021	848.983	-7.3	-0.01
Extreme (30C)		824.021	848.983	-8.0	-0.01
Extreme (10C)		824.021	848.983	-6.5	-0.01
Extreme (0C)		824.021	848.983	-8.2	-0.01
Extreme (-10C)		824.021	848.983	-5.7	-0.01
Extreme (-20C)		824.021	848.983	-5.6	-0.01
Extreme (-30C)		824.021	848.983	-6.0	-0.01
20C	15%	824.021	848.983	-7.0	-0.01
	-15%	824.021	848.983	-6.0	-0.01
	End Point	824.022	848.984	7.0	0.01

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9.4.3. WCDMA

ID:	43575	Date:	2/20/19

UMTS REL99 BAND 5

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.1653	848.8477		
Extreme (50C)		824.1653	848.8477	-1.7	-0.0020
Extreme (40C)		824.1653	848.8477	-2.0	-0.0023
Extreme (30C)		824.1653	848.8477	-1.8	-0.0022
Extreme (10C)		824.1653	848.8477	-1.8	-0.0021
Extreme (0C)		824.1653	848.8477	-2.5	-0.0030
Extreme (-10C)		824.1653	848.8477	-1.7	-0.0020
Extreme (-20C)		824.1653	848.8477	-1.9	-0.0023
Extreme (-30C)		824.1653	848.8477	-2.9	-0.0035
20C	15%	824.1653	848.8477	-1.8	-0.0021
	-15%	824.1653	848.8477	-2.3	-0.0027
	End Point	824.1653	848.8477	1.7	0.0020

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UMTS REL99 BAND 2

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.1371	1909.8379		
Extreme (50C)		1850.1371	1909.8379	13.4	0.0071
Extreme (40C)		1850.1371	1909.8379	13.5	0.0072
Extreme (30C)		1850.1371	1909.8379	13.2	0.0070
Extreme (10C)		1850.1371	1909.8379	12.6	0.0067
Extreme (0C)		1850.1371	1909.8379	12.7	0.0067
Extreme (-10C)		1850.1371	1909.8379	12.1	0.0064
Extreme (-20C)		1850.1371	1909.8379	14.1	0.0075
Extreme (-30C)		1850.1371	1909.8379	17.8	0.0095
20C	15%	1850.1371	1909.8379	12.7	0.0067
	-15%	1850.1371	1909.8379	13.4	0.0071
	End Point	1850.1371	1909.8379	13.6	0.0072

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9.4.4. LTE BAND 5

ID:	43575 OS	Date:	2/19/19

QPSK, (10MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.3000	848.4767		
Extreme (50C)		824.3000	848.4767	-9.2	-0.011
Extreme (40C)		824.3000	848.4767	-8.0	-0.010
Extreme (30C)		824.3000	848.4767	-8.3	-0.010
Extreme (10C)		824.3000	848.4767	-7.7	-0.009
Extreme (0C)		824.3000	848.4767	-7.9	-0.009
Extreme (-10C)		824.3000	848.4767	-8.9	-0.011
Extreme (-20C)		824.3000	848.4767	-7.5	-0.009
Extreme (-30C)		824.3000	848.4767	-9.7	-0.012
20C	15%	824.3000	848.4767	-9.4	-0.011
	-15%	824.3000	848.4767	-8.5	-0.010
	End Point	824.3000	848.4767	-7.7	-0.009

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9.4.5. LTE BAND 41

ID:	43575	Date:	3/8/19

QPSK, (20MHz BANDWIDTH)

Limit		2555	2655	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2556.0085	2653.9670		
Extreme (50C)		2556.0085	2653.9670	8.6	0.003
Extreme (40C)		2556.0085	2653.9670	7.6	0.003
Extreme (30C)		2556.0085	2653.9670	-2.4	-0.001
Extreme (10C)		2556.0085	2653.9670	-3.0	-0.001
Extreme (0C)		2556.0085	2653.9670	10.0	0.004
Extreme (-10C)		2556.0085	2653.9670	12.6	0.005
Extreme (-20C)		2556.0085	2653.9670	11.0	0.004
Extreme (-30C)		2556.0085	2653.9670	12.6	0.005
20C	15%	2556.0085	2653.9670	-5.4	-0.002
	-15%	2556.0085	2653.9670	-5.5	-0.002
	End Point	2556.0085	2653.9670	-6.1	-0.002

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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.

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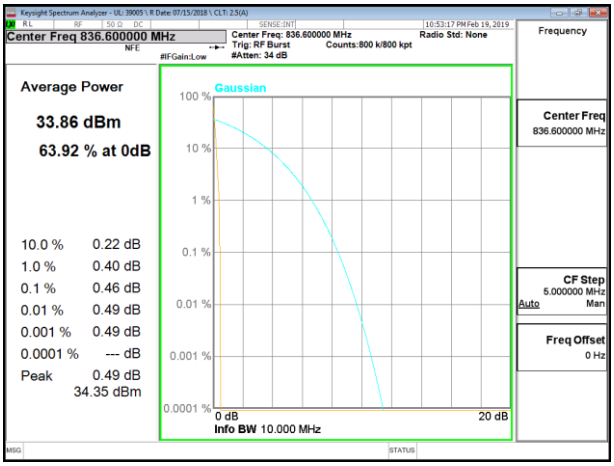
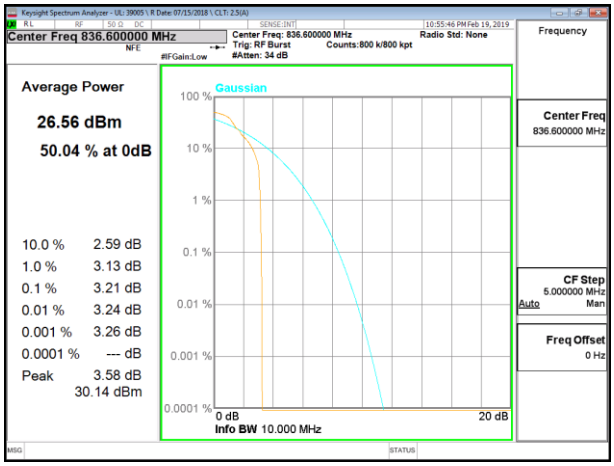
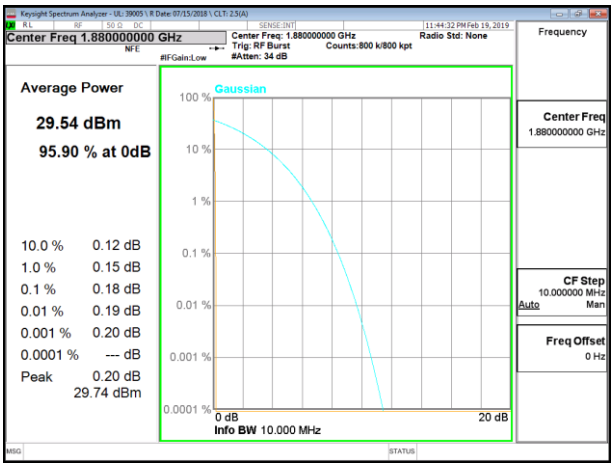
9.5.1. GSM



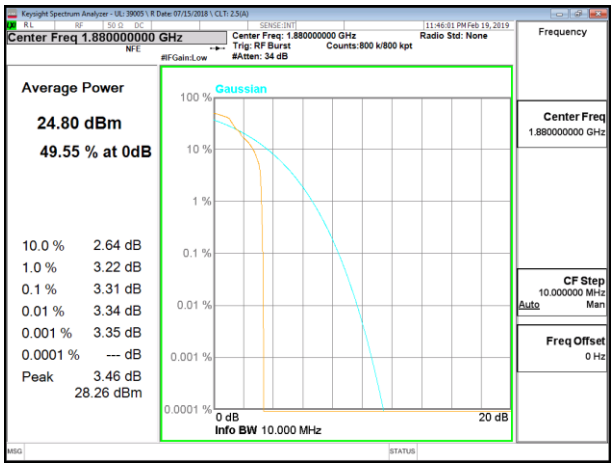
GSM 850MHz GPRS MID Channel



GSM 850MHz EGPRS MID Channel



GSM 1900MHz GPRS MID Channel



GSM 1900MHz EGPRS MID Channel

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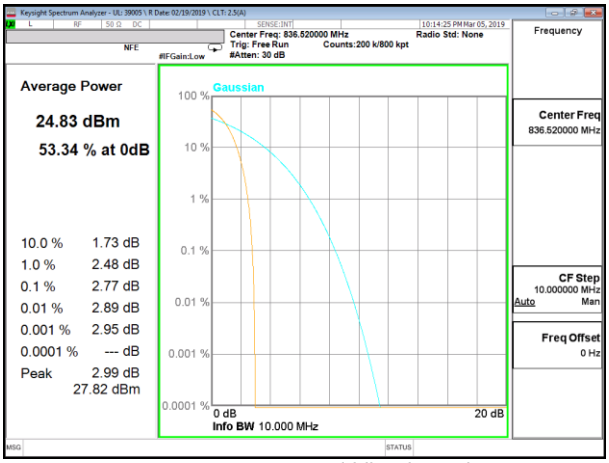
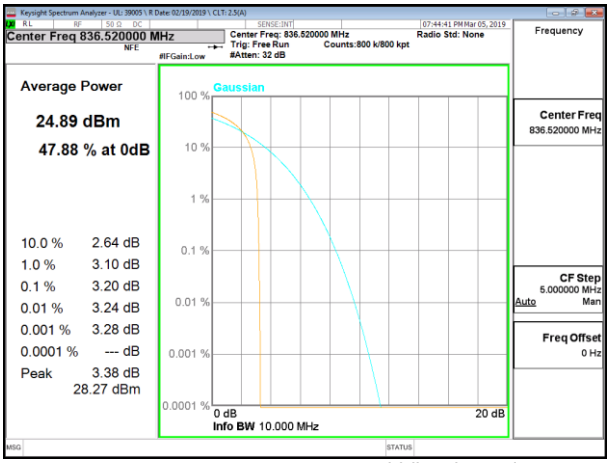
9.5.2. CDMA



CDMA BC0 1xRTT Middle Channel



CDMA BC0 1xEV-DO Rev A Middle Channel

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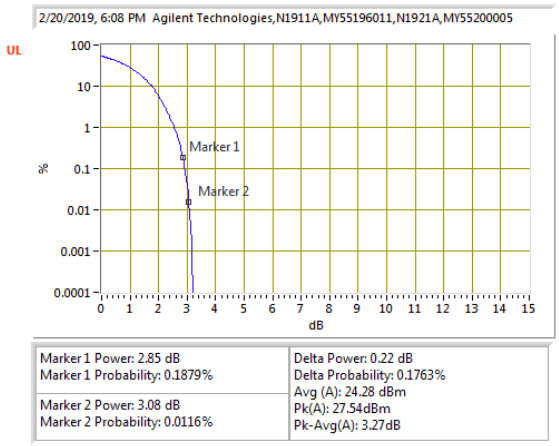
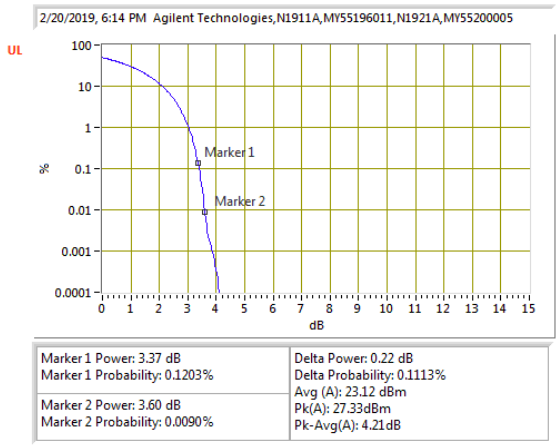
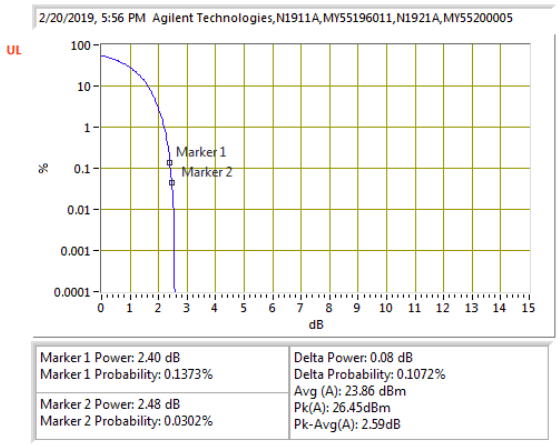
9.5.3. WCDMA



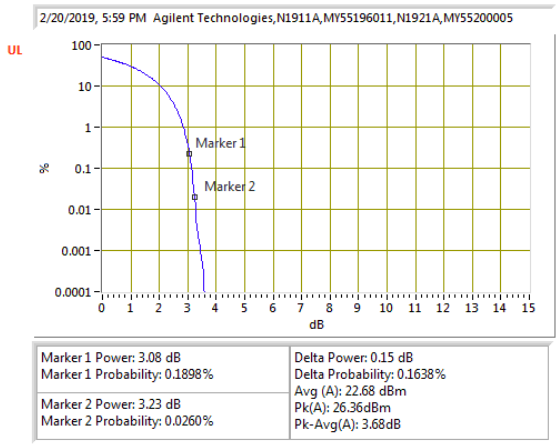
WCDMA BAND5 Rel99 MID Channel



WCDMA BAND5 HSDPA MID Channel



WCDMA BAND2 Rel99 MID Channel



WCDMA BAND2 HSDPA MID Channel

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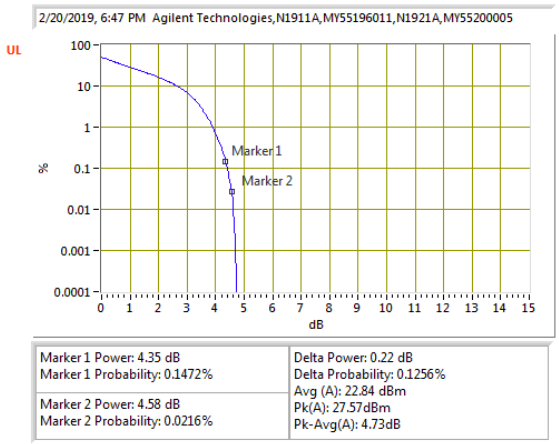
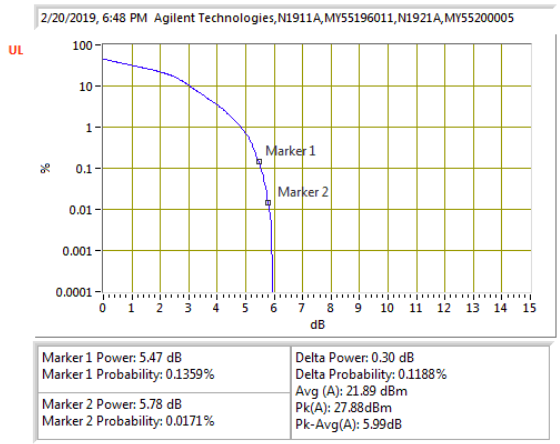
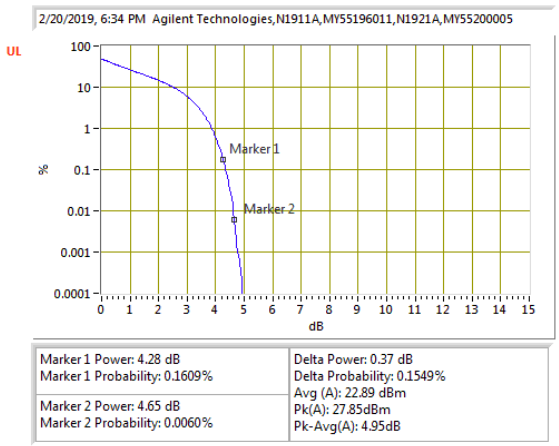
9.5.4. LTE BAND 5



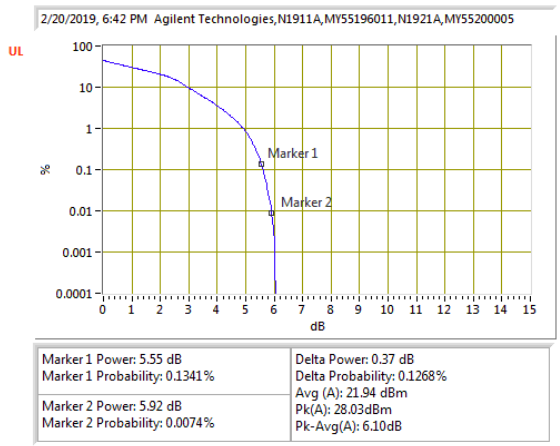
LTE B5 1.4MHz QPSK Mid Channel



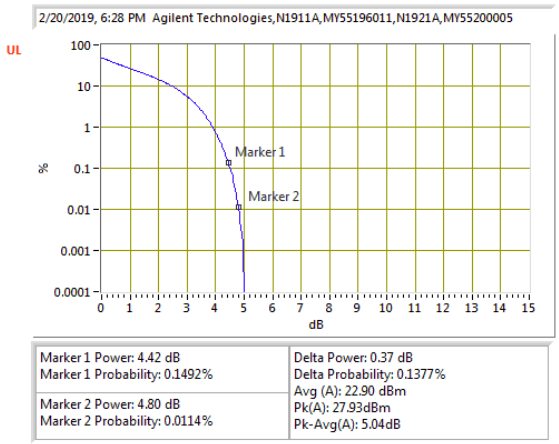
LTE B5 1.4MHz 16QAM Mid Channel



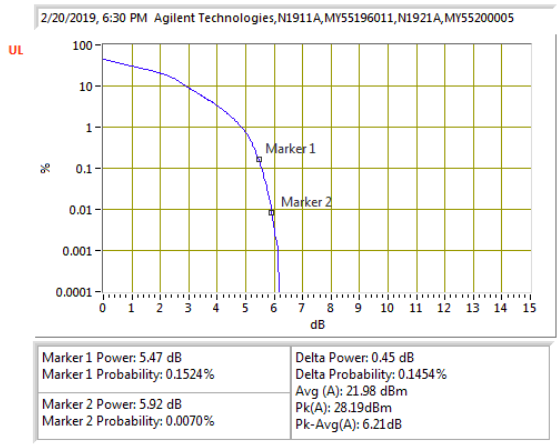
LTE B5 3MHz QPSK Mid Channel



LTE B5 3MHz 16QAM Mid Channel



LTE B5 5MHz QPSK Mid Channel



LTE B5 5MHz 16QAM Mid Channel

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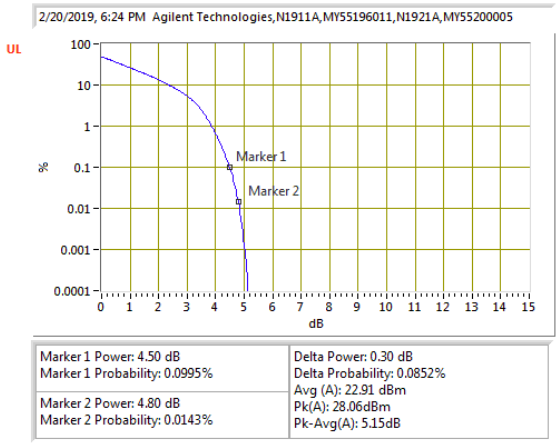
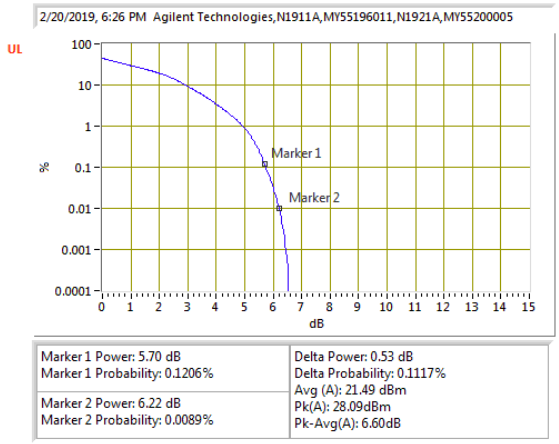


LTE B5 10MHz QPSK Mid Channel



LTE B5 10MHz 16QAM Mid Channel

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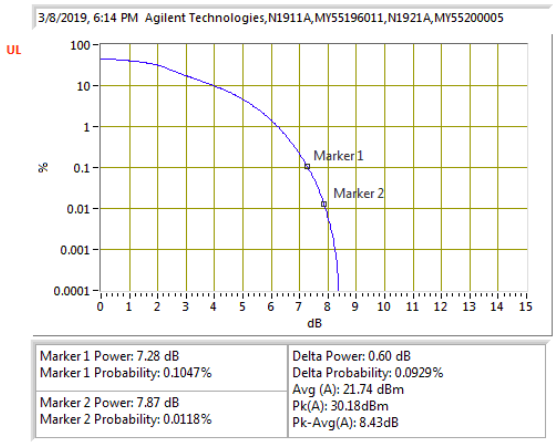
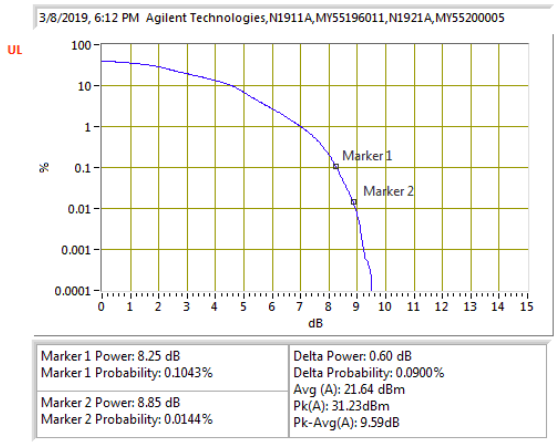
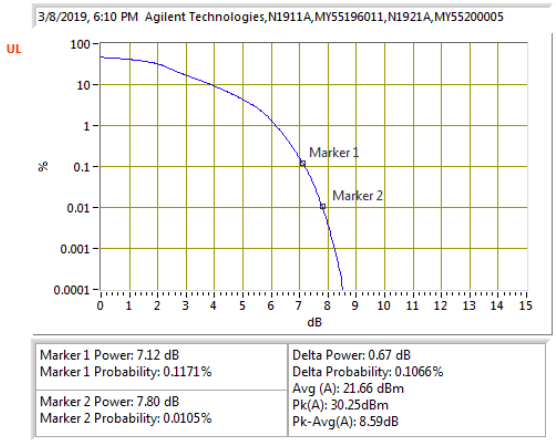
9.5.5. LTE BAND 41



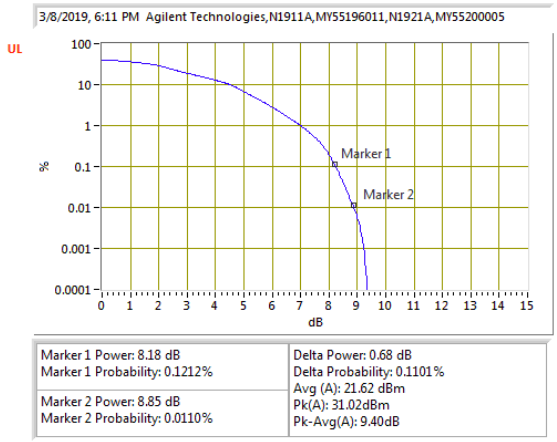
LTE B41 5MHz QPSK Middle Channel



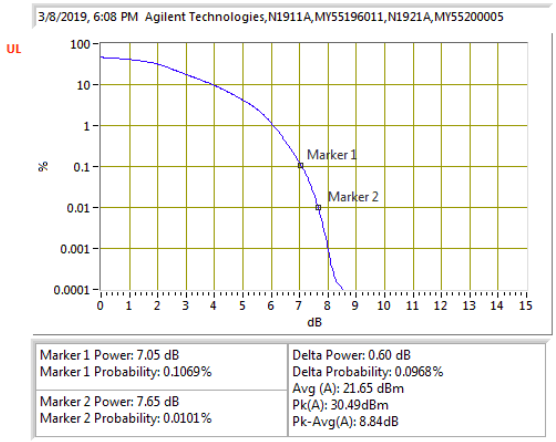
LTE B41 5MHz 16QAM Middle Channel



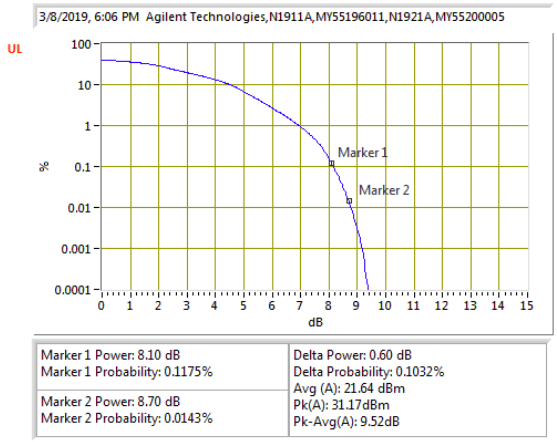
LTE B41 10MHz QPSK Middle Channel



LTE B41 10MHz 16QAM Middle Channel



LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel

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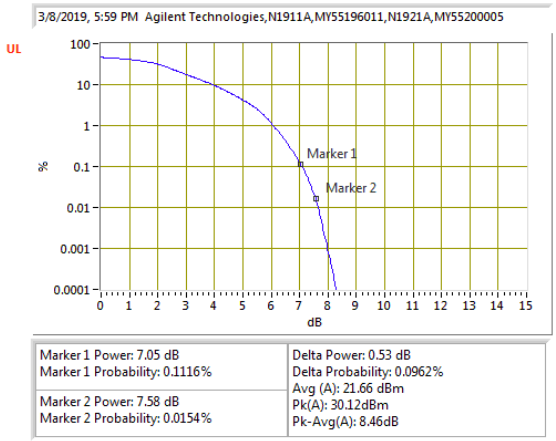
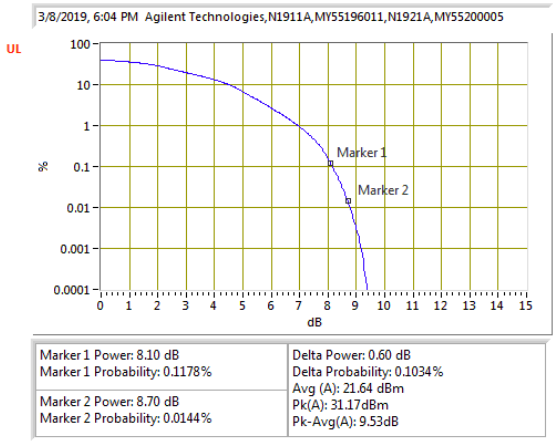


LTE B41 20MHz QPSK Middle Channel



LTE B41 20MHz 16QAM Middle Channel

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10. RADIATED TEST RESULTS

10.1. EFFECTIVE RADIATED POWER ERP/EIRP

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, and §27.50

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(h) - (2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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 603-E (2016), Clause 2.2.17; PSA setting reference to 971168 D01 v03r01

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, CDMA, WCDMA, 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 5.2 for the final ERP/EIRP results.

TEST RESULTS

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GSM

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
GSM 850	GPRS	128	824.2	26.17	414.00
		190	836.6	24.85	305.49
		251	848.8	25.87	386.37
	EGPRS	128	824.2	22.27	168.66
		190	836.6	20.41	109.90
		251	848.8	21.90	154.88
GSM 1900	GPRS	512	1850.2	24.31	269.77
		661	1880.0	23.71	234.96
		810	1909.8	23.50	223.87
	EGPRS	512	1850.2	21.78	150.66
		661	1880.0	21.00	125.89
		810	1909.8	20.73	118.30

CDMA

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
BC0	1xRTT	1013	824.7	19.78	95.06
		384	836.52	19.21	83.37
		777	848.31	19.94	98.63
	1xEV-DO Rev A	1013	824.7	20.04	100.93
		384	836.52	19.48	88.72
		777	848.31	19.87	97.05

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WCDMA

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	19.73	93.97
		9400	1880	18.25	66.83
		9538	1907.6	19.35	86.10
	HSDPA	9262	1852.4	18.82	76.21
		9400	1880.0	17.16	52.00
		9538	1907.6	18.31	67.76
Band 5	REL99	4132	826.4	18.27	67.14
		4183	836.6	17.78	59.98
		4233	846.6	18.33	68.08
	HSDPA	4132	826.4	17.65	58.21
		4183	836.6	17.24	52.97
		4233	846.6	17.45	55.59

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LTE Band 5

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
10	QPSK	1/0	829	17.07	50.93
		1/0	836.5	16.48	44.46
		1/0	844	16.48	44.46
	16QAM	1/0	829	16.35	43.15
		1/0	836.5	15.60	36.31
		1/0	844	15.77	37.76
5	QPSK	1/0	826.5	16.53	44.98
		1/0	836.5	16.12	40.93
		1/0	846.5	15.90	38.90
	16QAM	1/0	826.5	15.86	38.55
		1/0	836.5	15.23	33.34
		1/0	846.5	15.16	32.81
3	QPSK	1/0	825.5	16.01	39.90
		1/0	836.5	15.51	35.56
		1/0	847.5	15.76	37.67
	16QAM	1/0	825.5	15.25	33.50
		1/0	836.5	14.57	28.64
		1/0	847.5	14.81	30.27
1.4	QPSK	1/0	824.7	15.96	39.45
		1/0	836.5	15.59	36.22
		1/0	848.3	15.40	34.67
	16QAM	1/0	824.7	15.15	32.73
		1/0	836.5	14.70	29.51
		1/0	848.3	14.57	28.64

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LTE Band 41

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
20	QPSK	1/0	2565	19.26	84.33
		1/0	2605	19.24	83.95
		1/0	2645	19.19	82.99
	16QAM	1/0	2565	18.49	70.63
		1/0	2605	18.59	72.28
		1/0	2645	18.44	69.82
15	QPSK	1/0	2562.5	19.26	84.33
		1/0	2605	19.10	81.28
		1/0	2647.5	19.17	82.60
	16QAM	1/0	2562.5	18.51	70.96
		1/0	2605	18.25	66.83
		1/0	2647.5	18.31	67.76
10	QPSK	1/0	2560	18.70	74.13
		1/0	2605	19.16	82.41
		1/0	2650	18.56	71.78
	16QAM	1/0	2560	17.88	61.38
		1/0	2605	18.46	70.15
		1/0	2650	17.65	58.21
5	QPSK	1/0	2557.5	18.38	68.87
		1/0	2605	18.48	70.47
		1/0	2652.5	18.25	66.83
	16QAM	1/0	2557.5	17.61	57.68
		1/0	2605	17.84	60.81
		1/0	2652.5	17.58	57.28

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10.1.1. GSM

GPRS 850

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: GPRS 850 MHz Fundamentals

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	22.50	V	3.1	0.1	19.51	38.5	-19.0	
824.20	29.07	H	3.1	0.2	26.17	38.5	-12.3	
Mid Ch								
836.60	20.79	V	3.1	0.1	17.72	38.5	-20.8	
836.60	27.82	H	3.1	0.2	24.85	38.5	-13.7	
High Ch								
848.80	21.41	V	3.2	0.0	18.26	38.5	-20.2	
848.80	28.92	H	3.2	0.1	25.87	38.5	-12.6	

EGPRS 850

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: EGPRS 850 MHz Fundamentals

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	15.98	V	3.1	0.1	12.99	38.5	-25.5	
824.20	25.17	H	3.1	0.2	22.27	38.5	-16.2	
Mid Ch								
836.60	15.38	V	3.1	0.1	12.31	38.5	-26.2	
836.60	23.38	H	3.1	0.2	20.41	38.5	-18.1	
High Ch								
848.80	15.50	V	3.2	0.0	12.35	38.5	-26.1	
848.80	24.95	H	3.2	0.1	21.90	38.5	-16.6	

GPRS 1900

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: GPRS 1900 MHz Fundamentals

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	19.54	V	5.0	9.8	24.31	33.0	-8.7	
1850.20	15.90	H	5.0	9.8	20.67	33.0	-12.3	
Mid Ch								
1880.00	18.83	V	5.1	10.0	23.71	33.0	-9.3	
1880.00	15.58	H	5.1	10.0	20.46	33.0	-12.5	
High Ch								
1909.80	18.55	V	5.2	10.1	23.50	33.0	-9.5	
1909.80	11.56	H	5.2	10.1	16.51	33.0	-16.5	

EGPRS 1900

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: EGPRS 1900 MHz Fundamentals

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	17.01	V	5.0	9.8	21.78	33.0	-11.2	
1850.20	13.14	H	5.0	9.8	17.91	33.0	-15.1	
Mid Ch								
1880.00	16.12	V	5.1	10.0	21.00	33.0	-12.0	
1880.00	13.38	H	5.1	10.0	18.26	33.0	-14.7	
High Ch								
1909.80	15.78	V	5.2	10.1	20.73	33.0	-12.3	
1909.80	8.99	H	5.2	10.1	13.94	33.0	-19.1	

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10.1.2. CDMA

CDMA BC0 1xRTT

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: RTT BC0 Fundamentals

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	15.01	V	3.1	0.1	12.01	38.5	-26.5	
824.70	22.68	H	3.1	0.2	19.78	38.5	-18.7	
Mid Ch								
836.52	14.50	V	3.1	0.1	11.43	38.5	-27.1	
836.52	22.18	H	3.1	0.2	19.21	38.5	-19.3	
High Ch								
848.31	15.23	V	3.2	0.0	12.09	38.5	-26.4	
848.31	22.98	H	3.2	0.1	19.94	38.5	-18.6	

CDMA BC0 1xEV-DO Rev A

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: EVDO BC0 Fundamentals

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	15.26	V	3.1	0.1	12.26	38.5	-26.2	
824.70	22.94	H	3.1	0.2	20.04	38.5	-18.5	
Mid Ch								
836.52	15.06	V	3.1	0.1	11.99	38.5	-26.5	
836.52	22.45	H	3.1	0.2	19.48	38.5	-19.0	
High Ch								
848.31	15.43	V	3.2	0.0	12.29	38.5	-26.2	
848.31	22.91	H	3.2	0.1	19.87	38.5	-18.6	

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10.1.3. WCDMA

B2 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/23/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: Rel99 Band 2 Fundamentals

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	14.95	V	5.0	9.8	19.73	33.0	-13.3	
1852.40	13.25	H	5.0	9.8	18.03	33.0	-15.0	
Mid Ch								
1880.00	13.37	V	5.1	10.0	18.25	33.0	-14.8	
1880.00	11.39	H	5.1	10.0	16.27	33.0	-16.7	
High Ch								
1907.60	14.40	V	5.2	10.1	19.35	33.0	-13.7	
1907.60	6.67	H	5.2	10.1	11.62	33.0	-21.4	

B2 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/23/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: HSDPA Band 2 Fundamentals

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	14.04	V	5.0	9.8	18.82	33.0	-14.2	
1852.40	12.31	H	5.0	9.8	17.09	33.0	-15.9	
Mid Ch								
1880.00	12.28	V	5.1	10.0	17.16	33.0	-15.8	
1880.00	10.36	H	5.1	10.0	15.24	33.0	-17.8	
High Ch								
1907.60	13.36	V	5.2	10.1	18.31	33.0	-14.7	
1907.60	5.61	H	5.2	10.1	10.56	33.0	-22.4	

B5 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/21/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: Rel99 Band 5 Fundamentals

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	14.12	V	3.1	0.1	11.11	38.5	-27.4	
826.40	21.18	H	3.1	0.2	18.27	38.5	-20.2	
Mid Ch								
836.60	13.72	V	3.1	0.1	10.65	38.5	-27.9	
836.60	20.75	H	3.1	0.2	17.78	38.5	-20.7	
High Ch								
846.60	14.02	V	3.1	0.0	10.89	38.5	-27.6	
846.60	21.36	H	3.1	0.1	18.33	38.5	-20.2	

B5 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/21/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: HSDPA Band 5 Fundamentals

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	13.36	V	3.1	0.1	10.35	38.5	-28.1	
826.40	20.56	H	3.1	0.2	17.65	38.5	-20.8	
Mid Ch								
836.60	13.04	V	3.1	0.1	9.97	38.5	-28.5	
836.60	20.21	H	3.1	0.2	17.24	38.5	-21.3	
High Ch								
846.60	13.04	V	3.1	0.0	9.91	38.5	-28.6	
846.60	20.48	H	3.1	0.1	17.45	38.5	-21.1	

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10.1.4. LTE Band 5

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	15.25	V	3.1	0.1	12.23	38.5	-26.3	
829.00	19.99	H	3.1	0.2	17.07	38.5	-21.4	
Mid Ch								
836.50	14.80	V	3.1	0.1	11.73	38.5	-26.8	
836.50	19.45	H	3.1	0.2	16.48	38.5	-22.0	
High Ch								
844.00	14.98	V	3.1	0.0	11.86	38.5	-26.6	
844.00	19.50	H	3.1	0.1	16.48	38.5	-22.0	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	14.53	V	3.1	0.1	11.51	38.5	-27.0	
829.00	19.27	H	3.1	0.2	16.35	38.5	-22.2	
Mid Ch								
836.50	13.91	V	3.1	0.1	10.84	38.5	-27.7	
836.50	18.57	H	3.1	0.2	15.60	38.5	-22.9	
High Ch								
844.00	14.22	V	3.1	0.0	11.10	38.5	-27.4	
844.00	18.79	H	3.1	0.1	15.77	38.5	-22.7	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	14.62	V	3.1	0.1	11.61	38.5	-26.9	
826.50	19.44	H	3.1	0.2	16.53	38.5	-22.0	
Mid Ch								
836.50	14.54	V	3.1	0.1	11.47	38.5	-27.0	
836.50	19.09	H	3.1	0.2	16.12	38.5	-22.4	
High Ch								
846.50	14.65	V	3.1	0.0	11.52	38.5	-27.0	
846.50	18.93	H	3.1	0.1	15.90	38.5	-22.6	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	13.98	V	3.1	0.1	10.97	38.5	-27.5	
826.50	18.77	H	3.1	0.2	15.86	38.5	-22.6	
Mid Ch								
836.50	13.64	V	3.1	0.1	10.57	38.5	-27.9	
836.50	18.20	H	3.1	0.2	15.23	38.5	-23.3	
High Ch								
846.50	13.91	V	3.1	0.0	10.78	38.5	-27.7	
846.50	18.19	H	3.1	0.1	15.16	38.5	-23.3	

3MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	14.30	V	3.1	0.1	11.30	38.5	-27.2	
825.50	18.91	H	3.1	0.2	16.01	38.5	-22.5	
Mid Ch								
836.50	14.13	V	3.1	0.1	11.06	38.5	-27.4	
836.50	18.48	H	3.1	0.2	15.51	38.5	-23.0	
High Ch								
847.50	14.11	V	3.1	0.0	10.97	38.5	-27.5	
847.50	18.80	H	3.1	0.1	15.76	38.5	-22.7	

3MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	13.54	V	3.1	0.1	10.54	38.5	-28.0	
825.50	18.15	H	3.1	0.2	15.25	38.5	-23.3	
Mid Ch								
836.50	13.18	V	3.1	0.1	10.11	38.5	-28.4	
836.50	17.54	H	3.1	0.2	14.57	38.5	-23.9	
High Ch								
847.50	13.19	V	3.1	0.0	10.05	38.5	-28.4	
847.50	17.85	H	3.1	0.1	14.81	38.5	-23.7	

1.4MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	14.32	V	3.1	0.1	11.32	38.5	-27.2	
824.70	18.86	H	3.1	0.2	15.96	38.5	-22.5	
Mid Ch								
836.50	13.96	V	3.1	0.1	10.89	38.5	-27.6	
836.50	18.56	H	3.1	0.2	15.59	38.5	-22.9	
High Ch								
848.30	13.99	V	3.2	0.0	10.85	38.5	-27.7	
848.30	18.44	H	3.2	0.1	15.40	38.5	-23.1	

1.4MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12726900
Date: 2/22/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid PRE0181575, and Chamber J SMA Cables
Substitution: Dipole T416, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	13.52	V	3.1	0.1	10.52	38.5	-28.0	
824.70	18.05	H	3.1	0.2	15.15	38.5	-23.3	
Mid Ch								
836.50	13.05	V	3.1	0.1	9.98	38.5	-28.5	
836.50	17.67	H	3.1	0.2	14.70	38.5	-23.8	
High Ch								
848.30	13.15	V	3.2	0.0	10.01	38.5	-28.5	
848.30	17.61	H	3.2	0.1	14.57	38.5	-23.9	

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10.1.5. LTE Band 41

20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 41(FCC) Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2565.00	12.10	V	6.1	9.9	15.89	33.0	-17.1	
2565.00	15.47	H	6.1	9.9	19.26	33.0	-13.7	
Mid Ch								
2605.00	13.85	V	6.2	9.9	17.62	33.0	-15.4	
2605.00	15.47	H	6.2	9.9	19.24	33.0	-13.8	
High Ch								
2645.00	12.83	V	6.3	9.9	16.46	33.0	-16.5	
2645.00	15.56	H	6.3	9.9	19.19	33.0	-13.8	

20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 41(FCC) Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2565.00	11.33	V	6.1	9.9	15.12	33.0	-17.9	
2565.00	14.70	H	6.1	9.9	18.49	33.0	-14.5	
Mid Ch								
2605.00	13.08	V	6.2	9.9	16.85	33.0	-16.1	
2605.00	14.82	H	6.2	9.9	18.59	33.0	-14.4	
High Ch								
2645.00	12.06	V	6.3	9.9	15.69	33.0	-17.3	
2645.00	14.81	H	6.3	9.9	18.44	33.0	-14.6	

15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 41(FCC) Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2562.50	12.74	V	6.1	9.9	16.53	33.0	-16.5	
2562.50	15.47	H	6.1	9.9	19.26	33.0	-13.7	
Mid Ch								
2605.00	13.23	V	6.2	9.9	17.00	33.0	-16.0	
2605.00	15.33	H	6.2	9.9	19.10	33.0	-13.9	
High Ch								
2647.50	12.60	V	6.3	9.9	16.23	33.0	-16.8	
2647.50	15.54	H	6.3	9.9	19.17	33.0	-13.8	

15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 41(FCC) Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2562.50	11.90	V	6.1	9.9	15.69	33.0	-17.3	
2562.50	14.72	H	6.1	9.9	18.51	33.0	-14.5	
Mid Ch								
2605.00	12.62	V	6.2	9.9	16.39	33.0	-16.6	
2605.00	14.48	H	6.2	9.9	18.25	33.0	-14.7	
High Ch								
2647.50	11.72	V	6.3	9.9	15.35	33.0	-17.7	
2647.50	14.68	H	6.3	9.9	18.31	33.0	-14.7	

10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 41(FCC) Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2560.00	12.43	V	6.1	9.9	16.23	33.0	-16.8	
2560.00	14.90	H	6.1	9.9	18.70	33.0	-14.3	
Mid Ch								
2605.00	12.29	V	6.2	9.9	16.06	33.0	-16.9	
2605.00	15.39	H	6.2	9.9	19.16	33.0	-13.8	
High Ch								
2650.00	12.50	V	6.3	9.9	16.12	33.0	-16.9	
2650.00	14.94	H	6.3	9.9	18.56	33.0	-14.4	

10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 41(FCC) Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2560.00	11.57	V	6.1	9.9	15.37	33.0	-17.6	
2560.00	14.08	H	6.1	9.9	17.88	33.0	-15.1	
Mid Ch								
2605.00	11.57	V	6.2	9.9	15.34	33.0	-17.7	
2605.00	14.69	H	6.2	9.9	18.46	33.0	-14.5	
High Ch								
2650.00	11.60	V	6.3	9.9	15.22	33.0	-17.8	
2650.00	14.03	H	6.3	9.9	17.65	33.0	-15.4	

5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_QPSK Band 41(FCC) Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2557.50	12.04	V	6.1	9.8	15.84	33.0	-17.2	
2557.50	14.58	H	6.1	9.8	18.38	33.0	-14.6	
Mid Ch								
2605.00	12.28	V	6.2	9.9	16.05	33.0	-16.9	
2605.00	14.71	H	6.2	9.9	18.48	33.0	-14.5	
High Ch								
2652.50	11.33	V	6.3	9.9	14.94	33.0	-18.1	
2652.50	14.64	H	6.3	9.9	18.25	33.0	-14.8	

5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 12737383
Date: 3/6/2019
Test Engineer: 19480 BS
Configuration: EUT Only
Location: Chamber J
Mode: LTE_16QAM Band 41(FCC) Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn PRE0101793, and Chamber J SMA Cables
Substitution: Horn PRE0181258, Chamber J Passthrough Cables

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2557.50	11.19	V	6.1	9.8	14.99	33.0	-18.0	
2557.50	13.81	H	6.1	9.8	17.61	33.0	-15.4	
Mid Ch								
2605.00	11.58	V	6.2	9.9	15.35	33.0	-17.6	
2605.00	14.07	H	6.2	9.9	17.84	33.0	-15.2	
High Ch								
2652.50	10.67	V	6.3	9.9	14.28	33.0	-18.7	
2652.50	13.97	H	6.3	9.9	17.58	33.0	-15.4	

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10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMITS

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

FCC: §27.53 (m) (Band 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 v03r01/D02 v02/r01
TIA-603-E, Section 2.2.12.

MODES TESTED

- GSM 850
- GSM 1900
- CDMA BC0
- WCDMA Band 5
- WCDMA Band 2
- LTE Band 5
- LTE Band 41
-

RESULTS

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

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10.2.1. GSM

Company:	Samsung
Project #:	12726900
Date:	2/19/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 850
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	824.2MHz											
1	1.648	-52.98	Pk	28.3	-33.3	12.5	-45.48	-13	-32.48	0-360	148	H
3	2.472	-61.99	Pk	32.3	-32	11.3	-50.39	-13	-37.39	0-360	148	H
5	3.294	-71.54	Pk	32.8	-30.8	12.1	-57.44	-13	-44.44	0-360	148	H
2	1.648	-61.39	Pk	28.3	-33.3	11.4	-54.99	-13	-41.99	0-360	149	V
4	2.473	-63.46	Pk	32.3	-32	11.6	-51.56	-13	-38.56	0-360	149	V
6	3.296	-70.28	Pk	32.8	-30.8	12	-56.28	-13	-43.28	0-360	149	V
	836.6MHz											
1	1.673	-55.09	Pk	29.1	-33	11.6	-47.39	-13	-34.39	0-360	149	H
3	2.51	-64.49	Pk	32.4	-31.7	11.4	-52.39	-13	-39.39	0-360	149	H
5	3.341	-71.13	Pk	32.8	-30.7	11.6	-57.43	-13	-44.43	0-360	149	H
2	1.673	-59.55	Pk	29.1	-33	10.9	-52.55	-13	-39.55	0-360	149	V
4	2.509	-65.69	Pk	32.4	-31.8	11.4	-53.69	-13	-40.69	0-360	149	V
6	3.346	-70.6	Pk	32.8	-30.7	12	-56.5	-13	-43.5	0-360	149	V
	848.8MHz											
1	1.697	-57.42	Pk	29.1	-33.1	11.2	-50.22	-13	-37.22	0-360	149	H
3	2.546	-60.68	Pk	32.3	-31.6	12	-47.98	-13	-34.98	0-360	149	H
5	3.393	-71.77	Pk	32.7	-30.9	11.8	-58.17	-13	-45.17	0-360	149	H
2	1.698	-59.6	Pk	29.1	-33.1	12.2	-51.4	-13	-38.4	0-360	149	V
4	2.546	-67.46	Pk	32.3	-31.6	11.8	-54.96	-13	-41.96	0-360	149	V
6	3.394	-72.33	Pk	32.7	-30.9	11.8	-58.73	-13	-45.73	0-360	149	V

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Company:	Samsung
Project #:	12726900
Date:	2/19/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 850MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	824.2MHz											
1	1.648	-61.78	Pk	28.3	-33.3	12.5	-54.28	-13	-41.28	0-360	148	H
3	2.472	-70.26	Pk	32.3	-32	11.3	-58.66	-13	-45.66	0-360	148	H
5	3.295	-70.92	Pk	32.8	-30.8	12	-56.92	-13	-43.92	0-360	148	H
2	1.648	-64.33	Pk	28.3	-33.3	11.4	-57.93	-13	-44.93	0-360	149	V
4	2.473	-70.13	Pk	32.3	-32	11.6	-58.23	-13	-45.23	0-360	149	V
6	3.297	-71.57	Pk	32.8	-30.9	12.1	-57.57	-13	-44.57	0-360	149	V
	836.6MHz											
1	1.673	-59.33	Pk	29.1	-33	11.6	-51.63	-13	-38.63	0-360	149	H
3	2.509	-71.14	Pk	32.4	-31.8	11.4	-59.14	-13	-46.14	0-360	149	H
5	3.347	-70.22	Pk	32.8	-30.7	11.4	-56.72	-13	-43.72	0-360	149	H
2	1.673	-66.28	Pk	29.1	-33	10.9	-59.28	-13	-46.28	0-360	149	V
4	2.51	-66.47	Pk	32.4	-31.7	11.4	-54.37	-13	-41.37	0-360	149	V
6	3.345	-71.33	Pk	32.8	-30.7	12	-57.23	-13	-44.23	0-360	149	V
	848.8MHz											
1	1.698	-60.04	Pk	29.1	-33.1	11.2	-52.84	-13	-39.84	0-360	149	H
3	2.551	-70.9	Pk	32.4	-31.5	11.8	-58.2	-13	-45.2	0-360	149	H
5	3.399	-71.95	Pk	32.7	-30.8	11.9	-58.15	-13	-45.15	0-360	149	H
2	1.697	-66.65	Pk	29.1	-33.1	12.2	-58.45	-13	-45.45	0-360	149	V
4	2.546	-70.17	Pk	32.3	-31.6	11.8	-57.67	-13	-44.67	0-360	149	V
6	3.394	-70.9	Pk	32.7	-30.9	11.8	-57.3	-13	-44.3	0-360	149	V

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Company:	Samsung
Project #:	12726900
Date:	2/18/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	GPRS 1900MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1850.2MHz											
1	3.7	-62.24	Pk	32.9	-30.3	11.9	-47.74	-13	-34.74	0-360	149	H
3	5.551	-70.23	Pk	34.8	-28.7	12	-52.13	-13	-39.13	0-360	149	H
5	7.401	-77.59	Pk	35.6	-26.1	11.7	-56.39	-13	-43.39	0-360	149	H
2	3.7	-62.37	Pk	32.9	-30.3	12.1	-47.67	-13	-34.67	0-360	149	V
4	5.55	-64.96	Pk	34.8	-28.7	12.2	-46.66	-13	-33.66	0-360	149	V
6	7.399	-78.31	Pk	35.6	-26.1	11.8	-57.01	-13	-44.01	0-360	149	V
	1880MHz											
1	3.76	-58.07	Pk	33	-30	11.8	-43.27	-13	-30.27	0-360	149	H
3	5.64	-62.78	Pk	35	-28.6	11.8	-44.58	-13	-31.58	0-360	149	H
5	7.52	-72.22	Pk	35.6	-25.8	11.9	-50.52	-13	-37.52	0-360	149	H
2	3.76	-53.49	Pk	33	-30	11.8	-38.69	-13	-25.69	0-360	149	V
4	5.64	-58.5	Pk	35	-28.6	11.9	-40.2	-13	-27.2	0-360	149	V
6	7.521	-73.32	Pk	35.6	-25.8	12	-51.52	-13	-38.52	0-360	149	V
	1909.8MHz											
1	3.819	-65.32	Pk	33.1	-30	11.5	-50.72	-13	-37.72	0-360	149	H
3	5.729	-61.38	Pk	35	-28.4	11.8	-42.98	-13	-29.98	0-360	149	H
5	7.642	-79.12	Pk	35.7	-25.8	11.7	-57.52	-13	-44.52	0-360	149	H
2	3.819	-61.59	Pk	33.1	-30	11.3	-47.19	-13	-34.19	0-360	149	V
4	5.729	-63.47	Pk	35	-28.4	11.7	-45.17	-13	-32.17	0-360	149	V
6	7.641	-77.43	Pk	35.7	-25.8	11.8	-55.73	-13	-42.73	0-360	149	V

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Company:	Samsung
Project #:	12726900
Date:	2/18/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	EGPRS 1900MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1850.2MHz											
1	3.7	-66.43	Pk	32.9	-30.3	11.9	-51.93	-13	-38.93	0-360	149	H
3	5.55	-77.27	Pk	34.8	-28.7	12	-59.17	-13	-46.17	0-360	149	H
5	7.4	-78.21	Pk	35.6	-26.1	11.7	-57.01	-13	-44.01	0-360	149	H
2	3.7	-66.78	Pk	32.9	-30.3	12.1	-52.08	-13	-39.08	0-360	149	V
4	5.55	-70.03	Pk	34.8	-28.7	12.2	-51.73	-13	-38.73	0-360	149	V
6	7.401	-79.49	Pk	35.6	-26.1	11.8	-58.19	-13	-45.19	0-360	149	V
	1880MHz											
1	3.76	-65.35	Pk	33	-30	11.8	-50.55	-13	-37.55	0-360	149	H
3	5.64	-68.02	Pk	35	-28.6	11.8	-49.82	-13	-36.82	0-360	149	H
5	7.517	-79.17	Pk	35.6	-25.8	12	-57.37	-13	-44.37	0-360	149	H
2	3.76	-64.34	Pk	33	-30	11.8	-49.54	-13	-36.54	0-360	149	V
4	5.64	-60.54	Pk	35	-28.6	11.9	-42.24	-13	-29.24	0-360	149	V
6	7.521	-79.03	Pk	35.6	-25.8	11.9	-57.33	-13	-44.33	0-360	149	V
	1909.8MHz											
1	3.819	-72.94	Pk	33.1	-30	11.5	-58.34	-13	-45.34	0-360	149	H
3	5.729	-70.87	Pk	35	-28.4	11.8	-52.47	-13	-39.47	0-360	149	H
5	7.64	-78.46	Pk	35.7	-25.8	11.7	-56.86	-13	-43.86	0-360	149	H
2	3.819	-71.66	Pk	33.1	-30	11.3	-57.26	-13	-44.26	0-360	149	V
4	5.729	-66.01	Pk	35	-28.4	11.7	-47.71	-13	-34.71	0-360	149	V
6	7.638	-78.33	Pk	35.6	-25.8	11.9	-56.63	-13	-43.63	0-360	149	V

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10.2.2. CDMA

Company:	Samsung
Project #:	12737383
Date:	3/06/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	CDMA BC0 1xRTT
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	824.7MHz											
1	1.649	-65.24	Pk	28.3	-33.3	12.5	-57.74	-13	-44.74	0-360	148	H
3	2.475	-68.35	Pk	32.3	-32	11.3	-56.75	-13	-43.75	0-360	148	H
5	3.297	-70.28	Pk	32.8	-30.9	11.9	-56.48	-13	-43.48	0-360	148	H
2	1.649	-68.11	Pk	28.3	-33.3	11.4	-61.71	-13	-48.71	0-360	148	V
4	2.475	-66.75	Pk	32.3	-32	11.4	-55.05	-13	-42.05	0-360	148	V
6	3.301	-70.78	Pk	32.8	-30.9	12	-56.88	-13	-43.88	0-360	148	V
	836.52MHz											
1	1.672	-65.68	Pk	29	-33	11.6	-58.08	-13	-45.08	0-360	148	H
3	2.509	-67.82	Pk	32.4	-31.8	11.4	-55.82	-13	-42.82	0-360	148	H
5	3.348	-69.79	Pk	32.8	-30.7	11.4	-56.29	-13	-43.29	0-360	148	H
2	1.673	-67.33	Pk	29	-33	10.9	-60.43	-13	-47.43	0-360	148	V
4	2.51	-67.48	Pk	32.4	-31.7	11.4	-55.38	-13	-42.38	0-360	148	V
6	3.348	-71.68	Pk	32.8	-30.7	11.9	-57.68	-13	-44.68	0-360	148	V
	848.31MHz											
1	1.695	-62.47	Pk	29.1	-33.1	11.3	-55.17	-13	-42.17	0-360	148	H
3	2.544	-67.04	Pk	32.4	-31.7	12.2	-54.14	-13	-41.14	0-360	148	H
5	3.393	-70.14	Pk	32.7	-30.9	11.8	-56.54	-13	-43.54	0-360	148	H
2	1.695	-65.99	Pk	29.1	-33.1	12.3	-57.69	-13	-44.69	0-360	148	V
4	2.545	-68.55	Pk	32.4	-31.7	11.8	-56.05	-13	-43.05	0-360	148	V
6	3.395	-70.46	Pk	32.7	-30.9	11.8	-56.86	-13	-43.86	0-360	148	V

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Company:	Samsung
Project #:	12737383
Date:	3/06/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	CDMA BC0 1xEV-DO
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	824.7MHz											
1	1.649	-65.58	Pk	28.3	-33.3	12.5	-58.08	-13	-45.08	0-360	148	H
3	2.473	-65.78	Pk	32.3	-32	11.3	-54.18	-13	-41.18	0-360	148	H
5	3.298	-70.91	Pk	32.8	-30.9	11.9	-57.11	-13	-44.11	0-360	148	H
2	1.649	-66.27	Pk	28.3	-33.3	11.4	-59.87	-13	-46.87	0-360	149	V
4	2.475	-63.92	Pk	32.3	-32	11.5	-52.12	-13	-39.12	0-360	149	V
6	3.301	-71.06	Pk	32.7	-30.9	11.9	-57.36	-13	-44.36	0-360	149	V
	836.52MHz											
1	1.672	-65.56	Pk	29	-33	11.6	-57.96	-13	-44.96	0-360	148	H
3	2.51	-68.2	Pk	32.4	-31.7	11.4	-56.1	-13	-43.1	0-360	148	H
5	3.348	-71.4	Pk	32.8	-30.7	11.4	-57.9	-13	-44.9	0-360	148	H
2	1.674	-68.82	Pk	29.1	-33	10.9	-61.82	-13	-48.82	0-360	149	V
4	2.51	-69.77	Pk	32.4	-31.8	11.4	-57.77	-13	-44.77	0-360	149	V
6	3.345	-71.97	Pk	32.8	-30.7	12	-57.87	-13	-44.87	0-360	149	V
	848.31MHz											
1	1.696	-63.26	Pk	29.1	-33.1	11.3	-55.96	-13	-42.96	0-360	148	H
3	2.544	-65.2	Pk	32.4	-31.7	12.2	-52.3	-13	-39.3	0-360	148	H
5	3.393	-70.72	Pk	32.7	-30.9	11.8	-57.12	-13	-44.12	0-360	148	H
2	1.697	-63.66	Pk	29.1	-33.1	12.2	-55.46	-13	-42.46	0-360	148	V
4	2.544	-69.35	Pk	32.4	-31.7	11.8	-56.85	-13	-43.85	0-360	148	V
6	3.393	-71.23	Pk	32.7	-30.9	11.8	-57.63	-13	-44.63	0-360	148	V

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10.2.3. WCDMA

Company:	Samsung
Project #:	12726900
Date:	2/19/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL99 B5
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	826.4MHz											
1	1.654	-65.71	Pk	28.5	-33.2	12.2	-58.21	-13	-45.21	0-360	149	H
3	2.476	-68.96	Pk	32.3	-32	11.3	-57.36	-13	-44.36	0-360	149	H
5	3.308	-69.91	Pk	32.7	-30.9	11.6	-56.51	-13	-43.51	0-360	149	H
2	1.655	-69.61	Pk	28.6	-33.2	11.3	-62.91	-13	-49.91	0-360	149	V
4	2.48	-69.87	Pk	32.4	-32	11.3	-58.17	-13	-45.17	0-360	149	V
6	3.306	-70.26	Pk	32.7	-30.9	11.9	-56.56	-13	-43.56	0-360	149	V
	836.6MHz											
1	1.675	-66.61	Pk	29.1	-33	11.7	-58.81	-13	-45.81	0-360	149	H
3	2.516	-70.61	Pk	32.4	-31.8	11.6	-58.41	-13	-45.41	0-360	149	H
5	3.342	-71.26	Pk	32.8	-30.7	11.6	-57.56	-13	-44.56	0-360	149	H
2	1.672	-68.19	Pk	29	-33	11	-61.19	-13	-48.19	0-360	149	V
4	2.513	-69.54	Pk	32.4	-31.8	11.3	-57.64	-13	-44.64	0-360	149	V
6	3.347	-71.44	Pk	32.8	-30.7	12	-57.34	-13	-44.34	0-360	149	V
	846.6MHz											
1	1.694	-68.07	Pk	29.1	-33.2	11.4	-60.77	-13	-47.77	0-360	150	H
3	2.543	-70.91	Pk	32.4	-31.7	12.2	-58.01	-13	-45.01	0-360	150	H
5	3.391	-70.49	Pk	32.7	-30.9	11.7	-56.99	-13	-43.99	0-360	150	H
2	1.694	-68.89	Pk	29.1	-33.2	12.4	-60.59	-13	-47.59	0-360	150	V
4	2.543	-70.87	Pk	32.4	-31.7	11.7	-58.47	-13	-45.47	0-360	150	V
6	3.387	-72.21	Pk	32.7	-30.8	12	-58.31	-13	-45.31	0-360	150	V

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Company:	Samsung
Project #:	12726900
Date:	2/19/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B5
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	826.4MHz											
1	1.65	-66.44	Pk	28.4	-33.3	12.5	-58.84	-13	-45.84	0-360	149	H
3	2.474	-69.04	Pk	32.3	-32	11.3	-57.44	-13	-44.44	0-360	149	H
5	3.302	-71.33	Pk	32.7	-30.9	11.6	-57.93	-13	-44.93	0-360	149	H
2	1.65	-69.28	Pk	28.4	-33.3	11.4	-62.78	-13	-49.78	0-360	149	V
4	2.48	-67.01	Pk	32.4	-32	11.3	-55.31	-13	-42.31	0-360	149	V
6	3.308	-71.59	Pk	32.7	-30.9	11.9	-57.89	-13	-44.89	0-360	149	V
	836.6MHz											
1	1.675	-67.38	Pk	29.1	-33	11.7	-59.58	-13	-46.58	0-360	149	H
3	2.513	-68.67	Pk	32.4	-31.8	11.5	-56.57	-13	-43.57	0-360	149	H
5	3.344	-71.45	Pk	32.8	-30.7	11.5	-57.85	-13	-44.85	0-360	149	H
2	1.675	-69.51	Pk	29.1	-33	10.8	-62.61	-13	-49.61	0-360	149	V
4	2.51	-70.83	Pk	32.4	-31.7	11.4	-58.73	-13	-45.73	0-360	149	V
6	3.343	-70.66	Pk	32.8	-30.7	12	-56.56	-13	-43.56	0-360	149	V
	846.6MHz											
1	1.691	-68.96	Pk	29.1	-33.1	11.4	-61.56	-13	-48.56	0-360	149	H
3	2.544	-70.95	Pk	32.4	-31.7	12.1	-58.15	-13	-45.15	0-360	149	H
5	3.385	-70.09	Pk	32.7	-30.8	11.4	-56.79	-13	-43.79	0-360	149	H
2	1.694	-67.58	Pk	29.1	-33.2	12.4	-59.28	-13	-46.28	0-360	149	V
4	2.54	-70.81	Pk	32.3	-31.6	11.6	-58.51	-13	-45.51	0-360	149	V
6	3.382	-71.91	Pk	32.7	-30.9	12.1	-58.01	-13	-45.01	0-360	149	V

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Company:	Samsung
Project #:	12726900
Date:	2/18/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	REL99 B2
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1852.4MHz											
1	3.707	-73.98	Pk	32.9	-30.3	11.8	-59.58	-13	-46.58	0-360	149	H
3	5.557	-76.93	Pk	34.8	-28.7	11.9	-58.93	-13	-45.93	0-360	149	H
5	7.408	-78.47	Pk	35.6	-26.2	11.6	-57.47	-13	-44.47	0-360	149	H
2	3.703	-71.78	Pk	32.8	-30.3	12	-57.28	-13	-44.28	0-360	149	V
4	5.557	-78.03	Pk	34.8	-28.7	12	-59.93	-13	-46.93	0-360	149	V
6	7.41	-78.28	Pk	35.6	-26.2	11.6	-57.28	-13	-44.28	0-360	149	V
	1880MHz											
1	3.761	-72.83	Pk	33	-30	11.7	-58.13	-13	-45.13	0-360	148	H
3	5.643	-75.01	Pk	35.1	-28.6	11.8	-56.71	-13	-43.71	0-360	148	H
5	7.523	-78.83	Pk	35.6	-25.8	11.8	-57.23	-13	-44.23	0-360	148	H
2	3.763	-69.85	Pk	33	-30	11.8	-55.05	-13	-42.05	0-360	149	V
4	5.64	-74.68	Pk	35	-28.6	11.9	-56.38	-13	-43.38	0-360	149	V
6	7.523	-78.98	Pk	35.6	-25.8	11.8	-57.38	-13	-44.38	0-360	149	V
	1907.6MHz											
1	3.813	-73.61	Pk	33.1	-30	11.7	-58.81	-13	-45.81	0-360	149	H
3	5.719	-74.73	Pk	35.1	-28.6	12	-56.23	-13	-43.23	0-360	149	H
5	7.626	-78.12	Pk	35.7	-25.7	11.8	-56.32	-13	-43.32	0-360	149	H
2	3.813	-71.62	Pk	33.1	-30	11.4	-57.12	-13	-44.12	0-360	149	V
4	5.722	-76.76	Pk	35	-28.5	11.7	-58.56	-13	-45.56	0-360	149	V
6	7.631	-78.71	Pk	35.6	-25.7	12	-56.81	-13	-43.81	0-360	149	V

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Company:	Samsung
Project #:	12726900
Date:	2/18/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	HSDPA B2
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	1852.4MHz											
1	3.707	-75.16	Pk	32.9	-30.3	11.8	-60.76	-13	-47.76	0-360	149	H
3	5.557	-77.03	Pk	34.8	-28.7	11.9	-59.03	-13	-46.03	0-360	149	H
5	7.412	-78.31	Pk	35.6	-26.1	11.5	-57.31	-13	-44.31	0-360	149	H
2	3.704	-74.92	Pk	32.8	-30.3	12	-60.42	-13	-47.42	0-360	149	V
4	5.557	-76.18	Pk	34.8	-28.7	12	-58.08	-13	-45.08	0-360	149	V
6	7.407	-79.25	Pk	35.6	-26.2	11.7	-58.15	-13	-45.15	0-360	149	V
	1880MHz											
1	3.761	-73.94	Pk	33	-30	11.7	-59.24	-13	-46.24	0-360	149	H
3	5.643	-75.86	Pk	35.1	-28.6	11.8	-57.56	-13	-44.56	0-360	149	H
5	7.521	-78.9	Pk	35.6	-25.8	11.9	-57.2	-13	-44.2	0-360	149	H
2	3.758	-72.47	Pk	33	-29.9	11.8	-57.57	-13	-44.57	0-360	149	V
4	5.639	-75.29	Pk	35	-28.6	11.9	-56.99	-13	-43.99	0-360	149	V
6	7.52	-78.63	Pk	35.6	-25.8	12	-56.83	-13	-43.83	0-360	149	V
	1907.6MHz											
1	3.817	-74.5	Pk	33.1	-30	11.7	-59.7	-13	-46.7	0-360	149	H
3	5.719	-75.31	Pk	35.1	-28.6	12	-56.81	-13	-43.81	0-360	149	H
5	7.634	-77.61	Pk	35.6	-25.8	11.9	-55.91	-13	-42.91	0-360	149	H
2	3.813	-74.81	Pk	33.1	-30	11.4	-60.31	-13	-47.31	0-360	149	V
4	5.722	-76.61	Pk	35	-28.5	11.7	-58.41	-13	-45.41	0-360	149	V
6	7.632	-78.13	Pk	35.6	-25.8	12	-56.33	-13	-43.33	0-360	149	V

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10.2.4. LTE BAND 5

Company:	Samsung
Project #:	12726900
Date:	2/19/19
Test Engineer:	10649
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 QPSK 10MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	829MHz											
1	1.658	-67.03	Pk	28.7	-33.2	12	-59.53	-13	-46.53	0-360	149	H
3	2.487	-69.05	Pk	32.4	-31.9	11.5	-57.05	-13	-44.05	0-360	149	H
5	3.316	-72.81	Pk	32.7	-30.8	11.3	-59.61	-13	-46.61	0-360	149	H
2	1.658	-69.11	Pk	28.7	-33.2	11.4	-62.21	-13	-49.21	0-360	149	V
4	2.487	-71.89	Pk	32.4	-31.9	11.6	-59.79	-13	-46.79	0-360	149	V
6	3.316	-70.99	Pk	32.7	-30.8	11.6	-57.49	-13	-44.49	0-360	149	V
	836.5MHz											
1	1.673	-68.64	Pk	29	-33	11.6	-61.04	-13	-48.04	0-360	149	H
2	2.513	-70.89	Pk	32.4	-31.8	11.5	-58.79	-13	-45.79	0-360	149	H
3	3.343	-71.45	Pk	32.8	-30.7	11.5	-57.85	-13	-44.85	0-360	149	H
4	1.665	-69.18	Pk	28.9	-33.1	11.3	-62.08	-13	-49.08	0-360	149	V
5	2.51	-70.06	Pk	32.4	-31.7	11.4	-57.96	-13	-44.96	0-360	149	V
6	3.333	-70.88	Pk	32.8	-30.8	11.9	-56.98	-13	-43.98	0-360	149	V
	844MHz											
1	1.688	-65.96	Pk	29.1	-33	11.4	-58.46	-13	-45.46	0-360	149	H
3	2.533	-71.93	Pk	32.4	-31.7	12.7	-58.53	-13	-45.53	0-360	149	H
5	3.376	-73.2	Pk	32.7	-30.9	11.3	-60.1	-13-	-47.1	0-360	149	H
2	1.688	-70.67	Pk	29.1	-33	11.9	-62.67	-13	-49.67	0-360	149	V
4	2.533	-72.21	Pk	32.4	-31.7	11.4	-60.11	-13	-47.11	0-360	149	V
6	3.376	-72.64	Pk	32.7	-30.9	11.9	-58.94	-13	-45.94	0-360	149	V

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Company:	Samsung
Project #:	12726900
Date:	2/19/19
Test Engineer:	10649
Configuration:	EUT+ Support Equipment
Mode:	LTE 5 16QAM 10MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	829MHz											
1	1.658	-65.88	Pk	28.7	-33.2	12	-58.38	-13	-45.38	0-360	149	H
3	2.486	-70.89	Pk	32.4	-31.9	11.5	-58.89	-13	-45.89	0-360	149	H
5	3.315	-71.08	Pk	32.7	-30.8	11.3	-57.88	-13	-44.88	0-360	149	H
2	1.657	-68.87	Pk	28.7	-33.2	11.4	-61.97	-13	-48.97	0-360	149	V
4	2.488	-70.91	Pk	32.4	-31.9	11.6	-58.81	-13	-45.81	0-360	149	V
6	3.316	-70.88	Pk	32.7	-30.8	11.6	-57.38	-13	-44.38	0-360	149	V
	836.5MHz											
1	1.673	-68.86	Pk	29.1	-33	11.6	-61.16	-13	-48.16	0-360	149	H
3	2.509	-69.3	Pk	32.4	-31.8	11.4	-57.3	-13	-44.3	0-360	149	H
5	3.35	-70.88	Pk	32.8	-30.7	11.4	-57.38	-13	-44.38	0-360	149	H
2	1.675	-69.99	Pk	29.1	-33	10.8	-63.09	-13	-50.09	0-360	149	V
4	2.51	-70.41	Pk	32.4	-31.8	11.4	-58.41	-13	-45.41	0-360	149	V
6	3.344	-71.38	Pk	32.8	-30.7	12	-57.28	-13	-44.28	0-360	149	V
	844MHz											
1	1.687	-69.04	Pk	29.1	-33	11.4	-61.54	-13	-48.54	0-360	149	H
3	2.532	-70.13	Pk	32.4	-31.7	12.7	-56.73	-13	-43.73	0-360	149	H
5	3.376	-73.12	Pk	32.7	-30.9	11.3	-60.02	-13	-47.02	0-360	149	H
2	1.686	-69.58	Pk	29.1	-33	11.8	-61.68	-13	-48.68	0-360	149	V
4	2.532	-70.12	Pk	32.4	-31.7	11.4	-58.02	-13	-45.02	0-360	149	V
6	3.376	-72.92	Pk	32.7	-30.9	11.9	-59.22	-13	-46.22	0-360	149	V

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10.2.5. LTE BAND 41

Company:	Samsung
Project #:	12737383
Date:	3/06/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 QPSK 20MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2565MHz											
1	5.13	-74.48	Pk	34.3	-29.2	11.8	-57.58	-25	-32.58	0-360	148	H
2	7.684	-77.27	Pk	35.7	-25.5	12	-55.07	-25	-30.07	0-360	148	H
3	10.253	-77.16	Pk	37.2	-21.8	12.2	-49.56	-25	-24.56	0-360	148	H
4	5.13	-73.08	Pk	34.3	-29.2	11.8	-56.18	-25	-31.18	0-360	148	V
5	7.695	-74.01	Pk	35.7	-25.6	11.7	-52.21	-25	-27.21	0-360	148	V
6	10.26	-76.67	Pk	37.2	-21.8	12.3	-48.97	-25	-23.97	0-360	148	V
	2605MHz											
1	5.21	-72.97	Pk	34.4	-28.7	12.1	-55.17	-25	-30.17	0-360	148	H
2	7.806	-76.43	Pk	35.7	-25.5	12	-54.23	-25	-29.23	0-360	148	H
3	10.405	-76.92	Pk	37.4	-22	11.7	-49.82	-25	-24.82	0-360	148	H
4	5.21	-75.44	Pk	34.4	-28.7	12.2	-57.54	-25	-32.54	0-360	148	V
5	7.814	-75.12	Pk	35.7	-25.6	12.1	-52.92	-25	-27.92	0-360	148	V
6	10.42	-74.82	Pk	37.5	-22.1	11.8	-47.62	-25	-22.62	0-360	148	V
	2645MHz											
1	5.288	-74.35	Pk	34.5	-28.7	11.6	-56.95	-25	-31.95	0-360	148	H
2	7.922	-76.88	Pk	35.7	-25.2	12	-54.38	-25	-29.38	0-360	148	H
3	10.584	-78.18	Pk	37.7	-21.9	11.8	-50.58	-25	-25.58	0-360	148	H
4	5.29	-73.97	Pk	34.5	-28.7	11.9	-56.27	-25	-31.27	0-360	148	V
5	7.934	-74.95	Pk	35.7	-25.3	11.6	-52.95	-25	-27.95	0-360	148	V
6	10.589	-78.96	Pk	37.7	-21.9	11.8	-51.36	-25	-26.36	0-360	148	V

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Company:	Samsung
Project #:	12737383
Date:	3/06/19
Test Engineer:	19480
Configuration:	EUT+ Support Equipment
Mode:	LTE 41 16QAM 20MHz
Chamber #:	Chamber I

Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
	2565MHz											
1	5.129	-73.47	Pk	34.3	-29.2	11.7	-56.67	-25	-31.67	0-360	148	H
2	7.695	-76.18	Pk	35.7	-25.6	11.7	-54.38	-25	-29.38	0-360	148	H
3	10.263	-78.34	Pk	37.3	-21.8	12.2	-50.64	-25	-25.64	0-360	148	H
4	5.129	-69.74	Pk	34.3	-29.2	11.8	-52.84	-25	-27.84	0-360	149	V
5	7.694	-73.97	Pk	35.7	-25.6	11.8	-52.07	-25	-27.07	0-360	149	V
6	10.26	-77.05	Pk	37.2	-21.8	12.3	-49.35	-25	-24.35	0-360	149	V
	2605MHz											
1	5.21	-74.62	Pk	34.4	-28.7	12.1	-56.82	-25	-31.82	0-360	148	H
2	7.815	-76.17	Pk	35.7	-25.6	12	-54.07	-25	-29.07	0-360	148	H
3	10.419	-76.21	Pk	37.5	-22.1	11.8	-49.01	-25	-24.01	0-360	148	H
4	5.21	-75.26	Pk	34.4	-28.7	12.2	-57.36	-25	-32.36	0-360	148	V
5	7.815	-73.79	Pk	35.7	-25.6	12.1	-51.59	-25	-26.59	0-360	148	V
6	10.42	-75.92	Pk	37.5	-22.1	11.8	-48.72	-25	-23.72	0-360	148	V
	2645MHz											
1	5.284	-74.89	Pk	34.4	-28.7	11.8	-57.39	-25	-32.39	0-360	148	H
2	7.921	-77.01	Pk	35.7	-25.2	12	-54.51	-25	-29.51	0-360	148	H
3	10.598	-78.52	Pk	37.7	-21.8	12	-50.62	-25	-25.62	0-360	148	H
4	5.29	-75	Pk	34.5	-28.7	11.9	-57.3	-25	-32.3	0-360	149	V
5	7.934	-75.79	Pk	35.7	-25.3	11.6	-53.79	-25	-28.79	0-360	149	V
6	10.58	-78.23	Pk	37.6	-21.8	11.8	-50.63	-25	-25.63	0-360	149	V

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