EIRP LTE 16QAM Band 2 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 3MHz BW
16-QAM , Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	15.7	V	1.50	7.94	22.14	33.0	-10.9	
1.852	16.4	H	1.50	8.14	23.04	33.0	-10.0	
Mid Ch								
1.880	15.0	V	1.50	7.95	21.45	33.0	-11.6	
1.880	15.0	H	1.50	8.26	21.76	33.0	-11.2	
High Ch								
1.909	14.8	V	1.50	7.97	21.27	33.0	-11.7	
1.909	15.5	H	1.50	8.38	22.38	33.0	-10.6	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 5MHz BW
QPSK , Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	16.7	V	1.50	7.94	23.14	33.0	-9.9	
1.853	17.5	H	1.50	8.14	24.14	33.0	-8.9	
Mid Ch								
1.880	15.2	V	1.50	7.95	21.65	33.0	-11.4	
1.880	16.0	H	1.50	8.26	22.76	33.0	-10.2	
High Ch								
1.908	15.3	V	1.50	7.97	21.77	33.0	-11.2	
1.908	16.3	H	1.50	8.38	23.18	33.0	-9.8	

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EIRP LTE 16QAM Band 2 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 5MHz BW
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	15.9	V	1.50	7.94	22.34	33.0	-10.7	
1.853	15.6	H	1.50	8.14	22.24	33.0	-10.8	
Mid Ch								
1.880	14.4	V	1.50	7.95	20.85	33.0	-12.2	
1.880	15.2	H	1.50	8.26	21.96	33.0	-11.0	
High Ch								
1.908	14.5	V	1.50	7.97	20.97	33.0	-12.0	
1.908	15.4	H	1.50	8.38	22.28	33.0	-10.7	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 10MHz BW
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	17.2	V	1.50	7.94	23.64	33.0	-9.4	
1.855	17.6	H	1.50	8.14	24.24	33.0	-8.8	
Mid Ch								
1.880	16.0	V	1.50	7.95	22.45	33.0	-10.6	
1.880	16.2	H	1.50	8.26	22.96	33.0	-10.0	
High Ch								
1.905	15.4	V	1.50	7.97	21.87	33.0	-11.1	
1.905	16.1	H	1.50	8.38	22.98	33.0	-10.0	

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EIRP LTE 16QAM Band 2 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 10MHz BW
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	16.4	V	1.50	7.94	22.84	33.0	-10.2	
1.855	15.8	H	1.50	8.14	22.44	33.0	-10.6	
Mid Ch								
1.880	15.2	V	1.50	7.95	21.65	33.0	-11.4	
1.880	15.3	H	1.50	8.26	22.06	33.0	-10.9	
High Ch								
1.905	14.6	V	1.50	7.97	21.07	33.0	-11.9	
1.905	15.2	H	1.50	8.38	22.08	33.0	-10.9	

Rev. 3.17.11

EIRP LTE QPSK Band 2 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 15MHz BW
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	17.1	V	1.50	7.94	23.54	33.0	-9.5	
1.858	18.0	H	1.50	8.14	24.64	33.0	-8.4	
Mid Ch								
1.880	15.3	V	1.50	7.95	21.75	33.0	-11.3	
1.880	16.5	H	1.50	8.26	23.26	33.0	-9.7	
High Ch								
1.903	16.9	V	1.50	7.97	23.37	33.0	-9.6	
1.903	17.6	H	1.50	8.38	24.48	33.0	-8.5	

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EIRP LTE 16QAM Band 2 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 15MHz BW
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	16.1	V	1.50	7.94	22.54	33.0	-10.5	
1.858	17.1	H	1.50	8.14	23.74	33.0	-9.3	
Mid Ch								
1.880	14.5	V	1.50	7.95	20.95	33.0	-12.1	
1.880	15.6	H	1.50	8.26	22.36	33.0	-10.6	
High Ch								
1.903	15.9	V	1.50	7.97	22.37	33.0	-10.6	
1.903	16.6	H	1.50	8.38	23.48	33.0	-9.5	

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EIRP LTE QPSK Band 2 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 20MHz BW
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	17.1	V	1.50	7.94	23.54	33.0	-9.5	
1.860	18.1	H	1.50	8.14	24.74	33.0	-8.3	
Mid Ch								
1.880	16.4	V	1.50	7.95	22.85	33.0	-10.2	
1.880	16.8	H	1.50	8.26	23.56	33.0	-9.4	
High Ch								
1.900	17.0	V	1.50	7.97	23.47	33.0	-9.5	
1.900	17.7	H	1.50	8.38	24.58	33.0	-8.4	

Rev. 3.17.11

EIRP LTE 16QAM Band 2 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 05/31/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 2, 20MHz BW
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	16.1	V	1.50	7.94	22.54	33.0	-10.5	
1.860	17.2	H	1.50	8.14	23.84	33.0	-9.2	
Mid Ch								
1.880	15.5	V	1.50	7.95	21.95	33.0	-11.1	
1.880	15.8	H	1.50	8.26	22.56	33.0	-10.4	
High Ch								
1.900	16.0	V	1.50	7.97	22.47	33.0	-10.5	
1.900	16.8	H	1.50	8.38	23.68	33.0	-9.3	

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9.1.9. UAT LTE BAND 4

EIRP LTE QPSK Band 4 (1.4 MHz BAND WIDTH)

PEAK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE band 4, 1.4MHz BW UAT
QPSK, Peak, RB6-0

Test Equipment:
Receiving: Horn T59, and Chamber F SMA Cables
Substitution: Horn T217 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.711	11.8	V	1.50	8.17	18.47	33.0	-14.5	
1.711	14.7	H	1.50	8.20	21.40	33.0	-11.6	
Mid Ch								
1.733	13.0	V	1.50	8.11	19.61	33.0	-13.4	
1.733	15.4	H	1.50	8.13	22.03	33.0	-11.0	
High Ch								
1.754	14.1	V	1.50	8.06	20.66	33.0	-12.3	
1.754	16.1	H	1.50	8.07	22.67	33.0	-10.3	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (1.4 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE band 4, 1.4MHz BW UAT
16QAM, Peak, RB6-0

Test Equipment:
Receiving: Horn T59, and Chamber F SMA Cables
Substitution: Horn T217 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.711	11.2	V	1.50	8.17	17.87	33.0	-15.1	
1.711	14.0	H	1.50	8.20	20.70	33.0	-12.3	
Mid Ch								
1.733	12.4	V	1.50	8.11	19.01	33.0	-14.0	
1.733	14.5	H	1.50	8.13	21.13	33.0	-11.9	
High Ch								
1.754	13.5	V	1.50	8.06	20.06	33.0	-12.9	
1.754	15.3	H	1.50	8.07	21.87	33.0	-11.1	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE band 4, 3MHz BW UAT
QPSK, Peak, RB15-0

Test Equipment:
Receiving: Horn T59, and Chamber F SMA Cables
Substitution: Horn T217 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	11.8	V	1.50	8.17	18.47	33.0	-14.5	
1.712	12.7	H	1.50	8.20	19.40	33.0	-13.6	
Mid Ch								
1.733	13.6	V	1.50	8.11	20.21	33.0	-12.8	
1.733	15.5	H	1.50	8.13	22.13	33.0	-10.9	
High Ch								
1.754	13.4	V	1.50	8.06	19.96	33.0	-13.0	
1.754	15.4	H	1.50	8.07	21.97	33.0	-11.0	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE band 4, 3MHz BW UAT
16QAM, Peak, RB15-0

Test Equipment:
Receiving: Horn T59, and Chamber F SMA Cables
Substitution: Horn T217 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.712	11.2	V	1.50	8.17	17.87	33.0	-15.1	
1.712	12.0	H	1.50	8.20	18.70	33.0	-14.3	
Mid Ch								
1.733	13.1	V	1.50	8.11	19.71	33.0	-13.3	
1.733	14.8	H	1.50	8.13	21.43	33.0	-11.6	
High Ch								
1.754	12.7	V	1.50	8.06	19.26	33.0	-13.7	
1.754	14.7	H	1.50	8.07	21.27	33.0	-11.7	

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EIRP LTE QPSK Band 4 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE band 4, 5MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T59, and Chamber F SMA Cables
Substitution: Horn T217 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.713	12.2	V	1.50	8.17	18.87	33.0	-14.1	
1.713	14.2	H	1.50	8.20	20.90	33.0	-12.1	
Mid Ch								
1.733	13.8	V	1.50	8.11	20.41	33.0	-12.6	
1.733	14.7	H	1.50	8.13	21.33	33.0	-11.7	
High Ch								
1.754	14.4	V	1.50	8.06	20.96	33.0	-12.0	
1.754	16.1	H	1.50	8.07	22.67	33.0	-10.3	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE band 4, 5MHz BW UAT
16QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T59, and Chamber F SMA Cables
Substitution: Horn T217 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.713	12.4	V	1.50	8.17	19.07	33.0	-13.9	
1.713	13.3	H	1.50	8.20	20.00	33.0	-13.0	
Mid Ch								
1.733	13.1	V	1.50	8.11	19.71	33.0	-13.3	
1.733	14.0	H	1.50	8.13	20.63	33.0	-12.4	
High Ch								
1.754	13.7	V	1.50	8.06	20.26	33.0	-12.7	
1.754	15.4	H	1.50	8.07	21.97	33.0	-11.0	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedia
Configuration: EUT only
Mode: LTE band 4, 10MHz BW UAT
QPSK, Peak, RB50-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.715	13.5	V	1.50	8.17	20.17	33.0	-12.8	
1.715	15.3	H	1.50	8.20	22.00	33.0	-11.0	
Mid Ch								
1.733	14.3	V	1.50	8.11	20.91	33.0	-12.1	
1.733	16.3	H	1.50	8.13	22.93	33.0	-10.1	
High Ch								
1.750	12.8	V	1.50	8.06	19.36	33.0	-13.6	
1.750	19.3	H	1.50	8.07	25.87	33.0	-7.1	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedia
Configuration: EUT only
Mode: LTE band 4,10MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.715	12.6	V	1.50	8.17	19.27	33.0	-13.7	
1.715	14.4	H	1.50	8.20	21.10	33.0	-11.9	
Mid Ch								
1.733	13.4	V	1.50	8.11	20.01	33.0	-13.0	
1.733	15.4	H	1.50	8.13	22.03	33.0	-11.0	
High Ch								
1.750	11.9	V	1.50	8.06	18.46	33.0	-14.5	
1.750	18.4	H	1.50	8.07	24.97	33.0	-8.0	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedia
Configuration: EUT only
Mode: LTE band 4,15MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.718	13.5	V	1.50	8.17	20.17	33.0	-12.8	
1.718	15.4	H	1.50	8.20	22.10	33.0	-10.9	
Mid Ch								
1.733	14.4	V	1.50	8.11	21.01	33.0	-12.0	
1.733	16.5	H	1.50	8.13	23.13	33.0	-9.9	
High Ch								
1.748	13.8	V	1.50	8.06	20.36	33.0	-12.6	
1.748	17.4	H	1.50	8.07	23.97	33.0	-9.0	

Rev. 3.17.11

EIRP LTE 16QAM Band 4 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedia
Configuration: EUT only
Mode: LTE band 4,15MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.718	12.7	V	1.50	8.17	19.37	33.0	-13.6	
1.718	14.5	H	1.50	8.20	21.20	33.0	-11.8	
Mid Ch								
1.733	13.5	V	1.50	8.11	20.11	33.0	-12.9	
1.733	15.6	H	1.50	8.13	22.23	33.0	-10.8	
High Ch								
1.748	12.9	V	1.50	8.06	19.46	33.0	-13.5	
1.748	16.5	H	1.50	8.07	23.07	33.0	-9.9	

Rev. 3.17.11

EIRP LTE QPSK Band 4 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedia
Configuration: EUT only
Mode: LTE band 4,20MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.720	14.1	V	1.50	8.17	20.77	33.0	-12.2	
1.720	15.7	H	1.50	8.20	22.40	33.0	-10.6	
Mid Ch								
1.733	14.8	V	1.50	8.11	21.41	33.0	-11.6	
1.733	16.9	H	1.50	8.13	23.53	33.0	-9.5	
High Ch								
1.745	13.9	V	1.50	8.06	20.46	33.0	-12.5	
1.745	17.4	H	1.50	8.07	23.97	33.0	-9.0	

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EIRP LTE 16QAM Band 4 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedia
Configuration: EUT only
Mode: LTE band 4,20MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (208955002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.720	13.2	V	1.50	8.17	19.87	33.0	-13.1	
1.720	14.8	H	1.50	8.20	21.50	33.0	-11.5	
Mid Ch								
1.733	13.9	V	1.50	8.11	20.51	33.0	-12.5	
1.733	15.8	H	1.50	8.13	22.43	33.0	-10.6	
High Ch								
1.745	13.0	V	1.50	8.06	19.56	33.0	-13.4	
1.745	16.5	H	1.50	8.07	23.07	33.0	-9.9	

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9.1.10. UAT LTE BAND 5

ERP LTE QPSK Band 5 (1.4 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 1.4MHz
QPSK Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	6.00	V	0.9	0.0	5.10	38.5	-33.3	
824.70	16.10	H	0.9	0.0	15.20	38.5	-23.2	
Mid Ch								
836.50	6.20	V	0.9	0.0	5.30	38.5	-33.1	
836.50	16.50	H	0.9	0.0	15.60	38.5	-22.8	
High Ch								
848.30	5.60	V	0.9	0.0	4.70	38.5	-33.7	
848.30	15.90	H	0.9	0.0	15.00	38.5	-23.4	

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ERP LTE 16QAM Band 5 (1.4 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 1.4MHz
16QAM Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	5.20	V	0.9	0.0	4.30	38.5	-34.1	
824.70	15.20	H	0.9	0.0	14.30	38.5	-24.1	
Mid Ch								
836.50	5.30	V	0.9	0.0	4.40	38.5	-34.0	
836.50	15.60	H	0.9	0.0	14.70	38.5	-23.7	
High Ch								
848.30	4.80	V	0.9	0.0	3.90	38.5	-34.5	
848.30	15.10	H	0.9	0.0	14.20	38.5	-24.2	

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ERP LTE QPSK Band 5 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 3MHz
QPSK Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	7.50	V	0.9	0.0	6.60	38.5	-31.8	
825.50	15.90	H	0.9	0.0	15.00	38.5	-23.4	
Mid Ch								
836.50	6.90	V	0.9	0.0	6.00	38.5	-32.4	
836.50	16.10	H	0.9	0.0	15.20	38.5	-23.2	
High Ch								
847.50	5.90	V	0.9	0.0	5.00	38.5	-33.4	
847.50	16.10	H	0.9	0.0	15.20	38.5	-23.2	

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ERP LTE 16QAM Band 5 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 3MHz
16QAM Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	6.60	V	0.9	0.0	5.70	38.5	-32.7	
825.50	15.00	H	0.9	0.0	14.10	38.5	-24.3	
Mid Ch								
836.50	6.00	V	0.9	0.0	5.10	38.5	-33.3	
836.50	15.30	H	0.9	0.0	14.40	38.5	-24.0	
High Ch								
847.50	5.00	V	0.9	0.0	4.10	38.5	-34.3	
847.50	15.20	H	0.9	0.0	14.30	38.5	-24.1	

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ERP LTE QPSK Band 5 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 5MHz
QPSK Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	6.20	V	0.9	0.0	5.30	38.5	-33.1	
826.50	15.90	H	0.9	0.0	15.00	38.5	-23.4	
Mid Ch								
836.50	5.90	V	0.9	0.0	5.00	38.5	-33.4	
836.50	16.50	H	0.9	0.0	15.60	38.5	-22.8	
High Ch								
846.50	5.50	V	0.9	0.0	4.60	38.5	-33.8	
846.50	16.40	H	0.9	0.0	15.50	38.5	-22.9	

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ERP LTE 16QAM Band 5 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 5MHz
16QAM Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	5.30	V	0.9	0.0	4.40	38.5	-34.0	
826.50	15.00	H	0.9	0.0	14.10	38.5	-24.3	
Mid Ch								
836.50	5.30	V	0.9	0.0	4.40	38.5	-34.0	
836.50	15.60	H	0.9	0.0	14.70	38.5	-23.7	
High Ch								
846.50	4.80	V	0.9	0.0	3.90	38.5	-34.5	
846.50	15.40	H	0.9	0.0	14.50	38.5	-23.9	

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ERP LTE QPSK Band 5 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 10MHz
QPSK Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	7.80	V	0.9	0.0	6.90	38.5	-31.5	
824.20	16.00	H	0.9	0.0	15.10	38.5	-23.3	
Mid Ch								
836.60	7.10	V	0.9	0.0	6.20	38.5	-32.2	
836.60	16.40	H	0.9	0.0	15.50	38.5	-22.9	
High Ch								
848.80	6.60	V	0.9	0.0	5.70	38.5	-32.7	
848.80	16.40	H	0.9	0.0	15.50	38.5	-22.9	

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ERP LTE 16QAM Band 5 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: Band5 10MHz
16QAM Avg RB 1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	7.10	V	0.9	0.0	6.20	38.5	-32.2	
824.20	15.20	H	0.9	0.0	14.30	38.5	-24.1	
Mid Ch								
836.60	6.30	V	0.9	0.0	5.40	38.5	-33.0	
836.60	15.60	H	0.9	0.0	14.70	38.5	-23.7	
High Ch								
848.80	5.80	V	0.9	0.0	4.90	38.5	-33.5	
848.80	15.50	H	0.9	0.0	14.60	38.5	-23.8	

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9.1.11. UAT LTE BAND 13

ERP LTE QPSK, Band 13 (5.0 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE BAND 13
QPSK, 5MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	6.40	V	0.9	0.0	5.50	38.5	-32.9	
779.50	15.50	H	0.9	0.0	14.60	38.5	-23.8	
Mid Ch								
782.00	6.70	V	0.9	0.0	5.80	38.5	-32.6	
782.00	16.20	H	0.9	0.0	15.30	38.5	-23.1	
High Ch								
784.50	6.60	V	0.9	0.0	5.70	38.5	-32.7	
784.50	15.50	H	0.9	0.0	14.60	38.5	-23.8	

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ERP LTE 16QAM Band 13 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE BAND 13
16QAM , 5MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	5.90	V	0.9	0.0	5.00	38.5	-33.4	
779.50	14.60	H	0.9	0.0	13.70	38.5	-24.7	
Mid Ch								
782.00	6.00	V	0.9	0.0	5.10	38.5	-33.3	
782.00	15.50	H	0.9	0.0	14.60	38.5	-23.8	
High Ch								
784.50	6.00	V	0.9	0.0	5.10	38.5	-33.3	
784.50	14.90	H	0.9	0.0	14.00	38.5	-24.4	

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ERP LTE QPSK Band 13 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T WANG
Configuration: EUT only
Mode: TX, LTE BAND 13
QPSK, 10MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Mid Ch								
782.00	10.20	V	0.9	0.0	9.30	38.5	-29.1	
782.00	16.00	H	0.9	0.0	15.10	38.5	-23.3	

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ERP LTE 16QAM Band 13 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber D

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T WANG
Configuration: EUT only
Mode: TX, LTE BAND 13
16QAM, 10MHz BW, Average, RB1-0

Test Equipment:
Receiving: Sunol T122 and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Mid Ch								
782.00	9.50	V	0.9	0.0	8.60	38.5	-29.8	
782.00	15.20	H	0.9	0.0	14.30	38.5	-24.1	

Rev. 3.17.11

9.1.12. UAT LTE BAND 17

ERP LTE QPSK, Band 17 (5.0 MHz BAND WIDTH)

AVERAGE

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 5MHz BW
QPSK AVG RB1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	4.60	V	0.9	0.0	3.70	34.8	-31.1	
706.50	13.80	H	0.9	0.0	12.90	34.8	-21.9	
Mid Ch								
710.00	5.00	V	0.9	0.0	4.10	34.8	-30.7	
710.00	13.70	H	0.9	0.0	12.80	34.8	-22.0	
High Ch								
713.50	5.10	V	0.9	0.0	4.20	34.8	-30.6	
713.50	13.90	H	0.9	0.0	13.00	34.8	-21.8	

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ERP LTE 16QAM Band 17 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 5MHz BW
16QAM AVG RB1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	4.10	V	0.9	0.0	3.20	34.8	-31.6	
706.50	13.10	H	0.9	0.0	12.20	34.8	-22.6	
Mid Ch								
710.00	3.80	V	0.9	0.0	2.90	34.8	-31.9	
710.00	13.20	H	0.9	0.0	12.30	34.8	-22.5	
High Ch								
713.50	4.30	V	0.9	0.0	3.40	34.8	-31.4	
713.50	13.10	H	0.9	0.0	12.20	34.8	-22.6	

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ERP LTE QPSK Band 17 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 10MHz BW
QPSK AVG RB1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	2.00	V	0.9	0.0	1.10	34.8	-33.7	
706.50	12.60	H	0.9	0.0	11.70	34.8	-23.1	
Mid Ch								
710.00	2.30	V	0.9	0.0	1.40	34.8	-33.4	
710.00	12.70	H	0.9	0.0	11.80	34.8	-23.0	
High Ch								
713.50	2.00	V	0.9	0.0	1.10	34.8	-33.7	
713.50	12.40	H	0.9	0.0	11.50	34.8	-23.3	

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ERP LTE 16QAM Band 17 (10.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Apple
Project #: 13U14987
Date: 06/04/13
Test Engineer: T Wang
Configuration: EUT only
Mode: LTE Band 17, 10MHz BW
16QAM AVG RB1/0

Test Equipment:
Receiving: Sunol T122, and Chamber F N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	1.70	V	0.9	0.0	0.80	34.8	-34.0	
706.50	12.10	H	0.9	0.0	11.20	34.8	-23.6	
Mid Ch								
710.00	1.90	V	0.9	0.0	1.00	34.8	-33.8	
710.00	12.20	H	0.9	0.0	11.30	34.8	-23.5	
High Ch								
713.50	1.60	V	0.9	0.0	0.70	34.8	-34.1	
713.50	11.80	H	0.9	0.0	10.90	34.8	-23.9	

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9.1.13. UAT LTE BAND 25

EIRP LTE QPSK Band 25 (1.4 MHz BAND WIDTH)

PEAK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 1.4MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	15.1	V	1.50	7.94	21.54	33.0	-11.5	
1.851	17.3	H	1.50	8.14	23.94	33.0	-9.1	
Mid Ch								
1.883	16.3	V	1.50	7.95	22.75	33.0	-10.3	
1.883	17.6	H	1.50	8.26	24.36	33.0	-8.6	
High Ch								
1.914	16.0	V	1.50	7.97	22.47	33.0	-10.5	
1.914	16.4	H	1.50	8.38	23.28	33.0	-9.7	

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EIRP LTE 16QAM Band 25 (1.4 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 1.4MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	14.2	V	1.50	7.94	20.64	33.0	-12.4	
1.851	16.4	H	1.50	8.14	23.04	33.0	-10.0	
Mid Ch								
1.883	15.4	V	1.50	7.95	21.85	33.0	-11.2	
1.883	16.7	H	1.50	8.26	23.46	33.0	-9.5	
High Ch								
1.914	15.1	V	1.50	7.97	21.57	33.0	-11.4	
1.914	15.5	H	1.50	8.38	22.38	33.0	-10.6	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 3MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	15.3	V	1.50	7.94	21.74	33.0	-11.3	
1.852	17.3	H	1.50	8.14	23.94	33.0	-9.1	
Mid Ch								
1.883	15.2	V	1.50	7.95	21.65	33.0	-11.4	
1.883	16.6	H	1.50	8.26	23.36	33.0	-9.6	
High Ch								
1.914	16.1	V	1.50	7.97	22.57	33.0	-10.4	
1.914	16.2	H	1.50	8.38	23.08	33.0	-9.9	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (3.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 3MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	14.4	V	1.50	7.94	20.84	33.0	-12.2	
1.852	16.4	H	1.50	8.14	23.04	33.0	-10.0	
Mid Ch								
1.883	14.4	V	1.50	7.95	20.85	33.0	-12.2	
1.883	15.7	H	1.50	8.26	22.46	33.0	-10.5	
High Ch								
1.914	15.1	V	1.50	7.97	21.57	33.0	-11.4	
1.914	15.3	H	1.50	8.38	22.18	33.0	-10.8	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 5MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	16.1	V	1.50	7.94	22.54	33.0	-10.5	
1.853	18.2	H	1.50	8.14	24.84	33.0	-8.2	
Mid Ch								
1.883	16.0	V	1.50	7.95	22.45	33.0	-10.6	
1.883	17.5	H	1.50	8.26	24.26	33.0	-8.7	
High Ch								
1.913	17.0	V	1.50	7.97	23.47	33.0	-9.5	
1.913	17.2	H	1.50	8.38	24.08	33.0	-8.9	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (5.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 5MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	15.2	V	1.50	7.94	21.64	33.0	-11.4	
1.853	17.3	H	1.50	8.14	23.94	33.0	-9.1	
Mid Ch								
1.883	15.1	V	1.50	7.95	21.55	33.0	-11.5	
1.883	16.6	H	1.50	8.26	23.36	33.0	-9.6	
High Ch								
1.913	16.1	V	1.50	7.97	22.57	33.0	-10.4	
1.913	16.3	H	1.50	8.38	23.18	33.0	-9.8	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 10MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	16.3	V	1.50	7.94	22.74	33.0	-10.3	
1.855	18.4	H	1.50	8.14	25.04	33.0	-8.0	
Mid Ch								
1.883	16.3	V	1.50	7.95	22.75	33.0	-10.3	
1.883	17.5	H	1.50	8.26	24.26	33.0	-8.7	
High Ch								
1.910	17.8	V	1.50	7.97	24.27	33.0	-8.7	
1.910	14.9	H	1.50	8.38	21.78	33.0	-11.2	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (10.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 10MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	15.4	V	1.50	7.94	21.84	33.0	-11.2	
1.855	17.5	H	1.50	8.14	24.14	33.0	-8.9	
Mid Ch								
1.883	15.4	V	1.50	7.95	21.85	33.0	-11.2	
1.883	16.6	H	1.50	8.26	23.36	33.0	-9.6	
High Ch								
1.910	14.6	V	1.50	7.97	21.07	33.0	-11.9	
1.910	16.3	H	1.50	8.38	23.18	33.0	-9.8	

Rev. 3.17.11

EIRP LTE QPSK Band 25 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 15MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	16.5	V	1.50	7.94	22.94	33.0	-10.1	
1.858	18.4	H	1.50	8.14	25.04	33.0	-8.0	
Mid Ch								
1.883	15.7	V	1.50	7.95	22.15	33.0	-10.9	
1.883	17.6	H	1.50	8.26	24.36	33.0	-8.6	
High Ch								
1.908	16.3	V	1.50	7.97	22.77	33.0	-10.2	
1.908	17.1	H	1.50	8.38	23.98	33.0	-9.0	

Rev. 3.17.11

EIRP LTE 16QAM Band 25 (15.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 15MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	15.6	V	1.50	7.94	22.04	33.0	-11.0	
1.858	17.5	H	1.50	8.14	24.14	33.0	-8.9	
Mid Ch								
1.883	14.8	V	1.50	7.95	21.25	33.0	-11.8	
1.883	16.7	H	1.50	8.26	23.46	33.0	-9.5	
High Ch								
1.908	15.4	V	1.50	7.97	21.87	33.0	-11.1	
1.908	16.2	H	1.50	8.38	23.08	33.0	-9.9	

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EIRP LTE QPSK Band 25 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 20MHz BW UAT
QPSK, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	16.7	V	1.50	7.94	23.14	33.0	-9.9	
1.860	18.5	H	1.50	8.14	25.14	33.0	-7.9	
Mid Ch								
1.883	16.0	V	1.50	7.95	22.45	33.0	-10.6	
1.883	17.9	H	1.50	8.26	24.66	33.0	-8.3	
High Ch								
1.905	15.9	V	1.50	7.97	22.37	33.0	-10.6	
1.905	17.3	H	1.50	8.38	24.18	33.0	-8.8	

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EIRP LTE 16QAM Band 25 (20.0 MHz BAND WIDTH)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 06/03/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: LTE band 25, 20MHz BW UAT
16-QAM, Peak, RB25-0

Test Equipment:
Receiving: Horn T120, and Chamber F SMA Cables
Substitution: Horn T59 Substitution, 8ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	15.8	V	1.50	7.94	22.24	33.0	-10.8	
1.860	17.6	H	1.50	8.14	24.24	33.0	-8.8	
Mid Ch								
1.883	15.0	V	1.50	7.95	21.45	33.0	-11.6	
1.883	17.0	H	1.50	8.26	23.76	33.0	-9.2	
High Ch								
1.905	15.0	V	1.50	7.97	21.47	33.0	-11.5	
1.905	16.3	H	1.50	8.38	23.18	33.0	-9.8	

Rev. 3.17.11

9.1.14. UAT LTE BAND 26

PEAK

ERP LTE QPSK Band 26 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: Band26 3M
QPSK Pk RB15/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
820.30	12.45	V	0.9	0.0	11.55	38.5	-26.9	
820.30	18.60	H	0.9	0.0	17.70	38.5	-20.7	
Mid Ch								
821.30	12.34	V	0.9	0.0	11.44	38.5	-27.0	
821.30	19.08	H	0.9	0.0	18.18	38.5	-20.3	
High Ch								
822.30	11.70	V	0.9	0.0	10.80	38.5	-27.6	
822.30	18.50	H	0.9	0.0	17.60	38.5	-20.8	

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ERP LTE 16QAM Band 26 (3.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: Band26 3M
QPSK Pk RB15/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
820.30	11.44	V	0.9	0.0	10.54	38.5	-27.9	
820.30	17.60	H	0.9	0.0	16.70	38.5	-21.7	
Mid Ch								
821.30	11.30	V	0.9	0.0	10.40	38.5	-28.0	
821.30	18.08	H	0.9	0.0	17.18	38.5	-21.3	
High Ch								
822.30	10.70	V	0.9	0.0	9.80	38.5	-28.6	
822.30	17.40	H	0.9	0.0	16.50	38.5	-21.9	

Rev. 3.17.11

ERP LTE QPSK/16QAM Band 26 (5.0 MHz BAND WIDTH)

High Frequency Substitution Measurement
Compliance Certification Services Chamber F

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: Band26 5MHz
QPSK /16QAM Pk RB25/0

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 8ft SMA Cable (SN # 208955002) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
QPSK								
Mid Ch								
821.30	12.93	V	0.9	0.0	12.03	38.5	-26.4	
821.30	20.13	H	0.9	0.0	19.23	38.5	-19.2	
16QAM								
Mid Ch								
821.30	11.95	V	0.9	0.0	11.05	38.5	-27.4	
821.30	19.22	H	0.9	0.0	18.32	38.5	-20.1	

Rev. 3.17.11

9.2. PEAK-TO-AVERAGE RATIO

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

9.2.1. LTE BAND 5

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	1.4	RB1-0	836.5	28.7	22.97	5.73
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	1.4	RB1-0	836.5	28.38	21.79	6.59
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	3	RB1-0	836.5	28.95	22.96	5.99
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	3	RB1-0	836.5	28.61	21.96	6.65
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	RB1-0	836.5	28.78	23.04	5.74
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	836.5	28.91	22.09	6.82
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	10	RB1-0	836.5	28.93	22.98	5.95
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	836.5	28.8	21.98	6.82
*Peak Reading = Average Reading + Peak-to-Average Ratio						

9.2.2. LTE BAND 13

LTE BAND 13

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	RB1-0	782	28.75	24.52	4.23
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	782	28.95	22.95	6
*Peak Reading = Average Reading + Peak-to-Average Ratio						

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	10	RB1-0	782	27.48	24.25	3.23
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	782	27.46	23.16	4.3
*Peak Reading = Average Reading + Peak-to-Average Ratio						

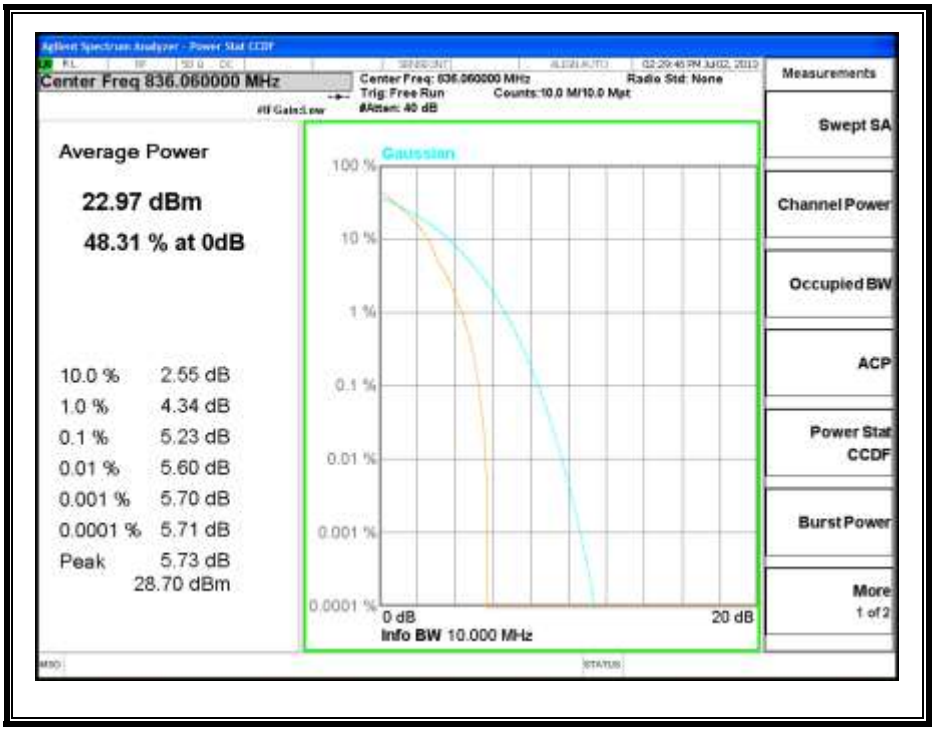
9.2.3. LTE BAND 17

Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	RB1-0	710	28.71	23.14	5.57
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	RB1-0	710	28.92	22.07	6.85
*Peak Reading = Average Reading + Peak-to-Average Ratio						

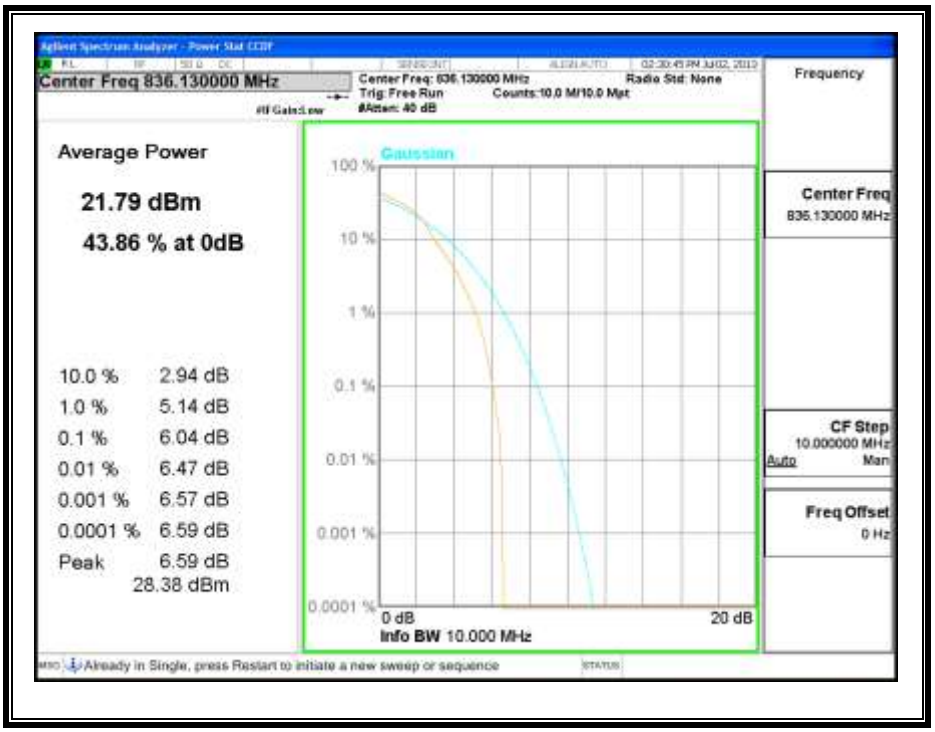
Mode	Channel Band-width (MHZ)	Modulation	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	10	RB1-0	710	28.94	23.27	5.67
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	RB1-0	710	28.89	22.27	6.62
*Peak Reading = Average Reading + Peak-to-Average Ratio						

LTE BAND 5

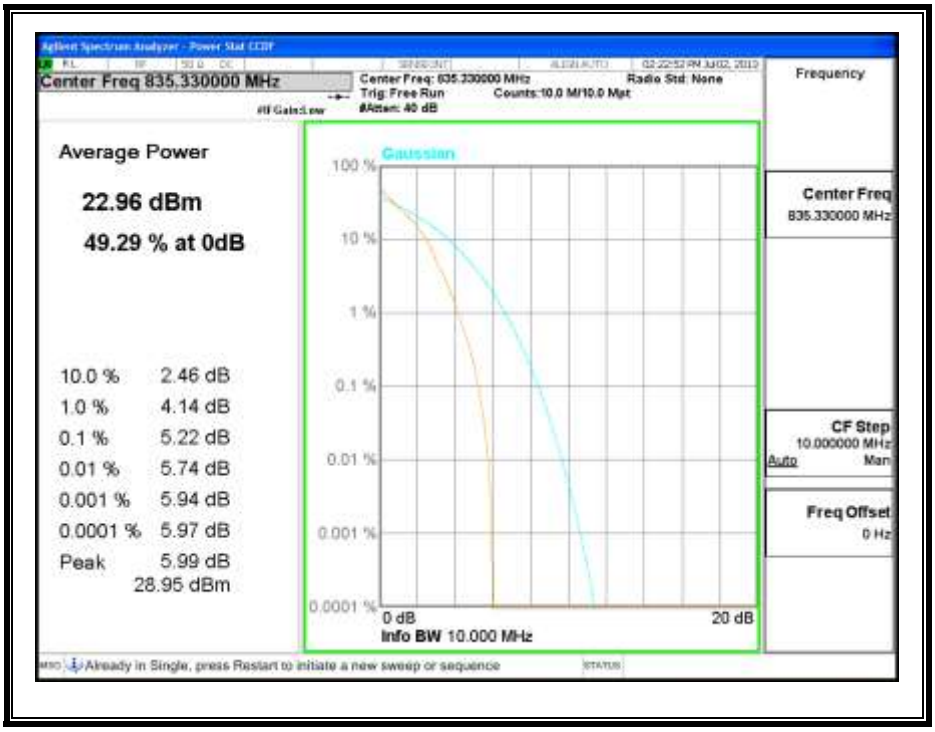
1.4MHz_QPSK



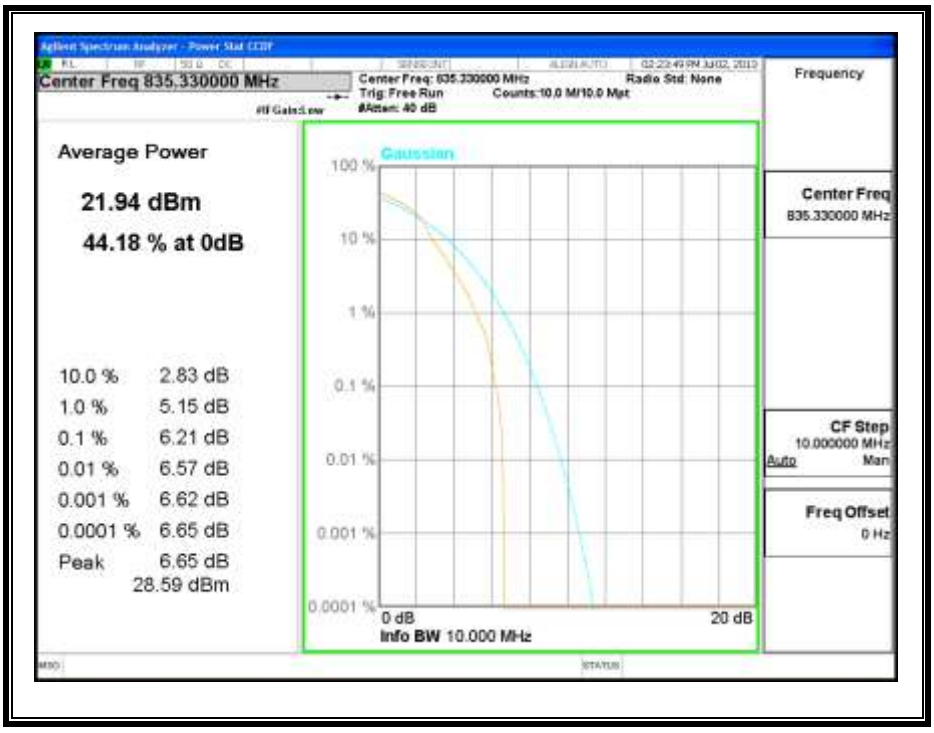
1.4MHz_16QAM



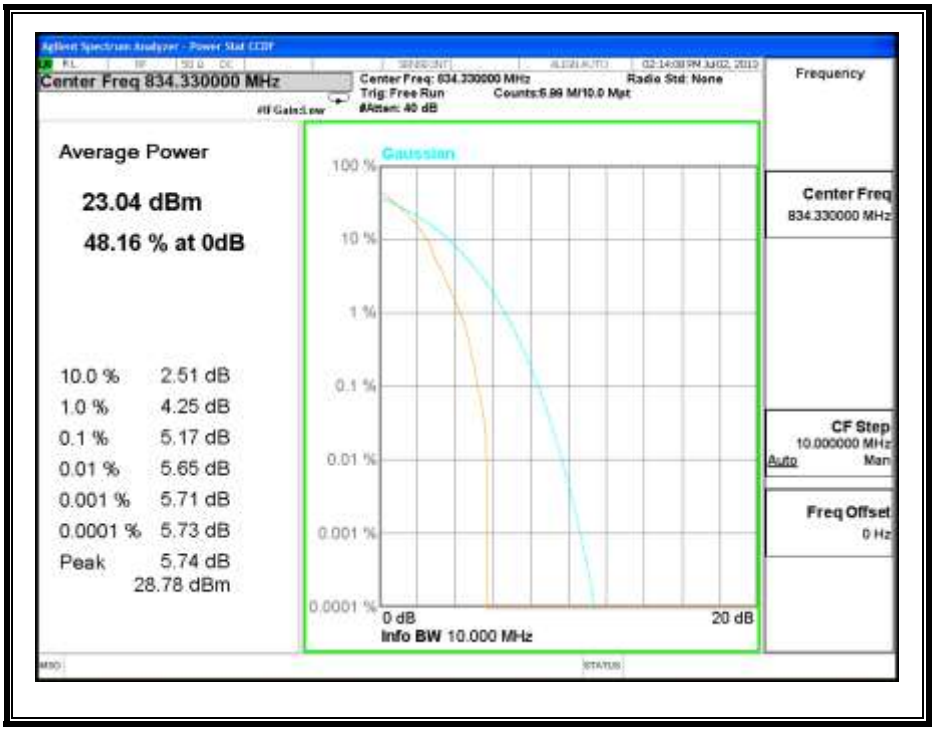
3.0MHz_QPSK



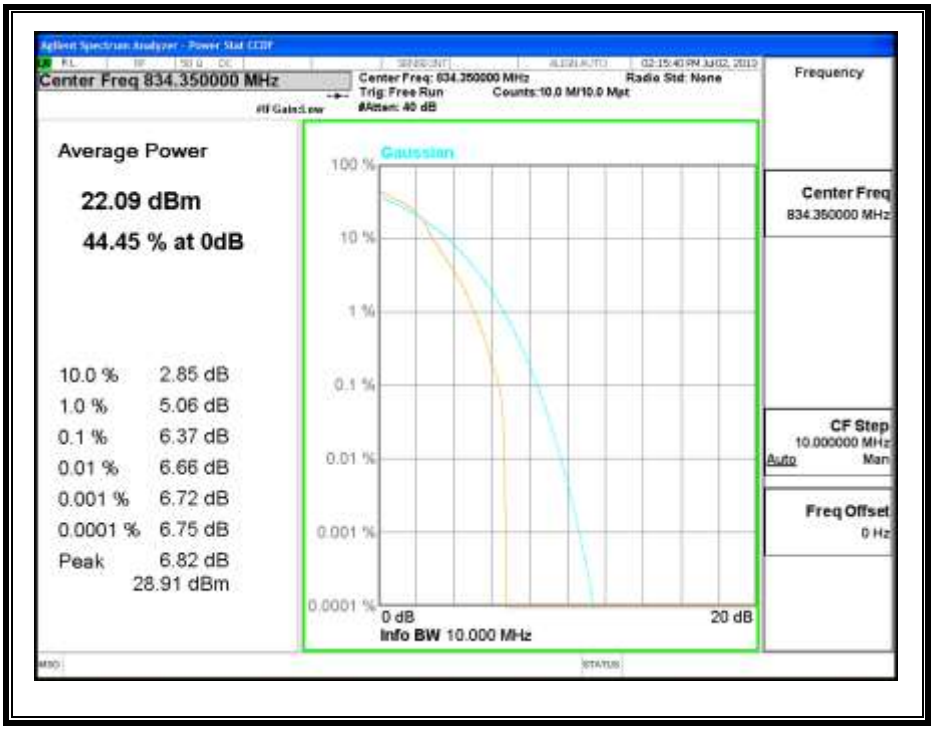
3.0MHz_16QAM



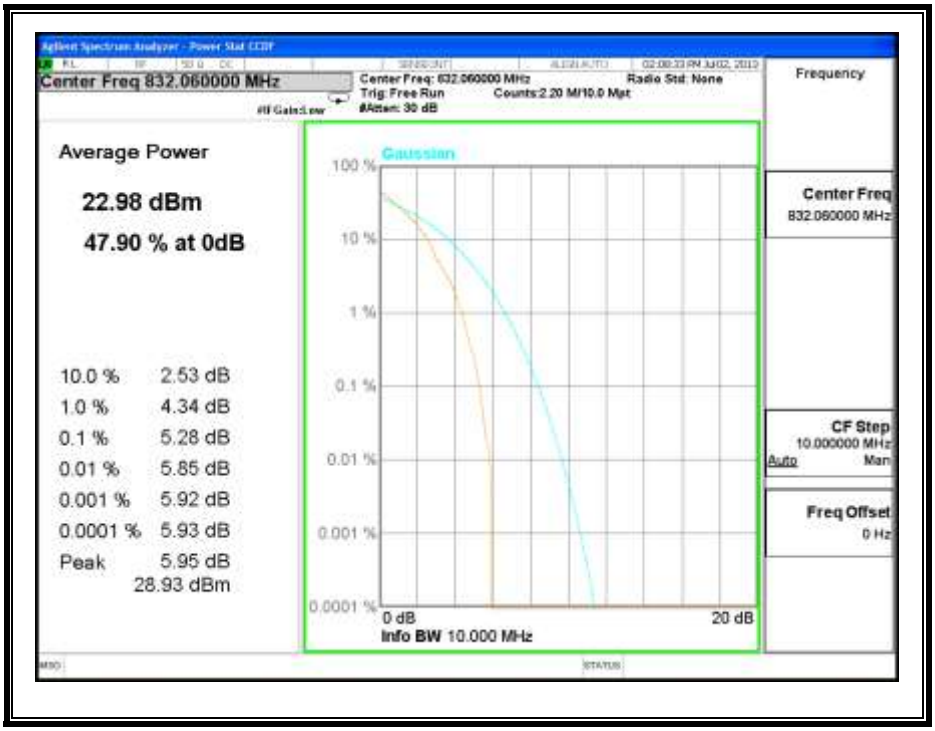
5.0MHz_QPSK



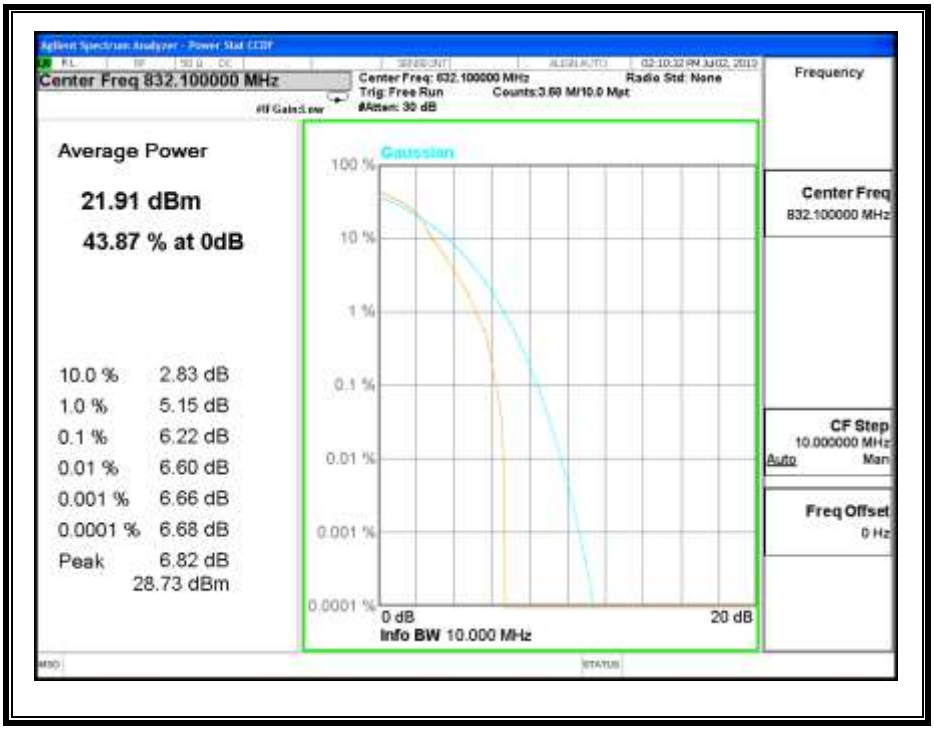
5.0MHz_16QAM



10MHz_QPSK

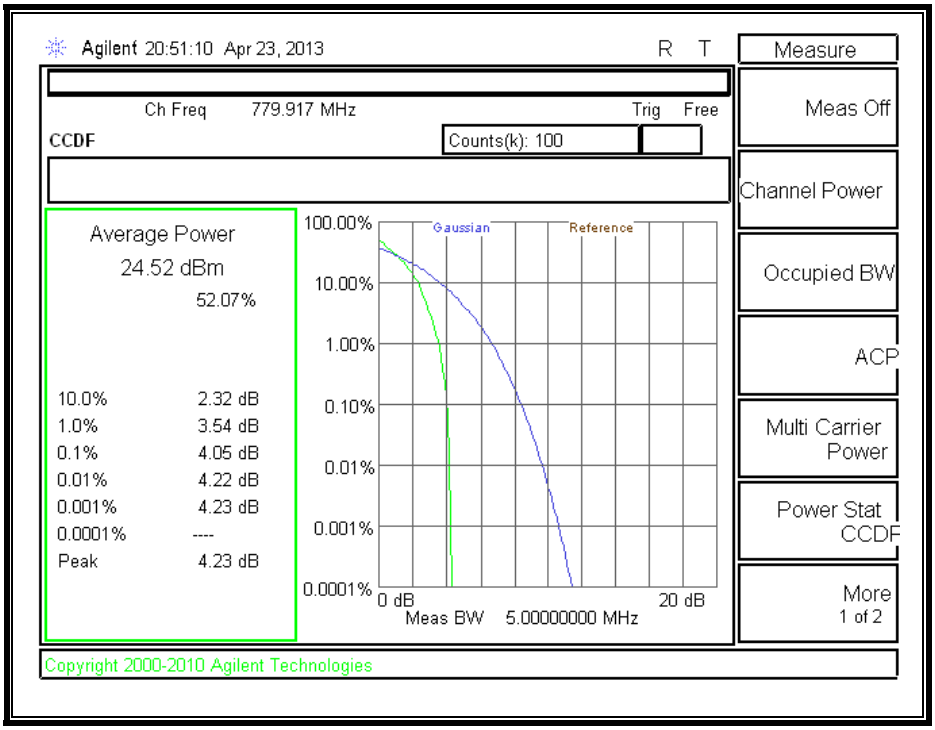


10MHz_16QAM

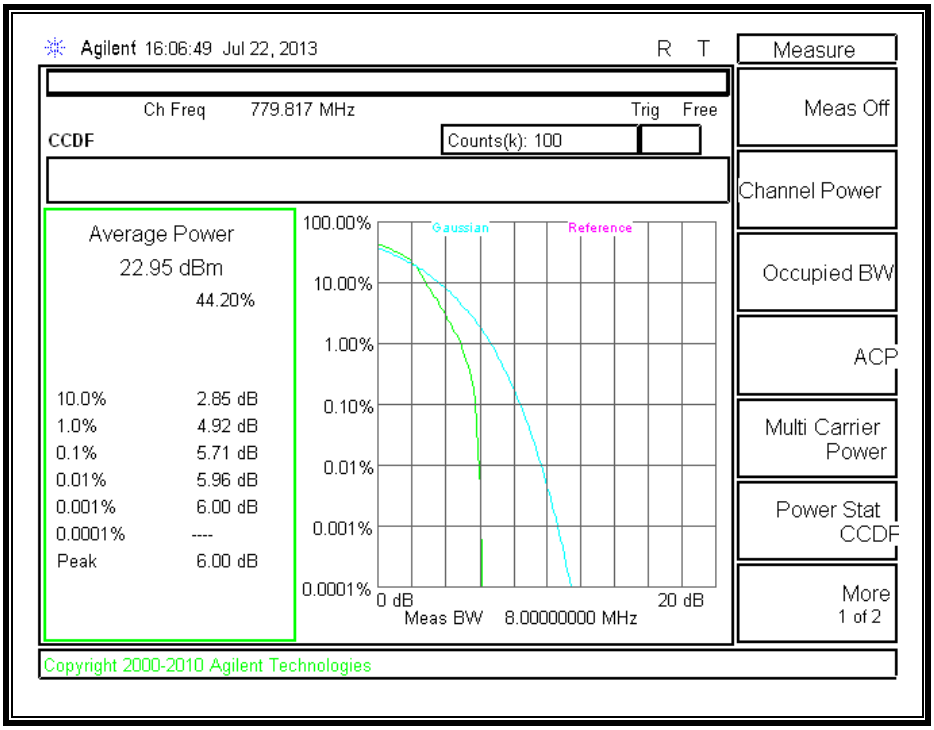


BAND 13

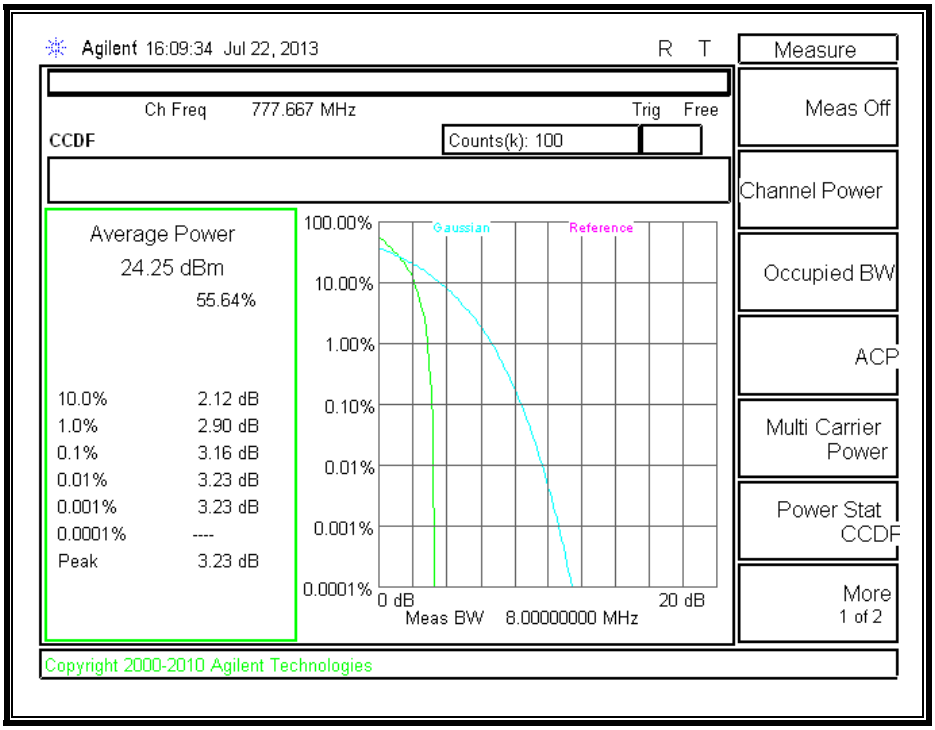
5.0MHz_QPSK



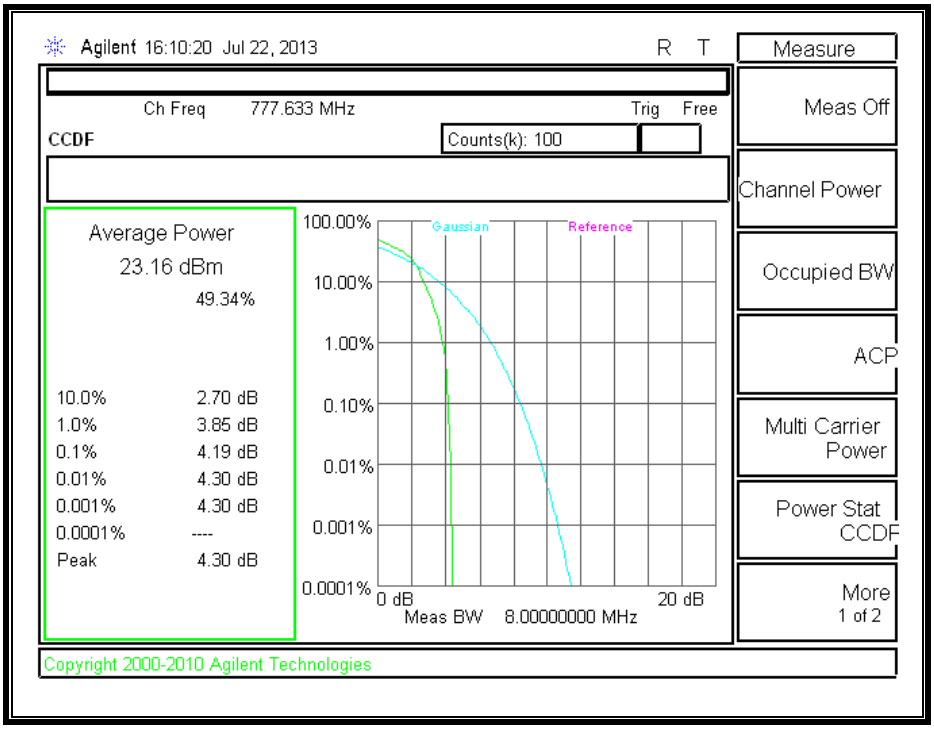
5.0MHz_16QAM



10MHz_QPSK

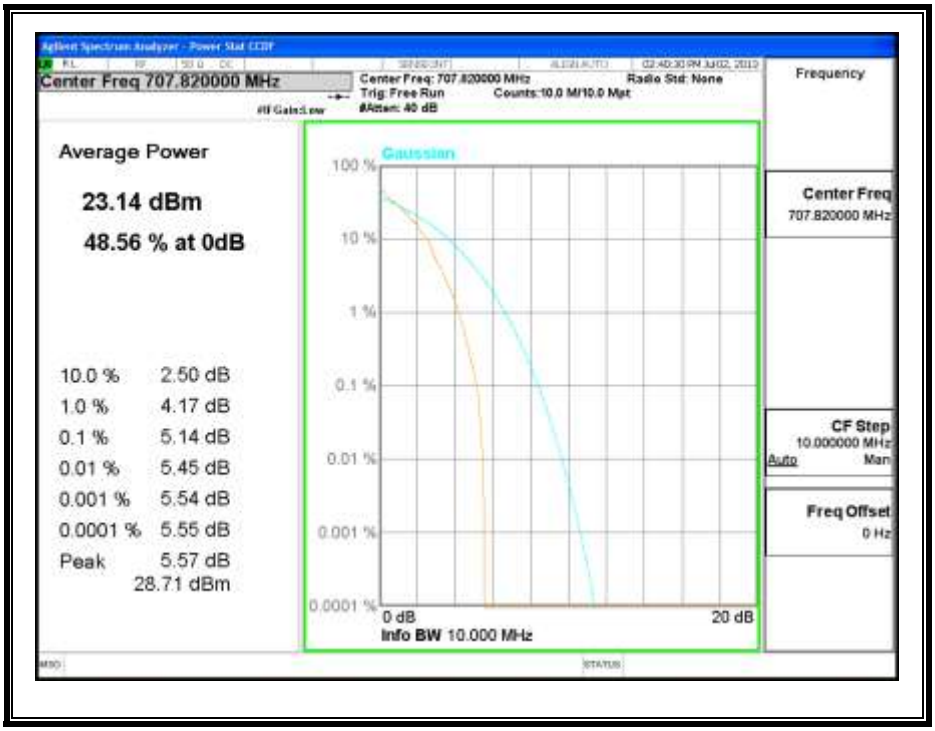


10MHz_16QAM

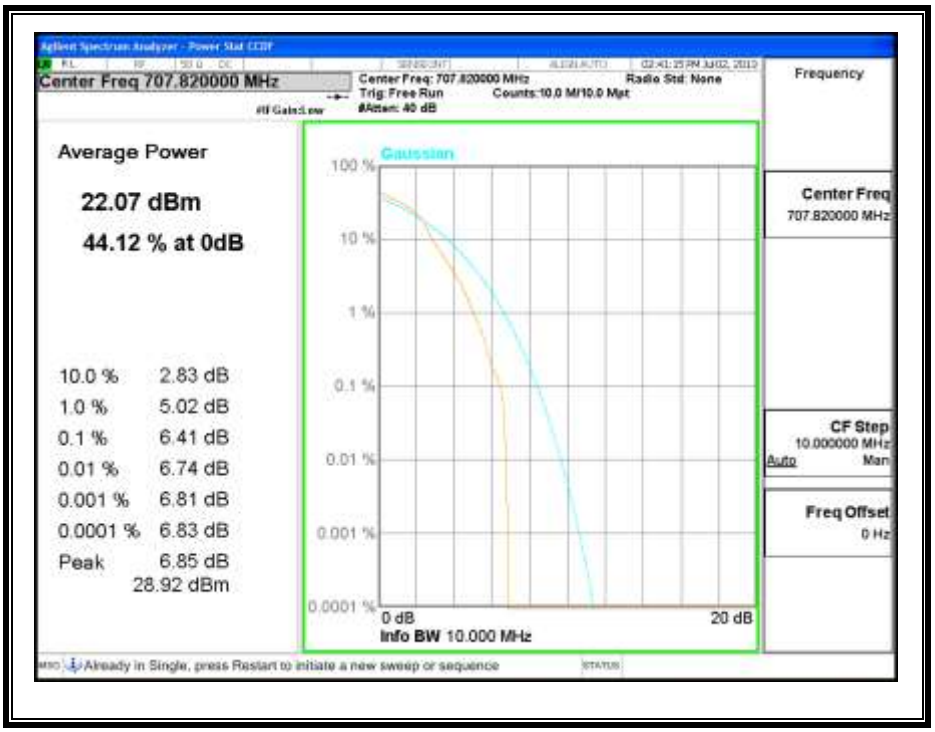


BAND 17

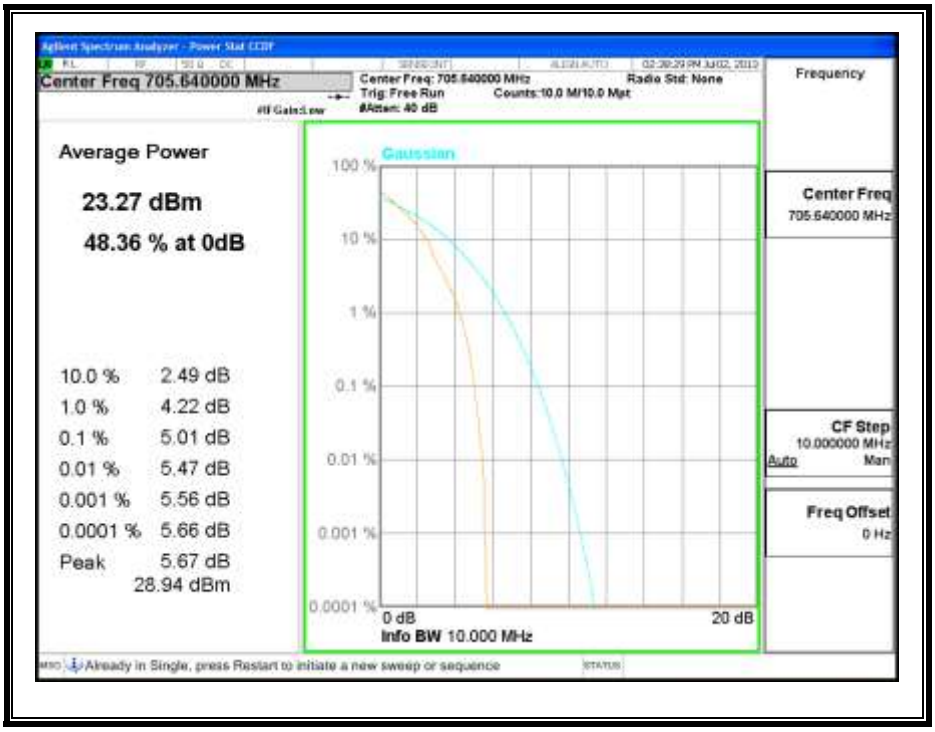
5.0MHz_QPSK



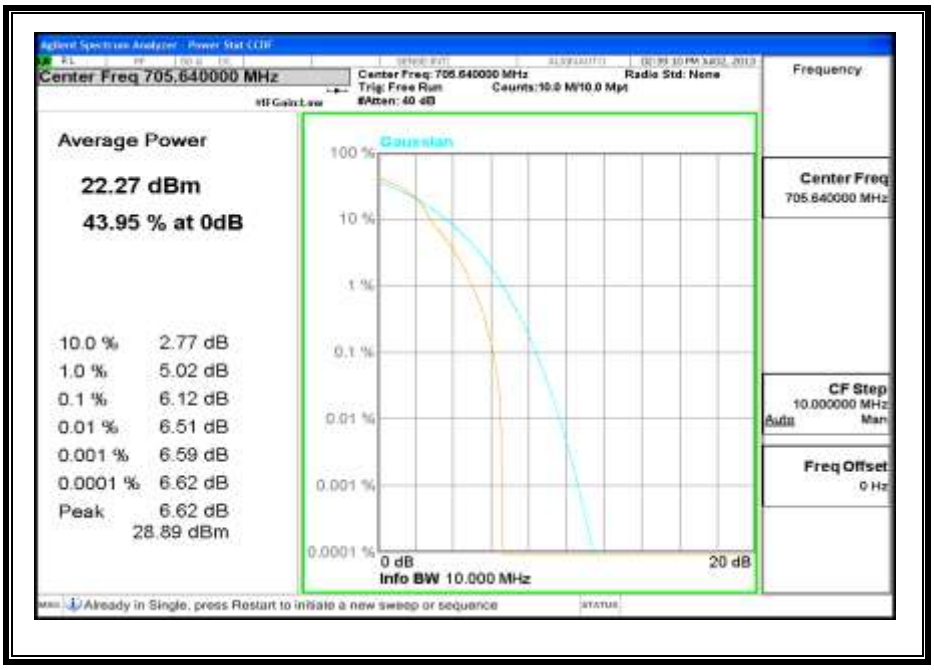
5.0MHz_16QAM



10MHz_QPSK



10MHz_16QAM



9.3. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

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

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

MODES TESTED

- LTE BAND 2, 4, 5, 13, 17, 25 and 26 (LAT & UAT)

RESULTS

9.3.1. LAT (PORT A)

QPSK BAND 2QPSK Band 2(1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 1.4MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851 MHz)									
3.702	-27.7	V	3.0	30.2	1.0	-56.9	-13.0	-43.9	
7.404	-29.6	V	3.0	26.5	1.0	-55.1	-13.0	-42.1	
3.702	-27.4	H	3.0	30.2	1.0	-56.6	-13.0	-43.6	
7.404	-27.7	H	3.0	26.5	1.0	-53.2	-13.0	-40.2	
Mid Ch, (1880 MHz)									
3.760	-27.0	V	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.520	-29.5	V	3.0	26.3	1.0	-54.8	-13.0	-41.8	
3.760	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.520	-27.9	H	3.0	26.3	1.0	-53.2	-13.0	-40.2	
High Ch, (1909.3 MHz)									
3.819	-27.4	V	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.637	-29.2	V	3.0	26.2	1.0	-54.3	-13.0	-41.3	
3.819	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.637	-28.3	H	3.0	26.2	1.0	-53.5	-13.0	-40.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	Kiya Kedida
Configuration:	EUT only
Mode:	TX, LTE band 2, 1.4MHz, 16QAM A28(FLTW)

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851 MHz)									
3.702	-28.5	V	3.0	30.2	1.0	-57.7	-13.0	-44.7	
7.404	-30.6	V	3.0	26.5	1.0	-56.1	-13.0	-43.1	
3.702	-28.3	H	3.0	30.2	1.0	-57.5	-13.0	-44.5	
7.404	-28.8	H	3.0	26.5	1.0	-54.3	-13.0	-41.3	
Mid Ch, (1880 MHz)									
3.760	-28.3	V	3.0	30.1	1.0	-57.5	-13.0	-44.5	
7.520	-30.3	V	3.0	26.3	1.0	-55.6	-13.0	-42.6	
3.760	-27.7	H	3.0	30.1	1.0	-56.8	-13.0	-43.8	
7.520	-28.8	H	3.0	26.3	1.0	-54.1	-13.0	-41.1	
High Ch, (1909.3 MHz)									
3.819	-28.9	V	3.0	30.1	1.0	-58.0	-13.0	-45.0	
7.637	-30.4	V	3.0	26.2	1.0	-55.5	-13.0	-42.5	
3.819	-28.4	H	3.0	30.1	1.0	-57.5	-13.0	-44.5	
7.637	-29.3	H	3.0	26.2	1.0	-54.5	-13.0	-41.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 3MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852 MHz)									
3.704	-28.1	V	3.0	30.2	1.0	-57.3	-13.0	-44.3	
7.408	-29.8	V	3.0	26.5	1.0	-55.3	-13.0	-42.3	
3.704	-28.1	H	3.0	30.2	1.0	-57.3	-13.0	-44.3	
7.408	-28.0	H	3.0	26.5	1.0	-53.5	-13.0	-40.5	
Mid Ch, (1880 MHz)									
3.760	-28.2	V	3.0	30.1	1.0	-57.4	-13.0	-44.4	
7.520	-29.5	V	3.0	26.3	1.0	-54.8	-13.0	-41.8	
3.760	-27.6	H	3.0	30.1	1.0	-56.7	-13.0	-43.7	
7.520	-27.9	H	3.0	26.3	1.0	-53.2	-13.0	-40.2	
High Ch, (1909 MHz)									
3.818	-27.4	V	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.636	-29.8	V	3.0	26.2	1.0	-54.9	-13.0	-41.9	
3.818	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.636	-28.2	H	3.0	26.2	1.0	-53.4	-13.0	-40.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1853 MHz)									
3.706	-29.0	V	3.0	30.2	1.0	-58.2	-13.0	-45.2	
7.412	-30.7	V	3.0	26.5	1.0	-56.1	-13.0	-43.1	
3.706	-28.6	H	3.0	30.2	1.0	-57.8	-13.0	-44.8	
7.412	-29.7	H	3.0	26.5	1.0	-55.2	-13.0	-42.2	
Mid Ch, (1880 MHz)									
3.760	-27.4	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.520	-29.6	V	3.0	26.3	1.0	-54.9	-13.0	-41.9	
3.760	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.520	-27.6	H	3.0	26.3	1.0	-52.9	-13.0	-39.9	
High Ch, (1908 MHz)									
3.816	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.632	-30.0	V	3.0	26.2	1.0	-55.1	-13.0	-42.1	
3.816	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.632	-29.5	H	3.0	26.2	1.0	-54.7	-13.0	-41.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2(5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	Kiya Kedida
Configuration:	EUT only
Mode:	band 2, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1853 MHz)									
3.706	-28.1	V	3.0	30.2	1.0	-57.3	-13.0	-44.3	
7.412	-30.1	V	3.0	26.5	1.0	-55.5	-13.0	-42.5	
3.706	-27.8	H	3.0	30.2	1.0	-57.0	-13.0	-44.0	
7.412	-28.4	H	3.0	26.5	1.0	-53.9	-13.0	-40.9	
Mid Ch, (1880 MHz)									
3.760	-26.5	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.520	-28.9	V	3.0	26.3	1.0	-54.2	-13.0	-41.2	
3.760	-25.7	H	3.0	30.1	1.0	-54.8	-13.0	-41.8	
7.520	-26.8	H	3.0	26.3	1.0	-52.1	-13.0	-39.1	
High Ch, (1908 MHz)									
3.816	-26.6	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.632	-29.7	V	3.0	26.2	1.0	-54.8	-13.0	-41.8	
3.816	-26.2	H	3.0	30.1	1.0	-55.3	-13.0	-42.3	
7.632	-28.3	H	3.0	26.2	1.0	-53.5	-13.0	-40.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1853 MHz)									
3.706	-29.0	V	3.0	30.2	1.0	-58.2	-13.0	-45.2	
7.412	-30.7	V	3.0	26.5	1.0	-56.1	-13.0	-43.1	
3.706	-28.6	H	3.0	30.2	1.0	-57.8	-13.0	-44.8	
7.412	-29.7	H	3.0	26.5	1.0	-55.2	-13.0	-42.2	
Mid Ch, (1880 MHz)									
3.760	-27.4	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.520	-29.6	V	3.0	26.3	1.0	-54.9	-13.0	-41.9	
3.760	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.520	-27.6	H	3.0	26.3	1.0	-52.9	-13.0	-39.9	
High Ch, (1908 MHz)									
3.816	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.632	-30.0	V	3.0	26.2	1.0	-55.1	-13.0	-42.1	
3.816	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.632	-29.5	H	3.0	26.2	1.0	-54.7	-13.0	-41.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2(10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 10MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-27.2	V	3.0	30.2	1.0	-56.4	-13.0	-43.4	
7.420	-30.1	V	3.0	26.5	1.0	-55.5	-13.0	-42.5	
3.710	-26.7	H	3.0	30.2	1.0	-55.9	-13.0	-42.9	
7.420	-28.3	H	3.0	26.5	1.0	-53.8	-13.0	-40.8	
Mid Ch, (1880 MHz)									
3.760	-27.4	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.520	-29.9	V	3.0	26.3	1.0	-55.2	-13.0	-42.2	
3.760	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.520	-28.4	H	3.0	26.3	1.0	-53.7	-13.0	-40.7	
High Ch, (1905 MHz)									
3.810	-27.6	V	3.0	30.1	1.0	-56.7	-13.0	-43.7	
7.620	-29.7	V	3.0	26.2	1.0	-54.9	-13.0	-41.9	
3.810	-27.2	H	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.620	-27.8	H	3.0	26.2	1.0	-53.0	-13.0	-40.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 10MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-28.1	V	3.0	30.2	1.0	-57.3	-13.0	-44.3	
7.420	-31.0	V	3.0	26.5	1.0	-56.4	-13.0	-43.4	
3.710	-27.6	H	3.0	30.2	1.0	-56.8	-13.0	-43.8	
7.420	-29.2	H	3.0	26.5	1.0	-54.7	-13.0	-41.7	
Mid Ch, (1880 MHz)									
3.760	-28.5	V	3.0	30.1	1.0	-57.7	-13.0	-44.7	
7.520	-30.8	V	3.0	26.3	1.0	-56.1	-13.0	-43.1	
3.760	-27.6	H	3.0	30.1	1.0	-56.7	-13.0	-43.7	
7.520	-29.3	H	3.0	26.3	1.0	-54.6	-13.0	-41.6	
High Ch, (1905 MHz)									
3.810	-28.5	V	3.0	30.1	1.0	-57.6	-13.0	-44.6	
7.620	-30.6	V	3.0	26.2	1.0	-55.8	-13.0	-42.8	
3.810	-28.1	H	3.0	30.1	1.0	-57.2	-13.0	-44.2	
7.620	-28.7	H	3.0	26.2	1.0	-53.9	-13.0	-40.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2(15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 15MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1858 MHz)									
3.716	-27.6	V	3.0	30.2	1.0	-56.8	-13.0	-43.8	
7.432	-29.3	V	3.0	26.4	1.0	-54.7	-13.0	-41.7	
3.716	-27.2	H	3.0	30.2	1.0	-56.4	-13.0	-43.4	
7.432	-27.6	H	3.0	26.4	1.0	-53.0	-13.0	-40.0	
Mid Ch, (1880 MHz)									
3.760	-28.1	V	3.0	30.1	1.0	-57.3	-13.0	-44.3	
7.520	-28.9	V	3.0	26.3	1.0	-54.2	-13.0	-41.2	
3.760	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
7.520	-27.1	H	3.0	26.3	1.0	-52.4	-13.0	-39.4	
High Ch, (1903 MHz)									
3.806	-28.0	V	3.0	30.1	1.0	-57.1	-13.0	-44.1	
7.612	-29.2	V	3.0	26.2	1.0	-54.4	-13.0	-41.4	
3.806	-28.0	H	3.0	30.1	1.0	-57.1	-13.0	-44.1	
7.612	-27.4	H	3.0	26.2	1.0	-52.6	-13.0	-39.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 15MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1858 MHz)									
3.716	-28.5	V	3.0	30.2	1.0	-57.7	-13.0	-44.7	
7.432	-30.2	V	3.0	26.4	1.0	-55.6	-13.0	-42.6	
3.716	-28.1	H	3.0	30.2	1.0	-57.3	-13.0	-44.3	
7.432	-28.7	H	3.0	26.4	1.0	-54.1	-13.0	-41.1	
Mid Ch, (1880 MHz)									
3.760	-29.0	V	3.0	30.1	1.0	-58.2	-13.0	-45.2	
7.520	-29.3	V	3.0	26.3	1.0	-54.6	-13.0	-41.6	
3.760	-28.7	H	3.0	30.1	1.0	-57.8	-13.0	-44.8	
7.520	-27.9	H	3.0	26.3	1.0	-53.2	-13.0	-40.2	
High Ch, (1903 MHz)									
3.806	-28.9	V	3.0	30.1	1.0	-58.0	-13.0	-45.0	
7.612	-30.1	V	3.0	26.2	1.0	-55.3	-13.0	-42.3	
3.806	-28.9	H	3.0	30.1	1.0	-58.0	-13.0	-45.0	
7.612	-28.2	H	3.0	26.2	1.0	-53.4	-13.0	-40.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2(20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 20MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-28.9	V	3.0	30.2	1.0	-58.1	-13.0	-45.1	
7.440	-30.1	V	3.0	26.4	1.0	-55.5	-13.0	-42.5	
3.720	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.440	-28.5	H	3.0	26.4	1.0	-53.9	-13.0	-40.9	
Mid Ch, (1880 MHz)									
3.760	-28.7	V	3.0	30.1	1.0	-57.9	-13.0	-44.9	
7.520	-29.3	V	3.0	26.3	1.0	-54.6	-13.0	-41.6	
3.760	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.520	-27.5	H	3.0	26.3	1.0	-52.8	-13.0	-39.8	
High Ch, (1900 MHz)									
3.800	-28.4	V	3.0	30.1	1.0	-57.5	-13.0	-44.5	
7.600	-29.3	V	3.0	26.2	1.0	-54.5	-13.0	-41.5	
3.800	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.600	-27.5	H	3.0	26.2	1.0	-52.8	-13.0	-39.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 20MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-30.0	V	3.0	30.2	1.0	-59.2	-13.0	-46.2	
7.440	-30.9	V	3.0	26.4	1.0	-56.3	-13.0	-43.3	
3.720	-28.4	H	3.0	30.2	1.0	-57.6	-13.0	-44.6	
7.440	-29.5	H	3.0	26.4	1.0	-54.9	-13.0	-41.9	
Mid Ch, (1880 MHz)									
3.760	-29.6	V	3.0	30.1	1.0	-58.8	-13.0	-45.8	
7.520	-30.3	V	3.0	26.3	1.0	-55.6	-13.0	-42.6	
3.760	-28.4	H	3.0	30.1	1.0	-57.5	-13.0	-44.5	
7.520	-28.3	H	3.0	26.3	1.0	-53.6	-13.0	-40.6	
High Ch, (1900 MHz)									
3.800	-29.3	V	3.0	30.1	1.0	-58.4	-13.0	-45.4	
7.600	-30.1	V	3.0	26.2	1.0	-55.3	-13.0	-42.3	
3.800	-28.4	H	3.0	30.1	1.0	-57.5	-13.0	-44.5	
7.600	-28.2	H	3.0	26.2	1.0	-53.5	-13.0	-40.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
1.4MHz BW, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1710.7 MHz)									
3.421	-28.6	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.132	-31.0	V	3.0	28.8	1.0	-58.8	-13.0	-45.8	
3.421	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.132	-29.5	H	3.0	28.8	1.0	-57.2	-13.0	-44.2	
Mid Ch, (1732.5 MHz)									
3.465	-28.3	V	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.198	-31.5	V	3.0	28.7	1.0	-59.2	-13.0	-46.2	
3.465	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-29.8	H	3.0	28.7	1.0	-57.5	-13.0	-44.5	
High Ch, (1754.3 MHz)									
3.509	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.263	-31.2	V	3.0	28.6	1.0	-58.8	-13.0	-45.8	
3.509	-29.2	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.263	-30.0	H	3.0	28.6	1.0	-57.7	-13.0	-44.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
1.4MHz BW, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1710.7 MHz)									
3.421	-28.9	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.132	-31.1	V	3.0	28.8	1.0	-58.9	-13.0	-45.9	
3.421	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.132	-29.8	H	3.0	28.8	1.0	-57.5	-13.0	-44.5	
Mid Ch, (1732.5 MHz)									
3.465	-28.6	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.198	-31.7	V	3.0	28.7	1.0	-59.4	-13.0	-46.4	
3.465	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.198	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
High Ch, (1754.3 MHz)									
3.509	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.263	-31.4	V	3.0	28.6	1.0	-59.0	-13.0	-46.0	
3.509	-28.8	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.263	-30.2	H	3.0	28.6	1.0	-57.9	-13.0	-44.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
3MHz BW, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1711.5 MHz)									
3.423	-28.9	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.135	-30.8	V	3.0	28.8	1.0	-58.6	-13.0	-45.6	
3.423	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.135	-28.8	H	3.0	28.8	1.0	-56.5	-13.0	-43.5	
Mid Ch, (1732.5 MHz)									
3.465	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.198	-31.0	V	3.0	28.7	1.0	-58.7	-13.0	-45.7	
3.465	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-28.7	H	3.0	28.7	1.0	-56.4	-13.0	-43.4	
High Ch, (1753.5 MHz)									
3.507	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.261	-31.0	V	3.0	28.6	1.0	-58.6	-13.0	-45.6	
3.507	-29.1	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.261	-29.8	H	3.0	28.6	1.0	-57.5	-13.0	-44.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
3MHz BW, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1711.5 MHz)									
3.423	-29.0	V	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.135	-30.9	V	3.0	28.8	1.0	-58.7	-13.0	-45.7	
3.423	-29.4	H	3.0	30.4	1.0	-58.8	-13.0	-45.8	
5.135	-29.3	H	3.0	28.8	1.0	-57.0	-13.0	-44.0	
Mid Ch, (1732.5 MHz)									
3.465	-28.9	V	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.198	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.465	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.198	-29.2	H	3.0	28.7	1.0	-56.9	-13.0	-43.9	
High Ch, (1753.5 MHz)									
3.507	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.261	-31.4	V	3.0	28.6	1.0	-59.0	-13.0	-46.0	
3.507	-29.2	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.261	-30.0	H	3.0	28.6	1.0	-57.7	-13.0	-44.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
5MHz BW, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5 MHz)									
3.425	-28.7	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.138	-30.9	V	3.0	28.8	1.0	-58.7	-13.0	-45.7	
3.425	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.138	-29.6	H	3.0	28.8	1.0	-57.3	-13.0	-44.3	
Mid Ch, (1732.5 MHz)									
3.465	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.465	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-29.4	H	3.0	28.7	1.0	-57.1	-13.0	-44.1	
High Ch, (1752.5 MHz)									
3.505	-28.1	V	3.0	30.4	1.0	-57.5	-13.0	-44.5	
5.258	-31.6	V	3.0	28.6	1.0	-59.2	-13.0	-46.2	
3.505	-28.9	H	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.258	-29.8	H	3.0	28.6	1.0	-57.5	-13.0	-44.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
5MHz BW, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5 MHz)									
3.425	-28.9	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.138	-31.0	V	3.0	28.8	1.0	-58.8	-13.0	-45.8	
3.425	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.138	-29.7	H	3.0	28.8	1.0	-57.4	-13.0	-44.4	
Mid Ch, (1732.5 MHz)									
3.465	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
High Ch, (1752.5 MHz)									
3.505	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.258	-31.5	V	3.0	28.6	1.0	-59.1	-13.0	-46.1	
3.505	-29.1	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.258	-29.9	H	3.0	28.6	1.0	-57.6	-13.0	-44.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
10MHz BW, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715 MHz)									
3.430	-28.6	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.145	-30.8	V	3.0	28.8	1.0	-58.5	-13.0	-45.5	
3.430	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.145	-29.3	H	3.0	28.8	1.0	-57.0	-13.0	-44.0	
Mid Ch, (1732.5 MHz)									
3.465	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.198	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.465	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	
High Ch, (1750 MHz)									
3.500	-29.1	V	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.250	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.500	-29.2	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.250	-29.4	H	3.0	28.7	1.0	-57.1	-13.0	-44.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
10MHz BW, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715 MHz)									
3.430	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.145	-31.0	V	3.0	28.8	1.0	-58.7	-13.0	-45.7	
3.430	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.145	-29.6	H	3.0	28.8	1.0	-57.3	-13.0	-44.3	
Mid Ch, (1732.5 MHz)									
3.465	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.465	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.198	-30.1	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	
High Ch, (1750 MHz)									
3.500	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.250	-31.0	V	3.0	28.7	1.0	-58.7	-13.0	-45.7	
3.500	-29.1	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.250	-30.1	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
15MHz BW, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1717.5 MHz)									
3.435	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.153	-31.0	V	3.0	28.7	1.0	-58.7	-13.0	-45.7	
3.435	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.153	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	
Mid Ch, (1732.5 MHz)									
3.465	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.465	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.198	-30.1	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	
High Ch, (1747.5 MHz)									
3.495	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.243	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.495	-28.9	H	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.243	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
15MHz BW, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1717.5 MHz)									
3.435	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.153	-30.9	V	3.0	28.7	1.0	-58.6	-13.0	-45.6	
3.435	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.153	-29.6	H	3.0	28.7	1.0	-57.3	-13.0	-44.3	
Mid Ch, (1732.5 MHz)									
3.465	-29.1	V	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.465	-29.4	H	3.0	30.4	1.0	-58.8	-13.0	-45.8	
5.198	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	
High Ch, (1747.5 MHz)									
3.495	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.243	-31.5	V	3.0	28.7	1.0	-59.2	-13.0	-46.2	
3.495	-29.1	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.243	-29.8	H	3.0	28.7	1.0	-57.5	-13.0	-44.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
20MHz BW, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1720 MHz)									
3.440	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.160	-30.9	V	3.0	28.7	1.0	-58.6	-13.0	-45.6	
3.440	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.160	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
Mid Ch, (1732.5 MHz)									
3.465	-28.3	V	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.198	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
High Ch, (1745 MHz)									
3.490	-27.9	V	3.0	30.4	1.0	-57.3	-13.0	-44.3	
5.235	-30.9	V	3.0	28.7	1.0	-58.6	-13.0	-45.6	
3.490	-28.5	H	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.235	-29.8	H	3.0	28.7	1.0	-57.4	-13.0	-44.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
20MHz BW, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1720 MHz)									
3.440	-29.1	V	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.160	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.440	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.160	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
Mid Ch, (1732.5 MHz)									
3.465	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.198	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.465	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.198	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	
High Ch, (1745 MHz)									
3.490	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.235	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.490	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.235	-30.0	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/06/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B5
	1.4M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-24.7	V	3.0	32.7	1.0	-56.4	-13.0	-43.4	
2.474	-25.5	V	3.0	31.4	1.0	-55.9	-13.0	-42.9	
1.649	-25.3	H	3.0	32.7	1.0	-57.0	-13.0	-44.0	
2.474	-27.5	H	3.0	31.4	1.0	-57.9	-13.0	-44.9	
Mid Ch, (836.5MHz)									
1.673	-23.2	V	3.0	32.6	1.0	-54.8	-13.0	-41.8	
2.510	-25.2	V	3.0	31.5	1.0	-55.7	-13.0	-42.7	
1.673	-24.0	H	3.0	32.6	1.0	-55.6	-13.0	-42.6	
2.510	-27.1	H	3.0	31.5	1.0	-57.6	-13.0	-44.6	
High Ch, (848.3MHz)									
1.697	-22.3	V	3.0	32.6	1.0	-53.8	-13.0	-40.8	
2.545	-25.8	V	3.0	31.4	1.0	-56.3	-13.0	-43.3	
1.697	-23.3	H	3.0	32.6	1.0	-54.8	-13.0	-41.8	
2.545	-27.9	H	3.0	31.4	1.0	-58.3	-13.0	-45.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/06/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5
1.4M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-25.1	V	3.0	32.7	1.0	-56.8	-13.0	-43.8	
2.474	-26.0	V	3.0	31.4	1.0	-56.4	-13.0	-43.4	
1.649	-26.1	H	3.0	32.7	1.0	-57.8	-13.0	-44.8	
2.474	-27.9	H	3.0	31.4	1.0	-58.3	-13.0	-45.3	
Mid Ch, (836.5MHz)									
1.673	-24.0	V	3.0	32.6	1.0	-55.6	-13.0	-42.6	
2.510	-25.5	V	3.0	31.5	1.0	-56.0	-13.0	-43.0	
1.673	-24.5	H	3.0	32.6	1.0	-56.1	-13.0	-43.1	
2.510	-27.5	H	3.0	31.5	1.0	-58.0	-13.0	-45.0	
High Ch, (848.3MHz)									
1.697	-22.8	V	3.0	32.6	1.0	-54.3	-13.0	-41.3	
2.545	-26.1	V	3.0	31.4	1.0	-56.6	-13.0	-43.6	
1.697	-24.6	H	3.0	32.6	1.0	-56.1	-13.0	-43.1	
2.545	-27.7	H	3.0	31.4	1.0	-58.1	-13.0	-45.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/06/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5 3M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-24.9	V	3.0	32.7	1.0	-56.6	-13.0	-43.6	
2.477	-24.6	V	3.0	31.4	1.0	-55.0	-13.0	-42.0	
1.651	-25.4	H	3.0	32.7	1.0	-57.1	-13.0	-44.1	
2.477	-26.1	H	3.0	31.4	1.0	-56.5	-13.0	-43.5	
Mid Ch, (836.5MHz)									
1.673	-24.4	V	3.0	32.6	1.0	-56.0	-13.0	-43.0	
2.510	-25.5	V	3.0	31.5	1.0	-56.0	-13.0	-43.0	
1.673	-26.2	H	3.0	32.6	1.0	-57.8	-13.0	-44.8	
2.510	-27.7	H	3.0	31.5	1.0	-58.2	-13.0	-45.2	
High Ch, (847.5MHz)									
1.695	-24.3	V	3.0	32.6	1.0	-55.8	-13.0	-42.8	
2.543	-25.9	V	3.0	31.4	1.0	-56.3	-13.0	-43.3	
1.695	-25.6	H	3.0	32.6	1.0	-57.1	-13.0	-44.1	
2.543	-27.5	H	3.0	31.4	1.0	-57.9	-13.0	-44.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5 3M har 16 QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-25.4	V	3.0	32.7	1.0	-57.1	-13.0	-44.1	
2.477	-25.1	V	3.0	31.4	1.0	-55.5	-13.0	-42.5	
1.651	-26.1	H	3.0	32.7	1.0	-57.8	-13.0	-44.8	
2.477	-27.0	H	3.0	31.4	1.0	-57.4	-13.0	-44.4	
Mid Ch, (836.5MHz)									
1.673	-24.7	V	3.0	32.6	1.0	-56.3	-13.0	-43.3	
2.510	-25.8	V	3.0	31.5	1.0	-56.3	-13.0	-43.3	
1.673	-26.7	H	3.0	32.6	1.0	-58.3	-13.0	-45.3	
2.510	-27.8	H	3.0	31.5	1.0	-58.3	-13.0	-45.3	
High Ch, (847.5MHz)									
1.695	-24.8	V	3.0	32.6	1.0	-56.3	-13.0	-43.3	
2.543	-26.0	V	3.0	31.4	1.0	-56.4	-13.0	-43.4	
1.695	-26.1	H	3.0	32.6	1.0	-57.6	-13.0	-44.6	
2.543	-28.1	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/06/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5, 5MHz
har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.653	-26.4	V	3.0	32.7	1.0	-58.1	-13.0	-45.1	
2.480	-26.3	V	3.0	31.4	1.0	-56.7	-13.0	-43.7	
1.653	-27.4	H	3.0	32.7	1.0	-59.0	-13.0	-46.0	
2.480	-28.0	H	3.0	31.4	1.0	-58.4	-13.0	-45.4	
Mid Ch, (836.5MHz)									
1.673	-24.9	V	3.0	32.6	1.0	-56.5	-13.0	-43.5	
2.510	-24.9	V	3.0	31.5	1.0	-55.4	-13.0	-42.4	
1.673	-26.4	H	3.0	32.6	1.0	-58.0	-13.0	-45.0	
2.510	-27.9	H	3.0	31.5	1.0	-58.4	-13.0	-45.4	
High Ch, (846.5MHz)									
1.693	-25.2	V	3.0	32.6	1.0	-56.7	-13.0	-43.7	
2.540	-26.2	V	3.0	31.4	1.0	-56.6	-13.0	-43.6	
1.693	-27.2	H	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.540	-28.0	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B5, 5MHz
	har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.653	-27.7	V	3.0	32.7	1.0	-59.4	-13.0	-46.4	
2.480	-26.4	V	3.0	31.4	1.0	-56.8	-13.0	-43.8	
1.653	-27.8	H	3.0	32.7	1.0	-59.4	-13.0	-46.4	
2.480	-28.1	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	
Mid Ch, (836.5MHz)									
1.673	-25.5	V	3.0	32.6	1.0	-57.1	-13.0	-44.1	
2.510	-25.8	V	3.0	31.5	1.0	-56.3	-13.0	-43.3	
1.673	-27.2	H	3.0	32.6	1.0	-58.8	-13.0	-45.8	
2.510	-27.9	H	3.0	31.5	1.0	-58.4	-13.0	-45.4	
High Ch, (846.5MHz)									
1.693	-25.9	V	3.0	32.6	1.0	-57.4	-13.0	-44.4	
2.540	-26.4	V	3.0	31.4	1.0	-56.8	-13.0	-43.8	
1.693	-27.2	H	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.540	-28.0	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09

QPSK Band 5 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE B5 10M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829MHz)									
1.658	-26.1	V	3.0	32.6	1.0	-57.8	-13.0	-44.8	
2.487	-25.8	V	3.0	31.4	1.0	-56.2	-13.0	-43.2	
1.658	-28.0	H	3.0	32.6	1.0	-59.6	-13.0	-46.6	
2.487	-27.8	H	3.0	31.4	1.0	-58.3	-13.0	-45.3	
Mid Ch, (836.5MHz)									
1.673	-25.1	V	3.0	32.6	1.0	-56.7	-13.0	-43.7	
2.510	-26.2	V	3.0	31.5	1.0	-56.7	-13.0	-43.7	
1.673	-26.8	H	3.0	32.6	1.0	-58.4	-13.0	-45.4	
2.510	-28.4	H	3.0	31.5	1.0	-58.9	-13.0	-45.9	
High Ch, (844MHz)									
1.688	-25.9	V	3.0	32.6	1.0	-57.4	-13.0	-44.4	
2.532	-26.6	V	3.0	31.5	1.0	-57.1	-13.0	-44.1	
1.688	-27.2	H	3.0	32.6	1.0	-58.8	-13.0	-45.8	
2.532	-28.2	H	3.0	31.5	1.0	-58.7	-13.0	-45.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE B5 10M 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829MHz)									
1.658	-26.4	V	3.0	32.6	1.0	-58.1	-13.0	-45.1	
2.487	-26.1	V	3.0	31.4	1.0	-56.5	-13.0	-43.5	
1.658	-28.1	H	3.0	32.6	1.0	-59.7	-13.0	-46.7	
2.487	-27.9	H	3.0	31.4	1.0	-58.4	-13.0	-45.4	
Mid Ch, (836.5MHz)									
1.673	-25.6	V	3.0	32.6	1.0	-57.2	-13.0	-44.2	
2.510	-26.3	V	3.0	31.5	1.0	-56.8	-13.0	-43.8	
1.673	-27.2	H	3.0	32.6	1.0	-58.8	-13.0	-45.8	
2.510	-28.3	H	3.0	31.5	1.0	-58.8	-13.0	-45.8	
High Ch, (844MHz)									
1.688	-26.2	V	3.0	32.6	1.0	-57.7	-13.0	-44.7	
2.532	-26.5	V	3.0	31.5	1.0	-57.0	-13.0	-44.0	
1.688	-27.8	H	3.0	32.6	1.0	-59.4	-13.0	-46.4	
2.532	-28.0	H	3.0	31.5	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

LAT (PORT A)

QPSK Band 13 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE band 13, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.559	-26.5	V	3.0	32.9	1.0	-58.4	-13.0	-45.4	
2.339	-25.4	V	3.0	31.1	1.0	-55.6	-13.0	-42.6	
1.559	-29.1	H	3.0	32.9	1.0	-60.9	-13.0	-47.9	
2.339	-27.3	H	3.0	31.1	1.0	-57.4	-13.0	-44.4	
Mid Ch, (782 MHz)									
1.564	-26.7	V	3.0	32.9	1.0	-58.6	-13.0	-45.6	
2.346	-25.9	V	3.0	31.1	1.0	-56.0	-13.0	-43.0	
1.564	-29.2	H	3.0	32.9	1.0	-61.1	-13.0	-48.1	
2.346	-27.8	H	3.0	31.1	1.0	-57.9	-13.0	-44.9	
High Ch, (784.5 MHz)									
1.569	-26.6	V	3.0	32.8	1.0	-58.5	-13.0	-45.5	
2.354	-25.6	V	3.0	31.1	1.0	-55.7	-13.0	-42.7	
1.569	-28.7	H	3.0	32.8	1.0	-60.6	-13.0	-47.6	
2.354	-27.2	H	3.0	31.1	1.0	-57.3	-13.0	-44.3	

Rev. 03.03.09

16QAM Band 13 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE band 13, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.559	-26.6	V	3.0	32.9	1.0	-58.5	-13.0	-45.5	
2.339	-25.6	V	3.0	31.1	1.0	-55.8	-13.0	-42.8	
1.559	-29.2	H	3.0	32.9	1.0	-61.0	-13.0	-48.0	
2.339	-27.3	H	3.0	31.1	1.0	-57.4	-13.0	-44.4	
Mid Ch, (782 MHz)									
1.564	-26.8	V	3.0	32.9	1.0	-58.7	-13.0	-45.7	
2.346	-25.8	V	3.0	31.1	1.0	-55.9	-13.0	-42.9	
1.564	-29.1	H	3.0	32.9	1.0	-61.0	-13.0	-48.0	
2.346	-27.9	H	3.0	31.1	1.0	-58.0	-13.0	-45.0	
High Ch, (784.5 MHz)									
1.569	-26.8	V	3.0	32.8	1.0	-58.7	-13.0	-45.7	
2.354	-25.7	V	3.0	31.1	1.0	-55.8	-13.0	-42.8	
1.569	-28.9	H	3.0	32.8	1.0	-60.8	-13.0	-47.8	
2.354	-27.3	H	3.0	31.1	1.0	-57.4	-13.0	-44.4	

Rev. 03.03.09

LTE QPSK Radiated Measurement in 1559-1610MHz Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE band 13, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.559	-26.5	V	3.0	32.9	1.0	-58.4	-40.0	-18.4	
1.559	-29.1	H	3.0	32.9	1.0	-60.9	-40.0	-20.9	
Mid Ch, (782 MHz)									
1.564	-26.7	V	3.0	32.9	1.0	-58.6	-40.0	-18.6	
1.564	-29.2	H	3.0	32.9	1.0	-61.1	-40.0	-21.1	
High Ch, (784.5 MHz)									
1.569	-26.6	V	3.0	32.8	1.0	-58.5	-40.0	-18.5	
1.569	-28.7	H	3.0	32.8	1.0	-60.6	-40.0	-20.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

LTE QPSK Radiated Measurement in 1559-1610MHz Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE band 13, 5MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.559	-26.6	V	3.0	32.9	1.0	-58.5	-40.0	-18.5	
1.559	-29.2	H	3.0	32.9	1.0	-61.0	-40.0	-21.0	
Mid Ch, (782 MHz)									
1.564	-26.8	V	3.0	32.9	1.0	-58.7	-40.0	-18.7	
1.564	-29.1	H	3.0	32.9	1.0	-61.0	-40.0	-21.0	
High Ch, (784.5 MHz)									
1.569	-26.8	V	3.0	32.8	1.0	-58.7	-40.0	-18.7	
1.569	-28.9	H	3.0	32.8	1.0	-60.8	-40.0	-20.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 13 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 13, 10MHz, QPSK
QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch. (782 MHz)									
1.564	-26.7	V	3.0	32.9	1.0	-58.6	-13.0	-45.6	
2.346	-26.0	V	3.0	31.1	1.0	-56.1	-13.0	-43.1	
1.564	-29.2	H	3.0	32.9	1.0	-61.1	-13.0	-48.1	
2.346	-27.6	H	3.0	31.1	1.0	-57.7	-13.0	-44.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 13 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 13, 10MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, (782 MHz)									
1.564	-27.2	V	3.0	32.9	1.0	-59.1	-13.0	-46.1	
2.346	-26.3	V	3.0	31.1	1.0	-56.4	-13.0	-43.4	
1.564	-29.8	H	3.0	32.9	1.0	-61.7	-13.0	-48.7	
2.346	-28.0	H	3.0	31.1	1.0	-58.1	-13.0	-45.1	

Rev. 03.03.09

LTE QPSK and 16QAM Radiated Measurement in 1559-1610MHz Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 13, 10MHz, QPSK
QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
QPSK, Mid Ch, (782 MHz)									
1.564	-26.7	V	3.0	32.9	1.0	-58.6	-40.0	-18.6	
1.564	-29.2	H	3.0	32.9	1.0	-61.1	-40.0	-21.1	
16QAM, Mid Ch, (782 MHz)									
Mid Ch, (782 MHz)									
1.564	-27.2	V	3.0	32.9	1.0	-59.1	-13.0	-46.1	
1.564	-29.8	H	3.0	32.9	1.0	-61.7	-13.0	-48.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

LAT (PORT A)

QPSK Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B17
5M QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.413	-27.5	V	3.0	33.1	1.0	-59.6	-13.0	-46.6	
2.120	-27.3	V	3.0	31.6	1.0	-57.9	-13.0	-44.9	
1.413	-30.0	H	3.0	33.1	1.0	-62.1	-13.0	-49.1	
2.120	-29.6	H	3.0	31.6	1.0	-60.2	-13.0	-47.2	
Mid Ch, (710MHz)									
1.420	-28.8	V	3.0	33.1	1.0	-60.9	-13.0	-47.9	
2.130	-27.9	V	3.0	31.6	1.0	-58.5	-13.0	-45.5	
1.420	-30.6	H	3.0	33.1	1.0	-62.7	-13.0	-49.7	
2.130	-29.7	H	3.0	31.6	1.0	-60.3	-13.0	-47.3	
High Ch, (713.5MHz)									
1.427	-28.9	V	3.0	33.1	1.0	-60.9	-13.0	-47.9	
2.141	-27.8	V	3.0	31.6	1.0	-58.3	-13.0	-45.3	
1.427	-30.8	H	3.0	33.1	1.0	-62.9	-13.0	-49.9	
2.141	-28.7	H	3.0	31.6	1.0	-59.2	-13.0	-46.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B17 5M 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.413	-27.7	V	3.0	33.1	1.0	-59.8	-13.0	-46.8	
2.120	-27.5	V	3.0	31.6	1.0	-58.1	-13.0	-45.1	
1.413	-29.9	H	3.0	33.1	1.0	-62.0	-13.0	-49.0	
2.120	-29.9	H	3.0	31.6	1.0	-60.5	-13.0	-47.5	
Mid Ch, (710MHz)									
1.420	-28.9	V	3.0	33.1	1.0	-61.0	-13.0	-48.0	
2.130	-28.0	V	3.0	31.6	1.0	-58.6	-13.0	-45.6	
1.420	-30.5	H	3.0	33.1	1.0	-62.6	-13.0	-49.6	
2.130	-29.9	H	3.0	31.6	1.0	-60.5	-13.0	-47.5	
High Ch, (713.5MHz)									
1.427	-29.0	V	3.0	33.1	1.0	-61.0	-13.0	-48.0	
2.141	-28.1	V	3.0	31.6	1.0	-58.6	-13.0	-45.6	
1.427	-30.7	H	3.0	33.1	1.0	-62.8	-13.0	-49.8	
2.141	-29.1	H	3.0	31.6	1.0	-59.6	-13.0	-46.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B17
10M QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709MHz)									
1.418	-28.2	V	3.0	33.1	1.0	-60.3	-13.0	-47.3	
2.127	-27.7	V	3.0	31.6	1.0	-58.3	-13.0	-45.3	
1.418	-30.6	H	3.0	33.1	1.0	-62.7	-13.0	-49.7	
2.127	-29.8	H	3.0	31.6	1.0	-60.4	-13.0	-47.4	
Mid Ch, (710MHz)									
1.420	-28.6	V	3.0	33.1	1.0	-60.7	-13.0	-47.7	
2.130	-27.7	V	3.0	31.6	1.0	-58.3	-13.0	-45.3	
1.420	-30.5	H	3.0	33.1	1.0	-62.6	-13.0	-49.6	
2.130	-29.4	H	3.0	31.6	1.0	-60.0	-13.0	-47.0	
High Ch, (711MHz)									
1.422	-28.4	V	3.0	33.1	1.0	-60.5	-13.0	-47.5	
2.133	-28.1	V	3.0	31.6	1.0	-58.6	-13.0	-45.6	
1.422	-30.8	H	3.0	33.1	1.0	-62.9	-13.0	-49.9	
2.133	-29.3	H	3.0	31.6	1.0	-59.9	-13.0	-46.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B17
	10M 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709MHz)									
1.418	-28.4	V	3.0	33.1	1.0	-60.5	-13.0	-47.5	
2.127	-27.8	V	3.0	31.6	1.0	-58.4	-13.0	-45.4	
1.418	-30.7	H	3.0	33.1	1.0	-62.8	-13.0	-49.8	
2.127	-29.6	H	3.0	31.6	1.0	-60.2	-13.0	-47.2	
Mid Ch, (710MHz)									
1.420	-28.7	V	3.0	33.1	1.0	-60.8	-13.0	-47.8	
2.130	-27.9	V	3.0	31.6	1.0	-58.5	-13.0	-45.5	
1.420	-30.7	H	3.0	33.1	1.0	-62.8	-13.0	-49.8	
2.130	-29.7	H	3.0	31.6	1.0	-60.3	-13.0	-47.3	
High Ch, (711MHz)									
1.422	-28.5	V	3.0	33.1	1.0	-60.6	-13.0	-47.6	
2.133	-27.9	V	3.0	31.6	1.0	-58.4	-13.0	-45.4	
1.422	-30.7	H	3.0	33.1	1.0	-62.8	-13.0	-49.8	
2.133	-29.6	H	3.0	31.6	1.0	-60.2	-13.0	-47.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
1.4MHz, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.7 MHz)									
3.701	-26.3	V	3.0	30.2	1.0	-55.5	-13.0	-42.5	
7.403	-27.8	V	3.0	26.5	1.0	-53.3	-13.0	-40.3	
3.701	-27.3	H	3.0	30.2	1.0	-56.5	-13.0	-43.5	
7.403	-27.0	H	3.0	26.5	1.0	-52.5	-13.0	-39.5	
Mid Ch, (1882.5 MHz)									
3.765	-26.3	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.530	-27.4	V	3.0	26.3	1.0	-52.7	-13.0	-39.7	
3.765	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.530	-26.6	H	3.0	26.3	1.0	-51.9	-13.0	-38.9	
High Ch, (1914.3 MHz)									
3.829	-26.2	V	3.0	30.1	1.0	-55.3	-13.0	-42.3	
7.657	-27.0	V	3.0	26.1	1.0	-52.2	-13.0	-39.2	
3.829	-25.9	H	3.0	30.1	1.0	-55.0	-13.0	-42.0	
7.657	-26.0	H	3.0	26.1	1.0	-51.1	-13.0	-38.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
1.4MHz, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.7 MHz)									
3.701	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
7.403	-27.9	V	3.0	26.5	1.0	-53.4	-13.0	-40.4	
3.701	-27.4	H	3.0	30.2	1.0	-56.6	-13.0	-43.6	
7.403	-27.2	H	3.0	26.5	1.0	-52.7	-13.0	-39.7	
Mid Ch, (1882.5 MHz)									
3.765	-26.6	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.530	-27.6	V	3.0	26.3	1.0	-52.9	-13.0	-39.9	
3.765	-27.2	H	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.530	-27.1	H	3.0	26.3	1.0	-52.4	-13.0	-39.4	
High Ch, (1914.3 MHz)									
3.829	-26.4	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.657	-27.2	V	3.0	26.1	1.0	-52.4	-13.0	-39.4	
3.829	-26.6	H	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.657	-26.1	H	3.0	26.1	1.0	-51.2	-13.0	-38.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 3MHz, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.5 MHz)									
3.703	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
7.406	-27.9	V	3.0	26.5	1.0	-53.4	-13.0	-40.4	
3.703	-26.6	H	3.0	30.2	1.0	-55.8	-13.0	-42.8	
7.406	-27.1	H	3.0	26.5	1.0	-52.6	-13.0	-39.6	
Mid Ch, (1882.5 MHz)									
3.765	-26.5	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.530	-27.5	V	3.0	26.3	1.0	-52.8	-13.0	-39.8	
3.765	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-26.7	H	3.0	26.3	1.0	-52.0	-13.0	-39.0	
High Ch, (1913.5 MHz)									
3.827	-26.3	V	3.0	30.1	1.0	-55.4	-13.0	-42.4	
7.654	-27.7	V	3.0	26.1	1.0	-52.8	-13.0	-39.8	
3.827	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.654	-26.6	H	3.0	26.1	1.0	-51.7	-13.0	-38.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 3MHz, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.5 MHz)									
3.703	-26.9	V	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.406	-28.0	V	3.0	26.5	1.0	-53.5	-13.0	-40.5	
3.703	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.406	-26.9	H	3.0	26.5	1.0	-52.4	-13.0	-39.4	
Mid Ch, (1882.5 MHz)									
3.765	-26.6	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.530	-27.9	V	3.0	26.3	1.0	-53.2	-13.0	-40.2	
3.765	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.530	-27.2	H	3.0	26.3	1.0	-52.5	-13.0	-39.5	
High Ch, (1913.5 MHz)									
3.827	-26.8	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.654	-28.0	V	3.0	26.1	1.0	-53.1	-13.0	-40.1	
3.827	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.654	-26.9	H	3.0	26.1	1.0	-52.0	-13.0	-39.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
5MHz, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.5 MHz)									
3.705	-26.0	V	3.0	30.2	1.0	-55.2	-13.0	-42.2	
7.410	-27.5	V	3.0	26.5	1.0	-52.9	-13.0	-39.9	
3.705	-27.3	H	3.0	30.2	1.0	-56.5	-13.0	-43.5	
7.410	-26.5	H	3.0	26.5	1.0	-52.0	-13.0	-39.0	
Mid Ch, (1882.5 MHz)									
3.765	-27.4	V	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.530	-28.4	V	3.0	26.3	1.0	-53.7	-13.0	-40.7	
3.765	-27.6	H	3.0	30.1	1.0	-56.7	-13.0	-43.7	
7.530	-27.7	H	3.0	26.3	1.0	-53.0	-13.0	-40.0	
High Ch, (1912.5 MHz)									
3.825	-25.4	V	3.0	30.1	1.0	-54.5	-13.0	-41.5	
7.650	-27.7	V	3.0	26.2	1.0	-52.8	-13.0	-39.8	
3.825	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.650	-28.8	H	3.0	26.2	1.0	-53.9	-13.0	-40.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
5MHz, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.5 MHz)									
3.705	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
7.410	-27.7	V	3.0	26.5	1.0	-53.1	-13.0	-40.1	
3.705	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.410	-27.0	H	3.0	26.5	1.0	-52.5	-13.0	-39.5	
Mid Ch, (1882.5 MHz)									
3.765	-27.5	V	3.0	30.1	1.0	-56.7	-13.0	-43.7	
7.530	-28.5	V	3.0	26.3	1.0	-53.8	-13.0	-40.8	
3.765	-28.0	H	3.0	30.1	1.0	-57.1	-13.0	-44.1	
7.530	-27.6	H	3.0	26.3	1.0	-52.9	-13.0	-39.9	
High Ch, (1912.5 MHz)									
3.825	-25.9	V	3.0	30.1	1.0	-55.0	-13.0	-42.0	
7.650	-27.8	V	3.0	26.2	1.0	-52.9	-13.0	-39.9	
3.825	-27.9	H	3.0	30.1	1.0	-57.0	-13.0	-44.0	
7.650	-27.1	H	3.0	26.2	1.0	-52.2	-13.0	-39.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
10MHz, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-27.0	V	3.0	30.2	1.0	-56.2	-13.0	-43.2	
7.420	-27.9	V	3.0	26.5	1.0	-53.3	-13.0	-40.3	
3.710	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.420	-27.3	H	3.0	26.5	1.0	-52.8	-13.0	-39.8	
Mid Ch, (1882.5 MHz)									
3.765	-26.7	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.530	-28.0	V	3.0	26.3	1.0	-53.3	-13.0	-40.3	
3.765	-26.6	H	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.530	-27.2	H	3.0	26.3	1.0	-52.5	-13.0	-39.5	
High Ch, (1909.8 MHz)									
3.820	-25.9	V	3.0	30.1	1.0	-55.0	-13.0	-42.0	
7.639	-28.8	V	3.0	26.2	1.0	-53.9	-13.0	-40.9	
3.820	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.639	-27.6	H	3.0	26.2	1.0	-52.8	-13.0	-39.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
10MHz, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-27.2	V	3.0	30.2	1.0	-56.4	-13.0	-43.4	
7.420	-28.2	V	3.0	26.5	1.0	-53.6	-13.0	-40.6	
3.710	-27.7	H	3.0	30.2	1.0	-56.9	-13.0	-43.9	
7.420	-27.4	H	3.0	26.5	1.0	-52.9	-13.0	-39.9	
Mid Ch, (1882.5 MHz)									
3.765	-26.9	V	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.530	-27.9	V	3.0	26.3	1.0	-53.2	-13.0	-40.2	
3.765	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.530	-27.4	H	3.0	26.3	1.0	-52.7	-13.0	-39.7	
High Ch, (1909.8 MHz)									
3.820	-26.6	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.639	-28.3	V	3.0	26.2	1.0	-53.4	-13.0	-40.4	
3.820	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.639	-27.2	H	3.0	26.2	1.0	-52.4	-13.0	-39.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 15MHz, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1857.5 MHz)									
3.715	-26.0	V	3.0	30.2	1.0	-55.2	-13.0	-42.2	
7.430	-28.0	V	3.0	26.4	1.0	-53.4	-13.0	-40.4	
3.715	-26.2	H	3.0	30.2	1.0	-55.4	-13.0	-42.4	
7.430	-26.7	H	3.0	26.4	1.0	-52.1	-13.0	-39.1	
Mid Ch, (1882.5 MHz)									
3.765	-26.6	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.530	-27.8	V	3.0	26.3	1.0	-53.1	-13.0	-40.1	
3.765	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.530	-26.7	H	3.0	26.3	1.0	-52.0	-13.0	-39.0	
High Ch, (1907.5 MHz)									
3.815	-25.7	V	3.0	30.1	1.0	-54.8	-13.0	-41.8	
7.630	-28.0	V	3.0	26.2	1.0	-53.2	-13.0	-40.2	
3.815	-26.6	H	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.630	-26.7	H	3.0	26.2	1.0	-51.9	-13.0	-38.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 15MHz, 16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1857.5 MHz)									
3.715	-26.3	V	3.0	30.2	1.0	-55.5	-13.0	-42.5	
7.430	-28.1	V	3.0	26.4	1.0	-53.5	-13.0	-40.5	
3.715	-26.3	H	3.0	30.2	1.0	-55.5	-13.0	-42.5	
7.430	-27.0	H	3.0	26.4	1.0	-52.4	-13.0	-39.4	
Mid Ch, (1882.5 MHz)									
3.765	-26.8	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-28.1	V	3.0	26.3	1.0	-53.4	-13.0	-40.4	
3.765	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.530	-27.0	H	3.0	26.3	1.0	-52.3	-13.0	-39.3	
High Ch, (1907.5 MHz)									
3.815	-26.2	V	3.0	30.1	1.0	-55.3	-13.0	-42.3	
7.630	-28.1	V	3.0	26.2	1.0	-53.3	-13.0	-40.3	
3.815	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.630	-27.0	H	3.0	26.2	1.0	-52.2	-13.0	-39.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
20MHz, QPSK LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-26.9	V	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.440	-27.9	V	3.0	26.4	1.0	-53.3	-13.0	-40.3	
3.720	-26.6	H	3.0	30.2	1.0	-55.8	-13.0	-42.8	
7.440	-26.9	H	3.0	26.4	1.0	-52.3	-13.0	-39.3	
Mid Ch, (1882.5 MHz)									
3.765	-26.9	V	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.530	-28.0	V	3.0	26.3	1.0	-53.3	-13.0	-40.3	
3.765	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-27.1	H	3.0	26.3	1.0	-52.4	-13.0	-39.4	
High Ch, (1905 MHz)									
3.810	-26.5	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.620	-28.0	V	3.0	26.2	1.0	-53.2	-13.0	-40.2	
3.810	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.620	-27.4	H	3.0	26.2	1.0	-52.6	-13.0	-39.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
20MHz,16QAM LAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-27.1	V	3.0	30.2	1.0	-56.3	-13.0	-43.3	
7.440	-28.3	V	3.0	26.4	1.0	-53.7	-13.0	-40.7	
3.720	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.440	-27.4	H	3.0	26.4	1.0	-52.8	-13.0	-39.8	
Mid Ch, (1882.5 MHz)									
3.765	-27.0	V	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.530	-28.0	V	3.0	26.3	1.0	-53.3	-13.0	-40.3	
3.765	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.530	-27.2	H	3.0	26.3	1.0	-52.5	-13.0	-39.5	
High Ch, (1905 MHz)									
3.810	-26.9	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.620	-27.8	V	3.0	26.2	1.0	-53.0	-13.0	-40.0	
3.810	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.620	-27.2	H	3.0	26.2	1.0	-52.4	-13.0	-39.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 26 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 3M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (820.3MHz)									
1.641	-29.3	V	3.0	32.7	1.0	-61.0	-13.0	-48.0	
2.461	-27.6	V	3.0	31.3	1.0	-57.9	-13.0	-44.9	
1.641	-30.3	H	3.0	32.7	1.0	-62.0	-13.0	-49.0	
2.461	-29.2	H	3.0	31.3	1.0	-59.5	-13.0	-46.5	
Mid Ch, (821.3MHz)									
1.643	-28.7	V	3.0	32.7	1.0	-60.4	-13.0	-47.4	
2.496	-27.3	V	3.0	31.5	1.0	-57.8	-13.0	-44.8	
1.643	-28.3	H	3.0	32.7	1.0	-60.0	-13.0	-47.0	
2.496	-28.3	H	3.0	31.5	1.0	-58.8	-13.0	-45.8	
High Ch, (822.3MHz)									
1.645	-28.6	V	3.0	32.7	1.0	-60.3	-13.0	-47.3	
2.467	-27.6	V	3.0	31.3	1.0	-57.9	-13.0	-44.9	
1.645	-31.1	H	3.0	32.7	1.0	-62.8	-13.0	-49.8	
2.467	-29.1	H	3.0	31.3	1.0	-59.4	-13.0	-46.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 26 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 3M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (820.3MHz)									
1.641	-30.3	V	3.0	32.7	1.0	-62.0	-13.0	-49.0	
2.461	-28.5	V	3.0	31.3	1.0	-58.8	-13.0	-45.8	
1.641	-31.2	H	3.0	32.7	1.0	-62.9	-13.0	-49.9	
2.461	-30.1	H	3.0	31.3	1.0	-60.4	-13.0	-47.4	
Mid Ch, (821.3MHz)									
1.643	-29.7	V	3.0	32.7	1.0	-61.4	-13.0	-48.4	
2.496	-28.3	V	3.0	31.5	1.0	-58.8	-13.0	-45.8	
1.643	-29.5	H	3.0	32.7	1.0	-61.2	-13.0	-48.2	
2.496	-29.3	H	3.0	31.5	1.0	-59.8	-13.0	-46.8	
High Ch, (822.3MHz)									
1.645	-29.7	V	3.0	32.7	1.0	-61.4	-13.0	-48.4	
2.467	-28.5	V	3.0	31.3	1.0	-58.8	-13.0	-45.8	
1.645	-32.0	H	3.0	32.7	1.0	-63.7	-13.0	-50.7	
2.467	-30.0	H	3.0	31.3	1.0	-60.3	-13.0	-47.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK/16QAM Band 26 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 5M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, (821.3MHz)									
1.643	-29.2	V	3.0	32.7	1.0	-60.9	-13.0	-47.9	
2.464	-27.6	V	3.0	31.3	1.0	-57.9	-13.0	-44.9	
1.643	-27.9	H	3.0	32.7	1.0	-59.6	-13.0	-46.6	
2.464	-28.5	H	3.0	31.3	1.0	-58.8	-13.0	-45.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 5M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, (821.3MHz)									
1.643	-30.1	V	3.0	32.7	1.0	-61.8	-13.0	-48.8	
2.464	-28.6	V	3.0	31.3	1.0	-58.9	-13.0	-45.9	
1.643	-28.8	H	3.0	32.7	1.0	-60.5	-13.0	-47.5	
2.464	-29.4	H	3.0	31.3	1.0	-59.7	-13.0	-46.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

9.3.2. UAT (PORT B)

QPSK Band 2 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: Band 2, 1.4MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851 MHz)									
3.702	-26.9	V	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.404	-29.1	V	3.0	26.5	1.0	-54.6	-13.0	-41.6	
3.702	-26.7	H	3.0	30.2	1.0	-55.9	-13.0	-42.9	
7.404	-27.8	H	3.0	26.5	1.0	-53.3	-13.0	-40.3	
Mid Ch, (1880 MHz)									
3.760	-26.4	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.520	-28.9	V	3.0	26.3	1.0	-54.2	-13.0	-41.2	
3.760	-25.7	H	3.0	30.1	1.0	-54.8	-13.0	-41.8	
7.520	-27.9	H	3.0	26.3	1.0	-53.2	-13.0	-40.2	
High Ch, (1909.3 MHz)									
3.819	-25.2	V	3.0	30.1	1.0	-54.3	-13.0	-41.3	
7.637	-28.5	V	3.0	26.2	1.0	-53.6	-13.0	-40.6	
3.819	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.637	-28.1	H	3.0	26.2	1.0	-53.3	-13.0	-40.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 1.4MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851 MHz)									
3.702	-28.0	V	3.0	30.2	1.0	-57.2	-13.0	-44.2	
7.404	-29.7	V	3.0	26.5	1.0	-55.2	-13.0	-42.2	
3.702	-27.7	H	3.0	30.2	1.0	-56.9	-13.0	-43.9	
7.404	-28.4	H	3.0	26.5	1.0	-53.9	-13.0	-40.9	
Mid Ch, (1880 MHz)									
3.760	-27.1	V	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.520	-29.6	V	3.0	26.3	1.0	-54.9	-13.0	-41.9	
3.760	-26.4	H	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.520	-28.7	H	3.0	26.3	1.0	-54.0	-13.0	-41.0	
High Ch, (1909.3 MHz)									
3.819	-26.3	V	3.0	30.1	1.0	-55.4	-13.0	-42.4	
7.637	-29.1	V	3.0	26.2	1.0	-54.2	-13.0	-41.2	
3.819	-28.1	H	3.0	30.1	1.0	-57.2	-13.0	-44.2	
7.637	-28.7	H	3.0	26.2	1.0	-53.9	-13.0	-40.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	Kiya Kedida
Configuration:	EUT only
Mode:	Band 2, 3MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852 MHz)									
3.704	-26.4	V	3.0	30.2	1.0	-55.6	-13.0	-42.6	
7.408	-29.0	V	3.0	26.5	1.0	-54.5	-13.0	-41.5	
3.704	-26.2	H	3.0	30.2	1.0	-55.4	-13.0	-42.4	
7.408	-28.2	H	3.0	26.5	1.0	-53.7	-13.0	-40.7	
Mid Ch, (1880 MHz)									
3.760	-26.7	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.520	-29.1	V	3.0	26.3	1.0	-54.4	-13.0	-41.4	
3.760	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.520	-27.8	H	3.0	26.3	1.0	-53.1	-13.0	-40.1	
High Ch, (1909 MHz)									
3.818	-27.1	V	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.636	-28.9	V	3.0	26.2	1.0	-54.0	-13.0	-41.0	
3.818	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.636	-27.4	H	3.0	26.2	1.0	-52.6	-13.0	-39.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 3MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852 MHz)									
3.704	-27.1	V	3.0	30.2	1.0	-56.3	-13.0	-43.3	
7.408	-29.7	V	3.0	26.5	1.0	-55.2	-13.0	-42.2	
3.704	-27.0	H	3.0	30.2	1.0	-56.2	-13.0	-43.2	
7.408	-29.0	H	3.0	26.5	1.0	-54.5	-13.0	-41.5	
Mid Ch, (1880 MHz)									
3.760	-27.6	V	3.0	30.1	1.0	-56.8	-13.0	-43.8	
7.520	-29.8	V	3.0	26.3	1.0	-55.1	-13.0	-42.1	
3.760	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
7.520	-29.0	H	3.0	26.3	1.0	-54.3	-13.0	-41.3	
High Ch, (1909 MHz)									
3.818	-28.0	V	3.0	30.1	1.0	-57.1	-13.0	-44.1	
7.636	-29.0	V	3.0	26.2	1.0	-54.1	-13.0	-41.1	
3.818	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.636	-28.2	H	3.0	26.2	1.0	-53.4	-13.0	-40.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	Kiya Kedida
Configuration:	EUT only
Mode:	Band 2, 5MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T1458449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1853 MHz)									
3.706	-27.9	V	3.0	30.2	1.0	-57.1	-13.0	-44.1	
7.412	-28.9	V	3.0	26.5	1.0	-54.3	-13.0	-41.3	
3.706	-27.4	H	3.0	30.2	1.0	-56.6	-13.0	-43.6	
7.412	-28.1	H	3.0	26.5	1.0	-53.6	-13.0	-40.6	
Mid Ch, (1880 MHz)									
3.760	-26.4	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.520	-28.9	V	3.0	26.3	1.0	-54.2	-13.0	-41.2	
3.760	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.520	-28.6	H	3.0	26.3	1.0	-53.9	-13.0	-40.9	
High Ch, (1908 MHz)									
3.816	-26.5	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.632	-28.5	V	3.0	26.2	1.0	-53.6	-13.0	-40.6	
3.816	-26.6	H	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.632	-27.4	H	3.0	26.2	1.0	-52.6	-13.0	-39.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 5MHz, 16QAM
A28(FLTW)

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1853 MHz)									
3.706	-28.8	V	3.0	30.2	1.0	-58.0	-13.0	-45.0	
7.412	-29.8	V	3.0	26.5	1.0	-55.2	-13.0	-42.2	
3.706	-28.3	H	3.0	30.2	1.0	-57.5	-13.0	-44.5	
7.412	-29.0	H	3.0	26.5	1.0	-54.5	-13.0	-41.5	
Mid Ch, (1880 MHz)									
3.760	-27.1	V	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.520	-29.7	V	3.0	26.3	1.0	-55.0	-13.0	-42.0	
3.760	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
7.520	-29.1	H	3.0	26.3	1.0	-54.4	-13.0	-41.4	
High Ch, (1908 MHz)									
3.816	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.632	-29.7	V	3.0	26.2	1.0	-54.8	-13.0	-41.8	
3.816	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.632	-28.9	H	3.0	26.2	1.0	-54.1	-13.0	-41.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: Band 2, 10MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-27.7	V	3.0	30.2	1.0	-56.9	-13.0	-43.9	
7.420	-29.7	V	3.0	26.5	1.0	-55.1	-13.0	-42.1	
3.710	-27.0	H	3.0	30.2	1.0	-56.2	-13.0	-43.2	
7.420	-28.3	H	3.0	26.5	1.0	-53.8	-13.0	-40.8	
Mid Ch, (1880 MHz)									
3.760	-26.4	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.520	-28.0	V	3.0	26.3	1.0	-53.3	-13.0	-40.3	
3.760	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.520	-28.0	H	3.0	26.3	1.0	-53.3	-13.0	-40.3	
High Ch, (1905 MHz)									
3.810	-26.7	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.620	-28.2	V	3.0	26.2	1.0	-53.4	-13.0	-40.4	
3.810	-27.8	H	3.0	30.1	1.0	-56.9	-13.0	-43.9	
7.620	-27.4	H	3.0	26.2	1.0	-52.6	-13.0	-39.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 10MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	IERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-28.6	V	3.0	30.2	1.0	-57.8	-13.0	-44.8	
7.420	-30.4	V	3.0	26.5	1.0	-55.8	-13.0	-42.8	
3.710	-27.8	H	3.0	30.2	1.0	-57.0	-13.0	-44.0	
7.420	-29.3	H	3.0	26.5	1.0	-54.8	-13.0	-41.8	
Mid Ch, (1880 MHz)									
3.760	-27.2	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.520	-28.9	V	3.0	26.3	1.0	-54.2	-13.0	-41.2	
3.760	-28.7	H	3.0	30.1	1.0	-57.8	-13.0	-44.8	
7.520	-28.6	H	3.0	26.3	1.0	-53.9	-13.0	-40.9	
High Ch, (1905 MHz)									
3.810	-27.6	V	3.0	30.1	1.0	-56.7	-13.0	-43.7	
7.620	-29.4	V	3.0	26.2	1.0	-54.6	-13.0	-41.6	
3.810	-28.6	H	3.0	30.1	1.0	-57.7	-13.0	-44.7	
7.620	-28.6	H	3.0	26.2	1.0	-53.8	-13.0	-40.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: Band 2, 15MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1858 MHz)									
3.716	-27.5	V	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.432	-29.6	V	3.0	26.4	1.0	-55.0	-13.0	-42.0	
3.716	-26.6	H	3.0	30.2	1.0	-55.8	-13.0	-42.8	
7.432	-28.0	H	3.0	26.4	1.0	-53.4	-13.0	-40.4	
Mid Ch, (1880 MHz)									
3.760	-27.3	V	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.520	-29.6	V	3.0	26.3	1.0	-54.9	-13.0	-41.9	
3.760	-26.5	H	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.520	-27.5	H	3.0	26.3	1.0	-52.8	-13.0	-39.8	
High Ch, (1903 MHz)									
3.806	-26.8	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.612	-29.2	V	3.0	26.2	1.0	-54.4	-13.0	-41.4	
3.806	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.612	-27.8	H	3.0	26.2	1.0	-53.0	-13.0	-40.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 15MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1858 MHz)									
3.716	-28.5	V	3.0	30.2	1.0	-57.7	-13.0	-44.7	
7.432	-30.4	V	3.0	26.4	1.0	-55.8	-13.0	-42.8	
3.716	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.432	-29.1	H	3.0	26.4	1.0	-54.5	-13.0	-41.5	
Mid Ch, (1880 MHz)									
3.760	-28.4	V	3.0	30.1	1.0	-57.6	-13.0	-44.6	
7.520	-30.5	V	3.0	26.3	1.0	-55.8	-13.0	-42.8	
3.760	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.520	-28.9	H	3.0	26.3	1.0	-54.2	-13.0	-41.2	
High Ch, (1903 MHz)									
3.806	-27.3	V	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.612	-30.6	V	3.0	26.2	1.0	-55.8	-13.0	-42.8	
3.806	-27.5	H	3.0	30.1	1.0	-56.6	-13.0	-43.6	
7.612	-28.5	H	3.0	26.2	1.0	-53.7	-13.0	-40.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 2 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: Band 2, 20MHz, QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-25.5	V	3.0	30.2	1.0	-54.7	-13.0	-41.7	
7.440	-28.8	V	3.0	26.4	1.0	-54.2	-13.0	-41.2	
3.720	-25.6	H	3.0	30.2	1.0	-54.8	-13.0	-41.8	
7.440	-28.2	H	3.0	26.4	1.0	-53.6	-13.0	-40.6	
Mid Ch, (1880 MHz)									
3.760	-27.1	V	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.520	-29.6	V	3.0	26.3	1.0	-54.9	-13.0	-41.9	
3.760	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.520	-27.7	H	3.0	26.3	1.0	-53.0	-13.0	-40.0	
High Ch, (1900 MHz)									
3.800	-26.8	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.600	-29.6	V	3.0	26.2	1.0	-54.8	-13.0	-41.8	
3.800	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.600	-27.7	H	3.0	26.2	1.0	-53.0	-13.0	-40.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 2 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Kiya Kedida
Configuration: EUT only
Mode: band 2, 20MHz, 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-26.4	V	3.0	30.2	1.0	-55.6	-13.0	-42.6	
7.440	-29.4	V	3.0	26.4	1.0	-54.8	-13.0	-41.8	
3.720	-26.4	H	3.0	30.2	1.0	-55.6	-13.0	-42.6	
7.440	-29.3	H	3.0	26.4	1.0	-54.7	-13.0	-41.7	
Mid Ch, (1880 MHz)									
3.760	-28.2	V	3.0	30.1	1.0	-57.4	-13.0	-44.4	
7.520	-30.6	V	3.0	26.3	1.0	-55.9	-13.0	-42.9	
3.760	-28.0	H	3.0	30.1	1.0	-57.1	-13.0	-44.1	
7.520	-28.3	H	3.0	26.3	1.0	-53.6	-13.0	-40.6	
High Ch, (1900 MHz)									
3.800	-27.7	V	3.0	30.1	1.0	-56.8	-13.0	-43.8	
7.600	-30.6	V	3.0	26.2	1.0	-55.8	-13.0	-42.8	
3.800	-27.7	H	3.0	30.1	1.0	-56.8	-13.0	-43.8	
7.600	-28.5	H	3.0	26.2	1.0	-53.8	-13.0	-40.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
1.4MHz BW, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1710.7 MHz)									
3.421	-28.4	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.132	-31.4	V	3.0	28.8	1.0	-59.2	-13.0	-46.2	
3.421	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.132	-30.1	H	3.0	28.8	1.0	-57.8	-13.0	-44.8	
Mid Ch, (1732.5 MHz)									
3.465	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
High Ch, (1754.3 MHz)									
3.509	-28.3	V	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.263	-31.0	V	3.0	28.6	1.0	-58.6	-13.0	-45.6	
3.509	-29.3	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.263	-29.7	H	3.0	28.6	1.0	-57.4	-13.0	-44.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
1.4MHz BW, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1710.7 MHz)									
3.421	-28.5	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.132	-31.2	V	3.0	28.8	1.0	-59.0	-13.0	-46.0	
3.421	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.132	-30.2	H	3.0	28.8	1.0	-57.9	-13.0	-44.9	
Mid Ch, (1732.5 MHz)									
3.465	-28.4	V	3.0	30.4	1.0	-57.8	-13.0	-44.8	
5.198	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.465	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	
High Ch, (1754.3 MHz)									
3.509	-28.6	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.263	-31.5	V	3.0	28.6	1.0	-59.1	-13.0	-46.1	
3.509	-29.0	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.263	-30.0	H	3.0	28.6	1.0	-57.7	-13.0	-44.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
3MHz BW, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1711.5 MHz)									
3.423	-28.2	V	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.135	-30.9	V	3.0	28.8	1.0	-58.7	-13.0	-45.7	
3.423	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.135	-29.3	H	3.0	28.8	1.0	-57.0	-13.0	-44.0	
Mid Ch, (1732.5 MHz)									
3.465	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.198	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.465	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.198	-29.6	H	3.0	28.7	1.0	-57.3	-13.0	-44.3	
High Ch, (1753.5 MHz)									
3.507	-28.9	V	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.261	-30.9	V	3.0	28.6	1.0	-58.5	-13.0	-45.5	
3.507	-29.0	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.261	-29.7	H	3.0	28.6	1.0	-57.4	-13.0	-44.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
3MHz BW, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1711.5 MHz)									
3.423	-28.6	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.135	-31.1	V	3.0	28.8	1.0	-58.9	-13.0	-45.9	
3.423	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.135	-30.0	H	3.0	28.8	1.0	-57.7	-13.0	-44.7	
Mid Ch, (1732.5 MHz)									
3.465	-29.1	V	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.465	-29.5	H	3.0	30.4	1.0	-58.9	-13.0	-45.9	
5.198	-29.8	H	3.0	28.7	1.0	-57.5	-13.0	-44.5	
High Ch, (1753.5 MHz)									
3.507	-28.4	V	3.0	30.4	1.0	-57.8	-13.0	-44.8	
5.261	-31.2	V	3.0	28.6	1.0	-58.8	-13.0	-45.8	
3.507	-28.8	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.261	-29.9	H	3.0	28.6	1.0	-57.6	-13.0	-44.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
5MHz BW, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5 MHz)									
3.425	-28.7	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.138	-30.8	V	3.0	28.8	1.0	-58.6	-13.0	-45.6	
3.425	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.138	-29.6	H	3.0	28.8	1.0	-57.3	-13.0	-44.3	
Mid Ch, (1732.5 MHz)									
3.465	-29.1	V	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-29.1	H	3.0	30.4	1.0	-58.5	-13.0	-45.5	
5.198	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	
High Ch, (1752.5 MHz)									
3.505	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.258	-31.4	V	3.0	28.6	1.0	-59.0	-13.0	-46.0	
3.505	-29.3	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.258	-29.8	H	3.0	28.6	1.0	-57.5	-13.0	-44.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
5MHz BW, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5 MHz)									
3.425	-28.8	V	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.138	-31.4	V	3.0	28.8	1.0	-59.2	-13.0	-46.2	
3.425	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.138	-29.6	H	3.0	28.8	1.0	-57.3	-13.0	-44.3	
Mid Ch, (1732.5 MHz)									
3.465	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.465	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-29.7	H	3.0	28.7	1.0	-57.4	-13.0	-44.4	
High Ch, (1752.5 MHz)									
3.505	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.258	-31.4	V	3.0	28.6	1.0	-59.0	-13.0	-46.0	
3.505	-29.1	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.258	-30.0	H	3.0	28.6	1.0	-57.7	-13.0	-44.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band4
10MHz BW, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715 MHz)									
3.430	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.145	-31.1	V	3.0	28.8	1.0	-58.8	-13.0	-45.8	
3.430	-29.0	H	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.145	-29.9	H	3.0	28.8	1.0	-57.6	-13.0	-44.6	
Mid Ch, (1732.5 MHz)									
3.465	-28.3	V	3.0	30.4	1.0	-57.7	-13.0	-44.7	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.198	-30.1	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	
High Ch, (1750 MHz)									
3.500	-23.0	V	3.0	30.4	1.0	-52.4	-13.0	-39.4	
5.250	-31.2	V	3.0	28.7	1.0	-58.9	-13.0	-45.9	
3.500	-28.8	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.250	-29.3	H	3.0	28.7	1.0	-57.0	-13.0	-44.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band4
10MHz BW, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715 MHz)									
3.430	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.145	-31.0	V	3.0	28.8	1.0	-58.7	-13.0	-45.7	
3.430	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.145	-29.3	H	3.0	28.8	1.0	-57.0	-13.0	-44.0	
Mid Ch, (1732.5 MHz)									
3.465	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.198	-31.8	V	3.0	28.7	1.0	-59.5	-13.0	-46.5	
3.465	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
High Ch, (1750 MHz)									
3.500	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.250	-30.9	V	3.0	28.7	1.0	-58.6	-13.0	-45.6	
3.500	-28.6	H	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.250	-29.7	H	3.0	28.7	1.0	-57.4	-13.0	-44.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
15MHz BW, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1717.5 MHz)									
3.435	-28.6	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.153	-31.8	V	3.0	28.7	1.0	-59.5	-13.0	-46.5	
3.435	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.153	-30.0	H	3.0	28.7	1.0	-57.7	-13.0	-44.7	
Mid Ch, (1732.5 MHz)									
3.465	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.198	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	
High Ch, (1747.5 MHz)									
3.495	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.243	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.495	-29.3	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.243	-29.9	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
15MHz BW, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1717.5 MHz)									
3.435	-28.9	V	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.153	-31.6	V	3.0	28.7	1.0	-59.3	-13.0	-46.3	
3.435	-28.8	H	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.153	-30.3	H	3.0	28.7	1.0	-58.0	-13.0	-45.0	
Mid Ch, (1732.5 MHz)									
3.465	-28.4	V	3.0	30.4	1.0	-57.8	-13.0	-44.8	
5.198	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.465	-28.9	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.198	-30.1	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	
High Ch, (1747.5 MHz)									
3.495	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.243	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.495	-29.0	H	3.0	30.4	1.0	-58.3	-13.0	-45.3	
5.243	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
20MHz BW, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1720 MHz)									
3.440	-28.5	V	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.160	-31.4	V	3.0	28.7	1.0	-59.1	-13.0	-46.1	
3.440	-28.5	H	3.0	30.4	1.0	-57.9	-13.0	-44.9	
5.160	-30.1	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	
Mid Ch, (1732.5 MHz)									
3.465	-28.6	V	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.198	-30.9	V	3.0	28.7	1.0	-58.6	-13.0	-45.6	
3.465	-28.7	H	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.198	-29.8	H	3.0	28.7	1.0	-57.5	-13.0	-44.5	
High Ch, (1745 MHz)									
3.490	-28.2	V	3.0	30.4	1.0	-57.6	-13.0	-44.6	
5.235	-31.6	V	3.0	28.7	1.0	-59.3	-13.0	-46.3	
3.490	-28.6	H	3.0	30.4	1.0	-58.0	-13.0	-45.0	
5.235	-30.2	H	3.0	28.7	1.0	-57.8	-13.0	-44.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 4 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 4,
20MHz BW, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1720 MHz)									
3.440	-29.0	V	3.0	30.4	1.0	-58.4	-13.0	-45.4	
5.160	-31.1	V	3.0	28.7	1.0	-58.8	-13.0	-45.8	
3.440	-29.2	H	3.0	30.4	1.0	-58.6	-13.0	-45.6	
5.160	-29.5	H	3.0	28.7	1.0	-57.2	-13.0	-44.2	
Mid Ch, (1732.5 MHz)									
3.465	-28.8	V	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.198	-31.3	V	3.0	28.7	1.0	-59.0	-13.0	-46.0	
3.465	-29.3	H	3.0	30.4	1.0	-58.7	-13.0	-45.7	
5.198	-29.4	H	3.0	28.7	1.0	-57.1	-13.0	-44.1	
High Ch, (1745 MHz)									
3.490	-28.7	V	3.0	30.4	1.0	-58.1	-13.0	-45.1	
5.235	-31.7	V	3.0	28.7	1.0	-59.4	-13.0	-46.4	
3.490	-28.8	H	3.0	30.4	1.0	-58.2	-13.0	-45.2	
5.235	-30.0	H	3.0	28.7	1.0	-57.6	-13.0	-44.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5, 1.4M
QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-25.2	V	3.0	32.7	1.0	-56.9	-13.0	-43.9	
2.474	-25.2	V	3.0	31.4	1.0	-55.6	-13.0	-42.6	
1.649	-27.5	H	3.0	32.7	1.0	-59.2	-13.0	-46.2	
2.474	-27.1	H	3.0	31.4	1.0	-57.5	-13.0	-44.5	
Mid Ch, (836.5MHz)									
1.673	-24.3	V	3.0	32.6	1.0	-55.9	-13.0	-42.9	
2.510	-25.1	V	3.0	31.5	1.0	-55.6	-13.0	-42.6	
1.673	-25.0	H	3.0	32.6	1.0	-56.6	-13.0	-43.6	
2.510	-27.2	H	3.0	31.5	1.0	-57.7	-13.0	-44.7	
High Ch, (848.3MHz)									
1.697	-22.4	V	3.0	32.6	1.0	-53.9	-13.0	-40.9	
2.545	-26.5	V	3.0	31.4	1.0	-57.0	-13.0	-44.0	
1.697	-23.6	H	3.0	32.6	1.0	-55.1	-13.0	-42.1	
2.545	-28.0	H	3.0	31.4	1.0	-58.4	-13.0	-45.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B5, 1.4M 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.7MHz)									
1.649	-25.6	V	3.0	32.7	1.0	-57.3	-13.0	-44.3	
2.474	-25.5	V	3.0	31.4	1.0	-55.9	-13.0	-42.9	
1.649	-27.4	H	3.0	32.7	1.0	-59.1	-13.0	-46.1	
2.474	-27.4	H	3.0	31.4	1.0	-57.8	-13.0	-44.8	
Mid Ch, (836.5MHz)									
1.673	-24.0	V	3.0	32.6	1.0	-55.6	-13.0	-42.6	
2.510	-25.3	V	3.0	31.5	1.0	-55.8	-13.0	-42.8	
1.673	-25.6	H	3.0	32.6	1.0	-57.2	-13.0	-44.2	
2.510	-27.5	H	3.0	31.5	1.0	-58.0	-13.0	-45.0	
High Ch, (848.3MHz)									
1.697	-22.8	V	3.0	32.6	1.0	-54.3	-13.0	-41.3	
2.545	-26.6	V	3.0	31.4	1.0	-57.1	-13.0	-44.1	
1.697	-24.1	H	3.0	32.6	1.0	-55.6	-13.0	-42.6	
2.545	-28.2	H	3.0	31.4	1.0	-58.6	-13.0	-45.6	

Rev. 03.03.09

QPSK Band 5 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5 3M
QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-26.0	V	3.0	32.7	1.0	-57.7	-13.0	-44.7	
2.477	-25.3	V	3.0	31.4	1.0	-55.7	-13.0	-42.7	
1.651	-26.6	H	3.0	32.7	1.0	-58.3	-13.0	-45.3	
2.477	-27.0	H	3.0	31.4	1.0	-57.4	-13.0	-44.4	
Mid Ch, (836.5MHz)									
1.673	-24.5	V	3.0	32.6	1.0	-56.1	-13.0	-43.1	
2.510	-25.6	V	3.0	31.5	1.0	-56.1	-13.0	-43.1	
1.673	-27.4	H	3.0	32.6	1.0	-59.0	-13.0	-46.0	
2.510	-28.2	H	3.0	31.5	1.0	-58.7	-13.0	-45.7	
High Ch, (847.5MHz)									
1.695	-24.8	V	3.0	32.6	1.0	-56.3	-13.0	-43.3	
2.543	-26.4	V	3.0	31.4	1.0	-56.8	-13.0	-43.8	
1.695	-26.1	H	3.0	32.6	1.0	-57.6	-13.0	-44.6	
2.543	-28.1	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B5 3M 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (825.5MHz)									
1.651	-26.5	V	3.0	32.7	1.0	-58.2	-13.0	-45.2	
2.477	-26.0	V	3.0	31.4	1.0	-56.4	-13.0	-43.4	
1.651	-27.4	H	3.0	32.7	1.0	-59.1	-13.0	-46.1	
2.477	-27.7	H	3.0	31.4	1.0	-58.1	-13.0	-45.1	
Mid Ch, (836.5MHz)									
1.673	-25.0	V	3.0	32.6	1.0	-56.6	-13.0	-43.6	
2.510	-26.0	V	3.0	31.5	1.0	-56.5	-13.0	-43.5	
1.673	-27.7	H	3.0	32.6	1.0	-59.3	-13.0	-46.3	
2.510	-28.1	H	3.0	31.5	1.0	-58.6	-13.0	-45.6	
High Ch, (847.5MHz)									
1.695	-25.2	V	3.0	32.6	1.0	-56.7	-13.0	-43.7	
2.543	-26.6	V	3.0	31.4	1.0	-57.0	-13.0	-44.0	
1.695	-26.7	H	3.0	32.6	1.0	-58.2	-13.0	-45.2	
2.543	-28.3	H	3.0	31.4	1.0	-58.7	-13.0	-45.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/06/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B5, 5MHz
QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.653	-26.1	V	3.0	32.7	1.0	-57.8	-13.0	-44.8	
2.480	-26.4	V	3.0	31.4	1.0	-56.8	-13.0	-43.8	
1.653	-29.3	H	3.0	32.7	1.0	-60.9	-13.0	-47.9	
2.480	-28.1	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	
Mid Ch, (836.5MHz)									
1.673	-26.8	V	3.0	32.6	1.0	-58.4	-13.0	-45.4	
2.510	-26.0	V	3.0	31.5	1.0	-56.5	-13.0	-43.5	
1.673	-26.4	H	3.0	32.6	1.0	-58.0	-13.0	-45.0	
2.510	-28.1	H	3.0	31.5	1.0	-58.6	-13.0	-45.6	
High Ch, (846.5MHz)									
1.693	-26.6	V	3.0	32.6	1.0	-58.1	-13.0	-45.1	
2.540	-26.4	V	3.0	31.4	1.0	-56.8	-13.0	-43.8	
1.693	-27.2	H	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.540	-28.0	H	3.0	31.4	1.0	-58.5	-13.0	-45.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/06/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B5, 5MHz 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (826.5MHz)									
1.653	-26.7	V	3.0	32.7	1.0	-58.4	-13.0	-45.4	
2.480	-26.5	V	3.0	31.4	1.0	-56.9	-13.0	-43.9	
1.653	-29.4	H	3.0	32.7	1.0	-61.0	-13.0	-48.0	
2.480	-28.2	H	3.0	31.4	1.0	-58.6	-13.0	-45.6	
Mid Ch, (836.5MHz)									
1.673	-26.9	V	3.0	32.6	1.0	-58.5	-13.0	-45.5	
2.510	-26.3	V	3.0	31.5	1.0	-56.8	-13.0	-43.8	
1.673	-27.3	H	3.0	32.6	1.0	-58.9	-13.0	-45.9	
2.510	-28.2	H	3.0	31.5	1.0	-58.7	-13.0	-45.7	
High Ch, (846.5MHz)									
1.693	-26.9	V	3.0	32.6	1.0	-58.4	-13.0	-45.4	
2.540	-26.8	V	3.0	31.4	1.0	-57.2	-13.0	-44.2	
1.693	-28.1	H	3.0	32.6	1.0	-59.6	-13.0	-46.6	
2.540	-28.2	H	3.0	31.4	1.0	-58.7	-13.0	-45.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 5 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE B5 10M
QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829MHz)									
1.658	-26.8	V	3.0	32.6	1.0	-58.5	-13.0	-45.5	
2.487	-26.6	V	3.0	31.4	1.0	-57.0	-13.0	-44.0	
1.658	-29.0	H	3.0	32.6	1.0	-60.6	-13.0	-47.6	
2.487	-28.5	H	3.0	31.4	1.0	-59.0	-13.0	-46.0	
Mid Ch, (836.5MHz)									
1.673	-26.8	V	3.0	32.6	1.0	-58.4	-13.0	-45.4	
2.510	-26.3	V	3.0	31.5	1.0	-56.8	-13.0	-43.8	
1.673	-27.5	H	3.0	32.6	1.0	-59.1	-13.0	-46.1	
2.510	-28.2	H	3.0	31.5	1.0	-58.7	-13.0	-45.7	
High Ch, (844MHz)									
1.688	-27.1	V	3.0	32.6	1.0	-58.6	-13.0	-45.6	
2.532	-26.5	V	3.0	31.5	1.0	-57.0	-13.0	-44.0	
1.688	-29.3	H	3.0	32.6	1.0	-60.9	-13.0	-47.9	
2.532	-28.2	H	3.0	31.5	1.0	-58.7	-13.0	-45.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 5 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	Tony Wang
Configuration:	EUT only
Mode:	TX, LTE B5 10M 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (829MHz)									
1.658	-27.0	V	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.487	-26.5	V	3.0	31.4	1.0	-56.9	-13.0	-43.9	
1.658	-29.3	H	3.0	32.6	1.0	-60.9	-13.0	-47.9	
2.487	-28.6	H	3.0	31.4	1.0	-59.1	-13.0	-46.1	
Mid Ch, (836.5MHz)									
1.673	-27.1	V	3.0	32.6	1.0	-58.7	-13.0	-45.7	
2.510	-26.5	V	3.0	31.5	1.0	-57.0	-13.0	-44.0	
1.673	-28.0	H	3.0	32.6	1.0	-59.6	-13.0	-46.6	
2.510	-28.5	H	3.0	31.5	1.0	-59.0	-13.0	-46.0	
High Ch, (844MHz)									
1.688	-26.9	V	3.0	32.6	1.0	-58.4	-13.0	-45.4	
2.532	-26.7	V	3.0	31.5	1.0	-57.2	-13.0	-44.2	
1.688	-30.1	H	3.0	32.6	1.0	-61.7	-13.0	-48.7	
2.532	-28.3	H	3.0	31.5	1.0	-58.8	-13.0	-45.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 13 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE band 13, 5MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.559	-25.4	V	3.0	32.9	1.0	-57.3	-13.0	-44.3	
2.339	-25.6	V	3.0	31.1	1.0	-55.8	-13.0	-42.8	
1.559	-29.3	H	3.0	32.9	1.0	-61.1	-13.0	-48.1	
2.339	-27.1	H	3.0	31.1	1.0	-57.2	-13.0	-44.2	
Mid Ch, (782 MHz)									
1.564	-26.8	V	3.0	32.9	1.0	-58.7	-13.0	-45.7	
2.346	-26.0	V	3.0	31.1	1.0	-56.1	-13.0	-43.1	
1.564	-29.0	H	3.0	32.9	1.0	-60.9	-13.0	-47.9	
2.346	-27.4	H	3.0	31.1	1.0	-57.5	-13.0	-44.5	
High Ch, (784.5 MHz)									
1.569	-26.9	V	3.0	32.8	1.0	-58.8	-13.0	-45.8	
2.354	-25.3	V	3.0	31.1	1.0	-55.4	-13.0	-42.4	
1.569	-29.1	H	3.0	32.8	1.0	-61.0	-13.0	-48.0	
2.354	-26.9	H	3.0	31.1	1.0	-57.0	-13.0	-44.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 13 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: Tony Wang
Configuration: EUT only
Mode: TX, LTE band 13, 5MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (779.5 MHz)									
1.559	-26.2	V	3.0	32.9	1.0	-58.1	-13.0	-45.1	
2.339	-25.7	V	3.0	31.1	1.0	-55.9	-13.0	-42.9	
1.559	-29.2	H	3.0	32.9	1.0	-61.0	-13.0	-48.0	
2.339	-27.2	H	3.0	31.1	1.0	-57.3	-13.0	-44.3	
Mid Ch, (782 MHz)									
1.564	-27.0	V	3.0	32.9	1.0	-58.9	-13.0	-45.9	
2.346	-26.2	V	3.0	31.1	1.0	-56.3	-13.0	-43.3	
1.564	-29.3	H	3.0	32.9	1.0	-61.2	-13.0	-48.2	
2.346	-27.5	H	3.0	31.1	1.0	-57.6	-13.0	-44.6	
High Ch, (784.5 MHz)									
1.569	-27.1	V	3.0	32.8	1.0	-59.0	-13.0	-46.0	
2.354	-25.5	V	3.0	31.1	1.0	-55.6	-13.0	-42.6	
1.569	-29.2	H	3.0	32.8	1.0	-61.1	-13.0	-48.1	
2.354	-27.1	H	3.0	31.1	1.0	-57.2	-13.0	-44.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 13 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 13, 10MHz
QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch. (782 MHz)									
1.564	-26.0	V	3.0	32.9	1.0	-57.9	-13.0	-44.9	
2.346	-25.2	V	3.0	31.1	1.0	-55.3	-13.0	-42.3	
1.564	-29.0	H	3.0	32.9	1.0	-60.9	-13.0	-47.9	
2.346	-27.7	H	3.0	31.1	1.0	-57.8	-13.0	-44.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 13 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 13, 10MHz
16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch. (782 MHz)									
1.564	-26.6	V	3.0	32.9	1.0	-58.5	-13.0	-45.5	
2.346	-25.6	V	3.0	31.1	1.0	-55.7	-13.0	-42.7	
1.564	-29.1	H	3.0	32.9	1.0	-61.0	-13.0	-48.0	
2.346	-27.7	H	3.0	31.1	1.0	-57.8	-13.0	-44.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B17
5M QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.413	-28.7	V	3.0	33.1	1.0	-60.8	-13.0	-47.8	
2.120	-27.7	V	3.0	31.6	1.0	-58.3	-13.0	-45.3	
1.413	-30.2	H	3.0	33.1	1.0	-62.3	-13.0	-49.3	
2.120	-29.3	H	3.0	31.6	1.0	-59.9	-13.0	-46.9	
Mid Ch, (710MHz)									
1.420	-28.7	V	3.0	33.1	1.0	-60.8	-13.0	-47.8	
2.130	-28.2	V	3.0	31.6	1.0	-58.8	-13.0	-45.8	
1.420	-30.5	H	3.0	33.1	1.0	-62.6	-13.0	-49.6	
2.130	-29.7	H	3.0	31.6	1.0	-60.3	-13.0	-47.3	
High Ch, (713.5MHz)									
1.427	-29.0	V	3.0	33.1	1.0	-61.0	-13.0	-48.0	
2.141	-27.8	V	3.0	31.6	1.0	-58.3	-13.0	-45.3	
1.427	-30.6	H	3.0	33.1	1.0	-62.7	-13.0	-49.7	
2.141	-29.9	H	3.0	31.6	1.0	-60.4	-13.0	-47.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B17
5M 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (706.5MHz)									
1.413	-28.6	V	3.0	33.1	1.0	-60.7	-13.0	-47.7	
2.120	-28.1	V	3.0	31.6	1.0	-58.7	-13.0	-45.7	
1.413	-30.3	H	3.0	33.1	1.0	-62.4	-13.0	-49.4	
2.120	-29.5	H	3.0	31.6	1.0	-60.1	-13.0	-47.1	
Mid Ch, (710MHz)									
1.420	-28.8	V	3.0	33.1	1.0	-60.9	-13.0	-47.9	
2.130	-28.3	V	3.0	31.6	1.0	-58.9	-13.0	-45.9	
1.420	-30.6	H	3.0	33.1	1.0	-62.7	-13.0	-49.7	
2.130	-29.8	H	3.0	31.6	1.0	-60.4	-13.0	-47.4	
High Ch, (713.5MHz)									
1.427	-28.8	V	3.0	33.1	1.0	-60.8	-13.0	-47.8	
2.141	-28.2	V	3.0	31.6	1.0	-58.7	-13.0	-45.7	
1.427	-30.8	H	3.0	33.1	1.0	-62.9	-13.0	-49.9	
2.141	-23.7	H	3.0	31.6	1.0	-54.2	-13.0	-41.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	13U14987
Date:	06/07/13
Test Engineer:	T Wang
Configuration:	EUT only
Mode:	TX, LTE B17
	10M QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709MHz)									
1.418	-28.2	V	3.0	33.1	1.0	-60.3	-13.0	-47.3	
2.127	-27.7	V	3.0	31.6	1.0	-58.3	-13.0	-45.3	
1.418	-30.7	H	3.0	33.1	1.0	-62.8	-13.0	-49.8	
2.127	-29.9	H	3.0	31.6	1.0	-60.5	-13.0	-47.5	
Mid Ch, (710MHz)									
1.420	-28.8	V	3.0	33.1	1.0	-60.9	-13.0	-47.9	
2.130	-27.5	V	3.0	31.6	1.0	-58.1	-13.0	-45.1	
1.420	-30.3	H	3.0	33.1	1.0	-62.4	-13.0	-49.4	
2.130	-29.8	H	3.0	31.6	1.0	-60.4	-13.0	-47.4	
High Ch, (711MHz)									
1.422	-28.9	V	3.0	33.1	1.0	-61.0	-13.0	-48.0	
2.133	-28.0	V	3.0	31.6	1.0	-58.5	-13.0	-45.5	
1.422	-30.7	H	3.0	33.1	1.0	-62.8	-13.0	-49.8	
2.133	-28.9	H	3.0	31.6	1.0	-59.5	-13.0	-46.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 17 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/07/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE B17
10M 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (709MHz)									
1.418	-28.4	V	3.0	33.1	1.0	-60.5	-13.0	-47.5	
2.127	-28.0	V	3.0	31.6	1.0	-58.6	-13.0	-45.6	
1.418	-30.6	H	3.0	33.1	1.0	-62.7	-13.0	-49.7	
2.127	-30.0	H	3.0	31.6	1.0	-60.6	-13.0	-47.6	
Mid Ch, (710MHz)									
1.420	-28.7	V	3.0	33.1	1.0	-60.8	-13.0	-47.8	
2.130	-28.1	V	3.0	31.6	1.0	-58.7	-13.0	-45.7	
1.420	-30.6	H	3.0	33.1	1.0	-62.7	-13.0	-49.7	
2.130	-30.0	H	3.0	31.6	1.0	-60.6	-13.0	-47.6	
High Ch, (711MHz)									
1.422	-28.8	V	3.0	33.1	1.0	-60.9	-13.0	-47.9	
2.133	-28.1	V	3.0	31.6	1.0	-58.6	-13.0	-45.6	
1.422	-30.8	H	3.0	33.1	1.0	-62.9	-13.0	-49.9	
2.133	-29.4	H	3.0	31.6	1.0	-60.0	-13.0	-47.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
1.4MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.7 MHz)									
3.701	-26.5	V	3.0	30.2	1.0	-55.7	-13.0	-42.7	
7.403	-28.3	V	3.0	26.5	1.0	-53.8	-13.0	-40.8	
3.701	-27.8	H	3.0	30.2	1.0	-57.0	-13.0	-44.0	
7.403	-27.1	H	3.0	26.5	1.0	-52.6	-13.0	-39.6	
Mid Ch, (1882.5 MHz)									
3.765	-26.5	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.530	-27.4	V	3.0	26.3	1.0	-52.7	-13.0	-39.7	
3.765	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.530	-27.2	H	3.0	26.3	1.0	-52.5	-13.0	-39.5	
High Ch, (1914.3 MHz)									
3.829	-26.9	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.657	-27.9	V	3.0	26.1	1.0	-53.1	-13.0	-40.1	
3.829	-26.2	H	3.0	30.1	1.0	-55.3	-13.0	-42.3	
7.657	-25.9	H	3.0	26.1	1.0	-51.0	-13.0	-38.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (1.4 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
1.4MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.7 MHz)									
3.701	-26.6	V	3.0	30.2	1.0	-55.8	-13.0	-42.8	
7.403	-28.1	V	3.0	26.5	1.0	-53.6	-13.0	-40.6	
3.701	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.403	-27.3	H	3.0	26.5	1.0	-52.8	-13.0	-39.8	
Mid Ch, (1882.5 MHz)									
3.765	-26.7	V	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.530	-27.7	V	3.0	26.3	1.0	-53.0	-13.0	-40.0	
3.765	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.530	-27.3	H	3.0	26.3	1.0	-52.6	-13.0	-39.6	
High Ch, (1914.3 MHz)									
3.829	-27.1	V	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.657	-27.7	V	3.0	26.1	1.0	-52.9	-13.0	-39.9	
3.829	-26.7	H	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.657	-26.2	H	3.0	26.1	1.0	-51.3	-13.0	-38.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 3MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.5 MHz)									
3.703	-26.3	V	3.0	30.2	1.0	-55.5	-13.0	-42.5	
7.406	-28.2	V	3.0	26.5	1.0	-53.7	-13.0	-40.7	
3.703	-26.7	H	3.0	30.2	1.0	-55.9	-13.0	-42.9	
7.406	-26.9	H	3.0	26.5	1.0	-52.4	-13.0	-39.4	
Mid Ch, (1882.5 MHz)									
3.765	-26.6	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.530	-27.4	V	3.0	26.3	1.0	-52.7	-13.0	-39.7	
3.765	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.530	-26.3	H	3.0	26.3	1.0	-51.6	-13.0	-38.6	
High Ch, (1913.5 MHz)									
3.827	-26.4	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.654	-27.9	V	3.0	26.1	1.0	-53.0	-13.0	-40.0	
3.827	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.654	-26.8	H	3.0	26.1	1.0	-51.9	-13.0	-38.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 3MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.5 MHz)									
3.703	-26.7	V	3.0	30.2	1.0	-55.9	-13.0	-42.9	
7.406	-28.4	V	3.0	26.5	1.0	-53.9	-13.0	-40.9	
3.703	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.406	-27.1	H	3.0	26.5	1.0	-52.6	-13.0	-39.6	
Mid Ch, (1882.5 MHz)									
3.765	-26.9	V	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.530	-27.6	V	3.0	26.3	1.0	-52.9	-13.0	-39.9	
3.765	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.530	-26.8	H	3.0	26.3	1.0	-52.1	-13.0	-39.1	
High Ch, (1913.5 MHz)									
3.827	-26.6	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.654	-28.1	V	3.0	26.1	1.0	-53.2	-13.0	-40.2	
3.827	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.654	-27.0	H	3.0	26.1	1.0	-52.1	-13.0	-39.1	

Rev. 03.03.09

QPSK Band 25 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
5MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.5 MHz)									
3.705	-26.9	V	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.410	-28.0	V	3.0	26.5	1.0	-53.4	-13.0	-40.4	
3.705	-27.5	H	3.0	30.2	1.0	-56.7	-13.0	-43.7	
7.410	-27.0	H	3.0	26.5	1.0	-52.5	-13.0	-39.5	
Mid Ch, (1882.5 MHz)									
3.765	-26.3	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.530	-26.4	V	3.0	26.3	1.0	-51.7	-13.0	-38.7	
3.765	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-26.7	H	3.0	26.3	1.0	-52.0	-13.0	-39.0	
High Ch, (1912.5 MHz)									
3.825	-26.0	V	3.0	30.1	1.0	-55.1	-13.0	-42.1	
7.650	-28.1	V	3.0	26.2	1.0	-53.2	-13.0	-40.2	
3.825	-26.8	H	3.0	30.1	1.0	-55.9	-13.0	-42.9	
7.650	-27.7	H	3.0	26.2	1.0	-52.8	-13.0	-39.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
5MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.5 MHz)									
3.705	-27.1	V	3.0	30.2	1.0	-56.3	-13.0	-43.3	
7.410	-27.8	V	3.0	26.5	1.0	-53.2	-13.0	-40.2	
3.705	-27.4	H	3.0	30.2	1.0	-56.6	-13.0	-43.6	
7.410	-27.2	H	3.0	26.5	1.0	-52.7	-13.0	-39.7	
Mid Ch, (1882.5 MHz)									
3.765	-26.6	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.530	-27.8	V	3.0	26.3	1.0	-53.1	-13.0	-40.1	
3.765	-27.2	H	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.530	-26.9	H	3.0	26.3	1.0	-52.2	-13.0	-39.2	
High Ch, (1912.5 MHz)									
3.825	-26.2	V	3.0	30.1	1.0	-55.3	-13.0	-42.3	
7.650	-27.8	V	3.0	26.2	1.0	-52.9	-13.0	-39.9	
3.825	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.650	-26.9	H	3.0	26.2	1.0	-52.0	-13.0	-39.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
10MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-27.2	V	3.0	30.2	1.0	-56.4	-13.0	-43.4	
7.420	-28.0	V	3.0	26.5	1.0	-53.4	-13.0	-40.4	
3.710	-27.0	H	3.0	30.2	1.0	-56.2	-13.0	-43.2	
7.420	-26.9	H	3.0	26.5	1.0	-52.4	-13.0	-39.4	
Mid Ch, (1882.5 MHz)									
3.765	-26.8	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-28.5	V	3.0	26.3	1.0	-53.8	-13.0	-40.8	
3.765	-27.1	H	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.530	-27.7	H	3.0	26.3	1.0	-53.0	-13.0	-40.0	
High Ch, (1909.8 MHz)									
3.820	-26.5	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.639	-28.3	V	3.0	26.2	1.0	-53.4	-13.0	-40.4	
3.820	-27.2	H	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.639	-27.1	H	3.0	26.2	1.0	-52.3	-13.0	-39.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (10.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
10MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1855 MHz)									
3.710	-27.3	V	3.0	30.2	1.0	-56.5	-13.0	-43.5	
7.420	-28.3	V	3.0	26.5	1.0	-53.7	-13.0	-40.7	
3.710	-27.2	H	3.0	30.2	1.0	-56.4	-13.0	-43.4	
7.420	-27.0	H	3.0	26.5	1.0	-52.5	-13.0	-39.5	
Mid Ch, (1882.5 MHz)									
3.765	-27.0	V	3.0	30.1	1.0	-56.2	-13.0	-43.2	
7.530	-28.6	V	3.0	26.3	1.0	-53.9	-13.0	-40.9	
3.765	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.530	-27.6	H	3.0	26.3	1.0	-52.9	-13.0	-39.9	
High Ch, (1909.8 MHz)									
3.820	-26.7	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.639	-39.1	V	3.0	26.2	1.0	-64.2	-13.0	-51.2	
3.820	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.639	-27.2	H	3.0	26.2	1.0	-52.4	-13.0	-39.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 15MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1857.5 MHz)									
3.715	-26.3	V	3.0	30.2	1.0	-55.5	-13.0	-42.5	
7.430	-29.0	V	3.0	26.4	1.0	-54.4	-13.0	-41.4	
3.715	-26.6	H	3.0	30.2	1.0	-55.8	-13.0	-42.8	
7.430	-28.0	H	3.0	26.4	1.0	-53.4	-13.0	-40.4	
Mid Ch, (1882.5 MHz)									
3.765	-26.4	V	3.0	30.1	1.0	-55.6	-13.0	-42.6	
7.530	-29.0	V	3.0	26.3	1.0	-54.3	-13.0	-41.3	
3.765	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-28.1	H	3.0	26.3	1.0	-53.4	-13.0	-40.4	
High Ch, (1907.5 MHz)									
3.815	-26.4	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.630	-28.6	V	3.0	26.2	1.0	-53.8	-13.0	-40.8	
3.815	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.630	-27.8	H	3.0	26.2	1.0	-53.0	-13.0	-40.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (15.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25, 15MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1857.5 MHz)									
3.715	-26.6	V	3.0	30.2	1.0	-55.8	-13.0	-42.8	
7.430	-28.9	V	3.0	26.4	1.0	-54.3	-13.0	-41.3	
3.715	-26.9	H	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.430	-28.2	H	3.0	26.4	1.0	-53.6	-13.0	-40.6	
Mid Ch, (1882.5 MHz)									
3.765	-26.8	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-29.0	V	3.0	26.3	1.0	-54.3	-13.0	-41.3	
3.765	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.530	-28.0	H	3.0	26.3	1.0	-53.3	-13.0	-40.3	
High Ch, (1907.5 MHz)									
3.815	-26.7	V	3.0	30.1	1.0	-55.8	-13.0	-42.8	
7.630	-29.0	V	3.0	26.2	1.0	-54.2	-13.0	-41.2	
3.815	-27.4	H	3.0	30.1	1.0	-56.5	-13.0	-43.5	
7.630	-27.9	H	3.0	26.2	1.0	-53.1	-13.0	-40.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 25 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
20MHz, QPSK UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-26.9	V	3.0	30.2	1.0	-56.1	-13.0	-43.1	
7.440	-29.7	V	3.0	26.4	1.0	-55.1	-13.0	-42.1	
3.720	-27.4	H	3.0	30.2	1.0	-56.6	-13.0	-43.6	
7.440	-28.5	H	3.0	26.4	1.0	-53.9	-13.0	-40.9	
Mid Ch, (1882.5 MHz)									
3.765	-26.3	V	3.0	30.1	1.0	-55.5	-13.0	-42.5	
7.530	-29.3	V	3.0	26.3	1.0	-54.6	-13.0	-41.6	
3.765	-26.9	H	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.530	-28.1	H	3.0	26.3	1.0	-53.4	-13.0	-40.4	
High Ch, (1905 MHz)									
3.810	-26.6	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.620	-28.4	V	3.0	26.2	1.0	-53.6	-13.0	-40.6	
3.810	-27.0	H	3.0	30.1	1.0	-56.1	-13.0	-43.1	
7.620	-28.2	H	3.0	26.2	1.0	-53.4	-13.0	-40.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 25 (20.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 06/10/13
Test Engineer: T Wang
Configuration: EUT only
Mode: TX, LTE band 25
20MHz, 16QAM UAT

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1860 MHz)									
3.720	-27.1	V	3.0	30.2	1.0	-56.3	-13.0	-43.3	
7.440	-29.2	V	3.0	26.4	1.0	-54.6	-13.0	-41.6	
3.720	-27.3	H	3.0	30.2	1.0	-56.5	-13.0	-43.5	
7.440	-28.3	H	3.0	26.4	1.0	-53.7	-13.0	-40.7	
Mid Ch, (1882.5 MHz)									
3.765	-26.5	V	3.0	30.1	1.0	-55.7	-13.0	-42.7	
7.530	-29.2	V	3.0	26.3	1.0	-54.5	-13.0	-41.5	
3.765	-27.2	H	3.0	30.1	1.0	-56.3	-13.0	-43.3	
7.530	-28.2	H	3.0	26.3	1.0	-53.5	-13.0	-40.5	
High Ch, (1905 MHz)									
3.810	-26.9	V	3.0	30.1	1.0	-56.0	-13.0	-43.0	
7.620	-28.9	V	3.0	26.2	1.0	-54.1	-13.0	-41.1	
3.810	-27.3	H	3.0	30.1	1.0	-56.4	-13.0	-43.4	
7.620	-27.8	H	3.0	26.2	1.0	-53.0	-13.0	-40.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK Band 26 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 3M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (820.3MHz)									
1.641	-28.5	V	3.0	32.7	1.0	-60.2	-13.0	-47.2	
2.461	-27.8	V	3.0	31.3	1.0	-58.1	-13.0	-45.1	
1.641	-31.0	H	3.0	32.7	1.0	-62.7	-13.0	-49.7	
2.461	-29.3	H	3.0	31.3	1.0	-59.6	-13.0	-46.6	
Mid Ch, (821.3MHz)									
1.643	-29.0	V	3.0	32.7	1.0	-60.7	-13.0	-47.7	
2.496	-27.2	V	3.0	31.5	1.0	-57.7	-13.0	-44.7	
1.643	-30.8	H	3.0	32.7	1.0	-62.5	-13.0	-49.5	
2.496	-28.6	H	3.0	31.5	1.0	-59.1	-13.0	-46.1	
High Ch, (822.3MHz)									
1.645	-29.2	V	3.0	32.7	1.0	-60.9	-13.0	-47.9	
2.467	-27.5	V	3.0	31.3	1.0	-57.8	-13.0	-44.8	
1.645	-31.3	H	3.0	32.7	1.0	-63.0	-13.0	-50.0	
2.467	-28.9	H	3.0	31.3	1.0	-59.2	-13.0	-46.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

16QAM Band 26 (3.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 3M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (820.3MHz)									
1.641	-29.3	V	3.0	32.7	1.0	-61.0	-13.0	-48.0	
2.461	-28.7	V	3.0	31.3	1.0	-59.0	-13.0	-46.0	
1.641	-31.9	H	3.0	32.7	1.0	-63.6	-13.0	-50.6	
2.461	-30.3	H	3.0	31.3	1.0	-60.6	-13.0	-47.6	
Mid Ch, (821.3MHz)									
1.643	-29.9	V	3.0	32.7	1.0	-61.6	-13.0	-48.6	
2.496	-28.1	V	3.0	31.5	1.0	-58.6	-13.0	-45.6	
1.643	-31.7	H	3.0	32.7	1.0	-63.4	-13.0	-50.4	
2.496	-29.6	H	3.0	31.5	1.0	-60.1	-13.0	-47.1	
High Ch, (822.3MHz)									
1.645	-30.2	V	3.0	32.7	1.0	-61.9	-13.0	-48.9	
2.467	-28.3	V	3.0	31.3	1.0	-58.6	-13.0	-45.6	
1.645	-32.2	H	3.0	32.7	1.0	-63.9	-13.0	-50.9	
2.467	-29.7	H	3.0	31.3	1.0	-60.0	-13.0	-47.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

QPSK /16QAM Band 26 (5.0 MHz BANDWIDTH)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 5M har QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, (821.3MHz)									
1.643	-28.8	V	3.0	32.7	1.0	-60.5	-13.0	-47.5	
2.464	-27.7	V	3.0	31.3	1.0	-58.0	-13.0	-45.0	
1.643	-31.4	H	3.0	32.7	1.0	-63.1	-13.0	-50.1	
2.464	-29.6	H	3.0	31.3	1.0	-59.9	-13.0	-46.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 13U14987
Date: 07/16/13
Test Engineer: R Zheng
Configuration: EUT only
Mode: B26 5M har 16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber D	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, (821.3MHz)									
1.643	-29.9	V	3.0	32.7	1.0	-61.6	-13.0	-48.6	
2.464	-27.6	V	3.0	31.3	1.0	-57.9	-13.0	-44.9	
1.643	-32.4	H	3.0	32.7	1.0	-64.1	-13.0	-51.1	
2.464	-30.6	H	3.0	31.3	1.0	-60.9	-13.0	-47.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

9.4.

9.5. RECEIVER SPURIOUS EMISSIONS

RULE PART(S)

FCC: N/A

LIMIT

Spurious Emission Limits for Receivers:

Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

TEST PROCEDURE

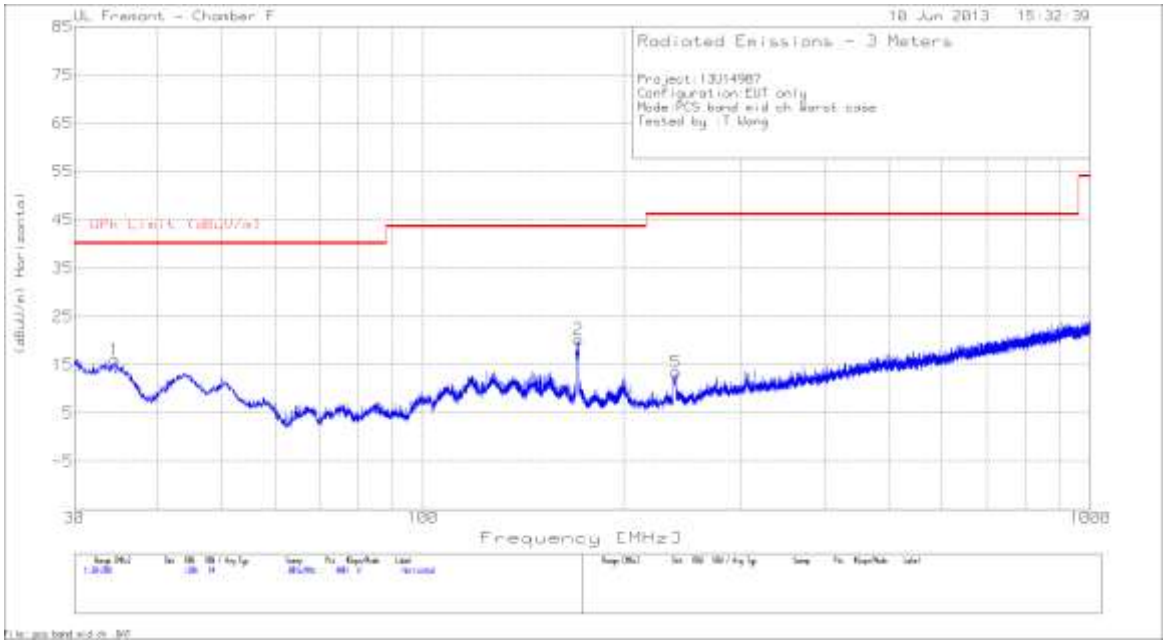
The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency),

or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

RESULTS

RECEIVER SPURIOUS EMISSIONS FOR 30 TO 1000 MHz, HORIZONTAL

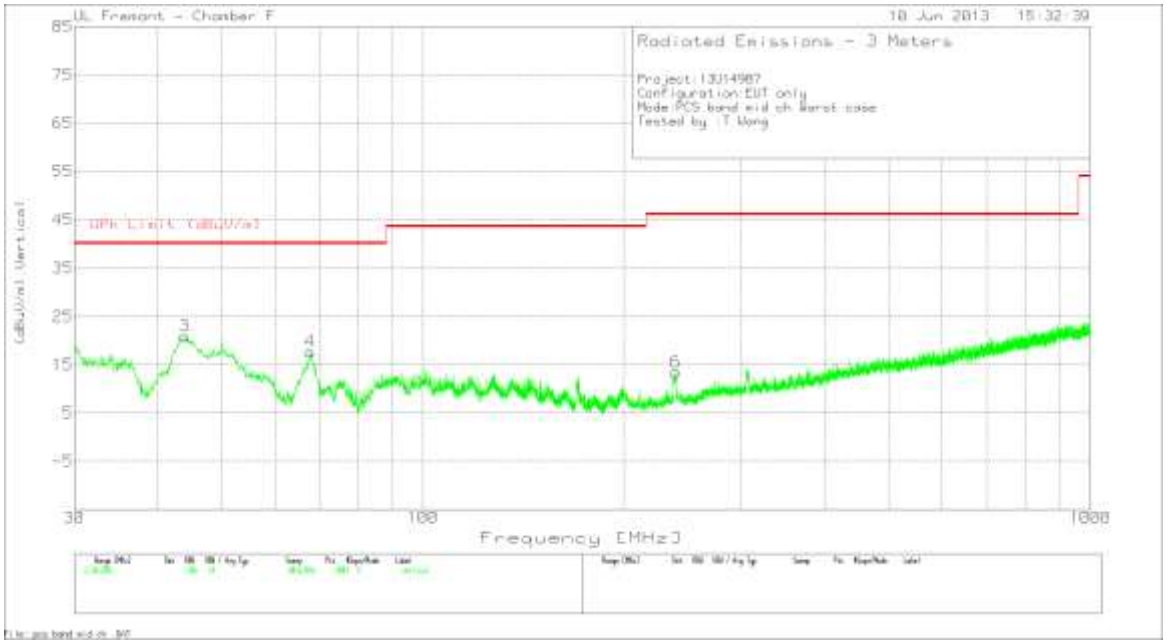
HORIZONTAL PLOT



Horizontal 30 - 200MHz										
Marker No.	Test Frequency	Meter Reading (dBuV)	Detector	AF T122 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
1	34.505	30.11	PK	18	-32.1	16.01	40	-23.99	100	Horz
2	171.0575	39.68	PK	11.8	-31.3	20.18	43.52	-23.34	100	Horz
Horizontal 200 - 1000MHz										
5	239.5	32.74	PK	11.7	-31	13.44	46.02	-32.58	100	Horz

RECEIVER SPURIOUS EMISSIONS FOR 30 TO 1000 MHz, VERTICAL

VERTICAL PLOT



Vertical 30 - 200MHz										
Marker No.	Test Frequency	Meter Reading (dBuV)	Detector	AF T122 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
3	43.94	41.91	PK	11	-32	20.91	40	-19.09	100	Vert
4	67.74	41.49	PK	8	-31.8	17.69	40	-22.31	100	Vert
Vertical 200 - 1000MHz										
6	239.5	32.79	PK	11.7	-31	13.49	46.02	-32.53	300	Vert