MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313
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13501 MCCALLEN PASS • AUSTIN, TEXAS 78753 • PHONE (512) 287-2500 • FAX (512) 287-2513

January 4, 2017

CommScope Technologies LLC
250 Apollo Drive
Chelmsford, MA 01824

Dear Kevin Craig,

Enclosed is the EMC Wireless test report for compliance testing of the CommScope Technologies LLC, Small Cell/ Model S1000R as tested to the requirements of the FCC Certification rules under Title 47 of the CFR Part 27 Subpart L and RSS-139, Issue 2, February 2009 for Broadband Radio Service (BRS) Devices.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\CommScope Technologies LLC\EMC91761-FCC27 Rev. 3)

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Electromagnetic Compatibility Criteria Test Report

for the

CommScope Technologies LLC
Model Small Cell/ Model S1000R

Tested under
FCC Certification Rules
Title 47 of the CFR, Part 27 Subpart L
& RSS-139, Issue 2, February 2009

MET Report: EMC91761-FCC27 Rev. 3

January 4, 2017

Prepared For:

CommScope Technologies LLC
250 Apollo Drive
Chelmsford, MA 01824

Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave
Baltimore, MD 21230

Electromagnetic Compatibility Criteria
Test Report

for the

CommScope Technologies LLC
Model Small Cell/ Model S1000R

Tested Under

FCC Certification Rules
Title 47 of the CFR, Part 27 Subpart L
& RSS-139, Issue 2, February 2009

Deepak Giri, Project Engineer
Electromagnetic Compatibility Lab

Jennifer Warnell
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 27 Lof the FCC Rules and Industry Canada standard RSS-139, Issue 2, February 2009 under normal use and maintenance.

Asad Bajwa,
Director, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	October 26, 2016	Initial Issue.
1	November 18, 2016	Updated per engineer and customer corrections.
2	December 9, 2016	Engineer corrections.
3	January 4, 2017	EUT Photos Removed for Short Term Confidentiality

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ertz
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ertz
kPa	**k**ilo**pa**scal
kV	**k**ilovolt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**micro**henry
µ	**micro**farad
µs	**micro**seconds
NEBS	**N**etwork **E**quipment-**B**uilding **S**ystem
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the CommScope Technologies LLC Small Cell/ Model S1000R, with the requirements of Part 27. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the Small Cell/ Model S1000R. CommScope Technologies LLC should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Small Cell/ Model S1000R, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 27, in accordance with CommScope Technologies LLC, purchase order number 60521.

Reference	IC Reference	Description	Compliance
§2.1046; §27.50(h)	RSS-139; Section 6. 5	RF Power Output	Compliant
§2.1047	RSS-139; Section 6.2	Modulation Characteristics	Not Applicable
§2.1049	RSS-GEN	Occupied Bandwidth	Compliant
§27.53	RSS-139; Section 6.5	Emissions in GPS Bands	Not Applicable – EUT does not operate in the 700-800 MHz bands.
§2.1051; §27.53(m)	RSS-139; Section 6. 6	Spurious Emissions at Antenna Terminals	Compliant
§2.1053	RSS-139; Section 6. 6	Radiated Spurious Emissions	Compliant
§2.1055	RSS-139; Section 6.4	Frequency Stability	Compliant

Table 1. Executive Summary of EMC ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by CommScope Technologies LLC to perform testing on the Small Cell/ Model S1000R, under CommScope Technologies LLC's purchase order number 60521.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the CommScope Technologies LLC, Small Cell/ Model S1000R.

The results obtained relate only to the item(s) tested.

Model(s) Tested	Small Cell/ Model S1000R	
Model(s) Covered:	Small Cell/ Model S1000R	
EUT Specifications:	Primary Power: 120 VAC, 60 Hz	
	Equipment Code:	PCB
	RF Output Power:	19.78 dBm
	EUT Frequency Range:	2496MHz-2690 MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35° C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Deepak Giri	
Date(s):	January 4, 2017	

Table 2. EUT Summary Table

B. References

CFR 47, Part 27	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 27: Rules and Regulations for Advanced Wireless Services
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
EIA/TIA-603-A-2001	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards
RSS-139, Issue 2, July 2015	Advanced wireless Services Equipment Operating in the Bands 1710-1755 MHz and 2110-2155 MHz

Table 3. Standard References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Ave, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 meter semi-anechoic chamber (equivalent to an Open Area Test Site).

D. Description of Test Sample

The CommScope Technologies LLC Small Cell/ Model S1000R, Equipment Under Test (EUT), is a LTE/Wi-Fi Low Power Femto Backhaul Relay Base Station. It is intended to be use in the Small to Medium Business's to provide indoor voice and data coverage.

E. Equipment Configuration

Ref. ID	Name / Description	Model Number	Part Number
1	Femto Backhaul Relay Base Station	S1000R	800239
2	DYS Switching Mode Power Supply	DYS650-120400W-1	DYS650-120400-16419

Table 4. Equipment Configuration

F. Support Equipment

Ref. ID	Name / Description	Manufacturer	Model Number	Customer Supplied Calibration Data
1	MXA Analyzer	Agilent	N9020A	10-14-2015-10-14-2017
2	Rubidium	Stanford Research Systems	FS725	06-06-2016
3	Waveform Generator	Keysight	33500B	not applicable
4	Wi-Fi Router	Linksys	EA2700	not applicable
5	Laptop	Dell	Latitude E6440	not applicable
6	USB Optical Mouse	Dell		not applicable
7	AC Adapter for Laptop	Dell		not applicable
8	Cat5 cables			not applicable
9	RF Test cables	Murata	MXHS83QE3000	not applicable

Table 5. Support Equipment

*-- the customer supplied calibration data column will be marked as either not applicable, or will contain the calibration date supplied by the customer.

G. Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
1	Data	RG59 Coax	1	15	Yes	B. TX
2	AC Input	3 conductor, 18 awg	1	2	No	(230v/50hz)

Table 6. Ports and Cabling Information

H. Mode of Operation

The Femto Backhaul Relay Base station will be operating in 2 modes LTE and Wi-Fi.

LTE - The Backhaul relay radio transmits in Bands 25 & 26 (FDD) Bandwidth 3, 5 & 10 MHz & Band 41 (TDD) sub bands 2500-2570 MHz & 2620-2690 MHz. Test mode uses the suppliers test software CLI in order to be able to provide a continuous transmit stream for EMC testing. Transmitters shall be at max power of Band 25 (+22dBm), Band 26 (+20dBm) & Band 41(+22dBm).

LTE - The service radio transmits in Band 41 (TDD). Test mode uses the chipset suppliers test software TMU in order to be able to provide a continuous transmit stream for EMC testing. Transmitters shall be at max power of. + 22 dBm

Wi-Fi – The Wi-Fi radios, 2.4 & 5 GHz, will be tested uses the chipset suppliers test software ART. Transmitters shall be at max power of +17dBm.

A laptop using telnet sessions and test scripts will be used to control the radio for LTE and Wi-Fi during EMC testing.

A laptop using a serial connection and test scripts will be used during LTE Radio & Safety testing.

Mode of Operation Tested:

Band 41 LTE – TDD transmitter modes;

1. FCC Part 27 (Band 41) – 20 MHz Bw- QPSK modulation
2. FCC Part 27 (band 41) – 20 MHz Bw- QAM-16 modulation
3. FCC Part 27 (Band 41) – 20 MHz Bw- QAM-64 modulation

I. Method of Monitoring EUT Operation

Consistent with the Mode of Operation section above, there needs to be a means of continuously monitoring the operation of the EUT.

1. All radios can be monitored by the software indicating the state of the radio links via CLI. Also the DC power consumed is an indicator of the state of the system.
2. Same as above.

J. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to CommScope Technologies LLC upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1046 RF Power Output

Test Requirement(s): §2.1046 and 27.50 (h) --- Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

RSS-139, Section 6.5 Transmitter Output Power --- The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1710-1780 MHz shall not exceed one watt.

Consult SRSP-513 for e.i.r.p. limits on fixed and base stations operating in the band 2110-2180 MHz

Test Procedures: *RF power output measurement* was made at the RF output terminal using a spectrum analyzer for downlink.

Test Results: Equipment complies with 47CFR 2.1046 and 27.50(h). The following page show measurements of RF Power output which is recorded below:

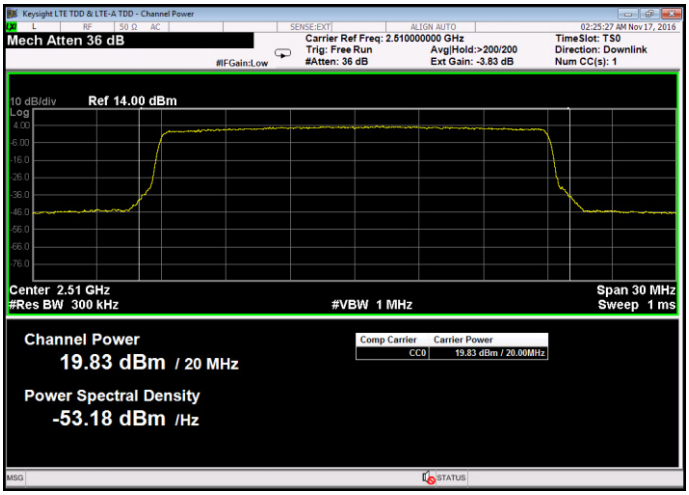
Test Engineer(s): Deepak Giri

Test Date(s): 10/06/16

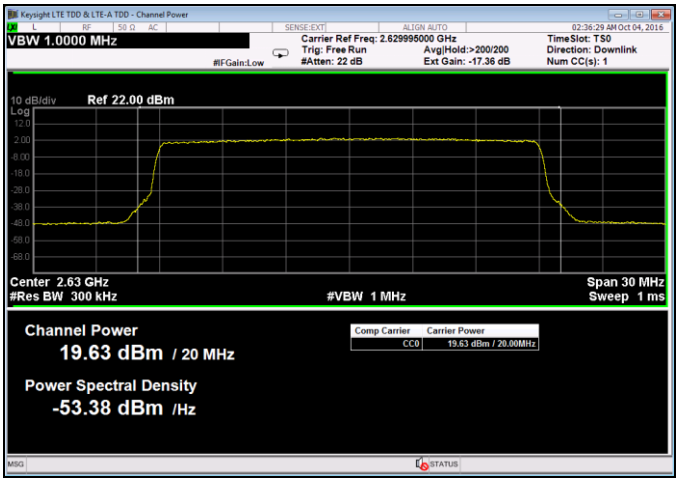
Conducted Power					
Frequency MHz	**Ch. Width**	**Port**	**Channel**	**Mode**	**Conducted Power dBm**
2510	20MHz	1	low	QPSK	19.88
2630	20MHz	1	mid	QPSK	19.78
2680	20MHz	1	high	QPSK	19.78
2510	20MHz	2	low	QPSK	19.62
2630	20MHz	2	mid	QPSK	19.7
2680	20MHz	2	high	QPSK	19.78
2510	20MHz	1	low	QAM-16	19.83
2630	20MHz	1	mid	QAM-16	19.63
2680	20MHz	1	high	QAM-16	19.69
2510	20MHz	2	low	QAM-16	19.71
2630	20MHz	2	mid	QAM-16	19.63
2680	20MHz	2	high	QAM-16	19.74
2510	20MHz	1	low	QAM-64	19.84
2630	20MHz	1	mid	QAM-64	19.65
2680	20MHz	1	high	QAM-64	19.72
2510	20MHz	2	low	QAM-64	19.79
2630	20MHz	2	mid	QAM-64	19.6
2680	20MHz	2	high	QAM-64	19.74

Table 7. RF Output Power, Test Results

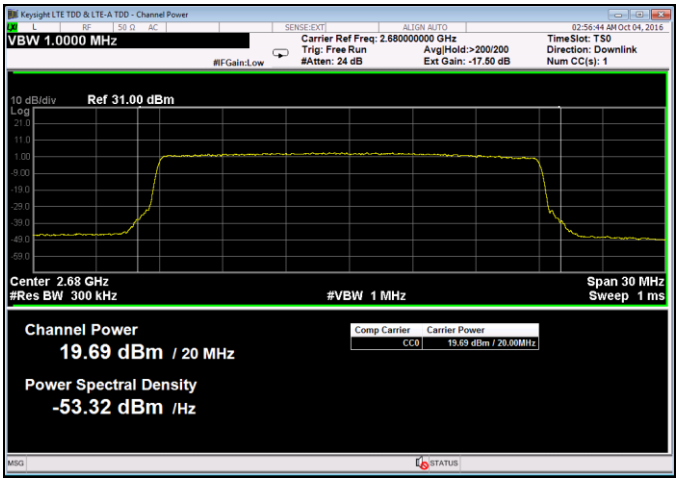
RF Output Power, QAM-16, Port 1



Plot 1. RF Output Power, Low Channel, QAM-16, Port 1

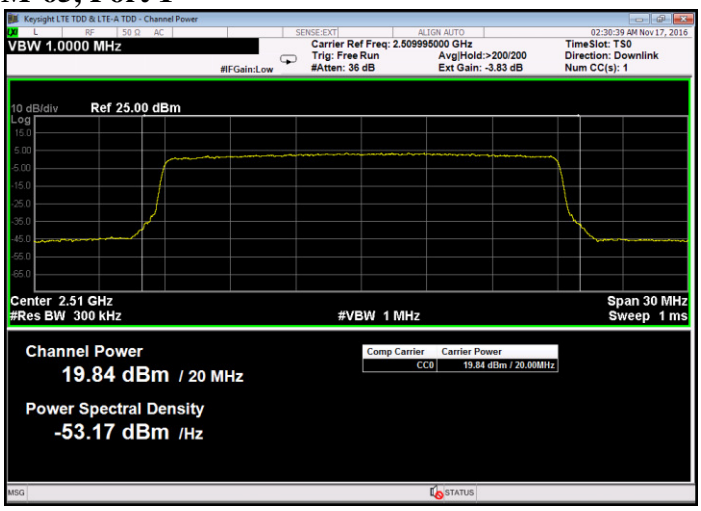


Plot 2. RF Output Power, Mid Channel, QAM-16, Port 1

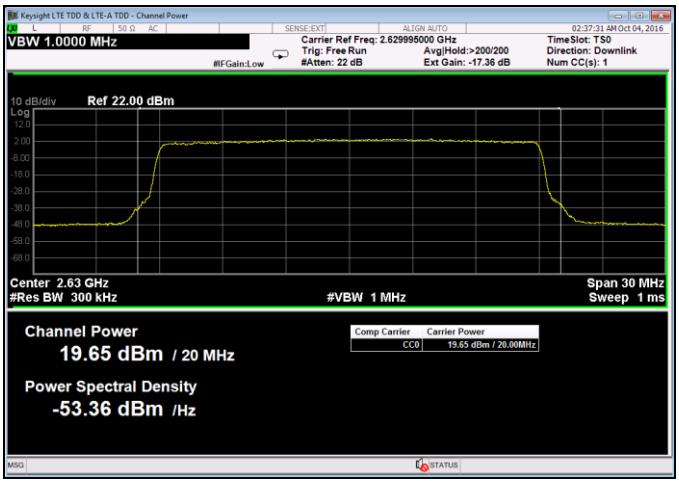


Plot 3. RF Output Power, High Channel, QAM-16, Port 1

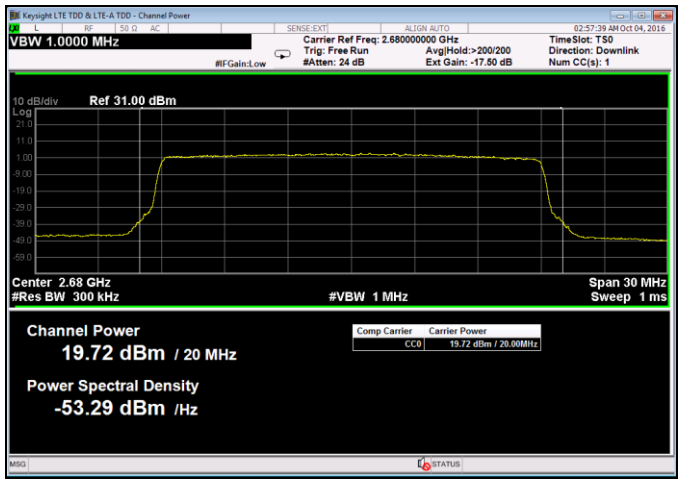
RF Output Power, QAM-65, Port 1



Plot 4. RF Output Power, Low Channel, QAM-64, Port 1

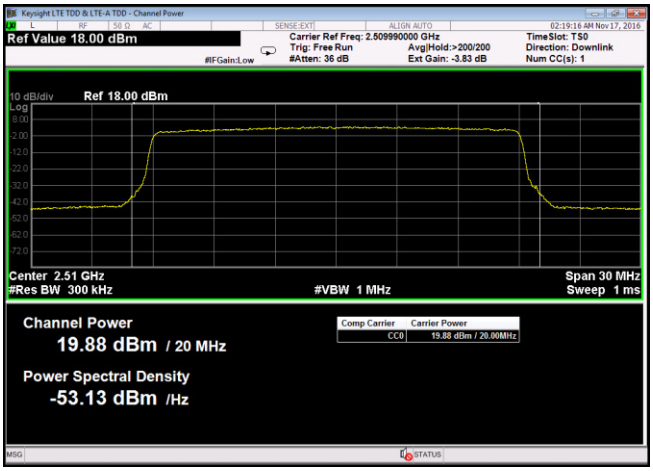


Plot 5. RF Output Power, Mid Channel, QAM-64, Port 1

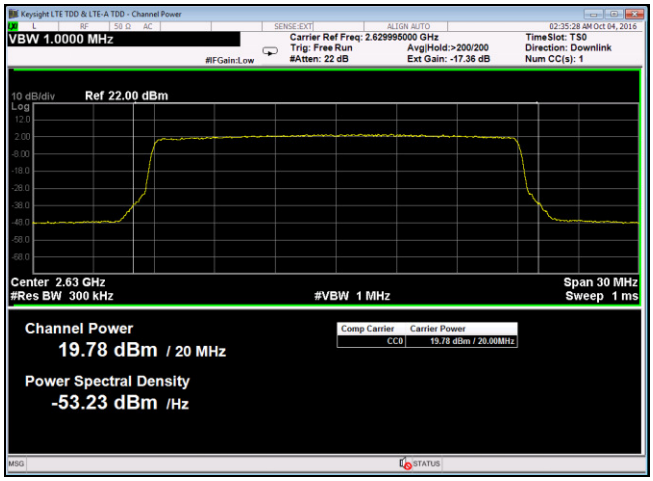


Plot 6. RF Output Power, High Channel, QAM-64, Port 1

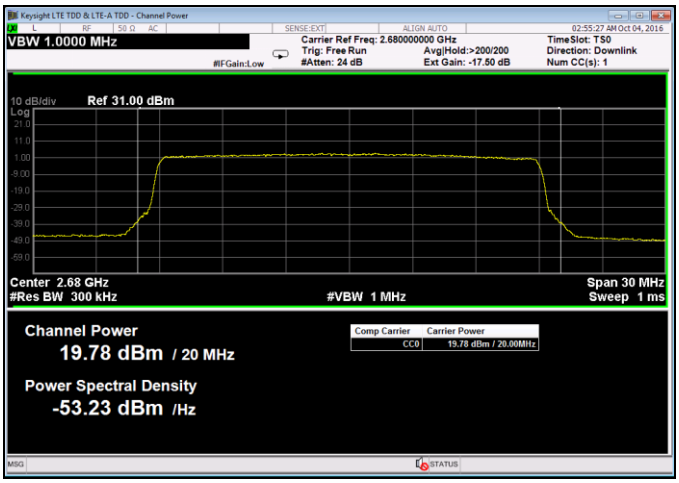
RF Output Power, QPSK, Port 1



Plot 7. RF Output Power, Low Channel, QPSK, Port 1

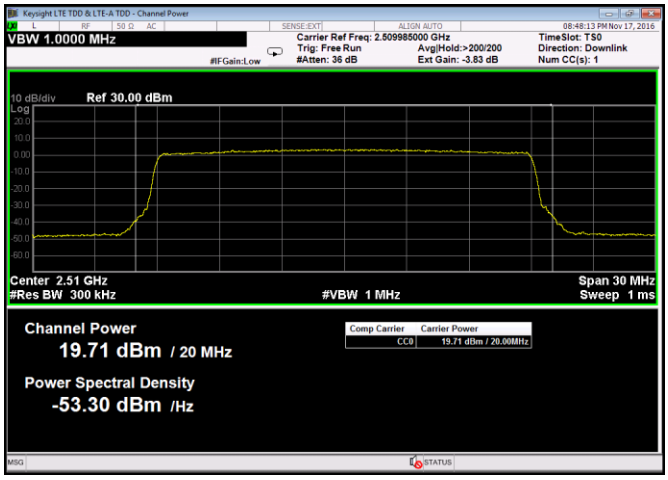


Plot 8. RF Output Power, Mid Channel, QPSK, Port 1

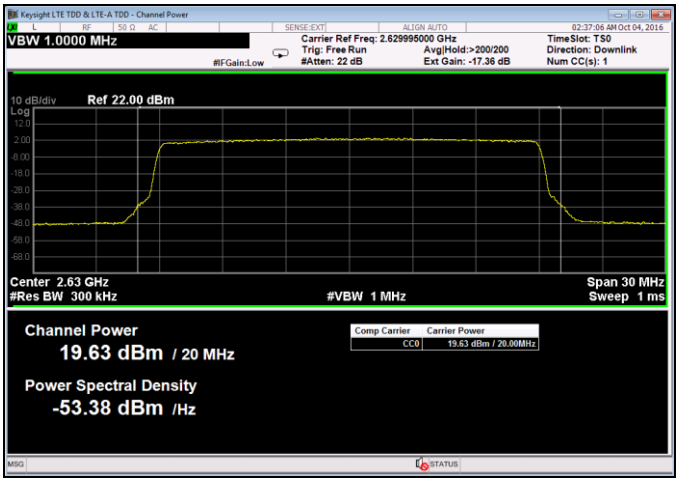


Plot 9. RF Output Power, High Channel, QPSK, Port 1

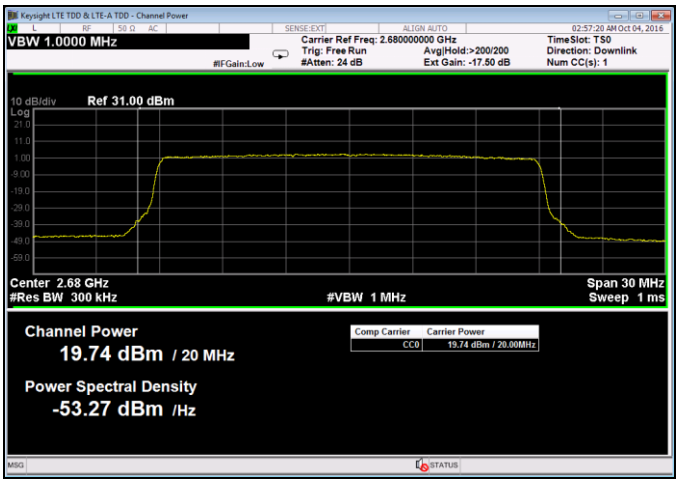
RF Output Power, QAM-16, Port 2



Plot 10. RF Output Power, Low Channel, QAM-16, Port 2

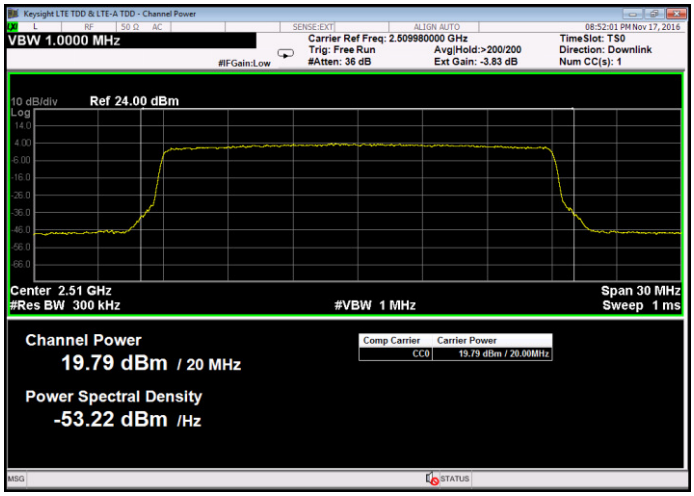


Plot 11. RF Output Power, Mid Channel, QAM-16, Port 2

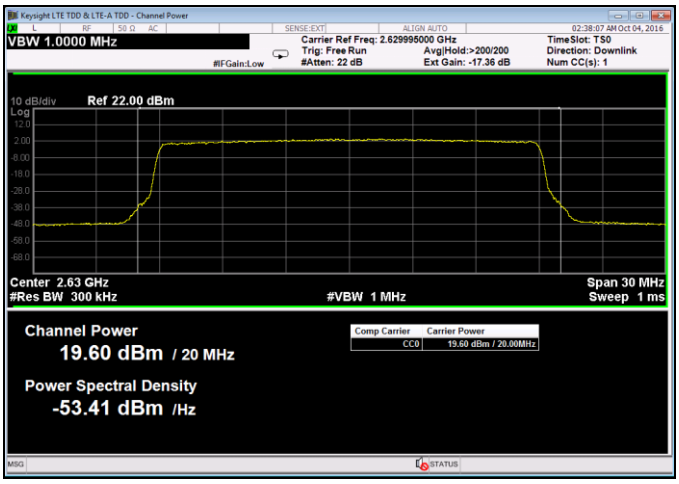


Plot 12. RF Output Power, High Channel, QAM-16, Port 2

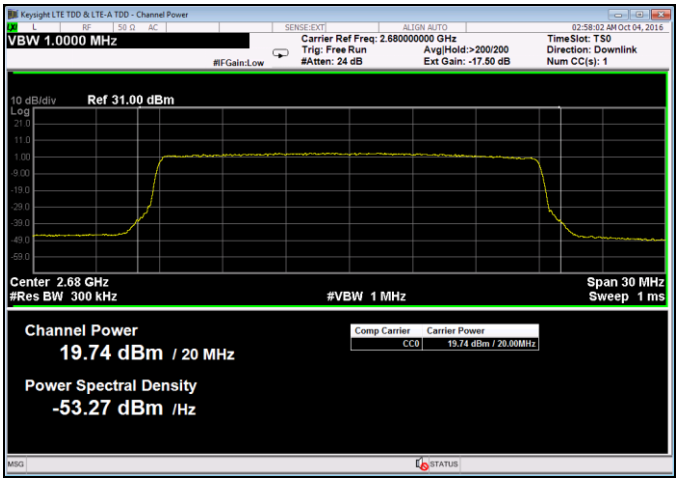
RF Output Power, QAM-64, Port 2



Plot 13. RF Output Power, Low Channel, QAM-64, Port 2

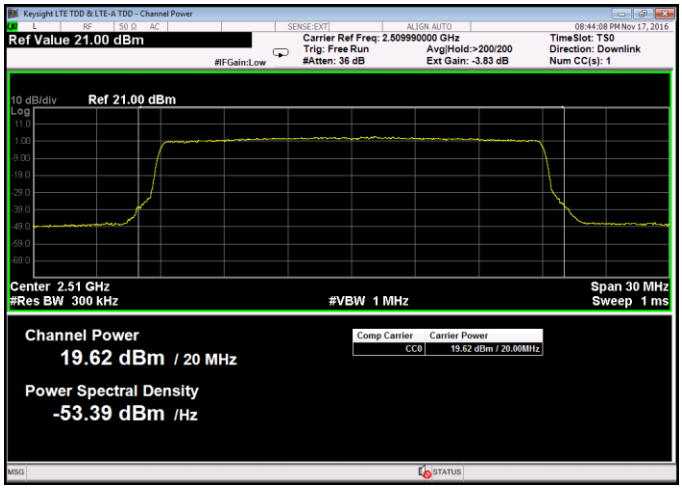


Plot 14. RF Output Power, Mid Channel, QAM-64, Port 2

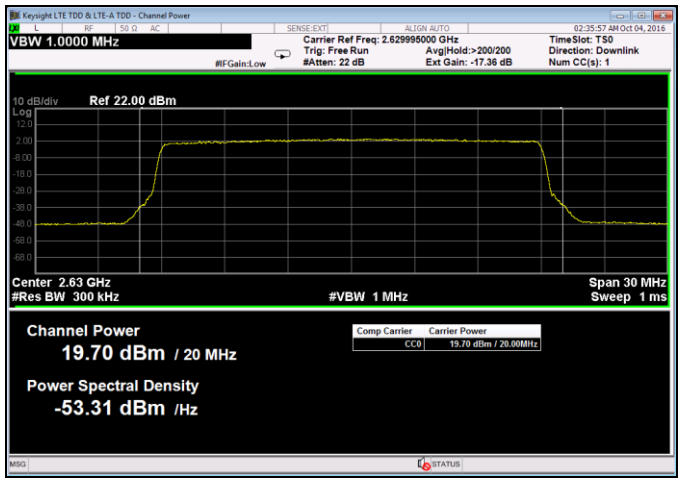


Plot 15. RF Output Power, High Channel, QAM-64, Port 2

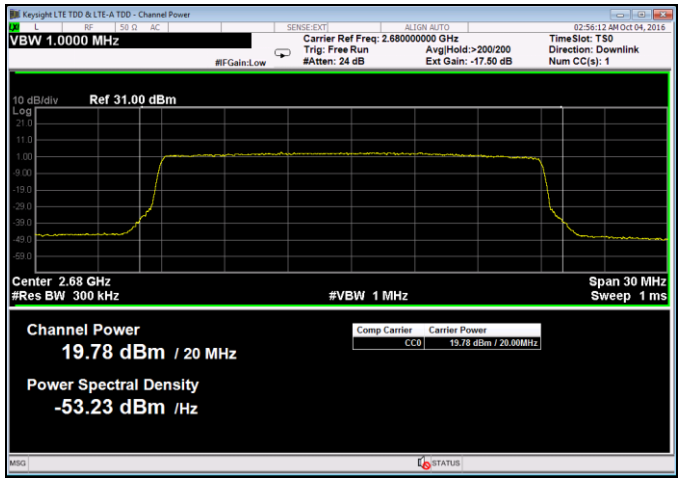
RF Output Power, QPSK, Port 2



Plot 16. RF Output Power, Low Channel, QPSK, Port 2



Plot 17. RF Output Power, Mid Channel, QPSK, Port 2



Plot 18. RF Output Power, High Channel, QPSK, Port 2

§ 2.1049 Occupied Bandwidth

Test Requirement(s): **§ 2.1049 Measurements required: Occupied bandwidth:** The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the specified conditions of § 2.1049 (a) through (i) as applicable.

Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made with a Spectrum Analyzer connected to the RF ports for both Uplink and Downlink (this only, Downlink only).

Test Results: Equipment complies with Section 2.1049. The following pages show measurements of 99% and -26 dB Occupied Bandwidth plots.

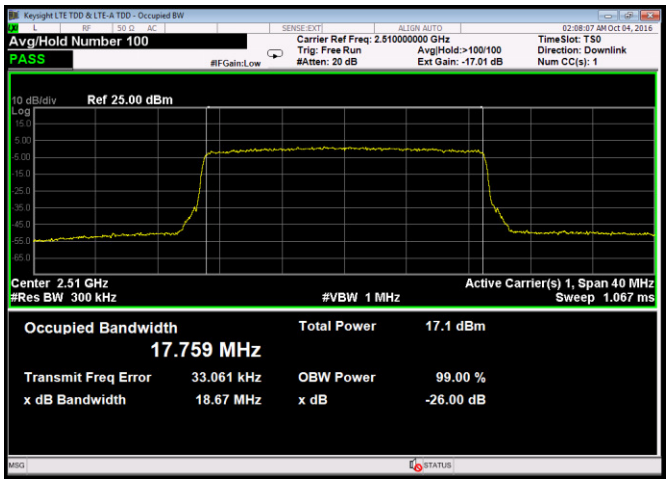
Test Engineer(s): Deepak Giri

Test Date(s): 10/14/16

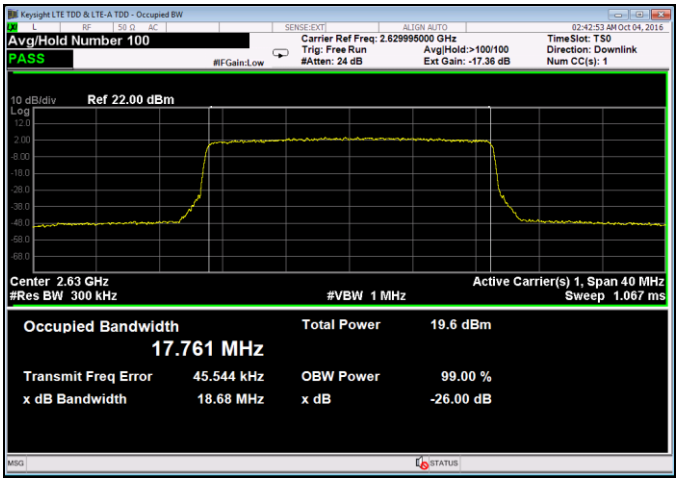
Frequency MHz	Ch. Width	Port	Channel	Mode	99% BW	26dB BW
2510	20MHz	1	low	QPSK	17.76	18.68
2630	20MHz	1	mid	QPSK	17.5	18.67
2680	20MHz	1	high	QPSK	17.75	18.66
2510	20MHz	2	low	QPSK	17.75	18.67
2630	20MHz	2	mid	QPSK	17.77	18.67
2680	20MHz	2	high	QPSK	17.75	18.67
2510	20MHz	1	low	QAM-16	17.75	18.67
2630	20MHz	1	mid	QAM-16	17.76	18.66
2680	20MHz	1	high	QAM-16	17.74	18.67
2510	20MHz	2	low	QAM-16	17.73	18.68
2630	20MHz	2	mid	QAM-16	17.77	18.68
2680	20MHz	2	high	QAM-16	17.73	18.68
2510	20MHz	1	low	QAM-64	17.73	18.67
2630	20MHz	1	mid	QAM-64	17.76	18.69
2680	20MHz	1	high	QAM-64	17.74	18.66
2510	20MHz	2	low	QAM-64	17.77	18.67
2630	20MHz	2	mid	QAM-64	17.77	18.68
2680	20MHz	2	high	QAM-64	17.72	18.69

Table 8. Occupied Bandwidth, Test Results

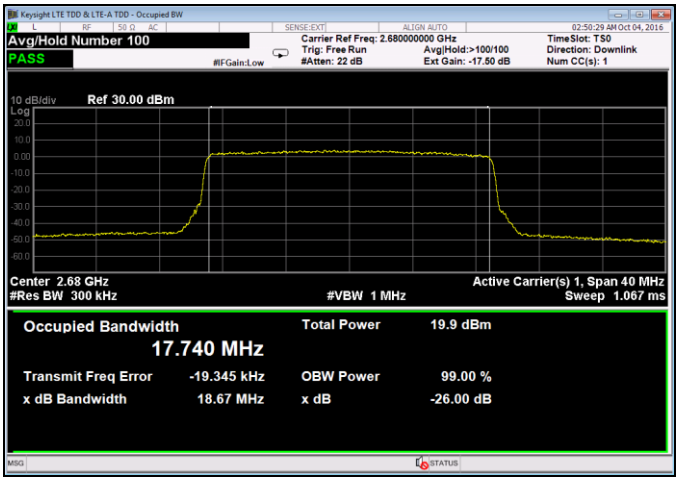
Occupied Bandwidth, QAM-16, Port 1



Plot 19. Occupied Bandwidth, Low Channel, QAM-16, Port 1

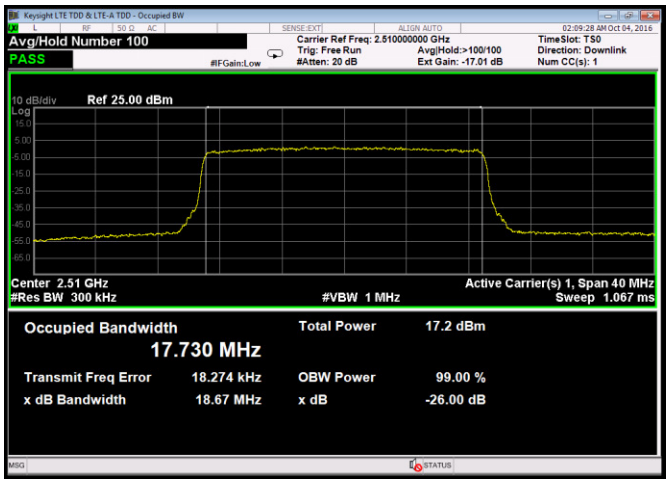


Plot 20. Occupied Bandwidth, Mid Channel, QAM-16, Port 1

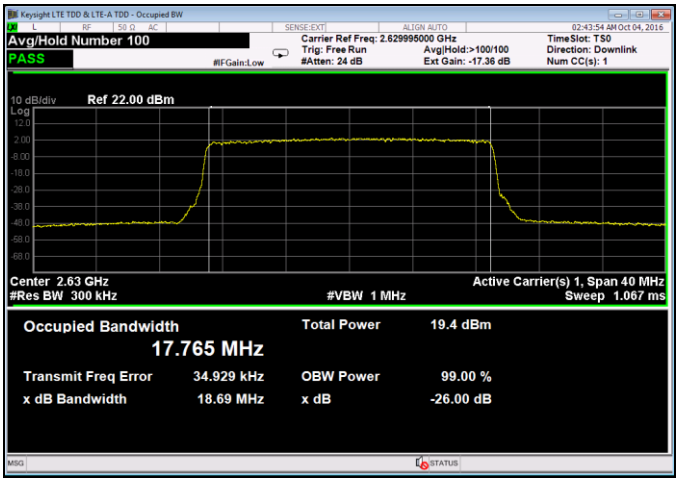


Plot 21. Occupied Bandwidth, High Channel, QAM-16, Port 1

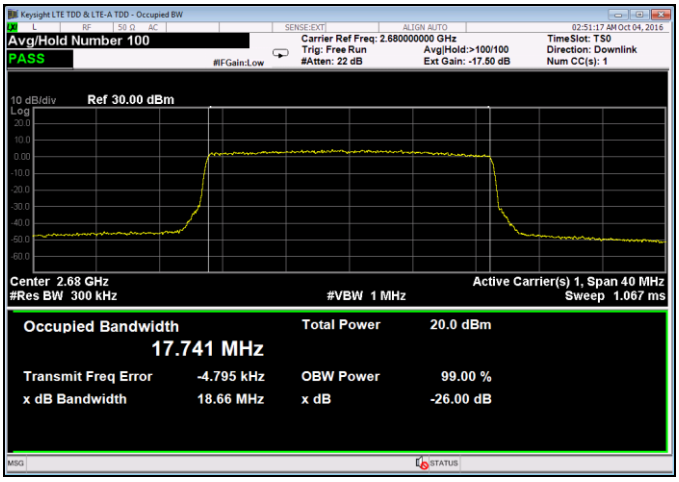
Occupied Bandwidth, QAM-64, Port 1



Plot 22. Occupied Bandwidth, Low Channel, QAM-64, Port 1

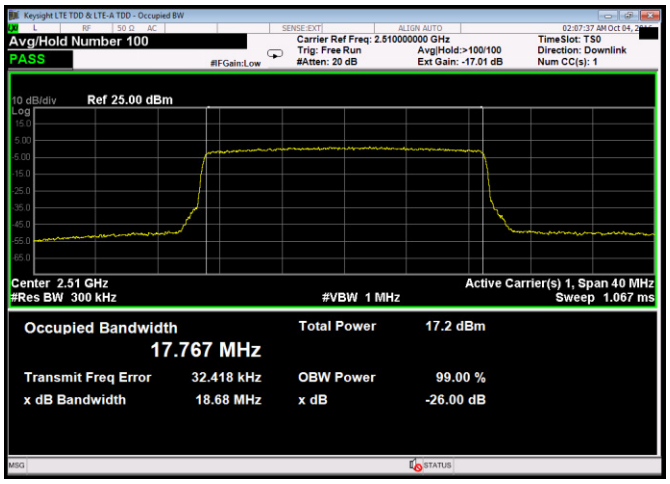


Plot 23. Occupied Bandwidth, Mid Channel, QAM-64, Port 1

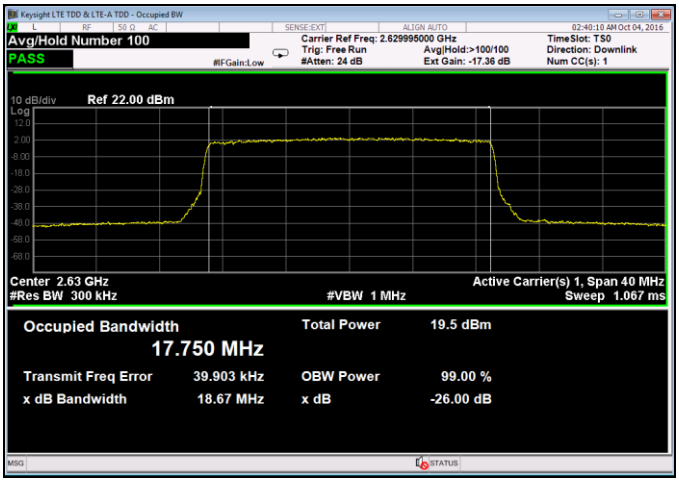


Plot 24. Occupied Bandwidth, High Channel, QAM-64, Port 1

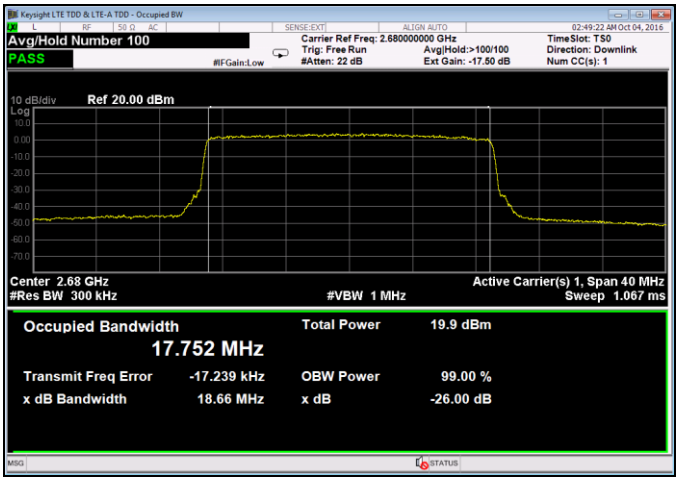
Occupied Bandwidth, QPSK, Port 1



Plot 25. Occupied Bandwidth, Low Channel, QPSK, Port 1

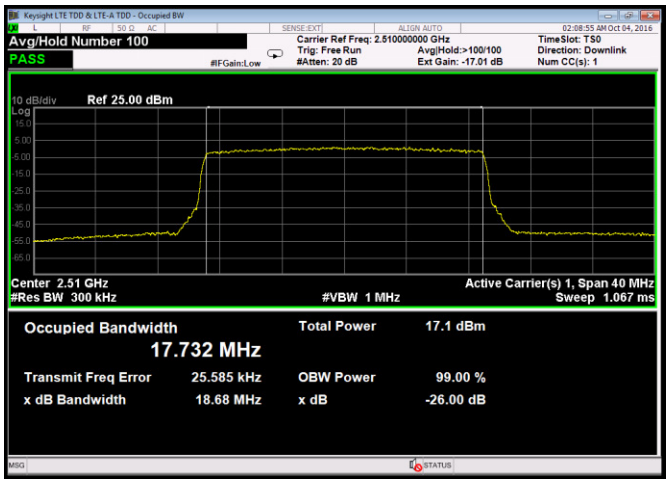


Plot 26. Occupied Bandwidth, Mid Channel, QPSK, Port 1

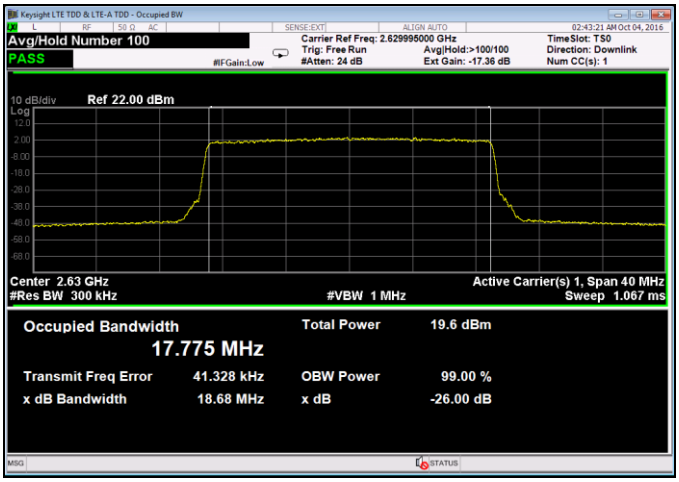


Plot 27. Occupied Bandwidth, High Channel, QPSK, Port 1

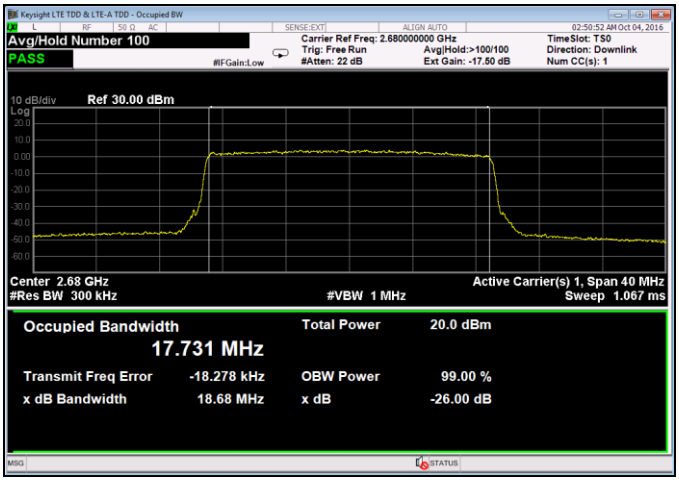
Occupied Bandwidth, QAM-16, Port 2



Plot 28. Occupied Bandwidth, Low Channel, QAM-16, Port 2

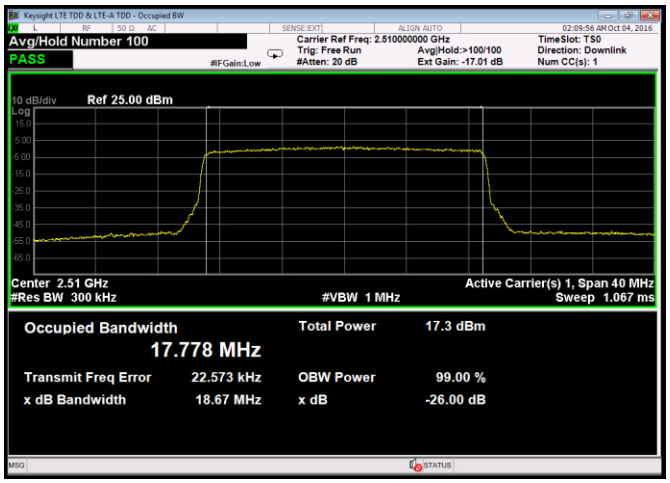


Plot 29. Occupied Bandwidth, Mid Channel, QAM-16, Port 2

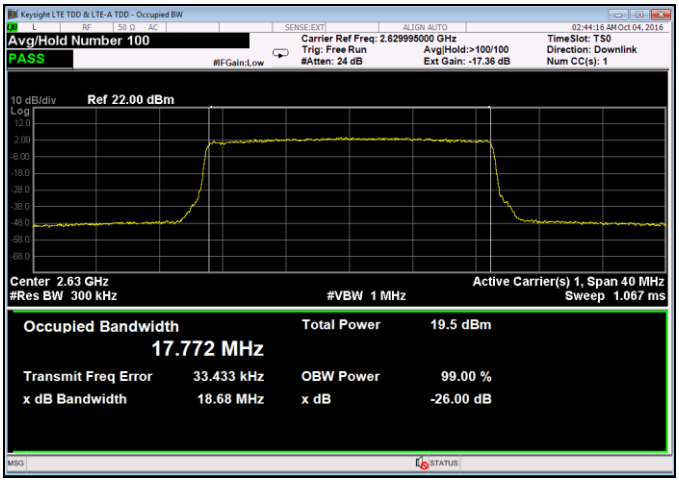


Plot 30. Occupied Bandwidth, High Channel, QAM-16, Port 2

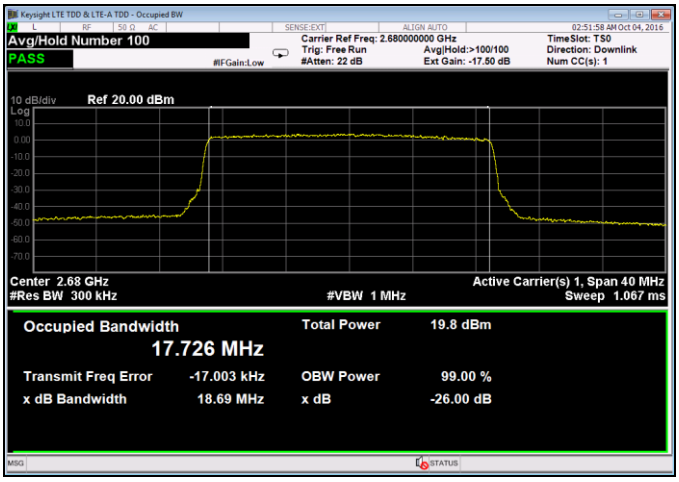
Occupied Bandwidth, QAM-64, Port 2



Plot 31. Occupied Bandwidth, Low Channel, QAM-64, Port 2

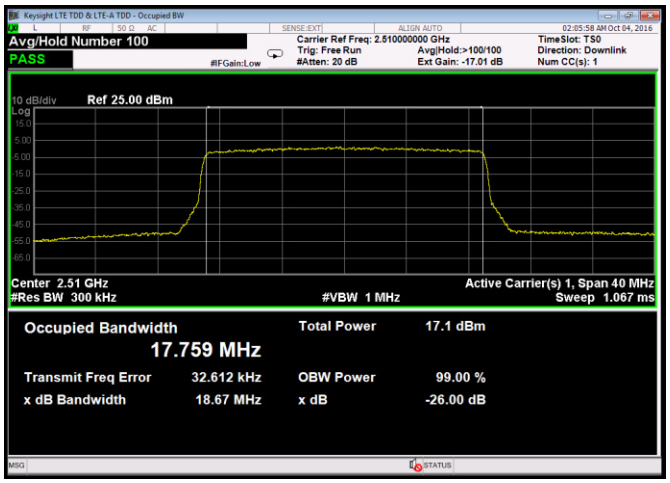


Plot 32. Occupied Bandwidth, Mid Channel, QAM-64, Port 2

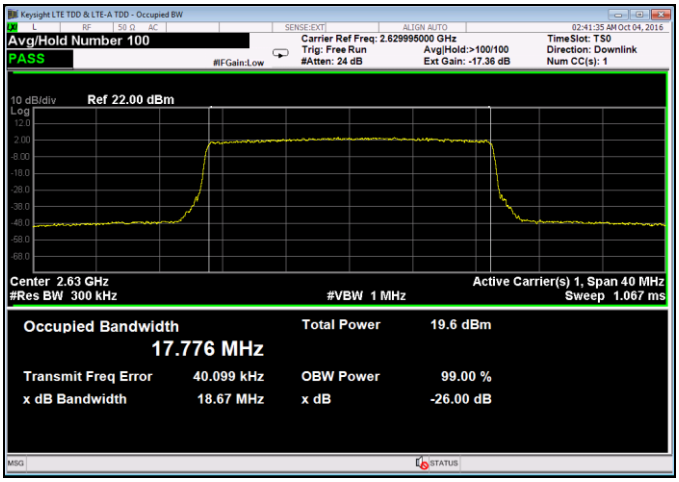


Plot 33. Occupied Bandwidth, High Channel, QAM-64, Port 2

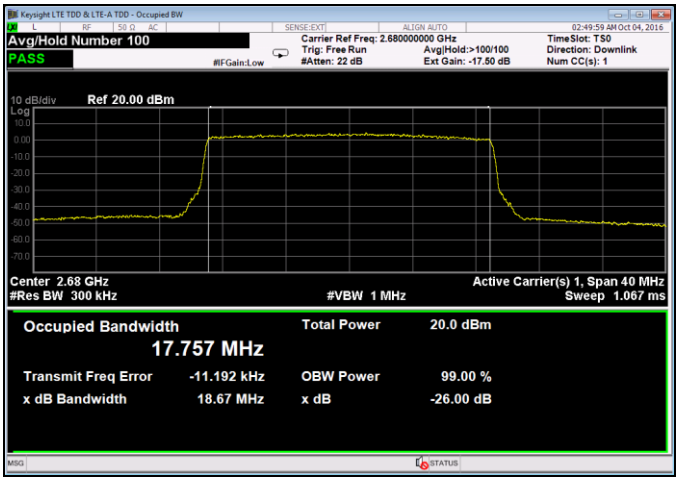
Occupied Bandwidth, QPSK, Port 2



Plot 34. Occupied Bandwidth, Low Channel, QPSK, Port 2



Plot 35. Occupied Bandwidth, Mid Channel, QPSK, Port 2



Plot 36. Occupied Bandwidth, High Channel, QPSK, Port 2

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1053 Radiated Spurious Emissions

Test Requirement(s): **§ 2.1053 Measurements required: Field strength of spurious radiation.**

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

Test Procedures: As required by 47 CFR 2.1053, the *field strengths of radiated spurious emissions* were made in accordance with the procedures of TIA/EIA-603-A-2001 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

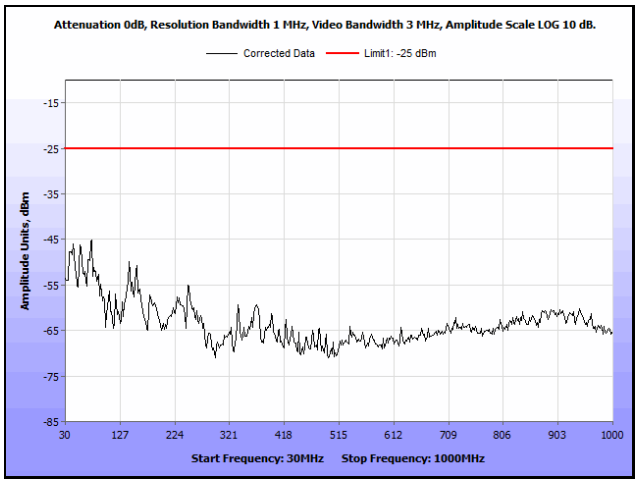
Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber (equivalent to an Open Area Test Site). The distance between the EUT and the test antenna was 3 meters for below 1 GHz and 1m for frequencies above 1 GHz. The EUT's RF port was connected to a dummy load. The intensities of the radiated emissions were maximized by rotating the turntable 360 degrees and varying the receive antenna from 1 to 4m. Measurements were made with the receive antenna in both horizontal and vertical polarizations.

Test Results: Equipment complies with Section 2.1053. The limit for spurs is -13dBm. Measurements revealed that no spurs came even close to this limit. Therefore, measurements using substitution method were not performed. Measurements were made with a pre-amp for above 1 GHz. Only noise floor was measured below 1GHz and above 18 GHz. -13dBm limit line couldn't be displayed, so -25dBm limit line is used.

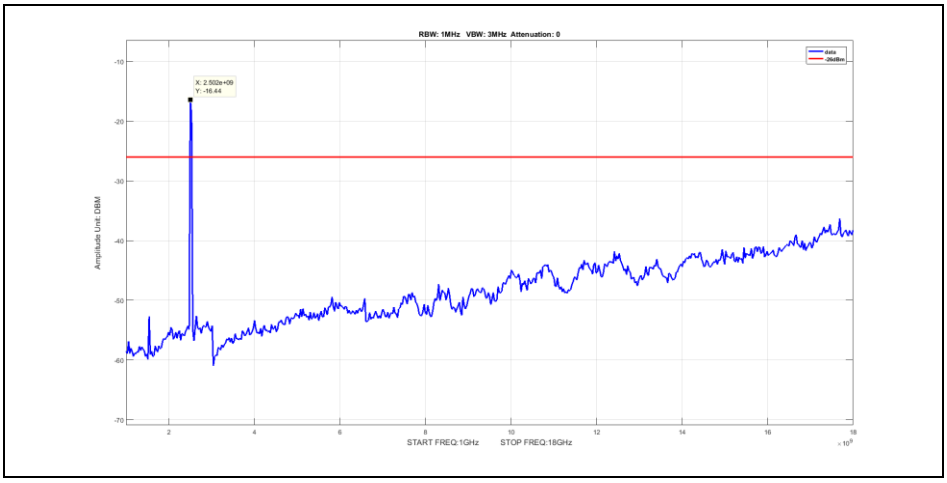
Test Engineer: Deepak Giri

Test Date(s): 10/14/16

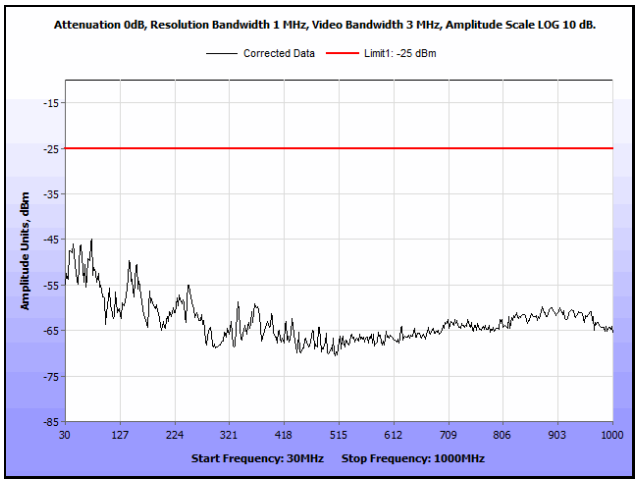
Radiated Spurious Emissions, QAM-16, Port 1



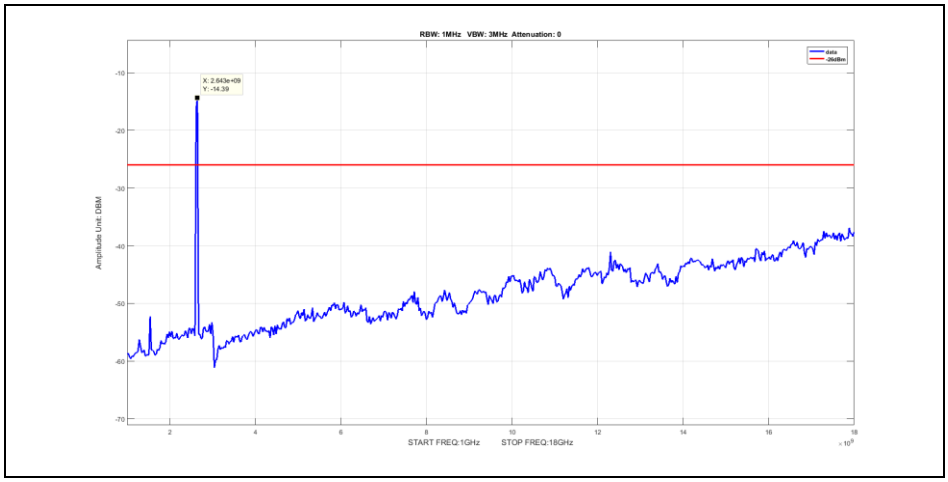
Plot 37. Radiated Spurious Emissions, Low Channel, QAM-16, Port 1, 30 MHz – 1 GHz



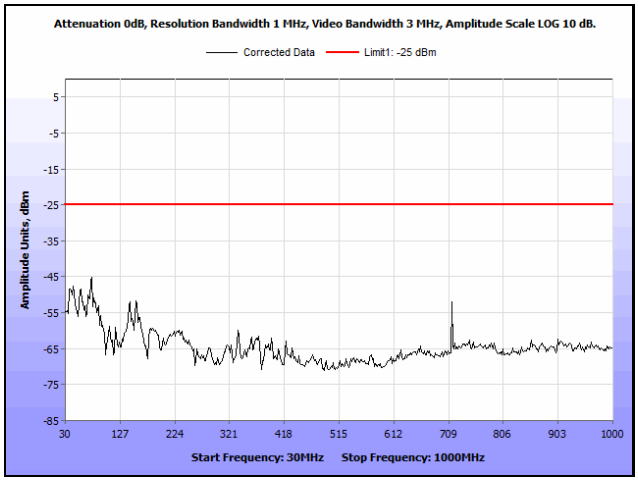
Plot 38. Radiated Spurious Emissions, Low Channel, QAM-16, Port 1, 1 GHz – 18 GHz



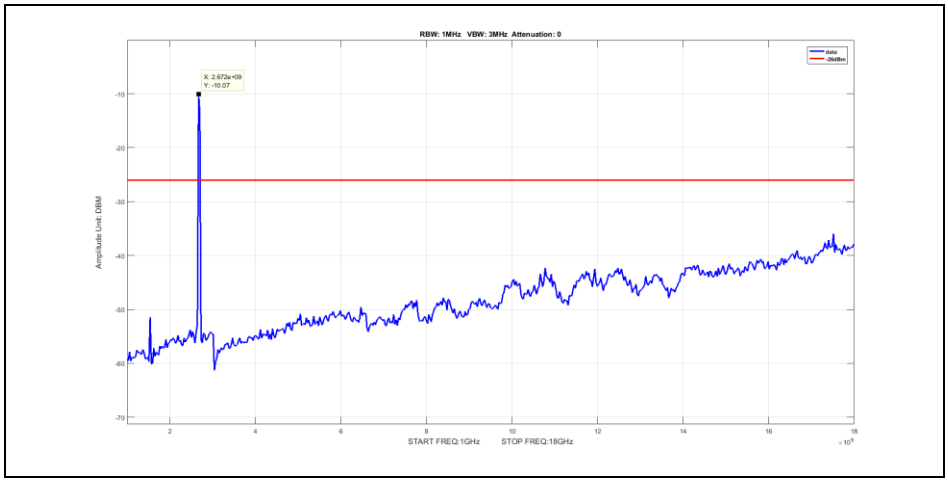
Plot 39. Radiated Spurious Emissions, Mid Channel, QAM-16, Port 1, 30 MHz – 1 GHz



Plot 40. Radiated Spurious Emissions, Mid Channel, QAM-16, Port 1, 1 GHz – 18 GHz

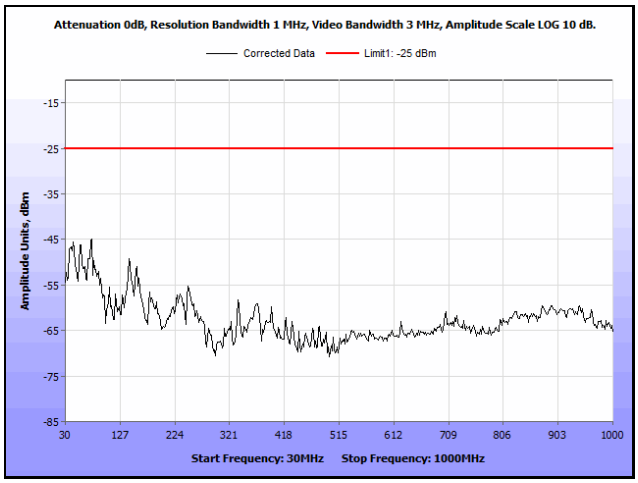


Plot 41. Radiated Spurious Emissions, High Channel, QAM-16, Port 1, 30 MHz – 1 GHz

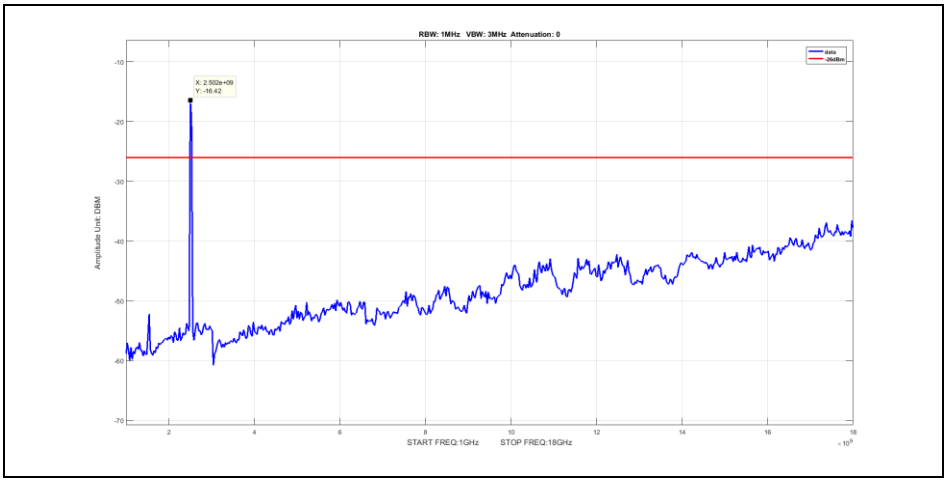


Plot 42. Radiated Spurious Emissions, High Channel, QAM-16, Port 1, 1 GHz – 18 GHz

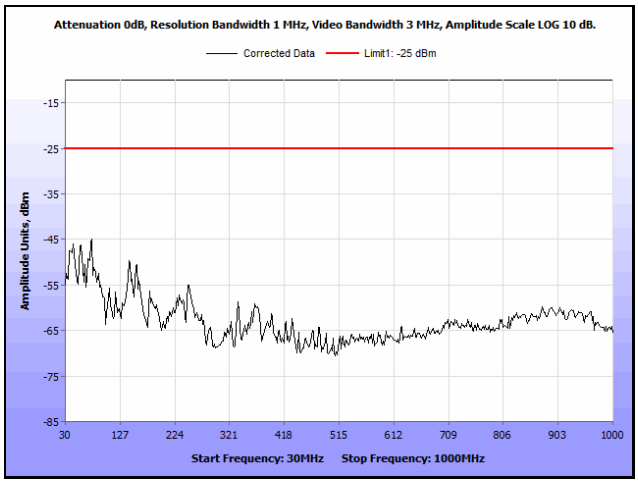
Radiated Spurious Emissions, QAM-64, Port 1



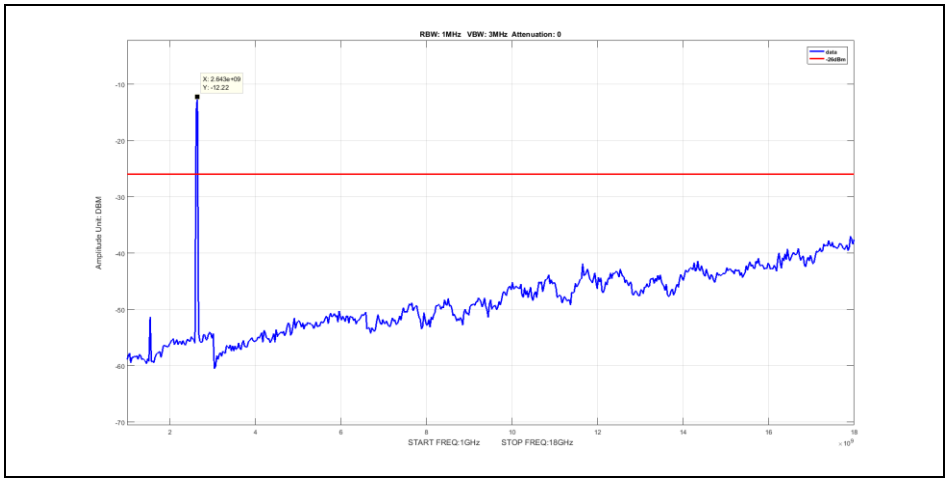
Plot 43. Radiated Spurious Emissions, Low Channel, QAM-64, Port 1, 30 MHz – 1 GHz



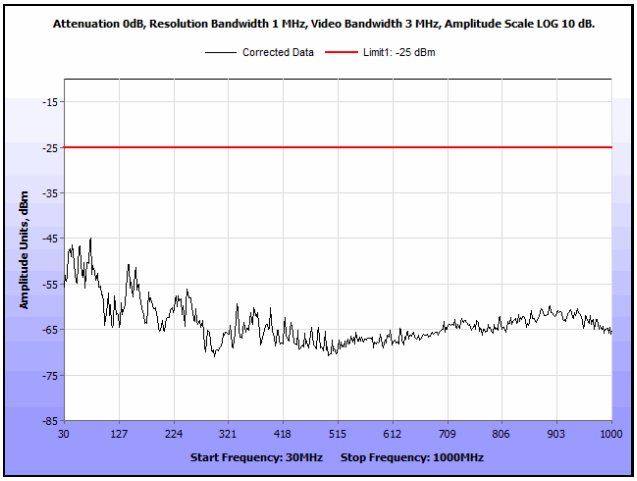
Plot 44. Radiated Spurious Emissions, Low Channel, QAM-64, Port 1, 1 GHz – 18 GHz



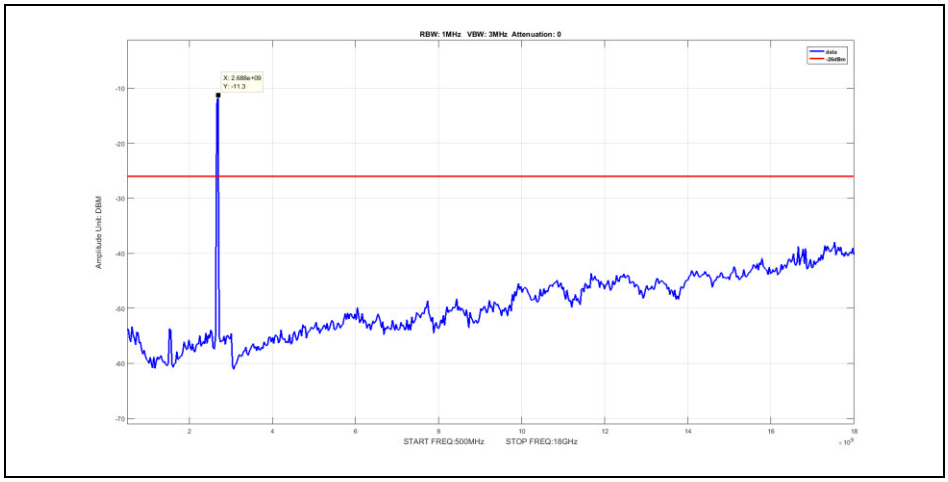
Plot 45. Radiated Spurious Emissions, Mid Channel, QAM-64, Port 1, 30 MHz – 1 GHz



Plot 46. Radiated Spurious Emissions, Mid Channel, QAM-64, Port 1, 1 GHz – 18 GHz

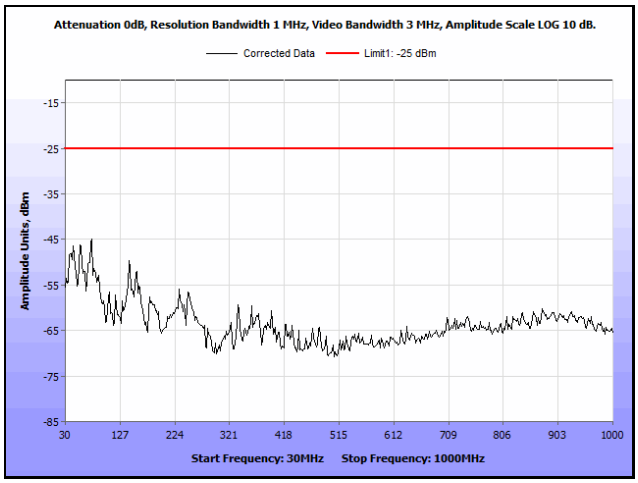


Plot 47. Radiated Spurious Emissions, High Channel, QAM-64, Port 1, 30 MHz – 1 GHz

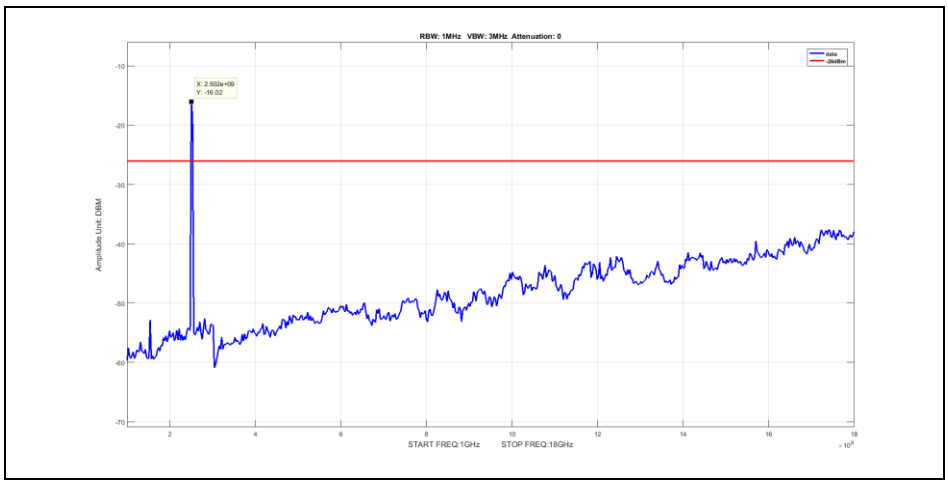


Plot 48. Radiated Spurious Emissions, High Channel, QAM-64, Port 1, 1 GHz – 18 GHz

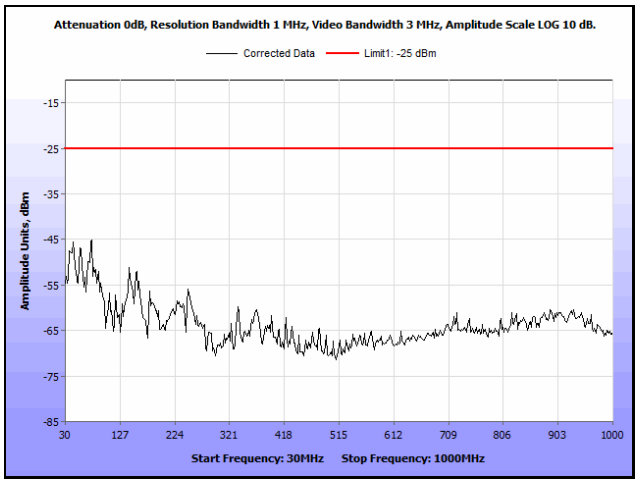
Radiated Spurious Emissions, QPSK, Port 1



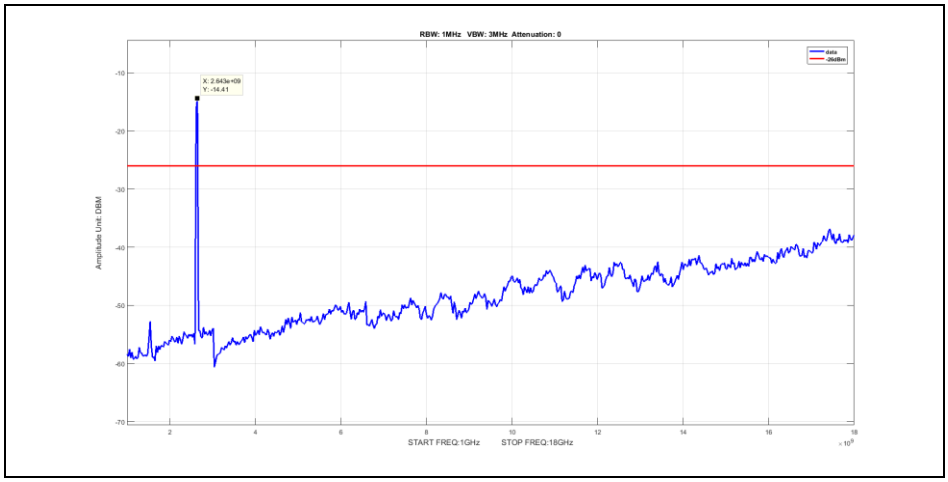
Plot 49. Radiated Spurious Emissions, Low Channel, QPSK, Port 1, 30 MHz – 1 GHz



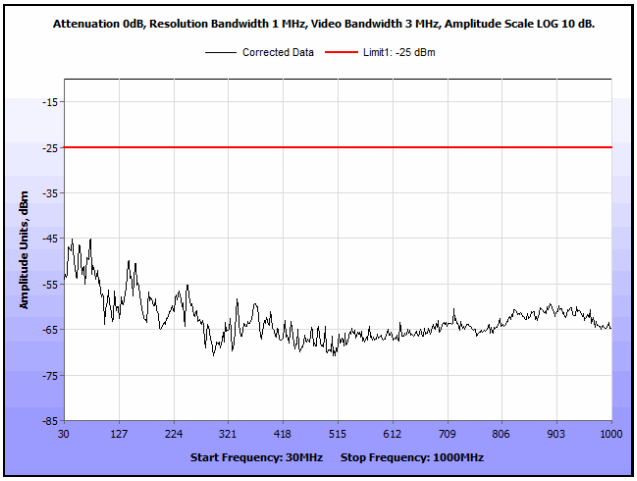
Plot 50. Radiated Spurious Emissions, Low Channel, QPSK, Port 1, 1 GHz – 18 GHz



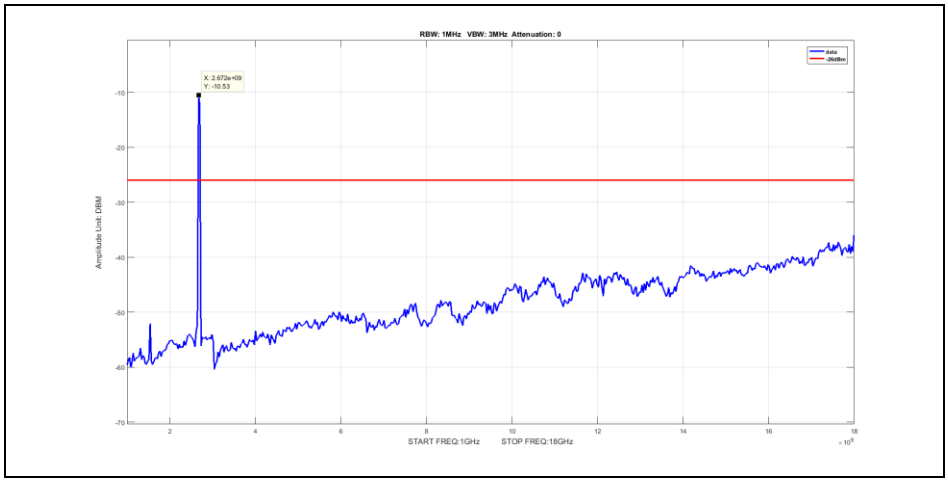
Plot 51. Radiated Spurious Emissions, Mid Channel, QPSK, Port 1, 30 MHz – 1 GHz



Plot 52. Radiated Spurious Emissions, Mid Channel, QPSK, Port 1, 1 GHz – 18 GHz

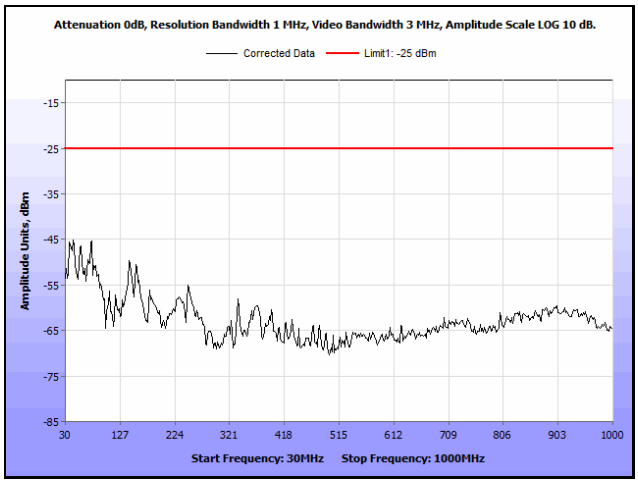


Plot 53. Radiated Spurious Emissions, High Channel, QPSK, Port 1, 30 MHz – 1 GHz

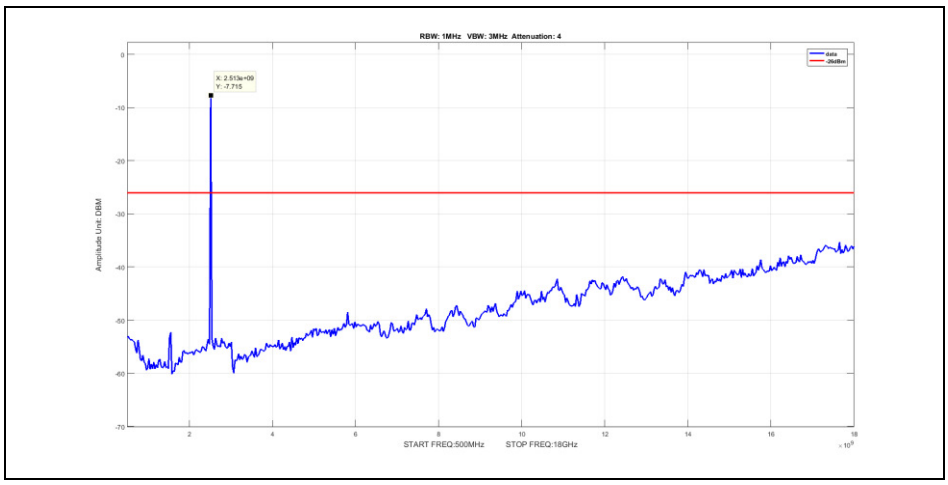


Plot 54. Radiated Spurious Emissions, High Channel, QPSK, Port 1, 1 GHz – 18 GHz

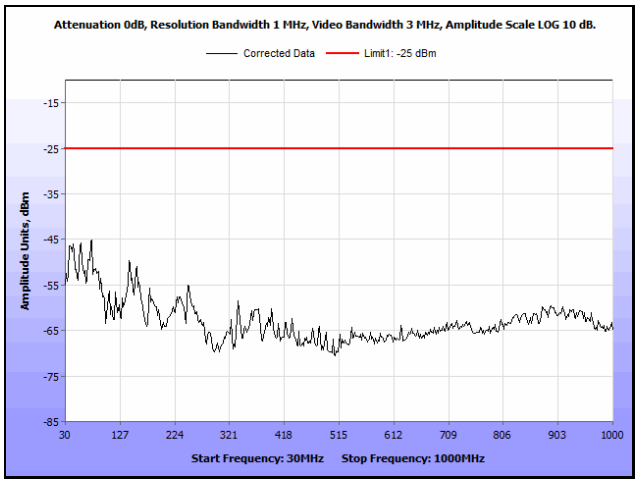
Radiated Spurious Emissions, QAM-16, Port 2



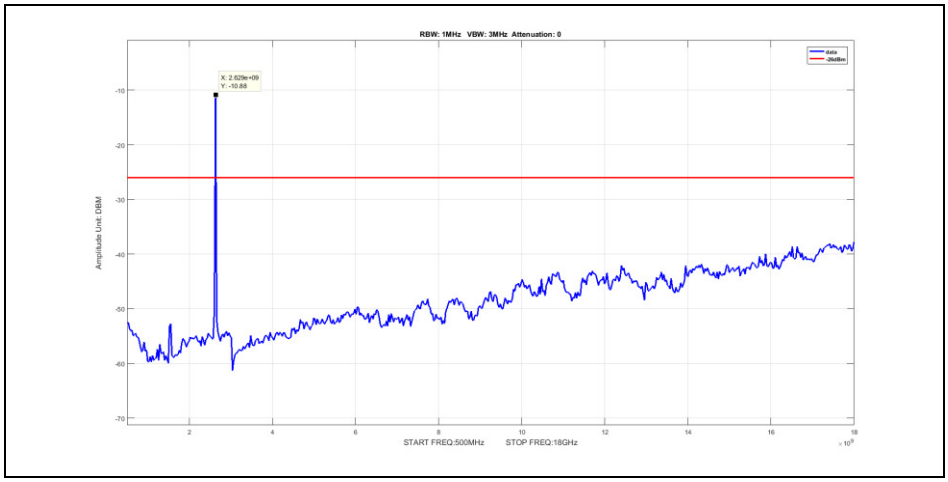
Plot 55. Radiated Spurious Emissions, Low Channel, QAM-16, Port 2, 30 MHz – 1 GHz



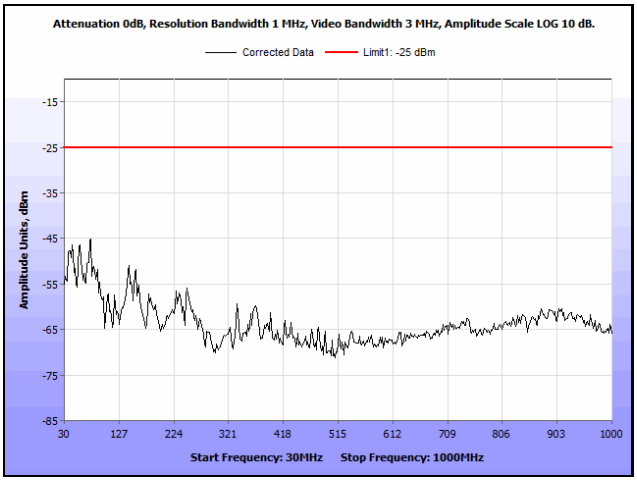
Plot 56. Radiated Spurious Emissions, Low Channel, QAM-16, Port 2, 1 GHz – 18 GHz



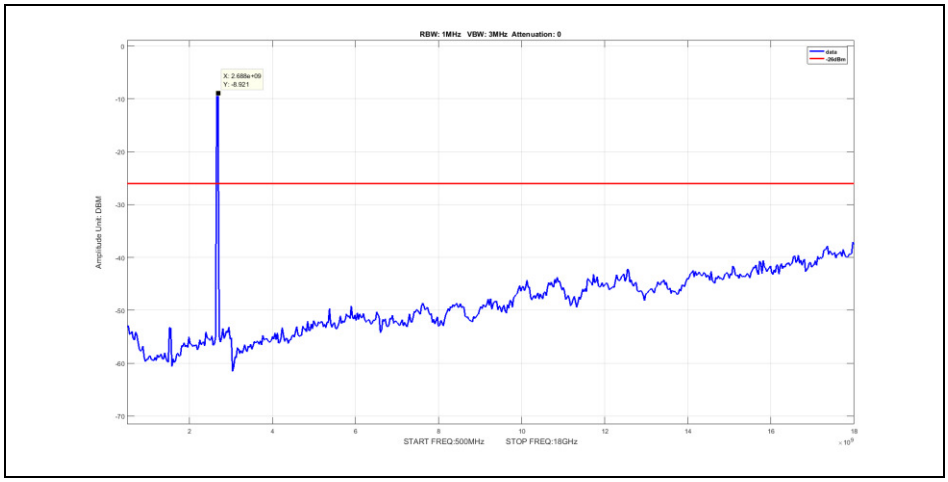
Plot 57. Radiated Spurious Emissions, Mid Channel, QAM-16, Port 2, 30 MHz – 1 GHz



Plot 58. Radiated Spurious Emissions, Mid Channel, QAM-16, Port 2, 1 GHz – 18 GHz

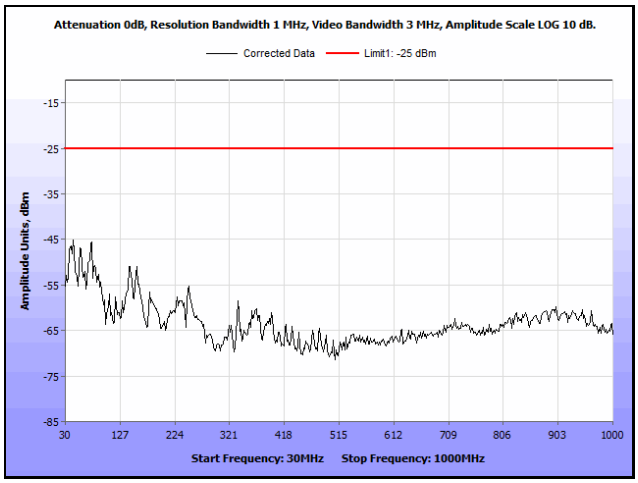


Plot 59. Radiated Spurious Emissions, High Channel, QAM-16, Port 2, 30 MHz – 1 GHz

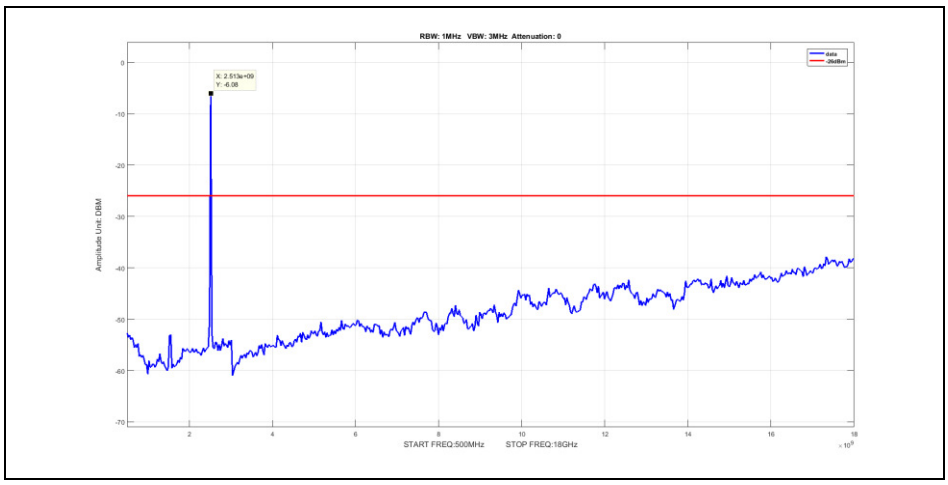


Plot 60. Radiated Spurious Emissions, High Channel, QAM-16, Port 2, 1 GHz – 18 GHz

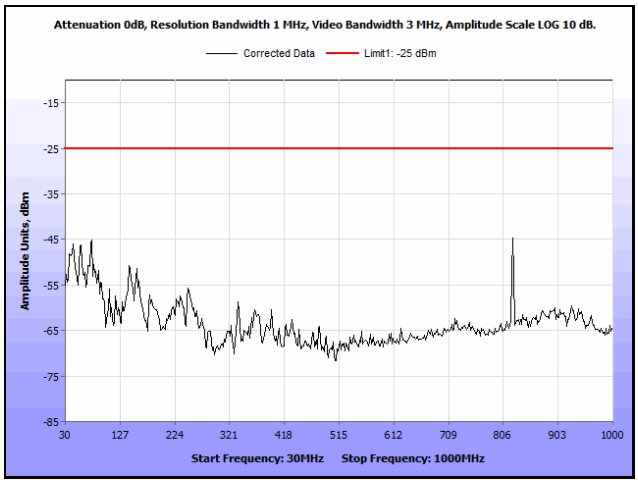
Radiated Spurious Emissions, QAM-64, Port 2



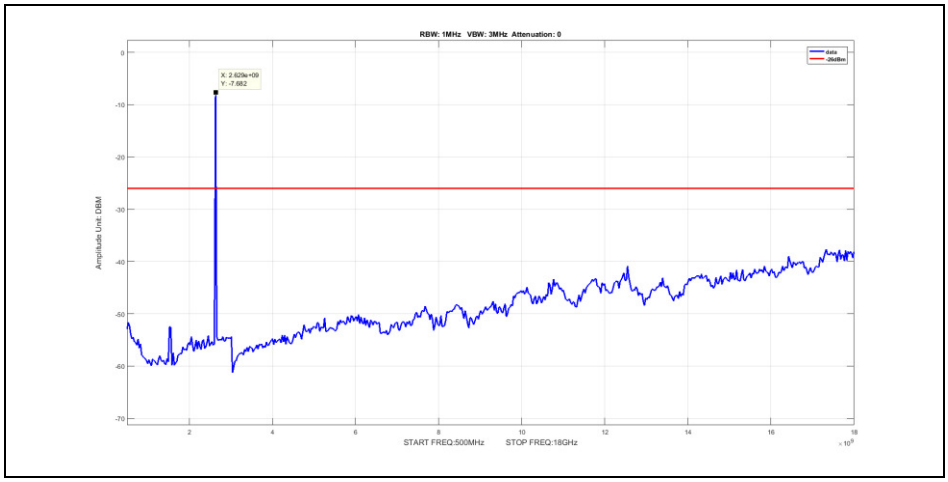
Plot 61. Radiated Spurious Emissions, Low Channel, QAM-64, Port 2, 30 MHz – 1 GHz



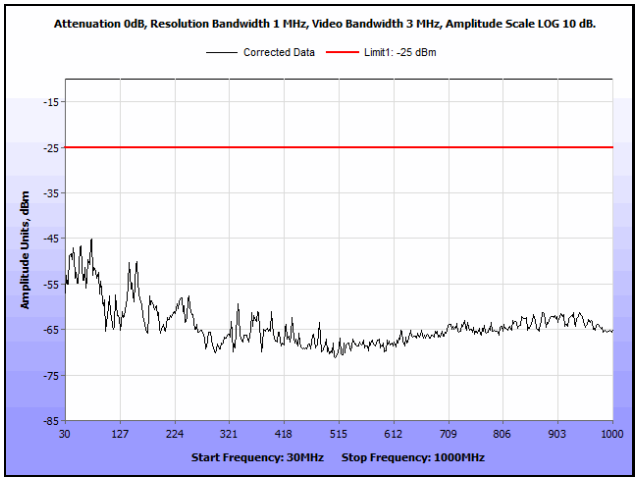
Plot 62. Radiated Spurious Emissions, Low Channel, QAM-64, Port 2, 1 GHz – 18 GHz



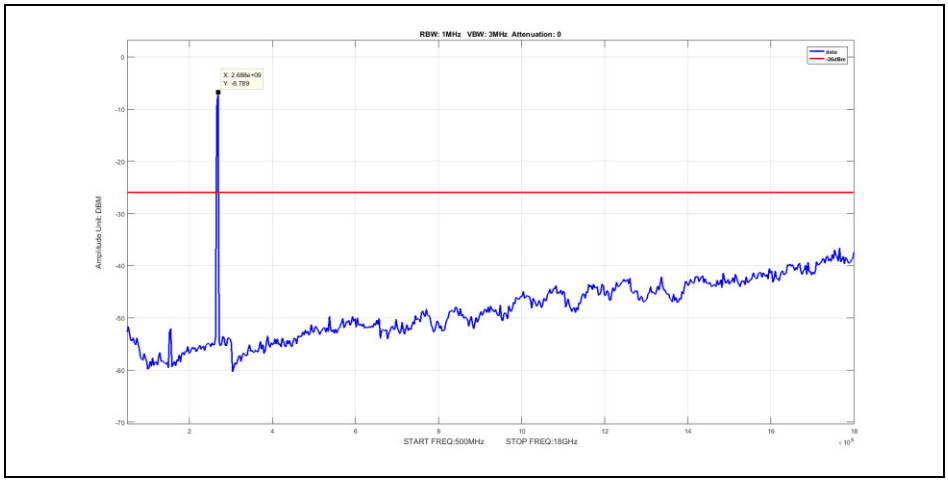
Plot 63. Radiated Spurious Emissions, Mid Channel, QAM-64, Port 2, 30 MHz – 1 GHz



Plot 64. Radiated Spurious Emissions, Mid Channel, QAM-64, Port 2, 1 GHz – 18 GHz

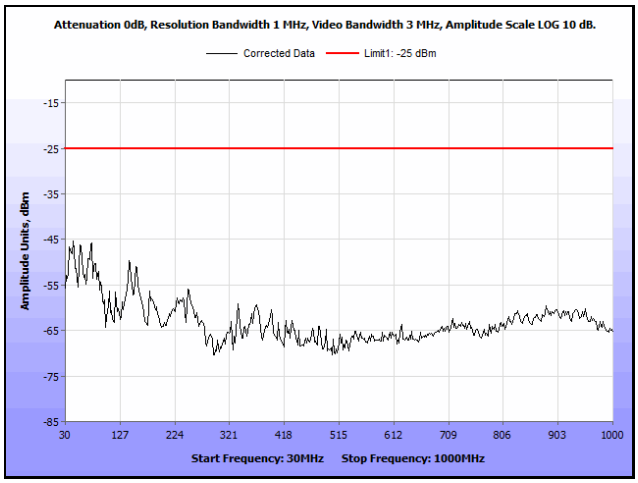


Plot 65. Radiated Spurious Emissions, High Channel, QAM-64, Port 2, 30 MHz – 1 GHz

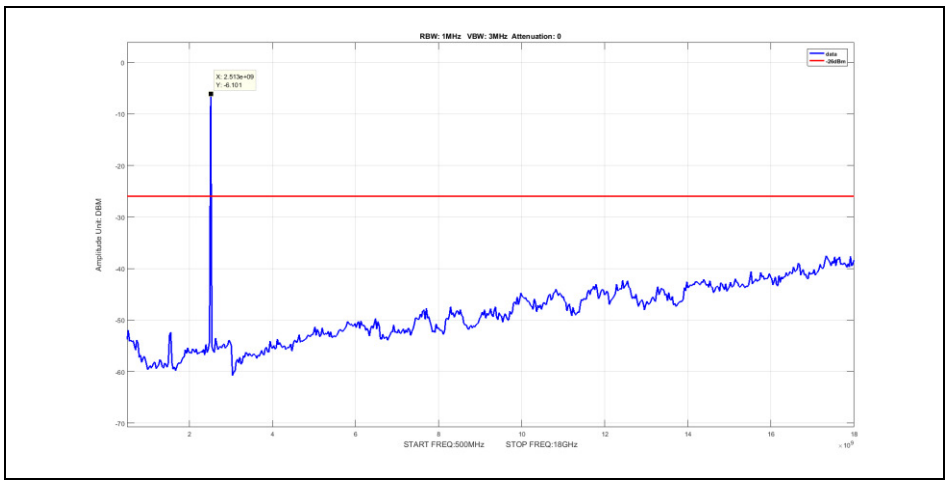


Plot 66. Radiated Spurious Emissions, High Channel, QAM-64, Port 2, 1 GHz – 18 GHz

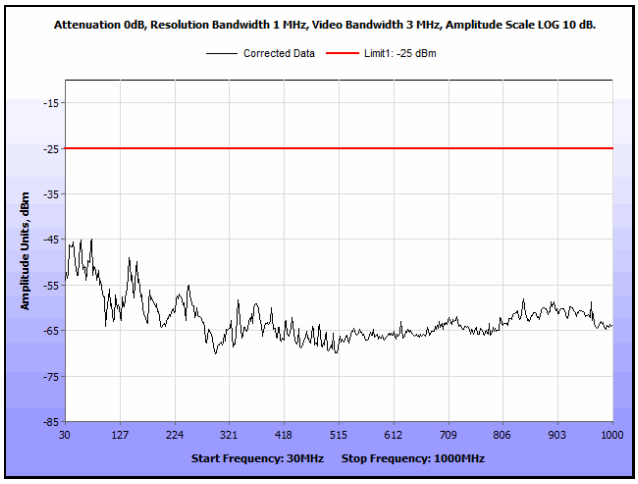
Radiated Spurious Emissions, QPSK, Port 2



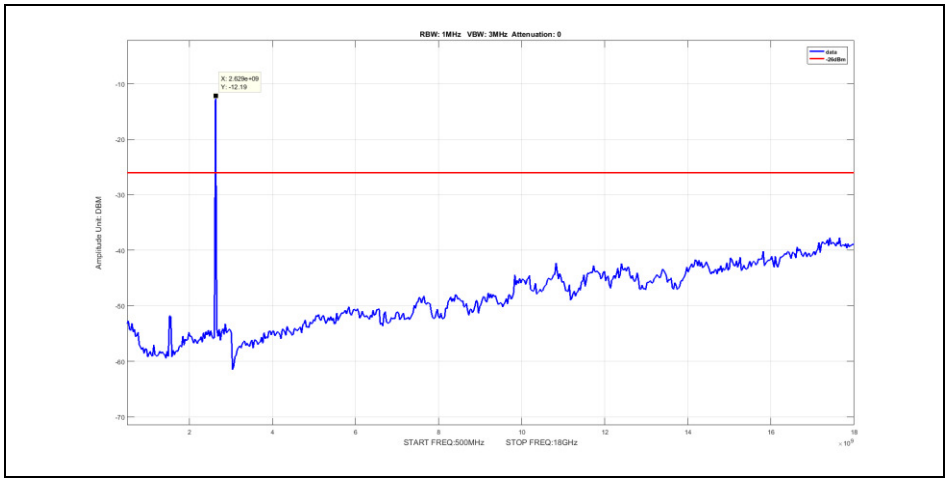
Plot 67. Radiated Spurious Emissions, Low Channel, QPSK, Port 2, 30 MHz – 1 GHz



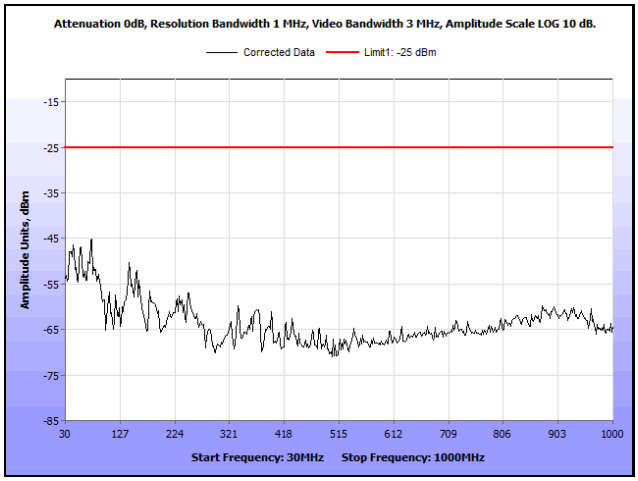
Plot 68. Radiated Spurious Emissions, Low Channel, QPSK, Port 2, 1 GHz – 18 GHz



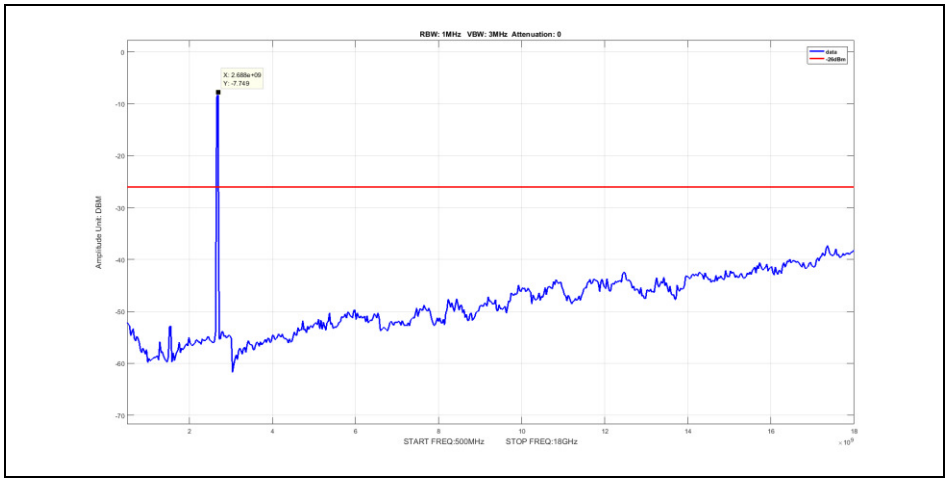
Plot 69. Radiated Spurious Emissions, Mid Channel, QPSK, Port 2, 30 MHz – 1 GHz



Plot 70. Radiated Spurious Emissions, Mid Channel, QPSK, Port 2, 1 GHz – 18 GHz



Plot 71. Radiated Spurious Emissions, High Channel, QPSK, Port 2, 30 MHz – 1 GHz



Plot 72. Radiated Spurious Emissions, High Channel, QPSK, Port 2, 1 GHz – 18 GHz

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 2.1051 Spurious Emissions at Antenna Terminals

Test Requirement(s): **§ 2.1051and 27.53(m) Measurements required: Spurious emissions at antenna terminals:** The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate.

Test Procedures: A modulated carrier generated by the EUT/its support equipment; a spectrum analyzer was connected to the Downlink RF port. The spectrum analyzer was set to 1MHz RBW and 3MHz VBW. The spectrum was investigated from 30MHz to the 10th harmonic of the carrier.

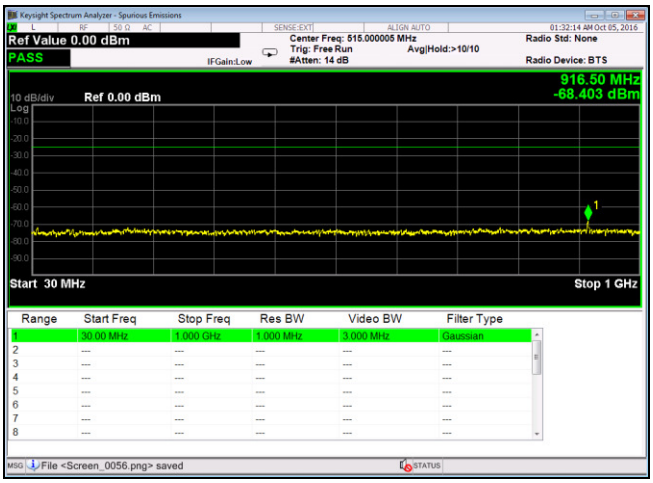
Test Results: Equipment complies with Section 2.1051 and 27.53(m). The following pages show measurements of Spurious Emission plots. All Spurious Emissions are below -13dBm

The following analysis and plots are included below to illustrate compliance with the required rule parts.

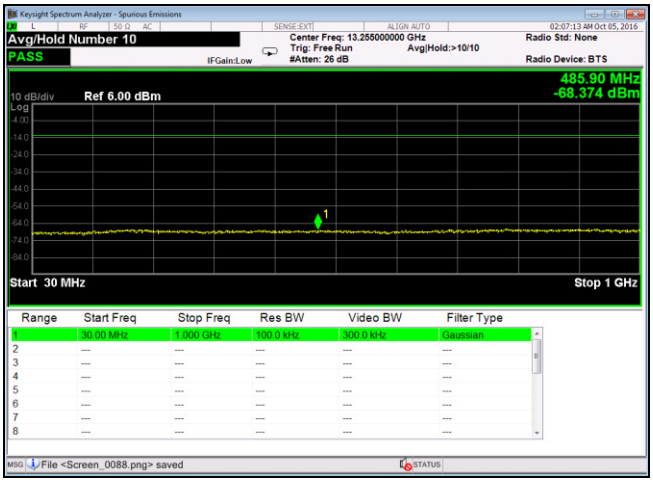
Test Engineer(s): Deepak Giri

Test Date(s): 10/06/16

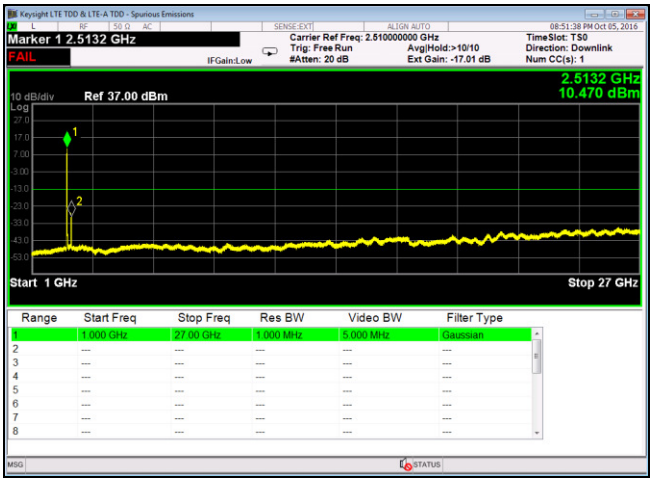
Spurious Emissions at Antenna Terminal, QAM-16, Port 1



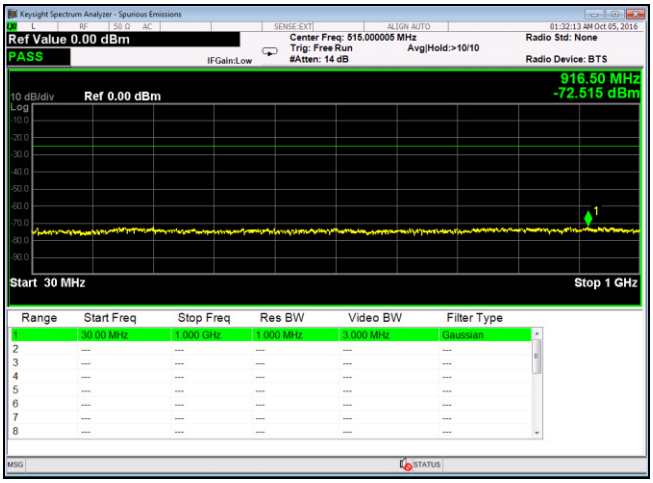
Plot 73. Spurious Emissions at Antenna Terminal, Low Channel, QAM-16, Port 1, 30 MHz – 1 GHz



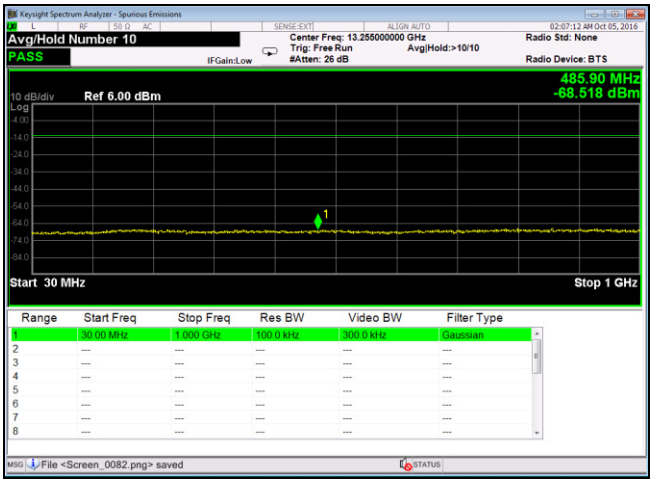
Plot 74. Spurious Emissions at Antenna Terminal, Low Channel, QAM-16, Port 1, 30 MHz – 1 GHz, 100K



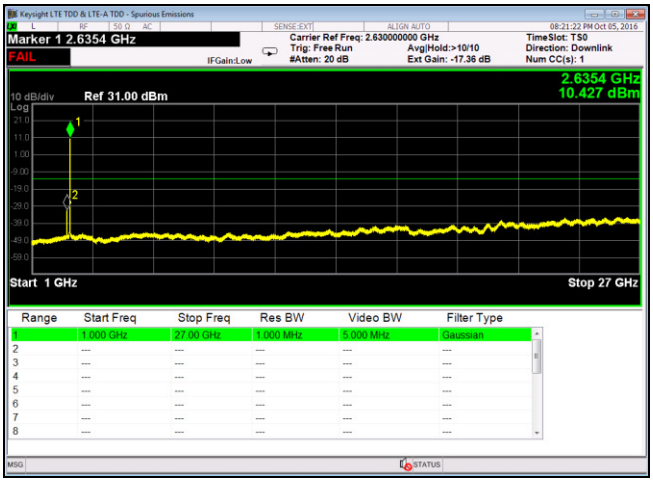
Plot 75. Spurious Emissions at Antenna Terminal, Low Channel, QAM-16, Port 1, 1 GHz – 27 GHz



Plot 76. Spurious Emissions at Antenna Terminal, Mid Channel, QAM-16, Port 1, 30 MHz – 1 GHz



Plot 77. Spurious Emissions at Antenna Terminal, Mid Channel, QAM-16, Port 1, 30 MHz – 1 GHz, 100K



Plot 78. Spurious Emissions at Antenna Terminal, Mid Channel, QAM-16, Port 1, 1 GHz – 27 GHz

