MOBILE DEVICES BUSINESS

PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

Test Report Number – 25258-1BTLE

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature:  Name: Albert J. Patapack

Title: EMC Engineer Date: February 5, 2013

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Test Report Details

Tests Performed By:	ADR Testing Service Location Code: ADR LV Motorola Mobility Inc Product Safety and Compliance Group 600 North US Hwy 45 Libertyville, IL 60048 PH (847) 523-6167 Fax (847) 523-4538 FCC Registration Number: 316588 Industry Canada Number: 109O-1
Tests Requested By:	Motorola Mobility, Inc. Mobile Devices Business 600 North US Hwy 45 Libertyville, IL 60048
Product Type :	Cellular Phone
Signaling Capability:	WCDMA 850/1900, GSM 850/1900, EDGE 850/1900, HSDPA, HSUPA, GPRS, Bluetooth LE + EDR, 802.11b/g/n
FCC ID:	IHDP56ND1
Serial Numbers:	353208050050346, 353208050050477
Testing Complete Date:	January 30, 2013

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

__X__ Part 15 Subpart C – Intentional Radiators

Applicable Standards: ANSI 63.4 2003, RSS-210 Issue 8

All testing was performed according to KDB 558074 v02.

Summary of Testing

Test	Test Name	Pass/Fail
1	Spectrum Bandwidth	Pass
2	Peak Power	Pass
3	Power Spectral Density	Pass
4	Spurious RF Conducted Emissions	Pass
5	AC Line Conducted Emissions	Pass

Test	Test Name	Results
1	Spectrum Bandwidth	See plots
2	Peak Power	See plots
3	Power Spectral Density	See tables
4	Spurious RF Conducted Emissions	See plots
5	AC Line Conducted Emissions	See Plots

General and Special Conditions

This product utilizes an internal battery that is not removable. When applicable, EMC testing was performed with the internal battery fully charged.

All testing was done in an indoor controlled environment. The temperature and the relative humidity were maintained within the ANSI C63.4 2003 Standard requirements during the entire duration of testing.

Equipment and Cable Configurations

The EUT was tested in a stand-alone configuration that is representative of typical use.

Measuring Equipment and Calibration Information

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde & Schwarz	Receiver	ESIB40	100226	5/15/2013
Agilent	Signal Analyzer	N9020A	US46470586	01/20/2014
Attenuator	Weinschel	AS-6	6675	NCR
Attenuator	Weinschel	AS-6	6677	NCR
ETS	LISN	3810/2	00062907	8/7/2013
ETS	LISN	3810/2	00062912	8/6/2013

Note that the signal analyzer is on a two-year calibration cycle. All testing was performed using equipment that was within calibration at the time that the test was performed. No equipment listed in the table above was used after the specified calibration due date. If, during the course of product testing, a piece of equipment went out of calibration and that piece of equipment was needed to complete product testing, a similar piece of calibrated equipment was substituted. If a substitution was made, that new piece of equipment would be listed in the above table along with the piece that was removed from service.

Description of Bluetooth Transmitter

The Equipment Under Test (EUT) offers Bluetooth LE + EDR as a feature. This report covers Bluetooth LE operation only. The Bluetooth LE + EDR spread-spectrum, is designed to operate between 2402 and 2480MHz. The Bluetooth antenna is mounted inside of the EUT. The antenna installation is permanent. For a more thorough description of the functionality please refer to Exhibit 12 of this package.

As a Bluetooth LE transmitter, it is designed operate with other Bluetooth LE devices as defined by the industrial standard. In this application, the device is battery operated.

De Facto EIRP Limit – Pursuant 47 CFR 15.247(b)(4); RSS-210 Section A8.4.

Criterion: The conducted output power limit of 1-watt is based on the use of antennas with directional gains that do not exceed $6dB_i$. If transmitting antennas of directional gain greater than $6dB_i$ are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds $6dB_i$.

The antenna employed by this transmitter is intended to be omni-directional, and thus will not exhibit directional gain in excess of $6dB_i$. The conducted power is less than the limits set forth (see elsewhere in this report for details).

Measurement Procedures and Data

Spectrum Bandwidth

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. The fully charged internal battery was used for the supply voltage.

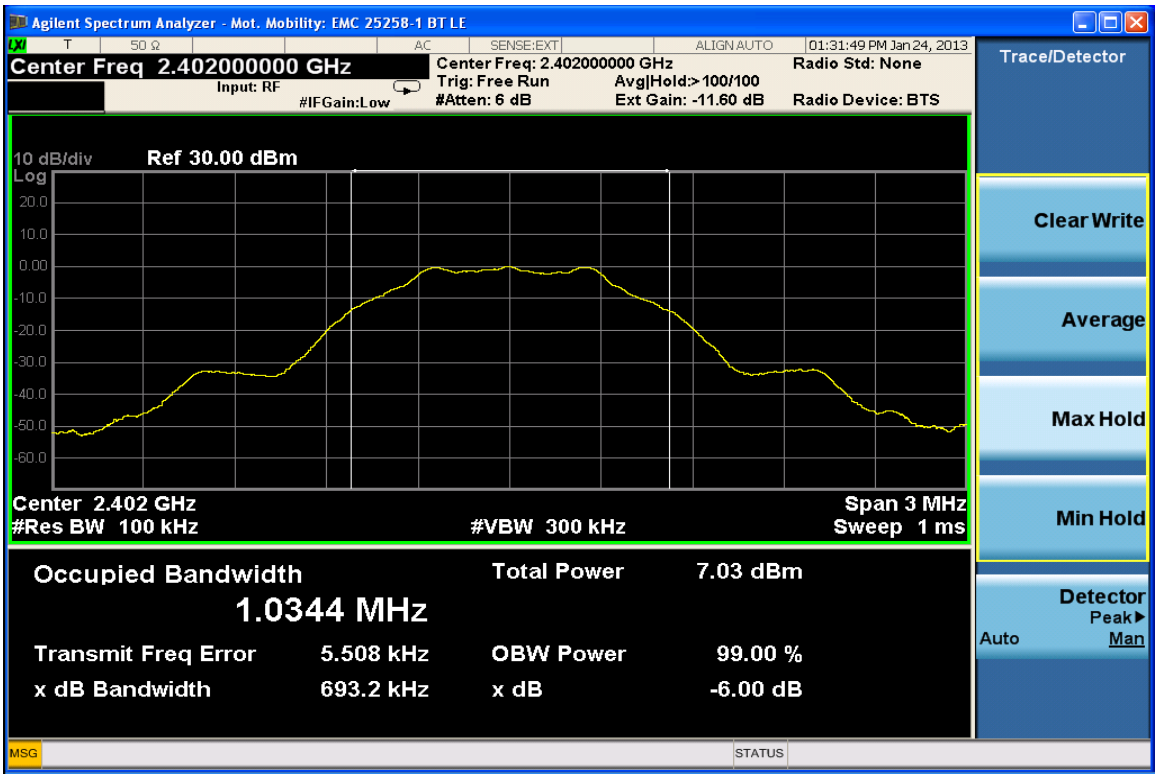
The spectrum analyzer used the following settings:

1. RBW ≥ 100 kHz
2. VBW ≥ 300 kHz
3. Sweep = auto couple
4. Detector function = peak
5. Trace = max hold
6. Span = 3MHz

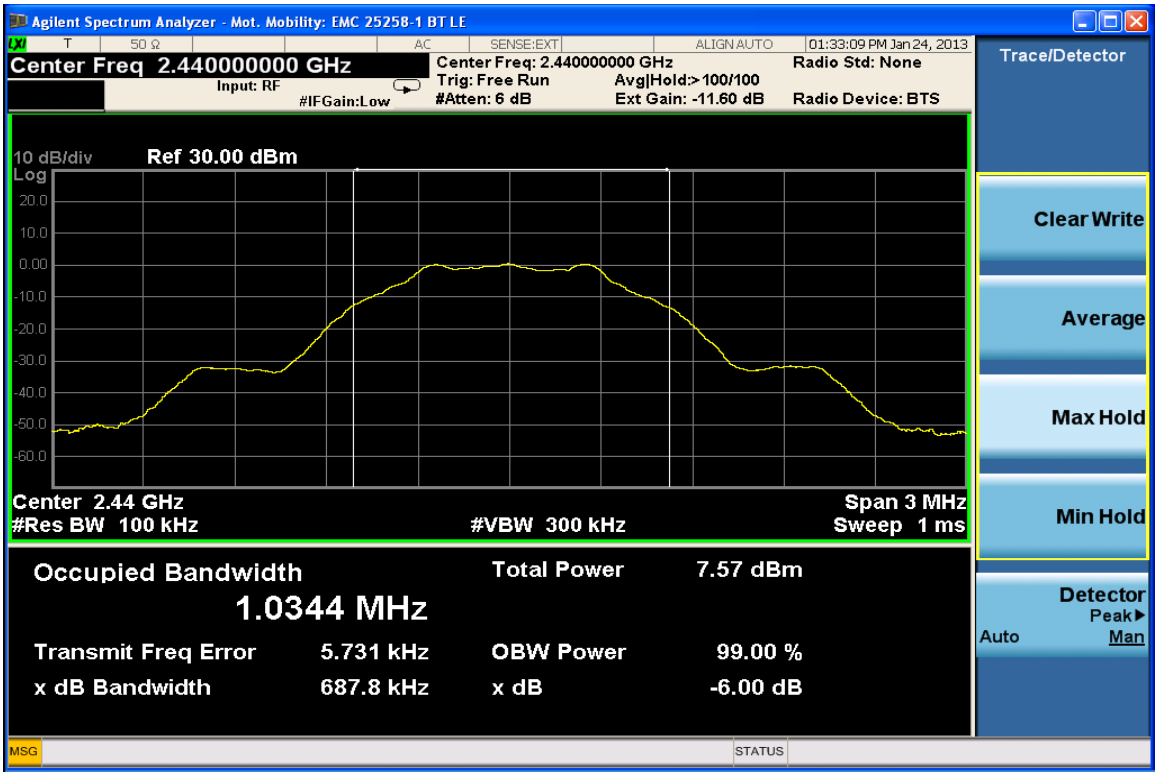
The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The automatic occupied bandwidth measurement function of the spectrum analyzer, set to 6dB or 26dB, is used.

Measurement Results

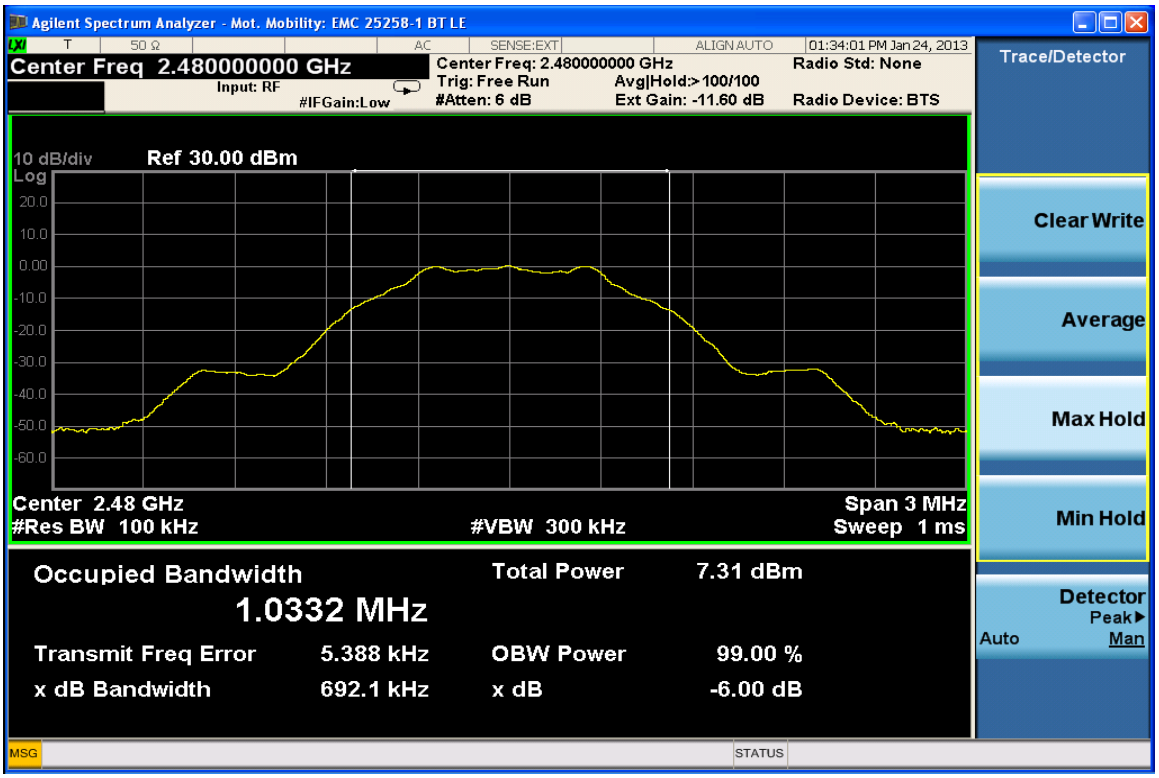
See attached



6 dB Bandwidth Low Channel

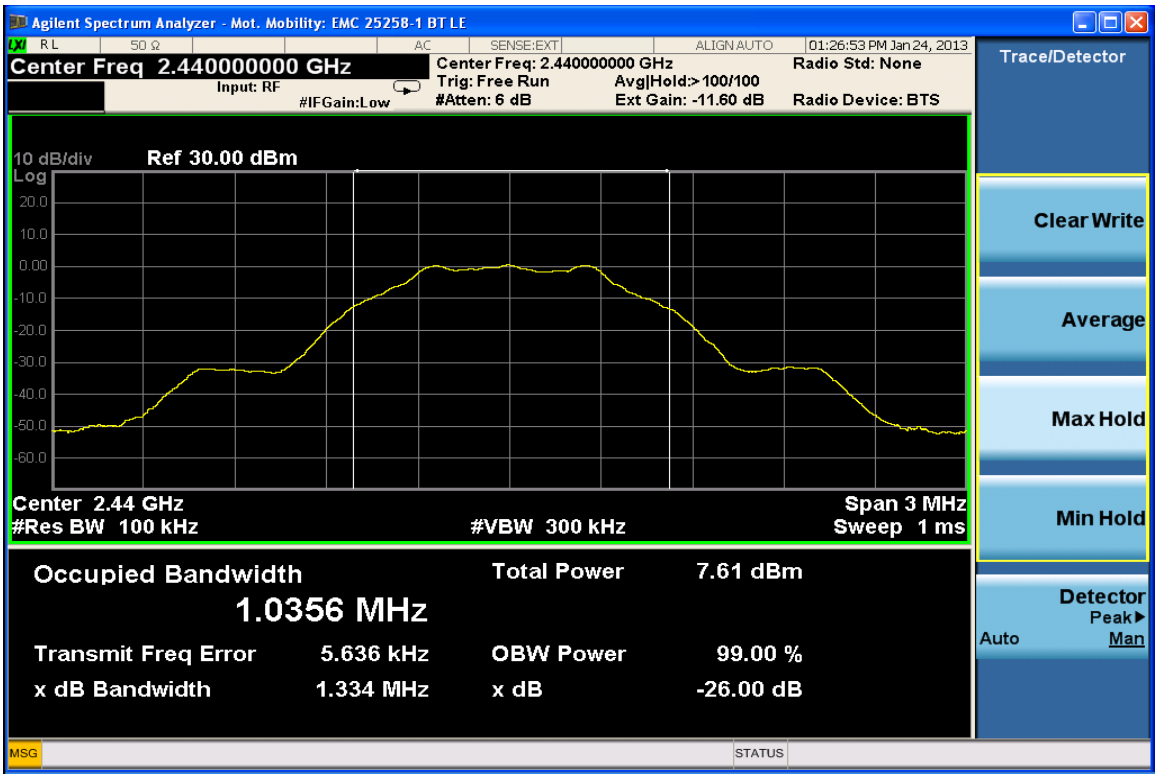


6 dB Bandwidth Mid Channel



6 dB Bandwidth High Channel

26 dB Bandwidth Low Channel



26 dB Bandwidth Mid Channel

26 dB Bandwidth High Channel

Output Power

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the Spectrum analyzer through a specialized RF connector and a 10dB passive attenuator. The EUT was transmitting at its maximum data rate. The fully charged internal battery was used for the supply voltage. The trace was allowed to stabilize.

The peak power is measured by the spectrum analyzer, using the peak marker function to determine the peak amplitude level. The spectrum analyzer used the following settings:

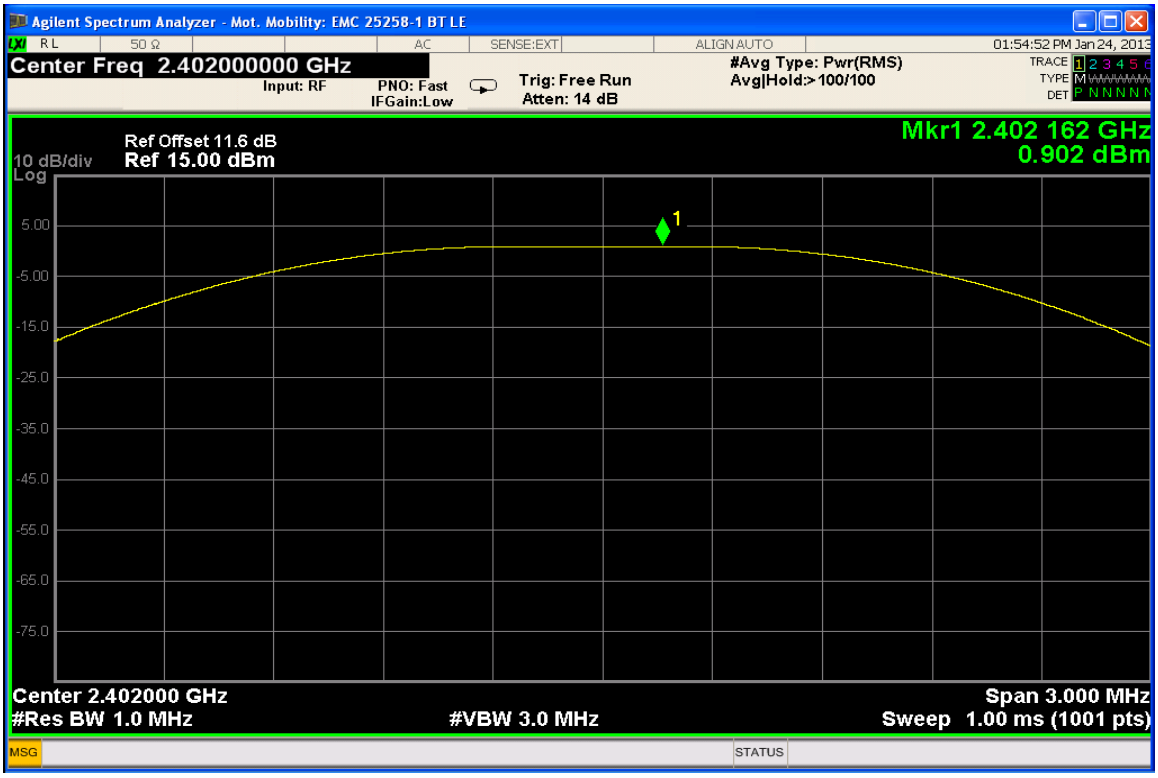
1. RBW ≥ 6dB bandwidth
2. VBW ≥ 3 x RBW
3. Span ≥ 3 x RBW
4. Sweep = auto couple
5. Detector function = peak
6. Trace = max hold

The average power is also measured by the spectrum analyzer, using the band/channel power measurement function with the band limits (Integration bandwidth) equal to the 26dB bandwidth. The spectrum analyzer used the following settings:

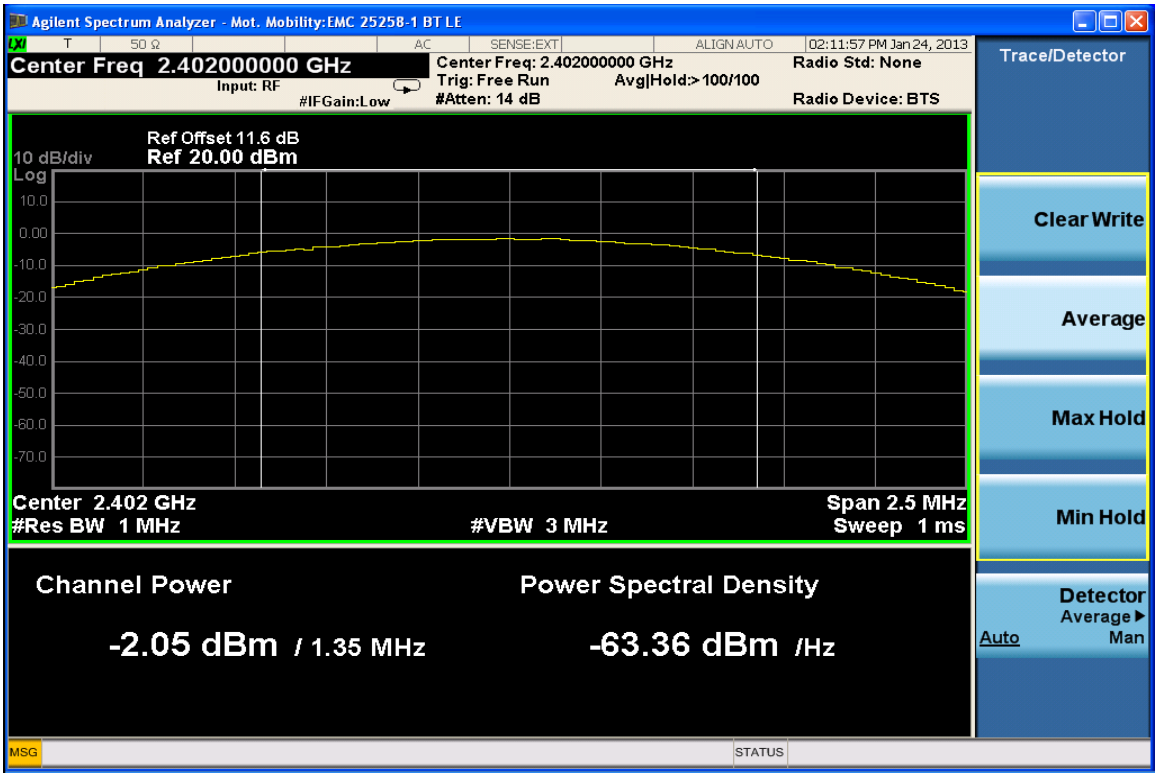
1. RBW = 1MHz
2. VBW ≥ 3MHz
3. Span = 1.5 x 26dB BW (EBW)
4. Sweep = auto couple
5. Number of measurement points ≥ 2 x Span/RBW
6. Detector = RMS detector
7. Trace averaging = minimum of 100 traces

Measurement Results

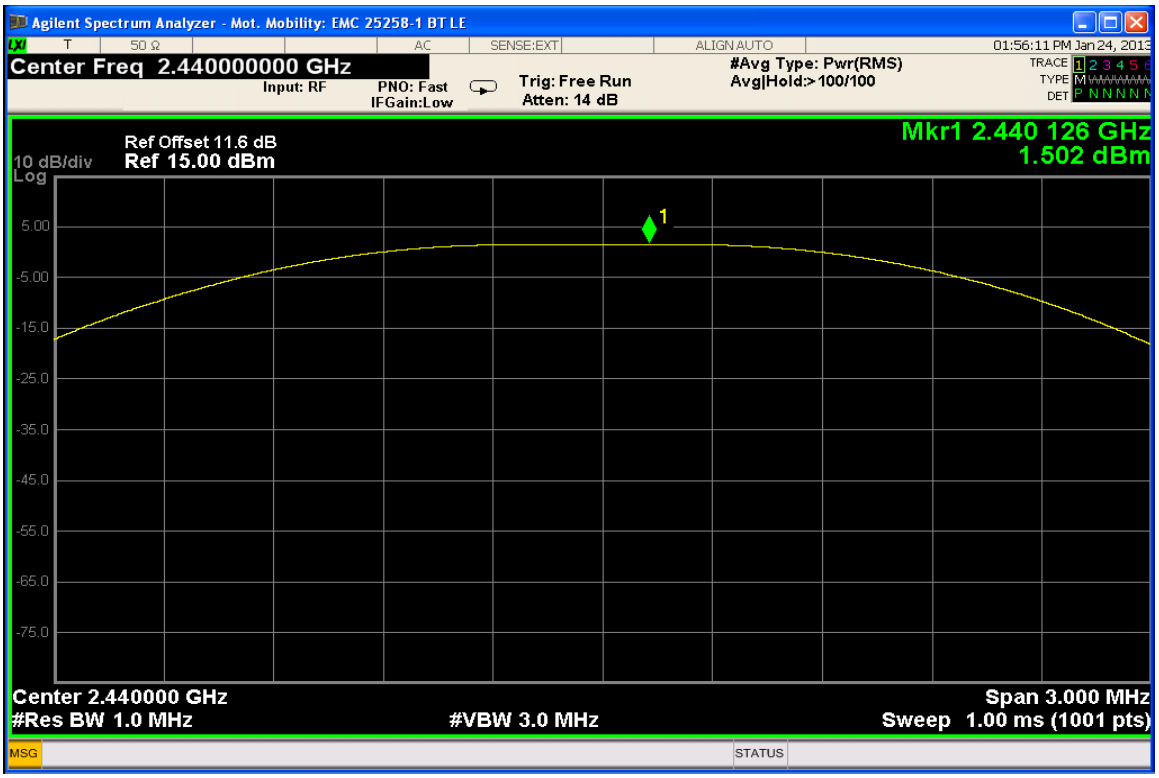
See Attached



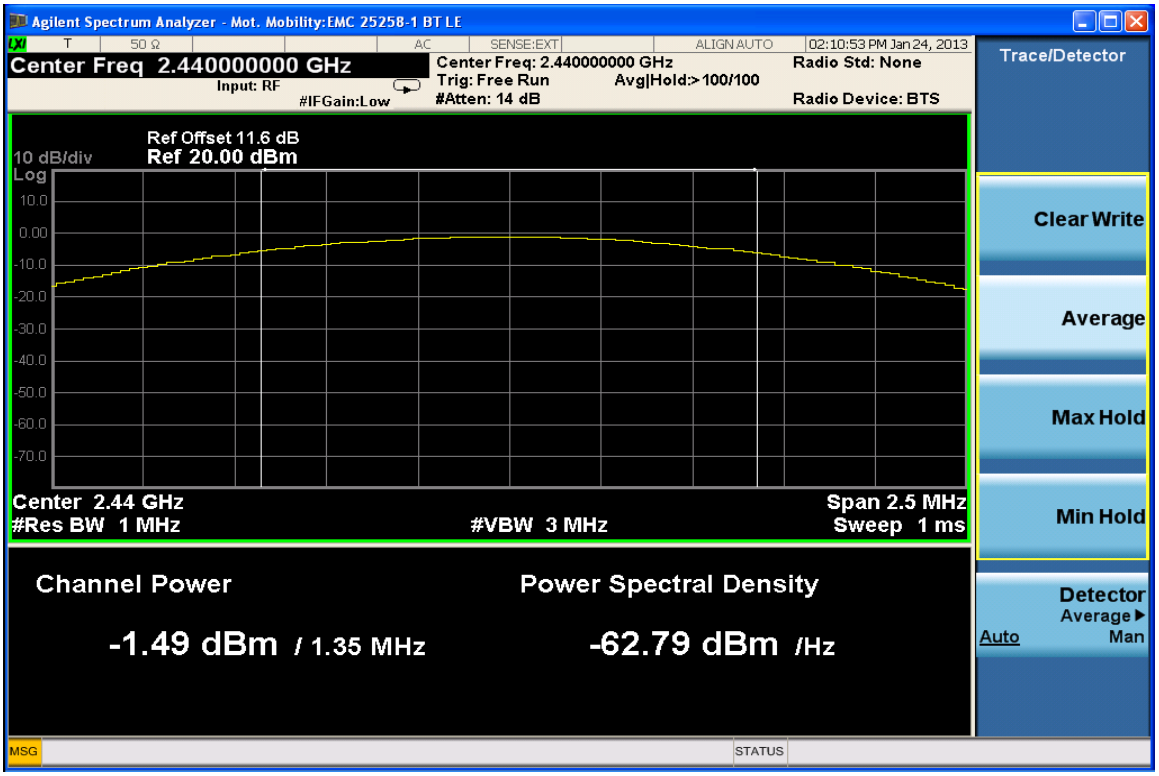
Max Power Low Channel



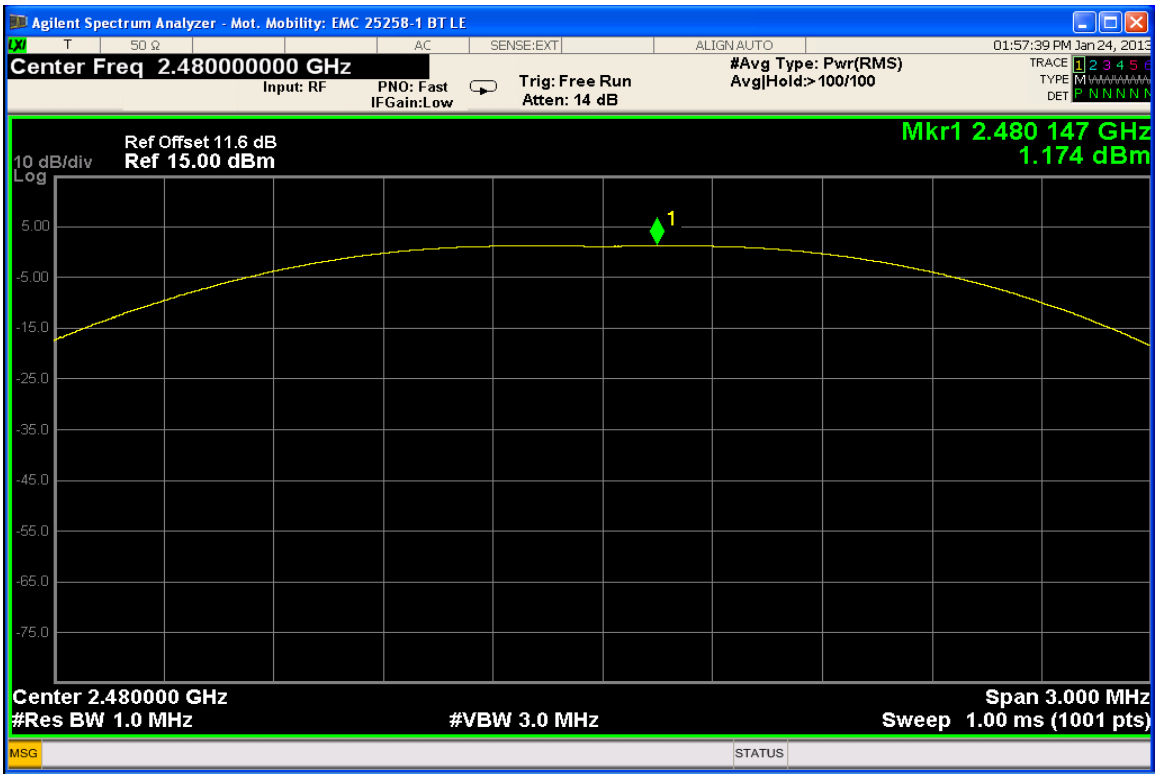
Average Power Low Channel



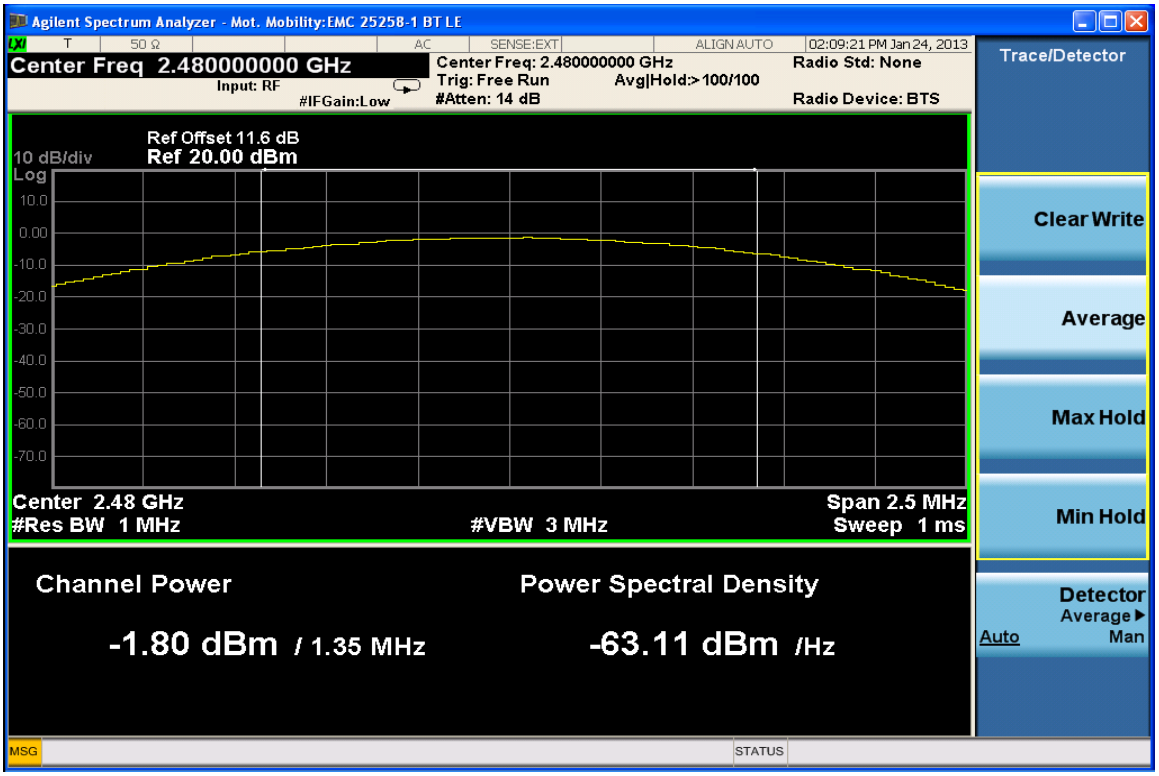
Max Power Mid Channel



Average Power Mid Channel



Max Power High Channel



Average Power High Channel

Power Spectral Density

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the spectrum analyzer through a specialized RF connector and a 10dB passive attenuator. The fully charged internal battery was used for the supply voltage. The BT LE function of the EUT was enabled. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize.

The peak power is measured by the spectrum analyzer, using the peak marker function to determine the peak amplitude level. The spectrum analyzer used the following settings:

1. Span = 1.5 x 6dB BW (DTS Bandwidth)
2. RBW = 100kHz
3. VBW ≥ 300kHz
4. Detector function = peak
5. Sweep = auto couple
6. Trace = max hold

Measurement Results

2402 MHz	2440 MHz	2480 MHz
0.115	0.716	0.377

Spurious RF Conducted Emissions

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the spectrum analyzer through a specialized RF connector and a 10dB passive attenuator. The fully charged internal battery was used for the supply voltage. The BT LE function of the EUT was enabled. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize.

The reference level for 20 dB down is calculated based on the peak power measurement made using the 100 kHz RBW settings within the fundamental emissions.

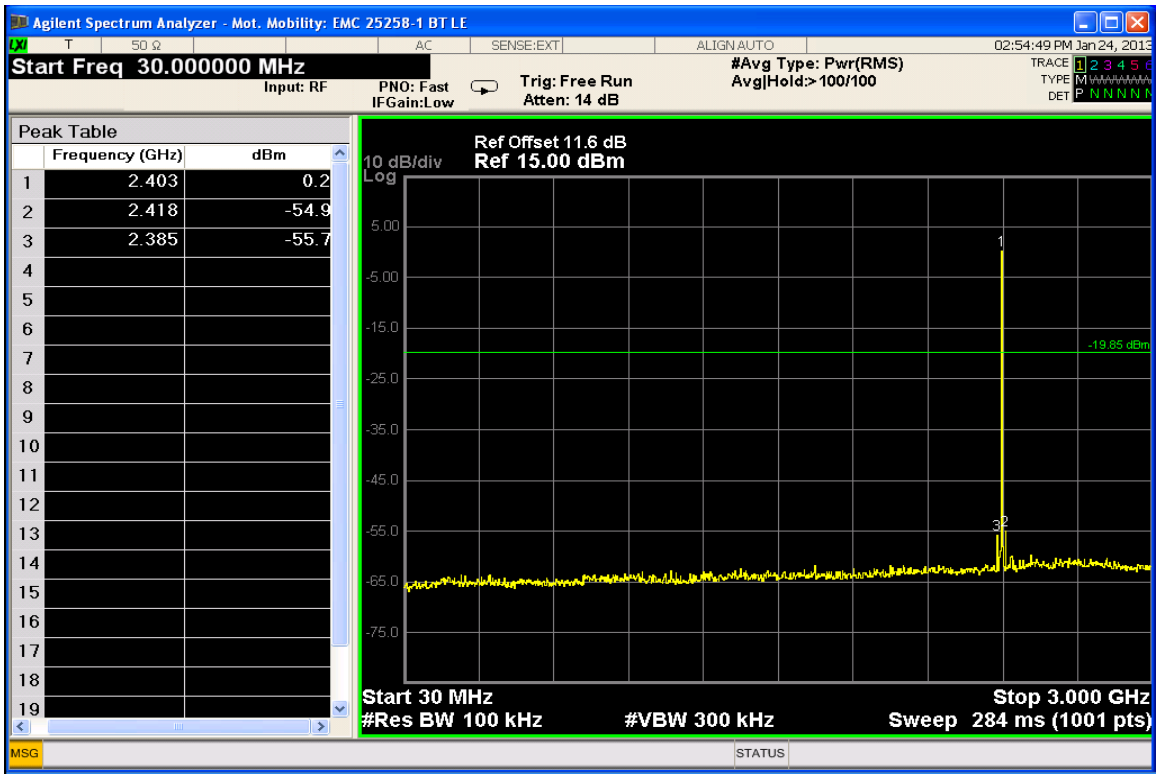
The peak power of the carrier signal is measured by the spectrum analyzer, using the peak marker function to determine the peak amplitude level. The spectrum analyzer used the following settings:

1. RBW = 100kHz
2. VBW ≥ 300kHz
3. Detector function = peak
4. Sweep = auto couple
5. Trace = max hold

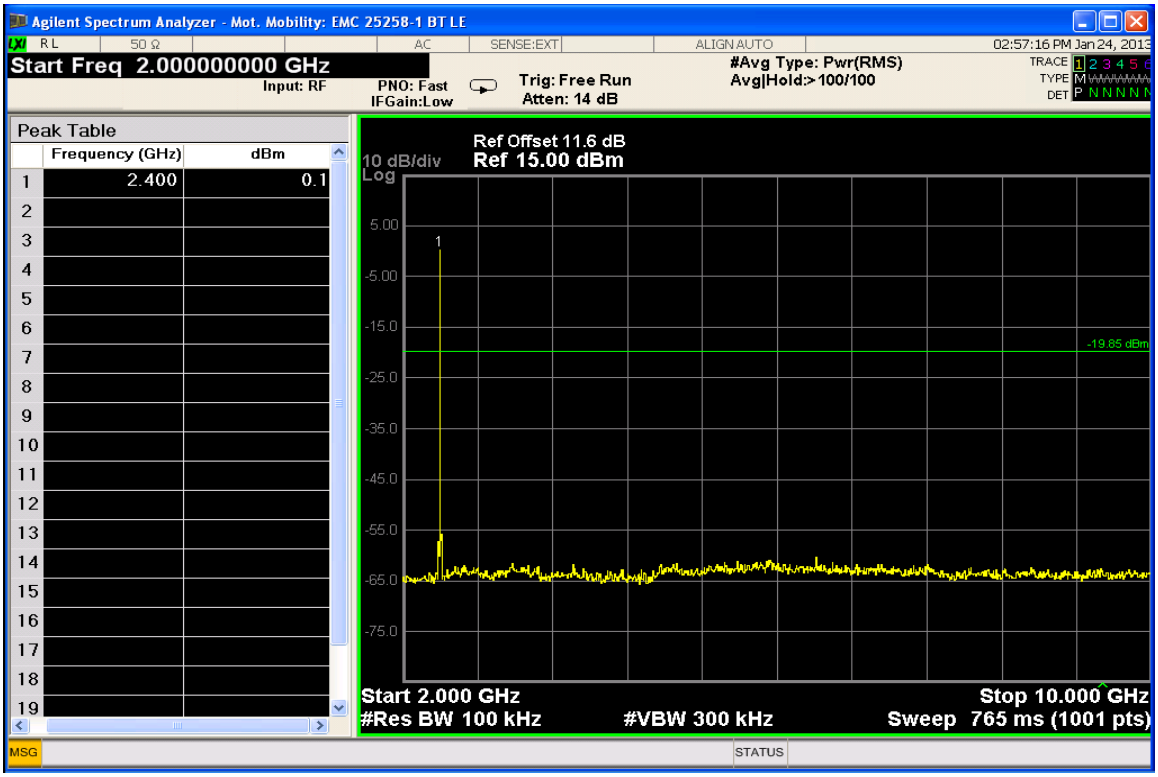
Measurement Results

All measured emissions are greater than 20dB below the fundamental.

See attached:

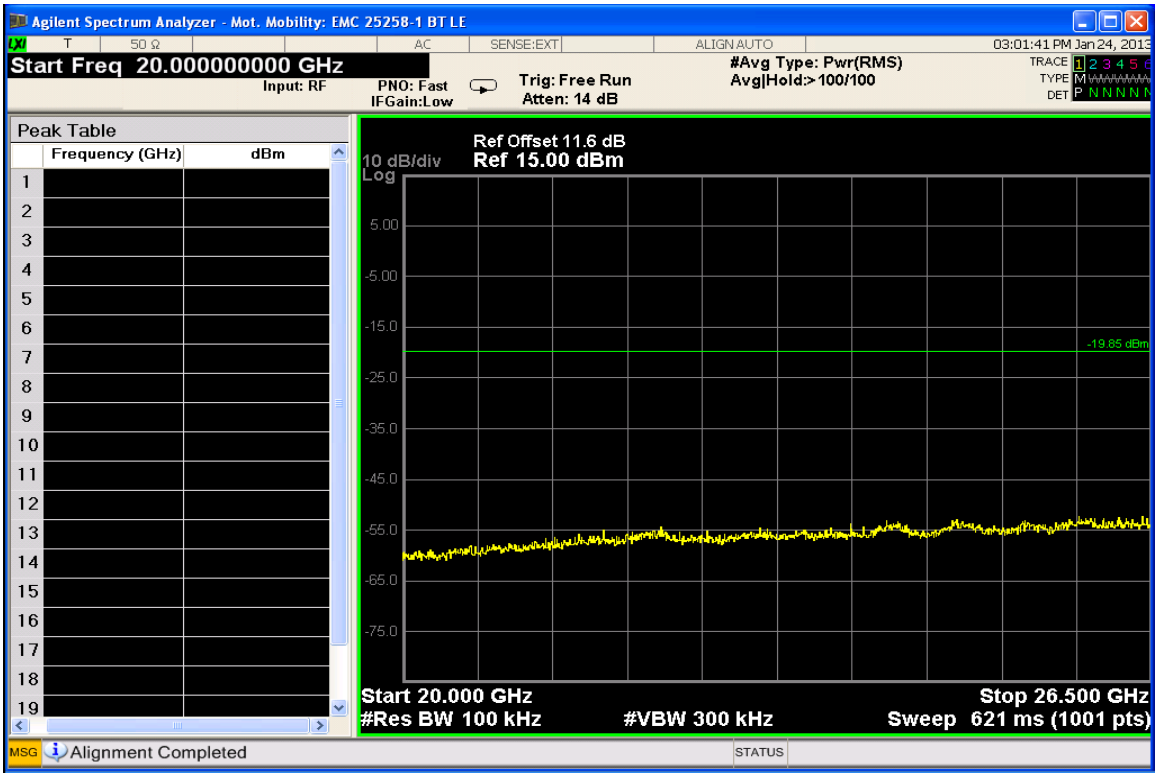


Conducted Spurious Emissions 30MHz-3000MHz (Low Channel)

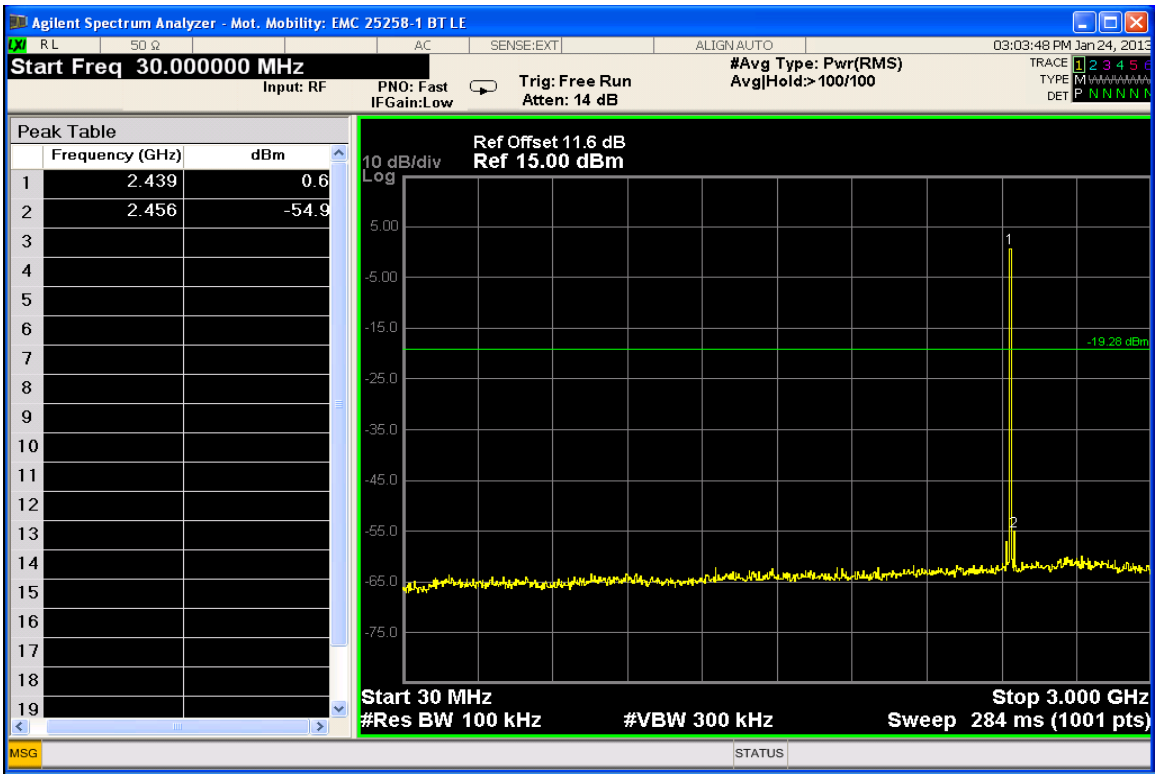


Conducted Spurious Emissions 2GHz-10GHz (Low Channel)

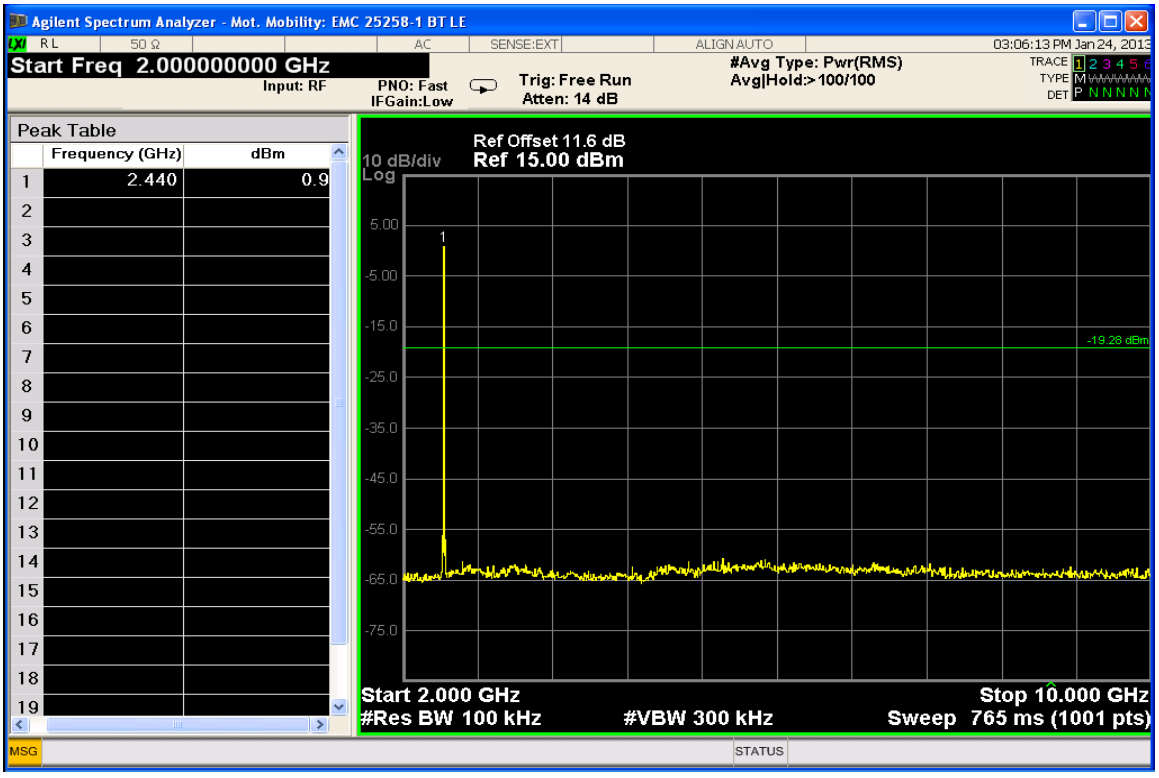
Conducted Spurious Emissions 10GHz-20GHz (Low Channel)



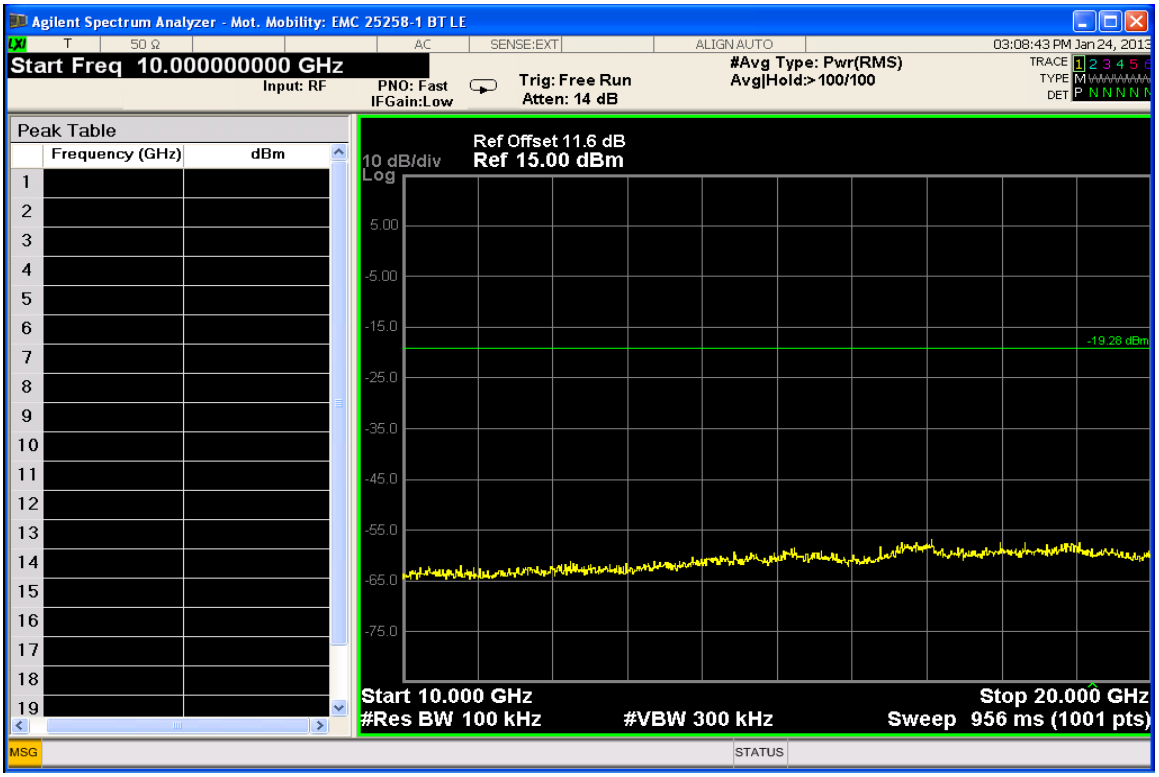
Conducted Spurious Emissions 20GHz-26.5GHz (Low Channel)



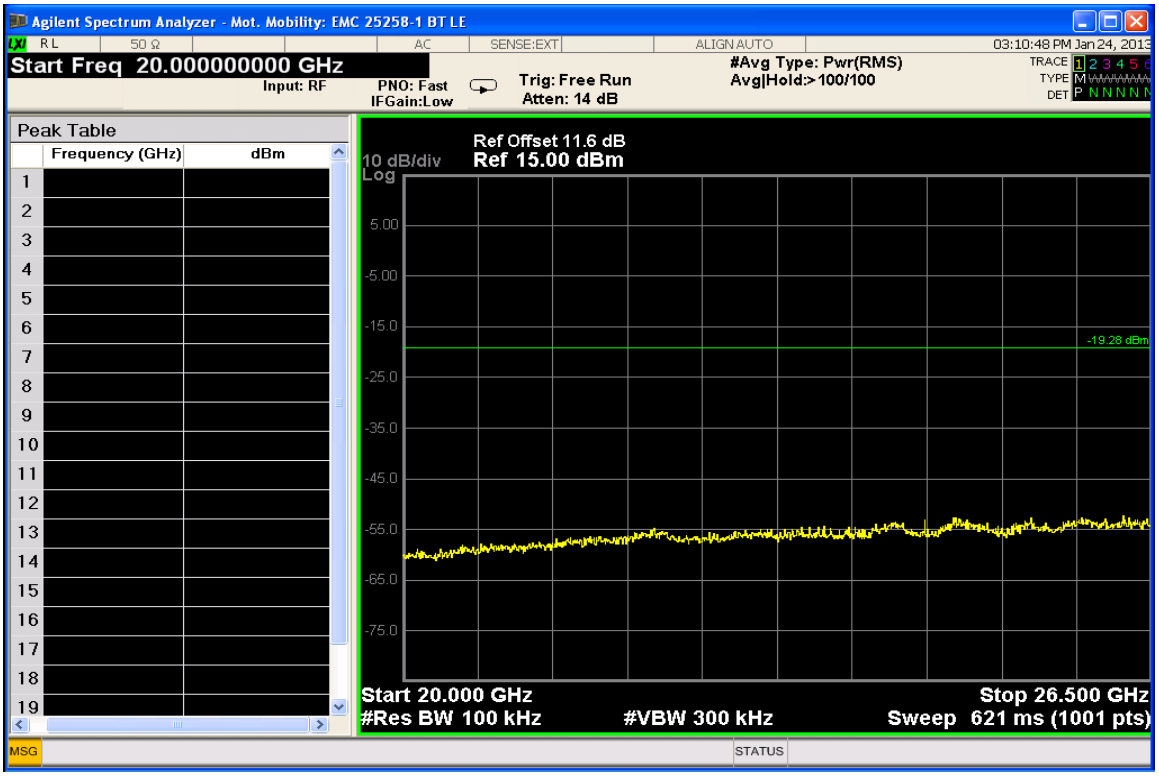
Conducted Spurious Emissions 30MHz-3000MHz (Mid Channel)



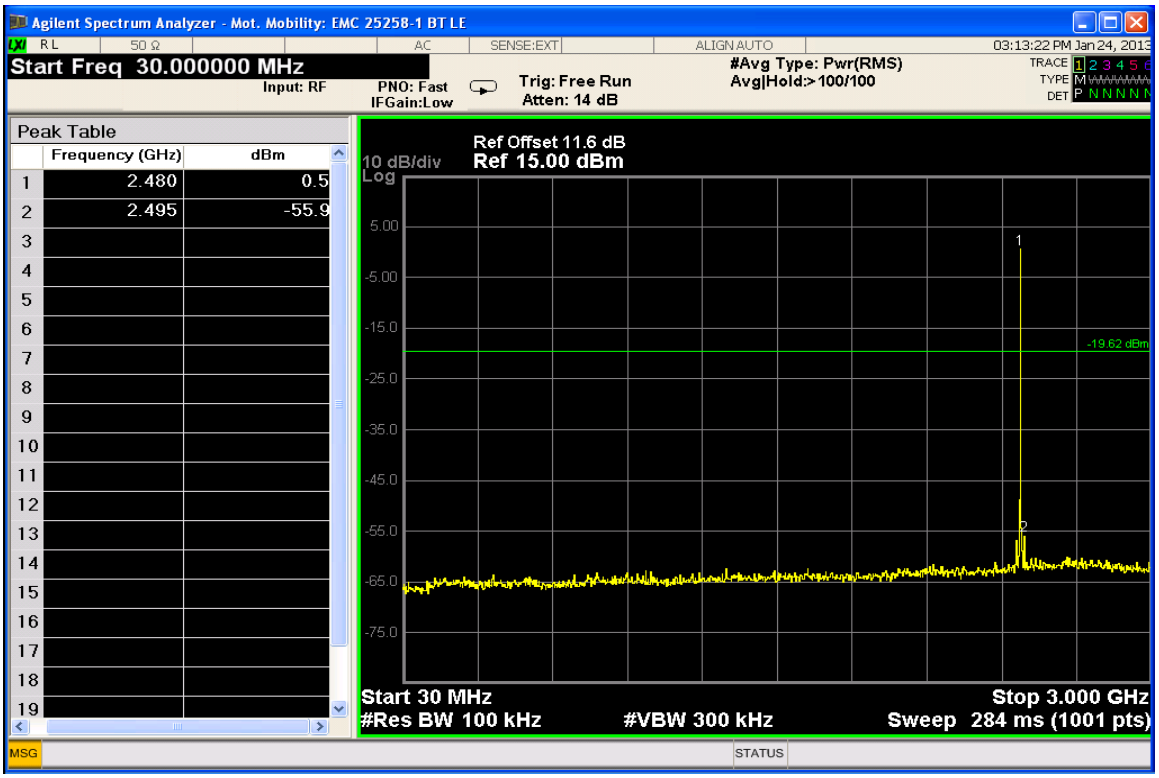
Conducted Spurious Emissions 2GHz-10GHz (Mid Channel)



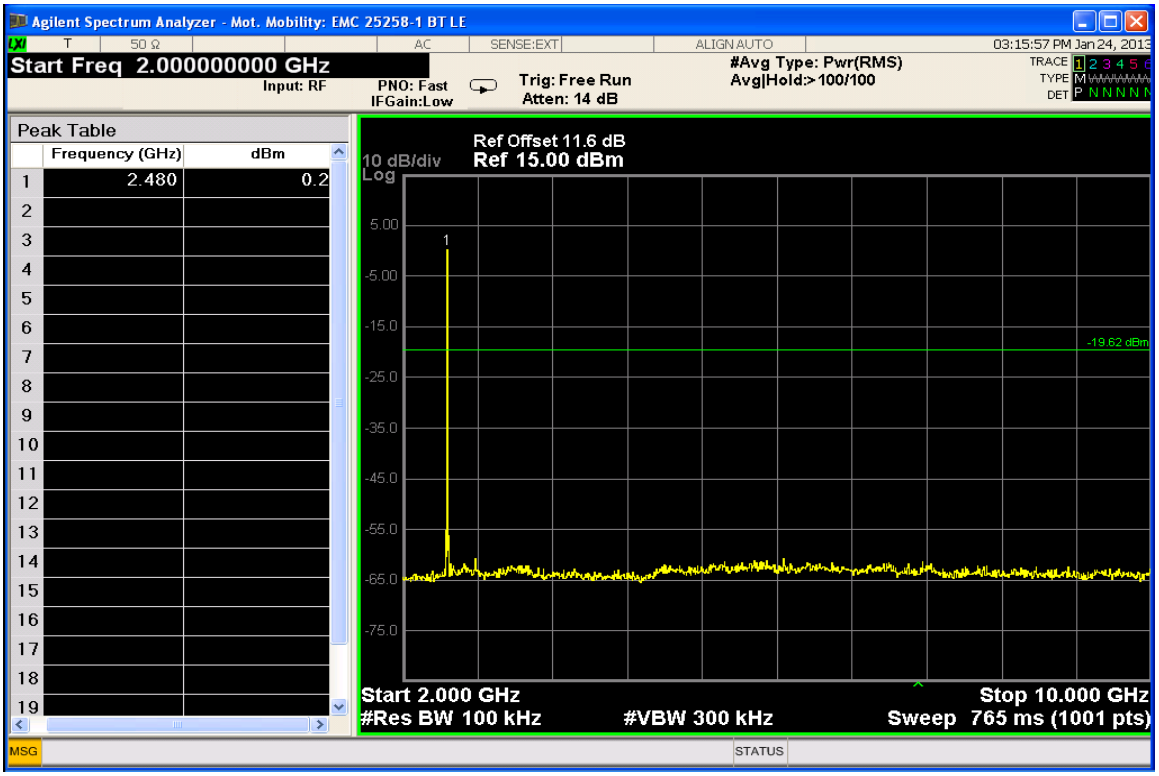
Conducted Spurious Emissions 10GHz-20GHz (Mid Channel)



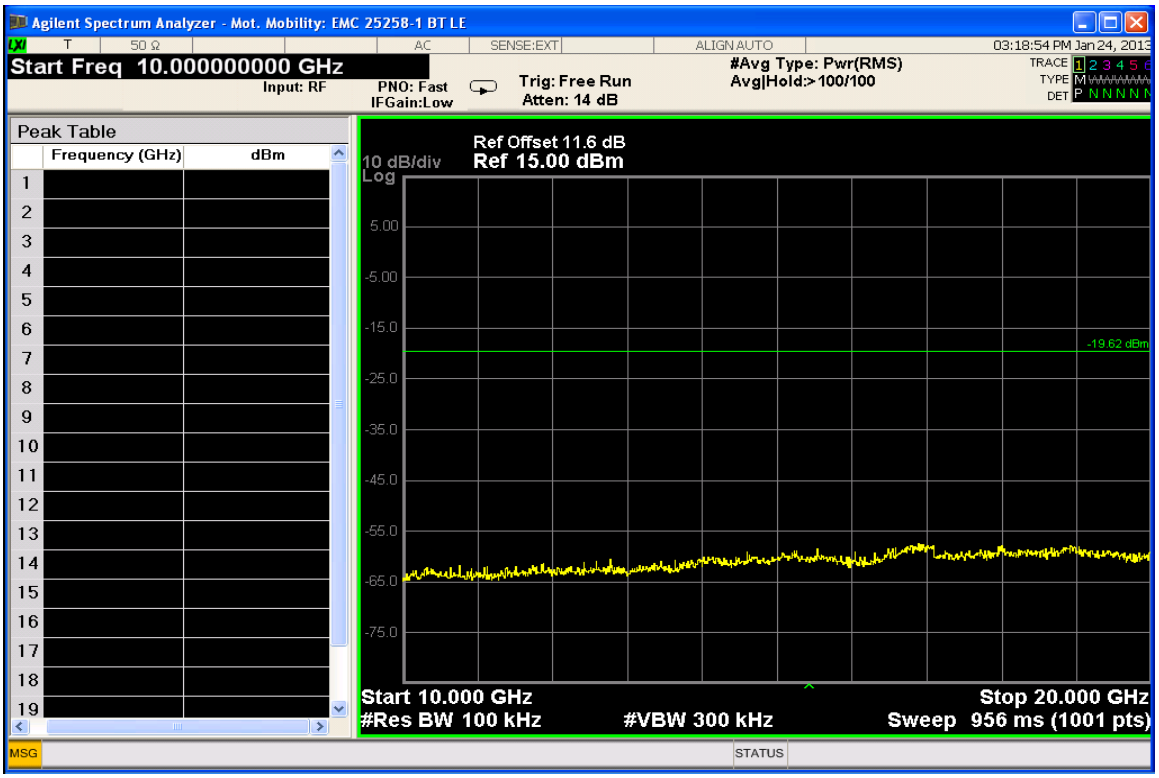
Conducted Spurious Emissions 20GHz-26.5GHz (Mid Channel)



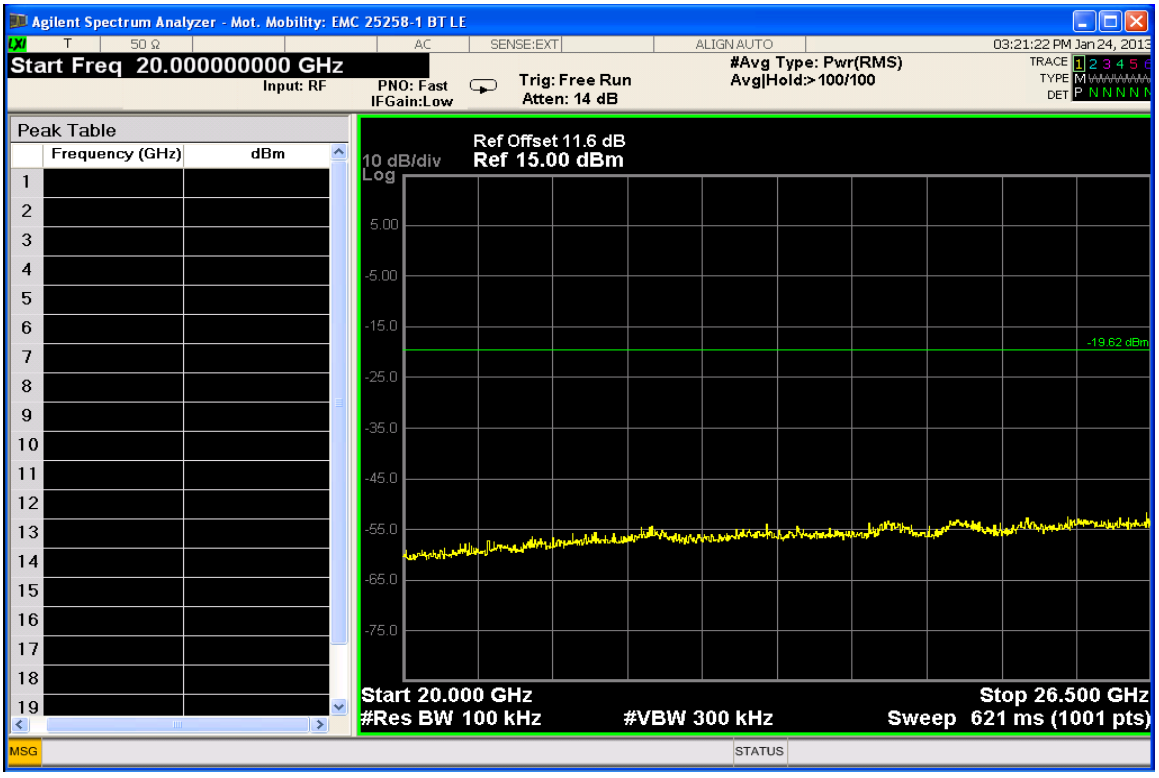
Conducted Spurious Emissions 30MHz-3000MHz (High Channel)



Conducted Spurious Emissions 2GHz-10GHz (High Channel)



Conducted Spurious Emissions 10GHz-20GHz (High Channel)



Conducted Spurious Emissions 20GHz-26.5GHz (High Channel)

Conducted Spurious Emissions at the Band Edge

CFR 47 Part 15.247

Measurement Procedure

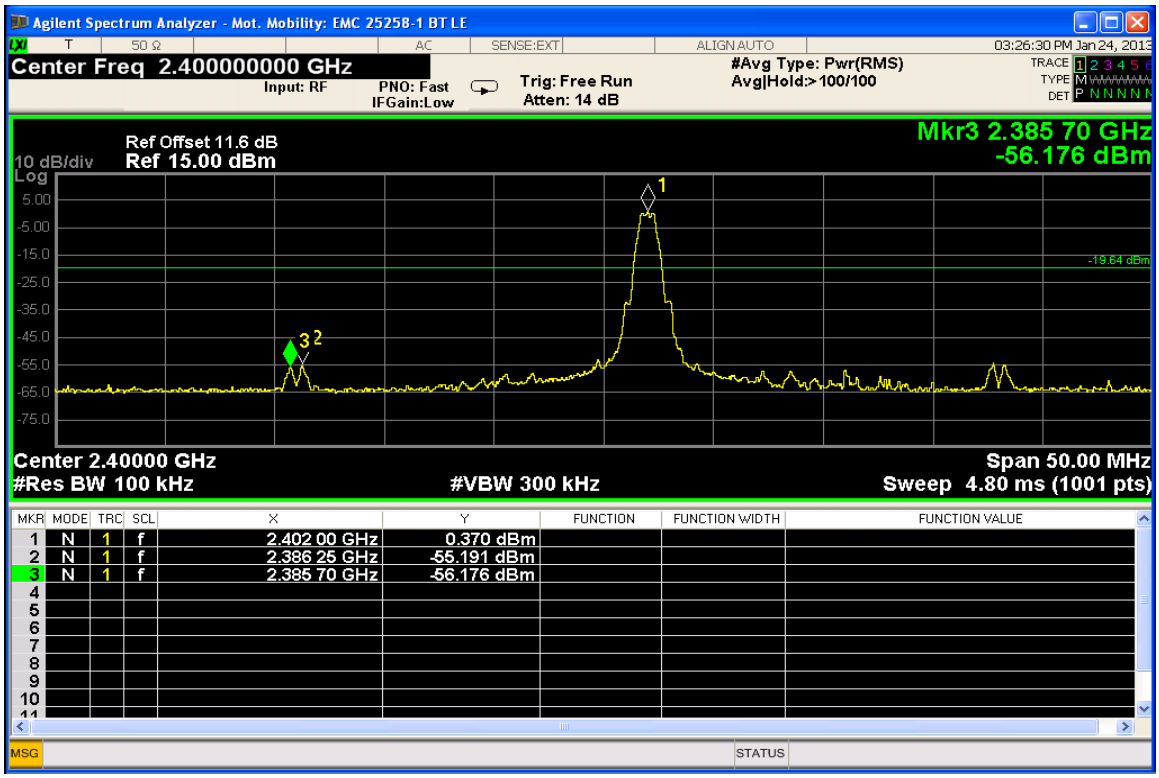
The RF output port of the Equipment-Under-Test is directly coupled to the input of the spectrum analyzer through a specialized RF connector and a 10dB passive attenuator. The fully charged internal battery was used for the supply voltage. The BT LE function of the EUT was enabled. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize.

The spectrum analyzer used the following settings:

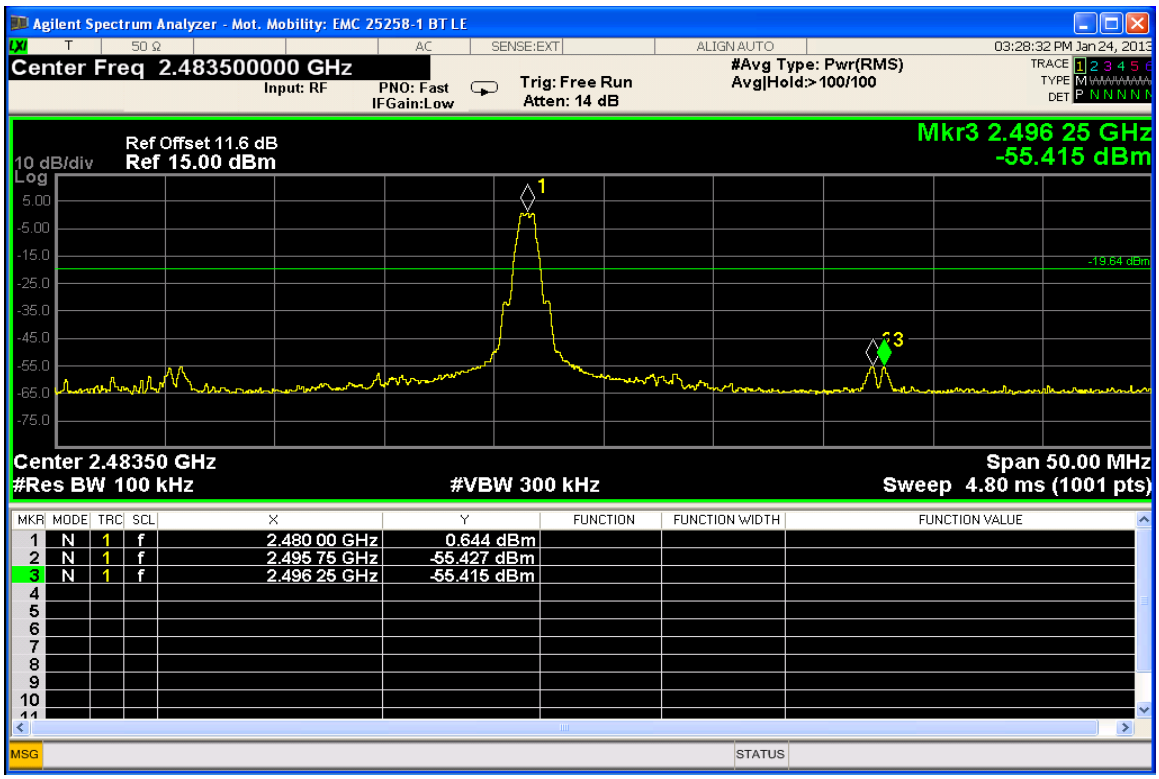
1. Center Frequency = 2.4GHz (lower band edge) or 2.4835GHz (upper band edge)
2. Span = 50MHz
3. RBW = 100kHz
4. VBW ≥ 300kHz
5. Detector function = peak
6. Sweep = auto couple
7. Trace = max hold
8. Sweep = Auto

Measurement Results

See attached:



Conducted Spurious Emissions at the Low Band Edge



Conducted Spurious Emissions at the High Band Edge

AC Line Conducted Emissions

CFR 47 Part 15.207

Measurement Procedure

Measured levels of ac power line conducted emission shall be the radio-noise voltage from the line probe or across the 50 Ω LISN port, where permitted, terminated into a 50 Ω noise meter, or where permitted or required, the radio-noise current on the power line sensed by a current probe.

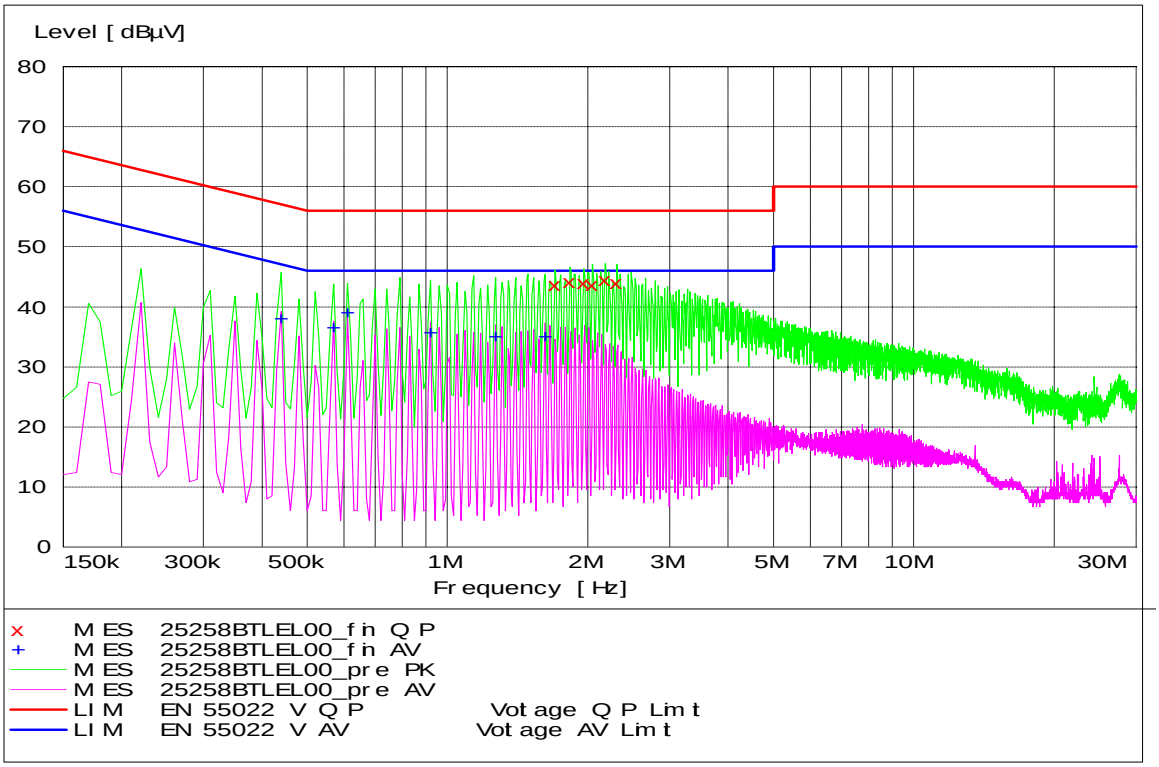
All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. Equipment shall be tested with power cords that are normally supplied using an LISN, the 50 Ω measuring port is terminated by a 50 Ω radio-noise meter or a 50 Ω resistive load. All other ports are terminated in 50 Ω.

Detectors – Quasi Peak and Average Detector.

Measurement Results

See attached:

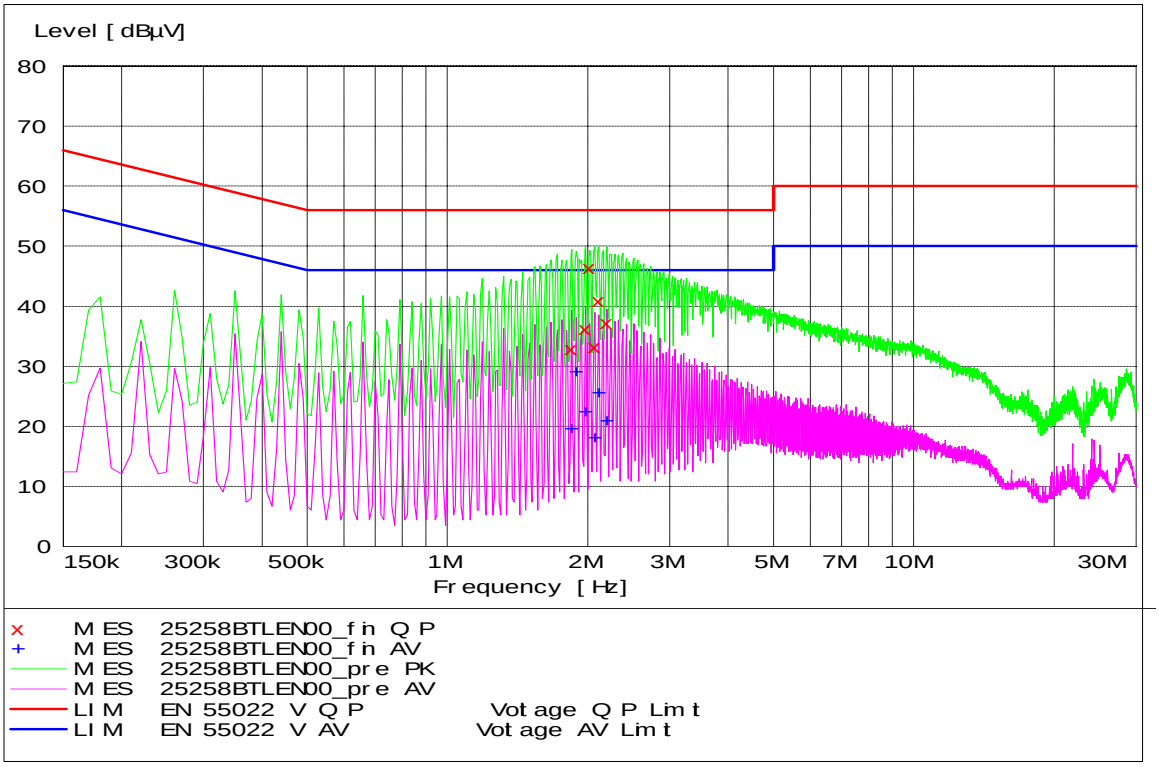
Low Channel - Tx Mode - Line Coupling



Frequency MHz	QuasiPeak dBuV	Correction dB	Limit dBuV	Margin dB
1.70	43.8	10	56	12.2
1.83	44.2	10	56	11.8
1.96	44.0	10	56	12.0
2.05	43.7	10	56	12.3
2.18	44.6	10	56	11.4

Frequency MHz	Average dBuV	Correction dB	Limit dBuV	Margin dB
0.44	38.0	10	47	9.1
0.57	36.5	10	46	9.5
0.61	39.1	10	46	6.9
0.92	35.8	10	46	10.2
1.27	35.1	10	46	10.9
1.62	35.1	10	46	10.9

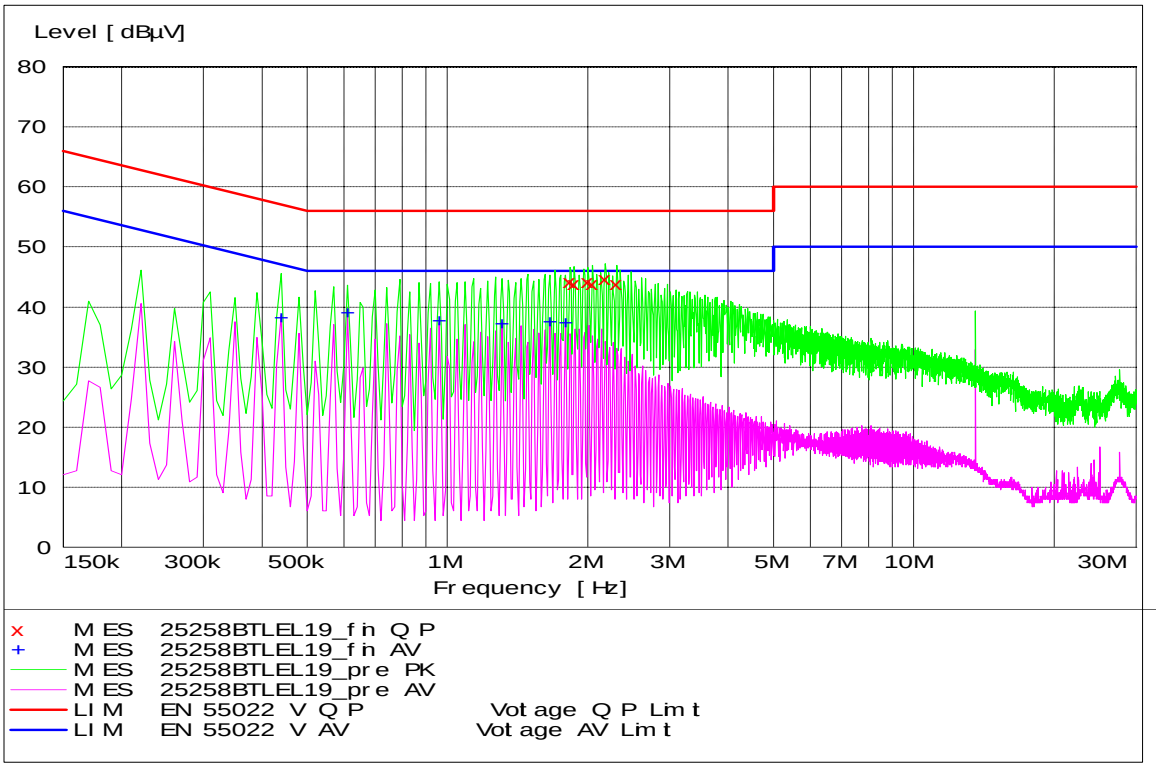
Low Channel - Tx Mode – Neutral Coupling



Frequency MHz	QuasiPeak dBuV	Correction dB	Limit dBuV	Margin dB
1.85	33.0	10	56	23.0
1.98	36.3	10	56	19.7
2.02	46.5	10	56	9.5
2.07	33.3	10	56	22.7
2.11	40.9	10	56	15.1

Frequency MHz	Average dBuV	Correction dB	Limit dBuV	Margin dB
1.85	19.6	10	46	26.4
1.89	29.2	10	46	16.8
1.98	22.5	10	46	23.5
2.07	18.2	10	46	27.8
2.11	25.6	10	46	20.4
2.20	20.9	10	46	25.1

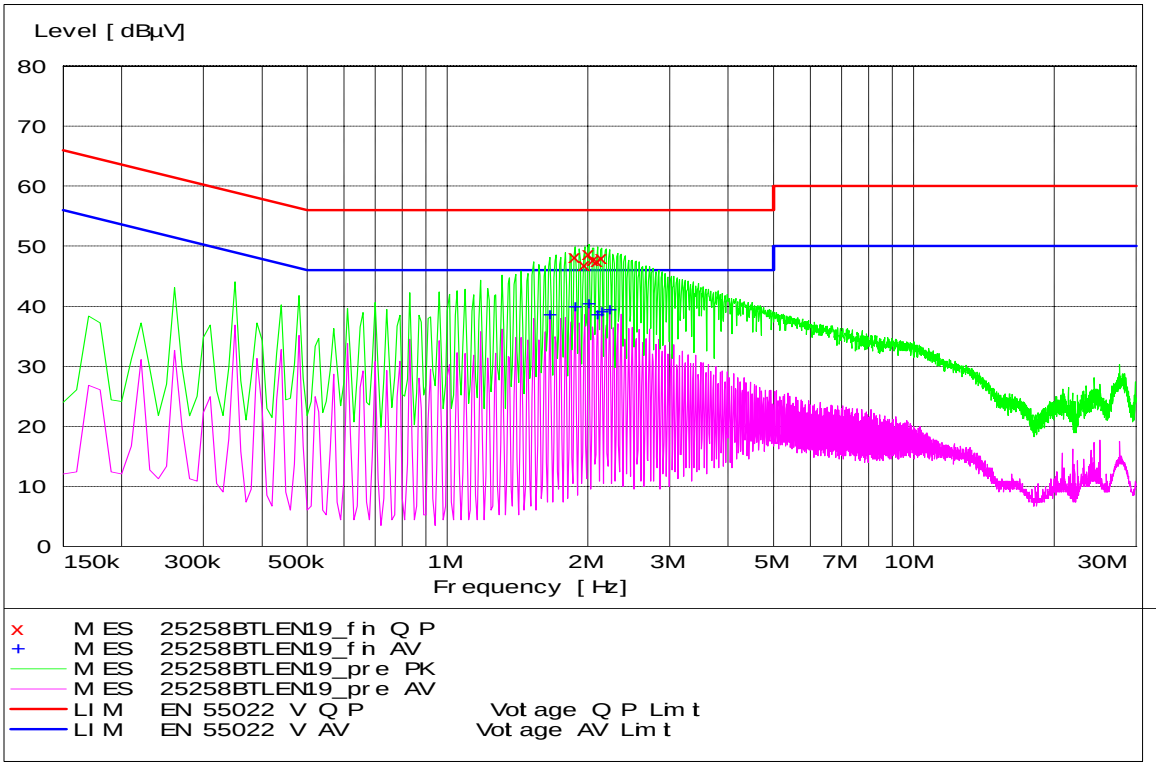
Mid Channel - Tx Mode - Line Coupling



Frequency MHz	QuasiPeak dBuV	Correction dB	Limit dBuV	Margin dB
1.83	44.2	10	56	11.8
1.87	43.9	10	56	12.1
2.00	44.3	10	56	11.7
2.05	44.0	10	56	12.0
2.18	44.8	10	56	11.2

Frequency MHz	Average dBuV	Correction dB	Limit dBuV	Margin dB
0.44	38.3	10	47	8.8
0.61	39.1	10	46	6.9
0.96	37.7	10	46	8.3
1.31	37.3	10	46	8.7
1.66	37.6	10	46	8.4
1.79	37.4	10	46	8.6

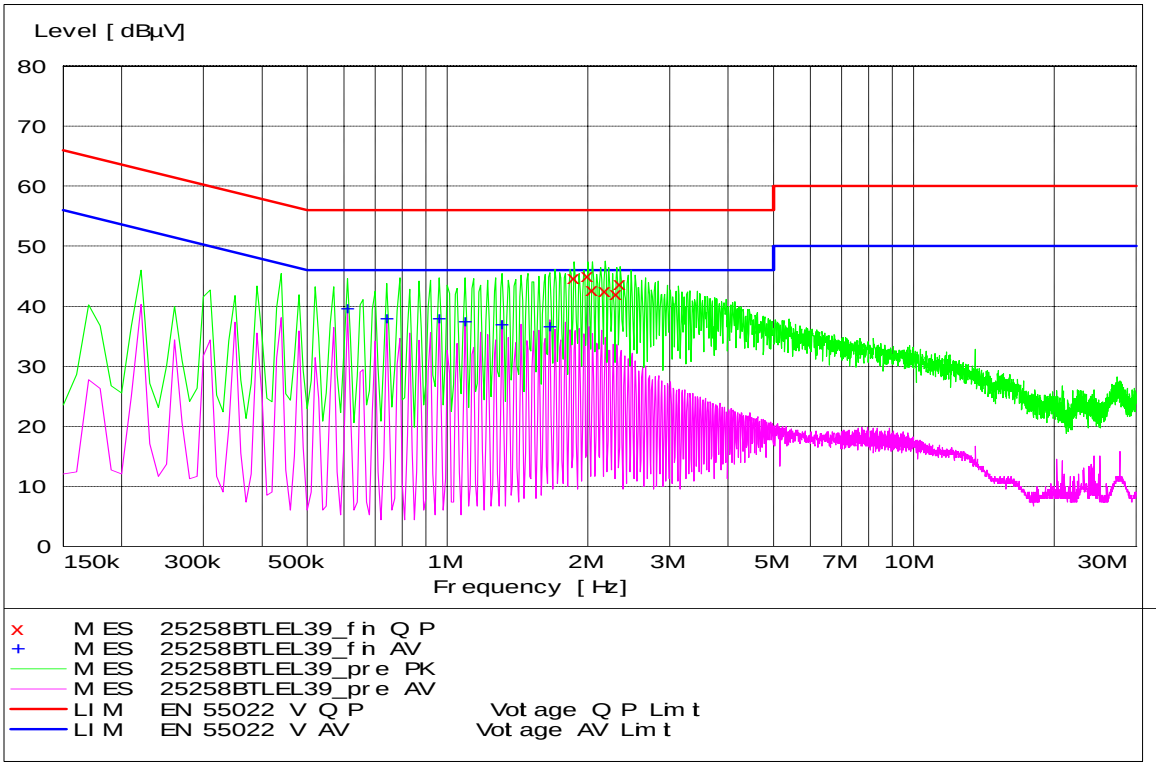
Mid Channel - Tx Mode - Neutral Coupling



Frequency MHz	QuasiPeak dBuV	Correction dB	Limit dBuV	Margin dB
1.88	48.3	10	56	7.7
1.97	46.9	10	56	9.1
2.01	48.8	10	56	7.2
2.06	47.8	10	56	8.2
2.10	47.6	10	56	8.4

Frequency MHz	Average dBuV	Correction dB	Limit dBuV	Margin dB
1.66	38.6	10	46	7.4
1.88	40.0	10	46	6.0
2.01	40.5	10	46	5.5
2.10	38.6	10	46	7.4
2.14	39.1	10	46	6.9
2.23	39.4	10	46	6.6

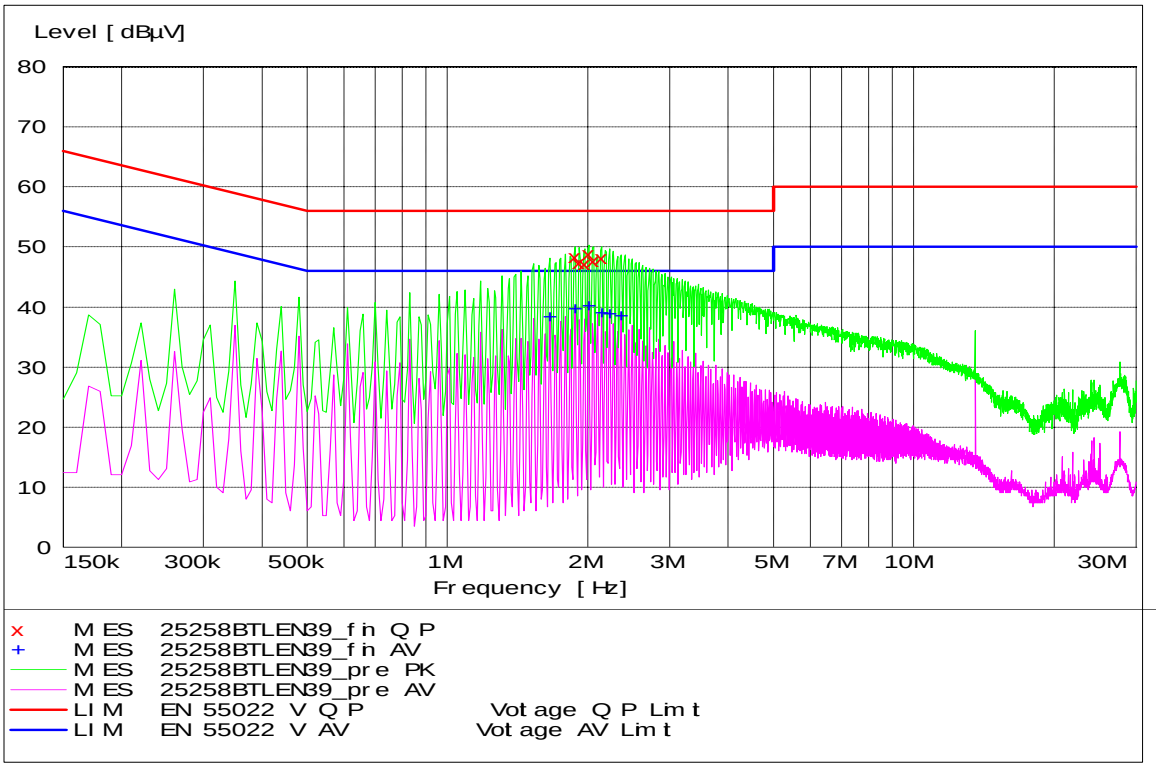
High Channel - Tx Mode - Line Coupling



Frequency MHz	QuasiPeak dBuV	Correction dB	Limit dBuV	Margin dB
1.87	44.8	10	56	11.2
2.00	45.1	10	56	10.9
2.05	42.7	10	56	13.3
2.18	42.6	10	56	13.4
2.31	42.1	10	56	13.9

Frequency MHz	Average dBuV	Correction dB	Limit dBuV	Margin dB
0.61	39.6	10	46	6.4
0.74	37.9	10	46	8.1
0.96	37.9	10	46	8.1
1.09	37.5	10	46	8.5
1.31	37.0	10	46	9.0
1.66	36.6	10	46	9.4

High Channel - Tx Mode - Neutral Coupling



Frequency MHz	QuasiPeak dBuV	Correction dB	Limit dBuV	Margin dB
1.88	48.4	10	56	7.6
1.92	47.5	10	56	8.5
1.97	47.2	10	56	8.8
2.01	48.9	10	56	7.1
2.06	47.7	10	56	8.3

Frequency MHz	Average dBuV	Correction dB	Limit dBuV	Margin dB
1.66	38.5	10	46	7.5
1.88	39.7	10	46	6.3
2.01	40.2	10	46	5.8
2.14	39.1	10	46	6.9
2.23	38.9	10	46	7.1
2.36	38.6	10	46	7.4

End of Test Report