



**DATE: 21 June 2014**

**I.T.L. (PRODUCT TESTING) LTD.**  
**FCC Radio Test Report**  
for  
**Micronet Ltd.**

**Equipment under test:**

**Mobile Data Terminal (MDT)**

**M317  
WiFi Transmitter**

Written by:

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A. Sharabi, Test Engineer

Approved by:

I. Raz

I. Raz, EMC Laboratory Manager

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This report relates only to items tested.



## Measurement/Technical Report for Micronet Ltd.

### Mobile Data Terminal (MDT)

M317

**FCC ID: : U80NB860**

**IC: 12186A-NB860**

**21 June 2014**

This report concerns:                      Original Grant:                      X  
                                                    Class I Change:  
                                                    Class II Change:

Equipment type:                              Spread Spectrum/Digital Device  
                                                            2400-2483.5 MHz

Limits used:                                      47CFR15 Section 15.247

Measurement procedure used is KDB 558074 D01 v03r02 June 5, 2014 and  
ANSI C63.4-2003.

Application for Certification  
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## TABLE OF CONTENTS

<b>1. GENERAL INFORMATION -----</b>	<b>5</b>
1.1 Administrative Information.....	5
1.2 List of Accreditations .....	6
1.3 Product Description .....	7
1.4 Test Methodology .....	7
1.5 Test Facility .....	7
1.6 Measurement Uncertainty .....	8
<b>2. SYSTEM TEST CONFIGURATION-----</b>	<b>9</b>
2.1 Justification.....	9
2.2 EUT Exercise Software .....	9
2.3 Special Accessories .....	9
2.4 Equipment Modifications .....	9
2.5 Configuration of Tested System.....	10
<b>3. RADIATED MEASUREMENT TEST SET-UP PHOTO -----</b>	<b>11</b>
<b>4. 6 DB MINIMUM BANDWIDTH -----</b>	<b>13</b>
4.1 Test procedure .....	13
4.2 Results table.....	22
4.3 Test Equipment Used.6 dB Minimum Bandwidth.....	23
<b>5. 26 DB MINIMUM BANDWIDTH-----</b>	<b>24</b>
5.1 Test procedure .....	24
5.2 Results table.....	31
5.3 Test Equipment Used. 26 dB Minimum Bandwidth.....	32
<b>6. MAXIMUM TRANSMITTED PEAK POWER OUTPUT -----</b>	<b>33</b>
6.1 Test procedure .....	33
6.2 Results table.....	40
6.3 Test Equipment Used. Peak Power Output .....	41
<b>7. BAND EDGE SPECTRUM -----</b>	<b>42</b>
7.1 Test procedure .....	42
7.2 Results table.....	47
7.3 Test Equipment Used. Band edge Spectrum.....	48
<b>8. RADIATED EMISSION, 9 KHZ – 30 MHZ -----</b>	<b>49</b>
8.1 Test Specification .....	49
8.2 Test Procedure .....	49
8.3 Measured Data.....	49
8.4 Test Instrumentation Used, Radiated Measurements.....	50
8.5 Field Strength Calculation .....	51
<b>9. SPURIOUS RADIATED EMISSION, 30 – 25000 MHZ -----</b>	<b>52</b>
9.1 Radiated Emission 30-25000 MHz.....	52
9.2 Test Data.....	53
9.3 Test Instrumentation Used, Radiated Measurements Above 1 GHz .....	60
<b>10. TRANSMITTED POWER DENSITY -----</b>	<b>61</b>
10.1 Test procedure .....	61
10.2 Results table.....	68
10.3 Test Equipment Used; Transmitted Power Density .....	69
<b>11. ANTENNA GAIN/INFORMATION-----</b>	<b>70</b>
<b>12. R.F EXPOSURE/SAFETY-----</b>	<b>71</b>
<b>13. APPENDIX A - CORRECTION FACTORS -----</b>	<b>72</b>
13.1 Correction factors for CABLE .....	72
13.2 Correction factors for CABLE .....	73
13.3 Correction factors for CABLE .....	74
13.4 Correction factors for CABLE .....	75
12.6 Correction factors for LOG PERIODIC ANTENNA .....	76



13.5	Correction factors for LOG PERIODIC ANTENNA .....	77
13.6	Correction factors for BICONICAL ANTENNA .....	78
13.7	Correction factors for BICONICAL ANTENNA .....	79
13.8	Correction factors for Double-Ridged Waveguide Horn.....	80
13.9	Correction factors for Horn Antenna .....	81
13.10	Correction factors for Horn Antenna .....	82
13.11	Correction factors for ACTIVE LOOP ANTENNA .....	83
<b>14.</b>	<b>COMPARISON INDUSTRY CANADA REQUIREMENTS WITH FCC</b>	<b>84</b>



## 1. General Information

### 1.1 Administrative Information

Manufacturer: Micronet Ltd.

Manufacturer's Address: P.O.B. 11524,  
27 Hametsuda St.,  
Azor, 58001  
Israel

Tel : +972-3-558 4884  
Fax: +972-3-558 4885

Manufacturer's Representative: Erez Cohen-Zedek

Equipment Under Test (E.U.T): Mobile Data Terminal (MDT)

Equipment Model No.: M317

Equipment Serial No.: Not designated

Date of Receipt of E.U.T: 01.06.14

Start of Test: 01.06.14

End of Test: 08.06.14

Test Laboratory Location: I.T.L (Product Testing) Ltd.  
Kfar Bin Nun,  
ISRAEL 99780

Test Specifications: FCC Part 15, Subpart C  
RSS-210, Issue 8, 2010



## 1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025B-1.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.



### **1.3     *Product Description***

The M-317 provides Original Equipment Manufacturers (OEMs) and Telematics Service Providers (TSP's) with a rugged and versatile vehicle-centric mobile-computing platform for a variety of Mobile Resource Management (MRM) applications. The E.U.T. includes new BT\WiFi 3G - approved transmitters.

### **1.4     *Test Methodology***

Radiated testing was performed according to the procedures in KDB 558074 D01 v03r02 June 5, 2014 and ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### **1.5     *Test Facility***

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing November 21, 2012).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.



## **1.6     *Measurement Uncertainty***

### Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

$\pm 5.2$  dB

Note: See ITL Procedure No. PM 198.



## 2. System Test Configuration

### 2.1 ***Justification***

Unit was tested on the table in an installation position.

### 2.2 ***EUT Exercise Software***

No special exercise software was used.

### 2.3 ***Special Accessories***

No special accessories were needed to achieve compliance.

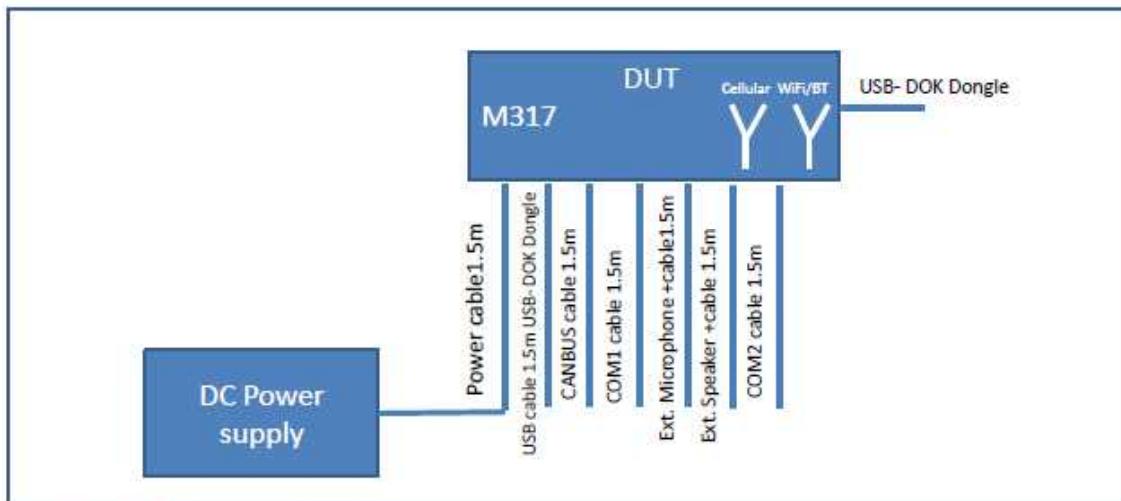
### 2.4 ***Equipment Modifications***

No modifications were necessary in order to achieve compliance.

## 2.5 Configuration of Tested System

The EUT was transmitting BT/WiFi modulation with SW application (MTS\_WiLink6&7).

The SW application forces the module to transmit in each frequency/data rate/modulation.



- USB are loaded with DOK dongle
- Serial ports (COM1, COM2) - Tx shorted to Rx (through parallel resistor) with data loop-back.
- Can Bus with resistor shorted between the two signals.
  - DUT= Device Under Test
  - DOK= Disk On Key
  - All the cables are shielded

**Figure 1. Configuration of Tested System**

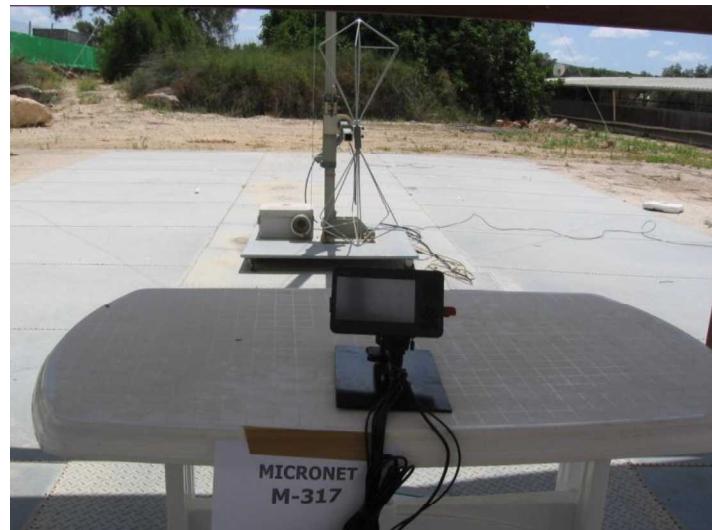
### 3. Radiated Measurement Test Set-up Photo



Figure 2. Radiated Emission Test



Figure 3. Radiated Emission Test



**Figure 4. Radiated Emission Test**



**Figure 5. Radiated Emission Test**

## 4. 6 dB Minimum Bandwidth

### 4.1 Test procedure

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T was tested at the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The spectrum bandwidth of the E.U.T. at the point of 6 dB below maximum peak power was measured and recorded.

1Mbps:

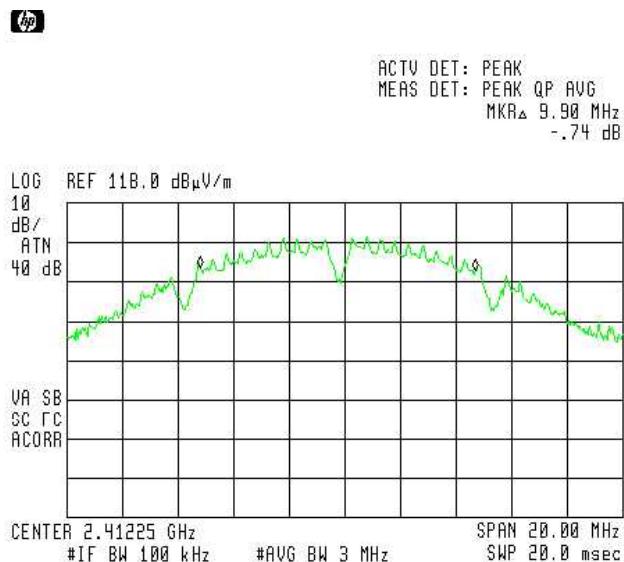


Figure 6 — Low Channel

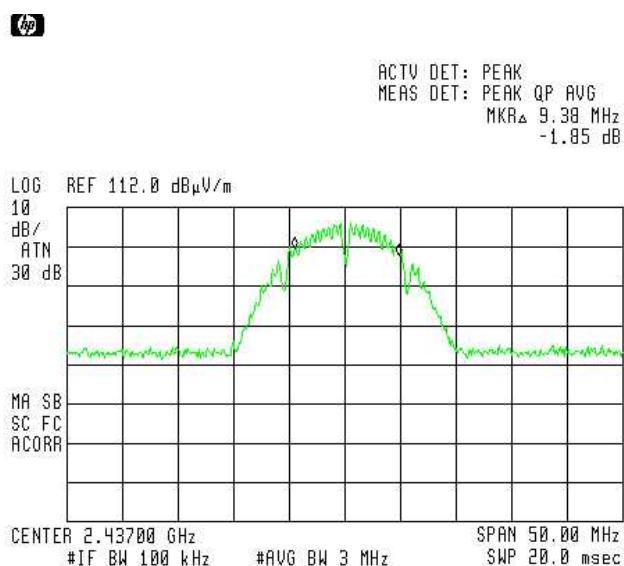
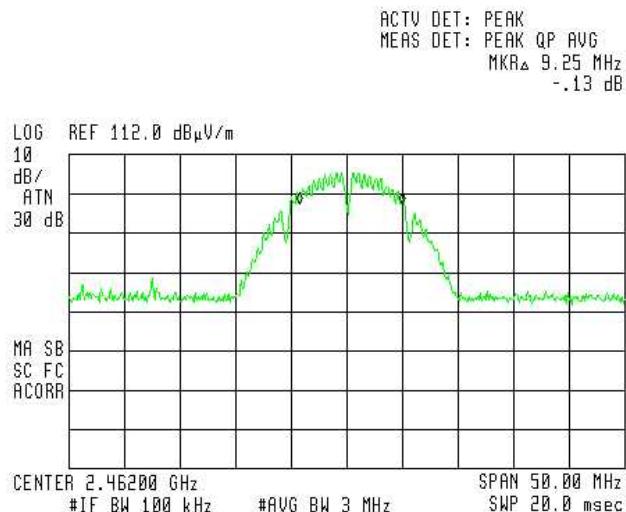


Figure 7 — Mid Channel



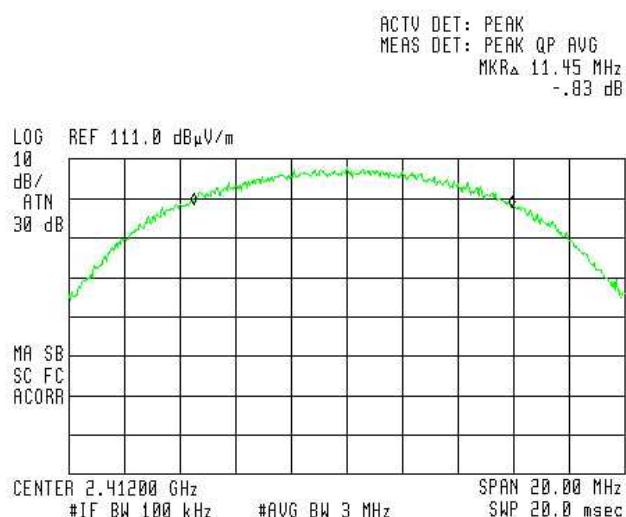
hp



**Figure 8 — High Channel**

11Mbps:

hp



**Figure 9 — Low Channel**



hp

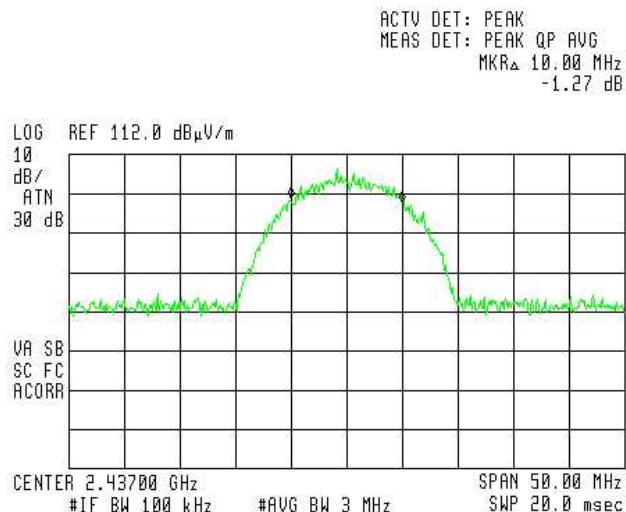


Figure 10 — Mid Channel

hp

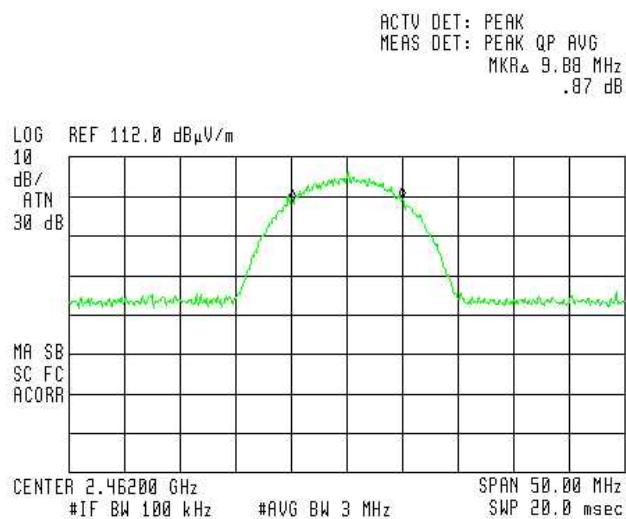


Figure 11 — High Channel



6Mbps:

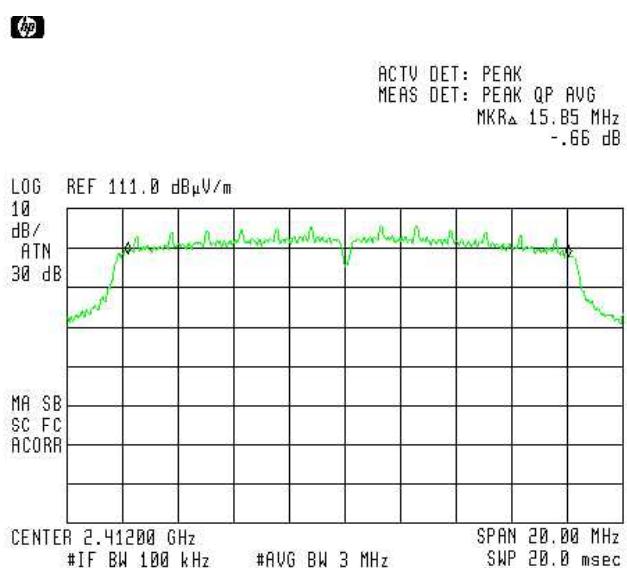


Figure 12 — Low Channel

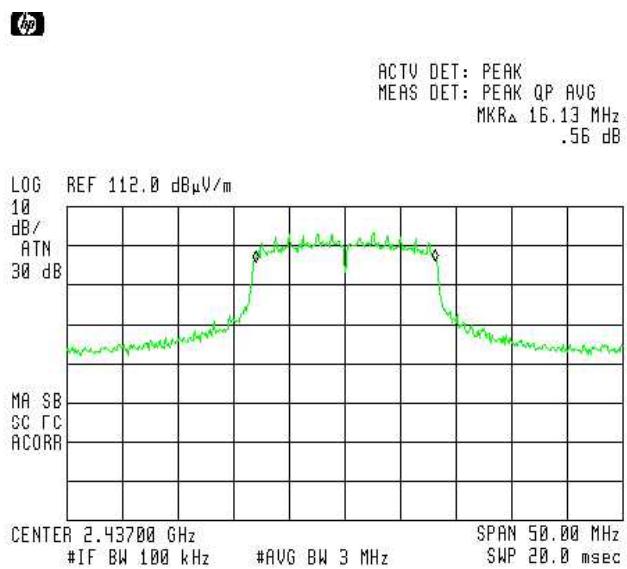


Figure 13 — Mid Channel



49

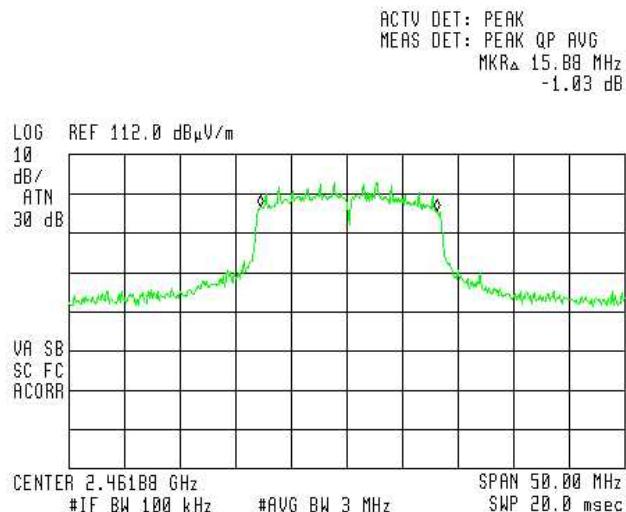


Figure 14 — High Channel

54Mbps:

49

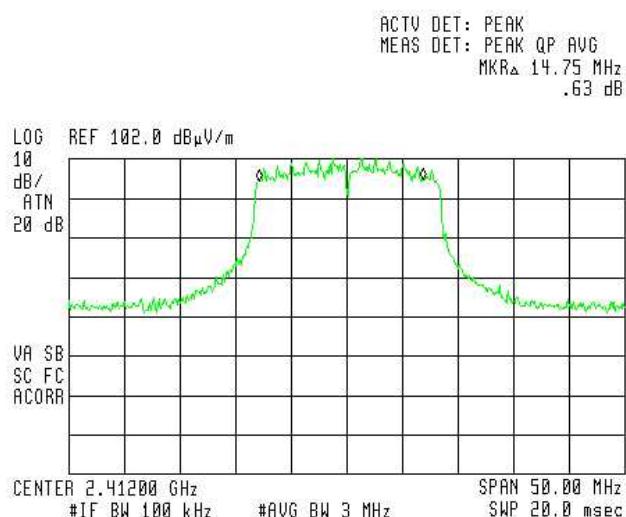


Figure 15 — Low Channel



hp

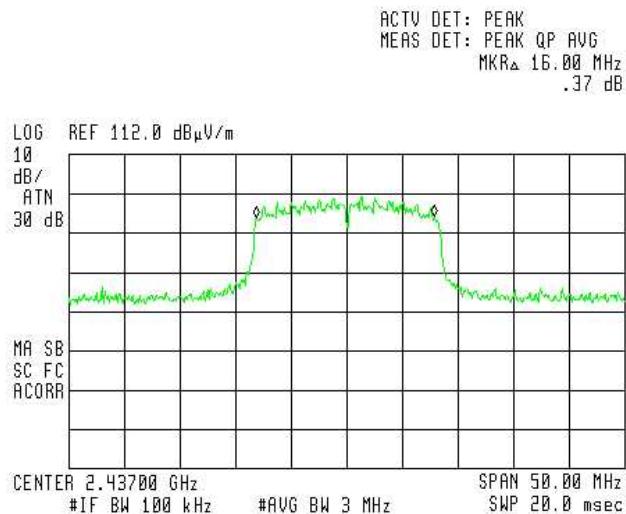


Figure 16 — Mid Channel

hp

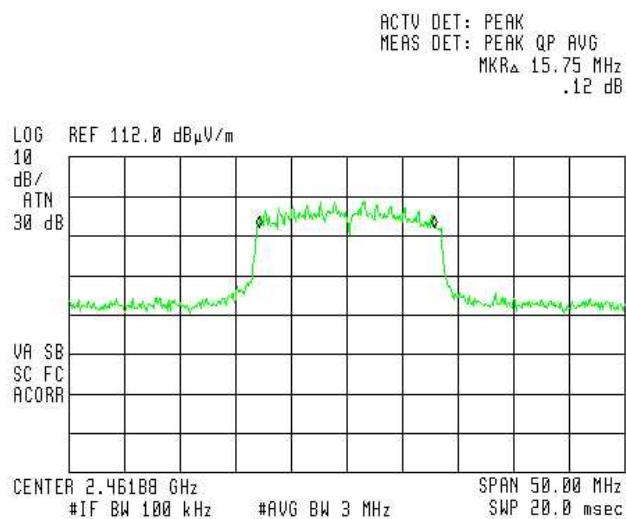


Figure 17 — High Channel



6.5Mbps:

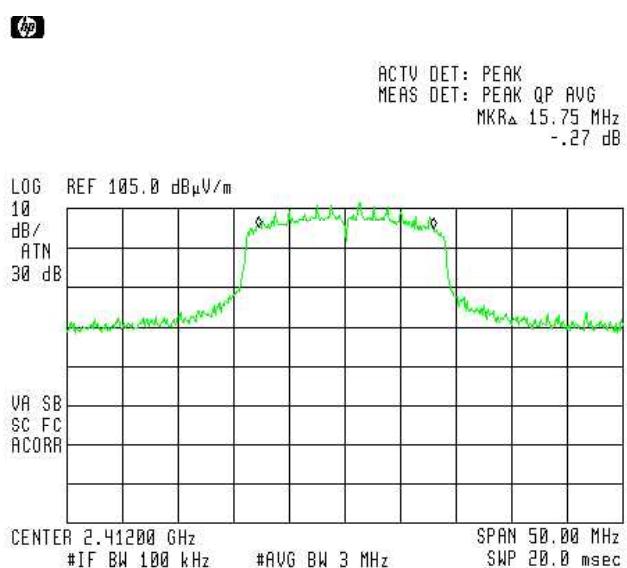


Figure 18 — Low Channel

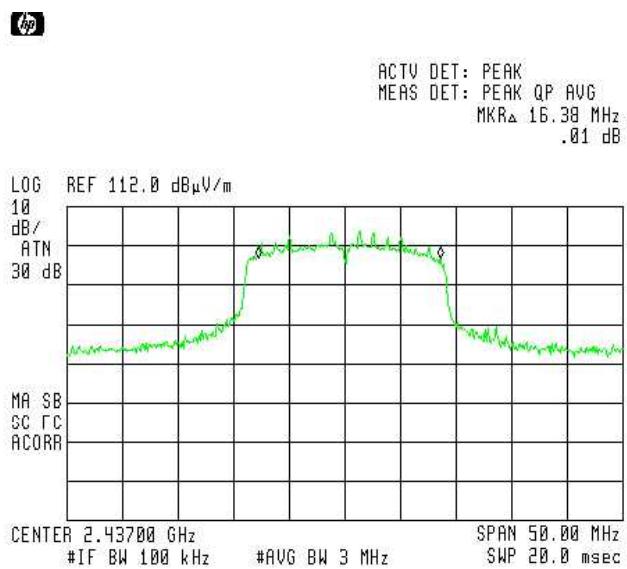
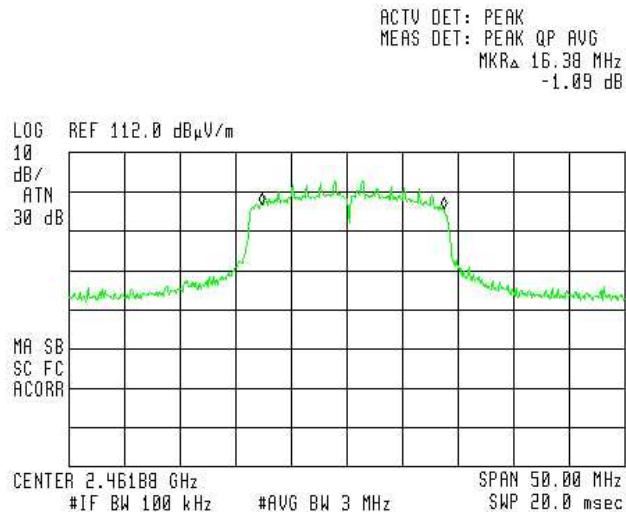


Figure 19 — Mid Channel



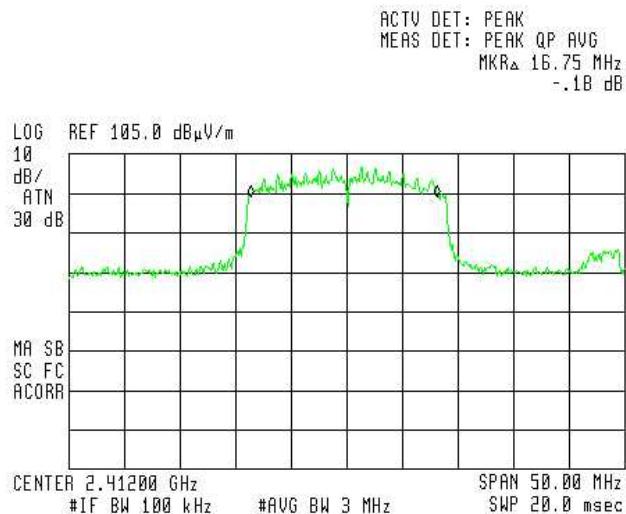
49



**Figure 20 — High Channel**

65Mbps:

49



**Figure 21 — Low Channel**



hp

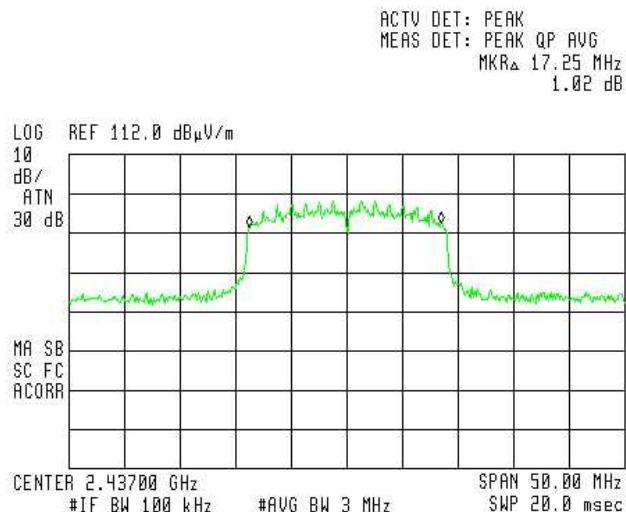


Figure 22 — Mid Channel

hp

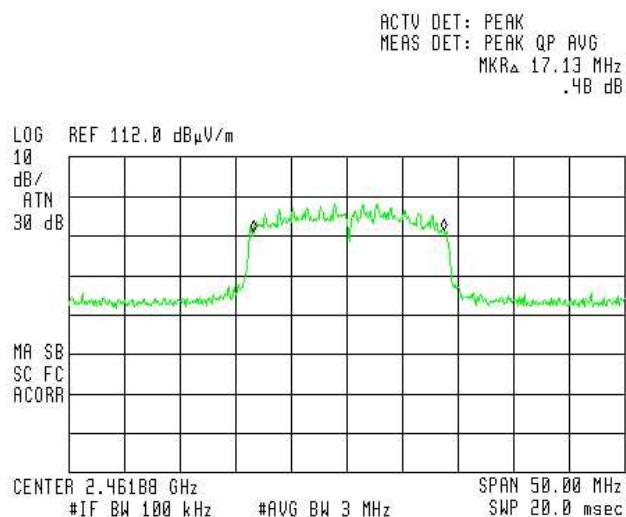


Figure 23 — High Channel



## 4.2 Results table

E.U.T Description: Mobile Data Terminal (MDT)

Model No.: M317

Serial Number: Not designated

Specification: F.C.C. Part 15, Subpart C: (15.247-a2)

Operation Frequency (MHz)	Modulation	Bandwidth Reading (MHz)	Specification (MHz)
Low	1 Mbps	9.90	>0.5
Mid	1 Mbps	9.38	>0.5
High	1 Mbps	9.25	>0.5
Low	11 Mbps	11.45	>0.5
Mid	11 Mbps	10.00	>0.5
High	11 Mbps	9.88	>0.5
Low	6 Mbps	15.85	>0.5
Mid	6 Mbps	16.13	>0.5
High	6 Mbps	15.88	>0.5
Low	54 Mbps	14.75	>0.5
Mid	54 Mbps	16.00	>0.5
High	54 Mbps	15.75	>0.5
Low	6.5 Mbps	15.75	>0.5
Mid	6.5 Mbps	16.38	>0.5
High	6.5 Mbps	16.38	>0.5
Low	65 Mbps	16.75	>0.5
Mid	65 Mbps	17.25	>0.5
High	65 Mbps	17.13	>0.5

Figure 24 6 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 22.07.14

Typed/Printed Name: A. Sharabi



#### 4.3 Test Equipment Used; 6 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 Year
RF Filter Section	HP	85420E	3705A00248	January 15, 2014	1 Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	2 Years
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	2 years
Horn Antenna	ETS	3115	29845	March 14, 2012	3 Years
Horn Antenna	ARA	SWH-28	1007	March 30, 2014	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2014	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	March 2, 2014	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 25 Test Equipment Used

## 5. 26 dB Minimum Bandwidth

### 5.1 Test procedure

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T was tested at the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The spectrum bandwidth of the E.U.T. at the point of 26 dB below maximum peak power was measured and recorded.

1Mbps:

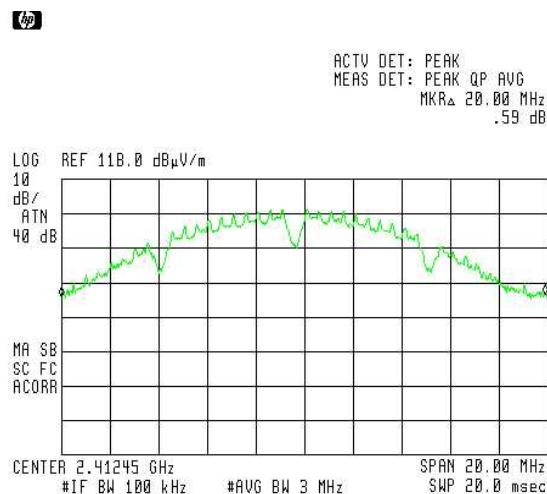


Figure 26 — Low Channel

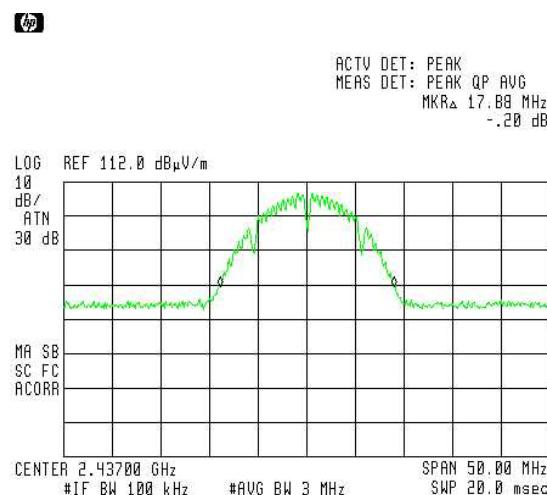


Figure 27 — Mid Channel



Op

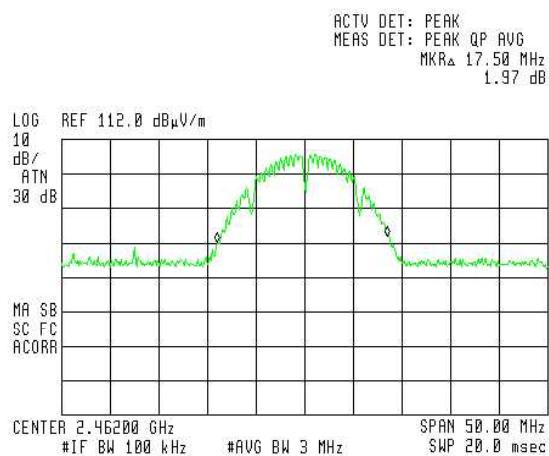


Figure 28 — High Channel

11Mbps:

Op

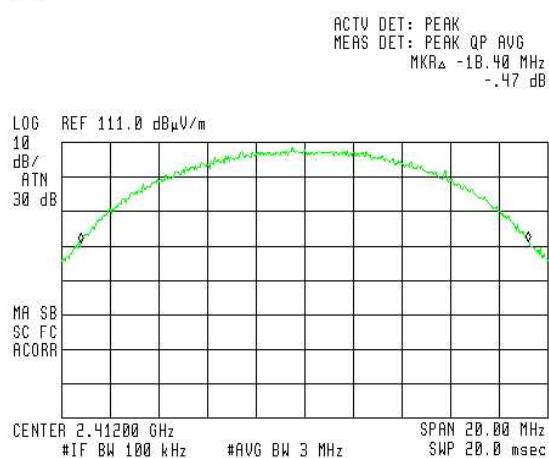


Figure 29 — Low Channel

Op

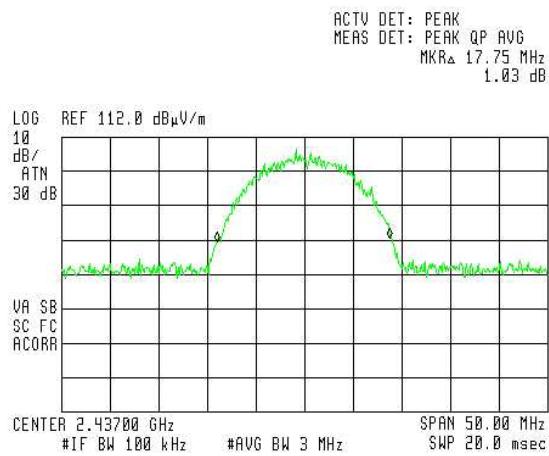


Figure 30 — Mid Channel



Op

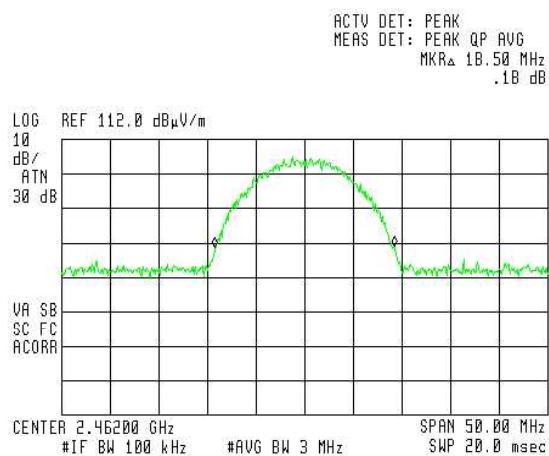


Figure 31 — High Channel

6Mbps:

Op

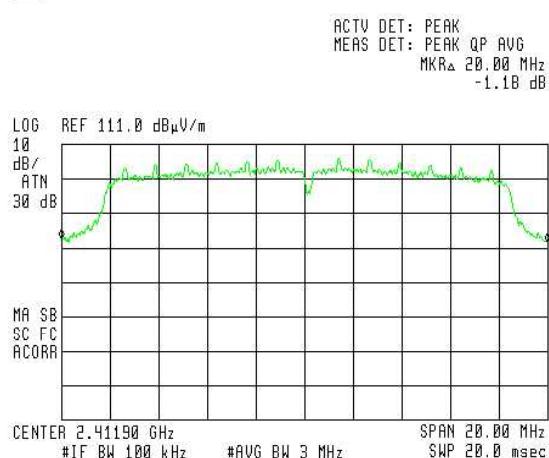


Figure 32 — Low Channel

Op

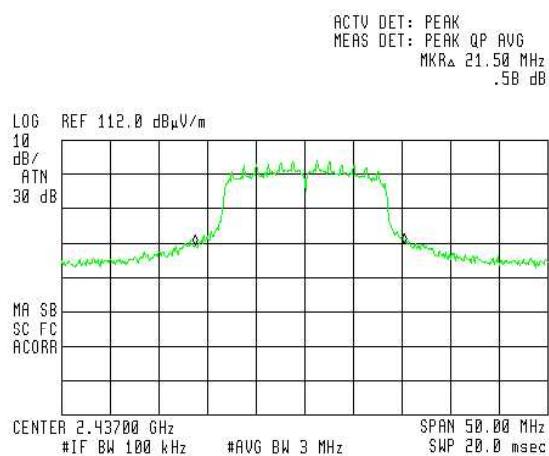


Figure 33 — Mid Channel



Op

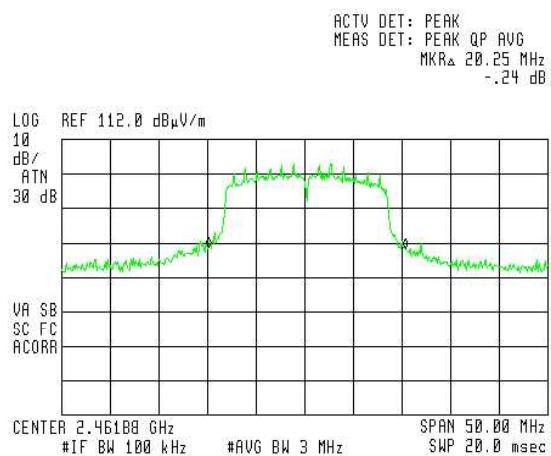


Figure 34 — High Channel

54Mbps:

Op

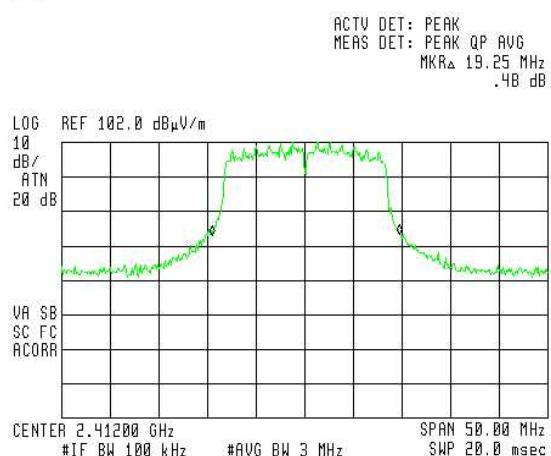


Figure 35 — Low Channel

Op

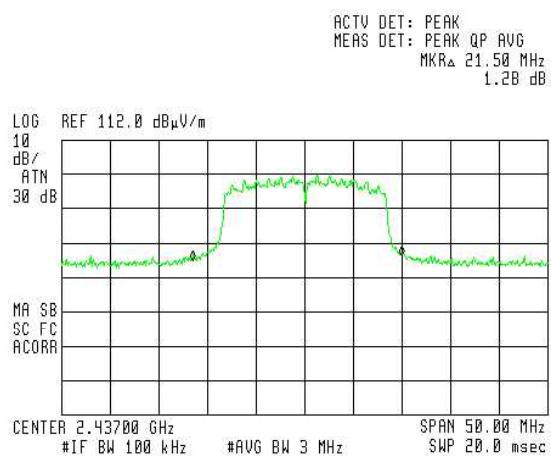


Figure 36 — Mid Channel



Op

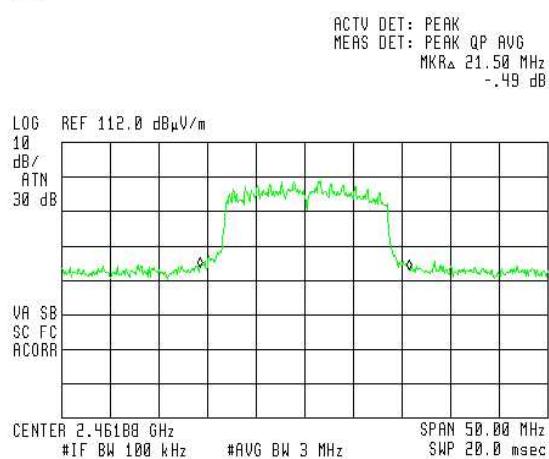


Figure 37 — High Channel

6.5Mbps:

Op

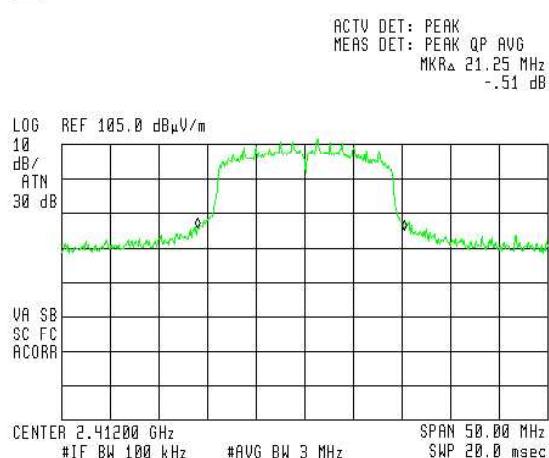


Figure 38 — Low Channel

Op

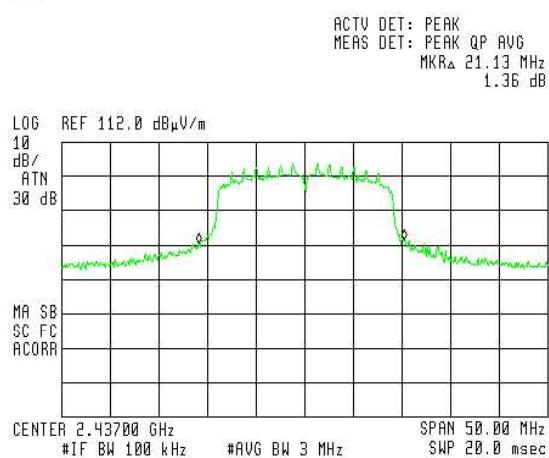


Figure 39 — Mid Channel



Op

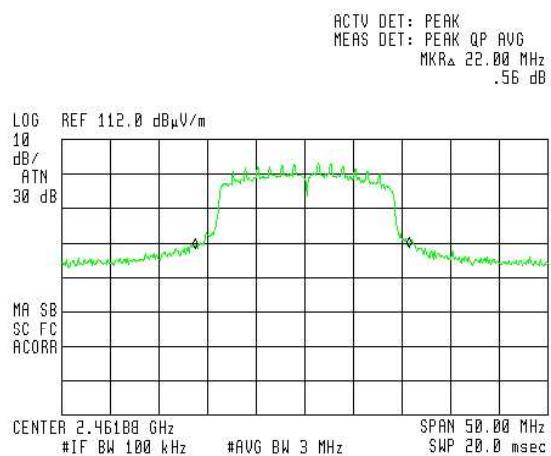


Figure 40 — High Channel

65Mbps:

Op

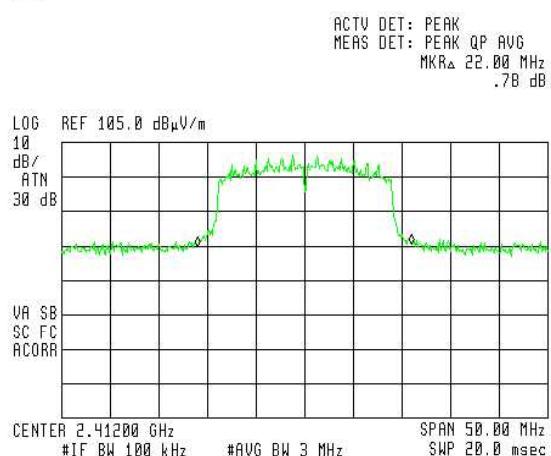


Figure 41 — Low Channel

Op

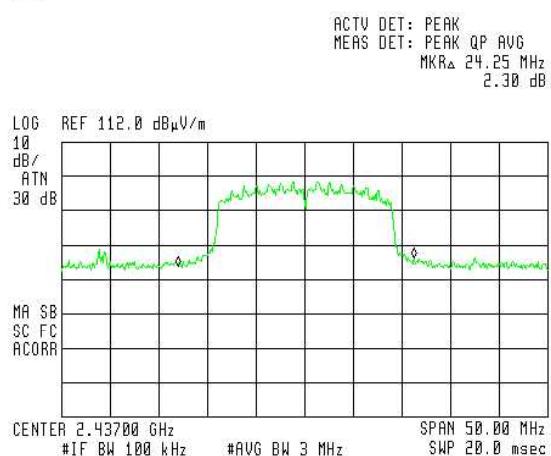
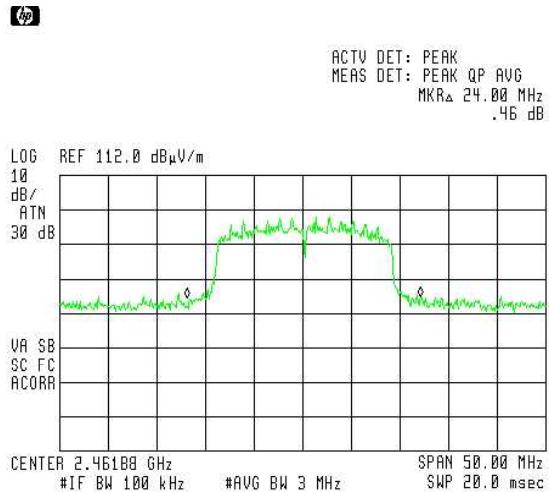


Figure 42 — Mid Channel



**Figure 43 — High Channel**



## 5.2 Results table

E.U.T Description: Mobile Data Terminal (MDT)

Model No.: M317

Serial Number: Not designated

Specification: F.C.C. Part 15, Subpart C: (15.247-a2)

Operation Frequency (MHz)	Modulation	Bandwidth Reading (MHz)	Specification (MHz)
Low	1 Mbps	20.00	N/A
Mid	1 Mbps	17.88	N/A
High	1 Mbps	17.50	N/A
Low	11 Mbps	18.40	N/A
Mid	11 Mbps	17.75	N/A
High	11 Mbps	18.50	N/A
Low	6 Mbps	20.00	N/A
Mid	6 Mbps	21.50	N/A
High	6 Mbps	20.25	N/A
Low	54 Mbps	19.25	N/A
Mid	54 Mbps	21.50	N/A
High	54 Mbps	21.50	N/A
Low	6.5 Mbps	21.25	N/A
Mid	6.5 Mbps	21.13	N/A
High	6.5 Mbps	22.00	N/A
Low	65 Mbps	22.00	N/A
Mid	65 Mbps	24.25	N/A
High	65 Mbps	24.00	N/A

Figure 44 26 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: 

Date: 22.07.14

Typed/Printed Name: A. Sharabi



### 5.3 Test Equipment Used. 26 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 Year
RF Filter Section	HP	85420E	3705A00248	January 15, 2014	1 Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	2 Years
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	2 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	3 Years
Horn Antenna	ARA	SWH-28	1007	March 30, 2014	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2014	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	March 2, 2014	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 45 Test Equipment Used



## 6. Maximum Transmitted Peak Power Output

### 6.1 Test procedure

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T was tested at the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The E.U.T. was tested at low, mid and high channels at 20MHz

Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \quad [W]$$

E - Field Strength (V/m)

d – Distance from transmitter (m)

G – Antenna gain

P – Peak power (W)



1Mbps:

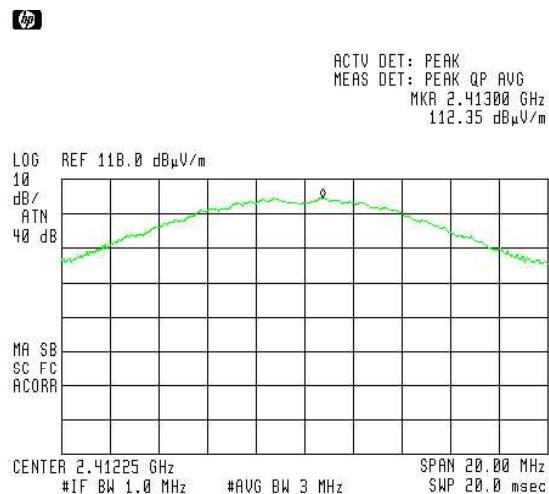


Figure 46 — Low Channel

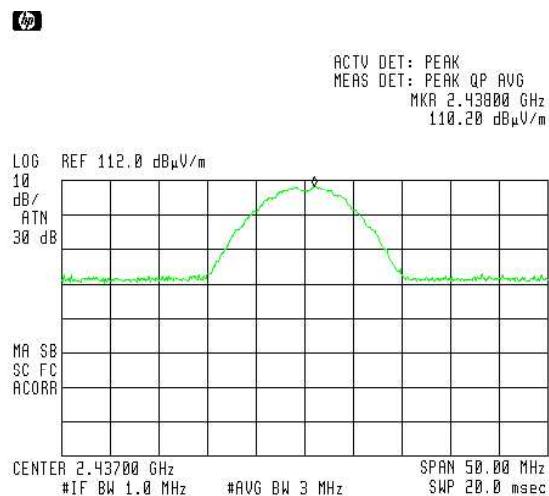


Figure 47 — Mid Channel

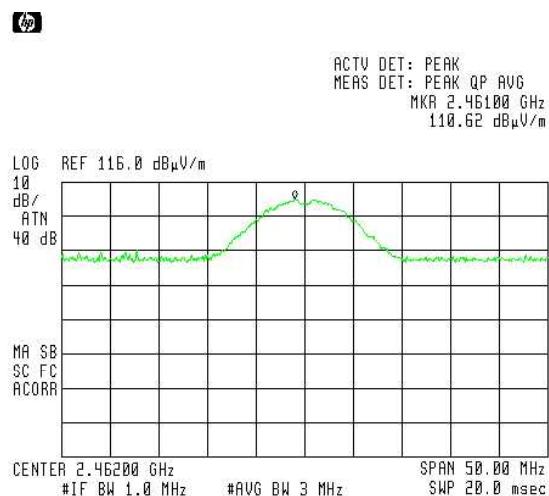


Figure 48 — High Channel



11Mbps:

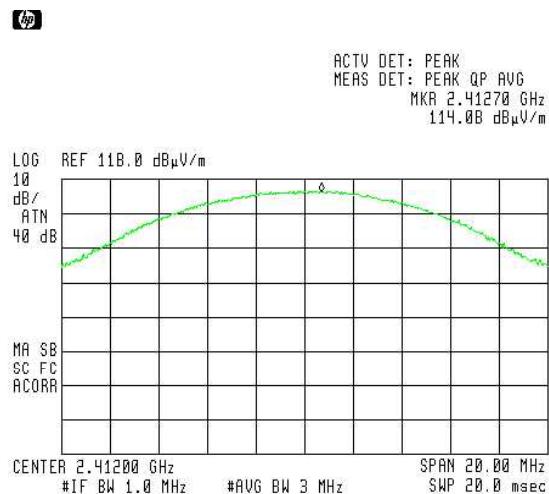


Figure 49 — Low Channel

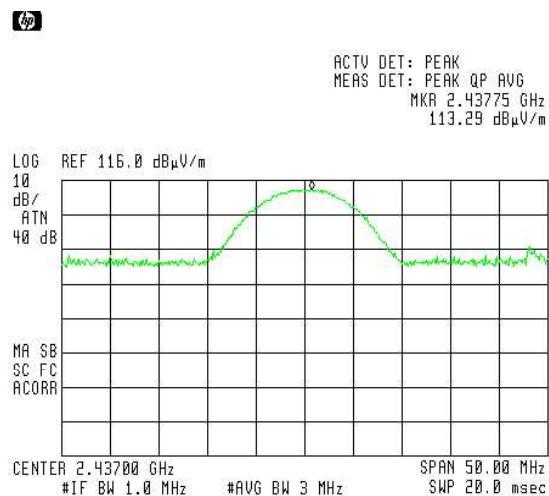


Figure 50 — Mid Channel

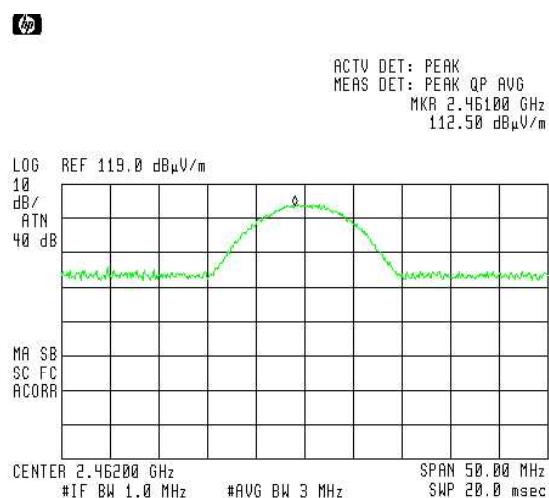
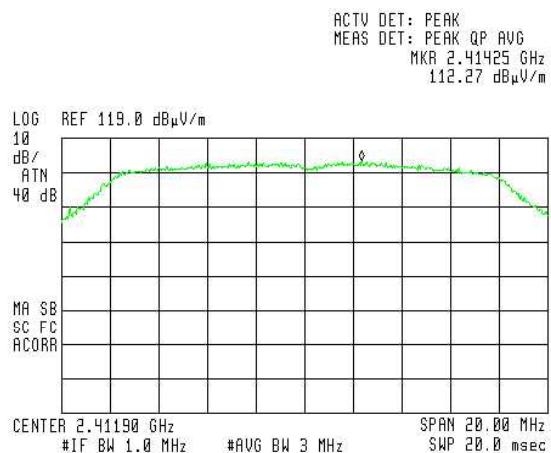


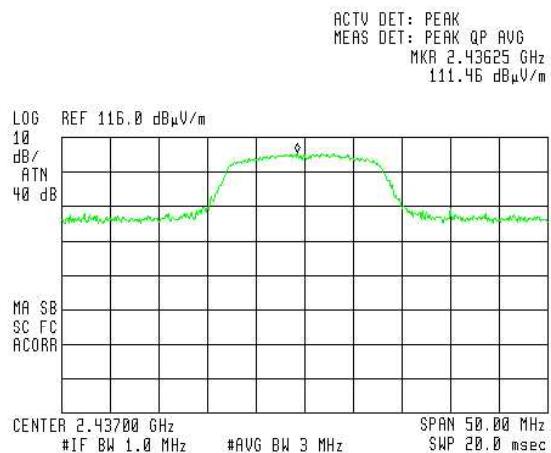
Figure 51 — High Channel



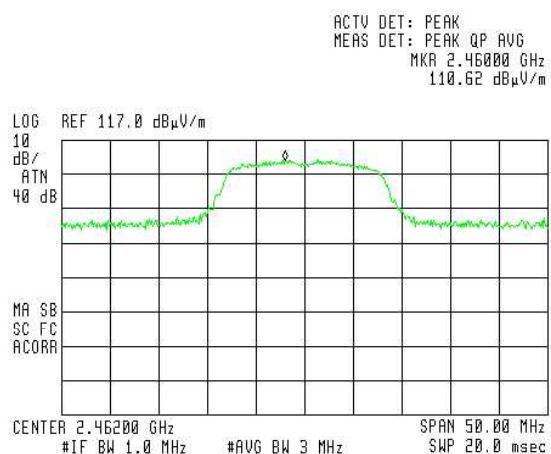
6Mbps:



**Figure 52 — Low Channel**



**Figure 53 — Mid Channel**



**Figure 54 — High Channel**

54Mbps:

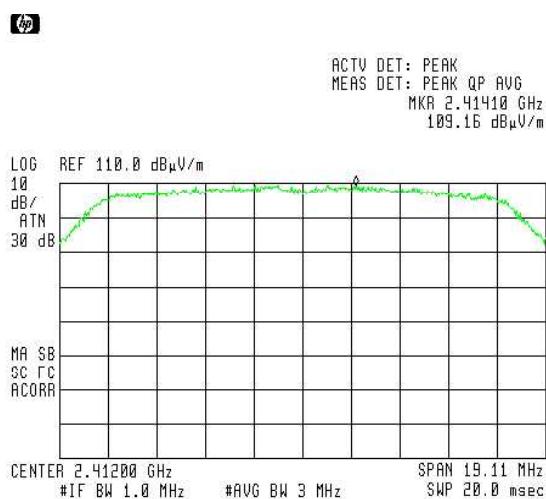


Figure 55 — Low Channel

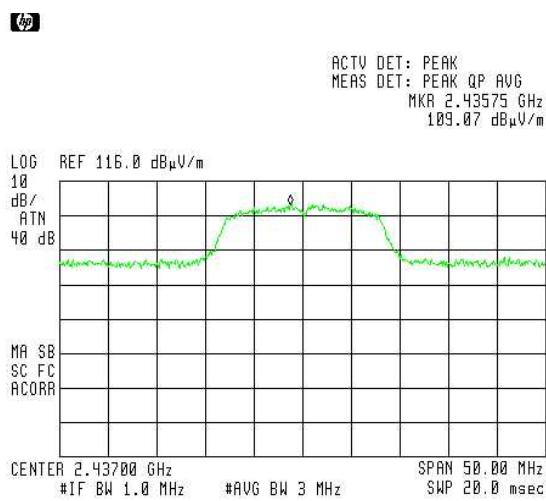


Figure 56 — Mid Channel

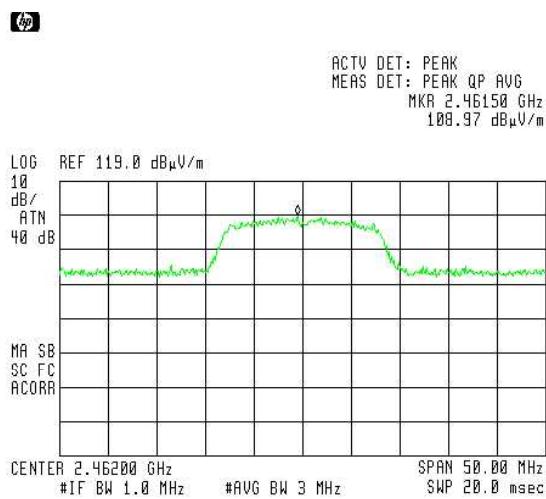


Figure 57 — High Channel

6.5Mbps:

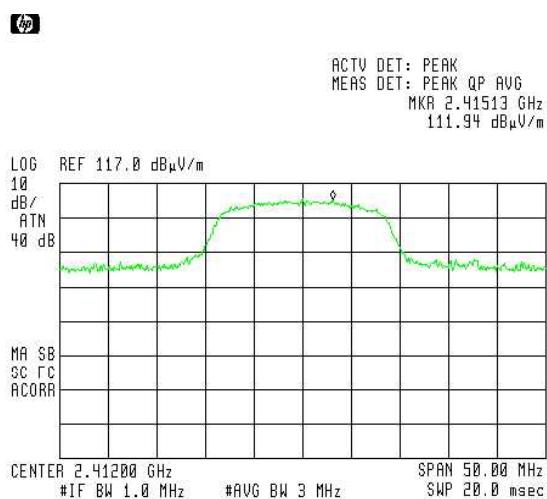


Figure 58 — Low Channel

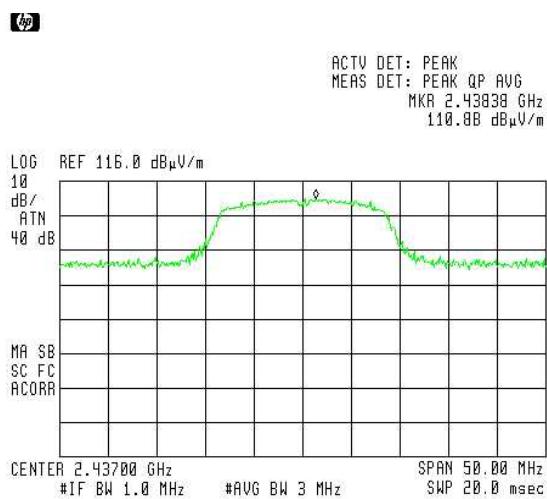


Figure 59 — Mid Channel

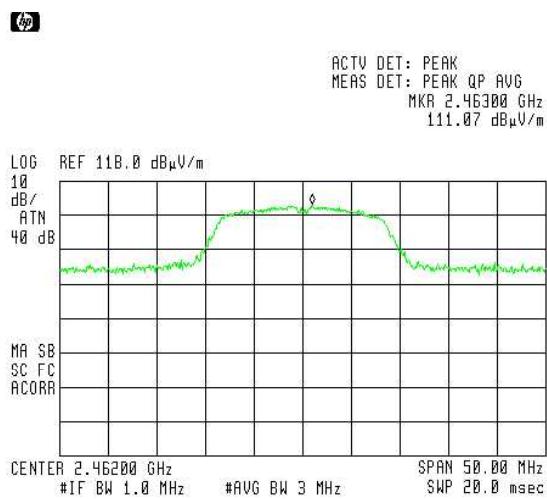
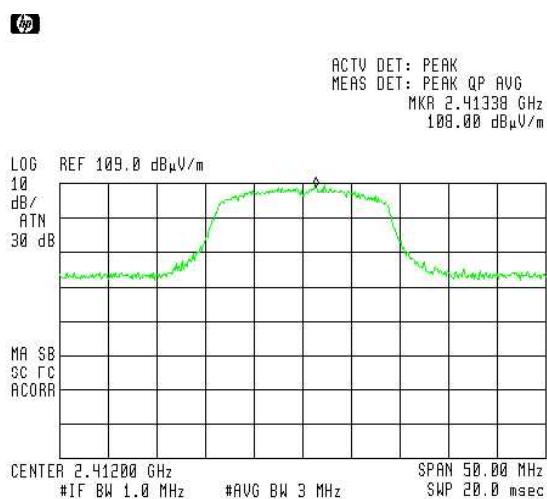
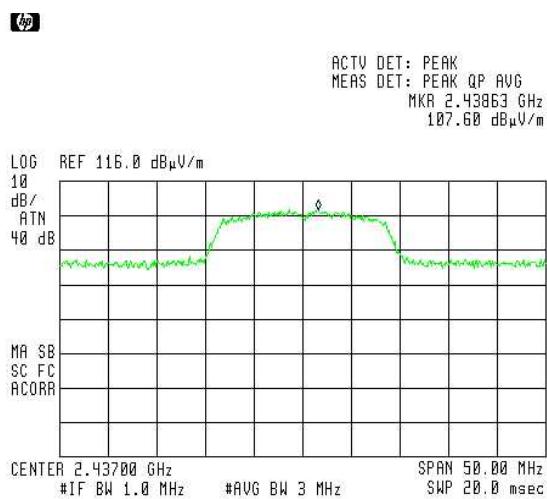
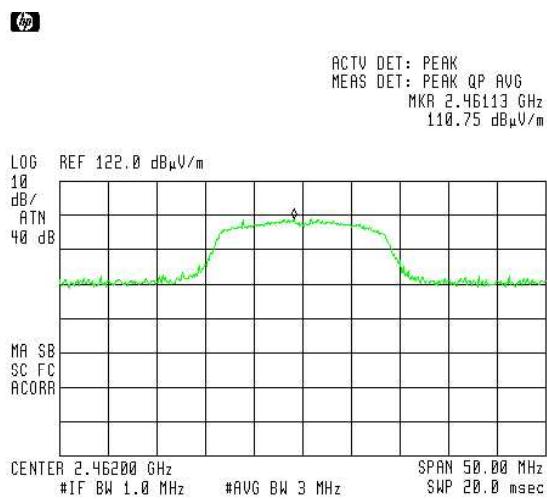


Figure 60 — High Channel

65Mbps:

**Figure 61 — Low Channel****Figure 62 — Mid Channel****Figure 63 — High Channel**



## 6.2 Results table

E.U.T. Description: Mobile Data Terminal (MDT)

Model No.: M317

Serial Number: Not designated

Specification: F.C.C. Part 15, Subpart C Section 15.247(b)

Operation Frequency (MHz)	Modulation Mbps	Antenna Polarization	Power (dBuV/m)	Power (mW)	Specification (mW)	Margin (mW)
Low	1 Mbps	H	112.35	22.92	1000	-997.08
Mid	1 Mbps	H	110.20	13.96	1000	-998.04
High	1 Mbps	H	110.62	15.76	1000	-984.24
Low	11 Mbps	H	114.08	35.46	1000	-964.54
Mid	11 Mbps	H	113.29	28.85	1000	-971.15
High	11 Mbps	H	112.50	24.05	1000	-975.95
Low	6 Mbps	H	112.27	22.92	1000	-997.08
Mid	6 Mbps	H	111.46	18.66	1000	-981.34
High	6 Mbps	H	110.62	15.76	1000	-984.24
Low	54 Mbps	H	109.16	11.46	1000	-988.54
Mid	54 Mbps	H	109.07	10.69	1000	-989.31
High	54 Mbps	H	108.97	10.69	1000	-989.31
Low	6.5 Mbps	H	111.94	21.81	1000	-978.19
Mid	6.5 Mbps	H	110.88	16.70	1000	-983.30
High	6.5 Mbps	H	111.07	17.67	1000	-982.33
Low	65 Mbps	H	108.00	8.52	1000	-991.48
Mid	65 Mbps	H	107.60	7.85	1000	-992.15
High	65 Mbps	H	110.75	15.76	1000	-984.24

Figure 64 Maximum Peak Power Output

JUDGEMENT: Passed by 964.54 dB

TEST PERSONNEL:

Tester Signature:

Date: 22.07.14

Typed/Printed Name: A. Sharabi



### 6.3 Test Equipment Used. Peak Power Output

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 Year
RF Filter Section	HP	85420E	3705A00248	January 15, 2014	1 Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	2 Years
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	2 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	3 Years
Horn Antenna	ARA	SWH-28	1007	March 30, 2014	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2014	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	March 2, 2014	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 65 Test Equipment Used

## 7. Band Edge Spectrum

[In Accordance with section 15.247(c)]

### 7.1 Test procedure

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T was tested at the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The E.U.T. was tested at low, mid and high channels at 20MHz

1Mbps:

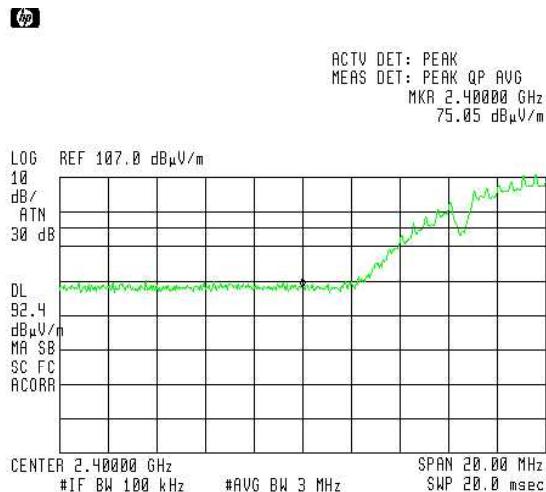


Figure 66 — Low Channel

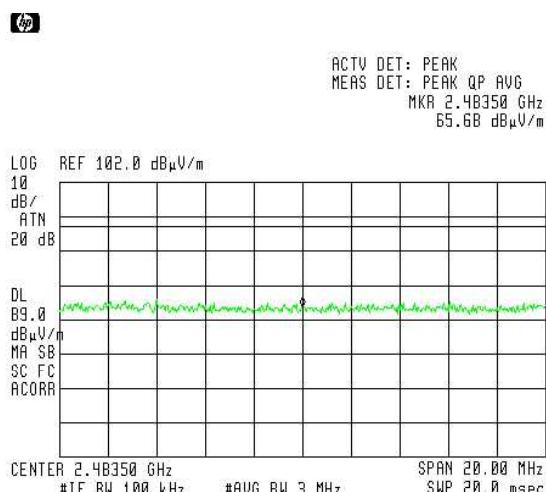
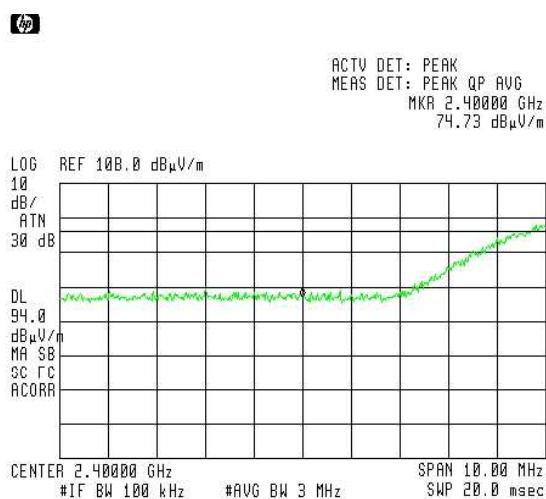
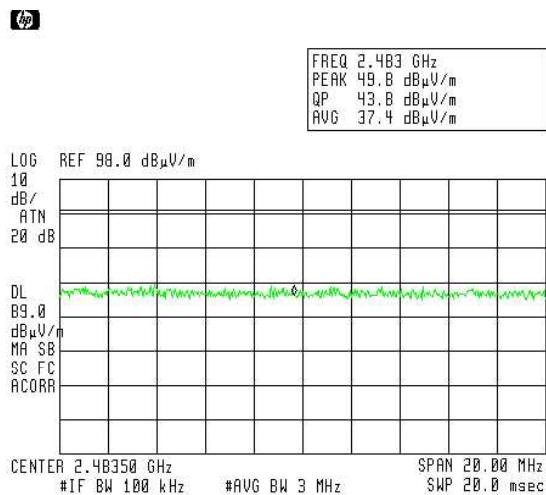


Figure 67 — High Channel

11Mbps:

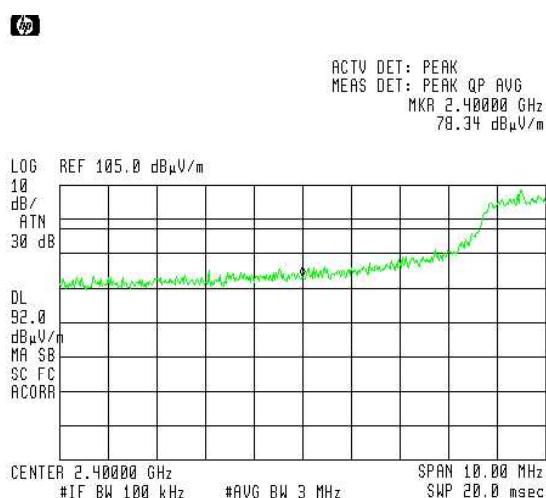


**Figure 68 — Low Channel**



**Figure 69 — High Channel**

6Mbps:



**Figure 70 — Low Channel**

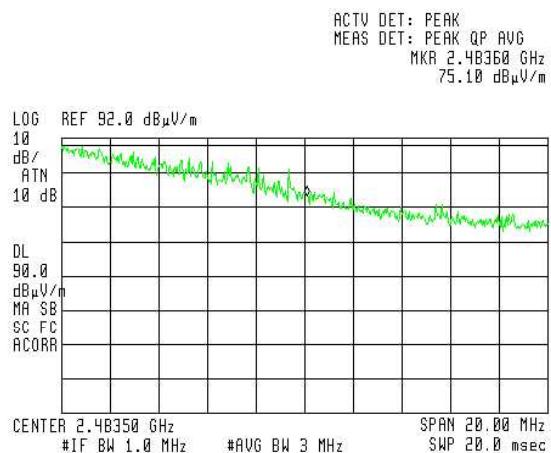


Figure 71 — High Channel

54Mbps:

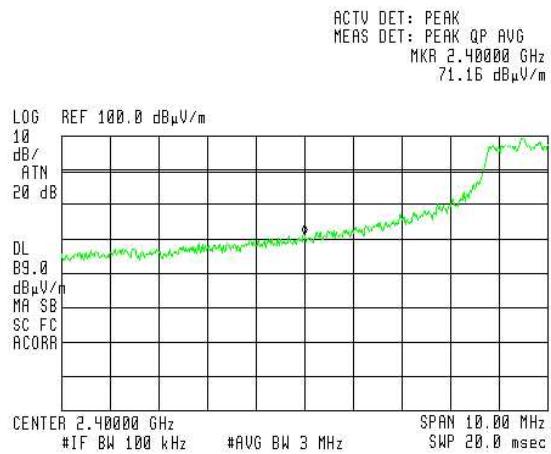


Figure 72 — Low Channel

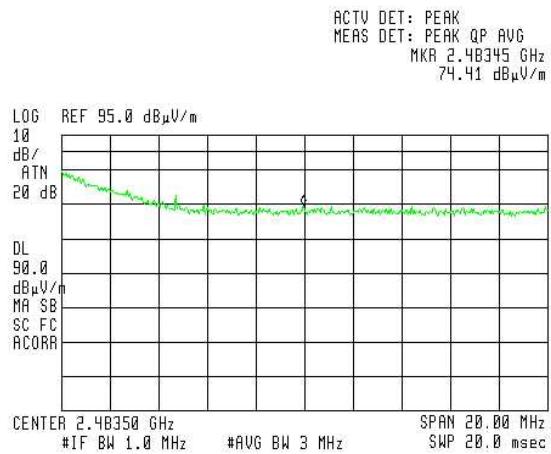


Figure 73 — High Channel



6.5Mbps:

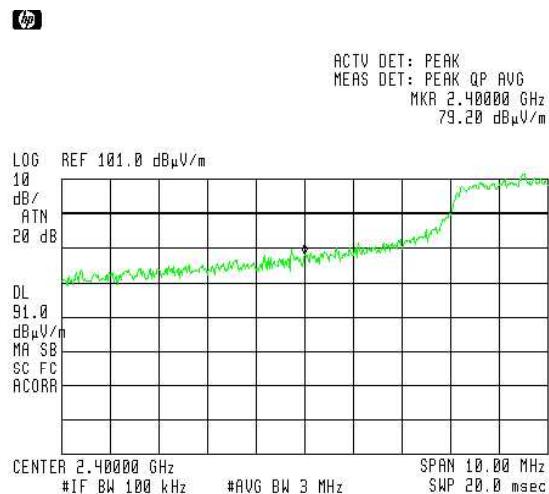


Figure 74 — Low Channel

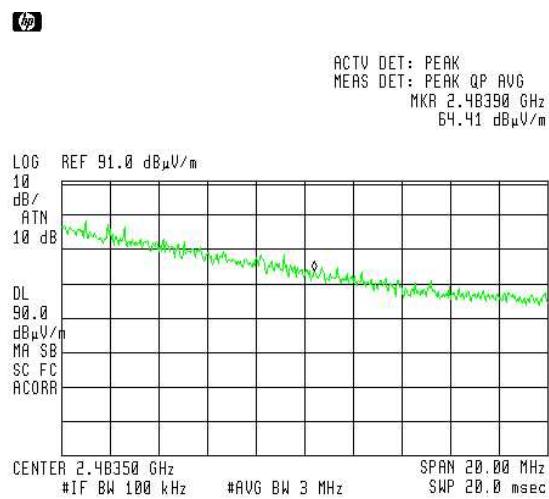


Figure 75 — High Channel

65Mbps:

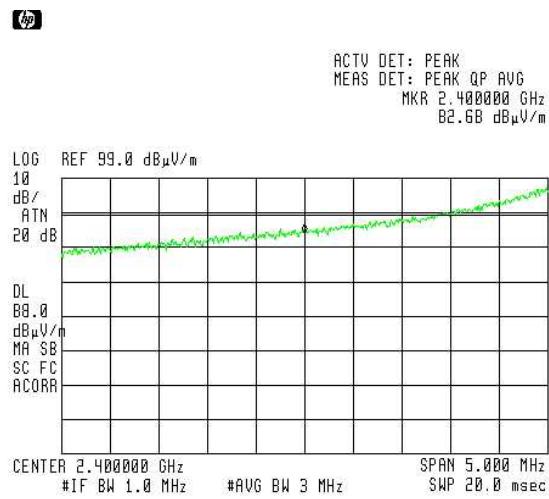
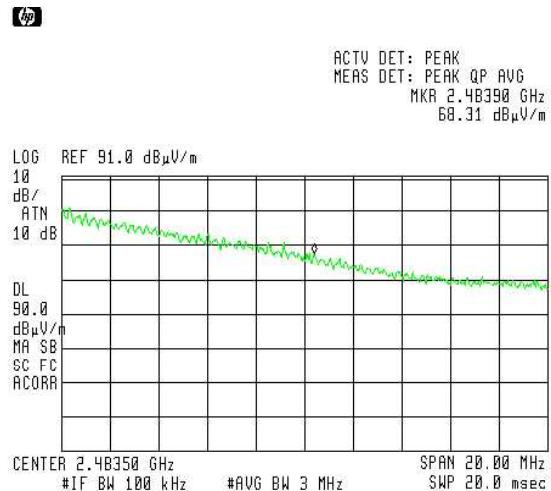


Figure 76 — Low Channel



**Figure 77 — High Channel**



## 7.2 Results table

E.U.T. Description: Mobile Data Terminal (MDT)

Model No.: M317

Serial Number: Not designated

Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency (MHz)	Modulation Mbps	Band Edge Frequency (MHz)	Spectrum Level (dBuV/m)	Specification (dBuV/m)	Margin (dB)
2402	1Mbps	2400.0	75.05	92.4	-17.35
2480	1Mbps	2483.5	65.68	89.0	-23.32
2402	11Mbps	2400.0	74.73	94.0	-19.27
2480	11Mbps	2483.5	78.00	89.0	-11.00
2402	6 Mbps	2400.0	78.34	92.0	-13.66
2480	6 Mbps	2483.5	75.10	90.0	-14.90
2402	54 Mbps	2400.0	71.16	89.0	-17.84
2480	54 Mbps	2483.5	74.41	90.0	-15.59
2402	6.5 Mbps	2400.0	79.20	91.0	-11.80
2480	6.5 Mbps	2483.5	64.41	90.0	-25.59
2402	65 Mbps	2400.0	82.68	88.0	-5.32
2480	65 Mbps	2483.5	68.31	90.0	-21.69

Figure 78 Band Edge Spectrum

JUDGEMENT:

Passed by 5.32 dB

TEST PERSONNEL:

Tester Signature:

Date: 22.07.14

Typed/Printed Name: A. Sharabi



### 7.3 Test Equipment Used; Band Edge Spectrum

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 Year
RF Filter Section	HP	85420E	3705A00248	January 15, 2014	1 Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	2 Years
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	2 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	3 Years
Horn Antenna	ARA	SWH-28	1007	March 30, 2014	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2014	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	March 2, 2014	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 79 Test Equipment Used



## 8. Radiated Emission, 9 kHz – 30 MHz

### 8.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

### 8.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying with CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was operated at the low, mid and high channels using a peak detector.

### 8.3 Measured Data

JUDGEMENT: Passed by more than 20dB.

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

TEST PERSONNEL:

Tester Signature: 

Date: 22.07.14

Typed/Printed Name: A. Sharabi



#### 8.4 **Test Instrumentation Used, Radiated Measurements**

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 year
RF Section	HP	85420E	3705A00248	January 15, 2014	1 year
Active Loop Antenna	EMCO	6502	9506-2950	November 4, 2013	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

**Figure 80 Test Equipment Used**



### **8.5 Field Strength Calculation**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS: Field Strength [dB $\mu$ V/m]

RA: Receiver Amplitude [dB $\mu$ V]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable Attenuation Factor [dB]

Example:  $FS = 30.7 \text{ dB}\mu\text{V (RA)} + 14.0 \text{ dB (AF)} + 0.9 \text{ dB (CF)} = 45.6 \text{ dB}\mu\text{V}$

No external pre-amplifiers are used.

## 9. Spurious Radiated Emission, 30 – 25000 MHz

### 9.1 Radiated Emission 30-25000 MHz

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying with CISPR 16 requirements was used.

In the frequency range 2.9-25.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements, the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements, the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.

The test distance was 3 meters.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The E.U.T. was operated at the low, mid and high channels using a peak detector.



## 9.2 **Test Data**

JUDGEMENT: Passed by 1 dB

For the operation modulation of 1 Mbps, the margin between the emission level and the specification limit is in the worst case 6.5dB at the frequency of 4824.0 MHz, horizontal polarization.

For the operation frequency of 11 Mbps, the margin between the emission level and the specification limit is in the worst case 7.6 dB at the frequency of 2390.0 MHz, horizontal polarization.

For the operation frequency of 6 Mbps 2462 MHz, the margin between the emission level and the specification limit is 2.3 dB in the worst case at the frequency of 2483.5 MHz, horizontal polarization.

For the operation modulation of 54 Mbps, the margin between the emission level and the specification limit is in the worst case 2.1 dB at the frequency of 2483.5 MHz, horizontal polarization.

For the operation frequency of 6.5 Mbps, the margin between the emission level and the specification limit is in the worst case 1.0 dB at the frequency of 2390.0 MHz, horizontal polarization.

For the operation frequency of 65 Mbps, the margin between the emission level and the specification limit is 4.1 dB in the worst case at the frequency of 2483.5 MHz, horizontal polarization.

Interval modulation testing was conducting while EUT was transmitting simultaneously at 2.4 GHz and cellular modem. Not results were detected.

The EUT met the requirements of the F.C.C. Part 15, Subpart C specification.

The details of the highest emissions are given in *Figure 81* to *Figure 86*.

TEST PERSONNEL:

Tester Signature: 

Date: 22.07.14

Typed/Printed Name: A. Sharabi



## Radiated Emission Above 1 GHz

E.U.T Description: Mobile Data Terminal (MDT)  
Type: M317  
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters      Detector: Peak/Avg.  
Operation Modulation: 1 Mbps

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB $\mu$ V/m)	Peak. Specification (dB $\mu$ V/m)	Peak. Margin (dB)	Avg. Amp (dB $\mu$ V/m)	Avg. Specification (dB $\mu$ V/m)	Avg. Margin (dB)
2390.0	V	54.2	74.0	-19.8	41.4	54.0	-12.6
2390.0	H	56.8	74.0	-17.7	44.1	54.0	-9.9
4824.0	V	50.4	74.0	-23.6	45.6	54.0	-8.4
4824.0	H	53.0	74.0	-21.0	47.5	54.0	-6.5
4874.0	V	49.0	74.0	-25.0	44.8	54.0	-9.2
4874.0	H	52.0	74.0	-22.0	45.9	54.0	-8.1
4924.0	V	48.9	74.0	-25.1	40.6	54.0	-13.4
4924.0	H	50.6	74.0	-23.4	43.8	54.0	-10.2
2483.5	V	42.8	74.0	-31.2	30.6	54.0	-23.4
2483.5	H	48.4	74.0	-25.6	35.7	54.0	-18.3

**Figure 81. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak/Avg.**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak/Avg. Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



## Radiated Emission Above 1 GHz

E.U.T Description: Mobile Data Terminal (MDT)  
Type: M317  
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters      Detector: Peak/Avg.  
Operation Modulation: 11 Mbps

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB $\mu$ V/m)	Peak. Specificati on (dB $\mu$ V/m)	Peak. Margin (dB)	Avg. Amp (dB $\mu$ V/m)	Avg. Specification (dB $\mu$ V/m)	Avg. Margin (dB)
2390.0	V	56.6	74.0	-17.4	43.7	54.0	-10.3
2390.0	H	60.5	74.0	-13.5	46.4	54.0	-7.6
4824.0	V	48.9	74.0	-25.1	37.8	54.0	-16.2
4824.0	H	51.2	74.0	-22.8	39.8	54.0	-14.2
4874.0	V	48.9	74.0	-25.1	36.9	54.0	-17.21
4874.0	H	50.3	74.0	-23.7	38.7	54.0	-15.3
4924.0	V	47.8	74.0	-26.2	35.9	54.0	-18.1
4924.0	H	49.3	74.0	-24.7	37.9	54.0	-16.1
2483.5	V	43.9	74.0	-30.1	33.9	54.0	-20.1
2483.5	H	49.0	74.0	-25.0	37.8	54.0	-16.2

**Figure 82. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak/Avg.**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak/Avg. Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



## Radiated Emission Above 1 GHz

E.U.T Description: Mobile Data Terminal (MDT)  
Type: M317  
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters      Detector: Peak/Avg.  
Operation Modulation: 6 Mbps

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB $\mu$ V/m)	Peak. Specificati on (dB $\mu$ V/m)	Peak. Margin (dB)	Avg. Amp (dB $\mu$ V/m)	Avg. Specification (dB $\mu$ V/m)	Avg. Margin (dB)
2390.0	V	64.0	74.0	-10.0	48.5	54.0	-5.5
2390.0	H	68.5	74.0	-5.5	51.5	54.0	-2.5
4824.0	V	46.7	74.0	-27.3	35.8	54.0	-18.2
4824.0	H	48.9	74.0	-25.1	37.4	54.0	-16.6
4874.0	V	45.9	74.0	-28.1	35.7	54.0	-18.3
4874.0	H	47.5	74.0	-26.5	36.5	54.0	-17.5
4924.0	V	43.9	74.0	-30.1	35.0	54.0	-19.0
4924.0	H	45.7	74.0	-28.3	35.8	54.0	-18.2
2483.5	V	62.7	74.0	-11.3	46.8	54.0	-7.2
2483.5	H	67.3	74.0	-6.7	51.7	54.0	-2.3

**Figure 83. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak/Avg.**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak/Avg. Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



## Radiated Emission Above 1 GHz

E.U.T Description: Mobile Data Terminal (MDT)  
Type: M317  
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters      Detector: Peak/Avg.  
Operation Modulation: 54 Mbps

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB $\mu$ V/m)	Peak. Specification (dB $\mu$ V/m)	Peak. Margin (dB)	Avg. Amp (dB $\mu$ V/m)	Avg. Specification (dB $\mu$ V/m)	Avg. Margin (dB)
2390.0	V	62.0	74.0	-12.0	41.8	54.0	-12.2
2390.0	H	66.9	74.0	-7.1	45.4	54.0	-8.6
4824.0	V	47.7	74.0	-26.3	35.0	54.0	-19.0
4824.0	H	49.7	74.0	-24.3	36.6	54.0	-17.4
4874.0	V	44.8	74.0	-29.2	34.9	54.0	-19.1
4874.0	H	46.8	74.0	-27.2	35.6	54.0	-18.4
4924.0	V	45.0	74.0	-29.0	33.5	54.0	-20.5
4924.0	H	49.9	74.0	-24.1	35.2	54.0	-18.8
2483.5	V	64.8	74.0	-9.2	47.3	54.0	-6.7
2483.5	H	68.0	74.0	-6.0	51.9	54.0	-2.1

**Figure 84. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak/Avg.**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak/Avg. Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



## Radiated Emission Above 1 GHz

E.U.T Description: Mobile Data Terminal (MDT)  
Type: M317  
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters      Detector: Peak/Avg.  
Operation Modulation: 6.5 Mbps

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB $\mu$ V/m)	Peak. Specificati on (dB $\mu$ V/m)	Peak. Margin (dB)	Avg. Amp (dB $\mu$ V/m)	Avg. Specification (dB $\mu$ V/m)	Avg. Margin (dB)
2390.0	V	63.3	74.0	-10.7	49.5	54.0	-4.5
2390.0	H	68.7	74.0	-5.3	53.0	54.0	-1.0
4824.0	V	45.9	74.0	-28.1	35.7	54.0	-18.3
4824.0	H	47.8	74.0	-26.2	37.3	54.0	-16.7
4874.0	V	46.9	74.0	-27.1	33.0	54.0	-21.0
4874.0	H	48.2	74.0	-25.8	34.8	54.0	-19.2
4924.0	V	42.9	74.0	-31.1	33.9	54.0	-20.1
4924.0	H	46.0	74.0	-28.0	35.8	54.0	-18.2
2483.5	V	62.7	74.0	-11.3	47.9	54.0	-6.1
2483.5	H	67.9	74.0	-6.1	51.9	54.0	-2.1

**Figure 85. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak/Avg.**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak/Avg. Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



## Radiated Emission Above 1 GHz

E.U.T Description: Mobile Data Terminal (MDT)  
Type: M317  
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical      Frequency range: 1.0 GHz to 25.0 GHz  
Test Distance: 3 meters      Detector: Peak/Avg.  
Operation Modulation: 65 Mbps

Freq. (MHz)	Polarity (H/V)	Peak Amp (dB $\mu$ V/m)	Peak. Specificati on (dB $\mu$ V/m)	Peak. Margin (dB)	Avg. Amp (dB $\mu$ V/m)	Avg. Specification (dB $\mu$ V/m)	Avg. Margin (dB)
2390.0	V	56.7	74.0	-68.3	40.5	54.0	-13.5
2390.0	H	60.6	74.0	-13.4	44.7	54.0	-9.3
4824.0	V	43.6	74.0	-30.4	35.0	54.0	-19.0
4824.0	H	46.9	74.0	-27.1	35.4	54.0	-18.6
4874.0	V	44.0	74.0	-30.0	32.7	54.0	-21.3
4874.0	H	46.6	74.0	-27.4	34.8	54.0	-19.2
4924.0	V	41.9	74.0	-32.1	32.6	54.0	-21.4
4924.0	H	46.0	74.0	-28.0	35.0	54.0	-19.0
2483.5	V	61.3	74.0	-12.7	48.9	54.0	-5.1
2483.5	H	68.3	74.0	-5.7	49.9	54.0	-4.1

**Figure 86. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL.  
Detector: Peak/Avg.**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak/Avg. Amp” includes correction factor.

\* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain



### 9.3 **Test Instrumentation Used, Radiated Measurements Above 1 GHz**

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 Year
RF Filter Section	HP	85420E	3705A00248	January 15, 2014	1 Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	2 Years
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	2 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	3 Years
Horn Antenna	ARA	SWH-28	1007	March 30, 2014	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2014	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	March 2, 2014	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

**Figure 87 Test Equipment Used**

## 10. Transmitted Power Density

[In accordance with section 15.247(d)]

### 10.1 Test procedure

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

The E.U.T was tested at the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.

The spectrum analyzer was set to 3 kHz resolution BW and sweep time of 1 second for each 3 kHz “window”. The spectrum peaks were located at each of the 3 operating frequencies.

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \quad [\text{W}]$$

1Mbps:

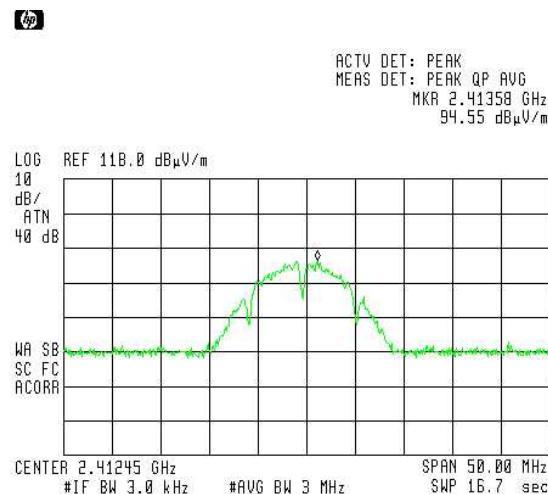


Figure 88 — Low Channel



Op

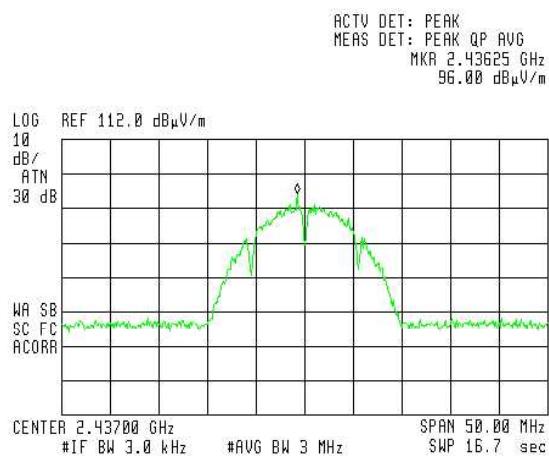


Figure 89 — Mid Channel

Op

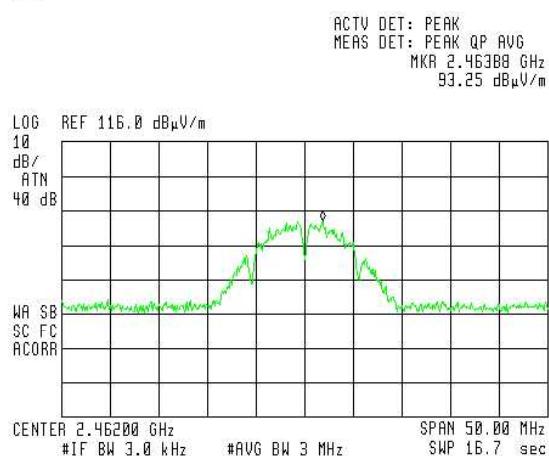


Figure 90 — High Channel

11Mbps:

Op

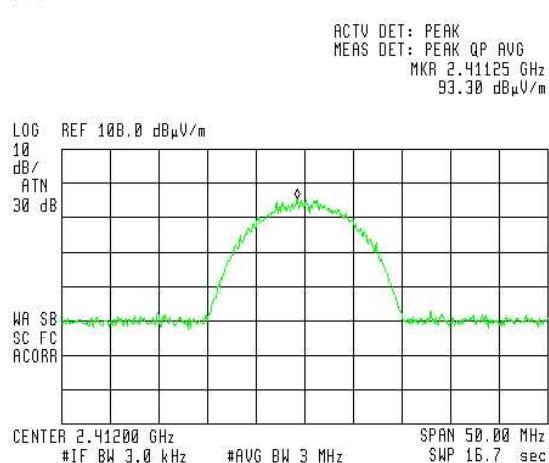


Figure 91 — Low Channel



Op

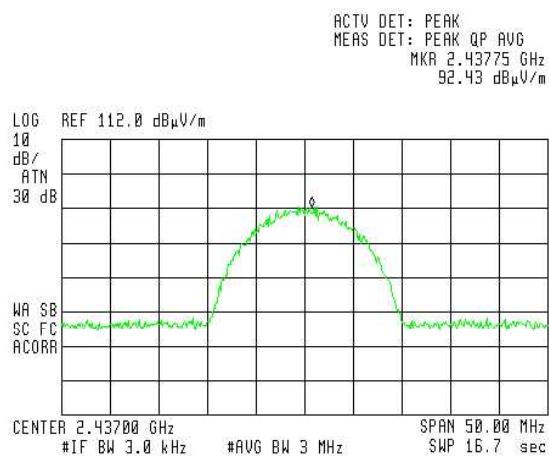


Figure 92 — Mid Channel

Op

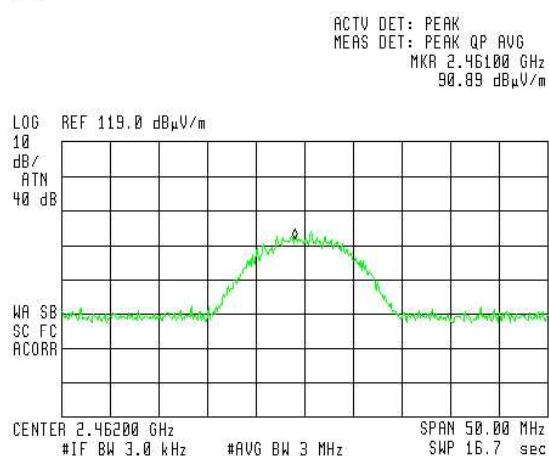


Figure 93 — High Channel

6Mbps:

Op

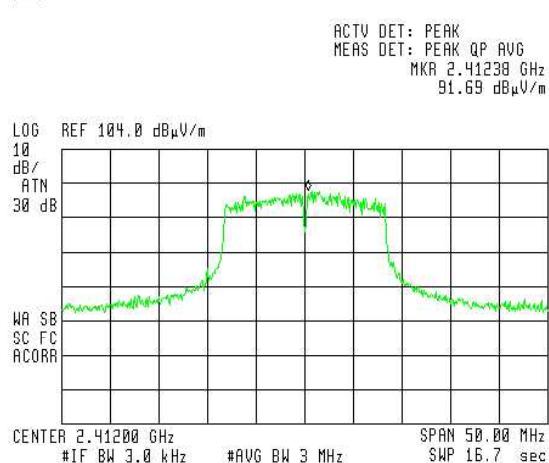


Figure 94 — Low Channel



Op

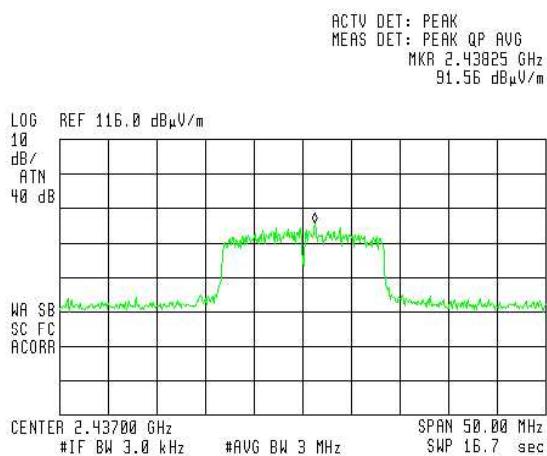


Figure 95 — Mid Channel

Op

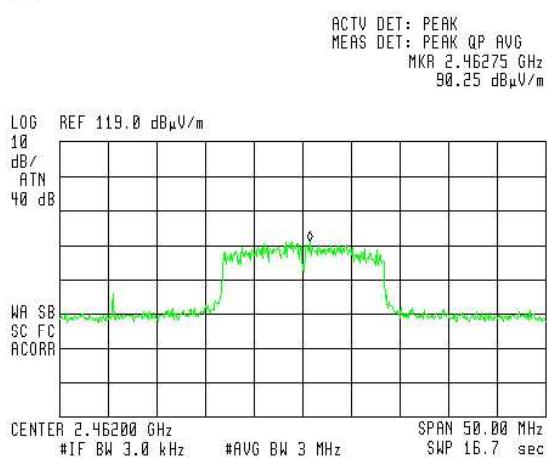


Figure 96 — High Channel

54Mbps:

Op

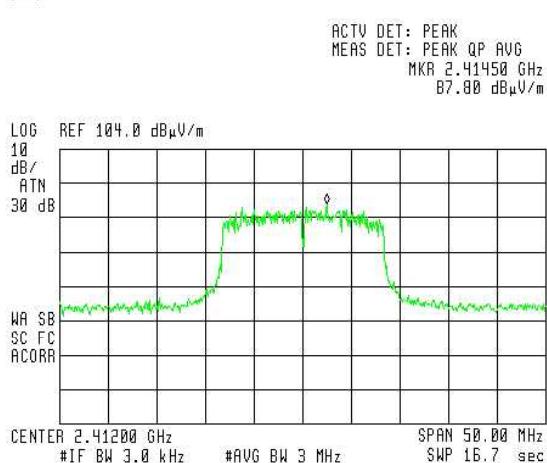
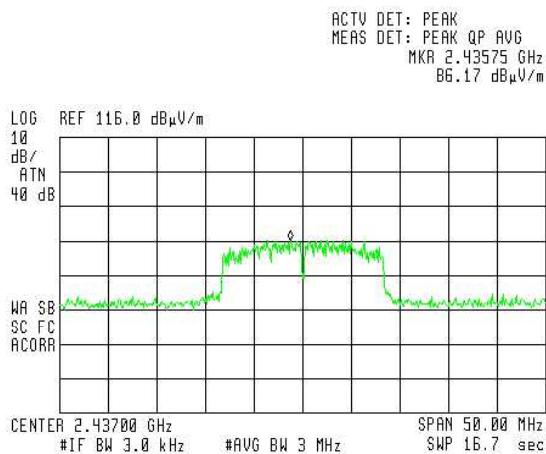


Figure 97 — Low Channel

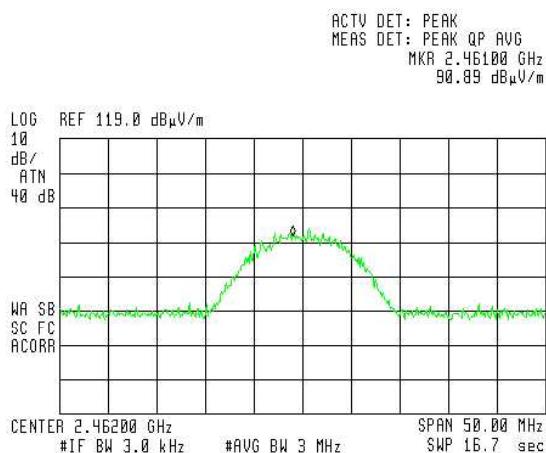


Op



**Figure 98 — Mid Channel**

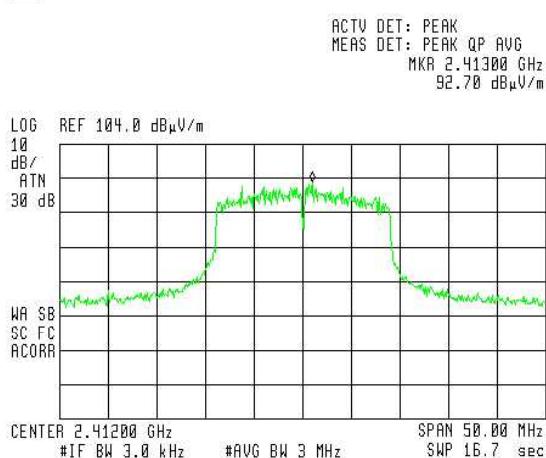
Op



**Figure 99 — High Channel**

6.5Mbps:

Op



**Figure 100 — Low Channel**



Op

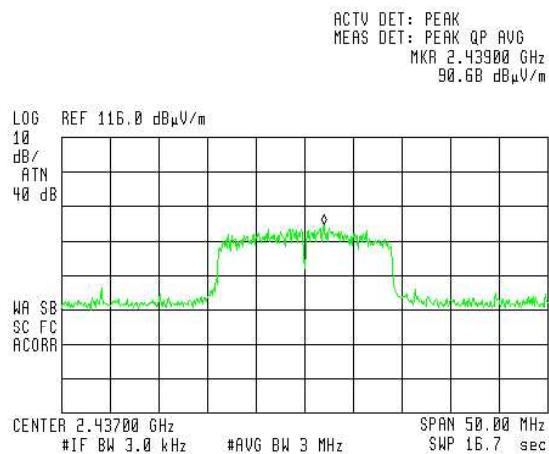


Figure 101 — Mid Channel

Op

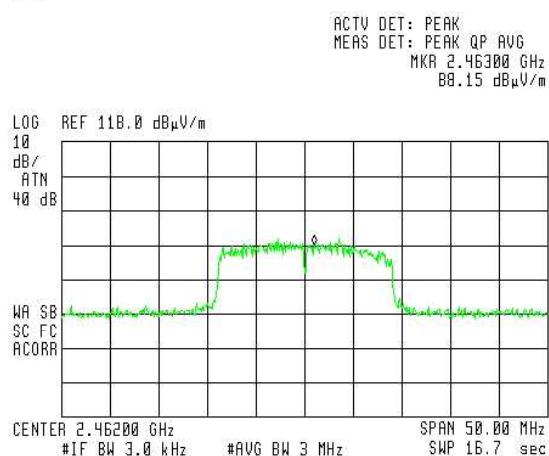


Figure 102 — High Channel

65Mbps:

Op

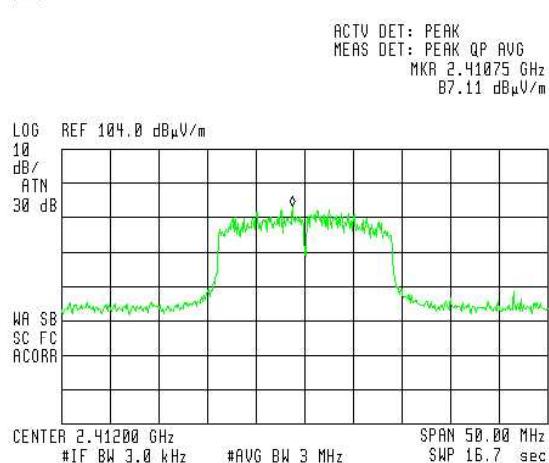
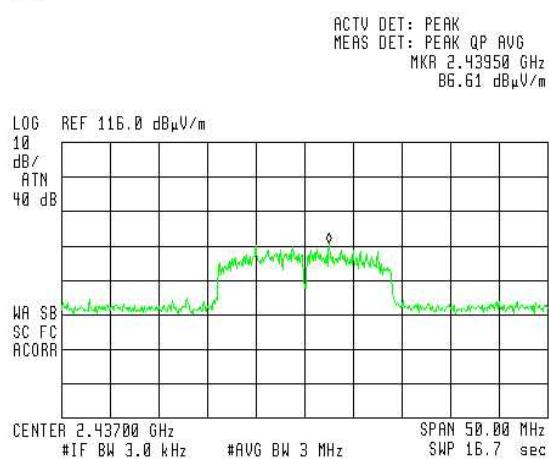
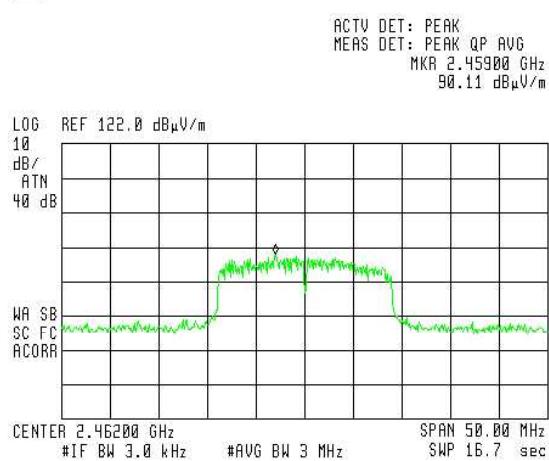


Figure 103 — Low Channel



**Figure 104 — Mid Channel**



**Figure 105 — High Channel**



## 10.2 Results table

E.U.T. Description: Mobile Data Terminal (MDT)

Model No.: M317

Serial Number: Not designated

Specification: F.C.C. Part 15, Subpart C (15.247)

Operation Frequency	Modulation	Reading Spectrum Analyzer	Reading Spectrum Analyzer	Specification	Margin
(MHz)	Mbps	(dB $\mu$ V/m)	(dBm)	(dBm)	(dB)
low	1Mbps	94.55	-0.65	8.0	-8.65
mid	1Mbps	96.00	0.80	8.0	-7.20
high	1Mbps	93.25	-1.95	8.0	-9.95
low	11Mbps	93.30	-1.90	8.0	-9.90
mid	11Mbps	92.43	-2.77	8.0	-10.77
high	11Mbps	90.89	-4.31	8.0	-12.31
low	6 Mbps	91.69	-3.51	8.0	-11.51
mid	6 Mbps	91.56	-3.64	8.0	-11.64
high	6 Mbps	90.25	-4.95	8.0	-12.95
low	54 Mbps	87.80	-7.40	8.0	-15.40
mid	54 Mbps	86.17	-9.03	8.0	-17.03
high	54 Mbps	90.89	-4.31	8.0	-12.31
low	6.5 Mbps	92.70	-2.50	8.0	-10.52
mid	6.5 Mbps	90.68	-4.52	8.0	-12.52
high	6.5 Mbps	88.15	-7.05	8.0	-15.05
low	65 Mbps	87.11	-8.09	8.0	-16.09
mid	65 Mbps	86.61	-8.59	8.0	-16.59
high	65 Mbps	90.11	-5.09	8.0	-13.09

Figure 106 Test Results

JUDGEMENT:

Passed by 7.2 dB

TEST PERSONNEL:

Tester Signature:

Date: 22.07.14

Typed/Printed Name: A. Sharabi



### 10.3 Test Equipment Used; Transmitted Power Density

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	January 15, 2014	1 Year
RF Filter Section	HP	85420E	3705A00248	January 15, 2014	1 Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	2 Years
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	2 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Horn Antenna	ARA	SWH-28	1007	March 30, 2014	2 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2014	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	March 2, 2014	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKG19982	N/A	N/A

Figure 107 Test Equipment Used



## 11. Antenna Gain/Information

The antenna gain is 3.40 dBi, integral.



## 12. R.F Exposure/Safety

Typical use of the E.U.T. is as a versatile vehicle-centric mobile –computing platform. The typical placement of the E.U.T. is on a vehicle dashboard or cabin. The distance between the E.U.T. and the user in the worst case application, is 20 cm.

### Calculation of Maximum Permissible Exposure (MPE) Based on Section 1.110 Requirements

(a) FCC limits at 2437 MHz is:  $1 \frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

P<sub>t</sub>- Transmitted Power 114.08 dBuV/m (peak) = 35.46 mW

G<sub>T</sub>- Antenna Gain, 3.40 dBi= 2.2 numeric

R- Distance from Transmitter using 20 cm worst case

(c) The peak power density (time averaging) of the E.U.T. is:

$$S = \frac{35.46 \times 2.2}{4\pi(20)^2} = 0.0155 \frac{mW}{cm^2}$$

(e) This is below the FCC limit.



## 13. APPENDIX A - CORRECTION FACTORS

13.1 **Correction factors for CABLE**  
**from EMI receiver**  
**to test antenna**  
**at 3 meter range.**

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

### NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".



**13.2 Correction factors for CABLE  
from EMI receiver  
to test antenna  
at 3 meter range.**

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

*NOTES:*

1. The cable type is RG-8.
2. The overall length of the cable is 10 meters.



### 13.3 Correction factors for

### CABLE

from spectrum analyzer  
to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

*NOTES:*

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.
2. The cable is used for measurements above 2.9 GHz.
3. The overall length of the cable is 10 meters.



### 13.4 Correction factors for

### CABLE

from EMI receiver  
to test antenna  
at 10 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	9.8
20.0	0.8	1400.0	10.0
30.0	0.9	1600.0	11.3
40.0	1.2	1800.0	12.2
50.0	1.4	2000.0	13.1
60.0	1.6	2300.0	14.5
70.0	1.8	2600.0	15.9
80.0	1.9	2900.0	16.4
90.0	2.0		
100.0	2.1		
150.0	2.6		
200.0	3.2		
250.0	3.8		
300.0	4.2		
350.0	4.6		
400.0	5.1		
450.0	5.3		
500.0	5.6		
600.0	6.3		
700.0	7.0		
800.0	7.6		
900.0	8.0		
1000.0	8.7		

#### NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 34 meters.
3. The above data is located in file 34M10MO.CBL on the disk marked "Radiated Emissions Tests EMI Receiver".



## 12.6 Correction factors for LOG PERIODIC ANTENNA

Type LPD 2010/A  
at 3 and 10 meter ranges.

### Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

### Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

#### NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".



### 13.5 Correction factors for

### LOG PERIODIC ANTENNA

Type SAS-200/511  
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

#### NOTES:

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".



**13.6 Correction factors for BICONICAL ANTENNA  
Type BCD-235/B,  
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

*NOTES:*

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".



**13.7 Correction factors for BICONICAL ANTENNA  
Type BCD-235/B,  
10 meter range**

FREQUENCY (MHz)	AFE (dB/m)
30.0	12.1
40.0	10.6
50.0	10.6
60.0	8.9
70.0	8.5
80.0	9.6
90.0	9.4
100.0	9.6
110.0	10.3
120.0	10.7
130.0	12.6
140.0	12.7
150.0	12.7
160.0	13.8
170.0	13.7
180.0	14.9
190.0	13.4
200.0	13.1
210.0	14.0
220.0	14.5
230.0	15.8
240.0	16.0
250.0	16.6
260.0	16.7
270.0	18.3
280.0	18.5
290.0	19.3
300.0	20.9

*NOTES:*

1. Antenna serial number is 1041.
2. The above list is located in file 41BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".



**13.8 Correction factors for  
Horn**

**Double-Ridged Waveguide**

**Model: 3115, S/N 29845  
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			



### 13.9 Correction factors for

*Horn Antenna*  
**Model: SWH-28**  
**at 1 meter range.**

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4



**13.10 Correction factors for**

**Horn Antenna  
Model: V637**

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
26.0	43.6	14.9
27.0	43.7	15.1
28.0	43.8	15.3
29.0	43.9	15.5
30.0	43.9	15.8
31.0	44.0	16.0
32.0	44.1	16.2
33.0	44.1	16.4
34.0	44.1	16.7
35.0	44.2	16.9
36.0	44.2	17.1
37.0	44.2	17.4
38.0	44.2	17.6
39.0	44.2	17.8
40.0	44.2	18.0



**13.11 Correction factors for ACTIVE LOOP ANTENNA**  
**Model 6502**  
**S/N 9506-2950**

FREQUENCY (MHz)	Magnetic Antenna Factor (dB)	Electric Antenna Factor (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2



## 14. Comparison Industry Canada Requirements With FCC

**Micronet Ltd.**

**M/N: M317**

**IC: 12186A-NB860 FCC ID: U8ONB860**

Test	FCC	IC
<input type="checkbox"/> Radiated Emission	15.209	RSS 210 Issue 8 Clause 2.5
<input type="checkbox"/> Max power / Peak power	15.247(b)(3)	RSS 210 Issue 8 A8.4(4)
<input type="checkbox"/> 6dB BW	15.247(a)2	RSS 210 Issue 8 A8.2a
<input type="checkbox"/> Power density	15.247(e)	RSS 210 Issue 8 A8.2b
<input type="checkbox"/> Spurious radiated emission in the restricted band	15.205(c)	RSS 210 Issue 8 2.5 RSS Gen 7.2.2 (Table 1)
<input type="checkbox"/> Band edge spectrum	15.247(d)	RSS 210 Issue 8 A8.5
<input type="checkbox"/> RF Exposure Limits	1.1310	RSS 102 4.4