

# FCC TEST REPORT

For

**LTE MOBILE WIFI ROUTER**

**Model Number: MW41NF**

**FCC ID: 2ACCJB081**

**Report Number : WT168006222**

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
		National Digital Electronic Product Testing Center
Site Location	:	NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China
Tel	:	0086-755-86928965
Fax	:	0086-755-86009898-31396
Web	:	www.smq.com.cn
E-mail	:	emcrf@smq.com.cn

## TEST REPORT DECLARATION

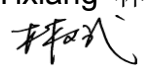
Applicant : TCL Communication Ltd  
Address : 5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong, Shanghai, China  
Manufacturer : TCL Mobile Communication Co. Ltd. Huizhou  
Address : 70 Huifeng 4rd., ZhongKai High-Technology Development District, Huizhou, Guangdong, PRC. 516006  
EUT Description : LTE MOBILE WIFI ROUTER  
Model No : MW41NF  
Trade mark : Alcatel  
Serial Number : /  
FCC ID : 2ACCJB081

Test Standards:

### FCC Part 15 Subpart B 15.107, 15.109 (2016)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2014).

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	 (Chen Silin 陈司林)	Date:	<u>Nov. 16, 2016</u>
Checked by:	 (Lin Yixiang 林奕翔)	Date:	<u>Nov. 16, 2016</u>
Approved by:	 (Lin Bin 林斌)	Date:	<u>Nov. 16, 2016</u>

## TABLE OF CONTENTS

<b>TEST REPORT DECLARATION</b>	<b>2</b>
<b>1. TEST RESULTS SUMMARY</b>	<b>4</b>
<b>2. GENERAL INFORMATION</b>	<b>5</b>
2.1. Report information	5
2.2. Laboratory Accreditation and Relationship to Customer	5
2.3. Measurement Uncertainty	5
<b>3. PRODUCT DESCRIPTION</b>	<b>6</b>
3.1. EUT Description	6
3.2. Block Diagram of EUT Configuration	7
3.3. Operating Condition of EUT	7
3.4. Support Equipment List	7
3.5. Test Conditions	7
3.6. Modifications	7
<b>4. TEST EQUIPMENT USED</b>	<b>7</b>
4.1. Test Equipment Used to Measure Conducted Disturbance	7
4.2. Test Equipment Used to Measure Radiated Disturbance	8
<b>5. CONDUCTED DISTURBANCE TEST</b>	<b>9</b>
5.1. Test Standard and Limit	9
5.2. Test Procedure	9
5.3. Test Arrangement	9
5.4. Test Data	9
<b>6. RADIATION DISTURBANCE TEST</b>	<b>13</b>
6.1. Test Standard and Limit	13
6.2. Test Procedure	13
6.3. Test Arrangement	13
6.4. Test Data	13

## 1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	15.107	Pass
Radiation Emission	15.109	Pass

Remark: "N/A" means "Not applicable."

## 2. GENERAL INFORMATION

### 2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

### 2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 446246 806614 994606(semi anechoic chamber).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 11177A-1 11177A-2.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

### 2.3. Measurement Uncertainty

Conducted Emission  
9kHz~30MHz 3.5dB

Radiated Emission  
30MHz~1000MHz 4.5dB  
1GHz~26.5GHz 4.6dB

### 3. PRODUCT DESCRIPTION

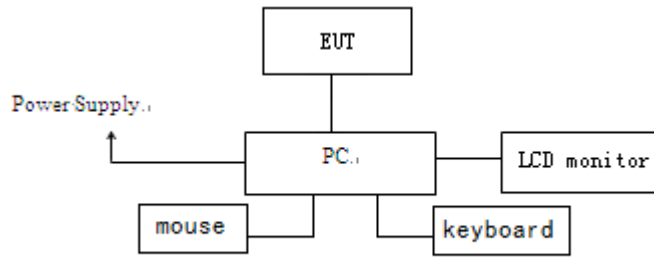
#### 3.1.EUT Description

Table 2 Specification of the Equipment under Test

Product Type:	LTE MOBILE WIFI ROUTER
Hardware Version:	V2.0
Software Version :	MW41_01_02.00_08
FCC-ID:	2ACCJB081
Frequency:	GSM850: TX 824MHz~849MHz RX 869MHz~894MHz PCS1900: TX 1850MHz~1910MHz RX 1930MHz~1990MHz WCDMA 850: TX 824MHz~849MHz RX 869MHz~894MHz WCDMA 1700: TX 1710MHz~1755MHz RX 2110MHz~2155MHz WCDMA 1900: TX 1850MHz~1910MHz RX 1930MHz~1990MHz LTE Band 2: TX 1850MHz~1910MHz RX 1930MHz~1990MHz LTE Band 4: TX: 1710MHz~1755MHz RX 2110MHz~2155MHz LTE Band 5: TX 824MHz~849MHz RX 869MHz~894MHz LTE Band 7: TX 2500MHz~2570MHz RX 2620MHz~2690MHz LTE Band 12: TX 698 ~ 716 MHz RX 728 ~ 746MHz LTE Band 13: TX 777 ~ 787 MHz RX 746 ~ 756MHz LTE Band 17: TX 704 ~ 716 MHz RX 734 ~ 746MHz
Type(s) of Modulation:	GSM850/PCS1900 :GMSK 8PSK WCDMA:QPSK LTE:QPSK, 16QAM
Antenna Type:	GSM/WCDMA/LTE: Internal antenna 698MHz~800MHz: 0.5dBi 824MHz~849MHz: 0.5dBi 1710MHz~1755MHz: 0.5dBi 1850MHz~1910MHz: 0.5dBi 2500MHz~2570MHz: 0.5dBi WiFi: Internal antenna 1dBi
Operating voltage:	Internal battery, 120V AC Adapter; 3.6V (Low)/3.8V (Nominal)/ 4.2V (Max)

Remark: The model MW41NF has two kinds color of enclosure, Black and white.

### 3.2. Block Diagram of EUT Configuration



Test mode 1

### 3.3. Operating Condition of EUT

Test mode 1: Data transmitting with PC by USB

The test mode mentioned above is identified as worst case for this EUT and the test results for this mode is recorded in this report.

The Radiated emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).

### 3.4. Support Equipment List

Name	Model No	S/N	Manufacturer	FCC
Computer	9439	L3BDF2K	Lenovo	DOC
Keyboard (USB)	SK-8825 (L)	02553778	Lenovo	DOC
Mouse (USB)	MO28UOL	4418011108	Lenovo	DOC
Monitor	9227-AE1	V1TDB38	Lenovo	DOC
Computer	Computer	CNG51204V3	HP	DOC
Monitor	HP L1506	CNC53909Y1	HP	DOC

### 3.5. Test Conditions

Date of test : Nov.07, 2016-Nov. 16, 2016

Date of EUT Receive : Oct. 27, 2016

Temperature: 22-24 °C

Relative Humidity:47-50%

### 3.6. Modifications

No modification was made.

## 4. TEST EQUIPMENT USED

### 4.1. Test Equipment Used to Measure Conducted Disturbance

**Table 3 Conducted Disturbance Test Equipment**

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB3319	EMI Test Receiver	R&S	ESCS30	Dec.11,2015	1 Year
SB4357	AMN	R&S	ESH2-Z5	Sep.23,2016	1 Year

#### **4.2. Test Equipment Used to Measure Radiated Disturbance**

**Table 4 Radiated Disturbance Test Equipment**

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB3436	EMI Test Receiver	R&S	ESI26	Dec.11,2015	1 Year
SB3955	Trilog Broadband Antenna (30M-3GHz)	SCHWARZBECK	VULB9163	Jan.07,2016	1 Year
SB8501/01	Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF906	Mar.21,2016	1 Year
SB8501/17	Preamplifier	Rohde & Schwarz	SCU-18	Mar.26, 2016	1 Year
SB8501/16	Preamplifier	Rohde & Schwarz	SCU-26	Mar.26, 2016	1 Year
SB9059	Preamplifier	Rohde & Schwarz	SCU-40	Sep.21,2016	1 Year
SB8501/11	Horn Antenna	ETS-Lindgren	3160-09	Mar.28,2016	1 Year
SB8501/12	Horn Antenna	ETS-Lindgren	3160-10	Mar.28,2016	1 Year

## 5. CONDUCTED DISTURBANCE TEST

### 5.1. Test Standard and Limit

#### 5.1.1. Test Standard

FCC Part 15: Section 15.107

#### 5.1.2. Test Limit

Table 5 Conducted Disturbance Test Limit (Class B)

Frequency	Power Port limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15MHz ~ 0.5MHz	66~56*	56~46*
0.5MHz ~ 5 MHz	56	46
5 MHz ~ 30MHz	60	50

\* Decreasing linearly with logarithm of the frequency

### 5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

### 5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 5.4. Test Data

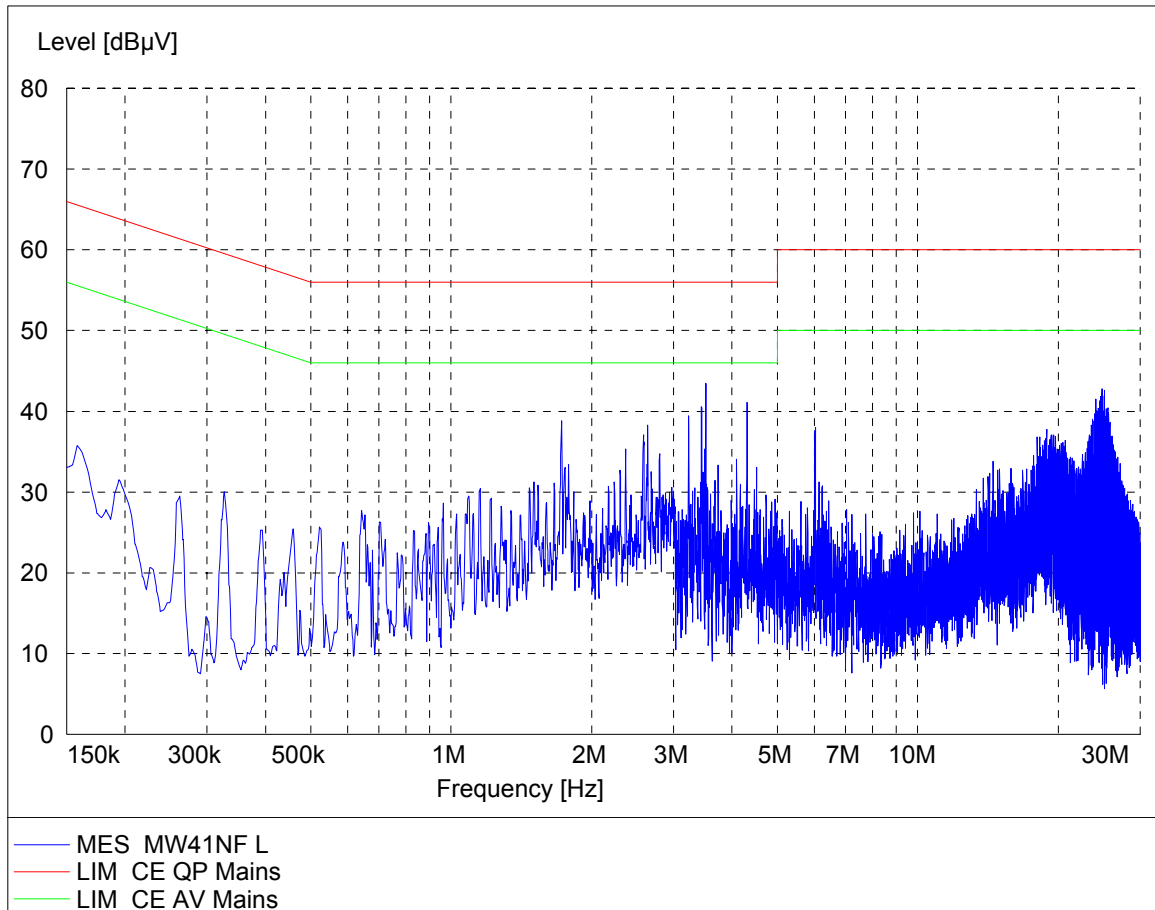
The emissions don't show in following result tables are more than 20dB below the limits, the test curves are shown in the next page.

**Table 6 Conducted Disturbance Test Data at mains Port**

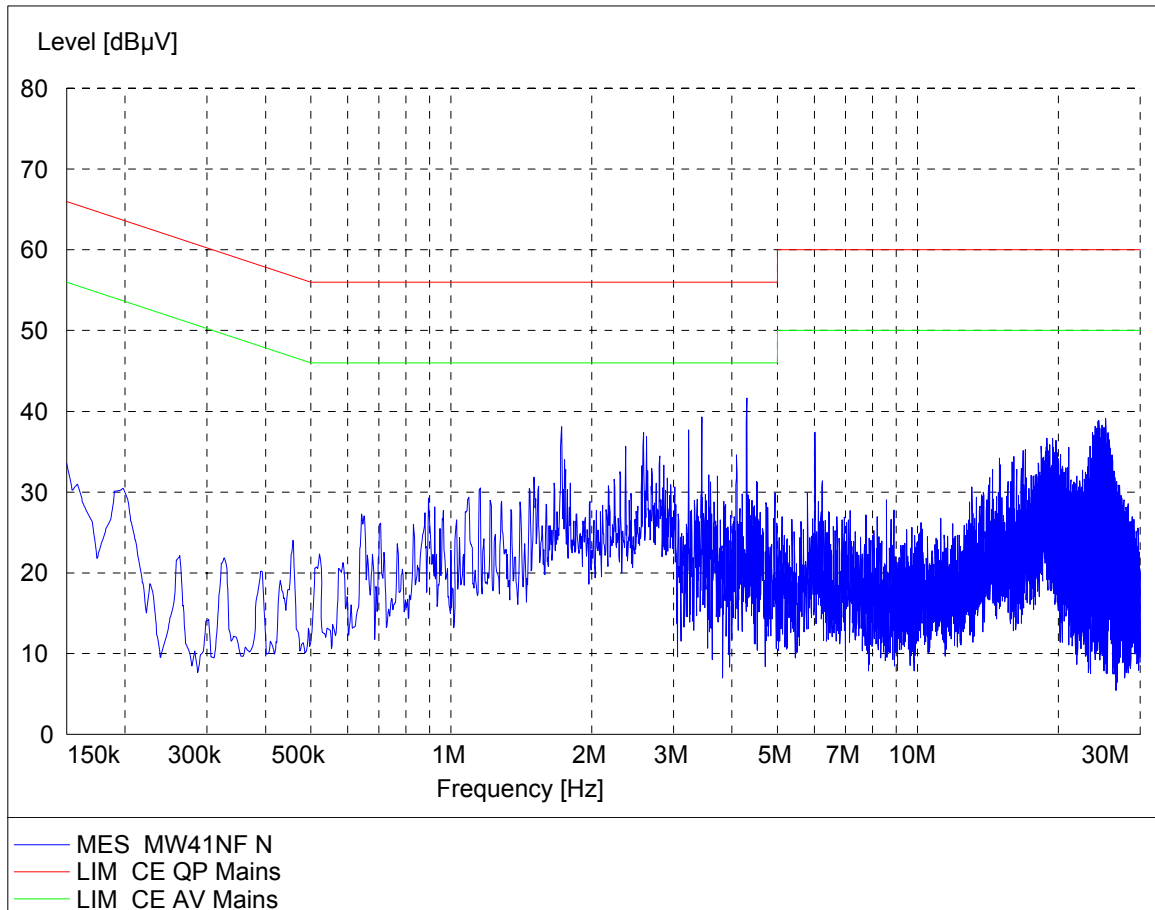
Model No.: MW41NF								
Test mode: Test Mode 1								
	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
			Reading (dB $\mu$ V)	Emission Level (dB $\mu$ V)	Limits (dB $\mu$ V)	Reading (dB $\mu$ V)	Emission Level (dB $\mu$ V)	Limits (dB $\mu$ V)
Line	0.158	9.7	33.6	43.3	65.6	18.7	28.4	55.6
	0.326	9.7	29.9	39.6	59.6	20.0	29.7	49.6
	1.726	9.8	35.7	45.5	56	21.3	31.1	46
	2.638	9.9	36.2	46.1	56	22.7	32.6	46
	3.512	9.9	40.1	50.0	56	25.7	35.6	46
	4.312	9.9	39.2	49.1	56	26.7	36.6	46
Neutral	0.150	9.7	31.9	41.6	66	21.0	30.7	56
	1.709	9.8	36.6	46.4	56	28.9	38.7	46
	2.582	9.9	34.9	44.8	56	27.7	37.6	46
	3.224	9.9	35.1	45.0	56	25.1	35.0	46
	3.456	9.9	38.2	48.1	56	26.9	36.8	46
	4.300	9.9	39.1	49.0	56	27.0	36.9	46

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)  
2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)  
3. The other emission levels were are more than 20dB below the limits.

EUT: MW41NF  
Operating Condition: Test mode 1  
Test Specification: L  
Comment: AC 120V/60Hz



EUT: MW41NF  
Operating Condition: Test mode 1  
Test Specification: N  
Comment: AC 120V/60Hz



## 6. RADIATION DISTURBANCE TEST

### 6.1. Test Standard and Limit

#### 6.1.1. Test Standard

FCC Part 15: Section 15.109

#### 6.1.2. Test Limit

Table 7 Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Table 8 Radiation Disturbance Test Limit for FCC (Class B)(Above 1G)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

\* The lower limit shall apply at the transition frequency.

\* The test distance is 3m.

### 6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set **3 meters** away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. Set RBW=100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Detector function = peak;

Set RBW = 1 MHz, VBW= 3MHz for  $f > 1$  GHz for peak measurement.

### 6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

### 6.4. Test Data

The emissions don't show in following result tables are more than 20dB below the limits, the test curves are shown in the next page.

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

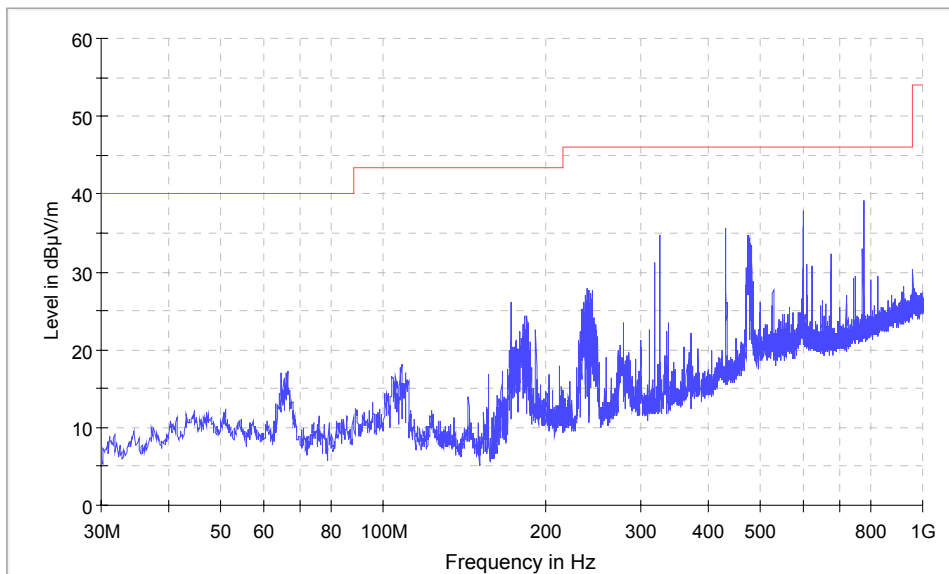
Table 9 Radiated Disturbance Test Data

Frequency (MHz)	Cable Loss +preamp(dB)	Antenna Factor (dB)	Readings (dBμV/m)	Level (dBμV/m)	Polarity (H/V)	Turntable Angle(deg)	Antenna Height(m)	Limits (dBμV/m)	Margin (dB)
240.005	1.9	12.1	14.3	28.3	V	45	1.0	46	17.7
325.001	2.1	13.3	17.6	33.0	V	360	1.0	46	13.0
475.593	2.6	15.6	11.9	30.1	V	23	1.0	46	15.9
609.453	3.1	18.5	10.9	32.5	V	318	1.0	46	13.5
677.111	3.2	18.5	11.9	33.6	V	296	1.0	46	12.4
744.890	3.5	18.8	11.5	33.8	V	340	1.0	46	12.2
317.847	2.2	13.1	16.0	31.3	H	45	2.0	46	14.7
325.001	2.1	13.3	19.2	34.6	H	326	2.0	46	11.4
432.065	2.5	15.5	17.7	35.7	H	15	1.0	46	10.3
475.593	2.6	15.6	16.5	34.7	H	330	1.0	46	11.3
599.753	3.1	16.6	18.1	37.8	H	48	1.0	46	8.2
780.052	3.5	18.8	16.8	39.1	H	10	1.0	46	6.9
PK									
1200.400	-40.9	24.3	60.1	43.5	V	341	1.0	74	30.5
1651.302	-40.6	26.7	54.7	40.8	V	26	1.0	74	33.2
2342.685	-40.2	28.3	54.5	42.6	V	329	1.0	74	31.4
3004.008	-39.4	30.4	55.4	46.4	V	53	1.0	74	27.6
5018.036	-39.3	34.3	57.3	52.3	V	116	1.0	74	21.7
6000.000	-38.3	34.7	49.0	45.4	V	0	1.0	74	28.6
2392.785	-40.2	28.3	52.4	40.5	H	37	1.0	74	33.5
2853.707	-39.5	29.4	52.2	42.1	H	350	1.0	74	31.9
3004.008	-39.4	30.4	57.5	48.5	H	98	1.0	74	25.5
4797.595	-39.5	33.4	53.0	46.9	H	110	1.0	74	27.1
5398.797	-38.6	33.9	51.2	46.5	H	306	1.0	74	27.5
6000.000	-38.3	34.7	49.3	45.7	H	360	1.0	74	28.3
AV									
1200.400	-40.9	24.3	41.2	24.6	V	341	1.0	54	29.4
1651.302	-40.6	26.7	36.6	22.7	V	26	1.0	54	31.3
2342.685	-40.2	28.3	35.3	23.4	V	329	1.0	54	30.6
3004.008	-39.4	30.4	36.6	27.6	V	53	1.0	54	26.4
5018.036	-39.3	34.3	35.9	30.9	V	116	1.0	54	23.1
6000.000	-38.3	34.7	30.1	26.5	V	0	1.0	54	27.5
2392.785	-40.2	28.3	34.2	22.3	H	37	1.0	54	31.7
2853.707	-39.5	29.4	34.0	23.9	H	350	1.0	54	30.1
3004.008	-39.4	30.4	38.8	29.8	H	98	1.0	54	24.2
4797.595	-39.5	33.4	34.0	27.9	H	110	1.0	54	26.1
5398.797	-38.6	33.9	32.2	27.5	H	306	1.0	54	26.5
6000.000	-38.3	34.7	30.2	26.6	H	360	1.0	54	27.4

1. Emission level(dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +pre amp(dB)

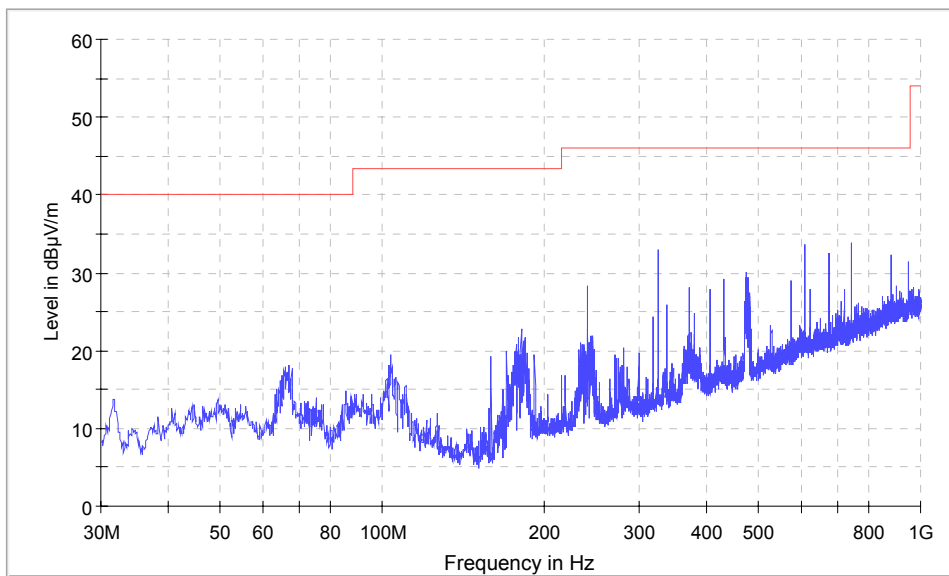
EUT Name: MW41NF  
Operating Condition: Data transmitter with PC by USB port  
Test site: SMQ NETC EMC Lab.  
Antenna Position: Horizontal & Vertical  
Comment: AC 120V60Hz

Normal Sweep\_TT2m



(Horizontal)

Normal Sweep\_TT2m

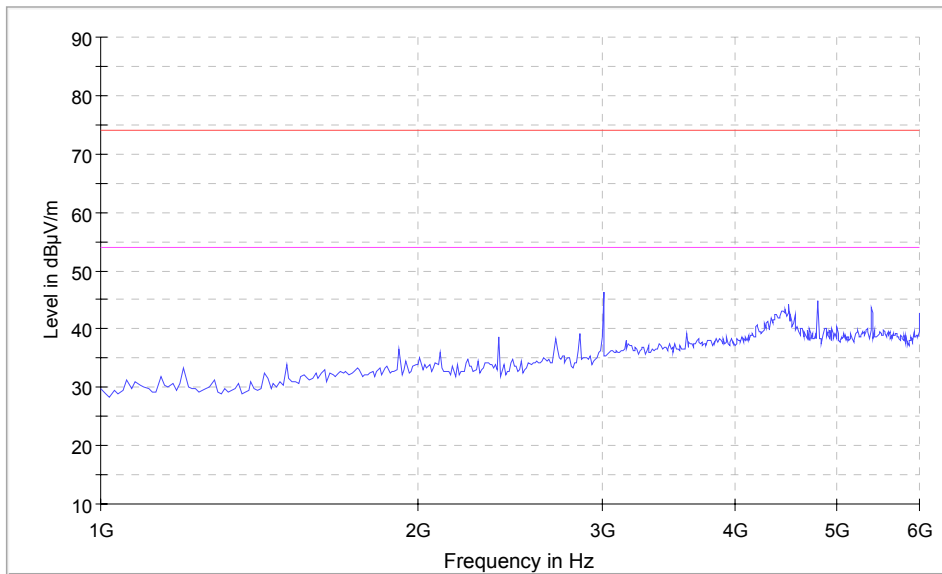


(Vertical)

## ***Radiated Emission***

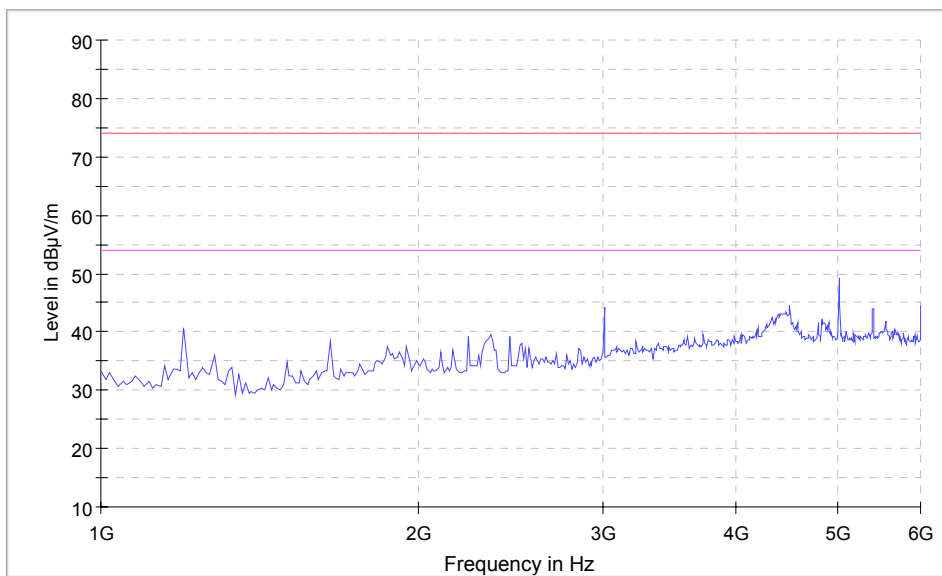
EUT Name: MW41NF  
Operating Condition: Test Mode 1  
Test site: SMQ NETC EMC Lab.  
Antenna Position: Vertical & Horizontal  
Comment: AC 120V/60Hz

Normal Sweep\_TT2m\_1G-18GHz



(Horizontal)

Normal Sweep\_TT2m\_1G-18GHz



(Vertical)

# Radiated Emission

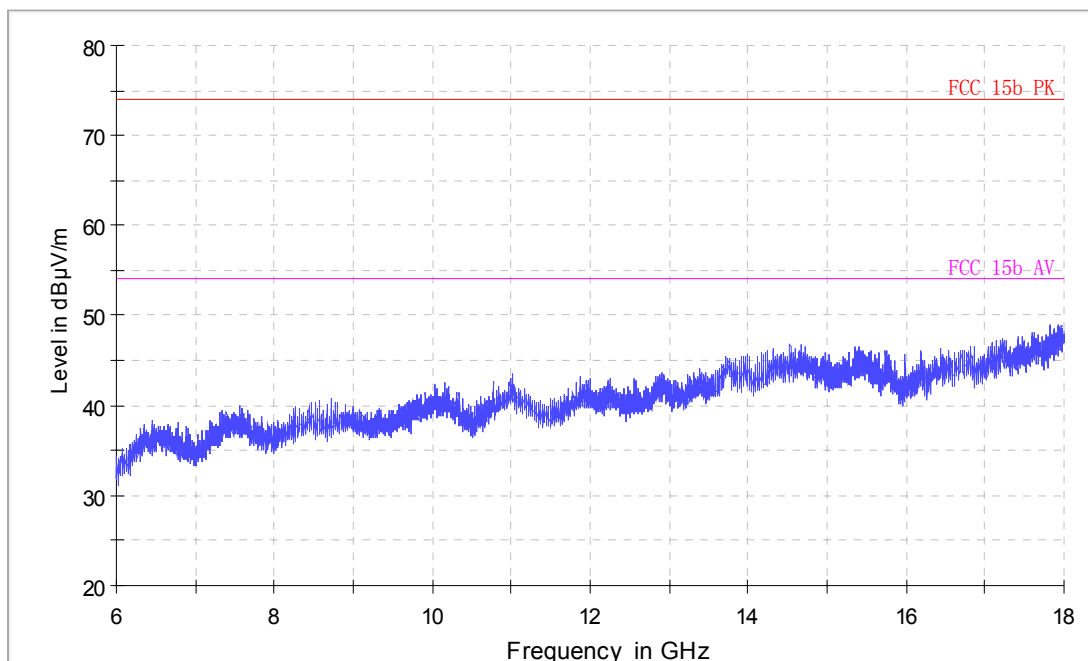
## EUT Information

EUT Model name: MW41NF  
Operator Mode: Test Mode 1  
Comment:

## Common Information

Test Description: SMQ NETC EMC Lab.  
Customer  
Antenna Position: Horizontal  
Operator Name:  
Comment1: AC 120V/60Hz  
Comment2:

Copy (2) of FCC Electric Field Strength 1-18GHz operate on 2.4GHz



# Radiated Emission

## EUT Information

EUT Model name: MW41NF  
Operator Mode: Test Mode 1  
Comment:

## Common Information

Test Description: SMQ NETC EMC Lab.  
Customer:  
Antenna Position: Vertical  
Operator Name:  
Comment1: AC 120V/60Hz  
Comment2:

Copy (2) of FCC Electric Field Strength 1-18GHz operate on 2.4GHz

