

FCC RF Test Report

APPLICANT	:	Huawei Technologies Co.,Ltd.
EQUIPMENT	:	Huawei Mediapad M5 wp
BRAND NAME	:	HUAWEI
MODEL NAME	:	d-02K
FCC ID	:	QISHDL-L0J
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Apr. 04, 2018 and testing was completed on Apr. 21, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Journes Huarg

R TESTING NVLAP LAB CODE 600155-0

Approved by: James Huang / Manager

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR840402C	Rev. 01	Initial issue of report	May 11, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	\geq 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	\leq 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
2.4	15.247(d)	Conducted Band Edges	< 20dDa	Pass	-
3.4		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.36 dB at 2483.510 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.25 dB at 0.564 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Huawei Technologies Co.,Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.2 Manufacturer

Huawei Technologies Co.,Ltd.

Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.3 Product Feature of Equipment Under Test

Product Feature				
Equipment	Huawei Mediapad M5 wp			
Brand Name	HUAWEI			
Model Name	d-02K			
FCC ID	QISHDL-L0J			
EUT supports Radios application	WCDMA/HSDPA/HSUPA B5			
	LTE B5			
	WLAN 2.4GHz 802.11b/g/n HT20/HT40			
	WLAN 5GHz 802.11a/n HT20/HT40			
	WLAN 5GHz 802.11ac VHT20/VHT40/VHT80			
	Bluetooth v2.1+EDR/Bluetooth v 4.2 LE			
	Conducted: 867555030008853			
IMEI Code	Conduction: 867555030008853			
	Radiation: 867555030008713			
HW Version	SH1HDLAL09M			
SW Version	18032602			

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.4 Product Specification of Equipment Under Test

Standards-related Product Specification					
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz				
	802.11b : 15.82 dBm (0.0382 W)				
Maximum (Peak) Output Power to	802.11g : 22.28 dBm (0.1690 W)				
antenna	802.11n HT20 : 22.46 dBm (0.1762 W)				
	802.11n HT40 : 20.34 dBm (0.1081 W)				
Antenna Type / Gain	IFA Antenna with gain 0.10 dBi				
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK)				
Type of Modulation	802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)				

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

Test Site	Sporton International (Kunshan) Inc.					
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958					
Test Site No.		Sporton Site No.		FCC Test Firm Registration No.		
	TH01-KS	03CH03-KS	CO01-KS	630927		

Note: The test site complies with ANSI C63.4 2014 requirement.



1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ANSI C63.10-2013

Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier requeitcy and channe	2.1	Carrier	Freq	uency	and	Channe
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Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	1	2412	8	2447
2400-2483.5 MHz	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432		
	6	2437		
	7	2442		



2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases						
AC Conducted Emission	Mode 1 :WCDMA Band V Idle + Bluetooth Link + WLAN Link(2.4G) + USB Cable (Charging from Adapter) + Earphone					
Remark: For Radiated Test Cases, The tests were performed with Adapter, Earphone, USB Cable.						



2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

ltem	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritus	MT8820C	N/A	N/A	Unshielded, 1.8 m
2						shielded cable DC
				Q87-WRT600NV11	N/A	O/P1.8m ,
2.		LINKSYS	WRIGUUN			Unshielded AC
						I/P1.8m
2	NOTE BOOK	E BOOK Lenovo	G480	N/A	N/A	AC I/P:
						Unshielded, 1.8m
5.						DC O/P:
						Shielded, 1.8 m
4	Bluetooth		N1/A	NI/A	N//A	
4.	Earphone	Lenovo	LBH308	IN/A	IN/A	N/A
5.	Earphone	Lenovo	LH102	N/A	N/A	Unshielded,1.2m
6.	SD Card	Kingston	SDC4/4GB	N/A	N/A	N/A



2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss. *Offset = RF cable loss.* Following shows an offset computation example with cable loss 5.5 dB.

Offset(dB) = RF cable loss(dB). = 5.5 (dB)



3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

- 1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
- 5. Measure and record the results in the test report.

3.1.4 Test Setup



EUT

Spectrum Analyzer



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

- The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.3 PKPM1 Peak power meter method.
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

- The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz.
 Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 6. Measure and record the results in the test report.



3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.





3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

- 1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
- 5. Measure and record the results in the test report.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Silent Hai	Temperature :	21~25℃
		Relative Humidity :	51~55%





Test Mode :	802.11b			Test Channel :	06		
100	kHz PSD refere	ence Level					
Spectrum Ref Level 25.50 dBm Offset Att 30 dB SWT 0 1Pk Max 20 dBm	5.50 dB RBW 100 kHz I.1 ms VBW 300 kHz Mode	B Sweep M1[1] 2.	.4375138 GHz				
10 dBm -10 dBm -20 dBm -20 dBm -20 dBm	Mar Mar Mar						
-40 dBm							
CF 2.437 CHz	ous Emission 3	30MHz~3GHz	12.8565 MHz	Spuri	ous Emission 2	GHz~25GF	łz
Spectrum Ref Level 25.50 dBm Offset Att 30 dB SWT	5.50 dB ● RBW 100 kHz 29.7 ms ● VBW 300 kHz Mod	е Ѕжеер		Spectrum Ref Level 25.50 dBm Offset Att 30 dB SWT	5.50 dB RBW 100 kHz 230 ms VBW 300 kHz	Sweep	
1Pk View 20 dBm 10 dBm 0 dBm		M1[1] M2[1]	-52.77 dBm 936.40 MHz 2.80 dBm 2.43480 GHz	10 dBm 10 dBm 10 dBm	N	11[1]	-48.07 dBm 16.1420 GHz 2.72 dBm 2.4480 GHz
-10 dBm				-10 dBm -20 dBm -30 dBm			
-40 dBm -50 dBm -50 dBm -60 dBm			Hall Martin Laboratory	-0 dBm -0 dBm -0 dBm -60 dBm	Muneryperson and the	MI Prover and the second of the	My physical and a second
-70 dBm	1001 pts	Securita	Stop 3.0 GHz	-70 dBm	1001 pts	Measuring	Stop 25.0 GHz











Test Mode :	802.11g			Test Chanı	nel :	06		
10	00kHz PSD	reference Leve	el					
Spectrum Ref Level 25.50 dBm Of Att 30 dB SV 11 dBm 0 dBm 10 dBm 0 dBm -10 dBm	fset S.S0 dB RBW 100 I ms VBW 300	KH2 Mode Sweep	0.70 dBm 2.4444940 GHz					
CF 2.437 GHz CF 2.437 GHz Date: 18.APR 2018 15 20 52 Spectrum Ref Level 25.50 dBm Of	rious Emiss	bion 30MHz~3(Span 24.516 MHz	Spectrum Ref Level 25.50 dBm	purious E	mission 2	GHz~25G	Hz
Att 30 dB SV PIPk View 20 dBm 0 dBm	VT 29.7 ms • VBW 300	Mi[1] M2[1]	-52.47 dBm 2.74040 GHz 0.56 dBm 2.43180 GHz	Att 30 dB IPk View 20 dBm 10 dBm	SWT 230 ms	VBW 300 kHz Mode	Sweep 11[1] 12[1]	-47.89 dBm 6.8600 GHz -2.53 dBm 2.4480 GHz
-10 dBm 01 -19.300 dBm -20 dBm 01 -19.300 dBm -40 dBm -50 dBm -50 dBm -60 dBm	halping land in the source with	ungenergenergenergenergenergenergenergen	ni deger Velegi nyeki digerent	-10 dBm -20 dBm 01 -19.300 -30 dBm -0 dBm -0 dBm -0 dBm -60 dBm	dBm	hyershipstory here A seast	eterene atter	Ref Kannen Allen Brankler Ander
-70 dBm Start 30.0 MHz Date: 18.APR 2018 15:21:27	10	001 pts	Stop 3.0 GHz	-70 dBm Start 2.0 GHz Date: 18.APR 2018 15:22:05	5	1001 pts	Measuring	Stop 25.0 GHz











Test Mode :	802.11n HT20	Test Cha	nnel : 06	
100k	Hz PSD reference Level			
Spectrum Ref Level 25,50 dbm Att 30 dB SWT ID dbm 10 dbm 0 dbm -10 dbm -20 dbm -30 dbm -30 dbm -30 dbm -70 dbm -60 dbm -70 dbm	50 dB • RBW 100 kHz 1 ms • VBW 300 kHz Mode Sweep M1[1] Multiple M1[1] Multiple M1[1] M1			
Spurio	us Emission 30MHz~3GHz	<u>z</u>	Spurious Emissio	n 2GHz~25GHz
Spectrum Ref Level 25.50 dBm Offset 5. • Att 30 dB SWT 25	.50 dB B RBW 100 kHz 9.7 ms B VBW 300 kHz Mode Sweep	(T0) Ref Level 25.50 d ■ Att 30 ■ FIV View	lBm Offset 5.50 dB ● RBW 100 kHz dB SWT 230 ms ● VBW 300 kHz	Mode Sweep
20 dBm	M1[1] M2[1]	-53.10 dBm 1.84140 GHz 2.43180 GHz 2.43180 GHz 0 dBm -10 dBm -10 dBm		
-20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -50 dBm -60 dBm		-20 dBm -20 dBm -0 dBm -0 dBm -0 dBm -60 dBm -60 dBm	10 dBm	Lytuple of the second s
-70 dBm Start 30.0 MHz Date: 18 APR 2016 15 41:58	1001 pts	Stop 3.0 GHz -70 dBm Stop 3.0 GHz Start 2.0 GHz Date: 18 APR 2018 15.4	1001 pr	is Stop 25.0 GHz











Test Mode :	802.11n HT40	Test Cha	nnel : 06		
100k	Hz PSD reference Level				
Spectrum Ref Level 25.50 dBm Offset 5 Att 30 dB 9 19k Max 20 dBm 10 dBm 10 dBm 10 dBm -10 dBm 10 dBm -30 dBm	50 dB = RBW 100 kH2 1 ms = VBW 300 kH2 Mode Swaep M1[1] routinghyddyddyddyddyddyddyddyddyddyddyddyddydd	-4.13 dBm 2.4420040 GHz			
-70 dBm CF 2.437 GHz Date: 18 APR 2018 16 06 34 Spurio	us Emission 30MHz~3GHz	an 53.286 MHz	Spurious Emis	sion 2GHz~25G	Hz
Spectrum Ref Level 25.50 dBm Offset 5 Att 30 dB SWT 21	.50 dB ● RBW 100 kHz 9.7 ms ● VBW 300 kHz Mode Sweep	Spectrum Ref Level 25.50 Att 3	dBm Offset 5.50 dB RBW 100 0 dB SWT 230 ms VBW 300) kHz) kHz Mode Sweep	
20 dBm	M1[1] M2[1]	-51.41 dBm 877.10 MHz -4.59 dBm 2.439480 GHz 10 dBm - -0 dBm - -0 dBm		M1[1] M2[1]	-48.46 dBm 16.3260 GHz -4.33 dBm 2.4480 GHz
01 -24.130 dBm -40 dBm -50 dBm -50 dBm -60 dBm -70 dBm	Wayner may be deserver the area better water being the second second second second second second second second	-0 dBm	130 dBm	MI MI MANANA	Mart Herenard Transported
Date: 18.APR.2018 16:10:16	1001 pts Neasuring 📲 🖬 🖬	Stop 3.0 GHz J Start 2.0 GHz Date: 18.APR 2018 16	09.25	UU1 pts Measuring	Stop 25.0 GHz