



# FCC RF Test Report

**Product Name: HUAWEI MediaPad T1 10**

**Model Number: T1-A22L**

**Report No: SYBH(Z-RF)023092015-2005**

**FCC ID: QIST1-A22L**

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## Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
  2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
  3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 684868.
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  7. The test report is only valid for the test samples.
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1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.



**Applicant:** Huawei Technologies Co., Ltd.  
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**Date of Receipt Sample:** 2015-09-22  
**Start Date of Test:** 2015-09-23  
**End Date of Test:** 2015-10-10

**Test Result:** Pass

<b>Approved by Senior Engineer:</b>	2015-10-12	Liu Chunlin	
	Date	Name	Signature

<b>Prepared by:</b>	2015-10-12	Wu Tingsi	
	Date	Name	Signature



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## 2 Test Summary

### 2.1 Measurement Technical Requirements

#### 2.1.1 U-NII (5150-5250, 5250-5350, 5470-5725 MHz, 5725-5850)

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Appendix A	Pass
	5250-5350	15.403(i) 15.407(a)(2)			
	5470-5725	15.403(i) 15.407(a)(2)			
	5725-5850	15.403(i) 15.407(e)	≥ 500 kHz.		
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	< 250mW (avg during transmission)	Appendix B	Pass
	5250-5350	15.407(a)(2) 15.407(a)(4)	<MIN{250mW, 11dBm+10*Ig(E BW)} (avg during transmission)		
	5470-5725	15.407(a)(2) 15.407(a)(4)	<MIN{250mW, 11dBm+10*Ig(E BW)} (avg during transmission)		
	5725-5850	15.407(a)(3)	< 1W (avg during transmission)		
Duty Cycle	--	--	No limit.	Appendix C	Pass
Peak Power Spectral Density	5150-5250	15.407(a)(1) 15.407(a)(4)	<11dBm/MHz	Appendix D	Pass
	5250-5350	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz		
	5470-5725	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz		
	5725-5850	15.407(a)(3) 15.407(a)(4)	<30dBm/500KHz		
Unwanted Emissions	5150-5250	15.407(b)(1) 15.407(b)(6) 15.407(b)(7) 15.209	<ul style="list-style-type: none"> <li>● F&lt;1GHz: §15.209/§7.2.5 limit (QP).</li> <li>● F≥1GHz &amp; out-restricted: &lt;-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz).</li> <li>● F≥1GHz &amp; in-restricted: §15.209/§7.2.5 limit (AV&amp;PK).</li> </ul>	Appendix E	Pass

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
	5250-5350	15.407(b)(2) 15.407(b)(6) 15.407(b)(7) 15.209	<ul style="list-style-type: none"> <li>F&lt;1GHz: §15.209/§7.2.5 limit (QP).</li> <li>F≥1GHz &amp; out-restricted: &lt;-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz).</li> <li>F≥1GHz &amp; in-restricted: §15.209/§7.2.5 limit (AV&amp;PK).</li> </ul>		
	5470-5725	15.407(b)(3) 15.407(b)(6) 15.407(b)(7) 15.209	<ul style="list-style-type: none"> <li>F&lt;1GHz: §15.209/§7.2.5 limit (QP).</li> <li>F≥1GHz &amp; out-restricted: &lt;-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz).</li> <li>F≥1GHz &amp; in-restricted: §15.209/§7.2.5 limit (AV&amp;PK).</li> </ul>		
	5725-5850	15.407(b)(4) 15.407(b)(6) 15.407(b)(7) 15.209	<ul style="list-style-type: none"> <li>F&lt;1GHz: §15.209/§7.2.5 limit (QP)</li> <li>F≥1GHz &amp; out-restricted: &lt;-17dBm/MHz PK e.i.r.p(from the edge to 10 MHz above or below the band edge); &lt;-27dBm/MHz PK e.i.r.p( for frequencies 10 MHz or greater above or below the band edge) (exl. 5725-5850 GHz).</li> <li>F≥1GHz &amp; in-restricted: §15.209/§7.2.5 limit (AV&amp;PK).</li> </ul>		
Frequency Stability	5150-5250 5250-5350 5470-5725 5725-5850	15.407(g)	FCC Part 15.407(g)	Appendix F	Pass

### 3 Description of the Equipment under Test (EUT)

#### 3.1 General Description

HUAWEI MediaPad T1 10 (MediaPad T1 10 for short) is a 9.6-inch tablet that incorporates a Qualcomm MSM8916 chip, and a 28 nm A53 quad-core at 1.2 GHz. With support for 4G and Wi-Fi data connections, MediaPad T1 10 provides users with unprecedented access to high-speed Internet services.

With a light metal unibody and ultra-thin 8.3 mm design, MediaPad T1 10 weights about 433g grams.

#### 3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

##### 3.2.1 Board

Board		
Description	Hardware Version	Software Version
Main Board	SH1T1A21LM	T1-A22LV100R001C001

##### 3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050100U2W	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.2A Output Voltage: +5V  1A
Battery	HB3080G1EBC	Huawei Technologies Co., Ltd.	Rated capacity: 4800mAh Nominal Voltage:  +3.8V Charging Voltage:  +4.35V
Battery	HB3080G1EBW	Huawei Technologies Co., Ltd.	Rated capacity: 4800mAh Nominal Voltage:  +3.8V Charging Voltage:  +4.35V

### 3.3 Technical Description

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	<input checked="" type="checkbox"/> 802.11a (20 MHz channel bandwidth) , <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11n (40 MHz channel bandwidth),			
TX/RX Operating Range	All	$f_c = 5000 \text{ MHz} + N * 5 \text{ MHz}$ , where: - $f_c$ = "Operating Frequency" in MHz, - $N$ = "Channel Number".		
	5150-5250 MHz (U-NII)	$N = 36$ to $48$ with step of $4$ for the $20 \text{ MHz}$ channel bandwidth. $N = 38$ to $46$ with step of $4$ for the $40 \text{ MHz}$ channel bandwidth. $N = 42$ for the $80 \text{ MHz}$ channel bandwidth.		
	5250-5350 MHz (U-NII)	$N = 52$ to $64$ with step of $4$ for the $20 \text{ MHz}$ channel bandwidth. $N = 54$ to $62$ with step of $4$ for the $40 \text{ MHz}$ channel bandwidth. $N = 58$ for the $80 \text{ MHz}$ channel bandwidth.		
	5470-5725 MHz (U-NII)	$N = 100$ to $140$ with step of $4$ for the $20 \text{ MHz}$ channel bandwidth. $N = 102$ to $134$ with step of $4$ for the $40 \text{ MHz}$ channel bandwidth. $N = 106$ for the $80 \text{ MHz}$ channel bandwidth.		
	5725-5850 MHz U-NII	$N = 149$ to $165$ with step of $4$ for the $20 \text{ MHz}$ channel bandwidth. $N = 151$ to $159$ with step of $4$ for the $40 \text{ MHz}$ channel bandwidth. $N = 155$ for the $80 \text{ MHz}$ channel bandwidth.		
Modulation Type	BPSK/QPSK/16QAM/64QAM (OFDM).			
Emission Designator	U-NII(5150-5250 , 5250-5350, 5470-5725)	17M5G7D (for 802.11a mod), 18M4G7D (for 802.11n 20 MHz mode), 36M6G7D (for 802.11n 40 MHz mode),		
	U-NII (5725-5850)	17M4G7D (for 802.11a mod), 18M3G7D (for 802.11n 20 MHz mode), 36M6G7D (for 802.11n 40 MHz mode),		
TPC	<input checked="" type="checkbox"/> Supported, <input type="checkbox"/> Not Supported			
Antenna	Type	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated		
	Ports	<input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3, <input type="checkbox"/> Ant 4		
	Smart System	<input checked="" type="checkbox"/> SISO (for 802.11a/n), <input type="checkbox"/> CDD (for 802.11a), <input type="checkbox"/> MIMO (for 802.11n/ac), <input type="checkbox"/> Diversity (for 802.11a) :           Tx &           Rx		
	Gain	1.7 dBi (per antenna port, max.)		
	Remark	When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above.		
Power Supply	Type	<input checked="" type="checkbox"/> AC/DC Adapter	<input type="checkbox"/> PoE:	<input type="checkbox"/> Other:



## 4 General Test Conditions / Configurations

### 4.1 Test Modes

NOTE: Worst cases for each IEEE 802.11 mode are selected to perform tests.

Test Mode	Test Modes Description
11A	IEEE 802.11a with data rate of 6 Mbps using SISO mode.
11N20	IEEE 802.11n with data rate of MCS0 and bandwidth of 20 MHz using SISO mode.
11N40	IEEE 802.11n with data rate of MCS0 and bandwidth of 40 MHz using SISO mode.

### 4.2 EUT Configurations

#### 4.2.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none"> <li>All TX tests are performed at all TX antenna ports of the EUT, and</li> <li>All RX tests are performed at all RX antenna ports of the EUT.</li> </ul>
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

#### 4.2.2 Customized Configurations

##### 4.2.2.1 U-NII

Test Mode	Antenna Port	TX Freq. [MHz]	RX Freq. [MHz]	Power Conf., per Port	Duty Cycle
11A	Ant 1	5180 (Ch.36)	---	9	87%
11A	Ant 1	5240 (Ch.36)	---	9	87%
11A	Ant 1	5260 (Ch.52)	---	8.5	87%
11A	Ant 1	5320 (Ch.64)	---	8.5	87%
11A	Ant 1	5500(Ch.100)	---	9	87%
11A	Ant 1	5700 (Ch.140)	---	9	87%
11A	Ant 1	5475 (Ch.149)	---	9	87%
11A	Ant 1	5825 (Ch.165)	---	9	87%
11N20	Ant 1	5180 (Ch.36)	---	9	87%
11N20	Ant 1	5240 (Ch.36)	---	9	87%
11N20	Ant 1	5260 (Ch.52)	---	8.5	87%
11N20	Ant 1	5320 (Ch.64)	---	8.5	87%



Test Mode	Antenna Port	TX Freq. [MHz]	RX Freq. [MHz]	Power Conf., per Port	Duty Cycle
11N20	Ant 1	5500(Ch.100)	---	9	87%
11N20	Ant 1	5700 (Ch.140)	---	9	87%
11N20	Ant 1	5475 (Ch.149)	---	9	87%
11N20	Ant 1	5785 (Ch.157)	---	9	87%
11N40	Ant 1	5190 (Ch.38)	---	9	76%
11N40	Ant 1	5230 (Ch.46)	---	9	76%
11N40	Ant 1	5270 (Ch.54)	---	8.5	76%
11N40	Ant 1	5310 (Ch.62)	---	8.5	76%
11N40	Ant 1	5510 (Ch.102)	---	9	76%
11N40	Ant 1	5670 (Ch.134)	---	9	76%
11N40	Ant 1	5755 (Ch.151)	---	9	76%
11N40	Ant 1	5795 (Ch.159)	---	9	76%

### 4.3 Test Environments

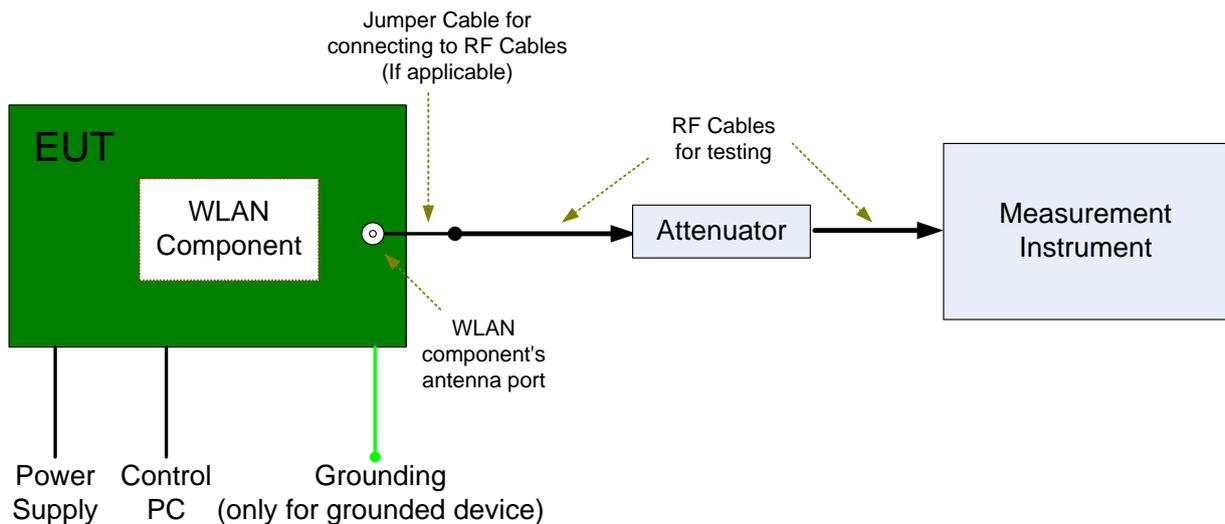
NOTE: The values used in the test report may be stringent than the declared.

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	3.8 VDC	Ambient

## 4.4 Test Setups

### 4.4.1 Test Setup 1

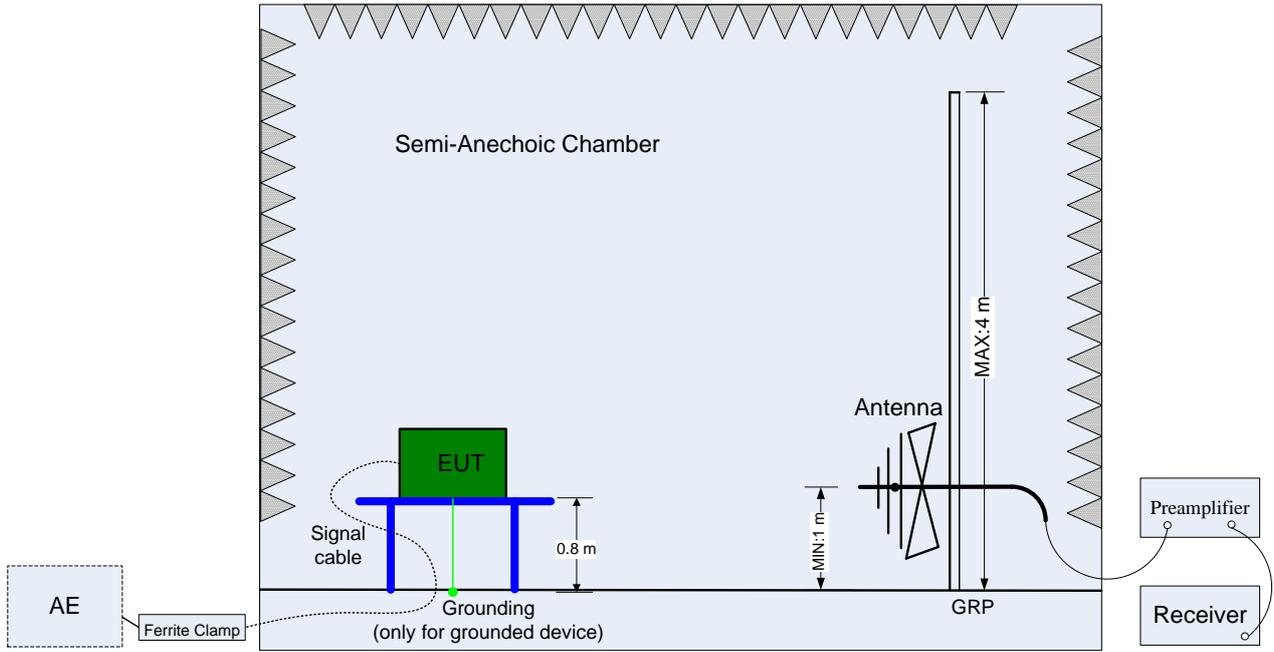
The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



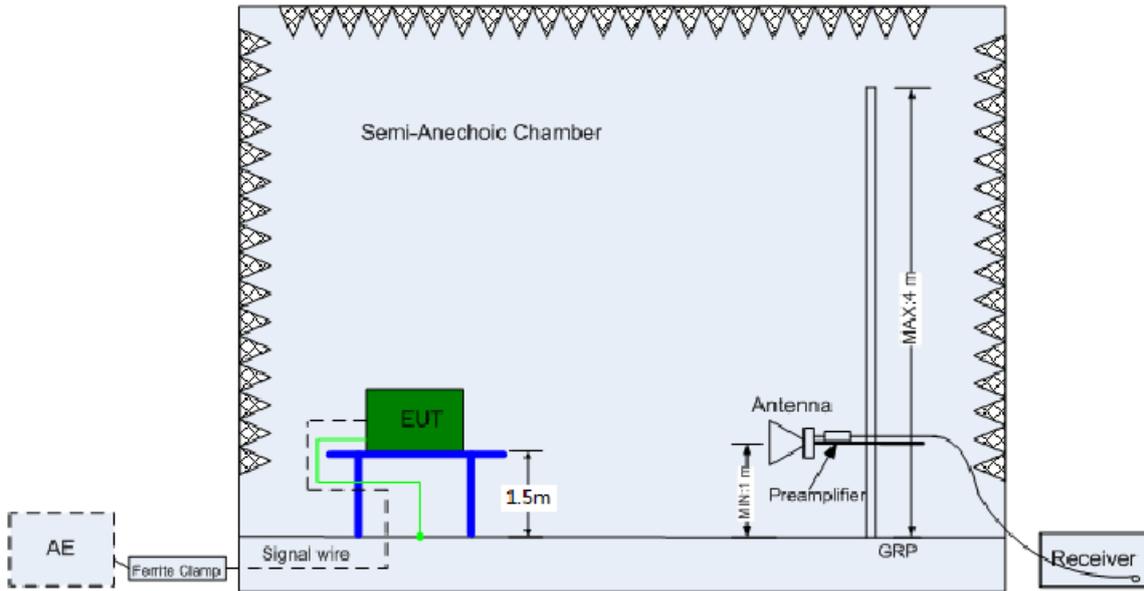
### 4.4.2 Test Setup 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4. The test distance is 3 m (for 30 MHz to 26.5 GHz) or 1 m (for 26.5 GHz to 40 GHz). The setup is according to ANSI C63.10, ANSI C63.4 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).



(Below 1 GHz)

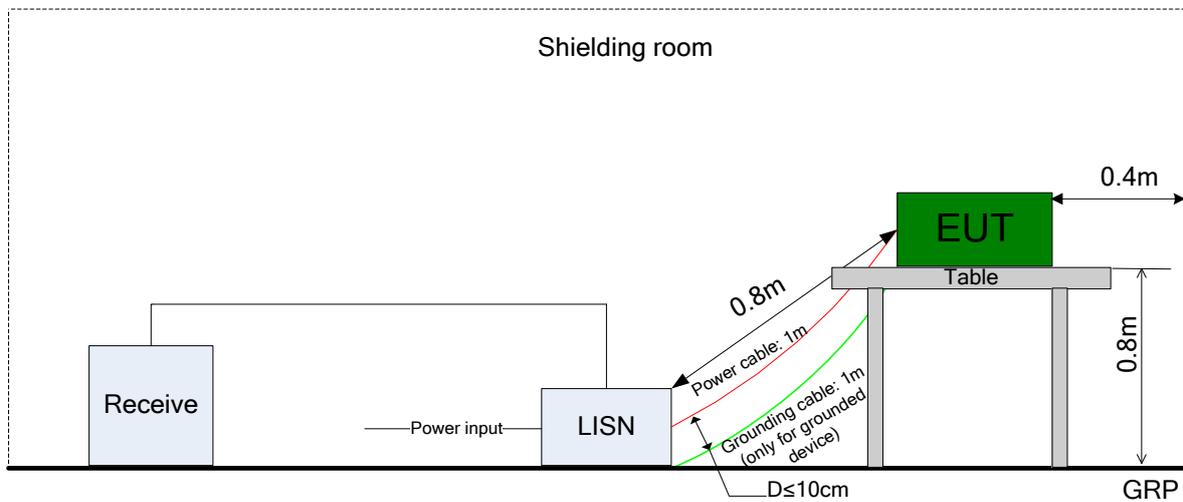


(Above 1 GHz)

### 4.4.3 Test Setup 3

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8 m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.



## 4.5 Test Conditions

### 4.5.1 U-NII

Test Case	Test Conditions		
	Configuration	Description	
26 dB Emission Bandwidth (EBW)	Meas. Method	FCC KDB 789033 §C).	
	Test Env.	NTNV	
	Test Setup	Test Setup 1	
	EUT Conf.	All EUT conf. with Tx modes.	
Maximum Conducted Output Power	Meas. Method	FCC KDB 789033 §E)2)b) Method SA-1 and d) Method SA-2.	
	Test Env.	NTNV	
	Test Setup	Test Setup 1	
	EUT Conf.	All EUT conf. with Tx modes.	
Peak Power Spectral Density	Meas. Method	FCC KDB 789033 §F).	
	Test Env.	NTNV	
	Test Setup	Test Setup 1	
	EUT Conf.	All EUT conf. with Tx modes.	
Unwanted Emissions (Cond.)	Meas. Method	FCC KDB 789033 §G), Conducted (antenna-port).  NOTE: Antenna-port conducted measurements (Cond.) are acceptable as an alternative to radiated measurements (Rad.) for demonstrating compliance to the limits in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test (Radt-a) for cabinet/case emissions will also be required.	
	Test Env.	NTNV	
	Test Setup	Test Setup 1	
	EUT Conf.	5150-5250	All EUT Test Mode 20 MHz bandwidth: Ch.36, Ch.48 40 MHz bandwidth: Ch.38, Ch.46 80 MHz bandwidth: Ch.42
		5250-5350	All EUT Test Mode 20 MHz bandwidth: Ch.52, Ch.64 40 MHz bandwidth: Ch.54, Ch.62 80 MHz bandwidth: Ch.58
		5470-5725	All EUT Test Mode 20 MHz bandwidth: Ch.100, Ch.140 40 MHz bandwidth: Ch.102, Ch.134 80 MHz bandwidth: Ch.106
		5725-5850	All EUT Test Mode 20 MHz bandwidth: Ch.149, Ch.165



Test Case	Test Conditions	
	Configuration	Description
		40 MHz bandwidth: Ch.151, Ch.159 80 MHz bandwidth: Ch.155

**5 Main Test Instruments**

Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	A120714713	2014-08-07	2016-08-06
Wireless Communication Test set	Agilent	N4010A	MY49081592	2014-11-04	2015-11-03
Universal Radio Communication Tester	R&S	CMU200	123299	2014-11-04	2015-11-03
Spectrum Analyzer	Agilent	N9020A	MY52090652	2014-07-11	2015-07-10
Universal Radio Communication Tester	R & S	CMW500	126855	2013-08-08	2015-08-09
Spectrum Analyzer	Agilent	E4440A	MY48250119	2014-07-11	2015-07-10
Signal Analyzer	R&S	FSQ31	200021	2014-11-04	2015-11-03
Spectrum Analyzer	Agilent	N9030A	MY49431698	2014-11-04	2015-11-03
Temperature Chamber	ESPEC	MW3030	06114003	2014-05-09	2015-05-08
Signal generator	Agilent	E8257D	MY51500314	2014-05-09	2015-05-08
Vector Signal Generator	R&S	SMU200A	104162	2014-11-04	2015-11-03
Test receiver	R&S	ESU26	100150	2014-05-09	2015-05-08
Spectrum analyzer	R&S	FSU3	200474	2014-11-04	2015-11-03
Spectrum analyzer	R&S	FSU43	100144	2014-11-04	2015-11-03
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	2013-12-21	2015-12-20
Trilog Broadband Antenna (30M~3GHz)	SCHWARZ BECK	VULB 9163	9163-521	2013-12-21	2015-12-20
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2013-03-23	2015-03-22
Pyramidal Horn Antenna(18GHz-26-5GHz)	ETS-LIND GREN	3160-09	5140299	2013-03-05	2015-03-04
Artificial Mains Network	R&S	ENV4200	100134	2014-11-04	2015-11-03
Artificial Mains Network	R&S	ENV216	100382	2014-11-04	2015-11-03

END