RF Test Report

Product Name: Videoconferencing Endpoint

Product Model: HUAWEI TE30

Report Number: SYBH(R)00869625EB-1

FCC ID: QIS-TE30

Reliability Laboratory of Huawei Technologies Co., Ltd.

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

Tel: +86 755 28780808 Fax: +86 755 89652518

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 97456.

4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1 and 6369A-3.

5. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers of test site No.1 are R-2364, G-415, C-2583, and T-256, and the accreditation numbers of test site No.2 are R-3760, G-485, C-4210 and T-1237.

6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

7. The test report is invalid if there is any evidence of erasure and/or falsification.

8. The test report is only valid for the test samples.

9. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

Applicant:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Product Name:	Videoconferencing Endpoint
Product Model:	HUAWEI TE30

Date of Receipt Sample:	2011-03-30
Start Date of Test:	2013-03-31
End Date of Test:	2013-04-03

Test Result: Pass

Approved by Senior Engineer:	2013-04-07	Zhang Xinghai	Zhang Xing hai
	Date	Name	Signature

Prepared by:	2013-04-07	Zhang Weimin	
	Date	Name	Signature

Modification Record

No.	Last Report No.	Modification Description
1	---	First report.

CONTENT

1 General Information

1.1 Applied Standard

Applied Rules:	47 CFR FCC Part 2, Subpart J (10-1-12 Edition) 47 CFR FCC Part 15, Subpart C (10-1-12 Edition)
Test Method:	FCC KDB 558074 D01 DTS Meas Guidance v02 FCC KDB 662911 D01 Multiple Transmitter Output v01r02 FCC KDB 662911 D02 MIMO with Cross-Polarized Antennas v01 ANSI C63.10-2009, American National Standard for Testing Unlicensed Wireless Devices

1.2 Test Location

Test Location 1 (TL1):	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.3 Test Environment Condition

Ambient Temperature:	15 to 30 °C
Ambient Relative Humidity:	20 to 85 %
Atmospheric Pressure:	Not applicable

2 Test Summary

2.1 Measurement Technical Requirements

Test Item	FCC Rule	IC Rule	Requirements	Test Result	Verdict (NOTE 1)	Test Location
DTS (6 dB) Bandwidth	15.247(a)(2)	RSS-210,A8.2(a)	≥ 500 kHz.	Annex A	Pass	TL1
Occupied Bandwidth	---	RSS-210,2.1 RSS-Gen,4.6.1	No limit.	Annex B	N/T	TL1
Maximum Peak Conducted Output Power	15.247(b)(3)	RSS-210,A8.4(4)	<30dBm-IF{G[dBi]>6dBi, G[dBi]-6dB,0dB}. (Peak)	Annex C	Pass	TL1
Maximum Power Spectral Density Level	15.247(e)	RSS-210,A8.2(b)	<8dBm/3kHz-IF{G[dBi]> 6dBi,G[dBi]-6dB,0dB}. (Peak)	Annex D	Pass	TL1
Unwanted Emissions into Non-Restricted Frequency Bands	15.247(d)	RSS-210,A8.5	<-20dBc/100kHz.	Annex E	Pass	TL1
Unwanted Emissions into Restricted Frequency Bands (NOTE 2)	15.247(d) 15.209	RSS-210,A8.5 RSS-210,2.2 RSS-Gen,7.2.2 RSS-Gen,7.2.5	§15.209/§7.2.5 limit.	Annex F	Pass	TL2 (Radt.)
AC Power Line Conducted Emissions	15.207	RSS-Gen,7.2.4	§15.207/§7.2.4 limit.	Annex G	Pass	TL2
Photos of Test Setups	---	---	---	Annex H	---	---

NOTE 1: For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”.

NOTE 2: According to KDB558074, antenna-port conducted measurements (Cond.) are acceptable as an alternative to radiated measurements (Radt.) 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 for cabinet/case emissions will also be required.

2.2 Non-measurement Technical Requirements

Item	FCC Rule	IC Rule	Requirements	Evidence	Verdict (NOTE)
Antenna use	§15.203	RSS-Gen,7.1.2	Permanently attached antenna. User manual notices requied (see detailed for RSS-Gen, 7.1.2) .	See user's manual.	Comply
User manual notice for licence-exempt radio apparatus	---	RSS-Gen,7.1.3	User manual notice for licence-exempt radio apparatus is required (see detailed for RSS-Gen, 7.1.3).	See user's manual.	Comply
Radio apparatus containing digital circuits	15 subpart B	RSS-Gen,7.1.4 ICES-003	FCC: §15 subpart B. IC: ICES-003.	See separate test EMC report.	Comply
Radiation exposure	§15.247(i) §1.1307(b) §2.1091 §2.1093	RSS-Gen,5.6 RSS-102	General population/uncontrolled limit.	See separate test MPE/EMF report or declaration.	Comply
NOTE: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

3 Description of the Equipment under Test (EUT)

3.1 General Description

HUAWEI TE30,Telepresence Endpoint (720P,All-in-One HD videoconferencing system with embedded HD Codec,1080p30 camera and microphone, including cable assembly, Rack, Remote control).

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	
Board Name	Description
VC84HDIM	High Definition Integrative Terminal Main Board
VC84HDIA	High Definition Integrative Terminal Aux-Board
VC84HDCT	High Definition Camera Lens Driver & Tilt Ctl Board
VC84HDSA	High Definition Camera Sensor Board A
VC84FPCB	High Definition Camera FPC B
VC84OPEA	HD camera optical encoder board
VC84HDCO	High Definition Camera 5th Optical coupler Board
VC84AMICL	Videoconferencing Endpoint MIC Adapter Board A
VC84AMICR	Videoconferencing Endpoint MIC Adapter Board A
VC84BMICL	Videoconferencing Endpoint MIC Adapter Board B
VC84BMICR	Videoconferencing Endpoint MIC Adapter Board B
VC84OTFA	Commutate Box for Integrative Cable

3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-60-12AC14D-1	HUAWEI Technologies Co., Ltd.	(see clause for Technical Description)

3.3 Technical Description

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	☒ 802.11b (20 MHz channel bandwidth), ☒ 802.11g (20 MHz channel bandwidth) ☒ 802.11n (20 MHz channel bandwidth), ☒ 802.11n (40 MHz channel bandwidth)			
TX/RX Operating Range	2400-2483.5 MHz band	fc = 2407 MHz + N * 5 MHz, where: ● fc = "Operating Frequency" in MHz, ● N = "Channel Number" with the range from 1 to 11 with step of 1 for the 20 MHz channel bandwidth, or 3 to 9 with step of 1 for the 40 MHz channel bandwidth.		
Data Rate	802.11b	1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps		
	802.11g	6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps		
	802.11n (SISO)	MCS 0 to MCS 7		
	802.11n (MIMO)	(Not support)		
Modulation Type	DBPSK/DQPSK/CCK (DSSS), BPSK/QPSK/16QAM/64QAM (OFDM).			
Emission Designator	14M4G1D (for 802.11b mode), 16M5G7D (for 802.11g mod), 36M6G7D (for 802.11n mode)			
TX Power Control	☒ Supported, ☐ Not Supported			
Antenna	Model/ID	27011198		
	Type	☐ External, ☒ Integrated		
	Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3, ☐ Ant 4		
	Smart System	☒ SISO (for 802.11b/g/n), ☐ MIMO (for 802.11n): Tx & Rx, ☐ Diversity (for 802.11b/g) : Tx & Rx		
	Gain	-2 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	☒ AC/DC Adapter	☐ PoE	☐ Other:
	Model/ID	02220404	---	---
	Specification	IN: 100~240 VAC, 50/60 Hz OUT: 12VDC 5A	---	---

4 General Test Conditions / Configurations

4.1 EUT Configurations

4.1.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, ● All TX tests are performed at all TX antenna ports of the EUT, and ● All RX tests are performed at all RX antenna ports of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

4.1.2 Customized Configurations

# EUT Conf.	Test Mode	Ant. Port	TX/RX Freq. [MHz]	Power Conf. per Port	Duty Cycle
11B1-B-Ant1	Tx, 802.11b, 1 Mbps, SISO.	Ant 1	2412 (Ch.1)	12	0.97
11B1-M-Ant1	Tx, 802.11b, 1 Mbps, SISO.	Ant 1	2437 (Ch.6)	12	0.97
11B1-T-Ant1	Tx, 802.11b, 1 Mbps, SISO.	Ant 1	2462 (Ch.11)	12	0.97
11G6-B-Ant1	Tx, 802.11g, 6 Mbps, SISO.	Ant 1	2412 (Ch.1)	12	0.86
11G6-M-Ant1	Tx, 802.11g, 6 Mbps, SISO.	Ant 1	2437 (Ch.6)	12	0.86
11G6-T-Ant1	Tx, 802.11g, 6 Mbps, SISO.	Ant 1	2462 (Ch.11)	12	0.86
11N0-20B-Ant1	Tx, 802.11n, 20 MHz, MCS0, SISO.	Ant 1	2412 (Ch.1)	12	0.86
11N0-20M-Ant1	Tx, 802.11n, 20 MHz, MCS0, SISO.	Ant 1	2437 (Ch.6)	12	0.86
11N0-20T-Ant1	Tx, 802.11n, 20 MHz, MCS0, SISO.	Ant 1	2462 (Ch.11)	12	0.86
11N0-40B-Ant1	Tx, 802.11n, 40 MHz, MCS0, SISO.	Ant 1	2422 (Ch.3)	12	0.75
11N0-40M-Ant1	Tx, 802.11n, 40 MHz, MCS0, SISO.	Ant 1	2437 (Ch.6)	12	0.75
11N0-40T-Ant1	Tx, 802.11n, 40 MHz, MCS0, SISO.	Ant 1	2452 (Ch.9)	12	0.75

4.2 Test Environments

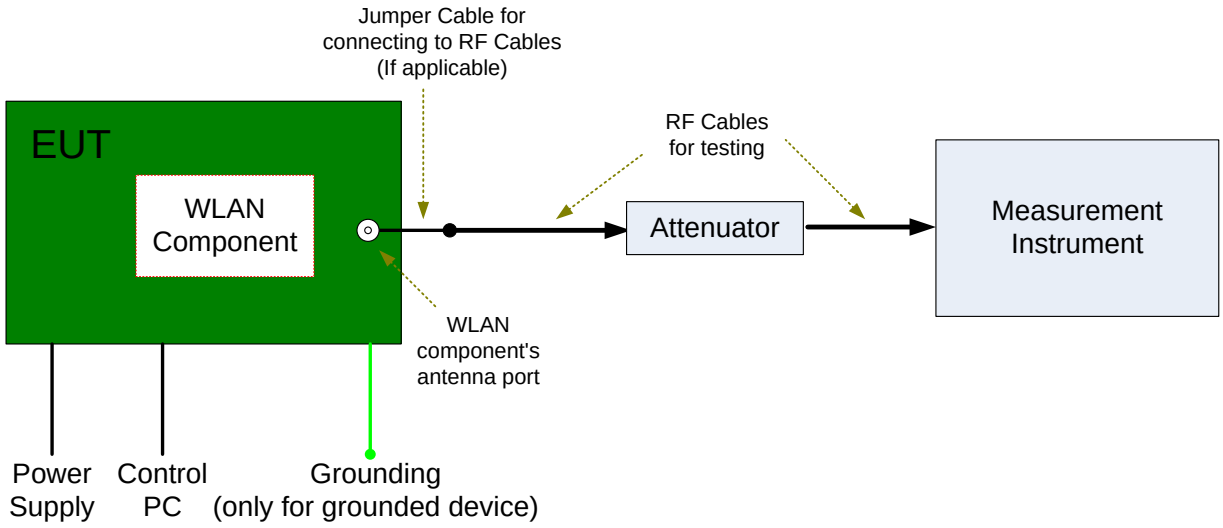
NOTE: The values used in the test report may be stringent than the declared.

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	120 VAC, 60 Hz	Ambient

4.3 Test Setups

4.3.1 Test Setup 1

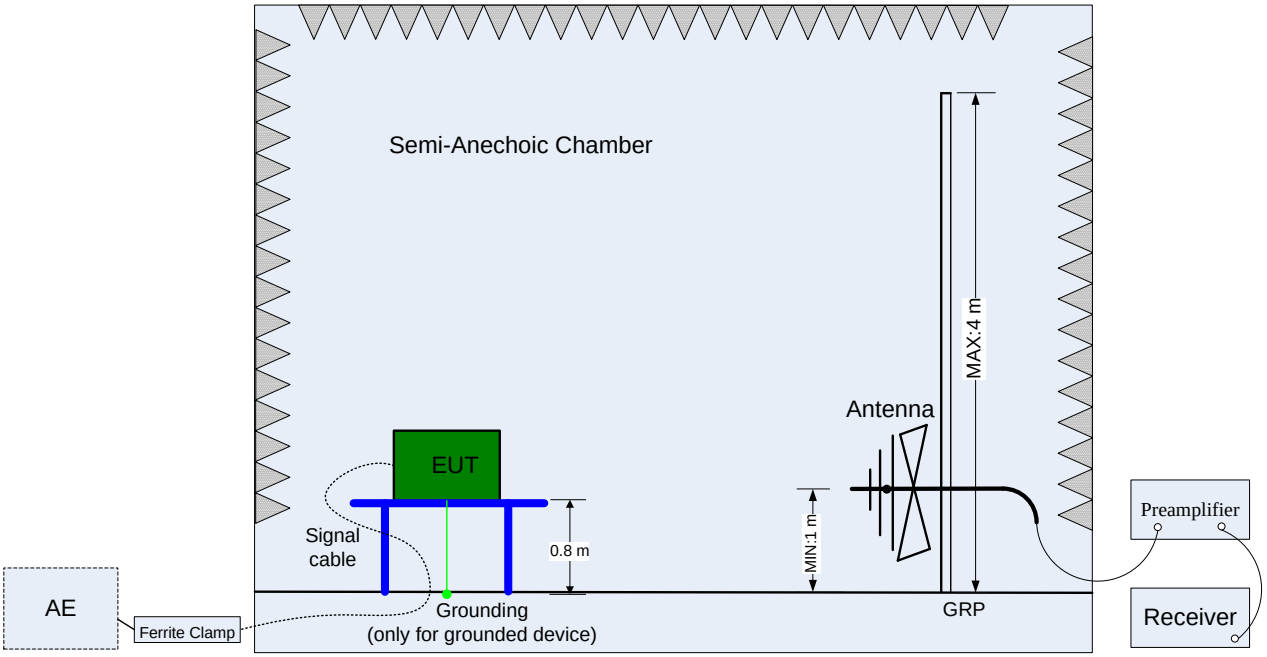
The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



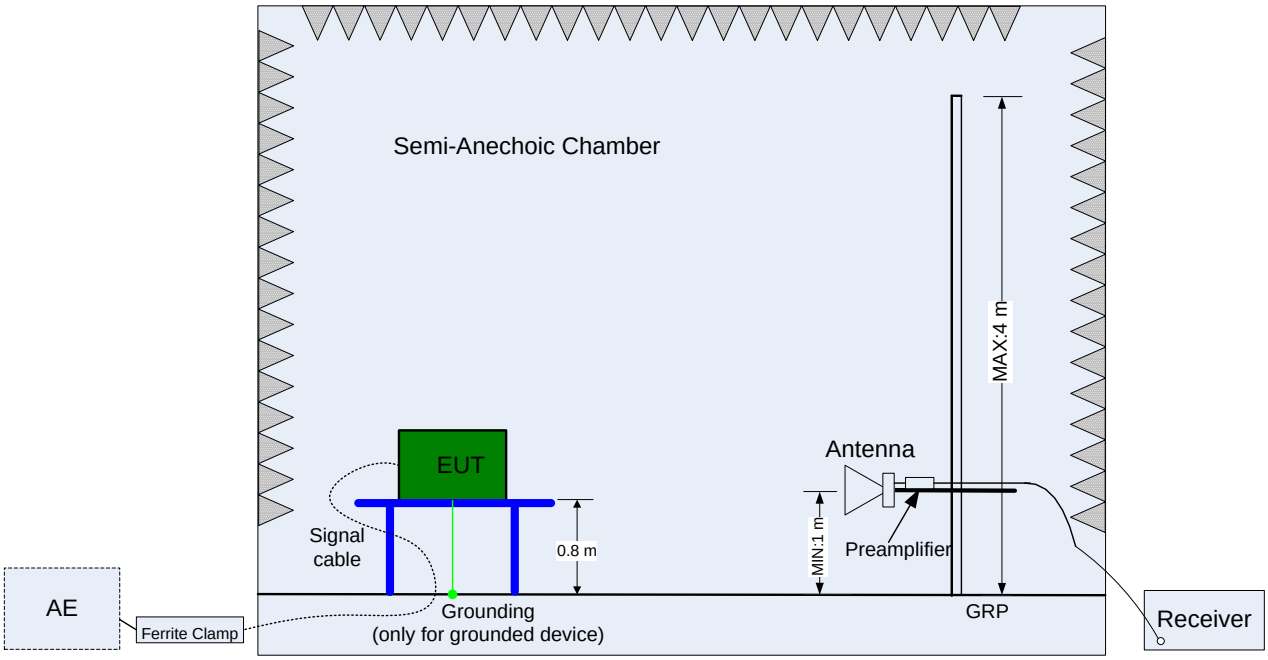
4.3.2 Test Setup 2

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. 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)

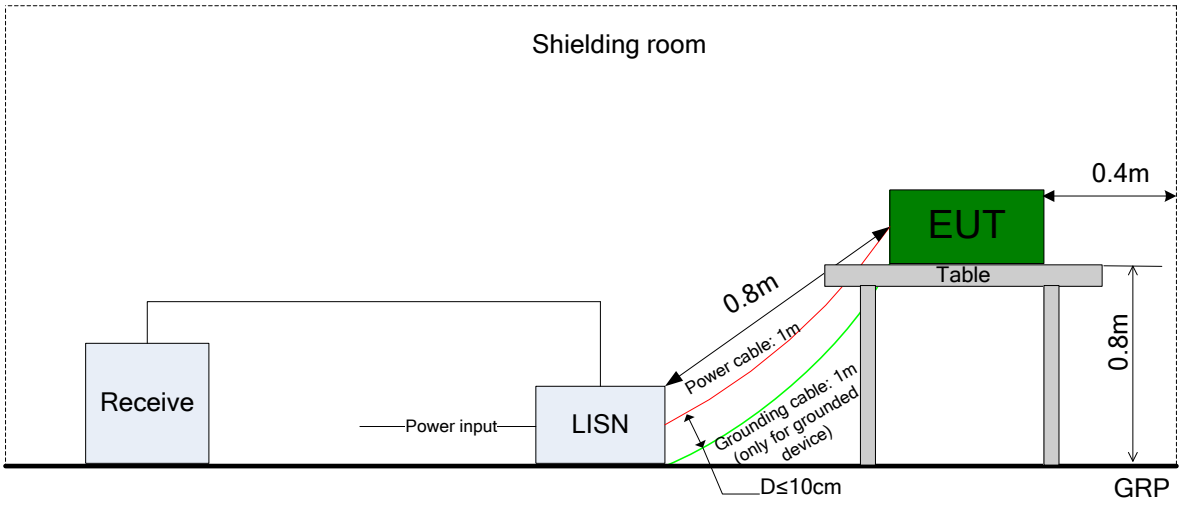


(Above 1 GHz)

4.3.3 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 0.8m 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.



4.4 Test Conditions

Configuration	Description	
DTS (6 dB) Bandwidth		
Test Method	FCC KDB 558074 §7.1 Option 1.	
Test Env.	NTNV	
Test Setup	Test Setup 1	
EUT Conf.	All EUT conf. with Tx modes.	
Occupied Bandwidth		
Test Method	RSS-Gen, §4.6.1.	
Test Env.	NTNV	
Test Setup	Test Setup 1	
EUT Conf.	All EUT conf. with Tx modes.	
Maximum Peak Conducted Output Power		
Test Method	FCC KDB 558074 §8.1.2 Option 2 (channel integration method).	
Test Env.	NTNV	
Test Setup	Test Setup 1	
EUT Conf.	All EUT conf. with Tx modes.	
Maximum Power Spectral Density Level		
Test Method	FCC KDB 558074 §9.1 Option 1.	
Test Env.	NTNV	
Test Setup	Test Setup 1	
EUT Conf.	All EUT conf. with Tx modes.	
Unwanted Emissions into Non-Restricted Frequency Bands		
Test Method	FCC KDB 558074 §10.1.	
Test Env.	NTNV	
Test Setup	Test Setup 1	
EUT Conf.	All EUT conf. with Tx modes.	
Unwanted Emissions into Restricted Frequency Bands		
Test Method	Cond.	FCC KDB 558074 §10.2, Conducted (antenna-port).
	Radt.	ANSI C63.10; FCC KDB 558074 §10.2, Radiated (Radt_A: whole device emissions; Radt_B: cabinet/case emissions with impedance matching for antenna-port). (1) 30 MHz to 1 GHz: Pre: RBW=100kHz; VBW=300kHz; Det=Peak. Final: RBW=120kHz; Det=CISPR Quasi-Peak. (2) 1 GHz to 40 GHz: Average: (KDB558074 §10.2.3.3, §8.2.1 Option 1, §8.2.4 Alternative 1) RBW=1MHz; VBW=3MHz; Det.=RMS; SPAN/Sweep-point≤RBW/2; Sweep-time=Auto; Trace≥RMS*100; Add-Transd.=10*lg(1/X). Peak: (KDB558074 §10.2.3.2, §8.1.1) RBW=1MHz; VBW=3MHz; Det.=Peak; Sweep-time=Auto; Trace=Max Hold.
Test Env.	Cond.	NTNV

Configuration	Description		
	Radt.	NTNV	
Test Setup	Cond.	Test Setup 1	
	Radt.	Test Setup 2	
EUT Conf.	Cond.	1G-3GHz	---
	Radt_B	1G-3GHz	---
	Radt_A	30M-1GHz	Worst Case (11B1-B-Ant1)
		1GHz-3GHz	Worse Case (11B1-B-Ant1) Worse Case (11B1-M-Ant1) Worse Case (11B1-T-Ant1) Worse Case (11G6-B-Ant1) Worse Case (11G6-M-Ant1) Worse Case (11G6-T-Ant1)
		3G-18GHz	Worse Case (11B1-B-Ant1) Worse Case (11B1-M-Ant1) Worse Case (11B1-T-Ant1) Worse Case (11G6-B-Ant1) Worse Case (11G6-M-Ant1) Worse Case (11G6-T-Ant1)
		18G-26.5GHz	Worst Case (11B1-B-Ant1)
AC Power Line Conducted Emissions			
Test Method	AC mains conducted. Pre: RBW = 10 kHz; Det. = Peak. Final: RBW = 9 kHz; Det. = CISPR Quasi-Peak & Average.		
Test Env.	NTNV		
Test Setup	Test Setup 3		
EUT Conf.	11B1-B-Ant1		

5 Main Test Instruments

NOTE: Unless otherwise specified, the calibration intervals for test instruments were Annual (per year). The other intervals, if applicable, are marked with (##y), which denotes ## years calibration interval.

Equipment Name	Manufacturer	Model	Serial Number	Cal. Due
Test Setup 1				
Spectrum Analyzer	Agilent	E4440A	MY49420179	2013-05-13
Test Setup 2				
EMI Test Receiver	R&S	ESU26	100150	2013-05-27
Bilog Antenna (30M-1GHz)	SCHWARZBECK	VULB 9163	9163-357	2014-05-27 (2y)
Horn Antenna (1G-18GHz)	R&S	HF906	100683	2014-02-01 (2y)
Horn Antenna (18G-16.5GHz)	ETS	3160-9	053215-21874	2014-12-24 (2y)
Test Setup 3				
EMI Test Receiver	R&S	ESCI	101163	2014-01-28
Artificial Mains Network	R&S	ENV4200	100134	2014-01-28

END