



RF Test Report

Product Name: IP Phone

Product Model: eSpace 7950

Report Number: SYBH(R)00797929EB-1

FCC ID: QIS-IPP7950

IC ID: 6369A-IPP7950

Reliability Laboratory of Huawei Technologies Co., Ltd.

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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 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: IP Phone
Product Model: eSpace 7950
Version: V100R001

Date of Receipt Sample: 2012-09-21, 2012-12-18
Start Date of Test: 2012-10-23, 2012-12-19
End Date of Test: 2012-10-27, 2012-12-19

Test Result: Pass

Approved by Senior Engineer:	2012-12-22	Zhang Xinghai	<i>Zhang Xing hai</i>
	Date	Name	Signature

Prepared by:	2012-12-22	Zhang Weimin	<i>Zhang Weimin</i>
	Date	Name	Signature



Modification Record

No.	Last Report No.	Modification Description
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1 General Information

1.1 Applied Standard

Applied Rules:	47 CFR FCC Part 2, Subpart J (10-1-11 Edition) 47 CFR FCC Part 15, Subpart C (10-1-11 Edition)
Test Method:	FCC PUBLIC NOTICE DA 00-705 Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems (Released March 30, 2000) ANSI C63.4-2003/-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. ANSI C63.10-2009, American National Standard for Testing Unlicensed Wireless Devices.

1.2 Test Location

Test Location 1:	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:	22 to 23 °C
Ambient Relative Humidity:	62 to 68 %
Atmospheric Pressure:	Not applicable



2 Test Summary

Test Item	FCC Part No.	IC Standard No.	Requirements	Test Result	Verdict (NOTE)
20dB Emission Bandwidth (EBW)	15.247(a)(1)	RSS-210 A8.1(a)	No limit.	Appendix A	Pass
Carrier Frequency Separation	15.247(a)(1)	RSS-210 A8.1(b)	$\geq \text{MAX} \{25\text{kHz}, \text{IIF}\{\text{output power} \leq 125\text{mW}, 2/3 * 20\text{dB EBW}, 20\text{dB EBW}\}\}$.	Appendix B	Pass
Number of Hopping Channel	15.247(a)(1)(iii)	RSS-210 A8.1(d)	≥ 15 channels.	Appendix C	Pass
Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	RSS-210 A8.1(d)	$< 0.4\text{s}$ within a period of $(0.4\text{s} * \text{hopping number})$.	Appendix D	Pass
Maximum Peak Conducted Output Power	15.247(b)(1)	RSS-210 A8.4(2)	$< 1\text{ W}$ if using ≥ 75 non-overlapping channels.	Appendix E	Pass
Conducted RF Spurious Emission	15.247(d)	RSS-210, A8.5	$< -20\text{ dBm}/100\text{ kHz}$ if total peak power $\leq$ power limit.	Appendix F	Pass
Radiated Emissions in the Restricted Bands	15.247(d) 15.209	RSS-210, A8.5 RSS-210, 2.2 RSS-Gen, 7.2.2 RSS-Gen, 7.2.5	FCC Part 15.209 field strength limit; RSS-Gen 7.2.5 field strength limit.	Appendix G	Pass
Receiver Spurious Emissions	---	RSS-210, 2.3 RSS-Gen, 6.1	RSS-Gen 6.1 radiated limit.	Appendix H	Pass
AC Power Line Conducted Emissions	15.207	RSS-Gen, 7.2.4	FCC Part 15.207 conducted limit; RSS-Gen, 7.2.4 conducted limit.	Appendix I	Pass
Photos of Test Setups	---	---	---	Appendix J	---
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

eSpace 7950 is a full-featured six-line business IP phone with excellent user experience. eSpace 7950 has the following features:

- Six lines.
- 5-inch true color Liquid Crystal Display (LCD) screen, 800 x 480 high-resolution.
- Advanced Audio Coding-Low Delay (AAC-LD) super-wideband voice codec with a sample rate as high as 48 kHz
- Two GE ports.
- Support for Power over Ethernet (PoE).
- One embedded Bluetooth module.
- One Universal Serial Bus (USB) port for connecting to standard USB devices, such as a USB headset or USB flash drive.
- Multiple expansion modules.

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	Hardware Version	Description
EP11MPUA	VER.B	Main Board
EP11LKEA	VER.A	Linekey Board
EP21HKEA	VER.A	Hook Board
EP11USBA	VER.B	USB board

3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
AC/DC Adapter	HW-050200 U2W	FUHUA	(See section 3.3)
AC/DC Adapter	HKA012050 20-2F	Huntkey	(See section 3.3)

3.3 Technical Description

Characteristics	Description			
TX/RX Operating Range	2400-2483.5 MHz band	fc = 2402 MHz + N * 1 MHz, where: - fc = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 0 to 78.		
	Modulation Type	Carrier	Frequency Hopping Spread Spectrum (FHSS)	
	Digital	☒ GFSK, ☒ π/4-DQPSK, ☒ 8DPSK, ☐ Other:		
Emission Designator	1M30GXD			
Bluetooth Power Class	☐ Class 1, ☐ Class 2, ☒ Class 3			
Antenna	Model/ID	Not applicable		
	Description	Not applicable		
	Type	☐ External, ☒ Integrated		
	Gain	3 dBi (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	---	---	---
	Specification	IN: 100-240 VAC, 50/60 Hz OUT: +5 VDC	-48 VDC	---

4 General Test Conditions / Configurations

4.1 Declaration

4.1.1 Modular Approval

- ☒ Not applicable.
- ☐ The present document is based on the RF module installed within the product. The RF module was proved complying with relevant standard, see test report issued by _____ with report number _____ for the RF module with model number _____. The present document provides additive assessments and/or measurements to prove that the whole product still complies with relevant standard.

The differences and modifications between the “alone RF module” (RF_org) and the “RF module integrated into the host/combination product” (RF_new) are declared by the applicant and showed as below:

- ---
- All other components of the RF_org are not changed.

4.1.2 Permissive Change

- ☐ Not applicable.
- ☒ The present document/product is based on another report/product as reference, both of which utilize the similar or identical radio design, shielding, interface, physical layout and so on. The referred test report was proved complying with relevant standard, see test report issued by Reliability Laboratory of Huawei Technologies Co., Ltd. with report number SYBH(R)00728376EB-1 for the product with model number eSpace7950. The present document provides additive assessments and/or measurements, which are based on the referred test report, to prove the compliance with relevant standard.

The differences and modifications between the referred test report/product (Product_ref) and the present test report/product (Product_cur) are declared by the applicant and showed as below:

- A filter beyond the Bluetooth antenna-conducted port was replaced by a new type of filter, which has the better effects on harmonic frequencies filtering and rejection. The Bluetooth chip is unchanged. So, only the Radiated Emissions measurement is re-considered.
- A new type of AC/DC adapter is added, which has the identical specifications, only the different manufacturer. The Conducted Emissions measurement in the EMC report can be referred for the new adapter. The Radiated Emissions (lower frequency range) from the new adapter are considered in the Unwanted Emissions measurement in the RF report.
- All other components of the Product_ref are not changed.

4.1.3 Multiple Models Applications

- ☒ The present document applies to single model number.
- ☐ The present document applies to several model numbers. The practical measurements are performed with the model number _____.



These model numbers utilize the similar radio design, shielding, interface, physical layout and so on. The differences and modifications between these model numbers are declared by the applicant and showed as below:

- ---
- All others between these model numbers are identical.

4.2 EUT Configurations

4.2.1 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.

4.2.2 Customized Configurations

# EUT Conf.	Signal Description	Operating Frequency
TM1_DH5_Hop	GFSK modulation, package type DH5, hopping on.	---
TM1_DH5_Ch0	GFSK modulation, package type DH5, hopping off.	Ch No. 0 / 2402 MHz
TM1_DH5_Ch39	GFSK modulation, package type DH5, hopping off.	Ch No. 39 / 2441 MHz
TM1_DH5_Ch78	GFSK modulation, package type DH5, hopping off.	Ch No. 78 / 2480 MHz
TM2_DH5_Hop	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping on.	---
TM2_DH5_Ch0	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping off.	Ch No. 0 / 2402 MHz
TM2_DH5_Ch39	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping off.	Ch No. 39 / 2441 MHz
TM2_DH5_Ch78	$\pi/4$ -DQPSK modulation, package type 2DH5, hopping off.	Ch No. 78 / 2480 MHz
TM3_DH5_Hop	8DPSK modulation, package type 3DH5, hopping on.	---
TM3_DH5_Ch0	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 0 / 2402 MHz
TM3_DH5_Ch39	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 39 / 2441 MHz
TM3_DH5_Ch78	8DPSK modulation, package type 3DH5, hopping off.	Ch No. 78 / 2480 MHz
RX	Receiving continually.	Ch No. 39 / 2441 MHz



4.3 Test Environments

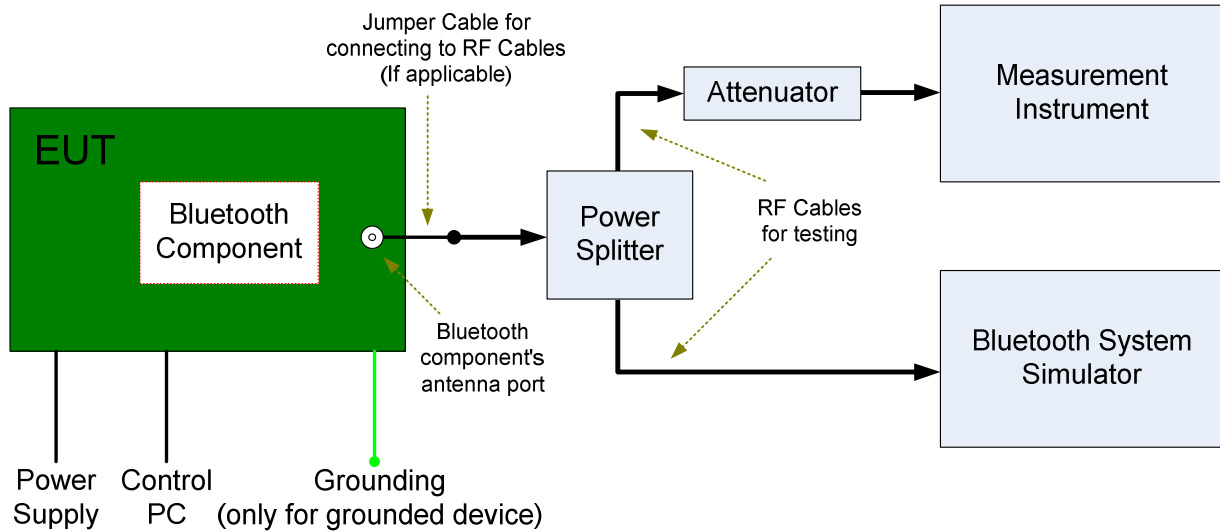
NOTE: The values used in the test report may be stringent than the declared.

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	Ambient	5.0 VDC	Ambient

4.4 Test Setups

4.4.1 Test Setup 1

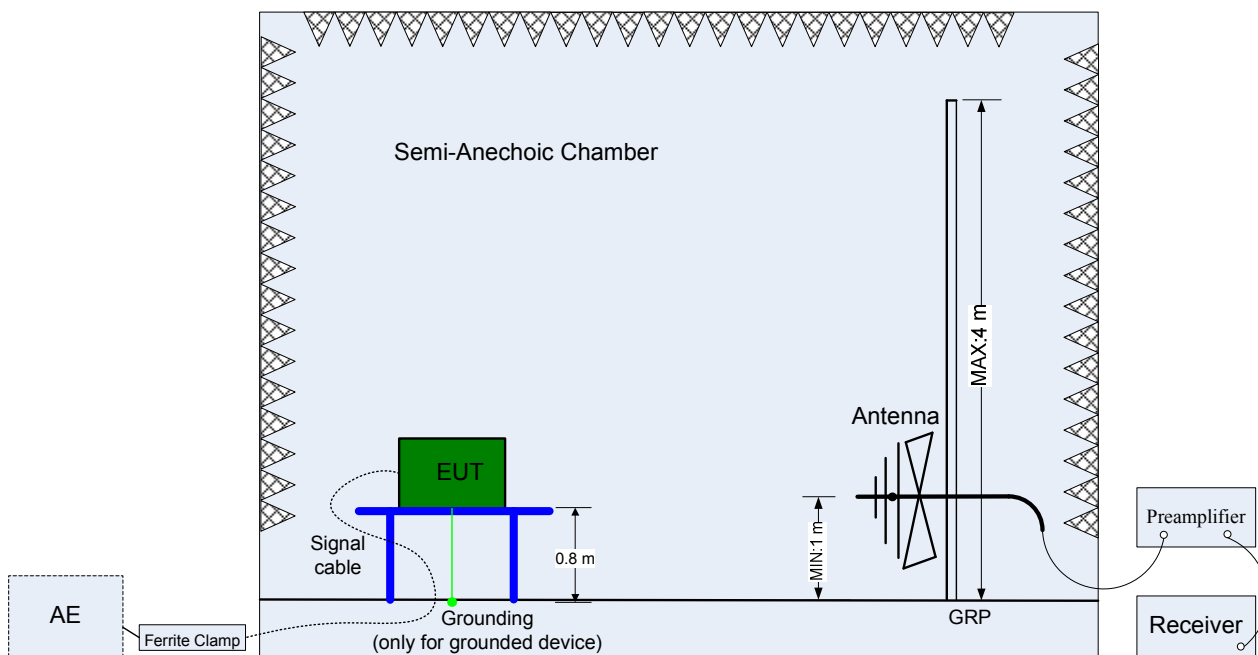
The Bluetooth component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by Bluetooth System Simulator and/or PC/software to emit the specified signals for the purpose of measurements.



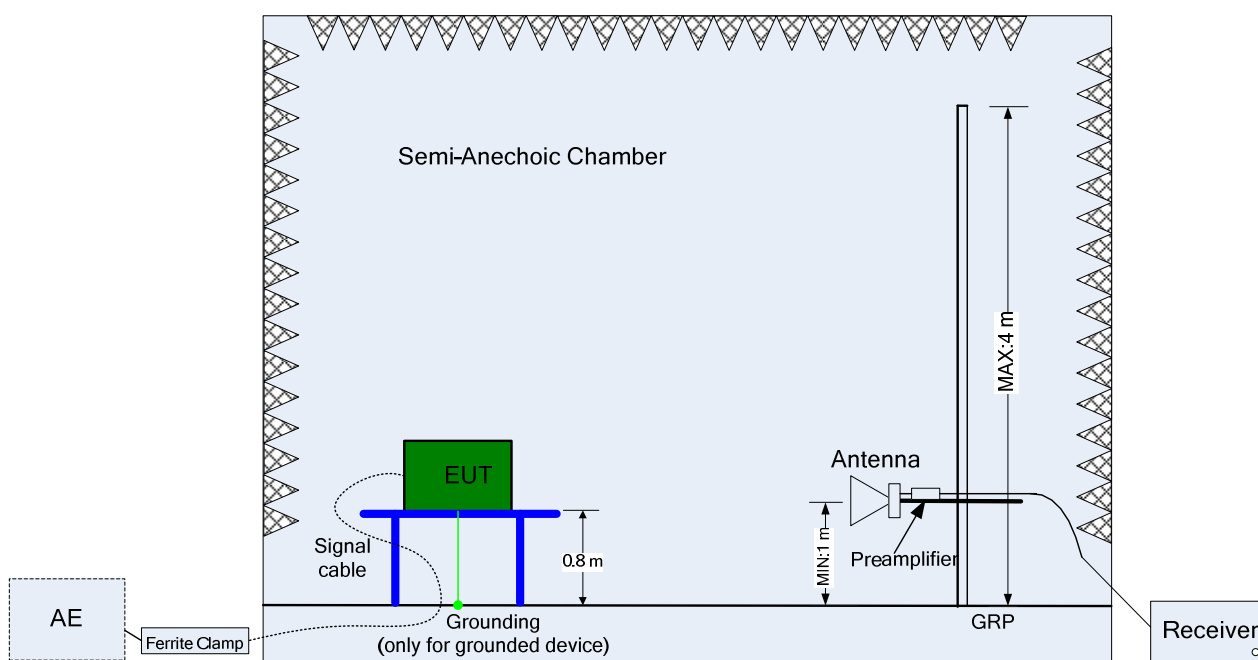
4.4.2 Test Setup 2

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 3m. The setup is according to 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)

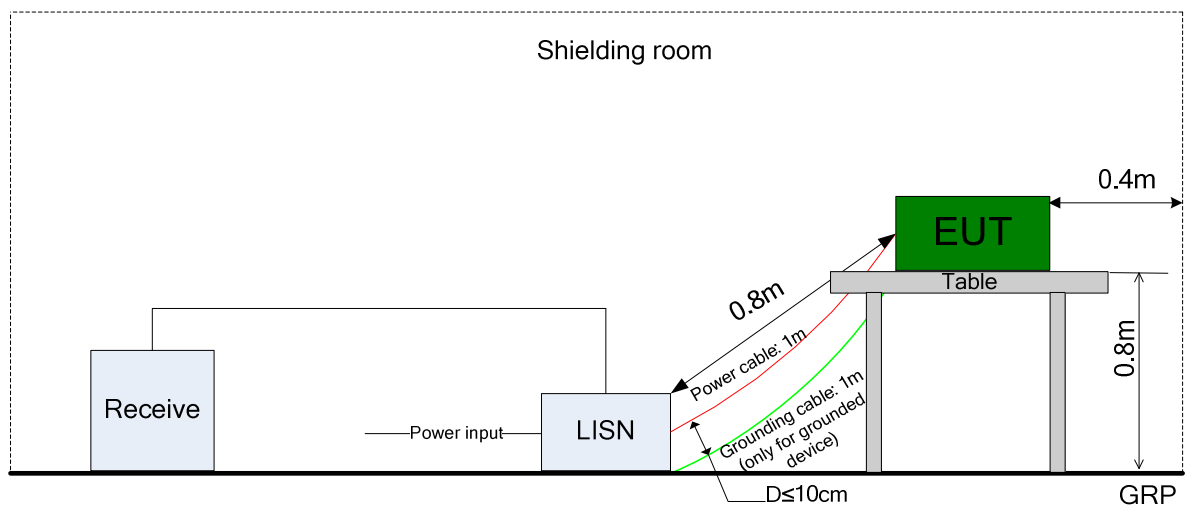


(Above 1 GHz)

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 0.8m 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.



4.5 Test Conditions

Test Case	Test Conditions	
	Configuration	Description
20dB Emission Bandwidth (EBW)	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_DH5_Ch0, TM2_DH5_Ch39, TM2_DH5_Ch78, TM3_DH5_Ch0, TM3_DH5_Ch39, TM3_DH5_Ch78.
Carrier Frequency Separation	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Hop, TM2_DH5_Hop, TM3_DH5_Hop.
Number of Hopping Channel	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Hop, TM2_DH5_Hop, TM3_DH5_Hop.
Time of Occupancy (Dwell Time)	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM2_DH5_Ch0, TM3_DH5_Ch0.
Maximum Peak Conducted Output Power	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_DH5_Ch0, TM2_DH5_Ch39, TM2_DH5_Ch78, TM3_DH5_Ch0, TM3_DH5_Ch39, TM3_DH5_Ch78.
Conducted RF Spurious Emission	Meas. Method	DA 00-705
	Test Env.	NTNV
	Test Setup	Test Setup 1
	EUT Conf.	TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_DH5_Ch0, TM2_DH5_Ch39, TM2_DH5_Ch78, TM3_DH5_Ch0, TM3_DH5_Ch39, TM3_DH5_Ch78.
Radiated Emissions in the Restricted	Meas. Method	DA 00-705, C63.4, C63.10. (1) 30 MHz to 1 GHz:

Test Case	Test Conditions	
	Configuration	Description
Bands		Pre: RBW = 100 kHz; VBW = 300 kHz; Det. = Peak. Final: RBW = 120 kHz; Det. = CISPR Quasi-Peak. (2) 1 GHz to 26.5 GHz: Average: RBW = 1 MHz; VBW = 10 Hz; Det. = Peak; Sweep-time = Auto; Trace = Single. Peak: RBW = 1 MHz; VBW = 3 MHz; Det. = Peak; Sweep-time = Auto; Trace $\geq$ Max Hold * 100.
	Test Env.	NTNV
	Test Setup	Test Setup 2
	EUT Conf.	30 MHz -1 GHz TM1_DH5_Ch78 (Worst Conf.).
		1-3 GHz TM1_DH5_Ch0, TM1_DH5_Ch39, TM1_DH5_Ch78, TM2_DH5_Ch0, TM2_DH5_Ch39, TM2_DH5_Ch78, TM3_DH5_Ch0, TM3_DH5_Ch39, TM3_DH5_Ch78.
		3-18 GHz TM1_DH5_Ch0 (Worse Conf.), TM1_DH5_Ch39 (Worse Conf.), TM1_DH5_Ch78 (Worse Conf.).
		18-26.5 GHz TM1_DH5_Ch78 (Worst Conf.).
Receiver Spurious Emissions	Meas. Method	☐ Antenna-conducted, ☒ Radiated. NOTE: If the receiver has a detachable antenna of known impedance, antenna conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method is recommended. The antenna conducted test shall be performed with the antenna disconnected and the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna. (1) 30 MHz to 1 GHz: Pre: RBW = 100 kHz; VBW = 300 kHz; Det. = Peak. Final: RBW = 120 kHz; Det. = CISPR Quasi-Peak. (2) 1 GHz to 8 GHz: Pre: RBW = 1 MHz; VBW = 3 MHz; Det. = Peak. Final: RBW = 1 MHz; Det. = Average.
	Test Env.	NTNV
	Test Setup	Test Setup 2
	EUT Conf.	RX.
AC Power Line Conducted Emissions	Meas. 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.	TM1_DH5_Ch39.



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
All Test Setups				
Bluetooth System Simulator	Agilent	N4010A	MY49081592	2012-11-25
Test Setup 1				
Spectrum Analyzer	Agilent	E4440A	MY49420179	2013-05-13
Test Setup 2				
EMI Test Receiver	R&S	ESU26	100150	2013-05-27
Antenna (30M-1GHz)	Schwarzbeck	VULB 9163	9163-520	2013-12-08
Horn Antenna (1G-18GHz)	R&S	HF906	100683	2013-05-15
Horn Antenna (18G-16.5GHz)	ETS	3160-9	00091989	2013-10-19
Test Setup 3				
EMI Test Receiver	R&S	ESCI	101019	2013-2-26
Artificial Mains Network	R&S	ENV4200	100141	2012-12-19

END