

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100431-0

PCTEST Engineering Laboratory, Inc.
Columbia, MD

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listed on the Scope of Accreditation, for:*

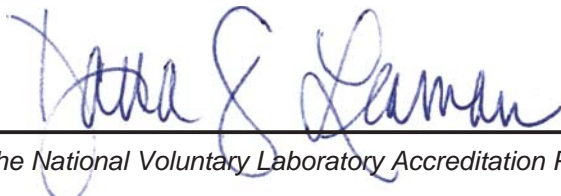
Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2018-09-17 through 2019-09-30

Effective Dates




For the National Voluntary Laboratory Accreditation Program



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

PCTEST Engineering Laboratory, Inc.

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**ELECTROMAGNETIC
COMPATIBILITY &
TELECOMMUNICATIONS**

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Emissions

Designation

Description

ETSI TS 134 124 V14.0.0 (2017-04)	Universal Mobile Telecommunications System (UMTS); Electromagnetic compatibility (EMC) requirements for mobile terminals and ancillary equipment (3GPP TS 34.124 version 14.0.0 Release 14)
ETSI TS 136 124 V14.1.0 (2017-05)	LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Electromagnetic compatibility (EMC) requirements for mobile terminals and ancillary equipment (3GPP TS 36.124 version 14.1.0 Release 14)
ETSI TS 151 010-1 V13.4.0 (2017-08)	Digital cellular telecommunications system (Phase 2+) (GSM); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 13.4.0 Release 13) <i>Section 12 only (Conducted and Radiated Spurious Emissions)</i>
EN 55011 (2009) + A1 (2010)	Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
EN 55032 (2015)	Electromagnetic compatibility of multimedia equipment. Emission Requirements
EN 61000-3-2 (2014)	Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current = 16 A per phase)
KN 61000-3-2 (Annex 1-11); RRA 2014-37 (Sept. 23, 2014)	Test Method for Electromagnetic Interference; Korean only

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IEC 61000-3-2, Ed. 3.0 (2005) +A1 (2008) +A2 (2009)	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-2 (2006) + A1 (2009) + A2 (2009)	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
KN 61000-3-3 (Annex 1-12); RRA 2014-37 (Sept. 23, 2014)	Test Methods for Electromagnetic Interference; Korean only
EN 61000-3-3 (2013)	EMC- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low- voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
IEC 61000-3-3 Ed. 2.0 (2008)	EMC- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
IEC 61000-3-3 Ed. 3.0 (2013-05)	(EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current 16 A per phase and not subject to conditional connection
CNS 13438 (2006) (up to 6GHz)	Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
ANSI C63.10 (2013)	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices, DTS; Section 11
ANSI C63.10 (2013)	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.26 (2015)	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
AS/NZS CISPR 11 (2011)	Industrial, scientific and medical (ISM) radio frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010)	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
CISPR 32 (2015)	Electromagnetic compatibility of multimedia equipment - Emission requirements
ANSI C63.4 (2014)	Unintentional Radiators in 47 CFR FCC Part 15, Subpart B
ANSI C63.10 (2013)	Intentional Radiators in 47 CFR FCC Part 15, Subpart C
ANSI C63.17 (2013)	Unlicensed Personal Communications Service Devices in 47 CFR FCC Part 15, Subpart D
FCC KDB 905462 (April 8, 2016)	Compliance measurement procedures for unlicensed-national information infrastructure (U-NII) devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection; FCC Part 15 Subpart E <i>Limited to TX conducted and radiated power and RX-TX radiated spurious emissions</i>



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Table with 2 columns: Standard Reference and Description. Rows include ANSI C63.10 (2013) for Unlicensed National Information Infrastructure Devices, FCC OST/MP-5 (1986) for FCC Methods of Measurement, and various VCCI Council agreements.

Immunity

Designation

Description

Table with 2 columns: Designation and Description. Rows include EN 55024 (2010), IEC 61000-4-2 (2008-12), EN 61000-4-2 (2009-05), KN 61000-4-2 with RRL Notice No. 2005-83, EN 61000-4-3 (2006) + A2 (2010), and IEC 61000-4-3, Ed. 3.1 (2008-04).



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KN 61000-4-3 with RRL Notice No. 2005-83 (Sept. 29, 2005)	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4 (2012)	Electromagnetic compatibility (EMC). Testing and measurement techniques. Electrical fast transient/burst immunity test
IEC 61000-4-4 (2012-04)	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
KN 61000-4-4 with RRL Notice No. 2005-83 (Sept. 29, 2005)	Electromagnetic compatibility (EMC): Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
IEC 61000-4-5, Ed 2 (2005-11)	EMC - Part 4-5: Testing and measurement techniques - Surge immunity test
BS EN 61000-4-5 (2006)	Electromagnetic compatibility (EMC). Testing and measurement techniques. Surge immunity test
KN 61000-4-5 with RRL Notice No. 2005-83 (Sept. 29, 2005)	Surge Immunity Test
EN 61000-4-6 (2014)	Electromagnetic compatibility (EMC). Testing and measurement techniques. Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-4-6 Ed. 4.0 (2013)	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
KN 61000-4-6 with RRL Notice No. 2005-83 (Sept. 29, 2005)	Electromagnetic compatibility (EMC): Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-4-8 (2009)	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
EN 61000-4-8 (2010)	Electromagnetic compatibility (EMC). Testing and measurement techniques. Power frequency magnetic field immunity test
KN 61000-4-8 with RRL Notice No. 2005-83 (Sept. 29, 2005)	Power Frequency Magnetic Field Immunity Test
EN 61000-4-11 (2004)	Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
IEC 61000-4-11 (2004)	Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
KN 61000-4-11 with RRL Notice No. 2005-83 (Sept. 29, 2005)	Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
KN 61000-6-2 (Annex 14) w/ RRA Announce 2014-92 (12/29/14)	Test Method for Electromagnetic Susceptibility (RRA Announce 2014-92, Dec. 29, 2014) Korean only
EN 61000-6-2 (2005) + AC (2005)	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
KN 61000-6-2 (Annex 14) w/ RRA Announce 2013-25 (6/17/13)	Test Method for Electromagnetic Susceptibility (RRA Announce 2013-25, June 17, 2013) Korean only

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IEC/CISPR 24 (1997) + A2 (2002)
& EN 55024 (1998) + A2 (2003) Information technology equipment - Immunity characteristics - Limits and methods of measurement

CISPR 24 ed2.0 (2010-08) Information technology equipment - Immunity characteristics - Limits and methods of measurement

KN 35:2015 (Annex 11-2) Testing method of electromagnetic wave endurance of multimedia device

ANSI/AAMI PC69 (2007);
(Sections 4.8 and 4.9 only) Active implantable medical devices - Electromagnetic compatibility: EMC test Protocols for Implantable cardiac pacemakers and implantable cardioverter defibrillators

Product Safety

Designation

IEC 60601-1-2, Ed. 4, (2014-02)

IEC 60601-1-2, Ed. 3.0 (2007)

Description

Medical electrical equipment-Part 1-2: General requirements for basic safety and essential performance-Collateral Standard: Electromagnetic disturbances-Requirements and tests

Medical electrical equipment - Part 1-2: General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and tests

Radio

Designation

ETSI EN 300 220-1 V3.1.1
(2017-02)

ETSI EN 300 220-2 V3.1.1
(2017-02)

ETSI EN 300 328 V2.1.1 (2016-11)

ETSI EN 300 330 V2.1.1 (2017-02)

ETSI EN 300 440 V2.1.1 (2017-03)

ETSI EN 300 440-2 v1.4.1
(2010-08)

ETSI EN 301 489-1 V1.9.2
(2011-09)

Description

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 1: Technical characteristics and methods of measurement

Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU for non specific radio equipment

Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

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ETSI EN 301 489-3 v1.4.1 (2002-08)	Electromagnetic compatibility and Radio spectrum Matters; ElectroMagnetic Compatibility standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz
ETSI EN 301 489-3 V1.6.1 (2013-08)	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
ETSI EN 301 489-7 v1.3.1 (2005-11)	ERM; EMC standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)
ETSI EN 301 489-17 V3.1.1 (2017-02)	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
ETSI EN 301 489-17 V2.2.1 (2012-09)	(ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems
ETSI EN 301 489-27 V1.1.1 (2004-06)	ERM; EMC standard for radio equipment and services; Part 27: Specific conditions for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheal devices (ULP-AMI-P)
ETSI EN 301 489-33 V2.2.0 (2017-03)	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 33: Specific conditions for Ultra-WideBand (UWB) devices; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
ETSI EN 301 489-34 V1.4.1 (2013-05)	(ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 34: Specific conditions for External Power Supply (EPS) for mobile phones
ETSI EN 301 511 V12.5.1 (2017-03)	Global System for Mobile communications (GSM); Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU <i>Sections 4.2.16 – 4.2.19 (Radiated Spurious Emissions Mobile Station)</i>
ETSI EN 301 839 V2.1.1 (2016-04)	Ultra Low Power Active Medical Implants (ULP-AMI) and associated Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU
ETSI EN 301 893 V2.1.1 (2017-05)	5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
ETSI EN 301 893 V1.8.1 (2015-03)	Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
ETSI EN 301 908-1 V11.1.1 (2016-07)	IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements <i>Section 4.2.2 (Radiated Emissions UE)</i>

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ETSI EN 301 908-13 V11.1.1 (2016-07)	IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)
ETSI EN 302 065-1 V2.1.1 (2016-11)	Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Requirements for Generic UWB applications
ETSI EN 302 065-2 V2.1.1 (2016-11)	Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: Requirements for UWB location tracking
ETSI EN 302 065-3 V2.1.1 (2016-11)	Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 3: Requirements for UWB devices for ground based vehicular applications
ETSI EN 302 065-4 V1.1.1 (2016-11)	Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 4: Material Sensing devices using UWB technology below 10,6 GHz
EN 302 291-1 V. 1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 1: Technical characteristics and test methods
EN 302 291-2, v1.1.1	ERM; Short Range Devices; Close Range Inductive Data Communication equipment operating at 13,56 MHz - Part 2: Harmonized EN covering essential requirements of Article 3(2) of the R&TTE Directive
ETSI EN 302 502 V2.1.1 (2017-03)	Wireless Access Systems (WAS); 5,8 GHz fixed broadband data transmitting systems; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
ETSI EN 302 510-1 V1.1.1	ERM; Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories; Part 1: Technical characteristics and test methods
ETSI EN 302 510-2 V1.1.1	ERM, Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories, Part 1: Technical characteristics and test methods
ETSI EN 302 537 V2.1.1 (2016-10)	Ultra Low Power Medical Data Service (MEDS) Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU
AS/NZS 4268 (2017)	Radio equipment and systems-Short range devices-Limits and methods of measurement
ANSI C63.19 (2011)	American National Standard for Methods of Measurement Compatibility between Wireless Communication Devices and Hearing Aids
LP0002 (January 2018)	Low-power Radio-frequency Devices Technical Specifications



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Table with 2 columns: Regulatory Reference and Description. Rows include DGT LP0002, MSIP Public Notification 2015-95, MSIP Public Notification 2017-21, MSIT Public Notification 2017-10, MSIT Public Notification 2017-8, MSIT Public Notification 2017-7, MSIT Public Notification 2017-7, Enforcement Decree of MSIT No. 1, and RRA Notice 2014-2.

RF Exposure

Designation

IEEE 1528:2013

Description

Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques; FCC requirements for RF Exposure- Devices subject to SAR requirements

RRA Public Notification 2015-23 (Nov. 18 2015)

Technical Requirements for Measurement and Test Procedure of Specific Absorption Rate; Korea only

Telecommunications

Designation

ETSI EN 300 386 V2.1.1 (2016-07)

Description

Telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements; Harmonised Standard covering the essential requirements of the Directive 2014/30/EU

ANSI/TIA/EIA-603-E (2016)

Microwave and Millimeter Wave Bands Radio Services (FCC Licensed Radio Service Equipment) in 47 CFR FCC Parts 25, 30, 74, 90 (M DSRC, Y, Z), 95 (M and L), and 101

ANSI/TIA/EIA-603-E (2016)

Maritime and Aviation Radio Services (FCC Licensed Radio Service Equipment) in 47 CFR FCC Parts 80 and 87

ANSI/TIA/EIA-603-E (2016)

Commercial Mobile Services (FCC Licensed Radio Service Equipment) in 47 CFR FCC Parts 22 (cellular), 24, 25 (below 3 GHz), and 27



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ANSI/TIA/EIA-603-E (2016)	Broadcast Radio Services (FCC Licensed Radio Service Equipment) in 47 CFR FCC parts 73 and 74 (below 3 GHz)
ANSI/TIA/EIA-603-E (2016)	Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) in 47 CFR FCC Part 96
FCC KDB 935210 D05 (February 12, 2016)	Signal Boosters (Part 20)- Measurements Guidance for Industrial and Non-consumer Signal Booster, Repeater, and Amplifier Devices- Industry Booster Basic Measurements v01r01
FCC KDB 935210 D04 (February 12, 2016)	Signal Boosters (Part 20)- Wideband Consumer Signal Booster Compliance Measurement Guidance- Provider Specific Booster Measurements v02
FCC KDB 935210 D03 (February 12, 2016)	Signal Boosters (Part 20)- Wideband Consumer Signal Booster Compliance Measurement Guidance- Signal Booster Measurements v04
ANSI/TIA 603-D (2010) and TIA-102.CAAA-D with 47 CFR FCC Part 2	Citizens Broadband Radio Services in 47 CFR FCC Part 96
ANSI/TIA 603-D (2010) and TIA-102.CAAA-D with 47 CFR FCC Part 2	Broadcast Radio Services in 47 CFR Parts FCC 73 and 74 (non-microwave)
ANSI/TIA 603-D (2010) and TIA-102.CAAA-D with 47 CFR FCC Part 2	Commercial Mobile Services in 47 CFR FCC Parts 22 (cellular), 24, 25 (non-microwave), and 27
ANSI/TIA 603-D (2010) with 47 CFR FCC Part 2	Maritime and Aviation Radio Services in 47 CFR FCC Parts 80 and 87
ANSI/TIA 603-D (2010) and TIA-102.CAAA-D with 47 CFR FCC Part 2	Microwave and Millimeter Bands Radio Services in 47 CFR FCC Parts 25, 74, 90 (90Y, 90Z, DSRC) and 101