



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Element Materials Technology San Jose, CA  
(formerly PCTEST)  
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ELECTRICAL

Valid to: May 31, 2026

Certificate Number: 2041.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above, *as well as the satellite laboratory locations listed below*, to perform the following EMC, SAR, HAC, RF, Conformance, Protocol, and OTA testing of wireless devices:

**Test Technology:**

OTA

**Test Method(s):**

CTIA 01.01 Test Scope, Requirements, and Applicability<sup>1</sup>;  
CTIA 01.20 Test Methodology, SISO, Anechoic Chamber;  
CTIA 01.40 Test Methodology, MIMO, Static Channel Model, Multi-Probe Anechoic Chamber;  
PTCRB NAPRD.03; PTCRB PPMD;  
VZW OTA Radiated Performance for CDMA & LTE Multimode Devices;  
VZW 5G NR FR1 RF OTA Test Plan, VZW Location Determination Test Plan; VZW LTE LBS Performance Test Plan; VZW LTE Over the Air Radiated Performance Test Plan; T-Mobile Radiated Performance TRD;  
AT&T 13340 OTA;  
USCC CDMA Over The Air Radiated Test Plan;  
USCC LTE Over The Air Radiated Test Plan;  
CTIA Test Plan for RF Performance Evaluation of Wi-Fi Mobile Converged Devices;  
GSMA TS.24 Operator Acceptance Values for Device Antenna Performance;  
3GPP TS 34.114 Technical Specification UE/MS OTA Antenna Performance;  
3GPP TS 37.544 Technical Specification UTRA & E-UTRA UE OTA Antenna Performance;  
3GPP TS 38.521 NR UE Conformance Specification; Radio Transmission and Reception;  
QCVN 117:2023/BTTTT

**Test Technology:**

**Test Method(s):**

**Mobile Communications/  
Conformance**

*(conducted measurements only)*

2G/GSM/GERAN

ETSI TS 151 010-2; 3GPP TS 51.010-2;  
ETSI TS 151 010-4; 3GPP TS 51.010-4;  
ETSI TS 151 010-5; 3GPP TS 51.010-5;  
ETSI EN 301 511; GFC-CC

3G/WCDMA/UTRA

3GPP TS 31.121; 3GPP TS 31.124;  
3GPP TS 34.121-1; 3GPP TS 34.121-2;  
3GPP TS 34.123-1; 3GPP TS 34.123-2;  
3GPP TS 34.123-3; ETSI TS 102 230;  
GCF-CC; ETSI EN 301-908-2

4G/LTE/E-UTRA

3GPP TS 36.521-1; 3GPP TS 36.521-2;  
3GPP TS 36.521-3; 3GPP TS 36.523-1  
3GPP TS 36.523-2;  
GCF-CC;  
ETSI EN 301-908-13

5G/NR

3GPP TS 38.521-1; 3GPP TS 38.521-2;  
3GPP TS 38.521-3; 3GPP TS 38.521-4;  
3GPP TS 38.523-1; 3GPP TS 523-2;  
3GPP TS 38.533; 3GPP TS 38.508-2;  
GCF-CC

IMS

3GPP TS 34.229-1; 3GPP TS 34.229-2;  
3GPP TS 34.229-5

18855 Adams Court  
Building AM1, AM2  
Morgan Hill, CA 95037

**Test Technology:**

**Test Method(s):**

**Emissions**

Radiated and Conducted  
*(3m semi-anechoic chambers)*

CFR 47 FCC Part 15, Subpart B (using ANSI C63.4:2014); CFR 47  
FCC Part 18 (using MP-5:1986);  
IEC/CISPR 11; EN 55011; KS C 9811;  
CISPR 14-1 (excluding click and power disturbance);  
IEC/EN 55014-1; KS C 9814-1;  
CISPR 15; IEC/EN 55015; IEC/CISPR 22; IEC/EN 55022; IEC/EN  
55032; CISPR 32; EN 55103-1; KS C 9832;  
AS/NZS CISPR 11; AS/NZS CISPR 32; ICES-001;  
ICES-003; ICES-005;  
VCCI V-3; VCCI-CISPR 32 (up to 6 GHz); CNS 13803;  
CNS 13783-1; CNS 13438; CNS 15936 (up to 6 GHz)

**Test Technology:****Test Method(s):****Emissions**

Radiated and Conducted  
(3m semi-anechoic chambers)

TCVN 7189 (2009); 3GPP TS 36.124;  
3GPP TS 51.010-1, Section 12 (Conducted and Radiated Spurious Emissions);  
3GPP TS 38.124;  
ETSI TS 136 124 LTE; ETSI TS 151 010-1;  
ETSI TS 138.124 5G; ETSI TS 134.124 3G;  
Digital Cellular Telecommunications System (Phase 2+) (GSM)

Harmonic Current Emissions

IEC 61000-3-2; EN 61000-3-2; KS C 9610-3-2

Voltage Fluctuations and Flicker

IEC 61000-3-3; EN 61000-3-3; KS C 9610-3-3

**Immunity**

Electrostatic Discharge (ESD)  
Radiated Immunity

IEC 61000-4-2; EN 61000-4-2; KS C 9610-4-2  
IEC 61000-4-3; EN 61000-4-3; KS C 9610-4-3

Electrical Fast Transient/Burst  
Surge Immunity

IEC 61000-4-4; EN 61000-4-4; KS C 9610-4-4  
IEC 61000-4-5; EN 61000-4-5; KS C 9610-4-5

Conducted Immunity

IEC 61000-4-6; EN 61000-4-6; KS C 9610-4-6

Power Frequency Magnetic  
Field Immunity

IEC 61000-4-8; EN 61000-4-8; KS C 9610-4-8

Voltage Dips, Short Interrupts,  
and Line Voltage Variations

IEC 61000-4-11; EN 61000-4-11; KS C 9610-4-11

Harmonics and Inter-harmonics

IEC 61000-4-13; EN 61000-4-13

Voltage Fluctuations

IEC 61000-4-14; EN 61000-4-14

Voltage Frequency Variations

IEC 61000-4-28; EN 61000-4-28

Voltage Dips, Short Interruptions  
and Voltage Variations on DC  
Input Power Port

IEC 61000-4-29; EN 61000-4-29

**Automotive EMC**

CISPR 25; EN/IEC 55025

**Generic or Product Specific  
EMC Standards**

EN/IEC 61000-6-1; EN/IEC 61000-6-2; EN/IEC 61000-6-3; EN/IEC  
61000-6-4; KS C 9610-6-1;  
KS C 9610-6-2; KS C 9610-6-3; KS C 9610-6-4;  
IEC/EN 61204-3;  
EN/IEC 61547; KS C 9547;  
EN 62233; EN 55103-2; EN/IEC 61800-3;  
KS C 9800-3; CISPR 24; EN 55024; EN 50121-1;  
EN 50130-4; EN 50121-4; EN 50121-3-2

**Test Technology:**

**Test Method(s):**

**Generic or Product Specific  
EMC Standards**

EN/IEC 50155; EN 50270; EN 50293;  
EN/IEC 55014-2; IEC/CISPR 14-2; IEC/EN 61326-1;  
IEC/EN 61326-2-1; IEC/EN 61326-3-1; IEC/EN 61326-3-2; IEC/EN  
60601-1-2; KS C IEC 60601-1-2;  
TCVN 7317:2003; TCVN 7189:2009; TCVN 7317:2003

**EMC for Radio Equipment  
and Services**

ETSI EN 301 489-1; ETSI EN 301 489-3;  
ETSI EN 301 489-4;  
ETSI EN 301 489-5; ETSI EN 301 489-6;  
ETSI EN 301 489-7;  
ETSI EN 301 489-8; ETSI EN 301 489-9;  
ETSI EN 301 489-10;  
ETSI EN 301 489-12; ETSI EN 301 489-15;  
ETSI EN 301 489-16; ETSI EN 301 489-17;  
ETSI EN 301 489-18; ETSI EN 301 489-19;  
ETSI EN 301 489-20; ETSI EN 301 489-23;  
ETSI EN 301 489-24; ETSI EN 301 489-25;  
ETSI EN 301 489-26; ETSI EN 301 489-31;  
ETSI EN 301 489-33; ETSI EN 301 489-50;  
ETSI EN 301 489-52; ETSI EN 300 386;  
KS X 3124; KS X 3125; KN 301 489-07; KS X 3126;  
KS X 3129

**Bluetooth**

RF:1;  
RF-PHY1;  
RF-PHY2

**Radio**

US/FCC

47 CFR, FCC Parts 15B/C/D/E/F/G/H (using ANSI C63.4:2014,  
ANSI C63.10:2013, ANSI C63.10:2020; ANSI C63.17:2013 and/or  
FCC KDB 905462 D02 (v02));  
47 CFR Parts 2, 11, 20, 21, 22, 24, 25, 27, 30, 73, 74, 80, 87, 90, 95,  
96, 97, and 101  
(using ANSI/TIA-603-D, ANSI/TIA-603-E,  
TIA-102.CAAA-E, ANSI C63.26:2015);  
CFR 47 Part 90 (using ANSI/TIA-603-D, ANSI/TIA 603-E);  
ANSI C63.30:2021

Canada/ISED

RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125;  
RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134;  
RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142;  
RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194  
RSS-195; RSS-196; RSS-197; RSS-198; RSS-199; RSS-210;  
RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222;  
RSS-236; RSS-238; RSS-243; RSS-244; RSS-246; RSS-247;  
RSS-248; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310;  
RSS-GEN

EU

EN 301 126-1; EN 301 390; EN 301 751;  
EN 302 217-2-2; EN 302 217-2; EN 302 217-3;  
EN 302 326-2; EN 300 224; EN 300 224-2;  
EN 300 341; EN 300 113; EN 301 166

**Test Technology:****Test Method(s):**

EU	EN 300 390; EN 300 471-1; EN 300 471-2; EN 300 330; EN 300 220-2; EN 300 220-3-1; EN 300 220-3-2; EN 300 220-4; EN 300 440; EN 300 440-2; EN 300 440-4; EN 300 328; EN 302 536-2; EN 302 571; EN 303 687; EN 305 550-1; EN 305 550-2; EN 301 893; EN 302 502; EN 301 559; EN 301 598; EN 302 544-1; EN 302 544-2; EN 301 091-1; EN 301 091-2; EN 302 208; EN 302 291-1; EN 302 291-2; EN 303 204; EN 302 065-1; EN 302 065-2; EN 302 065-3; EN 302 065-4; EN 303 413; EN 303 417; EN 302 567; EN 300 433; EN 301 502; EN 301 511; EN 301 908-1; EN 301 908-2; EN 301 908-3; EN 301 908-10; EN 301 908-11; EN 301 908-12; EN 301 908-13; EN 301 908-14; EN 301 908-15; EN 301 908-16; EN 301 908-17; EN 301 908-18; EN 301 908-19; EN 301 908-20; EN 301 908-21; EN 301 908-22; EN 301 908-25
Korea	Ordinance of MSIT No. 63, Dec 24, 2020; MSIT Public Notification 2021-86, Nov 29, 2021; KS X 3123 Conformity Assessment Test Methods for Radio Equipment; KS X 3142; RRA Public Notification 2019-3, Mar 4, 2019; RRA Public Notification 2021-15, Oct 12, 2021; KS X 3074, (RRA Public Notification 2020- 6, Sep 25, 2020); RRA Public Notification 2021-3, Feb 8, 2021; MSIT Public Notification 2019-4, Jan 16, 2019; RRA Public Notification 2019-1, Jan 17, 2019
Hong Kong	HKCA 1035; HKCA 1039; HKCA 1042; HKCA 1043; HKCA 1049; HKCA 1053; HKCA 1054; HKCA 1056; HKCA 1057; HKCA 1061; HKCA 1080
Singapore	IMDA TS WBA; IMDA TS SRD; IMDA TS LMR; IMDA TS CMT; IMDA TS UWB
Taiwan	DGT C-IS2031-0 (2020); DGT C-IS2034-0 (2020); PLMN01 (2020); PLMN02 (2020); PLMN08 (2020); PLMN09 (2020); DGT LP0001 (2020); DGT LP0002 (2024); RTTE01 (2020); CNS 13438; CNS 15936 (2016) (up to 6 GHz)
Australia	AS/NZS 4268:2017
Vietnam	QCVN 16:2018/BTTTT; QCVN 18:2022/BTTTT

**Test Technology:****Test Method(s):**

Vietnam

QCVN 23:2011/BTTTT; QCVN 25:2011/BTTTT;  
QCVN 41: 2016/BTTTT; QCVN 42:2011/BTTTT;  
QCVN 43:2011/BTTTT; QCVN 44:2018/BTTTT;  
QCVN 54:2020/BTTTT; QCVN 55:2011/BTTTT;  
QCVN 65: 2021/BTTTT; QCVN 66: 2018/BTTTT;  
QCVN 53: 2017/BTTTT; QCVN 73:2013/BTTTT;  
QCVN 74: 2020/BTTTT; QCVN 94:2015/BTTTT;  
QCVN 95:2015/BTTTT; QCVN 96:2015/BTTTT

Japan

(Specified Radio Equipment Article 38-2-2, paragraph 1), Item 1 of Radio Law;  
(Specified Radio Equipment Article 38-2-2, paragraph 1), Item 2 of Radio Law;  
(Specified Radio Equipment Article 38-2-2, paragraph 1), Item 3 of Radio Law;  
ARIB Standard STD-T29; STD-T57; STD-T66; STD-T70; STD-T71;  
STD-T81; STD-T90; STD-T91; STD-T106; STD-T107; STD-T108

Mexico

IFT-014-2018 (Part 1); IFT-014-2018 (Part 2);  
IFT-008-2015; NOM-208-SCFI-2016;  
NOM-EM-016-SCFI-2015

**RF Exposure / SAR (Specific Absorption Rate)**

IEEE 1528-2013; EN IEC/IEEE 62209-1528:2021;  
RSS-102; RSS-102.SAR.MEAS; RSS-102.NS.MEAS;  
RSS-102.IPD.MEAS; SPR-001; SPR-002; SPR-003;  
SPR-004;  
IEEE C95.3-2021; EN 50566-2017; EN 50360-2017;  
EN 62209-1:2016; EN 62209-3: 2019;  
EN 62209-2:2010/A1:2019; IEC 62209-1 2<sup>nd</sup> Edition 2016;  
IEC 62209-2:2010;  
IEC 62209-3:2019; IEC PAS 63083:2017; EN 50401:2017;  
IEC PAS 63184:2021; EN 50385:2017; EN 62311:2020;  
EN 62232:2017; IEC 62232:2017; EN 62311:2008;  
IEC 62311:2019; IEC 62311:2020; IEC TR 62630:2010;  
IEC 62209-2 AMD 1; EN 62479:2010; IEC 62479:2010;  
EN 50663:2017; IEC/IEEE 62209-1528:2020;  
EN 63195-1:2023; EN 50665:2017; IEC 63446:2022;  
IEC/IEEE 63195-1:2022; AS/NZS 2772.2:2016;  
Australian Communications Authority Radio Communications  
(Electromagnetic Radiation – Human Exposure) Standard 2014;  
ANSI/IEEE C95.1-2005; ANSI/IEEE C95.1-1992;  
ANSI/IEEE C95.3-2002; ANSI/IEEE C95.3.1-2010  
ANSI/IEEE C95.1:2019; ICNIRP (100KHz-300GHz):2020;  
IEC TR 63170:2018;  
RRA Public Notification 2018-18, December 7, 2018;  
ARIB STD-T56

**Hearing Aid Compatibility**

ANSI C63.19:2011; ANSI C63.19:2019;  
CTIA Test Plan for Hearing Aid Compatibility; RSS-HAC

<b><u>Test Technology:</u></b>	<b><u>Test Method(s):</u></b>
<b>Radiated Spurious Emissions</b>	PVG.04 PTCRB
<b>CBRS/Winnforum</b>	CBRSA-TS-9001 CBRS Alliance OnGo Certification Test Plan; WINNF-TS-0122 Winnforum CBRS CBSD Test Specification

<sup>1</sup> CTIA 01.01 Test Scope Requirements and Applicability is used in support of the CTIA Test Plan for Wireless Device Over-the-Air Performance<sup>3</sup> and should not be considered its own test method

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>:

<b>Rule Subpart/Technology</b>	<b>Test Method</b>	<b>Maximum Frequency (MHz)</b>
<u>Unintentional Radiators</u> Part 15B	ANSI C63.4:2014	40000
<u>Industrial, Scientific, and Medical Equipment</u> Part 18	FCC MP-5 (February 1986)	330000
<u>Intentional Radiators</u> Part 15C	ANSI C63.10:2013 ANSI C63.10:2020	330000
<u>Unlicensed Personal Communication Systems Devices</u> Part 15D	ANSI C63.17:2013	40000
<u>U-NII without DFS Intentional Radiators</u> Part 15E	ANSI C63.10:2013 ANSI C63.10:2020	40000
<u>U-NII with DFS Intentional Radiators</u> Part 15E	FCC KDB 905462 D02 (v02)	40000
<u>UWB Intentional Radiators</u> Part 15F	ANSI C63.10:2013 ANSI C63.10:2020	40000
<u>BPL Intentional Radiators</u> Part 15G	ANSI C63.10:2013 ANSI C63.10:2020	40000
<u>White Space Device Intentional Radiators</u> Part 15H	ANSI C63.10:2013 ANSI C63.10:2020	40000
<u>Commercial Mobile Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E or ANSI C63.26:2015	330000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1<sup>2</sup>:

<b>Rule Subpart/Technology</b>	<b>Test Method</b>	<b>Maximum Frequency (MHz)</b>
<u>General Mobile Radio Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (non-cellular), 90 (below 3GHz), 95, 97, and 101 (below 3GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E or ANSI C63.26:2015	330000
<u>Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)</u> Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E or ANSI C63.26:2015	330000
<u>Maritime and Aviation Radio Services</u> Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	330000
<u>Microwave and Millimeter Bands Radio Services</u> Parts 25, 30, 74, 90 (above 3 GHz), 95 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E or ANSI C63.26:2015	330000
<u>Broadcast Radio Services</u> Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E or ANSI C63.26:2015	330000
<u>RF Exposure</u> Devices Subject to SAR Requirements	IEEE Std 1528:2013	6000
<u>Hearing Aid Compatibility</u> Part 20 (HAC for Commercial Mobile Services)	ANSI C63.19:2011	6000
<u>Signal Boosters</u> Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters), Section 90.219	ANSI C63.26:2015	330000

<sup>2</sup> Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/eas/>) for a listing of FCC approved laboratories.





## Accredited Laboratory

A2LA has accredited

### ELEMENT MATERIALS TECHNOLOGY SAN JOSE, CA

San Jose, CA

for technical competence in the field of

### Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 5<sup>th</sup> day of June 2024.

A blue ink signature of Mr. Trace McInturff, written in a cursive style.

Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2041.02  
Valid to May 31, 2026

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*