



Engineering Test Report No. 2402768-05

Report Date	November 26, 2025	
Manufacturer Name	Last Lock	
Manufacturer Address	25 W Main Street, STE 550 Madison, WI 53703	
Model No.	Smart Core – C100	
Date Received	November 13, 2025	
Test Dates	November 13, 2025 – November 21, 2025	
Specifications	FCC "Code of Federal Regulations" Title 47 Part 15, Subpart F, Section 15.519 Innovation, Science, and Economic Development Canada, RSS-220	
Test Facility	Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515	FCC Reg. Number: 269750 IC Reg. Number: 2987A CAB Identifier: US0107
Signature	<i>Nathaniel Bouchie</i>	
Tested by	Nathaniel Bouchie	
Signature	<i>Raymond J. Klouda</i>	
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	P00080	

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1. Report Revision History

Revision	Date	Description
–	26 NOV 2025	Initial Release of Engineering Test Report No. 2402768-05

2. Introduction

2.1. Scope of Tests

This document presents the results of a series of RF emissions tests that were performed on the Last Lock Smart Core, Model No. C100 (hereinafter referred to as the Equipment Under Test (EUT)). The EUTs were manufactured and submitted for testing by Last Lock located in Madison, WI.

2.2. Purpose

The test series was performed to determine if the EUTs meet the RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart F, §15.519 for an Ultra-Wideband intentional radiator operating within the 3100 – 10600MHz band.

The test series was also performed to determine if the EUTs meet the RF emission requirements of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-220 for an Ultra-Wideband intentional radiator operating within the 3100 – 10600MHz band.

Testing was performed in accordance with ANSI C63.10-2013.

2.3. Identification of the EUTs

The EUTs were identified as follows:

EUT Identification	
Product Description	Smart Core
Model/Part No.	C100
Serial No.*	109-1, 112-1, or 24-1
Size of EUT	2.125 in x 1.25 in x 1.25 in
Software/Firmware Version	110-1 UWB
Device Type	Ultra-Wideband Transmission Device
Band of Operation	3100 – 10600MHz
Antenna Type	Trace Antenna PN: 7000AT18A1600002E
Conducted Output Power	-42.38dBm
Rated Output Power	-41.3dBm
10dB Bandwidth	548.5MHz
Note*: Three EUTs were used interchangeably due to battery constraints. All EUTs are identical.	

The EUTs listed above were used throughout the test series.

3. Power Input

The EUTs were powered by 3.6VDC from internal batteries.

4. Grounding

The EUTs were not connected to ground.

5. Support Equipment

No support equipment was used during the tests.

6. Interconnect Leads

No interconnect leads were used during the tests.

7. Modifications Made to the EUT

No modifications were made to the EUTs during the testing.

8. Modes of Operation

The EUTs and all peripheral equipment were energized. The EUTs were programmed to transmit in one of the following modes:

Mode	Description
UWB Ch 5 @ 6489.6MHz	The EUT was set to transmit continuously on UWB Ch 5 at 6489.6MHz.
UWB Ch 9 @ 7987.2MHz	The EUT was set to transmit continuously on UWB Ch 9 at 7987.2MHz.

9. Test Specifications

The tests were performed to selected portions of, and in accordance with, the test specifications.

- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart F
- ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices"
- RSS-220 Issue 1, July 2018, Amendment 1, "Devices Using Ultra-Wideband (UWB) Technology"

10. Test Plan

No test plan was provided. Instructions were provided by personnel from Last Lock and used in conjunction with the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart F, Section 15.519, Innovation, Science, and Economic Development Canada, RSS-220, and ANSI C63.10-2013 specifications.

11. Deviation, Additions to, or Exclusions from Test Specifications

There were no deviations, additions to, or exclusions from the test specifications during this test series.

12. Laboratory Conditions

The ambient parameters of the laboratory during testing were as follows:

Ambient Parameters	Value
Temperature	24.2°C
Relative Humidity	22%
Atmospheric Pressure	1021mb

13. Summary

The following EMC tests were performed and the results are shown below:

Test Description	Requirements	Test Method	S/N	Results
10dB Bandwidth	FCC 15.519 ISED RSS-220	ANSI C63.10:2013	109-1, 112-1, or 24-1	Conforms
Shutoff Time	FCC 15.519 ISED RSS-220	ANSI C63.10:2013	109-1, 112-1, or 24-1	Conforms
Maximum Peak Conducted Output Power	FCC 15.519 ISED RSS-220	ANSI C63.10:2013	109-1, 112-1, or 24-1	Conforms
Effective Isotropic Radiated Power (EIRP)	FCC 15.519 ISED RSS-220	ANSI C63.10:2013	109-1, 112-1, or 24-1	Conforms
Spurious Radiated Emissions	FCC 15.519 ISED RSS-220	ANSI C63.10:2013	109-1, 112-1, or 24-1	Conforms
Power Spectral Density	FCC 15.519 ISED RSS-220	ANSI C63.10:2013	109-1, 112-1, or 24-1	Conforms

14. Sample Calculations

For Powerline Conducted Emissions:

The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF).

$$\text{Formula 1: VL (dB}\mu\text{V)} = \text{MTR (dB}\mu\text{V)} + \text{CF (dB)}.$$

For Radiated Emissions:

The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external preamplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

$$\text{Formula 1: FS (dB}\mu\text{V/m)} = \text{MTR (dB}\mu\text{V)} + \text{AF (dB/m)} + \text{CF (dB)} + (-\text{PA (dB)}) + \text{DC (dB)}$$

To convert the Field Strength dB μ V/m term to μ V/m, the dB μ V/m is first divided by 20. The Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in μ V/m terms.

$$\text{Formula 2: FS (}\mu\text{V/m)} = \text{AntiLog} [(\text{FS (dB}\mu\text{V/m)})/20]$$

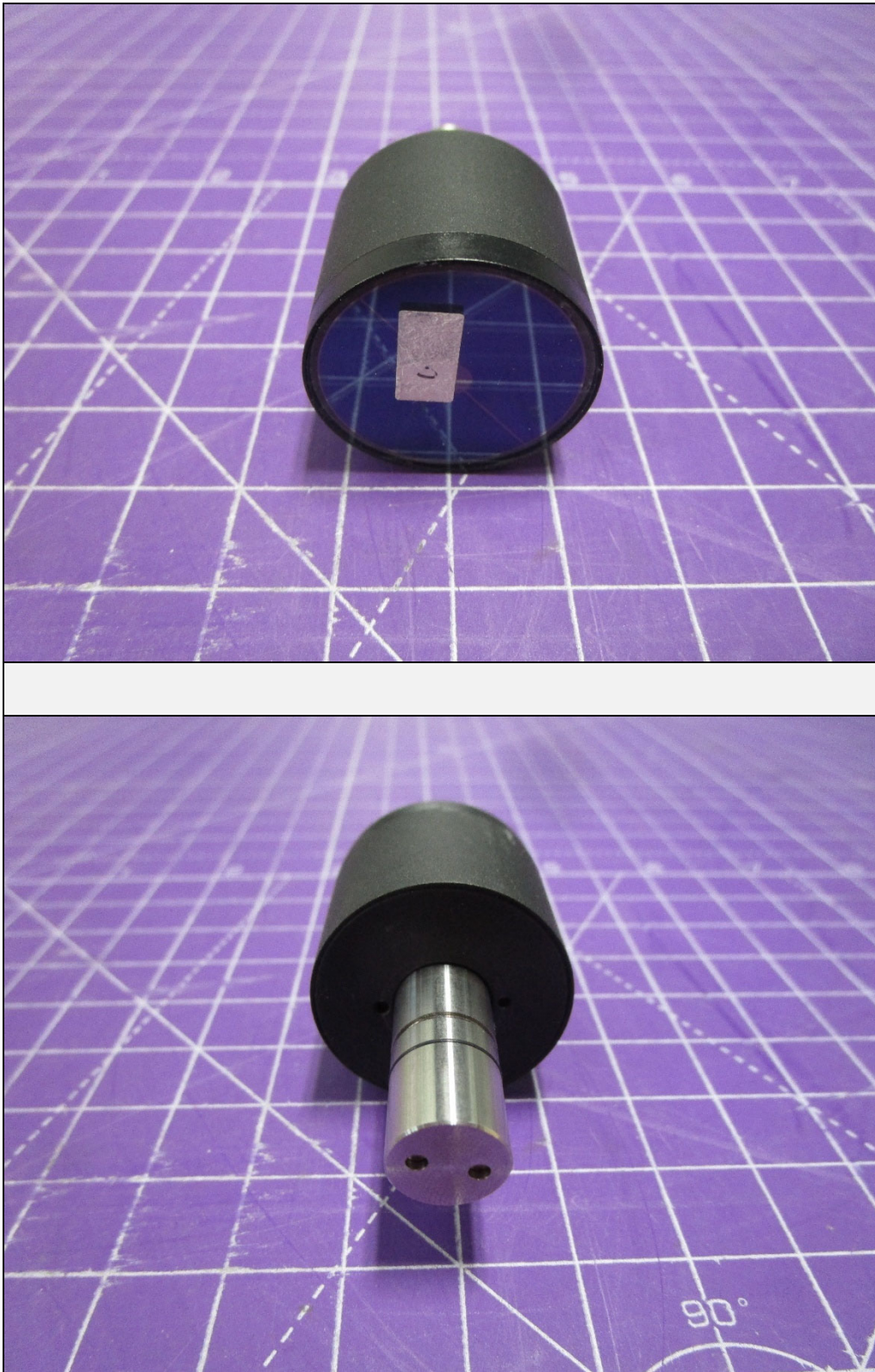
15. Statement of Conformity

The Last Lock Smart Core, Model No. C100 did fully conform to the selected requirements of FCC "Code of Federal Regulations" Title 47 Part 15, Subpart F, Section 15.519 and Innovation, Science, and Economic Development Canada, RSS-220:

16. Certification

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart F, Section 15.519 and Innovation, Science, and Economic Development Canada, RSS-220 test specifications. The data presented in this test report pertains to the EUTs as received by the customer on the test date specified. Any electrical or mechanical modifications made to the EUTs subsequent to the specified test date will serve to invalidate the data and void this certification.

17. Photographs of EUT



18. Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW10	Preamplifier	Planar	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1-18GHz	3/18/2025	3/18/2026
APW17	Preamplifier	Planar	PE2-36-26D540G-5R0-10-12-292FF	PL30297/2039	26.5-40GHz	3/25/2025	3/25/2026
APW18	Preamplifier	Planar	PE2-30-20G20R6G-3R0-10-12-SFF	PL34312/2148	18-26.5GHz	2/11/2025	2/11/2026
CDM5	Lab Computer	ELITE		---	---	N/A	
NHG1	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NHH1	STANDARD GAIN HORN ANTENNA	NARDA	V637	---	26.5-40GHZ	NOTE 1	
NWN1	DOUBLE RIDGED GUIDE ANTENNA	ETS LINDGREN	3116C	227802	10GHz-40GHz	9/16/2024	9/16/2026
PHA0	MAGNETIC FIELD PROBE	ELECTRO-METRICS	EM-6882	134	22-230MHZ	NOTE 1	
R29F	3M ANECHOIC CHAMBER NSA	EMC TEST SYSTEMS	3M ANECHOIC		30MHZ-18GHZ	6/1/2025	6/1/2027
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	5/4/2025	5/4/2026
RBG4	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	103007	2HZ-44GHZ	4/5/2025	4/5/2026
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
VBV2	COMMERCIAL RADIATED EMISSIONS.EXE	ELITE		---	---	N/A	
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	

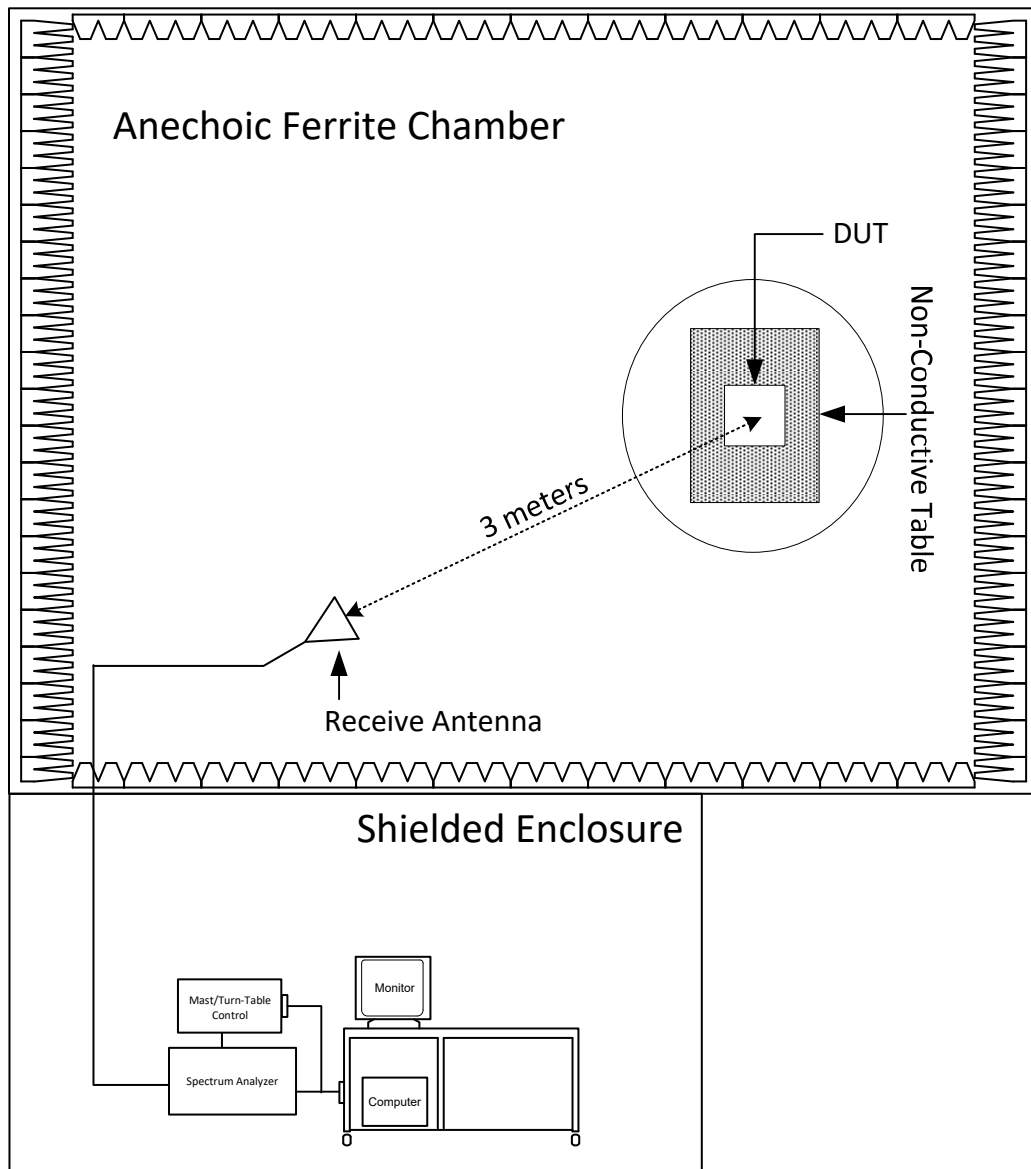
N/A: Not Applicable

I/O: Initial Only

CNR: Calibration Not Required

NOTE 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

19. Block Diagram of Test Setup



Radiated Measurements Test Setup

20. 10dB Bandwidth

EUT Information	
Manufacturer	Last Lock
Product	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz UWB Ch 9 @ 7987.2MHz

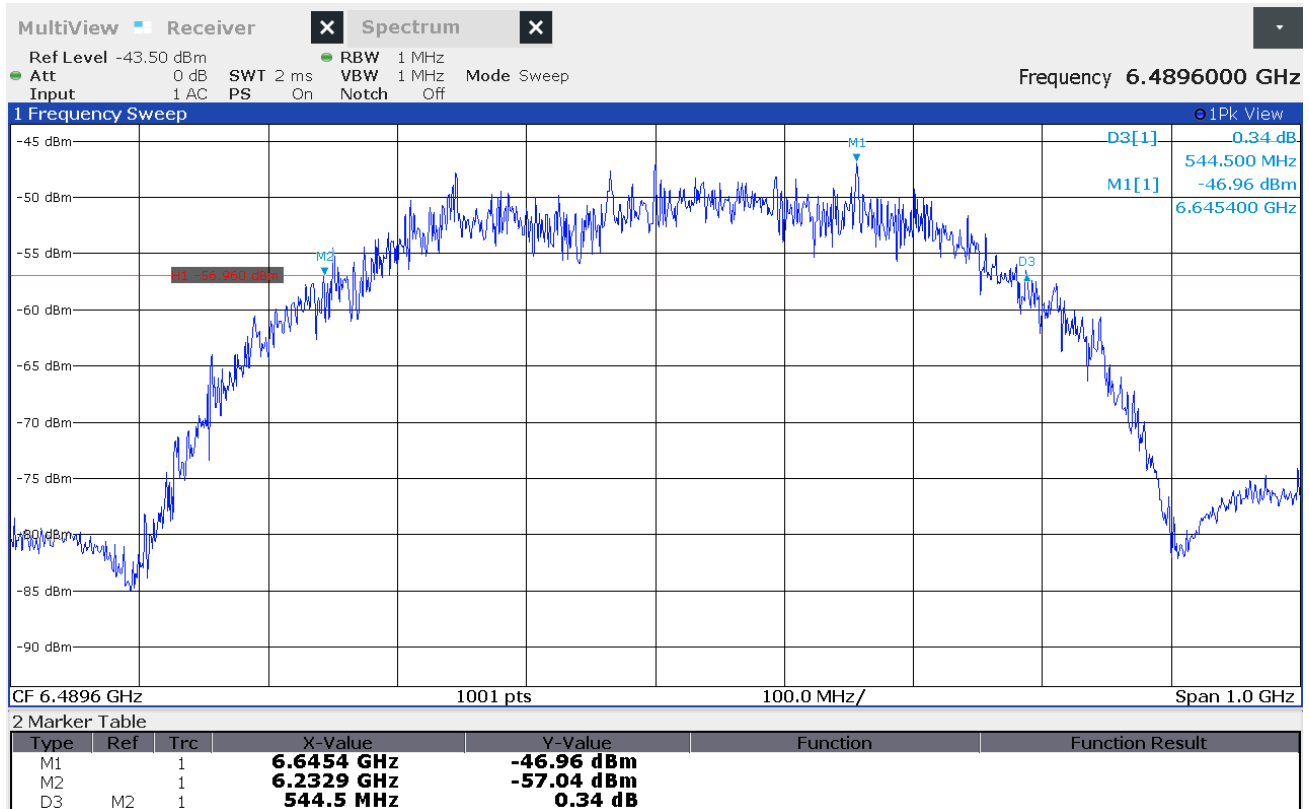
Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Type of Test Site	Tabletop
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

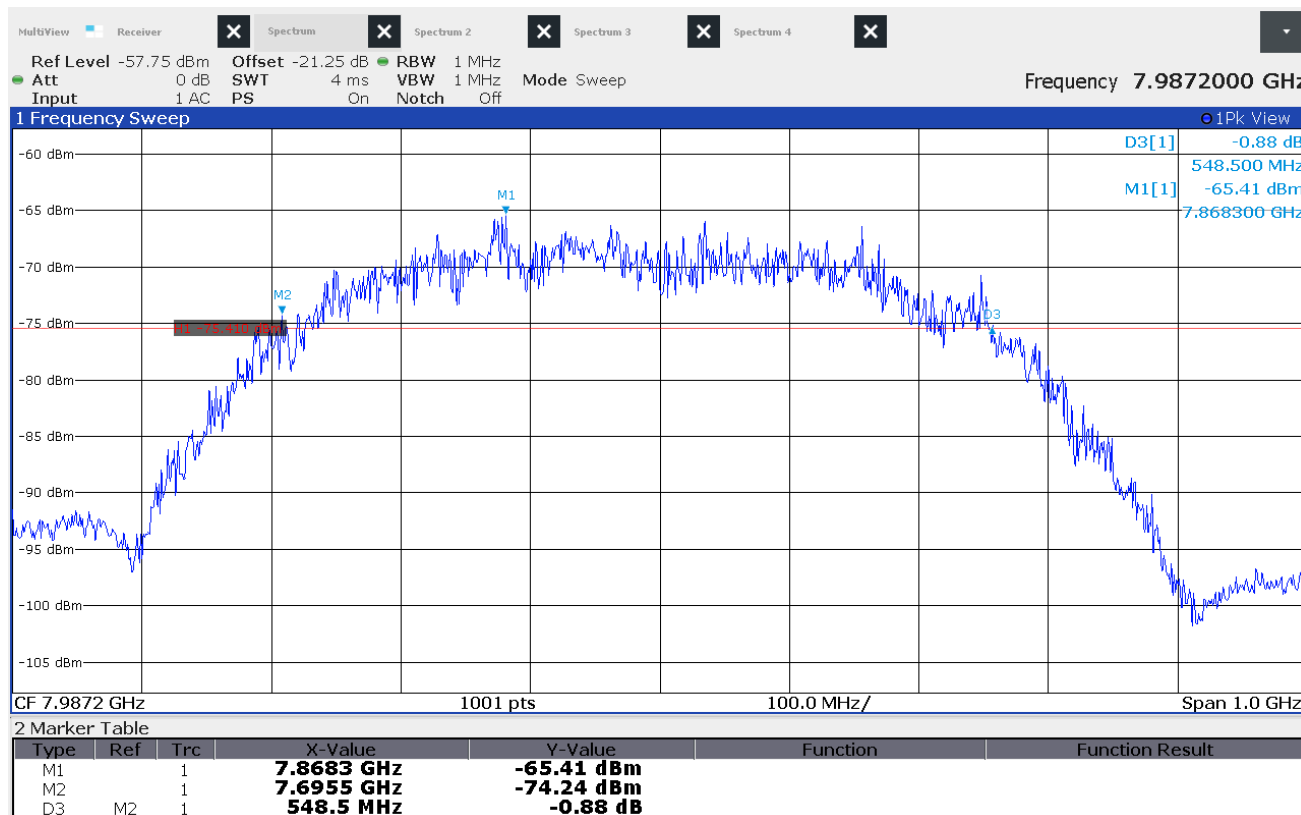
Requirements
Ultra-wideband transmitters shall have a minimum 10dB bandwidth of 500MHz.

Procedure
The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. The EUT was allowed to transmit continuously. The transmit channel was set separately to the low and high channels. The resolution bandwidth (RBW) was set to 1MHz, the video bandwidth (VBW) was set to 1MHz or greater, and the span was set to 1GHz. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. Two markers were placed at points 10dB lower than the fundamental, one above the fundamental frequency and one below. The analyzer's display was then screenshot and saved.

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz
Frequency Tested	6489.6MHz
Result	10dB BW = 544.5MHz



Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz
Frequency Tested	7987.2MHz
Result	10dB BW = 548.5MHz



21. Shutoff Time

EUT Information	
Manufacturer	Last Lock
Product	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz

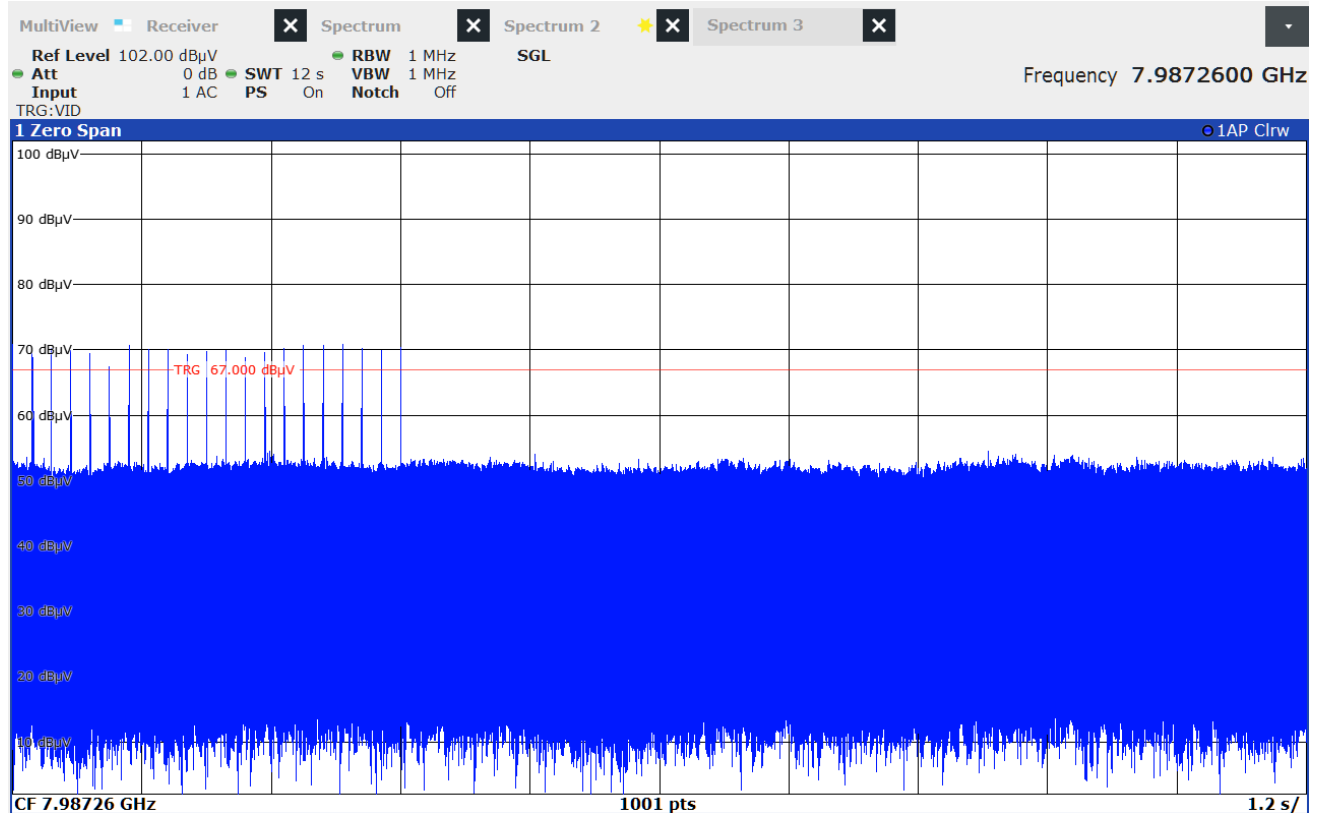
Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Type of Test Site	Tabletop
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

Requirements
The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

Procedure
The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously. The spectrum analyzer was set to zero span centered on a hopping channel. The resolution bandwidth (RBW) was set $\geq$ to the channel spacing. The sweep was set to capture the entire dwell time per hopping channel. The peak detector and 'Max-Hold' function were engaged. The analyzer's display was plotted using a 'screen dump' utility.

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz
Frequency Tested	7987.2MHz
Result	On Time < 4s



22. Maximum Peak Conducted Output Power

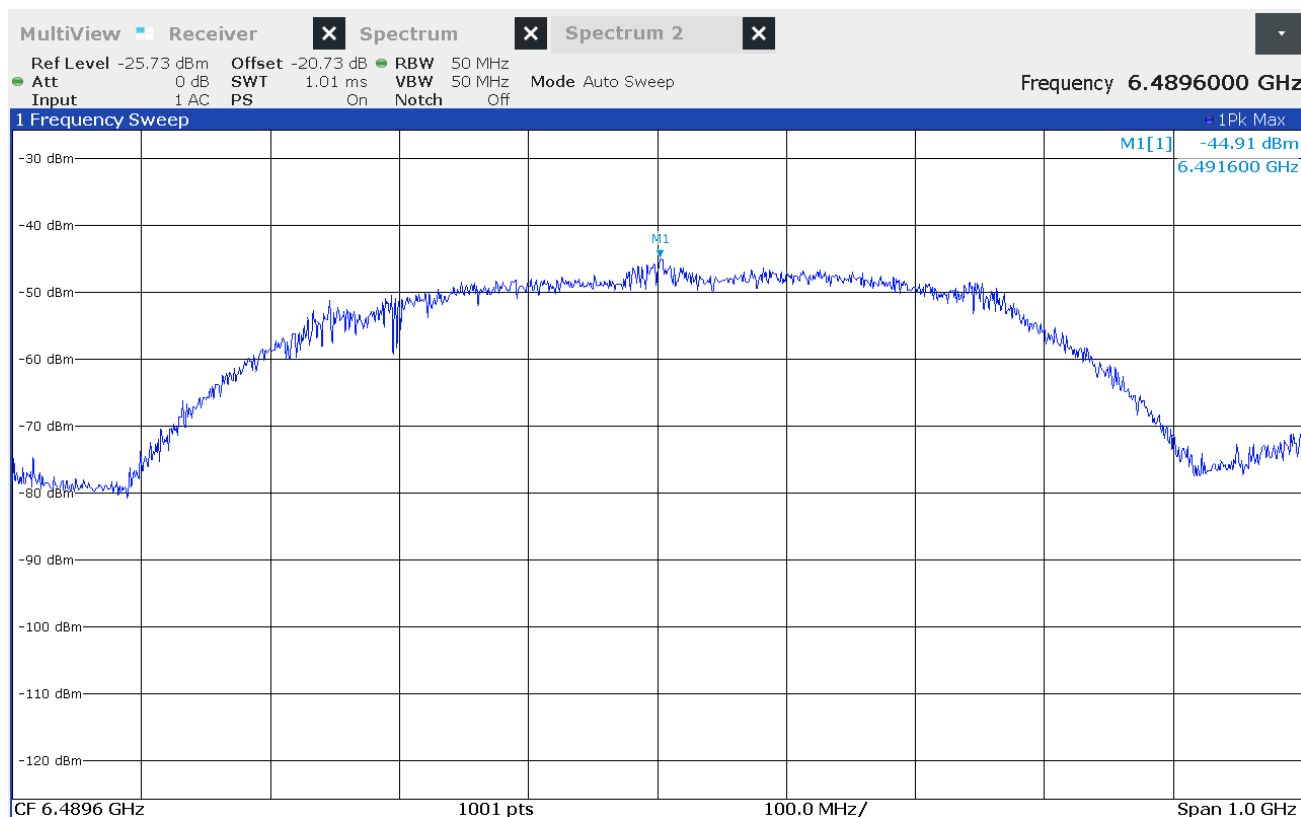
EUT Information	
Manufacturer	Last Lock
Product	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz UWB Ch 9 @ 7987.2MHz

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Type of Test Site	Tabletop
Notes	None

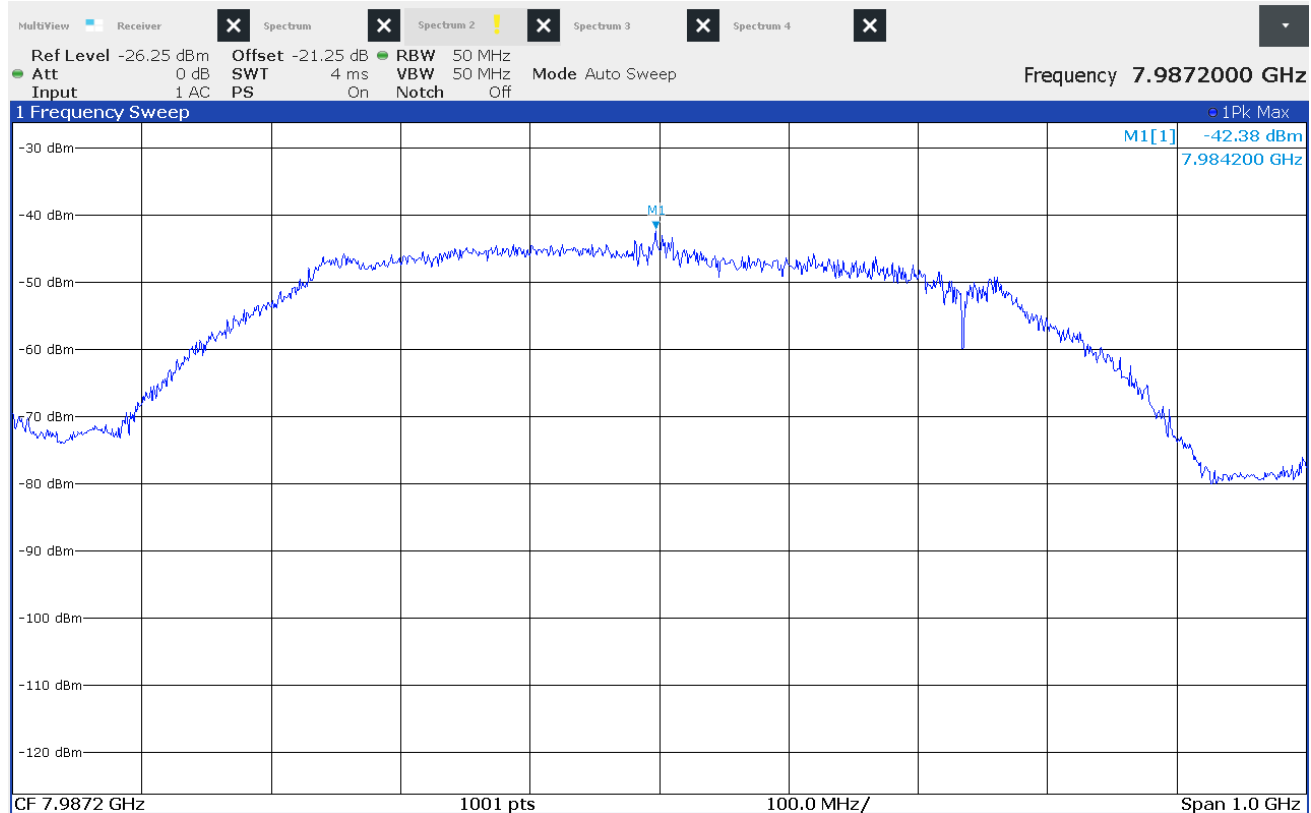
Requirements
The output power shall not exceed 1mW (0dBm).

Procedure
The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation. The EUT was set to transmit separately at the low, middle, and high channels. The resolution bandwidth (RBW) was set to greater than the 6dB bandwidth. The span was set to greater than 3 times the RBW. The 'Max-Hold' function was engaged. The maximum meter reading was recorded. The peak power output was calculated for the low, middle, and high channels.

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz
Frequency Tested	6489.6MHz
Result	Output Power = 32.3nW (-44.91dBm)



Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz
Frequency Tested	7987.2MHz
Result	Output Power = 57.8nW (-42.38dBm)



23. Effective Isotropic Radiated Power (EIRP)

EUT Information	
Manufacturer	Last Lock
Product	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz UWB Ch 9 @ 7987.2MHz

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Radiated
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	Room 29
Type of Antennas Used	Double-ridged waveguide (or equivalent)
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

Requirements
The output power shall not exceed 1mW (0dBm).

Procedure
The EUT was placed on the non-conductive stand and set to transmit. A <u>double ridged waveguide antenna</u> was placed at a test distance of 3 meters from the EUT. The resolution bandwidth (RBW) of the spectrum analyzer was set to greater than the 6dB bandwidth. The EUT was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded. The peak power output was measured for the low and high channels. The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a dipole antenna (double ridged waveguide antenna for all measurements above 1GHz) was then set in place of the EUT and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was then corrected to compensate for cable loss (and antenna gain for all measurements above 1GHz), as required. The peak power output was calculated for low and high hopping frequencies.

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz UWB Ch 9 @ 7987.2MHz
Result	Max EIRP = 0.524mW (-2.8dBm)

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Total dBuV/m at 3m	EIRP (dBm)
6489.4	H	47.8	5.3	35.6	0.0	88.6	-6.6
	V	47.7	5.3	35.6	0.0	88.6	-6.7
7987.2	H	49.1	6.0	35.7	0.0	90.8	-4.5
	V	50.8	6.0	35.7	0.0	92.5	-2.8

24. Spurious Radiated Emissions

EUT Information	
Manufacturer	Last Lock
Product	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz UWB Ch 9 @ 7987.2MHz

Test Setup Details	
Setup Format	Tabletop
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	Room 29
Type of Antennas Used	1 – 18GHz: Double-Ridged Waveguide (or equivalent) Above 18GHz: Horn (or equivalent)
Notes	Per the average limits listed in FCC 15.519, the traditional 3m distance would create insufficient margin between the limits and the system's noise floor. To avoid taking failing readings even before the EUT's emissions were factored in, the antenna was brought closer than 3m to the EUT and a distance correction factor was applied. The following DCCFs were used during testing: $DCCF_{1m} = 20 * \log\left(\frac{1}{3}\right) = -9.5dB$ $DCCF_{0.3m} = 20 * \log\left(\frac{0.3}{3}\right) = -20dB$ $DCCF_{0.8m} = 20 * \log\left(\frac{1}{3}\right) = -11.5dB$ Applicable test distances are listed above the corresponding data.

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2
Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz)	3.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz)	3.4

Procedure

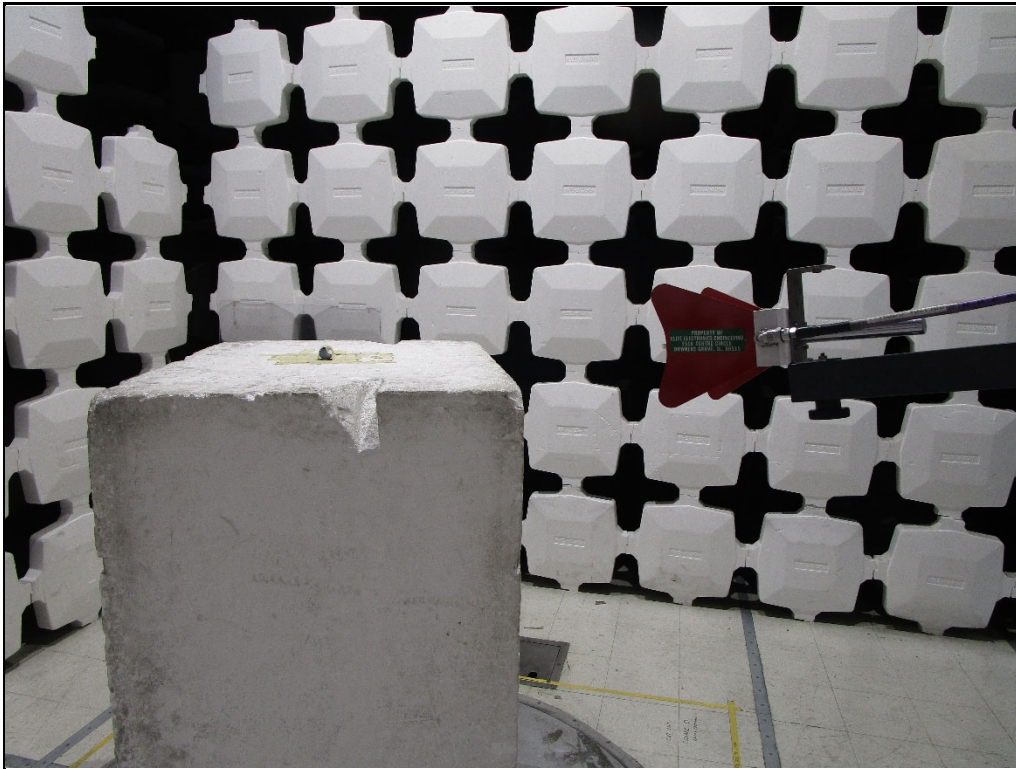
Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations, from interfering with the measurements. All power lines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 40GHz was investigated using a peak detector function.

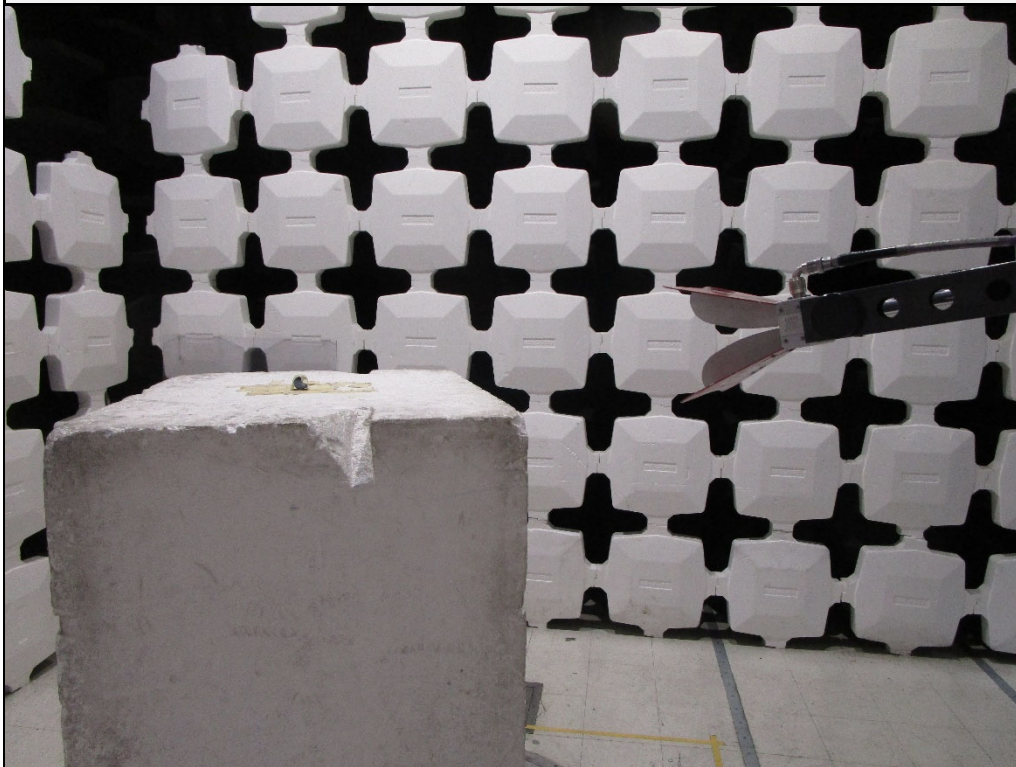
The final open field emission tests were then manually performed over the frequency range of 30MHz to 40GHz.

1) For all harmonics, the following procedure was used:

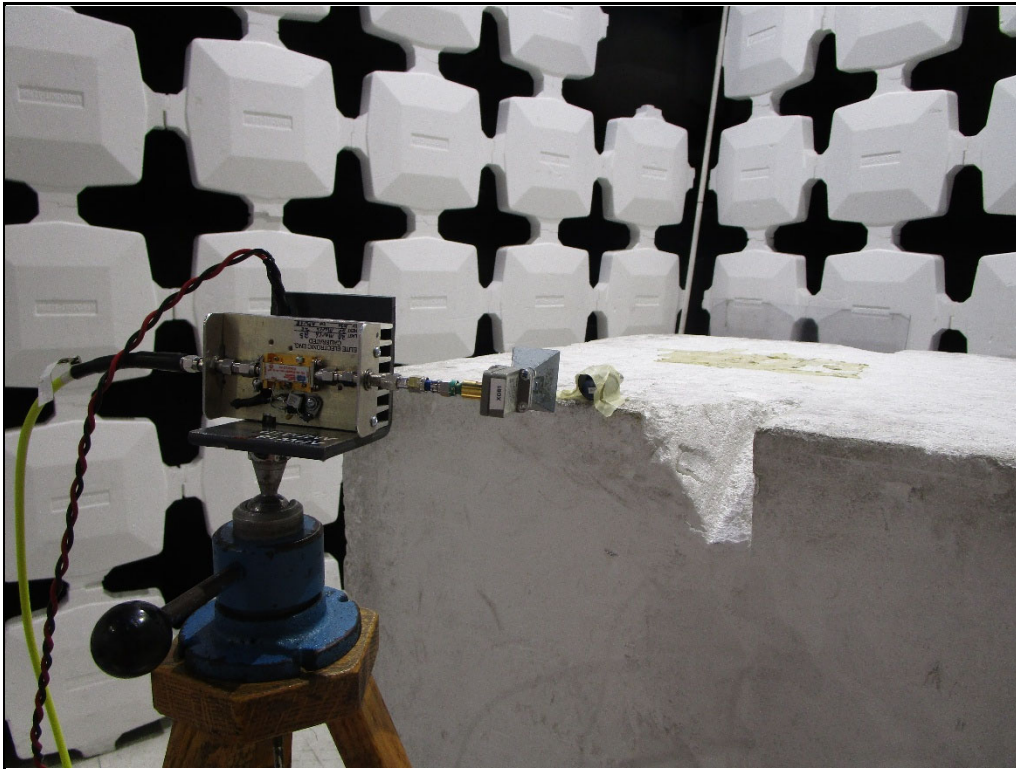
- a) The field strength of the fundamental was measured using a double ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1MHz was used on the spectrum analyzer.
- b) The field strengths of all of the harmonics were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at the required distance from the EUT to lower the noise floor below the limit (see Note at beginning of section). The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1MHz was used on the spectrum analyzer.
- c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:
 - i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
 - ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
 - iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer, the measuring antenna was not raised or lowered to ensure maximized readings. Instead, the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
- d) All harmonics must be below the general limits specified in §15.519(c).



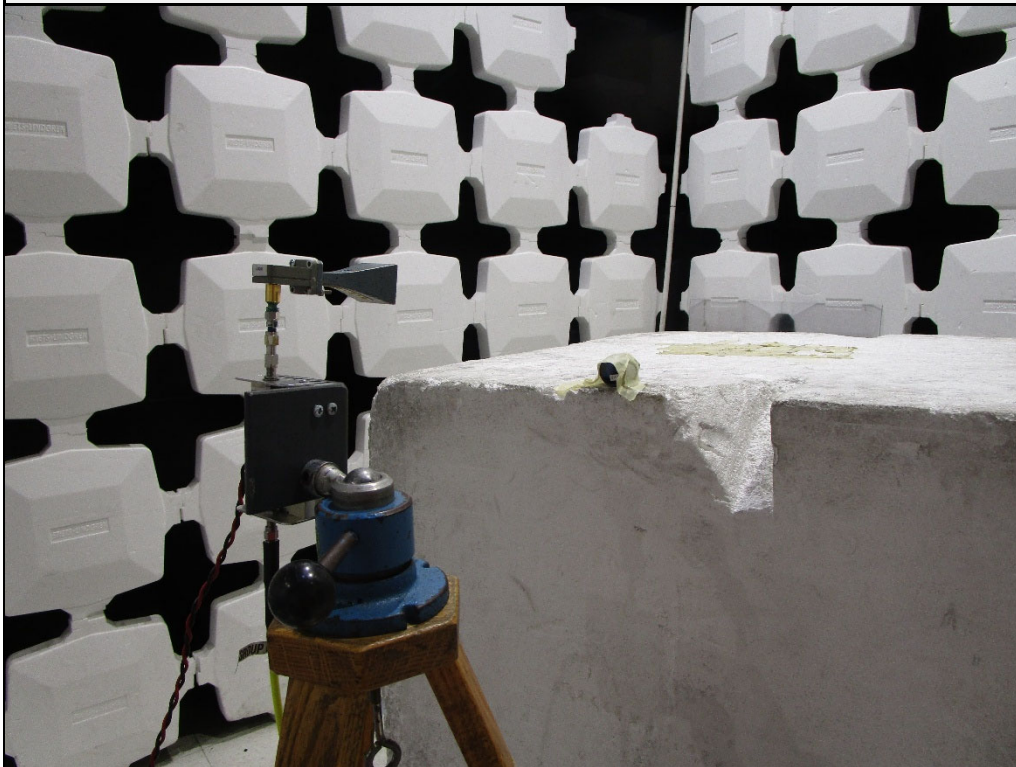
Test Setup for Spurious Radiated Emissions, 1 – 18GHz – Antenna Polarization Horizontal



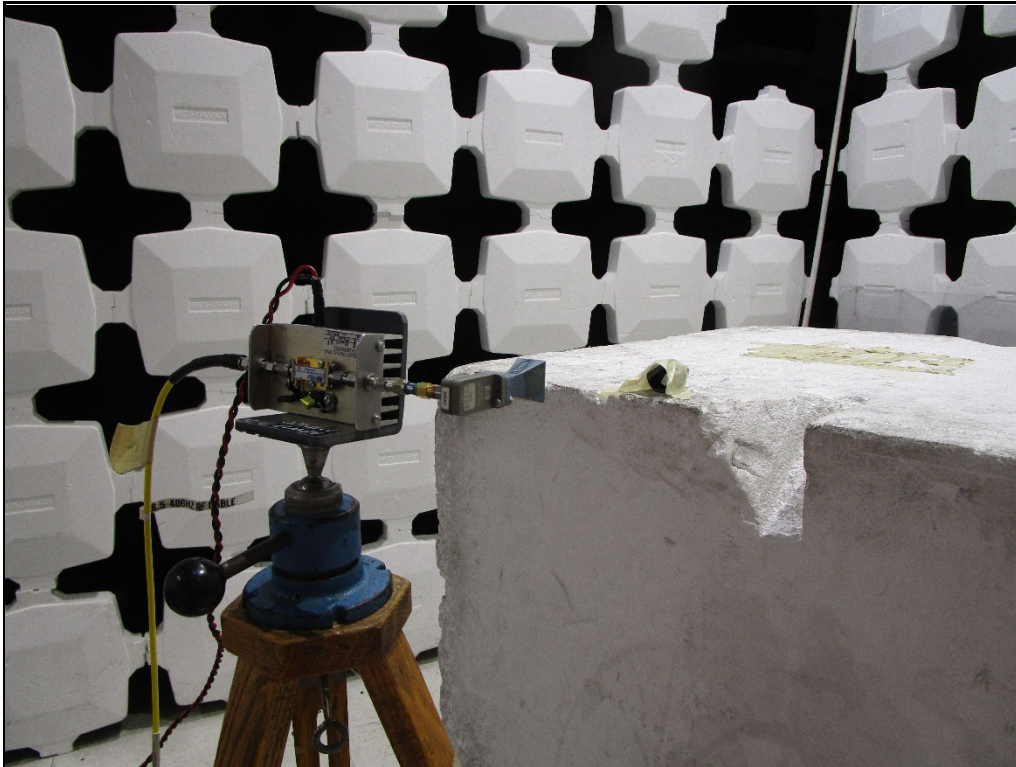
Test Setup for Spurious Radiated Emissions, 1 – 18GHz – Antenna Polarization Vertical



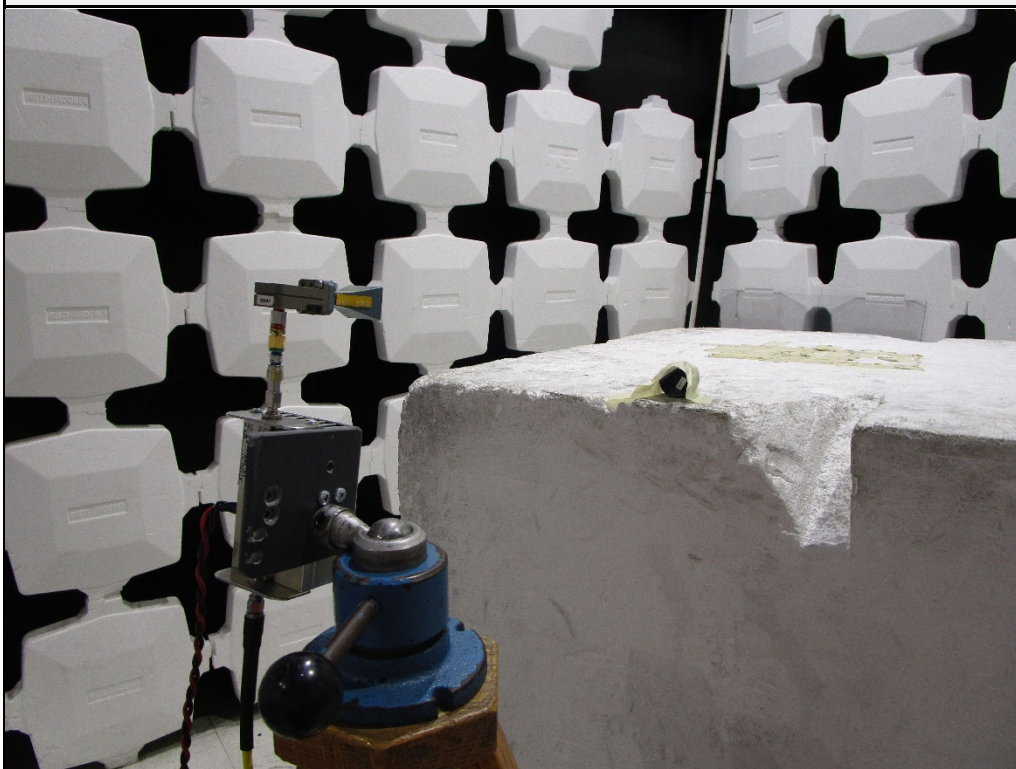
Test Setup for Spurious Radiated Emissions, 18GHz – 26.5GHz – Antenna
Polarization Horizontal



Test Setup for Spurious Radiated Emissions, 18GHz – 26.5GHz – Antenna
Polarization Vertical



Test Setup for Spurious Radiated Emissions, Above 26.5GHz – Antenna Polarization Horizontal



Test Setup for Spurious Radiated Emissions, Above 26.5GHz – Antenna Polarization Vertical

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz
Frequency Tested	6489.6MHz
Notes	Measurements at 1m

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Total dBuV/m at 3m	ERP (dBm)	Distance Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
12979.2	H	34.8	7.4	39.2	-40.1	41.2	-56.2	-9.5	-63.6	-61.3	-2.3
12979.2	V	35.4	7.4	39.2	-40.1	41.8	-55.6	-9.5	-63.0	-61.3	-1.7

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz
Frequency Tested	6489.6MHz
Notes	Measurements at 30cm

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Total dBuV/m at 3m	ERP (dBm)	Distance Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
19468.8	H	25.0	2.0	40.4	-26.8	40.6	-56.8	-20.0	-74.7	-61.3	-13.4
19468.8	V	24.9	2.0	40.4	-26.8	40.5	-56.9	-20.0	-74.8	-61.3	-13.5
25958.4	H	25.5	2.3	40.7	-25.0	43.5	-53.9	-20.0	-71.7	-61.3	-10.4
25958.4	V	25.4	2.3	40.7	-25.0	43.4	-54.0	-20.0	-71.8	-61.3	-10.5
32448.0	H	32.3	0.0	44.0	-35.6	40.7	-56.7	-20.0	-74.5	-61.3	-13.2
32448.0	V	32.2	0.0	44.0	-35.6	40.6	-56.8	-20.0	-74.6	-61.3	-13.3
38937.6	H	38.0	0.0	44.2	-33.6	48.6	-48.8	-20.0	-66.7	-61.3	-5.4
38937.6	V	37.6	0.0	44.2	-33.6	48.2	-49.2	-20.0	-67.1	-61.3	-5.8

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz
Frequency Tested	7987.2MHz
Notes	Measurements at 80cm

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Total dBuV/m at 3m	ERP (dBm)	Distance Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
15974.4	H	33.2	8.3	41.2	-39.0	43.7	-53.7	-11.5	-63.0	-61.3	-1.7
15974.4	V	33.2	8.3	41.2	-39.0	43.7	-53.7	-11.5	-63.0	-61.3	-1.7

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz
Frequency Tested	7987.2MHz
Notes	Measurements at 30cm

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Total dBuV/m at 3m	ERP (dBm)	Distance Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
23961.6	H	29.6	2.2	40.6	-25.3	47.2	-50.2	-20.0	-68.1	-61.3	-6.8
23961.6	V	29.6	2.2	40.6	-25.3	47.2	-50.2	-20.0	-68.1	-61.3	-6.8
31948.8	H	32.9	0.0	43.9	-36.3	40.5	-56.9	-20.0	-74.7	-61.3	-13.4
31948.8	V	32.6	0.0	43.9	-36.3	40.2	-57.2	-20.0	-75.0	-61.3	-13.7
39936.0	H	33.0	0.0	44.2	-31.7	45.5	-51.9	-20.0	-69.7	-61.3	-8.4
39936.0	V	33.0	0.0	44.2	-31.7	45.5	-51.9	-20.0	-69.7	-61.3	-8.4

25. Power Spectral Density

EUT Information	
Manufacturer	Last Lock
Product	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz UWB Ch 9 @ 7987.2MHz

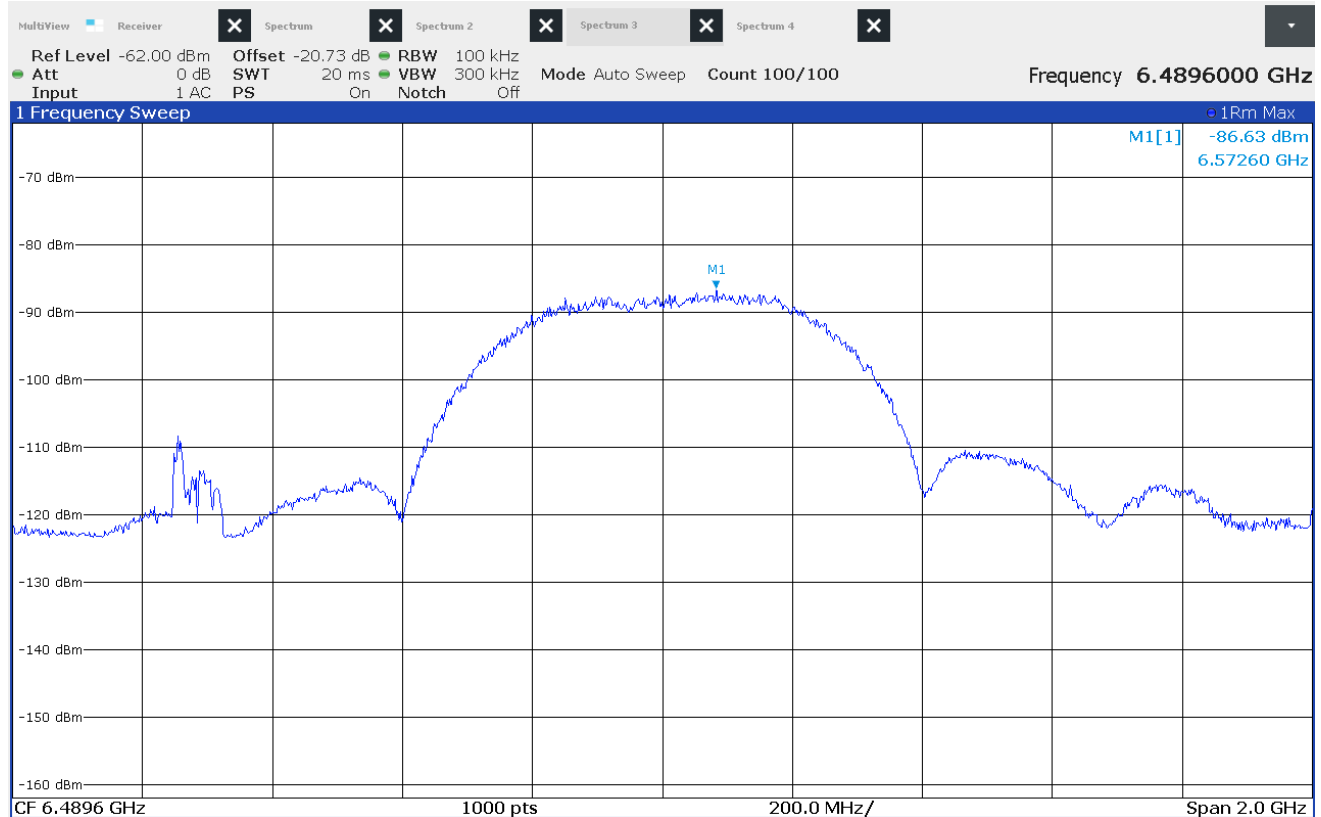
Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Type of Test Site	Elite Test Bench
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

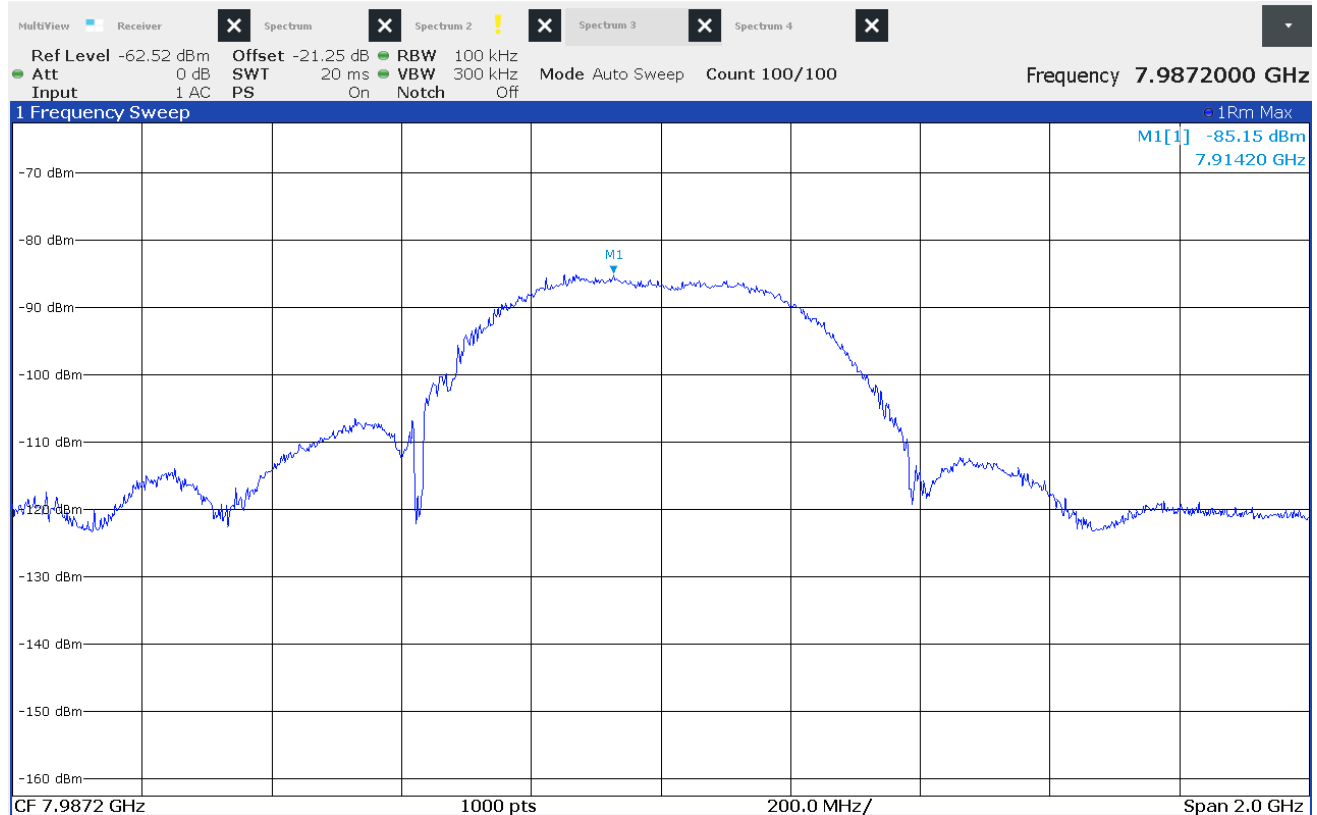
Requirement
The power spectral density from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Procedure
1) The antenna port of the EUT was connected to the spectrum analyzer through a 20dB pad. 2) The EUT was then placed in the normal operation mode. 3) To determine the power spectral density, the following spectrum analyzer settings were used: a) Center Frequency = Transmit Frequency b) Span = 1.5× the DTS (6dB) bandwidth c) Resolution Bandwidth (RBW) = 3kHz ≤ RBW ≤ 100kHz d) Sweep time = Auto e) Detector = Peak f) Trace Function = Max-Hold 4) A display line was then placed on the corresponding +8dBm level. 5) The analyzers display was then screenshot and saved.

Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 5 @ 6489.6MHz
Frequency Tested	6489.6MHz
Result	PSD = -86.63dBm



Test Details	
Manufacturer	Last Lock
EUT	Smart Core
Model No.	C100
Serial No.	109-1, 112-1, or 24-1
Mode	UWB Ch 9 @ 7987.2MHz
Frequency Tested	7987.2MHz
Result	PSD = -85.15dBm



26. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.
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Downers Grove, IL 60515
Robert Bugielski (QA Manager) Phone: 630 495 9770 ext. 168
Email: rbugielski@elitetest.com
Craig Fanning (EMC Lab Manager) Phone: 630 495 9770 ext. 112
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Brandon Lugo (Automotive Team Leader) Phone: 630 495 9770 ext. 163
Email: blugo@elitetest.com
Richard King (FCC/Commercial Team Leader) Phone: 630 495 9770 ext. 123
Email: reking@elitetest.com
Website: www.elitetest.com

ELECTRICAL

Valid To: June 30, 2027

Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory at the location listed above, as well as the satellite location listed below, to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:**Test Method(s)¹:**

Transient Immunity
(Max Voltage 1500 V/Max current 1000 A)

ISO 7637-2 (including emissions); ISO 7637-3; ISO 7637-4;
ISO 16750-2, Sections 4.6.3 and 4.6.4;
ISO 21498-1; ISO 21498-2;
CS.00054, Section 5.9; CS.00244 Section 5.2.15 through 5.2.21; CS.00245; CS.00246 Section 5.2.4;
EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222);
GMW 3097, Section 3.5; SAE J1113-11; SAE J1113-12;
ECE Regulation 10.06 Annex 10

Electrostatic Discharge (ESD)
(Up to +/-25 kV)

ISO 10605 (2001, 2008); ISO 10605;
CS.00054, Section 5.10; CS.00244 Section 5.5;
EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13;
GMW 3097 Section 3.6

Conducted Emissions

CISPR 25 (2002, 2008), Sections 6.2 and 6.3;
CISPR 25 (2016), Sections 6.3 and 6.4; CISPR 25;
CS.00054, Sections 5.6.1 and 5.6.2;
CS.00244 Sections 5.4.2 and 5.4.3; GMW 3097, Section 3.3.2;
EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421, CE 430, CE440)

(A2LA Cert. No. 1786.01) 08/14/2025



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5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Test Technology:
Test Method(s)¹:

Radiated Emissions Anechoic
(Up to 6 GHz)

CISPR 25 (2002, 2008), Section 6.4;
CISPR 25 (2016), Section 6.5; CISPR 25;
CS.00054, Section 5.6.3; CS.00244 Section 5.4.4;
GMW 3097, Section 3.3.1;
EMC-CS-2009.1 (RE 310); FMC1278 (RE310, RE320)

Vehicle Radiated Emissions

CISPR 12; CISPR 36; ICES-002;
ECE Regulation 10.06 Annex 4;
ECE Regulation 10.06 Annex 5

Bulk Current Injection (BCI)
(1 to 400MHz 500mA)

ISO 11452-4; CS.00054, Section 5.8.1;
CS.00244 Section 5.3.2;
GMW 3097, Section 3.4.1; SAE J1113-4;
EMC-CS-2009.1 (RI112); FMC1278 (RI112);
ECE Regulation 10.06 Annex 9

Radiated Immunity Anechoic
(Up to 6GHz and 200V/m)
(Including Radar Pulse 600V/m)

ISO 11452-2;
CS.00054, Section 5.8.2; CS.00244 Section 5.3.3;
GMW 3097, Section 3.4.2;
EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21;
ECE Regulation 10.06 Annex 9

Radiated Immunity Magnetic Field

ISO 11452-8; FMC 1278 (RI140); CS.00244 Section 5.3.4

Radiated Immunity Reverb
(360MHz to 6GHz and 100V/m)

ISO/IEC 61000-4-21; GMW 3097, Section 3.4.3;
EMC-CS-2009.1 (RI114); FMC1278 (RI114);
ISO 11452-11

Radiated Immunity
(Portable Transmitters)
(Up to 6GHz and 20W)

ISO 11452-9;
CS.00244 Section 5.3.5;
EMC-CS-2009.1 (RI115); FMC1278 (RI115);
GMW 3097, Sec 3.4.4

Vehicle Radiated Immunity (ALSE)

ISO 11451-2; ECE Regulation 10.06 Annex 6

Vehicle Product Specific EMC Standards

EN 14982; EN ISO 13309; ISO 13766; EN 50498;
EC Regulation No. 2015/208; EN 55012

Electrical Loads

ISO 16750-2

Stripline

ISO 11452-5

Emissions

Radiated and Conducted
(3m Semi-anechoic chamber,
up to 40 GHz)

47 CFR, FCC Part 15 B (using ANSI C63.4:2014);
47 CFR, FCC Part 18 (using FCC MP-5:1986);
ICES-001; ICES-003; ICES-005;
IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004);
IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010);
KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008);
CISPR 11; EN 55011; KS C 9811; CNS 13803 (1997, 2003);
CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1;

Test Technology:

Radiated and Conducted (cont'd)
(3m Semi-anechoic chamber,
up to 40 GHz)

Test Method(s)¹:

CISPR 16-2-1 (2008); CISPR 16-2-1; KS C 9814-1; KN 14-1;
IEC/CISPR 22 (1997);
EN 55022 (1998) + A1(2000);
EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006);
IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004);
AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz);
CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz);
CISPR 32; EN 55032; KS C 9832; KN 32;
ECE Regulation 10.06 Annex 7 (Broadband);
ECE Regulation 10.06 Annex 8 (Narrowband);
ECE Regulation 10.06 Annex 13 (Conducted);
ECE Regulation 10.06 Annex 14 (Conducted)

Cellular Radiated Spurious Emissions

ETSI TS 151 010-1 GSM; 3GPP TS 51.010-1, Sec 12;
ETSI TS 134 124 UMTS; 3GPP TS 34.124;
ETSI TS 136 124 LTE; E-UTRA; 3GPP TS 36.124

Current Harmonics

IEC 61000-3-2; IEC 61000-3-12;
EN 61000-3-2; KN 61000-3-2;
KS C 9610-3-2; ECE Regulation 10.06 Annex 11

Flicker and Fluctuations

IEC 61000-3-3; IEC 61000-3-11;
EN 61000-3-3; KN 61000-3-3;
KS C 9610-3-3; ECE Regulation 10.06 Annex 12

Immunity

Electrostatic Discharge

IEC 61000-4-2, Ed. 1.2 (2001);
IEC 61000-4-2 (1995) + A1(1998) + A2(2000);
EN 61000-4-2 (1995); EN 61000-4-2 (2009-05);
KN 61000-4-2 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2;
KS C 9610-4-2; IEEE C37.90.3 2001

Radiated Immunity

IEC 61000-4-3 (1995) + A1(1998) + A2(2000);
IEC 61000-4-3, Ed. 3.0 (2006-02);
IEC 61000-4-3, Ed. 3.2 (2010);
KN 61000-4-3 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3;
KS C 9610-4-3; IEEE C37.90.2 2004

Electrical Fast Transient/Burst

IEC 61000-4-4, Ed. 2.0 (2004-07);
IEC 61000-4-4, Ed. 2.1 (2011);
IEC 61000-4-4 (1995) + A1(2000) + A2(2001);
KN 61000-4-4 (2008-5);
RRL Notice No. 2008-5 (May 20, 2008);
IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4;
KS C 9610-4-4; ECE Regulation 10.06 Annex 15

Test Technology:
Test Method(s)¹:

Surge

IEC 61000-4-5 (1995) + A1(2000);
IEC 61000-4-5, Ed 1.1 (2005-11);
EN 61000-4-5 (1995) + A1(2001);
KN 61000-4-5 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5;
KS C 9610-4-5;
IEEE C37.90.1 2012; IEEE STD C62.41.2 2002;
ECE Regulation 10.06 Annex 16

Conducted Immunity

IEC 61000-4-6 (1996) + A1(2000);
IEC 61000-4-6, Ed 2.0 (2006-05);
IEC 61000-4-6 Ed. 3.0 (2008);
KN 61000-4-6 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6;
EN 61000-4-6; KN 61000-4-6; KS C 9610-4-6

Power Frequency Magnetic Field Immunity (*Down to 3 A/m*)

IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009);
EN 61000-4-8 (1994) + A1(2000);
KN 61000-4-8 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8; KS C 9610-4-8

Voltage Dips, Short Interrupts, and Line Voltage Variations

IEC 61000-4-11, Ed. 2 (2004-03);
KN 61000-4-11 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11;
KS C 9610-4-11

Ring Wave

IEC 61000-4-12, Ed. 2 (2006-09);
EN 61000-4-12:2006;
IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12;
IEEE STD C62.41.2 2002

Generic and Product Specific EMC Standards

IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1;
KS C 9610-6-1; IEC/EN 61000-6-2; AS/NZS 61000-6-2;
KN 61000-6-2; KS C 9610-6-2; IEC/EN 61000-6-3;
AS/NZS 61000-6-3; KN 61000-6-3; KS C 9610-6-3;
IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4;
KS C 9610-6-4; EN 50130-4; EN 61326-1; EN 50121-3-2;
EN 12895; EN 50270; EN 50491-1; EN 50491-2; EN 50491-3;
EN 55015; EN 60730-1; EN 60945; IEC 60533;
EN 61326-2-6; EN 61800-3; IEC/CISPR 14-2; EN 55014-2;
AS/NZS CISPR 14.2; KN 14-2; KS C 9814-2;
IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24;
IEC/CISPR 35; AS/NZS CISPR 35; EN 55035; KN 35;
KS C 9835; IEC 60601-1-2; JIS T0601-1-2; ANSI C63.27

Test Technology:
Test Method(s)¹:
TxRx EMC Requirements

EN 301 489-1; EN 301 489-3; EN 301 489-9;
EN 301 489-17; EN 301 489-19; EN 301 489-20

European Radio Test Standards

ETSI EN 300 086-1; ETSI EN 300 086-2;
ETSI EN 300 113-1; ETSI EN 300 113-2;
ETSI EN 300 220-1; ETSI EN 300 220-2;
ETSI EN 300 220-3-1; ETSI EN 300 220-3-2;
ETSI EN 300 330-1; ETSI EN 300 330-2;
ETSI EN 300 440-1; ETSI EN 300 440-2;
ETSI EN 300 422-1; ETSI EN 300 422-2;
ETSI EN 300 328; ETSI EN 301 893;
ETSI EN 301 511; ETSI EN 301 908-1;
ETSI EN 908-2; ETSI EN 908-13;
ETSI EN 303 413; ETSI EN 302 502;
EN 303 340; EN 303 345-2; EN 303 345-3; EN 303 345-4

Canadian Radio Tests

RSS-102; RSS-102.NS.MEAS;
SPR-002; 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-192; RSS-194;
RSS-195; RSS-196; RSS-197; RSS-198; RSS-199;
RSS-210 (up to 40 GHz); RSS-211 (up to 40 GHz);
RSS-213; RSS-215; RSS-216 (up to 40 GHz);
RSS-220 (up to 40 GHz); RSS-222; RSS-236; RSS-238;
RSS-243; RSS-244; RSS-247; RSS-248; RSS-252; RSS-287;
RSS-288; RSS-310; RSS-GEN

Mexico Radio Tests

IFT-008-2015; NOM-208-SCFI-2016

Japan Radio Tests

Radio Law No. 131, Ordinance of MPT No. 37, 1981,
MIC Notification No. 88:2004, Table No. 22-11;
ARIB STD-T66, Regulation 18

Taiwan Radio Tests

LP-0002 (February 6, 2024)

Australia/New Zealand Radio Tests

AS/NZS 4268; Radiocommunications (Short Range Devices)
Standard (2014)

Hong Kong Radio Tests

HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7;
HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057;
HKCA 1073

Korean Radio Test Standards

KN 301 489-1; KN 301 489-3; KN 301 489-9;
KN 301 489-17; KN 301 489-52; KS X 3124; KS X 3125;
KS X 3130; KS X 3126; KS X 3129

Vietnam Radio Test Standards

QCVN 47:2015/BTTTT; QCVN 54:2020/BTTTT;
QCVN 55:2011/BTTTT; QCVN 65:2013/BTTTT;
QCVN 73:2013/BTTTT; QCVN 74:2020/BTTTT;
QCVN 112:2017/BTTTT; QCVN 117:2020/BTTTT

Test Technology:
Test Method(s)¹:
Vietnam EMC Test Standards

QCVN 18:2014/BTTTT; QCVN 86:2019/BTTTT;
QCVN 96:2015/BTTTT; QCVN 118:2018/BTTTT

Unlicensed Radio Frequency Devices
(3 Meter Semi-Anechoic Room)

47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H
(using ANSI C63.10:2020, ANSI C63.17:2013 and
FCC KDB 905462 D02 (v02))

Licensed Radio Service Equipment

47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87,
90, 95, 96, 97, 101 (using ANSI/TIA-603-E,
TIA-102.CAAA-E, ANSI C63.26:2015); ANSI/TIA-603-F

OTA (Over the Air) Performance

GSM, GPRS, EGPRS
UMTS (W-CDMA)
LTE Cat 0+, M1, NB1
A-GNSS for UMTS/GSM, LTE
Large Device/Laptop/Tablet Testing
Integrated Device Testing
WiFi 802.11 a/b/g/n/ac

CTIA Test Plan for Wireless Device Over-the-Air
Performance (Method for Measurement for Radiated Power
and Receiver Performance) V6.0²;
CTIA Test Plan for RF Performance Evaluation of WiFi
Mobile Converged Devices V4.0²
***Electrical Measurements and
Simulation***

AC Voltage / Current
(1mV to 5kV) 60 Hz
(0.1V to 250V) up to 500 MHz
(1μA to 150A) 60 Hz

FAA AC 150/5345-10;
FAA AC 150/5345-43;
FAA AC 150/5345-44;
FAA AC 150/5345-46;
FAA AC 150/5345-47;
FAA EB 67

DC Voltage / Current
(1mV to 15 kV) / (1μA to 10A)

Power Factor / Efficiency / Crest Factor
(Power to 30kW)

Resistance
(1mΩ to 4000MΩ)

Surge
(Up to 10 kV / 5 kA) (Combination
Wave and Ring Wave)

West Annex
1524 Centre Circle
Downers Grove, IL 60515

Test Technology:
Test Method(s)²:
Transient Immunity

ISO 7637-2 (including emissions); ISO 7637-3; ISO 7637-4;
ISO 16750-2, Sections 4.6.3 and 4.6.4;
ISO 21498-1; ISO 21498-2;
CS.00054, Section 5.9; CS.00244 Section 5.2.15 through
5.2.21; CS.00245; CS.00246 Section 5.2.4; EMC-CS-2009.1
(CI220); FMC1278 (CI220, CI221, CI222); GMW 3097,
Section 3.5; SAE J1113-11; SAE J1113-12;
ECE Regulation 10.06 Annex 10

***Transverse Electromagnetic (TEM)
Cell***

ISO 11452-3

Emissions

Current Harmonics

IEC 61000-3-2; IEC 61000-3-12;
EN 61000-3-2; KN 61000-3-2;
KS C 9610-3-2; ECE Regulation 10.06 Annex 11

Flicker and Fluctuations

IEC 61000-3-3; IEC 61000-3-11;
EN 61000-3-3; KN 61000-3-3;
KS C 9610-3-3; ECE Regulation 10.06 Annex 12

Immunity

Electrical Fast Transient/Burst

IEC 61000-4-4, Ed. 2.0 (2004-07);
IEC 61000-4-4, Ed. 2.1 (2011);
IEC 61000-4-4 (1995) + A1(2000) + A2(2001);
KN 61000-4-4 (2008-5);
RRL Notice No. 2008-5 (May 20, 2008);
IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4;
KS C 9610-4-4; ECE Regulation 10.06 Annex 15

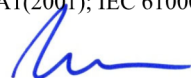
Surge

IEC 61000-4-5 (1995) + A1(2000);
IEC 61000-4-5, Ed 1.1 (2005-11);
EN 61000-4-5 (1995) + A1(2001);
KN 61000-4-5 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5;
KS C 9610-4-5; IEEE C37.90.1 2012;
IEEE STD C62.41.2 2002; ECE Regulation 10.06 Annex 16

Conducted Immunity

IEC 61000-4-6 (1996) + A1(2000);
IEC 61000-4-6, Ed 2.0 (2006-05);
IEC 61000-4-6 Ed. 3.0 (2008);
KN 61000-4-6 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6;

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Test Technology:
Test Method(s)²:

Power Frequency Magnetic Field Immunity (*Down to 3 A/m*)

EN 61000-4-6; KN 61000-4-6; KS C 9610-4-6
IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009);
EN 61000-4-8 (1994) + A1(2000);
KN 61000-4-8 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8; KS C 9610-4-8

Voltage Dips, Short Interrupts, and Line Voltage Variations

IEC 61000-4-11, Ed. 2 (2004-03);
KN 61000-4-11 (2008-5);
RRL Notice No. 2008-4 (May 20, 2008);
IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11;
KS C 9610-4-11

Ring Wave

IEC 61000-4-12, Ed. 2 (2006-09);
EN 61000-4-12:2006;
IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12;
IEEE STD C62.41.2 2002

Electrical Measurements and Simulation
AC Voltage / Current

(1mV to 5kV) 60 Hz
(0.1V to 250V) up to 500 MHz
(1μA to 150A) 60 Hz

FAA AC 150/5345-10;
FAA AC 150/5345-43;
FAA AC 150/5345-44;
FAA AC 150/5345-46;
FAA AC 150/5345-47;
FAA EB 67

DC Voltage / Current

(1mV to 15 kV) / (1μA to 10A)

Power Factor / Efficiency / Crest Factor

(Power to 30kW)

Resistance

(1mΩ to 4000MΩ)

Surge

(Up to 10 kV / 5 kA) (Combination
Wave and Ring Wave)

On the following products and materials:

Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

¹ When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA R101 - General Requirements- Accreditation of Conformity Assessment Bodies.

² Accreditation to the requirements of the CTIA Certification Test Plan does not imply authorization by the CTIA Certification program. Please see the CTIA website <https://ctiacertification.org/test-labs/> for a listing of Authorized Test Labs (ATLs).

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

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
<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)	40000
<u>Intentional Radiators</u> Part 15C	ANSI C63.10:2013	40000
<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	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	40000
<u>BPL Intentional Radiators</u> Part 15G	ANSI C63.10:2013	40000
<u>White Space Device Intentional Radiators</u> Part 15H	ANSI C63.10:2013	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; ANSI C63.26:2015	40000

General Mobile Radio Services (FCC Licensed Radio Service Equipment)

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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

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)</u> Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Maritime and Aviation Radio Services</u> Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
<u>Microwave and Millimeter Bands Radio Services</u> Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Broadcast Radio Services</u> Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<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	40000

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

ELITE ELECTRONIC ENGINEERING INC.

Downers Grove, IL

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 14th day of August 2025.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1786.01
Valid to June 30, 2027

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