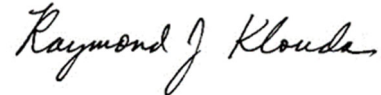




Engineering Test Report No. 2503044-01 Rev. A

Report Date	January 26, 2026	
Manufacturer Name	TCGP	
Manufacturer Address	13135 W Libson Rd Waukesha, WI 53005	
Product Name	Demolition Hammer	
Model No.	0149	
HVIN	3018-20	
Date Received	January 6, 2026	
Test Dates	January 6 and 9, 2026	
Specifications	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247 Innovation, Science, and Economic Development Canada, RSS-GEN Innovation, Science, and Economic Development Canada, RSS-247	
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		
Tested by	Tylar Jozefczyk	
Signature		
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	280008773	

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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 C, Section 15.247 and Innovation, Science, and Economic Development Canada, RSS-247 test specifications. The data presented in this test report pertains to the EUT on the test dates specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification. This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

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1. Report Revision History

Revision	Date	Description
–	28 JAN 2026	Initial Release of Engineering Test Report No. 2503044-01
A	19 MAR 2026 by TMJ	- Throughout report: Updated Engineering Test Report No. to “2503044-01 Rev. A”. - Cover Page, Section 2.3: Added “HVIN” row.

2. Introduction

2.1. Scope of Tests

This document presents the results of a series of RF emissions tests that were performed on the TCGP Demolition Hammer (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was manufactured and submitted for testing by TCGP located in Waukesha, WI.

2.2. Purpose

The test series was performed to determine if the EUT meets the RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, §15.247 for a Digital Modulation intentional radiator operating within the 2400 – 2483.5MHz band.

The test series was also performed to determine if the EUT meets the RF emission requirements of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen and RSS-247 for a Digital Modulation intentional radiator operating within the 2400 – 2483.5MHz band.

Testing was performed in accordance with ANSI C63.10-2020+Cor. 1:2023+C63.10a:2024.

2.3. Identification of the EUT

The EUT was identified as follows and used throughout the test series:

EUT Identification	
Product Description	Demolition Hammer
Model/Part No.	0149
HVIN	3018-20
Serial No.	N/A
Software/Firmware Version	3.2.11.2
Device Type	Digitally Modulated Transmission Device
Band of Operation	2400 – 2483.5MHz
Modulation Type	BLE
Antenna Type	Trace
Conducted Output Power	0.0038W (5.8dBm)
EIRP	0.0032W (5.1dBm)
6dB Bandwidth	854.272kHz
Occupied Bandwidth (99% CBW)	1.028MHz

3. Power Input

The EUT was powered by a Milwaukee Tool M18 lithium-ion battery.

4. Grounding

The EUT was not connected to ground.

5. Support Equipment

The EUT was submitted for testing along with the following support equipment:

Description	Model #	S/N
Laptop	N/A	N/A

6. Interconnect Leads

The following interconnect cables were submitted with the test item:

Item	Description
USB to serial cable	Used to program EUT

7. Modifications Made to the EUT

No modifications were made to the EUT during the testing.

8. Modes of Operation

The EUT was programmed to transmit in one of the following modes:

Mode	Description
Tx (Power setting = 6dBm)	- 2402MHz - 2440MHz - 2480MHz
Advertising	Used only for Duty Cycle measurements

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 C – "Intentional Radiators"
- KDB 558074 D01v05r02 (April 2, 2019) – "Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under Section 15.247 of the FCC Rules"
- Radio Standard Specification RSS-Gen Issue 5, Amendment 2 (February 2021) – "General Requirements for Compliance of Radio Apparatus"
- Radio Standard Specification RSS-247 Issue 4 (July 24, 2025) – "Digital Transmission Systems, Frequency Hopping Systems and License-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands"
- ANSI C63.10-2020+Cor. 1:2023+C63.10a:2024 – "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices"

10. Test Plan

No test plan was provided. Instructions were provided by personnel from TCGP and used in conjunction with the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247, Innovation, Science, and Economic Development Canada, RSS-247, and ANSI C63.10-2020+Cor. 1:2023+C63.10a:2024 specifications.

11. Deviations, 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	21.7°C
Relative Humidity	30.2%
Atmospheric Pressure	1000.34mb

13. Summary

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

Test Description	Requirements	Test Method	Result
6dB Bandwidth	FCC 15.247	ANSI C63.10-2020	Conforms
99% Bandwidth	ISED RSS-GEN	ANSI C63.10-2020	---
Output Power	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	Conforms
Power Spectral Density	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	Conforms
Low Band Edge	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	Conforms
Duty Cycle Correction Factor	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	---
EIRP	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	Conforms
Spurious Radiated Emissions	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	Conforms
High Band Edge	FCC 15.247 ISED RSS-247	ANSI C63.10-2020	Conforms

14. Sample Calculations

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 TCGP Demolition Hammer (Model No. 0149) did fully conform to the selected requirements of FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247 and Innovation, Science, and Economic Development Canada, RSS-247.

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 C, Section 15.247 and Innovation, Science, and Economic Development Canada, RSS-247 test specifications. The data presented in this test report pertains to the EUT as received by the customer on the test date specified. Any electrical or mechanical modifications made to the EUT 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
CDM5	Lab Computer	ELITE		---	---	N/A	
GSF0	VECTOR SIGNAL GENERATOR	ROHDE & SCHWARZ	SMBV100A	260452	9KHZ - 6GHZ	9/15/2024	9/15/2026
GSFB	OSP-B157W BASE UNIT	ROHDE & SCHWARZ	OSP-B157W	101071	---	9/2/2025	9/2/2027
GSFE	OSP120	ROHDE & SCHWARZ	OSP120	102278	.01-40GHZ	7/22/2025	7/22/2027
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NWQ1	Double Ridged Waveguide	ETS-Lindgren	3117	66655	1-18GHz	7/26/2024	7/26/2026
R29F	3M ANECHOIC CHAMBER NSA	EMC TEST SYSTEMS	3M ANECHOIC		30MHZ-18GHZ	6/1/2025	6/1/2027
RBG2	EMI Analyzer	Rohde & Schwarz	ESW44	101591	2HZ-44GHZ	12/12/2025	12/12/2026
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	
XPQ4	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000-O/O	1	4.8-20GHZ	9/16/2025	9/16/2027

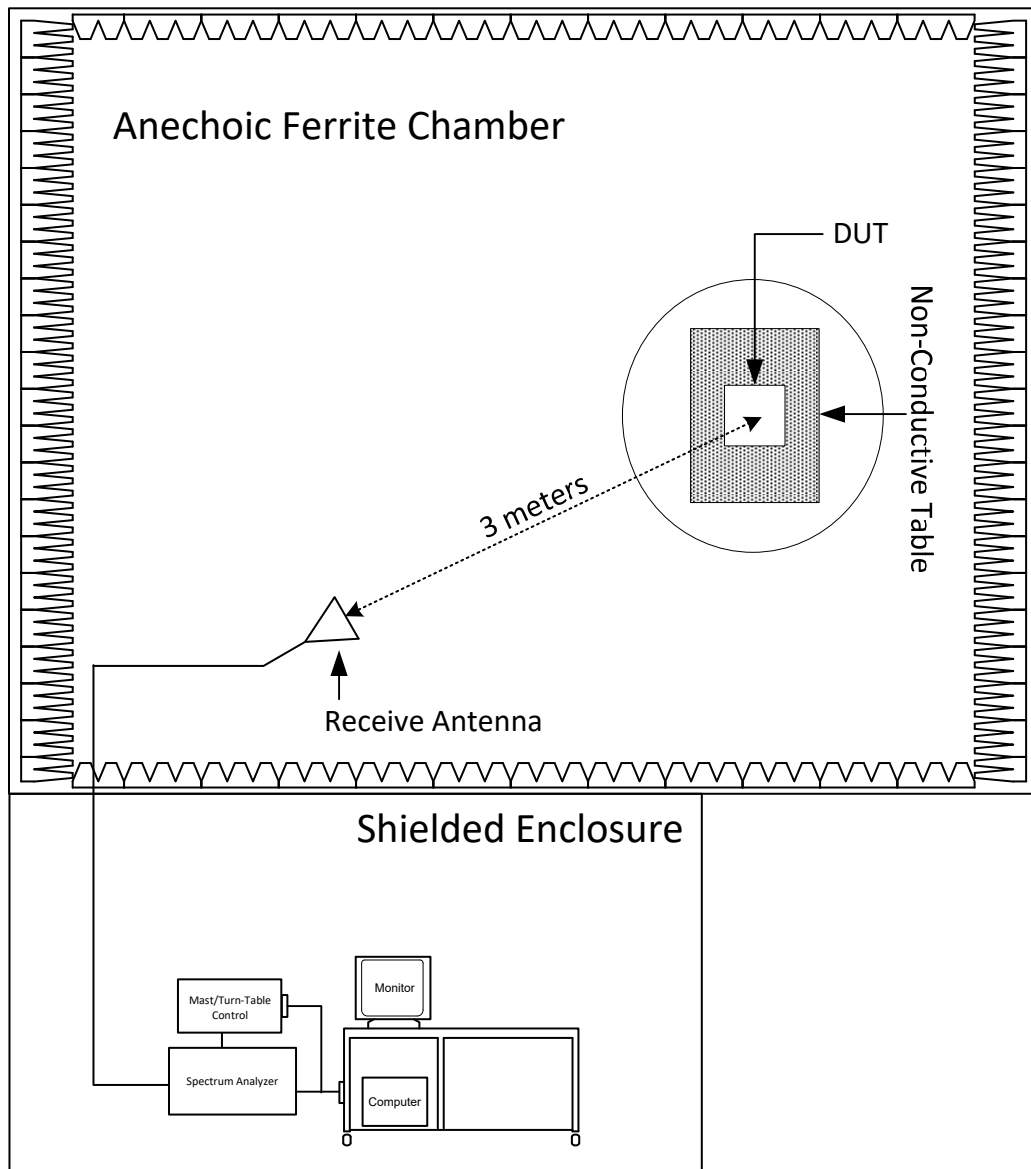
N/A: Not Applicable

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. Antenna Port Conducted Emissions Tests

EUT Information	
Manufacturer	TCGP
Product	Demolition Hammer
Model No.	0149
Serial No.	N/A
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	EMC Bench
Note	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Occupied Channel Bandwidth	$\pm 224\text{kHz}$
Power Spectral Density	$\pm 0.372\text{Hz}$
RF Output Power, Conducted	$\pm 0.349\text{ dB}$
Unwanted Emissions, Conducted	$\pm 1.39\text{ dB}$
All Emissions Radiated Below 1GHz	$\pm 2.629\text{ dB}$
All Emissions Radiated Above 1GHz	$\pm 2.710\text{ dB}$
Temperature	$\pm 0.165^{\circ}\text{C}$
Humidity	$\pm 1.7\% \text{ RH}$
Time	$\pm 0.05\%$

Requirements
6dB Bandwidth (DTS Bandwidth): Per FCC 15.247(a)(2) and RSS-247 Section 5.2(a), the minimum 6dB bandwidth shall be at least 500kHz for all systems using digital modulation techniques.
99% Bandwidth: RSS-Gen requires the measurement of the 99% bandwidth (Occupied Bandwidth).
Peak Conducted Output Power: Per FCC 15.247(b)(3) and RSS-247 Section 5.4(d), for systems using digital modulation, the maximum peak conducted output power shall not exceed 1 watt.
Peak Power Spectral Density: Per FCC 15.247(e) and RSS-247 Section 5.2(b), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission. If peak conducted output power was measured, the same method must be used to measure the power spectral density.
Low Band Edge: Per FCC 15.247(d) and RSS-247 Section 5.5, in any 100kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. Attenuation below the general limits specified in §15.209(a) and RSS-Gen is not required.

Procedures

6dB Bandwidth (DTS Bandwidth) (C63.10-2020 Section 11.8 Option 1):

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = 2 x Occupied Channel Bandwidth
 3. RBW = 100kHz
 4. VBW = 3 x RBW
 5. Detector Mode = Max Peak
 6. Trace Mode = Max Hold
- b) Allow the trace to stabilize.
- c) Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- d) To determine the 6dB down amplitude, place two markers, one at the lowest frequency and the other at the highest frequency of the envelope trace, such that each marker is at or slightly below the 6dB down amplitude determined in step d). If a marker is below this 6dB down amplitude value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers.

99% Bandwidth (C63.10-2020 Section 6.9.3):

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = Between 1.5 and 5 times the OBW
 3. RBW = Between 1% to 5% of the OBW
 4. VBW = Approximately 3 x RBW
 5. Detector Mode = Max Peak
 6. Trace Mode = Max Hold
- b) Allow the trace to stabilize.
- c) Use the 99% power bandwidth function of the EMI receiver.

Peak Conducted Output Power (C63.10-2020 Section 11.9.1.1):

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. RBW = $\geq$ DTS Bandwidth
 3. VBW = $\geq$ 3 x RBW
 4. Span = $\geq$ 3 x RBW
 5. Sweep Time = Auto couple
 6. Detector Mode = Max Peak
 7. Trace Mode = Max Hold
- b) Allow the trace to stabilize.
- c) Use the peak marker function to determine the peak amplitude level.

Peak Power Spectral Density (C63.10-20013 Section 11.10.2):

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = At least 1.5 times the OBW
 3. RBW = $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$

4. VBW = $\geq 3 \times \text{RBW}$
5. Detector Mode = Max Peak
6. Sweep Time = Auto Couple
7. Trace Mode = Max Hold

- b) Allow the trace to stabilize.
- c) Use the peak marker function to determine the maximum amplitude level within the RBW.
- d) If measured value exceeds requirement, then reduce RBW (but no less than 3kHz) and repeat.

Low Band Edge (C63.10-2020 Section 11.11):

a) Reference Level Measurement

1. Start Frequency = 2400MHz
2. Stop Frequency = 2483.5MHz
3. RBW = 100kHz
4. VBW = $\geq 3 \times \text{RBW}$
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold
7. Sweep Time = Auto

- b) Allow the trace to stabilize and use the peak marker function to determine the maximum level.

c) Emission Level Measurement

1. Start Frequency = 2310MHz
2. Stop Frequency = 2400MHz
3. RBW = 100kHz
4. VBW = $\geq 3 \times \text{RBW}$
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold
7. Sweep Time = Auto

- d) Allow the trace to stabilize and use the peak marker function to determine the maximum level.
- e) The two sweeps were combined and plotted.
- f) Ensure that the amplitude of all unwanted emissions are attenuated by at least 20dB.

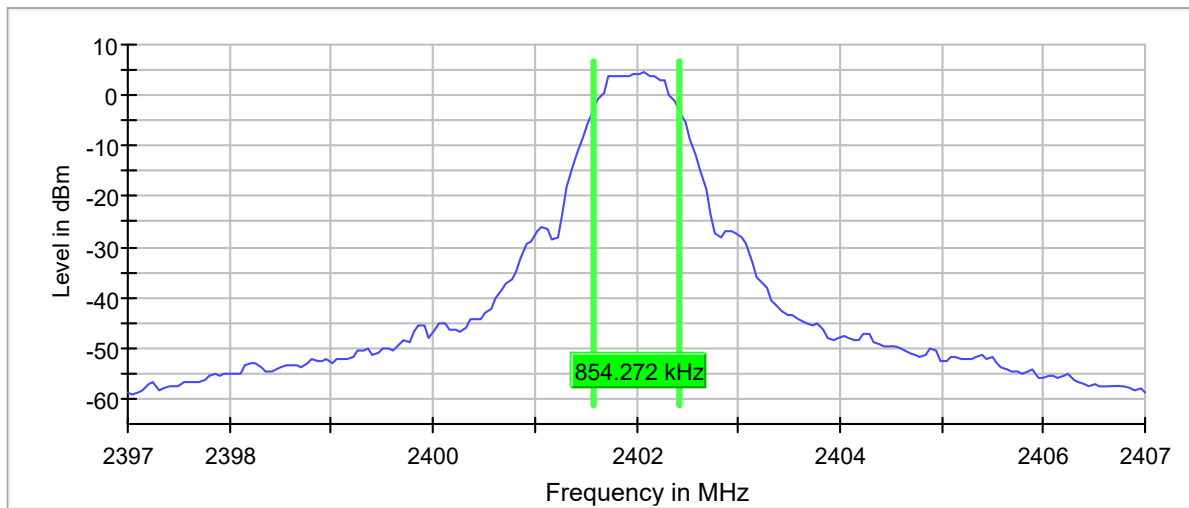
6dB Bandwidth

Tested according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2020 11.8.1

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

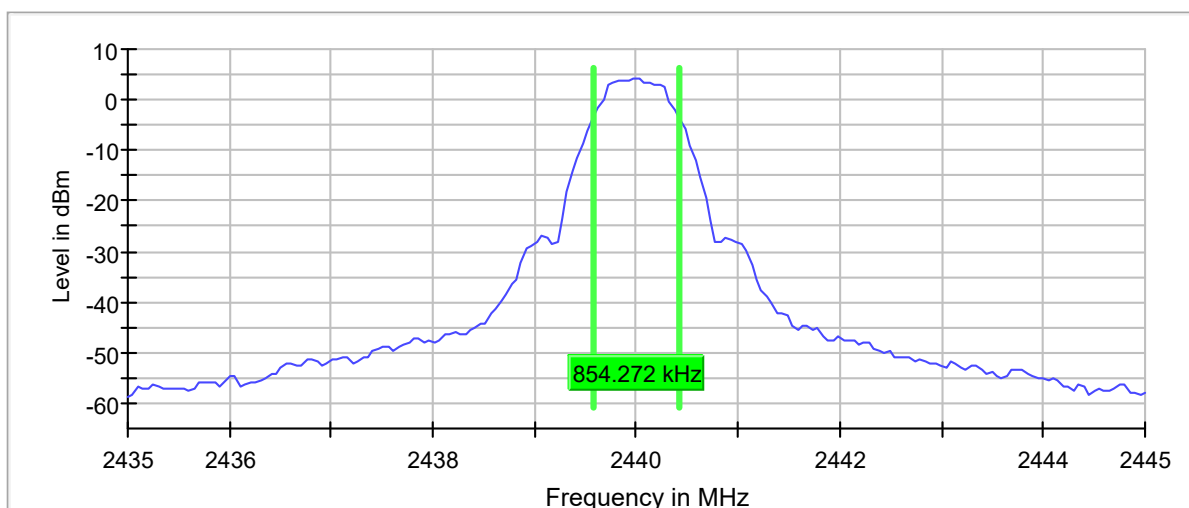
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2402.000000	0.854272	0.500000	---	2401.572864	2402.427136	4.6	PASS

6 dB Bandwidth



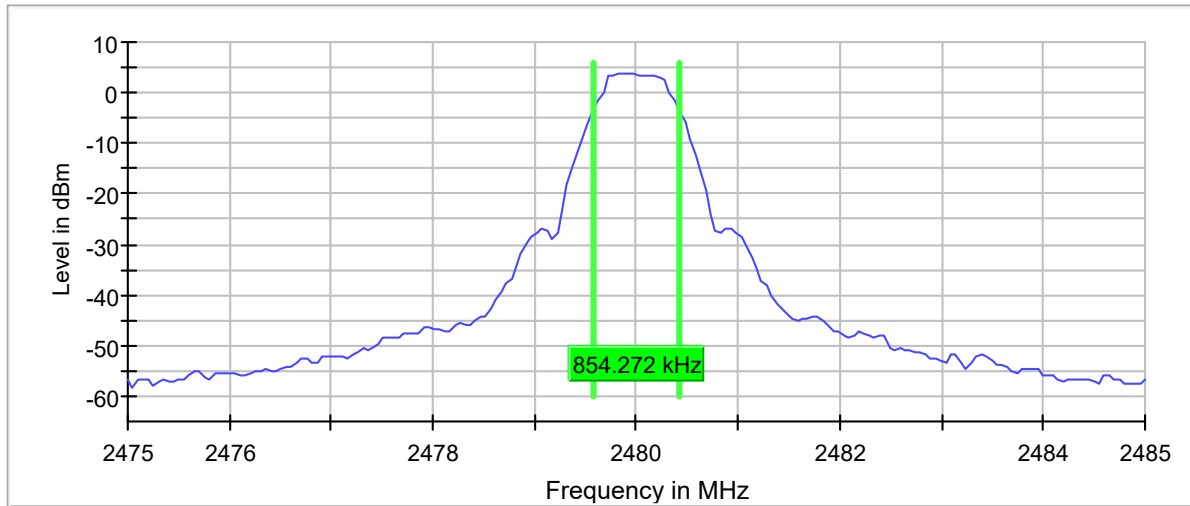
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2440.000000	0.854272	0.500000	---	2439.572864	2440.427136	4.1	PASS

6 dB Bandwidth



DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2480.000000	0.854272	0.500000	---	2479.572864	2480.427136	3.7	PASS

6 dB Bandwidth



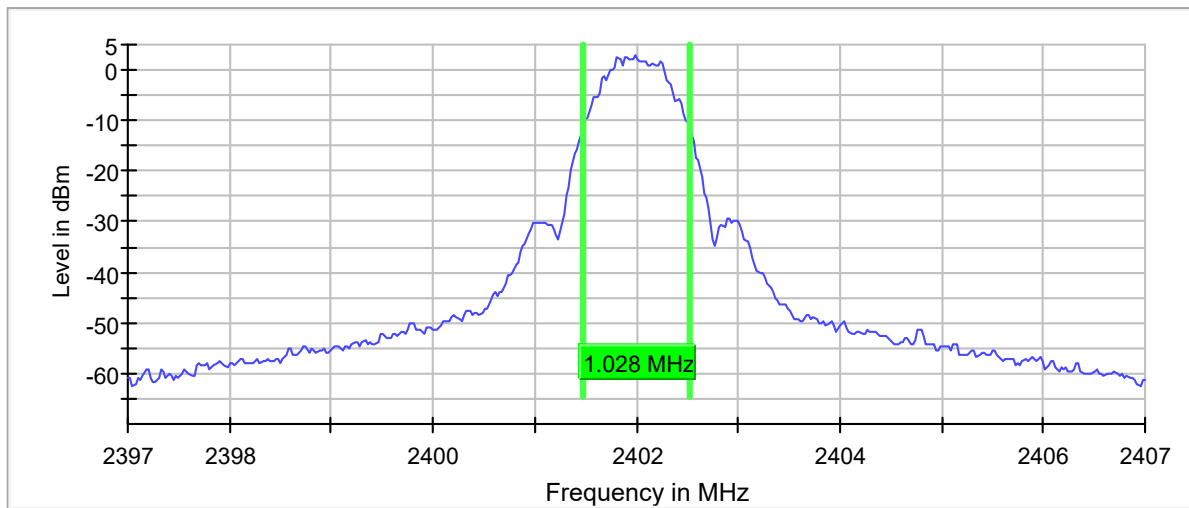
Occupied Channel Bandwidth 99%

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2020 11.8.1

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

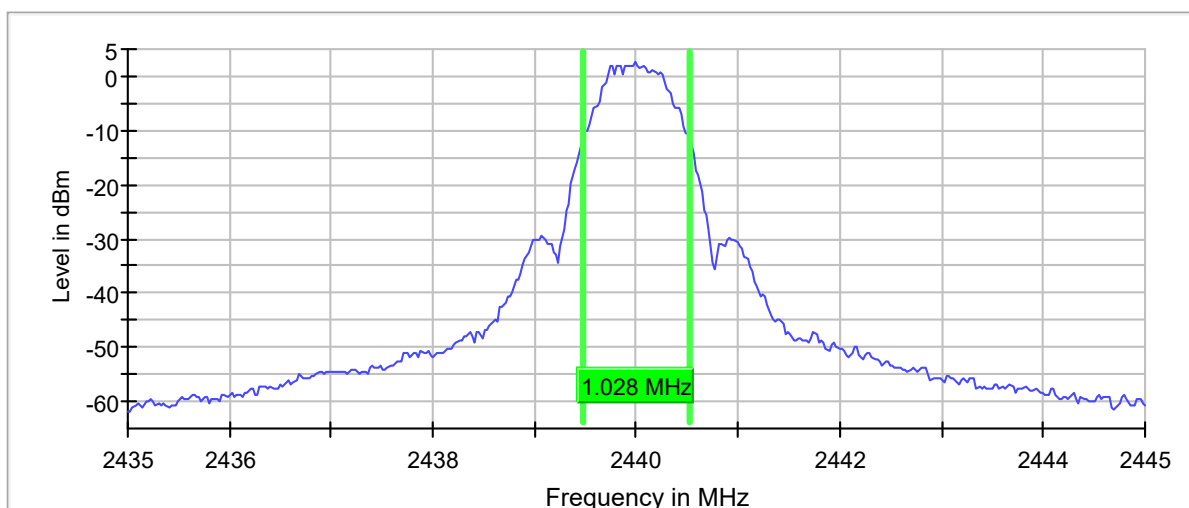
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	1.027568	---	---	2401.486216	2402.513784	PASS

99 % Bandwidth



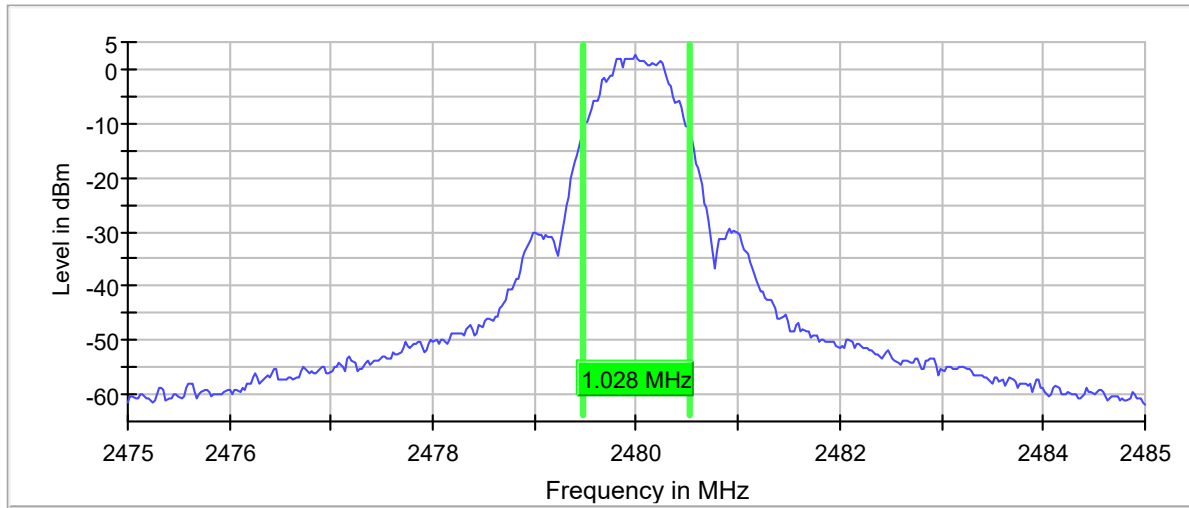
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2440.000000	1.027568	---	---	2439.486216	2440.513784	PASS

99 % Bandwidth



DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2480.000000	1.027568	---	---	2479.486216	2480.513784	PASS

99 % Bandwidth



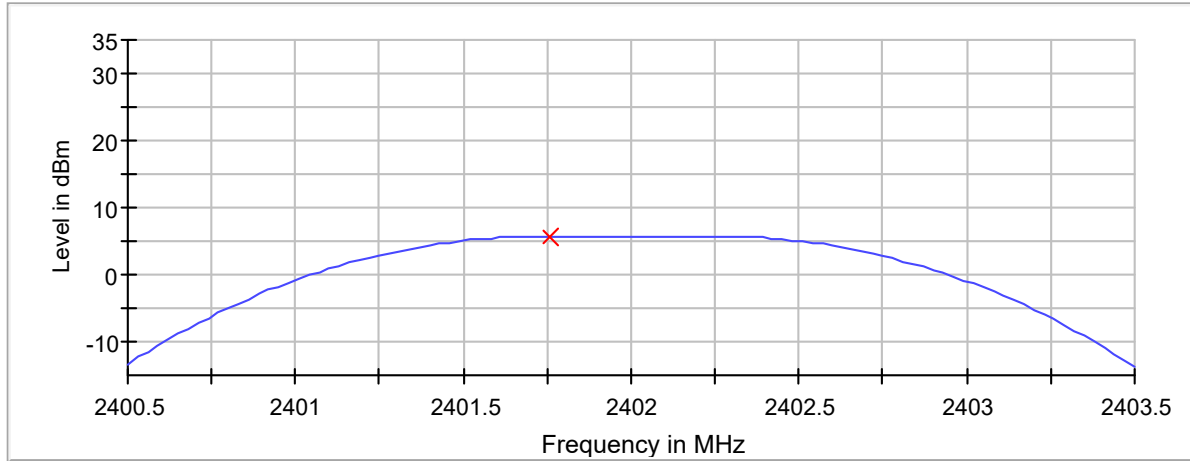
Peak Output Power (Sweep)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2020 11.9.1.1

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

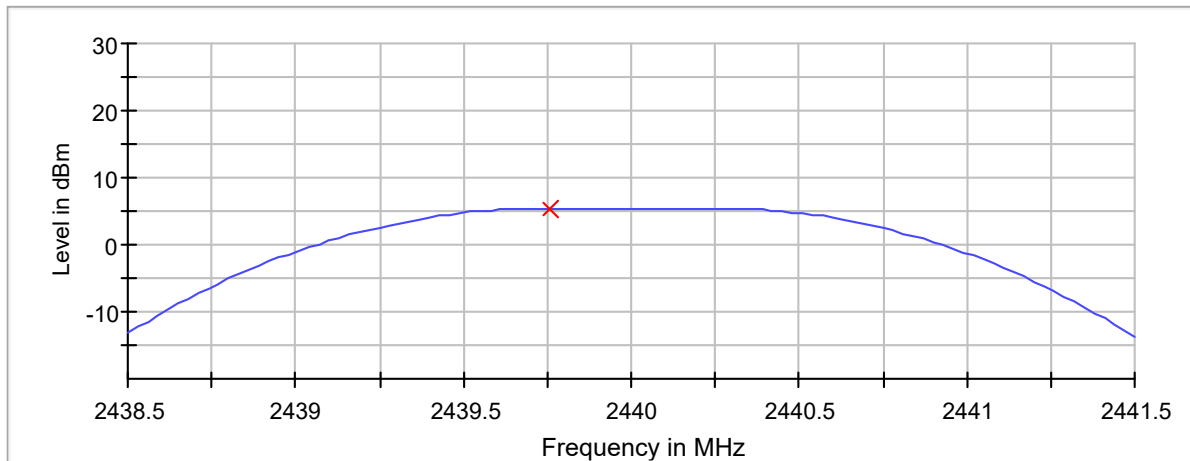
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	5.8	30.0	PASS

Peak Power



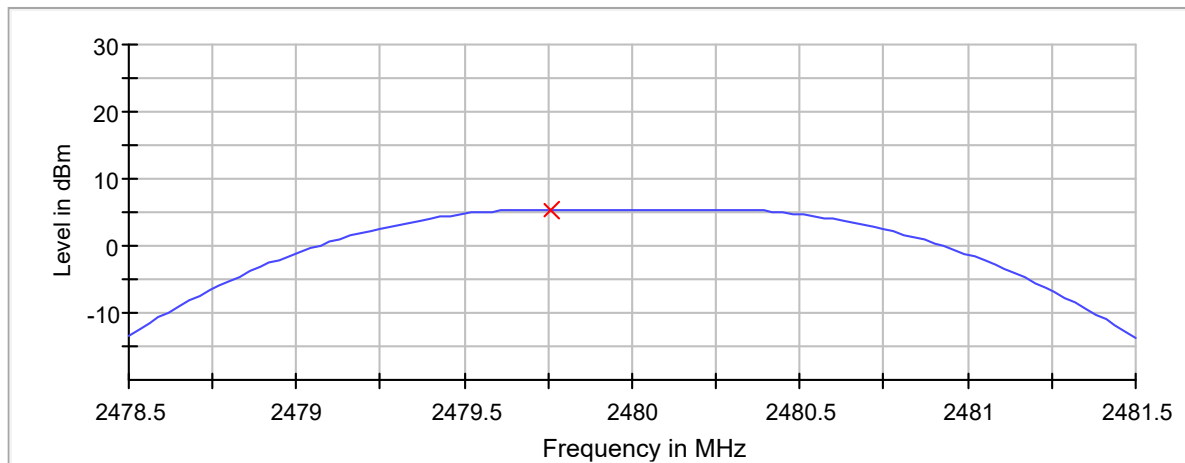
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2440.000000	5.4	30.0	PASS

Peak Power



DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2480.000000	5.5	30.0	PASS

Peak Power



— Connector 1 X Peak Connector 1

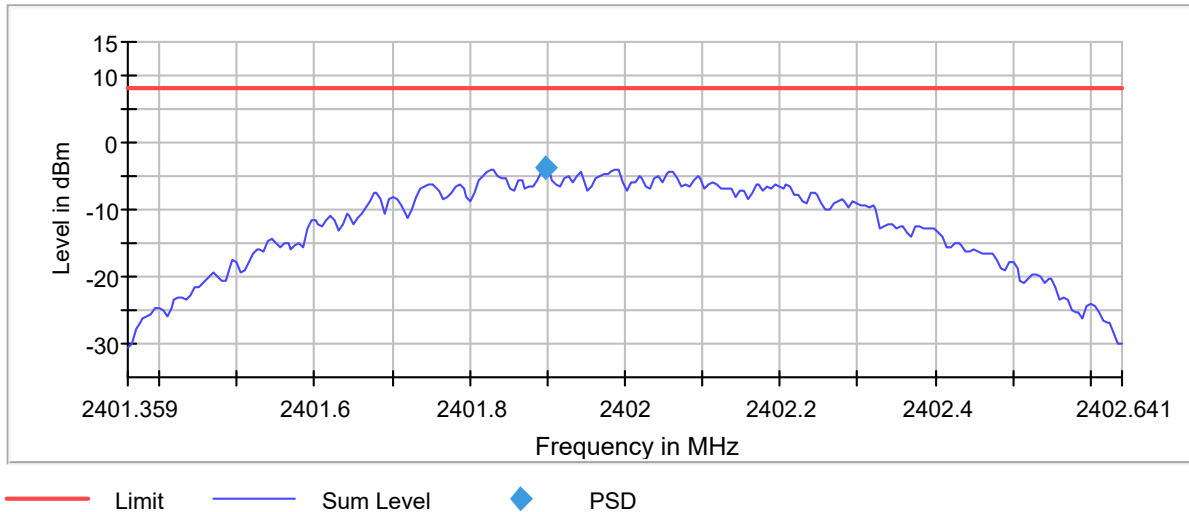
Peak Power Spectral Density

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05r02 F, and ANSI C63.10-2020

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

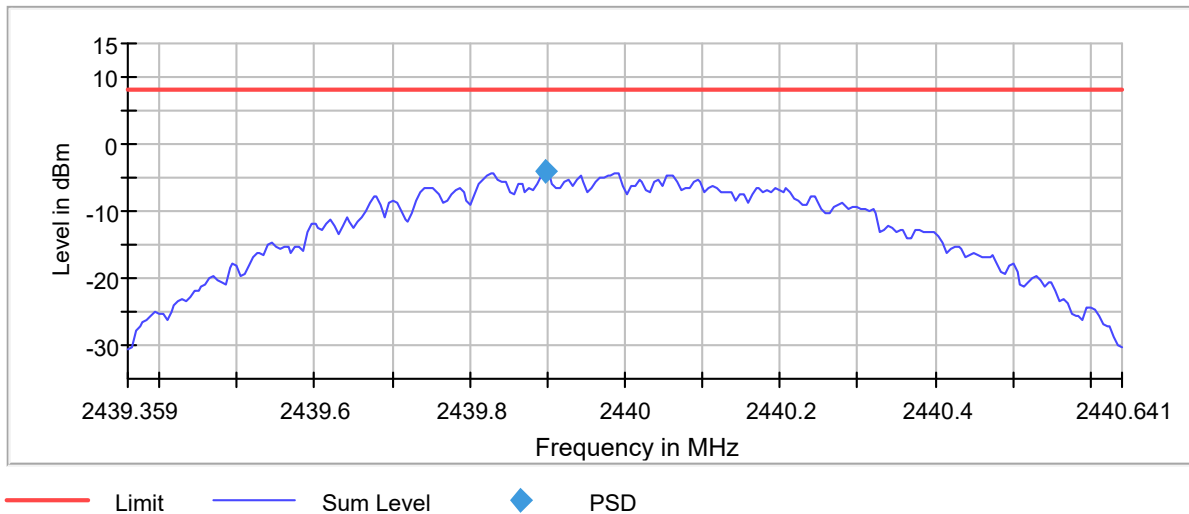
DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2402.000000	2401.896985	-3.879	8.0	PASS

Peak Power Spectral Density



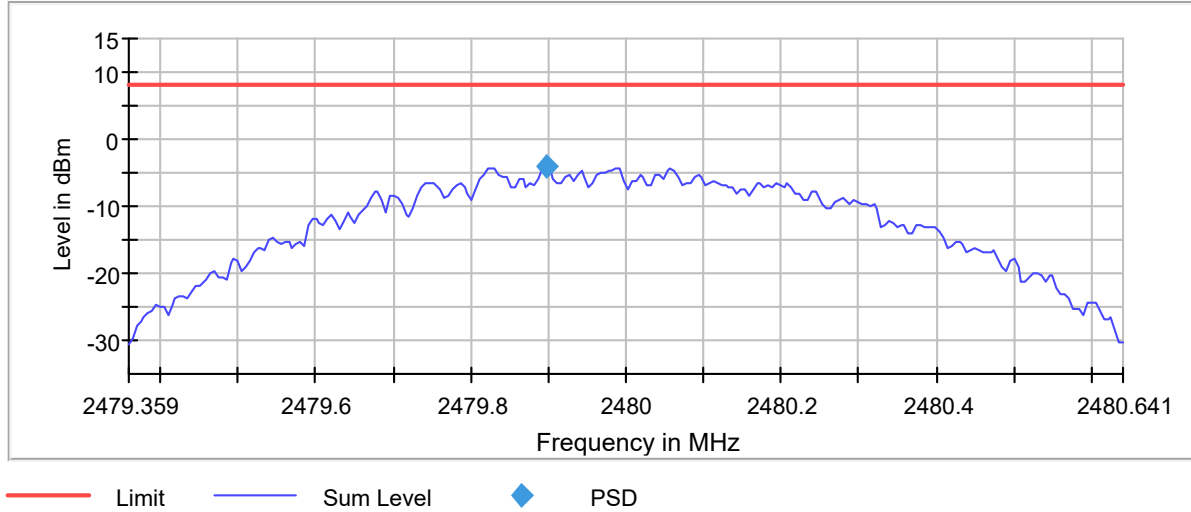
DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2440.000000	2439.896985	-4.173	8.0	PASS

Peak Power Spectral Density



DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2480.000000	2479.896985	-4.099	8.0	PASS

Peak Power Spectral Density



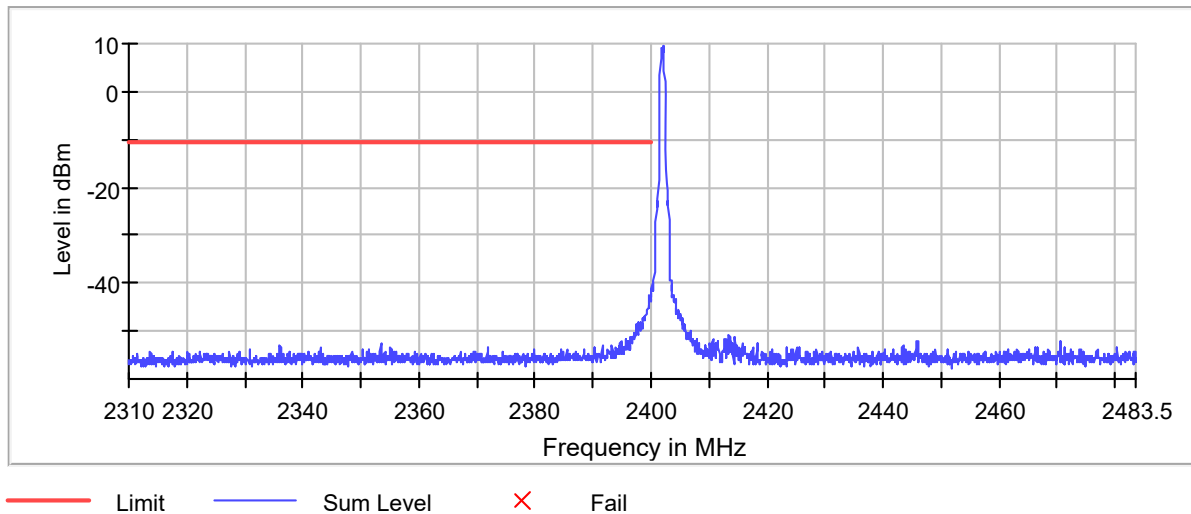
Band Edge – Low

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 8.7, and ANSI C63.10-2020

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

Frequency (MHz)	Level (dBm)	Margin (dBm)	Limit (dBm)	Result
2399.949972	-42.4	31.9	-10.5	PASS
2399.799889	-42.5	32.0	-10.5	PASS
2399.749861	-42.7	32.2	-10.5	PASS
2399.849917	-43.2	32.8	-10.5	PASS
2399.899944	-43.6	33.1	-10.5	PASS
2399.649805	-44.3	33.8	-10.5	PASS
2399.699833	-44.4	33.9	-10.5	PASS
2399.549750	-44.5	34.0	-10.5	PASS
2399.499722	-44.8	34.3	-10.5	PASS
2399.599778	-45.0	34.6	-10.5	PASS
2399.449694	-45.3	34.9	-10.5	PASS
2399.349639	-45.4	35.0	-10.5	PASS
2399.399666	-45.7	35.2	-10.5	PASS
2399.299611	-45.9	35.5	-10.5	PASS
2399.199555	-46.3	35.8	-10.5	PASS

Band Edge



21. Duty Cycle Factor

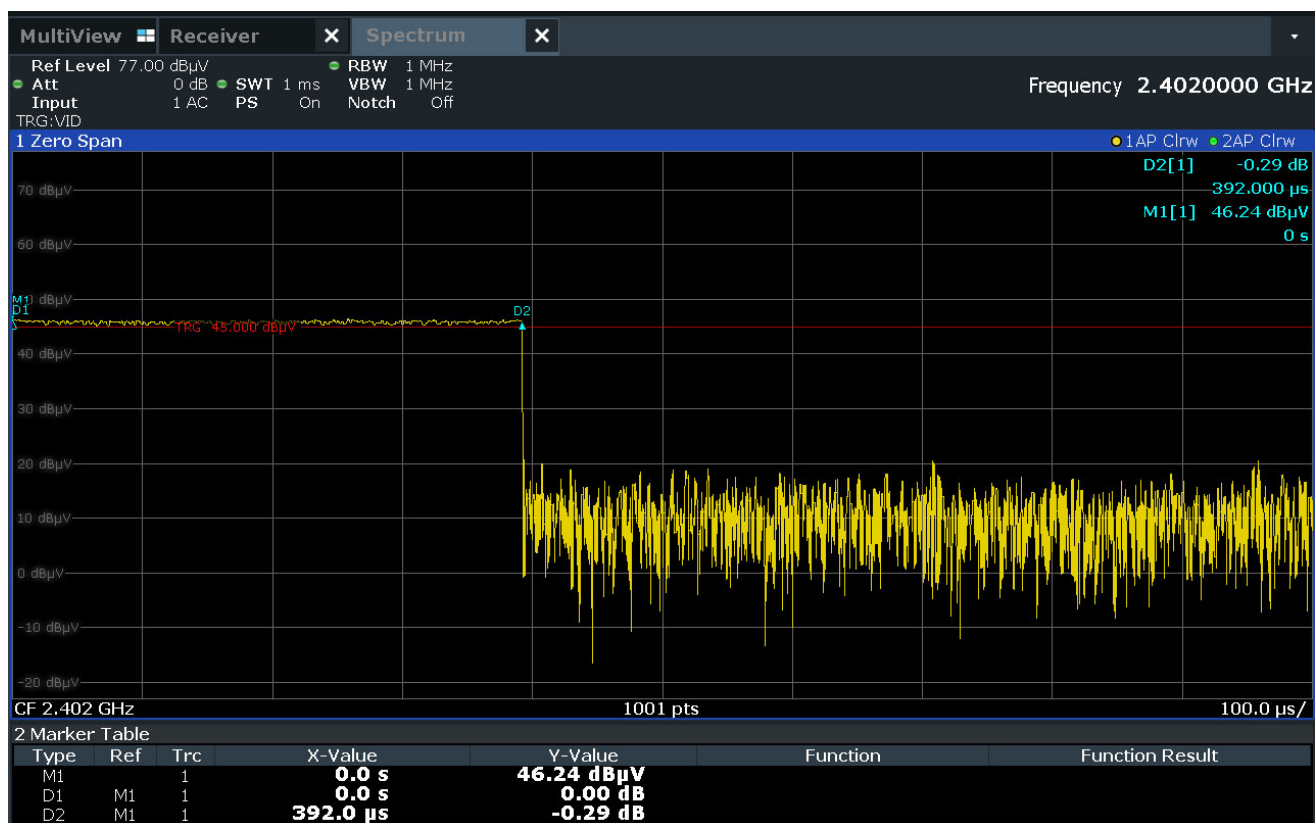
EUT Information	
Manufacturer	TCGP
Equipment Under Test	Demolition Hammer
Model No.	0149
Serial No.	N/A
Mode	Advertising

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Radiated
Test Site Type	Semi-Anechoic Chamber
Test Site Used	R29F
Antenna Type Used	Double-ridged waveguide (or equivalent)
Notes	

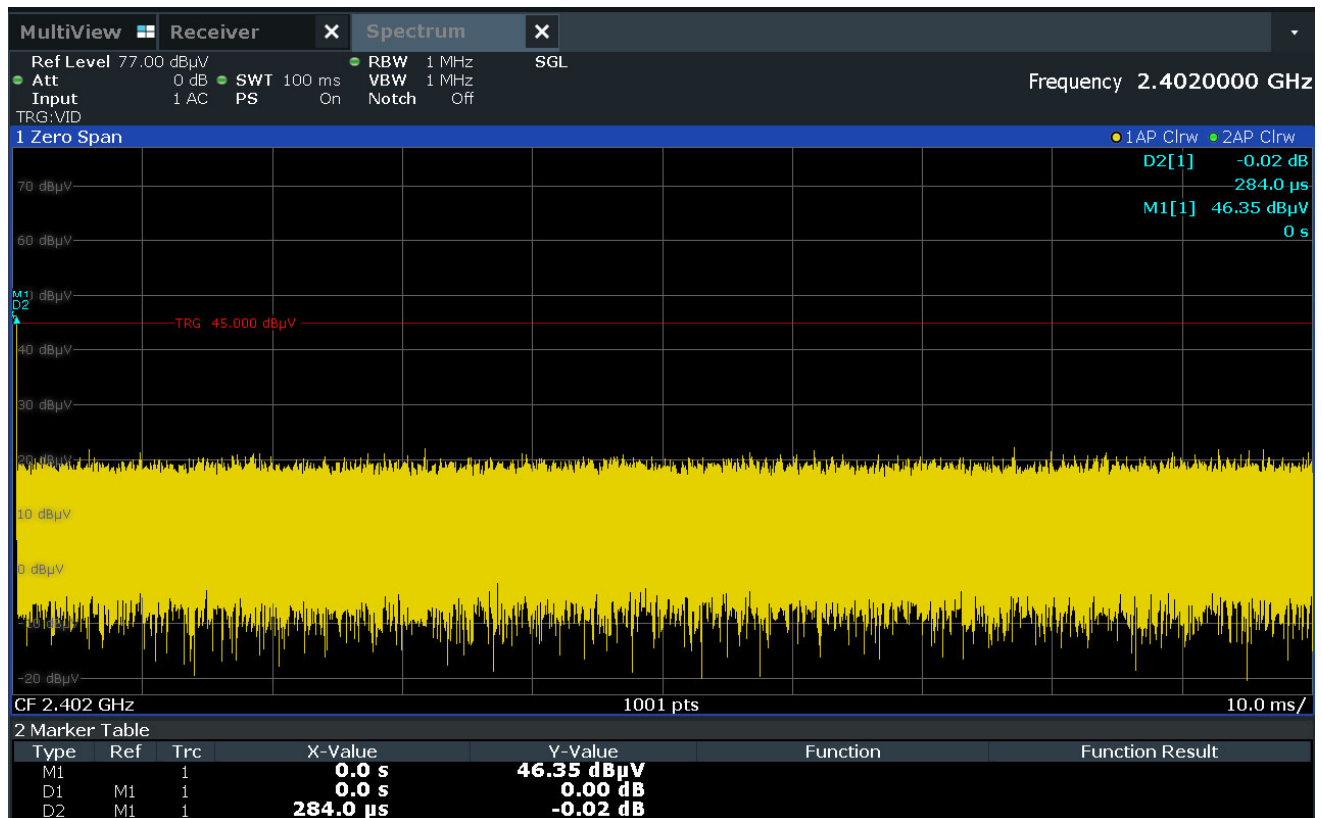
Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

Procedure
The duty cycle factor is used to convert peak detected readings to average readings when pulsed modulation is employed. This factor is computed from the time domain trace of the pulsed signal. With the transmitter set up to transmit for maximum operating power level, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span width with 1msec/div. The resolution bandwidth (RBW) is set $\geq$ OBW. The video bandwidth (VBW) was set $\geq$ OBW and $\geq$ RBW. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The markers are set at the beginning and end of the transmission duration (T). The trace is recorded. Next the spectrum analyzer center frequency is set to the transmitter frequency with a zero span width and 10msec/div. This shows if the word or transmission duration is longer than 100msec or shorter than 100msec. If the word period is less than 100msec, the display is set to show at least one word. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as $\left(\frac{\text{On Time}}{\text{Word Period}}\right)$, where $\text{Word Period} = (\text{On Time} + \text{Off Time})$.

Test Details	
Manufacturer	TCGP
Equipment Under Test	Demolition Hammer
Model No.	0149
Serial No.	N/A
Mode	Advertising
Result	On Time = 0.392ms
Notes	



Test Details	
Manufacturer	TCGP
Equipment Under Test	Demolition Hammer
Model No.	0149
Serial No.	N/A
Mode	Advertising
Result	Duty Cycle = -48.13dB
Notes	Duty Cycle Factor Calculation: Pulse: $1 \times 0.392\text{ms} = 0.392\text{ms}$ Total Time ON: 0.392ms $\text{Duty Cycle Factor} = 20 \log \left(\frac{0.392\text{ms}}{100\text{ms}} \right) = -48.13\text{dB}$



22. Radiated Emissions Tests

EUT Information	
Manufacturer	TCGP
Product	Demolition Hammer
Model No.	0149
Serial No.	N/A
Mode	Tx, Advertising

Test Setup Details	
Setup Format	Tabletop
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	R29F
Antenna Types Used	1 – 18GHz: Double-Ridged Waveguide (or equivalent) Above 18GHz: Horn (or equivalent)
Notes	N/A

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
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

Requirements
<u>Peak EIRP:</u> Per FCC 15.247(b)(3) and RSS-247 Section 5.4(d), for systems using digital modulation, the maximum peak conducted output power shall not exceed 1 watt.
<u>Radiated Emissions in Non-Restricted Bands:</u> Per FCC 15.247(d) and RSS-247 Section 5.5, in any 100kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated emissions measurement. Attenuation below the general limits specified in §15.209(a) is not required.
<u>Radiated Emissions in Restricted Bands:</u> Per 15.247(d), radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a). Per RSS-247 Section 3.3, radiated emissions which fall in the restricted bands, as defined in RSS-Gen Section 8.10, must comply with the radiated emission limits specified in RSS-Gen Section 8.9.
<u>High Band Edge:</u> Per 15.247(d), radiated emissions which fall in the restricted band beginning at 2483.5MHz, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a). Per RSS-247 Section 3.3, radiated emissions which fall in the restricted band beginning at 2483.5MHz, as defined in RSS-Gen Section 8.10, must comply with the radiated emission limits specified in RSS-Gen Section 8.9.

Procedures

Peak EIRP (C63.10 Annex G and Section 11.9.1.1):

The EUT was placed on a 1.5 meter high non-conductive stand and set to transmit. A double ridged waveguide antenna was placed at a test distance of 3 meters from the EUT.

a) The following settings were employed on the EMI Test Receiver:

- | | |
|--------------------------------|--|
| 1) Center Frequency = | Transmit frequency of EUT |
| 2) Span = | $\geq 3 \times \text{RBW}$ |
| 3) RBW = | $\geq \text{DTS Bandwidth}$ |
| 4) VBW = | $\geq 3 \times \text{RBW}$ |
| 5) Number of points in sweep = | $\geq (2 \times \text{span} / \text{RBW})$ |
| 6) Sweep time = | Auto |
| 7) Detector = | Peak |
| 8) Trace = | Max hold |

b) Allow trace to stabilize and use peak marker function to determine the peak amplitude level.

c) The equivalent power was determined using equation G.1 in C63.10 to convert field intensity levels measured at 3 meters into EIRP readings.

Radiated Emissions in Non-Restricted Bands (C63.10-2020 Section 11.11):

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.

For the preliminary test to determine the emission characteristics of the EUT, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 25GHz was investigated using a peak detector function.

The final radiated emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

- 1) The field strength of the fundamental was measured using a double ridged waveguide antenna positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand and set to transmit. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.
- 2) The field strengths of all harmonics not in the restricted band were then measured using a double-ridged waveguide antenna positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand and set to transmit. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.
- 3) 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:
 - a) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
 - b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - c) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
 - d) 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.

- 4) All harmonics not in the restricted bands must be at least 20dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required.

Radiated Emissions in Restricted Bands (C63.10-2020 Section 11.12):

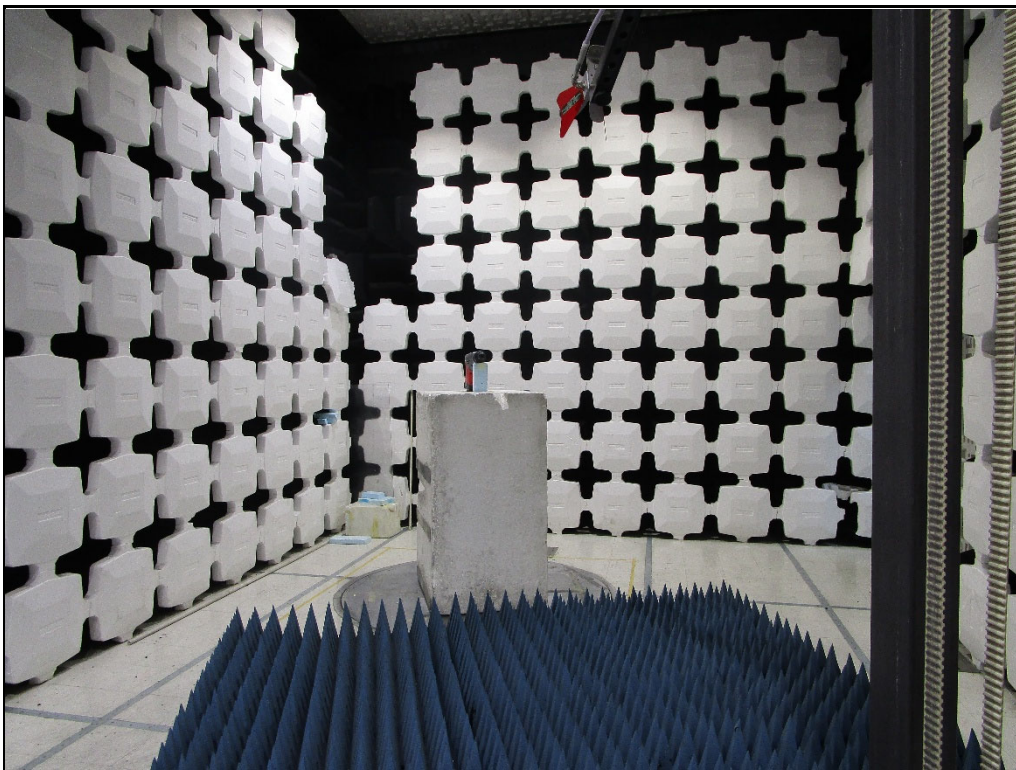
- 1) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand and set to transmit. A peak detector with a resolution bandwidth of 1MHz was used on the spectrum analyzer.
- 2) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
 - a) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
 - b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - c) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
 - d) 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.
- 3) For all radiated emissions measurements above 1GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1GHz must be no greater than 20dB above the limits specified in 15.209(a).
- 4) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken. The duty cycle correction $[(DCCF) = 20 \log (1/D)]$ factor was added to the measurement results.

High Band Edge (C63.10-2020 Section 6.10.5):

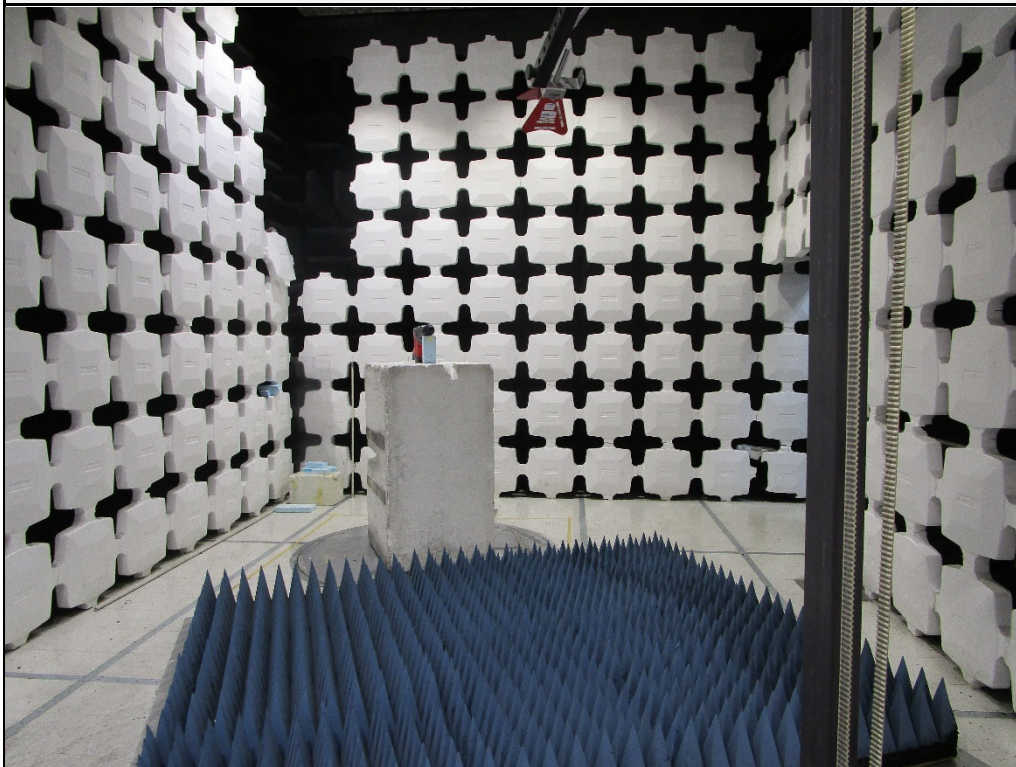
- 1) The EUT was set to transmit continuously at the channel closest to the high band-edge.
- 2) The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1MHz was used on the spectrum analyzer.
- 3) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
 - a) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
 - b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - c) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
- 4) The peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum

permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).

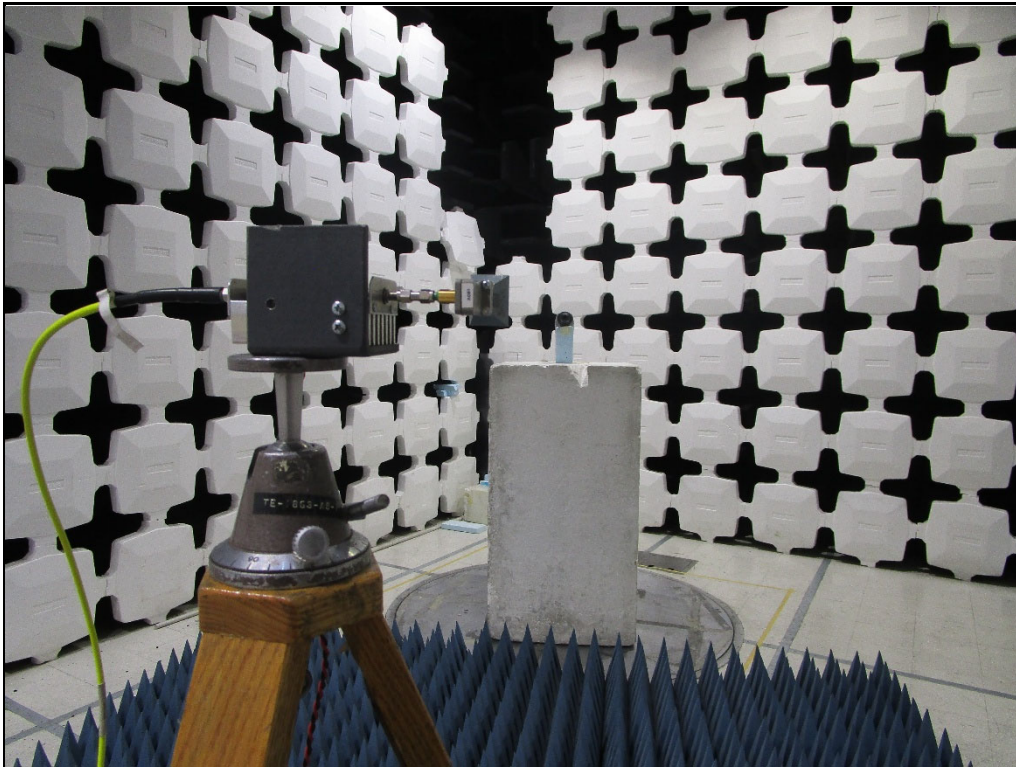
- 5) Next, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken. The duty cycle correction $[(DCCF) = 20 \log (1/D)]$ factor was added to the measurement results.



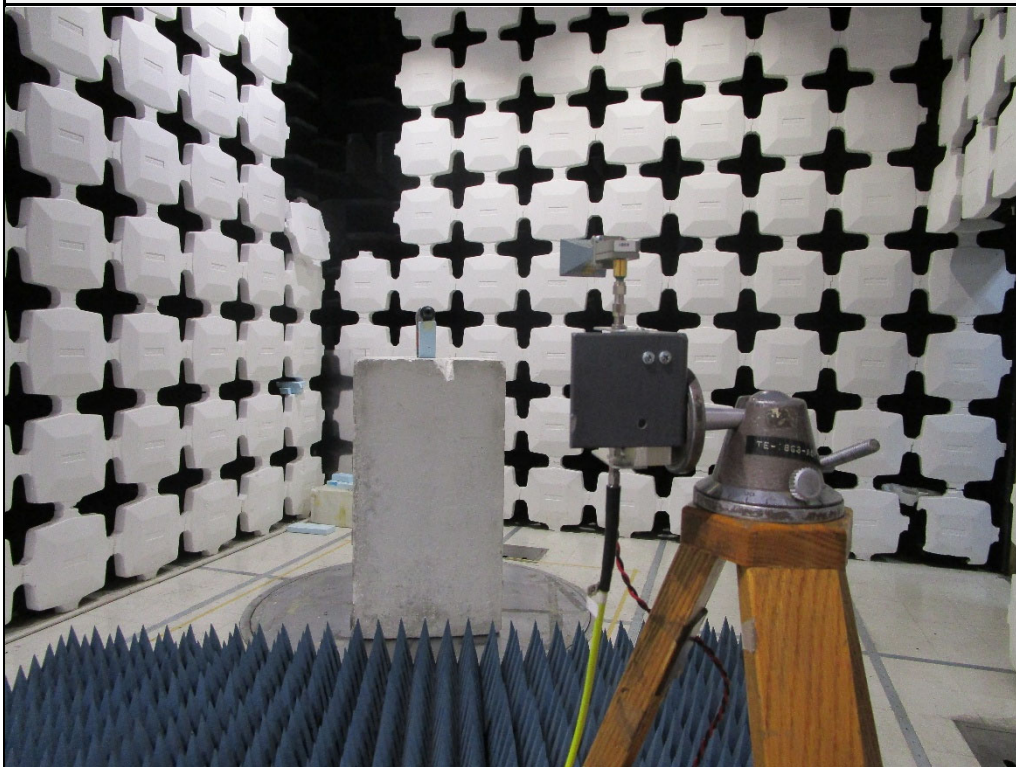
Test Setup for Spurious Radiated Emissions, 1 – 18GHz – Antenna Polarization
Horizontal



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



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



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

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Mode	Tx
Result	Max EIRP = 0.0032W (5.12dBm)
Notes	

Freq (MHz)	Ant Pol	Wide BW Meter Reading (dBμV)	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total (dBμV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2402.00	H	64.47	3.38	32.57	0.00	100.42	5.12	36.00	-30.88
	V	63.83	3.38	32.57	0.00	99.78	4.48	36.00	-31.52
2440.00	H	60.57	3.39	32.75	0.00	96.71	1.41	36.00	-34.59
	V	60.82	3.39	32.75	0.00	96.96	1.66	36.00	-34.34
2480.00	H	58.12	3.40	32.93	0.00	94.45	-0.85	36.00	-36.85
	V	58.47	3.40	32.93	0.00	94.80	-0.50	36.00	-36.50

Peak Total (dBμV/m) = Meter Reading (dBμV) + CBL Fac (dB) + Ant Fac (dB/m) + Pre Amp (dB)

EIRP (dBm) = Peak Total (dBμV/m) – 95dB

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Peak Measurements in the Restricted Bands
Mode	Tx
Frequency Tested	2402MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
4804.00	H	55.89		4.82	34.74	-39.31	56.14	641.35	5000.00	-17.84
	V	51.34		4.82	34.74	-39.31	51.59	379.84	5000.00	-22.39
12010.00	H	52.08		6.87	39.02	-39.16	58.81	872.44	5000.00	-15.16
	V	52.05		6.87	39.02	-39.16	58.78	869.43	5000.00	-15.19
19216.00	H	38.61	Ambient	1.97	40.38	-28.22	52.74	433.37	5000.00	-21.24
	V	38.92	Ambient	1.97	40.38	-28.22	53.05	449.11	5000.00	-20.93

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Average Measurements in the Restricted Bands
Mode	Tx
Frequency Tested	2402MHz
Notes	Average Measurements in the Restricted Bands. The EUT's duty cycle is protocol limited. Guidance per KDB 558074 D01 v05r02 Section 11, Q3, was followed when deriving the RMS average value.

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBμV/m)	Average Total at 3m (μV/m)	Average Limit at 3m (μV/m)	Margin (dB)
4804.00	H	48.21		4.82	34.74	-39.31	-48.13	0.33	1.04	500.00	-53.65
	V	39.88		4.82	34.74	-39.31	-48.13	-8.00	0.40	500.00	-61.98
12010.00	H	39.00		6.87	39.02	-39.16	-48.13	-2.40	0.76	500.00	-56.38
	V	38.27		6.87	39.02	-39.16	-48.13	-3.13	0.70	500.00	-57.11
19216.00	H	23.27	Ambient	1.97	40.38	-28.22	-48.13	-10.74	0.29	500.00	-64.72
	V	23.44	Ambient	1.97	40.38	-28.22	-48.13	-10.57	0.30	500.00	-64.55

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Peak Measurements in the Non-Restricted Bands
Mode	Tx
Frequency Tested	2402MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
2402.00	H	62.82		3.38	32.57	0.00	98.77	86813.97		
	V	62.11		3.38	32.57	0.00	98.06	79999.93		
7206.00	H	62.81		5.89	35.75	-39.42	65.03	1783.69	8681.40	-13.75
	V	58.64		5.89	35.75	-39.42	60.86	1103.62	8681.40	-17.92
9608.00	H	39.02	Ambient	6.27	36.68	-39.27	42.70	136.47	8681.40	-36.07
	V	39.41	Ambient	6.27	36.68	-39.27	43.09	142.74	8681.40	-35.68
14412.00	H	45.40		7.43	39.89	-38.30	54.42	526.17	8681.40	-24.35
	V	47.21		7.43	39.89	-38.30	56.23	648.08	8681.40	-22.54
16814.00	H	43.31		7.72	42.66	-37.49	56.20	645.53	8681.40	-22.57
	V	43.93		7.72	42.66	-37.49	56.82	693.29	8681.40	-21.95
21618.00	H	26.19	Ambient	2.15	40.56	-28.49	40.41	104.78	8681.40	-38.37
	V	26.75	Ambient	2.15	40.56	-28.49	40.97	111.76	8681.40	-37.81
24020.00	H	27.35	Ambient	2.29	40.62	-29.27	40.99	112.14	8681.40	-37.78
	V	27.27	Ambient	2.29	40.62	-29.27	40.91	111.11	8681.40	-37.86

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Peak Measurements in the Restricted Bands
Mode	Tx
Frequency Tested	2440MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
4880.00	H	54.38		5.01	34.58	-39.33	54.64	539.53	5000.00	-19.34
	V	52.96		5.01	34.58	-39.33	53.22	458.15	5000.00	-20.76
7320.00	H	63.75		5.84	35.74	-39.42	65.91	1974.69	5000.00	-8.07
	V	61.95		5.84	35.74	-39.42	64.11	1605.09	5000.00	-9.87
12200.00	H	51.27		7.25	39.10	-39.09	58.53	844.46	5000.00	-15.45
	V	51.17		7.25	39.10	-39.09	58.43	834.79	5000.00	-15.55
19520.00	H	39.51	Ambient	2.05	40.39	-27.76	54.19	512.30	5000.00	-19.79
	V	38.37	Ambient	2.05	40.39	-27.76	53.05	449.28	5000.00	-20.93

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Average Measurements in the Restricted Bands
Mode	Tx
Frequency Tested	2440MHz
Notes	Average Measurements in the Restricted Bands. The EUT's duty cycle is protocol limited. Guidance per KDB 558074 D01 v05r02 Section 11, Q3, was followed when deriving the RMS average value.

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBμV/m)	Average Total at 3m (μV/m)	Average Limit at 3m (μV/m)	Margin (dB)
4880.00	H	47.14		5.01	34.58	-39.33	-48.13	-0.73	0.92	500.00	-54.71
	V	43.93		5.01	34.58	-39.33	-48.13	-3.94	0.64	500.00	-57.92
7320.00	H	58.07		5.84	35.74	-39.42	-48.13	12.10	4.03	500.00	-41.88
	V	55.74		5.84	35.74	-39.42	-48.13	9.77	3.08	500.00	-44.21
12200.00	H	37.56		7.25	39.10	-39.09	-48.13	-3.31	0.68	500.00	-57.29
	V	37.85		7.25	39.10	-39.09	-48.13	-3.02	0.71	500.00	-57.00
19520.00	H	23.59	Ambient	2.05	40.39	-27.76	-48.13	-9.86	0.32	500.00	-63.84
	V	23.24	Ambient	2.05	40.39	-27.76	-48.13	-10.21	0.31	500.00	-64.19

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Peak Measurements in the Non-Restricted Bands
Mode	Tx
Frequency Tested	2440MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
2440.00	H	57.90		3.39	32.75	0.00	94.04	50335.53		
	V	58.45		3.39	32.75	0.00	94.59	53625.91		
9760.00	H	37.67	Ambient	6.37	36.92	-39.25	41.70	121.64	5362.59	-32.89
	V	38.49	Ambient	6.37	36.92	-39.25	42.52	133.68	5362.59	-32.07
14640.00	H	46.49		7.32	40.17	-38.23	55.76	613.83	5362.59	-18.83
	V	47.42		7.32	40.17	-38.23	56.69	683.20	5362.59	-17.90
17080.00	H	41.45		7.64	41.87	-37.55	53.41	468.53	5362.59	-21.17
	V	41.44		7.64	41.87	-37.55	53.40	467.99	5362.59	-21.18
21960.00	H	27.01	Ambient	2.13	40.58	-28.88	40.84	110.15	5362.59	-33.75
	V	26.89	Ambient	2.13	40.58	-28.88	40.72	108.64	5362.59	-33.87
24400.00	H	27.91	Ambient	2.14	40.63	-29.29	41.39	117.39	5362.59	-33.19
	V	27.44	Ambient	2.14	40.63	-29.29	40.92	111.21	5362.59	-33.66

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Peak Measurements in the Restricted Bands
Mode	Tx
Frequency Tested	2480MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
4960.00	H	54.66		5.21	34.43	-39.35	54.95	559.01	5000.00	-19.03
	V	55.09		5.21	34.43	-39.35	55.38	587.38	5000.00	-18.60
7440.00	H	63.18		5.90	35.72	-39.43	65.37	1856.39	5000.00	-8.61
	V	62.27		5.90	35.72	-39.43	64.46	1671.74	5000.00	-9.52
12400.00	H	53.15		7.29	38.88	-39.01	60.30	1035.74	5000.00	-13.67
	V	51.93		7.29	38.88	-39.01	59.08	900.01	5000.00	-14.89
19840.00	H	38.71	Ambient	1.95	40.40	-28.04	53.02	447.82	5000.00	-20.96
	V	39.10	Ambient	1.95	40.40	-28.04	53.41	468.38	5000.00	-20.57
22320.00	H	37.97	Ambient	1.93	40.59	-28.84	51.65	382.28	5000.00	-22.33
	V	38.57	Ambient	1.93	40.59	-28.84	52.25	409.62	5000.00	-21.73

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Average Measurements in the Restricted Bands
Mode	Tx
Frequency Tested	2480MHz
Notes	Average Measurements in the Restricted Bands. The EUT's duty cycle is protocol limited. Guidance per KDB 558074 D01 v05r02 Section 11, Q3, was followed when deriving the RMS average value.

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBμV/m)	Average Total at 3m (μV/m)	Average Limit at 3m (μV/m)	Margin (dB)
4960.00	H	47.76		5.21	34.43	-39.35	-48.13	-0.09	0.99	500.00	-54.07
	V	47.38		5.21	34.43	-39.35	-48.13	-0.47	0.95	500.00	-54.45
7440.00	H	57.58		5.90	35.72	-39.43	-48.13	11.64	3.82	500.00	-42.34
	V	56.48		5.90	35.72	-39.43	-48.13	10.54	3.36	500.00	-43.44
12400.00	H	40.74		7.29	38.88	-39.01	-48.13	-0.24	0.97	500.00	-54.22
	V	38.50		7.29	38.88	-39.01	-48.13	-2.48	0.75	500.00	-56.46
19840.00	H	23.61	Ambient	1.95	40.40	-28.04	-48.13	-10.21	0.31	500.00	-64.19
	V	23.26	Ambient	1.95	40.40	-28.04	-48.13	-10.56	0.30	500.00	-64.54
22320.00	H	23.06	Ambient	1.93	40.59	-28.84	-48.13	-11.40	0.27	500.00	-65.38
	V	22.46	Ambient	1.93	40.59	-28.84	-48.13	-12.00	0.25	500.00	-65.98

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	Peak Measurements in the Non-Restricted Bands
Mode	Tx
Frequency Tested	2480MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
2480.00	H	55.09		3.40	32.93	0.00	91.42	37238.61		
	V	55.62		3.40	32.93	0.00	91.95	39581.61		
9920.00	H	38.85	Ambient	6.46	37.06	-39.24	43.13	143.37	3958.16	-28.82
	V	39.38	Ambient	6.46	37.06	-39.24	43.66	152.39	3958.16	-28.29
14880.00	H	46.20		7.40	40.09	-38.16	55.53	598.04	3958.16	-16.42
	V	47.58		7.40	40.09	-38.16	56.91	701.02	3958.16	-15.04
17360.00	H	41.79		7.65	41.71	-37.73	53.41	468.41	3958.16	-18.54
	V	40.43		7.65	41.71	-37.73	52.05	400.52	3958.16	-19.90
24800.00	H	28.82	Ambient	2.34	40.64	-29.32	42.48	133.04	3958.16	-29.47
	V	27.50	Ambient	2.34	40.64	-29.32	41.16	114.28	3958.16	-30.79

Test Details	
Manufacturer	TCGP
EUT	Demolition Hammer
Model No.	0149
Serial No.	N/A
Test	High Band-Edge – Peak and Average Readings
Mode	Tx
Frequency Tested	2480MHz
Notes	Average Measurements in the Restricted Bands. The EUT's duty cycle is protocol limited. Guidance per KDB 558074 D01 v05r02 Section 11, Q3, was followed when deriving the RMS average value.

Spurious Emissions in the Restricted Bands - Peak

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBμV/m)	Peak Total at 3m (μV/m)	Peak Limit at 3m (μV/m)	Margin (dB)
2483.50	H	23.01	Ambient	3.40	32.95	0.00	59.36	928.60	5000.00	-14.62
	V	22.73	Ambient	3.40	32.95	0.00	59.08	899.14	5000.00	-14.90

Spurious Emissions in the Restricted Bands - Average

Freq (MHz)	Ant Pol	Meter Reading (dBμV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBμV/m)	Average Total at 3m (μV/m)	Average Limit at 3m (μV/m)	Margin (dB)
2483.50	H	11.55	Ambient	3.40	32.95	0.00	-48.13	-0.24	0.97	500.00	-54.22
	V	11.55	Ambient	3.40	32.95	0.00	-48.13	-0.24	0.97	500.00	-54.22

23. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.
1516 Centre Circle
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
Email: cfanning@elitetest.com
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.



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.