



# element

## Garrett Metal Detectors

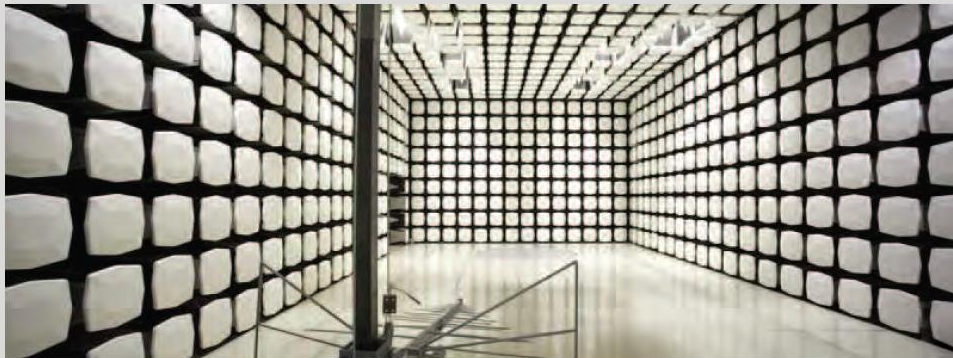
CS-3

FCC 1.1307:2025

FCC 2.1093:2025

2.4 GHz ISM

Report: GARR0129.5, Issue Date: April 16, 2025



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# CERTIFICATE OF EVALUATION

Last Date of Evaluation: April 10, 2025  
Garrett Metal Detectors  
EUT: CS-3

## RF Exposure Evaluation

### Standards

| Specification                      | Method          |
|------------------------------------|-----------------|
| FCC 1.1307:2025<br>FCC 2.1093:2025 | FCC 1.1307:2025 |

### Results

| Method Clause | Description                           | Applied | Results   | Comments |
|---------------|---------------------------------------|---------|-----------|----------|
| (b)(3)(i)(A)  | Exemption From RF Exposure Evaluation | Yes     | Compliant | None     |

### Deviations From Evaluation Standards

None

### Approved By:



Donald Facteau, Process Architect

*Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing*

# REVISION HISTORY



| Revision Number | Description | Date<br>(yyyy-mm-dd) | Page Number |
|-----------------|-------------|----------------------|-------------|
| 00              | None        |                      |             |

# ACCREDITATIONS AND AUTHORIZATIONS



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## United States

**FCC** - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

**A2LA** - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

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## Canada

**ISED** - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

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## European Union

**European Commission** – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

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## United Kingdom

**BEIS** – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

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## Australia/New Zealand

**ACMA** - Recognized by ACMA as a CAB for the acceptance of test data.

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## Korea

**MSIT / RRA** - Recognized by KCC's RRA as a CAB for the acceptance of test data.

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## Japan

**VCCI** - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

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## Taiwan

**BSMI** – Recognized by BSMI as a CAB for the acceptance of test data.

**NCC** - Recognized by NCC as a CAB for the acceptance of test data.

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## Singapore

**IDA** – Recognized by IDA as a CAB for the acceptance of test data.

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## Israel

**MOC** – Recognized by MOC as a CAB for the acceptance of test data.

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## Hong Kong

**OFCA** – Recognized by OFCA as a CAB for the acceptance of test data.

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## Vietnam

**MIC** – Recognized by MIC as a CAB for the acceptance of test data.

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## SCOPE

For details on the Scopes of our Accreditations, please visit:

[Texas](#)

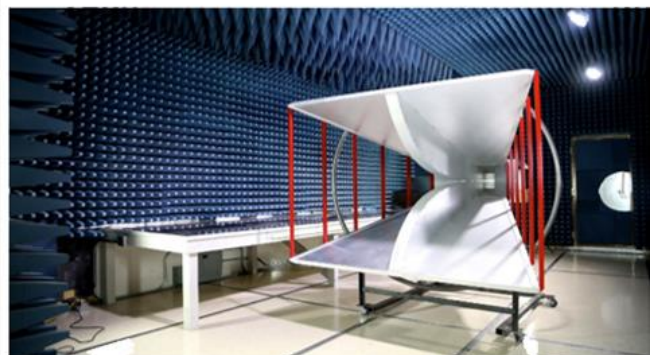
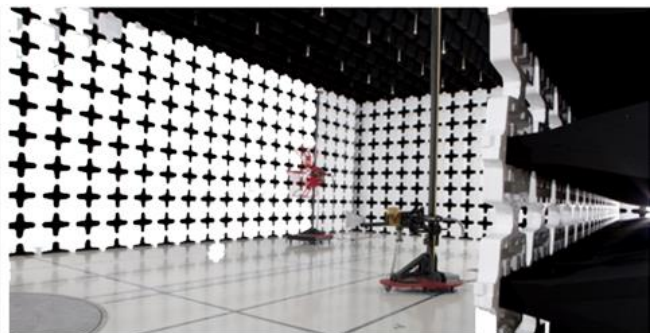
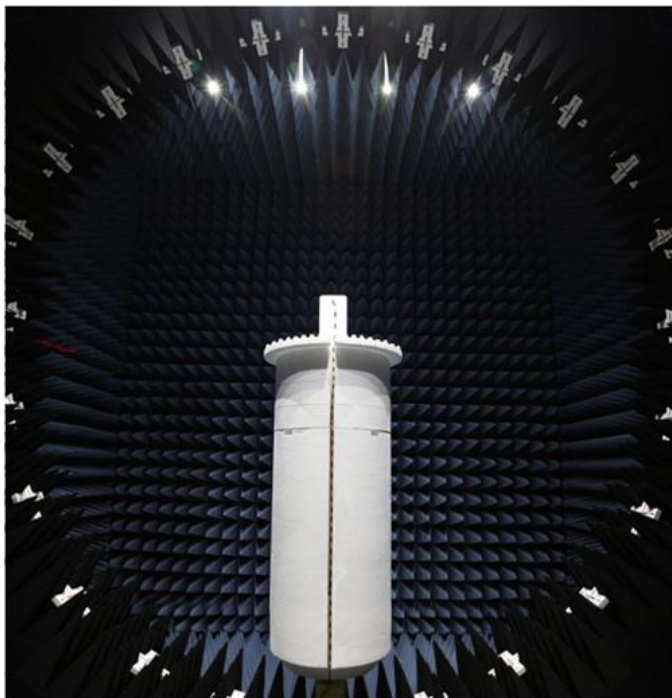
# FACILITIES

Testing was performed at the following location(s)

|                                     | Location    | Labs <sup>(1)</sup> | Address                                                         | A2LA <sup>(2)</sup> | ISED <sup>(3)</sup> | BSMI <sup>(4)</sup> | VCCI <sup>(5)</sup> | CAB <sup>(6)</sup> | FDA <sup>(7)</sup> |
|-------------------------------------|-------------|---------------------|-----------------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|
| <input checked="" type="checkbox"/> | Plano Texas | PT01-15             | 1701 E Plano Pkwy, Ste 150<br>Plano, TX 75074<br>(972) 509-2566 | 214.19              | 32637               | SL2-IN-E-057R       | A-0426              | US0054             | TL-137             |
| <input type="checkbox"/>            | Offsite     | N/A                 | See Product Description                                         | N/A                 | N/A                 | N/A                 | N/A                 | N/A                | N/A                |

See data sheets for specific labs

- (1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
- (2) A2LA Certificate No.
- (3) ISED Company No.
- (4) BSMI No.
- (5) VCCI Site Filing No.
- (6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MOC, NCC, OFCA
- (7) FDA ASCA No.



# PRODUCT DESCRIPTION



## Client and Equipment Under Evaluation Information

|                          |                         |
|--------------------------|-------------------------|
| Company Name:            | Garrett Metal Detectors |
| Address:                 | 1881 West State Street  |
| City, State, Zip:        | Garland, TX 75042       |
| Evaluation Requested By: | Bob Podhrasky           |
| EUT:                     | CS-3                    |
| Date of Evaluation:      | 4/10/2025               |

## Information Provided by the Party Requesting the Evaluation

### Functional Description of the Equipment:

Wireless Headphone pack using 2.4GHz Wideband Radio that allows user to connect their own headphones to a wireless module.

### Objective:

To demonstrate compliance with FCC Requirements for RF exposure for 1.1307 RF exempt devices

# PRODUCT DESCRIPTION

## Duty Cycle Analysis:

The following analysis was provided by Robert Podhrasky, Sr VP, Director of Engineering at Garrett Electronics, Inc.

### Garrett CS-3 Wireless Headphones Radio Transmit Duty Cycle Analysis

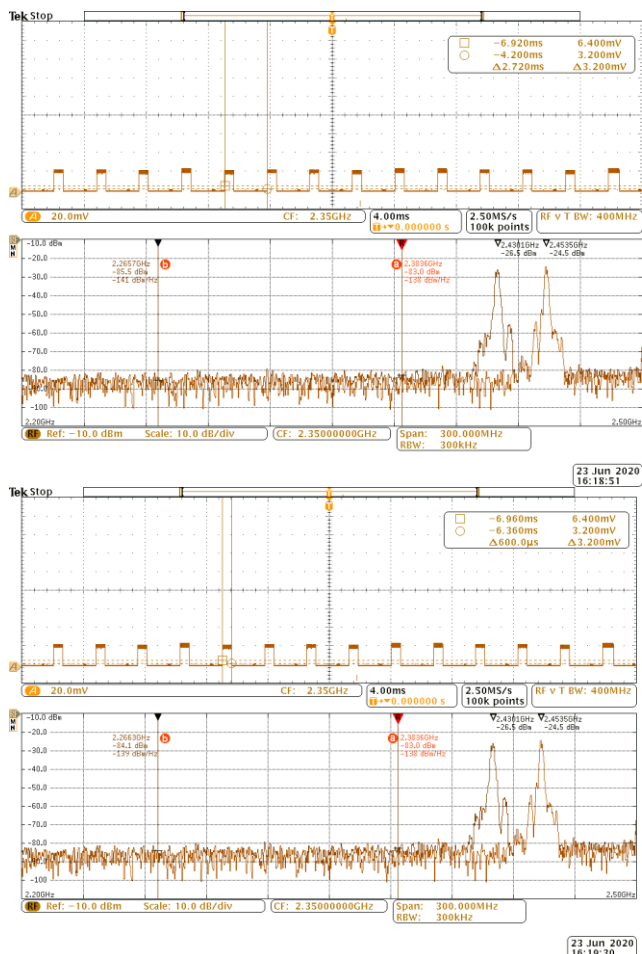
The images below demonstrate the transmitter characteristics of the Pure Path radio in the Garrett CS-3.

In each image the top graph is a time domain representation of the energy received using a closely coupled antenna connected to the RF input of a Tektronix MDO 4104B-6 Mixed Domain Oscilloscope. The lower lower graph is the energy received represented in the time domain.

The top image shows the measurement of the transmit period which is 2.72 ms.

The lower image shows the measurement of the duration of the transmit period which is 600 us.

The calculation of the transmit duty cycle is  $0.6/2.72 = 22\%$



# RF EXPOSURE CONDITION



| The following RF Exposure conditions were used for the assessment documented in this report: |                                                 |
|----------------------------------------------------------------------------------------------|-------------------------------------------------|
| Intended Use                                                                                 | Portable                                        |
| Location on Body (if applicable)                                                             | Head/Torso                                      |
| How is the Device Used                                                                       | The CS-3 is used less than 20 cm from the user. |
| Radios Contained in the Same Host Device                                                     | 2.4 GHz ISM                                     |
| Simultaneous Transmitting Radios                                                             | None                                            |
| Body Worn Accessories                                                                        | None                                            |
| Environment                                                                                  | General Population/Uncontrolled Exposure        |

# EXEMPTION FROM RF EXPOSURE EVALUATION



## OVERVIEW

Section 1.3 of KDB 44798 D04 v01 states that, “Under the new rules, all radio services and operations are subject to Routine Evaluation [§§ 1.1307(b)(1), 2.1033(f), etc.], unless shown to qualify under the exemptions provided in the rules and OET Lab policies for equipment authorization.”

The glossary of KDB 44798 D04 v01 specifies that an exempt RF device is defined “solely from the obligation to perform a routine environmental evaluation to demonstrate compliance with the RF exposure limits in § 1.1310; it is not exemption from the equipment authorization procedures described in 47 CFR Part 2, not exemption from general obligations of compliance with the RF exposure limits in § 1.1310 of this chapter, and not exemption from determination of whether there is no significant effect on the quality of the human environment under § 1.1306.” Compliance with the exemption criteria defined in 1.1307(b) confirm compliance with the limits in § 1.1310.

## COMPLIANCE WITH FCC 1.1310

Per 1.1307(b)(3), (i) For single RF sources (*i.e.*, any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
- (B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by:

$$P_{th}(mW) = \begin{cases} ERP_{20\text{ cm}}(d/20\text{ cm})^x & d \leq 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \leq 40\text{ cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\text{ cm}}\sqrt{f}}\right) \text{ and } f \text{ is in GHz};$$

And

$$ERP_{20\text{ cm}}(mW) = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

- (C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

TABLE 1 TO §1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

| RF Source frequency (MHz) | Threshold ERP (watts) |
|---------------------------|-----------------------|
| 0.3-1.34                  | $1,920 R^2$ .         |
| 1.34-30                   | $3,450 R^2/f^2$ .     |
| 30-300                    | $3.83 R^2$ .          |
| 300-1,500                 | $0.0128 R^2 f$ .      |
| 1,500-100,000             | $19.2 R^2$ .          |

# EXEMPTION FROM RF EXPOSURE EVALUATION

(ii) For multiple RF sources: Multiple RF sources are exempt if:

- (A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).
- (B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Where:

$a$  = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for  $P_m$ , including existing exempt transmitters and those being added.

$b$  = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

$c$  = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_i$  = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source  $i$  at a distance between 0.5 cm and 40 cm (inclusive).

$P_{m,i}$  = the exemption threshold power ( $P_m$ ) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source  $i$ .

$ERP_j$  = the ERP of fixed, mobile, or portable RF source  $j$ .

$ERP_{m,j}$  = exemption threshold ERP for fixed, mobile, or portable RF source  $j$ , at a distance of at least  $\lambda/2\pi$  according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$  = the maximum reported SAR or MPE of fixed, mobile, or portable RF source  $k$  either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure Limit_k$  = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source  $k$ , as applicable from §1.1310

The relationship between EIRP and ERP is:

$$ERP \text{ (dBm)} = EIRP \text{ (dBm)} - 2.14 \text{ dB}$$

Where EIRP is the sum of the conducted power (dBm) and the antenna gain (dBi).

# EXEMPTION FROM RF EXPOSURE EVALUATION



## ASSESSMENT

The exemption from RF exposure evaluation is summarized in the following table(s):

| Radio       | Transmit Frequency (MHz) | Conducted Output Power | Power Tolerance (dB) | Duty Cycle | Antenna Assembly Gain (dBi) | Minimum Separation Distance (cm) | Calculated Conducted Exposure Power (mW) | Limit (mW) | Compliant |
|-------------|--------------------------|------------------------|----------------------|------------|-----------------------------|----------------------------------|------------------------------------------|------------|-----------|
| 2.4 GHz ISM | 2406-2474                | 3.5 dBm                | 2.0                  | 22.0%      | 3.3                         | 0.5                              | 0.8                                      | 1.0        | yes       |

The information in the table above was obtained from:

The rated value was used in these calculations. This assessment is based on customer supplied information and Element report GARR0129.4 Rev. 1

Evaluator: Jay Whitworth

End of Test Report