



element

Graphic Products, Inc.

Toro Max

FCC 1.1307:2022

RFID

Report: GRAP0077.5, Issue Date: March 2, 2022



CERT #3310.02

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CERTIFICATE OF EVALUATION



Last Date of Evaluation: March 2, 2022
Graphic Products, Inc.
EUT: Toro Max

RF Exposure Evaluation

Standards

| Specification | Method |
|-----------------|-----------------|
| FCC 1.1307:2022 | FCC 1.1307:2022 |

Results

| Method Clause | Description | Applied | Results | Comments |
|---------------|---------------------------------------|---------|---------|----------|
| (b)(3)(i)(A) | Exemption From RF Exposure Evaluation | Yes | Pass | 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 (yyyy-mm-dd) | Page Number |
|-----------------|-------------|----------------------|-------------|
| 00 | None | | |

ACCREDITATIONS AND AUTHORIZATIONS

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.

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.

European Union

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

United Kingdom

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

Australia/New Zealand

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Korea

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

Japan

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

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.

Singapore

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

Israel

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

Hong Kong

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

Vietnam

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

SCOPE

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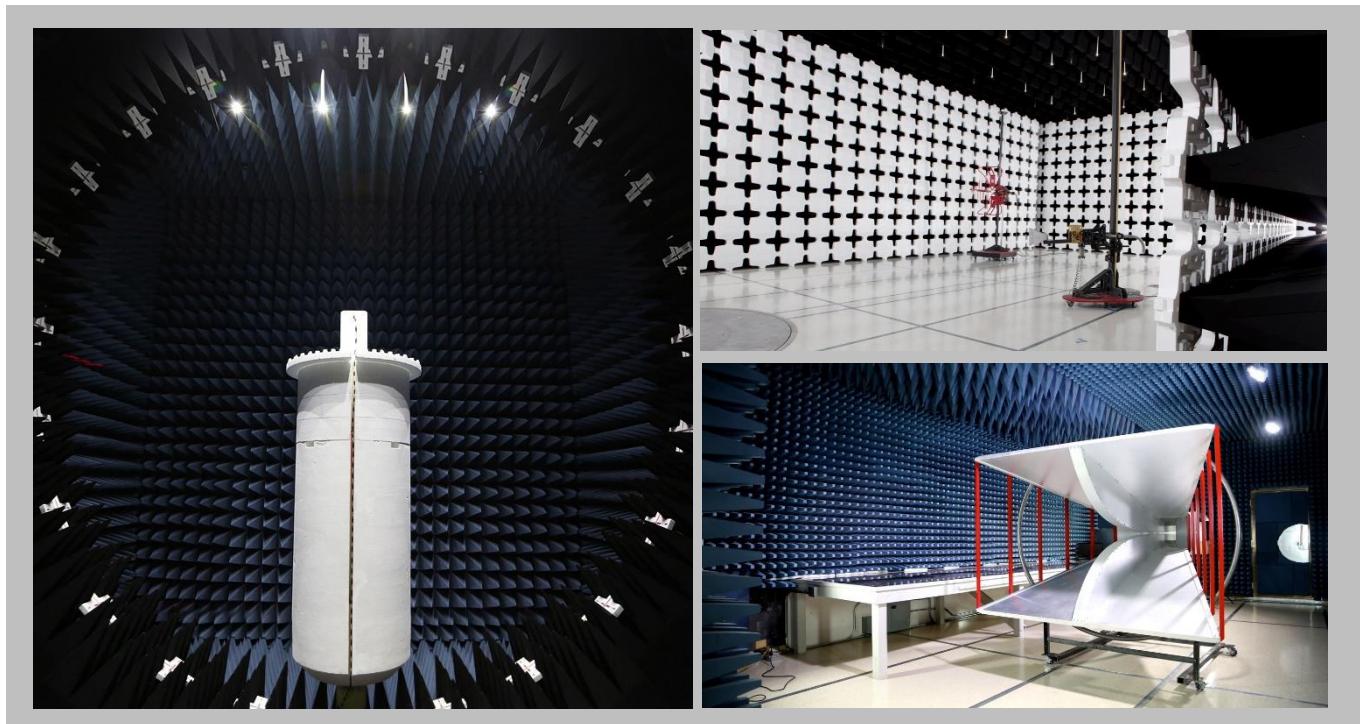
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FACILITIES



| California | Minnesota | Oregon | Texas | Washington |
|---|---|--|--|---|
| Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918 | Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136 | Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066 | Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255 | Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425) 984-6600 |
| A2LA | | | | |
| Lab Code: 3310.04 | Lab Code: 3310.05 | Lab Code: 3310.02 | Lab Code: 3310.03 | Lab Code: 3310.06 |
| Innovation, Science and Economic Development Canada | | | | |
| 2834B-1, 2834B-3 | 2834E-1, 2834E-3 | 2834D-1 | 2834G-1 | 2834F-1 |
| BSMI | | | | |
| SL2-IN-E-1154R | SL2-IN-E-1152R | SL2-IN-E-1017 | SL2-IN-E-1158R | SL2-IN-E-1153R |
| VCCI | | | | |
| A-0029 | A-0109 | A-0108 | A-0201 | A-0110 |
| Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA | | | | |
| US0158 | US0175 | US0017 | US0191 | US0157 |



PRODUCT DESCRIPTION

Client and Equipment Under Evaluation Information

| | |
|---------------------------------|------------------------|
| Company Name: | Graphic Products, Inc. |
| Address: | 9825 SW Sunshine Court |
| City, State, Zip: | Beaverton, 97005 |
| Evaluation Requested By: | Michael Noble |
| EUT: | Toro Max |
| Date of Evaluation: | March 2, 2022 |

Information Provided by the Party Requesting the Evaluation

Functional Description of the Equipment:

The Toro Max is a desktop printer.
The radio is used to confirm compatible supply is being used.
The largest dimension is 13 inches.

Objective:

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

RF Exposure Condition



The following RF Exposure conditions were used for the assessment documented in this report:

| | |
|--|---|
| Intended Use | Any |
| Location on Body (if applicable) | Head/Torso |
| How is the Device Used | The Toro Max is used at a distance of greater than 20 cm from the user. |
| Radios Contained in the Same Host Device | RFID |
| Simultaneous Transmitting Radios | None |
| Body Worn Accessories | None |
| Environment | General Population/Uncontrolled Exposure |

EXEMPTION FROM RF EXPOSURE EVALUATION



OVERVIEW

With respect to the limits on human exposure to RF emissions provided in 47 CFR §1.1310, if equipment can be shown to qualify for an exemption pursuant to 47 CFR §1.1307(b)(3), an evaluation is not required.

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 λ 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 $P_{th,i}$, 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).

$P_{th,i}$ = the exemption threshold power ($P_{th,i}$) 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 .

$ERP_{th,j}$ = 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:

$$ERP\ (dBm) = EIRP\ (dBm) - 2.14\ dB$$

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

EXEMPTION FROM RF EXPOSURE EVALUATION



When the transmitted power is measured as a field strength value (dB μ V/m), this value is converted to a power level using the following derivation (assuming the field strength value has been distance corrected to 3 m, see notes below table):

Step 1 – Per ANSI C63.10:2013 section 10.3.9 equation (34), the relationship between EIRP and field strength is as follows:

$$EIRP_{meas} = E_{meas} - 95.3$$

Where:

$EIRP_{meas}$ is the equivalent isotropically radiated power in dBm as converted from a measured value

E_{meas} is the field strength at a 3 m measurement distance in dB μ V/m. To convert from the specification measurement distance to 3m, a 40 dB/decade adjustment was applied.

Step 2 – If a power tolerance or a tune-up value is provided, the reported power should be scaled accordingly:

$$EIRP = EIRP_{meas} + Tolerance$$

Where:

EIRP is the maximum equivalent isotropically radiated power in dBm

$EIRP_{meas}$ is the equivalent isotropically radiated power in dBm as converted from a measured value

Tolerance is either the tolerance provided in dB or the positive tune-up tolerance range in dB

Step 3 – Convert the EIRP value to linear terms

$$EIRP(mW) = 10^{\frac{EIRP(dBm)}{10}}$$

Where:

EIRP is the maximum equivalent isotropically radiated power, in terms of either mW or dBm

This value can then be compared against the limit to determine compliance.

ASSESSMENT

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

| Radio | Transmit Frequency (MHz) | Radiated Output Power or Field Strength | Power Tolerance (dB) | Duty Cycle | Minimum Separation Distance (cm) | Calculated Exposure Power (mW) | Limit (mW) | Compliant |
|-------|--------------------------|---|----------------------|------------|----------------------------------|--------------------------------|------------|-----------|
| RFID | 13.56 | 38.7 dB μ V/m @ 30m | 1.0 | 100.0% | 20 | 0.3 | 1.0 | Yes |

The information in the table above was obtained from:

A measured value was used in these calculations. Customer supplied information and Element report # GRAP0077.1 Rev. 1 were used. The 30 m field strength value was adjusted by 40 dB to a 3 m value.

Evaluator: Jay Whitworth



End of Test Report