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Applicant:

FEIG ELECTRONIC GmbH
Industriestraße 1a
35781 Weilburg
Tel.: +49 647131090

Test report no.:

240410-AU01+W03

for:

FEIG ELECTRONIC GmbH
Bluetooth extension board
TST RBA-B

according to:

47 CFR Part 1
RSS-102

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12155-01-00

Accreditation:

FCC test firm accreditation expiration date: 2025-09-19
MRA US-EU, FCC designation number: DE0010
Test firm registration number: 997268
FCC Registration Number (FRN): 0032245045
BNetzA-CAB-02/21-02/7 Valid until 2028-11-26

Recognized until 2025-03-16 by the
Department of Innovation, Science and Economic Development Canada (ISED)
as a recognized testing laboratory
CAB identifier: DE0011
Company number: 3472A

Location of Testing:

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The technical accuracy is guaranteed through the quality management of Element Materials Technology Straubing GmbH.

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1.1 FCC standard

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1.2 IC standard

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RSS-102 Issue 6, section 6.6	Evaluation for separation distance > 20 cm, except 3 kHz – 10 MHz	Passed	10

Straubing, January 24, 2025

Tested by
Konrad Graßl
Department Manager Radio

Approved by
Christian Kiermeier
Reviewer

2 Test regulations

2.1 FCC standards

Standard	*Title*
Part 1, Subpart I, Section 1.1310 October 2024	Radiofrequency radiation exposure limits

2.2 IC standards

Standard	*Title*
RSS-102 Issue 6 (December 15, 2023)	Spectrum Management and Telecommunications Radio Standards Specification Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)

3 Equipment under Test

All Information in this clause is declared by customer.

3.1 General information

Product type:	Bluetooth extension board		
Model name:	TST RBA-B		
Serial number(s):	N/A		
Manufacturer:	FEIG ELECTRONIC GmbH		
Hardware version:	FE1218-1-B		
Software version:	TST RBA BLE-PER V01.01 / TST RBA BLE-DTM V01.01		
Short description:	Extension Board connects the controller to a smartphone via Bluetooth LE (2.4 GHz) to transmit data.		
Additional modifications:	None		
FCC ID:	PJMTSTRBA		
IC registration number:	6633A-TSTRBA		
Designation of emissions:	1M09F7D--		
Power supply:	DC supply		
	Nominal voltage:	3.3 V	
Device type:	☐ Portable	☒ Mobile	☐ Fixed

3.2 Radio specifications

System type (Note 1):	Digital transmission system (DTS)		
Application frequency band:	2400.0 MHz - 2483.5 MHz		
Number of RF channels:	40		
Nominal bandwidth:	2 MHz		
Modulation(s):	GFSK		
Antenna:	Type:	PCB antenna (antenna design)	
	Gain:	3.3 dBi (maximum)	
	Model:	2.4-GHz Inverted F Antenna	
	Manufacturer:	Texas Instruments	
	Connector:	☐ external	☐ internal
		☐ temporary	☒ none (integral antenna)

Note(s):
1. “DTS” is the equipment class for digital transmission systems, “DSS” for all other Part 15 spread spectrum transmitters as used for equipment authorization system form 731.
2. The final device has only an integrated antenna. The EUT was equipped with a temporary antenna port which was used for all tests.

3.3 Human exposure specifications

Exposure tier:	Body
Separation distance:	> 20 cm
Evaluated against exposure limits:	General public use
Simultaneous transmissions:	no

3.4 Photographs of EUT

See Annex B of test report 240410-AU01+W01 of test laboratory Element Materials Technology Straubing GmbH.

4 Test results

This clause gives details about the test results as collected in the summary of test results on page 4.

4.1 FCC

4.1.1 Maximum permissible exposure, except WPT, calculation

Requirement:	Part 1, § 1.1310(e)(1)
Reference:	---

Performed by:	Konrad Graßl	Date of test:	January 24, 2025
Result:	☒ Limits kept	☐ Limits not kept	

4.1.1.1 Requirements and limits maximum permissible exposure

According to §1.1310(e)(1):
Table 1 to § 1.1310(e)(1) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Frequency range (MHz)	*Electric field strength (V/m)*	*Magnetic field strength (A/m)*	*Power densitiy (mW/cm^2)*	*Averaging time (minutes)*
1.34-30	824/f	2.19/f	$180/f^2$ (see note 2)	<30
1500-100000	---	---	1.0	<30

Table 1: Table 1 to §1.1310(e)(1) Limits for Maximum Permissible Exposure (MPE) for General Population/Uncontrolled Exposure

Notes:
1. F = frequency in MHz
2. Plane-wave equivalent power density

4.1.1.2 Results

The following data are based on applicants document: Test report 240410-AU01+W01 of the test laboratory Element Materials Technology Straubing GmbH

Conducted output power:	7.3 dBm at 2402 MHz
Antenna gain:	3.3 dBi

Information related to Exposure:

Tune-up tolerance (according to the manufacturer):	0 dB
Separation distance:	20 cm
Exposure tier:	general public
Power averaging over time:	not applied

Operation f requency (MHz)	*EIRP + tune-up tolerance (dBm)*	*Power densitiy (mW/cm^2)*	*Limit (mW/cm^2)*	*Ratio of limit*	*Result*
2402	10.6	0.002	1.000	0.002	Passed

Table 2: Result of evaluation of compliance

4.2 Canada

4.2.1 Evaluation for separation distance > 20 cm, except 3 kHz – 10 MHz

Requirement:	RSS-102 Issue 6, section 6.6
Reference:	n/a

Performed by:	Konrad Graßl	Date of test:	January 24, 2025
Result:	☒ Limits kept	☐ Limits not kept	

4.2.1.1 Field reference level exposure exemption limits

According to RSS 102, section 6.6:
Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance)
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31\times10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz
- at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

4.2.1.2 Results

The following data are based on applicants document: Test report 240410-AU01+W01 of the test laboratory Element Materials Technology Straubing GmbH

Conducted output power:	7.3 dBm at 2402 MHz
Antenna gain:	3.3 dBi

Information related to Exposure:

Tune-up tolerance (according to the manufacturer):	0 dB
Separation distance:	20 cm
Exposure tier:	general public
Power averaging over time:	not applied

Channel Frequency (MHz)	*EIRP + tuneup tolerance (dBm)*	*EIRP (W)*	*EIRP limit (W)*	*Ratio of limit*	*Result*
2402	10.6	0.011	2.676	0.004	Passed

Table 3: Result of exemption for routine evaluation of RF exposure

5 Revision history

Revision	*Date*	*Issued by*	*Description of modifications*
0	2025-01-24	Konrad Graßl	First edition

Template: RF_FCC_IC_Human Exposure_V1.10