R F – T E S T R E P O R T

- Human Exposure -

Type / Model Name	:	PRA 400 (01)
Product Description	:	Laser Receiver
Applicant	:	Hilti Corporation
Address	:	Feldkircherstrasse 100
		9494 SCHAAN, LIECHTENSTEIN
Manufacturer	:	Hilti Corporation
Address	:	Feldkircherstrasse 100
		9494 SCHAAN, LIECHTENSTEIN

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : 80183254-05 Rev_1	21. January 2025 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-03
D-PL-12030-01-04

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FCC ID: SDL-PRA4X

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 1, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 1, Subpart 2, Section 2.1091	Radiofrequency radiation exposure evaluation: **mobile devices**.
Part 1, Subpart 2, Section 2.1093	Radiofrequency radiation exposure evaluation: **portable devices**.
KDB 447498 D04	RF Exposure procedures and equipment authorisation policies for mobile and portable devices, April 20, 2021.
ANSI C95.1: 2005	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
ETSI TR 100 028 V1.3.1: 2001-03,	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the Measurement of Mobile Radio Equipment Characteristics—Part 1 and Part 2

2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according his/her instructions.

2.3 Photo documentation of the EUT – See ATTACHMENT A

2.4 Equipment type, category

BLE device, portable equipment

2.5 Short description of the equipment under test (EUT)

The laser receiver can be used to remotely control the rotating laser and to detect and locate the laser beam.

Number of tested samples:	1
Serial number:	336
Firmware version:	0.1.0-233

2.6 Variants of the EUT

There are no variants.

2.7 Operation frequency and channel plan

The operating frequency is 2400 MHz to 2483.5 MHz.

Channel No.	Frequency (MHZ)	Channel No.	Frequency (MHZ)
37	2402	18	2442
0	2404	19	2444
1	2406	20	2446
2	2408	21	2448
3	2410	22	2450
4	2412	23	2452
5	2414	24	2454
6	2416	25	2456
7	2418	26	2458
8	2420	27	2460
9	2422	28	2462
10	2424	29	2464
38	2426	30	2466
11	2428	31	2468
12	2430	32	2470
13	2432	33	2472
14	2434	34	2474
15	2436	35	2476
16	2438	36	2478
17	2440	39	2480

2.8 Transmit operating modes

The EUT uses GFSK modulation and may provide following data rates:

- 125 kbps (kbps = *kilobits per second)*

2.9 Antennas

The following antenna shall be used with the EUT:

Number	Characteristic	Model number	Plug	Frequency range (GHz)	Gain (dBi)
1	Omni	PCB inverted F antenna	PCB	2.4 – 2.5	1.1

2.10 Power supply system utilised

Power supply voltage, V_{nom} : 3.0 V DC (battery powered)

3 TEST RESULT SUMMARY

FCC Rule Part	Description	Result
KDB 447498, 2.1.3	SAR-Based Exemption	passed

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80183254-05	0	25 April 2024	Initial test report
	1	21 January 2025	Clause 5: distance changed to 11 mm; Duty cycle included

The test report with the highest revision number replaces the previous test reports.

3.2 Final assessment

The equipment under test fulfills the requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 11 April 2024

Testing concluded on : 11 April 2024

Checked by:

Klaus Gegenfurtner
I confirm the correctness and integrity of this document
2025.01.21 14:23:45 +01'00'

Klaus Gegenfurtner
Teamleader Radio

Tested by:

I am the author of this document
2025.01.21 13:56:40 +01'00'

Franz-Xaver Schrettenbrunner
Radio Team

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15 - 35 °C
Humidity:	30 - 60 %
Atmospheric pressure:	86 - 106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule (w = 0).
Details can be found in the procedure CSA_B_V50_29.

5 HUMAN EXPOSURE

5.1 RF Exposure Test Exemption for Single Source

For test instruments and accessories used see section 6 Part **DC** .

5.1.1 Applicable standard

According to KDB 447498 D04 Section 2.1 there are three test exemptions for single sources:

- 1mW Test exemption
- SAR-Based Exemption
- MPE- Based Exemption

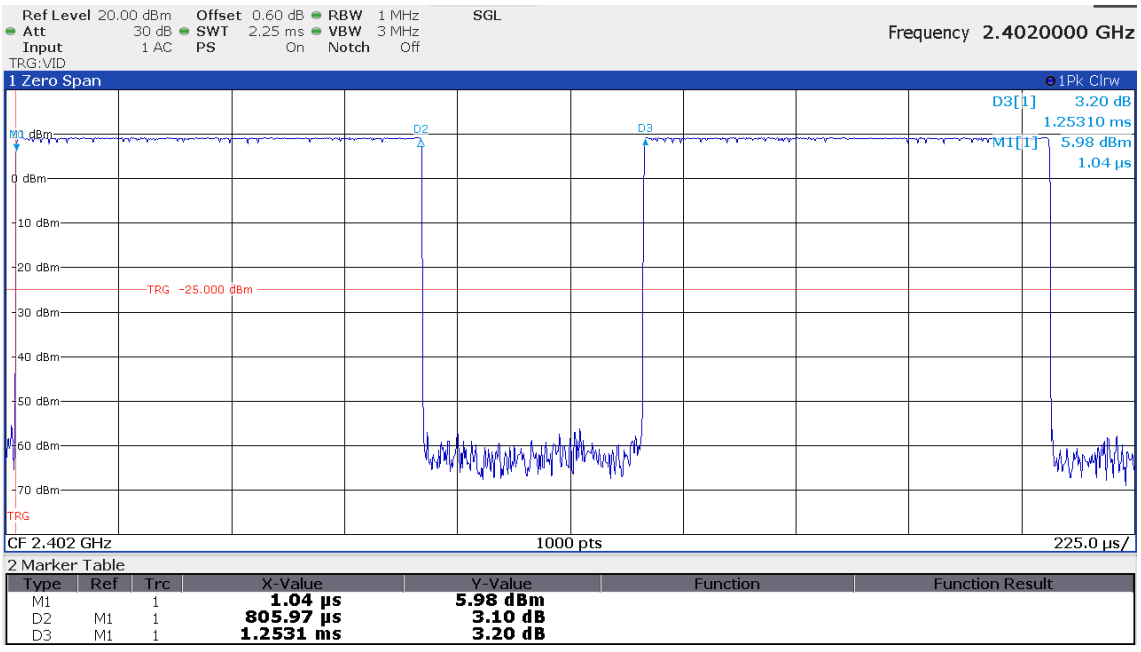
If one of the exemption conditions is met the EuT qualifies as exempt RF device. No further RF assessment is required for exempt RF devices.

5.1.2 EUT parameters

The maximum peak radiated output power is taken from the test report 80183254-04 Rev_1 of the accredited test laboratory CSA Group Bayern GmbH, Straubinger Straße 100, 94447 Plattling, Germany.

Frequency (minimum)	2402 MHz	
Max. EIRP (peak)	10.4 dBm	P = 10.96 mW

The duty cycle of the EUT is measured conducted. It is independent of the used channel:



Duty cycle correction according to ANSI C63.10 section 7.5:

δ(dB) = 20log(Δ) = 20log(805.97µs / 1253.1µs) = -3.8 dB

EIRP (average power) **6.6 dBm** **4.57 mW**

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5.1.3 SAR-Based Exemption

	Condition for exemption	EUT	Result
frequency	300 - 6000 MHz	2400 – 2483.5 MHz	passed
Separation distance	0.5 – 40 cm	1.1 cm	passed
Pth	12.37 mW	4.57 mW	passed

Overall result: SAR-Based Exemption is applicable.

Calculation of Pth

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

where

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

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

f: frequency in GHz
d: separation distance in cm

The requirements are **FULFILLED.**

Remarks: None.

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
DC	FSW43	02-02/11-21-001	22/05/2024	22/05/2023		