RF Report

Manufacturer: Ypsomed AG

Model: Smartpilot

Antenna Gain Measurements

Prepared for: Ypsomed AG.
Brunnmattstrasse 6,
Burgdorf
Switzerland

COMMERCIAL-IN-CONFIDENCE

Document 75964883-01 Issue 01

SIGNATURE			
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NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	11 August 2025

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

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Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	11 August 2025

Table 1

1.2 Introduction

Applicant	Ypsomed AG
Manufacturer	Ypsomed AG
Model Number(s)	SmartPilot
Serial Number(s)	20007667
Hardware Version(s)	1.1.0
Software Version(s)	7.0.0
Number of Samples Tested	1
Order Number	198552:R0
Date	28-July-2025
Date of Receipt of EUT	24-July-2025
Start of Test	24-July-2025
Finish of Test	24-July-2025
Name of Engineer(s)	Hugo Petty

1.3 Brief Summary of Results

A brief summary of the tests carried out are shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode:				
2.1	Bluetooth Low Energy	Antenna Gain Measurements	-	For information only

Table 2

1.4 Product Information

1.4.1 Technical Description

The device contains a 2.4 GHz BLE functionality using a PCB antenna. The 2.4 GHz signal is modulated by the micro controller of type nRF52840.

1.5 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: SmartPilot, Serial Number: 20007667			
0	As supplied by the customer	Not Applicable	Not Applicable
1	The device was programmed with the special test firmware "integrationtest_maxemission_merged" of the firmware release 7.0.0. A coaxial connector (X100, normally not assembled) was assembled and connected to the antenna path between C106 and L100.	Konstantin Sieler	24-July-2025

Table 3

1.6 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Bluetooth Low Energy		
Antenna Gain Measurements	Hugo Petty	None

Table 4

Office Address:

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Antenna Gain Measurements

2.1.1 Equipment Under Test and Modification State

SmartPilot, S/N: 20007667, Modification State 0 (Radiated)
SmartPilot, S/N: 20007667, Modification State 1 (Conducted)

2.1.2 Date of Test

24-July-2025

2.1.3 Test Method

The manufacturer provided a modified sample with a temporary 50 ohm SMA connector in place of the antenna which was used to perform a conducted power measurement in accordance with ANSI C63.10 clause 11.9.1.1.

The non-modified sample was then placed in a fully anechoic chamber on a turntable at 1.5m height at a measurement distance of 1m. The equipment under test (EUT) was placed in 3 orientations (X, Y, Z) to establish which plane provided the maximum EIRP, this was found to be the X-Orientation, and this orientation can be seen in the test setup photo in section 3 of this report.

The chamber is calibrated to make EIRP measurements thus for each frequency point the total loss from the centre of the turntable is determined using the substitution method and set as a correction factor on the measuring equipment. The EUT was oriented for maximum EIRP and rotated in azimuth in 15 degree steps and the EIRP recorded as shown on the polar plots in the test result section below.

Conducted measurements were made using a Siretta I-PEX MHF4 To SMA Female Bulkhead Jack 1.13 Coaxial cable connected to a temporary antenna connector. The loss across this connector was calculated as 0.34dB for 2402 MHz and 0.35dB for 2440 MHz and 2480 MHz. The conducted power results were corrected for these adaptor losses.

2.1.4 Environmental Conditions

Ambient Temperature	20.2 °C
Relative Humidity	63.5 %

2.1.5 Test Equipment Diagram

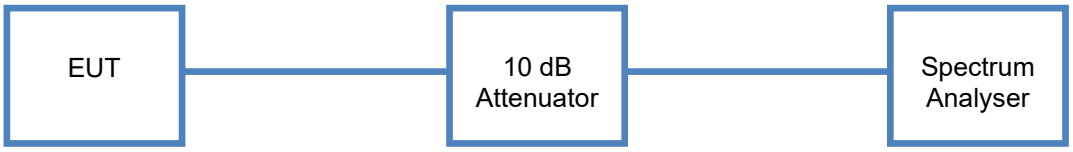

Figure 1 – Conducted Test Setup

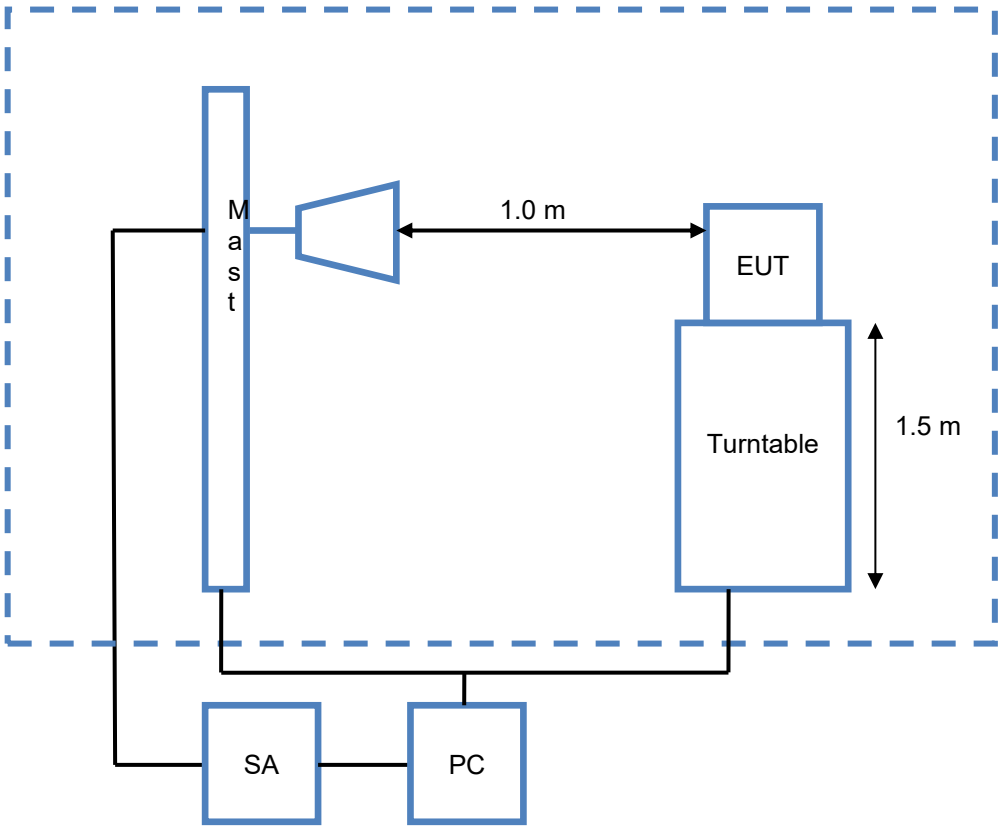

Figure 1 – Radiated Test Setup

2.1.6 Test Results

Summary of Results

Frequency (MHz)	Antenna Gain (dBi)
2402	-2.53
2440	-3.98
2480	-6.45

Table 5 – Antenna Gain Results

Conducted Results

Frequency (MHz)	Result (dBm)
2402	-10.61
2440	-9.24
2480	-8.45

Table 6 – Maximum Conducted Output Power Results

Radiated Results

Frequency (MHz)	Result (dBm EIRP)
2402	-13.14
2440	-13.22
2480	-14.90

Table 7 – Maximum Radiated Output Power Results

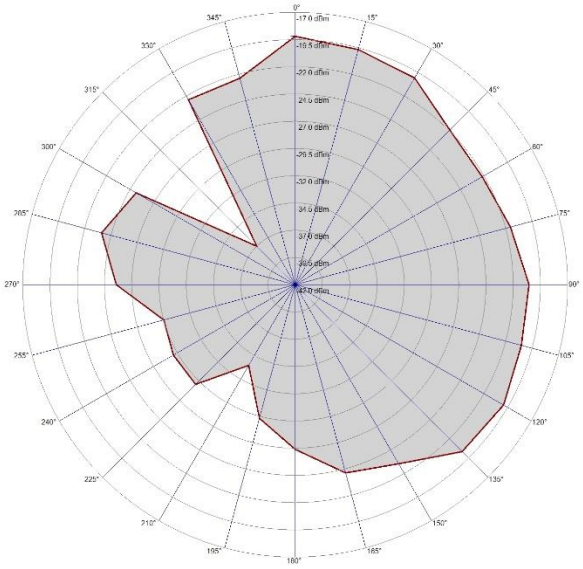

Figure 2 – 2402 MHz, Horizontal, X-Orientation

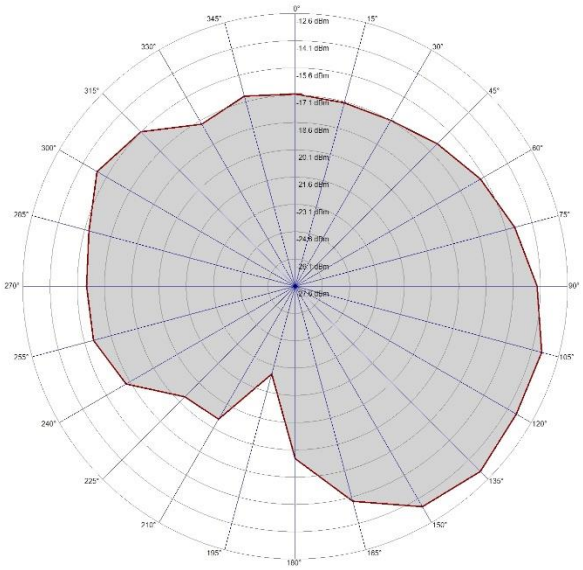

Figure 3 – 2402 MHz, Vertical, X-Orientation

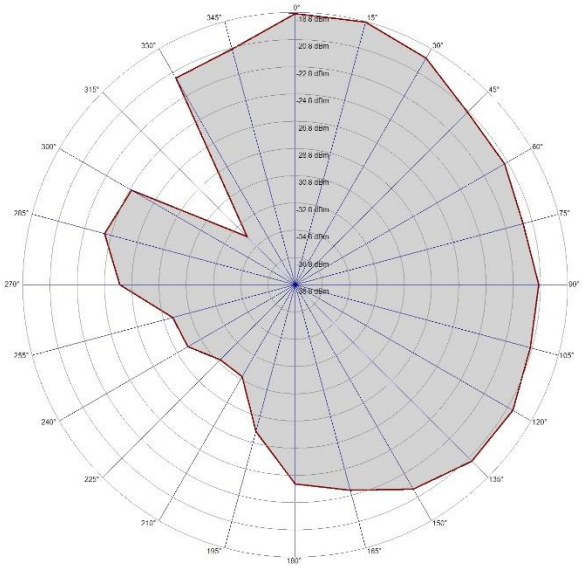

Figure 4 – 2440 MHz, Horizontal, X-Orientation

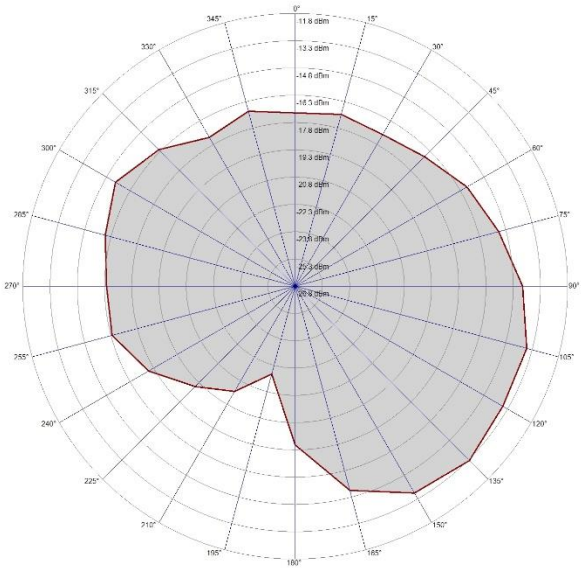

Figure 5 – 2440 MHz, Vertical, X-Orientation

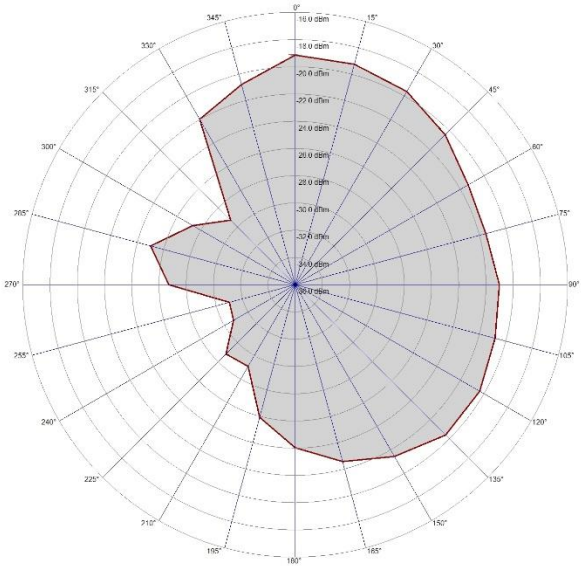

Figure 6 – 2480 MHz, Horizontal, X-Orientation

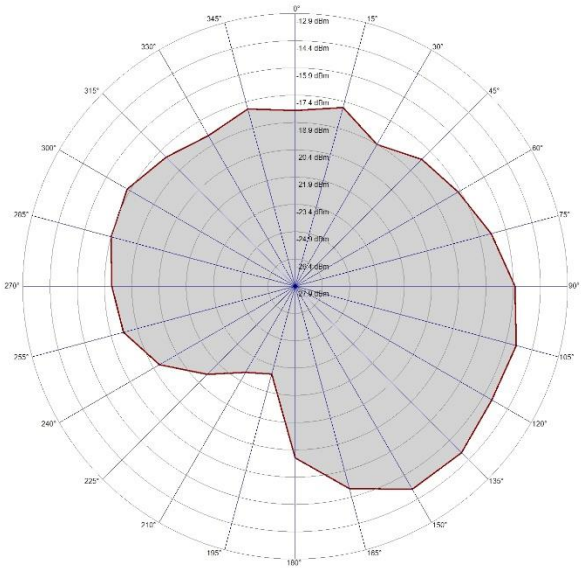

Figure 7 – 2480 MHz, Vertical, X-Orientation

2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 8.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
3m Fully-Anechoic Chamber	Rainford	RF Chamber 8	1548	12	16-May-2026
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	12-May-2026
Antenna (DRG, 1 GHz to 18 GHz)	ETS-Lindgren	3115	3125	12	12-Oct-2025
PXA Signal Analyser	Agilent Technologies	N9030A PXA	4409	12	23-Jan-2026
1 - 8 GHz pre amp	Wright Technologies	PS06-0060	4972	12	12-May-2026
3.5 mm 1m Cable	Junkosha	MWX221-01000DMS	5417	12	06-Jun-2026
Coaxial Fixed Attenuator DC-18GHz 5W 10dB	RF-Lambda	RFS5G18B10SMP	6175	12	21-Jul-2026
Humidity and Temperature meter	R.S Components	1364	6347	12	13-Mar-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000DMSDMS/A	6409	-	O/P Mon
4m Coaxial Cable Assy	Junkosha	MWX221-04000NMSNMS/A	6411	-	O/P Mon
2m Coaxial Cable Assy	Junkosha	MWX221-02000NMSNMS/A	6414	-	O/P Mon

O/P Mon – Output Monitored using calibrated equipment

3 Photographs

3.1 Test Setup Photographs

Figure 8 – Test Setup Photo BLE (Radiated), X-Orientation, 0 Degrees

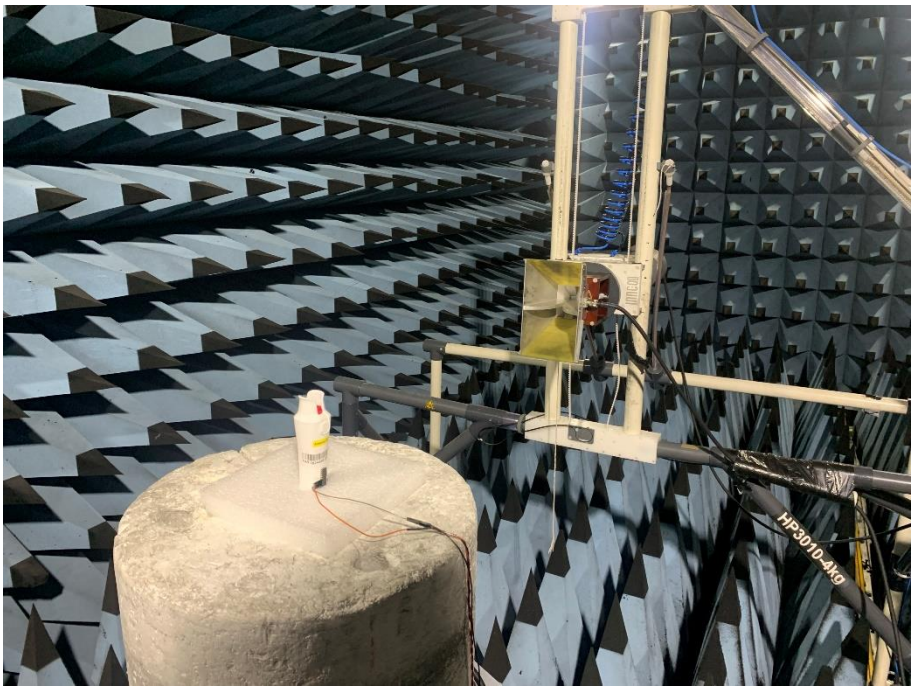

Figure 9 – Test Setup Photo BLE (Radiated), Y-Orientation, 0 Degrees

Figure 10 – Test Setup Photo BLE (Radiated), Z-Orientation, 0 Degrees

4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Antenna Gain Measurements	Conducted: ±0.96 dB Radiated: ±3.08 dB

Table 8

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.