

Address:
CSA Group Bayern GmbH
 Straubinger Straße 100
 94447 Plattling
 GERMANY

Phone: +49(0)9931-98360
 E - mail: info@csagroup.org
 Internet: http://www.csagroup.org

Test – Results

Order-No.:

80268816-02 Rev_0

Client	TQ-Systems GmbH, Gut Delling, Muehlstrasse 2, 82229 SEEFELD, GERMANY		
Manufacturer	TQ-Systems GmbH, Gut Delling, Muehlstrasse 2, 82229 SEEFELD, GERMANY		
Product Description	HPR Gateway		
Type / Model Name	HPR-SB02		
Testing commenced on	2025-09-25	Pretest is made according to Customer specific	
Testing concluded on	2025-09-25		
Serial - No.	n/a		

Remarks:

Customer specific tests in order to determine antenna gain and antenna performance.

According to the applicant there is a model variant "HPR-SB02-A".

According to the manufacturer, the antenna will be used in a product with FCC ID 2ANFF-Q105.

The HW Version of the EUT is 373580.0010.

This test result consists of 14 page(s). The test result only corresponds to the tested sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

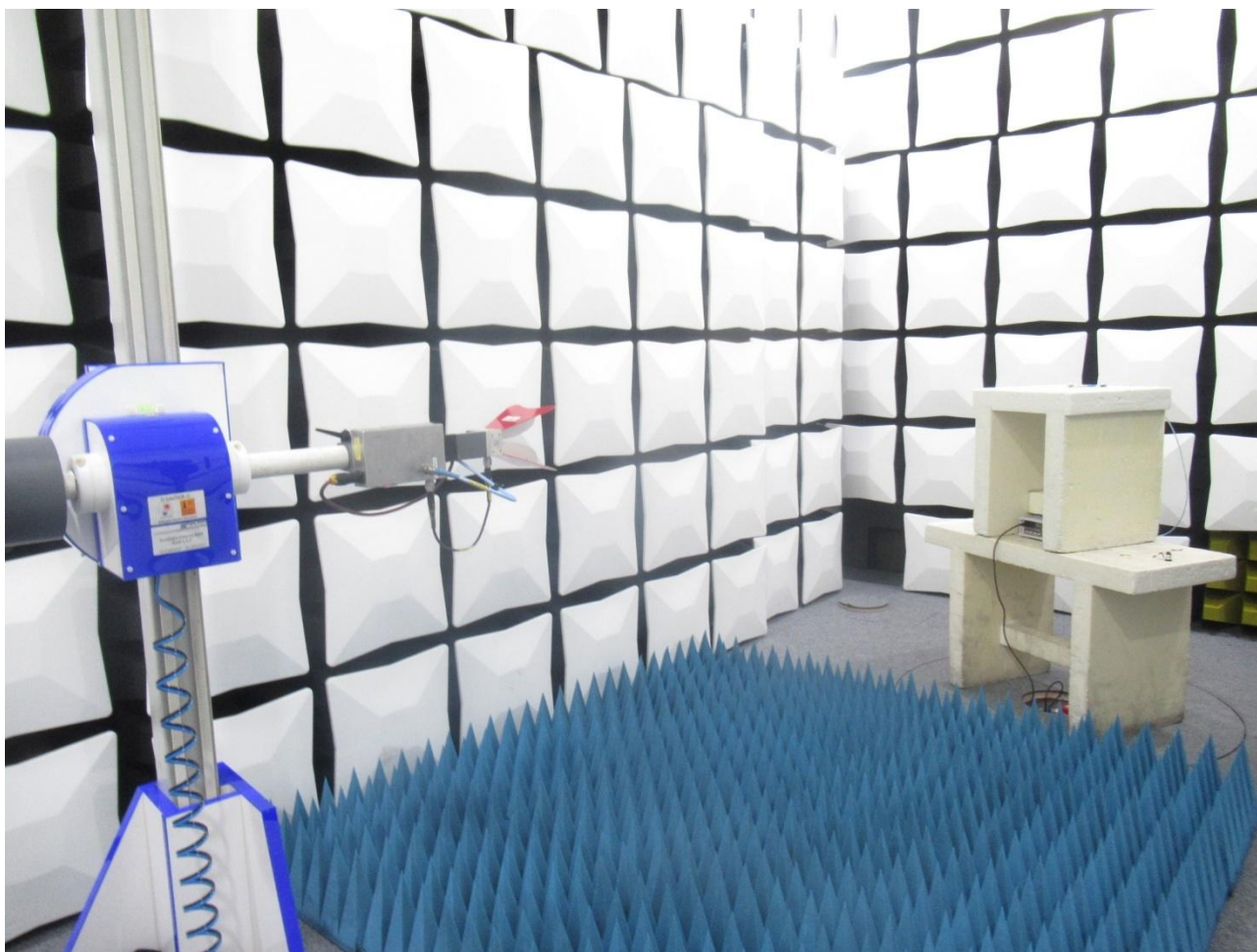
Date	Checked by	Tested by	Result
2025-11-07	 Klaus Gegenfurtner I confirm the correctness and integrity of this document 2025.11.10 14:29:10 +01'00'	 Franz-Xaver Schrettenbrunner I am the author of this document 2025.11.07 15:10:32 +01'00'	Not applicable, no standards used

Photo documentation and setup description

Measurements are performed with a 3-meter test setup in fully anechoic room FAR1.

Height of EUT:	1.5 m
Height of receiving antenna:	1.5 m
Test distance:	3.0 m
Polarisation of receiving antenna	horizontal and vertical
Measured frequencies:	2402 MHz, 2440 MHz, 2480 MHz
Output power of signal generator	0.0 dBm
Attenuator and cable loss	19.9 dB at all frequencies
Power at antenna	- 19.9 dBm

test setup:



Measurement method:

The EUT antenna is connected to a calibrated signal generator with a 20 dB attenuator. In 3 meters distance, a calibrated receiving system is placed following standard test method ANSI C63.10 section 6.6. The EIRP is measured according to formula (39):

$$\text{EIRP[dBm]} = \text{E[dB}\mu\text{V/m]} - 95.2.$$

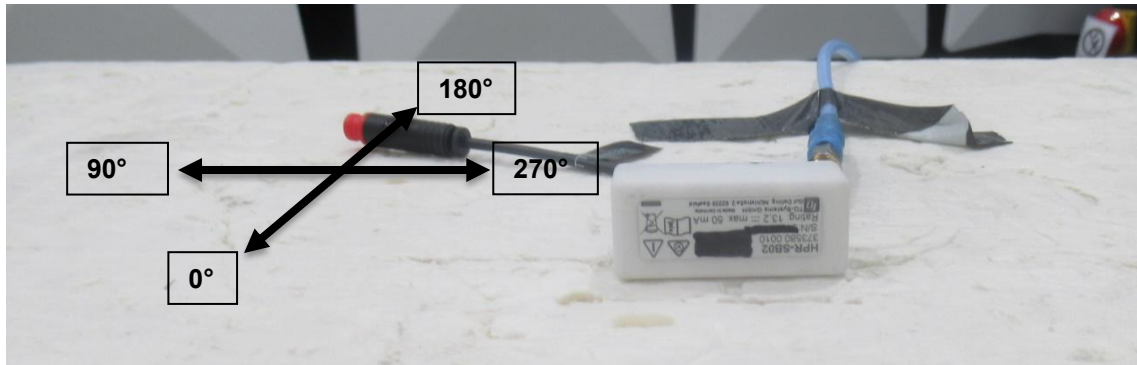
With the knowledge of measured EIRP and applied power P at the antenna, gain G can be determined according to:

$$\text{G[dBi]} = \text{EIRP} - \text{P}$$

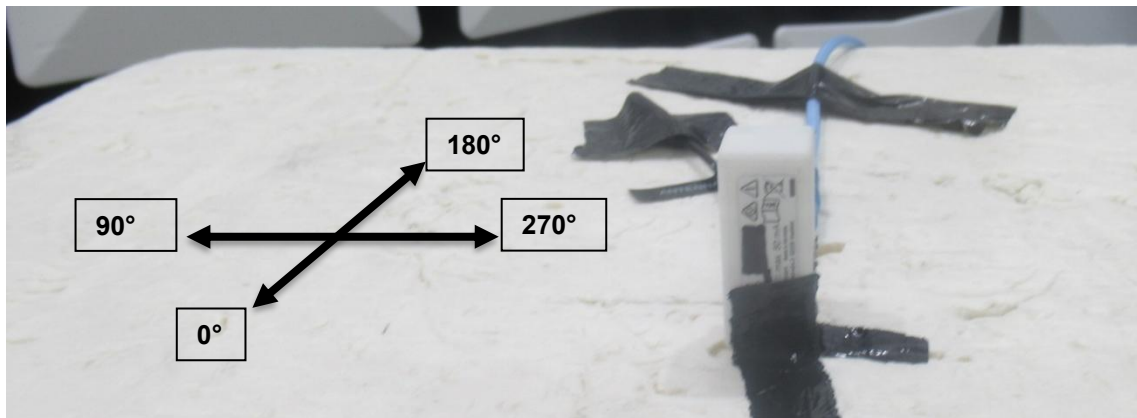
Detailed photos of the EUT are shown in ATTACHMENT A.

The turntable is rotated counterclockwise. This leads to the following relationship in the polar plots of the test result graphs:

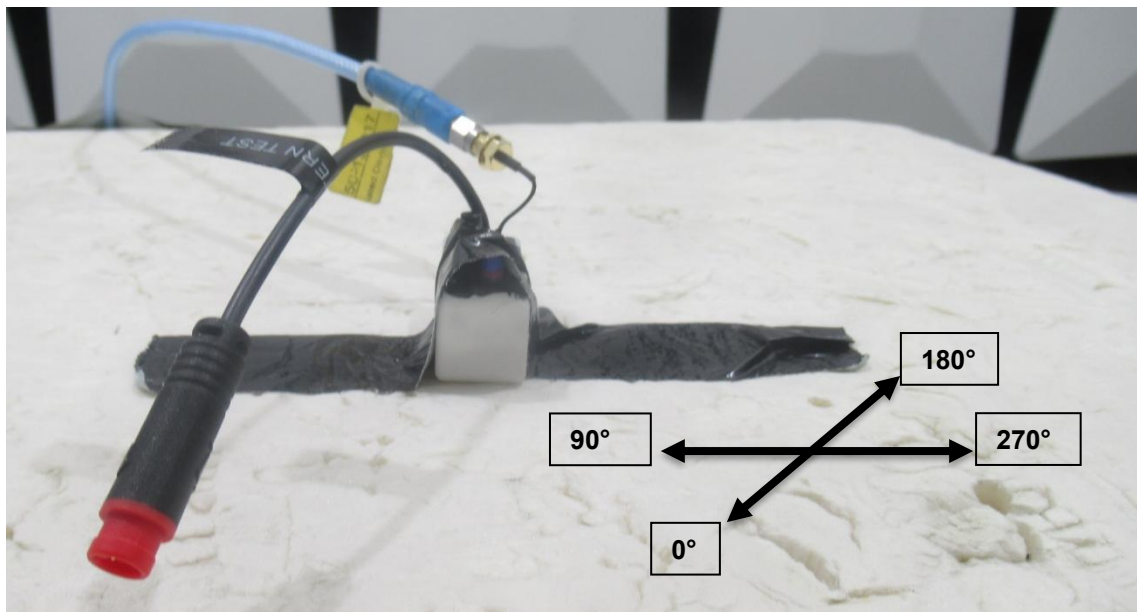
EUT X



EUT Y



EUT Z



Test results

for test instruments and accessories used see **CPR 3**

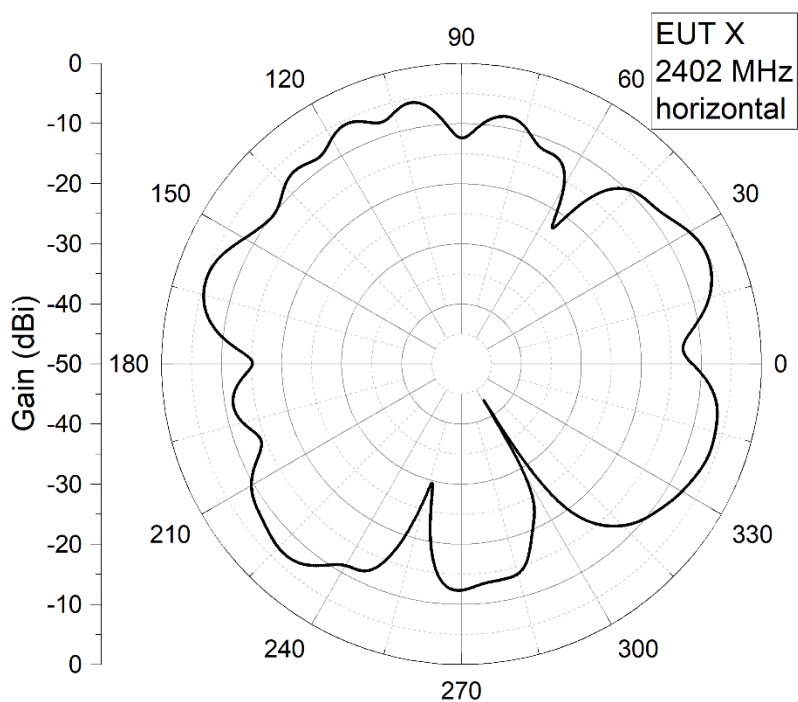
Peak gain overview

Peak Gain (dBi)	EUT X horizontal	EUT X vertical	EUT Y horizontal	EUT Y vertical	EUT Z horizontal	EUT Z vertical
2402 MHz	-5.2	-8.8	-4.3	-4.1	-3.1	-6.0
2440 MHz	-3.8	-9.6	-3.8	-3.3	-2.3	-4.6
2480 MHz	-1.7	-8.7	-4.4	-3.6	-2.0	-3.9

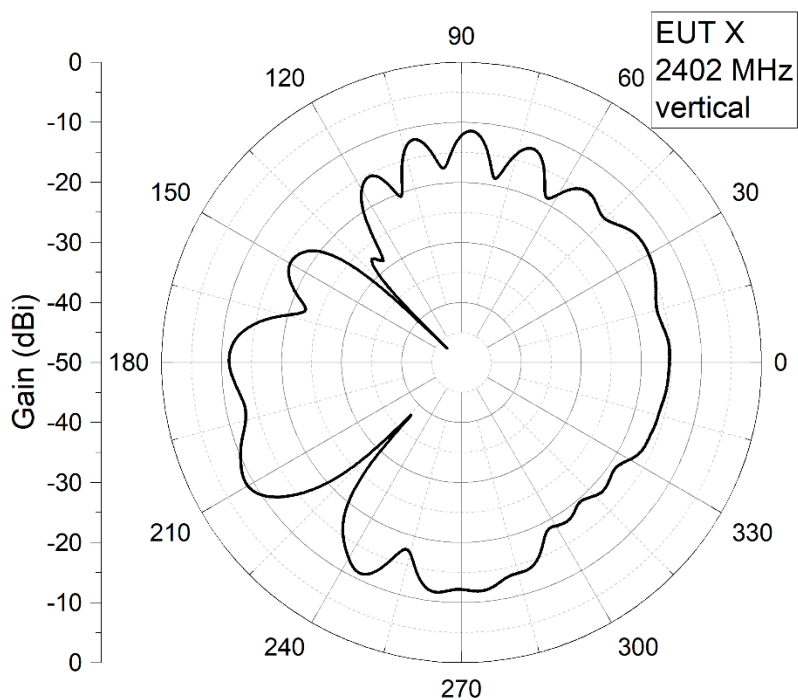
The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

Detailed graphical representation

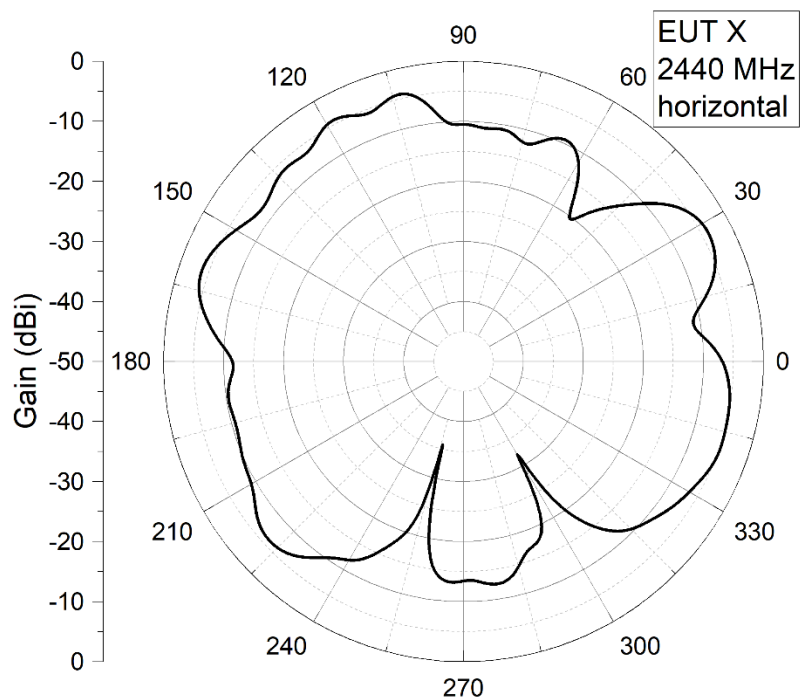
EUT X, 2402 MHz, horizontal



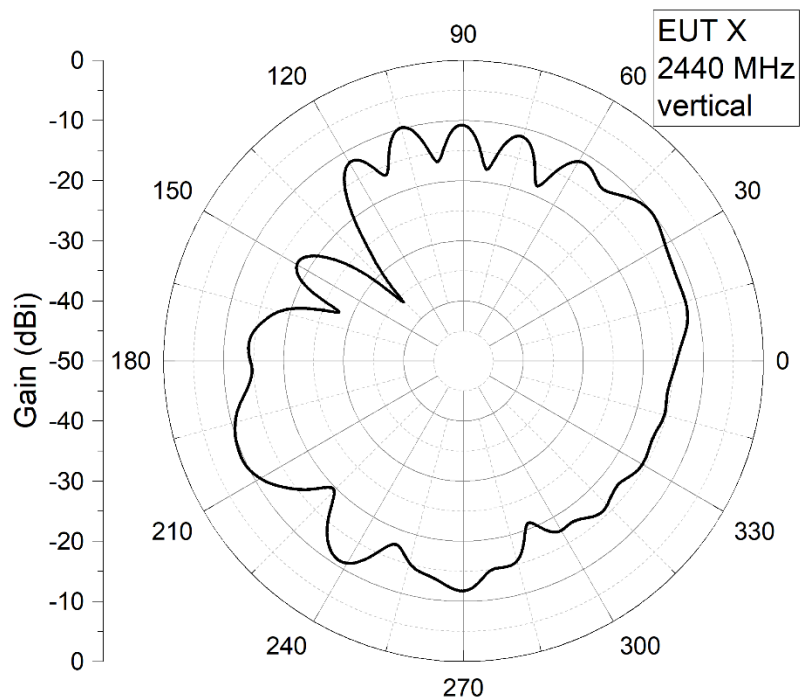
EUT X, 2402 MHz, vertical



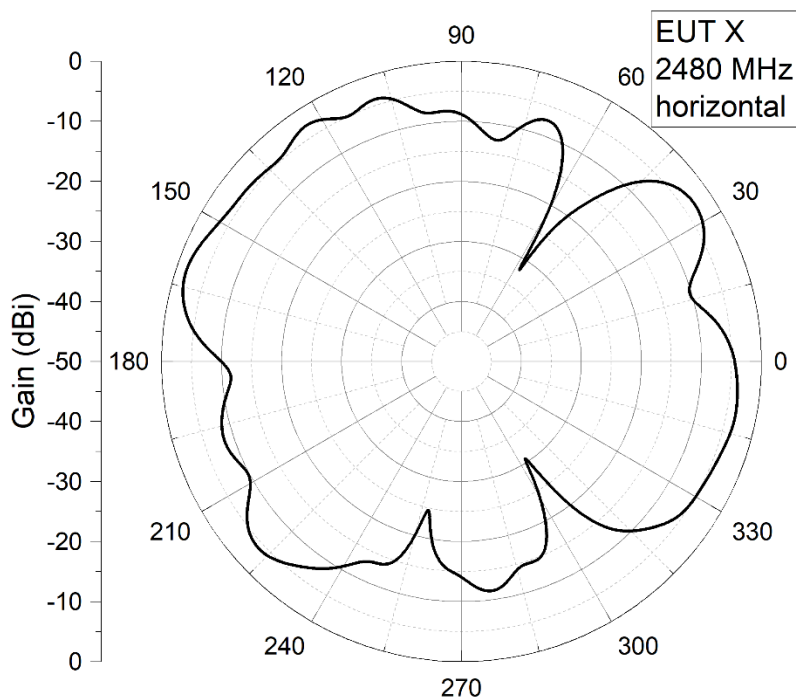
EUT X, 2440 MHz, horizontal



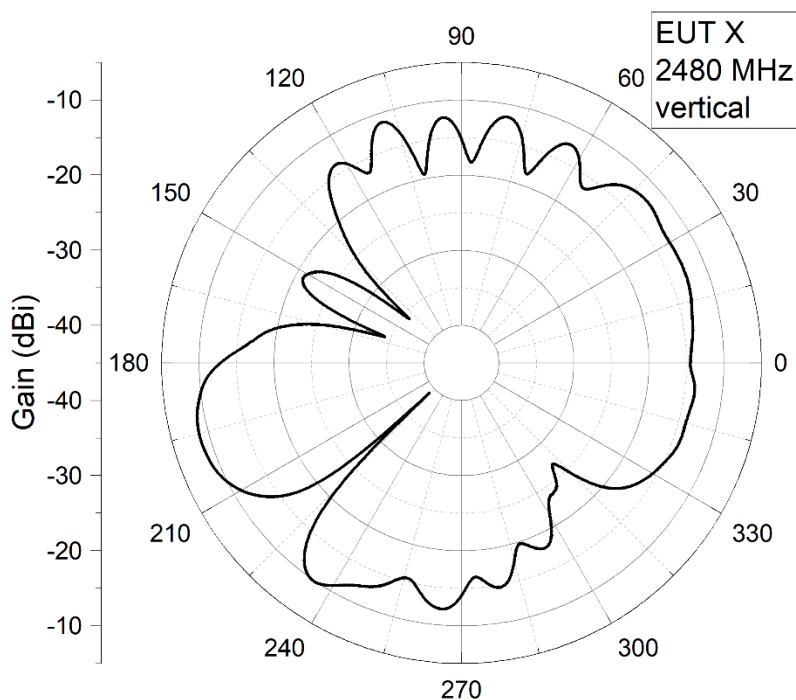
EUT X, 2440 MHz, vertical



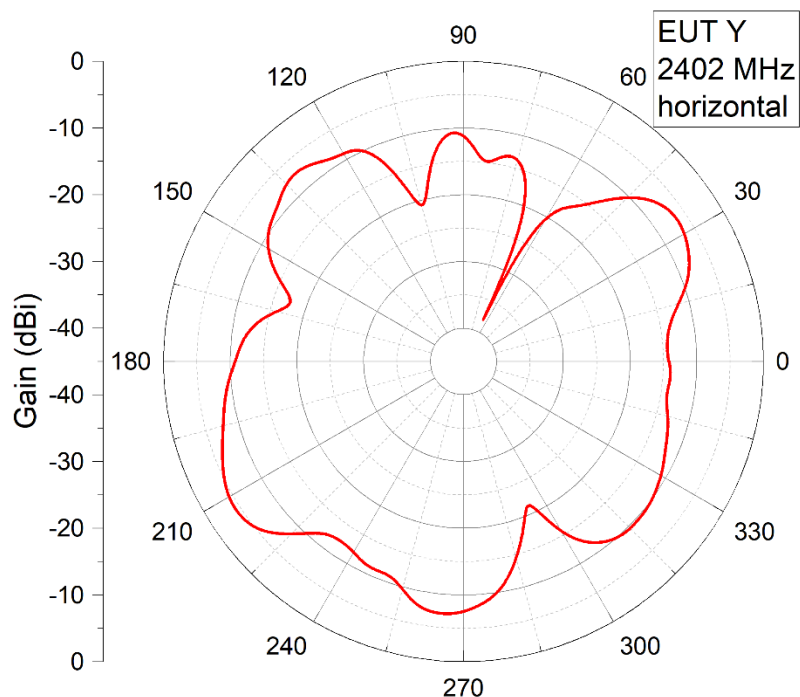
EUT X, 2480 MHz, horizontal



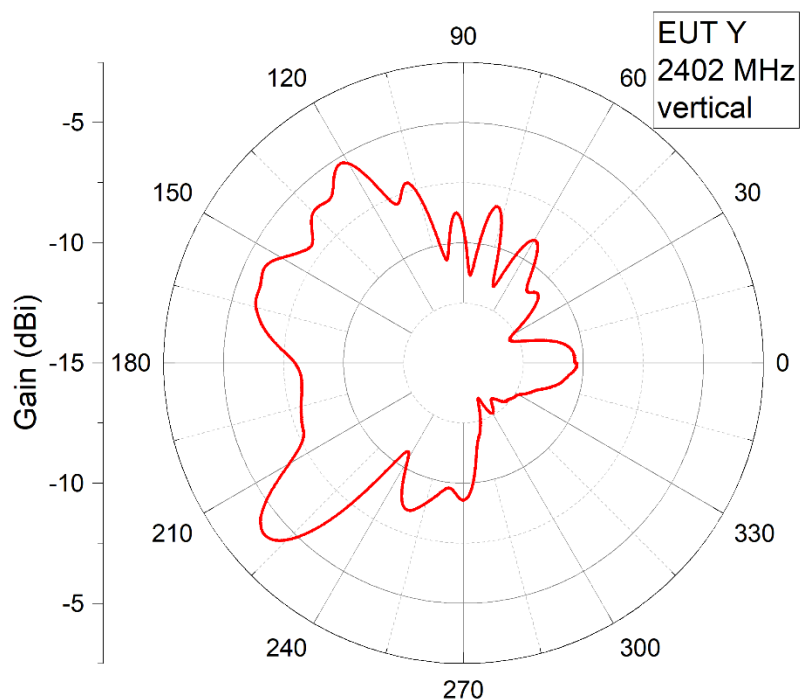
EUT X, 2480 MHz, vertical



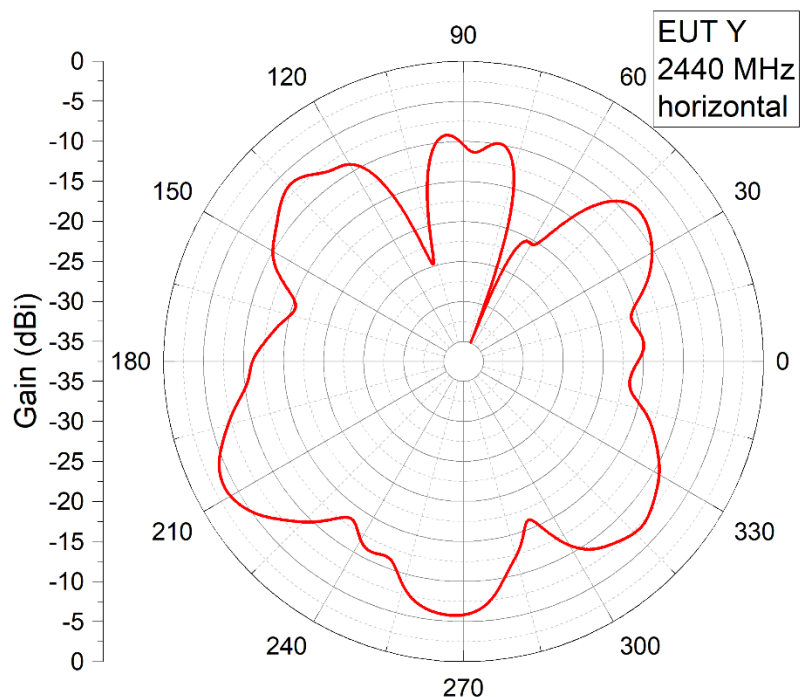
EUT Y, 2402 MHz, horizontal



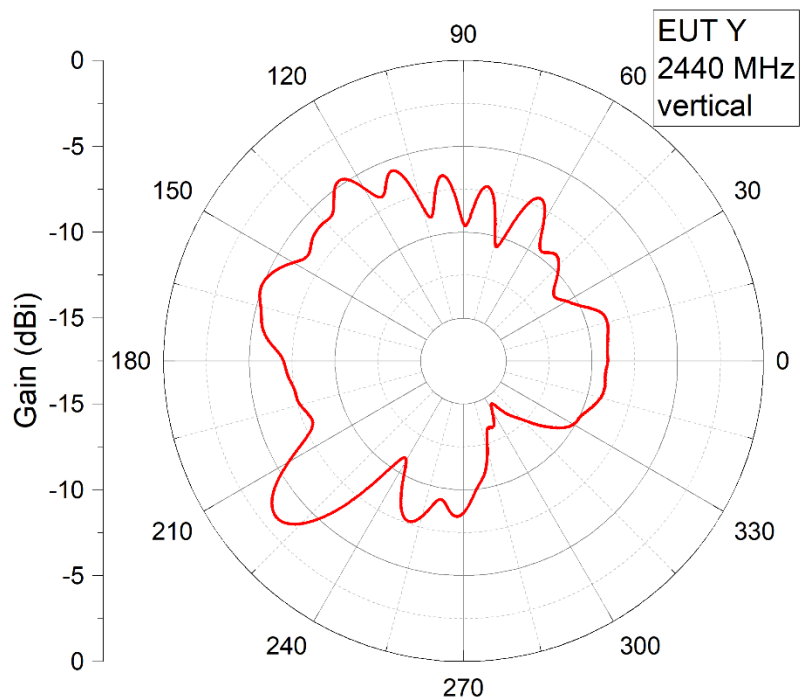
EUT Y, 2402 MHz, vertical



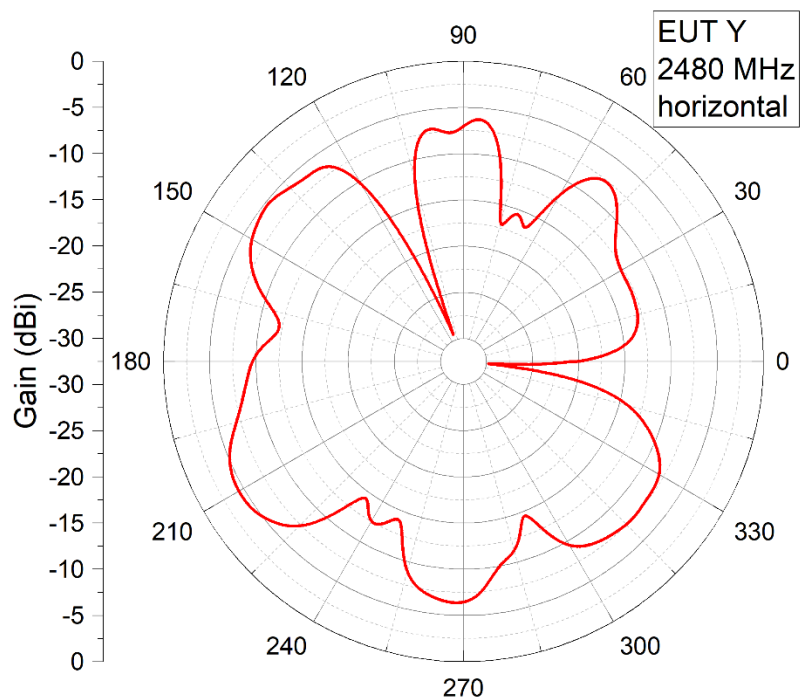
EUT Y, 2440 MHz, horizontal



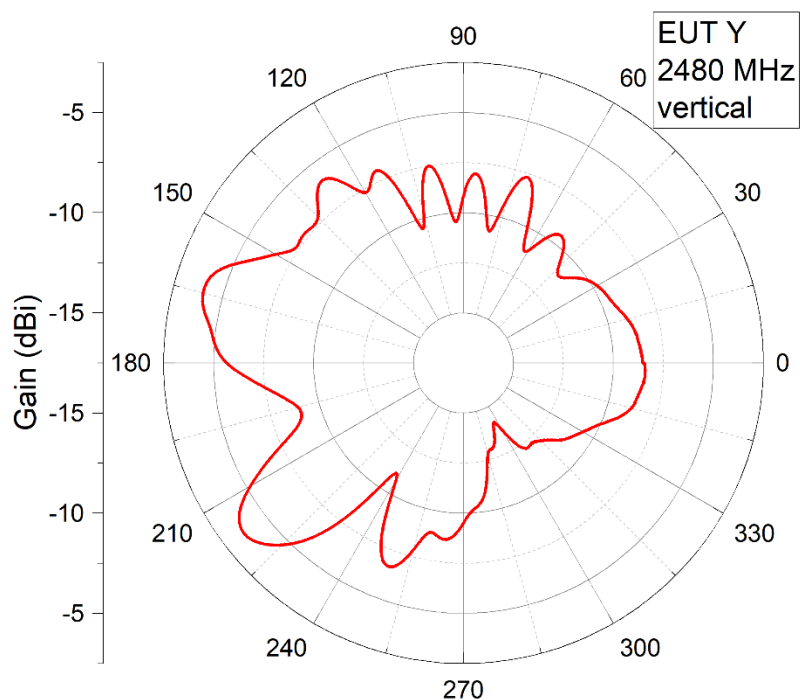
EUT Y, 2440 MHz, vertical



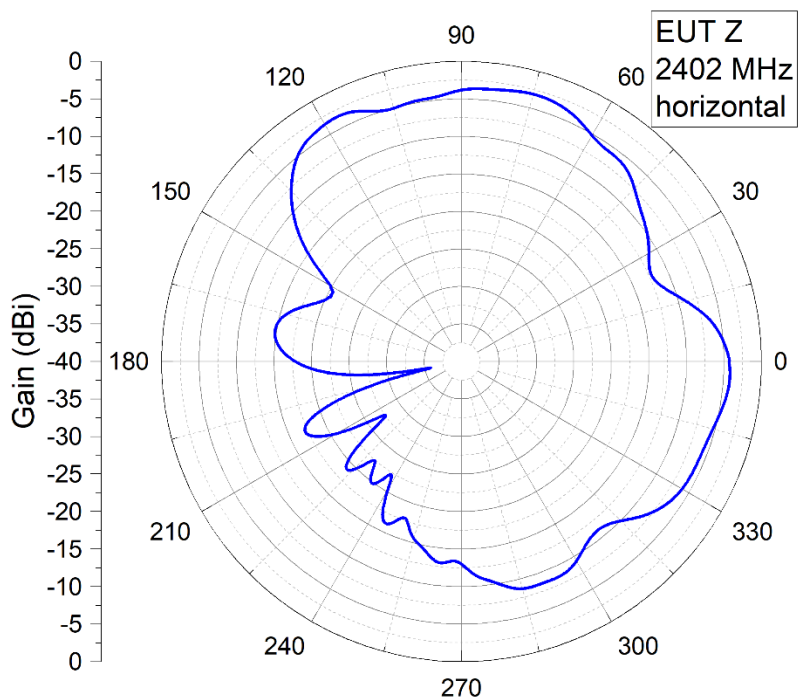
EUT Y, 2480 MHz, horizontal



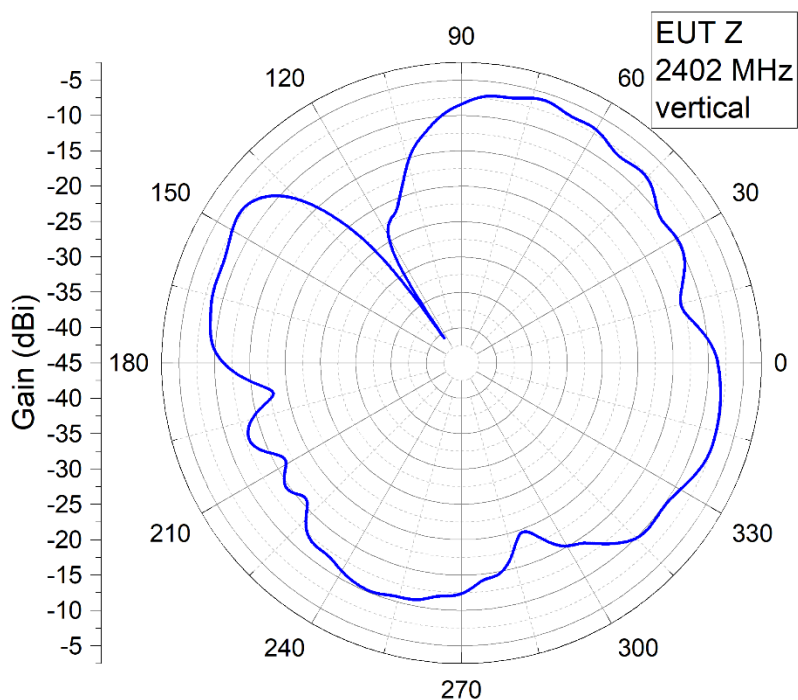
EUT Y, 2480 MHz, vertical



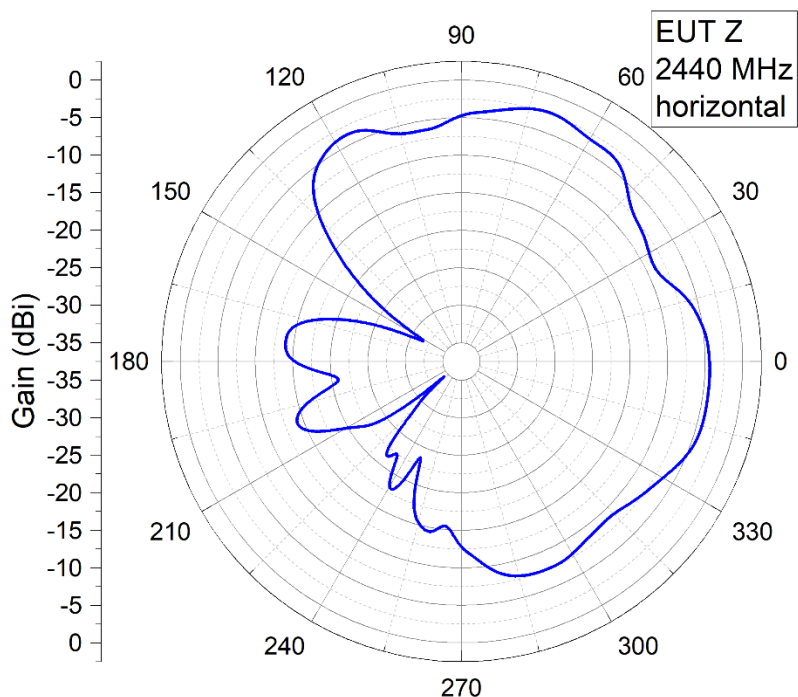
EUT Z, 2402 MHz, horizontal



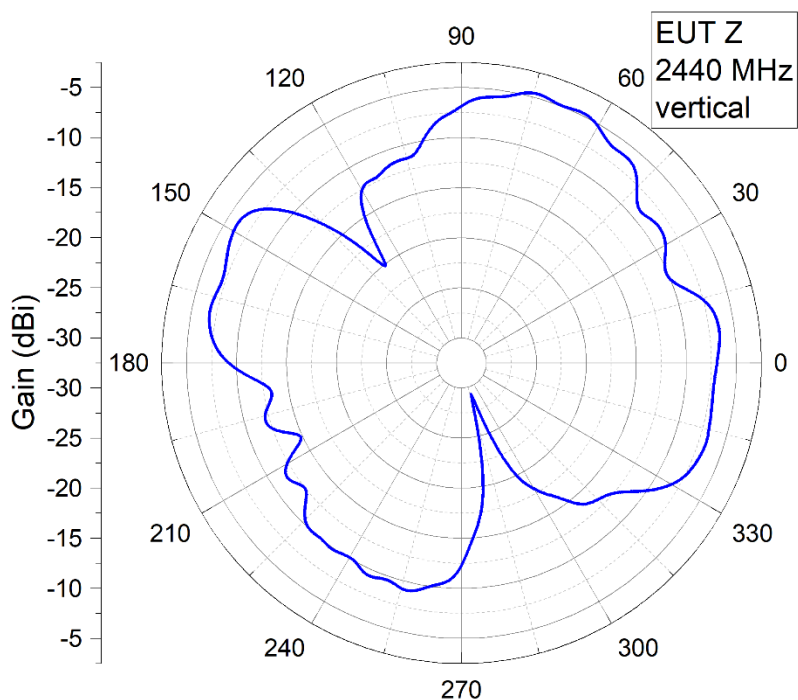
EUT Z, 2402 MHz, vertical



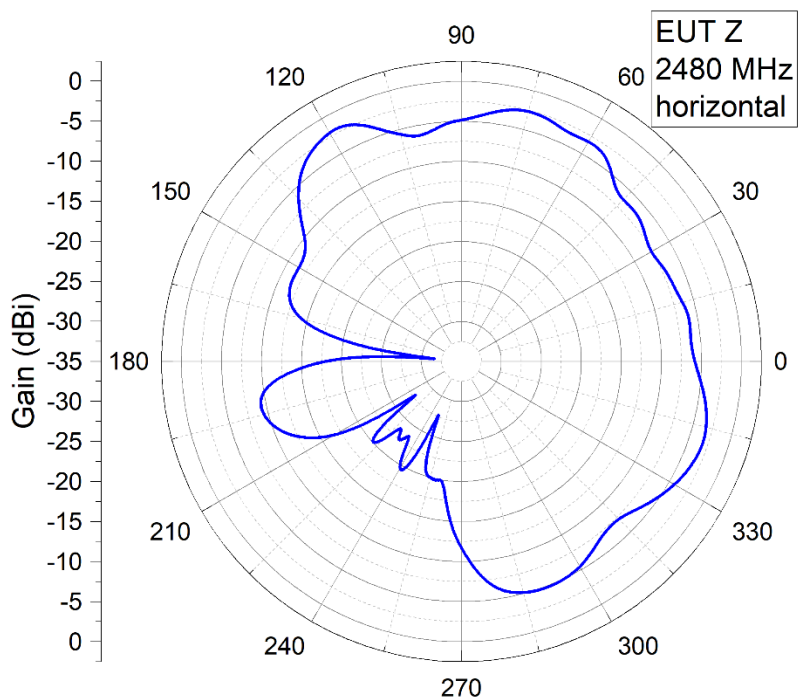
EUT Z, 2440 MHz, horizontal



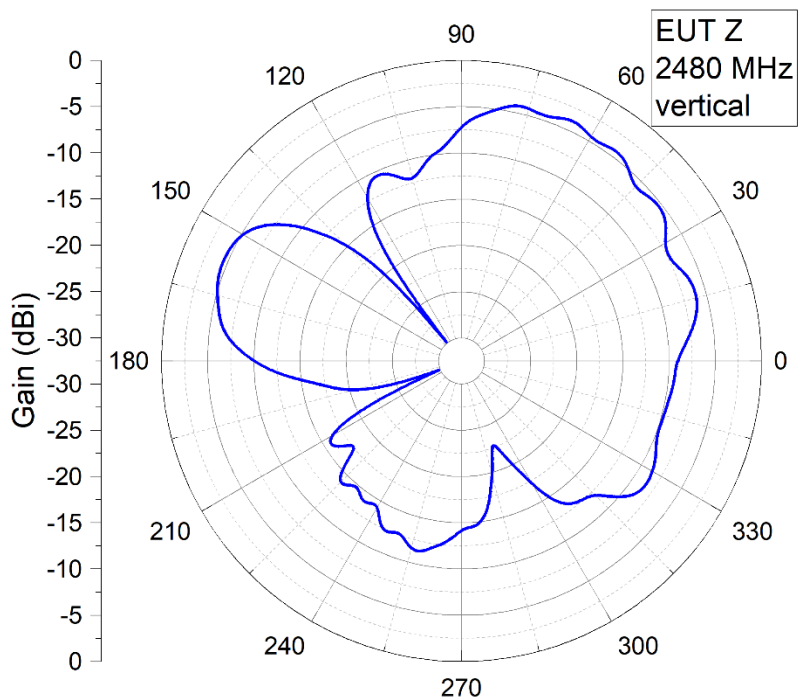
EUT Z, 2440 MHz, vertical



EUT Z, 2480 MHz, horizontal



EUT Z, 2480 MHz, vertical



USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
CPR 3	ESW26	02-02/03-17-002	25/04/2026	25/04/2025		
	AFS4-01000400-10-10P-4	02-02/17-13-002				
	AMF-4F-04001200-15-10P	02-02/17-13-003				
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	3117	02-02/24-20-007	20/11/2025	20/11/2024		
	INA 3425	02-02/50-13-007				
	18N-20	02-02/50-17-002			24/01/2026	24/07/2025
	BAM 4.5-P	02-02/50-17-024				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
	SMCV100B	09-02/05-23-001	28/11/2025	28/11/2024		
	0_5 Meter DC-18GHz	09-16/50-23-003				