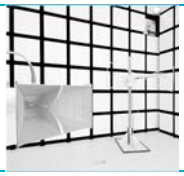
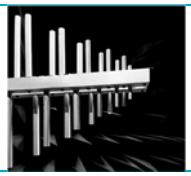
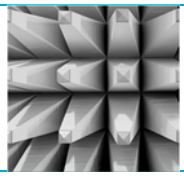

CTC advanced
member of RWTÜV group

Bundesnetzagentur

BNetzA-CAB-02/21-102

TEST REPORT

Test report no.: 1-7303_18-01-12-B

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-03

Testing Laboratory

CTC advanced GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.ctcadvanced.com
e-mail: mail@ctcadvanced.com

Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-04 and 05

Applicant

FEIG ELECTRONIC GmbH
Lange Str. 4
35781 Weilburg / GERMANY
Phone: +49 6471 31 09-0
Contact: Reinhard Monno
e-mail: reinhard.monno@feig.de
Phone: +49 6471-3109.428

Manufacturer

FEIG ELECTRONIC GmbH
Lange Str. 4
35781 Weilburg / GERMANY

Test Standard/s

Customer Specification: Over The Air Performance, 2D radiation pattern (3° resolution)

Test Item

Kind of test item:	902 to 928 MHz single patch antenna; 902 to 928 MHz double patch antenna
Model name / SN:	ID ANT.U290/290-FCC; ID ANT.U580/290-FCC
Frequency [MHz]:	902.0 to 928.0 MHz

Test report authorized:

cn=Marco Bertolino, o=CTC advanced GmbH, ou=BTL-161128, email=Marco.Bertolino@ctcadvanced.com, c=DE
2019.05.15 09:46:29 +02'00'

Marco Bertolino
Lab Manager
Radio Communications & EMC

Test performed:

cn=Rene Oelmann, o=CTC advanced GmbH, ou=OEL-171123, email=rene.oelmann@ctcadvanced.com, c=DE
2019.05.15 06:44:38 +02'00'

René Oelmann
Lab Manager
Radio Communications & EMC

1 Table of contents

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.
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In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

This test report replaces the test report with the number 1-7303/18-01-12-A and dated 2019-04-25

2.2 Application details

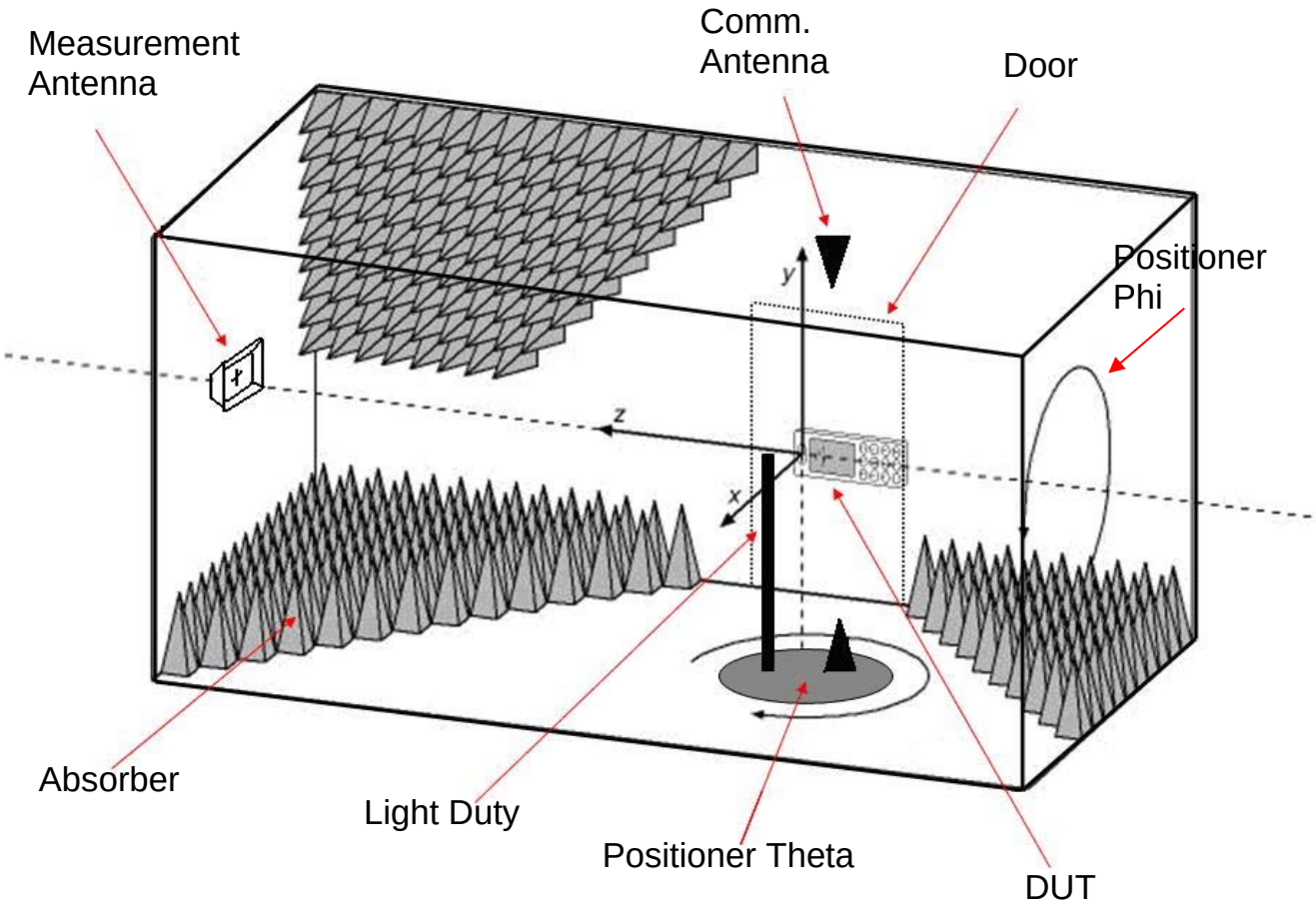
Date of receipt of order:	2018-11-26
Date of receipt of test item:	2018-11-27
Start of test:	2019-02-15
End of test:	2019-02-15
Person(s) present during the test:	-/-

2.3 Test laboratories sub-contracted

None

3 Testsite

Coordinate system anechoic chamber (OTA)



4 Measurements

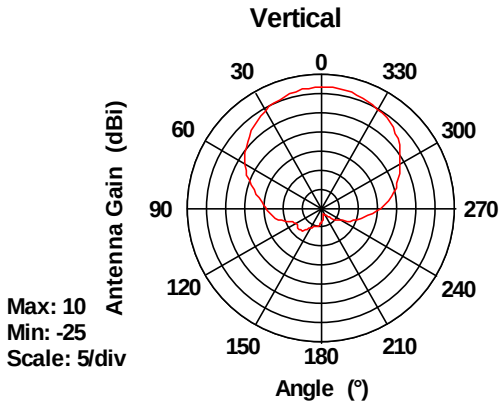
Passive Single Patch Antenna:

Results:

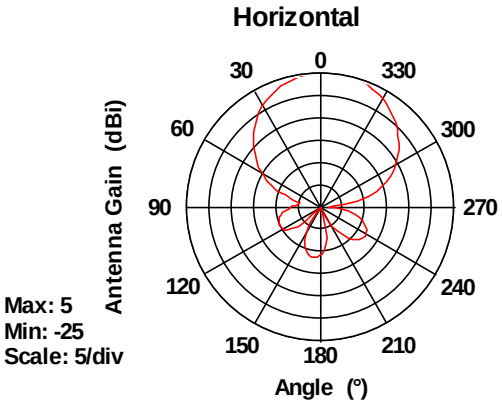
Frequency [MHz]	902	915	928
Resolution [°]	3	3	3
Gain [dBi]	6.4	6.3	6.6
Gain [dBic]	8.7	8.4	8.4

Plots horizontal cut 902 MHz:

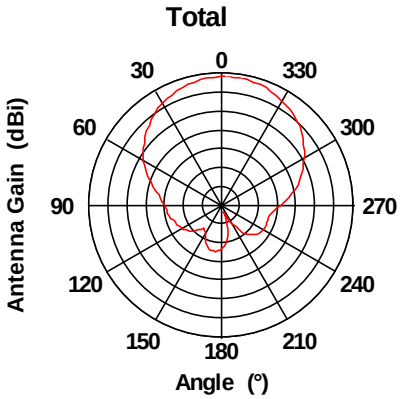
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



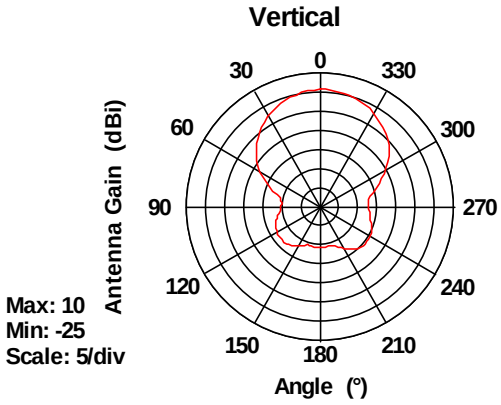
Plot 3: Total (summary of vertical and horizontal Polarisation)



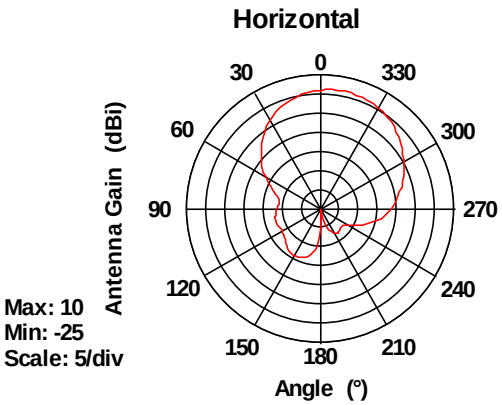
Max: 10
Min: -25
Scale: 5/div

Plots vertical cut (Elevation) 902 MHz:

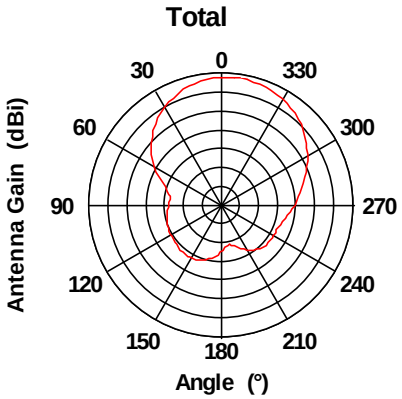
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



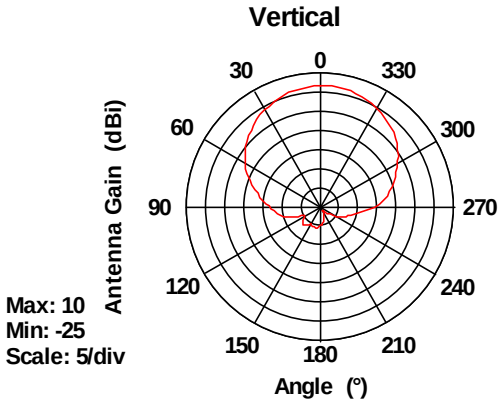
Plot 3: Total (summary of vertical and horizontal Polarisation)



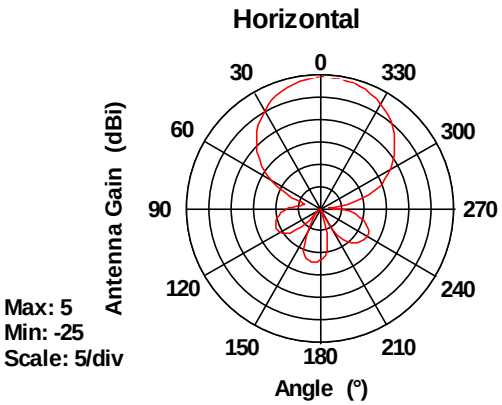
Max: 10
Min: -25
Scale: 5/div

Plots horizontal cut 915 MHz:

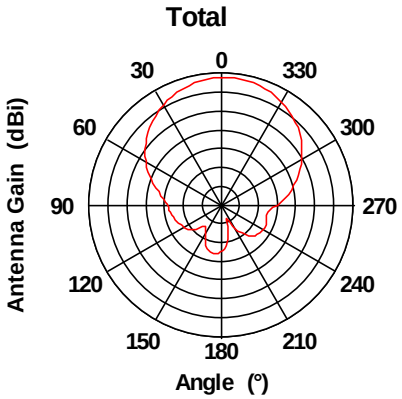
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



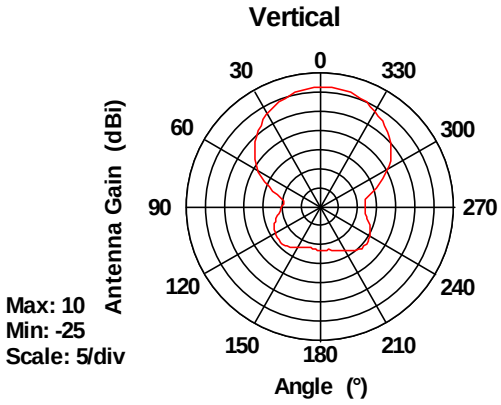
Plot 3: Total (summary of vertical and horizontal Polarisation)



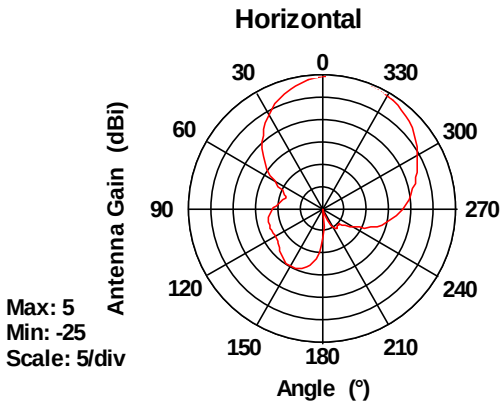
Max: 10
Min: -25
Scale: 5/div

Plots vertical cut (Elevation) 915 MHz:

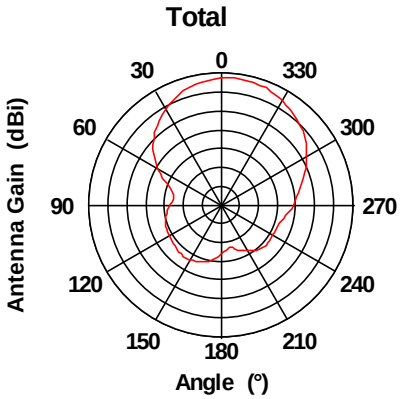
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



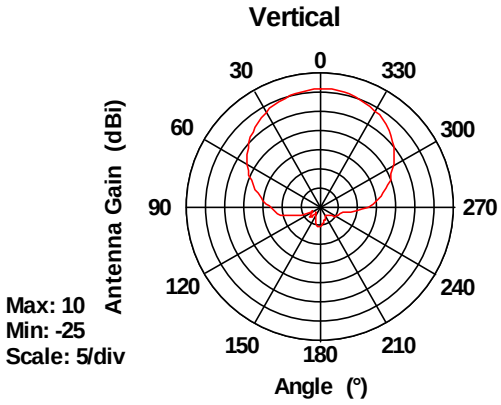
Plot 3: Total (summary of vertical and horizontal Polarisation)



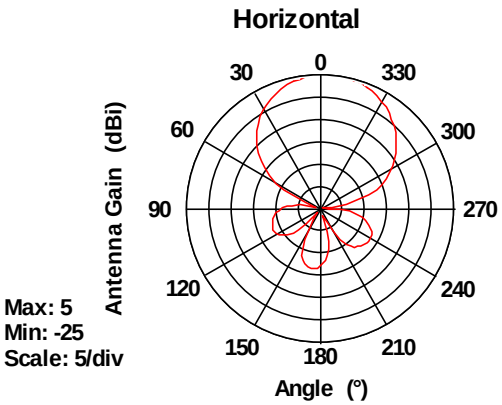
Max: 10
Min: -25
Scale: 5/div

Plots horizontal cut 928 MHz:

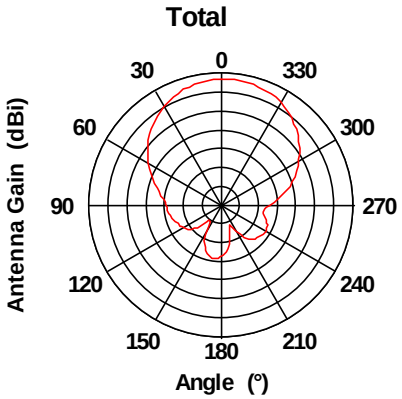
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



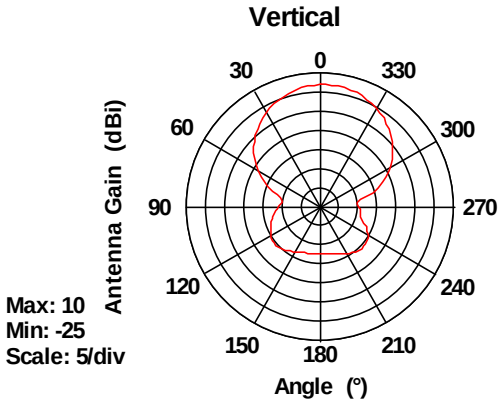
Plot 3: Total (summary of vertical and horizontal Polarisation)



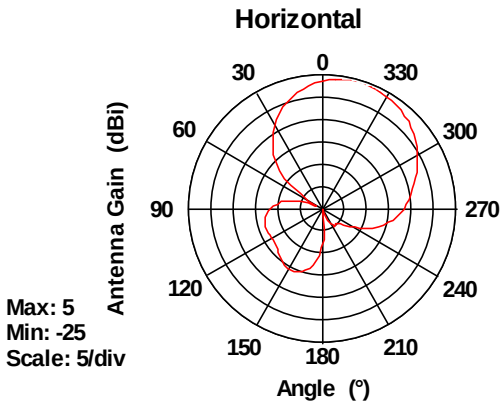
Max: 10
Min: -25
Scale: 5/div

Plots vertical cut (Elevation) 928 MHz:

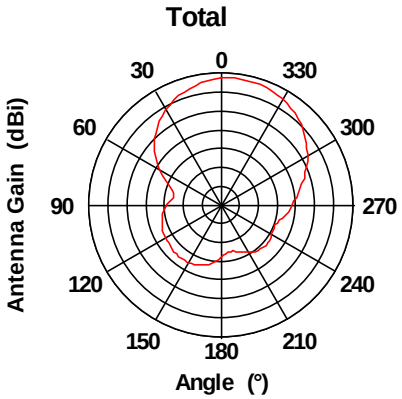
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



Plot 3: Total (summary of vertical and horizontal Polarisation)



Max: 10
Min: -25
Scale: 5/div

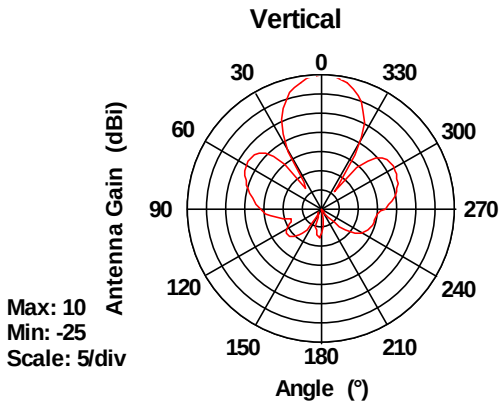
Passive Double Patch Antenna:

Results:

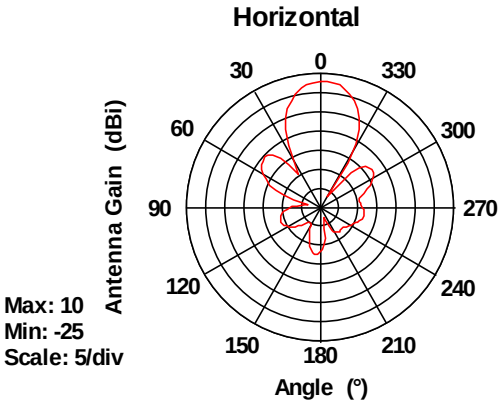
Frequency [MHz]	902	915	928
Resolution [°]	3	3	3
Gain [dBi]	9.4	9.5	9.2
Gain [dBic]	11.6	11.4	11.3

Plots horizontal cut 902 MHz:

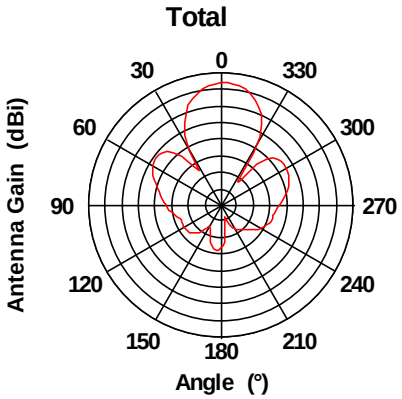
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



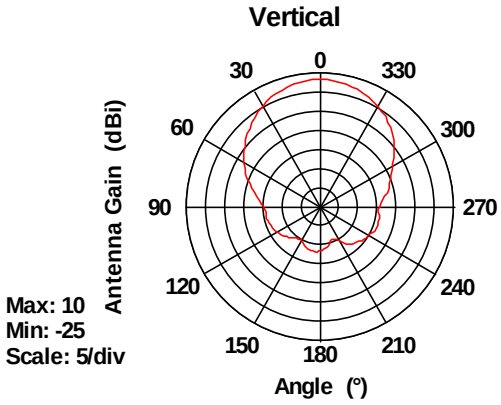
Plot 3: Total (summary of vertical and horizontal Polarisation)



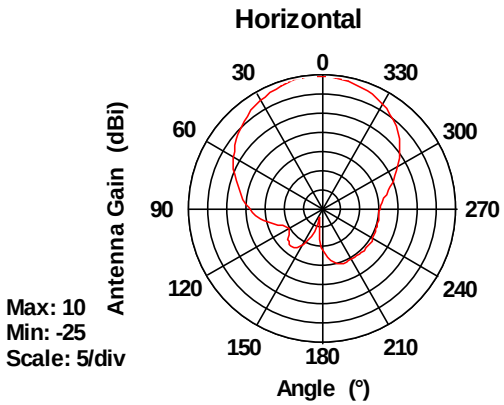
Max: 15
Min: -25
Scale: 5/div

Plots vertical cut (Elevation) 902 MHz:

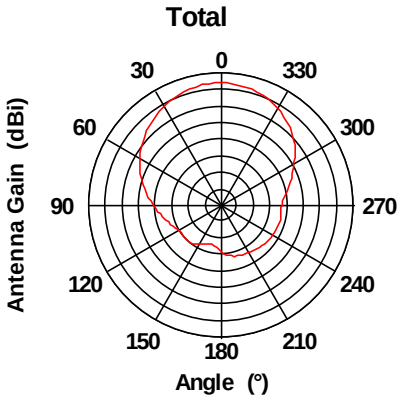
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



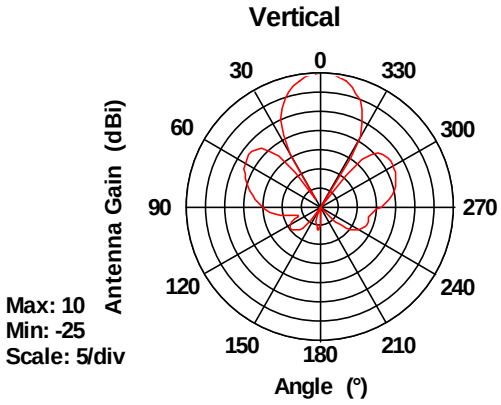
Plot 3: Total (summary of vertical and horizontal Polarisation)



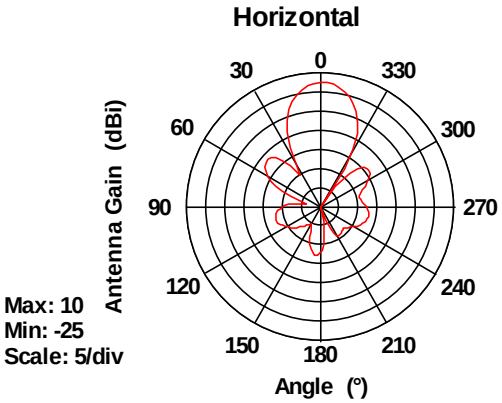
Max: 15
Min: -25
Scale: 5/div

Plots horizontal cut 915 MHz:

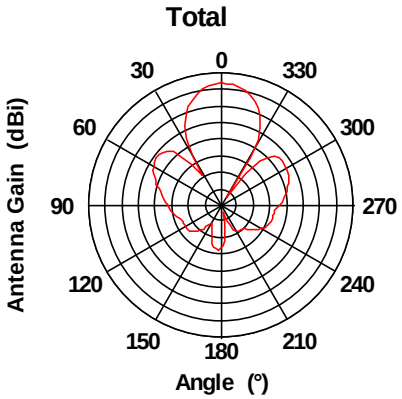
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



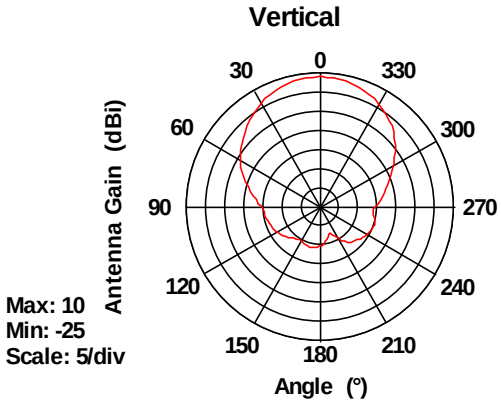
Plot 3: Total (summary of vertical and horizontal Polarisation)



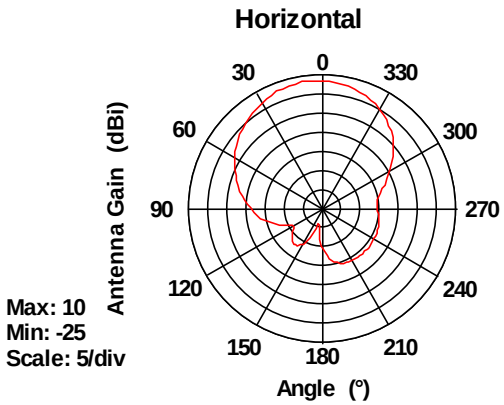
Max: 15
Min: -25
Scale: 5/div

Plots vertical cut (Elevation) 915 MHz:

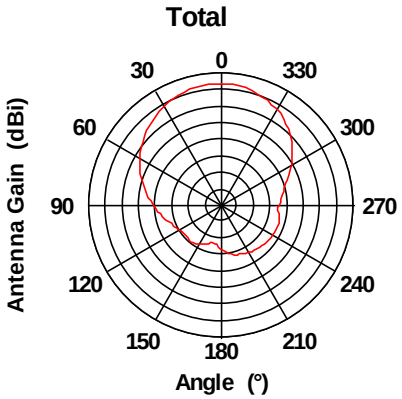
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



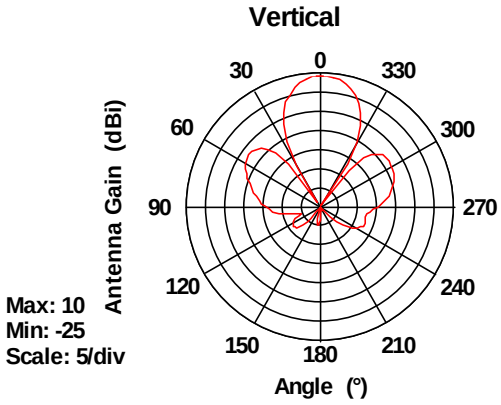
Plot 3: Total (summary of vertical and horizontal Polarisation)



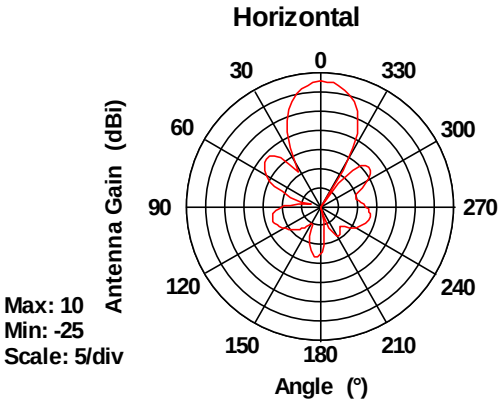
Max: 15
Min: -25
Scale: 5/div

Plots horizontal cut 928 MHz:

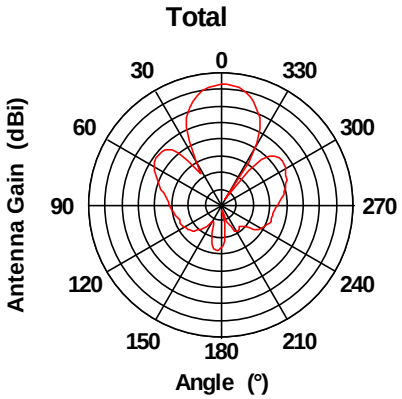
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



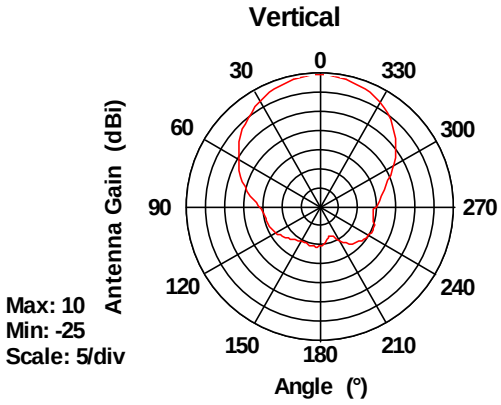
Plot 3: Total (summary of vertical and horizontal Polarisation)



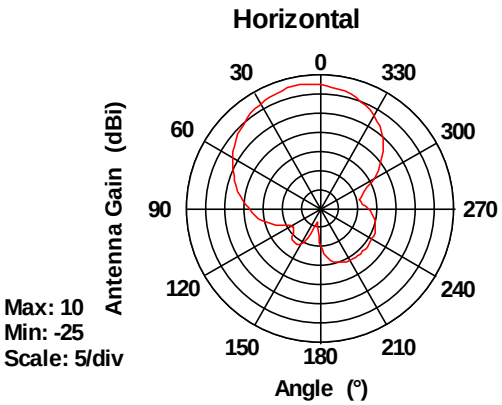
Max: 15
Min: -25
Scale: 5/div

Plots vertical cut (Elevation) 928 MHz:

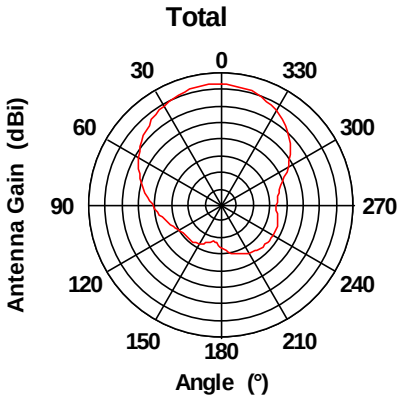
Plot 1: vertical Polarisation



Plot 2: horizontal Polarisation



Plot 3: Total (summary of vertical and horizontal Polarisation)



Max: 15
Min: -25
Scale: 5/div

5 Photographs

Photo 1

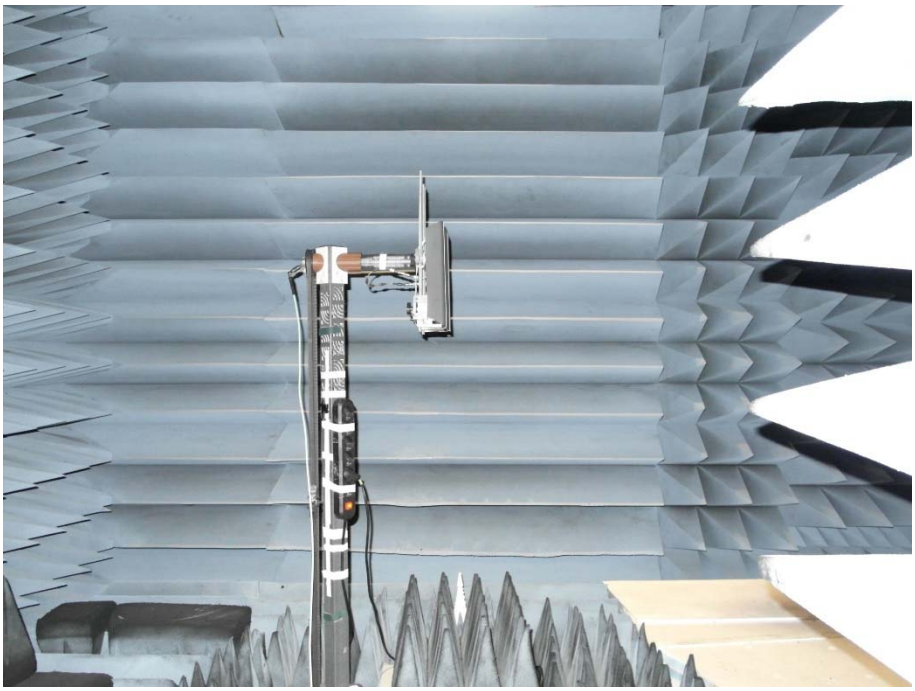


Photo 2

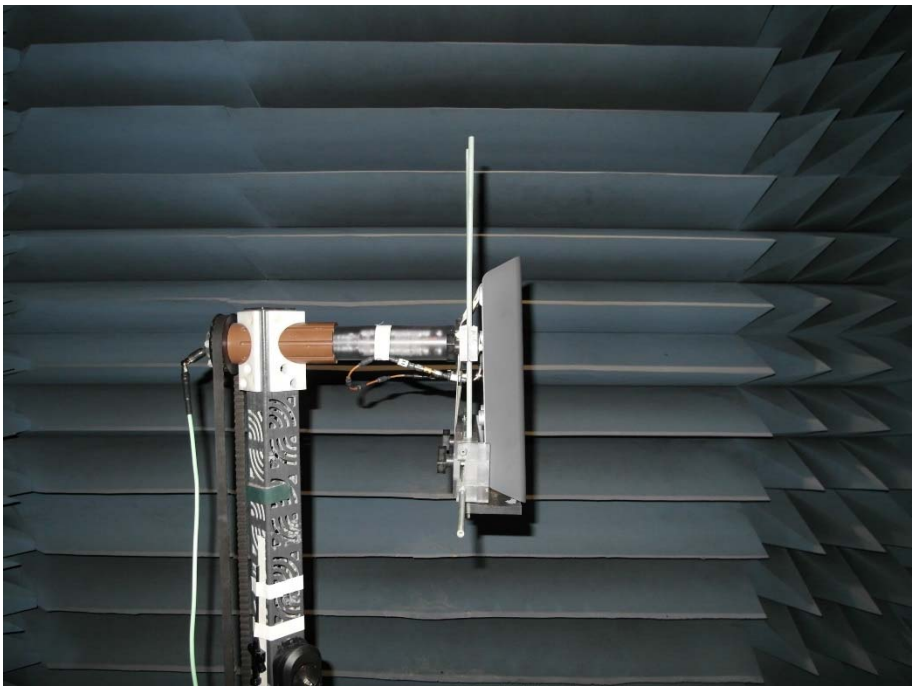


Photo 3

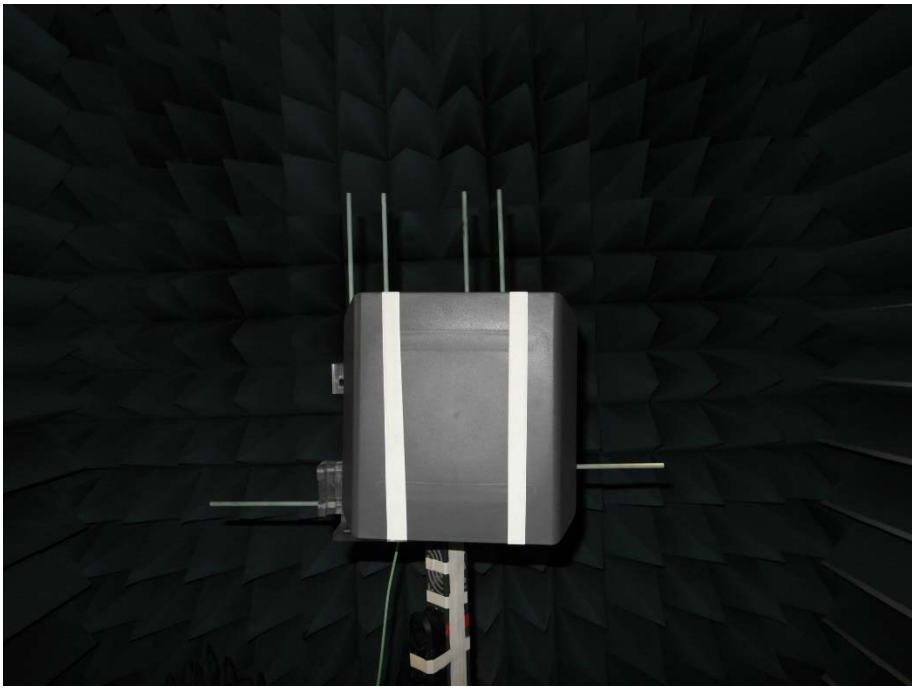


Photo 4

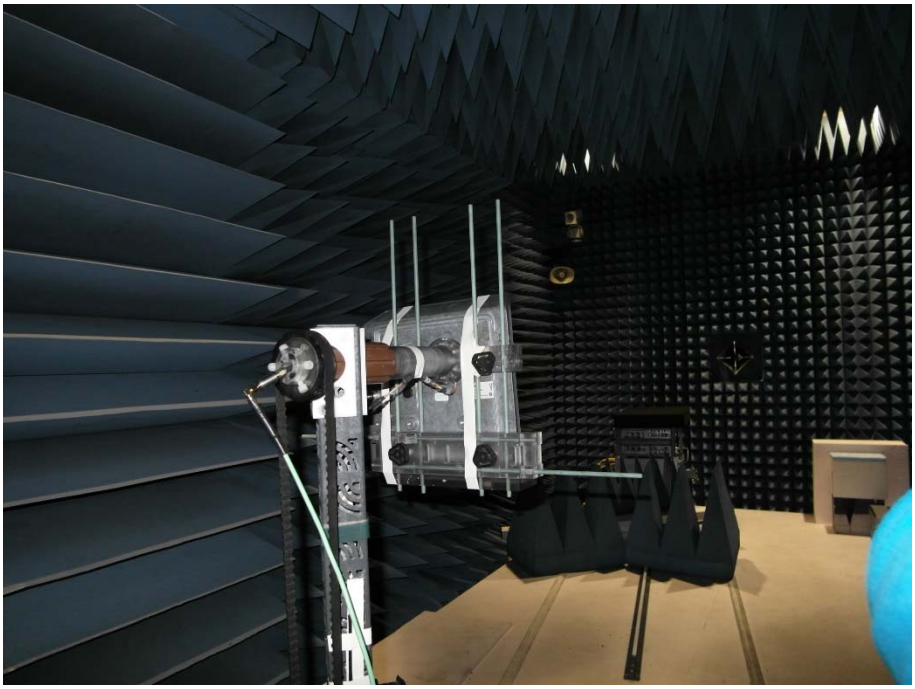


Photo 5

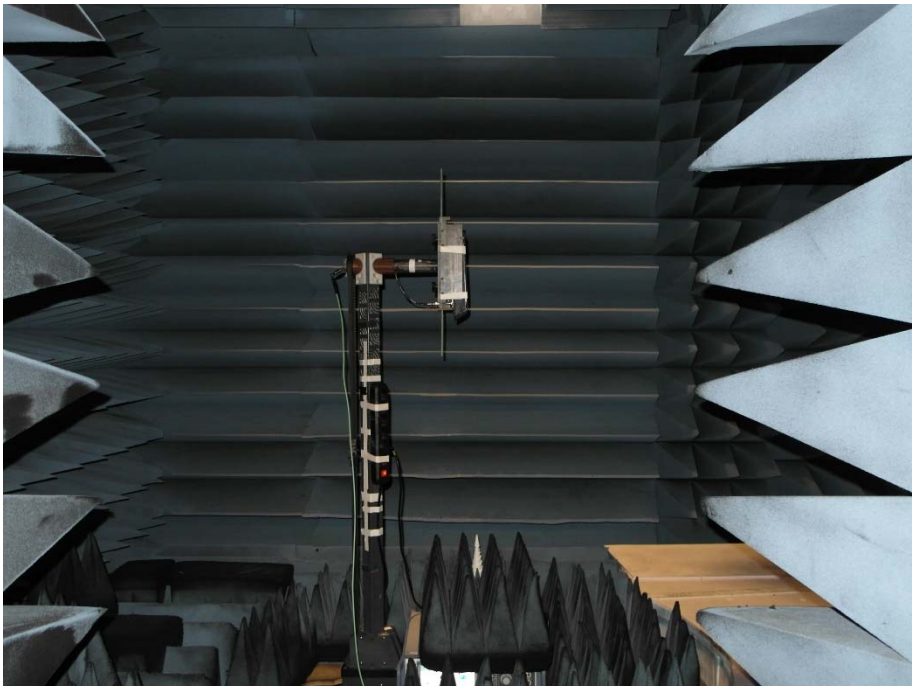


Photo 6

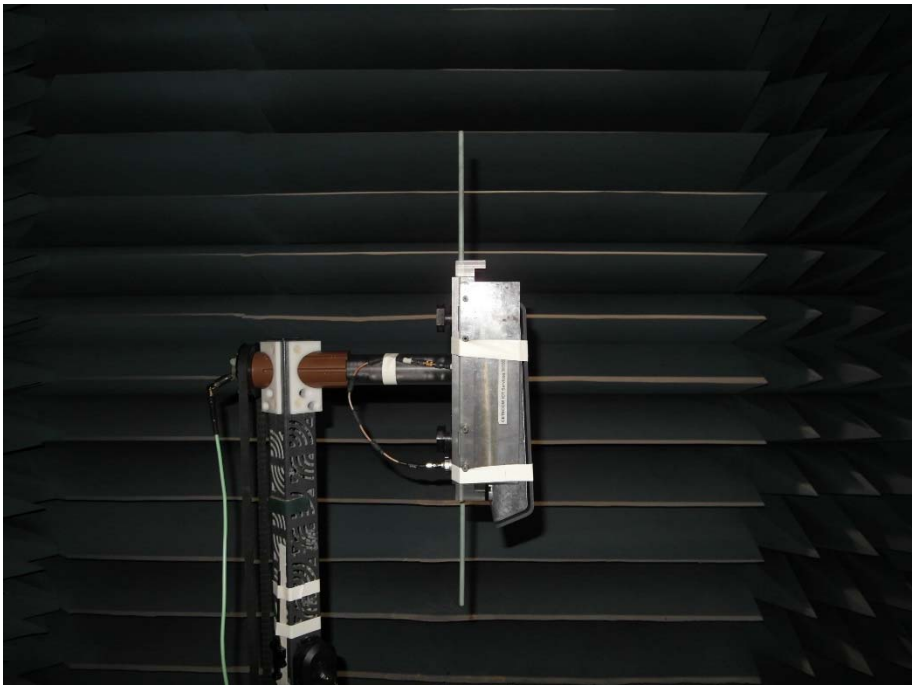


Photo 7

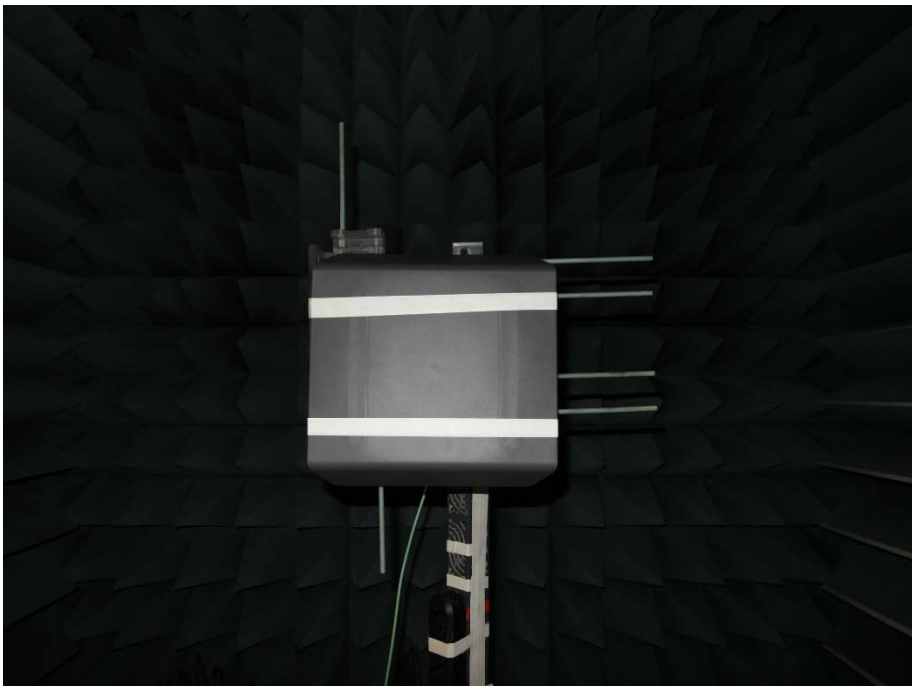
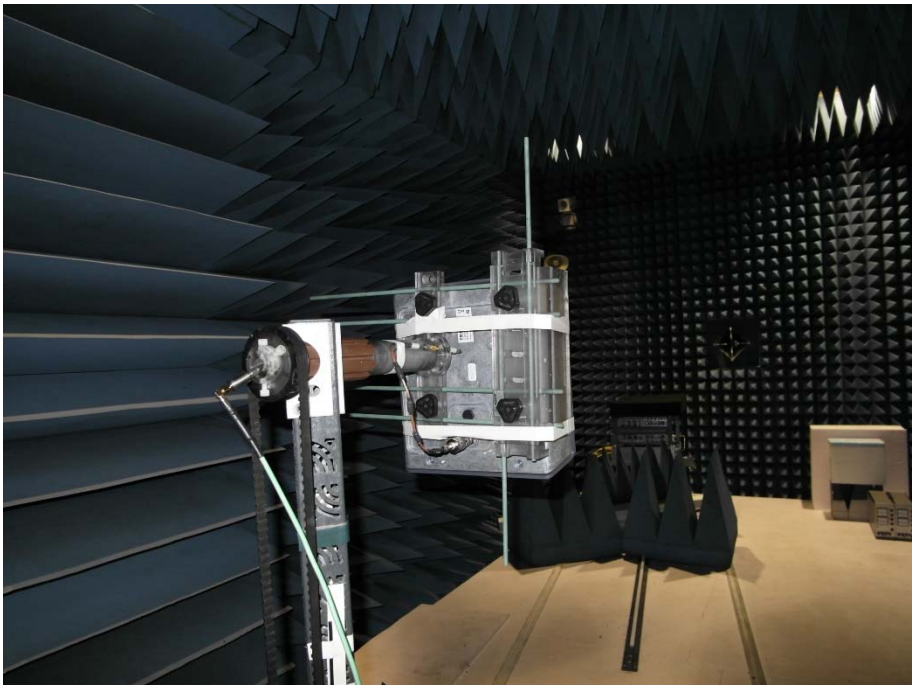


Photo 8



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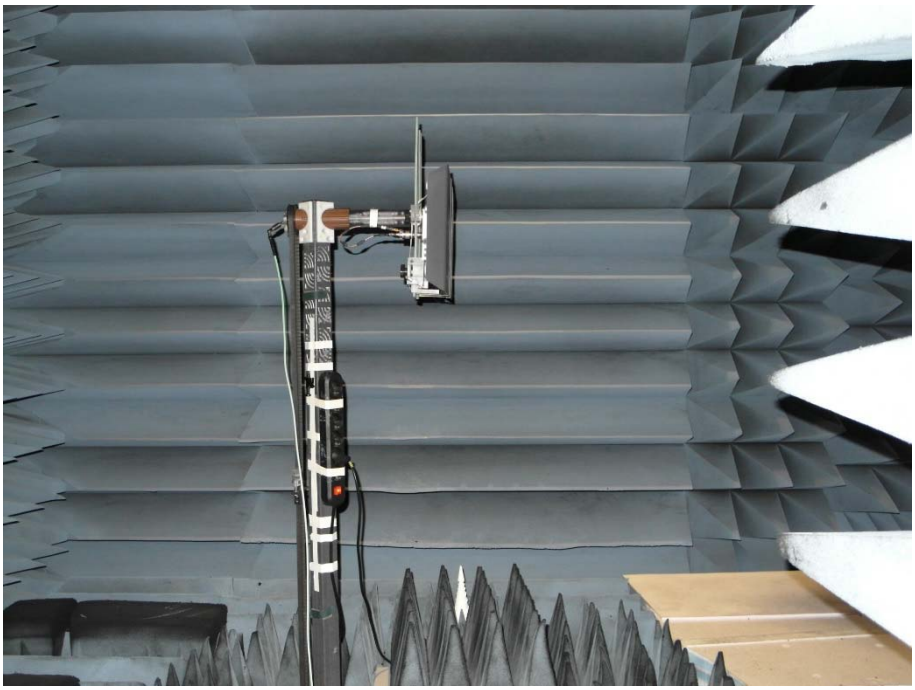

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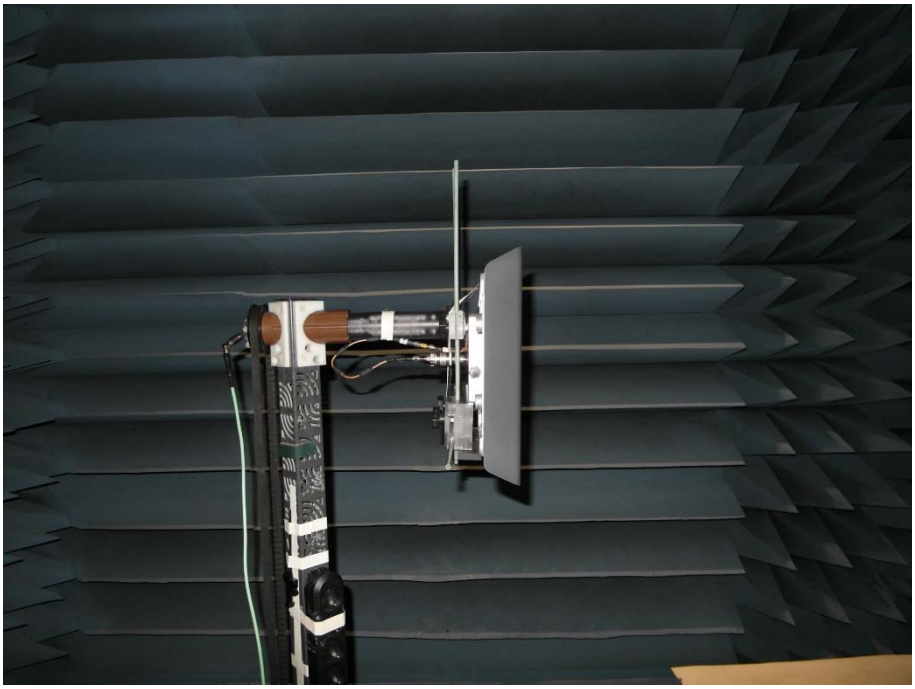

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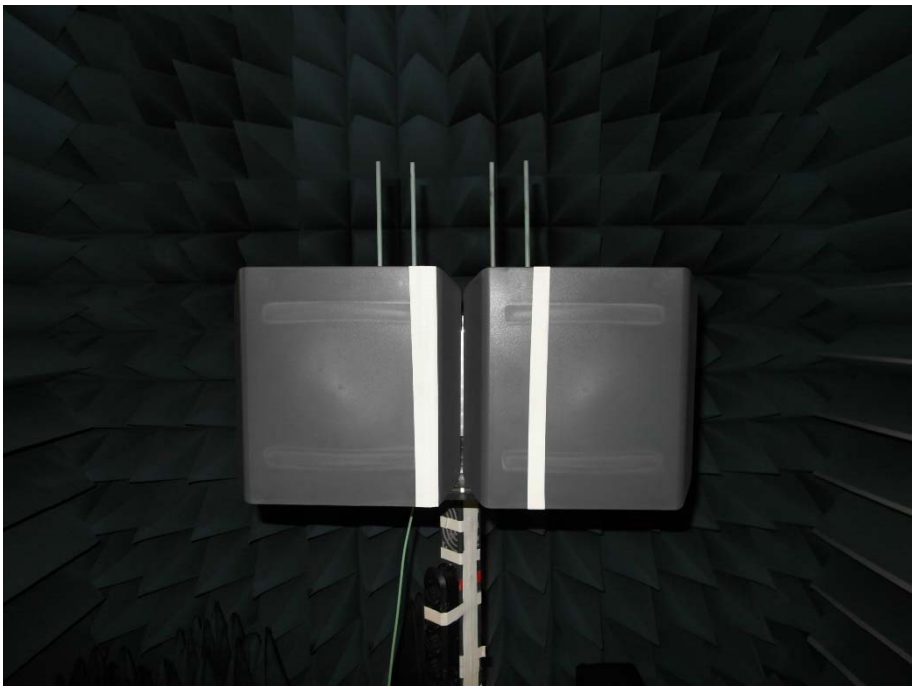

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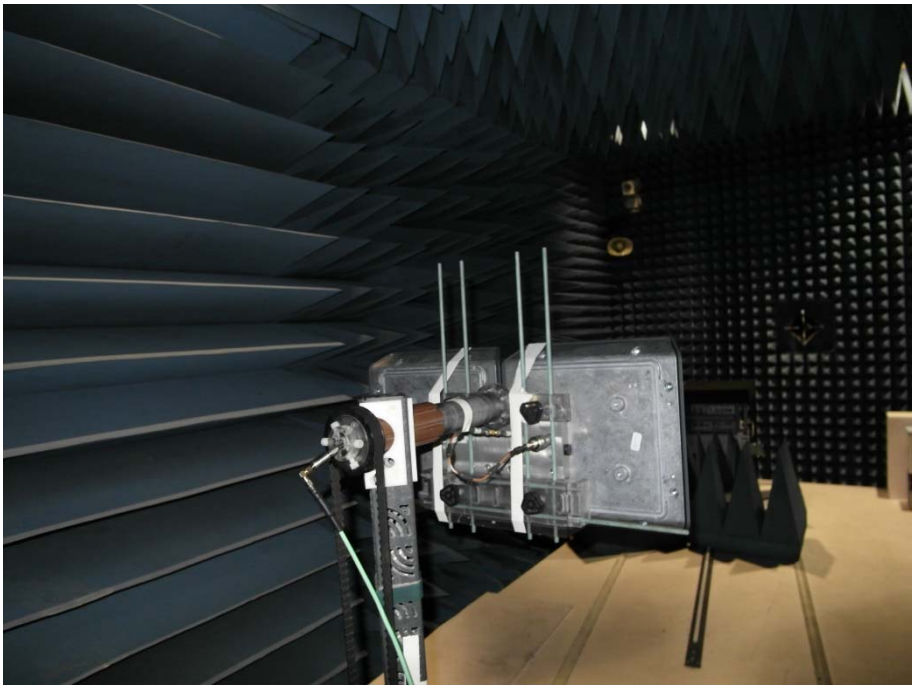

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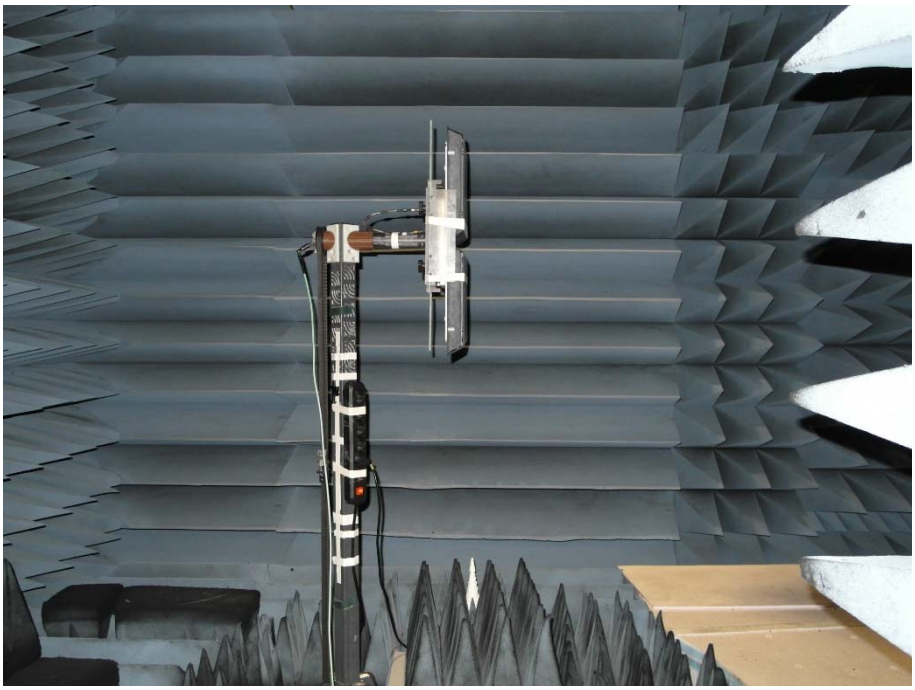

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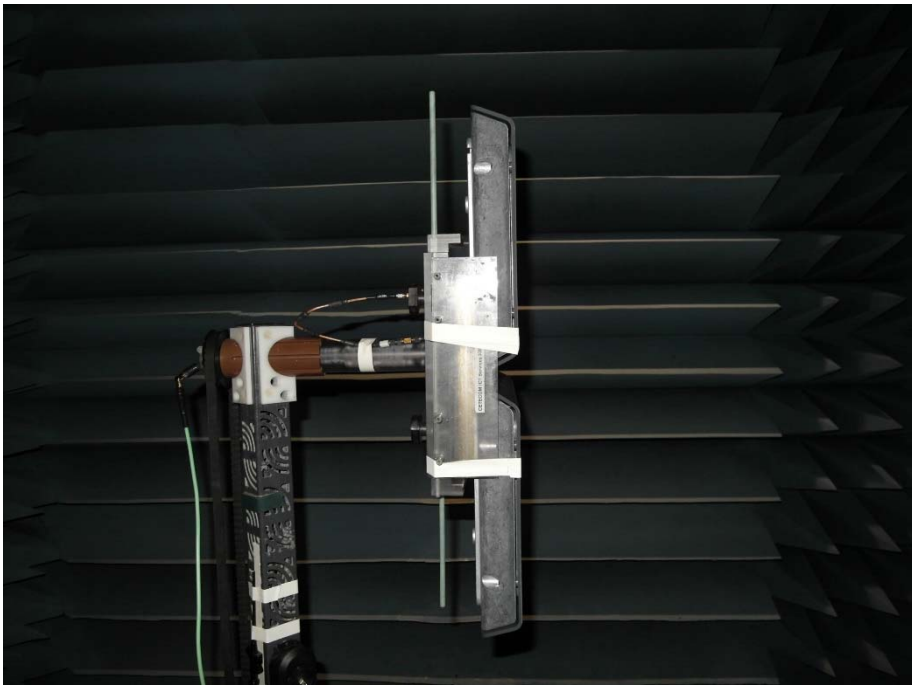

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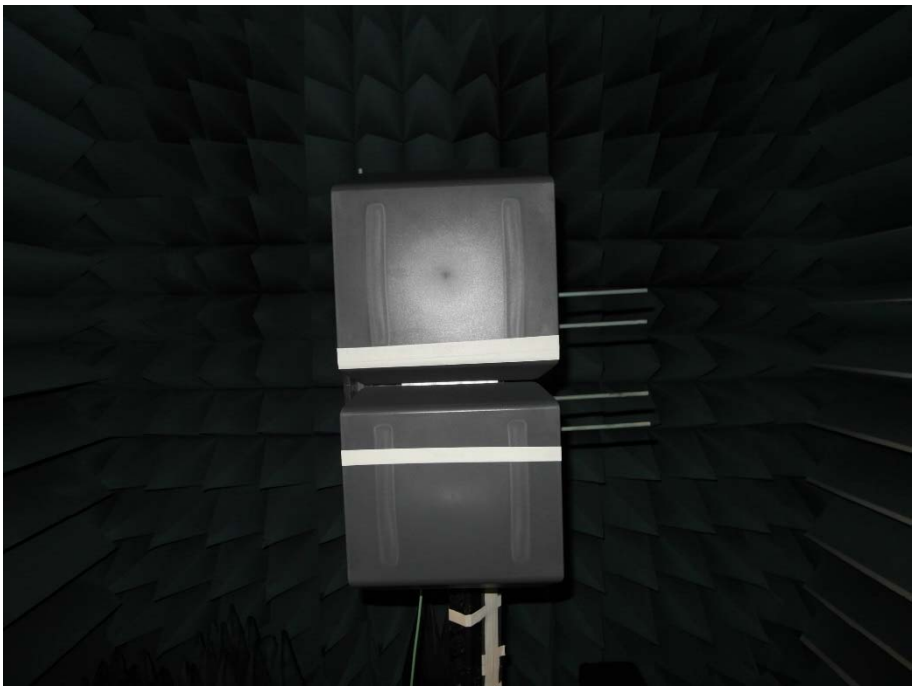

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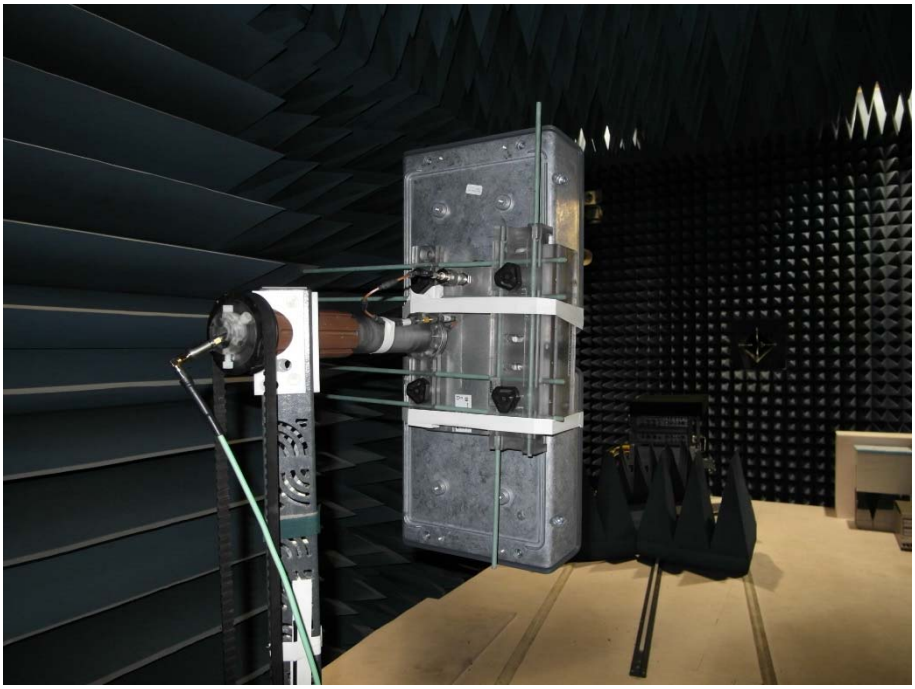


6 Observations

No observations except those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2019-05-15
A	Editorial changes	2019-04-25
B	Antenna gain in dBi added	2019-05-15

Annex B Further information

Glossary

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software
PMN - Product marketing name
HMN - Host marketing name
HVIN - Hardware version identification number
FVIN - Firmware version identification number

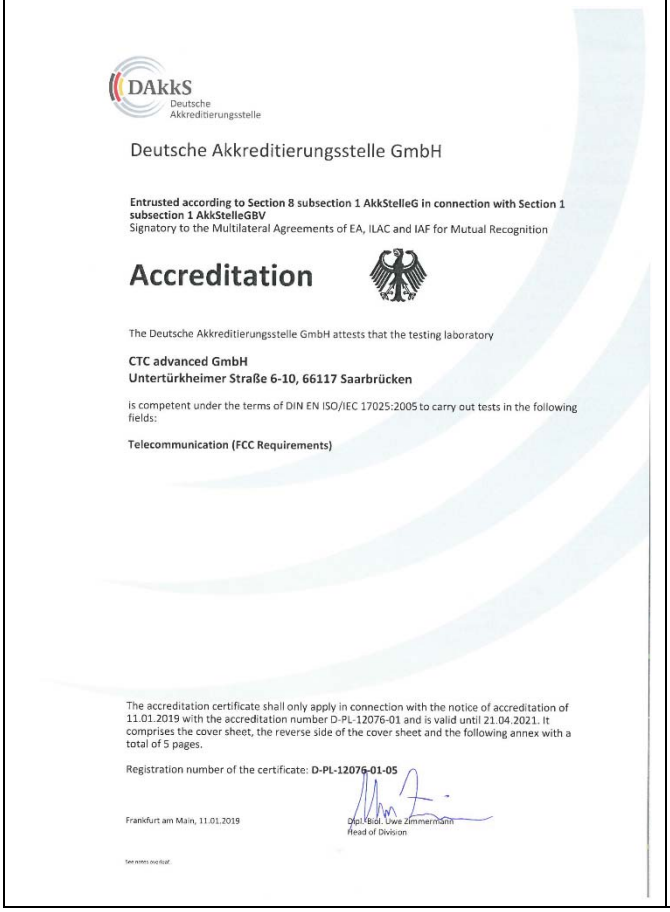
Annex C Accreditation Certificate – D-PL-12076-01-04

first page	last page
	

Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkkS or may be received by CTC advanced GmbH on request

https://www.dakks.de/as/ast/d/D-PL-12076-01-04.pdf

Annex D Accreditation Certificate – D-PL-12076-01-05

first page	last page
	

DAkkS Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

CTC advanced GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Telecommunication (FCC Requirements)

The accreditation certificate shall only apply in connection with the notice of accreditation of 11.01.2019 with the accreditation number D-PL-12076-01 and is valid until 21.04.2021. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 5 pages.

Registration number of the certificate: **D-PL-12076-01-05**

Frankfurt am Main, 11.01.2019

Dipl.-Biol. Uwe Zimmermann
Head of Division

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Office Berlin
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10117 Berlin

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Europa-Allee 52
60327 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkkS or may be received by CTC advanced GmbH on request

https://www.dakks.de/as/ast/d/D-PL-12076-01-05.pdf

########## END OF TEST REPORT ##########