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Radio approval 80GHZ-L-C

Antenna for LPR applications

RF Sensors

Distribution list: KMTKI RF Sensors

Document Type: Report

Revision history	Issue	Date	Issued by	Modification
	0.1	2017-08-21	C. Ouzounis	Created
	0.2	2017-10-04	C. Ouzounis	Updated antenna list
	0.3	2018-01-03	C. Ouzounis	Differentiation between HART and FF/PA devices

Contents

1 Purpose

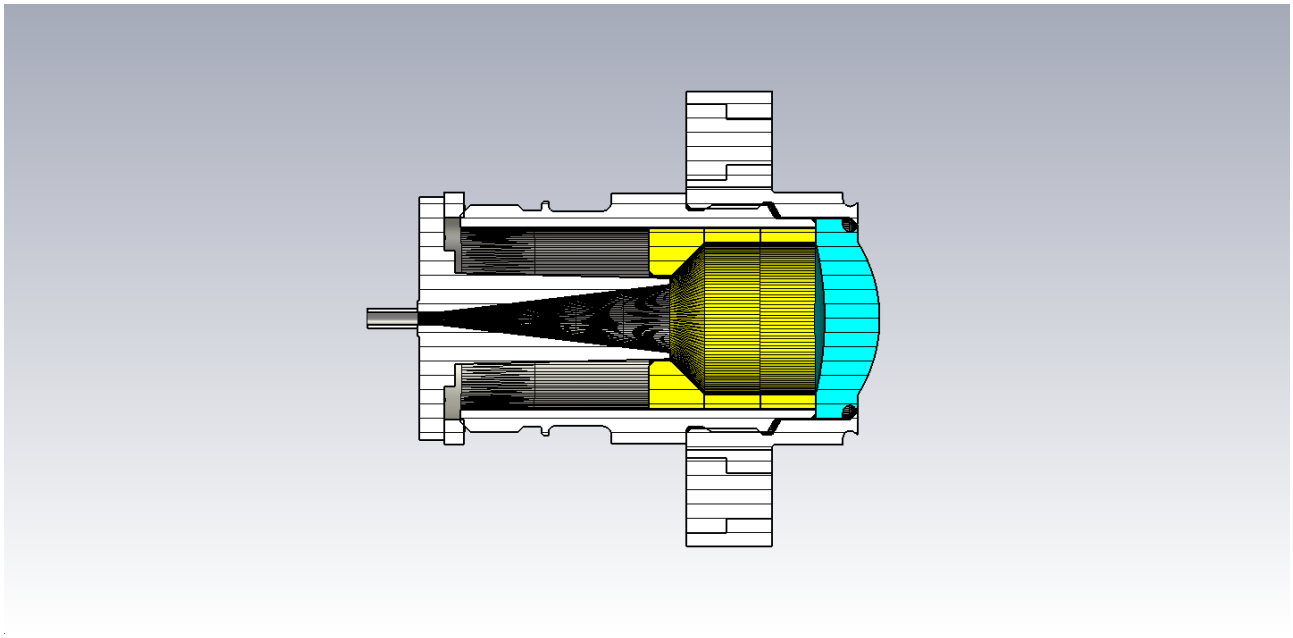
In the following measurements several characteristics of antennas have been performed, like

- Radiation pattern in E-plane and H-plane
- Main lobe magnitude
- Angular width (3 dB)

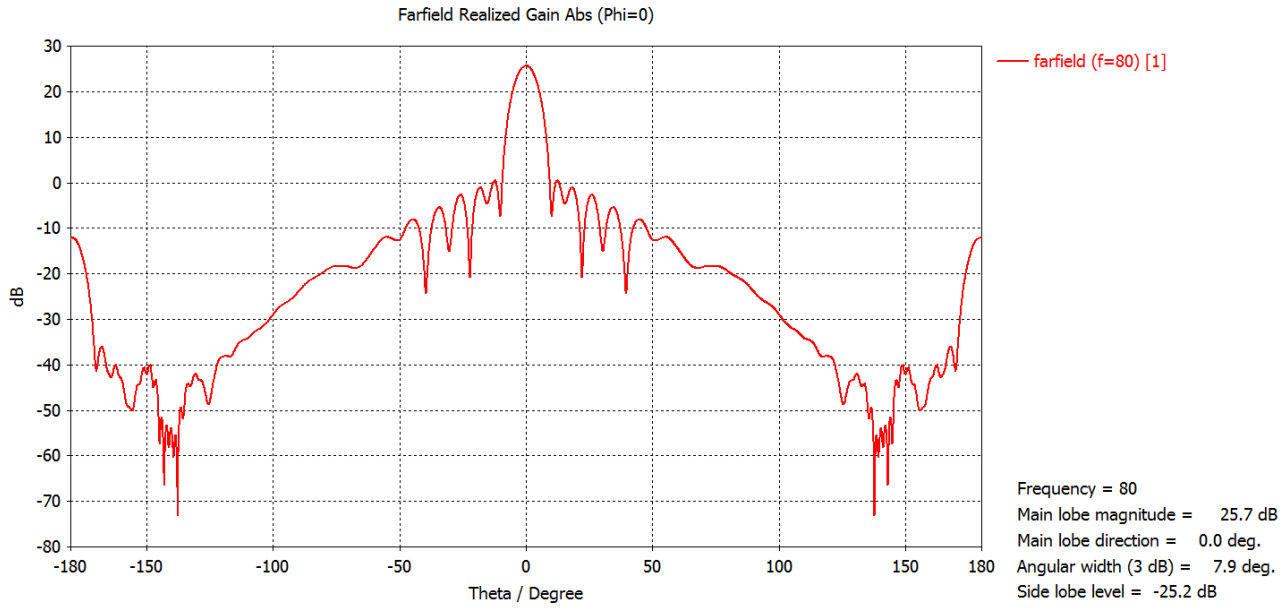
The antenna list is valid for HART devices (PMN: “OPTIWAVE x500 series”) and FF/PA devices (PMN: “OPTIWAVE x500 FF-PA series”).

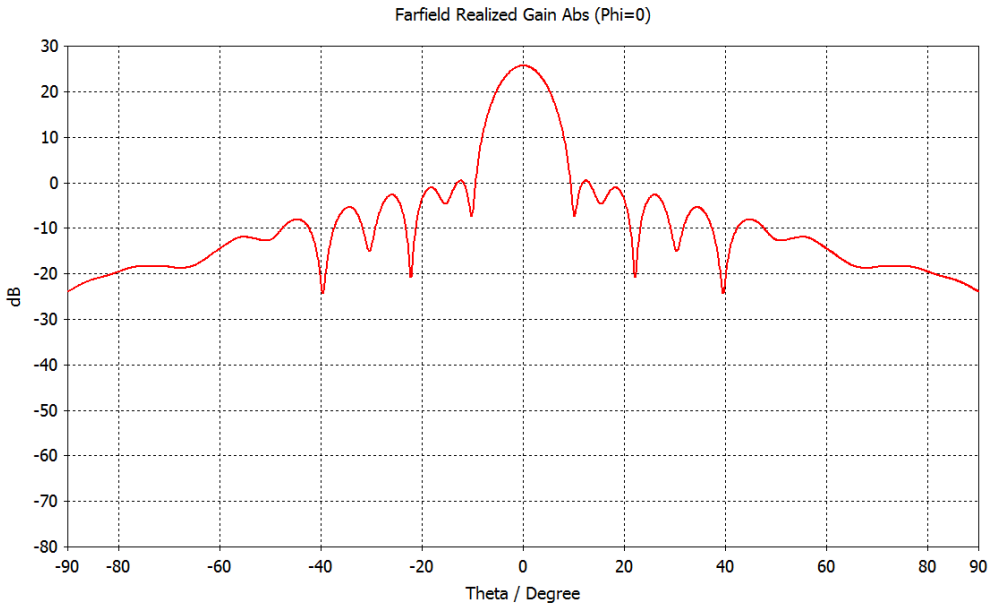
2 Antenna characteristics

2.1 PEEK / DN40 (1½") Lens

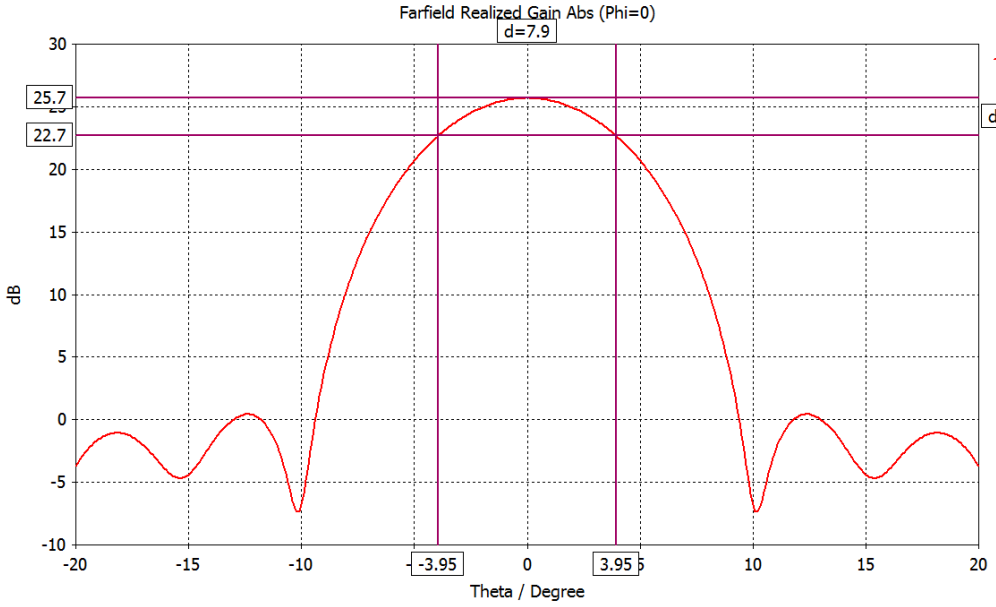


2.1.1 Radiation pattern in E-plane





Frequency = 80
Main lobe magnitude = 25.7 dB
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 7.9 deg.
Side lobe level = -25.2 dB



Frequency = 80
Main lobe magnitude = 25.7 dB
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 7.9 deg.
Side lobe level = -25.2 dB

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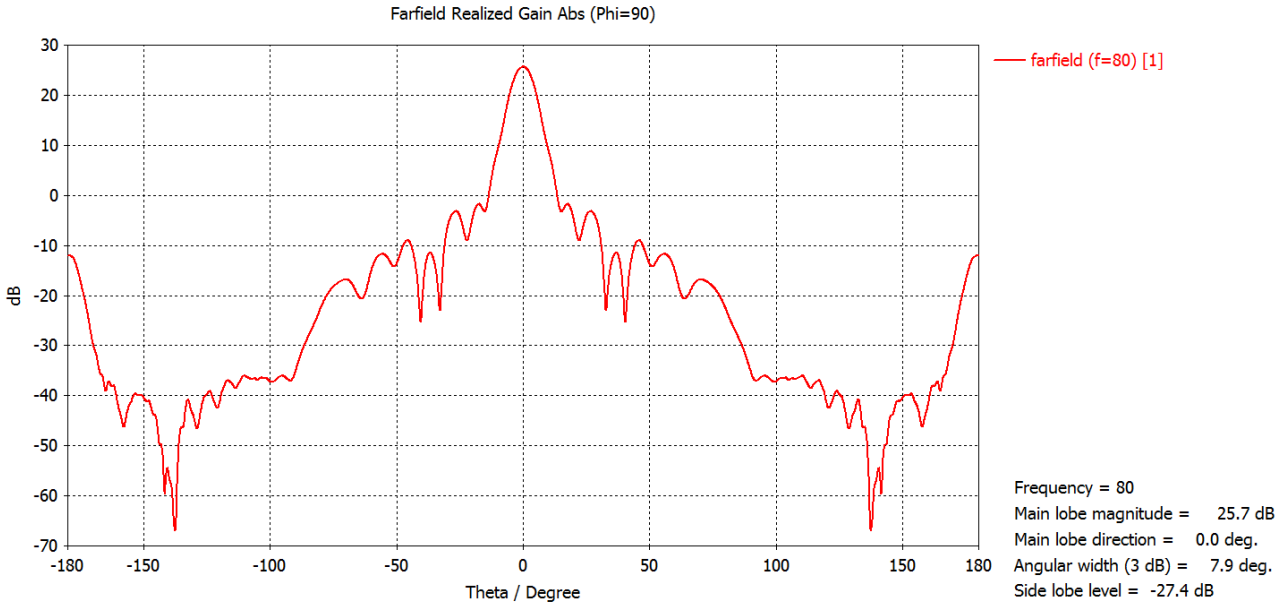
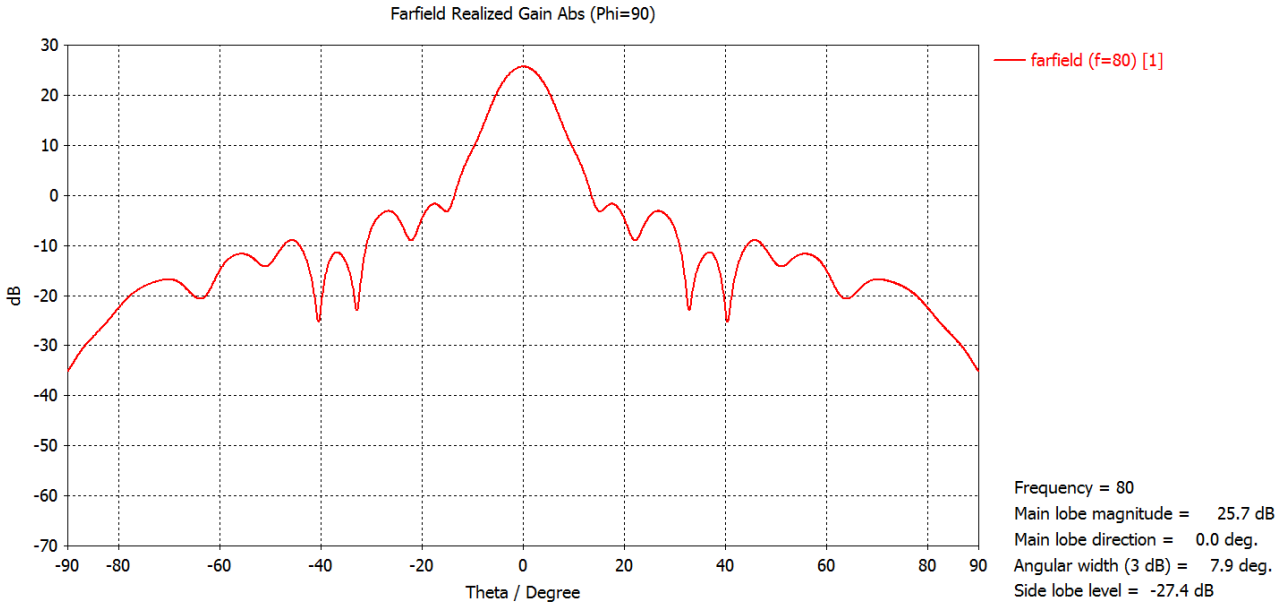
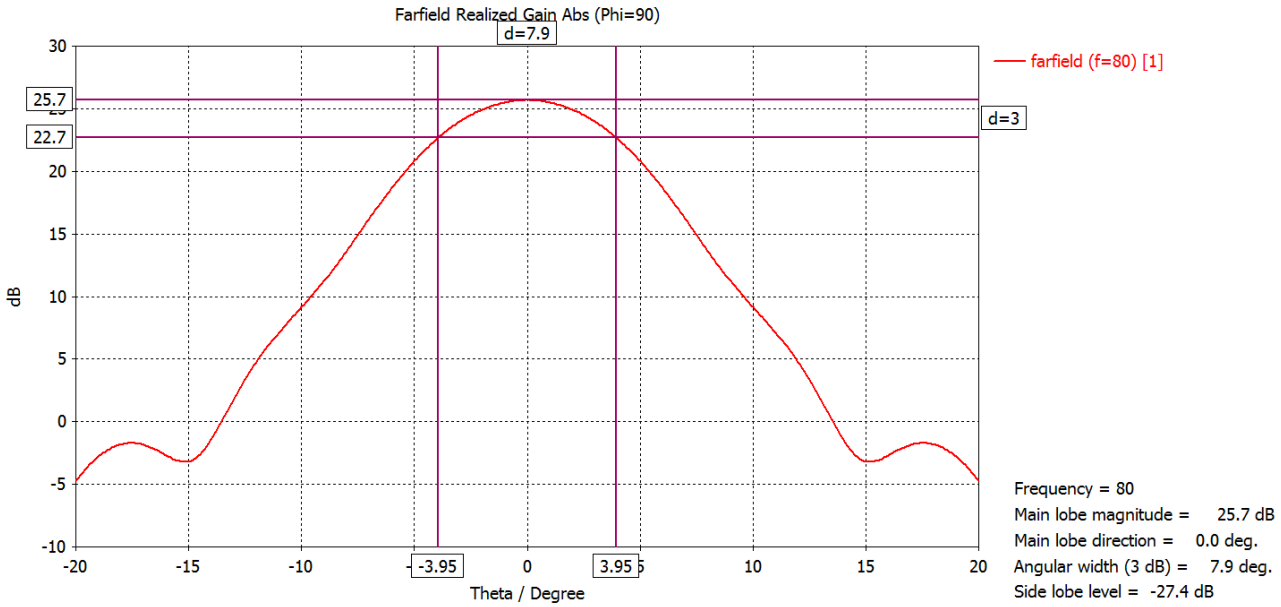
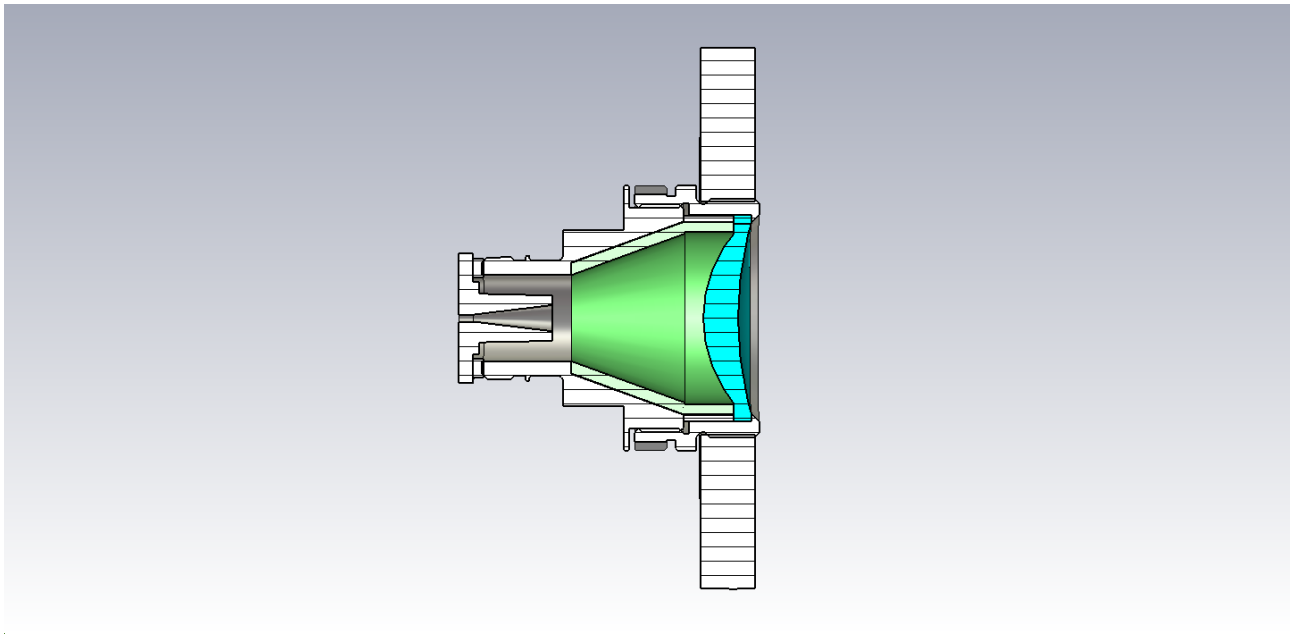
2.1.2 Radiation pattern in H-plane



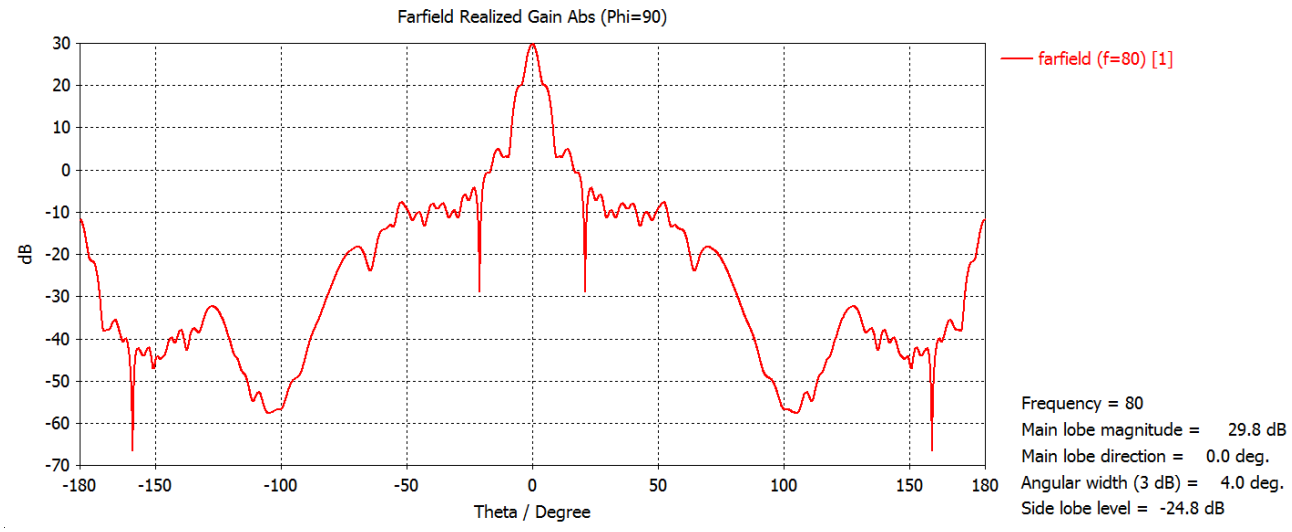


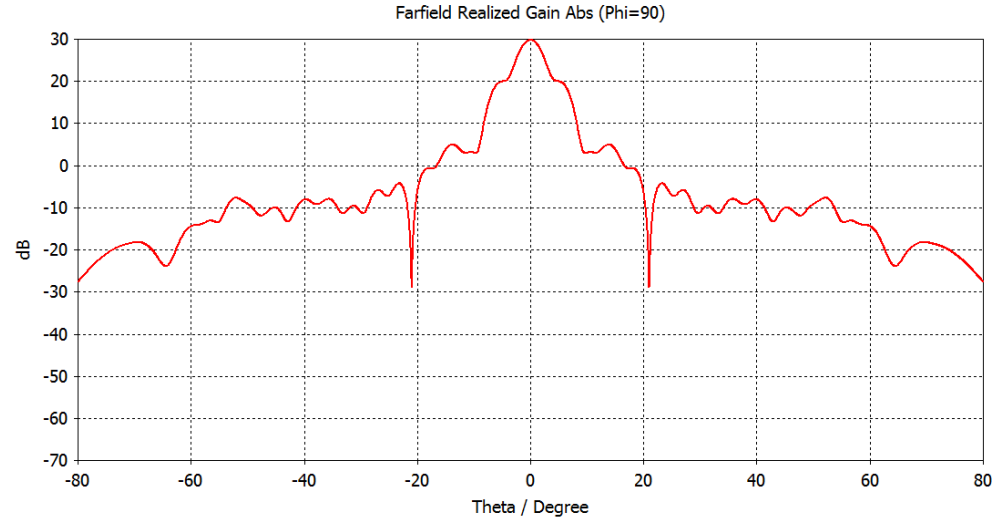

Farfield Realized Gain Abs (Phi=90)
d=7.9
farfield (f=80) [1]
25.7
22.7
d=3
dB
30
20
15
10
5
0
-5
-10
-20
-15
-10
-3.95
0
3.95
10
15
20
Theta / Degree
Frequency = 80
Main lobe magnitude = 25.7 dB
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 7.9 deg.
Side lobe level = -27.4 dB

2.2 PEEK / DN70 (2¾") Lens

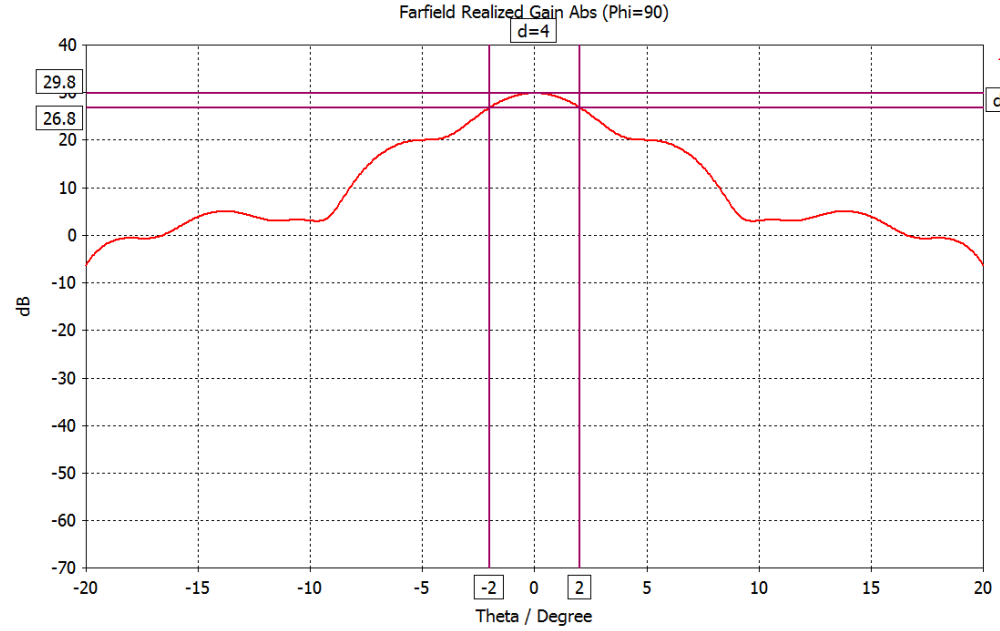


2.2.1 Radiation pattern in E-plane



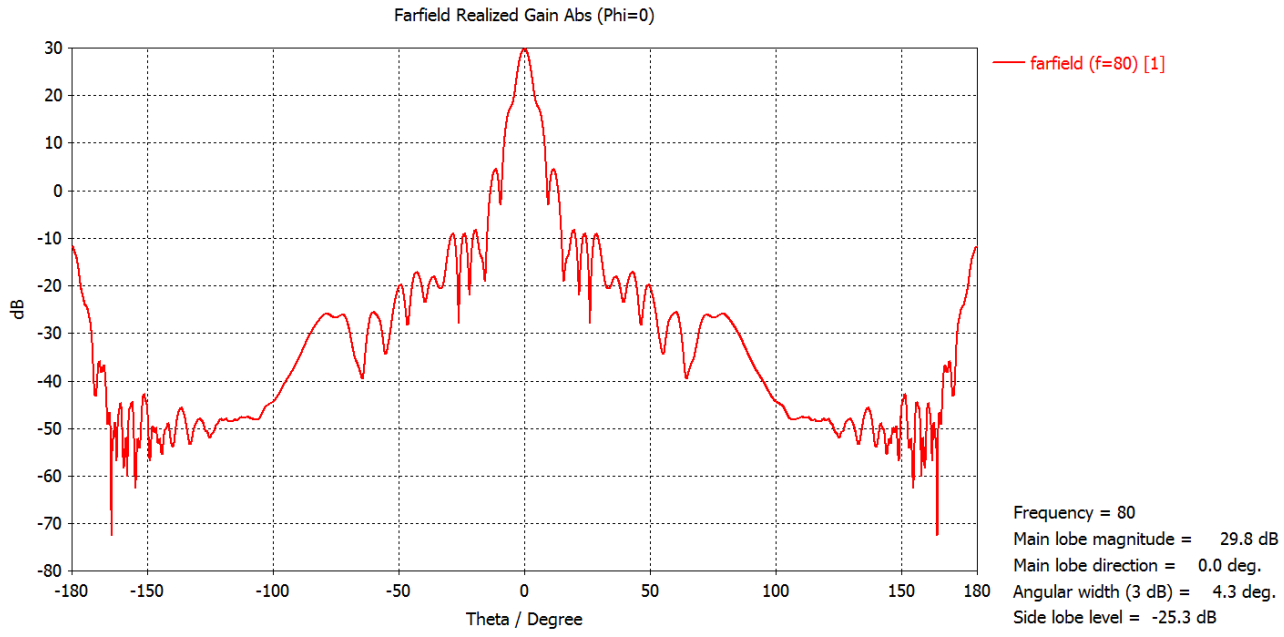


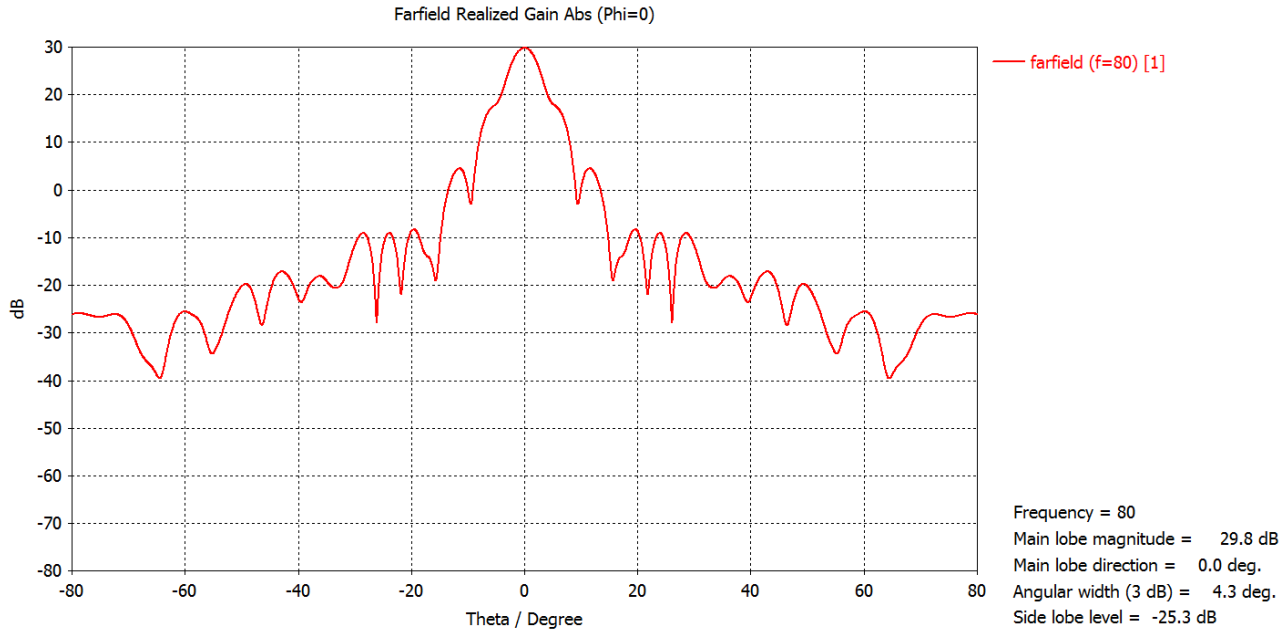
Frequency = 80
Main lobe magnitude = 29.8 dB
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 4.0 deg.
Side lobe level = -24.8 dB

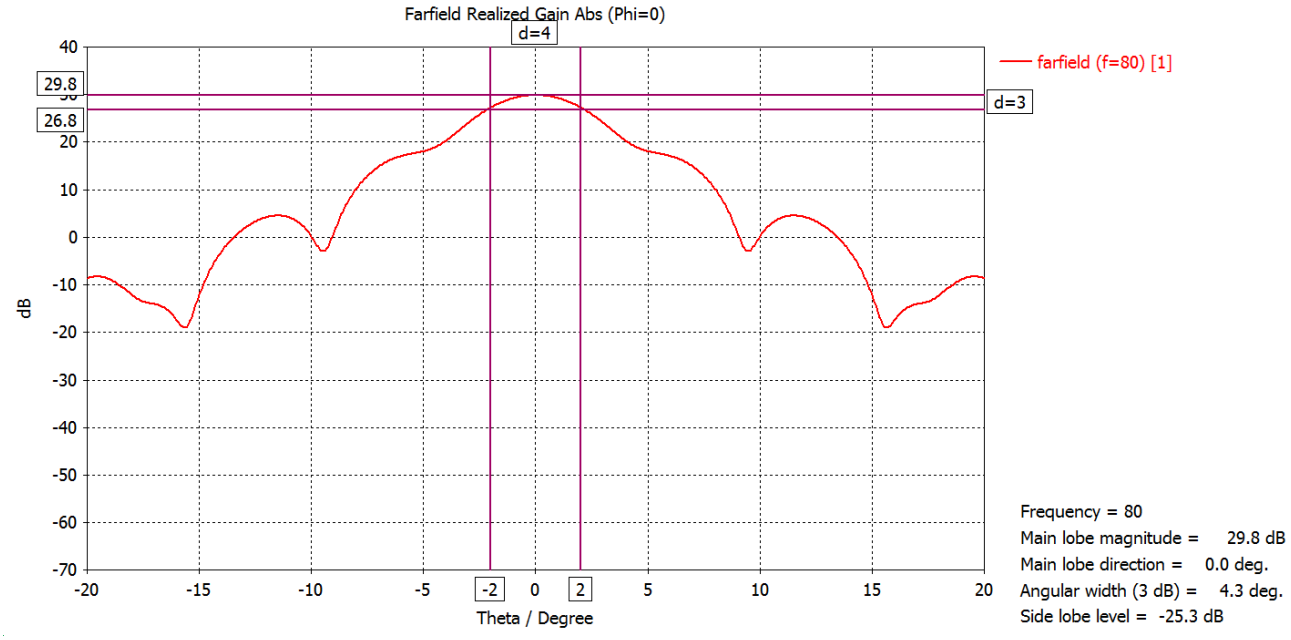


Frequency = 80
Main lobe magnitude = 29.8 dB
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 4.0 deg.
Side lobe level = -24.8 dB

2.2.2 Radiation pattern in H-plane






Farfield Realized Gain Abs (Phi=0)
d=4
farfield (f=80) [1]
d=3
29.8
26.8
dB
Theta / Degree
Frequency = 80
Main lobe magnitude = 29.8 dB
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 4.3 deg.
Side lobe level = -25.3 dB

2.3 LPR antenna overview

Type	Gain [dB]	Angular width E- / H-plane [°]
PEEK / DN40 (1½") Lens	25.7	7.9 / 7.9
PEEK / DN70 (2¾") Lens	29.8	4.0 / 4.3