Product – Specification of the VW Gen 4 roof antenna 3WA.035.507.A Revision 09H

Originator: MMI
Approver: FSC

Location: Molex CVS Hildesheim GmbH

Change History

Version	Date	Status	Handled by	Comments
1.0	28-Aug-2025	released	MMI	Certification abstract

Table of Content

1. INTRODUCTION

This document defines the specification of the VW Gen 4 roof antenna 3WA.035.507.A Revision 09H

2. GENERAL REMARKS

For all specified values appearing in this document, the following definitions are valid:

Min.: Minimal limit, minimal adjustable value of respective parameter

Nom.: Nominal or typical value of respective parameter with tolerance range at room temperature (25°C).
This tolerance range does not include the temperature response.

Max.: Maximal limit, maximal adjustable value of respective parameter

Design-range: This range defines the limits for all component parameters that must not be exceeded.
The Nominal – value must be chosen from within the Design – range.

Frequency-range: In this case the Min. and Max. value stands for that frequency-range within which the parameters, stated in this document, need to be met.

3. GENERAL CONCEPT

3.1 Variants

Model	Type	Customer Part number	Roof curvature	Functions
RAN-102	RAN-102e	3WA.035.507.A	Curved	GNSS L1 + L5; 2x Tel 5G; BTLE/WiFi 2.4 Ghz; BTLE/WiFi Dual 2.4 & 5 GHz; V2X;
RAN-102	RAN-102f	3WA.035.507.B	Curved	GNSS L1 + L5; 2x Tel 5G; BTLE/WiFi 2.4 Ghz; BTLE/WiFi Dual 2.4 & 5 GHz; V2X; Telestart
RAN-102	RAN-102a	3WA.035.507.C	Curved	GNSS L1 + L5; 2x Tel 5G; BTLE/WiFi 2.4 Ghz; BTLE/WiFi Dual 2.4 & 5 GHz; V2X; SDARS
RAN-102	RAN-102d	3WA.035.507.E	Flat	GNSS L1 + L5; 2x Tel 5G; BTLE/WiFi 2.4 Ghz; BTLE/WiFi Dual 2.4 & 5 GHz; V2X;
RAN-102	RAN-102c	3WA.035.507.F	Flat	GNSS L1 + L5; 2x Tel 5G; BTLE/WiFi 2.4 Ghz; BTLE/WiFi Dual 2.4 & 5 GHz; V2X; Telestart
RAN-102	RAN-102b	3WA.035.507.G	Flat	GNSS L1 + L5; 2x Tel 5G; BTLE/WiFi 2.4 Ghz; BTLE/WiFi Dual 2.4 & 5 GHz; V2X; SDARS

4. ELECTRICAL PROPERTIES 3WA.035.507.A REVISION 09H

Unless otherwise stated, all data in this document apply for nominal requirements at 25°C.

Radiated measurements were done mounted on 1m groundplane

Disclaimer: The part 3WA.035.507.A revision 09H is a preliminary design status (B-sample) that does not fully achieved the VW requirements.

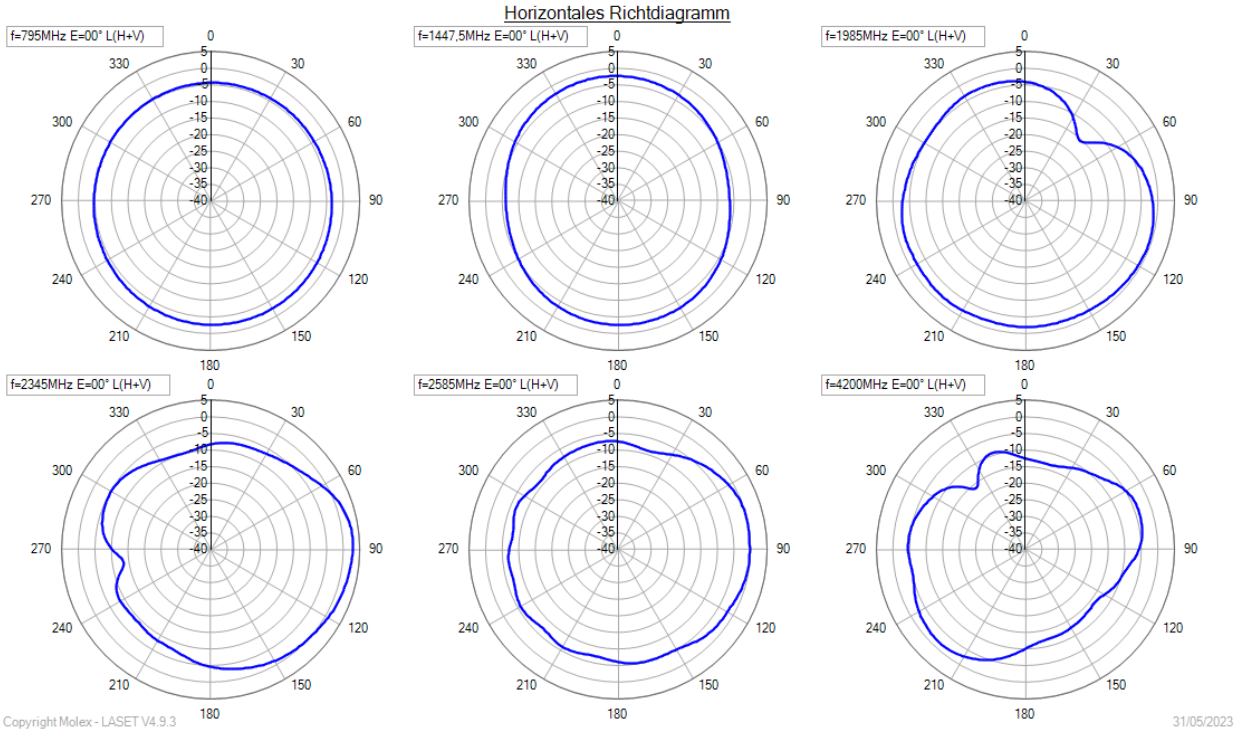
4.1 Measurement setup passive antennas (1 meter GND)

Messprinzip	Art der Messstrecke	Nahfeld
	Entfernung DUT<-> Sendeantenne	Satimo Messraum Molex Hildesheim SG3000F
	Nah/Fernfeldtransformation	Ja
	Referenzdokument	

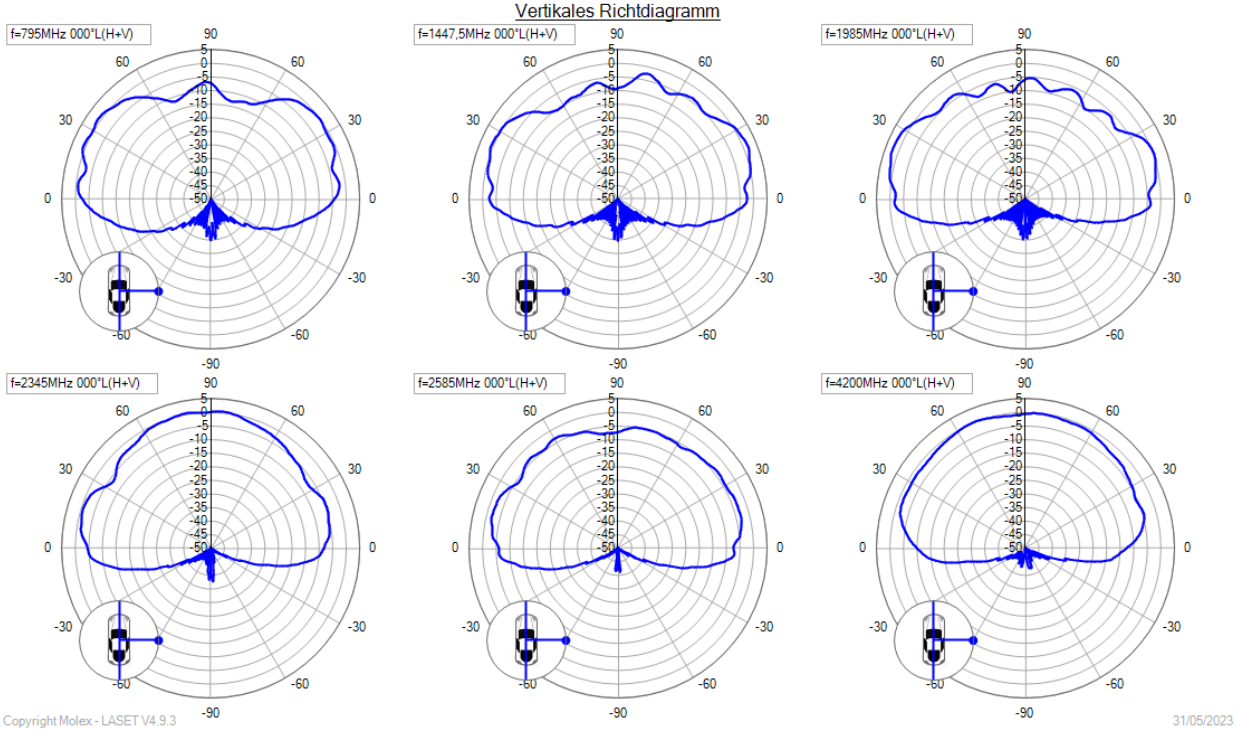
Messparameter	Wetterbedingungen	Innenraum
	Frequenzbereich	600 MHz – 6000 MHz
	Winkelbereich Elevation Azimuth	 0° bis 180° 0° - 360°
	Winkelschritte Elevation Azimuth	- 1° 1°
	Time Domain Gate Start,Gate Stop Gate Funktion Translated Spherical Wave Expansion Probe Pattern Compensation AnyGround	Nein Nein Nein Nein
	Ausgangsleistung	
	Gemessene Polarisationen	Vertikal / Horizontal

4.2 Tel1 5G

frequency band in MHz		partial average gain of freq. band in dBi (Theta=[60-90]°)		max. gain in partial area (Theta=[60-90]°)	absolut maximum gain (Theta=[0-180]°)
begin	end	in freq. band in dBi	maximum	in freq. band in dBi	in freq. band in dBi
617	***960***	***-2,15***	***-0,99***	***1,44***	***1,74***
1427,9	***1510,9***	***-1,36***	***-1,15***	***1,82***	***1,82***
1710	***2170***	***0,41***	***0,87***	***4,37***	***4,37***
2300	***2370***	***-0,07***	***0,13***	***7,19***	***7,19***
2500	***2690***	***-0,99***	***0,30***	***5,11***	***5,11***
3300	***4400***	***-2,98***	***-1,73***	***2,88***	***2,88***
4600	***5000***	***-3,66***	***-2,71***	***2,07***	***2,07***

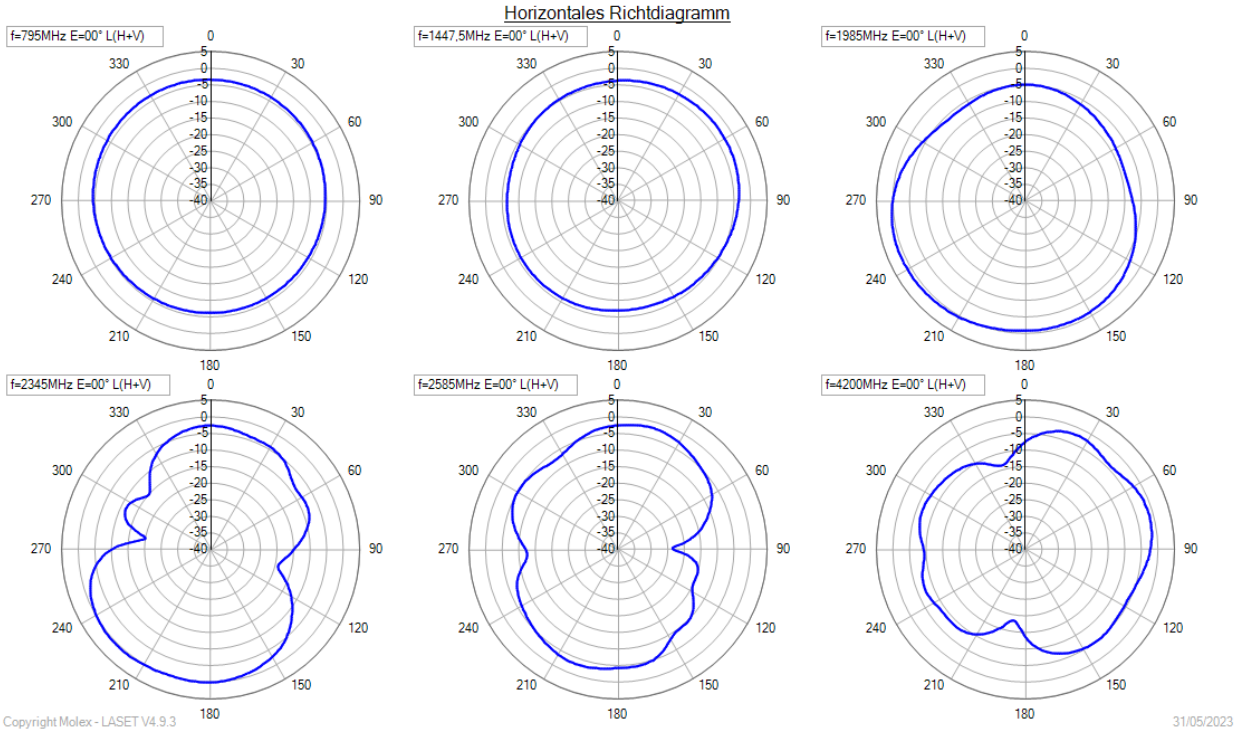


Vertikales Richtdiagramm



4.3 Tel2 5G

frequency band in MHz		partial average gain of freq. band in dBi (Theta=[60-90]°)		max. gain in partial area (Theta=[60-90]°)	absolut maximum gain (Theta=[0-180]°)
begin	end	in freq. band in dBi	maximum	in freq. band in dBi	in freq. band in dBi
617	***960***	***-2,60***	***-0,96***	***2,51***	***2,51***
1427,9	***1510,9***	***-1,85***	***-1,15***	***2,20***	***2,20***
1710	***2170***	***0,52***	***1,00***	***6,57***	***6,57***
2300	***2370***	***-0,95***	***-0,15***	***6,32***	***6,32***
2500	***2690***	***-1,72***	***-0,69***	***4,49***	***4,49***
3300	***4400***	***-2,17***	***-1,04***	***3,99***	***3,99***
4600	***5000***	***-3.22***	***-1,72***	***4,30***	***4,30***



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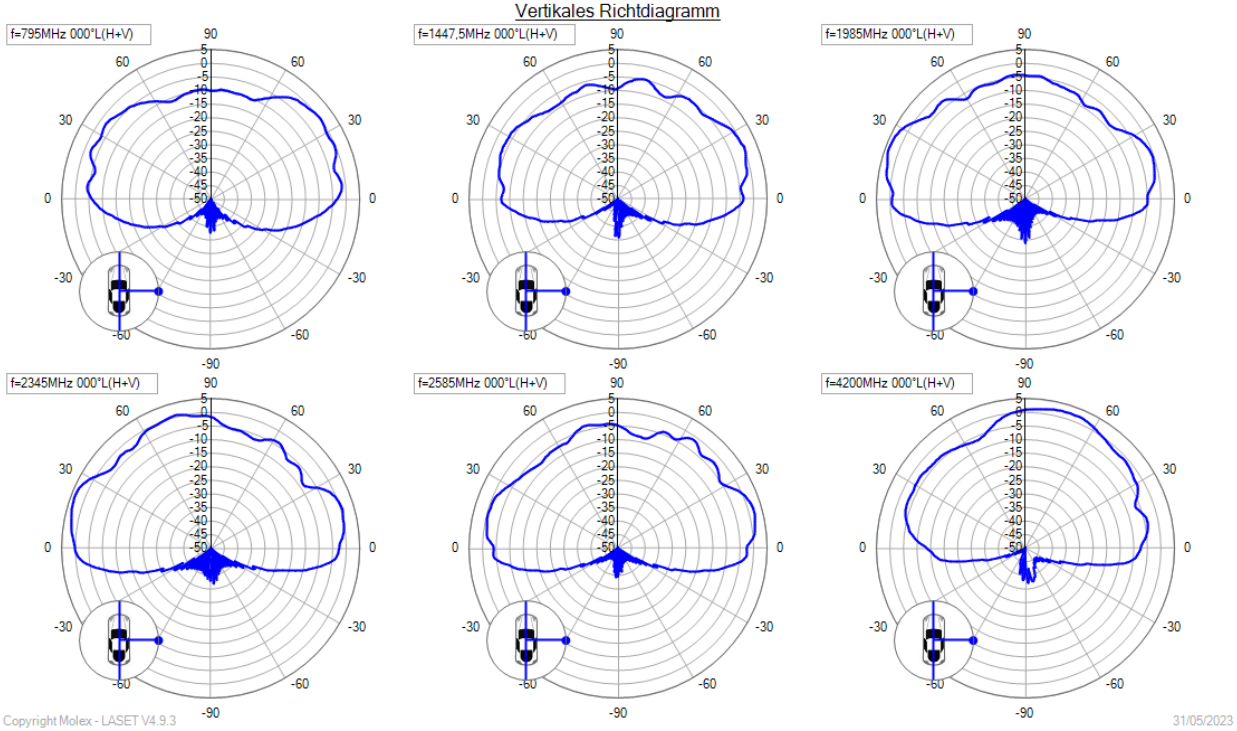
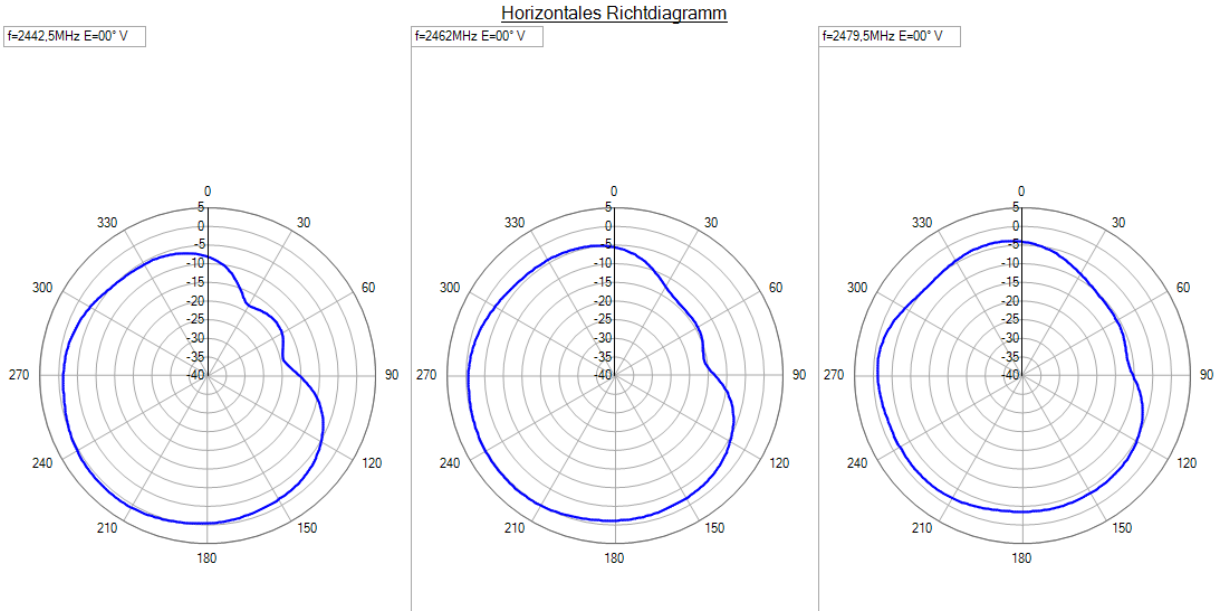
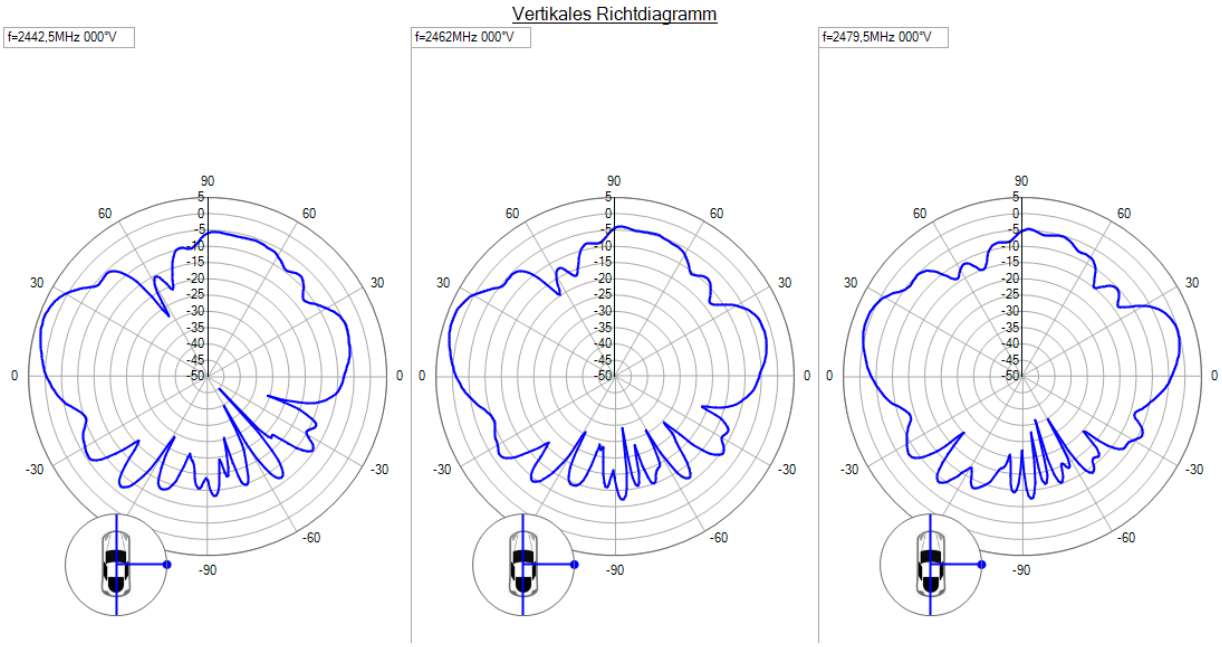


4.4 BTLE/WiFI 2.4 GHz

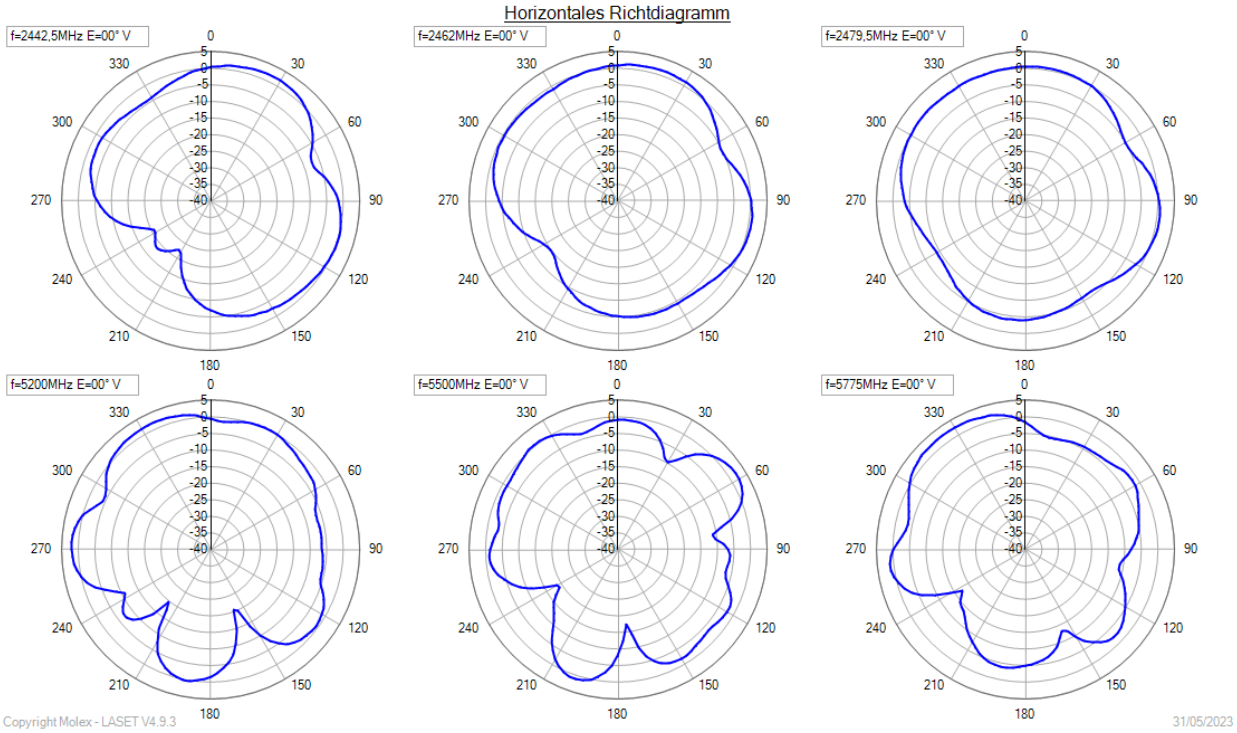
frequency band in MHz		partial average gain of freq. band in dBi (Theta=[80-90]°)		max. gain in partial area (Theta=[80-90]°)	absolut maximum gain (Theta=[0-180]°)
begin	end	in freq. band in dBi	maximum	in freq. band in dBi	in freq. band in dBi
2400	***2480,9***	***-1,66***	***-0,90***	***4,50***	***5,56***



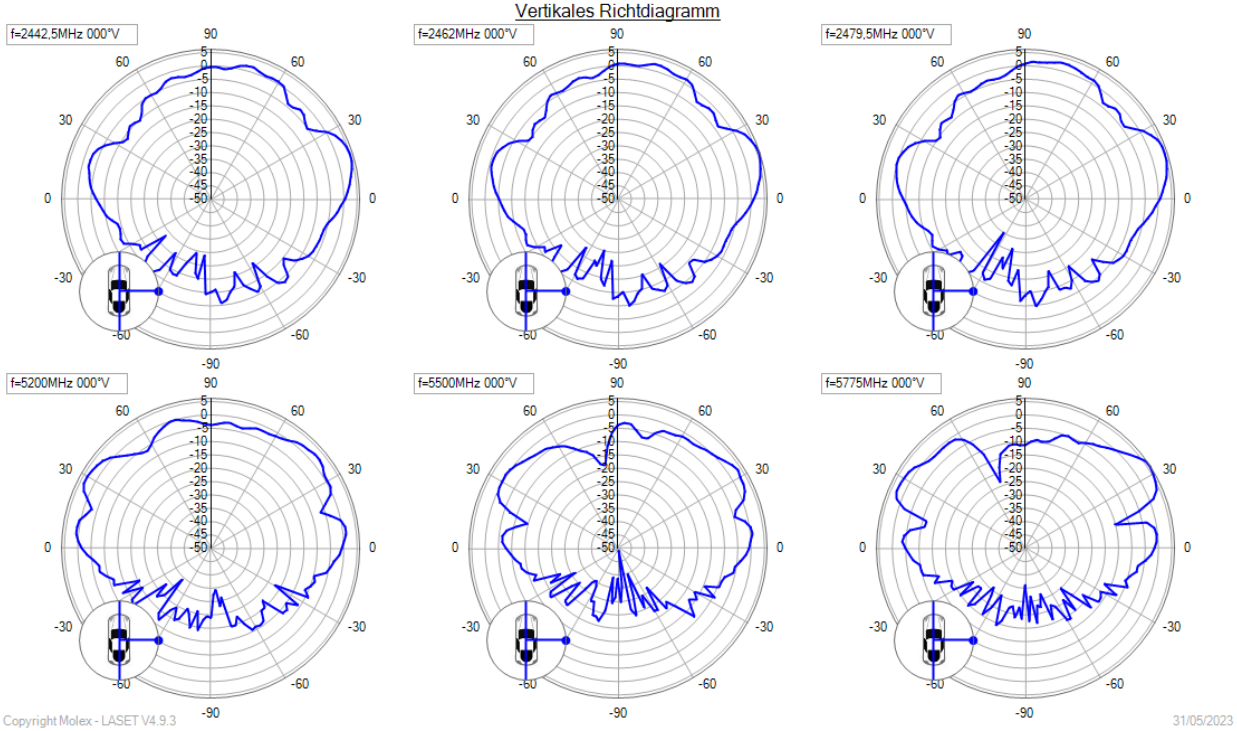


4.5 BTLE/WiFi Dual 2.4 & 5 GHz

frequency band in MHz		partial average gain of freq. band in dBi (Theta=[80-90]°)		max. gain in partial area (Theta=[80-90]°)	absolut maximum gain (Theta=[0-180]°)
begin	end	in freq. band in dBi	maximum	in freq. band in dBi	in freq. band in dBi
2400	***2483,5***	***-0,35***	***0,62***	***5,71***	***7,50***
5170	***5835***	***-0,56***	***0,38***	***7,00***	***7,46***



Vertikales Richtdiagramm



4.6 C2X

frequency band in MHz		partial average gain of freq. band in dBi (Theta=[80-90]°)		max. gain in partial area (Theta=[80-90]°)	absolut maximum gain (Theta=[0-180]°)
begin	end	in freq. band in dBi	maximum	in freq. band in dBi	in freq. band in dBi
5855	***5925***	***0,23***	***0,58***	***6,70***	***6,99***