

# **Technical Document**

## **FBD6**

### **BLE & UWB Antenna Description**

## Document History

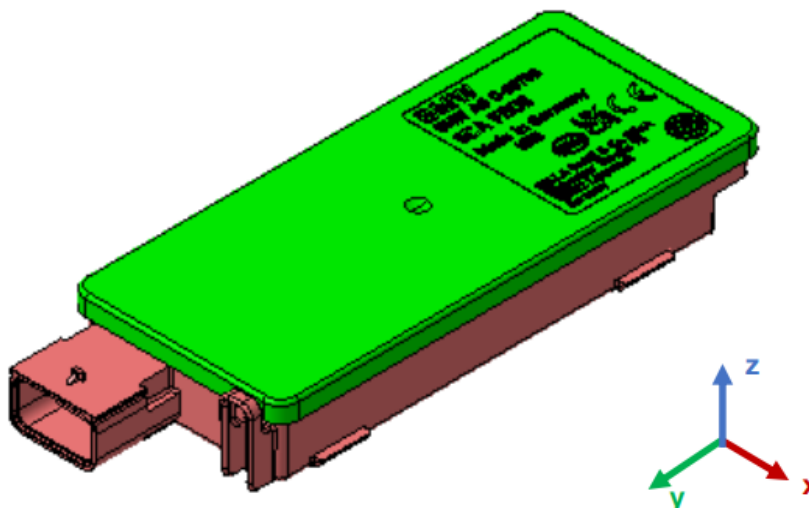
| PTC version | Date       | Description      |
|-------------|------------|------------------|
| 1.1         | 2024-10-31 | Released version |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |
|             |            |                  |

## Content

|       |                                           |    |
|-------|-------------------------------------------|----|
| 1     | PCB integrated BLE antenna description    | 4  |
| 1.1   | BLE Antenna Electrical Specification      | 4  |
| 1.1.1 | BLE Antenna Radiation Characteristic      | 5  |
| 2     | PCB integrated UWB Antenna #1 description | 6  |
| 2.1   | UWB Antenna #1 Electrical Specification   | 7  |
| 2.1.1 | UWB Antenna #1 Radiation Characteristic   | 8  |
| 2.2   | UWB Antenna #2 Electrical Specification   | 9  |
| 2.2.1 | UWB Antenna #2 Radiation Characteristic   | 10 |
| 2.3   | UWB Antenna #3 Electrical Specification   | 11 |
| 2.3.1 | UWB Antenna #3 Radiation Characteristic   | 12 |

## 1 PCB integrated BLE antenna description

The following pictures show FBD6 in its housing with corresponding coordinate definition. Radiation patterns in XY, YZ and XZ planes are given for H-polarization, V-polarization, and total power:



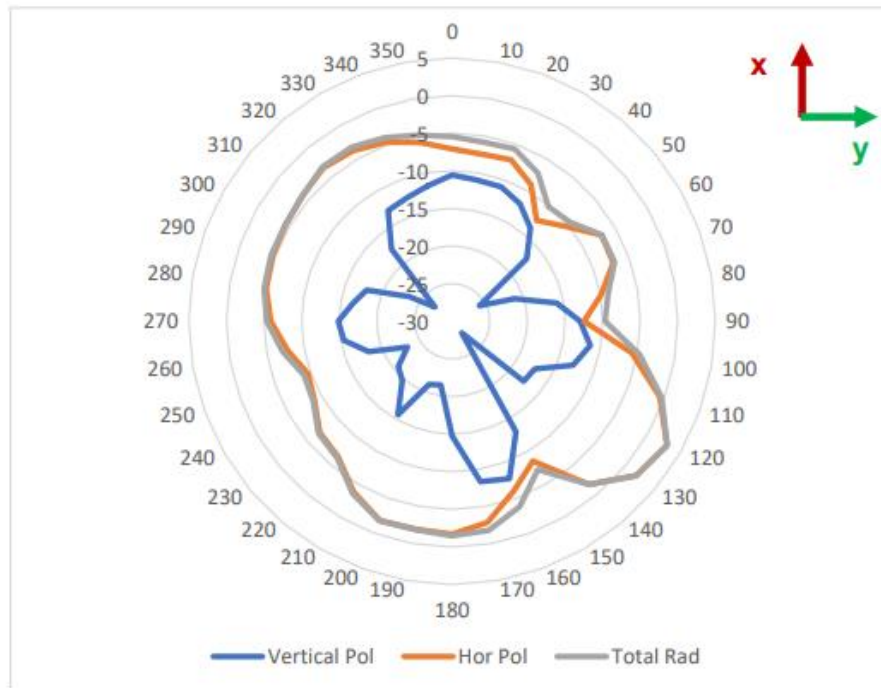
Picture 1: FBD6 box with coordinate system

### 1.1 BLE Antenna Electrical Specification

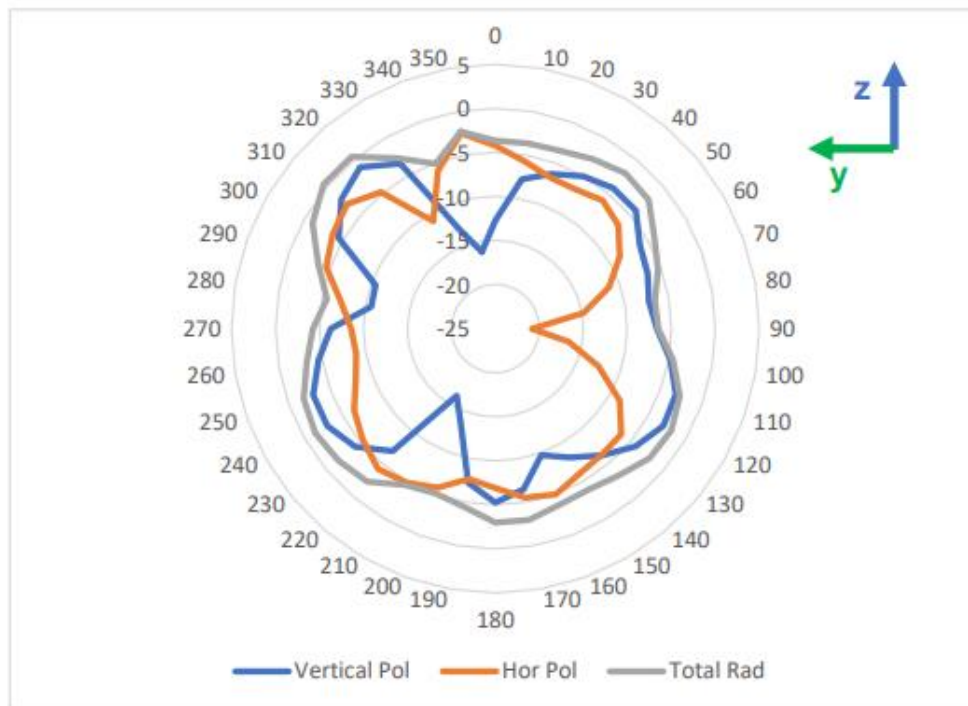
- Antenna name            BLE Antenna
- Type of antenna:      Printed PCB antenna
- Antenna supplier:      Hella

| No | Item         | Spec.       |
|----|--------------|-------------|
| 1  | Max EIRP     | 3.0 dBi     |
| 2  | VSWR         | max 3:1     |
| 3  | Polarization | linear      |
| 4  | Impedance    | 50 $\Omega$ |
| 5  | Frequency    | 2440 MHz    |

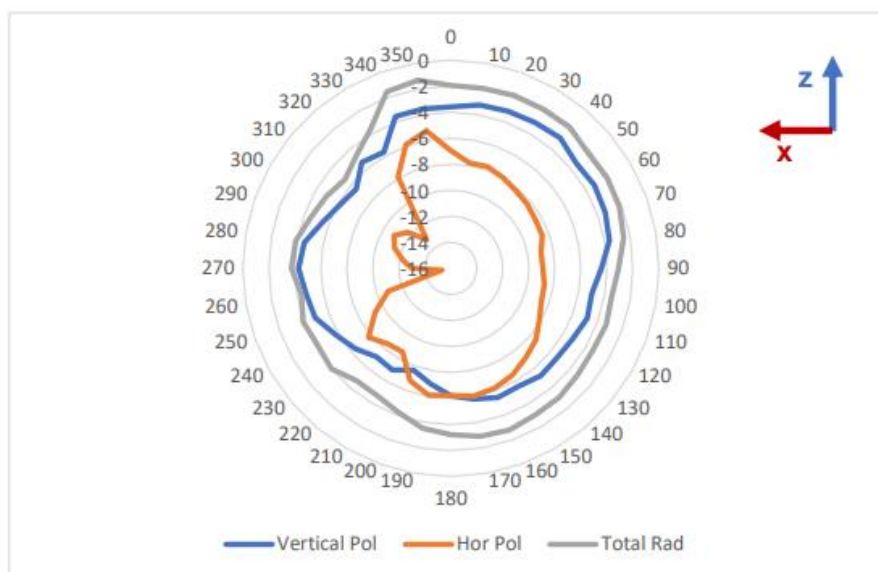
### 1.1.1 BLE Antenna Radiation Characteristic



**Picture 2: BLE antenna radiation XY plane pattern**



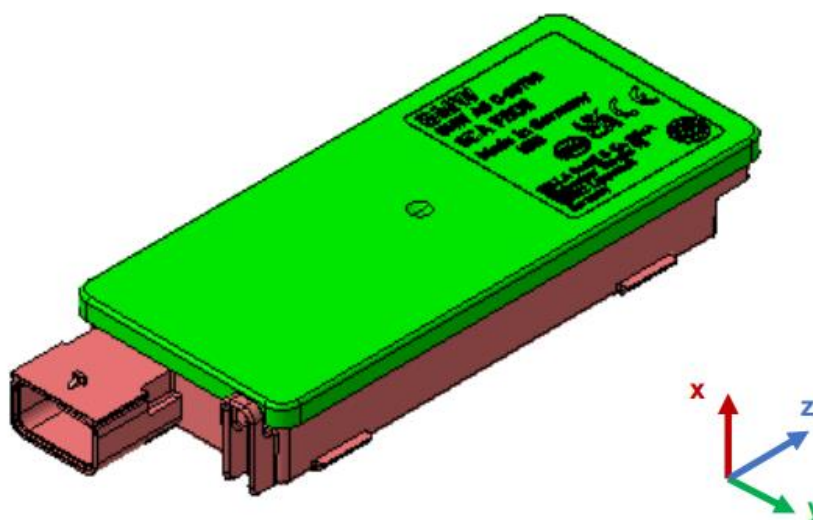
**Picture 3: BLE antenna radiation YZ plane pattern**



**Picture 4: BLE antenna radiation XZ plane pattern**

## 2 PCB integrated UWB Antennas description

The following pictures show FBD6 in its housing with corresponding coordinate definition. Radiation patterns in XY, YZ and XZ planes are given for H-polarization, V-polarization, and total power:



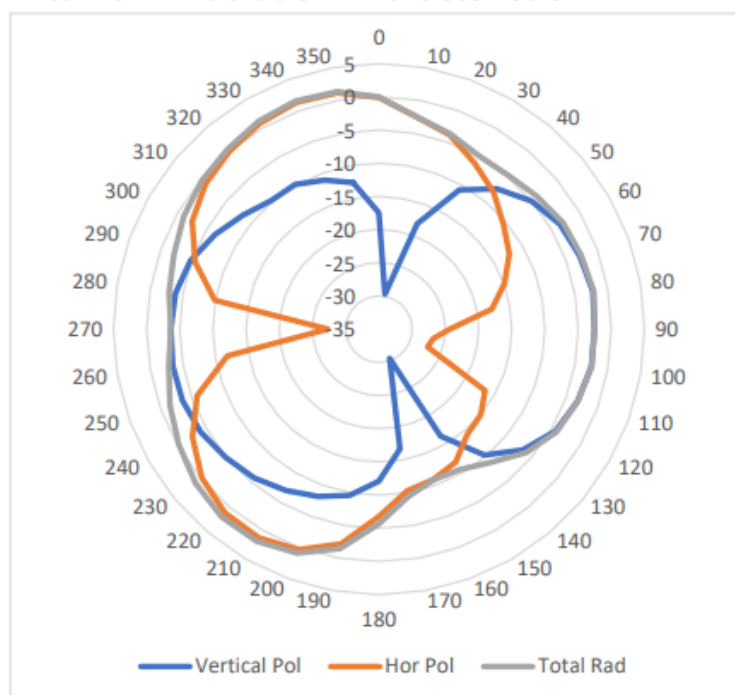
**Picture 5: FBD6 box with coordinate system**

## 2.1 UWB Antenna #1 Electrical Specification

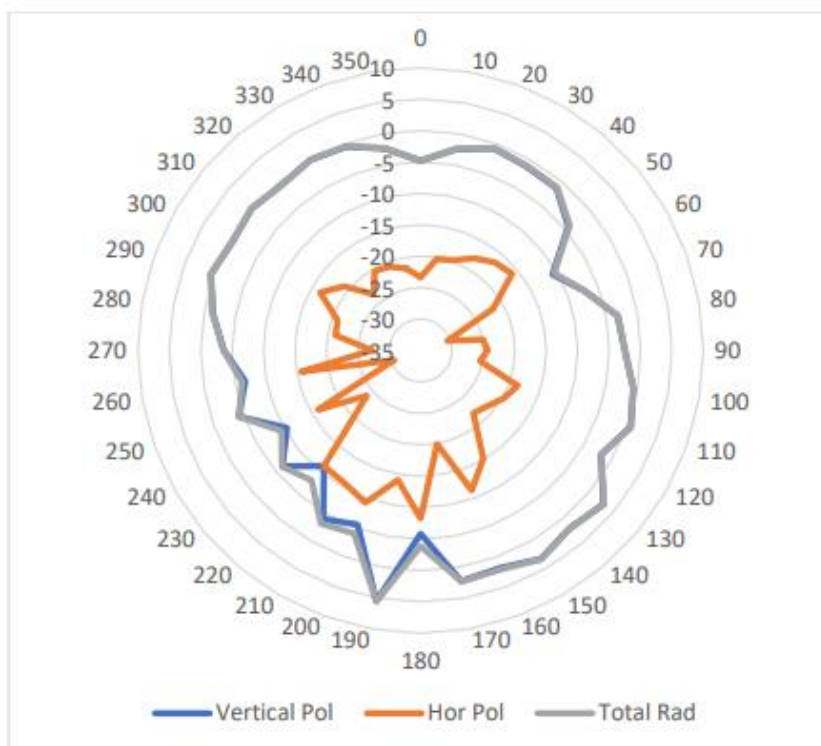
- Antenna name: UWB Ant #1
- Type of antenna: Printed PCB antenna
- Antenna supplier: Hella

| No | Item         | Spec.       |
|----|--------------|-------------|
| 1  | Max EIRP     | 5.6 dBi     |
| 2  | VSWR         | Max 2:1     |
| 3  | Polarization | Linear      |
| 4  | Impedance    | 50 $\Omega$ |
| 5  | Frequency    | 7987.2 MHz  |

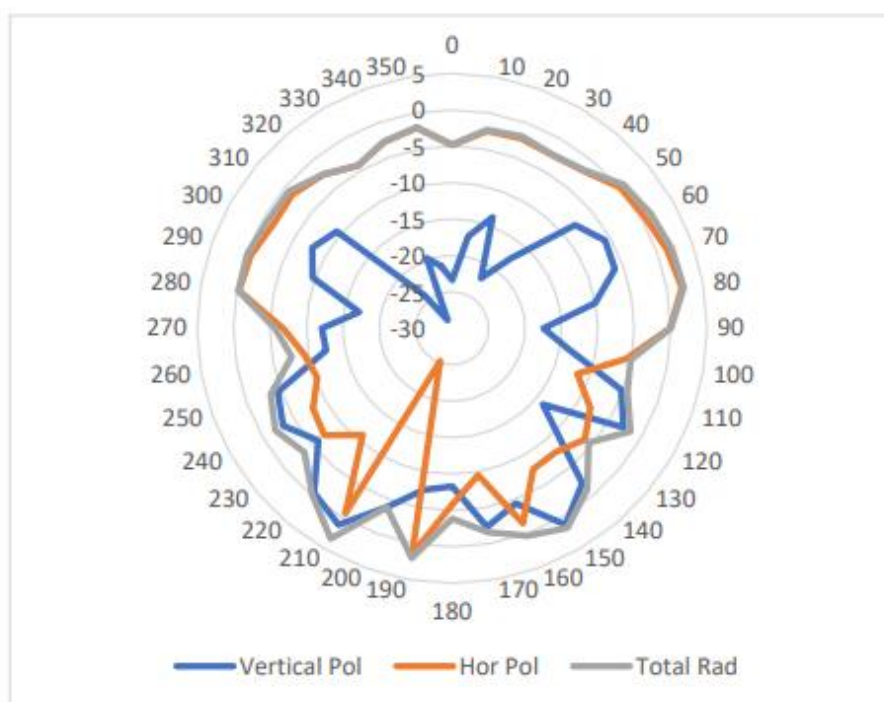
### 2.1.1 UWB Antenna #1 Radiation Characteristic



**Picture 6: UWB Antenna #1 radiation XY plane pattern**



**Picture 7: UWB Antenna #1 radiation YZ plane pattern**



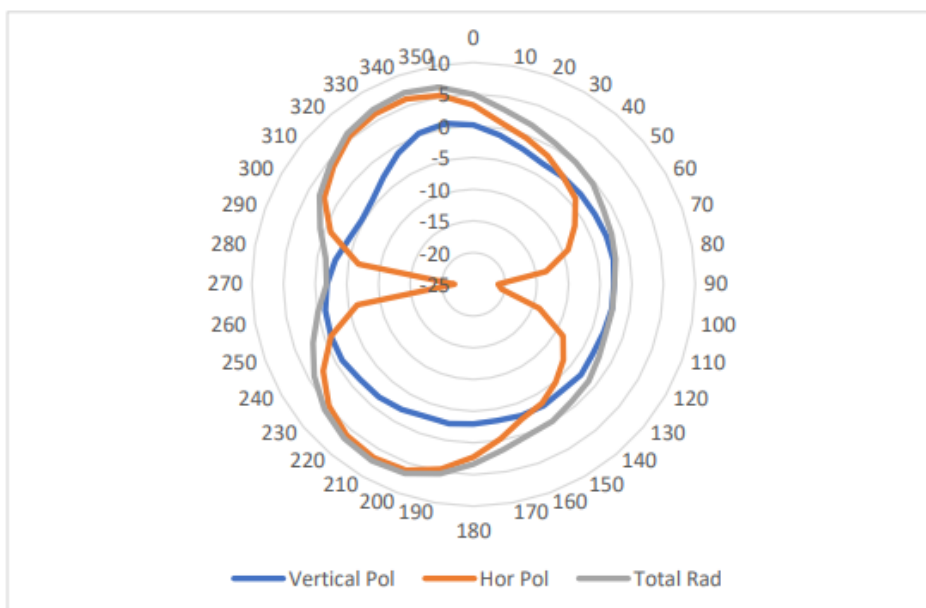
**Picture 8: UWB Antenna #1 radiation XZ plane pattern**

## 2.2 UWB Antenna #2 Electrical Specification

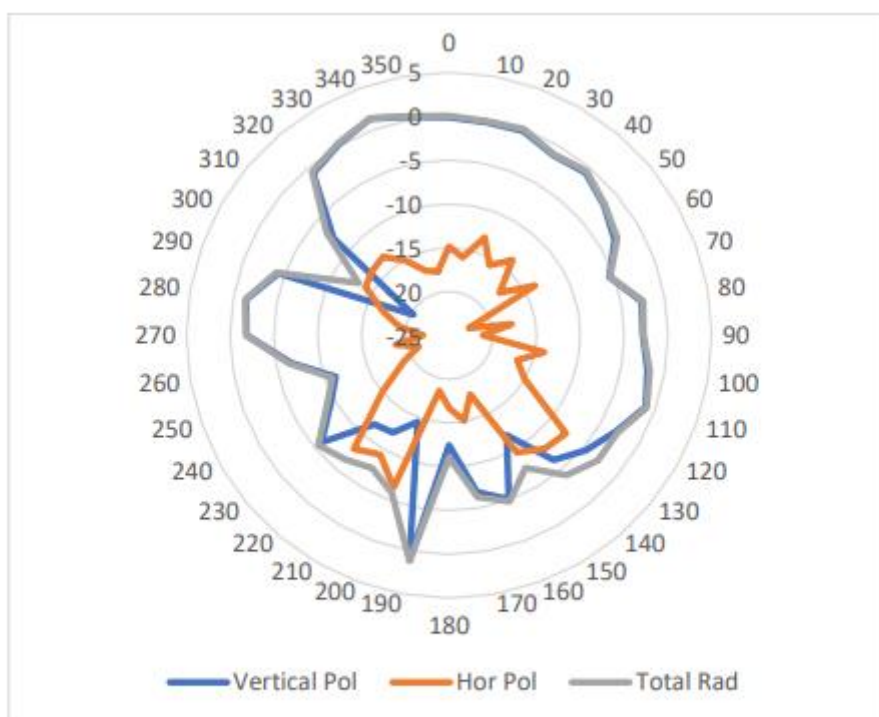
- Antenna name: UWB Ant #2
- Type of antenna: Printed PCB antenna
- Antenna supplier: Hella

| No | Item         | Spec.       |
|----|--------------|-------------|
| 1  | Max EIRP     | 6.1 dBi     |
| 2  | VSWR         | Max 2:1     |
| 3  | Polarization | Linear      |
| 4  | Impedance    | 50 $\Omega$ |
| 5  | Frequency    | 7987.2 MHz  |

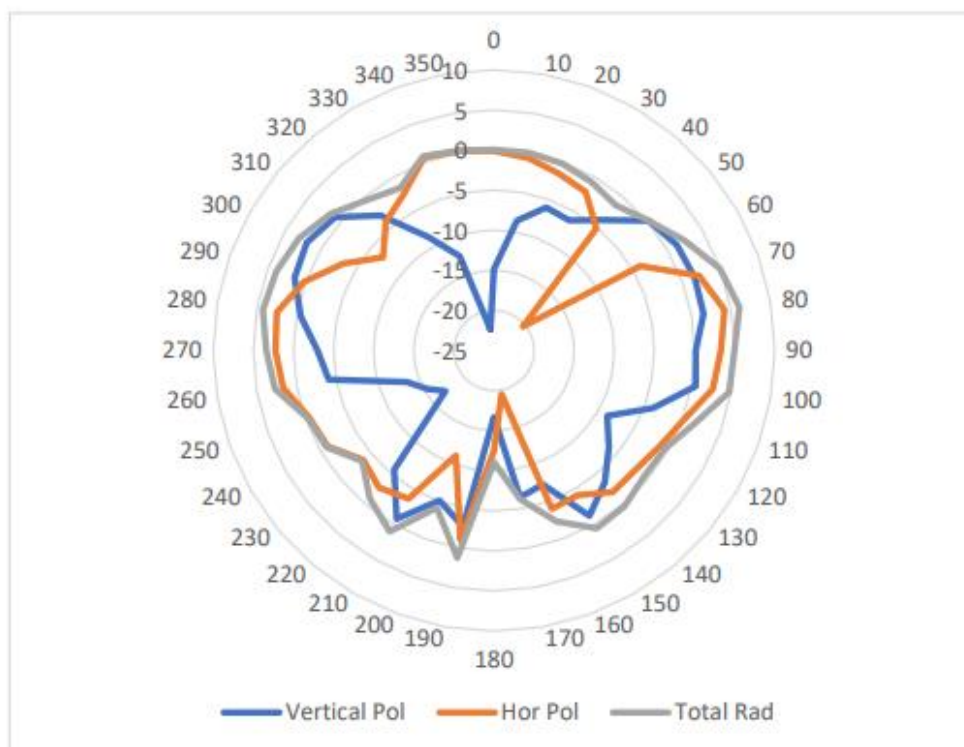
## 2.2.1 UWB Antenna #2 Radiation Characteristic



**Picture 9: UWB Antenna #2 radiation XY plane pattern**



**Picture 10: UWB Antenna #2 radiation YZ plane pattern**



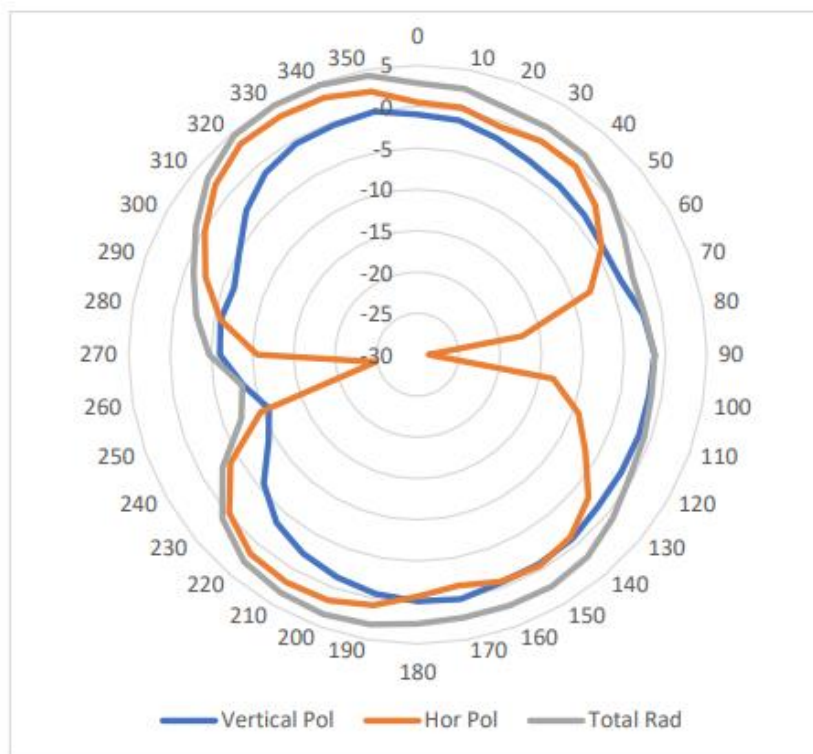
**Picture 11: UWB Antenna #2 radiation XZ plane pattern**

### 2.3 UWB Antenna #3 Electrical Specification

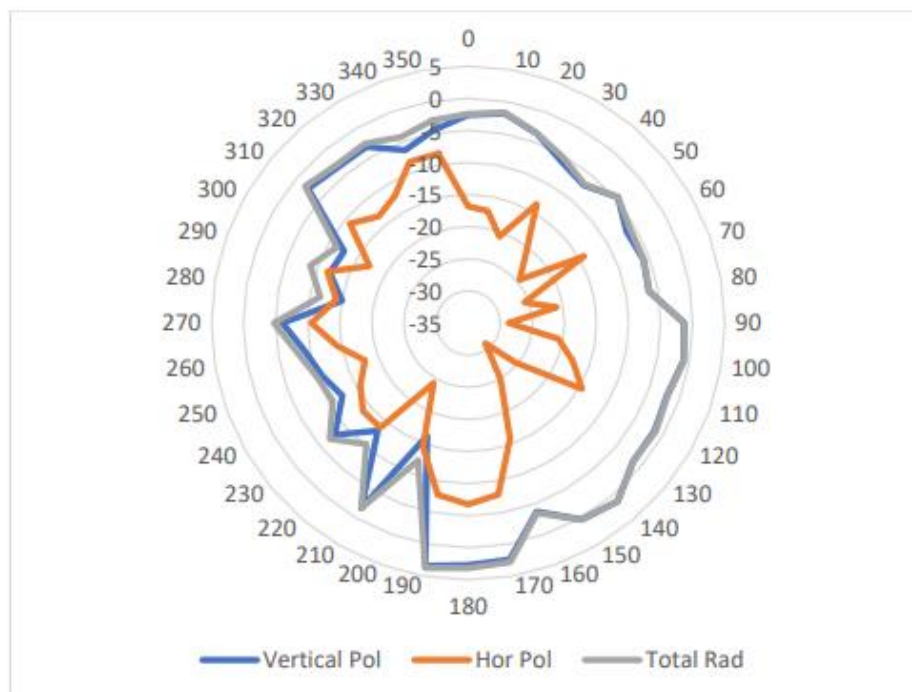
- Antenna name: UWB Ant #3
- Type of antenna: Printed PCB antenna
- Antenna supplier: Hella

| No | Item         | Spec.       |
|----|--------------|-------------|
| 1  | Max EIRP     | 7.9 dBi     |
| 2  | VSWR         | Max 2:1     |
| 3  | Polarization | Linear      |
| 4  | Impedance    | 50 $\Omega$ |
| 5  | Frequency    | 7987.2 MHz  |

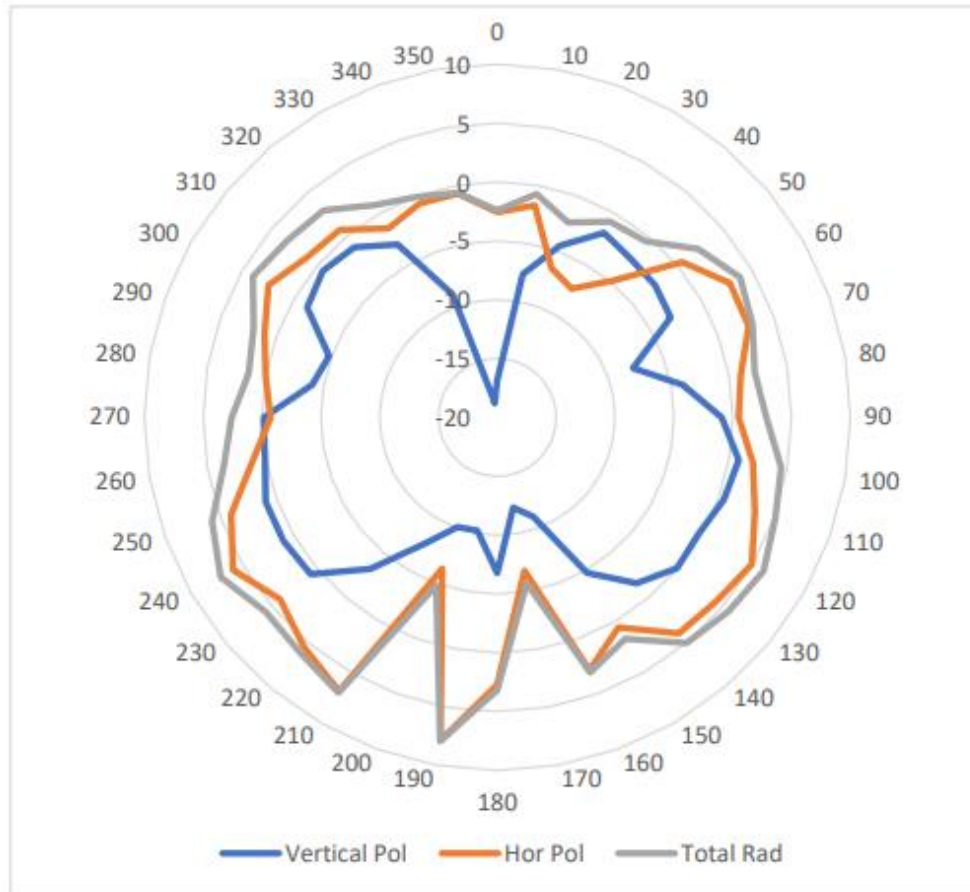
### 2.3.1 UWB Antenna #3 Radiation Characteristic



**Picture 12: UWB Antenna #3 radiation XY plane pattern**



**Picture 13: UWB Antenna #3 radiation YZ plane pattern**



**Picture 14: UWB Antenna #3 radiation XZ plane pattern**