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Antenna Test & Measurement Report - Project – HDT602

A) Measurement Setup

Antenna Measurement Using the NSI Near Field Measurement System

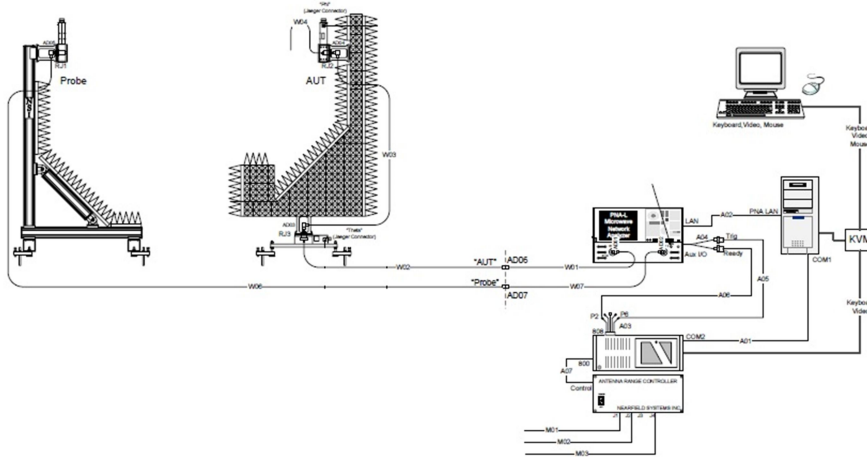
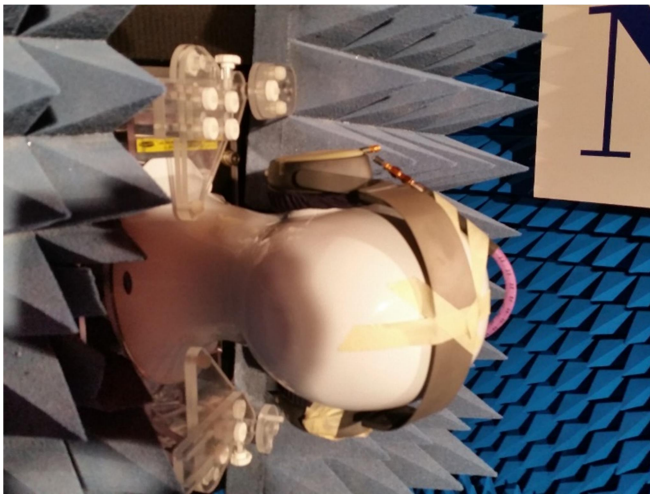


Fig.1 NSI-700 Antenna Measurement Setup



Fig, 2 Mounting of Phantom Head inside the Anechoic Chamber for HDT602 RX

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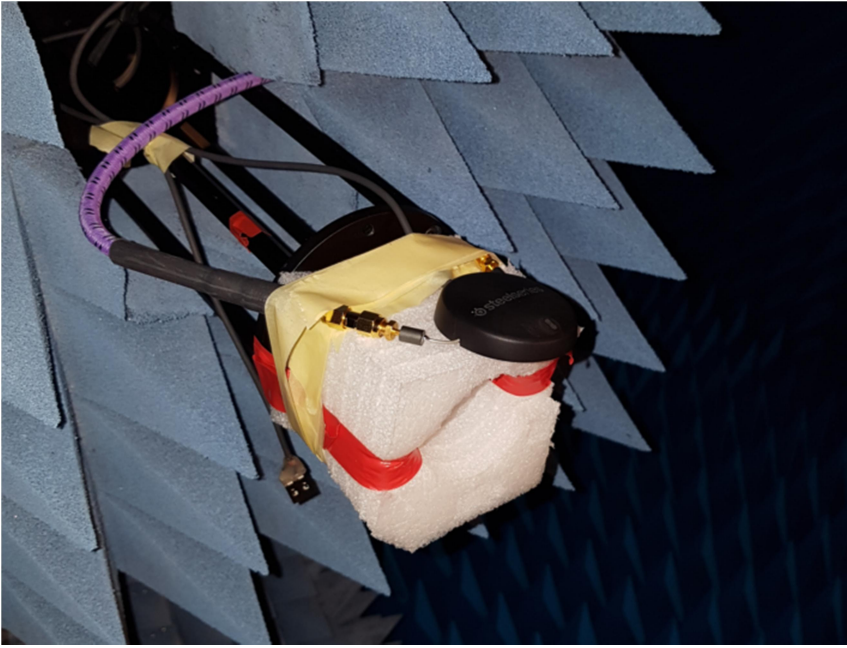


Fig 3, HDT602 TX Test Set up Photo inside anechoic chamber.

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B) Measurement Results

Antenna Gain Measurement:

- | | |
|---|----------------|
| 1. HDT602 RX Antenna ANT101 with Phantom Head | Gain =2.557dB |
| 2. HDT602 RX Antenna ANT102 with Phantom Head | Gain = 4.738dB |
| 3. HDT602 TX Antenna ANT1 | Gain = 4.423dB |
| 4. HDT602 TX Antenna ANT2 | Gain = 2.827dB |

1. HDT602 RX with Phantom Head – ANT101

Far-Field Gain Measurement

The screenshot shows the 'Far-field' software interface with three main sections: 'Far-field display', 'Far-field transform setup', and 'Plot parameters'.

Far-field limits:

| | Minimum | Maximum |
|----------------|---------------|-------------|
| Amplitude | -50.000 dB | 0.000 dB |
| Phase | -180.000 deg | 180.000 deg |
| X-axis cut | auto | auto |
| Normalization | Peak (Global) | |
| Network offset | 0.000 dB | |

Plot label centering

Plot comment block configuration:

| | |
|--|---|
| <input checked="" type="checkbox"/> FF Max | <input checked="" type="checkbox"/> Selected Beam |
| <input checked="" type="checkbox"/> Title | <input checked="" type="checkbox"/> NF Setup |
| <input checked="" type="checkbox"/> File info | <input checked="" type="checkbox"/> Measurement Setup |
| <input checked="" type="checkbox"/> FF Data Analysis | <input checked="" type="checkbox"/> RF System |
| <input checked="" type="checkbox"/> FF Display | <input type="checkbox"/> Additional comments |
| <input checked="" type="checkbox"/> FF Transform | |

Plot parameters:

Plot calculations:

| | Global | Plot |
|-------------|----------|----------|
| Peak | 3.511 dB | 1.782 dB |
| Directivity | 7.923 dB | |

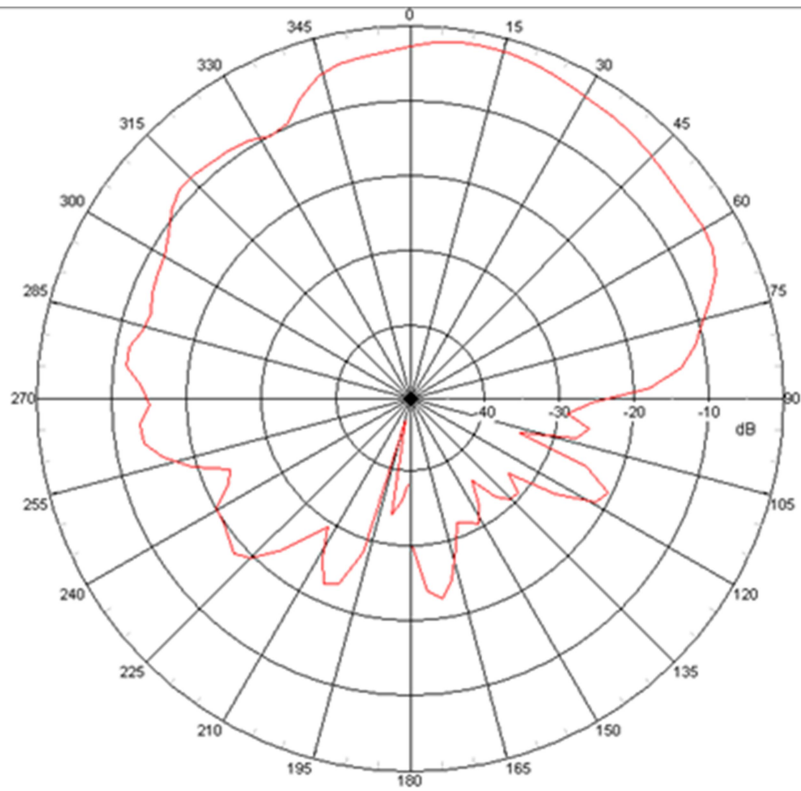
Comparison method Direct method

Comparison gain calculation:

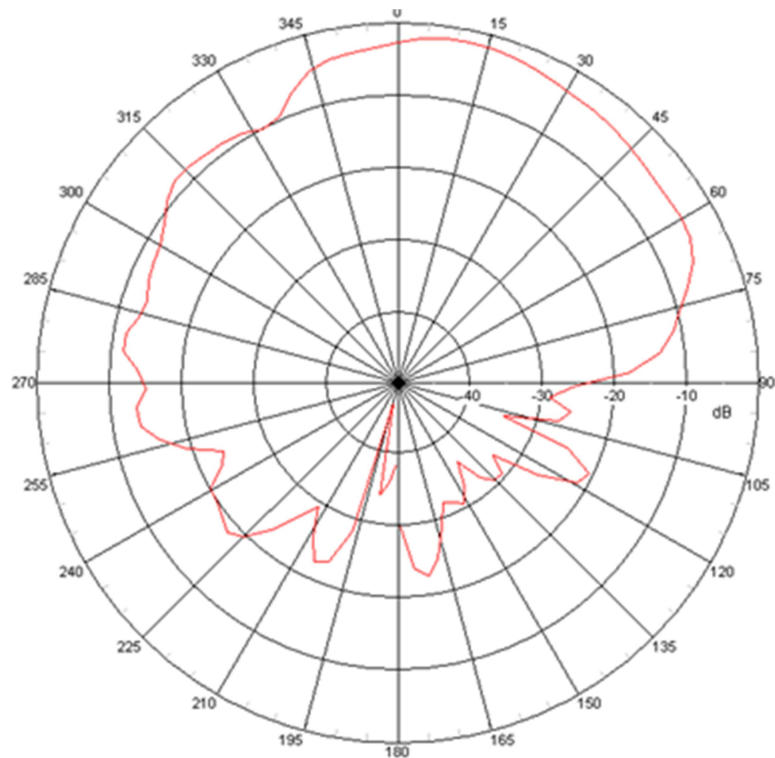
| | |
|-----------------------------------|-----------|
| 1. AUT Max Far-field | 3.511 dB |
| 2. SGA Max Far-field | 17.654 dB |
| 3. SGA gain (pre-measured) | 16.700 dB |
| 4. Gain constant (3.-2.) | -0.954 dB |
| 5. AUT network adjustment | 0.000 dB |
| 6. Calculated AUT gain (1.+4.+5.) | 2.557 dB |

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Horizontal Cut (Azimuth Plot) @ 2.401GHz

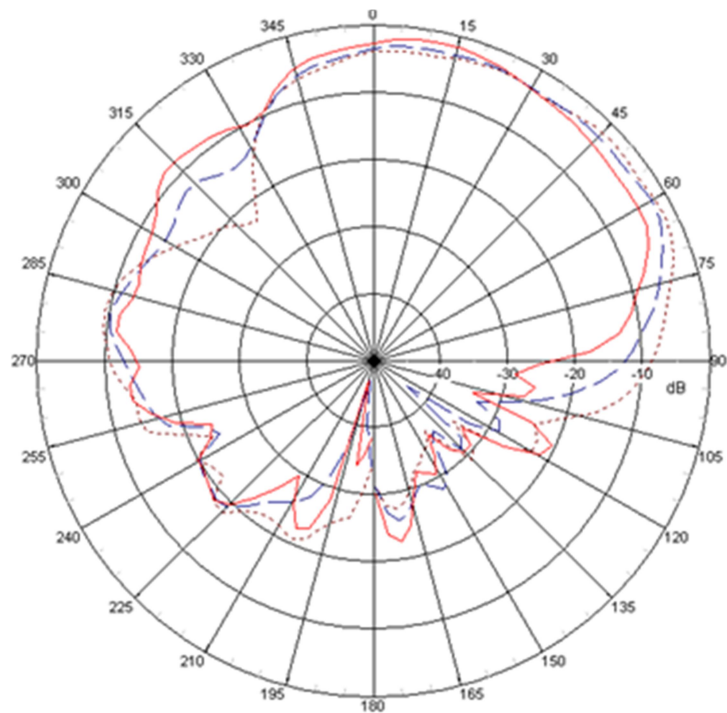


Vertical Cut (Elevation Plot) @ 2.401GHz

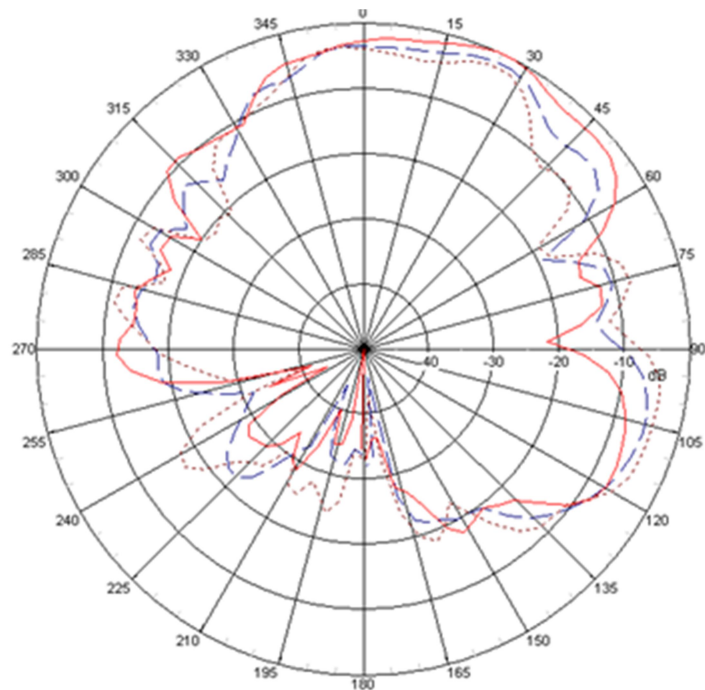


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Horizontal Cut (Azimuth Plot) @ 2.401GHz, 2.44GHz & 2.479GHz

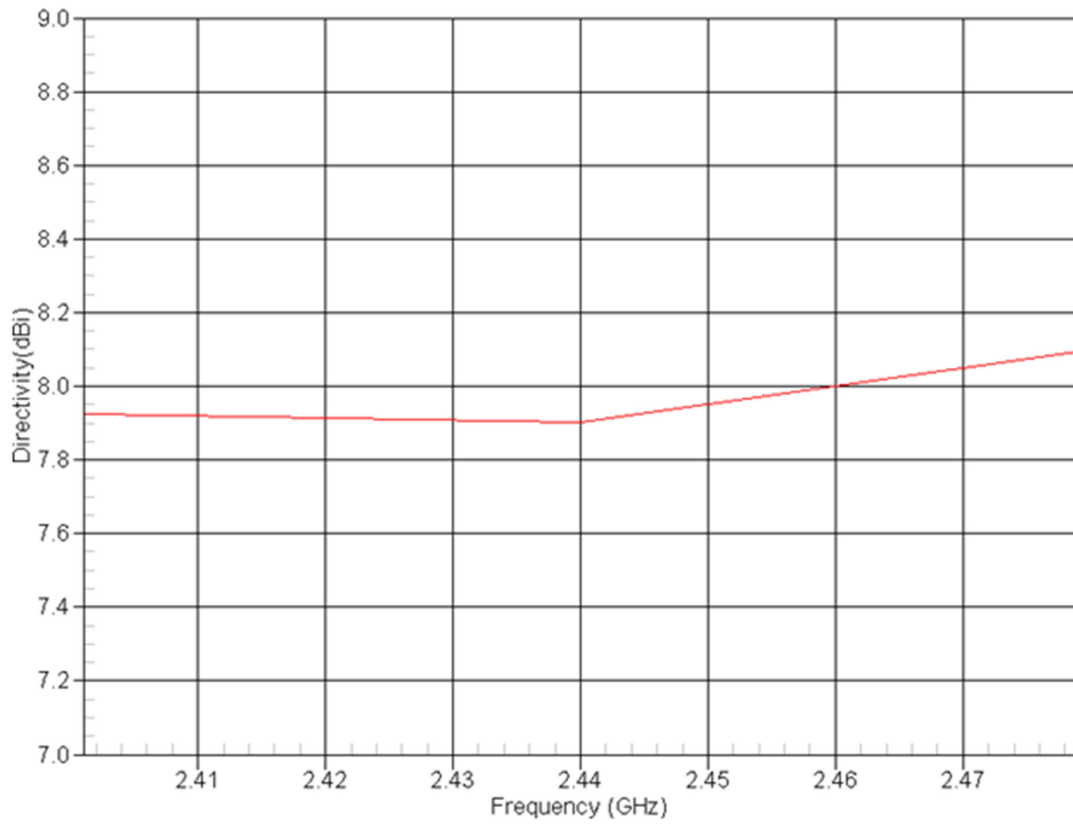


Vertical Cut (Elevation Plot) @ 2.401GHz, 2.44GHz & 2.479GHz



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2. HDT602 RX with Phantom Head – ANT102

Far-Field Gain Measurement

The screenshot shows the 'Far-field' software interface with three main sections: 'Far-field display', 'Far-field transform setup', and 'Plot parameters'.

Far-field limits:

| | Minimum | Maximum |
|----------------|---------------|-------------|
| Amplitude | -50.000 dB | 0.000 dB |
| Phase | -180.000 deg | 180.000 deg |
| X-axis cut | auto | auto |
| Normalization | Peak (Global) | |
| Network offset | 0.000 dB | |

Plot label centering

Plot comment block configuration:

| | |
|--|---|
| <input checked="" type="checkbox"/> FF Max | <input checked="" type="checkbox"/> Selected Beam |
| <input checked="" type="checkbox"/> Title | <input checked="" type="checkbox"/> NF Setup |
| <input checked="" type="checkbox"/> File info | <input checked="" type="checkbox"/> Measurement Setup |
| <input checked="" type="checkbox"/> FF Data Analysis | <input checked="" type="checkbox"/> RF System |
| <input checked="" type="checkbox"/> FF Display | <input type="checkbox"/> Additional comments |
| <input checked="" type="checkbox"/> FF Transform | |

Plot parameters:

Plot calculations:

| | Global | Plot |
|-------------|----------|----------|
| Peak | 5.692 dB | 3.780 dB |
| Directivity | 8.068 dB | |

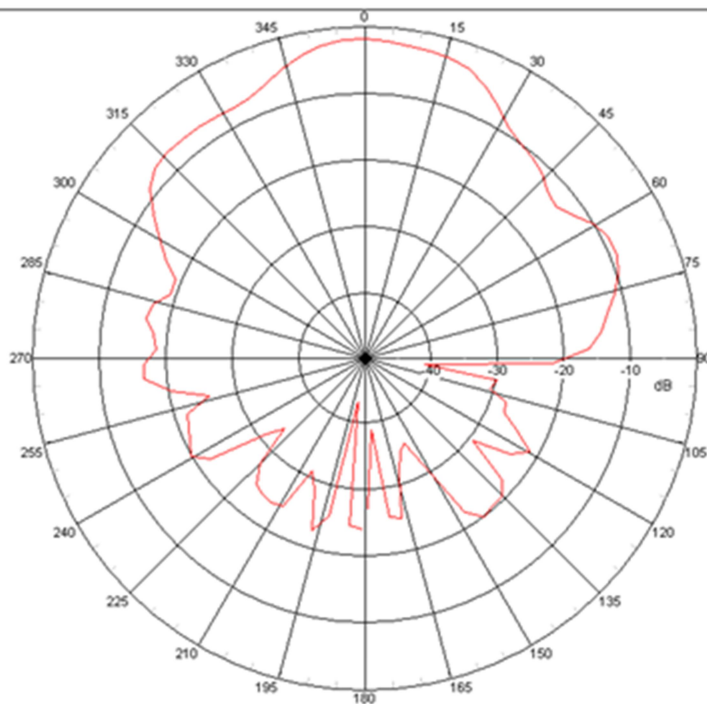
Comparison method Direct method

Comparison gain calculation:

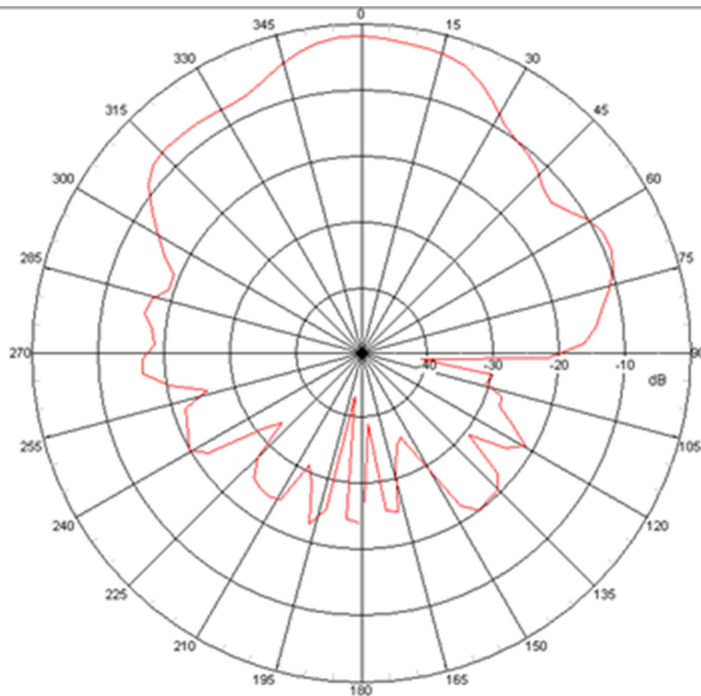
| | |
|-----------------------------------|-----------|
| 1. AUT Max Far-field | 5.692 dB |
| 2. SGA Max Far-field | 17.654 dB |
| 3. SGA gain (pre-measured) | 16.700 dB |
| 4. Gain constant (3.-2.) | -0.954 dB |
| 5. AUT network adjustment | 0.000 dB |
| 6. Calculated AUT gain (1.+4.+5.) | 4.738 dB |

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Horizontal Cut (Azimuth Plot) @ 2.401GHz

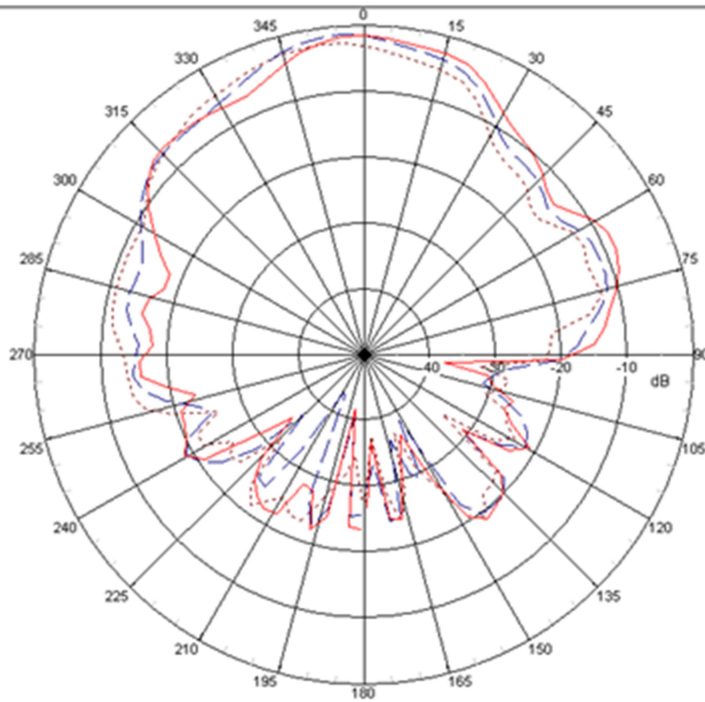


Vertical Cut (Elevation Plot) @ 2.401GHz

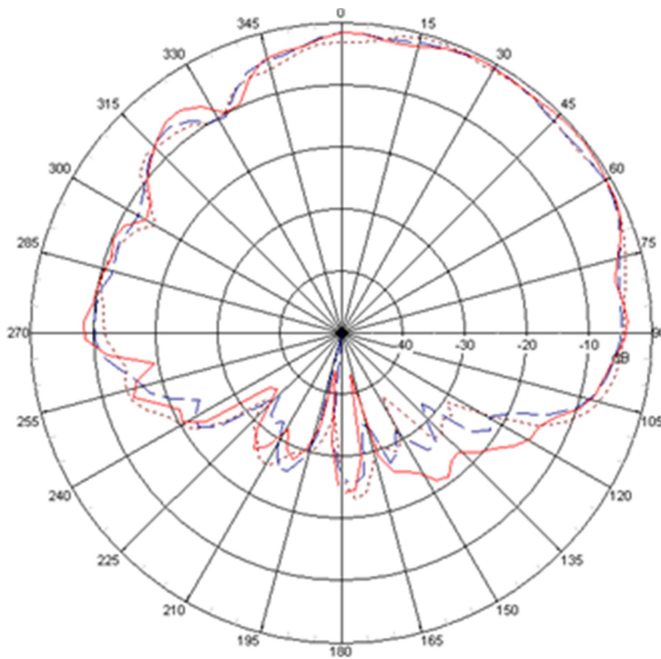


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Horizontal Cut (Azimuth Plot) @ 2.401GHz, 2.44GHz & 2.479GHz

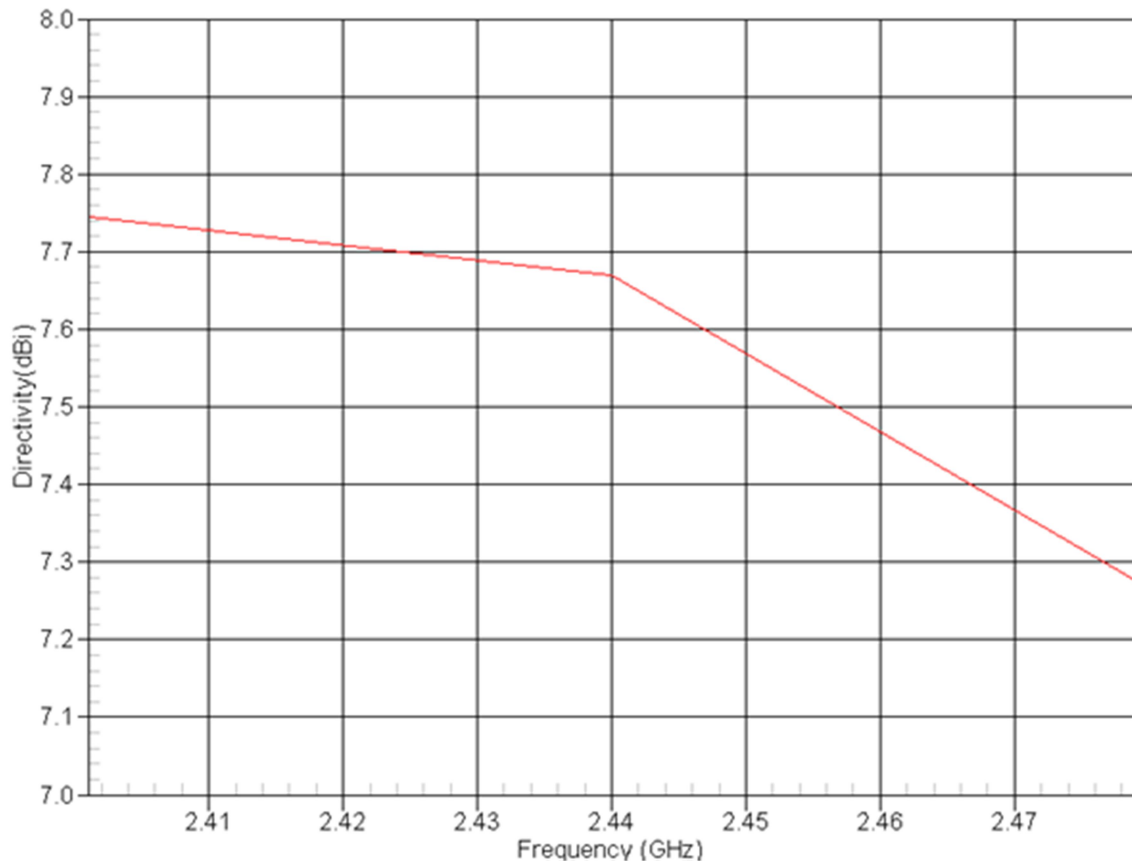


Vertical Cut (Elevation Plot) @ 2.401GHz, 2.44GHz & 2.479GHz



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3. HDT602 TX Antenna 1 – ANT1

The screenshot shows the 'Far-field' software interface with three main tabs: 'Far-field display', 'Far-field transform setup', and 'Plot parameters'. The 'Plot parameters' tab is active and contains the following settings:

Far-field limits:

| | Minimum | Maximum |
|----------------|---------------|-------------|
| Amplitude | -50.000 dB | 0.000 dB |
| Phase | -180.000 deg | 180.000 deg |
| X-axis cut | auto | auto |
| Normalization | Peak (Global) | |
| Network offset | 0.000 dB | |

Plot label centering

Plot comment block configuration:

| | |
|--|---|
| <input checked="" type="checkbox"/> FF Max | <input checked="" type="checkbox"/> Selected Beam |
| <input checked="" type="checkbox"/> Title | <input checked="" type="checkbox"/> NF Setup |
| <input checked="" type="checkbox"/> File info | <input checked="" type="checkbox"/> Measurement Setup |
| <input checked="" type="checkbox"/> FF Data Analysis | <input checked="" type="checkbox"/> RF System |
| <input checked="" type="checkbox"/> FF Display | <input type="checkbox"/> Additional comments |
| <input checked="" type="checkbox"/> FF Transform | |

Plot calculations:

| | Global | Plot |
|-------------|----------|----------|
| Peak | 5.377 dB | 5.368 dB |
| Directivity | 7.274 dB | |

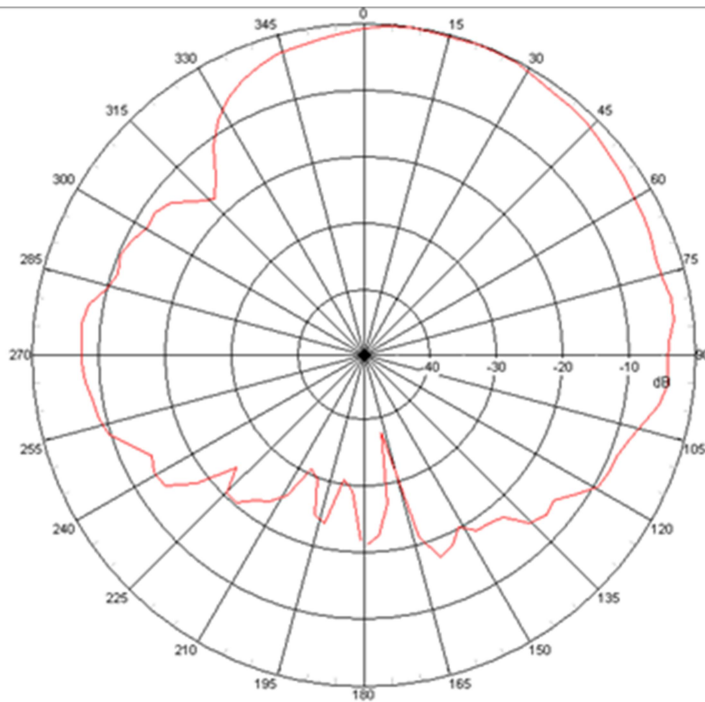
Comparison method Direct method

Comparison gain calculation:

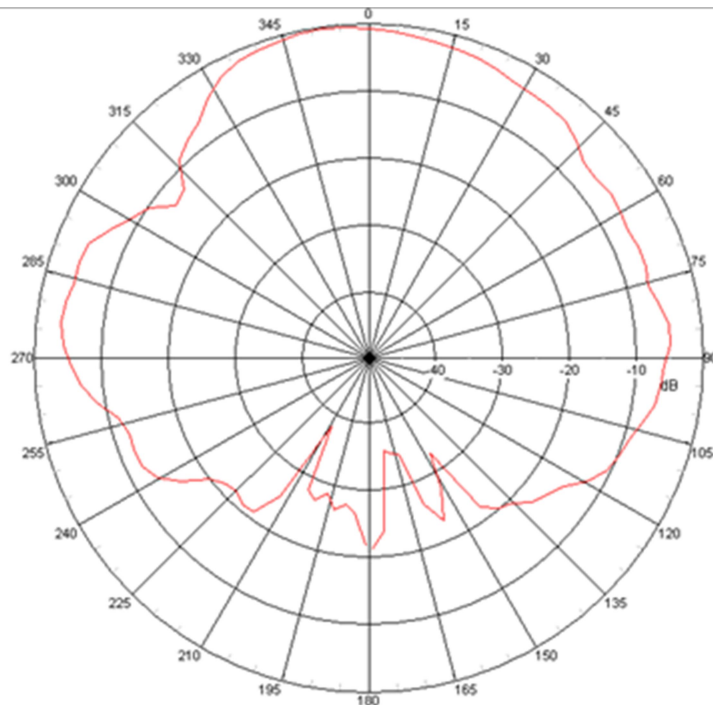
| | |
|-----------------------------------|-----------|
| 1. AUT Max Far-field | 5.377 dB |
| 2. SGA Max Far-field | 17.654 dB |
| 3. SGA gain (pre-measured) | 16.700 dB |
| 4. Gain constant (3.-2.) | -0.954 dB |
| 5. AUT network adjustment | 0.000 dB |
| 6. Calculated AUT gain (1.+4.+5.) | 4.423 dB |

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Horizontal Cut (Azimuth Plot) @ 2.401GHz

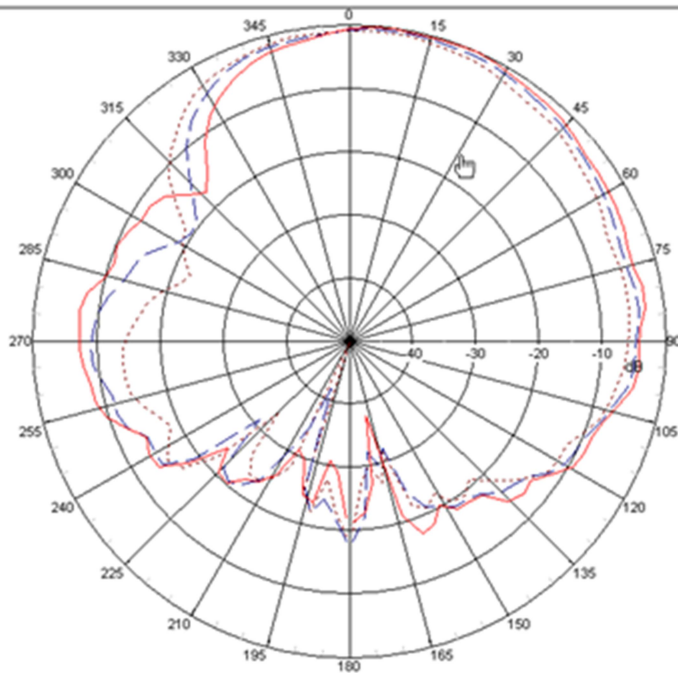


Vertical Cut (Elevation Plot) @ 2.401GHz

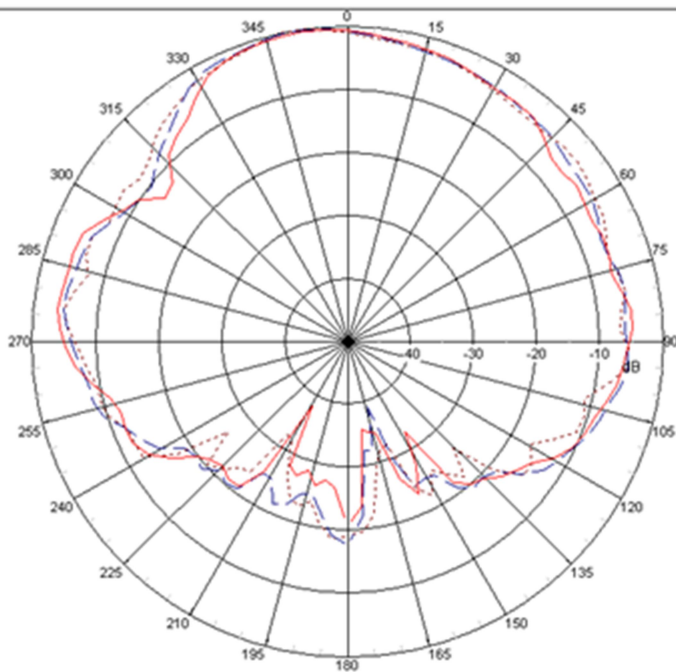


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Horizontal Cut (Azimuth Plot) @ 2.401GHz, 2.44GHz & 2.479GHz

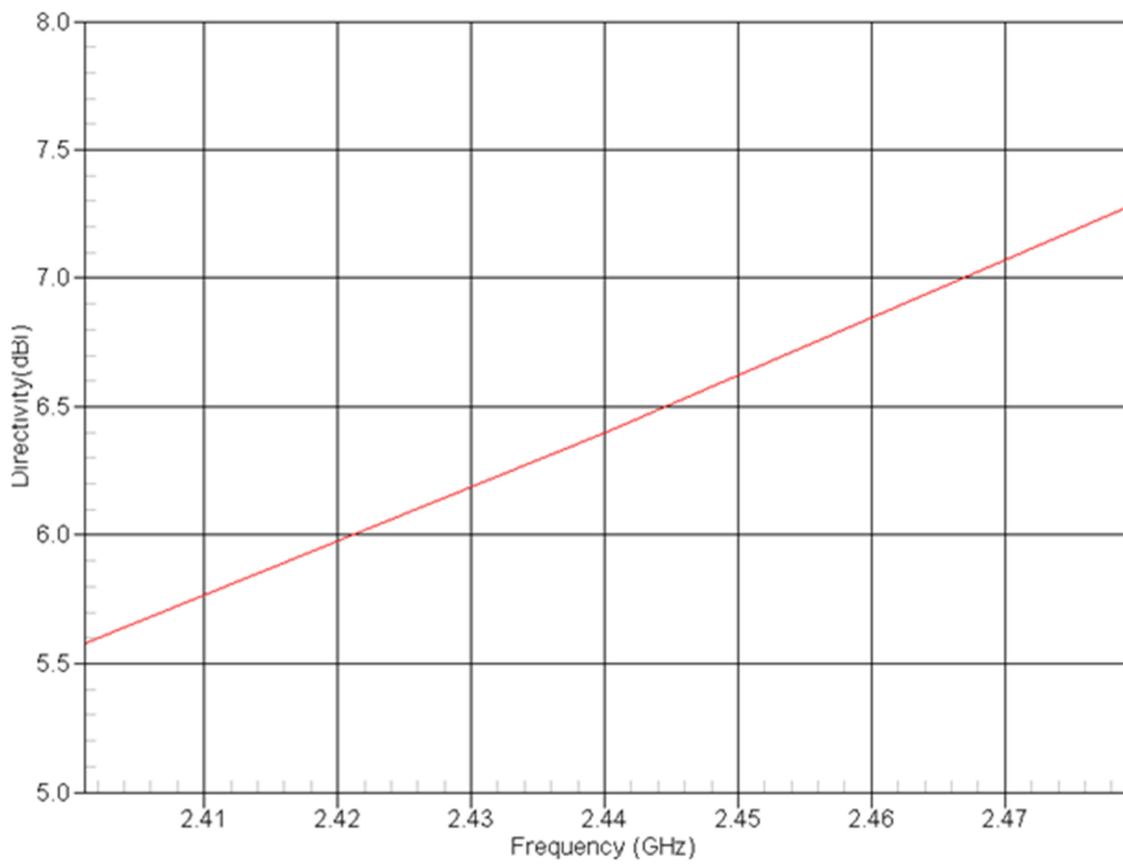


Vertical Cut (Elevation Plot) @ 2.401GHz, 2.44GHz & 2.479GHz



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4. HDT602 TX Antenna 2 – ANT2

The screenshot displays the 'Far-field' software interface, which is divided into three main sections: 'Far-field display', 'Far-field transform setup', and 'Plot parameters'. The 'Plot parameters' section is the primary focus, containing 'Far-field limits' and 'Plot calculations'.

Far-field limits:

| | Minimum | Maximum |
|----------------|---------------|-------------|
| Amplitude | -50.000 dB | 0.000 dB |
| Phase | -180.000 deg | 180.000 deg |
| X-axis cut | auto | auto |
| Normalization | Peak (Global) | |
| Network offset | 0.000 dB | |

Plot label centering

Plot comment block configuration:

| | |
|--|---|
| <input checked="" type="checkbox"/> FF Max | <input checked="" type="checkbox"/> Selected Beam |
| <input checked="" type="checkbox"/> Title | <input checked="" type="checkbox"/> NF Setup |
| <input checked="" type="checkbox"/> File info | <input checked="" type="checkbox"/> Measurement Setup |
| <input checked="" type="checkbox"/> FF Data Analysis | <input checked="" type="checkbox"/> RF System |
| <input checked="" type="checkbox"/> FF Display | <input type="checkbox"/> Additional comments |
| <input checked="" type="checkbox"/> FF Transform | |

Plot calculations:

| | Global | Plot |
|-------------|----------|----------|
| Peak | 3.781 dB | 2.464 dB |
| Directivity | 7.300 dB | |

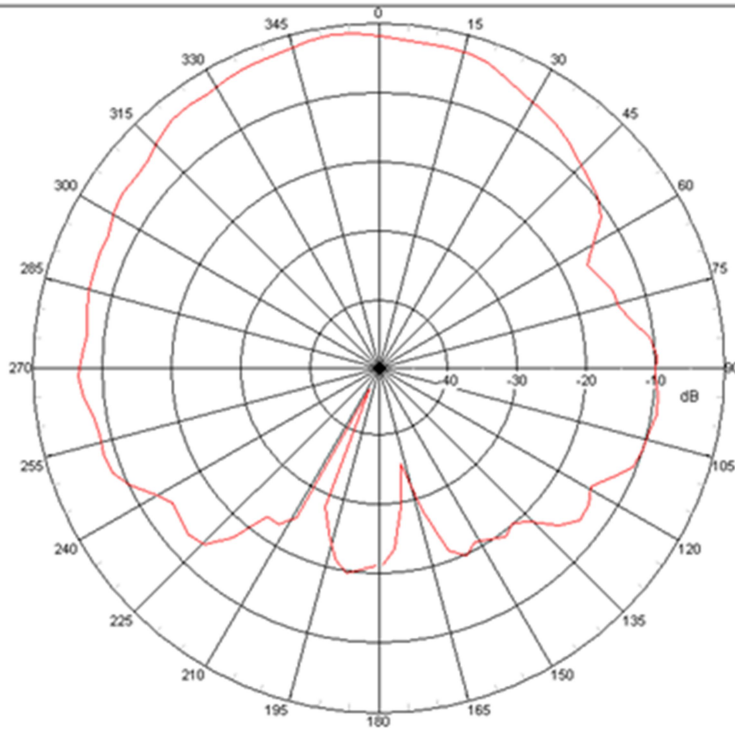
Comparison method Direct method

Comparison gain calculation:

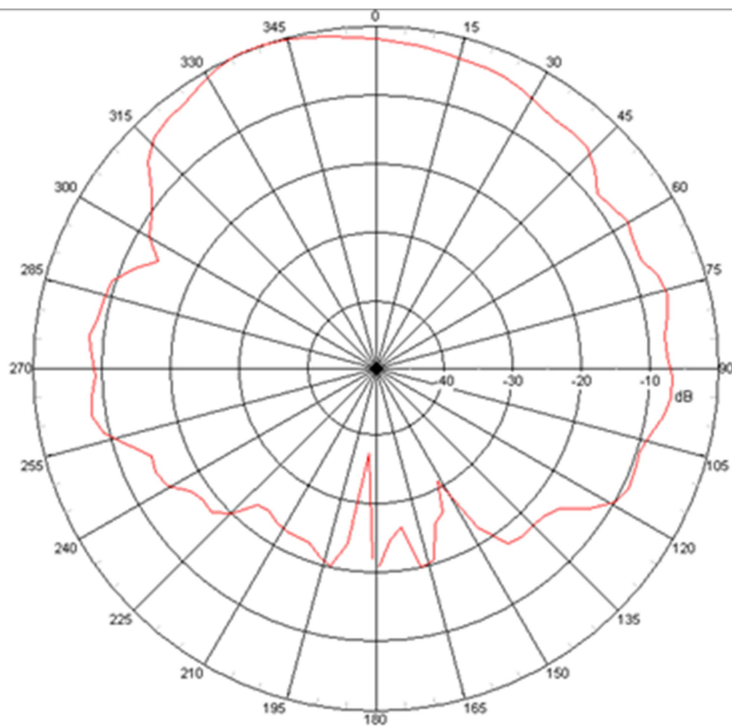
| | |
|-----------------------------------|-----------|
| 1. AUT Max Far-field | 3.781 dB |
| 2. SGA Max Far-field | 17.654 dB |
| 3. SGA gain (pre-measured) | 16.700 dB |
| 4. Gain constant (3.-2.) | -0.954 dB |
| 5. AUT network adjustment | 0.000 dB |
| 6. Calculated AUT gain (1.+4.+5.) | 2.827 dB |

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Horizontal Cut (Azimuth Plot) @ 2.401GHz

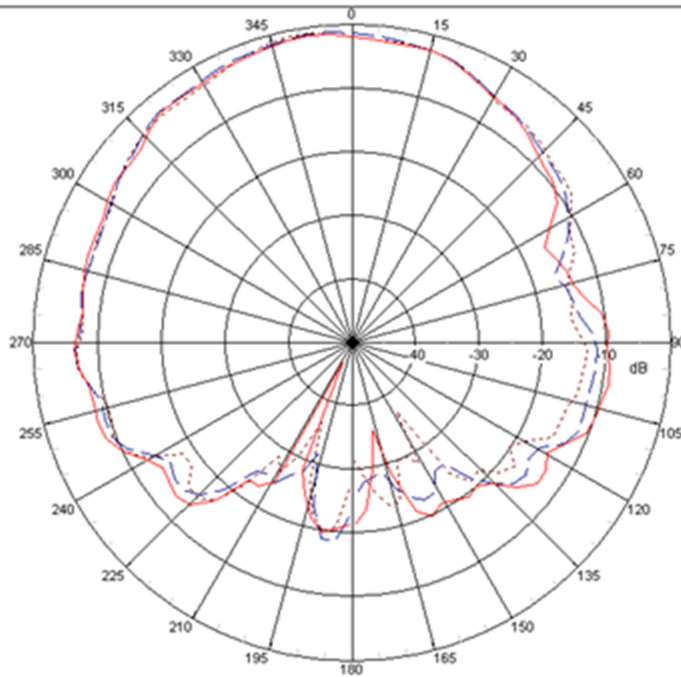


Vertical Cut (Elevation Plot) @ 2.401GHz

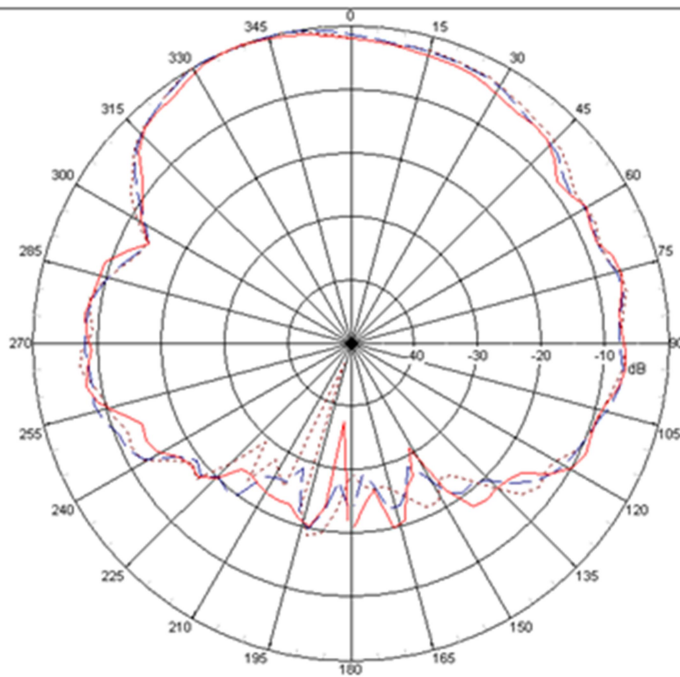


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Horizontal Cut (Azimuth Plot) @ 2.401GHz, 2.44GHz & 2.479GHz



Vertical Cut (Elevation Plot) @ 2.401GHz, 2.44GHz & 2.479GHz



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