

【TN0040B】 Bluetooth/Wi-Fi Antenna

1. Specification

Antenna Type : Sheet Metal Antenna

Part No. Bluetooth : ANT2507-A3.0-W/U-115-A
Wi-Fi : ANT2313-A3.0-W/U-230-W

See fig1,2 on another Document. (【TN0040B】 Antenna_Photo)

Antenna Gain(Peak) : Bluetooth -1.78dBi
Wi-Fi 2.4GHz 0.19dBi
Wi-Fi 5GHz 3.06dBi (W52)
3.34dBi (W58)

Frequency Band : Bluetooth 2400 - 2483.5 MHz
Wi-Fi 2.4GHz 2400 - 2483.5 MHz
Wi-Fi 5GHz 5170 - 5250 MHz (W52)
5735 - 5835 MHz (W58)

2. Measurement content

Measurement condition

- Measurement ANT : ETS-LINDGREN 3115 (1-18GHz)
- Reference ANT : ETS-LINDGREN 3160-03 (1.7-2.6GHz) / 3160-05 (3.95-5.85GHz)
- Measuring instrument : P9372A (Keysight network analyzer)

- Measured distance : 3m (1.5m high)
- Range of measurement : 360 degree / 5 degree step
- Measurement layout : The measurement environment is measured with the following layout.

See fig3 on another Document. (【TN0040B】 Antenna_Photo)

Measurement direction

XY plane

ZX plane

See fig4 on another Document. (【TN0040B】 Antenna_Photo)

- Test dates : 2022/7/12
- Names of test personnel : Shinpei Matagawa (NISSEI ELECTRIC CO.,LTD.)
- Names of commercial test software being used : Antenna gain measurement system(NISSEI ELECTRONICS CO.,LTD.)

3. Antenna gain

3-1. Antenna-Bluetooth (2.4GHz-Band)

| frequency [MHz] | Plane | plane of polarization | 360° Peak [dBi] | 360° Average [dBi] | Composite true value | Composite [dBi] | DIP [dBi] | DIP-AVE [dB] |
|-----------------|-------|-----------------------|-----------------|--------------------|----------------------|-----------------|-----------|--------------|
| 2402 | XY | HOR. | -3.28 | -7.64 | 0.40 | -3.93 | -8.29 | 4.86 |
| | | VER. | -3.55 | -6.34 | | | | |
| | ZX | HOR. | -1.78 | -6.22 | 0.53 | -2.73 | -9.35 | 5.91 |
| | | VER. | -2.36 | -5.31 | | | | |
| 2441 | XY | HOR. | -2.79 | -7.74 | 0.42 | -3.79 | -8.15 | 4.72 |
| | | VER. | -2.82 | -6.02 | | | | |
| | ZX | HOR. | -2.11 | -5.99 | 0.53 | -2.77 | -9.91 | 6.47 |
| | | VER. | -1.99 | -5.58 | | | | |
| 2480 | XY | HOR. | -3.90 | -8.43 | 0.40 | -4.01 | -9.42 | 5.98 |
| | | VER. | -2.94 | -5.96 | | | | |
| | ZX | HOR. | -2.12 | -6.55 | 0.44 | -3.58 | -12.68 | 9.25 |
| | | VER. | -2.56 | -6.64 | | | | |

-3.43 dBi Ave
-1.78 dBi Max Peak

3-2. Antenna-WiFi (2.4GHz-Band)

| frequency [MHz] | Plane | plane of polarization | 360° Peak [dBi] | 360° Average [dBi] | Composite true value | Composite [dBi] | DIP [dBi] | DIP-AVE [dB] |
|-----------------|-------|-----------------------|-----------------|--------------------|----------------------|-----------------|-----------|--------------|
| 2402 | XY | HOR. | -5.22 | -11.63 | 0.16 | -8.09 | -20.03 | 14.96 |
| | | VER. | -4.69 | -10.62 | | | | |
| | ZX | HOR. | -3.89 | -7.42 | 0.29 | -5.44 | -13.72 | 8.65 |
| | | VER. | -4.72 | -9.81 | | | | |
| 2441 | XY | HOR. | -3.97 | -9.90 | 0.23 | -6.44 | -17.35 | 12.28 |
| | | VER. | -2.92 | -9.04 | | | | |
| | ZX | HOR. | -2.56 | -6.48 | 0.35 | -4.51 | -12.16 | 7.10 |
| | | VER. | -4.10 | -8.88 | | | | |
| 2480 | XY | HOR. | -1.16 | -7.80 | 0.39 | -4.14 | -17.49 | 12.42 |
| | | VER. | 0.19 | -6.59 | | | | |
| | ZX | HOR. | -1.59 | -5.60 | 0.46 | -3.36 | -12.82 | 7.75 |
| | | VER. | -3.18 | -7.32 | | | | |

-5.07 dBi Ave
0.19 dBi Max Peak

3-3. Antenna-WiFi (5GHz-W52)

| frequency [MHz] | Plane | plane of polarization | 360° Peak [dBi] | 360° Average [dBi] | Composite true value | Composite [dBi] | DIP [dBi] | DIP-AVE [dB] |
|-----------------|-------|-----------------------|-----------------|--------------------|----------------------|-----------------|-----------|--------------|
| 5170 | XY | HOR. | 2.57 | -4.30 | 0.44 | -3.61 | -18.18 | 15.02 |
| | | VER. | -6.38 | -11.94 | | | | |
| | ZX | HOR. | -7.30 | -11.35 | 0.49 | -3.14 | -16.87 | |
| | | VER. | 1.26 | -3.85 | | | | |
| 5210 | XY | HOR. | 2.73 | -3.92 | 0.48 | -3.21 | -15.34 | |
| | | VER. | -6.45 | -11.46 | | | | |
| | ZX | HOR. | -6.39 | -10.75 | 0.52 | -2.83 | -16.41 | |
| | | VER. | 1.75 | -3.60 | | | | |
| 5250 | XY | HOR. | 3.06 | -3.90 | 0.49 | -3.12 | -16.53 | |
| | | VER. | -5.27 | -10.97 | | | | |
| | ZX | HOR. | -7.25 | -10.86 | 0.50 | -3.05 | -16.58 | |
| | | VER. | 1.77 | -3.84 | | | | |

-3.16 dBi Ave
3.06 dBi Max Peak

3-4. Antenna-WiFi (5GHz-W58)

| frequency [MHz] | Plane | plane of polarization | 360° Peak [dBi] | 360° Average [dBi] | Composite true value | Composite [dBi] | DIP [dBi] | DIP-AVE [dB] |
|-----------------|-------|-----------------------|-----------------|--------------------|----------------------|-----------------|-----------|--------------|
| 5735 | XY | HOR. | 3.02 | -2.98 | 0.58 | -2.33 | -18.24 | 15.58 |
| | | VER. | -5.82 | -10.94 | | | | |
| | XZ | HOR. | -2.39 | -8.35 | 0.57 | -2.47 | -17.92 | |
| | | VER. | 3.11 | -3.77 | | | | |
| 5785 | XY | HOR. | 3.34 | -3.32 | 0.55 | -2.58 | -17.71 | |
| | | VER. | -5.52 | -10.58 | | | | |
| | XZ | HOR. | -1.80 | -7.31 | 0.58 | -2.39 | -20.70 | |
| | | VER. | 3.05 | -4.08 | | | | |
| 5835 | XY | HOR. | 2.27 | -4.16 | 0.46 | -3.33 | -19.07 | |
| | | VER. | -5.91 | -10.91 | | | | |
| | XZ | HOR. | -2.46 | -7.58 | 0.51 | -2.96 | -18.22 | |
| | | VER. | 2.09 | -4.79 | | | | |

-2.66 dBi Ave
3.34 dBi Max Peak