

**Product specification**

**Quick Reference Data**

|                            |                                    |  |
|----------------------------|------------------------------------|--|
|                            | Antenna module on the system board |  |
| Antenna type               | PCB                                |  |
| Frequency                  | 2.45GHz*1                          |  |
| Ant. Port Input Pwr. (dBm) | 0 (Typ. BT class 2 output power)   |  |
| Tot. Rad. Pwr. (dBm)       | -2.3 (Input pwr ?loss pwr)         |  |
| Peak EIRP(dBm)             | 1.3                                |  |
| Directivity (dBi)          | 1 (all direction antenna)          |  |
| Efficiency (dB)            | -2.3 (58.5%)                       |  |
| Gain (dBi)                 | 1.7 (Peak Gain X Z-plane)          |  |
| Maximum Power (dBm)        | 1.3 (XY-plane)                     |  |
| Minimum Power (dBm)        | -4(XY-plane)                       |  |
| Avg. Power (dBm)           | -0.5(XY-plane)                     |  |
| Max/Min Ratio (dB)         | 5.3(XY-plane)                      |  |
| Max/Avg Ratio (dB)         | 1.8(XY-plane)                      |  |
| Min/Avg Ratio (dB)         | -3.5(XY-plane)                     |  |
| Average Gain (dB)          | -0.5 (Avg Gain XY-plane)           |  |
|                            |                                    |  |

All the technical data and information contained herein are subject to change without prior notice

**Antenna Gain**

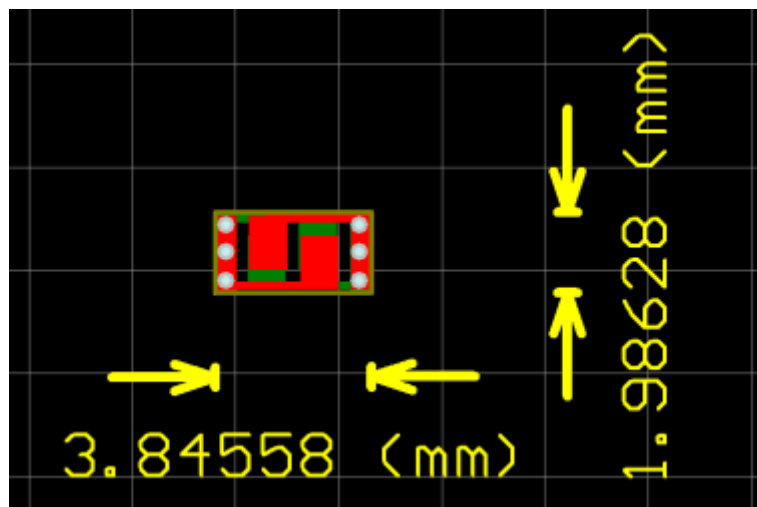
| Unit in dBi @2.44GHz | XY-plane |      | XZ-plane |      | YZ-plane |      | Efficiency |
|----------------------|----------|------|----------|------|----------|------|------------|
|                      | Peak     | Avg. | Peak     | Avg. | Peak     | Avg. |            |
| Module Board         | 1.3      | -0.5 | 1.7      | -3.8 | 1.1      | -3.0 | 58.5%      |
|                      |          |      |          |      |          |      |            |

frequency domain:2400Mhz-2500Mhz

|                                                                                                               |                 |                                                                                                                                                                                  |  |
|---------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| UNLESS OTHER SPECIFIED TOLERANCES ON:<br>X=±      X.X=±      X.XX=±<br>A N G L E S = ±      H O L E D I A = ± |                 | 江门市永旭电路板有限公司                                                                                                                                                                     |  |
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| DRAWN BY : Sera                                                                                               | CHECKED BY: XD  |                                                                                                                                                                                  |  |
| DESIGNED BY: Sera                                                                                             | APPROVED BY: XD |                                                                                                                                                                                  |  |
| TITLE: WH-H03                                                                                                 |                 | DOCUMENT NO.                                                                                                                                                                     |  |

**Manufacturer:**Jiangmen Yongxu Circuit Board Co., Ltd.  
Address:Building No. 13, Redling Middle Road, Redling Industrial Zone, Chongluo Town, Taishan City

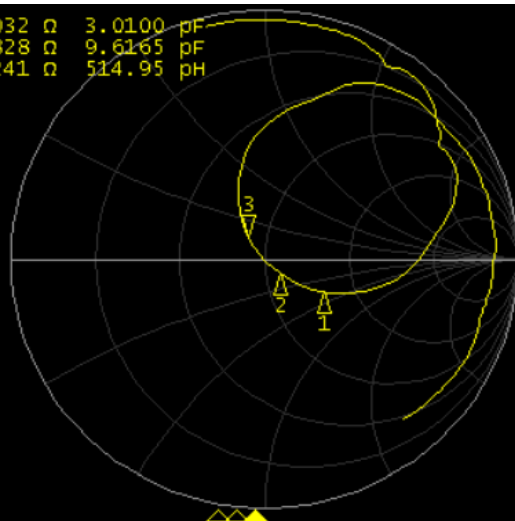
Antenna Layout & module on the system board



|                                                                                                                                   |                 |                                                                                                                                                                                                       |                        |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| UNLESS OTHER SPECIFIED TOLERANCES ON:<br><b>X=±            X.X=±            X.XX=</b><br><b>ANGLES = ±            HOLEDIA = ±</b> |                 | 江门市永旭电路板有限公司                                                                                                                                                                                          |                        |
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| DESIGNED BY: Sera                                                                                                                 | APPROVED BY: XD |                                                                                                                                                                                                       |                        |
| TITLE: WH-H03                                                                                                                     |                 | DOCUMENT NO.                                                                                                                                                                                          | SPEC REV.<br><b>P1</b> |

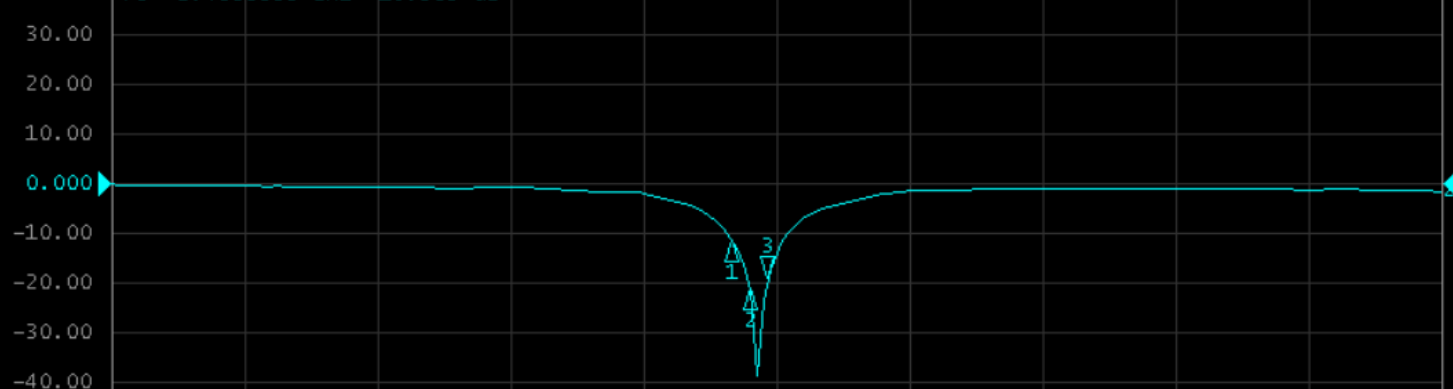
# Return Loss

|    |           |     |        |          |         |          |        |    |
|----|-----------|-----|--------|----------|---------|----------|--------|----|
| 1  | 2.4000000 | GHZ | 77.264 | $\Omega$ | -22.032 | $\Omega$ | 3.0100 | pF |
| 2  | 2.4400000 | GHZ | 56.124 | $\Omega$ | -6.7828 | $\Omega$ | 9.6165 | pF |
| >3 | 2.4800000 | GHZ | 43.038 | $\Omega$ | 8.0241  | $\Omega$ | 514.95 | pH |

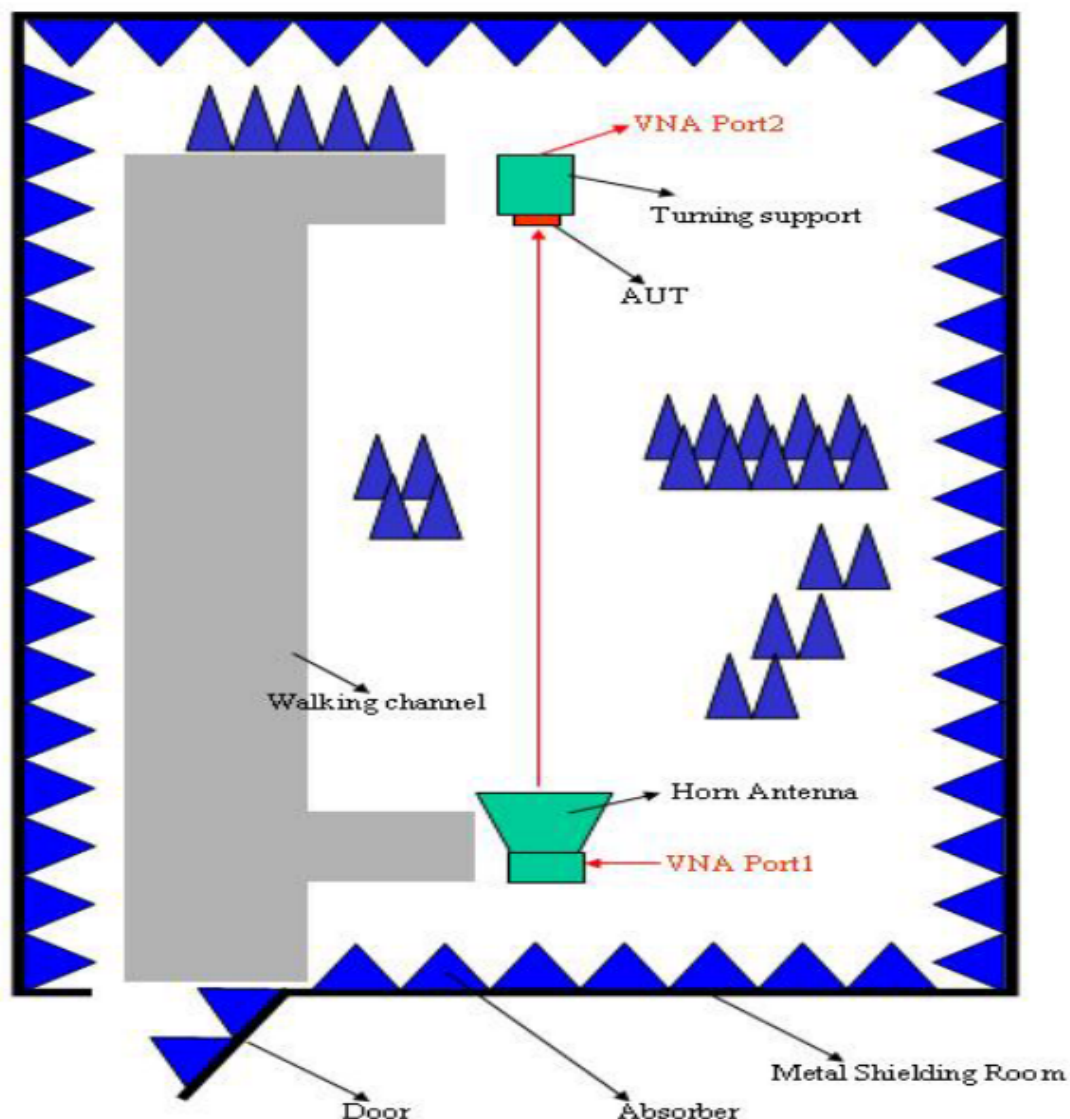


► Tr2 S44 Log Mag 10.00dB/ Ref 0.000dB [F1]

|    |           |     |         |    |
|----|-----------|-----|---------|----|
| 1  | 2.4000000 | GHZ | -11.425 | dB |
| 2  | 2.4400000 | GHZ | -21.317 | dB |
| >3 | 2.4800000 | GHZ | -19.303 | dB |

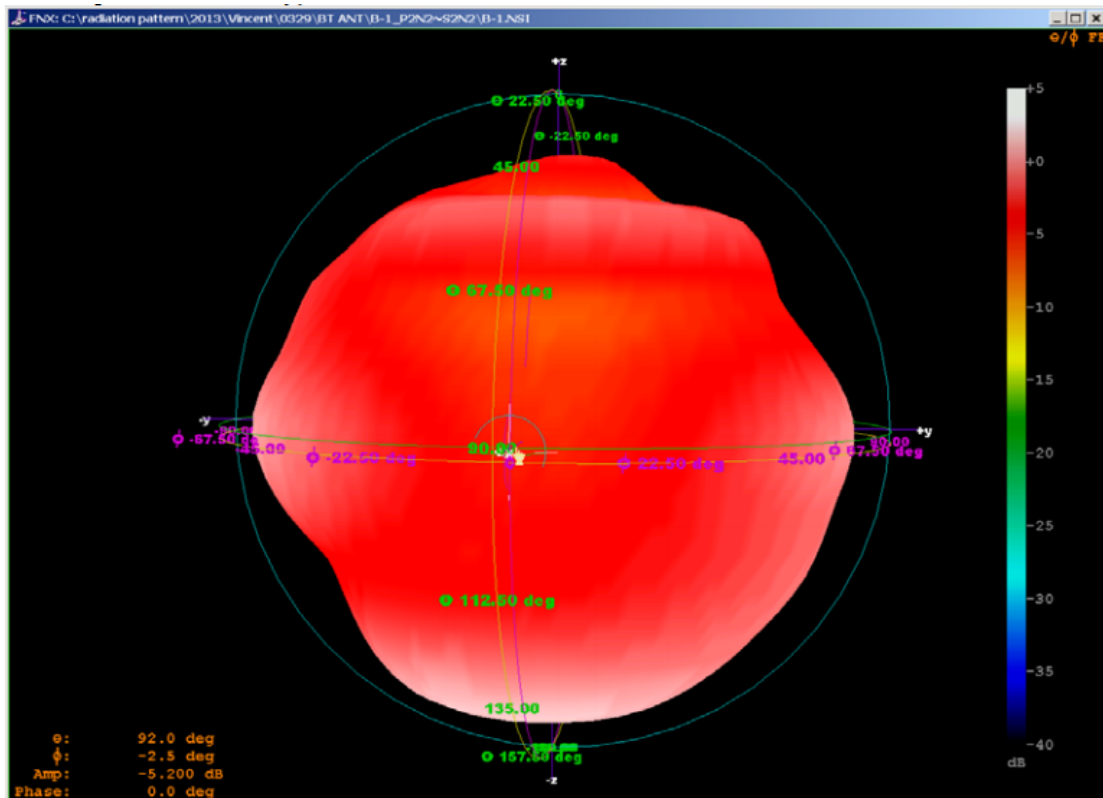


# The Environment of Antenna Radiation Pattern



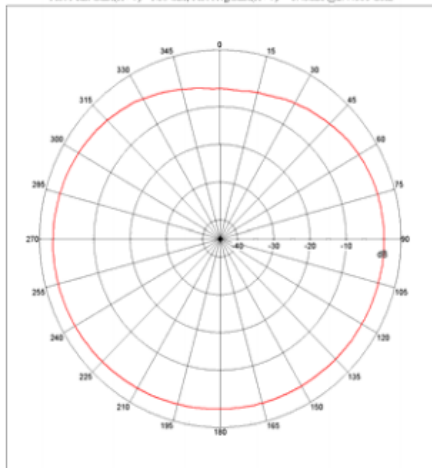
|                                                                                                                         |                 |                                                                                                                                                                                                       |                 |
|-------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| UNLESS OTHER SPECIFIED TOLERANCES ON:<br>$X = \pm$ $X.X = \pm$ $X.XX =$<br><b>ANGLES</b> = $\pm$ <b>HOLEDIA</b> = $\pm$ |                 | 江门市永旭电路板有限公司                                                                                                                                                                                          |                 |
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| DESIGNED BY: Sera                                                                                                       | APPROVED BY: XD |                                                                                                                                                                                                       |                 |
| TITLE: WH-H03                                                                                                           |                 | DOCUMENT NO.                                                                                                                                                                                          | SPEC REV.<br>P1 |

### 3D radiation pattern diagram



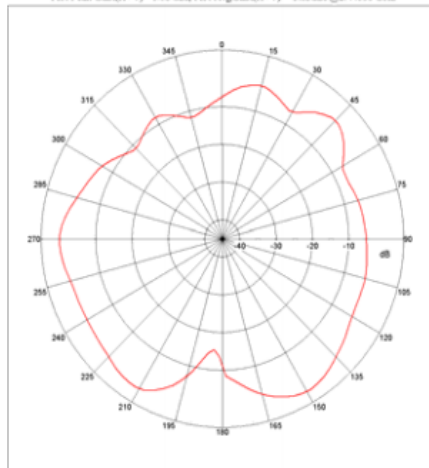
### XY-plane

Far-field Power Distribution(H+V) on X-Y Plane  
Plot Peak Gain(H+V)= 1.35 dB; Plot AvgGain(H+V)= -0.48dB @2.44000 GHz



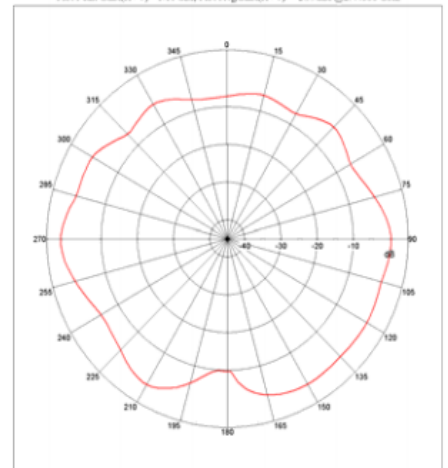
### XZ-plane

Far-field Power Distribution(H+V) on X-Z Plane  
Plot Peak Gain(H+V)= 1.68 dB; Plot AvgGain(H+V)= -3.83dB @2.44000 GHz



### YZ-plane

Far-field Power Distribution(H+V) on Y-Z Plane  
Plot Peak Gain(H+V)= 1.11 dB; Plot AvgGain(H+V)= -2.99dB @2.44000 GHz



UNLESS OTHER SPECIFIED TOLERANCES ON:

X=± X.X=± X.XX=

ANGLES = ± HOLEDIA = ±

SCALE: N/A

UNIT: mm

DRAWN BY : Sera

CHECKED BY: XD

DESIGNED BY: Sera

APPROVED BY: XD

TITLE: WH-H03

DOCUMENT  
NO.

江门市永旭电路板有限公司

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SPEC REV.

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