# HONANT Small dimension acoustics SAQ001 Model project antenna RF system development experience description



| Report each version | | |
|---|---|---|
| Report each version | Reporting time | This antenna research and development mainly solve the problem |
| V1 | 20230321 | The preliminary passive debugging + test of the whole machine |
| V2 | 20230322 | Test the data of the whole machine |
| Hongji wireless antenna research and development of the main process is briefly introduced | | |
| Stage one | Pre-evaluation of antenna performance | According to the characteristics of different projects to advise customers the most appropriate project evaluation methods, including simulation review, drawing review, hand review, etc. Antenna review, as a very important link in antenna research and development, should be introduced in the early stage of the project, so as to ensure the feasibility of the performance of the antenna debugging in the later stage. |
| Stage two | Passive antenna performance test | As an energy conversion and transmission device, antenna is essentially a passive device, and the parameters characterizing its own performance are passive parameters.In the passive debugging stage, the main debugging antenna transmission parameters and radiation parameters, the main test parameters are impedance, return loss and efficiency, gain, etc... |
| Stage three | Antenna active performance test | After confirming that the passive parameter of the debugging antenna is OK, the final performance shall be confirmed by placing the 3D microwave darkroom measurement results. At this stage, the debugging is the overall performance of the whole parameter. The main parameters are power and sensitivity, which are the most intuitive active parameters to quantify the antenna transmission and reception ability. |

| | | | |
|---|---|---|---|
| Active antenna parameter | Total antenna radiated power (TRP) | The total radiated power of the antenna refers to the power value of the whole machine in each typical direction of 360° collected by the standard antenna probe of the darkroom in 3D microwave anechoic chamber, and the total radiated power of the project in all directions in space is finally calculated through the conversion from near field to far field and spherical integration. Ideally, it is closely related to the antenna efficiency. | According to different product forms and customer requirements |
| | Total antenna receiving sensitivity（TIS） | Similar to TRP, TIS also refers to the receiving sensitivity of the whole machine in each typical direction of 360° collected by using the standard antenna probe in the darkroom in 3D microwave darkroom, and the total receiving sensitivity of the project in all directions in space was finally calculated through the conversion from near field to far field and spherical integration. In the case of project approval, it is also positively correlated with efficiency. | According to different product forms and customer requirements |

HONANT

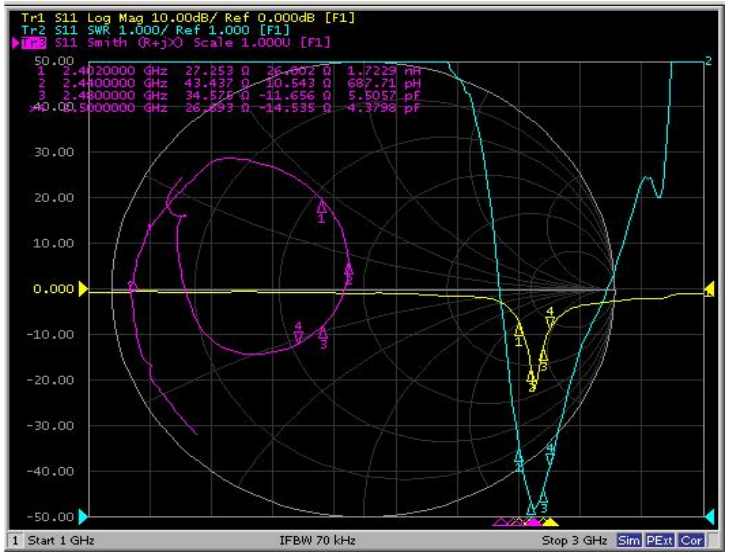
Small dimension acoustics SAQ001 Project antenna RF R&D report V1

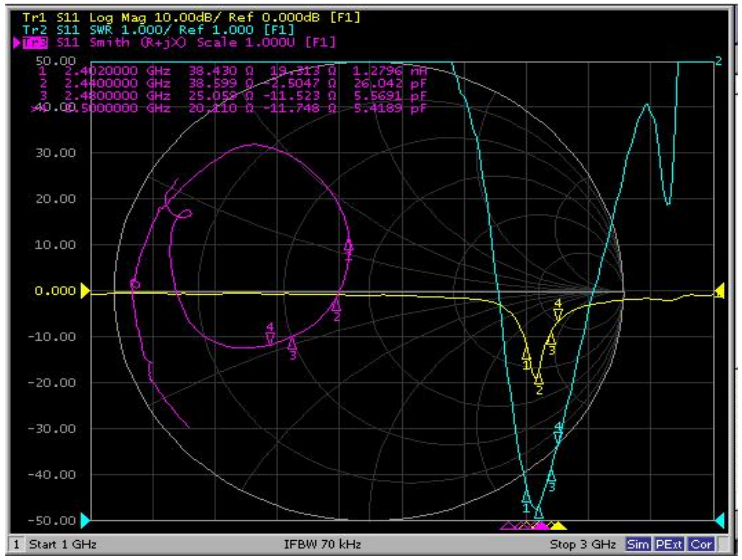
The main purpose of this report: OTA test data for antenna

Main conclusions of this report: The free field efficiency of passive antenna is about 20%, Head die efficiency 10%. The customer tests OK on site.

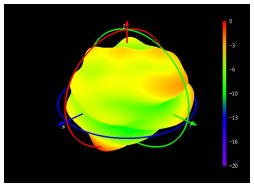
Key points to note in this report: Temporarily absent

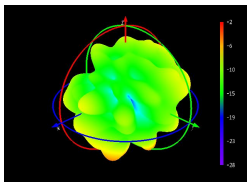
| Antenna impedance parameter test status | |
|---|---|
| L | R |

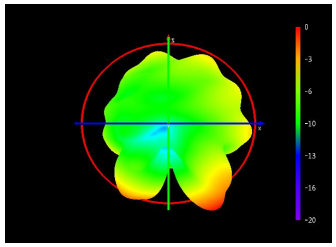


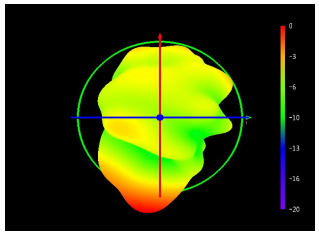



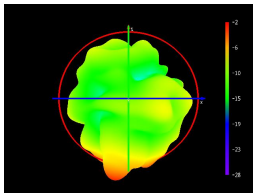
| Antenna passive efficiency test (Attached are 3D&2D directions) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | L | | | | | R | | | |
| | Free space | | Head die | | | Free space | | Head die | |
| Frequency point (MHz) | Gain (dBi) | efficiency (dB ) | Gain (dBi) | efficiency (dB ) | Frequency point:MHz | Gain (dBi) | efficiency (dB ) | Gain (dBi) | efficiency (dB ) |
| 2400 | -0.86 | -6.45 | -5.55 | -11 | 2400 | -4.26 | -6.93 | -2.04 | -8.94 |
| 2410 | -0.7 | -6.26 | -5.17 | -10.84 | 2410 | -4.09 | -6.73 | -2.19 | -9.03 |
| 2420 | -0.6 | -6.2 | -4.95 | -10.78 | 2420 | -3.95 | -6.61 | -2.34 | -9.2 |
| 2430 | -0.53 | -6.22 | -4.79 | -10.78 | 2430 | -3.79 | -6.58 | -2.48 | -9.43 |
| 2440 | -0.51 | -6.28 | -4.7 | -10.82 | 2440 | -3.66 | -6.59 | -2.66 | -9.73 |
| 2450 | -0.43 | -6.31 | -4.63 | -10.82 | 2450 | -3.54 | -6.59 | -2.91 | -10.09 |
| 2460 | -0.38 | -6.34 | -4.62 | -10.83 | 2460 | -3.45 | -6.6 | -3.22 | -10.5 |
| 2470 | -0.4 | -6.4 | -4.68 | -10.86 | 2470 | -3.43 | -6.66 | -3.54 | -10.84 |
| 2480 | -0.54 | -6.49 | -4.8 | -10.92 | 2480 | -3.54 | -6.77 | -3.87 | -11.17 |
| 2490 | -0.79 | -6.65 | -5 | -11.02 | 2490 | -3.79 | -6.94 | -4.21 | -11.49 |
| 2500 | -1.16 | -6.91 | -5.19 | -11.2 | 2500 | -4.17 | -7.24 | -4.49 | -11.77 |
| Average value | -0.55 | -6.33 | -4.88 | -10.85 | Average value | -3.75 | -6.67 | -2.81 | -9.88 |

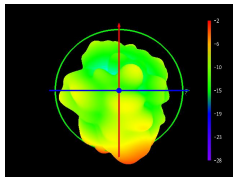








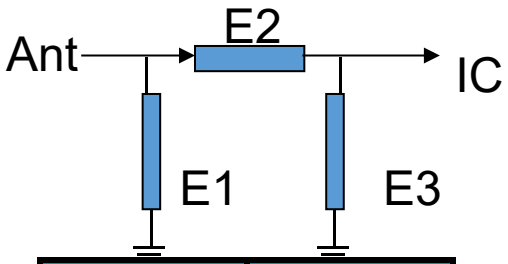




| Active test data of the whole machine | | | |
|---|---|---|---|
| L | | | |
| freedom | Channel | TRP（dBm） | TIS（dBm） |
| | CH 0 | -1.7 | -85.93 |
| | CH 39 | -0.77 | -87.37 |
| | CH 78 | -0.13 | -87.18 |
| Head die | Channel | TRP（dBm） | TIS（dBm） |
| | CH 0 | -5.98 | -81.94 |
| | CH 39 | -5.65 | -82.8 |
| | CH 78 | -5.88 | -81.71 |

| R | | | |
|---|---|---|---|
| freedom | Channel | TRP（dBm） | TIS（dBm） |
| | CH 0 | -0.72 | -87.34 |
| | CH 39 | 0.07 | -87.65 |
| | CH 78 | 0.78 | -88.14 |
| Head die | Channel | TRP（dBm） | TIS（dBm） |
| | CH 0 | -5.62 | -81.67 |
| | CH 39 | -5.63 | -81.78 |
| | CH 78 | -5.64 | -81.83 |

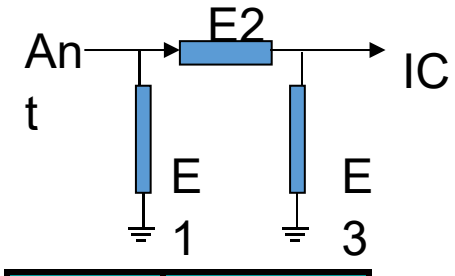
| Antenna matching circuit | |
|---|---|
| L | R |




| Element | Value |
|---|---|
| E1 | NC |
| E2 | OR |
| E3 | 2.5PF |

Matching material type

GRM0335C1H1R2BA01D


| Elemen t | Value |
|---|---|
| E1 | NC |
| E2 | OR |
| E3 | 2.7PF |

Matching material type

GRM0335C1H1R2BA01D