

Parts Acknowledgment

Name of Part: antenna

Specification of Parts: Accessory, can Antenna, be used DRC01, 2.4 GHz ~ 5 GHz, WiFi
Antenna, pogopin, FPC

Stare at the material numbe: 10883000139

Model of application: DRC01 recorder (Hil102A/WIFI+BT chip)

Name of Supplier: Shenzhen Suo Ward Communication Technology Co., Ltd.

Type of Supplier: Manufacturer、 Agent、 Trader;

Manufacturer's material number: SF2159A-1B2-A

Recognition number: 10883000139

Keep an eye on the date of issue:

Supplier approval column

| | | | | | |
|--|-----------------------|-----------------------------------|---|------------------|--|
| To develop: LTT | | audit: | | Approved by the: | |
| * The following is the check column of the tag tag | | | | | |
| Material to send sample check column | | | Material confirmation and approval column | | |
| Procurement Engineer | Purchasing Supervisor | Research and Development Engineer | Research and Development Supervisor | | |
| | | | | | |
| | | | | | |

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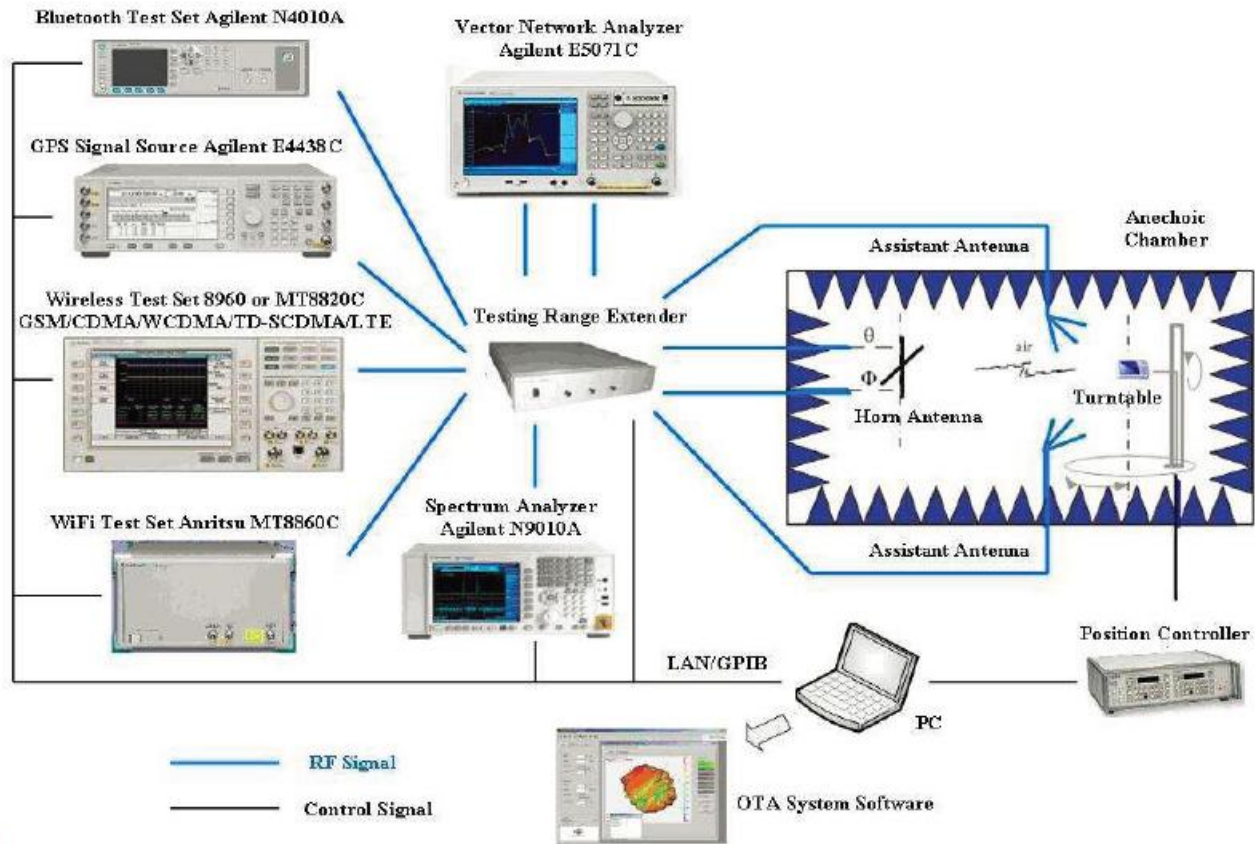
Contact information of supplier: Chen Heng /13717086260

| Serial number | Certification number | Material type | Date of issue | Remarks |
|---------------|----------------------|--------------------|---------------|----------|
| 1 | A2230173541101001E | Tinned copper wire | 2023-04-24 | One year |
| 2 | CANEC2227657302 | halogen | 2022-12-28 | One year |
| 3 | CANEC2227657303 | Adhesive | 2022-12-28 | One year |
| 4 | SHAEC23000346911 | FEP sheath | 2023-01-13 | One year |
| 5 | SHAEC22004639301 | FEP insulation | 2022-12-15 | One year |
| 6 | SZXEC2203054804 | Tin wire | 2022-09-19 | One year |
| 7 | SZXEC2203054808 | Tin | 2022-09-19 | One year |
| 8 | ETR23701480 | Printing ink | 2023-07-13 | One year |
| 9 | A2230173918101001E | Substrate | 2023-04-18 | One year |
| 10 | CANEC2227574118 | EVA foam | 2023-01-03 | One year |
| 11 | A2230383826101003 | Conductive cloth | 2023-08-04 | One year |
| 12 | CANEC23002609908 | Gold plating | 2023-05-11 | One year |

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一: Device Support & Testable Antenna Type



| Antenna function | Frequency Range | test instrument | test method | standard test |
|--|--|---|--|---|
| 2G antenna (GSM) | 824MHz-960MHz, 1710MHz-1990MHz | 5071B、8960 OTA darkroom | Active test, passive test | Soward standards, customer requirements |
| 3G antenna (WCDMA/TDSCDMA/CDMA-EVDO/2000) | 824MHz-960MHz, 1710MHz-2170MHz | 5071B、8960 OTA darkroom | Active test, passive test | Soward standards, customer requirements |
| 4G antenna (LTE-FDD/LTE-TDD) | | 5071B、CMW500、 SP8011、OTA darkroom | Active test, passive test | Soward standards, customer requirements |
| WiFi antenna | 2.4GHz-2.48GHz, 5.15GHz-5.35GHz, 5.725GHz-5.825GHz | 5071B、CMW500、OTA darkroom、router、 PC | Active test, passive test, APK actual test, throughput test | Soward standards, customer requirements |
| BT antenna | 2.4GHz-2.48GHz, | 5071B、OTA darkroom 、Bluetooth Speaker | Passive test, actual test | Soward standards, customer requirements |
| Positioning antenna (GPS, GLONASS, Beidou, Galileo) | 1.575.42MHz±10MHz 1602MHz+0.5625MHz 1561MHz+2.046MHz | 5071B、OTA darkroom 、APK | Passive test, actual test | Soward standards, customer requirements |
| NFC antenna | 13.56MHz | 5071B、Dedicated test fixture、OTA darkroom、APK | Passive test, actual test | Soward standards, customer requirements |
| Remote control antenna | 433MHz | 5071B、OTA darkroom | Passive test, actual test | Soward standards, customer requirements |

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二: Overview

(1) Antenna performance

1. This approval sheet supports for MID project. FPC antennas include in this project. This report is for the performance of WIFI&BT antenna.
2. Antenna shape size: Meet the requirement of MID
3. Antenna band: 2.4GHz~5GHz
4. Antenna material: Antenna material meet the requirement of MID
5. Adhesive performance: Adhesive performance meet the requirement of MID
6. Antenna performance meet the spec below:

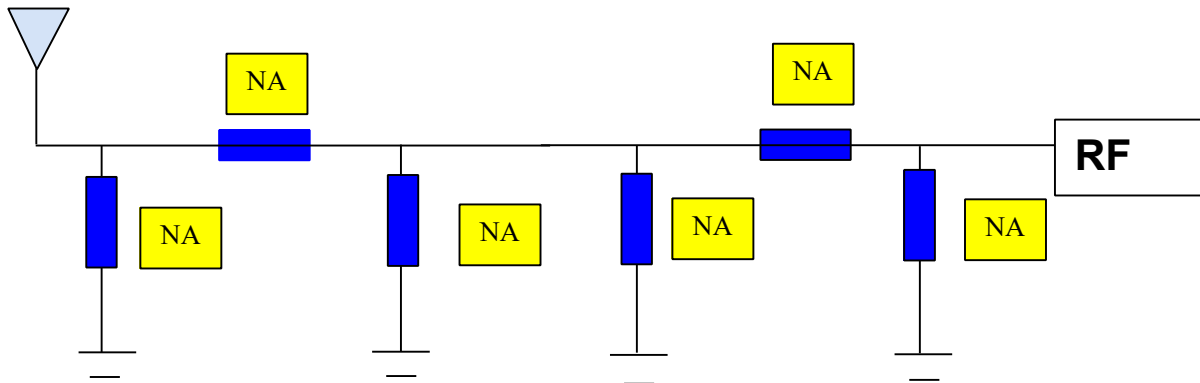
| Description | 2.4GHz~5GHz | Units |
|------------------------|---------------------------|-------|
| VSWR | ≤ 2.0 | |
| Average Antenna Gain | ≥ -4.5 | dB |
| | | |
| Feed Impedance | 50 ohms | |
| Operating Temperature | -40 to +85 deg C | |
| Polarization / Azimuth | Linear / Omni-directional | |

(2) Mechanical Information

| Mechanical Dimension | |
|-----------------------|------------------|
| Cable Length | NA |
| Description | WIFI&BT antenna |
| Material | FPC |
| Coaxial Cable | NA |
| Environmental | |
| Operation Temperature | -40 to +85 deg C |
| Storage Temperature | -40 to +85 deg C |

三: Matching circuit diagram & machine picture & antenna picture

(1) Matching circuit



(2) Machine picture & antenna picture



四 :Antenna Standing Wave Ratio & Antenna Efficiency (VSWR)



| Passive Test For 2.4G | | | |
|-----------------------|----------|-----------|------------|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) |
| 2400 | 40.89 | -3.88 | -1.13 |
| 2410 | 37.21 | -4.29 | -1.72 |
| 2420 | 43.32 | -3.63 | -0.99 |
| 2430 | 47.37 | -3.24 | -0.73 |
| 2440 | 52.12 | -2.83 | -0.3 |
| 2450 | 54.6 | -2.63 | -0.23 |
| 2460 | 49.27 | -3.07 | -0.67 |
| 2470 | 43.92 | -3.57 | -1.18 |
| 2480 | 44.12 | -3.55 | -1.15 |
| 2490 | 52.63 | -2.79 | -0.46 |
| 2500 | 55.9 | -2.53 | -0.35 |

| Passive Test For 5G-WIFI | | | |
|--------------------------|----------|-----------|------------|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) |
| 5000 | 32.82 | -4.84 | 0.2 |
| 5100 | 34.53 | -4.62 | 0.67 |
| 5200 | 49.26 | -3.07 | 2.12 |
| 5300 | 51.23 | -2.9 | 2.04 |
| 5400 | 43.38 | -3.63 | 0.97 |
| 5500 | 42.78 | -3.69 | 1.26 |
| 5600 | 32.44 | -4.89 | 0.06 |
| 5700 | 37.17 | -4.3 | 0.39 |
| 5800 | 30.03 | -5.22 | -0.46 |
| 5900 | 27.8 | -5.56 | -1.51 |
| 6000 | 31.96 | -4.95 | -0.98 |

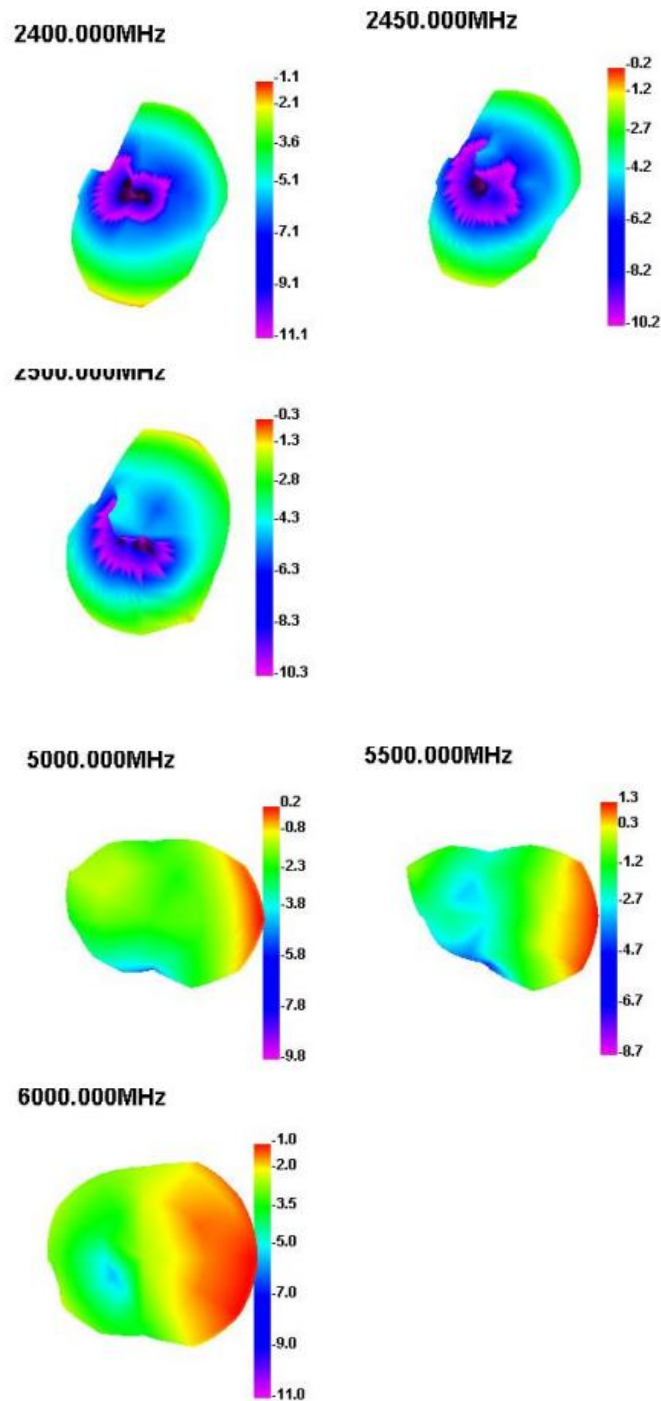
五:Active data

| | | |
|------------------|--------|--------|
| 802.11b : 11Mbps | | |
| Wifi 2G TRP | | |
| 1 | 7 | 13 |
| 2412 | 2442 | 2472 |
| 14.62 | 15.71 | 15.01 |
| Wifi 2G TIS | | |
| 1 | 7 | 13 |
| 2412 | 2442 | 2472 |
| -79.11 | -81.41 | -79.72 |

| | | |
|----------------|-------|--------|
| 802.11n : MCS7 | | |
| Wifi 2G TRP | | |
| 1 | 7 | 13 |
| 2412 | 2442 | 2472 |
| 13.75 | 13.76 | 13.31 |
| Wifi 2G TIS | | |
| 1 | 7 | 13 |
| 2412 | 2442 | 2472 |
| -64.7 | -64.1 | -64.84 |

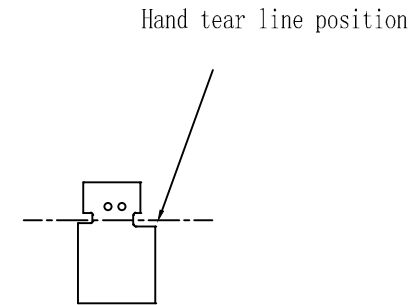
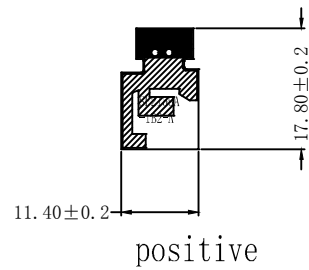
| | | |
|------------------|--------|--------|
| 802.11a : 54Mbps | | |
| Wifi 5G TRP | | |
| 36 | 64 | 165 |
| 5180 | 5320 | 5825 |
| 10.88 | 10.89 | 7.61 |
| Wifi 5G TIS | | |
| 36 | 64 | 165 |
| 5180 | 5320 | 5825 |
| -70.64 | -70.35 | -68.65 |

六:3D pattern



七:Structural drawing

Gum-3M300



Technical requirements:

- 1, Please use a pair of half PI base material, electrolytic copper.
- 2, the yellow part is the wiring part, the surface spray matte black, text printing bright black.
3. The yellow shaded parts are exposed welding points, and the process requires electrometal treatment.
- 4, all materials meet environmental ROHS standards.
- 5, with "*" is the key size, tolerance is: ± 0.03 .

Test criteria:

- 1, Shape dimensions and line dimensions consistent with drawings, within controllable tolerances.
- 2, Antenna line, broken line, FPC bend to do 180 ° bending experiment, no fracture, more than 5 times PASS.
- 3, Clear, no misprints.。

Packaging requirements:

1. PE sealed pocket packaging。
2. 100 pcs/bag。

SWARD

ShenZhen SWARD Communication
Technology Co.Ltd

SF2159A-1B2-A

ROHS

| | signatures | date | mass | signatures | date |
|--------|------------|------------|----------|------------|------|
| RD | YWD | 2023.05.16 | QC | | |
| RF | | | | | |
| audits | | | approval | | |

| time markup | | percentage |
|-------------|-------|------------|
| 1 | A | 1:1 |
| 共 1 张 | 第 1 张 | |