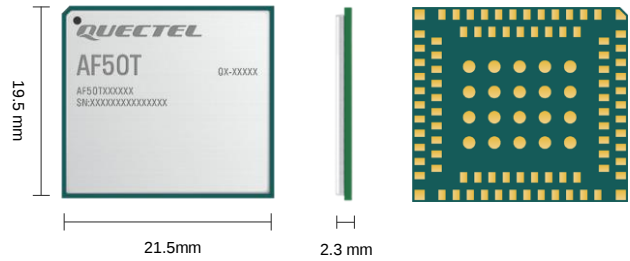


# Quectel AF50T

Automotive Grade  
Wi-Fi & Bluetooth Module  
Compact LGA Package



AF50T is an automotive grade Wi-Fi 6 and Bluetooth 5.2 module with high performance. It is designed to be used together with Quectel automotive modules AG52xR and AG55xQ to establish WLAN and Bluetooth connections, supporting  $2 \times 2 + 2 \times 2$  MU-MIMO.

With a compact and unified form factor of 19.5 mm × 21.5 mm × 2.3 mm, AF50T is an ideal Wi-Fi/Bluetooth solution for size-sensitive applications, and helps customers reduce product size and optimize application design cost. The surface-mount technology enhances its durability and robustness, and the LGA package makes sure the module can be easily embedded into size-constrained applications and provide reliable connectivity with these applications. The advanced package allows for large-scale automated manufacturing which has strict requirements on cost and efficiency.

Designed with a reliable PCIe 2.0 interface to provide WLAN capability, AF50T achieves low-power and high-speed data transmission. Coupled with its compact size and extended temperature range, AF50T enables the module to meet Wi-Fi/Bluetooth + LTE-A/5G application design requirements in automotive industry.



## Key Features

- ✓ Automotive grade Wi-Fi & Bluetooth module supporting 2.4 GHz and 5 GHz and Bluetooth 5.2
- ✓ Support Dual-Band Simultaneous (DBS) with dual-MAC
- ✓ Support PCIe 2.0 interface which provides higher data transmission rate and lower power consumption
- ✓ Good co-existence with Quectel LTE-A/5G module
- ✓ Ideal for automotive market applications with IATF16949:2016 requirement, compliant with automotive quality processes such as APQP, PPAP, etc.
- ✓ Wide operating temperature range meets the demanding requirements for automotive devices
- ✓ Fast time-to-market: simple design minimizes design-in time and development efforts



Ultra-compact  
Size



LGA Package



IEEE 802.11  
a/b/g/n/ac/ax



Bluetooth 5.2



Operating Temperature  
Range: -40 °C to +85 °C

| Wi-Fi & Bluetooth AF50T     |                                                                                                                                                                                |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Region                      | Global                                                                                                                                                                         |
| Function                    | Wi-Fi 2.4 GHz/ 5 GHz + Bluetooth 5.2                                                                                                                                           |
| WLAN                        | IEEE 802.11 a/b/g/n/ac/ax                                                                                                                                                      |
| Modulation Mode             | BPSK, QPSK, CCK, 16QAM, 64QAM, 256QAM, 1024QAM                                                                                                                                 |
| Temperature Range           |                                                                                                                                                                                |
| Operating Temperature Range | -40 °C to +85 °C                                                                                                                                                               |
| Data Rate                   |                                                                                                                                                                                |
| 802.11a                     | Max. 54 Mbps                                                                                                                                                                   |
| 802.11b                     | Max. 11 Mbps                                                                                                                                                                   |
| 802.11g                     | Max. 54 Mbps                                                                                                                                                                   |
| 802.11n                     | Max. 300 Mbps                                                                                                                                                                  |
| 802.11ac                    | Max. 866 Mbps                                                                                                                                                                  |
| 802.11ax                    | Max. 1774.5 Mbps                                                                                                                                                               |
| BLE (Bluetooth 5.2)         | Max. 2 Mbps                                                                                                                                                                    |
| Interfaces                  |                                                                                                                                                                                |
| PCIe 2.0                    | × 1                                                                                                                                                                            |
| PCM                         | × 1                                                                                                                                                                            |
| UART                        | × 1                                                                                                                                                                            |
| Coexistence Interfaces      | × 2                                                                                                                                                                            |
| Antenna Interfaces          | ANT_WIFI0: 2.4 GHz/ 5 GHz WLAN and Bluetooth antenna interface<br>ANT_WIFI1: 2.4 GHz/ 5 GHz WLAN antenna interface<br>ANT_BT: dedicated Bluetooth antenna interface (Optional) |
| Electrical Features         |                                                                                                                                                                                |
| Power Supply Voltage        | VDD_RF: 3.3–4.25 V, Typ. 3.85 V<br>VDD_CORE: 1.90 V, 1.35 V, 0.95 V                                                                                                            |
| I/O Power Supply Voltage    | VDD_IO: 1.71–1.89 V, Typ. 1.8 V                                                                                                                                                |
| General Features            |                                                                                                                                                                                |
| Encryption Mode             | WPA3                                                                                                                                                                           |
| AP (Max. Access Points)     | 32                                                                                                                                                                             |
| Operating Mode              | Soft-AP/ STA                                                                                                                                                                   |
| Dimension                   | 19.5 mm × 21.5 mm × 2.3 mm                                                                                                                                                     |
| Weight                      | Approx. 2.1 g                                                                                                                                                                  |

# Quectel AF50T

| Wi-Fi & Bluetooth |                     | AF50T                 |                    |
|-------------------|---------------------|-----------------------|--------------------|
| RF Performance    |                     |                       |                    |
|                   |                     | Receiving Sensitivity | Transmitting Power |
| 2.4 GHz           | 802.11b/1 Mbps      | -96 dBm               | 20 dBm             |
|                   | 802.11b/11 Mbps     | -87 dBm               | 20 dBm             |
|                   | 802.11g/6 Mbps      | -92 dBm               | 19 dBm             |
|                   | 802.11g/54 Mbps     | -74 dBm               | 16 dBm             |
|                   | 802.11n/HT20 MCS0   | -92 dBm               | 19 dBm             |
|                   | 802.11n/HT20 MCS7   | -73 dBm               | 16 dBm             |
|                   | 802.11n/HT40 MCS0   | -89 dBm               | 19 dBm             |
|                   | 802.11n/HT40 MCS7   | -71 dBm               | 16 dBm             |
|                   | 802.11ax/HE20 MCS0  | -92 dBm               | 19 dBm             |
|                   | 802.11ax/HE20 MCS11 | -62 dBm               | 14 dBm             |
|                   | 802.11ax/HE40 MCS0  | -89 dBm               | 19 dBm             |
|                   | 802.11ax/HE40 MCS11 | -60 dBm               | 14 dBm             |
|                   |                     | Receiving Sensitivity | Transmitting Power |
| 5 GHz             | 802.11a/6 Mbps      | -92 dBm               | 17 dBm             |
|                   | 802.11a/54 Mbps     | -75 dBm               | 15 dBm             |
|                   | 802.11n/HT20 MCS0   | -92 dBm               | 17 dBm             |
|                   | 802.11n/HT20 MCS7   | -74 dBm               | 15 dBm             |
|                   | 802.11n/HT40 MCS0   | -90 dBm               | 17 dBm             |
|                   | 802.11n/HT40 MCS7   | -72 dBm               | 15 dBm             |
|                   | 802.11ac/VHT20 MCS0 | -93 dBm               | 17 dBm             |
|                   | 802.11ac/VHT20 MCS8 | -71 dBm               | 14 dBm             |
|                   | 802.11ac/VHT40 MCS0 | -90 dBm               | 17 dBm             |
|                   | 802.11ac/VHT40 MCS9 | -67 dBm               | 13 dBm             |
|                   | 802.11ac/VHT80 MCS0 | -87 dBm               | 17 dBm             |
|                   | 802.11ac/VHT80 MCS9 | -62 dBm               | 13 dBm             |
|                   | 802.11ax/HE20 MCS0  | -93 dBm               | 17 dBm             |
|                   | 802.11ax/HE20 MCS11 | -63 dBm               | 12 dBm             |
|                   | 802.11ax/HE40 MCS0  | -90 dBm               | 17 dBm             |
|                   | 802.11ax/HE40 MCS11 | -60 dBm               | 12 dBm             |
|                   | 802.11ax/HE80 MCS0  | -87 dBm               | 17 dBm             |
|                   | 802.11ax/HE80 MCS11 | -56 dBm               | 12 dBm             |