

### 3.5.1. Operating Frequencies

**Table 12: Operating Frequencies (Unit: GHz)**

Feature	Frequency
2.4 GHz Wi-Fi	2.400–2.4835
Bluetooth	2.400–2.4835

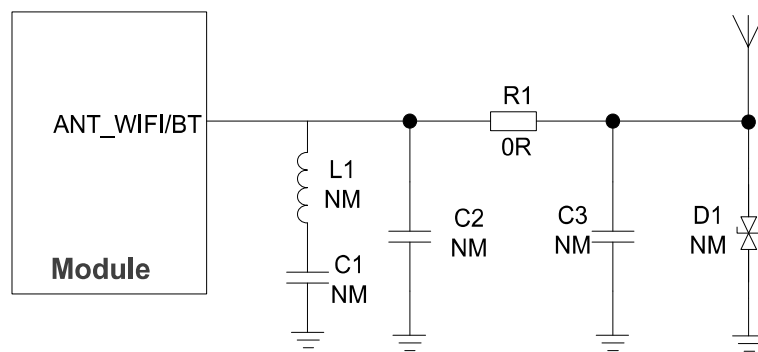
### 3.5.2. Pin Antenna Interface (ANT\_WIFI/BT) <sup>5</sup>

**Table 13: ANT\_WIFI/BT Pin Definition**

Pin Name	Pin No.	I/O	Description	Comment
ANT_WIFI/BT	2	AIO	Wi-Fi/Bluetooth antenna interface	50 Ω characteristic impedance.

#### 3.5.2.1. Reference Design

In order to achieve better RF performance, it is necessary to reserve LC and π matching circuit, and add an ESD protection component. Matching components such as R1, L1, C1, C2, C3 and D1 should be placed as close to the antenna as possible. L1, C1, C2, C3 and D1 are not mounted by default. The parasitic capacitance of TVS should be less than 0.05 pF and R1 is recommended to be 0 Ω.



**Figure 6: Antenna Reference Design**

<sup>5</sup> The module is provided in one of the three antenna/antenna interface designs. For more details, contact Quectel Technical Support.

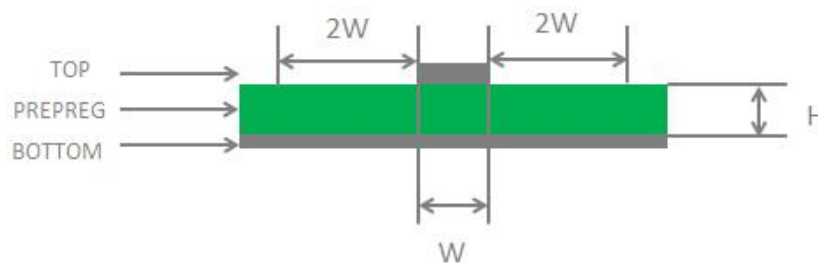
**3.5.2.2. Antenna Design Requirements**

**Table 14: Antenna Design Requirements**

Parameter	Requirement
Frequency Range (GHz)	2.4 GHz: 2.400–2.4835
Cable Insertion Loss (dB)	< 1
VSWR	≤ 2
Gain (dBi)	1 (Typ.)
Max. input power (W)	50
Input impedance (Ω)	50
Polarization type	Vertical

**3.5.2.3. RF Routing Guidelines**

For user’s PCB, the characteristic impedance of all RF traces should be controlled to 50 Ω. The impedance of the RF traces is usually determined by the trace width (W), the materials’ dielectric constant, the height from the reference ground to the signal layer (H), and the spacing between RF traces and grounds (S). Microstrip or coplanar waveguide is typically used in RF layout to control characteristic impedance. The following are reference designs of microstrip or coplanar waveguide with different PCB structures.



**Figure 7: Microstrip Design on a 2-layer PCB**

# 7 Mechanical Information

This chapter describes the mechanical dimensions of the module. All dimensions are measured in millimeters (mm), and the dimensional tolerances are  $\pm 0.2$  mm unless otherwise specified.

## 7.1. Mechanical Dimensions

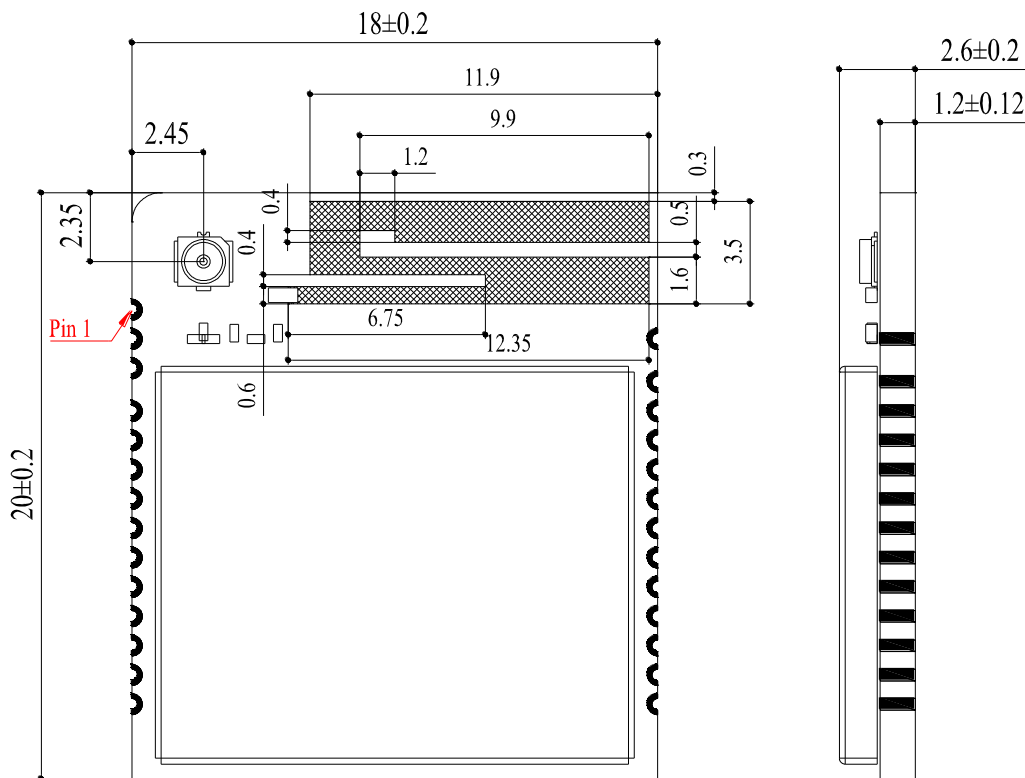


Figure 29: Top and Side Dimensions

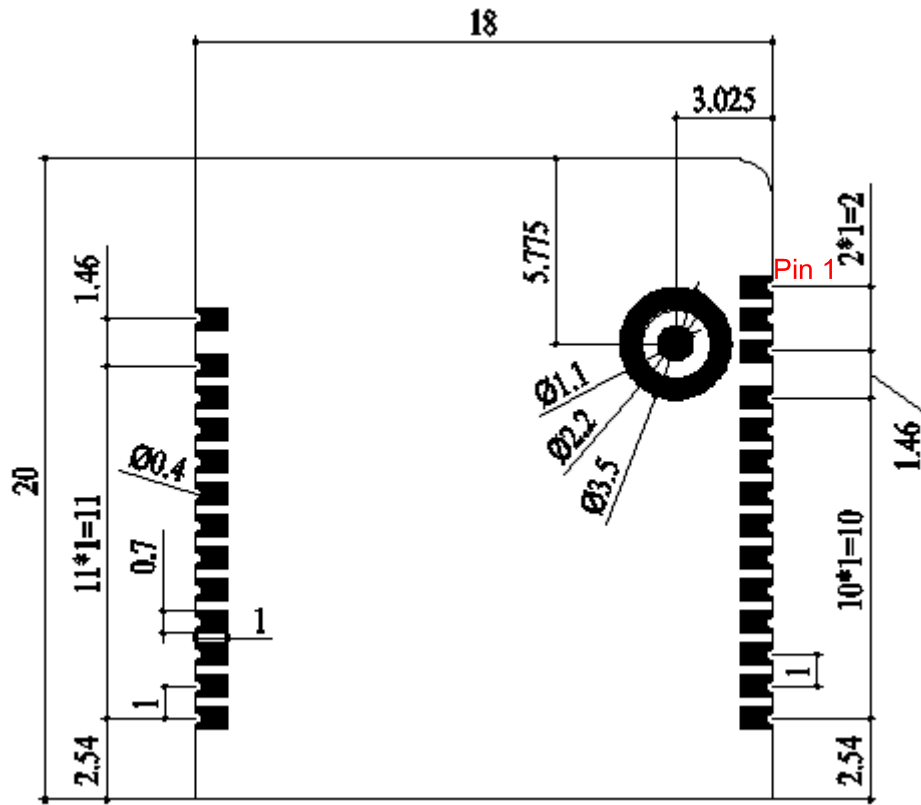


Figure 30: Bottom Dimensions (Bottom View)

**NOTE**

The package warpage level of the module conforms to the *JEITA ED-7306* standard.

## 7.2. Recommended Footprint

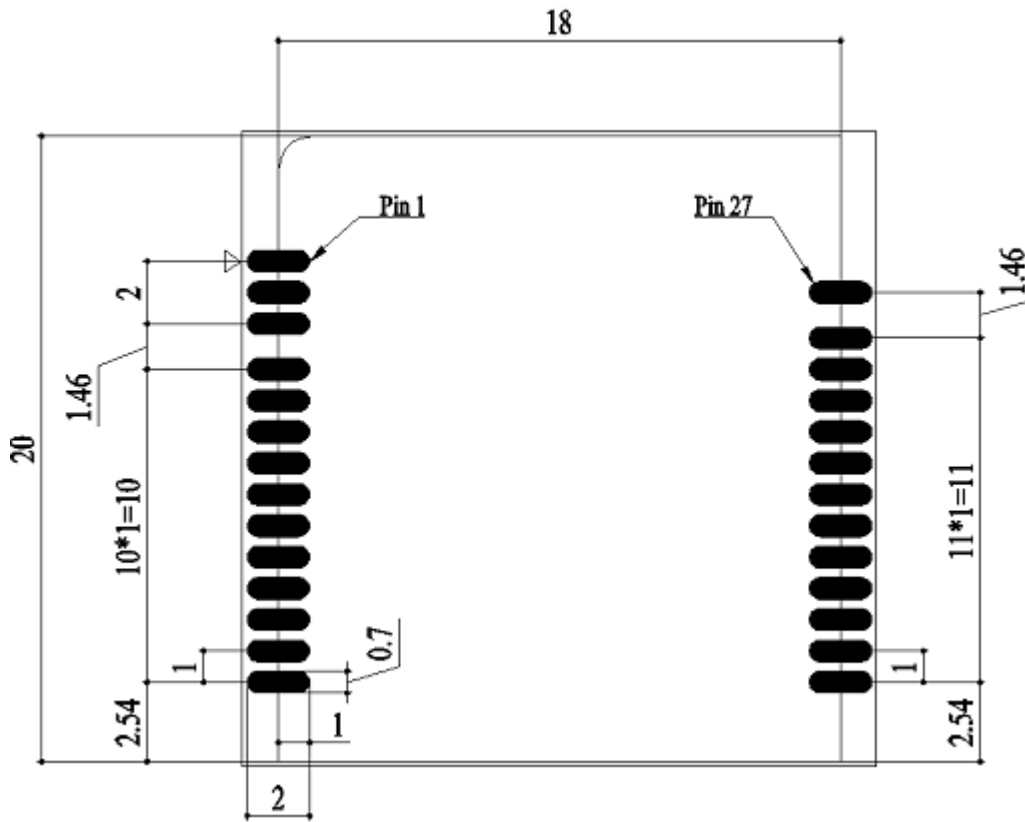


Figure 31: Recommended Footprint

**NOTE**

Keep at least 3 mm between the module and other components on the motherboard to improve soldering quality and maintenance convenience.

