

LILY-W131 Antenna Connector Reference Design

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1 Scope

This document defines the essential specifications necessary to implement the LILY-W131 antenna connector reference designs. The information contained herein and its references should be sufficient to guide a skilled person in an attempt to implement the design on a host carrier. It will provide the designer with PCB layout details.

2 FCC/IC ID reference

Model	FCC ID	IC ID
LILY-W131	XPYLILYW1	8595A-LILYW1

Table 1: FCC and IC ID for LILY-W131.

3 General description

When using the LILY-W131 together with this antenna reference design, the circuit trace layout must be made in strict compliance with the instructions below.

All the components placed on each RF trace must be kept as indicated in the reference design. The reference design uses a micro coaxial connector that is connected to the external antenna via a 50 Ω pigtail.

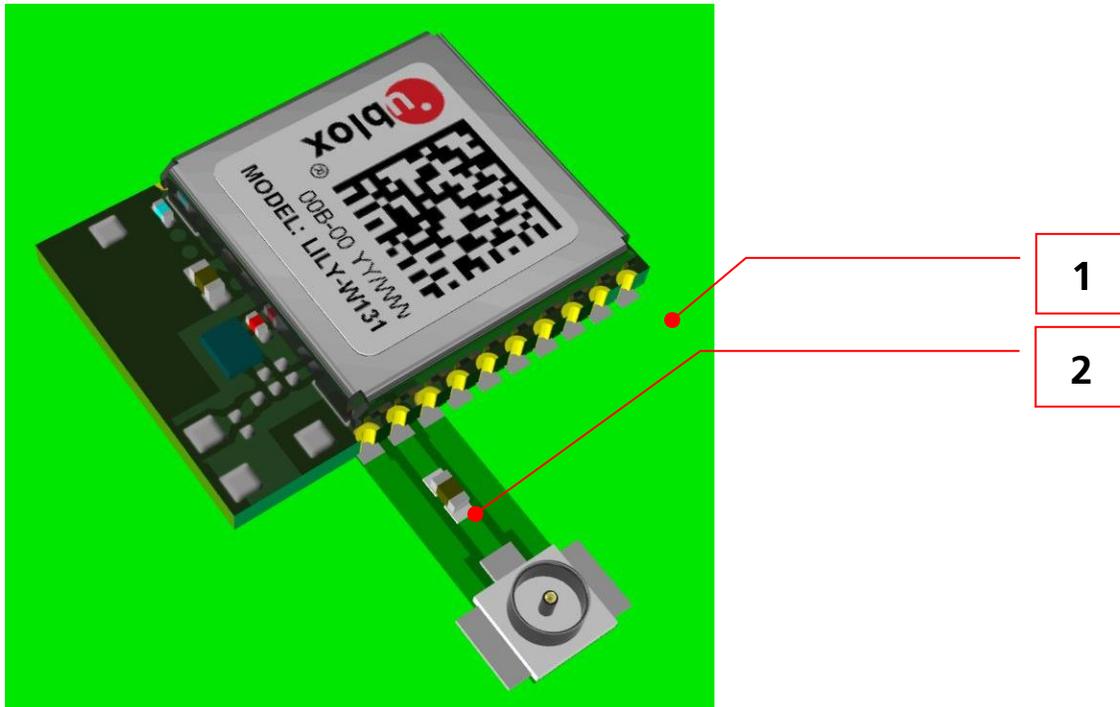


Figure 1: Antenna Reference design embedded in a host carrier PCB

Reference	Description
1	Host carrier PCB (light green)
2	Antenna connector reference design (darker green)

Table 2: LILY-W131 and host carrier PCB.

3.1 Floor plan and PCB stack-up

This section describes where the critical components are positioned on the reference design. It also presents the stack-up of the four layers of the PCB.

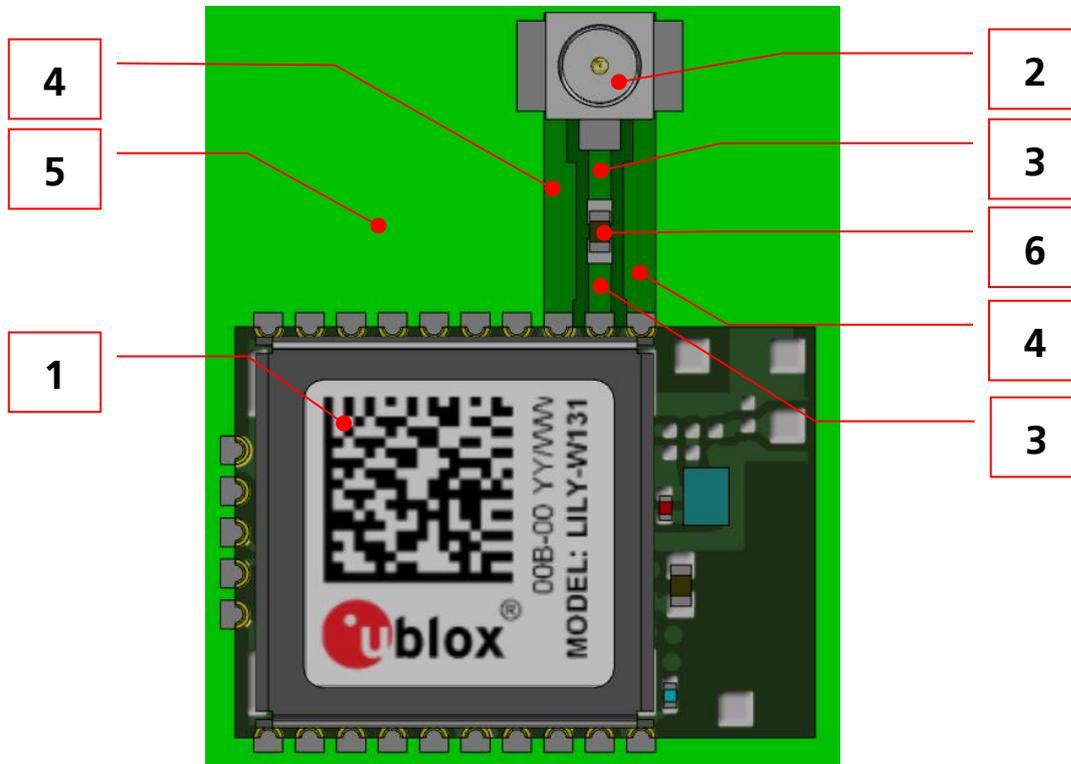


Figure 2: LILY-W131 antenna reference design

Reference	Part	Manufacturer	Description
1	LILY-W131	u-blox	LILY-W131 module
2	U.FL-R-SMT-1(10)	Hirose	Coaxial Connector, 0 – 6 GHz, for external antenna
3			Antenna coplanar microstrip, matched to 50 Ω
4			Top layer GND-plane
5			Host PCB. Should have a solid GND inner layer under and around the RF components (vias and small openings is allowed).
6	10pF, COG, 0402, 10P +/-0.25P 25V		Antenna connector capacitor

Table 3: Included part in the antenna connector reference design.

3.2 PCB stack-up

The stack-up from top to solid GND layer used in the reference design is specified in Table 4.

PCB Layer	Material	Thickness
Soldermask Top	Generic LPI Soldermask	20 μm +/- 10 μm
Top	Copper Foil	35 μm +/- 15 μm
Dielectric	Pre-preg, ϵ_r @2GHz: 4.05 +/- 0.15	300 μm +/- 40 μm
GND plane	Copper Foil	15 μm +30 μm

Table 4: Stack-up of EVK-LILY-W131

3.2.1 RF trace specification

The 50 Ω coplanar micro-strip dimensions used in these reference designs are stated in Figure 3 and Table 5.

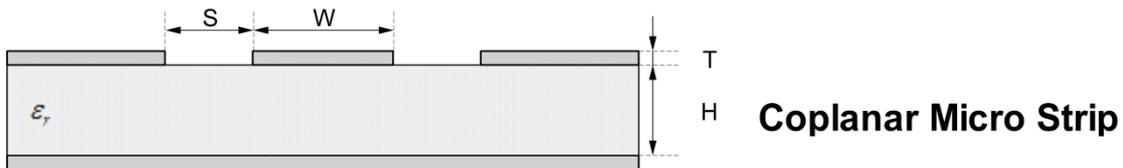


Figure 3: Coplanar micro-strip dimension specification

Item	Value
S	300 μm
W	540 μm
T	35 μm
H	300 μm
ϵ_r	4

Table 5: Coplanar micro-strip specification

3.3 Mechanical dimensions

The mechanical dimensions and position of the components are specified in Figure 4.

The solid GND layer beneath the 'top layer' shall be minimum 19x15 mm according Figure 4. No traces are allowed to be routed on the GND layer within this area but vias and small openings are allowed.

The minimum size of the top layer GND plane is marked in Figure 4 and no other components are allowed within this area.

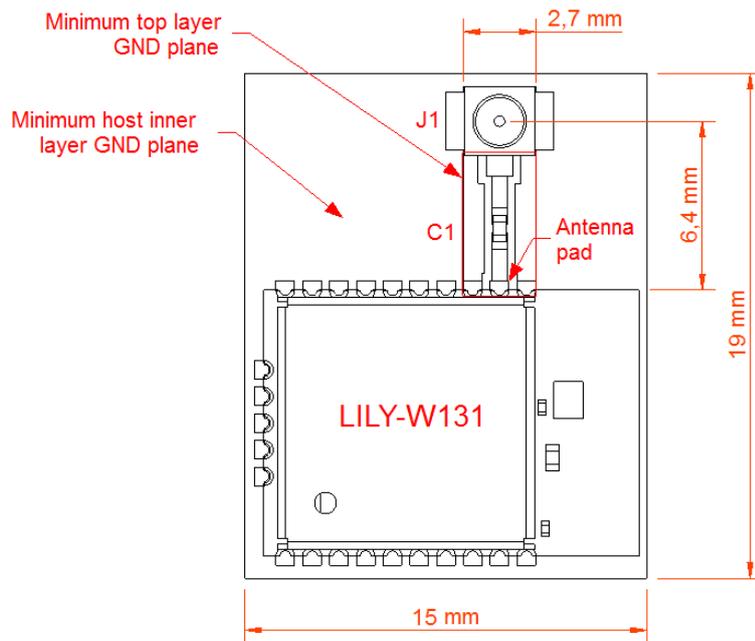


Figure 4: Mechanical dimensions of EVK-LILY-W131