

# Reference Design Guide

## Sterling-LWB+ SiP

*Version 1.0*

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## REVISION HISTORY

| Version | Date      | Notes           | Contributors | Approver  |
|---------|-----------|-----------------|--------------|-----------|
| 1.0     | 4/28/2022 | Initial Release | Andrew Chen  | Andy Ross |
|         |           |                 |              |           |
|         |           |                 |              |           |

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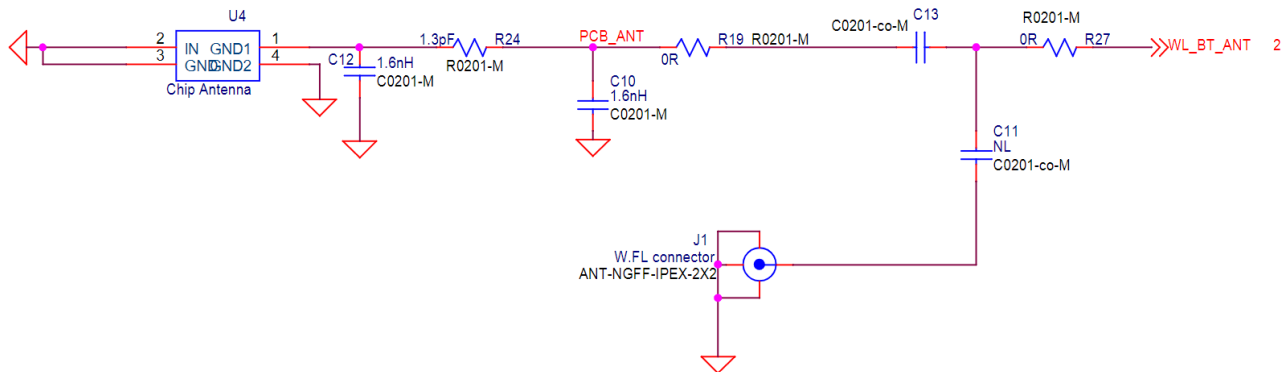
## 1 SCOPE

This document provides information on the recommended reference design requirements for the Sterling-LWB+ SiP (453-00083). The guidelines are provided to allow integration of the Sterling-LWB+ SiP and allow customers to leverage existing regulatory certification available from Laird Connectivity for the Sterling-LWB+ modules and SiP.

Following the schematic and layout guidelines will allow the use of existing modular approvals provided by Laird Connectivity, however a design review, by Laird Connectivity, of the final implementation is recommended to assure conformance has been maintained.



## 2.2 RF Network Schematic



**Figure 2: RF Network Schematic**

### 3 PCB STACK-UP

Guidance on necessary PCB stack. Compliance is necessary to ensure and maintain trace characteristics in the RF network.

**Table 1: General Stack-up Information**

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| Dielectric Constant   | 4.04                                                          |
| Trace Characteristics | 50Ω trace width is 9.5mil and 10mil gap to the ground copper. |



**Figure 3: Stack Up Trace Data**

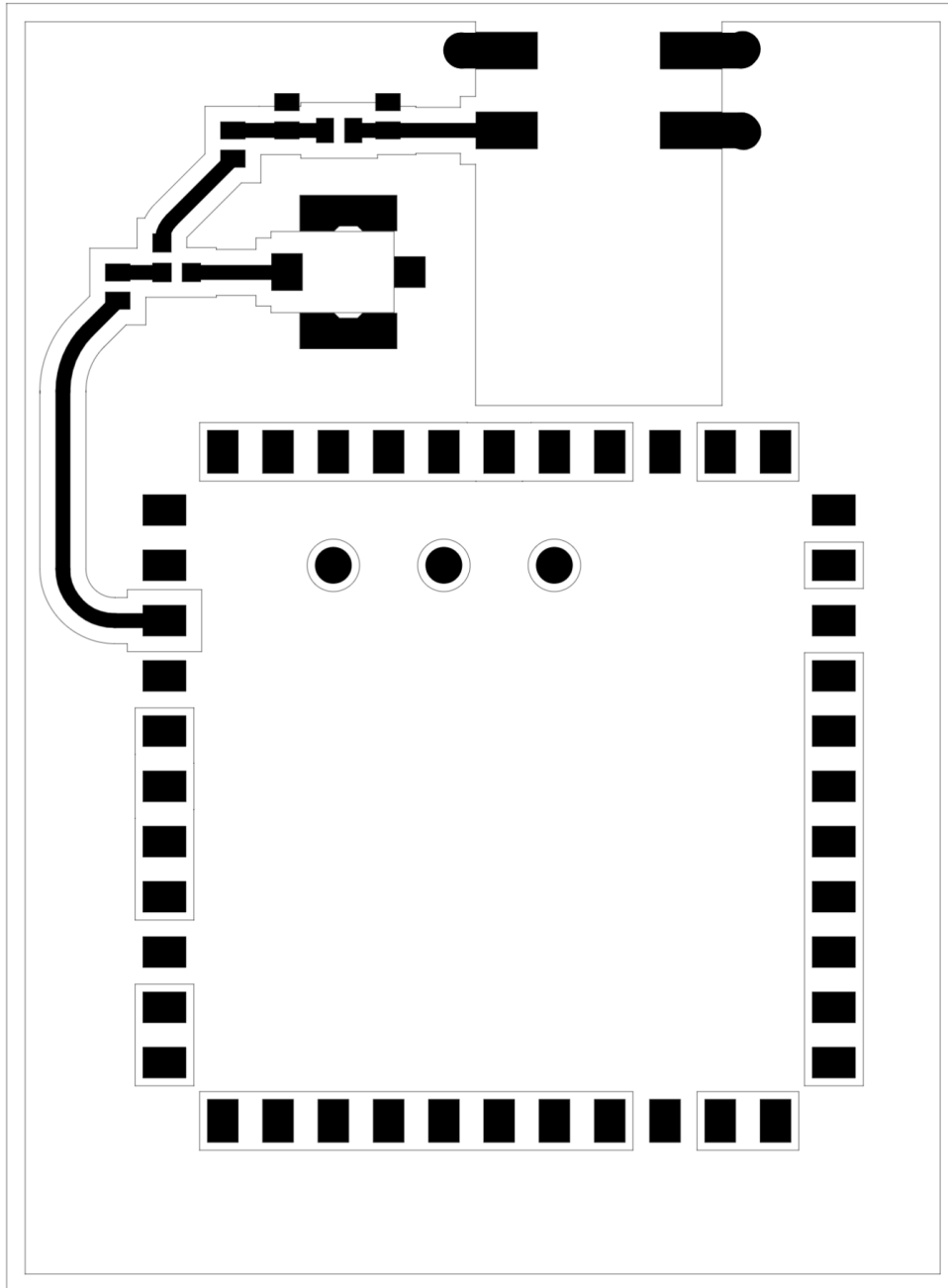
**Table 2: PCB Stack-up Details**

| Layer           | Layer Type  | Layer Structure | Thickness(mil) | DK   |
|-----------------|-------------|-----------------|----------------|------|
|                 | Solder mask |                 | 0.9            |      |
| L1              | Top         | 0.5oz+Plating   | 1.69           |      |
|                 |             | Prepreg         | 5.85           | 4.04 |
| L2              | Plane       | 0.5oz           | 0.55           |      |
|                 |             | Core            | 13.78          |      |
| L3              | Plane       | 0.5oz           | 0.55           |      |
|                 |             | Prepreg         | 5.88           | 4.04 |
| L4              | Bottom      | 0.5oz+Plating   | 1.69           |      |
|                 | Solder mask |                 | 0.9            |      |
| Total Thickness |             |                 | 31.79          |      |

## 4 RF NETWORK TRACE PATTERN

The drawing below is provided for guidance. .DXF files are available for detailed trace dimensions and placement:

<https://www.lairdconnect.com/documentation/reference-design-sterling-lwb-dxf-format>



**Figure 4: RF Network Trace Diagram**



## 5 ADDITIONAL ASSISTANCE

Please contact your local sales representative or our support team for further assistance:

Laird Connectivity

Support Center: <https://www.lairdconnect.com/contact>

Email: [support@lairdconnect.com](mailto:support@lairdconnect.com)

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Hong Kong: +852 2762 4823

Web: <https://www.lairdconnect.com/products>

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**Note:** Information contained in this document is subject to change.

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