FPC GNSS/GPS L1 L2 L5 ANTENNA

Part Number: LK1850301

Description: FPC GNSS/GPS L1 L2 L5 antenna

Frequency: 1166-1660MHz

Size: 49 mm x 10 mm x 0.1 mm

Features:

- Support n255, GPS L1 L2 L5, GALILEO E1 E5, GLONASS L1 L5, and BEIDOU B1 B2
- Omni-directional radiation pattern
- Low Gain with high efficiency for easy certification
- Performance independent of ground plane and cable length
- Various cable lengths and connector options available
- High precision positioning

RoHS compliant

Revision: B

Jun 26, 2026

Contents

1.0 Product Description 3
2.0 General Specification 3
3.0 Mechanical and Part Number 4
3.1 Product Dimension 4
3.2 Part Number 5
4.0 Electrical Characteristics 5
4.1 S11/Return Loss 6
4.2 VSWR 7
4.3 Efficiency 7
4.4 Peak Gain 8
4.5 Radiation Pattern 8
5.0 Application Guides 11
5.1 Recommended Distance Away from Metallic Structure 11
5.2 Recommended Cable Routing 13
6.0 Matching Network 13
7.0 Packaging 15
8.0 Website and Company Address 15
9.0 Revision History 15

1.0 Product Description

The LK1850301 series is a balanced dipole flexible PCB antenna designed for GPS/GNSS high precision positioning application. It supports NTN band n255, GPS L1 L2 L5, GALILEO E1 E5, GLONASS L1 L5, and BEIDOU B1 B2. Its unique balanced design ensures exceptional RF performance, unaffected by variations in cable length and ground plane. Moreover, its compact form factor enables easy integration into a wide range of products without compromising superior wireless functionality.

This series offers a range of cable lengths and connector options to accommodate diverse application requirements. Additionally, it provides customization options for cable length and connector type to align with specific needs.

Features:

- High precision positioning
- Low Gain for certification friendly
- Omni-directional radiation pattern
- Performance independent of ground plane and cable length

Applications:

- Tracker
- Satellite
- Navigation
- Surveillance
- Agriculture

2.0 General Specification

Part Number	**LK1850301**			
Frequency (MHz)	1176 ±10	1227 ±10	1559-1610	n255
S11 (Return Loss) (dB)	< -8.0	< -9.0	< -10.0	< -5.9
VSWR	< 2.4	< 2.1	< 2.0	< 3.1
Average Efficiency	> 47%	> 58%	> 50%	> 30%
Peak Gain (dBi)	-0.7	1.0	1.2	1.1
Polarization	Linear			
Radiation Pattern	Omni-directional			
Antenna Type	Dipole			
Impedance	50 Ω			
RF Connector Type	LK185030100x		LK185030110x	
	Compatible MHF 1 Plug		Compatible MHF 4 Plug	
Cable Diameter	Ø1.13mm			
Power Rating	5 Watts			
Operation Temperature	-40℃ to +85℃			
Storage Temperature	-40℃ to +85℃			

Notes:

1. The values above are typical performance measured on a PC/ABS plastic plank with a thickness of 1.5mm. All data presented in this document are derived from LK1850301001.
2. When the antenna is placed parallel to the earth's plane, as shown in Figure 2.1.1, the polarization will be horizontal. Conversely, when the antenna is positioned vertically with respect to the earth's plane, as depicted in Figure 2.1.2, the polarization will be vertical. Linear polarization includes Horizontal and Vertical.

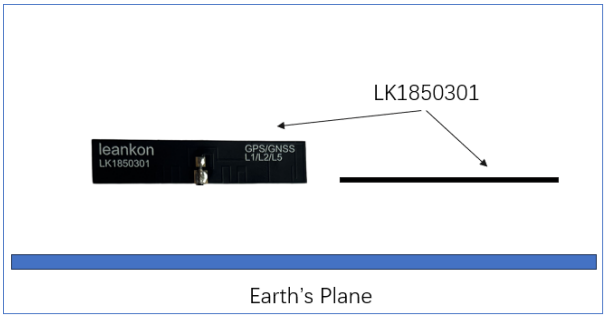


Figure 2.1.1

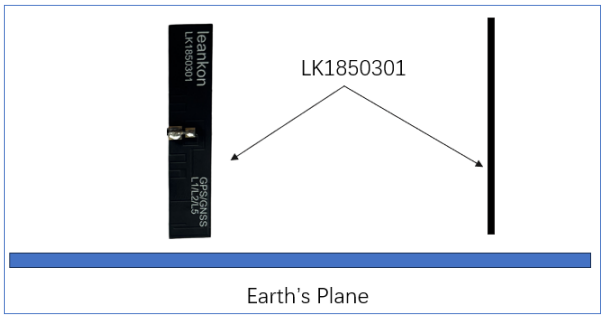
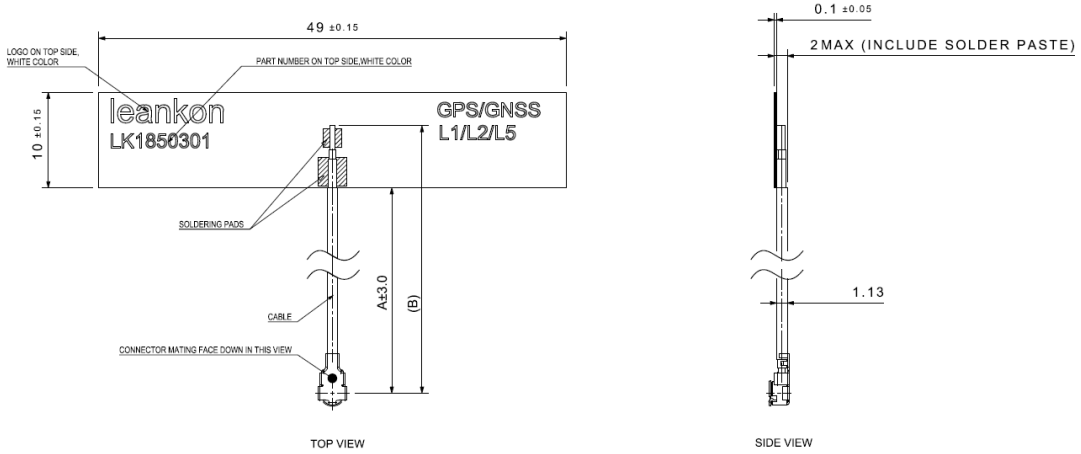


Figure 2.1.2

3.0 Mechanical and Part Number

3.1 Product Dimension



Dimensions: mm

Part Number	Cable length		Connector Type	Cable Diameter	Cable Color
	A	B			
LK1850301001	94mm	100 mm	Compatible MHF1	1.13 mm	Black
LK1850301002	144mm	150 mm			
LK1850301003	194mm	200 mm			
LK1850301004	244mm	250 mm			
LK1850301101	94mm	100 mm	Compatible MHF 4		
LK1850301102	144mm	150 mm			
LK1850301103	194mm	200 mm			
LK1850301104	244mm	250 mm			

3.2 Part Number

A range of cable lengths and connector options are available, as shown below.

Table 1: LK1850301 series part numbers

Part Number	Cable length	Connector Type	Cable Diameter	Cable Color
LK1850301001	100 mm	Compatible MHF1	1.13 mm	Black
LK1850301002	150 mm			
LK1850301003	200 mm			
LK1850301004	250 mm			
LK1850301101	100 mm	Compatible MHF4		
LK1850301102	150 mm			
LK1850301103	200 mm			
LK1850301104	250 mm			

Notes:

1) For information on customizing other cable lengths, cable colors, and connector types, please contact: Info@leankon.com

4.0 Electrical Characteristics

The electrical characteristics are measured on a PC/ABS plastic plank with a thickness of 1.5mm.

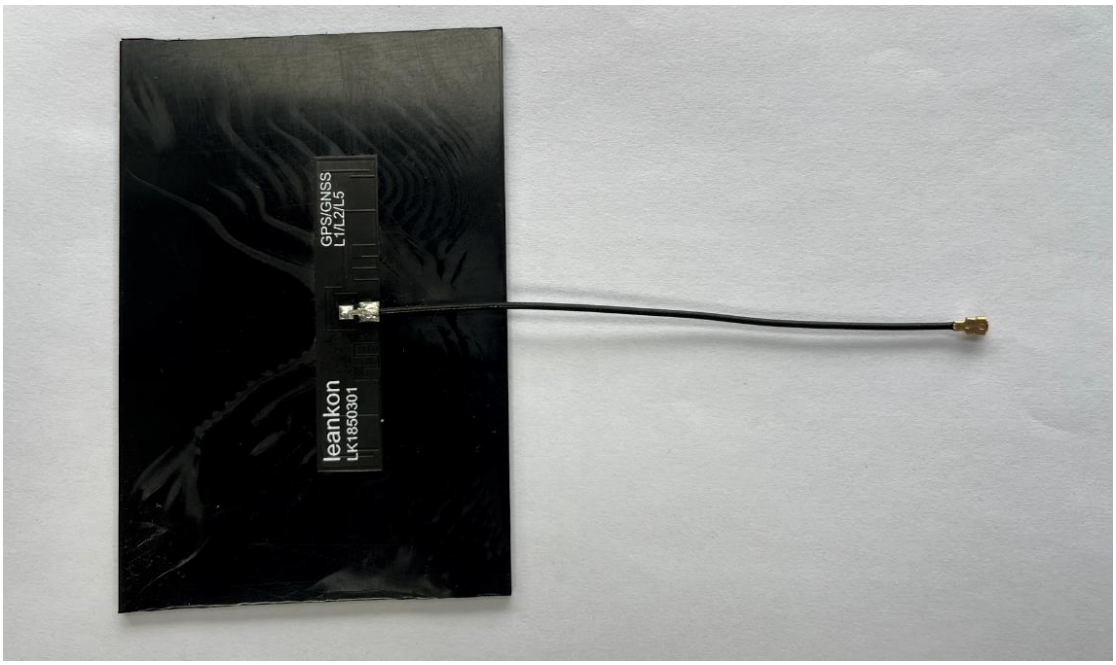


Figure 4.1: The measured plastic plank of LK1850301

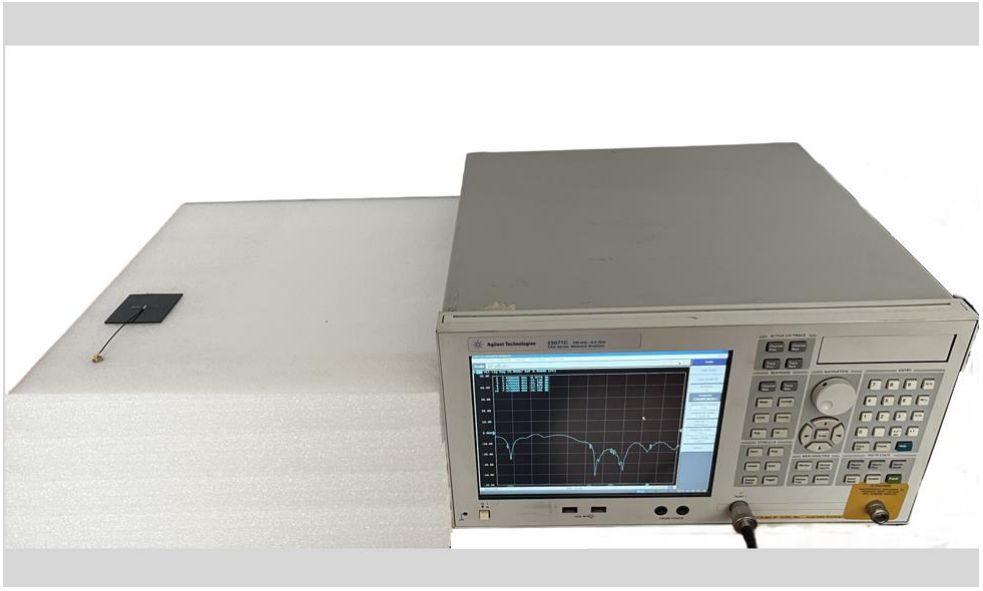


Figure 4.2: The free space test condition of Return Loss and VSWR

4.1 S11/Return Loss

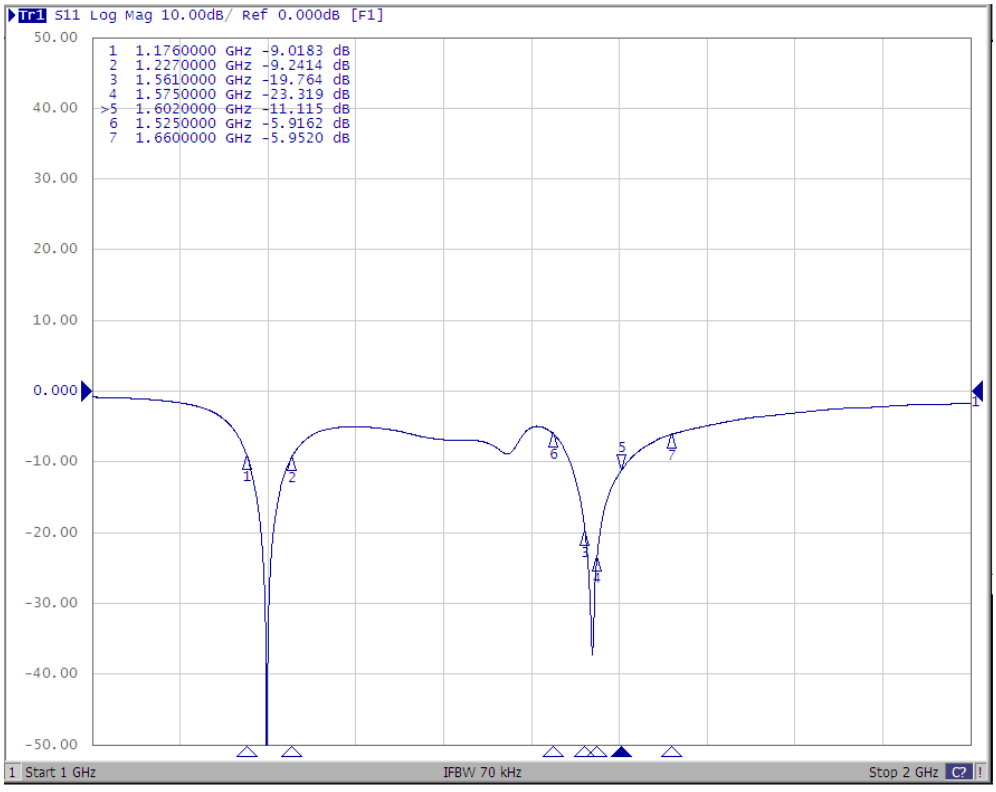


Figure 4.3 S11/Return Loss in free space

4.2 VSWR

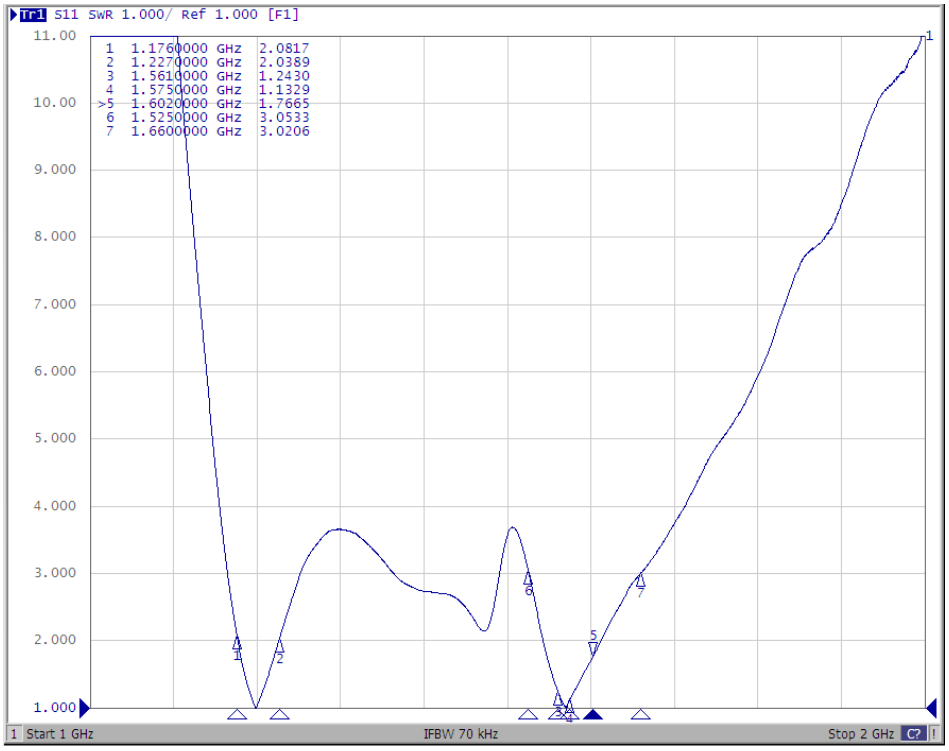


Figure 4.4 VSWR in free space

4.3 Efficiency

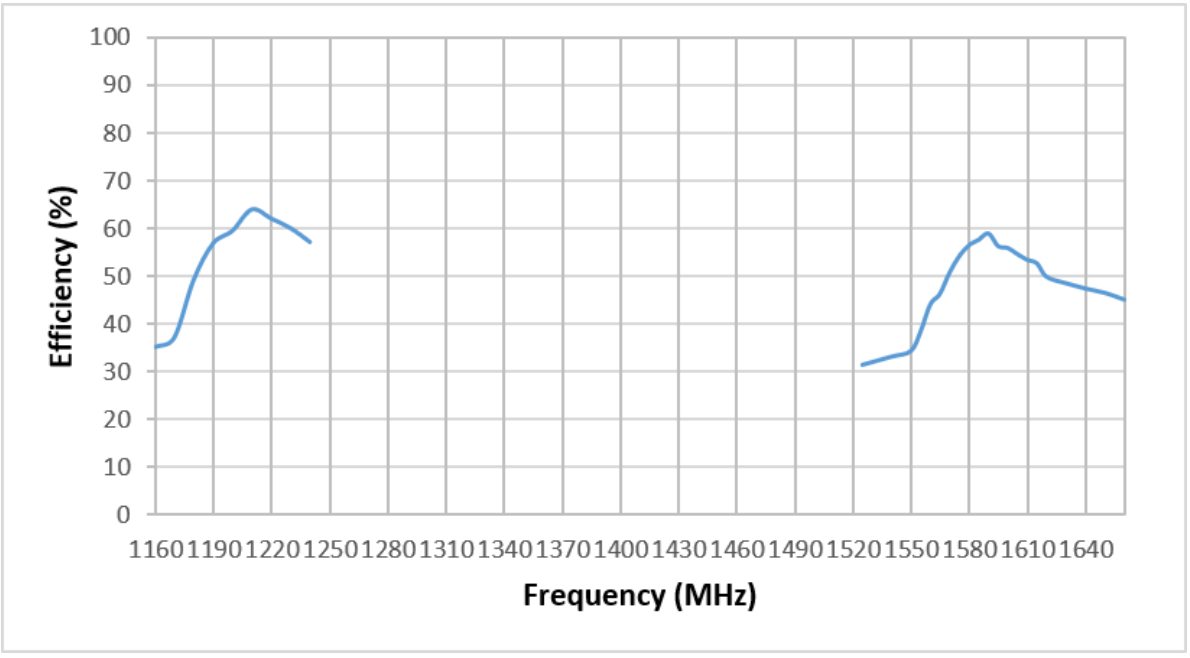


Figure 4.5 Efficiency in free space

4.4 Peak Gain

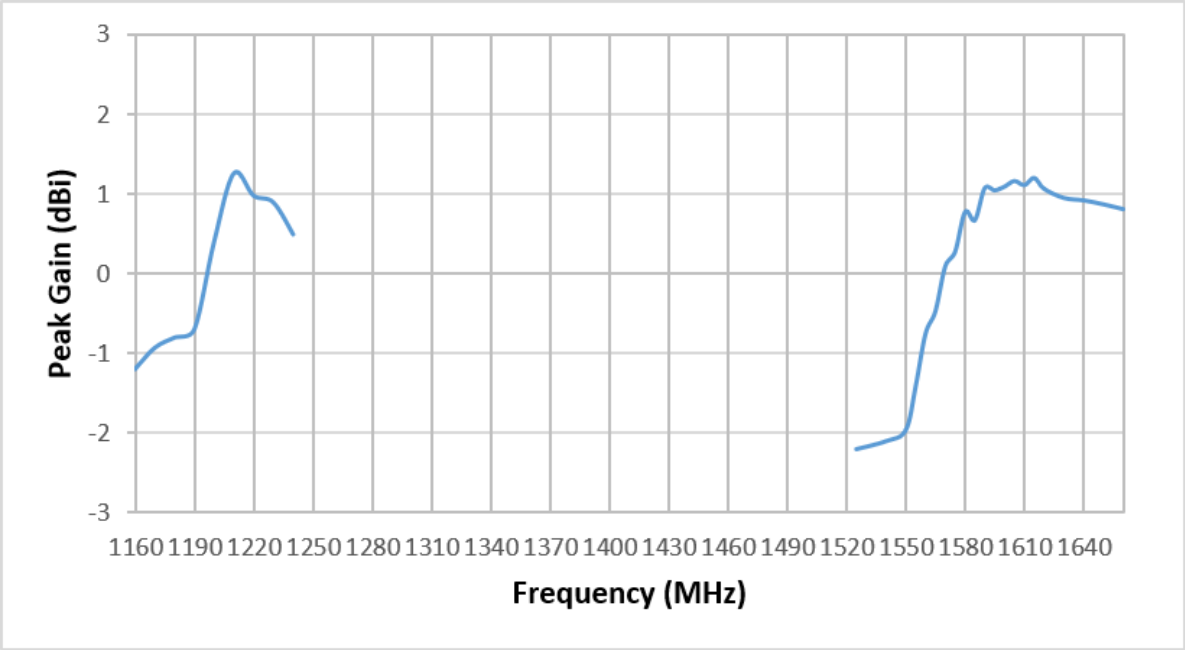
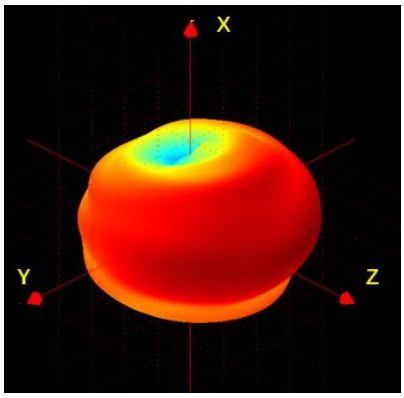


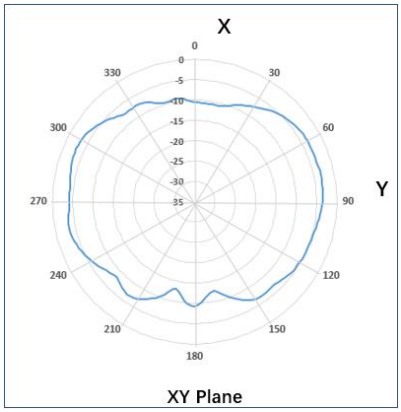
Figure 4.6 Peak Gain in free space

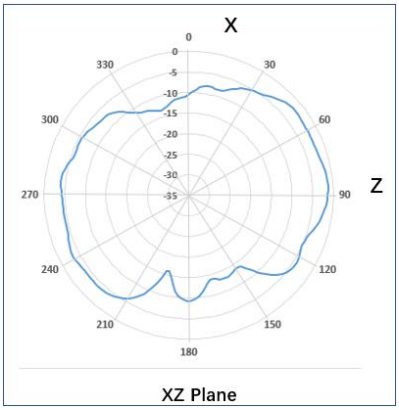
4.5 Radiation Pattern

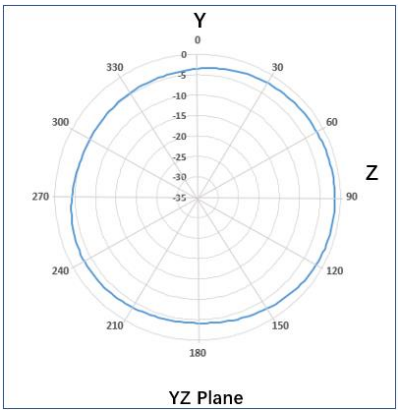
The picture below illustrates the antenna radiation patterns measured in an anechoic chamber.

■ 1176MHz Radiation Pattern

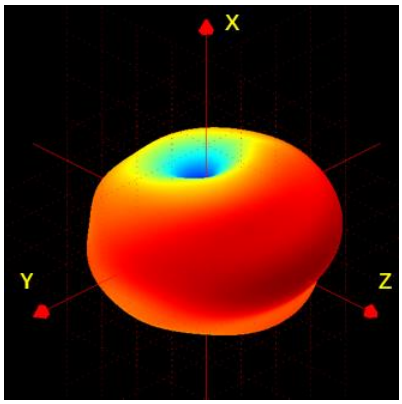


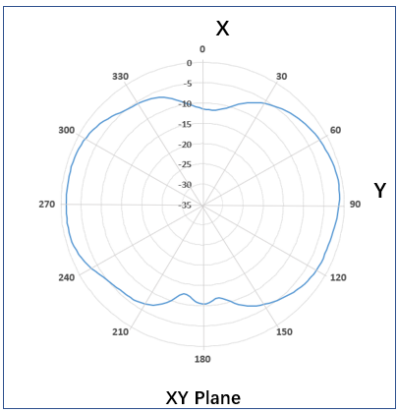


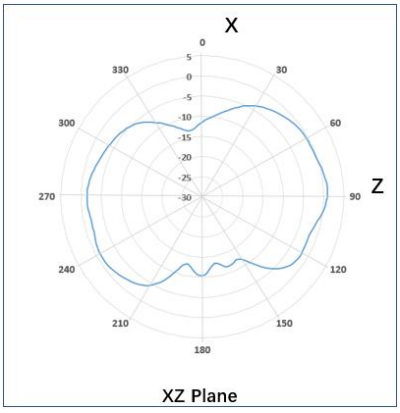


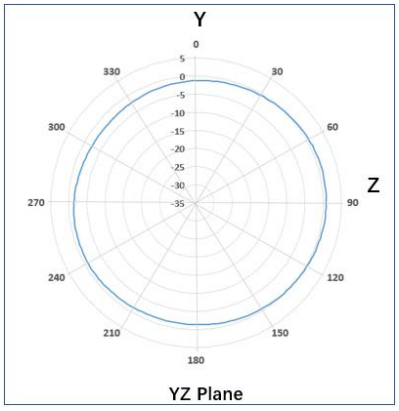


■ 1227MHz Radiation Pattern

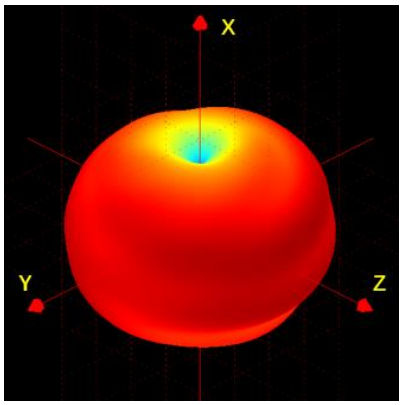


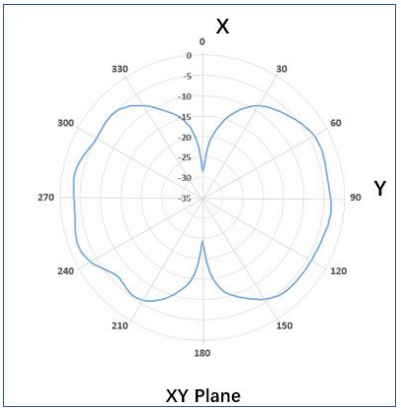


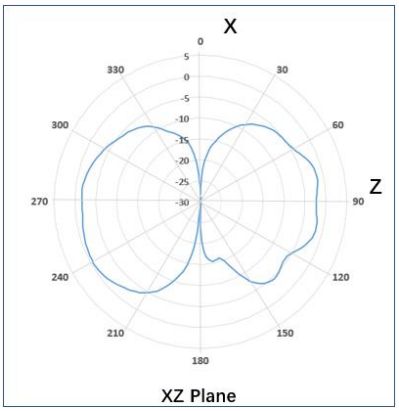


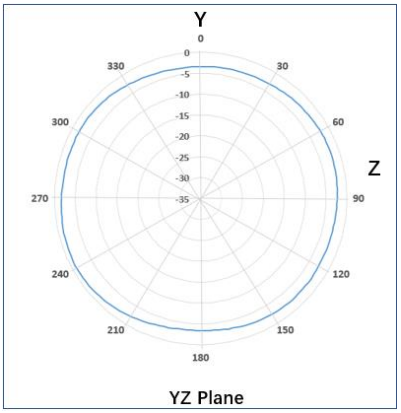


■ 1561MHz Radiation Pattern

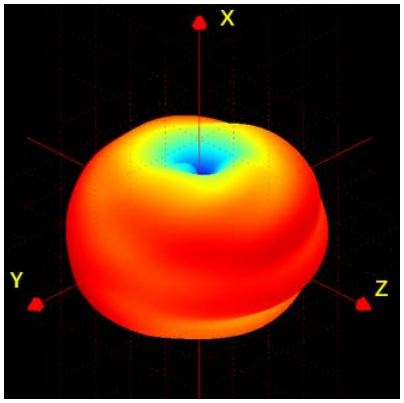


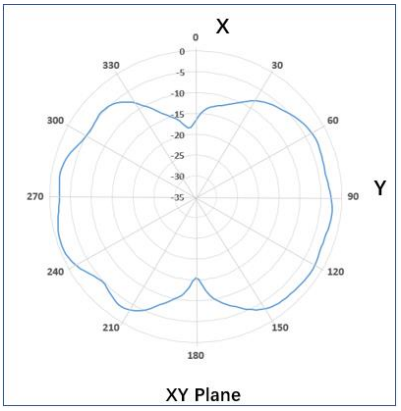


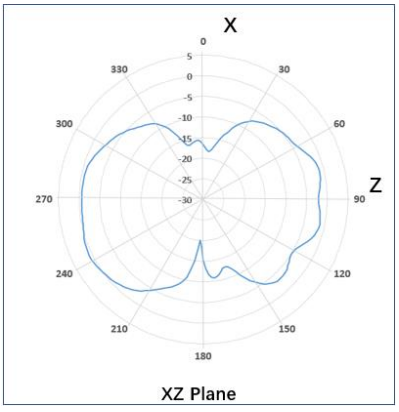


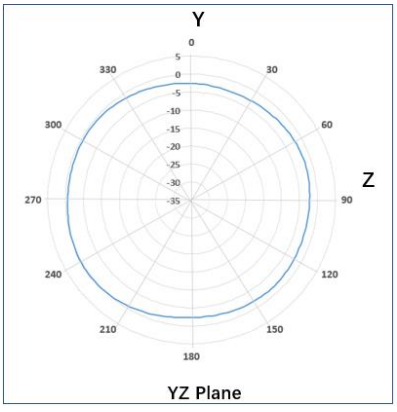


■ 1575MHz Radiation Pattern

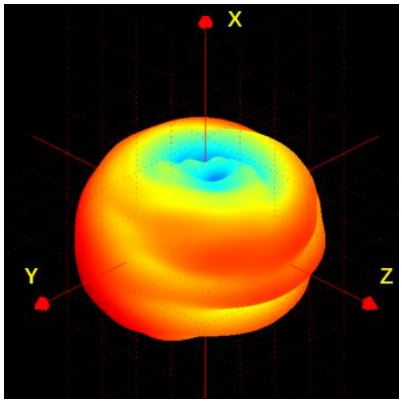


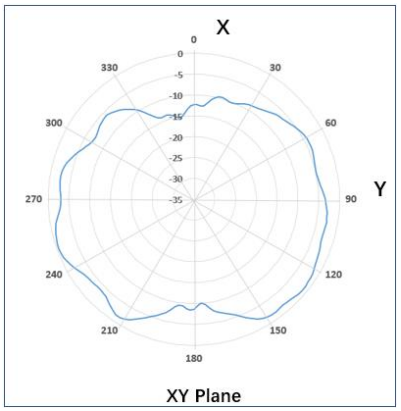


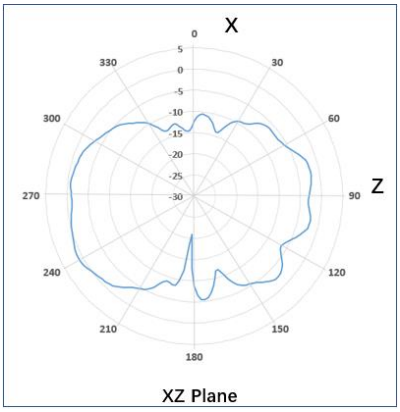


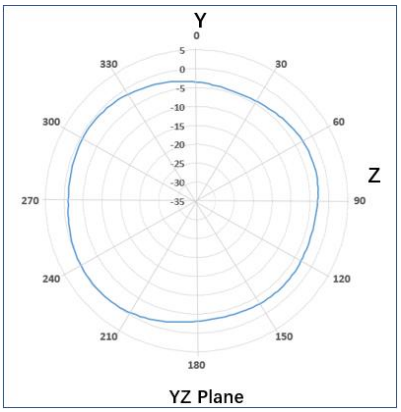


■ **1602MHz Radiation Pattern**









5.0 Application Guides

5.1 Recommended Distance Away from Metallic Structure

To achieve promising antenna performance, a series of applications related to metallic structures will be investigated. Corresponding recommended distances will be provided to maintain good antenna performance despite the presence of surrounding metallic structures, which would otherwise degrade antenna performance.

The blue blocks below represent the metallic structure including PCBA board. For optimal performance, avoid mounting the antenna directly onto metal surfaces; it is designed for plastic mounting. Keep the antenna away from metallic components as far as possible to maximize antenna performance.

Figure 5.1.1: The recommended distance of Scenario 1

Figure 5.1.2: The recommended distance of Scenario 2

Figure 5.1.3: The recommended distance of Scenario 3 (For one side metallic plane)

5.2 Recommended Cable Routing

Below shows the recommended bending distance to minimize the impact on antenna performance from cable routing.

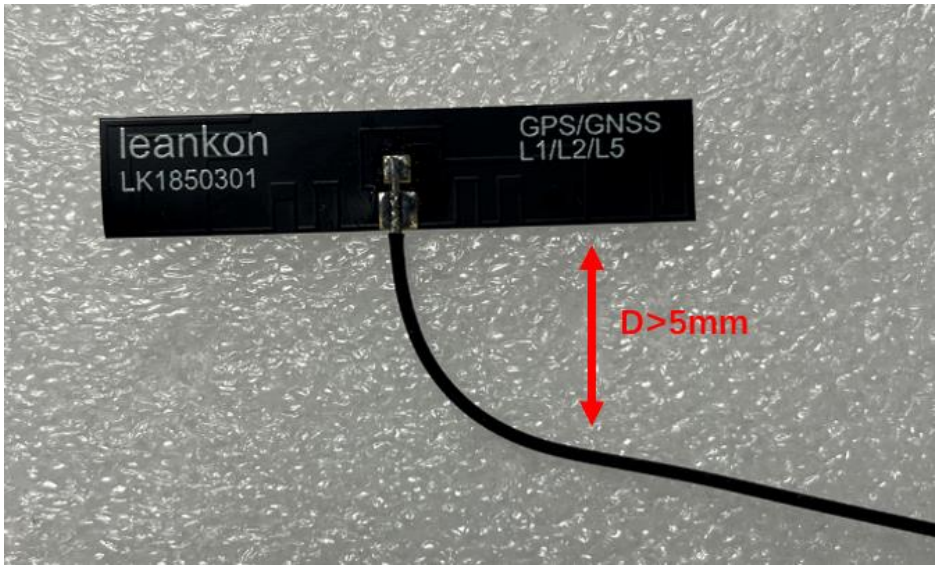


Figure 5.2.1: Recommended Cable Bending Distance

6.0 Matching Network

The LK1850301 series is designed to match 50 Ohm impedance across the operational frequency bands. While it performs well in most applications, in some cases, the antenna impedance may be detuned by surrounding components, leading to suboptimal antenna performance. To address this issue, we advise incorporating a "π" shaped matching network near the RF connector on the PCBA board. Below, you'll find the recommended schematic for the matching network and PCB layout.

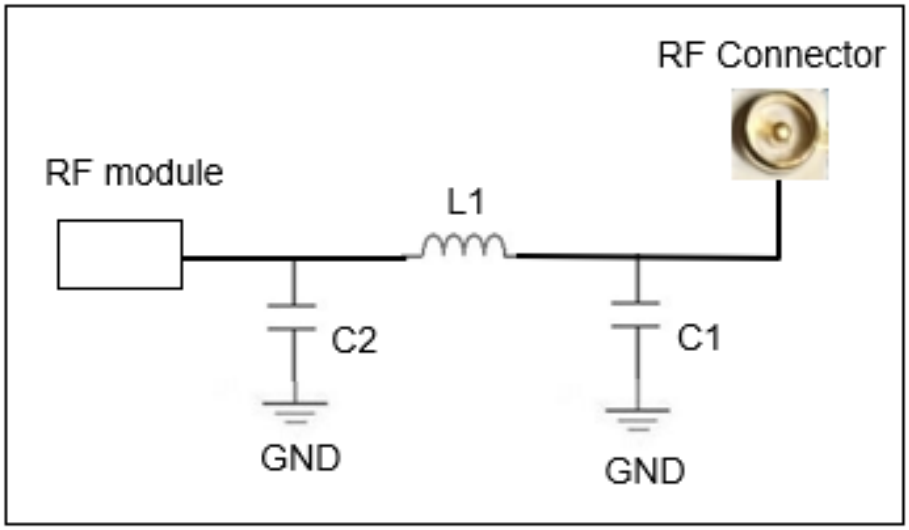


Figure 6.1: The matching circuit schematics

Figure 6.2: The reference PCB layout of matching network

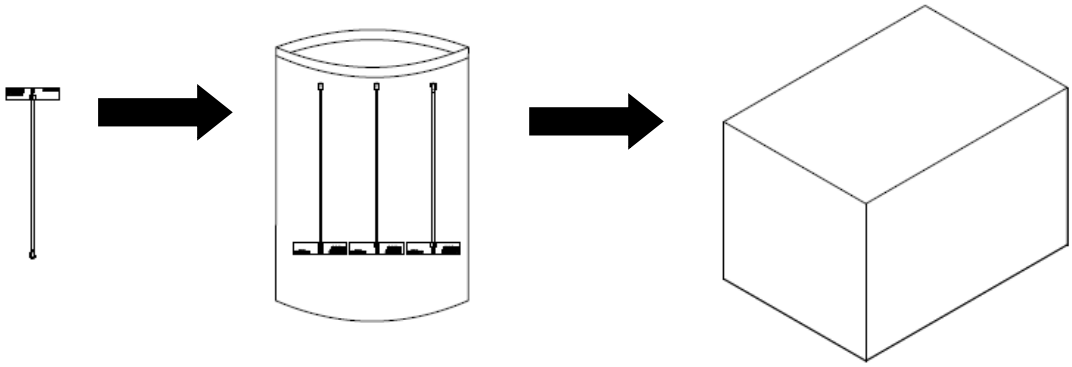
Table 2: Defaulted matching circuit values

Matching circuit	Value	Component size	Part number
C1	NA	0402	Not Applicable
L1	0 Ohm	0402	No Specific
C2	NA	0402	Not Applicable

Leankon offers free technical support to designers in order to streamline the development process, which includes:

a) Early-phase antenna selection and placement recommendations.
b) Antenna PCB layout evaluation and recommendations.
c) Antenna performance evaluation based on actual applications.
d) Matching network optimization in actual devices.
e) Passive antenna parameter measurements in actual devices, such as Return loss,Gain, Efficiency, and Radiation pattern, among others.
f) Active antenna measurements in actual devices, such as OTA (Over The Air) tests for both TRP (Total Radiation Power) and TIS (Total Isotropic Sensitivity) to reduce the certification risks.
g) Leankon also offers the custom design services for specific applications where off-the-shelf products are not suitable.
h) For more information or technical support, please contact info@leankon.com to speak directly with engineering team.

7.0 Packaging



Antenna Bag Box

8.0 Website and Company Address

Website: www.leankon.com
Address: B1337 1F, Building 3, 5018 Hutai Road, Baoshan District, Shanghai China.

9.0 Revision History

Revision	Date	Description	Issued by:
A	2024-03-16	Initial release	Tony Fu
B	2026-06-26	Added 5G NTN n255 band	Tony Fu

NOTE:

Leankon makes no warranties as to the accuracy of the contents addressed in this document and reserves the right to make changes to enhance design or performance without prior notice.
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