



Antenna Specifications

SHENZHEN SUNWAY COMMUNICATION CO., LTD.

MIMOSA Bluetooth Antenna

Revision History

Part Number	1100023240
Description	Engineering Requirements Specification for MIMOSA Bluetooth antenna
Initiated by	Sunway Development Team

Revision	Description	Authored by	Date	Notes
01	MIMOSA Bluetooth Antenna Specification	Yangfulong; Zikang wang;	6/14/2024	Initial version
02	MIMOSA Bluetooth Antenna Specification	Yangfulong; Zikang wang;	6/21/2024	Updated better functional data (A2 Pattern)
03	MIMOSA Bluetooth Antenna Specification	Yangfulong; Zikang wang;	6/25/2024	Updated Antenna Electrical Requirement and packing (A2 Pattern)
04	MIMOSA Bluetooth Antenna specification	Yangfulong; Zikang wang;	6/26/2024	Updated FPC Layout.(A2 Pattern)
05	MIMOSA Bluetooth Antenna specification	Yangfulong; Zikang wang;	7/26/2024	POC2 updated B1 version pattern to adjust frequency offset
06	MIMOSA Bluetooth Antenna specification	Yangfulong; Zikang wang;	8/21/2024	POA updated to C12 version pattern to improve passive efficiency
07	MIMOSA Bluetooth Antenna specification	Yangfulong; Lidaoyong;	10/17/2024	1.Update BT antenna Electrical Requirements 1.1_ASM information 2.Add Antenna 2D radiation direction diagram.



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08	MIMOSA Bluetooth Antenna specification	Yangfulong; Lidaoyong;	11/15/2024	1.Update the release film shape
09	MIMOSA Bluetooth Antenna specification	Yangfulong; Lidaoyong;	12/11/2024	1.Update the Film package
10	MIMOSA Bluetooth Antenna specification	Yangfulong; Lidaoyong;	03/02/2026	1.Update the PN information on Page 10

MIMOSA Bluetooth Antenna

BUILD LEVEL: SP

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1.1 Bluetooth Antenna Electrical Requirements

- _ASM
 - Covers BLE bands
 - Antenna type: PIFA
 - Antenna directional characteristics: Omnidirectional antenna
 - Antenna polarization characteristics: Linear polarization
 - Antenna connection type: Metal spring connection
 - $S_{11} < -10\text{dB}$
 - Antenna Passive Efficiency $\geq 20\%$
 - Antenna Passive Peak gain $< 2\text{dBi}$
 - MAX communication range $\geq 10\text{m}$ ($0^\circ, 90^\circ, 180^\circ, 270^\circ, 360^\circ$)
 - Manufacturer: Sunway
 - Testing organization: Sunway
-
- Passive for mass production machines

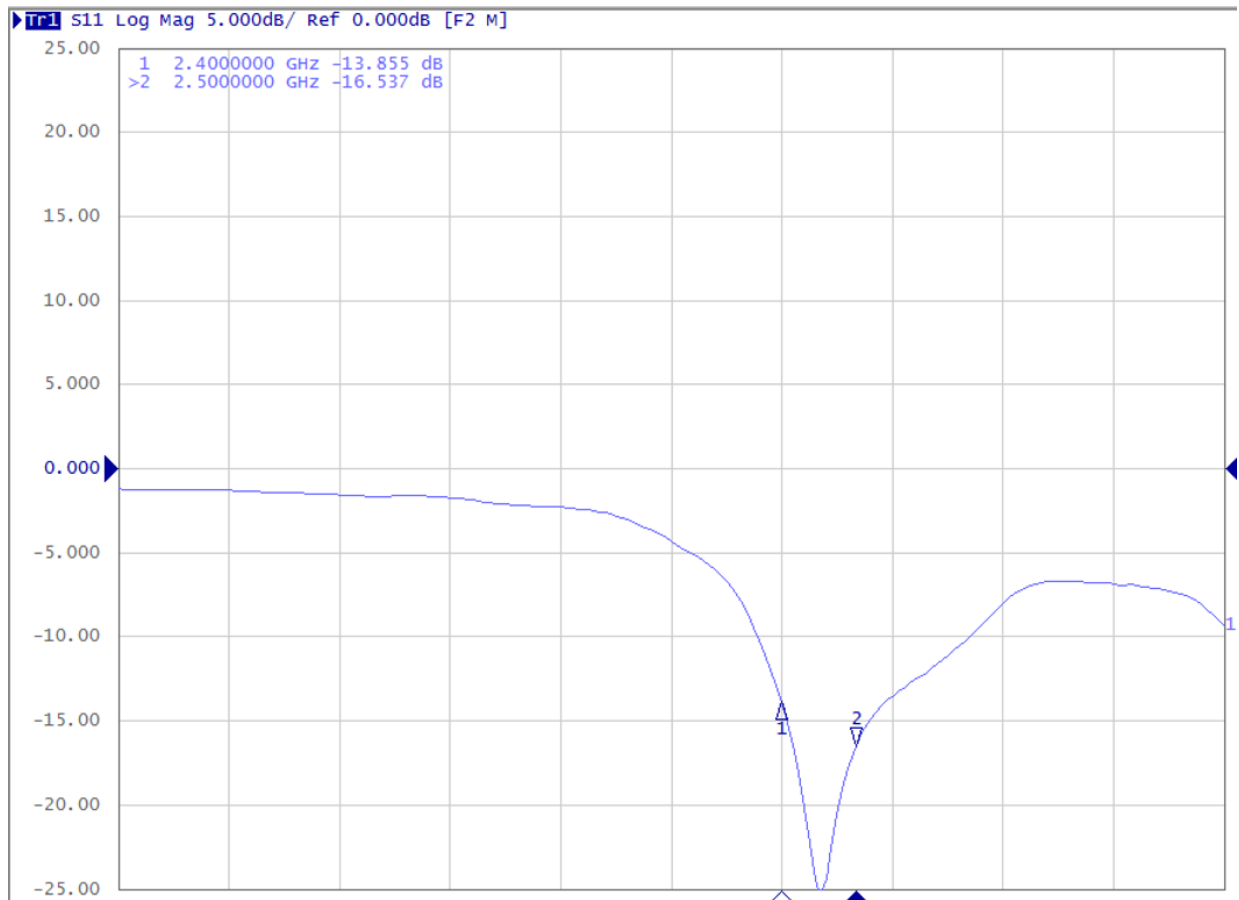


- Return loss measurements(S_{11}) were performed using Agilent E5071C Network Analyzer and the previously described test fixture. The testing was performed in free space.



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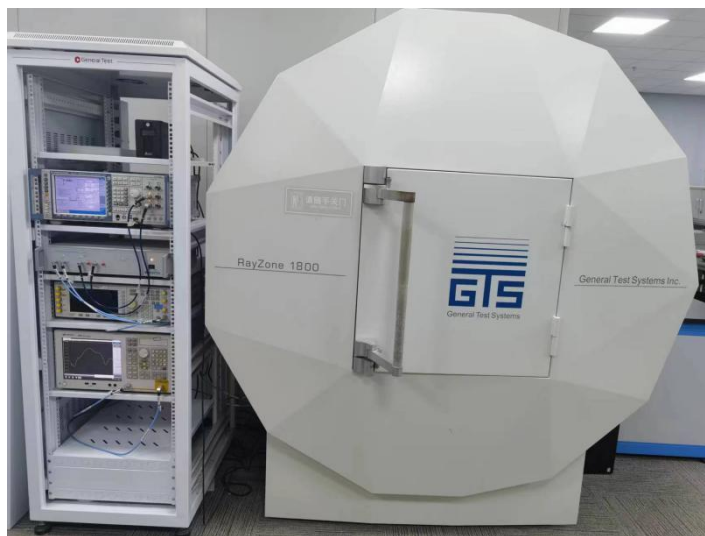
S11 (dB)	Bluetooth	
	2400	2500
FPC Antenna	-13.9	-16.5

- The gain and efficiency of the antenna was measured in the GTS1800 darkroom.



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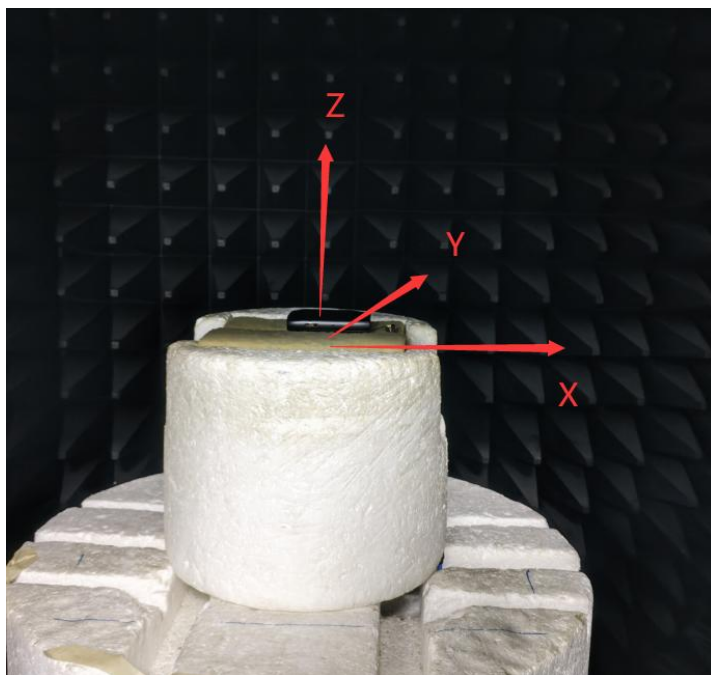
Freq (MHz)	FPC-Efficiency(%)
2400	25.92
2410	27.06
2420	27.05
2430	26.57
2440	26.93
2450	26.36
2460	25.7
2470	25.20
2480	24.75
2490	24.12
2500	23.59
AVG	25.75



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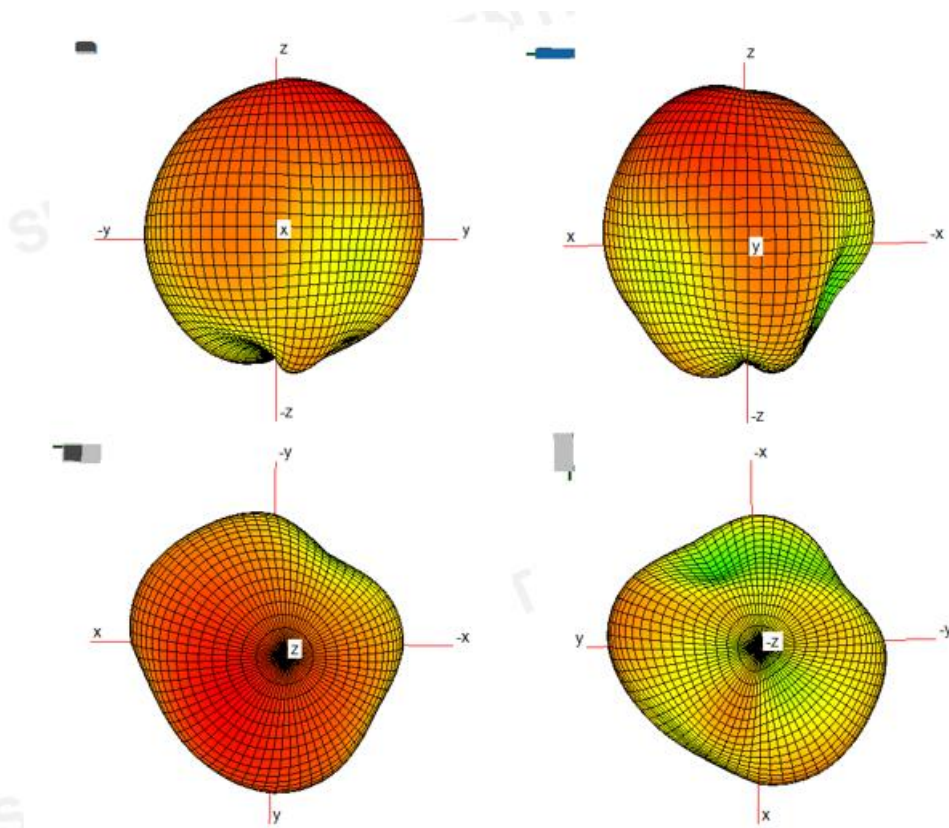
Freq (MHz)	MAX Gain
2400	-0.29
2410	-0.05
2420	-0.02
2430	-0.10
2440	-0.02
2450	-0.08
2460	-0.23
2470	-0.35
2480	-0.46
2490	-0.62
2500	-0.78
AVG	-0.27



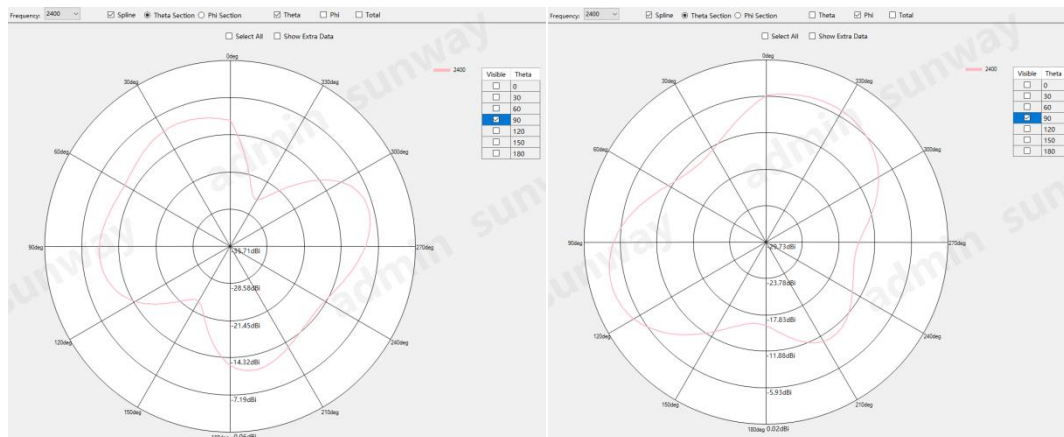


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3D radiation direction (2450MHz)

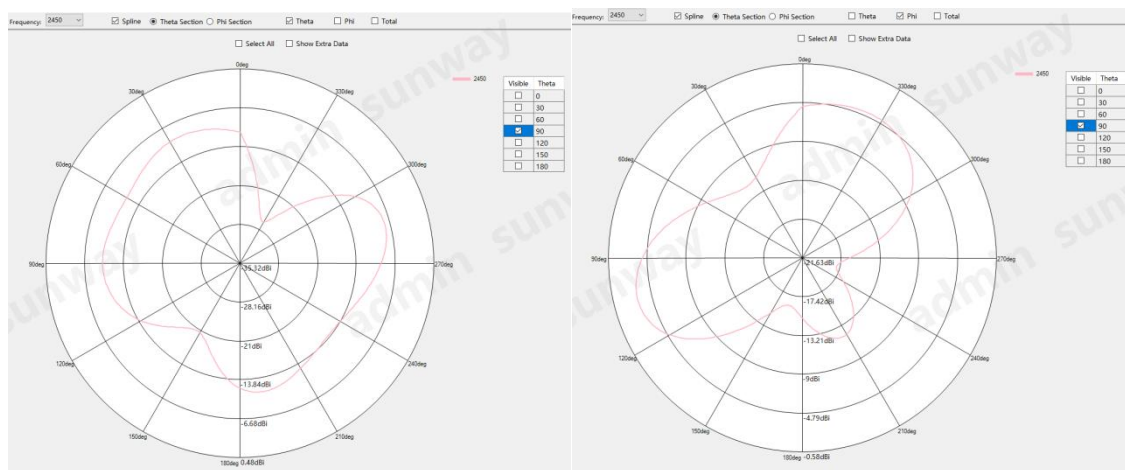


2D radiation direction (2400MHz, Max Gain=-0.29 dBi)

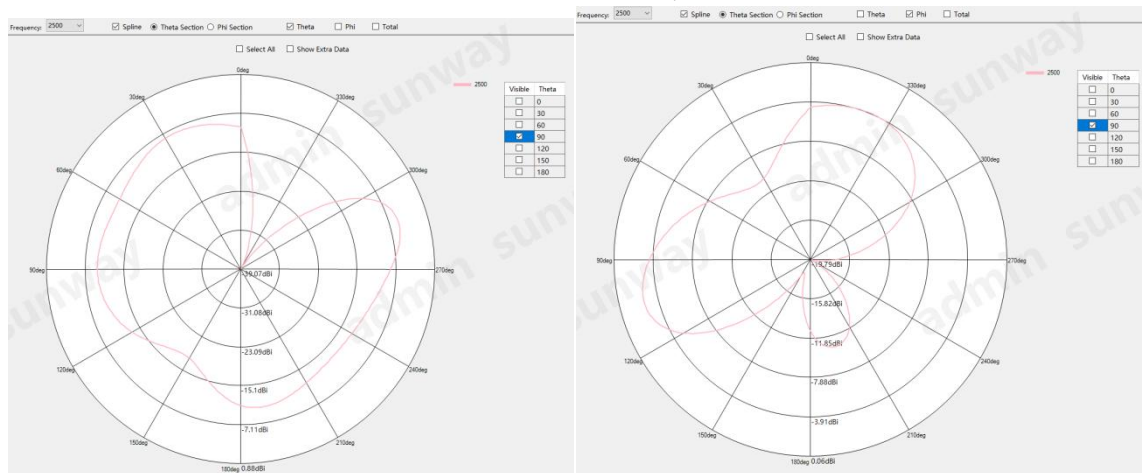


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2D radiation direction (2450MHz, Max Gain=-0.08dBi)

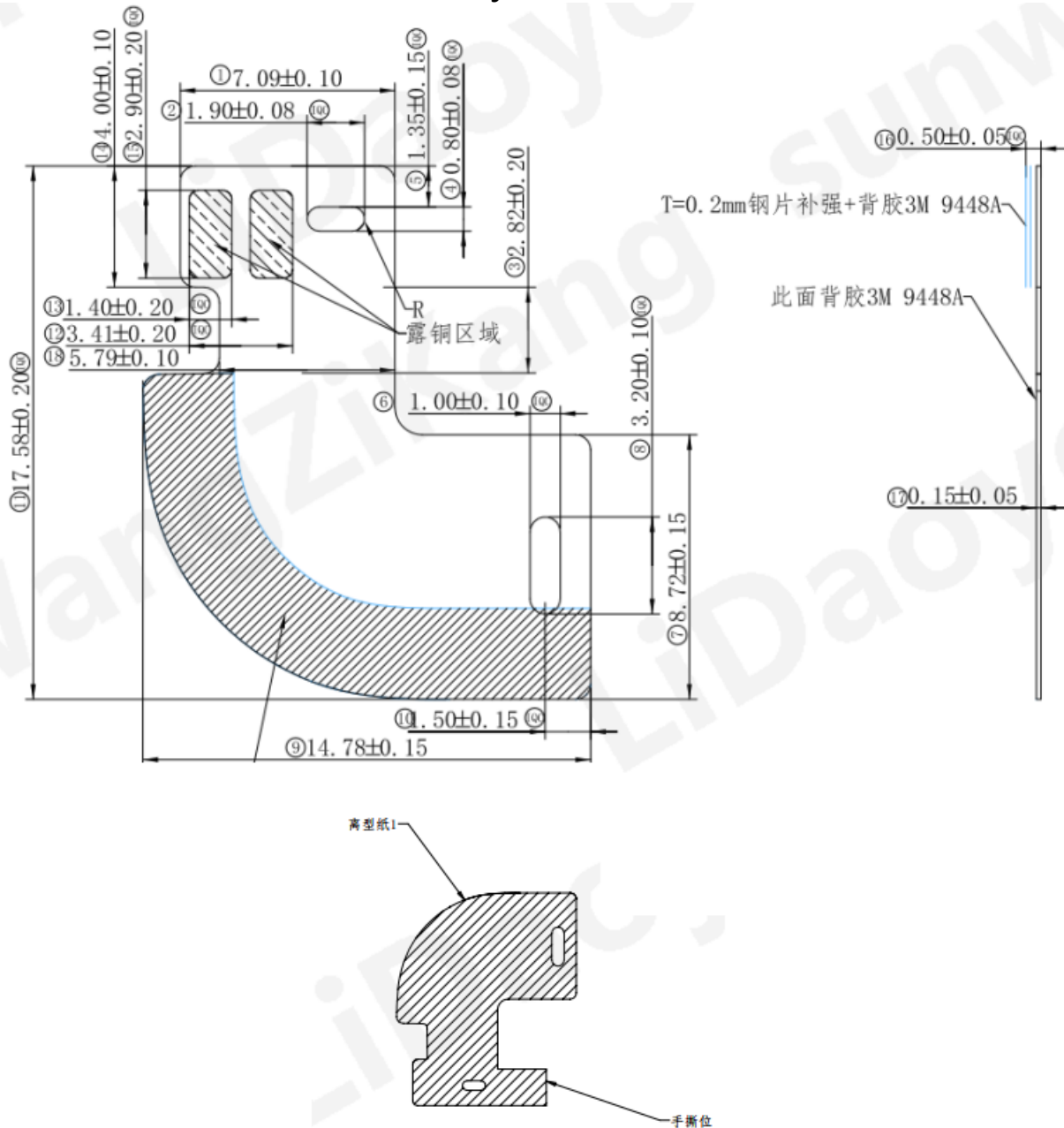


2D radiation direction (2500MHz, Max Gain=-0.78 dBi)



2 Mechanical Requirements

2.1 For the Mechanical Layout 2D and 3D file





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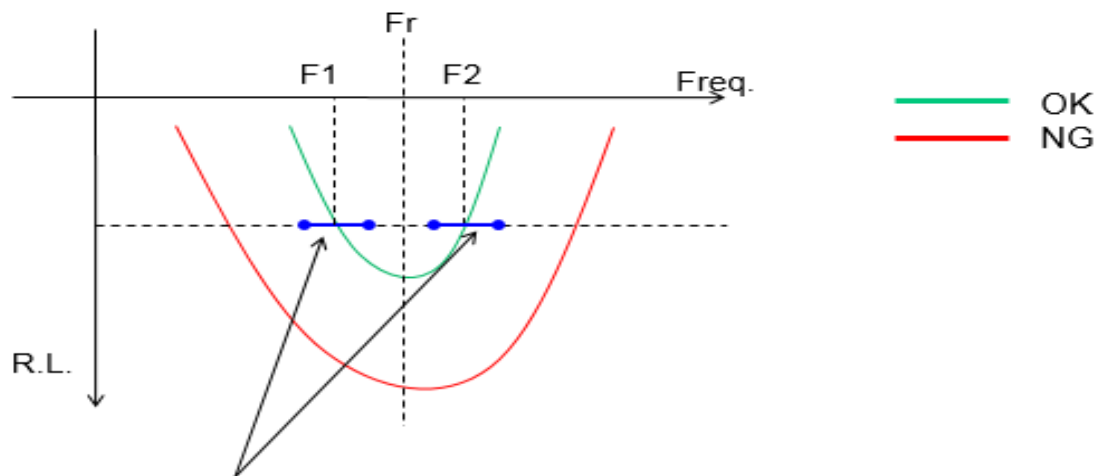
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10	Stiffener AD liner	Blue PET;T=0.05mm		
9	Stiffener adhesive	3M 9448A;T=0.15mm		
8	Stiffener	SUS304;T=0.20mm		
7	Stiffener AD	T=0.03mm		
6	Bottom adhesive	3M 9448A;T=0.15mm		
5	FCCL Base	Cu<RA18um>+AD<13um>+PI<12.5um>		
4	FCCL Copper			
3	TOP Coverlay	coverlay <27.5um>,yellow		
2	Top PAD	Plating Ni:3-8um,Au:min 0.05um	-----	
1	Silkscreen	White;T=15um	-----	
No. 序号	Layer 层别	Description(Thickness) 规格描述	Manufacture 制造商	Remark 备注

Document Description	PN
MIMOSA-Bluetooth Antenna	1100023240

3 Bluetooth Antenna Test Setup

- Antenna supplier (Sunway)
 - Stand alone bottom antenna in the RF test fixture is matched near a LB frequency (2400MHz)
 - Antenna return loss is measured using a VNA
 - Markers around target frequency are set to target RL
 - +/-20MHz < 1GHz
 - +/-30MHz > 1GHz



Set limits of F1 and F2
It is "Pass" in case the curve crosses the both blue lines.

- Test limits: +/-30MHz

4 Quality Control Requirements

1. Measure return loss (S11), and record the data. The pass or fail based on the OQC approved test limit.
2. OQC should include but are not limited to the following items: cosmetic, dimension, functionality according SIP.

5 Reliability Requirements

Reliability Test for Lower Antenna			
No	Item	Condition	Quantity
1	High Temperature High Humidity	60°C/95% RH, 96 hrs	5 pcs
2	Thermal Cycling (Non Operational)	-0 °C @30 mins/70 °C @30 mins,96 cycles,(non operational)	5 pcs
3	Salt Fog	ASTM B117 (Non Operational) 1 cycle = Expose 24 hours and dry at room temperature for 24 hours.	5 pcs



6. Packaging, Storage and Shipping requirements

1. Parts are to be stored under environmental controlled conditions (Temperature/ Humidity)
2. Packaging materials shall not generate particles, outgas, or deposit significant ions.
3. Parts to be packed so as to prevent damage in shipment and handling.
4. Boxes must be labeled with part number, rev level, lot number, date, supplier name, quantity, and proper bar codes. External labels must include traceability back to piece part identification.
5. Outer Packaging must pass the vibration and drop test stated in the reliability test plan.

Film package

