



2.4GHz Remote Control PCB Antenna Specification

SHENZHEN SHINETEK TECHNOLOGY

深圳芯耀科技

High-Efficiency, Compact On-Board Antenna Solutions.

2.4G ISM Band

Optimized specifically for remote control and IoT telemetry.

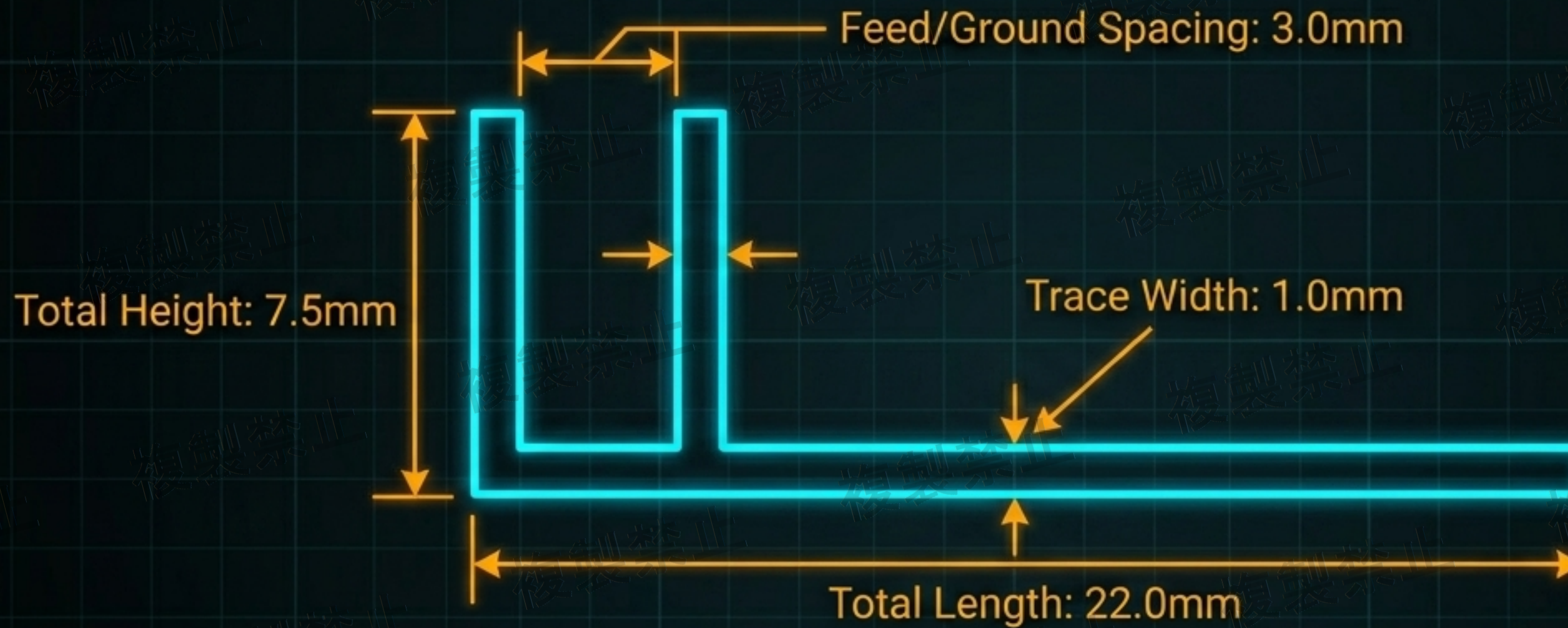
22.0mm × 7.5mm

Highly compact, L-shaped trace footprint minimizing board real estate.

1.50 dBi
Peak Gain

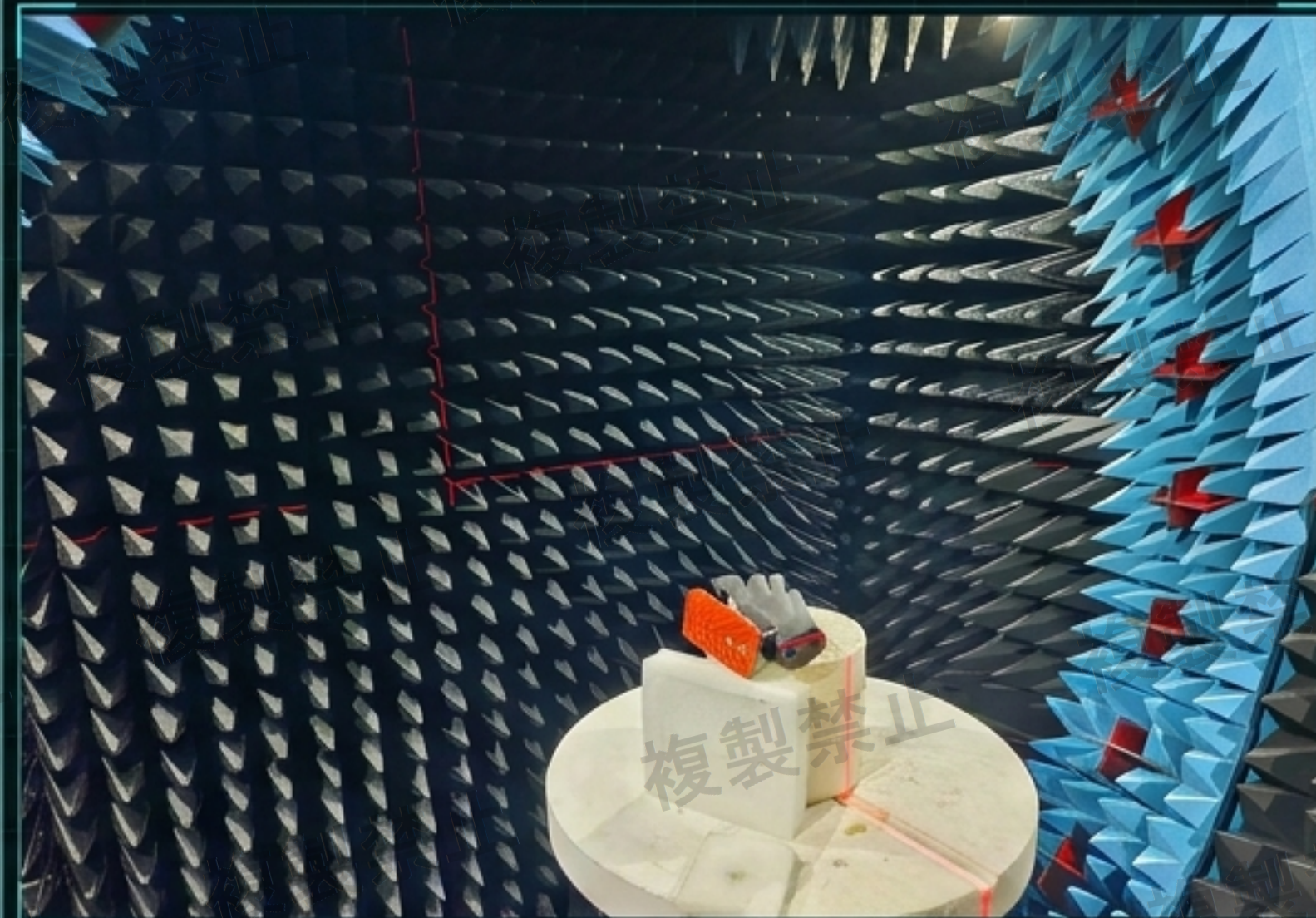
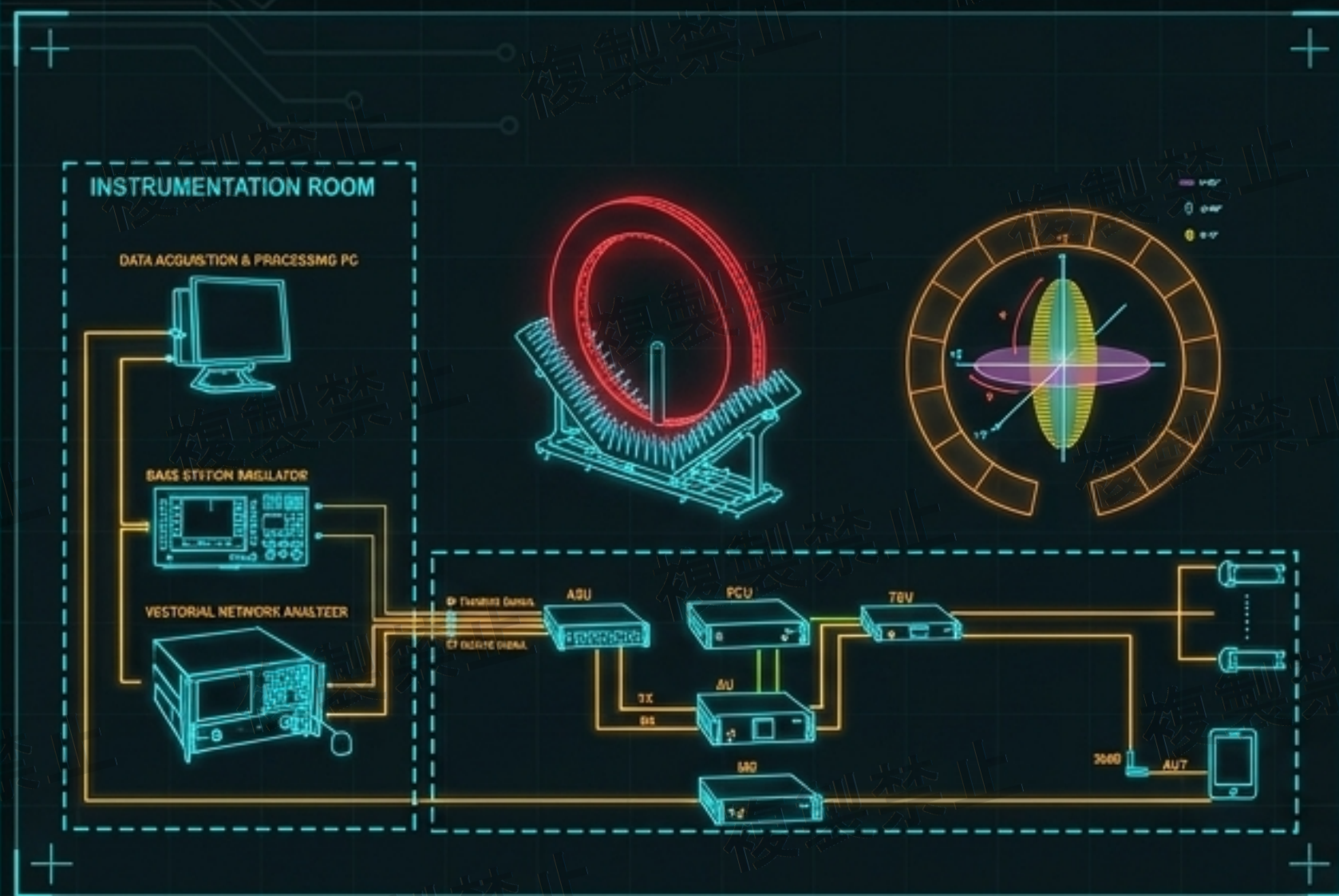
Consistent >50% efficiency across the operating band, ensuring robust RF penetration.

Precision Physical Layout



Minimal clearance area required, ensuring flexible routing for high-density controller boards.

Rigorous OTA Measurement Environment

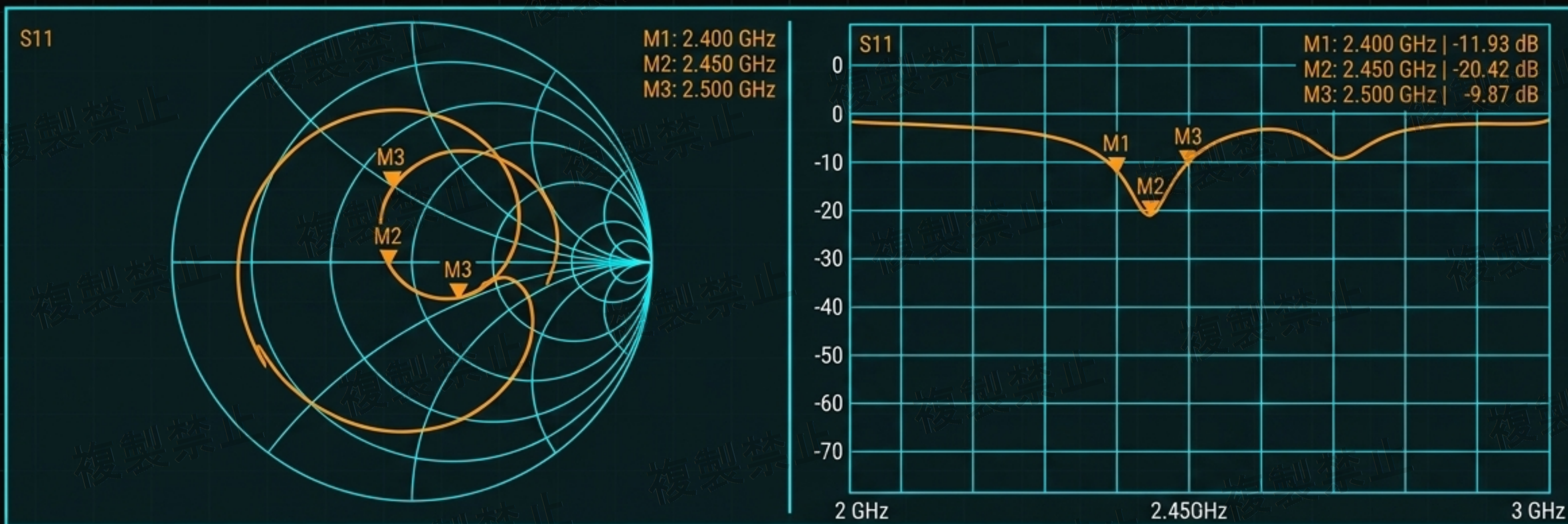


Test System: SY-24 Multi-Probe OTA Measurement System (0.4-8.5GHz)

Instrumentation: Agilent E5071B Network Analyzer / R&S CMW500

Environment: Fully Anechoic Chamber ensuring zero RF interference and precise 3D spatial mapping.

Stable Transmission: Return Loss & VSWR



Data Extraction Matrix

@ 2.400 GHz (M1):

S11 = -11.93 dB | VSWR = 1.67

@ 2.450 GHz (M2):

S11 = -20.42 dB | VSWR = 1.21

@ 2.500 GHz (M3):

S11 = -9.87 dB | VSWR = 1.94

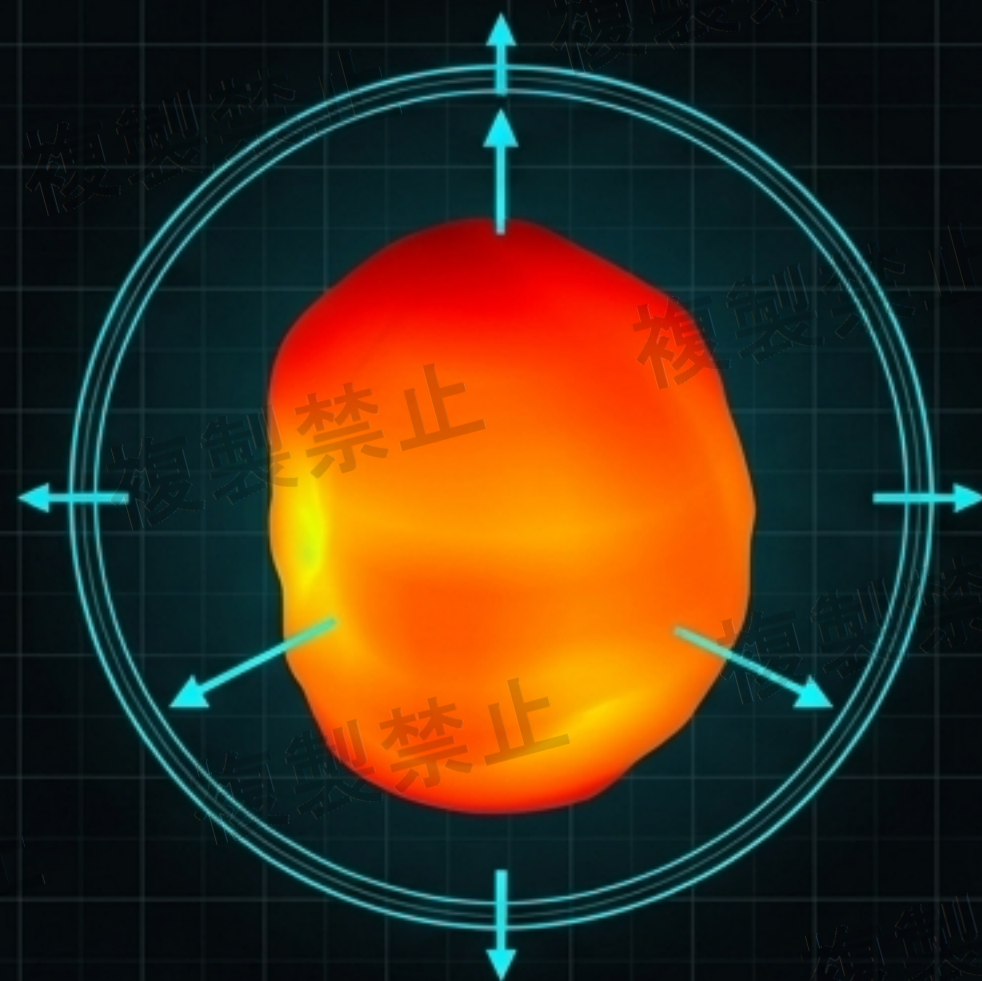
S11 parameters demonstrate deep resonance centered perfectly within the operating band (2.45GHz), paired with optimal impedance matching on the Smith Chart to eliminate signal reflection and maximize power transfer.

Passive Test: Efficiency & Gain Optimization

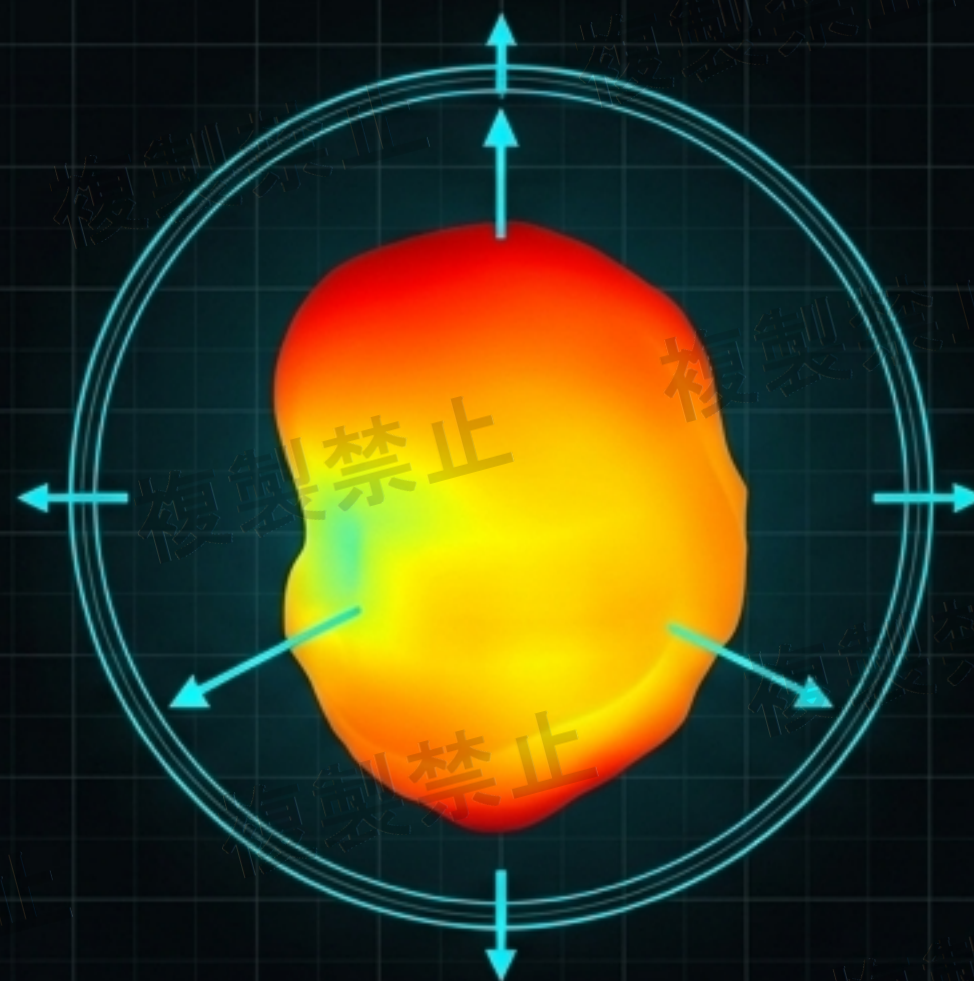
Peak Gain: 1.50 dBi (@ 2440MHz) | Peak Efficiency: 55.82% (@ 2410MHz)

Frequency (MHz)	Gain (dBi)	Efficiency (%)	Efficiency (dB)
2400.00	1.07	53.40	-2.72
2410.00	1.03	55.82 Peak Efficiency	-2.53
2440.00	1.50 Peak Gain	53.31	-2.73
2450.00	1.31	53.50	-2.72
2500.00	0.38	48.48	-3.14

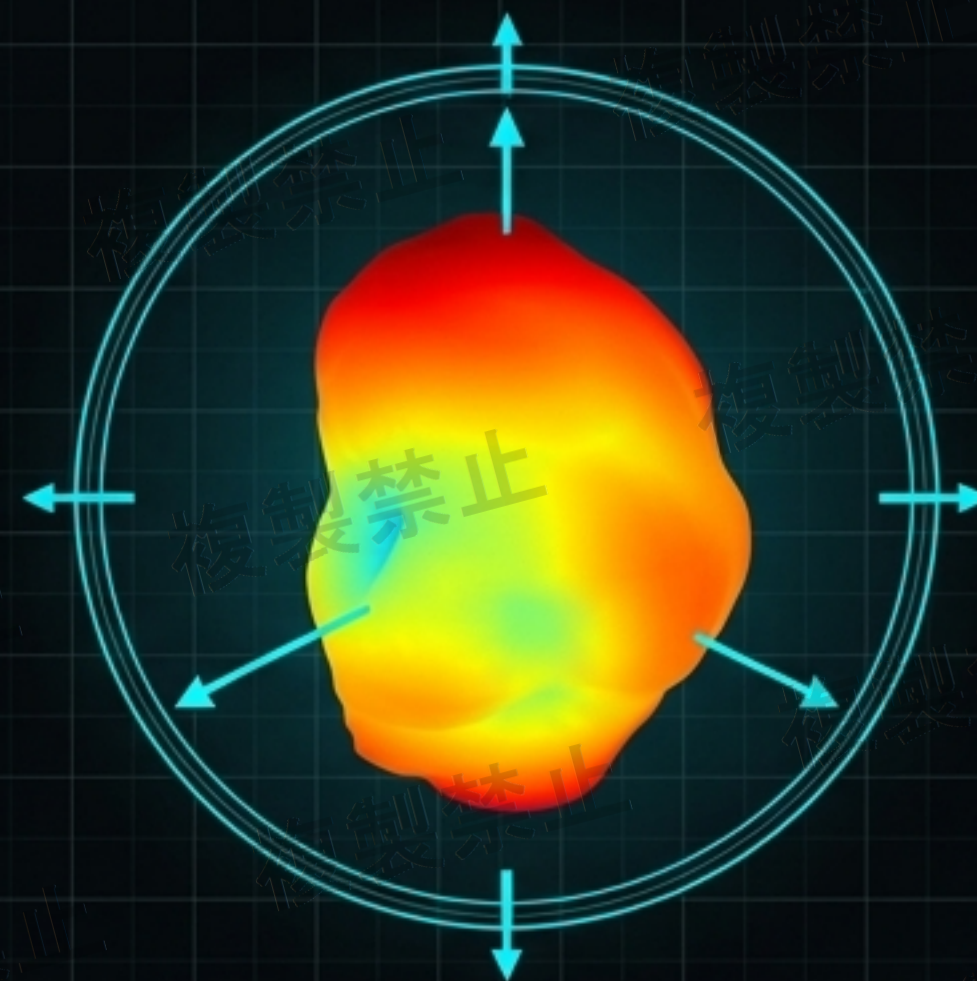
Omnidirectional 3D Radiation Patterns



2400 MHz



2450 MHz



2500 MHz

The 3D thermal maps display uniform, class-leading omnidirectional characteristics. This guarantees reliable telemetry for remote control applications, preventing signal drop-out regardless of user grip angle or dynamic device orientation.

2D Directional Diagram Matrix

2400 MHz

$\Phi=0^\circ$



$\Phi=90^\circ$



$\Theta=90^\circ$



2450 MHz

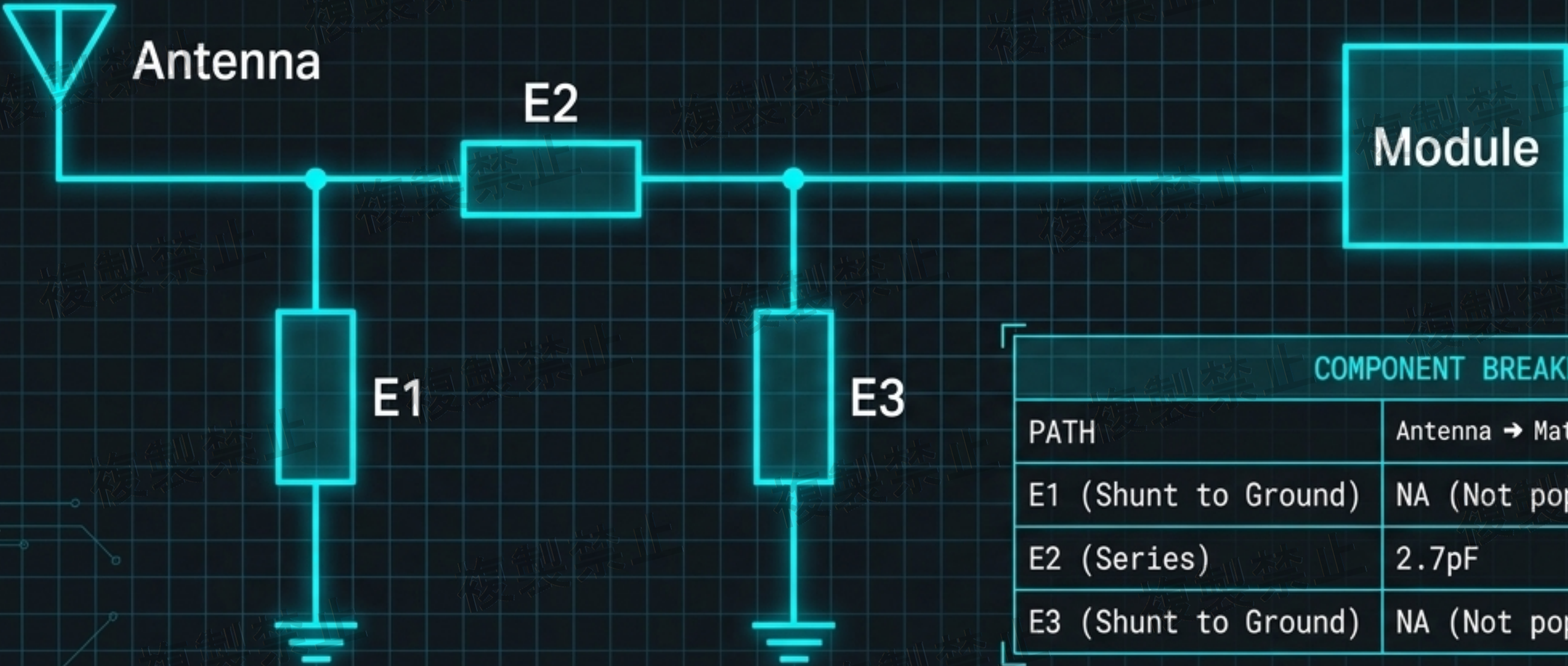


2500 MHz



Uniform spatial coverage validated systematically across all primary axes, confirming zero severe nulls in the operatic

Hardware Integration: Recommended Matching Circuit



COMPONENT BREAKDOWN	
PATH	Antenna → Matching Network → RF Module
E1 (Shunt to Ground)	NA (Not populated)
E2 (Series)	2.7pF
E3 (Shunt to Ground)	NA (Not populated)

Optimized matching values provided for immediate schematic implementation. Reduces required engineering tuning time and accelerates time-to-market.

Core Technical & Physical Parameters

[Mechanical & Physical]

Type:

Onboard PCB Antenna
(L-Shape)

Dimensions:

22.0mm × 7.5mm

Trace Width:

1.0mm

Trace Spacing:

3.0mm

[RF & Electrical]

Frequency:

2.4GHz ISM Band
(2400-2500MHz)

Peak Gain:

1.50 dBi

Peak Efficiency:

55.82%

Radiation Type:

Omnidirectional

Matching Network:

Series 2.7pF

SHENZHEN SHINETEK TECHNOLOGY

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Contact us for complete engineering Gerber files and technical integration guidance.