



# 承认书

## SPECIFICATION FOR APPROVAL

客户 Customer: 龙辉

品牌 Brand: 启元

品名 Description: 2.4G 波浪形天线

规格/型号

Specification

/part no: 外置天线/50 Ω /2.4-2.5GHz/3.0dBi@2.4G/黑色波浪形天线

日期 Date: 2023.10.28

备注 Remark:

承认签章后请回复一份（或复印件）给我司，其余由贵公司留作存档。如果在签章的承认书（或复印件）回复给我司之前，下了有关此规格产品的订单且又无特别说明，那么我司就确定贵司已完全承认了。Please return one specification or one copy of it with your chop and signature of approval and retain the others for your record. In the event of an order being placed for this part number before the chop and signed with specification (or copy) is returned and without special explanation, it will be assumed that full approval have been given.

客户签字盖章:

拟制/日期 CHECKED/DATE	审核/日期 AUDITOR/DATE	批准/日期 APPROVED/DATE



# 规 格 书

客户料号

Customer P/N:

规格描述

Specification: 外置天线/50 Ω /2. 4–2. 5GHz/3.0dBi@2.4G/黑色波浪形形天线

品名 Description: 2.4G 波浪形天线

供应商 Supplier: 启元

生产商 Producer: 启元

备注 Remark:

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拟制/日期 CHECKED/DATE	审核/日期 AUDITOR/DATE	批准/日期 APPROVED/DATE
Zhang Bingxiang 2023.10.28	Wu Qianjin 2023.10.28	Luo Daxun 2023.10.28



## 天线照片 (Picture) :



(图片仅供参考, 以图纸为准)

## 电气参数 (Electrical parameters) :

<b>Frequency</b> 频率范围	2.4~2.5GHz
<b>Impedance</b> 特性阻抗	50Ω
<b>S.W.R.</b> 电压驻波比	≤2.0
<b>Antenna Gain</b> 增益	3.0dBi±0.5@2.4GHz
<b>Polarization</b> 极化形式	垂直极化
<b>Return Loss</b> 回波损耗	-9.2dB MAX

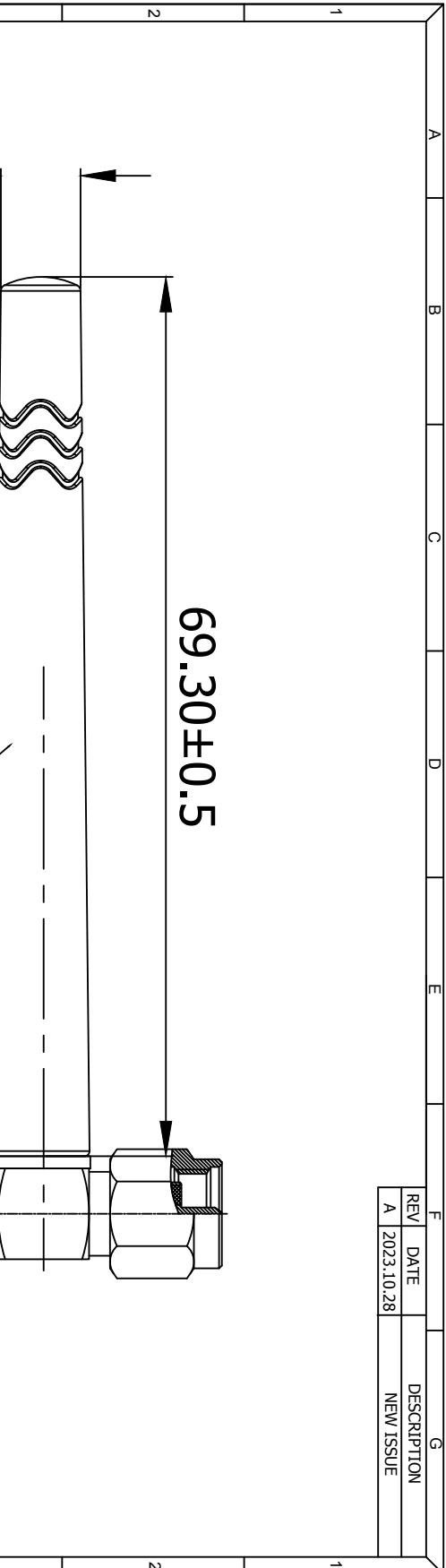
## 机械参数(Mechanical parameters) :

<b>Antenna Colour</b> 天线颜色	黑色
<b>RF Cable Model</b> 射频线型号	RG178, 棕色
<b>Connect Type</b> 接口方式	

## 工作/储存温度 (Operating/ Storage Temperature) :

<b>Operating Temperature</b> 工作温度	-40~85℃
<b>Storage Temperature</b> 储存温度	-40~85℃

A	B	C	D	E	F	G
REV.	DATE	DESCRIPTION				
A	2023.10.28	NEW ISSUE				



②

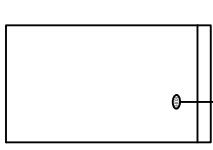
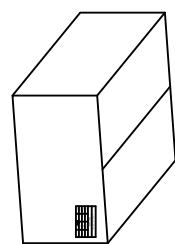
①

Φ6.3±0.5

ROHS标签

Specification:

Frequency Range : 2400~2500MHz  
VSWR: 1.92:1max  
Gain: 3.0dBi



1. 外箱需贴上1pcs/ROHS环保  
标签至外箱标签上;
2. 外箱须贴上1pcs外箱标签至  
外箱右上角。

A B C D E F G

5 4 3 2 1

Pack full: 50pcs/PE Bag

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XXX	±5.0	APPROVED
XX	±3.0	
X	±1.0	CHECKED
X	±0.5	
.XX	±0.1	DRAWING

④	□	未制图

NO	DESCRIPTION	Q'TY	REMARK
1	塑胶体	1	

CUSTOMER:	QY165
PART NO :	HYG10031
PARTNAME :	东莞市启元电子科技有限公司
R.F.P.NO :	QY165-2150004A
REV	UNIT
1	mm
SCALE	1:1
SIZE	A4
SHEET	10F1

QiYuan Electronic technology Co.,  
LTD.

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## 测试设备(Test equipment):



安捷伦 E5071C 网络分析仪



HP 8594E 频谱分析仪



CMW-500

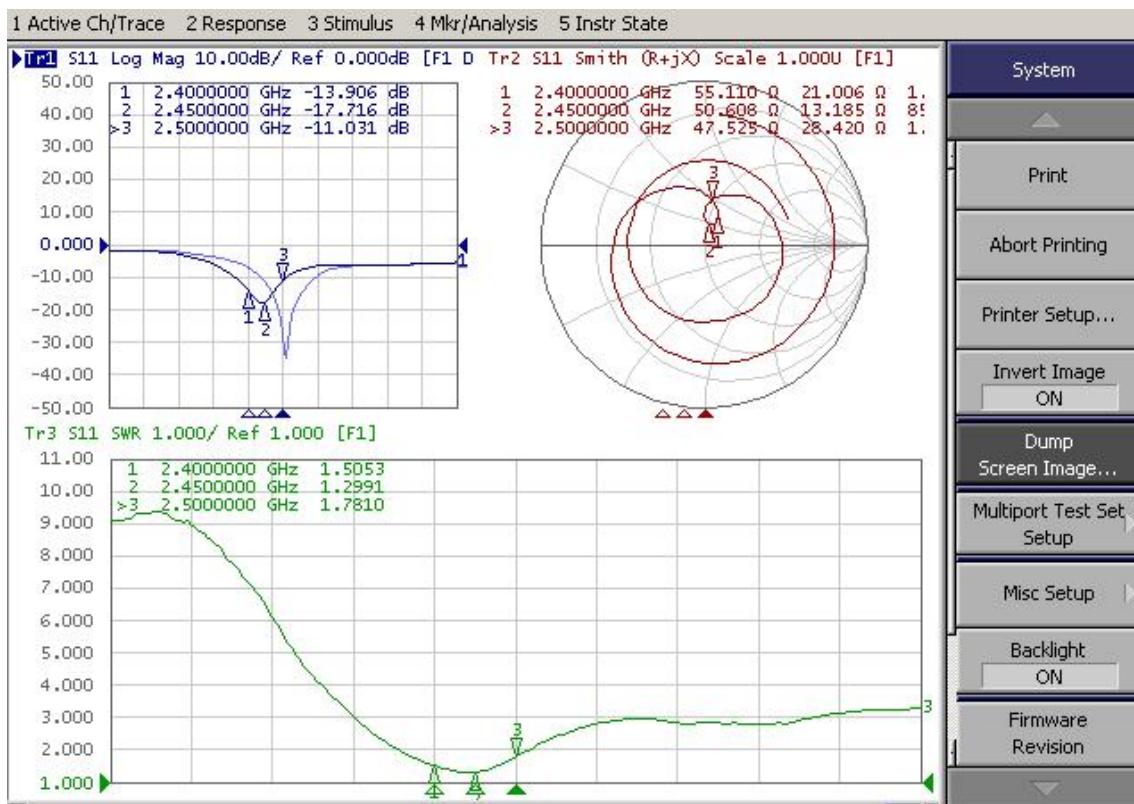


微波暗室



## 测试参数(Testing Parameters)

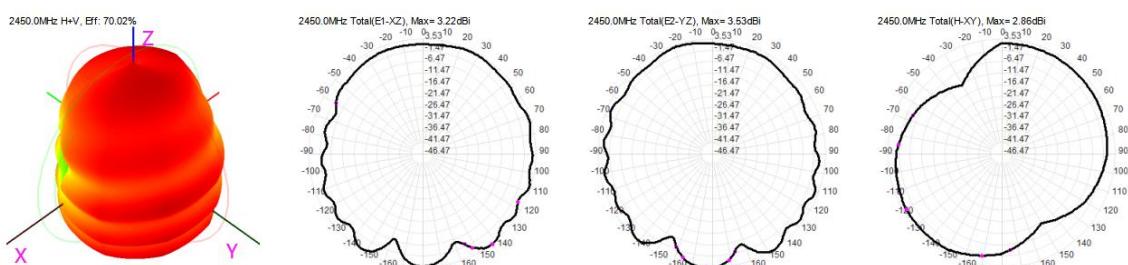
### 阻波比&回波损耗(V.S.W.R&Return Loss)



### 增益&效率(Gain&Efficiency)

Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Gain (dBi)	3.41	3.33	3.27	3.39	3.45	3.53	3.52	3.41	3.58	3.34	3.45
Efficiency (%)	65.72	68.41	69.44	68.68	69.10	70.02	71.74	68.89	69.35	67.20	66.89

### 2D、3D 场型图(2D、3D Radiation Patter)



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