

深圳市红心科技电子有限公司
Shenzhen Hongxin Technology Electronics Co., Ltd.

产品承认书

SPECIFICATION FOR APPROVAL

项目名称 corporate name	
品 名 Product Name	2.4G FPC 天线
料 号 Part number	HX-FPC24-6515-120B1
客户料号 Customer part number	
规 格 Specification	详见规格书 see specification
日 期 Date	2026.08.06 August 06, 2026

客户回签 (Customer countersignature) :

工 程 部 Department of Engin eering	品 质 部 Quality department	批 准 Approve

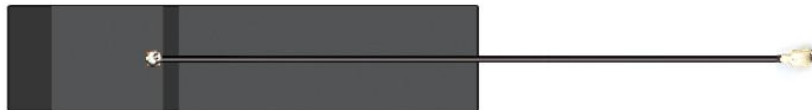
深圳市红心科技电子有限公司:

工 程 部 Department of Engin eering	品 质 部 Quality department	制表人 Watchmaker
Huang X Y	Zhang H	Lu Shan M

一：主要参数（Antenna parameter）

Design Specifications	Typical	Units
天线形式 (Antenna configuration)	FPC Antenna	N/A
工作频率 (working Frequency)	2400-2500	MHZ
增益(Gain)	5.5	DBi
天线效率 (Antenna efficiency)	35~80	%
电压驻波比 (VSWR)	≤ 1.8	N/A
极化方式 (Polarization)	垂直极化 (vertical polarization)	N/A
辐射方向 (Radiation pattern)	全向 (all directions)	N/A
馈电阻抗 (impedance)	50	ohm
功率容量 (Power handling)	33	dbm
天线接口 (Interface)	IPEX1 代	N/A
天线尺寸 (Overall dimensions)	65*15	mm
重量 (Weight)	~0.83	g
工作温度 (Operating Temp)	-40~+85	°C
储存温度 (Storing Temp)	-40~+85	°C

二：天线实物图（Antenna physical diagram）

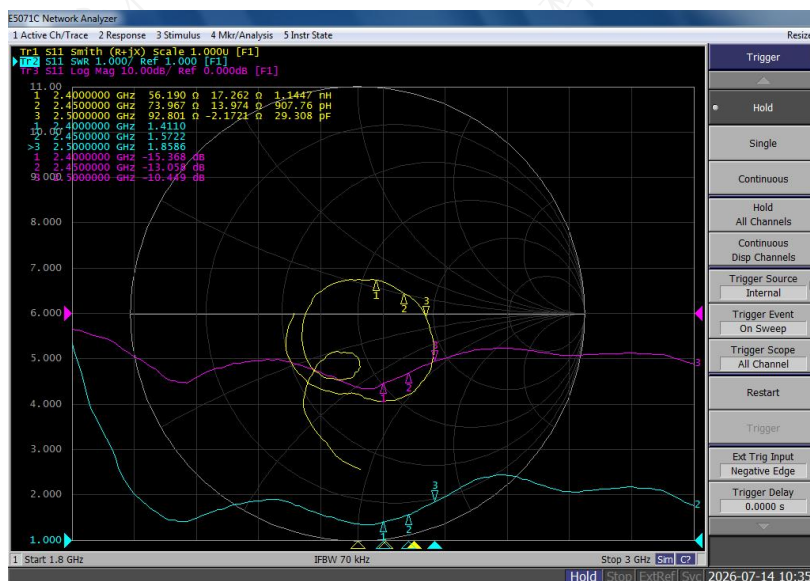


注：1. 天线参数是根据模拟环境测试，针对不同的产品会有性能偏差
2. 天线功能较为敏感，主体周边结构有变更请通知我们评估

Note: 1. Antenna parameters are based on testing in a simulated environment, and performance may vary depending on the specific product.

2. The antenna functionality is quite sensitive, and any changes to the surrounding structure of the main unit should be reported to us for evaluation.

三: VSWR (电压驻波比) /Return Loss (回波损耗) /Smith Chart (史密斯圆图)



参数图数据解读 (Interpretation of parameter chart data) :

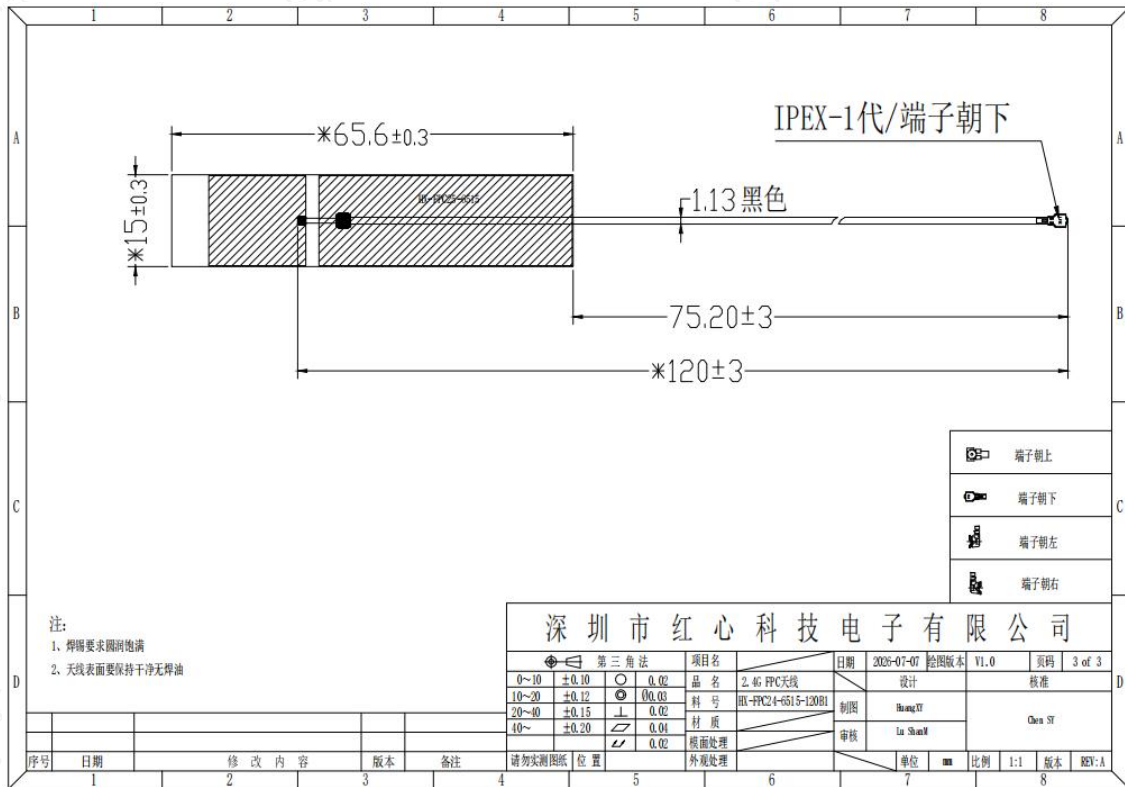
频率 Frequency	2400MHz	2450MHz	2500MHz
VSWR(电压驻波比)	1.4	1.5	1.8

四: 贮藏环境 (Storage environment)

工作温度 (Operating temperature) : -40 to +85°C

贮藏温度 (Storage temperature) : -40 to +85°C

五: 规格尺寸 (Specifications and dimensions)



六: 注意事项 (Precautions)

1. 不要对产品组件施加多大的机械应力, 不要试图弯曲或拆解并重新组件产品, 因为这样会导致产品组件或零部件受到破坏。
 2. 产品不要直接暴露在明火下。
 3. 本规格书仅适用于 HX-FPC24-6515-120B1 产品作为单个单元的功能。
1. Avoid applying excessive mechanical stress to product components. Do not attempt to bend or disassemble and reassemble the product, as this can cause damage.
This can result in damage to product components or parts.
 2. The product should not be exposed directly to open flames.
 3. This specification applies solely to the functionality of the HX-FPC24-6515-120B1 product as a standalone unit

七: 增益、效率、辐射方向图(Gain, efficiency, radiation pattern)

Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Efficiency (dBi)	-2.42	-2.34	-2.32	-2.30	-2.43	-2.37	-2.53	-2.56	-2.69	-2.52	-2.46
Gain (dBi)	3.20	3.24	3.23	3.23	3.07	4.00	3.90	3.76	3.63	3.89	3.07
Efficiency (%)	57.27	58.36	58.58	58.95	57.09	57.95	55.82	55.47	53.84	55.98	56.80
Directivity (dB)	6.62	6.58	6.56	6.53	6.51	6.51	6.43	6.32	6.32	6.41	6.52
Peak Gain Position (Theta)	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	135.00	135.00	135.00
Peak Gain Position (Phi)	75.00	75.00	75.00	75.00	75.00	75.00	75.00	75.00	90.00	90.00	90.00
Efficiency ThetaPol (%)	42.02	42.66	42.75	42.74	41.30	41.60	39.97	39.50	38.49	39.98	40.81
Efficiency PhiPol (%)	15.25	15.70	15.83	16.21	15.79	16.35	15.85	15.97	15.36	16.00	15.99
Upper Hem. Efficiency (%)	14.81	15.04	15.10	15.25	14.74	14.78	13.88	13.38	12.64	12.96	13.05
Lower Hem. Efficiency (%)	42.46	43.32	43.48	43.70	42.35	43.18	41.95	42.09	41.20	43.02	43.75
T90(H)圆度	6.23	6.68	7.50	8.22	8.50	8.77	9.55	10.35	11.51	12.72	13.68
Gain 15deg (dBi)											
E1(XZ)波瓣宽度	30.00	30.00	31.00	30.00	30.00	30.00	30.00	30.00	32.00	34.00	36.00
E1(XZ)前后比	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E2(YZ)波瓣宽度	45.00	46.00	46.00	46.00	46.00	46.00	45.00	43.00	42.00	42.00	40.00
E2(YZ)前后比	1.49	1.29	1.19	1.17	1.18	1.25	1.36	1.48	1.66	1.82	2.03
最大增益处轴比(P)	35.56	29.28	24.66	21.68	19.82	19.19	19.44	19.26	11.92	12.11	12.05
顶点(Theta=0)处轴比(P)	24.46	23.04	22.22	21.81	22.24	22.75	20.56	16.22	14.90	15.14	14.29
仰角10度最差(大)轴比(P)	48.47	46.64	49.33	51.34	50.47	47.54	46.19	50.34	45.23	50.76	47.19
Hc(XY)波瓣宽度	96.00	92.00	90.00	85.00	85.00	136.00	133.00	128.00	123.00	114.00	110.00
Hc(XY)前后比	0.00	0.00	0.00	0.00	0.00	0.10	0.52	0.99	1.32	1.57	1.64
左旋圆极化效率(%)	31.93	32.09	31.63	31.46	30.02	30.72	30.04	30.12	29.41	30.42	30.49
右旋圆极化效率(%)	25.34	26.27	26.95	27.49	27.07	27.23	25.78	25.35	24.44	25.56	26.31

