

深圳市金航标电子有限公司

SHENZHEN KINGHELM ELECTRON CO., LTD.

SPECIFICATION

Ceramic Antenna 2012 Size

2400-2500 MHz

P/N: KH-2012-HM1

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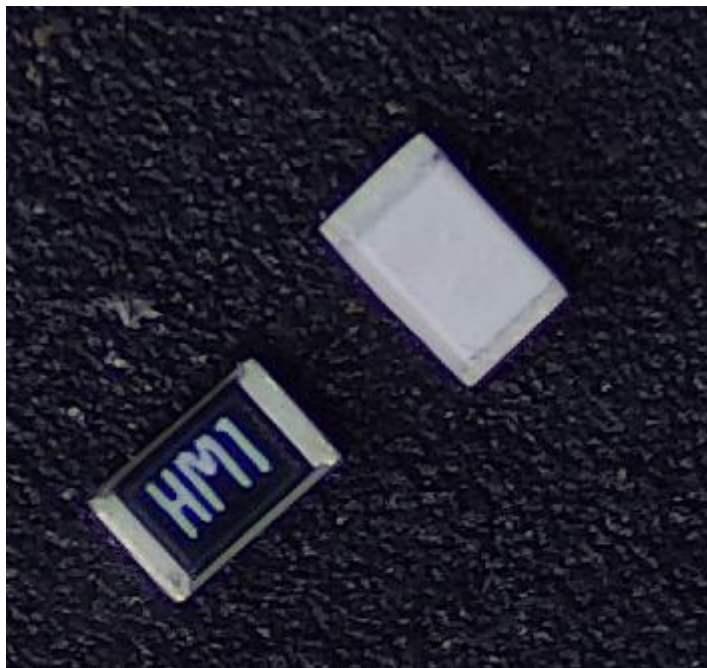
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概述 Overview

■ 适用范围 Scope

KH-2012-HM1



■ 功能特性 Features

- (1) KH-2012-HM1为双极陶瓷天线，性能稳定可靠；
- (2) 尺寸小巧紧凑；
- (3) 满足RoHS 和 REACH 标准；
- (4) 支持SMT贴片工艺；
- (5) 无极性区分，焊接方向不影响天线效率。

■ 产品应用 Applications

- (1) 2.4GHz频段无线设备；
- (2) 蓝牙、WIFI产品；
- (3) 智能手表、智能手环等穿戴设备；
- (4) IoT 无线模块。

1 技术规格 Specification

1.1 电气参数 Electrical parameter

Electrical	
Part Number 料号	KH-2012-HM1
Frequency Range 频率范围	2400-2500MHz
V.S.W.R 电压驻波比	≤ 2.0
Peak Gain 峰值增益	0.7dBi（典型值）
Efficiency（2450MHz） 效率	66.31%
Impedance 阻抗	50Ω
Polarization 极化	线性极化
Radiation Pattern 辐射模式	全向辐射

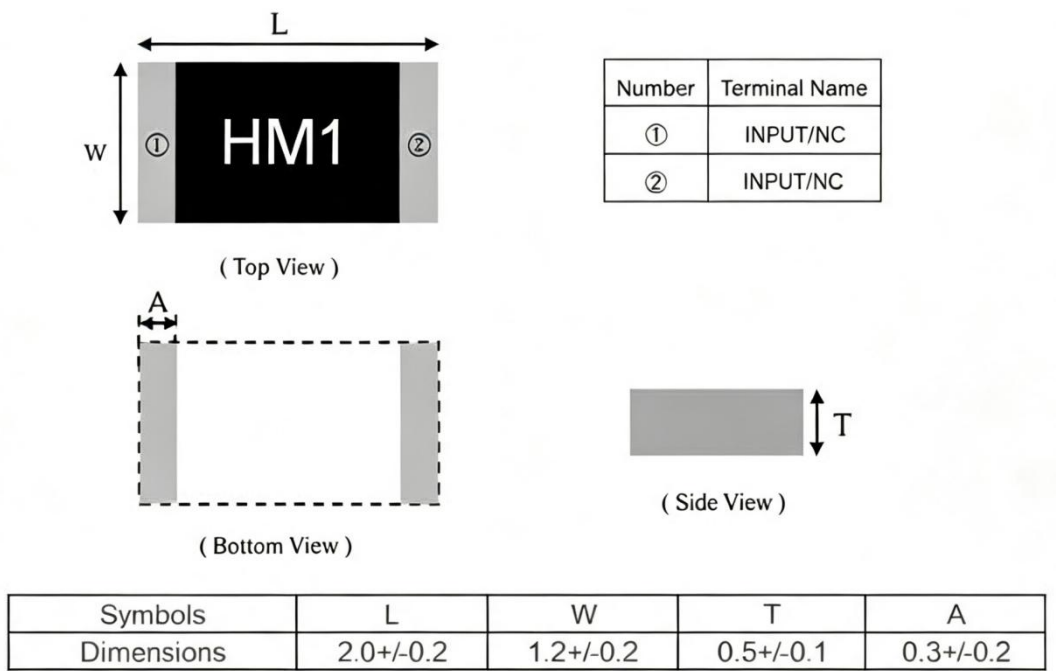
1.2 机械及环境规格 Mechanical & Environmental

Mechanical	
Antenna Size 天线尺寸	2.0mm × 1.2mm × 0.5mm
Material & Color 材质与颜色	LTCC低温共烧陶瓷； 外观：乳白色陶瓷体，两端电极镀银钯合金
Antenna Weight 天线重量	6mg
Mounting Type 安装类型	SMT贴片焊接（无极性区分，可反向装贴）
Recommended Clearance Size 推荐净空大小	天线净空区：长度≥6mm，宽度≥5mm，天线正下方整层地层挖空（无铜）
Environmental	
Operation Temperature 工作温度	-40℃ ~ +85℃
Storage Temperature 储存温度	-45℃ ~ +125℃
RoHS & REACH Compliant RoHS 和 REACH 标准	Yes

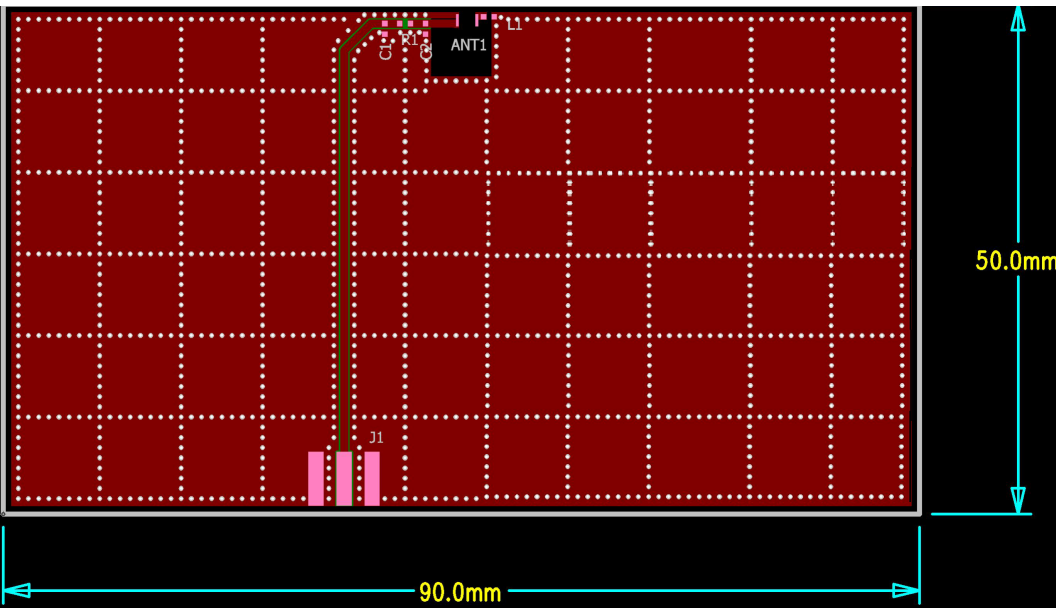
2 图纸 Drawing

2.1. 天线 Antenna

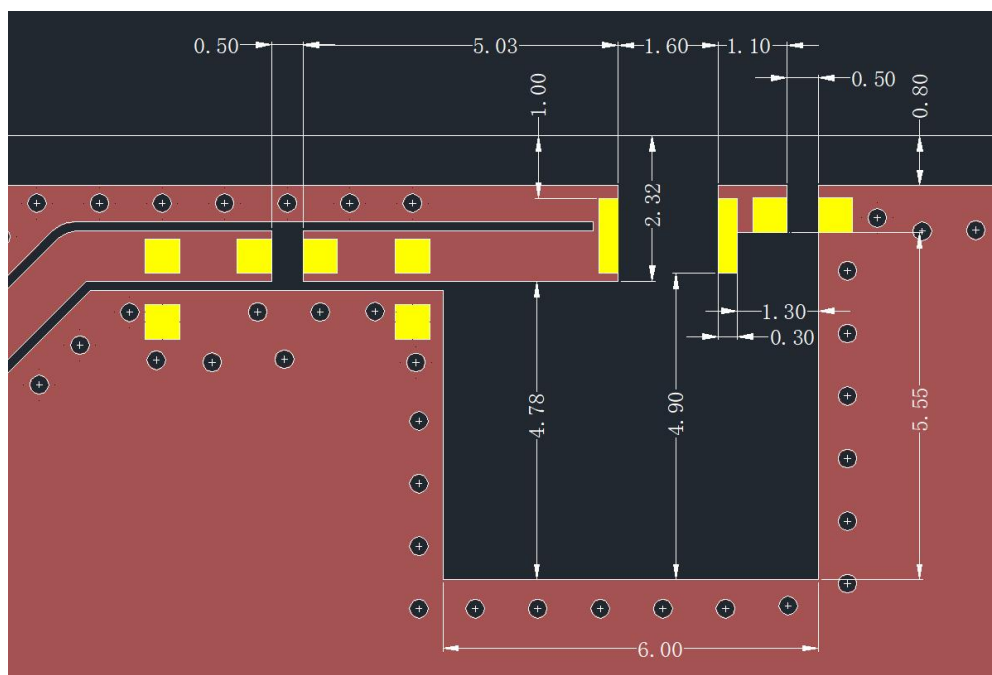
(1) 概述 Over View :



(2) 开发板尺寸 Evaluation Board Size :

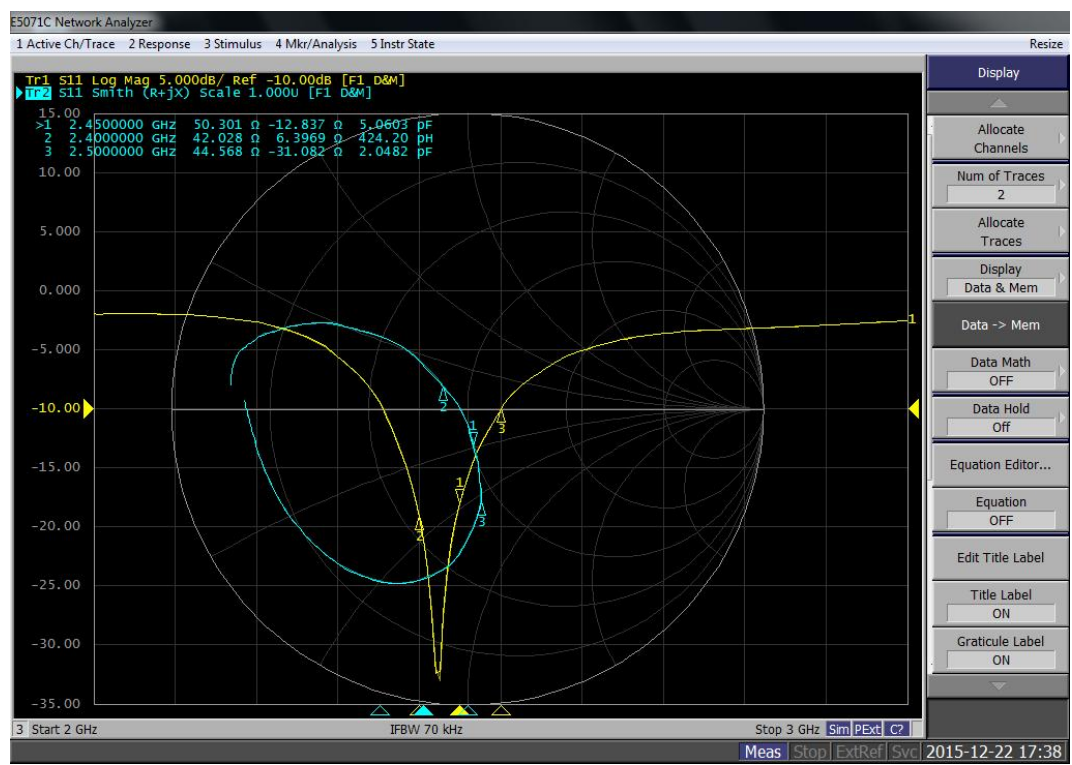


(3) PCB 布局 PCB Layout (Unit : mm):

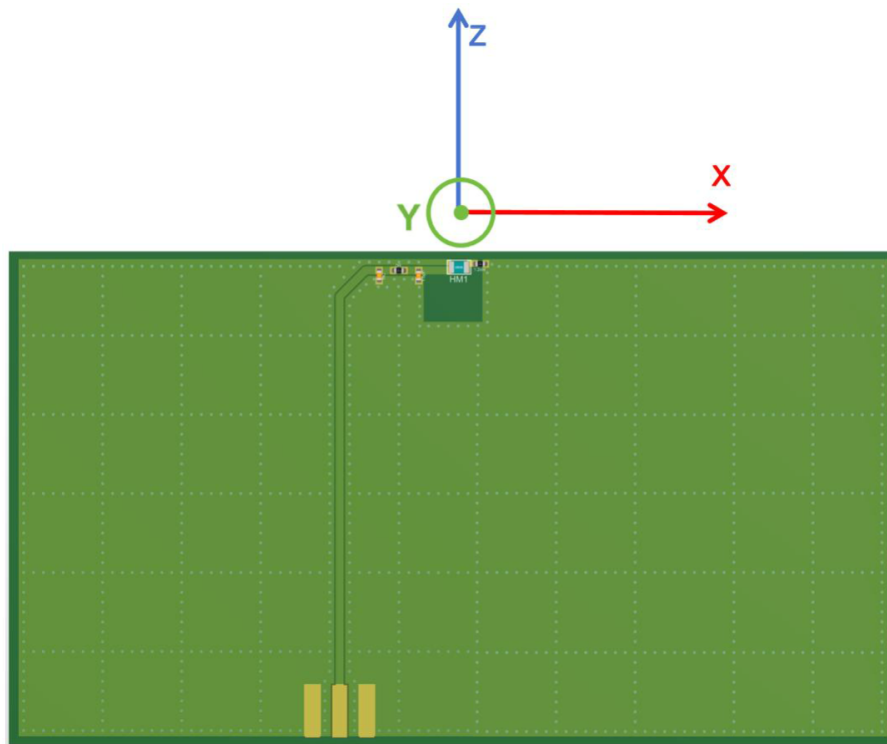


3 详细性能说明 Detailed Performance

3.1 回波损耗 Return Loss (S11)与Smith圆图

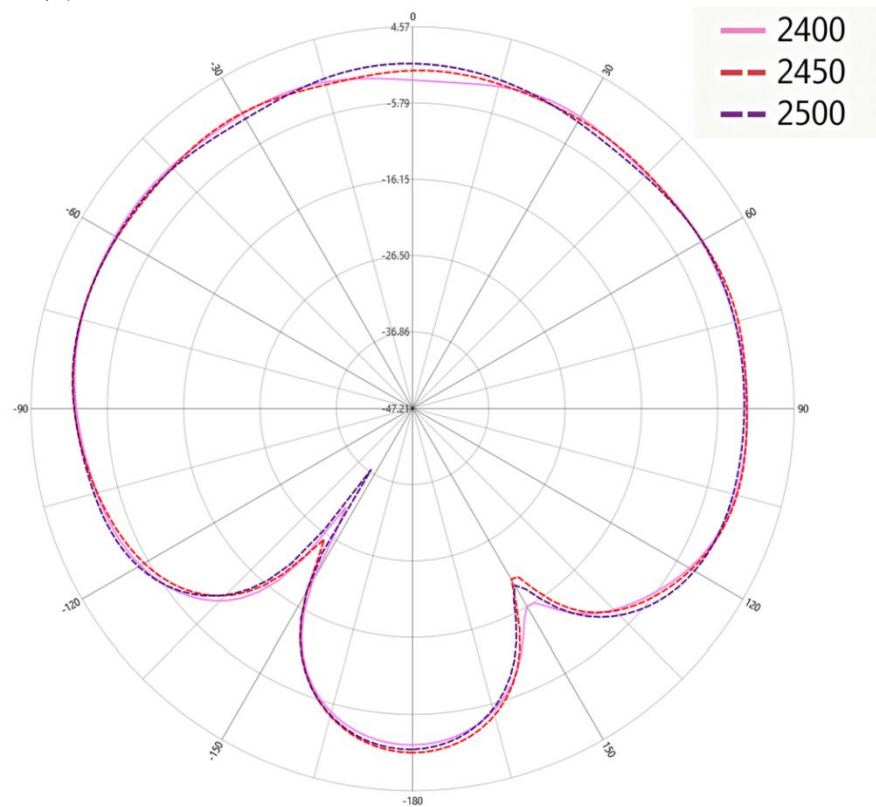


3.2 辐射方向图与效率 Radiation Pattern & Efficiency

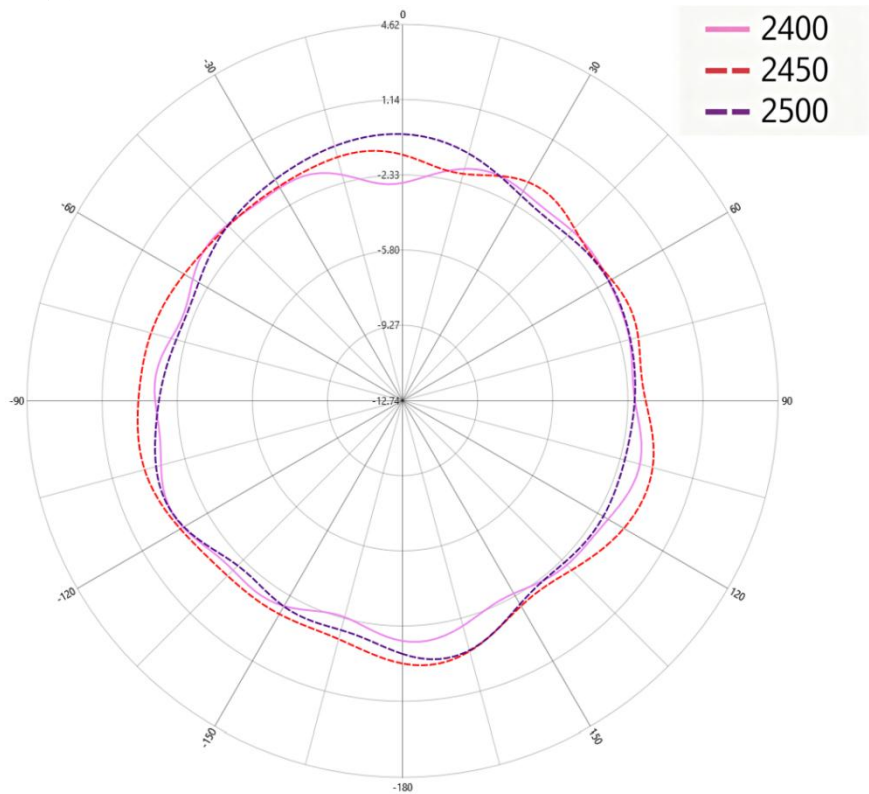


(1) 2D方向图

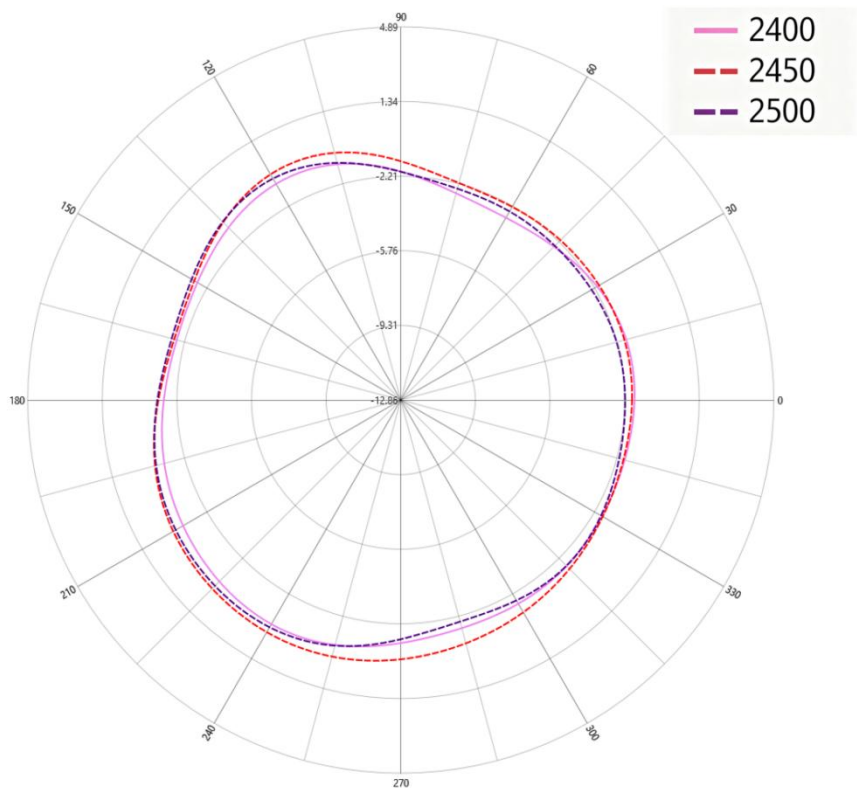
Phi=0° (XZ面) :



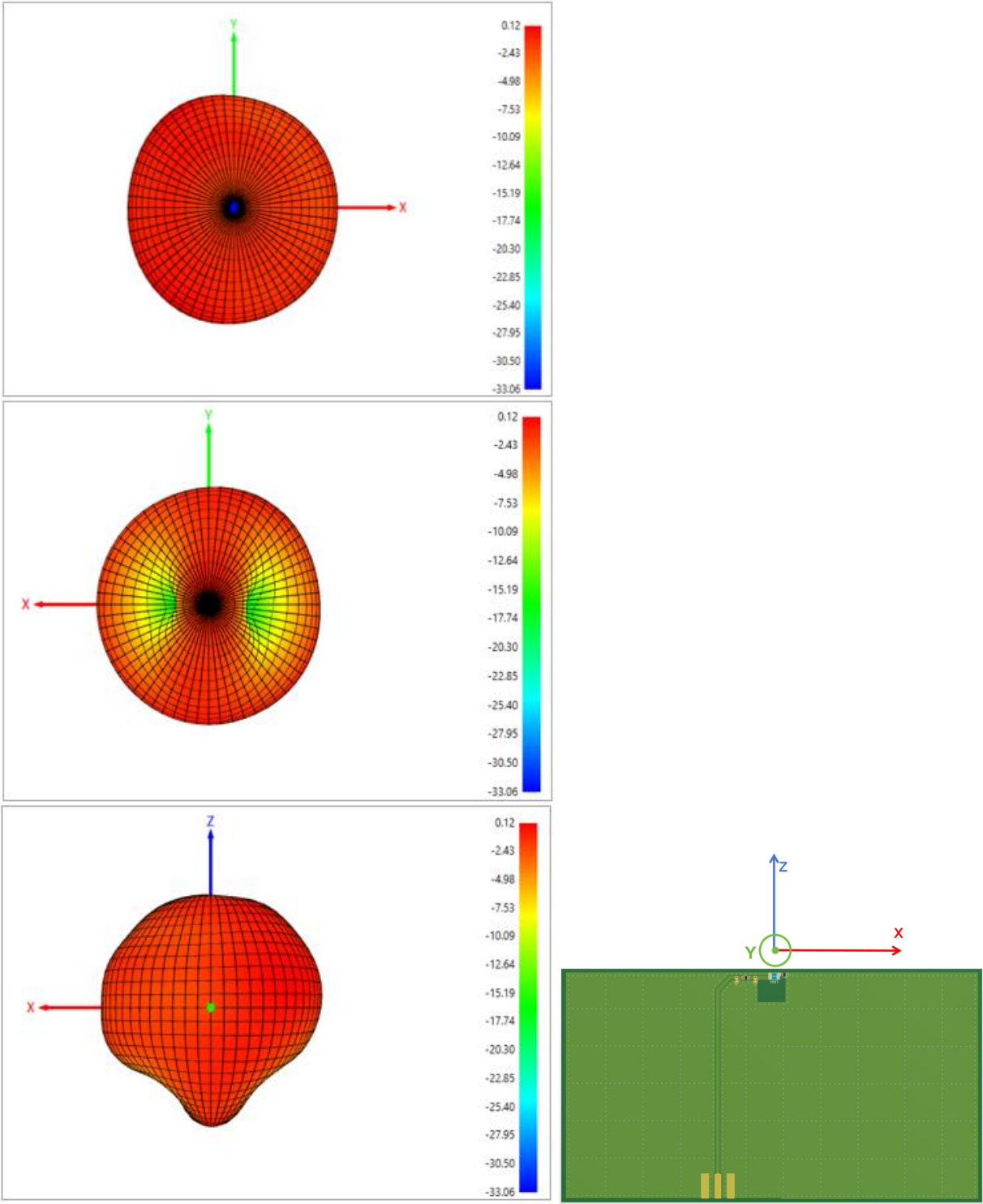
Phi=90°（YZ面）：



Theta=90°（XY面）：

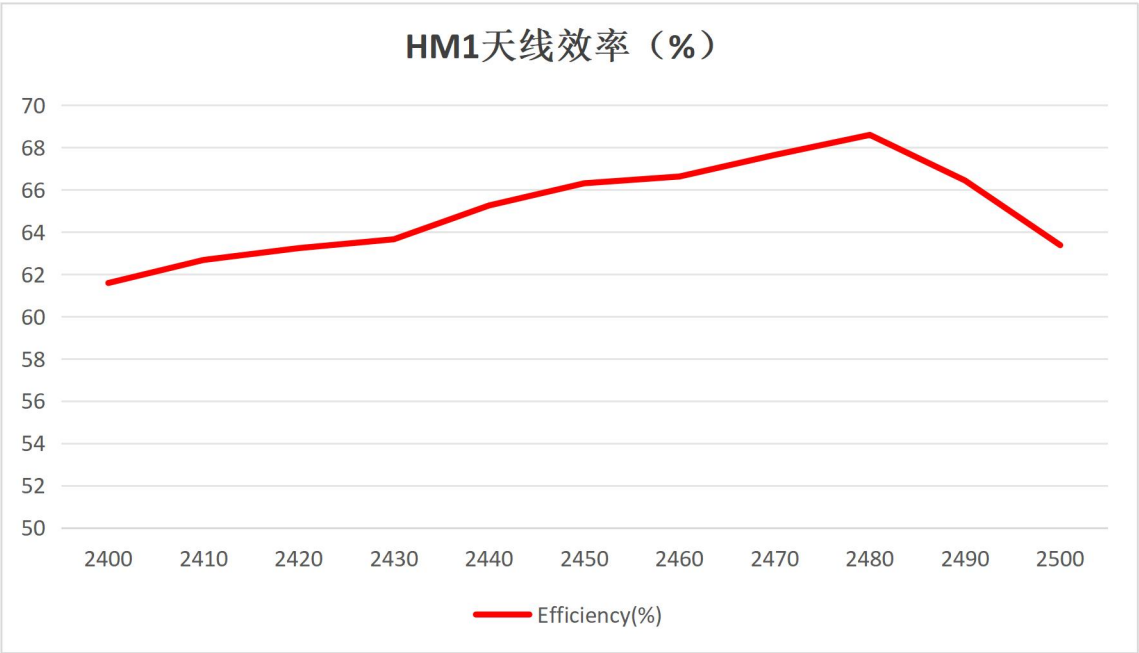


(2) 3D方向图



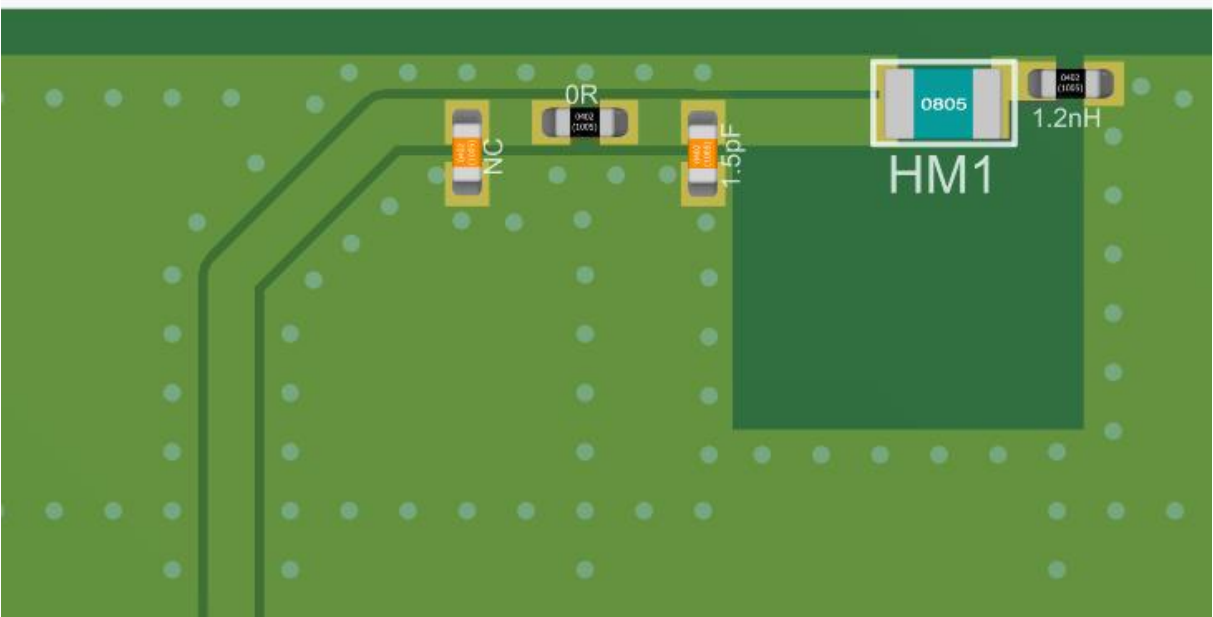
(3) 效率

Frequency(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400	-0.04	-2.1	61.59
2410	-0.01	-2.03	62.68
2420	0.12	-1.99	63.24
2430	0.13	-1.96	63.66
2440	0.26	-1.85	65.26
2450	0.34	-1.78	66.31
2460	0.42	-1.76	66.63
2470	0.63	-1.7	67.65
2480	0.7	-1.64	68.6
2490	0.51	-1.78	66.44
2500	0.15	-1.98	63.38

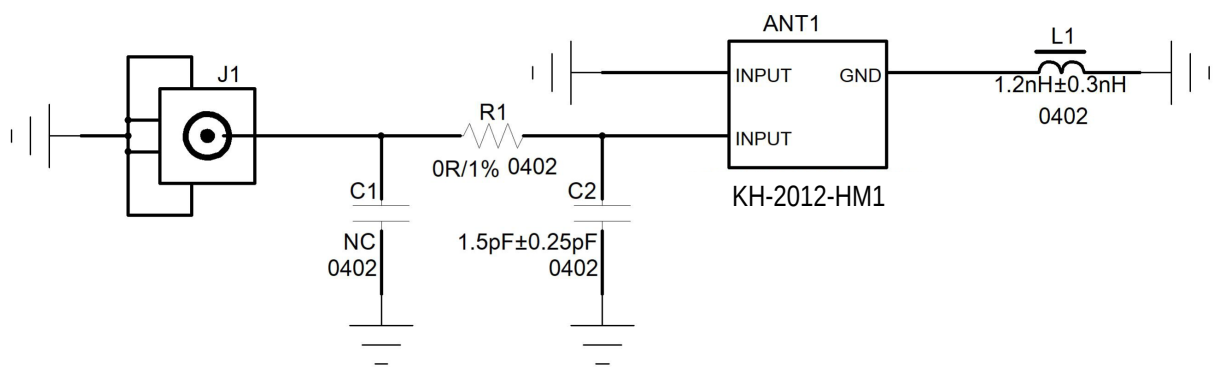


4 匹配电路 Matching Circuit

(1) PCB图



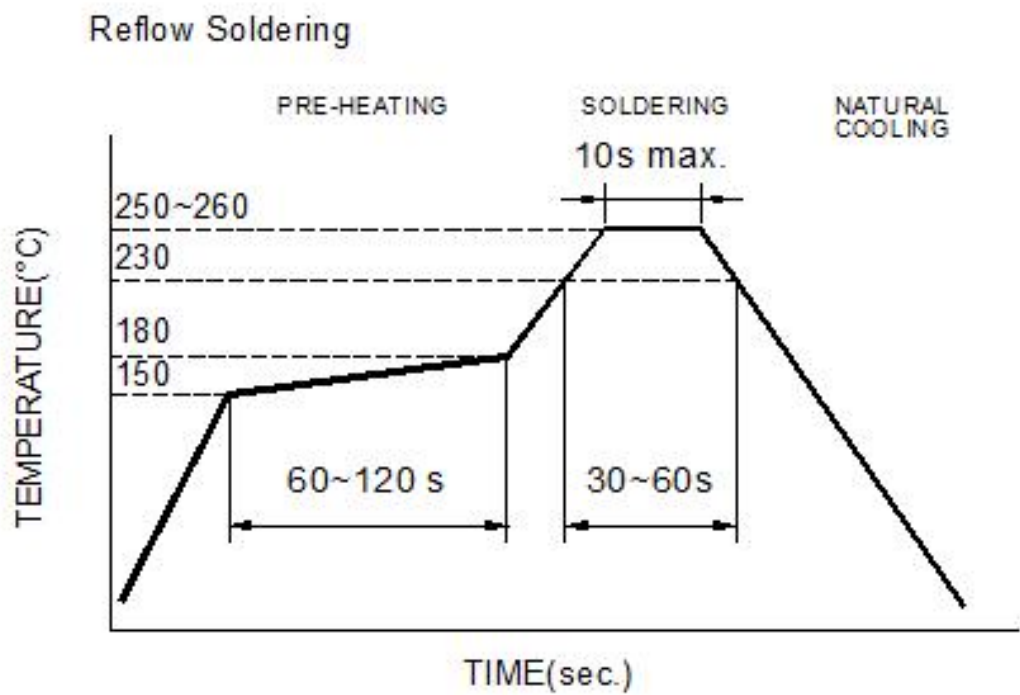
(2) 原理图



位号	相关参数	厂商	材质
C1	NC	/	/
L1	1.2nH ± 0.3nH (0402)	顺络	叠层陶瓷
C2	1.5pF ± 0.25pF (0402)	风华	C0G
R1	0Ω ± 1% (0402)	厚声	厚膜氧化铝陶瓷

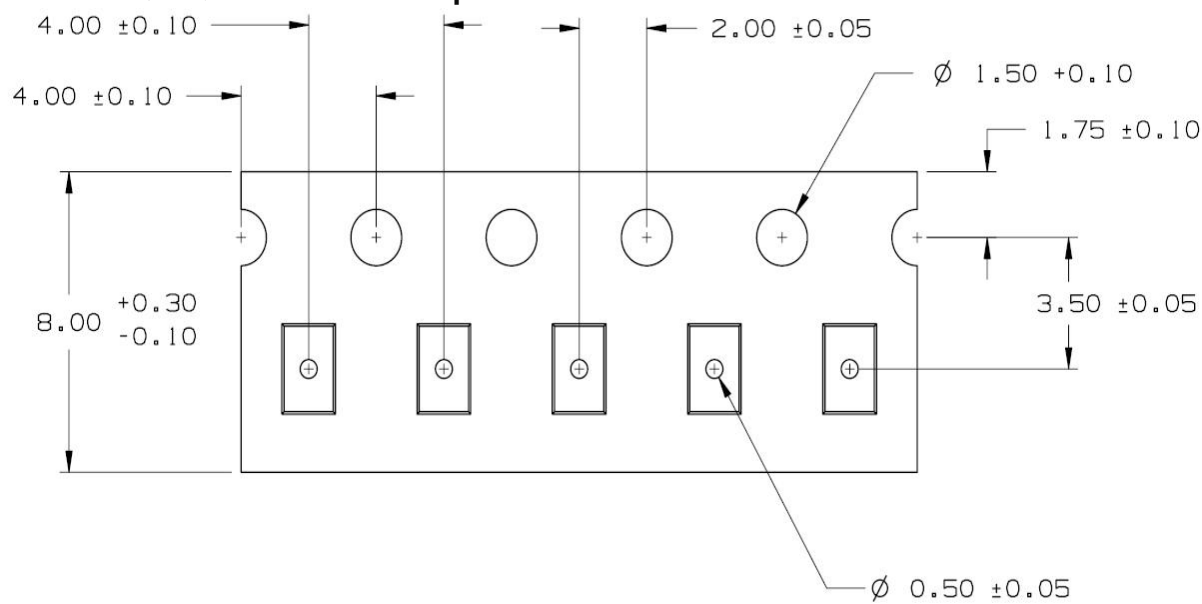
注：上表参数均在开发板上调试得出，仅供参考，客户PCB板材、元器件厂商有变更则需要根据实际环境对匹配重新调整。

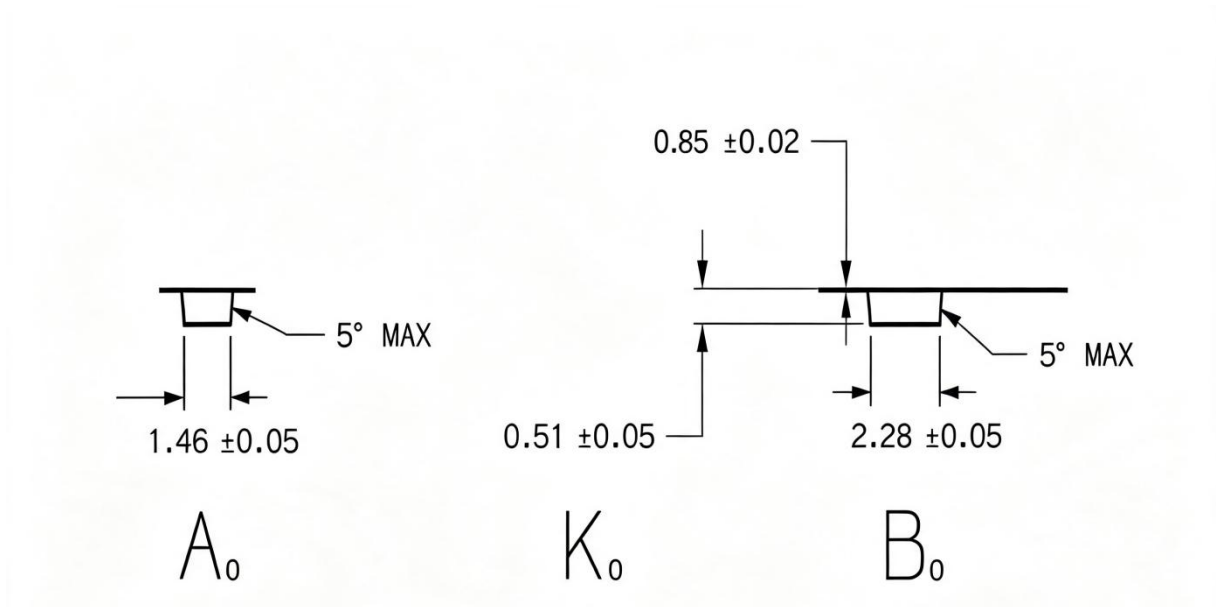
5 回流焊标准 Reflow Soldering Standard



6 包装与尺寸 Packaging and Dimensions

6.1 塑料胶带 Plastic Tape



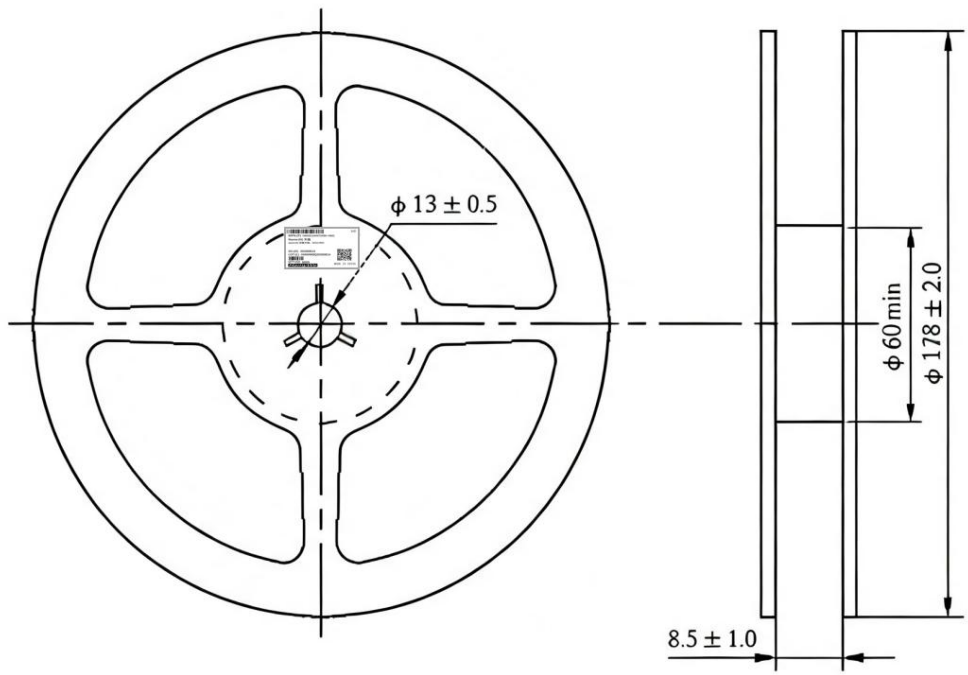


6.2 包装说明 Remarks for Package

载带尾带预留长度150~200毫米；载带引带预留 250~300毫米；另需在载带起始端额外预留250毫米的上封带。

Reserve a length of 150~200mm for the trailer of the carrier and 250~300 mm for the leader of the carrier and further 250mm of cover tape at the leading part of the carrier.

6.3 卷带 Reel (6000 pcs/Reel)



6.4 存储条件 Storage Period

易氧化物料;

真空密封包装内可保存 12 个月。开封使用后, 请在 168 小时内重新密封包装。(J-STD033-MSL3)

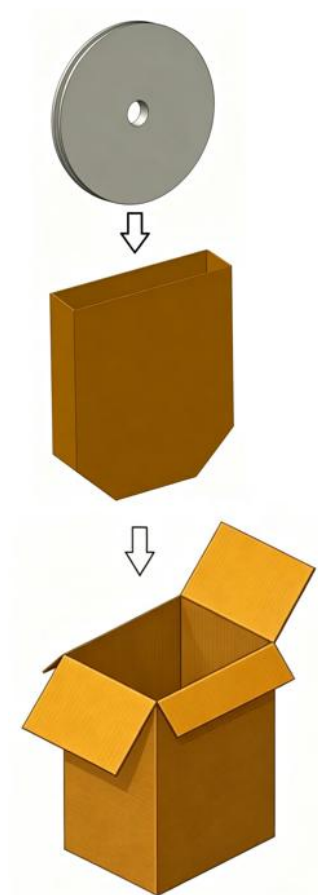
存储温度范围: < 30°C, 湿度: < 60% RH

Oxidizable Material,

12 months in vacuum sealed bag. please repack within 168 hours by re-seal the package treatment after using. (J-STD033-MSL3)

Storage Temperature Range : <30 degree C, Humidity : <60%RH

6.5 装箱流程 Process of Packing



(1) **1**盘载带最多可容纳**6000**颗陶瓷天线。

(2) **1**个小纸箱最多可容纳**2**盘载带。

(3) **1**个纸箱最多可容纳**2**个小纸箱。

7 可靠性测试 Dependability Test

Test item	Test condition / Test method	Specification
Solderability IEC 60068-2-58 GB/T2423.28	*Solder bath temperature : 240±5°C *Immersion time : 2±0.5 sec Solder : Sn96.5Ag3.0Gu0.5 for lead-free.	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Leaching (Resistance to dissolution of metallization) JIS C5101	*Solder bath temperature : 260±5°C *Leaching immersion time : 10±1 sec Solder : Sn96.5 Ag3.0 Gu0.5 for lead-free.	Loss of metallization on the edges of each electrode shall not exceed 25%.
Resistance to soldering heat IEC 60068-2-58 GB/T2423.28	*Preheating temperature : 120~150°C, 1 minute. *Solder temperature : 260±5°C *Immersion time : 10±1 sec Solder : Sn96.5Ag3.0Gu0.5 for lead-free Measurement to be made after keeping at room temperature for 24±2 hrs.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature. Loss of metallization on the edges of each electrode shall not exceed 25%.
Drop Test IEC 60068-2-32 GB/T2423.8 Customer's specification.	*Height : 50 cm *Test Surface: Rigid surface of concrete or steel. *Times : 6 surfaces for each units ; 2 times for each side.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature.
Vibration IEC 60068-2-6 GB/T 2423.10	*Frequency : 10Hz~55Hz~10Hz(1min) *Total amplitude : 1.5mm *Test times : 6hrs.(Two hrs each in three mutually perpendicular directions)	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature.
Adhesive Strength of Termination IEC60068-2-21 GB/T 2423.6	*Pressurizing force : 5N(≤0603) ; 10N(>0603) *Test time:10±1 sec	No remarkable damage or removal of the termination.

Bending test IEC 60068-2-21 GB/T 2423.29	The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm/s per second until the deflection becomes 2mm and then pressure shall be maintained for 10±1 sec. Measurement to be made after keeping at room temperature for 24±2 hours.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature.
Temperature cycle IEC60068-2-14 GB/T 2423.22	30 minutes at -40°C±2°C. 10~15 minutes at room temperature. 30minutes at +85°C±2°C. 10~15 minutes at room temperature. Total 100 continuous cycles Measurement to be made after keeping at room temperature for 24±2 hrs.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature.
High temperature IEC 60068-2-2 GB/T2423.2	*Temperature : 85±2°C. *Test duration : 500+24/-0 hours. Measurement to be made after keeping at room temperature for 24±2 hrs.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics.
Humidity (steady conditions) IEC60068-2-3 GB/T 2423.3	*Humidity : 85±5%R.H. *Temperature : 85±2°C. *Time : 500+24/-0 hrs. Measurement to be made after keeping at room temperature for 24±2 hrs ※ 200hrs measuring the first data then 300hrs data.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature.
Low temperature IEC 60068-2-1 GB/T2423.1	*Temperature : -40±2°C. *Test duration : 500+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs.	No mechanical damage. Electrical specification shall satisfy the descriptions in electrical characteristics at the room temperature.