

产 品 技 术 规 格 书
SPECIFICATION

产品型号 PART NO: KH-LD2012-D88M
客户料号 CUSTOMER PART NO:
客户确认 CUSTOMER APPROVED BY:
确认日期 APPROVED DATE:

RoHS Compliant Parts

拟制 Prepared by:	审核 Checked by :	批准 Approved by:
送样日期 Formed On	产品版本 Document Version (V2.0)	

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产品规格书版本更改记录
Version rejigger track record

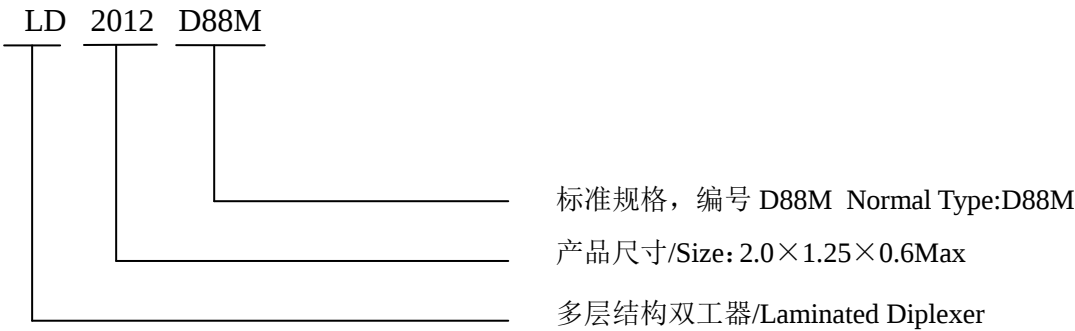
版本号 Version	更改记录 Rejigger	拟制 Prepared	批准 Approve	日期 Date
V1.0	首次发行	华嘉源	罗昌桅	2021. 03. 01
V2.0	修正第 5 点电气性能中最大输入功率	苏彩琴	罗昌桅	2023. 03. 17
备注： 1、更改产品电性能指标时，版本号需更换（V1.0 换为 V2.0、V3.0……）； 2、更改产品测试方法（包括可靠性测试条件），或更改使用条件时，当前版本号加系列（V1.0 换为 V1.1、V1.2……）。				

1. 概述 **INTRODUCTION**

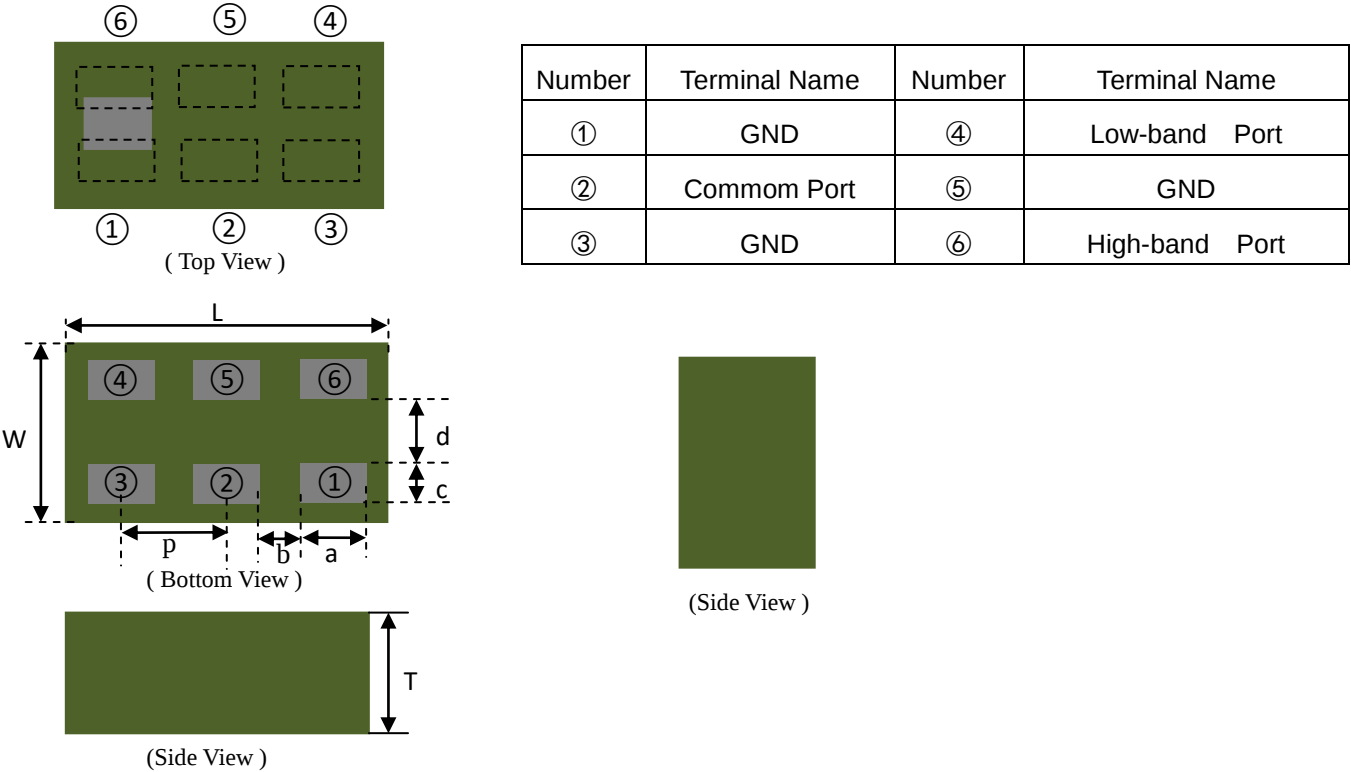
微波双工器，也称频分器，英文 Diplexer,它是由低通滤波器和高通滤波器（或带通滤波器）组成，从而实现对无线通讯信号进行高低分频，因而适用于带双频的无线通讯系统，比如 GSM/DCS, GSM/PCS, GSM/WCDMA 或 WLAN 的 2.4GHz/5GHz 等。具有低的插入损耗、高的衰减和小体积 SMD 片式设计，能减少复杂的调校工作，可以简化电路设计。

Microwave Diplexer (also called band separator) is formed with LP and HP (or BPF) to be applied for band separator, especially for dual-band system, such as GSM/DCS, GSM/PCS, GSM/WCDMA or WLAN 2.4GHz/5GHz, etc. with low insertion loss and high attenuation as well as small size SMD chip design , which can simplify your complex tuning and circuit design .

2. 型号 **Part Number**

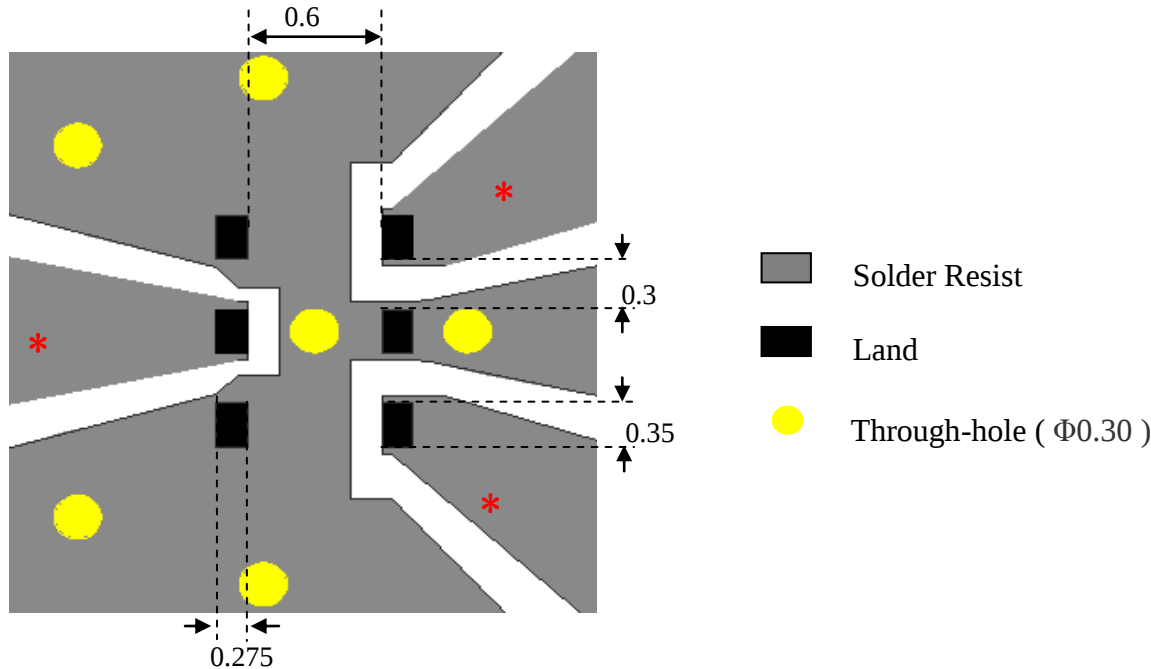


2. 外型尺寸 **Dimensions (Unit: mm)**



Symbols	L	W	T	a	b	c	d	p
Dimensions	2.0±0.1	1.25±0.1	0.6Max	0.35±0.10	0.3±0.15	0.275±0.1	0.6±0.1	0.65±0.1

Recommended PCB Layout:



*Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness

4. 结构及材料 **Structure and Material**

No	Part Name	名称	Structure and Material	结构及材料
4.1	Resonator	谐振体	Dielectric Material	LTCC 介质材料
4.2	In/Output Terminals	输入/输出	Ag+Ni+Sn	银+ 镍+锡
4.3	Ground Base	接地面	Ag+Ni+Sn	银+ 镍+锡

5. 电气性能 **Electrical Characteristics**

低通部分（Lower Band）

No.	Item （项目）	Specifications （特性）
5.1	Frequency Range 通带范围	617~2690 MHz
5.2	Insertion Loss 插入损耗	≤0.35 dB (617~960MHz) ≤0.45 dB (1427~1511MHz) ≤0.55 dB (1710~2170MHz) ≤0.75 dB (2300~2496MHz) ≤0.9 dB (2496~2690MHz)
5.3	VSWR 驻波比	≤1.5 (617~960MHz) ≤1.5 (1427~1710MHz) ≤1.67 (1710~2170MHz) ≤1.67 (2170~2690MHz)
5.4	Attenuation 阻带衰耗	≥18dB (3300~3400MHz) ≥23dB (3400~3800MHz) ≥30dB (5150~5925MHz)
5.5	In/Output Impedance 输入/输出阻抗	50 Ω
5.6	Input power (max.) 最大输入功率	3W

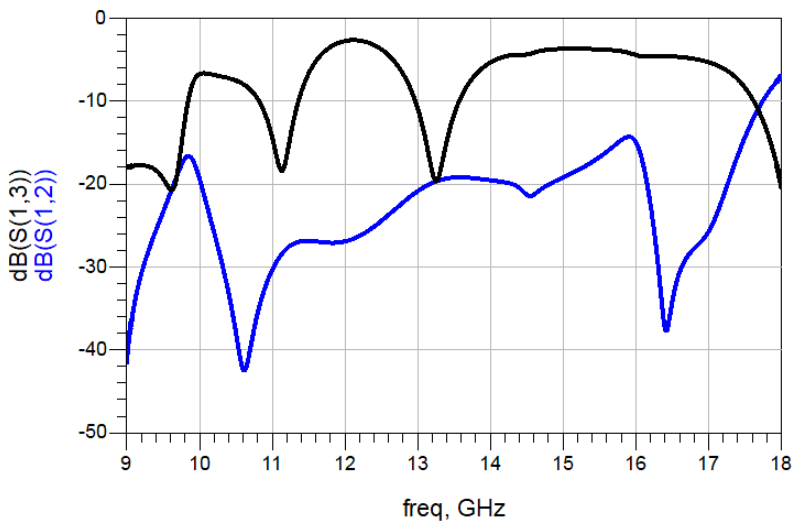
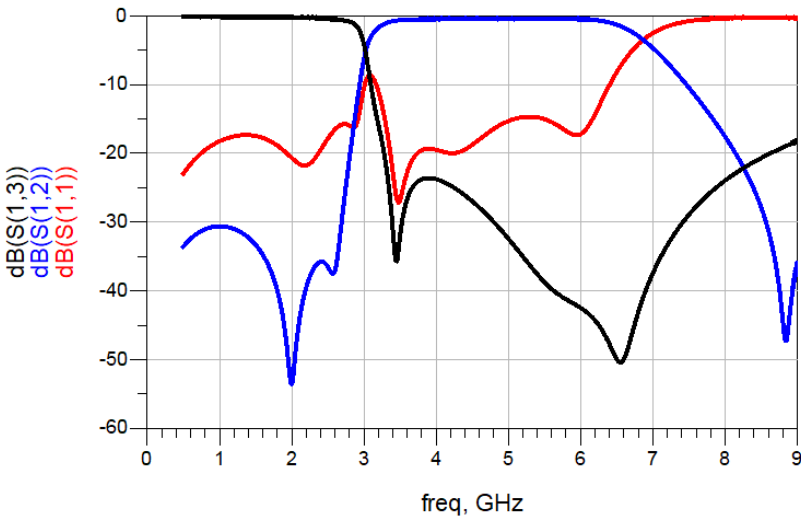
高通部分（Higher Band）

No.	Item （项目）	Specifications （特性）
5.1	Frequency Range 通带范围	3300~5925 MHz
5.2	Insertion Loss 插入损耗	≤1.3 dB (3300~3400 MHz) ≤1.0 dB (3400~3800 MHz) ≤0.5dB (5150~5925 MHz)
5.3	VSWR 驻波比	≤1.67 (3300~3400 MHz) ≤1.67 (3400~3800 MHz) ≤1.5(5150~5925 MHz)
5.4	Attenuation 阻带衰耗	≥30 dB (617~960 MHz) ≥30 dB (1427~1511 MHz) ≥25 dB (1710~2170MHz) ≥22 dB (2170~2690MHz) ≥25 dB (10300~11850MHz) ≥5.0 dB (15450~17775MHz)
5.5	In/Output Impedance 输入/输出阻抗	50 Ω
5.6	Input power (max.) 最大输入功率	3W

隔离度 (Isolation)

No.	Item (项目)	Specifications (特性)
5.1	Isolation(隔离度)	≥30 dB (617~960 MHz) ≥30 dB (1427~1511 MHz) ≥23 dB (1710~2170MHz) ≥23 dB (2170~2690MHz) ≥20 dB (3300~3400MHz) ≥23 dB (3400~3800MHz) ≥28 dB (5150~5925MHz)

6. 特性曲线 Characteristic curve



7 可靠性试验 Reliability Test

基准条件: 温度范围	Temperature range	25±5°C
相对湿度范围	Relative Humidity range	55~75%RH
工作温度	Operating Temperature range	-40°C~+85°C
贮藏温度	Storage Temperature range	-40°C~+85°C

7.1 耐振动 Vibration Resist

在振动频率为 10~55Hz 振幅为 1.5mm 沿 X.Y.Z 方向各振动 2 小时后测试需符合电气性能指标。

The device should fulfill the electrical specification after applied to the vibration of 10 to 55Hz with amplitude of 1.5mm for 2 hours each in X, Y and Z directions.

7.2 耐跌落冲击 Drop Shock

在 100cm 高度处按 X, Y, Z 三个面分别自由跌落在木制地板上共 3 次后, 要求无机械损伤。

The device should have no mechanical damage after dropping onto the hard wooden board from the height of 100cm for 3 times each facet of the 3 dimensions of the device.

7.3 耐焊接热 Solder Heat Proof

能承受经 120~150°C 的温度预热 120 秒后, 在 255°C+10°C 的焊锡浸 5±0.5 秒, 或 300°C-10°C 的电烙铁焊接 3±0.5 秒, 焊接面无损伤。

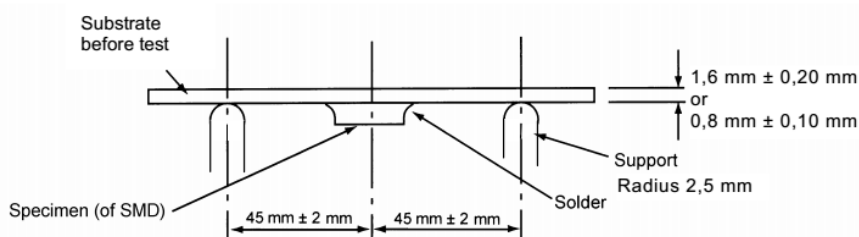
The device should be satisfied after preheating at 120°C~150°C for 120 seconds and dipping in soldering Sn at 255°C+10°C for 5±0.5 seconds, or electric iron 300°C-10°C for 3±0.5 seconds, without damage.

7.4 推力试验 Adhesive Strength of Termination

在产品电极端子上或表面上可承受 5N(≤0603); 10N(>0603) 水平推力 10±1 秒而无明显外观损坏与电极移位。

The device have no remarkable damage or removal of the termination after horizontal force of 5N(≤0603); 10N(>0603) with 10±1 seconds.

7.5 耐弯曲试验 Bending Resist Test



将产品按图焊在 1.6±0.2mm 或 0.8±0.1mm 的 PCB 板中间, 由箭头方向施力: 1mm/S, 弯曲距离: 1.5mm, 保持 5±1S, 产品金属层无脱落。

Weld the product to the center part of the PCB with the thickness 1.6±0.2mm or 0.8±0.1mm as the illustration shows, and keep exerting force arrow-ward on it at speed of 1mm/S, and hold for 5±1S at the position of 1.5mm bending distance, so far, any peeling off of the product metal coating should not be detected.

7.6 耐湿热特性 **Moisture Proof**

在温度为 $60 \pm 2^\circ\text{C}$ ，相对湿度 90~95% 的恒温湿箱中放置 96 小时，在常温中恢复 1~2 小时后测试，测试需符合电气性能指标。

The device should fulfill the electrical specification after exposed to the temperature $60 \pm 2^\circ\text{C}$ and the relative humidity 90~95% RH for 96 hours and 1~2 hours recovery time under normal condition.

7.7 高温特性 **High Temperature Endurance**

在温度为 $85 \pm 5^\circ\text{C}$ 的恒温箱中放置 96 ± 2 小时，在常温中恢复 1~2 小时后测试。测试需符合电气性能指标。

The device should fulfill the electrical specification after exposed to temperature $85 \pm 5^\circ\text{C}$ for 96 ± 2 hours and 1~2 hours recovery time under normal temperature.

7.8 低温特性 **Low Temperature Endurance**

在温度为 $-40^\circ\text{C} \pm 5^\circ\text{C}$ 低温箱中放置 96 ± 2 小时后恢复 1~2 小时，测试需符合电气性能指标。

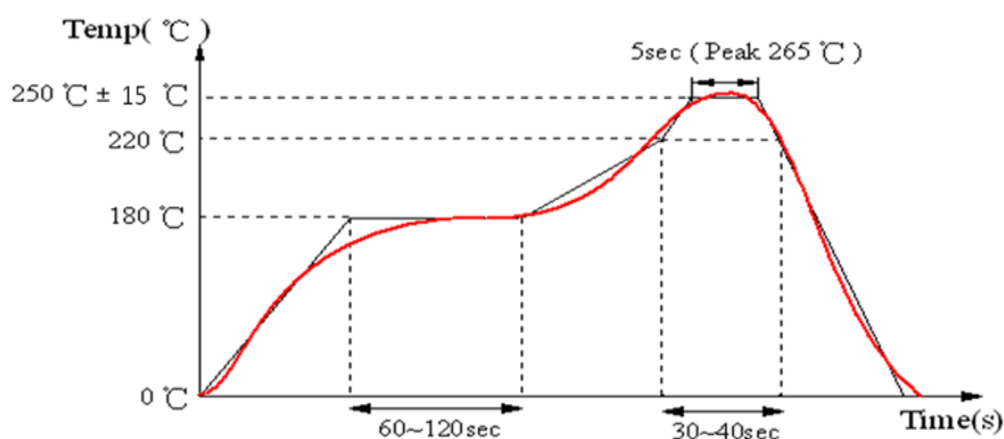
The device should fulfill the electrical specification after exposed to the temperature $-40^\circ\text{C} \pm 5^\circ\text{C}$ for 96 ± 2 hours and to 2 hours recovery time under normal temperature.

7.9 温度循环 **Temperature Cycle Test**

在 -40°C 温度中保持 30 分钟，再在 $+85^\circ\text{C}$ 温度中保持 30 分钟，共循环 5 次后在常温中恢复 1~2 小时后测试需符合电气性能指标。

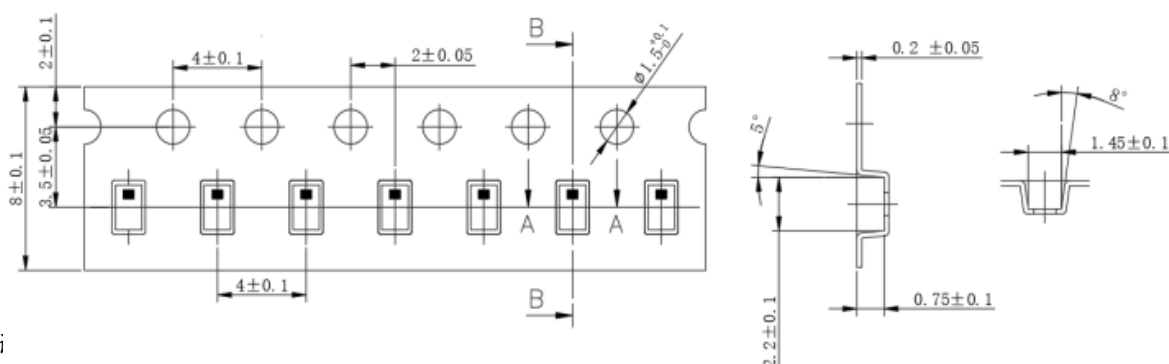
The device should fulfill the electrical specification after exposed to the low temperature -40°C and high temperature $+85^\circ\text{C}$ for 30 ± 2 min each by 5 cycles and 1 to 2 hours recovery time under normal temperature.

8 回流焊温度 **Reflow Soldering Standard Condition**



9 包装尺寸 (2012) Packaging and Dimensions

9.1 Plastic Tape (Unit: mm)

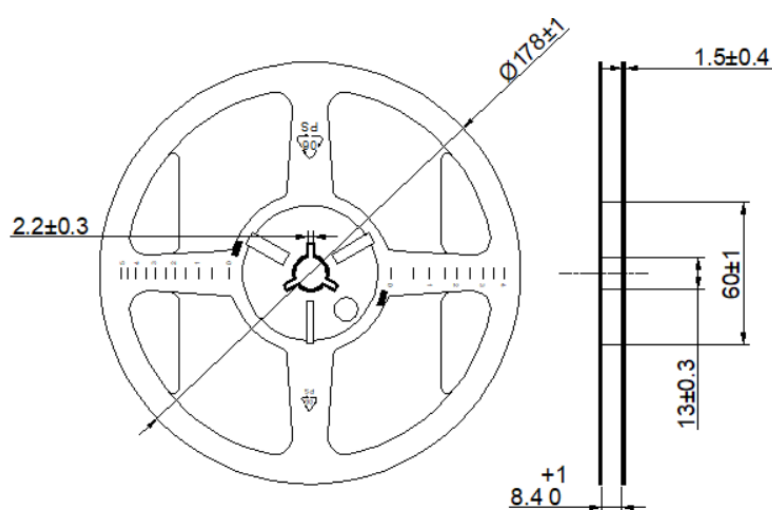


包装i

载带尾部空穴长度至少 200mm，载带头部空穴长度至少 200mm，头部的盖带加长至少 200mm。

Reserve a length of 200mm at least for the trailer of the carrier and 200mm at least for the leader of the carrier and further 200mm at least of cover tape at the leading part of the carrier.

9.2 Reel (4000 pcs/Reel)



9.3 储存条件 Storage Period

产品收到后一年内使用完毕.

Product should be used within twelve months of receipt.

湿敏等级 1 / 储存温度与湿度:

MSL 1 / Storage Temperature Range : -40~85 degree C, Humidity : <85%RH