

客户 Customer: \_\_\_\_\_

日期 Date: \_\_\_\_\_

# 纳入仕様书 SPECIFICATION

产 品 名 称 PRODUCT NAME: 叠层片式双工器

Multilayer Chip Diplexer

贵 司 料 号 YOUR PART NO.: \_\_\_\_\_

敝 司 料 号 OUR PART NO.: MDPX18M1524P69-D03

版 本 号 VERSION.: V 2.0

接受 RECEPTION

THE SPECIFICATION HAS BEEN ACCEPTED.

该纳入仕様书已被我司接受

日期:  
DATE:

公司:  
COMPANY:

批准  
CFMD

审核  
CHKD

接收  
RCVD

本纳入仕様书共 13 页

## MANUFACTURING NAME

深圳市麦捷微电子科技股份有限公司

SHENZHEN MICROGATE TECHNOLOGY CO., LTD

TEL: 86-755-28085000

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|             |             |             |
|-------------|-------------|-------------|
| CFMD.<br>批准 | CHKD.<br>审核 | DSGD.<br>担当 |
| 梁启新         | 赖定权         | 曾艳峰         |

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## 纳入仕様书改定履历 MODIFY HISTORY OF SPECIFICATION

| Ver. | DATE       | CONTENT                                  | APPROVED |
|------|------------|------------------------------------------|----------|
| 1.0  | 2012.12.06 | 初稿 Constitute                            | 梁启新      |
| 1.1  | 2014.05.20 | 增加 Land Pattern                          | 梁启新      |
| 2.0  | 2015.11.24 | 更改电性曲线 Modify Electrical Characteristics | 梁启新      |
|      |            |                                          |          |

## 目录 CATALOG

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## 1 适用范围 Scope

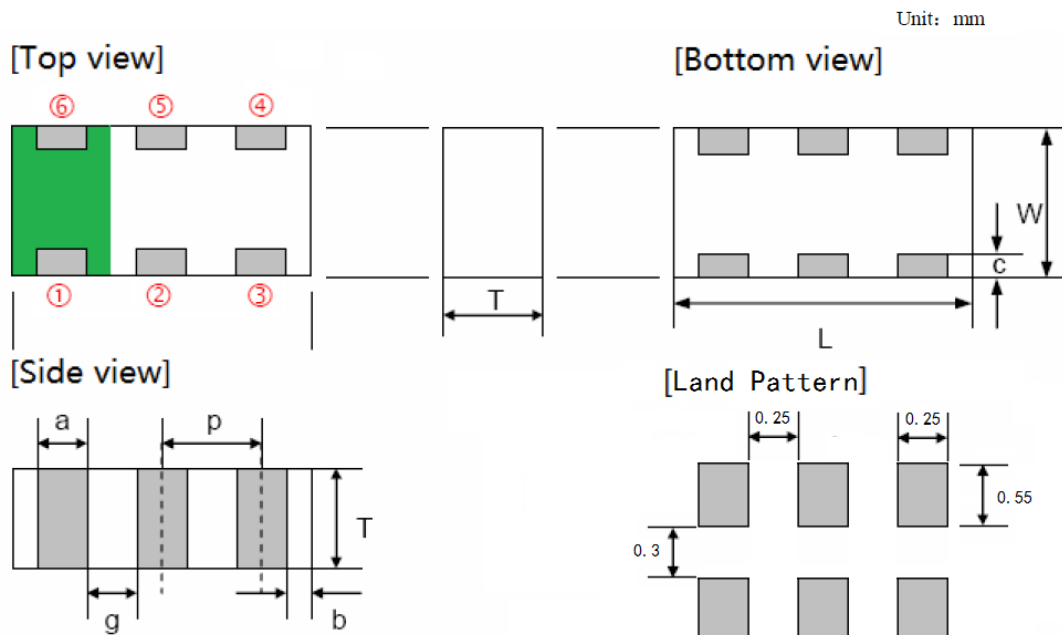
“麦捷”微波双工器系列产品设计用于 PHS、WLAN、GSM、Bluetooth、PDA 和无绳电话机中，具有低的插入损耗、高的衰减和小体积 SMD 片式设计，能减少复杂的调校工作，可以简化电路设计。

“Microgate” Microwave Diplexer series are designed to be used in PHS、WLAN、GSM、Bluetooth、PDA & Cordless phones 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 品名构成 Product Identification



## 3 形状、尺寸和材料 Appearance, Dimensions and Material



Dimension

| L             | W             | T             | a             | b             | c              | g             | p              |
|---------------|---------------|---------------|---------------|---------------|----------------|---------------|----------------|
| $1.6 \pm 0.1$ | $0.8 \pm 0.1$ | $0.6 \pm 0.1$ | $0.2 \pm 0.1$ | $0.2 \pm 0.1$ | $0.15 \pm 0.1$ | $0.3 \pm 0.1$ | $0.5 \pm 0.05$ |

PIN Configuration

| 1   | 2             | 3   | 4                | 5   | 6                |
|-----|---------------|-----|------------------|-----|------------------|
| GND | Antenna Input | GND | Lower Freq. Port | GND | Higher Freq.Port |

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| Part Name 名称              | Structure and Material 结构及材料  |
|---------------------------|-------------------------------|
| Resonator 谐振体             | Dielectric Material LTCC 介质材料 |
| In/Output Terminals 输入/输出 | Ag 银                          |
| Ground Base 接地面           | Ag 银                          |

## 4 测试条件 Testing Conditions

除非另有规定，否则在以下条件下测试 <Unless otherwise specified>

温度 Temperature : Ordinary Temperature (5 to 35℃)  
 湿度 Humidity : Ordinary Humidity (25 to 85% RH)

大气压强 Atmospheric Pressure : 86 to 106 kPa

当对测量结果有疑问时<In case of doubt>

温度 Temperature : 20±2℃  
 湿度 Humidity : 60 to 75% RH  
 大气压强 Atmospheric Pressure : 86 to 106 kPa

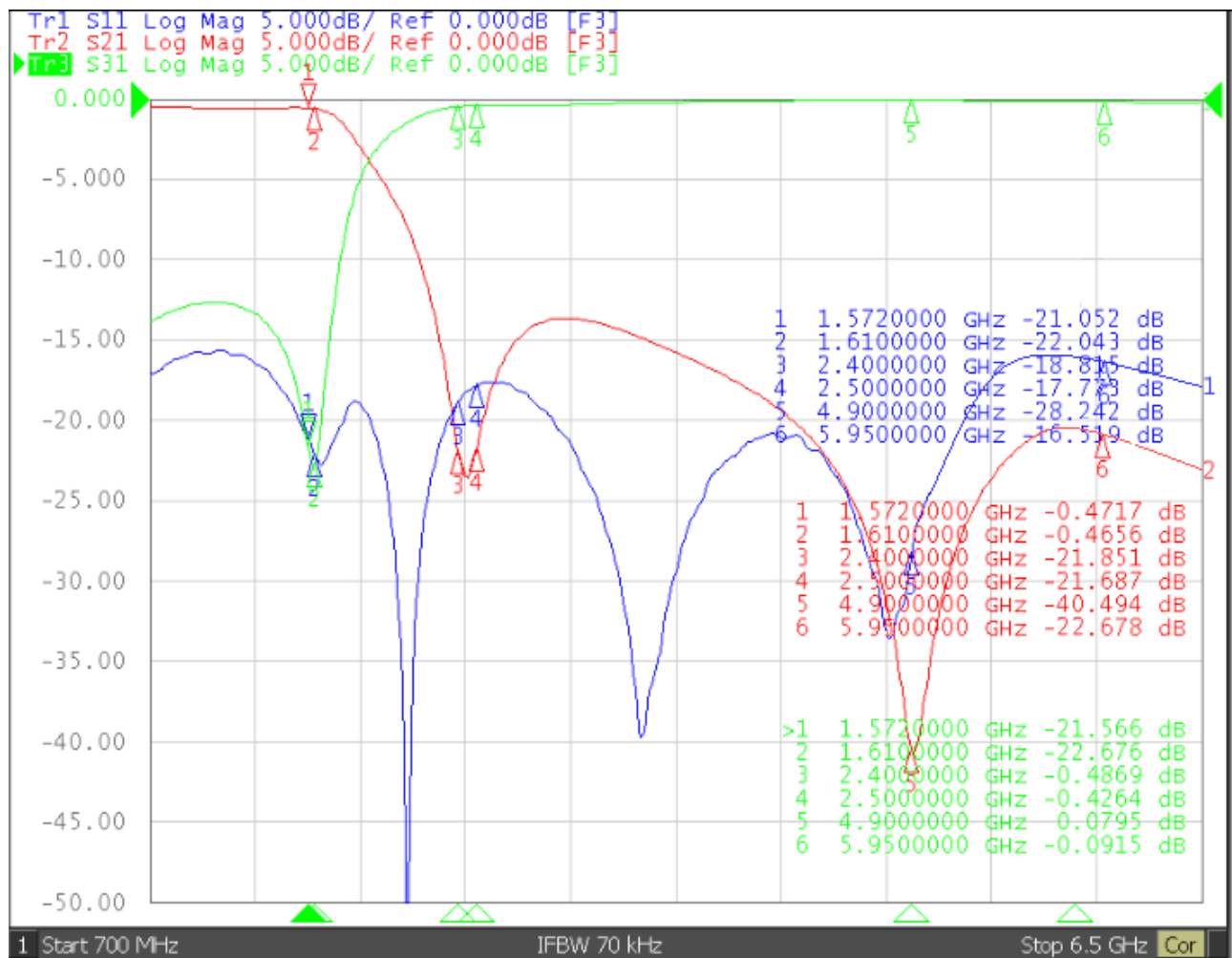
## 5 电气性能 Electrical Characteristics

操作温度范围 Operating Temperature Range : -40 to +85℃

保存温度范围 Storage Temperature Range : -40 to +85℃

| No. | Item (项目)                        | Specifications (特性)    |         |
|-----|----------------------------------|------------------------|---------|
| 5.1 | Frequency Range 频率范围 f1          | 2400-2500 MHz          |         |
|     |                                  | 4900-6000 MHz          |         |
|     | Frequency Range 频率范围 f2          | 1570-1610 MHz          |         |
| 5.2 | Insertion Loss (in f1) 插入损耗      | 2400-2500 MHz          | ≤ 0.7dB |
|     |                                  | 4900-6000 MHz          | ≤ 0.6dB |
| 5.3 | Insertion Loss (in f2) 插入损耗      | ≤ 0.6dB                |         |
| 5.4 | V.S.W.R (in BW) 驻波比 (in f1 & f2) | ≤ 2.0                  |         |
| 5.5 | Attenuation 阻带损耗 (in f1)         | ≥ 20dB (1570~1610 MHz) |         |
| 5.6 | Attenuation 阻带损耗 (in f2)         | ≥ 15dB (2400~2500MHz)  |         |
|     |                                  | ≥ 15dB (4900~6000MHz)  |         |
| 5.7 | In/Output Impedance 输入/输出阻抗      | 50 Ω                   |         |
| 5.8 | Power Capacity 功率容量              | 2.0 W max.             |         |

## 6 特性曲线 Characteristic Curve



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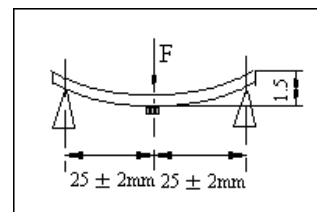
传真(Fax): 0755-28085605

邮编(Postcode): 518118

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## 7 信赖性试验 Reliable Performance

| NO. | Item                       | Specifications                                                                  | Test Methods                                                                                                                                                                                                                                                                                                                                                                                |             |
|-----|----------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 7-1 | Solder-Ability<br>可焊性      | More than 90% of termination should be covered with new solder. 端电极焊锡覆盖率为90%以上。 | 焊锡 Solder: Sn: Pb=                                                                                                                                                                                                                                                                                                                                                                          | 100:0       |
|     |                            |                                                                                 | 焊锡温度 Temperature:                                                                                                                                                                                                                                                                                                                                                                           | 255℃+5℃/-0℃ |
|     |                            |                                                                                 | 助焊剂 Flux: 松香 rosin                                                                                                                                                                                                                                                                                                                                                                          |             |
|     |                            |                                                                                 | 浸渍时间 Duration:                                                                                                                                                                                                                                                                                                                                                                              | 5±0.5s      |
| 7-2 | Leaching Resistance<br>耐焊性 | More than 75% of termination Should be covered with new solder. 端电极焊锡覆盖率为75%以上  | 焊锡 Solder: Sn: Pb=                                                                                                                                                                                                                                                                                                                                                                          | 100:0       |
|     |                            |                                                                                 | 焊锡温度 Temperature:                                                                                                                                                                                                                                                                                                                                                                           | 270℃+2℃/-0℃ |
|     |                            |                                                                                 | 助焊剂 Flux: 松香 rosin                                                                                                                                                                                                                                                                                                                                                                          |             |
|     |                            |                                                                                 | 浸渍时间 Duration:                                                                                                                                                                                                                                                                                                                                                                              | 10±0.5s     |
| 7-3 | Terminal Strength<br>端头强度  | The terminal and body should be no damage<br>端头和瓷体不应见损伤                         | The device should not be broken after tensile force of 1.0kg is slowly applied to pull a lead pin of the fixed device in the lead axis direction for 10±1 seconds.<br>在产品电极端子上或表面上应能承受 1kg 垂直拉力 10±1 秒                                                                                                                                                                                      |             |
| 7-4 | Bending Strength<br>弯曲试验   | No mechanical damage should be noticed<br>不应见机械损伤                               | Weld the product to the center part of the PCB with the thickness 1.6±0.2mm 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.<br>将产品按图焊在 1.6±0.2mm 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。 |             |



| NO.  | Item                                                     | Specifications                                                                                                                                                                                                                                                                                            | Test Methods                                                                                                                                                                                                                                                          |
|------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7-5  | Drop<br>跌落                                               | Post Environmental Tolerance<br>(环境试验后允许附加误差)<br><br>1 Center Frequency 中心频率 fo:<br>± 2.0 MHz;<br><br>2 Insertion Loss 插入损耗:<br>± 0.5 dB;<br><br>3 Band Width 通带宽度:<br>± 1.0 MHz<br><br>4 Ripple (in BW) 通带波动:<br>± 0.5 dB;<br><br>5 V.S.W.R (in BW) 驻波比:<br>± 0.2<br><br>6 Attenuation 阻带衰耗:<br>± 2.0 dB | Drop 10 times on a concrete floor from a height of 1m.<br>从距混凝土地面 1m 高度自由落下, 重复 3 次。                                                                                                                                                                                  |
| 7-6  | Vibration<br>振动                                          |                                                                                                                                                                                                                                                                                                           | 频率 Frequency: 10 to 55Hz<br>振幅 Amplitude: 1.5mm<br>方向及时间 Direction and time:<br>X, Y and Z directions for 2 hours each.                                                                                                                                               |
| 7-7  | Humidity<br>resistance<br>耐潮湿                            |                                                                                                                                                                                                                                                                                                           | a. 试验条件 Test condition<br>温度 Temp.: 60±2℃<br>湿度 Humidity: 90%~95%<br>试验时间 Test time: 96±2 h<br>b. 测量条件 Measurement method:<br>试验后常温常湿环境中放置 (24±2) 小时后测量。<br>The component should be stabilized at normal condition for (24±2) hours before test.                      |
| 7-8  | High<br>temperature<br>resistance<br>耐高温                 |                                                                                                                                                                                                                                                                                                           | a. 试验条件 Test condition<br>温度 Temp.: + 85±2℃<br>试验时间 Test time: 96±2 h<br>b. 测量条件 Measurement method:<br>试验后常温常湿环境中放置 (24±2) 小时后测量。<br>The component should be stabilized at normal condition for (24±2) hours before test.                                            |
| 7-9  | Low<br>temperature<br>resistance<br>耐低温                  |                                                                                                                                                                                                                                                                                                           | a. 试验条件 Test condition<br>温度 Temp.: -40±2℃<br>试验时间 Test time: 96±2 h<br>b. 测量条件 Measurement method:<br>试验后常温常湿环境中放置 (24±2) 小时后测量。<br>The component should be stabilized at normal condition for (24±2) hours before test.                                             |
| 7-10 | Thermal shock<br>(Temperature<br>cycle)<br>热冲击<br>(温度循环) |                                                                                                                                                                                                                                                                                                           | a. 试验条件 Test condition<br>1) 温度 Temp.: -40℃, 时间 time: 30±3min<br>2) 温度 Temp.: +85℃, 时间 time: 30±3min<br>5 cycles<br>b. 测量条件 Measurement method:<br>试验后常温常湿环境中放置 (24±2) 小时后测量。<br>The component should be stabilized at normal condition for (24±2) hours before test. |

## 8 焊接条件 Recommended Soldering Conditions

### 1、焊剂 Flux, Solder

① 使用松香助焊剂，禁止使用卤化物含量超过 0.2wt% 的强酸性助焊剂。

Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).

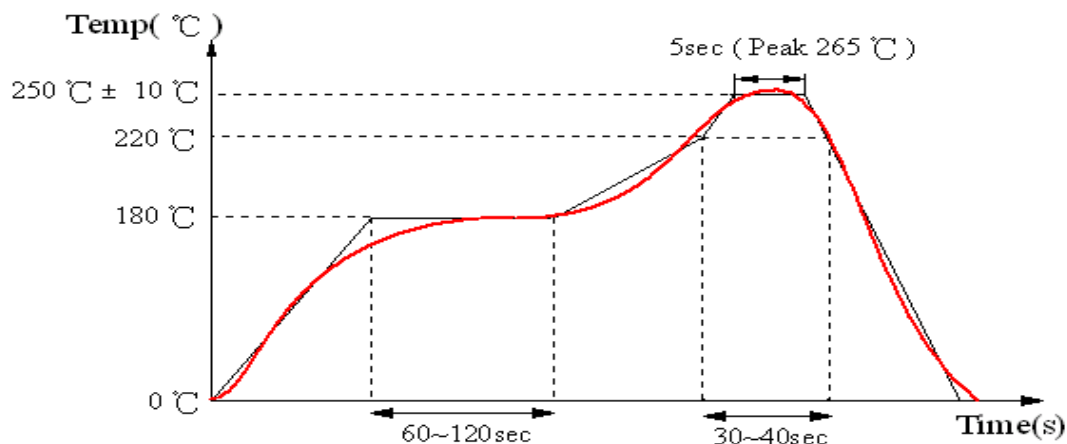
② 使用纯锡焊料 Use Sn solder.

### 2、回流焊条件 Reflow soldering conditions

● 预热时，产品表温与焊料温度的温差最大不允许超出 150℃，焊接完后冷却时，产品表温与溶剂温度之间的温差最大不允许超出 100℃。预热不足有可能引发产品表面裂纹，导致产品品质下降。

Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150℃ max. Cooling into solvent after soldering also should be in such a way that temperature difference is limited to 100℃ max. Unwrought pre-heating may cause cracks on the product, resulting in the deterioration of products quality.

● 标准回流焊曲线 Standard soldering profile.



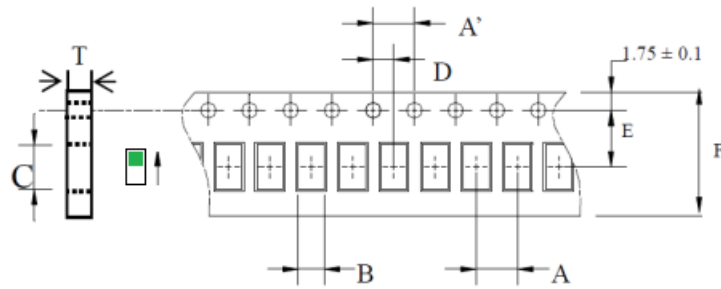
### 3、手工返工 Reworking with soldering iron

当使用电烙铁进行手工焊接时，以下条件必须严格遵守 The following conditions must be strictly followed when using a soldering iron.

|                                |                |
|--------------------------------|----------------|
| 预热 Pre-heating                 | 150℃, 1 minute |
| 尖端温度 Tip temperature           | 350℃ max       |
| 输出功率 Soldering iron output     | 80w max        |
| 电烙铁头尖端尺寸 End of soldering iron | φ3mm max       |
| 焊接时间 Soldering time            | 3 seconds max  |

## 9 包装 Packaging

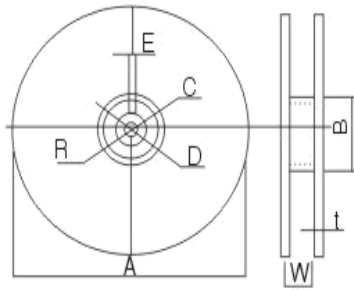
### ① 编带尺寸 Dimensions of Tape:



| Type | A             | A'            | B             | C             | D             | E             | F             | T               | Tape Material |
|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|---------------|
| 1608 | $4.0 \pm 0.1$ | $4.0 \pm 0.1$ | $1.1 \pm 0.1$ | $1.9 \pm 0.1$ | $2.0 \pm 0.1$ | $3.5 \pm 0.1$ | $8.0 \pm 0.1$ | $0.75 \pm 0.05$ | Paper         |

### ② 带轮尺寸 Dimensions of Reel

Unit: mm



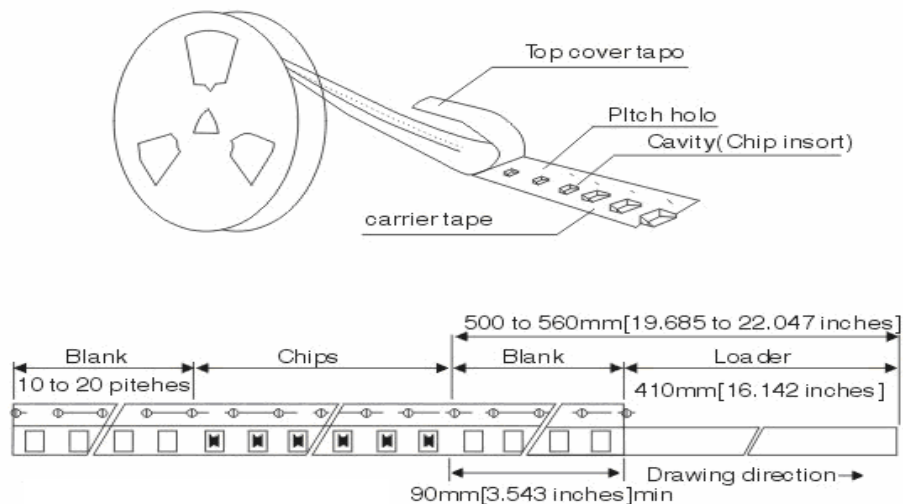
Reel material: PS (Polystyrene)

|   |                |
|---|----------------|
| A | $178 \pm 2$    |
| B | $60 \pm 2$     |
| C | $13.0 \pm 0.5$ |
| D | $21.0 \pm 0.8$ |
| E | $2.0 \pm 0.5$  |
| W | $8.5 \pm 1.0$  |
| t | $1.2 \pm 0.2$  |
| R | $1.0 \pm 0.25$ |

### ③ 编带抗拉强度 Pulling strength of tapes:

|                 |                            |
|-----------------|----------------------------|
| 载带 Carrier tape | 10N or more (1kgf or more) |
| 上盖带 Cover tape  | 5N or more (1kgf or more)  |

### ④ 编带简图及拉伸方向 Taping figure and drawing direction:



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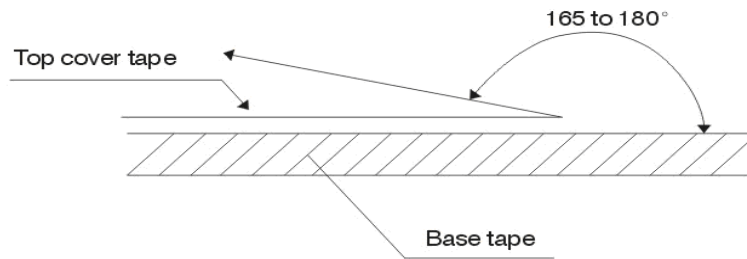
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⑤ 盖带的剥离强度 Peeling strength of cover tape:

|               |                      |
|---------------|----------------------|
| 盖带 Cover tape | 0.3~0.7N (30gf~70gf) |
|---------------|----------------------|



测试条件 Test condition.

- 1) 剥离角度 peel angle: 165 ~180 °vs. carrier tape.
- 2) 剥离速度 peel speed: 300mm/min±10%.

⑥ 包装数量 Packaging quantities: 4000 PCS / Reel

## 10 装箱清单及标志 Packing documents and marking

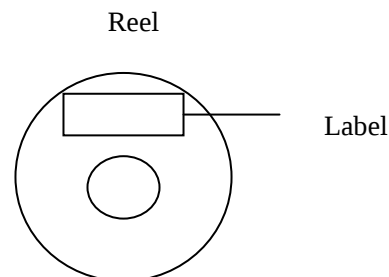
### 1. 包装文件 Packing documents

Packing includes the following:

- a. 装箱清单 Packing list.
- b. 合格证书 Certificate of compliance.

### 2. 盘上标记 Marking on reels:

- a 麦捷料号 MICROGATE Part No.
- b 生产批号 Lot number
- c 盘装数量 Quantity per reel
- d 检验员号 Inspector No.



以上内容必须在标签上注明.All above shall be shown on marking label

麦捷公司标签如下所示: MICROGATE marking label will be as following:

| MICROGATE         |           |          |
|-------------------|-----------|----------|
| CUSTOMER:         | P. O. NO  |          |
| CUSTOMER PART NO: | DATE CODE | LOT NO   |
| MG PART NO:       | QUANTITY  | INSP. NO |

||||| ||||| ||||| |||||  
MG PART NO

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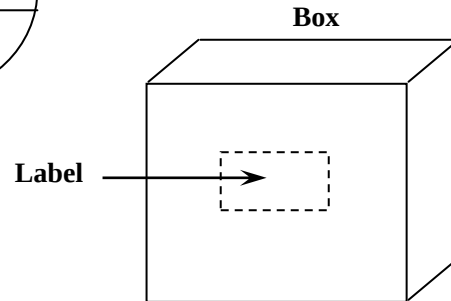
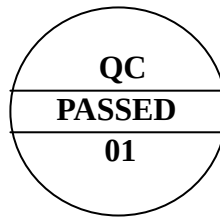
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传真(Fax): 0755-28085605

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检验合格后,检验员在标签上盖上合格章。合格章如下所示: The eligible reels will be pressed a mark onto the surface. The mark will be as following:



3. 内包装盒标记: Marking on inner box

- a. 型号 MICROGATE part No.
- b. 每盒数量 Quantity per box
- c. 包装日期 Date

以上内容必须在标签上注明(标签见 10.2 所示)。Above shall be shown on marking label (The marking label is shown in item 10.2).

4. 外包装箱标记 Marking on outer case:

1) 制造商 Manufacturer: “MICROGATE” ①

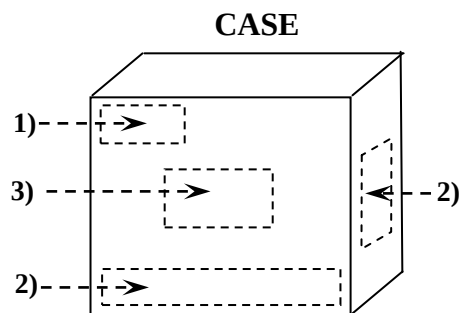
“中国深圳制造” “Made in Shenzhen CHINA” ②

2) 发运标记 Ship marking:

“向上” “UP”, “小心轻放” “HAND CARE”, “防潮” “MOISTURE-PROOF”.

3) 包装标签包括以下内容 Packing label include the following:

- a. 型号 MICROGATE Part No
- b. 总数量 Total quantity per case
- c. 包装日期 Date;



以上内容必须在标签上注明。(参见 10.2 所示)

All above shall be shown on marking label.

(The marking label is shown in item 10.2)

## 11 保管 Storage

### ①. 保管期限 Storage period

距麦捷出厂检验时间六个月内，产品可以使用；检验时间可以通过包装外侧标记的检验号确认；若时间超出六个月，应检查焊接性能后方可使用。Products which inspected in MICROGATE over 6 months ago should be examined and used, which can be confirmed with inspection No. marked on the container. Solder ability should be checked if this period is exceeded.

### ②. 保存条件 Storage conditions

●存放货物的库房应满足以下条件 Products should be storage in the warehouse on the following conditions

温度 Temperature: 10~ 40℃

湿度 Humidity: 30~70% relative humidity

不允许温、湿度有极剧变化。No rapid change on temperature and humidity

●禁止将产品保管在腐蚀性物质中，例如硫磺、氯气或者酸，否则将引起端头氧化，导致降低焊接性。Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solder ability.

●为了避免受潮气、灰尘等物质的影响，产品应保管于货架上。Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.

●产品保管在库房中时，应避免热冲击，振动以及直接光照等等。Products should be storage in the warehouse without heat shock, vibration, and direct sunlight and so on.

●产品应密封包装 Products should be storage under the airtight packaged condition.