# 产品承认书

## SPECIFICATION FOR APPROVAL

供 应 商
Supplier: 惠州市长瑞工贸有限公司

品　　名
Product Name: 环形电感

规格型号
Type: T038-125-21uH±15%(CR2744)

长瑞料号
CRnumber: CR2744

客户名称
Customer:

客户料号
Number:

客户描述
Description:

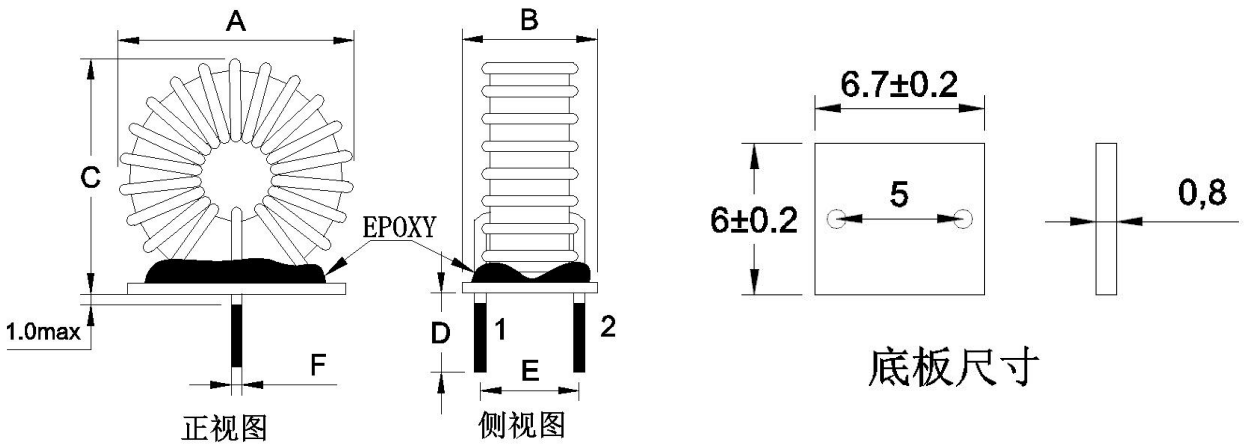
| 客户确认 Customer confirmation | | | 供应商确认 Vendor confirmation | | |
|---|---|---|---|---|---|
| 接收 Receive | 审核 Checked | 批准 Approval | 拟制 Fiction | 审核 Checked | 批准 Approval |
| | | | | 夏欢 | |

惠州市长瑞工贸有限公司（Huizhou Changrui Industry and Trade Co., Ltd.）
惠州市长瑞智造电子有限公司（Huizhou Changrui Intelligent Manufacturing Electronics Co., Ltd.）
Web:www.changereal.cn/Tel:0752-2280100/Fax:0752-2280130
地址(Add): 惠州市惠城区水口街道水青路 1 号联东 U 谷 1 栋 11 楼

## ■变更履历表Change of resume

| 版本<br>version | 日 期<br>Date | 变更内容及原因<br>Change Content and Reasons | 拟制<br>Fiction | 批准<br>Approval |
|---|---|---|---|---|
| V1.0 | 2024-08-12 | 1.新制作/发行 | 刘珊萍 | 夏欢 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## ■外观尺寸 Dimensions




备注：单漆包线密绕，底部留空;线包置于 PCB 板中心位置不可倾斜;线包与底板点胶固定，胶水分量要足，但是不可超出板边外套 UL 热缩超薄套管;成品需含浸。

| 尺寸规格 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| | 12.5max | 7.2max | 12.3max | 2.8±0.3 | 5.0±0.5 | 0.6±0.1 |

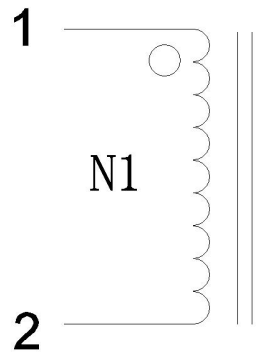
## ■重点技术参数 Important ability

### 1.主要电性参数 The main performance parameters

| 序号 (N0) | 项 目 Parameter | 测试端 Test terminal | 测试结果 Results | 测试条件/设备 TEST CONDITION INSTRUMENT |
|---|---|---|---|---|
| 1 | 电感量 Inductance | 1-2 | 21uH±15% | at25℃,1KHz,0.25V，100Ω/ ZX1085BX |
| 2 | 直流电阻 DC Resistance | 1-2 | ≤30mΩ | at25℃/TH2512B |
| 3 | 绝缘阻抗 Insulation impedance | COIL-CORE， | 100MΩmin | 500VDC / ZX9320S-4 |
| 4 | 阻抗 impedance | 1-2 | 45Ωmin | 0.5MHz/HP 4395 |
| | | 1-2 | 90Ωmin | 1MHz/HP 4395 |
| | | 1-2 | 900Ωmin | 10MHz/HP 4395 |
| 5 | 温升电流 Irms | 1-2 | △T≤40℃ | 3A/ZX1373X-12A |
| 6 | 饱和电流 Iast | 1-2 | L≥60%L0 | 2A/ZX1373X-12A |

备注:电检成品在 25℃环境下摊开静置 3 小时，测试电参数。

2.电路图 Circuit diagram




3.材料参数 Material parameters

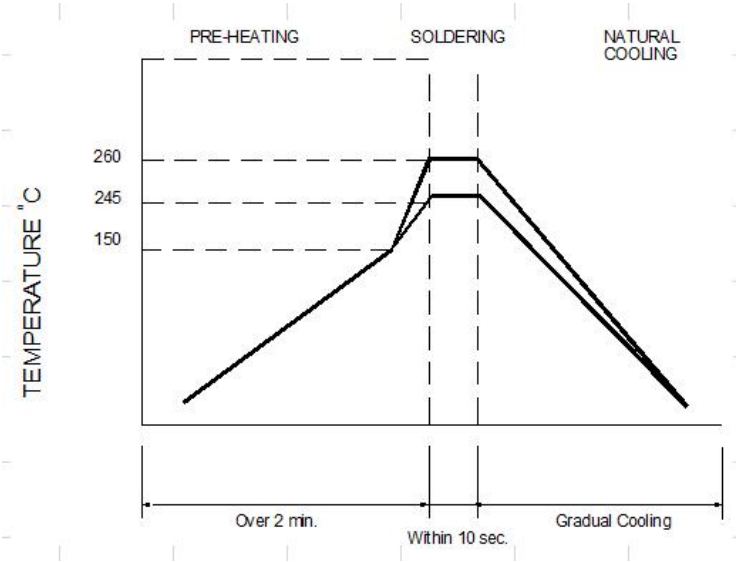
| | |
|---|---|
| 磁芯<br>Core | 铁硅铝T038-125 |
| 线材<br>Wire | N1(1-2): QA-1/155Φ0.6mm本色 |
| 参考圈数<br>Number of turns | 18Ts 密绕 |

## ■材料明细 Material detailed

| NO. | 名称<br>Item | 材料<br>Material | 温度<br>temperature | 制造厂商<br>Manufacturer | UL 号 |
|---|---|---|---|---|---|
| 1 | 磁芯 Core | 铁硅铝<br>T038-125 | / | Boluo County F Chenxing Electronic Technology Co., Ltd. | |
| | | 铁硅铝<br>T31-125 | / | CMSS Technology Co.,Ltd | |
| 2 | 漆包线 wire | QA-1/155 | 155℃ | HONGQI GROUP JIANGXI COPPER CO.,LTD | E355168 |
| | | 2UEW-F | 155℃ | DONGGUAN YIDA NDUSTRY Co,LTD. | E344055 |
| 3 | 锡 Sn | SC07 | / | Guangdong Zhongshi Metal Co., Ltd | |
| 4 | 黑胶 epoxy | 3300A-1/3300B-1 | 130℃ | DONGGUAN EATTO ELECTRONIC MATERIAL CO.,LTD. | E218090 |
| 5 | 底板 Base | FR-4 | 130℃ | KINGBO ARD LAMINATES HOLDINGS LTD | E123995 |
| 6 | 凡立水 Varnish | JX-1150(a) | 130℃ | Yueyang GREEN Technology Co., LTD | E303754 |

## ■ 应用技术说明 Application technical description

### 1.过波峰焊特性 Wave soldering



## 2.温度环境 temperature environment

1、 贮存时间：常温存储不超过 6 个月。Storage at room temperature for no more than three months

2、 工作温度：-40℃~150℃。Working temperature:-40℃~150℃

3、 推荐储存温度：室温、相对湿度小于 75%。

Recommended storage temperature: room temperature, relative humidity is less than 75%

## 3.外观质量 Appearance quality:

1、产品表面不允许有明显损伤。产品表面无标记。

The product surface does not allow any damage. Product surface without marks.

2、外形及尺寸参考绘图。

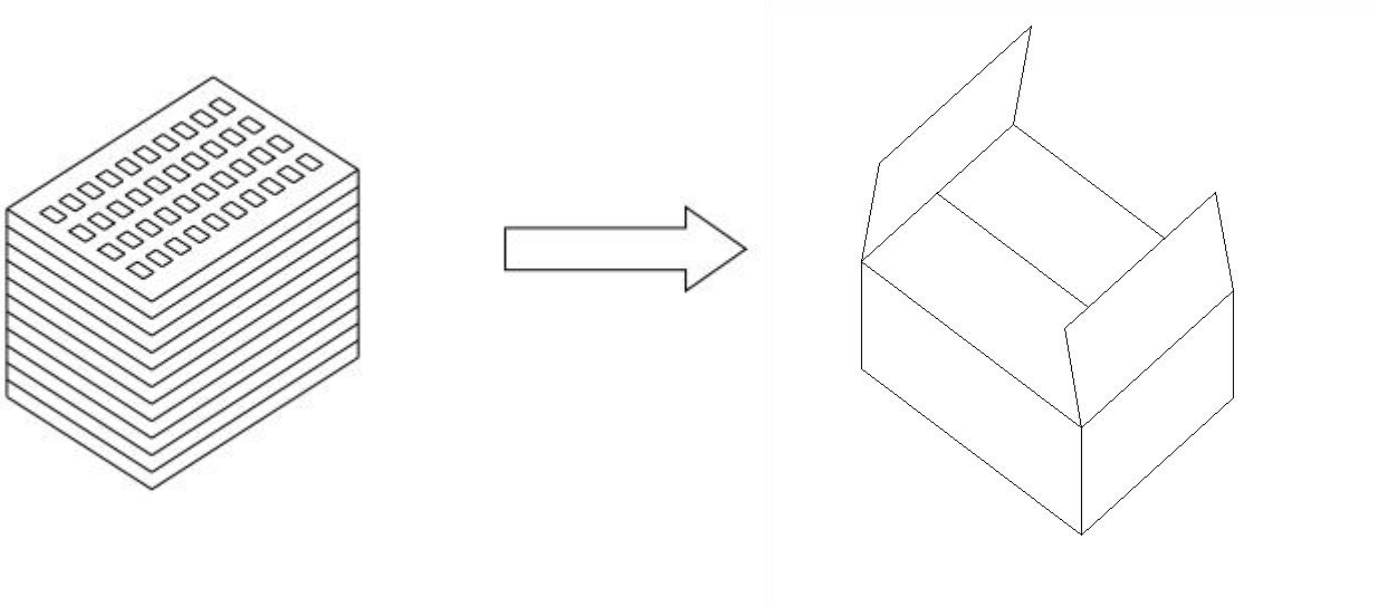
Shape and size reference drawing。

## 4.包装方式 Packaging：

1、内包装：吸塑 skin packing

2、外包装：纸箱 the outer packing: carton

3、合格证：包括产品名称或型号、数量、批号/日期、检验员 certificate of approval, including the product name or model, quantity, batch number/date and inspector

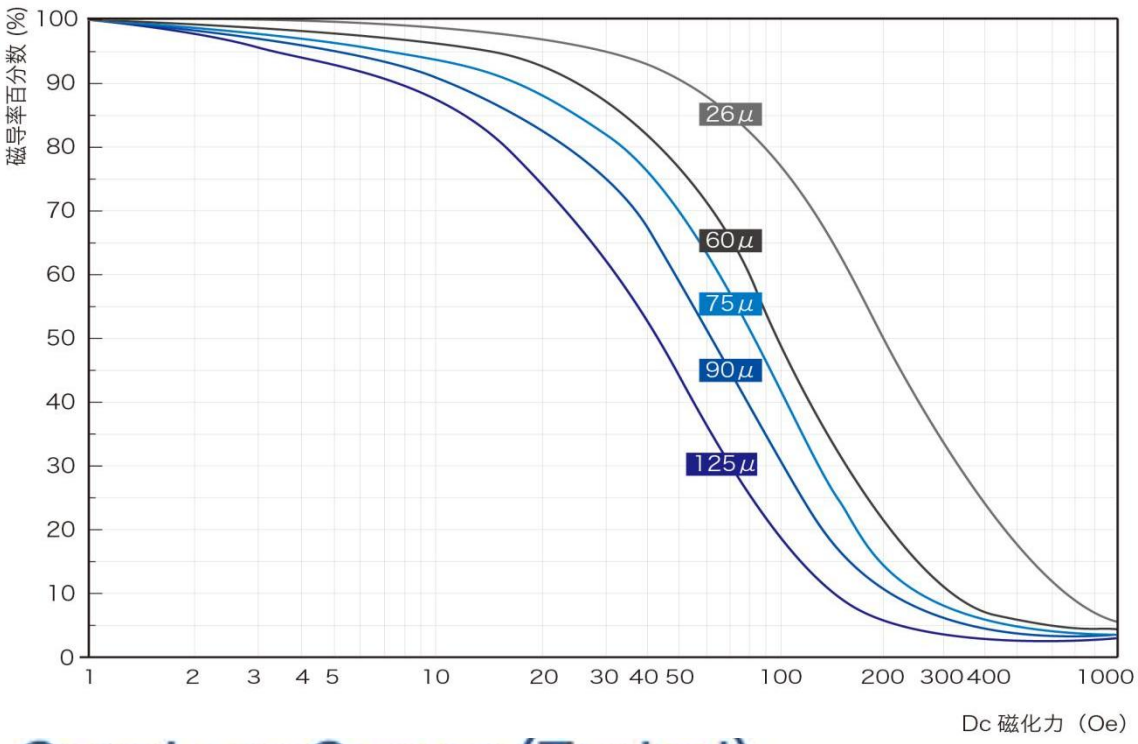


| 序号<br>(N0) | 包装材料<br>Packing material | 尺寸<br>Size | 材质<br>Material | 数量<br>Quantity |
|---|---|---|---|---|
| 1 | 吸塑 Plastic uptake | 378*275*13mm | PET | 77pcs/BOX |
| 2 | 外箱 Master Carton | 385*280*145mm | K747K | 3080pcs/Carton |

## 磁芯曲线 CORE MATERIAL CURVE

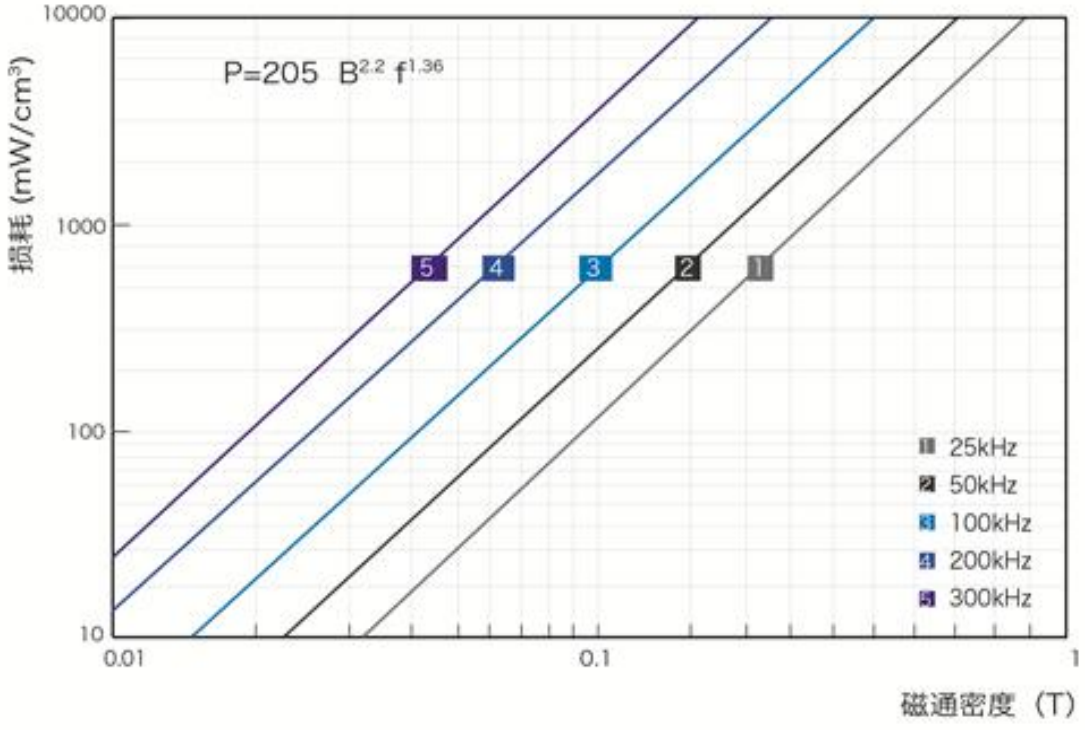
### DC-Bias curves(Typical)

铁硅铝（FeSiAl）

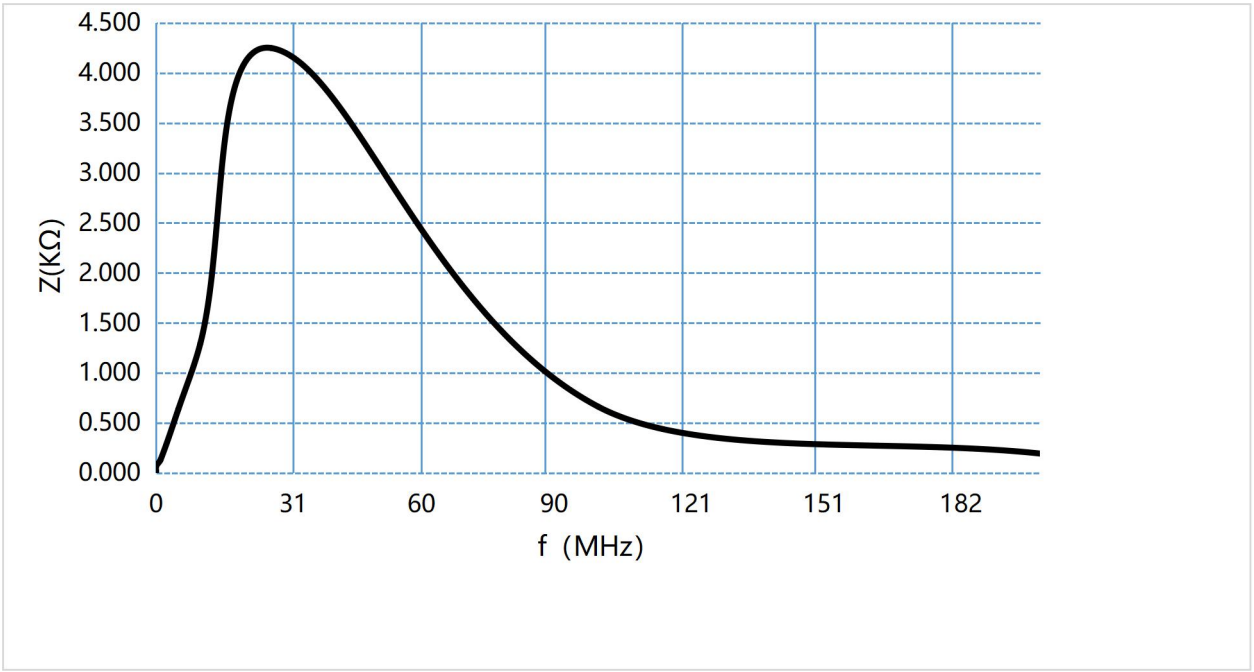



### Core Loss Curves (Typical)

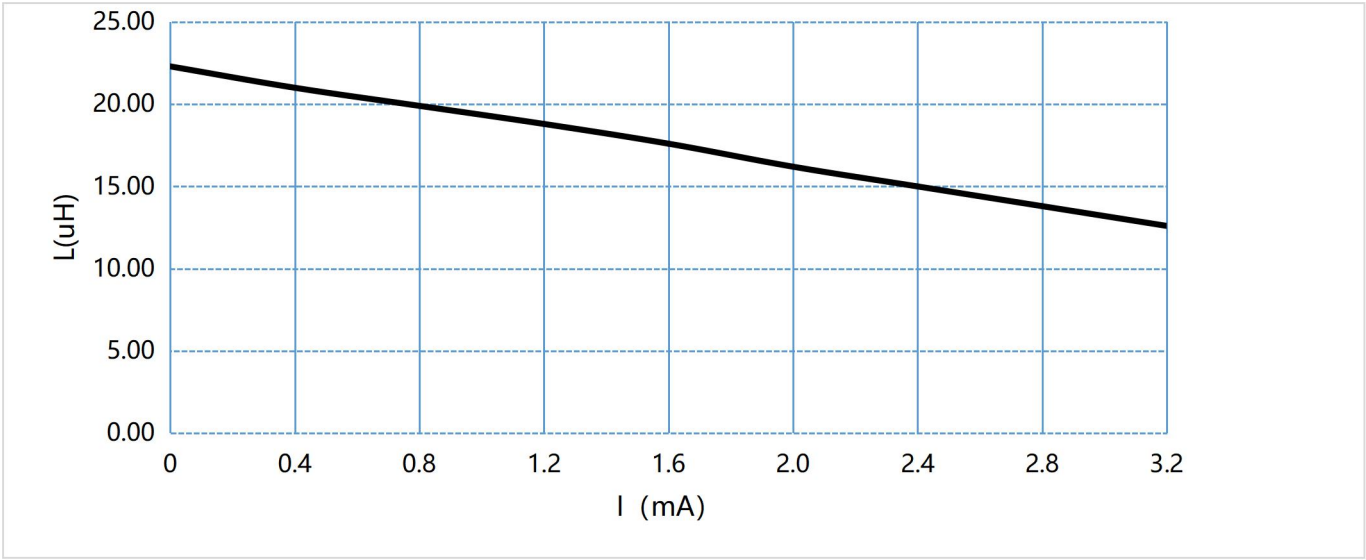
铁硅铝（FeSiAl） 60μ,75μ,90μ,125μ



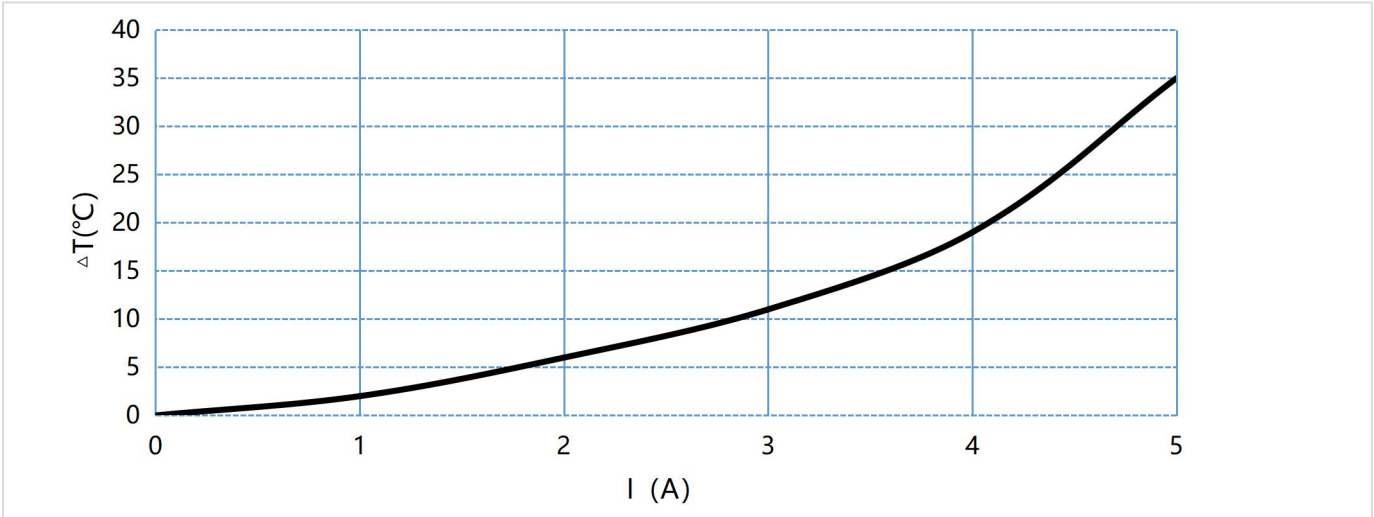
## 阻抗曲线 Application technical description




## 叠加电流曲线 Superimposed current curve




## 温升电流曲线 Temperature rise current curve



# 外观尺寸测试

| 项目 | A | B | C | D | E | F | | |
|---|---|---|---|---|---|---|---|---|
| 要求（mm） | 12.5max | 7.2max | 12.3max | 2.8±0.3 | 5.0±0.5 | 0.6±0.1 | | |
| 1 | 12.11 | 6.82 | 12.01 | 2.84 | 5 | 0.59 | | |
| 2 | 12.05 | 7.02 | 12.00 | 2.82 | 5.15 | 0.6 | | |
| 3 | 12.22 | 7 | 12.00 | 2.8 | 5.09 | 0.59 | | |
| 4 | 12.11 | 6.86 | 11.90 | 2.83 | 5.07 | 0.59 | | |
| 5 | 12.22 | 7.01 | 12.03 | 2.92 | 5.04 | 0.6 | | |
| 6 | 12.07 | 6.85 | 12.00 | 2.76 | 5.17 | 0.6 | | |
| 7 | 12.05 | 7.1 | 11.80 | 2.72 | 4.9 | 0.59 | | |
| 8 | 12.24 | 7.09 | 11.99 | 2.84 | 5.05 | 0.6 | | |
| 9 | 12.16 | 6.96 | 12.02 | 2.73 | 5.1 | 0.59 | | |
| 10 | 12.27 | 7.04 | 11.91 | 2.79 | 5.11 | 0.59 | | |
| 11 | 12.06 | 6.82 | 11.80 | 2.76 | 4.95 | 0.59 | | |
| 12 | 12.2 | 6.98 | 11.83 | 2.98 | 5.13 | 0.59 | | |
| 13 | 12.21 | 6.96 | 11.86 | 2.99 | 5.04 | 0.6 | | |
| 14 | 12.22 | 6.96 | 12.05 | 2.82 | 4.91 | 0.6 | | |
| 15 | 12.11 | 7.06 | 11.83 | 2.71 | 5.07 | 0.59 | | |
| 16 | 12.05 | 6.81 | 11.83 | 2.82 | 5.12 | 0.59 | | |
| 17 | 12.19 | 6.93 | 12.05 | 2.83 | 4.96 | 0.6 | | |
| 18 | 12.06 | 6.95 | 11.85 | 3 | 5.01 | 0.6 | | |
| 19 | 12.22 | 6.97 | 11.92 | 2.8 | 4.99 | 0.6 | | |
| 20 | 12.27 | 6.85 | 11.90 | 2.92 | 4.91 | 0.6 | | |
| 21 | 12.13 | 7.08 | 11.92 | 2.73 | 5.02 | 0.6 | | |
| 22 | 12.11 | 6.9 | 11.83 | 2.85 | 4.96 | 0.59 | | |
| 23 | 12.19 | 6.93 | 11.91 | 3 | 4.96 | 0.59 | | |
| 24 | 12.18 | 6.9 | 11.80 | 2.98 | 5.12 | 0.6 | | |
| 25 | 12.06 | 7 | 11.87 | 2.96 | 5.1 | 0.59 | | |
| 26 | 12.24 | 7.09 | 12.03 | 2.95 | 5 | 0.6 | | |
| 27 | 12.07 | 6.96 | 11.80 | 2.74 | 5.16 | 0.6 | | |
| 28 | 12.21 | 6.81 | 11.89 | 2.74 | 4.95 | 0.6 | | |
| 29 | 12.21 | 6.92 | 12.05 | 2.75 | 5.06 | 0.6 | | |
| 30 | 12.15 | 6.82 | 11.85 | 2.91 | 4.91 | 0.6 | | |
| 31 | 12.16 | 6.82 | 12.01 | 2.98 | 4.97 | 0.6 | | |
| 32 | 12.07 | 6.91 | 12.01 | 2.76 | 5.19 | 0.6 | | |
| 33 | 12.13 | 6.94 | 11.88 | 2.72 | 4.9 | 0.6 | | |
| 34 | 12.24 | 6.98 | 11.98 | 2.75 | 5 | 0.6 | | |
| 35 | 12.14 | 6.94 | 11.82 | 2.76 | 5.15 | 0.59 | | |
| 36 | 12.07 | 6.86 | 12.00 | 2.9 | 5.19 | 0.6 | | |
| Min | 12.05 | 6.81 | 11.80 | 2.71 | 4.9 | 0.59 | | |
| Max | 12.27 | 7.1 | 12.05 | 3.00 | 5.19 | 0.6 | | |
| Average | 12.15 | 6.94 | 11.92 | 2.84 | 5.04 | 0.60 | | |
| Judge | ok | ok | ok | ok | ok | ok | | |

# 电性能测试

| 项目 | 电感量 L | 直流电阻 | | | | |
|---|---|---|---|---|---|---|
| 要求 | 21uH±15%<br>1KHz,0.25V,100Ω | ≤30mΩ | | | | |
| 1 | 21.3 | 18.9 | | | | |
| 2 | 22.8 | 18.6 | | | | |
| 3 | 20.7 | 18.5 | | | | |
| 4 | 21 | 18.6 | | | | |
| 5 | 20.8 | 18.6 | | | | |
| 6 | 22.4 | 18.7 | | | | |
| 7 | 21.6 | 18.6 | | | | |
| 8 | 21.8 | 18.8 | | | | |
| 9 | 21.6 | 18.6 | | | | |
| 10 | 20.6 | 18.5 | | | | |
| Min | 20.6 | 18.5 | | | | |
| Max | 22.8 | 18.9 | | | | |
| Average | 21.46 | 18.64 | | | | |
| Judge | OK | OK | | | | |

# 阻抗测试（辰星）

| 频率（MHz） | 0.1 | 0.5 | 1 | 5 | 10 | 100 | 200 | |
|---|---|---|---|---|---|---|---|---|
| 阻抗（Ω） | | 45min | 90min | | 900min | | | |
| 1 | 15.3 | 62.3 | 123.1 | 607.2 | 1250 | 561.4 | 163.3 | |
| 2 | 13.8 | 54.4 | 137.6 | 653.8 | 1281.3 | 583.9 | 186.1 | |
| 3 | 13.3 | 53.4 | 136.5 | 547.5 | 1429.7 | 652.2 | 215.5 | |
| 4 | 11.8 | 53 | 154 | 694.3 | 1346.1 | 664.2 | 190.2 | |
| 5 | 14.9 | 63.6 | 133.4 | 645.2 | 1401.7 | 680.1 | 180.6 | |
| 6 | 15 | 50 | 106.1 | 605.9 | 1455.1 | 610.2 | 185.2 | |
| 7 | 10.3 | 58.7 | 140.9 | 641 | 1421.8 | 668.2 | 200.6 | |
| 8 | 10.2 | 69.3 | 154.4 | 593.5 | 1344.4 | 645.2 | 172.4 | |
| 9 | 12.6 | 77.2 | 142.1 | 639.9 | 1261.4 | 687.5 | 213.5 | |
| 10 | 14.3 | 51.9 | 130.4 | 673.2 | 1174.4 | 677.9 | 177.1 | |
| 11 | 10.6 | 64.2 | 157.1 | 565.4 | 1115.6 | 697.4 | 206.5 | |
| 12 | 13 | 58.1 | 122.5 | 637.8 | 1320.7 | 615.2 | 163 | |
| 13 | 12.8 | 50.2 | 107.7 | 616.6 | 1236.7 | 550.6 | 195.6 | |
| 14 | 12.1 | 77.8 | 144.1 | 552.5 | 1150.5 | 619.7 | 195.9 | |
| 15 | 13.6 | 53 | 129.3 | 680 | 1181.9 | 618.7 | 163.2 | |
| 16 | 15.9 | 58 | 107.3 | 651.2 | 1417 | 589.5 | 212.7 | |
| 17 | 14.2 | 71.3 | 118.5 | 551.5 | 1353.6 | 569.4 | 204.6 | |
| 18 | 10 | 66.6 | 150.3 | 681 | 1268 | 685.2 | 197.7 | |
| 19 | 13.7 | 56.9 | 146.3 | 699.7 | 1253.6 | 657.7 | 161.9 | |
| 20 | 10.3 | 63.8 | 108.3 | 687 | 1342.7 | 696.3 | 207.8 | |
| 21 | 14.7 | 73.7 | 147 | 623.2 | 1484.4 | 644.1 | 199.6 | |
| 22 | 11.9 | 50.8 | 153.4 | 583.4 | 1123.9 | 641.1 | 193.5 | |
| 23 | 10.2 | 68.5 | 126.5 | 646 | 1453.1 | 687.7 | 210.7 | |
| 24 | 12.7 | 53.6 | 150.2 | 658.7 | 1446 | 679.7 | 170 | |
| 25 | 11 | 67.1 | 105.7 | 532.1 | 1390.8 | 595 | 191.7 | |
| 26 | 12.8 | 63.9 | 137 | 692.6 | 1418.1 | 630.7 | 178.5 | |
| 27 | 14.6 | 65.8 | 127.6 | 571.9 | 1357.3 | 554.5 | 173.4 | |
| 28 | 14.2 | 62 | 147.1 | 622.1 | 1407.2 | 594.8 | 176.3 | |
| 29 | 14.7 | 67.1 | 154.8 | 598.1 | 1226 | 557.7 | 211.8 | |
| 30 | 14.5 | 60.8 | 113.1 | 700 | 1350.4 | 593.2 | 216.3 | |
| 31 | 13.6 | 67.3 | 129.1 | 544 | 1379.6 | 607.1 | 164.8 | |
| 32 | 14.7 | 57.8 | 130.1 | 615.2 | 1199.9 | 651.4 | 205.3 | |
| 33 | 13.9 | 57.6 | 109.8 | 575.6 | 1172.1 | 652.3 | 203.1 | |
| 34 | 12.7 | 58.6 | 159 | 655.2 | 1264.2 | 590.8 | 214 | |
| 35 | 15.4 | 74.8 | 117.6 | 567.3 | 1276.6 | 572.4 | 200.1 | |
| 36 | 15.3 | 51.1 | 157.9 | 633.7 | 1140.7 | 695.1 | 192.2 | |
| Min | 10 | 50 | 105.7 | 532.1 | 1115.6 | 550.6 | 161.9 | |
| Max | 15.9 | 77.8 | 159 | 700 | 1484.4 | 697.4 | 216.3 | |
| Average | 13.18 | 61.51 | 133.77 | 623.43 | 1308.24 | 629.95 | 191.52 | |
| Judge | ok | ok | ok | ok | ok | ok | ok | |

# 阻抗测试（中磁）

| 频率（MHz） | 0.1 | 0.5 | 1 | 5 | 10 | 100 | 200 | |
|---|---|---|---|---|---|---|---|---|
| 阻抗（Ω） | | 45min | 90min | | 900min | | | |
| 1 | 13.6 | 69.4 | 125.5 | 575.1 | 1212.6 | 614 | 233.1 | |
| 2 | 12.2 | 56.1 | 146 | 522.9 | 1263.4 | 548.3 | 184.4 | |
| 3 | 12.5 | 55.6 | 122.3 | 587.9 | 1105.2 | 679.1 | 212.3 | |
| 4 | 11.5 | 60.5 | 120.9 | 601.7 | 1000.1 | 682.6 | 191.6 | |
| 5 | 13.2 | 66.8 | 113.1 | 587 | 1202.2 | 521.2 | 225.3 | |
| 6 | 9.6 | 67.8 | 148.6 | 562.7 | 1123.9 | 661 | 205.6 | |
| 7 | 11.3 | 56.5 | 108.4 | 625.4 | 1107.3 | 624.5 | 212.5 | |
| 8 | 10.2 | 71.4 | 109.6 | 591.8 | 1161.3 | 528.6 | 206.7 | |
| 9 | 12.1 | 53.3 | 142.6 | 569.5 | 1269 | 614.7 | 182.8 | |
| 10 | 12.5 | 62.2 | 143.4 | 578 | 1000.9 | 636 | 197.3 | |
| 11 | 14.1 | 70 | 147.3 | 522.4 | 1100.5 | 629 | 236.5 | |
| 12 | 14.5 | 57.9 | 129.3 | 608.6 | 1466.6 | 614 | 186.5 | |
| 13 | 12.5 | 62.8 | 125.1 | 620.6 | 1470 | 603.7 | 209.3 | |
| 14 | 14.6 | 67.3 | 114.1 | 607.2 | 1322.5 | 691.6 | 185.7 | |
| 15 | 11.1 | 63.2 | 147.6 | 523.8 | 1258.7 | 691.4 | 223.4 | |
| 16 | 10.3 | 55.1 | 141.5 | 593.9 | 1193.5 | 683 | 215.7 | |
| 17 | 12.6 | 55.8 | 106.4 | 590.1 | 1059.6 | 675.5 | 230 | |
| 18 | 13.6 | 64.3 | 115.6 | 613.8 | 1275.8 | 598.6 | 195.8 | |
| 19 | 13.7 | 57.3 | 140.1 | 625.5 | 1279.5 | 690.7 | 196.9 | |
| 20 | 13.1 | 66.8 | 131.5 | 642.7 | 1302.8 | 527.9 | 216.9 | |
| 21 | 11.7 | 62.1 | 113.9 | 573.7 | 1174.9 | 686.4 | 213.6 | |
| 22 | 9.7 | 74.7 | 130.8 | 532.6 | 1334.3 | 567.5 | 233 | |
| 23 | 11.5 | 62 | 113.7 | 596.6 | 1123.5 | 588.4 | 222 | |
| 24 | 14.5 | 61.3 | 100.7 | 648.4 | 1111.6 | 666.4 | 196.7 | |
| 25 | 10.1 | 60 | 122.6 | 645.1 | 1392.2 | 660.6 | 227.8 | |
| 26 | 10.2 | 54.6 | 121 | 627 | 1240.8 | 522.7 | 191.8 | |
| 27 | 9.6 | 59.5 | 101.8 | 593.8 | 1318.6 | 657.3 | 192.4 | |
| 28 | 10.4 | 71.5 | 108.6 | 605.2 | 1472.4 | 536.9 | 230.8 | |
| 29 | 12.4 | 67 | 105.3 | 607.1 | 1211 | 577.8 | 198.2 | |
| 30 | 11 | 52.4 | 114.8 | 574.2 | 1000.4 | 573.7 | 202.6 | |
| 31 | 13.2 | 64.6 | 119.1 | 578.5 | 1364.7 | 563.5 | 215.2 | |
| 32 | 11 | 56.4 | 112.7 | 629.2 | 1289.6 | 617.4 | 187.8 | |
| 33 | 12.8 | 65.3 | 103.2 | 611.9 | 1492.2 | 685.8 | 210.9 | |
| 34 | 9.9 | 57 | 130.6 | 620.1 | 1112.9 | 525.9 | 229.2 | |
| 35 | 11.1 | 69.3 | 104.5 | 620.1 | 1230.6 | 650 | 195.1 | |
| 36 | 11.8 | 54.7 | 116 | 582.5 | 1397.4 | 589.8 | 183.7 | |
| Min | 9.6 | 52.4 | 100.7 | 522.4 | 1000.1 | 521.2 | 236.6 | |
| Max | 14.6 | 74.7 | 148.6 | 648.4 | 1492.2 | 691.6 | 199.8 | |
| Average | 11.94 | 62.01 | 122.17 | 594.35 | 1234.51 | 616.26 | 188.3 | |
| Judge | ok | ok | ok | ok | ok | ok | ok | |