

制品规格书  
SPECIFICATION FOR APPROVAL

|                |                                      |                         |                   |
|----------------|--------------------------------------|-------------------------|-------------------|
| 产品编码<br>P/N    | PSPMAA1770H-470M-IGP                 | 测试设备<br>TEST INSTRUMENT | Chroma:3302 16502 |
| 产品系列<br>Series | 一体成型电感<br>SMD Molding Power Inductor | 测试频率<br>TEST FREQUENCY  | 100KHZ / 1V       |

客户名称  
Customer

:

客户编码  
Customer P/N

:

产品系列  
Series

:

一体成型电感  
SMD Molding Power Inductor产品编码  
Supply P/N

:

PSPMAA1770H-470M-IGP

发版号  
Version

:

A4.0

承认日期  
Endorsement Date

:

2025-6-18

备注  
Note

:

|                                                                     |       |
|---------------------------------------------------------------------|-------|
| 谱罗德电子科技（深圳）有限公司<br>PuLuoDe Electronic Technology (Shenzhen) Co. LTD |       |
| 制作<br>APPROVED                                                      | Ben   |
| 审查<br>CHECKED                                                       | Yuki  |
| 确认<br>PREPARED                                                      | Peter |

\*烦请贵司在正式订单下达前确认回签本承认书，否则敝司默认贵司认可本承认书内的参数与条款，并以此参数生产交货

Please confirm and sign this acknowledgement letter before placing the formal order, otherwise PROD will acquiesce that your company recognizes the parameters and terms in this acknowledgement letter, and will produce and deliver according to these parameters.

客户承认

Customer Approval

客户签章



A4.0

修订记录

REVISION RECORD



|                |                                      |                         |                   |
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| Version | REVISION ITEM | BEFORE REVISION | AFTER REVISION | DATE      |
|---------|---------------|-----------------|----------------|-----------|
| A4.0    | First Version |                 |                | 2025-6-18 |
|         |               |                 |                |           |
|         |               |                 |                |           |
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谱罗德

PROD

谱罗德电子科技（深圳）有限公司

PuLuoDe Electronic Technology (Shenzhen) Co. LTD

深圳市宝安区石岩三联工业区B栋311

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<http://www.prodtech.cn/>



# 电气特性

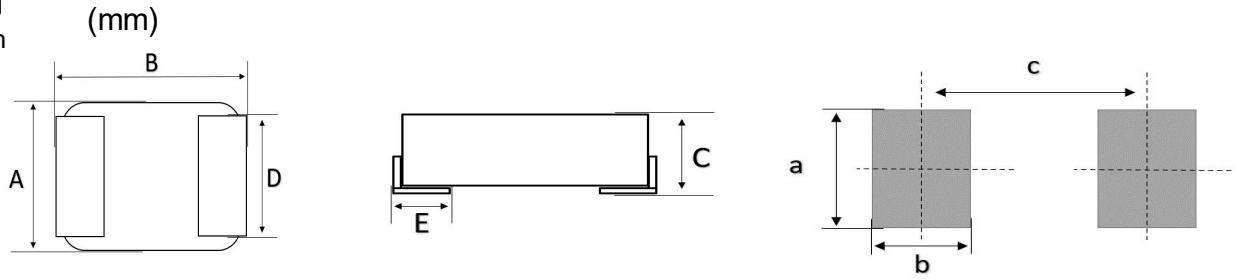
## ELECTRICAL CHARACTERISTICS

A4.0



|                |                                      |                         |                   |
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### 封装尺寸 Dimension



| 系列     | 封装尺寸<br>Dimension |        |         |          |       | 焊盘尺寸<br>Land Pattern |        |        |
|--------|-------------------|--------|---------|----------|-------|----------------------|--------|--------|
| Series | A                 | B      | C       | D        | E     | a                    | b      | c      |
| 1770   | 17.0±0.5          | 17.5±1 | 7.0 MAX | 12.0±0.3 | 3.0±1 | 13Typ                | 3.1Typ | 4.8Typ |

### 编码解释

Code interpretation

|               |             |   |            |           |   |              |
|---------------|-------------|---|------------|-----------|---|--------------|
| <b>PSPMAA</b> | <b>XXXX</b> | - | <b>XXX</b> | <b>M</b>  | - | <b>IGP</b>   |
| 类别码           | 尺寸系列        |   | 感值         | 精度        |   | 标识码          |
| Category code | Dimension   |   | Inductance | Tolerance |   | Other's code |

### 电气参数

Electrical Characteristics

| 产品编码<br>P/N          | @ 25 °C Ambient Temperture |           |     |     |                |                |
|----------------------|----------------------------|-----------|-----|-----|----------------|----------------|
|                      | 感值                         | 精度        | DCR |     | 温升电流<br>(IRMS) | 饱和电流<br>(ISAT) |
|                      | Inductance                 | Tolerance | mΩ  |     | A              | A              |
|                      | μH                         | ±         | Typ | Max | ΔT≈40℃         | L0 drop≈30%    |
| PSPMAA1770H-470M-IGP | 47                         | 20%       | 42  | 46  | 9              | 16             |

- 规格参数基于环境温度25℃取得  
All test Data is referenced to 25℃ ambient
- 电感工作环境温度：-40℃ ~ 125℃  
Operating temperature range -40 °C to +125 °C
- 加载温升电流（Irms）会使电感温度上升大约 40℃ (电感初始温度+上升温度=电感最终温度)  
Typical Irms would cause an approximately ΔT of 40℃
- 加载饱和电流（ISAT）会使感量下降大约30%  
Typical ISAT would cause Lo to drop approximately 30%.
- 请从温升电流（IRMS）和饱和电流（ISAT）中选取一个最小值作为额定电流  
Choose a minimum of IRMS and ISAT as the rated current
- 务必考虑最终的产品设计，元器件布局，线路板走线，以及使用环境过程中，电感最终温度不得超过125℃  
The operating temperature of inductance do not exceed 125℃
- 参考产品开发设计实测尺寸，感值，DCR等数据，请参考规格书第7页  
The Dimension, Inductance, DCR test data is on page 7
- 使用电感时，请查阅第9页注意事项  
The announcements is on page 9

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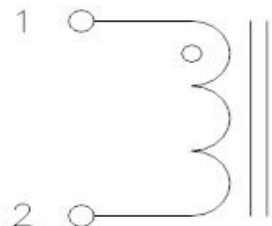
<http://www.prodtech.cn/>



|                |                                      |                         |                   |
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## 电路结构

## Connections



- ◎ 电感内置一组线圈

Inductor Contents one (1) Set(s) of Coil

## 印字方式

## Marking

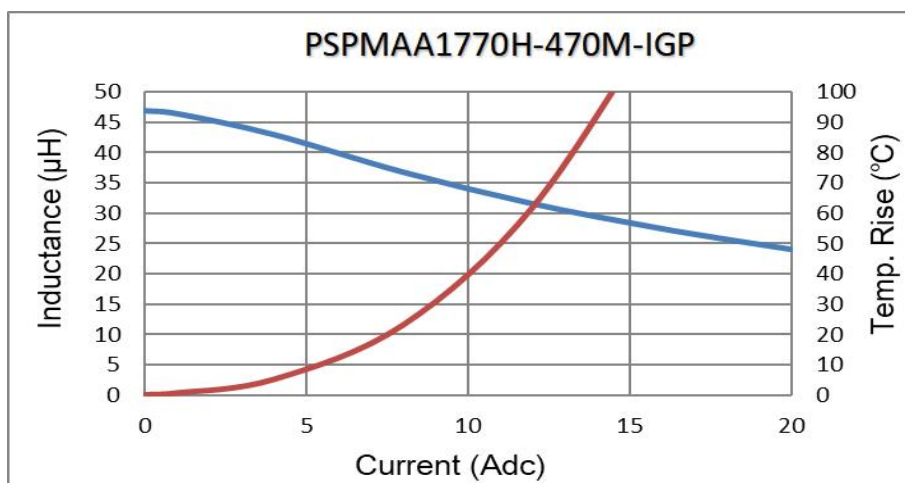


- ◎ 电感顶部使用黑色油墨喷码印字“470”

Marking:black "470"

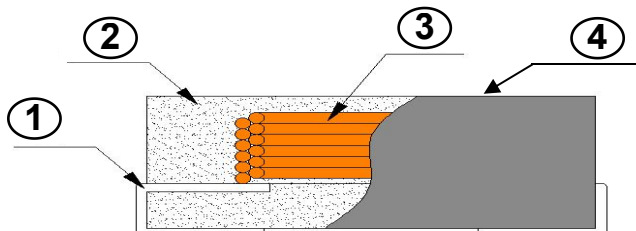
## 特性曲线

## Performance Curves



## 材料清单

## Material List



| NO. | 结构<br>Structure Name | 材料规格<br>Material Name  | 材料制造商<br>Materia Manufacturer |
|-----|----------------------|------------------------|-------------------------------|
| ①   | 电极/Electrode         | Sn-Ni-Cu               | YUE ZHONG                     |
| ②   | 磁芯/Core              | FeSiCr                 | Dahe                          |
| ③   | 铜线/Copper Wire       | F-220°C                | Pacific                       |
| ④   | 防锈层/Antirust Coat    | 环保漆/eco-friendly paint |                               |

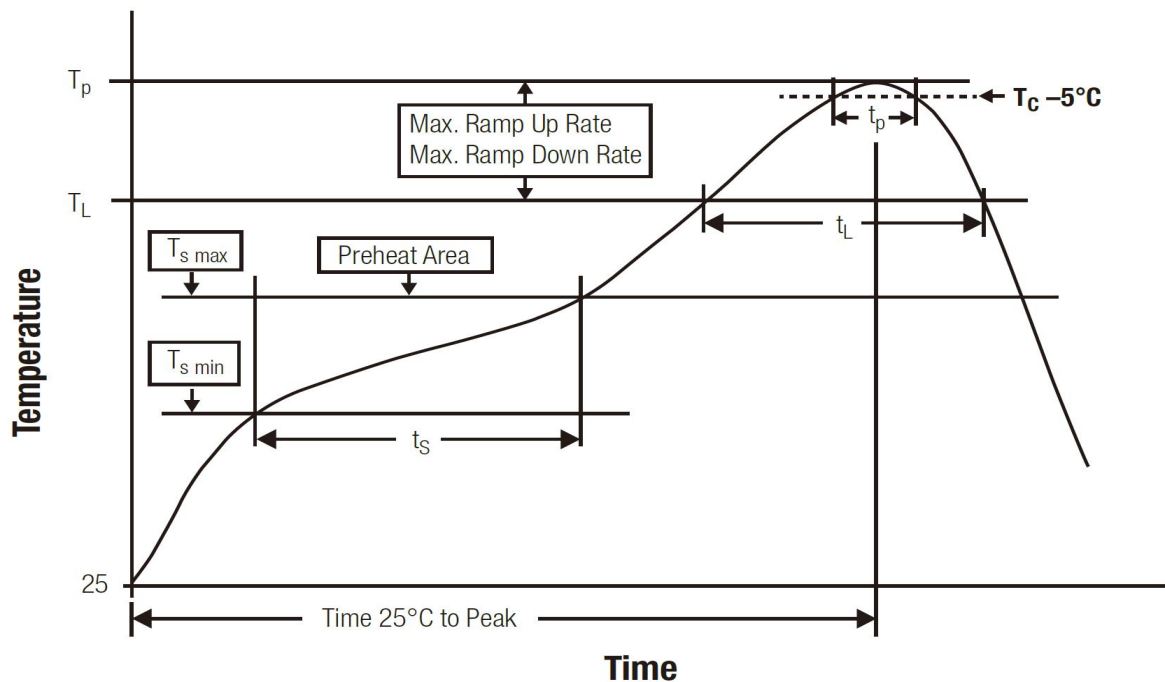
\*组件的材料不限制于清单内的制造商/The material of the part is not limited to the listed manufacturer



|                |                                      |                         |                   |
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## 焊接温度（推荐）

## Recommended Classification Wave Soldering Profile



## Classification Reflow Soldering Profile:

| Profile Feature                            | Item   | Value                    |
|--------------------------------------------|--------|--------------------------|
| Preheat Temperature Min                    | Ts min | 150 °C                   |
| Preheat Temperature Max                    | Ts max | 200 °C                   |
| Preheat Time ts from Ts min to Ts max      | ts     | 60 - 120 seconds         |
| Ramp-up Rate (TL to TP)                    |        | 3 °C/ second max.        |
| Liquidous Temperature                      | TL     | 217 °C                   |
| Time tL maintained above TL                | tL     | 60 - 150 seconds         |
| Peak package body temperature              | Tp     | Tp ≤ Tc, see Table below |
| Time within 5°C of actual peak temperature | tp     | 20 - 30 seconds          |
| Ramp-down Rate (TP to TL)                  |        | 6 °C/ second max.        |
| Time 25°C to peak temperature              |        | 8 minutes max.           |

## Package Classification Reflow Temperature (Tc):

| Properties                                              | Volume mm <sup>3</sup><br><350 | Volume mm <sup>3</sup><br>350-2000 | Volume mm <sup>3</sup><br>>2000 |
|---------------------------------------------------------|--------------------------------|------------------------------------|---------------------------------|
| PB-Free Assembly   Package Thickness<br>< 1.6 mm        | 260°C                          | 260°C                              | 260°C                           |
| PB-Free Assembly   Package Thickness<br>1.6 mm - 2.5 mm | 260°C                          | 250°C                              | 245°C                           |
| PB-Free Assembly   Package Thickness<br>> 2.5 mm        | 250°C                          | 245°C                              | 245°C                           |

\* 参考标准: IPC/ JEDEC J-STD-020E refer standard to: IPC/ JEDEC J-STD-020E



# 信赖性实验 RELIABILITY TEST

|                |                                      |                         |                   |
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## 机械可靠性测试

### Mechanical Reliability

| 实验名称<br>ITEM           | 试验要求<br>Specification & Requirement                                          | 试验方法<br>Method Used                                                                                                     |
|------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 可焊性实验<br>Solderability | The surface of terminal/pin tested shall be covered with new solder by 95%   | Solder heat proof:<br>Preheating: 180 ±10℃ 90 seconds<br>Soldering: 255 ±5℃ for 3 ±1 sec                                |
| 机械冲击<br>Shock          | Inductance change within ± 5% Without mechanical damage SMD Molding Inductor | Drop down with 981m/s <sup>2</sup> (100G) shock<br>Attitude upon a rubber block method shock testing machinem, 3 tests. |
| 振动实验<br>Vibration      | Inductance change within ± 5% Without mechanical damage                      | Vibration frequency:<br>10Hz to 55Hz to 10Hz 60 seconds cycle<br>Vibration time: 2 hours                                |

## 老化测试

### Aging Reliability

| 实验名称<br>ITEM                 | 试验要求<br>Specification & Requirement                     | 试验方法<br>Method Used                                                                            |
|------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 冷热冲击<br>Thermal Shock        | Inductance change within ± 5% Without mechanical damage | -40℃, (30 mins) -> room temp. (5 mins) -> 125℃, (30 mins) -> room temp. (5 mins)<br>100 cycles |
| 耐热性<br>Heat Resistance       | Inductance change within ± 5% Without mechanical damage | Apply IDC current @ 85℃ ambient<br>Duration: 1000 hrs                                          |
| 耐湿性<br>Humidity Resistance   | Inductance change within ± 5% Without mechanical damage | Apply IDC current @ 60℃ ambient<br>Humidity: 90~95%<br>Duration: 1000 hrs                      |
| 低温存储实验<br>Low Temp. Storing  | Inductance change within ± 5% Without mechanical damage | Storing Temp.<br>-40 ±2 °C for total 1,000 +4/-0 hours                                         |
| 高温存储实验<br>High Temp. Storing | Inductance change within ± 5% Without mechanical damage | Storing Temp.<br>125 ±2 °C for total 1,000 +4/-0 hours                                         |



|                |                                      |                         |                   |
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## 测试数据

Test Date

| 序号        | 尺寸测试数据<br>Dimension Test Date |        |         |          |       | 特性测试数据<br>Characteristics Test Date |        |      |
|-----------|-------------------------------|--------|---------|----------|-------|-------------------------------------|--------|------|
|           | A                             | B      | C       | D        | E     | DCR                                 | Lo     | ISAT |
|           | mm                            | mm     | mm      | mm       | mm    | mΩ Max                              | μH±20% | 16A  |
|           | 17.0±0.5                      | 17.5±1 | 7.0 MAX | 12.0±0.3 | 3.0±1 | 46                                  | 47.00  | ≈30% |
| 1         | 17.11                         | 17.82  | 6.78    | 11.93    | 2.44  | 41.6                                | 46.88  | PASS |
| 2         | 17.00                         | 17.76  | 6.85    | 11.93    | 2.32  | 41.2                                | 47.32  | PASS |
| 3         | 17.10                         | 17.77  | 6.84    | 11.94    | 2.45  | 41.7                                | 46.65  | PASS |
| 4         | 17.08                         | 17.86  | 6.79    | 11.89    | 2.46  | 41.6                                | 46.77  | PASS |
| 5         | 17.08                         | 17.89  | 6.79    | 11.92    | 2.46  | 41.5                                | 47.38  | PASS |
| 6         |                               |        |         |          |       |                                     |        |      |
| 7         |                               |        |         |          |       |                                     |        |      |
| 8         |                               |        |         |          |       |                                     |        |      |
| 9         |                               |        |         |          |       |                                     |        |      |
| 10        |                               |        |         |          |       |                                     |        |      |
| $\bar{X}$ | 17.07                         | 17.82  | 6.81    | 11.92    | 2.43  | 41.504                              | 47     |      |
| R         | 0.11                          | 0.13   | 0.07    | 0.05     | 0.14  | 0.52                                | 0.73   |      |

◎ 所有测试数据基于环境温度25℃取得  
All test Data is referenced to 25℃ ambient

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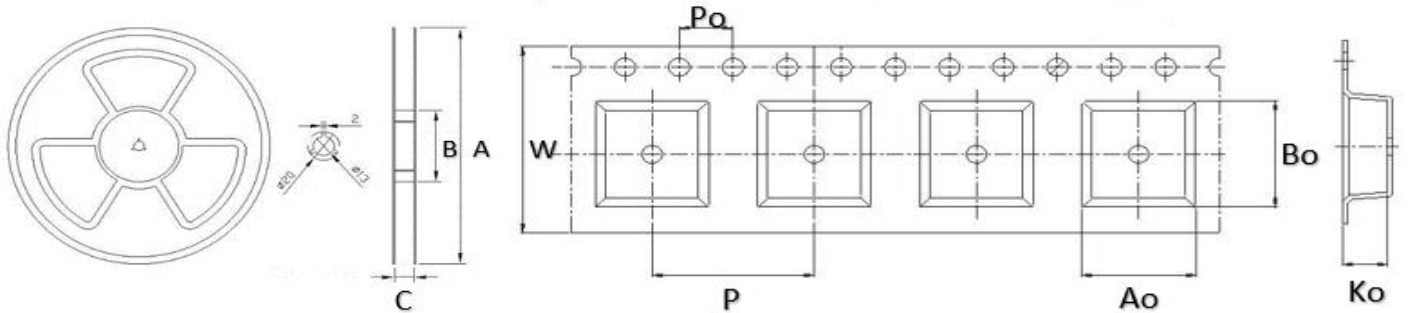


|                |                                      |                         |                   |
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载带卷盘尺寸 : (mm)

### Packing Dimension

| MPQ       | A   | B   | C  | W  | P  | Po | Ao       | Bo       | Ko      |
|-----------|-----|-----|----|----|----|----|----------|----------|---------|
| 300pcs/卷盘 | 330 | 100 | 17 | 32 | 24 | 4  | 17.7 Ref | 19.4 Ref | 7.9 Ref |

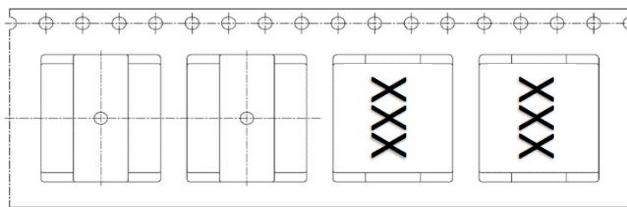


载带内产品排列方式:

Inductance Packing Method

首字对孔

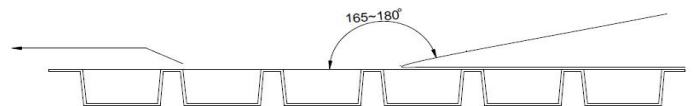
The first mark is on the side of the gear hole



载带剥离力:

Typical Pulling Force

20~120 gf



装箱数量:

Package Quantity

300pcs/卷盘

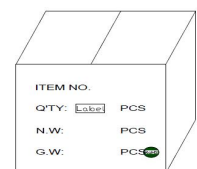
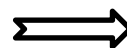
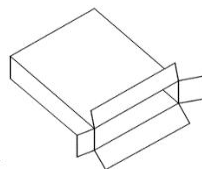
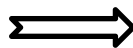
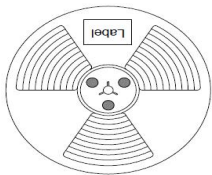
300pcs/Reel

600pcs/每盒

600pcs/ Middle box

1200pcs/每箱

1200pcs/ Outer box



© 实际出货过程, 依据客户需求状况的不同, 包装数量会有变化, 最终的包装数量请参照实际出货包装

In the actual delivery process, the package quantity will change according to the different customer demands. Please refer to the actual shipment quantity for the final package quantity





## 注意事项

使用本产品时，请注意以下事项

- ◎ 产品保存期限为12个月，保存条件：温度5~40℃，湿度10~75%RH以内，超过保存期限可能会使元器件电极发生氧化，存储标准可参照：IEC\_61760-2-2021  
This components storage life is 12 months, Storage Temperature: TEMP.5~40℃; RH10%~75%. Please use this components within the warranty period. refer standard to: IEC\_61760-2-2021
- ◎ 请勿在极端环境下使用和保存（高盐，强酸，强碱，强辐射等）。  
Do not use this component in special environments, such as high salt content, strong acid, strong alkali, strong corrosion and other special environments.
- ◎ 焊接前请先预热，预热与焊接温度之间温差建议控制在150℃以内；焊接标准参考：IPC/ JEDEC J-STD-020E  
Please preheat the product before welding; it is recommended to control the preheating temperature and welding temperature within 150℃. refer standard to: IPC/ JEDEC J-STD-020E
- ◎ 元器件焊接后需重新拆卸焊接修正时，请遵循规格书规定的条件范围；过高的加热温度以及反复的拆卸可能会导致元器件失效。  
When repairing this component, the temperature used for disassembly should not exceed the datasheet limit and do not disassemble it frequently to prevent damage to the component.
- ◎ 请勿用清洗剂、丙酮等腐蚀性液体接触该元器件，这可能会侵蚀元器件本体以至于失效。  
Do not use acetone or other corrosive liquids to contact this component or it will cause it to fail.
- ◎ 元器件焊接到线路板后，请注意不可因线路板整体变形或局部变形而施加给电感剩余应力，这可能会导致元器件脱落、破损失效。  
When this component is soldered to the circuit board, you need to pay attention to the stress applied to it by the PCB, which may cause it to fall off or damaged fail.
- ◎ 元器件通电后温度会随电流的增大而上升，设计时请务必考虑留有余量。  
Self heating (Rated Current or Irms) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- ◎ 过高的静电会损坏该元器件，请注意静电防护。  
Too high static electricity will cause permanent damage to the product, please pay attention to electrostatic protection.
- ◎ 本元器件作为磁性产品，设计时请务必考虑周边元器件与本产品可能产生的耦合效应影响。  
This magnetic component needs to be considered for coupling effects in the application.
- ◎ 谱罗德并不能完全掌握或熟悉客户的特定应用以及要求，贵司有责任和义务验证此元器件以及元器件规格书中的描述是否满足于贵司的设计要求；需要指出是：即使按照现有的技术标准操作，该元器件依然有几率在典型寿命结束前发生故障，谱罗德强烈建议贵司对于该元器件在一些典型的严苛应用中，例如安规产品，工业产品、医疗产品、车载产品、航空/航天等产品应用，对于该元器件可能存在的失效情况做适当的冗余设计，以避免该元器件在失效时造成严重后果；特别提醒：对于特定的应用对象谱罗德强烈要求贵司同谱罗德取得书面的许可，否则谱罗德不承担元器件失效带来的任何责任，特定对象包括且不限于：车用，航空航天，安规产品，军用以及贵司对元器件有严苛要求的产品。

PROD cannot fully understand and be familiar with customers' specific applications and requirements. Your company has the responsibility and obligation to verify whether the components and the description in the component specification meet your design requirements. Special reminder: Even if operated in accordance with existing technical standards, this component still has a chance of failure before the end of its typical life. PROD strongly recommends that your company make appropriate redundant designs for possible failure situations of this component in some typical harsh applications, such as safety products, industrial products, medical products, automotive products, aviation/aerospace products, etc., so as to avoid serious consequences when the component fails.

**PROD Requirements:** For specific application item, PROD strongly requires your (or company) to obtain written permission from PROD, otherwise PROD will not bear any responsibility for component failure. Specific item list include but are not limited to: automotive, aerospace, safety products, military and products that your company has strict requirements on components.

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