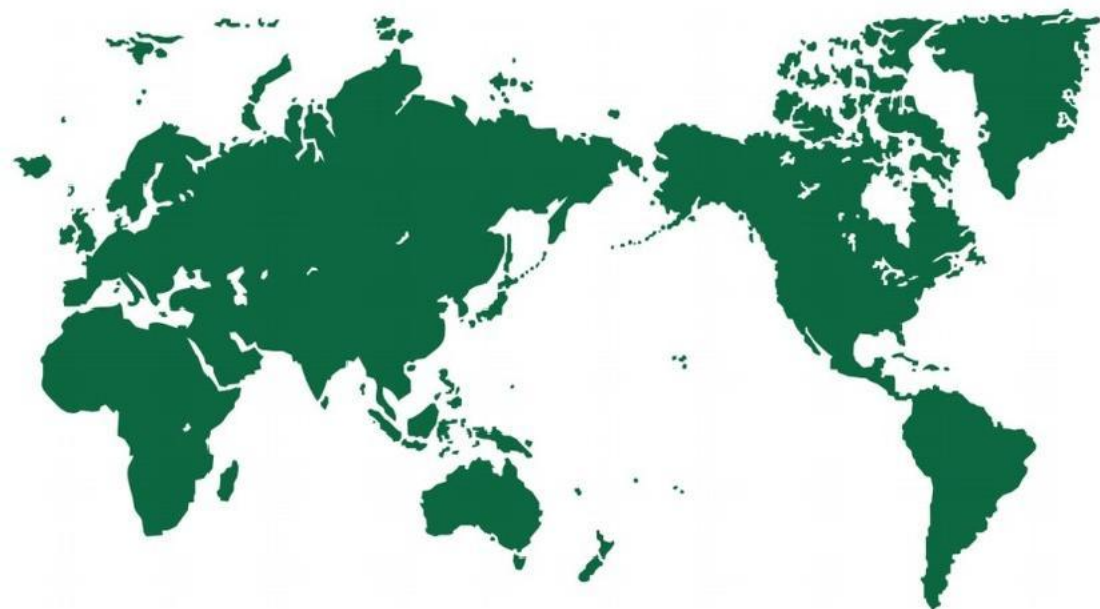




电路保护问题，宝宫帮您解决

We Make Electrical Circuits More Safety and Reliability



# 电路保护产品与应用

Circuit Protection Products and Applications

上海总部Head Office  
电话Tel: +86 2161401058  
传真Fax: +86 2161730538  
E-mail: kar.li@boarden.com.cn  
地址Address: 上海市胶州路941号  
长久商务中心1904室

深圳分公司Shenzhen Branch  
电话Tel: +86 13818979277  
E-mail: sale@boarden.com.cn  
地址Address: 深圳市宝安区西乡镇  
宝源路2003号璟运大厦511

上海宝宫  
Shanghai Boarden

<http://www.boarden.com.cn/>

2024-09



## 关于宝宫电子

上海宝宫电子科技有限公司是一家汇集众多电路保护器件，为客户提供一站式服务的电路保护企业。公司具有深厚的技术背景，为客户提供电路保护方案设计、技术咨询和免费测试，也为客户提供齐备的电路保护器件，主要的产品包括气体放电管(GDT)、瞬态抑制二极管(TVS)、半导体放电管(TSS)、静电抑制器(ESD)、压敏电阻(MOV)和自恢复保险丝(PPTC)等，应用领域包括汽车电子、安防、照明、通讯、IT周边设备、消费电子和工业控制等。

宝宫是一家创新技术型公司，跟随市场不断创新和发展的需要，不断推出创新型产品，比如：

高能贴片压敏电阻(CMS)，主要特点是浪涌保护能力高、尺寸小，贴片化，热稳定特性优异，性能领先世界水平，主要应用于照明、通讯电源和汽车电子等保护；

宽输入低残压SPD，输入电压高达400Vac, 典型钳位电压1000V，产品的可靠性和保护效果极好；

隔离浪涌保护器(BIS)，是针对非隔离LED驱动的浪涌保护要求而开发的半导体器件，该器件和MOV串联，在满足1000+2U的对地电气绝缘强度的安规要求基础上，可提供对地低残压浪涌保护，有效降低LED灯具共模浪涌损坏的风险；

抗浪涌贴片电阻（BRW），完全适合SMT组装，抗浪涌能力强，适用于有小型化、贴片化需求的应用；

高压贴片保险丝(2410BC系列)，可以在250VAC下工作，能够耐受1500A浪涌电流，适合用于高工作电压的过流保护场合；

宝宫也在积极与大学研究所、国际大公司、行业标杆客户以及行业方案商保持紧密接触，保证宝宫始终走在产品技术创新的前沿，不断有新的产品投放市场，以满足客户和市场的发展需求。



## About Boarden Electronics

Shanghai Boarden Electronics Technology CO., LTD is a leading circuit protection solution provider. Our Vision is to Make Electronics Safe and Reliable with one stop services. With deep technology background, we can provide professional solutions for electronics equipment, consulting and free testing. Boarden Electronics has complete and wide product lines for over voltage and over current protection, including Gas Discharge Tube (GDT), Transient Voltage Suppressor (TVS), Thyristor Surge Suppressors (TSS) Electrostatic Discharge Protectors (ESD) and PPTC. These products are widely used in security, telecommunication, lighting, computer, auto electronics, consumers and industrial markets etc.

Boarden Electronics is an innovative and technology-oriented company. We have designed and released new products such as:

Ceramic Micro-Surge Protection Device (CMS) offers robust protection and excellent transient energy absorption in a small form factor. Main applications are surge protection (SPD), lighting and auto electronics.

Wide input voltage, Low Clamping Voltage SPD provides the input voltage up to 400Vac and the typical clamp voltage around 1000V, has excellent reliability and protection.

BIS is a semiconductor device developed for surge protection requirements of non-isolated LED drivers. On the basis of meeting the safety requirements of electrical strength (1000+2U), the BIS can offer L/N-PE surge protection with low residual voltage for class I LED lamps, which can effectively reduce common mode surge damage risk of LED lamps.

Surge-proof SMD Resistor(BRW) performs well on SMT assembling process with powerful surge resistance.

High Voltage Chip Fuse (2410BC Series) can work under 250VAC and has lightning handling capability of 1500A.

Boarden provides a total solution for circuit protection to meet the increasing requirements of the market and keeps releasing new products by cooperation with universities, worldwide companies, leading companies of electronics and solution providers in industrial field.

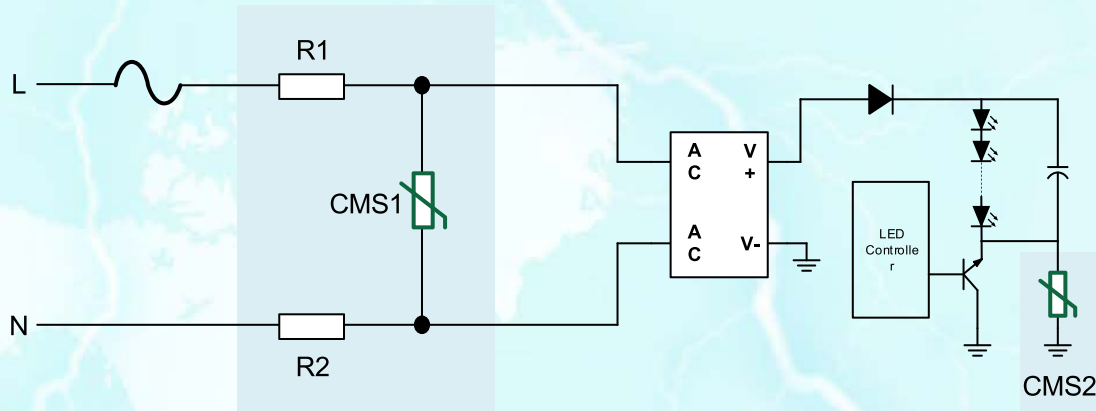
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## 典型应用 Typical Applications

### 1 LED照明驱动浪涌保护方案 Surge protection solutions for LED lighting drivers

#### 1.1 小功率线性LED Low power linear LED



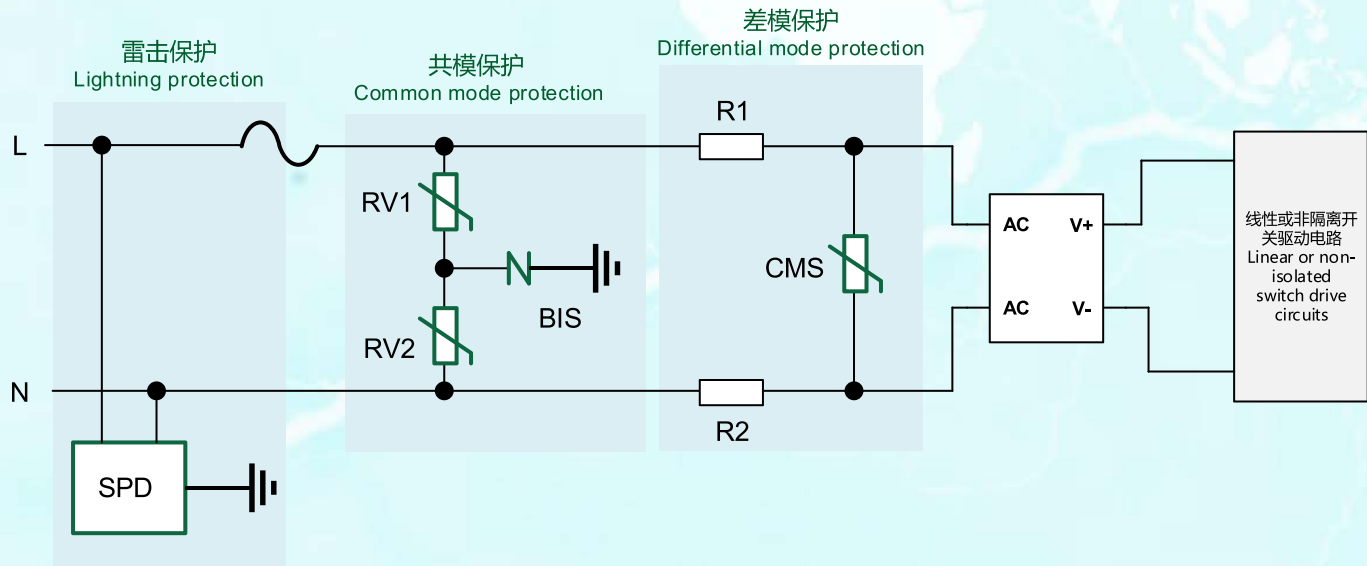
| Area                                 | R1     | R2   | CMS1               | CMS2            | Note                                                                            |
|--------------------------------------|--------|------|--------------------|-----------------|---------------------------------------------------------------------------------|
| 北美<br>North American                 | 30~47Ω | -    | CMS0806V241P101    | -               | 振铃波 2500V<br>Ring wave 2500V                                                    |
|                                      |        |      | CMS0806V271P151    | -               |                                                                                 |
|                                      |        |      | CMS0604V271P500    | CMS0806V750P201 |                                                                                 |
|                                      |        |      | CMS0604V271P500    | CMS0604V750P151 |                                                                                 |
| 欧洲, 澳洲<br>Europe, Australia          | 30~47Ω | -    | CMS0806V471P500    | -               | 浪涌 1000V, 满足新欧规线性驱动<br>Surge 1000V, Meeting IEC/EN 61000-3-2:2019 linear driver |
|                                      | -      | -    | CMS1206V471P101    | -               |                                                                                 |
|                                      | -      | -    | -                  | CMS0806V151P700 |                                                                                 |
| 印度,<br>India                         | 100Ω   | 100Ω | CMS1206V511P500-G3 | -               | 浪涌 4000V, 440Vac 2 小时<br>Surge 4000V, 440Vac 2hrs                               |
|                                      | 100Ω   | 100Ω | CMS1206V511P500-G4 | -               |                                                                                 |
|                                      | 100Ω   | -    | CMS1206V511P500-H1 | -               | 浪涌 4000V, 400Vac 2 小时<br>Surge 4000V, 400Vac 2hrs                               |
| 中国, 东南亚<br>China ,<br>Soth East Asia | 30~47Ω | -    | CMS1206V511P500    | -               | 浪涌 4000V, 350Vac 2 小时<br>Surge 4000V, 350Vac 2hrs                               |
|                                      | 30~47Ω | -    | CMS1206V511P500-E  | -               |                                                                                 |



主要型号 Main Part Numbers

| P/N                | V <sub>M</sub> |        | V <sub>N</sub> @1mA | Surge (8/20μs) | CQC | UL | TUV |
|--------------------|----------------|--------|---------------------|----------------|-----|----|-----|
|                    | AC (V)         | DC (V) | (V)                 | (A)            |     |    |     |
| CMS0604V750P151    | 46             | 60     | 75 [69-83]          | 150            | •   |    |     |
| CMS0806V151P700    | 95             | 125    | 150 [135-185]       | 70             | •   | •  |     |
| CMS0806V750P201    | 46             | 60     | 75 [69-83]          | 200            | •   | •  | •   |
| CMS0806V271P151    | 175            | 225    | 270[243-297]        | 150            | •   | •  | •   |
| CMS0806V471P500    | 300            | 385    | 470[423-517]        | 50             | •   | •  | •   |
| CMS0806V511P500    | 320            | 410    | 510[459-561]        | 50             | •   | •  | •   |
| CMS1206V471P101    | 300            | 385    | 470[423-517]        | 100            | •   | •  | •   |
| CMS1206V511P500    | 320            | 410    | 510[459-561]        | 100            | •   | •  | •   |
| CMS1206V561P500    | 350            | 460    | 560[504-616]        | 50             | •   | •  | •   |
| CMS1206V511P500-H1 | 350            | 450    | 504-561             | 100            | •   | •  | •   |
| CMS1206V511P500-G3 | 380            | 490    | 550-580             | 80             | •   | •  | •   |
| CMS1210V471P401    | 300            | 385    | 470[423-517]        | 400            | •   | •  | •   |
| CMS1812V511P801    | 320            | 410    | 510[459-561]        | 800            | •   | •  | •   |

1.2 户外&工业照明  
Outdoor & Industrial Lighting



- RV1/RV2: MOV, 10D681 or 10D102
- R1/R2: 保险电阻, 根据实际电路选择阻值和功率  
Fusible resistors, select the resistor specification according to the actual circuit
- CMS: 贴片压敏电阻, 常用规格见下表  
SMD varistor, commonly used specifications shown in the table below
- BIS: 隔离浪涌保护器, 常用规格见下表  
Isolated surge protection device, commonly used specifications shown in the table below
- SPD: 浪涌保护器, 常用规格: BSP2L10RPT (10kV, CB/TUV/CQC certification)  
Surge protective device, commonly used model: BSP2L10RPT (10kV, CB/TUV/CQC certification)

主要型号 Main Part Numbers

| P/N               | V <sub>M</sub> |        | V <sub>N</sub> @1mA | Surge (8/20μs) | CQC | UL | TUV |
|-------------------|----------------|--------|---------------------|----------------|-----|----|-----|
|                   | AC (V)         | DC (V) | (V)                 | (A)            |     |    |     |
| CMS1210V271P601   | 175            | 225    | 270[243-297]        | 600            | •   | •  | •   |
| CMS1210V471P201-E | 300            | 385    | 470[423-517]        | 300            | •   | •  | •   |
| CMS1210V511P151-E | 320            | 410    | 510[459-561]        | 250            | •   | •  | •   |
| CMS1812V271P801   | 175            | 225    | 270[243-297]        | 800            | •   | •  | •   |
| CMS1812V471P401-E | 300            | 385    | 470[423-517]        | 600            | •   | •  | •   |
| CMS1812V511P401   | 320            | 410    | 510[459-561]        | 600            | •   | •  | •   |
| CMS3025V271P501-B | 175            | 225    | 270[243-297]        | 1200           | •   | •  | •   |
| CMS3025V471P501-B | 300            | 385    | 470[423-517]        | 1200           | •   | •  | •   |
| CMS3025V511P401-B | 320            | 410    | 510[459-561]        | 1200           | •   | •  | •   |
| CMS3025V561P401-B | 350            | 460    | 560[504-616]        | 1200           | •   | •  | •   |
| CMS3025V681P401-B | 420            | 560    | 680[612-748]        | 1000           | •   | •  | •   |
| CMS4032V271P102-B | 175            | 225    | 270[243-297]        | 2000           | •   | •  | •   |
| CMS4032V471P102-B | 300            | 385    | 470[423-517]        | 2000           | •   | •  | •   |
| CMS4032V511P801-B | 320            | 410    | 510[459-561]        | 2000           | •   | •  | •   |
| CMS4032V561P801-B | 350            | 460    | 560[504-616]        | 2000           | •   | •  | •   |
| CMS4032V681P801-B | 420            | 560    | 680[612-748]        | 1500           | •   | •  | •   |

BIS主要型号

| Part Number               | Insulation Voltage (V <sub>I</sub> ) | Surge Starting Voltage (V <sub>s</sub> ) | Surge Capacity <sup>1)</sup> | Package |
|---------------------------|--------------------------------------|------------------------------------------|------------------------------|---------|
|                           | Min (V)                              | Max (V)                                  | V                            |         |
| BIS-DS602-S <sup>2)</sup> | 1600                                 | 2200                                     | 6000                         | SMB     |
| BIS-BR602-LM              | 1200                                 | 1700                                     | 6000                         | DO-27   |
| BIS-CS103 <sup>2)</sup>   | 1600                                 | 2200                                     | 10000+20%                    | SMC     |

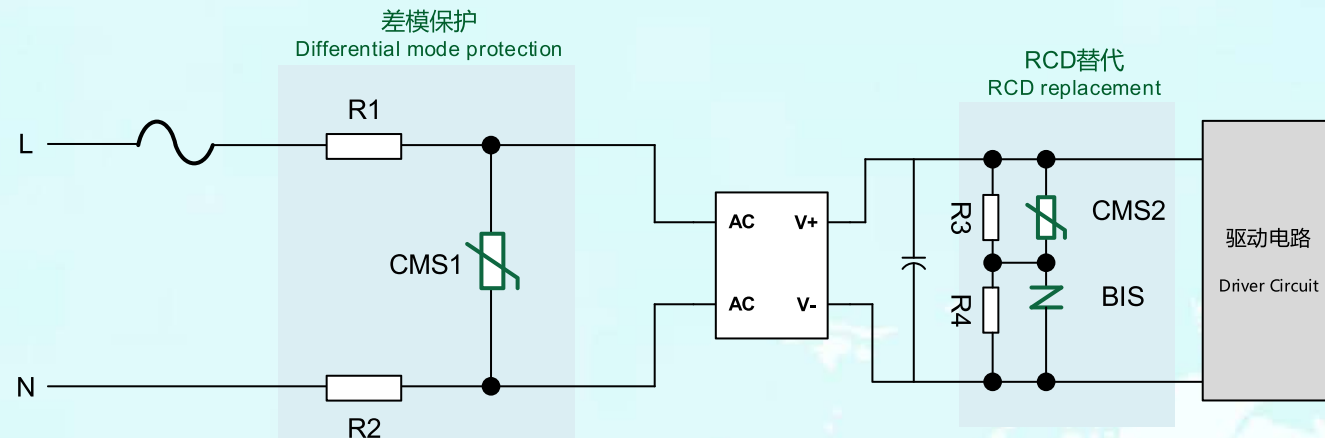
Note 1: 浪涌波形 Surge Waveform 1.2/50us & 8/20us, Ri=12ohm

Note 2: 对于 BIS-DS602-S 和 BIS-CS103, 由于此二型号应用时为两个产品串联, 故 V<sub>I</sub> 和 V<sub>s</sub> 参数为两个产品串联之和  
For BIS-DS602-S and BIS-CS103, the parameters V<sub>I</sub> and V<sub>s</sub> are the total values of two components, for these two components should be used by pairs in series during installation.



## 2 小功率电源浪涌保护贴片化升级方案

SMD upgrading solutions for surge protection in low power drivers



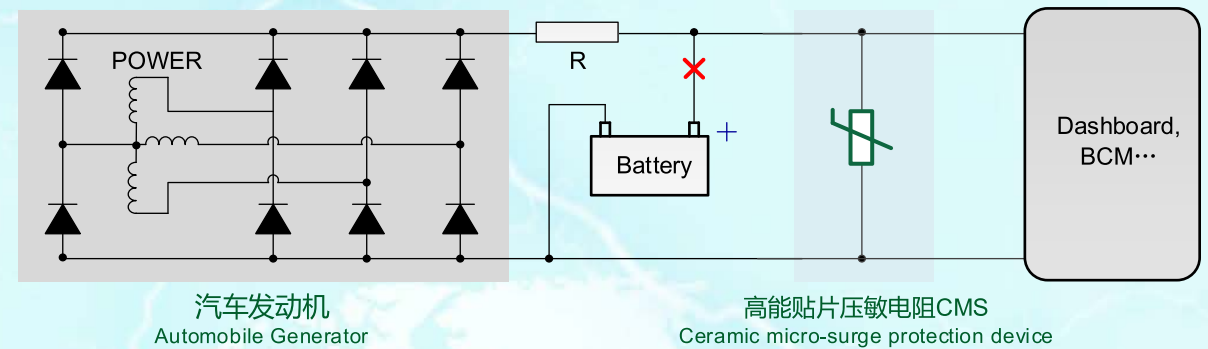
- R1/R2: 保险电阻, 根据实际电路选择阻值和功率  
Fusible resistors, select the resistor specification according to the actual circuit
- R3/R4: 分压电阻, 根据CMS2和BIS电压大小选型  
Voltage division resistor, Selection according to CMS2 and BIS voltage magnitude
- CMS: 贴片压敏电阻, 常用规格见下表  
SMD varistor, commonly used specifications shown in the table below
- BIS: 隔离浪涌保护器, 常用规格见下表  
Isolated surge protection device, commonly used specifications shown in the table below

### 主要型号 Main Part Numbers

| Class | P/N               | V <sub>M</sub> |        | V <sub>N @1mA</sub> | Surge (8/20μs) | CQC | UL | TUV |
|-------|-------------------|----------------|--------|---------------------|----------------|-----|----|-----|
|       |                   | AC (V)         | DC (V) |                     |                |     |    |     |
| CMS1  | CMS0806V511P500   | 320            | 410    | 510[459-561]        | 50             | •   | •  | •   |
|       | CMS1206V511P500   | 320            | 410    | 510[459-561]        | 100            | •   | •  | •   |
|       | CMS1210V511P151-E | 320            | 410    | 510[459-561]        | 250            | •   | •  | •   |
| CMS2  | CMS0806V391P500   | 250            | 320    | 390[351-429]        | 50             | •   | •  | •   |
|       | CMS1206V391P101   | 250            | 320    | 390[351-429]        | 100            | •   | •  | •   |
|       | CMS1210V391P201   | 250            | 320    | 390[351-429]        | 200            | •   |    | •   |
| BIS   | BIS131P201B       | 75             | 100    | 130[120-160]        | 200            |     |    |     |
|       | BIS311P201B       | 185            | 250    | 310[290-350]        | 200            |     |    |     |

## 3 汽车抛负载保护方案

Surge protection solutions for automobile load-dump

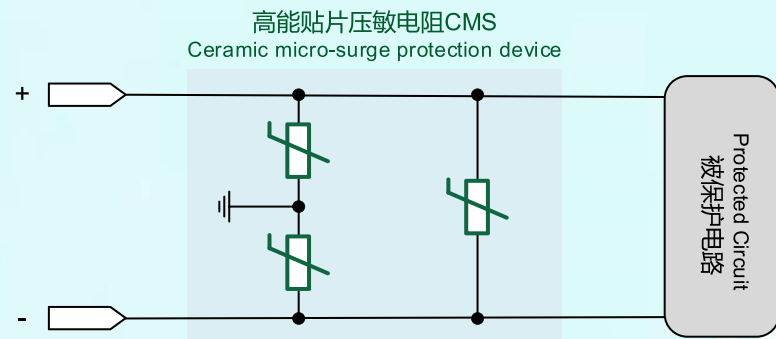


### 主要型号 Main Part Numbers

| Applications | P/N             | V <sub>M</sub> (DC) | V <sub>N @1mA</sub> | Surge (8/20μs) | Size (mm) |
|--------------|-----------------|---------------------|---------------------|----------------|-----------|
|              |                 | (V)                 | (V)                 | (A)            |           |
| 12V System   | CMS1206V240P501 | 18                  | 24[22-28]           | 500            | 3.2×1.6   |
|              | CMS1206V270P401 | 22                  | 27[24-30]           | 400            | 3.2×1.6   |
|              | CMS1812V240P202 | 18                  | 24[22-28]           | 2000           | 4.5×3.2   |
|              | CMS2220V240P302 | 18                  | 24[22-28]           | 3000           | 5.6×5.0   |
| 24V System   | CMS1206V420P501 | 30                  | 42[37-46]           | 500            | 3.2×1.6   |
|              | CMS1210V420P102 | 30                  | 42[37-46]           | 1000           | 3.2×2.5   |
|              | CMS1812V420P202 | 30                  | 42[37-46]           | 2000           | 4.5×3.2   |
|              | CMS2220V420P302 | 30                  | 42[37-46]           | 3000           | 5.6×5.0   |

## 4 DC电源端口浪涌保护方案

Surge protection solutions for DC power ports



### 主要型号 Main Part Numbers

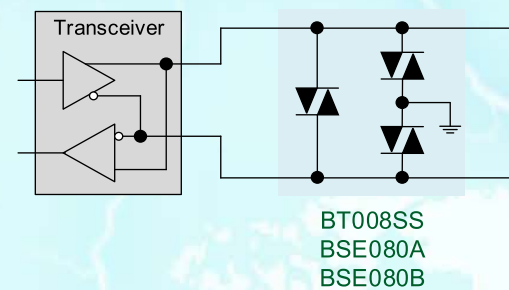
| Applications | P/N             | V <sub>M</sub> (DC) | V <sub>N</sub> @1mA | Surge (8/20μs) | Size (mm) |
|--------------|-----------------|---------------------|---------------------|----------------|-----------|
|              |                 | (V)                 | (V)                 | (A)            |           |
| 12V          | CMS0603V240P101 | 18                  | 24[22-28]           | 100            | 1.6×0.8   |
|              | CMS0806V240P401 | 18                  | 24[22-28]           | 400            | 2.0×1.6   |
|              | CMS1206V240P501 | 18                  | 24[22-28]           | 500            | 3.2×1.6   |
|              | CMS1210V240P102 | 18                  | 24[22-28]           | 1000           | 3.2×2.5   |
|              | CMS1812V240P202 | 18                  | 24[22-28]           | 2000           | 4.5×3.2   |
|              | CMS2220V240P302 | 18                  | 24[22-28]           | 3000           | 5.6×5.0   |
| 24V          | CMS0603V420P101 | 30                  | 42[37-46]           | 100            | 1.6×0.8   |
|              | CMS0806V420P401 | 30                  | 42[37-46]           | 400            | 2.0×1.6   |
|              | CMS1206V420P501 | 30                  | 42[37-46]           | 500            | 3.2×1.6   |
|              | CMS1210V420P102 | 30                  | 42[37-46]           | 1000           | 3.2×2.5   |
|              | CMS1812V420P202 | 30                  | 42[37-46]           | 2000           | 4.5×3.2   |
|              | CMS2220V420P302 | 30                  | 42[37-46]           | 3000           | 5.6×5.0   |
| 48V          | CMS0806V750P301 | 60                  | 75[69-83]           | 300            | 2.0×1.6   |
|              | CMS1206V750P501 | 60                  | 75[69-83]           | 500            | 3.2×1.6   |
|              | CMS1210V750P801 | 60                  | 75[69-83]           | 800            | 3.2×2.5   |
|              | CMS1210V750P122 | 60                  | 75[69-83]           | 1200           | 3.2×2.5   |
|              | CMS1812V750P202 | 60                  | 75[69-83]           | 2000           | 4.5×3.2   |
|              | CMS2220V750P502 | 60                  | 75[69-83]           | 5000           | 5.6×5.0   |

## 5 总线保护方案

Surge protection solutions for BUS

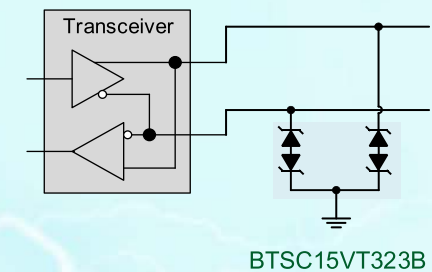
### RS-485 浪涌&ESD保护

Surge & ESD protection for RS-485



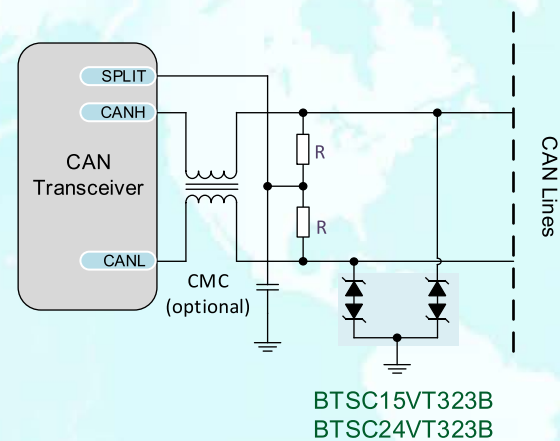
### RS-485 ESD保护

ESD protection for RS-485



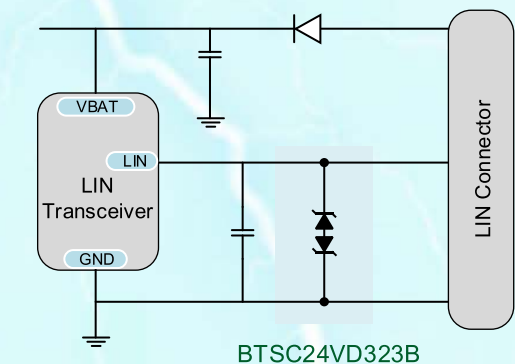
### CAN BUS 静电保护

ESD protection for CAN BUS



### LIN BUS 静电保护

ESD protection for LIN BUS



### 主要型号 Main Part Numbers

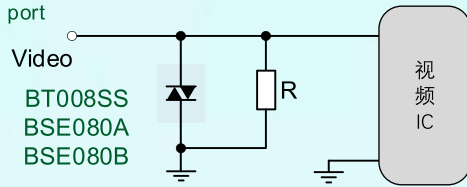
| P/N          | V <sub>RWM</sub> | C <sub>j</sub> | ESD (air and contact) | Surge      |              | Package |
|--------------|------------------|----------------|-----------------------|------------|--------------|---------|
|              | (V)              | (pF)           | (kV)                  | 8/20μs (A) | 10/700μs (V) |         |
| BT008SS      | 6                | 50             | 30                    |            | 2000         | SOD-123 |
| BSE080A      | 6                | 25             | 30                    |            | 4000         | SMA     |
| BSE080B      | 6                | 50             | 30                    |            | 6000         | SMB     |
| BTSC15VT323B | 15               | 15             | 30                    | 11         |              | SOT-23  |
| BTSC24VT323B | 24               | 11             | 30                    | 5          |              | SOT-23  |
| BTSC24VD323B | 24               | 50             | 30                    | 5          |              | SOD323  |



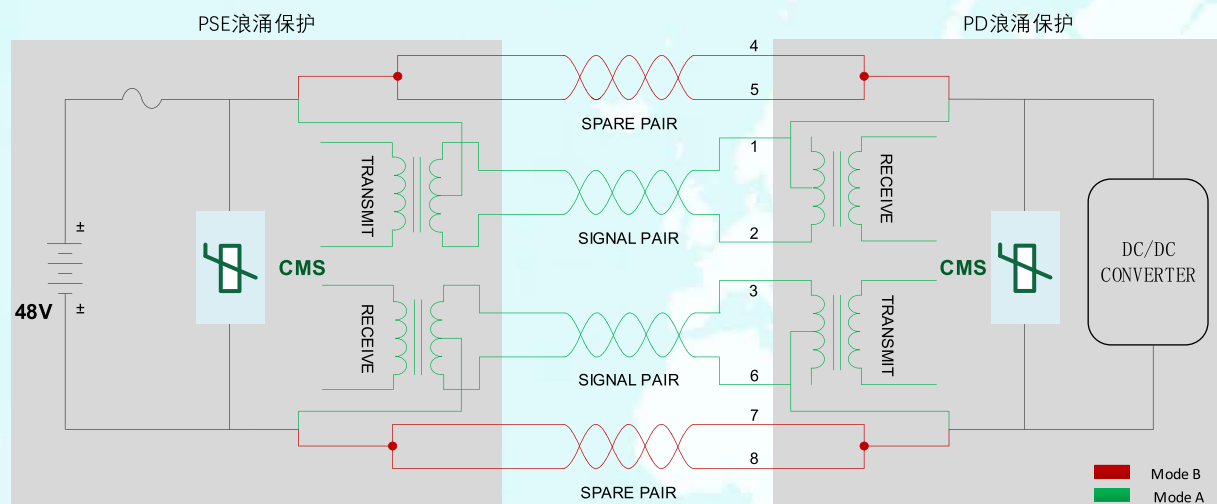
## 6 安防、通讯设备接口浪涌保护方案

Surge protection solutions for security and communication equipment interfaces

视频接口浪涌&ESD保护  
Surge & ESD protection for Video port



PoE保护方案  
Surge protection for PoE

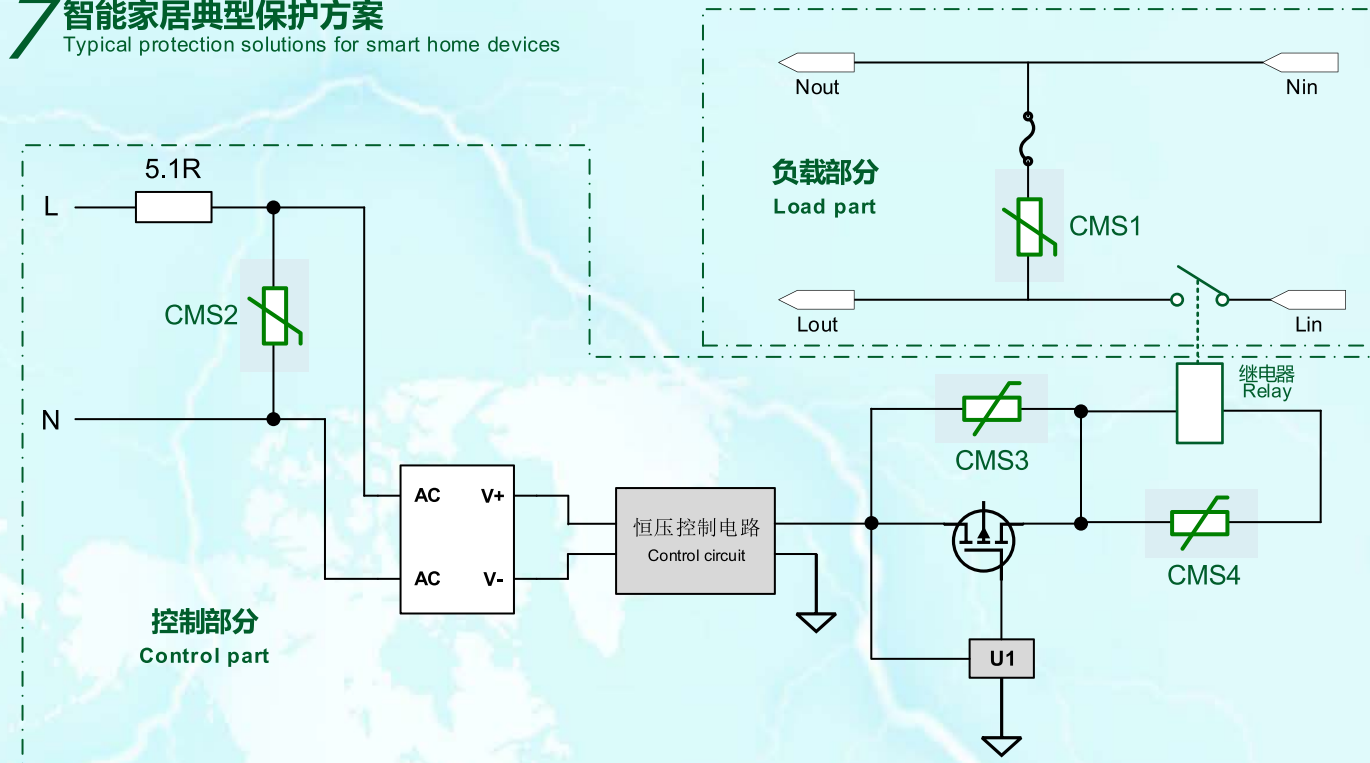


### 主要型号 Main Part Numbers

| P/N             | V <sub>M</sub> (DC) | V <sub>N @1mA</sub> | Surge      |              | Size (mm) |
|-----------------|---------------------|---------------------|------------|--------------|-----------|
|                 | (V)                 |                     | 8/20μs (A) | 10/700μs (V) |           |
| CMS1206V750P501 | 60                  | 75[69-83]           | 500        | 2000         | 3.2×1.6   |
| CMS1210V750P801 | 60                  | 75[69-83]           | 800        | 4000         | 3.2×2.5   |
| CMS1210V750P122 | 60                  | 75[69-83]           | 1200       | 6000         | 3.2×2.5   |
| CMS1812V750P202 | 60                  | 75[69-83]           | 2000       | 8000         | 4.5×3.2   |
| CMS1812V820P302 | 65                  | 82[73-91]           | 3000       | 10000        | 5.6×5.0   |
| CMS1812V820P401 | 65                  | 82[73-91]           | 400        | 2000         | 5.6×5.0   |
| CMS1812V820P601 | 65                  | 82[73-91]           | 600        | 4000         | 5.6×5.0   |
| CMS2220V820P502 | 65                  | 82[73-91]           | 5000       | 12000        | 6.0×5.3   |

## 7 智能家居典型保护方案

Typical protection solutions for smart home devices

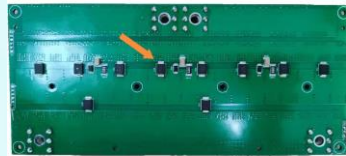
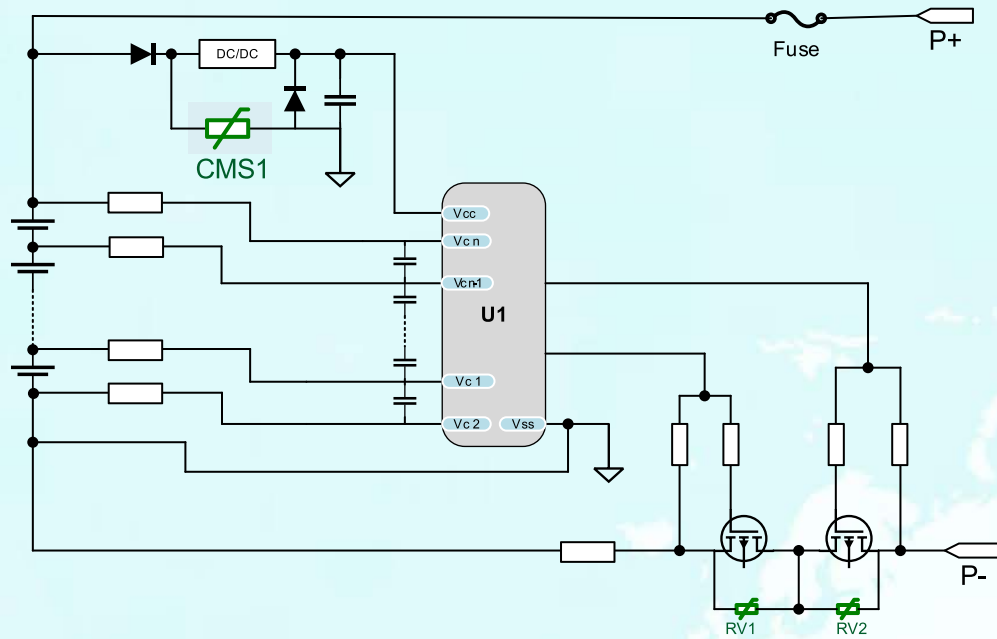


### 主要型号 Main Part Numbers

| CMS  | P/N               | V <sub>M</sub> |        | V <sub>N @1mA</sub> | Surge (8/20μs) | UL | TUV |
|------|-------------------|----------------|--------|---------------------|----------------|----|-----|
|      |                   | AC (V)         | DC (V) | (V)                 | (A)            |    |     |
| CMS1 | CMS1210V471P201-E | 300            | 385    | 470[423-517]        | 300            | •  | •   |
|      | CMS1210V511P151-E | 320            | 410    | 510[459-561]        | 300            | •  | •   |
|      | CMS1812V471P401-E | 300            | 385    | 470[423-517]        | 800            | •  | •   |
|      | CMS1812V511P401   | 320            | 410    | 510[459-561]        | 600            | •  | •   |
| CMS2 | CMS1206V471P101   | 300            | 385    | 470[423-517]        | 100            | •  | •   |
|      | CMS1206V511P500   | 320            | 410    | 510[459-561]        | 100            | •  | •   |
| CMS3 | CMS1206V240P251   | 12.7           | 18     | 24[22-28]           | 250            |    |     |
|      | CMS1206V420P201   | 21.3           | 30     | 42[37-46]           | 200            |    |     |
|      | CMS1206V750P151   | 46             | 60     | 75[69-83]           | 150            |    |     |
| CMS4 | CMS0603V140P101   | 6.4            | 9      | 14[12-16]           | 100            |    |     |
|      | CMS0603V240P101   | 12.7           | 18     | 24[22-28]           | 100            |    |     |
|      | CMS1206V140P251   | 6.4            | 9      | 14[12-16]           | 250            |    |     |
|      | CMS1206V240P251   | 12.7           | 18     | 24[22-28]           | 250            |    |     |

## 8 BMS全电路保护方案

Total solutions for circuits protection of BMS



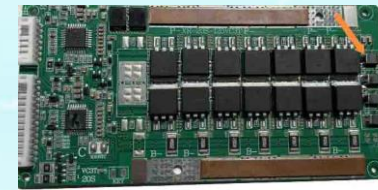
### 方案1：TVS对TVS的替代方案 Replacement of TVS to TVS solution.

- 对主流方案PIN-PIN替代，不用变更PCB布线  
TVS Pin-Pin replacement, no changing of layout
- 更具性价比  
More cost-effective



### 方案2：CMS 对TVS的替代 Replacement of CMS to TVS

- 浪涌能力高，能耐受更大的浪涌冲击  
High surge capacity, able to withstand larger surge wave
- 钳位低，保护效果更好  
Low clamp voltage for better protection
- 高温性能好，在125°C电性能不降额  
Good high-temperature performance, No degradation of electrical properties at 125°C



### 方案3：一颗CMS替代多颗大功率TVS的方案 Replacement of one CMS to multiple power TVS

- 一颗CMS最多替代6颗SMD的TVS  
One CMS replaces up to 6 SMD TVSs
- 大大减少布线空间和提升贴片效率  
Significantly reduce layout space and improve assembly efficiency
- 温度稳定性更好，可工作在125度  
High temperature stability at 125°C
- 解决TVS多颗并联“肩膀”问题,提高浪涌可靠性  
Improve the reliability comparing with multiples TVS because of random voltage range



### 方案4：低残压的CMSL方案 Low clamping voltage CMSL solution

- 更低的残压，更好的保护效果  
Low clamping voltage of CMSL for better protection
- 更容易匹配MOS管，降低BMS方案成本  
Better to protect surge wave sensitive MOS, saving cost of BMS
- 更小的布线空间  
Saveing layout space

### 总结：全电路保护方案优点 Total solutions for circuit protection of BMS

- 尺寸小，节省布线空间  
Small size saving layout space
- 浪涌能力高，能耐受更大的浪涌冲击  
High surge capacity, able to withstand larger surge wave
- 钳位低，保护效果更好  
Low clamp voltage for better protection
- 高温性能好，在125°C电性能不降额  
Good high-temperature performance, No degradation of electrical properties at 125°C
- 一颗CMS最多替代6颗SMD的TVS  
One CMS replaces up to 6 SMD TVSs

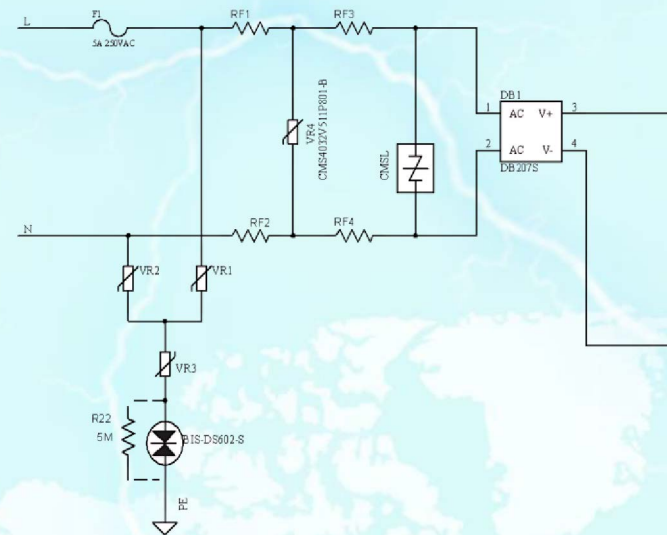
主要型号 Main Part Numbers

| CMS  | Battery strings | P/N or Size (mil)   | V <sub>M</sub> (DC) | V <sub>N</sub> @1mA | Surge      |
|------|-----------------|---------------------|---------------------|---------------------|------------|
|      |                 |                     | (V)                 | (V)                 | 8/20μs (A) |
| CMS1 | 10              | 1206/1210/1812/2220 | 38                  | 50[46-54]           | 200~3000   |
|      | 16              | 1206/1210/1812/2220 | 65                  | 82[73-91]           | 150~3000   |
|      | 24              | 1206/1210/1812/2220 | 100                 | 120[108-132]        | 150~3000   |

主要型号 Main Part Numbers

| CMS     | P/N or Size (mil)           | V <sub>R</sub> | V <sub>N</sub> @1mA | Surge         | Surge      |
|---------|-----------------------------|----------------|---------------------|---------------|------------|
|         |                             | (V)            | (V)                 | 10/1000μs (A) | 8/20μs (A) |
| RV1/RV2 | 1.5SMCJ64CA                 | 64             | 71.1-78.60          | 14.6          | /          |
|         | 3SMDJ64CA                   | 64             | 71.1-78.60          | 29.1          | /          |
|         | 1.5SMCJ85CA                 | 85             | 94.4-104.0          | 11.0          | /          |
|         | 1.5SMCJ100CA                | 100            | 111-123             | 9.3           | /          |
|         | CMS0806V520P501&BIS300P201B | 64             | 73.8-92.2           | 19.5          | /          |
|         | CMS1206V520P102&BIS300P201B | 64             | 73.8-92.2           | 30.1          | /          |
|         | CMS0806V820P501&BIS300P201B | 100            | 100-126             | 16.8          | /          |
|         | CMS0806V750P501&BIS300P201B | 85             | 94.5-117.5          | 19.4          | /          |
|         | CMSLAV640P501               | 64             | 73.8-92.2           | 19.5          | /          |
|         | CMSLAV101P501               | 100            | 94.5-117.5          | 19.1          | /          |
|         | CMS1210V750P122             | 60             | 69-83               | 171           | 1200       |
|         | CMS1812V750P302             | 60             | 69-83               | 429           | 3000       |
|         | CMS2220V680P502             | 56             | 61-75               | 714           | 5000       |
|         | CMS2220V680P802             | 56             | 61-75               | 1143          | 8000       |
|         | CMS2220V820P502             | 65             | 73-91               | 714           | 5000       |

9 低残压保护器件CMSL应用  
Low Residual Voltage Protection Device Applications



方案特征与优势 Features and Benefits

- CMSL系列贴片模式，自动化强生产效率高  
CMSL series, SMT type, automation of assembly and high producing efficiency
- 体积小，占用空间小  
Small size and small footprint
- 漏电流低，不容易劣化  
Low leakage current, no deterioration
- 耐受工频电压高，不容易起火  
Withstand high frequency voltage, no fire
- 残压低，对电路保护效果好  
Low residual voltage, good protection for circuits

主要型号 Main Part Numbers

| P/N or Size (mil) | V <sub>R</sub> | V <sub>N</sub> @1mA | Surge      |
|-------------------|----------------|---------------------|------------|
|                   | (V)            | (V)                 | 8/20μs (A) |
| CMSLAV641P500     | 640            | 702-858             | 50         |
| CMSLDV401P751     | 400            | 413-517             | 750        |



## 产品选型速查 Quick Selection of Products

### 1 高能贴片压敏电阻CMS

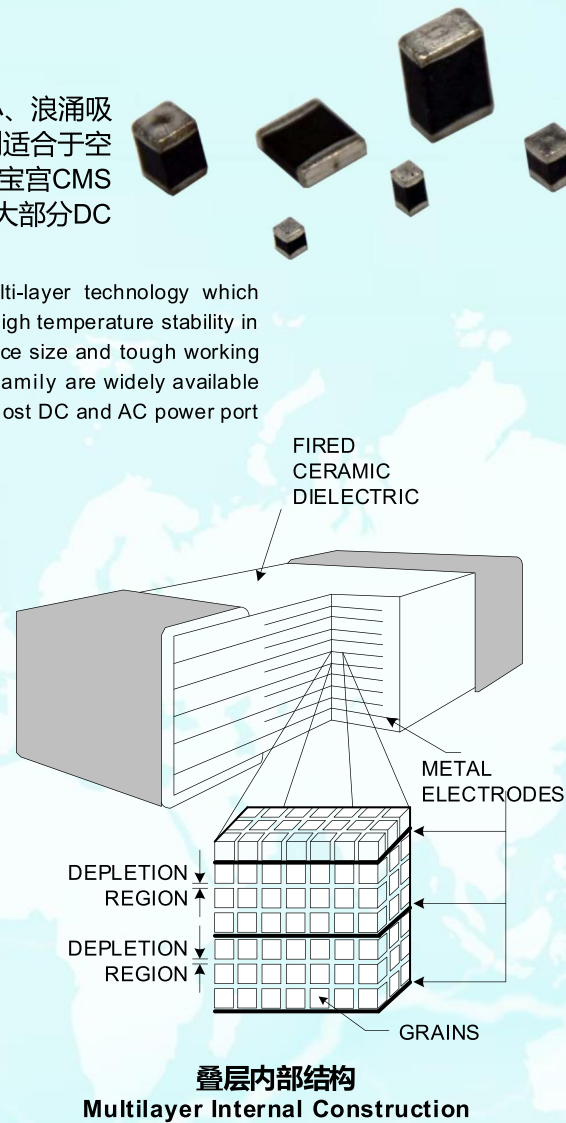
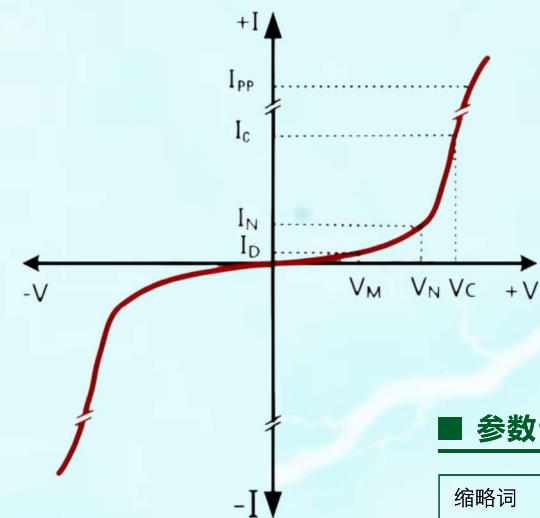
CMS (ceramic micro-surge) protection device

CMS是一种基于多层工艺的贴片高能浪涌保护器，具有尺寸小、浪涌吸收能力强、低保护电压效果好以及高温性能稳定等特点，特别适合于空间尺寸受限和工作环境严酷(比如高温，高湿等)的应用场景。宝宫CMS型号齐全(压敏电压14~560V，浪涌电流高达5kA)，满足绝大部分DC和AC电源端口浪涌保护的需求。

CMS (Ceramic micro-surge protection device) is manufactured by multi-layer technology which presents excellent transient energy absorption, low clamping voltage and high temperature stability in a small SMD package, particularly suitable for applications with limited space size and tough working environment (e.g. high temperature, high humidity, etc.). Boarden's CMS family are widely available (varistor voltage:14~560V, surge current up to 5kA) to meet the needs of most DC and AC power port surge protection

#### 产品特点 Features

- 小型化、贴片化 Small size, SMD type
- 保护电压低 Low clamping voltage
- 环境125°C不降额 No temperature derating up to 125°C ambient
- 雷击防护能量强 High surge handling capability
- 雷击重复冲击寿命长 Long life under repetitive surges
- 高温性能稳定 Reliability under high temperature
- 失效不起火 Failure without fire, better than UL94 V-0
- 安规证书 Certificates: TUV,UL



#### 参数说明 Parameters description

| 缩略词      | 参数说明                    |        |
|----------|-------------------------|--------|
| $V_M$    | Peak Off-state Voltage  | 不动作电压  |
| $I_D$    | Leakage Current @ $V_N$ | 漏电流    |
| $V_N$    | Spark Over Voltage      | 击穿电压   |
| $I_N$    | 1mA Test Current        | 测试电流   |
| $V_C$    | Clamping Voltage        | 钳位电压   |
| $I_C$    | Examination Current     | 测试浪涌电流 |
| $I_{PP}$ | Peak Current            | 峰值电流   |

#### 高压产品规格 High voltage product specifications

| Part Number        | Maximum Continuous Voltage |        | Nominal Varistor Voltage @1mA | Max. Clamping Voltage @8/20μs |           | Energy @10/1000μs | Peak Pulse Current @8/20μs | UL | TUV | CQC |
|--------------------|----------------------------|--------|-------------------------------|-------------------------------|-----------|-------------------|----------------------------|----|-----|-----|
|                    | AC (V)                     | DC (V) |                               | $V_C$ (V)                     | $I_C$ (A) |                   |                            |    |     |     |
| CMS0604V151P500    | 95                         | 125    | 150[135-185]                  | 250                           | 1.0       | 0.30              | 50                         |    |     |     |
| CMS0604V241P500    | 150                        | 200    | 240[216-264]                  | 360                           | 1.0       | 0.30              | 50                         |    |     |     |
| CMS0604V271P500    | 175                        | 225    | 270[243-297]                  | 410                           | 1.0       | 0.30              | 50                         | ●  |     |     |
| CMS0806V151P700    | 95                         | 125    | 150[135-185]                  | 250                           | 5.0       | 0.80              | 70                         |    |     | ●   |
| CMS0806V241P101    | 150                        | 200    | 240[216-264]                  | 360                           | 5.0       | 0.50              | 100                        | ●  | ●   | ●   |
| CMS0806V271P151    | 175                        | 225    | 270[243-297]                  | 410                           | 5.0       | 0.50              | 150                        | ●  | ●   | ●   |
| CMS0806V301P101    | 195                        | 250    | 300[270-330]                  | 450                           | 5.0       | 0.50              | 100                        |    | ●   | ●   |
| CMS0806V331P500    | 210                        | 270    | 330[297-363]                  | 500                           | 5.0       | 0.50              | 50                         |    | ●   | ●   |
| CMS0806V361P500    | 230                        | 300    | 360[324-396]                  | 540                           | 5.0       | 0.50              | 50                         |    | ●   | ●   |
| CMS0806V391P500    | 250                        | 320    | 390[351-429]                  | 590                           | 5.0       | 0.50              | 50                         | ●  | ●   | ●   |
| CMS0806V431P500    | 275                        | 350    | 430[387-473]                  | 650                           | 5.0       | 0.50              | 50                         | ●  | ●   | ●   |
| CMS0806V471P500    | 300                        | 385    | 470[423-517]                  | 710                           | 5.0       | 0.50              | 50                         | ●  | ●   | ●   |
| CMS0806V511P500    | 320                        | 410    | 510[459-561]                  | 840                           | 5.0       | 0.50              | 50                         | ●  | ●   | ●   |
| CMS1206V241P201    | 150                        | 200    | 240[216-264]                  | 360                           | 5.0       | 1.0               | 200                        | ●  | ●   | ●   |
| CMS1206V271P201    | 175                        | 225    | 270[243-297]                  | 410                           | 5.0       | 1.0               | 200                        | ●  | ●   | ●   |
| CMS1206V301P201    | 195                        | 250    | 300[270-330]                  | 450                           | 5.0       | 1.0               | 200                        |    | ●   | ●   |
| CMS1206V331P151    | 210                        | 270    | 330[297-363]                  | 500                           | 5.0       | 1.0               | 150                        |    | ●   | ●   |
| CMS1206V361P151    | 230                        | 300    | 360[324-396]                  | 540                           | 5.0       | 1.0               | 150                        |    | ●   | ●   |
| CMS1206V391P101    | 250                        | 320    | 390[351-429]                  | 590                           | 5.0       | 1.0               | 100                        | ●  | ●   | ●   |
| CMS1206V431P101    | 275                        | 350    | 430[387-473]                  | 650                           | 5.0       | 1.0               | 100                        | ●  | ●   | ●   |
| CMS1206V471P101    | 300                        | 385    | 470[423-517]                  | 710                           | 5.0       | 1.0               | 100                        | ●  | ●   | ●   |
| CMS1206V511P500    | 320                        | 410    | 510[459-561]                  | 840                           | 5.0       | 1.0               | 100                        | ●  | ●   | ●   |
| CMS1206V561P500    | 350                        | 460    | 560 [504-616]                 | 950                           | 5.0       | 1.0               | 50                         | ●  | ●   | ●   |
| CMS1206V471P101-J  | 300                        | 385    | 470[423-517]                  | 710                           | 5.0       | 0.5               | 70                         | ●  | ●   | ●   |
| CMS1206V511P500-J  | 320                        | 410    | 510[459-561]                  | 840                           | 5.0       | 0.5               | 70                         | ●  | ●   | ●   |
| CMS1206V511P500-H1 | 320                        | 410    | 530[500-561]                  | 840                           | 5.0       | 1.0               | 100                        | ●  | ●   | ●   |
| CMS1206V511P500-G1 | 350                        | 460    | 590[560-620]                  | 1020                          | 5.0       | 0.8               | 100                        | ●  | ●   | ●   |
| CMS1210V241P601    | 150                        | 200    | 240[216-264]                  | 360                           | 5.0       | 2.2               | 600                        | ●  | ●   | ●   |
| CMS1210V271P601    | 175                        | 225    | 270[243-297]                  | 410                           | 5.0       | 2.2               | 600                        | ●  | ●   | ●   |
| CMS1210V301P401    | 195                        | 250    | 300[270-330]                  | 450                           | 5.0       | 2.0               | 400                        |    | ●   | ●   |
| CMS1210V331P301    | 210                        | 270    | 330[297-363]                  | 500                           | 5.0       | 2.0               | 300                        |    | ●   | ●   |

| Part Number       | Maximum Continuous Voltage |        | Nominal Varistor Voltage @1mA | Max. Clamping Voltage @8/20µs |                    | Energy @10/1000µs  | Peak Pulse Current @8/20µs | UL | TUV | CQC |
|-------------------|----------------------------|--------|-------------------------------|-------------------------------|--------------------|--------------------|----------------------------|----|-----|-----|
|                   | AC (V)                     | DC (V) | V <sub>N</sub> (V)            | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |    |     |     |
| CMS1210V361P301   | 230                        | 300    | 360[324-396]                  | 540                           | 5.0                | 2.0                | 300                        |    | ●   | ●   |
| CMS1210V391P201   | 250                        | 320    | 390[351-429]                  | 590                           | 5.0                | 2.0                | 200                        |    | ●   | ●   |
| CMS1210V431P201   | 275                        | 350    | 430[387-473]                  | 650                           | 5.0                | 2.0                | 200                        | ●  | ●   | ●   |
| CMS1210V471P201   | 300                        | 385    | 470[423-517]                  | 710                           | 5.0                | 2.0                | 200                        | ●  | ●   | ●   |
| CMS1210V471P201-E | 300                        | 385    | 470[423-517]                  | 710                           | 5.0                | 2.5                | 300                        | ●  | ●   | ●   |
| CMS1210V471P401   | 300                        | 385    | 470[423-517]                  | 710                           | 5.0                | 2.7                | 400                        | ●  | ●   | ●   |
| CMS1210V511P151   | 320                        | 410    | 510[459-561]                  | 840                           | 5.0                | 2.0                | 150                        | ●  | ●   | ●   |
| CMS1210V511P151-E | 320                        | 410    | 510[459-561]                  | 840                           | 5.0                | 2.5                | 250                        | ●  | ●   | ●   |
| CMS1210V511P401   | 320                        | 410    | 510[459-561]                  | 840                           | 5.0                | 2.0                | 400                        | ●  | ●   | ●   |
| CMS1210V561P101   | 350                        | 460    | 560[504-616]                  | 950                           | 5.0                | 2.0                | 100                        |    | ●   | ●   |
| CMS1812V241P801   | 150                        | 200    | 240[216-264]                  | 360                           | 5.0                | 4.5                | 800                        | ●  | ●   | ●   |
| CMS1812V271P801   | 175                        | 225    | 270[243-297]                  | 410                           | 5.0                | 4.5                | 800                        | ●  | ●   | ●   |
| CMS1812V301P601   | 195                        | 250    | 300[270-330]                  | 450                           | 5.0                | 4.5                | 600                        |    | ●   | ●   |
| CMS1812V331P501   | 210                        | 270    | 330[297-363]                  | 500                           | 5.0                | 4.5                | 500                        |    | ●   | ●   |
| CMS1812V361P501   | 230                        | 300    | 360[324-396]                  | 540                           | 5.0                | 4.5                | 500                        |    | ●   | ●   |
| CMS1812V391P401   | 250                        | 320    | 390[351-429]                  | 590                           | 5.0                | 4.5                | 400                        |    | ●   | ●   |
| CMS1812V431P401   | 275                        | 350    | 430[387-473]                  | 650                           | 5.0                | 4.5                | 400                        | ●  | ●   | ●   |
| CMS1812V471P401   | 300                        | 385    | 470[423-517]                  | 710                           | 5.0                | 4.5                | 400                        | ●  | ●   | ●   |
| CMS1812V471P401-E | 300                        | 385    | 470[423-517]                  | 710                           | 5.0                | 5.5                | 600                        | ●  | ●   | ●   |
| CMS1812V471P801   | 300                        | 385    | 470[423-517]                  | 710                           | 5.0                | 6.5                | 800                        | ●  | ●   | ●   |
| CMS1812V511P251   | 320                        | 410    | 510[459-561]                  | 840                           | 5.0                | 4.5                | 250                        | ●  | ●   | ●   |
| CMS1812V511P401   | 320                        | 410    | 510[459-561]                  | 840                           | 5.0                | 4.5                | 400                        | ●  | ●   | ●   |
| CMS1812V561P251   | 350                        | 460    | 560[504-616]                  | 950                           | 5.0                | 4.5                | 250                        |    | ●   | ●   |
| CMS2220V241P152   | 150                        | 200    | 240[216-264]                  | 395                           | 10.0               | 7.0                | 1500                       |    | ●   | ●   |
| CMS2220V271P152   | 175                        | 225    | 270[243-297]                  | 455                           | 10.0               | 7.5                | 1500                       |    | ●   | ●   |
| CMS2220V301P122   | 195                        | 250    | 300[270-330]                  | 495                           | 10.0               | 7.5                | 1200                       |    | ●   | ●   |
| CMS2220V331P102   | 210                        | 270    | 330[297-363]                  | 500                           | 5.0                | 7.0                | 1000                       |    | ●   | ●   |
| CMS2220V361P102   | 230                        | 300    | 360[324-396]                  | 595                           | 10.0               | 7.0                | 1000                       | ●  | ●   | ●   |
| CMS2220V391P801   | 250                        | 320    | 390[351-429]                  | 650                           | 10.0               | 7.0                | 800                        | ●  | ●   | ●   |
| CMS2220V431P801   | 275                        | 350    | 430[387-473]                  | 710                           | 10.0               | 7.5                | 800                        | ●  | ●   | ●   |
| CMS2220V471P801   | 300                        | 385    | 470[423-517]                  | 775                           | 10.0               | 8.0                | 800                        |    | ●   | ●   |
| CMS2220V511P401   | 320                        | 410    | 510[459-561]                  | 840                           | 5.0                | 7.0                | 400                        |    | ●   | ●   |
| CMS2220V561P401   | 350                        | 460    | 560[504-616]                  | 950                           | 5.0                | 7.0                | 400                        |    | ●   | ●   |

■ 低压产品规格 Low voltage product specifications

0603 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20µs |                    | Energy @10/1000µs  | Peak Pulse Current @8/20µs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS0603V120P300 | 5.5                        | 4.0    | 12 [10-14]            | 23                            | 1.0                | 0.1                | 30                         |
| CMS0603V140P101 | 9                          | 6.4    | 14 [11-16]            | 30                            | 1.0                | 0.1                | 100                        |
| CMS0603V240P101 | 18                         | 12.7   | 24 [22-28]            | 45                            | 1.0                | 0.1                | 100                        |
| CMS0603V420P101 | 30                         | 21.3   | 42 [37-46]            | 70                            | 1.0                | 0.1                | 100                        |
| CMS0603V500P800 | 38                         | 30.0   | 50 [46-54]            | 80                            | 1.0                | 0.08               | 80                         |
| CMS0603V600P600 | 48                         | 34.1   | 60 [54-67]            | 110                           | 1.0                | 0.08               | 60                         |
| CMS0603V680P300 | 56                         | 40.0   | 68 [61-75]            | 125                           | 1.0                | 0.05               | 30                         |
| CMS0603V750P300 | 60                         | 46.0   | 75 [69-83]            | 130                           | 1.0                | 0.05               | 30                         |
| CMS0603V820P300 | 65                         | 50.0   | 82 [73-91]            | 135                           | 1.0                | 0.05               | 30                         |
| CMS0603V101P200 | 85                         | 60.0   | 100 [90-110]          | 165                           | 1.0                | 0.03               | 20                         |

0806 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20µs |                    | Energy @10/1000µs  | Peak Pulse Current @8/20µs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS0806V140P401 | 5.5                        | 6.4    | 14 [11-16]            | 30                            | 5.0                | 0.5                | 400                        |
| CMS0806V240P401 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.5                | 400                        |
| CMS0806V420P401 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.5                | 400                        |
| CMS0806V500P401 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 0.7                | 400                        |
| CMS0806V600P301 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 0.7                | 300                        |
| CMS0806V680P301 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 0.7                | 300                        |
| CMS0806V750P301 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 0.7                | 300                        |
| CMS0806V820P301 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 0.7                | 300                        |
| CMS0806V101P201 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 0.7                | 200                        |
| CMS0806V121P201 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 0.7                | 200                        |
| CMS0806V151P151 | 125                        | 95.0   | 150 [135-165]         | 260                           | 5.0                | 0.5                | 150                        |
| CMS0806V181P101 | 150                        | 115    | 180 [162-198]         | 325                           | 5.0                | 0.5                | 100                        |



0805 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20μs |                    | Energy @10/1000μs  | Peak Pulse Current @8/20μs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS0805V120P600 | 5.5                        | 4      | 12 [10-14]            | 23                            | 5.0                | 0.2                | 60                         |
| CMS0805V120P121 | 5.5                        | 4      | 12 [10-14]            | 23                            | 5.0                | 0.3                | 120                        |
| CMS0805V120P151 | 5.5                        | 4      | 12 [10-14]            | 23                            | 5.0                | 0.4                | 150                        |
| CMS0805V140P600 | 9.0                        | 6.4    | 14 [11-16]            | 30                            | 5.0                | 0.2                | 60                         |
| CMS0805V140P121 | 9.0                        | 6.4    | 14 [11-16]            | 30                            | 5.0                | 0.3                | 120                        |
| CMS0805V140P151 | 9.0                        | 6.4    | 14 [11-16]            | 30                            | 5.0                | 0.4                | 150                        |
| CMS0805V180P600 | 14                         | 10     | 18 [16-22]            | 35                            | 5.0                | 0.2                | 60                         |
| CMS0805V180P121 | 14                         | 10     | 18 [16-22]            | 35                            | 5.0                | 0.3                | 120                        |
| CMS0805V180P151 | 14                         | 10     | 18 [16-22]            | 35                            | 5.0                | 0.4                | 150                        |
| CMS0805V240P600 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.2                | 60                         |
| CMS0805V240P121 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.3                | 120                        |
| CMS0805V240P151 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.4                | 150                        |
| CMS0805V300P600 | 22                         | 15.6   | 30 [26-34]            | 50                            | 5.0                | 0.2                | 60                         |
| CMS0805V300P121 | 22                         | 15.6   | 30 [26-34]            | 50                            | 5.0                | 0.3                | 120                        |
| CMS0805V330P600 | 26                         | 18.4   | 33 [31-38]            | 60                            | 5.0                | 0.2                | 60                         |
| CMS0805V330P121 | 26                         | 18.4   | 33 [31-38]            | 60                            | 5.0                | 0.3                | 120                        |
| CMS0805V420P600 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.2                | 60                         |
| CMS0805V420P121 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.3                | 120                        |

1206 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20μs |                    | Energy @10/1000μs  | Peak Pulse Current @8/20μs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS1206V120P251 | 5.5                        | 4.0    | 12 [10-14]            | 23                            | 5.0                | 0.5                | 250                        |
| CMS1206V140P251 | 9                          | 6.4    | 14 [12-16]            | 30                            | 5.0                | 0.5                | 250                        |
| CMS1206V140P501 | 9                          | 6.4    | 14 [12-16]            | 30                            | 5.0                | 0.5                | 500                        |
| CMS1206V240P251 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.3                | 250                        |
| CMS1206V240P501 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.5                | 500                        |
| CMS1206V420P201 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.4                | 200                        |
| CMS1206V420P501 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.8                | 500                        |
| CMS1206V500P201 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 0.4                | 200                        |
| CMS1206V500P501 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 1                  | 500                        |
| CMS1206V600P151 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 0.4                | 150                        |
| CMS1206V600P501 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 1.2                | 500                        |
| CMS1206V680P151 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 0.4                | 150                        |
| CMS1206V680P501 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 1.2                | 500                        |
| CMS1206V750P151 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 0.4                | 150                        |
| CMS1206V750P501 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 1.2                | 500                        |
| CMS1206V820P151 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 0.6                | 150                        |
| CMS1206V820P501 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 1.2                | 500                        |
| CMS1206V101P151 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 0.6                | 150                        |
| CMS1206V101P401 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 1.2                | 400                        |
| CMS1206V121P151 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 0.6                | 150                        |
| CMS1206V121P401 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 1.2                | 400                        |



1210 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20μs |                    | Energy @10/1000μs  | Peak Pulse Current @8/20μs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS1210V120P401 | 5.5                        | 4.0    | 12 [10-14]            | 23                            | 5.0                | 0.5                | 400                        |
| CMS1210V140P401 | 9                          | 6.4    | 14 [12-16]            | 30                            | 5.0                | 0.5                | 400                        |
| CMS1210V240P401 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.5                | 400                        |
| CMS1210V240P102 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 1.5                | 1000                       |
| CMS1210V420P301 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.5                | 300                        |
| CMS1210V420P102 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 2                  | 1000                       |
| CMS1210V500P301 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 0.8                | 300                        |
| CMS1210V500P102 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 2.5                | 1000                       |
| CMS1210V600P301 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 0.8                | 300                        |
| CMS1210V600P102 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 3                  | 1000                       |
| CMS1210V680P301 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 1                  | 300                        |
| CMS1210V680P122 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 4                  | 1200                       |
| CMS1210V750P301 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 1                  | 300                        |
| CMS1210V750P801 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 4                  | 800                        |
| CMS1210V750P122 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 4                  | 1200                       |
| CMS1210V820P301 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 1.6                | 300                        |
| CMS1210V820P122 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 4                  | 1200                       |
| CMS1210V101P201 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 0.7                | 200                        |
| CMS1210V101P401 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 1.6                | 400                        |
| CMS1210V101P152 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 5                  | 1500                       |
| CMS1210V121P201 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 1                  | 200                        |
| CMS1210V121P102 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 5                  | 1000                       |

1812 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20μs |                    | Energy @10/1000μs  | Peak Pulse Current @8/20μs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS1812V120P801 | 5.5                        | 4.0    | 12 [10-14]            | 23                            | 5.0                | 1                  | 800                        |
| CMS1812V140P801 | 9                          | 6.4    | 14 [12-16]            | 30                            | 5.0                | 0.5                | 800                        |
| CMS1812V240P801 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 0.5                | 800                        |
| CMS1812V240P202 | 18                         | 12.7   | 24 [22-28]            | 45                            | 5.0                | 1.3                | 2000                       |
| CMS1812V420P801 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 0.7                | 800                        |
| CMS1812V420P202 | 30                         | 21.3   | 42 [37-46]            | 70                            | 5.0                | 2                  | 2000                       |
| CMS1812V500P801 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 1                  | 800                        |
| CMS1812V500P202 | 38                         | 30.0   | 50 [46-54]            | 80                            | 5.0                | 2.5                | 2000                       |
| CMS1812V600P601 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 1.1                | 600                        |
| CMS1812V600P202 | 48                         | 34.1   | 60 [54-67]            | 110                           | 5.0                | 3                  | 2000                       |
| CMS1812V680P601 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 1.1                | 600                        |
| CMS1812V680P202 | 56                         | 40.0   | 68 [61-75]            | 125                           | 5.0                | 3.5                | 2000                       |
| CMS1812V750P601 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 1.1                | 600                        |
| CMS1812V750P202 | 60                         | 46.0   | 75 [69-83]            | 130                           | 5.0                | 3                  | 2000                       |
| CMS1812V820P601 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 1.5                | 600                        |
| CMS1812V820P302 | 65                         | 50.0   | 82 [73-91]            | 135                           | 5.0                | 7.5                | 3000                       |
| CMS1812V101P501 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 2                  | 500                        |
| CMS1812V101P152 | 85                         | 60.0   | 100 [90-110]          | 165                           | 5.0                | 7                  | 1500                       |
| CMS1812V121P501 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 2                  | 500                        |
| CMS1812V121P152 | 100                        | 75.0   | 120 [108-132]         | 200                           | 5.0                | 7                  | 1500                       |
| CMS1812V151P801 | 125                        | 95.0   | 150 [135-165]         | 260                           | 5.0                | 0.5                | 800                        |
| CMS1812V181P501 | 150                        | 115    | 180 [162-198]         | 325                           | 5.0                | 0.5                | 500                        |

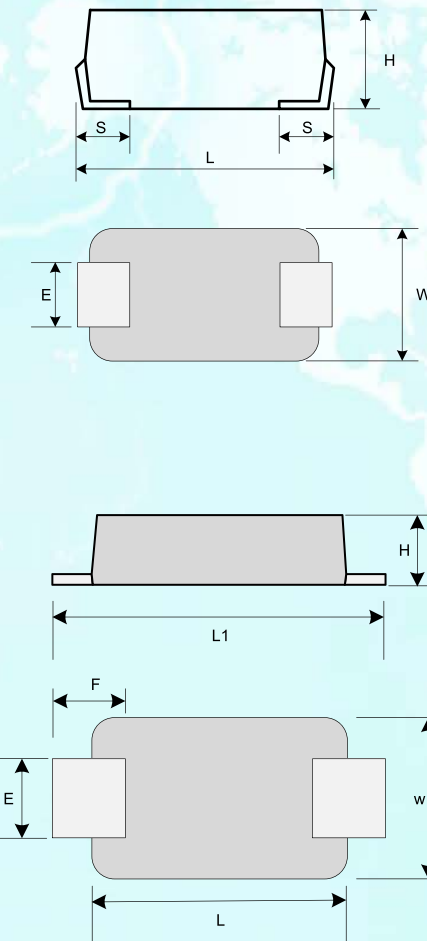
2220 Type

| Part Number     | Maximum Continuous Voltage |        | Varistor Voltage @1mA | Max. Clamping Voltage @8/20μs |                    | Energy @10/1000μs  | Peak Pulse Current @8/20μs |
|-----------------|----------------------------|--------|-----------------------|-------------------------------|--------------------|--------------------|----------------------------|
|                 | DC (V)                     | AC (V) | V <sub>N</sub> (V)    | V <sub>C</sub> (V)            | I <sub>C</sub> (A) | E <sub>T</sub> (J) | I <sub>PP</sub> (A)        |
| CMS2220V120P122 | 5.5                        | 4.0    | 12 [10-14]            | 23                            | 5.0                | 1.5                | 1200                       |
| CMS2220V140P122 | 9                          | 6.4    | 14 [12-16]            | 30                            | 10.0               | 1.5                | 1200                       |
| CMS2220V240P122 | 18                         | 12.7   | 24 [22-28]            | 45                            | 10.0               | 1.5                | 1200                       |
| CMS2220V240P302 | 18                         | 12.7   | 24 [22-28]            | 45                            | 10.0               | 4                  | 3000                       |
| CMS2220V420P122 | 30                         | 21.3   | 42 [37-46]            | 70                            | 10.0               | 2.6                | 1200                       |
| CMS2220V420P302 | 30                         | 21.3   | 42 [37-46]            | 70                            | 10.0               | 7                  | 3000                       |
| CMS2220V500P122 | 38                         | 30.0   | 50 [46-54]            | 80                            | 10.0               | 2.6                | 1200                       |
| CMS2220V500P302 | 38                         | 30.0   | 50 [46-54]            | 80                            | 10.0               | 8                  | 3000                       |
| CMS2220V500P502 | 38                         | 30.0   | 50 [46-54]            | 80                            | 10.0               | 10                 | 5000                       |
| CMS2220V500P802 | 38                         | 30.0   | 50 [46-54]            | 80                            | 10.0               | 6                  | 8000                       |
| CMS2220V600P901 | 48                         | 34.1   | 60 [54-67]            | 110                           | 10.0               | 3                  | 900                        |
| CMS2220V600P302 | 48                         | 34.1   | 60 [54-67]            | 110                           | 10.0               | 10                 | 3000                       |
| CMS2220V680P901 | 56                         | 40.0   | 68 [61-75]            | 125                           | 10.0               | 3                  | 900                        |
| CMS2220V680P502 | 56                         | 40.0   | 68 [61-75]            | 125                           | 10.0               | 17                 | 5000                       |
| CMS2220V750P901 | 60                         | 46.0   | 75 [69-83]            | 130                           | 10.0               | 2.7                | 900                        |
| CMS2220V750P502 | 60                         | 46.0   | 75 [69-83]            | 130                           | 10.0               | 5                  | 5000                       |
| CMS2220V820P901 | 65                         | 50.0   | 82 [73-91]            | 135                           | 10.0               | 3                  | 900                        |
| CMS2220V820P302 | 65                         | 50.0   | 82 [73-91]            | 135                           | 10.0               | 10                 | 3000                       |
| CMS2220V820P502 | 65                         | 50.0   | 82 [73-91]            | 135                           | 10.0               | 18                 | 5000                       |
| CMS2220V101P801 | 85                         | 60.0   | 100 [90-110]          | 165                           | 10.0               | 4                  | 800                        |
| CMS2220V101P452 | 85                         | 60.0   | 100 [90-110]          | 165                           | 10.0               | 21                 | 4500                       |
| CMS2220V121P801 | 100                        | 75.0   | 120 [108-132]         | 200                           | 10.0               | 4                  | 800                        |
| CMS2220V121P402 | 100                        | 75.0   | 120 [108-132]         | 200                           | 10.0               | 21                 | 4000                       |
| CMS2220V151P202 | 125                        | 95.0   | 150 [135-165]         | 260                           | 5.0                | 12                 | 2000                       |
| CMS2220V181P152 | 150                        | 115    | 180 [162-198]         | 325                           | 5.0                | 12                 | 1500                       |

2 塑封贴片压敏电阻  
Plastic chip varistor



产品尺寸 Product Dimensions



| Dim | 3025-B     |            | 4032-B      |             |
|-----|------------|------------|-------------|-------------|
|     | Inch       | Millimeter | Inch        | Millimeter  |
| L   | 0.307~0.33 | 7.80~8.60  | 0.421~0.445 | 10.70~11.30 |
| W   | 0.236~0.26 | 6.00~6.60  | 0.315~0.331 | 8.00~8.40   |
| H   | 0.149~0.18 | 3.80~4.60  | 0.177~0.201 | 4.50~5.10   |
| S   | 0.047~0.07 | 1.20~1.80  | 0.047~0.071 | 1.20~1.80   |
| E   | 0.106~0.13 | 2.70~3.30  | 0.106~0.130 | 2.70~3.30   |

| Dimensions | 4032/4032-E |            |
|------------|-------------|------------|
|            | Inch        | Millimeter |
| L          | 0.39±0.004  | 9.9±0.1    |
| W          | 0.323±0.004 | 8.2±0.1    |
| H          | 0.157±0.004 | 4.0±0.1    |
| L1         | 0.469±0.004 | 11.9±0.1   |
| E          | 0.197±0.004 | 5.0±0.1    |
| F          | 0.067±0.004 | 1.7±0.1    |



3025-B产品规格 3025-B specifications

| Part Number       | Maximum Continuous Voltage (V) |     | Nominal Varistor Voltage @1mA (V) | Clamping Voltage (Max. V) | Class Current (Max. A) | Maximum Peak Current 8/20μs (A) |         | Energy (J) (2ms) | Rated Power (mW) | TUV |
|-------------------|--------------------------------|-----|-----------------------------------|---------------------------|------------------------|---------------------------------|---------|------------------|------------------|-----|
|                   | AC                             | DC  | V <sub>N</sub>                    | V <sub>C</sub>            | 8/20μs I <sub>C</sub>  | 1 Time                          | 2 Times | 1 Time           |                  |     |
| CMS3025V241P501-B | 150                            | 200 | 240[216-264]                      | 395                       | 10                     | 1200                            | 1000    | 7.5              | 200              | ●   |
| CMS3025V271P501-B | 175                            | 225 | 270[243-297]                      | 455                       | 10                     | 1200                            | 1000    | 8.0              | 200              | ●   |
| CMS3025V331P501-B | 210                            | 270 | 330[297-336]                      | 545                       | 10                     | 1200                            | 1000    | 9.5              | 200              | ●   |
| CMS3025V361P501-B | 230                            | 300 | 360[324-396]                      | 595                       | 10                     | 1200                            | 1000    | 11.0             | 200              | ●   |
| CMS3025V391P501-B | 250                            | 320 | 390[351-429]                      | 650                       | 10                     | 1200                            | 1000    | 12.0             | 200              | ●   |
| CMS3025V431P501-B | 275                            | 350 | 430[387-473]                      | 710                       | 10                     | 1200                            | 1000    | 13.5             | 200              | ●   |
| CMS3025V471P501-B | 300                            | 385 | 470[423-517]                      | 775                       | 10                     | 1200                            | 1000    | 15.0             | 200              | ●   |
| CMS3025V511P401-B | 320                            | 418 | 510[459-561]                      | 842                       | 10                     | 1200                            | 1000    | 16.0             | 200              | ●   |
| CMS3025V561P401-B | 350                            | 460 | 560[504-616]                      | 920                       | 10                     | 1200                            | 1000    | 16.5             | 200              | ●   |
| CMS3025V621P401-B | 385                            | 505 | 620[558-682]                      | 1025                      | 10                     | 1200                            | 1000    | 17.0             | 200              | ●   |
| CMS3025V681P401-B | 420                            | 560 | 680[612-748]                      | 1120                      | 10                     | 1200                            | 1000    | 18.0             | 200              | ●   |

4032-B产品规格 4032-B specifications

| Part Number       | Maximum Continuous Voltage (V) |     | Nominal Varistor Voltage @1mA (V) | Clamping Voltage (Max. V) | Class Current (Max. A) | Maximum Peak Current 8/20μs (A) |         | Energy (J) (2ms) | Rated Power (mW) | TUV |
|-------------------|--------------------------------|-----|-----------------------------------|---------------------------|------------------------|---------------------------------|---------|------------------|------------------|-----|
|                   | AC                             | DC  | V <sub>N</sub>                    | V <sub>C</sub>            | 8/20μs I <sub>C</sub>  | 1 Time                          | 2 Times | 1 Time           |                  |     |
| CMS4032V241P102-B | 150                            | 200 | 240[216-264]                      | 395                       | 25                     | 2500                            | 2000    | 16.2             | 320              | ●   |
| CMS4032V271P102-B | 175                            | 225 | 270[243-297]                      | 455                       | 25                     | 2500                            | 2000    | 18.5             | 320              | ●   |
| CMS4032V331P102-B | 210                            | 270 | 330[297-336]                      | 545                       | 25                     | 2500                            | 2000    | 22.3             | 320              | ●   |
| CMS4032V361P102-B | 230                            | 300 | 360[324-396]                      | 595                       | 25                     | 2500                            | 2000    | 24.5             | 320              | ●   |
| CMS4032V391P102-B | 250                            | 320 | 390[351-429]                      | 650                       | 25                     | 2500                            | 2000    | 26.5             | 320              | ●   |
| CMS4032V431P102-B | 275                            | 350 | 430[387-473]                      | 710                       | 25                     | 2500                            | 2000    | 29.0             | 320              | ●   |
| CMS4032V471P102-B | 300                            | 385 | 470[423-517]                      | 775                       | 25                     | 2500                            | 2000    | 30.0             | 320              | ●   |
| CMS4032V511P801-B | 320                            | 418 | 510[459-561]                      | 842                       | 25                     | 2500                            | 2000    | 32.0             | 320              | ●   |
| CMS4032V561P801-B | 350                            | 460 | 560[504-616]                      | 920                       | 25                     | 2500                            | 2000    | 32.0             | 320              | ●   |
| CMS4032V621P801-B | 385                            | 505 | 620[558-682]                      | 1025                      | 25                     | 2500                            | 2000    | 32.0             | 320              | ●   |
| CMS4032V681P801-B | 420                            | 560 | 680[612-748]                      | 1120                      | 25                     | 2500                            | 2000    | 32.0             | 320              | ●   |

4032产品规格 4032 specifications

| Part Number     | Maximum Continuous Voltage (V) |     | Nominal Varistor Voltage @1mA (V) | Clamping Voltage (Max. V) | Class Current (Max. A) | Maximum Peak Current 8/20μs (A) |          | Energy (J) (2ms) | Rated Power (mW) | TUV |
|-----------------|--------------------------------|-----|-----------------------------------|---------------------------|------------------------|---------------------------------|----------|------------------|------------------|-----|
|                 | AC                             | DC  | V <sub>N</sub>                    | V <sub>C</sub>            | 8/20μs I <sub>C</sub>  | 1 Time                          | 15 Times | 1 Time           |                  |     |
| CMS4032V241P102 | 150                            | 200 | 240[216-264]                      | 395                       | 25                     | 1200                            | 700      | 10.1             | 250              | ●   |
| CMS4032V271P102 | 175                            | 225 | 270[243-297]                      | 455                       | 25                     | 1200                            | 700      | 11.3             | 250              | ●   |
| CMS4032V391P102 | 250                            | 320 | 390[351-429]                      | 650                       | 25                     | 1200                            | 700      | 16.4             | 250              | ●   |
| CMS4032V431P102 | 275                            | 350 | 430[387-473]                      | 710                       | 25                     | 1200                            | 700      | 18.1             | 250              | ●   |
| CMS4032V471P102 | 300                            | 385 | 470[423-517]                      | 775                       | 25                     | 1200                            | 700      | 19.7             | 250              | ●   |
| CMS4032V511P801 | 320                            | 418 | 510[459-561]                      | 842                       | 25                     | 1200                            | 700      | 21.4             | 250              | ●   |
| CMS4032V561P801 | 350                            | 460 | 560[504-616]                      | 920                       | 25                     | 1200                            | 700      | 23.5             | 250              | ●   |
| CMS4032V621P801 | 385                            | 505 | 620[558-682]                      | 1025                      | 25                     | 1200                            | 700      | 26.0             | 250              | ●   |
| CMS4032V681P801 | 420                            | 560 | 680[612-748]                      | 1120                      | 25                     | 1200                            | 700      | 28.6             | 250              | ●   |

4032-E产品规格 4032-E specifications

| Part Number       | Maximum Continuous Voltage (V) |     | Nominal Varistor Voltage @1mA (V) | Clamping Voltage (Max. V) | Class Current (Max. A) | Maximum Peak Current 8/20μs (A) |          | Energy (J) (2ms) | Rated Power (mW) | TUV |
|-------------------|--------------------------------|-----|-----------------------------------|---------------------------|------------------------|---------------------------------|----------|------------------|------------------|-----|
|                   | AC                             | DC  | V <sub>N</sub>                    | V <sub>C</sub>            | 8/20μs I <sub>C</sub>  | 1 Time                          | 15 Times | 1 Time           |                  |     |
| CMS4032V241P102   | 150                            | 200 | 240[216-264]                      | 395                       | 25                     | 1200                            | 700      | 10.1             | 250              | ●   |
| CMS4032V241P102-E | 150                            | 200 | 240[216-264]                      | 395                       | 25                     | 1750                            | 1000     | 12.6             | 300              | ●   |
| CMS4032V271P102-E | 175                            | 225 | 270[243-297]                      | 455                       | 25                     | 1750                            | 1000     | 14.2             | 300              | ●   |
| CMS4032V391P102-E | 250                            | 320 | 390[351-429]                      | 650                       | 25                     | 1750                            | 1000     | 20.5             | 300              | ●   |
| CMS4032V431P102-E | 275                            | 350 | 430[387-473]                      | 710                       | 25                     | 1750                            | 1000     | 22.6             | 300              | ●   |
| CMS4032V471P102-E | 300                            | 385 | 470[423-517]                      | 775                       | 25                     | 1750                            | 1000     | 24.7             | 300              | ●   |
| CMS4032V511P801-E | 320                            | 418 | 510[459-561]                      | 842                       | 25                     | 1750                            | 1000     | 26.8             | 300              | ●   |
| CMS4032V561P801-E | 350                            | 460 | 560[504-616]                      | 920                       | 25                     | 1750                            | 1000     | 29.4             | 300              | ●   |
| CMS4032V621P801-E | 385                            | 505 | 620[558-682]                      | 1025                      | 25                     | 1750                            | 1000     | 32.6             | 300              | ●   |
| CMS4032V681P801-E | 420                            | 560 | 680[612-748]                      | 1120                      | 25                     | 1750                            | 1000     | 35.7             | 300              | ●   |

### 3 隔离浪涌保护器BIS Isolated Surge Protector (BIS)

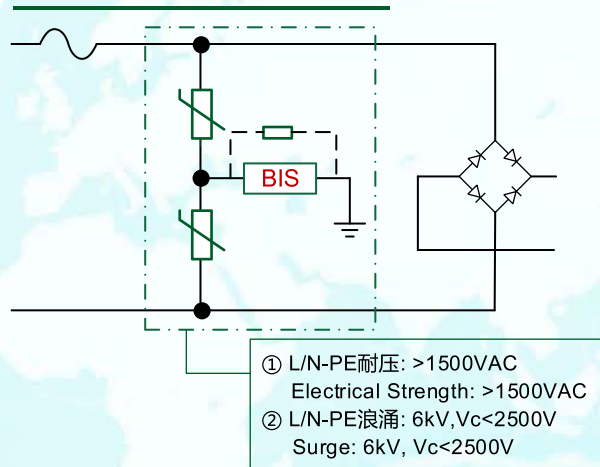
BIS是针对非隔离LED驱动的浪涌保护要求而开发的半导体器件，该器件和MOV串联，可显著增加工作电压和降低残压。其典型应用：对于I类灯具，在满足1000+2U的对地电气绝缘强度的安规要求基础上，能有效降低对地浪涌保护的钳位电压，从而有效降低LED灯具共模浪涌损坏的风险。该器件兼具高工作电压和低保护电压特性，特别适合应用在供电电压波动大、脉冲干扰大等的恶劣环境下的电子产品保护，如户外、工业照明及印度照明等，是宝宫电子为该应用特别开发的新型过压保护器件。

BIS is a semiconductor device developed for surge protection requirements of non-isolated LED drivers. The device series series with MOVs can significantly increase the trip voltage and reduce the residual voltage of L-N surge protection. The typical applications: On the basis of meeting the safety requirements of electrical insulation strength (1000+2U), the BIS can offer L/N-PE surge protection with low residual voltage for class I LED lamps, which can effectively reduce common mode surge damage risk of LED lamps. This product is a new type of overvoltage protection device developed by Boarden Electronics and targets for this application.

#### 产品特点 Features

- 提供共模浪涌保护, 满足对地电气绝缘强度的要求  
Offering L/N-PE surge protection, and meeting the safety requirements of electrical insulation strength
- 产品一致性高  
High consistency between products
- 相应速度快, 保护电压低  
Fast response time, low protection voltage
- 雷击重复冲击寿命长  
long life under repetitive surges
- 封装规格 Package SMB, SMC, DO-27
- 安规证书 Certificates: TUV,UL

#### 典型应用 Typical application



#### 产品规格 Product specifications

| Part Number               | Insulation Voltage (Vi) | Surge Starting Voltage (Vs) | Surge Capacity <sup>1)</sup> | Package |
|---------------------------|-------------------------|-----------------------------|------------------------------|---------|
|                           | Min (V)                 | Max (V)                     | V                            |         |
| BIS-DS602-S <sup>2)</sup> | 1600                    | 2200                        | 6000                         | SMB     |
| BIS-BR602-LM              | 1200                    | 1700                        | 6000                         | DO-27   |
| BIS-CS103 <sup>2)</sup>   | 1600                    | 2200                        | 10000                        | SMC     |

Note 1: 浪涌波形 Surge Waveform 1.2/50us & 8/20us, Ri=12ohm

Note 2: 对于 BIS-DS602-S 和 BIS-CS103, 由于此二型号应用时为两个产品串联, 故 Vi 和 Vs 参数为两个产品串联之和  
For BIS-DS602-S and BIS-CS103, the parameters Vi and Vs are the total values of two components, for these two components should be used by pairs in series during installation.

### 4 宽输入低残压浪涌保护器SPD Wide input voltage, low clamping voltage SPD

户外/工业照明使用环境复杂, 雷击/浪涌损坏风险高, 需要SPD的保护来提高产品的寿命和可靠性。然而, 普通的SPD只能满足部分LED的防雷要求。为了开发出满足绝大多数LED (包括线性驱动LED) 防雷要求的SPD, 宝宫电子定制关键元器件, 精心设计防雷保护方案, 经过大量测试, 开发出一系列小型化、低保护电压的新型SPD。

Due to complicate power supply environment and high risk of lightning/surge damage, the ordinary SPD protection needs to improve performance ensure the life and reliability of outdoor/industrial lighting products. In order to develop the SPD that meets lightning protection for most of LED, including linear driver LED, Boarden electronic customized key components, carefully designed lightning protection solutions, and have developed a series of new SPD with low protection voltage, small size and easy installation.



#### 产品特点 Features

- 定制元器件 Customized Components
- 宽输入电压 Wide Input Voltage (up to 100~400VAC)
- 典型钳位电压 Typical Clamping Voltage 1000V
- 最高工作温度 Maximum Operating Ambient Temperature 100°C
- 小尺寸, 易安装 Small Size, Easy Installing
- 防护等级 IP67
- 测试标准 Test Standard: IEC61643-11:2011, EN61643-11:2011, GB/T18802.1-2011
- 安规证书 Certificates: CB, TUV, CQC, CE
- 推荐应用: 防爆灯、工矿灯、路灯等 Applications: Explosion-proof lamp, mine lamp, street lamp, etc

#### 产品规格 Product specifications

| Part Number   | Maximum Continuous Operating Voltage | Open Circuit Voltage (1.2/50μs & 8/20μs) | Voltage Protection Rating (V) |        | Connection Mode | Wire Number | CB | TUV | CQC | CE |
|---------------|--------------------------------------|------------------------------------------|-------------------------------|--------|-----------------|-------------|----|-----|-----|----|
|               |                                      |                                          | L-N                           | L/N-PE |                 |             |    |     |     |    |
|               | U <sub>C</sub> (Vac)                 | U <sub>OC</sub> (kV)                     | U <sub>P</sub> (V)            |        |                 |             |    |     |     |    |
| BSP2L10RPT    | 320                                  | 10                                       | 1300                          | 2000   | Parallel        | 3           | ●  | ●   | ●   | ●  |
| BSP2L10RPT-1  | 320                                  | 10                                       | 1300                          | -      | Parallel        | 2 (L, N)    | ●  | ●   | ●   | ●  |
| BSP2L10RST    | 320                                  | 10                                       | 1300                          | 2000   | Series          | 5           | ●  | ●   | ●   | ●  |
| BSP2L10RPT-M  | 320                                  | 10                                       | 1300                          | 2000   | Parallel        | 3           |    |     |     | ●  |
| BSP2D10RST    | 320                                  | 10                                       | 1300                          | 2000   | Series          | 3           |    | ●   |     | ●  |
| BSP2D10RST-M1 | 320                                  | 10                                       | 1300                          | -      | Series          | 2           |    | ●   |     | ●  |

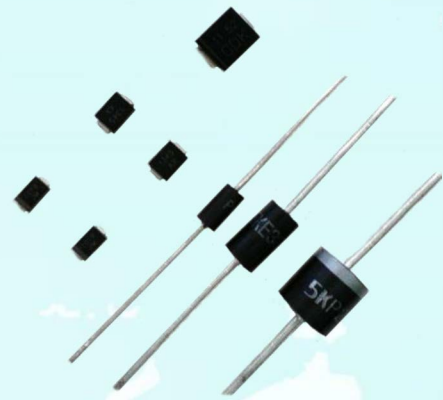


## 5 瞬态抑制二极管TVS

Transient voltage suppression diodes (TVS)

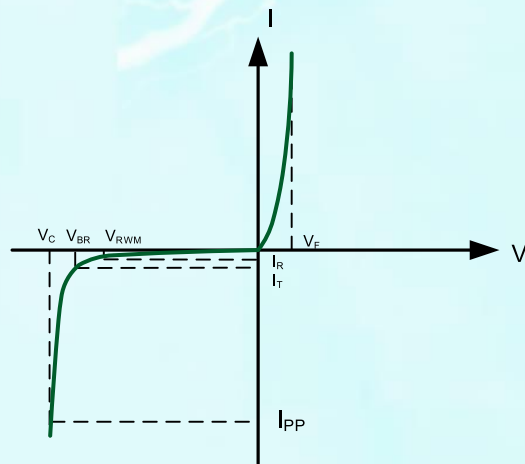
瞬态抑制二极管（TVS）是一类半导体工艺的突波吸收器，当过压情况发生的时候，TVS迅速发生雪崩击穿，从很高的电阻变成短路状态，把多余的能量旁路泄放，从而保护了负载不受过压的损坏。宝宫电子的TVS系列包括普通大功率管、低电容小功率管子等全系列产品，大功率管子涵盖从5V~550V电压范围，功率从200W到8000W主要用在电源保护、通讯保护和静电保护等场合。

Transient Voltage Suppressors (TVS) are semiconductor devices designed to provide protection against over voltage transients. When over voltage events occur, the silicon TVS actives from an very high impedance status to a very low impedance status by operating in the avalanche mode and uses a large junction area to absorb large transient currents in a fast response time, protecting voltage sensitive electronics equipment from damaging. Boarden supplies unipolar and bipolar TVS devices with axial and SMD packages, with maximum working voltage 5V to 550V, maximum power dissipation from 200W-8000W.

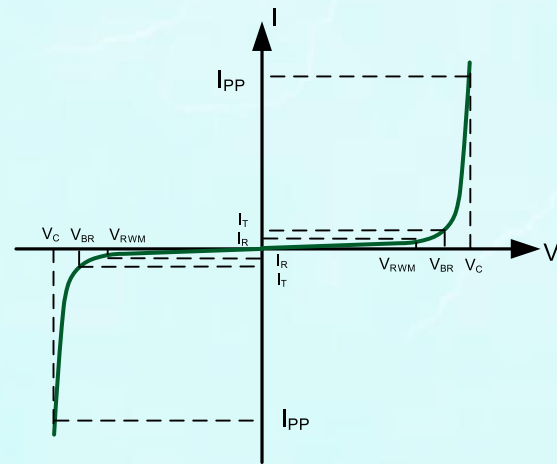


### 产品规格 Product specifications

| Structure | Series  | Package  | Power (W) | V <sub>RWM</sub> (V) | I <sub>R</sub> (μA) | V <sub>BR</sub> (V) | V <sub>C</sub> (V) | I <sub>PP</sub> (A) |
|-----------|---------|----------|-----------|----------------------|---------------------|---------------------|--------------------|---------------------|
| TH        | SA      | DO-15    | 500       | 5.0~180              | 1~600               | 6.4~200             | 9.2~289            | 1.7~55.4            |
|           | P4KE    | DO-41    | 400       | 5.0~376              | 1~1000              | 6.45~418            | 10.5~602           | 0.68~39             |
|           | P6KE    | DO-15    | 600       | 5.8~376              | 1~1000              | 6.45~418            | 10.5~602           | 1.0~58.1            |
|           | 1.5KE   | DO-201   | 1500      | 5.8~376              | 1~1000              | 6.45~418            | 10.5~602           | 2.5~144.8           |
|           | 3KP     | P600     | 3000      | 5.0~220              | 2~5000              | 6.4~244             | 9.2~371.1          | 8.1~326.1           |
|           | 5KP     | P600     | 5000      | 5.0~220              | 2~5000              | 6.4~244             | 9.2~371.1          | 13.7~554.3          |
| SMD       | SMF     | SOD123-F | 200       | 5.0~170              | 1~400               | 6.4~189             | 9.2~275            | 0.6~21.7            |
|           | SMAJ    | SMA      | 400       | 5.0~440              | 1~800               | 6.4~492             | 9.2~713            | 0.6~43.5            |
|           | SMBJ    | SMB      | 600       | 5.0~440              | 1~800               | 6.4~492             | 9.2~713            | 0.9~65.3            |
|           | 1.5SMCJ | SMC      | 1500      | 5.8~495              | 1~800               | 6.45~522.5          | 10.5~760           | 2.0~144.8           |
|           | 3SMCJ   | SMC      | 3000      | 5.0~220              | 1~800               | 6.4~244             | 9.2~355            | 8.5~326.1           |
|           | 5SMDJ   | SMC      | 5000      | 5.0~220              | 1~800               | 6.4~244             | 9.2~355            | 14.1~543.5          |
|           | SM8S    | DO218-AB | 8000      | 11.1~47.8            | 150~250             | 12.3~52.8           | 86~388             | 10~15               |



单向 Uni-Directional TVS



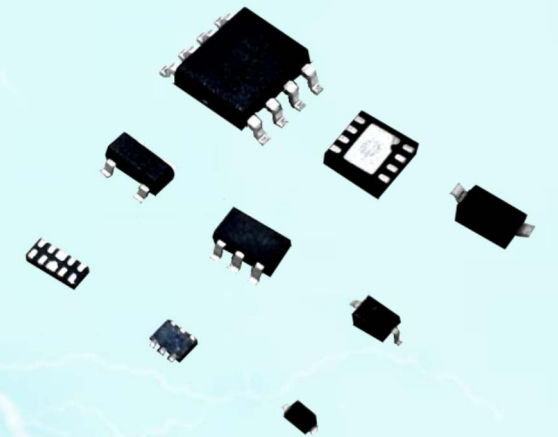
双向 Bi-Directional TVS

## 6 静电抑制器ESD TVS

ESD TVS

ESD TVS是为保护电压敏感元件免受ESD损坏而设计的。出色的箝位能力、低漏电和快速响应时间为暴露在ESD下的设计提供最佳保护。该系列是专门为保护连接到数据和传输线上的敏感元件免受ESD（静电放电）和EFT（电快速瞬变）引起的过电压影响而设计。

ESD TVS are designed to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. This series has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD(electrostatic discharge), and EFT (electrical fast transients).



### 产品规格 Product specifications

| Package | Lines | Direction | V <sub>RWM</sub> (V) | I <sub>R</sub> (μA) | V <sub>BR</sub> (V) | V <sub>C</sub> @1A (V) | C @1MHz (pF) | Power (W) |
|---------|-------|-----------|----------------------|---------------------|---------------------|------------------------|--------------|-----------|
| 0402    | 1     | Uni / Bi  | 5.0                  | 1.0                 | 6.0                 | 8~15                   | 0.3~17       | 46~100    |
| DFN1006 | 1     | Uni / Bi  | 3.3~12               | 1.0~2.5             | 4.8~13.3            | 7.0~23.7               | 0.5~90       | 100~200   |
| SOD923  | 1     | Uni / Bi  | 3.3~12               | 1.0~2.5             | 4.8~13.5            | 8.4~23.7               | 0.5~80       | 100~150   |
| SOD523  | 1     | Uni / Bi  | 3.3~15               | 1.0                 | 5.0~16.5            | 8.4~22                 | 0.5~105      | 100~250   |
| SOD323  | 1     | Uni / Bi  | 3.3~36               | 1.0~40              | 4.0~40              | 5.15~60                | 0.4~500      | 350~500   |
| SOT23   | 2     | Uni / Bi  | 3.3~36               | 1.0~20              | 4.0~40              | 5.15~60                | 0.8~400      | 300~350   |
| SOT143  | 2     | Uni       | 5.0                  | 1.0~5.0             | 6.0                 | 9.8~15.5               | 0.9~3.0      | 125~500   |
| SOT23-6 | 4     | Uni       | 5.0                  | 1.0                 | 6.0                 | 12~15.5                | 0.8~3.5      | 150~500   |
| DFN2510 | 4     | Uni       | 5.0                  | 1.0                 | 6.0                 | 15.5                   | 0.3          | 150       |
| DFN4120 | 6     | Uni       | 5.0                  | 1.0                 | 6.0                 | 25                     | 0.4          | 100       |
| SOP-8   | 4     | Bi        | 2.8                  | 1.0                 | 3.0                 | 8.5                    | 3.0          | 400       |

### 参数说明 Parameters description

| 缩略词              | 参数说明                                                                                      |        |
|------------------|-------------------------------------------------------------------------------------------|--------|
| V <sub>RWM</sub> | Reverse Stand-Off Voltage - Working Peak Reverse Voltage                                  | 反向截止电压 |
| I <sub>R</sub>   | Reverse Leakage Current - Current measured at VRWM                                        | 反向漏电流  |
| V <sub>BR</sub>  | Breakdown Voltage - Maximum current that flows though the TVS at a specified test current | 击穿电压   |
| V <sub>C</sub>   | Clamping Voltage - Peak voltage measured across the suppressor at a specified Ipp         | 钳位电压   |
| I <sub>PP</sub>  | Peak Pulse Current - Maximum Reverse Peak Pulse Current                                   | 脉冲峰值电流 |

## 7 固体放电管TSS

Thyristor (TSS)

宝宫电子的固体放电管是专门为通讯过电压防护而设计，用于防护常见的雷击、电力线搭接和感应引起的过电压破坏。TSS的工作原理类似其他的过压器件：正常工作的时候呈现高阻状态，然后当过电压情况来临时，TSS会在极短的时间里变成极低阻值状态，把过电压引起的电流吸收泄放掉，从而保护了局级和用户级设备安全，典型应用包括配线架(MDF)，交换机(PBX)，xDSL，路由器和电话机等。主要特点是电容低，电压保护准确，耐冲击电流大，安全可靠等。

Boarden TSS are designed to help protect sensitive telecommunication equipments from over voltage events as lightning strikes, power contact and power induction per as Telcordia GR-1089 and ITU-T K.20(K21). A TSPD appears as a very high impedance device under normal operating conditions, but will change its impedance to short to divert current to ground under over voltage events.

### 产品规格 Product specifications

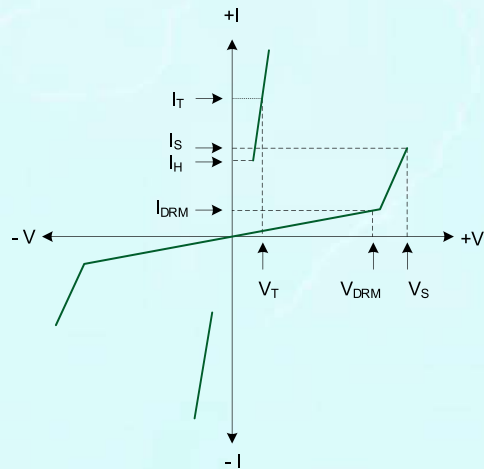
| Part Number | $V_{DRM}$<br>(V) | $I_{DRM}$<br>( $\mu$ A) | $V_S$<br>(V) | $I_S$<br>(mA) | $V_T$<br>(V) | $I_H$<br>(mA) | C<br>(pF) |
|-------------|------------------|-------------------------|--------------|---------------|--------------|---------------|-----------|
| BT008SS     | 6                | 10                      | 25           | 800           | 4            | 50            | 50        |
| BSE080A     | 6                | 10                      | 25           | 800           | 4            | 50            | 25        |
| BSE080B     | 6                | 10                      | 25           | 800           | 4            | 50            | 50        |
| P0080XY     | 6                | 10                      | 25           | 800           | 4            | 50            | 100       |
| P0300XY     | 25               | 5                       | 40           | 800           | 4            | 50            | 110       |
| P0640XY     | 58               | 5                       | 77           | 800           | 4            | 150           | 50        |
| P0720XY     | 65               | 5                       | 88           | 800           | 4            | 150           | 50        |
| P1100XY     | 90               | 2                       | 130          | 800           | 4            | 150           | 40        |
| P1300XY     | 120              | 2                       | 160          | 800           | 4            | 150           | 40        |
| P1500XY     | 140              | 2                       | 180          | 800           | 4            | 150           | 30        |
| P1800XY     | 180              | 2                       | 220          | 800           | 4            | 150           | 30        |
| P2300XY     | 200              | 2                       | 260          | 800           | 4            | 150           | 30        |
| P2600XY     | 220              | 2                       | 300          | 800           | 4            | 150           | 30        |
| P3100XY     | 275              | 1                       | 350          | 800           | 4            | 150           | 30        |
| P3500XY     | 320              | 1                       | 400          | 800           | 4            | 150           | 30        |
| P4200XY     | 400              | 1                       | 520          | 800           | 4            | 100           | 40        |

X: 代表封装形式 X=S(SMA/SMB); E(TO-92); L(DO-15)

Y: 代表能量等级(IPP @10/1000 $\mu$ s) Y=A(50A); B(80A); C(100A)

### 参数说明 Parameters description

| 缩略词       | 参数说明                        |       |
|-----------|-----------------------------|-------|
| $V_{DRM}$ | Peak Off-state Voltage      | 不动作电压 |
| $I_{DRM}$ | Leakage Current @ $V_{DRM}$ | 漏电流   |
| $V_S$     | Switching Voltage           | 转折电压  |
| $I_S$     | Switching Current           | 转折电流  |
| $V_T$     | On-state Voltage            | 通态电压  |
| $I_H$     | Holding Current             | 维持电流  |
| C         | Off-state Capacitance       | 静态电容  |



## 8 陶瓷气体放电管 GDT

Ceramic gas discharge tube (GDT)

宝宫电子的气体放电管系列产品包括普通气体放电管(GDT)、气体开关管(SSG)以及同轴气体放电管，其中的GDT包括普通GDT、低脉冲GDT、大功率GDT、小尺寸贴片GDT。气体放电管的工作原理类似一开关型器件，使用中并联在被保护设备线与线或线与地端。当外来浪涌电压未达其动作电压时，放电管呈高阻状态，而一旦浪涌电压达到其动作电压时，放电管内部放电间隙即发生电击穿现象，此时放电管相当于一良导体，浪涌电压在50ns时间内即被迅速短路至接近零电压，浪涌电流被迅速导入大地，从而对设备起到保护作用。当浪涌电压消失时，放电管则立即熄灭并恢复为高阻状态，静待下一次的动作。

Boarden gas discharge tube series products include ordinary gas discharge tube (GDT), gas switch tube (SSG) and coaxial gas discharge tube, which includes ordinary GDT, low pulse GDT, high power GDT, small size SMD GDT. Gas discharge tube working principle is similar to a switch-type devices, the use of parallel in the protected equipment line and line or line and GND. When the external surge voltage does not reach its action voltage, the GDT is a high resistance state, and once the surge voltage reaches its action voltage, the internal discharge gap of GDT immediately electrical breakdown phenomenon. The GDT is equivalent to a good conductor at this time and the surge voltage is quickly short-circuited to close to zero voltage in 50ns, thereby protecting the equipment. When the surge voltage disappears, the GDT is immediately extinguished and return to a high resistance state, waiting for the next action.

### 产品规格 Product specifications

| Structure | Dimensions                | Series | $V_S$<br>@100V/s | $V_{SS}$<br>@1kV/s | $V_S$<br>Range | IMDC<br>@8/20 $\mu$ s $\pm$ 5 | C<br>@1MHz | IR<br>@100V DC |
|-----------|---------------------------|--------|------------------|--------------------|----------------|-------------------------------|------------|----------------|
| Standard  | 1206                      | B2G2   | 75~600V          | 600~1400V          | 20%            | 0.5kA                         | <1         | >1G $\Omega$   |
| SMD       | 1812                      | B3G3   | 75~600V          | 600~1400V          | 20%            | 1kA                           | <1         | >1G $\Omega$   |
| SMD / TH  | $\Phi$ 5.0 $\times$ 4.4   | B2G5   | 75~3600V         | 600~1400V          | 20%            | 2.5 kA                        | <1         | >1G $\Omega$   |
|           | $\Phi$ 6.0 $\times$ 4.2   | B2G6   | 75~3600V         | 600~1400V          | 20%            | 5 kA                          | <1         | >1G $\Omega$   |
|           | $\Phi$ 8.0 $\times$ 6.0   | B2G8   | 75~3600V         | 600~1400V          | 20%            | 5 kA                          | <1         | >1G $\Omega$   |
|           | $\Phi$ 5.0 $\times$ 7.6   | B3G5   | 75~3600V         | 600~1400V          | 20%            | 5 kA                          | <1         | >1G $\Omega$   |
|           | $\Phi$ 6.0 $\times$ 8.0   | B3G6   | 75~3600V         | 600~1400V          | 20%            | 10kA                          | <1         | >1G $\Omega$   |
|           | $\Phi$ 7.5 $\times$ 11.5  | B3G7   | 75~600V          | 600~1400V          | 20%            | 20kA                          | <1         | >1G $\Omega$   |
|           | $\Phi$ 8.0 $\times$ 10.0  | B3G8   | 75~600V          | 600~1400V          | 20%            | 20kA                          | <1         | >1G $\Omega$   |
|           | $\Phi$ 11.8 $\times$ 17.8 | B2G12  | 75~600V          | 600~1400V          | 20%            | 20kA                          | <2         | >1G $\Omega$   |
|           | $\Phi$ 12.0 $\times$ 6.5  | B2G12  | 75~600V          | 600~1400V          | 20%            | 40kA                          | <2         | >1G $\Omega$   |
|           | $\Phi$ 20.2 $\times$ 5.2  | B2G20  | 75~600V          | 600~1400V          | 20%            | 40-80kA                       | <2         | >1G $\Omega$   |
|           | $\Phi$ 29.5 $\times$ 7.5  | B2G30  | 75~600V          | 450~1200V          | 20%            | 120kA                         | <2         | >1G $\Omega$   |

### 参数说明 Parameters description

| 缩略词      | 参数说明                       |        |
|----------|----------------------------|--------|
| $V_S$    | DC Spark Over Voltage      | 直流击穿电压 |
| $V_{SS}$ | Impulse Spark Over Voltage | 脉冲击穿电压 |
| IMDC     | Impulse Discharge Current  | 冲击耐受电流 |
| C        | Capacitance                | 极间电容   |
| $I_R$    | Insulation Resistance      | 绝缘电阻   |



## 贴片熔断丝

Chip fuse

| Package | Rated Voltage<br>(V) | Rated Current<br>(A) | Breaking Capacity<br>(A) | Typical Pre-Arcing I <sup>2</sup> t<br>(A <sup>2</sup> Sec) |
|---------|----------------------|----------------------|--------------------------|-------------------------------------------------------------|
| 0603    | DC 32                | 1~8                  | 50                       | 0.011~4.5                                                   |
|         | DC 63                | 0.25~1.5             | 50                       | 0.0004~0.04                                                 |
| 1206    | DC 32                | 0.25~30              | 50~150                   | 0.00012~100                                                 |
|         | DC 72                | 1~5                  | 50                       | 0.00012~2.5                                                 |
| 2410    | AC 125               | 0.25~15              | 50                       | 0.145~120                                                   |
|         | AC 250               | 0.5~5                | 100                      | 0.053~10                                                    |
| 4010    | AC 250               | 0.5~2                | 50                       | 1.3~30                                                      |



## 10 塑封贴片电阻

Plastic chip resistor

| Parameter                        | Condition                                     | Value      | Unit |
|----------------------------------|-----------------------------------------------|------------|------|
| Nominal Power Rating             | 40°C                                          | 0.5~2      | W    |
| Resistance Range                 | Wire-wound resistor                           | 0.5 ~ 150  | Ω    |
|                                  | Metal film resistor                           | 0.1 ~ 5M   |      |
| Tolerances                       |                                               | 1(F), 5(J) | ± %  |
| Fusing Characteristic            | Wire-wound resistor<br>6*(P/R) <sup>1/2</sup> | <60        | s    |
| Surge Capacity                   | Wire-wound resistor<br>1.2/50 & 8/20μs 10Hits | 1500       | V    |
| Max. Rated Operating Temperature |                                               | 125        | °C   |
| Temperature Range                |                                               | -55 ~ 150  | °C   |



## 11 防雷保险电阻

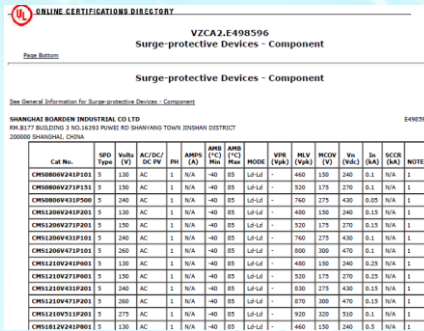
Surge-proof fusing resistor

| Size | Package    | Resistance Range | Power (W) | Surge Capacity     | Fusing Characteristic |
|------|------------|------------------|-----------|--------------------|-----------------------|
|      |            | (ohm)            |           | 1.2/50 & 8/20μs(V) |                       |
| 0207 | axial lead | 0.5~150          | 0.5, 1    | 1000               | <60s<br>@6*(P/R)^1/2  |
|      | leadless   |                  |           |                    |                       |
| 0309 | axial lead |                  | 1, 2      | 1500               |                       |
|      | leadless   |                  |           |                    |                       |
| 0411 | axial lead |                  | 2, 3      | 2000               |                       |
|      | leadless   |                  |           |                    |                       |



## 产品认证 Product Certifications

### CMS UL E498596



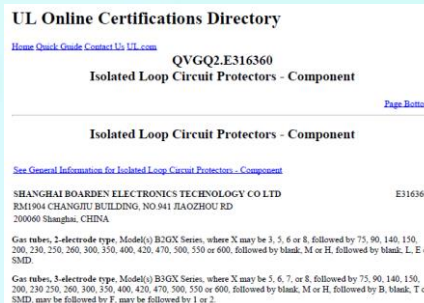
### SPD CB HU-003430



### SPD CQC CQC19123220244



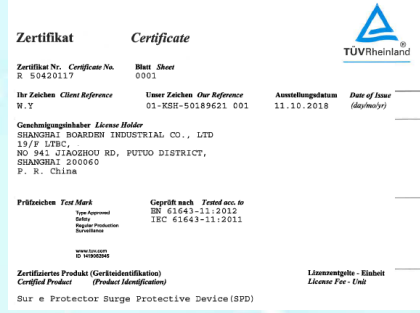
### GDT UL E316360



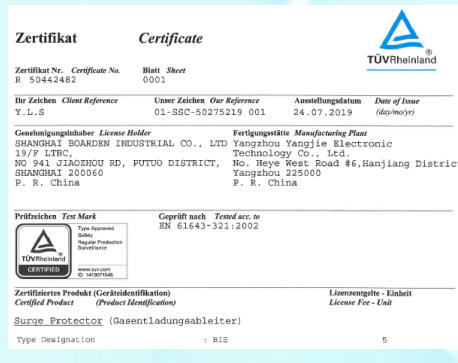
### CMS TUV B 002653 0001 Rev.01



### SPD TUV R 50420117



### BIS TUV R 50442482



### CMS CQC 21001318502





## 质量体系认证 Quality System Certification

### 16949体系认证



### 职业健康安全管理体系认证



### 社会责任管理体系认证



### 环境管理体系认证



### 质量管理体系认证



## 专利 Patents

### 部分专利

| 专利名称                   | 专利类型 | 授权公告号        |
|------------------------|------|--------------|
| 一种适合叠层陶瓷产品表面绝缘处理的制作方法  | 发明专利 | CN111524669B |
| 一种高介电常数NPO型介质陶瓷        | 发明专利 | CN110483034B |
| 一种用于电源保护的防浪涌电路         | 发明专利 | CN111864708A |
| 一种基于堆叠技术的电路保护元件        | 发明专利 | CN114172115A |
| 一种单段线性照明驱动的浪涌保护电路      | 实用新型 | CN216491146U |
| 一种电阻多次循环测试工装           | 实用新型 | CN216792353U |
| 一种分料装置                 | 实用新型 | CN216988588U |
| 一种可调速的锆珠倒角机            | 实用新型 | CN216731242U |
| 一种层叠机的去静电结构            | 实用新型 | CN211702511U |
| 一种提高混合均匀度的砂磨机          | 实用新型 | CN212189384U |
| 一种无线充电器用陶瓷电容           | 实用新型 | CN210443426U |
| 一种提高流延质量的陶瓷电容流延机       | 实用新型 | CN211221188U |
| 脱泡真空储藏罐                | 实用新型 | CN210762313U |
| 一种有效提高银浆涂封效率及精度的电容器封端机 | 实用新型 | CN210443443U |
| 一种可推拉置物板的排胶炉           | 实用新型 | CN210773420U |
| 一种便于上下料的陶瓷电容用切割机       | 实用新型 | CN211221465U |
| 一种便于清理切割碎料的电容切割机       | 实用新型 | CN210443442U |
| 一种用于陶瓷电容的配料的滚筒尼龙球磨机    | 实用新型 | CN210753003U |
| 一种提高吸盘工作效率的电容叠层机       | 实用新型 | CN210443441U |
| 一种带有加强结构的多层片式陶瓷电容器     | 实用新型 | CN210443437U |
| 一种提高工件成品质量的罩式炉         | 实用新型 | CN210773392U |
| 陶瓷铺膜机的进料盒拆装结构          | 实用新型 | CN211221285U |
| 一种片式多层陶瓷电容预切割装置        | 实用新型 | CN211221464U |
| 一种用于陶瓷电容的撕膜机           | 实用新型 | CN210443439U |
| 滚筒尼龙球磨机的吸尘装置           | 实用新型 | CN210753002U |
| 一种高密封性的真空包装机           | 实用新型 | CN210761497U |
| 一种用于陶瓷电容的陶瓷膜的脱模装置      | 实用新型 | CN211221292U |
| 一种用于MLCC精确定位的薄膜丝网印刷机   | 实用新型 | CN211195301U |





行业资质 Industry Qualifications



合作伙伴 Cooperative Partners

中国电子元件行业协会证明

中国电子元件行业协会

证 明

江苏省工业和信息化厅：

如东宝联电子科技有限公司是中国电子元件行业协会会员单位，根据江苏省专精特新小巨人的申报要求，现就该公司的主导产品高能高压片式压敏电阻器市场占有率情况提供证明如下：

| 产品准确名称 <sup>1</sup>                      | 高能高压片式压敏电阻器                           |                          |
|------------------------------------------|---------------------------------------|--------------------------|
| 产品类别<br>(根据产品准确名称与《统计用产品分类目录》类别是否对应选择填写) | <input type="checkbox"/> 是            | 对应的8位或10位代码 <sup>2</sup> |
|                                          | <input checked="" type="checkbox"/> 否 | 是否符合行业惯例分类 <sup>3</sup>  |
| 市场占有率相关数据 <sup>4</sup>                   | 2020年                                 | 2021年                    |
| 国内市场需求量占比和排名                             | 5.1% (第1)                             | 10.8% (第1)               |
| 省内本土企业排名                                 | 第1                                    | 第1                       |
| 备注                                       | 注：国内排名仅为国内本土企业排名；占比为国内市场占有率。          |                          |

注：1. 填写产品的准确规范名称。  
2. 可直接对应国家统计局《统计用产品分类目录》第四级或第五级产品类别的，填写相应的8位或10位代码。  
3. 无法对应《统计用产品分类目录》类别的，请注明是否符合行业惯例分类。  
4. 市场占有率各项数据按照“产品准确名称”表述的具体产品填写，排名为必填项。

中国电子元件行业协会  
2022年10月12日

行业标准参与与指定证明

关于参加《道路车辆用被动元件应力要求及试验方法》等五项团体标准起草工作的证明

兹证明如东宝联电子科技有限公司作为标准起草单位之一，参与《道路车辆用被动元件应力要求及试验方法》、《道路车辆用压敏技术要求》两项标准的制订工作，特此证明。

标准牵头单位：广东优科检测认证有限公司  
2023-05-25

压敏标准委员会理事单位

中国电子学会传感与微系统技术分会  
电压敏专业学部

主任委员单位

中国电子学会传感与微系统技术分会  
二零一八年十月

高新技术企业证书

高新技术企业证书

企业名称：如东宝联电子科技有限公司 证书编号：GR202232002780  
发证时间：2022年10月12日 有效期：三年  
批准机关：

LED 照明

昕诺飞

朗德万斯

GE

莱福德

佛山照明

得邦照明

立达信

欧普照明

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凯耀照明

三雄极光

雷士照明

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航盛

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中天安驰

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TECHNOLOGY

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CHENZHU 辰竹

辰竹

LUXSHARE ICT

立讯

## 新能源及其他

PACEex

沛城

Blueway

蓝微

Schneider  
Electric

施耐德

TCL

TCL

SMTc

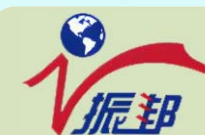
兆驰

JRY

嘉润源

Shark NINJA

尚可宁家



振邦

朗科智能  
Longood Intelligent

朗科智能