

# 东莞市安伏特电子有限公司

## DONGGUAN AMPFORT ELECTRICS CO.,LTD.

### 技术规格书

#### Technical Specification

贴片压敏电阻 (SMD Varistor) **JYVDR-xxDxxx**

(型号看第三页) (For model, please see Page 3)



客户:	
Client:	
品保部:	_____
QA Department:	_____
制造部:	_____
Manufacturing	
Department:	_____
工程部:	_____
Engineering	

供应商: 安伏特电子
Supplier: AMPFORT
制 作: <u>徐文杰</u>
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# 知识产权、安全认证

## Intellectual property、security certification

序号 NO	类别category		标准/标志 Standard / logo	证书号 Certificate number
01	知识产权 Intellectual property	外观专利Appearance patent		ZL 2017 3 0466542.2
02		实用新型Utility patent		ZL 2017 2 0473501.0
03		发明专利Invention patent		ZL 2017 1 0297717.0
04		国际PCT专利 International PCT patent		美国USA: 16666291 欧洲Europe: CN2017/118998 印度India: 57563
05	认证、报告 Certification report	中国 China	CQC	GB/T10193-1997  05D: CQC18001202949 07D: CQC18001202948 10D: CQC18001203056
06		美国/加拿大 USA /Canada	UL	UL1449  E481249-20180122
07		德国 (欧盟) Germany (EU)	TUV	IEC61051  B 094255 0002 Rev. 00
08		ROHS	SGS/SVHC	SGS每年更新 SVHC 长期有效  05DSGS: CANEC2121716202 07DSGS: CANEC2121716204 10DSGS: CANEC2121716206 SVHC: CANEC2200885702

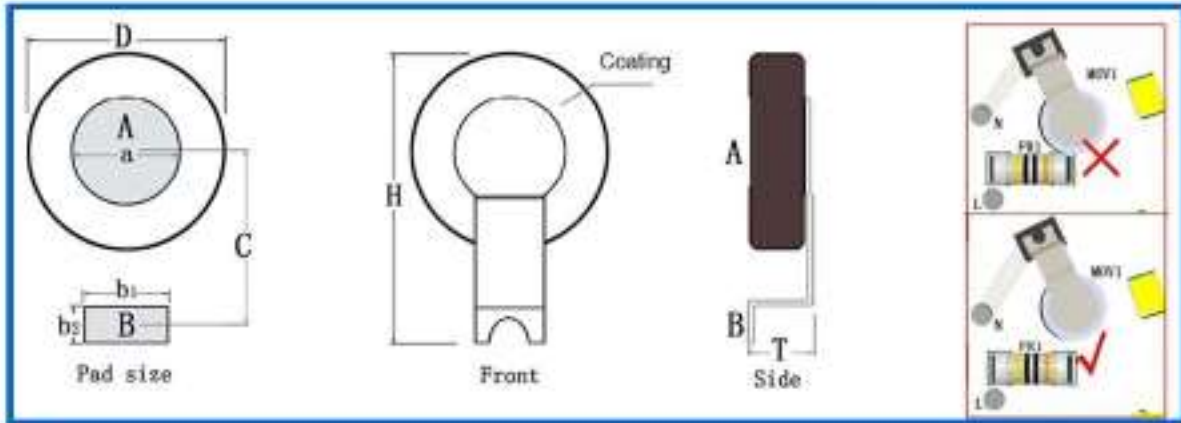
尊重创新！尊重你我！违者必究！

Respect innovation! Respect you and me! Rights reserved!

# 一、尺寸、外观标志及封装 ( $\pm 0.3\text{mm}$ )

## I. Dimensions, Appearance Identification and Packaging (mm)

### 1- 1 外形尺寸及外观 External dimensions and appearance



#### 强烈建议:

1. 在画板中, 建议A焊点当L线, B焊点当N线, 把与B焊点相连的铜皮绕压敏芯片圆外布线(要把整个直径D内看成属于A焊点)。2. 为安规飞越着想, 芯片圆形边缘与其他任何导体至少间隔2.5mm以上, 如上图(为了防止贴片时与其他器件相互移位, 如空间允许请间隔预留越大越好。)
3. 压敏电阻在直流电路中使用有不利因素, 不建议压敏在整流后的直流电路中使用, 请慎重考虑或者联系我司18128566098(sales1@ampfort.net), 谢谢!

#### Highly Recommended:

1. In the drawing board, it is recommended that the A solder joint be used as the L line, the B solder joint as the N line, and the copper skin connected to the B solder joint is routed around the pressure-sensitive chip circle (the entire diameter D should be regarded as belonging to the A solder joint). 2. For the sake of safety arcing, the circular edge of the chip should be at least 2.5mm away from any other conductive device, as shown in the figure above (in order to prevent mutual displacement with other devices during patching, if the space allows, please reserve the larger the interval is. Okay.)
3. The use of varistors in DC circuits has unfavorable factors. It is not recommended to use varistors in rectified DC circuits. Please consider carefully or contact our company at 18128566098 (sales1@ampfort.net), thank you!

型号 Model JYVDR~	焊盘 Pad A	焊盘 Pad B		焊盘 中心距C Pad center distance	直径D Diameter	高度H Height $\pm 1.0$	厚度T Thickness	涂装料及备注 (绝缘漆) Coating material and remarks (insulating paint)
	$\Phi a$	b1	b2					
05D271	2.7	3.5	2.5	5.75	5.0	9.1	2.0	 蓝色Blue 271: 270VDC $\pm 10\%$ ; 白色White 471: 470VDC $\pm 10\%$ ; 黄色Yellow 511: 510VDC $\pm 10\%$ ; 红色Red 561: 560VDC $\pm 10\%$ 15寸卷盘编带(最小包装): 5D271 4000PCS; 5D其他型号 3000PCS; 7D271 3000PCS; 7D其他型号 2000PCS; 10D271 2000PCS; 10D其他型号 1500PCS;
05D471 05D511							3.0	
07D271	3.3	3.8	2.5	6.75	7.0	11.1	2.0	
07D471 07D511 07D561							3.0	
10D271							2.0	
10D471 10D511 10D561							3.0	

05 07 10D全系列均采用15寸卷盘及24寸飞达上贴片机

05 07 10D all series adopt 15 inch reel and 24 inch Fee der placement machine

### 1- 2 产品标识 Product identification



无标识 Without logo



## 二、电气性能 Electrical Performance

主推系列型号 Series/Model JYVDR-	压敏电压 VDC Pressure Sensitive Resistance VDC	最大允许回路电压 Maximum Allowable Circuit Pressure		最大限制电压 (8/20us) Maximum Limiting Pressure (8/20us)		最大通流能量 Maximum Circulation Energy 组合波 Combined wave A	最大静态功率 Maximum Static Power W	电容量 Electric Capacity pF	漏电流 Leakage Current ≤20uA	认证温度 Certification Temperature (°C) -40~125	VI特性曲线 VI Characteristic Curve 附表一 Attachment I	脉冲降额曲线 Pulse Derating Curve 附表二 Attachment II								
		VAC	VDC	VDC	Alp															
05D271	270±10%	170	220	480	8A	500A (1000V)	0.1	100	≤20uA	-40~125	附表一 Attachment I	附表二 Attachment II								
05D471	470±10%	300	380	810	10A			65												
05D511	510±10%	325	415	870				60												
07D271	270±10%	170	220	450	15A	1.0KA (2000V)	0.25	170					≤20uA	-40~125	附表一 Attachment I	附表二 Attachment II				
07D471	470±10%	300	380	770	20A			115												
07D511	510±10%	325	415	840				110												
07D561	560±10%	350	450	925				100												
10D271	270±10%	170	220	450		35A	2.0KA (4000V)	0.40									380	≤20uA	-40~125	附表一 Attachment I
10D471	470±10%	300	380	760	40A	250														
10D511	510±10%	325	415	835		230														
10D561	560±10%	350	450	920		210														

针对不同的应用电压环境，推荐如下压敏组合对ACLED提供过压、浪涌、雷击防护：

For different voltage application environments, we recommend the following pressure sensitive combinations to provide overvoltage, surge and lightning stroke protection for ACLED.

工作电压环境 Working Voltage Environment	前级压敏参数 Last-level Pressure Sensitive Parameter	后级压敏参数 Next-level Pressure Sensitive Parameter	备注 Remarks
110VAC±20%	270VDC±10%		针对IC耐压能力不够，需两级压敏可提升至4KV防雷，用户根据对防浪涌等级需求选用压敏体积大小配合。
220-230VAC±20%	510VDC±10%	470VDC±10%	Tow levels of pressure sensitive combinations can be improved to 4KV lightning protection; user can select pressure sensitive volume as needed.
240VAC±20%	560VDC±10%	510VDC±10%	印度、巴西国家推荐该组合 The combination is recommended for users in Indian and Brazil.

因为压敏电阻在电压波动较大的环境中容易劣化的特性，所以在灯板上 IC(MOS 管)+灯珠耐压足够大及电压波动较大区域的前提下，尽可能选用压敏电压值较高的组合，并在成本允许的前提下尽可能选择流通量大且体积尺寸大的压敏电阻。

Since pressure sensitive resistor is easy to degrade under the environment with strong voltage fluctuation, it is required to select the combination with high pressure sensitive voltage value as much as possible under the premise that withstand voltage of IC (MOS tube) +lamp bead on lamp board is pretty high and that voltage has a large fluctuation area; besides, it is necessary to select pressure sensitive resistor with large circulation and volume as far as possible, without exceeding cost limit.

### 三、交收检验 Acceptance

抽样方法按GB2828-87符合该规格书要求。

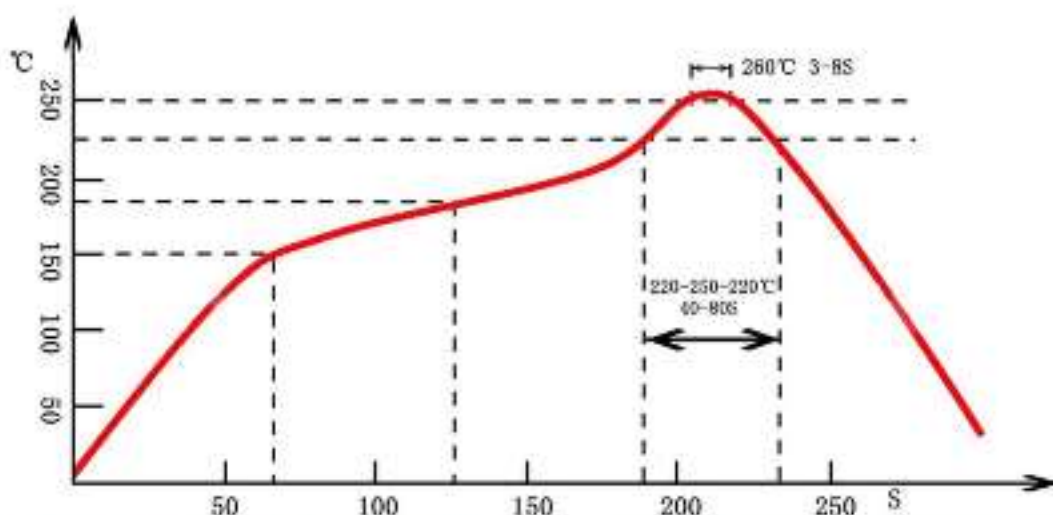
Sampling should follow GB2828-87 and this Specification.

项 目Item	IL	AQL
4-1 外观、尺寸、标志 4-1 Appearance, Dimension and Logo	II	0.65
4-2 压敏电压 4-2 Pressure Sensitive Voltage	II	0.65
4-3 电容量 4-3 Electric Capacity	S-3	0.65
4-4 可焊性 4-4 Weklability	S-3	2.5

### 四、使用环境条件 Using Environment Condition

使用环境温度 Environment Temperature	-40~125℃
相对湿度 Relative Humidity	≤95%
大气压 Atmospheric Pressure	86~106Kpa
振动频率 Vibration Frequency	10~50HZ
加速度 Acceleration	98m/S <sup>2</sup>
贮存温度 Storage Temperature	-40~85℃

### 五、热风回流焊曲线图Curve diagram of wave soldering



上图是目前市面上大致回流焊炉温曲线走向，我司贴片压敏利用瓷片本体的银电极做焊接电极之一，请用户注意设置炉温和时间，（如有最高260℃时，请注意时间为3-8S，如超过30S将会影响到压敏电阻的保护效果）。

The figure above shows the general trend of reflow soldering furnace temperature curve in the market. Our chip varistors use silver electrode of porcelain body as one of the welding electrodes. Please pay attention to the setting of furnace temperature and time (if the maximum temperature is 260℃, please note that the time is 3-8s. If it exceeds 30s, the protection effect of the chip varistors will be affected)

## 六、其他性能 Other Properties

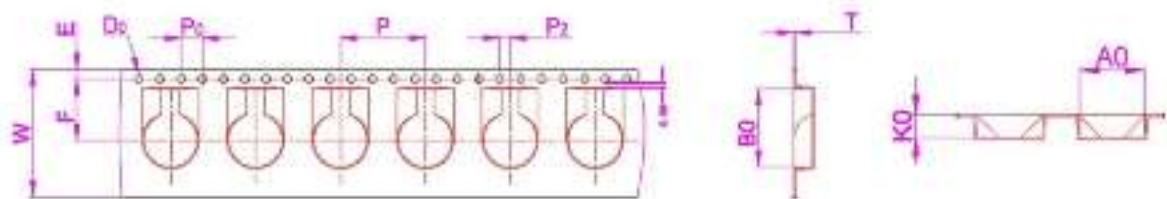
项 目 Item	技 术 要 求 Technical Requirement	测试条件及试验方法 Testing Condition and Method
4-1 外观 4-1 Appearance	<p>无明显气泡、针孔等缺陷；无任何降低使用性的可见性损伤；标志清晰耐久。</p> <p>No obvious bubble, pinhole and other defects; no any visible damage lowering using performance; clear and long-lasting sign</p>	<p>目 测 Visual inspection</p>
4-2 可焊性 4-2 Weldability	<p>浸锡部分上锡均匀,上锡面积 <math>\geq 90\%</math>。</p> <p>Tin is uniform in tin immersion part; tinned area is <math>\geq 90\%</math>.</p>	<p>将压敏电阻导线侵入<math>235^{\circ}\text{C}\pm 5^{\circ}\text{C}</math>的焊锡液中<math>2\pm 0.5\text{s}</math>取出,观察外观。</p> <p>Soak pressure sensitive resistor into <math>235^{\circ}\text{C}\pm 5^{\circ}\text{C}</math> tin soldering liquid for <math>2\pm 0.5\text{ s}</math>; then take it out and observe its appearance.</p>
4-3 耐焊接热 4-3 Resistance to Soldering Heat	<p>试验前后压敏电压变化率<math>\leq \pm 5\%</math></p> <p>Change rate of pressure sensitive voltage before and after test is <math>\leq \pm 5\%</math>.</p>	<p>将压敏电阻导线侵入<math>350^{\circ}\text{C}\pm 10^{\circ}\text{C}</math>的焊锡液中,侵入深度距基座平面<math>2\text{-}0.5\text{mm}</math>,采用<math>1.5\pm 0.2\text{mm}</math>的隔热层,并维持<math>5\pm 0.5\text{s}</math>,恢复时间1小时以上2小时以下测量压敏电压。</p> <p>Soak wire of pressure sensitive resistor into <math>350^{\circ}\text{C}\pm 10^{\circ}\text{C}</math> tin soldering liquid, with soak depth for <math>2\text{-}0.5\text{ mm}</math> far away from pedestal. Adopt <math>1.5\pm 0.2\text{ mm}</math> thermal insulation layer and keep it for <math>5\pm 0.5\text{ s}</math>; measure pressure sensitive voltage with recovery time within <math>1\text{ h}\text{-}2\text{ h}</math>.</p>
4-4 高温负荷 4-4 High Temperature Load	<p>试验前后压敏电压变化率<math>\leq \pm 10\%</math></p> <p>限制电压变化率<math>\leq \pm 20\%</math></p> <p>Before and after test, change rate of pressure sensitive voltage is <math>\leq \pm 10\%</math>; change rate of limiting voltage <math>\leq \pm 20\%</math>.</p>	<p>将压敏电阻放置在<math>125\pm 2^{\circ}\text{C}</math>环境中1000小时,并施加该温度相应的最大允许使用交流电压,通电90分钟,断电30分钟。取出后在常温下放置1小时以上,4小时以内测量压敏电压和限制电压。</p> <p>Put pressure sensitive resistor in <math>125\pm 2^{\circ}\text{C}</math> for <math>1,000\text{ h}</math> and apply corresponding allowable using AC pressure of the temperature; power on for <math>90\text{ min}</math> and power off for <math>30\text{ min}</math>. After taking pressure sensitive resistor out, put it under normal temperature for more than <math>1\text{ h}</math>; measure pressure sensitive voltage and limiting voltage within <math>4\text{ h}</math>.</p>
4-5 引出端强度 4-5 Outlet Terminal Strength	<p>试验前后压敏电压变化率<math>\leq \pm 5\%</math></p> <p>Change rate of pressure sensitive voltage before and after test is <math>\leq \pm 5\%</math>.</p>	<p>将拉力施加于引出端轴向并作用于离开样品主体的方向,施加10N荷重10秒钟。</p> <p>Apply tension to outlet terminal axis and make it act in sample main body direction; apply <math>10\text{N}</math> load for <math>10\text{ s}</math>.</p>



## 七、托盘卷带封装尺寸 Package size of tray tape

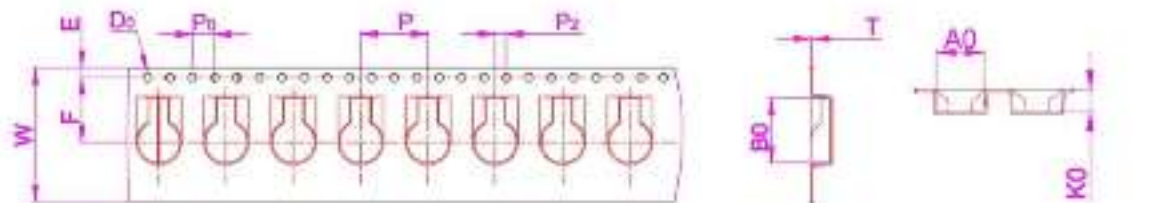
### 10D系列 Series

项目	W	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	K <sub>1</sub>	P	F	E	D <sub>0</sub>	D <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	T
尺寸	24.00 <sup>+0.08</sup>	10.12 <sup>+0.10</sup>	14.62 <sup>+0.08</sup>	3.55 <sup>+0.10</sup>	/	16.0 <sup>+0.10</sup>	11.50 <sup>+0.10</sup>	1.75 <sup>+0.10</sup>	1.50 <sup>+0.02</sup>	/	4.00 <sup>+0.10</sup>	2.00 <sup>+0.10</sup>	0.30 <sup>+0.05</sup>



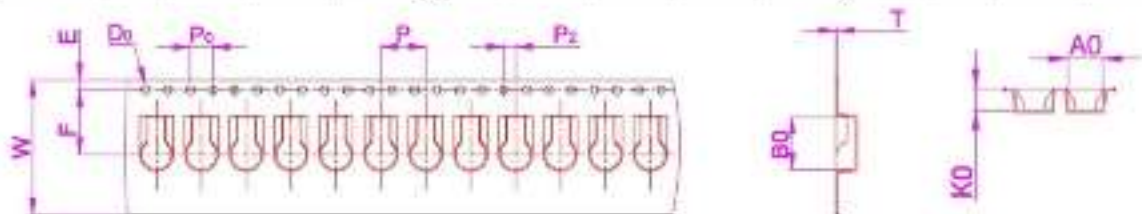
### 07D系列 Series

项目	W	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	K <sub>1</sub>	P	F	E	D <sub>0</sub>	D <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	T
尺寸	24.00 <sup>+0.10</sup>	7.50 <sup>+0.10</sup>	11.54 <sup>+0.10</sup>	3.45 <sup>+0.10</sup>	/	12.0 <sup>+0.10</sup>	11.50 <sup>+0.10</sup>	1.75 <sup>+0.10</sup>	1.50 <sup>+0.02</sup>	/	4.00 <sup>+0.10</sup>	2.00 <sup>+0.10</sup>	0.30 <sup>+0.05</sup>



### 05D系列 Series

项目	W	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	K <sub>1</sub>	P	F	E	D <sub>0</sub>	D <sub>1</sub>	P <sub>1</sub>	P <sub>2</sub>	T
尺寸	24.00 <sup>+0.08</sup>	5.40 <sup>+0.10</sup>	9.40 <sup>+0.10</sup>	3.45 <sup>+0.10</sup>	/	8.00 <sup>+0.10</sup>	11.50 <sup>+0.10</sup>	1.75 <sup>+0.10</sup>	1.50 <sup>+0.02</sup>	/	4.00 <sup>+0.10</sup>	2.00 <sup>+0.10</sup>	0.30 <sup>+0.05</sup>



#### 注意事项 Points for attention:

- 任意连续10个棘轮孔的累计误差不超过±0.2mm;  
The accumulated error of any continuous 10 ratchet holes shall not exceed ±0.2mm;
- 载带长度方向250mm距离的非平行不可超过1mm;  
The non parallel distance of 250 mm in the length direction of the carrier belt shall not exceed 1 mm;
- 未注R角度为0.2-0.3，未注脱模斜度为5°；  
The R angle of undeclared is 0.2-0.3, and the stripping angle of undeclared is 5°;
- 符合EIA-481-D规范及ROHS要求；  
Comply with EIA-481-d and ROHS requirements;
- 厚度：0.30±0.05mm；  
Thickness: 0.30 ± 0.05mm;
- 05 07 10D全系列均采用15寸卷盘及24寸飞达上贴片机。  
05 07 10D all series adopt 15 inch reel and 24 inch Feeder placement machine.

## 八、物料包装方式 Material packaging method



**最小包装数量 (单盘)**  
Quantity of small package (single disc)



**整箱发货 (5盘)**  
Full container delivery (5 discs)

JYVDR	单盘single disc (数量 pcs/重量约 Kg)						整箱发货Full container delivery (数量 pcs/重量约 Kg)					
	5D271	5D471 5D511	7D271	7D471 7D511 7D561	10D271	10D471 10D511 10D561	5D271	5D471 5D511	7D271	7D471 7D511 7D561	10D271	10D471 10D511 10D561
数量 pcs	4000	3000	3000	2000	2000	1500	20000	15000	15000	10000	10000	7500
重量 Kg	1.42	1.50	1.72	1.66	1.98	2.20	7.92	8.32	9.50	9.10	10.90	11.90



附件一：VI特性曲线表 Appendix I: Form of VI Characteristic Curve

型号 Model	电流(A) Current	$10^{-3}$	$10^{-2}$	$10^{-1}$	$10^0$	$10^1$	$10^2$	$10^3$
	电压(V) Voltage							
05D271		270	330	380	420	490	580	/
05D471		470	580	640	720	840	1020	/
05D511		510	640	700	780	900	1120	/
05D561		560	700	740	800	950	1200	/
07D271		270	320	370	390	440	520	720
07D471		470	560	620	670	760	900	1100
07D511		510	620	680	720	820	960	1250
07D561		560	660	700	740	850	1050	1290
10D271		270	310	360	380	430	500	640
10D471		470	540	600	650	740	820	1050
10D511		510	600	650	700	790	880	1190
10D561		560	610	660	710	830	930	1260

附件二：脉冲降额曲线表 Appendix II: Form of Pulse Derating Curve

规格型号 Specification/Model	脉宽 Pulse Width	50us				100us				500us			
	电流 Current	5A	10A	50A	100A	5A	10A	50A	100A	5A	10A	50A	100A
05D	次数 Times	$10^4$	$10^2$	X	X	$10^2$	10	X	X	10	X	X	X
07D		$10^6$	$10^4$	2	X	$10^5$	$10^3$	X	X	$10^2$	2	X	X
10D		$\infty$	$\infty$	$10^3$	10	$\infty$	$10^5$	$10^2$	2	$10^6$	$10^3$	1	X
14D		$\infty$	$\infty$	$10^4$	$10^3$	$\infty$	$10^6$	$10^3$	$10^2$	$10^6$	$10^4$	2	1
20D		$\infty$	$\infty$	$10^5$	$10^4$	$\infty$	$\infty$	$10^4$	$10^3$	$\infty$	$10^6$	$10^3$	$10^1$