



# 四川航昱微电子科技有限公司

SICHUAN HANGYU MICROELECTRONICS TECHNOLOGY CO., LTD

SPECIFICATION FOR APPROVAL

## 承认书

Spec. No.: HYV3225 Series

Issued Date: 2024-04-17

CUSTOMER:

客户

PART NAME: SMD Plastic Varistors

名称 SMD 塑封压敏电阻器

APPLICATION: Absorb the surge voltage

用途 吸收浪涌电压

PART NO.:

料号 HYV3225 series

UL FILE NO:

UL 证书号

CUSTOMER PART NO.:

客户料号

### 客户承认 CUSTOMER CONFIRM

承认章	核准	审核	经办人
STAMP	APPROVE	CHECK	SIGNATURE

公司名称: **四川航昱微电子科技有限公司**  
SICHUAN HANGYU MICROELECTRONICS TECHNOLOGY CO., LTD.


公司地址: 四川省泸州市江阳区利民路二段9号

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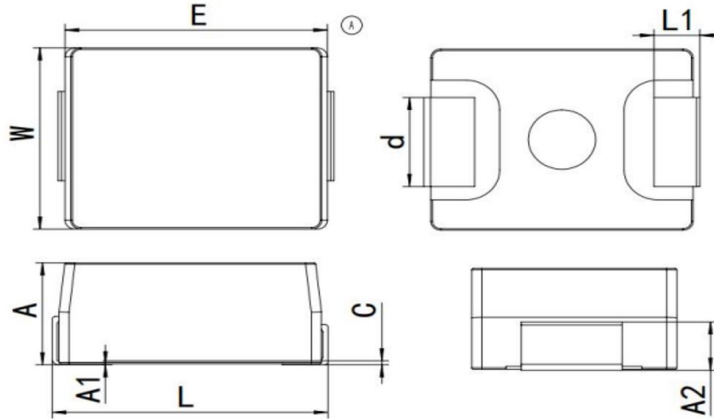
网 址: <http://www.hywdz.com>

Part No: HYV3225 series	Rev: 0/A (2024-04-17)
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1. Appearance 外形尺寸

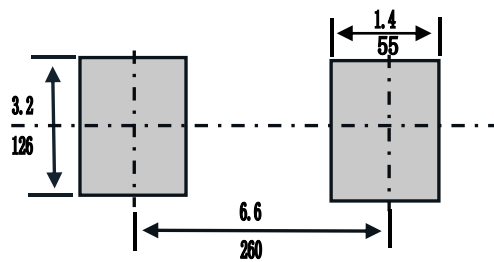
1-1. Marking 标志	 Logo 公司商标 3225-471 Product Spec. 产品规格 240103 Batch no. 生产批号
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1-2. Dimensional Drawing (mm) 尺寸



Unit	Item	E	W	A	L	A1	A2	C	L1	d
mm	Max.	8.3	6.6	4.0	8.7	0.12	2.16	0.18	2.0	3.50
	Cen.	7.8	6.1	3.6	8.2	0.11	1.80	0.15	1.5	3.00
	Min.	7.3	5.6	3.2	7.7	0.10	1.44	0.12	1.0	2.50

1-3. Recommended solder pad layout (mm) 焊盘布局



unit:  $\frac{mm}{(mil)}$

2. Part numbering 命名方式

HYV	3225	471	K	J
HANGYUWEI Plastic Varistors	Product Size 产品尺寸 mm	Varistor Voltage 压敏电压 V	Tolerance 压敏电压允差	High flux energy 高通流能量
航昱微塑封压敏电阻	7.8*6.0	470	±10%	J 高焦耳 H 高能

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## 3. Electrical Characteristics 电气参数

(Ta=25°C)

SMD Types 产品型号	Maximum Allowable Voltage 可容许最大电压		Withstanding Surge Current (8/20 μs) 突波电流耐量		Energy 能量 (10/1000μs)	Rated Power 额定功率
	V <sub>ACRMS</sub> [V]	V <sub>DC</sub> [V]	1 time[A]	2 times[A]	(1 time)[J]	[mW]
HYV3225-221KJ	140	180	1200	800	7.5	100
HYV3225-241KJ	150	200	1200	800	9.0	100
HYV3225-271KJ	175	225	1200	800	9.5	100
HYV3225-331KJ	210	270	1200	800	10.5	100
HYV3225-361KJ	230	300	1200	800	11.0	100
HYV3225-391KJ	250	320	1200	800	12.0	100
HYV3225-431KJ	275	350	1200	800	13.5	100
HYV3225-471KJ	300	385	1200	800	15.0	100
HYV3225-511KJ	320	415	1200	800	15.0	100
HYV3225-561KJ	350	460	1200	800	17.0	100
HYV3225-221KH	140	180	1750	1200	7.5	100
HYV3225-241KH	150	200	1750	1000	9.0	100
HYV3225-271KH	175	225	1750	1200	9.5	100
HYV3225-331KH	210	270	1750	1200	10.5	100
HYV3225-361KH	230	300	1750	1200	11.0	100
HYV3225-391KH	250	320	1750	1200	12.0	100
HYV3225-431KH	275	350	1750	1200	13.5	100
HYV3225-471KH	300	385	1750	1200	15.0	100
HYV3225-511KH	320	415	1750	1200	15.0	100
HYV3225-561KH	350	460	1750	1200	17.0	100

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### 3. Electrical characteristics 电气参数 (Ta=25°C)

SMD Types 产品型号	Varistor Voltage at 1 mA 压敏电压	Max Clamping Voltage at Class Current 最大抑制电压	Class Current 电流等级 (8/20 μs)	Capacitance 电容量
	[V](±10%)	[V]	[A]	@1kHz [pF]
HYVS225-221KJ	220	380	5	70
HYV3225-241KJ	240	415	5	70
HYV3225-271KJ	270	475	5	65
HYV3225-331KJ	330	580	5	65
HYV3225-361KJ	360	620	5	50
HYV3225-391KJ	390	675	5	50
HYV3225-431KJ	430	745	5	45
HYV3225-471KJ	470	810	5	40
HYV3225-511KJ	510	875	5	40
HYV3225-561KJ	560	940	5	35
HYV3225-221KH	220	380	5	70
HYV3225-241KH	240	415	5	70
HYV3225-271KH	270	475	5	65
HYV3225-331KH	330	580	5	65
HYV3225-361KH	360	620	5	50
HYV3225-391KH	390	675	5	50
HYV3225-431KH	430	745	5	45
HYV3225-471KH	470	810	5	40
HYV3225-511KH	510	875	5	40
HYV3225-561KH	560	940	5	35

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## 4. Mechanical Characteristics 机械性能

Item 指标项目	Specification 技术要求	Description 说明
Tensile 引出端拉伸强度	The lead wire is not broken and the resistor is not damaged. Pressure sensitive voltage change rate within $\pm 5\%$ .  引线无断裂，电阻器无损伤。压敏电压变化率在 $\pm 5\%$ 以内。	Referring to GBT10193-1997(4.10), UA1 UUB UC and Ud are quoted in IEC 43-2-21 to carry out the strength test of the leading end. 10 n tensile force .  参照 GBT10193-1997 第 4.10, 引用 IEC 43-2-21 中规定 Ua1、Ub、Uc 和 Ud 进行引出端强度试验。引出端施加10N拉力。
Vibration 振动	No significant mechanical damage. The rate of change of voltage is less than 10% .  无明显机械损伤。压敏电压变化率小于10%。	The test sample should be tested according to the GB 2423.10 Test Fe, the frequency is 10-55 Hz, the displacement amplitude is 0.75 mm, along the test sample x, Y two directions vibration 2Hr.  试验样品应根据GB 2423.10试验Fe进行试验，频率为10-55Hz, 位移幅值为0.75mm, 沿试验样品X, Y 两个方向各振动2Hr。
Solderability 可焊性	About 95 % of the lead end is evenly covered by solder. Not less than 90 % of wetting force.  引线末端约95%被焊锡均匀覆盖。不小于润湿力的90%。	Referring to GBT10193-1997(4.11), IEC 43-2-20 test method is used to insert the varistor $(5 + 1) \text{ mm / s} \sim (20 + 1) \text{ mm / s}$ into the molten solder at the temperature of $(235 \pm 0.5) ^\circ \text{C}$ for 5 S.  参照GBT10193-1997第4.11, 引用IEC 43-2-20的试验方法, 焊料温度 $(235 \pm 0.5) ^\circ \text{C}$ , 将压敏电阻器以 $(5+1) \text{ mm/s} \sim (20+1) \text{ mm/s}$ 的速度侵入熔融焊料中1.5至规定的深度, 并保持5 S。
Welding heat resistance 耐焊接热	No significant mechanical damage. Pressure sensitive voltage change rate within $\pm 5\%$ .  无明显机械损伤。压敏电压变化率在 $\pm 5\%$ 以内。	According to 4.12 of GBT10193-1997 and the test Tb method stipulated in IEC 43-2-20, the pins of the psa were impregnated in a welding groove at $(260 \pm 5) ^\circ \text{C}$ for $(10+1) \text{ s}$ .  参照GBT10193-1997第4.12, 引用IEC 43-2-20规定试验Tb方法, 将压敏电阻器的引脚浸渍于 $(260 \pm 5) ^\circ \text{C}$ 的焊槽中, 持续 $(10+1) \text{ s}$ 。

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## 5. Environmentalb 耐候特性

Characteristics 项目	Test Methods 试验方法	Specifications 性能要求
High Temperature Storage 高温存储	The specimen shall be subjected to $125\pm 2^{\circ}\text{C}$ for 1000 hours in a thermostatic bath without load and then be stored at room temperature and normal humidity for 1 to 2 hours. The change of $V_{1\text{mA}}$ shall be measured.  在 $125\pm 2^{\circ}\text{C}$ 无负荷存放 1000 小时, 其后在室温状态下, 1 到 2 小时以内, 测量 $V_{1\text{mA}}$ 。	$ \Delta V_{1\text{mA}}/V_{1\text{mA}}  \leq 10\%$
Humidity Storage 湿热	The specimen shall be subjected to $40\pm 2^{\circ}\text{C}$ , 90~95%RH for 1000 hours without load and then stored at room temperature and normal humidity for 1 to 2 hours. The change of $V_{1\text{mA}}$ shall be measured.  在温度为 $40\pm 2^{\circ}\text{C}$ , 湿度为 90~95%RH 中无负荷放置 1000 小时, 其后在室温状态下, 1 小时以上 2 小时以内测量 $V_{1\text{mA}}$ 。	$ \Delta V_{1\text{mA}}/V_{1\text{mA}}  \leq 10\%$
Low Temperature Storage 低温存储	The specimen shall be subjected to $-40\pm 2^{\circ}\text{C}$ , for 1000 hours without load and then stored at room temperature and normal humidity for 1 to 2 hours. The change of $V_{1\text{mA}}$ shall be measured.  在温度为 $-40\pm 2^{\circ}\text{C}$ , 无负荷放置 1000 小时其后在室温状态, 1 到 2 小时以内测量 $V_{1\text{mA}}$ 。	$ \Delta V_{1\text{mA}}/V_{1\text{mA}}  \leq 10\%$
Temperature Cycle 温度快速变化	The specimen shall be subjected to $-40\pm 2^{\circ}\text{C}$ , then to $125\pm 2^{\circ}\text{C}$ . At each temperature the specimen shall be stored for 30 minutes. The temperature cycle shall be applied for 5 times.  下限类别温度 $-40\pm 2^{\circ}\text{C}$ , 上限类别温度 $125\pm 2^{\circ}\text{C}$ , 共五个循环, 每个极限温度下放置 30 分钟, 进行外观检查和 $V_{1\text{mA}}$ 测量。	No remarkable mechanical damage $ \Delta V_{1\text{mA}}/V_{1\text{mA}}  \leq 10\%$ 无可见损伤
High Temperature Load 高温负荷	After being continuously applied the max. allowable voltage at $125\pm 2^{\circ}\text{C}$ for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of $V_{1\text{mA}}$ shall be measured.  在 $125\pm 2^{\circ}\text{C}$ 的温度下, 施加最大连续电压 1000 小时; 然后, 在室温状态下, 1 到 2 小时以内进行 $V_{1\text{mA}}$ 测量。	$ \Delta V_{1\text{mA}}/V_{1\text{mA}}  \leq 10\%$
Humidity Load 湿热负荷	The specimen shall be subjected to $40\pm 2^{\circ}\text{C}$ , 90~95%RH and the max. allowable voltage for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of $V_{1\text{mA}}$ shall be measured.  在温度为 $40\pm 2^{\circ}\text{C}$ , 湿度为 90~95%RH 中, 施加最大连续电压 1000 小时, 其后在室温状态下, 1 到 2 小时以内测量 $V_{1\text{mA}}$ 。	$ \Delta V_{1\text{mA}}/V_{1\text{mA}}  \leq 10\%$

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**6. Features 特点**

- Improved component design in a compact case. 改善产品的设计空间
- High surge current capability. 提供更高的产品通流量
- Superior performance at high temperature. 在更高温下使用
- Better stability and reliability under hot and humid conditions  
在湿热条件下有更好的稳定性和可靠性
- SMD mountable disk varistors, suitable for lead-free reflow / wave soldering.  
片式封装结构更适合回流焊和波峰焊

**7. Applications 应用领域**

- Power supplies for telecommunication systems. 通讯设备功率电源
- Protection for LED circuits. LED 电路保护
- Protection for consumer, industrial equipment. 消费类、工业类设备保护
- Protection for automotive electronics. 自动化设备保护

**8. Applicable standards 参照标准**

- UL1449
- TUV
- CQC (GB/T10193, GB/T10194, GB4943.1, GB8898)

**9. General technical data 技术要求**

Parameter 项目	Value 范围	Unit 单位
Operating temperature 工作温度	-10 to +125	°C
Storage temperature 贮存温度	-10 to +45	°C
Electric strength 电气强度	≥2.5	kV <sub>RMS</sub>
Insulation resistance 绝缘电阻	≥100	MΩ

**10. Storage condition 贮存条件**

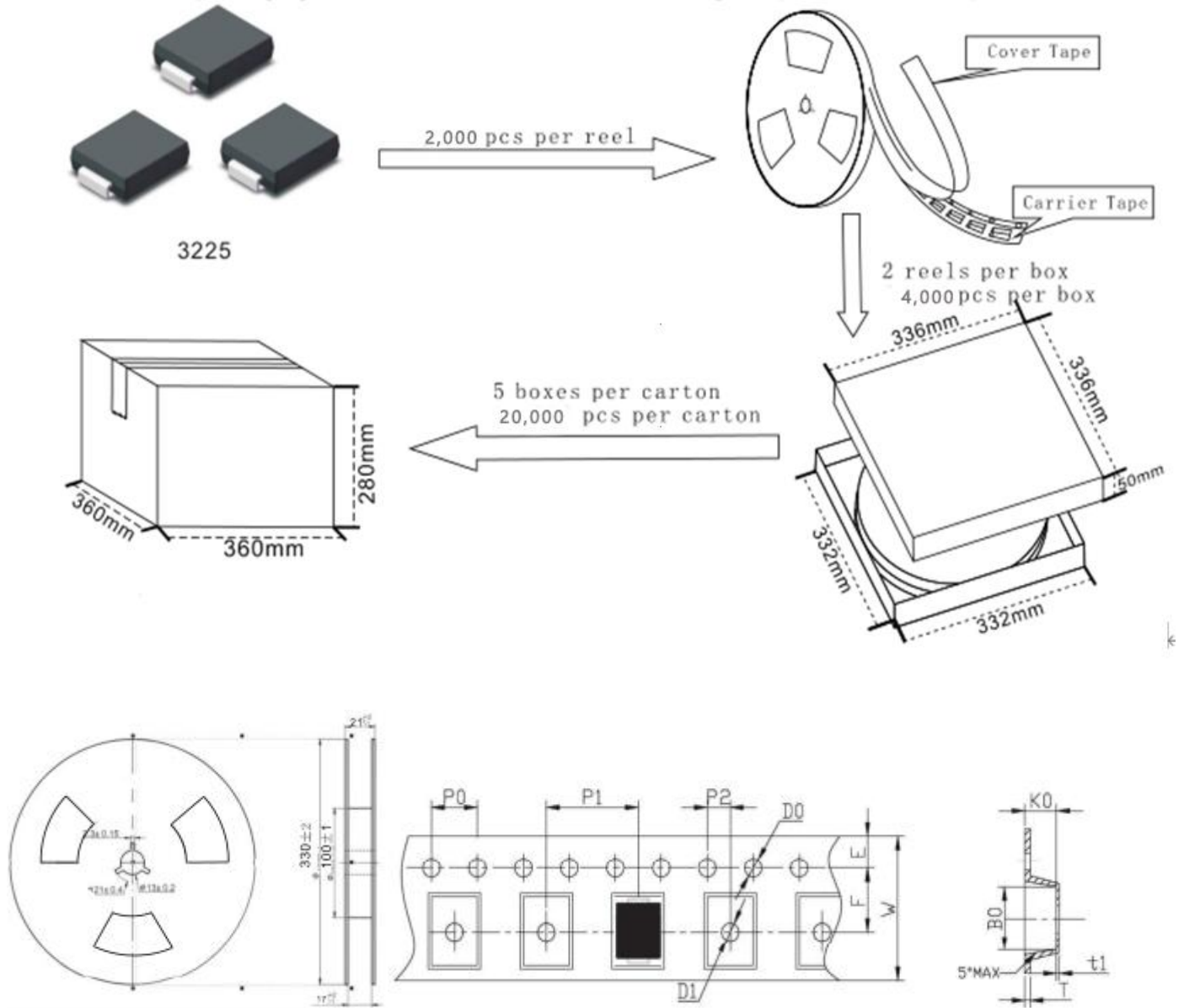
- As far as possible, the components should be employed within 24 months after delivery .  
从入库到使用时间不大于 24 个月。
- They should be left in their original packing to avoid soldering problems due to oxidized contacts. 为防止出现焊接问题产品尽量在使用前保持原包装。
- Storage temperature: - 10 up to + 45° C. 贮存温度在-10~45° C.
- Relative humidity: < 75 % 相对湿度 <75%。

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11. The method of packaging and dimension are shown as below figure.  
(Dimension in mm) 编带尺寸

1.The method of packaging and dimension are shown as below figure. (Dimension in mm)



尺寸测量位	W	E	F	D0	D1	P0	P1	P2	T	t1	A0	B0	K0	10P0
规范值	16.0	1.75	7.5	1.55	1.50	4.0	8.0	2.0	0.28	0.08	6.22	8.31	2.49	40.0
mm	±0.3	±0.1	±0.1	±0.05	±0.25	±0.1	±0.1	±0.05	±0.02	以上	±0.1	±0.1	±0.1	±0.2

