

压敏电阻

Metal Oxide Varistor (MOV)

SFV20D H型

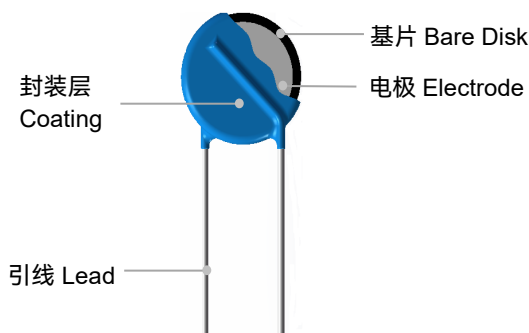


简介 Description

与标准型压敏电阻相比，高浪涌冲击型压敏电阻采用更高性能的材料，同尺寸产品通流能力提升30%左右，具有良好的性能和长期稳定的可靠性，可适用更高浪涌防护或者小型化的设计需求，节省空间。

Compared with standard type varistor, the high-surge impact varistor uses materials with extra high performance, having impulse capacity about 30% higher than normal varistor of the same size. Besides, the varistor has good long-term stability, and can be used in higher surge requirement or miniaturization designmen .

产品结构 Product Structure



应用领域 Applications

- 电源 Power Supplies
- 家用电器 Home Electrical Appliances
- 工业设备 Industrial Devices
- 防雷插座 Surge Protectors
- 通信电源 Telecom Devices

引线类型 Lead Types

引线类型 Lead Types		代码 Codes
	直型引线 Straight Lead	A
	内弯型引线 Inward Crimp Lead	B
	外弯型引线 Outward Crimp Lead	C
	微直型引线 Little Straight Lead	I
	Y型引线 Inline Crimp Lead	D

安规信息 Agency Approvals

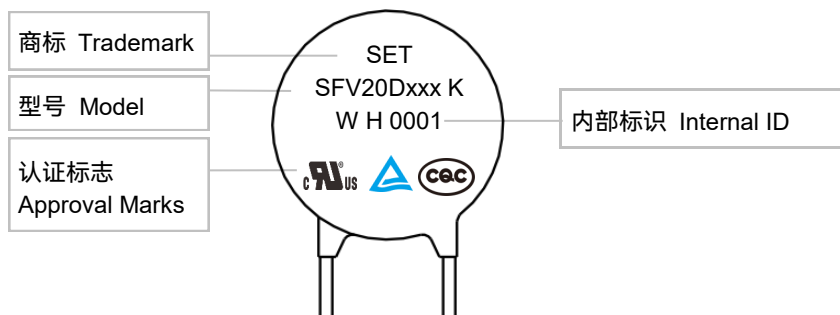
认证 Agency	标准 Standards	认证号 No.
	UL 1449 4 th Edition	E322662
	CSA C22.2 NO.269.5-17	E322662
	EN 61051-1:2008 IEC 61051-1:2007 IEC 61051-2:1991 IEC 61051-2-2:1991 Annex G 8.1 of IEC 62368-1:2018	J 50239739
	GB/T 10193-1997 GB/T 10194-1997 GB 4943.1-2011 GB 8898-2011	CQC12001084355

压敏电阻

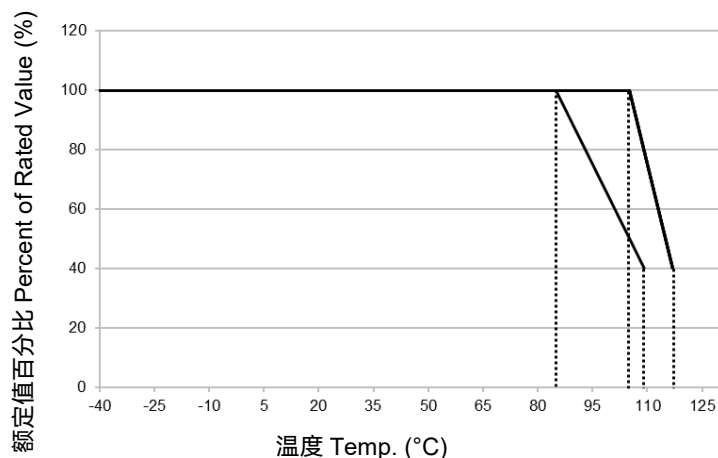
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产品标识 Marking



温度降额曲线 Temp. Derating Curve



常温系列温度降额曲线

For Normal Temp. Series

备注：应用环境温度超过85 °C / 105 °C 时，峰值电流和能量额定值应按照上述曲线相应的降低。

Note: When ambient temp. exceeds 85 °C / 105 °C , the peak surge current and energy rating should be reduced as shown in left curve.

技术参数 General Technical Data

项目 Item	值 Value	单位 Unit
工作温度 Operating Temp.	-40 ~ +85/+105	°C
存储温度 Storage Temp.	-40 ~ +125	°C
耐电压 Voltage Proof	≥2500	V _{ac}
绝缘电阻 Insulation Resistance	≥100	MΩ

型号说明 Part Numbering System

SFV 20 D 471 - K P H A BUL - 001

流水号 Other Options

包装 & 引脚长度 Packaging & Lead Length

散装: 散装+标准长度 (L28)

BUL: Bulk + Standard Lead Length (Normal L28)

散装: 散装+切脚至长度 3.5mm (范围: 2.5mm-6mm)

C35: Bulk + Cut to 3.5 mm (Range: 2.5 mm to 6 mm)

散装: 散装+特殊脚长 (范围: 28mm-32mm)

L30: Bulk + Special Lead Length 30 mm

(Range: 28 mm to 32 mm)

编带+盒装 (孔距12.7mm)

(0/1)AB: Taping + Box (Hole Pitch 12.7 mm)

编带+盒装 (孔距15.0mm)

(0/1)EB: Taping + Box (Hole Pitch 15.0 mm)

编带+卷轴 (孔距12.7mm)

(0/1)AR: Taping + Reel (Hole Pitch 12.7 mm)

编带+卷轴 (孔距15mm)

(0/1)ER: Taping + Reel (Hole Pitch 15.0 mm)

备注: 0/1表示产品的位置

Note: 0/1 Means Product Position

0: 代表两孔中间 In Middle of Two Holes

1: 代表跨孔 Across the Hole

引脚类型 Lead Types

A: 直线型引线 Straight Lead

B: 内弯型引线 Inward Crimp Lead

C: 外弯型引线 Outward Crimp Lead

D: Y型引线 Inline Crimp Lead

I: 微直线型引线 Little Straight Lead

*更多细节请参照包装信息

*For More Details Refer To Packaging Information.

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SFV20D H型

型号说明 Part Numbering System

SFV 20 D 471 - K P H A BUL - 001

浪涌等级 Surge Level

H: 高能型 High Energy Type

工作温度 Operating Temp.

N: 环氧树脂包封 Epoxy Coating 85 °C

P: 环氧树脂包封 Epoxy Coating 105 °C

M: 环氧树脂包封 Epoxy Coating 125 °C

T: 硅树脂包封 Silicone Coating 125 °C

电压公差 Voltage Tolerance

K: $\pm 10\%$ J: $\pm 5\%$

S: 特殊定制 Special Tolerance

标称压敏电压 Nominal Varistor Voltage

220: $22 \times 10^0 = 22V$ 471: $47 \times 10^1 = 470 V$ 122: $12 \times 10^2 = 1200 V$

形状 Disk Shape

D: 圆形 Round

S: 正方形 Square

基片尺寸 Bare Disk Dimension

圆形 D 20: 20 mm

产品类别 Product Category

压敏电阻

Setfuse Varistor

MOV

MOV

压敏电阻

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术语 Glossary

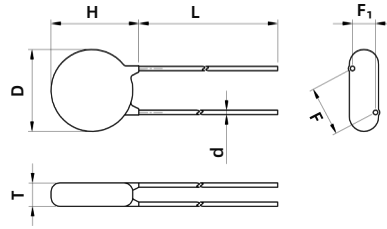
项目 Item	描述 Description
V_N	标准压敏电压 Nominal Varistor Voltage 在规定持续时间的脉冲电流下测得MOV两端的电压。 Voltage, at specified D.C. current used as a reference point in the component characteristics.
I_L	漏电流 Leakage Current 在25°C或规定的其它温度下，施加最大直流电压时，通过压敏电阻器中的电流。 Current passing through the varistor at the max. d.c. voltage, and at a temp. of 25 °C, or any other specified temp.
UCT	上限类别温度 Upper Category Temp. 压敏电阻器设计所确定的能够连续工作的最高环境温度。 Max. ambient temp. for which a varistor has been designed to operate continuously.
LCT	下限类别温度 Lower Category Temp. 压敏电阻器设计所确定的能够连续工作的最低环境温度。 Minimum ambient temp. at which a varistor has been designed to operate continuously.
Max. Peak Current	最大峰值电流 Max. Peak Current 在环境温度25°C时，对于规定的脉冲次数而言，压敏电阻器中允许通过的每个脉冲的最大电流值。 Max. current per pulse, which may be passed by a varistor at an ambient temp. of 25 °C, for a given number of pulses.
V_C	箝制电压 Clamping Voltage 规定脉冲峰值电流及规定波形下测得MOV两端的电压峰值。 Peak voltage developed across the varistor terminations under standard atmospheric conditions, when passing an 8/20 μ s class current pulse.
Voltage Proof	耐电压 Voltage Proof 连续可施加在压敏电阻器引出端和导电性安装之间的最大峰值电压。 Max. peak voltage, which may be applied under continuous operating conditions between the varistor terminations and any conducting mounting surface (Applicable only to insulated varistors).
C_V	电容量 Capacitance MOV两端之间的电容量，其测量应在规定的正弦频率和电压以及规定的温度下进行。除非另有规定，推荐采用25°C下, 1 V _{r.m.s.} , 1 kHz的信号。 Capacitance across the MOV measured at a specified frequency and voltage.
V_{ac}	最大连续交流电压 Max. Continuous a.c. Voltage 在环境温度25°C时，可以施加在元件上连续工作的、波形基本是正弦波（总谐波畸变小于5%）的最大交流电压有效值。当温度高于25°C时，详细规范应给出降额曲线。 Max. a.c. r.m.s. voltage of a substantially sinusoidal waveform (less than 5% total harmonic distortion) which can be applied to the component under continuous operating conditions at 25 °C.
V_{dc}	最大连续直流电压 Max. Continuous d.c. Voltage 在环境温度25°C时，可以施加在元件上连续工作的最大直流电压（波纹小于5%）。当温度高于25°C时，详细规范应给出降额曲线。 Max. d.c. voltage (with less than 5% ripple) which can be applied to the component under continuous operating conditions at an ambient temp. of 25 °C.

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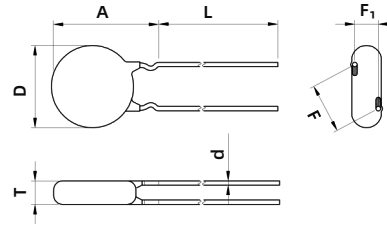
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SFV20D H型

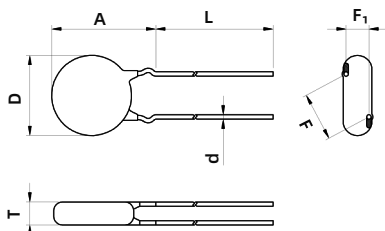
尺寸 Dimensions (mm)



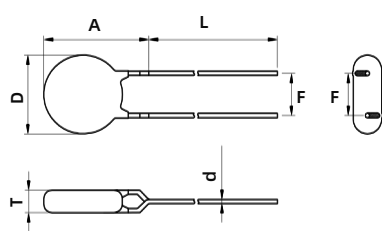
直型引线 Straight Lead



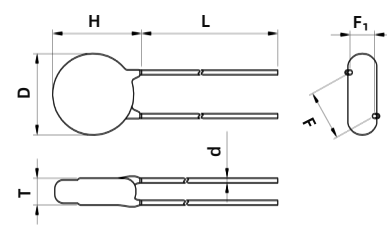
内弯型引线 Inward Crimp



外弯型引线 Outward Crimp



Y型引线 Inline Crimp



微直型引线 Little Straight Lead

型号 Model	L (Min.)	H (Max.)	T (Max.)	D (Max.)	d	F	F ₁	A (Max.)
SFV20D201K	20	25.5	5.1	23	1.00±0.05	10.0±0.6	1.5 - 3.2	27.5
SFV20D221K	20	25.5	5.2	23	1.00±0.05	10.0±0.6	1.6 - 3.3	27.5
SFV20D241K	20	25.5	5.3	23	1.00±0.05	10.0±0.6	1.7 - 3.4	27.5
SFV20D271K	20	25.5	5.5	23	1.00±0.05	10.0±0.6	1.8 - 3.6	27.5
SFV20D301K	20	25.5	5.7	23	1.00±0.05	10.0±0.6	1.9 - 3.8	27.5
SFV20D331K	20	25.5	5.8	23	1.00±0.05	10.0±0.6	2.0 - 3.9	27.5
SFV20D361K	20	25.5	6.0	23	1.00±0.05	10.0±0.6	2.1 - 4.1	27.5
SFV20D391K	20	25.5	6.2	23	1.00±0.05	10.0±0.6	2.3 - 4.3	27.5
SFV20D431K	20	25.5	6.4	23	1.00±0.05	10.0±0.6	2.5 - 4.5	27.5
SFV20D471K	20	25.5	6.7	23	1.00±0.05	10.0±0.6	2.8 - 4.8	27.5
SFV20D511K	20	25.5	6.9	23	1.00±0.05	10.0±0.6	3.0 - 5.0	27.5
SFV20D561K	20	25.5	7.2	23	1.00±0.05	10.0±0.6	3.3 - 5.3	27.5
SFV20D621K	20	25.5	7.6	23	1.00±0.05	10.0±0.6	3.6 - 5.6	27.5
SFV20D681K	20	25.5	8.0	23	1.00±0.05	10.0±0.6	4.0 - 6.0	27.5

备注：以上数据仅供参考

The above data is for reference only.

技术参数

Specification

型号 Model	浪涌 等级 Surge Level	最大连续工作 电压 Max. Continuous Operating Voltage		压敏电压 Varistor Voltage @1 mA DC		箝制电压 Clamping Voltage (Max.)		最大峰值 电流 Max. Peak Current (1 time, 8/20 μs)	最大能量 Max. Energy (8/20 μs)	静态电容 Typical Capacitance (For reference only) @1 kHz	安规认证 Agency Approvals			
											Vac	Vdc	Min.	Max.
		(V)	(V)	(V)	(V)	(V)	(A)				UL	CUL	TUV	CQC
SFV20D201K	H	130	170	180	220	340	100	13	300	2000	●	●	●	●
SFV20D221K	H	140	180	198	242	360	100	13	320	1800	●	●	●	●
SFV20D241K	H	150	200	216	264	395	100	13	340	1650	●	●	●	●
SFV20D271K	H	175	225	243	297	455	100	13	380	1500	●	●	●	●
SFV20D301K	H	190	250	270	330	500	100	13	400	1300	●	●	●	●
SFV20D331K	H	210	275	297	363	550	100	13	440	1200	●	●	●	●
SFV20D361K	H	230	300	324	396	595	100	13	470	1100	●	●	●	●
SFV20D391K	H	250	320	351	429	650	100	13	510	1000	●	●	●	●
SFV20D431K	H	275	350	387	473	710	100	13	550	930	●	●	●	●
SFV20D471K	H	300	385	423	517	775	100	13	600	850	●	●	●	●
SFV20D511K	H	320	415	459	561	845	100	13	650	780	●	●	●	●
SFV20D561K	H	350	460	504	616	925	100	13	700	710	●	●	●	●
SFV20D621K	H	385	505	558	682	1025	100	13	700	650	●	●	●	●
SFV20D681K	H	420	560	612	748	1120	100	13	800	600	●	●	●	●

备注 Note:

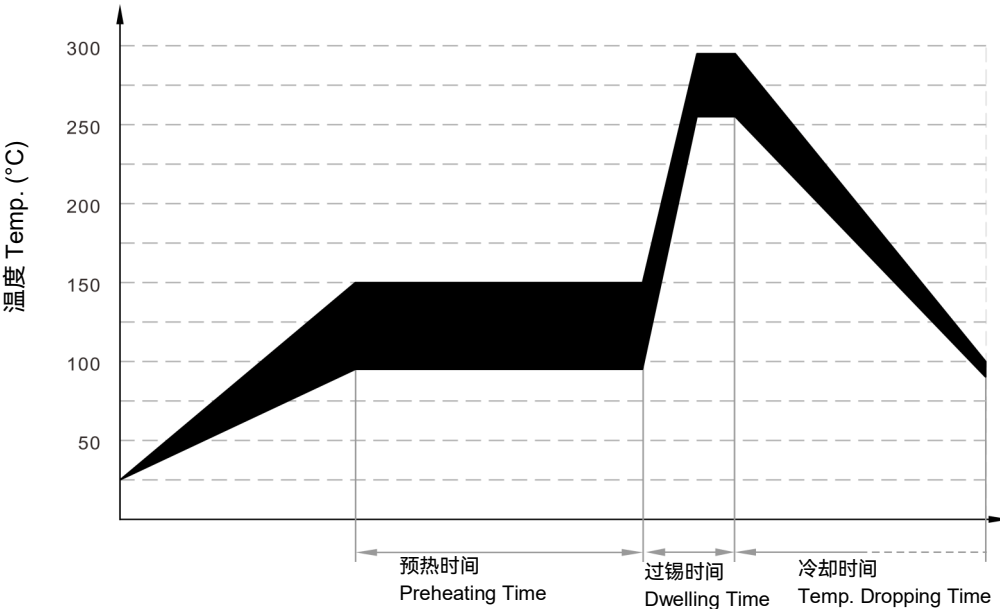
● 已认证 Approved

○ 无认证 Unauthorized

焊接参数 Soldering Parameters

波峰焊参数 Wave Soldering Parameters

本波峰焊参数仅供参考，实际使用时应做相关的试验进行验证。
 The wave soldering parameters are for reference only. When MOV is for practice use, some related validation is recommended.



波峰焊曲线 Wave Soldering Curve

项目 Item	温度 Temp. (°C)	时间 Time (s)
预热 Preheating	90 ~ 150	<150
过锡 Dwelling	255 ~ 290	3 ~ 10

手工焊参数 Hand-Soldering Parameters

项目 Item	条件 Condition
烙铁头部温度 Temp. of Solder Head	350 °C (max.)
焊接时间 Soldering Time	4 s (max.)

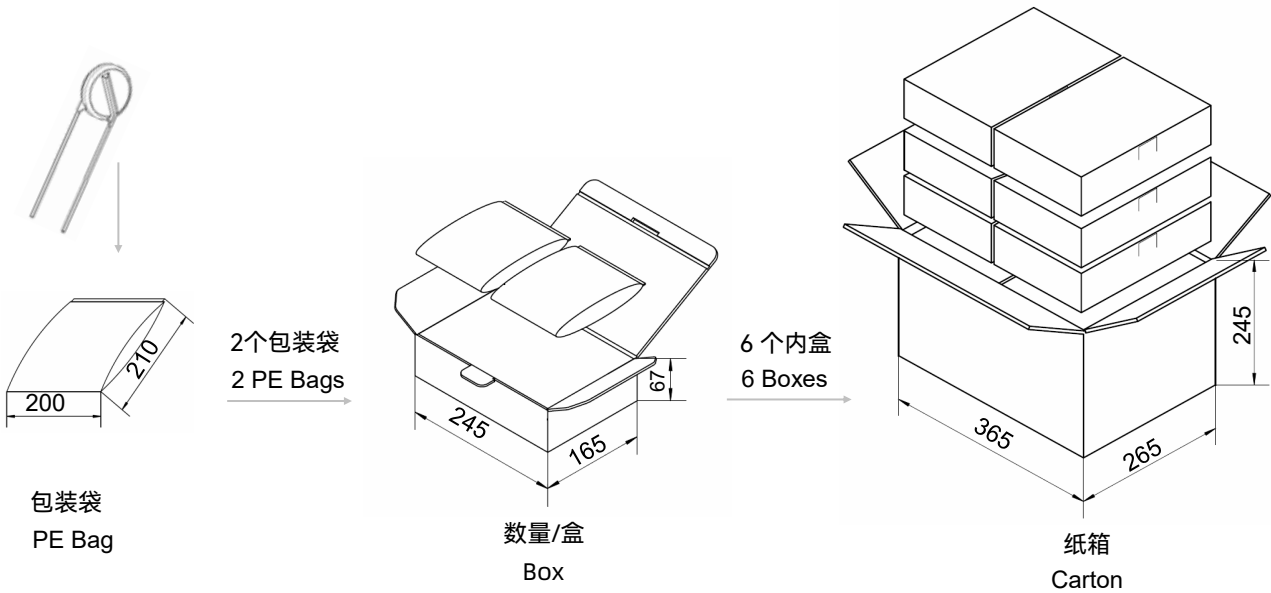
包装 Packaging Information

- 散装 Bulk Packaging (Code: BUL)
- 散装包装数量和重量 Bulk Packaging Quantity & Weight.

系列 Series	标称压敏电压 Nominal Varistor Voltage	PE袋 PE Bag	数量/盒 Box	数量/箱 Carton	毛重/箱 (365 × 265 × 245) G. W. / Carton
20D	(V)	(PCS)	(PCS)	(PCS)	(kg)±10%
	201 ~ 471	250	500	3000	11 ~ 16
	511 ~ 681	200	400	2400	14 ~ 18

备注：其他引线长度包装信息请咨询赛尔特。
Note: Other lead length packaging information, please contact SETsafe | SETfuse.

单位 Dimensions (mm)



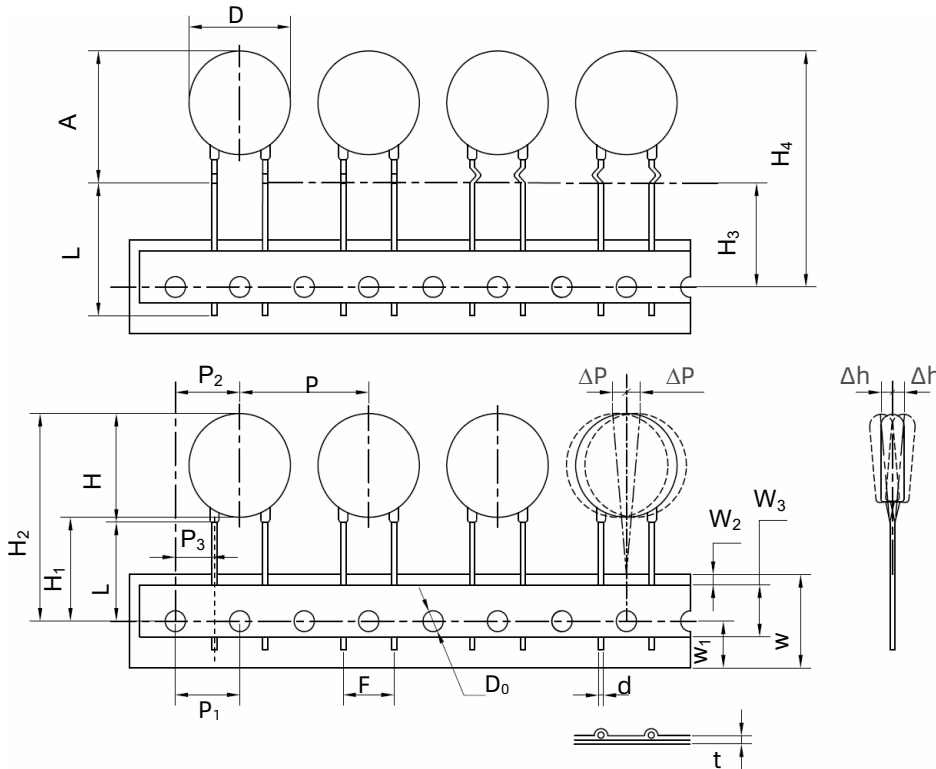
压敏电阻

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SFV20D H型

包装 Packaging Information

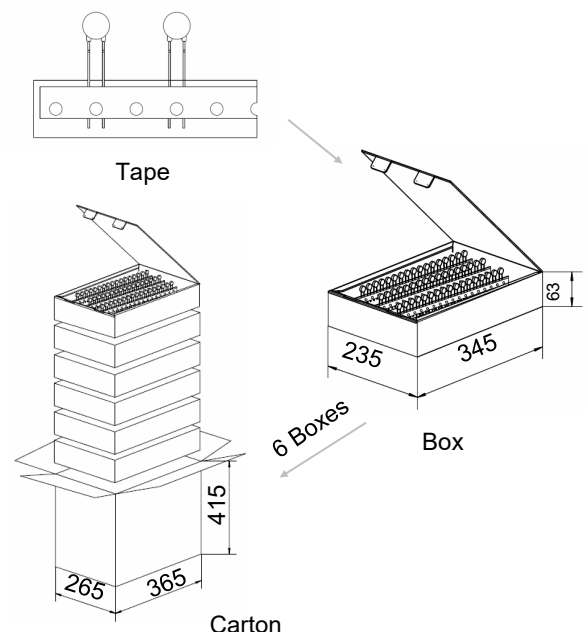
- 编带包装 Tape Packaging (Code: 1AB)



尺寸 Dimensions (mm)	
Symbol	Dimensions
P	25.4±1.0
P ₁	12.7±0.3
P ₂	12.7±1.3
P ₃	7.7±0.7
ΔP(max.)	1.0
W	18.0±1.0
W ₁	9.0±1.0
W ₂ (max.)	3.0
W ₃	10.0±2.0
H(max.)	25.5
H ₁	18.0 ^{+2.0} ₋₀
H ₂ (max.)	45.0
H ₃	18.0 ^{+2.0} ₋₀
H ₄ (max.)	48.0
Δh(max.)	2.0
t(max.)	0.6
D(max.)	23.0
D ₀	4.0±0.2
d	1.00±0.05
A(max.)	27.5
F	10.0±1.0
L(min.)	Taping

- 编带包装数量和重量 Tape Packaging Quantity & Weight.

系列 Series	标称压敏电压 Nominal Varistor Voltage	数量/盒 Box	数量/箱 Carton	毛重/箱 (365 × 265 × 415) G.W. / Carton
	(V)	(PCS)	(PCS)	(kg)±10%
20D	621 - 681	350	2100	17 - 18
	471 - 561	400	2400	16 - 17
	391 - 431	450	2700	15 - 16
	301 - 361	500	3000	15 - 16
	221 - 271	550	3300	13 - 15
	201	600	3600	14



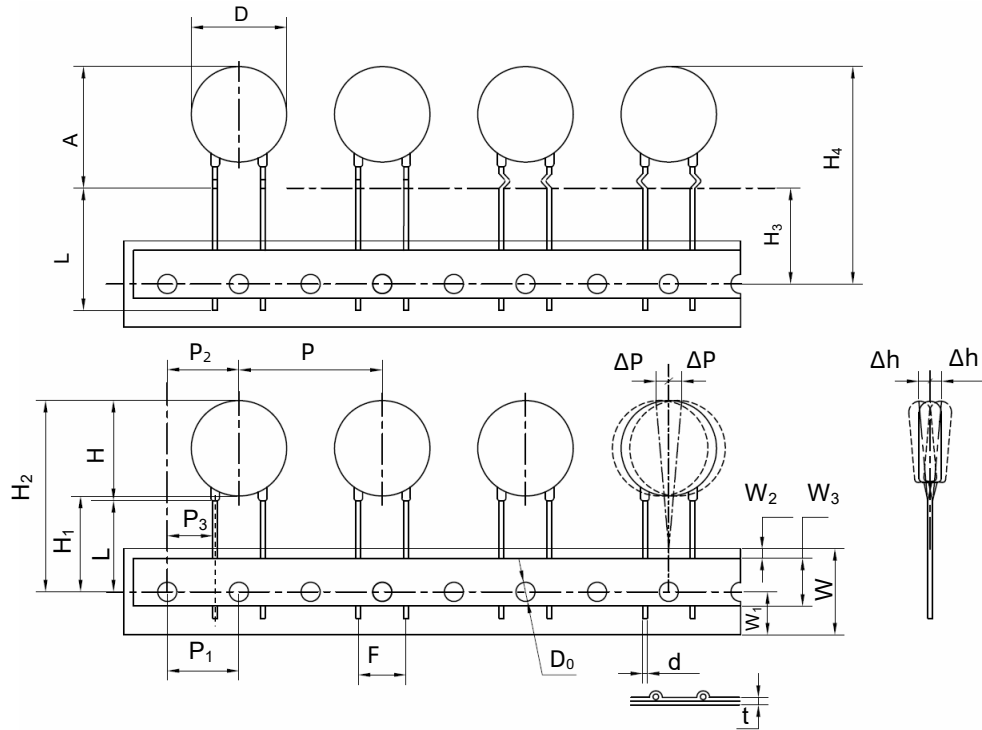
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包装 Packaging Information

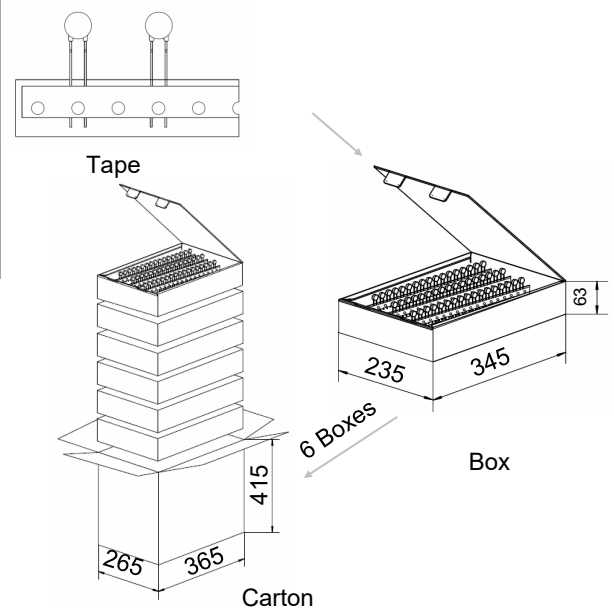
- 编带包装 Tape Packaging (Code: 1EB)



尺寸 Dimensions (mm)	
Symbol	Dimensions
P	30.0±1.0
P ₁	15.0±0.3
P ₂	15.0±1.3
P ₃	10.0±1.0
ΔP(max.)	1.0
W	18.0±1.0
W ₁	9.0±1.0
W ₂ (max.)	3.0
W ₃	10.0±2.0
H(max.)	25.5
H ₁	18.0 ^{+2.0} ₋₀
H ₂ (max.)	45.0
H ₃	18.0 ^{+2.0} ₋₀
H ₄ (max.)	48.0
Δh(max.)	2.0
t(max.)	0.6
D(max.)	23.0
D ₀	4.0±0.2
d	1.00±0.05
A(max.)	27.5
F	10.0±0.5
L(min.)	Taping

- 编带包装数量和重量 Tape Packaging Quantity & Weight.

系列 Series	标称压敏电压 Nominal Varistor Voltage	数量/盒 Box	数量/箱 Carton	毛重/箱 G. W / Carton (365 × 265 × 415)
20D	(V)	(PCS)	(PCS)	(kg)±10%
	561 - 681	300	1800	13 - 15
	431 - 511	350	2100	13 - 14
	331 - 391	400	2400	12 - 14
	241 - 301	450	2700	11 - 13
	201 - 221	500	3000	11 - 12





注意 ATTENTION

使用 Usage

1. 压敏电阻的使用环境温度不能超出技术条件规定的范围。
Varistor must operate within the specified ambient temp.
2. 请不要用酮类、酯类、苯类、卤代烃等强极性溶剂清洗本产品，以免破坏产品的封装层。
Do not clean the varistor with strong polar solvent such as ketone, esters, benzene, halogenated hydrocarbon, to avoid damaging the encapsulating layer.
3. 请不要强烈的振动、冲击或施加压力，以免压敏电阻表面树脂或元件产生裂痕。
Please do not apply severe vibration, shock or pressure to MOV, to avoid surface resin or element cracking.
4. 对引线进行弯曲加工或切断加工时，请固定元件端引线。折弯距离引线绝缘覆盖部分至少2 mm。
Please fix lead wires when bending or cutting. The distance between the bending point and the sealing of MOV shall be greater than 2 mm.

更换 Replacement

如发现压敏电阻外观有损伤，请更换。

If varistor is visually damaged, please replace it.

贮存 Storage

1. 存储温度：Storage Temp. Range: (-40 to +125) °C
2. 相对湿度：Relative Humidity: ≤75% RH
3. 海拔高度：Altitude: <2000 m

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4. 压敏电阻的存储应避免高温、高湿、阳光直射和腐蚀性气体的场合，以免影响引脚的可焊性，产品出厂后请于1年内使用。

Do not store the MOV at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder-ability of the lead wires, the product shall be used up within 1 year after receiving the goods.

不适宜环境条件 Environmental Conditions

1. 压敏电阻不应直接暴露在露天工作。
Varistor should not be exposed to the open air.
2. 压敏电阻应避免在雨水，水蒸汽等高温高湿的条件下工作。
Varistor should avoid rain, water vapor or other condition of high temp. and high humidity.
3. 压敏电阻应避免在沙尘、盐雾、有害气体的条件下工作。
Varistor should avoid sand dust, salt spray, or other harmful gases.

压敏电阻的固有电容 Max. Typical Capacitance of Varistor

压敏电阻的固有电容最大参考值已在规格表中列出，供设计师在高频电路中选择时参考。

The typical capacitance of varistor is listed in the specifications. Designers may refer to it when designing MOV in high frequency circuit.

安装 Installation

机械应力 Mechanical Stress

安装时应避免敲击压敏电阻，以免造成机械损伤。

Do not knock MOV when installing, to avoid mechanical damage.