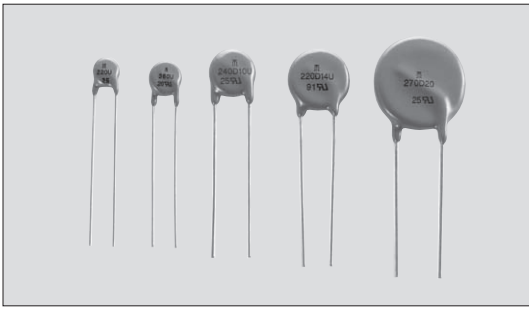


VARISTORS



NV 金属氧化物压敏电阻器 Metal Oxide Varistors



外观颜色: 绿色 Body color: Green 表示: 文字表示 Marking: Alphanumeric

特点 Features

- 有双向对称性, 可吸收正负浪涌。
- 包装上采用阻燃性环氧树脂 (UL94V-0)。
- 耐浪涌量提高到过去产品的约2倍 (公司内比较), 最大电能提高到过去产品的约1.5倍 (公司内比较)。
- 内部连接焊接无铅品, 符合欧盟RoHS。
- Varistors own two-way symmetries and can absorb positive and negative surges.
- Flame retardant epoxy resin (UL94V-0) is employed for the outer coating.
- The max. peak current has developed about 2 times and the max. energy about 1.5 times in comparison with the existing products.
- Products with lead free inner connect solder meet EU-RoHS requirements.

用途 Applications

- 直流和交流线路设备的防感应闪电冲击对策。
- 吸收来自电动机、继电器等感应载荷的过电压, 和在过电压时保护半导体元件。
- Measures for inductive lightning surges of those equipment that are connected to d.c. and a.c. lines.
- Absorption of surge voltages from inductive load of motors, relays, etc. and protection of semiconductor elements from excessive voltages.

额定值 Ratings

工作温度范围 Operating Temperature Range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ 保存温度范围 Storage Temperature Range: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

型号 Type	压敏电阻器 电压 Varistor Vol. (V)	最大允许 回路电压 Max. Allowable Circuit Vol.		NVD05UC			NVD07UC			NVD10UC•NVD10U BC ^{※3}			NVD14UC ^{※4}			NVD20UC		
		a.c.rms (V)	d.c.(V)	最大电能 Max. Energy E (J)	耐浪涌量 Max. Peak Current I _p (A)(2 times)	限制电压 Clamping Vol. V _{1A} V _{5A}	最大电能 Max. Energy E (J)	耐浪涌量 Max. Peak Current I _p (A)(2 times)	限制电压 Clamping Vol. V _{2.5A} V _{10A}	最大电能 Max. Energy E (J)	耐浪涌量 Max. Peak Current I _p (A)(2 times)	限制电压 Clamping Vol. V _{5A} V _{25A}	最大电能 Max. Energy E (J)	耐浪涌量 Max. Peak Current I _p (A)(2 times)	限制电压 Clamping Vol. V _{10A} V _{50A}	最大电能 Max. Energy E (J)	耐浪涌量 Max. Peak Current I _p (A)(2 times)	限制电压 Clamping Vol. V _{00A}
NVD□SCD018	16~22	11	14	0.3	50	40	—	—	—	—	—	—	—	—	—	—	—	—
NVD□UCD022	20~27	14	18	0.5	—	48	—	1.1	—	43	—	2.6	—	43	—	5.3	—	—
NVD□UCD027	25~32	17	22	0.7	—	60	—	1.3	—	53	—	3.2	—	53	—	6.5	—	—
NVD□UCD033	30~39	20	26	0.8	—	73	—	1.6	—	65	—	4.0	—	65	—	7.9	—	—
NVD□UCD039	37~47	25	31	0.9	125	86	—	1.9	250	77	—	4.4	500	77	—	9.4	—	—
NVD□UCD047	45~54	30	38	1.1	—	104	—	2.3	—	93	—	5.7	—	93	—	11.0	—	—
NVD□UCD056	52~62	35	45	1.3	—	123	—	2.7	—	110	—	6.7	—	110	—	13.0	—	—
NVD□UCD068	60~76	40	56	1.6	—	150	—	3.3	—	135	—	8.2	—	135	—	16.0	—	—
NVD□SCD082	74~90	50	65	1.7	200	—	145	3.5	600	—	135	8.0	1250	—	135	14.0	—	—
NVD□UCD100 ^{※4}	90~110	60	85	3.0	—	—	175	6.0	—	—	165	12.0	—	—	165	18.0 [※]	2500	—
NVD□UCD120	108~132	75	100	3.5	—	—	210	7.0	—	—	200	14.5	—	—	200	30.0	—	—
NVD□UCD150	135~165	95	125	4.5	—	—	260	9.0	—	—	250	18.0	—	—	250	37.5	—	—
NVD□UCD200	185~225	130	170	6.0	—	—	355	12.5	—	—	340	25.0	—	—	340	50.0	—	—
NVD□UCD220	198~242	140	180	6.5	—	—	380	13.5	—	—	360	27.5	—	—	360	55.0	—	—
NVD□UCD240	216~264	150	200	7.5	—	—	415	15.0	—	—	395	30.0	—	—	395	60.0	—	—
NVD□UCD270	247~303	175	225	8.0	—	—	475	17.0	—	—	455	35.0	—	—	455	70.0	—	—
NVD□UCD330	297~363	210	270	9.5	—	—	570	20.0	—	—	545	42.0	—	—	545	80.0	—	—
NVD□UCD360	342~396	230	300	11.0	—	—	620	23.0	—	—	595	45.0	—	—	595	90.0	—	—
NVD□UCD390	367~429	250	320	12.0	—	—	675	25.0	—	—	650	50.0	—	—	650	100.0	—	—
NVD□UCD430	407~473	275	350	13.5	—	—	745	27.5	—	—	710	55.0	—	—	710	110.0	—	—
NVD□UCD470	437~517	300	385	15.0	—	—	810	30.0	—	—	775	60.0	—	—	775	125.0	—	—
NVD□UCD510	474~561	320	410	—	—	—	—	—	—	—	—	—	—	—	845	—	—	—
NVD□UCD620	577~682	385	505	—	—	—	—	—	—	—	—	67.0	—	—	1025	136.0	—	—
NVD□UCD680	637~748	420	560	—	—	—	—	—	—	—	—	—	—	—	1120	—	—	—
NVD□UCD750	697~825	460	615	—	—	—	—	—	—	—	—	—	—	—	1240	150.0	—	—
NVD□UCD780	737~858	485	640	—	—	—	—	—	—	—	—	—	—	—	1290	—	—	—
NVD□UCD820	767~902	510	670	—	—	—	—	—	—	—	—	—	—	—	1355	165.0	—	—
NVD□UCD910	857~1000	550	745	—	—	—	—	—	—	—	—	—	—	—	1500	180.0	—	—
NVD□UCD1100	1070~1210	680	895	—	—	—	—	—	—	—	—	—	—	—	1815	—	—	—
NVD□UCD1800	1700~1980	1000	1465	—	—	—	—	—	—	—	—	—	—	—	2970	360.0	—	—

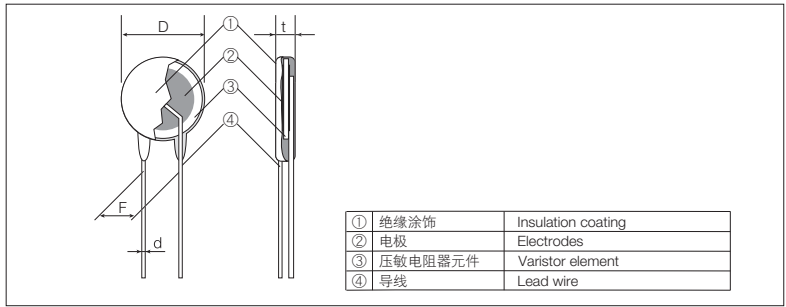
□中填入磁盘直径 Disk dia. enters □.

※3 NVD10UBC的制作范围为压敏电阻器电压22~270V. Manufacturing range of NVD10UBCD is varistor voltages 22~270V.

※4 适用NVD14C100 NVD14SCD100 is applied.

有除上述以外的详细数据, 请向营业所索要。 Detailed data other than the above-mentioned are also available, for which please ask our sales office.

结构图 Construction



外形尺寸 Dimensions

型号 Type	尺寸 Dimensions (mm)				Weight (g) (1000pcs)
	D Max.※1	d (Nominal)	F	t Max.※1	
NVD05U	7~7.5	0.6	5±1	4.3~5.90	50~80
NVD07U	9~9.5				90~140
NVD10UB	12	0.6	5±1	4.3~5.30	180~220
NVD10U	12~13.5	0.8	7.5±1	4.3~14.4	180~500
NVD14U	16~17	0.8	7.5±1	4.3~14.4	270~760
NVD20U	23~24	1.0	10±1	5.2~9.0	630~1210

※1 D最大和t最大, 因压敏电阻器电压不同而变化。

※1 D max. and t max. vary according to the varistor voltage.

品名构成 Type Designation

NV	D05	U	C	D	MT	A	022
品种 Product Code	磁盘直径 Diameter of Element	系列※2 Series	端子表面材质 Terminal Surface Material	端子表面材质 Inner Connect Solder Material	二次加工 Taping & Forming	包装 Packaging	压敏电阻器电压 Varistor Voltage
	D05: φ5mm D07: φ7mm D10: φ10mm D14: φ14mm D20: φ20mm	S: S系列 U: U系列 S: S系列 U: U系列 UB: U系列 (5mm节距) U: U系列 (5mm pitch)	C: SnCu	D: SnAgCu (Ni: Sn/Pb)	空栏: 散装 Nil: Bulk P: 231封装 Refer to P.291	空栏: 散装 Nil: Bulk A: AMMO包装 A: AMMO	EX. 22V-022 470V-470 1800V-1800

※2 UB只限适应NVD 10系列。

※2 UB is applied for NVD 10 series only.

欲知关于此产品含有的环境有害物质详情 (除EU-RoHS以外), 请与我们联系。

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.

取得规格和范围 Approval Awarded and Coverage

- UL1449 (File No. E328032)
NVD05, NVD07: 82~470V, NVD10: 82~1100V, NVD14: 82~910V,
NVD20: 200~910V
- VDE (CECC42000, CECC42200, CECC42201, IEC61051: File No. 40015637)
NVD05U, NVD07U: 22~470V, NVD10U: 22~1100V, NVD14U: 22~910V

取得规格和压敏电阻器电压范围

Approval Awarded and Varistor Vol..rang

unit: (V)

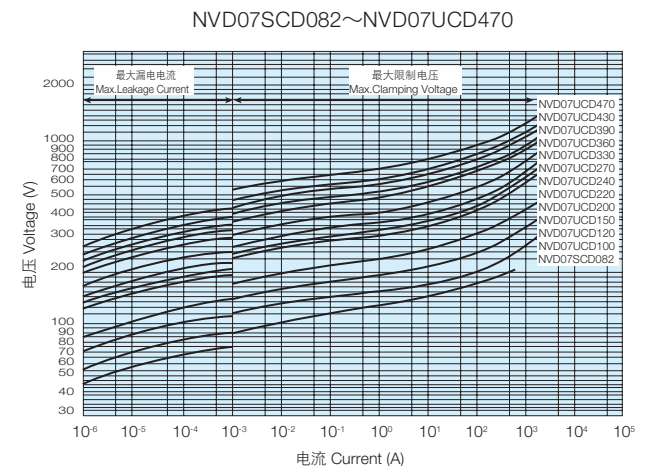
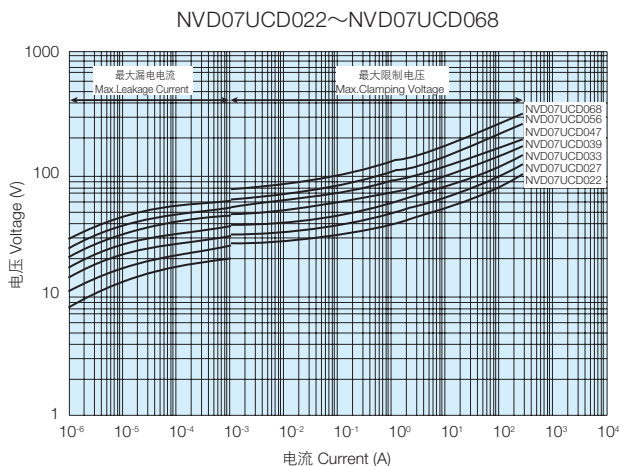
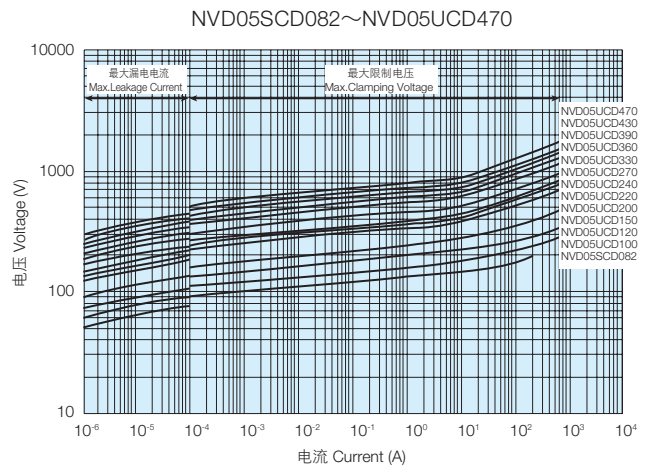
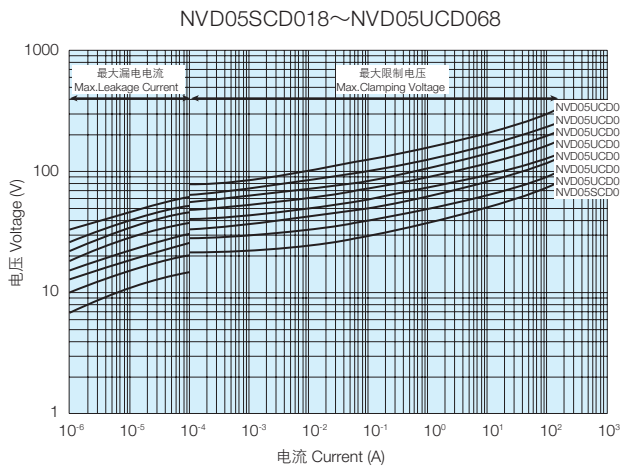
Type	UL1449 (File No.E328032)		c-UL1449 (File No.E328032)	VDE (File No.40015637)
	S series	U series	U series	U series
NVD05	82~470	100~470	100~240, 470	22~470
NVD07	82~470	100~470	100~470	22~470
NVD10	82~1100	100~1100	100~1100	22~1100
NVD14	82~910	120~910	100~910	22~910
NVD20	—	200~910	200~910	—

※S系列的330、510非认证对象

性能 Performance

试验项目 Test Items	标准值 Performance Requirements $\Delta V \pm \%$	试验方法 Test Methods						
压敏电阻器电压 Varistor Voltage	在规定的允许偏差以内。 Within specified tolerance	把规定的电流Ic流入压敏电阻器时的端子间电压。 The voltage between terminals when the specified current is flowed. <table border="1"> <tr> <th>Ic</th> <th>Type</th> </tr> <tr> <td>0.1mA</td> <td>NVD05UCD</td> </tr> <tr> <td>1mA</td> <td>NVD07UCD~NVD20UCD</td> </tr> </table>	Ic	Type	0.1mA	NVD05UCD	1mA	NVD07UCD~NVD20UCD
Ic	Type							
0.1mA	NVD05UCD							
1mA	NVD07UCD~NVD20UCD							
耐焊接热 Resistance to soldering heat	$\pm 5\%$, 外观应无异常。 No abnormality in appearance.	260 $\pm 5^\circ\text{C}$, 10s $\pm 1\text{s}$						
焊接性 Solderability	端子电极95%以上被新的焊接覆盖。 95% coverage min.	230 $^\circ\text{C} \pm 5^\circ\text{C}$, 5s $\pm 0.5\text{s}$ /250 $^\circ\text{C} \pm 5^\circ\text{C}$, 5s $\pm 0.5\text{s}$ (Pb free)						
温度突变 Rapid change of temperature	$\pm 5\%$, 外观应无异常。 No abnormality in appearance.	-40 $^\circ\text{C}$ (30min.)/+125 $^\circ\text{C}$ (30min.) 5cycles: 下述以外 Except NVD20UCD -40 $^\circ\text{C}$ (30min.)/+85 $^\circ\text{C}$ (30min.) 5cycles: NVD20UCD						
耐浪涌量 Maximum peak current	$\pm 10\%$, 外观应无异常。 No abnormality in appearance.	额定的冲击波电流 (T=8/20 μs)，正反施加各一次。 Rated impulse current of (T=8/20 μs), positive/negative applied once each.						
施加高温直流电压 High temperature life with d.c. bias	$\pm 10\%$, 外观应无异常。 No abnormality in appearance.	85 $^\circ\text{C} \pm 5^\circ\text{C}$, Vc=最大允许电压 (V d.c.) 1000小时 Load: Maximum Allowable Voltage (d.c.)						
施加高温交流电压 High temperature life with a.c. bias	$\pm 10\%$, 外观应无异常。 No abnormality in appearance.	85 $^\circ\text{C} \pm 5^\circ\text{C}$, Vc=最大允许电压 (V a.c.r.m.s.) 1000小时 Load: Maximum Allowable Circuit Voltage (V a.c.r.m.s.)						
高温高湿储存 High temperature & high humidity storage life	$\pm 5\%$, 外观应无异常。 No abnormality in appearance.	80 $^\circ\text{C} \pm 5^\circ\text{C}$, 95%RH, 1000h						
高温保存 High temperature storage life	$\pm 5\%$, 外观应无异常。 No abnormality in appearance.	125 $^\circ\text{C} \pm 5^\circ\text{C}$, 1000h						
低温保存 Low temperature storage life	$\pm 5\%$, 外观应无异常。 No abnormality in appearance.	-40 $^\circ\text{C} \pm 5^\circ\text{C}$, 1000h						

电压—电流曲线 Voltage-Current Curves (Reference) (Ta=25 $^\circ\text{C}$)



本样本手册中记载的产品规格如有变更，恕不一一奉告。订购以及使用之前，请仔细确认规格表的内容。

用于车载设备、医疗设备、航空设备以及其它涉及人身安全、或可能引起重大损失的设备上时，请务必先与我司联系。这些产品在这类用途中出现故障或失灵可能导致人身事故或严重损坏。

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

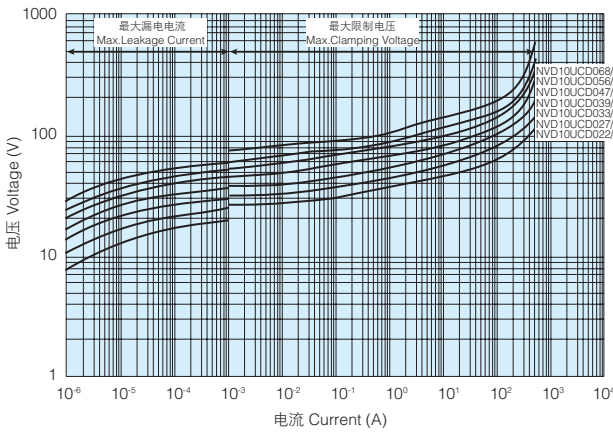
Contact our sales representatives before you use our products for applications including automobiles, medical equipment and aerospace equipment.

Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

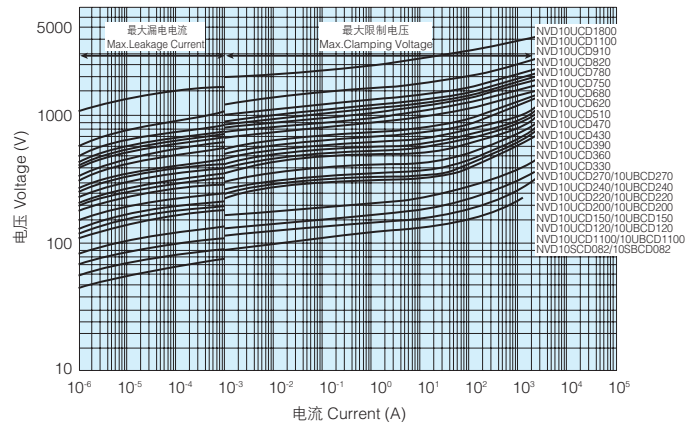
Mar. 2015

VARISTORS

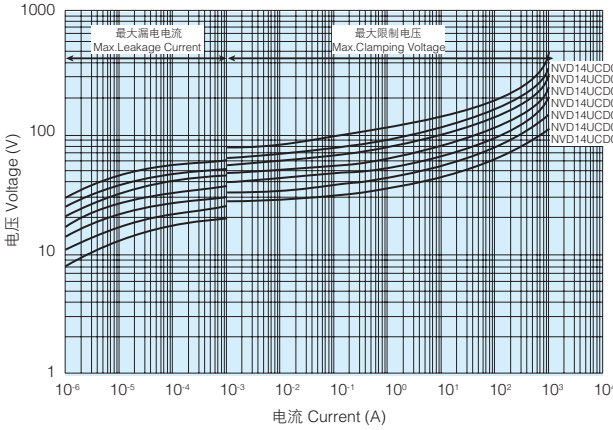
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NVD10UBCD022~NVD10UBCD068



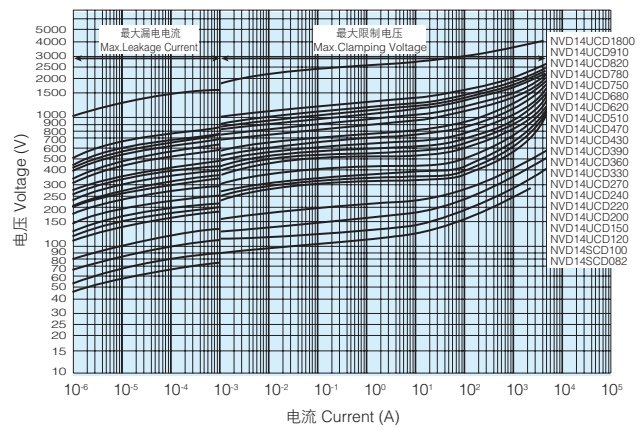
NVD10SCD082~NVD10UCD1800
NVD10SBCD082~NVD10UBCD270



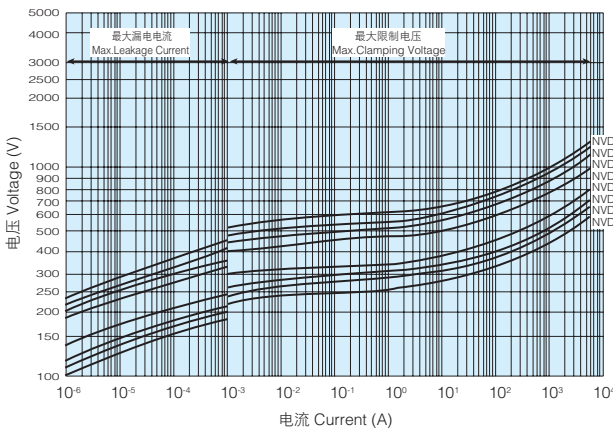
NVD14UCD022~NVD14UCD068



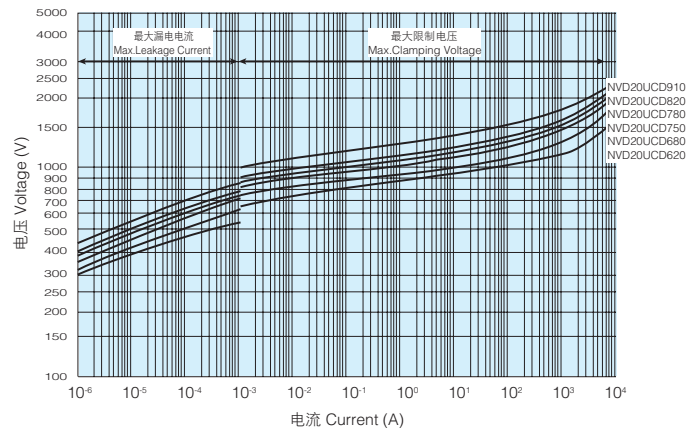
NVD14SCD082~NVD14UCD1800



NVD20UCD200~NVD20UCD470



NVD20UCD620~NVD20UCD910



■ 使用上注意 Precautions for Use

- 施加了超过最大电能的脉冲电力时，压敏电阻器有破坏的危险，应在既定值以内使用。
- Use it within the specified values as there is a risk of destruction of the varistor when the impulse power over the maximum energy is applied.

■ 成形 (不对应编带) Forming (Taping Not Available)

MH

品 种 Type	压敏电阻器电压 Varistor Vol.	H max. (mm)	包装数 Q'ty/bag(pcs)	重量 Weight g/100pcs
NVD05UCDMH	18~470V	13.5	200	30~80
NVD07UCDMH	18~470V	14.5	100	90~140

压敏电阻器电压 Varistor Vol. (V)	W	压敏电阻器电压 Varistor Vol. (V)	W
22~56	1.7	240	1.2
68	1.9	270	1.5
82	1.0	330	1.7
100	1.6	360	1.9
120	1.8	390	2.0
150	2.1	430	2.2
200	1.0	470	2.4
220	1.1		

GJ·MJ

品 种 Type	压敏电阻器电压 Varistor Vol.	H max. (mm)	包装数 Q'ty/bag (pcs)	重量 Weight g/100 (pcs)
NVD10UCDGJ	22~470V	17.0	100	180~500
NVD14UCDGJ	22~390V	23.5	100	270~760
NVD05UCDMJ	430~470V	13.0	50	30~80
NVD07UCDMJ	22~470V	14.5	100	90~140
NVD10UCDMJ	22~270V	17.5	100	180~220

压敏电阻器电压 Varistor Vol. (V)	W (mm)				压敏电阻器电压 Varistor Vol. (V)	W (mm)			
	D05	D07	D10	D14	D05	D07	D10	D14	
22~56	1.7	1.7	1.9	1.9	240	1.2	1.2	1.2	1.2
68	1.9	1.9	2.1	2.1	270	1.0	1.2	1.3	1.3
82	1.0	1.0	1.0	1.0	330	1.1	1.4	1.6	1.6
100	1.6	1.6	1.8	1.1	360	1.2	1.5	1.7	1.7
120	1.8	1.8	2.0	2.0	390	1.3	1.6	1.8	1.8
150	2.1	2.1	2.3	2.3	430	1.5	1.7	1.9	1.9
200	1.0	1.0	1.0	1.0	470	1.6	1.8	2.0	2.0
220	1.1	1.1	1.1	1.1					

■ 径向编带 Radial Taping

MT · GHT

Varistor vol. ≤ 150V Varistor vol. ≥ 200V

符号 Symbol	尺寸 Dimensions	符号 Symbol	尺寸 Dimensions
φD	※	W2	3Max.
φd	※	F	5.0±1.0
D0	4.0±0.2	F1	(5)
P	12.7±1.0	H	16±0.5
P0	12.7±0.3	H1	(20)
P1	6.35±1.3	Δh1, Δh2	1.8Max.
W	18.0 ^{+0.15}	Δp	1.3Max.
W0	15	t	0.6±0.3
W1	9.0±0.5	e	0.2Min.

※ 对于产品外形φD、导线线径φd、导线间隔F、希参照下面的表。
※ Refer to the following lists for φD, outside dia. of product, φd, lead dia. and F, distance between leads.

MT

品 种 Type	压敏电阻器电压 Varistor Vol.	φ Dmax. (mm)	φ d (mm)	F (mm)	包装 Package AMMO(pcs)	重量 Weight g/AMMO
NVD05UCDMT	22~47V	7.0	0.6	5 ± 1	2000	1240~1640
	56 · 68V				1500	1260
	82~150V				2000	1440
	200~470V				1000	790~990
NVD07UCDMT	22~47V	9.0	0.6	5 ± 1	2000	2040~2440
	56 · 68V				1500	1860
	82~150V				2000	2040
	200~470V				1000	1190~1590
NVD10UCDMT	22~150V	12.0	0.6	5 ± 1	1000	1990~2390
	200 · 220V				1000	2290
	240 · 270V				500	1270

GHT

品 种 Type	压敏电阻器电压 Varistor Vol.	φ Dmax. (mm)	φ d (mm)	F (mm)	包装 Package AMMO(pcs)	重量 Weight g/AMMO
NVD10UCDGHT	22~150V	12.0	0.8	7.5 ± 1	2000	1980~2390
	200~220V				1000	2280
	240~270V				500	1260
	330~470V				500	1410~1660

MHT

符号 Symbol	尺寸 Dimensions	符号 Symbol	尺寸 Dimensions
φD	※	W2	3Max.
φd	0.6	F	5.0±1.0
D0	4.0±0.2	F1	(5)
P	12.7±1.0	H	16±0.5
P0	12.7±0.3	H1	(20)
P1	6.35±1.3	Δh2	0±2.0
W	18.0 ^{+0.15}	Δp	0±1.3
W0	15	t	0.6±0.3
W1	9.0±0.5	e	less than 1.0

※ 对于产品外形φD、希参照下面的表。
※ Refer to the following list for φD, product dia.

MHT

品 种 Type	压敏电阻器电压 Varistor Vol.	φ Dmax. (mm)	φ d (mm)	F (mm)	包装 Package AMMO(pcs)	重量 Weight g/AMMO
NVD05UCDMHT	22~47V	7.0	0.6	5.0 ± 1.0	2000	1270~1670
	56 · 68V				1500	1280
	82~150V				2000	1470
	200~470V				1000	800~1000
NVD07UCDMHT	22~47V	9.0	0.6	5.0 ± 1.0	2000	2070~2470
	56 · 68V				1500	1890
	82~150V				2000	2070
	200~470V				1000	1200~1600
NVD10UCDMHT	22~220V	12.0	0.6	5.0 ± 1.0	1000	2010~2410
	240 · 270V				500	1280

GJT·MJT

符号 Symbol	尺寸 Dimensions	符号 Symbol	尺寸 Dimensions
φD	※	W2	3Max.
φd	0.8	F	※
D0	4.0±0.2	F1	(5)
P	12.7±1.0	H	16±0.5
P0	12.7±0.3	H1	(20)
P1	6.35±1.3	Δh1, Δh2	1.8Max.
W	18.0 ^{+0.15}	Δp	1.3Max.
W0	15	t	0.6±0.3
W1	9.0±0.5	e	0.2Min.

※ 对于产品外形φD、希参照下面的表。
※ Refer to the following list for φD, product dia.

品 种 Type	压敏电阻器电压 Varistor Vol.	φ D max. (mm)	φ d (mm)	F (mm)	H max. (mm)	包装 Package AMMO (pcs)	重量 Weight g/AMMO
NVD10UCDGJT	22~220V	12.0	0.8	7.5±1	—	1000	2010~2410
	240 · 270V					500	1280
	330~470V					500	1430~1680
NVD05UCDMJT	22~47V	7.0	0.6	5.0±1.0	13.0	2000	1270~1670
	56 · 68V					1500	1280
	100 · 120V					2000	1470
	150V					2000	1470
NVD07UCDMJT	200~470V	9.0	0.6	5.0±1.0	14.5	1000	800~1000
	22~47V					2000	2070~2470
	56 · 68V					1500	1890
	100 · 120V					2000	2070
NVD10UCDMJT	150V	12.0	0.6	5.0±1.0	17.5	2000	2070
	200~470V					1000	1200~1600
	22~220V					1000	2010~2410
	240 · 270V					500	1280

※ 压敏电阻器电压82V品 (整体形状) 的成形和编带和NVD14型的100V品的成形, S系列对应。

※ Forming and taping varistors of 82V (all shapes) and forming NVD14 type of 100V will be supplied with our standard type products.