

NEW

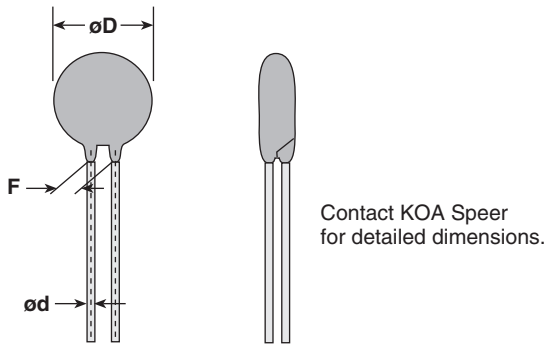
Metal Oxide Varistor Disk Type Type NVD

ISO 9001:2000
CERTIFIED
TS-16949
CERTIFIED

1. Features

- Flame retardant coating (UL 94V-0)
- Excellent transient voltage suppression characteristics
- Higher surge current
- Wide varistor voltage
- V-I characteristics are the same in both polarity
- Marking: green body color with black marking
- UL1449 (file No. E79023) recognized for products over 82V

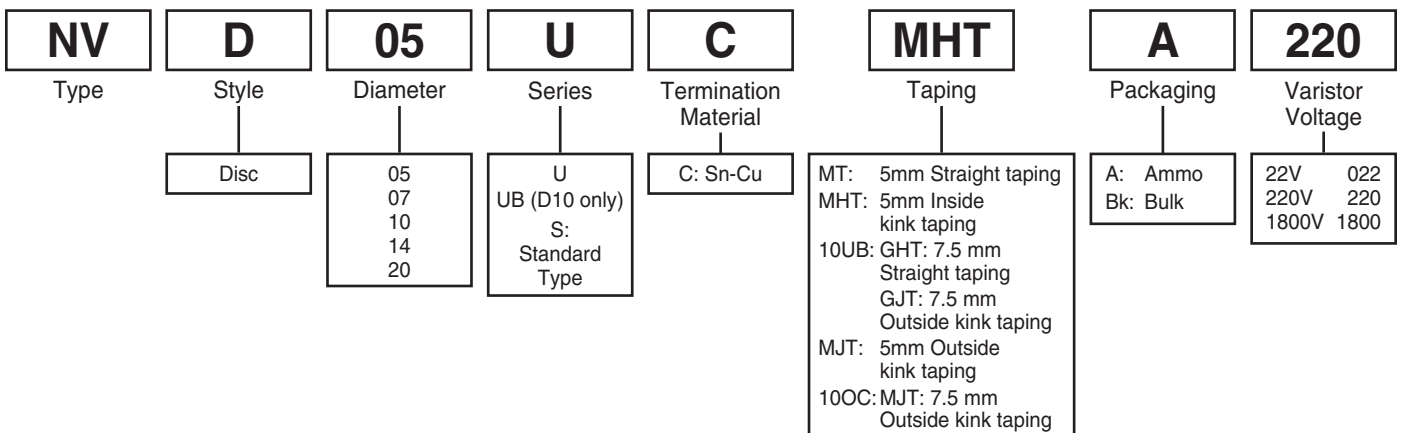
2. Dimensions



Type	øD (max.)	ød	F
05U	.276 - .295 (7.0 - 7.5)	.024 (0.6)	.197±.039 (5.0±1.0)
07U	.276 - .374 (9.0 - 9.5)		
10U	.472 - .531 (12.0 - 13.5)	.031 (0.8)	.295±.039 (7.5±1.0)
10UB	.472 (12.0)	.024 (0.6)	.197±.039 (5.0±1.0)
14U	.630 - .669 (16.0 - 17.0)	.031 (0.8)	.295±.039 (7.5±1.0)
20U	.846 - .886 (21.5 - 22.5)	.039 (1.0)	.394±.039 (10±1.0)

3. Ordering & Specifying Information

Type designation shall be as the following form.



4. Detailed Dimensions

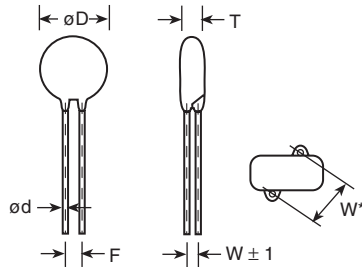


Table 1 Dimensions in inches (mm)

Type D05U	øD max.	H max.	T max.	W ± 1			
NVD05UC022	.276 (7.0)	.394 (10.0)	.169 (4.3)	.067 (1.7)			
NVD05UC027							
NVD05UC033							
NVD05UC039			.173 (4.4)				
NVD05UC047			.181 (4.6)				
NVD05UC056			.197 (5.0)				
NVD05UC068			.209 (5.3)		.075 (1.9)		
NVD05C082			.161 (4.1)		.055 (1.4)		
NVD05UC100			.169 (4.3)		.063 (1.6)		
NVD05UC120			.177 (4.5)		.071 (1.8)		
NVD05UC150			.189 (4.8)		.083 (2.1)		
NVD05UC200			.295 (7.5)		.413 (10.5)	.177 (4.5)	.039 (1.0)
NVD05UC220						.181 (4.6)	.043 (1.1)
NVD05UC240	.185 (4.7)	.047 (1.2)					
NVD05UC270	.193 (4.9)	.059 (1.5)					
NVD05UC330	.209 (5.3)	.067 (1.7)					
NVD05UC360	.213 (5.4)	.075 (1.9)					
NVD05UC390	.220 (5.6)	.079 (2.0)					
NVD05UC430	.224 (5.7)	.087 (2.2)					
NVD05UC470	.232 (5.9)	.094 (2.4)					

Table 1 Dimensions in inches (mm)

Type D07U	øD max.	H max.	T max.	W ± 1			
NVD07UC022	.276 (9.0)	.472 (12.0)	.169 (4.3)	.067 (1.7)			
NVD07UC027							
NVD07UC033							
NVD07UC039			.173 (4.4)				
NVD07UC047			.181 (4.6)				
NVD07UC056			.197 (5.0)				
NVD07UC068			.209 (5.3)		.075 (1.9)		
NVD07C082			.161 (4.1)		.055 (1.4)		
NVD07UC100			.169 (4.3)		.063 (1.6)		
NVD07UC120			.177 (4.5)		.071 (1.8)		
NVD07UC150			.189 (4.8)		.083 (2.1)		
NVD07UC200			.374 (9.5)		.492 (12.5)	.177 (4.5)	.039 (1.0)
NVD07UC220						.181 (4.6)	.043 (1.1)
NVD07UC240	.185 (4.7)	.047 (1.2)					
NVD07UC270	.193 (4.9)	.059 (1.5)					
NVD07UC330	.209 (5.3)	.067 (1.7)					
NVD07UC360	.213 (5.4)	.075 (1.9)					
NVD07UC390	.220 (5.6)	.079 (2.0)					
NVD07UC430	.224 (5.7)	.087 (2.2)					
NVD07UC470	.232 (5.9)	.094 (2.4)					

4. Detailed Dimensions (Continued)

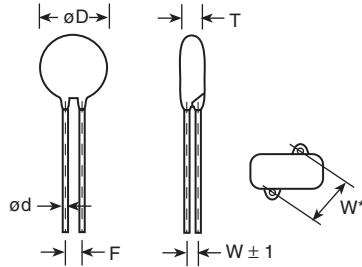


Table 1 Dimensions in inches (mm)

Type D10U/10UB	ϕD max.	H max.	T max.	$W \pm 1$	
NVD10U/10UBC022	.472 (12.0)	.591 (15.0)	.169 (4.3)	.075 (1.9)	
NVD10U/10UBC027					
NVD10U/10UBC033					
NVD10U/10UBC039			.173 (4.4)		
NVD10U/10UBC047			.185 (4.7)		
NVD10U/10UBC056			.197 (5.0)		
NVD10U/10UBC068			.209 (5.3)		.083 (2.1)
NVD10/10BC082			.177 (4.5)		.063 (1.6)
NVD10U/10UBC100			.185 (4.7)		.071 (1.8)
NVD10U/10UBC120			.193 (4.9)		.079 (2.0)
NVD10U/10UBC150			.205 (5.2)		.091 (2.3)
NVD10U/10UBC200			.185 (4.7)		.039 (1.0)
NVD10U/10UBC220			.189 (4.8)		.043 (1.1)
NVD10U/10UBC240			.197 (5.0)		.047 (1.2)
NVD10U/10UBC270			.209 (5.3)		.051 (1.3)

Table 1 Dimensions in inches (mm)

Type D10U	ϕD max.	H max.	T max.	$W \pm 1$
NVD10UC330	.492 (12.5)	.610 (15.5)	.492 (5.6)	.220 (1.6)
NVD10UC360			.224 (5.7)	.079 (2.0)
NVD10UC390			.232 (5.9)	.091 (2.3)
NVD10UC430			.240 (6.1)	.102 (2.6)
NVD10UC470			.248 (6.3)	.114 (2.9)
NVD10UC510			.264 (6.7)	.126 (3.2)
NVD10UC620			.311 (7.9)	.150 (3.8)
NVD10UC680			.327 (8.3)	.165 (4.2)
NVD10UC750			.346 (8.8)	.185 (4.7)
NVD10UC780			.350 (8.9)	.193 (4.9)
NVD10UC820			.362 (9.2)	.201 (5.1)
NVD10UC910			.382 (9.7)	.224 (5.7)
NVD10UC1100			.512 (13.0)	.630 (16.0)
NVD10UC1800	.531 (13.5)	.650 (16.5)	.567 (14.4)	*.433 (11.0 ± 2)

4. Detailed Dimensions (Continued)

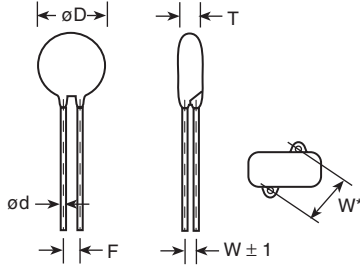


Table 1 Dimensions in inches (mm)

Type D14U	øD max.	H max.	T max.	W ± 1	
NVD14UC022	.630 (16.0)	.827 (21.0)	.169 (4.3)	.075 (1.9)	
NVD14UC027					
NVD14UC033					
NVD14UC039			.173 (4.4)		
NVD14UC047			.185 (4.7)		
NVD14UC056			.197 (5.0)		
NVD14UC068			.209 (5.3)		.083 (2.1)
NVD14C082			.177 (4.5)		.063 (1.6)
NVD14C100			.185 (4.7)		.071 (1.8)
NVD14UC120			.193 (4.9)		.079 (2.0)
NVD14UC150			.205 (5.2)		.091 (2.3)
NVD14UC200			.185 (4.7)		.039 (1.0)
NVD14UC220			.189 (4.8)		.043 (1.1)
NVD14UC240			.197 (5.0)		.047 (1.2)
NVD14UC270			.209 (5.3)		.051 (1.3)
NVD14UC330			.650 (16.5)		.846 (21.5)
NVD14UC360	.224 (5.7)	.079 (2.0)			
NVD14UC390	.220 (5.6)	.091 (2.3)			
NVD14UC430	.240 (6.1)	.102 (2.6)			

Table 1 Dimensions in inches (mm)

Type D14U	øD max.	H max.	T max.	W ± 1
NVD14UC470	.650 (16.5)	.846 (21.5)	.248 (6.3)	.114 (2.9)
NVD14UC510			.264 (6.7)	.126 (3.2)
NVD14UC620			.311 (7.9)	.150 (3.8)
NVD14UC680			.327 (8.3)	.165 (4.2)
NVD14UC750			.346 (8.8)	.185 (4.7)
NVD14UC780			.350 (8.9)	.193 (4.9)
NVD14UC820			.362 (9.2)	.201 (5.1)
NVD14UC910			.382 (9.7)	.224 (5.7)
NVD14UC1800			.669 (17.0)	.807 (20.5)

Type D20U						
NVD20UC200	.846 (21.5)	.965 (24.5)	.205 (5.2)	.083 (2.1)		
NVD20UC220			.209 (5.3)	.087 (2.2)		
NVD20UC240			.213 (5.4)	.091 (2.3)		
NVD20UC270			.220 (5.6)	.098 (2.5)		
NVD20UC360			.240 (6.1)	.118 (3.0)		
NVD20UC390			.244 (6.2)	.122 (3.1)		
NVD20UC430			.252 (6.4)	.130 (3.3)		
NVD20UC470			.260 (6.6)	.138 (3.5)		
NVD20UC620			.886 (22.5)	1.004 (25.5)	.295 (7.5)	.173 (4.4)
NVD20UC680					.307 (7.8)	.185 (4.7)
NVD20UC750	.323 (8.2)	.201 (5.1)				
NVD20UC780	.331 (8.4)	.209 (5.3)				
NVD20UC820	.335 (8.5)	.213 (5.4)				
NVD20UC910	.354 (9.0)	.232 (5.9)				

5. Applications and Ratings

Type	Varistor Voltage Vc Ic = 0.1mA (V)	Maximum Allowable Voltage		NVD05UC				NVD07UC			
		a.c. r.m.s. (v)	d.c. (v)	Maximum (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage		Maximum (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage	
				E (J)	Ip (A)	V1A	V5A	E (J)	Ip (A)	V2.5A	V10A
NVD SC018	16 - 22	11	14	0.3	50	40	—	—	—	—	—
NVD UC022	20 - 27	14	18	0.5	150	48	—	1.1	250	43	—
NVD UC027	25 - 32	17	22	0.7		60	—	1.3		53	—
NVD UC033	30 - 39	20	26	0.8		73	—	1.6		65	—
NVD UC039	37 - 47	25	31	0.9		86	—	1.9		73	—
NVD UC047	45 - 54	30	38	1.1		104	—	2.3		93	—
NVD UC056	52 - 62	35	45	1.3		123	—	2.7		110	—
NVD UC068	60 - 76	40	56	1.6		150	—	3.3		135	—
NVD SC082	74 - 90	50	65	1.7	200	—	145	3.5	600	—	135
NVD UC100	90 - 110	60	85	3.0	600	—	175	6.0	1250	—	165
NVD UC120	108 - 132	75	100	3.5		—	210	7.0		—	200
NVD UC150	135 - 165	95	125	4.5		—	260	9.0		—	250
NVD UC200	185 - 225	130	170	6.0		—	355	12.5		—	340
NVD UC220	198 - 242	140	180	6.5		—	380	13.5		—	360
NVD UC240	216 - 264	150	200	7.5		—	415	15.0		—	395
NVD UC270	247 - 303	175	225	8.0		—	475	17.0		—	455
NVD UC330	297 - 363	210	270	9.5		—	570	20.0		—	545
NVD UC360	342 - 396	230	300	11.0		—	620	23.0		—	595
NVD UC390	367 - 429	250	320	12.0		—	675	25.0		—	650
NVD UC430	407 - 473	275	350	13.5		—	745	27.5		—	710
NVD UC470	437 - 517	300	385	15.0		—	810	30.0		—	775

Add disk diameter

Type	Varistor Voltage Vc Ic = 0.1mA (V)	Maximum Allowable Voltage		NVD10UC - NVD10UC*				NVD14UC**				NVD20UC			
		a.c. r.m.s. (v)	d.c. (v)	Max. (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage		Max. (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage		Max. (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage	
				E (J)	Ip (A)	V5A	V25A	E (J)	Ip (A)	V10A	V50A	E (J)	Ip (A)	V100A	
NVD SC018	16 - 22	11	14	—	—	—	—	—	—	—	—	—	—	—	
NVD UC022	20 - 27	14	18	2.6	500	43	—	5.3	1000	43	—	—	—	—	
NVD UC027	25 - 32	17	22	3.2		53	—	6.5		53	—	—	—	—	
NVD UC033	30 - 39	20	26	4.0		65	—	7.9		65	—	—	—	—	
NVD UC039	37 - 47	25	31	4.4		77	—	9.4		73	—	—	—	—	
NVD UC047	45 - 54	30	38	5.7		93	—	11.0		93	—	—	—	—	
NVD UC056	52 - 62	35	45	6.7		110	—	13.0		110	—	—	—	—	
NVD UC068	60 - 76	40	56	8.2		135	—	16.0		135	—	—	—	—	
NVD SC082	74 - 90	50	65	8.0	1250	—	135	14.0	2500	—	135	—	—	—	
NVD UC100	90 - 110	60	85	12.0	2500	—	165	18.0	5000	—	165	—	—	—	
NVD UC120	108 - 132	75	100	14.5		—	200	30.0		—	200	—	—	—	—
NVD UC150	135 - 165	95	125	18.0		—	250	37.5		—	250	—	—	—	—
NVD UC200	185 - 225	130	170	25.0		—	340	50.0		—	340	100	—	—	340
NVD UC220	198 - 242	140	180	27.5		—	360	55.0		—	360	110	—	—	360
NVD UC240	216 - 264	150	200	30.0		—	395	60.0		—	395	120	—	—	395
NVD UC270	247 - 303	175	225	35.0		—	455	70.0		—	455	135	—	—	455

Add disk diameter

* Manufacturing range of NVD10UC is varistor voltages 22 - 270

** NVD14C100 is applied

5. Applications and Ratings (Continued)

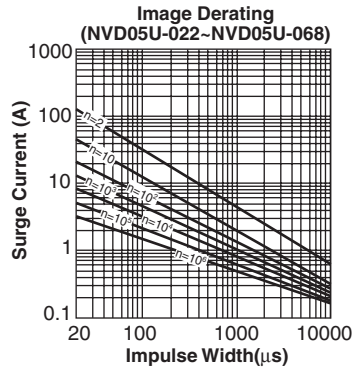
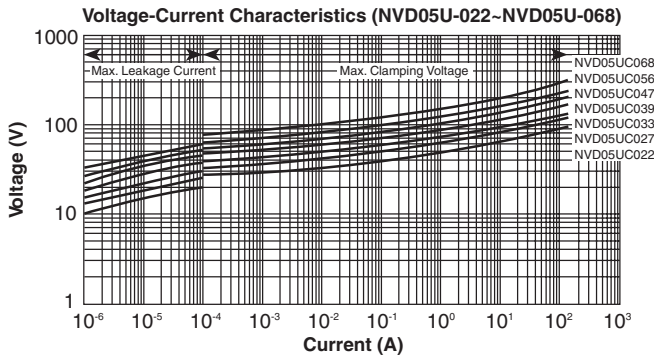
Type	Varistor Voltage Vc Ic = 0.1mA (V)	Maximum Allowable Voltage		NVD10UC - NVD10UBC*			NVD14UC**			NVD20UC		
		a.c. r.m.s. (v)	d.c. (v)	Max. (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage	Max. (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage	Max. (2ms) Energy	Max. Peak Current (2 pulses)	Clamping Voltage
				E (J)	Ip (A)	V5A V25A	E (J)	Ip (A)	V10A V50A	E (J)	Ip (A)	V100A
NVD <input type="checkbox"/> UC330	297 - 363	210	270	42.0	2500	— 545	80.0	4500	— 545	—	6500	—
NVD <input type="checkbox"/> UC360	342 - 396	230	300	45.0		— 595	90.0		— 595	180		
NVD <input type="checkbox"/> UC390	367 - 429	250	320	50.0		— 650	100.0		— 650	195		
NVD <input type="checkbox"/> UC430	407 - 473	275	350	55.0		— 710	110.0		— 710	215		
NVD <input type="checkbox"/> UC470	437 - 517	300	385	60.0		— 775	125.0		— 775	250		
NVD <input type="checkbox"/> UC510	474 - 561	320	410	67.0		— 845	136.0		— 845	—		
NVD <input type="checkbox"/> UC620	577 - 682	380	505	67.0		— 1025	136.0		— 1025	273		
NVD <input type="checkbox"/> UC680	637 - 748	420	560	67.0		— 1120	136.0		— 1120	273		
NVD <input type="checkbox"/> UC750	697 - 825	460	615	70.0		— 1240	150.0		— 1240	300		
NVD <input type="checkbox"/> UC780	737 - 858	485	640	70.0		— 1290	150.0		— 1290	300		
NVD <input type="checkbox"/> UC820	767 - 902	510	670	80.0		— 1355	165.0		— 1355	325		
NVD <input type="checkbox"/> UC910	857 - 1000	550	745	90.0		— 1500	180.0		— 1500	360		
NVD <input type="checkbox"/> UC1100	1070 - 1210	680	895	110.0		— 1815	—		—	—		—
NVD <input type="checkbox"/> UC1800	1700 - 1980	1000	1465	183.0		— 2970	360.0		— 2970	—		—

Add disk diameter

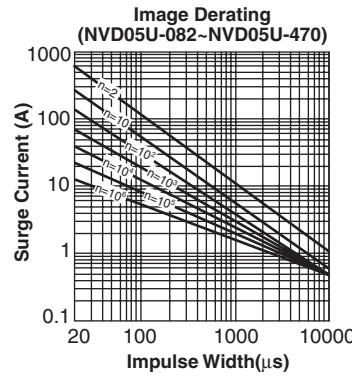
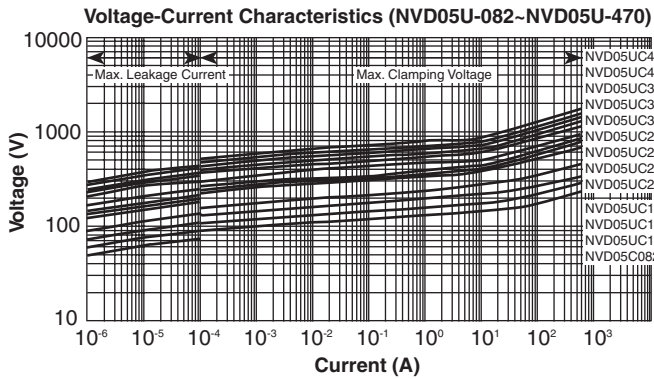
* Manufacturing range of NVD10UBC is varistor voltages 22 - 270

** NVD14C100 is applied

6. Typical Characteristics (Ta = +25°C) D05U

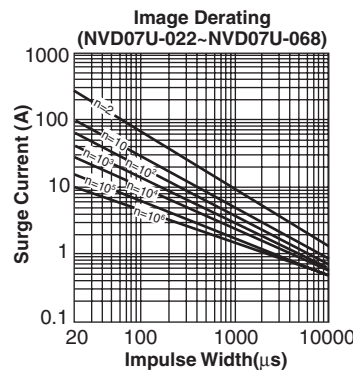
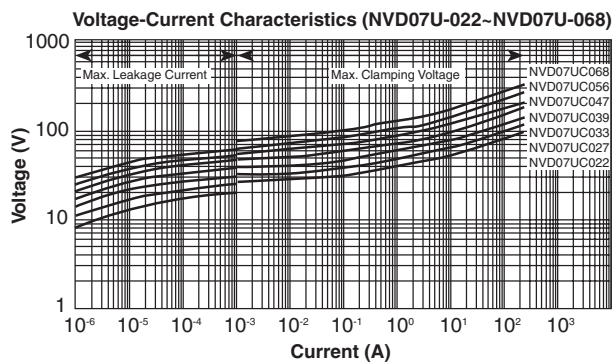


Surge current is related to impulse width and its repetition times.

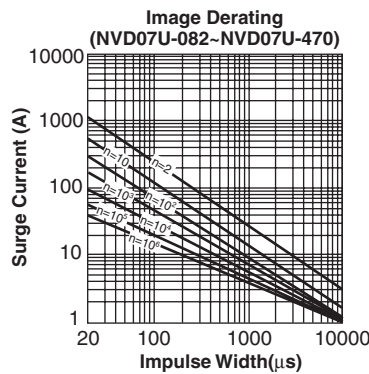
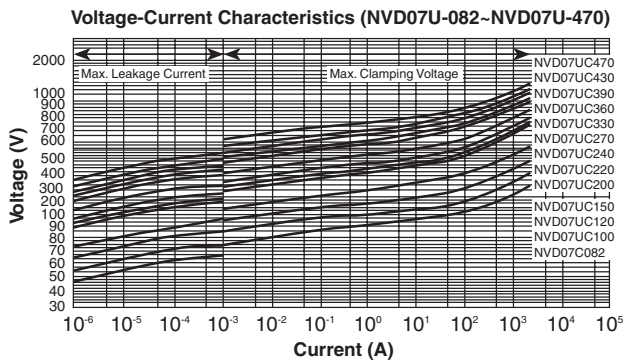


Surge current is related to impulse width and its repetition times.

Typical Characteristics (Ta = +25°C) D07U

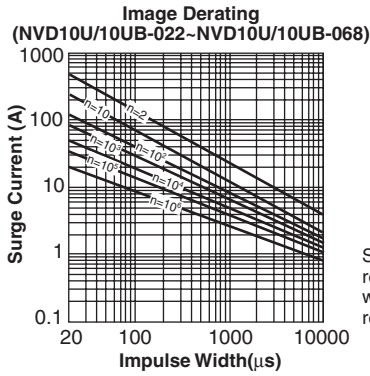
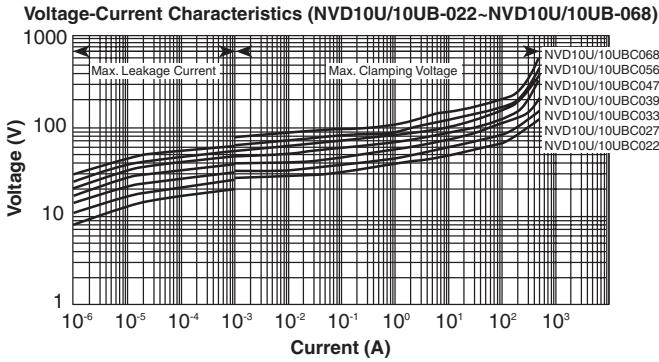


Surge current is related to impulse width and its repetition times.

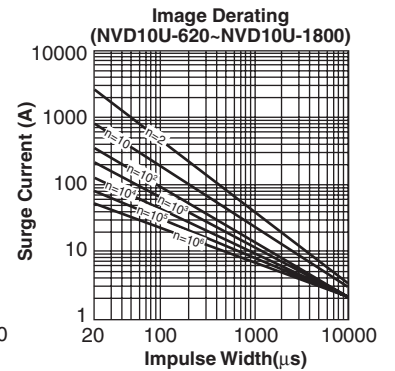
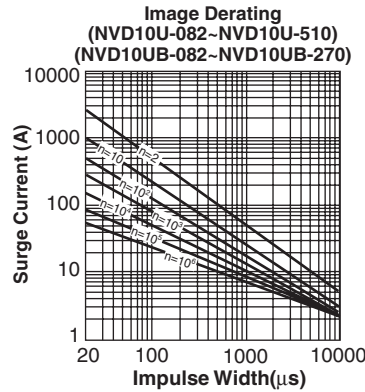
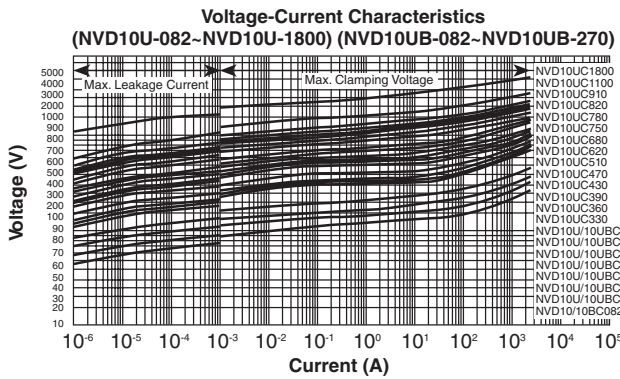


Surge current is related to impulse width and its repetition times.

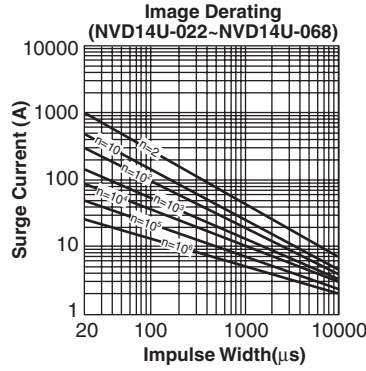
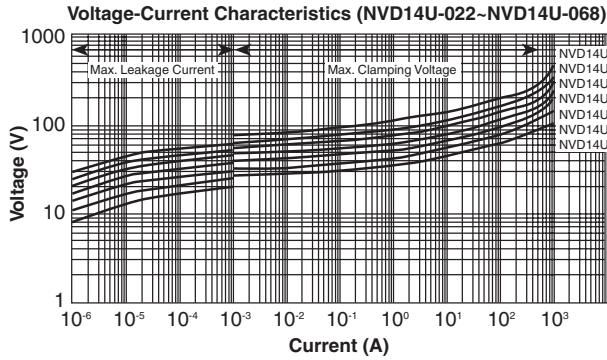
6. Typical Characteristics (Ta = +25°C) D10U/10UB



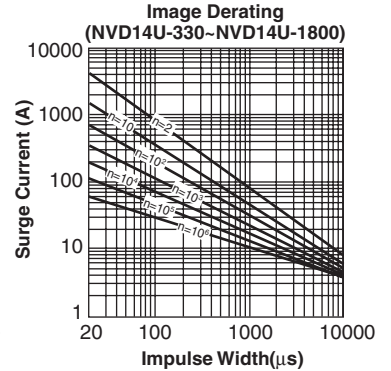
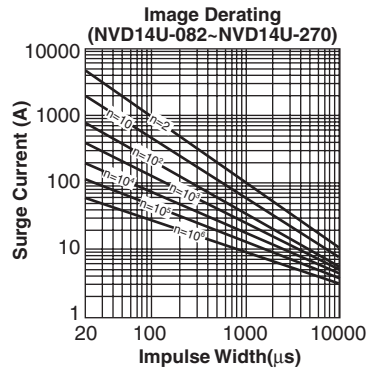
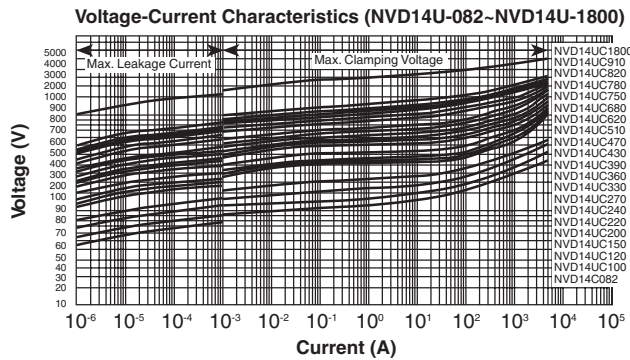
Surge current is related to impulse width and its repetition times.



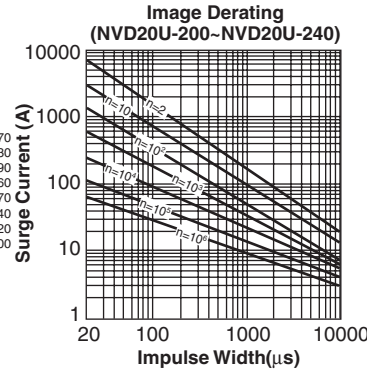
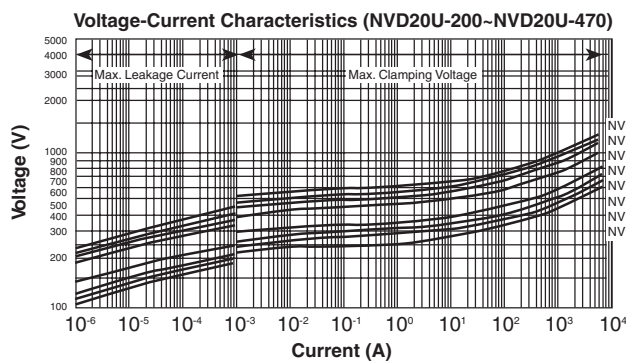
6. Typical Characteristics (Ta = +25°C) D14U



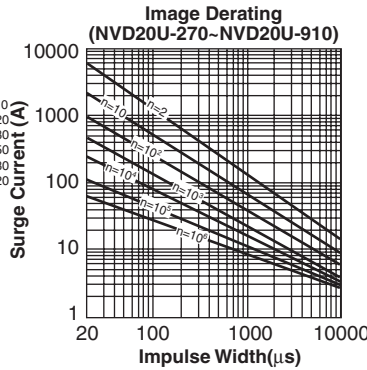
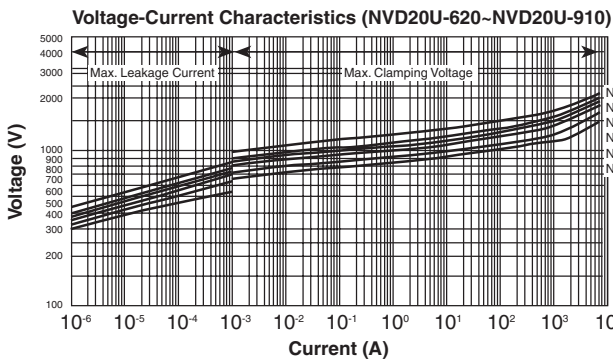
Surge current is related to impulse width and its repetition times.



6. Typical Characteristics (Ta = +25°C) D20U

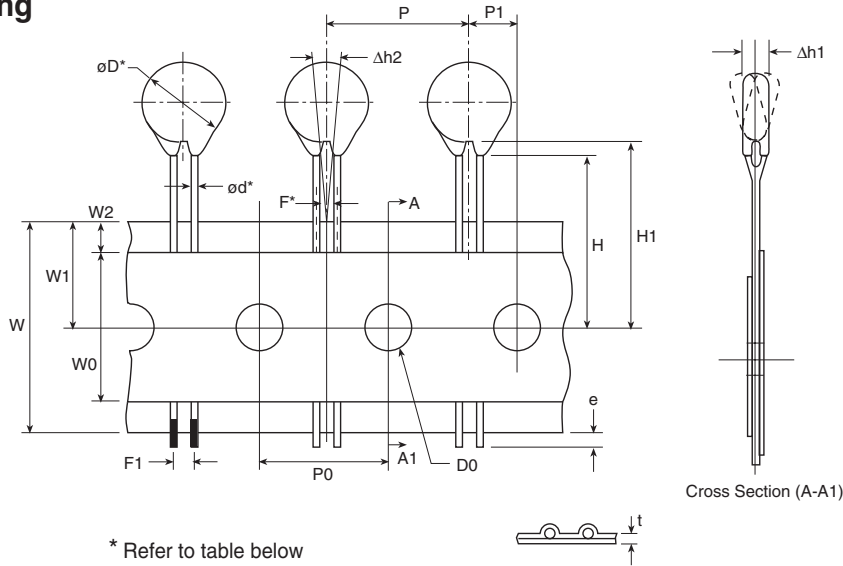


Surge current is related to impulse width and its repetition times.



Surge current is related to impulse width and its repetition times.

7. Packaging



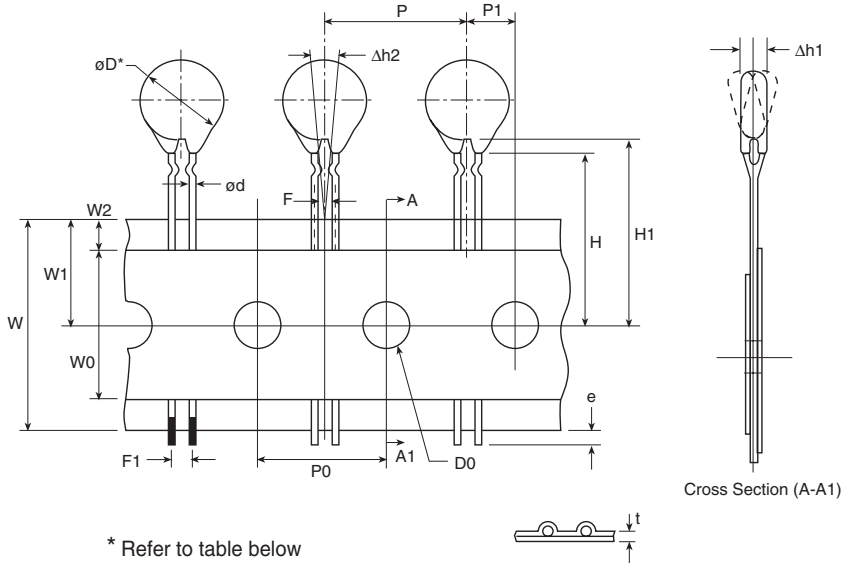
Dimensions in inches (mm)

Series	D0	P	P0	P1	W	W0	W1	W2
NVD [] U	0.157 (4.0 ± 0.2)	0.500 (12.7 ± 1.0)	0.500 (12.7 ± 0.3)	0.250 (6.35 ± 1.3)	0.709 (18 ⁺¹ _{-0.5})	0.591 (15)	0.354 (9.0 ± 0.5)	0.118 3 max.

Series	F1	H	H1	Δh1	Δh2	t	e
NVD [] U	0.197 (5.0)	0.669 (17)	0.787 (20 ^{+1.5} _{-1.0})	0 (0 ± 2.0)	0 (0 ± 1.3)	0.024 (0.6 ± 0.3)	< 0.039 (Less than 1)

Series	øD max.			ød	F
	22 ~ 150 V	200 ~ 270 V	330 ~ 470 V		
NVD05U-022 ~ NVD05U-150	0.276 (7.0)	—	—	0.024 (0.6)	0.197 (5 ± 1)
NVD05U-200 ~ NVD05U-470	—	0.295 (7.5)	0.295 (7.5)		
NVD07U-022 ~ NVD07U-150	0.354 (9.0)	—	—		
NVD07U-200 ~ NVD07U-470	—	0.374 (9.5)	0.374 (9.5)	0.031 (0.8)	0.295 (7.5 ± 1)
NVD10U-022 ~ NVD10U-150	0.472 (12.0)	—	—		
NVD10U-200 ~ NVD10U-470	—	0.472 (12.0)	0.492 (12.5)		
NVD10UB-022 ~ NVD10UB-150	0.472 (12.0)	—	—	0.024 (0.6)	0.197 (5 ± 1)
NVD10UB-200 ~ NVD10UB-470	—	0.472 (12.0)	—		

7. Packaging (Continued)



Dimensions in inches (mm)

Series	ϕD max.	
	22 ~ 270 V	360 ~ 470 V
NV [] D05U-CB3	0.276 (7.0)	0.295 (7.5)
NV [] D07U-CB3	0.354 (9.0)	0.374 (9.5)
NV [] D10UB-CB3	0.472 (12.0)	—
NV [] D10U-CB3	0.472 (12.0)	0.492 (12.5)

8. Packaging Quantity

Series D05U	Quantity
NVD05U-022 ~ NVD05U-047	2,000 pcs
NVD05U-056, NVD05U-068	1,500 pcs
NVD05U-082 ~ NVD05U-150	2,000 pcs
NVD05U-200 ~ NVD05U-470	1,000 pcs

Series D07U	Quantity
NVD07U-022 ~ NVD07U-047	2,000 pcs
NVD07U-056, NVD07U-068	1,500 pcs
NVD07U-082 ~ NVD07U-150	2,000 pcs
NVD07U-200 ~ NVD07U-470	1,000 pcs

Series D10U/10UB	Quantity
NVD10U-022 ~ NVD10U-150	1,000 pcs
NVD10U-200 • NVD10U-220	1,000 pcs
NVD10U-240 ~ NVD10U-470	500 pcs
NVD10UB-022 ~ NVD10UB-150	1,000 pcs
NVD10UB-200 • NVD10UB-220	1,000 pcs
NVD10UB-240 • NVD10UB-270	500 pcs

Series D14U	Quantity
NVD14U-022 ~ NVD14U-390	100 pcs/bulk
NVD14U-430 ~ NVD14U-1800	50 pcs/bulk

Series D20U	Quantity
NVD20U-200 ~ NVD20U-910	50 pcs/bulk