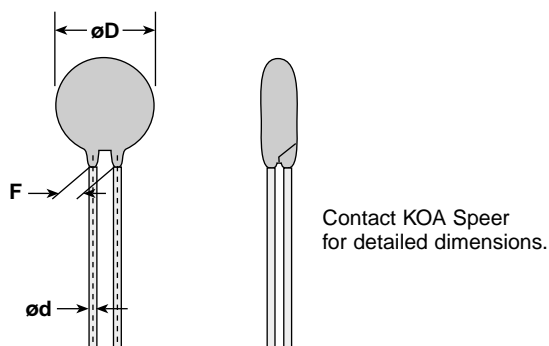


**features**

- Flame retardant coating (UL94V0)
- 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
- Products with lead-free terminations meet RoHS requirements

circuit protection

**dimensions and construction**



Type	Dimensions inches (mm)		
	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)

**ordering information**

New Part #	<b>NV</b>	<b>D</b>	<b>05</b>	<b>U</b>	<b>C</b>	<b>MHT</b>	<b>A</b>	<b>220</b>
	Type	Style	Diameter	Series	Termination Material	Taping	Packaging	Varistor Voltage
		Disc	05 07 10 14 20	U UB (D10 only) S: Standard Type	C: Sn-Cu	MT: 5mm straight taping MHT: 5mm inside kink taping 10UB: GHT: 7.5mm straight taping GJT: 7.5mm outside kink taping MJT: 5mm outside kink taping 10UC: MJT: 7.5mm outside kink taping	A: Ammo BK: Bulk	22V 022 220V 220 1800V 1800

For further information on packaging, please refer to Appendix C.

**applications and ratings**

circuit protection

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 E (J)	Max. Peak Current (2 pulses) Ip (A)	Clamping Voltage		Maximum (2ms) Energy E (J)	Max. Peak Current (2 pulses) Ip (A)	Clamping Voltage	
						V1A	V5A			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 E (J)	Max. Peak Current (2 pulses) Ip (A)	Clamping Voltage		Max. (2ms) Energy E (J)	Max. Peak Current (2 pulses) Ip (A)	Clamping Voltage		Max. (2ms) Energy E (J)	Max. Peak Current (2 pulses) Ip (A)	Clamping Voltage V100A			
						V5A	V25A			V10A	V50A						
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	—	165	18.0	—		165	—	—	—	—			
NVD□UC120	108 - 132	75	100	14.5	2500	—	200	30.0	5000	—	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	7000	—	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			
NVD□UC330	297 - 363	210	270	42.0		4500	—	545		80.0	4500	—	545	—	—		
NVD□UC360	342 - 396	230	300	45.0			—	595		90.0		—	595	180	6500	—	595
NVD□UC390	367 - 429	250	320	50.0			—	650		100.0		—	650	195		—	650
NVD□UC430	407 - 473	275	350	55.0			—	710		110.0		—	710	215		—	710
NVD□UC470	437 - 517	300	385	60.0			—	775		125.0		—	775	250	—	775	

□ Add disk diameter

\* Manufacturing range of NVD10UC is varistor voltages 22 - 270

\*\* NVD14C100 is applied

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

4/01/05

**applications and ratings (continued)**

Type	Varistor Voltage Vc Ic = 0.1mA (V)	Maximum Allowable Voltage		NVD10UC - NVD10UCB*			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 □ UC510	474 - 561	320	410	67.0	2500	—	845	136.0	4500	—	845	—	6500	—
NVD □ UC620	577 - 682	380	505	67.0		—	1025	136.0		—	1025	273		1025
NVD □ UC680	637 - 748	420	560	67.0		—	1120	136.0		—	1120	273		1120
NVD □ UC750	697 - 825	460	615	70.0		—	1240	150.0		—	1240	300		1240
NVD □ UC780	737 - 858	485	640	70.0		—	1290	150.0		—	1290	300		1290
NVD □ UC820	767 - 902	510	670	80.0		—	1355	165.0		—	1355	325		1355
NVD □ UC910	857 - 1000	550	745	90.0		—	1500	180.0		—	1500	360		1500
NVD □ UC1100	1070 - 1210	680	895	110.0		—	1815	—		—	—	—		—
NVD □ UC1800	1700 - 1980	1000	1465	183.0		—	2970	360.0		—	2970	—		—

□ Add disk diameter

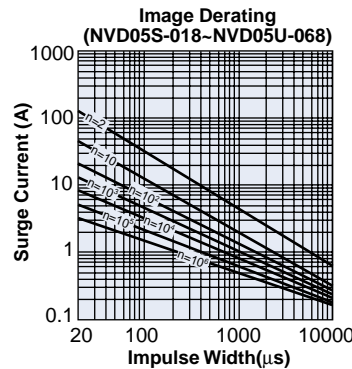
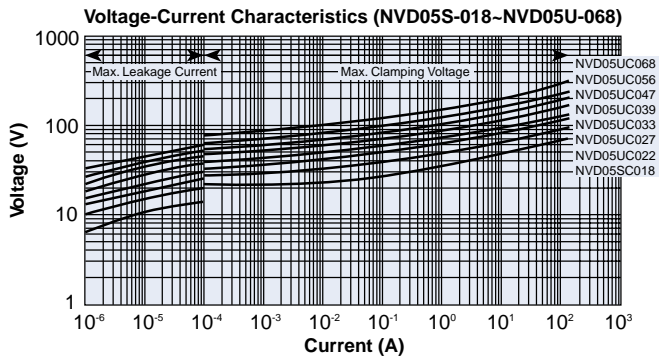
\* Manufacturing range of NVD10UCBis varistor voltages 22 - 270

\*\* NVD14C100 is applied

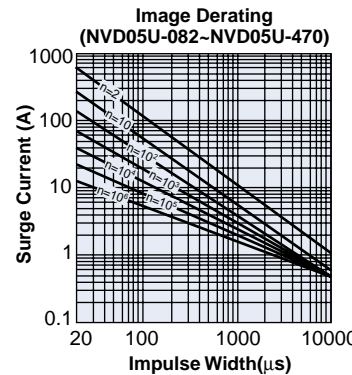
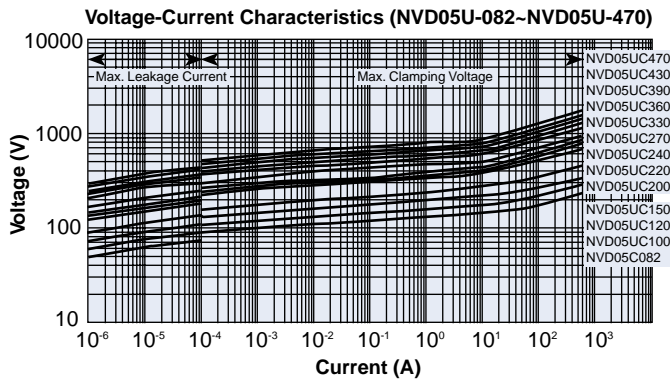
circuit protection

**environmental applications**

**Typical Characteristics (Ta = +25°C) D05U**



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

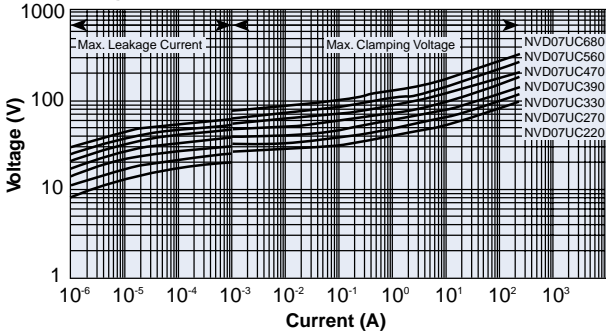


Surge current is related to impulse width and its repetition times.

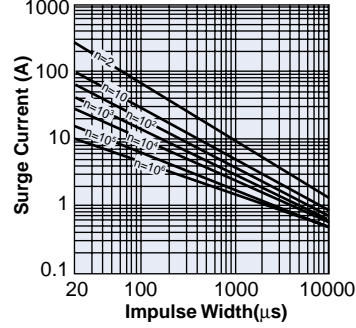
**environmental applications** (continued)

**Typical Characteristics (Ta = +25°C) D07U**

**Voltage-Current Characteristics (NVD07U-022~NVD07U-068)**

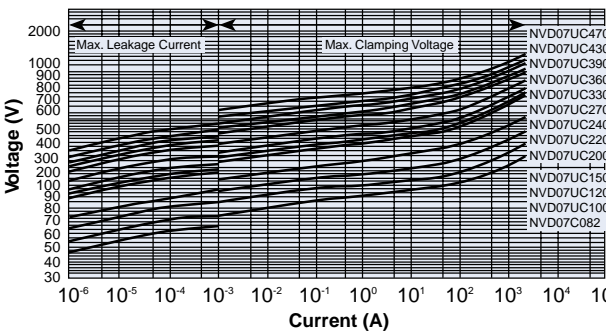


**Image Derating (NVD07U-022~NVD07U-068)**

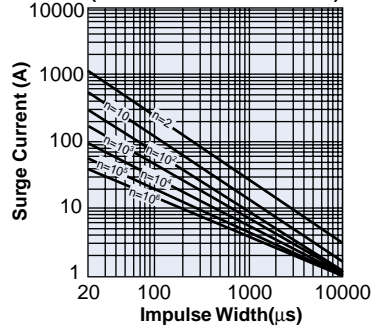


Surge current is related to impulse width and its repetition times.

**Voltage-Current Characteristics (NVD07U-082~NVD07U-470)**



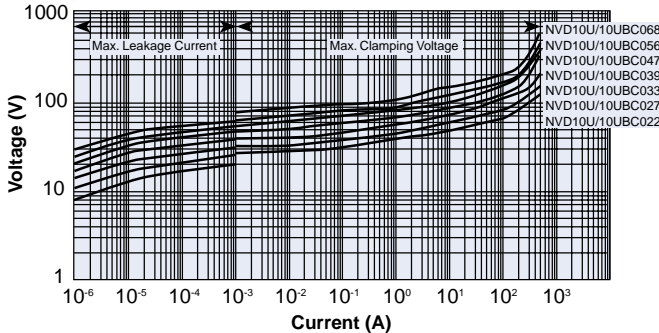
**Image Derating (NVD07U-082~NVD07U-470)**



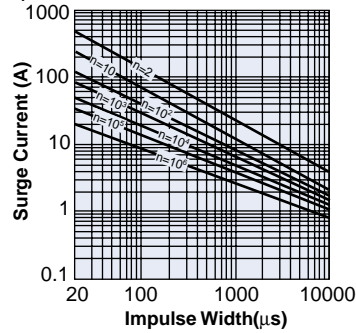
Surge current is related to impulse width and its repetition times.

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

**Voltage-Current Characteristics (NVD10U/10UB-022~NVD10U/10UB-068)**

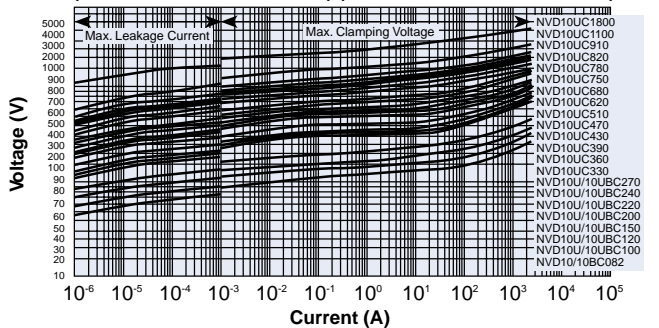


**Image Derating (NVD10U/10UB-022~NVD10U/10UB-068)**

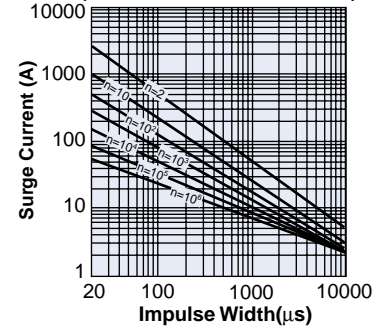


Surge current is related to impulse width and its repetition times.

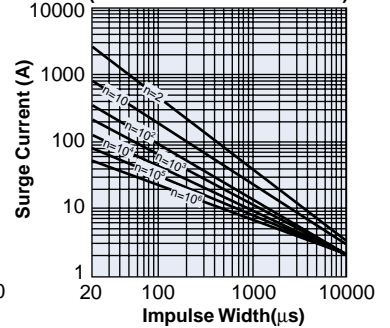
**Voltage-Current Characteristics (NVD10U-082~NVD10U-1800) (NVD10UB-082~NVD10UB-270)**



**Image Derating (NVD10U-082~NVD10U-510) (NVD10UB-082~NVD10UB-270)**



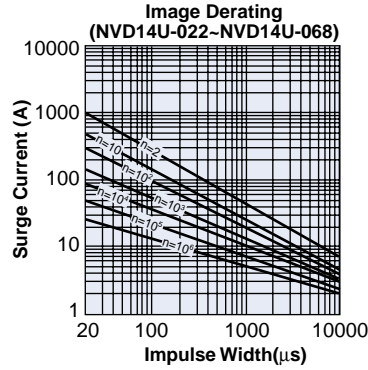
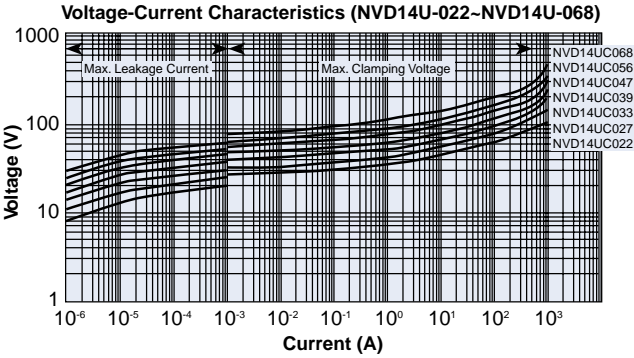
**Image Derating (NVD10U-620~NVD10U-1800)**



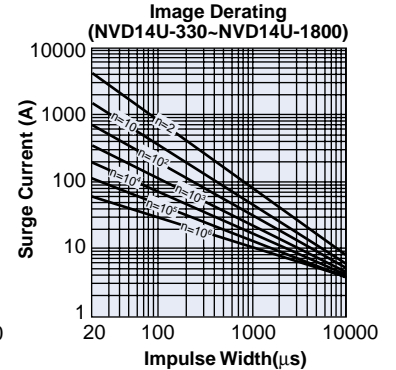
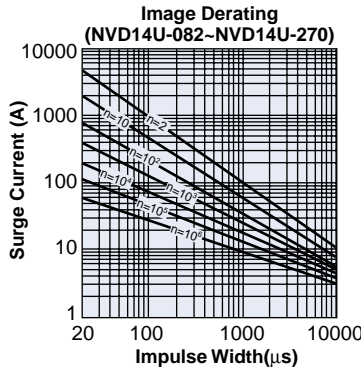
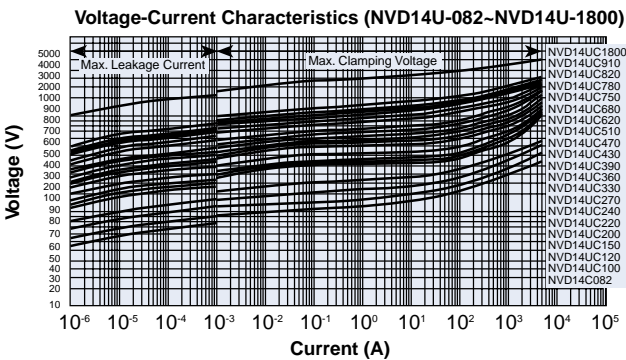


**environmental applications** (continued)

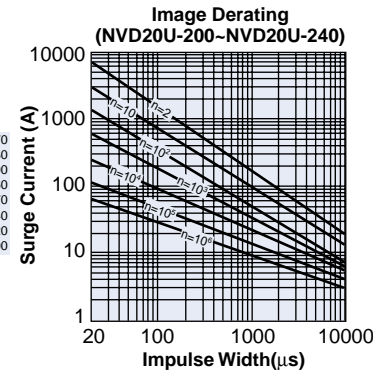
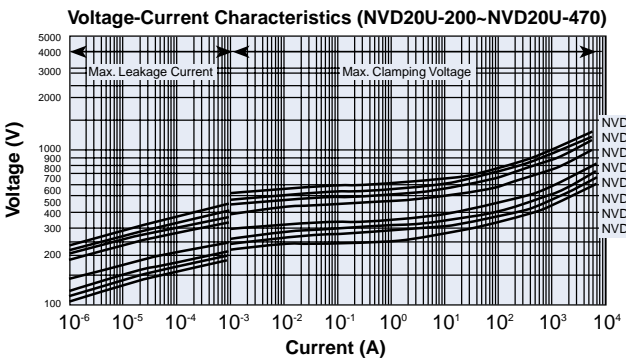
**Typical Characteristics (Ta = +25°C) D14U**



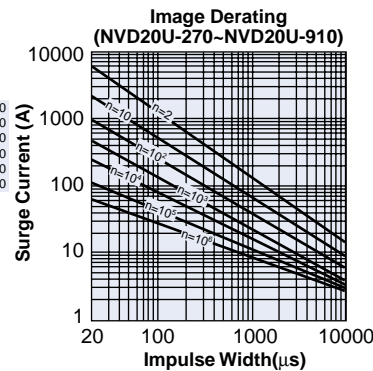
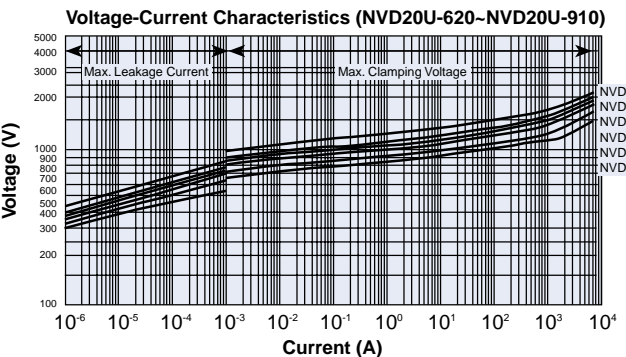
Surge current is related to impulse width and its repetition times.



**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.

**environmental applications** (continued)

**Performance Characteristics**

Parameter	Requirement	Test Method	
		Ic	Type
Varistor Voltage	Within specified tolerance	Voltage between terminals when the specified current is flowed	
		0.1mA	NVD05UC
		1mA	NVD07UC - NVD20UC
Solderability	95% coverage minimum	230°C ± 5°C, 5 seconds ± 0.5 second / 250°C ± 5°C, 5 seconds ± 0.5 second (Pb free)	
Resistance to Solder Heat	No abnormality in appearance	260°C ± 5°C, 10 seconds ± 1 second	
Rapid Change of Temperature	No abnormality in appearance	-40°C (30 minutes)/ +125°C (30 minutes), 5 cycles, except NVD20UC -40°C (30 minutes)/ +85°C (30 minutes), 5 cycles: NVD20UC	
Maximum Peak Current	±10%	Rated impulse current of (T=8/20µs), positive/negative applied once each	
High Temperature Life with d.c. Bias	±10%	85°C ± 5°C, Vc=(Vd.c.) 1000h Load: maximum allowable circuit voltage (d.c.)	
High Temperature Life with a.c. Bias	±10%	85°C ± 5°C, Vc=(Va.c.r.m.s.) 1000h Load: maximum allowable circuit voltage (d.c.)	
High Temperature & High Humidity Life with Bias	±5%	80°C ± 5°C, 95% RH, 1000h	
High Temperature Storage Life	±5%	125°C ± 5°C, 1000h	
Low Temperature Storage Life	±5%	-40°C ± 5°C, 1000h	