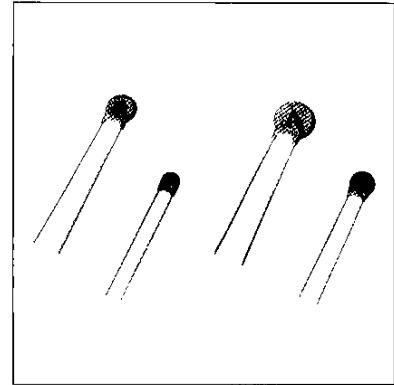


Z-TRAP ENE series

Nominal varistor voltage 200 to 470V

■ Features

- Excellent clamping characteristics
- High discharge current capability
- Fast response time
- Eliminate follow-on current



■ Maximum ratings and characteristics

● Nominal varistor voltage 200 to 270V

Device type	Max. applied voltage *1		Nominal varistor peak voltage*2 (Tolerance)(V)	Clamping voltage*3		Peak current*4 (A)	Energy *5 (J)	Average power dissipation (W)	Typical capacitance f=1kHz (pF)	Standards *6		
	AC(Vrms)	DC(V)		Vc(V)	Ip(A)					UL1	UL2	CSA
ENE201D-05A	130	170	200	355	5	700	6.0	0.1	200	○	—	○
ENE201D-07A			(185 ~ 225)	340	10	1350	12.5	0.25	400	○	○	○
ENE201D-10A				340	25	2750	25.0	0.4	800	○	○	○
ENE201D-14A				340	50	5500	50.0	0.6	1600	○	○	○
ENE201D-20A				340	100	7000	100.0	1.0	3200	○	○	○
ENE221D-05A	140	180	220	380	5	700	6.5	0.1	170	○	—	○
ENE221D-07A			(198 ~ 242)	360	10	1350	13.5	0.25	350	○	○	○
ENE221D-10A				360	25	2750	28.0	0.4	700	○	○	○
ENE221D-14A				360	50	5500	55.0	0.6	1400	○	○	○
ENE221D-20A				360	100	7000	110.0	1.0	2800	○	○	○
ENE241D-05A	150	200	240	415	5	700	7.5	0.1	170	○	—	○
ENE241D-07A			(216 ~ 264)	395	10	1350	15.0	0.25	350	○	○	○
ENE241D-10A				395	25	2750	30.0	0.4	700	○	○	○
ENE241D-14A				395	50	5500	60.0	0.6	1300	○	○	○
ENE241D-20A				395	100	7000	120.0	1.0	2600	○	○	○
ENE271D-05A	175	225	270	475	5	700	8.0	0.1	150	○	—	○
ENE271D-07A			(247 ~ 303)	455	10	1350	17.0	0.25	300	○	○	○
ENE271D-10A				455	25	2750	35.0	0.4	600	○	○	○
ENE271D-14A				455	50	5500	70.0	0.6	1200	○	○	○
ENE271D-20A				455	100	7000	135.0	1.0	2400	○	○	○

* Operating ambient temperature: — 40 °C to 85 °C

* Storage temperature: — 40 °C to 125 °C

Approved ○ Not approved —

*1 The waveform of the maximum DC applied voltage is flat. When a ripple voltage as from a rectifier source is applied, make sure that the peak voltage is within the V_{dc} rating.
The AC applied voltage is a sine waveform. When waveform distortion is extensive, make sure that the peak voltage is less than $\sqrt{2}$ times the V_{ac} rating.

*2 Indicates the varistor terminal voltage measured with 1mA DC applied (V_{1mA}). For 0.5A types, 0.1mA DC applied (V_{0.1mA})

*3 Indicates the peak terminal voltage measured with 8/20 μ s impulse current (I_p) applied.

*4 The peak current rating is based on 8/20 μ s test impulse waveform. The peak current is the max. peak current at which the nominal varistor voltage shift does not exceed $\pm 10\%$ when the test impulse is applied twice at a 5-minute interval.

*5 The rating is the max. allowable energy of a single 2ms square-waveform impulse current continuously applied. Energy ratings are based on a shift of V_{nom} of less than $\pm 10\%$ of the initial value.

*6 UL1: UL1414 File No. E66188
UL2: UL1449 File No. E123894
CSA: Class 2221 01 File No. LR98228

■ Maximum ratings and characteristics

● Nominal varistor voltage 360 to 470V

Device type	Max. applied voltage *1		Nominal varistor peak voltage*2 (Tolerance)(V)	Clamping voltage*3 Vc(V) Ip(A)		Peak current*4 (A)	Energy *5 (J)	Average power dissipation (W)	Typical capacitance f=1kHz (pF)	Standards *6		
	AC(Vrms)	DC(V)								UL1	UL2	CSA
ENE361D-05A	230	300	360 (324 ~ 396)	620	5	700	10.5	0.1	120	○	—	○
ENE361D-07A				595	10	1350	21.0	0.25	250	○	○	○
ENE361D-10A				595	25	2750	42.0	0.4	500	○	○	○
ENE361D-14A				595	50	5500	90.0	0.6	1000	○	○	○
ENE361D-20A				595	100	7000	180.0	1.0	2000	○	○	○
ENE391D-05A	250	320	390 (351 ~ 429)	675	5	700	11.0	0.1	110	○	—	○
ENE391D-07A				650	10	1350	24.0	0.25	220	○	○	○
ENE391D-10A				650	25	2750	48.0	0.4	450	○	○	○
ENE391D-14A				650	50	5500	100.0	0.6	900	○	○	○
ENE391D-20A				650	100	7000	195.0	1.0	1800	○	○	○
ENE431D-05A	275	350	430 (387 ~ 473)	745	5	700	12.5	0.1	100	○	—	○
ENE431D-07A				710	10	1350	28.0	0.25	200	○	○	○
ENE431D-10A				710	25	2750	55.0	0.4	400	○	○	○
ENE431D-14A				710	50	5500	105.0	0.6	800	○	○	○
ENE431D-20A				710	100	7000	215.0	1.0	1600	○	○	○
ENE471D-05A	300	385	470 (423 ~ 517)	810	5	700	15.0	0.1	80	○	—	○
ENE471D-07A				775	10	1350	30.0	0.25	170	○	○	○
ENE471D-10A				775	25	2750	60.0	0.4	350	○	○	○
ENE471D-14A				775	50	5500	125.0	0.6	700	○	○	○
ENE471D-20A				775	100	7000	250.0	1.0	1400	○	○	○

- Operating ambient temperature: — 40 °C to 85 °C
- Storage temperature: — 40 °C to 125 °C

Approved ○ Not approved —

*1 The waveform of the maximum DC applied voltage is flat. When a ripple voltage as from a rectifier source is applied, make sure that the peak voltage is within the V_{dc} rating.
The AC applied voltage is a sine waveform. When waveform distortion is extensive, make sure that the peak voltage is less than $\sqrt{2}$ times the V_{ac} rating.

*2 Indicates the varistor terminal voltage measured with 1mA DC applied (V_{1mA}). For 0.5A types, 0.1mA DC applied (V_{0.1mA})

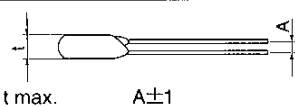
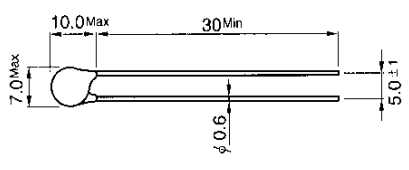
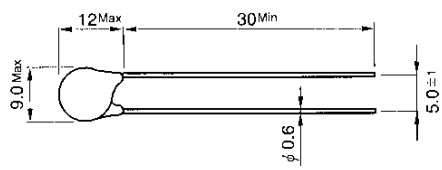
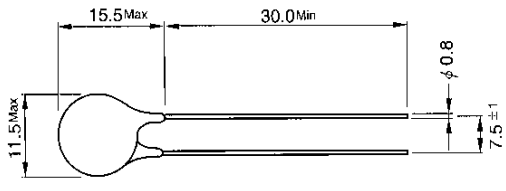
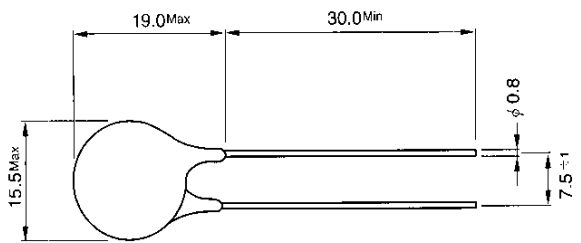
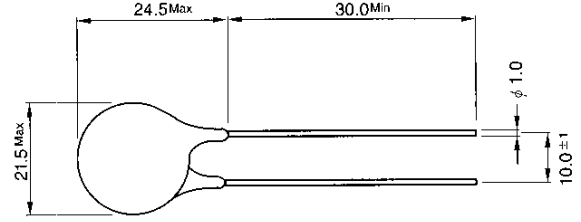
*3 Indicates the peak terminal voltage measured with 8/20μs impulse current (I_p) applied.

*4 The peak current rating is based on 8/20μs test impulse waveform. The peak current is the max. peak current at which the nominal varistor voltage shift does not exceed $\pm 10\%$ when the test impulse is applied twice at a 5-minute interval.

*5 The rating is the max. allowable energy of a single 2ms square-waveform impulse current continuously applied. Energy ratings are based on a shift of V_{nom} of less than $\pm 10\%$ of the initial value.

*6
UL1: UL1414 File No. E66188
UL2: UL1449 File No. E123894
CSA: Class 2221 01 File No. LR98228

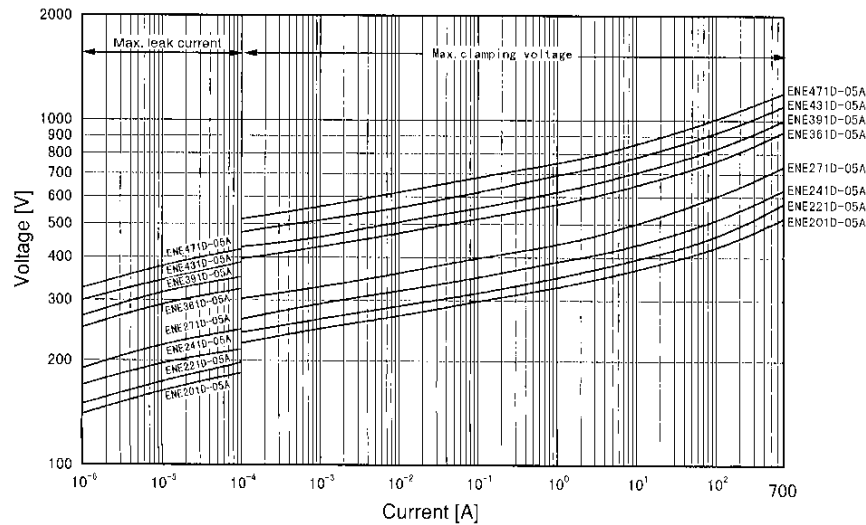
■ Outline drawing, mm

Type	Dimensions	 t max. A±1	
ENE201D-05A ENE221D-05A ENE241D-05A ENE271D-05A ENE361D-05A ENE391D-05A ENE431D-05A ENE471D-05A		4.4 4.5 4.6 4.8 5.3 5.4 5.6 5.8	1.7 1.8 1.9 2.1 2.5 2.7 2.9 3.1
ENE201D-07A ENE221D-07A ENE241D-07A ENE271D-07A ENE361D-07A ENE391D-07A ENE431D-07A ENE471D-07A		4.4 4.5 4.6 4.8 5.3 5.4 5.6 5.8	1.7 1.8 1.9 2.1 2.5 2.7 2.9 3.1
ENE201D-10A ENE221D-10A ENE241D-10A ENE271D-10A ENE361D-10A ENE391D-10A ENE431D-10A ENE471D-10A		4.8 4.9 5.0 5.2 5.7 5.8 6.0 6.2	1.9 2.0 2.1 2.3 2.8 2.9 3.1 3.3
ENE201D-14A ENE221D-14A ENE241D-14A ENE271D-14A ENE361D-14A ENE391D-14A ENE431D-14A ENE471D-14A		4.8 4.9 5.0 5.2 5.7 5.8 6.0 6.2	1.9 2.0 2.1 2.3 2.8 2.9 3.1 3.3
ENE201D-20A ENE221D-20A ENE241D-20A ENE271D-20A ENE361D-20A ENE391D-20A ENE431D-20A ENE471D-20A		5.2 5.3 5.4 5.6 6.1 6.2 6.4 6.6	2.1 2.2 2.3 2.5 3.0 3.1 3.3 3.5

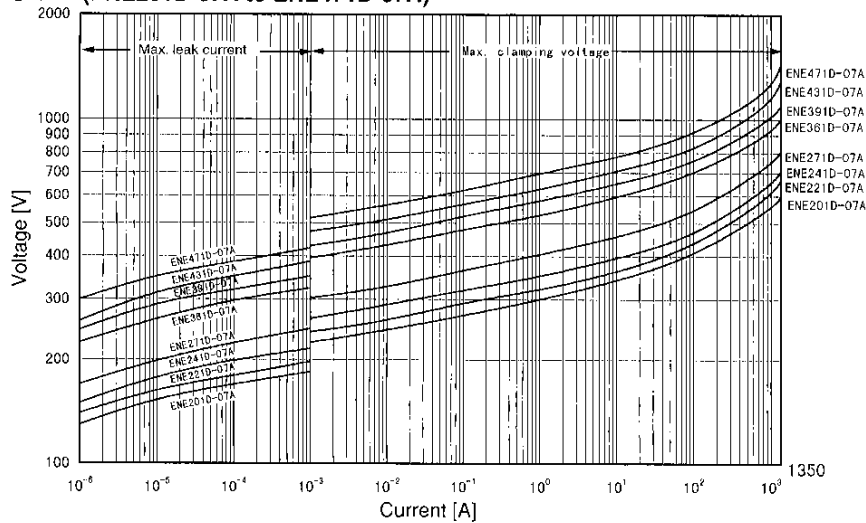
■ Transient V-I characteristics

● 05A (ENE201D-05A to ENE471D-05A)

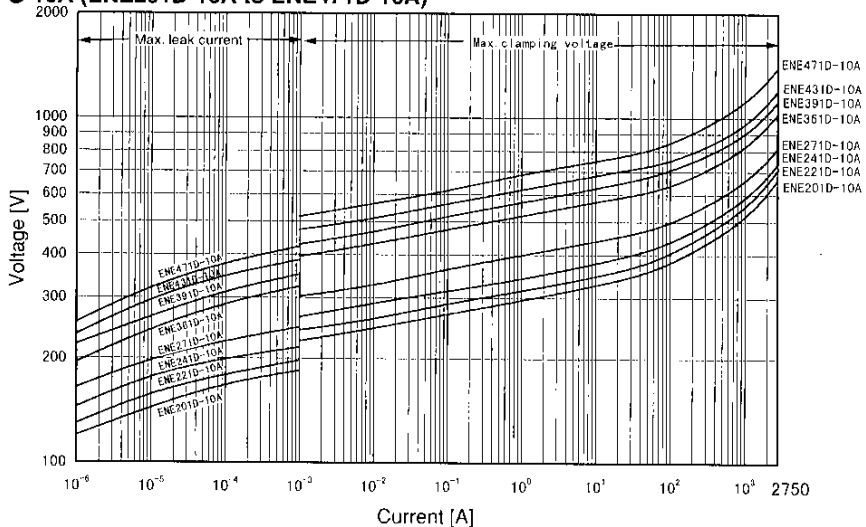
Current waveform Under 10^{-2} A: DC
Over 10^{-1} A: 8/20 μ s



● 07A (ENE201D-07A to ENE471D-07A)

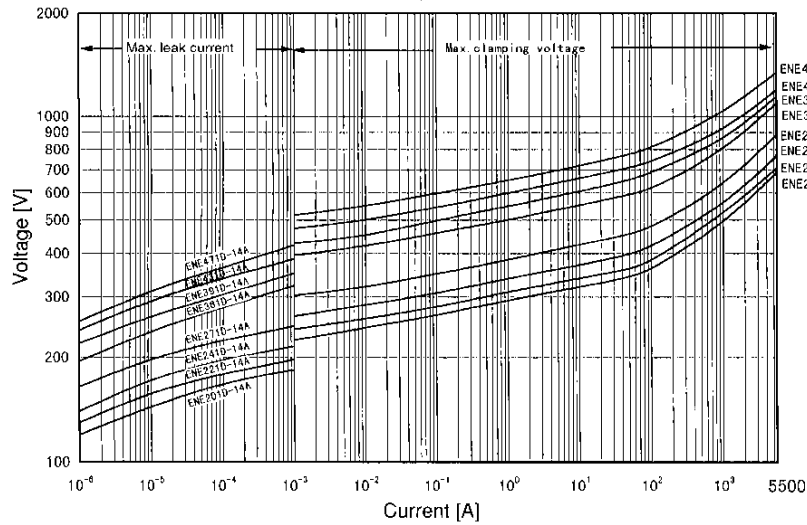


● 10A (ENE201D-10A to ENE471D-10A)

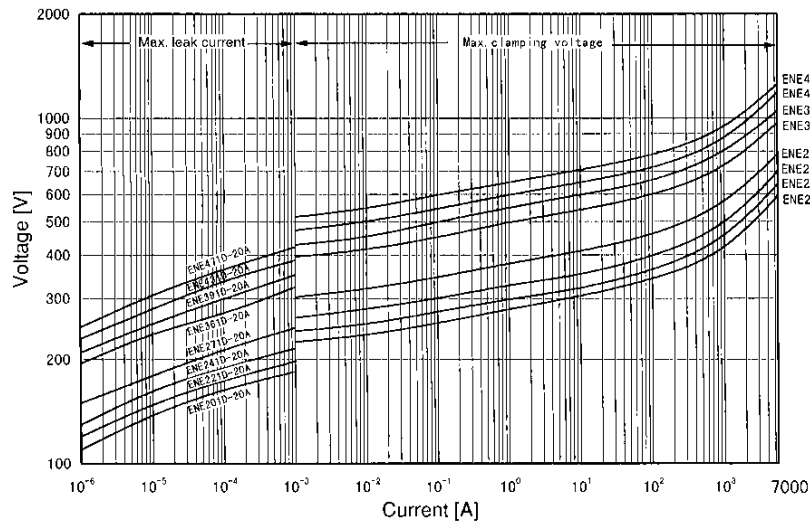


● 14A (ENE201D-14A to ENE471D-14A)

Current waveform Under 10^{-2} A: DC
Over 10^{-1} A: $8/20\mu\text{s}$



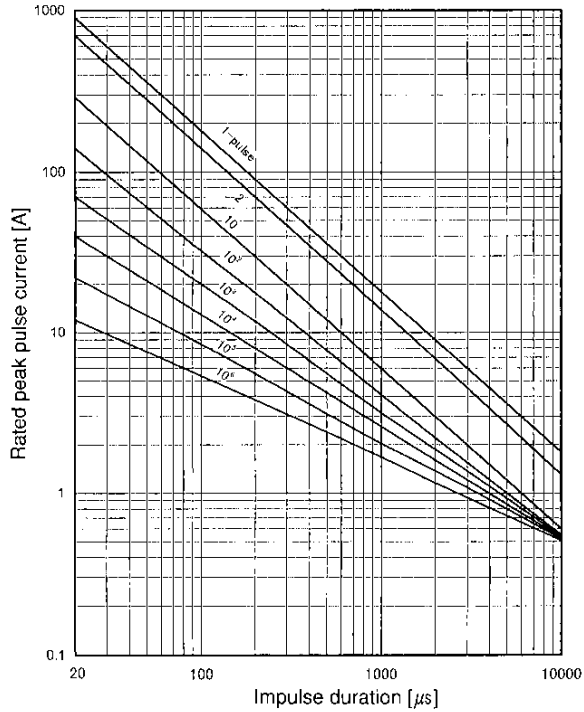
● 20A (ENE201D-20A to ENE471D-20A)



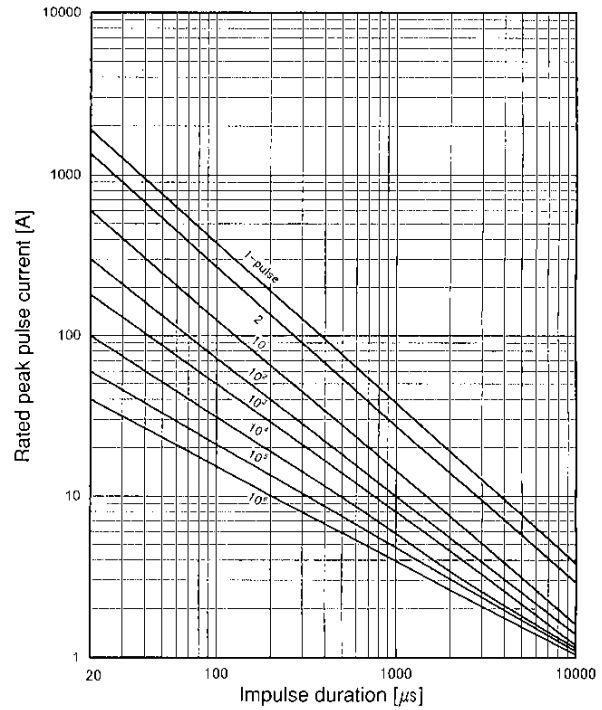
■ Pulse lifetime ratings

2-pulse: 5-minute interval
 3 to 10-pulse: 2-minute interval
 Up to 10^6 -pulse: 10-second interval

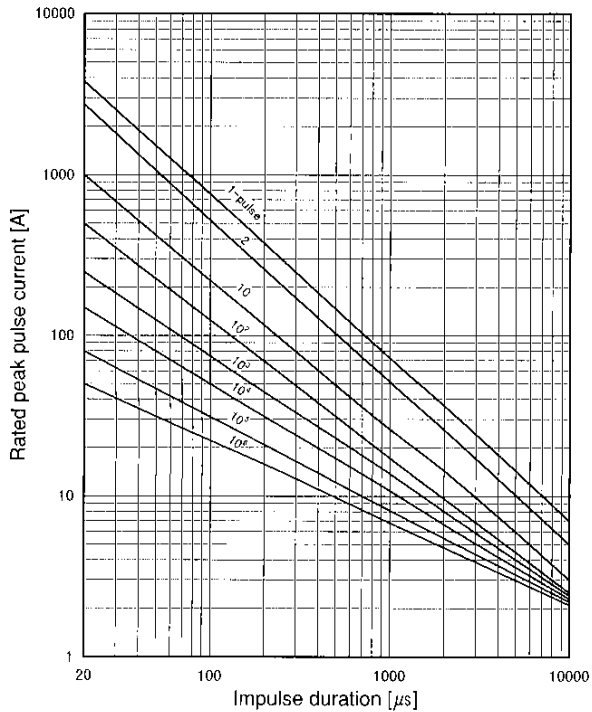
● 05A (ENE201D-05A to ENE471D-05A)



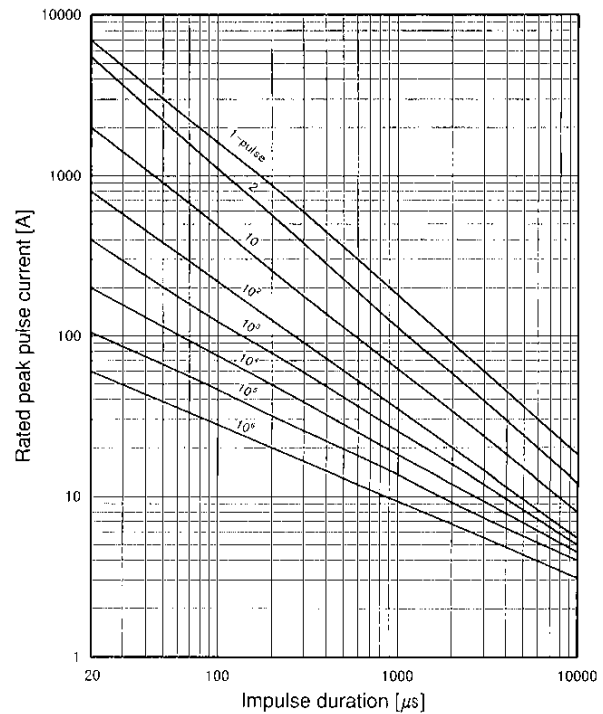
● 07A (ENE201D-07A to ENE471D-07A)



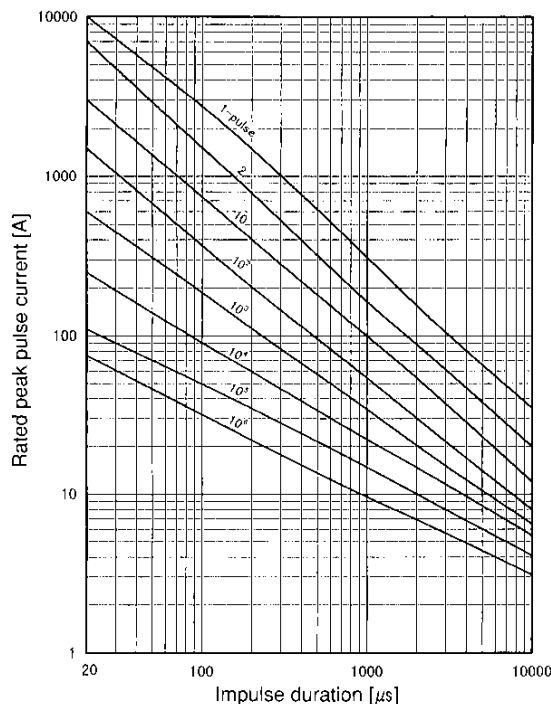
● 10A (ENE201D-10A to ENE471D-10A)



● 14A (ENE201D-14A to ENE471D-14A)



● 20A (ENE201D-20A to ENE471D-20A)



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