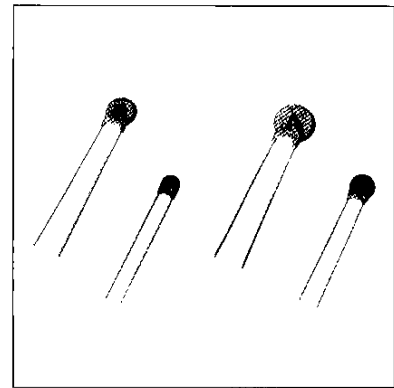


### Z-TRAP ENE series

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 (185 ~ 225)	355	5	700	6.0	0.1	200	○	—	○
ENE201D-07A				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 (198 ~ 242)	380	5	700	6.5	0.1	170	○	—	○
ENE221D-07A				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 (216 ~ 264)	415	5	700	7.5	0.1	170	○	—	○
ENE241D-07A				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 (247 ~ 303)	475	5	700	8.0	0.1	150	○	—	○
ENE271D-07A				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<sub>dc</sub> 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<sub>ac</sub> rating.

\*2 Indicates the varistor terminal voltage measured with 1mA DC applied (V<sub>1mA</sub>). For 0.5A types, 0.1mA DC applied (V<sub>0.1mA</sub>)

\*3 Indicates the peak terminal voltage measured with 8/20 $\mu$ s impulse current (Ip) applied.

\*4 The peak current rating is based on 8/20 $\mu$ 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<sub>nom</sub> 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		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
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<sub>dcm</sub> 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<sub>acm</sub> rating.

\*2 Indicates the varistor terminal voltage measured with 1mA DC applied (V<sub>1mA</sub>). For 0.5A types, 0.1mA DC applied (V<sub>0.1mA</sub>)

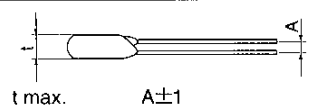
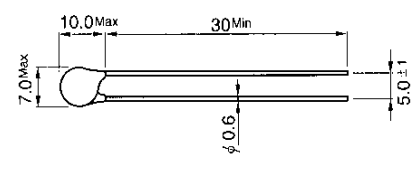
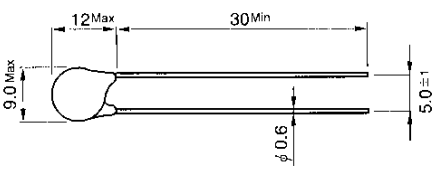
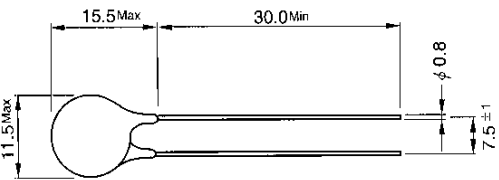
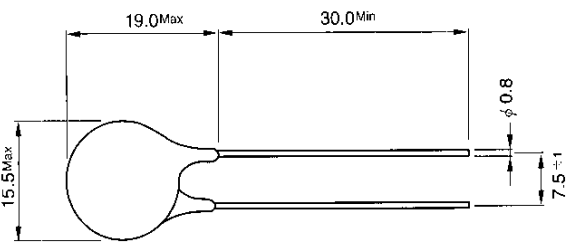
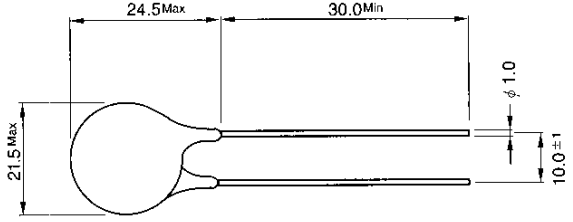
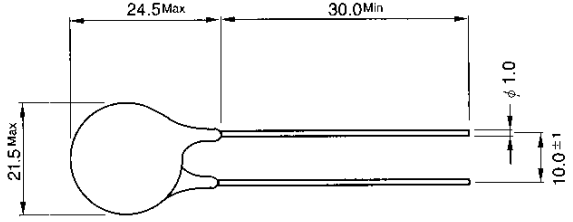
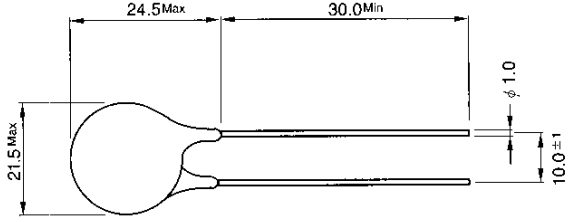
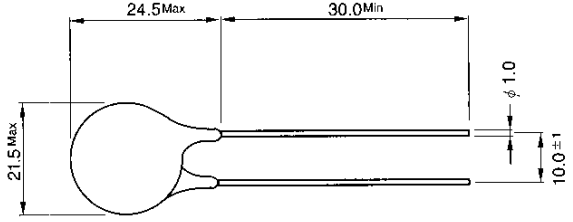
\*3 Indicates the peak terminal voltage measured with 8/20 $\mu$ s impulse current (Ip) applied.

\*4 The peak current rating is based on 8/20 $\mu$ 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<sub>nom</sub> 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

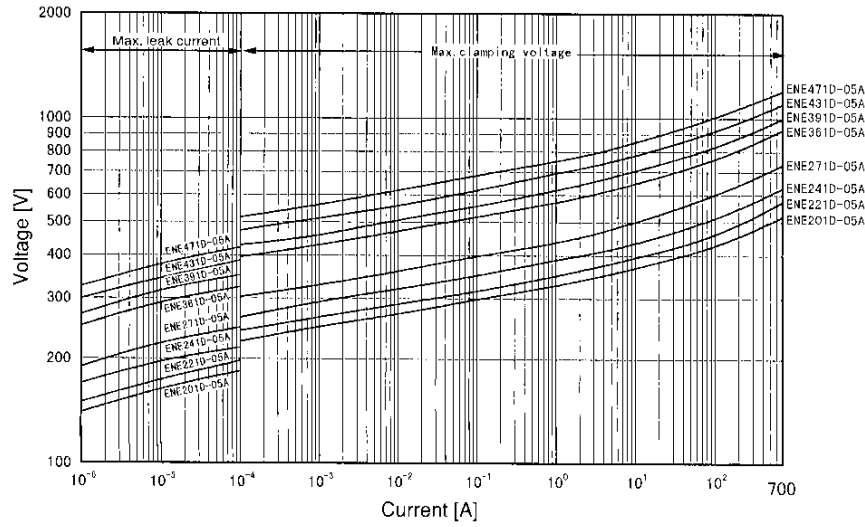
## ■ Outline drawing, mm

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

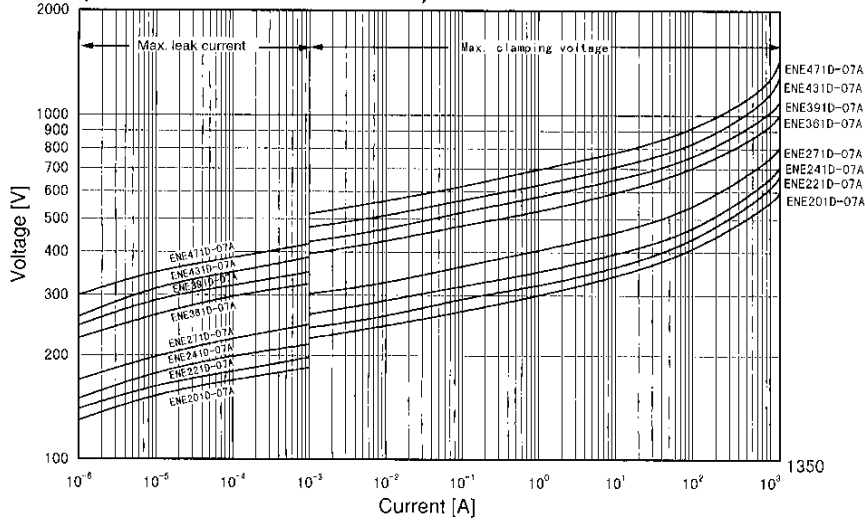
■ Transient V-I characteristics

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

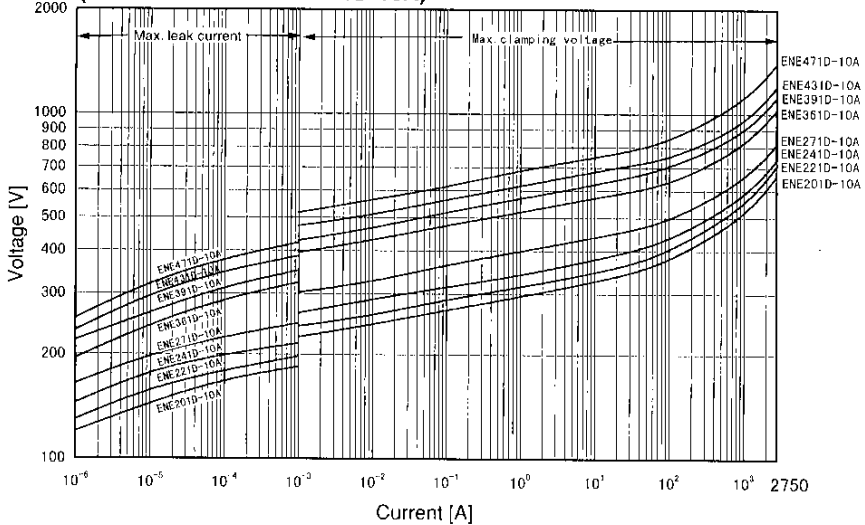
● 05A (ENE201D-05A to ENE471D-05A)



● 07A (ENE201D-07A to ENE471D-07A)

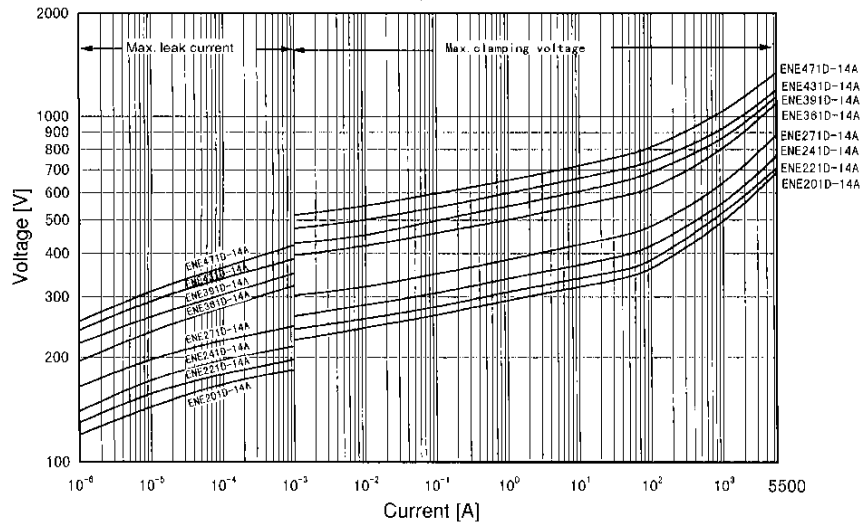


● 10A (ENE201D-10A to ENE471D-10A)

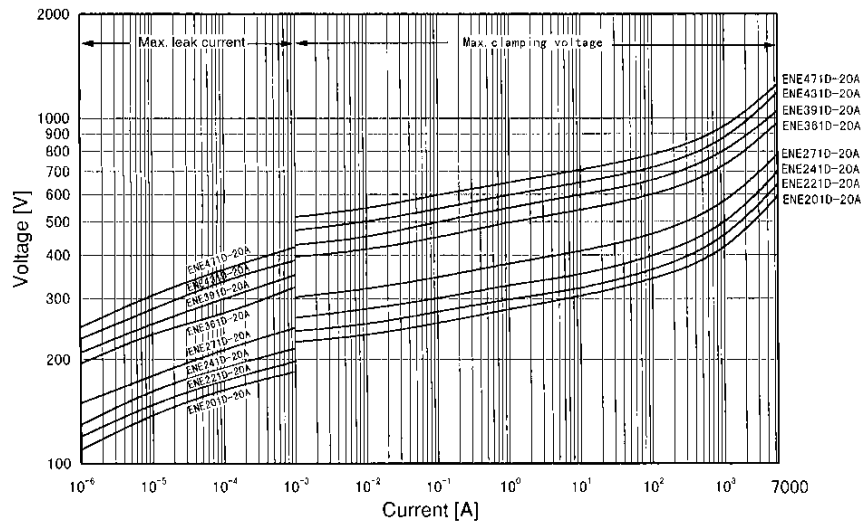


● 14A (ENE201D-14A to ENE471D-14A)

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



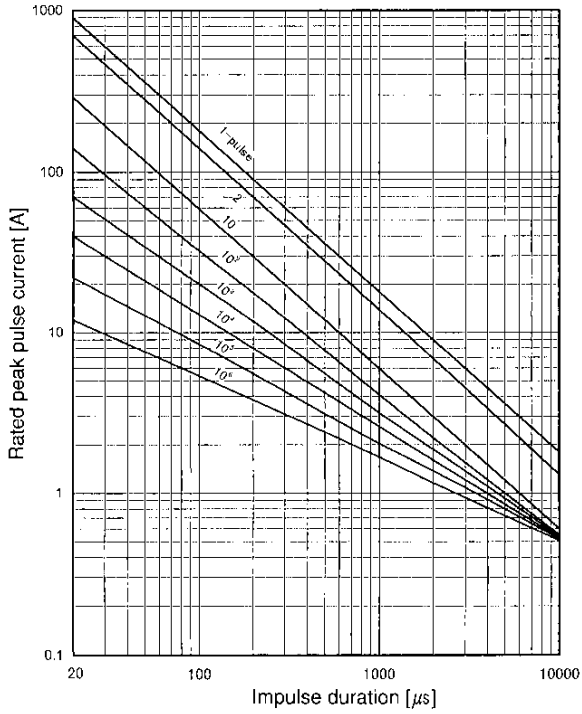
● 20A (ENE201D-20A to ENE471D-20A)



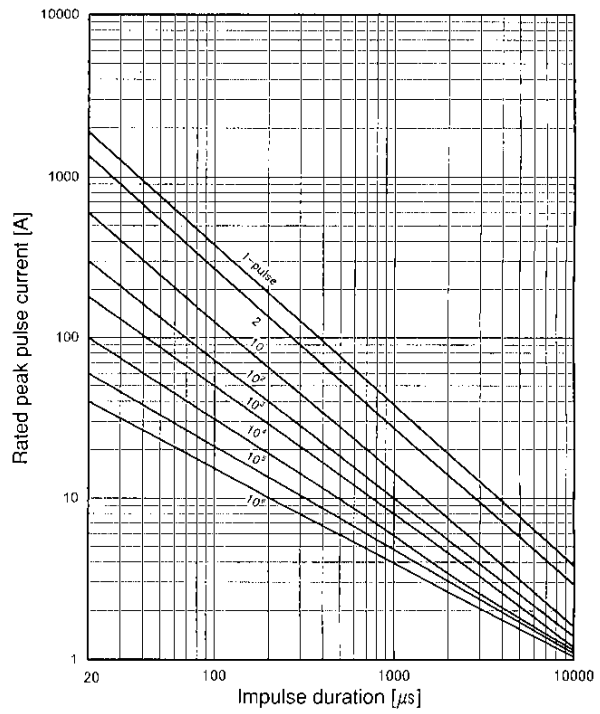
■ Pulse lifetime ratings

2-pulse: 5-minute interval  
 3 to 10-pulse: 2-minute interval  
 Up to 10<sup>6</sup>-pulse: 10-second interval

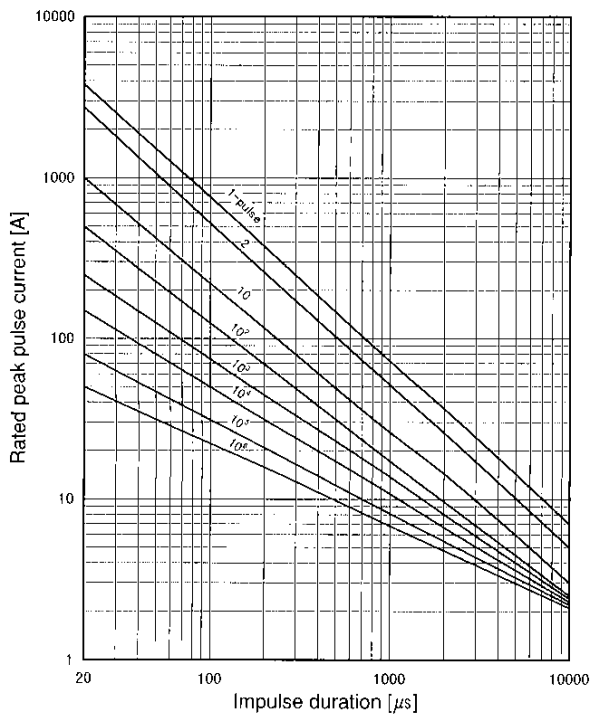
● 05A (ENE201D-05A to ENE471D-05A)



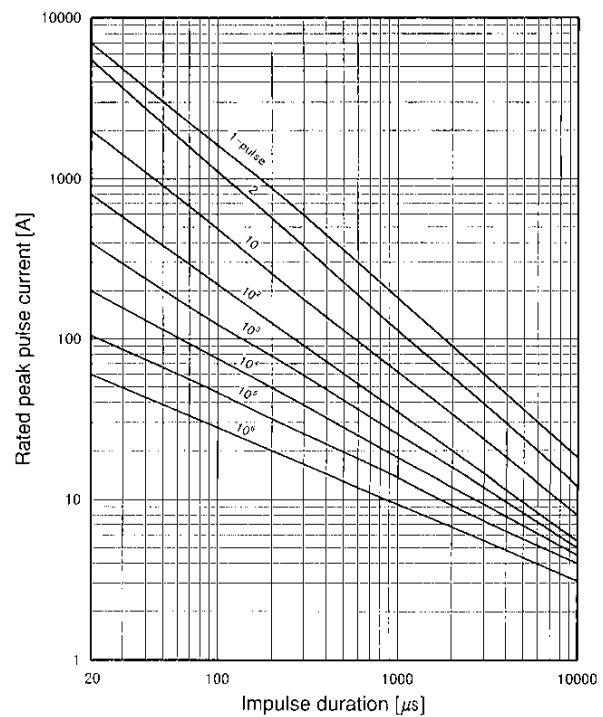
● 07A (ENE201D-07A to ENE471D-07A)



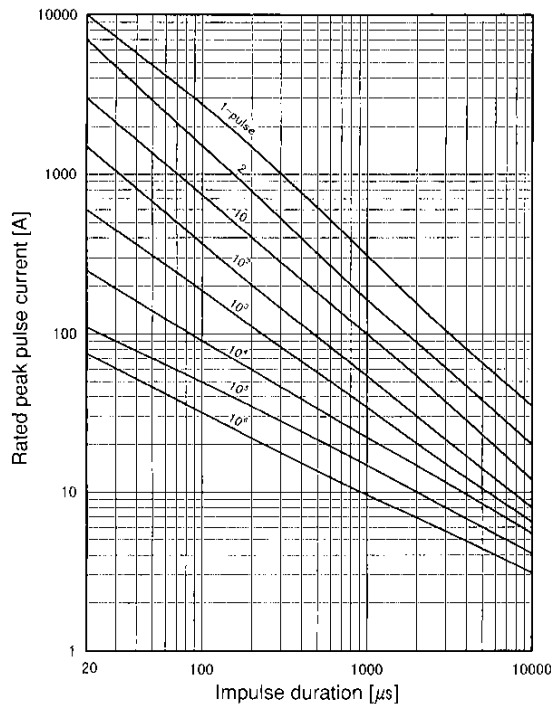
● 10A (ENE201D-10A to ENE471D-10A)



● 14A (ENE201D-14A to ENE471D-14A)



## ● 20A (ENE201D-20A to ENE471D-20A)



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