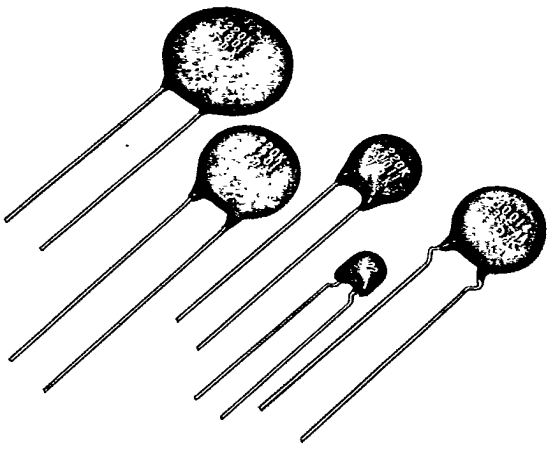
DISC VARISTORS, AVR SERIES



These varistors are non-linear voltage-current characteristics similar to back-to back Zener diodes. See Figure 1. The current increases quickly beyond a certain voltage known as the varistor voltage. These devices are used to protect electronic devices and circuits from transient high-voltage spikes. As Figure 2 shows, the varistor is placed in parallel with the circuit to be protected. When an over-voltage occurs in the circuit which exceeds the varistor voltage, the varistor's impedance circuit. This protects the circuit by limiting the voltage it sees to a level known as the varistor clamping voltage.

FEATURES

- Low clamping voltage and excellent protective characteristics.
- Rapid response to fast surges.
- Highly reliable.
- Symmetrical voltage-current characteristics are maintained even after a surge has been absorbed.
- Excellent temperature characteristics allows use over a wide range of temperatures.

Varistor voltage vs. current characteristics

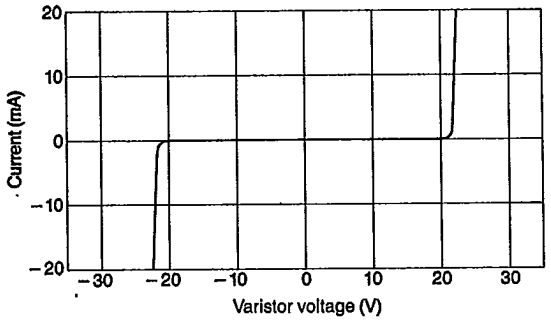
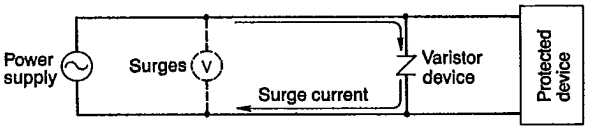
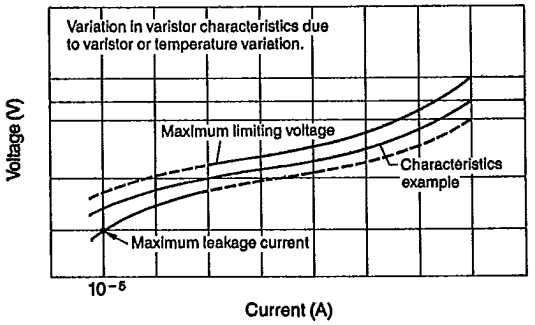


Fig. 1

Control of over-voltage using a varistor





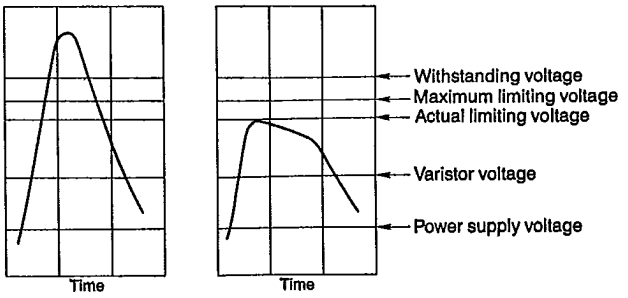


Fig. 2

APPLICATIONS

- Protection of automotive electronic devices.
- Protection of consumer electronic devices, including audio and video equipment.
- Protection of electronic devices in the home, including heating/cooling systems, kitchen equipment, home computers, etc.
- Protection of industrial electrical and electronic equipment, including control systems, test equipment, and telecommunications systems.
- Protection of office equipment, including computers, terminals, printers, and copiers.
- Protection of semiconductor devices, including diodes, transistors, thyristors, and ICs.
- Protection of devices and systems from static electricity accumulated in the human body.

PRODUCT IDENTIFICATION

AVR	-A	14	D	270	K
(1)	(2)	(3)	(4)	(5)	(6)

(1) Disc varistors
(2) Product feature
A: For low voltage high energy
B: Varistor voltage 18 to 47V
(3) Element's diameter
14: ϕ14mm
(4) Shape
D: Disc type
(5) Varistor voltage
Stands in three digits and in units of voltage (V).
The first and second digits identify the first and second significant figures.
The third digit identifies the multiplier.
270: 27V
(6) Varistor voltage tolerance
K: ±10%
J: ±5%

TEMPERATURE RANGE

Series	A Series	G Series
Operating	−40 to +125°C [−40 to +257°F]	−40 to +85°C [−40 to +185°F]
Storage	−40 to +150°C [−40 to +302°F]	−40 to +125°C [−40 to +257°F]

VARISTOR TESTING METHOD

For a detailed description of varistor testing methods, please refer to "Circular Board Oxidized Zinc Varistor Testing Method EMAS-8302," of the Electronic Material Industry Association of Japan Standards.

TERMINOLOGY

1. Varistor voltage
This is the nominal voltage at which the varistor begins to conduct current. The current level is denoted by V_{mA}, and is normally 1mA, or V_{1mA}.

2. Clamping voltage
This is the voltage which appears between the varistor terminals when the varistor voltage has been exceeded and the varistor begins to conduct current away from the device or circuit under protection. The clamping voltage will then appear across the device or circuit under protection.
As shown in Figure 2 (P. 320), the clamping voltage varies as a function of both the current flow through the varistor and the waveform of that current.
To ensure consistent conditions for determinig clamping voltage, a standardized current waveform with an 8μs rise time and a 20μs decay time (to 50% of the peak value) is used to measure clamping voltage. This waveform is shown in Figure 3. The clamping voltage is defined as the maximum voltage which appears across the varistor when it has been subjected to this "8 × 20μs" waveform.

Impulse current waveform

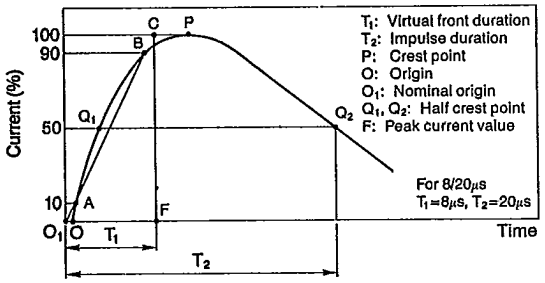


Fig. 3

3. Peak current
This is the maximum allowable current which can flow through the varistor. Since this value varies depending on the shape of the current waveform, a standard 8 × 20μs waveform is used to measure peak current. TDK measures peak current assuming a ±10% variation in the current impulse waveform. The measurement of peak current is based on the varistor being subjected to two times such current impulses.

4. Peak energy
This is the maximum energy the varistor can absorb when conducting a surge. Because the energy contained in a surge is a function of the peak current and the duration, a standardized current waveform is used to measure peak energy. This waveform is shown in Figure 4. The peak energy is calculated assuming a maximum variation in varistor voltage of 10%, using the following formula:
Voltage(V) × Current(A) × Time(s)=Energy(J)
When the current is not a square waveform, please refer to the section describing impulse energy (P. 324).

Square wave impulse current waveform

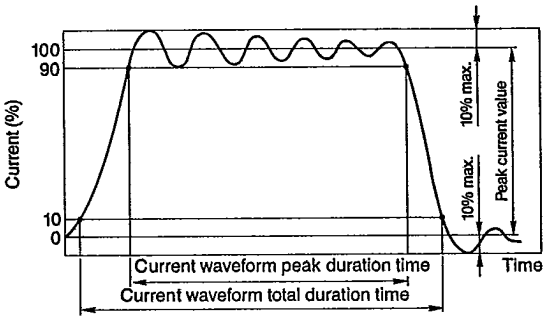


Fig. 4

5. Maximum allowable voltage
This is the maximum voltage which can be applied across the varistor without damage. This maximum voltage is applied for 1000 hours, at an ambient temperature of 85°C [185°F] (Some varistors are measured at 125°C [257°F]). It is measured assuming a ±10% variation in varistor voltage.

6. Maximum leakage current
This is the maximum amount of current which flows through the varistor when the applied voltage is below the clamping voltage.

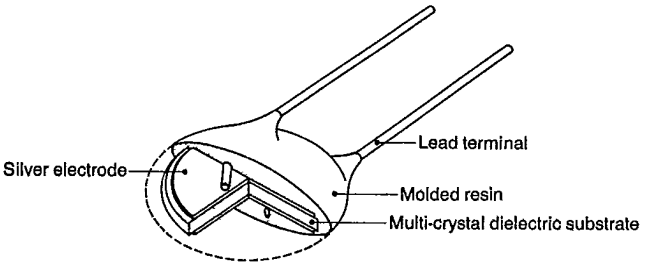
7. Lifetime surge rating
This measurement takes into account the fact that a varistor subjected to numerous surges will have a lower current handling capacity than one subjected to a single impulse. The lifetime surge rating is the maximum allowable surge current the varistor can withstand, assuming the application of 10000 surges in the form of an 8 × 20μs current waveform of the maximum allowable peak current.
A ±10% tolerance in varistor voltage is assumed.

8. Rated pulse power
When the surge consists of repeated, short-interval waveforms, it is necessary to estimate the total power in the surge. The rated pulse power is the maximum power the varistor can absorb, when commercial frequency AC power is continuously impressed for 1000 hours, at a temperature of 85°C [185°F].
A ± 10% tolerance in varistor voltage is assumed.

9. Lifetime energy rating
This measurement takes into account the fact that a varistor subjected to numerous surges will have a lower energy absorbing capacity than one subjected to a single impulse. The lifetime energy rating is the maximum energy in Joules the varistor can withstand, assuming the application of 10000 surges in the form of 2ms square wave current waveform.
A ± 10% tolerance in the varistor voltage is assumed.

RELATIONSHIP BETWEEN VARISTOR CONSTRUCTION AND PERFORMANCE CHARACTERISTICS

As shown in below, the TDK disc varistor consists of a multi-crystal body with electrodes and leads on both sides. It is covered by a coating of resin.
The multi-crystal body consists of a low-resistance crystal surrounded by a thin high-resistance particle field layer. The varistor characteristic is a tunnel phenomenon which occurs when the voltage impressed across the high-resistance particle field exceeds the nominal varistor voltage. Each grain boundary in the layer of particle field contributes approximately 2 to 3 volts to the varistor voltage. This means that the varistor voltage is proportional to thickness of the particle field, and therefore also proportional to the thickness of the varistor itself.



The relationship between varistor construction and characteristics are as follows:
- Varistor voltage is proportional to varistor element body thickness.
- Peak surge current is proportional to the electrode area which is proportional to the varistor element body area.
- Maximum energy is proportional to the volume of the varistor element body which is proportional to the product of its cross-section and thickness.

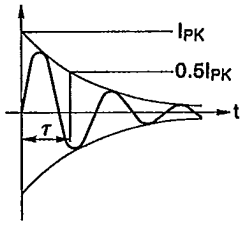
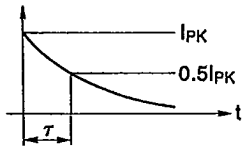
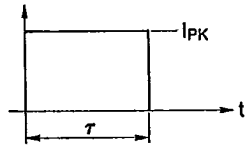
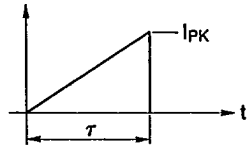
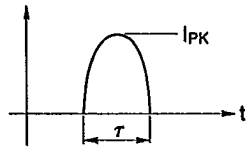
IMPULSE ENERGY

The energy contained in an impulse or waveform is calculated using the following equation:

$$E = \int_0^{\tau} Vx(t)\, I(t)\, \Delta t = K\, Vx\, I\tau$$

Vx: limiting voltage

The value of the constant K is tabulated in the table for various waveforms. Occasionally, it will be necessary to combine several of these example waveforms to duplicate the actual waveform for which the energy calculation is desired. See the example following the table.

Waveform	Calculation	K
	$I_{PK} \sin(\pi t)\, e^{-t/\tau}$	0.86
	$I_{PK}\, e^{-t/1.44\tau}$	1.4
	I_{PK}	1.0
	$I_{PK}\left(\frac{t}{\tau}\right)$	0.5
	$I_{PK} \sin\left(\frac{\pi}{\tau} t\right)$	0.637

Calculation example:

To determine the energy in the waveform shown below, it will be divided into two waveforms. The energy in each part will be calculated, and combined for the total.

The portion of the waveform up to 5μs resembles the fourth waveform in the table, with a K of 0.5.

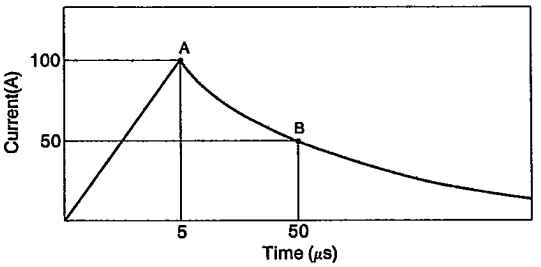
The portion of the waveform after 5μs resembles the second waveform in the table, with a K of 1.4.

Assuming that Vx=400V, the calculation is as follows:

$E_A = K\, Vx\, I\tau = (0.5)\,(400)\,(100)\,(5)\,(10^{-6}) = 0.1$ (J)

$E_B = K\, Vx\, I\tau = (1.4)\,(400)\,(100)\,(50-5)\,(10^{-6}) = 2.52$ (J)

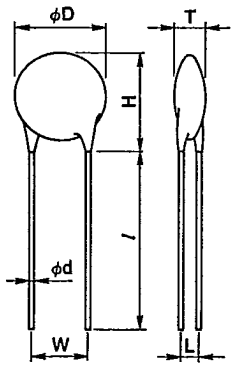
Total 2.62 (J)



Although two different waveforms may have exactly the same calculated energy, the one with a shorter duration and higher peak current will have a greater adverse effect on the varistor element.

AVR-A SERIES

AVR-A05D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	d $^{+0.06}_{-0.05}$ [$^{+.002}_{-.002}$]	l min.
AVR-A05D220K	7.5 [.295]	5.8 [.228]	5 [.197]	10.5 [.413]	1.5 [.059]	0.6 [.024]	25 [.984]
AVR-A05D270K	7.5 [.295]	5.8 [.228]	5 [.197]	10.5 [.413]	1.6 [.063]	0.6 [.024]	25 [.984]
AVR-A05D330K	7.5 [.295]	6 [.236]	5 [.197]	10.5 [.413]	1.9 [.075]	0.6 [.024]	25 [.984]
AVR-A05D390K	7.5 [.295]	6.3 [.248]	5 [.197]	10.5 [.413]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-A05D470K	7.5 [.295]	6.6 [.260]	5 [.197]	10.5 [.413]	2.5 [.098]	0.6 [.024]	25 [.984]

ELECTRICAL CHARACTERISTICS

Part No.	Varistor voltage $V_{0.1mA}$ (V)	Maximum circuit voltage (Vdc)	Maximum voltage V_{1A} (V)	Applied voltage (Vdc) 5 minutes	Energy (J) 20ms	Lifetime energy (J) 2ms/10^4 cycles	Capacitance (pF) at 1 kHz ref.
AVR-A05D220K	22 [20 to 24]	16	48	24	2.5	0.6	2200
AVR-A05D270K	27 [24 to 30]	19	60	29	2.5	0.6	1700
AVR-A05D330K	33 [30 to 36]	24	73	36	2.5	0.6	1500
AVR-A05D390K	39 [35 to 43]	28	86	42	2.5	0.6	1200
AVR-A05D470K	47 [42 to 52]	34	104	50	2.5	0.6	1100

• *Operating temperature range: −40 to +125°C [−40 to +257°F]*

AVR-A07D TYPE

Dimensions in mm [inches]

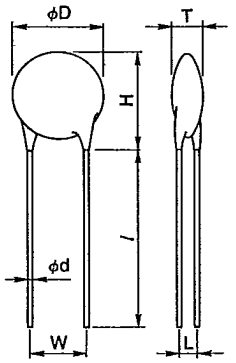
Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	d $^{+0.06}_{-0.05}$ [$^{+.002}_{-.002}$]	l min.
AVR-A07D220K	9.5 [.374]	5.8 [.228]	5 [.197]	12 [.472]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-A07D270K	9.5 [.374]	5.8 [.228]	5 [.197]	12 [.472]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-A07D330K	9.5 [.374]	6 [.236]	5 [.197]	12 [.472]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-A07D390K	9.5 [.374]	6.3 [.248]	5 [.197]	12 [.472]	2.4 [.094]	0.6 [.024]	25 [.984]
AVR-A07D470K	9.5 [.374]	6.6 [.260]	5 [.197]	12 [.472]	2.7 [.106]	0.6 [.024]	25 [.984]

ELECTRICAL CHARACTERISTICS

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vdc)	Maximum voltage $V_{2.5A}$ (V)	Applied voltage (Vdc) 5 minutes	Energy (J) 20ms	Lifetime energy (J) 2ms/10^4 cycles	Capacitance (pF) at 1 kHz ref.
AVR-A07D220K	22 [20 to 24]	16	45	24	5	1.2	4500
AVR-A07D270K	27 [24 to 30]	19	53	29	5	1.2	3500
AVR-A07D330K	33 [30 to 36]	24	65	36	5	1.2	3000
AVR-A07D390K	39 [35 to 43]	28	77	42	5	1.2	2500
AVR-A07D470K	47 [42 to 52]	34	93	50	5	1.2	2200

• *Operating temperature range: −40 to +125°C [−40 to +257°F]*

AVR-A10D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	$d^{+0.06}_{-0.05}$ [$^{+.002}_{-.002}$]	l min.
AVR-A10D220K	13.5 [.531]	5.8 [.228]	7.5 [.295]	17 [.669]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-A10D270K	13.5 [.531]	5.8 [.228]	7.5 [.295]	17 [.669]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-A10D330K	13.5 [.531]	6 [.236]	7.5 [.295]	17 [.669]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-A10D390K	13.5 [.531]	6.3 [.248]	7.5 [.295]	17 [.669]	2.4 [.094]	0.8 [.031]	25 [.984]
AVR-A10D470K	13.5 [.531]	6.6 [.260]	7.5 [.295]	17 [.669]	2.7 [.106]	0.8 [.031]	25 [.984]

ELECTRICAL CHARACTERISTICS

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vdc)	Maximum voltage V_{5A} (V)	Applied voltage (Vdc) 5 minutes	Energy (J) 20ms	Lifetime energy (J) 2ms/10^4 cycles	Capacitance (pF) at 1 kHz ref.
AVR-A10D220K	22 [20 to 24]	16	45	24	10	2.5	9000
AVR-A10D270K	27 [24 to 30]	19	53	29	10	2.5	7000
AVR-A10D330K	33 [30 to 36]	24	65	36	10	2.5	6000
AVR-A10D390K	39 [35 to 43]	28	77	42	10	2.5	5000
AVR-A10D470K	47 [42 to 52]	34	93	50	10	2.5	4500

• *Operating temperature range: −40 to +125°C [−40 to +257°F]*

AVR-A14D TYPE

Dimensions in mm [inches]

Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	$d^{+0.06}_{-0.05}$ [$^{+.002}_{-.002}$]	l min.
AVR-A14D220K	17.5 [.689]	5.8 [.228]	7.5 [.295]	20.5 [.807]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-A14D270K	17.5 [.689]	5.8 [.228]	7.5 [.295]	20.5 [.807]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-A14D330K	17.5 [.689]	6 [.236]	7.5 [.295]	20.5 [.807]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-A14D390K	17.5 [.689]	6.3 [.248]	7.5 [.295]	20.5 [.807]	2.4 [.094]	0.8 [.031]	25 [.984]
AVR-A14D470K	17.5 [.689]	6.6 [.260]	7.5 [.295]	20.5 [.807]	2.7 [.106]	0.8 [.031]	25 [.984]

ELECTRICAL CHARACTERISTICS

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vdc)	Maximum voltage V_{10A} (V)	Applied voltage (Vdc) 5 minutes	Energy (J) 20ms	Lifetime energy (J) 2ms/10^4 cycles	Capacitance (pF) at 1 kHz ref.
AVR-A14D220K	22 [20 to 24]	16	45	24	20	5	18000
AVR-A14D270K	27 [24 to 30]	19	53	29	20	5	14000
AVR-A14D330K	33 [30 to 36]	24	65	36	20	5	12000
AVR-A14D390K	39 [35 to 43]	28	77	42	20	5	10000
AVR-A14D470K	47 [42 to 52]	34	93	50	20	5	9000

• *Operating temperature range: −40 to +125°C [−40 to +257°F]*

AVR-A20D TYPE

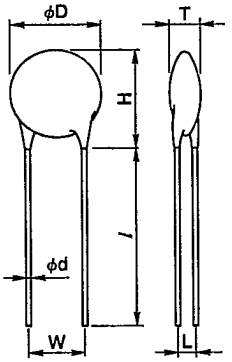
Dimensions in mm [inches]

Part No.	D max.	T max.	W ±1 [.039]	H max.	L ±1 [.039]	d ±1 [.004]	*l* min.
AVR-A20D220K	24 [.945]	5.8 [.228]	10 [.394]	28 [1.102]	1.8 [.071]	1 [.039]	25 [.984]
AVR-A20D270K	24 [.945]	5.8 [.228]	10 [.394]	28 [1.102]	1.8 [.071]	1 [.039]	25 [.984]
AVR-A20D330K	24 [.945]	6 [.236]	10 [.394]	28 [1.102]	2.1 [.083]	1 [.039]	25 [.984]
AVR-A20D390K	24 [.945]	6.3 [.248]	10 [.394]	28 [1.102]	2.4 [.094]	1 [.039]	25 [.984]
AVR-A20D470K	24 [.945]	6.6 [.260]	10 [.394]	28 [1.102]	2.7 [.106]	1 [.039]	25 [.984]

ELECTRICAL CHARACTERISTICS

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vdc)	Maximum voltage V_{20A} (V)	Applied voltage (Vdc) 5 minutes	Energy (J) 20ms	Lifetime energy (J) 2ms/10^4 cycles	Capacitance (pF) at 1 kHz ref.
AVR-A20D220K	22 [20 to 24]	16	45	24	40	10	38000
AVR-A20D270K	27 [24 to 30]	19	53	29	40	10	31000
AVR-A20D330K	33 [30 to 36]	24	65	36	40	10	25000
AVR-A20D390K	39 [35 to 43]	28	77	42	40	10	21000
AVR-A20D470K	47 [42 to 52]	34	93	50	40	10	18000

AVR-G SERIES
AVR-G05D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	d ± 0.1 [.004]	l min.
AVR-G05D180K	7.5 [.295]	5.8 [.228]	5 [.197]	10.5 [.413]	1.5 [.059]	0.6 [.024]	25 [.984]
AVR-G05D220K	7.5 [.295]	5.8 [.228]	5 [.197]	10.5 [.413]	1.5 [.059]	0.6 [.024]	25 [.984]
AVR-G05D270K	7.5 [.295]	5.8 [.228]	5 [.197]	10.5 [.413]	1.6 [.063]	0.6 [.024]	25 [.984]
AVR-G05D330K	7.5 [.295]	6 [.236]	5 [.197]	10.5 [.413]	1.9 [.075]	0.6 [.024]	25 [.984]
AVR-G05D390K	7.5 [.295]	6.3 [.248]	5 [.197]	10.5 [.413]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-G05D470K	7.5 [.295]	6.6 [.260]	5 [.197]	10.5 [.413]	2.5 [.098]	0.6 [.024]	25 [.984]
AVR-G05D560K	7.5 [.295]	4.9 [.193]	5 [.197]	10.5 [.413]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G05D680K	7.5 [.295]	5.2 [.205]	5 [.197]	10.5 [.413]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-G05D820K	7.5 [.295]	4.5 [.177]	5 [.197]	10.5 [.413]	1.4 [.055]	0.6 [.024]	25 [.984]
AVR-G05D101K	7.5 [.295]	4.6 [.181]	5 [.197]	10.5 [.413]	1.5 [.059]	0.6 [.024]	25 [.984]
AVR-G05D121K	7.5 [.295]	4.8 [.189]	5 [.197]	10.5 [.413]	1.7 [.067]	0.6 [.024]	25 [.984]
AVR-G05D151K	7.5 [.295]	5 [.197]	5 [.197]	10.5 [.413]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G05D181K	7.5 [.295]	5.1 [.201]	5 [.197]	10.5 [.413]	1.9 [.075]	0.6 [.024]	25 [.984]
AVR-G05D201K	7.5 [.295]	5.2 [.205]	5 [.197]	10.5 [.413]	2 [.079]	0.6 [.024]	25 [.984]
AVR-G05D221K	7.5 [.295]	5.3 [.209]	5 [.197]	10.5 [.413]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-G05D241K	7.5 [.295]	5.4 [.213]	5 [.197]	10.5 [.413]	2.2 [.087]	0.6 [.024]	25 [.984]
AVR-G05D271K	7.5 [.295]	5.6 [.220]	5 [.197]	10.5 [.413]	2.4 [.094]	0.6 [.024]	25 [.984]
AVR-G05D331K	7.5 [.295]	5.8 [.228]	5 [.197]	10.5 [.413]	2.7 [.106]	0.6 [.024]	25 [.984]
AVR-G05D361K	7.5 [.295]	6.2 [.244]	5 [.197]	10.5 [.413]	2.8 [.110]	0.6 [.024]	25 [.984]
AVR-G05D391K	7.5 [.295]	6.4 [.252]	5 [.197]	10.5 [.413]	3 [.118]	0.6 [.024]	25 [.984]
AVR-G05D431K	7.5 [.295]	6.7 [.264]	5 [.197]	10.5 [.413]	3.3 [.130]	0.6 [.024]	25 [.984]
AVR-G05D471K	7.5 [.295]	7 [.276]	5 [.197]	10.5 [.413]	3.5 [.138]	0.6 [.024]	25 [.984]

ELECTRICAL CHARACTERISTICS

Varistor voltage: 18 to 68V

Part No.	Varistor voltage $V_{0.1mA}$ (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{1A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G05D180K	18 [16 to 20]	11	14	40	0.01	0.7	100	2800
AVR-G05D220K	22 [20 to 24]	14	18	48	0.01	0.9	100	2300
AVR-G05D270K	27 [24 to 30]	17	22	60	0.01	1	100	1900
AVR-G05D330K	33 [30 to 36]	20	26	73	0.01	1.2	100	1600
AVR-G05D390K	39 [35 to 43]	25	31	86	0.01	1.5	100	1300
AVR-G05D470K	47 [42 to 52]	30	38	104	0.01	1.8	100	1100
AVR-G05D560K	56 [50 to 62]	35	45	123	0.01	1	100	700
AVR-G05D680K	68 [61 to 75]	40	56	150	0.01	1.2	100	600

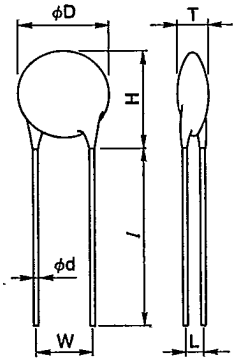
• *Operating temperature range: −40 to +85°C [−40 to +185°F]*

Varistor voltage: 82 to 470V

Part No.	Varistor voltage $V_{0.1mA}$ (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{5A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G05D820K	82 [74 to 90]	50	65	145	0.1	1.7	400	500
AVR-G05D101K	100 [90 to 110]	60	85	175	0.1	2	400	450
AVR-G05D121K	120 [108 to 132]	75	100	210	0.1	2.5	400	400
AVR-G05D151K	150 [135 to 165]	95	125	260	0.1	3	400	350
AVR-G05D181K	180 [162 to 198]	110	145	325	0.1	4	400	300
AVR-G05D201K	200 [185 to 225]	130	170	355	0.1	4	400	270
AVR-G05D221K	220 [198 to 242]	140	180	380	0.1	4.5	400	250
AVR-G05D241K	240 [216 to 264]	150	200	415	0.1	5	400	230
AVR-G05D271K	270 [247 to 303]	175	225	475	0.1	6	400	200
AVR-G05D331K	330 [297 to 363]	210	270	600	0.1	7	400	170
AVR-G05D361K	360 [324 to 396]	230	300	620	0.1	7.5	400	150
AVR-G05D391K	390 [351 to 429]	250	320	675	0.1	8	400	140
AVR-G05D431K	430 [387 to 473]	275	350	745	0.1	9	400	130
AVR-G05D471K	470 [423 to 517]	300	385	810	0.1	10	400	120

• *Operating temperature range: −40 to +85°C [−40 to +185°F]*

AVR-G07D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	d ± 0.1 [.004]	l min.
AVR-G07D180K	9.5 [.374]	5.8 [.228]	5 [.197]	12.5 [.492]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G07D220K	9.5 [.374]	5.8 [.228]	5 [.197]	12.5 [.492]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G07D270K	9.5 [.374]	5.8 [.228]	5 [.197]	12.5 [.492]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G07D330K	9.5 [.374]	6 [.236]	5 [.197]	12.5 [.492]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-G07D390K	9.5 [.374]	6.3 [.248]	5 [.197]	12.5 [.492]	2.4 [.094]	0.6 [.024]	25 [.984]
AVR-G07D470K	9.5 [.374]	6.6 [.260]	5 [.197]	12.5 [.492]	2.7 [.106]	0.6 [.024]	25 [.984]
AVR-G07D560K	9.5 [.374]	4.9 [.193]	5 [.197]	12.5 [.492]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G07D680K	9.5 [.374]	5.2 [.205]	5 [.197]	12.5 [.492]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-G07D820K	9.5 [.374]	4.5 [.177]	5 [.197]	12.5 [.492]	1.4 [.055]	0.6 [.024]	25 [.984]
AVR-G07D101K	9.5 [.374]	4.7 [.185]	5 [.197]	12.5 [.492]	1.6 [.063]	0.6 [.024]	25 [.984]
AVR-G07D121K	9.5 [.374]	4.9 [.193]	5 [.197]	12.5 [.492]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G07D151K	9.5 [.374]	5 [.197]	5 [.197]	12.5 [.492]	1.8 [.071]	0.6 [.024]	25 [.984]
AVR-G07D181K	9.5 [.374]	5.1 [.201]	5 [.197]	12.5 [.492]	1.9 [.075]	0.6 [.024]	25 [.984]
AVR-G07D201K	9.5 [.374]	5.2 [.205]	5 [.197]	12.5 [.492]	2 [.079]	0.6 [.024]	25 [.984]
AVR-G07D221K	9.5 [.374]	5.3 [.209]	5 [.197]	12.5 [.492]	2.1 [.083]	0.6 [.024]	25 [.984]
AVR-G07D241K	9.5 [.374]	5.4 [.213]	5 [.197]	12.5 [.492]	2.2 [.087]	0.6 [.024]	25 [.984]
AVR-G07D271K	9.5 [.374]	5.6 [.220]	5 [.197]	12.5 [.492]	2.4 [.094]	0.6 [.024]	25 [.984]
AVR-G07D331K	9.5 [.374]	5.8 [.228]	5 [.197]	12.5 [.492]	2.5 [.098]	0.6 [.024]	25 [.984]
AVR-G07D361K	9.5 [.374]	6.2 [.244]	5 [.197]	12.5 [.492]	2.6 [.102]	0.6 [.024]	25 [.984]
AVR-G07D391K	9.5 [.374]	6.4 [.252]	5 [.197]	12.5 [.492]	2.8 [.110]	0.6 [.024]	25 [.984]
AVR-G07D431K	9.5 [.374]	6.7 [.264]	5 [.197]	12.5 [.492]	3 [.118]	0.6 [.024]	25 [.984]
AVR-G07D471K	9.5 [.374]	7 [.276]	5 [.197]	12.5 [.492]	3.3 [.130]	0.6 [.024]	25 [.984]

ELECTRICAL CHARACTERISTICS

Varistor voltage: 18 to 68V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage $V_{2.5A}$ (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G07D180K	18 [16 to 20]	11	14	40	0.02	1.6	250	6000
AVR-G07D220K	22 [20 to 24]	14	18	45	0.02	2	250	5000
AVR-G07D270K	27 [24 to 30]	17	22	53	0.02	2.5	250	4000
AVR-G07D330K	33 [30 to 36]	20	26	65	0.02	3	250	3200
AVR-G07D390K	39 [35 to 43]	25	31	77	0.02	3.5	250	2700
AVR-G07D470K	47 [42 to 52]	30	38	93	0.02	4.5	250	2300
AVR-G07D560K	56 [50 to 62]	35	45	110	0.02	2.2	250	1500
AVR-G07D680K	68 [61 to 75]	40	56	135	0.02	2.5	250	1300

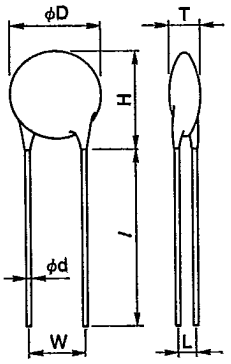
• Operating temperature range: −40 to +85°C [−40 to +185°F]

Varistor voltage: 82 to 470V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{10A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G07D820K	82 [74 to 90]	50	65	135	0.25	3.5	1200	1100
AVR-G07D101K	100 [90 to 110]	60	85	165	0.25	4	1200	1000
AVR-G07D121K	120 [108 to 132]	75	100	200	0.25	5	1200	850
AVR-G07D151K	150 [135 to 165]	95	125	250	0.25	6	1200	700
AVR-G07D181K	180 [162 to 198]	110	145	300	0.25	8	1200	600
AVR-G07D201K	200 [185 to 225]	130	170	340	0.25	10	1200	500
AVR-G07D221K	220 [198 to 242]	140	180	360	0.25	10	1200	450
AVR-G07D241K	240 [216 to 264]	150	200	395	0.25	10	1200	400
AVR-G07D271K	270 [247 to 303]	175	225	455	0.25	12	1200	350
AVR-G07D331K	330 [297 to 363]	210	270	550	0.25	15	1200	300
AVR-G07D361K	360 [324 to 396]	230	300	595	0.25	15	1200	280
AVR-G07D391K	390 [351 to 429]	250	320	650	0.25	17	1200	260
AVR-G07D431K	430 [387 to 473]	275	350	710	0.25	20	1200	240
AVR-G07D471K	470 [423 to 517]	300	385	775	0.25	20	1200	230

• Operating temperature range: −40 to +85°C [−40 to +185°F]

AVR-G10D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ±1 [.039]	H max.	L ±1 [.039]	$d^{+0.06}_{-0.05}$ [$^{+.002}_{-.002}$]	l min.
AVR-G10D180K	13.5 [.531]	5.8 [.228]	7.5 [.295]	17 [.669]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G10D220K	13.5 [.531]	5.8 [.228]	7.5 [.295]	17 [.669]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G10D270K	13.5 [.531]	5.8 [.228]	7.5 [.295]	17 [.669]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G10D330K	13.5 [.531]	6 [.236]	7.5 [.295]	17 [.669]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-G10D390K	13.5 [.531]	6.3 [.248]	7.5 [.295]	17 [.669]	2.4 [.094]	0.8 [.031]	25 [.984]
AVR-G10D470K	13.5 [.531]	6.6 [.260]	7.5 [.295]	17 [.669]	2.7 [.106]	0.8 [.031]	25 [.984]
AVR-G10D560K	13.5 [.531]	5.3 [.209]	7.5 [.295]	17 [.669]	2 [.079]	0.8 [.031]	25 [.984]
AVR-G10D680K	13.5 [.531]	5.6 [.220]	7.5 [.295]	17 [.669]	2.3 [.091]	0.8 [.031]	25 [.984]
AVR-G10D820K	13.5 [.531]	4.9 [.193]	7.5 [.295]	17 [.669]	1.6 [.063]	0.8 [.031]	25 [.984]
AVR-G10D101K	13.5 [.531]	5.1 [.201]	7.5 [.295]	17 [.669]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G10D121K	13.5 [.531]	5.3 [.209]	7.5 [.295]	17 [.669]	2 [.079]	0.8 [.031]	25 [.984]
AVR-G10D151K	13.5 [.531]	5.5 [.217]	7.5 [.295]	17 [.669]	2 [.079]	0.8 [.031]	25 [.984]
AVR-G10D181K	13.5 [.531]	5.6 [.220]	7.5 [.295]	17 [.669]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-G10D201K	13.5 [.531]	5.6 [.220]	7.5 [.295]	17 [.669]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-G10D221K	13.5 [.531]	5.7 [.224]	7.5 [.295]	17 [.669]	2.2 [.087]	0.8 [.031]	25 [.984]
AVR-G10D241K	13.5 [.531]	5.8 [.228]	7.5 [.295]	17 [.669]	2.3 [.091]	0.8 [.031]	25 [.984]
AVR-G10D271K	13.5 [.531]	6.1 [.240]	7.5 [.295]	17 [.669]	2.4 [.094]	0.8 [.031]	25 [.984]
AVR-G10D331K	13.5 [.531]	6.3 [.248]	7.5 [.295]	17 [.669]	2.7 [.106]	0.8 [.031]	25 [.984]
AVR-G10D361K	13.5 [.531]	6.7 [.264]	7.5 [.295]	17 [.669]	2.8 [.110]	0.8 [.031]	25 [.984]
AVR-G10D391K	13.5 [.531]	6.8 [.268]	7.5 [.295]	17 [.669]	3 [.118]	0.8 [.031]	25 [.984]
AVR-G10D431K	13.5 [.531]	7.2 [.283]	7.5 [.295]	17 [.669]	3.2 [.126]	0.8 [.031]	25 [.984]
AVR-G10D471K	13.5 [.531]	7.5 [.295]	7.5 [.295]	17 [.669]	3.5 [.138]	0.8 [.031]	25 [.984]

ELECTRICAL CHARACTERISTICS

Varistor voltage: 18 to 68V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{5A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G10D180K	18 [16 to 20]	11	14	40	0.05	3	500	13000
AVR-G10D220K	22 [20 to 24]	14	18	45	0.05	4	500	11000
AVR-G10D270K	27 [24 to 30]	17	22	53	0.05	5	500	9000
AVR-G10D330K	33 [30 to 36]	20	26	65	0.05	6	500	7000
AVR-G10D390K	39 [35 to 43]	25	31	77	0.05	7	500	6000
AVR-G10D470K	47 [42 to 52]	30	38	93	0.05	8.5	500	5000
AVR-G10D560K	56 [50 to 62]	35	45	110	0.05	5.5	500	3200
AVR-G10D680K	68 [61 to 75]	40	56	135	0.05	6.5	500	2800

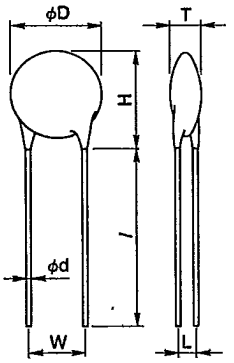
• Operating temperature voltage: −40 to +85°C [−40 to +185°F]

Varistor voltage: 82 to 470V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{25A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G10D820K	82 [74 to 90]	50	65	135	0.4	8	2500	2500
AVR-G10D101K	100 [90 to 110]	60	85	165	0.4	10	2500	2000
AVR-G10D121K	120 [108 to 132]	75	100	200	0.4	12	2500	1800
AVR-G10D151K	150 [135 to 165]	95	125	250	0.4	16	2500	1500
AVR-G10D181K	180 [162 to 198]	110	145	305	0.4	18	2500	1300
AVR-G10D201K	200 [185 to 225]	130	170	340	0.4	20	2500	1200
AVR-G10D221K	220 [198 to 242]	140	180	360	0.4	23	2500	1100
AVR-G10D241K	240 [216 to 264]	150	200	395	0.4	25	2500	1000
AVR-G10D271K	270 [247 to 303]	175	225	455	0.4	30	2500	850
AVR-G10D331K	330 [297 to 363]	210	270	550	0.4	35	2500	700
AVR-G10D361K	360 [324 to 396]	230	300	595	0.4	35	2500	650
AVR-G10D391K	390 [351 to 429]	250	320	650	0.4	40	2500	600
AVR-G10D431K	430 [387 to 473]	275	350	710	0.4	45	2500	550
AVR-G10D471K	470 [423 to 517]	300	385	775	0.4	45	2500	500

• Operating temperature range: −40 to +85°C [−40 to +185°F]

AVR-G14D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ± 1 [.039]	H max.	L ± 1 [.039]	$d^{+0.06}_{-0.05}$ [$^{+.002}_{-.002}$]	l min.
AVR-G14D180K	17.5 [.689]	5.8 [.228]	7.5 [.295]	20.5 [.807]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G14D220K	17.5 [.689]	5.8 [.228]	7.5 [.295]	20.5 [.807]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G14D270K	17.5 [.689]	5.8 [.228]	7.5 [.295]	20.5 [.807]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G14D330K	17.5 [.689]	6 [.236]	7.5 [.295]	20.5 [.807]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-G14D390K	17.5 [.689]	6.3 [.248]	7.5 [.295]	20.5 [.807]	2.4 [.094]	0.8 [.031]	25 [.984]
AVR-G14D470K	17.5 [.689]	6.6 [.260]	7.5 [.295]	20.5 [.807]	2.7 [.106]	0.8 [.031]	25 [.984]
AVR-G14D560K	17.5 [.689]	5.3 [.209]	7.5 [.295]	20.5 [.807]	2 [.079]	0.8 [.031]	25 [.984]
AVR-G14D680K	17.5 [.689]	5.6 [.220]	7.5 [.295]	20.5 [.807]	2.3 [.091]	0.8 [.031]	25 [.984]
AVR-G14D820K	17.5 [.689]	4.9 [.193]	7.5 [.295]	20.5 [.807]	1.6 [.063]	0.8 [.031]	25 [.984]
AVR-G14D101K	17.5 [.689]	5.1 [.201]	7.5 [.295]	20.5 [.807]	1.8 [.071]	0.8 [.031]	25 [.984]
AVR-G14D121K	17.5 [.689]	5.3 [.209]	7.5 [.295]	20.5 [.807]	2 [.079]	0.8 [.031]	25 [.984]
AVR-G14D151K	17.5 [.689]	5.5 [.217]	7.5 [.295]	20.5 [.807]	2 [.079]	0.8 [.031]	25 [.984]
AVR-G14D181K	17.5 [.689]	5.6 [.220]	7.5 [.295]	20.5 [.807]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-G14D201K	17.5 [.689]	5.6 [.220]	7.5 [.295]	20.5 [.807]	2.1 [.083]	0.8 [.031]	25 [.984]
AVR-G14D221K	17.5 [.689]	5.7 [.224]	7.5 [.295]	20.5 [.807]	2.2 [.087]	0.8 [.031]	25 [.984]
AVR-G14D241K	17.5 [.689]	5.8 [.228]	7.5 [.295]	20.5 [.807]	2.3 [.091]	0.8 [.031]	25 [.984]
AVR-G14D271K	17.5 [.689]	6.1 [.240]	7.5 [.295]	20.5 [.807]	2.4 [.094]	0.8 [.031]	25 [.984]
AVR-G14D331K	17.5 [.689]	6.3 [.248]	7.5 [.295]	20.5 [.807]	2.7 [.106]	0.8 [.031]	25 [.984]
AVR-G14D361K	17.5 [.689]	6.7 [.264]	7.5 [.295]	20.5 [.807]	2.8 [.110]	0.8 [.031]	25 [.984]
AVR-G14D391K	17.5 [.689]	6.8 [.268]	7.5 [.295]	20.5 [.807]	3 [.118]	0.8 [.031]	25 [.984]
AVR-G14D431K	17.5 [.689]	7.2 [.283]	7.5 [.295]	20.5 [.807]	3.2 [.126]	0.8 [.031]	25 [.984]
AVR-G14D471K	17.5 [.689]	7.5 [.295]	7.5 [.295]	20.5 [.807]	3.5 [.138]	0.8 [.031]	25 [.984]

ELECTRICAL CHARACTERISTICS

Varistor voltage: 18 to 68V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{10A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G14D180K	18 [16 to 20]	11	14	40	0.1	10	1000	25000
AVR-G14D220K	22 [20 to 24]	14	18	45	0.1	13	1000	20000
AVR-G14D270K	27 [24 to 30]	17	22	53	0.1	15	1000	16000
AVR-G14D330K	33 [30 to 36]	20	26	65	0.1	20	1000	13000
AVR-G14D390K	39 [35 to 43]	25	31	77	0.1	24	1000	11000
AVR-G14D470K	47 [42 to 52]	30	38	93	0.1	30	1000	9000
AVR-G14D560K	56 [50 to 62]	35	45	110	0.1	10	1000	6500
AVR-G14D680K	68 [61 to 75]	40	56	135	0.1	12	1000	5500

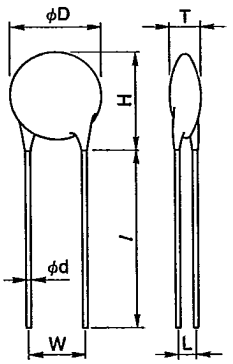
• Operating temperature range: −40 to +85°C [−40 to +185°F]

Varistor voltage: 82 to 470V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{50A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G14D820K	82 [74 to 90]	50	65	135	0.6	14	4500	4500
AVR-G14D101K	100 [90 to 110]	60	85	165	0.6	18	4500	4000
AVR-G14D121K	120 [108 to 132]	75	100	200	0.6	20	4500	3500
AVR-G14D151K	150 [135 to 165]	95	125	250	0.6	25	4500	2800
AVR-G14D181K	180 [162 to 198]	110	145	305	0.6	30	4500	2300
AVR-G14D201K	200 [185 to 225]	130	170	340	0.6	35	4500	2100
AVR-G14D221K	220 [198 to 242]	140	180	360	0.6	40	4500	1900
AVR-G14D241K	240 [216 to 264]	150	200	395	0.6	40	4500	1700
AVR-G14D271K	270 [247 to 303]	175	225	455	0.6	50	4500	1500
AVR-G14D331K	330 [297 to 363]	210	270	550	0.6	60	4500	1200
AVR-G14D361K	360 [324 to 396]	230	300	595	0.6	65	4500	1100
AVR-G14D391K	390 [351 to 429]	250	320	650	0.6	70	4500	1000
AVR-G14D431K	430 [387 to 473]	275	350	710	0.6	75	4500	950
AVR-G14D471K	470 [423 to 517]	300	385	775	0.6	80	4500	850

• Operating temperature range: −40 to +85°C [−40 to +185°F]

AVR-G20D TYPE



Dimensions in mm [inches]

Part No.	D max.	T max.	W ±1 [.039]	H max.	L ±1 [.039]	d ±0.1 [.004]	l min.
AVR-G20D180K	24 [.945]	5.8 [.228]	10 [.394]	28 [1.102]	1.8 [.071]	1 [.039]	25 [.984]
AVR-G20D220K	24 [.945]	5.8 [.228]	10 [.394]	28 [1.102]	1.8 [.071]	1 [.039]	25 [.984]
AVR-G20D270K	24 [.945]	5.8 [.228]	10 [.394]	28 [1.102]	1.8 [.071]	1 [.039]	25 [.984]
AVR-G20D330K	24 [.945]	6 [.236]	10 [.394]	28 [1.102]	2.1 [.083]	1 [.039]	25 [.984]
AVR-G20D390K	24 [.945]	6.3 [.248]	10 [.394]	28 [1.102]	2.4 [.094]	1 [.039]	25 [.984]
AVR-G20D470K	24 [.945]	6.6 [.260]	10 [.394]	28 [1.102]	2.7 [.106]	1 [.039]	25 [.984]
AVR-G20D560K	24 [.945]	5.7 [.224]	10 [.394]	28 [1.102]	2.2 [.087]	1 [.039]	25 [.984]
AVR-G20D680K	24 [.945]	6 [.236]	10 [.394]	28 [1.102]	2.5 [.098]	1 [.039]	25 [.984]
AVR-G20D820K	24 [.945]	5.3 [.209]	10 [.394]	28 [1.102]	1.8 [.071]	1 [.039]	25 [.984]
AVR-G20D101K	24 [.945]	5.5 [.217]	10 [.394]	28 [1.102]	2 [.079]	1 [.039]	25 [.984]
AVR-G20D121K	24 [.945]	5.7 [.224]	10 [.394]	28 [1.102]	2.2 [.087]	1 [.039]	25 [.984]
AVR-G20D151K	24 [.945]	5.9 [.232]	10 [.394]	28 [1.102]	2 [.079]	1 [.039]	25 [.984]
AVR-G20D181K	24 [.945]	6 [.236]	10 [.394]	28 [1.102]	2.1 [.083]	1 [.039]	25 [.984]
AVR-G20D201K	24 [.945]	6 [.236]	10 [.394]	28 [1.102]	2.1 [.083]	1 [.039]	25 [.984]
AVR-G20D221K	24 [.945]	6.2 [.244]	10 [.394]	28 [1.102]	2.2 [.087]	1 [.039]	25 [.984]
AVR-G20D241K	24 [.945]	6.3 [.248]	10 [.394]	28 [1.102]	2.3 [.091]	1 [.039]	25 [.984]
AVR-G20D271K	24 [.945]	6.5 [.256]	10 [.394]	28 [1.102]	2.4 [.094]	1 [.039]	25 [.984]
AVR-G20D331K	24 [.945]	6.8 [.268]	10 [.394]	28 [1.102]	2.9 [.114]	1 [.039]	25 [.984]
AVR-G20D361K	24 [.945]	7.2 [.283]	10 [.394]	28 [1.102]	3 [.118]	1 [.039]	25 [.984]
AVR-G20D391K	24 [.945]	7.4 [.291]	10 [.394]	28 [1.102]	3.2 [.126]	1 [.039]	25 [.984]
AVR-G29D431K	24 [.945]	7.7 [.303]	10 [.394]	28 [1.102]	3.5 [.138]	1 [.039]	25 [.984]
AVR-G20D471K	24 [.945]	8 [.315]	10 [.394]	28 [1.102]	3.8 [.150]	1 [.039]	25 [.984]

ELECTRICAL CHARACTERISTICS

Varistor voltage: 18 to 68V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{20A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G20D180K	18 [16 to 20]	11	14	40	0.2	20	2000	45000
AVR-G20D220K	22 [20 to 24]	14	18	45	0.2	26	2000	38000
AVR-G20D270K	27 [24 to 30]	17	22	53	0.2	30	2000	31000
AVR-G20D330K	33 [30 to 36]	20	26	65	0.2	40	2000	25000
AVR-G20D390K	39 [35 to 43]	25	31	77	0.2	48	2000	21000
AVR-G20D470K	47 [42 to 52]	30	38	93	0.2	60	2000	18000
AVR-G20D560K	56 [50 to 62]	35	45	110	0.2	35	2000	12000
AVR-G20D680K	68 [61 to 75]	40	56	135	0.2	40	2000	10000

• *Operating temperature range: −40 to +85°C [−40 to +185°F]*

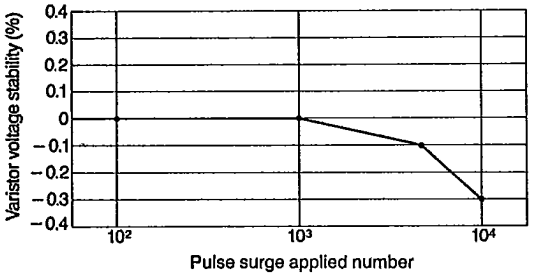
Varistor voltage: 82 to 470V

Part No.	Varistor voltage V_{1mA} (V)	Maximum circuit voltage (Vac.rms)	Maximum circuit voltage (Vdc)	Maximum voltage V_{100A} (V)	Rated power (W)	Energy (J) 2ms	Surge current (A)	Capacitance (pF) at 1 kHz ref.
AVR-G20D820K	82 [74 to 90]	50	65	135	1	27	6500	8500
AVR-G20D101K	100 [90 to 110]	60	85	165	1	30	6500	7000
AVR-G20D121K	120 [108 to 132]	75	100	200	1	40	6500	6000
AVR-G20D151K	150 [135 to 165]	95	125	250	1	50	6500	5000
AVR-G20D181K	180 [162 to 198]	110	145	305	1	60	6500	4500
AVR-G20D201K	200 [185 to 225]	130	170	340	1	70	6500	4000
AVR-G20D221K	220 [198 to 242]	140	180	360	1	75	6500	3500
AVR-G20D241K	240 [216 to 264]	150	200	395	1	80	6500	3200
AVR-G20D271K	270 [247 to 303]	175	225	455	1	90	6500	2800
AVR-G20D331K	330 [297 to 363]	210	270	550	1	110	6500	2300
AVR-G20D361K	360 [324 to 396]	230	300	595	1	120	6500	2100
AVR-G20D391K	390 [351 to 429]	250	320	650	1	130	6500	2000
AVR-G20D431K	430 [387 to 473]	275	350	710	1	140	6500	1800
AVR-G20D471K	470 [423 to 517]	300	385	775	1	150	6500	1600

• *Operating temperature range: −40 to +85°C [−40 to +185°F]*

VARISTOR VOLTAGE STABILITY FOR AUTOMOTIVE ELECTRONICS APPLICATIONS

Varistors used to protect automotive electronic systems must have a strong structure and offer stable performance in order to function properly over the wide range of environmental circumstances characterizing automotive applications. To meet these severe requirements, TDK has developed a proprietary technology which allows the mass production of extremely stable varistors. The varistor utilizes compound additives including oxidized rare earth in the high-resistance particle field. The result of this technology is a varistor which can withstand 10000 surges and experience a change in varistor voltage of only 0.3%. The TDK production line which manufactures these devices is the most advanced in the world.



• *This figure shows the change in varistor voltage for a ϕ14mm [.551 inches] varistor (varistor voltage=22V) when an 8 × 20μs surge current of 150A peak has been applied. Note that the change in varistor voltage after being subjected to 10000 current impulses is only 0.3%. By contrast, typical varistor specifications permit a change in varistor voltage as high as 10% after 10000 such current surges.*

TDK varistors employ a new epoxy system resin mold to achieve an immunity to environmental conditions far surpassing conventional varistors. New levels of humidity resistance and the ability to withstand heat shocks have been attained. TDK varistors for automotive applications meet the strictest requirements, with temperature ratings as broad as −50 to +150°C [−58 to +302°F].