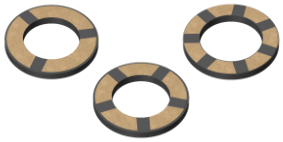
Ring Varistors (SrTiO3) for Micro motors

VAR-18 series

Type: VAR-18-P (Plane surface electrode type)

■ OVERVIEWS

Ring varistors are used in a wide range of applications from micro motor noise absorption to the protection of circuit contacts.
TDK has greatly improved the electrical and physical performances of these varistors to meet the latest demands. This varistor line covers the traditional shapes and dimensions as well as the more varied and specialized applications.



■ FEATURES

ELECTRICAL PERFORMANCES

- ○The temperature characteristics of the varistor voltage (E_{10} value) are positive. This prevents the varistor voltage from decreasing at high temperatures and from large currents flowing through the varistor. Therefore, these varistors remove design obstacles by eliminating the need for setting the room temperature varistor voltage (E_{10} value) higher—a measure that compromises noise reduction levels.
- ○Furthermore, the VAR-18 series has also eliminated the problem of the noise level being amplified at low-temperatures and having a negative impact on the life of the motor.
- ○Because the VAR-18 series has the same large capacitance as the conventional varistors, it has excellent functions to eliminate and control motor noise in high frequency bands.

PHYSICAL PERFORMANCES

- ○Because copper electrodes are used and the heat resistance of the ceramic elements has been improved, there is no concern for electrode erosion or thermal crack even at the higher soldering temperatures that are used in lead-free soldering.
- ○The ceramic element has excellent flexure strength as is suitable for automatic motor assembly.

PRODUCT LINEUP

- ○The varistors in this series come in a wide range of dimensions and so can be accurately used for almost all motors.

■ PRODUCT IDENTFICATIONS

VAR-18	085	240	M	3	P	-□□
Series name	Outer diameter	Varistor voltage center	Varistor voltage tolerance	Number of electrodes	Electrode location	TDK classification

Outer diameter	
042	Φ4.2mm
085	Φ8.5mm
230	Φ23.0mm

Varistor voltage center	
032	3.2V
240	24.0V
800	80.0V

Varistor voltage tolerance	
M	±20%
Y	Others

Number of electrodes	
3	3
5	5
7	7

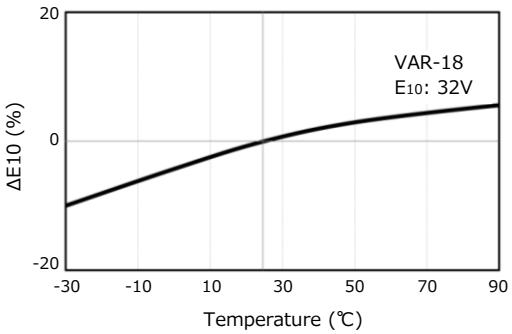
Electrode location	
P	Plane

■ PERFORMANCES

Operating temperature range	-30 to +85(℃)
Pulse resistance	ΔE10,Δα10±15(%)
Moisture resistance [60±2°C、90~95(%)RH、240h]	ΔE10,Δα10±10(%)
Soldering heat resistance [Within ΔT290°C、3s]	ΔE10,Δα10±10(%)
Flexure strength	According to individual specifications.
Electrode tensile strength	According to individual specifications.

■ VARISTOR VOLTAGE TEMPERATURE CHARACTERISTICS

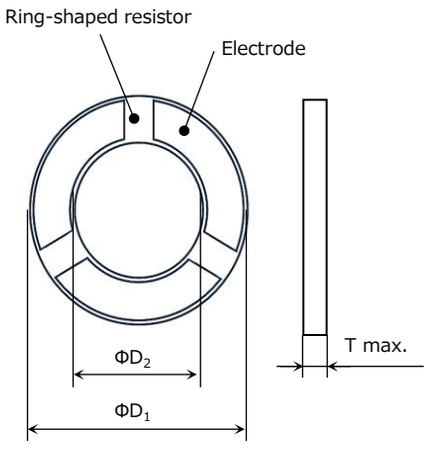
[Reference data]



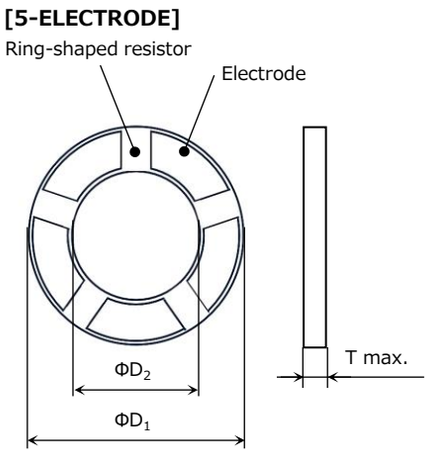
SHAPES AND DIMENSIONS

PLANE SURFACE ELECTRODE TYPE

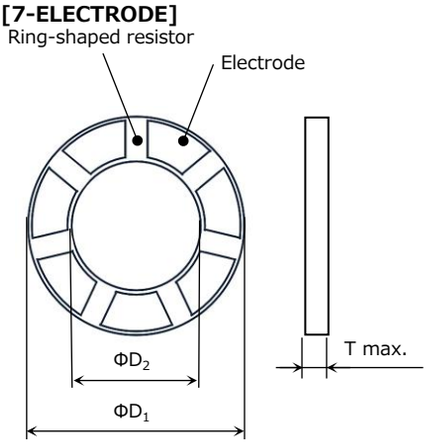
[3-ELECTRODE]



[5-ELECTRODE]



[7-ELECTRODE]



Outer diameter symbol	Dimensions (mm) ΦD1	ΦD2	T max.	Number of electrodes
042	4.2±0.15	2.8+0.2,-0.1	0.60	3
048	4.8+0.1,-0.2	3.5+0.2,-0.1	0.60	3
060	6.0±0.2	4.0+0.2,-0.1	0.70	3
080	8.0±0.25	5.0±0.15	0.85	3
085	8.5±0.3	5.8±0.15	0.75	3
094	9.4±0.3	5.78±0.15	1.05	3
107	10.7+0.2,-0.35	6.7+0.25,-0.1	1.10	3
120	12.0±0.3	6.95±0.15	1.10	5
160	16.0±0.4	9.4±0.3	1.70	5
230	23.0±0.5	15.0±0.5	2.00	7

ELECTRICAL CHARACTERISTICS

Varistor voltage symbol	Varistor voltage E10mA (V)	α10 min. [1 to 10mA]	Varistor voltage temperature coefficient (%/℃) [25 to 50℃]
032Y	2.0 to 4.5	2.3	0±0.3
053Y	4.0 to 6.6	2.3	0±0.3
077Y	5.9 to 9.4	2.3	0±0.3
115Y	9.0 to 14.0	2.3	0±0.3
157Y	13.0 to 18.4	2.3	0±0.3
218Y	17.6 to 26.0	2.3	0±0.3
240M	19.2 to 28.8	2.3	0±0.3
320M	25.6 to 38.4	2.3	0±0.3
360Y	27.0 to 45.0	2.3	0±0.3
550Y	40.0 to 70.0	2.3	0±0.3
650Y	50.0 to 80.0	2.3	0±0.3
800Y	60.0 to 100.0	2.3	0±0.3

PRODUCT LINEUP

Type		VAR-18042	VAR-18048	VAR-18060	VAR-18080	VAR-18085	VAR-18094	VAR-18107	VAR-18120	VAR-18160	VAR-18230
Number of electorodes, electrode locatin		3P	3P	3P	3P	3P	3P	3P	5P	5P	7P
Outer diameter [mm]		φ4.2±0.15	φ4.8+0.1,-0.2	φ6.0±0.2	φ8.0±0.25	φ8.5±0.3	φ9.4±0.3	φ10.7+0.2,-0.35	φ12.0 ±0.3	φ16.0±0.4	φ23.0±0.5
Inner diameter [mm]		φ2.8+0.2 ,-0.1	φ3.5+0.2,-0.1	φ4.0+0.2,-0.1	φ5.0±0.15	φ5.8±0.15	φ5.78±0.15	φ6.7+0.25,-0.1	φ6.95±0.15	φ9.4±0.3	φ15.0±0.5
Thickness [mm]		0.6 max.	0.6 max.	0.7 max.	0.85 max.	0.75 max.	1.05 max.	1.1 max.	1.1 max.	1.7 max.	2.0max.
E10 symbol	SPEC [V]										
032Y	2.0 to 4.5										
053Y	4.0 to 6.6										
077Y	5.9 to 9.4										
115Y	9.0 to 14.0										
157Y	13.0 to 18.4										
170Y	14.0 to 20.0										
218Y	17.6 to 26.0										
240M	19.2 to 28.8										
320M	25.6 to 38.4										
360Y	27.0 to 45.0										
550Y	40.0 to 70.0										
650Y	50.0 to 80.0										
800Y	60.0 to 100.0										

For custom products (shape, varistor voltage, number of electrodes), please contact our sales team.

REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using this products

⚠ REMINDERS

○The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.
The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.
If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

(1) Aerospace/aviation equipment
(2) Transportation equipment (cars, electric trains, ships, etc.)
(3) Medical equipment (excepting Pharmaceutical Affairs Law classification Class1,2)
(4) Power-generation control equipment
(5) Atomic energy-related equipment
(6) Seabed equipment
(7) Transportation control equipment
(8) Public information-processing equipment
(9) Military equipment
(10) Electric heating apparatus, burning equipment
(11) Disaster prevention/crime prevention equipment
(12) Safety equipment
(13) Other applications that are not considered general-purpose applications

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

○We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.

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