

# **SIOV metal oxide varistors**

## **Overview of types**







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## Overview of types

### Disk varistors, monolithic, leaded, $T_A = 105\text{ }^\circ\text{C}$

 					
Nominal diameter	5 mm		7 mm		10 mm
	<b>Standard</b>	<b>AdvanceD</b>	<b>Standard</b>	<b>AdvanceD</b>	<b>Standard</b>
	<b>S05</b> page	<b>S05 ... E2</b> page	<b>S07</b> page	<b>S07 ... E2</b> page	<b>S10</b> page
Operating voltage $V_{RMS}$	11 ... 460 V	130 ... 300 V	11 ... 460 V	130 ... 320 V	11 ... 680 V
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	100 ... 400 A	800 A	250 ... 1200 A	1750 A	500 ... 2500 A
Energy absorption (2 ms) $W_{max}$	0.3 ... 18 J	6.0 ... 15 J	0.8 ... 36 J	12.5 ... 32 J	1.7 ... 72 J
<b>Automotive</b>			<b>S07AUTO</b> page/		<b>S10AUTO</b> page/
Operating voltage $V_{RMS}$			14 $V_{RMS}$ 48 $V_{DC}^{1)}$		14 ... 17 $V_{RMS}$ 48 $V_{DC}^{1)}$
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$			250 A		500 A
Energy absorption (10 $\times$ ) $W_{LD}$			12.0 J		25.0 J

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

1) Automotive series for 42 V

## Overview of types

### Disk varistors, monolithic, leaded, $T_A = 105\text{ }^\circ\text{C}$

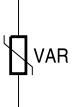
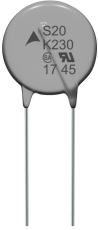
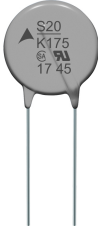

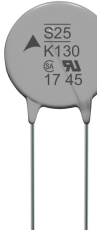
 VAR0017-R					
Nominal diameter	10 mm		14 mm		
	<b>AdvancedD</b>	<b>AdvancedD-MP</b>	<b>StandarD</b>	<b>AdvancedD</b>	<b>AdvancedD-MP</b>
	<b>S10 ... E2</b> page	<b>S10 ... E2K1</b> page	<b>S14</b> page	<b>S14 ... E2</b> page	<b>S14 ... E2K1</b> page
Operating voltage $V_{RMS}$	130 ... 680 V	175 ... 680	11 ... 1100 V	130 ... 680 V	
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	3.5 kA		1.0 ... 4.5 kA	5.0/ 6.0 kA	6.0 kA
Energy absorption (2 ms) $W_{max}$	25 ... 110 J	40 ... 115 J	3.2 ... 230 J	50 ... 220 J	60 ... 260 J
<b>Automotive</b>			<b>S14AUTO</b> page/		
Operating voltage $V_{RMS}$			14 ... 30 V 48 $V_{DC}^{2)}$		
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$			1.0 kA		
Energy absorption (10 $\times$ ) $W_{LD}$			50 J		

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

2) Automotive series for 42 V

## Overview of types

### Disk varistors, monolithic, leaded, $T_A = 105\text{ }^\circ\text{C}$





 <p>VAR0017-R</p>				
Nominal diameter	20 mm			25 mm
	<b>Standard</b>	<b>Advanced</b>	<b>Superior-MP</b>	<b>Superior</b>
	<b>S20</b> page	<b>S20 ... E2</b> page	<b>S20 ... E3K1</b> page	<b>S25 ... E4R12</b> page
Operating voltage $V_{RMS}$	11 ... 1100 V	130 ... 680 V	130 ... 680 V	130 ... 750 V
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	2.0 ... 6.5 kA	10 kA	10 kA/ 12 kA	20 kA
Energy absorption (2 ms) $W_{max}$	10 ... 410 J	100 ... 440 J	135 ... 595 J	185 ... 1025 J
<b>Automotive</b>	<b>S20AUTO</b> page/			
Operating voltage $V_{RMS}$	14 ... 30 V 48 $V_{DC}^{3)}$			
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	2.0 kA			
Energy absorption (10 $\times$ ) $W_{LD}$	100 J			

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

3) Automotive series for 42 V

## Overview of types




### SNF disk varistors, monolithic, leaded, $T_A = 125\text{ }^\circ\text{C}$

				
Nominal diameter	5 mm	7 mm	10 mm	
	<b>Advanced</b>	<b>Advanced</b>	<b>Advanced</b>	<b>Advanced-MP</b>
	<b>SNF05 ... E2S5</b> page	<b>SNF07 ... E2S5</b> page	<b>SNF10 ... E2S5</b> page	<b>SNF10 ... E2S5K1</b> page
Operating voltage $V_{RMS}$	130 ... 300 V	130 ... 320 V	130 ... 625 V	175 ... 550 V
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	800 A	1750 A	3500 A	3500 A
Energy absorption (2 ms) $W_{max}$	6 ... 15 J	12.5 ... 32 J	25 ... 100 J	40 ... 97 J

P Spice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

## Overview of types




### SNF disk varistors, monolithic, leaded, $T_A = 125\text{ }^\circ\text{C}$

 VAR0017-R				
Nominal diameter	14 mm		20 mm	
	<b>AdvancedD</b>	<b>AdvancedD-MP</b>	<b>AdvancedD</b>	<b>SuperiorR-MP</b>
	<b>SNF14 ... E2S5</b> page	<b>SNF14 ... E2S5K1</b> page	<b>SNF20 ... E2S5</b> page	<b>SNF20 ... E3S5K1</b> page
Operating voltage $V_{RMS}$	130 ... 625 V	130 ... 550	130 ... 625 V	130 ... 550 V
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	5 / 6 kA	6 kA	10 kA	5 kA
Energy absorption (2 ms) $W_{max}$	50 ... 200 J	60 ... 220 J	100 ... 400 J	135 ... 490 J
<b>Automotive</b>	<b>SNF14 ... E2S5</b> page		<b>SNF20 ... E2S5</b> page	
Operating voltage $V_{RMS}$	300 V / 420 V / 550 V AEC-Q200 specified types		275 V / 385 V AEC-Q200 specified types	
Surge current (8/20 $\mu\text{s}$ ) $i_{max}$	5 / 6 kA		10 kA	
Energy absorption (10 $\times$ ) $W_{LD}$	125 ... 180 J		215 / 273 J	

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

## Overview of types

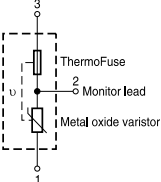



### Disk varistors, monolithic, leaded

 VAR0017-R		
Nominal diameter	14 mm	20 mm
<b>EnergetiQ</b>		
<b>Q14</b> page		<b>Q20</b> page
Operating voltage $V_{RMS}$	130 ... 460 V	
Surge current (8/20 $\mu$ s) $i_{max}$	8.0 kA	15 kA
Energy absorption (2 ms) $W_{max}$	75 ... 270 J	100 ... 380 J

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

## Overview of types

### Disk varistors in housing





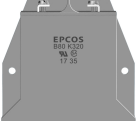
 <p>For ThermoFuse varistors</p>			
Nominal diameter	14 mm	20 mm	25 mm
	<b>ThermoFuse varistor, Advanced</b>		
	<b>T14 ... E2</b> page	<b>T20 ... E2</b> page	<b>ETFV25 ... E4</b> page
Operating voltage $V_{RMS}$	130 ... 420 V	130 ... 680 V	115 ... 420 V
Surge current (8/20 $\mu$ s) $i_{max}$	6 kA	10 kA	20 kA
Energy absorption (2 ms) $W_{max}$	50 ... 180 J	100 ... 440 J	170 ... 700 J

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)



## Overview of types






### Block varistors, monolithic, screw terminals



 VAR VAR0017-R				
Nominal diameter	32 mm	40 mm	60 mm	80 mm
	<b>HighE</b>			
	<b>B32</b>	<b>B40</b>	<b>B60</b>	<b>B80</b>
	page			
Operating voltage $V_{RMS}$	130 ... 750 V	75 ... 750 V	130 ... 1100 V	
Surge current (8/20 $\mu$ s) $i_{max}$	25 kA	25/ 40 kA	70 kA	100 kA
Energy absorption (2 ms) $W_{max}$	210 ... 800 J	190 ... 1200 J	490 ... 3000 J	660 ... 6000 J

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

## Overview of types

### Strap varistors, monolithic, straight or bent strap terminals

 VAR0017-R				
Nominal diameter	40 mm			
	<b>HighE</b>			
	<b>LS40 ... QP</b>	<b>LS40 ... QPK2</b>	<b>LS41 ... QP</b>	<b>LS41 ... QPK2</b>
	page		page	
Operating voltage $V_{RMS}$	130 ... 750 V		130 ... 460 V	
Surge current (8/20 $\mu$ s) $I_{max}$	40 kA		50 kA	
Energy absorption (2 ms) $W_{max}$	310 ... 1200 J		310 ... 960 J	

		
Nominal diameter	50 mm	50 mm
	<b>HighE</b>	
	<b>LS50 ... P</b>	<b>LS50 ... PK2</b>
	page	
Operating voltage $V_{RMS}$	130 ... 550 V	
Surge current (8/20 $\mu$ s) $I_{max}$	75 kA	
Energy absorption (2 ms) $W_{max}$	490 ... 1820 J	

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)

## Overview of types

### SMD varistors, CU types

<b>SMD</b>	Case sizes: CU3225 and CU4032		Case sizes: CU3225 and CU4032
	<b>CU varistors</b>		
	<b>CU standard series</b> page	<b>CU automotive series</b> page	
Operating voltage $V_{RMS}$	11 ... 300 V		14/ 17/ 30 V
Surge current (8/20 $\mu$ s) $i_{max}$	100 ... 1200 A		100/ 250 A
Energy absorption (2 ms) $W_{max}$	300 ... 23000 J		400 ... 2000 J

PSpice simulation models for all types on the Internet at [http://www.epcos.com/tools\\_varistors](http://www.epcos.com/tools_varistors)