

Kunde / customer :

 Artikelnummer / part number : **820423211**

 Datum / Date : **2010-09-15**

Bezeichnung :

 description : **Disk Varistor HighSurge WE-VD**

 DIAM: **20** mm

ROHS Compliant

A Elektrische Eigenschaften / electrical properties :

TECHNICAL DATA

Part Number	Breakdown Voltage	Tolerance	Working Voltage		Clamping Voltage	Current Clamp. Volt.	Peak Current Withstanding C.
	(V@mA) (*1)	(%)	AC	DC	V (*2)	(A)	A (*3)
820423211	510	10	320	418	842	100	10000

* 1 The varistor voltage was measured at 0.1 mA current for 5 mm diameter and 1 mA current for other

* 2 The Clamping voltage measured at "Current Clamping Voltage" see next column

 * 3 The Peak Current was tested at 8/20 μ s waveform for 1 time

Part Number	Rated Wattage	Energy	Capacitance	UL	Certification CSA	VDE	Diameter
	(W)	J (*4)	pF (*5)	(*6)	(*7)	(*8)	(mm)
820423211	1.0	382.0	760	yes	yes	yes	20

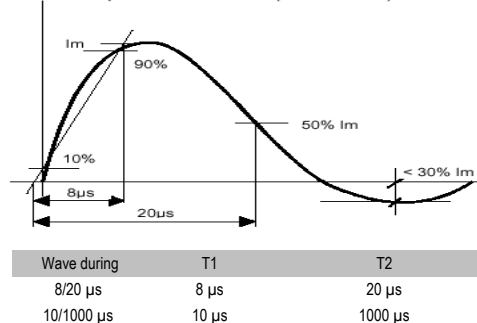
 * 4. The Energy measured at 10/1000 μ s waveform for 1 time

* 5. The capacitance value measured at standard frequency @ 1kHz

* 6. Certification UL 3rd N° E332875 for use in Type 2 SPD Applications

* 7. Certification CSA N° 224856

* 8. Certification VDE N° 40016998 & 40016986 + IEC 60950-1 Annex Q

 Wave shape "Short circuit" (Current I_{sc})


ORDER CODE

820

Varistor Type

MARKING CODE

X	X	XXX	X
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Serie

Diameter

 Vrms Voltage
Code

Tolerance

Other

Special Type

S

Disc Varistor

 5 = Standard
4 = High Surge

 5 = 5 mm
7 = 7 mm
1 = 10 mm
4 = 14 mm
2 = 20 mm

 5 = 5%
1 = 10%
6 = 15%
2 = 20%
7 = 25%
3 = 30%

 Lead Diameter See Table
Lead Pitch See Table
Lead Style Straight lead
Packing Ammopack with lead 20 mm

Example:

180 = 18 V

271 = 270 V

102 = 1 000 V

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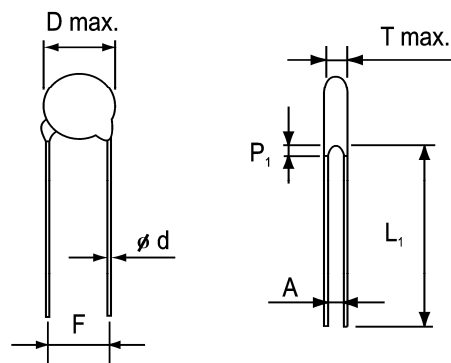
 DIAM: **20** mm

B Mechanische Abmessungen / dimensions :

SIZE

Diameter*	Ø 5	Ø 7	Ø 10	Ø 14	Ø 20
D max.	7,5	9,0	12,5	16,5	23,0
d +/-0,05	0,6	0,6	0,8	0,8	1,0
F +/-1,0	5,0	5,0	7,5	7,5	10,0
H max.	11	13	18	22	28
H1 max	3,5	3,5	5,0	5,0	5,0
L1 min.	25	25	25	25	25
L min.	24	24	24	24	24

(mm) - *Nominal Disk Diameter of Bare Disk


 Table of T max., A & P₁ . Unit : (mm)

Diameter	Ø 5			Ø 7			Ø 10			Ø 14			Ø 20		
Voltage Code	T max	A +/-0,8	P ₁	T max	A +/-0,8	P ₁	T max	A +/-0,8	P ₁	T max	A +/-0,8	P ₁	T max	A +/-0,8	P ₁
110	4,5	1,4	3,0	4,5	1,4	3,0	4,9	1,4	3,0	5,0	1,5	3,0	5,2	1,5	3,0
140	4,5	1,5	3,0	4,5	1,5	3,0	4,9	1,5	3,0	5,0	1,6	3,0	5,3	1,6	3,0
170	4,7	1,5	3,0	4,7	1,5	3,0	5,1	1,5	3,0	5,2	1,7	3,0	5,4	1,7	3,0
200	4,7	1,6	3,0	4,7	1,6	3,0	5,1	1,6	3,0	5,2	1,8	3,0	5,4	1,8	3,0
250	4,7	1,8	3,0	4,7	1,8	3,0	5,1	1,8	3,0	5,2	2,0	3,0	5,4	2,0	3,0
300	5,0	1,8	3,0	5,0	1,8	3,0	5,5	1,8	3,0	5,6	2,0	3,0	5,6	2,0	3,0
350	5,0	2,0	3,0	5,0	2,0	3,0	5,5	2,0	3,0	5,6	2,2	3,0	5,6	2,2	3,0
400	5,5	2,3	3,0	5,5	2,3	3,0	6,0	2,3	3,0	6,1	2,5	3,0	6,1	2,5	3,0
500	3,8	1,4	3,0	3,8	1,4	3,0	4,3	1,4	3,0	4,4	1,6	3,0	4,9	1,8	3,0
600	3,9	1,4	3,0	3,9	1,4	3,0	4,4	1,4	3,0	4,5	1,6	3,0	5,1	1,8	3,0
750	4,1	1,5	3,0	4,1	1,5	3,0	4,5	1,5	3,0	4,6	1,7	3,0	5,3	1,9	3,0
950	4,5	1,8	3,0	4,5	1,8	3,0	4,9	1,8	3,0	5,1	2,0	3,0	5,6	2,2	3,0
111	4,1	1,6	3,0	4,1	1,6	3,0	4,5	1,6	3,0	4,7	1,8	3,0	5,2	2,0	3,0
131	4,2	1,6	3,0	4,2	1,6	3,0	4,6	1,6	3,0	4,8	1,8	3,0	5,3	2,0	3,0
141	4,3	1,7	3,0	4,3	1,7	3,0	4,7	1,7	3,0	4,9	1,9	3,0	5,4	2,1	3,0
151	4,4	1,7	3,0	4,4	1,9	3,0	4,8	1,9	3,0	5,0	2,1	3,0	5,5	2,3	3,0
171	4,6	1,9	3,0	4,6	2,0	3,0	5,0	2,0	3,0	5,2	2,1	3,0	5,7	2,5	3,0
191	4,8	1,9	3,0	4,8	2,1	3,0	5,2	2,2	3,0	5,4	2,3	3,0	5,9	2,7	3,0
211	4,9	1,9	3,0	4,9	2,1	3,0	5,3	2,2	3,0	5,5	2,3	3,0	6,0	2,7	3,0
231	5,1	2,4	3,0	5,1	2,5	3,0	5,5	2,5	3,0	5,7	2,7	3,0	6,2	2,9	3,0
251	5,3	2,6	3,5	5,3	2,6	3,5	5,7	2,8	3,5	5,9	2,8	3,5	6,4	3,0	3,5
271	6,1	2,7	3,5	6,1	2,9	3,5	6,5	3,1	3,5	6,7	3,1	3,5	7,2	3,3	3,5
301	6,4	2,8	3,5	6,4	2,9	3,5	6,8	3,2	3,5	7,0	3,3	3,5	7,5	3,5	4,0
321	6,6	3,1	4,0	6,6	3,1	4,0	7,0	3,7	4,0	7,2	3,7	4,0	7,7	3,9	4,0
351	6,9	3,4	4,0	6,9	3,4	4,0	7,3	4,0	4,0	7,5	4,0	4,0	8,0	4,2	4,0
381	7,2	3,7	4,0	7,2	3,7	4,0	7,6	4,6	4,0	7,8	4,4	4,0	8,3	4,7	4,0
421	7,5	4,0	4,0	7,5	4,0	4,0	8,0	5,0	4,0	8,2	4,7	4,0	8,7	5,0	4,0
461	7,9	4,3	4,0	7,9	4,3	4,0	8,4	5,0	4,0	8,6	4,9	4,0	9,1	5,1	4,0
481				8,1	4,5	4,0	8,6	5,2	4,0	8,8	5,2	4,0	9,3	5,4	4,0
511				8,3	4,7	4,0	8,8	5,2	4,0	9,0	5,2	4,0	9,5	5,4	4,0
551							9,4	6,0	4,0	9,6	6,0	4,0	10,1	6,3	4,0
621							9,9	6,0	4,0	10,1	6,2	4,0	10,7	6,4	4,0
681							10,5	6,3	4,0	10,7	6,7	4,0	11,2	6,9	4,0
102							12,6	9,8	6,0	12,8	10,2	6,0	13,5	10,4	6,0

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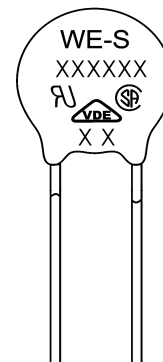
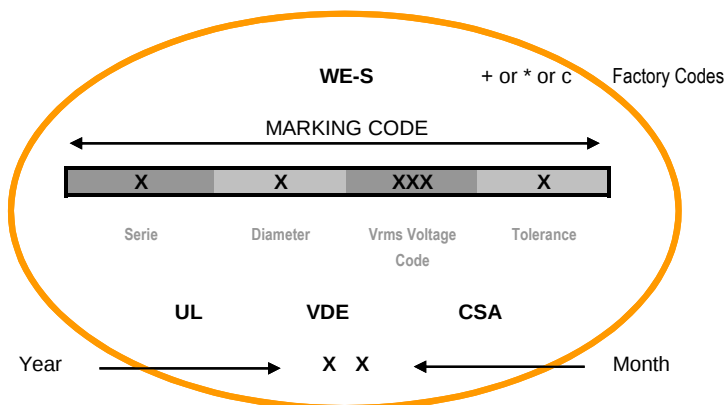
C Lötpad / soldering spec. :
MARKING

Würth Elektronik

Characteristic

Certification

Date Code


GENERAL CHARACTERISTICS

Storage temperature:	-40 / +125°C
Max. reponse time	25 n sec
Max. operating temperature:	-40 / +125°C
Insulation resistance (at DC 500V):	Over 1000 Mohm

LEAD FREE SOLDERING

Solder	Tin 100%
Soldering temperature at	255°C +/-5 °C
Profile soldering	270°C during 10s

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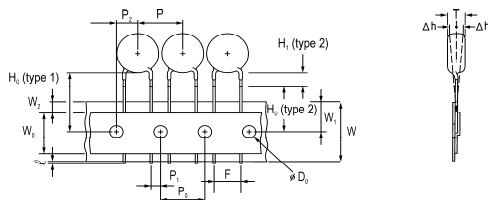
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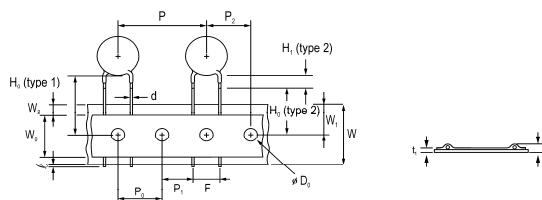
D Rollenspezifikation / tape and reel specification :

TAPE

1/2" pitch



1.0" pitch



Item	Ø 5 / 7	Ø 10	Ø 10 / 14 / 20	Ø 14 / 20
Taping pitch	1/2"		1.0"	
I	1,1 mm maxi.		1,1 mm maxi.	
H ₁ (type 2)	3,5 mm maxi.	5 mm maxi.	5 mm maxi.	
H ₀ (type 2)	16 +/-0,5 mm		16 +/-0,5 mm	
H ₀ (type 1)	16 à 21 mm		16 à 21 mm	
h	+/-2 mm		+/-2 mm	
W	18 mm +1 / - 0,5 mm		18 mm +1 / - 0,5 mm	
W ₀	10 mm		12 mm	
W ₁	9 mm +0,75 / -0,5 mm		9 mm +0,75 / -0,5 mm	
W ₂	3 mm maxi.		3 mm maxi.	
F	5 mm +0,8 / -0,2 mm		7,5 mm +0,8 / -0,2 mm	10 mm +0,8 / -0,2 mm
P	12,7 mm +/-1 mm		25,4 mm +/-1 mm	
P ₀	12,7 mm +/-0,3 mm		12,7 mm +/-0,3 mm	
P ₁	3,85 mm +/-0,7 mm		8,95 mm +/-0,7 mm	7,7 mm +/-0,7 mm
P ₂	6,35 mm +/-1,3 mm		12,7 mm +/-1,3 mm	
D ₀	4 mm +/-0,2 mm		4 mm +/-0,2 mm	
d	0,6 mm +/-0,05 mm		0,8 mm +/-0,05 mm	1,0 mm +/-0,05 mm
T	See T max. table		See T max. table	
t ₁	0,7 mm +/-0,05 mm		0,6 mm +/-0,05 mm	
t ₂	1,6 mm maxi.		1,8 mm maxi.	

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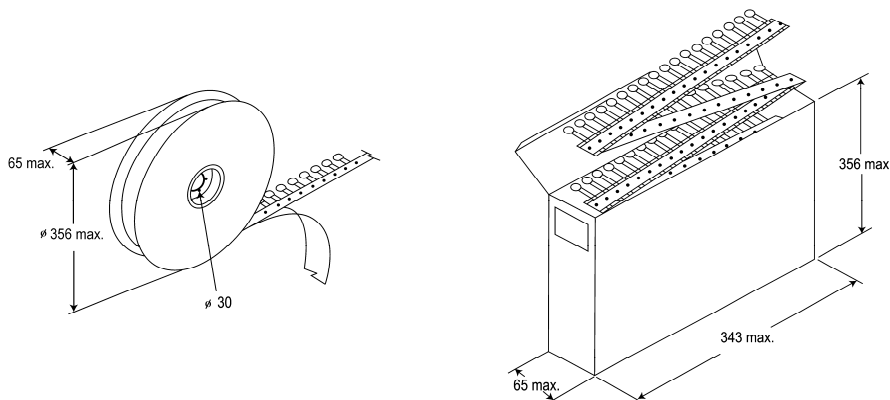
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D Rollenspezifikation / tape and reel specification :

REEL DIMENSION

(Unit : mm)



Lead Free "LF" Marking

QUANTITY PER PACKING UNIT

Diameter	Ø 5		Ø 7		Ø 10		Ø 14		Ø 20	
	Bulk	Reel	Bulk	Reel	Bulk	Reel	Bulk	Reel	Bulk	Reel
Voltage Serie	(Box)		(Box)		(Box)		(Box)		(Box)	
110 ~ 300	5 000	1 500	5 000	1 500	2 500	1 000	1 500	750	750	500
350 ~ 400	5 000	1 500	5 000	1 500	2 500	1 000	1 500	750	750	500
500 ~ 210	5 000	1 500	5 000	1 500	2 500	1 000	1 500	750	750	500
230 ~ 250	5 000	1 500	5 000	1 500	2 500	1 000	1 500	750	750	500
271 ~ 301	5 000	1 500	5 000	1 000	2 500	750	1 500	750	750	500
321 ~ 461	4 000	1 000	4 000	1 000	1 500	500	750	500	450	500
481 ~ 102	-	-	-	-	1 500	500	750	500	450	500

QUANTITY PER CARTON UNIT

Packaging	Bulk (Box)	Reel	Reel Ø 14 / 20
Box size	290 x 155 x 110	350 x 350 x 108	350 x 350 x 7
Carton size	310 x 328 x 250	371 x 371 x 590	370 x 370 x 468
One carton with	4 boxes	5 boxes (10 reels)	6 boxes

Würth Elektronik eiSos GmbH & Co.KG - Radlalex department

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E Testbedingungen / test conditions :

BASIC TEST AND ENVIRONMENTAL RELIABILITY TEST

Humidity

The specimen shall be subjected to 40 $\pm$ 2°C, 90 to 95% R.H. For 1000 hours without load and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of Vn shall be measured and meet the requirement of:

$$\Delta V_n/V_n \leq \pm 5\%$$

Impulse life

The impulse current listed on catalog is applied 1000 times continuously with the interval of 30 seconds at room temperature. The change of Vn shall be measured

$$\Delta V_n/V_n \leq \pm 10\%$$

Low temperature

The specimen shall be subjected to 40 $\pm$ 2°C without load for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of Vn shall be measured and meet the requirement of $\Delta V_n/V_n \leq \pm 5\%$.

High temperature load

After being continuously applied the maximum allowable Voltage at 85 $\pm$ 2°C for 1000 hours, the specimen shall be stored at room temperature and humidity for 1 to 2 hours. The change of Vn shall be measured and meet the requirement of $V_n/V_n \leq \pm 10\%$.

High temperature storage

The specimen shall be subjected to 125 $\pm$ 1°C for 1000 hours. In a drying oven without load stored at room temperature and humidity for 1 to 2 hours. The change of Vn shall be measured and meet the requirement of $\Delta V_n/V_n \leq \pm 5\%$.

Withstanding Voltage

The specified voltage shall be applied between both terminals of the specimen connected together for 1 minute, with no remarkable mechanical damage.

Withstanding Voltage (Body Insulation)

Classification (Nom. varistor voltage)	Test Voltage (AC)
$V_{0.1mA} - V_{1mA} \leq 330 V$	1 000 Vrms
$V_{0.1mA} - V_{1mA} > 330 V$	1 500 Vrms

Terminal pull strength

After gradually applying the load specified below and keeping the unit fixed for 10 $\pm$ 1 seconds, with no remarkable mechanical damage.

Terminal diameter	Loading weight in pull strength
0.6mm (0.024")	10N (1.02Kg)
0.8 mm (0.031")	10N (1.02Kg)
1.0 mm (0.039")	20N (2.04Kg)

Terminal bending strength

The unit shall be secured with its terminal kept vertical and the weight specified above shall be applied in the axial direction. The terminal shall gradually be bent 90° in one direction, then 90° in the opposite direction, and again back to the original position. A bend of lead wire shall be repeated 2 times, with no remarkable mechanical damage.

Loading weight in bending strength

5N (0.51Kg)

5N (0.51Kg)

10N (1.02Kg)

Vibration

Subjected to simple harmonic motion of 0.75 mm amplitude 1.5 mm maximum total excursion between limits of 10-55 Hz.

Frequency scan shall be traversed in one minute. This motion shall then be applied for period of 2 hours in each of three mutually perpendicular directions, with no remarkable mechanical damage.

Solderability

After dipping the terminal to a depth of approximately 3mm from the body in a soldering bath of 235 $\pm$ 5°C for 2 $\pm$ 0.5 seconds, the terminal shall be visually examined. Approximately 95% of the terminals shall be covered with new solder uniformly.

Resistance to soldering heat

The terminal shall be dipped into a soldering bath with temperature of 260 $\pm$ 5°C to a point of 2-2.5 mm from the body of the unit, be held there for 10 $\pm$ 1 sec (5N series: 5 $\pm$ 1 sec) and then be stored at room temperature and humidity for 1 to 2 hours. The change of Vn shall be measured and meet the requirement of $\Delta V_n/V_n \leq \pm 5\%$ with no remarkable mechanical damage.

Damp heat load

The specimen shall be subjected to 40 $\pm$ 2°C, 90 to 95% R.H. and the maximum allowable voltage for 100 hours and then stored at room temperature and normally humidity for 1 to 2 hours. The change of Vn shall be measured and meet the requirement of $\Delta V_n/V_n \leq \pm 10\%$.

Temperature cycle

The temperature cycle is repeated five cycles with (1)-40 $\pm$ 3°C keeping 30 $\pm$ 3 minutes then (2) room temperature keeping 15 $\pm$ 3 minutes then (3)125 $\pm$ 2°C keeping 30 $\pm$ 3 minutes then (4) room temperature keeping 15 $\pm$ 3 minutes and then stored at room temperature and humidity for 1 to 2 hours. The change of Vn shall be measured and meet requirement $\Delta V_n/V_n \leq \pm 5\%$ with no remarkable mechanical damage.

Freigabe erteilt / general release:	Kunde / customer			
		JB	Version 6	2010-09-15
		JB	Version 5	2006-06-29
Datum / date	Unterschrift / signature	JP Penlou	New P/N	2006-06-01
	Würth Elektronik	JP Penlou	Customer Layout	2006-05-11
		JP Penlou	Factory codes	2005-11-16
		JP Penlou	Lead Free Marking	2004-10-19
Geprüft / checked	2010-09-15	Kontrolliert / approved	JP. Penlou	Name Änderung / modification Datum / date

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