

Kunde / customer :

Artikelnummer / part number : 820 521 311

Datum / Date : 2006-06-29

Bezeichnung :

description : STANDARD VARISTOR DISC

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)                       |
| 820521311   | 200               | 10        | 130             | 170 | 340              | 100                  | 6500                         |

\* 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 us waveform for 1 time

| Part Number | Rated Wattage | Energy | Capacitance | UL   | Certification CSA | VDE  | Diameter |
|-------------|---------------|--------|-------------|------|-------------------|------|----------|
|             | (W)           | J (*4) | pF (*5)     | (*6) | (*7)              | (*8) | (mm)     |
| 820521311   | 1.0           | 114.0  | 1830        | yes  | yes               | yes  | 20       |

\* 4. The Energy measured at 10/1000  $\mu$ s waveform for 1 time

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

\* 6. Certification UL N° XUHT2.E244196

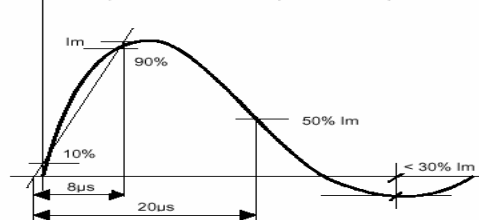
\* 7. Certification CSA N° XUHT8.E244196

\* 8. Certification VDE N° 40016998 &amp; 40016986

## SURGE LEVEL IEC61000-4-5

| Severity Level | (kV)    |
|----------------|---------|
| 1              | 0,5     |
| 2              | 1       |
| 3              | 2       |
| 4              | 4       |
| X              | Special |

Wave shape "Short circuit" (Current Isc)



| Wave during          | T1         | T2           |
|----------------------|------------|--------------|
| 8/20 $\mu$ s         | 10 $\mu$ s | 1000 $\mu$ s |
| 10/700 $\mu$ s CCITT | 10 $\mu$ s | 700 $\mu$ s  |
| 10/1000 $\mu$ s      | 10 $\mu$ s | 1000 $\mu$ s |

## ORDER CODE

820

## MARKING CODE

|   |   |     |   |
|---|---|-----|---|
| X | X | XXX | X |
|---|---|-----|---|

S

Varistor Type

Serie

Diameter

Vrms Voltage

Tolerance

Other

Special Type

Disc Varistor

 5 = Standard  
 4 = High Surge

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

Example:

180 = 18 V

271 = 270 V

102 = 1 000 V

 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

Kunde / customer :

Artikelnummer / part number : **820521311**

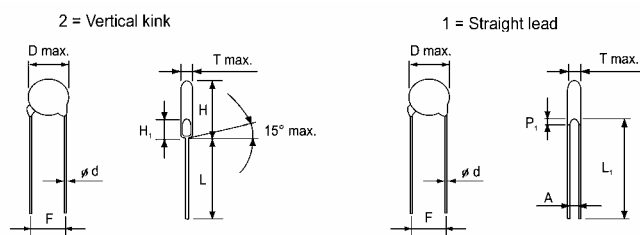
Bezeichnung :

description : **STANDARD VARISTOR DISC**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 | 0,6/0,8 | 0,8/1,0  | 0,8/1,0  |
| F +/-1,0  | 5,0 | 5,0 | 5,0/7,5 | 7,5/10,0 | 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) - \*Disc diameter before epoxy

Table of T max., A & P<sub>1</sub>. Unit : (mm)

| Diameter     | Ø 5   |          |                | Ø 7   |          |                | Ø 10  |          |                | Ø 14  |          |                | Ø 20  |          |                |
|--------------|-------|----------|----------------|-------|----------|----------------|-------|----------|----------------|-------|----------|----------------|-------|----------|----------------|
| Voltage Code | T max | A +/-0,8 | P <sub>1</sub> | T max | A +/-0,8 | P <sub>1</sub> | T max | A +/-0,8 | P <sub>1</sub> | T max | A +/-0,8 | P <sub>1</sub> | T max | A +/-0,8 | P <sub>1</sub> |
| 180          | 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            |
| 220          | 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            |
| 270          | 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            |
| 330          | 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            |
| 390          | 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            |
| 470          | 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            |
| 560          | 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            |
| 680          | 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            |
| 820          | 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            |
| 101          | 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            |
| 121          | 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            |
| 151          | 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            |
| 181          | 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            |
| 201          | 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            |
| 221          | 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            |
| 241          | 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            |
| 271          | 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            |
| 301          | 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            |
| 331          | 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            |
| 361          | 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            |
| 391          | 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            |
| 431          | 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            |
| 471          | 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            |
| 511          | 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            |
| 561          | 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            |
| 621          | 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            |
| 681          | 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            |
| 751          | 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            |
| 781          |       |          |                | 8,1   | 4,5      | 4,0            | 8,6   | 5,2      | 4,0            | 8,8   | 5,2      | 4,0            | 9,3   | 5,4      | 4,0            |
| 821          |       |          |                | 8,3   | 4,7      | 4,0            | 8,8   | 5,2      | 4,0            | 9,0   | 5,2      | 4,0            | 9,5   | 5,4      | 4,0            |
| 911          |       |          |                |       |          |                | 9,4   | 6,0      | 4,0            | 9,6   | 6,0      | 4,0            | 10,1  | 6,3      | 4,0            |
| 102          |       |          |                |       |          |                | 9,9   | 6,0      | 4,0            | 10,1  | 6,2      | 4,0            | 10,7  | 6,4      | 4,0            |
| 112          |       |          |                |       |          |                | 10,5  | 6,3      | 4,0            | 10,7  | 6,7      | 4,0            | 11,2  | 6,9      | 4,0            |
| 182          |       |          |                |       |          |                | 12,6  | 9,8      | 6,0            | 12,8  | 10,2     | 6,0            | 13,5  | 10,4     | 6,0            |

Kunde / customer :

Artikelnummer / part number : **820521311**

Bezeichnung :

description : **STANDARD VARISTOR DISC**DIAM: **20** MM**C Lötpad / soldering spec. :**

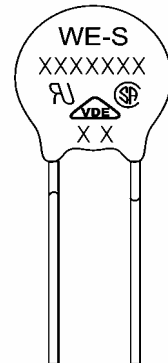
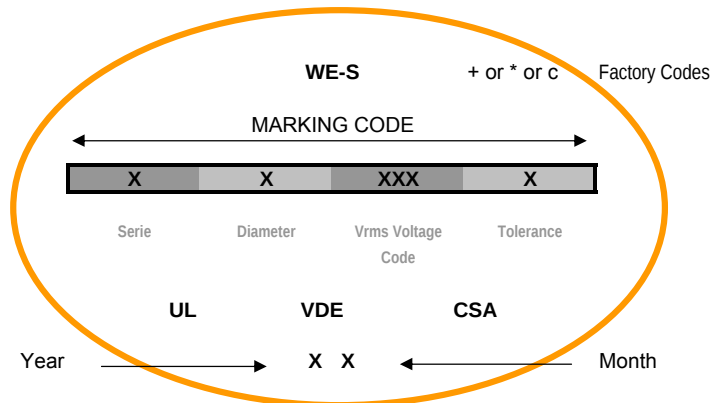
## MARKING

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       |
| Temp. Coefficient of voltage :       | 0 - 0.05% / °C max |
| Max. working surface temperature :   | +115°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 |

**Würth Elektronik eiSos GmbH & Co.KG - Radialex department**
 D-74638 Waldenburg · Max-Eyth-Straße 1 - 3 · Germany · Telefon (+49) (0) 7942 - 945 - 0 · Telefax (+49) (0) 7942 - 945 - 400  
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Kunde / customer :

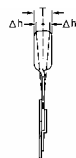
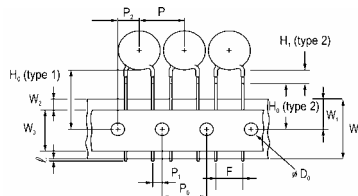
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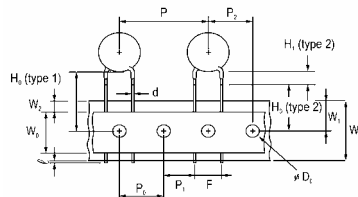
description : **STANDARD VARISTOR DISC**DIAM: **20** MM**D Rollenspezifikation / tape and reel specification :**

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"                  |                      |
| l                       | 1,1 mm maxi.         |            | 1,1 mm maxi.          |                      |
| H <sub>1</sub> (type 2) | 3,5 mm maxi.         | 5 mm maxi. | 5 mm maxi.            |                      |
| H <sub>0</sub> (type 2) | 16 +/-0,5 mm         |            | 16 +/-0,5 mm          |                      |
| H <sub>0</sub> (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 <sub>0</sub>          | 10 mm                |            | 12 mm                 |                      |
| W <sub>1</sub>          | 9 mm +0,75 / -0,5 mm |            | 9 mm +0,75 / -0,5 mm  |                      |
| W <sub>2</sub>          | 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 <sub>0</sub>          | 12,7 mm +/-0,3 mm    |            | 12,7 mm +/-0,3 mm     |                      |
| P <sub>1</sub>          | 3,85 mm +/-0,7 mm    |            | 8,95 mm +/-0,7 mm     | 7,7 mm +/-0,7 mm     |
| P <sub>2</sub>          | 6,35 mm +/-1,3 mm    |            | 12,7 mm +/-1,3 mm     |                      |
| D <sub>0</sub>          | 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 <sub>1</sub>          | 0,7 mm +/-0,05 mm    |            | 0,6 mm +/-0,05 mm     |                      |
| t <sub>2</sub>          | 1,6 mm maxi.         |            | 1,8 mm maxi.          |                      |

Kunde / customer :

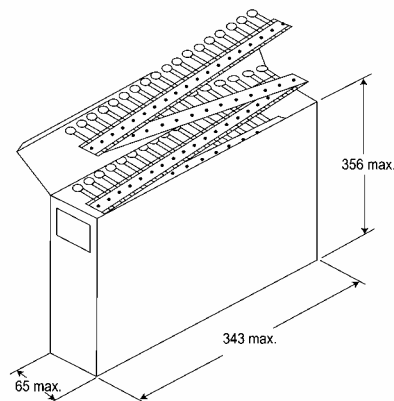
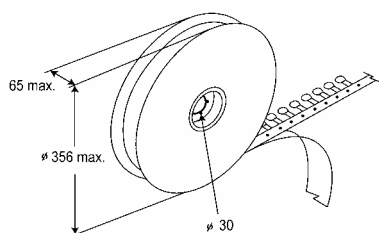
Artikelnummer / part number : **820521311**

Bezeichnung :

description : **STANDARD VARISTOR DISC**DIAM: **20** MM**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 | Ammo | Bulk  | Reel | Ammo | Bulk  | Reel | Ammo      | Ammo    | Bulk  | Reel | Ammo | Bulk  | Reel | Ammo |
| Voltage Serie | (Box) |      |      | (Box) |      |      | (Box) |      | Pitch 7,5 | Pitch 5 | (Box) |      |      | (Box) |      |      |
| 180 à 470     | 5000  | 1500 | 1500 | 5000  | 1500 | 1500 | 2500  | 1000 | 500       | 1000    | 1500  | 750  | 500  | 750   | 500  | 500  |
| 560 à 680     | 5000  | 1500 | 1500 | 5000  | 1500 | 1500 | 2500  | 1000 | 500       | 1000    | 1500  | 750  | 500  | 750   | 500  | 500  |
| 820 à 331     | 5000  | 1500 | 1500 | 5000  | 1500 | 1500 | 2500  | 1000 | 500       | 1000    | 1500  | 750  | 500  | 750   | 500  | 500  |
| 361 à 391     | 5000  | 1500 | 1000 | 5000  | 1500 | 1000 | 2500  | 1000 | 500       | 1000    | 1500  | 750  | 500  | 750   | 500  | 500  |
| 431 à 471     | 5000  | 1500 | 1000 | 5000  | 1000 | 1000 | 2500  | 750  | 500       | 750     | 1500  | 750  | 500  | 750   | 500  | 500  |
| 511 à 751     | 4000  | 1000 | 1000 | 4000  | 1000 | 1000 | 1500  | 500  | 500       | 500     | 750   | 500  | 500  | 450   | 500  | 500  |
| 781 à 182     | -     | -    | -    | -     | -    | -    | 1500  | 500  | 500       | 500     | 750   | 500  | 500  | 450   | 500  | 500  |

QUANTITY PER CARTON UNIT

| Packaging       | Bulk (Box)      | Reel               | Reel Ø 14 / 20  | Ammopack        | Ammo Ø 14 / 20  |
|-----------------|-----------------|--------------------|-----------------|-----------------|-----------------|
| Box size        | 290 x 155 x 110 | 350 x 350 x 108    | 350 x 350 x 74  | 330 x 240 x 45  | 350 x 260 x 65  |
| Carton size     | 310 x 328 x 250 | 371 x 371 x 590    | 370 x 370 x 468 | 354 x 515 x 258 | 365 x 535 x 275 |
| One carton with | 4 boxes         | 5 boxes (10 reels) | 6 boxes         | 10 boxes        | 8 boxes         |
| Unit:(mm)       |                 |                    |                 |                 |                 |

**Würth Elektronik eiSos GmbH & Co.KG - Radialex department**
 D-74638 Waldenburg · Max-Eyth-Straße 1 - 3 · Germany · Telefon (+49) (0) 7942 - 945 - 0 · Telefax (+49) (0) 7942 - 945 - 400  
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Kunde / customer :

Artikelnummer / part number : 820 521 311

Bezeichnung :

description : STANDARD VARISTOR DISC

DIAM: 20 MM

**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:

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

**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

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

**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  $\Delta Vn/Vn \leq \pm 5\%$ .

**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  $Vn/Vn \leq \pm 10\%$ .

**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  $\Delta Vn/Vn \leq \pm 5\%$ .

**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  $\Delta Vn/Vn \leq \pm 5\%$  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  $\Delta Vn/Vn \leq \pm 10\%$ .

**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  $\Delta Vn/Vn \leq \pm 5\%$  with no remarkable mechanical damage.

|                                        |                          |                         |                         |              |
|----------------------------------------|--------------------------|-------------------------|-------------------------|--------------|
| Freigabe erteilt /<br>general release: | Kunde / customer         |                         |                         |              |
|                                        |                          |                         |                         |              |
| 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                      | 2006-06-01               | Kontrolliert / approved | JP. Penlou              |              |
|                                        |                          | Name                    | Änderung / modification | Datum / date |

**Würth Elektronik eiSos GmbH & Co.KG - Radialex department**

D-74638 Waldenburg · Max-Eyth-Straße 1 - 3 · Germany · Telefon (+49) (0) 7942 - 945 - 0 · Telefax (+49) (0) 7942 - 945 - 400  
http://www.we-online.com

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

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- Оценку стоимости проекта по компонентам.
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Тел: +7 (812) 336 43 04 (многоканальный)

Email: [org@lifeelectronics.ru](mailto:org@lifeelectronics.ru)

[www.lifeelectronics.ru](http://www.lifeelectronics.ru)