

SMD Varistors

Monolithic; Standard Series



Construction

- Cylindrical varistor element, encapsulated
- Encapsulation: thermoplast, flame-retardant to UL 94 V-0
- Termination: tinned copper alloy

Features

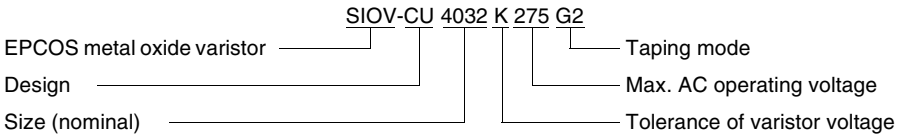
- Electrical equivalents to leaded types SIOV-S05/S07 up to 460 V_{RMS}
- Good solderability
- PSpice models
- Approvals: UL (all types) and CSA (≥ K130)

Taping

- Supply on 8/12-mm tape, for tape dimensions see pages 154/155, for reel dimensions and packing units see page 157, chapter "SMD Varistors: Taping"

Type designation

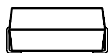
Detailed description of coding system on page 39, chapter "General Technical Information"



General technical data

| | | |
|---|-------------------------|-----------------------------------|
| Climatic category | 40/85/56 | in accordance with IEC 60068-1 |
| LCT | – 40 °C | |
| UCT | + 85 °C | |
| Damp heat, steady state (93 % r.h., 40 °C) | 56 days | in accordance with IEC 60068-2-3 |
| Operating temperature | – 40 ... + 85 °C | in accordance with CECC 42 000 |
| Storage temperature | – 40 ... + 125 °C | |
| Electric strength | ≥ 2,5 kV _{RMS} | in accordance with CECC 42 000 |
| Insulation resistance | ≥ 1,0 GΩ | in accordance with CECC 42 000 |
| Response time | < 10 ns | |
| Solderability | 235 °C, 2 s | in accordance with IEC 60068-2-58 |
| Resistance to soldering heat | 260 °C, 10 s | in accordance with IEC 60068-2-20 |

Note: Contact EPCOS for consultancy if solvents on water-base are used for cleaning.

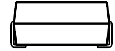


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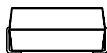
Monolithic; Standard Series

Maximum ratings ($T_A = 85\text{ }^\circ\text{C}$)

| Type | Ordering code | V_{RMS} | V_{DC} | i_{max} 8/20 μs | W_{max} (2 ms) | P_{max} |
|--------------|-----------------|-----------|----------|---------------------------------|---------------------|-----------|
| | | V | V | A | J | W |
| SIOV- | | | | | | |
| CU3225K11G2 | B72650M0110K072 | 11 | 14 | 100 | 0,3 | 0,01 |
| CU4032K11G2 | B72660M0110K072 | 11 | 14 | 250 | 0,8 | 0,02 |
| CU3225K14G2 | B72650M0140K072 | 14 | 18 | 100 | 0,4 | 0,01 |
| CU4032K14G2 | B72660M0140K072 | 14 | 18 | 250 | 0,9 | 0,02 |
| CU3225K17G2 | B72650M0170K072 | 17 | 22 | 100 | 0,5 | 0,01 |
| CU4032K17G2 | B72660M0170K072 | 17 | 22 | 250 | 1,1 | 0,02 |
| CU3225K20G2 | B72650M0200K072 | 20 | 26 | 100 | 0,6 | 0,01 |
| CU4032K20G2 | B72660M0200K072 | 20 | 26 | 250 | 1,3 | 0,02 |
| CU3225K25G2 | B72650M0250K072 | 25 | 31 | 100 | 0,7 | 0,01 |
| CU4032K25G2 | B72660M0250K072 | 25 | 31 | 250 | 1,6 | 0,02 |
| CU3225K30G2 | B72650M0300K072 | 30 | 38 | 100 | 0,9 | 0,01 |
| CU4032K30G2 | B72660M0300K072 | 30 | 38 | 250 | 2,0 | 0,02 |
| CU3225K35G2 | B72650M0350K072 | 35 | 45 | 100 | 1,1 | 0,01 |
| CU4032K35G2 | B72660M0350K072 | 35 | 45 | 250 | 2,5 | 0,02 |
| CU3225K40G2 | B72650M0400K072 | 40 | 56 | 100 | 1,3 | 0,01 |
| CU4032K40G2 | B72660M0400K072 | 40 | 56 | 250 | 3,0 | 0,02 |
| CU3225K50G2 | B72650M0500K072 | 50 | 65 | 400 | 1,8 | 0,10 |
| CU4032K50G2 | B72660M0500K072 | 50 | 65 | 1200 | 4,2 | 0,25 |
| CU3225K60G2 | B72650M0600K072 | 60 | 85 | 400 | 2,2 | 0,10 |
| CU4032K60G2 | B72660M0600K072 | 60 | 85 | 1200 | 4,8 | 0,25 |
| CU3225K75G2 | B72650M0750K072 | 75 | 100 | 400 | 2,5 | 0,10 |
| CU4032K75G2 | B72660M0750K072 | 75 | 100 | 1200 | 5,9 | 0,25 |
| CU3225K95G2 | B72650M0950K072 | 95 | 125 | 400 | 3,4 | 0,10 |
| CU4032K95G2 | B72660M0950K072 | 95 | 125 | 1200 | 7,6 | 0,25 |
| CU3225K115G2 | B72650M0111K072 | 115 | 150 | 400 | 3,6 | 0,10 |
| CU4032K115G2 | B72660M0111K072 | 115 | 150 | 1200 | 8,4 | 0,25 |
| CU3225K130G2 | B72650M0131K072 | 130 | 170 | 400 | 4,2 | 0,10 |
| CU4032K130G2 | B72660M0131K072 | 130 | 170 | 1200 | 9,5 | 0,25 |
| CU3225K140G2 | B72650M0141K072 | 140 | 180 | 400 | 4,5 | 0,10 |
| CU4032K140G2 | B72660M0141K072 | 140 | 180 | 1200 | 10,0 | 0,25 |

Characteristics ($T_A = 25\text{ }^\circ\text{C}$)

| Type | V_V (1 mA) V | ΔV_V (1 mA) % | Max. clamping voltage | | C_{typ} (1 kHz) pF | Derating curve Page | V/I char- acteristic Page |
|--------------|----------------------|-----------------------------|-----------------------|----------|----------------------------|---------------------------|---------------------------------|
| | | | v V | i A | | | |
| CU3225K11G2 | 18 | ± 10 | 36 | 1,0 | 1750 | 246 | 274 |
| CU4032K11G2 | 18 | ± 10 | 36 | 2,5 | 2750 | 246 | 275 |
| CU3225K14G2 | 22 | ± 10 | 43 | 1,0 | 1450 | 246 | 274 |
| CU4032K14G2 | 22 | ± 10 | 43 | 2,5 | 2300 | 246 | 275 |
| CU3225K17G2 | 27 | ± 10 | 53 | 1,0 | 1200 | 246 | 274 |
| CU4032K17G2 | 27 | ± 10 | 53 | 2,5 | 1900 | 246 | 275 |
| CU3225K20G2 | 33 | ± 10 | 65 | 1,0 | 980 | 246 | 274 |
| CU4032K20G2 | 33 | ± 10 | 65 | 2,5 | 1600 | 246 | 275 |
| CU3225K25G2 | 39 | ± 10 | 77 | 1,0 | 850 | 246 | 274 |
| CU4032K25G2 | 39 | ± 10 | 77 | 2,5 | 1400 | 246 | 275 |
| CU3225K30G2 | 47 | ± 10 | 93 | 1,0 | 720 | 246 | 274 |
| CU4032K30G2 | 47 | ± 10 | 93 | 2,5 | 1200 | 246 | 275 |
| CU3225K35G2 | 56 | ± 10 | 110 | 1,0 | 620 | 246 | 274 |
| CU4032K35G2 | 56 | ± 10 | 110 | 2,5 | 1050 | 246 | 275 |
| CU3225K40G2 | 68 | ± 10 | 135 | 1,0 | 520 | 246 | 274 |
| CU4032K40G2 | 68 | ± 10 | 135 | 2,5 | 900 | 246 | 275 |
| CU3225K50G2 | 82 | ± 10 | 135 | 5,0 | 300 | 247 | 274 |
| CU4032K50G2 | 82 | ± 10 | 135 | 10,0 | 530 | 247 | 275 |
| CU3225K60G2 | 100 | ± 10 | 165 | 5,0 | 250 | 247 | 274 |
| CU4032K60G2 | 100 | ± 10 | 165 | 10,0 | 480 | 247 | 275 |
| CU3225K75G2 | 120 | ± 10 | 200 | 5,0 | 210 | 247 | 274 |
| CU4032K75G2 | 120 | ± 10 | 200 | 10,0 | 430 | 247 | 275 |
| CU3225K95G2 | 150 | ± 10 | 250 | 5,0 | 135 | 247 | 274 |
| CU4032K95G2 | 150 | ± 10 | 250 | 10,0 | 260 | 247 | 275 |
| CU3225K115G2 | 180 | ± 10 | 300 | 5,0 | 110 | 247 | 274 |
| CU4032K115G2 | 180 | ± 10 | 300 | 10,0 | 220 | 247 | 275 |
| CU3225K130G2 | 205 | ± 10 | 340 | 5,0 | 100 | 247 | 274 |
| CU4032K130G2 | 205 | ± 10 | 340 | 10,0 | 200 | 247 | 275 |
| CU3225K140G2 | 220 | ± 10 | 360 | 5,0 | 95 | 247 | 274 |
| CU4032K140G2 | 220 | ± 10 | 360 | 10,0 | 180 | 247 | 275 |

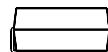


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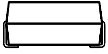
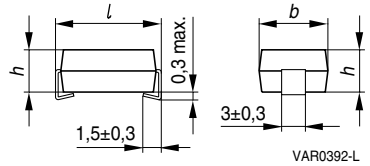
Monolithic; Standard Series

Maximum ratings ($T_A = 85\text{ °C}$)

| Type | Ordering code | V_{RMS} | V_{DC} | i_{max} 8/20 μ s | W_{max} (2 ms) | P_{max} |
|--------------|-----------------|-----------|----------|---------------------------|---------------------|-----------|
| SIOV- | | V | V | A | J | W |
| CU3225K150G2 | B72650M0151K072 | 150 | 200 | 400 | 4,9 | 0,10 |
| CU4032K150G2 | B72660M0151K072 | 150 | 200 | 1200 | 11,0 | 0,25 |
| CU3225K175G2 | B72650M0171K072 | 175 | 225 | 400 | 5,6 | 0,10 |
| CU4032K175G2 | B72660M0171K072 | 175 | 225 | 1200 | 13,0 | 0,25 |
| CU3225K230G2 | B72650M0231K072 | 230 | 300 | 400 | 7,2 | 0,10 |
| CU4032K230G2 | B72660M0231K072 | 230 | 300 | 1200 | 17,0 | 0,25 |
| CU3225K250G2 | B72650M0251K072 | 250 | 320 | 400 | 8,2 | 0,10 |
| CU4032K250G2 | B72660M0251K072 | 250 | 320 | 1200 | 19,0 | 0,25 |
| CU3225K275G2 | B72650M0271K072 | 275 | 350 | 400 | 8,6 | 0,10 |
| CU4032K275G2 | B72660M0271K072 | 275 | 350 | 1200 | 21,0 | 0,25 |
| CU3225K300G2 | B72650M0301K072 | 300 | 385 | 400 | 9,6 | 0,10 |
| CU4032K300G2 | B72660M0301K072 | 300 | 385 | 1200 | 23,0 | 0,25 |
| CU4032K460G2 | B72660M0461K072 | 460 | 615 | 1000 | 36,0 | 0,25 |


Characteristics ($T_A = 25\text{ }^\circ\text{C}$)

| Type | V_V (1 mA) V | ΔV_V (1 mA) % | Max. clamping voltage | | C_{typ} (1 kHz) pF | Derating curve Page | V/I char- acteristic Page |
|--------------|----------------------|-----------------------------|-----------------------|----------|----------------------------|---------------------------|---------------------------------|
| | | | v V | i A | | | |
| CU3225K150G2 | 240 | ± 10 | 395 | 5,0 | 90 | 247 | 274 |
| CU4032K150G2 | 240 | ± 10 | 395 | 10,0 | 170 | 247 | 275 |
| CU3225K175G2 | 270 | ± 10 | 455 | 5,0 | 75 | 247 | 274 |
| CU4032K175G2 | 270 | ± 10 | 455 | 10,0 | 150 | 247 | 275 |
| CU3225K230G2 | 360 | ± 10 | 595 | 5,0 | 60 | 247 | 274 |
| CU4032K230G2 | 360 | ± 10 | 595 | 10,0 | 115 | 247 | 275 |
| CU3225K250G2 | 390 | ± 10 | 650 | 5,0 | 55 | 247 | 274 |
| CU4032K250G2 | 390 | ± 10 | 650 | 10,0 | 105 | 247 | 275 |
| CU3225K275G2 | 430 | ± 10 | 710 | 5,0 | 50 | 247 | 274 |
| CU4032K275G2 | 430 | ± 10 | 710 | 10,0 | 95 | 247 | 275 |
| CU3225K300G2 | 470 | ± 10 | 775 | 5,0 | 45 | 247 | 274 |
| CU4032K300G2 | 470 | ± 10 | 775 | 10,0 | 90 | 247 | 275 |
| CU4032K460G2 | 750 | ± 10 | 1240 | 10,0 | 55 | upon request | 275 |

**SMD Varistors****Monolithic; Standard Series**

Weight:

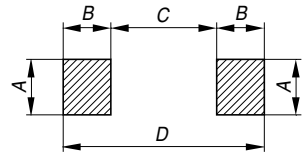
CU3225: approx. 0,5 g

CU4032: approx. 0,8 g

Dimensions

| Type | <i>l</i> mm | <i>b</i> mm | <i>h</i> mm |
|-----------------------|----------------|----------------|----------------|
| SIOV-CU3225K11...175 | 8,0 ± 0,3 | 6,3 ± 0,3 | 3,2 ± 0,3 |
| SIOV-CU3225K230...300 | 8,0 ± 0,3 | 6,3 ± 0,3 | 4,5 ± 0,3 |
| SIOV-CU4032K11...175 | 10,2 ± 0,3 | 8,0 ± 0,3 | 3,2 ± 0,3 |
| SIOV-CU4032K230...460 | 10,2 ± 0,3 | 8,0 ± 0,3 | 4,5 ± 0,3 |

Termination: tinned copper alloy



VAR0391-D

Recommended solder pad layout

| Type | <i>A</i> mm | <i>B</i> mm | <i>C</i> mm | <i>D</i> mm |
|-----------------------|----------------|----------------|----------------|----------------|
| SIOV-CU3225K11...175 | 3,5 | 2,8 | 4,5 | 10,1 |
| SIOV-CU3225K230...300 | 3,5 | 2,8 | 4,5 | 10,1 |
| SIOV-CU4032K11...175 | 3,5 | 2,8 | 6,5 | 12,1 |
| SIOV-CU4032K230...460 | 3,5 | 2,8 | 6,5 | 12,1 |

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