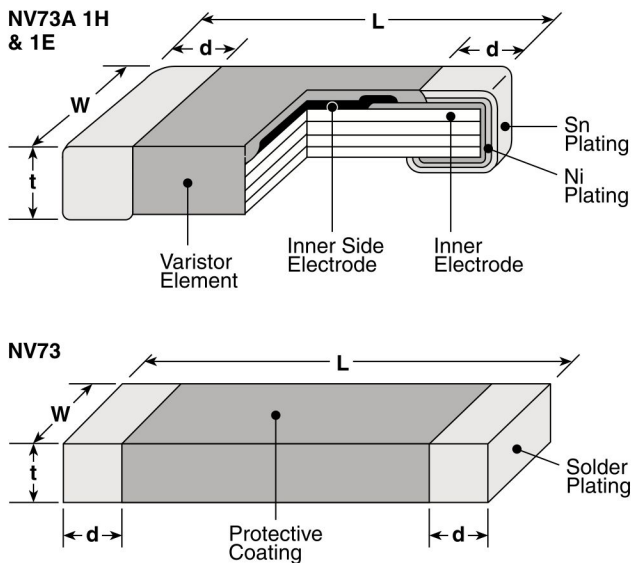


features

- Varistors own two-way symmetries and can absorb positive and negative surges
- SMD type metal oxide varistors (0201 and 0402 inch size)
- Multilayer construction allows its small size to absorb a large surge
- Small space and high density mounting available due to the small package
- Suitable for both flow and reflow solderings
- Products with lead free termination meet EU RoHS requirements

dimensions and construction



| Type (Inch Size Code) | Dimensions inches (mm) | | | |
|--------------------------|-------------------------|-------------------------|--------------------------|---|
| | L | W | t | d |
| 1H (0201) | .024±.001 (0.6±0.03) | .012±.001 (0.3±0.03) | .012±.001 (0.3±0.03) | .004 min. (0.1 min.) |
| 1E (0402) | .023±.004 (1.0±0.1) | .02±.004 (0.5±0.1) | .023 max. (0.6 max.) | .01±.006 (0.25±0.15) |
| 1J (0603) | .063±.006 (1.6±0.15) | .031±.006 (0.8±0.15) | .031±.006 (0.8±0.15) | .016 ^{+0.006} _{-0.008} (0.4 ^{+0.15} _{-0.2}) |
| 2A (0805) | .079±.008 (2.0±0.2) | .049±.008 (1.25±0.2) | .051 max. (1.3 max.) | .02±.010 (0.5±0.25) |
| 2B (1206) | .126±.008 (3.2±0.2) | .063±.008 (1.6±0.2) | .065 max. (1.65 max.) | .02 ^{+0.014} _{-0.010} (0.5 ^{+0.35} _{-0.25}) |

ordering information

| | | | | | | |
|-------------|--------------------|---|--|-----------------------------|--|-------------------------------|
| NV73 | A | | 1J | T | TE | 12 |
| Type | Energy Code | Capacitance Type | Size | Termination Material | Packaging | Varistor Voltage |
| | A B C | Blank: Standard L: Low Capacitance (1E only) | 1H: 0201 1E: 0402 1J: 0603 2A: 0805 2B: 1206 | T: Sn | TBM: 2mm press paper (1H: 15,000 pieces/reel) TP: 2mm pitch paper (1E: 10,000 pieces/reel) TE: 7" embossed plastic (1J, 2A, 2B: 2,500 pieces/reel) | 8: 8V 12: 12V 120: 120V |

The terminal surface material lead free is standard.
Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.
For further information on packaging, please refer to Appendix A.

applications and ratings

| Part Designation | Varistor Voltage V _{1mA} (V) | Varistor Voltage Tolerance (V) | Maximum Allowable Voltage d.c. (V) | Clamping Voltage I _c =1A (V) 8/20μs | Maximum Energy (J) 10/1000μs | Maximum Peak Current (A) 2 times 8/20μs | Capacitance (Typ) 1kHz (pF) | Operating Temp. (°C) | Storage Temp. (°C) |
|------------------|---------------------------------------|--------------------------------|------------------------------------|--|------------------------------|---|-----------------------------|----------------------|--------------------|
| NV73A1HTTB12 | 12 | 10 - 15.6 | 6.5 | 35 | 0.01 | 1 | 33 | -40°C to +85°C | -40°C to +125°C |
| NV73A1ETTP8 | 8 | 6.4 - 9.6 | 5.5 | 20 | 0.05 | 20 | 480 | | |
| NV73A1ETTP18 | 18 | 16.2 - 19.8 | 14.0 | 35 | | | 160 | | |
| NV73AL1ETTP12 | 12 | 10 - 14 | 5.5 | 30 | 0.03 | 5 | 50 | | |
| NV73AL1ETTP21 | 21 | 18 - 24 | 14.0 | 50 | | | 50 | | |
| NV73AL1ETTP28 | 28 | 24 - 32 | 18.0 | 65 | 0.005 | 2 | 15 | | |
| NV73AL1ETTP120 | 120 | 90 - 150 | | 350 (1C=0.5A) | | | 0.5 | | |

| Part Designation | Varistor Voltage V _c | Maximum Allowable Voltage | | Clamping Voltage | | Maximum Energy E (J) | Maximum Peak Current I _p (A) (2 times) | Operating Temp. T _{opt} (°C) | Storage Temp. T _{stg} (°C) |
|------------------|---------------------------------|---------------------------|---------|------------------|-----------------|----------------------|---|---------------------------------------|-------------------------------------|
| | I _c = 1mA (V) | a.c rms (V) | d.c (V) | V _{1A} | V _{2A} | | | | |
| NV73A1JTTE8.2 | 6.8 - 9.8 | 4.2 | 6.0 | — | 21 | 0.1 | 30 | -40°C to +85°C | -40°C to +125°C |
| NV73A1JTTE12 | 10 - 14.4 | 6.1 | 8.6 | — | 29 | | | | |
| NV73A1JTTE15 | 12.5 - 18 | 7.6 | 10.8 | — | 35 | | | | |
| NV73A1JTTE18 | 16 - 20 | 9.1 | 12.8 | — | 37 | | | | |
| NV73A1JTTE20 | 18 - 22 | 10.6 | 15.0 | — | 40 | | | | |
| NV73A1JTTE22 | 19 - 24 | 12.0 | 16.5 | — | 42 | | | | |
| NV73A1JTTE24 | 21.8 - 26.5 | 14.0 | 18.0 | — | 46 | | | | |
| NV73A1JTTE27 | 25 - 32 | 17.0 | 22.0 | — | 49 | | | | |
| NV73A2ATTE8.2 | 6.8 - 9.8 | 4.2 | 6.0 | 18 | — | 0.01 | 10 | | |
| NV73A2ATTE12 | 10 - 14.4 | 6.1 | 8.6 | 24 | — | 0.03 | 20 | | |
| NV73A2ATTE15 | 12.5 - 18 | 7.6 | 10.8 | 29 | — | 0.04 | | | |
| NV73A2ATTE18 | 16 - 20 | 9.1 | 12.8 | 29 | — | | | | |
| NV73A2ATTE20 | 18 - 22 | 10.6 | 15.0 | 33 | — | 0.05 | | | |
| NV73A2ATTE22 | 19 - 24 | 12.0 | 16.5 | 39 | — | | | | |
| NV73A2ATTE24 | 21.8 - 26.5 | 14.0 | 18.0 | 42 | — | 0.06 | | | |
| NV73A2ATTE27 | 25 - 32 | 17.0 | 22.0 | 50 | — | 0.07 | | | |
| NV73A2ATTE33 | 30 - 39 | 20.0 | 26.0 | 60 | — | 0.12 | 25 | | |
| NV73A2ATTE39 | 37 - 47 | 25.0 | 31.0 | 72 | — | 0.14 | | | |
| NV73A2ATTE47 | 45 - 54 | 30.0 | 38.0 | 86 | — | 0.16 | | | |
| NV73B2ATTE8.2 | 6.8 - 9.8 | 4.2 | 6.0 | — | 18 | 0.03 | 35 | | |
| NV73B2ATTE12 | 10 - 14.4 | 6.1 | 8.6 | — | 24 | 0.05 | | | |
| NV73B2ATTE15 | 12.5 - 18 | 7.6 | 10.8 | — | 30 | 0.07 | | | |
| NV73B2ATTE18 | 16 - 20 | 9.1 | 12.8 | — | 32 | 0.08 | | | |
| NV73B2ATTE20 | 18 - 22 | 10.6 | 15.0 | — | 36 | 0.09 | | | |
| NV73B2ATTE22 | 19 - 24 | 12.0 | 16.5 | — | 40 | 0.11 | | | |
| NV73B2ATTE24 | 21.8 - 26.5 | 14.0 | 18.0 | — | 42 | 0.12 | | | |
| NV73B2ATTE27 | 25 - 32 | 17.0 | 22.0 | — | 58 | 0.24 | 50 | | |
| NV73B2ATTE33 | 30 - 39 | 20.0 | 26.0 | — | 66 | 0.25 | | | |
| NV73C2ATTE8.2 | 6.8 - 9.8 | 4.2 | 6.0 | — | 18 | 0.04 | | 25 | |
| NV73C2ATTE12 | 10 - 14.4 | 6.1 | 8.6 | — | 24 | 0.09 | | 40 | |
| NV73C2ATTE15 | 12.5 - 18 | 7.6 | 10.8 | — | 29 | 0.11 | | | |
| NV73C2ATTE18 | 16 - 20 | 9.1 | 12.8 | — | 32 | 0.13 | | | |
| NV73C2ATTE20 | 18 - 22 | 10.6 | 15.0 | — | 35 | 0.14 | | | |
| NV73C2ATTE22 | 19 - 24 | 12.0 | 16.5 | — | 40 | 0.17 | | | |
| NV73C2ATTE24 | 21.8 - 26.5 | 14.0 | 18.0 | — | 42 | 0.18 | | | |
| NV73A2BTTE27 | 25 - 32 | 17.0 | 22.0 | — | 55 | 0.13 | | | |
| NV73A2BTTE33 | 30 - 39 | 20.0 | 26.0 | — | 60 | 0.15 | | | |
| NV73A2BTTE39 | 37 - 47 | 25.0 | 31.0 | — | 72 | 0.18 | | | |
| NV73A2BTTE47 | 45 - 54 | 30.0 | 38.0 | — | 85 | 0.22 | | | |
| NV73A2BTTE56 | 52 - 62 | 35.0 | 45.0 | — | 100 | 0.26 | | | |

vertical text: circuit protection

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use. 11/24/14

applications and ratings (continued)

| Part Designation | Varistor Voltage Vc | Maximum Allowable Voltage | | Clamping Voltage | | Maximum Energy E (J) | Maximum Peak Current I _p (A) (2 times) | Operating Temp. T _{opt} (°C) | Storage Temp. T _{stg} (°C) |
|------------------|--------------------------|---------------------------|---------|------------------|-----------------|----------------------|---|---------------------------------------|-------------------------------------|
| | I _c = 1mA (V) | a.c rms (V) | d.c (V) | V _{1A} | V _{2A} | | | | |
| NV73B2BTTE8.2 | 6.8 - 9.8 | 4.2 | 6.0 | — | 18 | 0.03 | 50 | -40°C to +85°C | -40°C to +125°C |
| NV73B2BTTE12 | 10 - 14.4 | 6.1 | 8.6 | — | 24 | 0.07 | | | |
| NV73B2BTTE15 | 12.5 - 18 | 7.6 | 10.8 | — | 29 | 0.09 | | | |
| NV73B2BTTE18 | 16 - 20 | 9.1 | 12.8 | — | 32 | 0.1 | | | |
| NV73B2BTTE20 | 18 - 22 | 10.6 | 15.0 | — | 35 | 0.11 | | | |
| NV73B2BTTE22 | 19 - 24 | 12.0 | 16.5 | — | 40 | 0.12 | | | |
| NV73B2BTTE24 | 21.8 - 26.5 | 14.0 | 18.0 | — | 42 | 0.14 | | | |
| NV73B2BTTE27 | 25 - 32 | 17.0 | 22.0 | — | 52 | 0.16 | | | |
| NV73C2BTTE8.2 | 6.8 - 9.8 | 4.2 | 6.0 | — | 18 | 0.06 | 40 | | |
| NV73C2BTTE12 | 10 - 14.4 | 6.1 | 8.6 | — | 24 | 0.1 | 70 | | |
| NV73C2BTTE15 | 12.5 - 18 | 7.6 | 10.8 | — | 29 | 0.13 | | | |
| NV73C2BTTE18 | 16 - 20 | 9.1 | 12.8 | — | 29 | 0.15 | | | |
| NV73C2BTTE20 | 18 - 22 | 10.6 | 15.0 | — | 31 | 0.17 | | | |
| NV73C2BTTE22 | 19 - 24 | 12.0 | 16.5 | — | 35 | 0.19 | | | |
| NV73C2BTTE24 | 21.8 - 26.5 | 14.0 | 18.0 | — | 38 | 0.2 | | | |
| NV73C2BTTE27 | 25 - 32 | 17.0 | 22.0 | — | 48 | 0.24 | | | |

environmental applications

Performance Characteristics

| Parameter | Requirement Δ V±% | Test Method |
|--|----------------------------|---|
| Varistor Voltage | Within specified tolerance | Voltage between terminals when 1mA is flowed |
| Solderability | 95% coverage minimum | 230°C ± 5°C, 4 seconds ± 1 second |
| Resistance to Solder Heat | ±10% | 260°C ± 5°C, 10 seconds ± 0.5 second*; 270°C ± 5°C, 3 seconds ± 0.5 second** |
| Rapid Change of Temperature | ±10% | -40°C (30 minutes), +125°C (30 minutes), 30 cycles**; 5 cycles* |
| Maximum Peak Current | ±10% | A single standard impulse of 8/20μ seconds, positive/negative applied once each |
| Maximum Energy | ±10% | A single standard impulse of 10/1000μs, once*; A single standard impulse of 2ms, once** |
| High Temperature Life with d.c. Bias | ±10% | 85°C ± 5°C, 1000h, Load: Maximum allowable circuit voltage (d.c.) |
| High Temperature Life with a.c. Bias** | ±10% | 85°C ± 5°C, 1000h, Load: Maximum allowable circuit voltage (V _{a.c.r.m.s.})** |
| High Temperature & High Humidity Life with d.c. Bias | ±10% | 40°C ± 5°C, 95% RH, 500h, Load: Maximum allowable voltage (d.c.) |
| Capacitance* | Typical | 1kHz: Others, 1MHz: Varistor voltage 120V |
| High Temperature Storage Life | ±10% | 125°C ± 5°C, 1000h |
| Low Temperature Storage Life | ±10% | -40°C ± 5°C, 1000h |

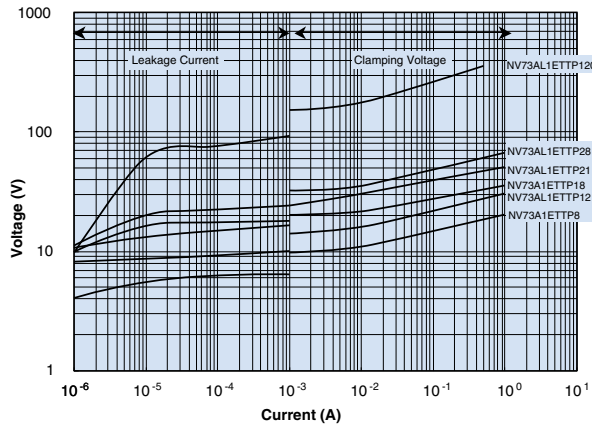
* 1H, 1E ** 1J, 2A, 2B

For Voltage Current Curves Graphs see Environmental Applications. Additional environmental applications can also be found at www.koaspeer.com

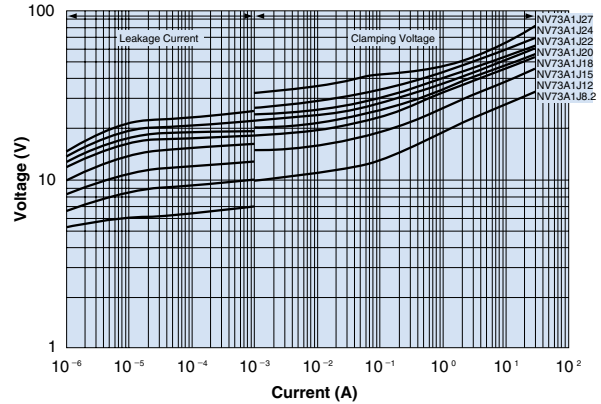
environmental applications (continued)

Voltage-Current Curves (Ta = 25°C)

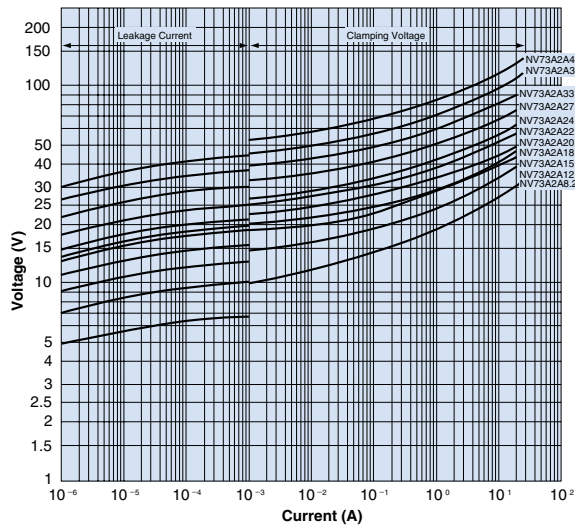
NV73A 1E



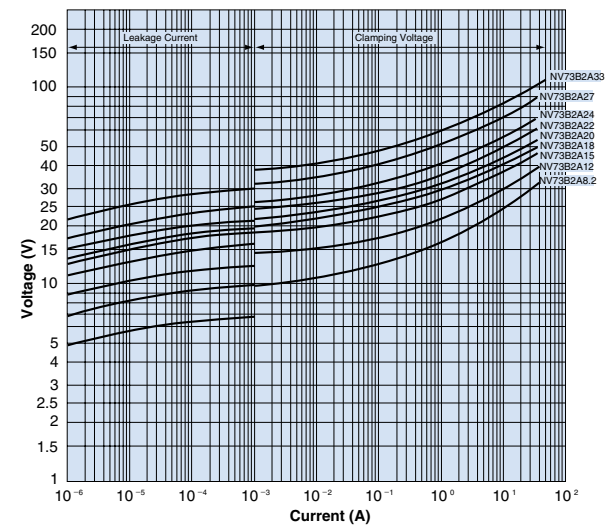
NV73A 1J



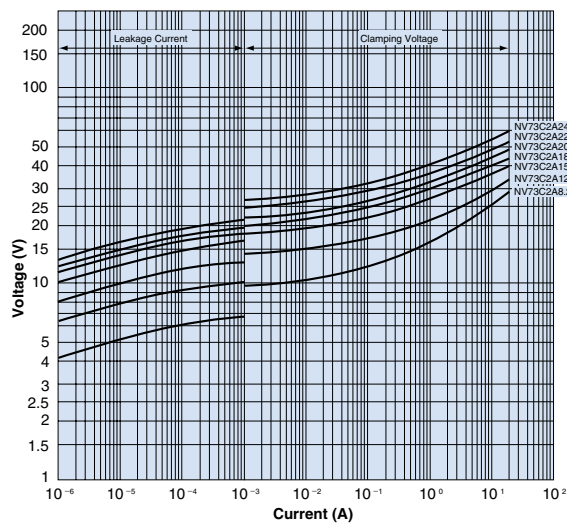
NV73A 2A



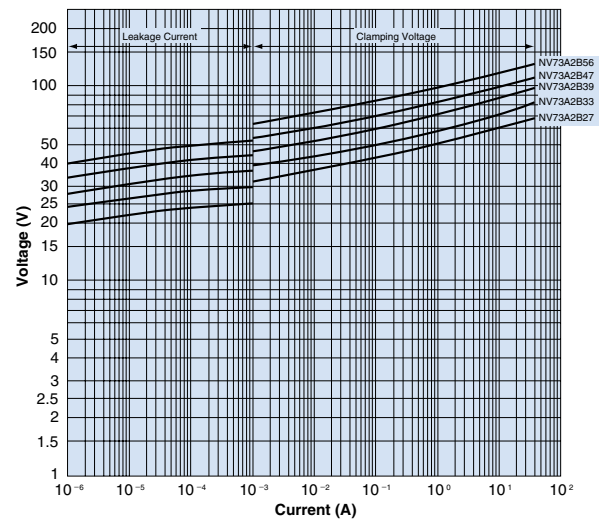
NV73B 2A



NV73C 2A



NV73A 2B

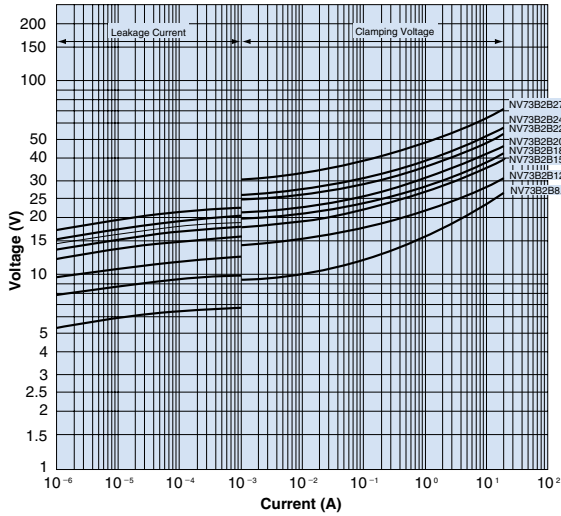


circuit protection

environmental applications (continued)

Voltage-Current Curves (Ta = 25°C)

NV73B 2B



NV73C 2B

