Metal oxide varistor

SMD multilayer varistor with nickel barrier termination

Series/Type:	**CT0402S14AHSG**
Ordering code:	**B72590T8140S160**
Date:	2007-05-10
Version:	2

Designation system

CT = **c**hip with **t**hree-layer- termination (Ag/Ni/Sn)
0402 = dimensions of the device **04 x 02** (length x width in 1/100 inch)
S…A = special tolerance of the varistor voltage
14 = maximum operating voltage
HS = designed for protection of **h**igh **s**peed data lines
G = taped version (cardboard tape, 7" reel, 10000 pcs. /reel)

Electrical data

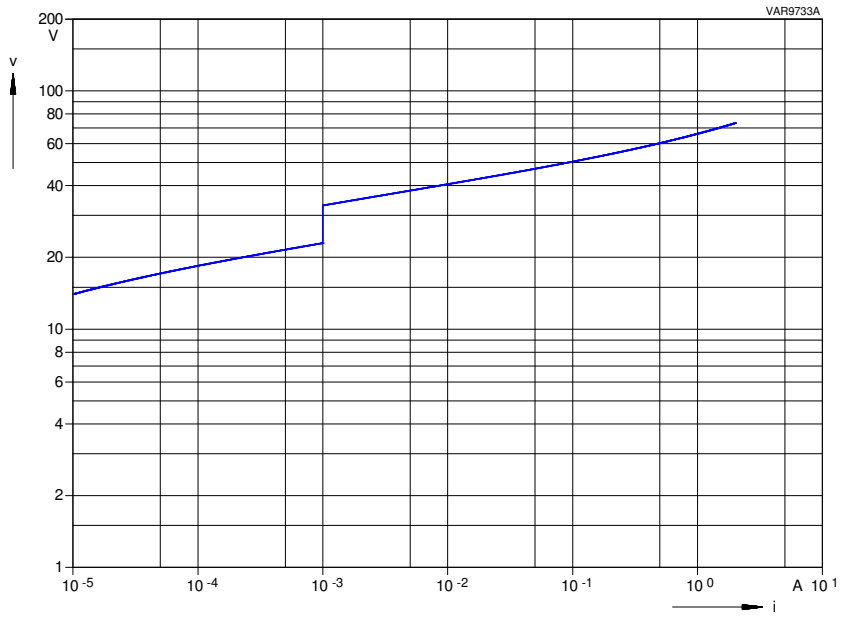
Maximum operating voltage	
RMS voltage	**V_{RMS} = 14 V**
DC voltage	**V_{DC} = 16 V**
Varistor voltage (@ 1 mA, 25 °C)	**V_V = 23 … 33 V**
Maximum clamping voltage (@ 1 A)	**V_C = 66 V**
Maximum average power dissipation	**P_{max} = 3 mW**
Maximum surge current (8/20 µs)	**I_{max} = 1 x 2 A**
Maximum energy absorption (ESD) (@ ESD according to IEC 61000-4-2, 15 kV air discharge)	**E_{max} = 30 mJ**
Maximum capacitance (@ 1 MHz, 1V, 25 °C)	**C = 15 pF**
Typical capacitance (@ 1 MHz, 1V, 25 °C)	**C = 10 pF**
Response time	**< 0.5 ns**
Operating temperature	**–55 … +85 °C**
Storage temperature (mounted parts)	**–55 … +125 °C**

Thickness not specified, adjusted to fulfil wettability specification to IEC 60068-2-58.

Application note

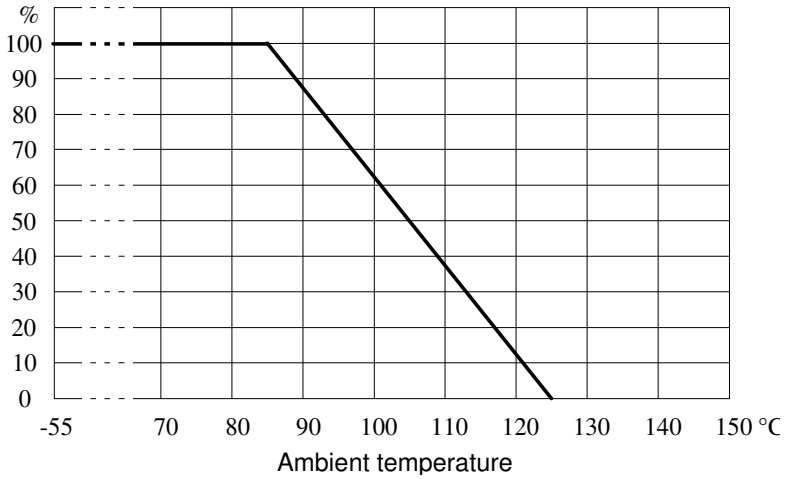
The described component is designed to meet ESD level 4 requirements according to IEC 61000-4-2 (8 kV contact discharge, 150 pF, 330 Ω)

v/i-characteristic

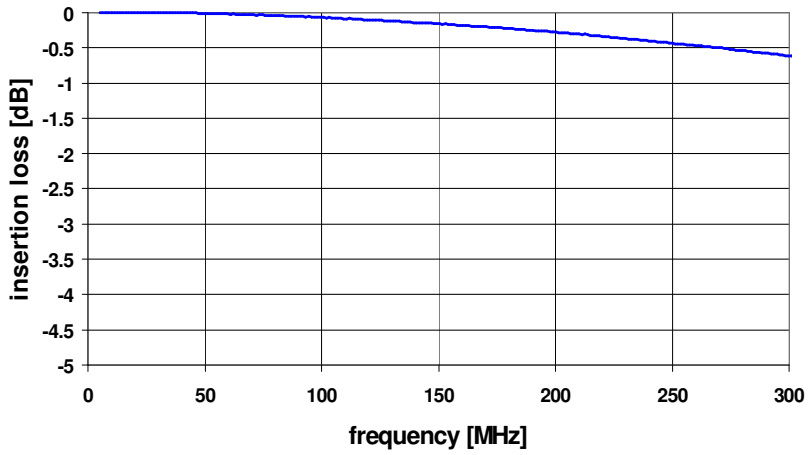


Temperature derating

Max. current, energy and average power dissipation depending on ambient temperature

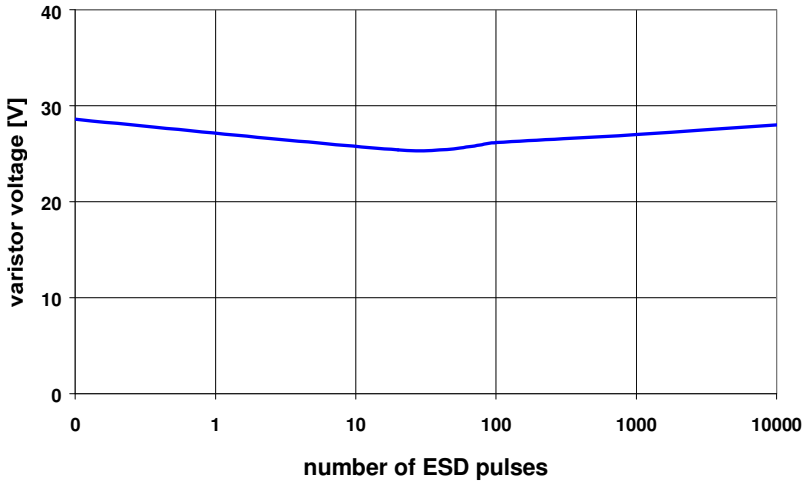


Signal insertion loss[1)]



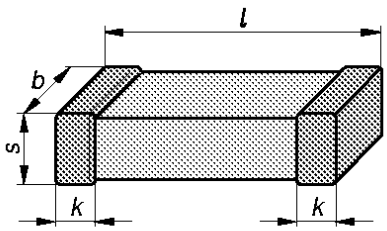
[1)] typical values, measured with network analyzer HP8753 E/S containing S-parameter test set.

Stability to multiple ESD discharges[2)]



[2)] Level IV conditions according to IEC 61000-4-2 (8 kV contact discharge, 150 pF/330 Ω).

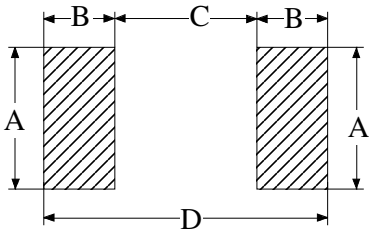
Dimensional drawing in mm



KKE0329-N

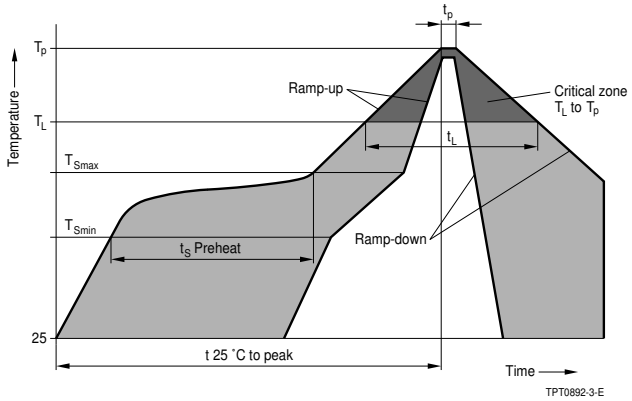
l = 1.0 ±0.15
b = 0.5 ±0.10
s = 0.5 ±0.10
k = 0.2 ±0.10

Recommended solder pad layout



A = 0.6 mm
B = 0.6 mm
C = 0.5 mm
E = 1.7 mm

Recommended reflow soldering temperature profile



Profile feature	Sn-Pb eutectic assembly	Pb-free assembly
Average ramp-up rate (T_{Smax} to T_p)	3 °C/ second max.	3 °C/ second max.
Preheat - Temperature min (T_{Smin}) - Temperature max (T_{Smax}) - Time (t_{Smin} to t_{Smax})	 100 °C 150 °C 60 … 120 seconds	 150 °C 200 °C 60 … 180 seconds
Time maintained above - Temperature min (T_L) - Time (t_L)	 183 °C 60 … 150 seconds	 217 °C 60 … 150 seconds
Peak classification temperature (T_p)	220 °C … 240 °C	240 °C … 260 °C
Time within 5 °C of actual peak temperature (t_p)	10 … 30 seconds	20 … 40 seconds
Ramp-down rate	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Notes: All temperatures refer to topside of the package, measured on the package body surface.
Max. number of reflow cycles: 3

Soldering guidelines

The usage of mild, non-activated fluxes for soldering is recommended, as well as proper cleaning of the PCB.
The components are suitable for reflow soldering to JEDEC J-STD-020C.

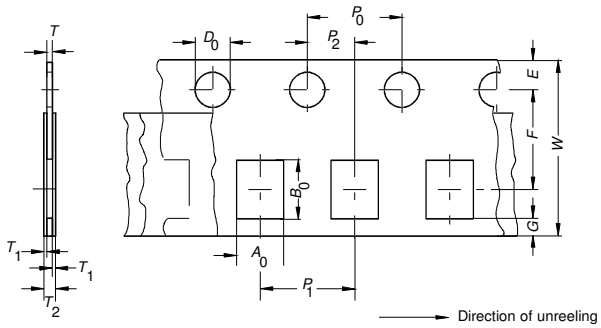
Storage condition

- As far as possible, the components should be employed within 12 months after delivery from EPCOS.
- They should be left in their original packings to avoid soldering problems due to oxidized contacts.
- Storage temperature: – 25 up to + 45°C.
- Relative humidity: < 75 % annual average, < 95 % on max. 30 days in a year.

Taping and packaging

Tape and reel packing according to IEC 60286-3

Tape material: Cardboard



Dimensions and tolerances

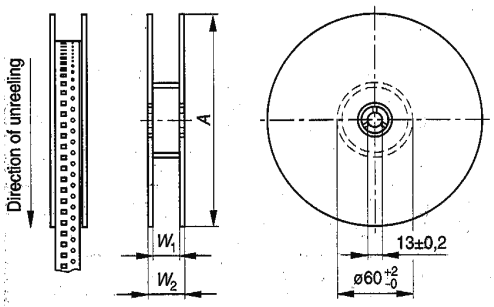
Definition	Symbol	Dimension [mm]	Tolerance [mm]
Compartment width	A_0	0.6	±0.2
Compartment length	B_0	1.15	±0.2
Sprocket hole diameter	D_0	1.5	±0.1
Sprocket hole pitch	P_0	4.0	±0.1 [1)]
Distance center hole to center compartment	P_2	2.0	±0.05
Pitch of the component compartments	P_1	2.0	±0.1
Tape width	W	8.0	±0.3
Distance edge to center of hole	E	1.75	±0.1
Distance center hole to center compartment	F	3.5	±0.05
Distance compartment to edge	G	0.75	min
Thickness of cardboard tape	T	0.6	max.
Overall thickness	T_2	0.7	max.

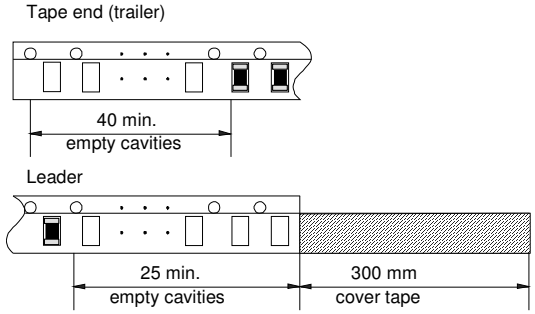
[1)] ≤ ± 0.2 mm over any 10 pitches
Package: 8-mm tape

Packing

Reel material: Plastic

Reel dimensions





Definition	Symbol	Dimension [mm]	Tolerance [mm]
Reel diameter	A	180	+0 / -3
Reel width (inside)	W_1	8.4	+1.5 / -0
Reel width (outside)	W_2	14.4	max.

Dimensions approx. 220 x 220 mm. Weight approx. 170 g.
6 bags in cardboard box, dimensions approx. 250 x 220 x 130 mm. Weight approx. 1 kg.

Packing unit: 10000 pcs. /reel

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