

## SMD Varistors

### MLV; Automotive Series



#### Construction

- Multilayer technology
- Termination: nickel barrier (CT series) or silver palladium (CN series)
- No plastic or epoxy encapsulation assures better than UL 94 V-0 flammability rating

#### Features

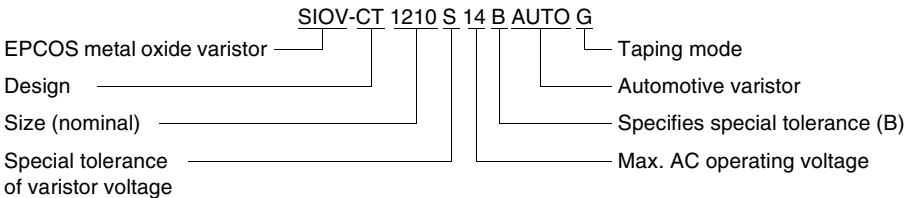
- Sizes 0603 ... 2220
- High energy absorption, particularly in case of load dump
- Stable protection level, low leakage current
- High resistance to cyclic temperature stress
- Wide range of operating temperature
- Low inductance (suitable for ESD protection)
- PSpice models
- Bidirectional clamping

#### 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	55/125/56	in accordance with IEC 60068-1
LCT	– 55 °C	
UCT	+ 125 °C	
Damp heat, steady state (93 % r.h., 40 °C)	56 days	in accordance with IEC 60068-2-3
Operating temperature	– 55 ... + 125 °C	in accordance with CECC 42 000
Storage temperature <sup>1)</sup>	– 55 ... + 150 °C	
Response time	< 0,5 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 60068-2-58

1) For mounted parts (storage conditions for unused parts on reel see page 38, chapter "General Technical Information")


**SMD Varistors**
**Automotive – Nickel Barrier Termination (available upon request)**
**Maximum ratings ( $T_A = 125\text{ °C}$ )**

Type	Ordering code	$V_{RMS}$ V	$V_{DC}$ V	$i_{max}$ 8/20 $\mu$ s A	$W_{max}$ (2 ms) J	$P_{max}$ W	$W_{LD}$ (10x) J
12-V supply systems							
CT0603S14BAUTOG	B72500T1140S260	14	16	30	0,2	0,003	—
CT0805S14BAUTOG	B72510T1140S262	14	16	120	0,3	0,008	1,0
CT1206S14BAUTOG	B72520T1140S262	14	16	200	0,6	0,008	1,5
CT1210S14BAUTOG	B72530T1140S262	14	16	400	1,6	0,010	3,0
CT1812S14BAUTOG	B72580T1140S262	14	16	800	2,4	0,015	6,0
CT2220S14BAUTOG	B72540T1140S262	14	16	1200	5,8	0,030	12,0
CT2220S14BAUTOE2G2	B72540T3140S272	14	16	1200	5,8	0,030	25,0
24-V supply systems							
CT2220K25AUTOE2G2	B72540T3250K072	25	31	1200	9,6	0,030	25,0
CT2220K30AUTOG	B72540T1300K062	30	34	1200	12,0	0,030	12,0
CT2220K30AUTOE2G2	B72540T3300K072	30	34	1200	12,0	0,030	25,0

**Characteristics ( $T_A = 25\text{ °C}$ )**

Type	$V_{Jump}$ (5 min) V	$V_V$ (1 mA) V	$\Delta V_V$ (1 mA) %	Max. clamping voltage		$C_{typ}$ (1 kHz) nF	$L_{typ}$ nH	Der. curve Page	V/I char. Page
				$v$ V	$i$ A				
12-V supply systems									
CT0603S14BAUTOG	24,5	22	+23/-0	42	1,0	0,12	1,0	238	272
CT0805S14BAUTOG	24,5	22	+23/-0	42	1,0	0,4	1,5	239	272
CT1206S14BAUTOG	24,5	22	+23/-0	40	1,0	0,8	1,8	240	272
CT1210S14BAUTOG	24,5	22	+23/-0	40	2,5	1,7	1,8	242	272
CT1812S14BAUTOG	24,5	22	+23/-0	40	5,0	5,6	2,5	244	272
CT2220S14BAUTOG	24,5	22	+23/-0	40	10,0	9,5	3,0	245	272
CT2220S14BAUTOE2G2	24,5	22	+23/-0	40	10,0	15,0	3,0	245	272
24-V supply systems									
CT2220K25AUTOE2G2	40,0	39	$\pm 10$	65	10,0	10,0	3,0	245	271
CT2220K30AUTOG	45,0	47	$\pm 10$	77	10,0	4,0	3,0	245	271
CT2220K30AUTOE2G2	45,0	47	$\pm 10$	77	10,0	10,0	3,0	245	271

**Notes**

- If the maximum loads specified for load dump and jump start are fully utilized, subsequent polarity reversal of the AUTO varistors is inadmissible.
- If the load remains under the maximum ratings, polarity reversal may be admissible. Contact EPCOS for consultancy on this kind of problem.
- Load dump or jump start can decrease the varistor voltage in load direction by max. 15 %.
- Load dump: min. time of energy input 40 ms, interval 60 s.  
(The load dump time constant  $t_d$  differs from the time constant of the energy input)


**Maximum ratings ( $T_A = 125\text{ °C}$ )**

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				$v$	$i$				
	V	V	%	V	A	nF	nH	Page	Page
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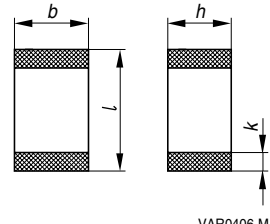
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Weight: < 0,2 g

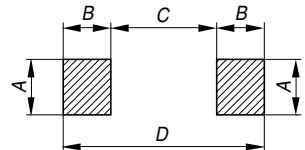
VAR0406-M

Termination acc. CECC 32101-801

### Dimensions

Type	<i>l</i> mm	<i>b</i> mm	<i>h</i> mm	<i>k</i> mm
SIOV-CT/CN0603	1,6 ± 0,15	0,80 ± 0,10	0,9 max.	0,1 ... 0,4
SIOV-CT/CN0805	2,0 ± 0,20	1,25 ± 0,15	1,4 max.	0,13 ... 0,75
SIOV-CT/CN1206	3,2 ± 0,30	1,60 ± 0,20	1,7 max.	0,25 ... 0,75
SIOV-CT/CN1210	3,2 ± 0,30	2,50 ± 0,25	1,7 max.	0,25 ... 0,75
SIOV-CT/CN1812	4,5 ± 0,40	3,20 ± 0,30	2,5 max.	0,25 ... 1,0
SIOV-CT/CN2220	5,7 ± 0,40	5,00 ± 0,40	2,5 max.	0,25 ... 1,0

Termination: nickel barrier (CT) or silver palladium (CN)



VAR0391-D

### Recommended solder pad layout

Type	<i>A</i> mm	<i>B</i> mm	<i>C</i> mm	<i>D</i> mm
SIOV-CT/CN0603	1,0	1,0	1,0	3,0
SIOV-CT/CN0805	1,4	1,2	1,0	3,4
SIOV-CT/CN1206	1,8	1,2	2,1	4,5
SIOV-CT/CN1210	2,8	1,2	2,1	4,5
SIOV-CT/CN1812	3,6	1,5	3,0	6,0
SIOV-CT/CN2220	5,5	1,5	4,2	7,2

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