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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# **CTVS – Ceramic transient voltage suppressors**

SMD multilayer varistors (MLVs),  
automotive E series

**Series/Type:**

Date: February 2016

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## Multilayer varistors (MLVs)

### Automotive E series

#### SMD

#### EPCOS type designation system for automotive series, single chips

CT	0603	S	14	B	AUTO	E2	G2
<b>Construction:</b> CT $\triangleq$ Single chip with nickel barrier termination (AgNiSn)							
<b>EAI case sizes:</b> 0402 0603 0805 1206 1210 1812 2220							
<b>Varistor voltage tolerance:</b> K $\triangleq$ $\pm 10\%$ , standard L $\triangleq$ $\pm 10\%$ , standard S $\triangleq$ Special tolerance							
<b>Maximum RMS operating voltage (<math>V_{RMS}</math>):</b> 14 $\triangleq$ 14 V $V_{RMS} < 25$ V are suitable for 12 V DC supply systems $V_{RMS} \geq 25$ V are suitable for 24 V DC supply systems							
<b>Special tolerance for the varistor voltage:</b> – $\triangleq$ Standard tolerance A or B $\triangleq$ Special tolerance							
– $\triangleq$ Standard series AUTO $\triangleq$ specified for load-dump/ jump-start protection (except CT0603S14BAUTOG and CT0805K17AUTOLCG)							
<b>Special features:</b> – $\triangleq$ Standard energy handling capability E2 $\triangleq$ Increased energy handling capability HT $\triangleq$ High temperature version LC $\triangleq$ Low capacitance version CC $\triangleq$ Controlled capacitance version RF $\triangleq$ Radio frequency							
<b>Taping mode:</b> G $\triangleq$ Taped, 180-mm reel, 7" G2 $\triangleq$ Taped, 330-mm reel, 13"							

## Multilayer varistors (MLVs)

### Automotive E series

#### SMD

#### EPCOS type designation system for automotive series, array

CA	05	M2	S	10	T	100	H	G
<b>Construction:</b> CA $\triangleq$ Array with nickel barrier termination (AgNiSn)								
<b>EAI case sizes:</b> 05 $\triangleq$ 0508 array								
<b>M2 <math>\triangleq</math> Array with two elements</b>								
<b>Varistor voltage tolerance:</b> S $\triangleq$ Special tolerance								
<b>Maximum RMS operating voltage (<math>V_{RMS}</math>):</b> 10 $\triangleq$ 10 V								
<b>Internal coding</b>								
<b>Capacitance value:</b> 100 $\triangleq$ 10 · 10 <sup>0</sup> pF $\triangleq$ 100 pF								
<b>Maximum capacitance matching tolerance:</b> H $\triangleq$ 3%								
<b>Taping mode:</b> G $\triangleq$ Taped, 180-mm reel, 7"								

## Multilayer varistors (MLVs)

### Automotive E series

#### SMD

#### Features

- Reliable ESD protection up to 30 kV acc. to IEC 61000-4-2, level 4 (8 kV contact, 15 kV air)
- High energy absorption capability
- Low leakage current
- Long-term ESD stability
- Bidirectional protection
- No temperature derating up to 150 °C
- RoHS-compatible, lead-free
- Nickel barrier suitable for lead-free soldering
- Qualification based on AEC-Q200
- PSpice simulation models available

#### Applications

- Transient overvoltage protection in automotive applications: engine management, airbag, control units, electrohydraulic brake, ABS/ESP, sunroof
- Load-dump protection
- Jump-start protection

#### Design

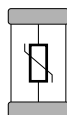
- Multilayer technology
- Flammability rating better than UL 94 V-0
- Termination (see “Soldering directions”):
  - CT types with nickel barrier terminations (AgNiSn), recommended for lead-free reflow and wave soldering, and compatible with tin/lead solder.

#### V/I characteristics and derating curves

V/I and derating curves are attached to the data sheet. The curves are sorted by  $V_{RMS}$  and then by case size, which is included in the type designation.

#### Single chip

##### Internal circuit



MLV0006-H

##### Available case sizes:

EIA	Metric
0402	1005
0603	1608
0805	2012
1206	3216
1210	3225
1812	4532
2220	5750

## Multilayer varistors (MLVs)

### Automotive E series

#### SMD

#### Description for ESD/ EMI filter array

The ESD/EMI filter array provides an ideal combination of EMI filtering and ESD protection for high-speed bus system transceivers such as Ethernet and Flexray.

#### Features

- ESD protection acc. to IEC 61000-4-2, level 4
- Capacitance deviation between array elements  
 $C_1$  and  $C_2$ : < 3%
- Max. relative capacitance change: < 0.1%/K
- Low leakage current
- Load-dump/ jump-start resistant
- Stable protection level
- Bidirectional protection
- No temperature derating up to 125 °C
- RoHS-compatible, lead-free
- Qualification based on AEC-Q200

#### Applications

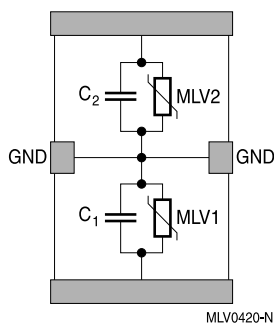
- Load-dump protection
- Jump-start protection

#### Design

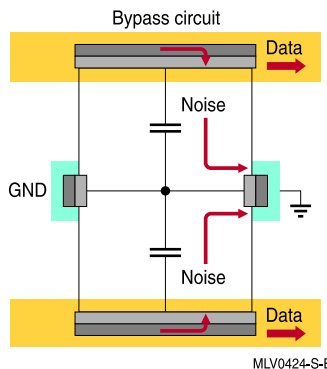
- Two multilayer varistors with a common ground CT types with nickel barrier terminations (AgNiSn), recommended for lead-free reflow and wave soldering, and compatible with tin/lead solder.
- Flammability rating better than UL 94 V-0
- Termination (see "Soldering directions"):
  - CT types with nickel barrier terminations (AgNiSn), recommended for lead-free reflow and wave soldering, and compatible with tin/lead solder.

#### 2-fold array

Internal circuit



Model of EMI filtering with matched capacitances  $C_1$  and  $C_2$



Available case sizes:

EIA	Metric
0508	1220

## Multilayer varistors (MLVs)

### Automotive E series

### SMD

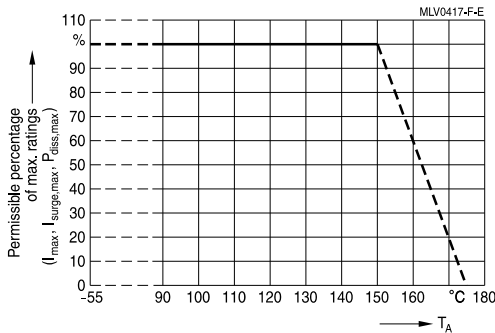
#### General technical data

Maximum RMS operating voltage		$V_{RMS,max}$	10 ... 40	V
Maximum DC operating voltage		$V_{DC,max}$	12 ... 56	V
Maximum surge current	(8/20 $\mu$ s)	$I_{surge,max}$	2 ... 1200	A
Maximum load dump energy	(10 pulses)	$W_{LD}$	1 ... 25	J
Maximum jump-start voltage	(5 min)	$V_{jump}$	24.5 ... 45	V
Maximum clamping voltage		$V_{clamp,max}$	35 ... 290	V
Operating temperature		$T_{op}$	-55/+150	°C
Storage temperature		LCT/UCT	-55/+150	°C
Response time		$t_{resp}$	< 0.5	ns

#### Temperature derating

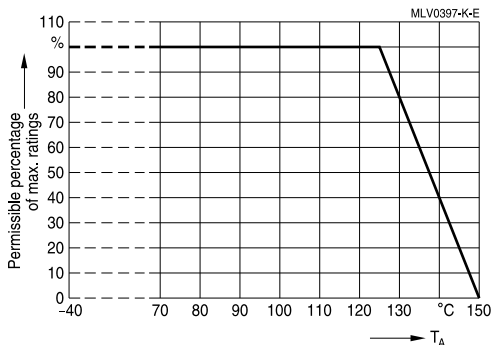
Climatic category: -55/+150 °C

for all single chips



Climatic category: -40/+125 °C

for ESD/ EMI filter array



**Multilayer varistors (MLVs)**
**Automotive E series**
SMD
**Electrical specifications and ordering codes**
**Maximum ratings ( $T_{op,max}$ ), automotive standard series<sup>1)</sup>**

Type	Ordering code	$V_{RMS,max}$	$V_{DC,max}$	$W_{max}$	$P_{diss,max}$	$V_V$	$\Delta V_V$
		V	V	(2 ms) mJ	mW	(1 mA) V	%
CT0805K11G	B72510E0110K062	11	14	200	5	18	±10
CT0402L14G	B72590E0140L060	14	16	30	3	23.5	±15
CT0402S14AHSG	B72590E8140S160	14	16	300	3	28	±20
CT0603K14G	B72500E0140K060	14	18	200	3	22	±10
CT0603S14AHSG	B72500E8140S160	14	16	30	3	28	±20
CT0603S14BG	B72500E0140S260	14	18	200	3	24.5	±15
CT0603V150RFG	B72500E7151V060	14	16	-	-	150	±35
CT0805K14G	B72510E0140K062	14	18	300	3	22	±10
CT1206K14G	B72520E0140K062	14	18	500	8	22	±10
CT1210K14G	B72530E0140K062	14	18	1500	10	22	±10
CT1812K14G	B72580E0140K062	14	18	2300	15	22	±10
CT2220K14G	B72540E0140K062	14	18	5800	20	22	±10
CT0402S17AG	B72590E0170S160	17	19	10	3	32.5	±25
CT0603K17G	B72500E0170K060	17	22	200	3	27	±10
CT0603K17LCG	B72500E2170K060	17	22	100	1	27	±10
CT0603S17ALCG	B72500E2170S160	17	22	75	3	32.5	±25
CT0603S17BCCG	B72500E5170S260	17	22	75	3	32.5	±25
CT0805K17G	B72510E0170K062	17	22	300	5	27	±10
CT1206K17G	B72520E0170K062	17	22	600	8	27	±10
CT1210K17G	B72530E0170K062	17	22	1700	10	27	±10
CT1812K17G	B72580E0170K062	17	22	2700	15	27	±10
CT2220K17G	B72540E0170K062	17	22	7200	20	27	±10
CT0603K20G	B72500E0200K060	20	26	200	3	33	±10
CT0603S20ACCG	B72500E5200S160	20	26	300	3	36	±20
CT0805K20G	B72510E0200K062	20	26	300	5	33	±10
CT0805S20ACCG2G2	B72510E9200S172	20	26	400	5	34.5	±15
CT1206K20G	B72520E0200K062	20	26	700	8	33	±10
CT1210K20G	B72530E0200K062	20	26	1900	10	33	±10
CT1812K20G	B72580E0200K062	20	26	3000	15	33	±10
CT2220K20G	B72540E0200K062	20	26	7800	20	33	±10
CT0603K25G	B72500E0250K060	25	31	300	3	39	±10
CT0603L25HSG	B72500E8250L060	25	32	50	-	61	±15
CT0603L25HTCCG	B72500E5250L060	25	32	50	-	61	±15
CT0805K25G	B72510E0250K062	25	31	300	5	39	±10
CT1206K25G	B72520E0250K062	25	31	1000	8	39	±10

1)  $W_{LD}$  and  $V_{jump}$  values are not specified for automotive standard series.



**Multilayer varistors (MLVs)**
**Automotive E series**
SMD
**Characteristics (T<sub>A</sub> = 25 °C)**

Type	V <sub>clamp,max</sub> V	I <sub>surge,max</sub> (8/20 μs) A	I <sub>clamp</sub> (8/20 μs) A	C <sub>typ</sub> <sup>2)</sup> pF	C <sub>min</sub> <sup>2)</sup> pF	C <sub>max</sub> <sup>2)</sup> pF	I <sub>leak,max</sub> μA	I <sub>leak</sub> μA
CT0805K11G	35	120	1	400	-	-	20 @ 14 V	-
CT0402L14G	46	8	1	15	-	-	1 @ 16 V	<1 @ 14 V
CT0402S14AHSG	66	2	1	10	-	15	1 @ 16 V	<1 @ 14 V
CT0603K14G	40	30	1	100	-	-	20 @ 18 V	<1 @ 14 V
CT0603S14AHSG	66	5	1	15	-	30	1 @ 16 V	<1 @ 14 V
CT0603S14BG	42	30	1	120	-	-	5 @ 18 V	<1 @ 14 V
CT0603V150RFG	290	-	1	3	-	5	3 @ 16 V	-
CT0805K14G	40	120	1	350	-	-	30 @ 18 V	1 @ 14 V
CT1206K14G	38	200	1	700	-	-	70 @ 18 V	<5 @ 14 V
CT1210K14G	38	400	2.5	2000	-	-	70 @ 18 V	<5 @ 14 V
CT1812K14G	38	800	5	4500	-	-	90 @ 18 V	<5 @ 14 V
CT2220K14G	38	1200	10	10000	-	-	80 @ 18 V	<10 @ 14 V
CT0402S17AG	59	6	1	15	-	-	1 @ 16 V	<1 @ 14 V
CT0603K17G	46	30	1	100	-	-	30 @ 22 V	<1 @ 14 V
CT0603K17LCG	50	10	1	30	-	50	20 @ 22 V	<1 @ 14 V
CT0603S17ALCG	50	30	1	50	-	75	5 @ 22 V	<1 @ 14 V
CT0603S17BCCG	50	30	1	53	31.8	74.2	5 @ 22 V	<1 @ 14 V
CT0805K17G	46	120	1	400	-	-	50 @ 22 V	1 @ 14 V
CT1206K17G	44	200	1	650	-	-	70 @ 22 V	<2 @ 14 V
CT1210K17G	44	400	2.5	1800	-	-	50 @ 22 V	1 @ 14 V
CT1812K17G	44	800	5	4000	-	-	35 @ 22 V	<2 @ 14 V
CT2220K17G	44	1200	10	9000	-	-	70 @ 22 V	<5 @ 14 V
CT0603K20G	56	30	1	90	-	-	20 @ 26 V	<1 @ 14 V
CT0603S20ACCG	67	30	1	80	64	96	5 @ 26 V	<1 @ 14 V
CT0805K20G	56	80	1	300	-	-	20 @ 26 V	<1 @ 14 V
CT0805S20ACC2G2	64	80	1	220	170	270	10 @ 22 V	1 @ 28 V
CT1206K20G	54	200	1	600	-	-	10 @ 26 V	<1 @ 14 V
CT1210K20G	54	400	2.5	1500	-	-	20 @ 26 V	1 @ 14 V
CT1812K20G	54	800	5	3000	-	-	60 @ 26 V	<1 @ 14 V
CT2220K20G	54	1200	10	7000	-	-	70 @ 26 V	<2 @ 14 V
CT0603K25G	67	30	1	90	-	-	10 @ 31 V	1 @ 28 V
CT0603L25HSG	120	5	1	10	-	15	1 @ 32 V	<1 @ 14 V
CT0603L25HTCCG	120	5	1	10	5	15	1 @ 32 V	<1 @ 28 V
CT0805K25G	67	80	1	250	-	-	25 @ 31 V	5 @ 28 V
CT1206K25G	65	200	1	550	-	-	10 @ 31 V	2.5 @ 28 V

**Note:**

Derating curve is not specified for automotive standard type CT0603V150RFG.

2) Measurement frequency: f = 1 MHz for C < 100 pF, f = 1 KHz for C ≥ 100 pF

**Multilayer varistors (MLVs)**
**Automotive E series**
**SMD**
**Electrical specifications and ordering codes**
**Maximum ratings ( $T_{op,max}$ ), automotive standard series<sup>1)</sup>**

Type	Ordering code	$V_{RMS,max}$	$V_{DC,max}$	$W_{max}$	$P_{diss,max}$	$V_V$	$\Delta V_V$
		V	V	(2 ms) mJ	mW	(1 mA) V	%
CT1210K25G	B72530E0250K062	25	31	1700	10	39	±10
CT1812K25G	B72580E0250K062	25	31	3700	15	39	±10
CT2220K25G	B72540E0250K062	25	31	9600	20	39	±10
CT0805K30G	B72510E0300K062	30	38	300	5	47	±10
CT1206K30G	B72520E0300K062	30	38	1100	8	47	±10
CT1210K30G	B72530E0300K062	30	38	2000	10	47	±10
CT1812K30G	B72580E0300K062	30	38	4200	15	47	±10
CT2220K30G	B72540E0300K062	30	38	12000	20	47	±10
CT0805K35G	B72510E0350K062	35	45	300	5	56	±10
CT1206K35G	B72520E0350K062	35	45	400	8	56	±10
CT1210K35G	B72530E0350K062	35	45	2000	10	56	±10
CT1812K35G	B72580E0350K062	35	45	4000	15	56	±10
CT2220K35G	B72540E0350K062	35	45	7700	20	56	±10
CT1206K40G	B72520E0400K062	40	56	500	8	68	±10
CT2220K40G	B72540E0400K062	40	56	9000	20	68	±10

1)  $W_{LD}$  and  $V_{jump}$  values are not specified for automotive standard series.

**Multilayer varistors (MLVs)**
**Automotive E series**
SMD
**Characteristics (T<sub>A</sub> = 25 °C)**

Type	V <sub>clamp,max</sub> V	I <sub>surge,max</sub> (8/20 μs) A	I <sub>clamp</sub> (8/20 μs) A	C <sub>typ</sub> <sup>2)</sup> pF	C <sub>min</sub> <sup>2)</sup> pF	C <sub>max</sub> <sup>2)</sup> pF	I <sub>leak,max</sub> μA	I <sub>leak</sub> μA
CT1210K25G	65	300	2.5	1500	-	-	25 @ 31 V	10 @ 28 V
CT1812K25G	65	800	5	2500	-	-	-	-
CT2220K25G	65	1200	10	5000	-	-	110 @ 31 V	<40 @ 28 V
CT0805K30G	77	80	1	200	-	-	40 @ 38 V	1 @ 28 V
CT1206K30G	77	200	1	500	-	-	25 @ 38 V	2 @ 28 V
CT1210K30G	77	300	2.5	1000	-	-	20 @ 38 V	1 @ 28 V
CT1812K30G	77	800	5	2000	-	-	70 @ 38 V	5 @ 28 V
CT2220K30G	77	1200	10	4000	-	-	50 @ 38 V	<5 @ 28 V
CT0805K35G	95	80	1	150	-	-	-	-
CT1206K35G	90	100	1	200	-	-	20 @ 45 V	<1 @ 28 V
CT1210K35G	90	250	2.5	600	-	-	20 @ 45 V	1 @ 28 V
CT1812K35G	90	500	5	1200	-	-	30 @ 45 V	1 @ 27 V
CT2220K35G	90	1000	10	2500	-	-	50 @ 45 V	<2 @ 28 V
CT1206K40G	110	100	1	250	-	-	20 @ 56 V	<1 @ 28 V
CT2220K40G	110	1000	10	2000	-	-	120 @ 56 V	<1 @ 28 V

2) Measurement frequency: f = 1 MHz for C < 100 pF, f = 1 KHz for C ≥ 100 pF

**Multilayer varistors (MLVs)**
**Automotive E series**
**SMD**
**Electrical specifications and ordering codes**
**Maximum ratings ( $T_{op,max}$ )**
**Automotive series with load-dump/ jump-start protection<sup>1)</sup>**

Type	Ordering code	$V_{RMS,max}$	$V_{DC,max}$	$I_{surge,max}$ (8/20 $\mu$ s)	$W_{max}$ (2 ms)	$W_{LD}$ (10 pulses)	$P_{diss,max}$
		V	V	A	mJ	J	mW
CT0603S14BAUTOG	B72500E1140S260	14	16	30	200	-	3
CT0805S14BAUTOG	B72510E1140S262	14	16	120	300	1	8
CT1206S14BAUTOG	B72520E1140S262	14	16	200	600	1.5	8
CT1210S14BAUTOG	B72530E1140S262	14	16	400	1600	3	10
CT1812S14BAUTOE2G2	B72580E3140S272	14	16	800	2400	12	15
CT1812S14BAUTOG	B72580E1140S262	14	16	800	2400	6	15
CT2220S14BAUTOE2G2	B72540E3140S272	14	16	1200	5800	25	30
CT2220S14BAUTOG	B72540E1140S262	14	16	1200	5800	12	30
CT0805K17AUTOLCG	B72510E2170K062	17	22	30	100	-	4
CT1210K17AUTOG	B72530E1170K062	17	22	400	1700	3	10
CT1206K20AUTOG	B72520E1200K062	20	26	200	700	1.5	8
CT1210K20AUTOG	B72530E1200K062	20	26	400	1900	3	10
CT0805K25AUTOG	B72510E1250K062	25	31	80	300	1	5
CT1206K25AUTOG	B72520E1250K062	25	31	200	1000	1.5	8
CT1210K25AUTOG	B72530E1250K062	25	31	300	1700	3	10
CT2220K30AUTOE2G2	B72540E3300K072	30	34	1200	12000	25	30
CT2220K30AUTOG	B72540E1300K062	30	34	1200	12000	12	30

1)  $C_{min}$  and  $C_{max}$  values are not specified for standard automotive series with load dump/ jump start specification.

**Multilayer varistors (MLVs)**
**Automotive E series**
**SMD**
**Characteristics (T<sub>A</sub> = 25 °C)**

Type	V <sub>V</sub> (1 mA) V	ΔV <sub>V</sub> %	V <sub>jump</sub> (5 min) V	V <sub>clamp,max</sub> V	I <sub>clamp</sub> (8/20 μs) A	C <sub>typ</sub> (1 kHz) pF	I <sub>leak,max</sub> μA	I <sub>leak</sub> μA
CT0603S14BAUTOG	24.5	±15	24.5	42	1	120	1@16 V	<1@14 V
CT0805S14BAUTOG	24.5	±15	24.5	42	1	400	5@16 V	1@14 V
CT1206S14BAUTOG	24.5	±15	24.5	40	1	800	5@16 V	<2.5@14 V
CT1210S14BAUTOG	24.5	±15	24.5	40	2.5	2000	5@16 V	<2.5@14 V
CT1812S14BAUTOE2G2	24.5	±15	24.5	40	5	7000	10@16 V	3@14 V
CT1812S14BAUTOG	24.5	±15	24.5	40	5	5600	10@16 V	3@14 V
CT2220S14BAUTOE2G2	24.5	±15	24.5	40	10	15000	20@16 V	10@14 V
CT2220S14BAUTOG	24.5	±15	24.5	40	10	9500	10@16 V	5@14 V
CT0805K17AUTOLCG	29	±15	-	50	1	100	10@22 V	1@14 V
CT1210K17AUTOG	27	±10	26.5	44	2.5	2000	50@22 V	1@14 V
CT1206K20AUTOG	33	±10	27	54	1	600	10@26 V	<1@14 V
CT1210K20AUTOG	33	±10	27	54	2.5	1500	20@26 V	1@14 V
CT0805K25AUTOG	39	±10	29	67	1	250	25@22 V	5@28 V
CT1206K25AUTOG	39	±10	29	65	1	550	10@31 V	2.5@28 V
CT1210K25AUTOG	39	±10	29	65	2.5	1500	25@31 V	10@28 V
CT2220K30AUTOE2G2	47	±10	45	77	10	10000	40@34 V	10@28 V
CT2220K30AUTOG	47	±10	45	77	10	4000	20@34 V	5@28 V

**Multilayer varistors (MLVs)**
**Automotive E series**
**SMD**
**Electrical specifications and ordering codes**
**Maximum ratings ( $T_{op,max}$ )**
**Automotive series, array specification**

Type	Ordering code	$V_{RMS,max}$	$V_{DC,max}$	$I_{surge,max}$ (8/20 $\mu$ s)	$W_{max}$ (2 ms)	$V_{LD}$ (10 pulses, 300 ms)	$P_{diss,max}$
		V	V	A	mJ	V	mW
CA05M2S10T100HG	B72812Q1120S160	10	12	5	10	27	3

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

Type	$V_V$ (1 mA)	$\Delta V_V$	$V_{jump}$ (60 s)	$V_{clamp,max}$	$I_{clamp}$ (8/20 $\mu$ s)	$C_{typ}$ (1 MHz)	$C_{max}$ (1 MHz)	$I_{leak,max}$
	V	%	V	V	A	pF	pF	$\mu$ A
CA05M2S10T100HG	26	$\pm 20$	28	60	1	10	15	0.5@5 V

**Note:**

Pulse derating curve is not specified for automotive array CA05M2S10T100HG.

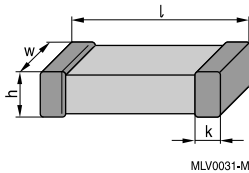
## Multilayer varistors (MLVs)

### Automotive E series

#### SMD

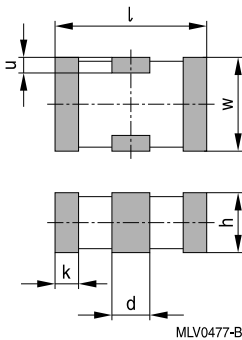
#### Dimensional drawings

##### Single chip



Case size EIA / mm	l	w	h	k
0402 / 1005	1.0 ±0.15	0.50 ±0.10	0.6 max.	0.10 ... 0.30
0603 / 1608	1.6 ±0.15	0.80 ±0.10	0.9 max.	0.10 ... 0.40
0805 / 2012	2.0 ±0.20	1.25 ±0.15	1.4 max.	0.13 ... 0.75
1206 / 3216	3.2 ±0.30	1.60 ±0.20	1.7 max.	0.25 ... 0.75
1210 / 3225	3.2 ±0.30	2.50 ±0.25	1.7 max.	0.25 ... 0.75
1812 / 4532	4.5 ±0.40	3.20 ±0.30	2.5 max.	0.25 ... 1.00
2220 / 5750	5.7 ±0.40	5.00 ±0.40	2.5 max.	0.25 ... 1.00

##### 2-fold MCV array



Case size EIA / mm	l	w	h	d	k	u
0508 / 1220	2.0 ±0.20	1.25 ±0.15	0.9 max.	0.50 ±0.20	0.30 ±0.20	0.20 ±0.10

Dimensions in mm

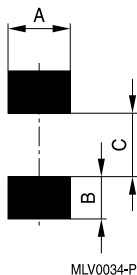
## Multilayer varistors (MLVs)

### Automotive E series

#### SMD

#### Recommended solder pad layout

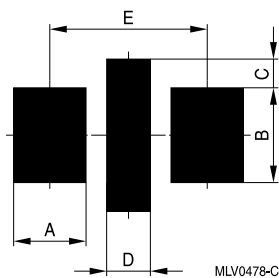
##### Single chip



Dimensions in mm

Case size EIA / mm	A	B	C
0402 / 1005	0.60	0.60	0.50
0603 / 1608	1.00	1.00	1.00
0805 / 2012	1.40	1.20	1.00
1206 / 3216	1.80	1.20	2.10
1210 / 3225	2.80	1.20	2.10
1812 / 4532	3.60	1.50	3.00
2220 / 5750	5.50	1.50	4.20

##### 2-fold MCV array



Dimensions in mm

Case size EIA / mm	A	B	C	D	E
0508 / 1220	1.00	1.30	0.40	0.60	2.16



**Multilayer varistors (MLVs)**
**Automotive E series**
SMD
**Delivery mode**

EIA case size	Taping	Reel size mm	Packing unit pcs.	Type	Ordering code
<b>Array</b>					
0508	Cardboard	180	4000	CA05M2S10T100HG	B72812Q1120S160
<b>Single chip</b>					
0402	Cardboard	180	10000	CT0402L14G	B72590E0140L060
0402	Cardboard	180	10000	CT0402S14AHSG	B72590E8140S160
0402	Cardboard	180	10000	CT0402S17AG	B72590E0170S160
0603	Cardboard	180	4000	CT0603K14G	B72500E0140K060
0603	Cardboard	180	4000	CT0603K17G	B72500E0170K060
0603	Cardboard	180	4000	CT0603K17LCG	B72500E2170K060
0603	Cardboard	180	4000	CT0603K20G	B72500E0200K060
0603	Cardboard	180	4000	CT0603K25G	B72500E0250K060
0603	Cardboard	180	4000	CT0603L25HSG	B72500E8250L060
0603	Cardboard	180	4000	CT0603L25HTCCG	B72500E5250L060
0603	Cardboard	180	4000	CT0603S14AHSG	B72500E8140S160
0603	Cardboard	180	4000	CT0603S14BAUTOG	B72500E1140S260
0603	Cardboard	180	4000	CT0603S14BG	B72500E0140S260
0603	Cardboard	180	4000	CT0603S17ALCG	B72500E2170S160
0603	Cardboard	180	4000	CT0603S17BCCG	B72500E5170S260
0603	Cardboard	180	4000	CT0603S20ACCG	B72500E5200S160
0603	Cardboard	180	4000	CT0603V150RFG	B72500E7151V060
0805	Blister	180	3000	CT0805K11G	B72510E0110K062
0805	Blister	180	3000	CT0805K14G	B72510E0140K062
0805	Blister	180	3000	CT0805K17AUTOLCG	B72510E2170K062
0805	Blister	180	3000	CT0805K17G	B72510E0170K062
0805	Blister	180	3000	CT0805K20G	B72510E0200K062
0805	Blister	180	3000	CT0805K25AUTOG	B72510E1250K062
0805	Blister	180	3000	CT0805K25G	B72510E0250K062
0805	Blister	180	3000	CT0805K30G	B72510E0300K062
0805	Blister	180	3000	CT0805K35G	B72510E0350K062
0805	Blister	180	3000	CT0805S14BAUTOG	B72510E1140S262
0805	Blister	330	12000	CT0805S20ACC2G2	B72510E9200S172
1206	Blister	180	2000	CT1206K25AUTOG	B72520E1250K062
1206	Blister	180	2000	CT1206K25G	B72520E0250K062
1206	Blister	180	2000	CT1206K30G	B72520E0300K062
1206	Blister	180	2000	CT1206K35G	B72520E0350K062
1206	Blister	180	2000	CT1206K40G	B72520E0400K062
1206	Blister	180	3000	CT1206K14G	B72520E0140K062
1206	Blister	180	3000	CT1206K17G	B72520E0170K062
1206	Blister	180	3000	CT1206K20AUTOG	B72520E1200K062
1206	Blister	180	3000	CT1206K20G	B72520E0200K062
1206	Blister	180	3000	CT1206S14BAUTOG	B72520E1140S262
1210	Blister	180	2000	CT1210K20AUTOG	B72530E1200K062

**Multilayer varistors (MLVs)**
**Automotive E series**
**SMD**

EIA case size	Taping	Reel size mm	Packing unit pcs.	Type	Ordering code
1210	Blister	180	2000	CT1210K20G	B72530E0200K062
1210	Blister	180	2000	CT1210K25AUTOG	B72530E1250K062
1210	Blister	180	2000	CT1210K25G	B72530E0250K062
1210	Blister	180	2000	CT1210K30G	B72530E0300K062
1210	Blister	180	2000	CT1210K35G	B72530E0350K062
1210	Blister	180	3000	CT1210K14G	B72530E0140K062
1210	Blister	180	3000	CT1210K17AUTOG	B72530E1170K062
1210	Blister	180	3000	CT1210K17G	B72530E0170K062
1210	Blister	180	3000	CT1210S14BAUTOG	B72530E1140S262
1812	Blister	180	1000	CT1812K25G	B72580E0250K062
1812	Blister	180	1000	CT1812K30G	B72580E0300K062
1812	Blister	180	1000	CT1812K35G	B72580E0350K062
1812	Blister	180	1500	CT1812K14G	B72580E0140K062
1812	Blister	180	1500	CT1812K17G	B72580E0170K062
1812	Blister	180	1500	CT1812K20G	B72580E0200K062
1812	Blister	180	1500	CT1812S14BAUTOG	B72580E1140S262
1812	Blister	330	3000	CT1812S14BAUTOE2G2	B72580E3140S272
2220	Blister	180	1000	CT2220K25G	B72540E0250K062
2220	Blister	180	1000	CT2220K30AUTOG	B72540E1300K062
2220	Blister	180	1000	CT2220K30G	B72540E0300K062
2220	Blister	180	1000	CT2220K35G	B72540E0350K062
2220	Blister	180	1000	CT2220K40G	B72540E0400K062
2220	Blister	180	1500	CT2220K14G	B72540E0140K062
2220	Blister	180	1500	CT2220K17G	B72540E0170K062
2220	Blister	180	1500	CT2220K20G	B72540E0200K062
2220	Blister	180	1500	CT2220S14BAUTOG	B72540E1140S262
2220	Blister	330	3000	CT2220K30AUTOE2G2	B72540E3300K072
2220	Blister	330	3000	CT2220S14BAUTOE2G2	B72540E3140S272

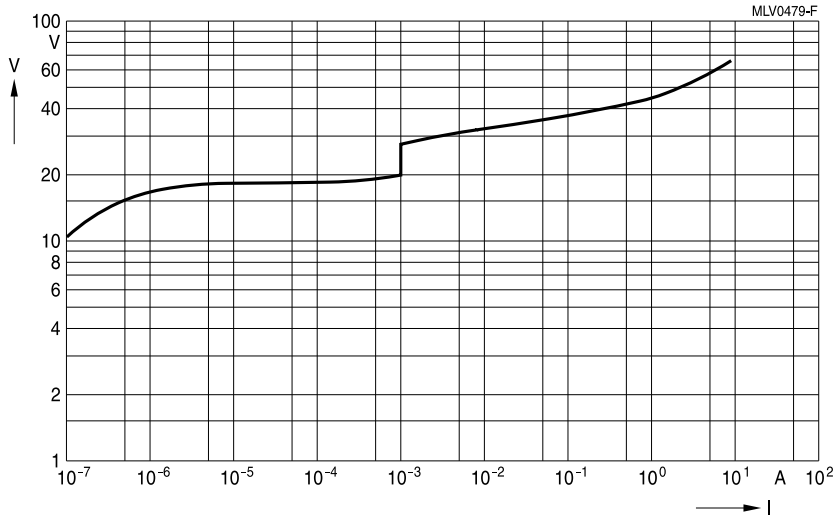
**Multilayer varistors (MLVs)**

**Automotive E series**

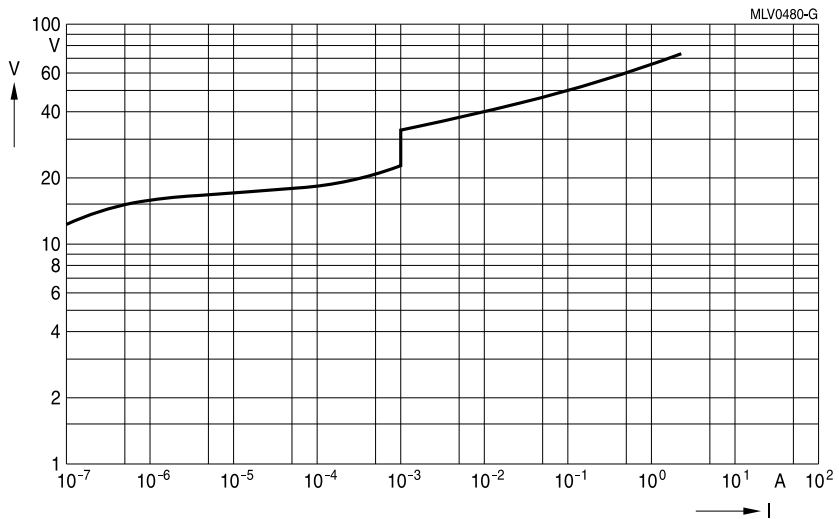
**SMD**

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



**CT0402L14G**



**CT0402S14AHSG**

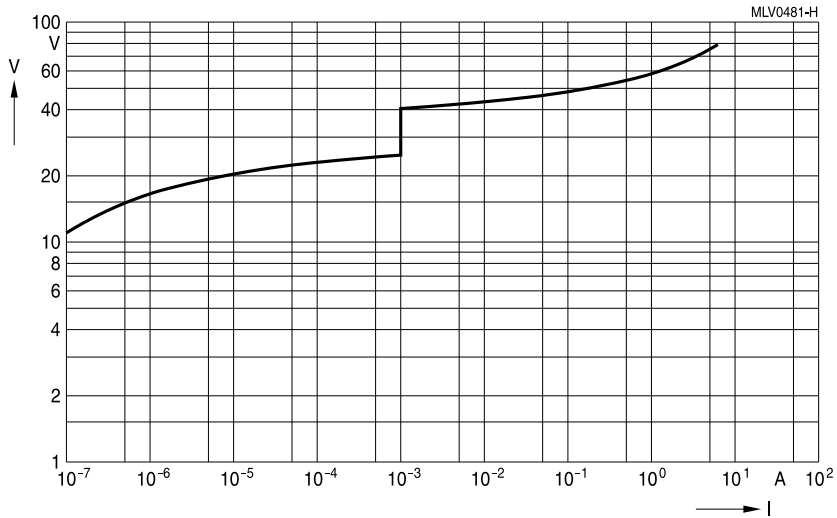
Multilayer varistors (MLVs)

Automotive E series

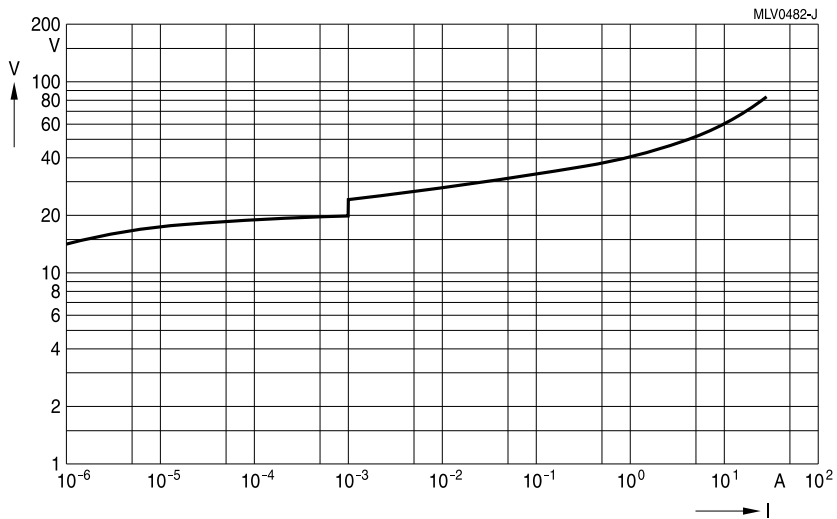
SMD

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



CT0402S17AG



CT0603K14G

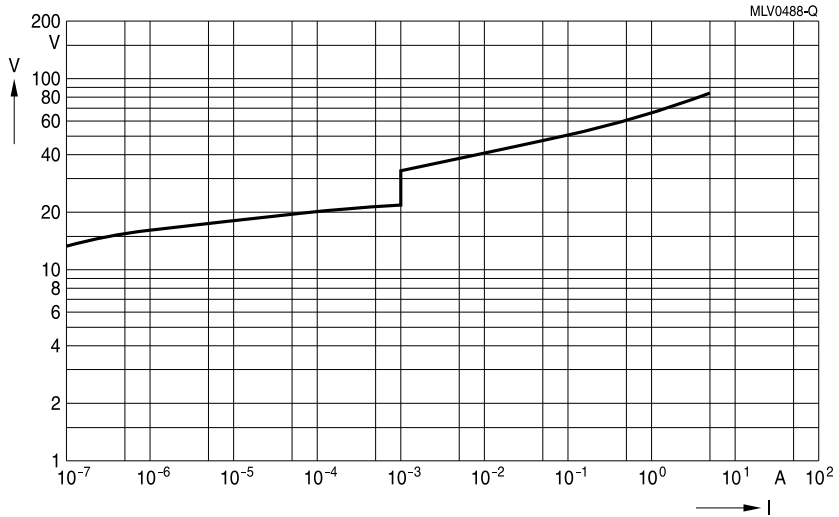
**Multilayer varistors (MLVs)**

**Automotive E series**

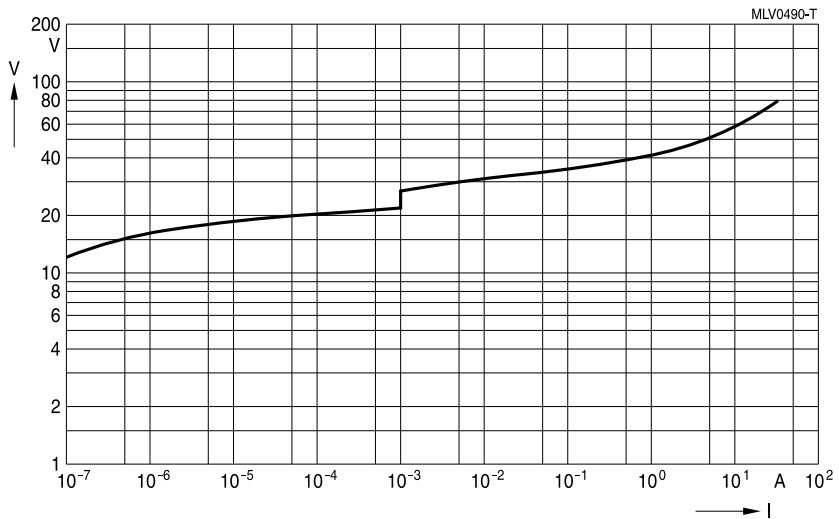
**SMD**

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



**CT0603S14AHSG**



**CT0603S14BG**

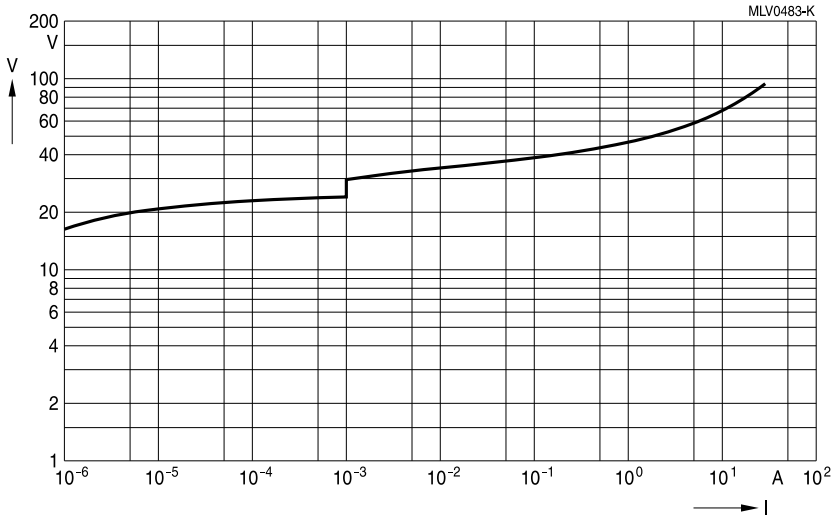
**Multilayer varistors (MLVs)**

**Automotive E series**

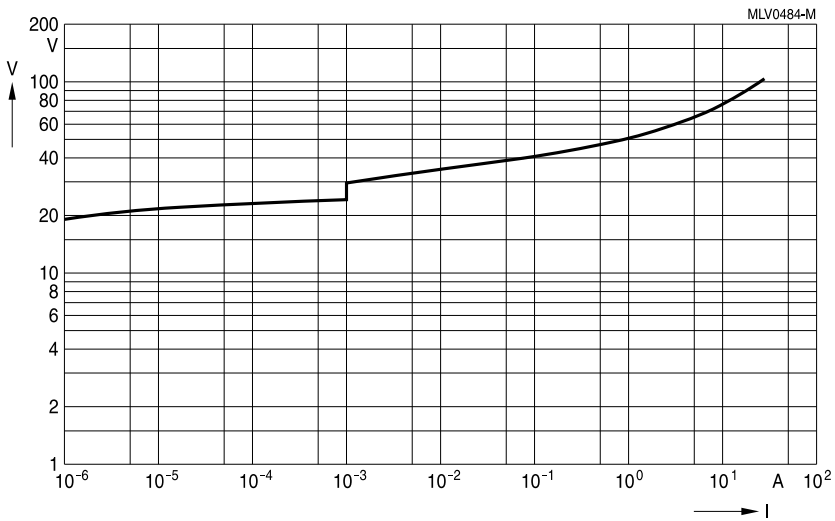
**SMD**

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



CT0603K17G



CT0603K17LCG

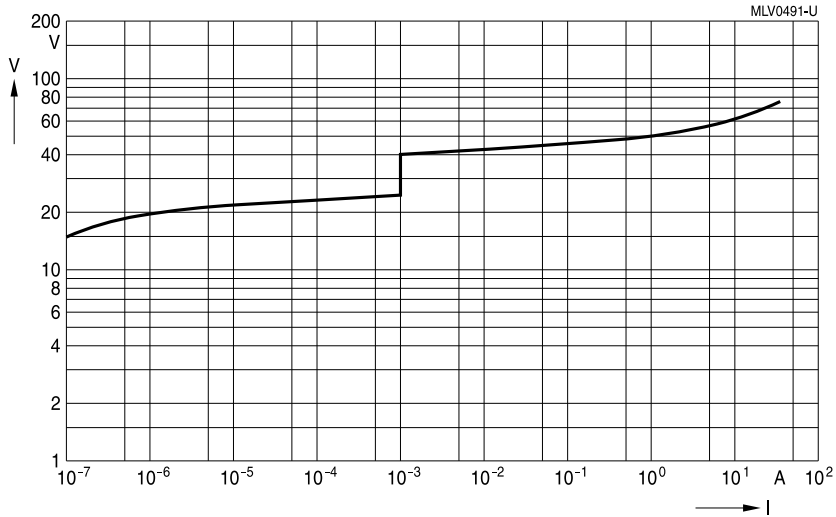
**Multilayer varistors (MLVs)**

**Automotive E series**

**SMD**

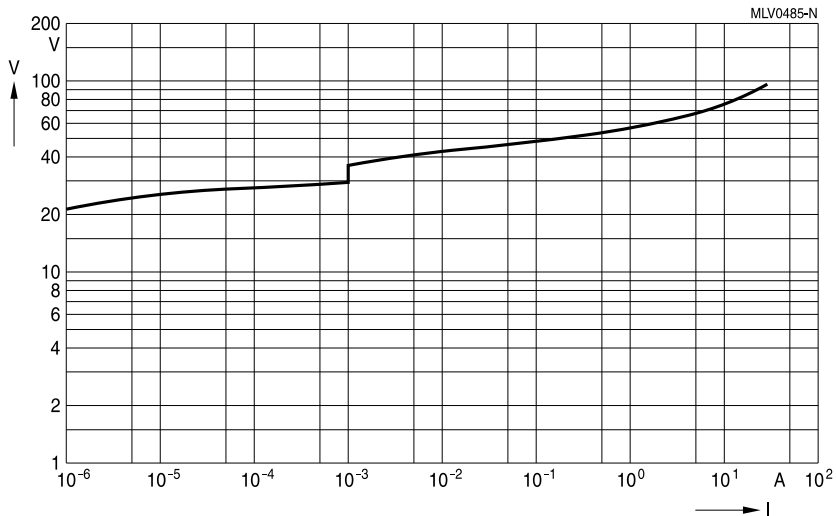
**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



CT0603S17ALCG

CT0603S17BCCG



CT0603K20G

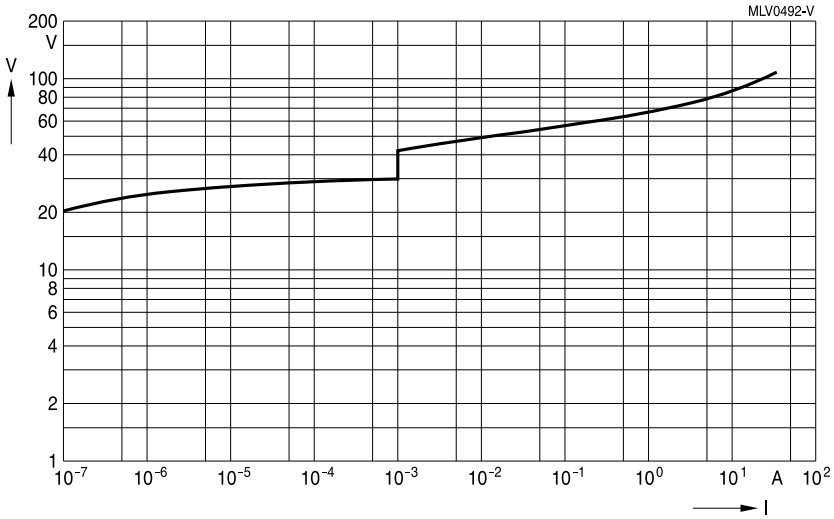
Multilayer varistors (MLVs)

Automotive E series

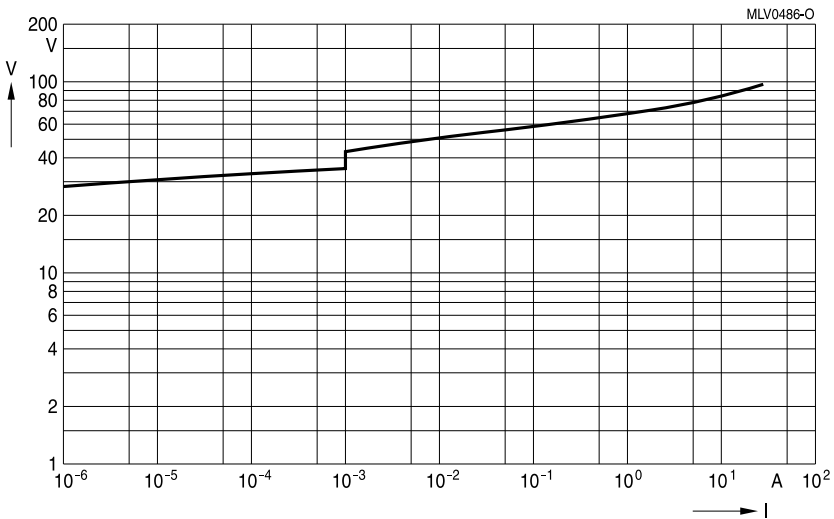
SMD

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



CT0603S20ACCG



CT0603K25G



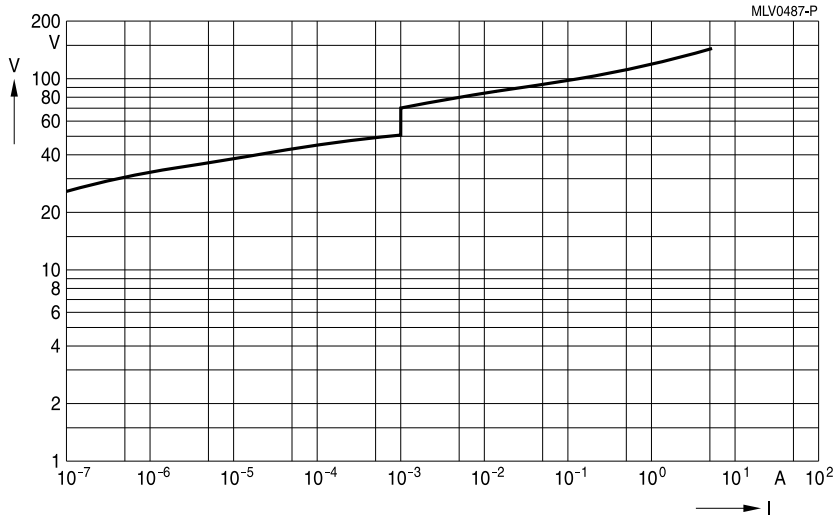
**Multilayer varistors (MLVs)**

**Automotive E series**

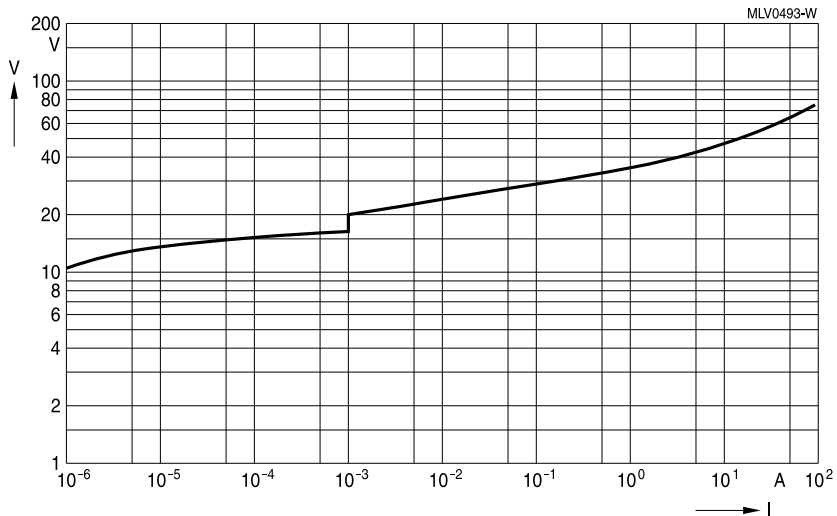
**SMD**

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



CT0603L25HSG  
CT0603L25HTCCG



CT0805K11G

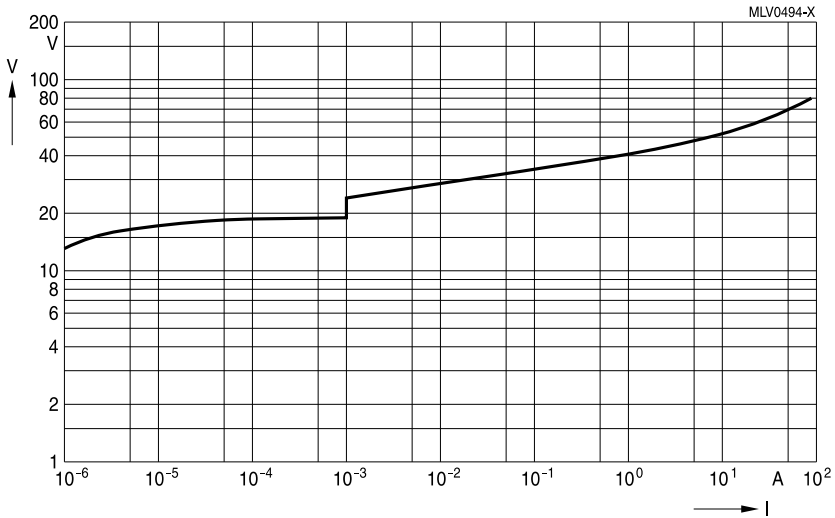
**Multilayer varistors (MLVs)**

**Automotive E series**

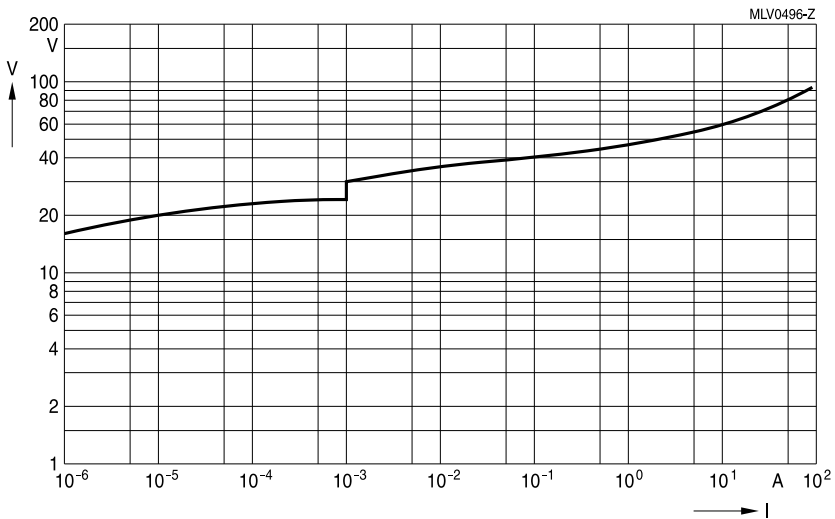
**SMD**

**V/I characteristics for automotive standard series**

(not specified for CT0603V150RFG)



**CT0805K14G**



**CT0805K17G**