EPCOS

Product Brief 2010

Leaded Transient Voltage and RFI Suppressors

SHCVs for Combined Overvoltage and RFI Suppression in Electric Motors

The super high capacitance varistor (SHCV) series are leaded devices that – in a single component – offer both overvoltage protection and RFI noise suppression on DC lines of small electric motors in industrial and automotive applications. SHCVs combine a high capacitance MLCC with X7R temperature characteristics for RF filtering with a multilayer varistor for transient protection.

The SHCV series was developed especially for use in automotive electronics and is qualified based on AEC-Q200 Rev-C. In addition to protecting the electrical systems of vehicles in stress conditions such as load dump and jump start, the SHCVs are suitable for the interference suppression of brushed DC motors, relays and electromagnetic actuators.

The leaded components cover the operating voltage range from 16 to 45 V DC and are designed for currents of between 100 and 1200 A at a standard pulse of 8/20 µs. Depending on the type, a maximum energy of 12 J per pulse can be absorbed for at least 10 pulses. The capacitance range is from 0.47 up to 4.7 µF. No temperature derating is required for temperatures up to 125 °C.

Features

- Suitable for lead-free soldering
- RoHS-compatible

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General technical data

Insulation resistance:	≥ 10	MΩ
Response time:	< 25	ns
Operating temperature:	–55 / +125	°C
Storage temperature:	–55 / +150	°C

Electrical specifications and ordering codes

Maximum ratings ($T_{op, max}$ = 125 °C) | **Characteristics (T_A = 25 °C)**

Ordering code	$V_{RMS, max}$ V	$V_{DC, max}$ V	$I_{surge, max}$ (8/20 µs) A	W_{max} (2 ms) mJ	W_{LD} (10 pulses) J	$P_{diss, max}$ mW	V_V (1 mA) V	ΔV_V %	V_{jump} (5 min) V	$V_{clamp, max}$ V	I_{clamp} (8/20 µs) A	C_{nom} [1] (1 kHz, 0.5 V) nF	Dim.[2]
B72587G3140S200	14	16	800	2400	6.0	15	22	+23/–0	24.5	40	5	1000	1
B72587H3140S200	14	16	800	2400	6.0	15	22	+23/–0	24.5	40	5	1500	1
B72587E3140S200	14	16	800	2400	6.0	15	22	+23/–0	24.5	40	5	470	1
B72547H3140S200	14	16	1200	5800	12.0	30	22	+23/–0	24.5	40	10	1500	4
B72547E3140S200	14	16	1200	5800	12.0	30	22	+23/–0	24.5	40	10	470	3
B72547L3140S200	14	16	1200	5800	12.0	30	22	+23/–0	24.5	40	10	4700	4
B72527C3140K000	14	18	200	500	1.5	8	22	±10	–	38	1	220	5
B72587G3200K000	20	26	800	3000	6.0	15	33	±10	26.0	58	5	1000	1
B72587H3200K000	20	26	800	3000	6.0	15	33	±10	26.0	58	5	1500	1
B72587J3200K000	20	26	800	3000	6.0	15	33	±10	26.0	58	5	2200	2
B72587E3200K000	20	26	800	3000	6.0	15	33	±10	26.0	58	5	470	1
B72547G3200K000	20	26	1200	7800	12.0	30	33	±10	26.0	58	10	1000	4
B72547E3200K000	20	26	1200	7800	12.0	30	33	±10	26.0	58	10	470	3
B72527G3200K000	20	26	200	700	1.5	8	33	±10	–	54	1	1000	5
B72527G3350K000	35	45	100	400	1.5	8	56	±10	–	90	1	1000	5
B72527E3350K000	35	45	100	400	1.5	8	56	±10	–	90	1	470	5

[1] ΔC_{nom} = ±20%
[2] Dimensions, see page 3

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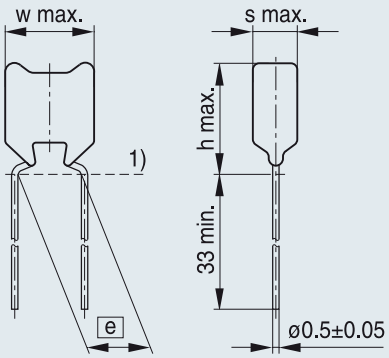
Dimensional drawing



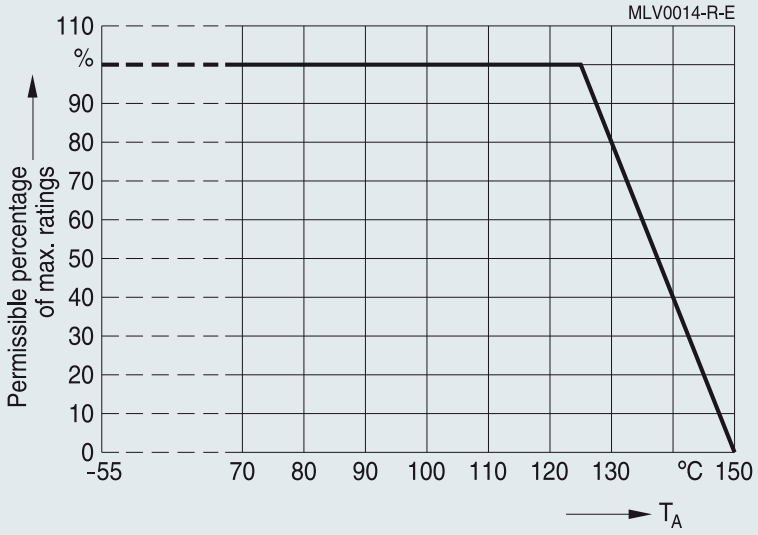
e = 5.0±1
Offset = 0.0±1
1) Seating plane to IEC 60717
VAR0394-B

Dimensions

	w_{max} mm	h_{max} mm	s_{max} mm
1	7.3	7.8	3.7
2	7.3	7.8	4.1
3	7.8	9.0	3.6
4	7.8	9.0	4.1
5	6.0	7.5	4.5

Temperature derating

Climatic category: –55/+125 °C



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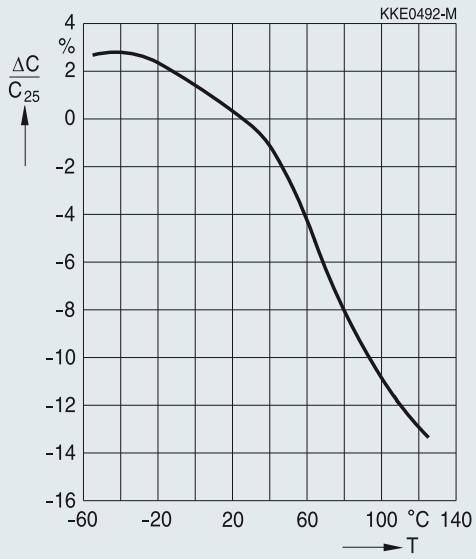
Typical characteristics

Capacitance change $\Delta C/C_{25}$ versus temperature T



Note:

The capacitance and the dissipation factor shall meet the specified values 1000 hours after the last heat treatment above the curie temperature.

Symbols and terms

Symbol	Term
I	Current
I_{clamp}	Clamping current
$I_{surge,max}$	Maximum surge current (also termed peak current)
$P_{diss,max}$	Maximum power dissipation
T_A	Ambient temperature
T_{op}	Operating temperature
V	Voltage
$V_{clamp,max}$	Maximum clamping voltage
$V_{DC,max}$	Maximum DC operating voltage (also termed working voltage)
$V_{RMS,max}$	Maximum AC operating voltage, root-mean-square value
V_V	Varistor voltage (also termed breakdown voltage)
ΔV_V	Tolerance of varistor voltage
W_{max}	Maximum energy absorption (also termed transient energy)

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