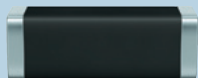




Sample Kit 2011



Multilayer Varistors (MLVs)

for ESD and High Energy Transient
Protection in Automotive Applications

What are multilayer varistors (MLVs)?

- MLVs are multilayer semiconductor ceramic components for ESD protection of safety-relevant data lines and bus systems and for high-energy transient protection (e.g. load dump and jump start) in automotive electronic devices.
- MLVs can replace semiconductor diodes.

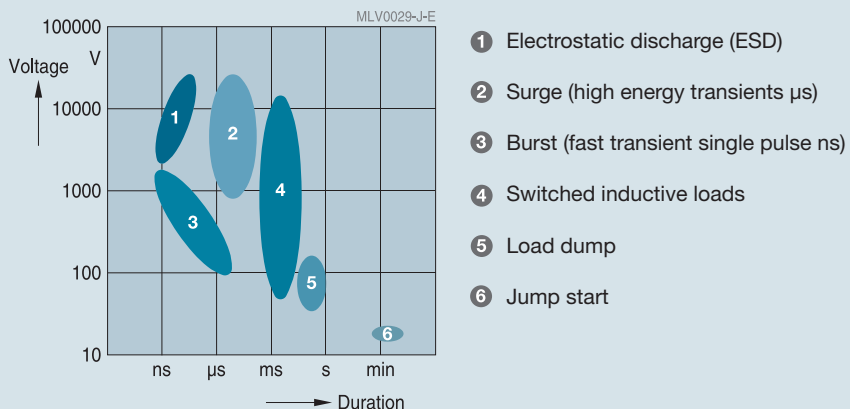
Benefits for customer applications

- Bidirectional protection for ESD and high energy transients
- Low capacitance types for bus systems
- Use of parasitic capacitance for RFI suppression and RF filtering (replacement of additional MLCC)
- High signal integrity due to low non-linearity → no signal distortion
- Use at temperatures up to 150 °C
- No temperature derating up to 125 °C/150 °C (depending on type)
- High energy handling capability
- Low parasitic inductance
- Low leakage current
- Fast response time < 0.5 ns

Qualification

- Reliability based on AEC-Q200, Rev. C
- ESD protection according to IEC61000-4-2 and ISO10605
- Jump start and load dump protection to ISO7637

Overview of transient overvoltages



Selection Guide

Typical requirements for automotive applications

ESD protection.

Typical applications: Bus systems, car infotainment. Typical case sizes: 0603, 0805

ESD specification (e.g. IEC, ISO, AEC, JEDEC, HBM, customer specification)

Type of bus system (e.g. LIN, CAN, FlexRay) defines capacitance requirement on protection device

Special capacitance range (controlled capacitance, low capacitance, high-speed)

Enhanced temperature requirement (150 °C)

High temperature (HT) range

Load dump/jump start protection.

Typical application: battery line. Typical case sizes: 1210, 2220

Load dump / jump start requirements (e.g. ISO 7637)

Additional requirements (e.g. centralized or module protection)

AUTO range

Enhanced temperature requirement (150 °C)

AUTO high temperature range

Transient voltage/RFI suppression.

Typical application: DC motors. Typical case sizes: SR1 (1812), SR2 (2220), SR6 (1206)

RFI suppression requirements:

Noise suppression level (e.g. VDE 0879, part 3), capacitance value, frequency range

Additional requirements (e.g. load dump, jump start, ISO 7637, JASO)

Leaded transient voltage / RFI suppressors (SHCV) ¹⁾

Surge current protection.

Typical application: motors. Typical case sizes: 3225, 4032

Additional requirements (e.g. load dump, jump start)

SMD disk varistors AUTO range (CU AUTO) ¹⁾

¹⁾ For samples or further information please contact your EPCOS sales office.

Product Range

Electrical parameters of parts in the sample kit

Case size	EPC0S type	V _{DC} [V]	I _{surge, max} @ 8/20 µs [A]	W _{max} @ 2 ms [mJ]	W _{L0} @ 10 pulses [J]	P _{diss, max} [mW]	V _V @ 1 mA ¹⁾ [V]	V _{jump} @ 5 min. [V]	V _{clamp, max} [V]	I _{clamp} @ 8/20 µs [A]	C _{typ} [pF]	C _{max} [pF]
AUTO range												
0805	CT0805S14BAUTOG	16	120	300	1	8	22	24.5	42	1.0	400	–
1206	CT1206K20AUTOG	26	200	700	1.5	8	33	27.0	54	1.0	600	–
1210	CT1210S14BAUTOG	16	400	1600	3	10	22	24.5	40	2.5	1700	–
1210	CT1210K17AUTOG	22	400	1700	3	10	27	26.5	44	2.5	1800	–
1210	CT1210K20AUTOG	26	400	1900	3	10	33	27.0	54	2.5	1500	–
1210	CT1210K25AUTOG	31	300	1700	3	10	39	29.0	65	2.5	1200	–
2220	CN2220S14BAUTOGK2	16	1200	5800	12	30	22	24.5	40	10.0	9500	–
2220	CN2220S14BAUTOE2G2K2	16	1200	5800	25	30	22	24.5	40	10.0	15000	–
2220	CN2220K30AUTOE2G2K2	34	1200	12000	25	30	47	45.0	77	10.0	10000	–
Standard and special capacitance range												
0603	CT0603K25G	31	30	300	–	3	39	–	67	1	90	–
0805	CT0805K25G	31	80	300	–	5	39	–	67	1	250	–
0603	CT0603K17LCG	22	10	100	–	1	27	–	50	1	–	50.0
0603	CT0603S17BCCG	22	30	75	–	3	25	–	50	1	–	74.2
0603	CT0603S17ALCG	22	30	75	–	3	25	–	50	1	–	75.0
0603	CT0603K14G	18	30	200	–	3	22	–	40	1	100	–
0603	CT0603S14AHSG	16	5	30	–	3	23	–	66	1	15	30.0
0603	CT0603L25HSG	32	5	–	–	–	51.9	–	120	1	10	15.0
AUTO high temperature range												
0603	CN0603S14BHTG2	18	30	200	–	3	22	–	42	1	120	–

¹⁾ Tolerances see data sheet on CD-ROM

Components

CT0805 S14BAUT0G	CT1206 K20AUT0G	CT1210 S14BAUT0G	CT1210 K17AUT0G	CT1210 K20AUT0G	CT1210 K25AUT0G	CN2220S14 BAUT0GK2	CN2220S14 BAUT0E2G2K2	CN2220K30 AUT0E2G2K2
---------------------	--------------------	---------------------	--------------------	--------------------	--------------------	-----------------------	--------------------------	-------------------------

CT0603 K25G	CT0805 K25G	CT0603 K17LCG	CT0603 S17BCCG	CT0603 S17ALCG	CT0603 K14G	CT0603 S14AHSG	CT0603 L25HSG	CN0603 S14BHTG2
----------------	----------------	------------------	-------------------	-------------------	----------------	-------------------	------------------	--------------------

AUTO range: Load dump/jump start suppression (centralized or on module)

[illegible]

Standard and special capacitance range: ESD protection and filtering in bus systems and datalines

Bus system	LIN	CAN class A/B	CAN class C	Flex Ray	MOST
------------	-----	---------------	-------------	----------	------

AUTO high temperature range:

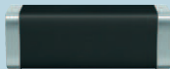
ESD protection in bus systems and overvoltage protection in high-temperature applications (hybrid systems)

BUS system	LIN	CAN class A/B	CAN class C	Flex Ray	MOST
------------	-----	---------------	-------------	----------	------

© 2013 Pearson Education, Inc. or its affiliate(s). All rights reserved. This publication is protected by copyright. Any unauthorized distribution or reproduction of this work is illegal. All other rights reserved.



Sample Kit 2011



Multilayer Varistors (MLVs)

for ESD and High Energy Transient
Protection in Automotive Applications

1. Data sheet 2. General information 3. PSpice model 4. Presentation

© EPCOS AG 2011

www.epcos.com

Important information: Some parts of this publication contain statements about the suitability of our products for certain areas of application. These statements are based on our knowledge of typical requirements that are often placed on our products. We expressly point out that these statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. This publication is only a brief product survey which may be changed from time to time. Our products are described in detail in our data sheets. The *Important notes* (www.epcos.com/ImportantNotes) and the product-specific *Cautions and warnings* must be observed. All relevant information is available through our sales offices.



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

EPCOS:

[B72499A9999K99](#) [B72499E9999K99](#)

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: org@lifeelectronics.ru

www.lifeelectronics.ru