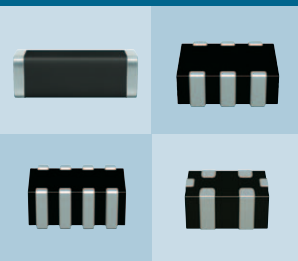




Sample Kit 2010



Ceramic Transient Voltage Suppressors (CTVS)

for ESD and High Transient Voltage Protection in
Car Entertainment and Infotainment Applications

What are CTVS?

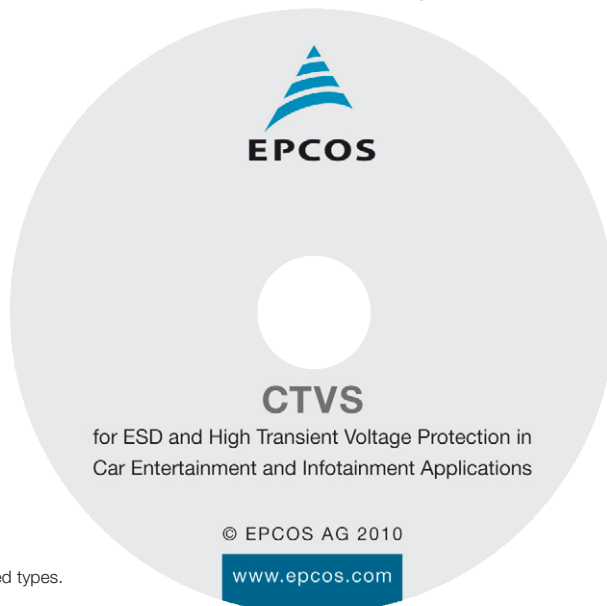
- CTVS are multilayer semiconductor ceramic components for ESD protection of data lines (USB, audio, video, etc.) and bus systems (LIN, CAN, MOST, FlexRay, etc.) and for high energy transient protection (e.g. load dump and jump start) in electronic devices.
- CTVS are able to replace semiconductor diodes such as Zener and TVS and offer advantages regarding cost and technology.

Benefits for customer applications

- Bidirectional protection for ESD and high energy transients
- High ESD stability to IEC 61000-4-2, level 4 and ISO10605
- No temperature derating up to 85 °C / 125 °C (depending on type)
- Low capacitance types for high-speed data lines and bus systems (e.g. LIN, CAN, FlexRay, MOST)
- Jump start and load dump protection to ISO 7637 for case sizes 1210 and 2220
- Use of parasitic capacitance for RFI suppression and RF filtering (replacement of additional MLCC)

Qualification

- Case sizes 0805, 1210, 2220 qualified based on AEC-Q200, Rev. C
- Case sizes 0402, 0603 and arrays qualified based on EPCOS standard qualification program¹⁾
- ESD protection according to IEC61000-4-2, level 4 (8 kV contact and 15 kV air discharge; all components) and ISO10605 (for single case sizes ≥ 0603)



¹⁾ Case size 0603 qualified based on AEC-Q200, Rev. C on request for selected types.

Components

CDS2 C20GTH	CDS2 C05HDMI2	CT0603 K25G	CT0603 L25HSG	CT0603 S5ARFG	CT0603 V150RFG			
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CT0805 K25AUT0G	CT1210 S14BAUT0G	CN2220S14 BAUT0E2G2K2		CA06P4 V150THSG	CDA3 C05GTH	CDA6 C05GTH		CA04F2 FT5AUD010G
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Application matrix

			Push button	Audio	USB, video, memory card, Ethernet			Antenna	Bus (CAN, LIN, Flex, MOST, etc.)		Battery line
Case size	EPCOS type	Semi diode package									
Single components											
0402	CDS2C20GTH	SOD-723	x	x	x						
0402	CDS2C05HDMI2	SOD-723	x	x	x	x					
0603	CT0603K25G	SOD-523	x	x				x			
0603	CT0603L25HSG	SOD-523	x	x	x			x			
0603	CT0603S5ARFG	SOD-523	x	x	x	x					
0603	CT0603V150RFG	SOD-523	x	x	x	x					
0805	CT0805K25AUTOG	–								x	
1210	CT1210S14BAUTOG	–								x	
2220	CN2220S14BAUTOE2G2K2	–								x	
Array components											
0612	CA06P4V150THSG	–	x	x	x						
0506	CDA3C05GTH	SOD-666			x						
1012	CDA6C05GTH	SOT-23 6L			x						
ESD/EMI audio filter array											
0405	CA04F2FT5AUD010G	–		x							

Product Range

Types and electrical data									
Case size	EPCOS type	Semi diode package	Device schematic	V _{DC} , max [V]	I _{surge} , max @ 8/20 µs [A]	V _{BR} , min @ 1 mA ¹⁾ [V]	V _{clamp} , max [V]	I _{clamp} , max @ 8/20 µs [A]	C _{typ} [pF]
Single components									
0402	CDS2C20GTH ⁷⁾	SOD-723		20	6	30	80	1	10
0402	CDS2C05HDMI2 ⁷⁾	SOD-723		5.6	–	90	–	1	0.6
0603	CT0603K25G ⁶⁾	SOD-523		31	30	35.1	67	1	90
0603	CT0603L25HSG ⁶⁾ 7)	SOD-523		32	5	51.9	120	1	10
0603	CT0603S5ARFG ⁷⁾	SOD-523		5.5	–	220	–	–	0.6
0603	CT0603V150RFG ⁷⁾	SOD-523		16	–	150	–	–	3
0805	CT0805K25 AUTOG ²⁾ 3)	–		31	80	35.1	67	1	250
1210	CT1210S14 BAUTOG ²⁾ 4)	–		16	400	22	40	2.5	1700
2220	CN2220S14 BAUTOE2G2K2 ²⁾ 5)	–		16	1200	22	40	10	15000
Array components									
0612	CA06P4V150THSG ⁷⁾	–		16	1	–	350	1	3
0506	CDA3C05GTH ⁷⁾	SOT-666		5.6	–	106	395	1	2.2
1012	CDA6C05GTH ⁷⁾	SOT-23 6L		5.6	–	52	195	1	7
ESD/EMI audio filter array									
0405	CA04F2FT5AUD010G	–		5	–	8	30	1	270

¹⁾ Breakdown voltage V_{BR} = Varistor voltage V_V; tolerances see data sheet on CD-ROM

²⁾ Qualified based on AEC-Q200, Rev. C

³⁾ Load dump and jump start capability: W_{max} (2 ms) = 0.3 J, W_{LD} (10 pulses) = 1 J, V_{jump} (5 min) = 29 V

⁴⁾ Load dump and jump start capability: W_{max} (2 ms) = 1.6 J, W_{LD} (10 pulses) = 3 J, V_{jump} (5 min) = 24.5 V

⁵⁾ Load dump and jump start capability: W_{max} (2 ms) = 5.8 J, W_{LD} (10 pulses) = 25 J, V_{jump} (5 min) = 24.5 V

⁶⁾ Qualification based on AEC-Q200, Rev. C on request

⁷⁾ For maximum capacitance see data sheet on CD-ROM.

See enclosed CD-ROM for data sheets and further details.

