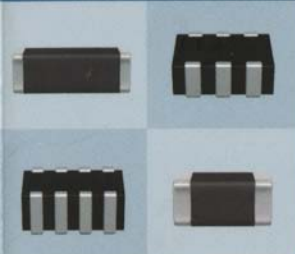




Sample Kit 2007



CeraDiode for ESD Protection

www.epcos.com

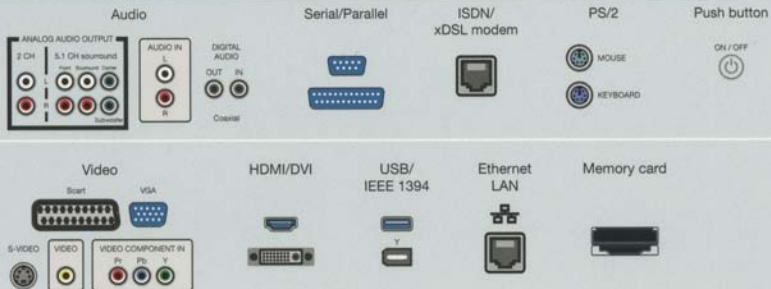
What is a CeraDiode?

- A CeraDiode is a ceramic component for the ESD protection of data, audio and video lines, ICs and I/O ports in electronic devices.
- A CeraDiode is a (cost effective) alternative to semiconductor protection devices such as Zener and TVS diodes.
- In many cases, CeraDiode is a 1:1 replacement for these semiconductor diodes (F.F.F. = Fit, Form, Function).

Benefits for customer applications

- Bidirectional protection in a single component
- High ESD stability to IEC 61000-4-2, Level 4
- No change of ESD protection performance at temperatures $> 25^{\circ}\text{C}$
- Use of parasitic capacitance for RFI suppression and RF filtering (replacement of additional MLCC)
- High surge current capability
- Low parasitic inductance
- Low leakage current
- Fast response time $< 0.5\text{ ns}$

Interfaces ESD protected by CeraDiode (examples)









Cross Reference

CeraDiode drop-in equivalents (1:1) to semiconductor diodes				
EPCOS type	Semtech	ST Micro	OnSemi	Philips / NXP
Single standard				
CDS2C05GTA			μESD3.3ST5G	
CDS2C15GTA			μESD5.0ST5G μESD12ST5G	
CDS3C05GTA	SM05, μClamp0501H	ESDA5V3L ESDA6V1L	ESD5Z2.5T1 ESD5Z3.3T1 ESD5Z5.0T1	PESD5V0S1BB PESD3V3S1UB PESD5V0S1UB
CDS3C09GTA			ESD5Z6.0T1 ESD5Z7.0T1	
CDS3C15GTA	SDC15, SM12, SM15, μClamp1201H	ESDA14V2L		PESD12VS1UB PESD15VS1UB
CDS3C20GTA	SM24	ESDA25L		
CDS4C12GTA	SD05C, SD12C, μClamp3301D		SD05T1 SD12T1	PESD5V0S1BA PESD3V3L1BA PESD5V0L1BA PESD12VL1BA
Single high-speed				
CDS3C16GTH	SL05, SL12, SL15, SL24			
CDS3C30GTH	SM36, μClamp3301H			
Array high-speed				
CDA6C05GTH	SMS3.3, SMS05, SRV05-4, RClamp0504S	ESDA6V1-4BC6, ESDA5V3SC6, ESDA6V1SC6 ESDA14V2SC6, ESDA6V1-5W6 USBLC6-4SC6		

Complete cross reference see CD ROM

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 warnings and cautions must be observed. All relevant information is available through our sales offices.

Product Range

Types and electrical data									
Case size	EPCOS type	Semi diode package	Lines to protect	Device schematic	V _{DC} [V]	V _{BR, min} @ 1 mA [V]	V _{clamp, max} @ 1 A [V]	I _{pp, max} @ 8/20 μs [A]	C _{typ} [pF]
Single standard									
0402	CDS2C05GTA	SOD-723	1		5.6	6.4	24	10	180
0402	CDS2C15GTA	SOD-723	1		15	20	46	10	47
0603	CDS3C05GTA	SOD-523	1		5.6	6.4	19	30	470
0603	CDS3C09GTA	SOD-523	1		9	10	30	30	220
0603	CDS3C15GTA	SOD-523	1		15	22	42	30	160
0603	CDS3C20GTA	SOD-523	1		22	25	50	30	56
1003	CDS4C12GTA	SOD-323	1		12	16	46	20	82
Array standard									
0508	CDA4C20GTA	-	4		22	24	60	10	33
0612	CDA5C20GTA	-	4		22	25	50	30	56
Single high-speed									
0402	CDS2C05HDM1	SOD-723	1		5.6	150	-	-	0.6
0402	CDS2C15GTH	SOD-723	1		15	23	66	-	10
0402	CDS2C16GTH	SOD-723	1		16	65	290	-	2
0603	CDS3C16GTH	SOD-523	1		16	65	290	-	3
0603	CDS3C30GTH	SOD-523	1		30	50	120	-	10
1003	CDS4C16GTH	SOD-323	1		16	38	146	-	3
Array high-speed									
0508	CDA4C16GTH	-	4		16	22	66	-	10
0612	CDA5C16GTH	-	4		16	80	350	-	3
1012	CDA6C05GTH	SOT-23 6L	2 or 4 data + 1 supply			5.6	52	195	-

Application Matrix

Case size	EPCOS type	Semi diode package	Video analog	DVI	HDMI	Audio analog	Audio digital	USB, IEEE 1394	Ethernet	Serial port	Parallel port	LCD data line	SATA	Memory card, SIM card	Bluetooth	Analog modem / ISDN	xDSL modem	WLAN	Keyboard, Pushbuttons, PS/2
Single standard																			
0402	CDS2C05GTA	SOD-723				x				x						x			x
0402	CDS2C15GTA	SOD-723				x		x ¹⁾		x						x			x
0603	CDS3C05GTA	SOD-523				x				x						x			x
0603	CDS3C09GTA	SOD-523				x				x						x			x
0603	CDS3C15GTA	SOD-523				x		x ¹⁾		x						x			x
0603	CDS3C20GTA	SOD-523				x				x						x			x
1003	CDS4C12GTA	SOD-323				x		x ¹⁾		x						x			x
Array standard																			
0508	CDA4C20GTA	-				x	x			x						x			x
0612	CDA5C20GTA	-				x	x			x						x			x
Single high-speed																			
0402	CDS2C05HDMI1	SOD-723		x	x			x ²⁾	x ³⁾				x						x
0402	CDS2C15GTH	SOD-723	x				x	x			x	x		x	x				x
0402	CDS2C16GTH	SOD-723	x	x			x	x	x		x	x	x	x	x				x
0603	CDS3C16GTH	SOD-523	x	x			x	x	x		x	x	x	x	x				x
0603	CDS3C30GTH	SOD-523	x				x	x			x	x		x	x				x
1003	CDS4C16GTH	SOD-323	x	x			x	x	x		x	x	x	x	x				x
Array high-speed																			
0508	CDA4C16GTH	-	x				x	x			x	x		x	x				x
0612	CDA5C16GTH	-	x	x			x	x	x		x	x	x	x	x				x
1012	CDA6C05GTH	SOT-23 6L	x				x	x	x		x		x	x	x				x

¹⁾ Power line, ²⁾ IEEE 1394b, ³⁾ GigaEthernet

Customer must test and approve parts for the application.

The Important Notes (www.epcos.com/ImportantNotes) and the product-specific warnings and cautions must be observed.

Components

CDS2 C05GTA	CDS2 C15GTA	CDS3 C05GTA	CDS3 C09GTA	CDS3 C15GTA	CDS3 C20GTA	CDS4 C12GTA	CDA4 C30GTA	CDA5 C20GTA
----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------



CDS2 C05HDM1	CDS2 C15GTH	CDS2 C16GTH	CDS3 C16GTH	CDS3 C30GTH	CDS4 C16GTH	CDA4 C16GTH	CDA5 C16GTH	CDA6 C05GTH
-----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------

