

Low-Capacitance ESD Protection Diode Arrays

Features:

- Small package saves board space
- Protects 1, 2, 4, 6 & 8 I/O lines
- ESD protection to over **8kV contact discharge** per IEC-61000
- Low capacitance: **1pF**
- Low clamping voltage
- Can handle multiple ESD strikes
- Full RoHS compliance

Applications:

- USB 2.0 Power & Data Line Protection
- DVI & HDMI Port Protection
- VGA & Serial ATA Port Protection
- Mobile Handsets
- Digital Cameras and camcorders
- PDA & MP3 Players
- Digital TV and Set-top Boxes
- Other Portable Electronic Components

Product Description

The ESD2100 provides a high level of protection for sensitive parts that may be subjected to over-voltage caused by electrostatic discharge (ESD). Key attribute is the low-capacitance of 1pF which is ideally suited for high-speed data ports. Each channel consists of a pair of diodes in series which steer the positive and negative ESD current pulse to either the positive (V_P) or negative (V_N) supply rail. A Zener (TVS) diode is embedded between V_P and V_N to protect the V_{CC} rail against ESD strikes and eliminates the need for a bypass capacitor (which would otherwise be needed for absorbing positive ESD strikes to ground). The TVS diode prevents over-voltage on the power line, protecting any down stream components.

ELECTRICAL OPERATING CHARACTERISTICS				
Electrical Specifications	MIN	TYP	MAX	UNITS
Operating Supply Voltage (V_P)		3.3	5.5	V
Operating Supply Current (I_P); $V_P=3.3V$			8	μA
Diode Forward Voltage ($I_F=8mA$, @ 25°C)				
Top Diode	0.6	0.8	0.95	V
Bottom Diode	0.6	0.8	0.95	V
Leakage current at $V_P=5V$, 25°C	-	± 0.1	± 1	μA
Signal Clamp Voltage at 25°C @ 10mA	6.5	7.5	9	V
ESD Protection				
Contact discharge per IEC 61000-4-2 standard	± 8	-	-	kV
Clamping voltage during ESD discharge MIL-STD-883D (Method 3015), 4kV				
Positive Transient	-	9	-	V
Negative Transient	-	-1.5	-	V
Input Capacitance(@; $V_P = 3.3V$; $V_{Channel} = 1.65V$; frequency = 1MHz)	0.6	0.8	1	pF
Temperature Range:				
Operating	-40	-	85	°C
Storage	-55		150	°C

PRELIMINARY DATA SHEET

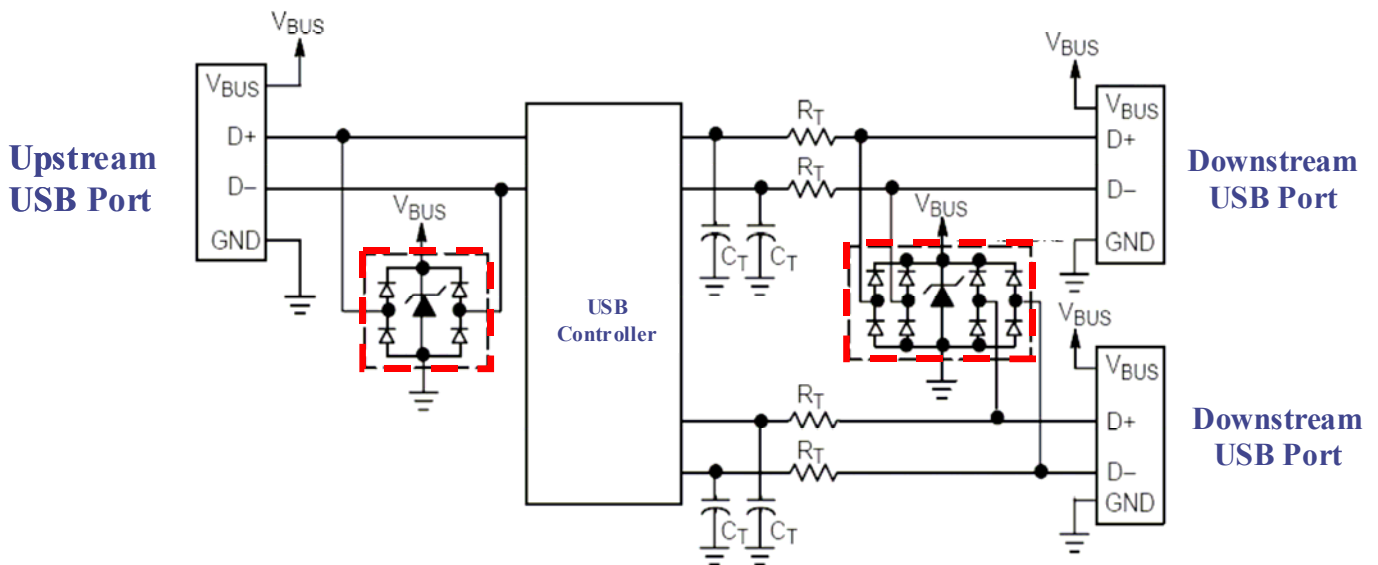
OnChip

ESD2100

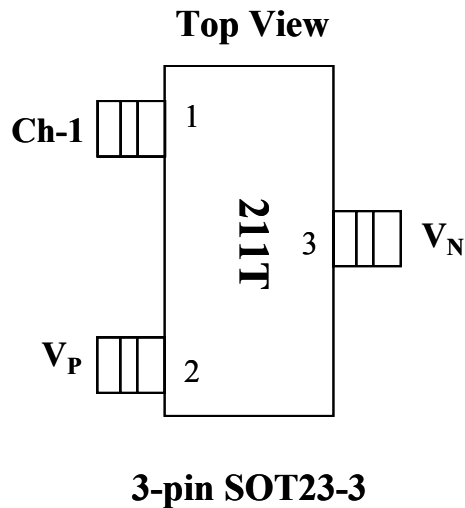
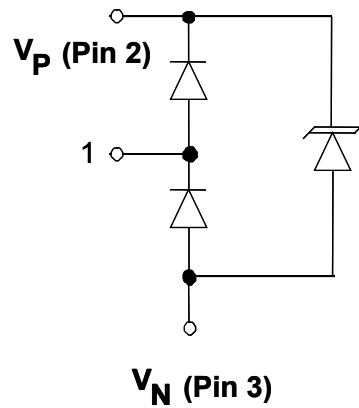
Ordering Part Number			
PART NUMBER	NUMBER OF ESD CHANNELS	PACKAGE	DEVICE MARKING CODE
ESD2100-01TR	1-Channel (lead-free)	SOT23-3	11TR
ESD2100-02TR	2-Channels (lead-free)	SOT-143	12TR
ESD2100-02T5R	2-Channels (lead-free)	SOT23-5	12T5R
ESD2100-04MR	4-Channels (lead-free)	MSOP-10	2100 04MR
ESD2100-04SR	4-Channels (lead-free)	SC70-6	04SR
ESD2100-04TR	4-Channels (lead-free)	SOT23-6	2104R
ESD2100-06MR	6-Channels (lead-free)	MSOP-8	2100 06MR
ESD2100-08MR	8-Channels (lead-free)	MSOP-10	2100 08MR
ESD2100-A8MR	8-Channels (lead-free)	MSOP-10	2100 A8MR

USB 2.0 Port ESD Protection Diodes

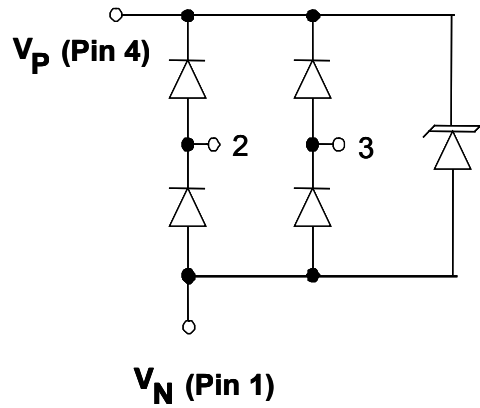
Application Schematic



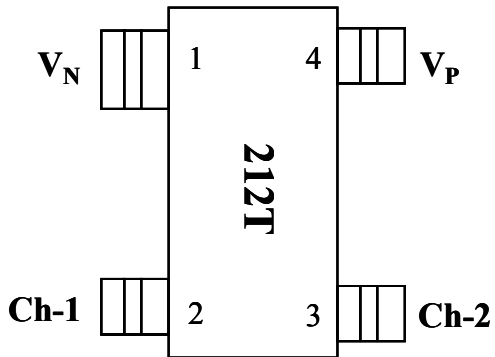
1-Ch in a 3-pin SOT23-3 package
ESD2100-01TR (lead-free)



2-Ch in a 4-pin SOT-143 package
ESD2100-02TR (lead-free)

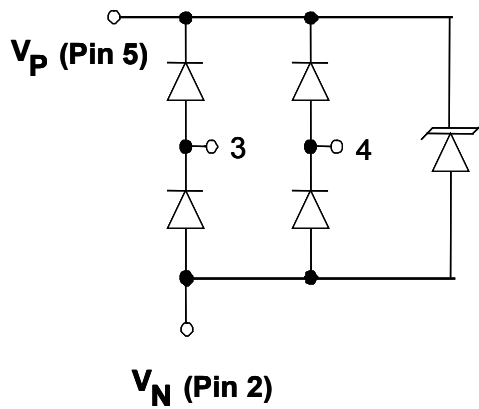


Top View

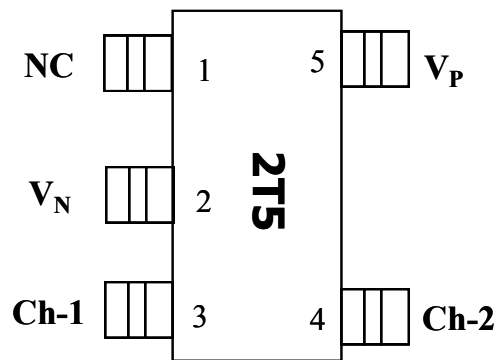


4-pin SOT143

2-Ch in a 5-pin SOT23-5 package
ESD2100-02T5R (lead-free)

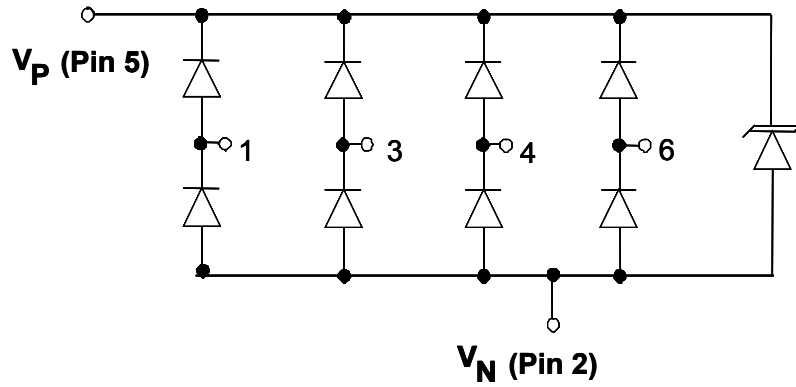


Top View

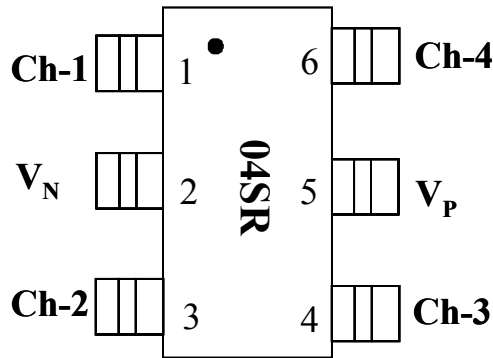


5-pin SOT23-5

4-Ch in a 6-pin SC70-6 package
ESD2100-04SR (lead-free)

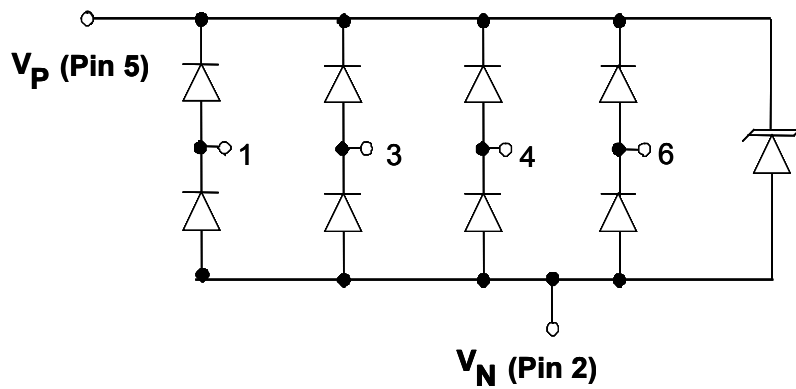


Top View

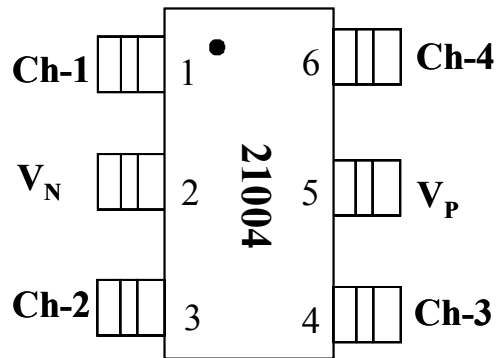


6-pin SC70-6

4-Ch in a 6-pin SOT23-6 package
ESD2100-04TR (lead-free)

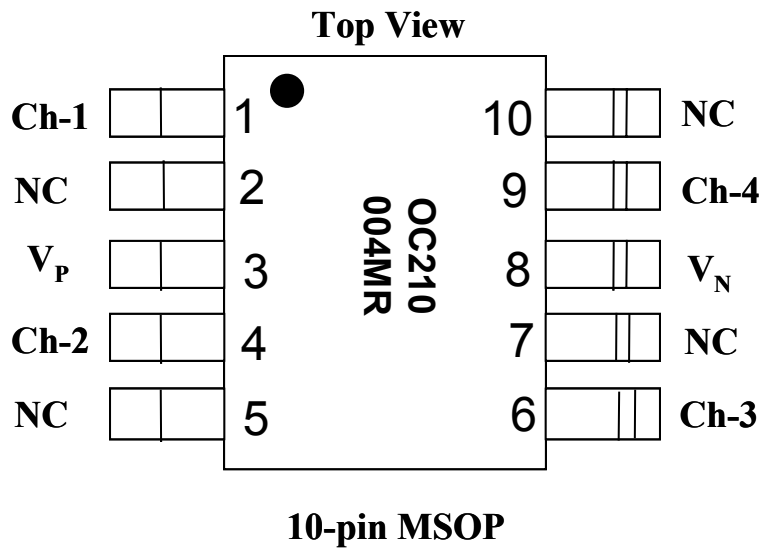
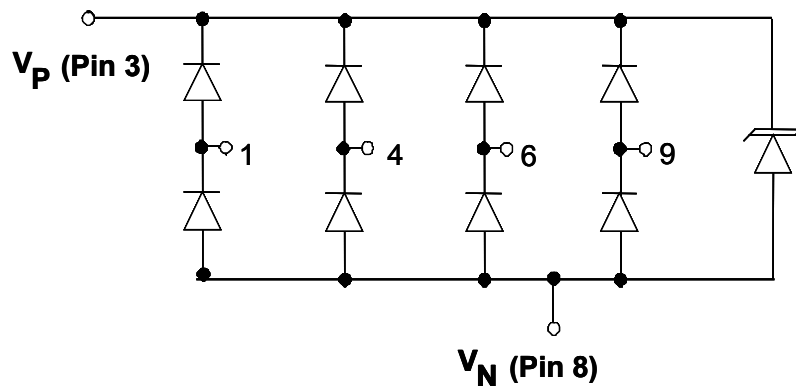


Top View

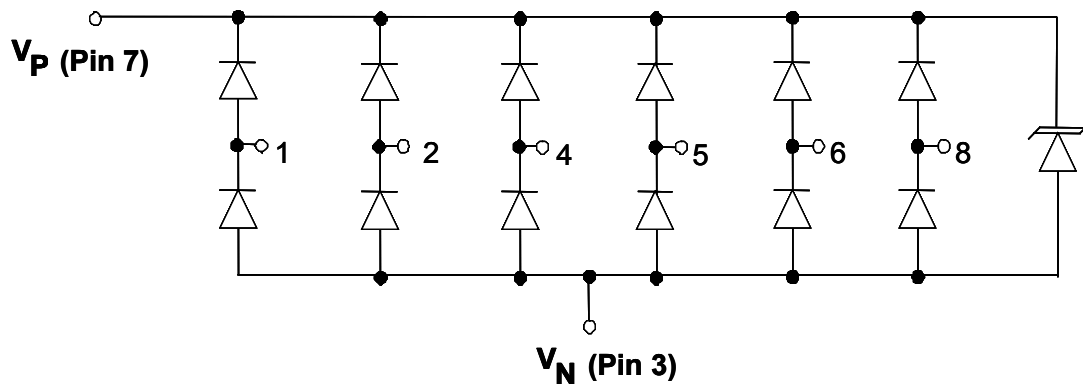


6-pin SOT23-6

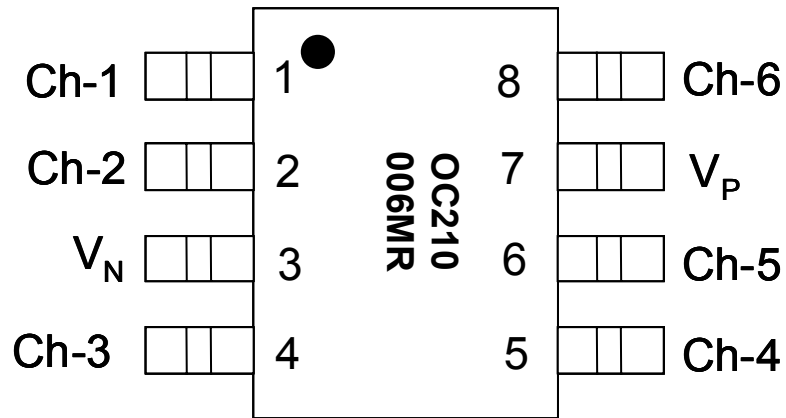
4-Ch in a 10-pin MSOP package
ESD2100-04MR (lead-free)



6-Ch in a 8-pin MSOP package
ESD2100-06MR (lead-free)

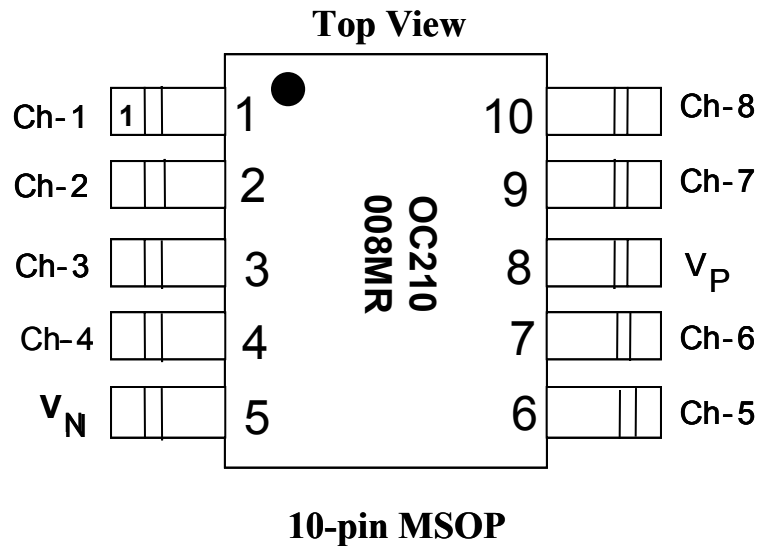
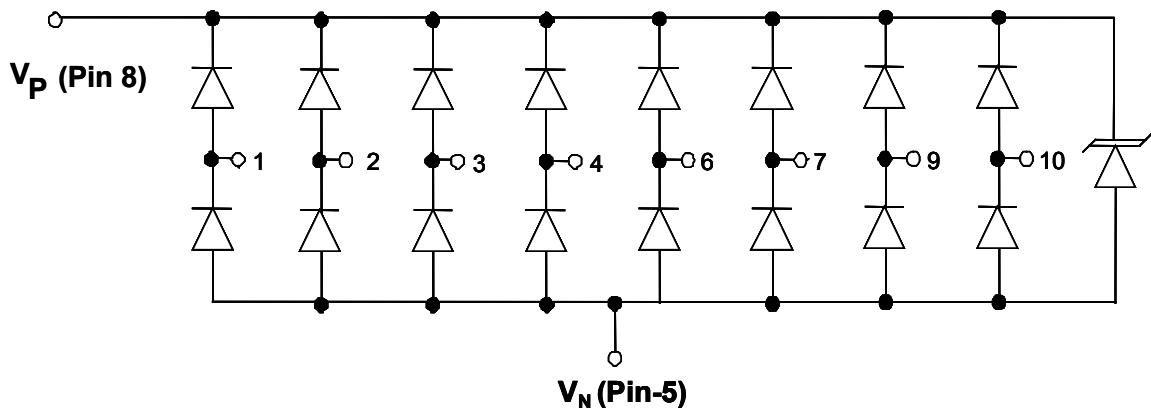


Top View



8-pin MSOP

8-Ch in a 10-pin MSOP package
ESD2100-08MR (lead-free)



8-Ch in a 10-pin MSOP package
ESD2100-A8MR (lead-free)

