

## Low-Capacitance ESD Protection Diode Arrays

**Features:**

- Small package saves board space
- Protects 4 I/O lines
- ESD protection to over **8kV contact discharge** per IEC-61000
- Low capacitance: **0.7pF** typical (Line-to-Line)
- Low clamping voltage
- Can handle multiple ESD strikes
- Full RoHS compliance

**Applications:**

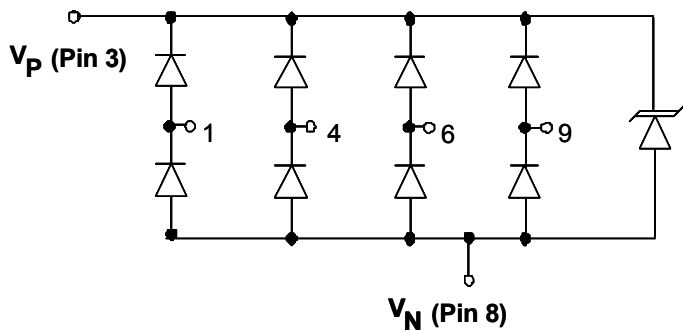
- USB 2.0 Power & Data Line Protection
- DVI & HDMI Port Protection
- VGA & Serial ATA Port Protection
- Mobile Handsets
- Digital Cameras and camcorders
- PDA & MP3 Players
- Digital TV and Set-top Boxes
- Other Portable Electronic Components

**Product Description**

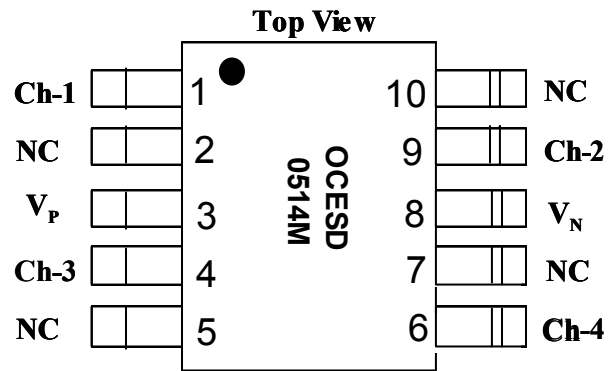
The ESD0514M provides a high level of protection for sensitive parts that may be subjected to over-voltage caused by electrostatic discharge (ESD). Key attribute is the low-capacitance of 0.7pF between I/O pins which is ideally suited for high-speed data ports. Each channel consists of a pair of diodes 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.

The ESD0514M is packaged in a lead-free MSOP-10L.

### Schematic & PIN Configuration



**Circuit Diagram**



**10-pin MSOP**

ORDERING PART NUMBER				
PART NUMBER	NUMBER OF CHANNLES	PACKAGE TYPE	DEVICE MARKING	ROHS COMPLIANCE
ESD0514M	4.000	MSOP-10L	OCESD 0514M	YES

**PRELIMINARY DATA SHEET**

**OnChip**

**ESD0514M**

<b>Absolute Maximum Rating</b>			
<b>Rating</b>	<b>Symbol</b>	<b>Value</b>	<b>Units</b>
Peak Pulse Power (tp = 8/20μs)	P <sub>pk</sub>	125	Watts
Peak Pulse Current (tp = 8/20μs)	I <sub>PP</sub>	5	A
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	15	kV
ESD per IEC 61000-4-2 (Contact)		8	
Lead Soldering Temperature	T <sub>L</sub>	260 (10 Sec.)	°C
Operating Temperature	T <sub>J</sub>	-55 to +125	°C
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C

<b>Electrical Characteristics (T=25°C)</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Conditions</b>	<b>Minimum</b>	<b>Typical</b>	<b>Maximum</b>	<b>Units</b>
Reverse Stand-Off Voltage	V <sub>RWM</sub>	Pin 3 to 8			5	V
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>t</sub> = 1mA Pin 3 to 8	6			V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 5V, T = 25°C Pin 3 to 8			1	μA
Forward Voltage	V <sub>F</sub>	I <sub>t</sub> = 15mA			1.2	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1A, tp = 8/20μs Any I/O pin to Ground			15	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5A, tp = 8/20μs Any I/O pin to Ground			20	V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz Between I/O pins		0.7	0.9	pF
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz Any I/O pin to Ground			1.4	pF

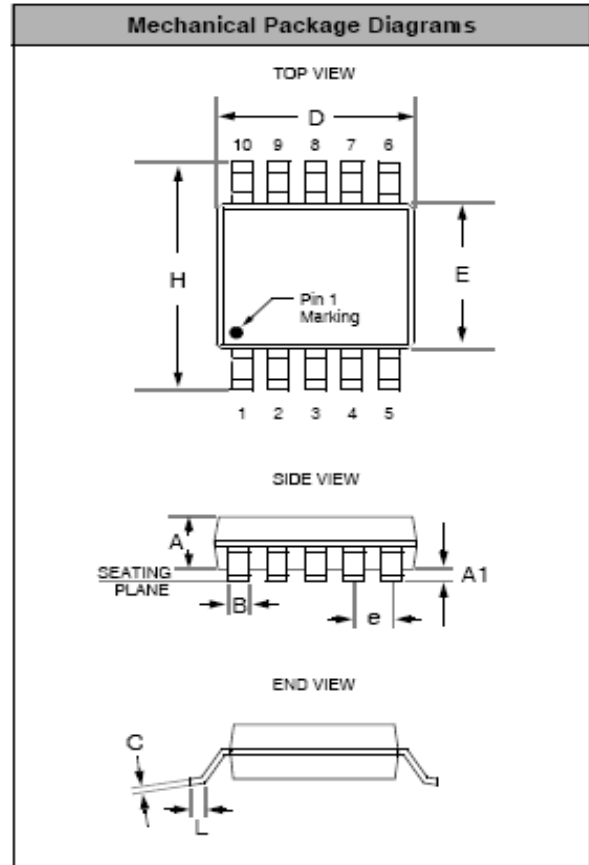
# PRELIMINARY DATA SHEET

# OnChip

# ESD0514M

## Package Outline Drawing MSOP 10L

PACKAGE DIMENSIONS				
Package	MSOP			
Pins	10			
Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A	0.75	0.95	0.028	0.038
A1	0.05	0.15	0.002	0.006
B	0.17	0.33	0.007	0.013
C	0.18		0.007	
D	2.90	3.10	0.114	0.122
E	2.90	3.10	0.114	0.122
e	0.50 BSC		0.0196 BSC	
H	4.90 BSC		0.193 BSC	
L	0.40	0.70	0.0137	0.029
# per tape and reel	4000			
Controlling dimension: inches				



## Land Pattern MSOP 10L

DIMENSIONS		
DIM.	INCHES	MILLIMETERS
C	(0.161)	(4.10)
G	0.098	2.50
P	0.020	0.50
X	0.011	0.30
Y	0.063	1.60
Z	0.224	5.70

