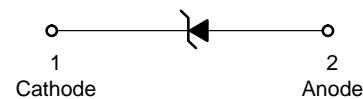


Description

The ESD7361 Series ESD protection diodes are designed to protect high speed data lines from ESD. Ultra-low capacitance make this device an ideal solution for protecting voltage sensitive high speed data lines.



Features

- Low Capacitance (0.55 pF Max, I/O to GND)
- Protection for the Following IEC Standards:
 - IEC61000-4-2 (ESD): Level 4 ± 15 kV Contact
 - IEC61000-4-4 (EFT): 40 A -5/50 ns
 - IEC61000-4-5 (Lightning): 1A (8/20 μ s)
- ISO 10605 (ESD) 330 pF/2 k Ω ± 15 kV Contact

Typical Applications

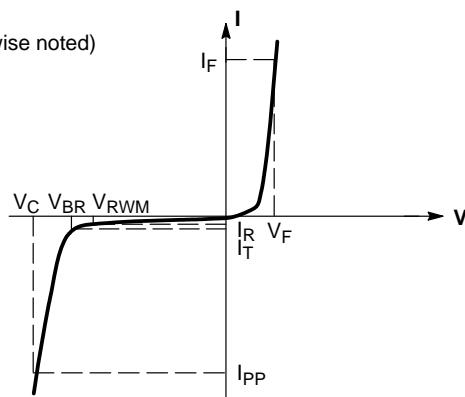
- Wireless Charger
- Near Field Communications

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Operating Junction Temperature Range	T_J	-55 to +125	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C
Lead Solder Temperature – Maximum (10 Seconds)	T_L	260	°C
IEC 61000-4-2 Contact (ESD)	ESD	± 15	kV
IEC 61000-4-2 Air (ESD)	ESD	± 15	kV
ISO 10605 330 pF/2 k Ω Contact (ESD)	ESD	± 15	kV

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current



Uni-Directional

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}			5	16	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{ mA}$; pin 1 to pin 2	16.5			V
Reverse Leakage Current	I_R	$V_{RWM} = 5.0\text{ V}$ $V_{RWM} = 15\text{ V}$		<1 20	1000 1000	nA nA
Clamping Voltage (Note 2)	V_C	$I_{PP} = 8\text{ A}$		31		V
Clamping Voltage (Note 2)	V_C	$I_{PP} = 16\text{ A}$		34		V
Junction Capacitance	C_J	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$ $V_R = 0\text{ V}$, $f < 1\text{ GHz}$			0.55 0.55	pF
Dynamic Resistance	R_{DYN}	TLP Pulse		0.735		Ω
Insertion Loss		$f = 1\text{ MHz}$ $f = 5\text{ GHz}$		0.01 2		dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. For test procedure see Figures 9 and 10
2. ANSI/ESD STM5.5.1 – Electrostatic Discharge Sensitivity Testing using Transmission Line Pulse (TLP) Model.
TLP conditions: $Z_0 = 50\text{ }\Omega$, $t_p = 100\text{ ns}$, $t_r = 4\text{ ns}$, averaging window; $t_1 = 30\text{ ns}$ to $t_2 = 60\text{ ns}$.

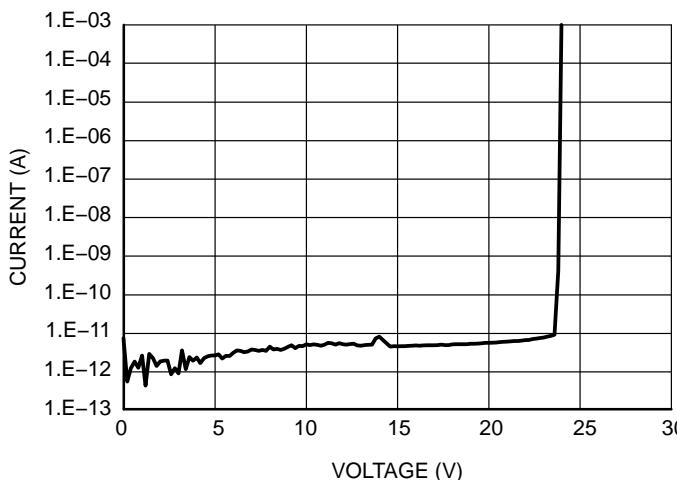


Figure 1. Typical IV Characteristics

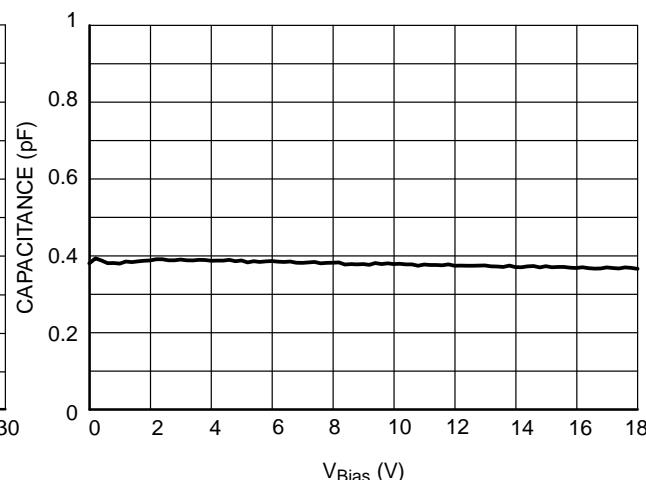


Figure 2. Typical CV Characteristics

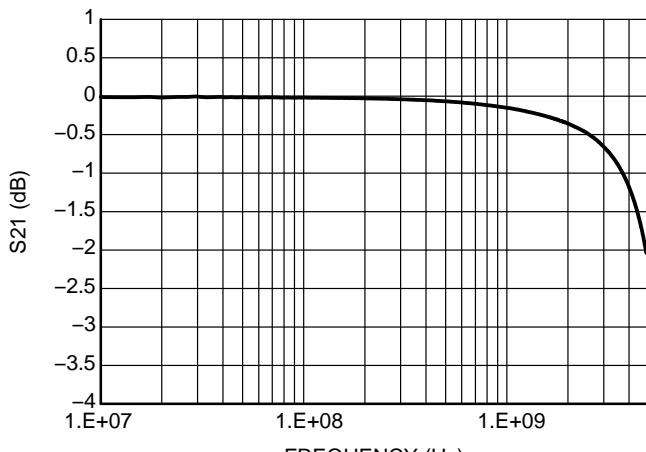


Figure 3. Typical Insertion Loss
ESD7361HT1G (SOD323)

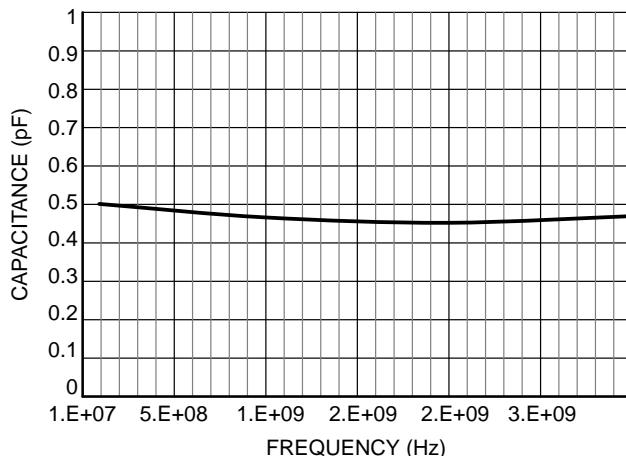


Figure 4. Typical Capacitance Over Frequency
ESD7361HT1G (SOD323)

IEC 61000-4-2 Spec.

Level	Test Voltage (kV)	First Peak Current (A)	Current at 30 ns (A)	Current at 60 ns (A)
1	2	7.5	4	2
2	4	15	8	4
3	6	22.5	12	6
4	8	30	16	8

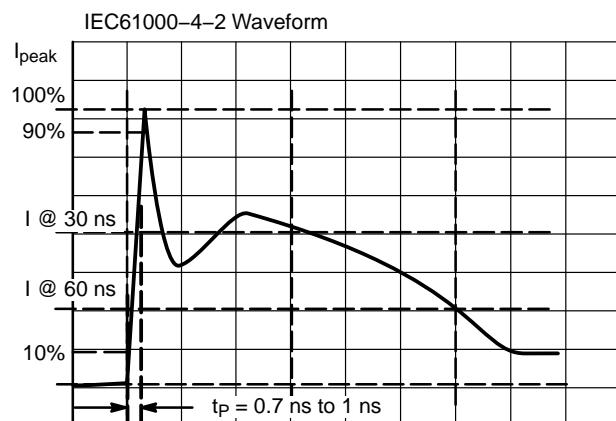


Figure 9. IEC61000-4-2 Spec

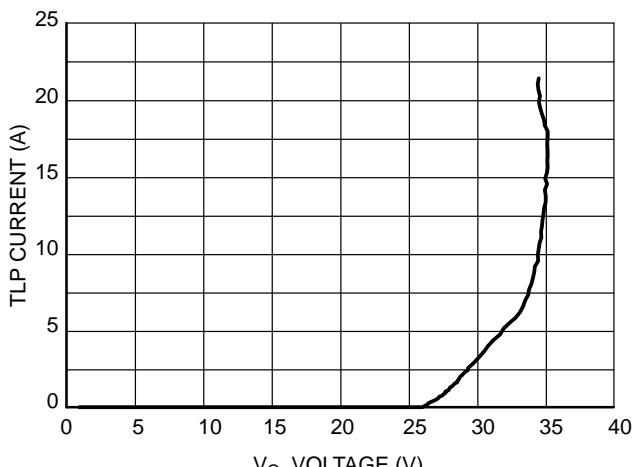


Figure 11. Positive TLP I-V Curve

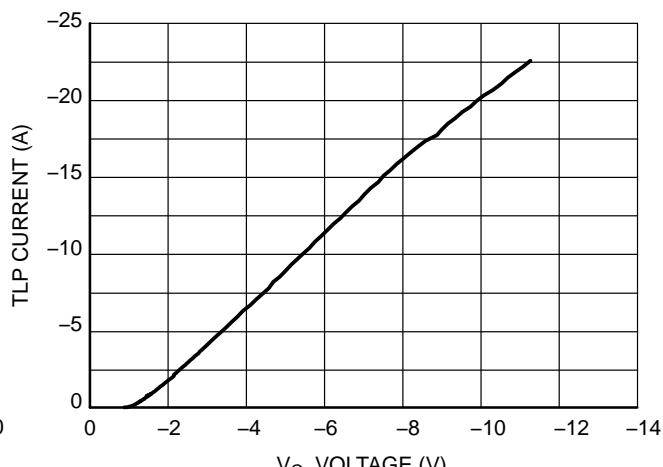


Figure 12. Negative TLP I-V Curve

NOTE: TLP parameter: $Z_0 = 50 \Omega$, $t_p = 100 \text{ ns}$, $t_r = 300 \text{ ps}$, averaging window: $t_1 = 30 \text{ ns}$ to $t_2 = 60 \text{ ns}$. V_{IEC} is the equivalent voltage stress level calculated at the secondary peak of the IEC 61000-4-2 waveform at $t = 30 \text{ ns}$ with 2 A/kV .

Transmission Line Pulse (TLP) Measurement

Transmission Line Pulse (TLP) provides current versus voltage (I-V) curves in which each data point is obtained from a 100 ns long rectangular pulse from a charged transmission line. A simplified schematic of a typical TLP system is shown in Figure 13. TLP I-V curves of ESD protection devices accurately demonstrate the product's ESD capability because the 10s of amps current levels and under 100 ns time scale match those of an ESD event. This is illustrated in Figure 14 where an 8 kV IEC 61000-4-2 current waveform is compared with TLP current pulses at 8 A and 16 A. A TLP I-V curve shows the voltage at which the device turns on as well as how well the device clamps voltage over a range of current levels.

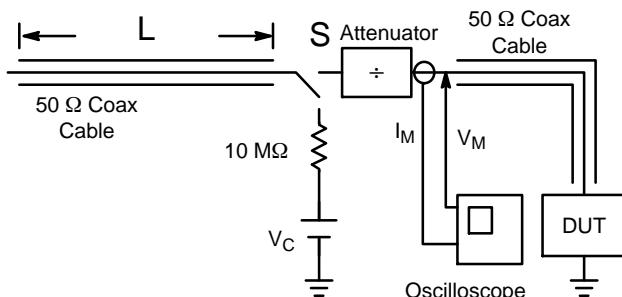


Figure 13. Simplified Schematic of a Typical TLP System

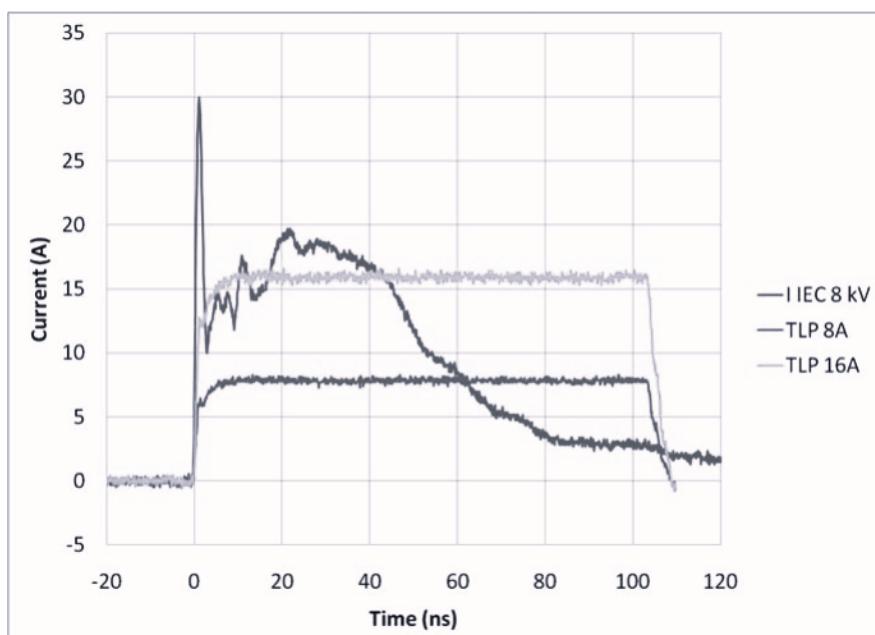
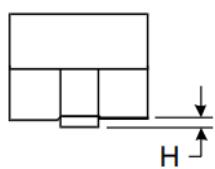
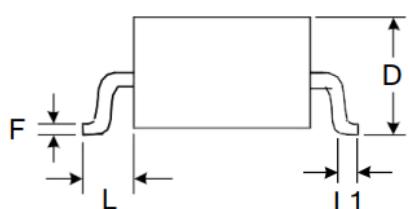
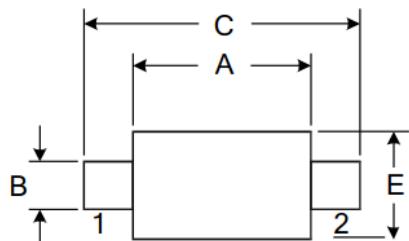


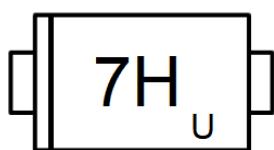
Figure 14. Comparison Between 8 kV IEC 61000-4-2 and 8 A and 16 A TLP Waveforms

Outline Drawing – SOD323



SYMBOL	DIMENSIONS			
	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	1.600	1.800	0.063	0.071
B	0.250	0.350	0.010	0.014
C	2.500	2.700	0.098	0.106
D		1.000		0.039
E	1.200	1.400	0.047	0.055
F	0.080	0.150	0.003	0.006
L	0.475 REF		0.019REF	
L1	0.250	0.400	0.010	0.016
H	0.000	0.100	0.000	0.004

Marking



Ordering information

Order code	Package	Base qty	Delivery mode
UMW ESD7361HT1G	SOD-323	3000	Tape and reel