

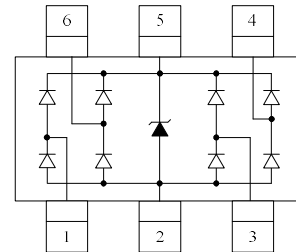
### DESCRIPTION

ESD0504F is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.20pF (I/O to I/O) only, ESD0504F is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4(±15KV air, ±8KV contact discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns),very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

ESD0504F uses small SOT-363 package. Each ESD0504F device can protect four high-speed data lines one Vcc line. The combined features of ultra-low capacitance, small size and high ESD robustness make ESD0504F ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the ESD0504F guarantees a minimum stress on the protected IC.

### APPLICATIONS

- Serial ATA
- MDDI Ports
- USB 2.0/3.0 Power and Data Line Protection
- Display Ports
- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interface (DVI)



### FEATURES

- Transient protection for high-speed data lines
  - IEC 61000-4-2(ESD) ±25KV(Air)
  - ±20KV(Contact)
  - IEC 61000-4-4(EFT)40A(5/50ns)
  - Cable Discharge Event(CDE)
- Package optimized for high-speed lines
- Small package(2.1mm\*2.3mm\*1.0mm)
- Protects four data lines and one Vcc line
- Low capacitance: 0.20pF (I/O to I/O)
- Low leakage current
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8KV contact discharge

### MACHANICAL DATA

- SOT-363 package
- Flammability Rating: UL 94V-0
- Terminal: Matte tin plated.
- Packaging: Tape and Reel
- High temperature soldering guaranteed:260<sup>o</sup>C /10s
- Reel size: 7 inch

## ABSOLUTE MAXIMUM RATING

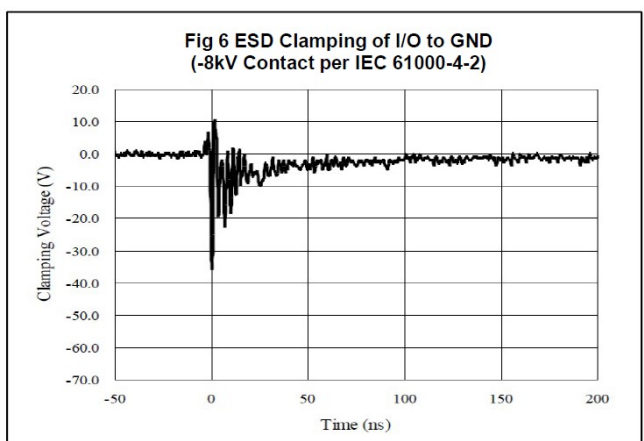
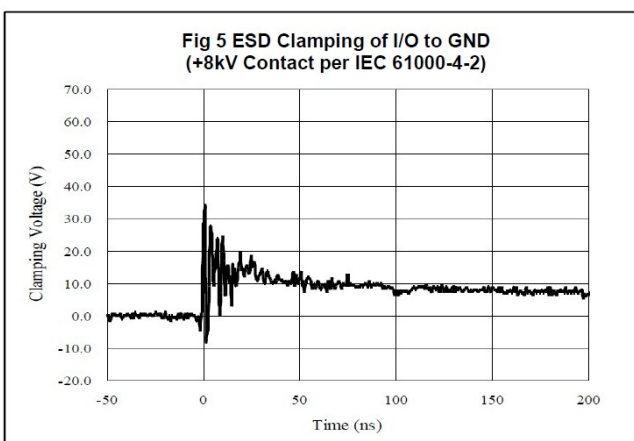
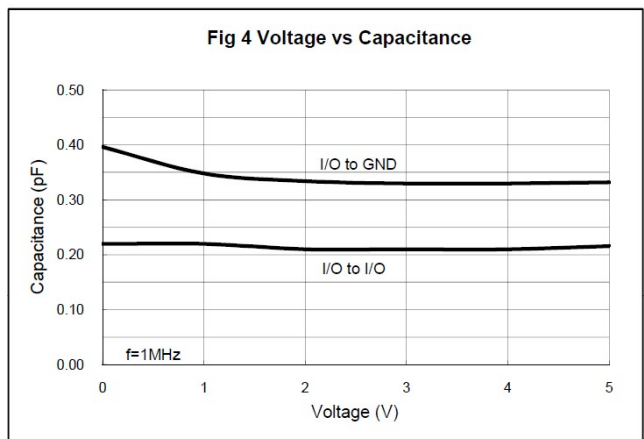
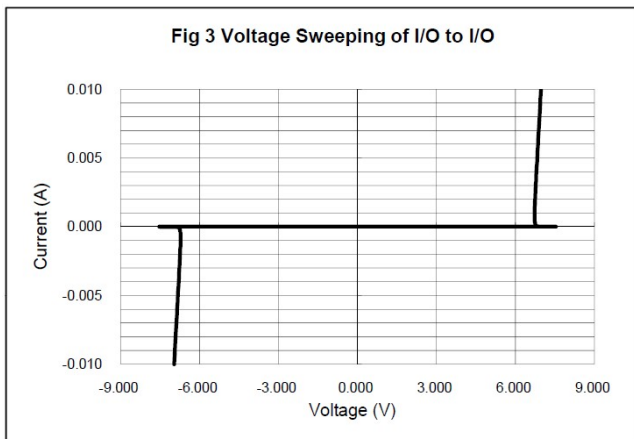
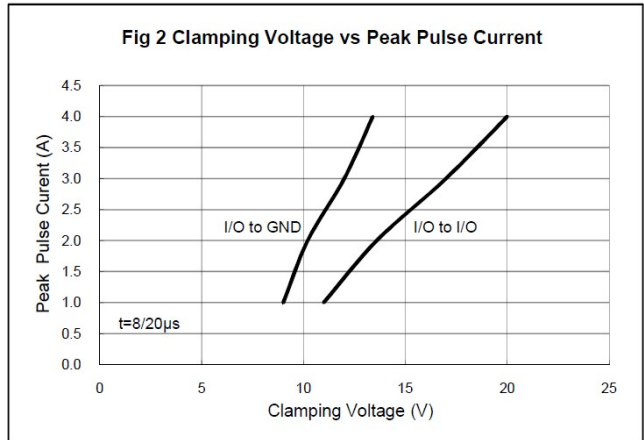
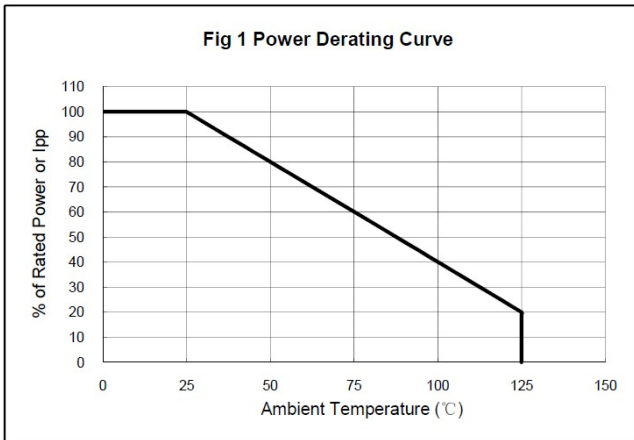
Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20 $\mu$ s)	60	W
$V_{ESD}$	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$\pm 25$ $\pm 20$	kV
$T_{OPT}$	Operating Temperature	-55/+125	$^{\circ}$ C
$T_{STG}$	Storage Temperature	-55/+150	$^{\circ}$ C

## ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}$ C)

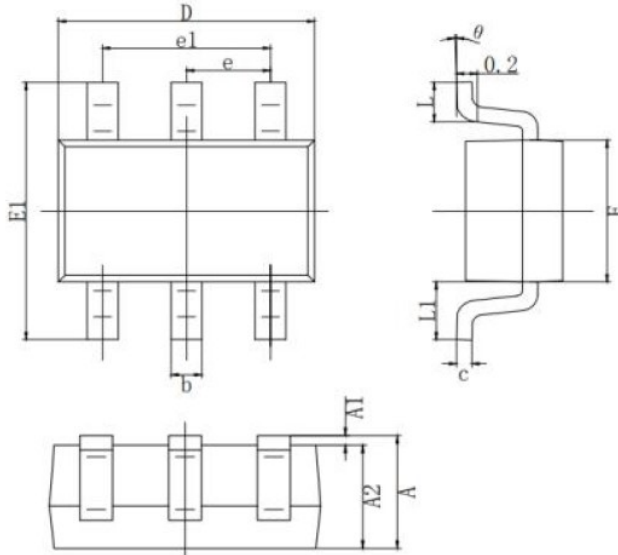
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
$V_{RWM}$	Reverse Working Voltage	Any I/O pin to GND			5.0	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T = 1\text{mA}$ Any I/O pin to GND	6.0		9.0	V
$I_R$	Reverse Leakage Current	$V_{RWM} = 5\text{V}$ Any I/O pin to GND			1.0	$\mu$ A
$V_C$	Clamping Voltage	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$ Any I/O pin to GND			10	V
		$I_{PP} = 4\text{A}, t_p = 8/20\mu\text{s}$ Any I/O pin to GND			15	V
		$I_{PP} = 8\text{A}, t_p = 8/20\mu\text{s}$ Vcc pin to GND			15	V
$C_{ESD}$	Parasitic Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$ Between I/O and I/O		0.20	0.30	pF
		$V_R = 0\text{V}, f = 1\text{MHz}$ Between I/O and GND		0.45	0.50	pF
		$V_R = 0\text{V}, f = 1\text{MHz}$ Between Vcc and GND		0.80		pF

Note: I/O Pins are pin 1,3,4,6. Pin 5 is Vcc. Pin 2 is GND.

**ELECTRICAL CHARACTERISTICS CURVE**

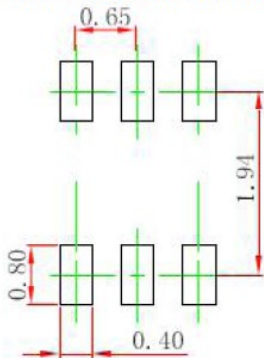


SOT-363 PACKAGE OUTLINE DIMENSIONS



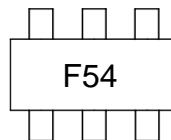
SYMBOL	MILLIMETER	
	MIN	MAX
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP.	
e1	1.200	1.400
L	0.525 REF.	
L1	0.260	0.460
theta	0°	8°

Recommended land dimensions for SOT-363. Electrode patterns for PCBs



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance: ± 0.05mm.  
 3. The pad layout is for reference purposes only.

Marking



Ordering information

Order code	Package	Base qty	Delivery mode
UMW ESD0504F	SOD-363	3000	Tape and reel