



ESD0504F

Ultra Low Capacitance ESD Protection Array

DESCRIPTION

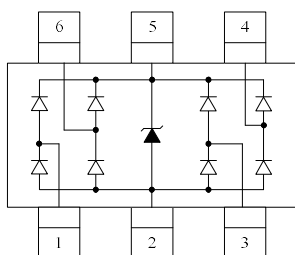
ESD0504F is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protect for high-speed data interfaces. With typical capacitance of 0.20pF (I/O to I/O) only, ESD0504F is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4($\pm 15\text{KV}$ air, $\pm 8\text{KV}$ 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.

ORDERING INFORMATION

- ✧ Device: ESD0504F
- ✧ Package: SOT-363
- ✧ Marking: F54
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

PIN CONFIGURATION



FEATURES

- ✧ Transient protection for high-speed data lines
 - IEC 61000-4-2(ESD) $\pm 25\text{KV}$ (Air)
 - $\pm 20\text{KV}$ (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 $\pm 8\text{KV}$ contact discharge

MACHANICAL DATA

- ✧ SOT-363 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed: $260^{\circ}\text{C}/10\text{s}$
- ✧ Reel size: 7 inch

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)

PACKAGE OUTLINE



ESD0504F

ABSOLUTE MAXIMUM RATING

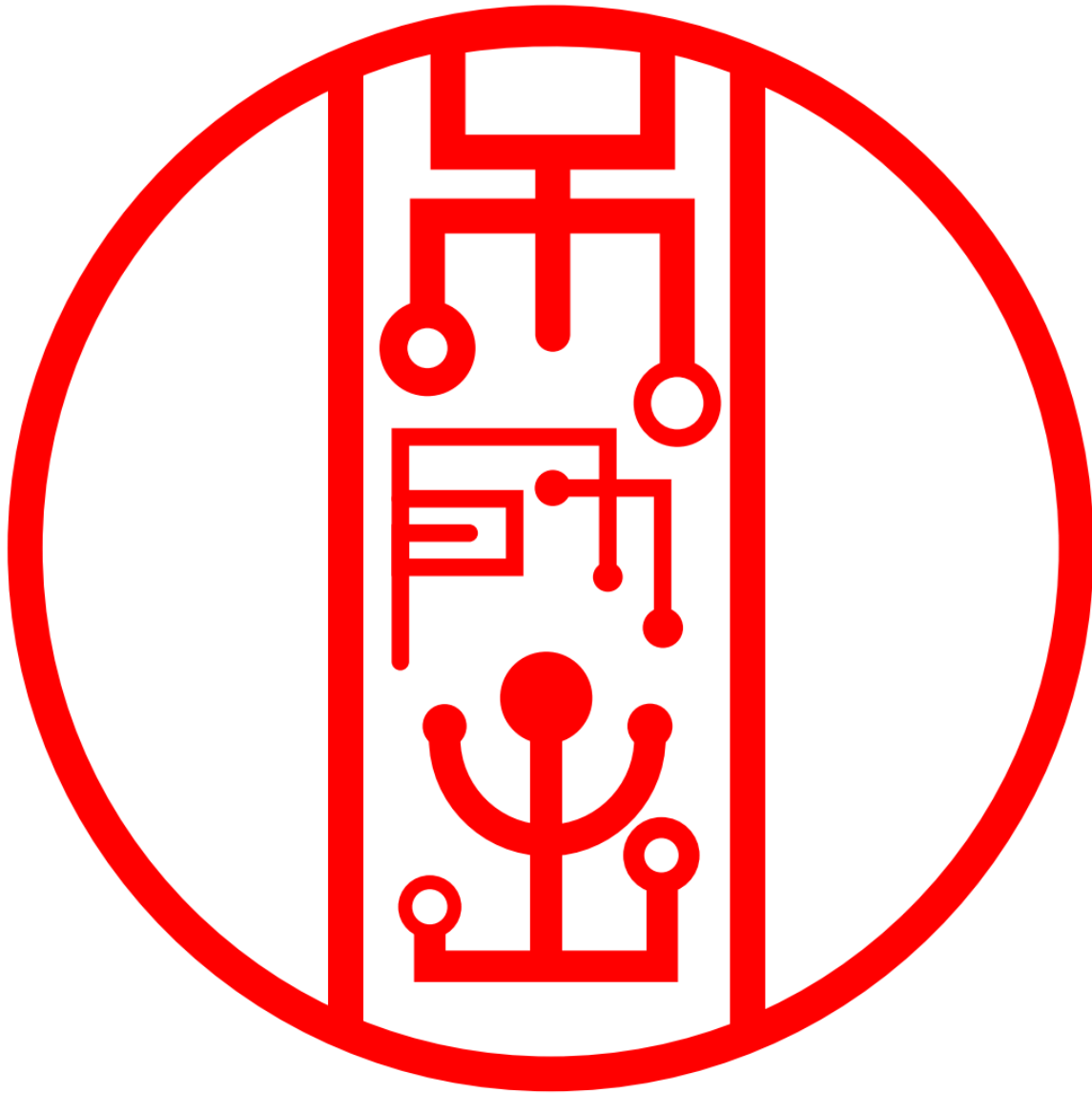
Symbol	Parameter	Value	Units
P _{PP}	Peak Pulse Power (8/20μs)	60	W
V _{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±25 ±20	kV
T _{OPT}	Operating Temperature	-55/+125	°C
T _{STG}	Storage Temperature	-55/+150	°C

ELECTRICAL CHARACTERISTICS (T_{amb}=25°C)

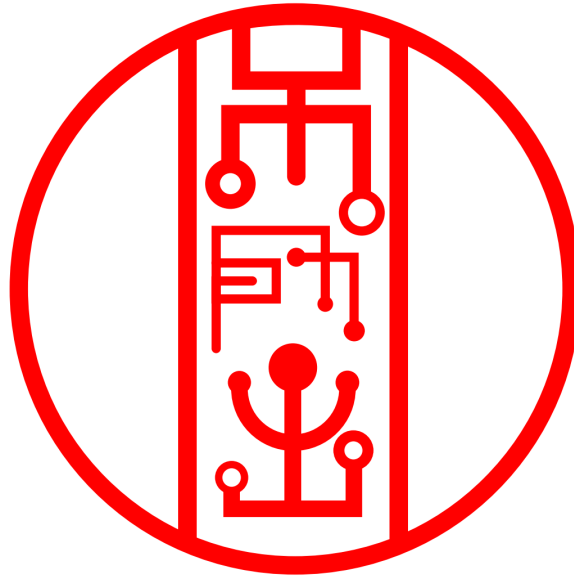
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V _{RWM}	Reverse Working Voltage	Any I/O pin to GND			5.0 V	
V _{BR}	Reverse Breakdown Voltage	I _T = 1mA Any I/O pin to GND	6.0		9.0 V	
I _R	Reverse Leakage Current	V _{RWM} = 5V Any I/O pin to GND			1.0	μA
V _C	Clamping Voltage	I _{PP} = 1A, t _p = 8/20μs Any I/O pin to GND			10 V	
		I _{PP} = 4A, t _p = 8/20μs Any I/O pin to GND			15 V	
		I _{PP} = 8A, t _p = 8/20μs V _{CC} pin to GND			15 V	
C _{ESD}	Parasitic Capacitance	V _R = 0V, f = 1MHz Between I/O and I/O		0.20	0.30	pF
		V _R = 0V, f = 1MHz Between I/O and GND		0.45	0.50 pF	
		V _R = 0V, f = 1MHz Between V _{CC} and GN		0.80		pF

Note: I/O Pins are pin 1,3,4,6. Pin 5 is V_{CC}. Pin 2 is GND.

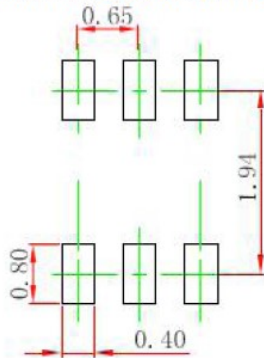
ELECTRICAL CHARACTERISTICS CURVE



SOT-363 PACKAGE OUTLINE DIMENSIONS



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



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.