

## DESCRIPTION

The SMF05C 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,

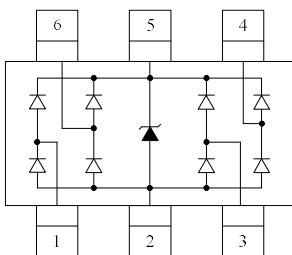
The SMF05C is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4(±15KV air, ±8KV contact discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

The SMF05C uses small SOT-363 package. Each The SMF05C 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 SMF05C is a ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the SMF05C guarantees a minimum stress on the protected IC.

## ORDERING INFORMATION

- ✧ 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) ±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

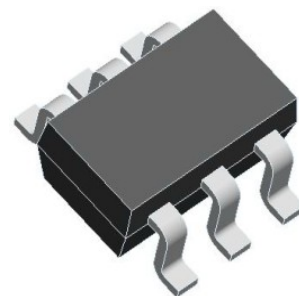
## MACHANICAL DATA

- ✧ SOT-363 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranted:260℃/10s
- ✧ 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



**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	°C
$T_{STG}$	Storage Temperature	-55/+150	°C

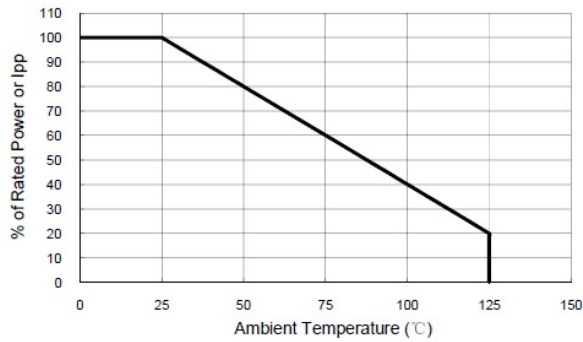
**ELECTRICAL CHARACTERISTICS (Tamb=25°C)**

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	$I_T = 1\text{mA}$ 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	$\mu\text{A}$
$V_C$	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

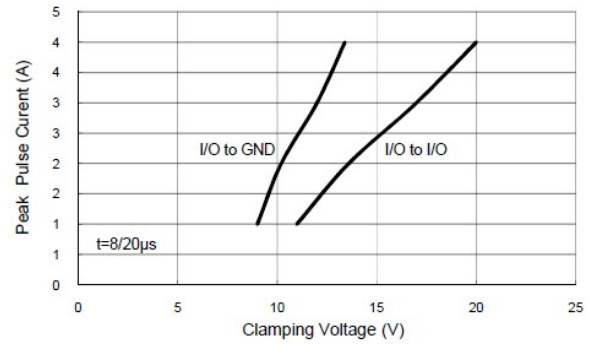
Note: I/O Pins are pin 1,3,4,6. Pin 5 is Vcc. Pin 2 is GND.

**ELECTRICAL CHARACTERISTICS CURVE**

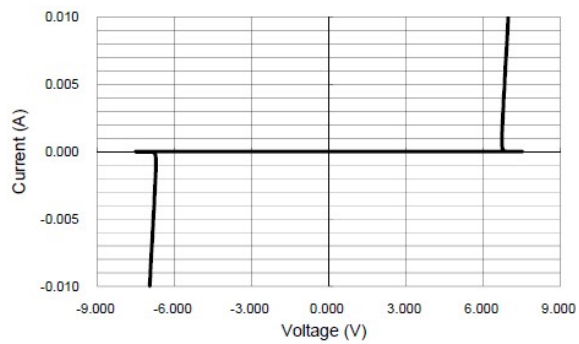
**Fig 1 Power Derating Curve**



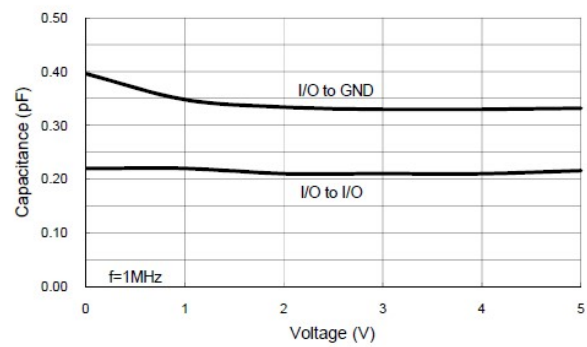
**Fig 2 Clamping Voltage vs Peak Pulse Current**



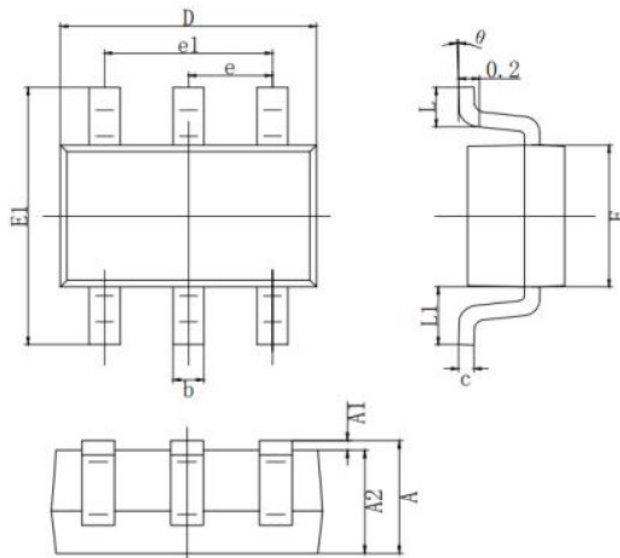
**Fig 3 Voltage Sweeping of I/O to I/O**



**Fig 4 Voltage vs Capacitance**

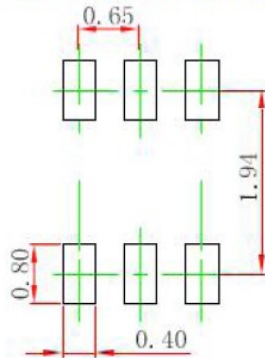


**SOT-363 PACKAGE OUTLINE DIMENSIONS**



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
θ	0°	8°

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.