

## Description

The MST0362S7-02F is an bi-directional TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive highspeed data lines. The MST0362S7-02F has an ultralow capacitance with atypical value at 15pF and complies with the IEC61000-4-2(ESD) standard with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into SOT-723 package. The small size, ultra-low capacitance and high ESD surge protection make MST0362S7-02F an ideal choice to protect cellphone, digital video interfaces and other high-speed ports.

## Features

- ◆ Protects Tow Lines
- ◆ Ultra low leakage: nA level
- ◆ Working voltages : 3.3V
- ◆ Ultra low clamping voltage
- ◆ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 11A (8/20 $\mu\text{s}$ )
- ◆ RoHS Compliant

## Mechanical Data

- ◆ Package: SOT-723
- ◆ Case Material: “Green” Molding Compound.
- ◆ Terminal Connections: See Diagram Below

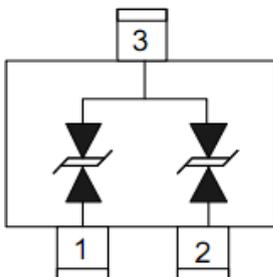
## Applications

- ◆ Battery, Power Lines
- ◆ Notebooks & Desktop Computers
- ◆ Keypads, Side Keys, LCD Displays
- ◆ Portable Instrumentation
- ◆ Industrial Controls
- ◆ Peripherals

## Product and Packing Information

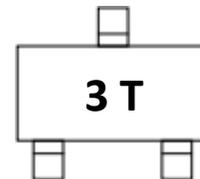
Part Number	QTY/Reel	Reel Size
MST0362S7-02F	8,000	7 inch

## Schematic and PIN Configuration



Circuit and Pin Schematic

## Marking Information



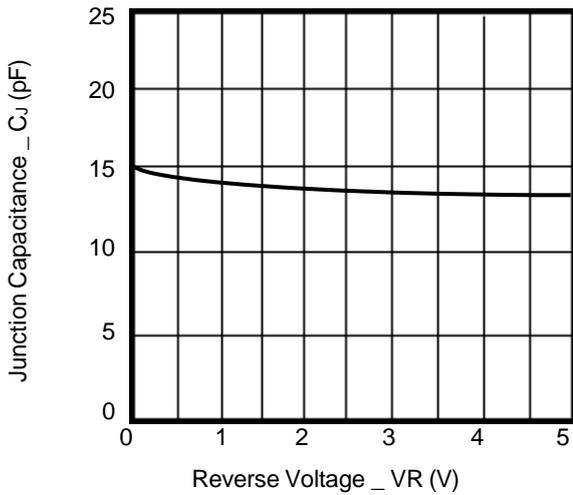
**Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)**

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ )	$P_{PP}$	110	W
Peak Pulse Current (8/20 $\mu\text{s}$ )	$I_{PP}$	11	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$V_{ESD}$	$\pm 30$ $\pm 30$	kV
Operating Temperature Range	$T_J$	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^{\circ}\text{C}$

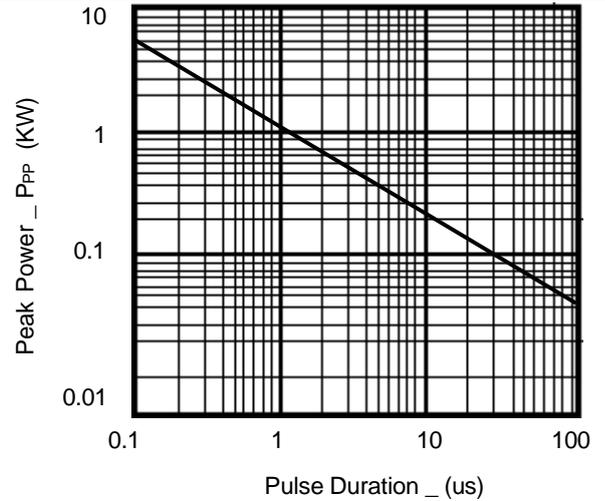
**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)**

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	$V_{RWM}$			3.3	V	
Breakdown Voltage	$V_{BR}$	3.5		5	V	$I_T = 1\text{mA}$ ,
Reverse Leakage Current	$I_R$			0.1	$\mu\text{A}$	$V_{RWM} = 3.3\text{V}$
TLP Clamping Voltage	$V_C$		6.5		V	$ITLP=4\text{A}, t_p=0.2/100\text{ns}$
TLP Clamping Voltage	$V_C$		7.8		V	$ITLP=16\text{A}, t_p=0.2/100\text{ns}$
ESD Dynamic Resistance	$R_{DYN}$		0.1		$\Omega$	$TLP=0.2/100\text{ns}$
Clamping Voltage	$V_C$			6.5	V	$I_{PP} = 1\text{A} (8 / 20\mu\text{s})$
Clamping Voltage	$V_C$			10	V	$I_{PP} = 11\text{A} (8 / 20\mu\text{s})$
Junction Capacitance	$C_J$		15	20	pF	$V_R = 0\text{V}, f = 1\text{MHz}$

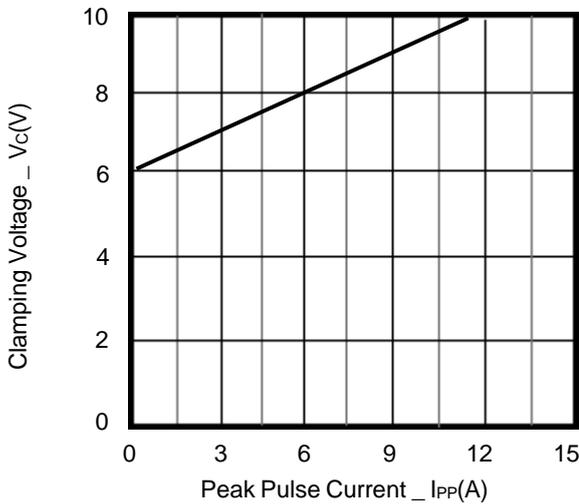
Typical Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise specified)



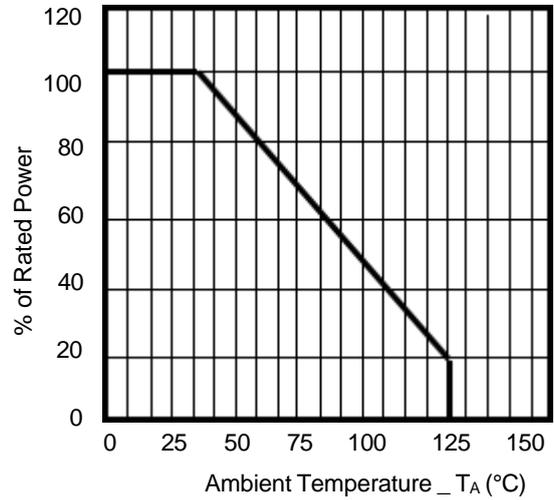
Junction Capacitance vs. Reverse Voltage



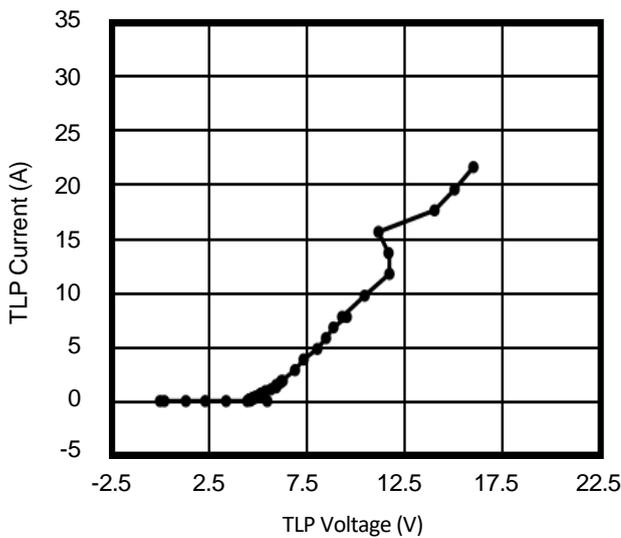
Peak Pulse Power vs. Pulse Time



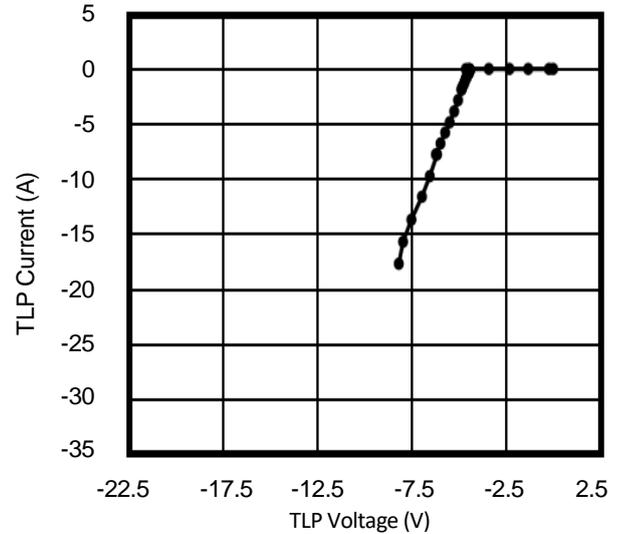
Clamping Voltage vs. Peak Pulse



Power Derating Curve

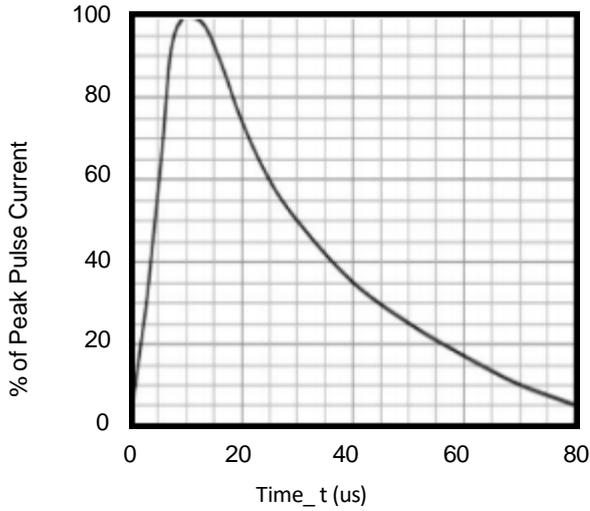


TLP I-V Curve

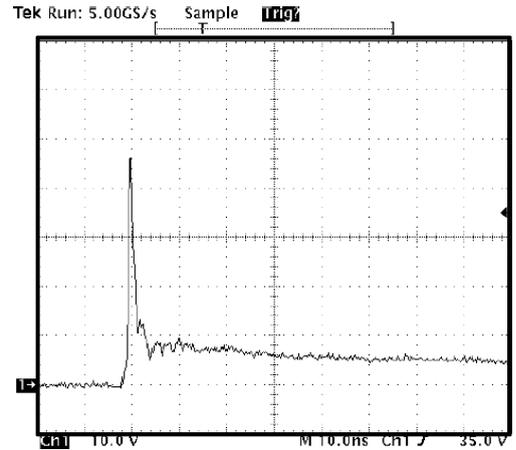


TLP I-V Curve

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



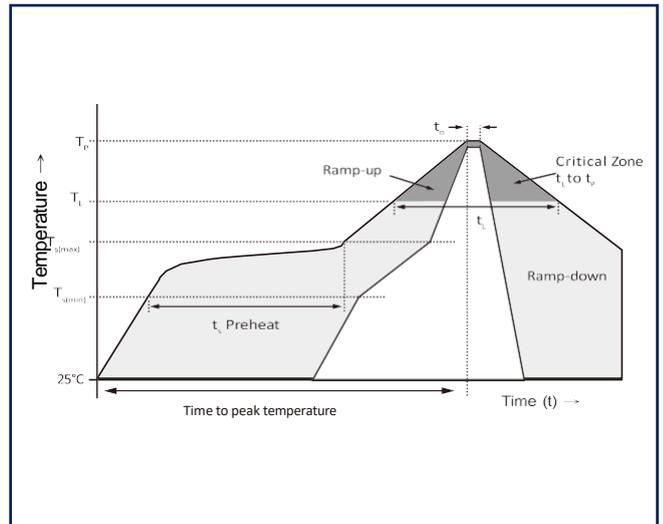
8x20us Pulse Waveform



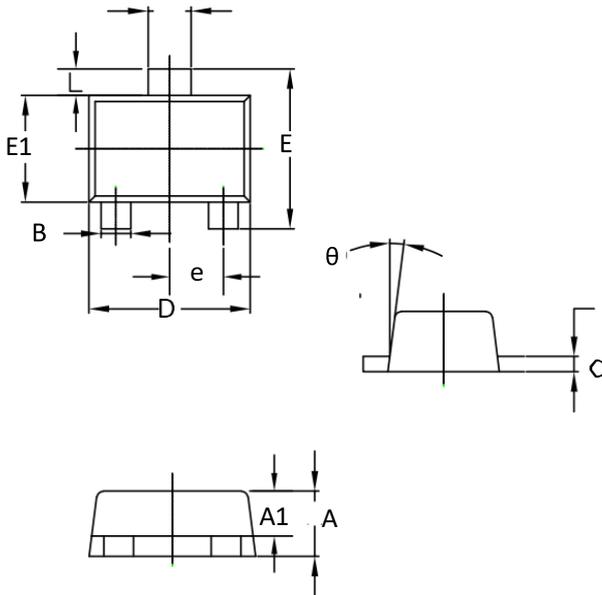
ESD clamping Voltage

### Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ( $T_{s(min)}$ )	150°C
	Temperature Max ( $T_{s(max)}$ )	200°C
	Time (min to max) ( $t_p$ )	60 – 180 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Time (min to max) ( $t_r$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260°C (+0/-5)
Time within 5°C of actual peak Temperature ( $t_p$ )		30 seconds Max
Ramp-down Rate		6°C/second Max
Time 25°C to peak Temperature ( $T_p$ )		8 minutes Max.
Do not exceed		260°C

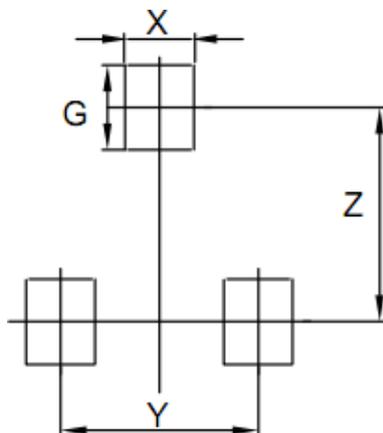


### SOT-723 Package Outline Drawing



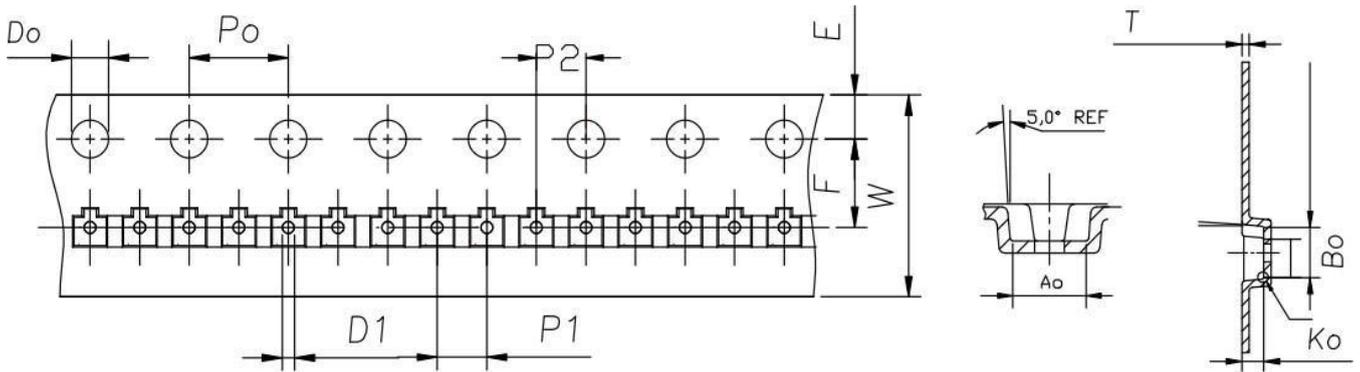
Symbol	Dimensions	
	Millimeters	
	Min	Max
A	0.44	0.54
A1	0.30	0.40
B	0.15	0.25
B1	0.25	0.35
L	0.10	0.30
C	0.12	0.18
D	0.10	1.30
E	1.10	1.30
E1	0.70	0.90
e	0.4 BSC	
$\theta$	7°REF	

### Suggested Land Pattern



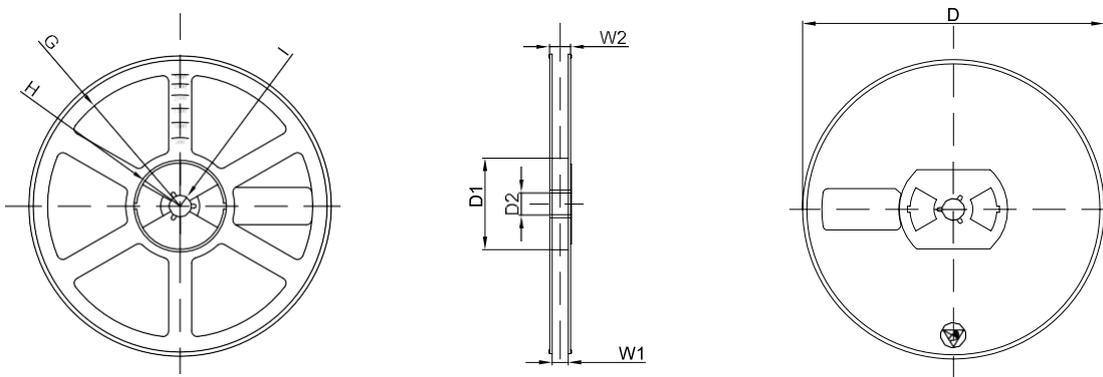
Symbol	Dimensions	
	Millimeters	
X	0.50	
Z	1.00	
Y	0.80	
G	0.40	

Carrier Tape



Symbol	A0	B0	K0	D0	D1	P0
Spec	$1.33 \pm 0.10$	$1.40 \pm 0.10$	$0.53 \pm 0.10$	$1.50 \pm 0.10$	$0.50 \pm 0.10$	$4.00 \pm 0.10$
Symbol	P1	P2	W	E	F	T
Spec	$2.00 \pm 0.10$	$2.00 \pm 0.10$	$8.00 \pm 0.2$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$0.20 \pm 0.05$

Reel



Symbol	D	D1	D2	G	H	I	W1	W2
Spec	$178 \pm 2.00$	$54.4 \pm 1.00$	$13.00 \pm 1.00$	R78.00	R25.60	R6.50	$9.50 \pm 1.00$	$12.30 \pm 1.00$