

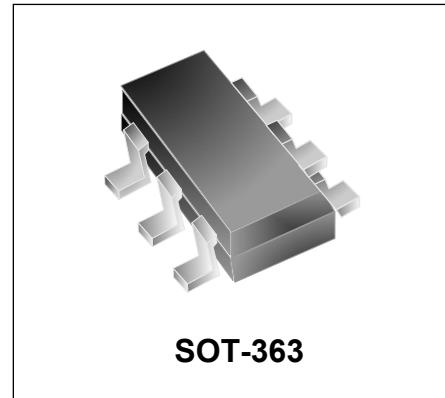


WS05MSC

Transient Voltage Suppressor

Features

- Solid-state silicon-avalanche technology
- 350 Watts Peak Pulse Power per Line ($t_p=8/20\mu s$)
- Low operating and clamping voltages
- Up to Four (4) Lines of Protection
- Working Voltage: 5 V
- Low Leakage



IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD) $\pm 15kV$ (air), $\pm 8kV$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 24A (8/20 μs)

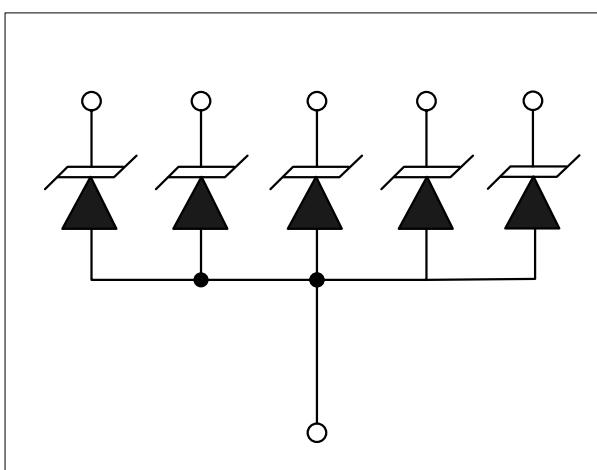
Mechanical Characteristics

- SOT-363 package
- Molding compound flammability rating:
UL 94V-0
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

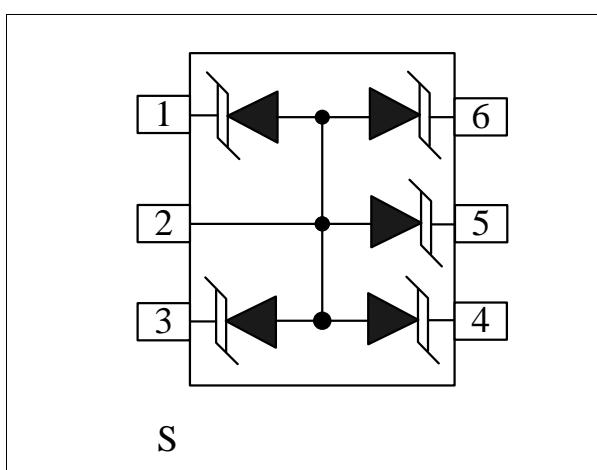
Applications

- Cell phone Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebook, Laptop, and Palmtop Computers
- Portable Instrumentation
- Digital Cameras
- MP3 Player

Circuit Diagram



Schematic & PIN Configuration

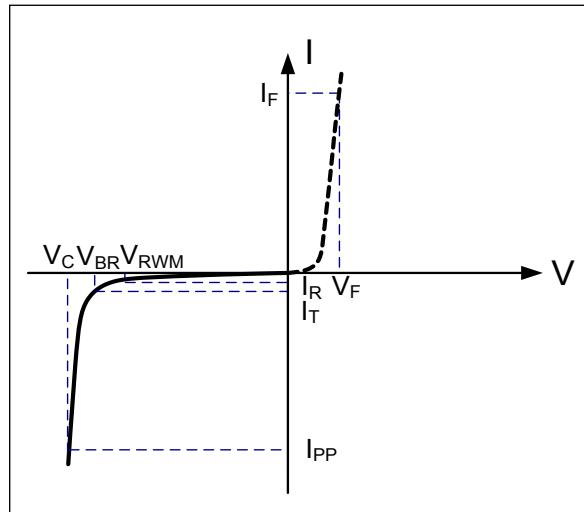


Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PP}	100	Watts
Peak Forward Voltage ($I_F = 1A$, $t_p=8/20\mu s$)	V_{FP}	1.5	V
Operating Temperature	T_J	-55 to + 125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters (T=25°C)

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
I_F	Forward Current
V_F	Forward Voltage @ I_F



Electrical Characteristics

WS05MSC						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	6.0			V
Reverse Leakage Current	I_R	$V_{RWM}=5V, T=25^\circ C$			1	µA
Peak Pulse Current	I_{PP}	$t_p = 8/20\mu s$			6.5	A
Clamping Voltage	V_C	$I_{PP}=1A, t_p=8/20\mu s$			9.5	V
Clamping Voltage	V_C	$I_{PP}=6.5A, t_p=8/20\mu s$		13.5	15	V
Junction Capacitance	C_j	Between I/O pins and Ground $V_R = 0V, f = 1MHz$		22		pF

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

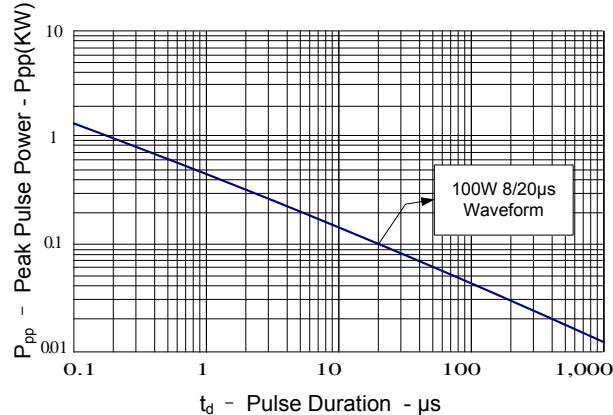


Figure 2: Power Derating Curve

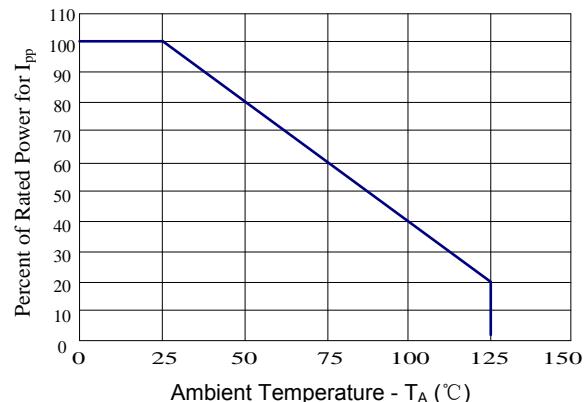


Figure 3: Clamping Voltage vs. Peak Pulse Current

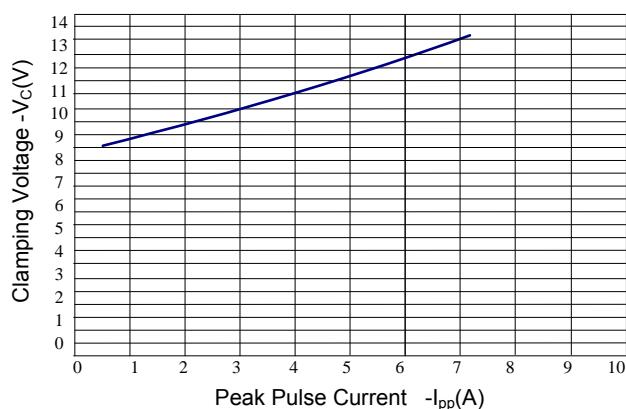


Figure 4: WS05MF Insertion Loss



Figure 5: Normalized Junction Capacitance vs. Reverse Voltage

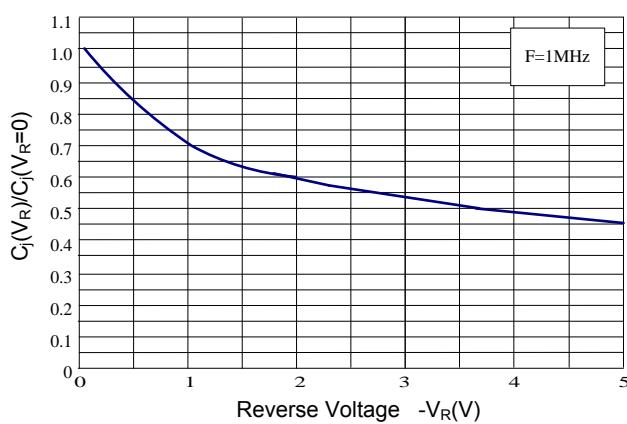
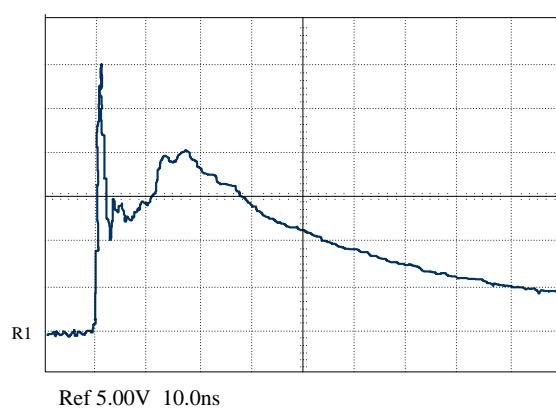


Figure 6: ESD Pulse Waveform (Per IEC 61000-4-2)



Application Information

The WS05MSC Series are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD or EFT. This product provides unidirectional protection; the device is connected as follows:

UNIDIRECTIONAL COMMON-MODE CONFIGURATION

The WS05MSC Series provides up to five(5) lines of protection in a common-mode configuration as depicted in Figure 7.

Circuit connectivity is as follows:

- I/O 1 is connected to Pin 6.
- I/O 2 is connected to Pin 5.
- I/O 3 is connected to Pin 4.
- I/O 4 is connected to Pin 3.
- I/O 5 is connected to Pin 1.
- Pin 2 is connected to ground.

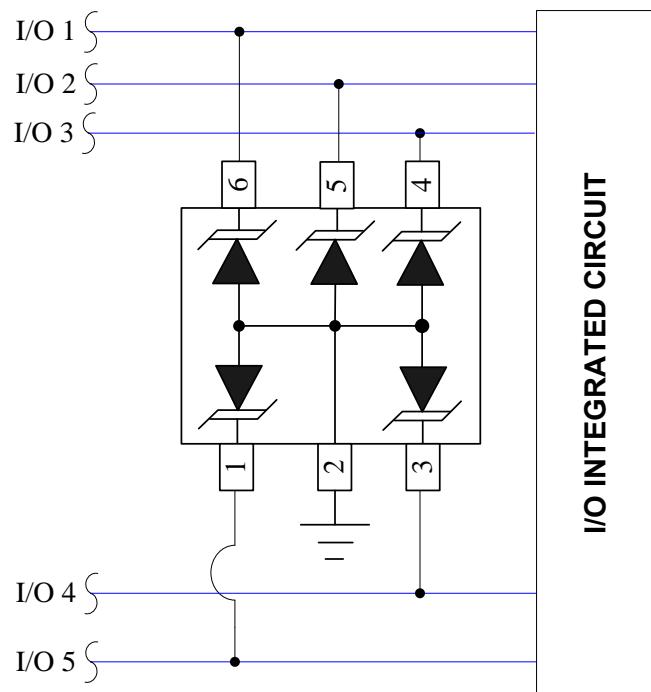


Figure 7 Unidirectional Configuration Common-Mode I/O Port Protections

CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Circuit board layout is critical for Electromagnetic Compatibility (EMC) protection. The following guidelines are recommended:

- The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- The path length between the TVS device and the protected line should be minimized.
- All conductive loops including power and ground loops should be minimized.
- The transient current return path to ground should be kept as short as possible to reduce parasitic inductance.
- Ground planes should be used whenever possible. For multilayer PCBs, use ground vias.

Outline Drawing – SOT-363

PACKAGE OUTLINE		SOT-363			
SYMBOL	INCHES		MILLIMETER		
	MIN	MAX	MIN	MAX	
A	0.035	0.043	0.900	1.100	
A1	0.000	0.004	0.000	0.100	
A2	0.035	0.039	0.900	1.000	
D	0.079	0.087	2.000	2.200	
E1	0.045	0.053	1.150	1.350	
E	0.085	0.096	2.150	2.450	
e	0.026 TYP		0.650 TYP		
e1	0.047	0.055	1.200	1.400	
L	0.021 REF		0.525 REF		
L1	0.010	0.018	0.260	0.460	
θ	“0°	8°	0°	8°	

DIMENSIONS		
DIM	INCHES	MILLIMETERS
Z	0.090	2.30
G	0.073	1.85
P	0.020 TYP	0.65 TYP
X	0.008	0.20
Y	0.033	0.085

Notes

- Dimensioning and tolerances per ANSI Y14.5M, 1985.
- Controlling Dimension: Inches
- Pin 3 is the cathode (Unidirectional Only).
- Dimensions are exclusive of mold flash and metal burrs.

Marking Codes

Part Number	WS05MSC
Marking Code	05S