

### Features

- Solid-state silicon-avalanche technology
- 135 Watts Peak Pulse Power per Line ( $t_p=8/20\mu s$ )
- Low operating and clamping voltages
- Protects five I/O lines
- Working Voltages: 5 V
- Low Leakage Current

### IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD)  $\pm 30kV$  (air),  $\pm 30kV$  (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 9A (8/20 $\mu s$ )

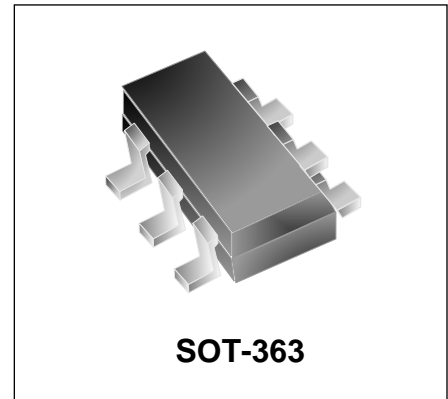
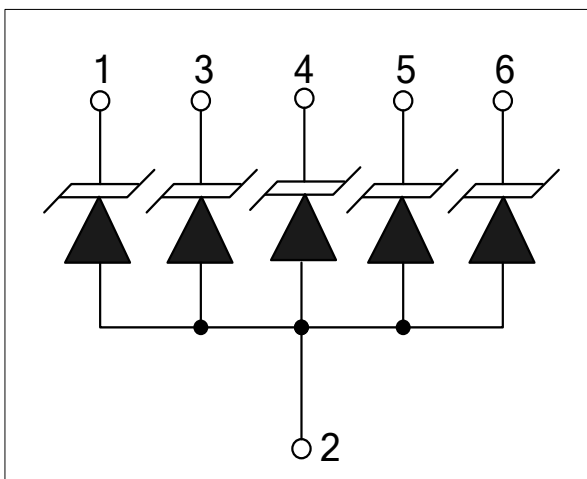
### Mechanical Characteristics

- SOT-363 package
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS Compliant

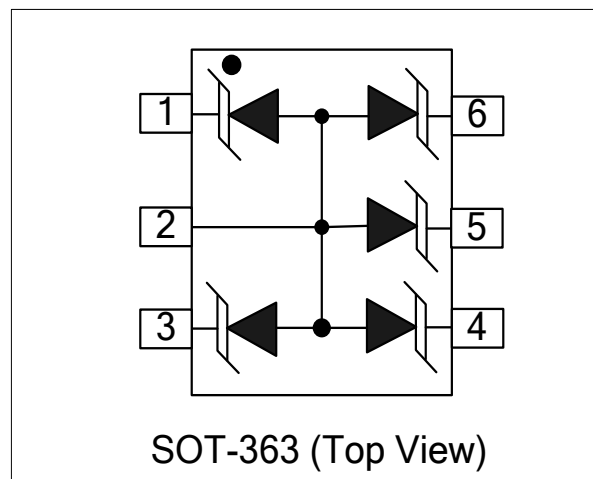
### Applications

- Cellular Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Player

### Circuit Diagram



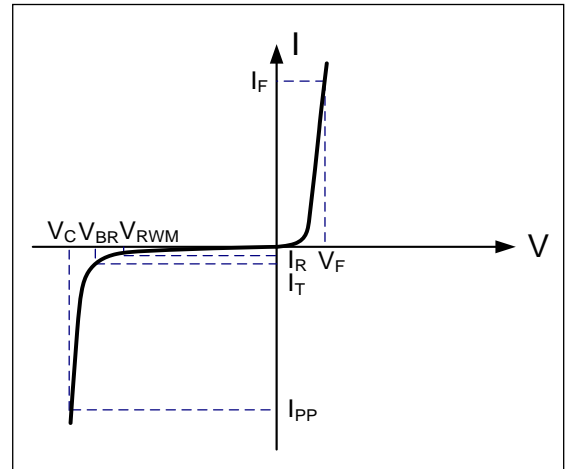
### Schematic & PIN Configuration



Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power ( $t_p = 8/20\mu s$ )	$P_{PP}$	135	Watts
Peak Pulse Current ( $t_p = 8/20\mu s$ )	$I_{PP}$	9	A
Operating Temperature	$T_J$	-55 to + 125	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55 to +150	$^{\circ}C$

Electrical Parameters (T=25 $^{\circ}C$ )

Symbol	Parameter
$I_{PP}$	Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Reverse Stand-Off Voltage
$I_R$	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

WS05MFC						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	$V_{RWM}$				5	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T = 1mA$	6		9	V
Forward Voltage	$V_F$	$I_F = 10mA$	0.5		1.0	V
Reverse Leakage Current	$I_R$	$V_{RWM} = 5V, T = 25^{\circ}C$			500	nA
Clamping Voltage	$V_C$	$I_{PP} = 1A, t_p = 8/20\mu s$		8	10	V
Clamping Voltage	$V_C$	$I_{PP} = 9A, t_p = 8/20\mu s$		11	15	V
ESD Clamping Voltage <sup>1</sup>	$V_C$	$I_{PP} = 4A$ $t_p = 0.2/100ns$		8.0		V
ESD Clamping Voltage <sup>1</sup>	$V_C$	$I_{PP} = 16A$ $t_p = 0.2/100ns$		10.5		V
Dynamic Resistance <sup>1,2</sup>	$R_{DYN}$	$TLP = 0.2/100ns$		0.2		$\Omega$
Junction Capacitance	$C_j$	Between I/O pins and Ground $V_R = 0V, f = 1MHz$		60	80	pF

Note: 1、 TLP Setting :  $t_p = 100ns, t_r = 0.2ns, I_{TLP}$  and  $V_{TLP}$  sample window:  $t_1 = 70ns$  to  $t_2 = 90ns$ .

2、 Dynamic resistance calculated from  $I_{PP} = 4A$  to  $I_{PP} = 16A$  using "Best Fit"

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

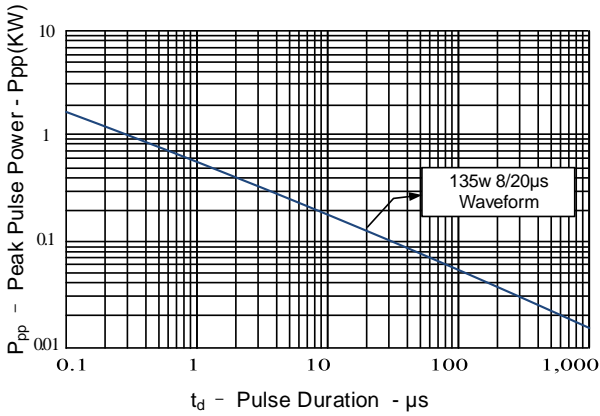


Figure 2: Power Derating Curve

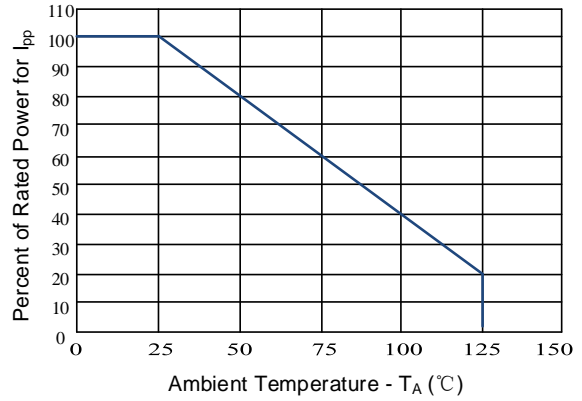


Figure 3: Clamping Voltage vs. Peak Pulse Current

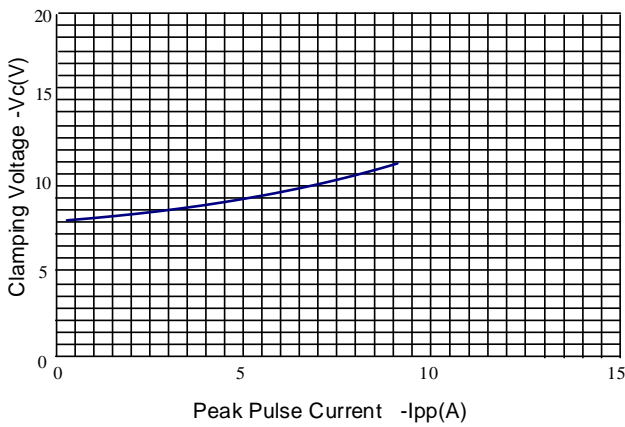


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

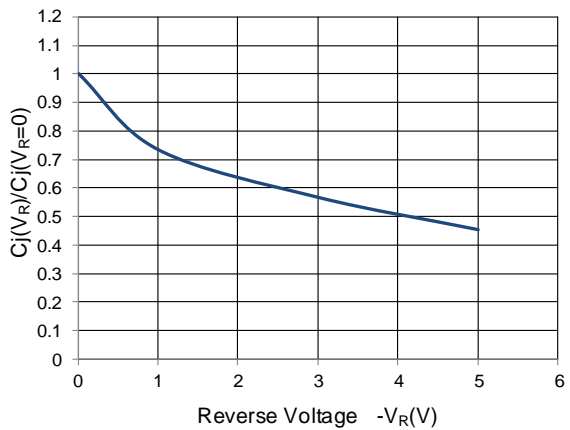


Figure 5: 8/20μs Pulse Waveform

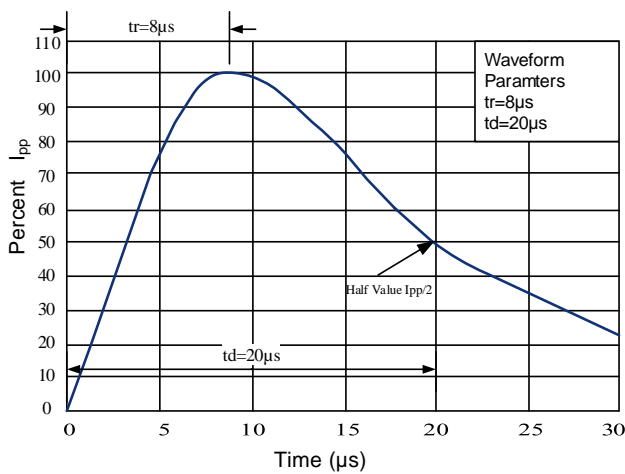
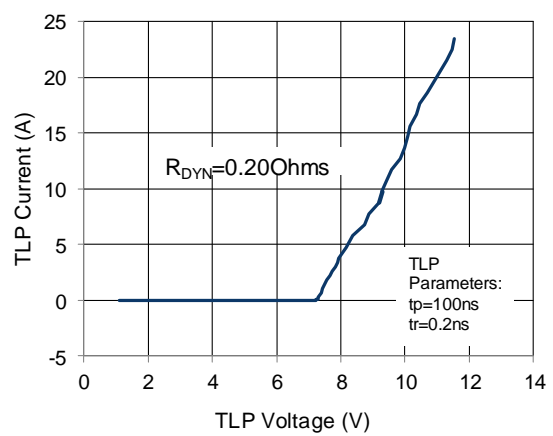
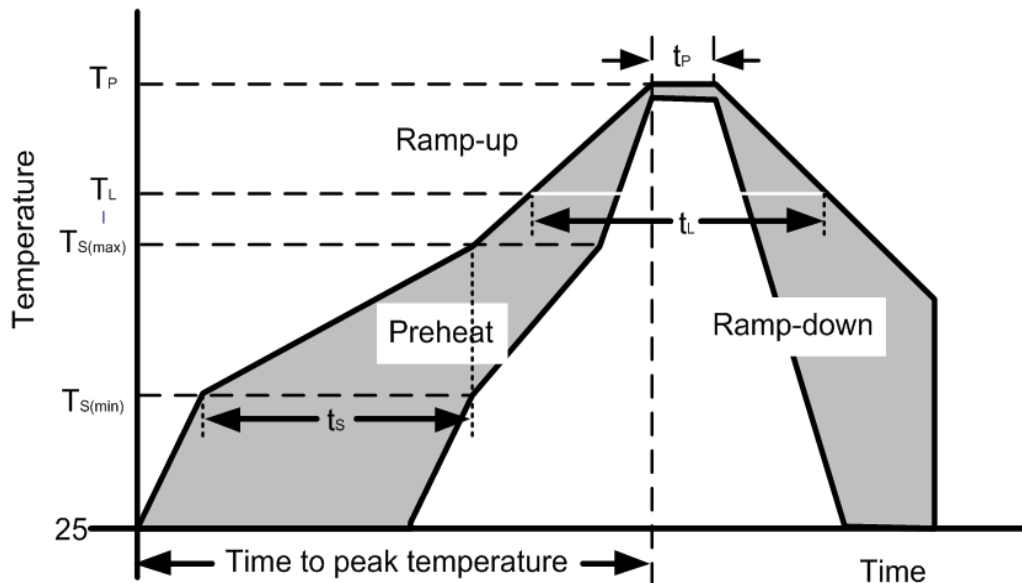


Figure 6: TLP Curve



**Soldering Parameters**

Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ( $T_{S(min)}$ )	150°C
	Temperature Max ( $T_{S(max)}$ )	200°C
	Time (min to max) ( $t_s$ )	60 – 190 secs
Average ramp up rate (Liquidus Temp) ( $T_L$ ) to peak		5°C/second max
$T_{S(max)}$ to $T_L$ Ramp-up Rate		5°C/second max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Temperature ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_P$ )		260+0/-5 °C
Time within actual peak Temperature ( $t_p$ )		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes Max.
Do not exceed		280°C



Outline Drawing – SOT-363

### PACKAGE OUTLINE

The drawings show the package outline with dimensions: D (width), E1 (height), E (total height), b (lead width), e (lead pitch), e1 (lead width), A1 (lead height), A2 (lead height), L (lead length), L1 (lead length), and θ (lead angle). A detail view labeled 'DETAIL A' shows the lead profile with dimensions c, L, L1, and θ, and a 0.20mm reference dimension.

**SOT-363**

DIMENSIONS				
SYMBOL	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E1	1.150	1.350	0.045	0.053
E	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

DIMENSIONS		
DIM	INCHES	MILLIMETERS
Z	0.110	2.79
G	0.043	1.09
C	0.076	1.94
P	0.026 TYP	0.65 TYP
X	0.016	0.40
Y	0.033	0.85

**Notes**

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

Marking Codes

Part Number	WS05MFC
Marking Code	5FC

Package Information

Qty: 3k/Reel

CONTACT INFORMATION

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Specifications are subject to change without notice.  
 The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.  
 Users should verify actual device performance in their specific applications.

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[>>WAY-ON\(维安\)](#)