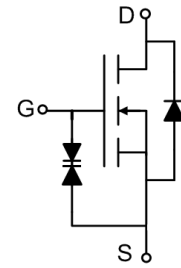


### FEATURES

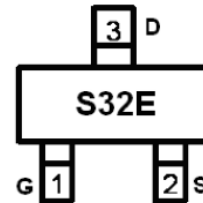
- $V_{DS} = 60V, I_D = 0.1A$   
 $R_{DS(ON)} < 8\Omega @ V_{GS}=4V$   
 $R_{DS(ON)} < 13\Omega @ V_{GS}=2.5V$   
 ESD Rating: 1000V HBM
- High Power and Current Handling Capability
- Lead Free
- Surface Mount Package

### APPLICATIONS

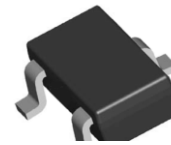
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



Schematic Diagram



Marking and Pin Assignment



SOT-523 Top View

### PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
S32E	SSF32E6E	SOT-523	Ø180mm	8 mm	3000 units

### ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D$	0.1	A
	$I_D (70^\circ\text{C})$	0.07	
	$I_{DM}$	0.4	A
Maximum Power Dissipation	$P_D$	0.2	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	400	$^\circ\text{C/W}$
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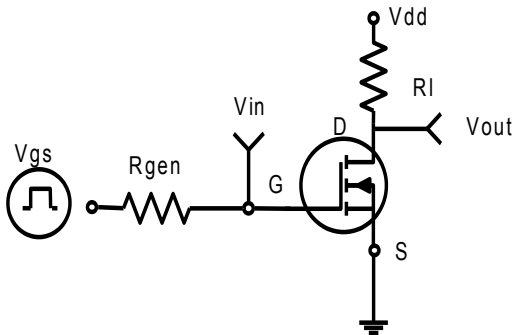
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 5V, V_{DS}=0V$			100	nA
		$V_{GS}=\pm 10V, V_{DS}=0V$			150	nA
		$V_{GS}=\pm 20V, V_{DS}=0V$			10	$\mu A$
Gate-Source Breakdown Voltage	$BV_{GSO}$	$V_{DS}=0V, I_G=\pm 250\mu A$	$\pm 20$			V
<b>ON CHARACTERISTICS (Note 3)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8		1.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4V, I_D=0.01A$		5	8	$\Omega$
		$V_{GS}=2.5V, I_D=0.001A$		7	13	
Forward Transconductance	$g_{FS}$	$V_{DS}=3V, I_D=0.01A$	0.02			S
<b>DYNAMIC CHARACTERISTICS (Note4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $F=1.0MHz$		30		PF
Output Capacitance	$C_{oss}$			12		PF
Reverse Transfer Capacitance	$C_{rss}$			6		PF
<b>SWITCHING CHARACTERISTICS (Note 4)</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V,$ $R_{GEN}=6\Omega, I_D=0.1A$		2.6		nS
Turn-on Rise Time	$t_r$			9		nS
Turn-Off Delay Time	$t_{d(off)}$			20		nS
Turn-Off Fall Time	$t_f$			6		nS
Total Gate Charge	$Q_g$	$V_{DS}=25V, I_D=0.1A,$ $V_{GS}=10V$		1.7		nC
Gate-Source Charge	$Q_{gs}$			0.1		nC
Gate-Drain Charge	$Q_{gd}$			0.4		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=0.01A$			1.3	V

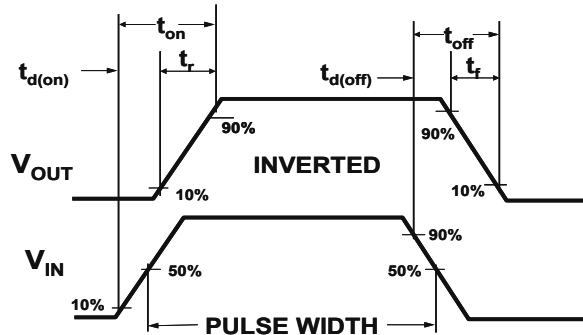
**NOTES:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

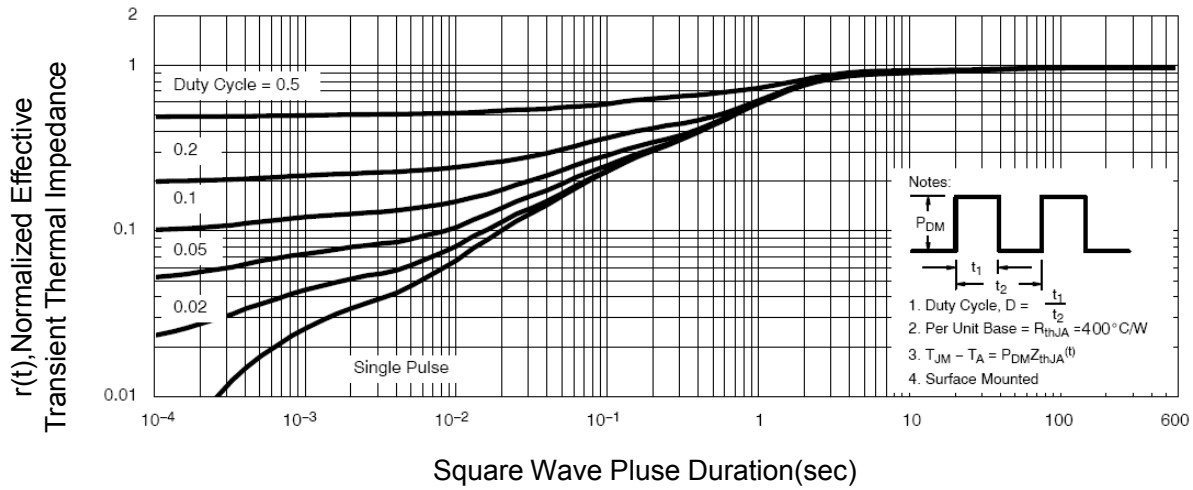
**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



**Figure 1. Switching Test Circuit**



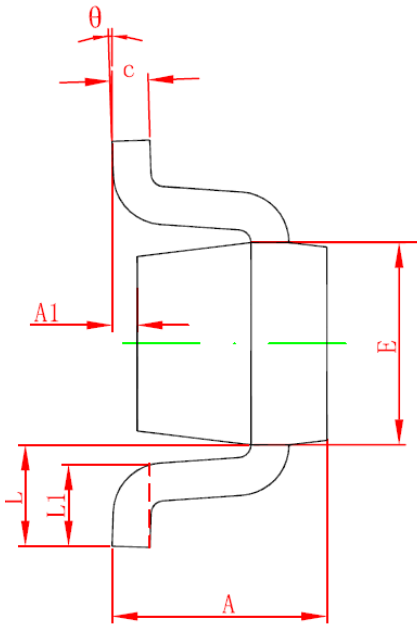
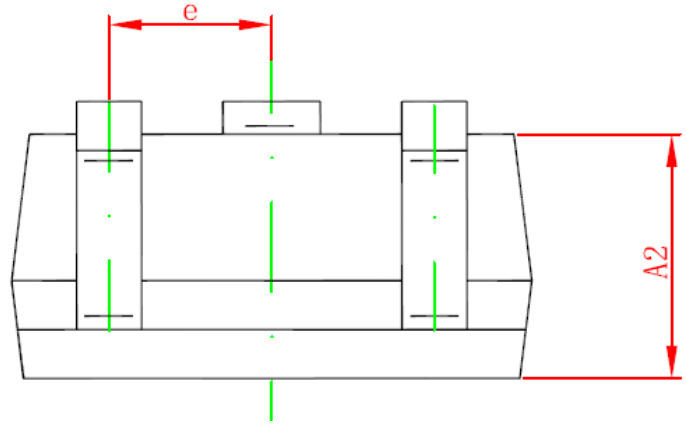
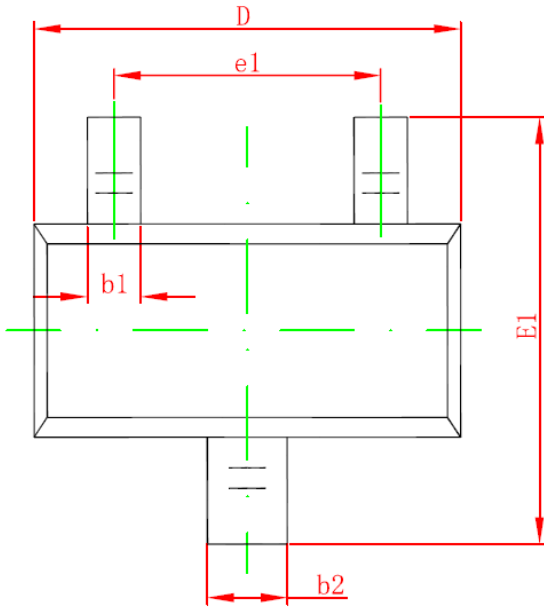
**Figure 2 Switching Waveforms**



**Figure 3. Normalized Maximum Transient Thermal Impedance**

**SOT-523 PACKAGE INFORMATION**

Dimensions in Millimeters (UNIT:mm)



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.700	0.900
A1	0.000	0.100
A2	0.700	0.800
b1	0.150	0.250
b2	0.250	0.350
c	0.100	0.200
D	1.500	1.700
E	0.700	0.900
E1	1.450	1.750
e	0.500TYP	
e1	0.900	1.100
L	0.400REF	
L1	0.260	0.460
theta	0°	8°

**NOTES**

1. All dimensions are in millimeters.
2. Tolerance  $\pm 0.10\text{mm}$  (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.