

60V Single N-Channel Enhancement-Mode MOSFET

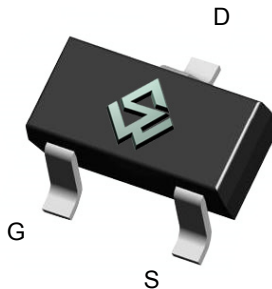
General Description

- Low gate charge.
- Use as a load switch.
- Use in PWM applications

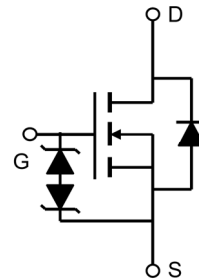
Product Summary

- BV_{DSS} 60V
- $R_{DS(on)}$ @ $V_{GS} = 10V$ < 5Ω
- $R_{DS(on)}$ @ $V_{GS} = 4.5V$ < 7Ω

SOT-23



ESD protected



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current ($T_A=25^\circ\text{C}$)	I_D	300	mA
Drain Current ($T_A=75^\circ\text{C}$)		150	mA
Pulsed Drain Current ^a	I_{DM}	500	mA
Power Dissipation ^b ($T_A=25^\circ\text{C}$)	P_D	0.5	W
Power Dissipation ^b ($T_A=75^\circ\text{C}$)		1.0	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	°C

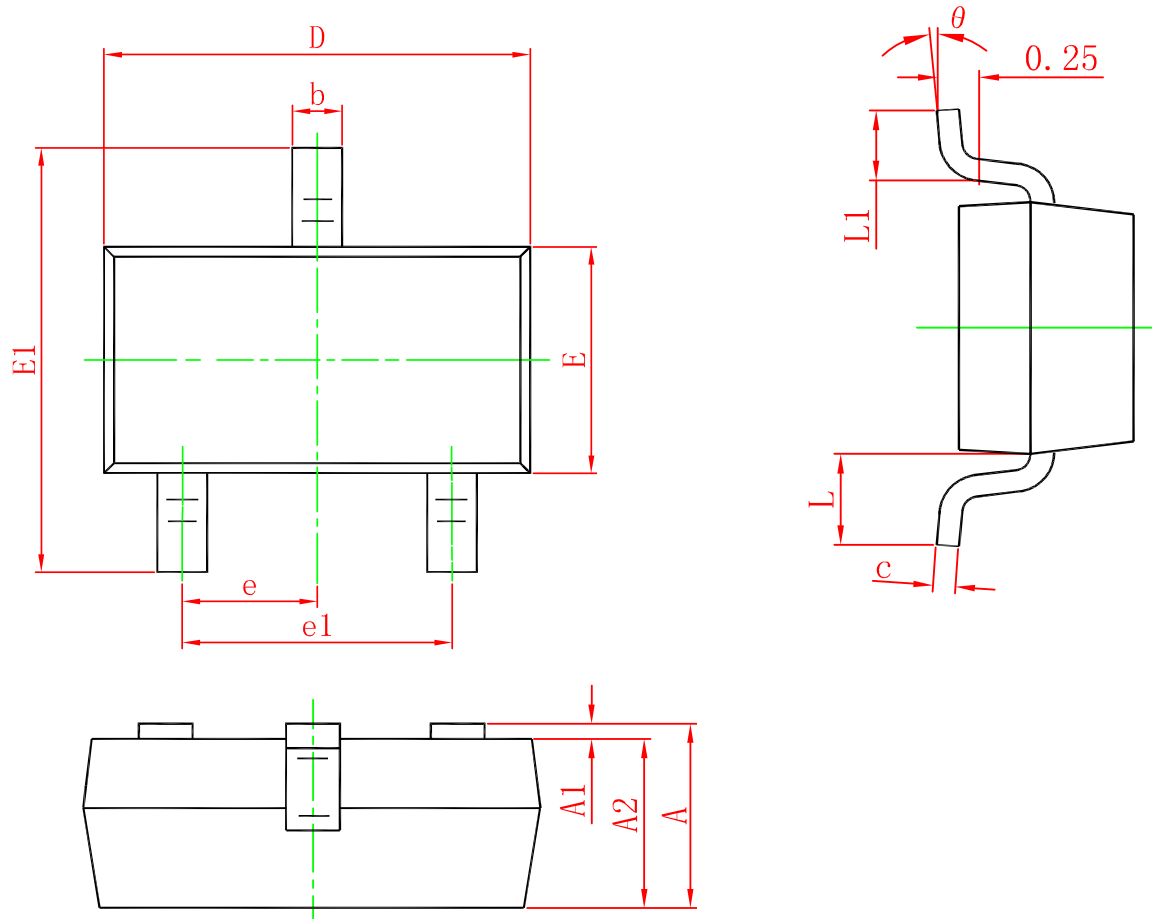
Thermal Characteristics

Parameter	Symbol	Maximum	Units
Junction-to-Ambient ^a ($t \leq 10s$)	$R_{\theta JA}$	100	°C/W
Junction-to-Ambient ^{a,d} (Steady-State)		130	°C/W
Junction-to-Lead (Steady-State)	$R_{\theta JL}$	90	°C/W

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	60			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0		3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 500mA$			5	Ω
		$V_{GS} = 4.5V, I_D = 200mA$			7	Ω
g_{FS}	Forward Transconductance	$V_{DS} = 10V, I_D = 500mA$		20		S
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = 500mA$			1.3	V
I_S	Maximum Body-Diode Continuous Current				800	mA
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 30V, V_{GS} = 0V$ $f = 1.0MHz$		405		pF
C_{oss}	Output Capacitance			73		pF
C_{rss}	Reverse Transfer Capacitance			40		pF
Q_g	Total Gate Charge	$V_{DS} = 30V, I_D = 500mA$ $V_{GS} = 10V$		3.5		nC
Q_{gs}	Gate-Source Charge			2.1		nC
Q_{gd}	Gate-Drain Charge			1.1		nC
$t_{D(ON)}$	Turn-On Delay Time	$V_{DD} = 30V, I_D = 500mA$ $V_{GS} = 10V$ $R_{GEN} = 6\text{ ohm}$		10		ns
t_r	Turn-On Rise Time			11		ns
$t_{D(OFF)}$	Turn-Off Delay Time			13.5		ns
t_f	Turn-Off Fall Time			8		ns

- Repetitive rating, Pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$
- The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10s$ junction-to-ambient thermal resistance.
- The value of $R_{\theta JA}$ is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application depends on the user's specific board design.
- The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

SOT-23 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.	0.022 REF.		
θ	0.300	0.500	0.012	0.020