

30V Single P-Channel Enhancement-Mode MOSFET

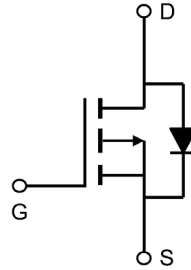
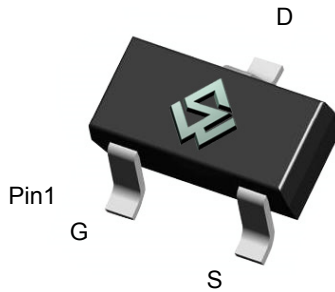
General Description

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

Product Summary

- BV_{DSS} -30V
- $R_{DS(on)}$ @VGS = -10V < 60mΩ
- $R_{DS(on)}$ @VGS = -4.5V < 75mΩ
- $R_{DS(on)}$ @VGS = -2.5V < 120mΩ

SOT-23



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current ($T_A=25^\circ\text{C}$)	I_D	-4.2	A
Drain Current ($T_A=75^\circ\text{C}$)		-2.0	A
Pulsed Drain Current ^a	I_{DM}	-20	A
Power Dissipation ^b ($T_A=25^\circ\text{C}$)	P_D	1.25	W
Power Dissipation ^b ($T_A=75^\circ\text{C}$)		0.9	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ\text{C}$

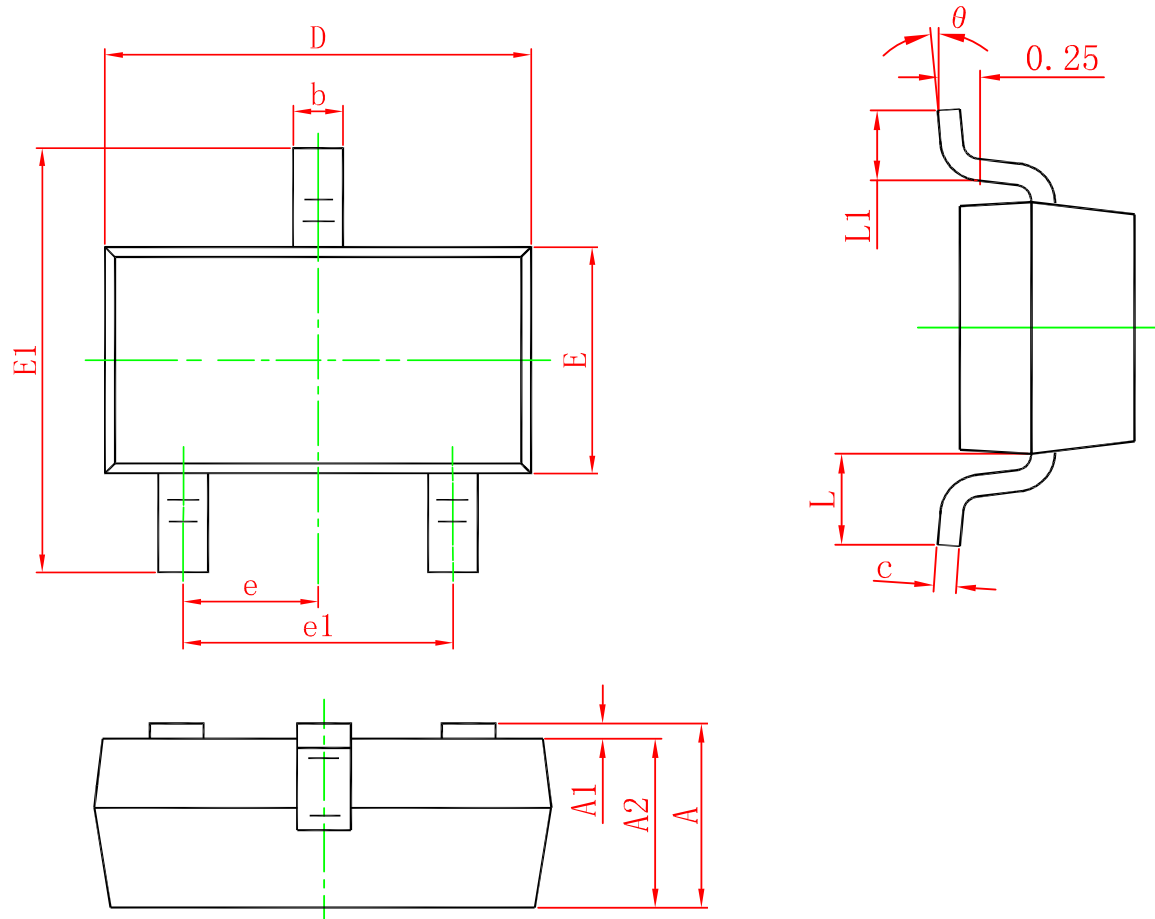
Thermal Characteristics

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

Electrical Characteristics (T _A = 25°C unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V , I _D = -250uA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -24V , V _{GS} = 0V			-1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} = 0V			±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250uA	-0.6		-1.3	V
R _{DS(ON))}	Drain-Source On-State Resistance	V _{GS} = -10V , I _D = -4.2A			60	mΩ
		V _{GS} = -4.5V , I _D = -2.0A			75	mΩ
		V _{GS} = -2.5V , I _D = -1.5A			120	mΩ
g _{FS}	Forward Transconductance	V _{DS} = -10V , I _D = -6.0A		15		S
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} = 0V , I _S = -1.0A			-1.2	V
I _S	Maximum Body-Diode Continuous Current				-2.0	A
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -15V , V _{GS} = 0V f = 1.0MHz		1020		pF
C _{oss}	Output Capacitance			125		pF
C _{rss}	Reverse Transfer Capacitance			85		pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} = -15V , I _D = -4.2A V _{GS} = -6V		10.5		nC
Q _{gs}	Gate-Source Charge			3.5		nC
Q _{gd}	Gate-Drain Charge			4.0		nC
t _{D(ON)}	Turn-On Delay Time	V _{DD} = -15V , ID = -1A V _{GS} = -6 V R _{GEN} = -6 ohm		7.5		ns
t _r	Turn-On Rise Time			4.5		ns
t _{D(OFF)}	Turn-Off Delay Time			45.5		ns
t _f	Turn-Off Fall Time			15		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