

20V Single P-Channel Enhancement-Mode MOSFET

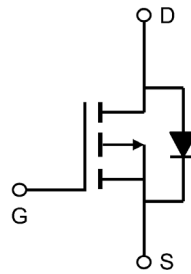
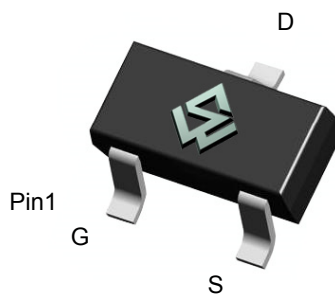
General Description

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

Product Summary

- BV_{DSS} -20V
- $R_{DS(on)}$ @ $V_{GS} = -4.5V$ < 42m Ω
- $R_{DS(on)}$ @ $V_{GS} = -2.5V$ < 55m Ω
- $R_{DS(on)}$ @ $V_{GS} = -1.8V$ < 60m Ω

SOT-23



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current ($T_A=25^\circ\text{C}$)	I_D	-4.5	A
Drain Current ($T_A=75^\circ\text{C}$)		-2.2	A
Pulsed Drain Current ^a	I_{DM}	-18	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	$^\circ\text{C}$

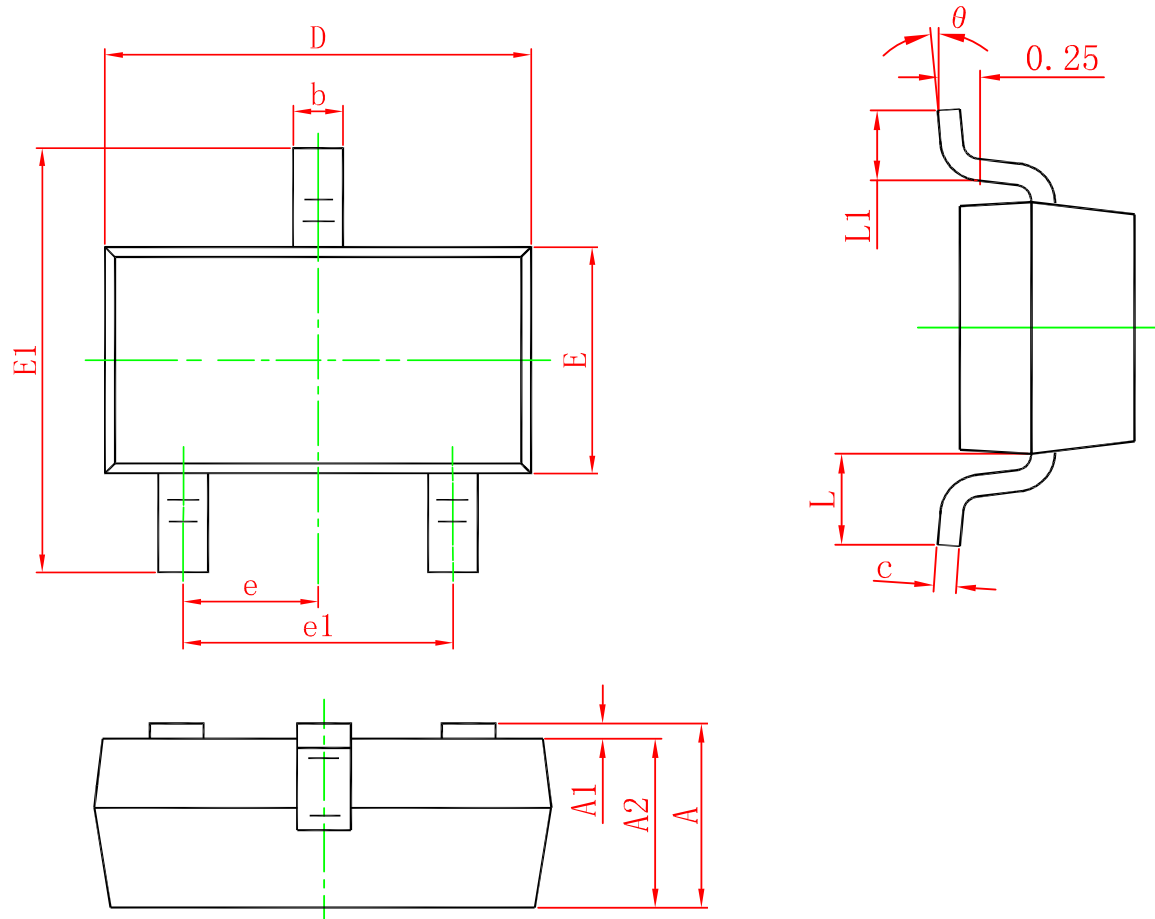
Thermal Characteristics

Parameter	Symbol	Maximum	Units
Junction-to-Ambient ^a ($t \leq 10s$)	$R_{\theta JA}$	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	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V , 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	-0.45		-1.3	V
R _{DS(ON))}	Drain-Source On-State Resistance	V _{GS} = -4.5V , I _D = -4.2A		28	42	mΩ
		V _{GS} = -2.5V , I _D = -3.5A		35	55	mΩ
		V _{GS} = -1.8V , I _D = -1.5A		45	60	mΩ
g _{FS}	Forward Transconductance	V _{DS} = -4.5V , I _D = -4.2A		22		S
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} = 0V , I _S = -1.0A			-1.3	V
I _S	Maximum Body-Diode Continuous Current				-1.8	A
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -4.5V , V _{GS} = 0V f = 1.0MHz		1220		pF
C _{oss}	Output Capacitance			480		pF
C _{rss}	Reverse Transfer Capacitance			210		pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} = -4.5V , I _D = -4.2A V _{GS} = -4V		15		nC
Q _{gs}	Gate-Source Charge			4		nC
Q _{gd}	Gate-Drain Charge			2.6		nC
t _{D(ON)}	Turn-On Delay Time	V _{DD} = -4.5V , ID = -1A V _{GS} = -4 V R _{GEN} = -6 ohm		16		ns
t _r	Turn-On Rise Time			36		ns
t _{D(OFF)}	Turn-Off Delay Time			39		ns
t _f	Turn-Off Fall Time			30		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 1in² 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