

20V Single P-Channel Enhancement-Mode MOSFET

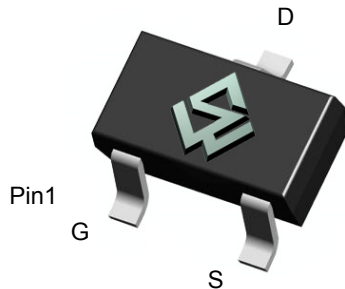
General Description

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

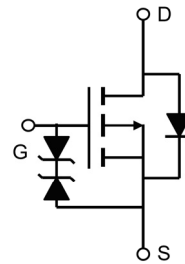
Product Summary

- BV_{DSS} -20V
- $R_{DS(on)}$ @VGS = -4.5V < 42mΩ
- $R_{DS(on)}$ @VGS = -2.5V < 54mΩ
- $R_{DS(on)}$ @VGS = -1.8V < 70mΩ

SOT23-3L



ESD protected



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}	±8	V
Drain Current ($T_A=25^\circ\text{C}$)	I_D	-4.0	A
Drain Current ($T_A=75^\circ\text{C}$)		-3.4	A
Pulsed Drain Current ^a	I_{DM}	-20	A
Power Dissipation ^b ($T_A=25^\circ\text{C}$)	P_D	1.4	W
Power Dissipation ^b ($T_A=75^\circ\text{C}$)		0.9	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	°C

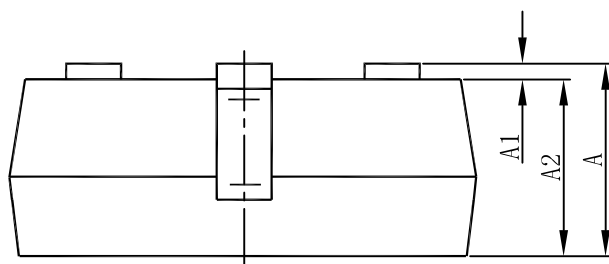
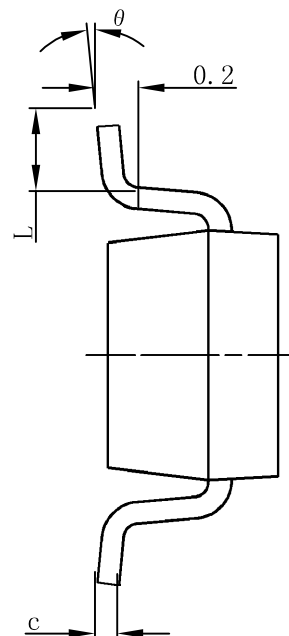
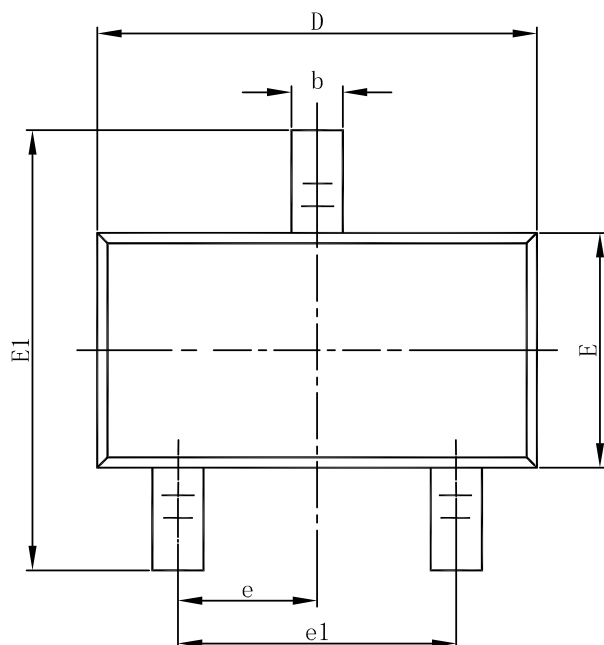
Thermal Characteristics

Parameter	Symbol	Maximum	Units
Junction-to-Ambient ^a ($t \leq 10\text{s}$)	$R_{\theta JA}$	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°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} = ±8V, V _{DS} = 0V			±10	uA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250uA	-0.45		-1.0	V
R _{DS(ON))}	Drain-Source On-State Resistance	V _{GS} = -4.5V , I _D = -4.0A			42	mΩ
		V _{GS} = -2.5V , I _D = -3.5A			54	mΩ
		V _{GS} = -1.8V , I _D = -2.5A			70	mΩ
g _{FS}	Forward Transconductance	V _{DS} = -10V , I _D = -4.0A		20		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				-2.0	A
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -10V , V _{GS} = 0V f = 1.0MHz		820		pF
C _{oss}	Output Capacitance			250		pF
C _{rss}	Reverse Transfer Capacitance			110		pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} = -10V , I _D = -4.0A V _{GS} = -4V		11.5		nC
Q _{gs}	Gate-Source Charge			2.2		nC
Q _{gd}	Gate-Drain Charge			2.8		nC
t _{D(ON)}	Turn-On Delay Time	V _{DD} = -10V , ID = -1A V _{GS} = -4 V R _{GEN} = -6 ohm		15		ns
t _r	Turn-On Rise Time			14.5		ns
t _{D(OFF)}	Turn-Off Delay Time			22.5		ns
t _f	Turn-Off Fall Time			32		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.

SOT23-3L Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°