

20V Common-Drain Dual N-Channel Enhancement-Mode MOSFET

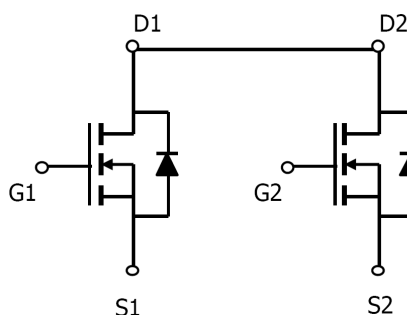
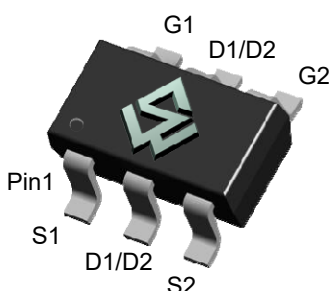
General Description

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

Product Summary

- BV_{DSS} 20 V
- I_D @ $V_{GS} = 4.5V$ 8.3 A ($T_C=25^\circ C$) ⁽¹⁾
- $R_{DS(on)}$ @ $V_{GS} = 4.5V$ Typ.: 19m Ω (< 25m Ω)
- $R_{DS(on)}$ @ $V_{GS} = 2.5V$ Typ.: 25m Ω (< 35m Ω)

SOT23-6L



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current ^{a,b,c,d} ($T_C=25^\circ C$) ⁽¹⁾	I_D	8.3	A
Drain Current ^{b,c} ($T_J<150^\circ C$ $t \leq 10S$ @ $T_A=25^\circ C$, $V_{GS}=4.5V$) ⁽²⁾		7.6	
Drain Current ^c ($T_J<150^\circ C$ Steady state @ $T_A=25^\circ C$, $V_{GS}=4.5V$) ⁽²⁾		6.0	
Pulsed Drain Current ^a	I_{DM}	24	A
Power Dissipation ^{a,b,c,d} ($T_C=25^\circ C$) ⁽¹⁾	P_D	2.7	W
Power Dissipation ^{b,c} ($T_J<150^\circ C$ $t \leq 10S$ @ $T_A=25^\circ C$, $V_{GS}=4.5V$) ⁽²⁾		2.3	
Power Dissipation ^c ($T_J<150^\circ C$ Steady state @ $T_A=25^\circ C$, $V_{GS}=4.5V$) ⁽²⁾		1.4	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Maximum	Units
Junction-to-Case ^{a,c,d}	$R_{\theta JL}$	45.7	$^\circ C/W$
Junction-to-Ambient ^{b,c} ($T_J<150^\circ C$ $t \leq 10S$ @ $T_A=25^\circ C$, $V_{GS}=4.5V$) ⁽²⁾	$R_{\theta JA}$	54.2	$^\circ C/W$
Junction-to-Ambient ^c ($T_J<150^\circ C$ Steady state @ $T_A=25^\circ C$, $V_{GS}=4.5V$) ⁽²⁾		86.8	$^\circ C/W$

(1) 指器件表面温度 T_C 能被保证维持在 $25^\circ C$ 理想散热条件下的极限电流。

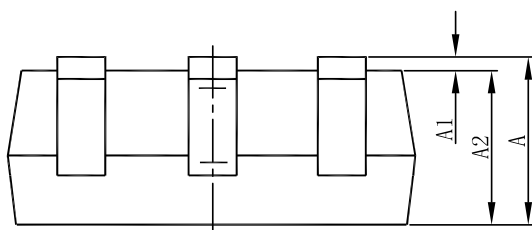
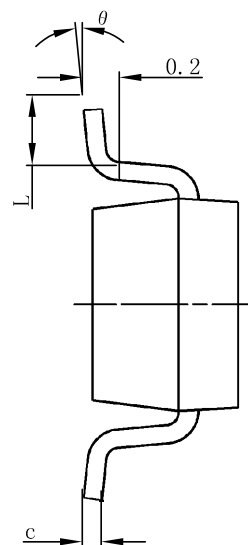
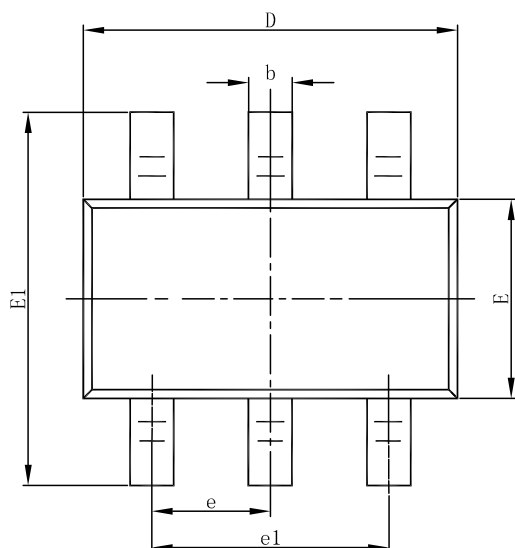
(2) 指环境温度 $T_A=25^\circ C$ 且电路板在非密闭空间自然散热的条件下，器件本身温度 T_C 不超过结温 $T_J=150^\circ C$ 时的极限电流;除温度的影响外,需注意的是MOS的驱动电压 V_{GS} 对极限电流影响也很大，随着驱动电压变小，内阻会变大，因而极限电流也相对会变得更小。

**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 = 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	0.7	1.2	V	
R _{DS(ON))}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =6.0A	T _J =25°C		19	25	mΩ
			T _J =70°C		24.5	30	
			T _J =100°C		28	34	
		V _{GS} = 2.5V , I _D = 5.0A			25	35	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 4.5V , I _D = 6.0A		20		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} = 10V , V _{GS} = 0V f = 1.0MHz		650		pF	
C _{oss}	Output Capacitance			165		pF	
C _{rss}	Reverse Transfer Capacitance			143		pF	
Switching Characteristics							
Q _g	Total Gate Charge	V _{DS} = 10V , I _D = 6A V _{GS} = 4V		11.5		nC	
Q _{gs}	Gate-Source Charge			1.2		nC	
Q _{gd}	Gate-Drain Charge			3.5		nC	
t _{D(ON)}	Turn-On Delay Time	V _{DD} = 10V , I _D = 1A V _{GS} = 4 V R _{GEN} = 3 ohm		4.5		ns	
t _r	Turn-On Rise Time			14		ns	
t _{D(OFF)}	Turn-Off Delay Time			29		ns	
t _f	Turn-Off Fall Time			8.2		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 $\leq 10\text{s}$ 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.

SOT23-6L 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°