



20V Complementary Enhancement-Mode MOSFET

General Description

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

Product Summary

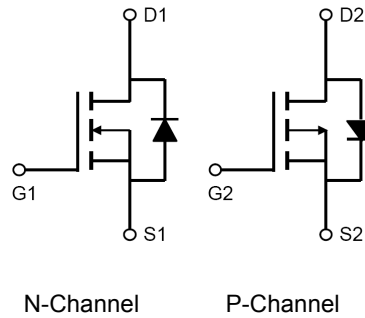
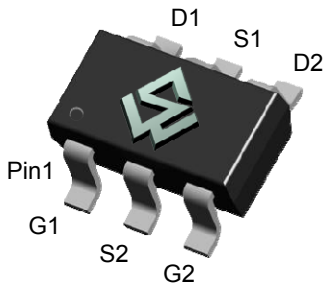
N-Channel

- $BV_{DSS} = 20V$
- $R_{DS(on)} (@VGS = 10V) < 42m\Omega$
- $R_{DS(on)} (@VGS = 4.5V) < 45m\Omega$

P-Channel

- $BV_{DSS} = -20V$
- $R_{DS(on)} (@VGS = -10V) < 42m\Omega$
- $R_{DS(on)} (@VGS = -4.5V) < 45m\Omega$

SOT23-6L



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

Parameter	Symbol	Maximum		Units
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 12	± 12	V
Drain Current ($T_A=25^\circ C$)	I_D	3.8	-4.2	A
Drain Current ($T_A=75^\circ C$)		2.3	-2.5	A
Pulsed Drain Current ^a	I_{DM}	10	-12	A
Power Dissipation ^b ($T_A=25^\circ C$)	P_D	1.25	1.25	W
Power Dissipation ^b ($T_A=75^\circ C$)		0.75	0.75	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	-55 ~ +150	$^\circ C$

Thermal Characteristics

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



N-Channel Electrical Characteristics (T _A = 25°C unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
B _V 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	0.4		1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} = 10V , I _D = 3.0A		32	42	mΩ
		V _{GS} = 4.5V , I _D = 2.5A		35	45	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 10V , I _D = 3.0A		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} = 10V , V _{GS} = 0V f = 1.0MHz		182		pF
C _{oss}	Output Capacitance			38		pF
C _{rss}	Reverse Transfer Capacitance			35		pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} = 10V , I _D = 3.0A V _{GS} = 5V		6.2		nC
Q _{gs}	Gate-Source Charge			6.1		nC
Q _{gd}	Gate-Drain Charge			0.6		nC
t _{D(ON)}	Turn-On Delay Time	V _{DD} = 10V , I _D = 3A V _{GS} = 5 V R _{GEN} = 6 ohm		4.6		ns
t _r	Turn-On Rise Time			30		ns
t _{D(OFF)}	Turn-Off Delay Time			12		ns
t _f	Turn-Off Fall Time			4.2		ns

- Repetitive rating, Pulse width limited by junction temperature T_{J(MAX)}=150 °C. Ratings are based on low frequency and duty cycles to keep initial T_J=25 °C
- The power dissipation P_D is based on T_{J(MAX)}=150 °C , using ≤10s junction-to-ambient thermal resistance.
- The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C. The value in any given application depends on the user's specific board design.
- The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

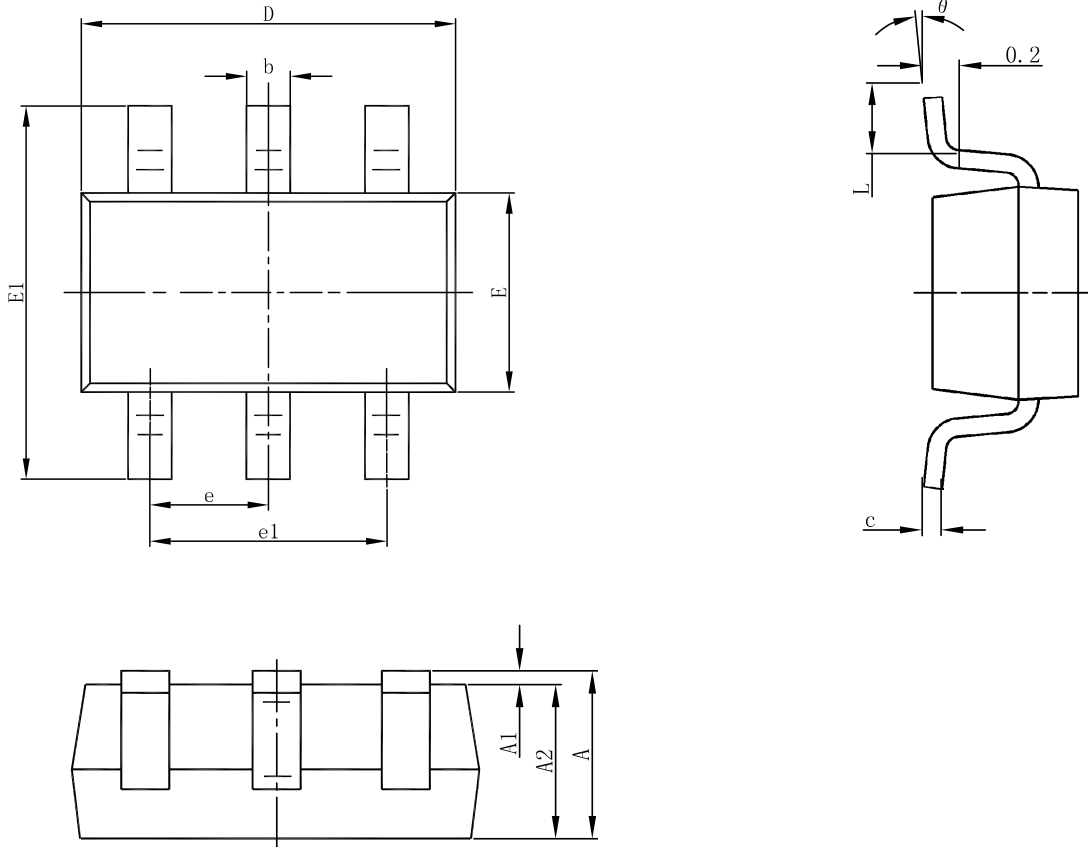


P-Channel Electrical Characteristics (T _A = 25°C unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V , I _D = -250uA	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V , V _{GS} = 0V			-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	-0.4		-1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} = -10V , I _D = -3.0A		30	42	mΩ
		V _{GS} = -4.5V , I _D = -2.5A		32	45	mΩ
g _{FS}	Forward Transconductance	V _{DS} = -10V , I _D = -3.0A		24		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		608		pF
C _{oss}	Output Capacitance			112		pF
C _{rss}	Reverse Transfer Capacitance			105		pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} = -10V , I _D = -3.8A V _{GS} = -4.5V		8.52		nC
Q _{gs}	Gate-Source Charge			1.56		nC
Q _{gd}	Gate-Drain Charge			2.64		nC
t _{D(ON)}	Turn-On Delay Time	V _{DD} = -10V , I _D = -3.8A V _{GS} = -4.5 V R _{GEN} = 3 ohm		5.7		ns
t _r	Turn-On Rise Time			35.2		ns
t _{D(OFF)}	Turn-Off Delay Time			52.1		ns
t _f	Turn-Off Fall Time			53		ns

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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°