

### Product Summary

- $V_{DS} = -250V$ ,  $I_D = -0.15A$
- $R_{DS(ON)} = 7.7 m\Omega$  @  $V_{GS} = -10V$  (typ)

### Application

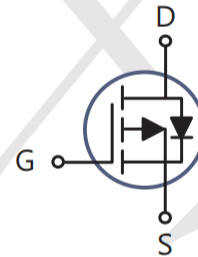
- Load Switch for Portable Devices
- DC/DC Converter

### Package and Pin Configuration

SOT23-3L



### Circuit diagram



### Marking: LDs

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Units	
Drain-Source Voltage	$V_{DS}$	-250	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Drain Current-Continuous (Note 2)	$I_D$	$T_A = 25^\circ C$	-0.15	A
		$T_A = 70^\circ C$	-0.12	A
-Pulsed (Note 1 · Note 2)	$I_{DM}$	-0.6	A	
Single Pulse Avalanche Energy (Note 3)	$E_{AS}$	8	mJ	
Maximum Power Dissipation	$P_D$	$T_A = 25^\circ C$	0.78	W
		$T_A = 70^\circ C$	0.5	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$	

### THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	160	$^\circ C/W$
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**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-250			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-200V, V_{GS}=0V$			-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.5	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-0.1A$			9.6	ohm
		$V_{GS}=-4.5V, I_D=-0.1A$			10	ohm
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=-0.1A$		1.5		S
<b>DYNAMIC CHARACTERISTICS</b> (Note 4)						
Input Capacitance	$C_{ISS}$	$V_{DS}=-100V, V_{GS}=0V$ $f=1.0\text{MHz}$		229		pF
Output Capacitance	$C_{OSS}$			16.7		pF
Reverse Transfer Capacitance	$C_{RSS}$			8.8		pF
Total Gate Charge	$Q_g$	$V_{DS}=-100V, I_D=-0.3A, V_{GS}=-10V$		4.1		nC
Gate-Source Charge	$Q_{gs}$	$V_{DS}=-100V, I_D=-0.1A,$ $V_{GS}=-10V$		0.7		nC
Gate-Drain Charge	$Q_{gd}$			0.8		nC
<b>SWITCHING CHARACTERISTICS</b> (Note 4)						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=-100V$ $I_D=-0.1A$ $V_{GS}=-10V$ $R_{GEN}=6\text{ohm}$		0.9		ns
Rise Time	$t_r$			0.7		ns
Turn-Off Delay Time	$t_{D(OFF)}$			9.9		ns
Fall Time	$t_f$			4.7		ns
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A$		-0.85	-1.3	V

**Notes**

1. Pulse Test Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
2. Drain current limited by maximum junction temperature.
3. Starting  $T_j=25^\circ\text{C}$ ,  $L=0.5\text{mH}$ ,  $V_{DD}=-100V$ . (See Figure 11)
4. Guaranteed by design, not subject to production testing.

**Typical Characteristics**

Figure 1. Output Characteristics

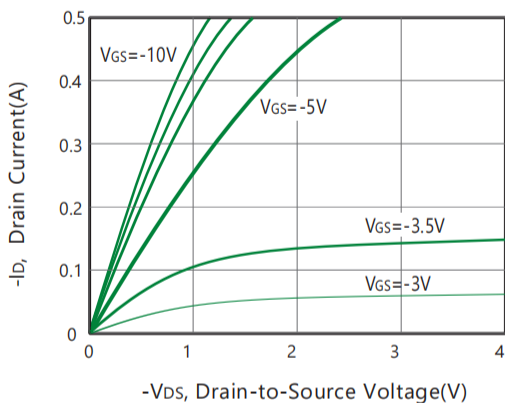


Figure 2. Body Diode Forward Voltage Variation with Source Current

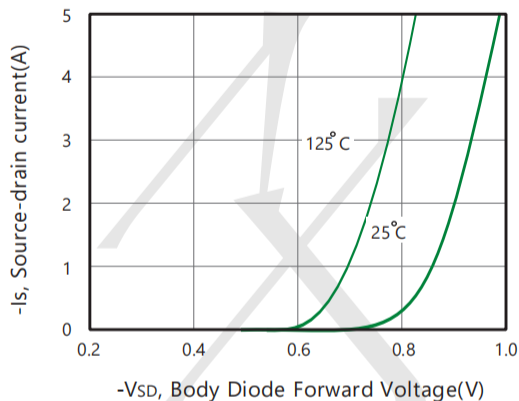


Figure 3. On-Resistance vs. Gate-Source Voltage

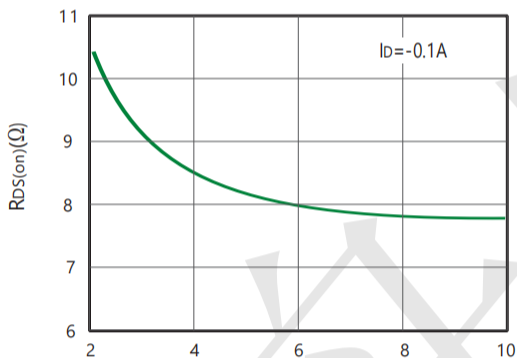


Figure 4. On-Resistance Variation with Drain Current and Temperature

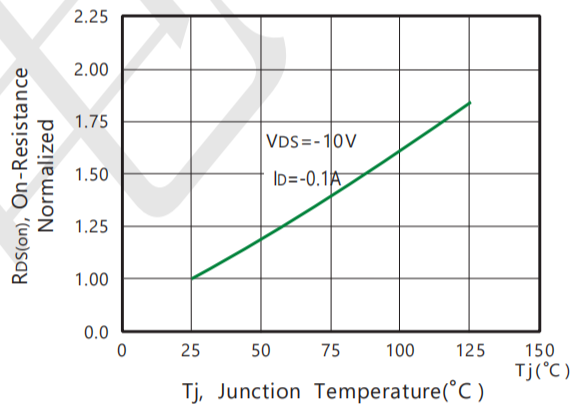


Figure 5. Gate Threshold Variation with Temperature

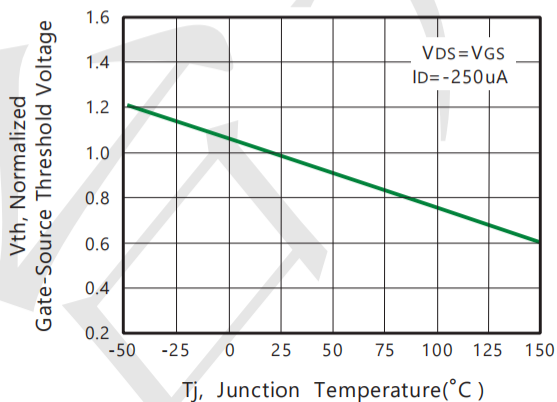
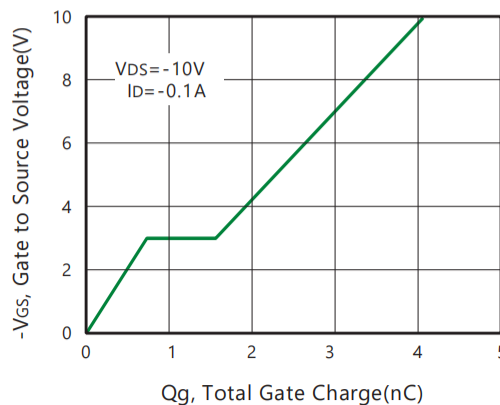


Figure 6. Gate Charge



Typical Characteristics

Figure 7. Capacitance

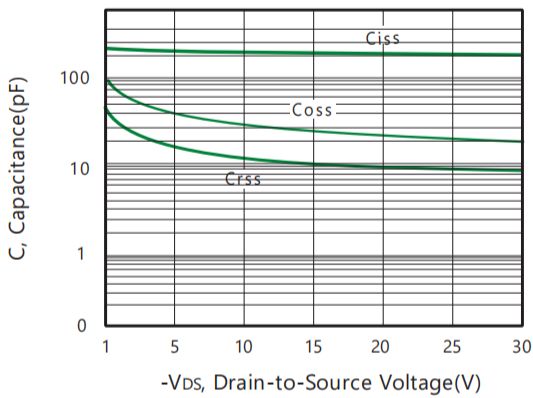


Figure 8. Maximum Safe Operating Area

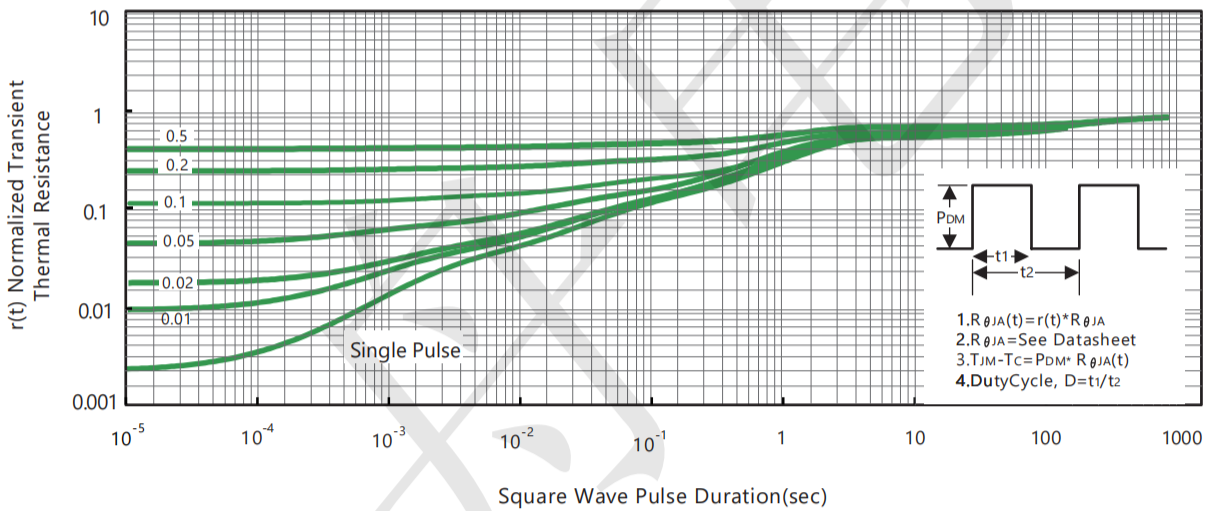
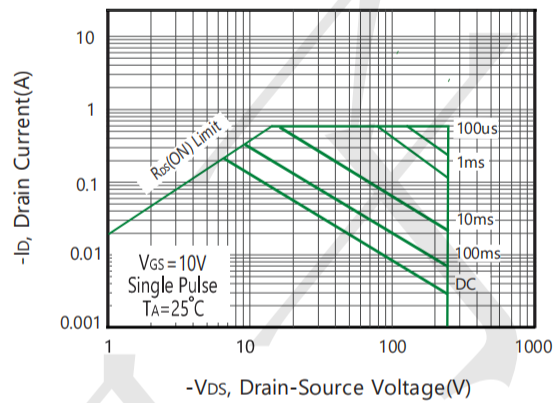


Figure 9. Normalized Thermal Transient Impedance Curve

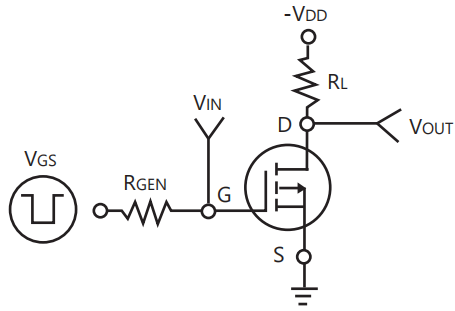


Figure 10a. Switching Test Circuit

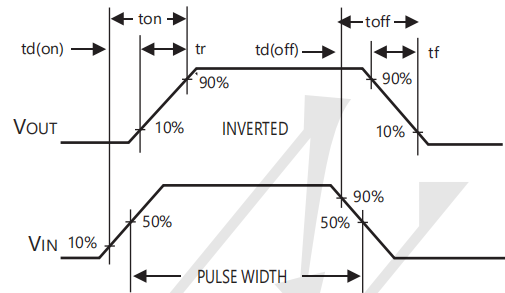
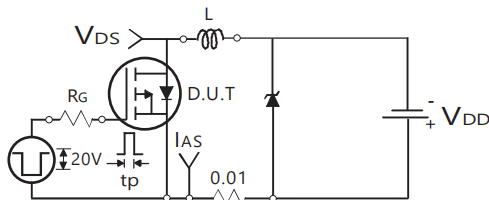
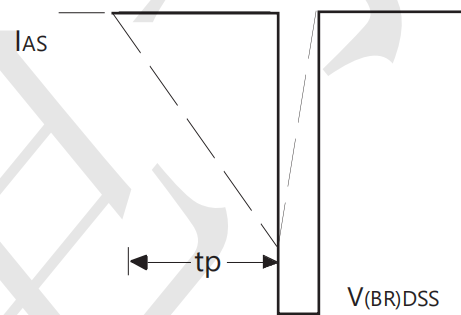


Figure 10b. Switching Waveforms



Unclamped Inductive Test Circuit

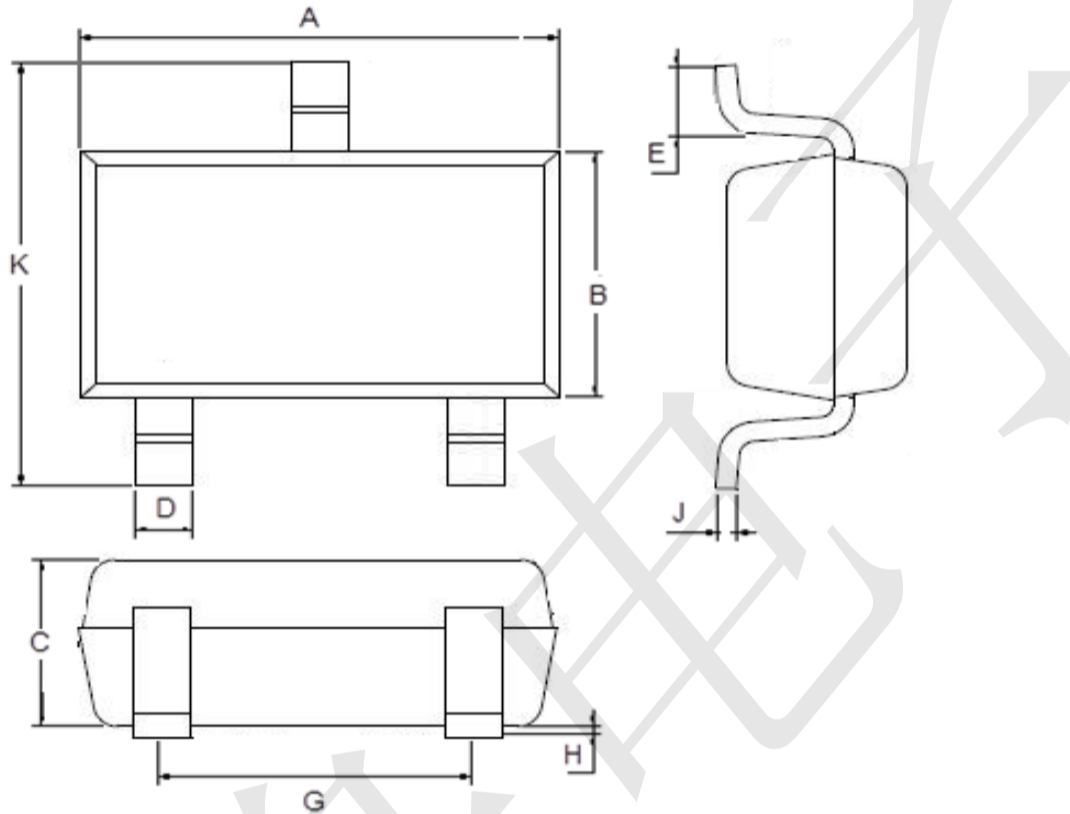
Figure 11a.



Unclamped Inductive Waveforms

Figure 11b.

**Package Outline Dimensions (SOT23-3L)**



SOT-23-3L		
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
G	1.80	2.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

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