

## 60V N-Channel Enhancement Mode MOSFET

### ■ DESCRIPTION

The SL2308 is the N-Channel logic enhancement mode power field effect transistor is produced using high cell density advanced trench technology..

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, and low in-line power loss are needed in a very small outline surface mount package.

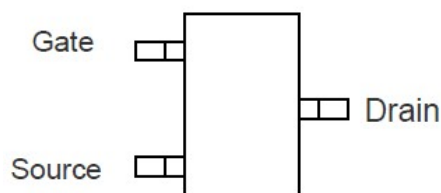
### ■ FEATURE

- ◆ 60V/1.8 A,  $R_{DS(ON)}=135m\Omega$ (typ.)@VGS=10V
- ◆ 60V/ 1.5 A,  $R_{DS(ON)}=154m\Omega$  (typ.)@VGS=4.5V
- ◆ Super high design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability
- ◆ This is a Full RoHS compliance
- ◆ SOT23-3 package design

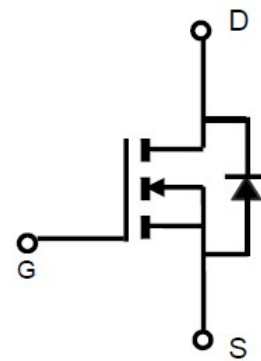
### ■ APPLICATIONS

- ◆ Power Management in Note Book
- ◆ Portable Equipment
- ◆ Battery Powered System

### ■ PIN CONFIGURATION



TOP VIEW  
SOT-23



N-Channel

**■ ABSOLUTE MAXIMUM RATINGS (  $T_A = 25\text{ }^\circ\text{C}$  Unless otherwise noted )**

Symbol	Parameter	Typical	Unit
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current ( $T_J=150\text{ }^\circ\text{C}$ )	VGS-4.5V	A
$I_{DM}$	Pulsed Drain Current	10	A
$I_S$	Continuous Source Current (Diode Conduction)	1	A
$P_D$	Power Dissipation	TA=25 $^\circ\text{C}$	1.25
		TA=75 $^\circ\text{C}$	0.8
$T_J$	Operation Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55~+150	$^\circ\text{C}$

**Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied**

**■ THERMAL DATA**

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	125	$^\circ\text{C}/\text{W}$

**■ ELECTRICAL CHARACTERISTICS** ( $V_{DD}=2.75V$ ,  $T_A=25^\circ C$  Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=250\mu A$	60			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ , $I_D=250\mu A$	1.0		2	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V$ , $V_{GS}=\pm 12V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=44V$ , $V_{GS}=0$			1	$\mu A$
		$V_{DS}=44V$ , $V_{GS}=0$ $T_J=85^\circ C$			5	
$I_{D(ON)}$	On=State Drain Current	$V_{DS}\geq 5V$ , $V_{GS}=4.5V$	10			A
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=10V$ , $I_D=1.8A$		135	160	$m\Omega$
		$V_{GS}=4.5V$ , $I_D=1.5A$		154	200	
$G_{fs}$	Forward Transconductance	$V_{DS}=5V$ , $I_D=2.1A$		10		S
<b>Source-Drain Diode</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=1.0A$ , $V_{GS}=0V$		0.8	1.0	V
<b>Dynamic Parameters</b>						
$Q_g$	Total Gate Charge	$V_{DS}=27V$ $V_{GS}=4.5V$ $I_D=2.1A$		2.1	3.9	nC
$Q_{gs}$	Gate-Source Charge			0.6		
$Q_{gd}$	Gate-Drain Charge			0.8		
$C_{iss}$	Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		295		pF
$C_{oss}$	Output Capacitance			40		
$C_{rss}$	Reverse Transfer Capacitance			15		
$T_{d(on)}$	Turn-On Time	$V_{DS}=27V$ $R_L=10\Omega$		3.6		nS
$T_r$				3.5		
$T_{d(off)}$	Turn-Off Time	$I_D=1A$ $V_{GEN}=4.5V$ $R_G=6\Omega$		32		
$T_f$				3		

**Note: 1. Pulse test: pulse width $\leq 300\mu S$ , duty cycle $\leq 2\%$**

**2.Static parameters are based on package level with recommended wire bonding**

## ■ TYPICAL CHARACTERISTICS (25°C Unless Note)

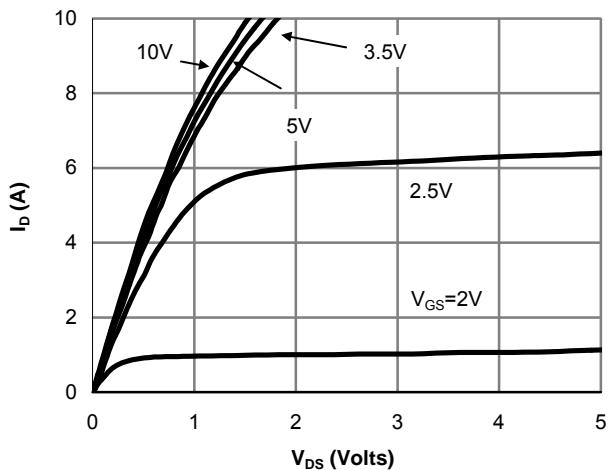


Fig 1: On-Region characteristics

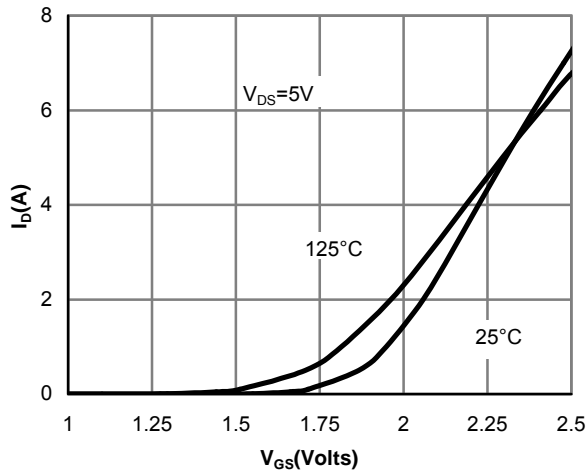


Figure 2: Transfer Characteristics

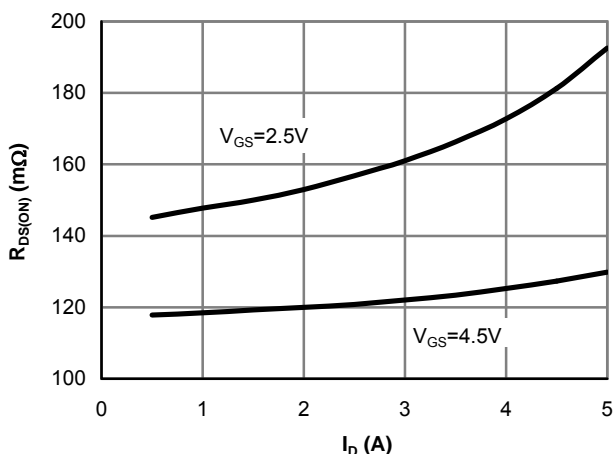


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

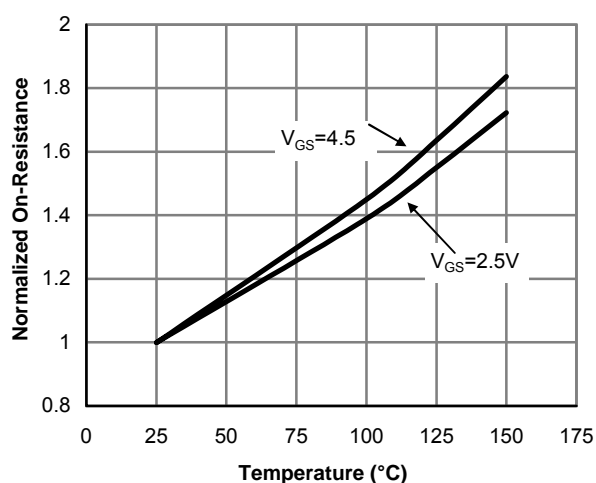


Figure 4: On-Resistance vs. Junction Temperature

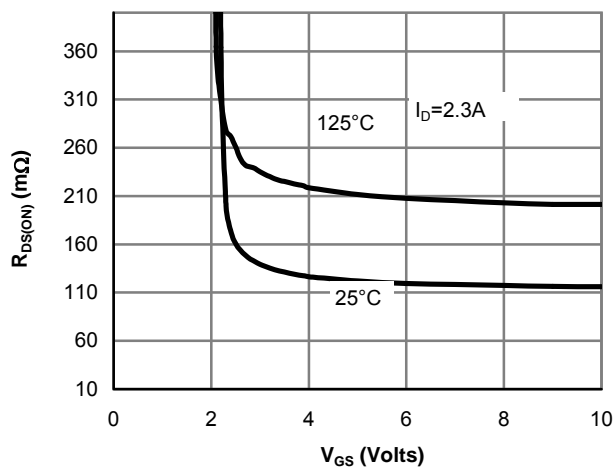


Figure 5: On-Resistance vs. Gate-Source Voltage

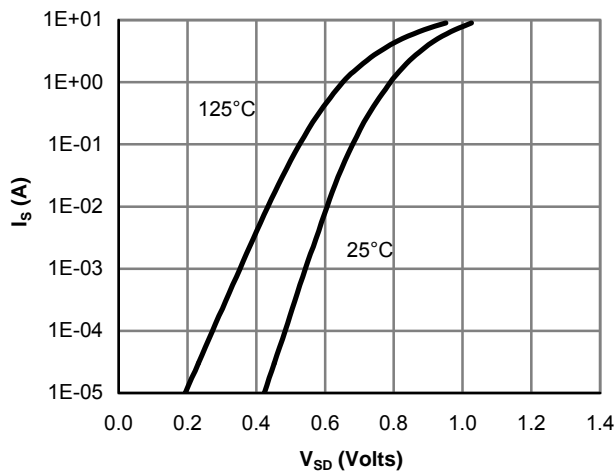


Figure 6: Body-Diode Characteristics

## ■ TYPICAL CHARACTERISTICS (continuous)

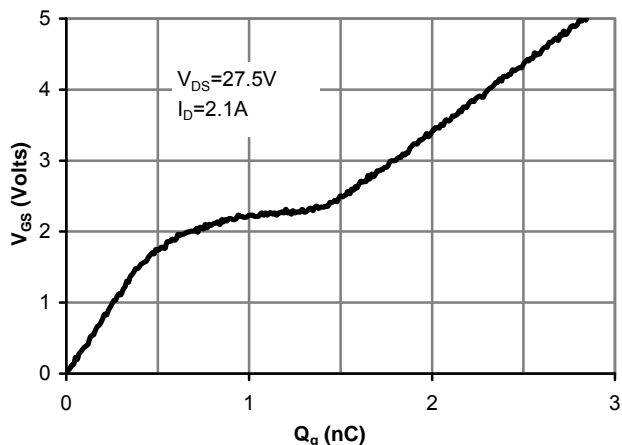


Figure 7: Gate-Charge Characteristics

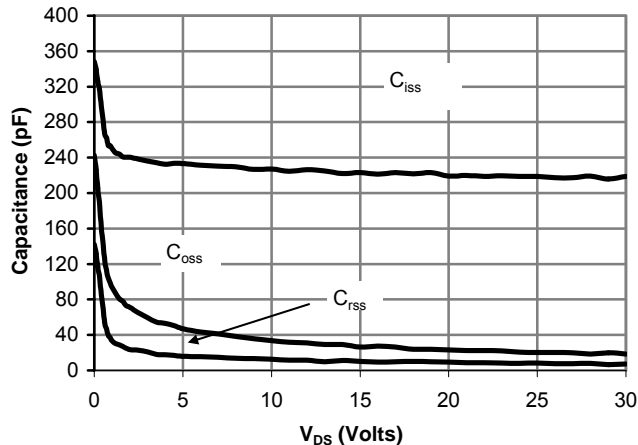


Figure 8: Capacitance Characteristics

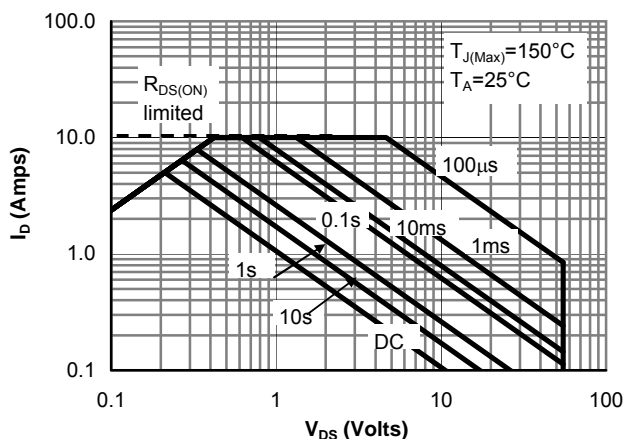


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

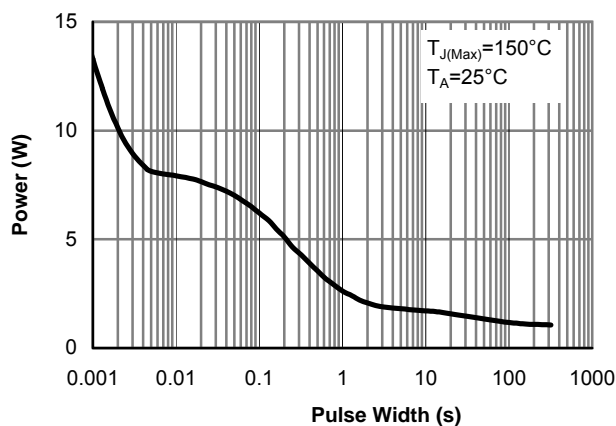


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

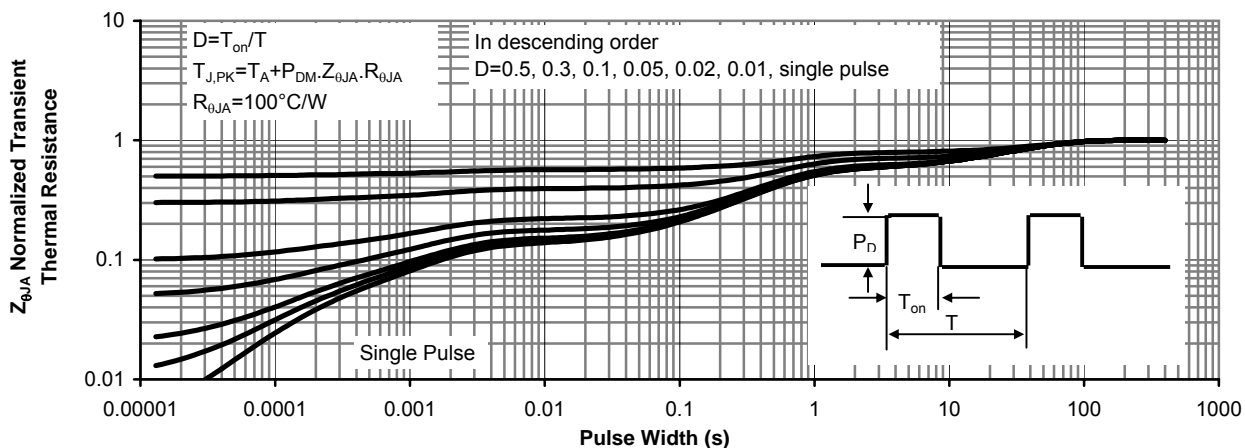
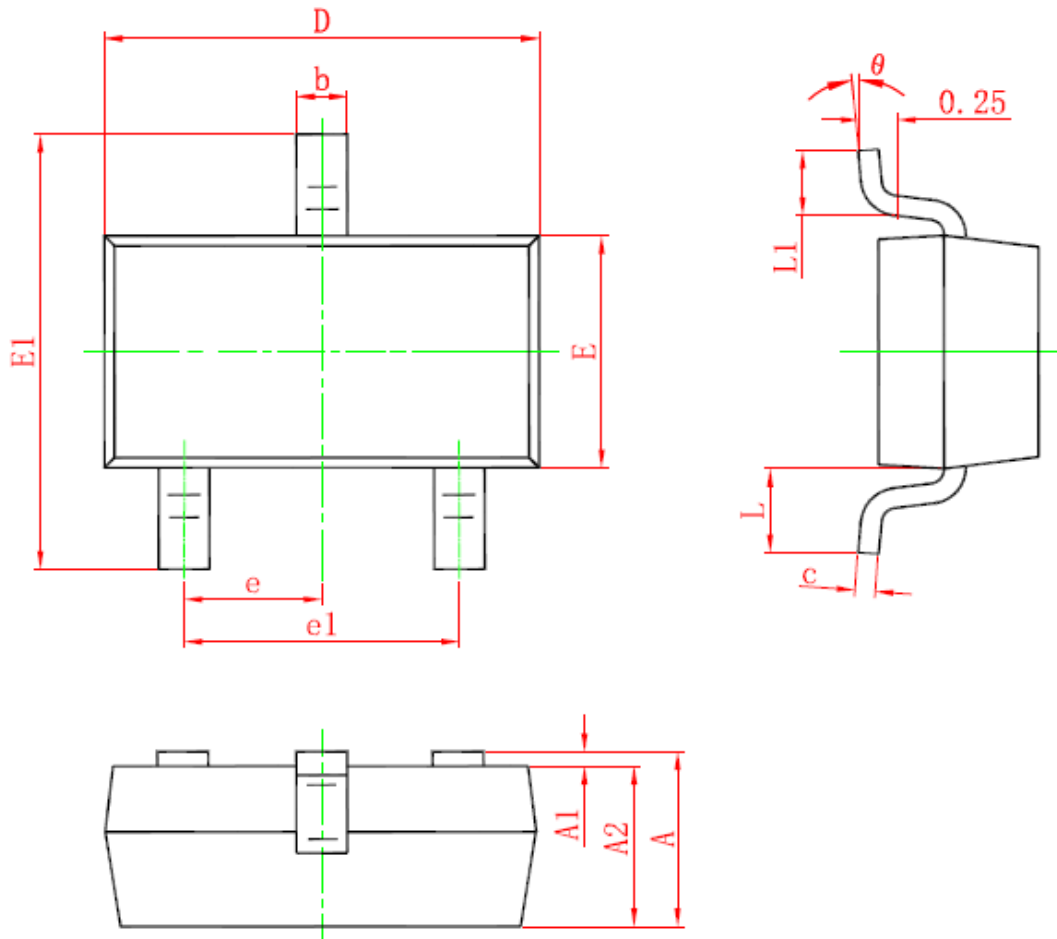


Figure 11: Normalized Maximum Transient Thermal Impedance

■ **SOT23 PACKAGE OUTLINE DIMENSIONS**



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.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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