

SE2300

**N-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

Thigh Density Cell Design For Ultra Low On-Resistance Fully Characterized Avalanche Voltage and Current Improved Shoot-Through FOM

- Simple Drive Requirement
- Small Package Outline
- Surface Mount Device

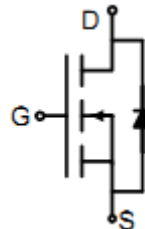
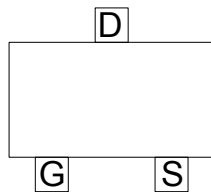
**Features**

For a single MOSFET

- $V_{DS} = 20V$
- $R_{DS(ON)} = 50m\Omega @ V_{GS}=2.5V$
- $R_{DS(ON)} = 40m\Omega @ V_{GS}=4.5V$

**Pin configurations**

See Diagram below



**Absolute Maximum Ratings**

Parameter		Symbol	Rating	Units
Drain-Source Voltage		$V_{DS}$	20	V
Gate-Source Voltage		$V_{GS}$	$\pm 10$	V
Drain Current	Continuous	$I_D$	5.9	A
	Pulsed		23	
Total Power Dissipation	@TA=25°C	$P_D$	1.2	W
Operating Junction Temperature Range		$T_J$	-55 to 150	°C

## SE2300

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS (Note 2)</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0 V	20			V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> = 20V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =10 V			100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.7	3.0	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A	-	34	50	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A		28	40	
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =105V, f=1MHz		500		pF
C <sub>oss</sub>	Output Capacitance			250		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			90		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>GS</sub> =4.2V, V <sub>DS</sub> =10V, I <sub>D</sub> =4.2A		10		nC
Q <sub>gs</sub>	Gate Source Charge			2.3		nC
Q <sub>gd</sub>	Gate Drain Charge			2.9		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, R <sub>GEN</sub> =6Ω I <sub>D</sub> =3.6A		7		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			16		ns
t <sub>d(r)</sub>	Turn-On Rise Time			55		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			10		ns
<b>Thermal Resistance</b>						
Symbol	Parameter		Typ	Max		Units
R <sub>θJA</sub>	Junction to Ambient (t ≤ 10s)		-	140		°C/W

Test Circuits and Waveform

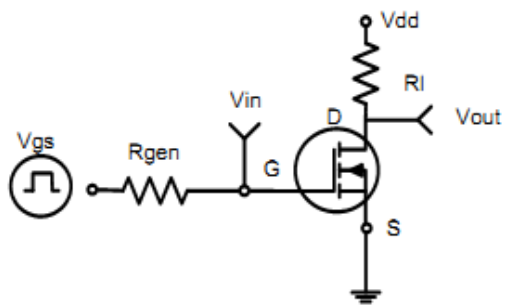


Figure 1: Switching Test Circuit

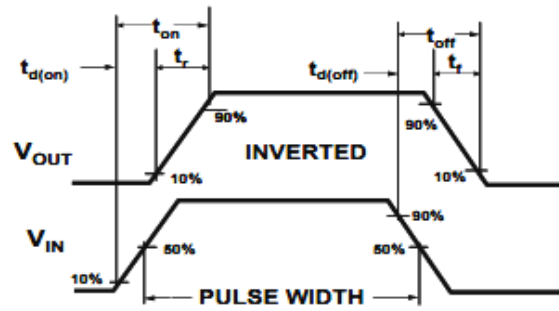


Figure 2: Switching Waveforms

Typical Characteristics

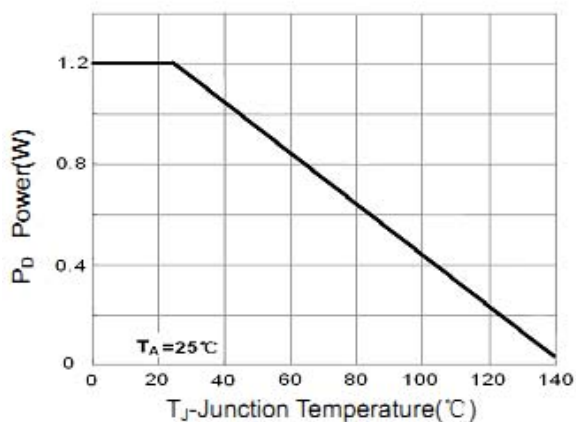


Figure 3 Power Dissipation

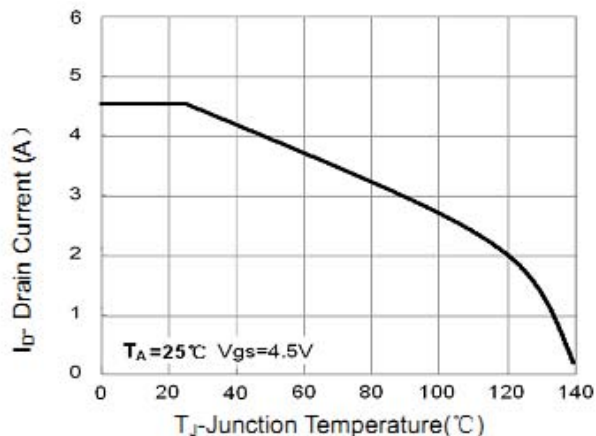


Figure 4 Drain Current

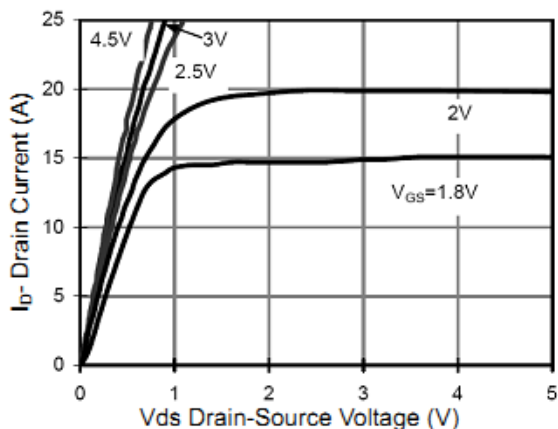


Figure 5 Output CHARACTERISTICS

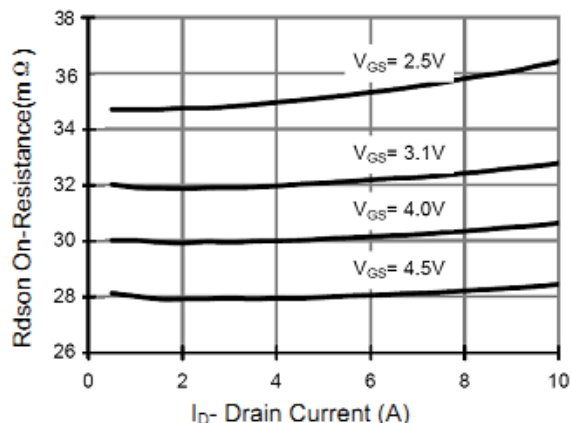


Figure 6 Drain-Source On-Resistance

Typical Characteristics

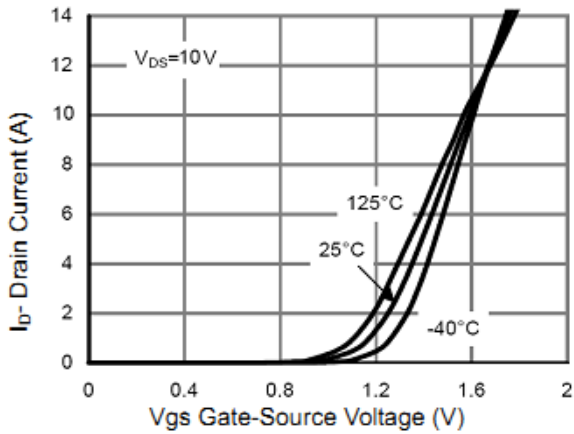


Figure 7 Transfer Characteristics

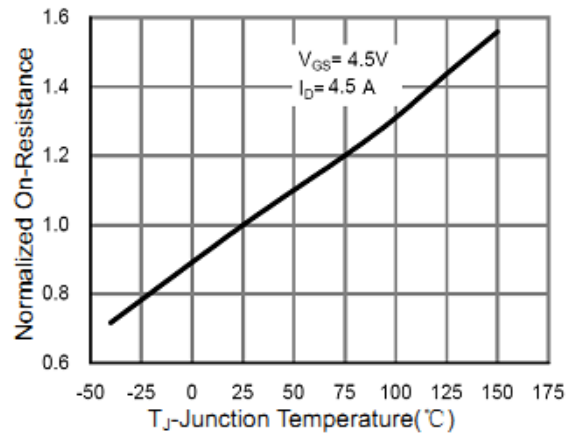


Figure 8 Drain-Source On-Resistance

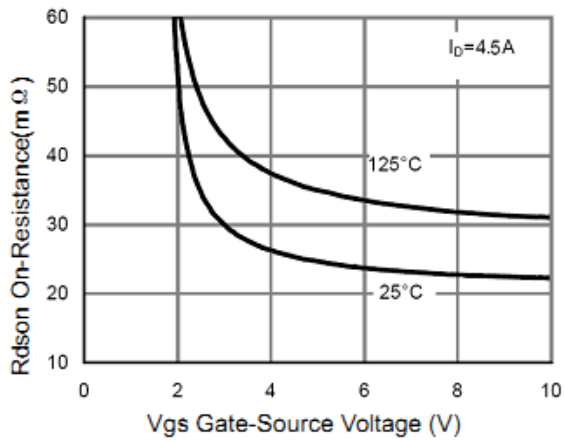


Figure 9 Rdson vs Vgs

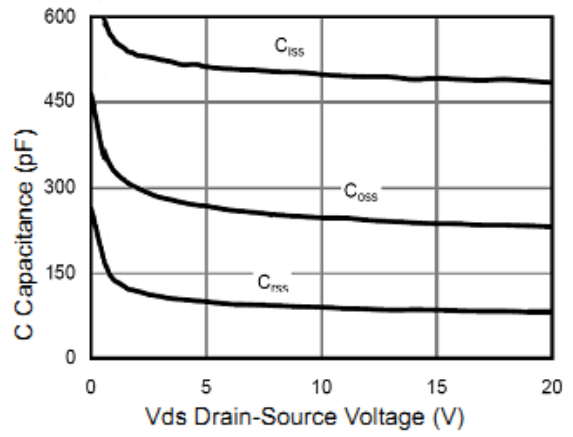


Figure 10 Capacitance vs Vds

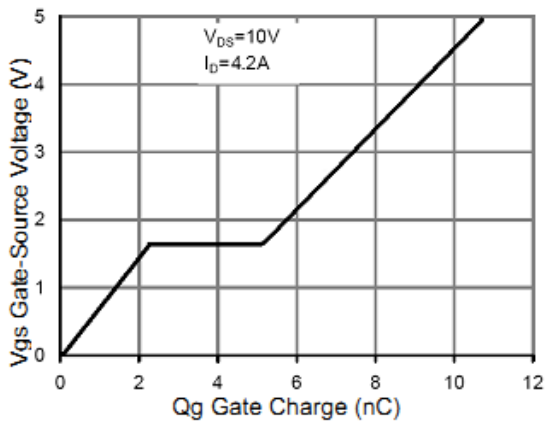


Figure 11 Gate Charge

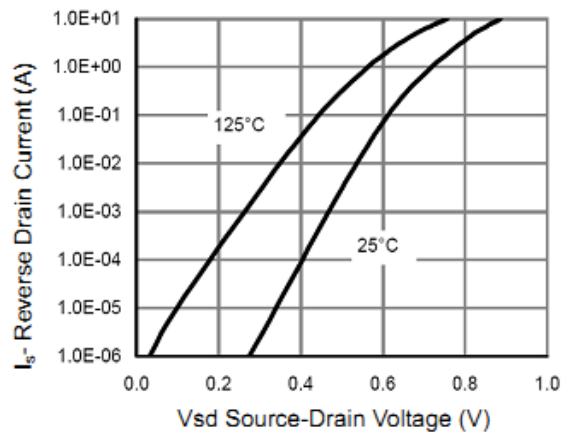


Figure 12 Source-Drain Diode Forward

Typical Characteristics

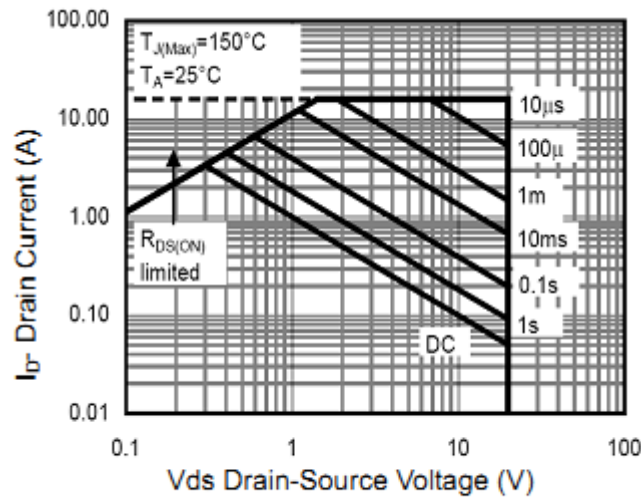


Figure 13 Safe Operation Area

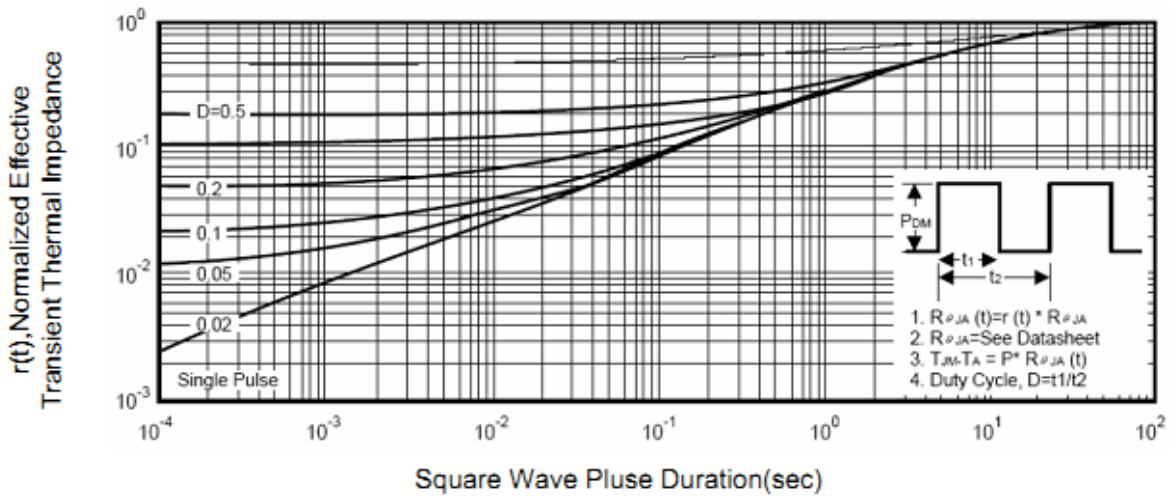
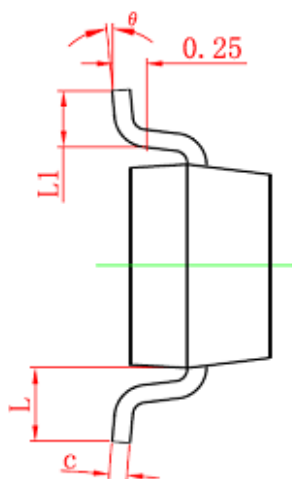
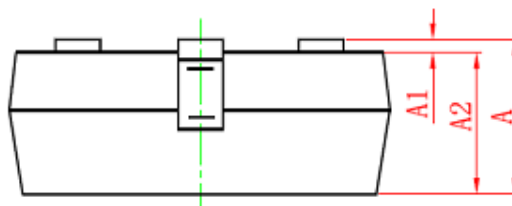
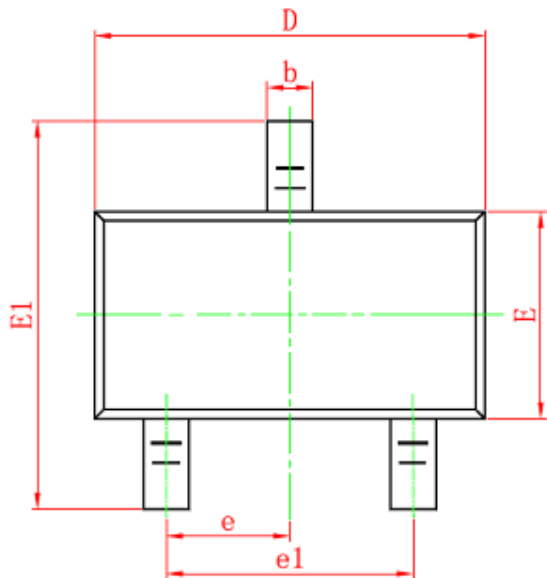


Figure 14 Normalized Maximum Transient Thermal Impedance

# SE2300

## Package Outline Dimension

### SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
$\theta$	0°	8°

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