

SE3035

**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**

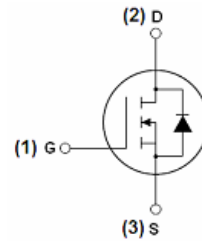
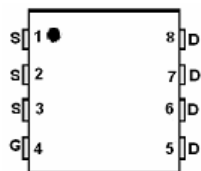
For a single MOSFET

- $V_{DS} = 30V$
- $R_{DS(ON)} = 5.5m\Omega @ V_{GS}=10$
- $R_{DS(ON)} = 9.5m\Omega @ V_{GS}=4.5$

**Pin configurations**

See Diagram below

Marking and pin assignment



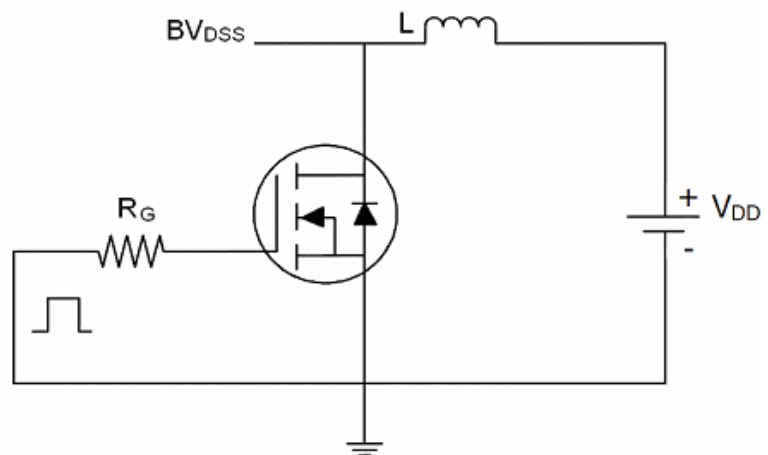
**Absolute Maximum Ratings**

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current		Continuous	35
		Pulsed	120
Total Power Dissipation	@TA=25°C	$P_D$	35
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

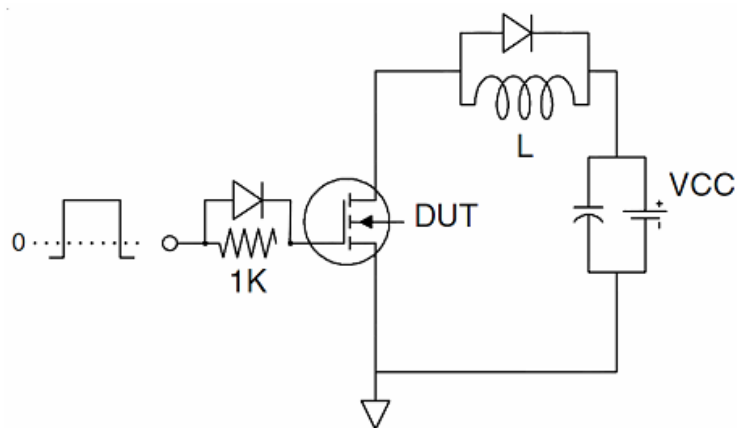
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Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS (Note 2)</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	I <sub>D</sub> =250μA, V <sub>GS</sub> =0 V	30	33		V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> = 30V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =20V			100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.6	3	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =12A	-	4.8	5.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A		8.2	9.5	
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz		1265		pF
C <sub>oss</sub>	Output Capacitance			600		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			130		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =12A		19		nC
Q <sub>gs</sub>	Gate Source Charge			2.7		nC
Q <sub>gd</sub>	Gate Drain Charge			2.5		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>GEN</sub> =6Ω I <sub>D</sub> =12A		18		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			34		ns
t <sub>d(r)</sub>	Turn-On Rise Time			10		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			10		ns
<b>Thermal Resistance</b>						
Symbol	Parameter		Typ	Max	Units	
R <sub>θJC</sub>	Thermal Resistance Junction to Case(t≤10s)		-	3.6	°C/W	

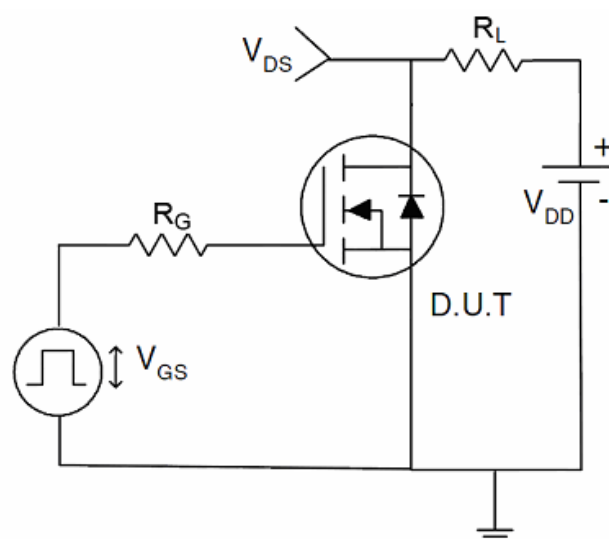
## Test Circuits and Waveform

1)  $E_{AS}$  Test Circuits

## 2) Gate Charge Test Circuit



## 3) Switch Time Test Circuit



Typical Characteristics

Typical Electrical and Thermal Characteristics (Curves)

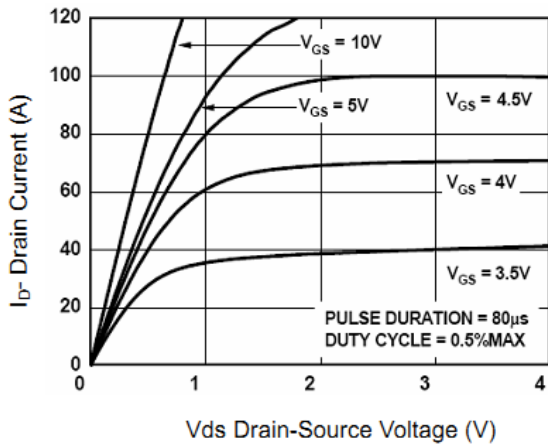


Figure 1 Output Characteristics

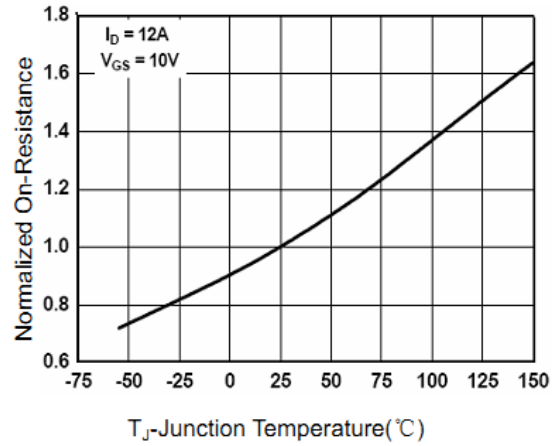


Figure 4  $R_{dson}$ -Junction Temperature

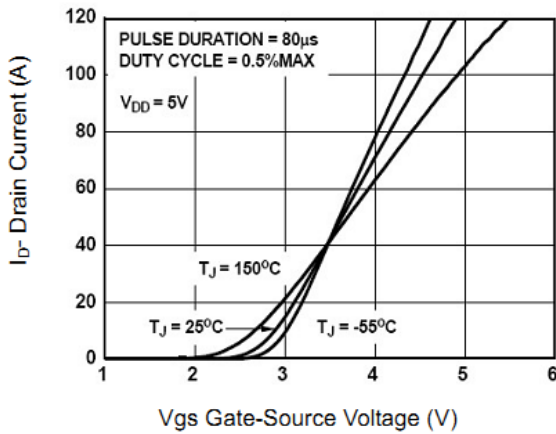


Figure 2 Transfer Characteristics

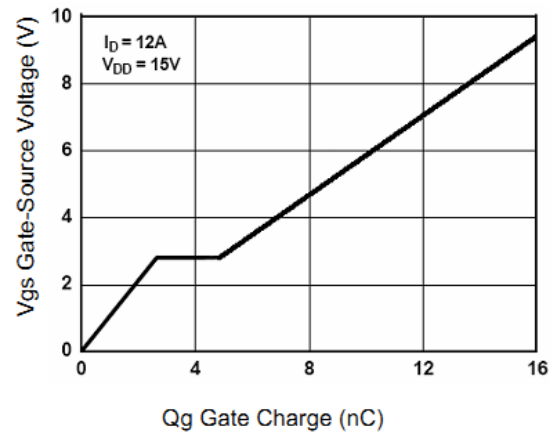


Figure 5 Gate Charge

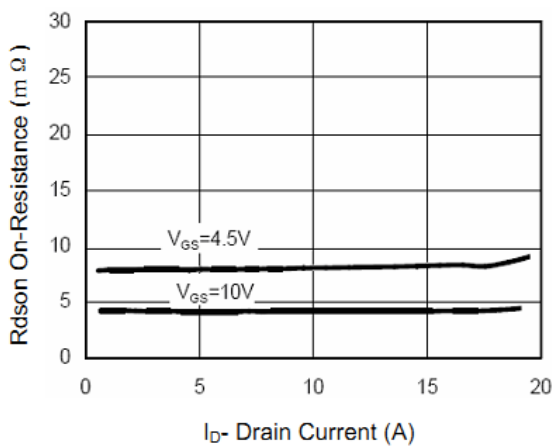


Figure 3  $R_{dson}$ - Drain Current

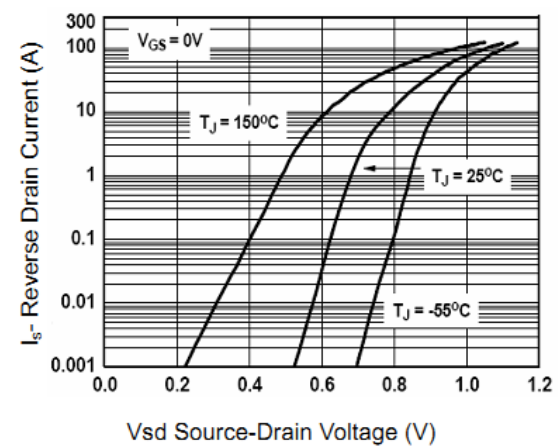


Figure 6 Source- Drain Diode Forward

Typical Characteristics

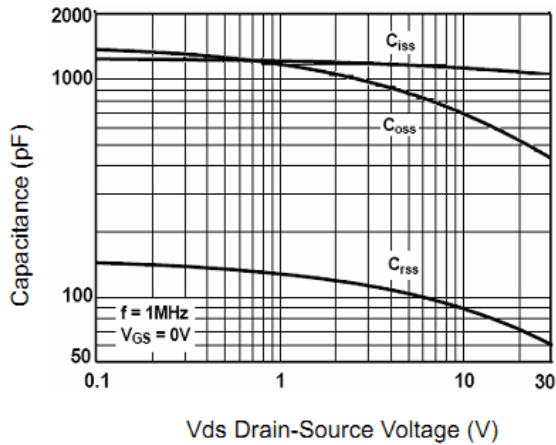


Figure 7 Capacitance vs Vds

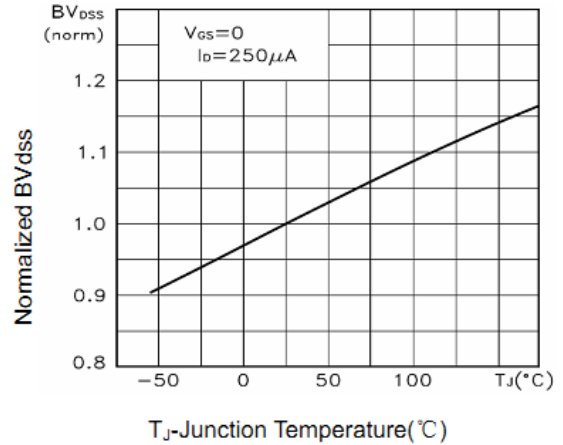


Figure 9  $BV_{DSS}$  vs Junction Temperature

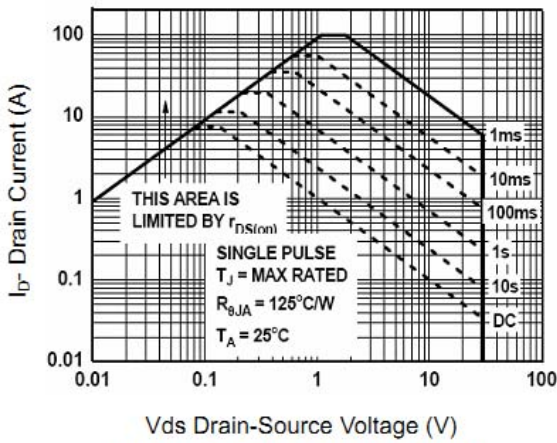


Figure 8 Safe Operation Area

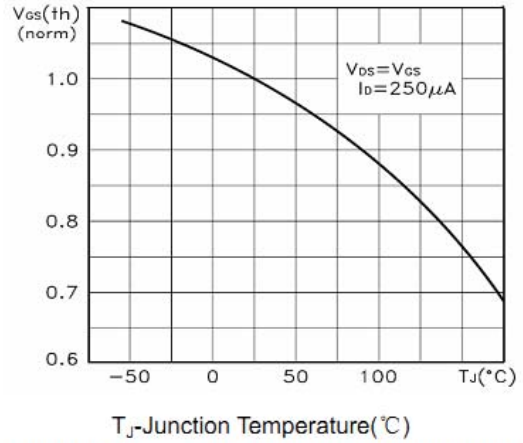


Figure 10  $V_{GS(th)}$  vs Junction Temperature

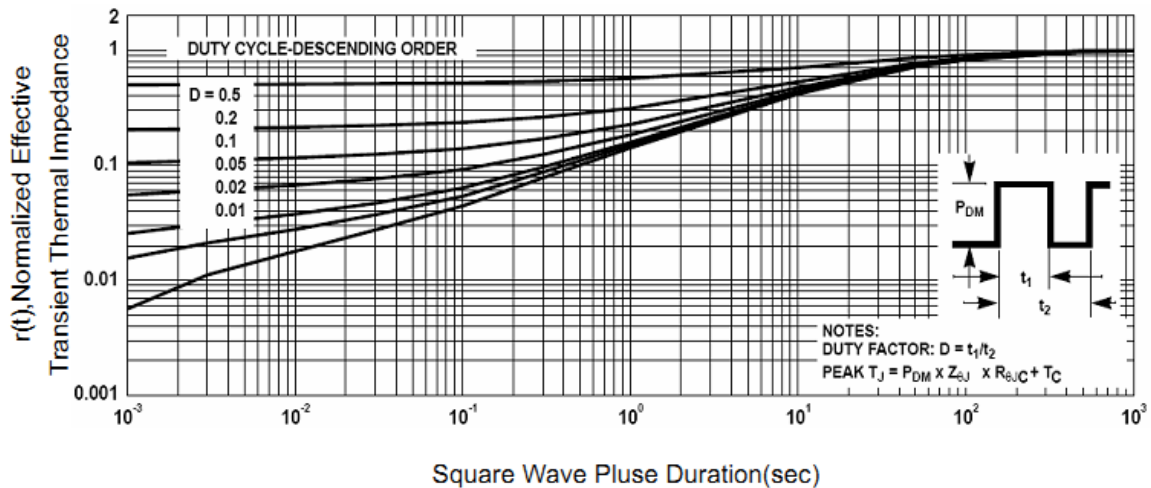
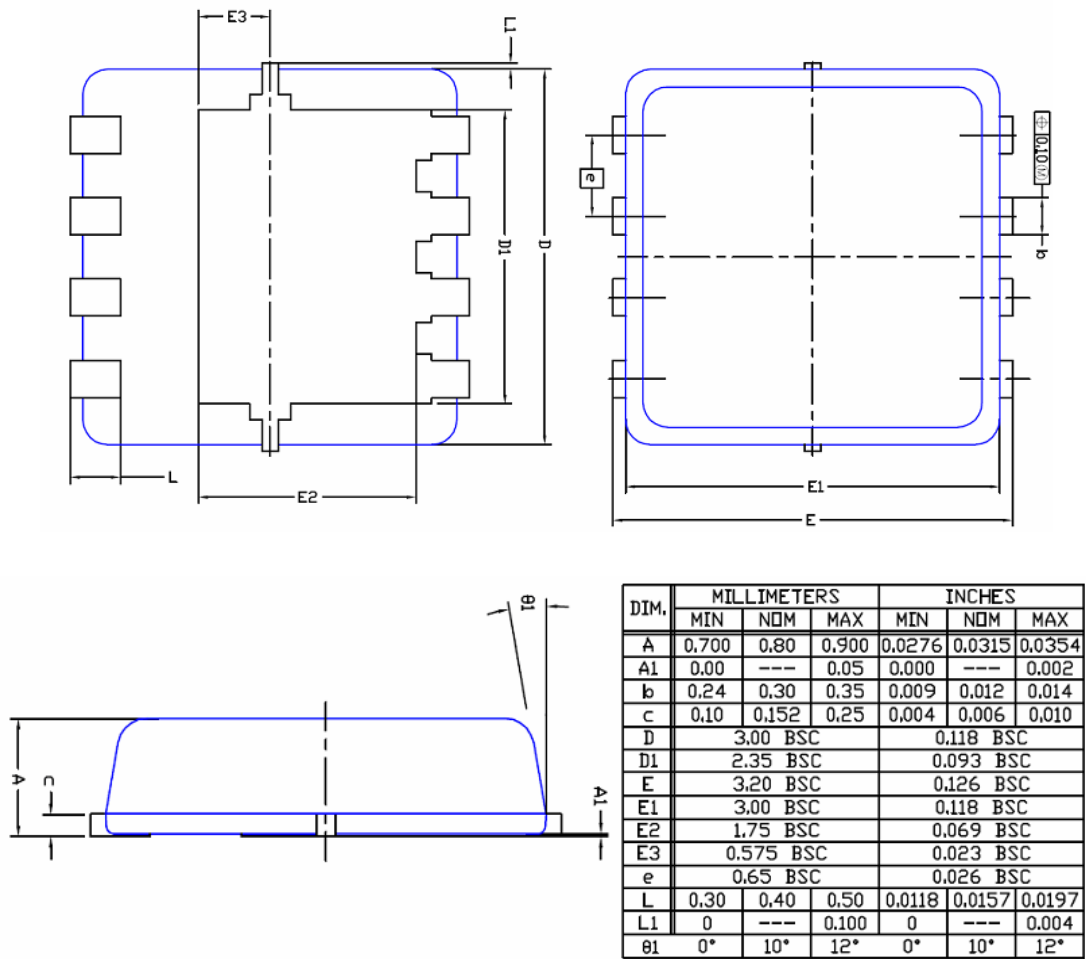


Figure 11 Normalized Maximum Transient Thermal Impedance

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## Package Outline Dimension

### DFN3X3 EP



**SE3035**

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