

SE30P09D

**P-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

Advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and low operation voltage. This device is suitable for using as a load switch or in PWM applications.

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

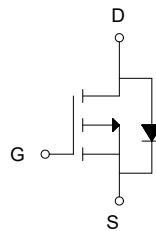
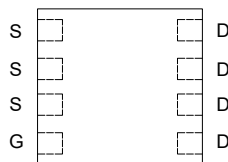
**Features**

For a single MOSFET

- $V_{DS} = -30V$
- $R_{DS(ON)} = 15m\Omega @ V_{GS}=-10V$
- $R_{DS(ON)} = 21m\Omega @ V_{GS}=-4.5V$

**Pin configurations**

See Diagram below



**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	$I_D$	-9	A
	Pulsed		-50	
Avalanche Current		$I_{AR}$	33	A
Repetitive Avalanche Energy L=0.1mH		$E_{AR}$	54	mJ
Total Power Dissipation	@TA=25°C	$P_D$	2	W
Operating Junction Temperature Range		$T_J$	-55 to 150	°C

## SE30P09D

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>VDS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0 V	-30			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	-1.5	-3	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A	-	15	20	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-7A		21	30	mΩ
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		2060	2600	pF
C <sub>oss</sub>	Output Capacitance			370		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			295		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> =-9A		30	39	nC
Q <sub>gs</sub>	Gate Source Charge			4.6		nC
Q <sub>gd</sub>	Gate Drain Charge			10		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>GEN</sub> =3Ω, R <sub>L</sub> =1Ω		11		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			24		ns
t <sub>d(r)</sub>	Turn-On Rise Time			9.4		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			12		ns
<b>Thermal Resistance</b>						
Symbol	Parameter		Typ	Max	Units	
R <sub>θJA</sub>	Junction to Ambient (t ≤ 10s)		48	62.5	°C/W	

Typical Characteristics

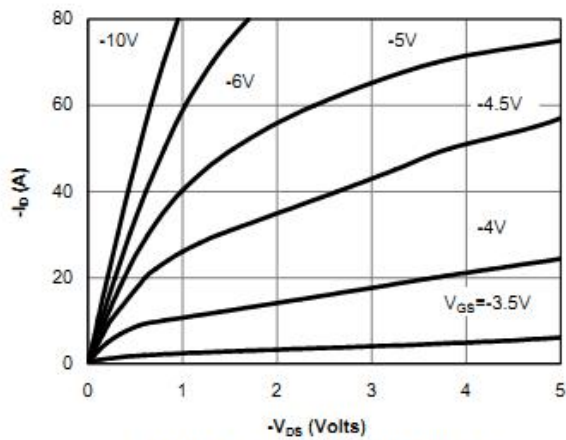


Fig 1: On-Region Characteristics (Note E)

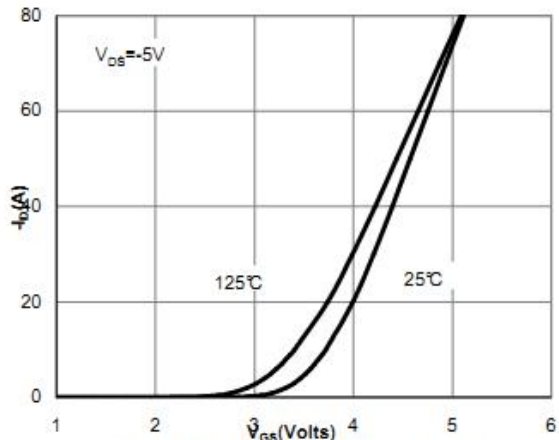


Figure 2: Transfer Characteristics (Note E)

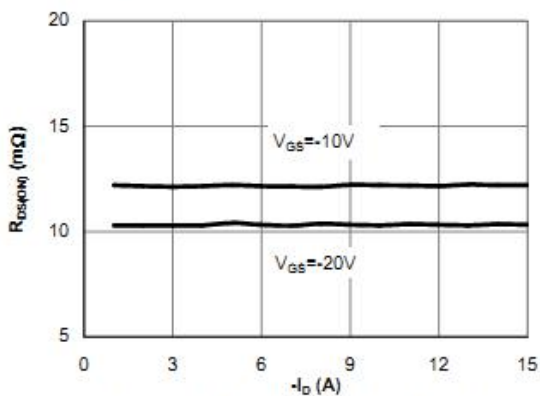


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

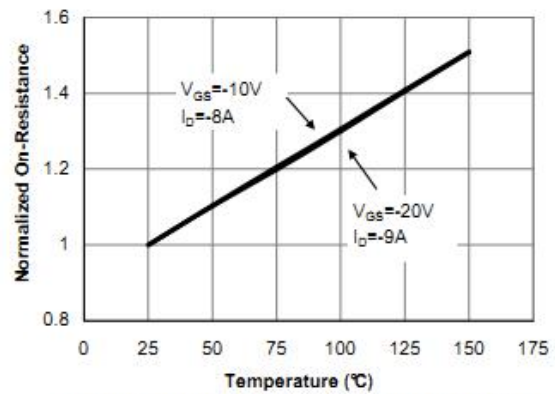


Figure 4: On-Resistance vs. Junction Temperature (Note E)

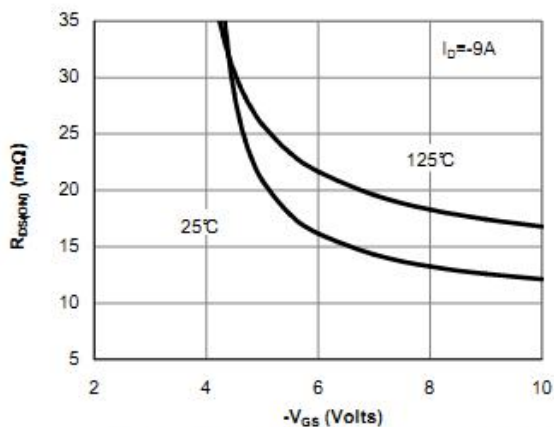


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

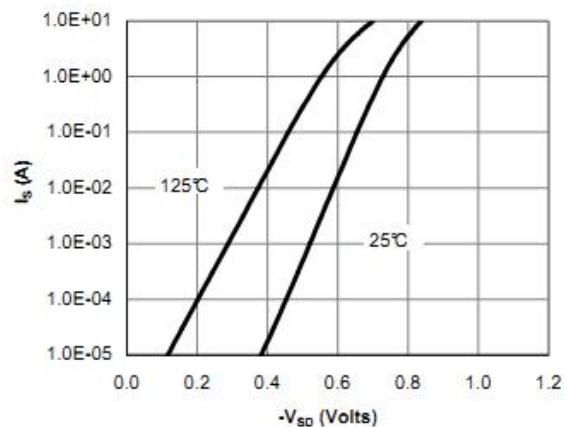


Figure 6: Body-Diode Characteristics (Note E)

Typical Characteristics

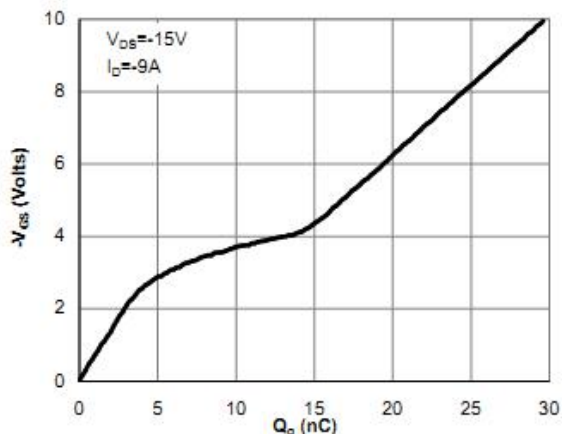


Figure 7: Gate-Charge Characteristics

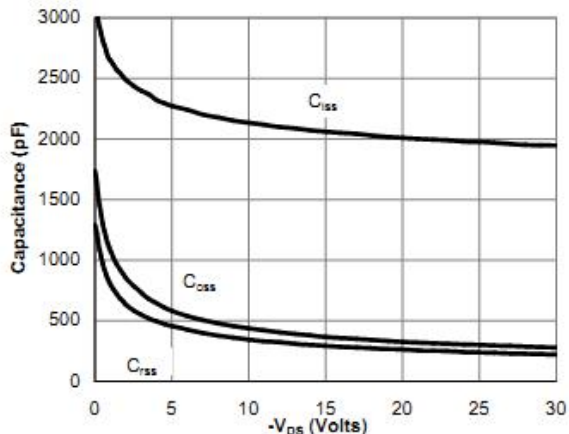


Figure 8: Capacitance Characteristics

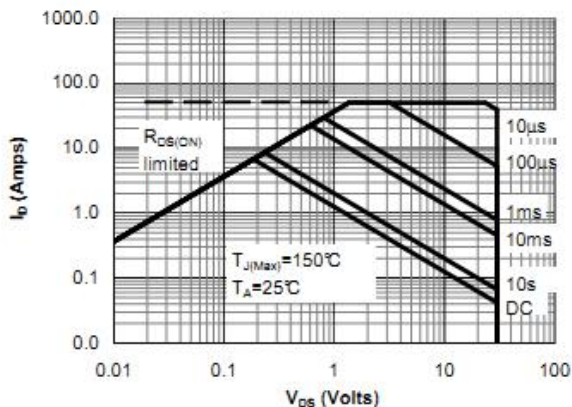


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

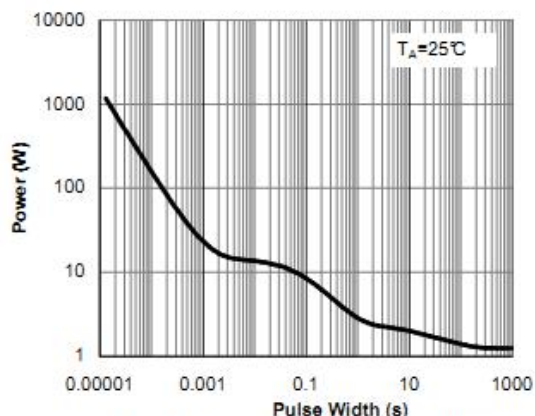


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

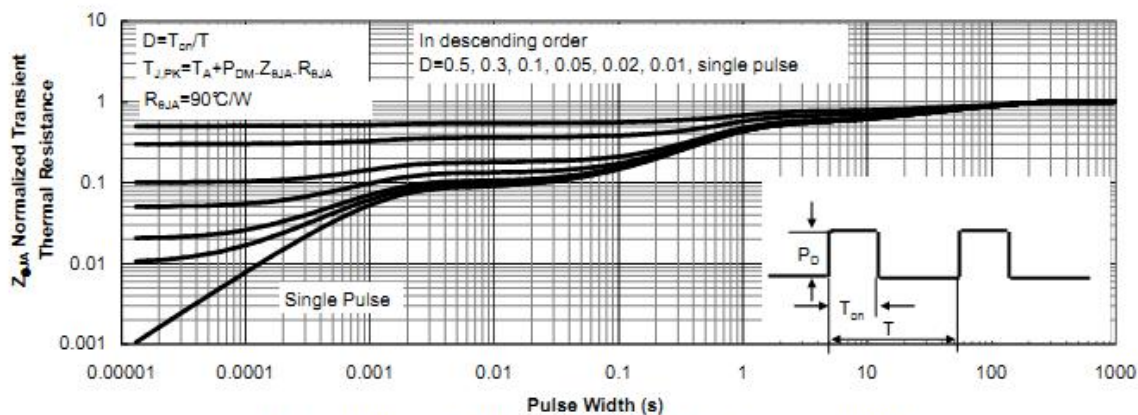
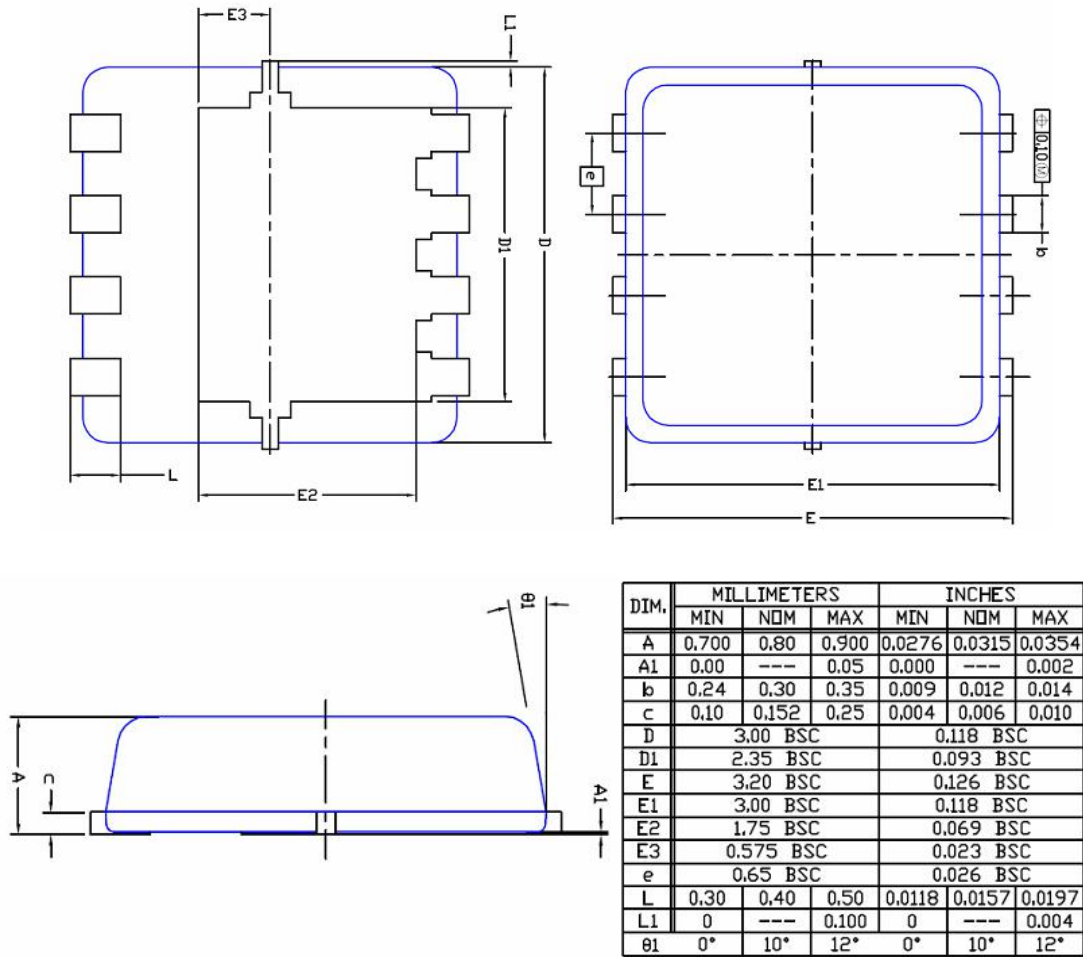


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

# SE30P09D

## Package Outline Dimension

### DFN3X3



The SINO-IC logo is a registered trademark of ShangHai Sino-IC Microelectronics Co., Ltd.

© 2005 SINO-IC - Printed in China - All rights reserved.

SHANGHAI SINO-IC MICROELECTRONICS CO., LTD

Add: Building 3, Room 3401-03, No.200 Zhangheng Road, ZhangJiang Hi-Tech Park, Pudong, Shanghai 201203, China

Phone: +86-21-33932402 33932403 33932405  
33933508 33933608

Fax: +86-21-33932401

Email: szrxw002@126.com

Website: <http://www.sino-ic.net>