

SE10060B

**N-Channel Enhancement-Mode MOSFET**

Revision: A

**General Description**

Advanced trench technology to provide excellent RDS(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

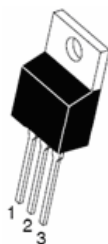
- $V_{DS} = 100V$
- $R_{DS(ON)} = 14m\Omega @ V_{GS}=10V$

**Pin configurations**

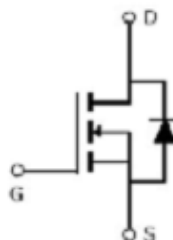
See Diagram below



TO-263



TO-220



**Absolute Maximum Ratings**

Parameter		Symbol	Rating	Units
Drain-Source Voltage		$V_{DS}$	100	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current	Continuous <sup>1,2,3</sup>	$I_D$	60	A
	Pulsed		200	
Total Power Dissipation	@TA=25°C	$P_D$	170	W
Single-pulse avalanche energy <sup>4</sup>		$E_{AS}$	580	mJ
Operating Junction Temperature Range		$T_J$	-55 to 150	°C

**Thermal Resistance**

Symbol	Parameter	Min	Typ	Units
$R_{\theta JA}$	Junction to Ambient		0.88	°C/W

## SE10060B

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	100			V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =20 V			100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		14	17	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = 25V, I <sub>D</sub> =28A	32			S
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		3400		pF
C <sub>oss</sub>	Output Capacitance			260		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			210		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A		94		nC
Q <sub>gs</sub>	Gate Source Charge			16		nC
Q <sub>gd</sub>	Gate Drain Charge			24		nC
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =2A, R <sub>GEN</sub> =2.5Ω		15		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			52		ns
t <sub>d(r)</sub>	Turn-On Rise Time			11		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			13		ns
<b>Source-Drain Characteristics</b>						
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>SD</sub>	Diode forward voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =100A		0.85	1.2	V
I <sub>S</sub>	Diode forward current				60	A
T <sub>rr</sub>	Reverse recovery time <sup>7</sup>	T <sub>J</sub> =25°C, I <sub>F</sub> =28A di/dt=100A/μs		33		ns
Q <sub>rr</sub>	Reverse recovery charge <sup>7</sup>			54		nC

Typical Characteristics

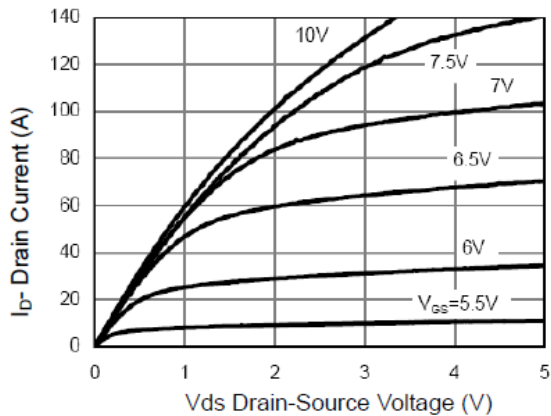


Figure 1 Output Characteristics

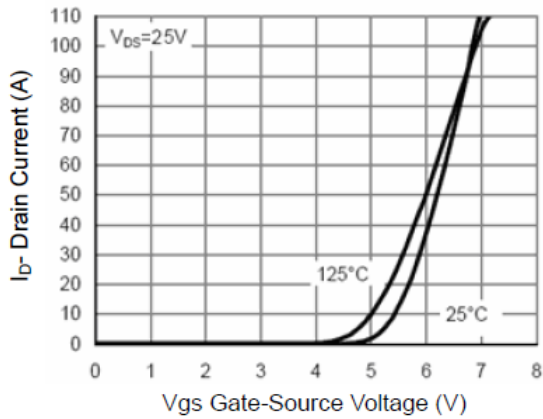


Figure 2 Transfer Characteristics

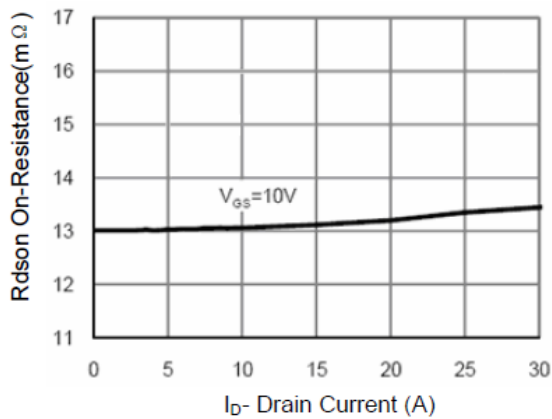


Figure 3  $R_{DS(on)}$ - Drain Current

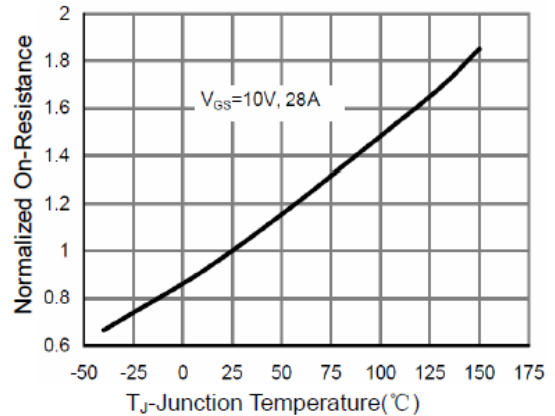


Figure 4  $R_{DS(on)}$ -Junction Temperature

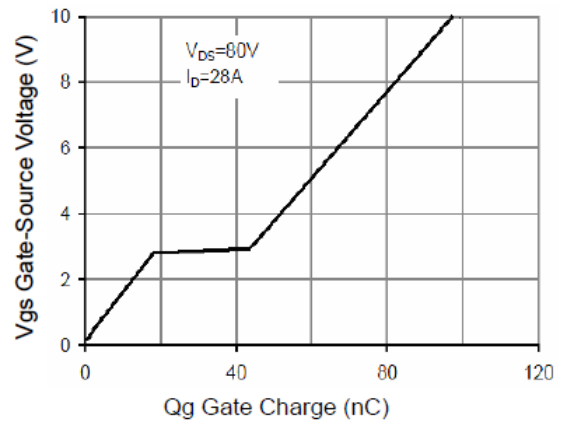


Figure 5 Gate Charge

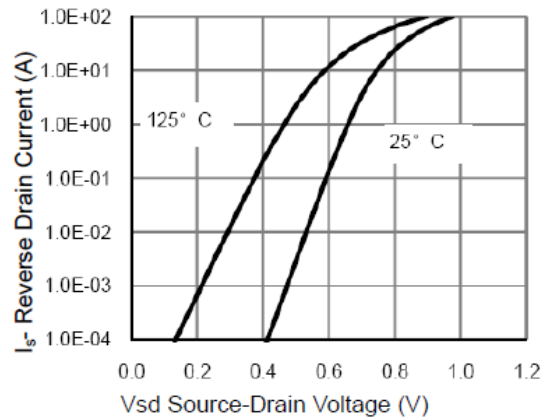


Figure 6 Source- Drain Diode Forward

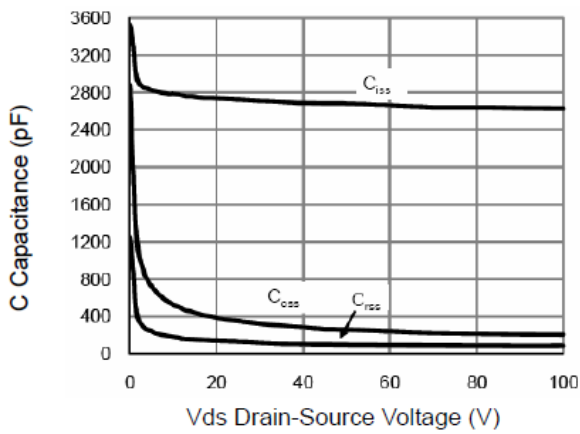


Figure 7 Capacitance vs Vds

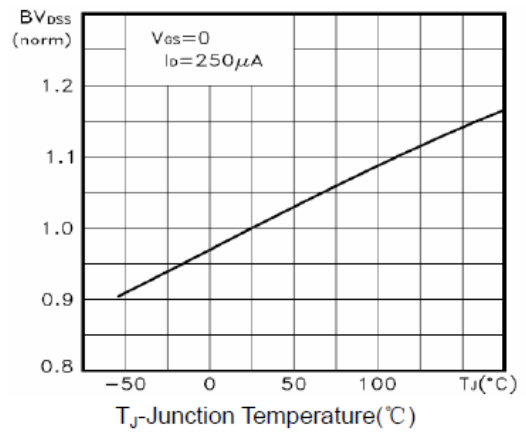


Figure 9  $BV_{DSS}$  vs Junction Temperature

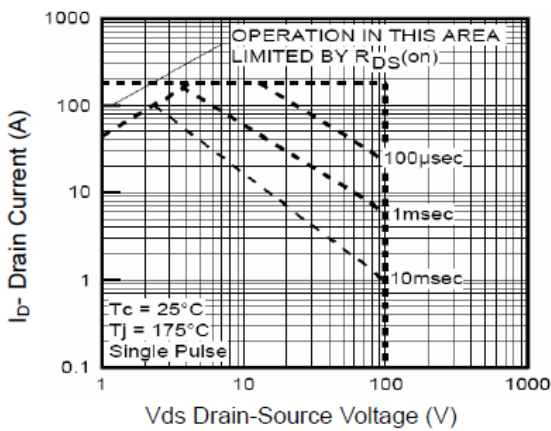


Figure 8 Safe Operation Area

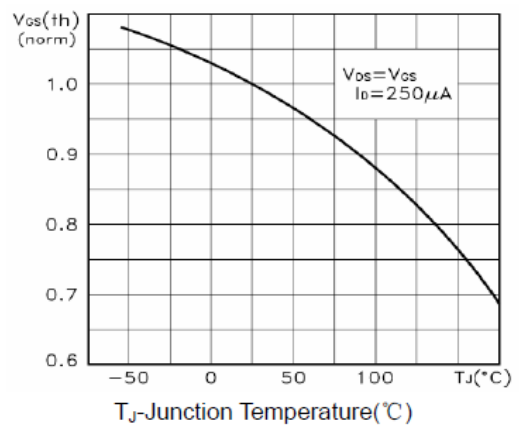


Figure 10  $V_{GS(th)}$  vs Junction Temperature

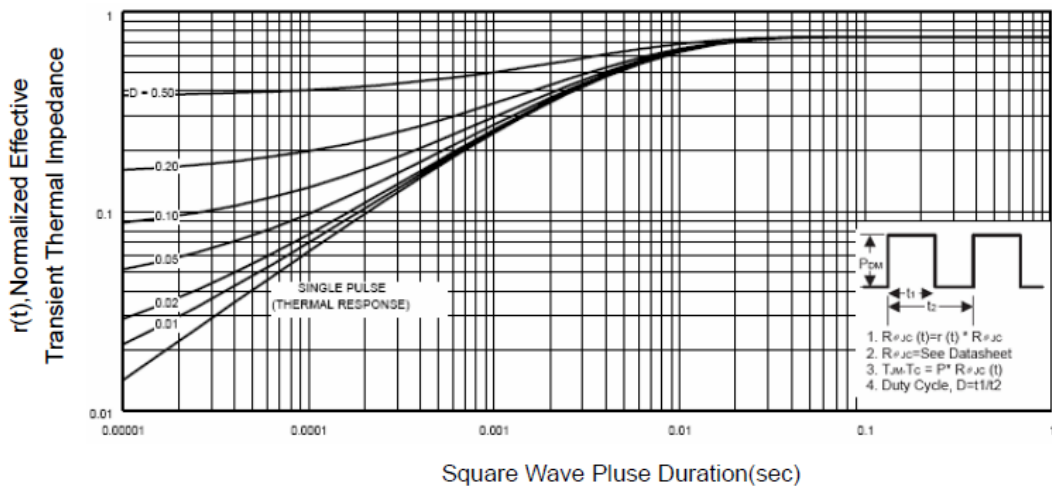
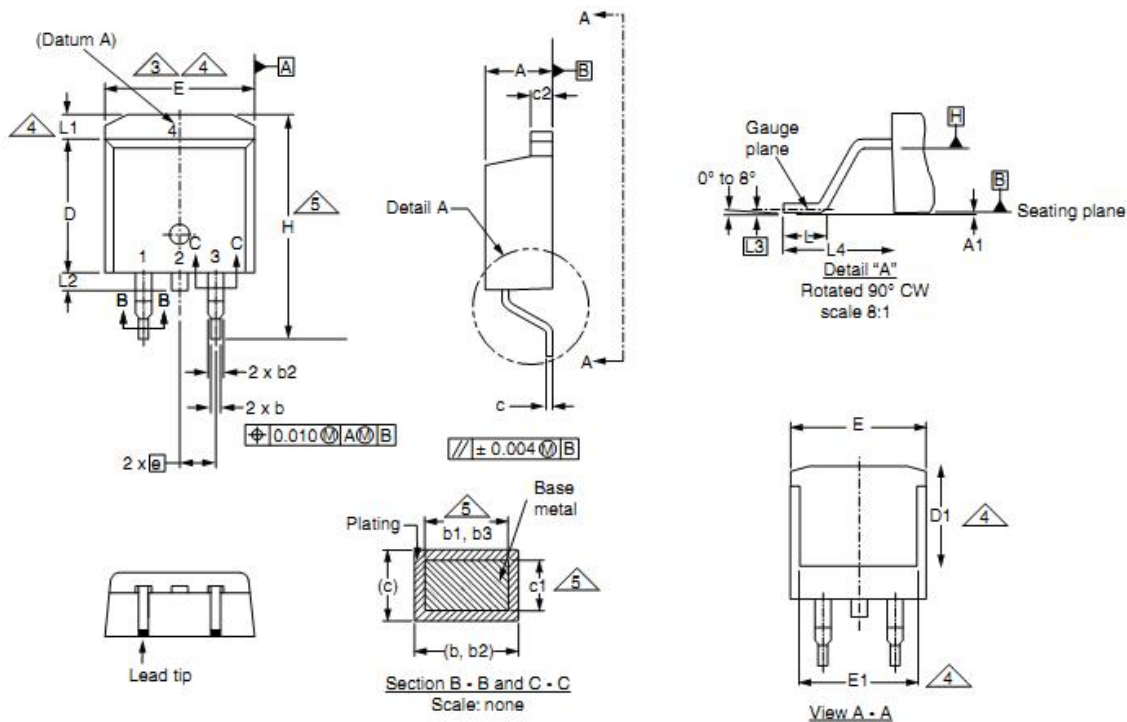


Figure 11 Normalized Maximum Transient Thermal Impedance

# SE10060B

## Package Outline Dimension

### TO-263



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b1	0.51	0.89	0.020	0.035
b2	1.14	1.78	0.045	0.070
b3	1.14	1.73	0.045	0.068
c	0.38	0.74	0.015	0.029
c1	0.38	0.58	0.015	0.023
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
D1	6.86	-	0.270	-
E	9.65	10.67	0.380	0.420
E1	6.22	-	0.245	-
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.65	-	0.066
L2	-	1.78	-	0.070
L3	0.25 BSC		0.010 BSC	
L4	4.78	5.28	0.188	0.208

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>