

SE01P13K

**P-Channel Enhancement Mode Power 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

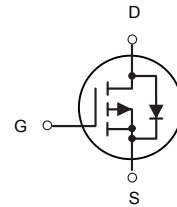
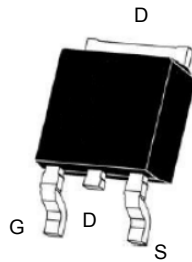
**Features**

For a single MOSFET

- $V_{DS} = -100V$
- $R_{DS(ON)} = 110m\Omega @ V_{GS}=-10V$

**Pin configurations**

See Diagram below



**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	$I_D$	-13	A
	Pulsed		-30	
Total Power Dissipation	@TA=25°C	$P_D$	40	W
Single Pulse Avalanche Energy		$E_{AS}$	110	mJ
Operating Junction Temperature Range		$T_J$	-55 to 150	°C

**Thermal Resistance**

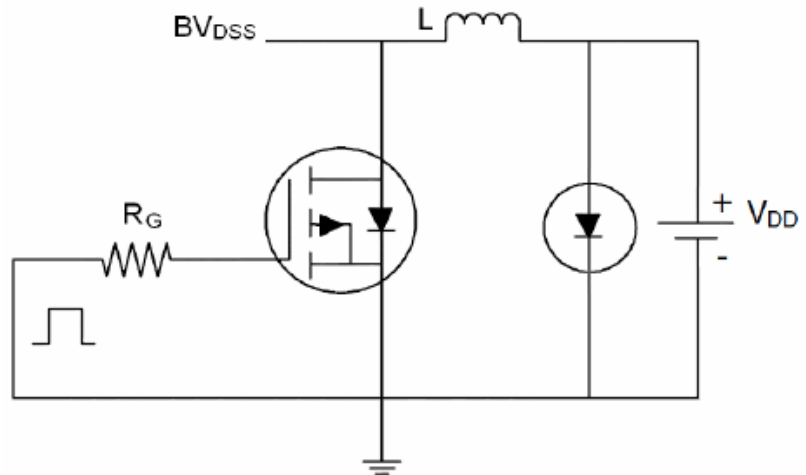
Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	3.13	°C/W

## SE01P13K

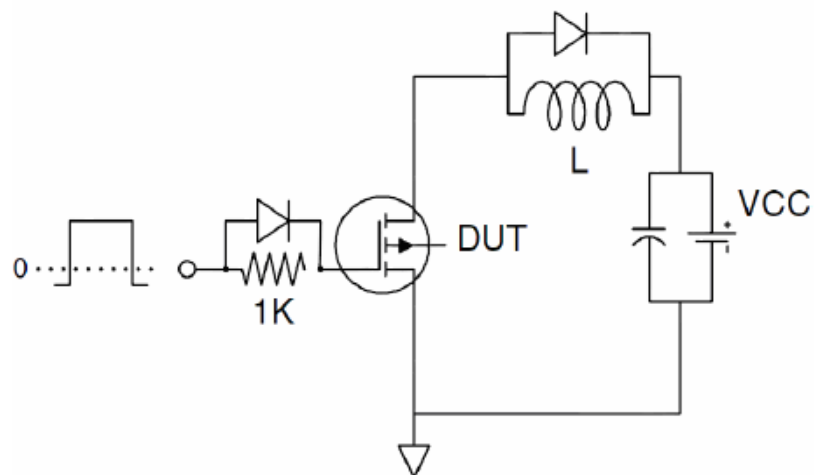
Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS (Note 2)</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0 V	-100			V
I <sub>DSS</sub>	Drain to 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> =20V			10	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	-1	-1.9	-3	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-16A	-	170	200	mΩ
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-15V, I <sub>D</sub> =-5A	12			S
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1MHz		760		pF
C <sub>oss</sub>	Output Capacitance			260		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			170		pF
<b>SWITCHING PARAMETERS</b>						
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V R <sub>GEN</sub> =9.1Ω, I <sub>D</sub> =-10A		14		ns
t <sub>d(off)</sub>	Turn-Off Delay Time			50		ns
t <sub>d(r)</sub>	Turn-On Rise Time			18		ns
t <sub>d(f)</sub>	Turn-Off Fall Time			18		ns
<b>Source-Drain Ratings and Characteristics</b>						
I <sub>S</sub>	Continuous Source Current				130	mA
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-10A, V <sub>GS</sub> =0V			-1.2	V
trr	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =-10A		35		nS
Qrr	Reverse Recovery Charge	di/dt=100A/μs		46		nc

Test Circuits and Waveform

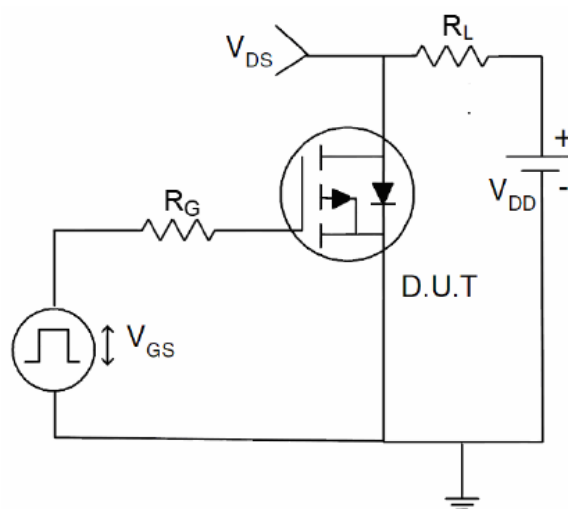
1)  $E_{AS}$  Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Characteristics

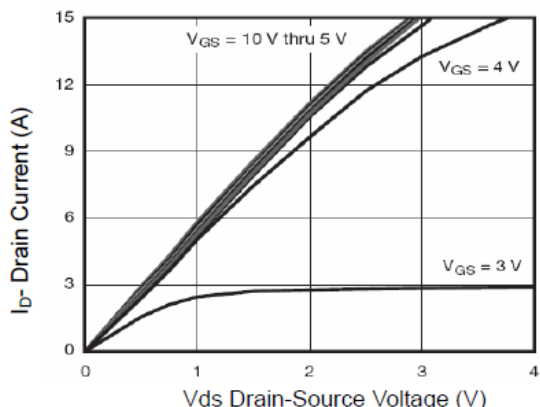


Figure 1 Output Characteristics

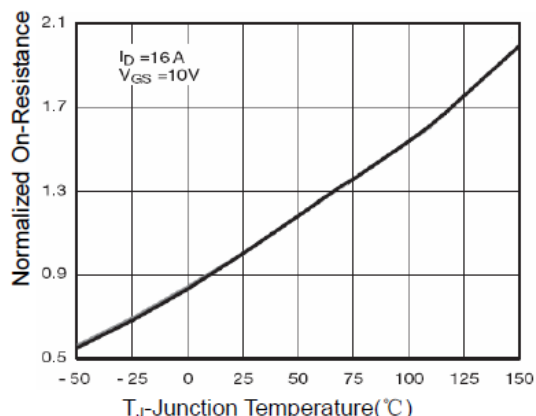


Figure 4 Rdson-Junction Temperature

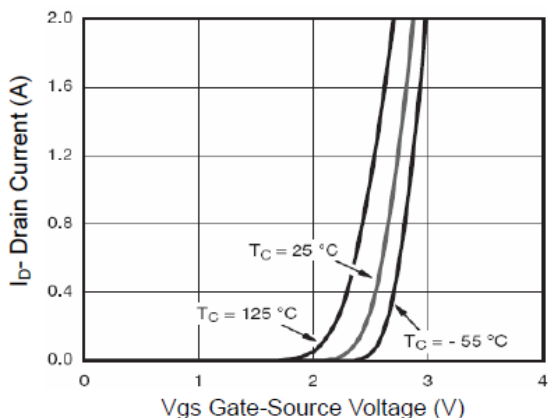


Figure 2 Transfer Characteristics

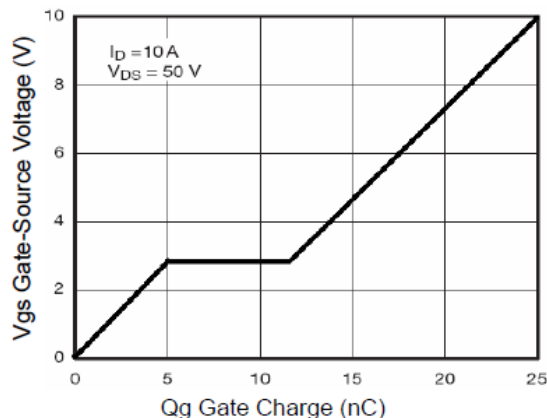


Figure 5 Gate Charge

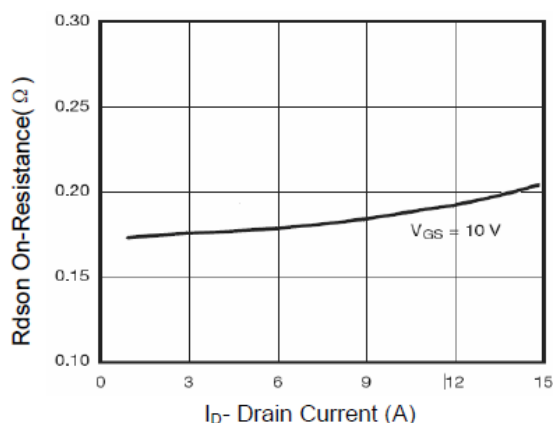


Figure 3 Rdson- Drain Current

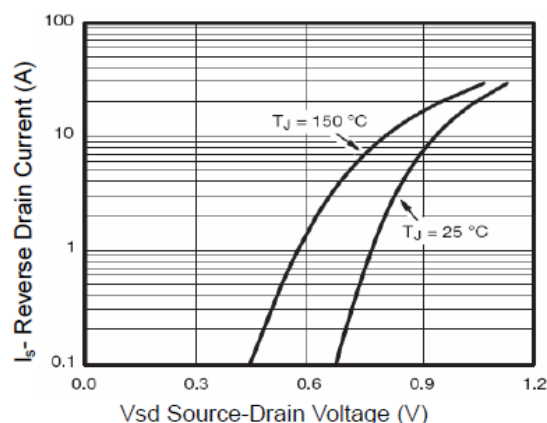


Figure 6 Source- Drain Diode Forward

Typical Characteristics

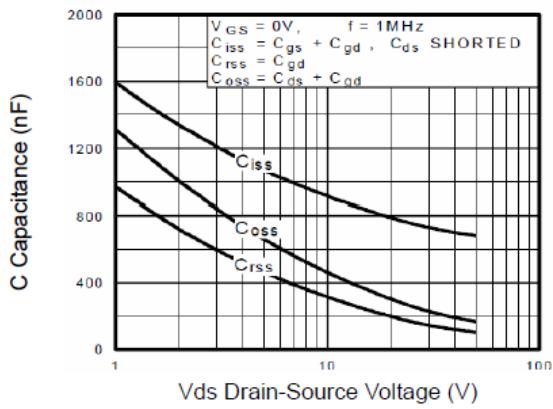


Figure 7 Capacitance vs Vds

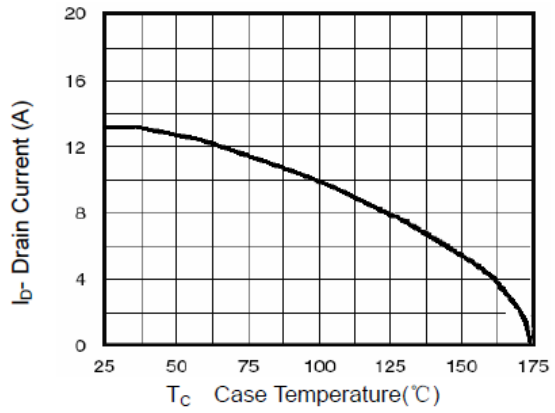


Figure 9 Drain Current vs Case Temperature

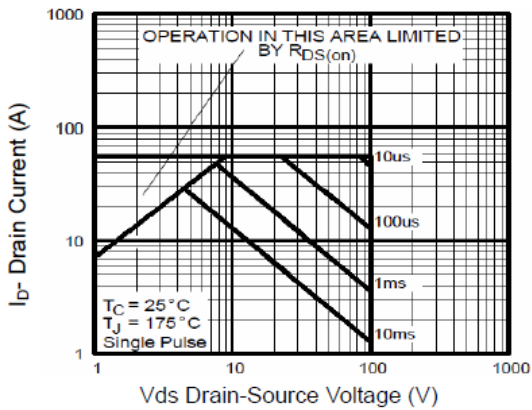


Figure 8 Safe Operation Area

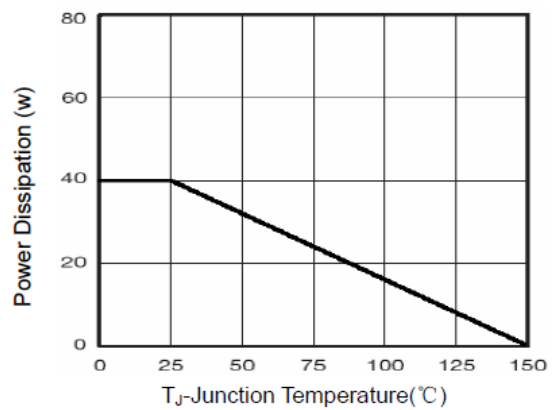


Figure 10 Power De-rating

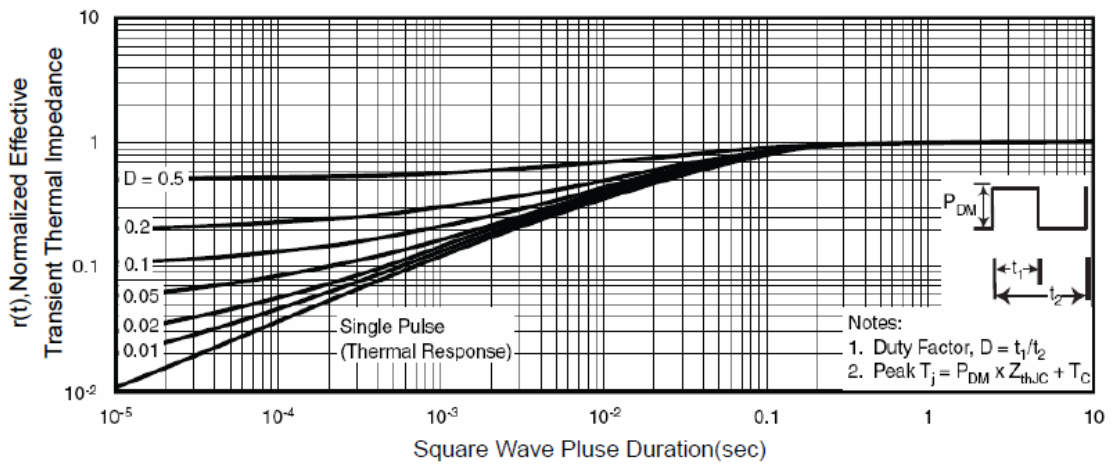
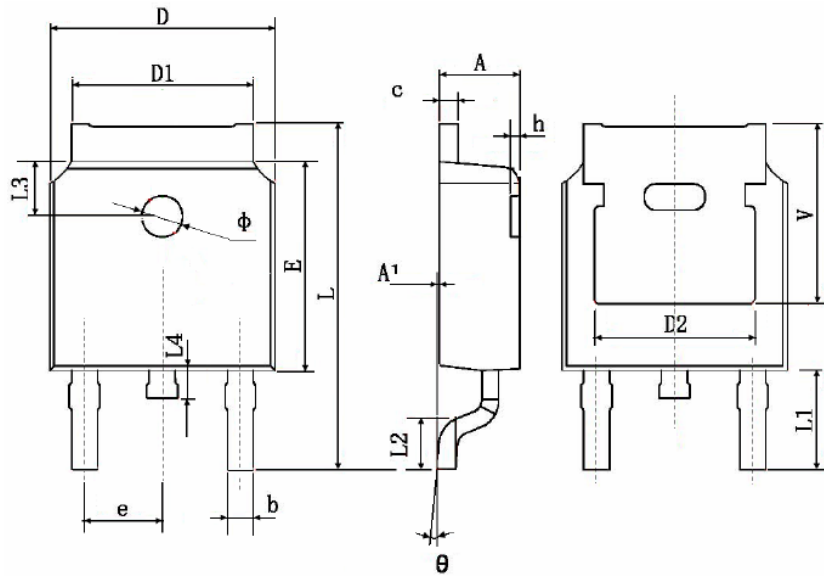


Figure 11 Normalized Maximum Transient Thermal Impedance

# SE01P13K

## Package Outline Dimension

### TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
phi	1.100	1.300	0.043	0.051
theta	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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

Email: szrxw002@126.com

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