SHANGHAI SINO-IC MICROELECTRONICS CO., LTD.

Mar 2015

SE3415A

P-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

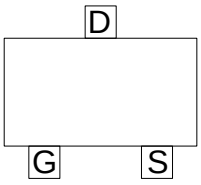
Features

For a single MOSFET

- V_{DS} = -20V
- $R_{DS(ON)}$ = 46mΩ @ V_{GS}=-2.5 @I_{DS}=-4A

Pin configurations

See Diagram below



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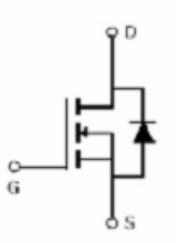


Absolute Maximum Ratings

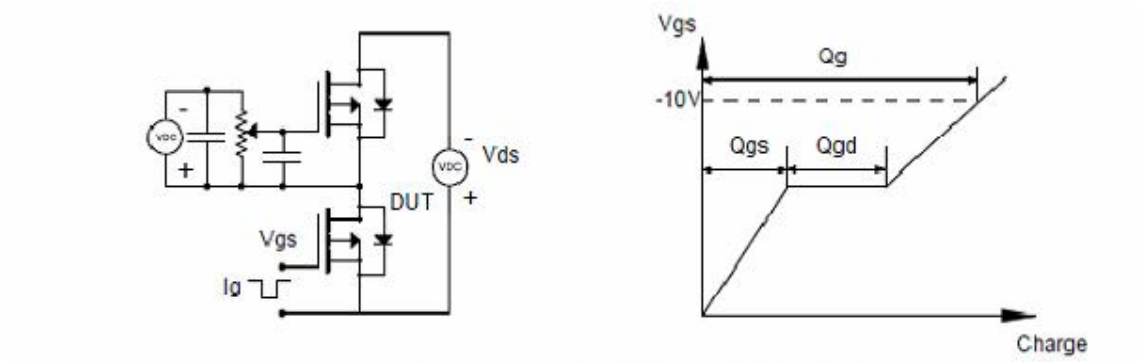
Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	V
Drain Current	Continuous	I_D	-4	A
	Pulsed		-30	
Total Power Dissipation	@TA=25℃	P_D	1.5	W
Operating Junction Temperature Range		T_J	-55 to 150	℃

Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ**	**Max**	**Units**
OFF CHARACTERISTICS (Note 2)						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS}=0 V	-20			V
I_{DSS}	Drain to Source Leakage Current	V_{DS}= -20V, V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= 18V			110	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	-0.3	-0.57	-0.9	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance [2]	V_{GS}=-2.5V, I_D=-4A	-	46	-	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=10V, f=1MHz	600	751	905	pF
C_{oss}	Output Capacitance		80	115	150	pF
C_{rss}	Reverse Transfer Capacitance		48	80	115	pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge [2]	V_{GS}=4.5V, V_{DS}=10V, I_D=4A	7.4	9.3	11	nC
Q_{gs}	Gate Source Charge		0.8	1	12	nC
Q_{gd}	Gate Drain Charge		1.3	2.2	3.1	nC
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=-4.5V, V_{DS}=-10V, R_{GEN}=3Ω, R_L=2.5Ω		13		ns
$t_{d(off)}$	Turn-Off Delay Time			19		ns
$t_{d(r)}$	Turn-On Rise Time			9		ns
$t_{d(f)}$	Turn-Off Fall Time			29		ns

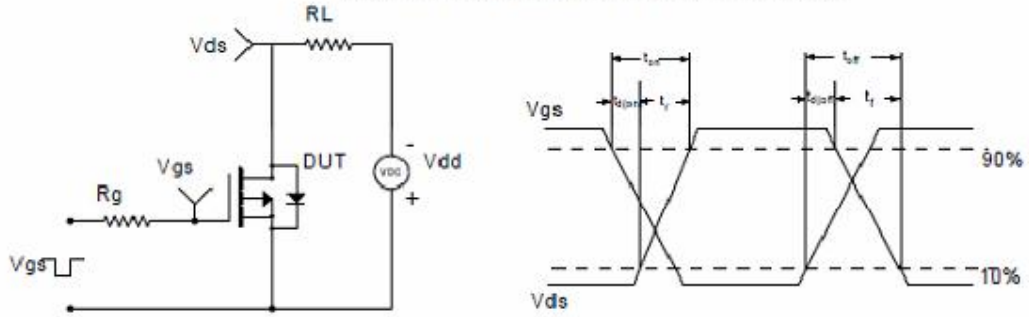
Thermal Resistance

Symbol	**Parameter**	**Typ**	**Max**	**Units**
$R_{\theta JC}$	Junction to Case	-	43	℃/W
$R_{\theta JA}$	Junction to Ambient (t≦10s)	-	65	℃/W

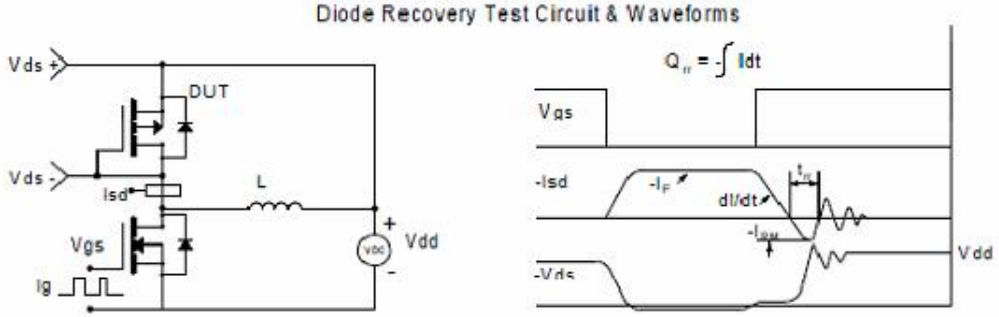
Test Circuits and Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Characteristics

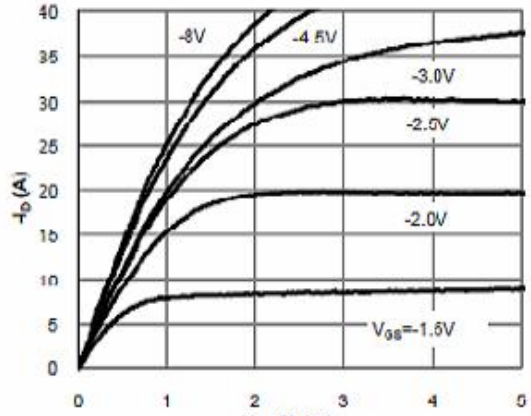


Fig 1: On-Region Characteristics (Note E)

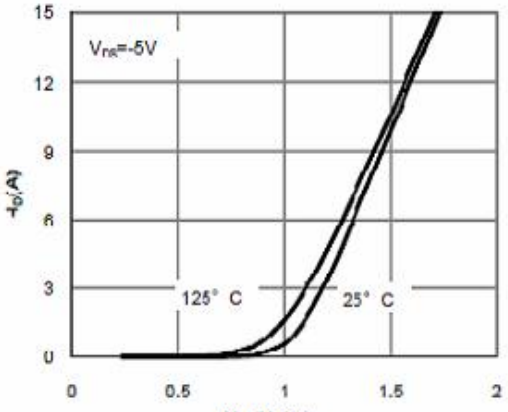


Figure 2: Transfer Characteristics (Note E)

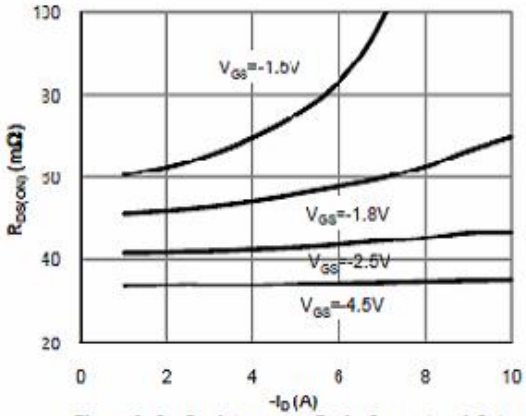


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

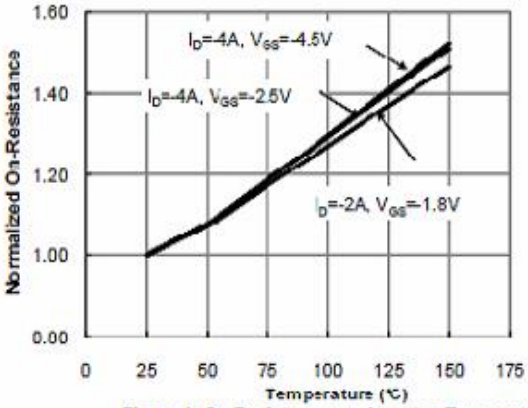


Figure 4: On-Resistance vs. Junction Temperature (Note E)

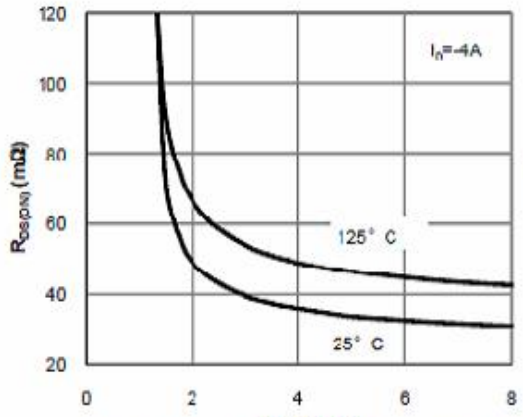


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

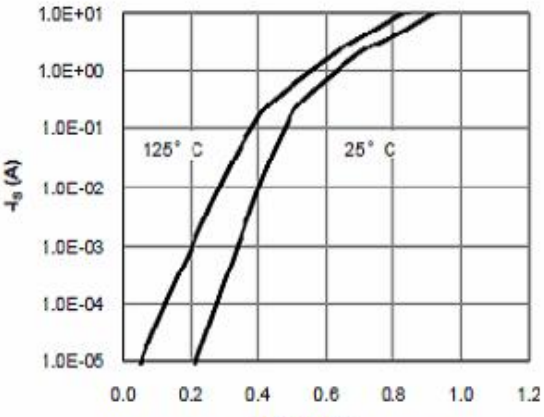


Figure 6: Body-Diode Characteristics (Note E)

Typical Characteristics

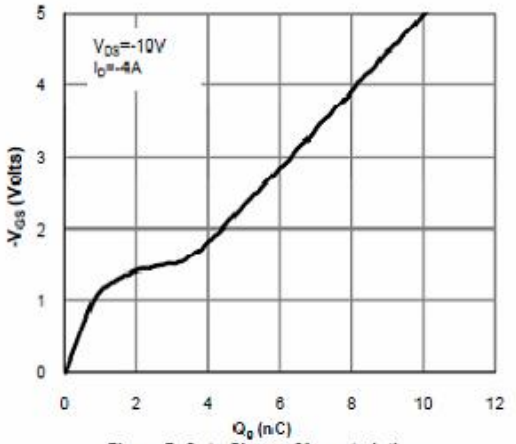


Figure 7: Gate-Charge Characteristics

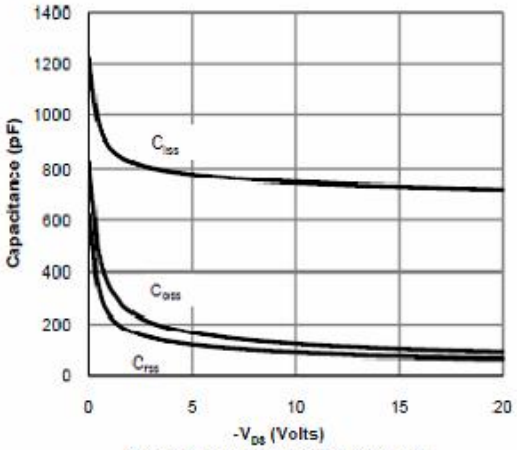


Figure 8: Capacitance Characteristics

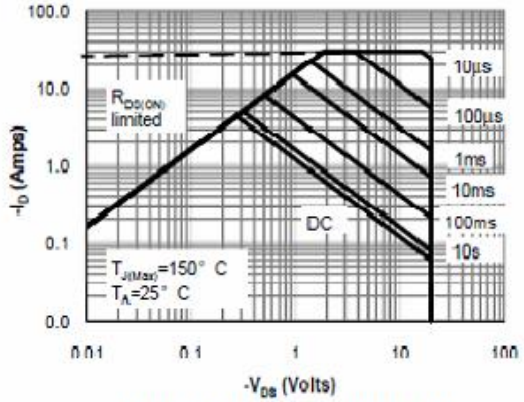


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

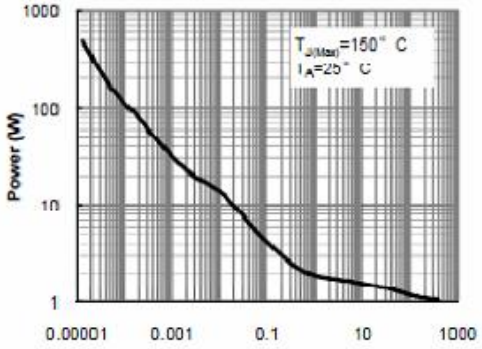


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

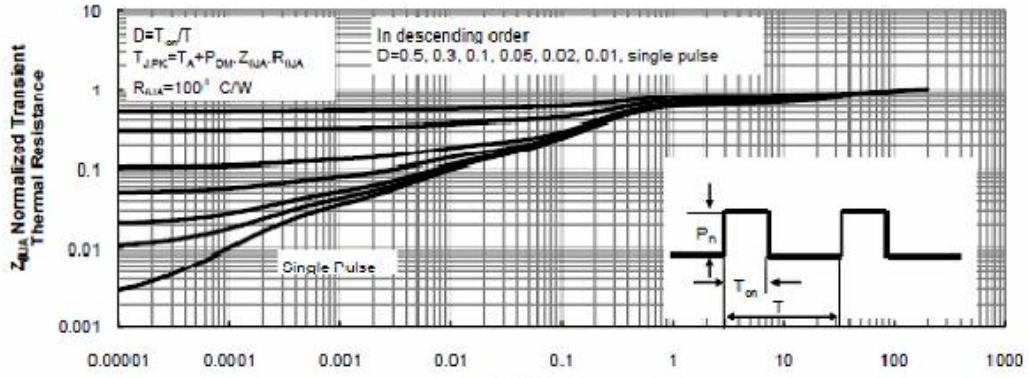


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Package Outline Dimension

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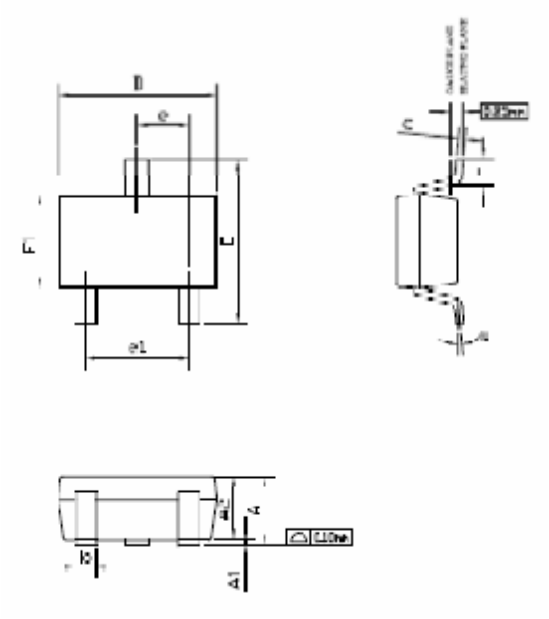
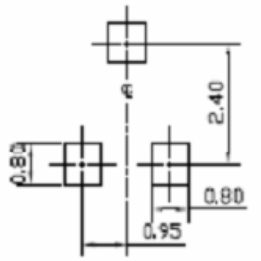


RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	—	1.25	0.033	—	0.049
A1	0.00	—	0.13	0.000	—	0.005
A2	0.70	1.00	1.15	0.028	0.039	0.045
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.08	0.13	0.20	0.003	0.005	0.008
D	2.80	2.90	3.10	0.110	0.114	0.122
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.40	1.60	1.80	0.055	0.063	0.071
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
L	0.30	—	0.60	0.012	—	0.024
θ1	0°	5°	8°	0°	5°	8°

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