

SE100130A

N-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

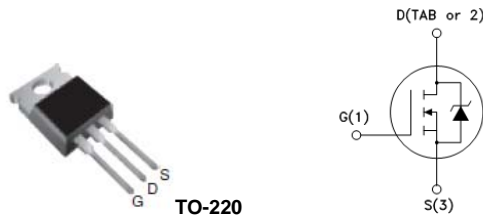
Features

For a single MOSFET

- $V_{DS} = 100V$
- $R_{DS(ON)} = 3.0m\Omega @ V_{GS}=10V$

Pin configurations

See Diagram below



Absolute Maximum Ratings

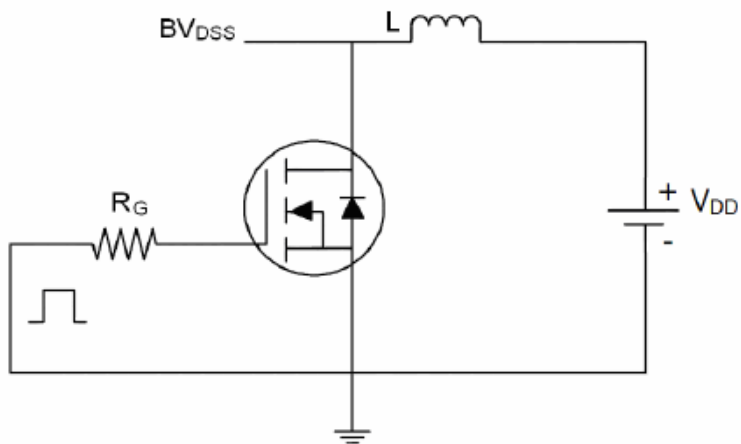
Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_D	130	A
	Pulsed		500	
Single Pulse Avalanche Energy			1100	mJ
Total Power Dissipation	@ $T_A=25^\circ C$	P_D	285	W
Operating Junction Temperature Range		T_J	-55 to 150	$^\circ C$

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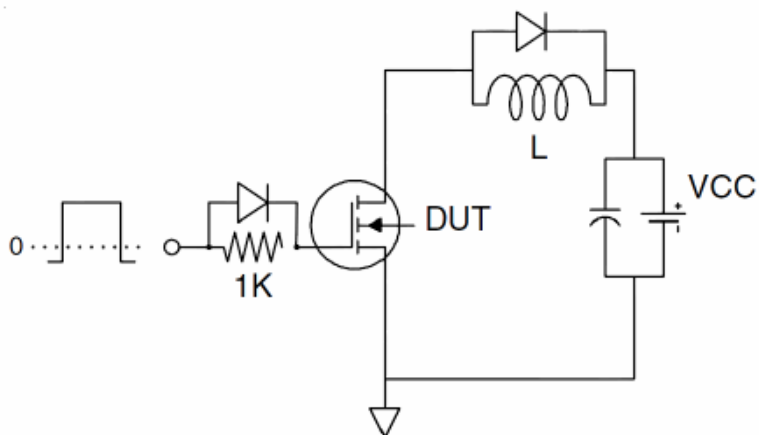
Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS (Note 2)						
B _{VDS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V	100			V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 100V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = 20V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	1.0		3.0	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =40A		3.0	4.0	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		75		S
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, f=1MHz		3650		pF
C _{oss}	Output Capacitance			290		pF
C _{rss}	Reverse Transfer Capacitance			88		pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge ²	V _{GS} =10V, V _{DS} =50V, I _D =65A		56		nC
Q _{gs}	Gate Source Charge			14		nC
Q _{gd}	Gate Drain Charge			18		nC
t _{d(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =50V, R _{GEN} =3Ω,		17		ns
t _{d(off)}	Turn-Off Delay Time			57		ns
t _{d(r)}	Turn-On Rise Time			40		ns
t _{d(f)}	Turn-Off Fall Time			37		ns
REVERSE DIODE						
I _S	Diode Continuous Forward Current	T _C =25°C			20	A
V _{SD}	Diode Forward Voltage	V _{DS} =0V, I _F =20V,		0.9	1.2	V
T _{rr}	Reverse Recovery Time	V _R =50V, I _F =I _S		50		ns
Q _{rr}	Reverse Recovery Charge	dI/dT=500A/μs		255		nC

Test Circuits and Waveform

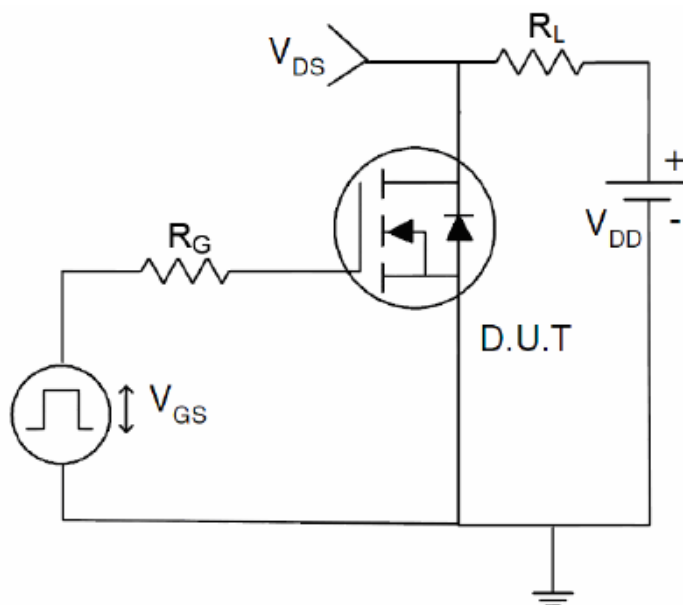
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Characteristics

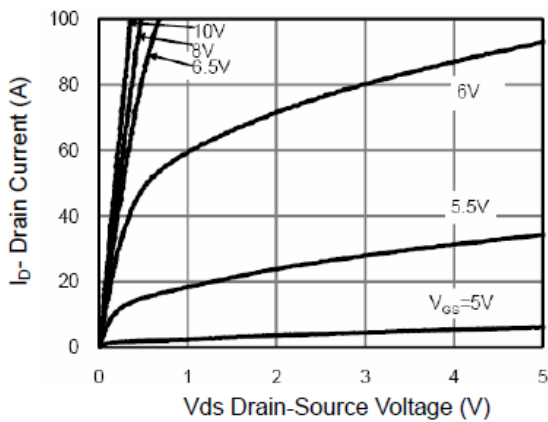


Figure 1 Output Characteristics

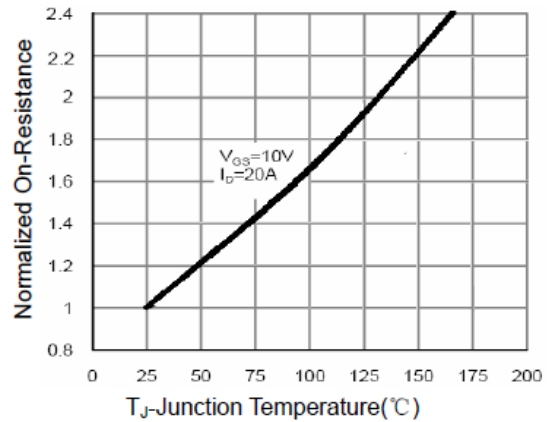


Figure 4 Rdson-Junction Temperature

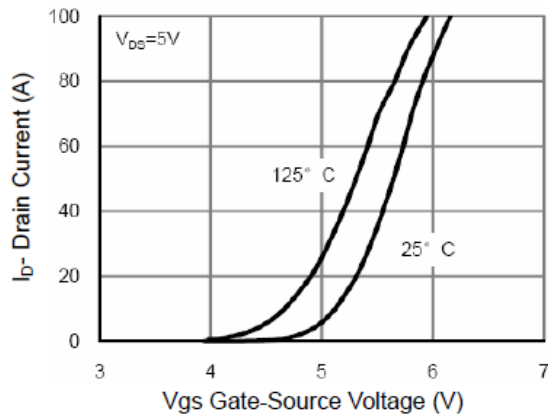


Figure 2 Transfer Characteristics

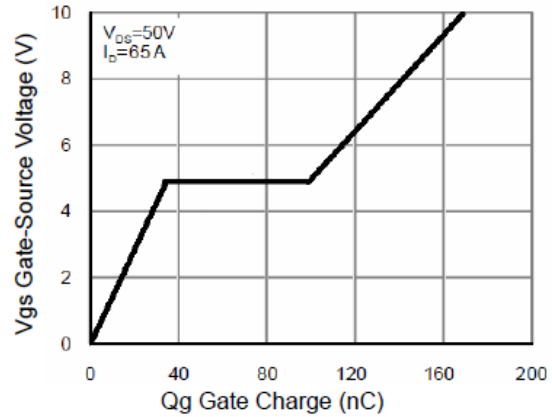


Figure 5 Gate Charge

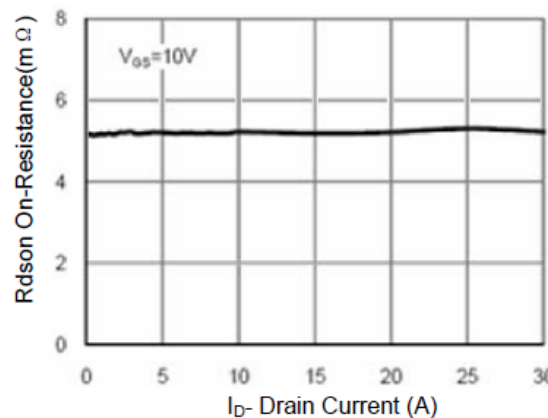


Figure 3 Rdson- Drain Current

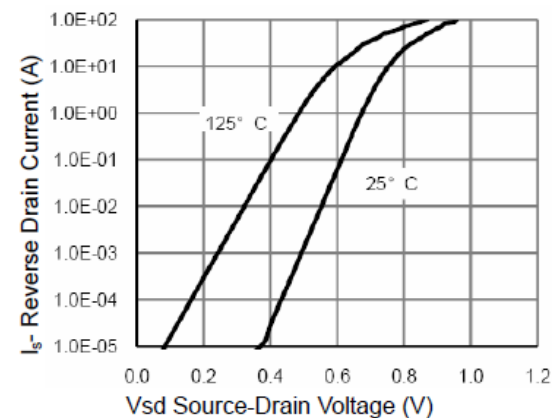


Figure 6 Source- Drain Diode Forward

Typical Characteristics

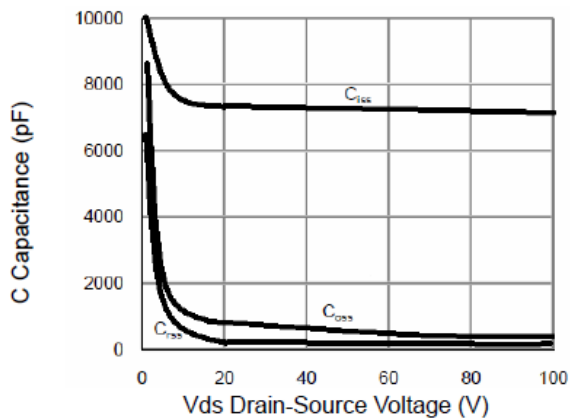


Figure 7 Capacitance vs Vds

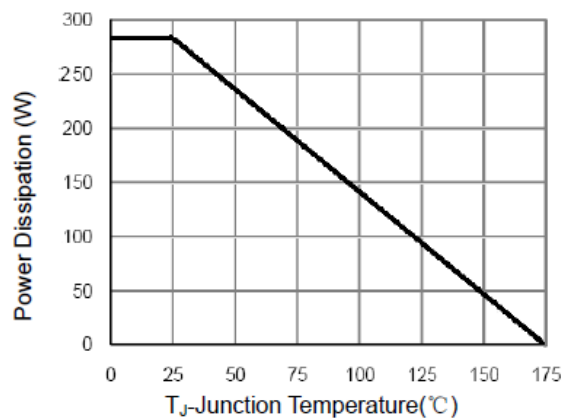


Figure 9 BV_{DSS} vs Junction Temperature

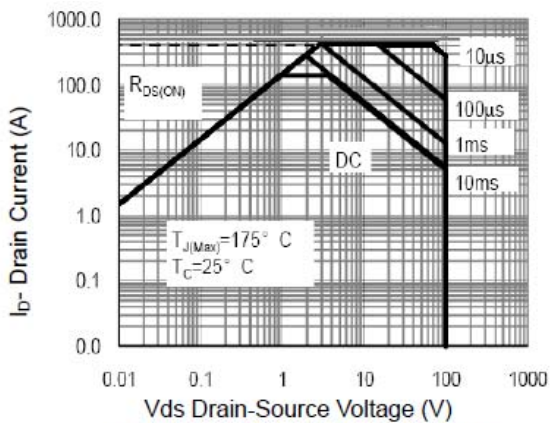


Figure 8 Safe Operation Area

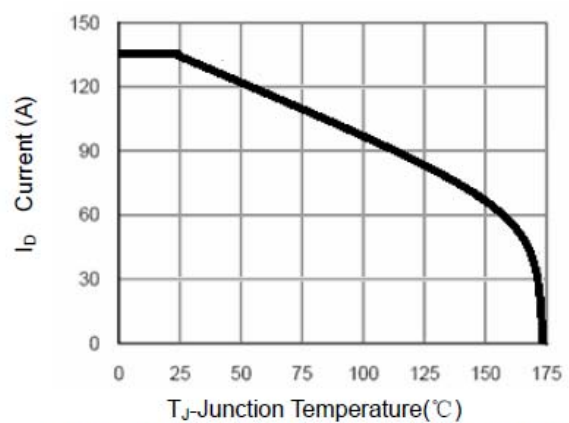


Figure 10 I_D Current- Junction Temperature

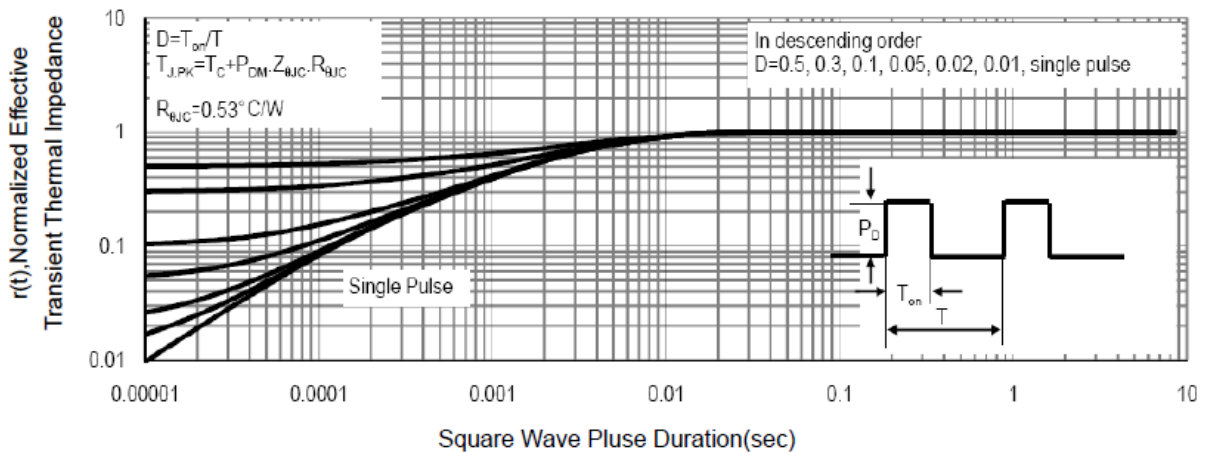
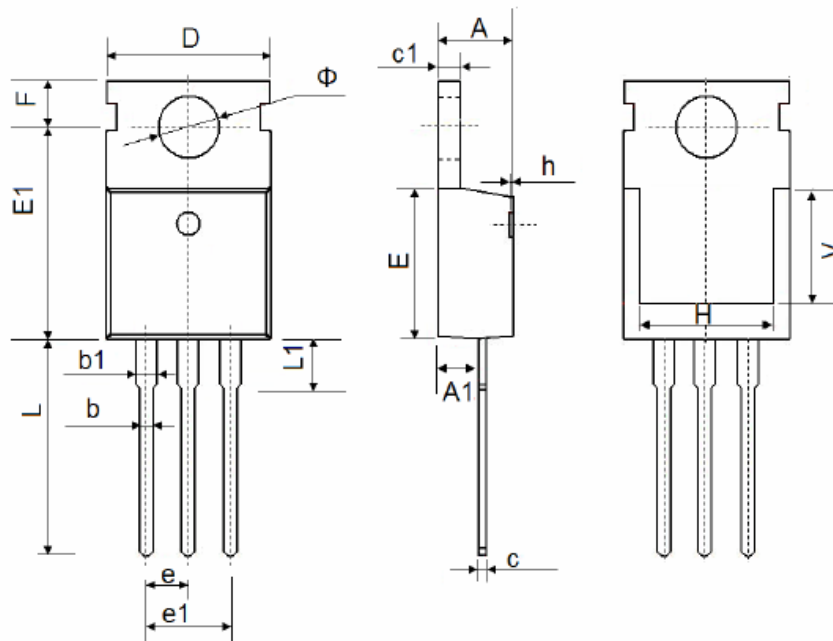


Figure 11 Normalized Maximum Transient Thermal Impedance

SE100130A

Package Outline Dimension

TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150

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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: webmaster@sino-ic.net

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

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