

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

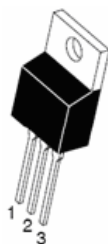
- $V_{DS} = 100V$
- $R_{DS(ON)} = 14m\Omega @ V_{GS}=10V$

Pin configurations

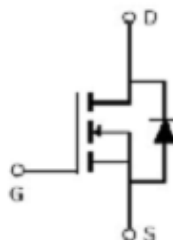
See Diagram below



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Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous ^{1,2,3}	I_D	60	A
	Pulsed		200	
Total Power Dissipation	@TA=25°C	P_D	170	W
Single-pulse avalanche energy ⁴		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

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

Typical Characteristics

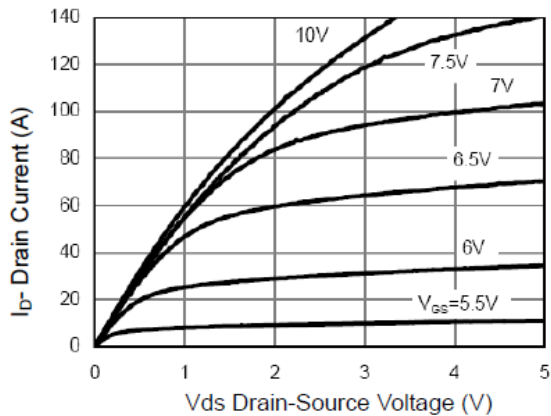


Figure 1 Output Characteristics

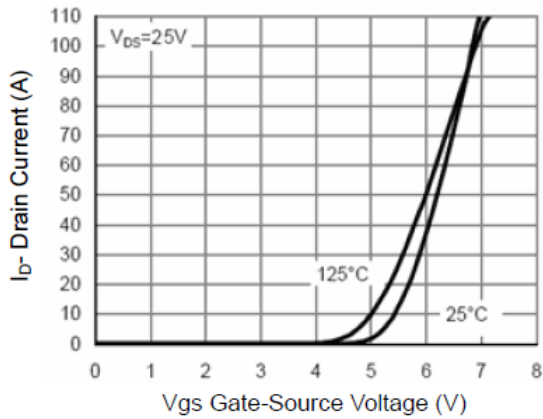


Figure 2 Transfer Characteristics

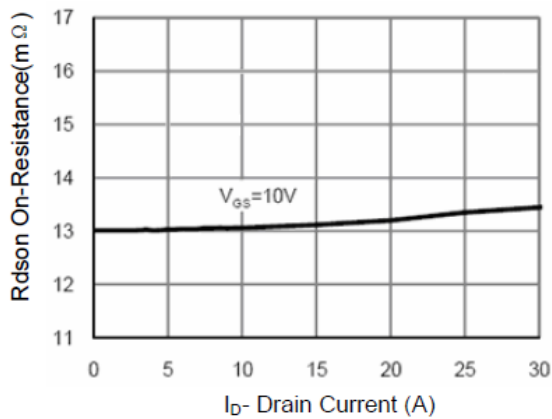


Figure 3 $R_{DS(on)}$ - Drain Current

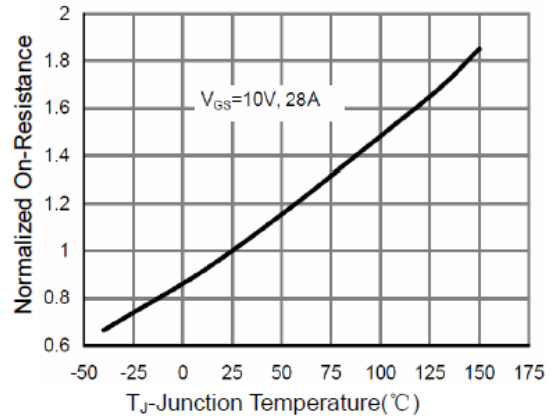


Figure 4 $R_{DS(on)}$ -Junction Temperature

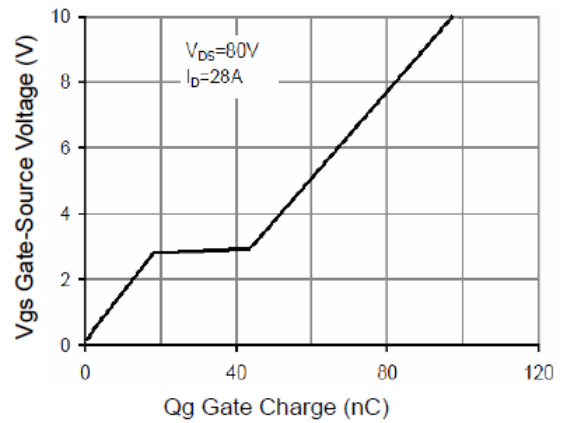


Figure 5 Gate Charge

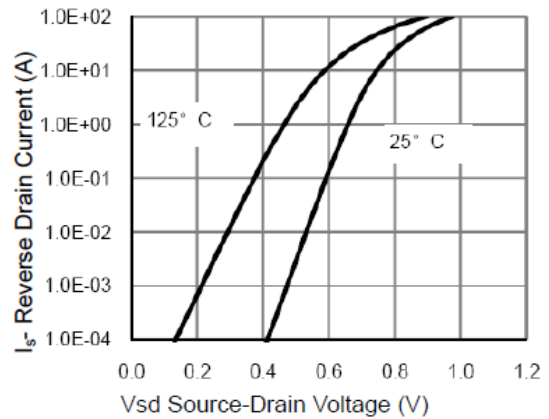


Figure 6 Source- Drain Diode Forward

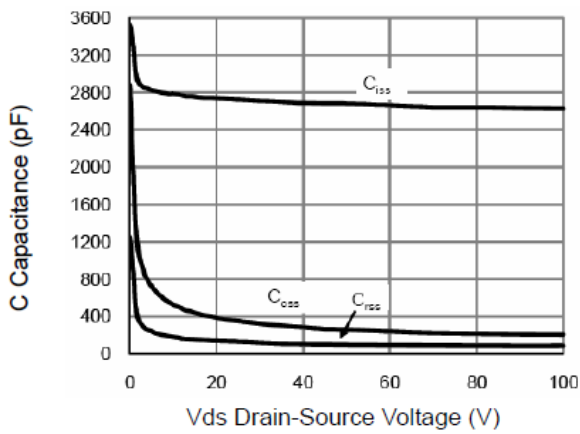


Figure 7 Capacitance vs Vds

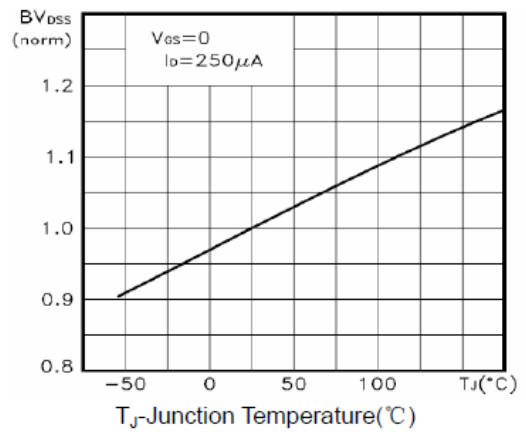


Figure 9 BV_{DSS} vs Junction Temperature

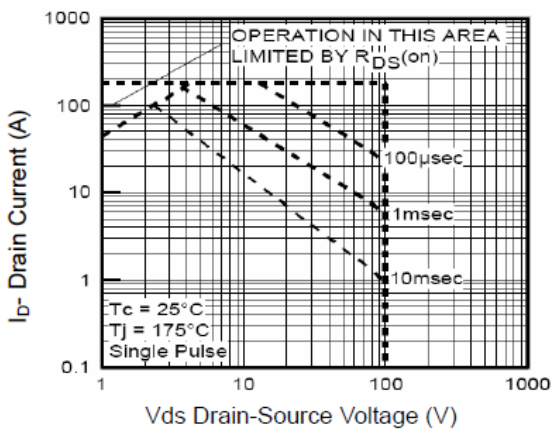


Figure 8 Safe Operation Area

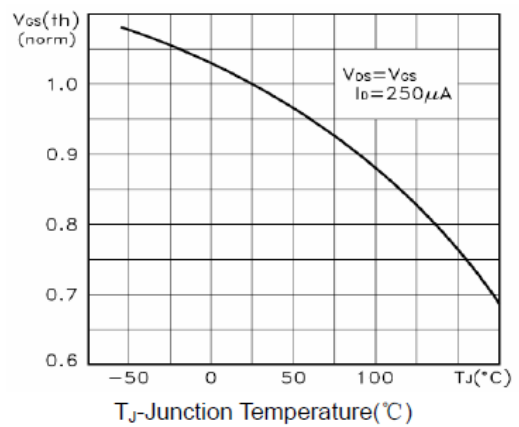


Figure 10 $V_{GS(th)}$ vs Junction Temperature

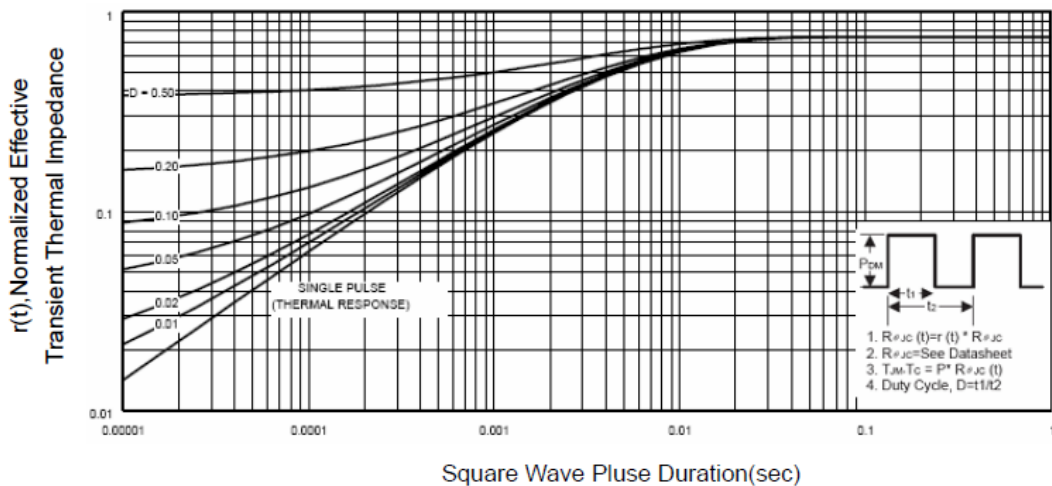
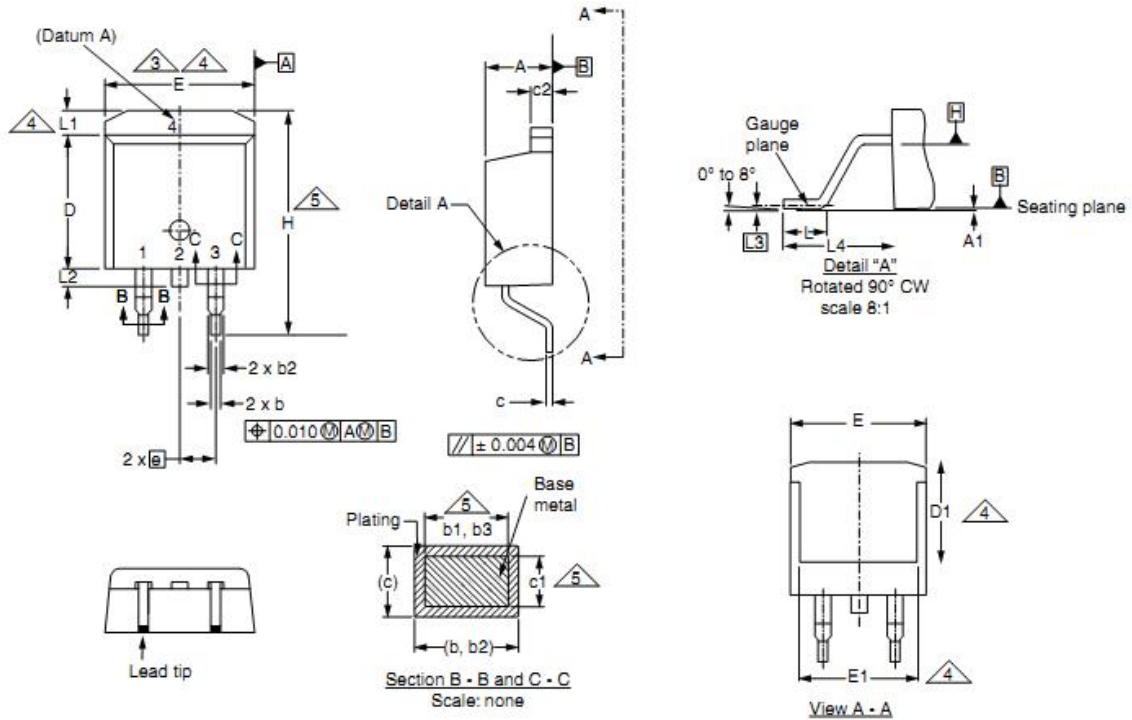


Figure 11 Normalized Maximum Transient Thermal Impedance

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Package Outline Dimension

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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

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