



SE3080

30V,80A N-Channel MOSFET

Revision:A

General Description

The SE3080 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

Features

- $V_{DS} = 30V$, $I_D = 80A$
- $R_{DS(ON)} < 7.5m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 10m\Omega$ ($V_{GS} = 5V$)

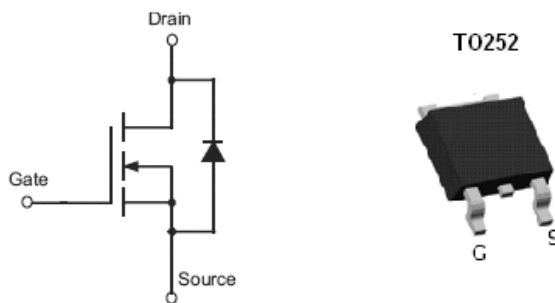
- High density cell design for ultra low Rdson
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

Application

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply
- RoHS product for packing code suffix "G"
- Halogen free product for packing code suffix "H"

Pin configurations

See Diagram below



Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current Continuous	I_D	80	A
Drain Current Continuous ($T_c=100^\circ C$)	$I_D (100^\circ C)$	50	A
Pulsed Drain Current	I_{DM}	170	A
Total Power Dissipation	P_D	83	W
Single pulse avalanche energy (Note 5)	E_{AS}	150	mJ
Operating Junction Temperature Range	T_J	-55 to 175	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Thermal Resistance ,Junction-to-case (Note 2)	$R_{\theta JC}$	1.8	-	$^\circ C/W$



Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250 μ A, V _{GS} =0 V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0 V			1	μ A
I _{GSS}	Gate-Body leakage current	V _{DS} =0 V, V _{GS} =±20 V			±100	nA
ON CHARACTERISTICS (Note 3)						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D =250uA	1	1.5	3	V
R _{DS(ON)}	Static Drain-Source On-Resistance2	V _{GS} =10V, I _D =30A		5.5	7.5	m Ω
		V _{GS} =5V, I _D =24A		7.5	10	m Ω
Y _{fs}	Forward Transfer Admittance	V _{GS} = 5 V, I _S =24A	20			S
DYNAMIC CHARACTERISTICS (Note 4)						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		2330		pF
C _{oss}	Output Capacitance			460		pF
C _{rss}	Reverse Transfer Capacitance			230		pF
SWITCHING CHARACTERISTICS (Note 4)						
t _{d(on)}	Turn-on Delay Time	V _{DD} =10V,I _D =30A V _{GS} =10V,R _{GEN} =2.7 Ω		20		nS
t _r	Turn-on Rise Time			15		nS
t _{d(off)}	Turn-off Delay Time			60		nS
t _f	Turn-off fall Time			10		nS
Q _g	Total Gate Charge	V _{DD} =10V,I _D =30A V _{GS} =10V		51		nC
Q _{gs}	Gate-Source Charge			14		nC
Q _{gd}	Gate-Drain Charge			11		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
V _{SD}	Diode Forward Voltage(Notes 3)	V _{GS} =0V,I _S =24A			1.2	V
I _S	Diode Forward Current(Notes 2)				80	A
t _{rr}	Reverse Recovery Time	TJ=25°C,IF=80A		32	50	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/ μ S(Note 3)		12	20	nC

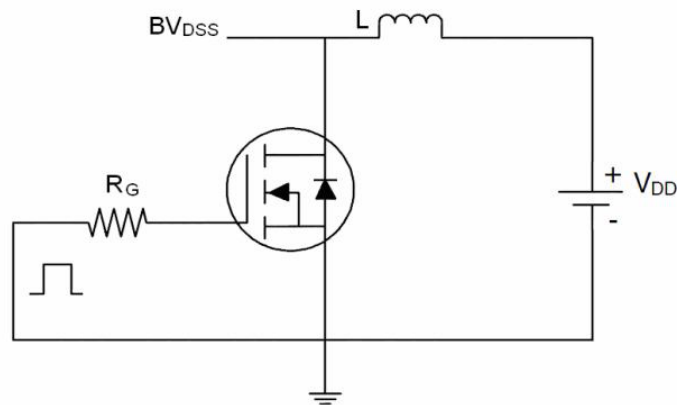
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=1mH, R_g=25Ω

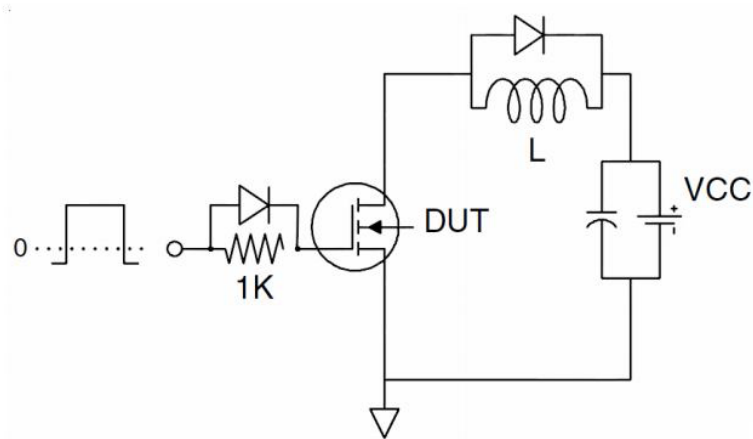


Test circuit

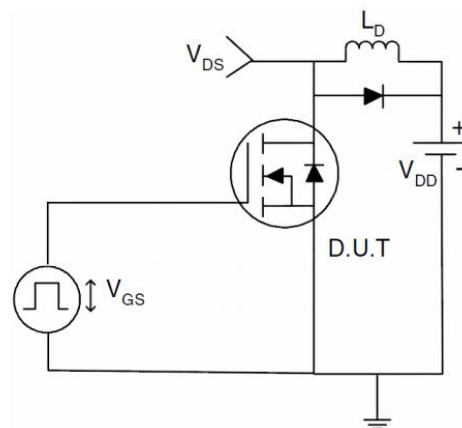
1) EAS test Circuits



2) Gate charge test Circuit:



3) Switch Time Test Circuit:





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

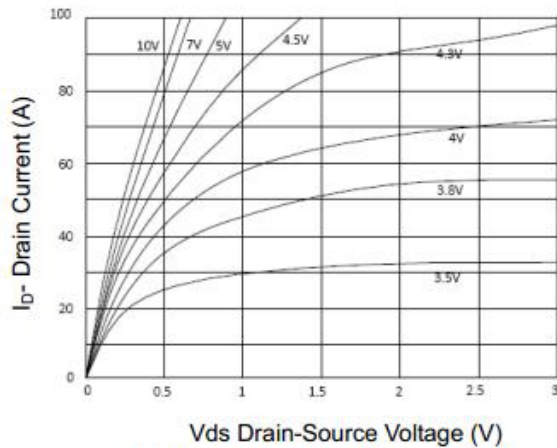


Figure 1 Output Characteristics

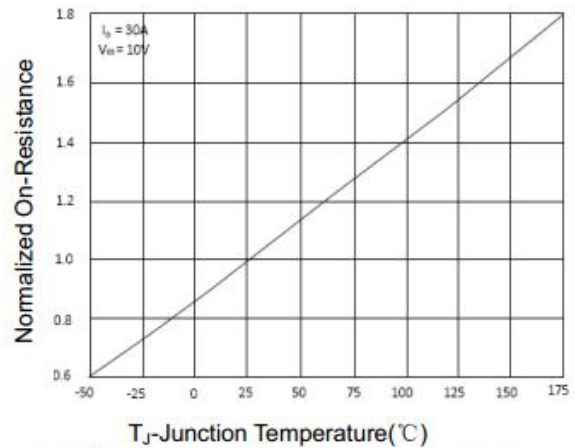


Figure 4 Rdson-Junction Temperature

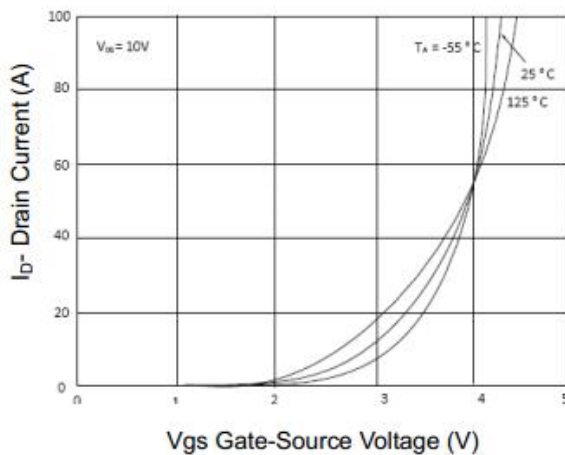


Figure 2 Transfer Characteristics

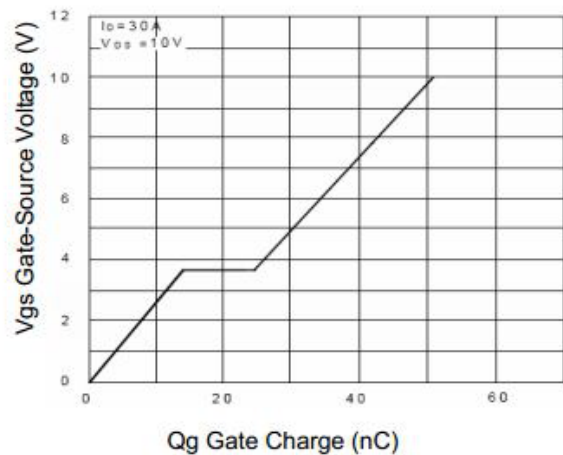


Figure 5 Gate Charge

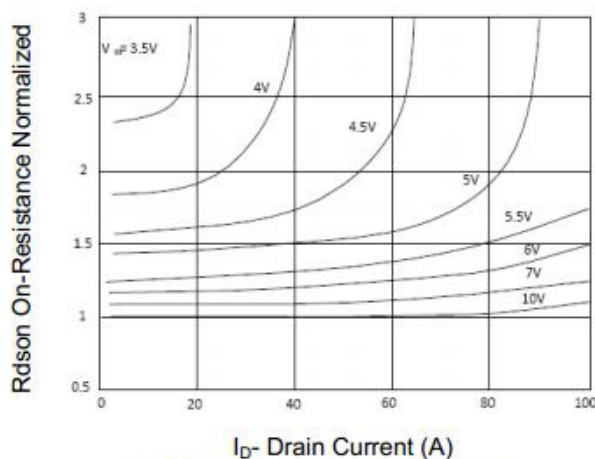


Figure 3 Rdson- Drain Current

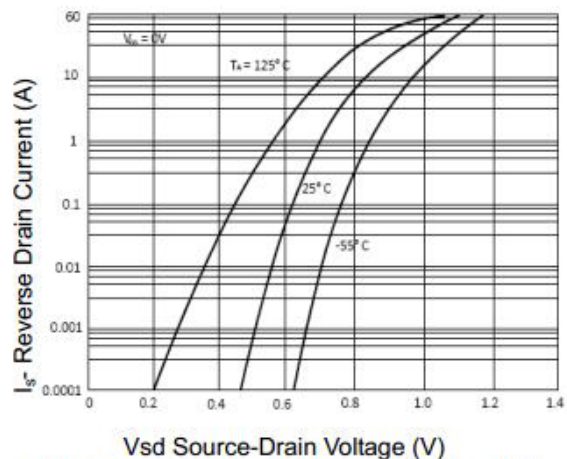
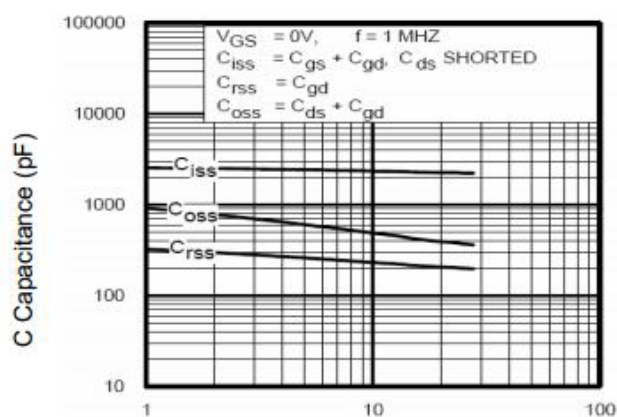
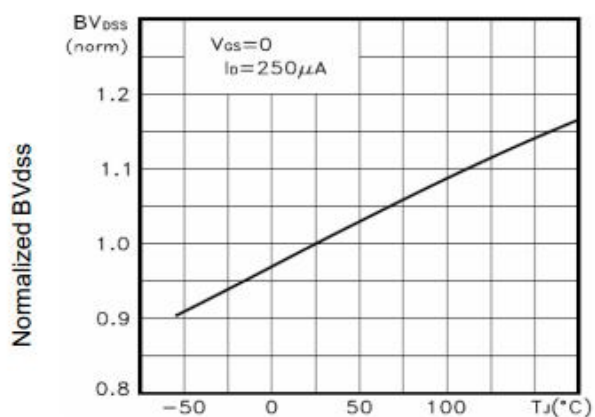


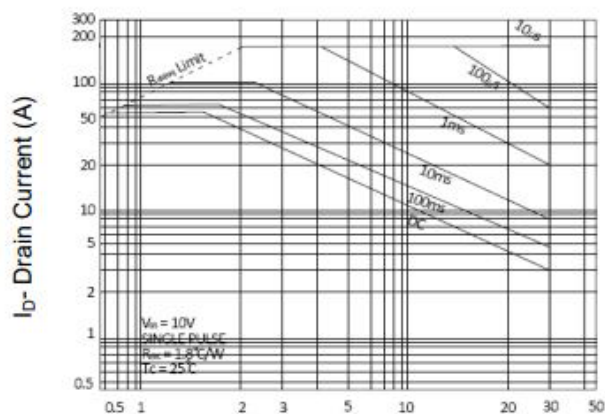
Figure 6 Source- Drain Diode Forward



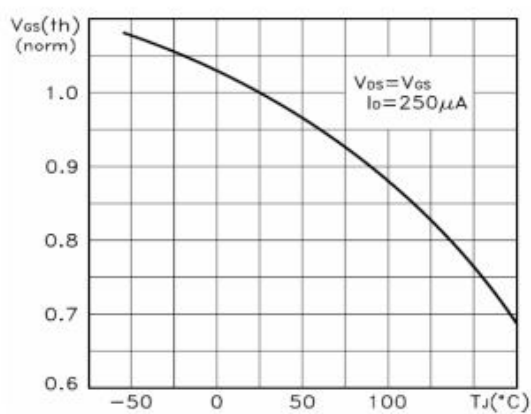
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



TJ-Junction Temperature(°C)
Figure 9 BV_{DSS} vs Junction Temperature



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



TJ-Junction Temperature(°C)
Figure 10 V_{GS(th)} vs Junction Temperature

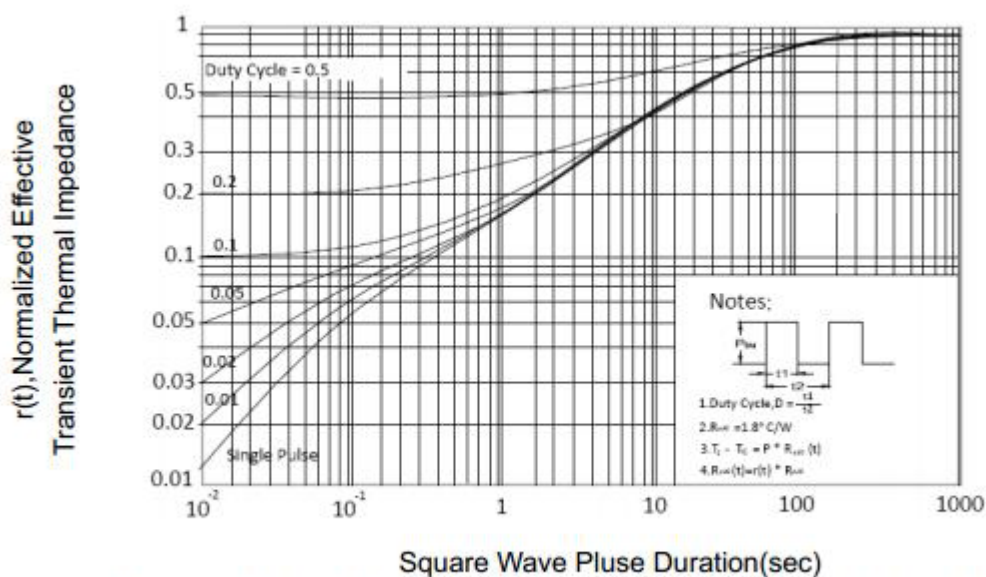


Figure 11 Normalized Maximum Transient Thermal Impedance