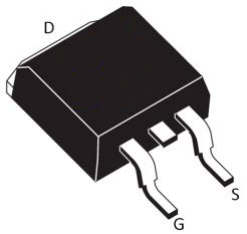
Silicon N-Channel Power MOSFET

V_{DSS}	68	V
I_D	80	A
P_D	156	W
$R_{DS(ON)max}$	8.0	mΩ

General Description:

The HMD80N07 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. The package form is TO-263, which accords with the RoHS standard.

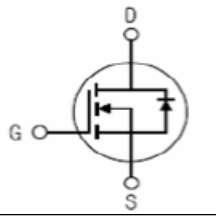
TO-263



Features:

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute (Tc=25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	70	V
I_D	Continuous Drain Current	80	A
	Continuous Drain Current T_C=100 °C	52	A
I_{DM}	Pulsed Drain Current	320	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS} [a2]	Single Pulse Avalanche Energy	600	mJ
E_{AR} [a1]	Avalanche Energy ,Repetitive	50	mJ
I_{AR} [a1]	Avalanche Current	33	A
dv/dt[a3]	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	156	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, −55 to 175	℃
T_L	Maximum Temperature for Soldering	300	℃

Electrical Characteristics (Tc=25℃ unless otherwise specified):

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	68	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA,Reference25℃	--	0.05	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS}=65V,V_{GS}=0V,T_a=25℃	--	--	1	μA
		V_{DS}=56V,V_{GS}=0V, T_a=125℃	--	--	250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=40A	--	6.5	8.0	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	2.9	4.0	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	V_{DS}=5V,I_D=40A	15	--	--	S
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=60V f=1.0MHz	--	3396	--	pF
C_{oss}	Output Capacitance		--	435	--	
C_{rss}	Reverse Transfer Capacitance		--	151	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=40A,V_{DD}=35V V_{GS}=10V,R_G=3.0Ω	--	15	--	ns
t_r	Rise Time		--	44	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	31	--	
t_f	Fall Time		--	15	--	
Q_g	Total Gate Charge	I_D=40A,V_{DD}=35V V_{GS}=10V	--	58	--	nC
Q_{gs}	Gate to Source Charge		--	22	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	15	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	80	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	320	A
V_{SD}	Diode Forward Voltage	I_S=80A,V_{GS}=0V	--	--	1.5	V
t_{rr}	Reverse Recovery Time	I_S=40A,T_j = 25°C	--	33	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/us,V_{GS}=0V	--	56	--	nC
Pulse width tp≤380μs,δ≤2%						

Symbol	Parameter	Typ.	Units
$R_{\theta Jc}$	Junction-to-Case	0.8	℃/W

[a1]: Repetitive rating; pulse width limited by maximum junction temperature

[a2]: EAS condition : Tj=25℃ ,VDD=30V,VG=10V,L=0.5mH,Rg=25Ω

[a3]: I_{SD} =80A,di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start T_J=25℃

Test Circuit and Waveform

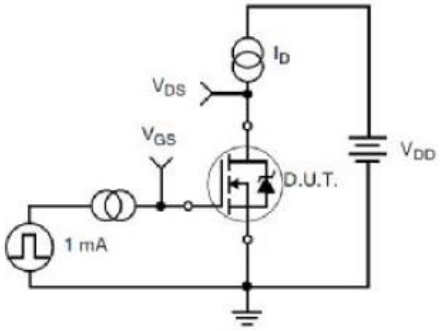


Figure 17. Gate Charge Test Circuit

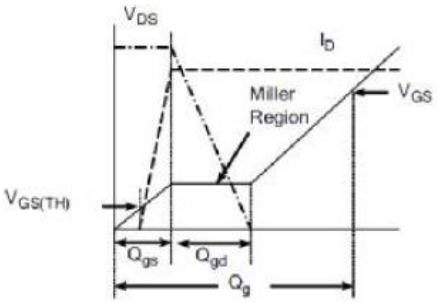


Figure 18. Gate Charge Waveform

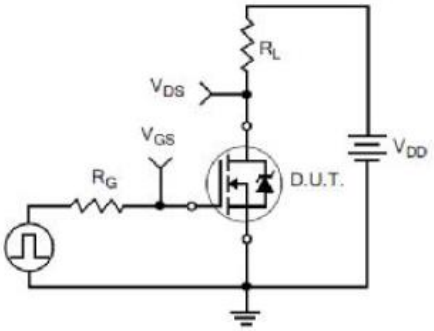


Figure 19. Resistive Switching Test Circuit

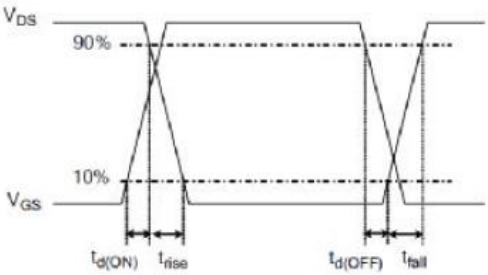


Figure 20. Resistive Switching Waveforms

Characteristics Curve:

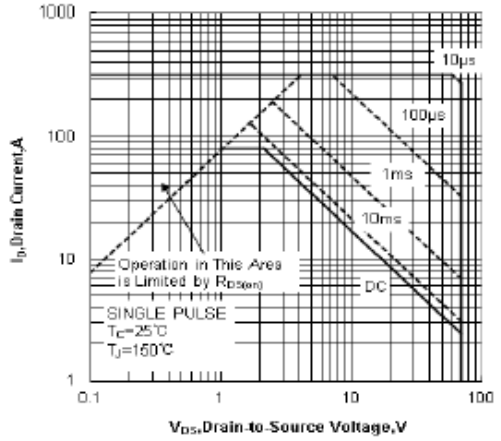


Figure 1 Maximum Forward Bias Safe Operating Area

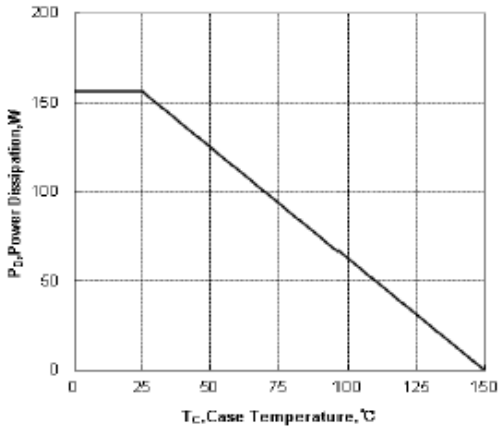


Figure 2 Maximum Power Dissipation vs Case Temperature

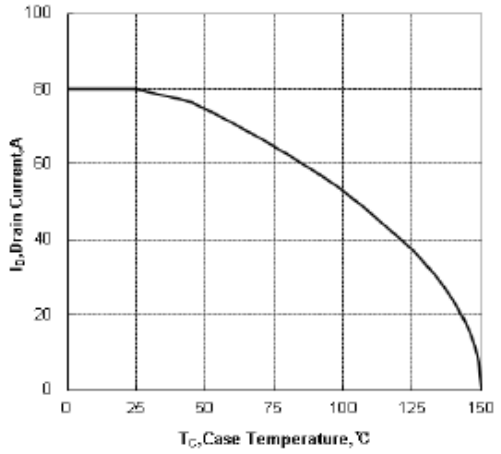


Figure3 Maximum Continuous Drain Current vs Case Temperature

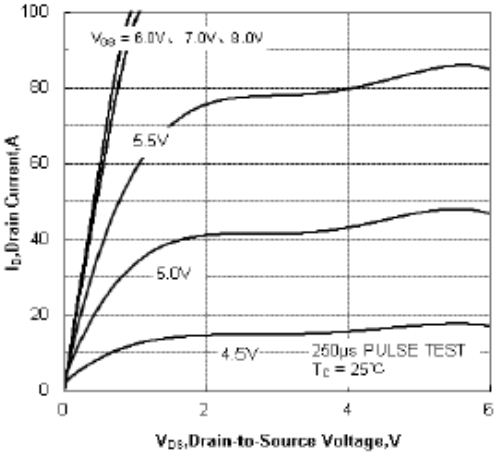


Figure 4 Typical Output Characteristics

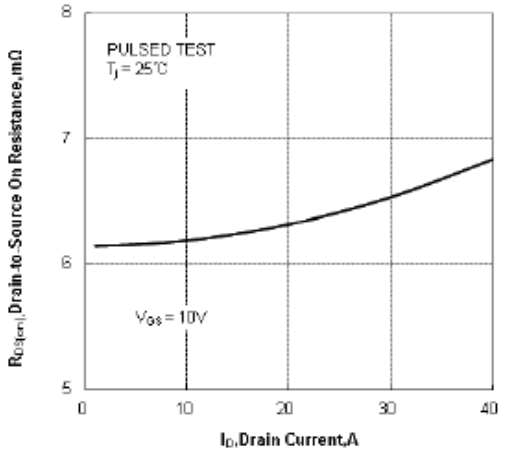


Figure 5 Drain-to-Source On Resistance vs Drain Current

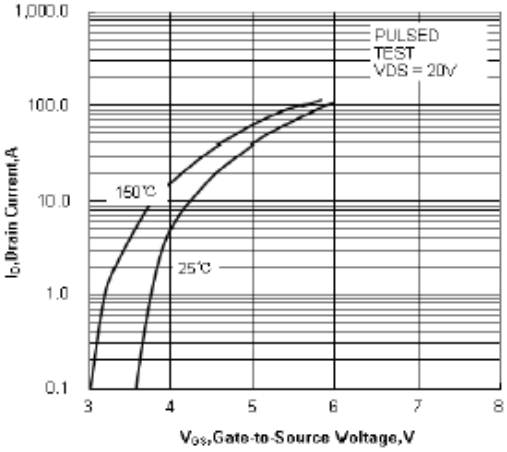


Figure 6 Typical Transfer Characteristics

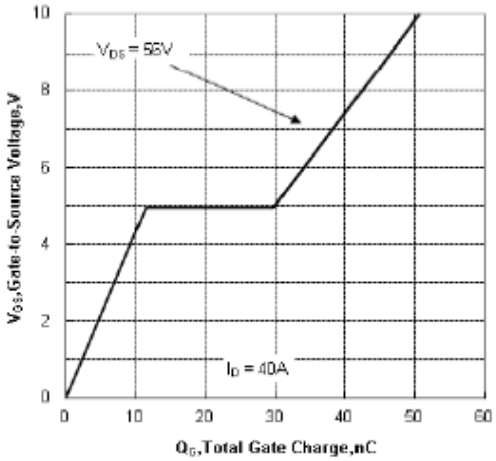


Figure 7 Typical Gate Charge vs Gate to Source Voltage

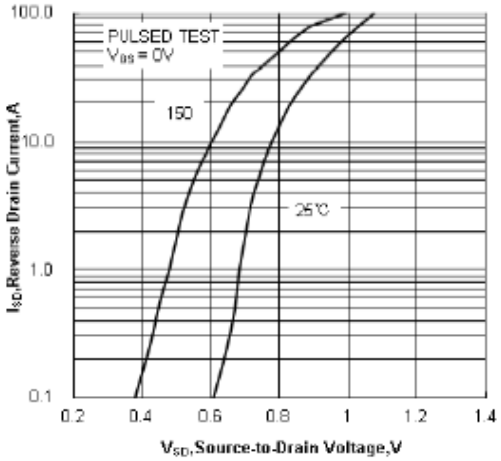


Figure 8 Typical Body Diode Transfer Characteristics

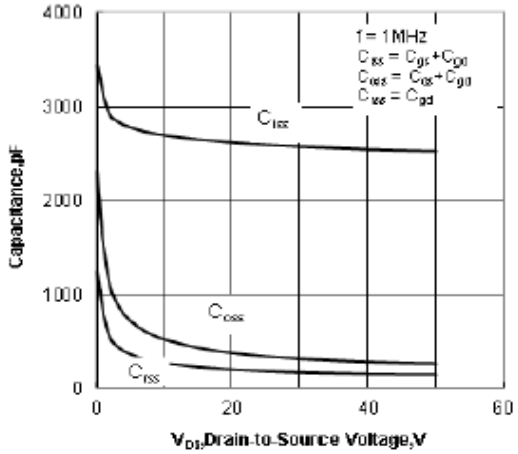


Figure 9 Typical Capacitance vs Drain to Source Voltage

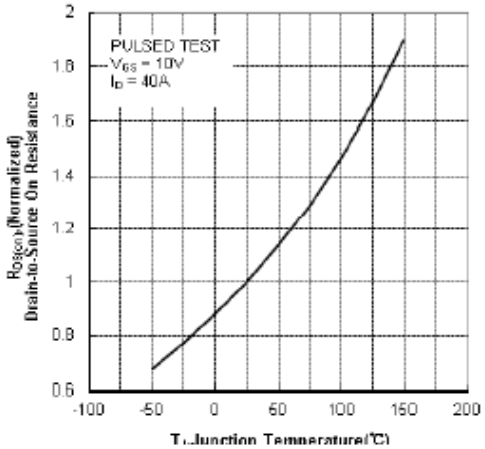


Figure 10 Typical Drian to Source on Resistance vs Junction Temperature

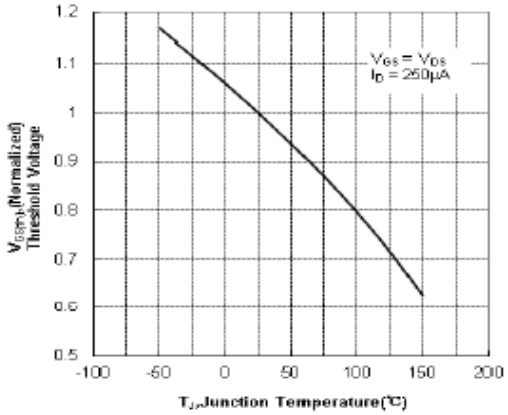


Figure 11 Typical Theshold Voltage vs Junction Temperature

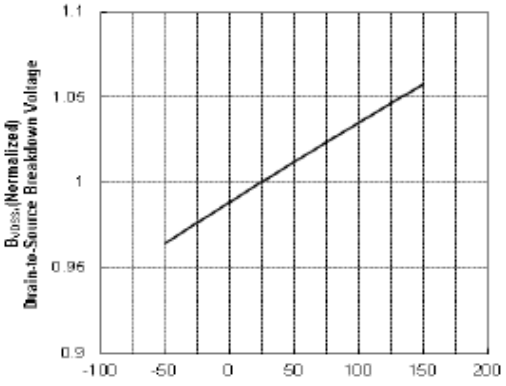


Figure 12 Typical Breakdown Voltage vs Junction Temperature