N-Channel Enhancement Mode Power MOSFET

Description

The HN20N03 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

- VDS = 30V,ID = 20A

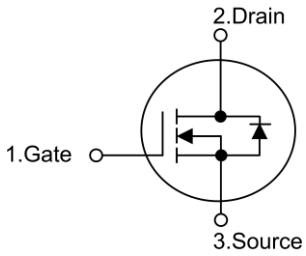
  RDS(ON) < 35mΩ @ VGS=5V

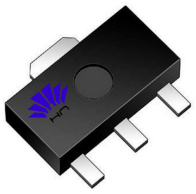
  RDS(ON) < 25mΩ @ VGS=10V

- High density cell design for ultra low RDS(on)
- Excellent package for good heat dissipation

Application

- PWM applications
- Load switch
- Power management





SOT-89

Maximum Ratings (Tc = 25℃ unless otherwise noted*)

Parameter		Symbol	Ratings	Units
Drain-Source Voltage		VDSS	30	V
Gate-Source Voltage		VGSS	±20	V
Continuous Drain Current	Tc=25℃	ID	20*	A
	Tc=100℃		12*	A
Pulsed Drain Current		IDM	39	A
Power Dissipation	Tc=25℃	PD	27	W
	Derate above 25℃		0.216	
Operating Junction and Storage Temperature Range		TJ,Tstg	-55~+175	℃

* Dran current limited by maximum junction temperature.

Thermal Characteristics

Parameter	Symbol	Ratings	Units
Thermal resistance junction to ambient.	RthJA	105	℃/W

Electrical characteristics (TA =25℃ Unless Otherwise Specified)

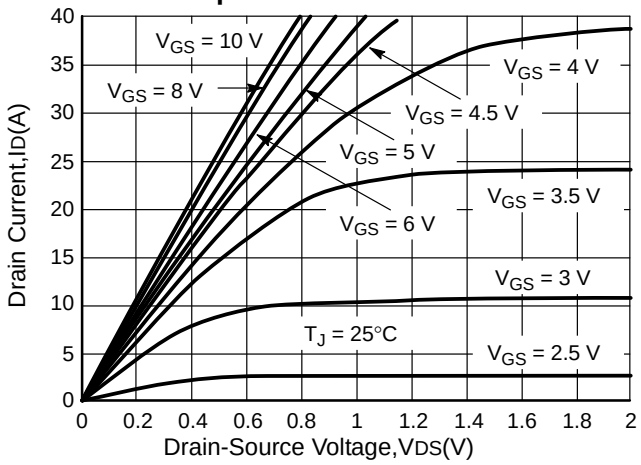
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
STATIC						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	—	—	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1	—	3	V
I_{GSS}	Gate-Body Leakage	V_{DS}=0V, V_{GS}=±20V	—	—	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	—	—	1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=10A	—	—	25	mΩ
		V_{GS}=4.5V, I_D=8A	—	—	35	mΩ
V_{SD}	Diode Forward Voltage	I_S=3A, V_{GS}=0V	—	—	1.3	V
DYNAMIC						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_D=10A	—	12	—	nC
Q_{gs}	Gate-Source Charge		—	5.5	—	
Q_{gd}	Gate-Drain Charge		—	2.2	—	
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	—	660	—	pF
C_{oss}	Output Capacitance		—	143	—	
C_{rss}	Reverse Transfer Capacitance		—	77	—	
$t_{d(on)}$	Turn-On Delay Time	V_{DD} =15V, R_G=3Ω R_L=2Ω,V_{GS}=5V,	—	5	—	ns
t_r	Turn-On Rise Time		—	3.2	—	
$t_{d(off)}$	Turn-Off Delay Time		—	24	—	
t_f	Turn-Off Fall Time		—	6	—	
I_{SD}	Continuous drain-source current		—	—	20	A
I_{SM}	Pulsed drain-source current		—	—	39	A

Notes :a. Pulse test:pulse width 300 us,duty cycle 2% ,Guaranteed by design,not subject to production testing.

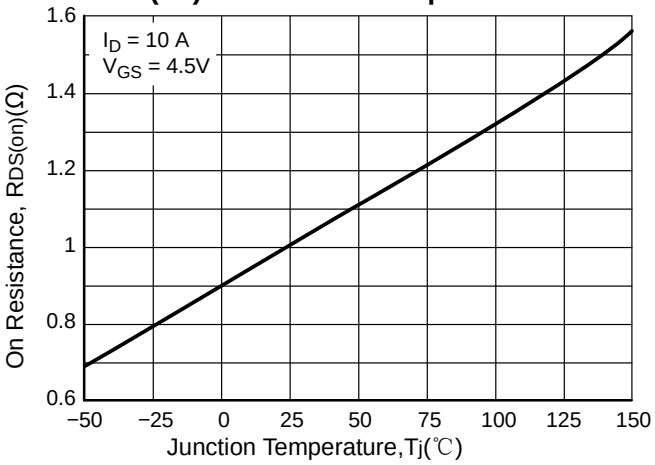
b. HN reserves the right to improve product design,functions and reliability without notice.

Typical Characteristics (TJ =25℃ Noted)

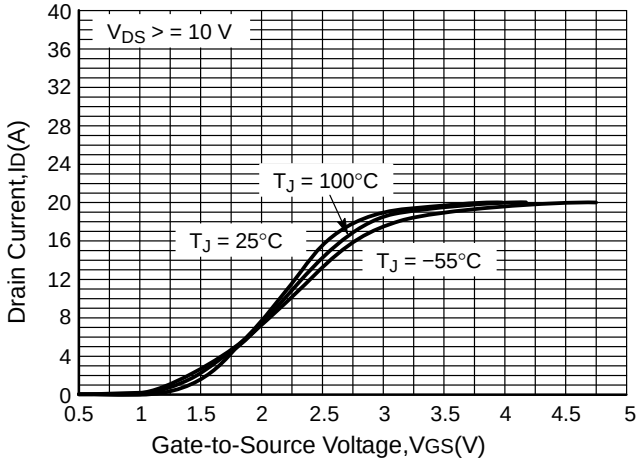
Output Characteristics



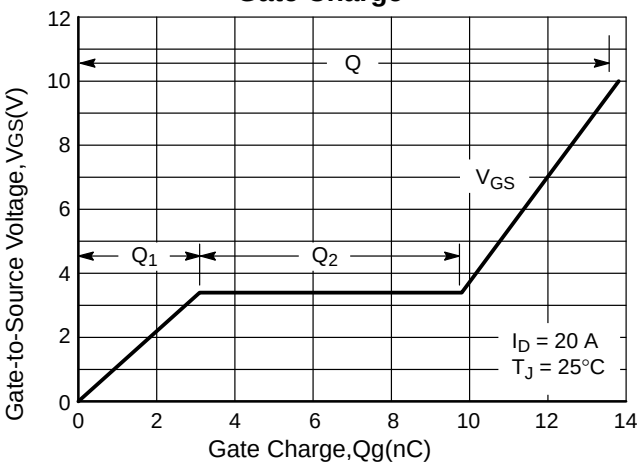
RDS(on) vs. JunctionTemperature



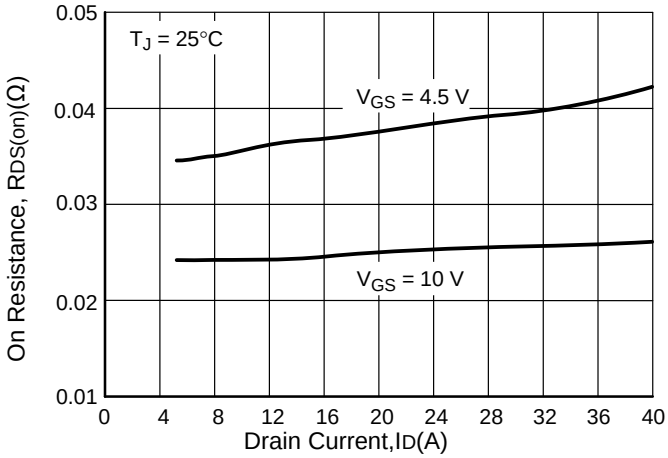
Transfer Characteristics



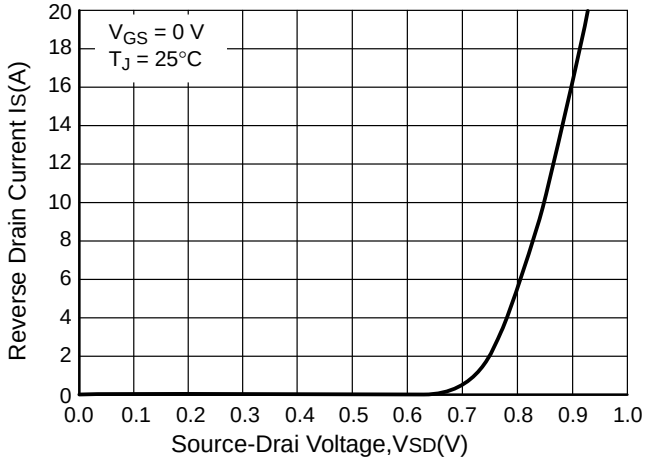
Gate Charge



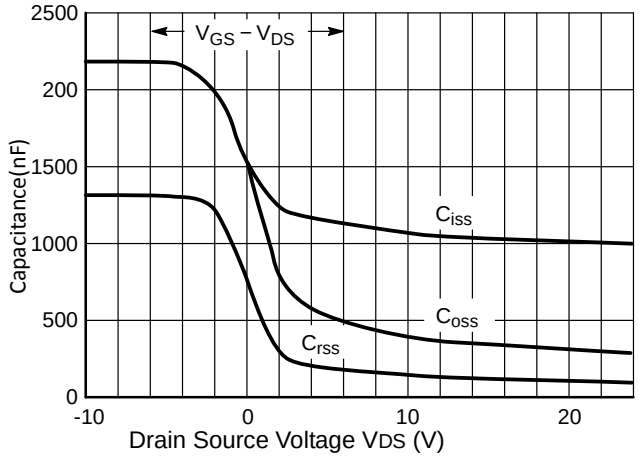
RDS(on) vs. Drain Current



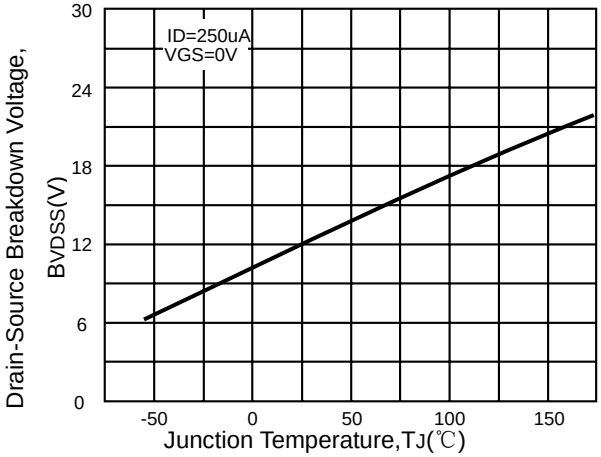
Source-to- Drain Diode Forward



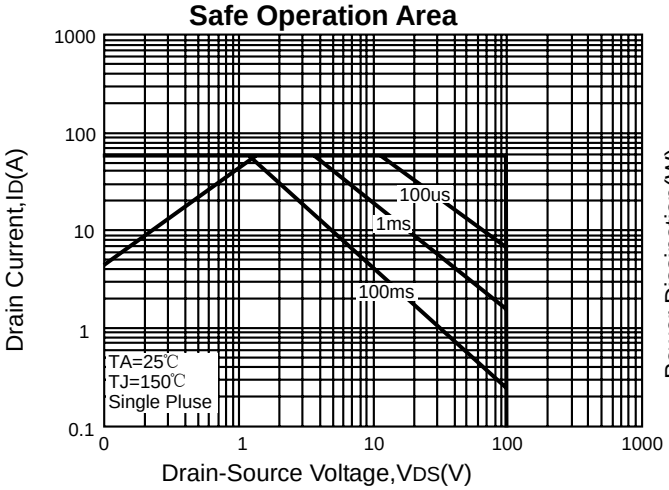
Capacitance vs. Drain Source Voltage



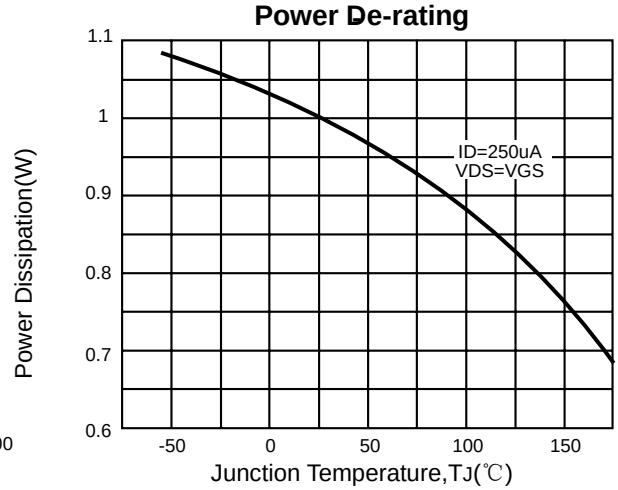
BVDSS vs. Junction Temperature



Safe Operation Area



Power De-rating



Normalized Thermal Transient Impedance,Junction to Ambient