

N-Channel Enhancement Mode Power MOSFET

Description

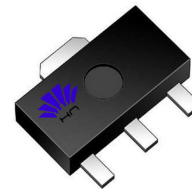
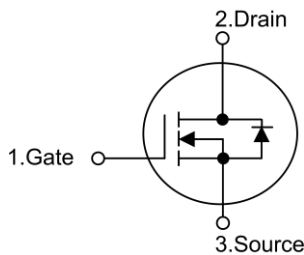
The HN20N03 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

Application

- PWM applications
- Load switch
- Power management

General Features

- $V_{DS} = 30V, I_D = 20A$
 - $R_{DS(ON)} < 35m \quad @ \quad V_{GS}=5V$
 - $R_{DS(ON)} < 25m \quad @ \quad V_{GS}=10V$
- High density cell design for ultra low RDS(on)
- Excellent package for good heat dissipation



SOT-89

Maximum Ratings ($T_c = 25^\circ C$ unless otherwise noted*)

Parameter	Symbol	Ratings	Units
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	ID	$T_c=25^\circ C$	20*
		$T_c=100^\circ C$	12*
Pulsed Drain Current	IDM	39	A
Power Dissipation	PD	$T_c=25^\circ C$	27
		Derate above $25^\circ C$	0.216
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+175	$^\circ C$

* Drain current limited by maximum junction temperature.

Thermal Characteristics

Parameter	Symbol	Ratings	Units
Thermal resistance junction to ambient.	RthJA	105	$^\circ C/W$



Electrical characteristics (TA =25°C Unless Otherwise Specified)

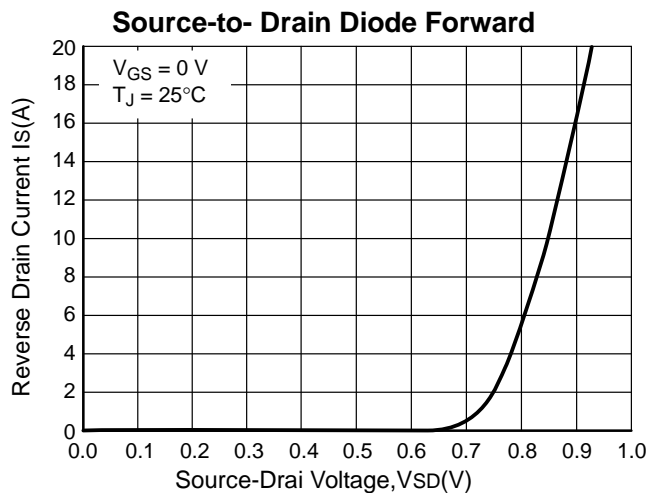
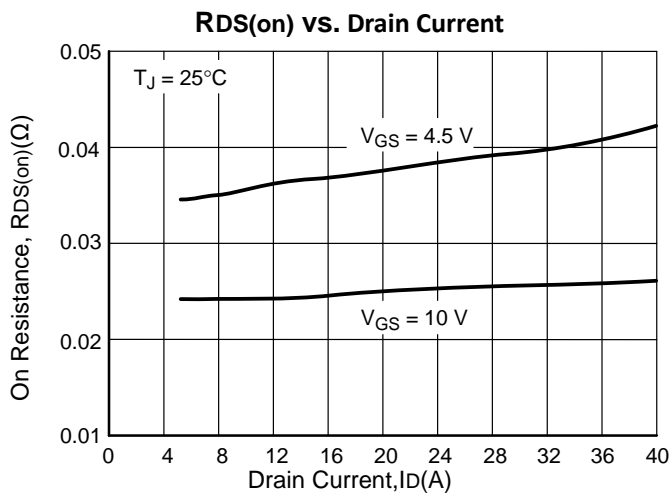
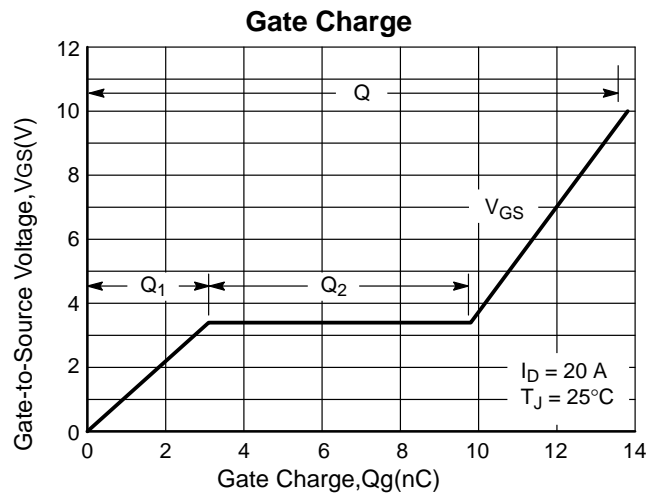
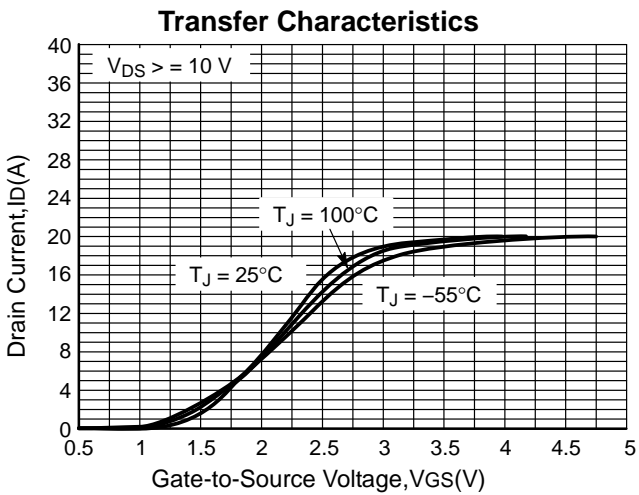
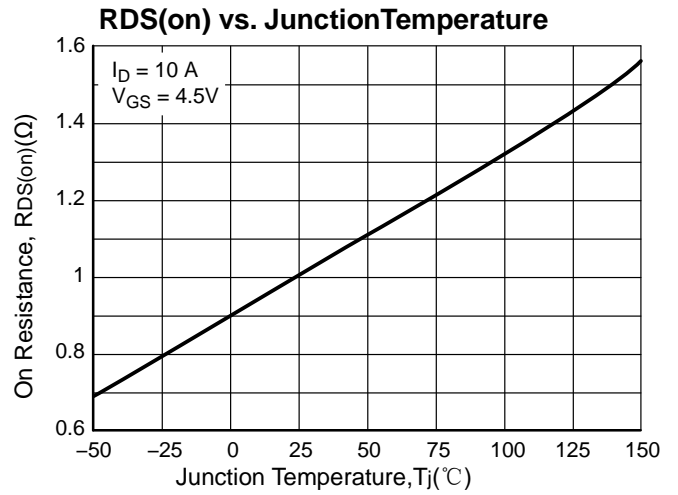
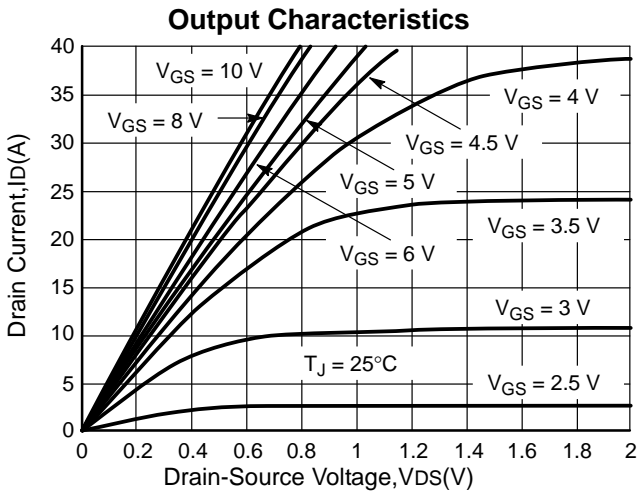
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
STATIC						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	30	—	—	V
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1	—	3	V
IGSS	Gate-Body Leakage	VDS=0V, VGS=±20V	—	—	±100	nA
IDSS	Zero Gate Voltage Drain Current	VDS=24V, VGS=0V	—	—	1	μA
RDS(ON)	Drain-Source On-Resistance	VGS=10V, ID=10A	—	—	25	mΩ
		VGS=4.5V, ID=8A	—	—	35	mΩ
VSD	Diode Forward Voltage	IS=3A, VGS=0V	—	—	1.3	V
DYNAMIC						
Qg	Total Gate Charge	VDS=15V, VGS=10V, ID=10A	—	12	—	nC
Qgs	Gate-Source Charge		—	5.5	—	
Qgd	Gate-Drain Charge		—	2.2	—	
Ciss	Input Capacitance	VDS=15V, VGS=0V, f=1MHz	—	660	—	pF
Coss	Output Capacitance		—	143	—	
Crss	Reverse Transfer Capacitance		—	77	—	
td(on)	Turn-On Delay Time	VDD =15V, RG=3Ω RL=2Ω, VGS=5V,	—	5	—	ns
tr	Turn-On Rise Time		—	3.2	—	
td(off)	Turn-Off Delay Time		—	24	—	
tf	Turn-Off Fall Time		—	6	—	
ISD	Continuous drain-source current		—	—	20	A
ISM	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.

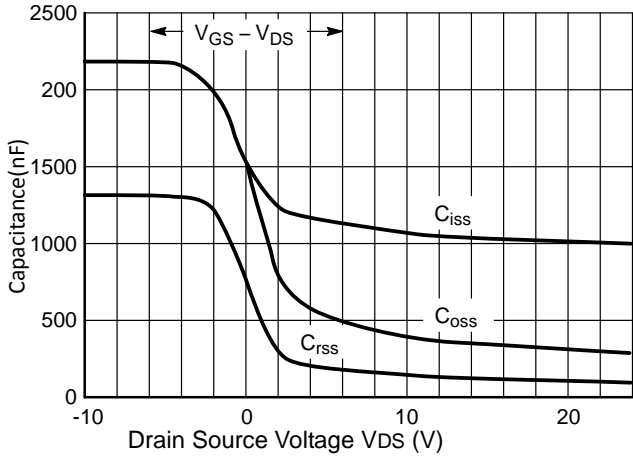


Typical Characteristics (T_J = 25°C Noted)

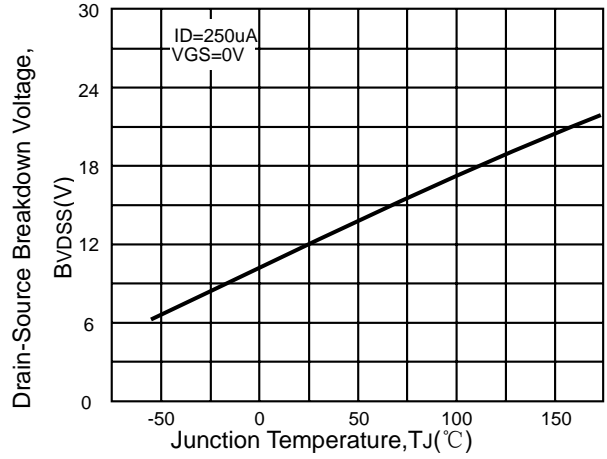




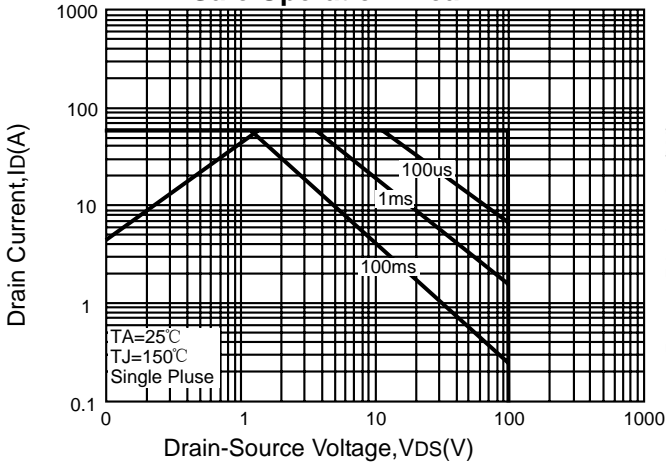
Capacitance vs. Drain Source Voltage



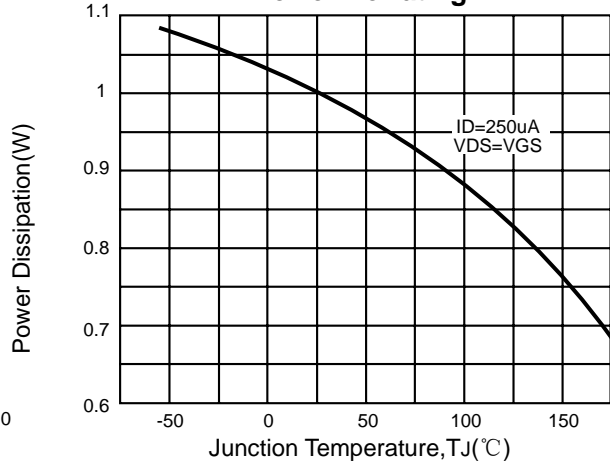
BVDSS vs. Junction Temperature



Safe Operation Area



Power De-rating



Normalized Thermal Transient Impedance, Junction to Ambient

