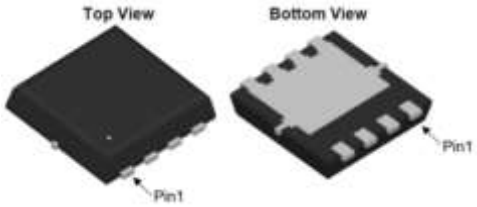
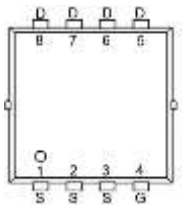
20V_{DS}/±12V_{GS} N-Channel Enhancement Mode MOSFET

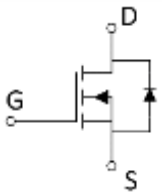
Features

- V_{DS}=20V,I_D=100A
- $R_{DS(ON)}$=3mΩ（TYP.）V_{GS}=4.5V
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

PDFN3333







Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

Ordering Information

Device	package	Device Marking	Package Qty.
HMN20100D3	PDFN3333	N20100D3	5000/PCS

Absolute Maximum Ratings (T$_C$=25℃,unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	20	V
Gate-Source Voltage (V_{GS}=0V,static)	V_{GS}	±12	V
Continuous Drain Current (T_C=25℃)	I_D	100	A
Continuous Drain Current (T_C=100℃)		70	A
Pulesd Drain Current	I_{DM}	420	A
Single Pulsed Avalanche Energy	E_{AS}	150	mJ
Maximum Power Dissipation (T_C =25℃)	P_D	30	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	℃

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=250μA	-	-	1.1	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=20A	-	2.6	3.5	mΩ
		V_{GS}=2.5V,I_D=20A	-	3.5	5.5	

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	4.2	-	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	-	62	-	℃/ W

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=15V	-	5372	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	890	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	860	-	
Gate Resistance	R_g	f=1MHz	-	1.5	-	Ω
Total Gate Charge	Q_g	V_{DS}=15V	-	52	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=10V	-	6.3	-	
Gate Drain Charge	Q_{gd}	I_D=20A	-	25	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=10V	-	7.5	-	ns
Rise time	t_r	V_{DS}=15V	-	25	-	
Turn-off delay Time	$t_{d(off)}$	R_L=0.75Ω	-	57	-	
Fall time	t_f	R_G=3Ω	-	37	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=1A	-		1.2	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=20A	-	41	50	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	60	20	nC

Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

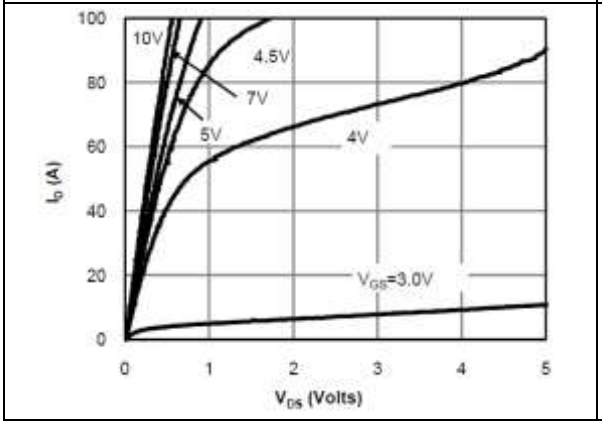


Figure 2. Transfer Characteristics

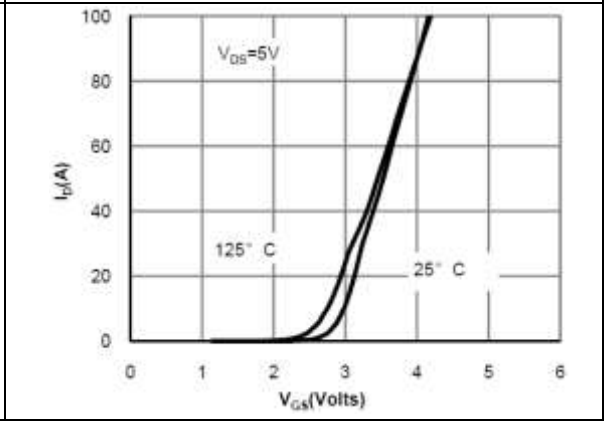


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

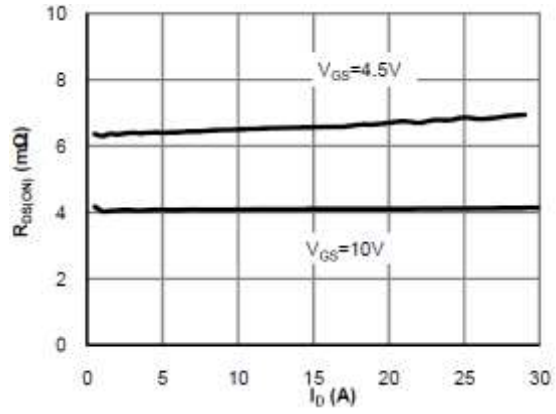


Figure 4. On-Resistance vs. Junction Temperature

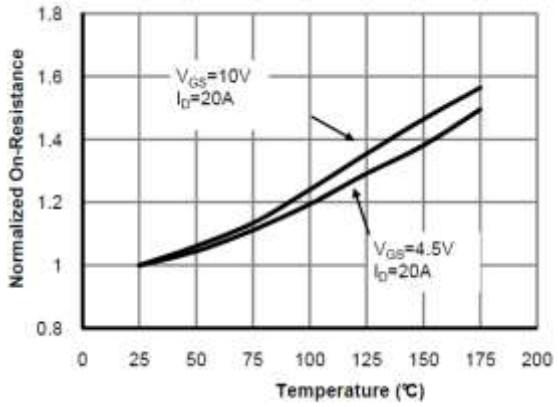


Figure 5. On-Resistance vs. Gate-Source Voltage

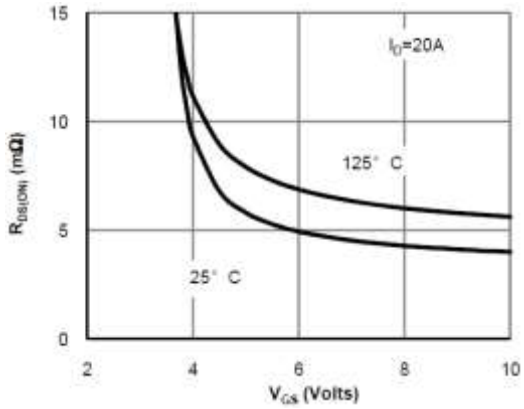


Figure 6. Body-Diode Characteristics

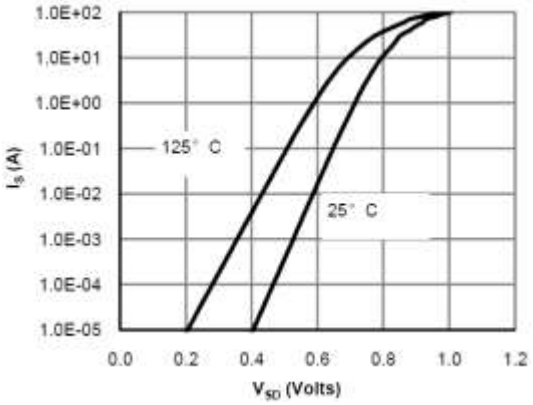


Figure 7. Gate-Charge Characteristics

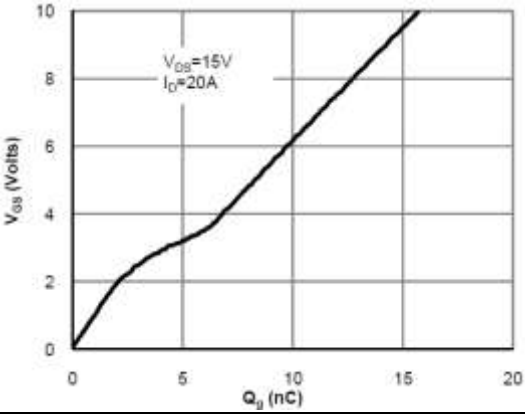


Figure 8. Capacitance Characteristics

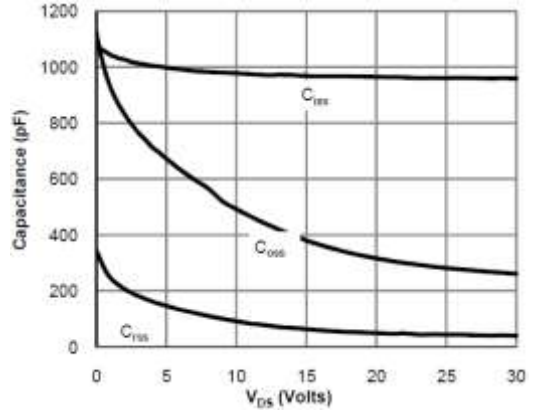


Figure 9. Maximum Forward Biased Safe Operating Area

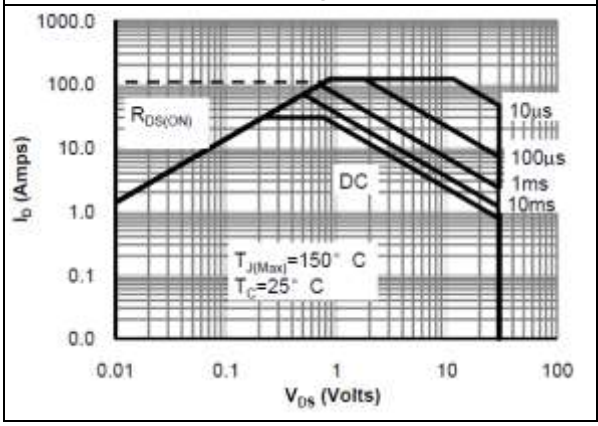


Figure 10. Single Pulse Power Rating Junction-to-Case

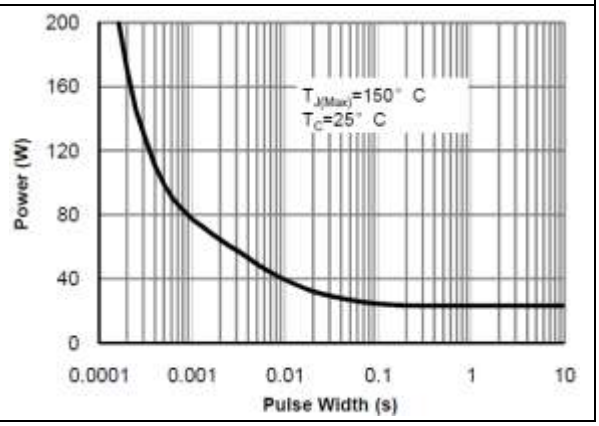
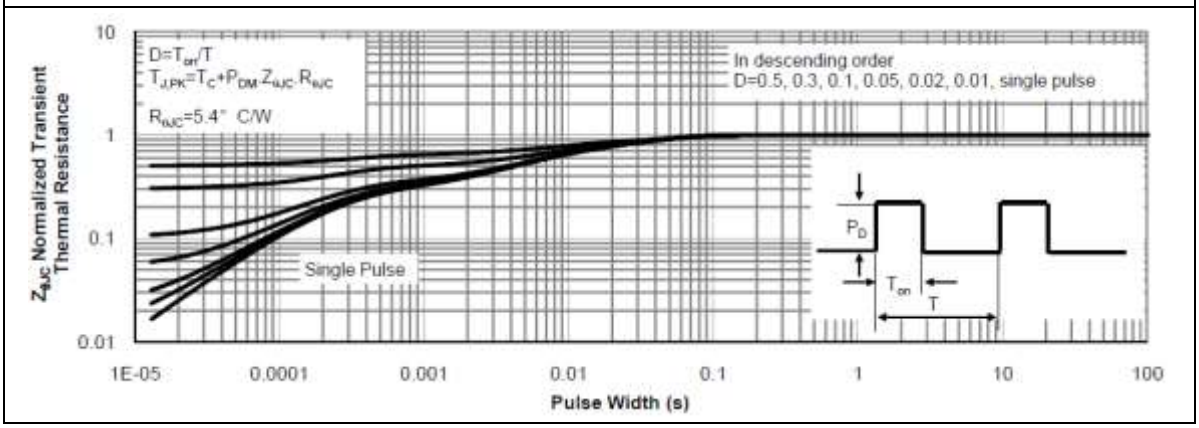


Figure 11. Normalized Maximum Transient Thermal Impedance



Physical Dimensions

符号	尺寸（mm）			符号	尺寸（mm）		
	最小值	典型值	最大值		最小值	典型值	最大值
A	0.70	0.80	0.90	E1	2.90	3.00	3.10
b	0.25	0.30	0.35	E2	1.64	1.74	1.84
c	0.14	0.15	0.20	H	0.32	0.42	0.52
D	3.10	3.30	3.50	K	0.59	0.69	0.79
D1	3.05	3.15	3.25	L	0.25	0.40	0.55
D2	2.35	2.45	2.55	L1	0.10	0.15	0.20
e	0.55	0.65	0.75	L2	-	-	0.15
E	3.10	3.30	3.50	θ	8°	10°	12°