

30V_{DS}/±20V_{GS} N-Channel Enhancement Mode MOSFET

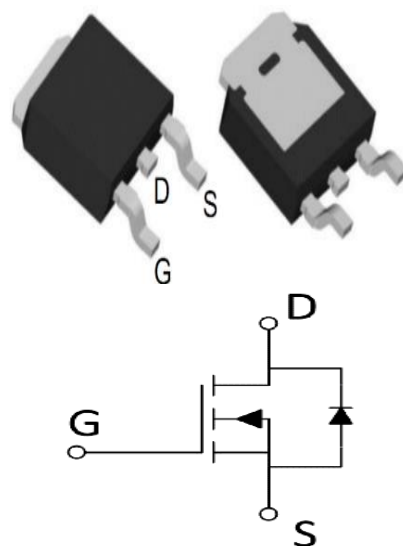
Features

- $V_{DS}=30V, I_D=20A$
- $R_{DS(ON)}=28m\Omega$ (TYP.) $V_{GS}=10V$
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

Applications

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

TO-252



Ordering Information

Device	Package		Marking	Package Qty.
HMN3020A4	TO-252	Pb-Free	N3020A4	2500pcs/Reel

Absolute Maximum Ratings ($T_C=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	30	V
Gate-Source Voltage ($V_{GS}=0V$, static)	V_{GS}	±20	V
Continuous Drain Current ($T_C=25^{\circ}C$)	I_D	20	A
Continuous Drain Current ($T_C=100^{\circ}C$)		12	A
Pulsed Drain Current	I_{DM}	100	A
Maximum Power Dissipation	P_D	25	W
Single pulse avalanche energy	E_{as}	32	mJ
Operating, Storage Temperature Range	T_J, T_{STG}	-55~175	$^{\circ}C$

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.5	V
Drain-Source On-state Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	21	27	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	26	45	

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	5	-	$^{\circ}\text{C}/\text{W}$

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=15\text{V}$	-	392	-	pF
Output capacitance	C_{oss}	$V_{GS}=0\text{V}$	-	76	-	
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$	-	54	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	1.5	-	Ω
Total Gate Charge	Q_g	$V_{DS}=15\text{V}$	-	4.3	-	nC
Gate Source Charge	Q_{gs}	$V_{GS}=10\text{V}$	-	1.3	-	
Gate Drain Charge	Q_{gd}	$I_D=20\text{A}$	-	1.6	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=10\text{V}$	-	5.9	-	ns
Rise time	t_r	$V_{DS}=15\text{V}$	-	11	-	
Turn-off delay Time	$t_{d(off)}$	$R_L=0.75\Omega$	-	17	-	
Fall time	t_f	$R_G=3\Omega$	-	3.8	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}, I_{SD}=1\text{A}$	-	0.73	1.0	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0\text{V}, I_{SD}=20\text{A}$	-	22	-	ns
Reverse Recovery Charge	Q_{rr}	$d_i/d_t=500\text{A}/\mu\text{s}$	-	11	-	nC

Electrical Characteristics Diagrames

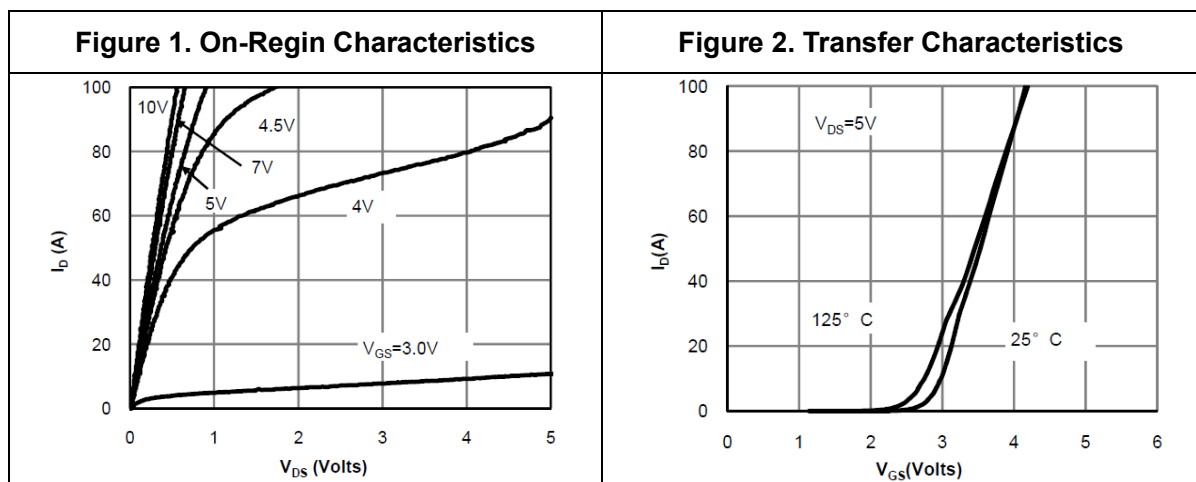


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

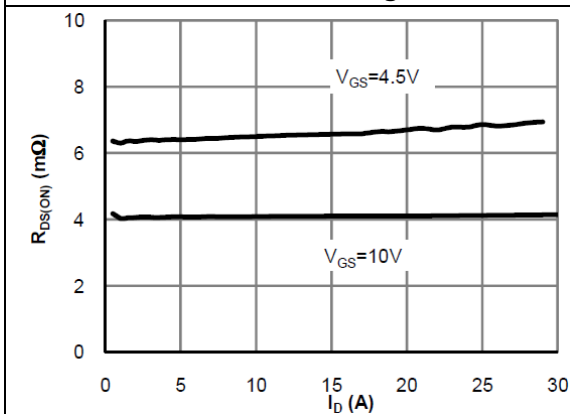


Figure 4. On-Resistance vs. Junction Temperature

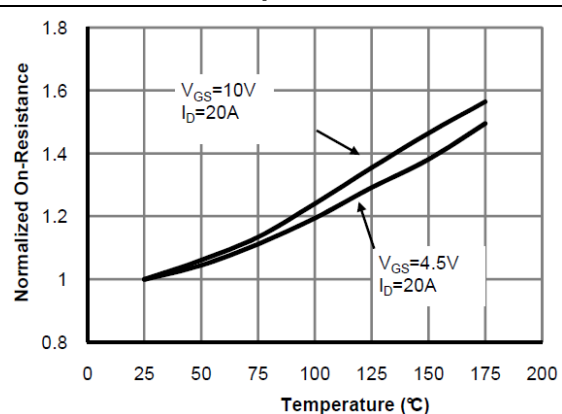


Figure 5. On-Resistance vs. Gate-Source Voltage

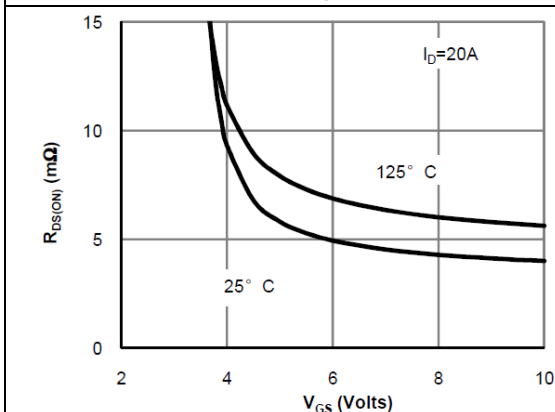


Figure 6. Body-Diode Characteristics

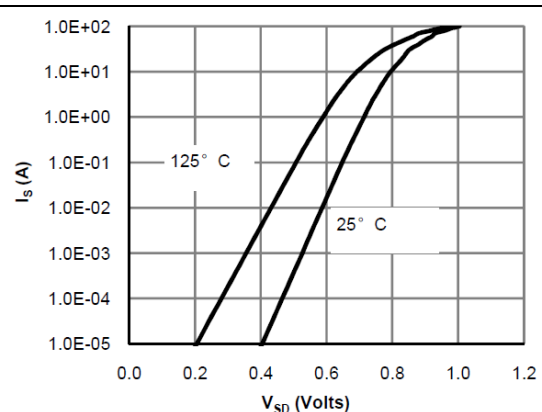


Figure 7. Gate-Charge Characteristics

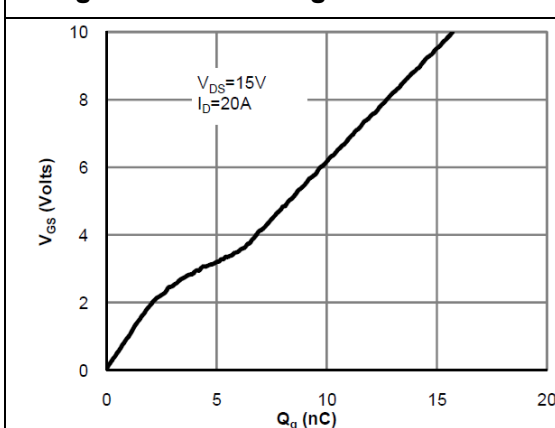


Figure 8. Capacitance Characteristics

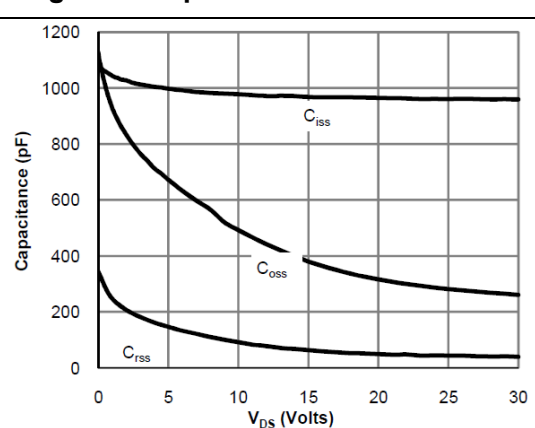


Figure 9. Maximum Forward Biased Safe Operating Area

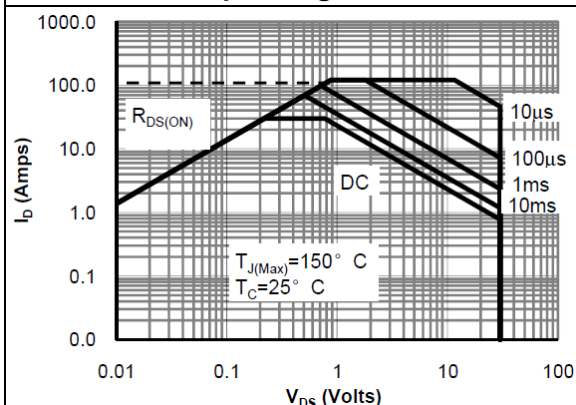


Figure 10. Single Pulse Power Rating Junction-to-Case

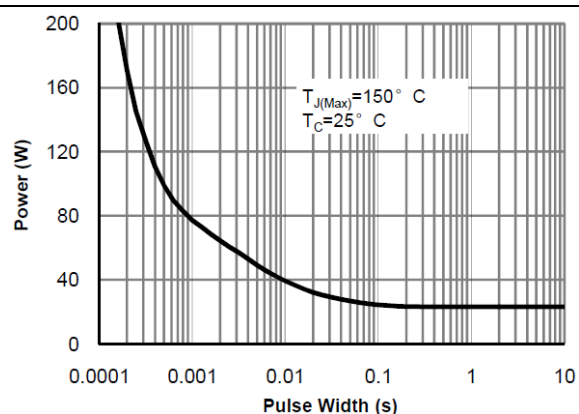
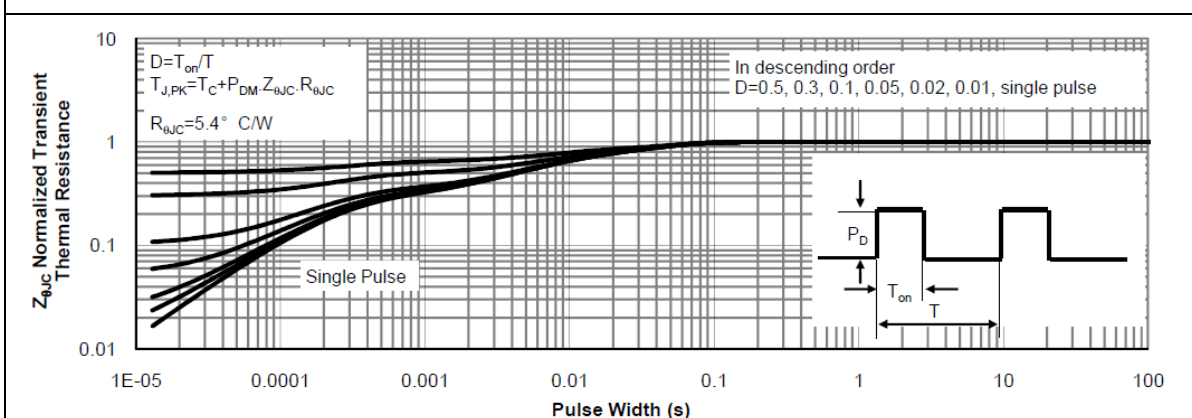


Figure 11. Normalized Maximum Transient Thermal Impedance



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