

**200V / 18A**  
**N-Channel Enhancement Mode MOSFET**

200V,  $R_{DS(ON)}=92m\Omega @ V_{GS}=10V, I_D=10A$

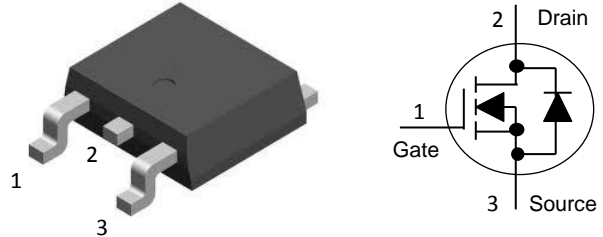
## Features

- Low On-State Resistance
- Excellent Gate Charge x  $R_{DS(ON)}$  Product ( FOM )
- Fully Characterized Avalanche Voltage and Current
- Specially Designed for DC-DC Converter, Off-line UPS, Automotive System, Solenoid and Motor Control
- In compliance with EU RoHs 2002/95/EC Directives

## TO-252

## Mechanical Information

- Case: TO-252 Molded Plastic
- Terminals : Solderable per MIL-STD-750, Method 2026



## Marking & Ordering Information

TYPE	MARKING	PACKAGE	PACKING
HY18N20D	18N20D	TO-252	2.5K/REEL

## Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ unless otherwise specified )

Parameter	Symbol	Value	Units
Drain-Source Voltage	$V_{DS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	18	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	72	A
Maximum Power Dissipation Derating Factor	$P_D$	48 0.38	W
Avalanche Energy with Single Pulse, $L=3mH$	$E_{AS}$	125	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Note : 1. Maximum DC current limited by the package

## Thermal Characteristics

Parameter	Symbol	Value	Units
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	2.6	$^\circ\text{C/W}$
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	50	$^\circ\text{C/W}$

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**Electrical Characteristics (  $T_C=25$ , Unless otherwise noted )**

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V \cdot I_D=250\mu A$	200	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS} \cdot I_D=250\mu A$	1	-	3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V \cdot I_D=10A$	-	80	92	m $\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=160V \cdot V_{GS}=0V$	-	-	1	$\mu A$
Gate Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 24V \cdot V_{DS}=0V$	-	-	100	nA
<b>Dynamic</b>						
Total Gate Charge	Qg	$V_{DS}=100V \cdot I_D=10A$ $V_{GS}=10V$	-	26.2	-	nC
Gate-Source Charge	Qgs		-	5.8	-	
Gate-Drain Charge	Qgd		-	11.2	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=100V \cdot I_D=10A$ $V_{GS}=10V \cdot R_G=3.6\Omega$	-	12.2	-	ns
Turn-On Rise Time	$t_r$		-	8.6	-	
Turn-Off Delay Time	$t_{d(off)}$		-	26	-	
Turn-Off Fall Time	$t_f$		-	9.2	-	
Input Capacitance	$C_{iss}$	$V_{DS}=30V \cdot V_{GS}=0V$ $f=1.0MHz$	-	840	-	pF
Output Capacitance	$C_{oss}$		-	55	-	
Reverse Transfer Capacitance	$C_{rss}$		-	32	-	
Gate Resistance	Rg		-	1.5	-	$\Omega$
<b>Source-Drain Diode</b>						
Max. Diode Forward Voltage	$I_S$	-	-	-	18	A
Diode Forward Voltage	$V_{SD}$	$I_S=18A \cdot V_{GS}=0V$	-	0.85	1.4	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V \cdot I_S=18A$ $di/dt=100A/\mu s$	-	76	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	265	-	$\mu C$

**NOTE** : Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

## Typical Characteristics Curves ( $T_C=25^\circ\text{C}$ , unless otherwise noted)

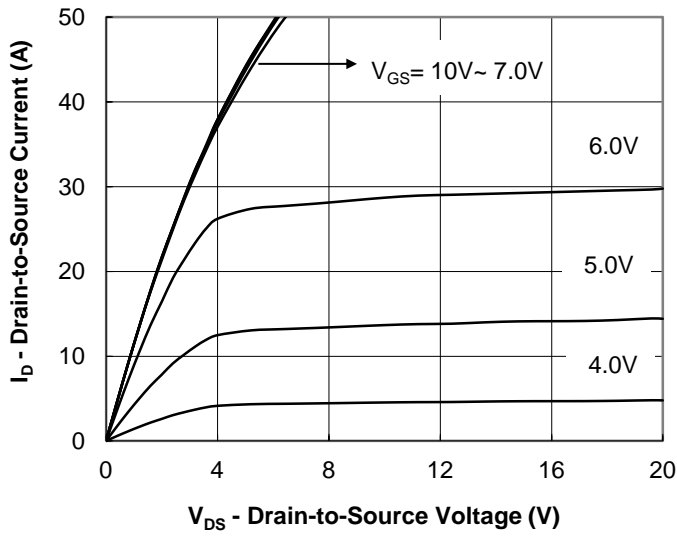


Fig.1 Output Characteristic

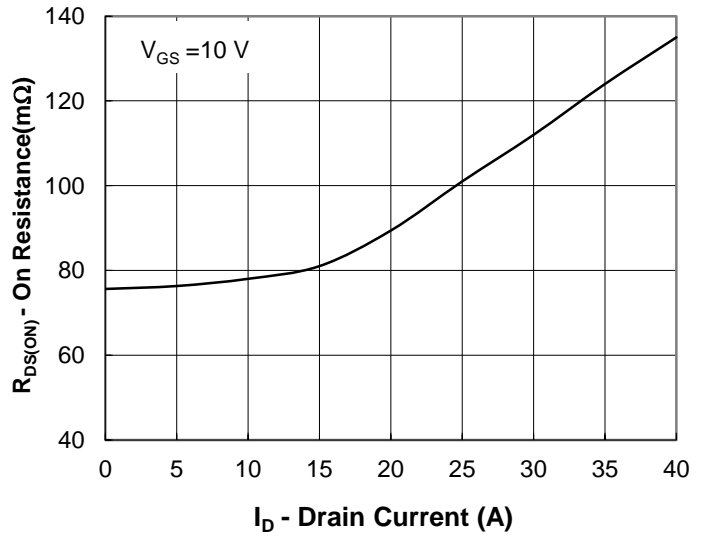


Fig.2 On-Resistance vs Drain Current

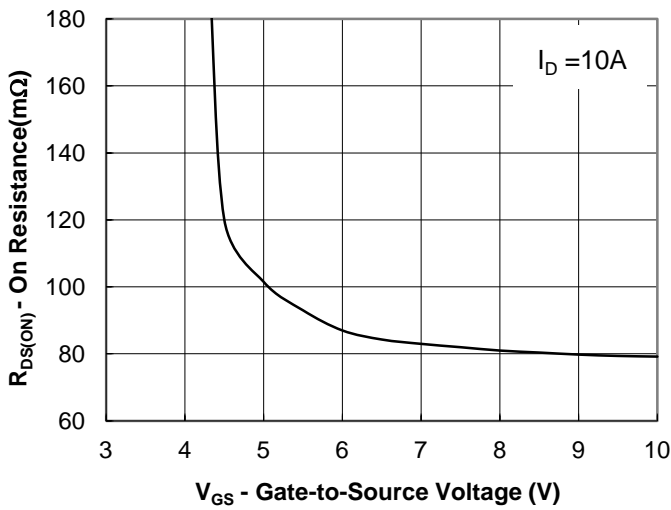


Fig.3 On-Resistance vs Gate to Source Voltage

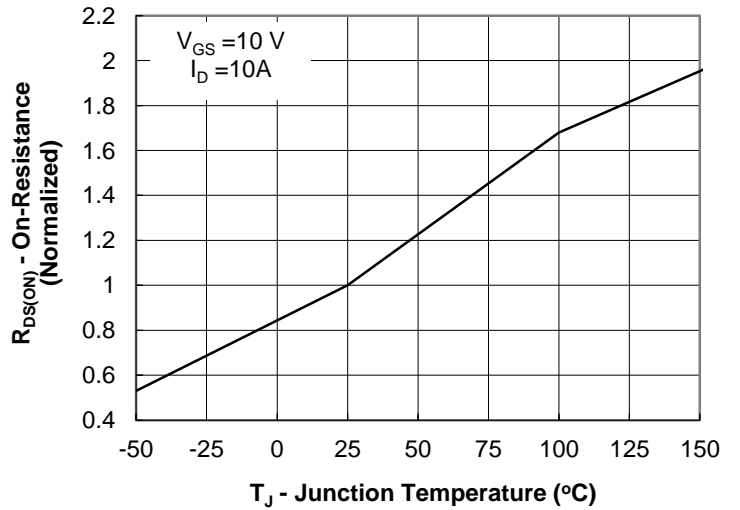


Fig.4 On-Resistance vs Junction Temperature

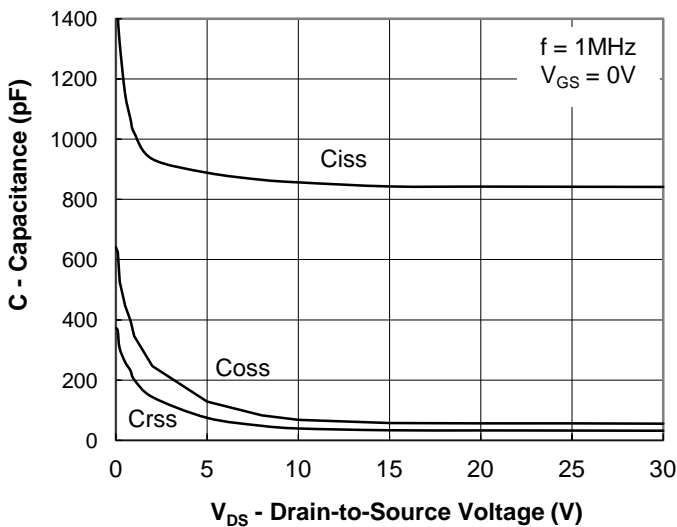


Fig.5 Capacitance Characteristic

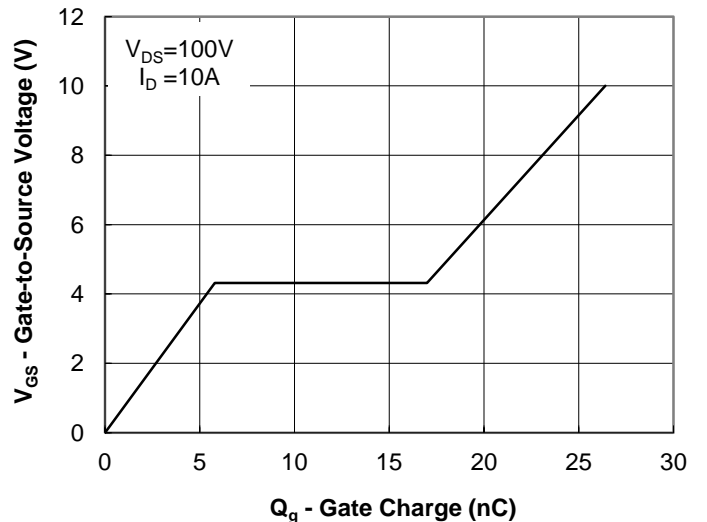
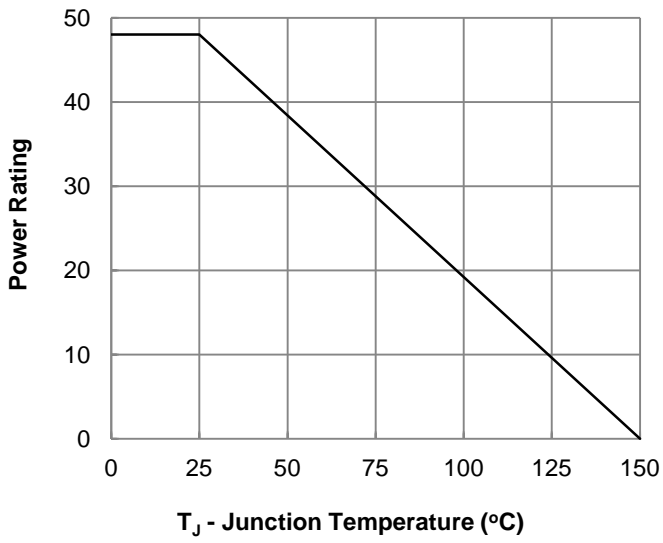
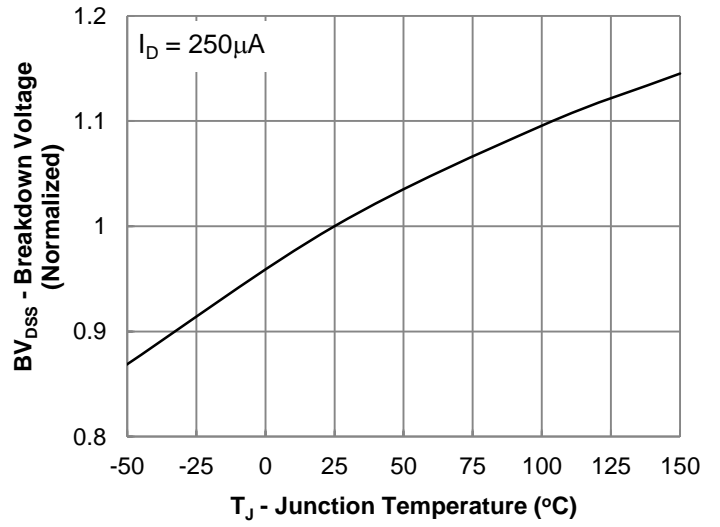


Fig.6 Gate Charge Characteristic

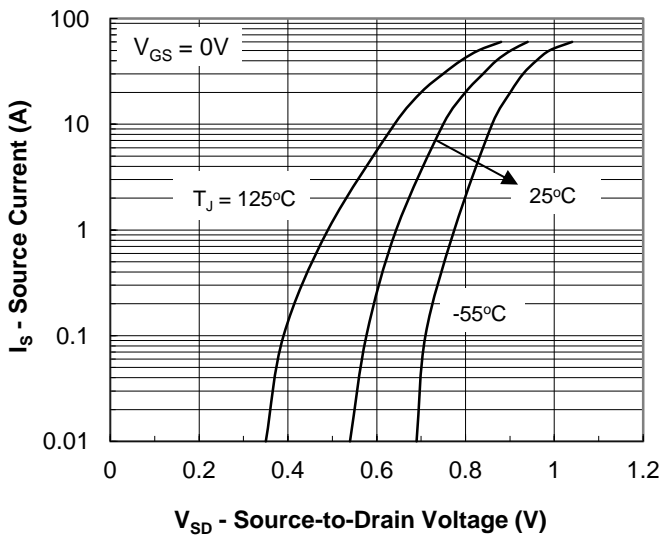
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**Fig.7 Power Derating Curve**



**Fig.8 Breakdown Voltage vs Junction Temperature**



**Fig.9 Body Diode Forward Voltage Characteristic**