

**700V / 8A**  
**N-Channel Enhancement Mode MOSFET**

700V,  $R_{DS(ON)}=1.2\Omega @ V_{GS}=10V, I_D=4.0A$

### Features

- Low On-State Resistance
- Fast Switching
- Low Gate Charge & Low  $C_{RSS}$
- Fully Characterized Avalanche Voltage and Current
- Specially Designed for AC Adapter, Battery Charger and SMPS
- In compliance with EU RoHs 2002/95/EC Directives

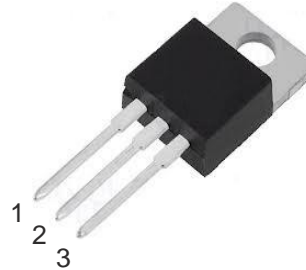
### Mechanical Information

- Case: TO-220AB / ITO-220AB Molded Plastic
- Terminals : Solderable per MIL-STD-750, Method 2026

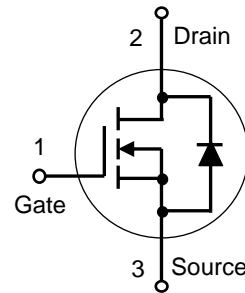
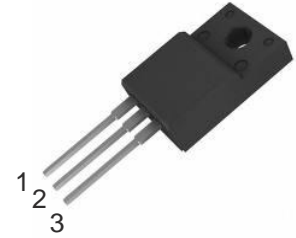
### Marking & Ordering Information

TYPE	MARKING	PACKAGE	PACKING
HY8N70T	8N70T	TO-220AB	50PCS/TUBE
HY8N70FT	8N70FT	ITO-220AB	50PCS/TUBE

TO-220AB



ITO-220AB



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

Parameter	Symbol	HY8N70T	HY8N70FT	Units
Drain-Source Voltage	$V_{DS}$	700		V
Gate-Source Voltage	$V_{GS}$	$\pm 30$		V
Continuous Drain Current	$I_D$	8	8	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	32	32	A
Maximum Power Dissipation	$P_D$	156	50	W
Derating Factor		1.25	0.4	
Avalanche Energy with Single Pulse $I_{AS}=7A, V_{DD}=95V, L=15.5mH$	$E_{AS}$	500		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	HY8N70T	HY8N70FT	Units
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	0.8	2.5	$^\circ\text{C/W}$
Junction-to-Air Thermal Resistance	$R_{\theta JA}$	50	110	$^\circ\text{C/W}$

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**Electrical Characteristics (  $T_c=25^\circ\text{C}$  , Unless otherwise noted )**

Paramter	Symbol	Test Condition	Min.	Typ.	Max.	Units
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V \cdot I_D=250\mu A$	700	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS} \cdot I_D=250\mu A$	2.0	-	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V \cdot I_D=4.0A$	-	0.95	1.2	$\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=700V \cdot V_{GS}=0V$	-	-	10	$\mu A$
Gate Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V \cdot V_{DS}=0V$	-	-	$\pm 100$	nA
<b>Dynamic</b>						
Total Gate Charge	Qg	$V_{DS}=560V \cdot I_D=8A$ $V_{GS}=10V$	-	32.6	38	nC
Gate-Source Charge	Qgs		-	6.2	-	
Gate-Drain Charge	Qgd		-	7.6	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=350V \cdot I_D=8A$ $V_{GS}=10V \cdot R_G=25\Omega$	-	28.8	34	ns
Turn-On Rise Time	$t_r$		-	42.6	52	
Turn-Off Delay Time	$t_{d(off)}$		-	56.2	62	
Turn-Off Fall Time	$t_f$		-	24.6	28	
Input Capacitance	$C_{iss}$	$V_{DS}=25V \cdot V_{GS}=0V$ $f=1.0M_{HZ}$	-	1250	-	pF
Output Capacitance	$C_{oss}$		-	210	-	
Reverse Transfer Capacitance	$C_{riss}$		-	3.5	-	
<b>Source-Drain Diode</b>						
Max. Diode Forwad Voltage	$I_S$	-	-	-	8.0	A
Max. Pulsed Source Current	$I_{SM}$	-	-	-	32	A
Diode Forward Voltage	$V_{SD}$	$I_S=5A \cdot V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V \cdot I_S=8A$ $di/dt=100A/\mu s$	-	355	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	3.6	-	$\mu C$

**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)

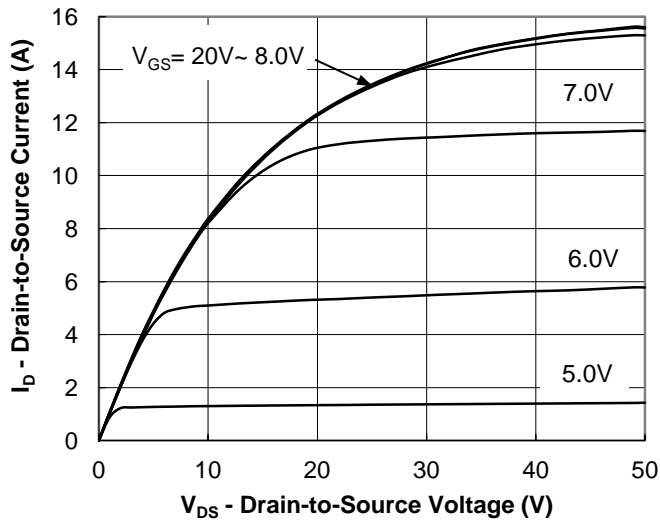


Fig.1 Output Characteristic

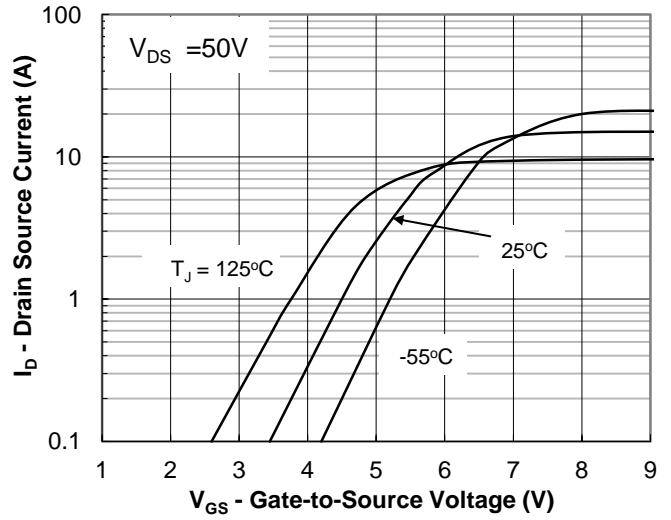


Fig.2 Transfer Characteristic

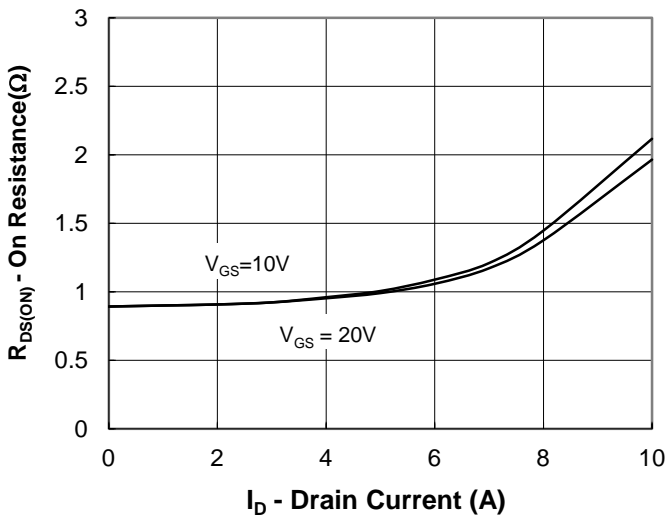


Fig.3 On-Resistance vs Drain Current

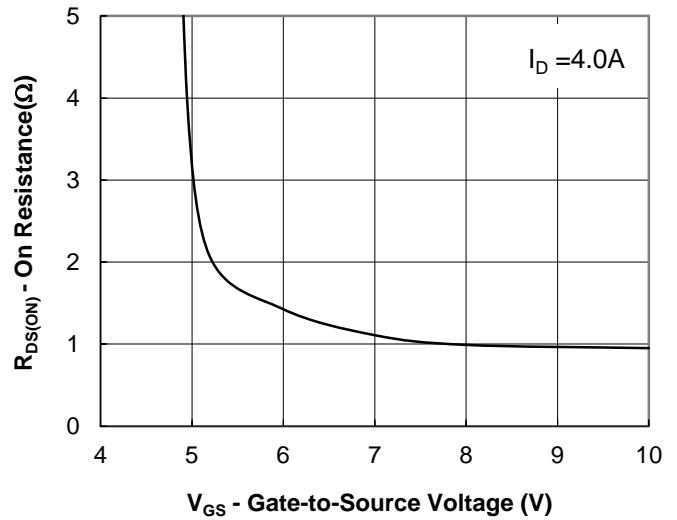


Fig.4 On-Resistance vs Gate to Source Voltage

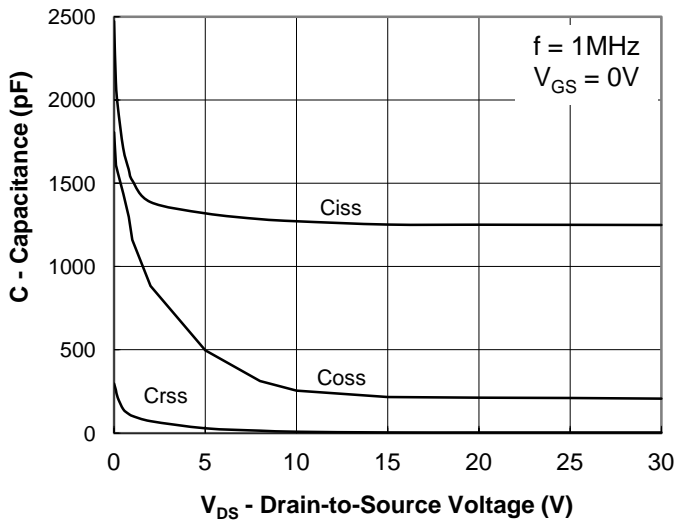


Fig.5 Capacitance Characteristic

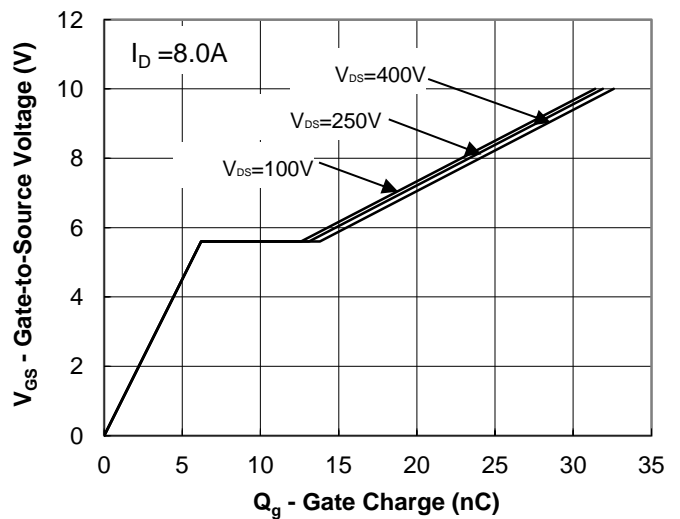


Fig.6 Gate Charge Characteristic

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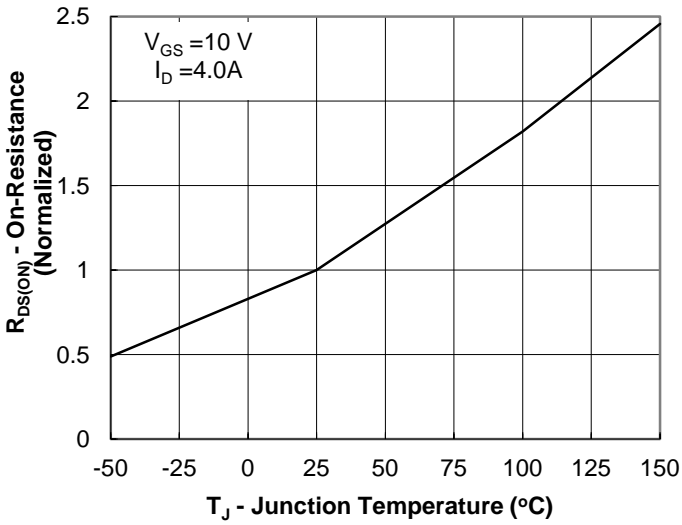


Fig.7 On-Resistance vs Junction Temperature

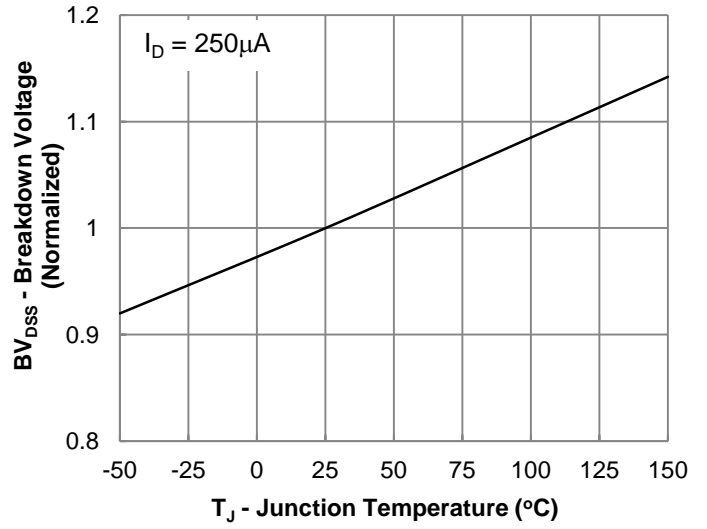


Fig.8 Breakdown Voltage vs Junction Temperature

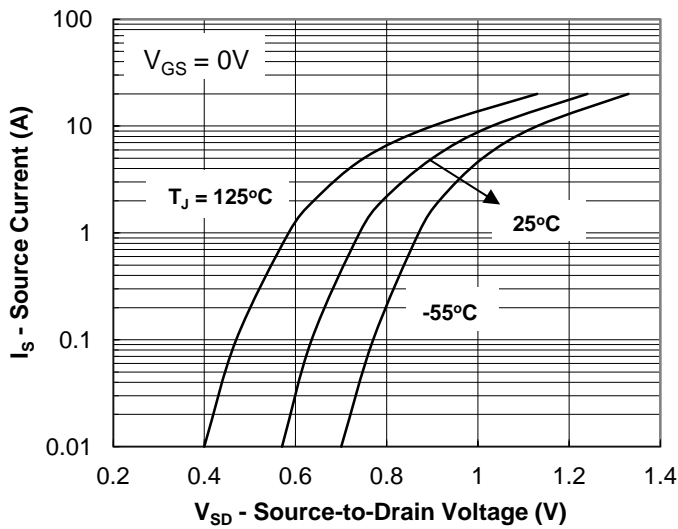


Fig.9 Body Diode Forward Voltage Characteristic