

500V / 5A
N-Channel Enhancement Mode MOSFET

500V, $R_{DS(ON)}=1.5\Omega@V_{GS}=10V, I_D=2.5A$

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

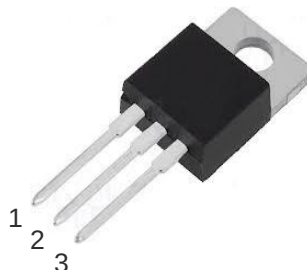
Mechanical Information

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

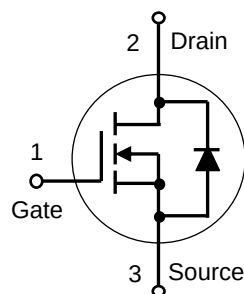
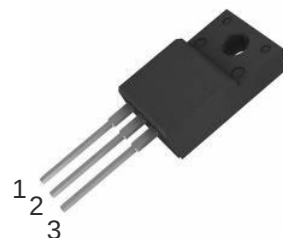
Marking & Ordering Information

TYPE	MARKING	PACKAGE	PACKING
HY5N50T	5N50T	TO-220AB	50PCS/TUBE
HY5N50FT	5N50FT	ITO-220AB	50PCS/TUBE

TO-220AB



ITO-220AB



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

Parameter		Symbol	HY5N50T	HY5N50FT	Units
Drain-Source Voltage		V_{DS}	500		V
Gate-Source Voltage		V_{GS}	± 30		V
Continuous Drain Current	$T_c=25^\circ\text{C}$	I_D	5	5	A
Pulsed Drain Current ¹⁾		I_{DM}	20	20	A
Maximum Power Dissipation Derating Factor	$T_c=25^\circ\text{C}$	P_D	71 0.57	27 0.22	W
Avalanche Energy with Single Pulse $I_{AS}=5A, V_{DD}=95V, L=11mH$		E_{AS}	135		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	HY5N50T	HY5N50FT	Units
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	1.76	4.6	$^\circ\text{C/W}$
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
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V 、 I _D =250uA	500	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} 、 I _D =250uA	2.0	-	4.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V 、 I _D =2.5A	-	1.2	1.5	Ω
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =500V 、 V _{GS} =0V	-	-	10	uA
Gate Body Leakage Current	I _{GSS}	V _{GS} =±30V 、 V _{DS} =0V	-	-	±100	nA
Dynamic						
Total Gate Charge	Qg	V _{DS} =400V 、 I _D =5A V _{GS} =10V	-	9.6	16	nC
Gate-Source Charge	Qgs		-	2.1	-	
Gate-Drain Charge	Qgd		-	2.7	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =250V 、 I _D =5A V _{GS} =10V 、 R _G =25Ω	-	15.8	21	ns
Turn-On Rise Time	t _r		-	36.2	48	
Turn-Off Delay Time	t _{d(off)}		-	22.6	28	
Turn-Off Fall Time	t _f		-	18.8	26	
Input Capacitance	C _{iss}	V _{DS} =25V 、 V _{GS} =0V f=1.0M _{HZ}	-	465	-	pF
Output Capacitance	C _{oss}		-	76	-	
Reverse Transfer Capacitance	C _{rss}		-	2.1	-	
Source-Drain Diode						
Max. Diode Forwad Voltage	I _S	-	-	-	5.0	A
Max. Pulsed Source Current	I _{SM}	-	-	-	20	A
Diode Forward Voltage	V _{SD}	I _S =5A 、 V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V 、 I _S =5A di/dt=100A/us	-	245	-	ns
Reverse Recovery Charge	Q _{rr}		-	2.2	-	uC

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)

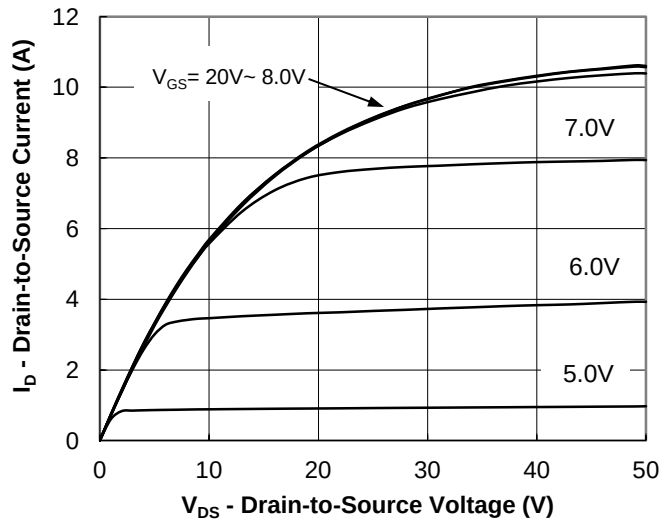


Fig.1 Output Characteristic

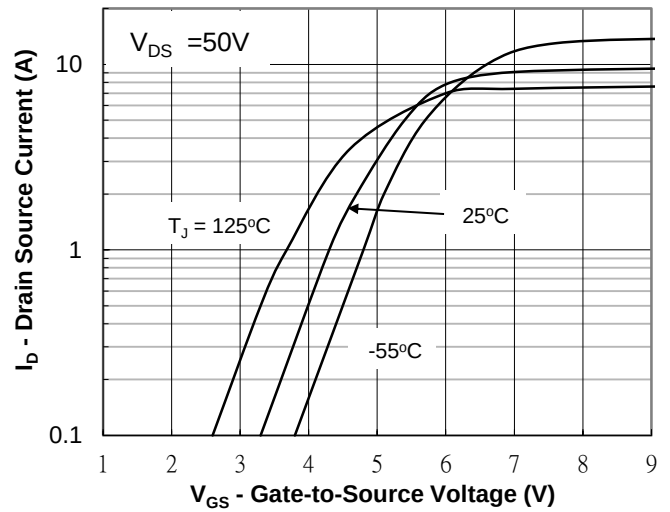


Fig.2 Transfer Characteristic

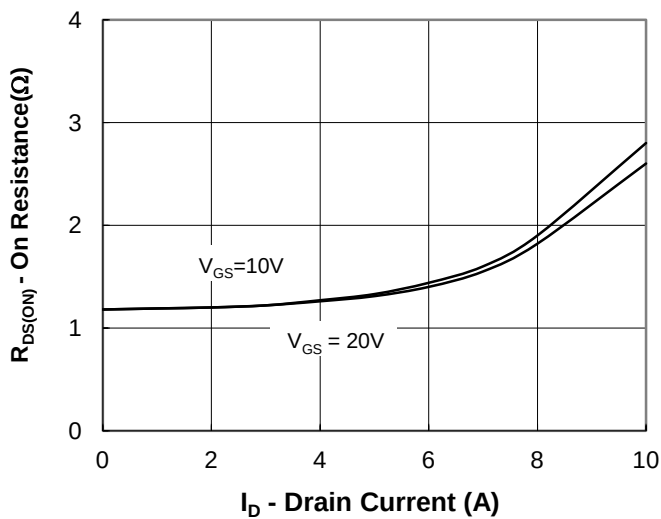


Fig.3 On-Resistance vs Drain Current

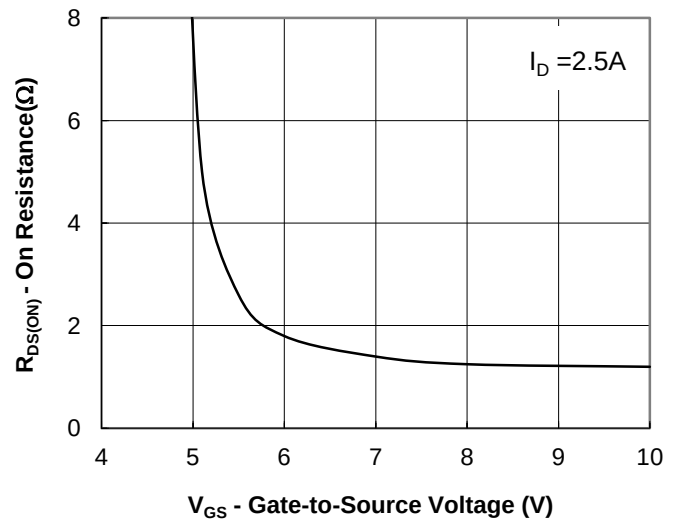


Fig.4 On-Resistance vs Gate to Source Voltage

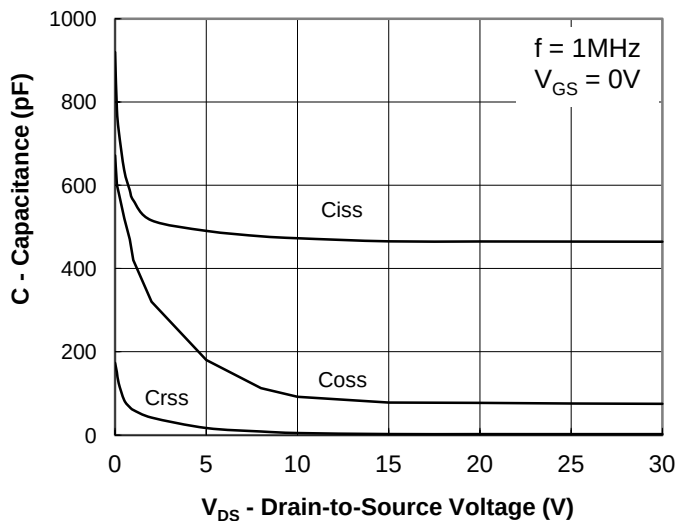


Fig.5 Capacitance Characteristic

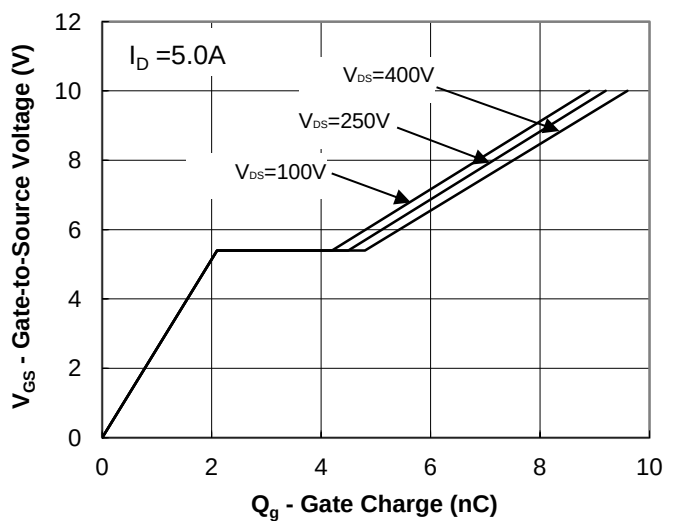


Fig.6 Gate Charge Characteristic

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

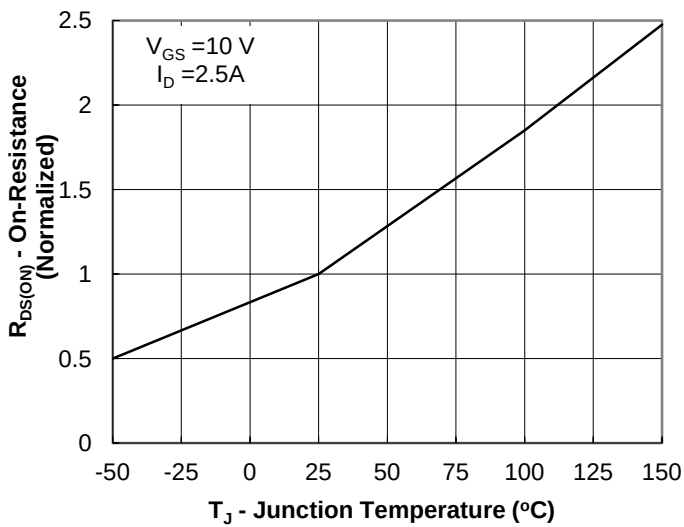


Fig.7 On-Resistance vs Junction Temperature

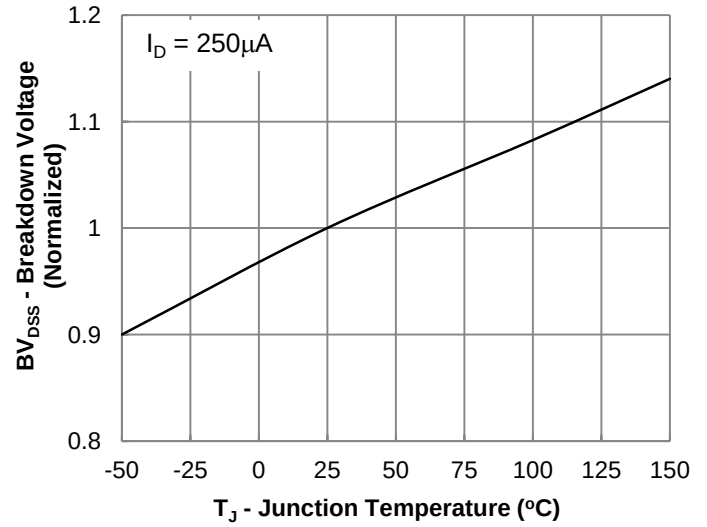


Fig.8 Breakdown Voltage vs Junction Temperature

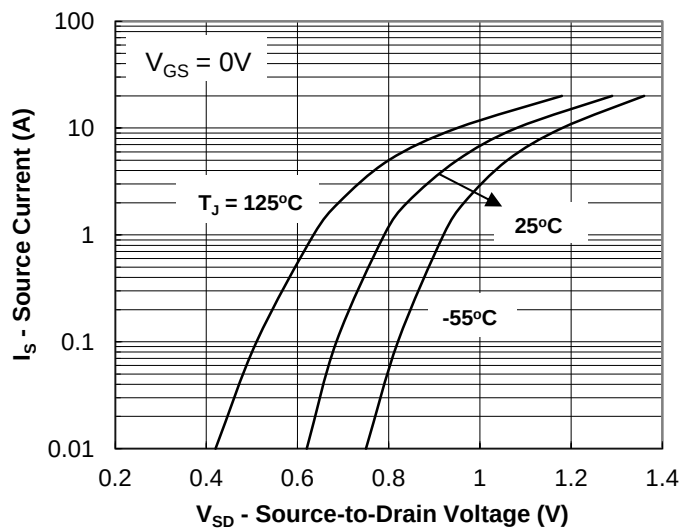


Fig.9 Body Diode Forward Voltage Characteristic