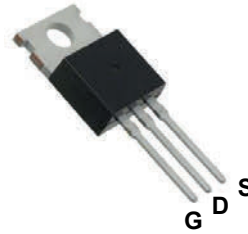
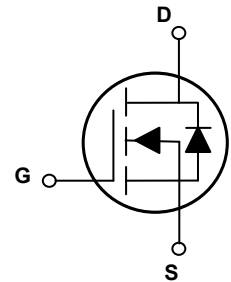


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	23m Ω (Max.)
I_D	50A



TO-220



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSFH50N06 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

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

Parameter	Symbol	Parameter	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^\circ\text{C}$)	I_D	50	A
Continuous Drain Current, @ Steady-State ($T_C=100^\circ\text{C}$)		35	A
Pulsed Drain Current	I_{DM}	200	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	100	W
		0.80	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	120	mJ
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction-to-Case	$R_{\theta JC}$	1.25	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to + 150	$^\circ\text{C}$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	15	μA
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V$	-	-	5	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=20V$	-	-	100	nA
		$V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	-	15	23	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1MHz$	-	950	-	pF
Output Capacitance	C_{oss}		-	435	-	
Reverse Transfer Capacitance	C_{rss}		-	82	-	
Total Gate Charge ^{2,3}	Q_g	$I_D=50A, V_{DS}=48V, V_{GS}=10V$	-	32	-	nC
Gate-to-Source Charge ^{2,3}	Q_{gs}		-	9.7	-	
Gate-to-Drain ("Miller") Charge ^{2,3}	Q_{gd}		-	10	-	
Turn-on Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, I_D=26A, R_G=50\Omega$	-	41	-	nS
Rise Time ^{2,3}	t_r		-	99	-	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	91	-	
Fall Time ^{2,3}	t_f		-	80	-	
Gate Resitance	R_g	$f=1MHz$	-	3.6	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	50	A
Diode Pulse Current	I_{SM}		-	-	200	A
Diode Forward Voltage	V_{SD}	$I_S=40A, V_{GS}=0V$	-	-	1.2	V
Reverse Recovery Time ²	T_{rr}	$I_S=40A, V_{GS}=0V, di_f/dt=100A/\mu s$	-	60	-	nS
Reverse Recovery Charge ²	Q_{rr}		-	120	-	nC

Note:

1. $L=0.1mH, I_{AS}=50A, R_G=25\Omega$, starting temperature $T_J=25^\circ\text{C}$.
2. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

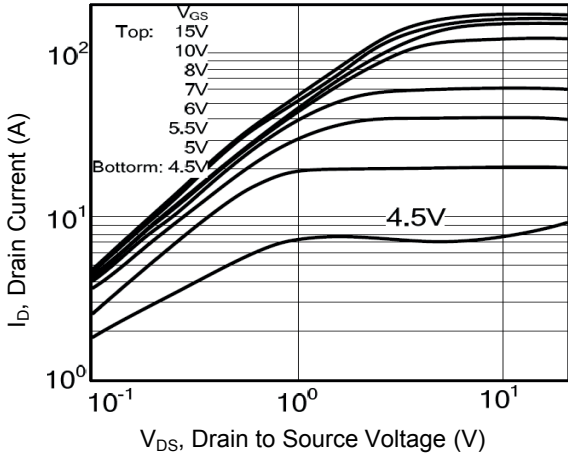


Figure 1. Typical Output Characteristics

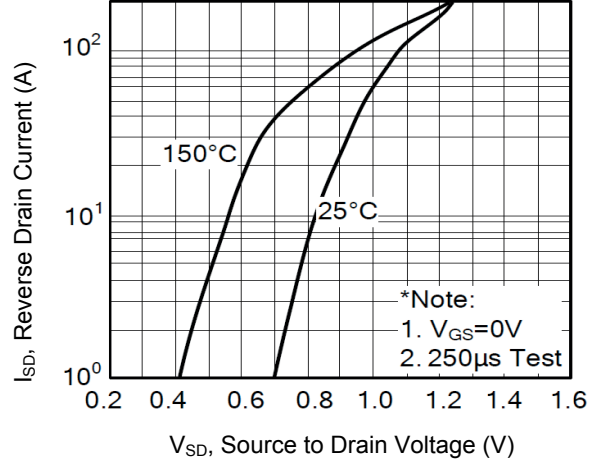


Figure 2. Body Diode Characteristics

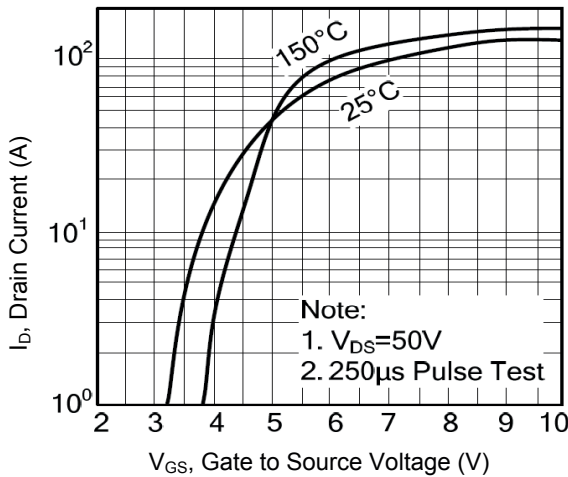


Figure 3. Transfer Characteristics

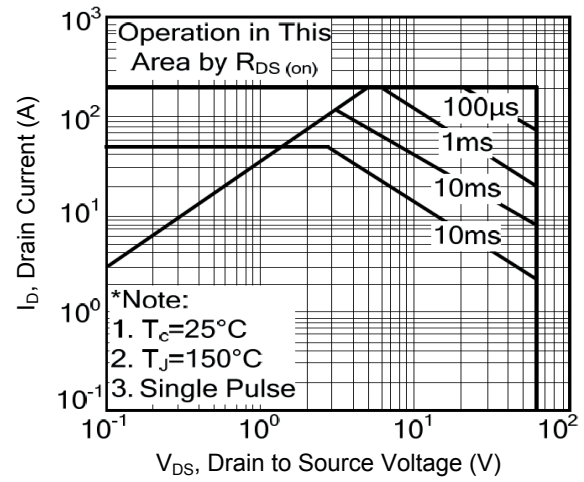


Figure 4. Safe Operation Area

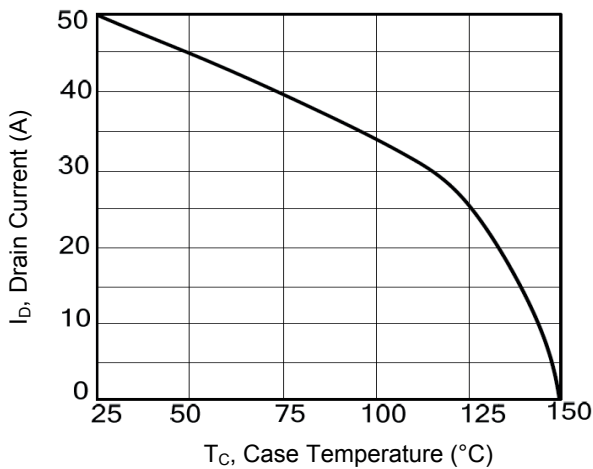


Figure 5. Drain Current vs. T_C

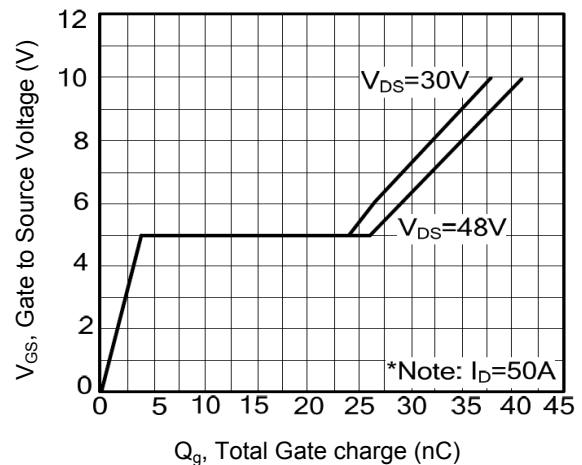


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

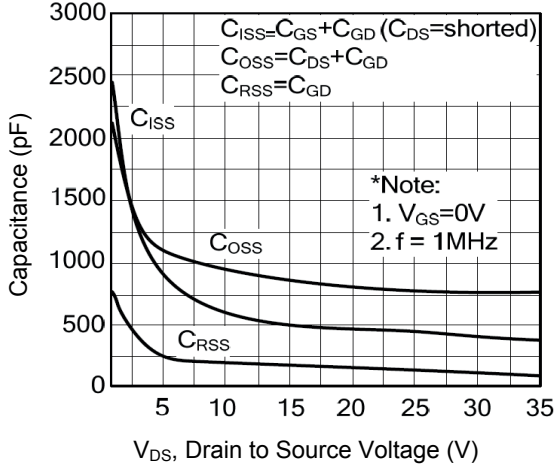


Figure 7. Capacitance Characteristics

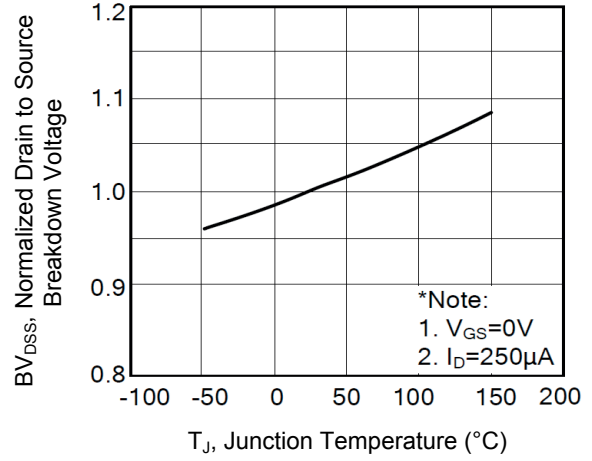
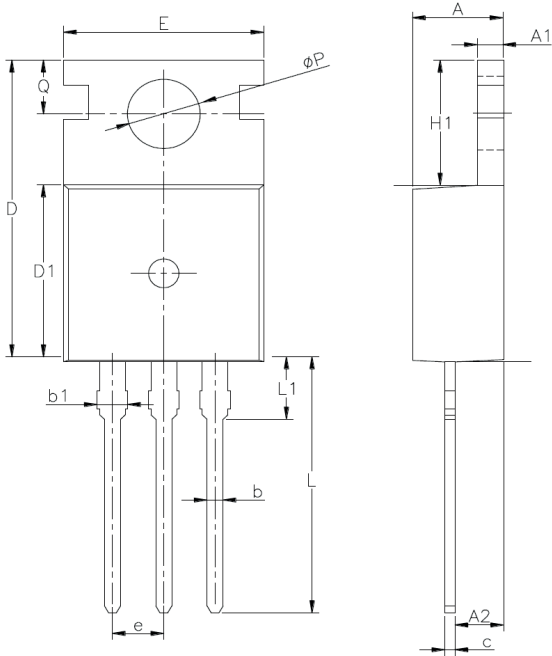


Figure 8. Normalized R_{DS(on)} vs. T_J

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.30	4.70	0.169	0.185
A1	1.00	1.50	0.039	0.059
A2	1.80	2.80	0.071	0.110
b	0.60	1.00	0.024	0.039
b1	1.00	1.60	0.039	0.063
c	0.30	0.70	0.012	0.028
D	15.10	16.10	0.594	0.634
D1	8.10	10.00	0.319	0.394
E	9.60	10.40	0.378	0.409
e	2.54 BSC		0.100 BSC	
H1	6.10	7.00	0.240	0.276
L	12.60	13.60	0.496	0.535
L1	-	3.95	-	0.156
ΦP	3.40	3.90	0.134	0.154
Q	2.60	3.20	0.102	0.126

Order Information

Device	Package	Marking	Carrier	Quantity
GSFH50N06	TO-220	H50N06	Tube	50pcs / Tube