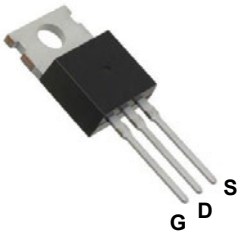
GSFH03152

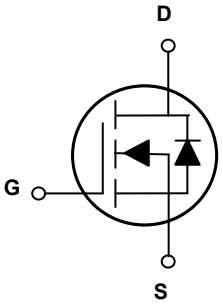
30V N-Channel MOSFET

Main Product Characteristics

V_{DS}	30V
$R_{DS(ON)}$	3.4mΩ (Max)
I_D	150A



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 GSFH03152 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_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_A=25°C)[1]	I_D	150	A
Drain Current-Continuous (T_A=100°C)		100	
Drain Current-Pulsed[2]	I_{DM}	400	A
Single Pulse Avalanche Energy[3]	E_{AS}	650	mJ
Power Dissipation (T_A=25°C)	P_D	110	W
Thermal Resistance, Junction-to-Ambient[4]	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.36	°C/W
Operating Junction Temperature Range	T_J	-55 To +175	°C
Storage Temperature Range	T_{STG}	-55 To +175	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=30V, V_{GS}=0V, T_J=125°C	-	-	50	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	-	2.5	3.4	mΩ
		V_{GS}=4.5V, I_D=20A	-	4.2	5.8	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.0	1.7	2.5	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=15V, I_D=30A, V_{GS}=10V	-	70.6	-	nC
Gate-Source Charge	Q_{gs}		-	12.2	-	
Gate-Drain Charge	Q_{gd}		-	16.5	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=15V, R_G=2Ω, V_{GS}=4.5V,R_L=0.25Ω, I_D=60A	-	11	-	nS
Rise Time	t_r		-	80	-	
Turn-Off Delay Time	$t_{d(off)}$		-	26	-	
Fall Time	t_f		-	58	-	
Input Capacitance	C_{lss}	V_{DS}=25V, V_{GS}=0V, F=1MHz	-	3400	-	pF
Output Capacitance	C_{oss}		-	357	-	
Reverse Transfer Capacitance	C_{rss}		-	306	-	
Gate Resistance	R_g	F=1MHz	-	1.9	3	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	150	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	400	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=20A	-	0.86	1.2	V
Reverse Recovery Time	t_{rr}	I_F=60A, di/dt=100A/μs, T_J=25°C	-	56	-	nS
Reverse Recovery Charge	Q_{rr}		-	110	-	nC

Note:

1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating: Pulsed width limited by maximum junction temperature.
3. L=0.5mH, V_{DD}=10V, R_g=25Ω, starting T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

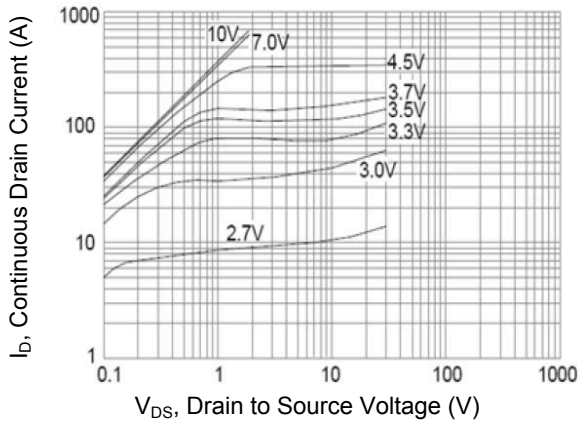


Figure 1. Output Characteristics

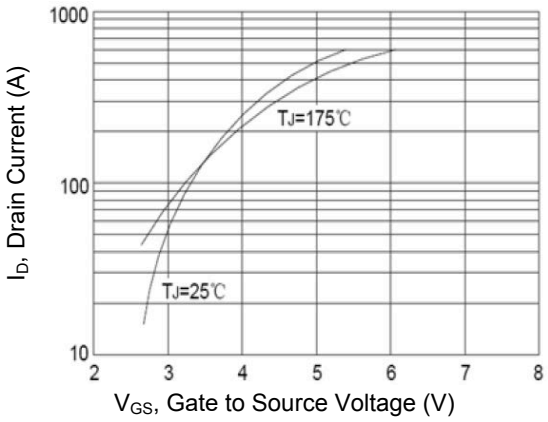


Figure 2. Transfer Characteristics

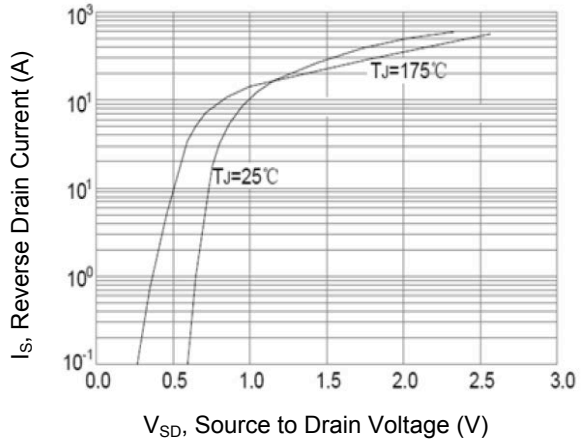


Figure 3. Body Diode Characteristics

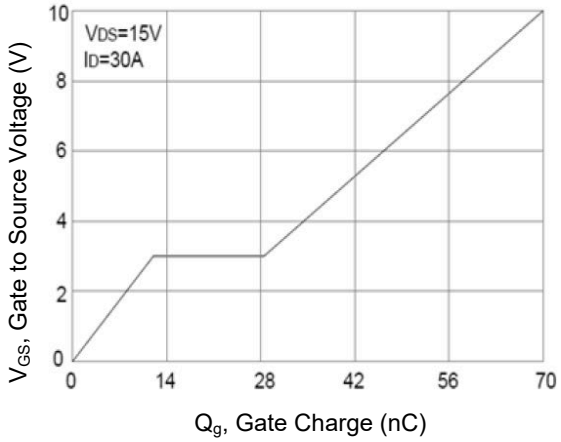


Figure 4. Gate Charge Waveform

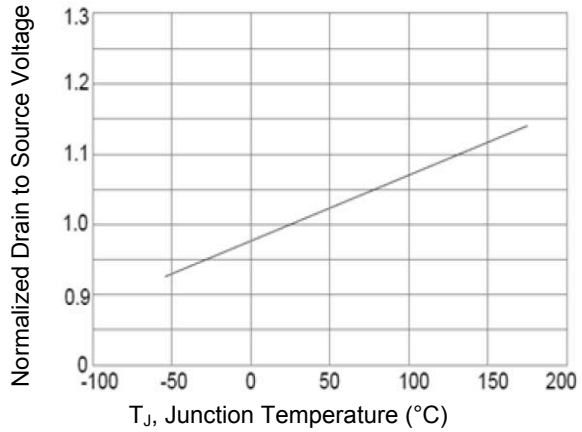


Figure 5. Normalized BV_{DSS} vs. Junction Temperature

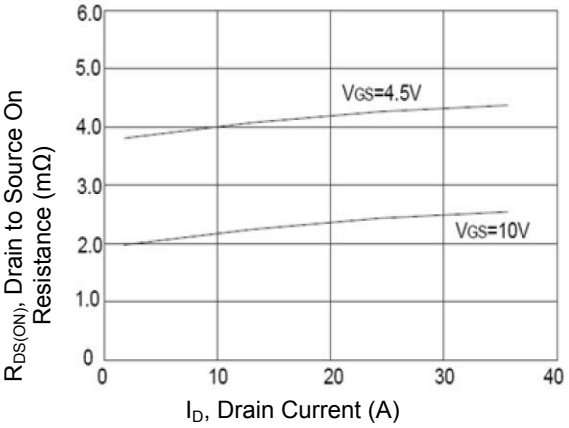


Figure 6. On-Resistance vs. Drain Current

Typical Electrical and Thermal Characteristic Curves

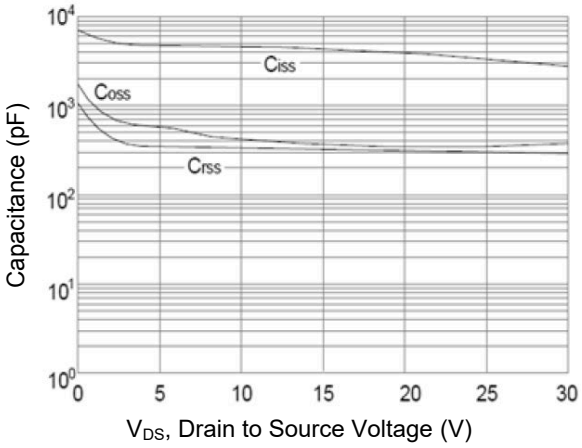


Figure 7. Capacitance Characteristics

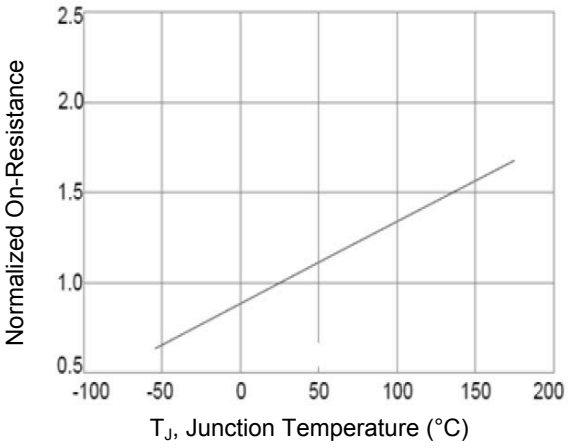


Figure 8. Normalized $R_{DS(ON)}$ vs. Drain Current

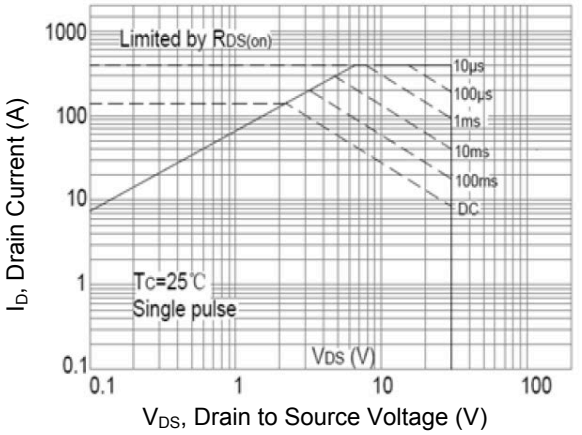


Figure 9. Safe Operation Area

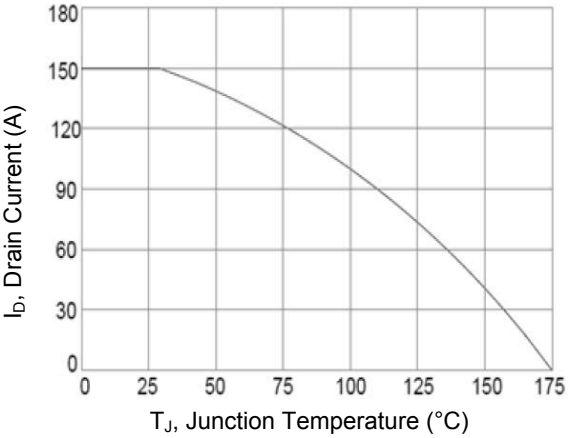


Figure 10. Current De-rating

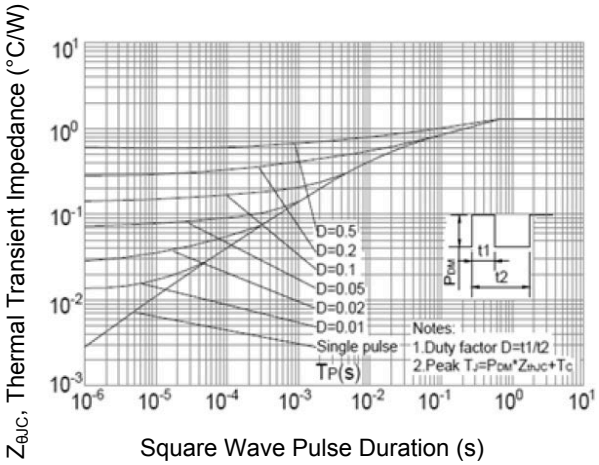
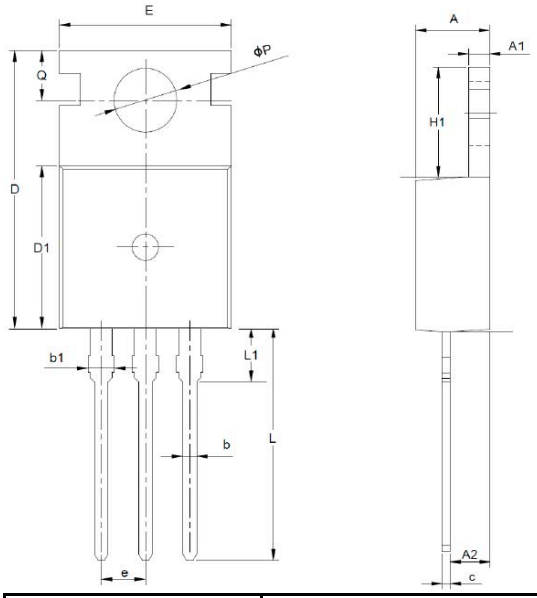


Figure 11. Transient Thermal Impedance

Package Outline Dimensions (TO-220)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.300	4.700	0.169	0.185
A1	1.000	1.500	0.039	0.059
A2	1.800	2.800	0.071	0.110
b	0.600	1.000	0.024	0.039
b1	1.000	1.600	0.039	0.063
c	0.300	0.700	0.012	0.028
D	15.100	16.100	0.594	0.634
D1	8.100	10.000	0.319	0.394
E	9.600	10.400	0.378	0.409
e	2.540 BSC		0.100 BSC	
H1	6.100	7.000	0.240	0.276
L	12.600	13.600	0.496	0.535
L1	-	3.950	-	0.156
ØP	3.400	3.900	0.134	0.154
Q	2.600	3.200	0.102	0.126

Order Information

Device	Package	Marking	Quantity	HSF Status
GSFH03152	TO-220	H3006	50pcs / Tube	RoHS Compliant