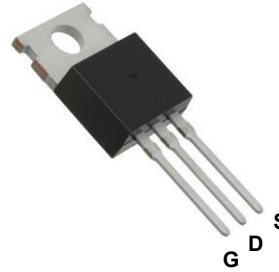
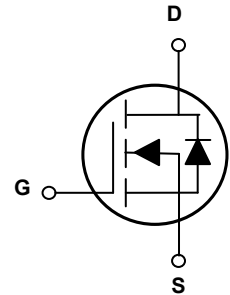


## Main Product Characteristics

$V_{DS}$	200V
$R_{DS(ON)}$	20m $\Omega$
$I_D$	75A



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 GSFH2076 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 supply and a wide variety of other applications.

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

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DSS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	75	A
Drain Current-Continuous ( $T_C=100^{\circ}\text{C}$ )		53	
Pulsed Drain Current	$I_{DM}$	300	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	1512	mJ
Maximum Power Dissipation	$P_D$	360	W
Derating Factor		2.4	
Thermal Resistance, Junction-to-Case <sup>1</sup>	$R_{\theta JC}$	0.42	$^{\circ}\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 To +175	$^{\circ}\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +175	$^{\circ}\text{C}$

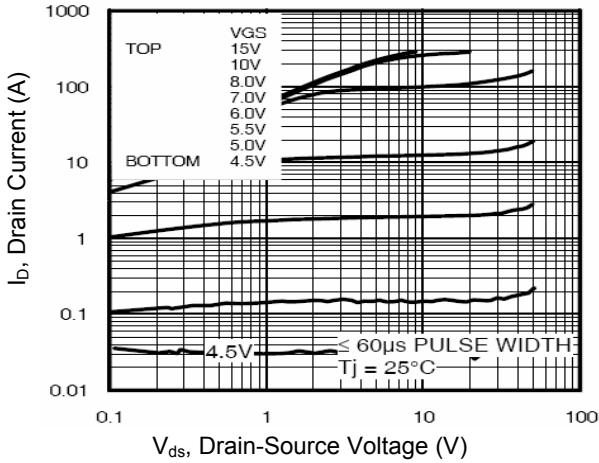
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=200V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 200$	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.5	3.5	4.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	-	17.8	20	m $\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS}=50V, I_D=40A$	-	79	-	S
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, F=1MHz$	-	6990	-	pF
Output Capacitance	$C_{oss}$		-	950	-	
Reverse Transfer Capacitance	$C_{rss}$		-	700	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=100V, R_G=2.7\Omega, V_{GS}=10V, I_D=40A$	-	17	-	nS
Turn-On Rise Time	$t_r$		-	18	-	
Turn-Off Delay Time	$t_{d(off)}$		-	56	-	
Turn-Off Fall Time	$t_f$		-	22	-	
Total Gate Charge	$Q_g$	$V_{DD}=100V, I_D=40A, V_{GS}=10V$	-	140	-	nC
Gate-Source Charge	$Q_{gs}$		-	40	-	
Gate-Drain Charge	$Q_{gd}$		-	45	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=75A$	-	-	1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=40A, di/dt=100A/\mu s^2, T_J=25^\circ C$	-	136	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	458	-	nC

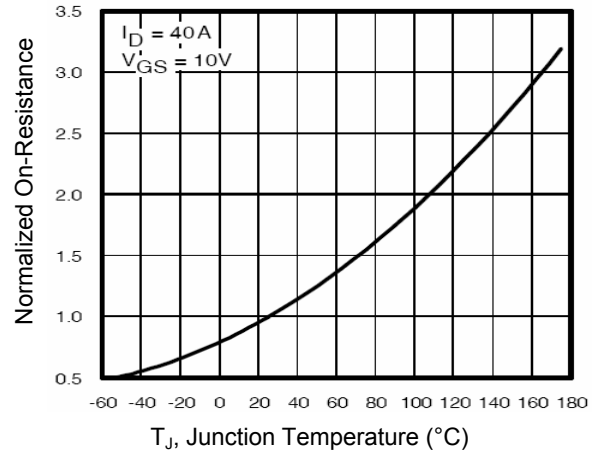
Note:

1. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
2. Pulse Test: Pulse Width  $\leq 400\mu s$ , Duty Cycle  $\leq 2\%$ .
3. EAS condition :  $T_J=25^\circ C, V_{DD}=50V, V_G=10V, L=1mH, R_g=25\Omega, I_{AS}=55A$
4.  $I_{SD} \leq 125A, di/dt \leq 260A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 175^\circ C$

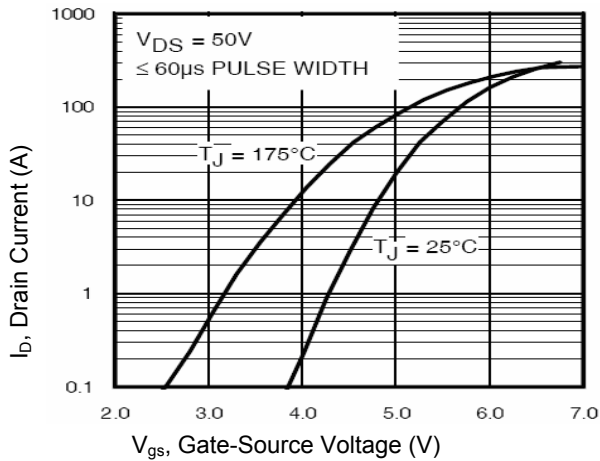
**Typical Electrical and Thermal Characteristic Curves**



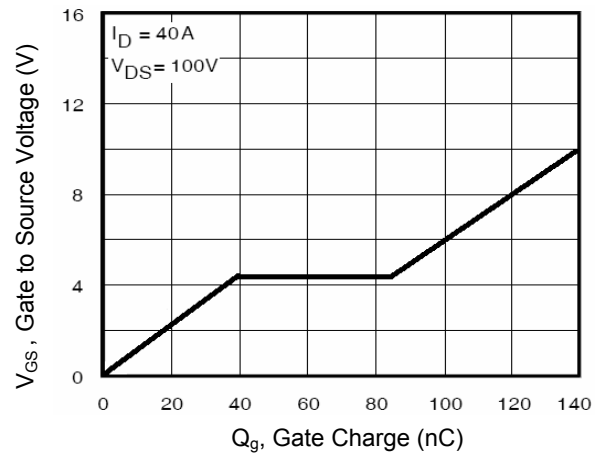
**Figure 1. Output Characteristics**



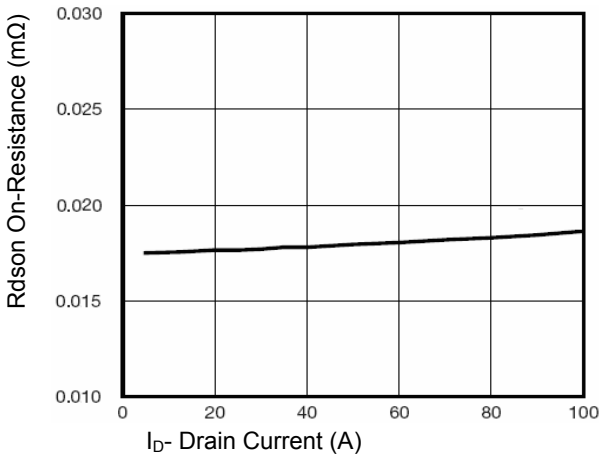
**Figure 2.  $R_{DS(on)}$ -Junction Temperature**



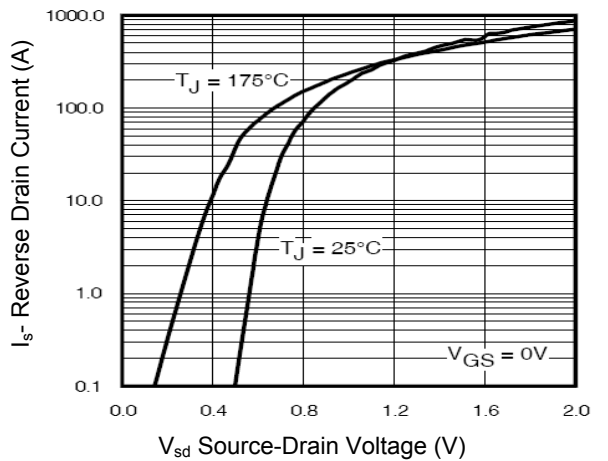
**Figure 3. Transfer Characteristics**



**Figure 4. Gate Charge**

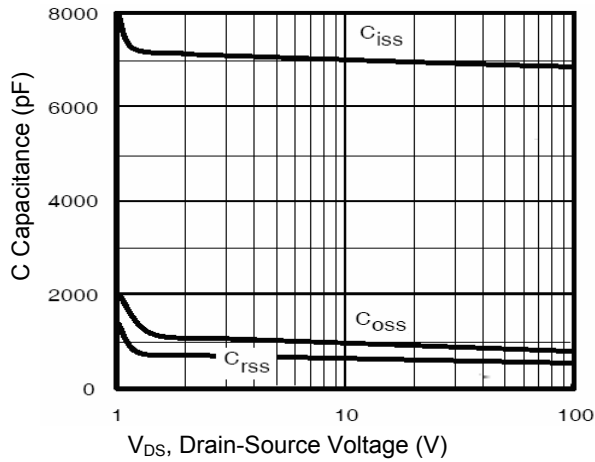


**Figure 5.  $R_{ds(on)}$ - Drain Current**

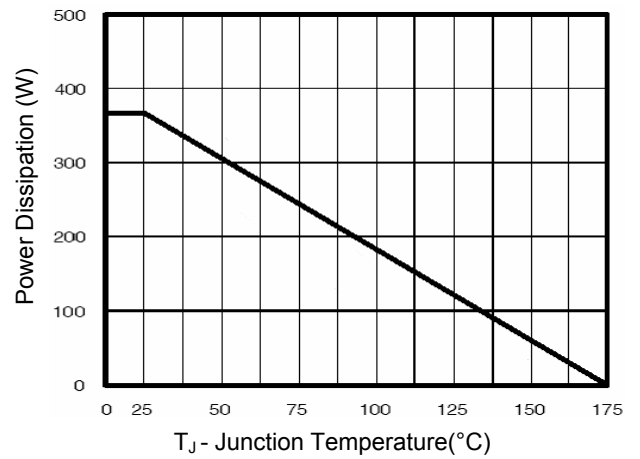


**Figure 6. Source- Drain Diode Forward**

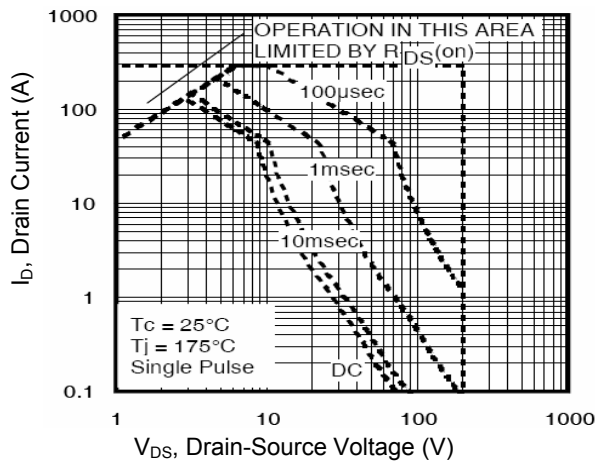
**Typical Electrical and Thermal Characteristic Curves**



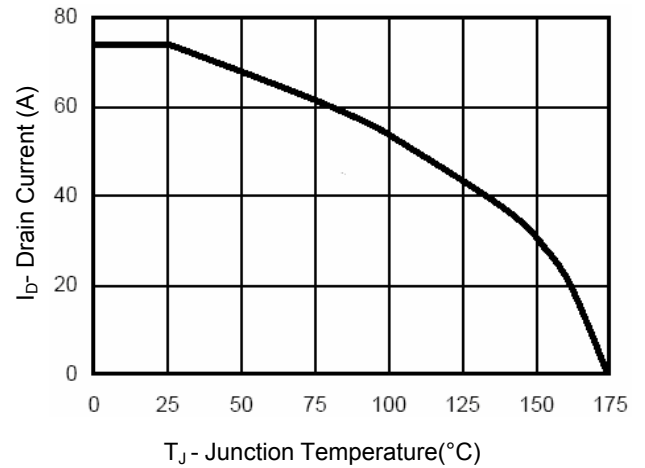
**Figure 7. Capacitance vs.  $V_{DS}$**



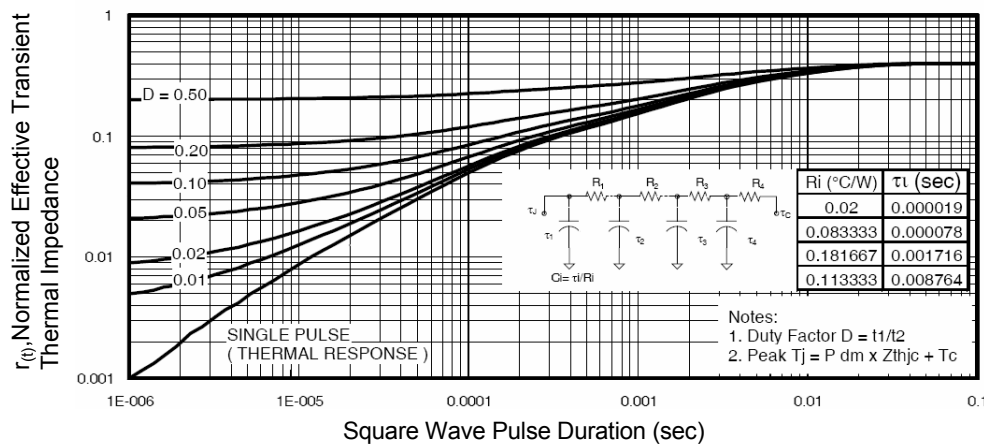
**Figure 8. Power De-rating**



**Figure 9. Safe Operation Area**

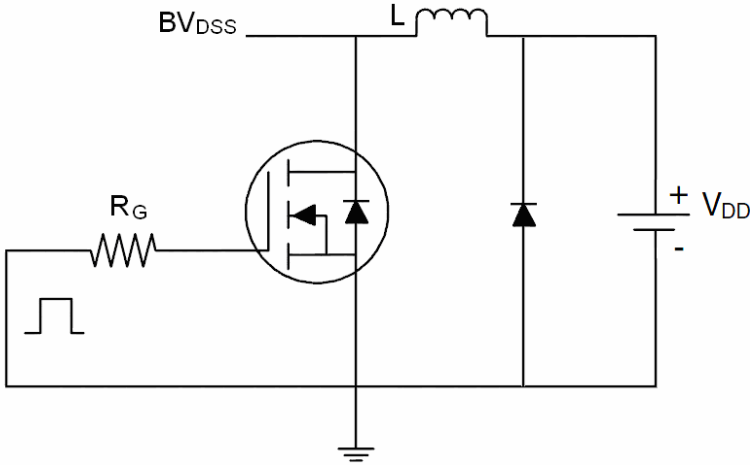


**Figure 10. Current De-rating vs. Junction Temperature**

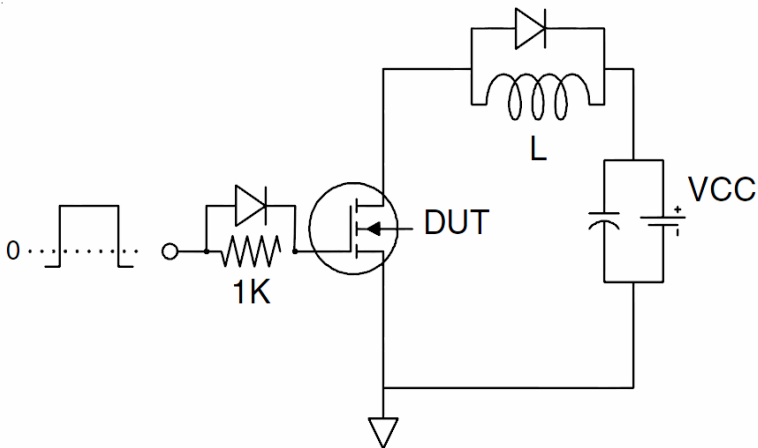


**Figure 11. Normalized Maximum Transient Thermal Impedance**

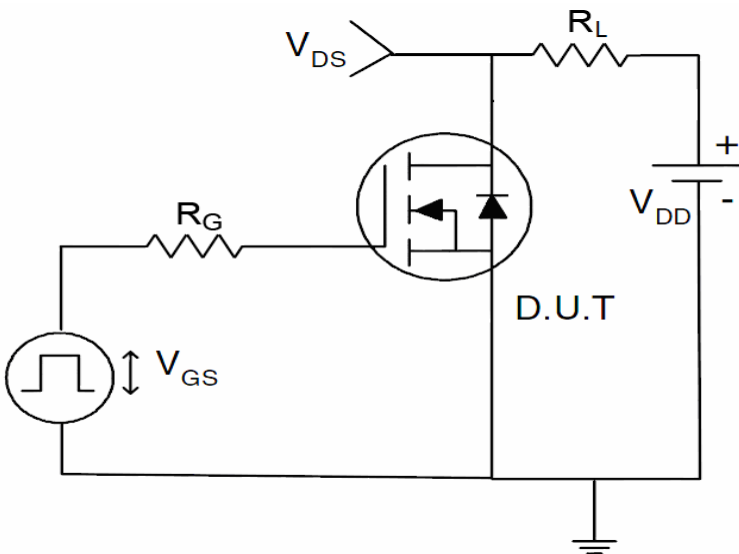
**Typical Electrical and Thermal Characteristic Curves**



**Figure 12. E<sub>AS</sub> Test Circuit**

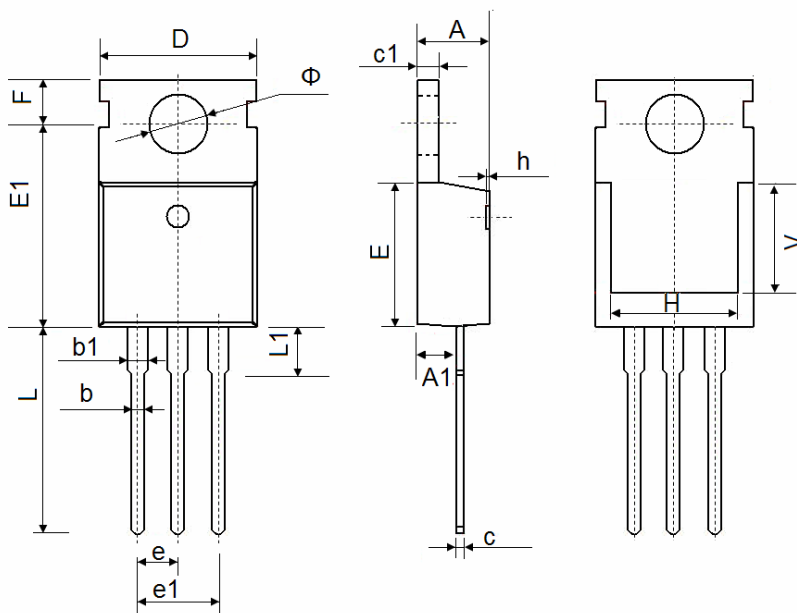


**Figure 13. Gate Charge Test Circuit**



**Figure 14. Switch Time Test Circuit**

**Package Outline Dimensions (TO-220)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
φ	3.400	3.800	0.134	0.150