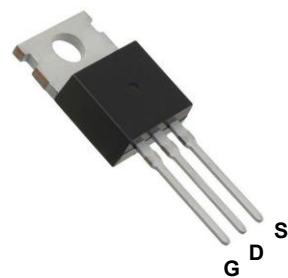
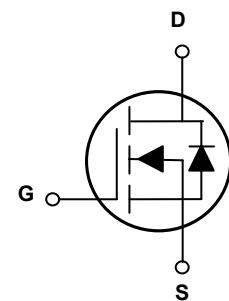


Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	11.5mΩ
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 GSFH0676 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_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	75	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	50	A
Pulsed Drain Current	I_{DM}	300	A
Maximum Power Dissipation	P_D	110	W
Derating Factor		0.73	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ⁵	E_{AS}	450	mJ
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.36	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +175	$^\circ\text{C}$

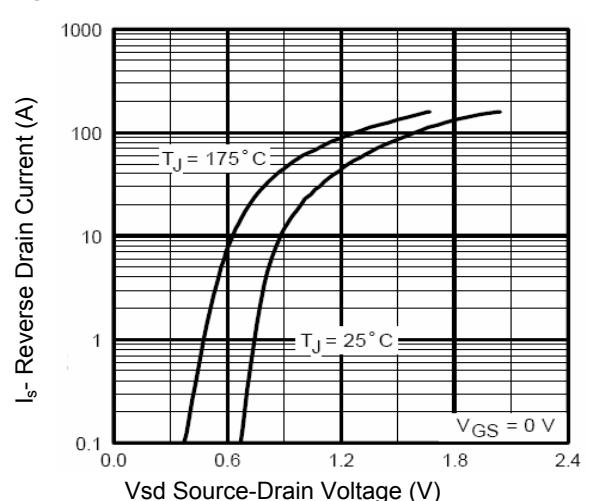
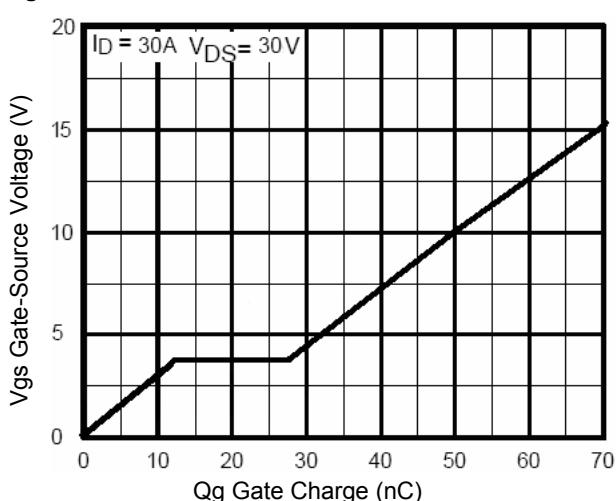
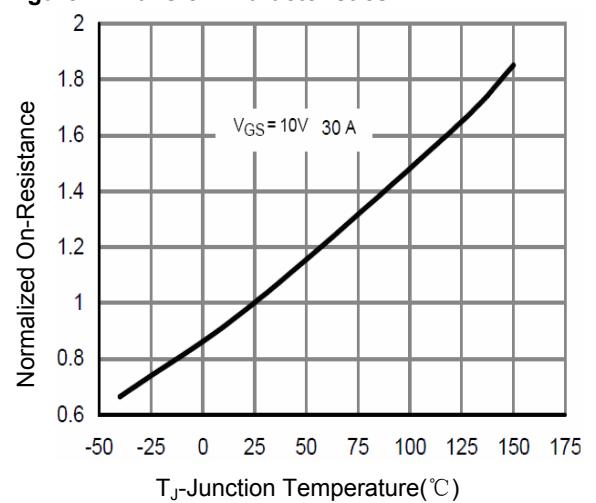
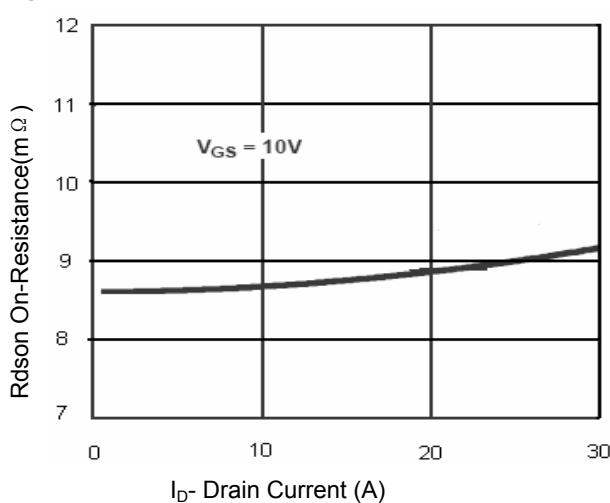
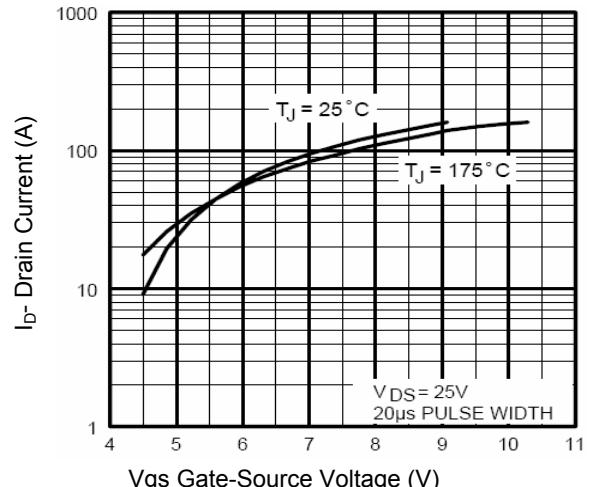
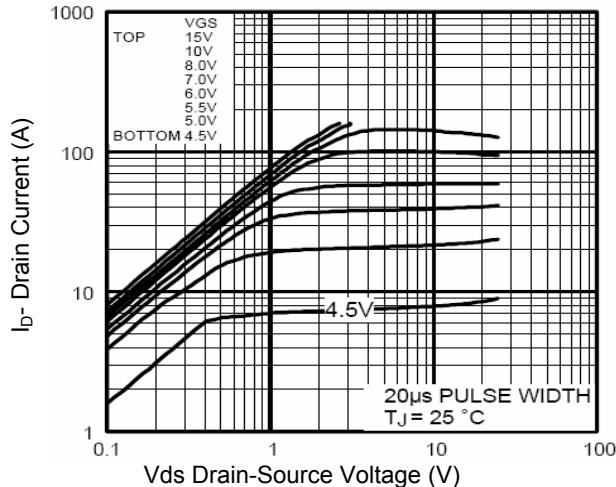
Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	2	3	4	V
Drain-Source On-State Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=30\text{A}$	-	9.1	11.5	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{\text{DS}}=25\text{V}, I_{\text{D}}=30\text{A}$	-	20	-	S
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{\text{DS}}=25\text{V}, V_{\text{GS}}=0\text{V}, F=1.0\text{MHz}$	-	2350	-	PF
Output Capacitance	C_{oss}		-	237	-	
Reverse Transfer Capacitance	C_{rss}		-	205	-	
Switching Characteristics⁴						
Total Gate Charge	Q_g	$V_{\text{DS}}=30\text{V}, I_{\text{D}}=30\text{A}, V_{\text{GS}}=10\text{V}$	-	50	-	nC
Gate-Source Charge	Q_{gs}		-	12	-	
Gate-Drain Charge	Q_{gd}		-	16	-	
Turn-On Delay Time	$t_{\text{d(on)}}$	$V_{\text{DD}}=30\text{V}, I_{\text{D}}=2\text{A}, V_{\text{GS}}=10\text{V}, R_{\text{GEN}}=2.5\Omega$	-	16	-	nS
Turn-On Rise Time	t_r		-	10	-	
Turn-Off Delay Time	$t_{\text{d(off)}}$		-	45	-	
Turn-Off Fall Time	t_f		-	12	-	
Drain-Source Diode Characteristics						
Diode Forward Current ²	I_s		-	-	75	A
Diode Forward Voltage ³	V_{SD}	$I_s=30\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.2	V
Reverse Recovery Time	t_{rr}	$T_j=25^\circ\text{C}, I_F=75\text{A}$ $dI/dt=-100\text{A}/\mu\text{s}^3$	-	28	-	nS
Reverse Recovery Charge	Q_{rr}		-	49	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on is negligible(turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_j=25^\circ\text{C}, V_{\text{DD}}=30\text{V}, V_G=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$

Typical Electrical and Thermal Characteristic Curves



Typical Electrical and Thermal Characteristic Curves

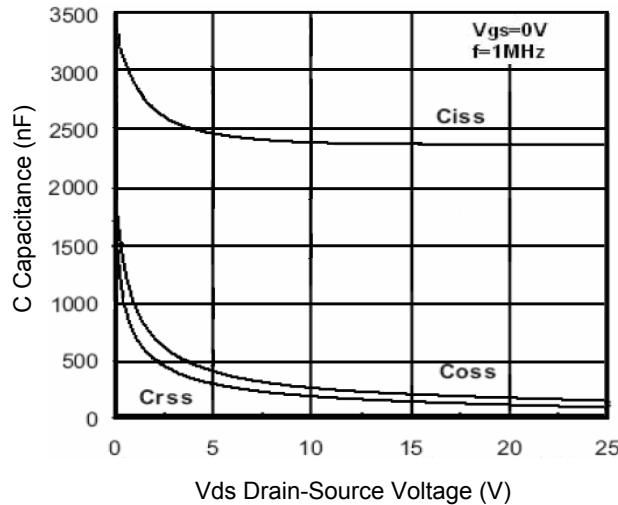


Figure 7. Capacitance vs Vds

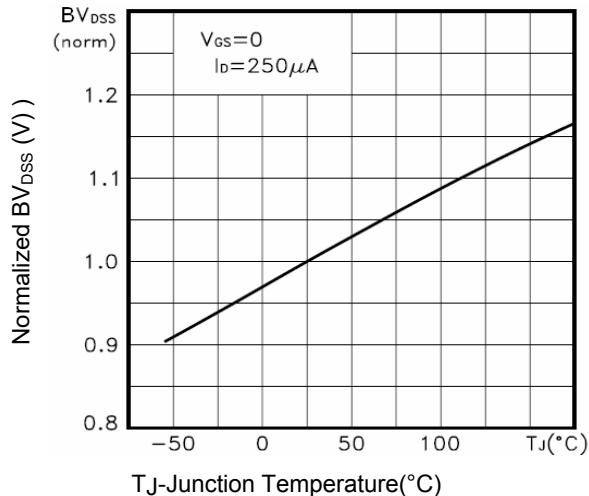


Figure 8. BV_{dss} vs Junction Temperature

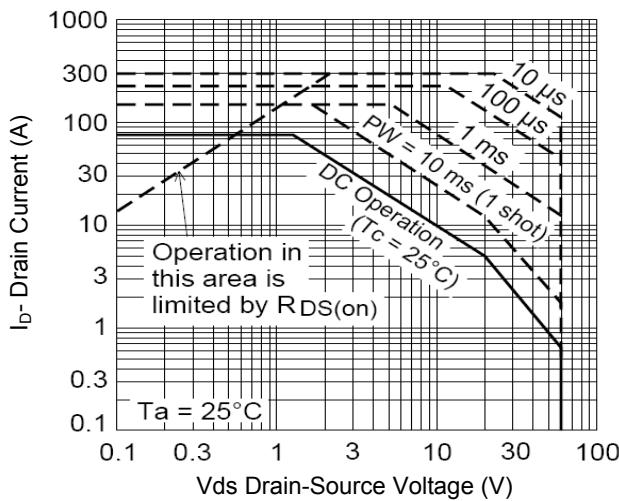


Figure 9. Safe Operation Area

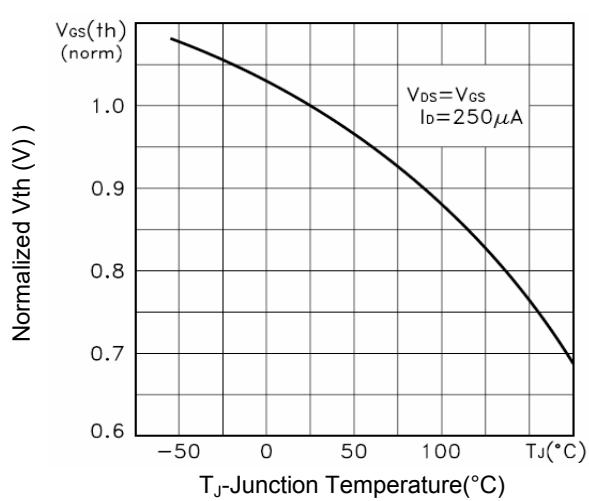


Figure 10. V_{th} vs Junction Temperature

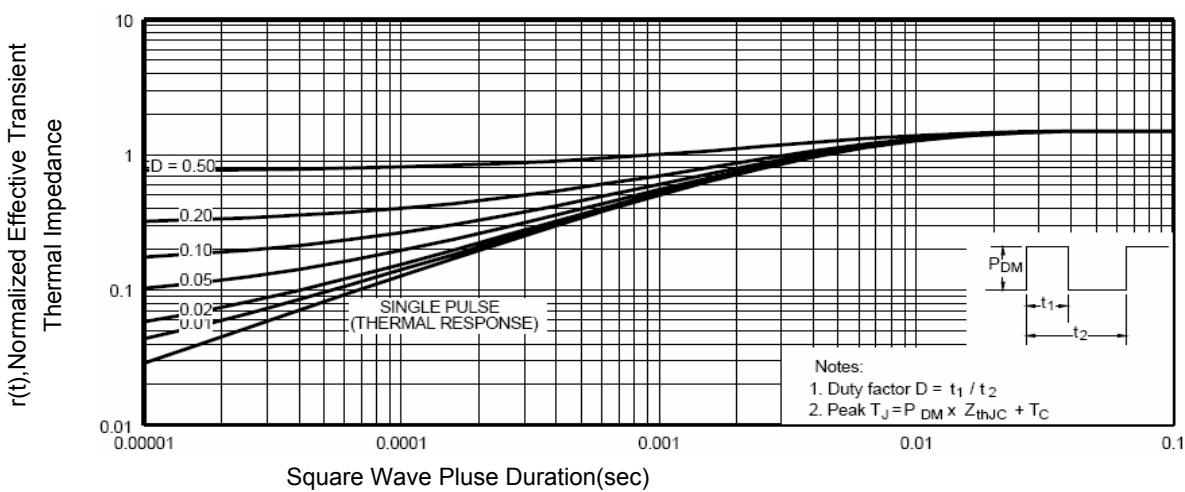


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

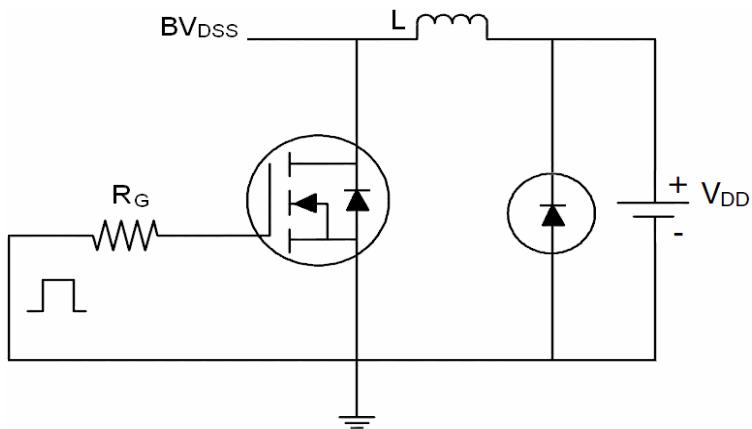


Figure 12. E_{AS} Test Circuit

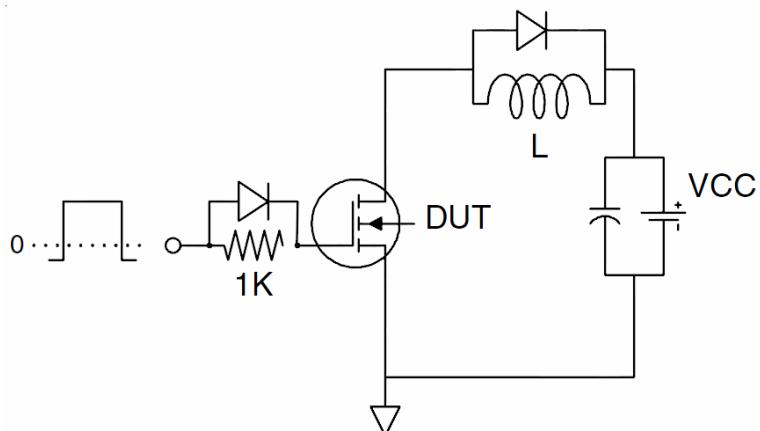


Figure 13. Gate Charge Test Circuit

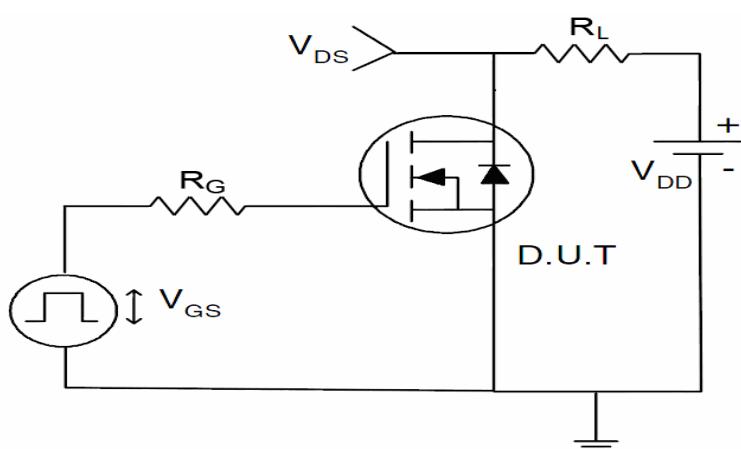
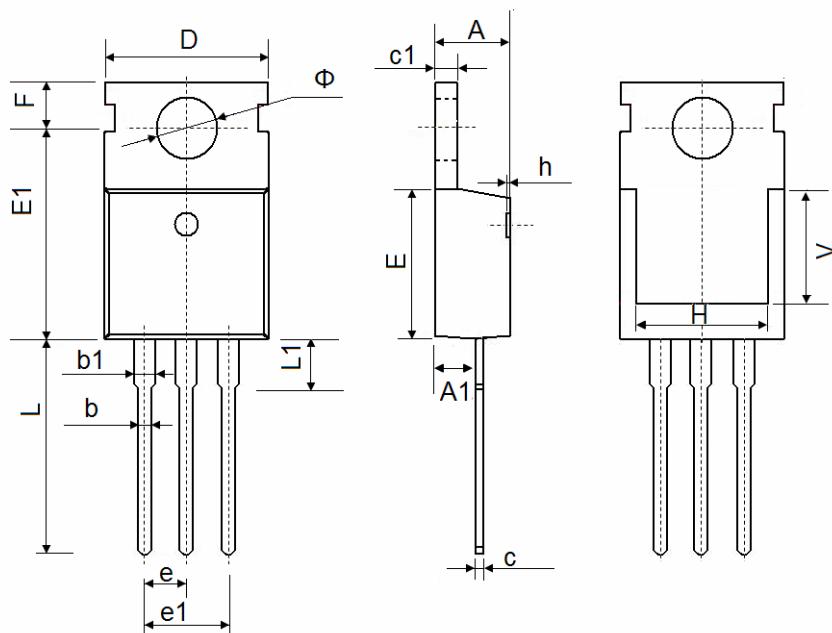


Figure 14. Switch Time Test Circuit

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