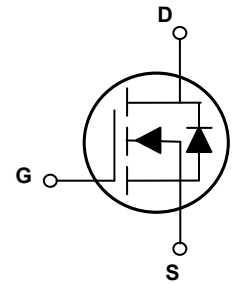
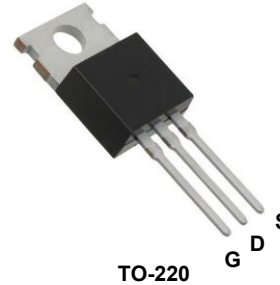


Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	7m Ω (Max.)
I_D	80A



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 GSFH0680 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°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	80	A
Drain Current-Continuous (T _C =100°C)		56.5	
Drain Current-Pulsed	I_{DM}	320	A
Single Pulse Avalanche Energy ⁵	E_{AS}	390	mJ
Maximum Power Dissipation	P_D	110	W
Derating Factor		0.73	
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	6	7	m Ω
Gate Threshold Voltage ³	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.8	4	V
Forward Transconductance ³	g_{fs}	$V_{DS}=5V, I_D=20A$	20	-	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ⁴	Q_g	$V_{DS}=30V, I_D=20A$ $V_{GS}=10V$	-	90	-	nC
Gate-Source Charge ⁴	Q_{gs}		-	9	-	
Gate-Drain Charge ⁴	Q_{gd}		-	18	-	
Turn-On Delay Time ⁴	$t_{d(on)}$	$V_{DD}=30V, R_L=1\Omega$ $V_{GS}=10V, R_G=3\Omega$	-	8.5	-	nS
Rise Time ⁴	t_r		-	7	-	
Turn-Off Delay Time ⁴	$t_{d(off)}$		-	40	-	
Fall Time ⁴	t_f		-	15	-	
Input Capacitance ⁴	C_{iss}	$V_{DS}=30V, V_{GS}=0V,$ $F=1MHz$	-	4000	-	pF
Output Capacitance ⁴	C_{oss}		-	290	-	
Reverse Transfer Capacitance ⁴	C_{rss}		-	210	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
Continuous Source Current ²	I_S	-	-	-	80	A
Reverse Recovery Time ³	t_{rr}	$T_J=25^\circ C, I_F=20A,$ $di/dt=100A/\mu s$	-	32	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	45	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Surface mounted on FR4 board, $t \leq 10s$.
3. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production.
5. EAS condition: $V_{DD}=20V, V_G=10V, L=0.5mH, R_G=25\Omega, T_J=25^\circ C$.

Typical Electrical and Thermal Characteristic Curves

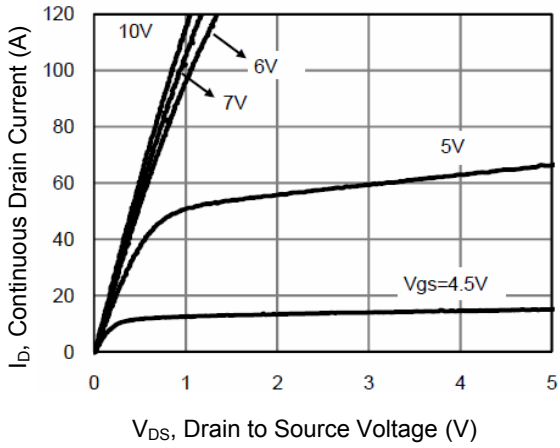


Figure 1. Typical Output Characteristics

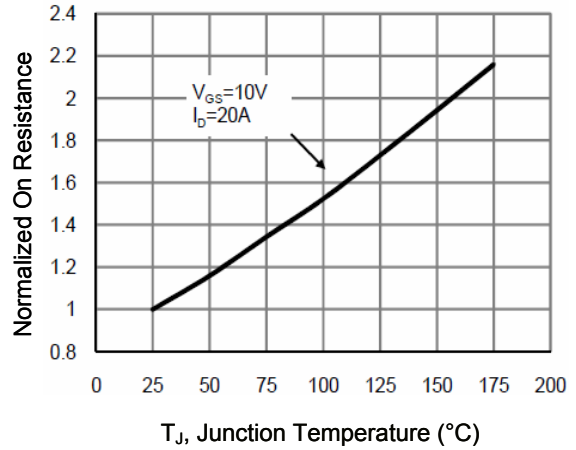


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

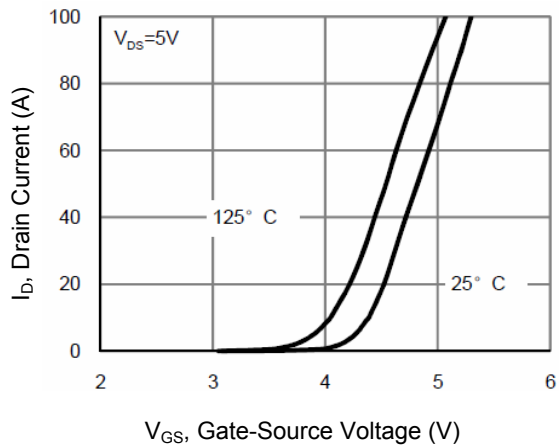


Figure 3. Transfer Characteristics

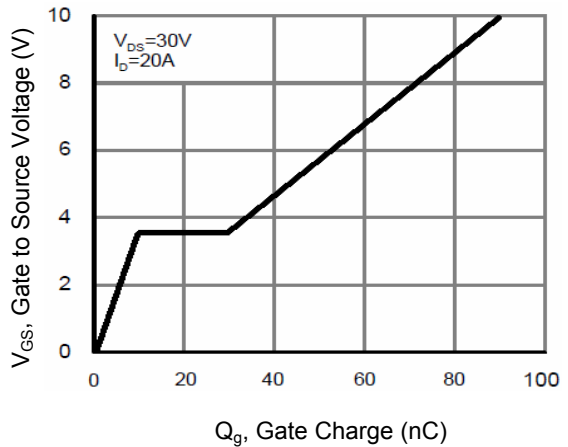


Figure 4. Gate Charge Characteristics

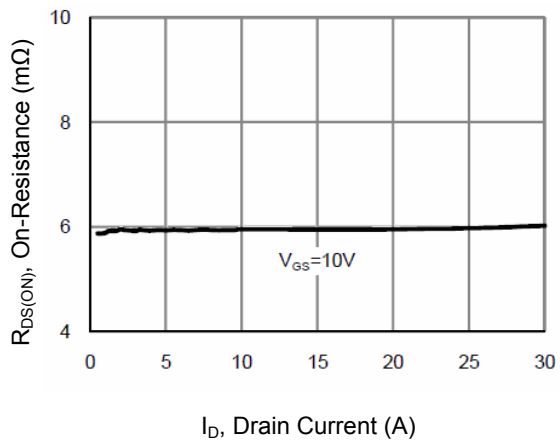


Figure 5. $R_{DS(ON)}$ - Continuous Drain Current

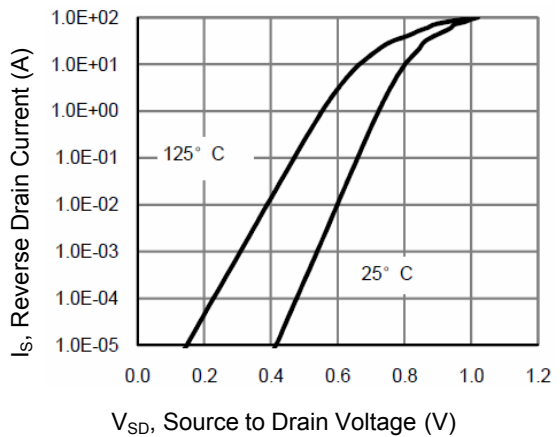


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

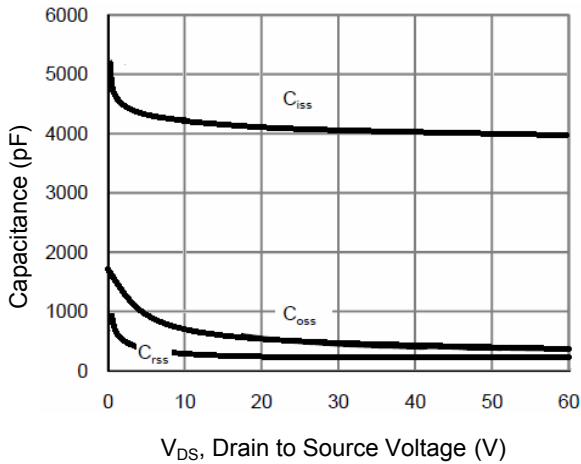


Figure 7. Capacitance Characteristics

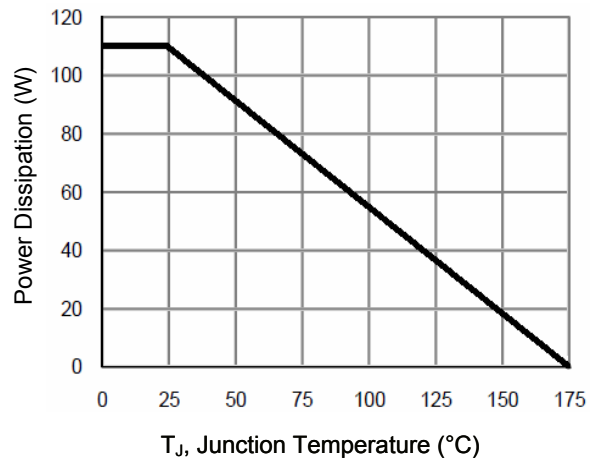


Figure 8. Power Derating

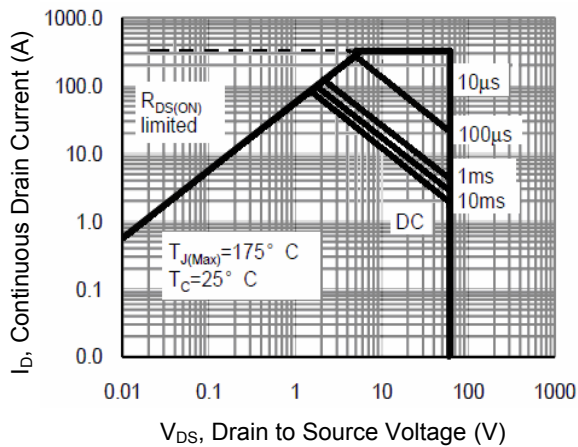


Figure 9. Maximum Safe Operation Area

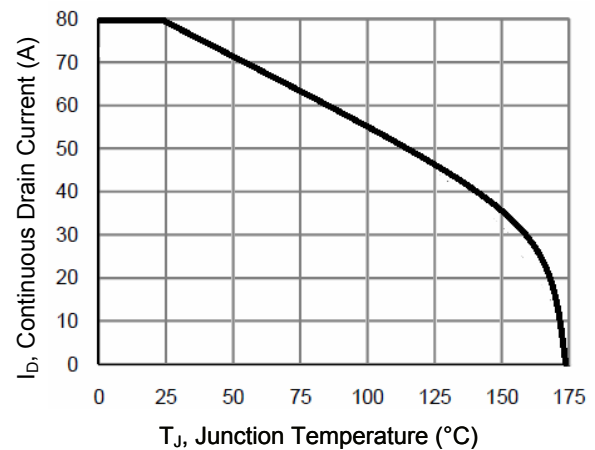


Figure 10. Drain Current - Junction Temperature

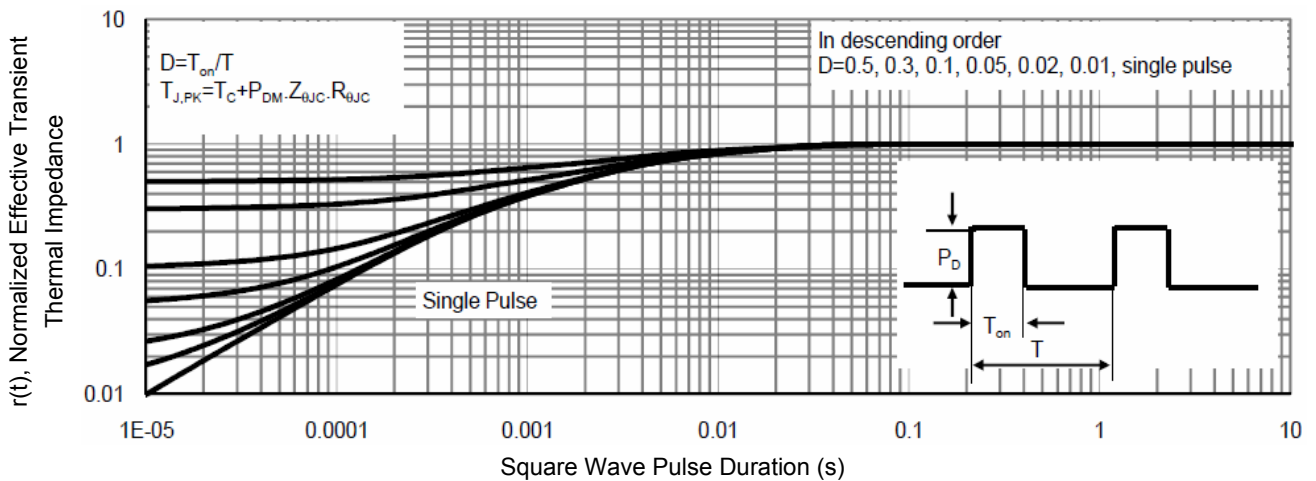
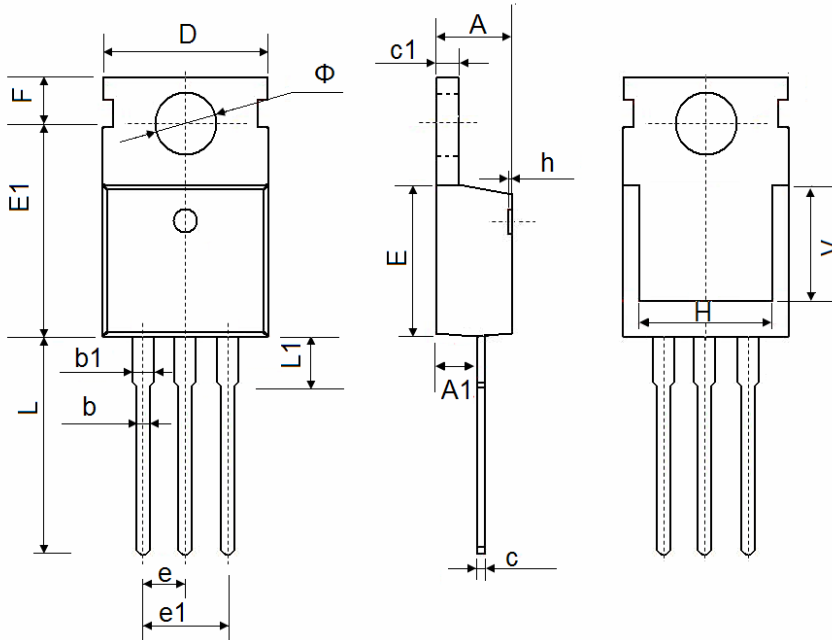


Figure 11. Normalized Maximum Transient Thermal Impedance

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	8.950	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