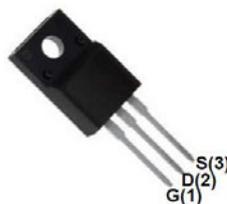
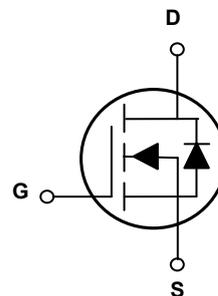


**Main Product Characteristics**

$V_{(BR)DSS}$	600V
$R_{DS(ON)}$	0.57Ω (Max.)
$I_D$	7A



TO-220F



Schematic Diagram

**Features and Benefits**

- Advanced MOSFET process technology
- Low on-resistance
- Fast switching and reverse body recovery

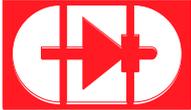


**Description**

The GSFU6008 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** ( $T_C=25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DSS}$	600	V
Gate-Source Voltage	$V_{GSS}$	±30	V
Continuous Drain Current @ Steady-State, $T_C=25^{\circ}C$	$I_D$	7	A
Continuous Drain Current @ Steady-State, $T_C=100^{\circ}C$		4.4	A
Pulsed Drain Current	$I_{DM}$	28	A
Single Pulsed Avalanche Energy <sup>1</sup>	$E_{AS}$	221	mJ
Power Dissipation, $T_C=25^{\circ}C$	$P_D$	28	W
		0.22	W/°C
Body Diode Reverse Voltage Slope <sup>2</sup>	dv/dt	50	V/ns
MOS dv/dt Ruggedness <sup>3</sup>	dv/dt	100	V/ns
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.4	°C/W
Junction to Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

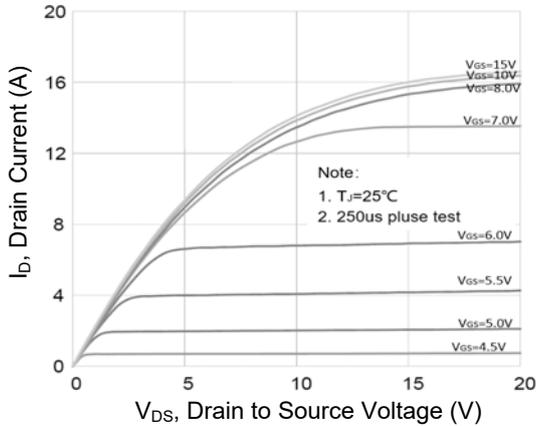

**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>On/Off Characteristic</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	600	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$	-	-	200	nA
Gate-Source Forward Leakage	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.5A, T_J=25^\circ\text{C}$	-	0.47	0.57	$\Omega$
		$V_{GS}=10V, I_D=3.5A, T_J=125^\circ\text{C}$	-	0.95	-	
Gate Resistance	$R_g$	$f=1.0\text{MHz}$	-	4.7	-	$\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=100V, V_{GS}=0V, f=1.0\text{MHz}$	-	602	-	pF
Output Capacitance	$C_{oss}$		-	25	-	pF
Reverse Transfer Capacitance	$C_{riss}$		-	0.8	-	pF
Total Gate Charge <sup>4,5</sup>	$Q_g$	$V_{DD}=480V, I_D=7A, V_{GS}=10V$	-	19	-	nC
Gate-Source Charge <sup>4,5</sup>	$Q_{gs}$		-	5.1	-	nC
Gate-Drain("Miller") Charge <sup>4,5</sup>	$Q_{gd}$		-	8.6	-	nC
<b>Switching Characteristics</b>						
Turn-On Delay Time <sup>4,5</sup>	$t_{d(on)}$	$V_{DD}=300V, I_D=7A, R_G=25\Omega, V_{GS}=10V$	-	20	-	nS
Turn-On Rise Time <sup>4,5</sup>	$t_r$		-	40	-	nS
Turn-Off Delay Time <sup>4,5</sup>	$t_{d(off)}$		-	91	-	nS
Turn-Off Fall Time <sup>4,5</sup>	$t_f$		-	38	-	nS
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current (Body Diode)	$I_S$	$T_C=25^\circ\text{C}$ , MOSFET symbol showing the integral reverse p-n junction diode.	-	-	7	A
Source Pulse Current	$I_{SM}$		-	-	28	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=7A$	-	-	1.4	V
Reverse Recovery Time <sup>3</sup>	$t_{rr}$	$V_{GS}=0V, I_F=7A, di/dt=100A/\mu\text{S}$	-	240	-	nS
Reverse Recovery Charge <sup>3</sup>	$Q_{rr}$		-	2.4	-	$\mu\text{C}$

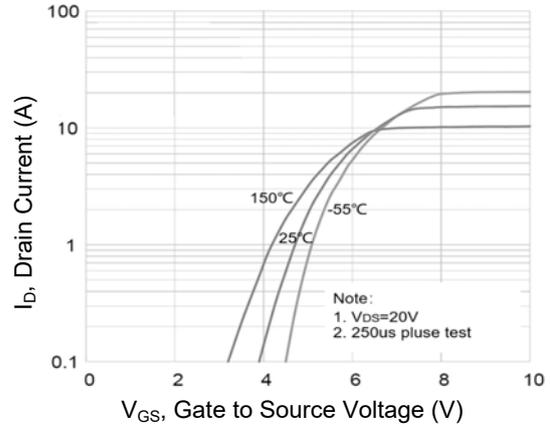
## Notes:

1.  $L=79\text{mH}, I_{AS}=2.2A, V_{DD}=100V$ , starting temperature  $T_J=25^\circ\text{C}$ .
2.  $V_{DS}=0-400V, I_{SD}\leq 20A, T_J=25^\circ\text{C}$ .
3.  $V_{DS}=0-480V$ .
4. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
5. Essentially Independent of Operating Temperature.

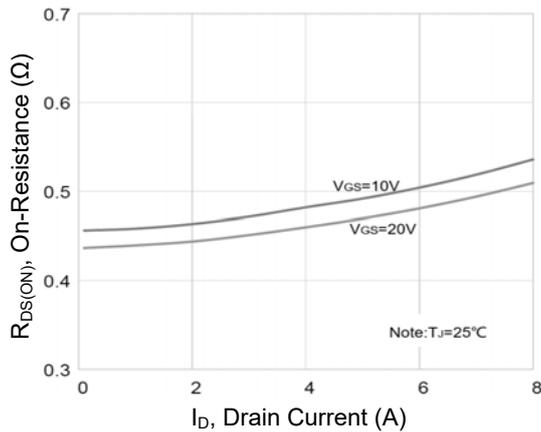
**Typical Electrical and Thermal Characteristic Curves**



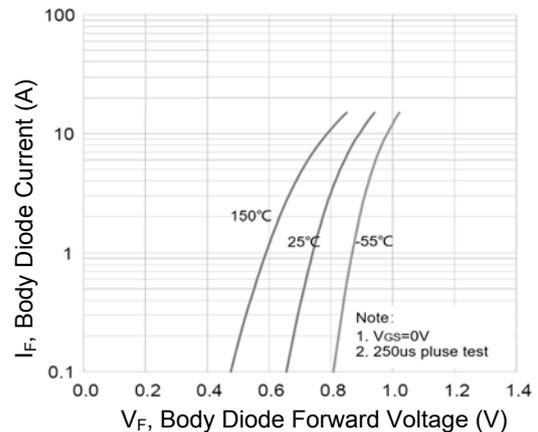
**Figure 1. Output Characteristics**



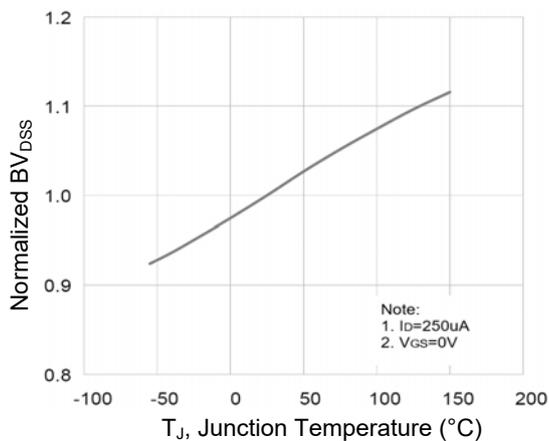
**Figure 2. Transfer Characteristics**



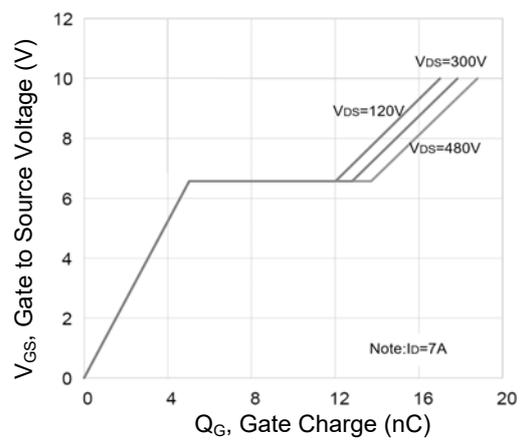
**Figure 3.  $R_{DS(ON)}$  vs. Drain Current**



**Figure 4. Body Diode Characteristics**

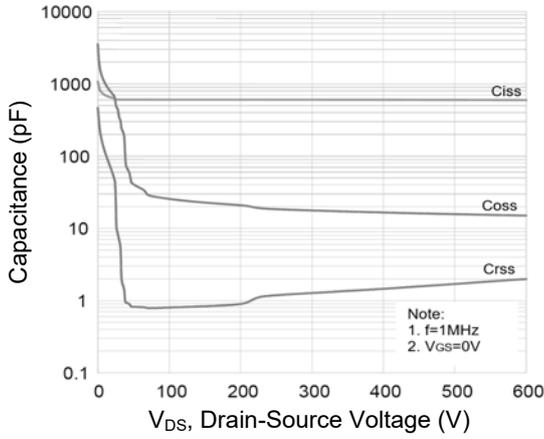


**Figure 5. Normalized  $BV_{DSS}$  vs. Junction Temperature**

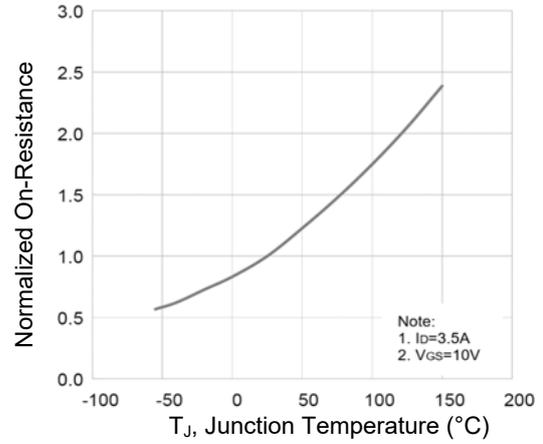


**Figure 6. Gate Charge**

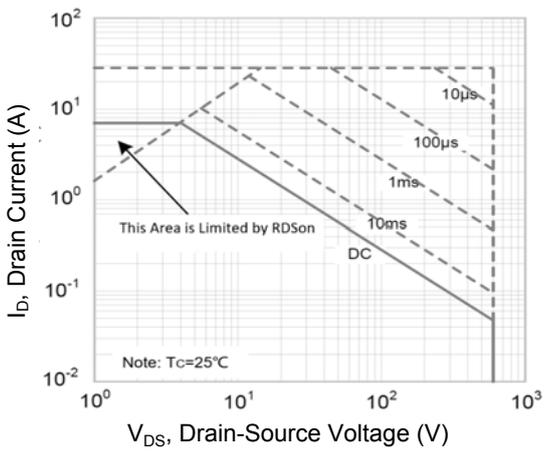
**Typical Electrical and Thermal Characteristic Curves**



**Figure 7. Capacitance Characteristics**

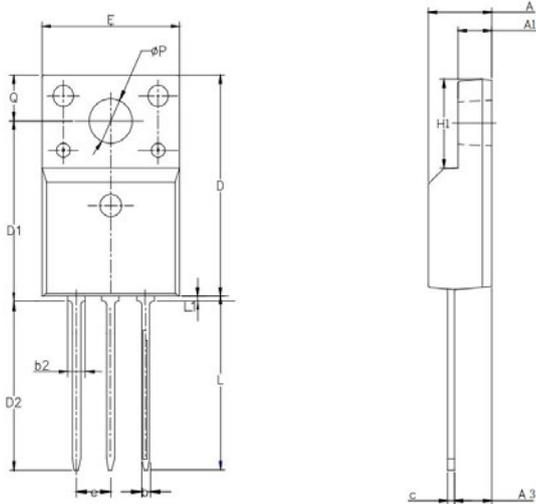


**Figure 8. Normalized  $R_{DS(ON)}$  vs. Junction Temperature**



**Figure 9. Safe Operation Area**

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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.420	5.020	0.174	0.198
A1	2.300	2.800	0.091	0.110
A3	2.500	3.100	0.098	0.122
b	0.550	0.800	0.022	0.031
b2	-	1.290	-	0.051
c	0.350	0.650	0.014	0.026
D	15.250	16.250	0.600	0.640
D1	12.870	13.270	0.507	0.522
D2	12.280	12.680	0.483	0.499
E	9.730	10.360	0.383	0.408
e	2.540 BCS		0.100 BCS	
H1	6.400	7.000	0.252	0.276
L	12.480	13.480	0.491	0.531
L1	-	0.850	-	0.033
theta P	3.000	3.400	0.118	0.134
Q	3.050	3.550	0.120	0.140