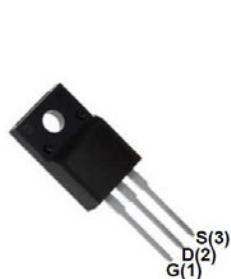
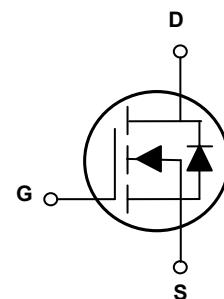


Main Product Characteristics

$V_{(BR)DSS}$	800V
$R_{DS(ON)}$	1.15Ω (Max.)
I_D	10A



TO-220F



Schematic Diagram

Features and Benefits

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



Description

The GSFU8010 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DSS}	800	V
Gate-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current @ Steady-State, $T_C=25^\circ\text{C}$	I_D	10	A
Continuous Drain Current @ Steady-State, $T_C=100^\circ\text{C}$		6.4	A
Pulsed Drain Current	I_{DM}	40	A
Single Pulsed Avalanche Energy ¹	E_{AS}	935	mJ
Power Dissipation, $T_C=25^\circ\text{C}$	P_D	62	W
		0.50	W/ $^\circ\text{C}$
Body Diode Reverse Voltage Slope ²	dv/dt	4.5	V/ns
MOS dv/dt Ruggedness ³	dv/dt	50	V/ns
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.02	$^\circ\text{C/W}$
Junction to Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
On/Off Characteristic						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	800	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=800\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate to Body Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 30\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2	-	4	V
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}}=10\text{V}, I_D=5\text{A}$	-	0.92	1.15	Ω
Gate Resistance	R_g	f=1.0MHz	-	16	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{\text{DS}}=25\text{V}, V_{\text{GS}}=0\text{V}, f=1.0\text{MHz}$	-	1630	-	pF
Output Capacitance	C_{oss}		-	150	-	pF
Reverse Transfer Capacitance	C_{rss}		-	6.8	-	pF
Total Gate Charge ^{4,5}	Q_g	$V_{\text{DD}}=640\text{V}, I_D=10\text{A}, V_{\text{GS}}=10\text{V}$	-	33	-	nC
Gate-Source Charge ^{4,5}	Q_{gs}		-	8.5	-	nC
Gate-Drain("Miller") Charge ^{4,5}	Q_{gd}		-	13	-	nC
Switching Characteristics						
Turn-On Delay Time ^{4,5}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=400\text{V}, I_D=10\text{A}, R_G=25\Omega, V_{\text{GS}}=10\text{V}$	-	27	-	nS
Turn-On Rise Time ^{4,5}	t_r		-	40	-	nS
Turn-Off Delay Time ^{4,5}	$t_{\text{d}(\text{off})}$		-	89	-	nS
Turn-Off Fall Time ^{4,5}	t_f		-	42	-	nS
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	10	A
Source Pulse Current	I_{SM}	-	-	40	A	
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_S=10\text{A}$	-	-	1.4	V
Reverse Recovery Time ²	t_{rr}	$V_{\text{GS}}=0\text{V}, I_F=10\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}$	-	610	-	nS
Reverse Recovery Charge ²	Q_{rr}		-	5.6	-	μC

Notes:

1. L=30mH, $I_{AS}=7.5\text{A}, V_{\text{DD}}=100\text{V}, R_G=25\Omega$, starting temperature $T_J=25^\circ\text{C}$.
2. $V_{\text{DS}}=0-400\text{V}, I_{SD}\leq 20\text{A}, T_J=25^\circ\text{C}$.
3. $V_{\text{DS}}=0-480\text{V}$.
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

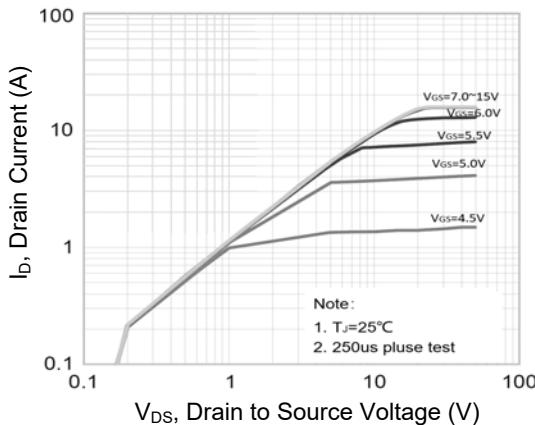


Figure 1. Output Characteristics

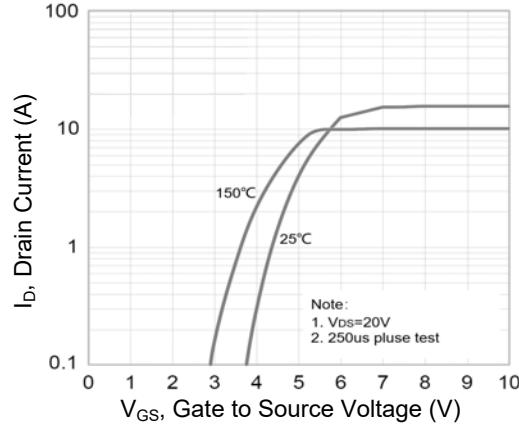


Figure 2. Transfer Characteristics

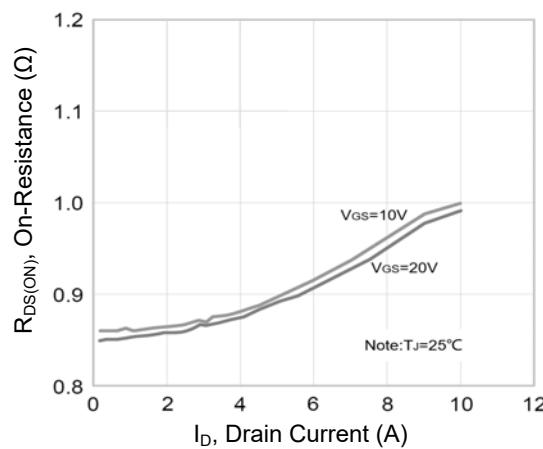


Figure 3. $R_{DS(ON)}$ vs. Drain Current

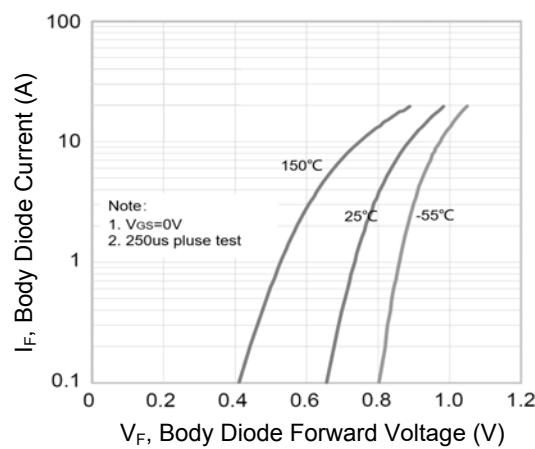


Figure 4. Body Diode Characteristics

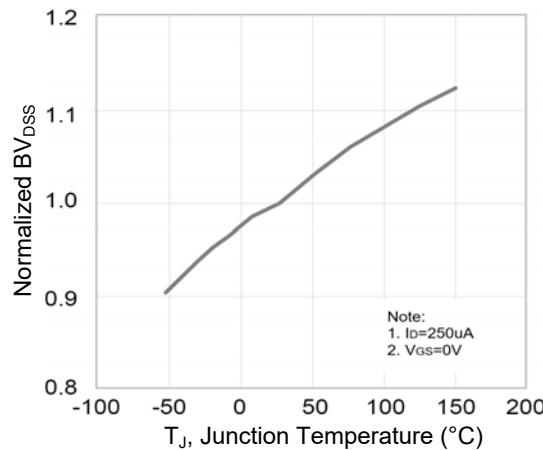


Figure 5. Normalized BV_{DSS} vs. Junction Temperature

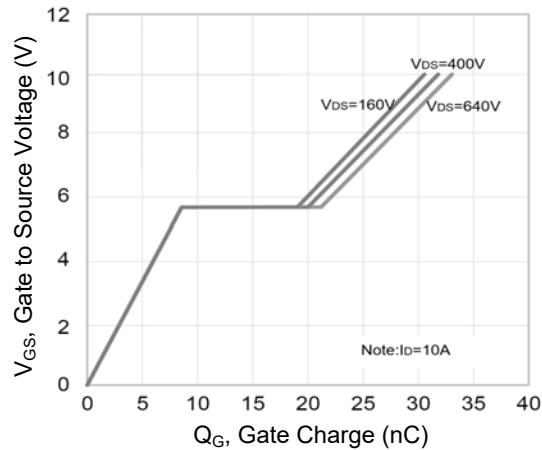


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

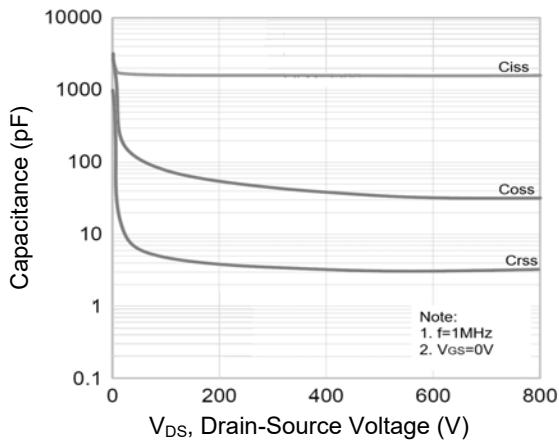


Figure 7. Capacitance Characteristics

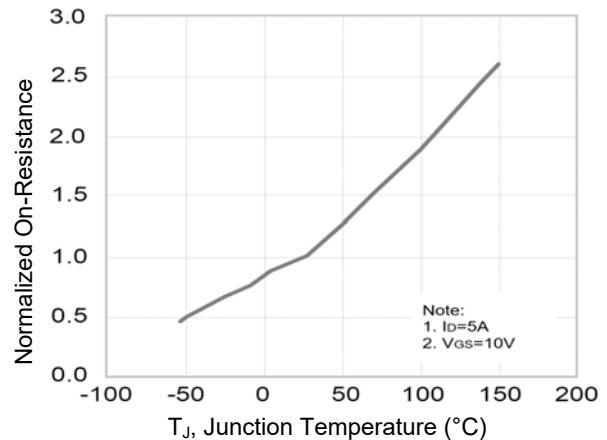


Figure 8. Normalized R_{DS(ON)} vs. Junction Temperature

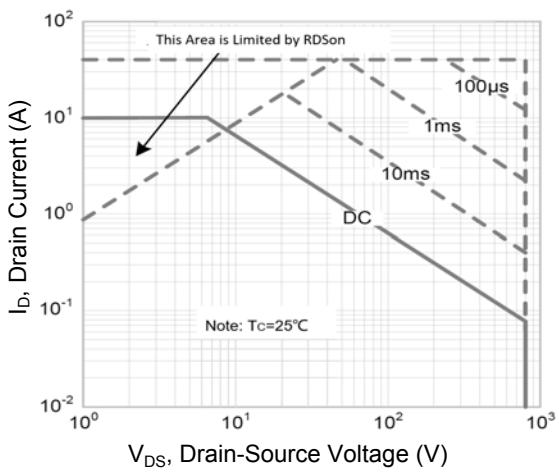
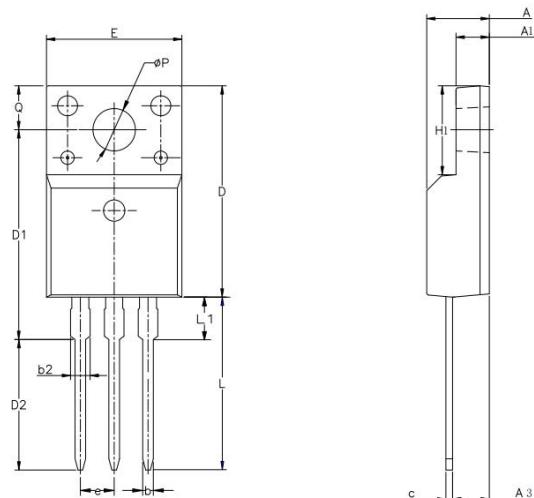


Figure 9. Safe Operation Area

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	0.850	0.022	0.033
b2	-	1.290	-	0.051
c	0.350	0.650	0.014	0.026
D	15.250	16.250	0.600	0.640
D1	13.970	14.970	0.550	0.589
D2	10.580	11.580	0.417	0.456
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	-	2.000	-	0.079
θP	3.000	3.400	0.118	0.134
Q	3.050	3.550	0.120	0.140