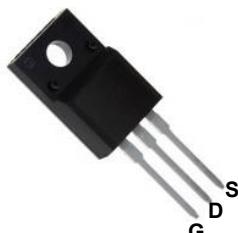
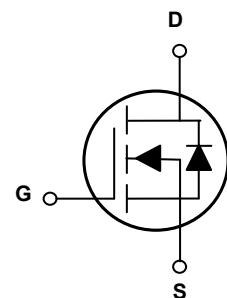


Main Product Characteristics

$V_{(BR)DSS}$	800V
$R_{DS(ON)}$	2.0Ω (typ)
I_D	5A



TO-220F



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 GSFU8005 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}	800	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	5	A
	$T_C = 100^\circ\text{C}$		3.2	A
Pulsed Drain Current ¹		I_{DM}	20	A
Single Pulsed Avalanche Energy ²		E_{AS}	323	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	48	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	2.6	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
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
Off Characteristic						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	800	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 800\text{V}, V_{GS} = 0\text{V}, T_J = 25^\circ\text{C}$ $V_{DS} = 640\text{V}, V_{GS} = 0\text{V}, T_J = 125^\circ\text{C}$	-	-	1	
Gate to Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 30\text{V}$	-	-	± 100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D=250\mu\text{A}$	2	-	4	V
Static Drain-Source on-Resistance ³	$R_{DS(\text{on})}$	$V_{GS} = 10\text{V}, I_D = 2.5\text{A}$	-	2.0	2.7	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	-	677.1	-	pF
Output Capacitance	C_{oss}		-	71	-	pF
Reverse Transfer Capacitance	C_{rss}		-	4.0	-	pF
Total Gate Charge	Q_g	$V_{DD} = 640\text{V}, I_D = 5\text{A}, V_{GS} = 10\text{V}$	-	15.16	-	nC
Gate-Source Charge	Q_{gs}		-	4.27	-	nC
Gate-Drain("Miller") Charge	Q_{gd}		-	6.78	-	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(\text{on})}$	$V_{DD} = 400\text{V}, I_D = 5\text{A}, R_G = 25\Omega$	-	11.9	-	ns
Turn-on Rise Time	t_r		-	23.1	-	ns
Turn-off Delay Time	$t_{d(\text{off})}$		-	25.3	-	ns
Turn-off Fall Time	t_f		-	23.2	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I_s		-	-	5	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{sM}		-	-	20	A
Drain to Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_{SD} = 5\text{A}$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0\text{V}, I_s = 5\text{A}, di/dt = 100\text{A}/\mu\text{s}$	-	548	-	ns
Reverse Recovery Charge	Q_{rr}		-	2.95	-	μC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. $I_{AS} = 4.5\text{A}, V_{DD} = 60\text{V}, L = 30\text{mH}, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$

Typical Electrical and Thermal Characteristic Curves

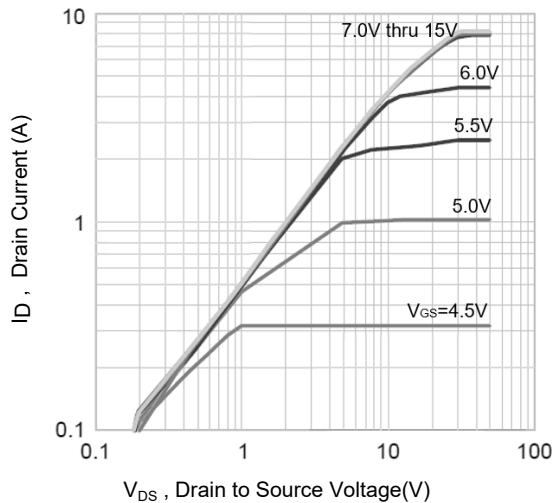


Figure 1. Output Characteristics

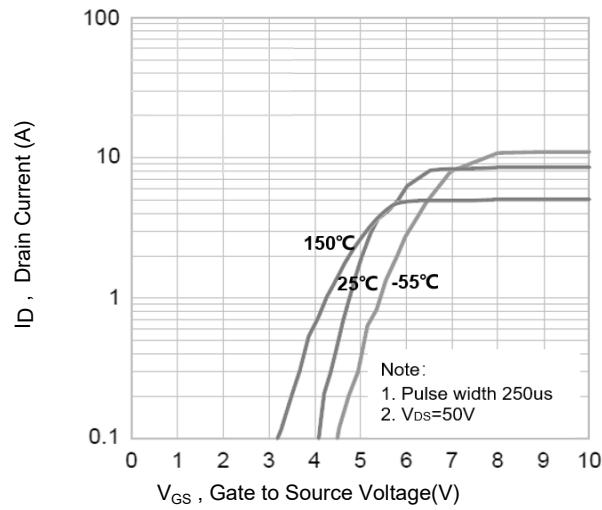


Figure 2. Transfer Characteristics

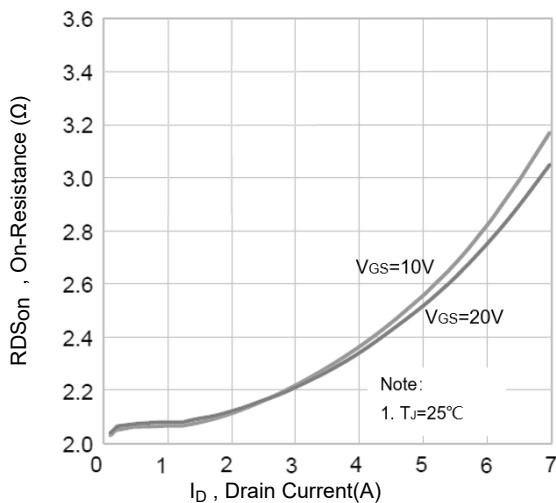


Figure 3. R_{DSon} vs. Drain Current

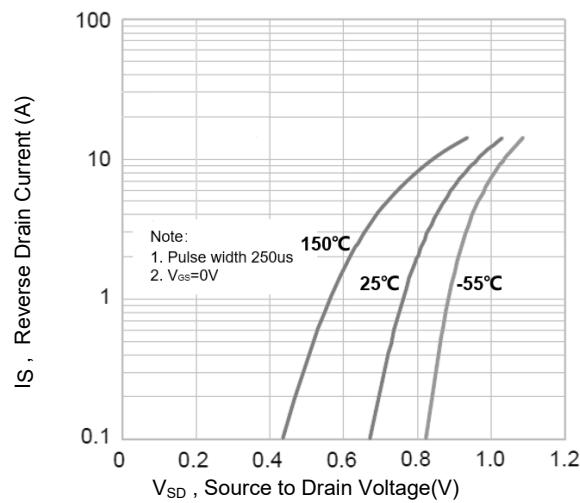


Figure 4. Body Diode Characteristics

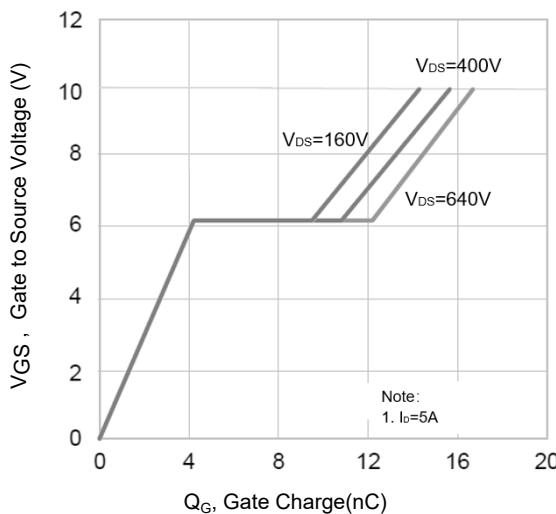


Figure 5. Gate Charge

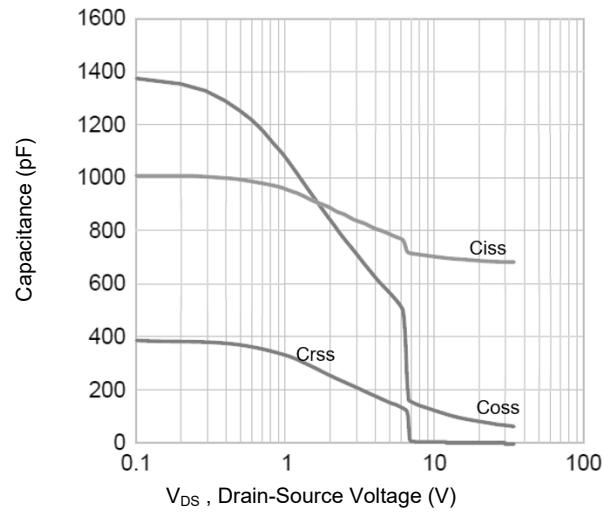


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

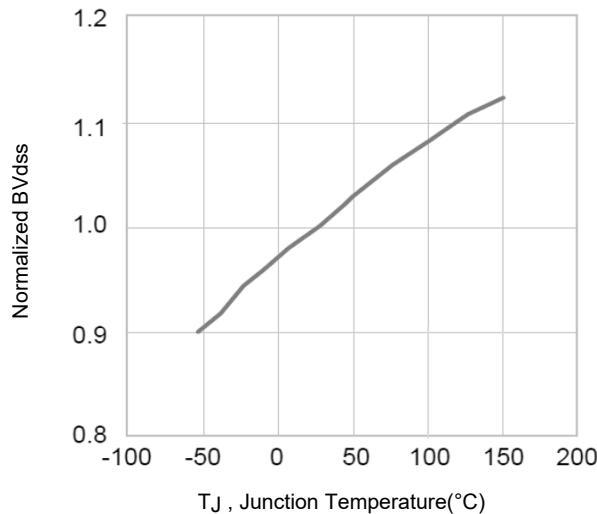


Figure 7. Normalized BV_{dss} vs. Junction Temperature

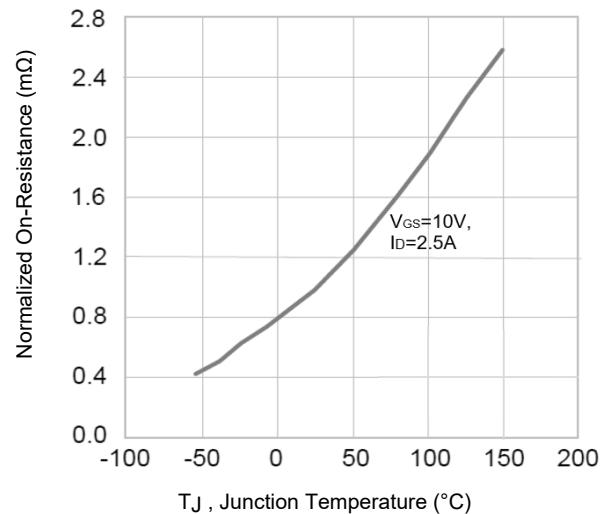


Figure 8. Normalized $R_{DS(on)}$ vs. Junction Temperature

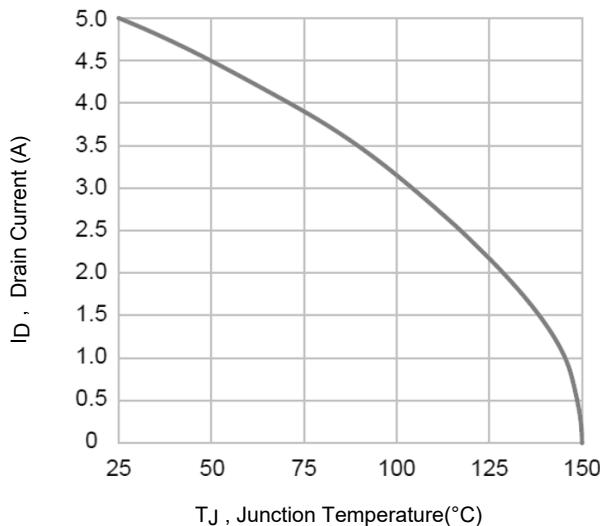


Figure 9. Current De-rating

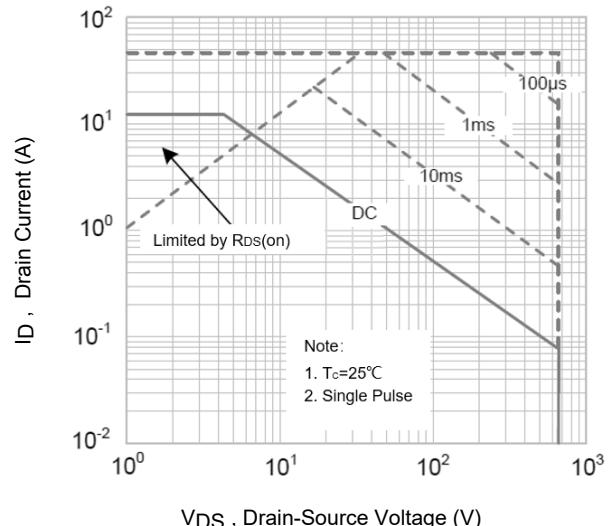


Figure 10. Safe Operation Area

Test Circuit & Waveform

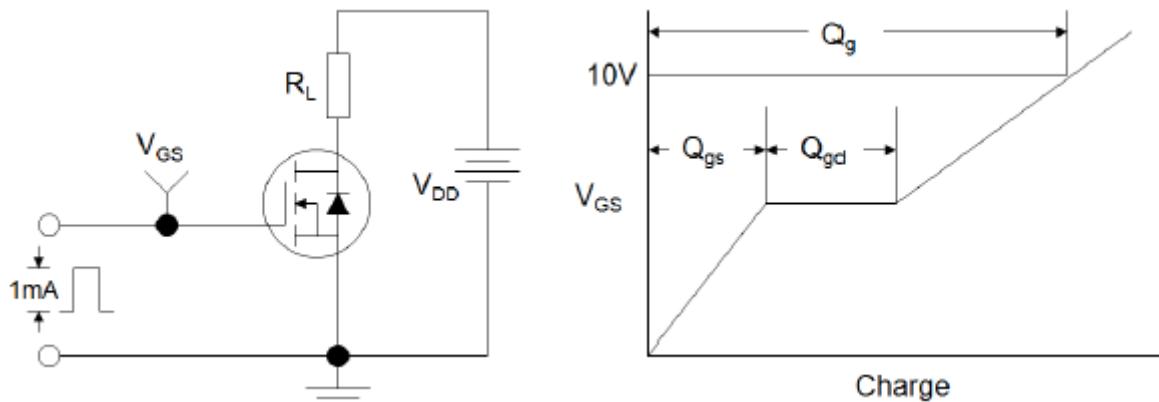


Figure 11. Gate Charge Test Circuit & Waveform

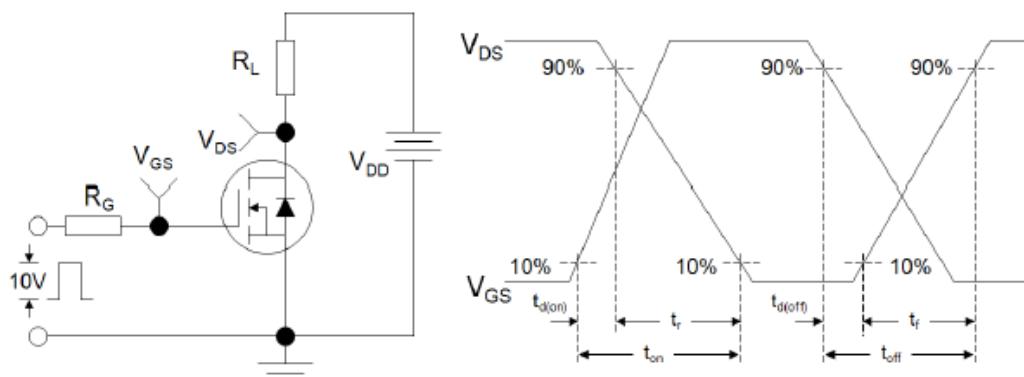


Figure 12. Resistive Switching Test Circuit & Waveforms

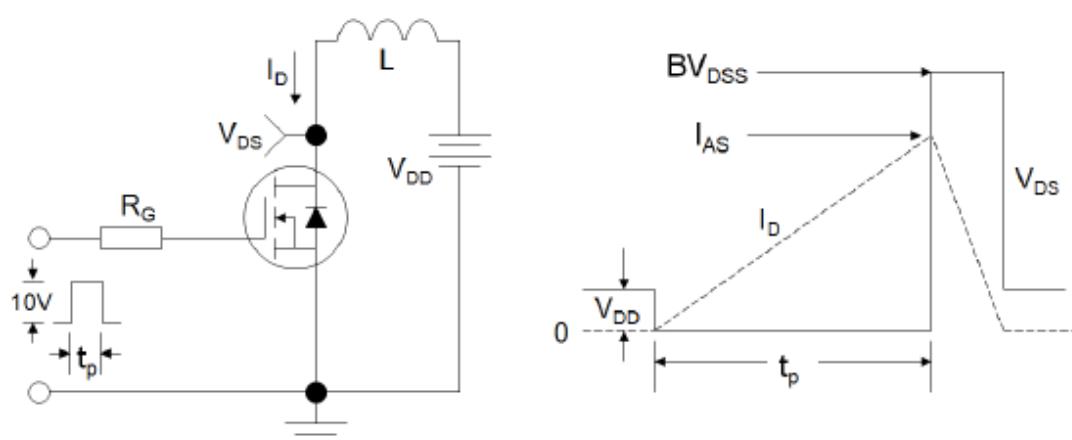
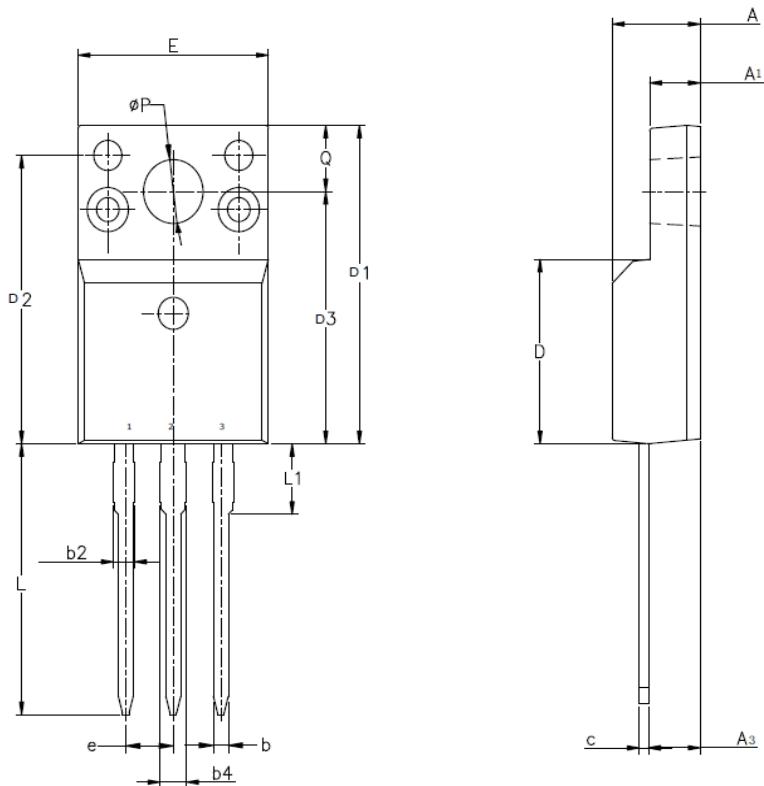


Figure 13. Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline Dimensions

TO-220F



Ref.	Dimensions						
	Millimeters						
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.50		4.90	D	8.80		9.39
A1	2.45		2.83	D1	15.8		16.2
A3	2.56		3.00	D2	14.1		14.6
b	0.74	0.80	0.9	D3	12.3		12.9
b2	0.96		1.19	E	9.80		10.40
b4	1.14		1.70	L	13.20		13.70
c	0.46		0.65	L1	3.37		3.67
Q	3.20		3.40	ØP	3.10		3.60
e	2.54 BSC						