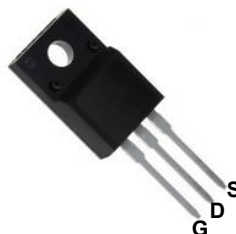
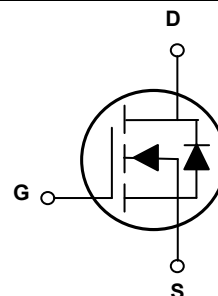


Main Product Characteristics

$V_{(BR)DSS}$	900V
$R_{DS(ON)}$	750mΩ (Max.)
I_D	6A



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 GSFU9006 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 ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DSS}	900	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current-Continuous ¹ ($T_C=25^{\circ}\text{C}$)	I_D	6	A
Drain Current-Continuous ¹ ($T_C=100^{\circ}\text{C}$)		3.8	
Drain Current-Pulsed ² ($T_C=25^{\circ}\text{C}$)	$I_{D,pulse}$	18	A
Continuous Diode Forward Current ¹ ($T_C=25^{\circ}\text{C}$)	I_S	6	A
Diode Pulsed Current ² ($T_C=25^{\circ}\text{C}$)	$I_{S,pulse}$	18	A
Power Dissipation ³ ($T_C=25^{\circ}\text{C}$)	P_D	32	W
Single Pulsed Avalanche Energy ⁴	E_{AS}	122	mJ
MOSFET dv/dt Ruggedness, $V_{DS}=0-480\text{V}$	dv/dt	50	V/ns
Reverse Diode dv/dt, $V_{DS}=0-480\text{V}$, $I_{SD}\leq I_D$	dv/dt	15	V/ns
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.91	$^{\circ}\text{C/W}$
Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	900	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =900V, V _{GS} =0V	-	-	1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V	-	-	±100	nA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3A	-	0.67	0.75	Ω
		V _{GS} =10V, I _D =3A, T _J =150°C	-	1.98	-	
Gate Resistance	R _G	F=1MHz, Open Drain	-	21	-	Ω
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	2.9	-	3.9	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =400V, I _D =6A, V _{GS} =10V	-	18.4	-	nC
Gate-Source Charge	Q _{gs}		-	6.2	-	
Gate-to-Drain Charge	Q _{gd}		-	4.5	-	
Gate Plateau Voltage	V _{plateau}		-	5.5	-	V
Turn-On Delay Time	t _{d(on)}	V _{DS} =400V, R _G =2Ω, V _{GS} =10V, I _D =6A	-	32.4	-	nS
Rise Time	t _r		-	19.8	-	
Turn-Off Delay Time	t _{d(off)}		-	51.8	-	
Fall Time	t _f		-	14.2	-	
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, F=100kHz	-	1250	-	pF
Output Capacitance	C _{oss}		-	49	-	
Reverse Transfer Capacitance	C _{rss}		-	1.9	-	
Effective Output Capacitance, Energy Related	C _{o(er)}	V _{GS} =0V, V _{DS} =0V-400V	-	29	-	
Effective Output Capacitance, Time Related	C _{o(tr)}		-	133	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Peak Reverse Recovery Current	I _{rrm}	V _R =400V, I _S =6A, di/dt=100A/μs	-	18.7	-	A
Reverse Recovery Time	T _{rr}		-	260	-	ns
Reverse Recovery Charge	Q _{rr}		-	2.9	-	uc
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =6A	-	-	1.3	V

Note:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. P_d is based on max. junction temperature, using junction-case thermal resistance.
4. $V_{DD}=100V, V_{GS}=10V, L=75\text{mH}$, starting $T_J=25^{\circ}\text{C}$.

Typical Electrical and Thermal Characteristic Curves

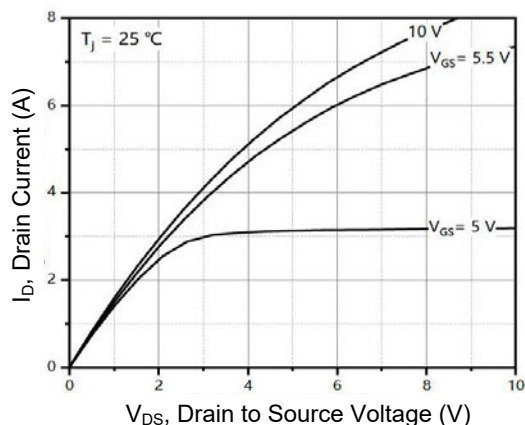


Figure 1. Output Characteristics

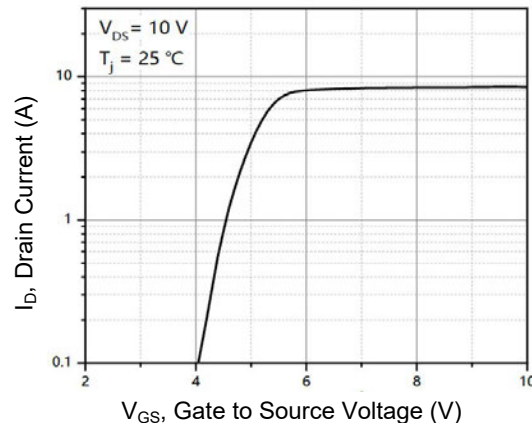


Figure 2. Transfer Characteristics

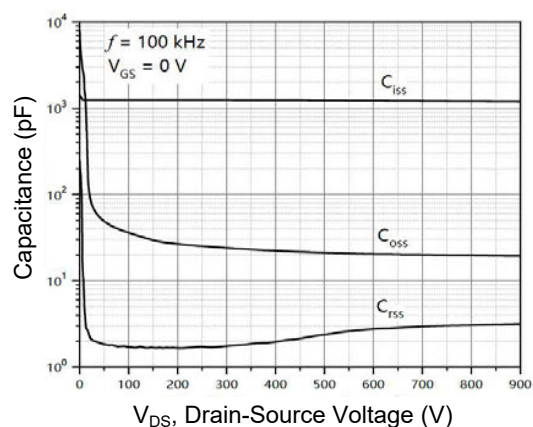


Figure 3. Capacitance Characteristics

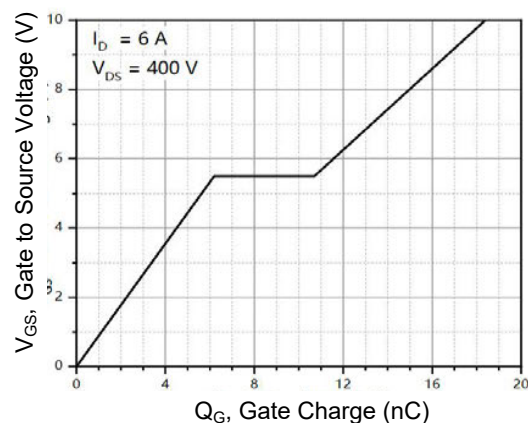


Figure 4. Gate Charge

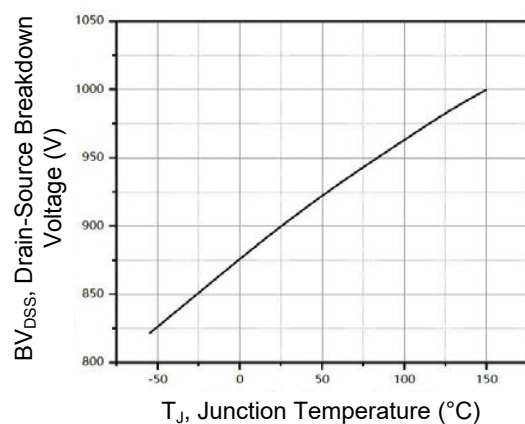


Figure 5. Drain-Source Breakdown Voltage

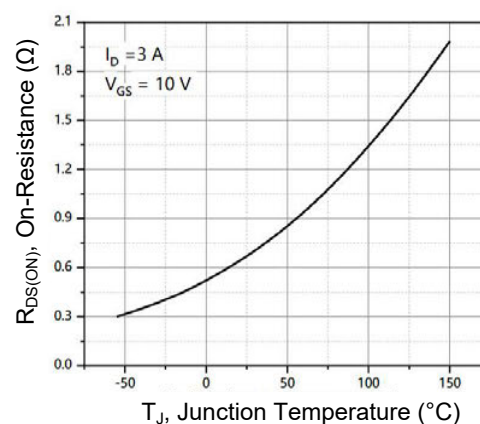


Figure 6. Drain-Source On-State Resistance

Typical Electrical and Thermal Characteristic Curves

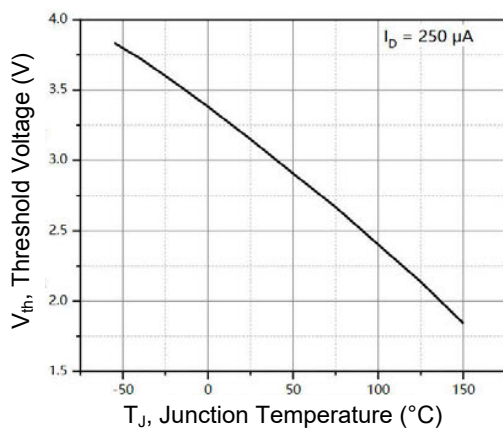


Figure 7. Threshold Voltage

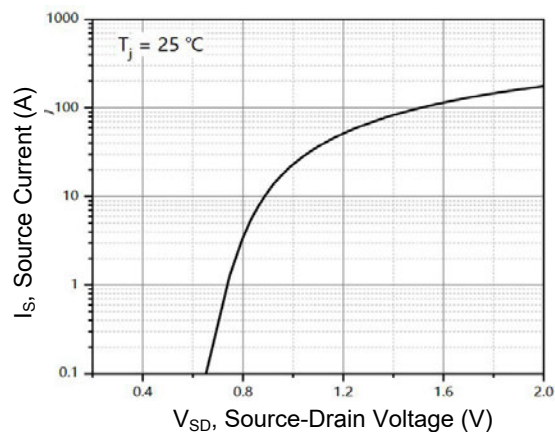


Figure 8. Forward Characteristics of Body Diode

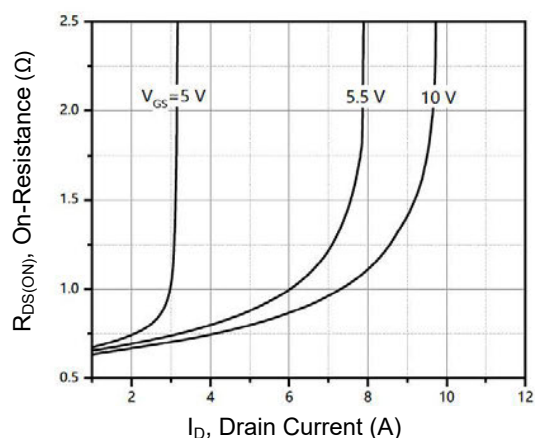


Figure 9. $R_{DS(on)}$ vs. Drain Current

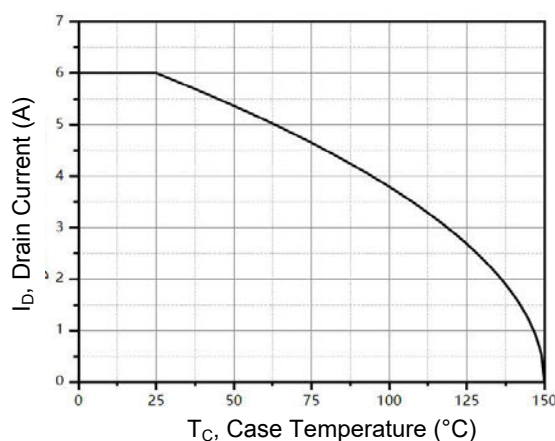


Figure 10. Drain Current

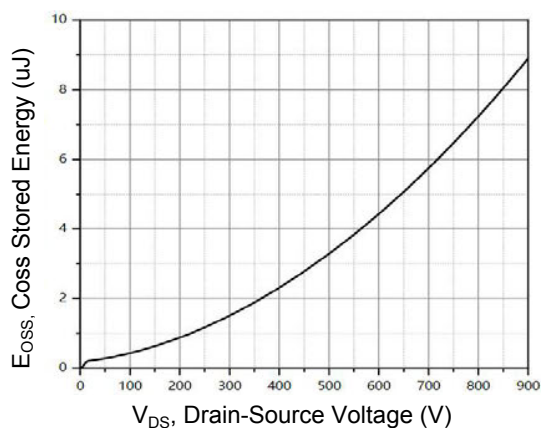


Figure 11. Typ. Coss Stored Energy

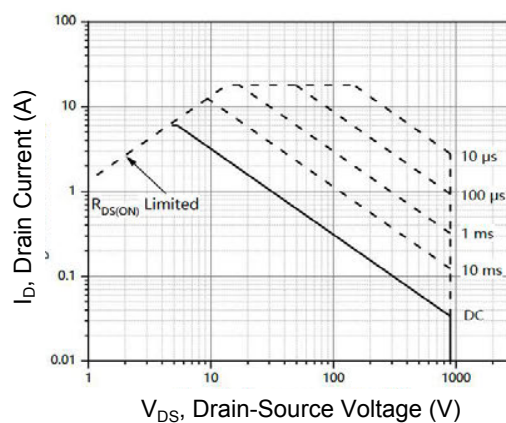


Figure 12. Safe Operation Area, $T_C=25^{\circ}\text{C}$

Typical Electrical and Thermal Characteristic Curves

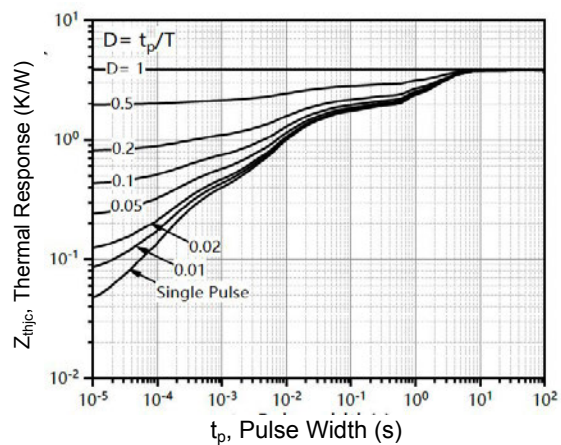
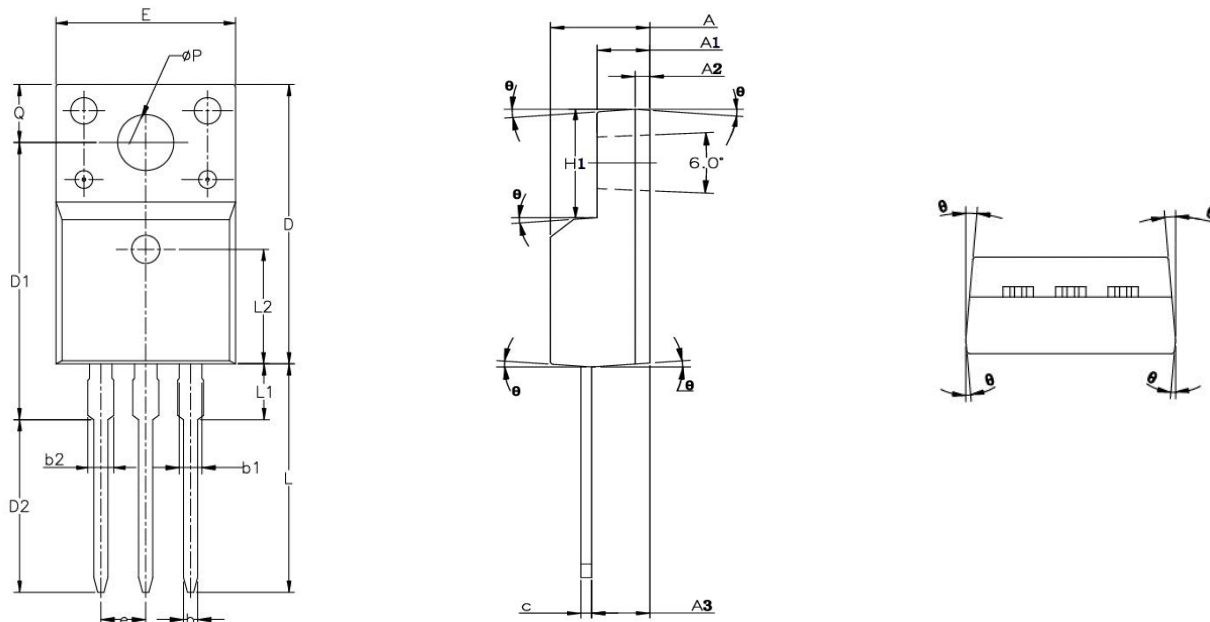


Figure 13. Max. Transient Thermal Impedance

Package Outline Dimensions (TO-220F)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.500	4.830	0.177	0.190
A1	2.340	2.740	0.092	0.108
A2	0.700 REF		0.028 REF	
A3	2.560	2.930	0.101	0.115
b	0.700	0.900	0.028	0.035
b1	1.180	1.380	0.046	0.054
b2	-	1.470	-	0.058
c	0.450	0.600	0.018	0.024
D	15.670	16.070	0.617	0.633
D1	15.550	15.950	0.612	0.628
D2	9.600	10.000	0.378	0.394
E	9.960	10.360	0.392	0.408
e	2.540 BSC		0.100 BSC	
H1	6.480	6.880	0.255	0.271
L	12.680	13.280	0.499	0.523
L1	-	3.500	-	0.138
L2	6.500 REF		0.256 REF	
θP	3.080	3.280	0.121	0.129
Q	3.200	3.400	0.126	0.134
θ	1°	5°	1°	5°