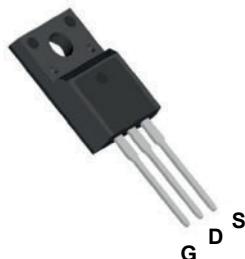
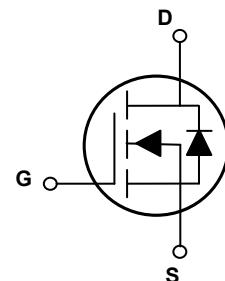


Main Product Characteristics

BV _{DSS}	800V
R _{DS(ON)}	0.38Ω (Max)
I _D	11A



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 GSFU80R380 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°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	800	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current, T _C =25°C ¹	I _D	11	A
Continuous Drain Current, T _C =100°C ¹		7	
Pulsed Drain Current, T _C =25°C ²	I _{D,pulse}	22	A
Continuous Diode Forward Current, T _C =25°C ¹	I _S	11	A
Diode Pulsed Current, T _C =25°C ²	I _{S,pulse}	22	A
Power Dissipation, T _C =25°C ³	P _D	33	W
Single Pulsed Avalanche Energy ⁴	E _{AS}	61	mJ
MOSFET dv/dt Ruggedness, V _{DS} =0 to 480V	dv/dt	50	V/ns
Reverse Diode dv/dt, V _{DS} =0 to 480V, I _{SD} ≤I _D		15	
Thermal Resistance, Junction to Case	R _{θJC}	3.79	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	62.5	°C/W
Operation and Storage Temperature Range	T _{stg} , T _J	-55 to +150	°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	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	800	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=800\text{V}, V_{\text{GS}}=0\text{V}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=30\text{V}$	-	-	100	nA
		$V_{\text{GS}}=-30\text{V}$	-	-	-100	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_D=250\mu\text{A}$	2.9	-	3.9	V
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=5.5\text{A}$	-	0.34	0.38	Ω
		$V_{\text{GS}}=10\text{V}, I_D=5.5\text{A}$ $T_J=150^\circ\text{C}$	-	0.88	-	
Gate Resistance	R_G	F=1MHz, Open drain	-	5.9	-	Ω
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{\text{DS}}=50\text{V}, V_{\text{GS}}=0\text{V}$ $F=100\text{KHz}$	-	1290	-	pF
Output Capacitance	C_{oss}		-	51	-	
Reverse Transfer Capacitance	C_{rss}		-	1.7	-	
Effective Output Capacitance, Energy Related	$C_{\text{o(er)}}$	$V_{\text{GS}}=0\text{V},$ $V_{\text{DS}}=0\text{V}-400\text{V}$	-	42	-	
Effective Output Capacitance, Time Related	$C_{\text{o(tr)}}$		-	180	-	
Turn-On Delay Time	$t_{\text{d(on)}}$	$V_{\text{DS}}=400\text{V}, R_G=2\Omega$ $V_{\text{GS}}=10\text{V}, I_D=11\text{A}$	-	12	-	ns
Rise Time	t_r		-	15	-	
Turn-Off Delay Time	$t_{\text{d(off)}}$		-	22	-	
Fall Time	t_f		-	4	-	
Total Gate Charge	Q_g	$V_{\text{DS}}=400\text{V}, I_D=11\text{A}$ $V_{\text{GS}}=10\text{V}$	-	17	-	nC
Gate-Source Charge	Q_{gs}		-	7	-	
Gate-Drain Charge	Q_{gd}		-	5	-	
Gate Plateau Voltage	V_{plateau}		-	6.85	-	V
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_S=11\text{A}$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$V_R=400\text{V}, I_S=11\text{A},$ $\text{di/dt}=100\text{A}/\mu\text{s}$	-	403	-	ns
Reverse Recovery Charge	Q_{rr}		-	5.4	-	μC
Peak Reverse Recovery Current	I_{rrm}		-	24	-	A

Note:

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

Typical Electrical and Thermal Characteristic Curves

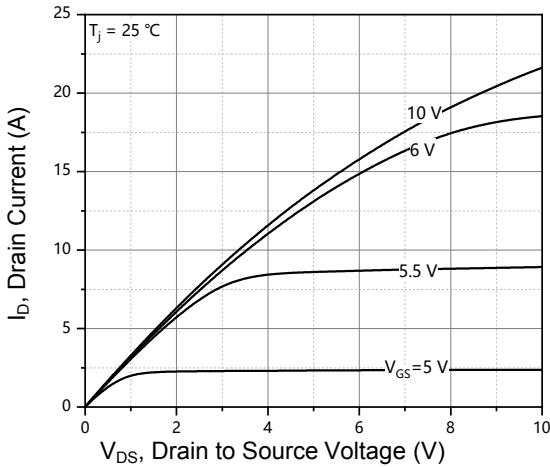


Figure 1. Typical Output Characteristics (T_j=25°C)

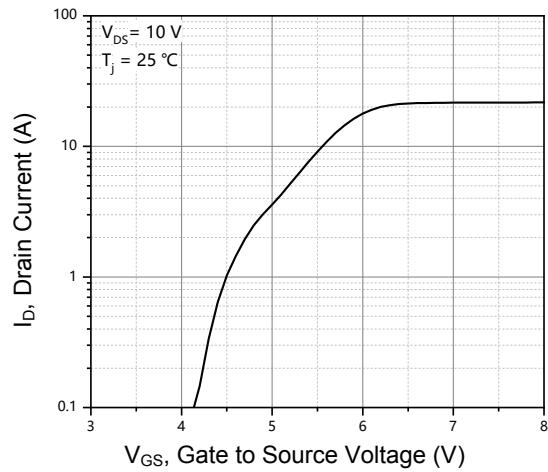


Figure 2. Typical Transfer Characteristics

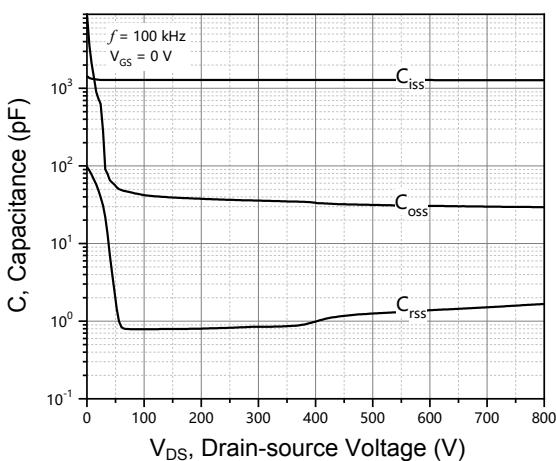


Figure 3. Typical Capacitances

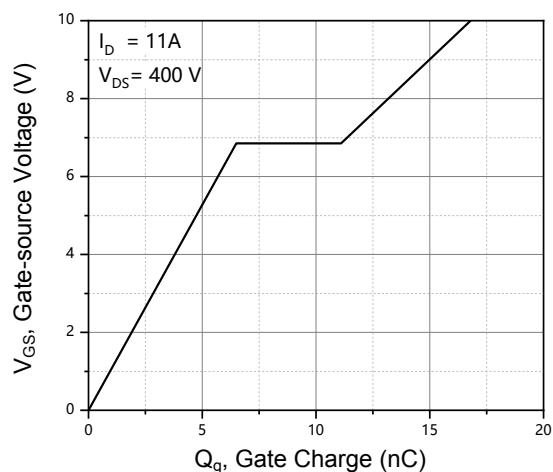


Figure 4. Typical Gate Charge

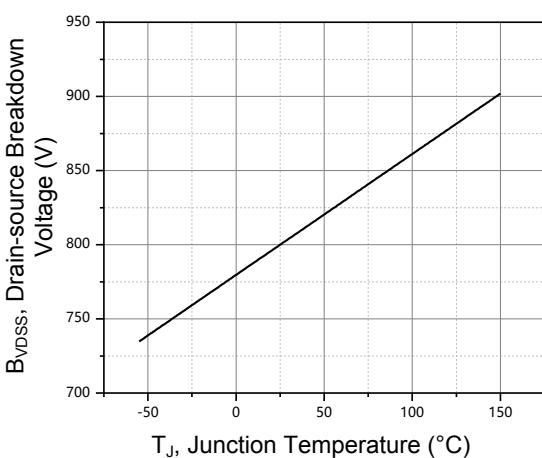


Figure 5. Drain-source Breakdown Voltage

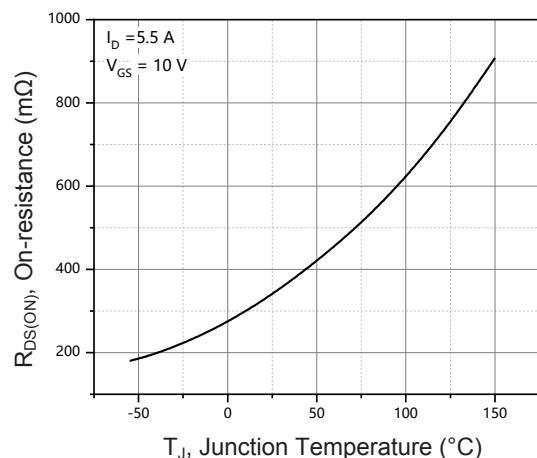


Figure 6. Drain-source On-state Resistance

Typical Electrical and Thermal Characteristic Curves

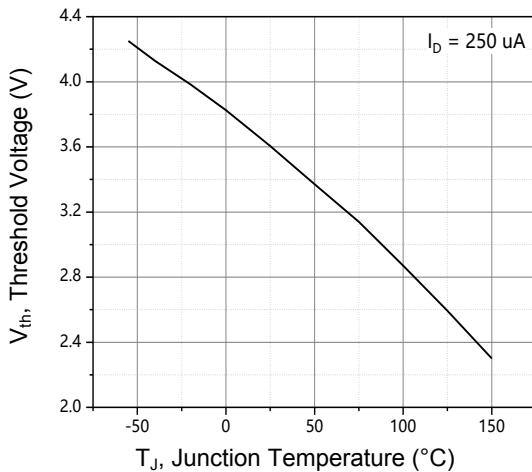


Figure 7. Threshold Voltage

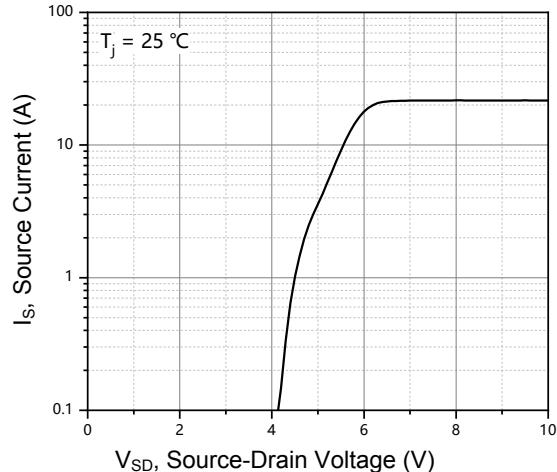


Figure 8. Forward Characteristic of Body Diode

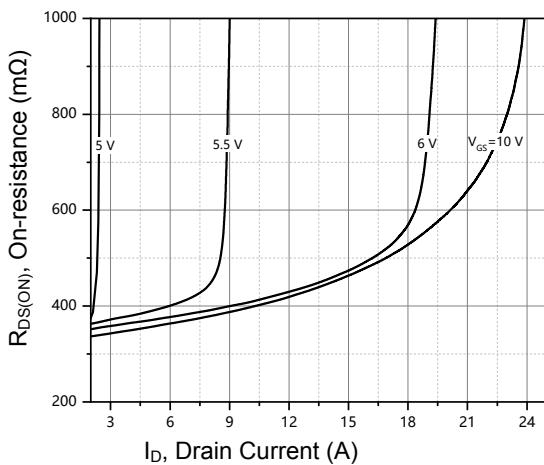


Figure 9. Drain-source On-state Resistance

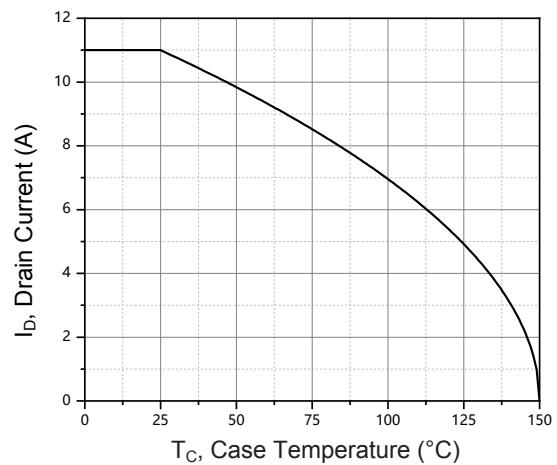


Figure 10. Drain Current

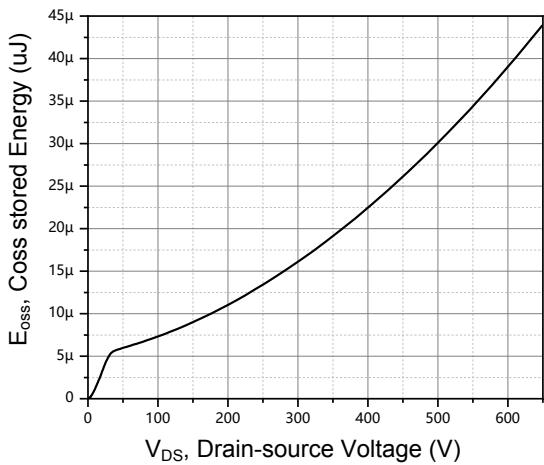


Figure 11. Typical Cross Stored Energy

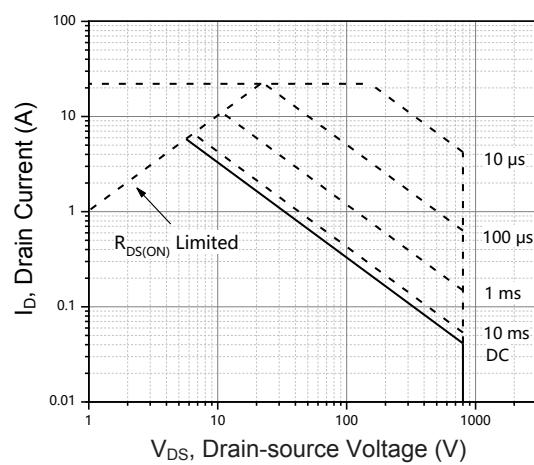


Figure 12. Safe Operation Area $T_C=25^\circ C$

Typical Electrical and Thermal Characteristic Curves

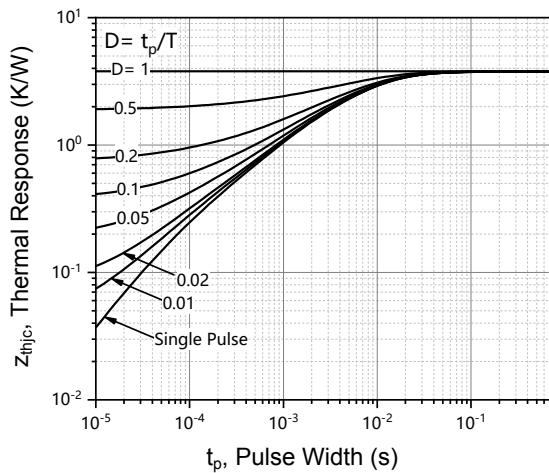
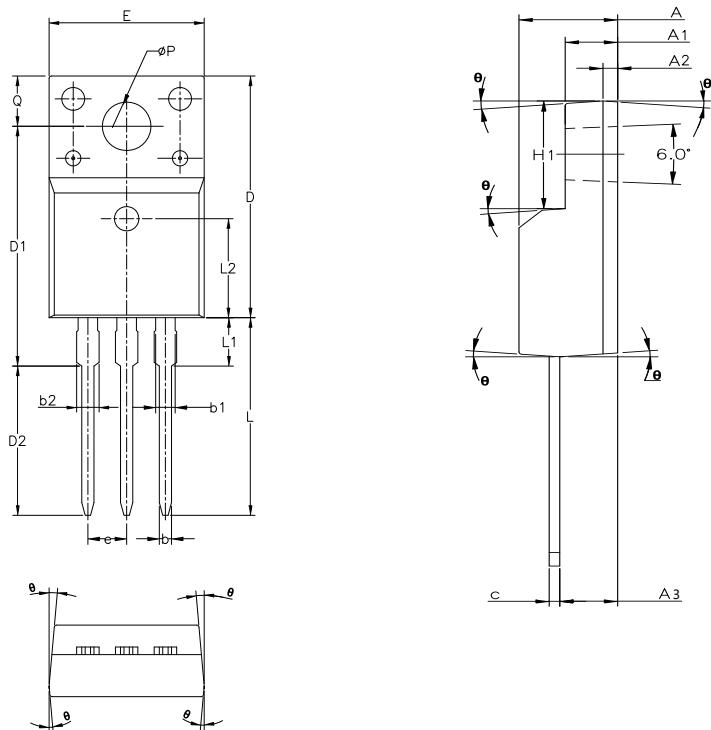


Figure 13. Max. Transient Thermal Impedance

Package Outline Dimensions (TO-220F)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.50	4.83	0.177	0.190
A1	2.34	2.74	0.092	0.108
A2	0.70 REF		0.028 REF	
A3	2.56	2.93	0.101	0.115
b	0.70	0.90	0.028	0.035
b1	1.18	1.38	0.046	0.054
b2	-	1.47	-	0.058
c	0.45	0.60	0.018	0.024
D	15.67	16.07	0.617	0.633
D1	15.55	15.95	0.612	0.628
D2	9.60	10.00	0.378	0.394
E	9.96	10.36	0.392	0.408
e	2.54 BSC		0.100 REF	
H1	6.48	6.88	0.255	0.271
L	12.68	13.28	0.499	0.523
L1	-	3.50	-	0.138
L2	6.50 REF		0.256 REF	
ΦP	3.08	3.28	0.121	0.129
Q	3.20	3.40	0.126	0.134
θ	1°	5°	1°	5°