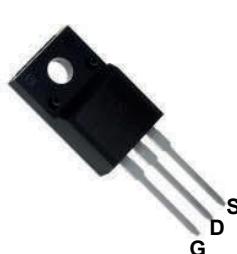
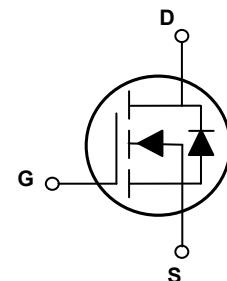


Main Product Characteristics

BV _{DSS}	600V
R _{DS(ON)}	70mΩ (Max)
I _D	47A



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 GSJU60R077 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, EV Charger, motor driver 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}	600	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current, T _C =25°C ¹	I _D	47	A
Continuous Drain Current, T _C =100°C ¹		30	
Pulsed Drain Current, T _C =25°C ²	I _D , pulse	141	A
Continuous Diode Forward Current, T _C =25°C ¹	I _S	47	A
Diode Pulsed Current, T _C =25°C ²	I _S , Pulse	141	A
Power Dissipation, T _C =25°C ³	P _D	35	W
Single Pulsed Avalanche Energy ⁵	E _{AS}	1000	mJ
MOSFET dv/dt Ruggedness, V _{DS} =0-480V	dv/dt	50	V/ns
Reverse Diode dv/dt, V _{DS} =0-480V, I _{SD} ≤I _D	dv/dt	15	V/ns
Thermal Resistance, Junction-Case	R _{θJC}	3.6	°C/W
Thermal Resistance, Junction-Ambient ⁴	R _{θJA}	62.5	°C/W
Operation and Storage Temperature	T _{stg} , T _J	-55 to +150	°C

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=1\text{mA}$	600	-	-	V
		$V_{\text{GS}}=0\text{V}, I_{\text{D}}=1\text{mA}, T_J=150^\circ\text{C}$	650	-	-	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=1\text{mA}$	2.0	-	4.0	V
Drain-Source On-State Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=23.5\text{A}$	-	60	70	$\text{m}\Omega$
		$V_{\text{GS}}=10\text{V}, I_{\text{D}}=23.5\text{A}, T_J=150^\circ\text{C}$	-	140	-	
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=30\text{V}$	-	-	100	nA
		$V_{\text{GS}}=-30\text{V}$	-	-	-100	
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=600\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=50\text{V}, f=1\text{MHz}$	-	2933	-	pF
Output Capacitance	C_{oss}		-	350.1	-	pF
Reverse Transfer Capacitance	C_{rss}		-	7.04	-	pF
Turn-On Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=400\text{V}, R_{\text{G}}=25\Omega, I_{\text{D}}=25\text{A}$	-	66.8	-	nS
Rise Time	t_{r}		-	76.2	-	nS
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	138.7	-	nS
Fall Time	t_{f}		-	67.9	-	nS
Total Gate Charge	Q_{g}	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=400\text{V}, I_{\text{D}}=25\text{A}$	-	47	-	nC
Gate-Source Charge	Q_{gs}		-	12.2	-	nC
Gate-Drain Charge	Q_{gd}		-	17.4	-	nC
Gate Plateau Voltage	V_{plateau}		-	5.6	-	V
Source-Drain Ratings and Characteristics						
Diode Forward Voltage	V_{SD}	$I_{\text{S}}=47\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.3	V
Reverse Recovery Time	T_{rr}	$V_{\text{R}}=400\text{V}, I_{\text{S}}=25\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}$	-	454.8	-	nS
Reverse Recovery Charge	Q_{rr}		-	7.9	-	μC
Peak Reverse Recovery Current	I_{rrm}		-	32.1	-	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.
- The value of $R_{\theta_{\text{JA}}}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper in a still air environment with $T_A=25^\circ\text{C}$.
- $V_{\text{DD}}=100\text{V}, V_{\text{GS}}=10\text{V}, L=40\text{mH}$, starting $T_J=25^\circ\text{C}$.

Typical Electrical and Thermal Characteristic Curves

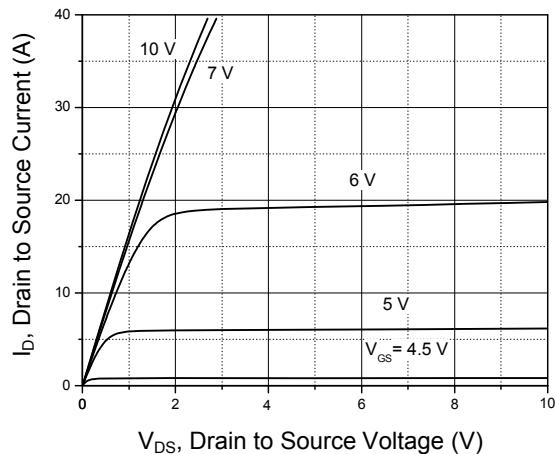


Figure 1. Typical Output Characteristics

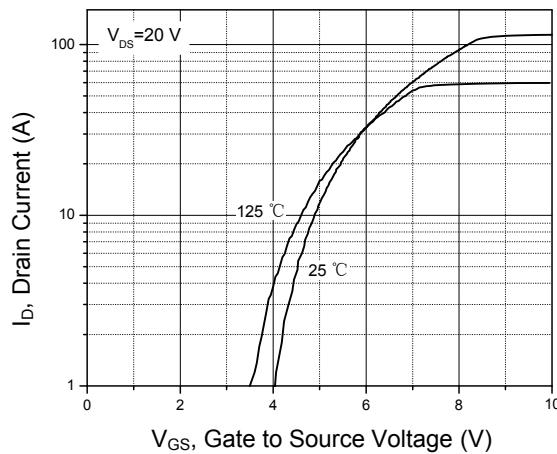


Figure 2. Typical Transfer Characteristics

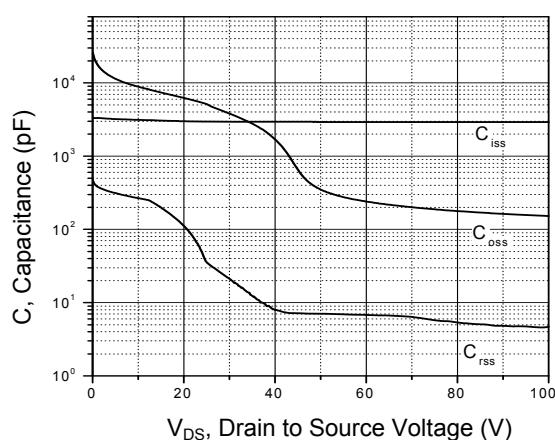


Figure 3. Typical Capacitances

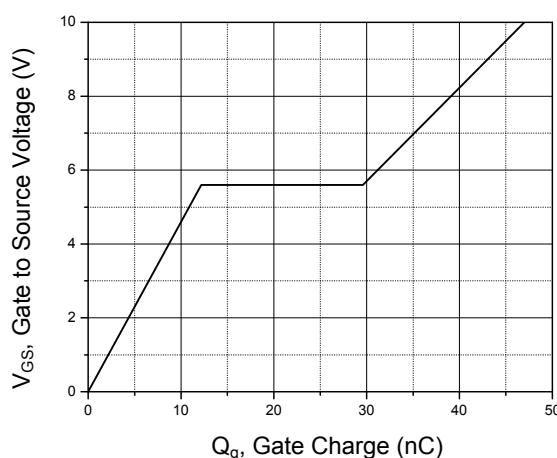


Figure 4. Typical Gate Charge

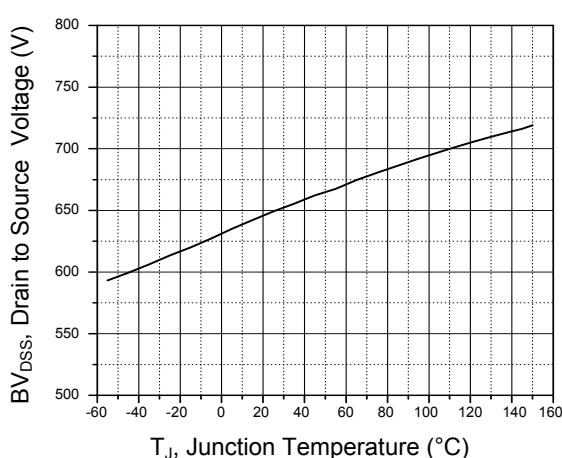


Figure 5. Drain to Source Breakdown Voltage

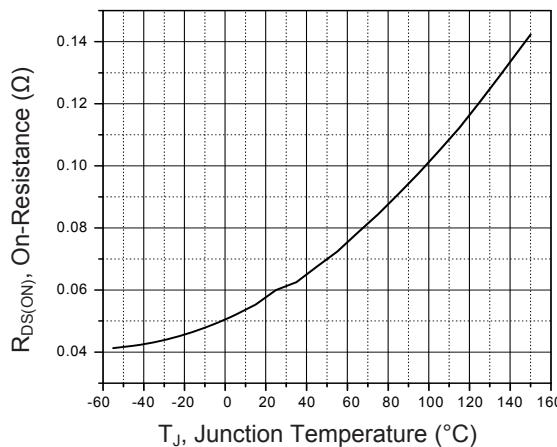


Figure 6. Drain to Source On-State Resistance

Typical Electrical and Thermal Characteristic Curves

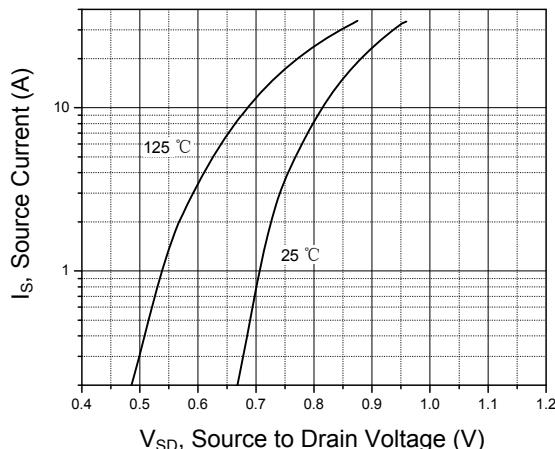


Figure 7. Forward Characteristic Of Body Diode

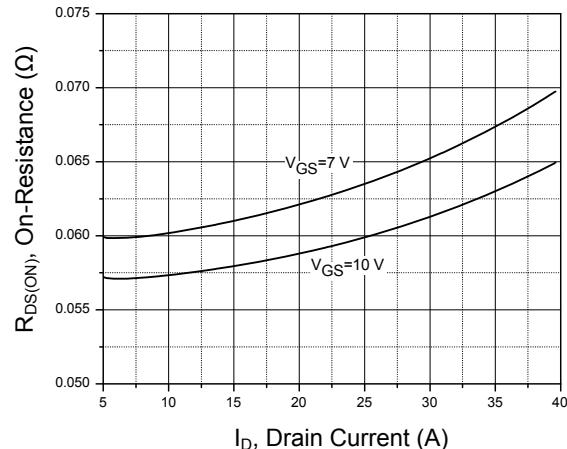


Figure 8. Drain to Source On-State Resistance

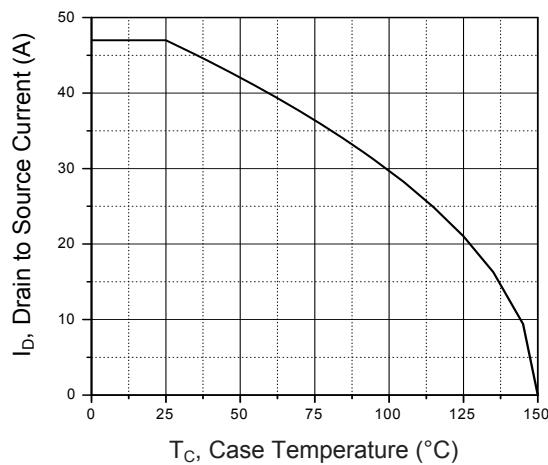


Figure 9. Drain Current

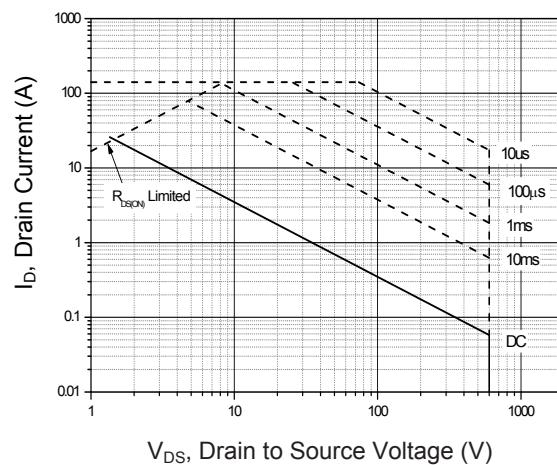
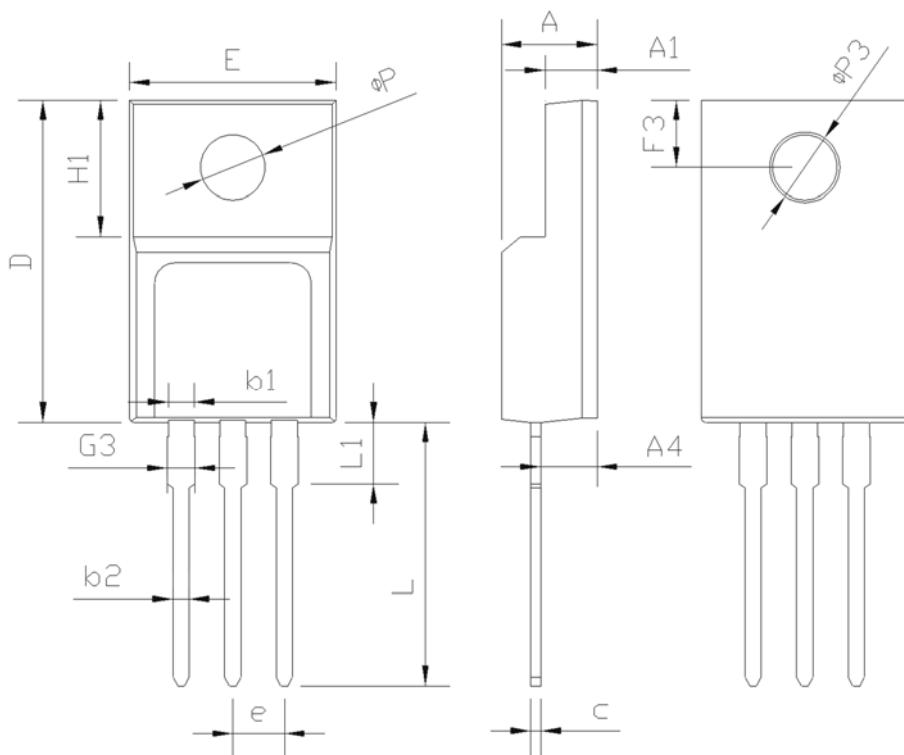


Figure 10. Safe Operation Area T_c=25°C

Package Outline Dimensions (TO-220F)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
E	9.96	10.36	0.392	0.408
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A4	2.56	2.96	0.101	0.117
c	0.40	0.65	0.016	0.026
D	15.57	16.17	0.613	0.637
H1	6.70 REF		0.264 REF	
e	2.54 BSC		0.100 BSC	
L	12.68	13.28	0.499	0.523
L1	2.88	3.18	0.113	0.125
ΦP	3.03	3.38	0.119	0.133
ΦP3	3.15	3.65	0.124	0.144
F3	3.15	3.45	0.124	0.136
G3	1.25	1.55	0.049	0.061
b1	1.18	1.43	0.046	0.056
b2	0.70	0.95	0.028	0.037