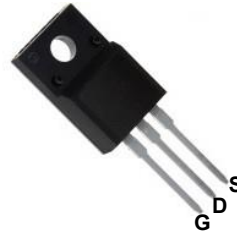
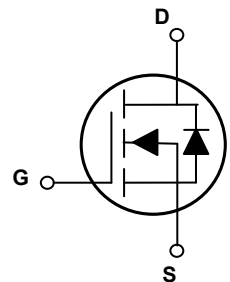


Main Product Characteristics

$V_{(BR)DSS}$	800V
$R_{DS(ON)}$	0.42Ω (max.)
I_D	12A



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 GSJU8012 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_{DS}	800	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current-Continuous, at Steady-State, ($T_C=25^{\circ}\text{C}$)	I_D	12	A
Drain Current-Continuous, at Steady-State, ($T_C=100^{\circ}\text{C}$)		7.6	
Drain Current-Pulsed	I_{DM}	48	A
Single Pulse Avalanche Energy ¹	E_{AS}	510	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	36	W
Power Dissipation – Derate above 25°C		0.29	W/ $^{\circ}\text{C}$
Body Diode Reverse Voltage Slope ²	dv/dt	50	V/ns
MOS dv/dt Ruggedness ³	dv/dt	100	V/ns
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	800	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6.0A$	-	0.36	0.42	Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.4	-	4.6	V
Dynamic and Switching Characteristics						
Total Gate Charge ^{4,5}	Q_g	$V_{DD}=640V, I_D=12A, V_{GS}=10V$	-	30	-	nC
Gate-Source Charge ^{4,5}	Q_{gs}		-	9.5	-	
Gate-Drain ("Miller") Charge ^{4,5}	Q_{gd}		-	12	-	
Turn-On Delay Time ^{4,5}	$t_{d(on)}$	$V_{DD}=400V, R_G=25\Omega, V_{GS}=10V, I_D=12A$	-	24	-	nS
Rise Time ^{4,5}	t_r		-	57	-	
Turn-Off Delay Time ^{4,5}	$t_{d(off)}$		-	80	-	
Fall Time ^{4,5}	t_f		-	36	-	
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, F=1MHz$	-	1130	-	pF
Output Capacitance	C_{oss}		-	36	-	
Reverse Transfer Capacitance	C_{rss}		-	1.9	-	
Gate Resistance	R_g	$F=1MHz$	-	6.4	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	$T_C=25^{\circ}\text{C}$, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	12	A
Pulsed Source Current	I_{SM}		-	-	48	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=12A$	-	1.1	1.4	V
Reverse Recovery Time ²	t_{rr}	$V_{GS}=0V, I_F=12A, di/dt=100A/\mu s$	-	391	-	nS
Reverse Recovery Charge ²	Q_{rr}		-	4.5	-	μC

Note:

1. $L=79mH, I_{AS}=3.4A, V_{DD}=100V, R_G=25\Omega$, starting temperature $T_J=25^{\circ}\text{C}$.
2. $V_{DS}=0 - 400V, I_{SD} \leq I_S, T_J=25^{\circ}\text{C}$.
3. $V_{DS}=0 - 480V$.
4. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

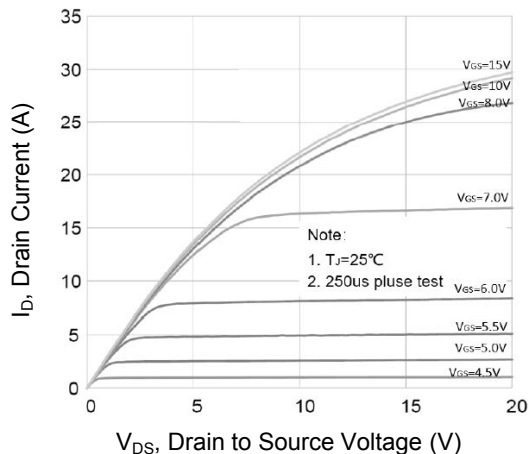


Figure 1. Typical Output Characteristics

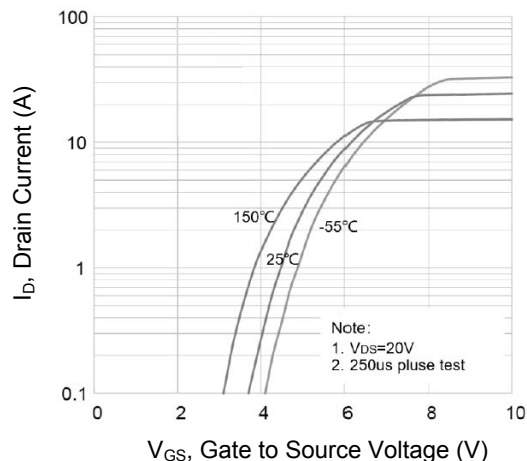


Figure 2. Typical Transfer Characteristics

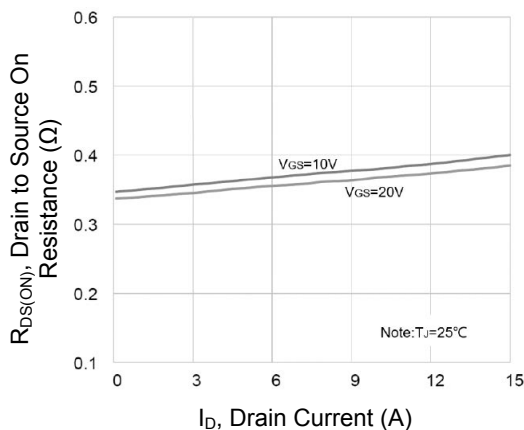


Figure 3. $R_{DS(ON)}$ vs. Drain Current

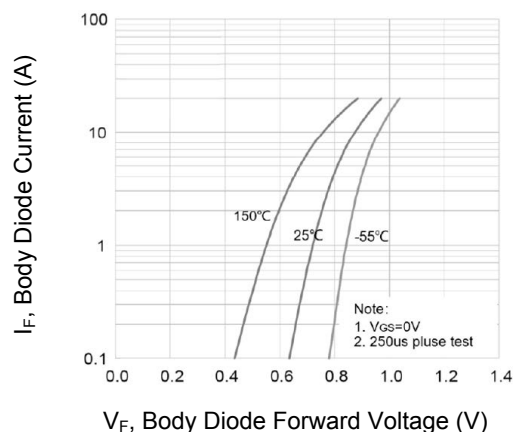


Figure 4. Body Diode Characteristics

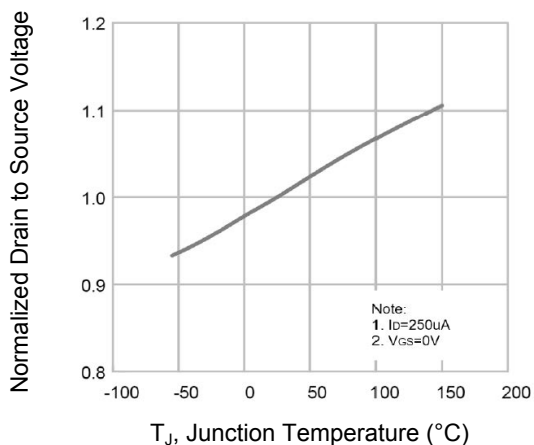


Figure 5. Normalized BV_{DSS} vs. Junction Temperature

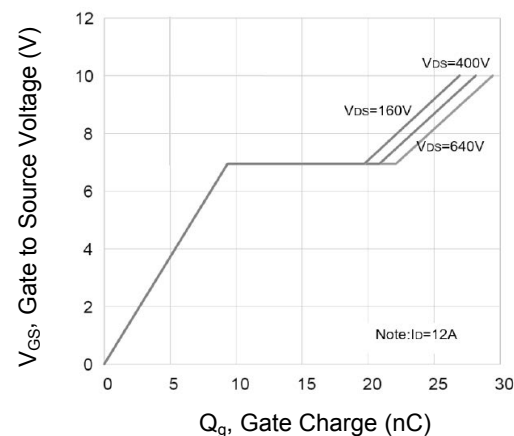


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

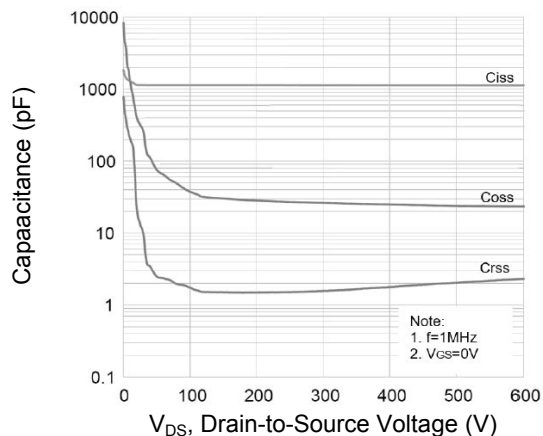


Figure 7. Capacitance Characteristics

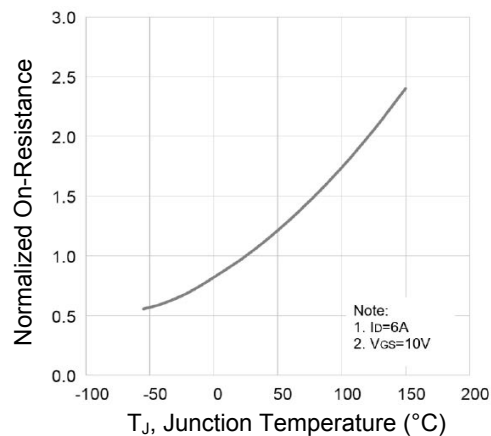


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

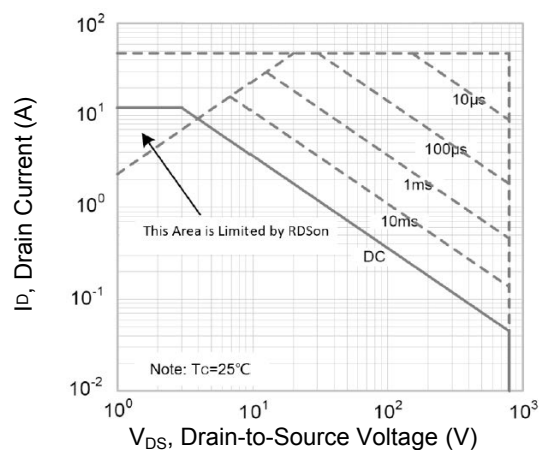
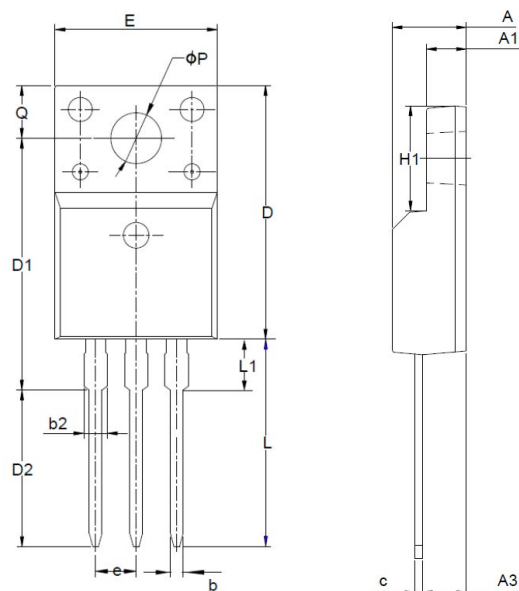


Figure 9. Safe Operation Area

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	0.700	0.900	0.028	0.035
b2	-	1.470	-	0.051
c	0.350	0.650	0.014	0.026
D	15.250	16.250	0.600	0.640
D1	15.300	16.300	0.602	0.642
D2	9.300	10.300	0.366	0.406
E	9.730	10.360	0.383	0.408
e	2.540 BSC		0.100 BSC	
H1	6.400	7.000	0.252	0.276
L	12.480	13.480	0.491	0.530
L1	-	3.500	-	0.138
ØP	3.000	3.400	0.118	0.134
Q	3.050	3.550	0.120	0.140

Order Information

Device	Package	Marking	Carrier	Quantity
GSJU8012	TO-220F	U80R420	Tape & Reel	50 pcs / Tube