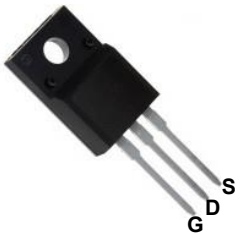
GOOD-ARK SEMICONDUCTOR

GSFU80R280

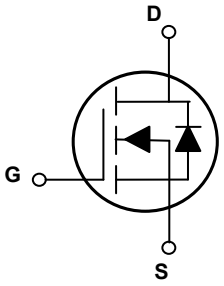
800V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	800V
$R_{DS(ON)}$	0.28Ω (max.)
I_D	17A



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 GSFU80R280 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°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°C)	I_D	17	A
Drain Current-Continuous, at Steady-State, (T_C=100°C)		7.6	
Drain Current-Pulsed	I_{DM}	68	A
Single Pulse Avalanche Energy[1]	E_{AS}	857	mJ
Power Dissipation (T_C=25°C)	P_D	42	W
Power Dissipation – Derate above 25°C		0.34	W/°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	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.0	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_C=25°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	800	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=800V, V_{GS}=0V	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8.0A	-	0.24	0.28	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	2.4	-	4.6	V
Dynamic and Switching Characteristics						
Total Gate Charge[4,5]	Q_g	V_{DD}=640V, I_D=17A, V_{GS}=10V	-	44	-	nC
Gate-Source Charge[4,5]	Q_{gs}		-	14	-	
Gate-Drain ("Miller") Charge[4,5]	Q_{gd}		-	17	-	
Turn-On Delay Time[4,5]	$t_{d(on)}$	V_{DD}=400V, R_G=25Ω, V_{GS}=10V, I_D=17A	-	31	-	nS
Rise Time[4,5]	t_r		-	78	-	
Turn-Off Delay Time[4,5]	$t_{d(off)}$		-	100	-	
Fall Time[4,5]	t_f		-	42	-	
Input Capacitance	C_{lss}	V_{DS}=100V, V_{GS}=0V, F=1MHz	-	1170	-	pF
Output Capacitance	C_{oss}		-	47	-	
Reverse Transfer Capacitance	C_{rss}		-	2.2	-	
Gate Resistance	R_g	F=1MHz	-	2.8	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	T_C=25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	17	A
Pulsed Source Current	I_{SM}		-	-	68	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=17A	-	1.1	1.4	V
Reverse Recovery Time[2]	t_{rr}	V_{GS}=0V, I_F=17A, di/dt=100A/μs	-	414	-	nS
Reverse Recovery Charge[2]	Q_{rr}		-	6.2	-	μC

Note:

1. L=79mH, I_{AS}=4.4A, V_{DD}=100V, Rg=25Ω, starting temperature T_J=25°C.
2. V_{DS}= 0 - 400V, I_{SD} ≤ I_S, T_J=25°C.
3. V_{DS}= 0 - 480V.
4. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

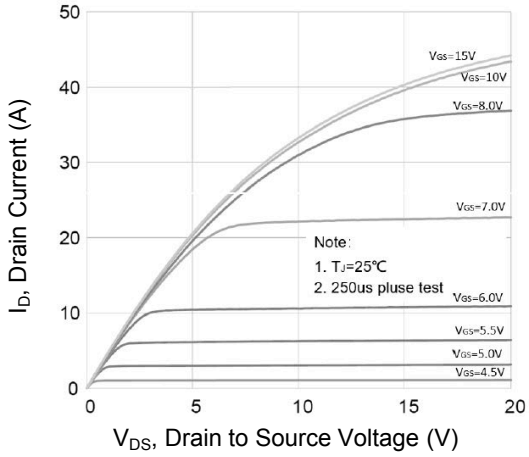


Figure 1. Typical Output Characteristics

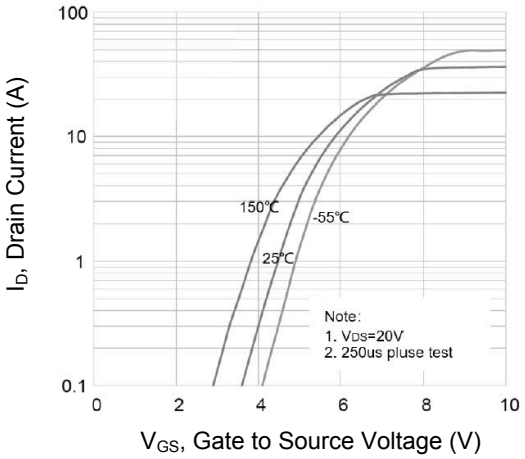


Figure 2. Typical Transfer Characteristics

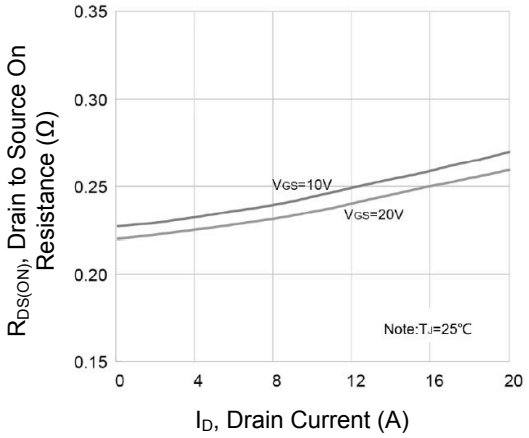


Figure 3. $R_{DS(ON)}$ vs. Drain Current

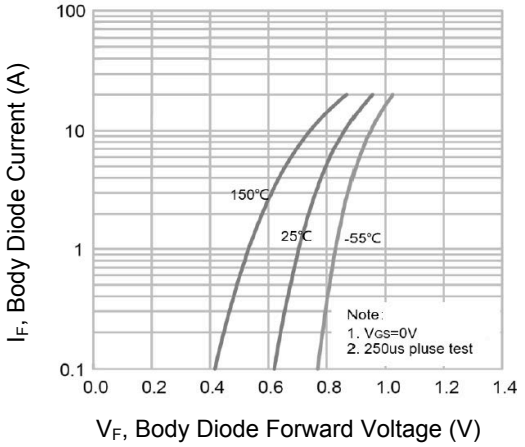


Figure 4. Body Diode Characteristics

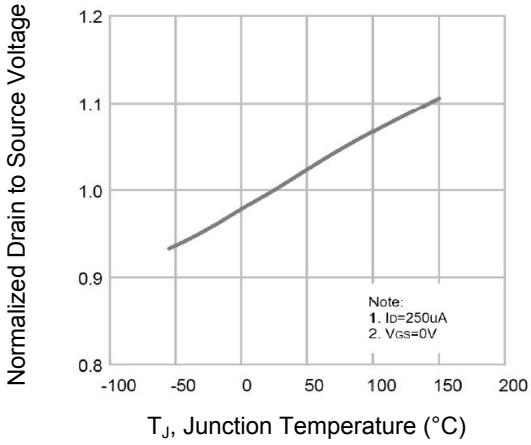


Figure 5. Normalized BV_{DSS} vs. Junction Temperature

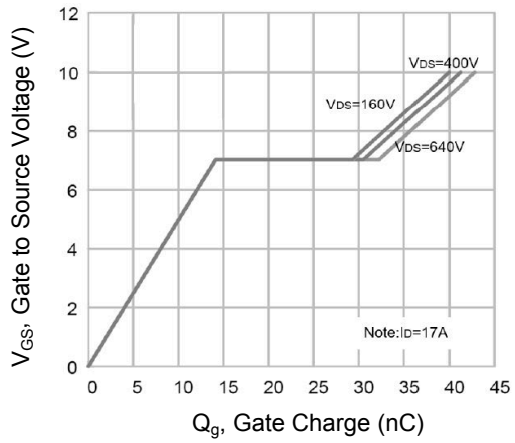


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

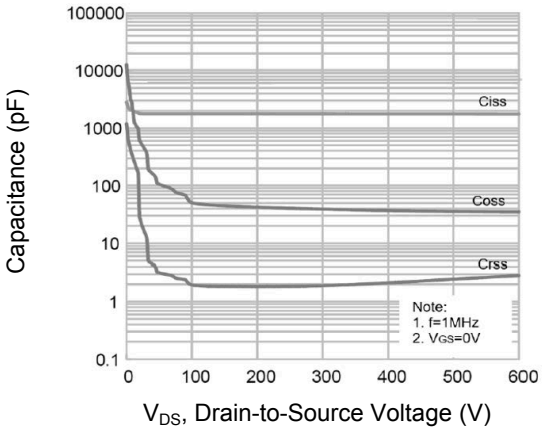


Figure 7. Capacitance Characteristics

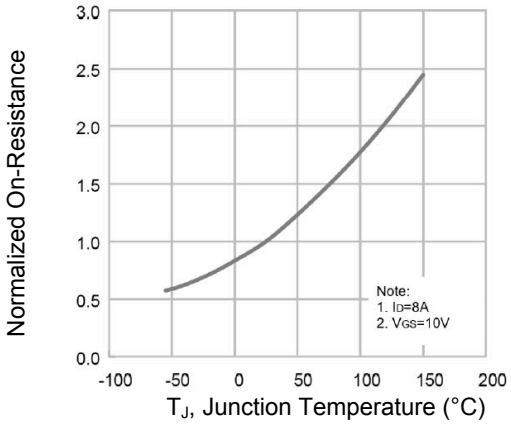


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

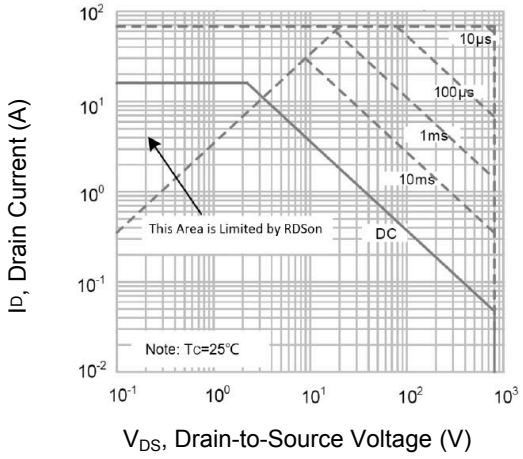
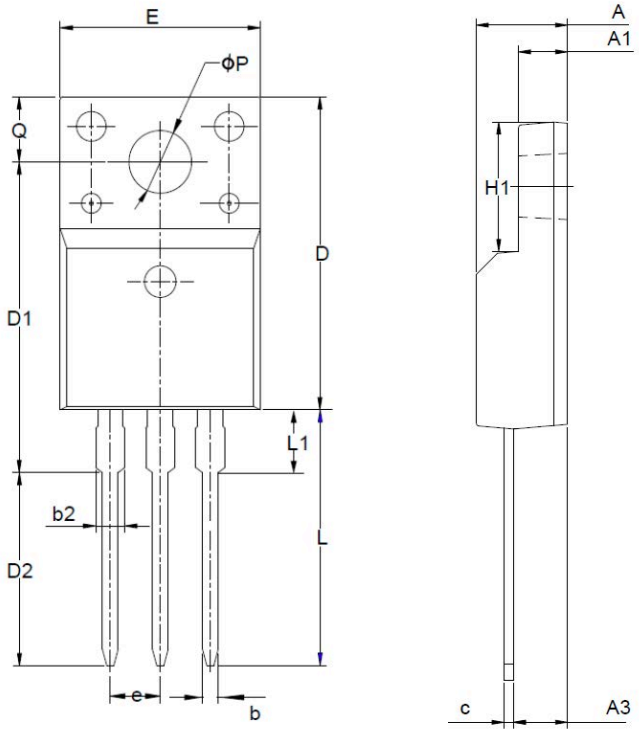


Figure 9. Safe Operation Area

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