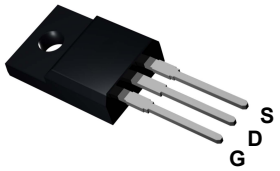
GOOD-ARK SEMICONDUCTOR

GSFU250N06

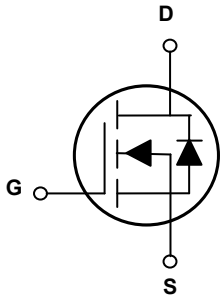
60V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	28mΩ (Max.)
I_D	64A



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

RoHS Compliant

Description

The GSFU250N06 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}	60	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)[1]	I_D	64	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		45	A
Pulsed Drain Current[2]	I_{DM}	256	A
Power Dissipation (T_C=25°C)	P_D	140	W
Linear Derating Factor (T_C=25°C)		0.94	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	256	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.07	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.0	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	°C

Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V, T_J=25°C	-	-	1.0	μA
		V_{DS}=60V, V_{GS}=0V, T_J=125°C	-	1.2	-	
Gate-to-Source Forward Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=20V	-	-	100	nA
		V_{DS}=0V, V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=15A	-	23	28	mΩ
		V_{GS}=4.5V, I_D=8A	-	26	34	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.1	-	2.7	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz	-	1051	-	pF
Output Capacitance	C_{oss}		-	108	-	
Reverse Transfer Capacitance	C_{rss}		-	100	-	
Total Gate Charge	Q_g	I_D=10A, V_{DD}=30V, V_{GS}=10V	-	32	-	nC
Gate-to-Source Charge	Q_{gs}		-	3.4	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	6.4	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=30V, V_{GS}=10V, R_G=3Ω, I_D=10A	-	13	-	nS
Rise Time	t_r		-	2.6	-	
Turn-Off Delay Time	$t_{d(off)}$		-	27	-	
Fall Time	t_f		-	3.3	-	
Gate Resistance	R_g	f=1MHz	-	1.3	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	64	A
Diode Pulse Current	$I_{S,pulse}$		-	-	256	A
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time	T_{rr}	I_S=10A, V_{GS}=0V, V_R=30V, dI_F/dt=100A/us	-	19	-	nS
Reverse Recovery Charge	Q_{rr}		-	15	-	nC

Notes

1. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, V_{DD}=30V, R_G=25Ω, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

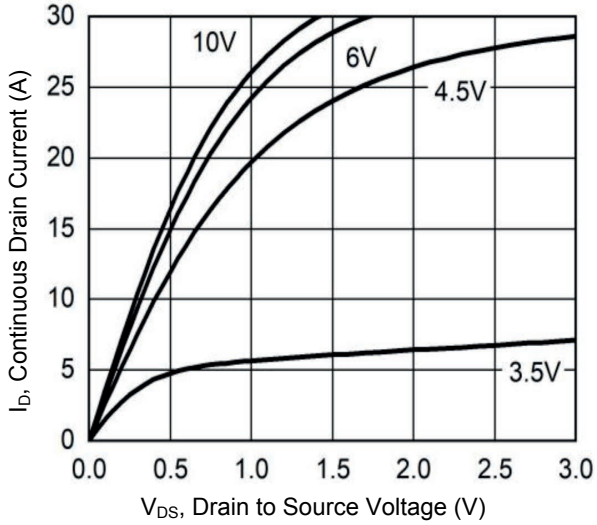


Figure 1. Output Characteristics

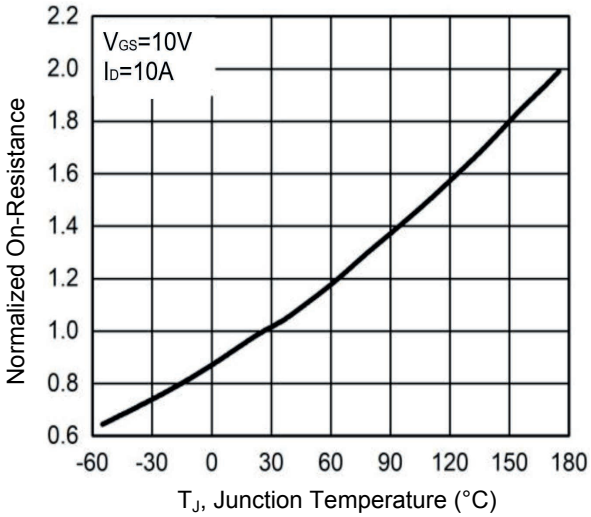


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

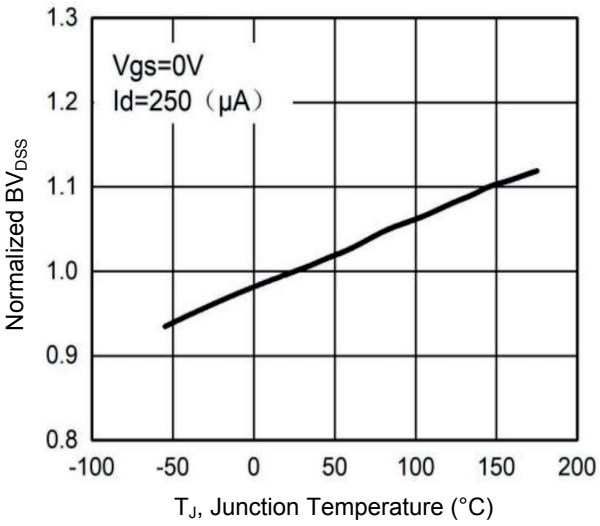


Figure 3. Normalized BV_{DSS} vs. T_J

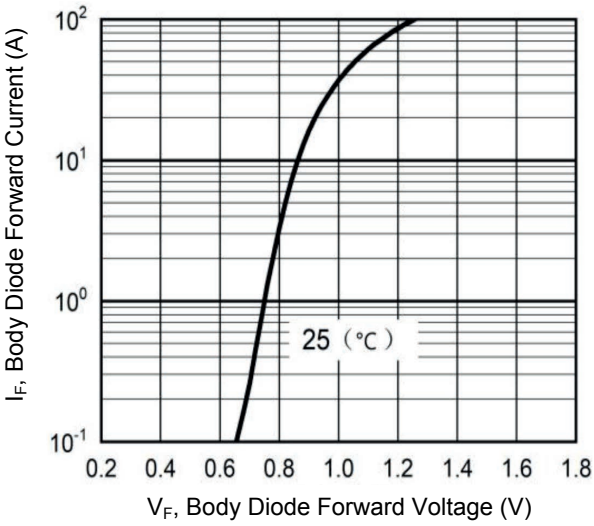


Figure 4. Body Diode Characteristics

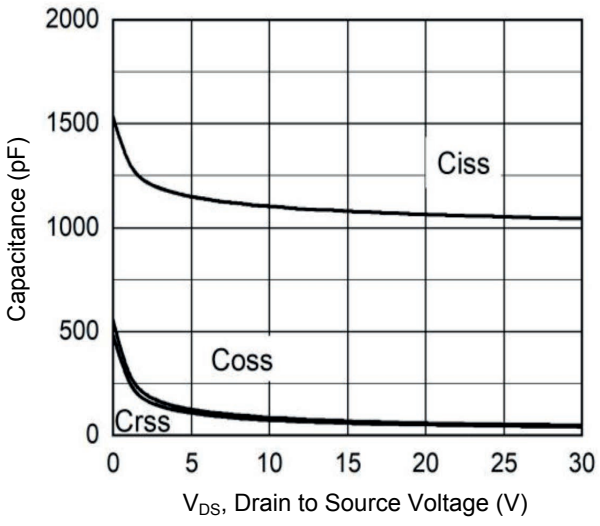


Figure 5. Capacitance Characteristics

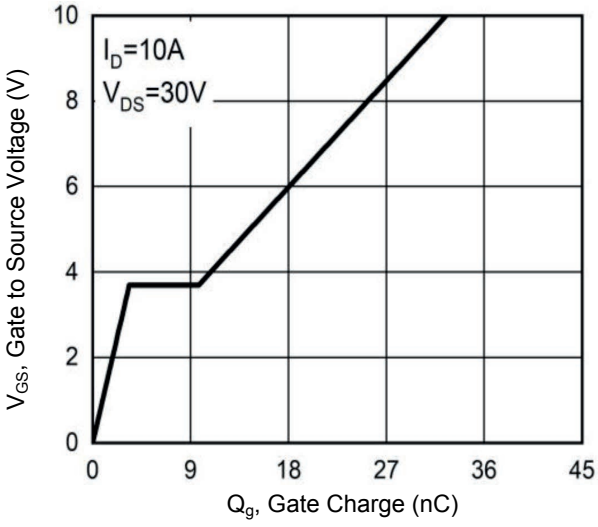
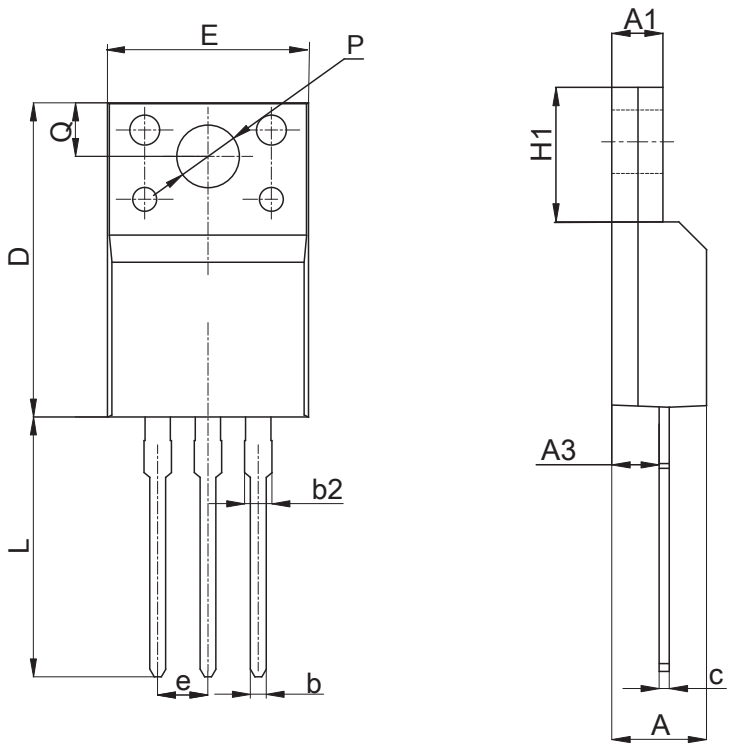


Figure 6. Gate Charge Characteristics

Package Outline Dimensions (TO-220F)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.42	5.02	0.174	0.198
A1	2.30	2.83	0.091	0.111
A3	2.15	3.10	0.085	0.122
b	0.55	0.85	0.022	0.033
b2	0.96	1.46	0.038	0.057
c	0.35	0.65	0.014	0.026
D	15.25	16.25	0.600	0.640
E	9.73	10.50	0.383	0.413
e	2.50	2.60	0.098	0.102
H1	6.40	6.70	0.252	0.264
L	12.48	13.70	0.491	0.539
P	3.00	3.60	0.118	0.142
Q	3.05	3.60	0.120	0.142

Order Information

Device	Package	Marking	Packaging	SPQ
GSFU250N06	TO-220F	250N06	Tube	50 Pcs / Tube