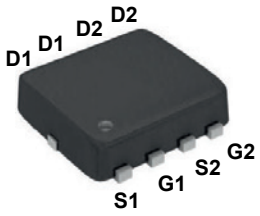
GOOD-ARK SEMICONDUCTOR

GSFN3839

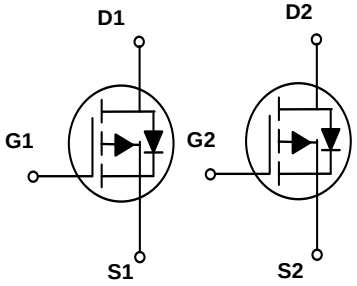
30V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-30V
$R_{DS(ON)}$	39mΩ(Max.)
I_D	-5.6A



PPAK3x3



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 GSFN3839 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_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	-5.6	A
Drain Current-Continuous (T_C=100°C)		-3.6	
Drain Current-Pulsed[1]	I_{DM}	-22.4	A
Single Pulse Avalanche Energy[2]	E_{AS}	30	mJ
Single Pulse Avalanche Current[2]	I_{AS}	-10.8	A
Power Dissipation (T_C=25°C)	P_D	2.7	W
Power Dissipation-Derate above 25°C		0.022	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	47	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_J=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	-30	-	-	V
BV_{DSS} Temperature Coefficent	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=-1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=125°C	-	-	-100	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-5A	-	31	39	mΩ
		V_{GS}=-4.5V, I_D=-4A	-	41	54	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1	-	-2.8	V
$V_{GS(th)}$ Temperature Coefficent	$\Delta V_{GS(th)}$		-	4	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=-5V, I_D=-5A	-	8.1	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-15V, I_D=-5A, V_{GS}=-10V	-	15	-	nC
Gate-Source Charge[2,3]	Q_{gs}		-	4	-	
Gate-to-Drain Charge[2,3]	Q_{gd}		-	2	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-15V, R_G=3Ω, V_{GS}=-10V, I_D=-5A,	-	13	-	nS
Rise Time[2,3]	t_r		-	3.4	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	41	-	
Fall Time[2,3]	t_f		-	9	-	
Input Capacitance	C_{lss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	739	-	pF
Output Capacitance	C_{oss}		-	54	-	
Reverse Transfer Capacitance	C_{rss}		-	44	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	Is	V_G=V_D=0V, Force Current	-	-	-5.6	A
Pulsed Source Current	I_{SM}		-	-	-22.4	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-3A, T_J=25°C	-	-	-1.2	V

Notes:
1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.5mH, R_G=25Ω, starting T_J=25°C.
3. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

Typical Electrical and Thermal Characteristic Curves

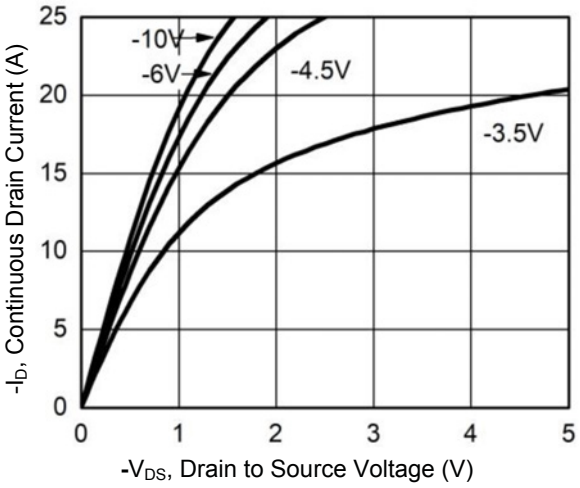


Figure 1. Typical Output Characteristics

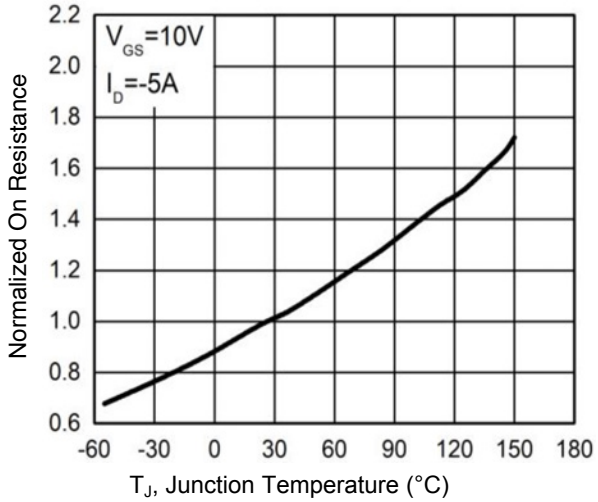


Figure 2. Normalized $R_{DS(ON)}$vs. T_J

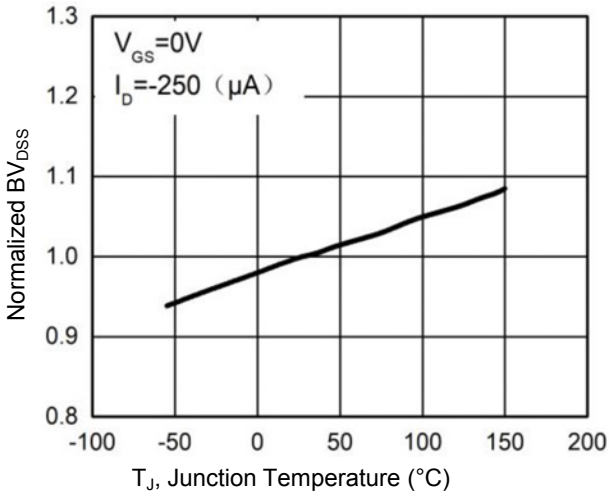


Figure 3. Normalized BV_{DSS} vs. T_J

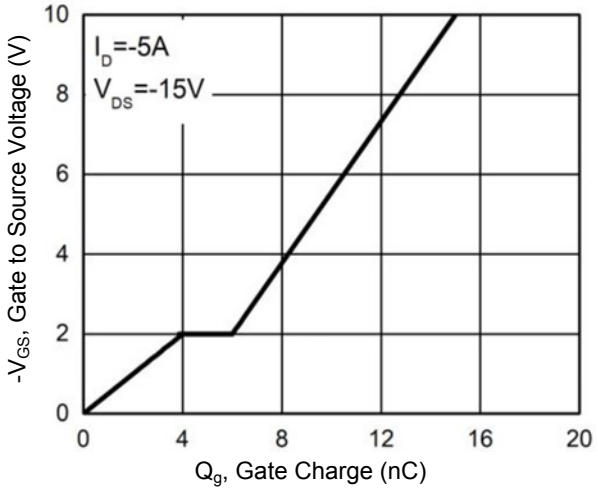


Figure 4. Gate Charge Waveform

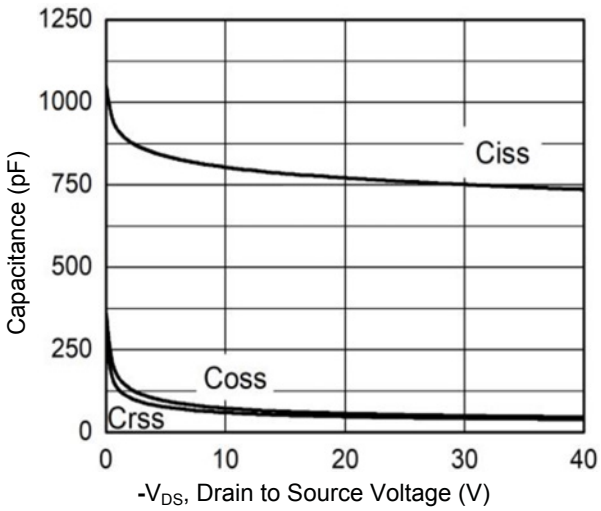


Figure 5. Capacitance Characteristics

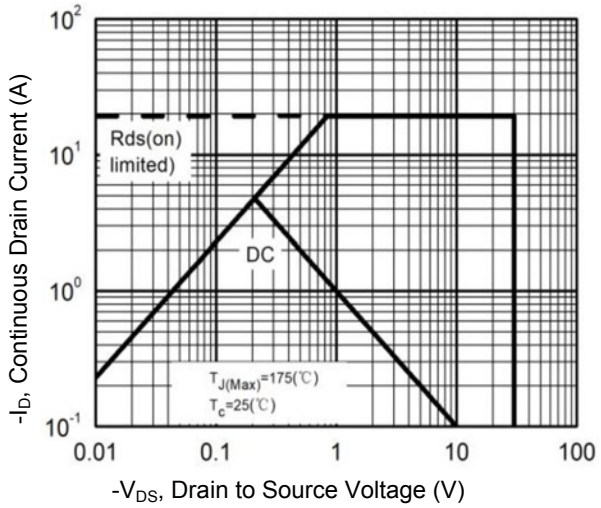
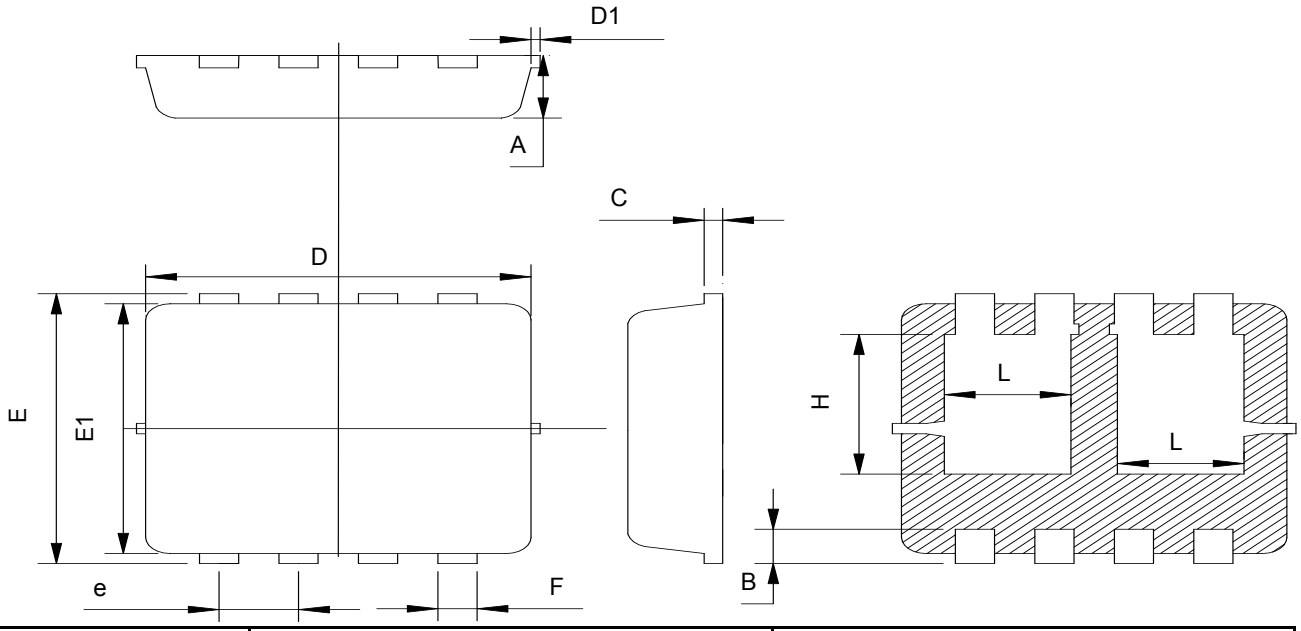


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.725	0.825	0.029	0.032
B	0.280	0.480	0.011	0.019
C	0.130	0.200	0.005	0.008
D	3.050	3.250	0.120	0.128
D1	-	0.100	-	0.004
E	3.250	3.450	0.128	0.136
E1	3.000	3.200	0.118	0.126
e	0.600	0.700	0.024	0.028
F	0.250	0.350	0.010	0.014
H	1.630	1.830	0.064	0.072
L	0.930	1.130	0.037	0.044

Order Information

Device	Package	Marking	Carrier	Quantity
GSFN3839	PPAK3x3	N3839	Tape & Reel	5,000 Pcs / Reel