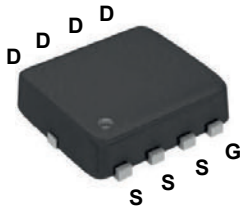
GOOD-ARK
SEMICONDUCTOR

GSFN6049

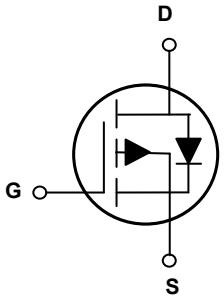
60V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	49mΩ (Max.)
I_D	-28A



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

Description

The GSFN6049 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	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	-28	A
Drain Current-Continuous (T_C=100°C)		-16	
Drain Current-Pulsed[1]	I_{DM}	-112	A
Single Pulse Avalanche Energy[2]	E_{AS}	484	mJ
Single Pulse Avalanche Current[2]	I_{AS}	-14	A
Power Dissipation (T_C=25°C)	P_D	40	W
Power Dissipation-Derate above 25°C		0.32	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.13	°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-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	-	-2.2	-	
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=-7A	-	35	49	mΩ
		V_{GS}=-4.5V, I_D=-6A	-	43	59	
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	-	727	-	pF
Output Capacitance	C_{oss}		-	161	-	
Reverse Transfer Capacitance	C_{rss}		-	17	-	
Total Gate Charge[3,4]	Q_g	I_D=-10A, V_{DD}=-30V, V_{GS}=-10V	-	13.4	-	nC
Gate-to-Source Charge[3,4]	Q_{gs}		-	3.4	-	
Gate-to-Drain ("Miller") Charge[3,4]	Q_{gd}		-	1.9	-	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=-30V, V_{GS}=-10V, R_G=5Ω, I_D=-10A	-	10	-	nS
Rise Time[3,4]	t_r		-	6	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	2	-	
Fall Time[3,4]	t_f		-	12	-	
Gate Resistance	R_g	f=1MHz	-	2.9	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	-28	A
Diode Pulse Current	$I_{S.pulse}$		-	-	-112	A
Diode Forward Voltage	V_{SD}	I_S=-5A, V_{GS}=0V	-	-	-1.4	V
Reverse Recovery Time[3]	t_{rr}	I_S=-10A, V_{GS}=0V, V_R=-30V, dI_F/dt=100A/us	-	18	-	nS
Reverse Recovery Charge[3]	Q_{rr}		-	27	-	nC

Note:

1. The rated value only refers to the maximum absolute value under 25°C shell temperature in the manual. If the shell temperature is higher than 25°C, the rating shall be reduced according to the actual environmental conditions.
2. Pulse time 5μs, and the pulse width is limited to the maximum junction temperature.
3. Pulse test: Pulse width ≤300μs, duty cycle ≤2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

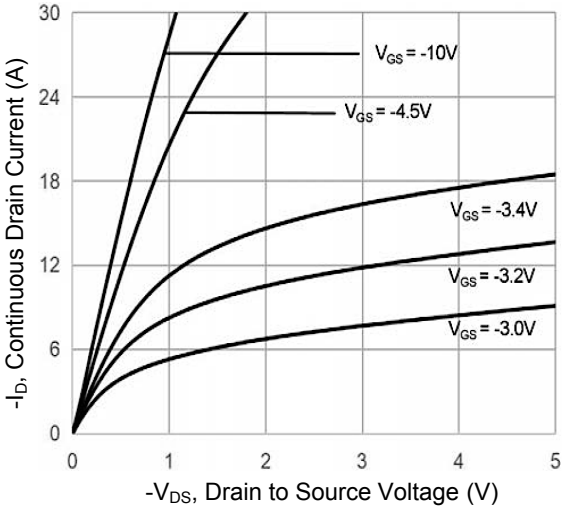


Figure 1. Output Characteristics

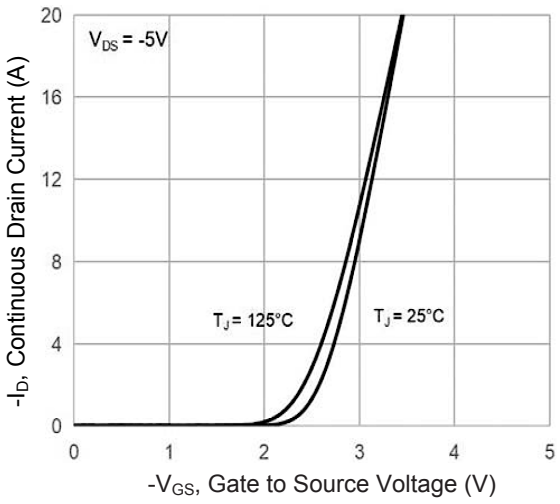


Figure 2. Transfer Characteristics

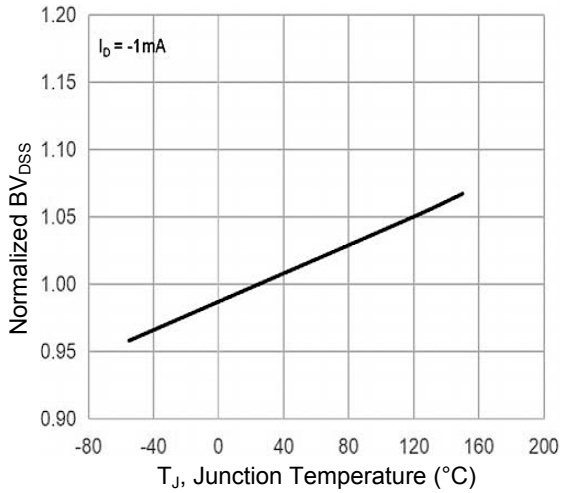


Figure 3. Normalized BV_{DSS} vs. T_J

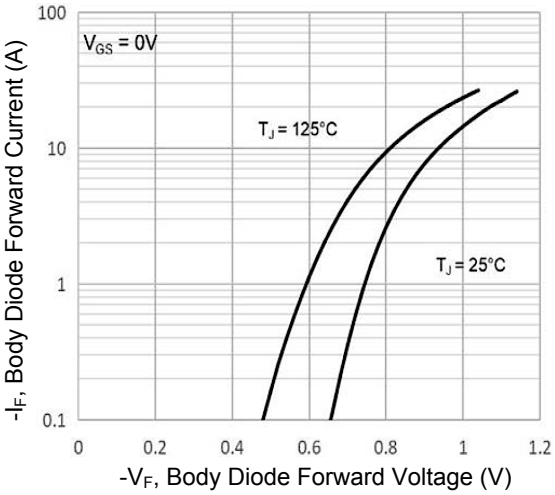


Figure 4. Body Diode Characteristics

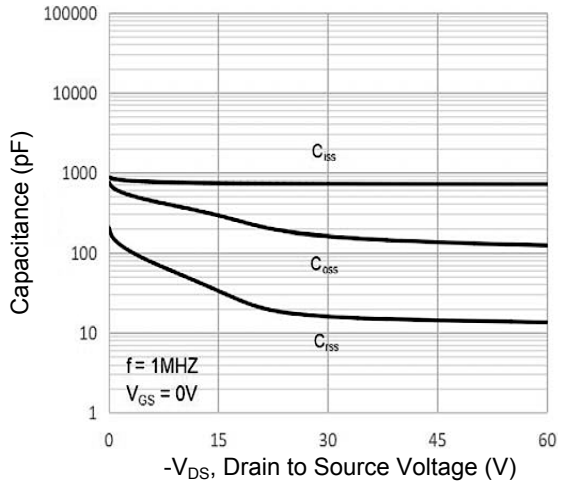


Figure 5. Capacitance Characteristics

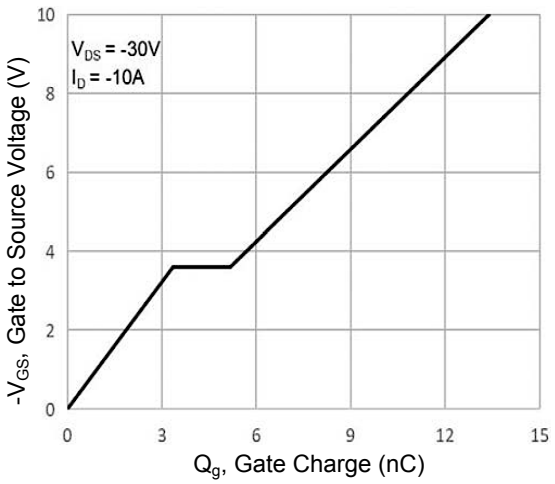
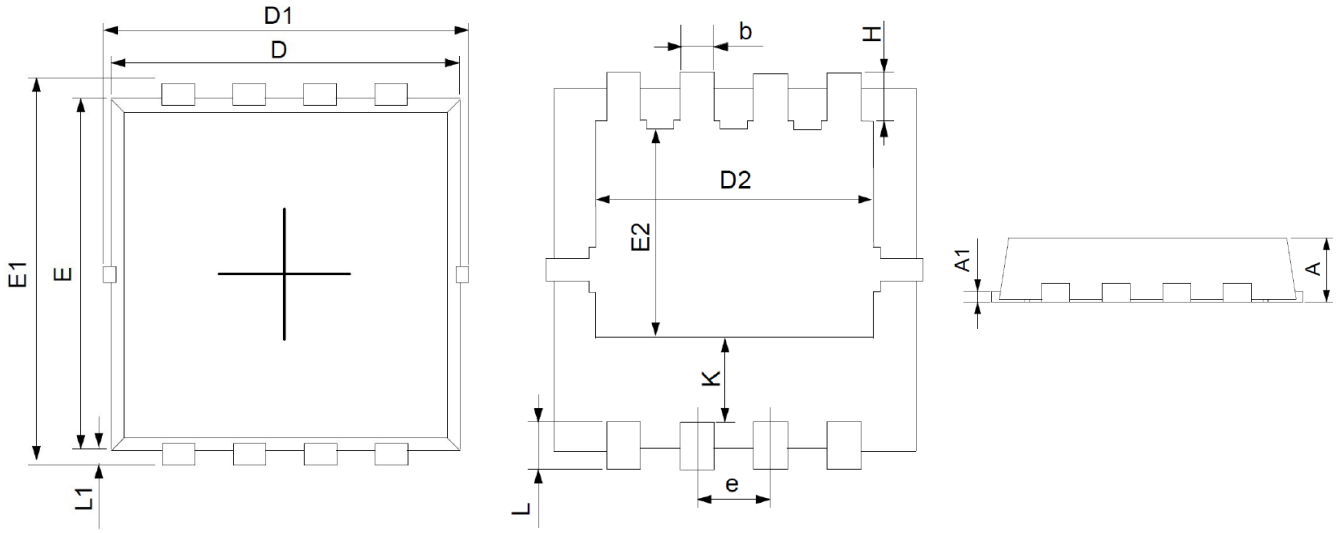


Figure 6. Gate Charge Characteristics

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.70	0.90	0.028	0.035
A1	0.14	0.20	0.006	0.008
D	3.05	3.25	0.120	0.128
E	2.90	3.10	0.114	0.122
D1	3.10	3.50	0.122	0.138
D2	2.35	2.50	0.093	0.098
E1	3.10	3.50	0.122	0.138
E2	1.64	1.84	0.065	0.072
b	0.25	0.35	0.010	0.014
K	0.59	0.79	0.023	0.031
e	0.55	0.75	0.022	0.030
L	0.25	0.55	0.010	0.022
L1	0.10	0.20	0.004	0.008
H	0.32	0.52	0.013	0.020

Order Information

Device	Package	Marking	Packaging	SPQ
GSFN6049	PPAK3x3	N6049	Tape & Reel	5,000 Pcs / Reel