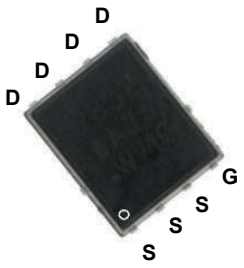
GOOD-ARK SEMICONDUCTOR

GSGP9R706AU

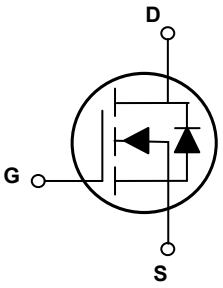
60V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	9.7mΩ (Max.)
I_D	60A



PPAK5x6



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
- AEC-Q101 qualified

Description

The GSGP9R706AU 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	Value	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	60	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		42.5	A
Pulsed Drain Current[2]	I_{DM}	240	A
Power Dissipation (T_C=25°C)	P_D	96	W
Linear Derating Factor (T_C=25°C)		0.64	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	81	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.56	°C/W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.5	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	°C

Electrical Characteristics (T_A=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	-	-	1	μA
		T_J=125°C	-	-	20	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=13A	-	8.0	9.7	mΩ
		V_{GS}=4.5V, I_D=11A	-	11	14	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.7	2.5	V
Forward Transconductance	gfs	V_{DS}=10V, I_D=6A	-	12	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz	-	1064	2200	pF
Output Capacitance	C_{oss}		-	434	870	
Reverse Transfer Capacitance	C_{rss}		-	26	54	
Total Gate Charge	Q_g	I_D=13A, V_{DS}=48V, V_{GS}=10V	-	18	-	nC
Gate-to-Source Charge	Q_{gs}		-	5.6	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	2.7	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=30V, I_D=13A, R_{GEN}=3Ω	-	8.5	-	nS
Rise Time	t_r		-	52	-	
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	
Fall Time	t_f		-	8.9	-	
Gate Resistance	R_g	f=1MHz	-	1.7	3	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	60	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	120	A
Diode Forward Voltage	V_{SD}	I_S=13A, V_{GS}=0V	-	1	1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=13A, di/dt=100A/μs	-	54	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.052	-	uC

Notes:

1. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, R_G=10Ω, V_{DD}=50V, 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

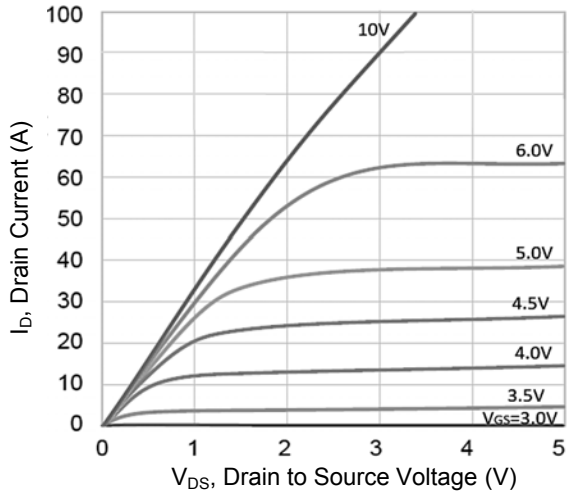


Figure 1. Output Characteristics

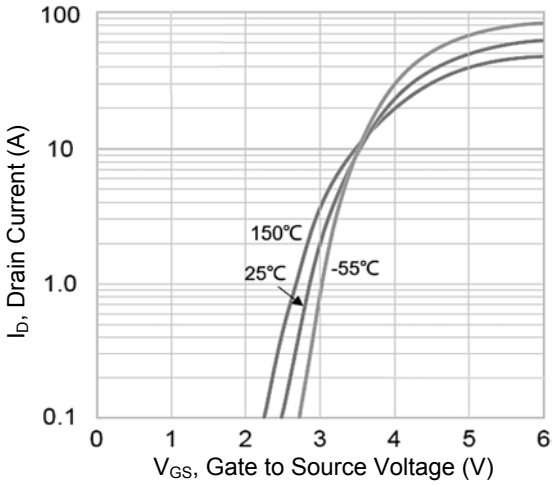


Figure 2. Transfer Characteristics

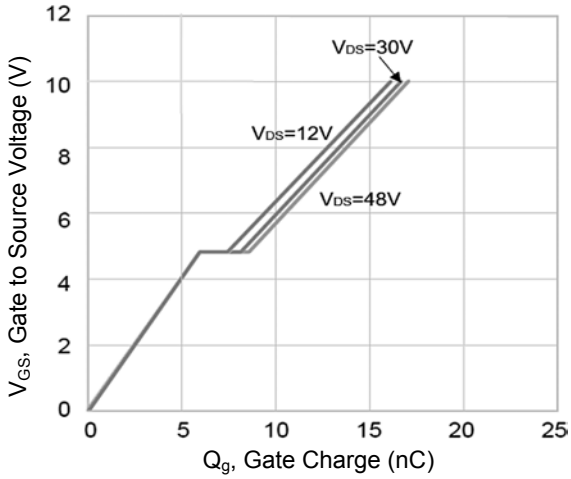


Figure 3. Gate Charge

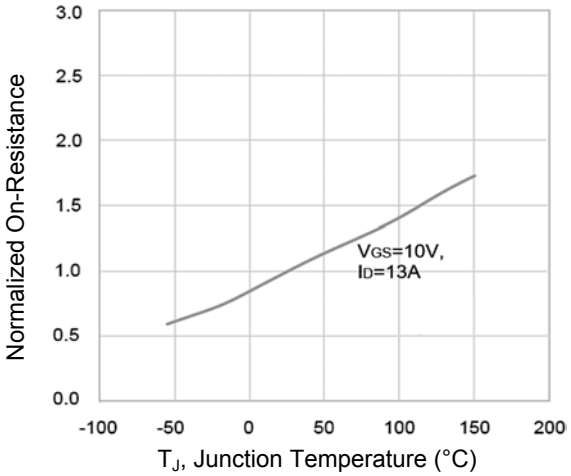


Figure 4. Normalized $R_{DS(ON)}$ vs. T_J

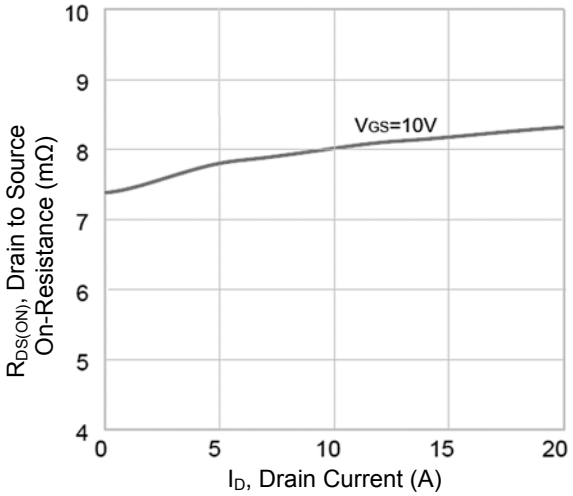


Figure 5. $R_{DS(ON)}$ vs. I_D

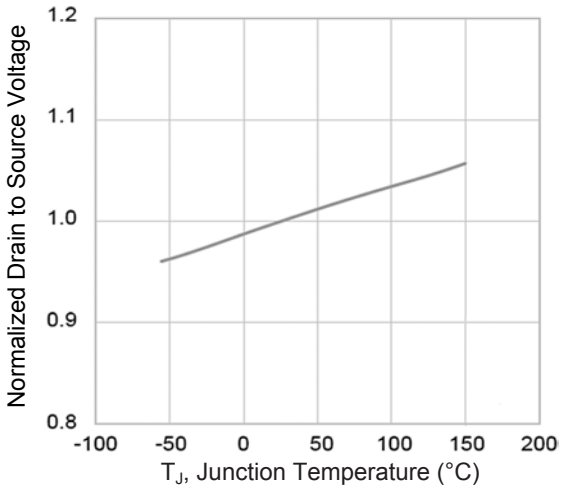


Figure 6. Normalized BV_{DSS} vs. T_J

Typical Electrical and Thermal Characteristic Curves

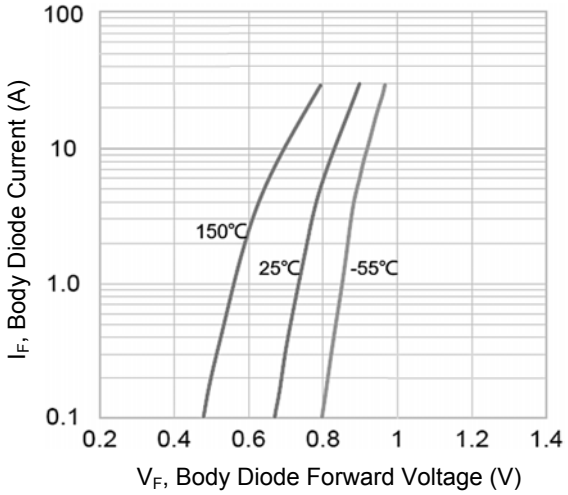


Figure 7. Body Diode Characteristics

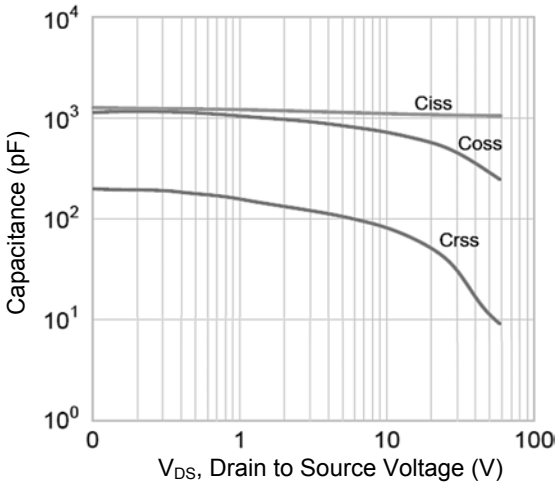


Figure 8. Capacitance Characteristics

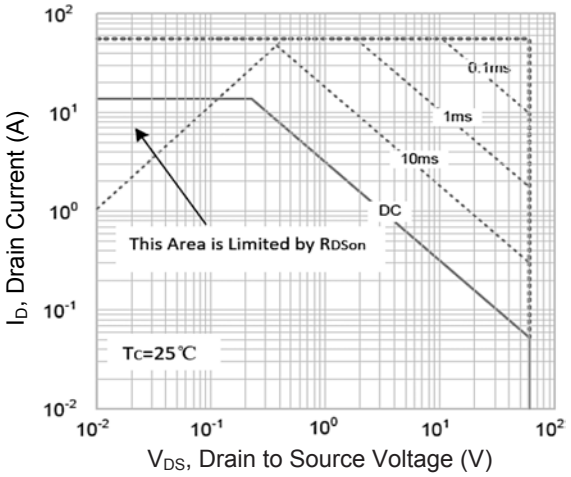
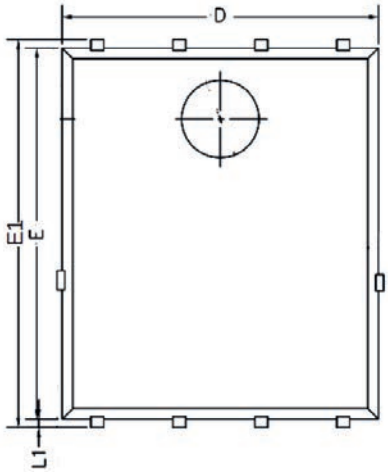
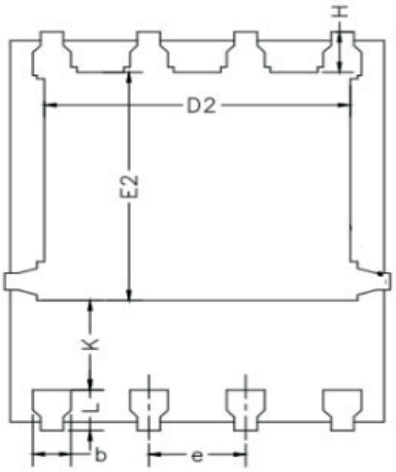


Figure 9. Safe Operation Area

Package Outline Dimensions (PPAK5x6)



TOP VIEW



BOTTOM VIEW

SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.20	0.035	0.047
b	0.30	0.55	0.012	0.022
C	0.15	0.35	0.006	0.014
D	4.70	5.20	0.185	0.205
D2	3.76	4.20	0.148	0.165
E2	3.30	3.85	0.130	0.152
E	5.60	5.90	0.220	0.232
E1	5.80	6.20	0.228	0.244
K	1.10	-	0.043	-
H	0.45	0.75	0.018	0.030
L	0.45	0.75	0.018	0.030
L1	0.25	0.45	0.010	0.018
e	1.27 BSC		0.050 BSC	

Order Information

Device	Package	Marking	Packaging	SPQ
GSGP9R706AU	PPAK5x6	P9R706	Tape & Reel	5,000 Pcs / Reel