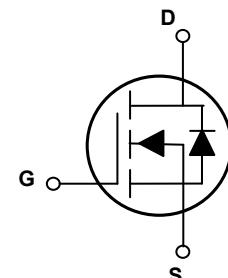
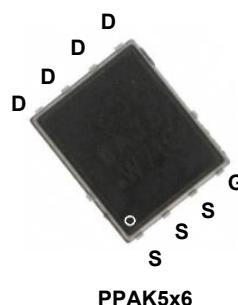


### Main Product Characteristics

BV <sub>DSS</sub>	60V
R <sub>DS(ON)</sub>	9.7mΩ (Max)
I <sub>D</sub>	60A



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 GSFP9R706 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<sub>c</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-to-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, @ Steady-State <sup>1</sup> (T <sub>c</sub> =25°C)	I <sub>D</sub>	60	A
Continuous Drain Current, @ Steady-State (T <sub>c</sub> =100°C)		42.5	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	240	A
Power Dissipation (T <sub>c</sub> =25°C)	P <sub>D</sub>	55	W
Linear Derating Factor (T <sub>c</sub> =25°C)		0.44	W/°C
Single Pulse Avalanche Energy <sup>3</sup>	E <sub>AS</sub>	81	mJ
Junction-to-Case	R <sub>θJC</sub>	2.72	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>	R <sub>θJA</sub>	62.5	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	60	-	-	V
Drain-to-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	$\mu\text{A}$
		$T_J=125^\circ\text{C}$	-	-	20	
Gate-to-Source Forward Leakage	$I_{\text{GSS}}$	$V_{\text{GS}}=20\text{V}$	-	-	100	$\text{nA}$
		$V_{\text{GS}}= -20\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}}=10\text{V}, I_D=13\text{A}$	-	8	9.7	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_D=11\text{A}$	-	11	14	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	1.2	1.7	2.5	V
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_D=6\text{A}$	-	12	-	S
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=30\text{V}$ $F=1\text{MHz}$	-	1064	2200	$\text{pF}$
Output Capacitance	$C_{\text{oss}}$		-	434	870	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	26	54	
Total Gate Charge	$Q_g$	$I_D=13\text{A}, V_{\text{DS}}=48\text{V}, V_{\text{GS}}=10\text{V}$	-	18	-	$\text{nC}$
Gate-to-Source Charge	$Q_{\text{gs}}$		-	5.6	-	
Gate-to-Drain ("Miller") Charge	$Q_{\text{gd}}$		-	2.7	-	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{GS}}=10\text{V}, V_{\text{DS}}=30\text{V}, I_D=13\text{A}, R_{\text{GEN}}=3\Omega$	-	8.5	-	$\text{nS}$
Rise Time	$t_r$		-	52	-	
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		-	18	-	
Fall Time	$t_f$		-	8.9	-	
Gate Resistance	$R_g$		-	1.7	3	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_s$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	75	A
Pulsed Source Current (Body Diode)	$I_{\text{SM}}$		-	-	300	A
Diode Forward Voltage	$V_{\text{SD}}$	$I_s=13\text{A}, V_{\text{GS}}=0\text{V}$	-	1	1.2	V
Reverse Recovery Time	$t_{\text{rr}}$	$T_J=25^\circ\text{C}, I_F=13\text{A}, \text{di}/\text{dt}= 100\text{A}/\mu\text{s}$	-	54	-	ns
Reverse Recovery Charge	$Q_{\text{rr}}$		-	0.052	-	uc

**Notes**

1. Pulse test: Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $L=0.5\text{mH}, R_G=10\Omega, V_{\text{DD}}=50\text{V}, T_J=25^\circ\text{C}$ .
4. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch.

## Typical Electrical and Thermal Characteristic Curves

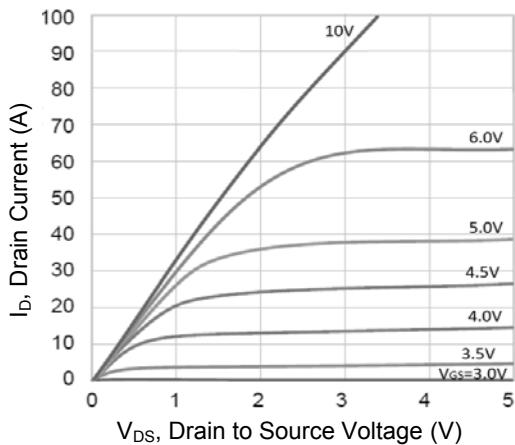


Figure 1. Typical Output Characteristics

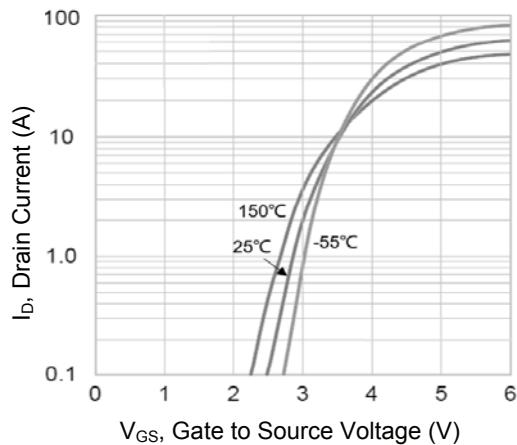


Figure 2. Transfer Characteristics

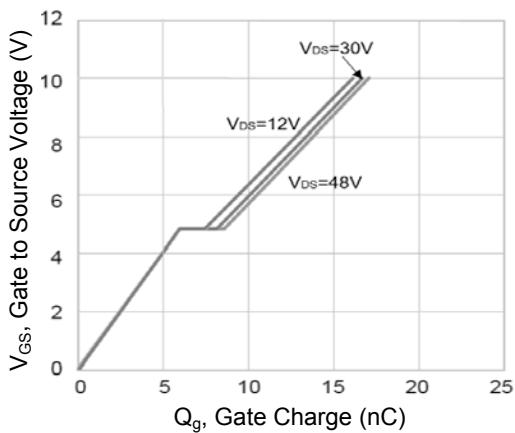


Figure 3. Gate Charge Characteristics

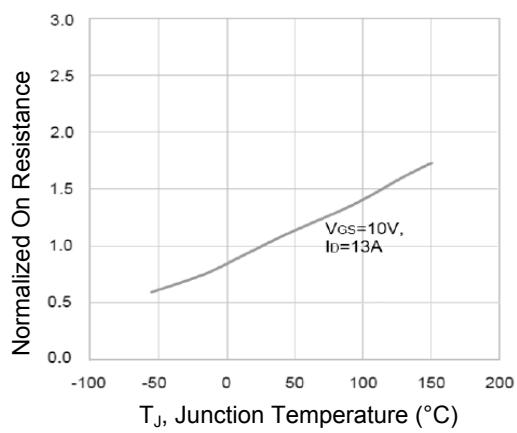


Figure 4. Normalized R<sub>DS(ON)</sub> vs. T<sub>J</sub>

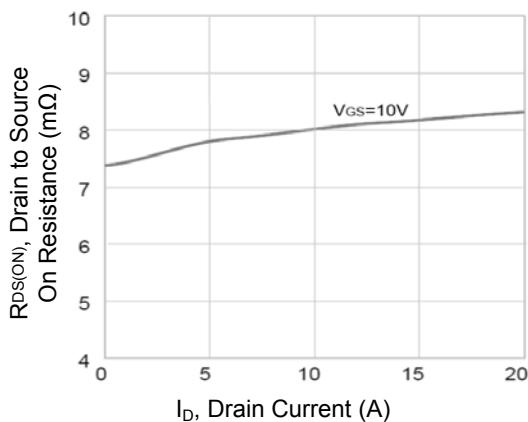


Figure 5. R<sub>DS(ON)</sub> vs. Drain Current

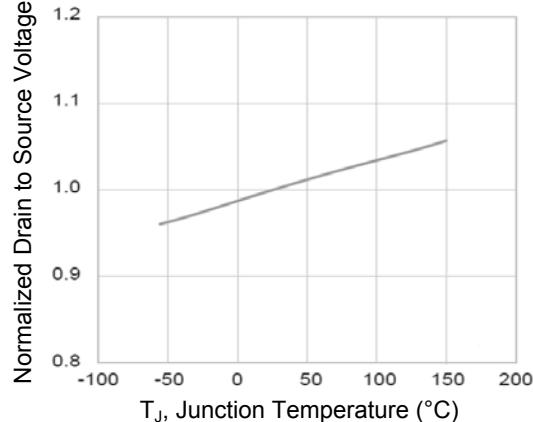


Figure 6. Normalized B<sub>V<sub>DS</sub>S</sub> vs. T<sub>J</sub>

### Typical Electrical and Thermal Characteristic Curves

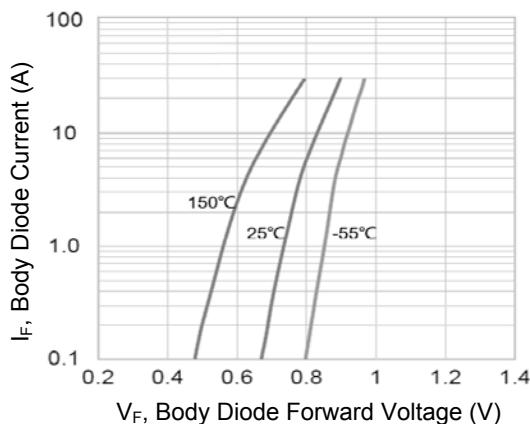


Figure 7. Body Diode Characteristics

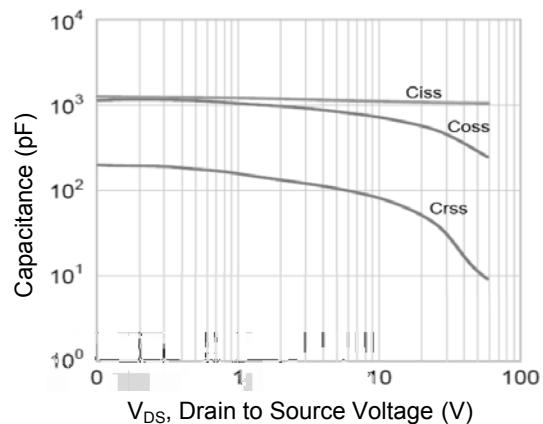


Figure 8. Capacitance Characteristics

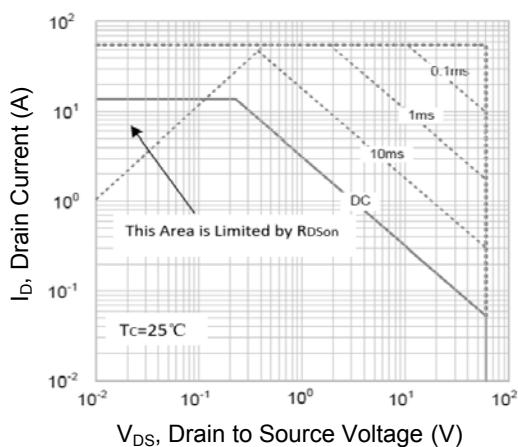
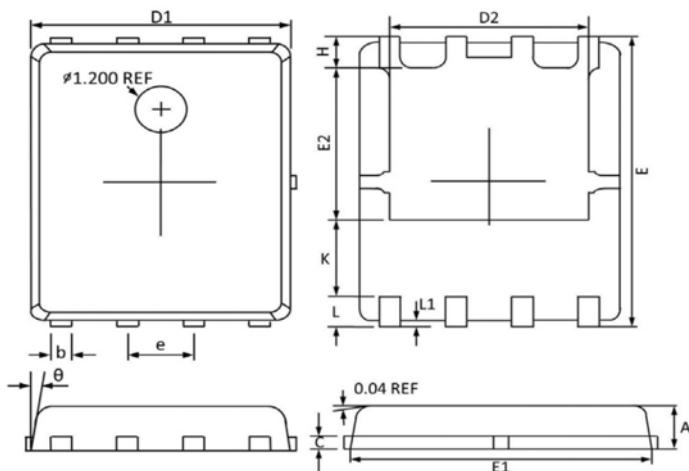


Figure 9. Safe Operation Area

### Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.100	0.031	0.043
b	0.330	0.510	0.013	0.020
C	0.200	0.300	0.008	0.012
D1	4.800	5.100	0.189	0.201
D2	3.610	4.100	0.142	0.161
E	5.900	6.200	0.232	0.244
E1	5.700	5.900	0.224	0.232
E2	3.350	3.780	0.132	0.149
e	1.27BSC		0.05BSC	
H	0.410	0.700	0.016	0.028
K	1.100	1.500	0.043	0.059
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
θ	0°	12°	0°	12°