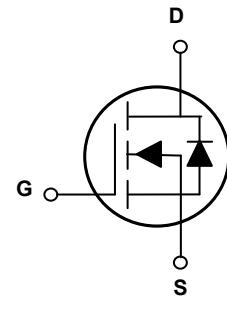
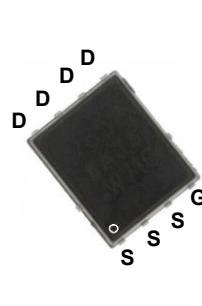


## Main Product Characteristics

BV <sub>DSS</sub>	100V
R <sub>DS(ON)</sub>	5.8mΩ
I <sub>D</sub>	70A



## 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 GSFP1070 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 supply 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>	100	V
Gate-Source Voltage	V <sub>GS</sub>	+20/-12	V
Drain Current-Continuous (T <sub>C</sub> =25°C)	I <sub>D</sub>	70	A
Drain Current-Continuous (T <sub>C</sub> =100°C)		44	
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	280	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	320	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	80	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	142	W
Power Dissipation-Derate above 25°C		1.14	W/°C
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.88	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-50 To +150	°C
Storage Temperature Range	T <sub>STG</sub>	-50 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$	100	-	-	V
Drain-Source Leakage Current	$\text{I}_{\text{DSS}}$	$\text{V}_{\text{DS}}=100\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$\text{V}_{\text{DS}}=80\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$\text{I}_{\text{GSS}}$	$\text{V}_{\text{GS}}=20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	-	-	100	nA
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=20\text{A}$	-	4.6	5.5	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=20\text{A}, T_J=25^\circ\text{C}$	-	8.1	-	
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_D=10\text{A}$	-	6.2	7.8	
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_D=250\mu\text{A}$	1	1.6	2.5	V
Forward Transconductance	$\text{g}_{\text{fs}}$	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_D=5\text{A}$	-	18	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$\text{Q}_g$	$\text{V}_{\text{DS}}=80\text{V}, \text{I}_D=10\text{A}, \text{V}_{\text{GS}}=10\text{V}$	-	58.2	100	nC
Gate-Source Charge <sup>3,4</sup>	$\text{Q}_{\text{gs}}$		-	9.2	18	
Gate-Drain Charge <sup>3,4</sup>	$\text{Q}_{\text{gd}}$		-	20.8	30	
Turn-On Delay Time <sup>3,4</sup>	$\text{t}_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=50\text{V}, \text{R}_G=6\Omega, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=1\text{A}$	-	24	48	nS
Rise Time <sup>3,4</sup>	$\text{t}_r$		-	19.8	39	
Turn-Off Delay Time <sup>3,4</sup>	$\text{t}_{\text{d}(\text{off})}$		-	46	92	
Fall Time <sup>3,4</sup>	$\text{t}_f$		-	26	52	
Input Capacitance	$\text{C}_{\text{iss}}$	$\text{V}_{\text{DS}}=25\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	-	4570	9100	pF
Output Capacitance	$\text{C}_{\text{oss}}$		-	1180	2300	
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$		-	49	98	
Gate Resistance	$\text{R}_g$	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	-	2	4	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$\text{I}_s$	Force Current	-	-	70	A
Pulsed Source Current	$\text{I}_{\text{SM}}$		-	-	140	A
Diode Forward Voltage	$\text{V}_{\text{SD}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$\text{t}_{\text{rr}}$	$\text{V}_R=0\text{V}, \text{I}_s=10\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	61.6	-	nS
Reverse Recovery Charge	$\text{Q}_{\text{rr}}$		-	120	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $\text{V}_{\text{DD}}=25\text{V}, \text{V}_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=80\text{A}, R_G=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.

## Typical Electrical and Thermal Characteristic Curves

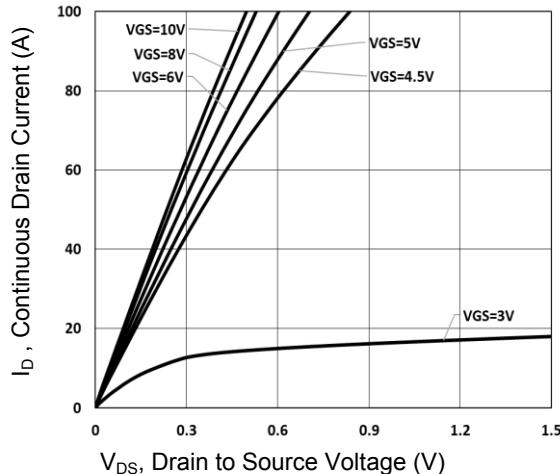


Figure 1. Typical Output Characteristics

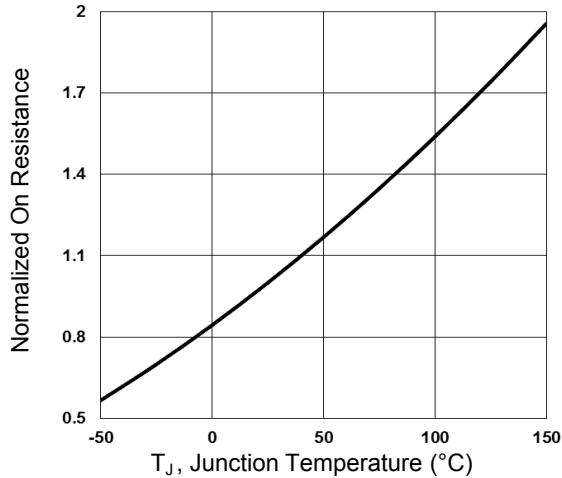


Figure 2. ....  $R_{DS(on)}$  vs.  $T_J$

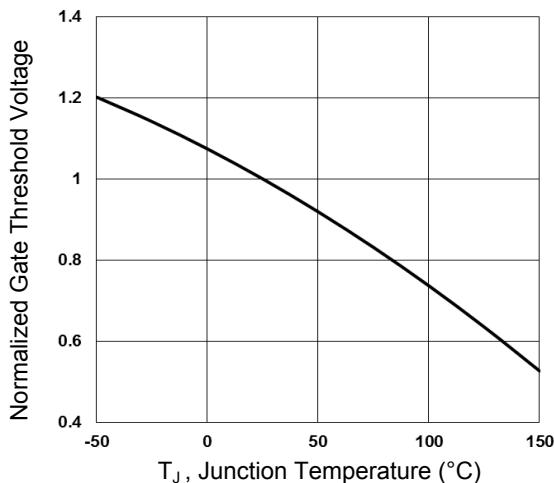


Figure 3. Normalized  $V_{th}$  vs.  $T_J$

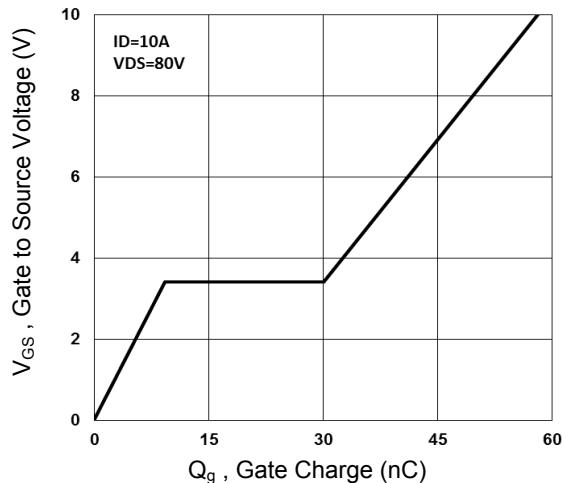


Figure 4. Gate Charge Characteristics

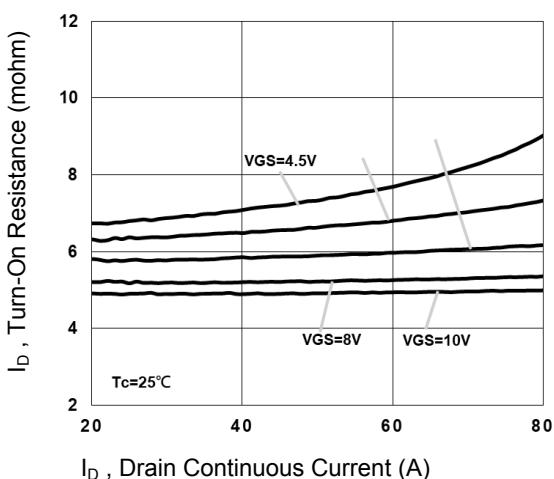


Figure 5. Turn-On Resistance vs.  $I_D$

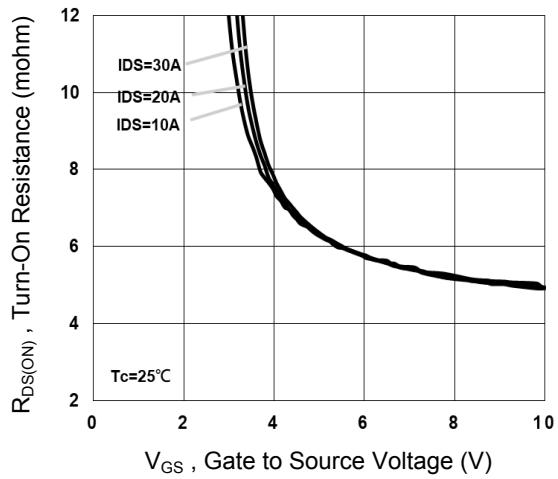


Figure 6. Turn-On Resistance vs.  $V_{GS}$

## Typical Electrical and Thermal Characteristic Curves

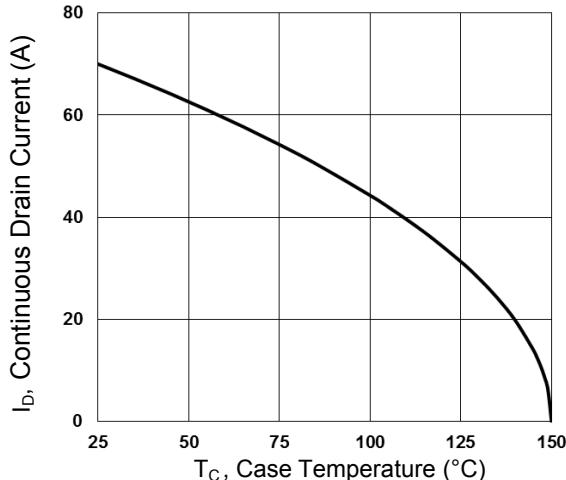


Figure 7. Continuous Drain Current vs. T<sub>c</sub>

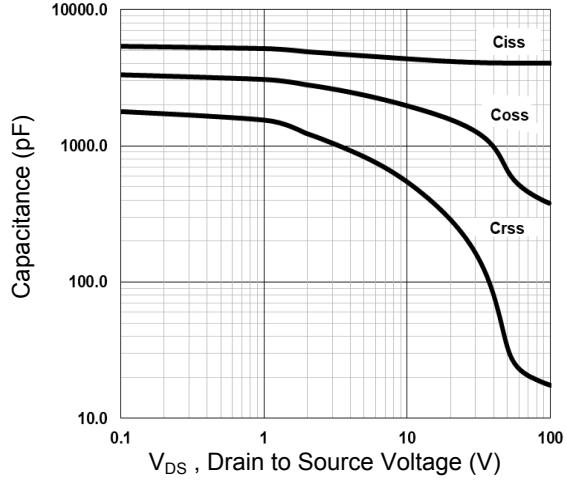


Figure 8. Capacitance Characteristics

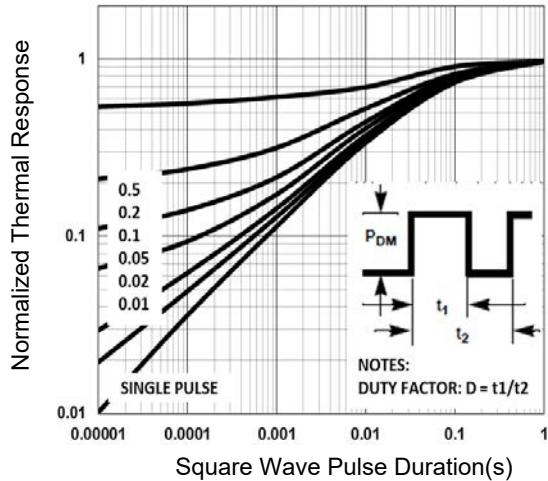


Figure 9 . Normalized Transient Impedance

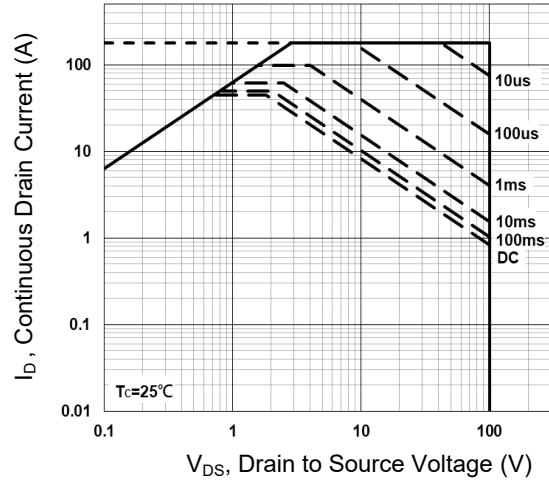


Figure 10. Maximum Safe Operation Area

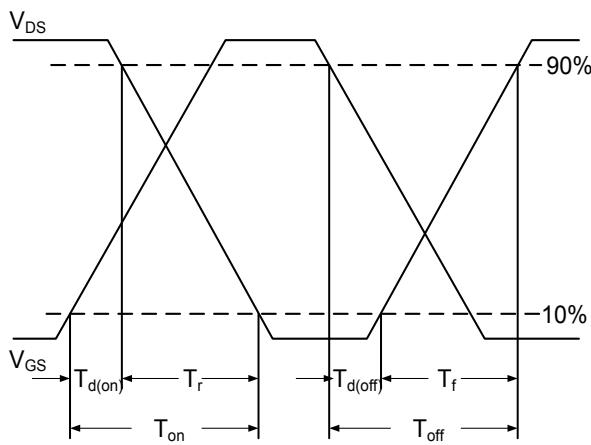


Figure 11. Switching Time Waveform

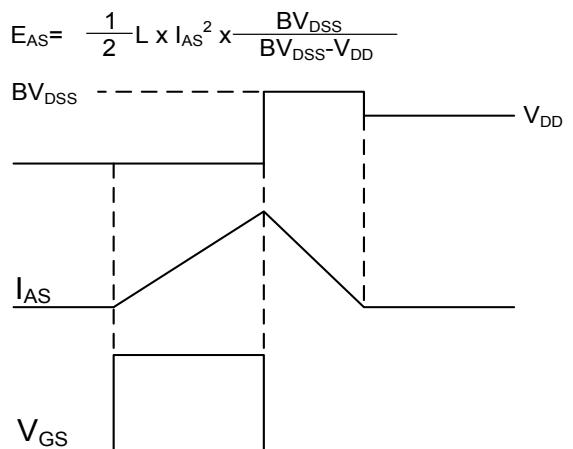
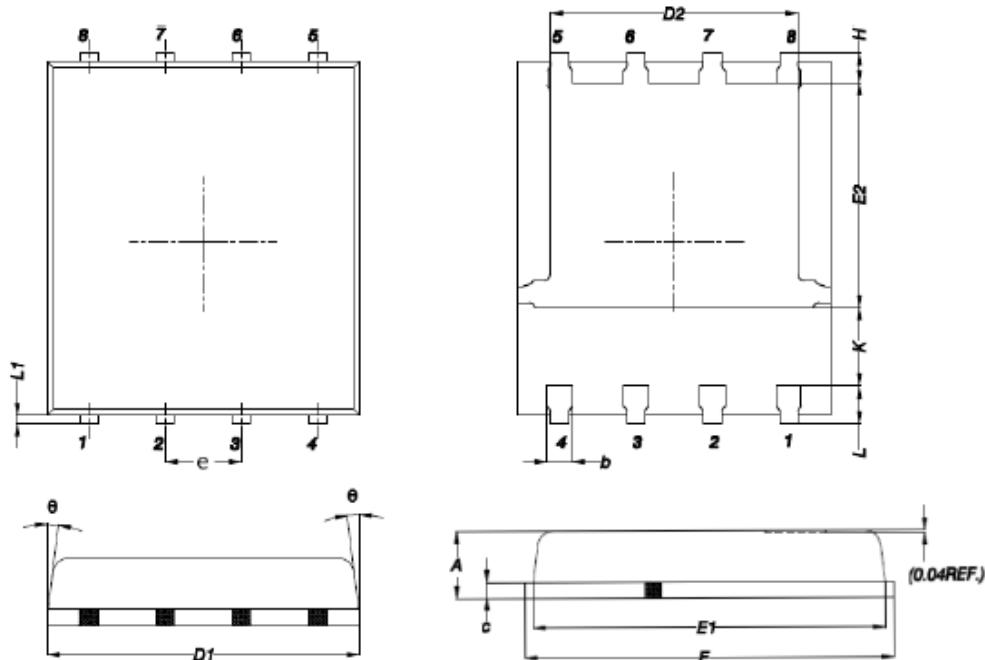


Figure 12. EAS Waveform

### Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	-	1.100	-	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°