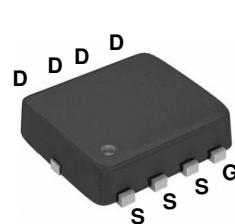
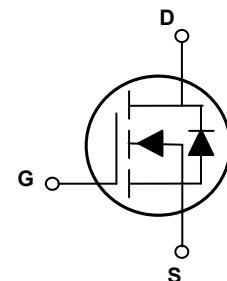


## Main Product Characteristics

BV <sub>DSS</sub>	65V
R <sub>DS(ON)</sub>	5.2mΩ
I <sub>D</sub>	70A



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 GSFN0670 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 ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	65	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	I <sub>D</sub>	70	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		44	
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	280	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	180	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	60	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	P <sub>D</sub>	61.2	W
Power Dissipation - Derate above 25°C		0.49	W/°C
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	2.04	°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** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	65	-	-	V
Drain-Source Leakage Current	$I_{\text{DS}(\text{SS})}$	$V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=48\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance <sup>3</sup>	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=20\text{A}$	-	4.3	5.2	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	2	3	4	V
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	10	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>4</sup>	$Q_g$	$V_{\text{DS}}=30\text{V}, I_{\text{D}}=35\text{A}, V_{\text{GS}}=10\text{V}$	-	34	50	nC
Gate-Source Charge <sup>4</sup>	$Q_{\text{gs}}$		-	7.4	10	
Gate-Drain Charge <sup>4</sup>	$Q_{\text{gd}}$		-	13	20	
Turn-On Delay Time <sup>4</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=30\text{V}, R_{\text{G}}=6\Omega, V_{\text{GS}}=10\text{V}, I_{\text{D}}=35\text{A}$	-	10	15	nS
Rise Time <sup>4</sup>	$t_r$		-	16	24	
Turn-Off Delay Time <sup>4</sup>	$t_{\text{d}(\text{off})}$		-	42	63	
Fall Time <sup>4</sup>	$t_f$		-	38	57	
Input Capacitance	$C_{\text{iss}}$		-	1900	2850	pF
Output Capacitance	$C_{\text{oss}}$	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	890	1340	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	17	25	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.2	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0\text{V}, \text{Force Current}$	-	-	70	A
Pulsed Source Current	$I_{\text{SM}}$		-	-	140	A
Diode Forward Voltage <sup>3</sup>	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$T_{\text{rr}}$	$V_R=50\text{V}, I_s=10\text{A}, \frac{\text{di}}{\text{dt}}=100\text{A}/\mu\text{s}$ $T_J=25^\circ\text{C}$	-	60	-	ns
Reverse Recovery Charge	$Q_{\text{rr}}$		-	80	-	nC

Note:

- Repetitive rating: Pulsed width limited by maximum junction temperature.
- $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=60\text{A}, R_{\text{G}}=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .
- Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
- Essentially independent of operating temperature.

### Typical Electrical and Thermal Characteristic Curves

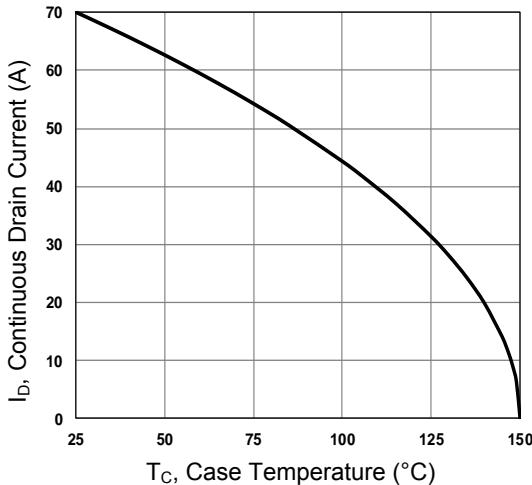


Figure 1. Continuous Drain Current vs. T<sub>C</sub>

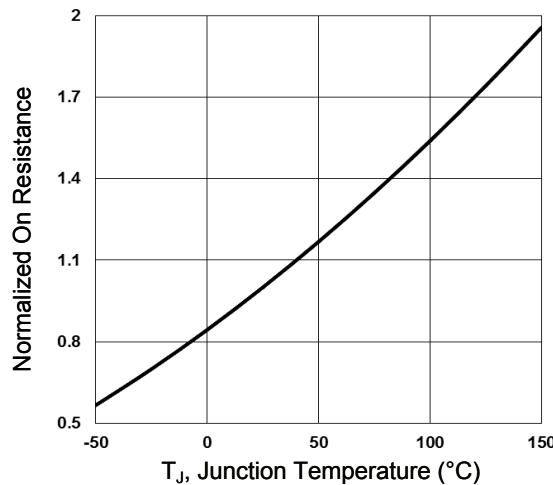


Figure 2. Normalized R<sub>DSON</sub> vs. T<sub>J</sub>

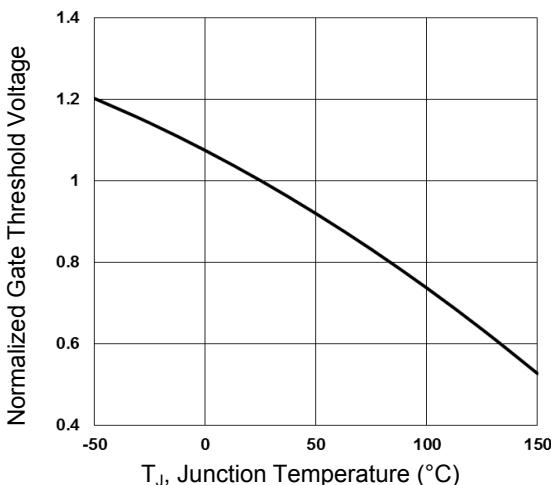


Figure 3. Normalized V<sub>th</sub> vs. T<sub>J</sub>

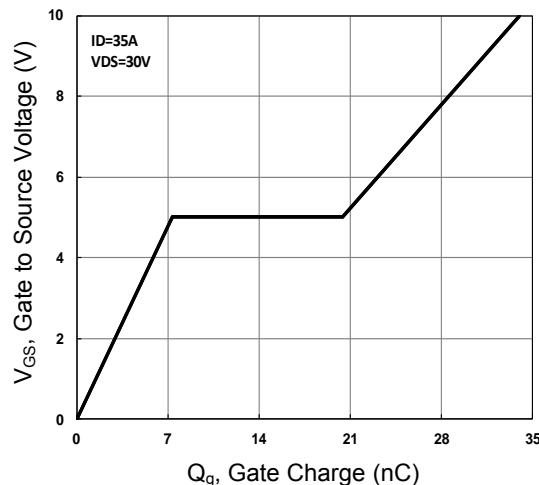


Figure 4. Gate Charge Characteristics

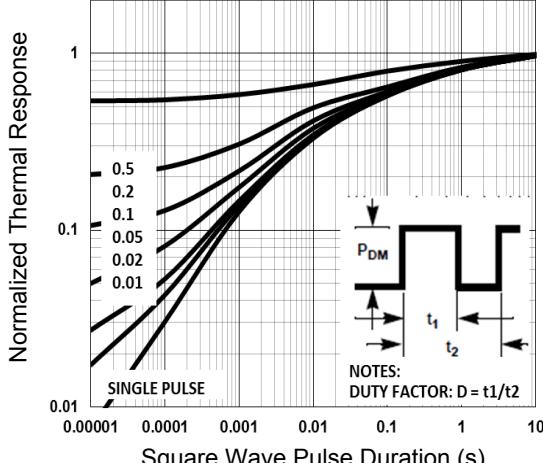


Figure 5. Normalized Transient Impedance

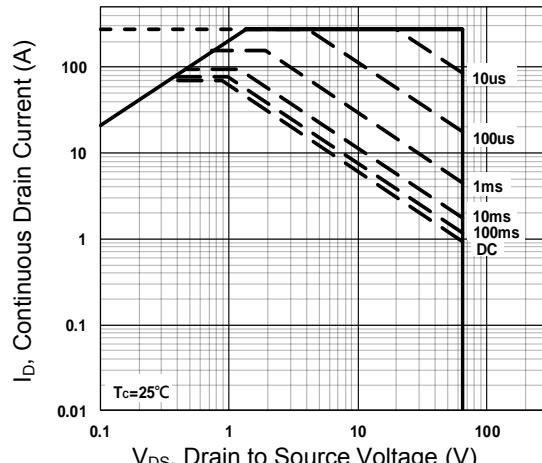


Figure 6. Maximum Safe Operation Area

### Typical Electrical and Thermal Characteristic Curves

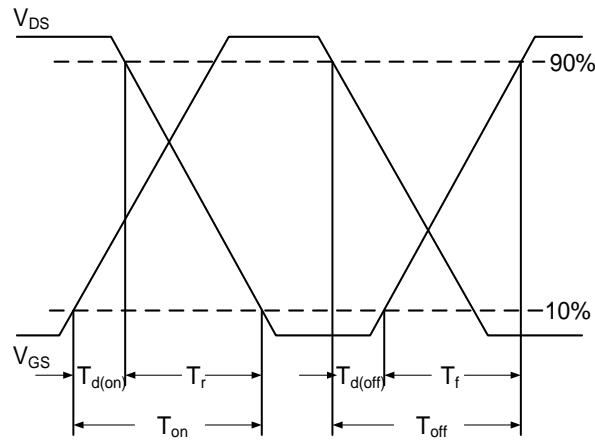


Figure 7. Switching Time Waveform

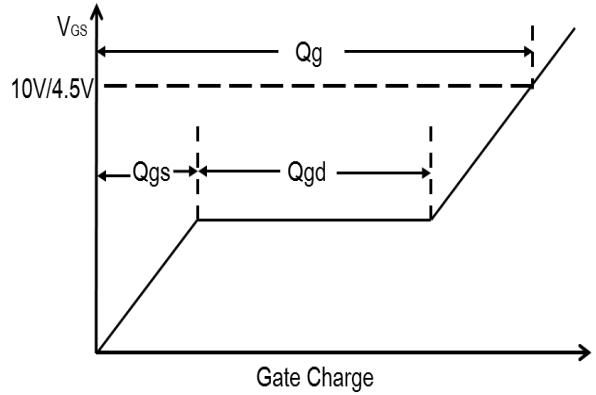
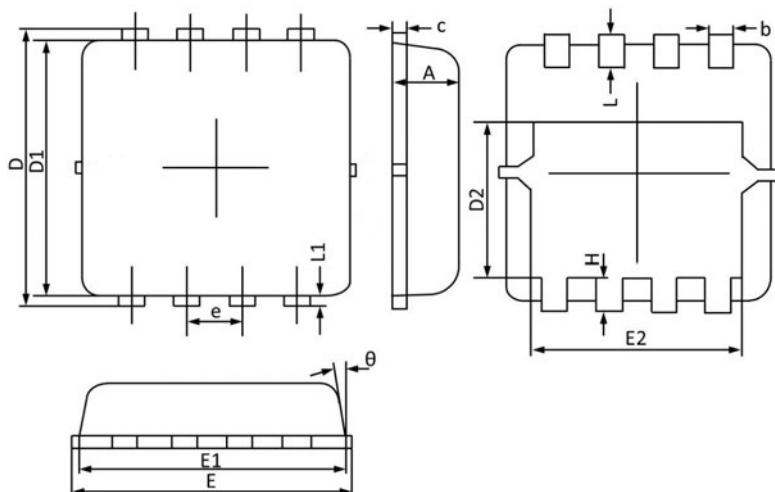


Figure 8. Gate Charge Waveform

**Package Outline Dimensions (PPAK3x3)**



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.050	3.500	0.120	0.138
D1	2.900	3.200	0.114	0.126
D2	1.350	1.950	0.053	0.077
E	3.000	3.400	0.118	0.134
E1	2.900	3.300	0.114	0.130
E2	2.350	2.600	0.093	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.750	0.012	0.030
L	0.300	0.600	0.012	0.024
L1	0.060	0.200	0.002	0.008
θ	6°	14°	6°	14°