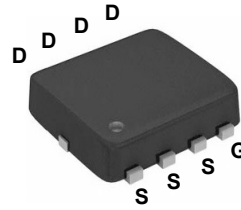
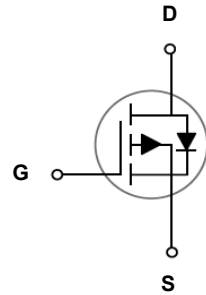


## Main Product Characteristics

$BV_{DSS}$	-30V
$R_{DS(ON)}$	10m $\Omega$
$I_D$	-45A



PPAK 3x3



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 GSFN0345 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 ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	-45	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		-28.5	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-180	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	125	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	50	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	46	W
Power Dissipation-Derate above $25^\circ\text{C}$		0.37	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.7	$^\circ\text{C/W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

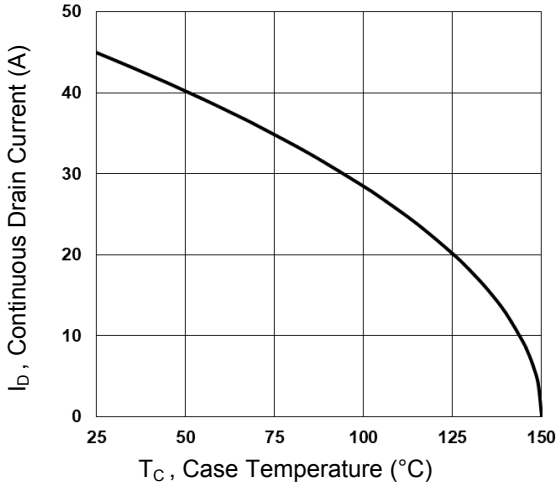
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$	-	8.4	10	m $\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	-	13.6	17.7	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
Forward Transconductance	$g_{fs}$	$V_{DS}=-10V, I_D=-3A$	-	7	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=-15V, I_D=-20A, V_{GS}=-10V$	-	34	50	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	5.2	7.8	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		-	7.9	12	
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=-15V, R_G=6\Omega, V_{GS}=-10V, I_D=-1A$	-	20	30	nS
Rise Time <sup>3,4</sup>	$t_r$		-	15	22	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	40	60	
Fall Time <sup>3,4</sup>	$t_f$		-	30	45	
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$	-	2020	3000	pF
Output Capacitance	$C_{oss}$		-	305	460	
Reverse Transfer Capacitance	$C_{rss}$		-	245	370	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	-45	A
Pulsed Source Current	$I_{SM}$		-	-	-90	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	-	-	-1	V
Reverse Recovery Time	$t_{rr}$	$V_R=-30V, I_R=-10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	80	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	170	-	nC

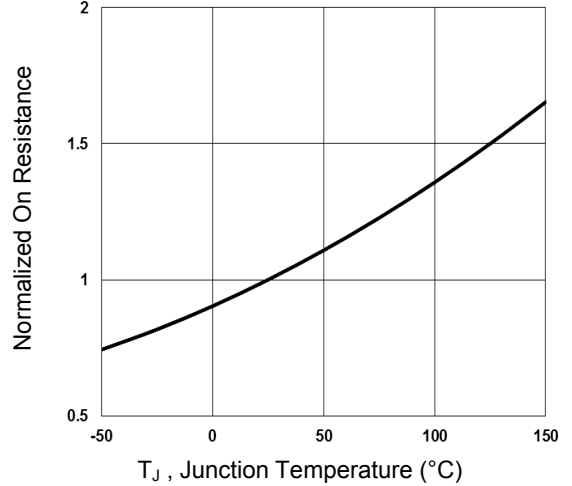
Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=50A, R_G=25\Omega, \text{starting } T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\mu s, \text{duty cycle} \leq 2\%$ .
4. Essentially independent of operation temperature.

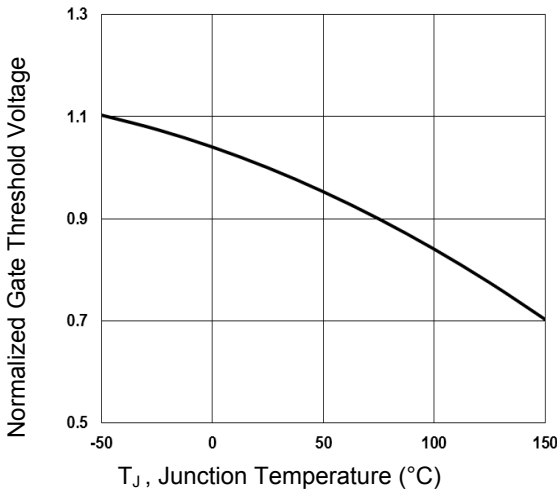
**Typical Electrical and Thermal Characteristic Curves**



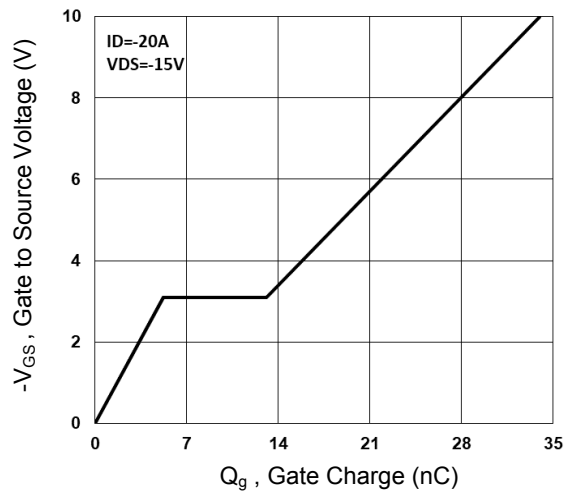
**Figure 1. Continuous Drain Current vs.  $T_C$**



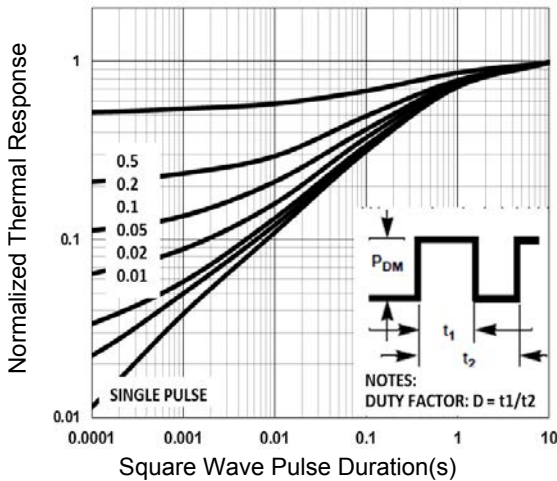
**Figure 2. Normalized  $R_{DSON}$  vs.  $T_J$**



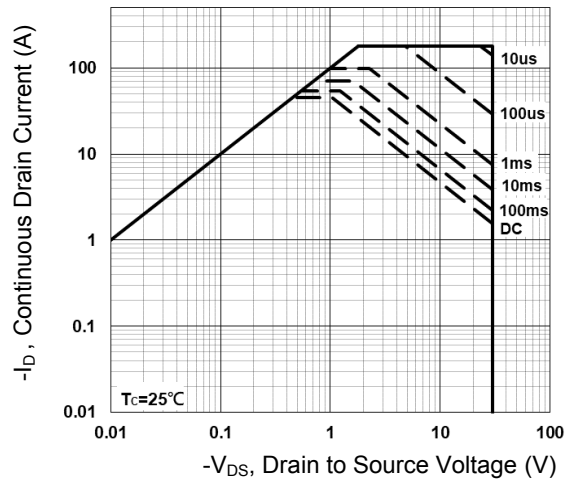
**Figure 3. Normalized  $V_{th}$  vs.  $T_J$**



**Figure 4. Gate Charge Waveform**

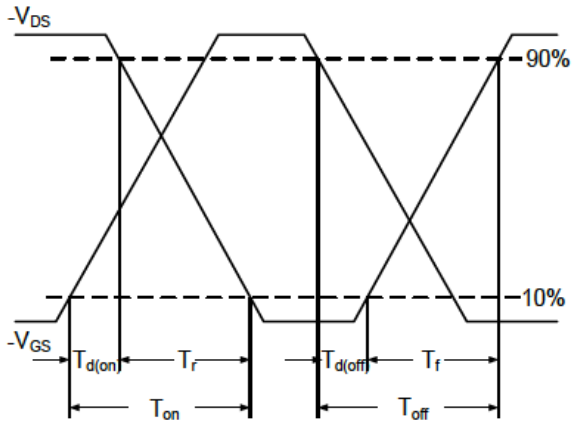


**Figure 5. Normalized Transient Impedance**

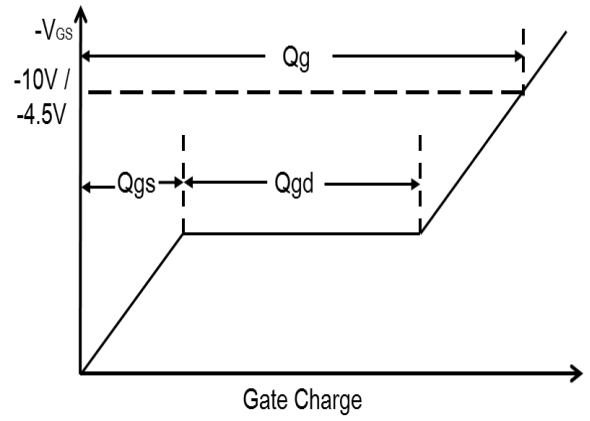


**Figure 6. Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**

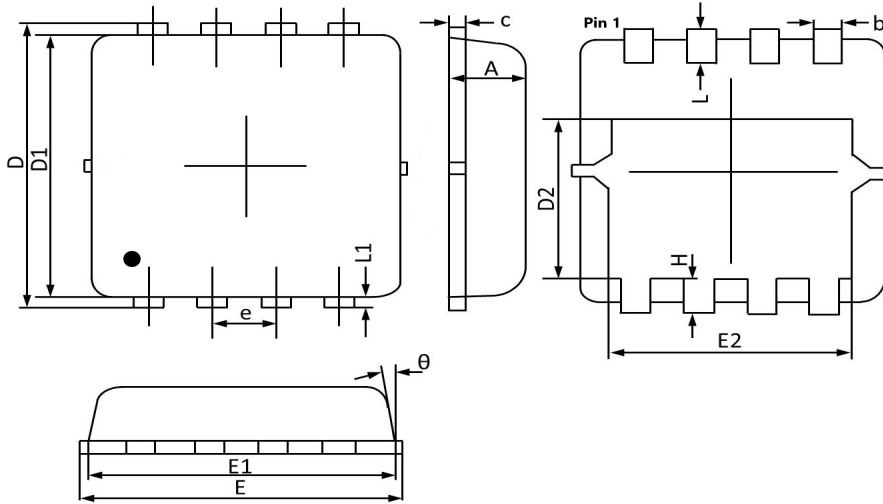


**Figure 7. Switching Time Waveform**



**Figure 8. Gate Charge Waveform**

**Package Outline Dimensions (PPAK3x3)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.240	0.014	0.009
c	0.250	0.100	0.010	0.004
D	3.450	3.050	0.136	0.120
D1	3.200	2.900	0.126	0.114
D2	1.850	1.350	0.073	0.053
E	3.400	3.000	0.134	0.118
E1	3.250	2.900	0.128	0.114
E2	2.600	2.350	0.102	0.093
e	0.65BSC		0.026BSC	
H	0.500	0.300	0.020	0.012
L	0.500	0.300	0.020	0.012
L1	0.200	0.070	0.008	0.003
θ	12°	0°	12°	0°

**Recommended Pad Layout**

