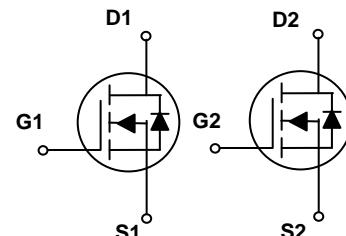
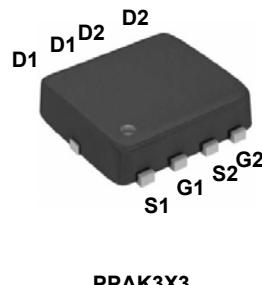


## Main Product Characteristics

$BV_{DSS}$	30V
$R_{DS(ON)}$	13mΩ
$I_D$	35A



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 GSFN2336 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 ( $T_C=25^\circ C$ 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 ( $T_C=25^\circ C$ )	$I_D$	35	A
Drain Current-Continuous ( $T_C=100^\circ C$ )		22	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	140	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	13	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	16	A
Power Dissipation ( $T_C=25^\circ C$ )	$P_D$	27	W
Power Dissipation-Derate above 25°C		0.22	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.6	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-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	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	30	-	-	V
Bv <sub>DSS</sub> Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_{\text{D}}=1\text{mA}$	-	0.04	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$I_{\text{DS}}^{\text{SS}}$	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	10	
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>	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=10\text{A}$	-	10	13	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=5\text{A}$	-	14	18	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1.2	1.8	2.5	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	-4	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	6	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{\text{DS}}=15\text{V}, I_{\text{D}}=5\text{A}, V_{\text{GS}}=4.5\text{V}$	-	7.4	12	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{\text{gs}}$		-	2.3	5.0	
Gate-Drain Charge <sup>3,4</sup>	$Q_{\text{gd}}$		-	3.0	6.0	
Turn-On Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=15\text{V}, R_{\text{G}}=6\Omega, V_{\text{GS}}=10\text{V}, I_{\text{D}}=1\text{A}$	-	3.8	7.0	nS
Rise Time <sup>3,4</sup>	$t_r$		-	10.0	19	
Turn-Off Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{off})}$		-	22.0	42	
Fall Time <sup>3,4</sup>	$t_f$		-	6.6	13	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=25\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	620	900	pF
Output Capacitance	$C_{\text{oss}}$		-	85	125	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	60	90	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	2.8	5.6	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0\text{V}$ , Force Current	-	-	35	A
Pulsed Source Current <sup>3</sup>	$I_{\text{SM}}$		-	-	70	A
Diode Forward Voltage <sup>3</sup>	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V

Note:

- Repetitive rating: Pulsed width limited by maximum junction temperature.
- $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=16\text{A}, R_{\text{G}}=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .
- The datasheet test by pulsed, pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
- Essentially independent of operation temperature.

## Typical Electrical and Thermal Characteristic Curves

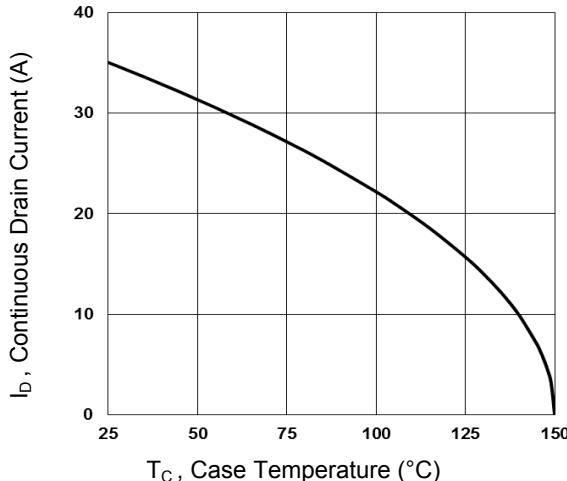


Figure 1. Continuous Drain Current vs. T<sub>c</sub>

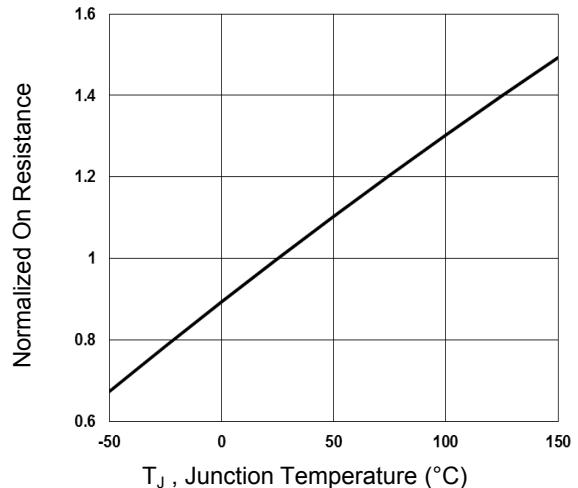


Figure 2. Normalized R<sub>DSON</sub> vs. T<sub>j</sub>

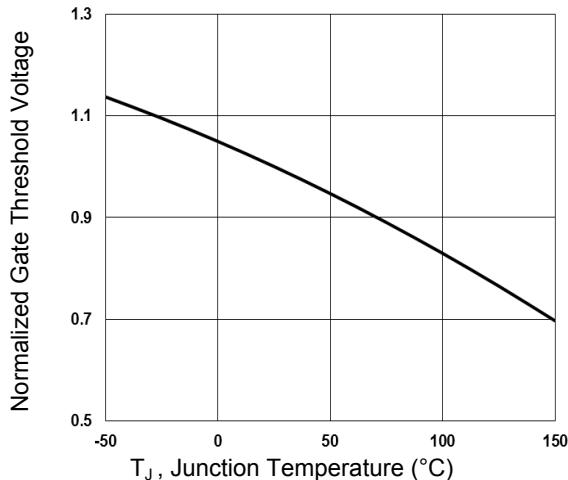


Figure 3. Normalized V<sub>th</sub> vs. T<sub>j</sub>

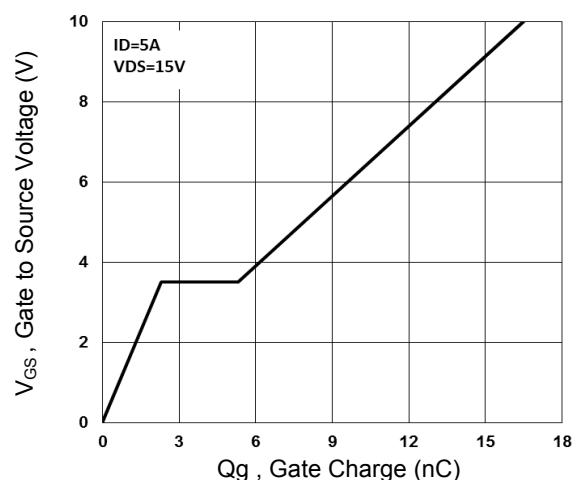


Figure 4. Gate Charge Waveform

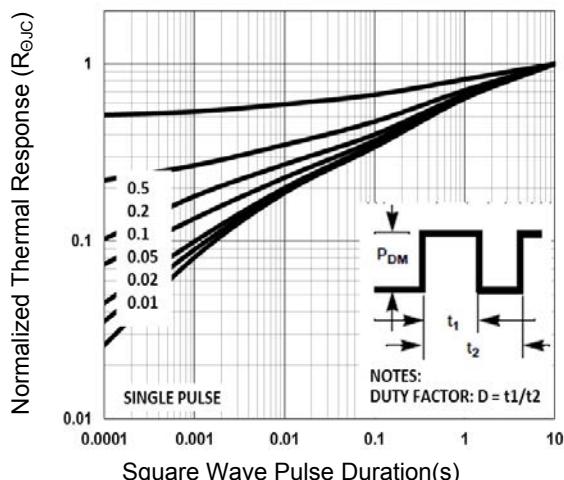


Figure 5. Normalized Transient Impedance

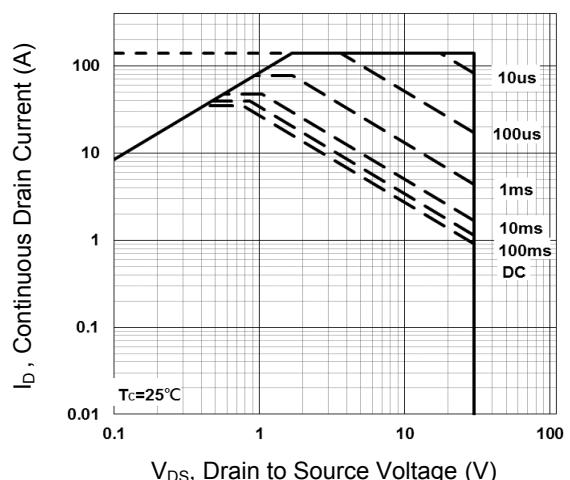


Figure 6. Maximum Safe Operation Area

## Test Circuit & Waveform

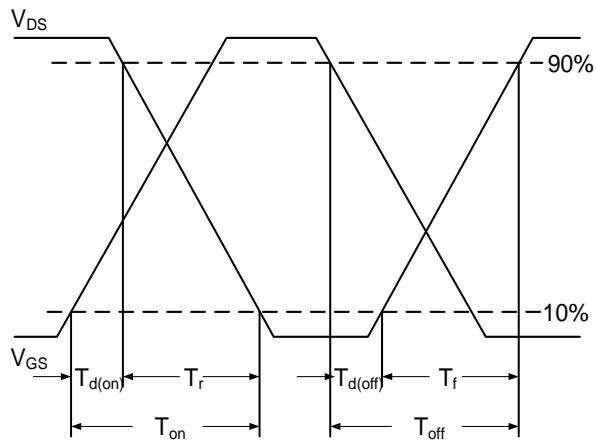


Figure 7. Switching Time Waveform

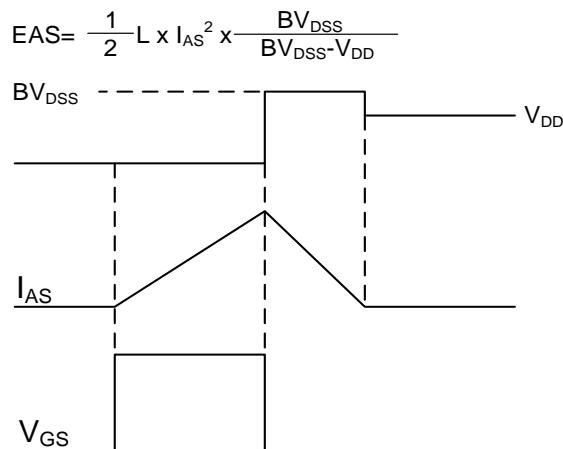
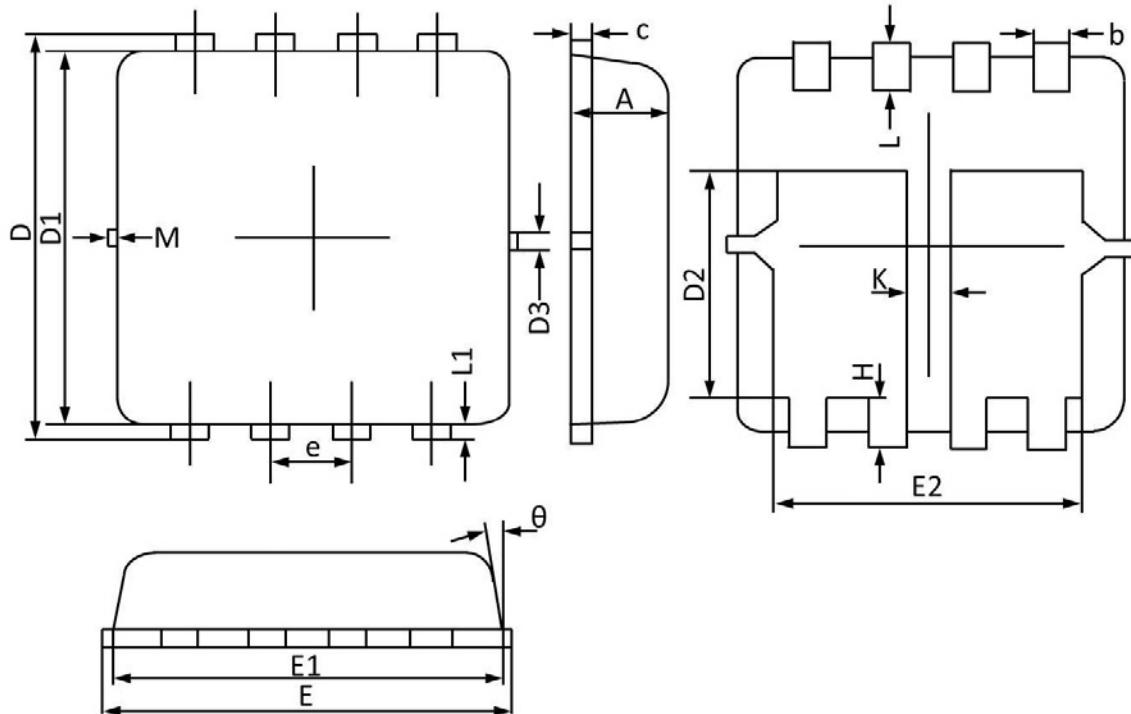


Figure 8. EAS Waveform

**Package Outline Dimensions**

**PPAK3x3 Dual EP**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
K	0.300 REF		0.012 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	