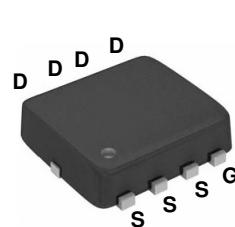
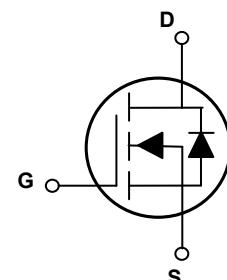


Main Product Characteristics

BV_{DSS}	40V
$R_{DS(ON)}$	8mΩ (Max.)
I_D	60A



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 GSFN4008 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_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ Steady-State, $T_C=25^\circ\text{C}$	I_D	60	A
Continuous Drain Current @ Steady-State, $T_C=100^\circ\text{C}$		45	A
Pulsed Drain Current ¹	I_{DM}	120	A
Single Pulsed Avalanche Energy ⁴	E_{AS}	76	mJ
Power Dissipation, $T_C=25^\circ\text{C}$	P_D	46	W
Linear Derating Factor, $T_C=25^\circ\text{C}$		0.37	W/ $^\circ\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.7	$^\circ\text{C}/\text{W}$
Junction to Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	40	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $I_{\text{D}}=1\text{mA}$	-	0.034	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$I_{\text{DS}(\text{SS})}$	$V_{\text{DS}}=40\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{\text{DS}}=32\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=12\text{A}$	-	-	8	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=10\text{A}$	-	-	12	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1	1.5	2.7	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	-4.96	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{\text{DS}}=5\text{V}, I_{\text{D}}=12\text{A}$	-	39	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{\text{DS}}=20\text{V}, I_{\text{D}}=12\text{A}, V_{\text{GS}}=4.5\text{V}$	-	18.8	-	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	4.7	-	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	8.1	-	
Turn-On Delay Time ^{2,3}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=15\text{V}, R_{\text{G}}=3.3\Omega, V_{\text{GS}}=10\text{V}, I_{\text{D}}=1\text{A}$	-	14.2	-	nS
Rise Time ^{2,3}	t_r		-	2.6	-	
Turn-Off Delay Time ^{2,3}	$t_{\text{d}(\text{off})}$		-	76	-	
Fall Time ^{2,3}	t_f		-	4.8	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	2330	-	pF
Output Capacitance	C_{oss}		-	193	-	
Reverse Transfer Capacitance	C_{rss}		-	138	-	
Gate Resistance	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.6	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$V_G=V_D=0\text{V}$, Force Current	-	-	60	A
Pulsed Source Current	I_{SM}		-	-	120	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.
4. $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, R_{\text{G}}=25\Omega$, Starting $T_J=25^\circ\text{C}$.

Typical Electrical and Thermal Characteristic Curves

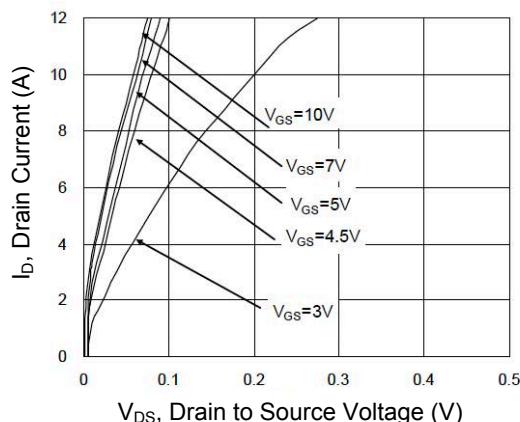


Figure 1. Output Characteristics

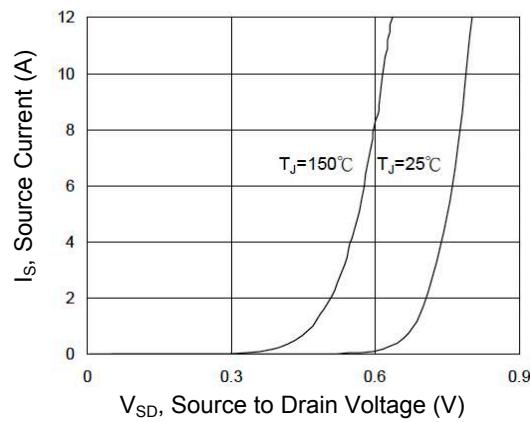


Figure 2. Forward Characteristics of Reverse

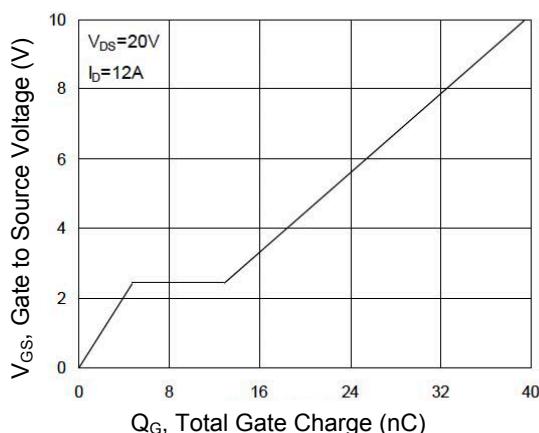


Figure 3. Gate Charge Characteristics

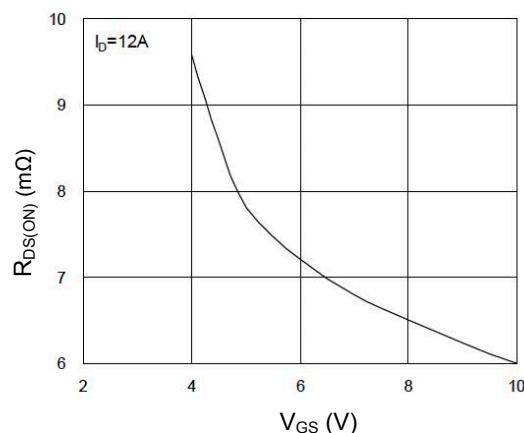


Figure 4. On-Resistance vs. G-S Voltage

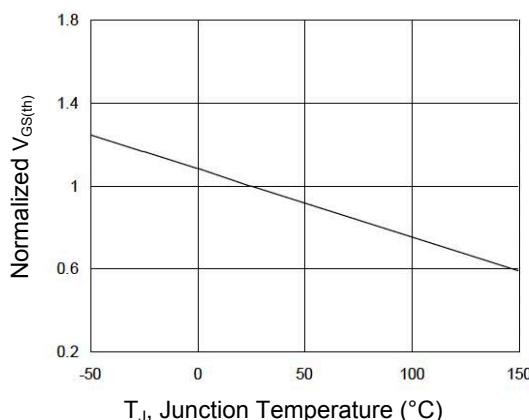


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

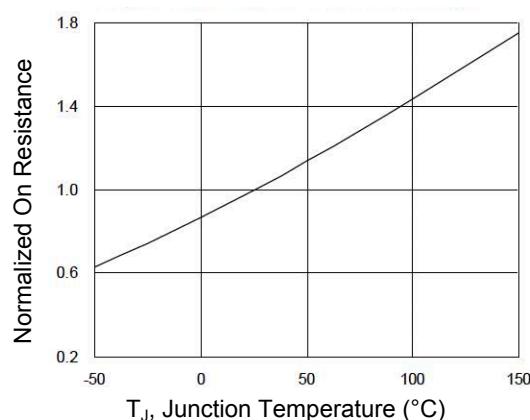


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

Typical Electrical and Thermal Characteristic Curves

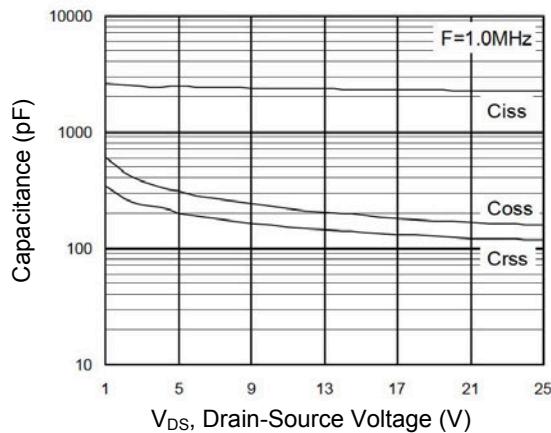


Figure 7. Capacitance Characteristics

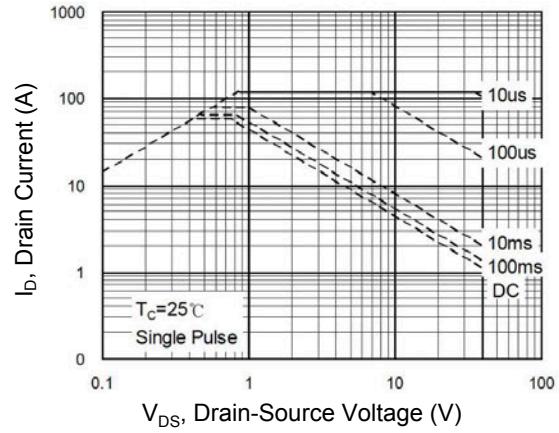


Figure 8. Safe Operating Area

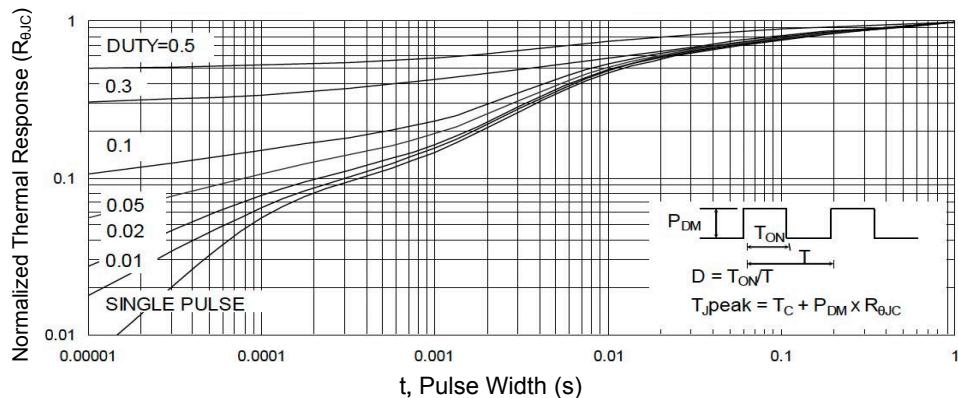
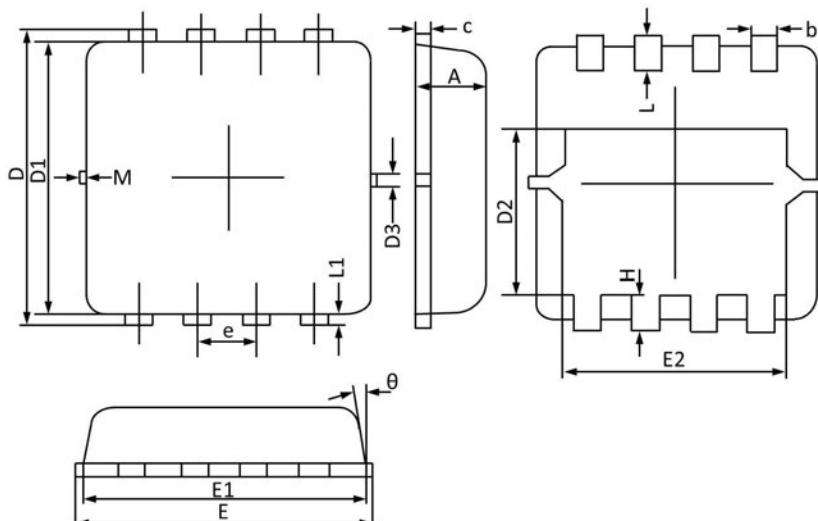


Figure 9. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.700	0.900	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	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	