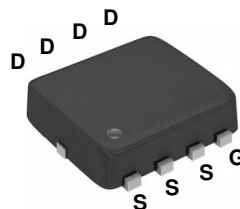
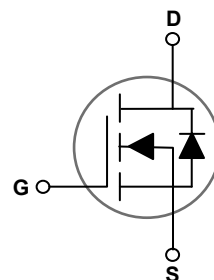


Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	8.5mΩ
I_D	48A



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 GSFN3908 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}	±20	V
Drain Current-Continuous ($T_C=25^{\circ}C$)	I_D	48	A
Drain Current-Continuous ($T_C=100^{\circ}C$)		30	A
Drain Current-Pulsed ¹	I_{DM}	192	A
Single Pulse Avalanche Energy ²	E_{AS}	45	mJ
Single Pulse Avalanche Current ²	I_{AS}	30	A
Power Dissipation ($T_C=25^{\circ}C$)	P_D	35	W
Power Dissipation-Derate Above 25°C		0.28	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.6	°C/W
Storage Temperature Range	T_{STG}	-55 To +150	°C
Operating Junction Temperature Range	T_J	-55 To +150	°C


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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static State Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1mA$	-	0.04	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=24V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source On-State Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=16A$	-	6.2	8.5	m Ω
		$V_{GS}=4.5V, I_D=8A$	-	9	13	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS},$ $I_D=250\mu A$	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-4	-	$mV/^\circ\text{C}$
Forward Transconductance	gfs	$V_{DS}=10V, I_D=8A$	-	9.5	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $F=1MHz$	-	850	1700	PF
Output Capacitance	C_{oss}		-	133	260	
Reverse Transfer Capacitance	C_{rss}		-	78	160	
Turn-On Delay Time ^{3,4}	$T_{d(on)}$	$V_{DD}=15V, R_G=3.3\Omega$ $V_{GS}=10V, I_D=15A$	-	4.8	9	nS
Rise Time ^{3,4}	T_r		-	12.5	24	
Turn-Off Delay Time ^{3,4}	$T_{d(off)}$		-	27.6	52	
Fall Time ^{3,4}	T_f		-	8.2	16	
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=15V, I_D=20A,$ $V_{GS}=4.5V$	-	7.5	12	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	1.3	2.6	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	4.5	8	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	2.7	5.4	Ω
Guaranteed Avalanche Energy						
Single Pulse Avalanche Energy	E_{AS}	$V_{DD}=25V, L=0.1mH,$ $I_{AS}=15A$	12	-	-	mJ
Drain-Source Diode Characteristics						
Continuous Source Current	I_S	$V_G=V_D=0V,$ Force Current	-	-	48	A
Pulsed Source Current ³	I_{SM}		-	-	192	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=1A,$ $T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=1A,$ $di/dt=100A/\mu s,$ $T_J=25^\circ\text{C}$	-	8.1	-	nS
Reverse Recovery Charge	Q_{rr}		-	1.6	-	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=30A, R_G=25\Omega,$ Starting $T_J=25^\circ\text{C}$.
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

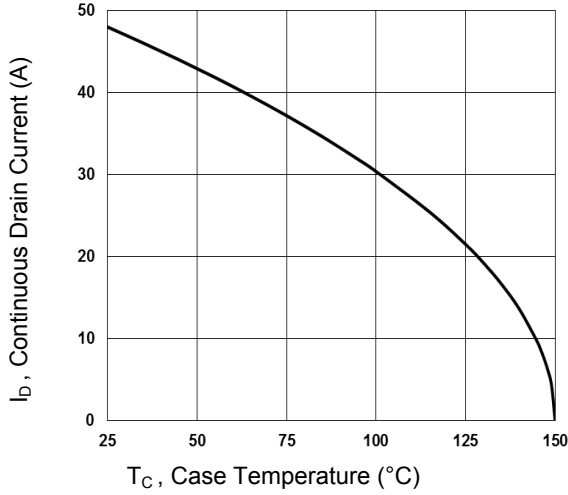


Figure 1. Continuous Drain Current vs. T_C

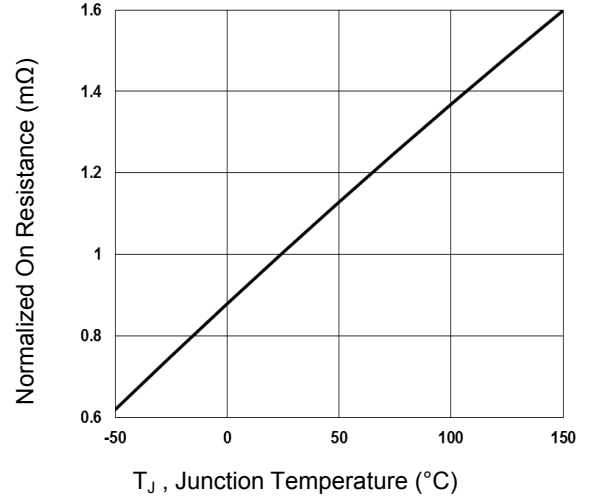


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

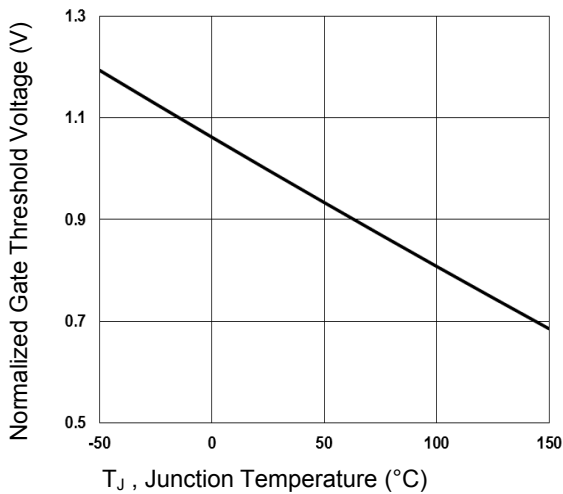


Figure 3. Normalized V_{th} vs. T_J

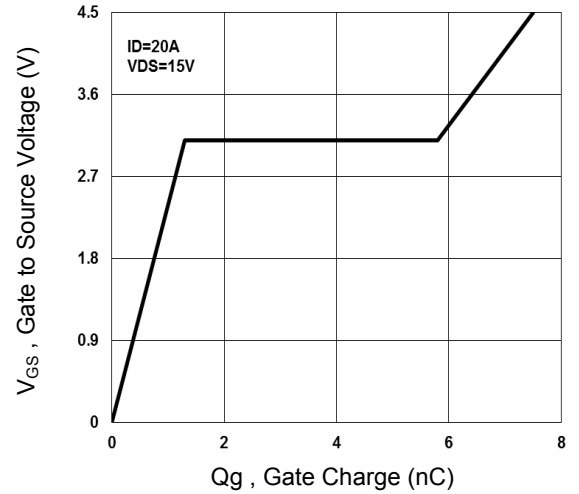


Figure 4. Gate Charge Waveform

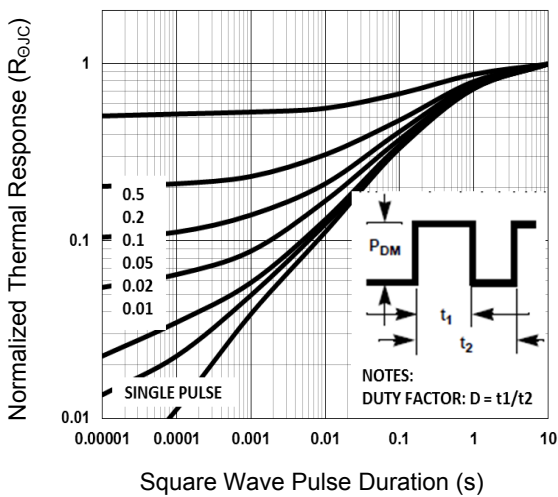


Figure 5. Normalized Transient Response

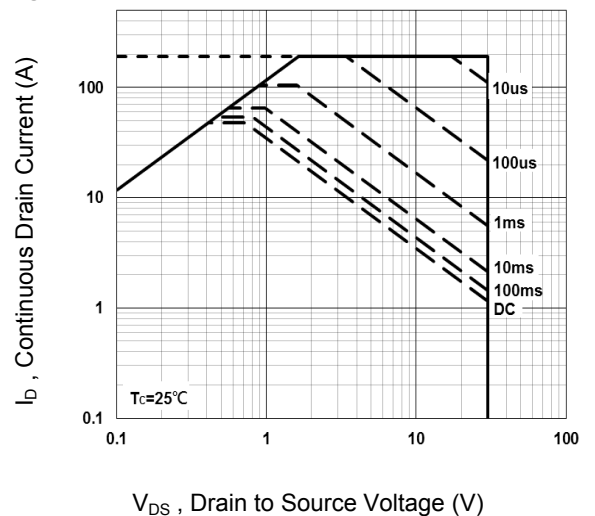


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

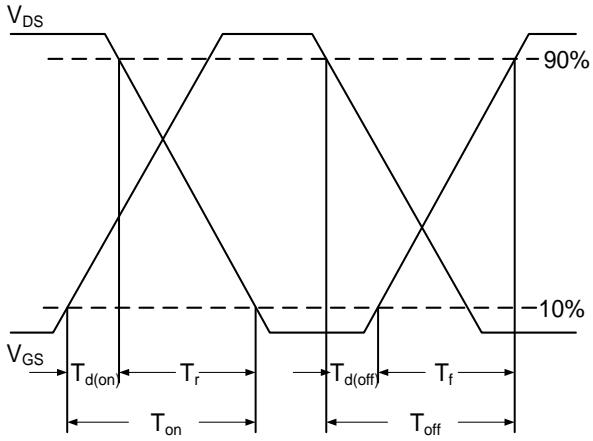


Figure 7. Switching Time Waveform

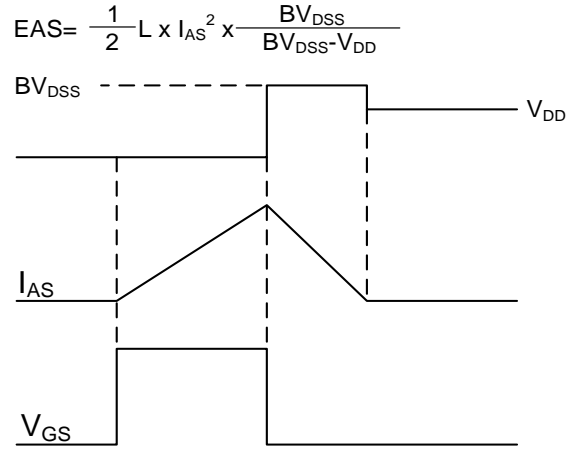
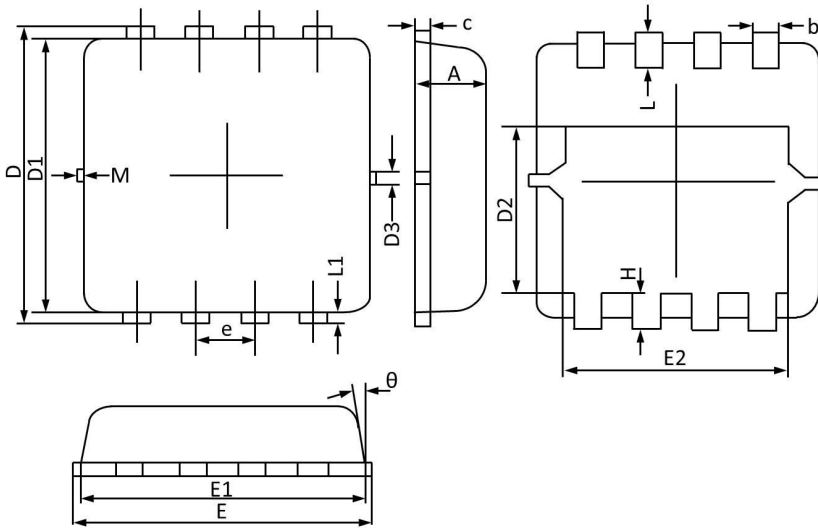


Figure 8. EAS Waveform

Package Outline Dimensions (PPAK 3x3)



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	0.650BSC		0.026BSC	
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	
theta	0°	12°	0°	12°
M	0.150 REF		0.006 REF	