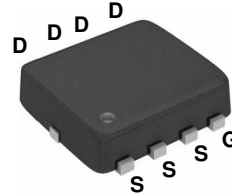
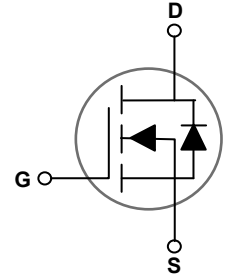


Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	13m Ω
I_D	30A



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 GSFN0430 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}	40	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current-Continuous($T_C=25^{\circ}\text{C}$)	I_D	30	A
Drain Current-Continuous($T_C=100^{\circ}\text{C}$)		19	
Drain Current-Pulsed ¹	I_{DM}	120	A
Single Pulse Avalanche Energy ²	E_{AS}	29	mJ
Single Pulse Avalanche Current ²	I_{AS}	24	A
Power Dissipation($T_C=25^{\circ}\text{C}$)	P_D	26	W
Power Dissipation-Derate above 25 $^{\circ}\text{C}$		0.21	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.8	$^{\circ}\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=32V, V_{GS}=0V, T_J=100^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
Drain-Source On-State Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	11	13	m Ω
		$V_{GS}=4.5V, I_D=3A$	-	17	22	
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}	$V_{DS}=10V, I_S=5A$	-	4	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=20V, I_D=15A, V_{GS}=10V$	-	6.9	10	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	1.3	2	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	3	4.5	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=20V, R_G=6\Omega, V_{GS}=10V, I_D=10A$	-	8	12	nS
Rise Time ^{3,4}	t_r		-	12	18	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	25	38	
Fall Time ^{3,4}	t_f		-	18	27	
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, F=1\text{MHz}$	-	495	740	pF
Output Capacitance	C_{oss}		-	310	460	
Reverse Transfer Capacitance	C_{rss}		-	13.5	20	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	2	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	30	A
Pulsed Source Current	I_{SM}		-	-	60	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}	$V_{GS}=10V, I_S=10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	15	-	nS
Reverse Recovery Charge	Q_{rr}		-	11	-	nC

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=24A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$.
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

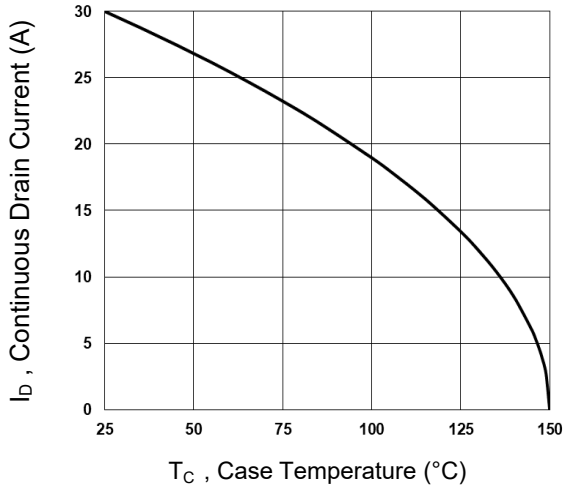


Fig.1 Continuous Drain Current vs. T_C

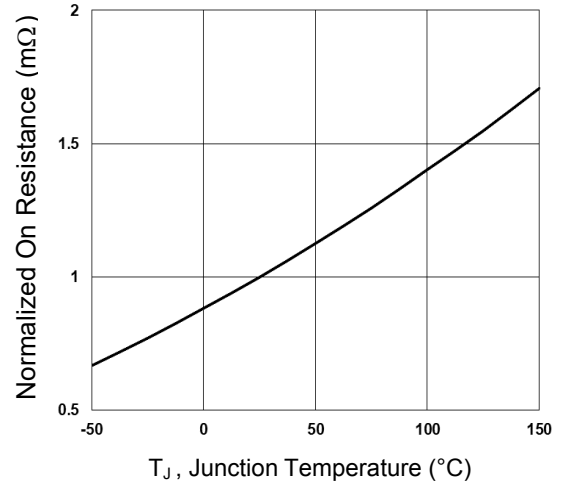


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

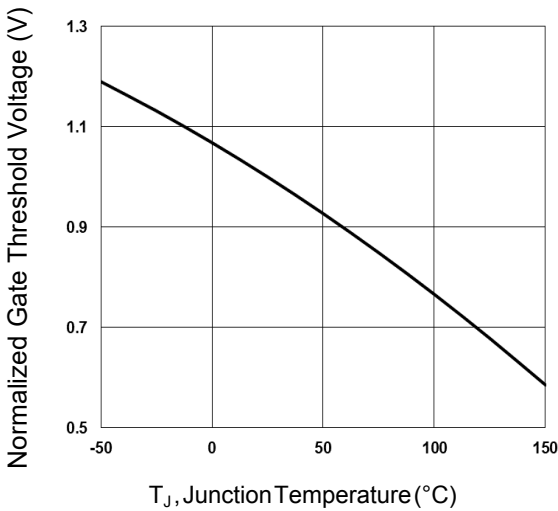


Fig.3 Normalized V_{th} vs. T_J

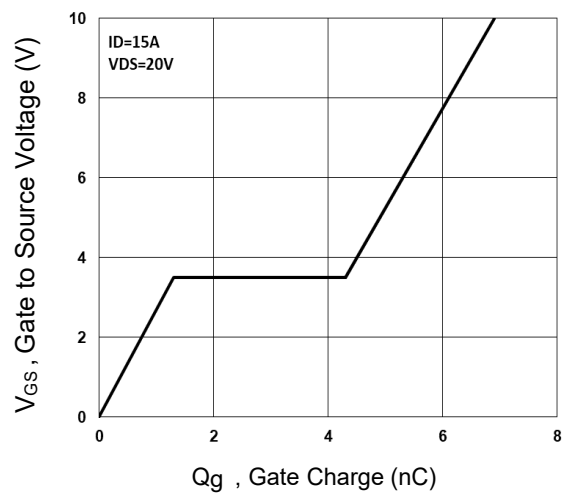


Fig.4 Gate Charge Waveform

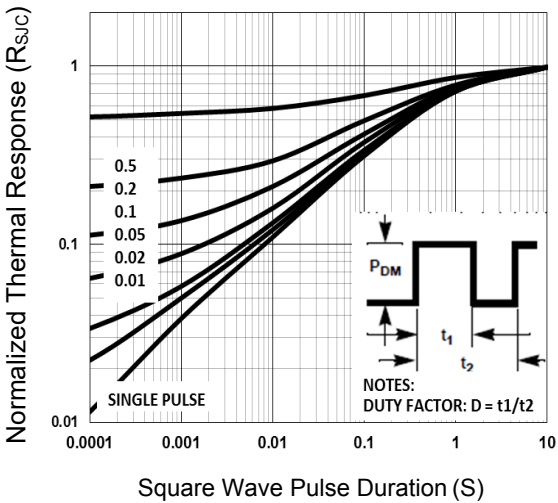


Fig.5 Normalized Transient Impedance

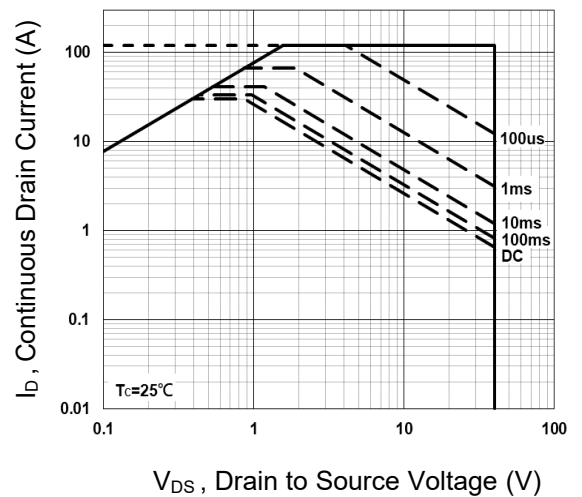


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

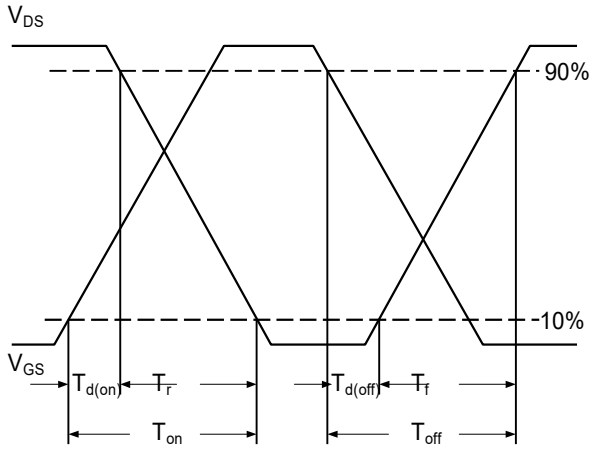


Fig.7 Switching Time Waveform

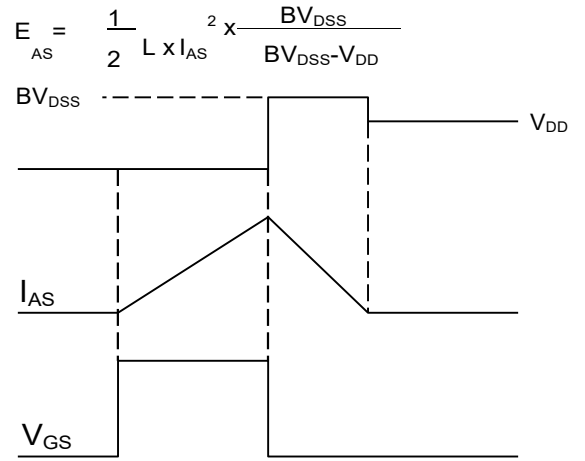
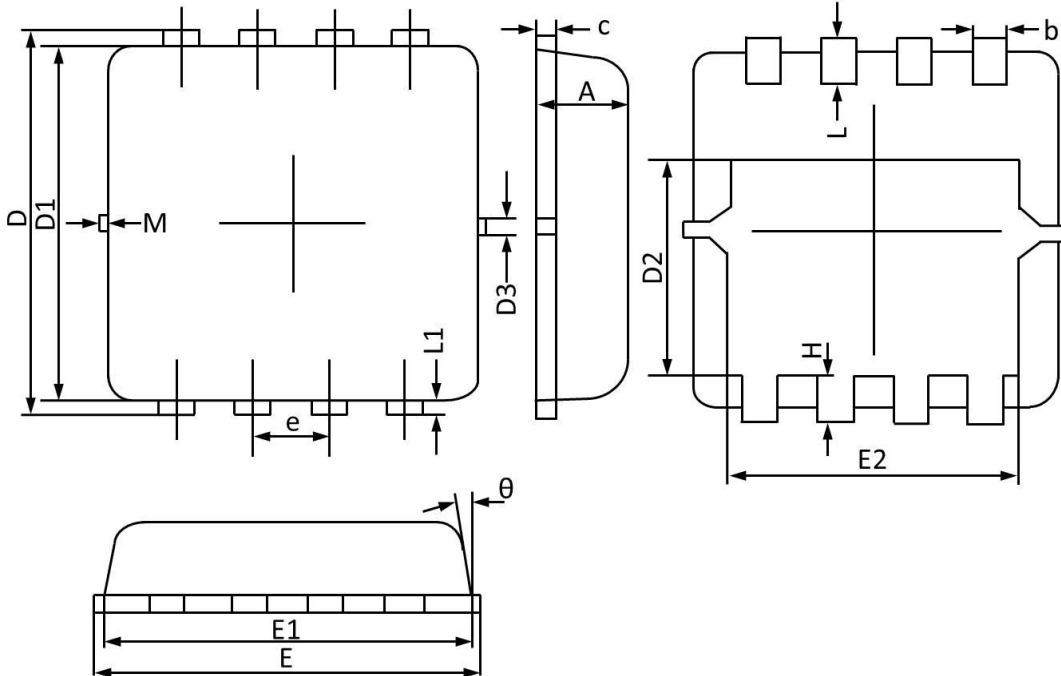


Fig. 8 E_{AS} Waveform

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°