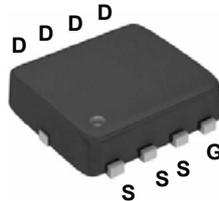
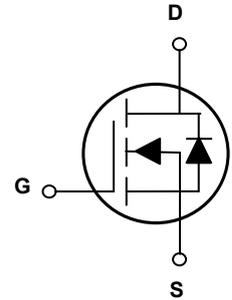


Main Product Characteristics

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	3.5m Ω
I_D	80A



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 GSFN2604 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°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current–Continuous(T _C =25°C)	I_D	80	A
Drain Current–Continuous(T _C =100°C)		51	A
Drain Current–Pulsed ¹	I_{DM}	320	A
Power Dissipation (T _C =25°C)	P_D	66	W
Power Dissipation – Derate above 25°C		0.53	W/°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2	°C/W
Storage Temperature Range	T_{STG}	-55 to +175	°C
Operating Junction Temperature Range	T_J	-55 to +175	°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}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	10	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=15A$	-	2.8	3.5	m Ω
		$V_{GS}=2.5V, I_D=10A$	-	3.5	4.5	
		$V_{GS}=1.8V, I_D=6A$	-	5	7	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.65	1	V
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=5A$	-	35	-	S
Dynamic Characteristics						
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=5A$	-	52	100	nC
Gate-Source Charge	Q_{gs}		-	6.6	12	
Gate-Drain Charge	Q_{gd}		-	13.8	28	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=10V, V_{GS}=4.5V, R_G=3.3\Omega, I_D=1A$	-	20.2	40	nS
Rise Time	T_r		-	31.2	60	
Turn-Off Delay Time	$T_{d(off)}$		-	68.5	120	
Fall Time	T_f		-	21.2	42	
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, F=1\text{MHz}$	-	3870	5500	pF
Output Capacitance	C_{oss}		-	580	850	
Reverse Transfer Capacitance	C_{rss}		-	340	600	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.3	2.6	Ω
Drain-Source Diode Characteristics						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	80	A
Pulsed Source Current ²	I_{SM}		-	-	160	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	-	-	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. Pulsed tested: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

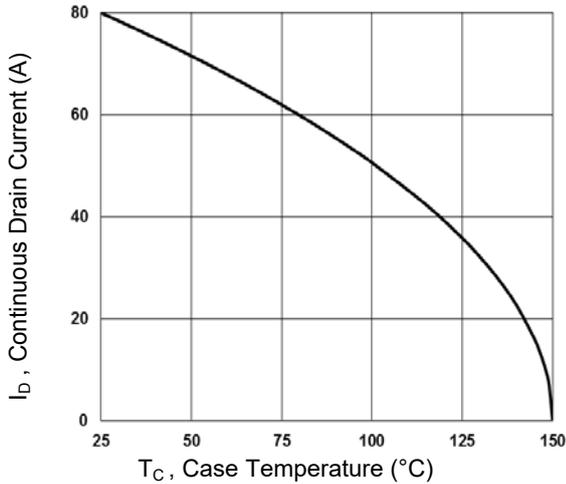


Figure 1. Continuous Drain Current vs. T_C

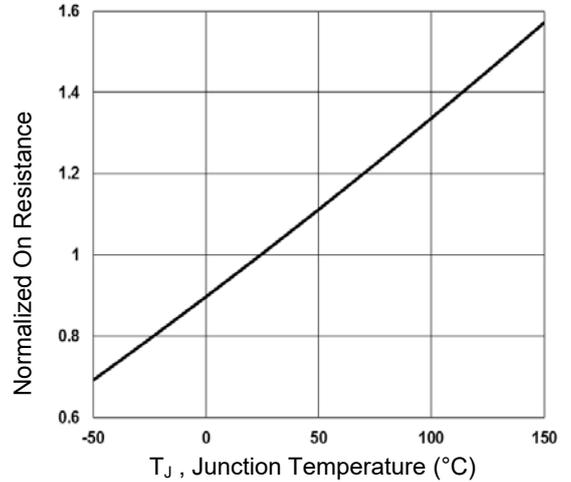


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

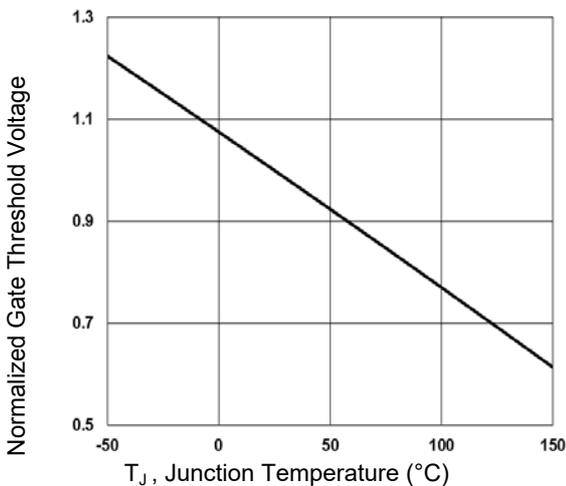


Figure 3. Normalized V_{th} vs. T_J

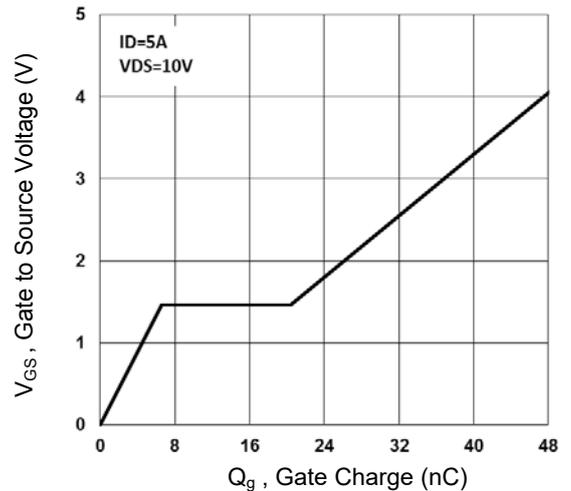


Figure 4. Gate Charge Waveform

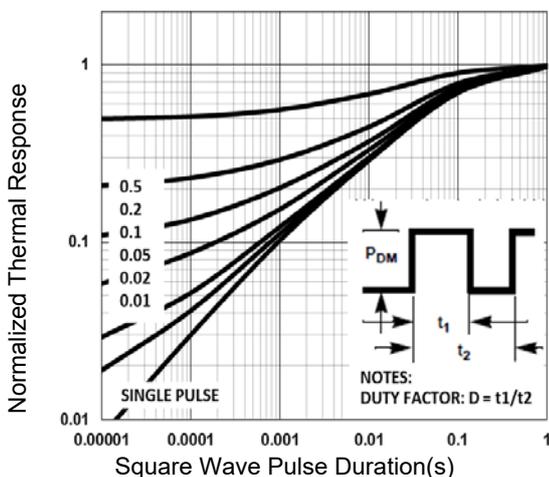


Figure 5. Normalized Transient Impedance

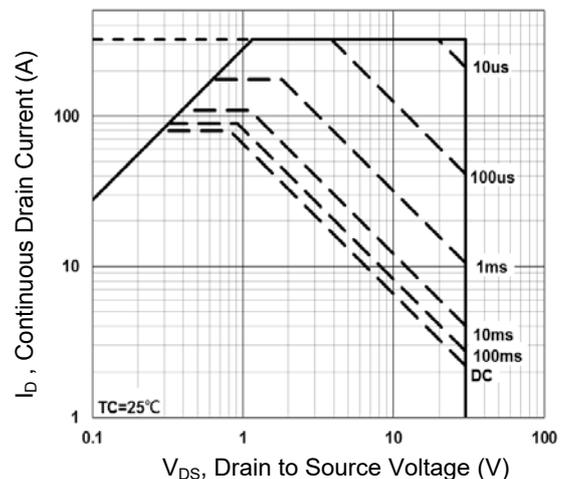


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

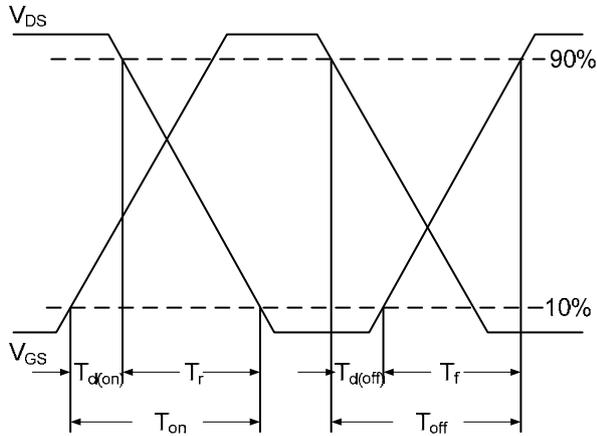


Figure 7. Switching Time Waveform

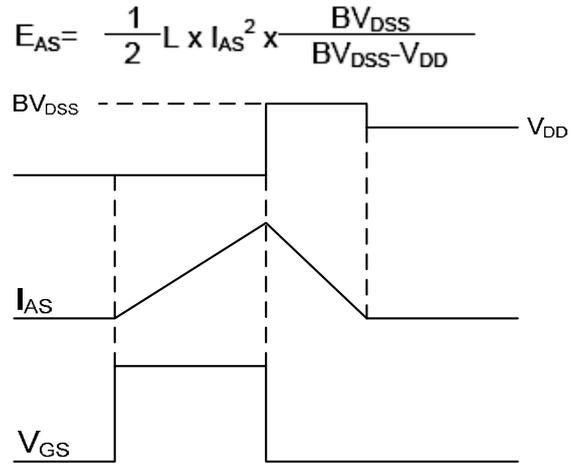
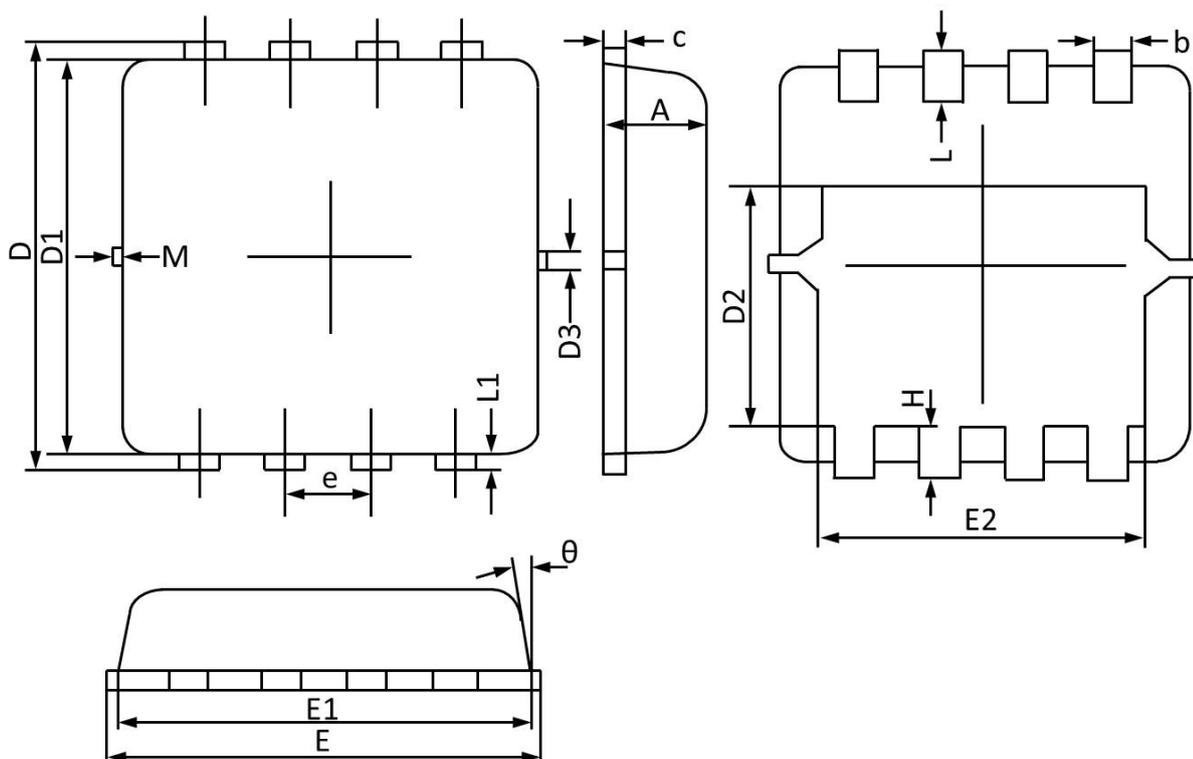


Figure 8. E_{AS} Waveform

Package Outline Dimensions

PPAK3X3



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	
theta	0°	12°	0°	12°
M	0.150 REF		0.006 REF	