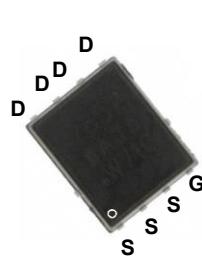
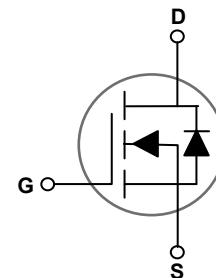


Main Product Characteristics

BV _{DSS}	65V
R _{DS(ON)}	16mΩ
I _D	44A



PPAK 5x6



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 GSGP6988 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}	60	V
Gate-Source Voltage	V _{GS}	+20/-12	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I _D	44	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		27	A
Drain Current-Pulsed ¹	I _{DM}	176	A
Single Pulse Avalanche Energy ²	E _{AS}	9.1	mJ
Single Pulse Avalanche Current ²	I _{AS}	13.5	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P _D	54.3	W
Power Dissipation-Derate above 25°C		0.43	W/°C
Thermal Resistance, Junction-to-Ambient	R _{θJA}	62	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	2.3	°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
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$	65	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $\text{I}_D=1\text{mA}$	-	0.03	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$\text{V}_{\text{DS}}=60\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$\text{V}_{\text{DS}}=48\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$\text{V}_{\text{GS}}=+20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	-	-	100	nA
On Characteristics						
Static Drain-Source On-Resistance ³	$\text{R}_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=16\text{A}$	-	13.6	16	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_D=12\text{A}$	-	24.5	30	$\text{m}\Omega$
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_D=250\mu\text{A}$	1	1.6	2.5	V
$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta \text{V}_{\text{GS}(\text{th})}$		-	-5.1	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_D=3\text{A}$	-	5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3, 4}	Q_g	$\text{V}_{\text{DS}}=30\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=12\text{A}$	-	10.9	22	nC
Gate-Source Charge ^{3, 4}	Q_{gs}		-	1.5	3	
Gate-Drain Charge ^{3, 4}	Q_{gd}		--	4.4	9	
Turn-On Delay Time ^{3, 4}	$\text{T}_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=30\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{R}_G=3.3\Omega, \text{I}_D=1\text{A}$	-	8	16	nS
Rise Time ^{3, 4}	T_r		-	12	24	
Turn-Off Delay Time ^{3, 4}	$\text{T}_{\text{d}(\text{off})}$		-	25	50	
Fall Time ^{3, 4}	T_f		-	18	36	
Input Capacitance	C_{iss}	$\text{V}_{\text{DS}}=30\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	-	653	1300	pF
Output Capacitance	C_{oss}		-	192	380	
Reverse Transfer Capacitance	C_{rss}		-	27	60	
Gate Resistance	R_g	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	-	0.3	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$\text{V}_{\text{G}}=\text{V}_{\text{D}}=0\text{V}$, Force Current	-	-	44	A
Pulsed Source Current ³	I_{SM}		-	-	88	A
Diode Forward Voltage ³	V_{SD}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $\text{V}_{\text{DD}}=50\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{L}=0.1\text{mH}, \text{I}_{\text{AS}}=13.5\text{A}, \text{R}_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.
3. Pulse test, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

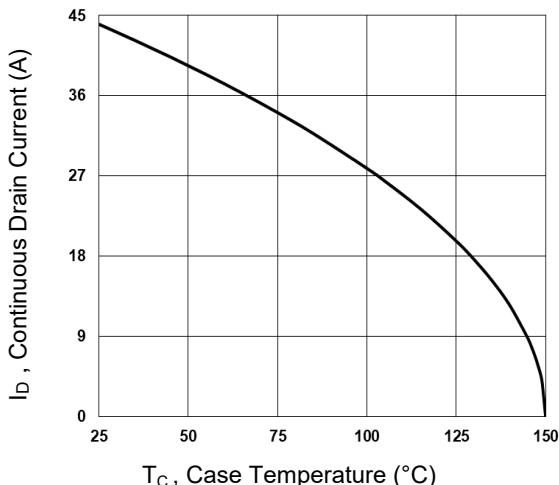


Figure 1. Continuous Drain Current vs. T_C

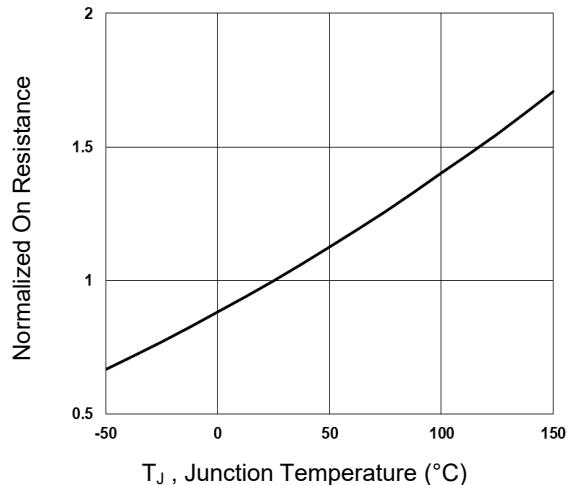


Figure 2. Normalized R_{DS(on)} vs. T_J

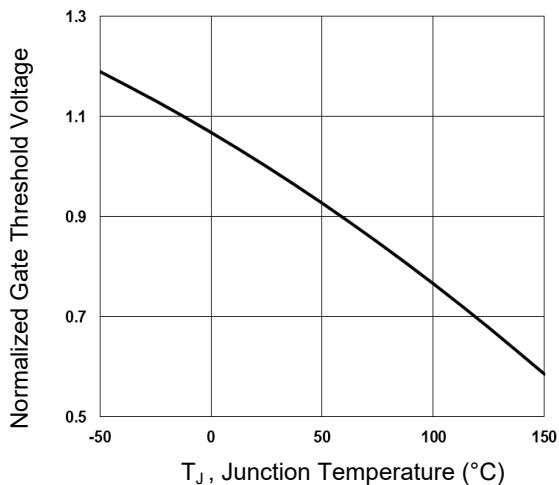


Figure 3. Normalized V_{th} vs. T_J

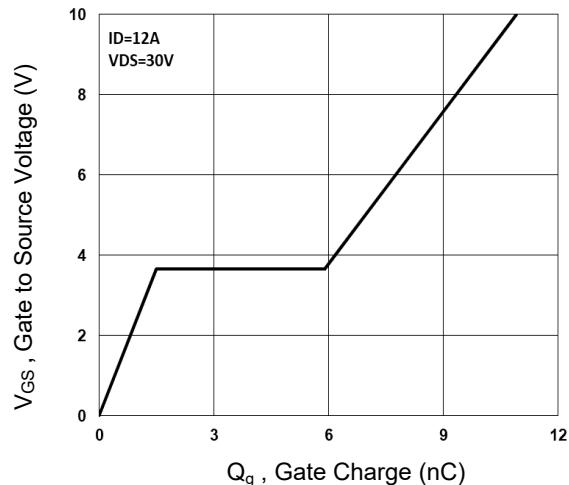


Figure 4. Gate Charge Waveform

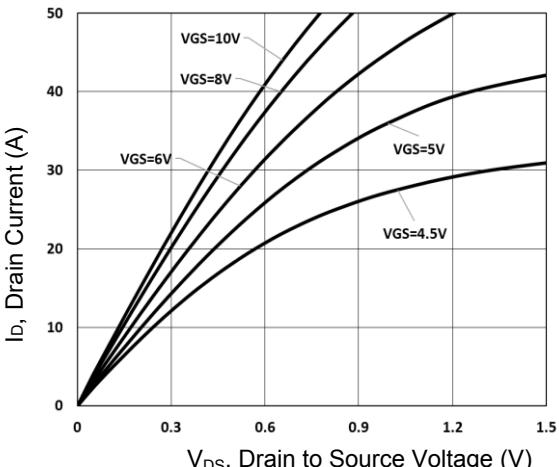


Figure 5. Typical Output Characteristics

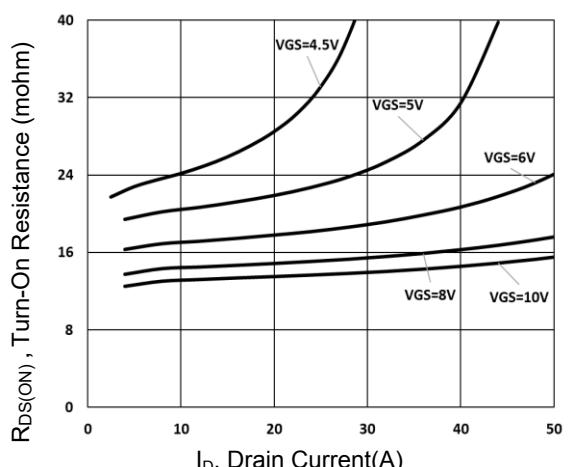


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

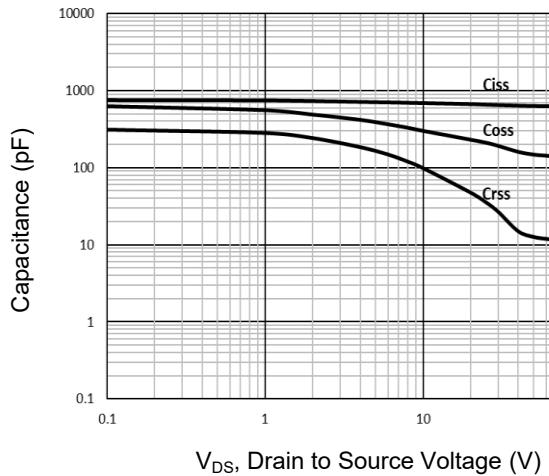


Figure 7. Capacitance Characteristics

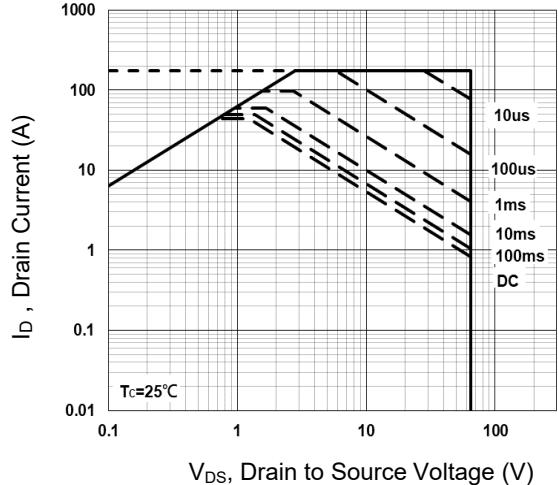


Figure 8. Maximum Safe Operation Area

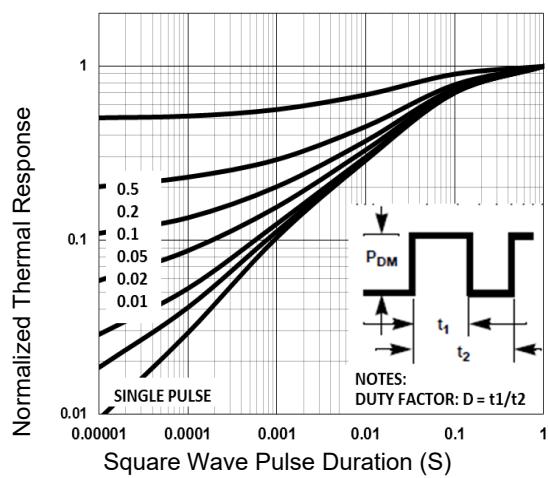


Figure 9. Normalized Transient Response

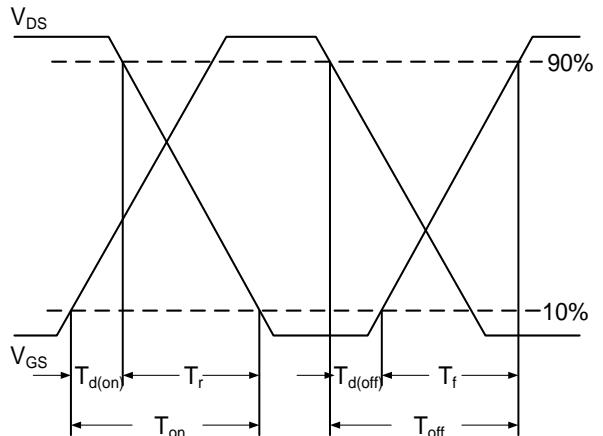


Figure 10. Switching Time Waveform

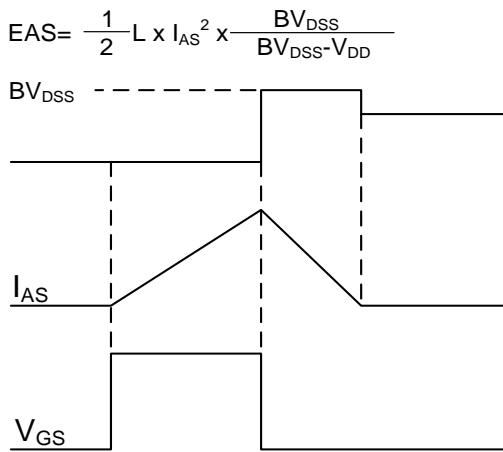
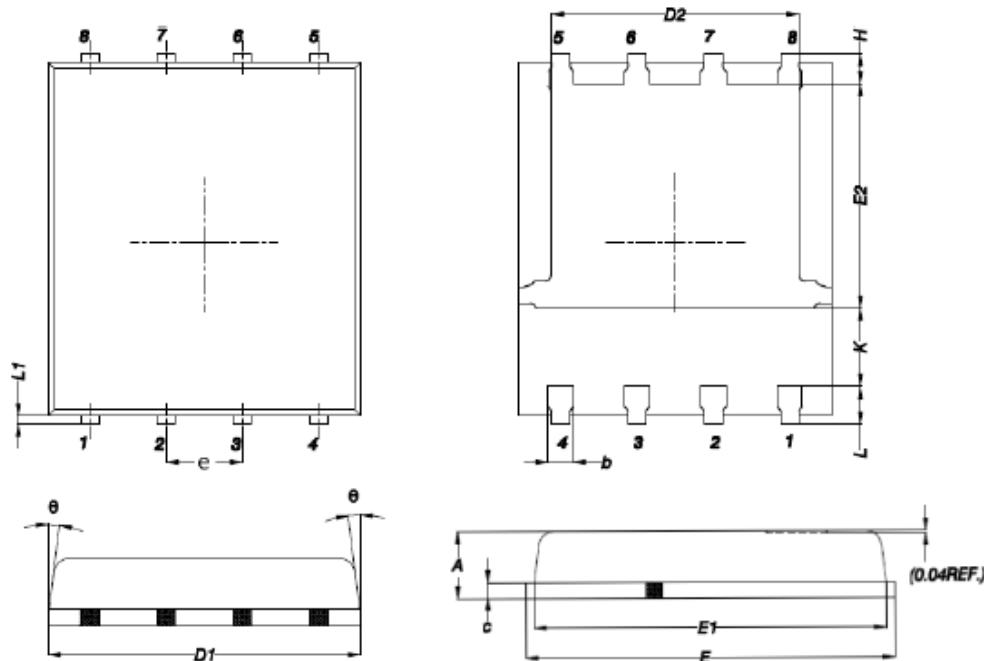


Figure 11. E_{AS} Waveform

Package Outline Dimensions

PPAK5x6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	-	1.100	-	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°