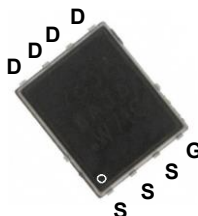
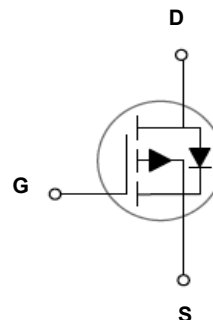


**Main Product Characteristics**

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	8.6mΩ
$I_D$	-72A



PPAK5x6



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 GSFP6901 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** ( $T_C=25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous ( $T_C=25^{\circ}C$ )	$I_D$	-72	A
Drain Current-Continuous ( $T_C=100^{\circ}C$ )		-45.5	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-288	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	320	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	-80	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	142	W
Power Dissipation - Derate Above 25°C		1.13	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.88	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

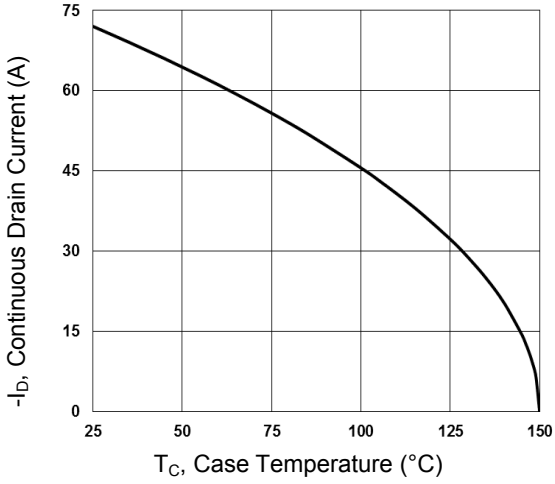
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	---	---	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}$ , $I_D=-1\text{mA}$	---	-0.036	---	$V/^{\circ}\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-48V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-20A$	---	7.1	8.6	m $\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	---	8.8	12	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	6.3	---	mV/ $^{\circ}\text{C}$
Forward Transconductance	$g_{fs}$	$V_{DS}=-10, I_D=-3A$	---	18	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3, 4</sup>	$Q_g$	$V_{DS}=-48V, V_{GS}=-10V, I_D=-5A$	---	141	210	nC
Gate-Source Charge <sup>3, 4</sup>	$Q_{gs}$		---	17	25.5	
Gate-Drain Charge <sup>3, 4</sup>	$Q_{gd}$		---	28.6	43	
Turn-On Delay Time <sup>3, 4</sup>	$T_{d(on)}$	$V_{DD}=-48V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	70	140	nS
Rise Time <sup>3, 4</sup>	$T_r$		---	205	410	
Turn-Off Delay Time <sup>3, 4</sup>	$T_{d(off)}$		---	402	804	
Fall Time <sup>3, 4</sup>	$T_f$		---	197	394	
Input Capacitance	$C_{iss}$	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	---	8620	12930	pF
Output Capacitance	$C_{oss}$		---	486	730	
Reverse Transfer Capacitance	$C_{rss}$		---	288	430	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	---	---	-72	A
Pulsed Source Current	$I_{SM}$		---	---	-144	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-1A, T_J=25^{\circ}\text{C}$	---	---	-1	V

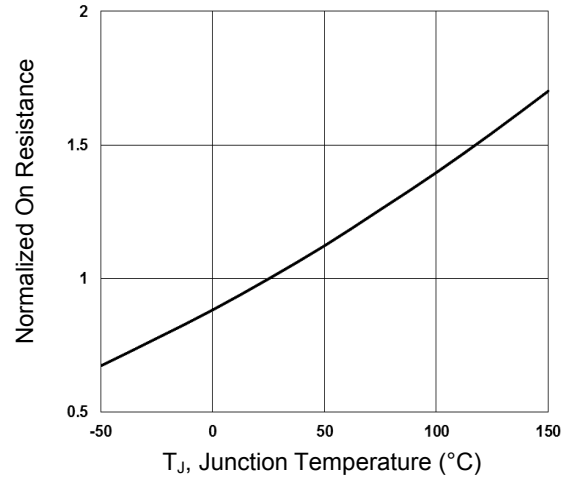
Note:

1. Repetitive rating: pulsed width limited by maximum junction temperature.
2.  $V_{DD}=-50V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-80A, R_G=25\Omega$ , starting  $T_J=25^{\circ}\text{C}$ .
3. Pulsed test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$
4. Essentially independent of operating temperature.

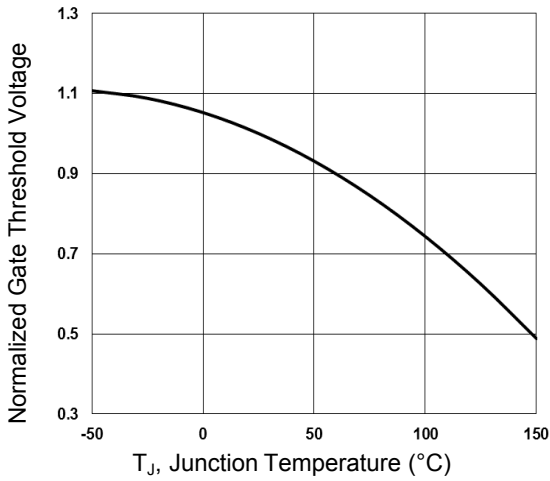
**Typical Electrical and Thermal Characteristic Curves**



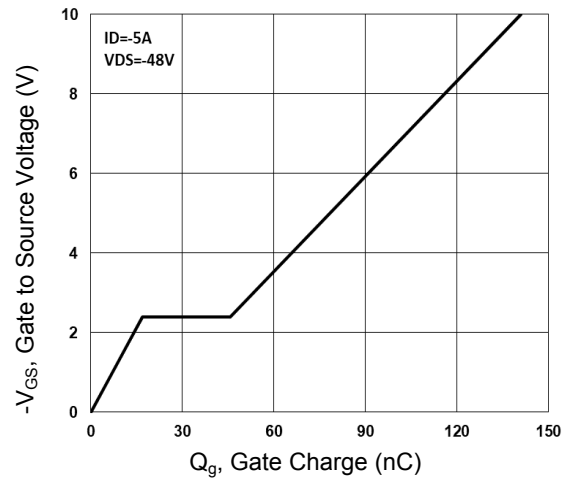
**Figure 1. Continuous Drain Current vs. T<sub>c</sub>**



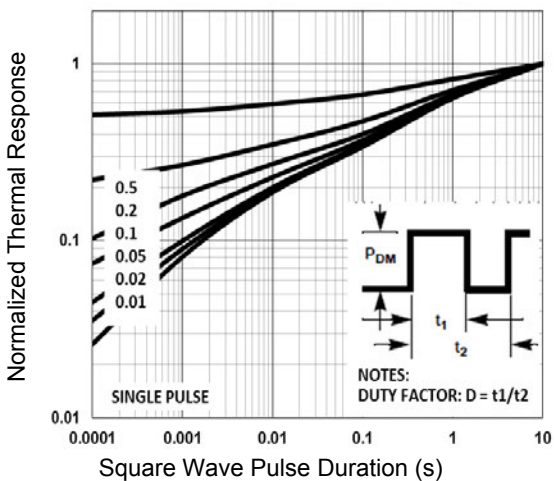
**Figure 2. Normalized R<sub>DS(ON)</sub> vs. T<sub>j</sub>**



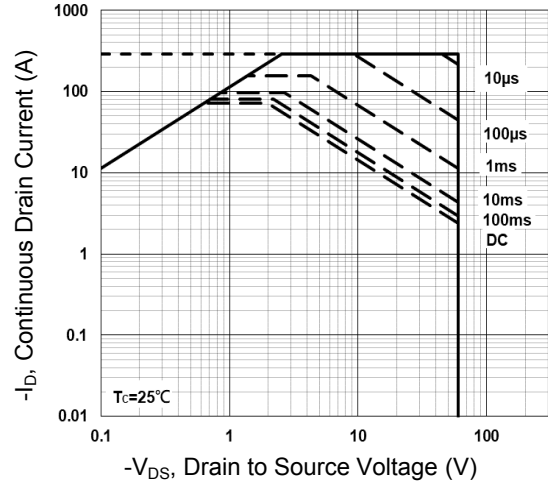
**Figure 3. Normalized V<sub>th</sub> vs. T<sub>j</sub>**



**Figure 4. Gate Charge Waveform**



**Figure 5. Normalized Transient Impedance**

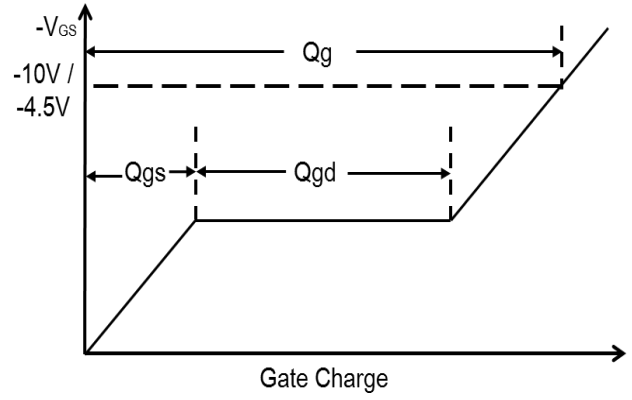


**Figure 6. Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**

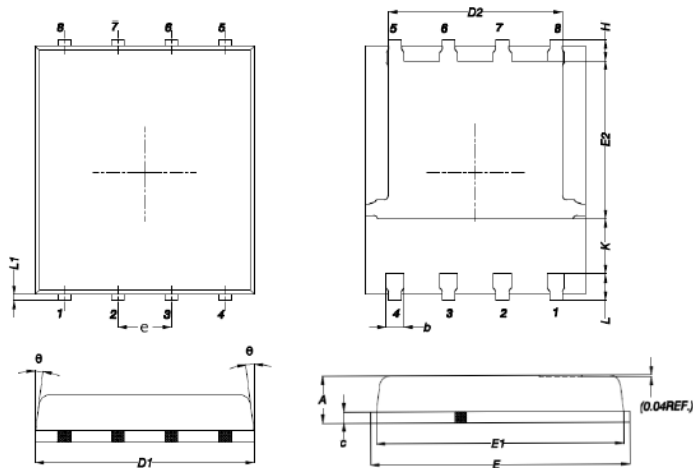


**Figure 7. Switching Time Waveform**



**Figure 8. Gate Charge Waveform**

**Package Outline Dimensions (PPAK5x6)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.850	1.200	0.033	0.047
b	0.300	0.510	0.012	0.020
c	0.200	0.300	0.008	0.012
D1	4.800	5.400	0.189	0.213
D2	3.610	4.310	0.142	0.170
E	5.850	6.300	0.230	0.248
E1	5.450	5.960	0.215	0.235
E2	3.300	3.920	0.130	0.154
e	1.270 BSC		0.050 BSC	
H	0.380	0.650	0.015	0.026
K	1.100	-	0.043	-
L	0.380	0.710	0.015	0.028
L1	0.050	0.250	0.002	0.010
θ	0°	12°	0°	12°

**Recommended Pad Layout**

