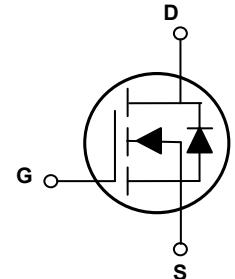
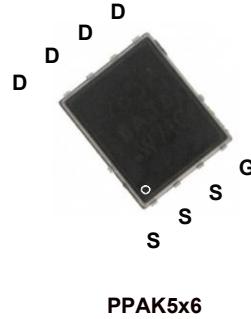


## Main Product Characteristics

BV <sub>DSS</sub>	65V
R <sub>DS(ON)</sub>	4.4mΩ
I <sub>D</sub>	95A



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 GSFP0696 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 <sub>DS</sub>	65	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	I <sub>D</sub>	95	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		60	A
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	380	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	151.3	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	55	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	P <sub>D</sub>	96	W
Power Dissipation-Derate Above 25°C		0.77	W/°C
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	1.3	°C/W
Storage Temperature Range	T <sub>STG</sub>	-50 To +150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-50 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	65	-	-	V
Drain-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=48\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=10\text{V}, I_D=20\text{A}$	-	3.7	4.4	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_D=15\text{A}$	-	5.8	7.5	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	1	1.6	2.5	V
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_D=3\text{A}$	-	10	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{\text{DS}}=48\text{V}, I_D=30\text{A}, V_{\text{GS}}=10\text{V}$	-	36	54	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{\text{gs}}$		-	4.7	7.1	
Gate-Drain Charge <sup>3,4</sup>	$Q_{\text{gd}}$		-	13.5	20	
Turn-On Delay Time <sup>3,4</sup>	$t_{\text{d(on)}}$	$V_{\text{DD}}=48\text{V}, R_{\text{G}}=6\Omega, V_{\text{GS}}=10\text{V}, I_D=1\text{A}$	-	10.2	15	nS
Rise Time <sup>3,4</sup>	$t_r$		-	16	24	
Turn-Off Delay Time <sup>3,4</sup>	$t_{\text{d(off)}}$		-	42	63	
Fall Time <sup>3,4</sup>	$t_f$		-	38	57	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=48\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	1675	2510	pF
Output Capacitance	$C_{\text{oss}}$		-	322	485	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	14	25	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.2	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	Force Current	-	-	95	A
Pulsed Source Current	$I_{\text{SM}}$		-	-	190	A
Diode Forward Voltage	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$T_{\text{rr}}$	$V_R=50\text{V}, I_s=10\text{A}, \text{di}/\text{dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	54	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		-	67	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.

2.  $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=55\text{A}, R_{\text{G}}=25\Omega$ , 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

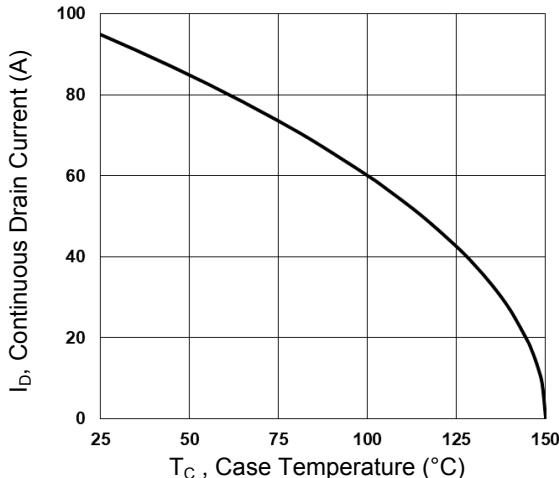


Fig.1 Continuous Drain Current vs. T<sub>c</sub>

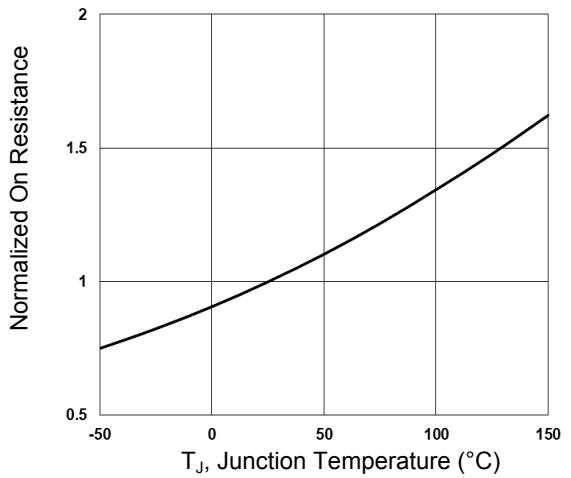


Fig.2 Normalized R<sub>DS(ON)</sub> vs. T<sub>J</sub>

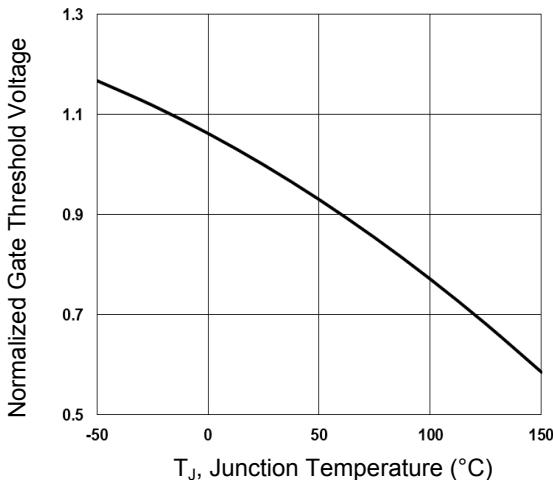


Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>

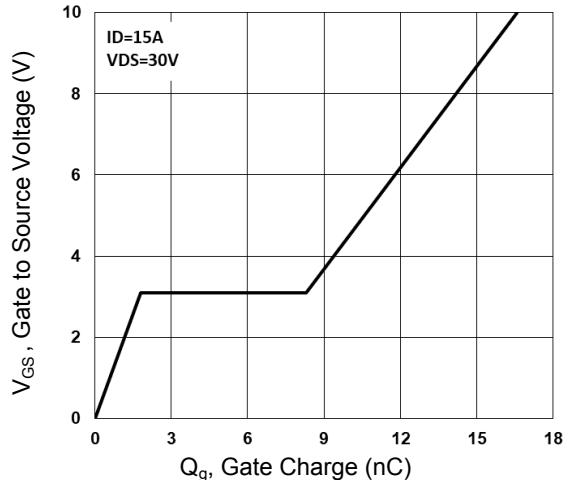


Fig.4 Gate Charge Characteristics

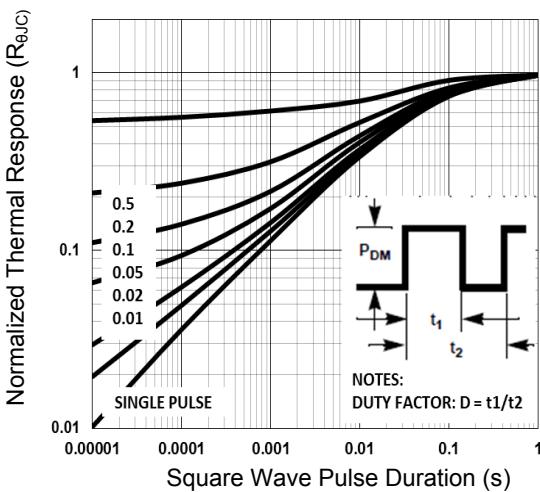


Fig.5 Normalized Transient Impedance

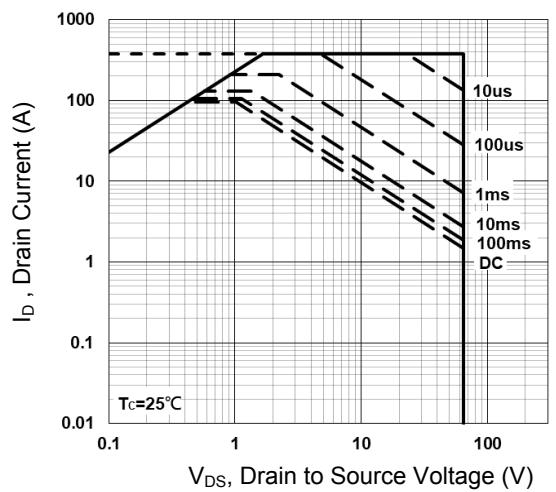


Fig.6 Maximum Safe Operation Area

## Typical Electrical and Thermal Characteristic Curves

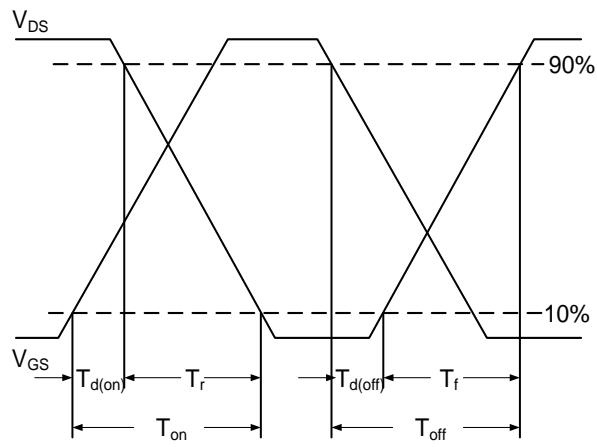


Fig.7 Switching Time Waveform

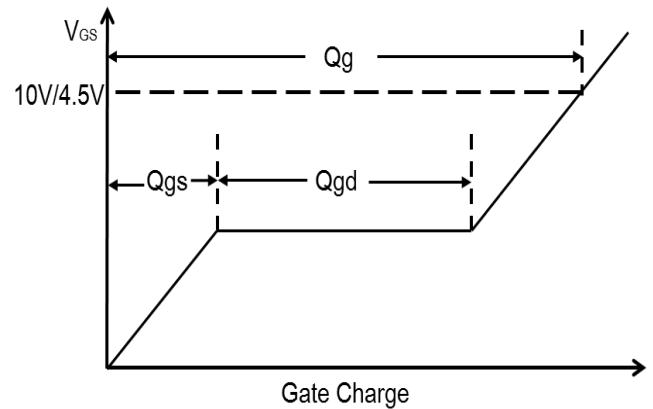
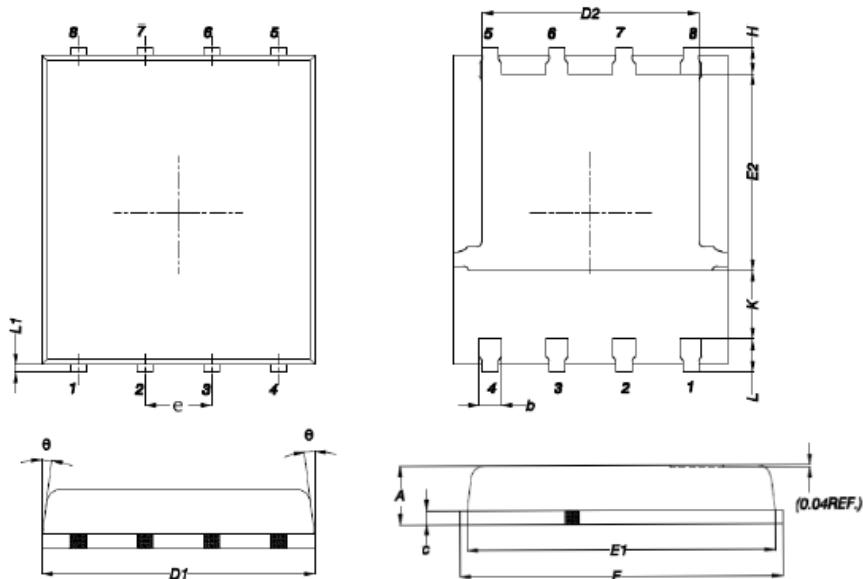


Fig.8 Gate Charge Waveform

### 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	1.27 BSC		0.05 BSC	
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°

### Order Information

Device	Package	Marking	Carrier	Quantity
GSFP0696	PPAK5x6	DC6982BX	Tape & Reel	3,000 pcs / Reel