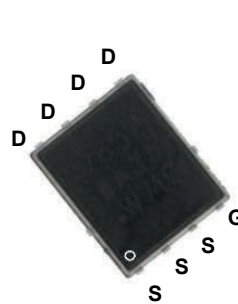
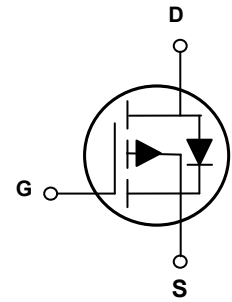


### Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	9m $\Omega$ (Max.)
$I_D$	-86A



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 GSFP6009 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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ ), $V_{GS}=10\text{V}^1$	$I_D$	-86	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ ), $V_{GS}=10\text{V}^1$		-55	A
Drain Current-Pulsed <sup>2</sup>	$I_{DM}$	-344	A
Maximum Power Dissipation ( $T_C=25^\circ\text{C}$ ) <sup>3</sup>	$P_D$	130	W
Single Pulse Avalanche Energy ( $L=0.3\text{mH}$ )	$E_{AS}$	812	mJ
Single Pulse Avalanche Current ( $L=0.3\text{mH}$ )	$I_{AS}$	57	A
Junction-to-Ambient ( $t \leq 10\text{s}$ ) <sup>4</sup>	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$	0.96	$^\circ\text{C/W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

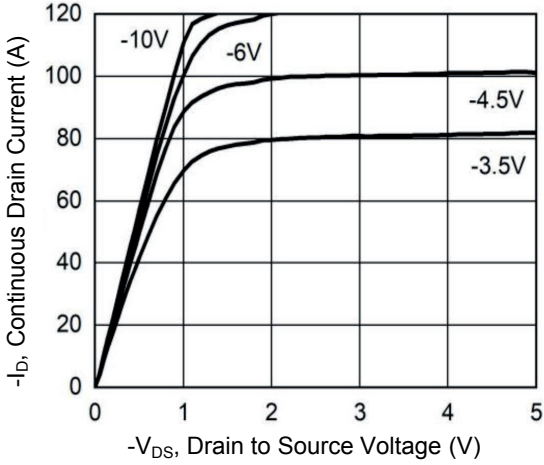
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1	$\mu A$
Drain-to-Source Leakage Current		$V_{DS}=-60V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	-50	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.0	-	-3	V
Drain Static-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$	-	7.3	9	m $\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	-	8.5	11	m $\Omega$
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DD}=-30V, I_D=-30A, V_{GS}=-10V$	-	196	-	nC
Gate-Source Charge	$Q_{gs}$		-	27	-	
Gate-Drain Charge	$Q_{gd}$		-	44	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, R_G=3\Omega, R_L=1.5\Omega, V_{GS}=-10V,$	-	26	-	nS
Rise Time	$t_r$		-	33	-	
Turn-Off Delay Time	$t_{d(off)}$		-	272	-	
Fall Time	$t_f$		-	91	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, F=1\text{MHz}$	-	13300	-	pF
Output Capacitance	$C_{oss}$		-	510	-	
Reverse Transfer Capacitance	$C_{rss}$		-	470	-	
Gate Resitance	$R_g$	$F=1\text{MHz}$	-	1.8	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Maximum Body-Diode Continuous Current	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-86	-	A
Maximum Body-Diode Pulse Current	$I_{SM}$		-	-344	-	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-10A, T_J=25^\circ\text{C}$	-	-0.9	-1.2	V
Reverse Recovery Time	$T_{rr}$	$I_F=-20A,$	-	36.4	-	nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	43.1	-	nC

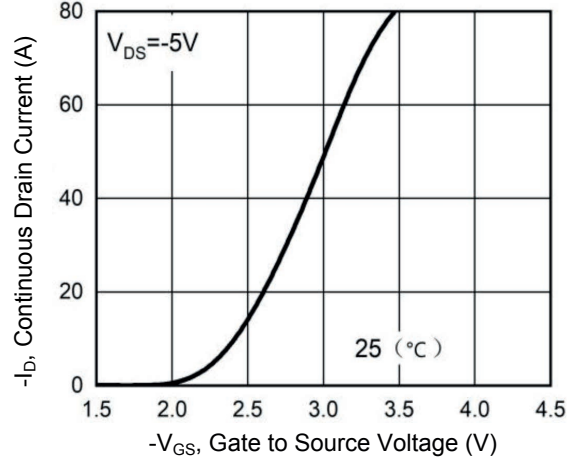
**Notes:**

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. The power dissipation  $P_D$  is based on max. junction temperature, using junction-to-case thermal resistance.
4. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .

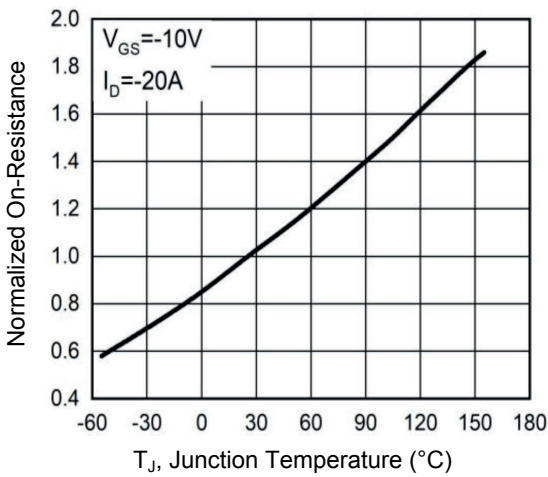
**Typical Electrical and Thermal Characteristic Curves**



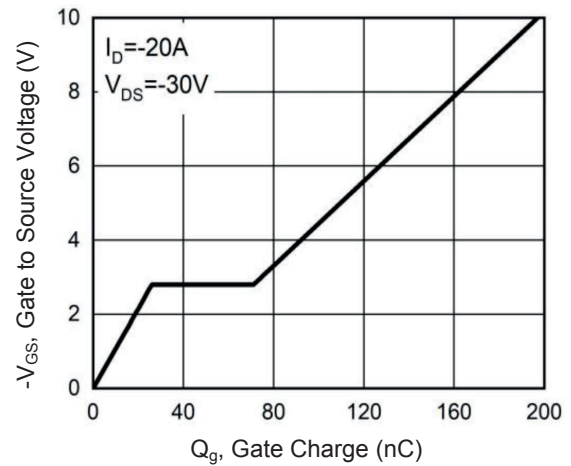
**Figure 1. Output Characteristics**



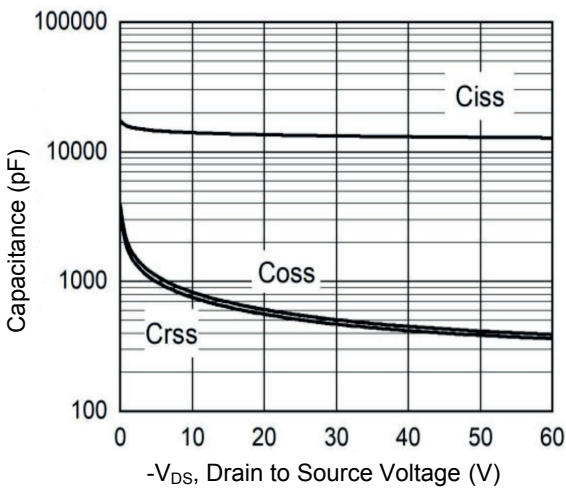
**Figure 2. Transfer Characteristics**



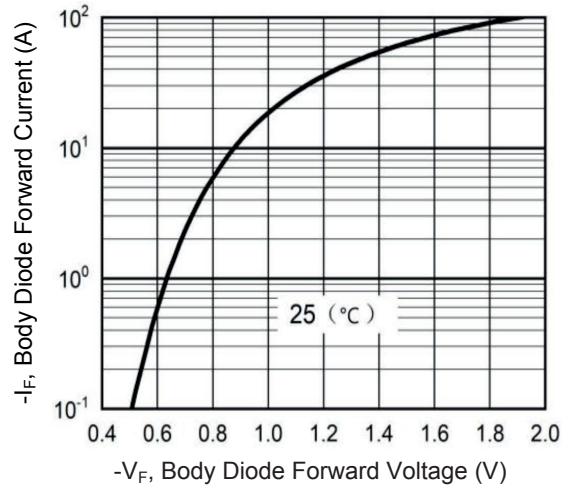
**Figure 3. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



**Figure 4. Gate Charge Waveform**

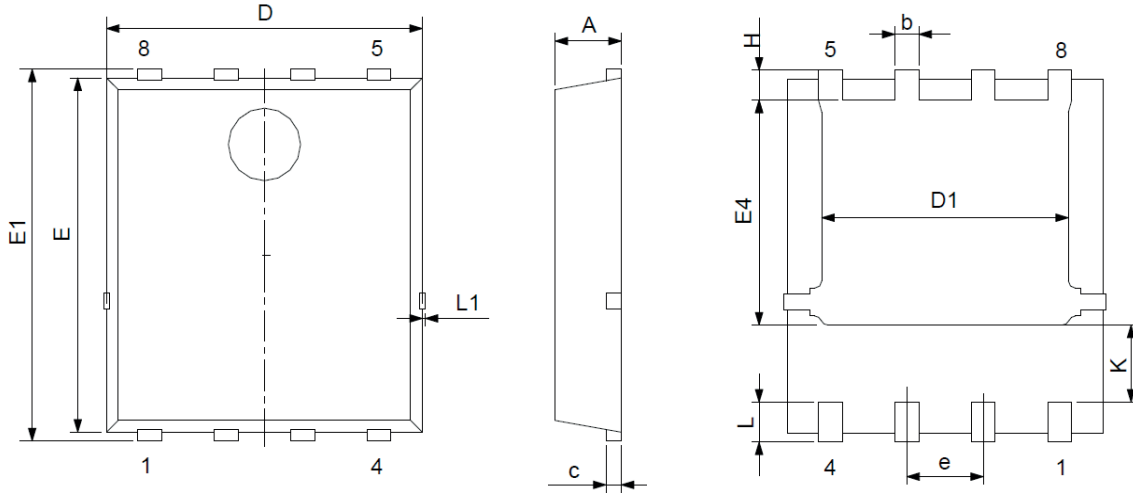


**Figure 5. Capacitance Characteristics**



**Figure 6. Body Diode Characteristics**

### Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.200	0.035	0.047
c	0.154	0.354	0.006	0.014
D	4.800	5.400	0.189	0.213
E	5.660	6.060	0.223	0.239
D1	3.760	4.300	0.148	0.169
E1	5.900	6.350	0.232	0.250
b	0.300	0.550	0.012	0.022
k	1.100	1.500	0.043	0.059
e	1.070	1.370	0.042	0.054
E4	3.340	3.920	0.131	0.154
L	0.300	0.710	0.012	0.028
L1	-	0.120	-	0.005
H	0.400	0.710	0.016	0.028

### Order Information

Device	Package	Marking	Carrier	Quantity
GSFP6009	PPAK5x6	P6009	Tape & Reel	5,000 Pcs / Reel

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)