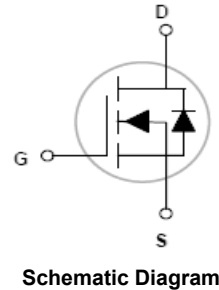
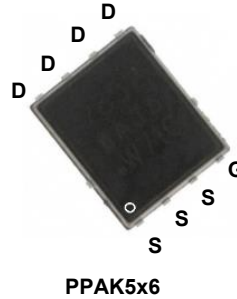


### Main Product Characteristics

$V_{DS}$	85V
$R_{DS(ON)}$	3.5m $\Omega$
$I_D$	135A



### 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 GSGP85136 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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	85	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous(Silicon limited)	$I_D$	135	A
Drain Current-Continuous(T <sub>C</sub> =100°C)		97.2	A
Drain Current-Pulsed(Package limited)	$I_{DM}$	540	A
Single Pulse Avalanche Energy <sup>5</sup>	$E_{AS}$	920	mJ
Maximum Power Dissipation	$P_D$	160	W
Derating Factor		1.28	W/°C
Thermal Resistance, Junction-to-Case <sup>2</sup>	$R_{\theta JC}$	0.78	°C/W
Storage Temperature Range	$T_{STG}$	-55 To +150	°C
Operating Junction Temperature Range	$T_J$	-55 To +150	°C

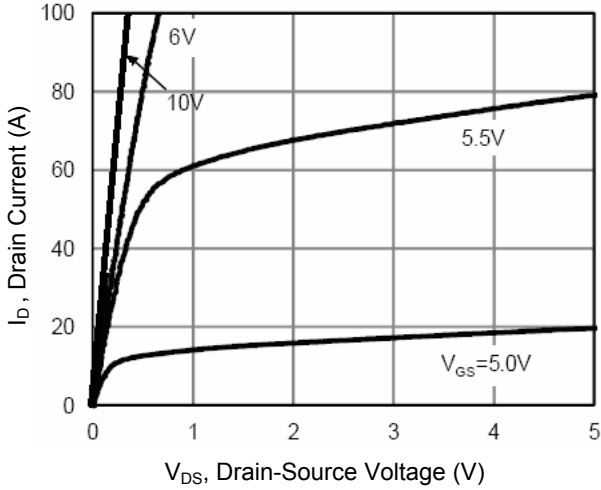
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	85	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=85V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics<sup>3</sup></b>						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=65A$	-	2.9	3.5	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=65A$	-	60	-	S
<b>Dynamic and Switching Characteristics<sup>4</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS}=40V, I_D=65A, V_{GS}=10V$	-	88	-	nC
Gate-Source Charge	$Q_{gs}$		-	22	-	
Gate-Drain Charge	$Q_{gd}$		-	25	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=40V, R_G=3\Omega, V_{GS}=10V, I_D=65A$	-	18	-	nS
Turn-On Rise Time	$t_r$		-	11	-	
Turn-Off Delay Time	$t_{d(off)}$		-	38	-	
Turn-Off Fall Time	$t_f$		-	9	-	
Input Capacitance	$C_{iss}$	$V_{DS}=40V, V_{GS}=0V, F=1MHz$	-	4950	-	pF
Output Capacitance	$C_{oss}$		-	850	-	
Reverse Transfer Capacitance	$C_{rss}$		-	40	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Current <sup>2</sup>	$I_S$		-	-	130	A
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=65A$	-	-	1.2	V
Reverse Recovery Time	$T_{rr}$	$T_J=25^\circ\text{C}, I_S=I_F=65A$	-	72	-	nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt=100A/\mu s^3$	-	102	-	nC

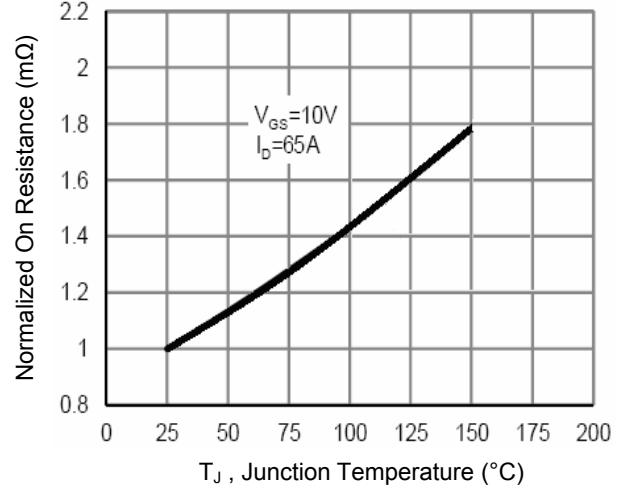
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5. EAS condition :  $T_J=25^\circ\text{C}, V_{DD}=40V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$

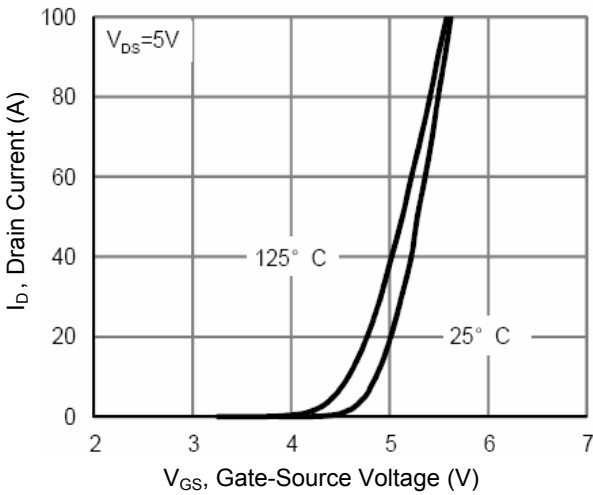
### Typical Electrical and Thermal Characteristic Curves



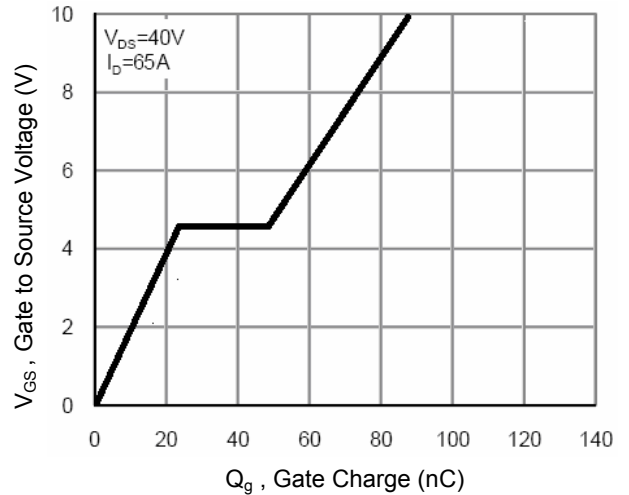
**Figure 1. Output Characteristics**



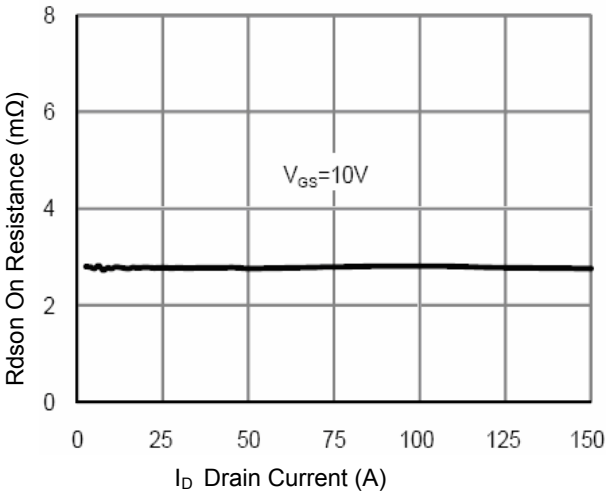
**Figure 2. Rdson- Junction Temperature**



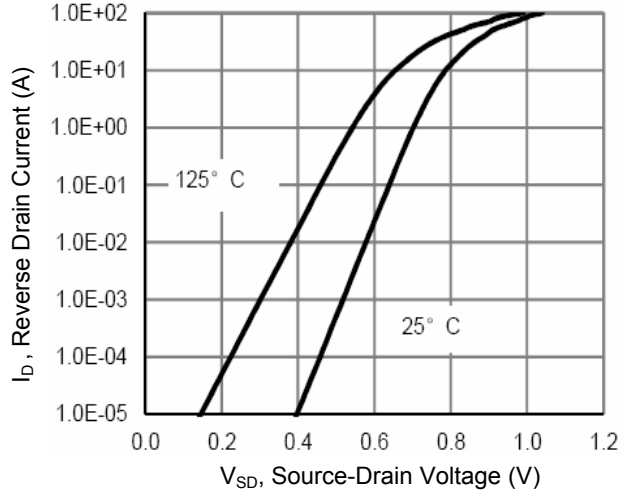
**Figure 3. Transfer Characteristics**



**Figure 4. Gate Charge**

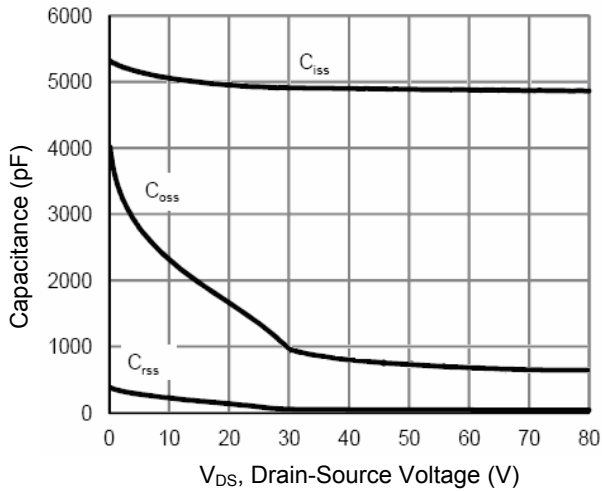


**Figure 5. Rdson - Drain Current**

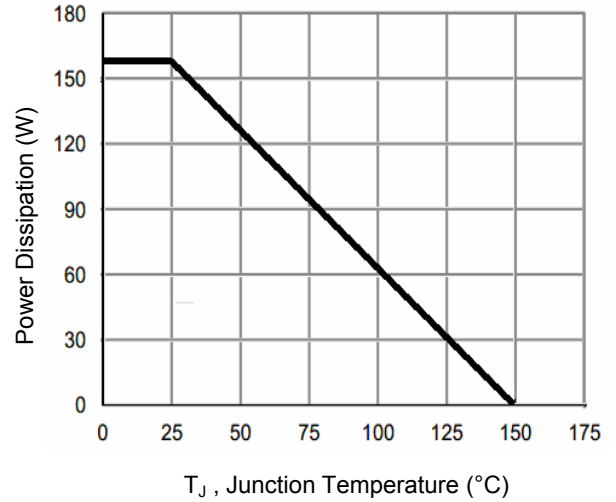


**Figure 6. Source-Drain Diode Forward**

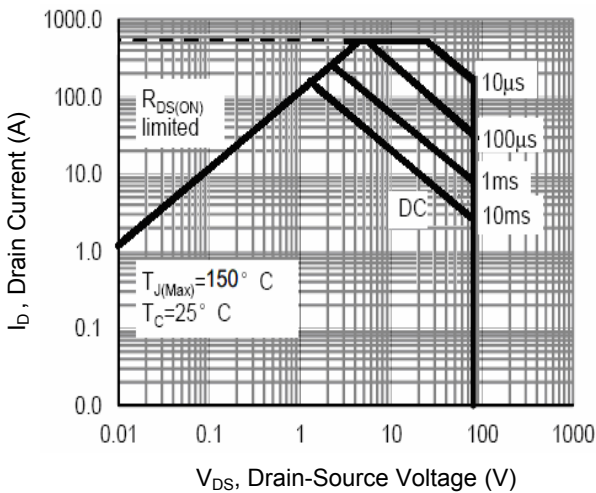
### Typical Electrical and Thermal Characteristic Curves



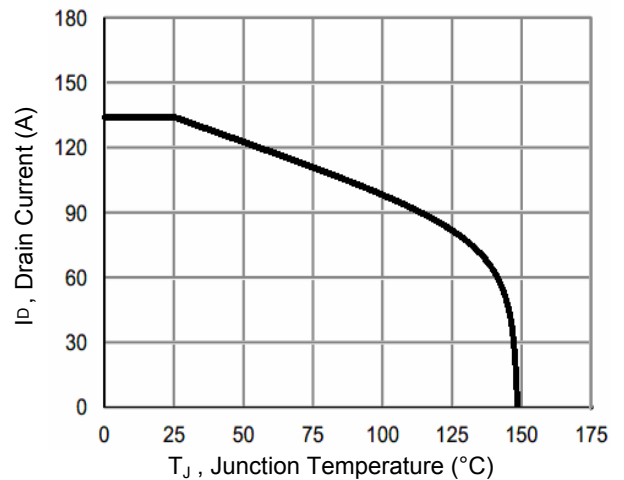
**Figure 7. Capacitance vs.  $V_{DS}$**



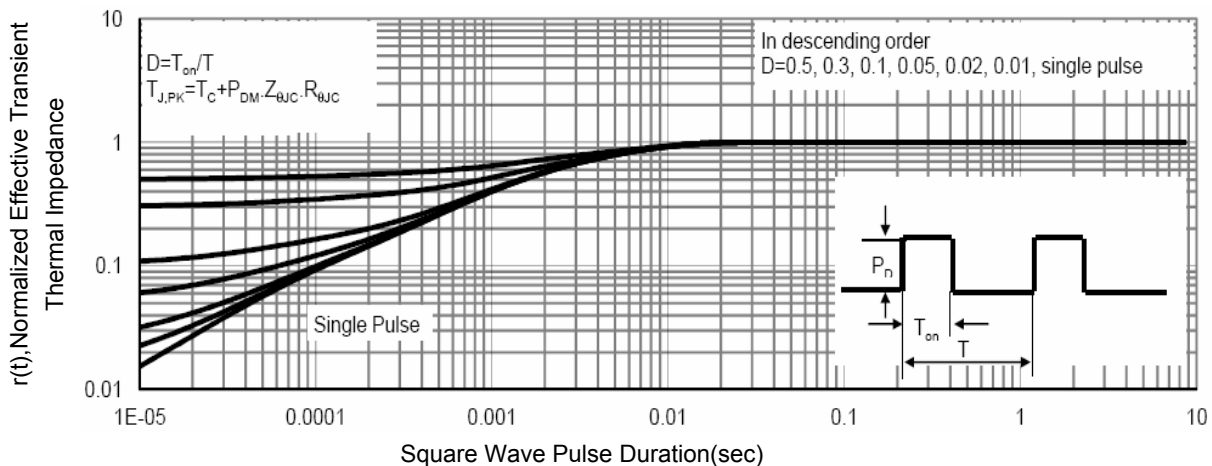
**Figure 8. Power De-Rating**



**Figure 9. Safe Operation Area**

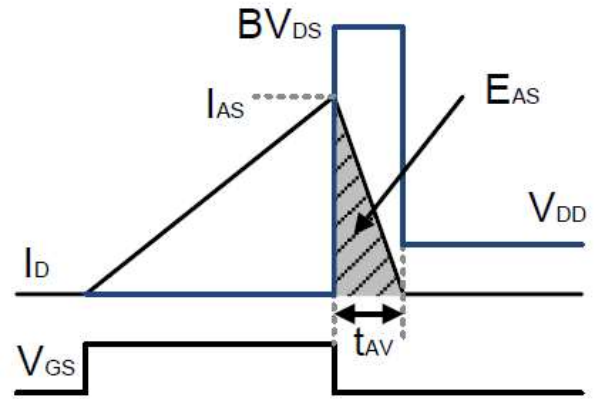
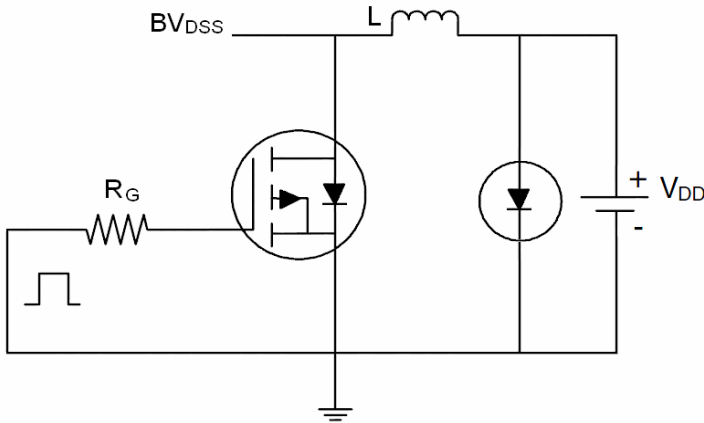


**Figure 10. Current De-Rating**

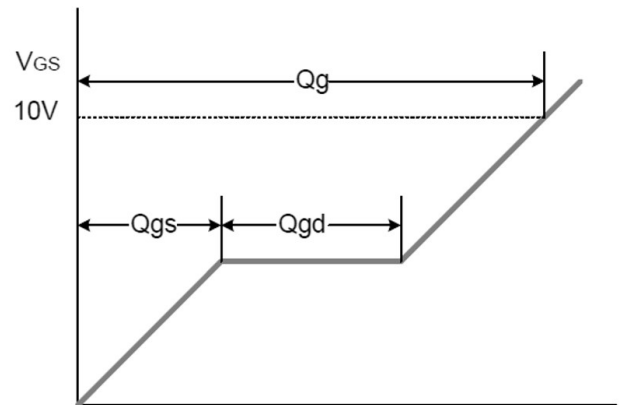
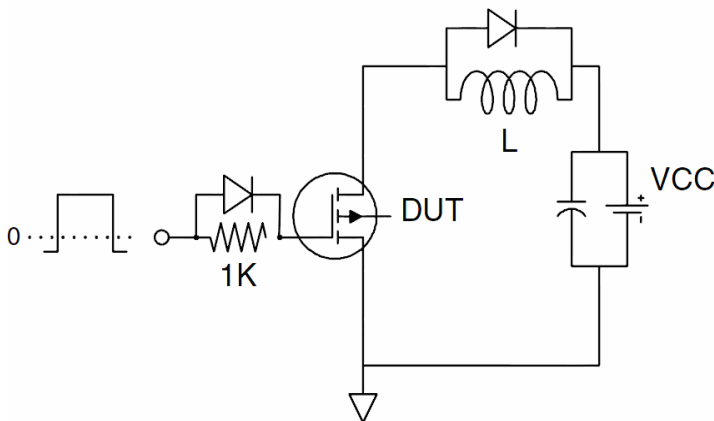


**Figure 11. Normalized Maximum Transient Thermal Impedance**

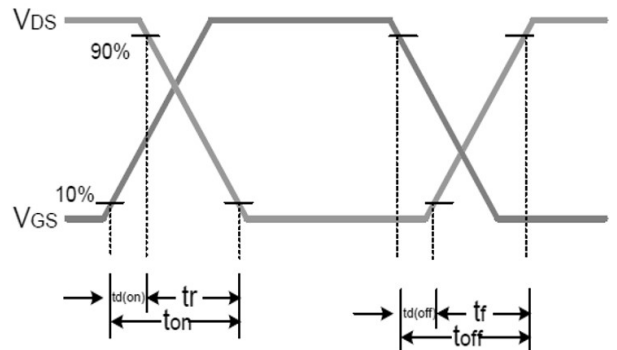
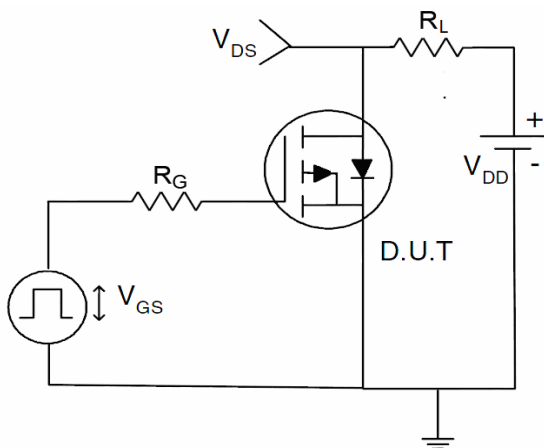
**Typical Electrical and Thermal Characteristic Curves**



**Figure 12. E<sub>AS</sub> Test Circuit and waveforms**

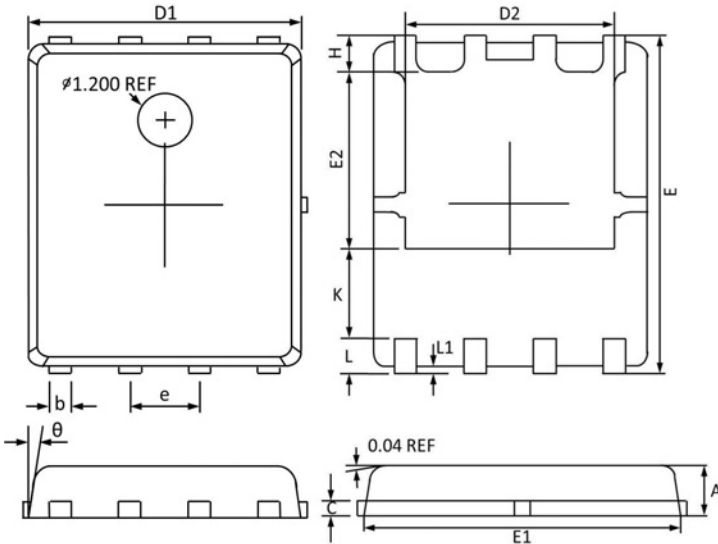


**Figure 13. Gate Charge Test Circuit and waveforms**



**Figure 14. Switch Time Test Circuit and waveforms**

**Package Outline Dimensions (PPAK5x6)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
theta	12°	0°	12°	0°