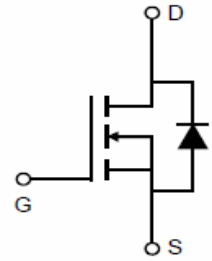
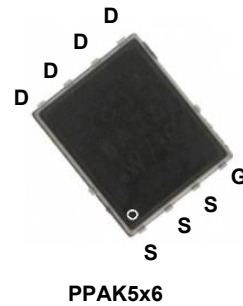


### Main Product Characteristics

$V_{DS}$	30V
$R_{DS(ON)}$	6.4m $\Omega$
$I_D$	45A



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 GSGP0345 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	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	45	A
Drain Current-Continuous( $T_C=100^\circ\text{C}$ )	$I_{D(100^\circ\text{C})}$	31.8	A
Pulsed Drain Current	$I_{DM}$	125	A
Maximum Power Dissipation	$P_D$	28	W
Derating Factor		0.22	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy <sup>5</sup>	$E_{AS}$	150	mJ
Thermal Resistance, Junction-to-Case <sup>2</sup>	$R_{\theta JC}$	4.5	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$

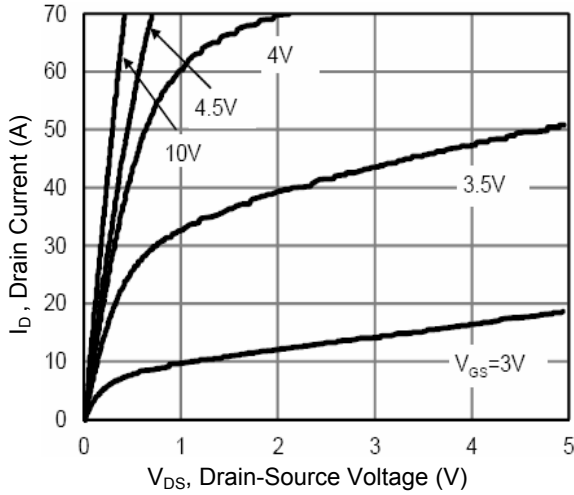
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$	-	-	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>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	5.8	6.4	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	8	10	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=20A$	-	30	-	S
<b>Dynamic Characteristics<sup>4</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, F=1.0MHz$	-	822	-	pF
Output Capacitance	$C_{oss}$		-	344	-	
Reverse Transfer Capacitance	$C_{rss}$		-	15.3	-	
<b>Switching Characteristics<sup>4</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=15V, I_D=20A, V_{GS}=10V, R_G=1.6\Omega$	-	6.5	-	nS
Turn-On Rise Time	$t_r$		-	2.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	17	-	
Turn-Off Fall Time	$t_f$		-	2.5	-	
Total Gate Charge	$Q_g$	$V_{DS}=15V, I_D=20A, V_{GS}=10V$	-	15	-	nC
Gate-Source Charge	$Q_{gs}$		-	2.9	-	
Gate-Drain Charge	$Q_{gd}$		-	2.1	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
Diode Forward Current <sup>2</sup>	$I_S$		-	-	20	A
Reverse Recovery Time	$t_{rr}$	$I_F=I_S, dI/dt=100A/\mu s^3, T_J=25^\circ C$	-	11	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	19	-	nC

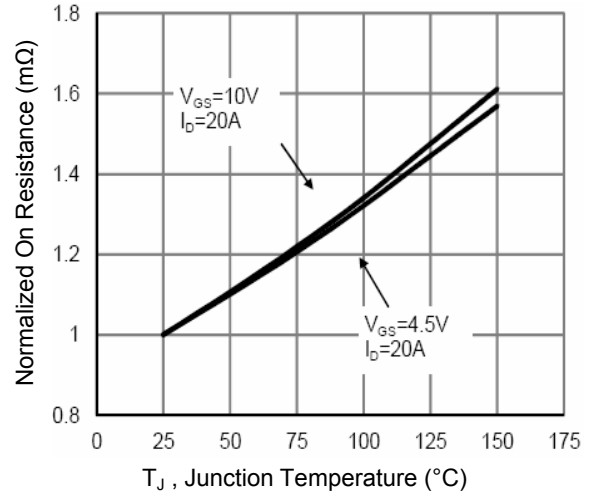
Notes:

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
5. EAS condition :  $T_J=25^\circ C, V_{DD}=20V, V_G=10V, L=0.5mH, R_G=25\Omega$

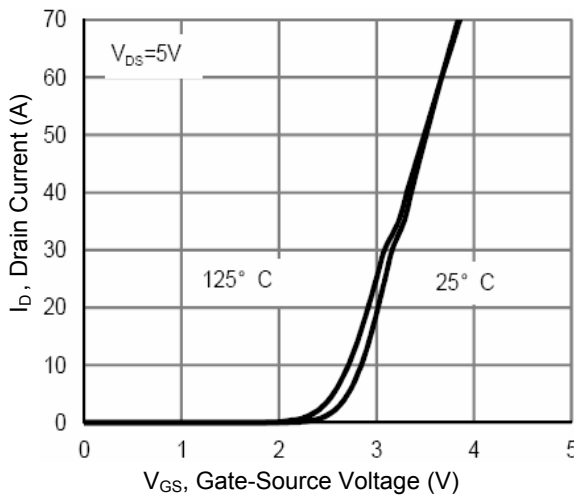
### Typical Electrical and Thermal Characteristic Curves



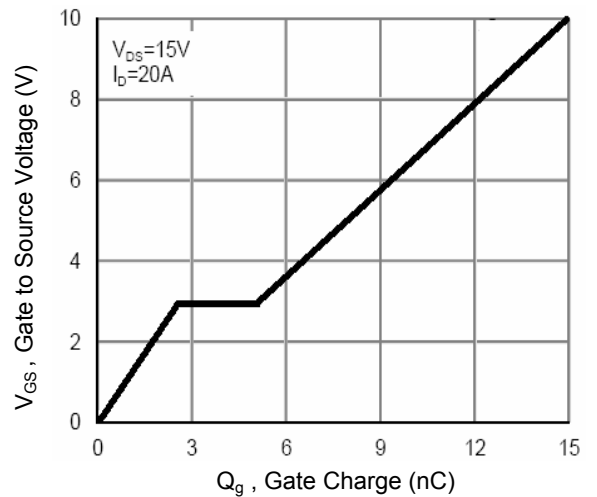
**Figure 1. Output Characteristics**



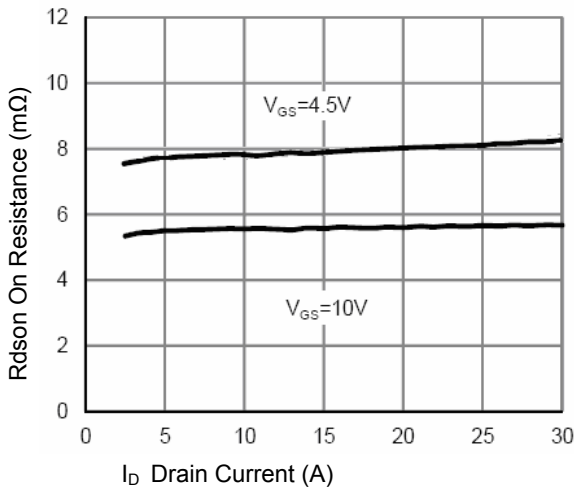
**Figure 2. Rdson-Junction Temperature**



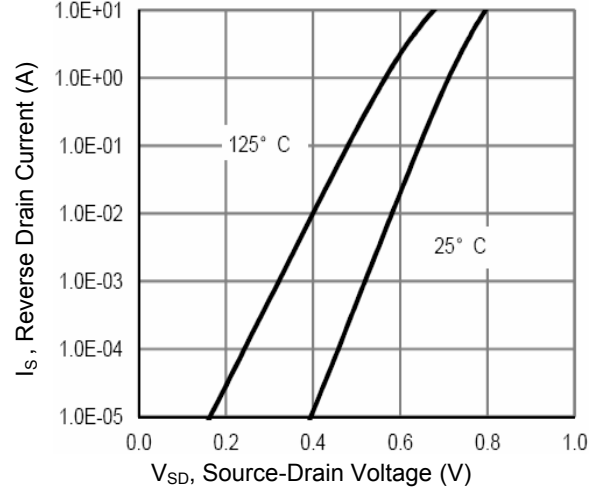
**Figure 3. Transfer Characteristics**



**Figure 4. Gate Charge**

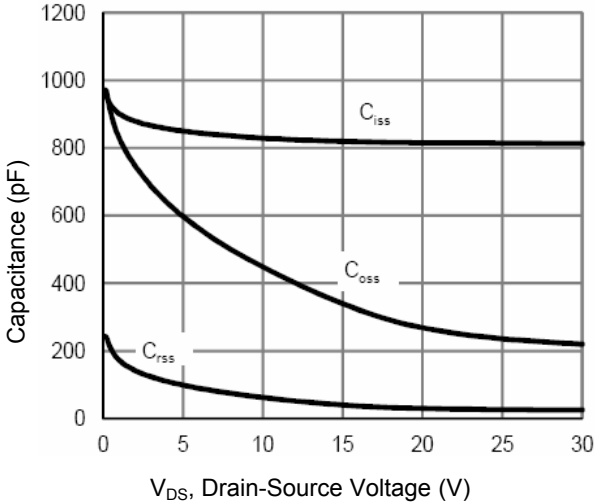


**Figure 5. Rdson-Drain Current**

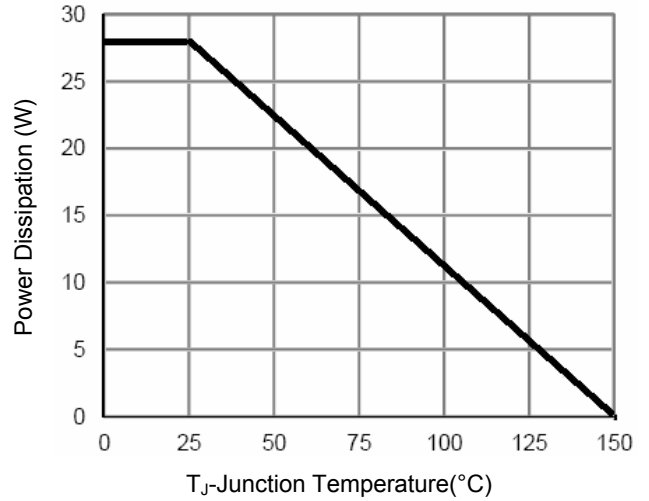


**Figure 6. Source-Drain Diode Forward**

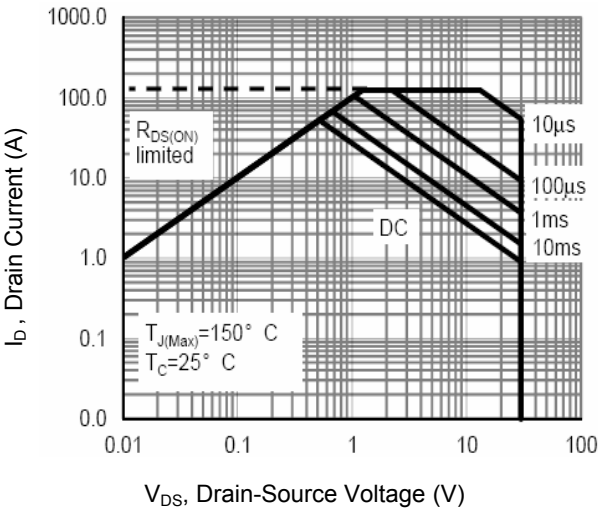
**Typical Electrical and Thermal Characteristic Curves**



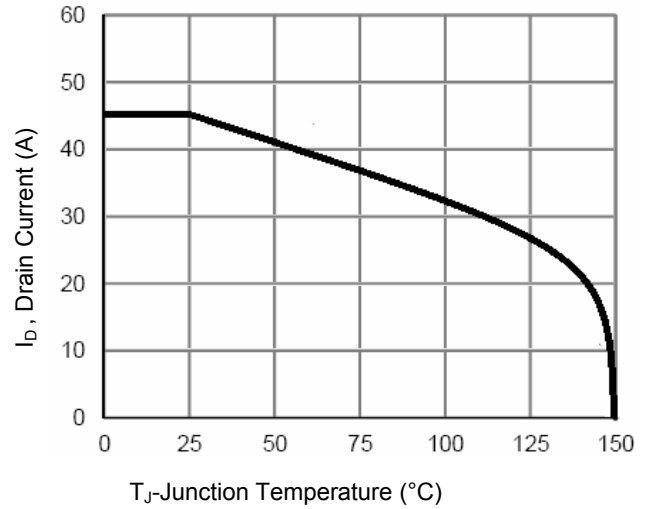
**Figure 7. Capacitance vs.  $V_{DS}$**



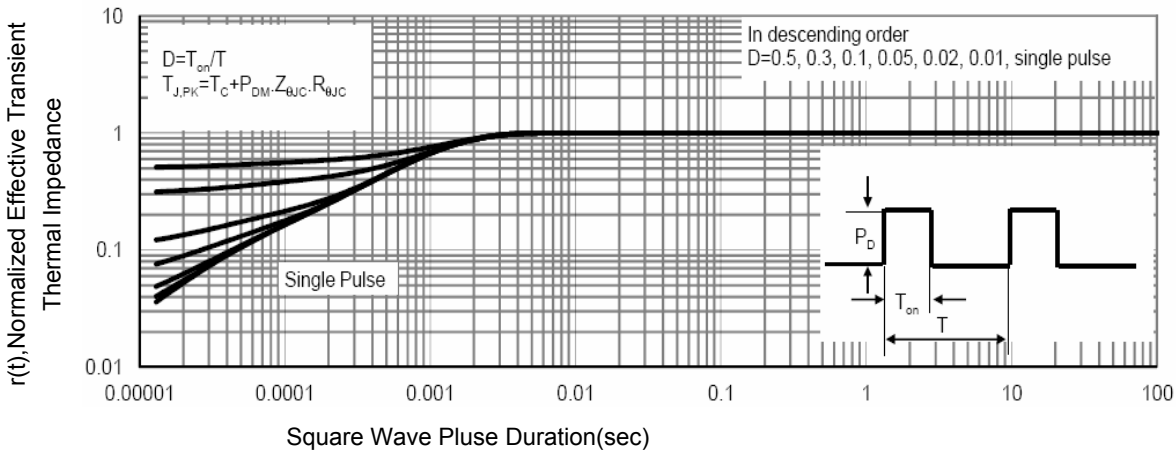
**Figure 8. Power De-rating**



**Figure 9. Safe Operation Area**

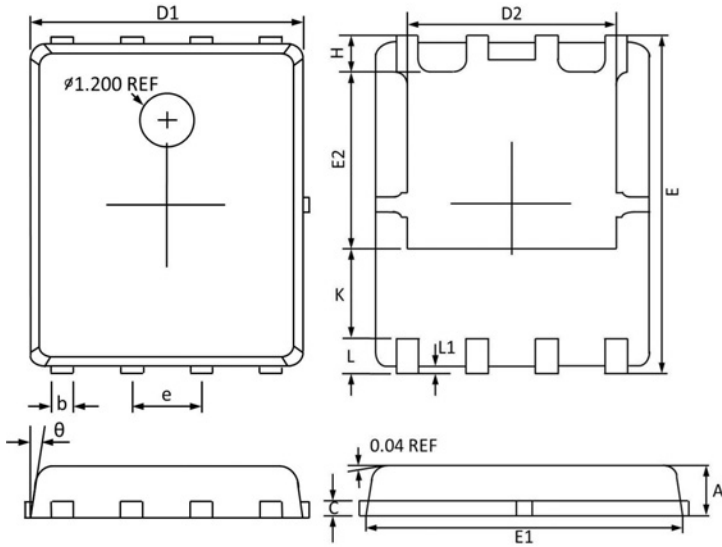


**Figure 10. Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

**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
θ	12°	0°	12°	0°