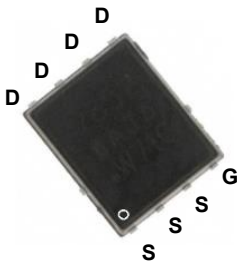
GOOD-ARK SEMICONDUCTOR

GSGP03150

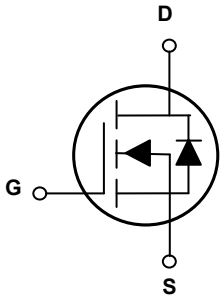
30V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	1.9mΩ
I_D	150A



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 GSGP03150 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°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	150	A
Drain Current-Continuous(T_C=100°C)		120	A
Drain Current-Pulsed	I_{DM}	340	A
Single Pulse Avalanche Energy[5]	E_{AS}	650	mJ
Maximum Power Dissipation	P_D	85	W
Derating Factor		0.68	W/°C
Thermal Resistance, Junction-to-Case[2]	$R_{\theta JC}$	1.47	°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°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V , V_{GS}=0V	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_GS=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics[3]						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=75A	-	1.5	1.9	mΩ
		V_{GS}=4.5V, I_D=75A	-	2.0	2.5	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.7	2.2	V
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=75A	-	65	-	S
Dynamic and Switching Characteristics[4]						
Total Gate Charge	Q_g	V_{DS}=15V, I_D=75A, V_{GS}=10V	-	55	-	nC
Gate-Source Charge	Q_{gs}		-	9	-	
Gate-Drain Charge	Q_{gd}		-	8.5	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=15V, R_G=1.6Ω V_{GS}=10V, I_D=75A	-	7	-	nS
Turn-On Rise Time	t_r		-	5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	32	-	
Turn-Off Fall Time	t_f		-	9	-	
Input Capacitance	C_{lss}	V_{DS}=15V, V_{GS}=0V, F=1MHz	-	3372	-	pF
Output Capacitance	C_{oss}		-	902	-	
Reverse Transfer Capacitance	C_{rss}		-	60	-	
Drain-Source Diode Characteristics						
Diode Forward Current[2]	I_S		-	-	150	A
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V, I_S=75A	-	-	1.2	V
Reverse Recovery Time	T_{rr}	T_J=25°C, I_S=I_F, di/dt=100A/μs[3]	-	-	26	nS
Reverse Recovery Charge	Q_{rr}		-	-	95	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : Tj=25°C,V_{DD}=15V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristic Curves

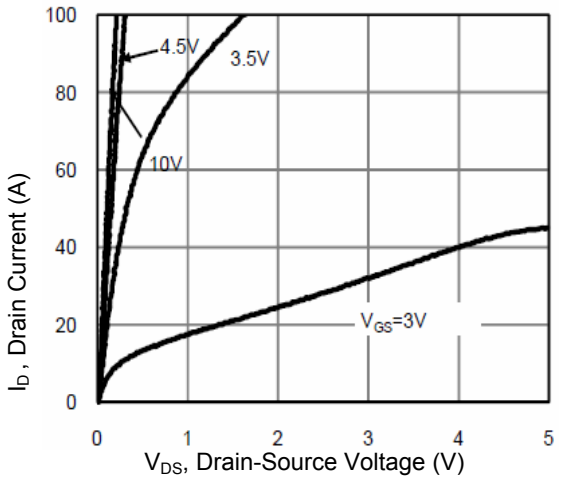


Figure 1. Output Characteristics

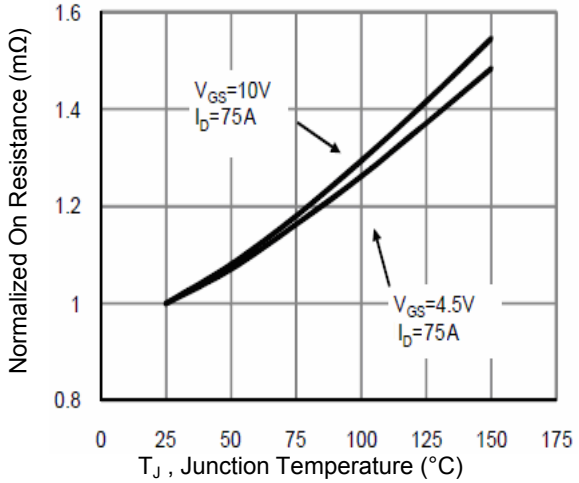


Figure 2. Rdson-Junction Temperature

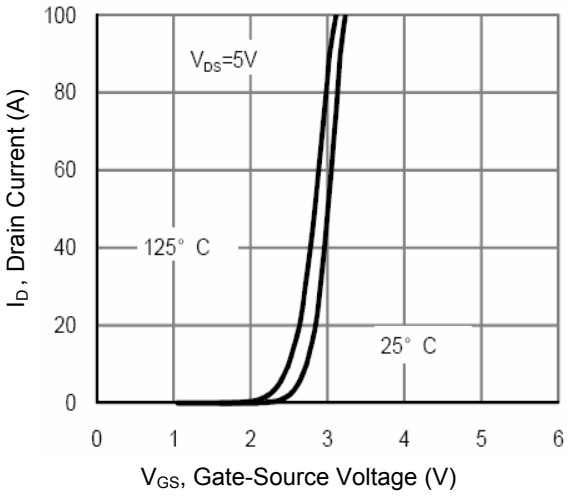


Figure 3. Transfer Characteristics

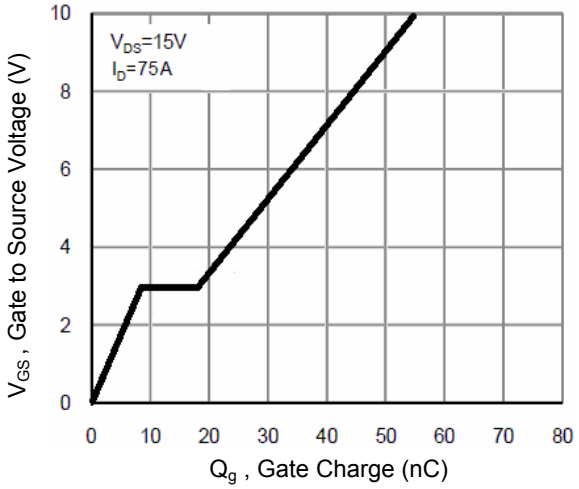


Figure 4. Gate Charge

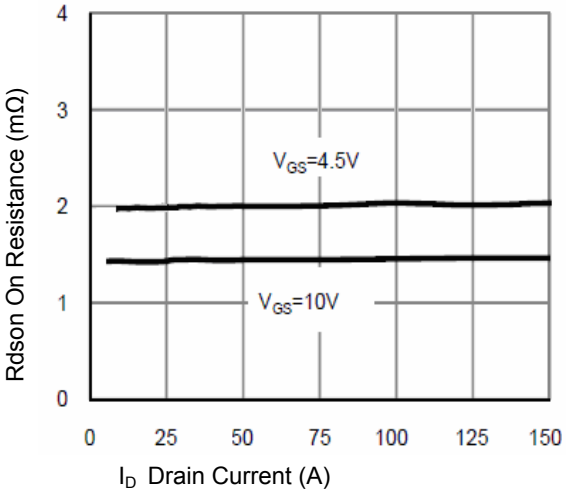


Figure 5. Rdson-Drain Current

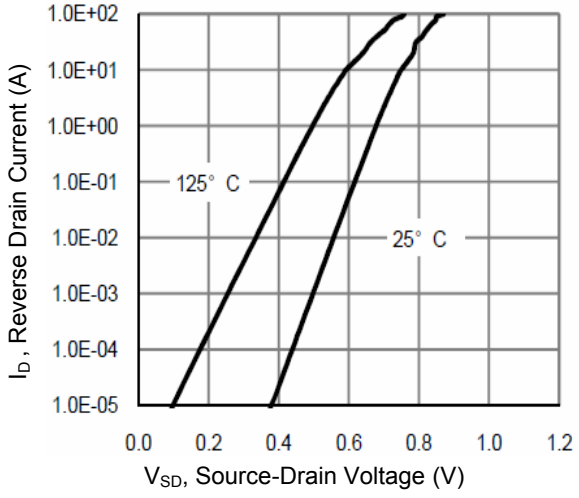


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

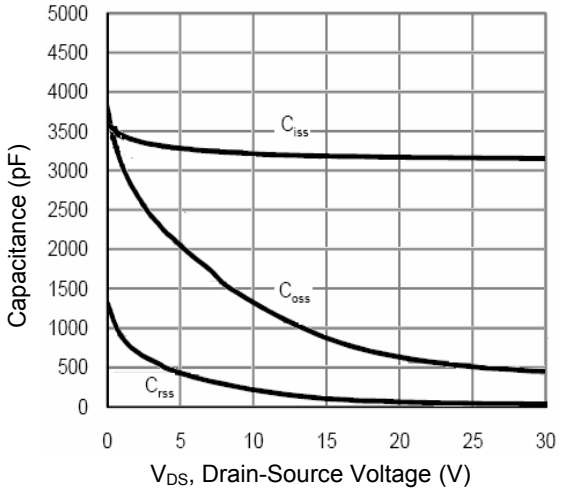


Figure 7. Capacitance vs. V_{DS}

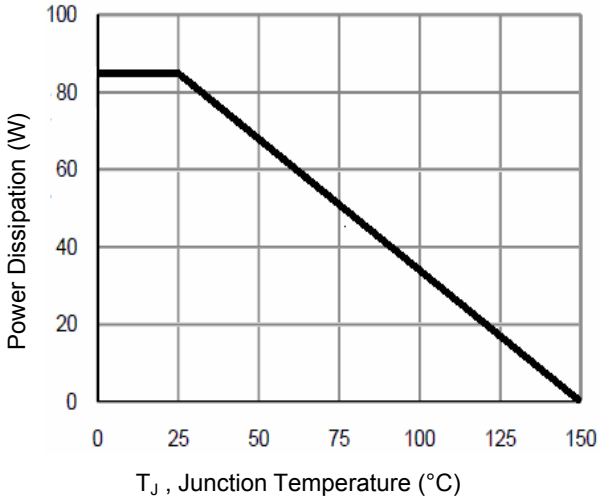


Figure 8. Power De-Rating

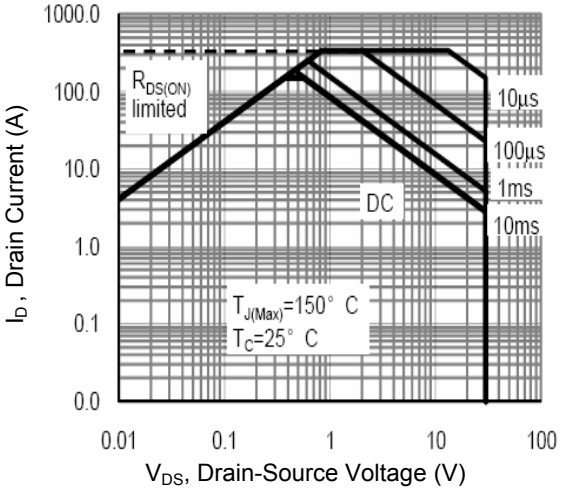


Figure 9. Safe Operation Area

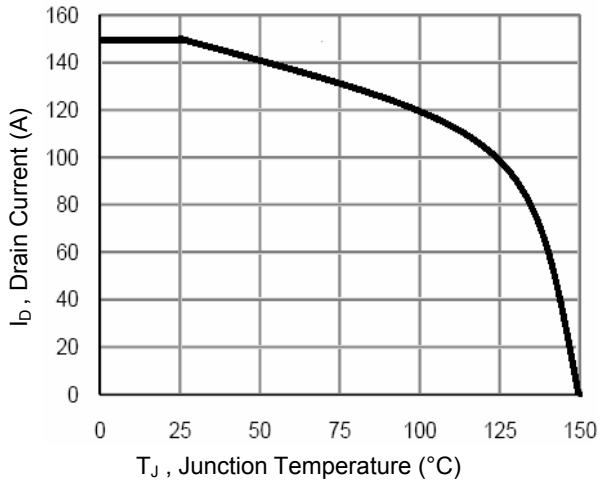


Figure 10. Current De-Rating

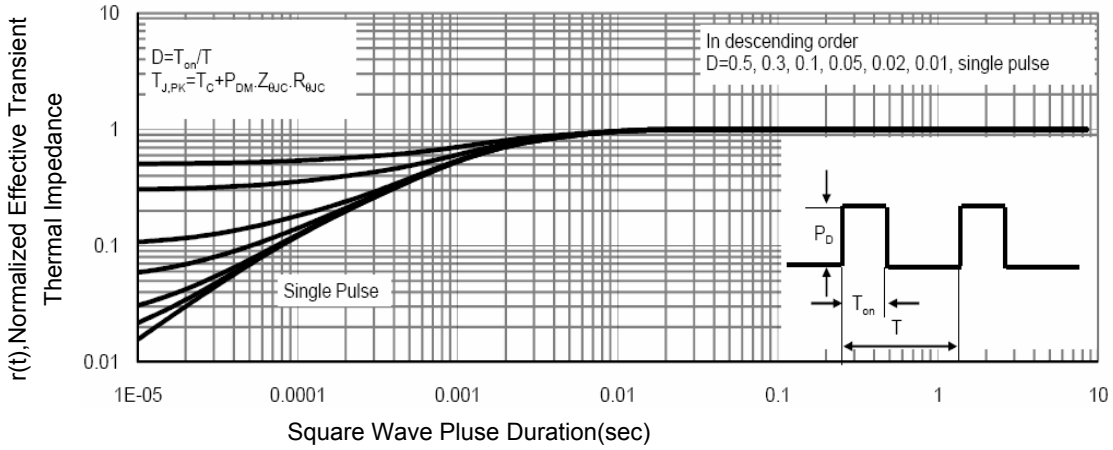
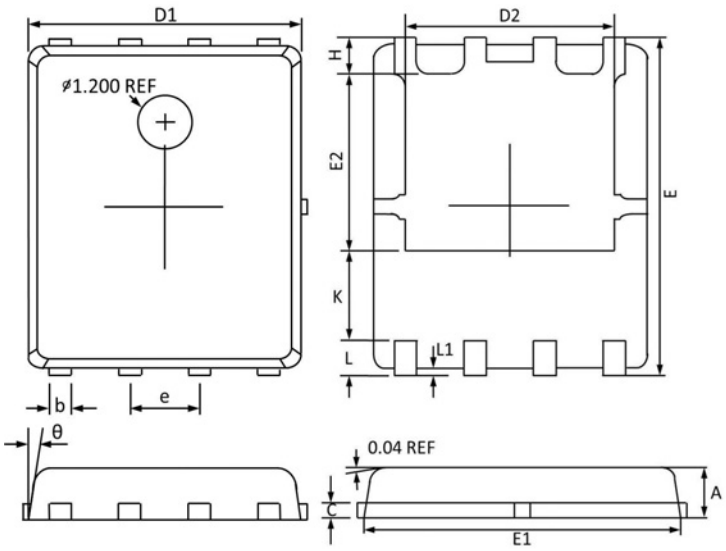


Figure 11 Normalized Maximum Transient Thermal Impedance

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°