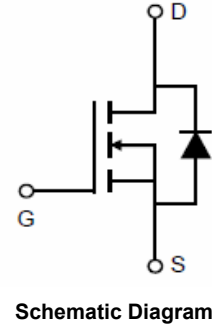
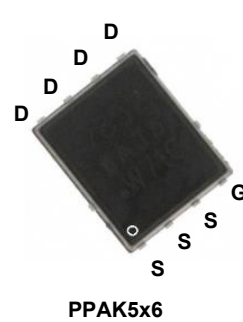


Main Product Characteristics

BV_{DSS}	30V
$R_{DS(ON)}$	2.3m Ω
I_D	90A



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 GSGP0390 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_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	90	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)		63.6	A
Drain Current-Pulsed	I_{DM}	360	A
Maximum Power Dissipation	P_D	70	W
Derating Factor		0.56	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ⁵	E_{AS}	500	mJ
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.8	$^\circ\text{C}/\text{W}$
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
Off Characteristics						
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	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	2	2.3	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	3.1	3.6	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=20A$	-	60	-	S
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, F=1MHz$	-	2100	-	pF
Output Capacitance	C_{oss}		-	773	-	
Reverse Transfer Capacitance	C_{rss}		-	15.5	-	
Switching Characteristics⁴						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=15V, R_G=1.6\Omega, V_{GS}=10V, I_D=20A$	-	7.5	-	nS
Turn-On Rise Time	t_r		-	4	-	
Turn-Off Delay Time	$t_{d(off)}$		-	37	-	
Turn-Off Fall Time	t_f		-	7.5	-	
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=20A, V_{GS}=10V$	-	34.8	-	nC
Gate-Source Charge	Q_{gs}		-	6.2	-	
Gate-Drain Charge	Q_{gd}		-	5.1	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
Diode Forward Current ²	I_S		-	-	90	A
Reverse Recovery Time	T_{rr}	$I_F=I_S, di/dt=100A/\mu s^3, T_J=25^\circ C$	-	14	-	nS
Reverse Recovery Charge	Q_{rr}		-	21	-	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 : $T_J=25^\circ C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Electrical and Thermal Characteristic Curves

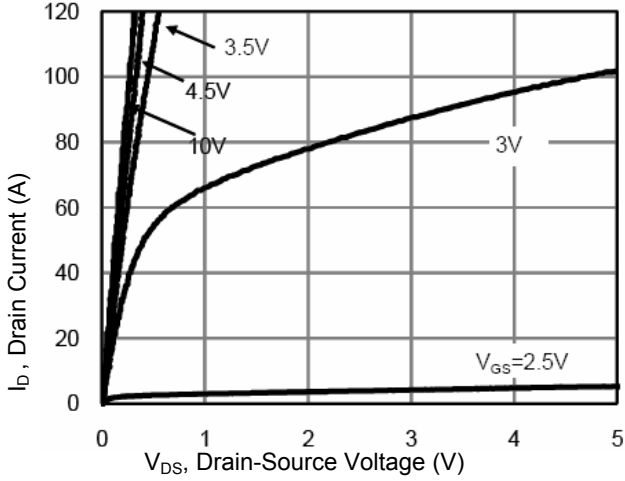


Figure 1. Output Characteristics

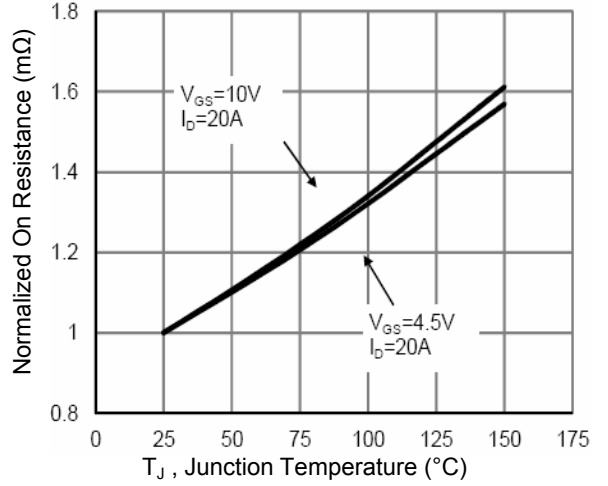


Figure 2. Rdson-Junction Temperature

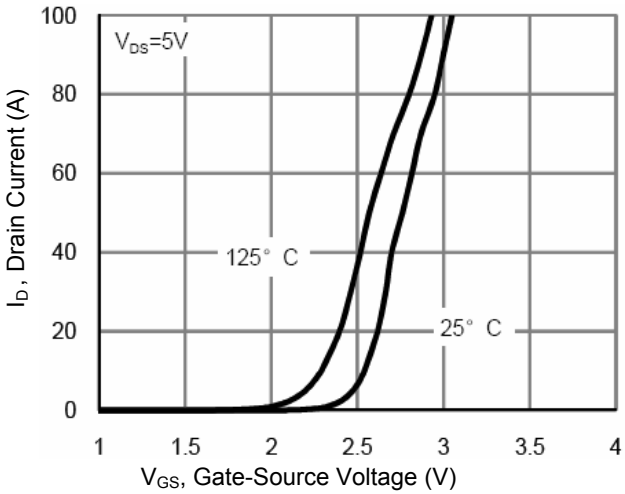


Figure 3. Transfer Characteristics

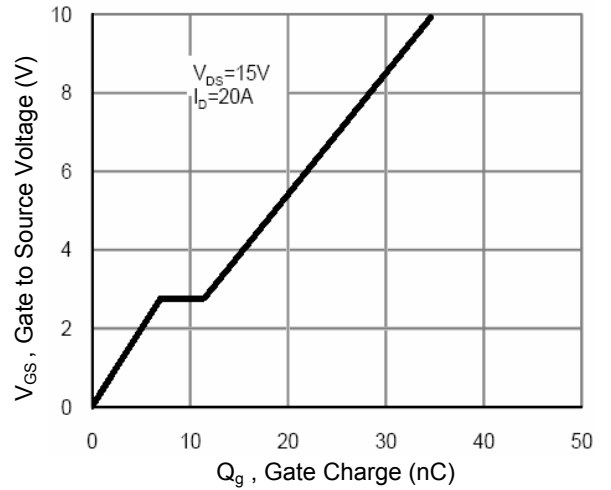


Figure 4. Gate Charge

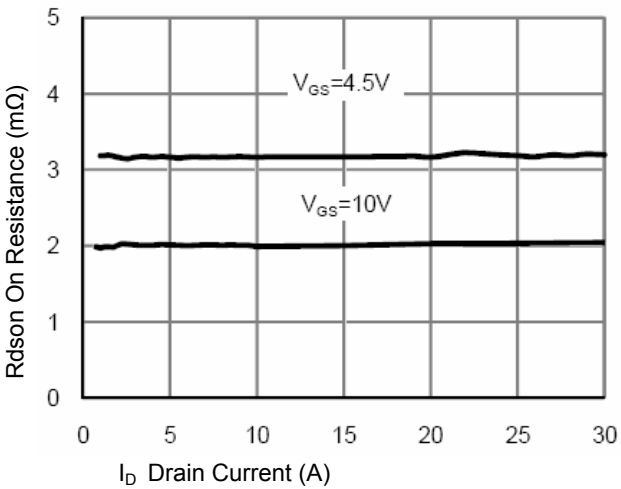


Figure 5. Rdson-Drain Current

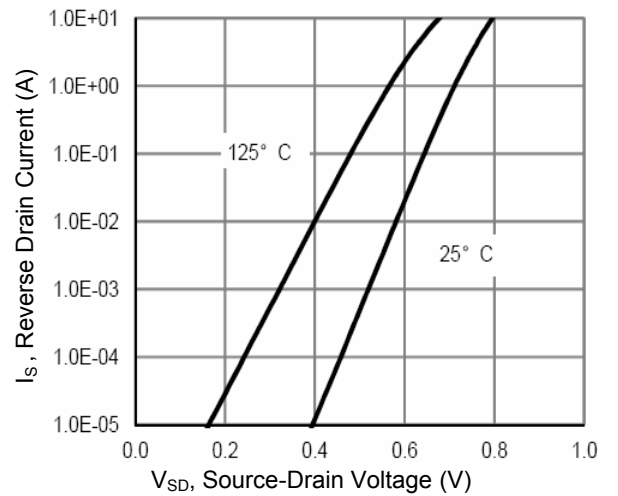


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

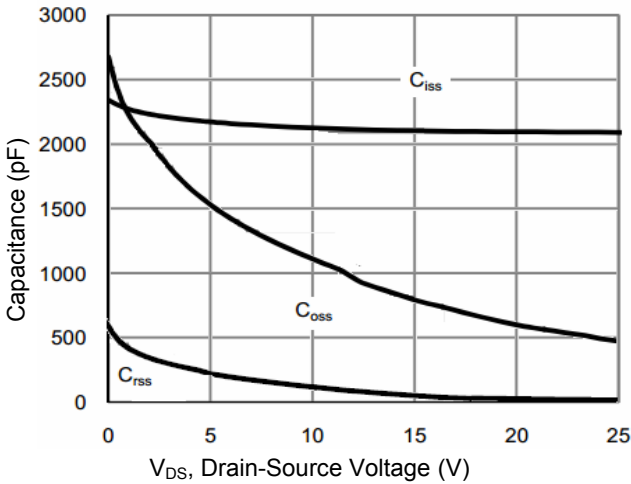


Figure 7. Capacitance vs. V_{DS}

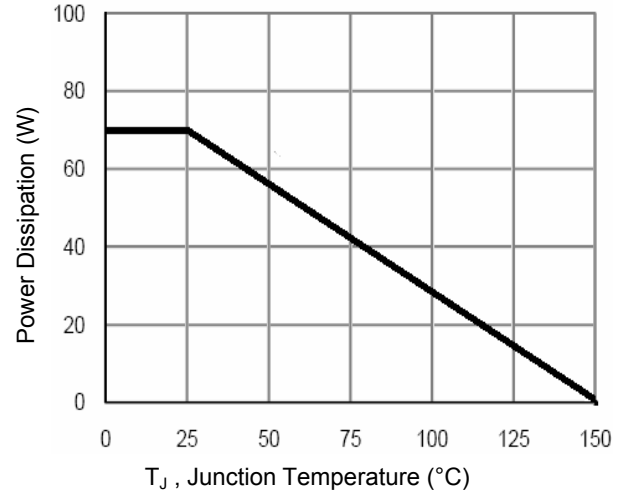


Figure 8. Power De-Rating

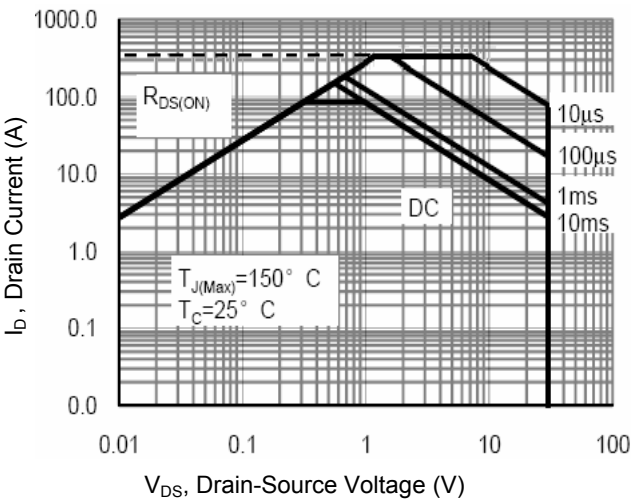


Figure 9. Safe Operation Area

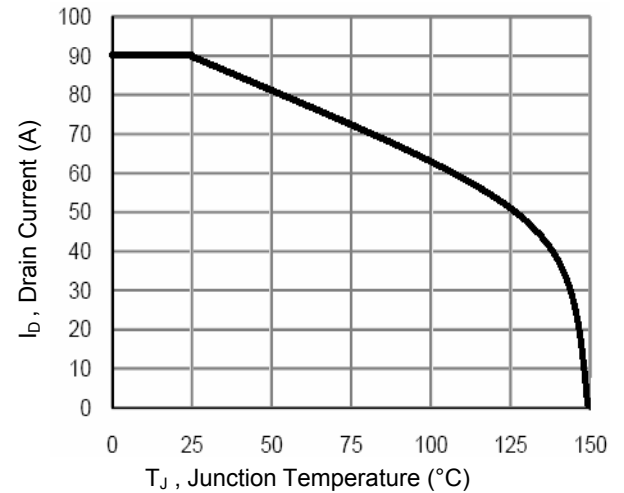


Figure 10. Current De-Rating

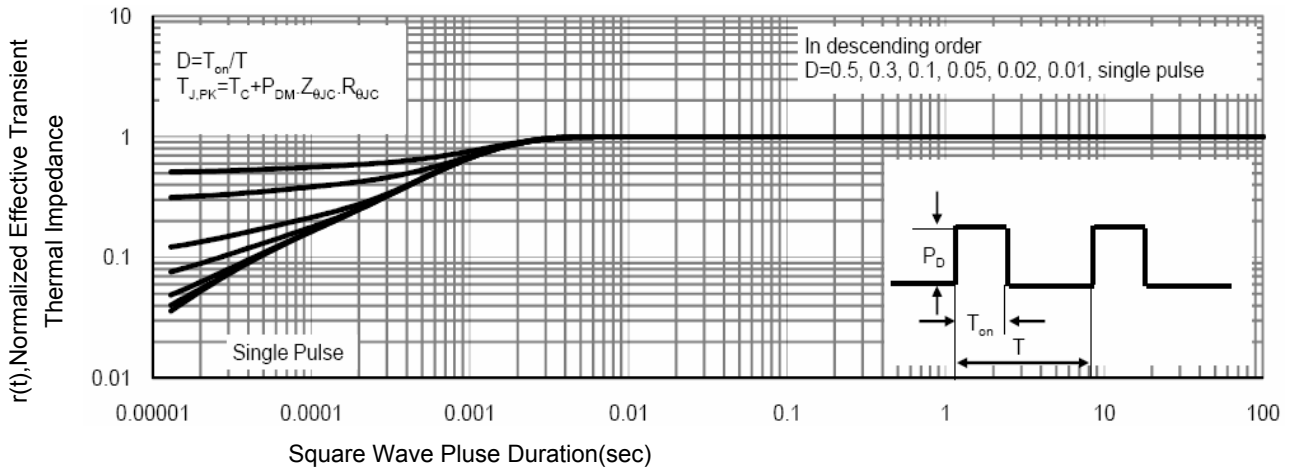
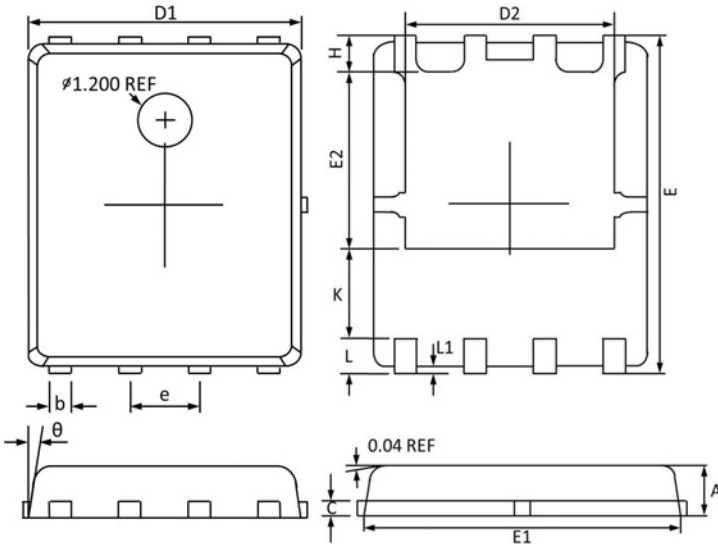


Figure 11 Normalized Maximum Transient Thermal Impedance

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°