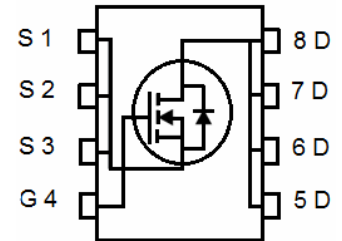
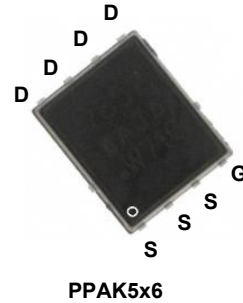


Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	6.5m Ω
I_D	55A



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

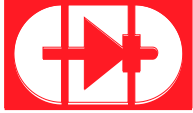


Description

The GSGP0656 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}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	55	A
Drain Current-Continuous($T_C=100^{\circ}\text{C}$)	$I_{D(100^{\circ}\text{C})}$	42.9	A
Pulsed Drain Current	I_{DM}	220	A
Maximum Power Dissipation	P_D	65	W
Derating Factor		0.52	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy ⁵	E_{AS}	350	mJ
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.92	$^{\circ}\text{C}/\text{W}$
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}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=25A$	-	6.5	7.5	m Ω
		$V_{GS}=4.5V, I_D=25A$	-	7.7	8.8	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=25A$	-	60	-	S
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, F=1.0MHz$	-	2000	-	pF
Output Capacitance	C_{oss}		-	315	-	
Reverse Transfer Capacitance	C_{rss}		-	9.9	-	
Switching Characteristics⁴						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, I_D=25A, V_{GS}=10V, R_G=1.6\Omega$	-	8	-	nS
Turn-On Rise Time	t_r		-	2	-	
Turn-Off Delay Time	$t_{d(off)}$		-	29	-	
Turn-Off Fall Time	t_f		-	4	-	
Total Gate Charge	Q_g	$V_{DS}=30V, I_D=25A, V_{GS}=10V$	-	34.8	-	nC
Gate-Source Charge	Q_{gs}		-	7	-	
Gate-Drain Charge	Q_{gd}		-	5.3	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=25A$	-	-	1.2	V
Diode Forward Current ²	I_S		-	-	55	A
Reverse Recovery Time	t_{rr}	$I_F=25A, dI/dt=100A/\mu s^3, T_J=25^\circ C$	-	38	-	nS
Reverse Recovery Charge	Q_{rr}		-	48	-	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 : $T_J=25^\circ C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25\Omega$

Typical Electrical and Thermal Characteristic Curves

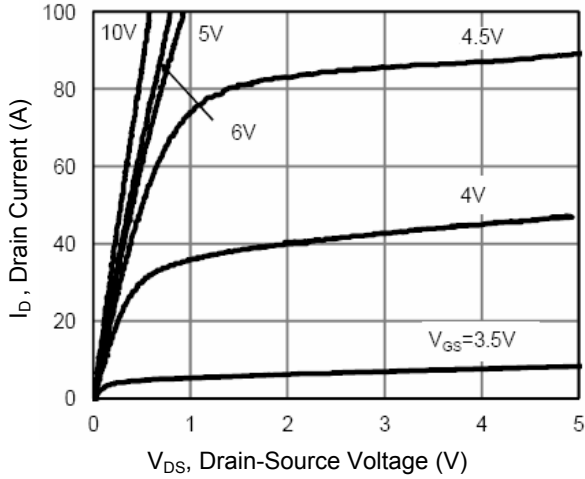


Figure 1. Output Characteristics

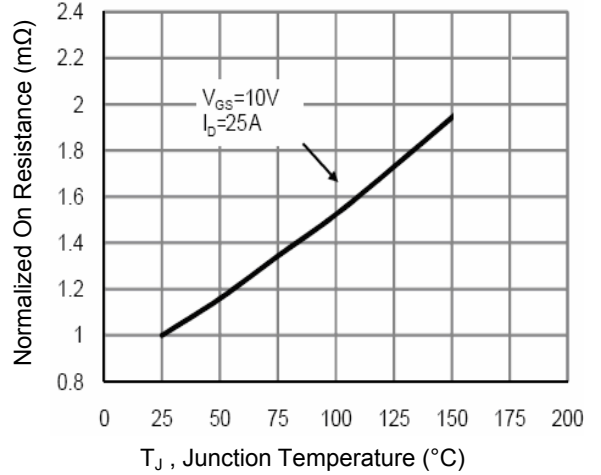


Figure 2. Rdson-Junction Temperature

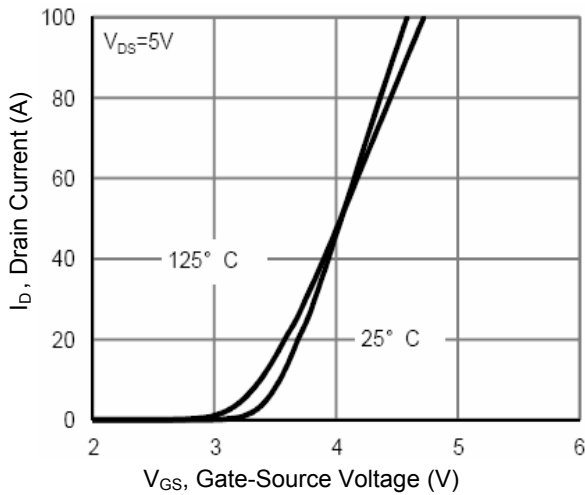


Figure 3. Transfer Characteristics

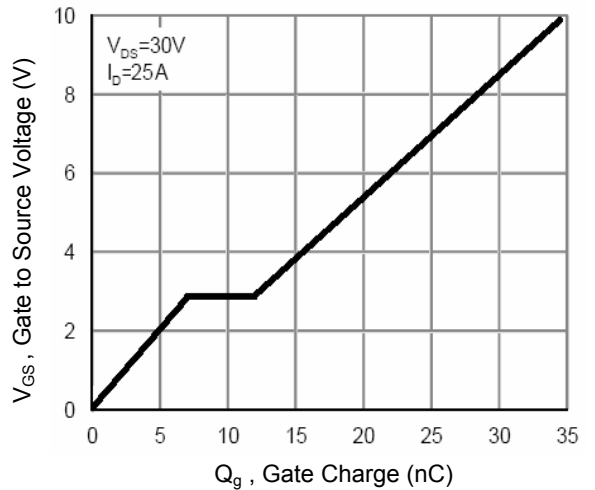


Figure 4. Gate Charge

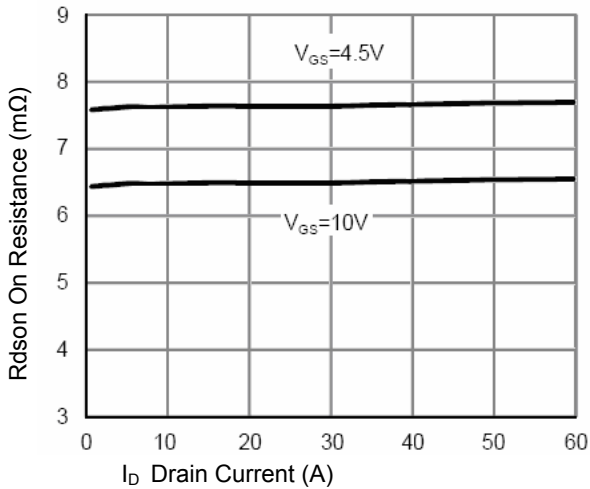


Figure 5. Rdson-Drain Current

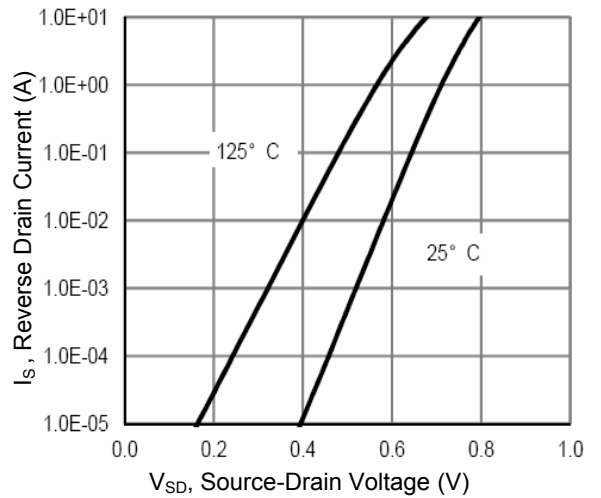


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

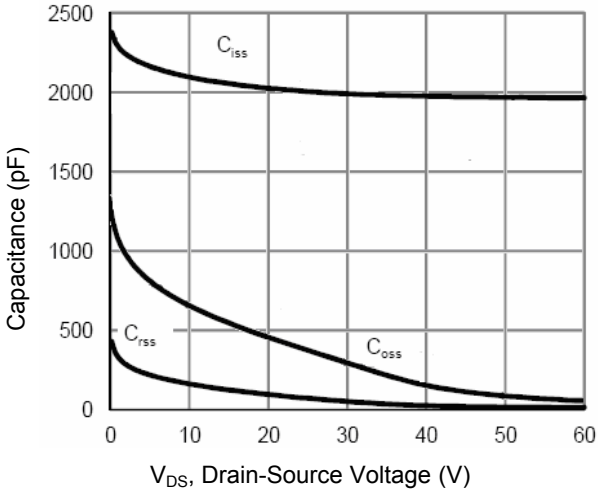


Figure 7. Capacitance vs. V_{DS}

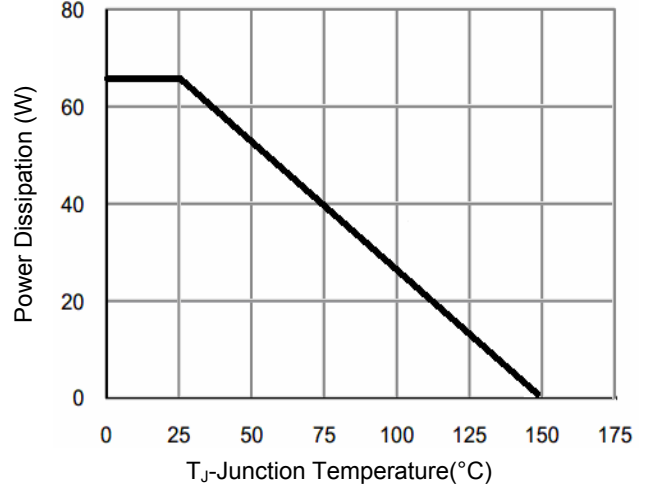


Figure 8. Power De-rating

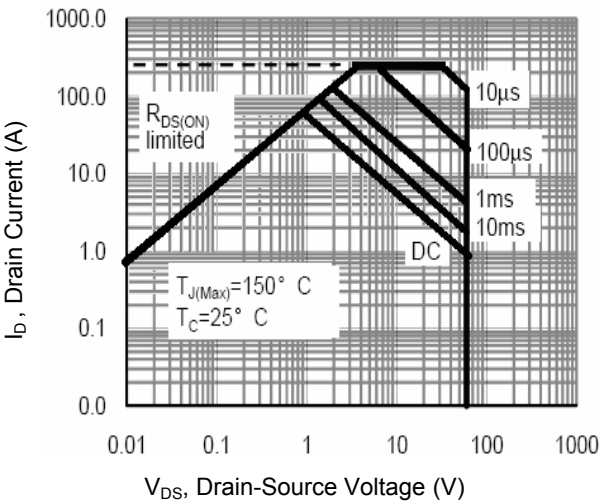


Figure 9. Safe Operation Area

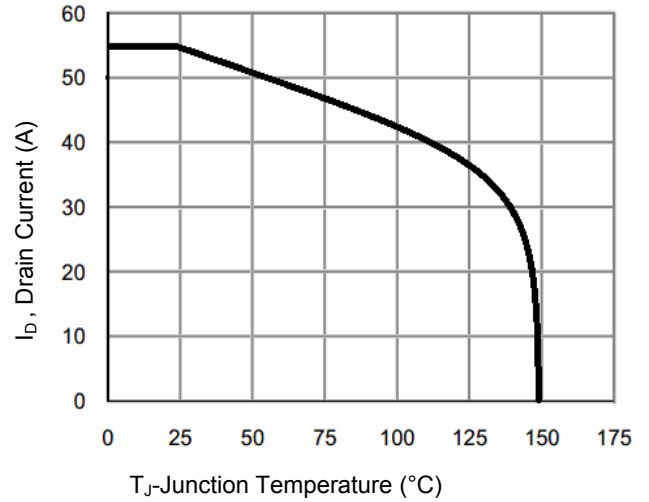


Figure 10. Current De-rating

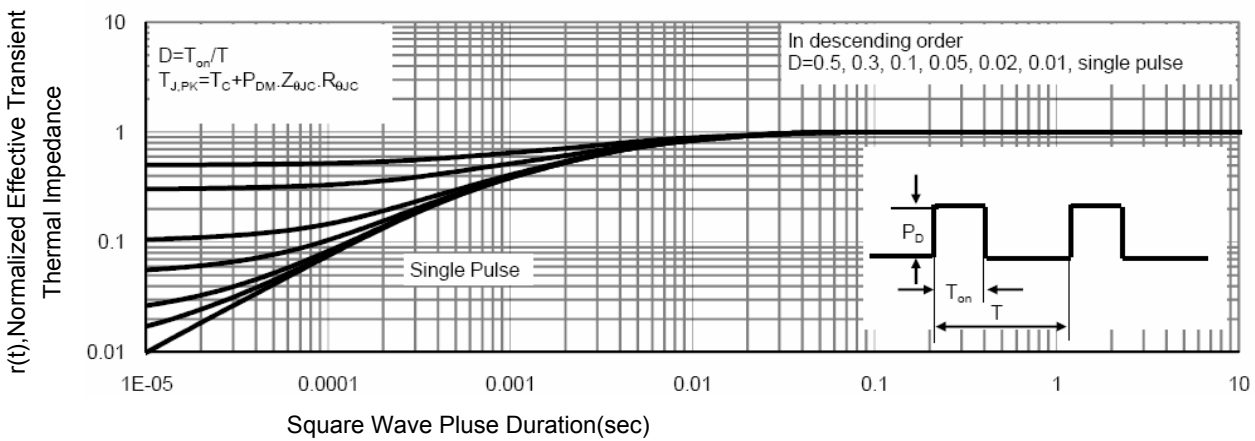
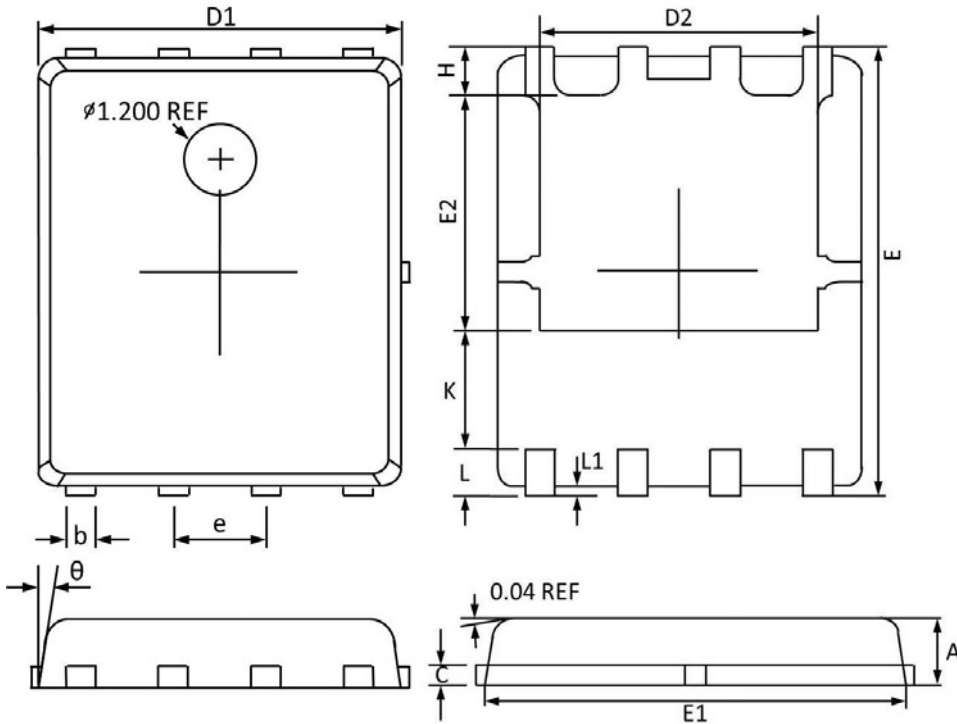


Figure 11. Normalized Maximum Transient Thermal Impedance

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°