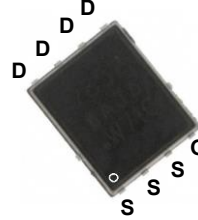
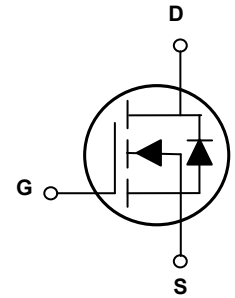


Main Product Characteristics

V_{DS}	100V
$R_{DS(ON)}$	12m Ω
I_D	55A



PPAK 5x6



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 GSGP1056 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}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	55	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		38.9	A
Drain Current-Pulsed ¹	I_{DM}	220	A
Maximum Power Dissipation	P_D	78	W
Derating Factor		0.62	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ⁵	E_{AS}	240	mJ
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.6	$^\circ\text{C}/\text{W}$
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}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.3	1.8	2.3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	9.5	12	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	11.5	15	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=20A$	-	60	-	S
Dynamic and Switching Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1MHz$	-	2500	-	pF
Output Capacitance	C_{oss}		-	170	-	
Reverse Transfer Capacitance	C_{rss}		-	11	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50V, R_G=1.6\Omega, V_{GS}=10V, I_D=20A$	-	8	-	nS
Turn-On Rise Time	t_r		-	3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	25	-	
Turn-Off Fall Time	t_f		-	4	-	
Total Gate Charge	Q_g	$V_{DS}=50V, I_D=20A, V_{GS}=10V$	-	50	-	nC
Gate-Source Charge	Q_{gs}		-	15	-	
Gate-Drain Charge	Q_{gd}		-	8.9	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=55A$	-	-	1.2	V
Diode Forward Current ²	I_S		-	-	55	A
Reverse Recovery Time	T_{rr}	$T_J=25^\circ C, I_F=20A, di/dt=500A/\mu s^3$	-	-	28	nS
Reverse Recovery Charge	Q_{rr}		-	-	128	nC

Note:

1. Repetitive rating: Pulsed 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 : $T_J=25^\circ C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega$ 2/5

Typical Electrical and Thermal Characteristic Curves

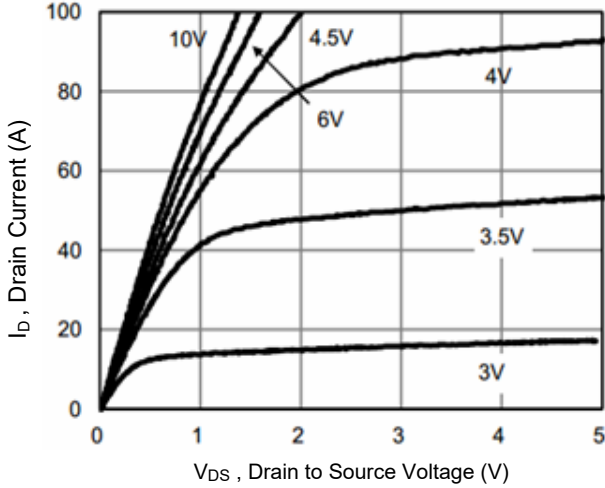


Figure.1 Output Characteristics

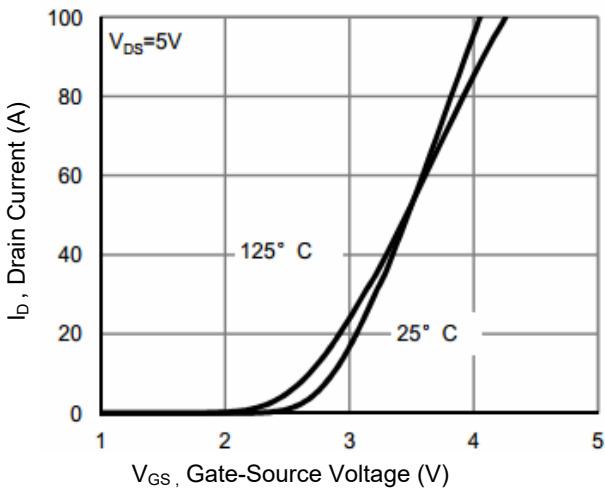


Figure 3. Transfer Characteristics

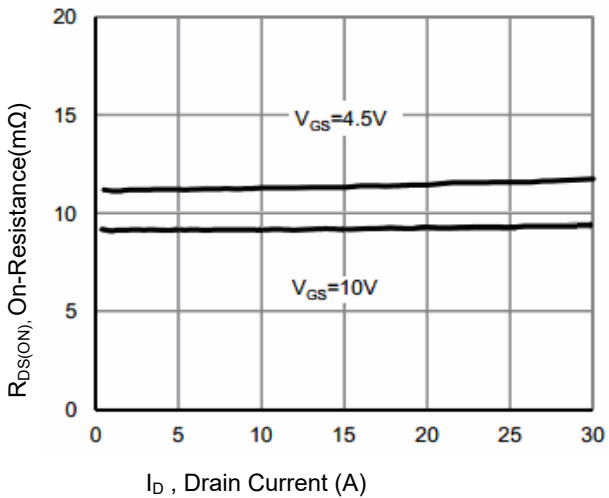


Figure 5. $R_{DS(ON)}$ - Drain Current

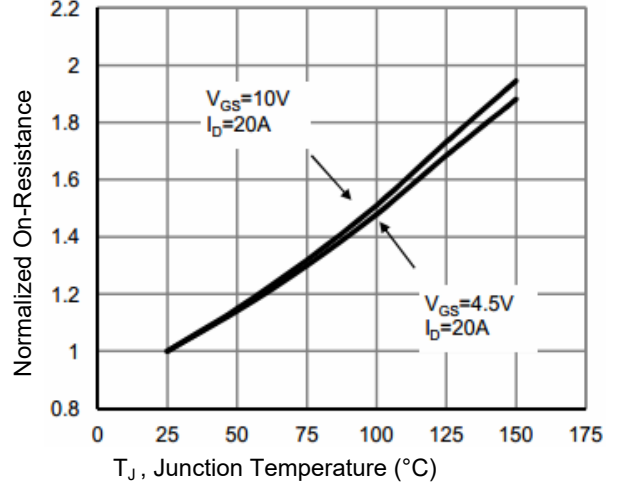


Figure 2. $R_{DS(ON)}$ -Junction Temperature

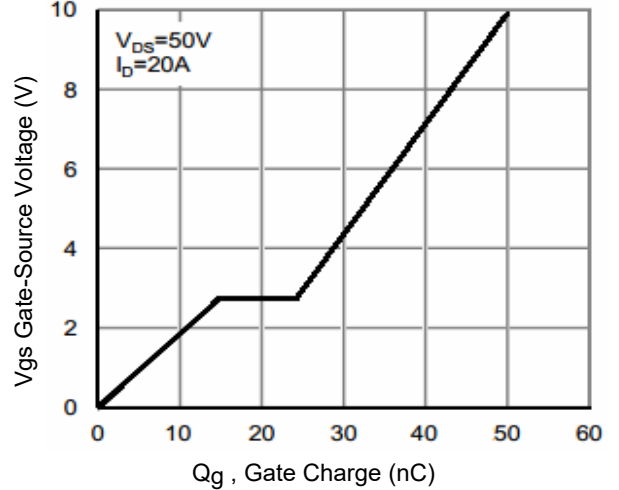


Figure 4. Gate Charge Characteristics

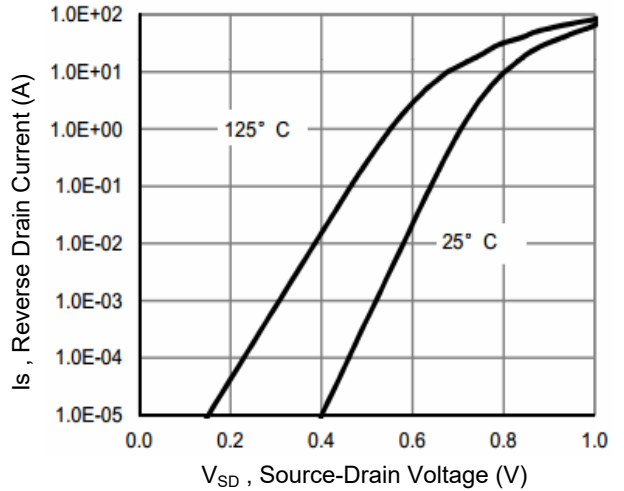


Figure 6. Source- Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

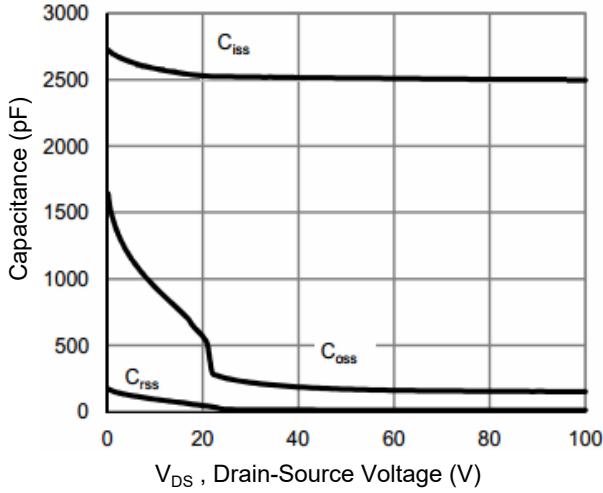


Figure 7. Capacitance vs V_{DS}

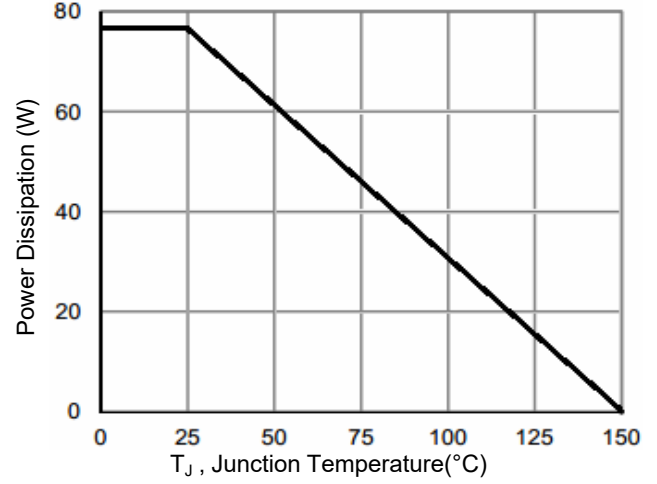


Figure 8. Power De-rating

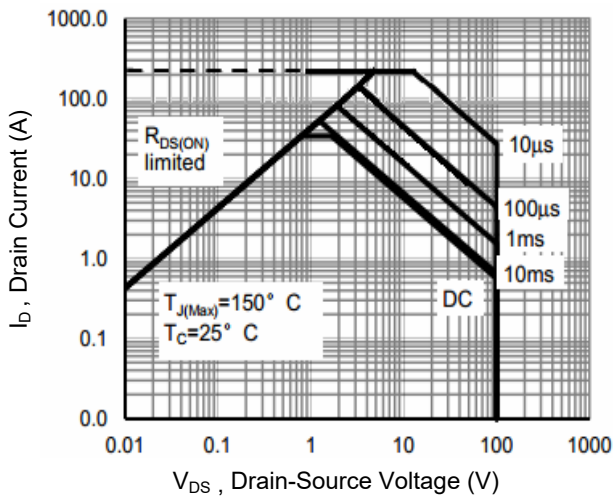


Figure 9. Safe Operation Area

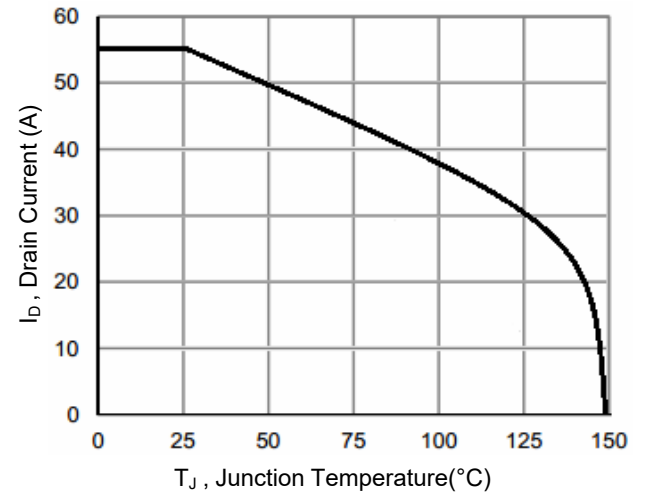


Figure 10. Current De-rating

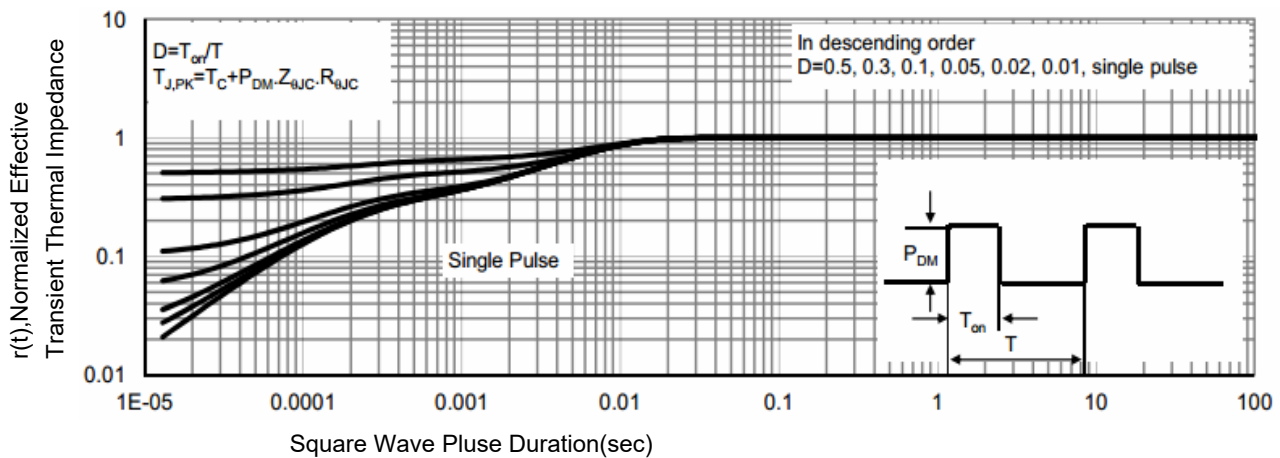
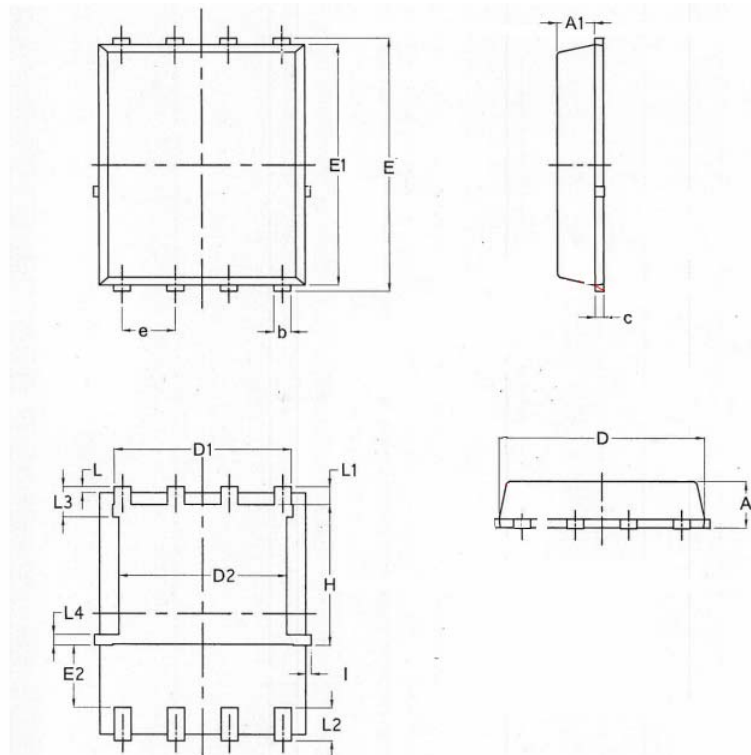


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.90	1.10	1.17	0.0354	0.0433	0.0461
A1	0.824	0.897	0.97	0.0324	0.0353	0.0382
b	0.33	0.41	0.50	0.0130	0.0161	0.0197
C	0.150	0.20	0.250	0.0059	0.0079	0.0098
D	4.80	4.90	5.00	0.1890	0.1929	0.1969
D1	3.91	4.22	4.36	0.1539	0.1661	0.1717
D2	3.85	4.00	4.15	0.1516	0.1575	0.1634
E	5.90	6.05	6.15	0.2323	0.2382	0.2421
E1	5.65	5.76	5.85	0.2224	0.2268	0.2303
E2	1.10	/	/	0.0433	/	/
e	1.27 BSC			0.050 BSC		
L	0.05	0.15	0.25	0.0020	0.0059	0.0098
L1	0.38	0.425	0.50	0.0150	0.0167	0.0197
L2	0.51	0.785	0.86	0.0201	0.0309	0.0339
L3	0.55	0.70	0.85	0.0217	0.0276	0.0335
L4	0.10	0.25	0.40	0.0039	0.0098	0.0157
H	3.25	3.35	3.58	0.1280	0.1319	0.1409
I	0	/	0.18	0	/	0.0071