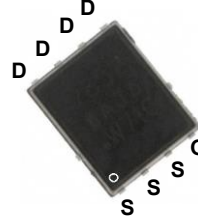
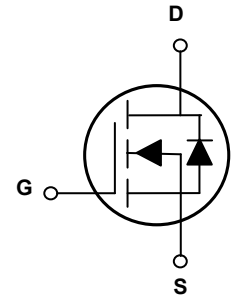


Main Product Characteristics

V_{DS}	100V
$R_{DS(ON)}$	10.8m Ω
I_D	55A



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 GSGP1054 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
Pulsed Drain Current	I_{DM}	240	A
Maximum Power Dissipation	P_D	98	W
Derating Factor		0.78	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ⁵	E_{AS}	235	mJ
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.28	$^\circ\text{C}/\text{W}$
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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	-	9.2	10.8	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=30A$	-	45	-	S
Dynamic and Switching Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1MHz$	-	2500	-	pF
Output Capacitance	C_{oss}		-	273	-	
Reverse Transfer Capacitance	C_{rss}		-	27	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50V, R_G=4.7\Omega, V_{GS}=10V, I_D=30A$	-	13	-	nS
Turn-On Rise Time	t_r		-	8.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	29	-	
Turn-Off Fall Time	t_f		-	4	-	
Total Gate Charge	Q_g	$V_{DS}=50V, I_D=30A, V_{GS}=10V$	-	37	-	nC
Gate-Source Charge	Q_{gs}		-	14	-	
Gate-Drain Charge	Q_{gd}		-	8	-	
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}	$T_J=25^\circ\text{C}, I_F=I_S, di/dt=100A/\mu s^3$	-	78	-	nS
Reverse Recovery Charge	Q_{rr}		-	149	-	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 : $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Electrical and Thermal Characteristic Curves

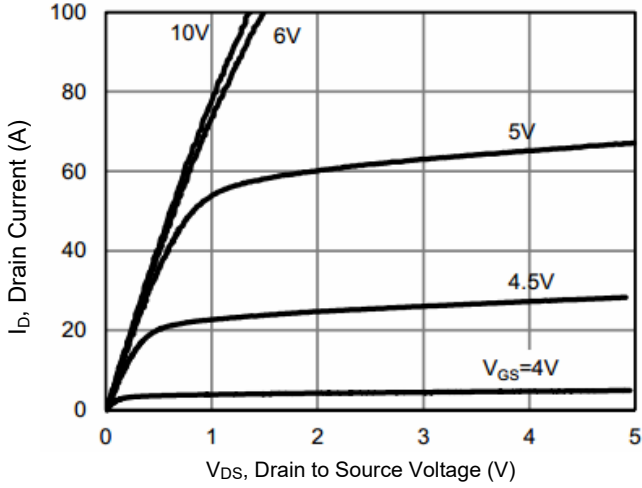


Figure.1 Output Characteristics

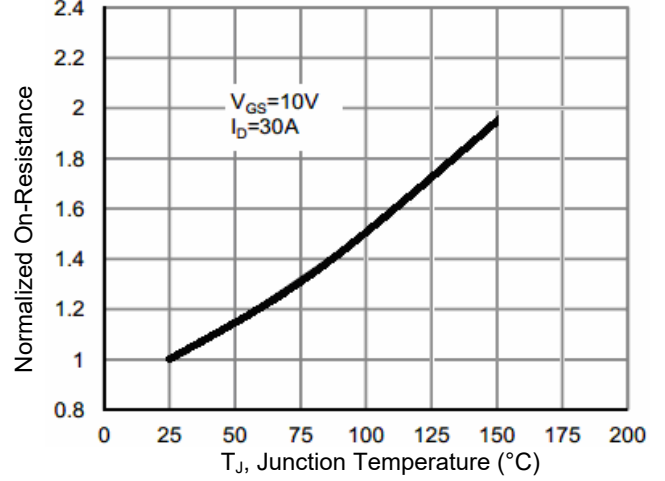


Figure 2. $R_{DS(ON)}$ - Junction Temperature

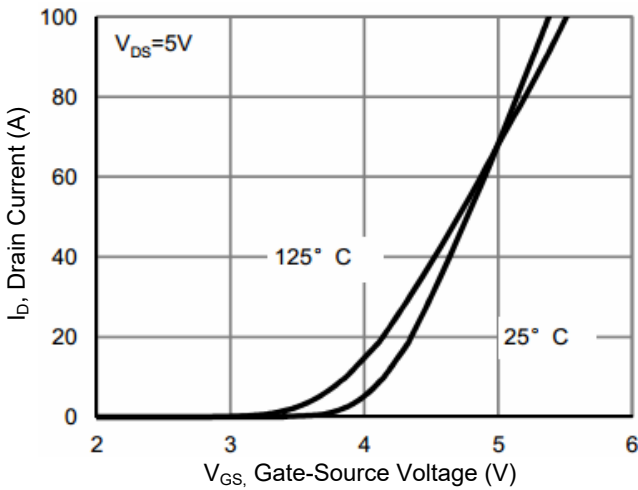


Figure 3. Transfer Characteristics

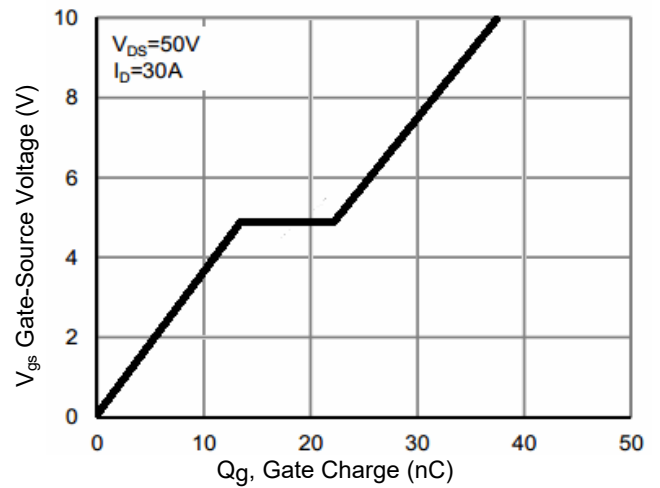


Figure 4. Gate Charge Characteristics

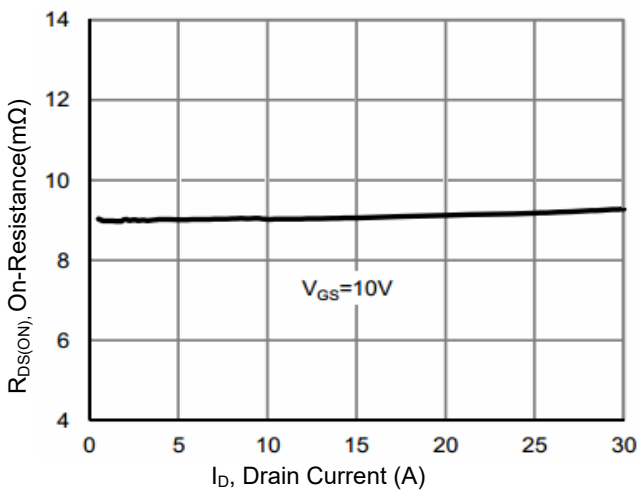


Figure 5. $R_{DS(ON)}$ - Drain Current

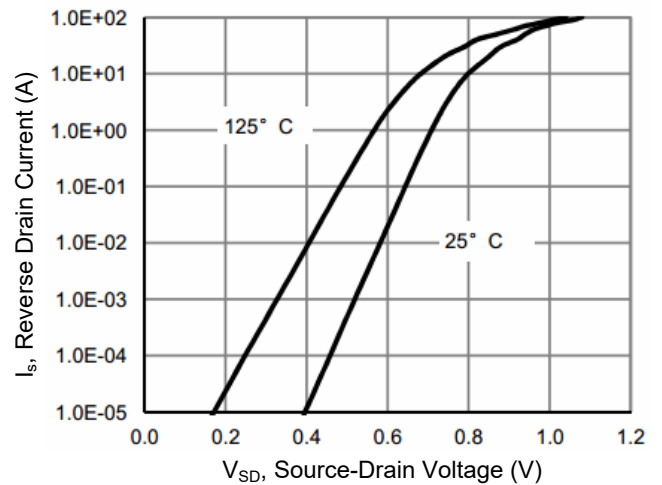


Figure 6. Source- Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

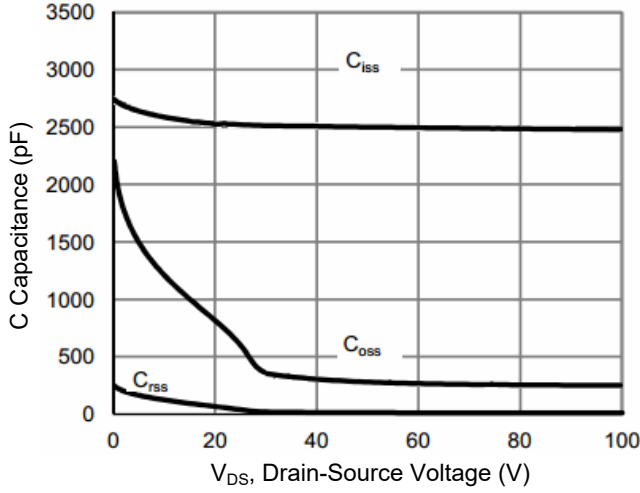


Figure 7. Capacitance vs V_{DS}

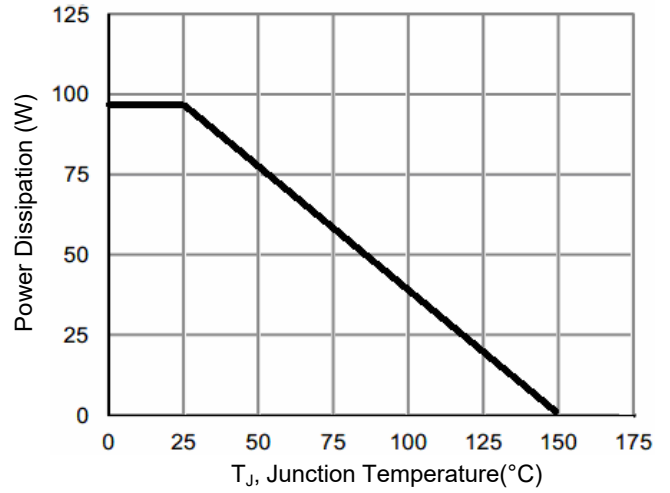


Figure 8. Power De-rating

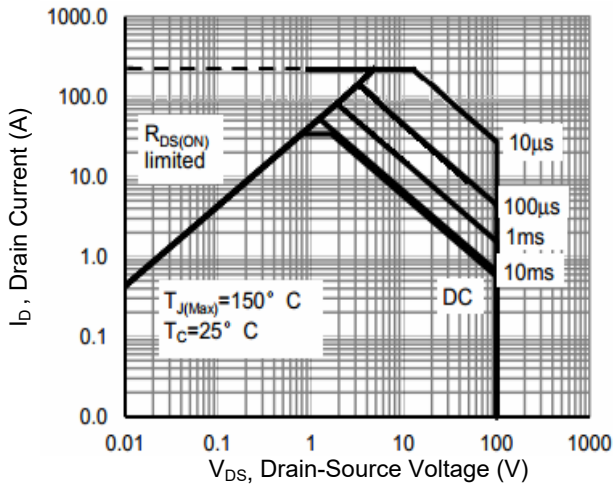


Figure 9. Safe Operation Area

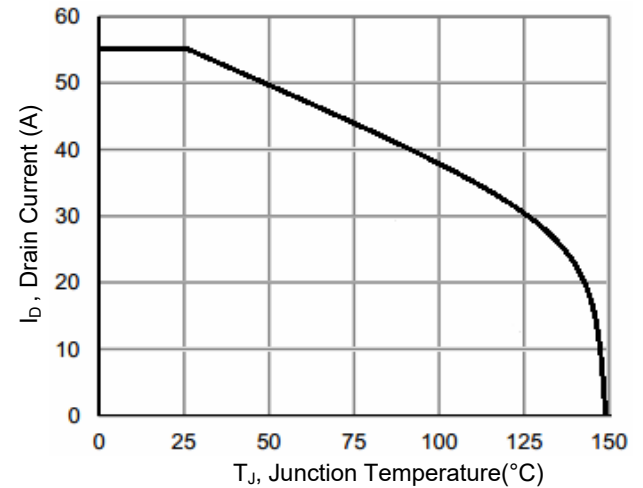


Figure 10. Current De-rating

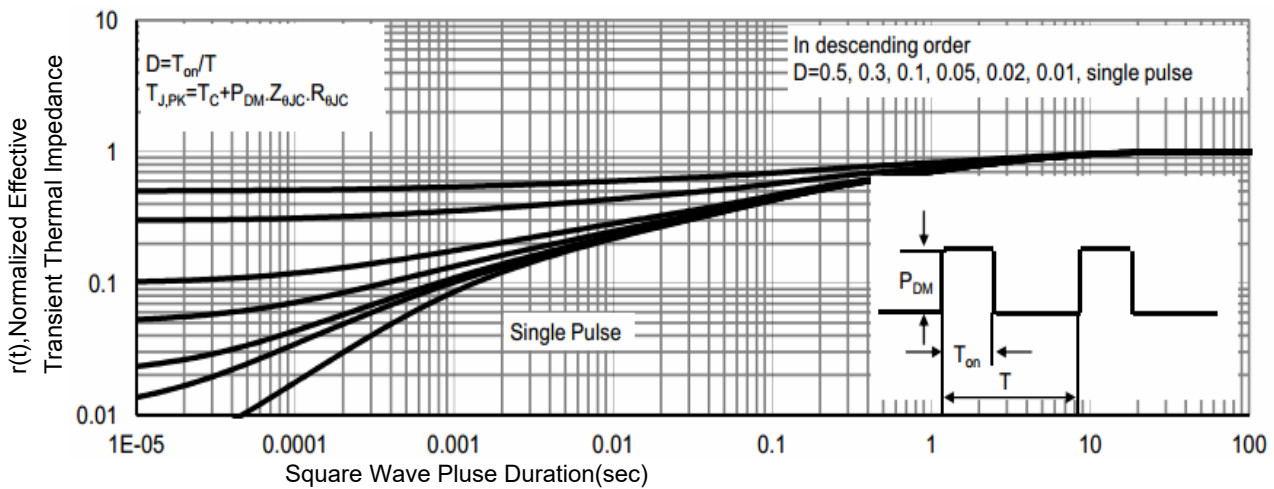


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

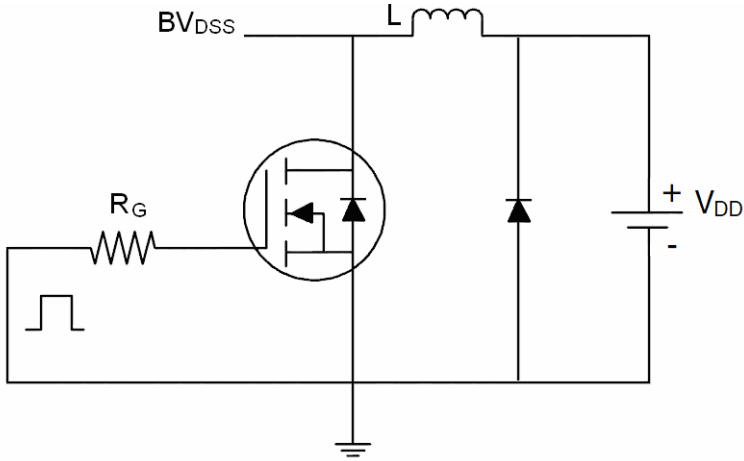


Figure 12. E_{AS} Test Circuit

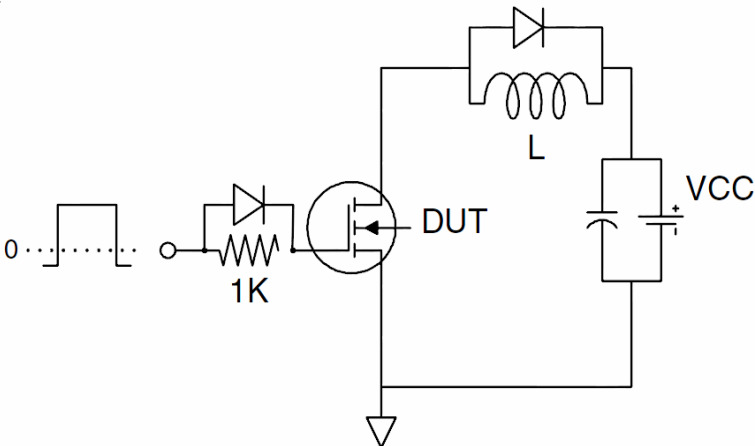


Figure 13. Gate charge test Circuit

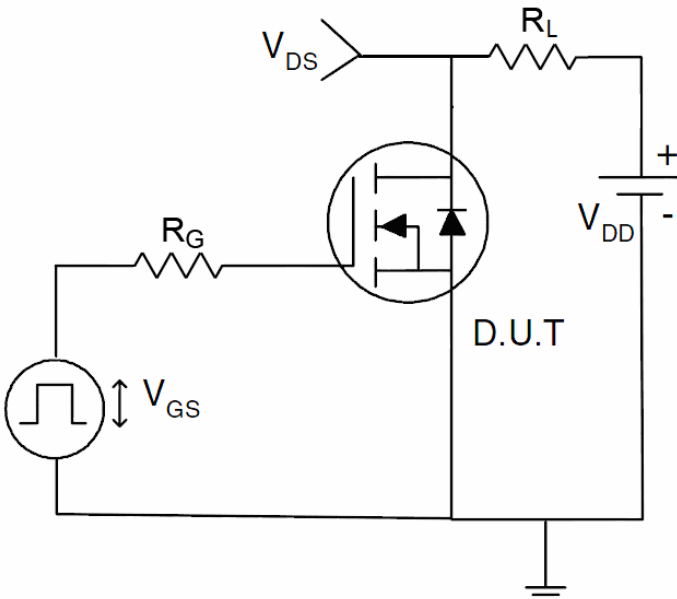


Figure 14. Switch Time Test Circuit

