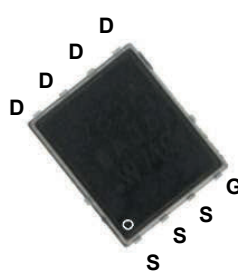
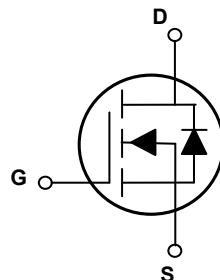


Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	1.7m Ω (Max)
I_D	144A



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
- AEC-Q101 qualified

Description

The GSGP1R704AU 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 supplies and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous, @ Steady-State ($T_C=25^{\circ}\text{C}$) ¹	I_D	144	A
Drain Current-Continuous, @ Steady-State ($T_C=100^{\circ}\text{C}$) ¹		91	
Drain Current-Pulsed ($T_C=25^{\circ}\text{C}$) ²	I_{DM}	576	A
Single Pulse Avalanche Energy	E_{AS}	105	mJ
Single Pulse Current	I_{AS}	46	A
Power Dissipation ($T_C=25^{\circ}\text{C}$) ³	P_D	95	W
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
Junction-to-Case	$R_{\theta JC}$	1.58	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +175	$^{\circ}\text{C}$
Soldering Temperature (SMD)	T_{sold}	260	$^{\circ}\text{C}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1.0	μA
		$V_{DS}=40V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	1.0	-	μA
Gate-Source Forward Leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	-	1.4	1.7	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.4	-	2.4	V
Dynamic and Switching Characteristics						
Total Gate Charge ^{4,5}	Q_g	$V_{DD}=20V, I_D=50A, V_{GS}=10V$	-	62	-	nC
Gate-Source Charge ^{4,5}	Q_{gs}		-	21	-	
Gate-Drain ("Miller") Charge ^{4,5}	Q_{gd}		-	6.0	-	
Gate to Plateau ^{4,5}	$V_{plateau}$		-	4.6	-	V
Turn-On Delay Time ^{4,5}	$t_{d(on)}$	$V_{DD}=20V, R_G=4.7\Omega, V_{GS}=10V, I_D=50A$	-	17	-	nS
Rise Time ^{4,5}	t_r		-	36	-	
Turn-Off Delay Time ^{4,5}	$t_{d(off)}$		-	52	-	
Fall Time ^{4,5}	t_f		-	16	-	
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, F=1\text{MHz}$	-	4242	-	pF
Output Capacitance	C_{oss}		-	1914	-	
Reverse Transfer Capacitance	C_{rss}		-	104	-	
Gate Resistance	R_g	$F=1\text{MHz}$	-	1.1	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	144	A
Diode Pulse Current	$I_{S,pulse}$		-	-	576	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=40A$	-	-	1.4	V
Reverse Recovery Time ⁴	t_{rr}	$V_{GS}=0V, V_R=20V, I_S=25A, di_f/dt=100A/\mu s$	-	56	-	nS
Reverse Recovery Charge ⁴	Q_{rr}		-	61	-	nC

Note:

1. The rated value only refers to the maximum absolute value under the case temperature of 25 degrees. If the case temperature is higher than 25 degrees, the frequency needs to be reduced according to the actual environmental conditions.
2. Pulse time of 5us, pulse width limited by maximum junction temperature.
3. The dissipated power value will change with the temperature. When it is greater than 25°C , the dissipated power value will decrease by 0.76°C/W for every 1 degree of temperature increase.
4. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

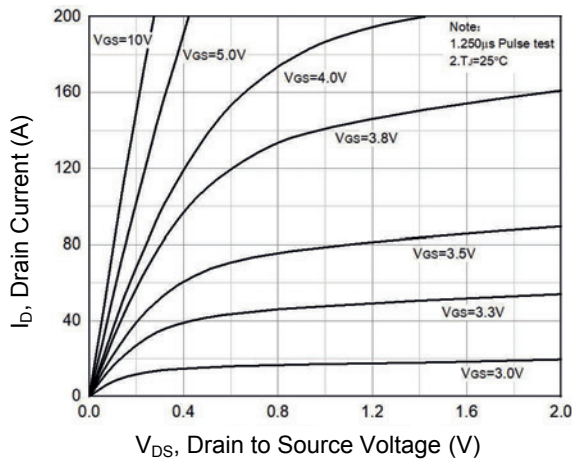


Figure 1. Typical Output Characteristics

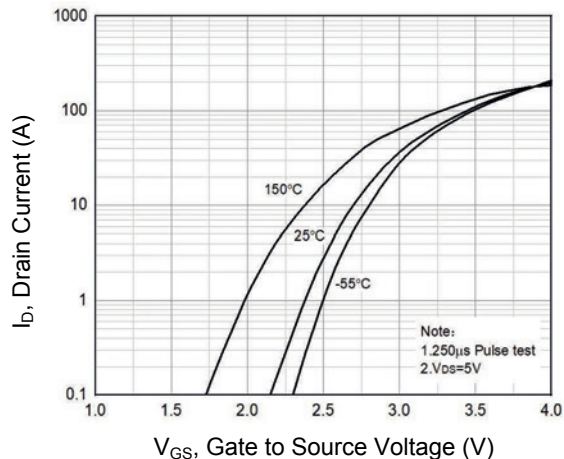


Figure 2. Transfer Characteristics

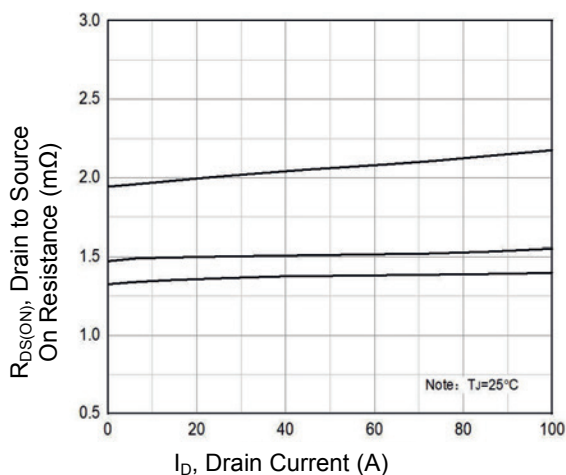


Figure 3. $R_{DS(ON)}$ vs. Drain Current

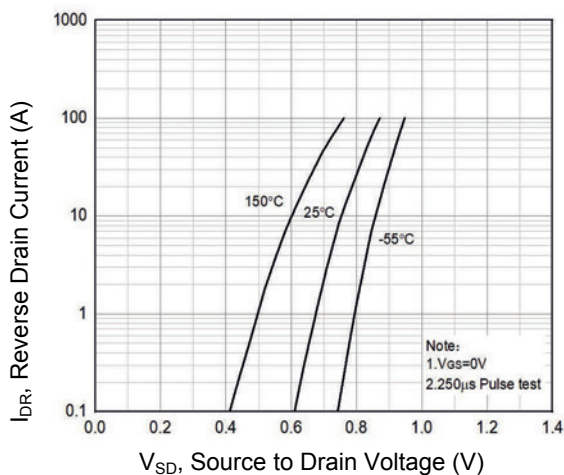


Figure 4. Body Diode Characteristics

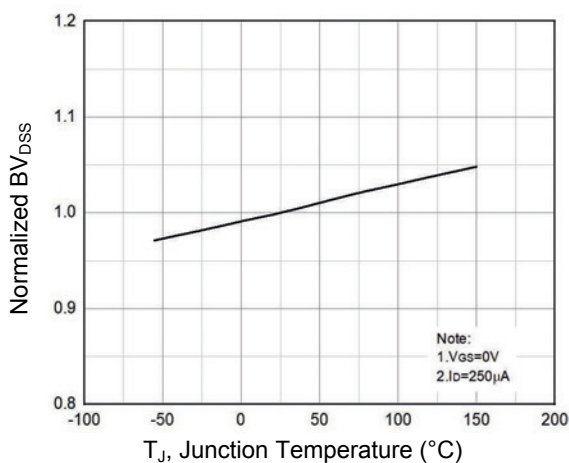


Figure 5. Normalized BV_{DS} vs. T_J

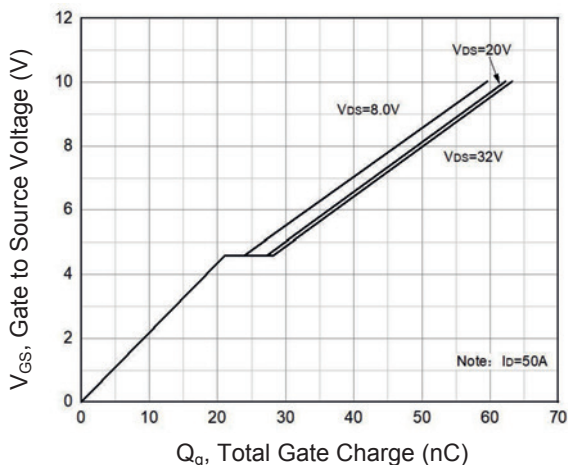


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

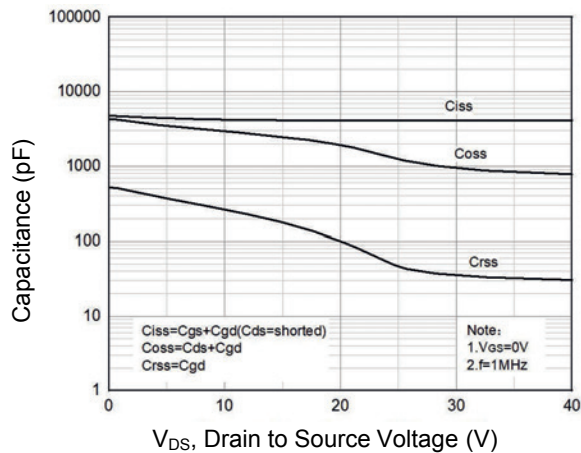


Figure 7. Capacitance Characteristics

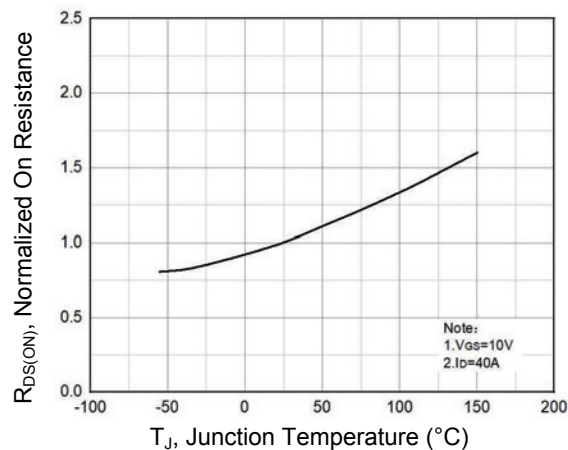


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

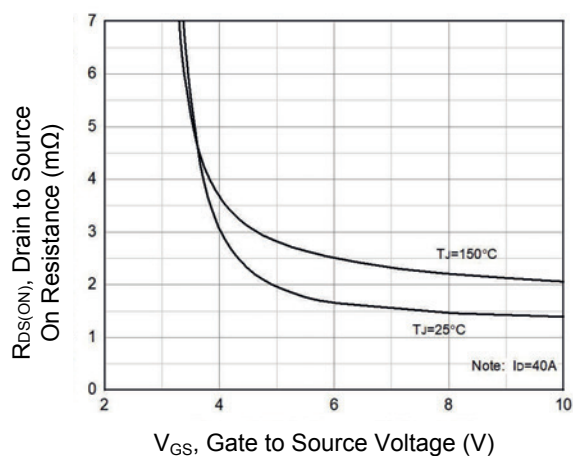


Figure 9. $R_{DS(ON)}$ vs. V_{GS}

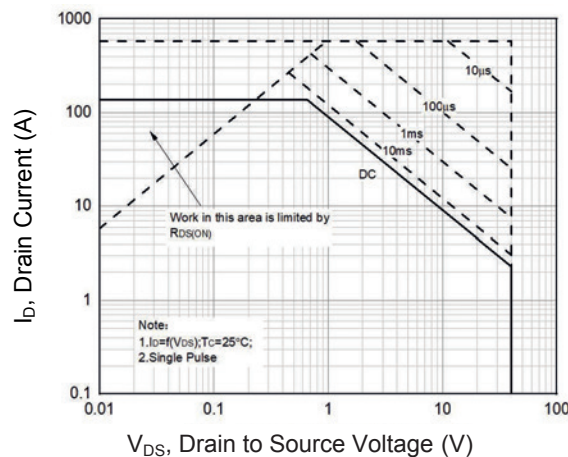
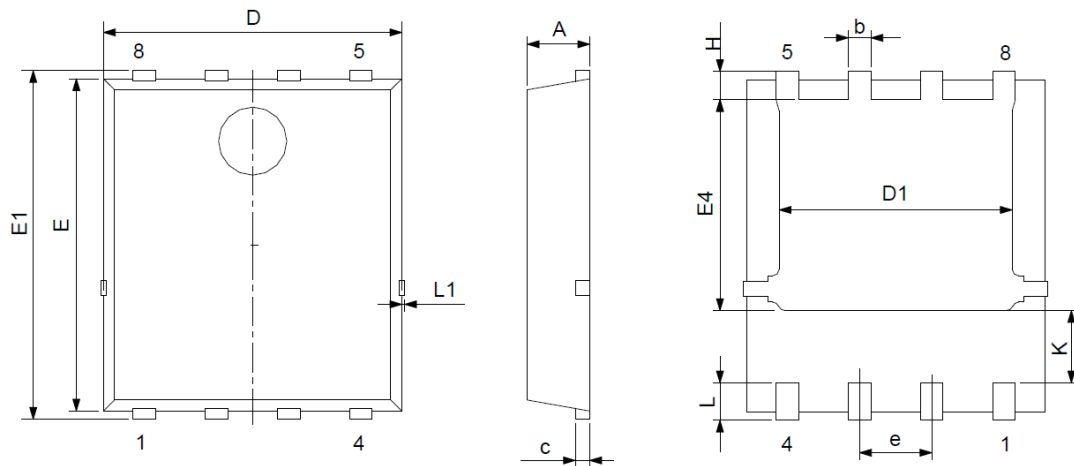


Figure 10. Safe Operation Area

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.047
c	0.154	0.354	0.006	0.014
D	4.800	5.400	0.189	0.213
E	5.660	6.060	0.223	0.239
D1	3.760	4.300	0.148	0.169
E1	5.900	6.350	0.232	0.250
b	0.300	0.550	0.012	0.022
k	1.100	1.500	0.043	0.059
e	1.070	1.370	0.042	0.054
E4	3.340	3.920	0.131	0.154
L	0.300	0.710	0.012	0.028
L1	-	0.120	-	0.005
H	0.400	0.710	0.016	0.028

Order Information

Device	Package	Marking	Carrier	Quantity
GSGP1R704AU	PPAK5x6	P1R704AU	Tape & Reel	5,000pcs / Reel