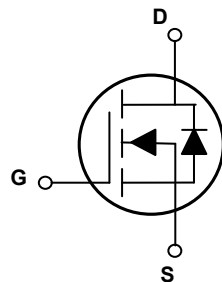
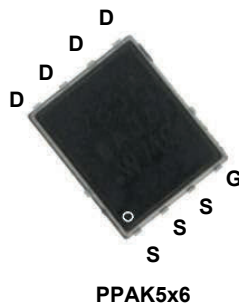


Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	6.5m Ω (Max.)
I_D	65A



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 GSGP6R504AU 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-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$)	I_D	65	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$)		43	A
Pulsed Drain Current ($T_C=25^{\circ}\text{C}$) ¹	I_{DM}	260	A
Power Dissipation ($T_C=25^{\circ}\text{C}$) ²	P_D	47	W
Single Pulse Avalanche Energy	E_{AS}	33.6	mJ
Single Pulse Current	I_{AS}	11.6	A
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.19	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	$^{\circ}\text{C}$
Soldering Temperature (SMD)	T_{sld}	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-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1.0	μA
		$V_{DS}=40V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	2.0	-	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	5.1	6.5	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	7.3	9.5	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	-	2.8	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=15V, f=1\text{MHz}$	-	860	-	pF
Output Capacitance	C_{oss}		-	495	-	
Reverse Transfer Capacitance	C_{rss}		-	36	-	
Total Gate Charge ^{3,4}	Q_g	$I_D=9A, V_{DD}=15V, V_{GS}=10V$	-	15.5	-	nC
Gate-to-Source Charge ^{3,4}	Q_{gs}		-	3.2	-	
Gate-to-Drain ("Miller") Charge ^{3,4}	Q_{gd}		-	2.2	-	
Gate-to-Plateau ^{3,4}	$V_{plateau}$		-	3.3	-	V
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=20V, V_{GS}=10V, R_G=3\Omega, I_D=9A$	-	4.4	-	nS
Rise Time ^{3,4}	t_r		-	31	-	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	21	-	
Fall Time ^{3,4}	t_f		-	12	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	2.2	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	65	A
Diode Pulse Current	$I_{S,pulse}$		-	-	260	A
Diode Forward Voltage	V_{SD}	$I_S=5A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time ³	T_{rr}	$I_S=2A, V_{GS}=0V, V_R=30V, dI_F/dt=100A/\mu s$	-	29	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	14	-	nC

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_A=11.6A$, starting $T_J=25^{\circ}\text{C}$.
3. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

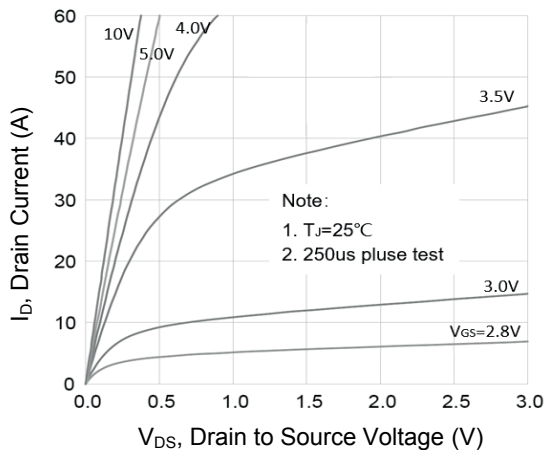


Figure 1. Typical Output Characteristics

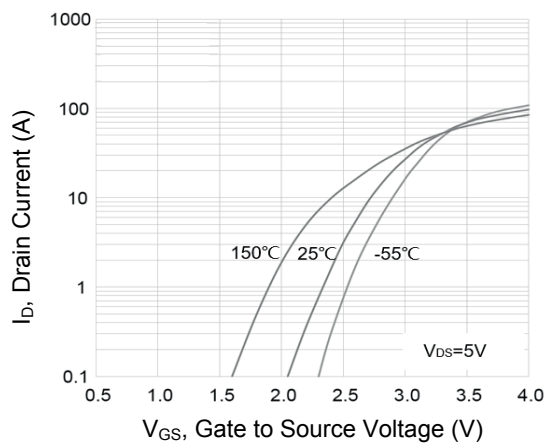


Figure 2. Transfer Characteristics

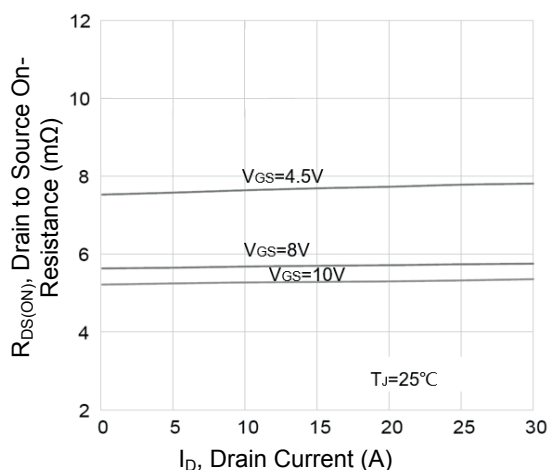


Figure 3. $R_{DS(ON)}$ vs. Drain Current

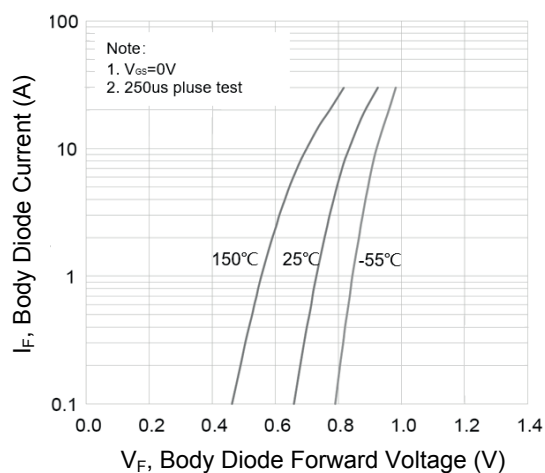


Figure 4. Body Diode Characteristics

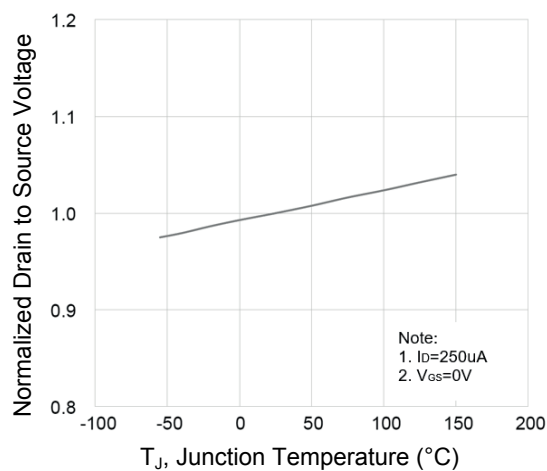


Figure 5. Normalized BV_{DS} vs. T_J

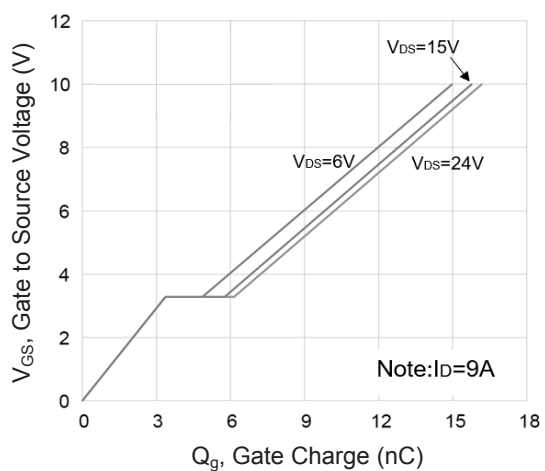


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

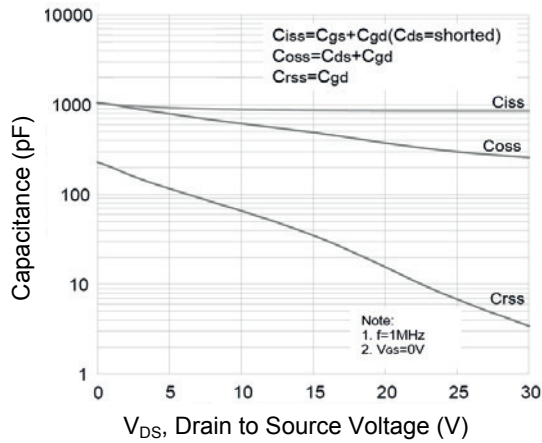


Figure 7. Capacitance Characteristics

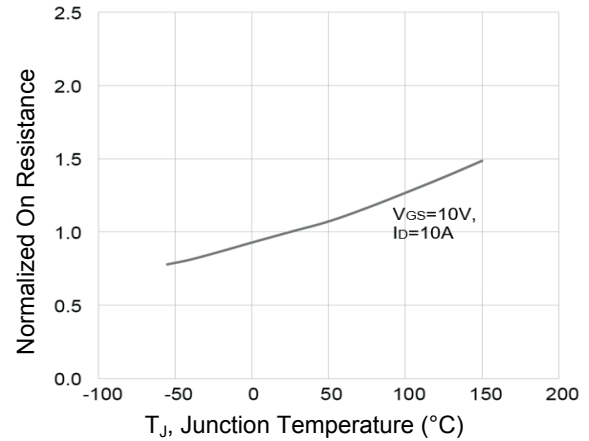


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

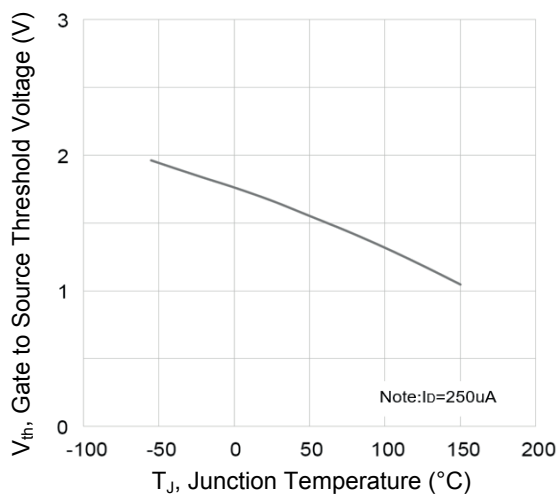


Figure 9. V_{th} vs. T_J

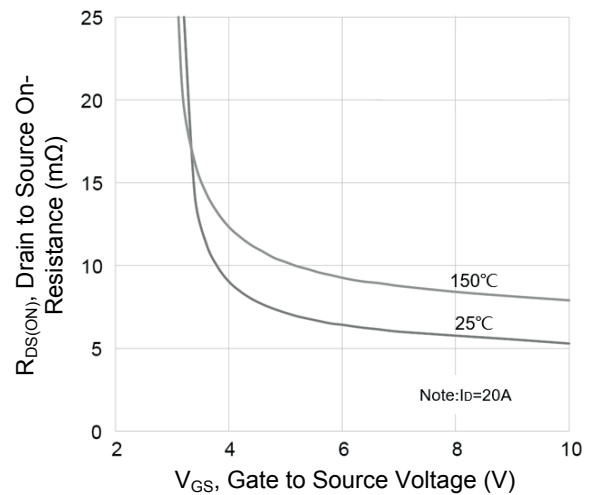
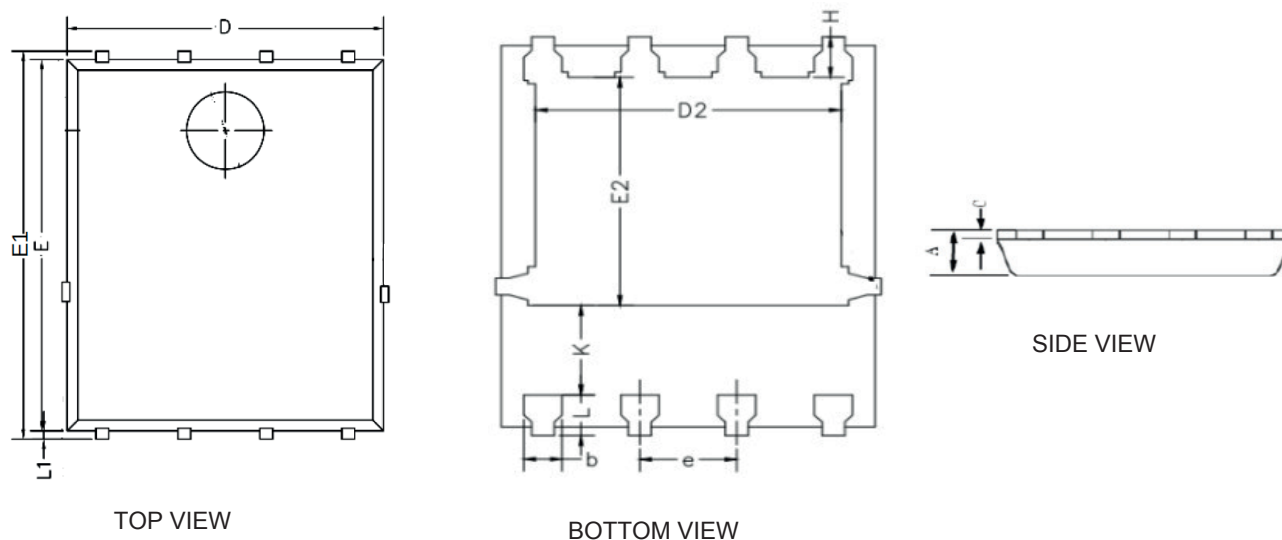


Figure 10. $R_{DS(ON)}$ vs. V_{GS}

Package Outline Dimensions (PPAK5x6)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.20	0.035	0.047
b	0.30	0.55	0.012	0.022
C	0.15	0.35	0.006	0.014
D	4.70	5.20	0.185	0.205
D2	3.76	4.20	0.148	0.165
E2	3.30	3.85	0.130	0.152
E	5.60	5.90	0.220	0.232
E1	5.80	6.20	0.228	0.244
K	1.10	-	0.043	-
H	0.45	0.75	0.018	0.030
L	0.45	0.75	0.018	0.030
L1	0.25	0.45	0.010	0.018
e	1.27 BSC		0.050 BSC	

Order Information

Device	Package	Marking	Carrier	Quantity
GS GP6R504AU	PPAK5x6	P6R504	Tape & Reel	5,000 Pcs / Reel