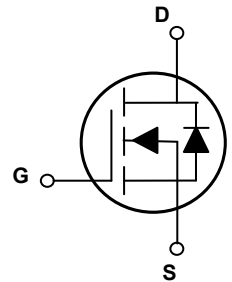


Main Product Characteristics

$V_{(BR)DSS}$	60V
$R_{DS(ON)}$	6.5m Ω (Max.)
I_D	91A



TO-252 (DPAK)



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 GSGD6R506HAU 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 ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Parameter	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$)	I_D	91	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$)		64	A
Pulsed Drain Current ²	I_{DM}	360	A
Power Dissipation ($T_C=25^{\circ}\text{C}$) ³	P_D	80	W
		0.53	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	144	mJ
Single Pulse Avalanche Current	I_{AS}	24	A
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.87	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	$^{\circ}\text{C}$
Soldering Temperature	T_{SOLD}	260	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1.0	μA
		$V_{DS}=60V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	2.5	-	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
		$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=14A$	-	4.8	6.5	m Ω
		$V_{GS}=6.5V, I_D=10A$	-	6.9	12	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.1	-	3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=30V, f=1\text{MHz}$	-	1650	-	pF
Output Capacitance	C_{oss}		-	658	-	
Reverse Transfer Capacitance	C_{rss}		-	48	-	
Total Gate Charge ^{4,5}	Q_g	$I_D=16A, V_{DD}=30V, V_{GS}=10V$	-	32	-	nC
Gate-to-Source Charge ^{4,5}	Q_{gs}		-	7.3	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q_{gd}		-	7.1	-	
Gate Plateau ^{4,5}	$V_{plateau}$		-	4.0	-	V
Turn-On Delay Time ^{4,5}	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, R_G=3\Omega, I_D=16A$	-	10	-	nS
Rise Time ^{4,5}	t_r		-	64	-	
Turn-Off Delay Time ^{4,5}	$t_{d(off)}$		-	36	-	
Fall Time ^{4,5}	t_f		-	12	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	2.1	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	$V_G=V_D=0V$	-	-	90	A
Diode Forward Voltage	V_{SD}	$I_S=15A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time ⁴	T_{rr}	$I_S=16A, V_{GS}=0V, V_R=48V, dI_F/dt=100A/\mu s$	-	35	-	nS
Reverse Recovery Charge ⁴	Q_{rr}		-	30	-	nC

Notes:

1. $L=0.5\text{mH}, V_{DD}=48V, R_G=25\Omega$, starting temperature $T_J=25^{\circ}\text{C}$.
2. Pulse time of $5\mu s$.
3. The dissipated power value will change with the temperature. When it is greater than 25°C , the dissipated power value will decrease by 0.55°C/W for every 1 degree of temperature increase.
4. Pulse test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Basically unaffected by operating temperature.

Typical Electrical and Thermal Characteristic Curves

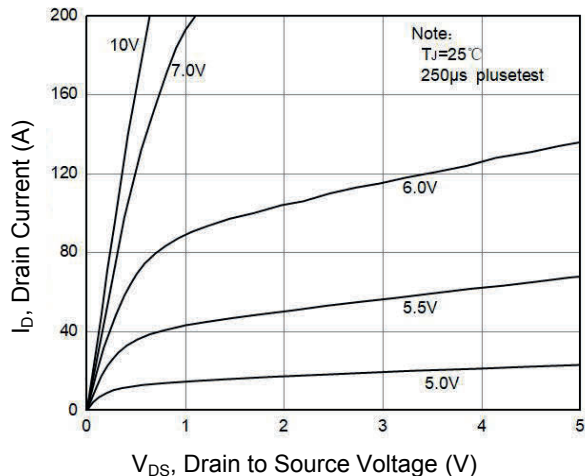


Figure 1. Typical Output Characteristics

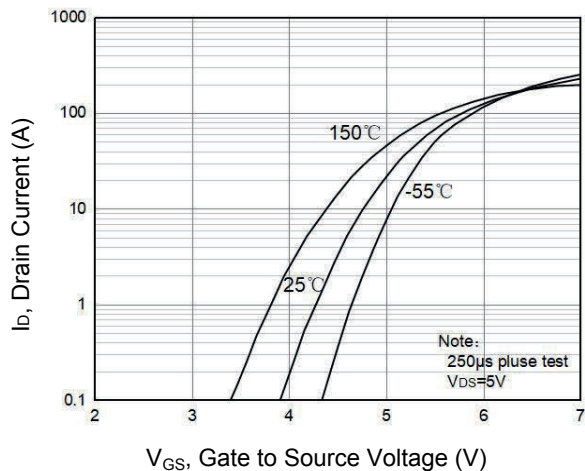


Figure 2. Transfer Characteristics

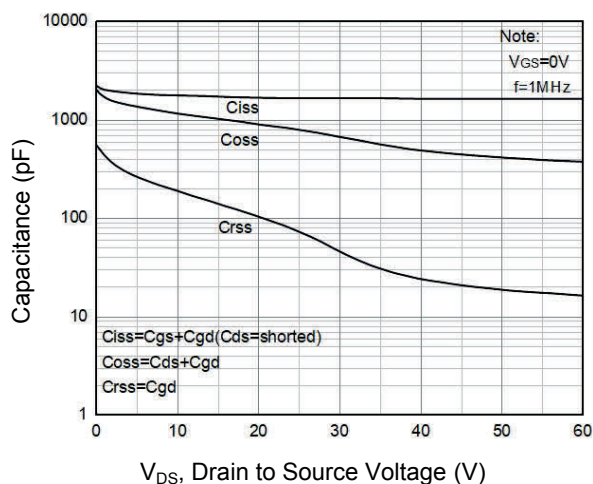


Figure 3. Capacitance Characteristics

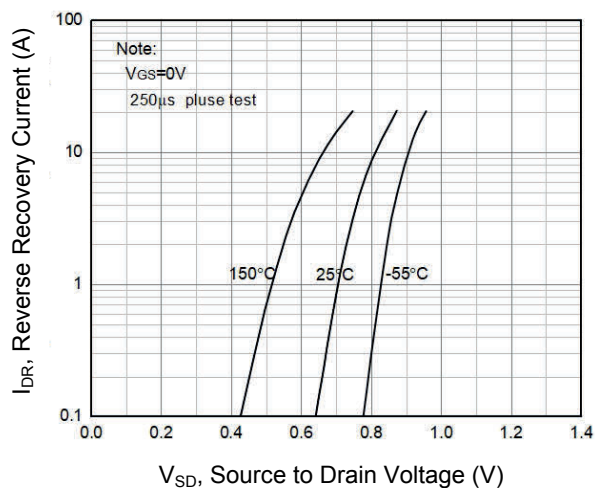


Figure 4. Body Diode Characteristics

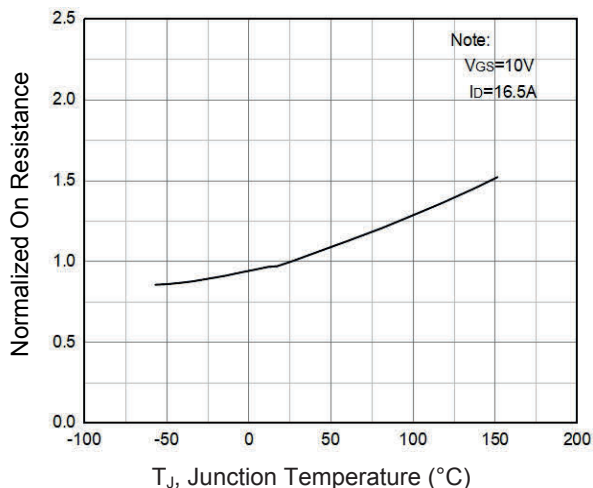


Figure 5. Normalized $R_{DS(ON)}$ vs. T_J

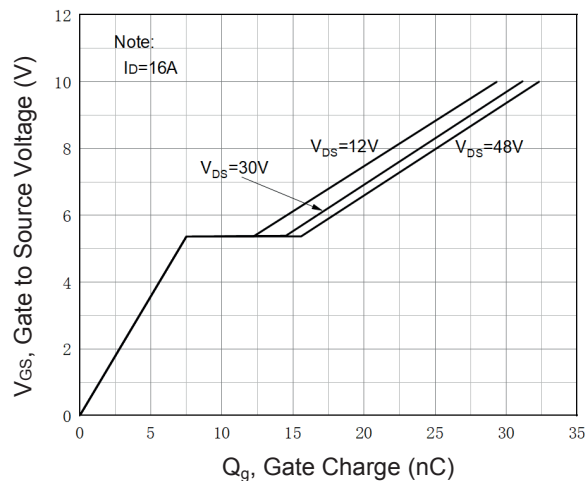


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

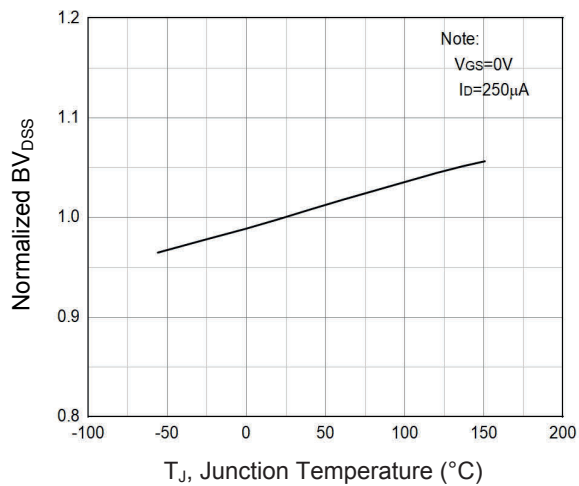


Figure 7. Normalized BV_{DSS} vs. T_J

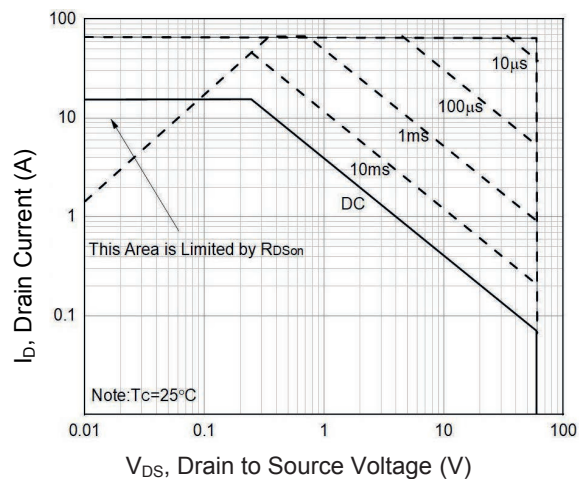
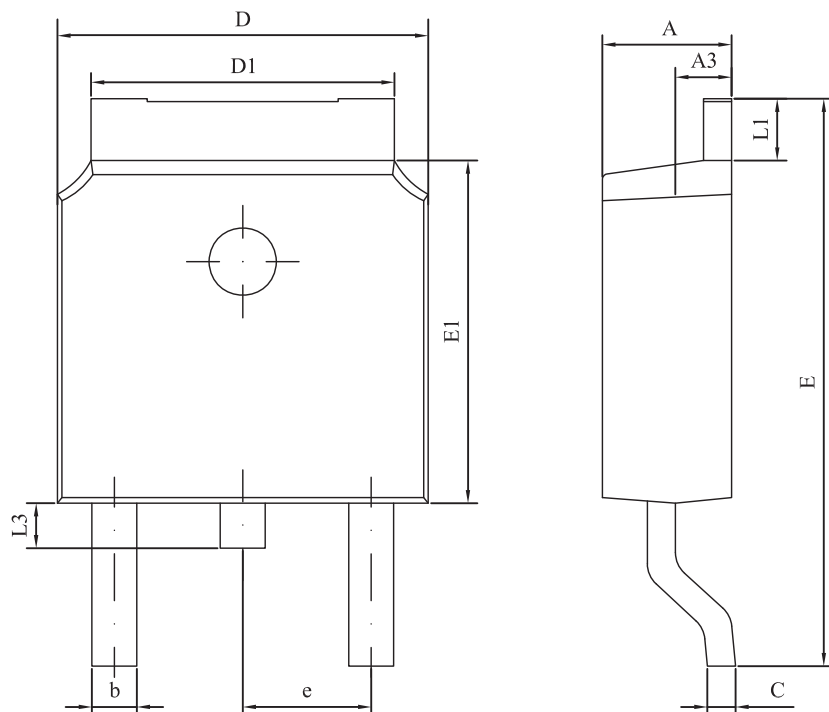


Figure 8. Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.40	0.085	0.094
A3	0.90	1.10	0.035	0.043
b	0.50	0.90	0.020	0.035
C	0.40	0.65	0.016	0.026
D	6.30	6.90	0.248	0.272
D1	4.95	5.50	0.195	0.217
E	9.40	10.41	0.370	0.410
E1	5.90	6.30	0.232	0.248
e	2.286 BSC		0.090 BSC	
L1	0.89	1.27	0.035	0.050
L3	0.60	1.10	0.024	0.043

Order Information

Device	Package	Marking	Carrier	Quantity
GSGD6R506HAU	TO-252 (DPAK)	D6R506H	Tape & Reel	2,500 Pcs / Reel