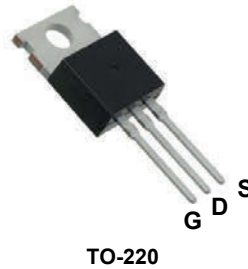
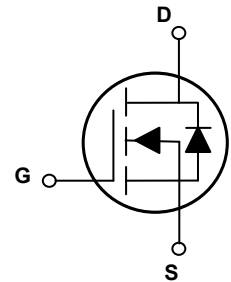


## Main Product Characteristics

$V_{(BR)DSS}$	800V
$R_{DS(ON)}$	2.2 $\Omega$ (Typ.)
$I_D$	4A



TO-220



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 GSJH8004 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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	800	V
Gate-to-Source Voltage	V <sub>GS</sub>	±30	V
Continuous Drain Current, V <sub>GS</sub> @ 10V (T <sub>C</sub> =25°C)	I <sub>D</sub>	4	A
Continuous Drain Current, V <sub>GS</sub> @ 10V (T <sub>C</sub> =100°C)		2.5	
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	16	
Single Pulse Avalanche Energy @ L=33.6mH	E <sub>AS</sub>	507	mJ
Avalanche Current @ L=33.6mH	I <sub>AS</sub>	5.3	A
Power Dissipation (T <sub>C</sub> =25°C) <sup>2</sup>	P <sub>D</sub>	130	W
Linear Derating Factor (T <sub>C</sub> =25°C)		1.04	
Junction-to-Case <sup>2</sup>	R <sub>θJC</sub>	0.96	°C/W
Junction-to-Ambient (t ≤ 10s) <sup>3</sup>	R <sub>θJA</sub>	62.5	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State) <sup>3</sup>		40	
Operating Junction and Storage Temperature Range	T <sub>J</sub> /T <sub>STG</sub>	-55 to +150	°C

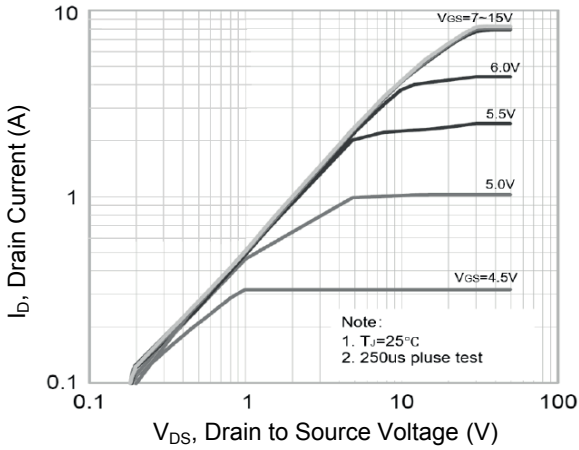
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	800	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V$	-	-	1	$\mu A$
		$T_J=125^\circ\text{C}$	-	-	50	
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS}=30V$	-	-	100	nA
		$V_{GS}=-30V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.0A$	-	2.2	3.0	$\Omega$
		$T_J=125^\circ\text{C}$	-	5.08	-	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
		$T_J=125^\circ\text{C}$	-	1.84	-	
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V,$ $f=1\text{MHz}$	-	715	-	pF
Output Capacitance	$C_{oss}$		-	71	-	
Reverse Transfer Capacitance	$C_{rss}$		-	3.6	-	
Total Gate Charge	$Q_g$	$I_D=4A, V_{DS}=640V,$ $V_{GS}=10V$	-	18.2	-	nC
Gate-to-Source Charge	$Q_{gs}$		-	5.3	-	
Gate-to-Drain ("Miller") Charge	$Q_{gd}$		-	6.9	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=400V,$ $R_G=25\Omega, I_D=4A$	-	14.4	-	ns
Rise Time	$t_r$		-	24.1	-	
Turn-Off Delay Time	$t_{d(off)}$		-	43.4	-	
Fall Time	$t_f$		-	27.6	-	
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	4	A
Pulsed Source Current (Body Diode)	$I_{SM}$		-	-	16	A
Diode Forward Voltage	$V_{SD}$	$I_S=2A, V_{GS}=0V$	-	0.87	1.4	V
Reverse Recovery Time	$T_{rr}$	$T_J=25^\circ\text{C}, I_F=4A,$ $di/dt=100A/\mu s$	-	540.7	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	2.96	-	$\mu C$

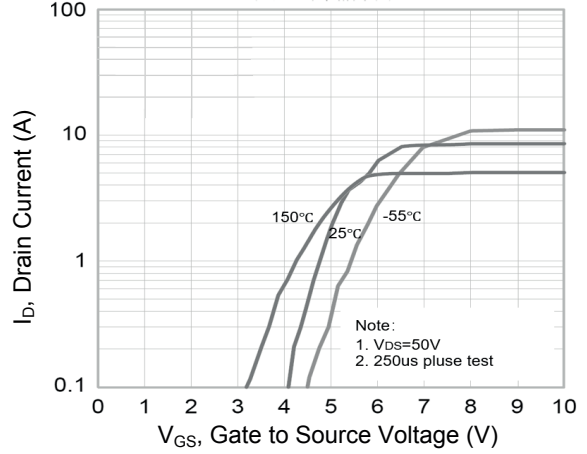
Note:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. The power dissipation  $P_D$  is based on max. junction temperature, using junction-to-case thermal resistance.
3. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .

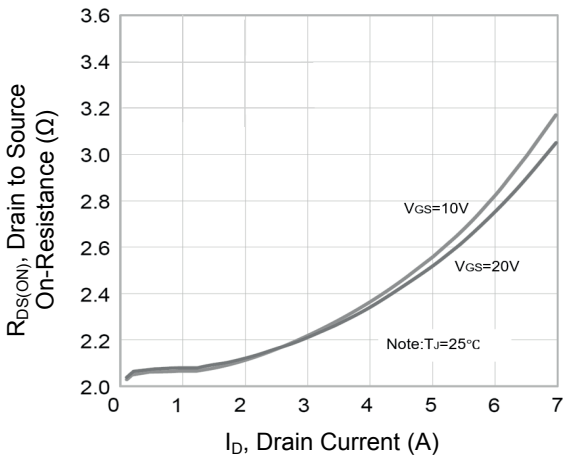
**Typical Electrical and Thermal Characteristic Curves**



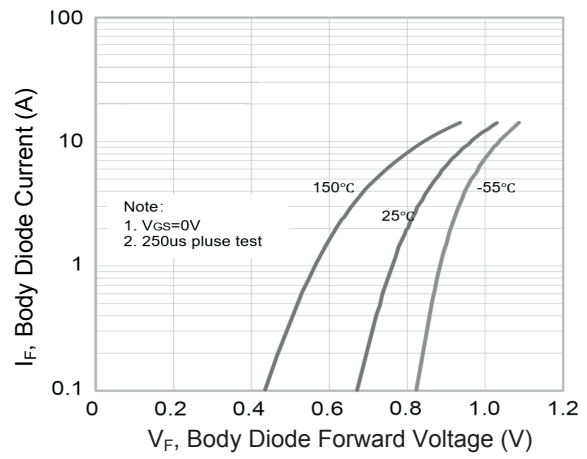
**Figure 1. Typical Output Characteristics**



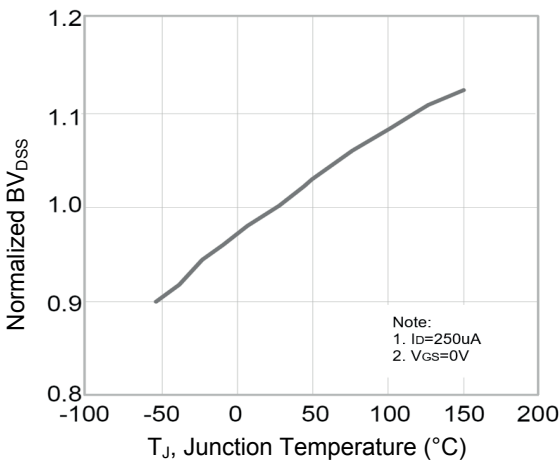
**Figure 2. Transfer Characteristics**



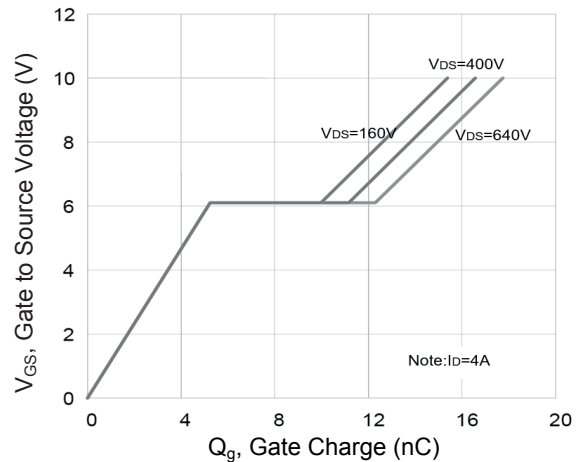
**Figure 3.  $R_{DS(ON)}$  vs. Drain Current**



**Figure 4. Body Diode Characteristics**

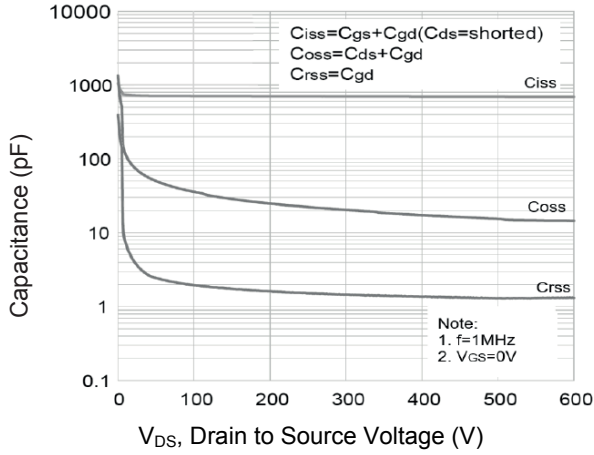


**Figure 5. Normalized  $BV_{DSS}$  vs.  $T_J$**

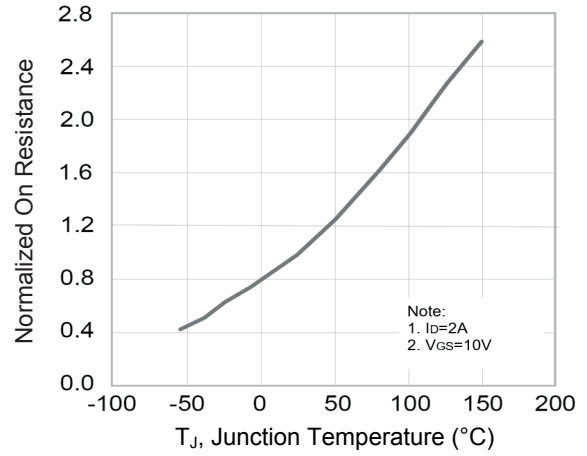


**Figure 6. Gate Charge**

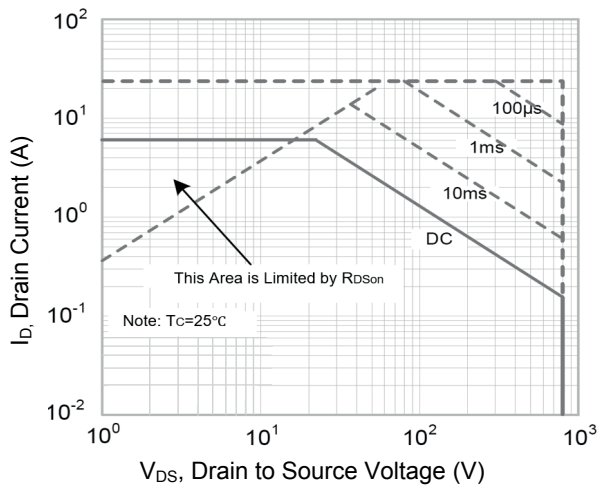
**Typical Electrical and Thermal Characteristic Curves**



**Figure 7. Capacitance Characteristics**

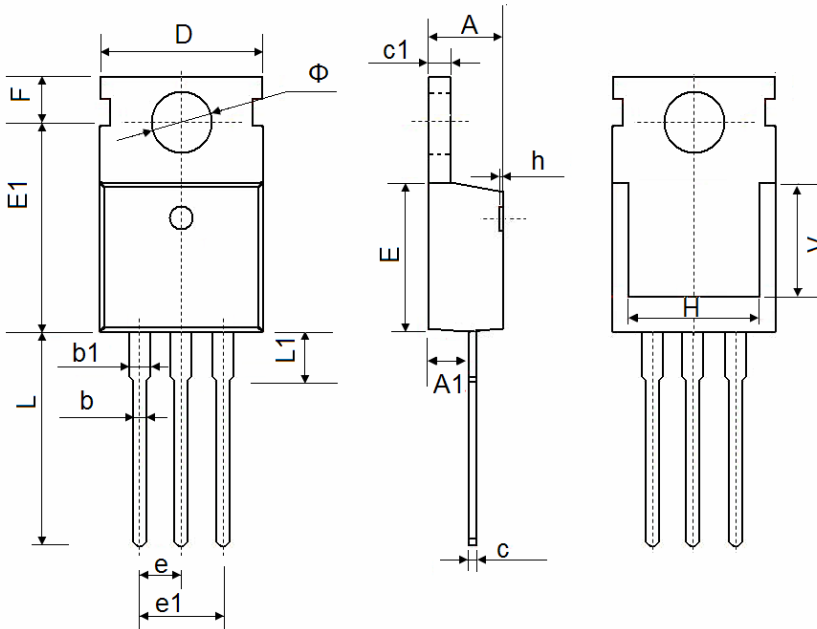


**Figure 8. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



**Figure 9. Safe Operation Area**

**Package Outline Dimensions (TO-220)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
φ	3.400	3.800	0.134	0.150

**Order Information**

Device	Package	Marking	Carrier	Quantity
GSJH8004	TO-220	H8004	Tube	50 pcs / Tube

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)