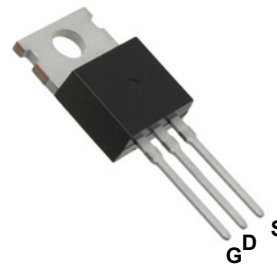
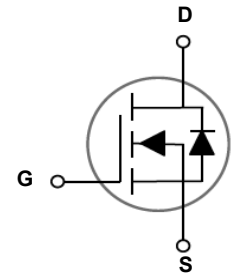


Main Product Characteristics

V_{DS}	650V
$R_{DS(ON)}$	540m Ω
I_D	8A



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 GSGH6508 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	Max.	Unit
Drain-Source Voltage($V_{GS}=0V$)	V_{DS}	650	V
Gate-Source Voltage($V_{DS}=0V$) AC ($f>1$ Hz)	V_{GS}	± 30	V
Drain Current-Continuous($T_C=25^\circ\text{C}$)	I_D	8	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)		5.2	A
Drain Current-Pulsed ¹	I_{DM}	32	A
Maximum Power Dissipation($T_C=25^\circ\text{C}$)	P_D	69	W
Maximum Power Dissipation-Derate above 25°C		0.55	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ²	E_{AS}	156	mJ
Avalanche Current ¹	I_{AR}	1.7	A
Repetitive Avalanche Energy, t_{AR} Limited By T_{jmax} ¹	E_{AR}	0.3	mJ
Drain Source Voltage Slope, $V_{DS}\leq 480V$	dv/dt	50	V/ns
Reverse Diode dv/dt, $V_{DS}\leq 480V$, $I_{SD}<I_D$		15	V/ns
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/W$
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.81	$^\circ\text{C}/W$
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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Zero Gate Voltage Drain Current ($T_C=25^\circ\text{C}$)	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$	-	-	1	μA
Zero Gate Voltage Drain Current ($T_C=125^\circ\text{C}$)		$V_{DS}=650V, V_{GS}=0V$	-	-	100	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3	-	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	460	540	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	-	590	-	pF
Output Capacitance	C_{oss}		-	37	-	
Reverse Transfer Capacitance	C_{rss}		-	0.9	-	
Total Gate Charge	Q_g	$V_{DS}=480V, I_D=8A, V_{GS}=10V$	-	14.6	22	nC
Gate-Source Charge	Q_{gs}		-	4	-	
Gate-Drain Charge	Q_{gd}		-	6.7	-	
Switching Times						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=380V, R_G=4.7\Omega, V_{GS}=10V, I_D=4A$	-	8	-	nS
Turn-On Rise Time	t_r		-	6	-	
Turn-Off Delay Time	$t_{d(off)}$		-	59	75	
Turn-Off Fall Time	t_f		-	10	15	
Source-Drain Diode Characteristics						
Source-Drain Current (Body Diode)	I_{SD}	$T_C=25^\circ\text{C}$	-	-	8	A
Pulsed Source-Drain Current (Body Diode)	I_{SDM}		-	-	32	A
Forward On Voltage	V_{SD}	$T_J=25^\circ\text{C}, V_{GS}=0V, I_{SD}=8A$	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=4A, di/dt=100A/\mu s$	-	230	-	nS
Reverse Recovery Charge	Q_{rr}		-	1.2	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	10.5	-	A

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, R_G=25\Omega$

Typical Electrical and Thermal Characteristic Curves

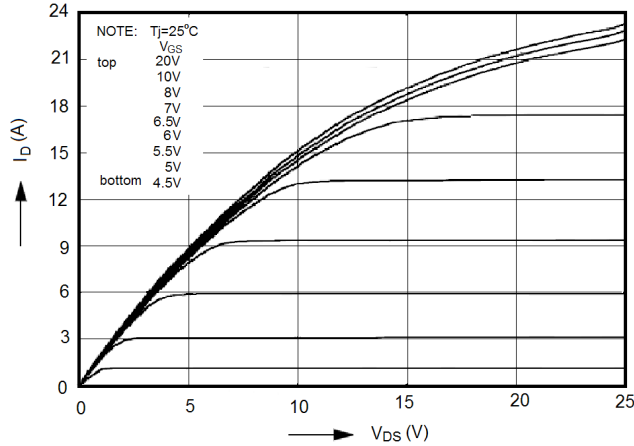


Figure 1. Output Characteristics

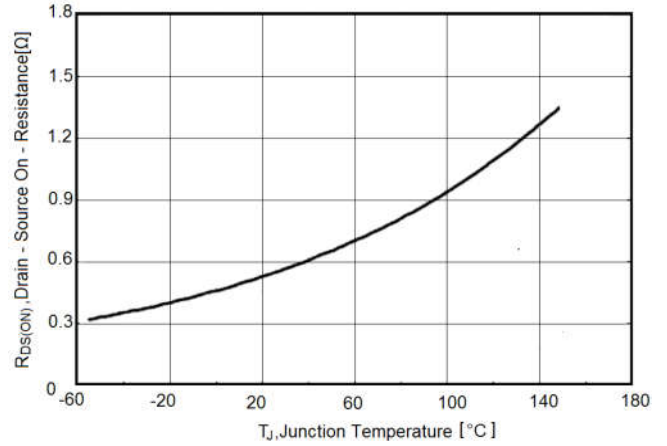


Figure 2. $R_{DS(on)}$ vs Junction Temperature

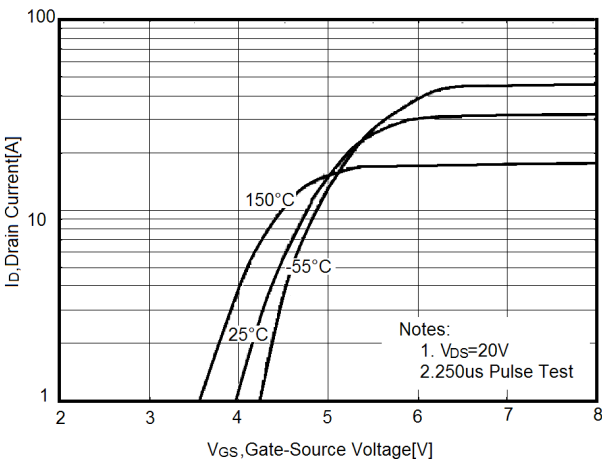


Figure 3. Transfer Characteristics

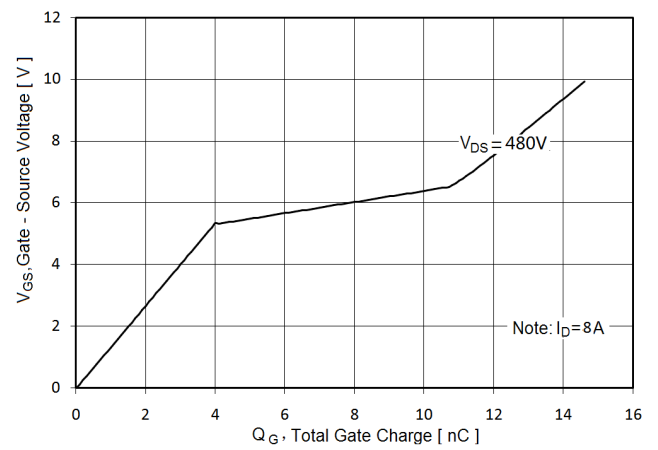


Figure 4. Gate Charge

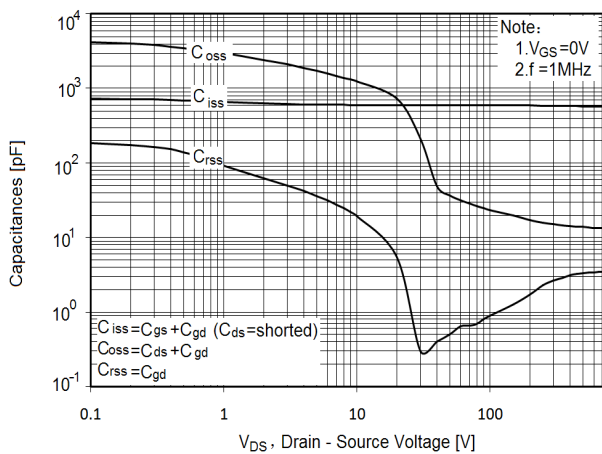


Figure 5. Capacitance

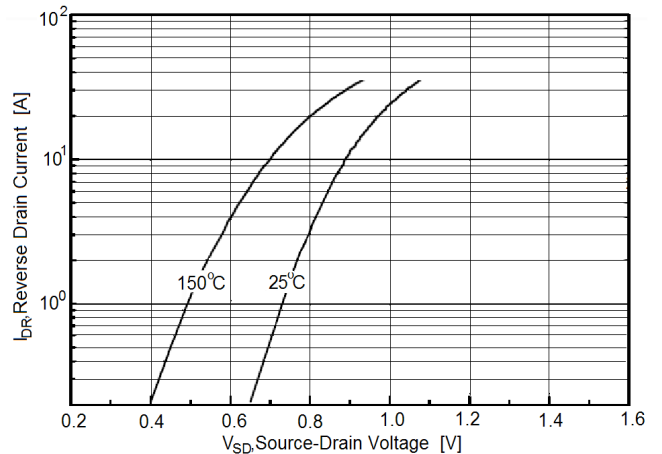


Figure 6. Source-Drain Diode Forward Voltage

Typical Electrical and Thermal Characteristic Curves

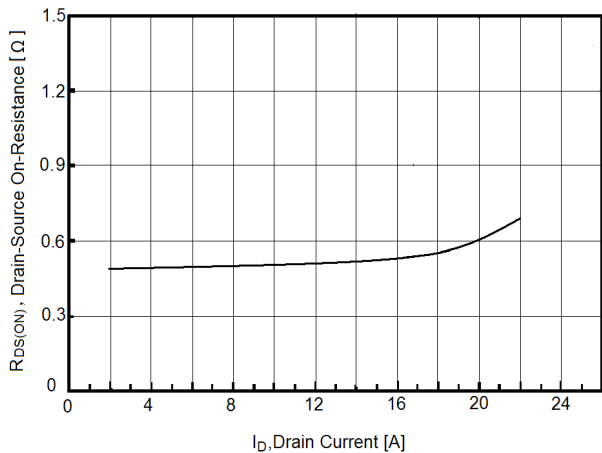


Figure 7. Static Drain-Source on Resistance

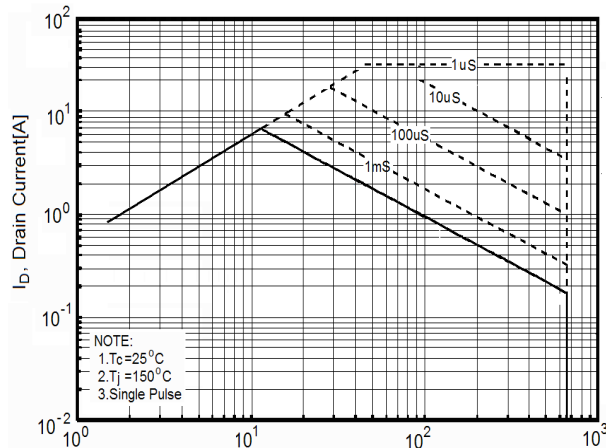


Figure 8. Safe Operation Area

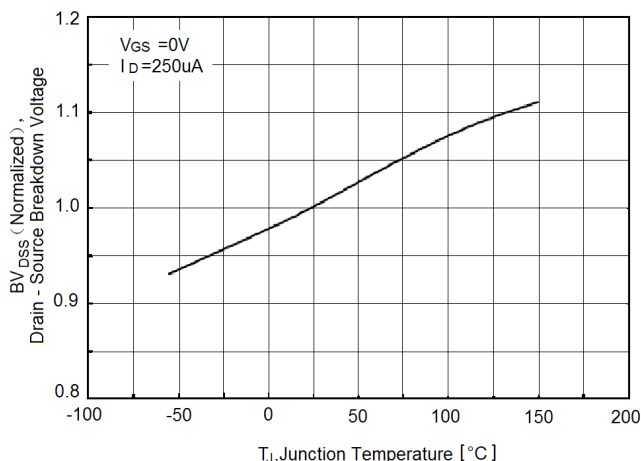


Figure 9. BV_{DS} vs Junction Temperature

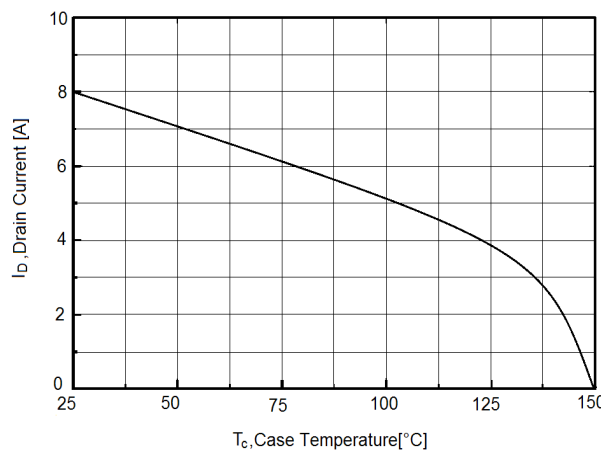


Figure 10. Maximum I_D vs Junction Temperature

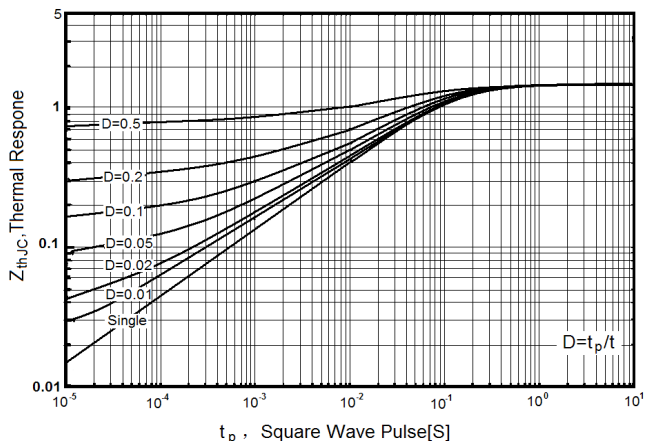


Figure 11. Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

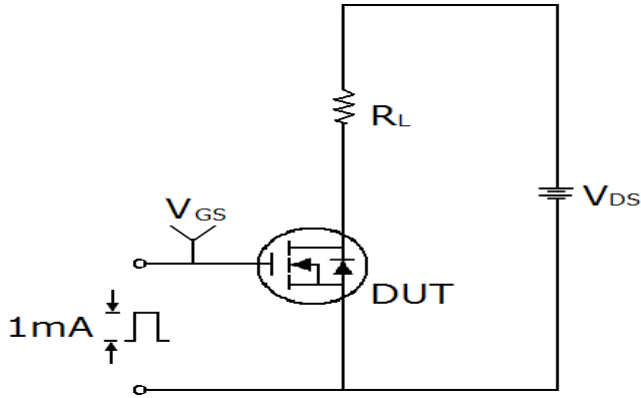


Figure 12. Gate Charge Test Circuit & Waveform

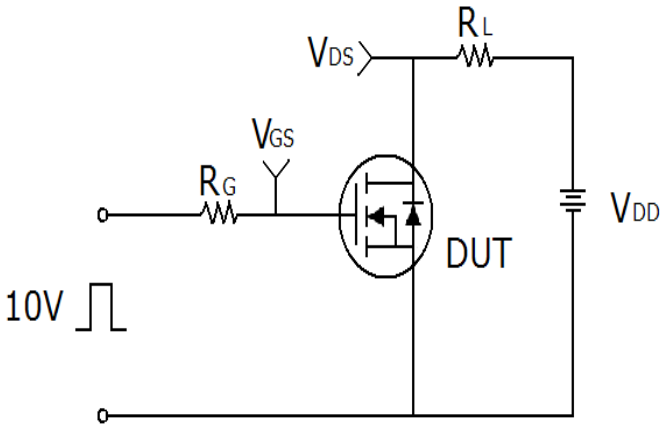
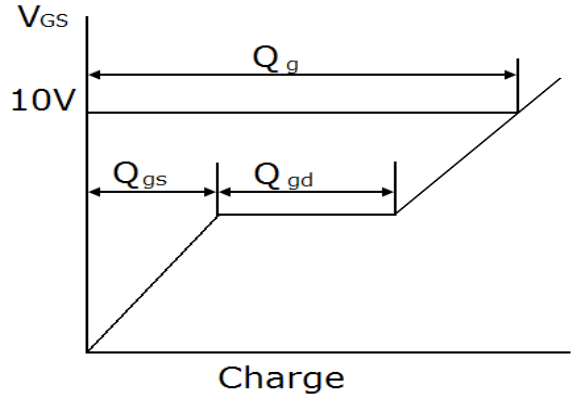


Figure 13. Switch Time Test Circuit

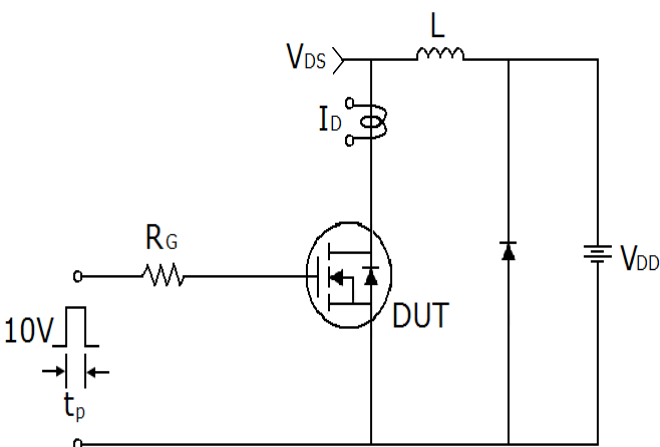
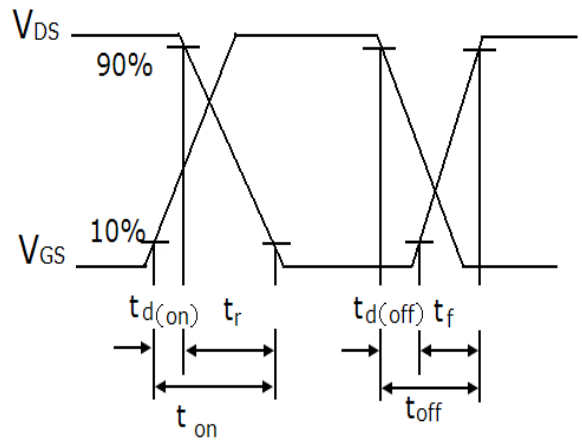
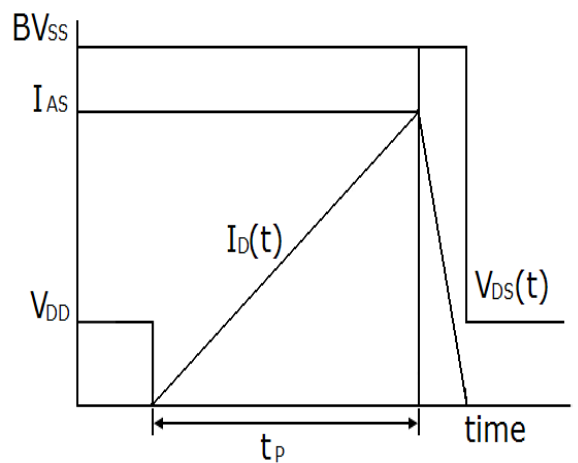
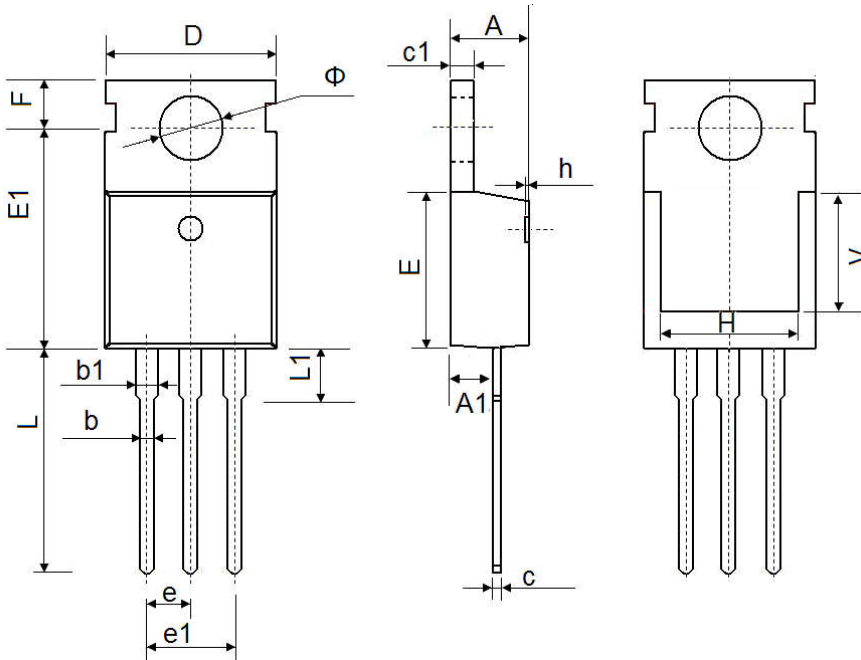


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms



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	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150