GL4332A8

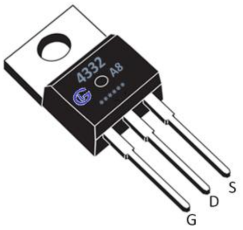
Silicon N-Channel Power MOSFET

General Description:

The GL4332A8 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-220AB, which accords with the RoHS standard.

V_{DSS}	250	V
I_D	58	A
$P_D(T_C$=25℃)	360	W
$R_{DS(ON)TYP}$	29	mΩ

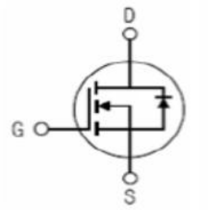
TO-220



Features:

- Fast Switching
- ESD Improved Capability
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Inner Equivalent Principium Chart



Applications:

- Power switch circuit of POWER
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

Absolute Maximum Ratings (TA= 25℃ unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	250	V
I_D	Continuous Drain Current	58	A
	Continuous Drain Current T_C=100 °C	40	A
$I_{DM}{}^{a1}$	Pulsed Drain Current (pulse width limited by T_{JM})	230	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy	300	mJ
$E_{Ar}{}^{a1}$	Avalanche Energy, Repetitive	75	mJ
$I_{AR}{}^{a1}$	Avalanche Current	45	A
dv/dt^{a2}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	360	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, –55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

Caution Stresses greater than those in the "Absolute Maximum Ratings" may cause permanent damage to the device

Electrical Characteristics （Tc=25℃ unless otherwise specified)：

OFF Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	250	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=250V, V_{GS}=0V,T_a=25℃	--	--	1.0	μA
		V_{DS}=250V, V_{GS}=0V,T_a=125℃	--	--	100	
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V	--	--	-100	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=35A	--	29	33	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	3.6	--	5.0	V
g_{fs}	Forward Trans conductance	V_{DS}=10V, I_D=35A	100	--	--	S
R_g	Gate Resistance	V_{GS}=0V V_{DS} open f=1.0MHz		1.5		Ω
Pulse width<380μs; duty cycle<2%.						

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=25V f=1.0MHz	--	7000	--	pF
C_{oss}	Output Capacitance		--	480	--	
C_{rss}	Reverse Transfer Capacitance		--	210	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=35A, V_{DS}=50V V_{GS}=10V, R_g=2.5Ω	--	45	--	ns
t_r	Rise Time		--	70	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	110	--	
t_f	Fall Time		--	90	--	
Q_g	Total Gate Charge	I_D=35A, V_{DD}=100V V_{GS}=10V	--	85	--	nC
Q_{gs}	Gate to Source Charge		--	15	--	
Q_{gd}	Gate to Drain（“Miller”）Charge		--	25	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_{SD}	Continuous Source Current (Body Diode)		--	--	58	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	230	A
V_{SD}	Diode Forward Voltage	I_S=35A, V_{GS}=0V	--	--	1.2	V
t_{rr}	Reverse Recovery Time	I_S=30A,T_j=25℃, V_{DD}=50V	--	120	--	ns
Q_{rr}	Reverse Recovery Charge	dI_F/dt=100A/μs, V_{GS}=0V	--	0.55	--	uC

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.45	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	℃/ W

a1： TJ = 25°C, L = 0.3mH, R_G = 25Ω, V_{DD}=50V， V_{GS}=10V

a2： I_{SD}=35A,di/dt≤100A/us, V_{DD}≤BV_{DS}, Start T_J=25℃

Test Circuits and Waveforms

Figure A: Gate Charge Test Circuit and Waveform

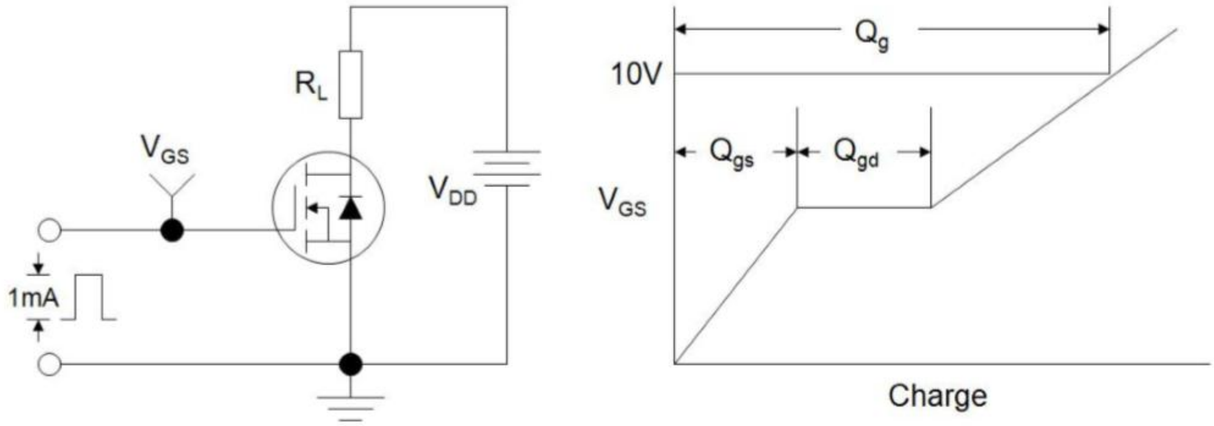


Figure B: Resistive Switching Test Circuit and Waveform

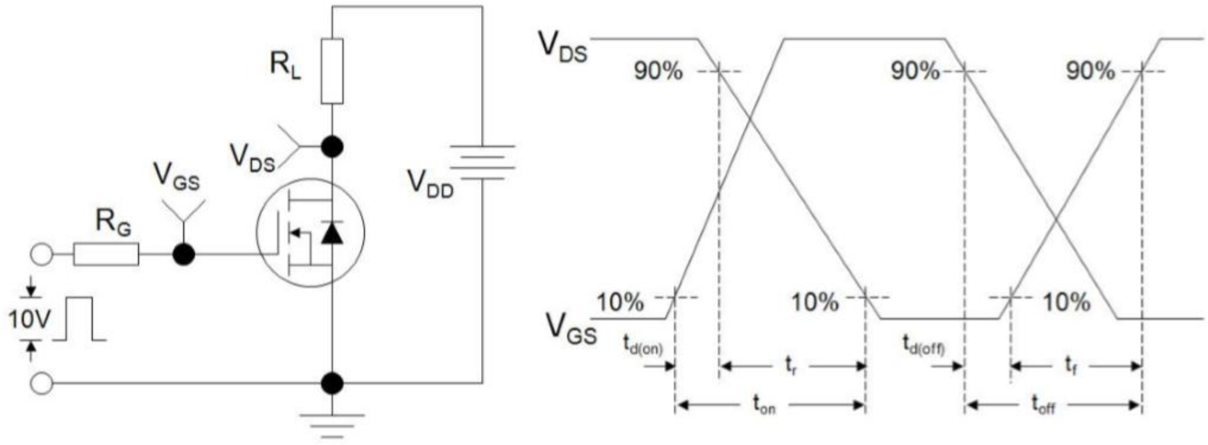
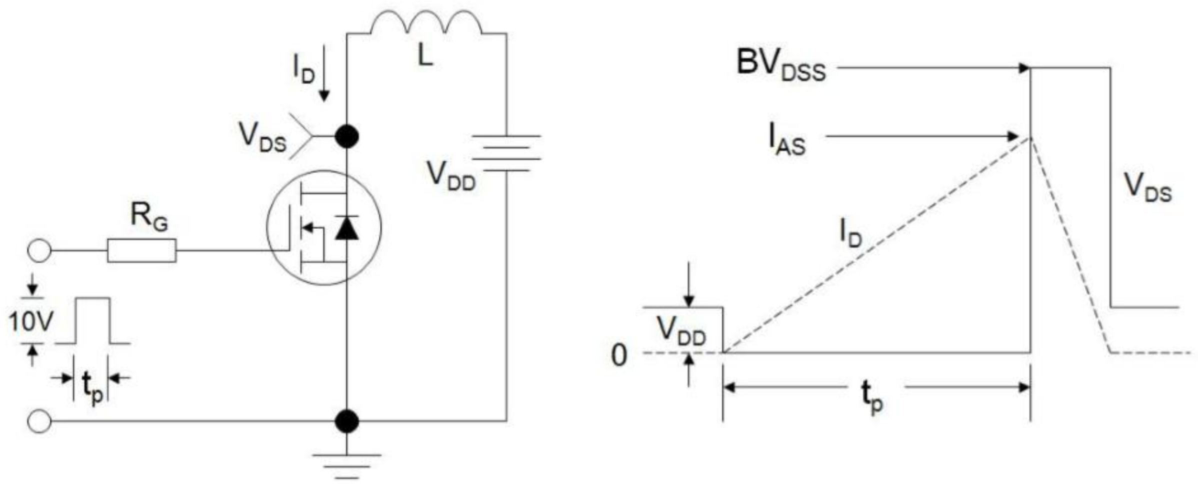


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Characteristics Curve:

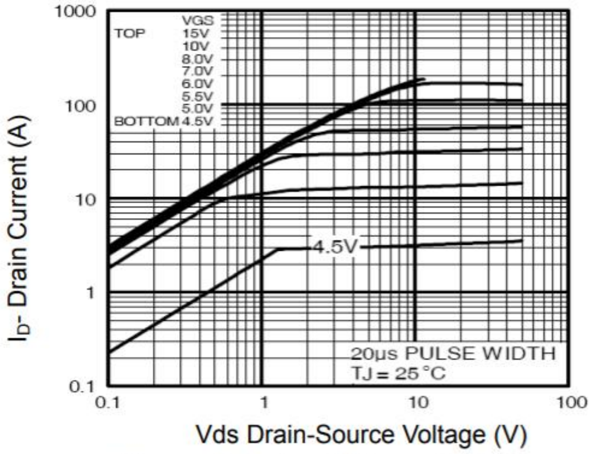


Figure 1 Output Characteristics

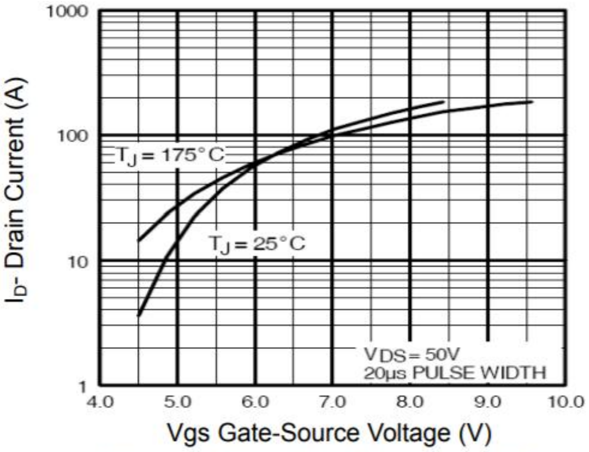


Figure 2 Transfer Characteristics

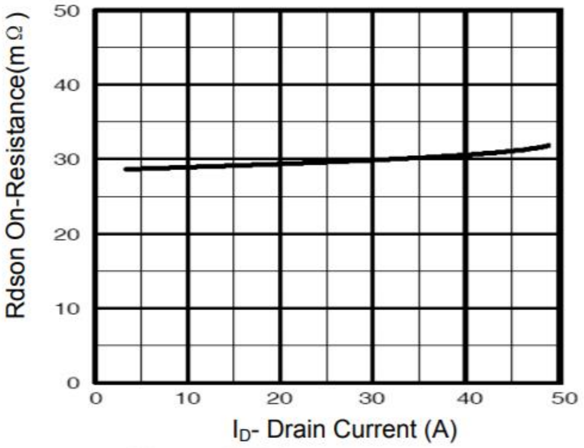


Figure 3 Rdson- Drain Current

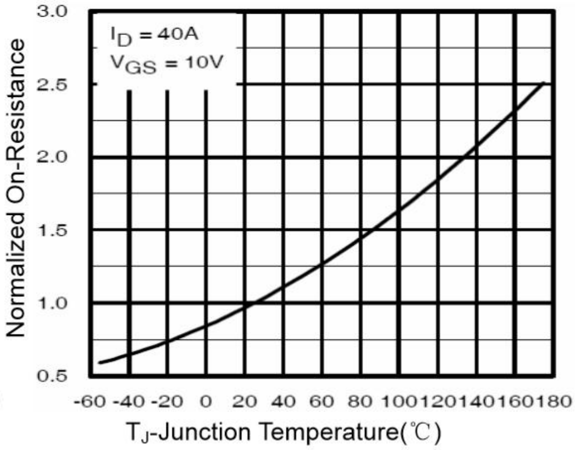


Figure 4 Rdson-JunctionTemperature

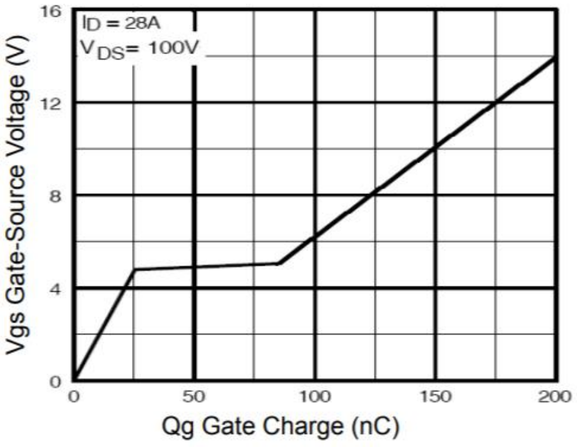


Figure 5 Gate Charge

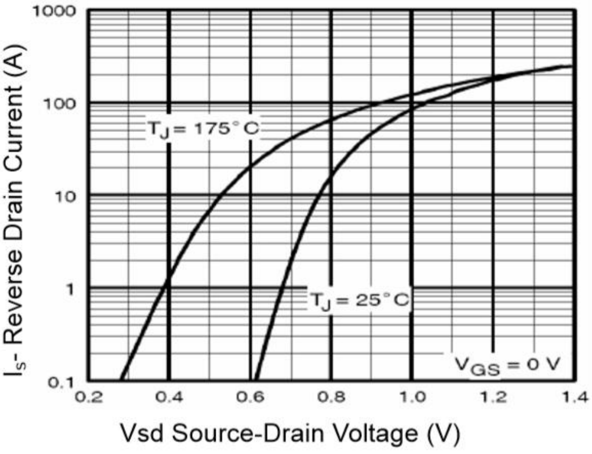


Figure 6 Source- Drain Diode Forward

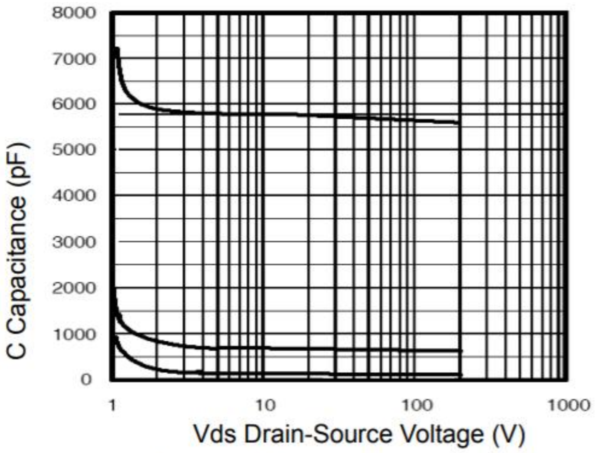


Figure 7 Capacitance vs Vds

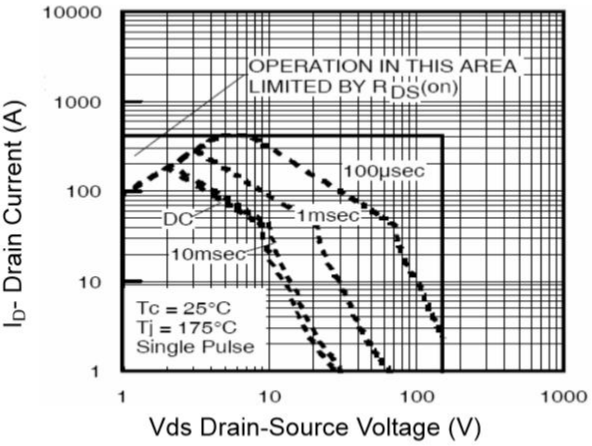


Figure 8 Safe Operation Area

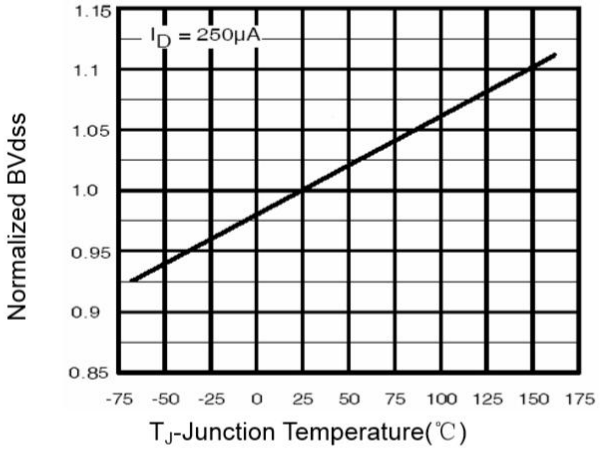


Figure 9 BV_{DSS} vs Junction Temperature

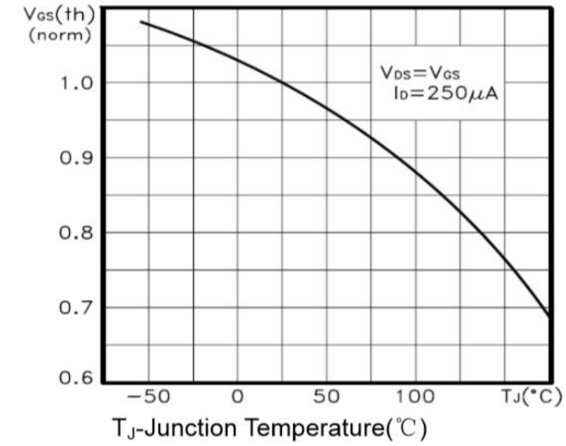


Figure 10 $V_{GS(th)}$ vs Junction Temperature

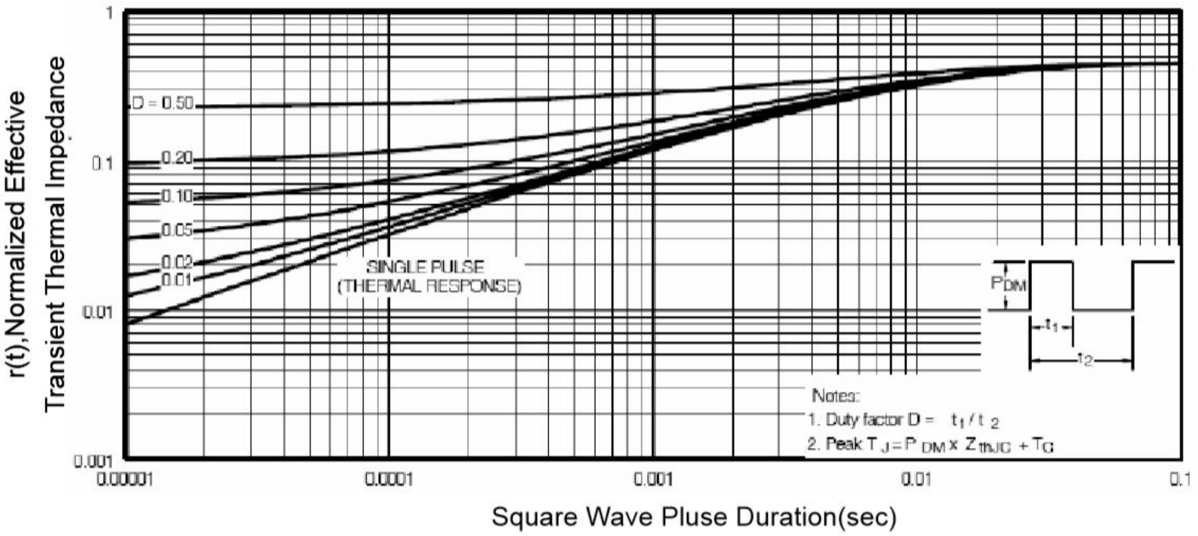


Figure 11 Normalized Maximum Transient Thermal Impedance