

GL Silicon P-Channel Power MOSFET

General Description:

The GL9Z24A8 uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications. The package form is TO-220AB, which accords with the RoHS standard.

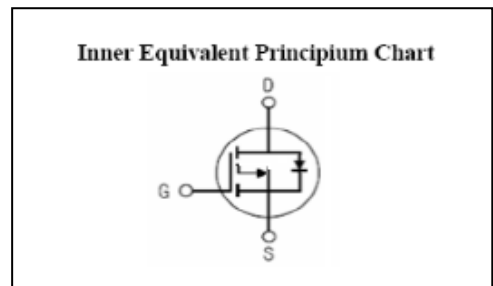
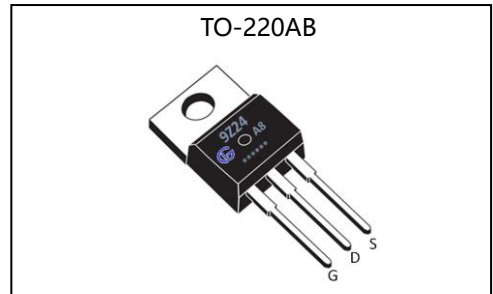
Features:

- Fast Switching
- Low Gate Charge and Rds(on)
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications:

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

V_{DSS}	-60	V
I_D	-15	A
P_D	45	W
$R_{DS(ON)}$	55	m Ω



Absolute (Tc= 25°C unless otherwise specified):

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-60	V
I_D	Continuous Drain Current	-15	A
	Continuous Drain Current $T_C = 100^\circ\text{C}$	-10.5	A
I_{DM}^{a1}	Pulsed Drain Current	-60	A
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	45	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	300	$^\circ\text{C}$



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Electrical Characteristics (Tc=25°C 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	-60	--	--	V
ΔBV _{DSS} /ΔT _J	Bvdss Temperature Coefficient	I _D =-250uA, Reference 25°C	--	0.15	--	V/°C
I _{DSS}	Drain to Source Leakage Current	V _{DS} =-60V, V _{GS} = 0V, T _a =25°C	--	--	-1	μA
		V _{DS} =-48V, V _{GS} = 0V, T _a =125°C	--	--	-250	
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} = +20V	--	--	1	μA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} =-20V	--	--	-1	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} =-10V, I _D =-7.5.0A	--	55	70	mΩ
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-3.0	-1.6	-1.0	V
Pulse width tp≤380μs, δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-7.5A	14	--	--	S
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-25V f=1.0MHz	--	1450	--	pF
C _{oss}	Output Capacitance		--	140	--	
C _{rss}	Reverse Transfer Capacitance		--	110	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	R _L =-1.5 Ω, V _{DD} =-30V V _{GS} =-10V, R _G =1.5Ω	--	7	--	ns
t _r	Rise Time		--	8	--	
t _{d(OFF)}	Turn-Off Delay Time		--	65	--	
t _f	Fall Time		--	30	--	
Q _g	Total Gate Charge	I _D =-7.5A, V _{DD} =-30V V _{GS} =-10V	--	25	--	nC
Q _{gs}	Gate to Source Charge		--	4.5	--	
Q _{gd}	Gate to Drain ("Miller") Charge		--	7	--	

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Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	-15	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	-60	A
V_{SD}	Diode Forward Voltage	$I_S = -15A, V_{GS} = 0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S = -15A, T_j = 25^\circ C$	--	45	--	ns
Q_{rr}	Reverse Recovery Charge	$di_f/dt = 100A/\mu s, V_{GS} = 0V$	--	88	--	nC

Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-Case	2.8	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient	62	$^\circ C/W$

^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

^{a3}: $I_{SD} = -15A, di/dt \leq 100A/\mu s, V_{DD} \leq BV_{DS}, \text{Start } T_j = 25^\circ C$

Typical Electrical and Thermal Characteristics

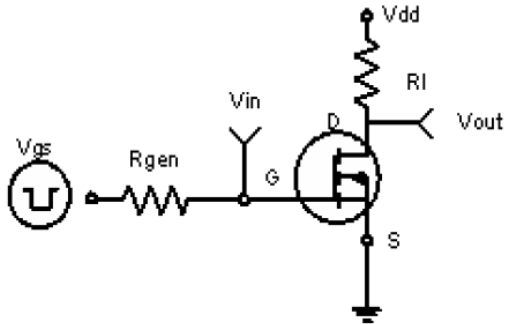


Figure 1: Switching Test Circuit

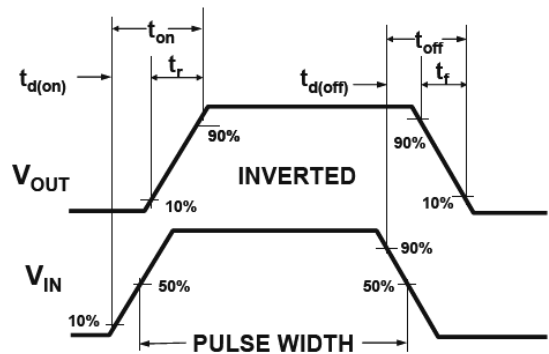


Figure 2: Switching Waveforms



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Typical Electrical and Thermal Characteristics (Curves)

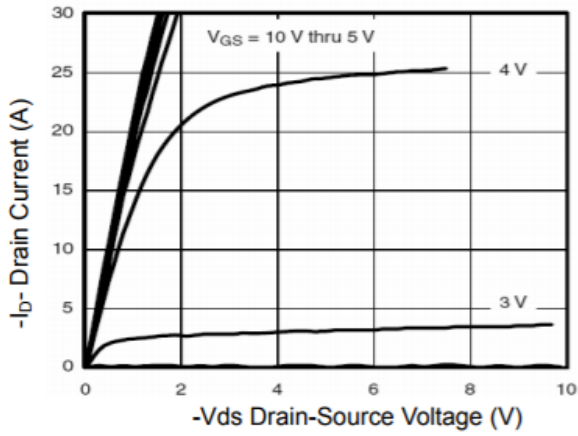


Figure 1 Output Characteristics

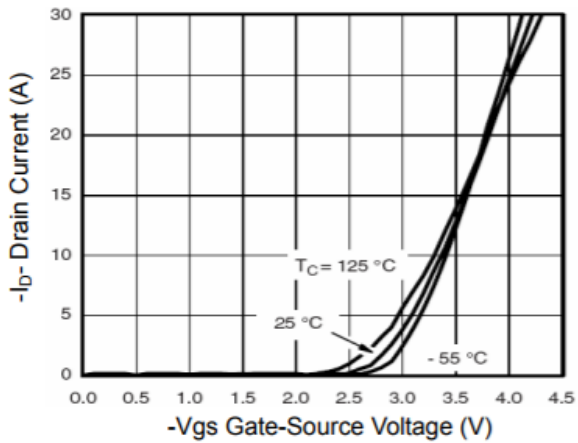


Figure 2 Transfer Characteristics

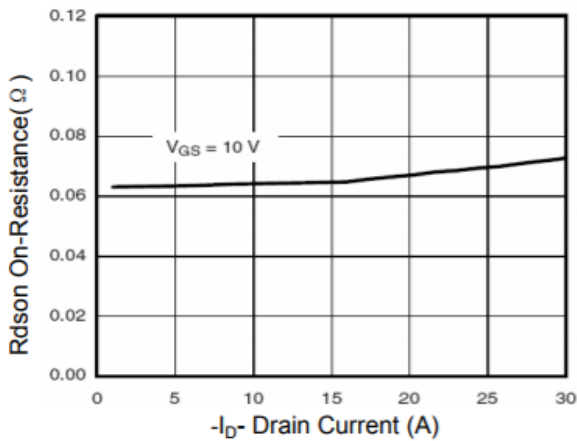


Figure 3 Rdson- Drain Current

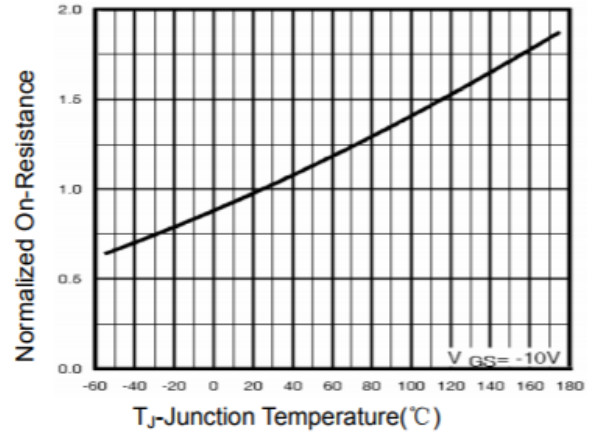


Figure 4 Rdson-Junction Temperature

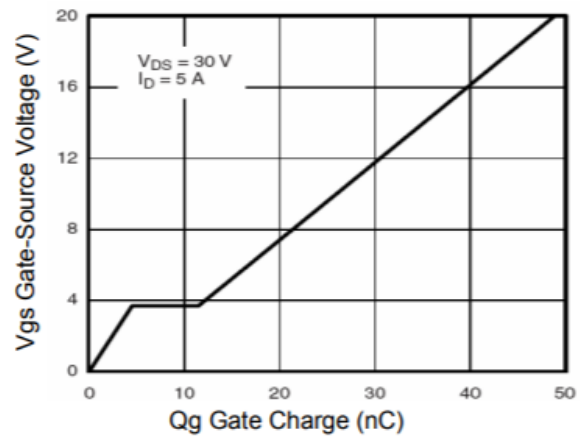


Figure 5 Gate Charge

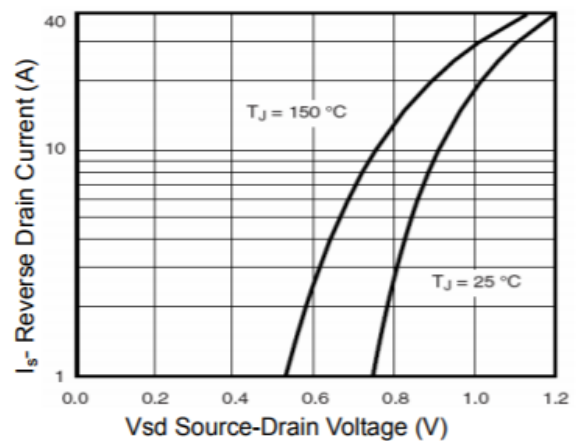


Figure 6 Source- Drain Diode Forward



GL9Z24A8

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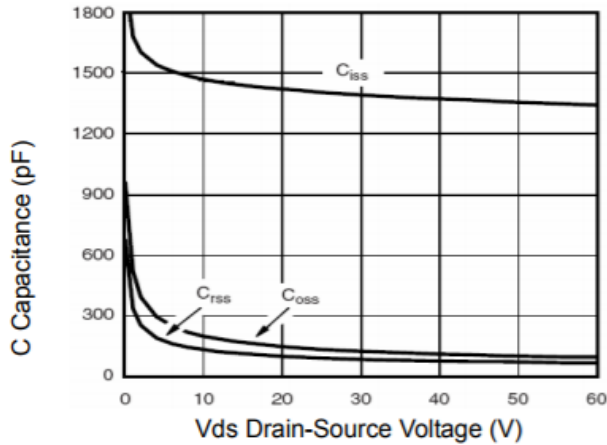


Figure 7 Capacitance vs Vds

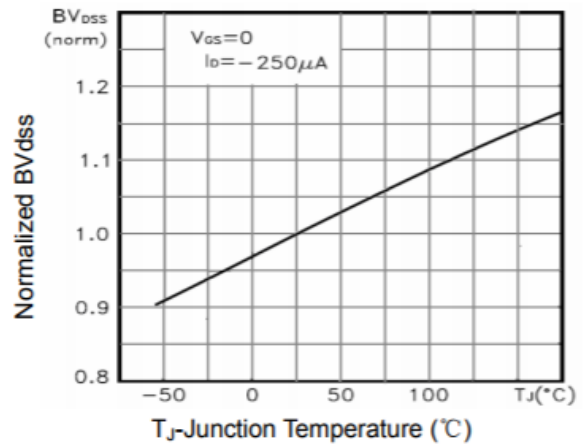


Figure 9 BV_{DSS} vs Junction Temperature

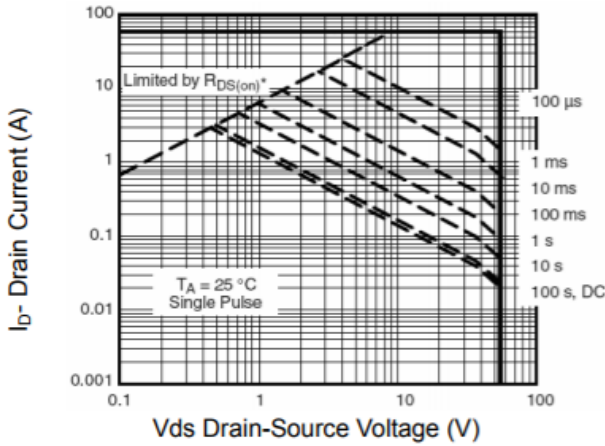


Figure 8 Safe Operation Area

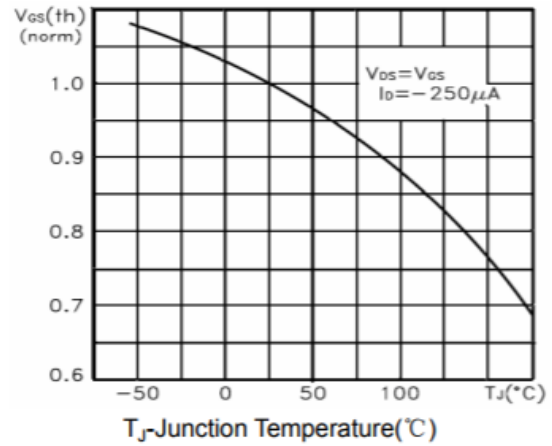


Figure 10 $V_{GS(th)}$ vs Junction Temperature

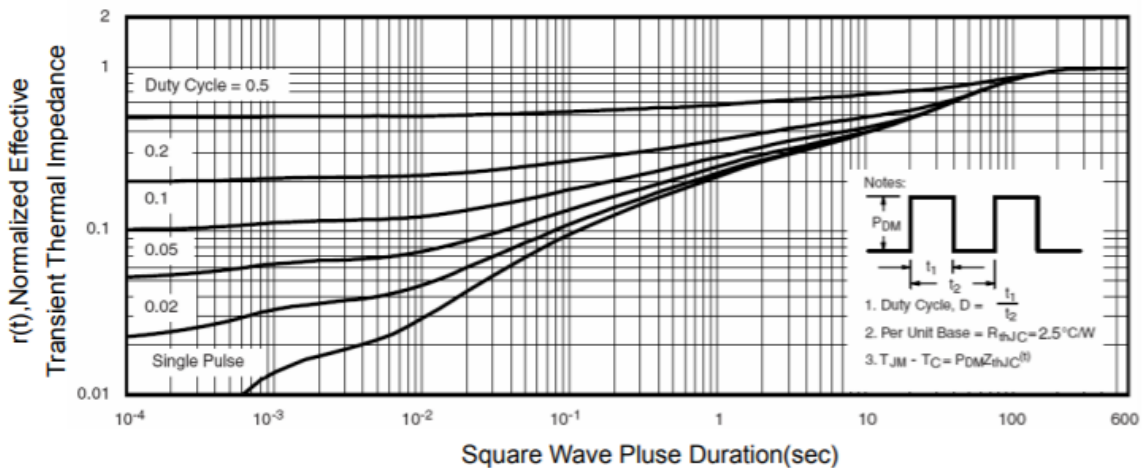


Figure 11 Normalized Maximum Transient Thermal Impedance

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