



GL13P10B3

GL Silicon P-Channel Power MOSFET

General Description:

The GL13P10B3 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-251, which accords with the RoHS standard.

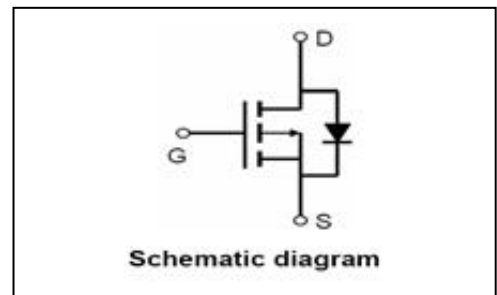
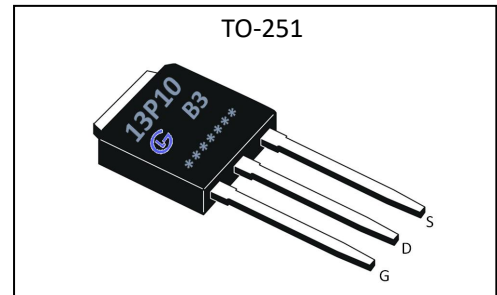
Features:

- Fast Switching
- Low Gate Charge and Rdson
- 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}	-100	V
I_D	-13	A
P_D	40	W
$R_{DS(ON)}$ TYPE	250	m Ω



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-100	V
I_D	Continuous Drain Current	-13	A
	Continuous Drain Current $T_C = 100^\circ\text{C}$	-9.5	A
I_{DM}^{a1}	Pulsed Drain Current	-30	A
V_{GS}	Gate-to-Source Voltage	± 20	V
d_v/d_t^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation	40	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	$V_{GS}=0V, I_D=-250\mu A$	-100	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	$I_D=-250\mu A$, Reference 25°C	--	0.15	--	V/°C
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=-100V, V_{GS}=0V, T_a=25^\circ C$	--	--	-1	μA
		$V_{DS}=-80V, V_{GS}=0V, T_a=125^\circ C$	--	--	-250	
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	10	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-10	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-13.0A$	--	250	270	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.9	-3.0	V
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-5A$	12	25	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-50V$ $f=1.0MHz$	--	510	--	pF
C_{oss}	Output Capacitance		--	170	--	
C_{rss}	Reverse Transfer Capacitance		--	115	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$R_L=-1.5\Omega, V_{DD}=-50V$ $V_{GS}=-10V, R_G=1.5\Omega$	--	11	--	ns
t_r	Rise Time		--	12	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	30	--	
t_f	Fall Time		--	12	--	
Q_g	Total Gate Charge	$I_D=-10.0A, V_{DD}=-50V$ $V_{GS}=-10V$	--	16	--	nC
Q_{gs}	Gate to Source Charge		--	4	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	4.2	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	-13	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	-30	A
V_{SD}	Diode Forward Voltage	$I_S = -13A, V_{GS} = 0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S = -13A, T_j = 25^\circ C$	--	25	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt = 100A/us, V_{GS} = 0V$	--	32	--	nC

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

Symbol	Parameter	Typ.	Units
$R_{\theta JC}$	Junction-to-case	3.13	$^\circ C/W$

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

^{a3}: $I_{SD} = -13A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}$, Start $T_j = 25^\circ C$

Typical Electrical and Thermal Characteristics

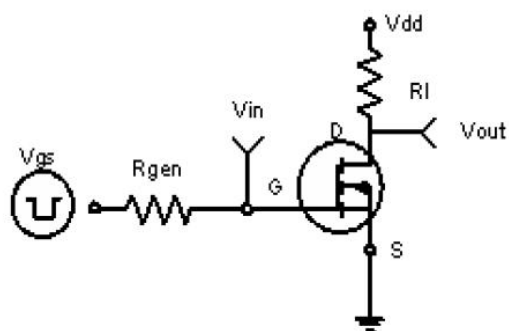


Figure 1: Switching Test Circuit

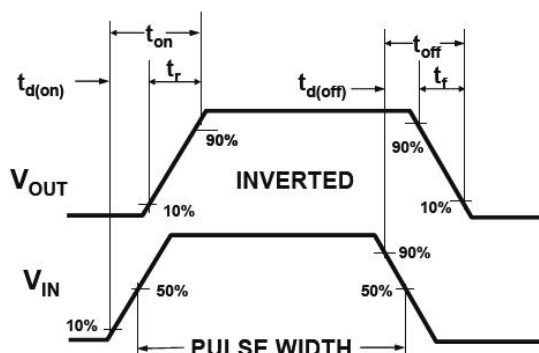


Figure 2: Switching Waveforms

Typical Electrical and Thermal Characteristics (Curves)

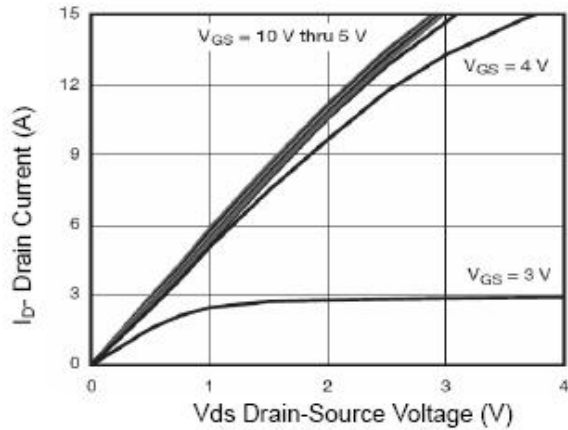


Figure 1 Output Characteristics

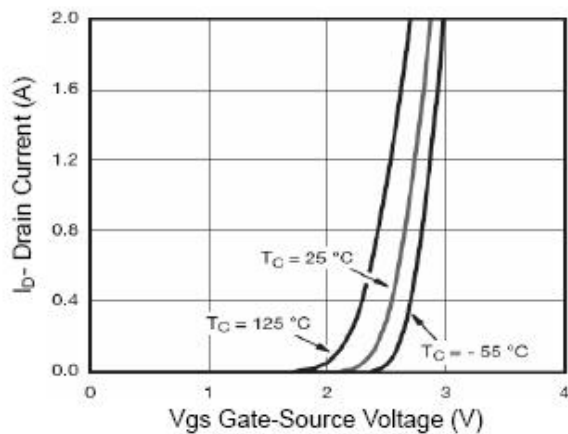


Figure 2 Transfer Characteristics

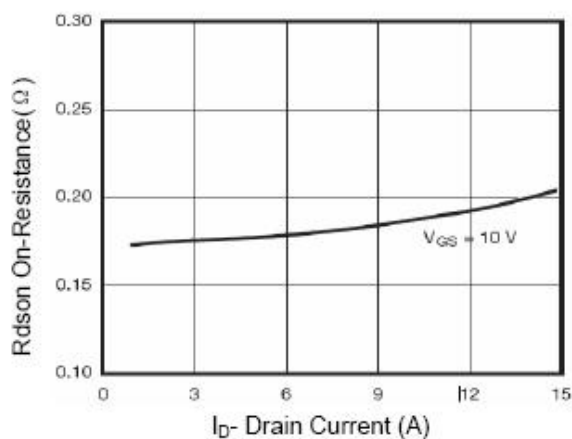


Figure 3 Rdson- Drain Current

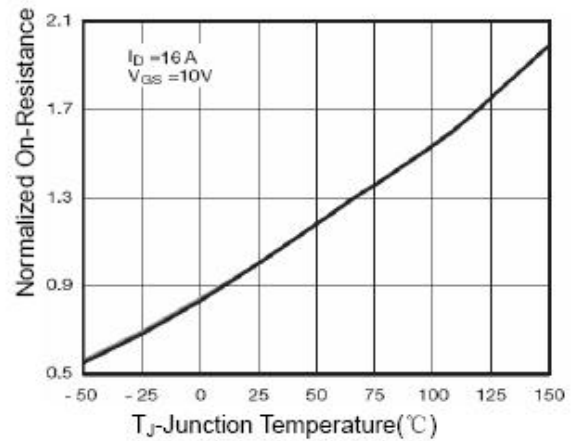


Figure 4 Rdson-Junction Temperature

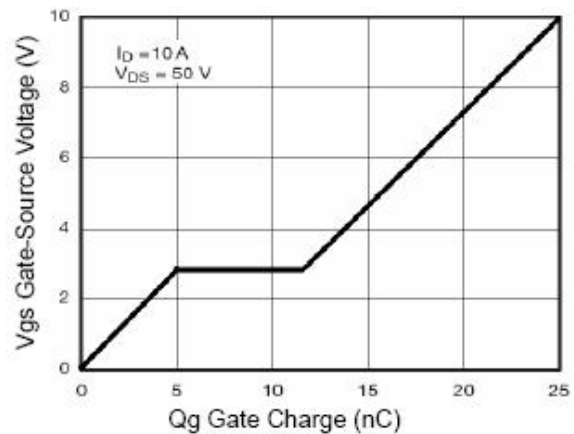


Figure 5 Gate Charge

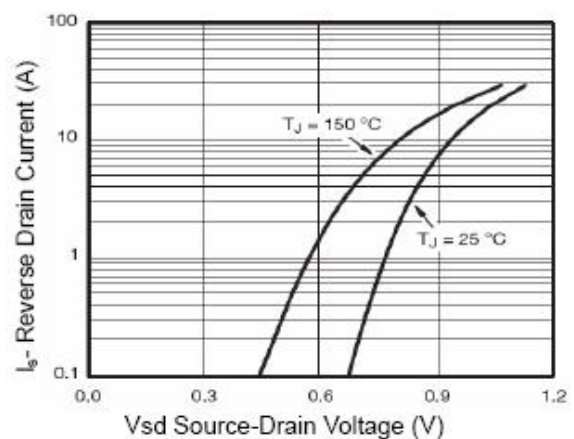


Figure 6 Source- Drain Diode Forward

