

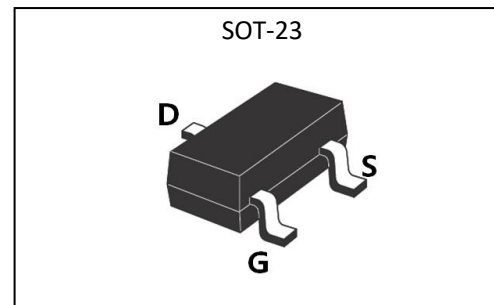
General Description

The GL0105 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOT-23L, which accords with the RoHS standard.

V_{DSS}	100	V
I_D	5	A
P_D	3	W
$R_{DS(ON)max}$	100	m Ω

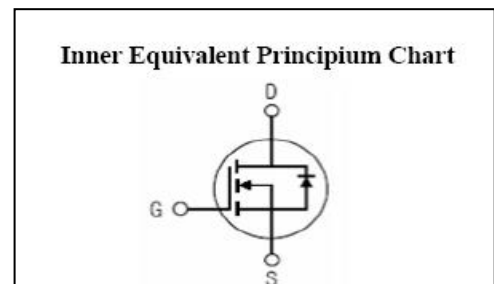
Features

- $R_{DS(ON)} < 100m\Omega$ @ $V_{GS}=10V$
- High density cell design for ultra low R_{dsn}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation



Applications

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



Absolute (Tc=25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	100	V
I_D	Continuous Drain Current	5	A
I_{DM}	Pulsed Drain Current	20	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	3	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	175, -55 to 175	$^{\circ}C$



GL0105

GL Silicon N-Channel Power MOSFET

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
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=100V, V_{GS}=0V, T_a=25^\circ C$	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-0.1	μA

ON Characteristics ^{a3}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=5A$	--	--	100	m Ω
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=4.5V, I_D=3A$	--	--	110	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.7	--	2.5	V
Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$						

Dynamic Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=5A$	--	9	--	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V$ $f=1.0MHz$	--	700	--	pF
C_{oss}	Output Capacitance		--	130	--	
C_{rss}	Reverse Transfer Capacitance		--	80	--	

Resistive Switching Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=50V, R_L=15\Omega$ $V_{GS}=10V, R_G=2.5\Omega$	--	11	--	ns
t_r	Rise Time		--	7.5	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	35	--	
t_f	Fall Time		--	9.5	--	
Q_g	Total Gate Charge	$V_{DD}=50V, I_D=5A$ $V_{GS}=10V$	--	25	--	nC
Q_{gs}	Gate to Source Charge		--	3.5	--	
Q_{gd}	Gate to Drain ("Miller") Charge		--	5.0	--	



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Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current ^{a2} (Body Diode)		--	--	5	A
V_{SD}	Diode Forward Voltage ^{a3}	$I_S=5A, V_{GS}=0V$	--	--	1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient ^{a2}	100	°C/W

^{a1}: Repetitive Rating: Pulse width limited by maximum junction temperature.

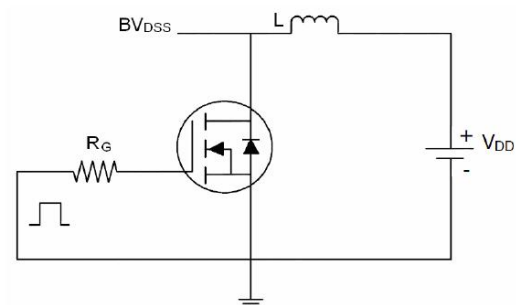
^{a2}: Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

^{a3}: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

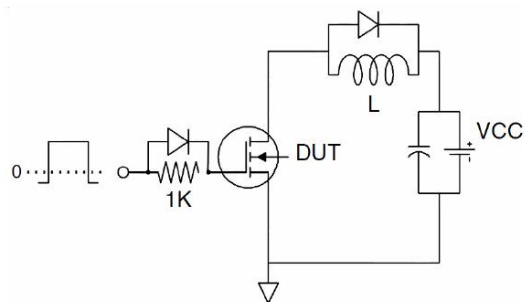
^{a4}: Guaranteed by design, not subject to production

Test Circuits

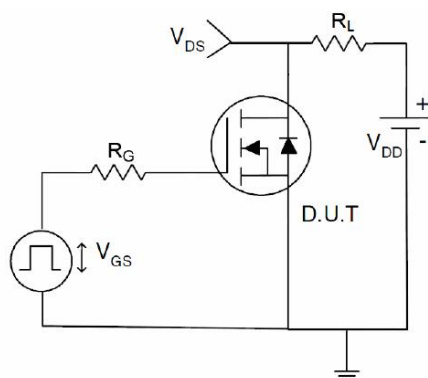
1) EAS test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Characteristics Curves

Figure1. Source-Drain Diode Forward Voltage

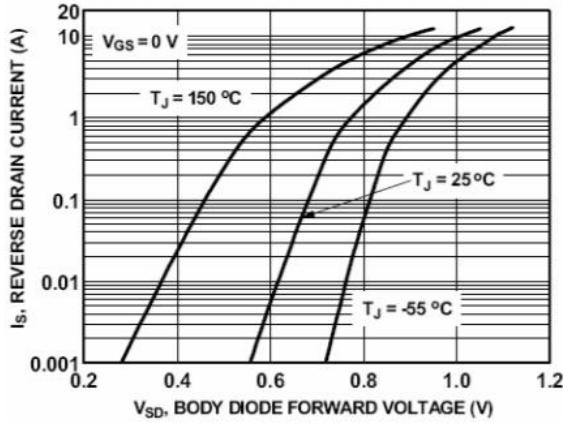


Figure2. Safe operating area

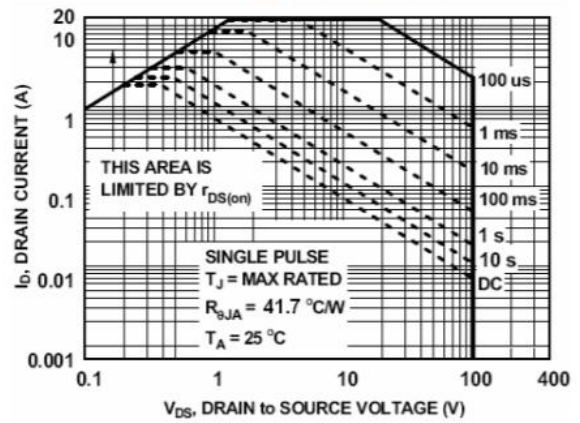


Figure3. Output characteristics

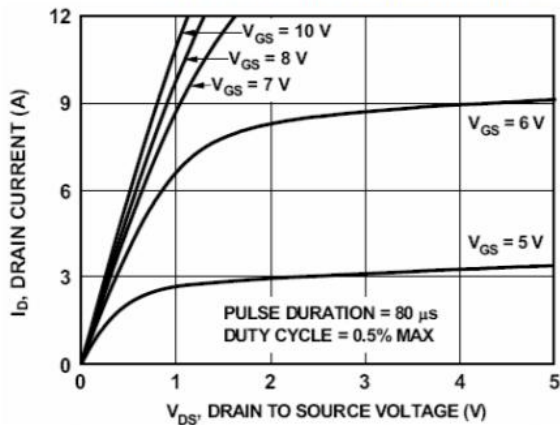


Figure4. Transfer characteristics

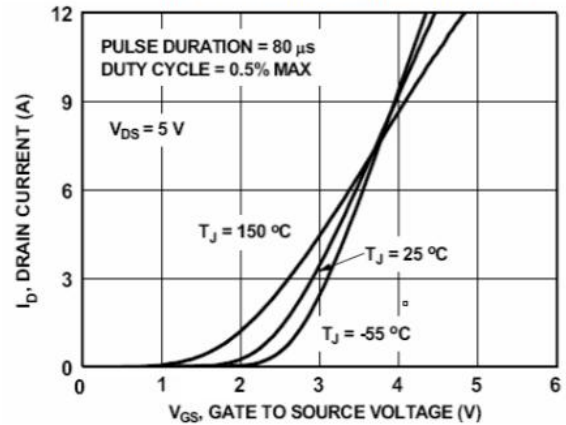


Figure5. Static drain-source on resistance

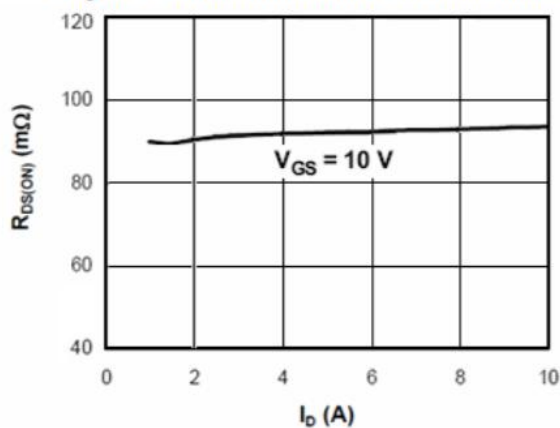


Figure6. $R_{DS(ON)}$ vs Junction Temperature

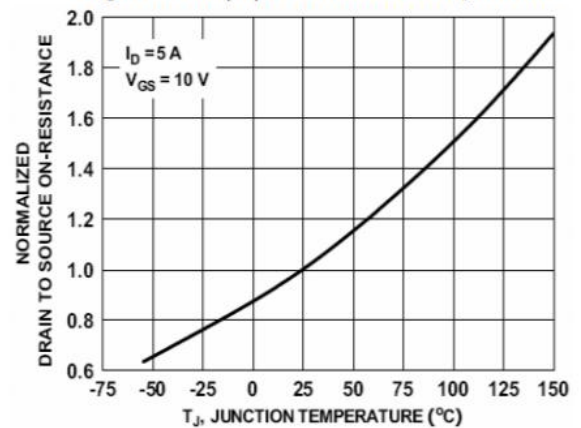


Figure7. BV_{DSS} vs Junction Temperature

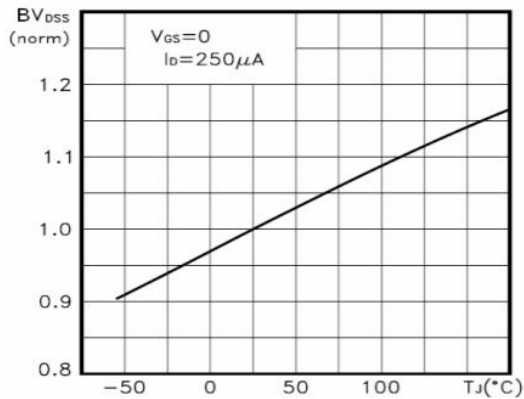


Figure8. $V_{GS(th)}$ vs Junction Temperature

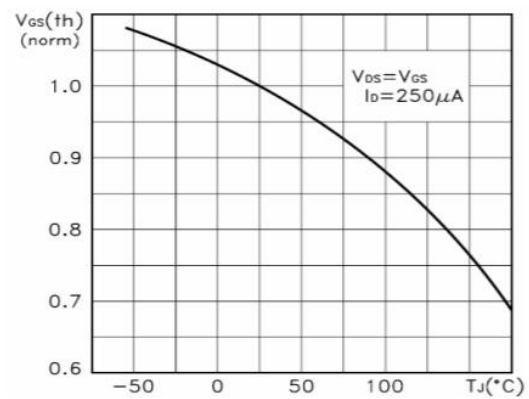


Figure9. Gate charge waveforms

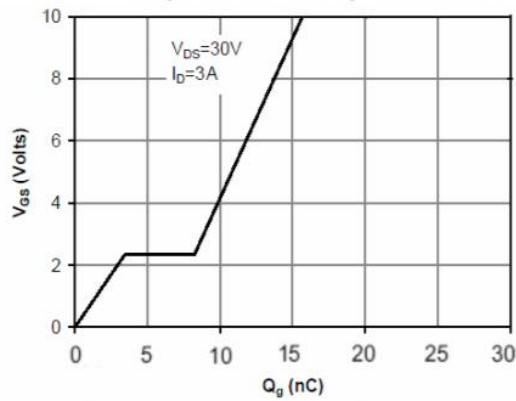


Figure10. Capacitance

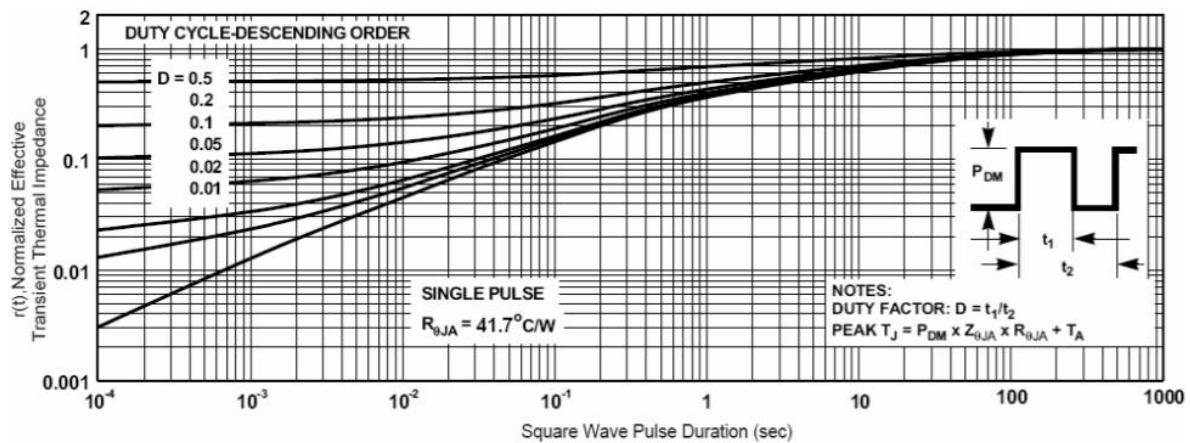
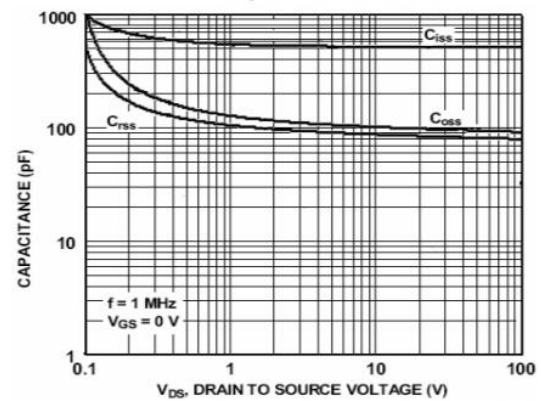


Figure11. Normalized Maximum Transient Thermal Impedance