



# GL3400K

## GL Silicon N-Channel Power MOSFET

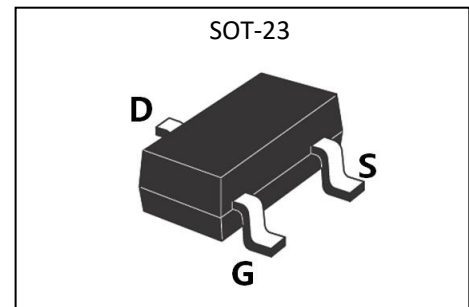
### General Description

The GL3400K 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-23, which accords with the RoHS standard.

$V_{DSS}$	30	V
$I_D$	5.8	A
$P_D$	0.35	W
$R_{DS(ON)MAX}$	30	m $\Omega$

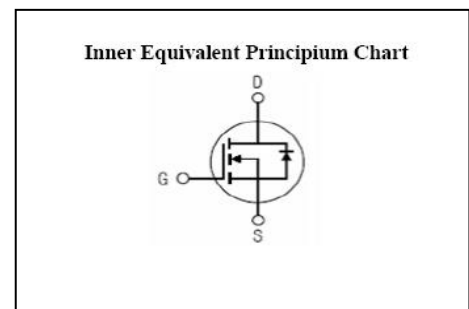
### Features

- $R_{DS(ON)} < 30m\Omega @ V_{GS}=10V$
- High density cell design for ultra low  $R_{dson}$
- 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	30	V
$I_D$	Continuous Drain Current	5.8	A
$I_{DM}$	Pulsed Drain Current	30	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 12$	V
$P_D$	Power Dissipation	0.35	W
$T_J, T_{stg}$	Operating Junction and Storage Temperature Range	150, -55 to 150	$^{\circ}C$

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

### Thermal Characteristics

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Junction-to-Ambient <sup>a2</sup>	357	$^{\circ}C/W$



# GL3400K

## GL Silicon N-Channel Power MOSFET

### Electrical Characteristics (T<sub>c</sub>= 25°C unless otherwise specified)

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V <sub>DSS</sub>	Drain to Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
I <sub>DSS</sub>	Drain to Source Leakage Current	V <sub>DS</sub> =24V, V <sub>GS</sub> = 0V, T <sub>a</sub> =25°C	--	--	1.0	μA
I <sub>GSS(F)</sub>	Gate to Source Forward Leakage	V <sub>GS</sub> = +12V	--	--	0.1	μA
I <sub>GSS(R)</sub>	Gate to Source Reverse Leakage	V <sub>GS</sub> =-12V	--	--	-0.1	μA

ON Characteristics <sup>a3</sup>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R <sub>DS(ON)</sub>	Drain-to-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5.8A	--	--	30	mΩ
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.7	--	1.4	V

Pulse width tp ≤ 380μs, δ ≤ 2%

Dynamic Characteristics <sup>a4</sup>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =5A	8	--	--	S
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V f=1.0MHz	--	--	1050	pF
C <sub>oss</sub>	Output Capacitance		--	99	--	
C <sub>rss</sub>	Reverse Transfer Capacitance		--	77	--	

Resistive Switching Characteristics <sup>a4</sup>						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V, R <sub>L</sub> =2.7Ω V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	--	--	5	ns
t <sub>r</sub>	Rise Time		--	--	7	
t <sub>d(OFF)</sub>	Turn-Off Delay Time		--	--	40	
t <sub>f</sub>	Fall Time		--	--	6	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V <sub>SD</sub>	Diode Forward Voltage <sup>a3</sup>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V	--	--	1	V

<sup>a1</sup>: Repetitive Rating: Pulse width limited by maximum junction temperature.

<sup>a2</sup>: Surface Mounted on FR4 Board, t ≤ 10sec.

<sup>a3</sup>: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

<sup>a4</sup>: Guaranteed by design, not subject to production

### Test Circuits

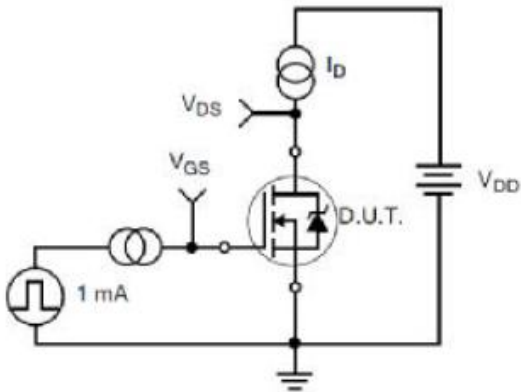


Figure 17. Gate Charge Test Circuit

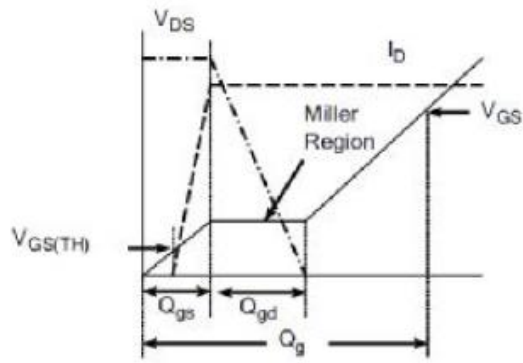


Figure 18. Gate Charge Waveform

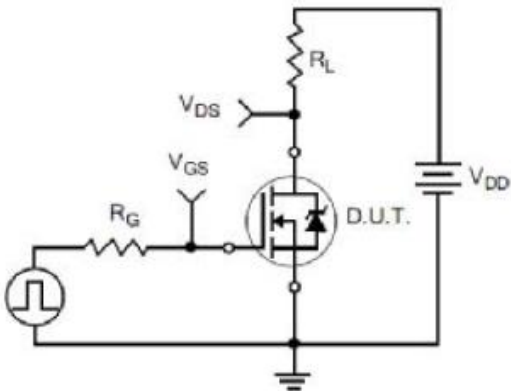


Figure 19. Resistive Switching Test Circuit

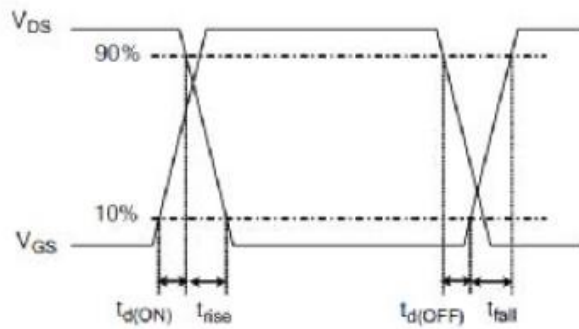


Figure 20. Resistive Switching Waveforms



# GL3400K

## GL Silicon N-Channel Power MOSFET

### Characteristics Curves

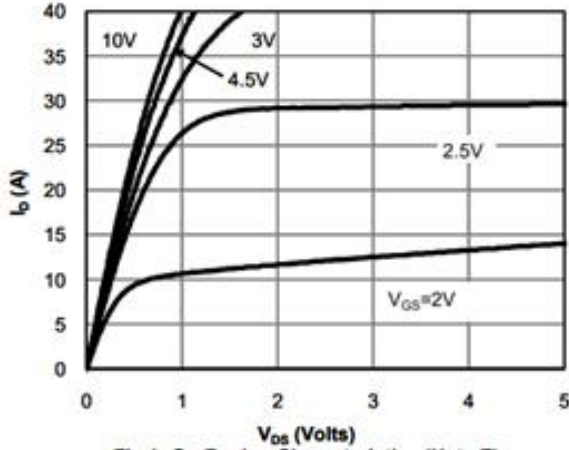


Fig 1: On-Region Characteristics (Note E)

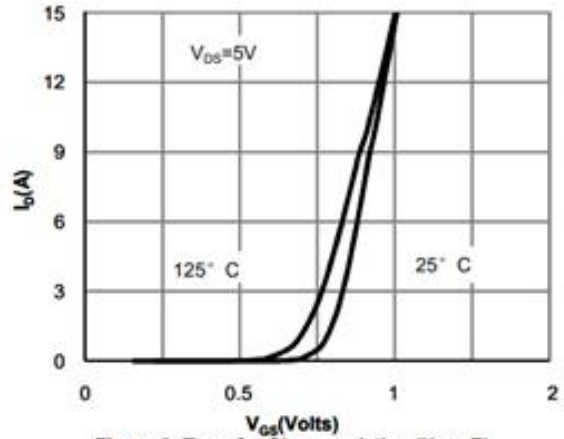


Figure 2: Transfer Characteristics (Note E)

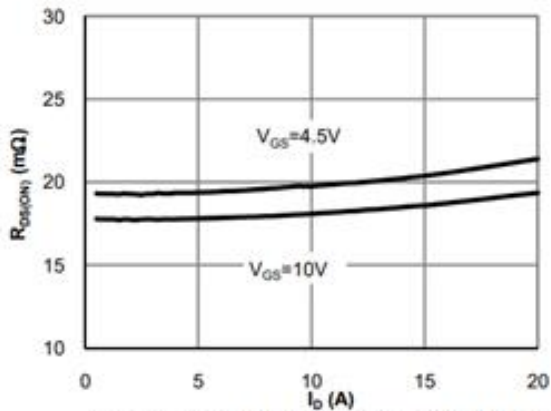


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

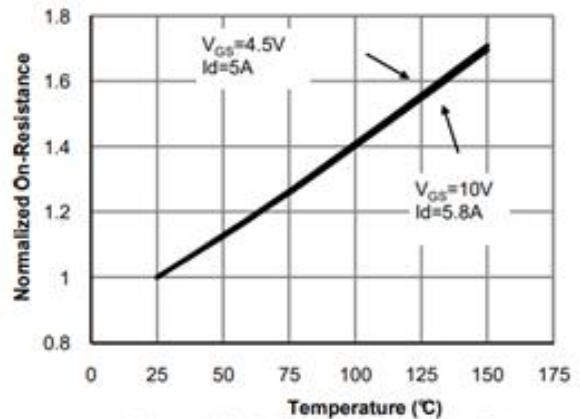


Figure 4: On-Resistance vs. Junction Temperature (Note E)

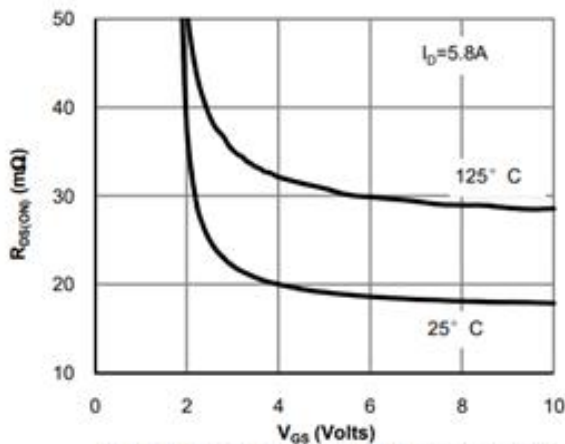


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

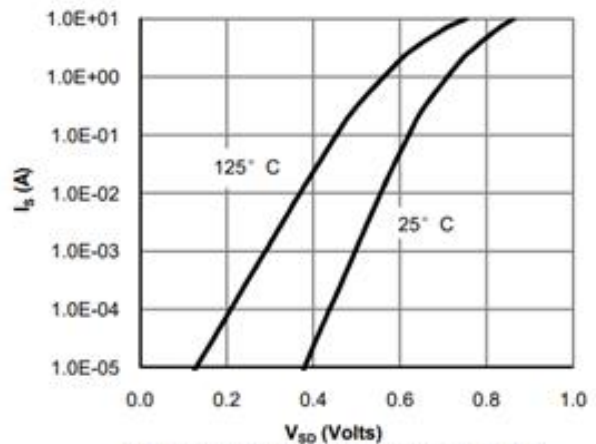


Figure 6: Body-Diode Characteristics (Note E)



# GL3400K

## GL Silicon N-Channel Power MOSFET

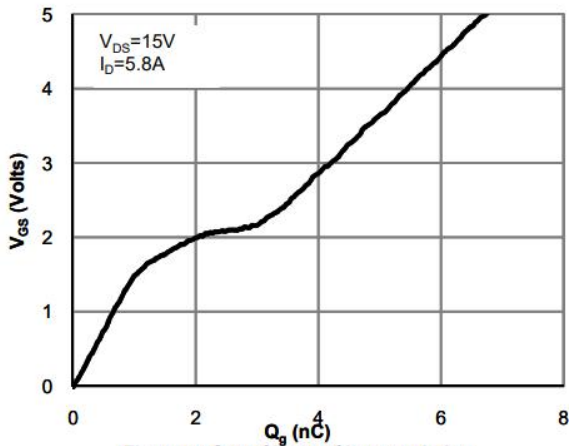


Figure 7: Gate-Charge Characteristics

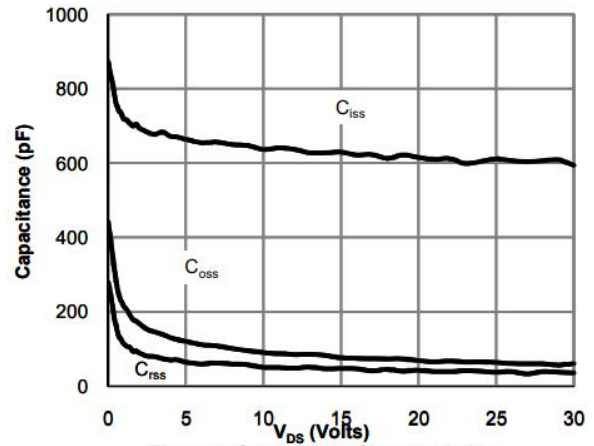


Figure 8: Capacitance Characteristics

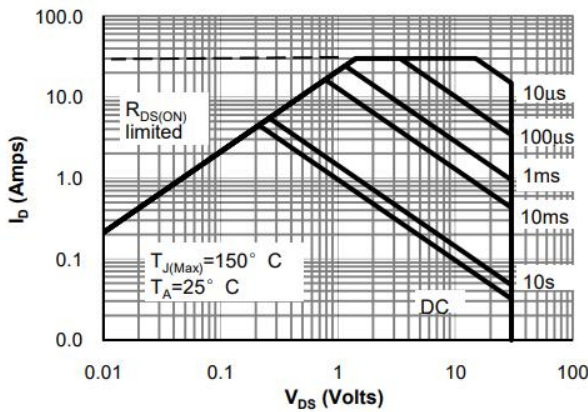


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

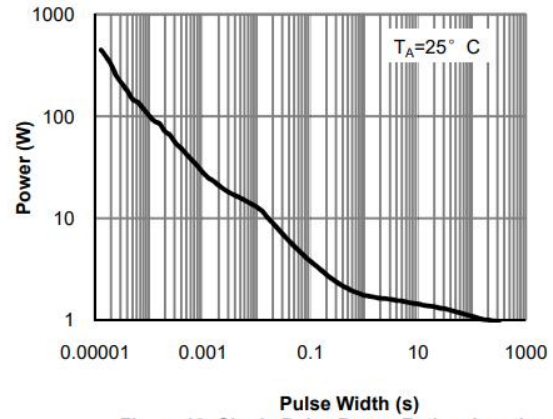


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

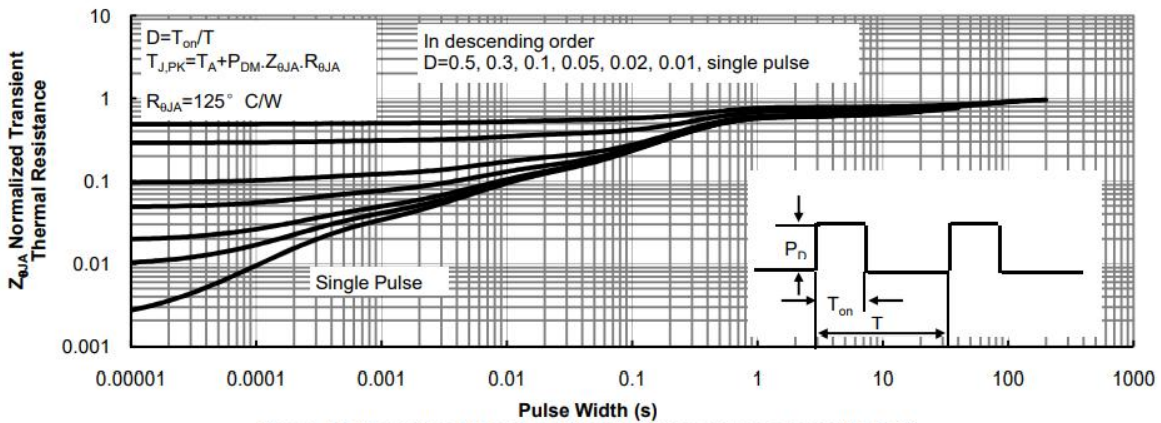


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)