



SLS50N03 N-Channel 30V/50A Enhancement Mode Power MOSFET

SLS50N03 Description

This Power SLS50N03 is produced using advanced TRENCH technology.

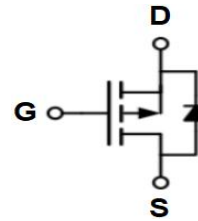
This advanced technology has been especially tailored to Minimize conduction loss , provide superior switching performance , and withstand high energy pulse in the avalanche and commutation mode.

SLS50N03 General Features

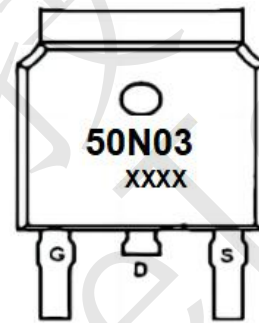
- $V_{DS} = 30V$, $I_D = 50A$
- $R_{DS(ON)} (TYP) = 7m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} (TYP) = 10m\Omega @ V_{GS}=4.5V$
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested

SLS50N03 Application

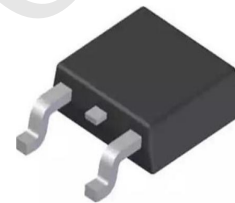
- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin assignment



TO-252-2L

SLS50N03 Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	30	V
I_D	Drain Current - Continuous ($T_C = 25^\circ C$) - Continuous ($T_C = 100^\circ C$)	50	A
		30	A
I_{DM}	Drain Current - Pulsed (Note 1)	120	A
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	39	mJ
E_{AR}	Repetitive Avalanche Energy	-	mJ
d_V/dt	Peak diode recovery d_V/dt	-	V/ns
P_D	Power Dissipation ($T_C = 25^\circ C$)	18	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4.32	W/°C
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C

* Drain current limited by maximum junction temperature.



SLS50N03 Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 uA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30 V, V _{GS} = 0 V	--	--	1	uA
		V _{DS} = 24V, T _C = 125°C	--	--	10	uA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 20V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -20 V, V _{DS} = 0 V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 uA	1.0	-	2.5	V
R _{DS(on)}	Static Drain-Source	V _{GS} = 10 V, I _D = 12A	--	7	8.5	mΩ
	On-Resistance	V _{GS} = 4.5 V, I _D = 10A	-	10	14	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 15 V, V _{GS} = 0 V, f = 1.0 MHz	--	1200	-	pF
C _{oss}	Output Capacitance		--	163	-	pF
C _{rss}	Reverse Transfer Capacitance		--	131	-	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{GS} = 10 V, V _{DS} = 12 V, R _G = 3.3Ω, I _D = 5A (Note 3)	--	4.5	--	ns
t _r	Turn-On Rise Time		--	10.8	--	ns
t _{d(off)}	Turn-Off Delay Time		--	25.5	--	ns
t _f	Turn-Off Fall Time		--	9.6	--	ns
Q _g	Total Gate Charge		--	12.8	--	nC
Q _{gs}	Gate-Source Charge	V _{DS} = 20 V, I _D = 12A, V _{GS} = 4.5V(Note 3)	--	3.3	--	nC
Q _{gd}	Gate-Drain Charge	--	6.5	--	nC	
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current	--	--	--	50	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	--	120	A
V _{SD}	Drain to Source Diode Forward Voltage, V _{GS} = 0V, I _{SD} = 5A, T _J = 25°C	--	--	--	1.2	V

Notes

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J = 25°C, V_{DD} = 20V, V_G = 10V, R_G = 25Ω, L = 0.1mH,
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%



SLS50N03 Typical Electrical and Thermal Characteristics

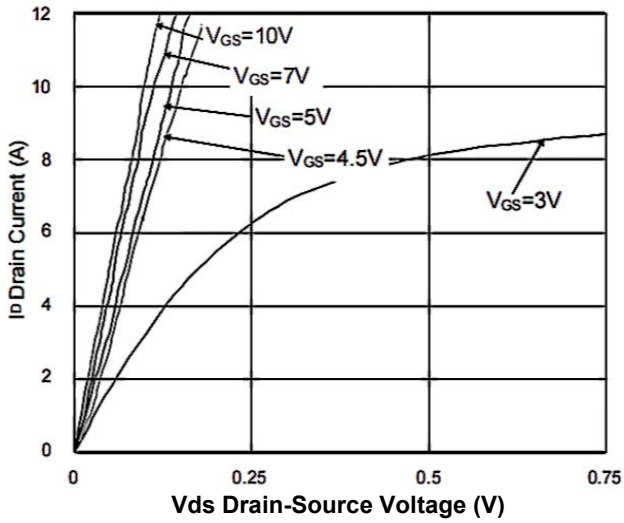


Figure.1 Typical Output Characteristics

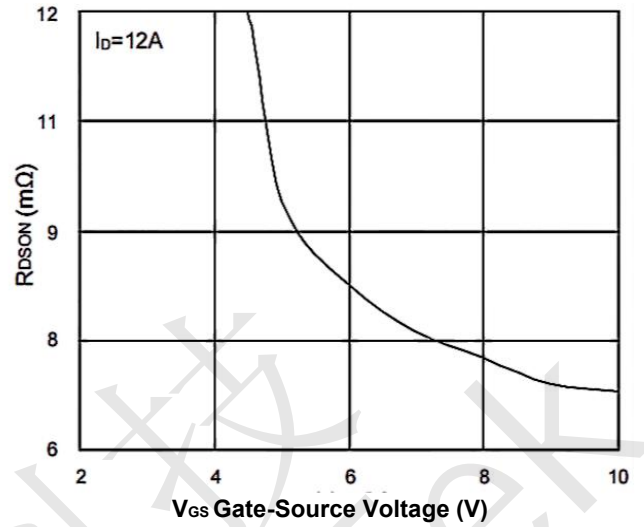


Figure 2. On-Resistance vs. G-S Voltage

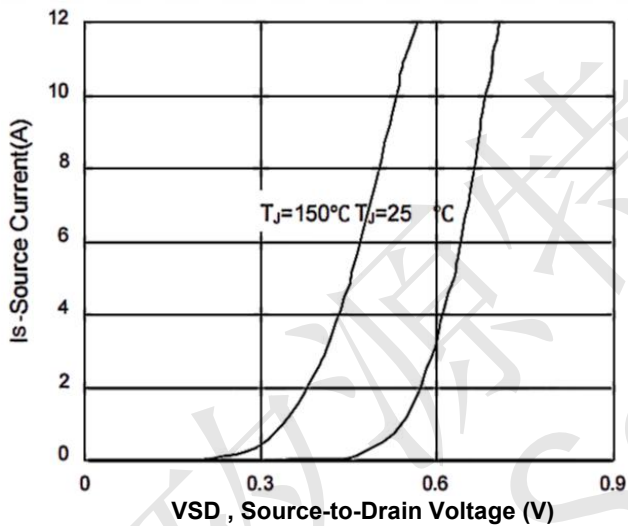


Figure 3. Forward Characteristics of Reverse

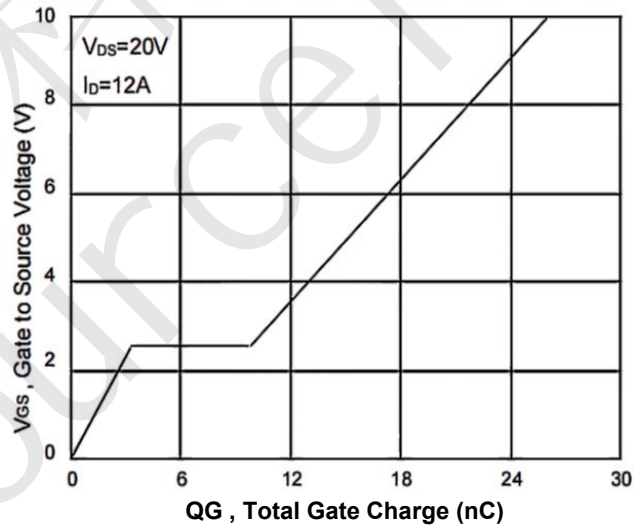


Figure 4. Gate-Charge Characteristics

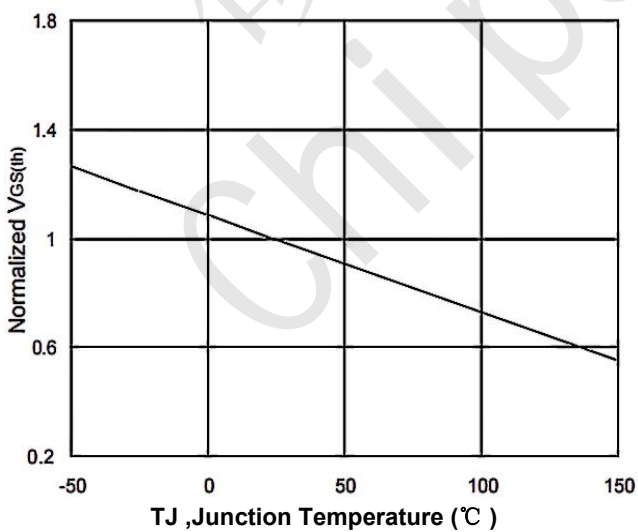


Figure 5. Normalized VGS(th) vs. TJ

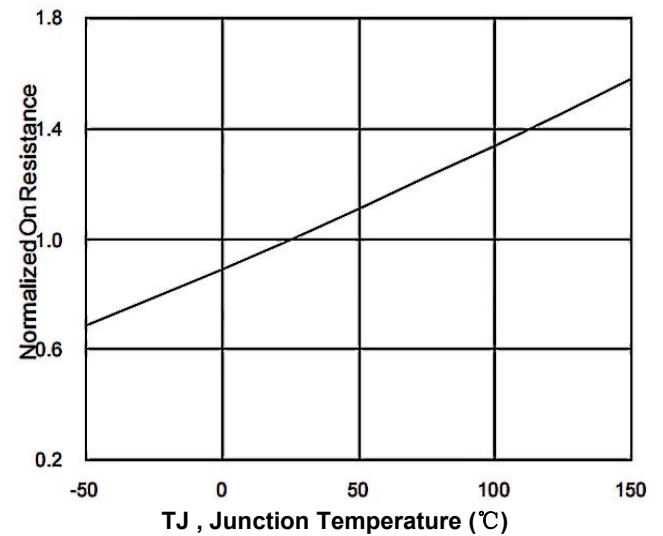
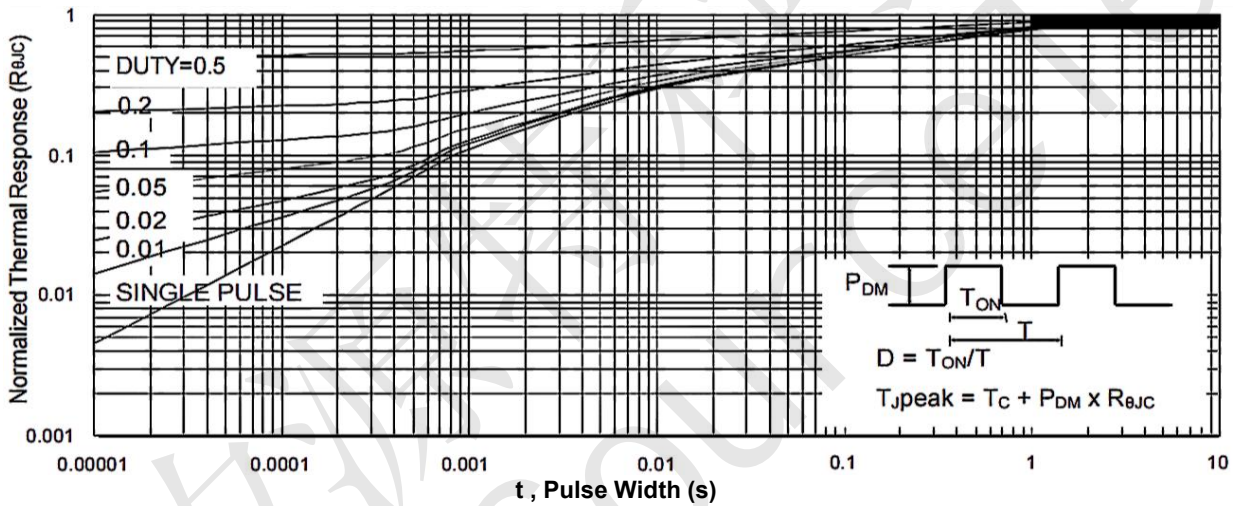
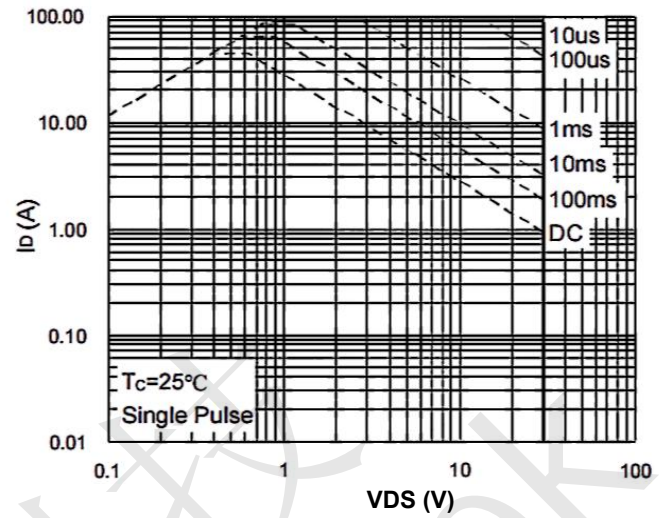
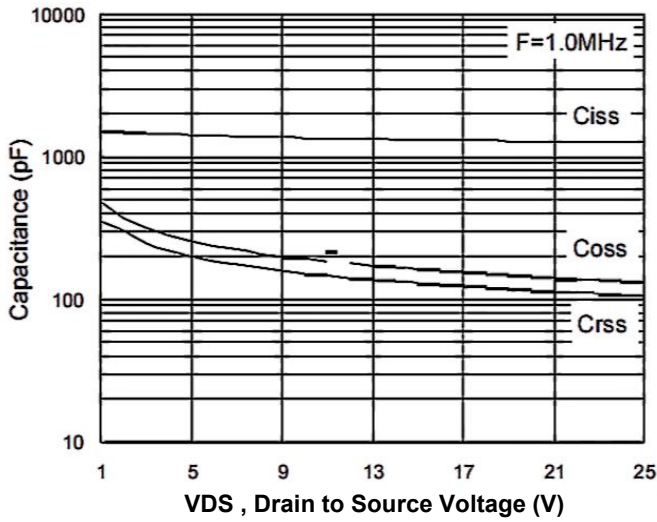
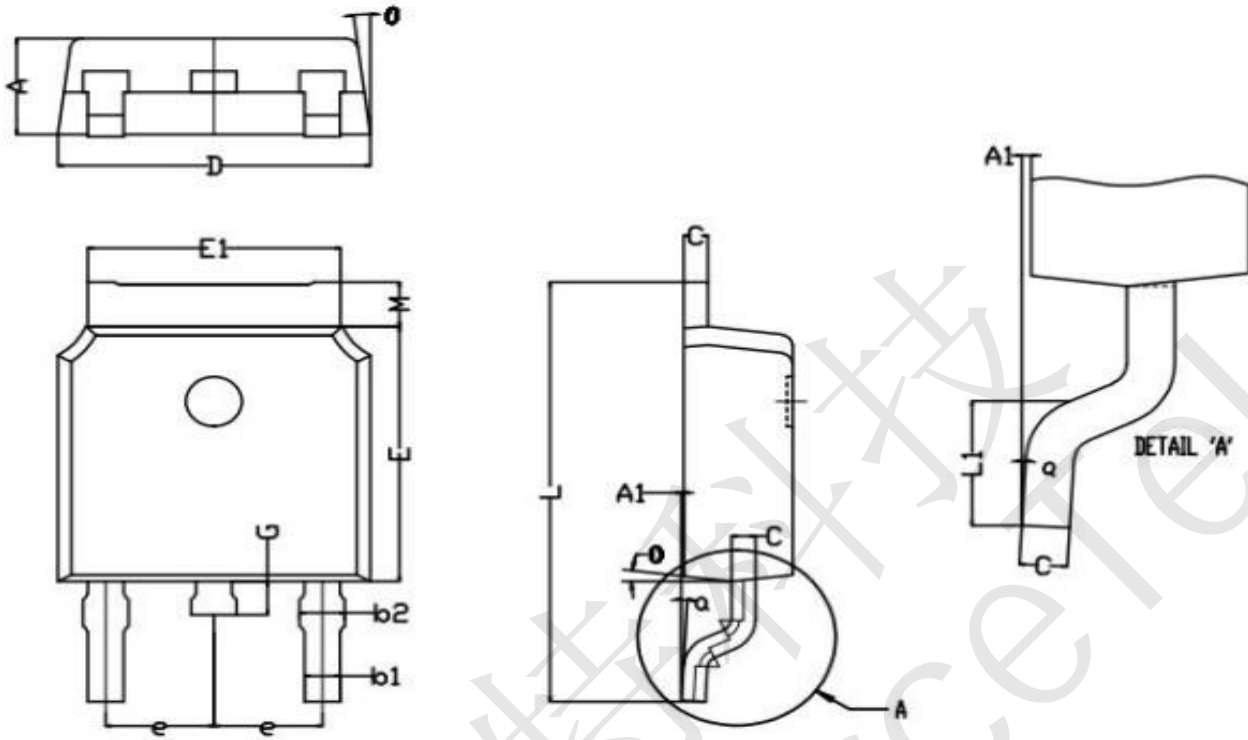


Figure 6. Normalized Rds(on) vs. TJ





SLS50N03 TO-252-2L Package Information



Symbol	Dim in mm		
	Min	Nor	Max
A	2.25	2.30	2.35
L1	2.90	3.00	3.10
b1	0.71	0.76	0.81
b2	0.91	0.96	1.01
C	0.46	0.51	0.56
D	6.55	6.60	6.65
e	2.29 (BSC)		
E	6.05	6.10	6.15
E1	5.23	5.33	5.43
L	9.84	10.04	10.24
A1	0.00	0.05	0.10
M	1.01	1.06	1.11
G	0.70	0.80	0.90
O	0°	5°	10°
Q	0°	3°	6°



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