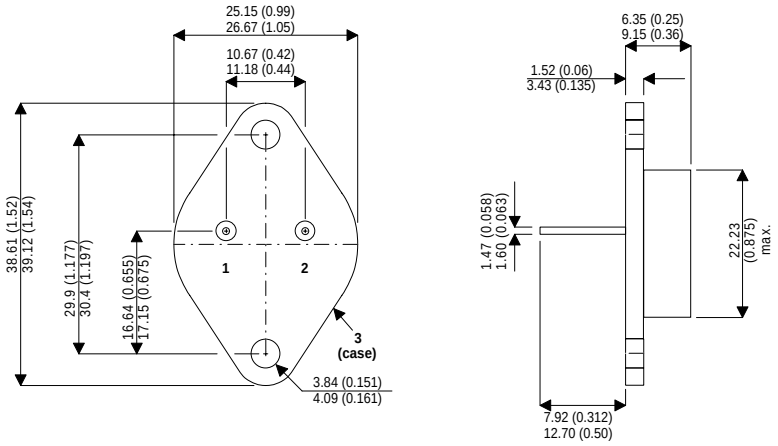
SML50A19

TO–3 Package Outline.

Dimensions in mm (inches)



Pin 1 – Gate **Pin 2 – Source** **Case – Drain**

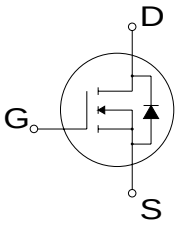
N–CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

V_{DSS} **500V**

$I_{D(cont)}$ **18.5A**

$R_{DS(on)}$ **0.240Ω**

- **Faster Switching**
- **Lower Leakage**
- **TO–3 Hermetic Package**



StarMOS is a new generation of high voltage N–Channel enhancement mode power MOSFETs. This new technology minimises the JFET effect, increases packing density and reduces the on-resistance. StarMOS also achieves faster switching speeds through optimised gate layout.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_{DSS}	Drain – Source Voltage	500	V
I_D	Continuous Drain Current	18.5	A
I_{DM}	Pulsed Drain Current [1]	74	A
V_{GS}	Gate – Source Voltage	±30	V
V_{GSM}	Gate – Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_{case} = 25°C	200	W
	Derate Linearly	1.6	W/°C
T_J , T_{STG}	Operating and Storage Junction Temperature Range	–55 to 150	°C
T_L	Lead Temperature : 0.063” from Case for 10 Sec.	300	
I_{AR}	Avalanche Current[1] (Repetitive and Non-Repetitive)	18.5	A
E_{AR}	Repetitive Avalanche Energy [1]	30	mJ
E_{AS}	Single Pulse Avalanche Energy [2]	1210	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Starting T_J = 25°C, L = 7.07mH, R_G = 25Ω, Peak I_L = 18.5A

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SEME LAB

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STATIC ELECTRICAL RATINGS (T_{case} = 25°C unless otherwise stated)

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain – Source Breakdown Voltage	V_{GS} = 0V , I_D = 250µA	500			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = V_{DSS}$			25	µA
	(V_{GS} = 0V)	$V_{DS} = 0.8V_{DSS}$, T_C = 125°C			250	
I_{GSS}	Gate – Source Leakage Current	V_{GS} = ±30V , V_{DS} = 0V			±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, I_D = 1.0mA	2		4	V
$I_{D(ON)}$	On State Drain Current [2]	$V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max, V_{GS} = 10V	18.5			A
$R_{DS(ON)}$	Drain – Source On State Resistance [2]	V_{GS} = 10V , I_D = 0.5 I_D [Cont.]			0.240	Ω

DYNAMIC CHARACTERISTICS

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{GS} = 0V		3600	4320	pF
C_{oss}	Output Capacitance	V_{DS} = 25V		470	660	
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		180	270	
Q_g	Total Gate Charge[3]	V_{GS} = 10V		140	210	nC
Q_{gs}	Gate – Source Charge	V_{DD} = 0.5 V_{DSS}		22	35	
Q_{gd}	Gate – Drain (“Miller”) Charge	$I_D = I_D$ [Cont.] @ 25°C		65	95	
$t_{d(on)}$	Turn–on Delay Time	V_{GS} = 15V		11	22	ns
t_r	Rise Time	V_{DD} = 0.5 V_{DSS}		10	20	
$t_{d(off)}$	Turn-off Delay Time	$I_D = I_D$ [Cont.] @ 25°C		50	75	
t_f	Fall Time	R_G = 1.6Ω		7	14	

SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	(Body Diode)			18.5	A
I_{SM}	Pulsed Source Current[1]	(Body Diode)			74	
V_{SD}	Diode Forward Voltage[2]	V_{GS} = 0V , $I_S = -I_D$ [Cont.]			1.3	V
t_{rr}	Reverse Recovery Time	$I_S = -I_D$ [Cont.] , dI_S / dt = 100A/µs		415		ns
Q_{rr}	Reverse Recovery Charge	$I_S = -I_D$ [Cont.] , dI_S / dt = 100A/µs		6.6		µC

THERMAL CHARACTERISTICS

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			0.62	°C/W
$R_{\theta JA}$	Junction to Ambient			30	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.
2) Pulse Test: Pulse Width < 380µS , Duty Cycle < 2%
3) See MIL–STD–750 Method 3471

CAUTION — Electrostatic Sensitive Devices. Anti-Static Procedures Must Be Followed.

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