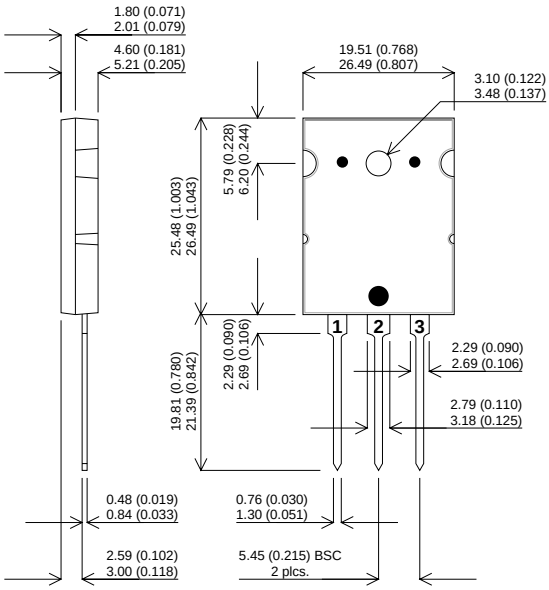
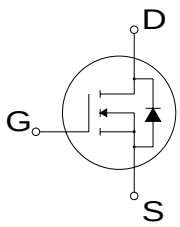
SML50L47

TO–264AA Package Outline.

Dimensions in mm (inches)



Pin 1 – Gate **Pin 2 – Drain** **Pin 3 – Source**



N–CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

V_{DSS} 500V

$I_{D(cont)}$ 44A

$R_{DS(on)}$ 0.100Ω

- **Faster Switching**
- **Lower Leakage**
- **100% Avalanche Tested**
- **Popular TO–264 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	47	A
I_{DM}	Pulsed Drain Current [1]	188	A
V_{GS}	Gate – Source Voltage	±30	V
V_{GSM}	Gate – Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_{case} = 25°C	520	W
	Derate Linearly	4.16	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)	47	A
E_{AR}	Repetitive Avalanche Energy [1]	50	mJ
E_{AS}	Single Pulse Avalanche Energy [2]	2500	

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

2) Starting T_J = 25°C, L = 2.26mH, R_G = 25Ω, Peak I_L = 47A

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SEME LAB

SML50L47

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}			250	µA
	(V_{GS} = 0V)	V_{DS} = 0.8V_{DSS} , T_C = 125°C			1000	
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 = 2.5mA	2		4	V
$I_{D(ON)}$	On State Drain Current [2]	V_{DS} > $I_{D(ON)}$ x $R_{DS(ON)}$ Max V_{GS} = 10V	47			A
$R_{DS(ON)}$	Drain – Source On State Resistance [2]	V_{GS} = 10V , I_D = 0.5 I_D [Cont.]			0.100	Ω

DYNAMIC CHARACTERISTICS

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{GS} = 0V		7400	8900	pF
C_{oss}	Output Capacitance	V_{DS} = 25V		1000	1400	
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		380	570	
Q_g	Total Gate Charge[3]	V_{GS} = 10V		312	470	nC
Q_{gs}	Gate – Source Charge	V_{DD} = 0.5 V_{DSS}		50	75	
Q_{gd}	Gate – Drain (“Miller”) Charge	I_D = I_D [Cont.] @ 25°C		127	190	
$t_{d(on)}$	Turn–on Delay Time	V_{GS} = 15V		14	30	ns
t_r	Rise Time	V_{DD} = 0.5 V_{DSS}		16	32	
$t_{d(off)}$	Turn-off Delay Time	I_D = I_D [Cont.] @ 25°C		54	80	
t_f	Fall Time	R_G = 0.6Ω		5	10	

SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS

	Characteristic	Test Conditions		Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	(Body Diode)				47	A
I_{SM}	Pulsed Source Current[1]	(Body Diode)				188	
V_{SD}	Diode Forward Voltage[2]	V_{GS} = 0V , I_S = – I_D [Cont.]				1.3	V
dv / dt	Peak Diode Recovery	$I_S \le I_D$ [cont] dI / dt = 100A/µs $V_{DD} \le V_{DSS}$ V_R = 200V $T_J \le 150°C$ R_G = 2.0Ω				5	V/ns
t_{rr}	Reverse Recovery Time	I_S = – I_D [Cont.] dI / dt = 100A/µs	T_J = 25°C			250	ns
			T_J = 125°C			500	
Q_{rr}	Reverse Recovery Charge	I_S = – I_D [Cont.] dI / dt = 100A/µs	T_J = 25°C		1.6		µC
			T_J = 125°C		5.5		
I_{rrm}	Peak Recovery Current	I_S = – I_D [Cont.] dI / dt = 100A/µs	T_J = 25°C		15		A
			T_J = 125°C		27		

THERMAL CHARACTERISTICS

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			0.24	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

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.