N-CHANNEL POWER MOSFET

TT electronics
Semelab Limited

SML20J175

- Fast Switching and Low leakage
- 100% Avalanche Tested
- Popular SOT-227 Package

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

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise stated)

VDS	Drain – Source Voltage	200V
V_{GS}	Gate – Source Voltage Continuous	
M	Gate – Source Voltage Transient	±30V
I_D	Continuous Drain Current	175A
I_{DM}	Pulsed Drain Current [1]	700A
$R_{DS(on)}$	On-State Drain-Source Resistance	0.011Ω
P_D	Total Power Dissipation	700W
	Derate Above 25°C	5.6W/°C
E_{AR}	Repetitive Avalanche Energy [1]	30mJ
E_{AS}	Single Pulse Avalanche Energy [4]	3600mJ
I_{AR}	Avalanche Current (Repetitive and Non-Repetitive) [1]	175A
T_J	Junction Temperature Range	-55 to +150°C
T_{stg}	Storage Temperature Range	-55 to +150°C
T_L	Lead Temperature: 0.063" from Case for 10 sec	300°C

THERMAL / PACKAGE CHARACTERISTICS

Symbols	Parameters	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction To Case			0.18	°C/W
θJA	Thermal Resistance, Junction To Ambient			0.40	
$V_{isolation}$	RMS Voltage (50-60Hz Sinusoidal waveform from terminals to mounting base for 1min)	2500			V
Torque	Device Mounting Screws and Electrical Terminations			1.4	Nm

Notes
(1) Repetitive Rating: Pulse width limited by maximum junction temperature
(2) Pulse Width ≤ 380us, δ ≤ 2%
(3) See MIL-STD-750 Method 3471
(4) Peak I_L = 175A, L = 235μH, R_G = 25Ω, Starting T_J = 25°C

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		Test Conditions	Min.	Typ	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 I_D = 250µA	200			V
$I_{D(on)}$ (2)	On-State Drain Current	(V_{DS} > $I_{D(on)}$ X $R_{DS(on)}$ MAX V_{GS} = 10V	175			A
$R_{DS(on)}$ (2)	Drain-Source On-State Resistance	V_{GS} = 10V 0.5 $I_{D(cont)}$			0.011	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS} I_D = 5mA	2		4	V
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0 V_{DS} = V_{DSS}			100	µA
		V_{DS} = 0.8V_{DSS} T_J = 125°C			500	

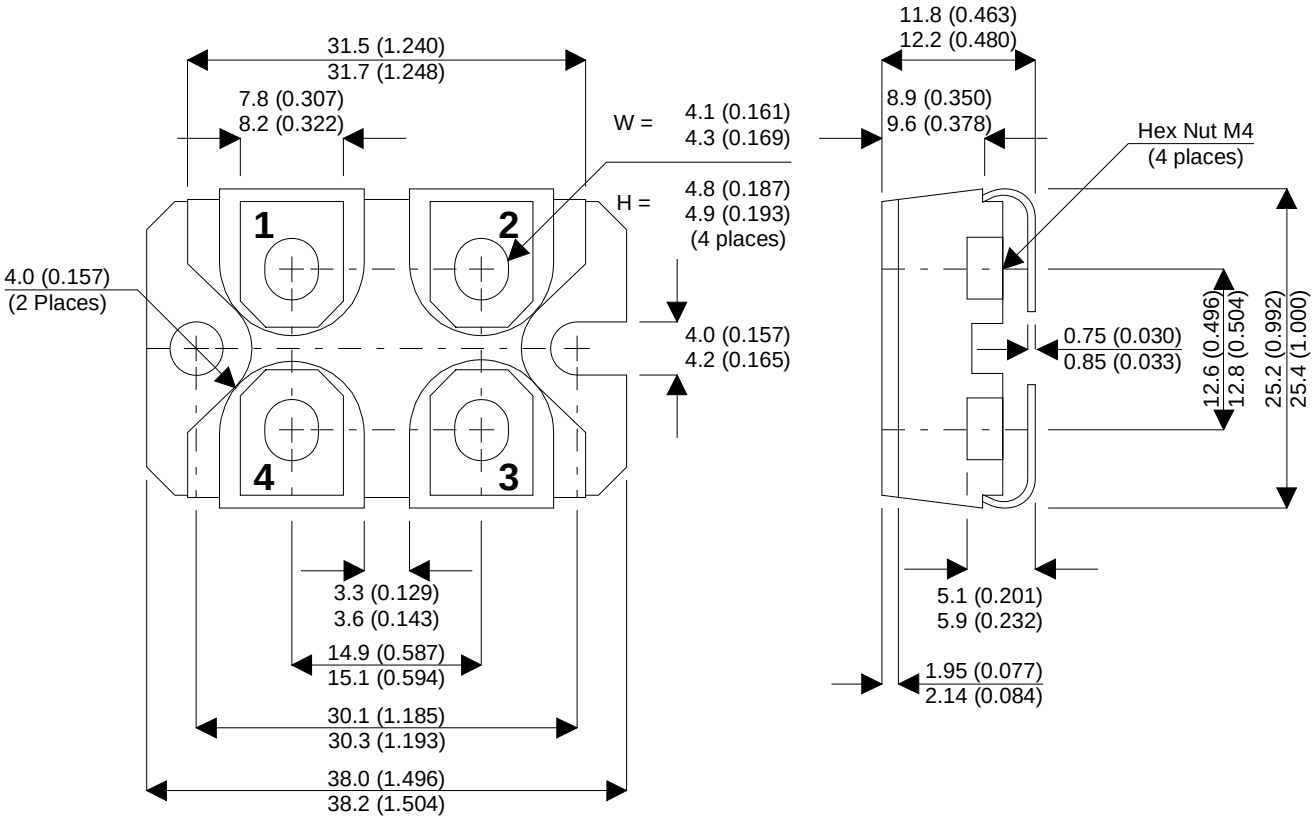
DYNAMIC CHARACTERISTICS

						pF
				1350		
Q_g (3)	Total Gate Charge	V_{GS} = 10V		690		nC
Q_{gs}	Gate-Source Charge	I_D = 0.5 $I_{D(cont)}$		95		
Q_{gd}	Gate-Drain Charge	V_{DS} = 0.5 V_{DSS}		290		
$t_{d(on)}$	Turn-On Delay Time	V_{GS} = 15V		20		ns
t_r	Rise Time	V_{DD} = 0.5 V_{DSS}		40		
$t_{d(off)}$	Turn-Off Delay Time	I_D = 0.5 $I_{D(cont)}$		75		
t_f	Fall Time	R_G = 0.6Ω		10		

SOURCE-DRAIN DIODE CHARACTERISTICS

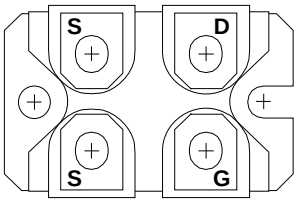
						A
(1)	Pulsed Source Current				700	
V_{SD} (2)	Diode Forward Voltage	I_S = - $I_{D(cont)}$ V_{GS} = 0			1.3	V
t_{rr}	Reverse Recovery Time	I_S = - $I_{D(cont)}$			460	ns
Q_{rr}	Reverse Recovery Charge	dIs/dt = 100A/µs			7	µC

Dimensions in mm (inches)



227 (ISOTOP)

Pins 1 & 4 - Source Pin 2 - Drain Pin 3 - Gate



* Source terminals are shorted internally. Current handling capability is equal for either Source terminal.