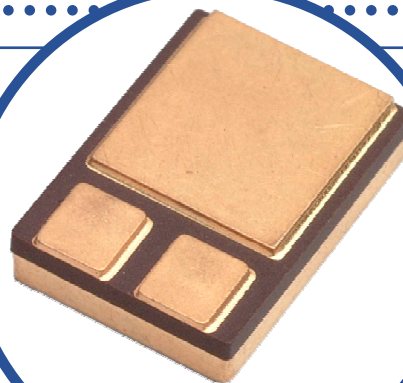


SiC 650V N-CHANNEL MOSFET

SML25SCM650N2B

- 650V SiC MOSFET In A Hermetic SMD1 (TO-276AB) Package
- Designed for High Temperature Applications
- Screening Options Available



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

V _{DS}	Drain – Source Voltage	650V
V _{GS}	Gate – Source Voltage	-6 ~ +22V
I _D	Continuous Drain Current ⁽¹⁾ T _C = 25°C	25A
I _{DM}	Pulsed Drain Current ⁽²⁾	60A
P _D	Total Power Dissipation at T _C = 25°C	90W
	Derate Above 25°C	0.45W/°C
T _J	Junction Temperature Range	-55 to +225°C
T _{stg}	Storage Temperature Range	-55 to +225°C

THERMAL PROPERTIES

Symbols	Parameters	Min.	Typ.	Max.	Units
R _{θJC}	Thermal Resistance, Junction To Case			2.2	°C/W

Notes

(1) Repetitive Rating: Pulse width limited by maximum junction temperature

(2) Pulse Width ≤ 10 μs, δ ≤ 1%

(3) Pulse Width ≤ 380 μs, δ ≤ 2%

Semelab Limited reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
I_{GSS+}	Forward Gate-Source Leakage	$V_{GS} = +22\text{V}$ $V_{DS} = 0\text{V}$			100	nA
I_{GSS-}	Reverse Gate-Source Leakage	$V_{GS} = -6\text{V}$ $V_{DS} = 0\text{V}$			-100	
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = 1.0\text{mA}$ $V_{GS} = 0$	650			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650\text{V}$ $V_{GS} = 0\text{V}$		1.0	10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$I_D = 3.3\text{mA}$ $V_{DS} = V_{GS}$	1.6		4.0	V
$R_{DS(on)}$	Static Drain-Source On-State Resistance	$V_{GS} = 18\text{V}$ $I_D = 8\text{A}^{(3)}$		120	148	$\text{m}\Omega$
		$T_J = 125^\circ$		150		
g_{fs}	Forward Transconductance	$V_{DS} = 10\text{V}$ $I_{DS} = 8\text{A}^{(3)}$		2		$\text{S}(\text{r})$

DYNAMIC CHARACTERISTICS

C_{iss}	Input Capacitance	$V_{DS} = 30\text{V}$		TBA		pF
C_{oss}	Output Capacitance	$V_{GS} = 0\text{V}$		TBA		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		TBA		
$t_{d(on)}$	Turn-On Delay Time			TBA		ns
t_r	Rise Time			TBA		
$t_{d(off)}$	Turn-Off Delay Time			TBA		
t_f	Fall Time			TBA		
Q_g	Total Gate Charge	$V_{DD} = 300\text{V}$ $I_D = 10\text{A}^{(3)}$ $V_{GS} = 18\text{V}$ $R_L = 30\Omega$		53		nC
Q_{gs}	Gate-Source Charge			14		
Q_{gd}	Gate-Drain Charge			16		

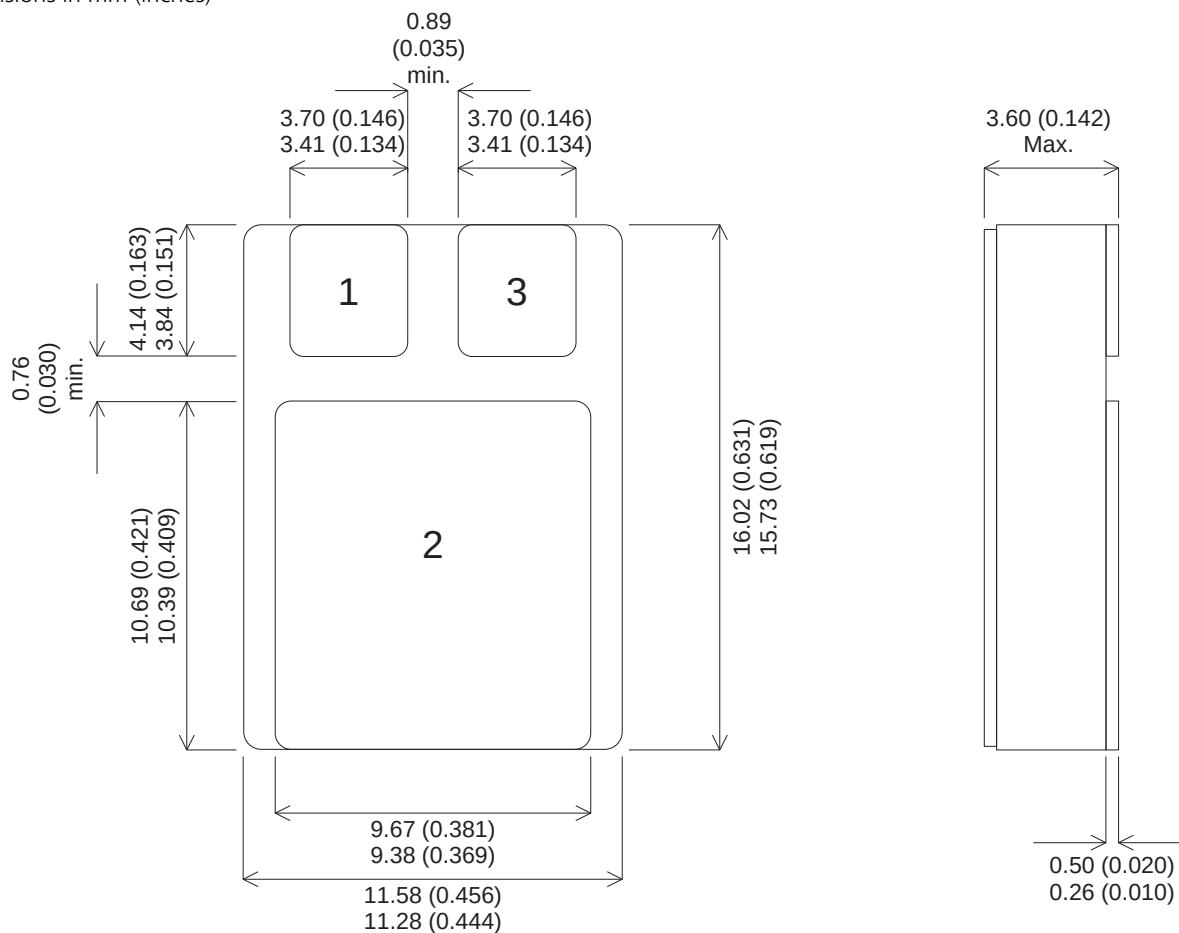
SOURCE-DRAIN DIODE CHARACTERISTICS

I_F	Continuous Source Current			TBA		A
V_{SD}	Diode Forward Voltage	$I_S = 8\text{A}$ $T_J = 25^\circ\text{C}$ $V_{GS} = 0^{(3)}$		5.0		V

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MECHANICAL DATA

Dimensions in mm (inches)

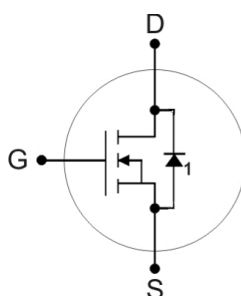


SMD1 (TO-276AB) (Underside View)

Pad 1 - Gate

Pad 2 - Drain

Pad 3 - Source



1- Body Diode