

Features

- 1) Low on-resistance
- 2) Fast switching speed
- 3) Fast reverse recovery
- 4) Easy to parallel
- 5) Simple to drive
- 6) Pb-free lead plating ; RoHS compliant

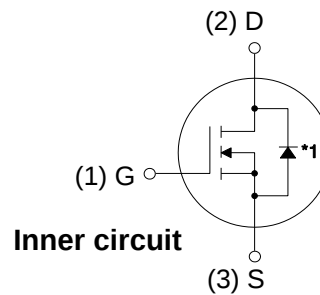
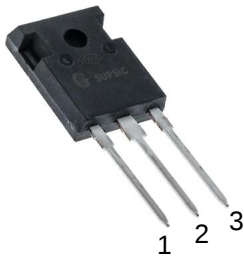
Parameter	Rating	Units
V_{DS}	900	V
I_D @ 25°C	11	A
$R_{DS(on)}$	280	m Ω



Applications

- Solar inverters
- DC/DC converters
- Switch mode power supplies
- Induction heating

T0-247-3
Package



- (1) Gate
(2) Drain
(3) Source

*1 Body Diode

Maximum Ratings ($T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain - Source Voltage	900	V	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	
V_{GSmax}	Gate - Source Voltage (dynamic)	-8/+19	V	AC ($f > 1\text{ Hz}$)	
V_{GSop}	Gate - Source Voltage (static)	-4/+15	V	Static	
I_D	Continuous Drain Current	11	A	$V_{GS} = 15\text{ V}, T_C = 25^\circ\text{C}$	
		7.1		$V_{GS} = 15\text{ V}, T_C = 100^\circ\text{C}$	
$I_{D(pulse)}$	Pulsed Drain Current	24	A	Pulse width t_p limited by T_{jmax}	
P_D	Power Dissipation	47	W	$T_C = 25^\circ\text{C}, T_J = 150^\circ\text{C}$	
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$		
T_L	Solder Temperature	260	$^\circ\text{C}$	1.6mm (0.063") from case for 10s	
M_d	Mounting Torque	1 8.8	Nm lbf-in	M3 or 6-32 screw	

Note (1): When using MOSFET Body Diode $V_{GSmax} = -4\text{V}/+19\text{V}$

Note (2): MOSFET can also safely operate at 0/+15 V

**Electrical Characteristics** ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	900			V	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	
$V_{GS(th)}$	Gate Threshold Voltage	1.8	2.7	3.7	V	$V_{DS} = V_{GS}, I_D = 1.2\text{ mA}$	
			2.2		V	$V_{DS} = V_{GS}, I_D = 1.2\text{ mA}, T_J = 150^\circ\text{C}$	
I_{DSS}	Zero Gate Voltage Drain Current		1	100	μA	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$	
I_{GSS}	Gate-Source Leakage Current		10	250	nA	$V_{GS} = 15\text{ V}, V_{DS} = 0\text{ V}$	
$R_{DS(on)}$	Drain-Source On-State Resistance		320	360	m Ω	$V_{GS} = 15\text{ V}, I_D = 7.5\text{ A}$	
			422			$V_{GS} = 15\text{ V}, I_D = 7.5\text{ A}, T_J = 150^\circ\text{C}$	
g_{fs}	Transconductance		3.9		S	$V_{DS} = 15\text{ V}, I_{DS} = 7.5\text{ A}$	
			3.6			$V_{DS} = 15\text{ V}, I_{DS} = 7.5\text{ A}, T_J = 150^\circ\text{C}$	
C_{iss}	Input Capacitance		153		pF	$V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}$ $f = 1\text{ MHz}$ $V_{AC} = 25\text{ mV}$	
C_{oss}	Output Capacitance		26				
C_{rss}	Reverse Transfer Capacitance		3				
E_{oss}	C_{oss} Stored Energy		5.5		μJ		
E_{ON}	Turn-On Switching Energy (Body Diode FWD)		82		μJ	$V_{DS} = 400\text{ V}, V_{GS} = -4\text{ V}/15\text{ V}, I_D = 7.5\text{ A},$ $R_{G(ext)} = 2.5\text{ }\Omega, L = 201\text{ }\mu\text{H}, T_J = 150^\circ\text{C}$	
E_{OFF}	Turn Off Switching Energy (Body Diode FWD)		6				
$t_{d(on)}$	Turn-On Delay Time		5.3		ns	$V_{DD} = 400\text{ V}, V_{GS} = -4\text{ V}/15\text{ V}$ $I_D = 7.5\text{ A}, R_{G(ext)} = 2.5\text{ }\Omega,$ Timing relative to V_{DS} Inductive load	
t_r	Rise Time		27				
$t_{d(off)}$	Turn-Off Delay Time		8.5				
t_f	Fall Time		6.4				
$R_{G(int)}$	Internal Gate Resistance		23.5		Ω	$f = 1\text{ MHz}, V_{AC} = 25\text{ mV}$	
Q_{gs}	Gate to Source Charge		3.3		nC	$V_{DS} = 400\text{ V}, V_{GS} = -4\text{ V}/15\text{ V}$ $I_D = 7.5\text{ A}$ Per IEC60747-8-4 pg 21	
Q_{gd}	Gate to Drain Charge		2.9				
Q_g	Total Gate Charge		7.7				

Reverse Diode Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.8		V	$V_{GS} = -4\text{ V}, I_{SD} = 4\text{ A}$	
		4.4		V	$V_{GS} = -4\text{ V}, I_{SD} = 4\text{ A}, T_J = 150^\circ\text{C}$	
I_S	Continuous Diode Forward Current		9	A	$V_{GS} = -4\text{ V}$	
$I_{S, pulse}$	Diode pulse Current		22	A	$V_{GS} = -4\text{ V},$ pulse width t_p limited by T_{jmax}	
t_{rr}	Reverse Recover time	26		ns	$V_{GS} = -4\text{ V}, I_{SD} = 7.5\text{ A}, V_R = 400\text{ V}$ $\text{dif}/\text{dt} = 775\text{ A}/\mu\text{s}, T_J = 150^\circ\text{C}$	
Q_{rr}	Reverse Recovery Charge	73		nC		
I_{rrm}	Peak Reverse Recovery Current	4		A		

Thermal Characteristics

Symbol	Parameter	Max.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	2.8	$^\circ\text{C}/\text{W}$		
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	40			

Note (3): Turn-off and Turn-on switching energy and timing values measured using SiC MOSFET Body Diode

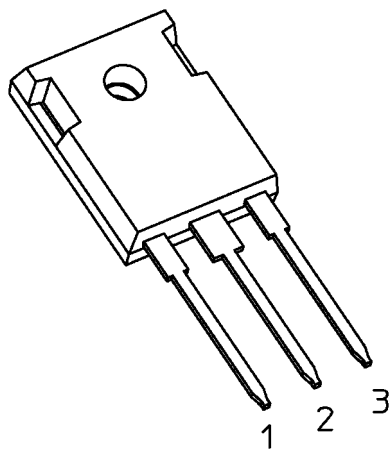


APSEMI

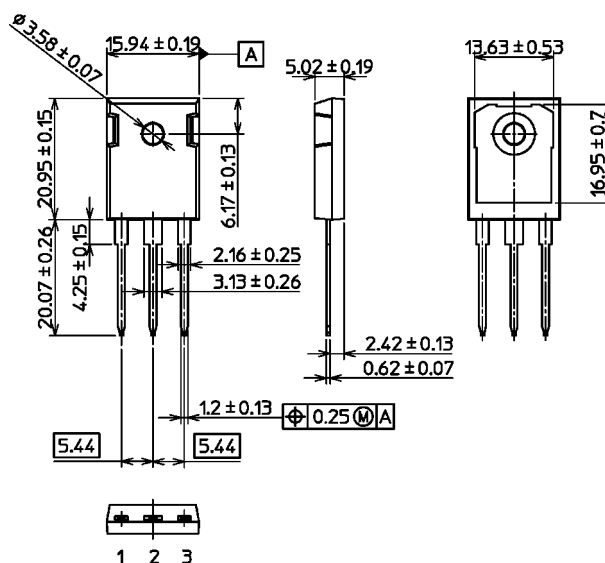
AC3M0280090D
Silicon Carbide Power MOSFET
N-Channel Enhancement Mode

Package Dimensions

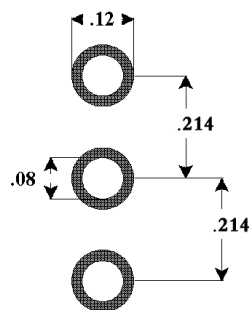
Unit: mm



TO-247-3



Recommended Solder Pad Layout



TO-247-3