

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

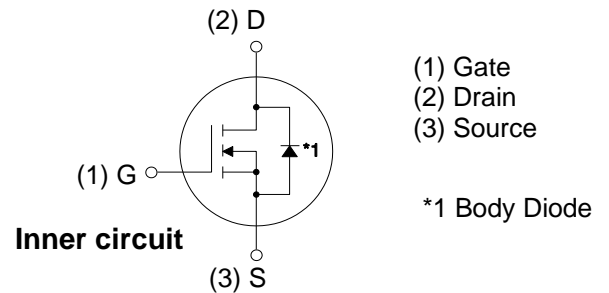
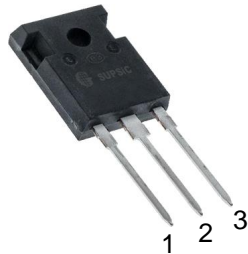
Parameter	Rating	Units
V_{DS}	1700	V
$I_D @ 25^\circ\text{C}$	78	A
$R_{DS(on)}$	45	m Ω



Applications

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

T0-247-3
Package



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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain - Source Voltage	1700	V	$V_{GS} = 0\text{ V}, I_b = 100\ \mu\text{A}$	
V_{GSmax}	Gate - Source Voltage	-10/+25	V	Absolute maximum values, AC ($f > 1\text{ Hz}$)	
V_{GSop}	Gate - Source Voltage	-5/+20	V	Recommended operational values	
I_D	Continuous Drain Current	78	A	$V_{GS} = 20\text{ V}, T_c = 25^\circ\text{C}$	
		48		$V_{GS} = 20\text{ V}, T_c = 100^\circ\text{C}$	
$I_{D(pulse)}$	Pulsed Drain Current	160	A	Pulse width t_p limited by T_{jmax}	
P_D	Power Dissipation	528	W	$T_c = 25^\circ\text{C}, T_j = 150^\circ\text{C}$	
T_J, T_{stg}	Operating Junction and Storage Temperature	-40 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	Nm lbf-in	M3 or 6-32 screw	
		8.8			



Electrical Characteristics (T_c = 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V _{(BR)DSS}	Drain-Source Breakdown Voltage	1700			V	V _{GS} = 0 V, I _D = 100 μA	
V _{GS(th)}	Gate Threshold Voltage	2.0	2.6	4	V	V _{DS} = V _{GS} , I _D = 18mA	
			1.8		V	V _{DS} = V _{GS} , I _D = 18mA, T _J = 150 °C	
I _{DSS}	Zero Gate Voltage Drain Current		2	100	μA	V _{DS} = 1700 V, V _{GS} = 0 V	
I _{GSS}	Gate-Source Leakage Current			600	nA	V _{GS} = 20 V, V _{DS} = 0 V	
R _{DS(on)}	Drain-Source On-State Resistance		45	70	mΩ	V _{GS} = 20 V, I _D = 50 A	
			90			V _{GS} = 20 V, I _D = 50 A, T _J = 150 °C	
g _{fs}	Transconductance		22		S	V _{DS} = 20 V, I _{DS} = 50 A	
			24.4			V _{DS} = 20 V, I _{DS} = 50 A, T _J = 150 °C	
C _{iss}	Input Capacitance		3617		pF	V _{GS} = 0 V	
C _{oss}	Output Capacitance		174			V _{DS} = 1200 V	
C _{rss}	Reverse Transfer Capacitance		6.7			f = 1 MHz	
E _{oss}	C _{oss} Stored Energy		105			V _{AC} = 25 mV	
E _{ON}	Turn-On Switching Energy (SiC Diode FWD)		2.1		mJ	V _{DS} = 1200 V, V _{GS} = -5/20 V, I _D = 50A, R _{G(ext)} = 2.5Ω, L = 105 μH, T _J = 150 °C, using SiC Diode as FWD	
E _{OFF}	Turn Off Switching Energy (SiC Diode FWD)		0.86				
E _{ON}	Turn-On Switching Energy (Body Diode FWD)		4.7		mJ	V _{DS} = 1200 V, V _{GS} = -5/20 V, I _D = 50A, R _{G(ext)} = 2.5Ω, L = 105 μH, T _J = 150 °C, using MOSFET as FWD	
E _{OFF}	Turn Off Switching Energy (Body Diode FWD)		0.93				
t _{d(on)}	Turn-On Delay Time		65		ns	V _{DD} = 1200 V, V _{GS} = -5/20 V I _D = 50 A, R _{G(ext)} = 2.5 Ω, Timing relative to V _{DS} Inductive load	
t _r	Rise Time		20				
t _{d(off)}	Turn-Off Delay Time		48				
t _f	Fall Time		18				
R _{G(int)}	Internal Gate Resistance		1.3		Ω	f = 1 MHz, V _{AC} = 25 mV	
Q _{gs}	Gate to Source Charge		44		nC	V _{DS} = 1200 V, V _{GS} = -5/20 V I _D = 50 A Per IEC60747-8-4 pg 21	
Q _{gd}	Gate to Drain Charge		57				
Q _g	Total Gate Charge		186				

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V _{SD}	Diode Forward Voltage	4.1		V	V _{GS} = -5 V, I _{SD} = 25 A	
		3.6		V	V _{GS} = -5 V, I _{SD} = 25 A, T _J = 150 °C	
I _S	Continuous Diode Forward Current		72	A	T _c = 25 °C, V _{GS} = -5 V	
t _{rr}	Reverse Recovery Time	70		ns	V _{GS} = -5 V, I _{SD} = 50 A, V _R = 1200 V dif/dt = 1400 A/μs	
Q _{rr}	Reverse Recovery Charge	531		nC		
I _{rrm}	Peak Reverse Recovery Current	14		A		

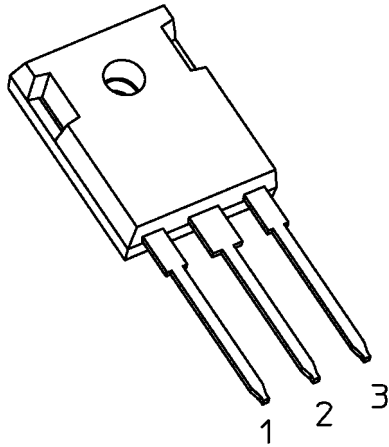
Note (1): When using SiC Body Diode the maximum recommended V_{GS} = -5V

Thermal Characteristics

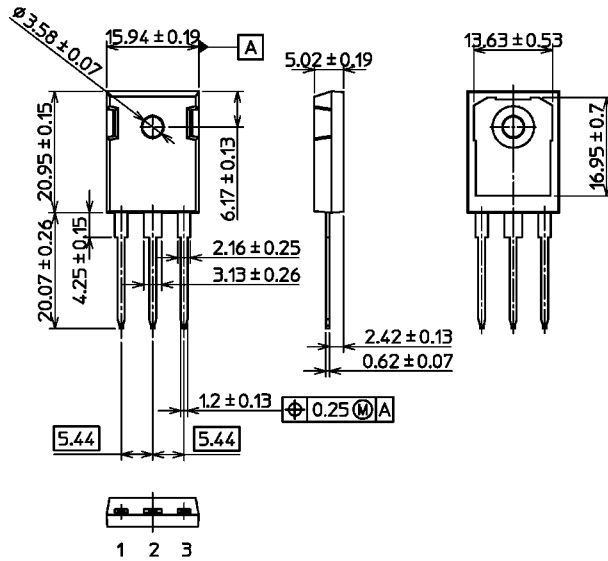
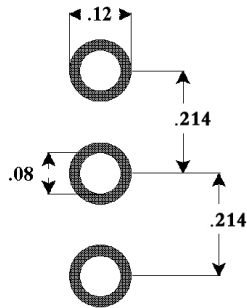
Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
R _{θJC}	Thermal Resistance from Junction to Case	0.22	0.24	°C/W		
R _{θJA}	Thermal Resistance from Junction to Ambient		40			

Package Dimensions

Unit: mm



TO-247-3


Recommended Solder Pad Layout


TO-247-3