

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

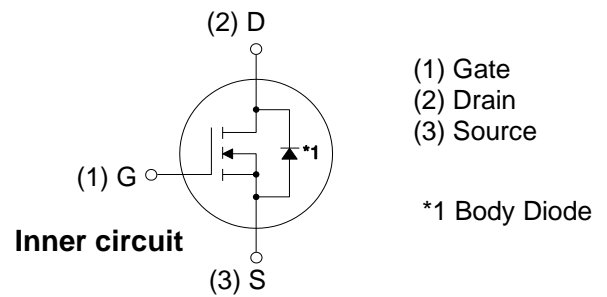
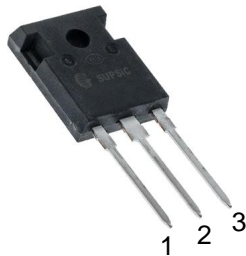
Parameter	Rating	Units
V_{DS}	1200	V
$I_D @ 25^\circ\text{C}$	94	A
$R_{DS(on)}$	25	m Ω



Applications

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

TO-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	1200	V	$V_{GS} = 0\text{ V}, I_D = 100\ \mu\text{A}$	
V_{GSmax}	Gate - Source Voltage	-10/+25	V	Absolute maximum values	
V_{GSop}	Gate - Source Voltage	-5/+20	V	Recommended operational values	
I_D	Continuous Drain Current	94	A	$V_{GS} = 20\text{ V}, T_C = 25^\circ\text{C}$	
		40		$V_{GS} = 20\text{ V}, T_C = 100^\circ\text{C}$	
$I_{D(pulse)}$	Pulsed Drain Current	250	A	Pulse width t_p limited by T_{jmax}	
P_D	Power Dissipation	380	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	Nm lbf-in	M3 or 6-32 screw	
		8.8			

Note (1): Die limits are 94A (25°C) and 60A (100°C)



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	1200			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 = 15mA	
			2.3		V	V _{DS} = V _{GS} , I _D = 15mA, T _J = 150 °C	
I _{DSS}	Zero Gate Voltage Drain Current		2	100	μA	V _{DS} = 1200 V, V _{GS} = 0 V	
I _{GSS}	Gate-Source Leakage Current			250	nA	V _{GS} = 20 V, V _{DS} = 0 V	
R _{DS(on)}	Drain-Source On-State Resistance		25	32	mΩ	V _{GS} = 20 V, I _D = 50 A	
			40			V _{GS} = 20 V, I _D = 50 A, T _J = 150 °C	
g _{fs}	Transconductance		24.4		S	V _{DS} = 20 V, I _{DS} = 50 A	
			24			V _{DS} = 20 V, I _{DS} = 50 A, T _J = 150 °C	
C _{iss}	Input Capacitance		3086		pF	V _{GS} = 0 V	
C _{oss}	Output Capacitance		226			V _{DS} = 1000 V	
C _{rss}	Reverse Transfer Capacitance		10			f = 1 MHz	
E _{oss}	C _{oss} Stored Energy		128		μJ	V _{AC} = 25 mV	
E _{ON}	Turn-On Switching Energy (Body Diode)		2.18		mJ	V _{DS} = 800 V, V _{GS} = -5/20 V, I _D = 50A, R _{G(ext)} = 2.5Ω, L = 99 μH FWD = Internal Body Diode of MOSFET	
E _{OFF}	Turn Off Switching Energy (Body Diode)		0.68				
E _{ON}	Turn-On Switching Energy (External SiC Diode)		1.14		mJ	V _{DS} = 800 V, V _{GS} = -5/20 V, I _D = 50A, R _{G(ext)} = 2.5Ω, L = 99 μH FWD = External SiC Diode	
E _{OFF}	Turn Off Switching Energy (External SiC Diode)		0.8				
t _{d(on)}	Turn-On Delay Time		15		ns	V _{DD} = 800 V, V _{GS} = -5/20 V I _D = 50 A, R _{G(ext)} = 2.5 Ω, Inductive Load Timing relative to V _{DS} Per IEC60747-8-4 pg 83	
t _r	Rise Time		58				
t _{d(off)}	Turn-Off Delay Time		34				
t _f	Fall Time		17				
R _{G(int)}	Internal Gate Resistance		1.0		Ω	f = 1 MHz, V _{AC} = 25 mV, ESR of C _{iss}	
Q _{gs}	Gate to Source Charge		46		nC	V _{DS} = 800 V, V _{GS} = -5/20 V I _D = 50 A Per IEC60747-8-4 pg 21	
Q _{gd}	Gate to Drain Charge		72				
Q _g	Total Gate Charge		192				



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	
		3.5		V	V _{GS} = - 5 V, I _{SD} = 25 A, T _J = 150 °C	
I _S	Continuous Diode Forward Current		64		V _{GS} = - 5 V, T _C = 25 °C	
I _{S,pulse}	Diode Pulse Current		250		V _{GS} = - 5 V, Pulse width t _p limited by T _{Jmax}	
t _{rr}	Reverse Recovery Time	34		ns	V _{GS} = - 5 V, I _{SD} = 50 A, T _J = 25 °C VR = 800 V dif/dt = 2180 A/μs	
Q _{rr}	Reverse Recovery Charge	487		nC		
I _{rrm}	Peak Reverse Recovery Current	24		A		
t _{rr}	Reverse Recovery Time	68		ns	V _{GS} = - 5 V, I _{SD} = 50 A, T _J = 25 °C VR = 800 V dif/dt = 1320 A/μs	
Q _{rr}	Reverse Recovery Charge	386		nC		
I _{rrm}	Peak Reverse Recovery Current	15		A		

Note (2): When using SiC Body Diode the maximum recommended V_{GS} = -5V

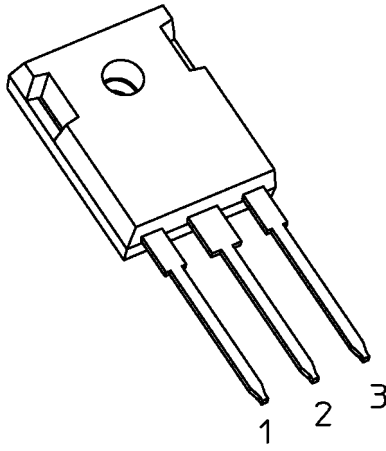
Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
R _{θJC}	Thermal Resistance from Junction to Case	0.24	0.33	°C/W		
R _{θJA}	Thermal Resistance from Junction to Ambient		40			

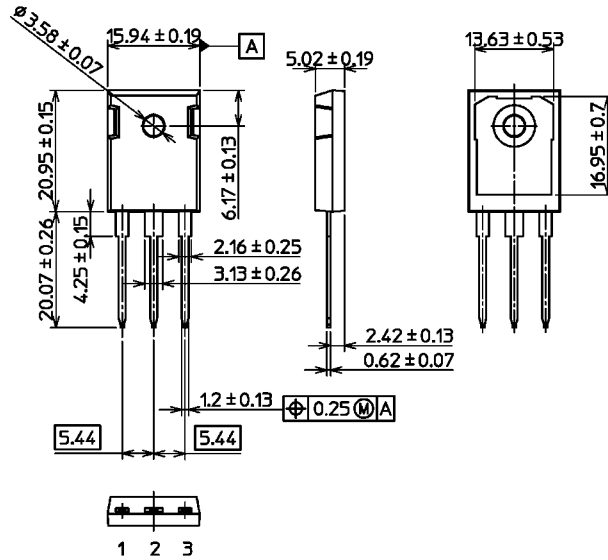


Package Dimensions

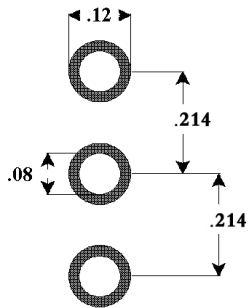
Unit: mm



TO-247-3



Recommended Solder Pad Layout



TO-247-3