新芯微电子
NewChip
Microelectronics

N2M-1200-0040

Silicon Carbide Power MOSFET

N-Channel Enhancement Mode

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

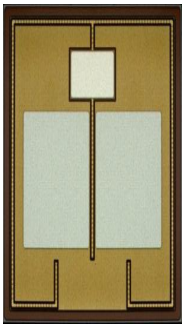
Benefits

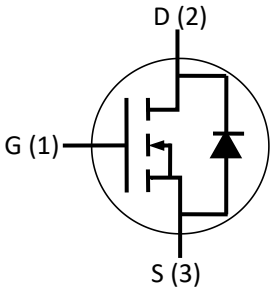
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power applications

Package





Part Number	Package
N2M-1200-0040	3.30*5.60

Maximum Ratings (T_c = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain - Source Voltage	1200	V	V_{GS}=0V,I_D=100μA	
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	60 40	A	V_{GS}=20V , T_C=25°C V_{GS}=20V , T_C=100°C	
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +150	°C		

Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	1200			V	V_{GS}=0V,I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	2.50	4.0	V	V_{GS}= V_{DS}, I_{DS}=10mA,T_C=25˚C	
			1.80			V_{GS}= V_{DS}, I_{DS}=10mA,T_C=150˚C	
I_{DSS}	Zero Gate Voltage Drain Current		1	100	μA	V_{DS}= 1200V, V_{GS}=0V	
I_{GSS}	Gate-Source Leakage Current			200	nA	V_{GS}= 20 V, V_{DS}= 0V	
$R_{DS(on)}$	Drain-Source on-state Resistance		45	55	mΩ	V_{GS}= 20 V, I_D=40A, T_C=25˚C	
			58		mΩ	V_{GS}= 20 V, I_D=40A, T_C=150˚C	
g_{fs}	Transconductance		14.1		S	V_{GS} = 20 V, I_D = 40A, T_J = 25 ˚C	
			12.5		S	V_{GS} = 20 V, I_D = 40A, T_J = 150 ˚C	
Ciss	Input Capacitance		3550		pF	V_{GS}=0V, V_{DS}=1000 V, f=1MHz, V_{AC}=25 mV	
Coss	Output Capacitance		162				
Crss	Reverse Transfer Capacitance		29				
E_{ON}	Turn-On Switching Energy		1.5		mJ	V_{DS}=800V, V_{GS}=-5/20V, I_D= 40A, $R_{G(ext)}$ = 5Ω, L= 80 μH	
E_{OFF}	Turn-Off Switching Energy		0.7				
$t_{d(on)}$	Turn-On Delay Time		60		ns	V_{DD}=800V, V_{GS}=-5/20 V I_D = 40A, $R_{G(ext)}$ = 5 Ω , R_L=20Ω , Timing relative to V_{DS}	
t_r	Rise Time		140				
$t_{d(off)}$	Turn-Off Delay Time		50				
t_f	Fall Time		42				
$R_{G(int)}$	Internal Gate Resistance		1.0		Ω	f=1 MHz, V_{AC}=25mV	
Q_{gs}	Gate to Source Charge		40		nC	V_{DD}=800V, V_{GS}=-5/20 V I_D = 40A	
Q_{gd}	Gate to Drain Charge		55				
Q_g	Total Gate Charge		160				

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.6		V	V_{GS} = -5V, I_{SD} = 20 A, T_J = 25 °C	
		3.3		V	V_{GS} =- 5V, I_{SD} = 20 A, T_J = 150 °C	
I_S	Continuous Diode Forward Current		20	A	T_C = 25˚C	

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	3.30 x 5.60	mm
Souece Pad Size	3.70*1.20	mm
Gate Pad Size	0.78*0.48	mm
Thickness	180 ± 10%	μm
Wafer Size	150	mm
Top Side Metalization (Al)	4	μm
Bottom Side Metalization (Ni/Ag)	1.5	μm