新芯微电子
NewChip
Microelectronics

N2M-1700-1000

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

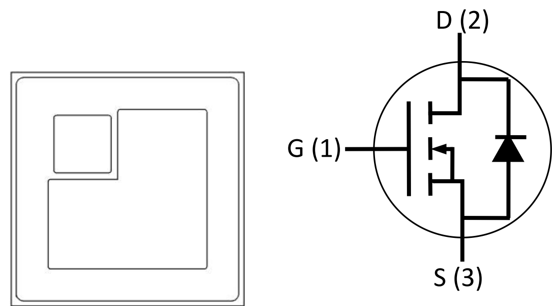
Benefits

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

Applications

- Auxiliary Power Supplies
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Pulsed Power applications

Package



Part Number	Die Size (mm)
N2M-1700-1000	1.61*1.61

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain - Source Voltage	1700	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	5.0 3.5	A	V_{GS}=20V , T_C=25°C V_{GS}=20V , T_C=100°C	
I_{DM}	Pulse Drain Current	6.0	A	Pulse width limited by T_{jmax}	
P_D	Power Dissipation	62	W	T_C=25°C, T_J=150°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	1700			V	V_{GS}=0V,I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	2.65	4.0	V	V_{GS}= V_{DS}, I_{DS}=5mA,T_C=25°C	
			1.75			V_{GS}= V_{DS}, I_{DS}=5mA,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		20	200	nA	V_{GS}=20V, V_{DS}= 0V	
$R_{DS(on)}$	Drain-Source on-state Resistance		650	750	mΩ	V_{GS}=20V, I_D=2A, T_C=25°C	
			950			V_{GS}=20V, I_D=2A, T_C=150°C	
g_{fs}	Transconductance		1.2		S	V_{DS} = 20 V, I_D = 2A, T_J = 25 °C	
			1.0			V_{DS} = 20 V, I_D = 2A, T_J = 150 °C	
Ciss	Input Capacitance		380		pF	V_{GS}=0V, V_{DS}=1000 V, f=1MHz V_{AC}=25 mV	
Coss	Output Capacitance		14				
Crss	Reverse Transfer Capacitance		3.2				
E_{ON}	Turn-On Switching Energy		37		μJ	V_{DS}=1200V, V_{GS}=-5/20V, I_D= 2A, $R_{G(ext)}$ =2.5Ω, L= 1478μH	
E_{OFF}	Turn-Off Switching Energy		15				
$t_{d(on)}$	Turn-On Delay Time		6.0		ns	V_{DD}=1200V, V_{GS}=-5/20 V I_D = 2A, $R_{G(ext)}$ = 2.5 Ω , R_L=600Ω , Timing relative to V_{DS}	
t_r	Rise Time		9.5				
$t_{d(off)}$	Turn-Off Delay Time		14.2				
t_f	Fall Time		23.0				
$R_{G(int)}$	Internal Gate Resistance		20		Ω	f=1 MHz, V_{AC}=25mV	
Q_{gs}	Gate to Source Charge		4.8		nC	V_{DD}=800V, V_{GS}=-5/20 V I_D = 20A	
Q_{gd}	Gate to Drain Charge		5.6				
Q_g	Total Gate Charge		13				

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.5		V	V_{GS} = -5V, I_{SD} = 1 A, T_J = 25 °C	
		3.3		V	V_{GS} =- 5V, I_{SD} = 1 A, T_J = 150 °C	
I_S	Continuous Diode Forward Current		4	A	T_C = 25°C	
t_{rr}	Reverse Recovery time	22		ns	V_{GS} = -5V, I_{SD} = 2 A, V_R= 1200V, dif/dt=1200A/μs;	
Q_{rr}	Reverse Recovery Charge	31		nC		
I_{rrm}	Peak Reverse Recovery Current	3.5		A		

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	1.61 x 1.61	mm
Souece Pad Size	1.10 x 1.10	mm
Gate Pad Size	0.40 x 0.40	mm
Thickness	180 ± 10%	μm
Wafer Size	150	mm
Top Side Metalization (Al)	4	μm
Bottom Side Metalization (Ni/Ag)	1.5	μm