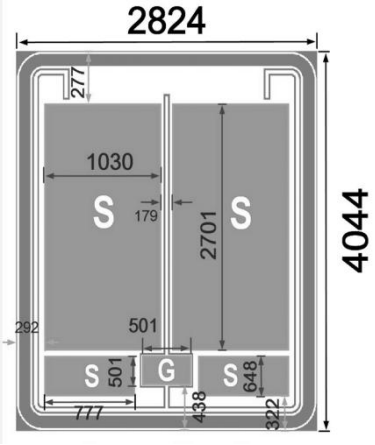
ASWCZM025065A

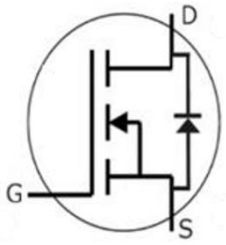
N-Channel Silicon Carbide Power MOSFET

Physical Characteristics



Die size：2824 μm x 4044 μm (without scribe line)
Gate pad：501 μm x 501 μm
Gross die / per 6” wafer = 1270 pcs

Main characteristics：
V_{DS} = 650V
I_D(T_C=25°C) = 99A
$R_{DS(on)MAX}$ = 38mΩ@18V



Mechanical Data

Parameter	Parameter
Nominal Back Metal Composition, Thickness	Ti- Ni - Ag
Nominal Front Metal Composition, Thickness	Al(4μm)
Wafer Diameter	150mm
Wafer Thickness	175μm±10μm
Scribe line width	80μm

Absolute Maximum Ratings(T_C=25°C,unless otherwise specified)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DS}	V_{GS} = 0V, I_D = 100μA	650	V
Gate-Source Voltage	V_{GSmax}	AC (f > 1 Hz)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+18	V
Continuous Drain Current	I_D	V_{GS} = 18V, T_C=25℃	99	A
	I_D	V_{GS} = 18V, T_C=100℃	70	
Pulsed Drain Current	$I_{D,pulse}$	Pulse with t_p limited by T_{jmax} at 1ms Pulse with t_p limited by T_{jmax} at 100μs	157 279	A
Junction Temperature	T_J		-55~ +175	℃
Storage Temperature	T_{STG}		-55~ +175	℃

Note 1: Assumes a $R_{th(jc)}$ will be less than 0.45 K/W.

Electrical characteristics (T_j=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =100μA	650			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V,V_{GS} = 0V		1	50	μA
Gate-Source leakage current	I_{GSS}	V_{GS} =18V, V_{DS} = 0V			250	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =16mA		3.0		V
		V_{DS} =V_{GS}, I_D =16mA,T_j = 175℃		2.0		
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =18V, I_D =40A		26	38	mΩ
		V_{GS} =18V, I_D =40A,T_j = 175℃		35		
Transconductance	g_{fs}	V_{DS} =18V, I_D =40A		27		S
		V_{DS} =18V, I_D =40A,T_j = 175℃		25		
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =600V,V_{GS} =0V,f =1MHz V_{AC} = 25mV		2543		pF
Output Capacitance	C_{oss}			173		
Reverse Transfer Capacitance	C_{rss}			8		
Total Gate Charge	Q_g	V_{DS} =400V,I_D =40A V_{GS} =-4V/18V		74.5		nC
Gate-Source Charge	Q_{gs}			29		
Gate-Drain Charge	Q_{gd}			35		
Internal Gate Resistance	$R_{G(int)}$	f=1 MHz, V_{AC}=25mV		1.2		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I_S	V_{GS} =-4V,T_C=25℃		66		A
Diode Forward voltage	V_{SD}	V_{GS} =-4V, I_{SD}= 20A		4.3		V
		V_{GS} =-4V, I_{SD}= 20A,T_J=175℃		3.7		V
Diode Pulse Current	$I_{S,pulse}$	V_{GS} = -4V, pulse width t_p limited by T_{jmax}		157		A