IV2D12020BD – 1200V 20A SiC Schottky Diode Chip

Features

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Extremely Fast Reverse Recovery Time
- Reduced Losses in Associated MOSFET
- High-Frequency Operation
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient on V_F

Chip Outline

Part Number	Die Size	Anode	Cathode
IV2D12020BD	2.85×2.85mm²	Al	Ti/Ni/Ag

Applications

- Solar Power Boost
- Inverter Free Wheeling Diodes
- Vienna 3-Phase PFC
- EV Charger Piles
- Switch Mode Power Supplies

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

Symbol	Parameter	Value	Unit
V_{RRM}	Reverse voltage (repetitive peak)	1200	V
V_{DC}	DC blocking voltage	1200	V
I_F	Forward current (continuous) @Tc=25°C	49.1*	A
	Forward current (continuous) @Tc=135°C	23.5*	A
	Forward current (continuous) @Tc=144°C	20*	A
I_{FSM}	Surge non-repetitive forward current sine halfwave @Tc=25°C tp=10ms	155	A
I_{FRM}	Surge repetitive forward current (Freq=0.1Hz, 100cycles) sine halfwave @T_{amb}=25°C tp=10ms	125	A
$\int i^2dt$	I^2t value @Tc=25°C tp=10ms	120	A^2s
Tstg	Storage temperature range	-55 to 175	°C
Tj	Operating junction temperature range	-55 to 175	°C

*** Assumes $R_{\theta jc}$ Thermal Resistance of 0.7℃/W or less.**

Stresses exceeding those listed in the Maximum Ratings table may damage the die. If any of these limits are exceeded, die functionality should not be assumed, damage may occur and reliability may be affected.

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.48	1.80	V	I_F = 20 A T_J=25°C	Fig. 1
		2.20	3.00		I_F = 20 A T_J=175°C	
I_R	Reverse Current	8	150	μA	V_R = 1200 V T_J=25°C	Fig. 2
		50	800		V_R = 1200 V T_J=175°C	
C	Total Capacitance	1000		pF	V_R = 1 V, T_J = 25°C, f = 1 MHz	Fig. 3
		89			V_R = 400 V, T_J = 25°C, f = 1 MHz	
		66			V_R = 800 V, T_J = 25°C, f = 1 MHz	
Q_C	Total Capacitive Charge	94		nC	V_R = 800 V, T_J = 25°C, $Q_c = \int_0^{VR} C(V)dV$	Fig. 4
E_C	Capacitance Stored Energy	27		μJ	V_R = 800 V, T_J = 25°C, $E_c = \int_0^{VR} C(V) \cdot VdV$	

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	2.85*2.85	mm^2
Anode Pad Size	External FAB: 1.80*1.80 Internal FAB: 2.27*2.27	mm^2
Thickness	180±20	μm
Wafer Size	150	mm
Anode Metallization (Al)	4	μm
Cathode Metallization (Ti/Ni/Ag)	0.2/0.2/1	μm
Frontside Passivation (Polyimide)	5	μm

Typical Performance

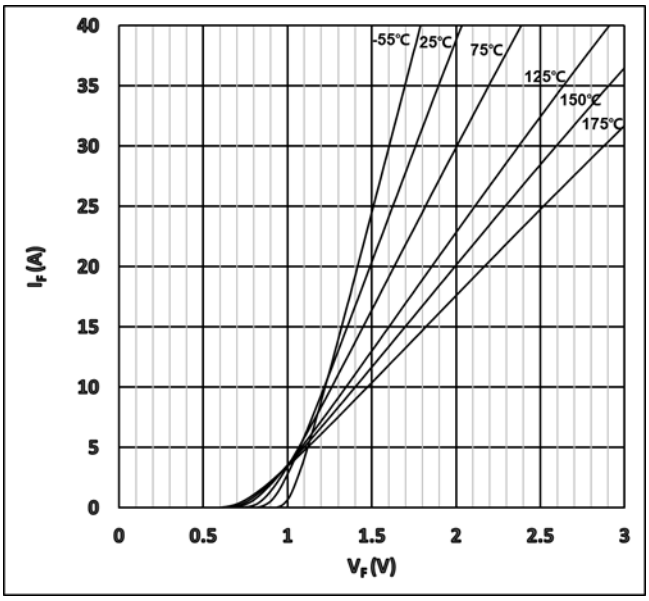


Figure 1. Typical Forward Characteristics

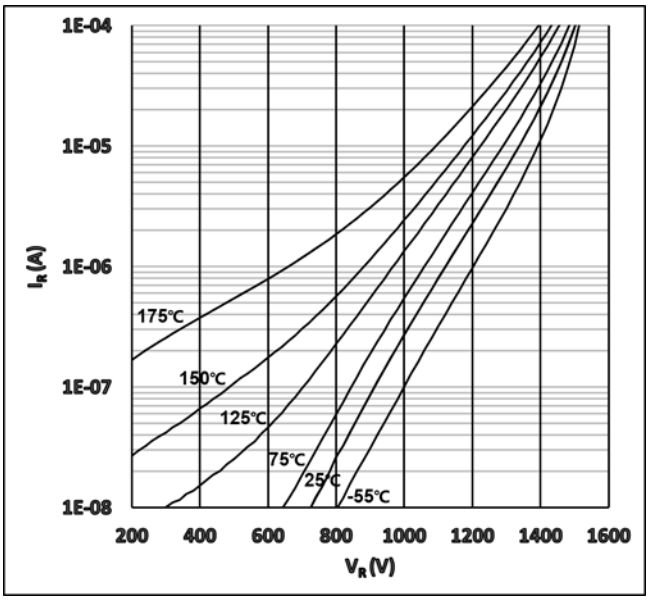


Figure 2. Typical Reverse Characteristics

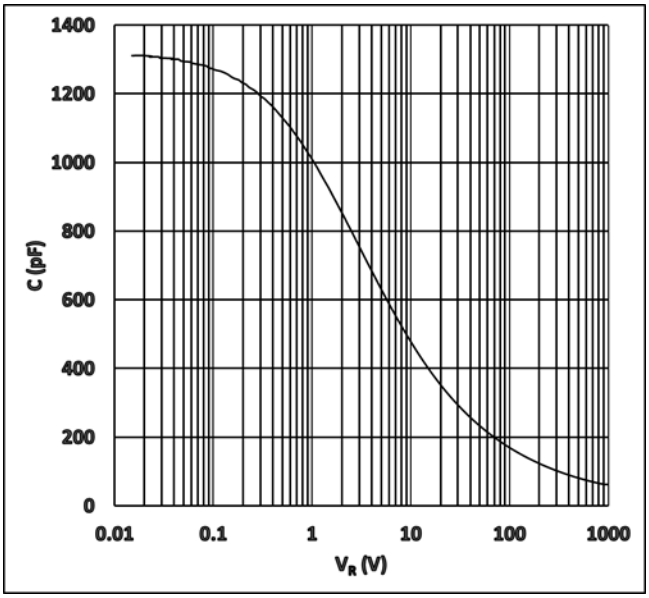


Figure 3. Capacitance vs. Reverse Voltage

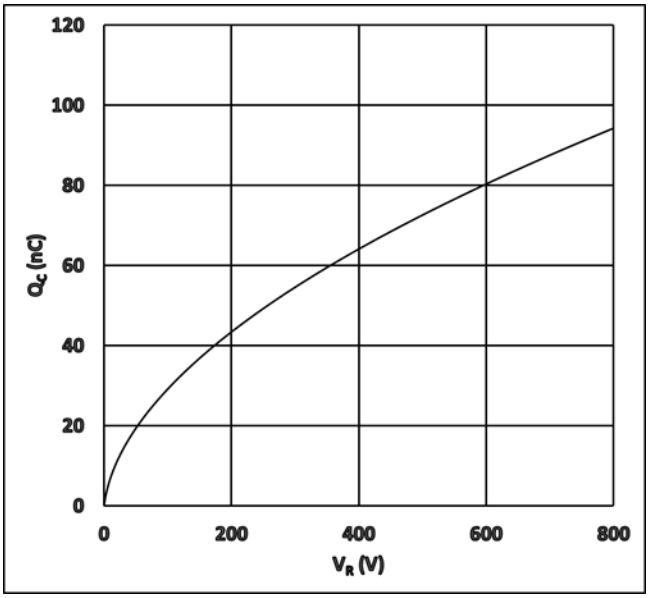
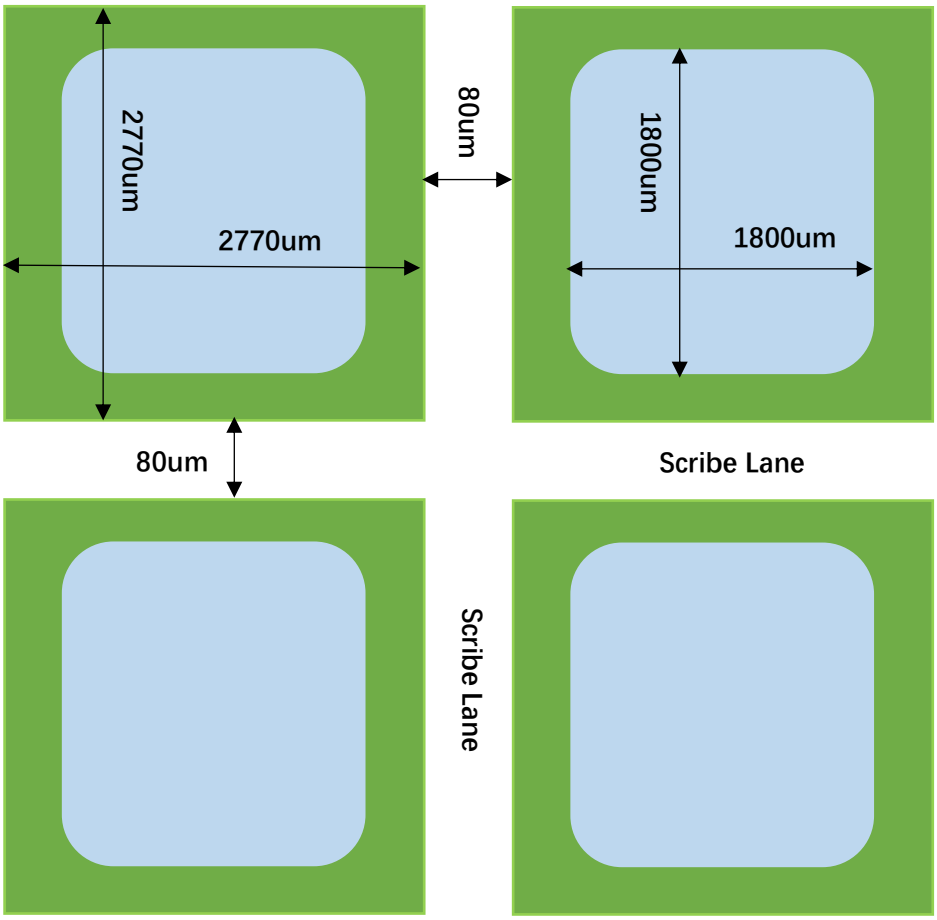


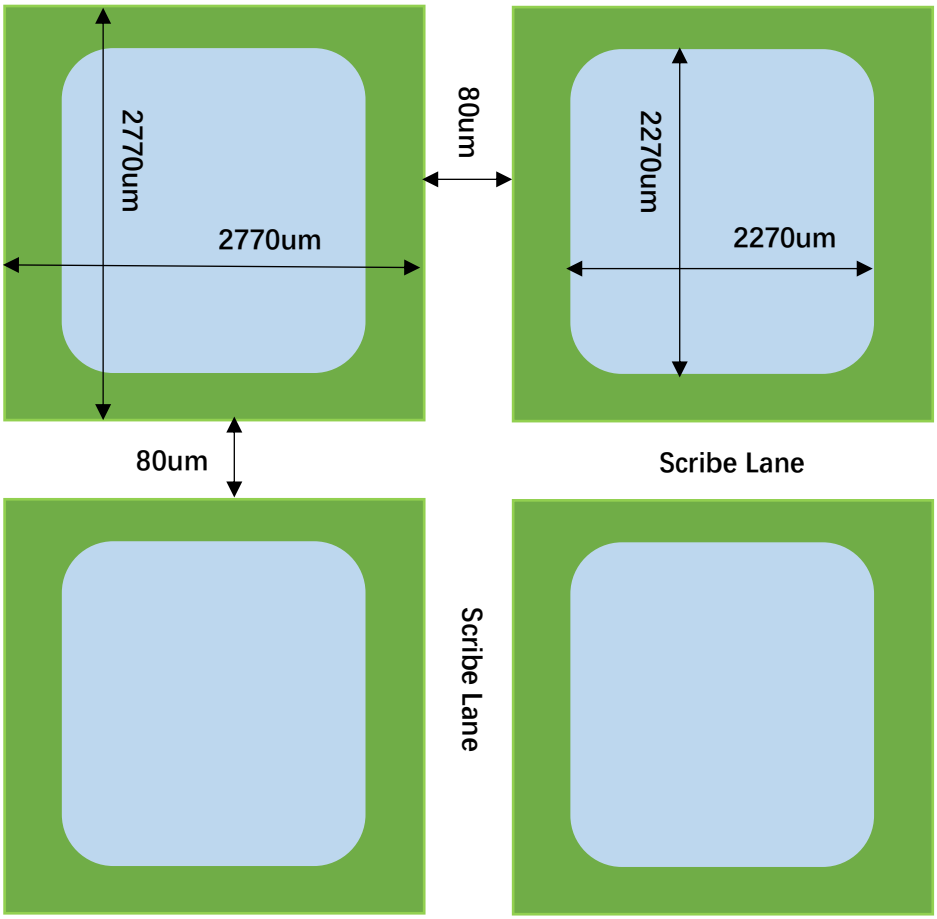
Figure 4. Recovery Charge vs. Reverse Voltage

The Configuration of Chips

External FAB:



Internal FAB:



Notes

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