

IV1D12020BD – 1200V 20A Silicon Carbide Schottky Diode Chip

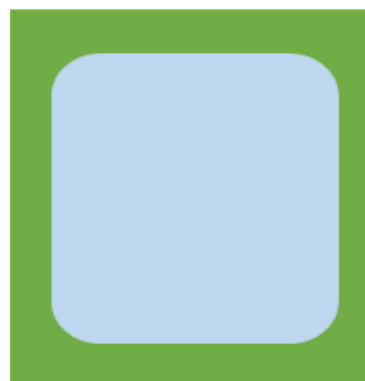
Features:

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature independent switching behavior
- Positive Temperature Coefficient on V_F

Applications:

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

Chip Outline



Part Number	Die Size	Anode	Cathode
IV1D12020BD	3.13×3.23mm ²	Al	Ti/Ni/Ag

Absolute Maximum Ratings

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	54*	A
	Forward current (continuous) @Tc=135°C	28*	A
	Forward current (continuous) @Tc=151°C	20*	A
I_{FSM}	Surge non-repetitive forward current sine halfwave @Tc=25°C tp=10ms	140	A
I_{FRM}	Surge repetitive forward current (Freq=0.1Hz, 100cycles) sine halfwave @Tamb=25°C tp=10ms	115	A
Tstg	Storage temperature range	-55 to 175	°C
Tj	Operating junction temperature range	-55 to 175	°C

* Assumes $R_{\theta jc}$ Thermal Resistance of 0.55°C/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	1.8	V	I _F = 20 A T _J =25°C	Fig. 1
		2.0	3		I _F = 20 A T _J =175°C	
I _R	Reverse Current	3	120	μA	V _R = 1200 V T _J =25°C	Fig. 2
		10	400		V _R = 1200 V T _J =175°C	
C	Total Capacitance	1114		pF	V _R = 1 V, T _J = 25°C, f = 1 MHz	Fig. 3
		100			V _R = 400 V, T _J = 25°C, f = 1 MHz	
		77			V _R = 800 V, T _J = 25°C, f = 1 MHz	
Q _C	Total Capacitive Charge	107		nC	V _R = 800 V, T _J = 25°C, $Q_C = \int_0^{V_R} C(V)dV$	Fig. 4
E _C	Capacitance Stored Energy	31		μJ	V _R = 800 V, T _J = 25°C, $E_C = \int_0^{V_R} C(V) \cdot VdV$	

Mechanical Parameters

Parameter	Typ.	Unit
Die Size	3.13*3.23	mm ²
Anode Pad Size	External FAB: 2.65*2.75 Internal FAB: 2.55*2.65	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

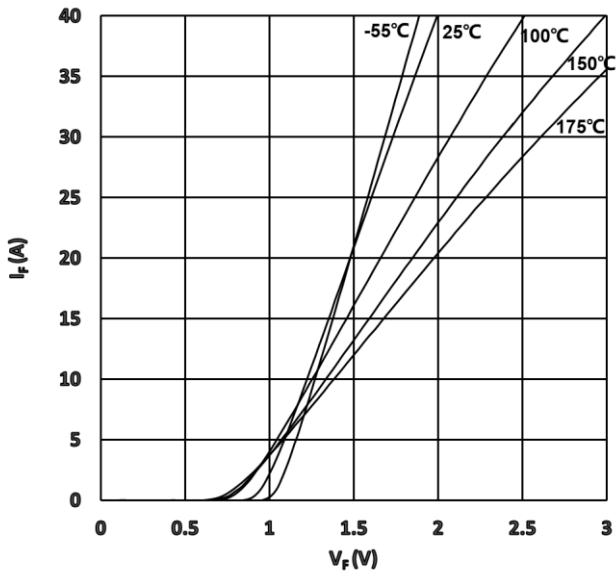


Figure 1. Typical Forward Characteristics

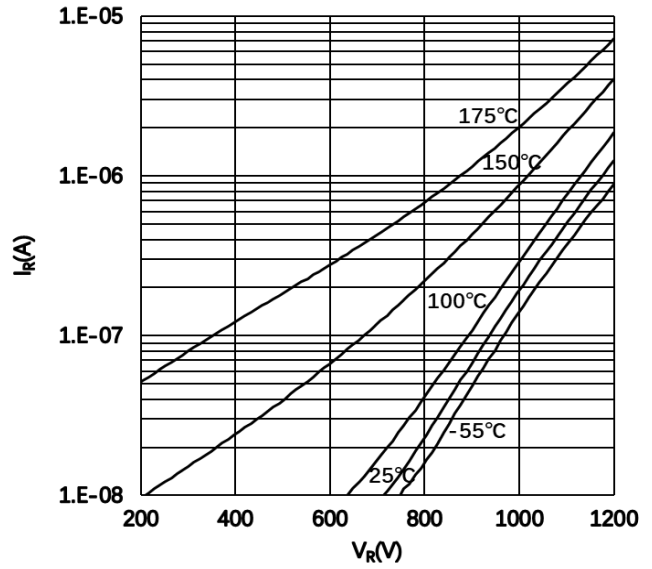


Figure 2. Typical Reverse Characteristics

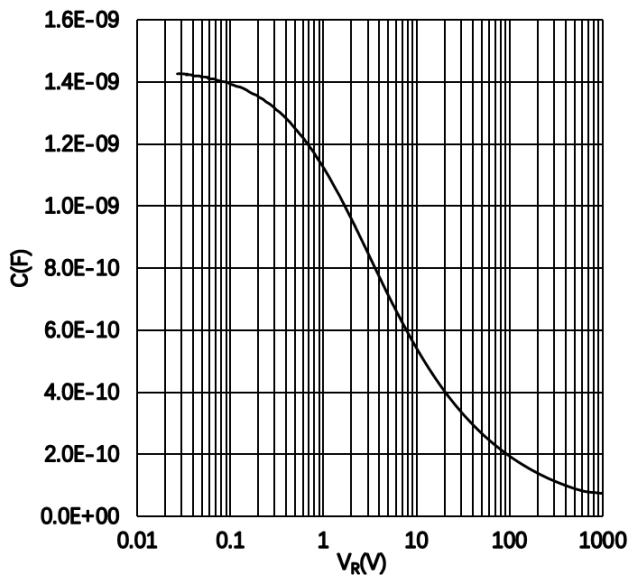


Figure 3. Capacitance vs. Reverse Voltage

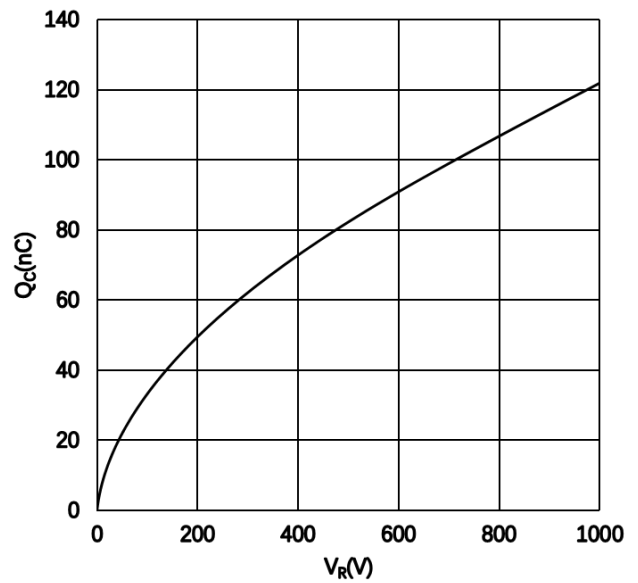
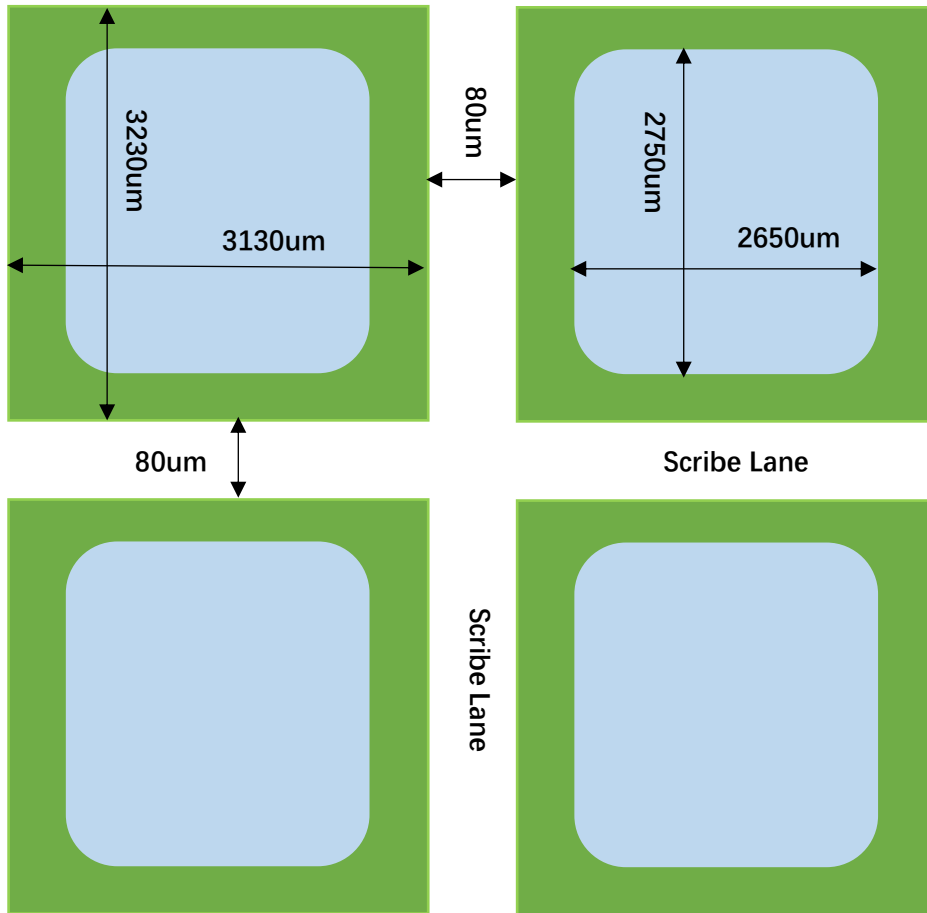


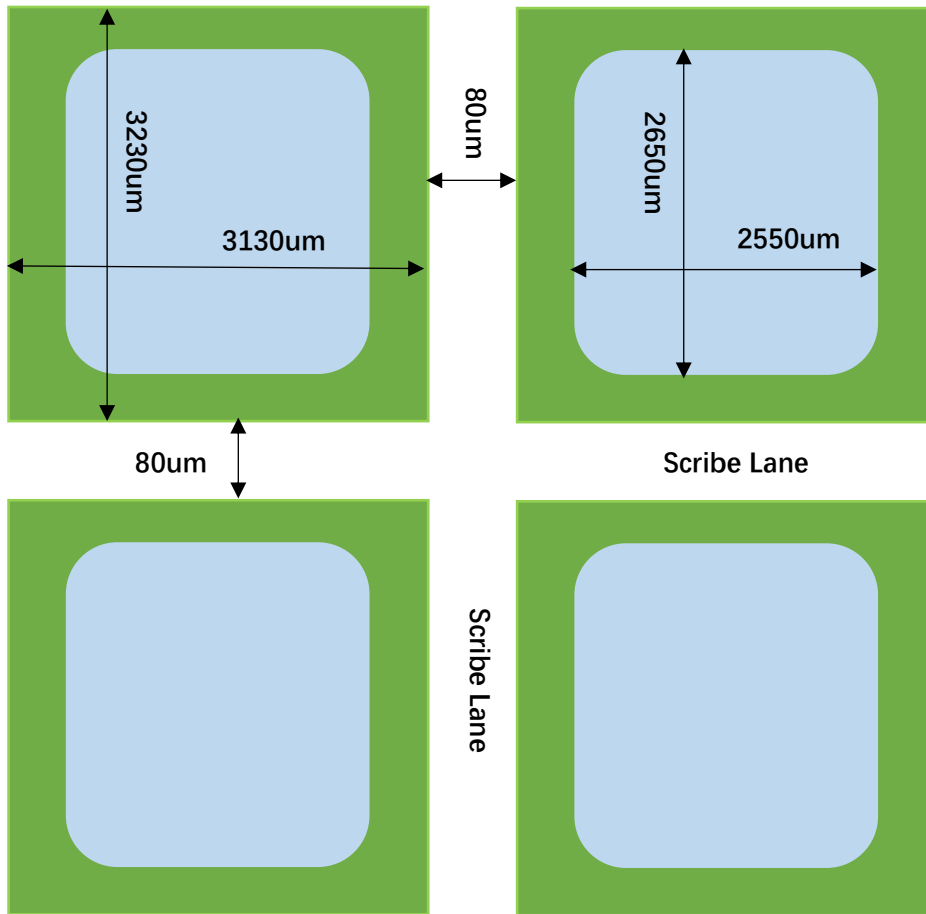
Figure 4. Recovery Charge vs. Reverse Voltage

The Configuration of Chips

External FAB:



Internal FAB:



Notes

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