IDC05S120E

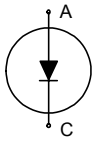
1200V thinQ!™ SiC Schottky Diode

Features:

- Revolutionary Semiconductor Material - Silicon Carbide
- Switching Behaviour Benchmark
- No Reverse Recovery / No Forward Recovery
- Temperature Independent Switching Behaviour
- Qualified According to JEDEC[1)] Based on Target Applications

Applications:

- Motor Drives / Solar Inverters
- High Voltage CCM PFC
- Switch Mode Power Supplies
- High Voltage Multipliers



Chip Type	V_{BR}	I_F	Die Size	Package
IDC05S120E	1200V	5A	1.692 x 1.692 mm^2	sawn on foil

Mechanical parameters

Raster size	1.692 x 1.692	mm^2
Anode pad size	1.156 x 1.156	
Area total	2.86	
Thickness	362	µm
Wafer size	100	mm
Max. possible chips per wafer	2360	
Passivation frontside	Photoimide	
Pad metal	3200 nm Al	
Backside metal	Ni Ag –system suitable for epoxy and soft solder die bonding	
Die bond	Electrically conductive glue or solder	
Wire bond	Al, ≤ 350µm	
Reject ink dot size	∅ ≥ 0.3 mm	
Recommended storage environment	Store in original container, in dry nitrogen, in dark environment, < 6 month at an ambient temperature of 23°C	

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Maximum Ratings

Parameter	Symbol	Condition	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	T_{vj} = 25 °C	1200	V
DC blocking voltage	V_{DC}		1200	
Continuous forward current, limited by T_{vjmax}	I_F	T_{vj} < 150°C	5	A
Surge non repetitive forward current, sine halfwave	$I_{F,SM}$	T_C =25°C, t_P =10 ms	29	
		T_C =150°C, t_P =10 ms	25	
Repetitive peak forward current, limited by thermal resistance R_{th}	$I_{F,RM}$	T_C = 100°C, T_{vj} =150°C, D=0.1	23	
Non-repetitive peak forward current	$I_{F,max}$	T_C =25°C, t_P=10µs	110	
i^2t value	$\int i^2 dt$	T_C =25°C, t_P =10 ms	4	A^2s
		T_C =150°C, t_P =10 ms	3	
Operating junction and storage temperature range	T_{vj} , T_{stg}		-55...+175	°C

Static Characteristics (tested on wafer)

Parameter	Symbol	Conditions	Value			Unit
			min.	Typ.	max.	
Reverse current	I_R	V_R=1200V, T_{vj} =25°C		5	120	µA
Diode forward voltage	V_F	I_F=5A, T_{vj} =25°C		1.6	1.8	V

Static Characteristics (not subject to production test - verified by design / characterization)

Parameter	Symbol	Conditions	Value			Unit
			min.	Typ.	max.	
Reverse current	I_R	V_R=1200V, T_{vj} =150°C		20	1000	µA
Diode forward voltage	V_F	I_F=5A, T_{vj} =150°C		2.5	3	V

Dynamic Characteristics (not subject to production test - verified by design / characterization)

Parameter	Symbol	Conditions		Value			Unit
				min.	Typ.	max.	
Total capacitive charge[3]	Q_C	$I_F \le I_{F,max}$ di/dt=200A/µs V_R=1200V	T_{vj}=150°C		18		nC
Switching time[2]	t_c		T_{vj}=150°C			<10	ns
Total capacitance	C	f=1MHz	V_R=1V		250		pF
			V_R=300V		20		
			V_R=600V		18		

[1] J-STD20 and JESD22
[2] t_c is the time constant for the capacitive displacement current waveform (independent from T_{vj}, I_{LOAD} and di/dt), different from t_{rr}, which is dependent on T_{vj}, I_{LOAD}, di/dt. No reverse recovery time constant t_{rr} due to absence of minority carrier inject.
[3] Only capacitive charge occurring, guaranteed by design (independent from T_{vj}, I_{LOAD} and di/dt).

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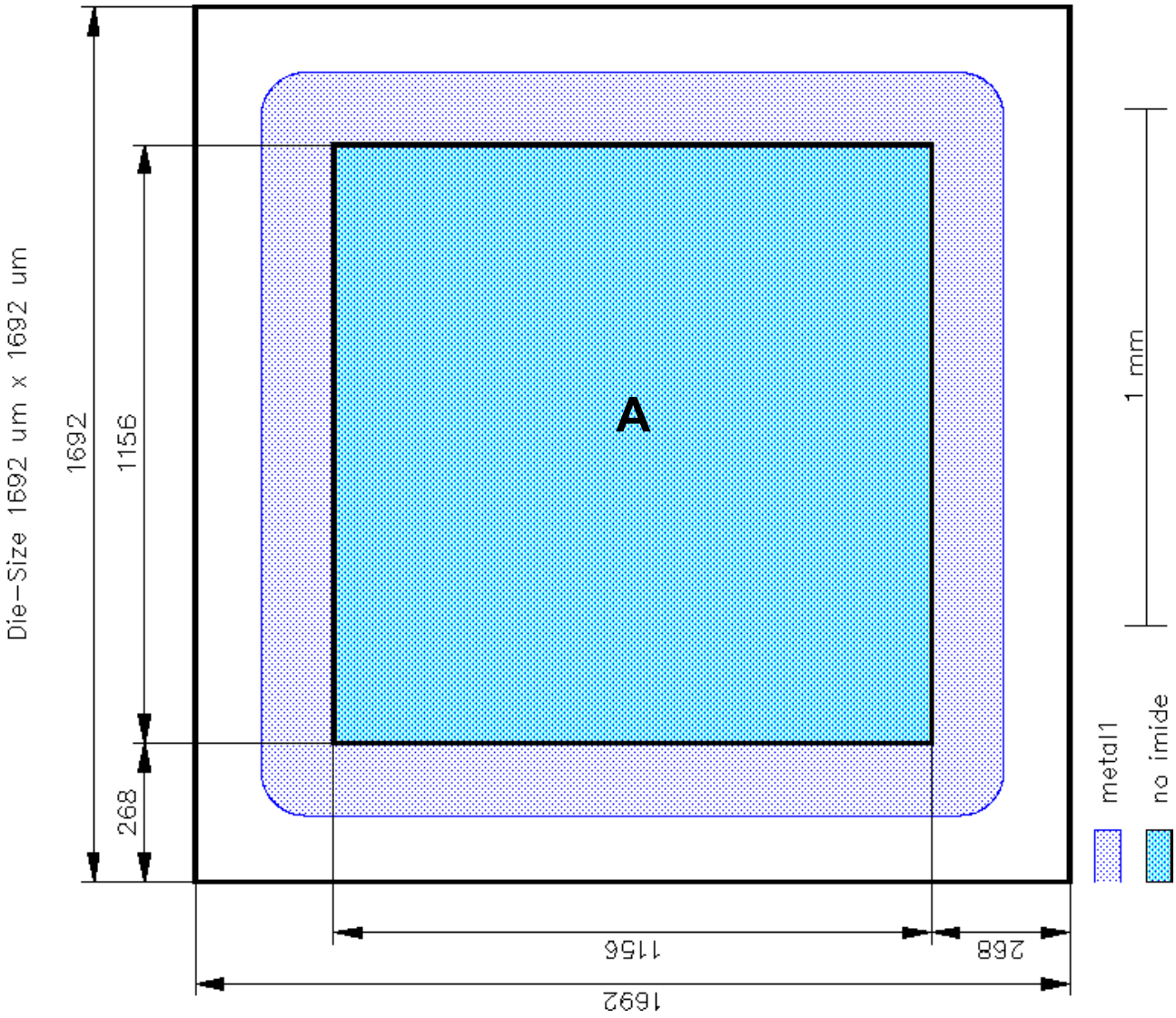
Chip drawing



A: Anode pad

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Description

AQL 0,65 for visual inspection according to failure catalogue

Electrostatic Discharge Sensitive Device according to MIL-STD 883

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