

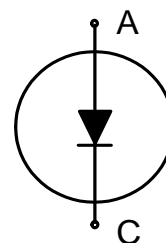
Emitter Controlled Diode 3rd Generation for Automotive Applications

Diode

Quality Requirement Category: Automotive

Features

- 750V Emitter Controlled Diode 3rd generation technology
- Soft, fast switching
- Low reverse recovery charge
- Small temperature coefficient
- Solderable / sinterable front-side pad



Potential Applications

- Drives

Description

Recommended for power modules

Product Validation

Technology qualified for automotive applications. Ready for validation for automotive applications according to AEC Q100/101 or AQC324

Key Performance Parameters

Chip Type	V_D	I_F	Die Size	Package
IDC45D75E8DA	750V	170A	44.88mm ²	Sawn on foil

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1 Parameters and characteristics

Table 1 Mechanical parameters

Raster size	8.800 x 5.100	mm ²
Area total	44.88	
Anode pad size	7.942 x 4.162	
Silicon thickness	68	μm
Wafer size	200	mm
Maximum possible chips per wafer	591	
Passivation frontside	Photoimide	
Pad metal	NiP/Pd	
Backside metal	NiP/Pd	
Die bond	Soft solder or sinter	
Reject ink dot size	Inkless	
Storage environment (<6 months)	for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C

Table 2 Maximum ratings

Parameter		Symbol	Value	Unit
Repetitive peak reverse voltage	$25^{\circ}\text{C} \leq T_{vj} \leq 175^{\circ}\text{C}$	V_{RRM}	750	V
	$T_{vj} = -40^{\circ}\text{C}^{1/2}$		700	
Continuous forward current, limited by $T_{vj\max}$		I_F	- ³	A
Pulsed forward current, limited by $T_{vj\max}^{1}$		$I_{F,puls}$	510	A
Operating junction temperature		$T_{vj,op}$	-40 ... +175	°C
Safe Operation area (SOA) ¹		$I_{F,max} = 340\text{A}, V_{R,max} = V_{RRM}, -40^{\circ}\text{C} \leq T_{vj,op} \leq 175^{\circ}\text{C}$		

Table 3 Static characteristics (tested on wafer), $T_{vj}=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Reverse leakage current	I_R	$V_R=750\text{V}$	-	-	100	μA
Forward voltage drop	V_F	$I_F=51\text{A}$	-	1.2	1.5	V

Table 4 Electrical characteristics¹

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Forward voltage drop	V_F	$I_F=170\text{A}$	-	1.55	1.9	V
			-	1.35	-	

¹ Not subject to production test - verified by design/characterization.

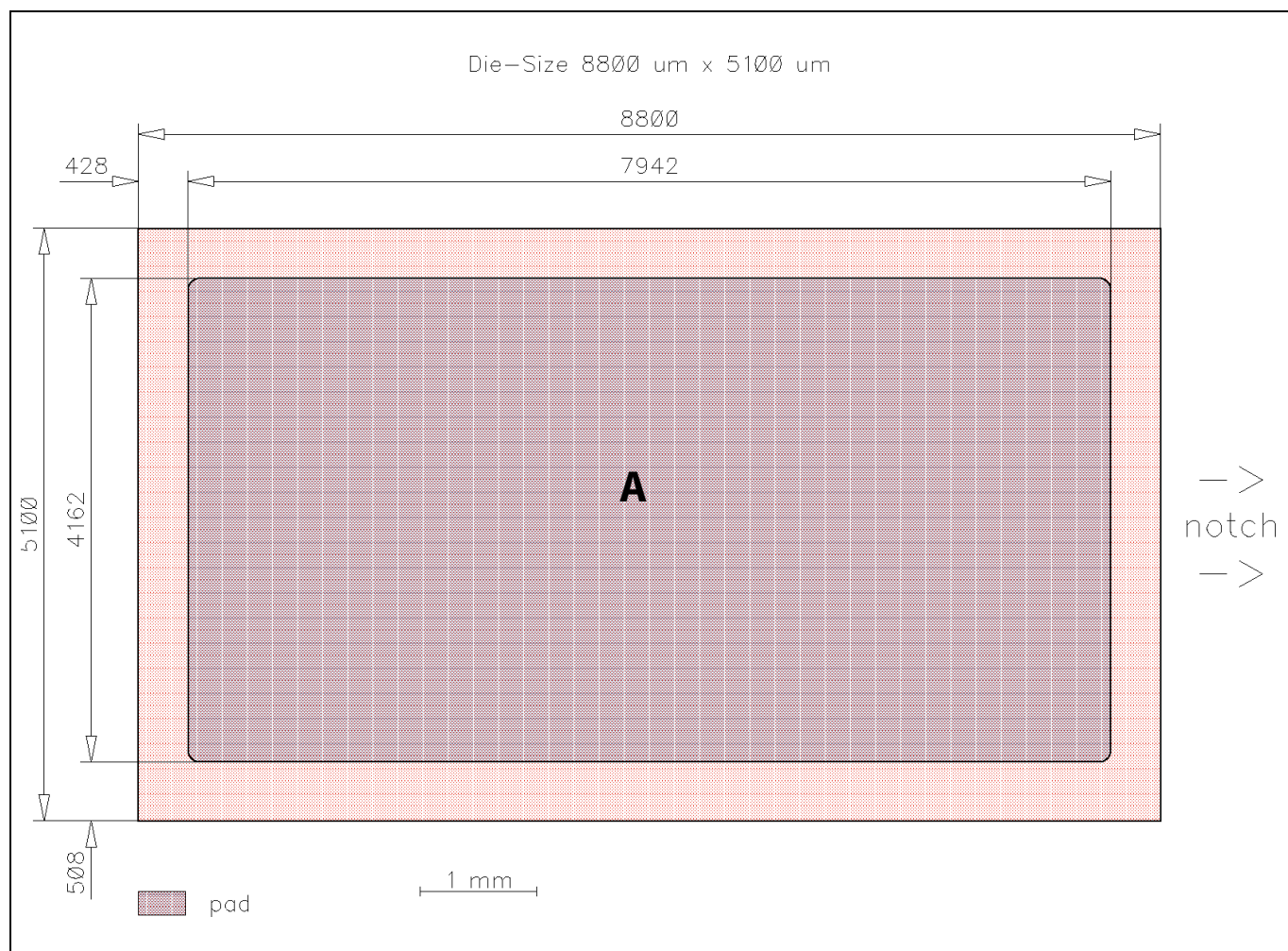
² V_{RRM} increases linearly between -40°C and 25°C .

³ Depending on thermal properties of assembly.

2 Further electrical characteristics

Note: Switching characteristics and thermal properties are dependent on module design and mounting technology and can therefore not be specified for a bare die.

3 Chip Drawing



Key

- A = Anode pad

4 Bare die product specifics

Note: Test coverage at wafer level cannot cover the full range of customer application conditions. Therefore it is the responsibility of the customer to test all performance characteristics, which are relevant for their specific application, at the package level, including RBSOA and SCSOA.

Description

- AQL 0.1 for visual inspection according to failure catalogue
- Electrostatic Discharge Sensitive Device according to MIL-STD 883

Revision history

Revision	Date of release	Description of change
V1.0	2019-08-05	Initial Datasheet
V1.01	2019-11-29	Datasheet update with additional parameters: <ul style="list-style-type: none">- V_{RRM} @ $T_{vj}=-40^{\circ}\text{C}$- I_R @ $V_R=750\text{V}$- V_F @ $T_{vj}=175^{\circ}\text{C}$

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