750 V, 200 A Extremefast Diode Die

PCRKA20075F8

V_{RRM} = 750V
I_F = Limited by $T_{j(max)}$

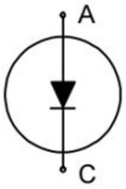
Features

- AEC−Q101 Rev. D Qualified for Enhanced Reliability
- Maximum Junction Temperature 175°C
- Extremefast Technology Generation 2 with Improved Soft Recovery
- Low Forward Voltage: V_F = 1.7 V (Typ.) @ I_F = 200 A

Applications

- Automotive Traction Modules
- General Power Modules

DIODE DIE



DIE OUTLINE



MECHANICAL PARAMETERS

Parameter	Mils	μm
Die Size	394 x 197	10,000 x 5,000
Anode Pad Size	346 x 149	8,776 x 3,776
Scribe Lane Width	3.14	80
Die Thickness	3.62	92
Top Metal	6 μm AlSiCu	
Back Metal	1.4 μm Ti/NiV/Ag	
Topside Passivation	Silicon Nitride plus Polyimide	
Wafer Diameter	200 mm	
Max Possible Die Per Wafer	467	
Recommended Storage Environment	In original container, in dry nitrogen, < 3 months at an ambient temperature of 23°C	

ORDERING INFORMATION

Device	Inking?	Shipping
PCRKA20075F8	Yes	Sawn Wafer on Tape

ABSOLUTE MAXIMUM RATINGS (T_{VJ} = 25°C Unless Otherwise Noted)

Parameter	Symbol	Ratings	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	750	V
DC Forward Current, limited by T_{VJ} max	I_F	(Note 1)	A
Pulsed Forward Current, tp limited by $T_{VJ\ max}$ (Note 2)	I_{FM}	600	A
Operating Junction Temperature	T_{VJ}	−40 to +175	°C
Storage Temperature Range	Tstg	+18 to +28	°C

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

1. Depends on the thermal properties of assembly.
2. Not subject to production test − verified by design/characterization.

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ELECTRICAL CHARACTERISTICS (T_J= 25°C Unless Otherwise Noted)

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
STATIC CHARACTERISTICS (Tested on Wafers)							
Breakdown Voltage	V_{BR}	I_R = 1 mA		750	–	–	V
Reverse Leakage Current	I_R	V_R = 750 V		–	–	30	μA
Forward Voltage	V_F	I_F = 200 A		1.4	1.7	1.95	V
ELECTRICAL CHARACTERISTICS (Not Subjected to Production Test – Verified by Design/Characterization)							
Breakdown Voltage	V_{BR}	I_R = 1 mA	T_{VJ} = −40°C	700	800	–	V
Forward Voltage	V_F	I_F = 200 A	T_{VJ} = 25°C	–	1.7	–	V
			T_{VJ} = 150°C	–	1.72	–	V
			T_{VJ} = 175°C	–	1.7	–	V
Reverse Recovery Charge	Q_{rr}	I_F = 200 A V_R = 400 V, dI_F/dt = 500 A/μs, T_{VJ} = 25°C		–	2.49	–	μC
Reverse Recovery Current	I_{rr}			–	23	–	A
Reverse Recover Time	T_{rr}			–	220	–	nS
Reverse Recovery Charge	Q_{rr}	I_F = 200 A V_R = 400 V, dI_F/dt = 500 A/μs, T_{VJ} = 150°C		–	9.6	–	μC
Reverse Recovery Current	I_{rr}			–	46	–	A
Reverse Recover Time	T_{rr}			–	420	–	nS
Reverse Recovery Charge	Q_{rr}	I_F = 200 A V_R = 400 V, dI_F/dt = 500 A/μs, T_{VJ} = 175°C		–	11.9	–	μC
Reverse Recovery Current	I_{rr}			–	49.5	–	A
Reverse Recover Time	T_{rr}			–	483	–	nS

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching characteristics and thermal properties are depending strongly on module design and mounting technology.

For ordering, technique and other information on **onsemi** automotive bare die products, please contact automotivebaredie@onsemi.com.

DIE LAYOUT

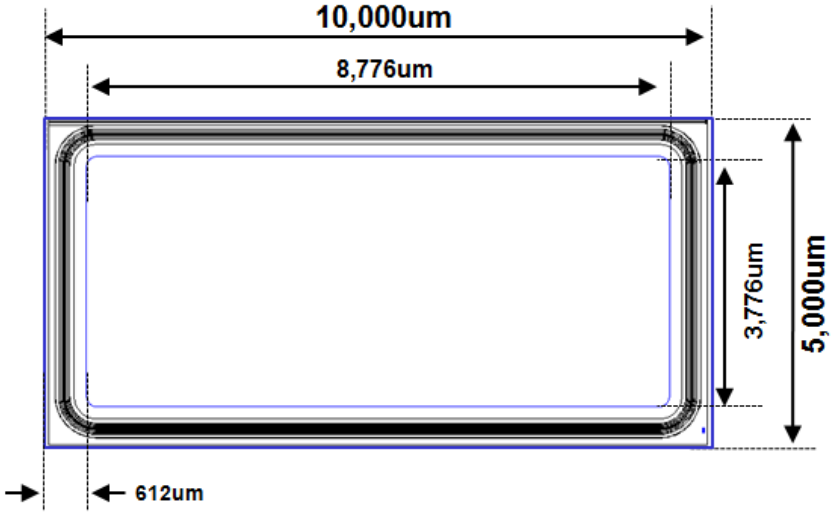


Figure 1. Die Layout

PCRKA20075F8

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