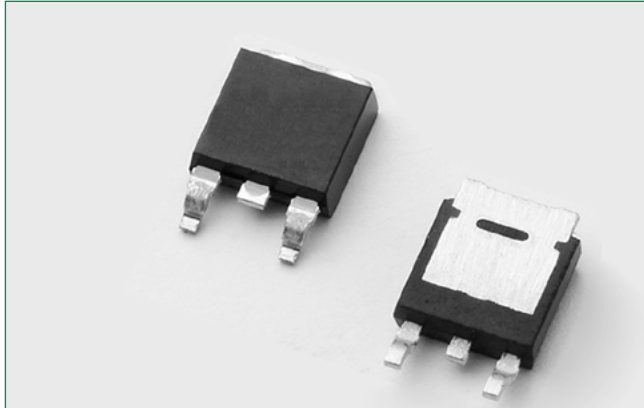


# DK208D Rectifier Diode



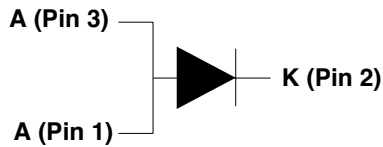
## Description

This DK208D 8A, 1200V rated standard recovery rectifier diode in a compact TO-252 surface mount package is ideal as a bypass diode or anti-parallel diode for active switching component.

## Features & Benefits

- Standard recovery rectifier
- Voltage capability up to 1200V
- 50Hz surge capability up to 150A
- High di/dt capability
- Halogen free and RoHS compliant

## Schematic Symbol



## Main Features

Symbol	Value	Unit
$I_{F(AV)}$	8	A
$V_{RRM}$	1200	V

## Applications

Typical applications are high voltage pulse generator using capacitor discharge such as electric fences and stun guns, and high voltage DC to DC converter seen in small EV / E-bike charger systems.

## Absolute Maximum Ratings

Symbol	Parameter	Test Conditions	Value	Unit
$I_{F(RMS)}$	RMS forward current	$T_c = 130^\circ\text{C}$	12.6	A
$I_{F(AV)}$	Average forward current		8.0	A
$I_{FSM}$	Peak non-repetitive surge current	single half cycle; $f = 50\text{Hz}$ ; $T_j(\text{initial}) = 25^\circ\text{C}$	150	A
		single half cycle; $f = 60\text{Hz}$ ; $T_j(\text{initial}) = 25^\circ\text{C}$	180	
$I^2t$	$I^2t$ Value for fusing	$t_p = 8.3\text{ ms}$	134	$\text{A}^2\text{s}$
di/dt	Critical rate of rise of on-state current	$f = 50\text{Hz}$ ; $T_j = 50^\circ\text{C}$	350	$\text{A}/\mu\text{s}$
$T_{stg}$	Storage temperature range		-40 to 150	$^\circ\text{C}$
$T_j$	Operating junction temperature range		-40 to 150	$^\circ\text{C}$

**Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)**

Symbol	Parameter	Test Conditions		Value	Unit
$t_{rr}$	Reverse-recovery Time	$I_F=0.9\text{A}$ , $I_R=1.5\text{A}$	TYP.	4	$\mu\text{s}$

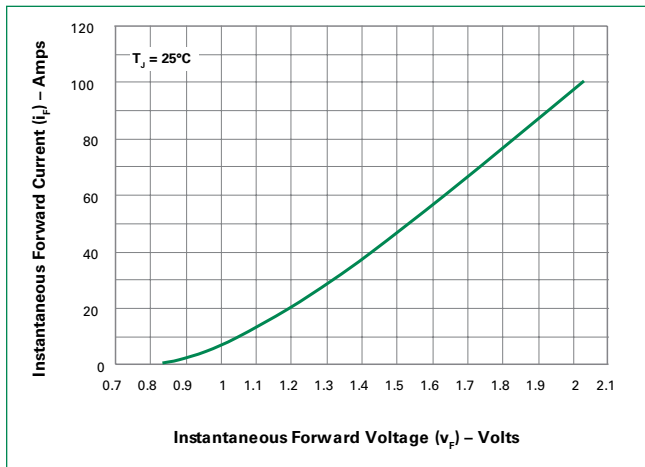
**Static Characteristics**

Symbol	Test Conditions			Value	Unit
$V_{FM}$	$I_T = 8\text{A}$ ; $t_p = 380\mu\text{s}$		MAX.	1.2	V
$I_{RM}$	$V_{RRM}$	$T_J = 25^\circ\text{C}$	MAX.	20	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$		500	
		$T_J = 150^\circ\text{C}$		1000	

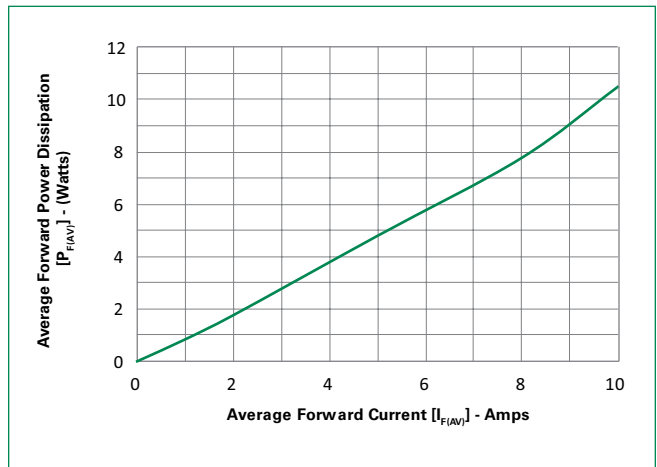
**Thermal Resistances**

Symbol	Parameter	Value	Unit
$R_{\theta(JC)}$	Junction to case (AC)	1.4	$^\circ\text{C/W}$

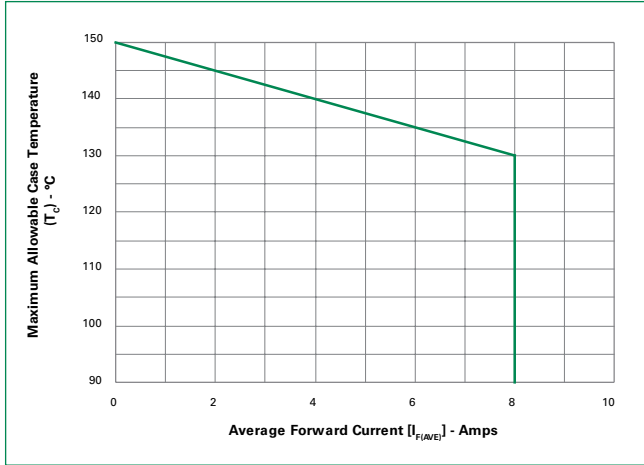
**Figure 1: On-State Current vs. On-State Voltage (Typical)**



**Figure 2: Power Dissipation vs. Average Forward On-State Current (Typical)**

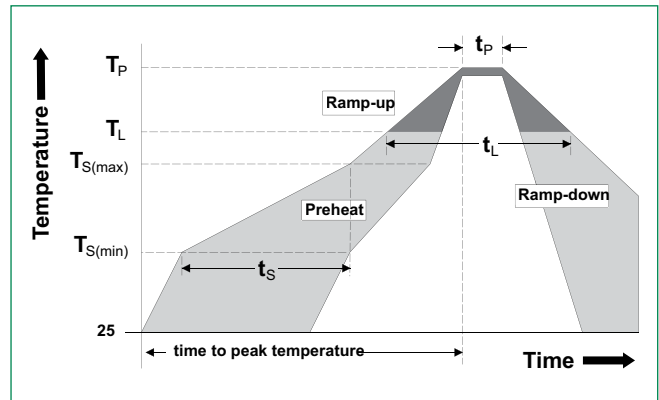


**Figure 3: Maximum Allowable Case Temperature vs. Average On-State Current**



**Soldering Parameters**

<b>Reflow Condition</b>		Pb – Free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_i$ )	60 – 120 secs
<b>Average ramp up rate (Liquidus Temp) (<math>T_L</math>) to peak</b>		3°C/second max
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		3°C/second max
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Time ( $t_L$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		30 seconds max
<b>Ramp-down Rate</b>		6°C/second max
<b>Time 25°C to peak Temperature (<math>T_p</math>)</b>		8 minutes Max.
<b>Do not exceed</b>		260°C



**Physical Specifications**

<b>Terminal Finish</b>	100% Matte Tin Plated
<b>Body Material</b>	UL Recognized compound meeting flammability rating V-0.
<b>Lead Material</b>	Copper Alloy

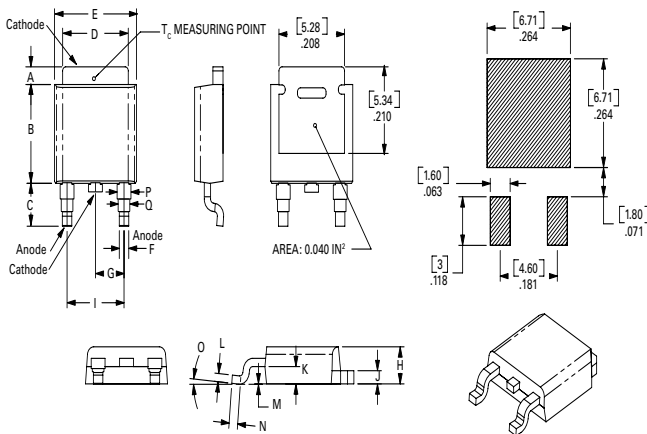
**Design Considerations**

Careful selection of the correct component for the application's operating parameters and environment will go a long way toward extending the operating life of the rectifier. Good design practice should limit the maximum continuous current through the main terminals to 75% of the component rating. Other ways to ensure long life for a power discrete semiconductor are proper heat sinking and selection of voltage ratings for worst case conditions. Overheating, overvoltage (including dv/dt), and surge currents are the main killers of semiconductors. Correct mounting, soldering, and forming of the leads also help protect against component damage.

**Environmental Specifications**

Test	Specifications and Conditions
<b>High Temperature Voltage Blocking</b>	MIL-STD-750: Method 1040, Condition A Rated $V_{RRM}$ 150°C, 168 hours
<b>Temperature Cycling</b>	MIL-STD-750: Method 1051 -40°C to 125°C, 15-minute dwell, 100 cycles
<b>Biased Temperature &amp; Humidity</b>	EIA/JEDEC: JESD22-A101 320VDC, 85°C, 85%RH, 168 hours
<b>High Temp Storage</b>	MIL-STD-750: Method 1031 150°C, 1008 hours
<b>Low-Temp Storage</b>	1008 hours; -40°C
<b>Resistance to Solder Heat</b>	MIL-STD-750: Method 2031 260°C, 10 seconds
<b>Solderability</b>	ANSI/J-STD-002, Category 3, Test A
<b>Lead Bend</b>	MIL-STD-750: Method 2036, Condition E
<b>Moisture Sensitivity Level</b>	Level 1, JEDEC-J-STD-020

**Dimensions — TO-252AA (D-Package) — D-PAK Surface Mount**

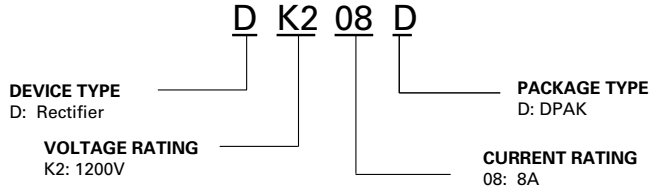


Dimension	Inches			Millimeters		
	Min	Typ	Max	Min	Typ	Max
<b>A</b>	0.037	0.040	0.043	0.94	1.01	1.09
<b>B</b>	0.235	0.243	0.245	5.97	6.16	6.22
<b>C</b>	0.106	0.108	0.113	2.69	2.74	2.87
<b>D</b>	0.205	0.208	0.213	5.21	5.29	5.41
<b>E</b>	0.255	0.262	0.265	6.48	6.65	6.73
<b>F</b>	0.027	0.031	0.033	0.69	0.80	0.84
<b>G</b>	0.087	0.090	0.093	2.21	2.28	2.36
<b>H</b>	0.085	0.092	0.095	2.16	2.33	2.41
<b>I</b>	0.176	0.179	0.184	4.47	4.55	4.67
<b>J</b>	0.018	0.020	0.023	0.46	0.51	0.58
<b>K</b>	0.035	0.037	0.039	0.90	0.95	1.00
<b>L</b>	0.018	0.020	0.023	0.46	0.51	0.58
<b>M</b>	0.000	0.000	0.004	0.00	0.00	0.10
<b>N</b>	0.021	0.026	0.027	0.53	0.67	0.69
<b>O</b>	0°	0°	5°	0°	0°	5°
<b>P</b>	0.042	0.047	0.052	1.06	1.20	1.32
<b>Q</b>	0.034	0.039	0.044	0.86	1.00	1.11

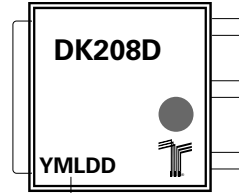
**Packing Option**

Part Number	Marking	Weight	Packing Mode	Base Quantity
DK208DRP	DK208D	0.3 g	Embossed Carrier	2500

**Part Numbering System**



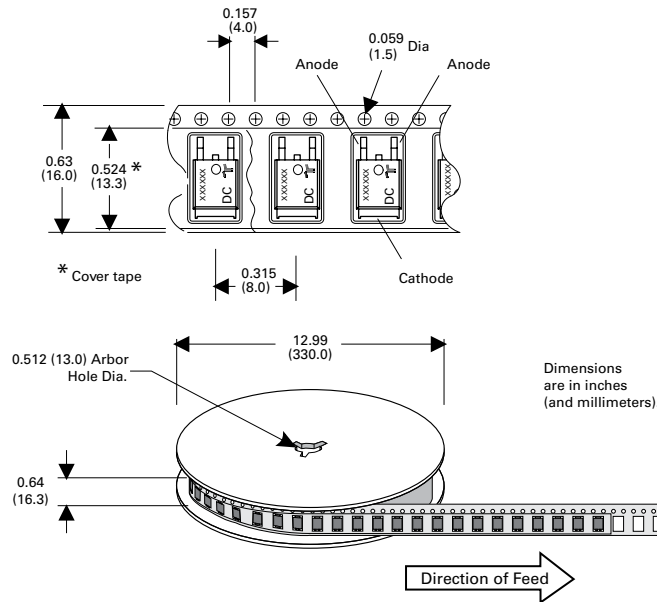
**Part Marking System**



**Date Code Marking**  
Y: Year Code  
M: Month Code  
L: Location Code  
DD: Calendar Code

**TO-252 Embossed Carrier Reel Pack (RP) Specifications**

Meets all EIA-481-2 Standards



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