

# LXA03D530

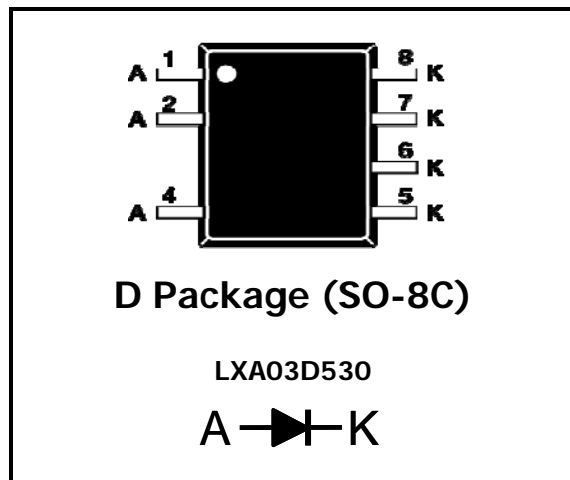
## Qspeed™ Family

530 V, 3 A X-Series Diode

### Product Summary

$I_{F(AVG)}$	3	A
$V_{RRM}$	530	V
$Q_{RR}$ (Typ at 125 °C)	75	nC
$I_{RRM}$ (Typ at 125 °C)	3.2	A
Softness $t_B/t_A$ (Typ at 125 °C)	0.34	

### Pin Assignment



### RoHS Compliant

Package uses lead-free plating and green mold compound.

Halogen-free per IEC 61249-2-21.

### General Description

This device is an extremely low reverse recovery 530 V silicon diode. Its recovery characteristics increase efficiency, reduce EMI and eliminate snubbers.

### Applications

- High-voltage power rectifier
- Power factor correction (PFC) boost diode
- Motor drive circuits
- DC-AC inverters

### Features

- Low  $Q_{RR}$ , low  $I_{RRM}$ , low  $t_{RR}$
- High  $di_F/dt$  capable
- Soft recovery

### Benefits

- Reduces peak reverse voltage
- Increases efficiency
  - Eliminates need for snubber circuits
  - Reduces EMI filter component size & count
- Enables extremely fast switching

### Absolute Maximum Ratings

Absolute maximum ratings are the values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Symbol	Parameter	Conditions	Rating	Units
$V_{RRM}$	Peak repetitive reverse voltage	$T_J = 25\text{ °C}$	530	V
$I_{F(AVG)}$	Average forward current	$T_J = 150\text{ °C}$ , $T_L = 29\text{ °C}$	3	A
$I_{FSM}$	Non-repetitive peak surge current	60 Hz, ½ cycle, $T_C = 25\text{ °C}$	25	A
$I_{FSM}$	Non-repetitive peak surge current	½ cycle of $t = 28\text{ }\mu\text{s}$ Sinusoid, $T_C = 25\text{ °C}$	350	A
$T_{J(MAX)}$	Maximum junction temperature		150	°C
$T_{STG}$	Storage temperature		-55 to 150	°C
$P_D$	Power dissipation	$T_L = 25\text{ °C}$	4.6	W

## Thermal Resistance

Symbol	Resistance	Conditions	Rating	Units
$R_{\theta JA}$	Junction to ambient	Soldered to 1 sq. in. (645 mm <sup>2</sup> ), 2 oz. Cu.	80	°C/W
$R_{\theta JL}$	Junction to lead	Lead temperature measured on pin 7	27	°C/W

## Electrical Specifications at $T_J = 25\text{ }^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units	
<b>DC Characteristics</b>							
$I_R$	Reverse current	$V_R = 530\text{ V}, T_J = 25\text{ }^\circ\text{C}$	-	0.4	250	$\mu\text{A}$	
		$V_R = 530\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	0.275	-	mA	
$V_F$	Forward voltage	$I_F = 3\text{ A}, T_J = 25\text{ }^\circ\text{C}$	-	1.55	1.71	V	
		$I_F = 3\text{ A}, T_J = 150\text{ }^\circ\text{C}$	-	1.33	-	V	
$C_J$	Junction capacitance	$V_R = 10\text{ V}, 1\text{ MHz}$	-	15	-	pF	
<b>Dynamic Characteristics</b>							
$t_{RR}$	Reverse recovery time	$di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}, I_F = 3\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	-	25	34.3	ns
			$T_J = 125\text{ }^\circ\text{C}$	-	33	-	ns
$Q_{RR}$	Reverse recovery charge	$di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}, I_F = 3\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	-	39	55	nC
			$T_J = 125\text{ }^\circ\text{C}$	-	75	-	nC
$I_{RRM}$	Maximum reverse recovery current	$di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}, I_F = 3\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	-	2.2	-	A
			$T_J = 125\text{ }^\circ\text{C}$	-	3.2	-	A
S	Softness factor = $\frac{t_B}{t_A}$	$di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}, I_F = 3\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	-	0.7	-	
			$T_J = 125\text{ }^\circ\text{C}$	-	0.34	-	

**Note to component engineers:** X-Series diodes employ Schottky technologies in their design and construction. Therefore, component engineers should plan their test setups to be similar to those for traditional Schottky test set-ups. (For additional details, see Application Note AN-300.)

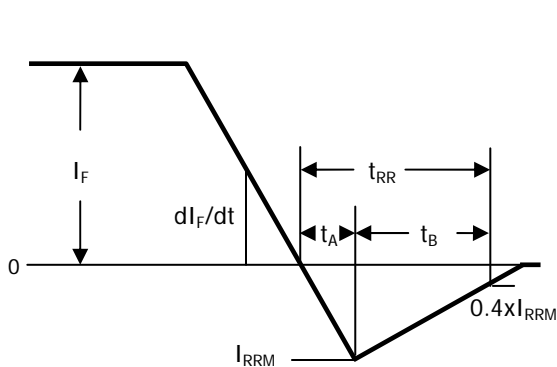


Figure 1. Reverse Recovery Definitions.

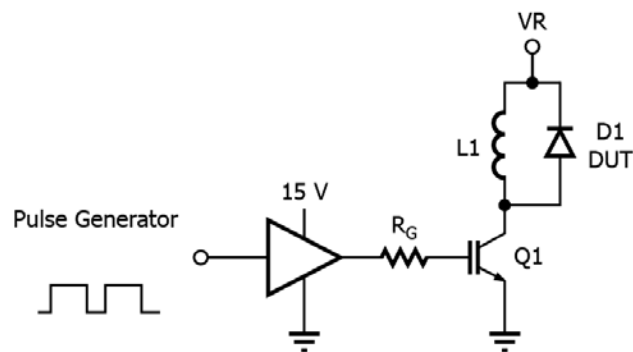


Figure 2. Reverse Recovery Test Circuit.

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Electrical Specifications at  $T_J = 25\text{ }^\circ\text{C}$  (unless otherwise specified)

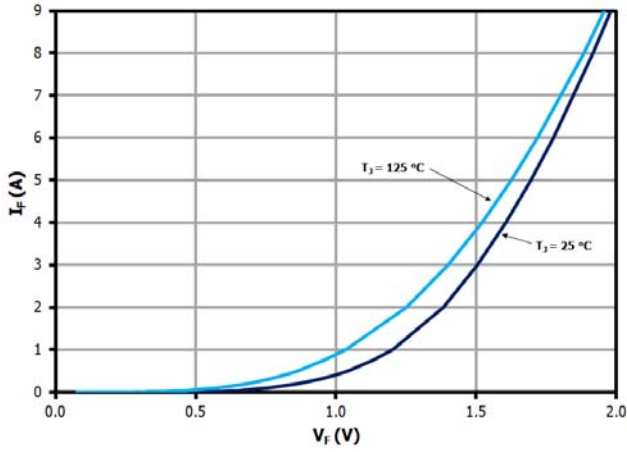


Figure 3. Typical  $I_F$  vs.  $V_F$ .

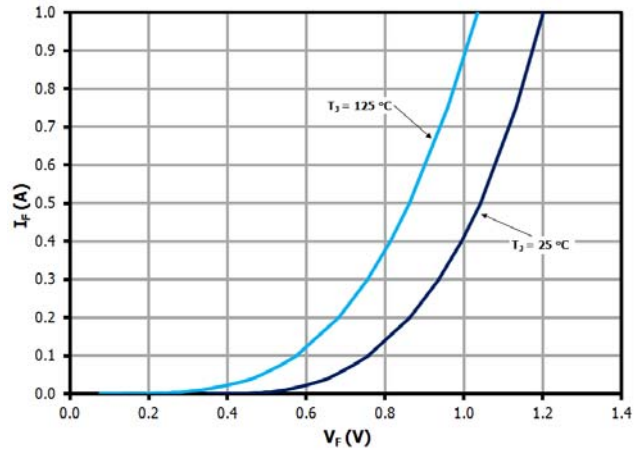


Figure 4. Typical  $I_F$  vs.  $V_F$ .

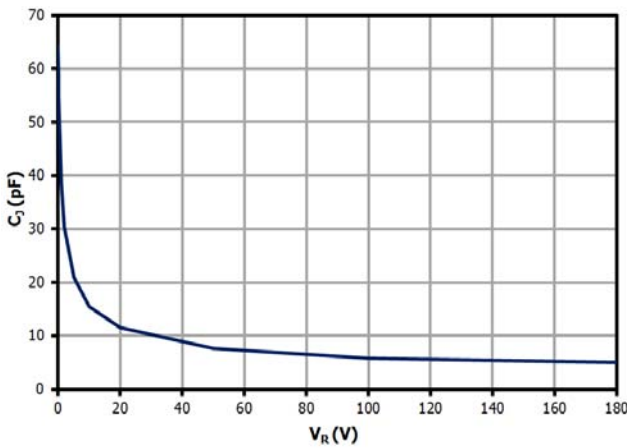


Figure 5. Typical  $C_J$  vs.  $V_R$ .

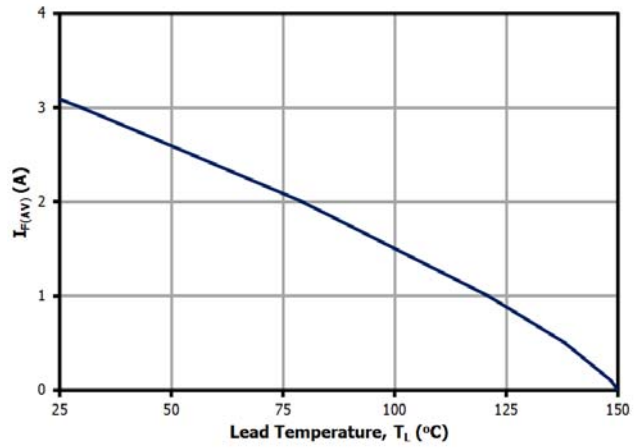


Figure 6. DC Current Derating Curve.

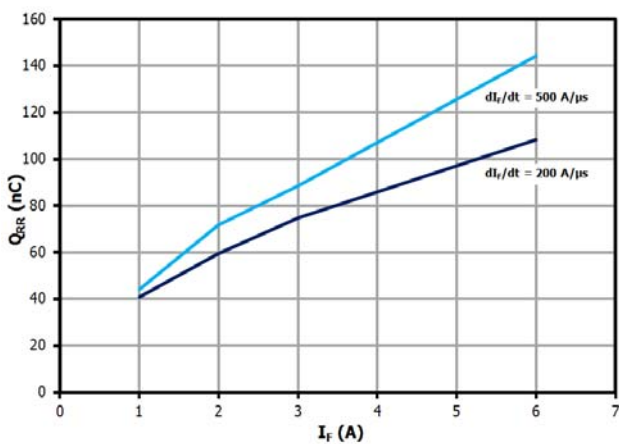


Figure 7. Typical  $Q_{RR}$  vs.  $I_F$  at  $T_J = 125\text{ }^\circ\text{C}$ .

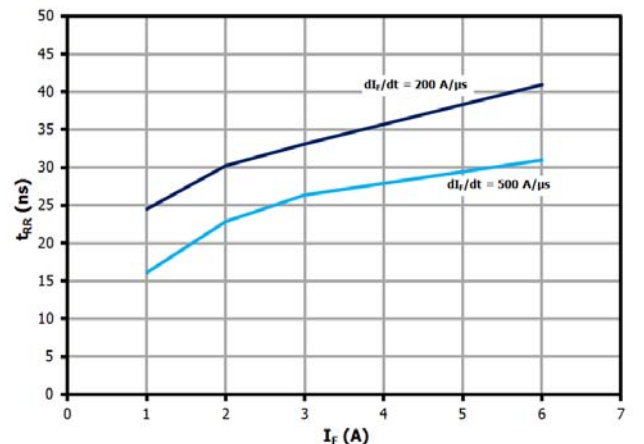


Figure 8. Typical  $t_{RR}$  vs.  $I_F$  at  $T_J = 125\text{ }^\circ\text{C}$ .

Electrical Specifications at  $T_J = 25\text{ }^\circ\text{C}$  (unless otherwise specified)

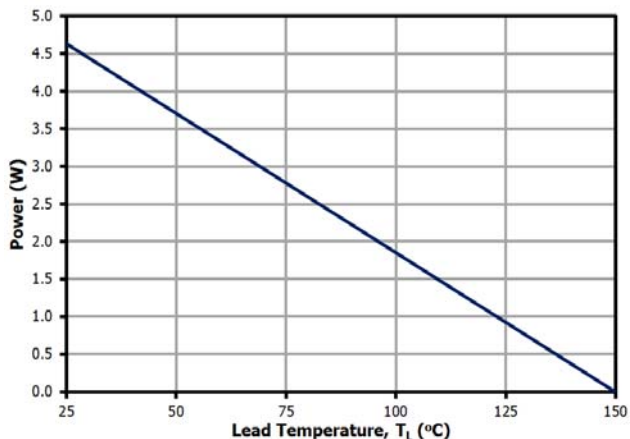


Figure 9. Power Derating Curve.

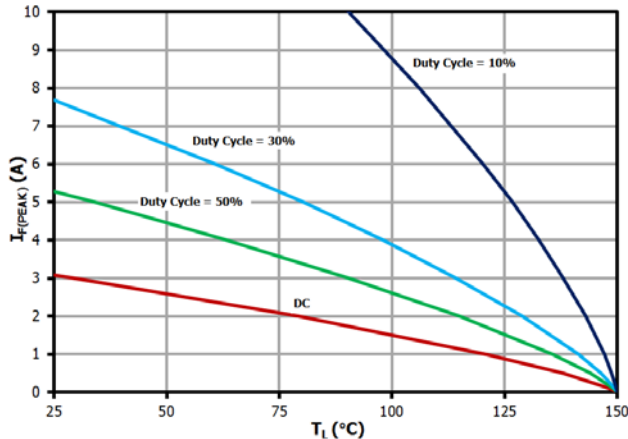


Figure 10.  $I_F$  (Peak) vs.  $T_L$ ,  $f = 70\text{ kHz}$ .

LXA03D530

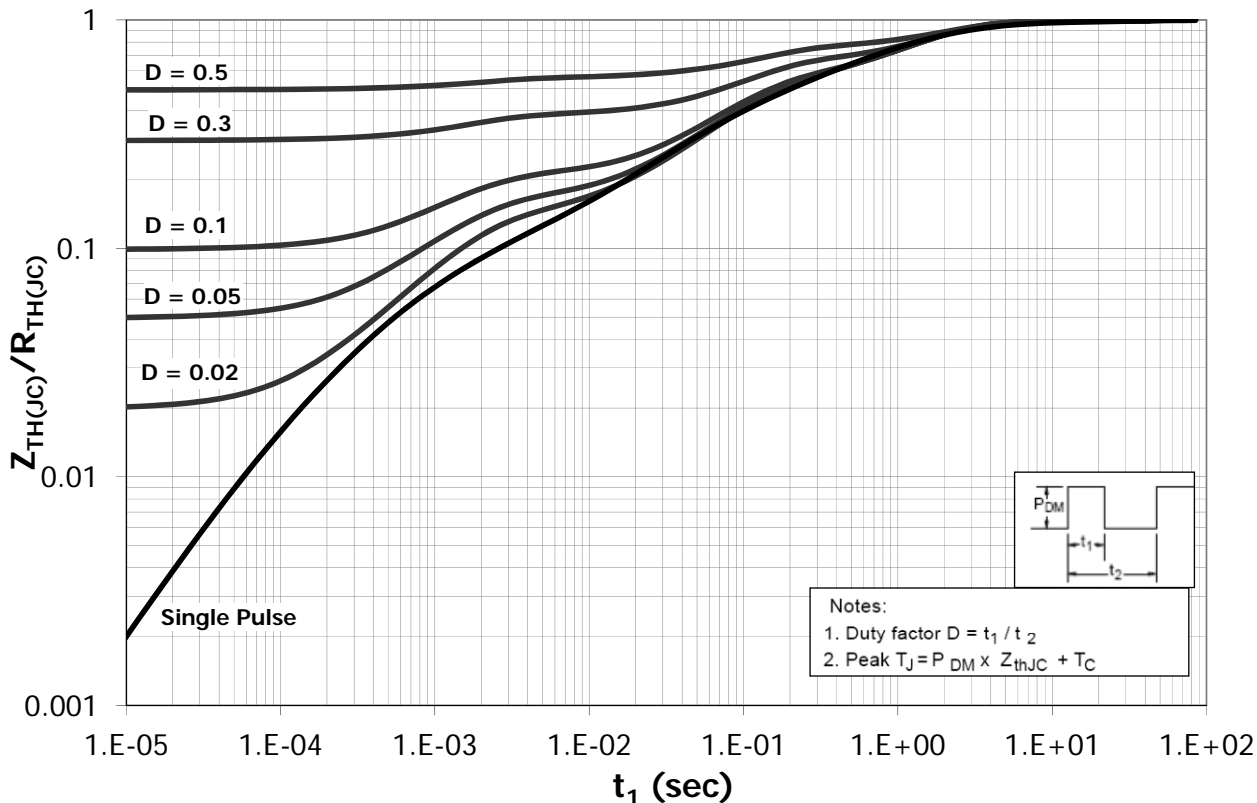
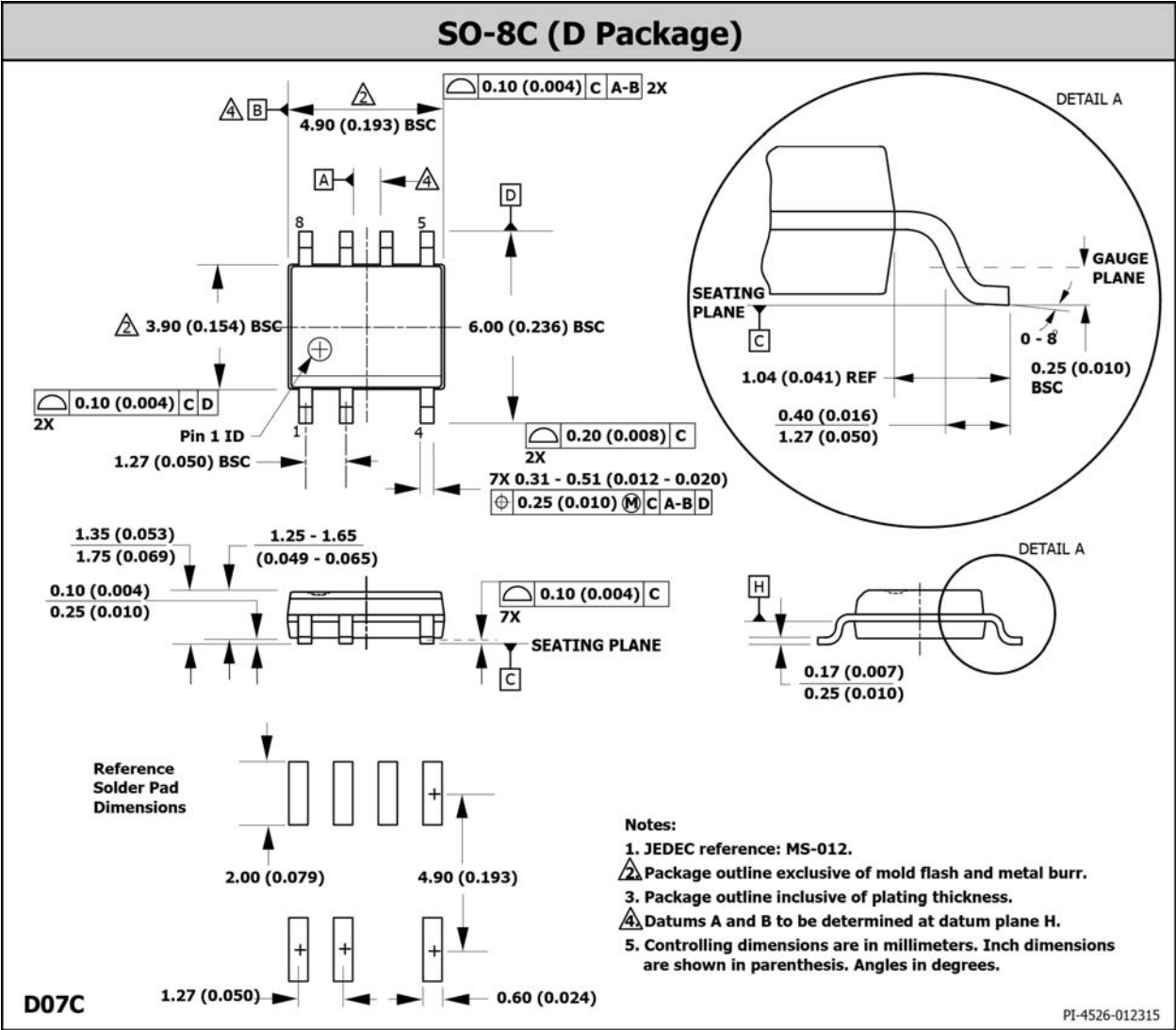


Figure 11. Normalized Maximum Transient Thermal Impedance.



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## Ordering Information

Part Number	Package	Packing
LXA03D530	SO-8C	2500 units/reel

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Revision	Notes	Date
1.0	Initial Release.	04/15

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