HIGH-TEMPERATURE, 80V DIODE FAMILY

FEATURES

- ▲ Reverse voltage V_R > 90V.
- ▲ Operational beyond the -60℃ to +230℃ temperature range.
- ▲ Forward current @ 230℃, V_F=1.2V:
  - XTR1N0815: I_F=165mA per diode.
  - XTR1N0850: I_F=570mA per diode.
- ▲ Forward voltage @ 25℃, I_F=1mA:
  - XTR1N0815: V_F=740mV per diode.
  - XTR1N0850: V_F=720mV per diode.
- ▲ Ruggedized SMT and thru-hole packages.
- ▲ Also available as bare die.

APPLICATIONS

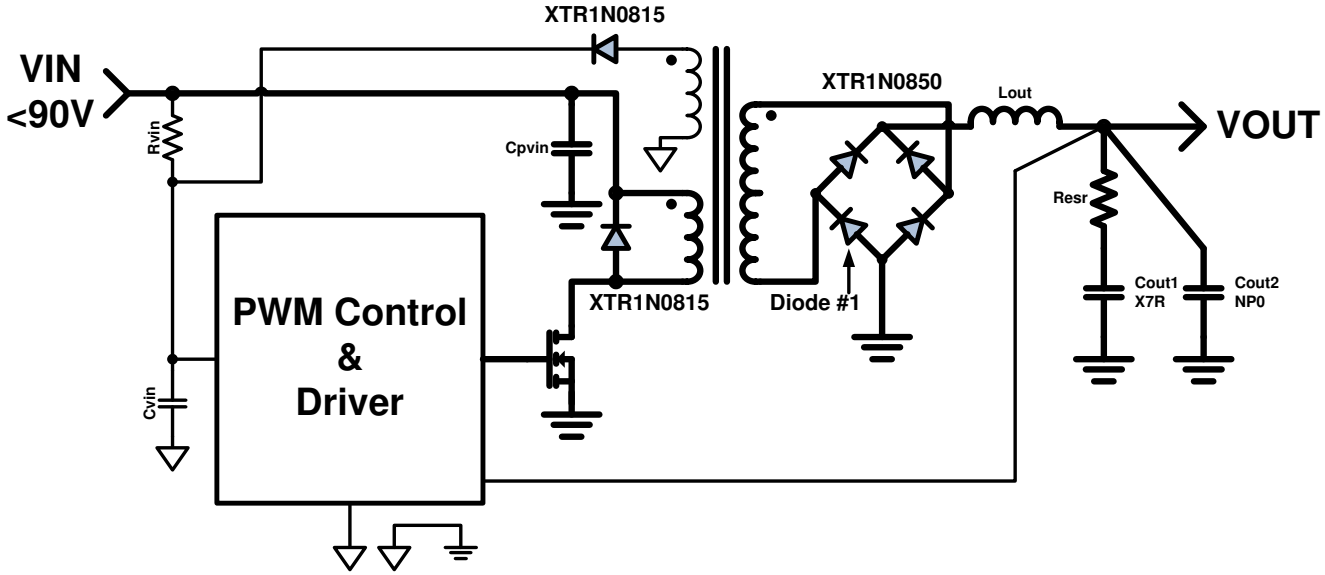
- ▲ Reliability-critical, Automotive, Aeronautics & Aerospace, Down-hole.
- ▲ General rectification, voltage blocking and clamping, power supplies.

DESCRIPTION

XTR1N0800 is a family of general purpose diodes with a reverse voltage above 90V. Each part is composed of four independent diodes which can be used individually, in half- or full-bridge rectifier architecture or connected in series or parallel.
Typical applications include rectification, demodulation, voltage blocking, voltage clamping, power supplies, charge pumps and voltage multipliers.
Full functionality is guaranteed from -60℃ to +230℃, though operation well below and above this temperature range is achieved.
XTR1N0800 parts have been designed to reduce system cost and ease adoption by reducing the learning curve and providing easy to use features.
Parts from the XTR1N0800 family are available in ruggedized SMT and thru-hole packages. Parts are also available as bare dies.

PRODUCT HIGHLIGHT

Diodes used in half- and full-bridge rectification as well as voltage clamping



ORDERING INFORMATION

X	TR	1N	02xx
Source: X = X-REL Semi	Process: TR = HiTemp, HiRel R = HiRel	Part family	Part number

Product Reference	Temperature Range	Package	Pin Count	Marking
XTR1N0815-BD	-60℃ to +230℃	Bare die		XTR1N0815
XTR1N0850-BD	-60℃ to +230℃	Bare die		XTR1N0850
XTR1N0815-TD	-60℃ to +230℃	Tested Bare die		XTR1N0815
XTR1N0850-TD	-60℃ to +230℃	Tested Bare die		XTR1N0850
XTR1N0815-D	-60℃ to +230℃	Ceramic side braze DIL	8	XTR1N0815
XTR1N0850-D	-60℃ to +230℃	Ceramic side braze DIL	8	XTR1N0850

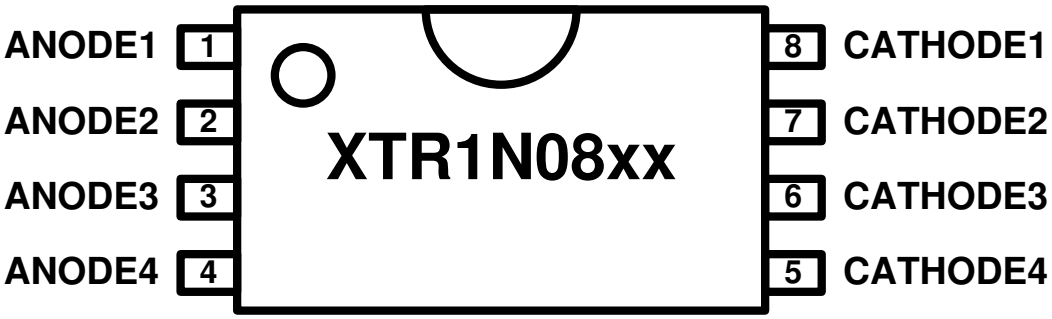
Other packages and packaging configurations possible upon request.

ABSOLUTE MAXIMUM RATINGS

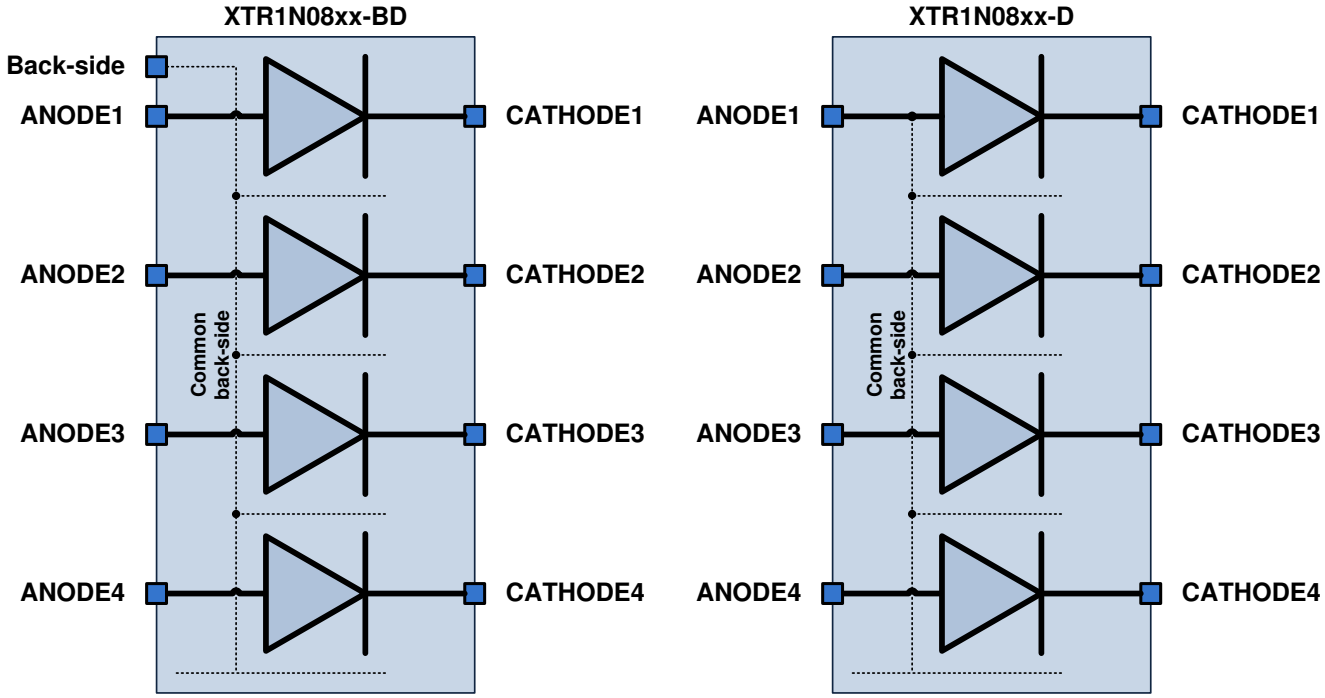
Repetitive peak reverse voltage V_{RRM}	90V
Continuous peak reverse voltage V_R	90V
Continuous forward current I_F @230℃	
XTR1N0815	0.5A
XTR1N0850	1.7A
Operating Junction Temperature Range	-70℃ to +300℃

Caution: Stresses beyond *those listed in "*ABSOLUTE MAXIMUM RATINGS*" may cause permanent damage to the device. These are* stress ratings only and functionality of the device at these or any other condition beyond those indicated in the operational sections of *the specifications is not implied. Exposure to "*ABSOLUTE MAXIMUM RATINGS*" conditions for extended periods may permanently* affect device reliability.

PACKAGING OPTIONS



BLOCK DIAGRAM



Important Notices:
Dashed lines indicate the back side connection. In the packaged versions (XTR1N08xx-D), the back-side is connected to the anode of the first diode (ANODE1). For best reverse voltage performance, the back-side must be connected to the most possible negative voltage seen by any of the four diodes.
In case a diode is not used, the diode should be shorted and tied to a fixed voltage in the application or at least to a terminal of any active diode.

RECOMMENDED OPERATING CONDITIONS

Parameter	Min	Typ	Max	Units
Reverse voltage V_R			80	V
Forward voltage V_F			1.5	V
Continuous forward current per diode @ T_j=25℃ I_F **XTR1N0815** **XTR1N0850**		 0.34 1.20		 A
Junction Temperature[1] T_j	-60		230	℃

[1] Operation beyond the specified temperature range is achieved.

XTR1N0815 ELECTRICAL SPECIFICATIONS

Unless otherwise stated, specification applies for one diode and -60℃<T_j<230℃.

Parameter	Condition	Min	Typ	Max	Units
Electrical Characteristics					
Forward Voltage V_F	I_F=1mA T_j=-60℃ T_j=25℃ T_j=230℃		 870 740 400		mV
Forward Current I_F	V_F=1.2V T_j=-60℃ T_j=25℃ T_j=230℃		 137 165 200		mA
Reverse Current I_R	V_R=80V T_j=25℃ T_j=230℃		 <0.003 3.5		µA
Switching Characteristics					
Diode Capacitance C_d	F=1MHz, V_R=0V		TBD		pF
Reverse Recovery Time t_{rr}			TBD		ns
Forward Recovery Voltage V_{fr}			TBD		V

XTR1N0850 ELECTRICAL SPECIFICATIONS

Unless otherwise stated, specification applies for one diode and -60℃<T_j<230℃.

Parameter	Condition	Min	Typ	Max	Units
Electrical Characteristics					
Forward Voltage V_F	I_F=1mA T_j=-60℃ T_j=25℃ T_j=230℃		 850 720 380		mV
Forward Current I_F	V_F=1.2V T_j=-60℃ T_j=25℃ T_j=230℃		 480 570 700		mA
Reverse Current I_R	V_R=80V T_j=25℃ T_j=230℃		 <0.01 12.5		µA
Switching Characteristics					
Diode Capacitance C_d	F=1MHz, V_R=0V		TBD		pF
Reverse Recovery Time t_{rr}			TBD		ns
Forward Recovery Voltage V_{fr}			TBD		V

THEORY OF OPERATION

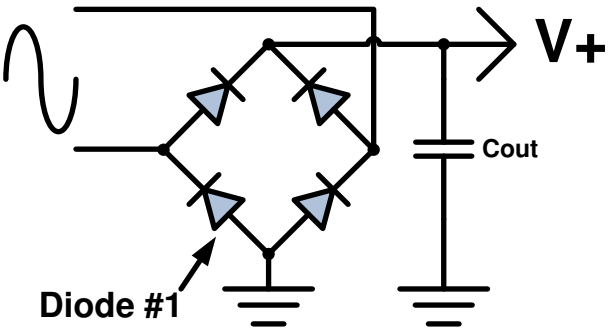
Introduction

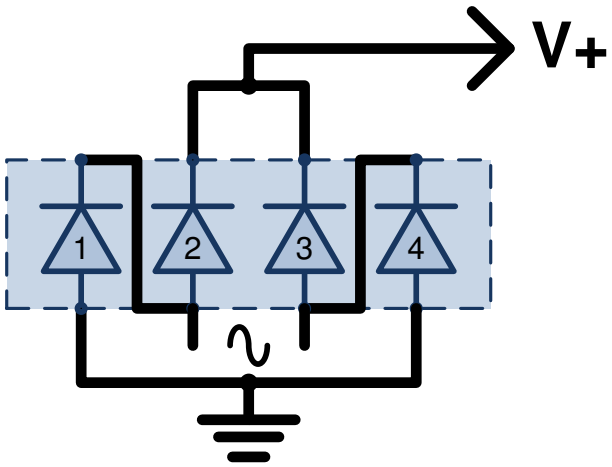
The XTR1N0800 is a family of general purpose diodes able to operate from -60℃ to +230℃ and withstand reverse voltages up to 90V.

Each die is composed of four independent diodes on top of the same silicon substrate (back-side connection).

Given the construction of the diodes, the back-side voltage has an influence on the maximum allowed reverse voltage. Optimum performance is achieved for the back-side connected to the most negative voltage see by any of the four diodes. In packaged parts, the back-side is connected to the anode of the first diode (ANODE1).

In the simple full-bridge rectifier example below, if the packaged version of XTR1N0815 or XTR1N0850 is used, the optimum result is achieved by connecting the anode of the first diode to the GND node.



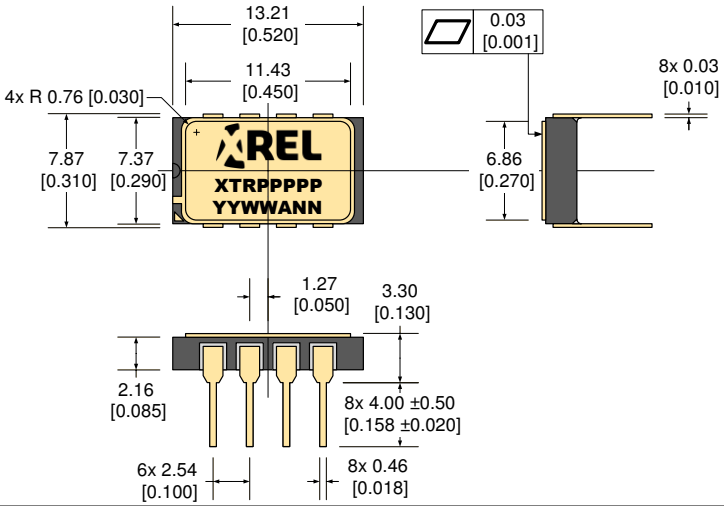


The previous figure shows a simple implementation of the full-bridge rectifier at board level. Bold black lines indicate tracks on the board. In this configuration, as recommended in the previous figure, the anode of the first diode is connected to the GND node in order to offer the best reverse voltage characteristics.

PACKAGE OUTLINES

Dimensions shown in mm [inches].

Ceramic Side Braze Dual In-line DIP8



Part Marking Convention	
Part Reference: XTRPPPPPP	
XTR	X-REL Semiconductor, high-temperature, high-reliability product (XTRM Series).
PPPPP	Part number (0-9, A-Z).
Unique Lot Assembly Code: YYWWANN	
YY	Two last digits of assembly year (e.g. 11 = 2011).
WW	Assembly week (01 to 52).
A	Assembly location code.
NN	Assembly lot code (01 to 99).

IMPORTANT NOTICE & DISCLAIMER

CONTACT US

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