

## Product Summary (@T<sub>A</sub> = +25°C)

| V <sub>RRM</sub> (V) | I <sub>O</sub> (mA) | V <sub>F(MAX)</sub> (V) | I <sub>R(MAX)</sub> (μA) |
|----------------------|---------------------|-------------------------|--------------------------|
| 30                   | 200                 | 1                       | 2.0                      |

## Features and Benefits

- Low Forward Voltage Drop
- Fast Switching
- Ultra-Small Leadless Surface Mount Package
- PN Junction Guard Ring for Transient and ESD Protection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- The BAT54LPQ is suitable for automotive applications requiring specific change control; it is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

## Applications

- SMPS
- Free Wheeling Diodes
- Reverse Polarity Protection
- DC-DC Converters
- General Switching Applications

## Mechanical Data

- Case: X1-DFN1006-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Bar
- Terminals: Finish - NiPdAu Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>(64)</sup>
- Weight: 0.001 grams (Approximate)

X1-DFN1006-2



Top View



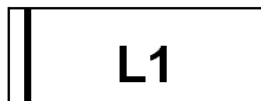
Bottom View

## Ordering Information (Note 4)

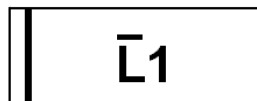
| Part Number | Compliance | Case         | Packaging          |
|-------------|------------|--------------|--------------------|
| BAT54LPQ-7  | Automotive | X1-DFN1006-2 | 3000/Tape & Reel   |
| BAT54LPQ-7B | Automotive | X1-DFN1006-2 | 10,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

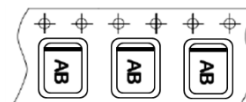
## Marking Information



Top View



Top View



Bar Denotes Cathode Side

L1 or  $\bar{L}1$  = Product Type Marking Code  
Bar Denotes Cathode Side

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                   | Symbol           | Value | Unit |
|----------------------------------|------------------|-------|------|
| Peak Repetitive Reverse Voltage  | V <sub>RRM</sub> | 30    | V    |
| Working Peak Reverse Voltage     | V <sub>RWM</sub> |       |      |
| DC Blocking Voltage              | V <sub>R</sub>   |       |      |
| Average Rectified Output Current | I <sub>O</sub>   | 200   | mA   |
| Repetitive Peak Forward Current  | I <sub>FRM</sub> | 300   | mA   |
| Forward Surge Current @ t < 1.0s | I <sub>FSM</sub> | 600   | mA   |

**Thermal Characteristics**

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                           | P <sub>D</sub>                    | 250         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R <sub>θJA</sub>                  | 400         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +125 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol             | Min | Typ | Max   | Unit | Test Condition                                                                                       |
|------------------------------------|--------------------|-----|-----|-------|------|------------------------------------------------------------------------------------------------------|
| Reverse Breakdown Voltage (Note 6) | V <sub>(BR)R</sub> | 30  | —   | —     | V    | I <sub>R</sub> = 100μA                                                                               |
| Forward Voltage                    | V <sub>F</sub>     | —   | —   | 240   | mV   | I <sub>F</sub> = 0.1mA                                                                               |
|                                    |                    |     |     | 320   |      | I <sub>F</sub> = 1mA                                                                                 |
|                                    |                    |     |     | 400   |      | I <sub>F</sub> = 10mA                                                                                |
|                                    |                    |     |     | 500   |      | I <sub>F</sub> = 30mA                                                                                |
|                                    |                    |     |     | 1,000 |      | I <sub>F</sub> = 100mA                                                                               |
| Reverse Leakage Current (Note 6)   | I <sub>R</sub>     | —   | —   | 2.0   | μA   | V <sub>R</sub> = 25V                                                                                 |
| Total Capacitance                  | C <sub>T</sub>     | —   | —   | 10    | pF   | V <sub>R</sub> = 1.0V, f = 1.0MHz                                                                    |
| Reverse Recovery Time              | t <sub>RR</sub>    | —   | —   | 5.0   | ns   | I <sub>F</sub> = 10mA through I <sub>R</sub> = 10mA to I <sub>R</sub> = 1.0mA, R <sub>L</sub> = 100Ω |

Notes: 5. Part mounted on FR-4 PC board with recommended pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.  
6. Short duration pulse test used to minimize self-heating effect.

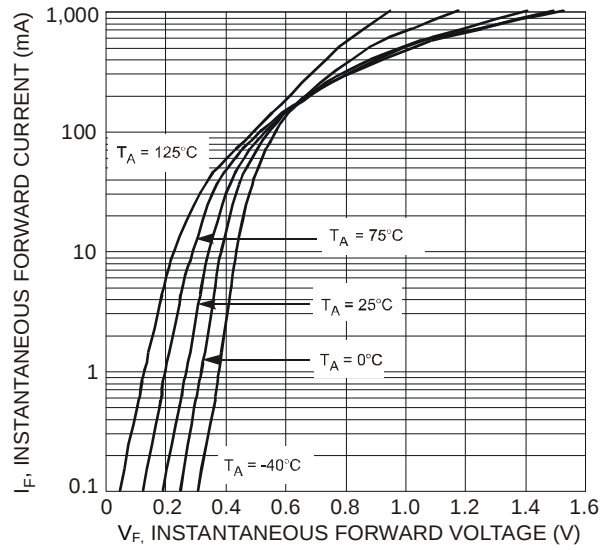


Fig. 1 Typical Forward Characteristics

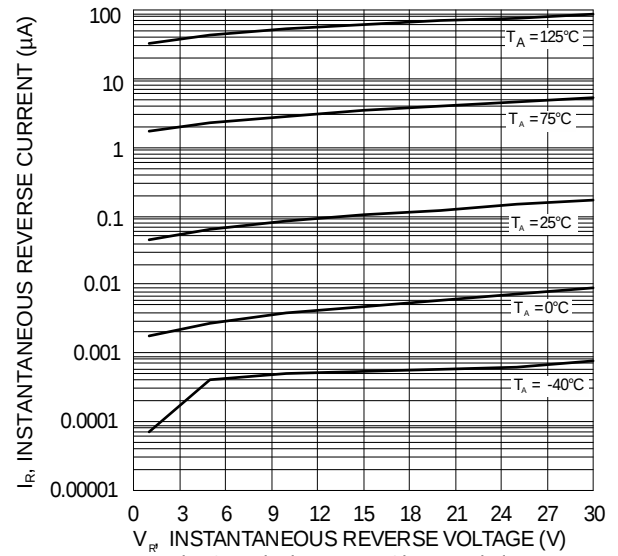


Fig. 2 Typical Reverse Characteristics

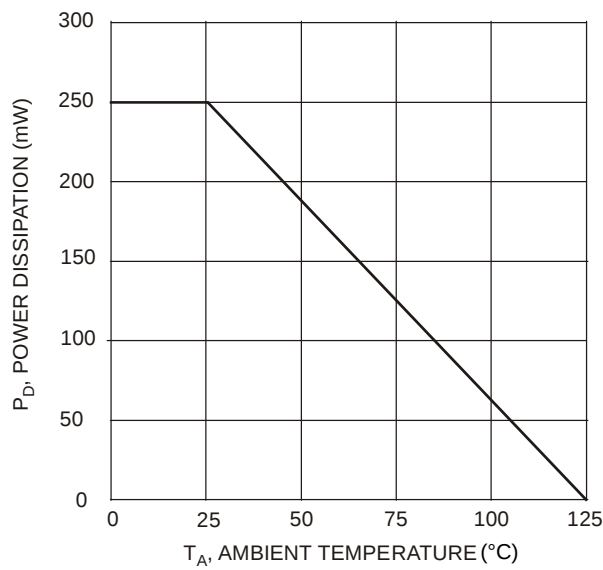
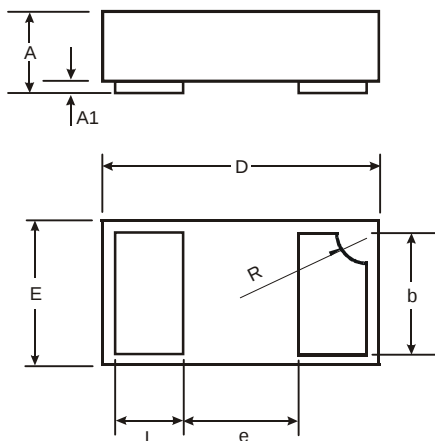


Fig. 3 Power Derating Curve

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**X1-DFN1006-2**

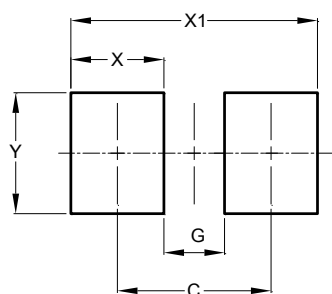


| X1-DFN1006-2         |      |       |      |
|----------------------|------|-------|------|
| Dim                  | Min  | Max   | Typ  |
| A                    | 0.47 | 0.53  | 0.50 |
| A1                   | 0    | 0.05  | 0.03 |
| b                    | 0.45 | 0.55  | 0.50 |
| D                    | 0.95 | 1.075 | 1.00 |
| E                    | 0.55 | 0.675 | 0.60 |
| e                    | -    | -     | 0.40 |
| L                    | 0.20 | 0.30  | 0.25 |
| R                    | 0.05 | 0.15  | 0.10 |
| All Dimensions in mm |      |       |      |

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**X1-DFN1006-2**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.70          |
| G          | 0.30          |
| X          | 0.40          |
| X1         | 1.10          |
| Y          | 0.70          |

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