NADAGY

ND16A60
Superdiode

FEATURES

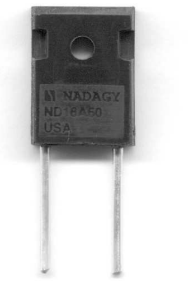
- **Max continuous current: 16A**
- **Forward voltage: 75mV (at 16A)**
- **Continuous blocking voltage: 60V**
- **Package: DO-247**

APPLICATIONS

- Solar installations
- Battery banks

GENERAL DESCRIPTION

The ND16A60 superdiode is a low-frequency rectifier performing a function analogous to the standard diode. Compared to a standard diode, the superdiode will conduct current with much reduced forward voltage drop. Typical forward voltage drop at 16A current is around 75mV. The standard Schottky diode rated for the same maximum forward current will feature substantially more power dissipation due to higher voltage drop across the device.

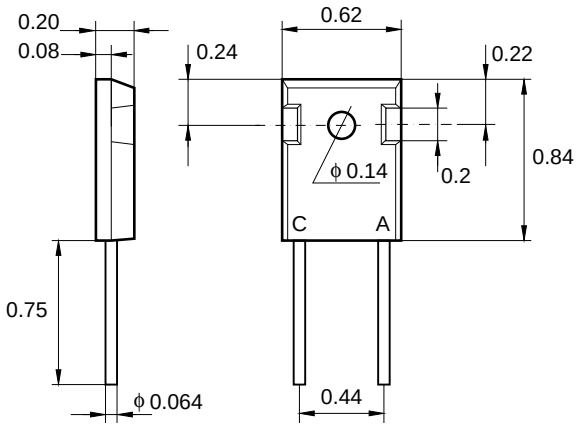


The ND16A60 superdiode is designed to operate without a heat-sink. As is the case with all semiconductor devices, forward current flow causes temperature rise of the device beyond the ambient temperature of the environment. The actual maximum sustainable device current is therefore dependent on the ambient temperature. The temperature rise of 50C corresponds to 16A forward current. Nevertheless, the device can sustain an occasional overcurrent exceeding 20A.

The forward start-up current of ND16A60 is less than 100mA. The voltage-current characteristic for very low current exhibits negative resistance.

The dynamic response of the ND16A60 is fast-on, slow-off. Switching times are somewhat dependent on the overall circuit impedance. The turn-off time when driven with a 20V peak-to-peak function generator square wave with a 50 Ω port is typically around 5ms. The reverse continuous blocking voltage is at least 60V.

DIMENSIONS



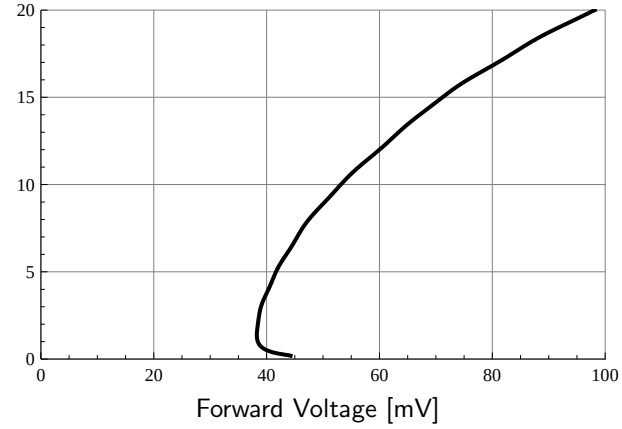
The ND16A60 comes in the DO-247 package. With 14ga leads the package can sustain a low voltage drop operation even with high current levels. The package does not have a metal plate which makes it very suitable for placing in an enclosure, such as a junction box, without a risk of electrical contact. The package is still suitable for mounting on a heatsink with the standard hardware, although a heat sink is not necessary to operate the diode up to 16A forward current.

INTEGRATION

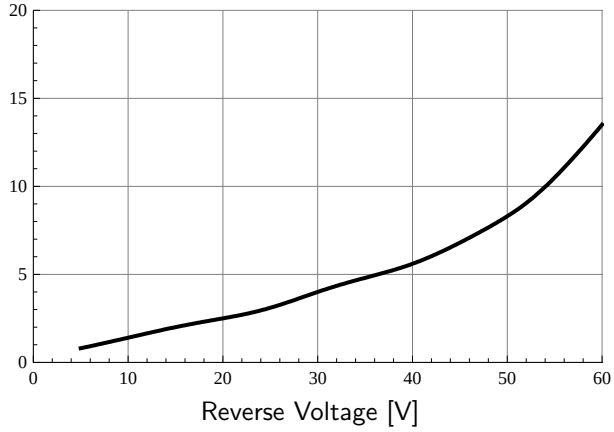
The superdiode can be integerated into a larger system application using standard potting compounds. For best performance, heat-conducting potting materials should be used. For custom applications, such as mounting on a special substrate, please contact Nadagy Corporation[1].

[1]Contact information via email: office@nadagy.com, or website http://www.nadagy.com, tel: 618-656-1941, fax: 618-300-0951.

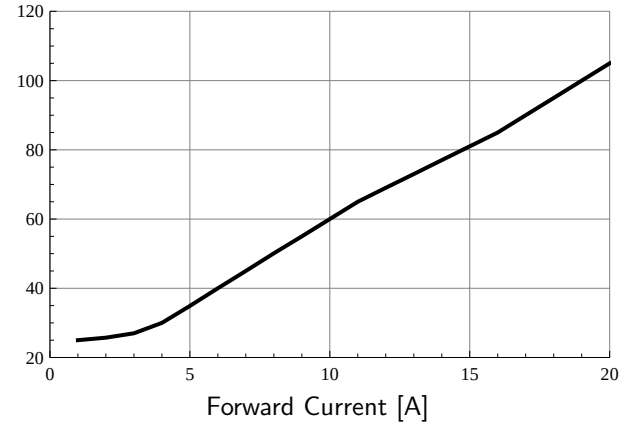
Forward Current [A]



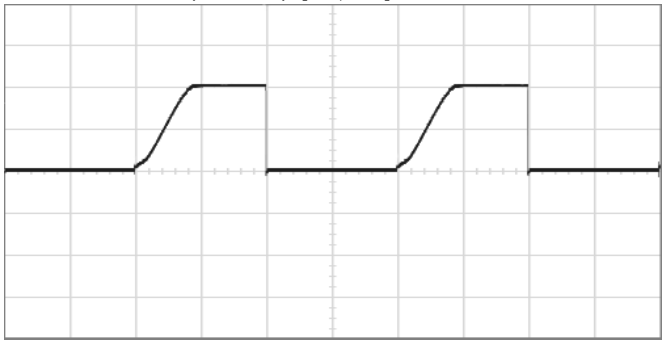
Reverse current [μA]



Temperature [C]

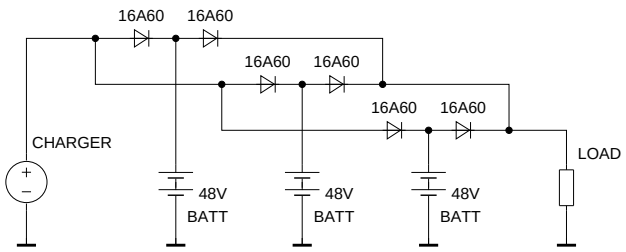


Step Response (Voltage) [5V/div]



APPLICATIONS

Battery separation: A common method to build a large capacity battery bank is to connect many battery strings in parallel. However, if one of the strings becomes weak or fails, the entire battery bank could be compromised and in need for service. Instead, battery strings can be separated from each other with superdiodes, as shown in the figure.



In such arrangement, the most depleted string with the lowest voltage will receive charge first, whereas the string with the highest charge will be loaded the most. Even if one or more batteries in the bank would fail, the system will still function with the remaining good battery strings.

Solar panel bypass diode:

Solar arrays are built of series-connected strings of solar panels arranged in parallel banks driving the inverter. In a long series string, one of the panels may become shaded by an object, while the other panels still remaining in sunlight. The section in shade would block the entire string from outputing power.

The 16A60 superdiode will bypass the shaded panel so that the remaining panels can continue to produce power.