Issue Number | 001
January 2016

New Product Announcement

SBRTF40U100CT/CTFP Rectifier

100V/40A Trench SBR® Delivers Industry-leading, Ultra-low Forward Voltage

Diodes Incorporated announces the addition of SBRTF40U100CT and SBRTF40U100CTFP to the high performance Trench SBR® family. They offer industry-leading low forward voltage as well as optimal reverse leakage current at high temperatures. Indeed, these devices can improve efficiency by up to 2% while reducing operating temperature by as much as 10ºC.

The combination of innovative device architecture and advanced trench process results in the ultra-low forward voltage drop (V_{F_TYP} = 0.27V @ I_F = 2A and T_A = 85ºC), low reverse leakage current (I_{R_MAX} = 0.5mA @ V_R = 100V), large peak repetitive reverse voltage (V_{RRM} = 100V), as well as high forward surge current capability (up to 200A) and maximum average rectified output current. These superior characteristics significantly reduce conduction losses while improving the energy efficiency, in particular at high operating temperatures. In addition, these devices are avalanche rated at a class leading 340mJ.

With intended uses as rectifiers, freewheeling diodes, blocking diodes, polarity protection diodes and switching diodes, the target applications for these devices are switched-mode power supplies, DC-DC converters, USB Type-C & Power Delivery compatible adapters and fast chargers for portable devices.

Housed in the thermally-efficient TO220AB and ITO-220AB packages which are fully green and RoHS-compliant, the SBRTF40U100CT and SBRTF40U100CTFP not only are green devices by nature, they also enable a highly green system to be realized.

The Diodes Advantage

- **Ultra-Low Forward Voltage**
  With ultra-low forward voltage (V_{F_TYP} = 0.27V @ I_F = 2A, T_A = 85ºC), these two devices reduce conduction losses. Moreover, a unique property of them is that the higher the ambient and operating temperature, the lower the V_F.
- **Low Reverse Leakage Current**
  These two devices have low reverse leakage current (I_{R_MAX} = 0.5mA @ V_R = 100V), which provides improved energy efficiency under nominal and extremely high temperatures.
- **Excellent Thermal Transfer Properties**
  The thermally efficient TO220AB and ITO-220AB packages allow these devices to operate reliably in volatile environments.
- **High, Forward Surge Current, and Avalanche Ruggedness**
  SBRTF40U100CT and SBRTF40U100CTFP have high average rectified output current (I_O = 40A per device) and high forward surge current capability (I_{FSM} = 200A). In conjunction to the class-leading avalanche rating (E_{AS} = 340mJ), excellent product reliability and operational ruggedness are resulted.

Circuit Functions

- Rectifier
- Freewheeling Diode
- Blocking Diode
- Switching Diode

Target Markets

- AC-DC Adaptors
- DC-DC Converters
- Switched-Mode Power Supplies
- USB Type-C/PD
- Fast Chargers

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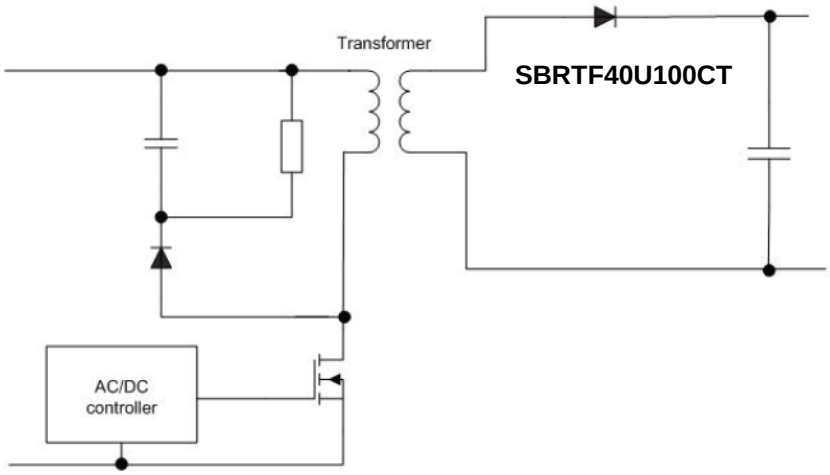
Rectifier

Product Portfolio

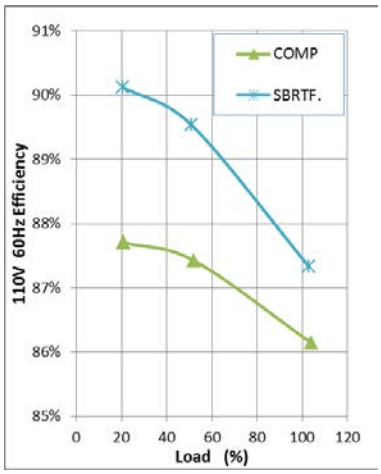
Part Number	Maximum Average Rectified Current I_O per diode (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Typical Forward Voltage Drop V_F (V)	Maximum Reverse Current I_R (mA)	Maximum Peak Forward Surge Current I_{FSM} (A)	Maximum Operating and Storage Temperature T_J (°C)	Typical Junction Capacitance C_J (pF)	Non-Repetitive Avalanche Energy E_{AS} (mJ)
SBRTF40U100CT	20	100	0.61	0.5	200	150	250	340
SBRTF40U100CTFP	20	100	0.61	0.5	200	150	250	340

Typical SMPS Application



Performance Comparison

Efficiency Improvements at 110V AC



Ultra-Low Forward Voltage, V_F