

USE OF TRANSILS AS RECTIFIER DIODES

INTRODUCTION

Transils are diodes especially designed to dissipate high peak power in avalanche operation. In direct conduction they have the properties of very good conventional diodes (with the possibility of handling very high surge currents) and perform as well as rectifiers.

In general, there could be a voltage surge due either to the power supply or to the load. Power supply overvoltages can be clamped by means of a Transil on the ac side : (see Figure 1).

Wherever possible, it is more attractive to use Transils directly as rectifiers instead of protecting separate rectifiers with Transils since the number of components is reduced: (see Figure 2). The characteristics given in the data-sheets (IFSM, forward voltage drop characteristic) enable calculations to be made in this mode of operation.

The following table gives the equivalence between Transils and common rectifiers.

Table 1.

TRANSIL	P6KE	1N5635A to 1N5665A	1.5KE	BZW50
Case	CB-417	DO 13	CB-429	AG
Rating of Equivalent Diode (A)	1	1.2	3	6

Neither of these two methods protects against overvoltages originating from the load. Fortunately, a study of bridge rectifier operation shows that it is sufficient to limit the voltage on the dc side to protect the bridge whatever the origin of the overvoltage : see Figure 3. In all cases, a single Transil is sufficient to protect a single phase or a 3-phase bridge rectifier.

Figure 1. The diodes are not protected from overvoltages due to the load

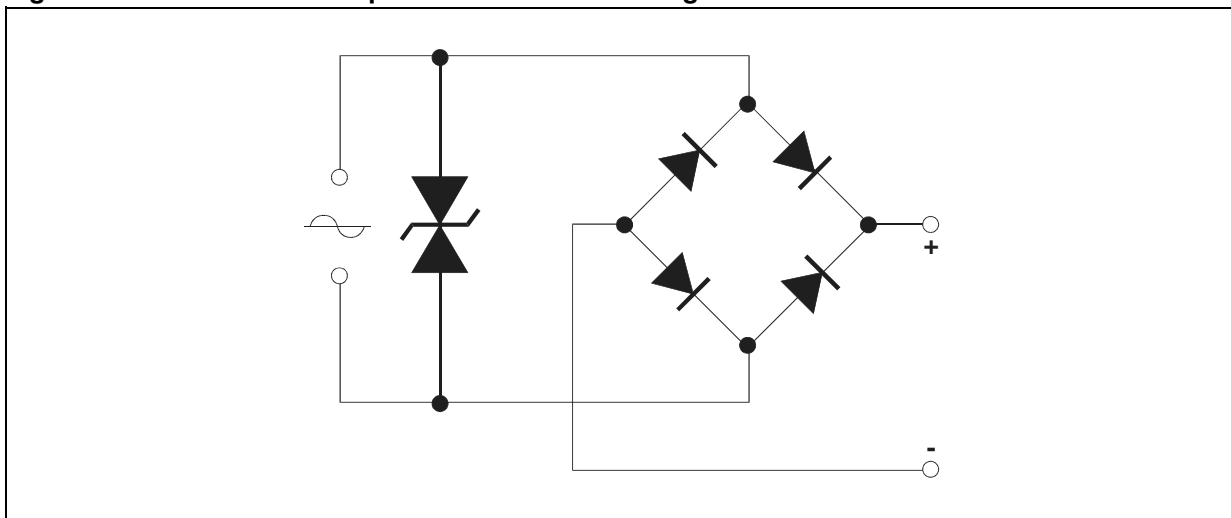


Figure 2. Mixed Solution which reduces the component count. The 2 Transils work as rectifiers

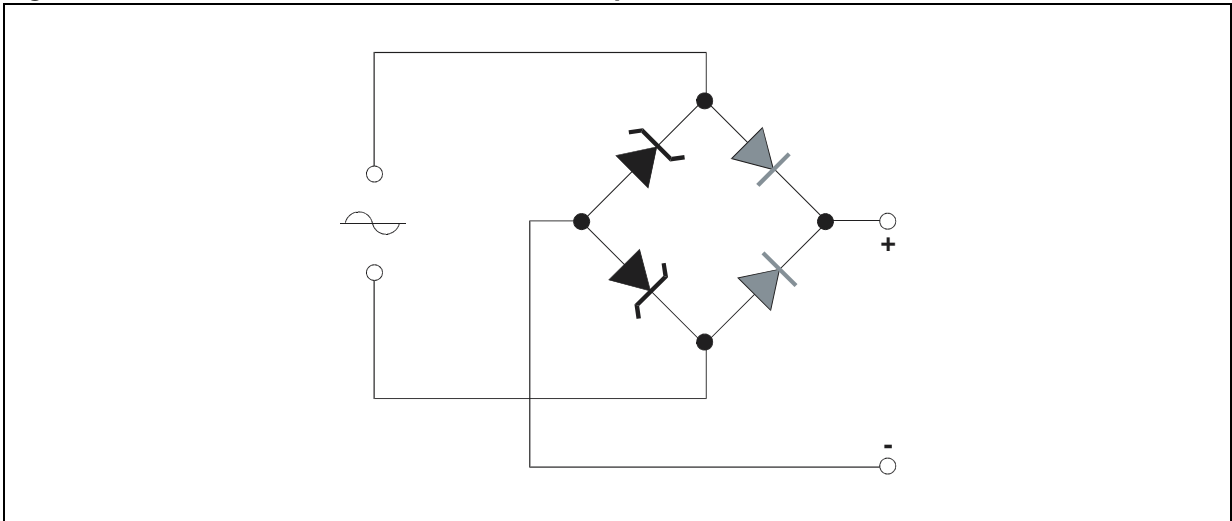
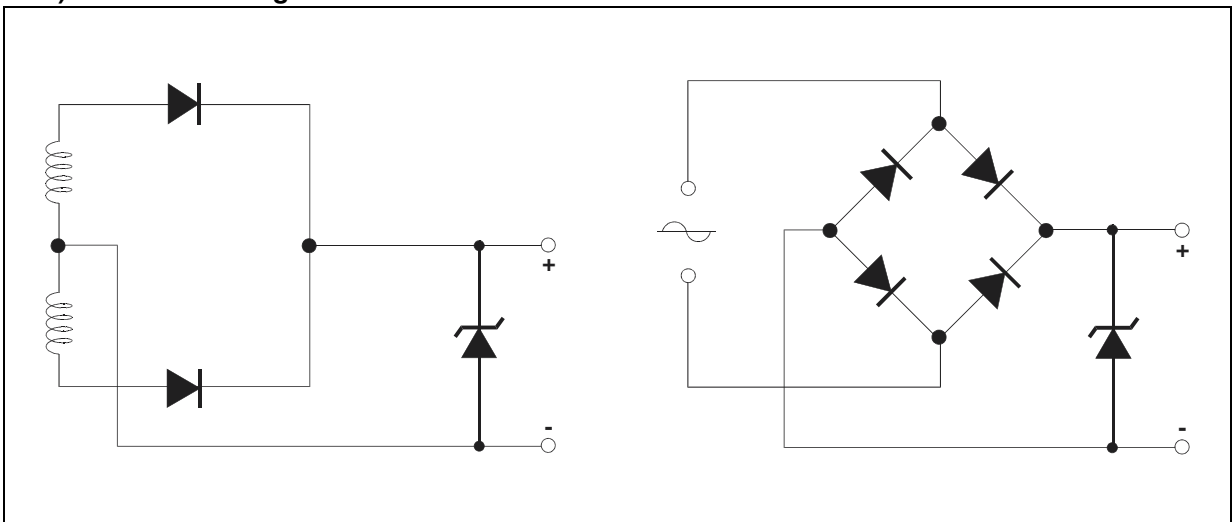


Figure 3. A single Transil protects the rectifying components whatever the origin (power supply or load) of the overvoltages



REVISION HISTORY**Table 2. Revision History**

Date	Revision	Description of Changes
March-1993	1	First Issue
3-May-2004	2	Stylesheet update. No content change.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States

www.st.com