

Diotec Products for *Telecommunication*

Typical Applications:

Handsets, Mobile Chargers, Modems, Interfaces, Power Supplies,
Equipment and Line Cards



Handsets	→	SMD Schottky Diodes
Mobile Chargers	→	Bridge Rectifiers: MiniDIL, MicroDIL
DC/DC-Converter	→	Schottky Diodes, Superfast-/ Ultrafast-Rectifiers
Protection	→	TVS-Diodes, SDA2/4AK (Low Cj), (Fast) Bridge Rectifiers
Voltage Regulation	→	Zener Diodes
OR-ing Diodes	→	Schottky Diodes, Standard Rectifiers

Handsets, Mobile Phones

Schottky Diodes for Polarity Protection

Connected between the battery of the mobile phone (or any other portable device) and the contacts to the external charger. They protect the battery of unwanted reverse current if contacts are short cut and also against charging with wrong polarity. Low forward voltage drop of a Schottky rectifier leads to small power losses during charging. The SGL34 and SGL1 in the MiniMELF package use minimal space on a PCB.

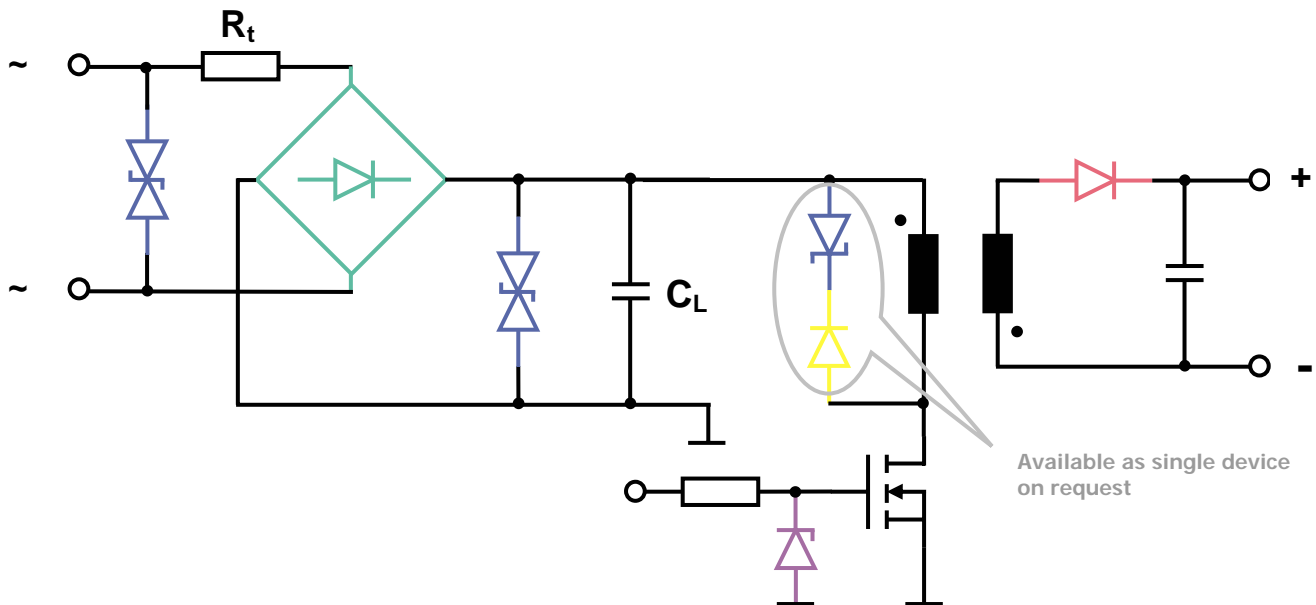
Types¹

SMD: **SGL34-20...100**, **SGL1-20...100**, **SMS120...1100**, **SMS220...2100**, **SMS320...3100**;
SK12...110, **SK32SMA...310SMA**, **SK52...510**, **SK82...810**; (0.5 to 8 A!)



¹ Preferred types are **bold**; colours according to Diotec Selection Guide

Mobile Chargers / DC-DC Converters



Overvoltage Protection: TVS-Diodes/Zenerdiodes¹

TGL34-..., TGL41-..., P4SMA..., P6SMB..., 1.5SMC...; (150 bis 1500 W peak; up to 550 V!)
 ZMM..., ZMD..., ZMY..., SMZ1..., SZ3C..., Z1SMA..., Z2SMB..., Z3SMC...; (0.5 bis 3 W continuous)

Input Rectification: Bridge Rectifiers¹

0.5 to 2 A
 SMD: MYS40...380, MS40...500, S40...500, B40...500S, B40...380FS (Fast), CS10...50S (Schottky)
 through hole: B40...500D, B40...380FD (Fast recovery), CS10...50D (Schottky), B40...500R (round)

Clamping Network: TVS-/Fast-Diode¹

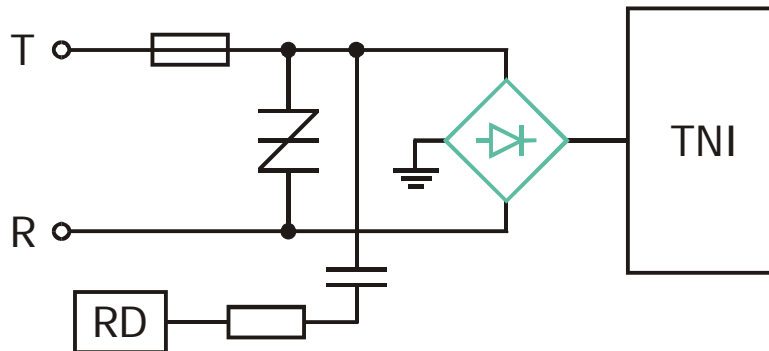
TGL34-..., TGL41-..., P4SMAJ..., P6SMBJ..., 1.5SMCJ...; (150 bis 1500 W peak; up to 550 V!)
 RGL34..., RGL1..., SA154...160, FR1..., FR2..., FR3...; (0.5 to 3 A)

Output Rectification: Schottky Diodes¹

SGL34-20...100, SGL1-20...100, SMS120...1100, SMS220...2100, SMS320...3100;
 SK12...110, SK32SMA...310SMA, SK52...510, SK82...810; (0.5 bis 8 A!)

¹ Preferred types are **bold**; colours according to Diotec Selection Guide. Datasheets see www.diotec.com, "Products". More detailed information see application note "Diotec Products for Power Supplies". Though devices mentioned here are mostly SMD types for space and weight saving there are also equivalent leaded versions available.

Telecom Equipment Lightning Protection



Rectifier bridges are commonly used in telecommunications equipment, such as Analogue Line Cards, Customer Premises Equipment (CPE – phones, modems, faxes and PABX), High Speed Transmission equipment such as ADSL, SHDSL, ISDN or E1/T1. Rectifiers can be used as clamping / steering diodes or to build common protection among multiple lines.

Recommend products¹:

Space Saving

MYS40, MS40

– offer space savings when having multiple lines per board (package only 3x3 mm²!)

Standard bridge rectifier

S40, B40S

– for standard solutions

Fast recovery bridges

S40F, B40FS

– offer a cost effective advantage of a faster recovery time during the Vf overshoot and as such reduce the let through energy

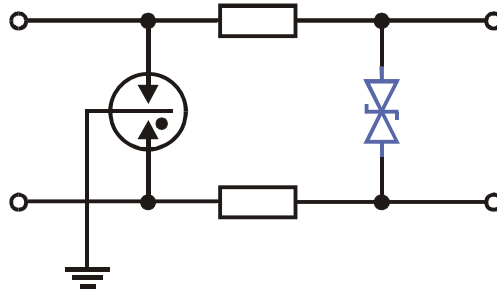
Schottky bridges

CS30S, CS50S

– Schottky bridges offer the lowest clamping

¹ Colours according to Diodec Selection Guide. Datasheets see www.diodec.com, "Products". Though devices mentioned here are SMD types for space and weight saving there are also equivalent leaded versions available.

Data Line Protection



TVS-Diodes

Available as unidirectional and bidirectional version (add suffix "C" resp. "B" at BZW-types).

Bidirectional devices clamp both positive and negative voltage spikes.

Dimensioning: the maximum occurring signal voltage must not exceed the stand-off voltage V_{WM} of the device. At a maximum current of I_{PPM} and 10/1000 μs pulse shape (see datasheet) the maximum clamping voltage is V_C . The circuits (input, output) to protect should withstand at least this voltage.

Types¹

Leaded: BZW04-..., **P4KE...**, BZW06-..., **P6KE...**, **1.5KE...**, **5KP...**; (400 to 5000 W; up to 520 V!)

SMD:

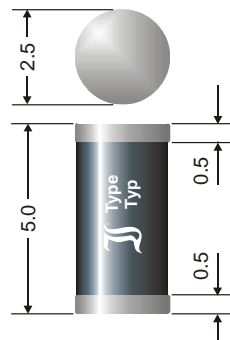
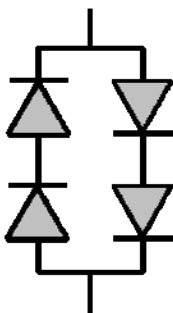
TGL34-..., **SDA2/4AK**, TGL41-..., **P4SMA...**, **P6SMB...**, **1.5SMC...**; (150 to 1500 W; up to 550 V!)

SDA2/4AK series: low capacitance protection

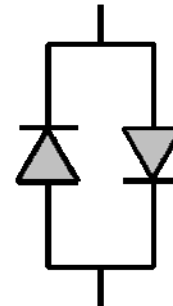
Special protection devices are the SDA4AK and the SDA2AK types. They consist of antiparallel switched standard rectifiers in a single MELF (DO-213AB) package (see below). By this a nominal clamping voltage of 2 respectively 1 V is achieved, allowing peak pulse currents as high as 40 A. On request, also higher clamping voltages can be offered.

The resulting capacitance of these parts are in the lower pF range, allowing for protection of high frequency data lines. Furthermore, these devices can be put in series to other protection devices to reduce their capacitance to extremely low values.

SDA4AK

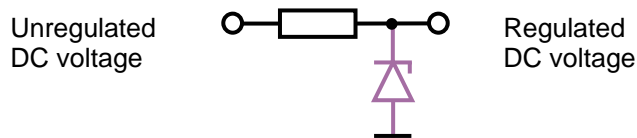


SDA2AK



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Voltage Regulation



Zener diodes for simple voltage regulation

A simple method to provide stabilized voltages from an unregulated voltage source. The resistor has to be chosen so that maximum allowable zener current I_{Zmax} (see datasheet) at the maximum occurring input voltage and at no load at the output is not exceeded. If voltage source is formed by a transformer, the series resistance of the windings may be enough to provide this resistor. Power dissipation of below devices ranges up to 5 W (leaded) and 3 W (SMD) respectively. For higher power needs series connection of zener diodes can be used.

Tolerance is graded to E24 standard (approximately +/- 5%), if tighter limits are required parts with +/- 2% tolerance are available on request.

Types¹

Leaded: **ZPD...**, **ZPY...**, **ZY...**, **3EZ...**, **1N53..B**; (0.5 to 5 W)

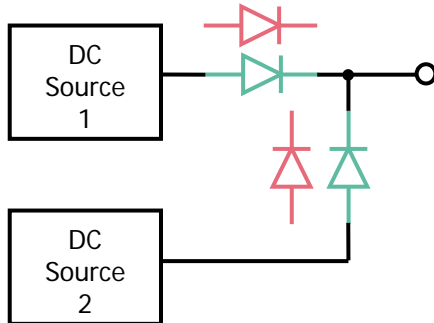
SMD: **BZX84C...**, **2BZX84C...**, **ZMM...**, **ZMD...**, **ZMY...**, **SMZ1...**, **SZ3C...**, **Z1SMA**, **Z2SMB...**, **Z3SMC...**; (0.2 to 3 W)

Reliable operation when lightning strikes ...

Small signal diodes like ZPD/ZMM or BZX84 are using small area, planar chips inside. Contacts are made either by pressure contact (glass packaged ZPD/ZMM) or wire bonds (BZX84). They provide a low cost solution for voltage regulation, but are more sensitive against overvoltages caused by lightning etc (there is always some let through energy from the primary/secondary protection when lightning strikes!). Power zener diodes like the ZY, ZMD, Z1SMA etc series are manufactured using rugged non-planar chips that have a bigger die area, and are contacted by using robust solder joints. They are the preferred solution for high reliability circuits.

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OR-ing Diodes



Decoupling of voltage sources: Standard or Schottky Diodes

If low power losses are required and DC voltage is below 100 V Schottky diodes can be used. Special diodes (on request) offer beside *low forward voltage drop* also *low leakage currents*. Standard diodes are suitable for higher voltages, for high current applications the usage of press-fit packages is possible. The D30V.. series is a **common cathode configuration** of standard diodes within a square bridge package.

Types¹

Leaded: 1N4001...7, 1N5391...99, 1N5400K...08K, 1N5400...08, BY251...55, BY550-..., P600..., P1000..., P1200...; (1 to 12 A)

SB120...1100, SB220...2100, SB320...3100, SB520...5100, SB820...8100; (1 to 8 A)

SMD: GL34..., GL1..., SM4001...7, SM5059...63, SM5400...08, S1..., S2..., S3..., S5...; (0.5 to 5 A)
 SMS120...1100, SMS220...2100, SMS32...310; SK12...110, SK32SMA...310SMA, SK52...510; SK82...810 (1 to 8 A!)

Pressfit: BYP25..., BYP35..., BYP60..., KYW25..., KYW35..., KYZ25..., KYZ35...; (25 to 60 A)

Square with Fast-on or Wire leads: D30VC20...80; (2x15 A)