

Centro Federal de Educação Tecnológica de Santa Catarina
Departamento Acadêmico de Eletrônica
Conversores Estáticos



Introdução aos Conversores CA-CC

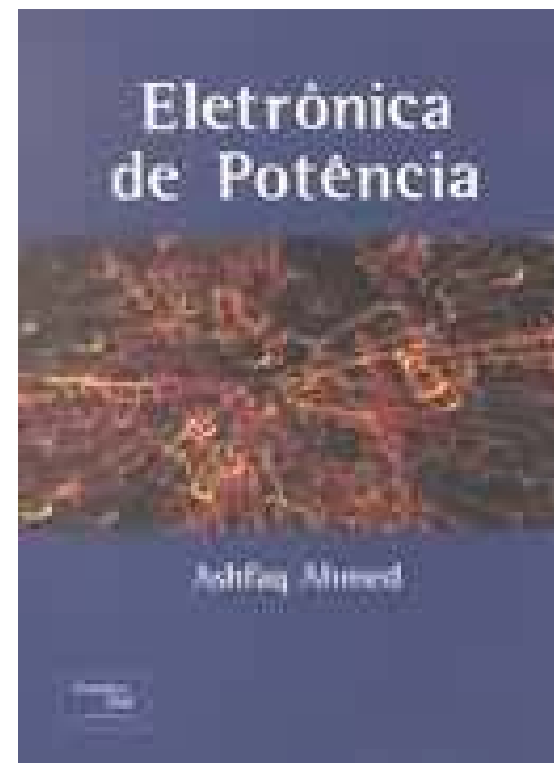
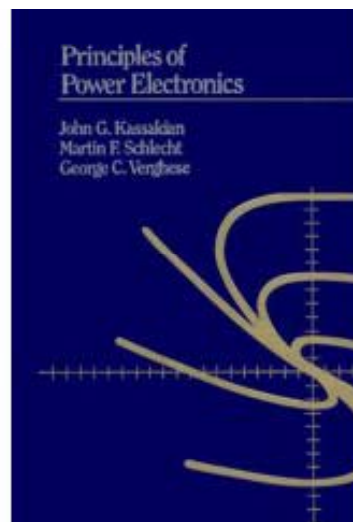
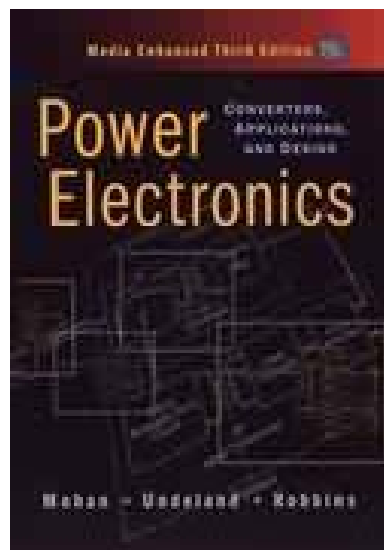
Prof. Clóvis Antônio Petry.

Florianópolis, julho de 2008.

Bibliografia para esta aula

Capítulo 5: Retificadores monofásicos não-controlados

1. Introdução.



www.cefetsc.edu.br/~petry

Nesta aula

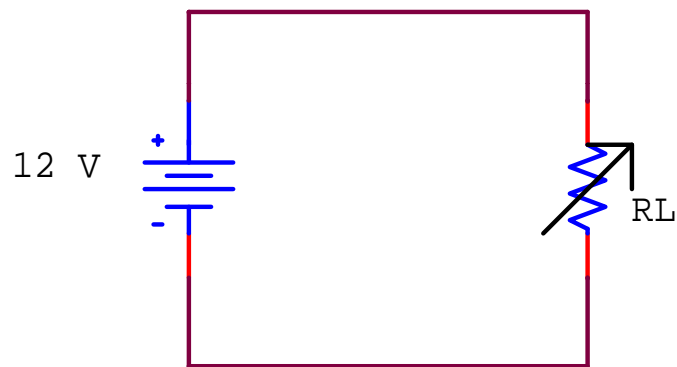
Conversores CA-CC:

1. Características gerais e aplicações.

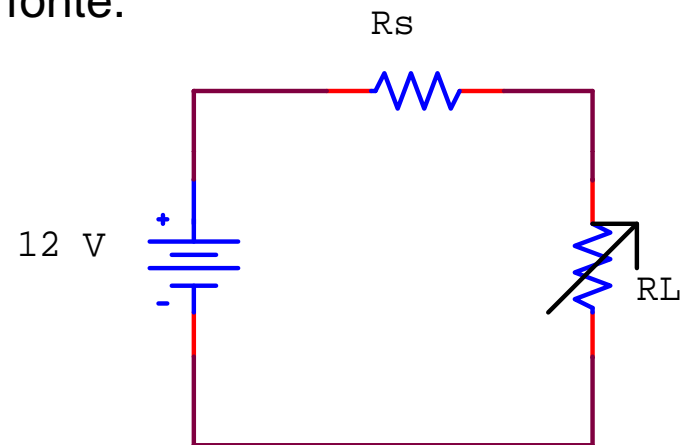
Revisão sobre fontes

Fonte de tensão:

Uma fonte de tensão ideal fornece na sua saída uma tensão que independe da carga, ou seja, da corrente solicitada da fonte.



Fonte de tensão ideal

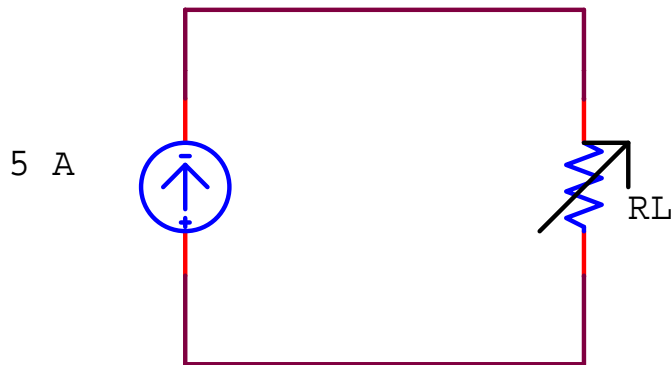


Fonte de tensão real

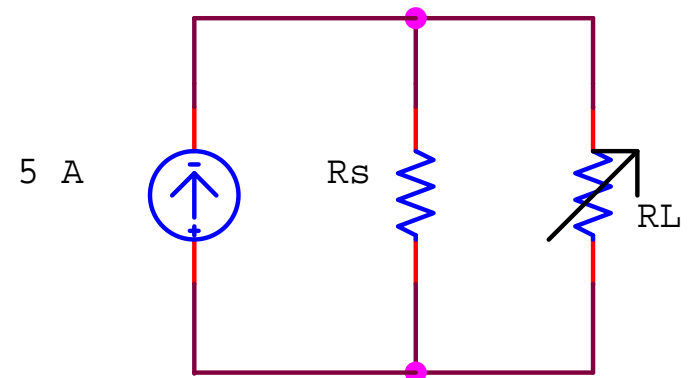
Revisão sobre fontes

Fonte de corrente:

Uma fonte de corrente ideal fornece na sua saída uma corrente que independe da tensão nos seus terminais e da carga na saída da mesma.



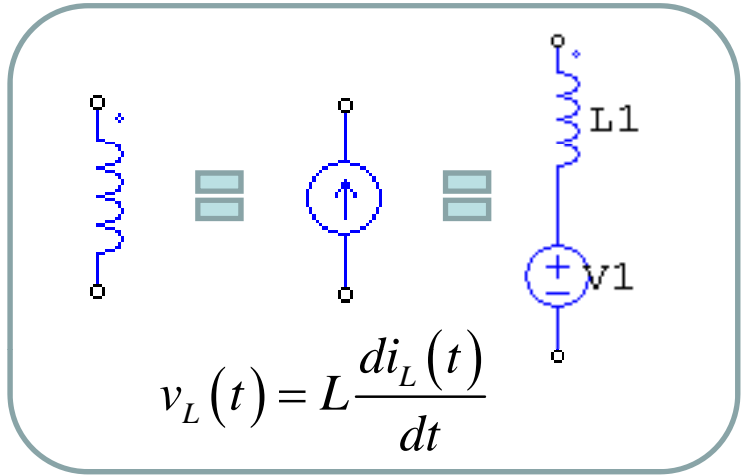
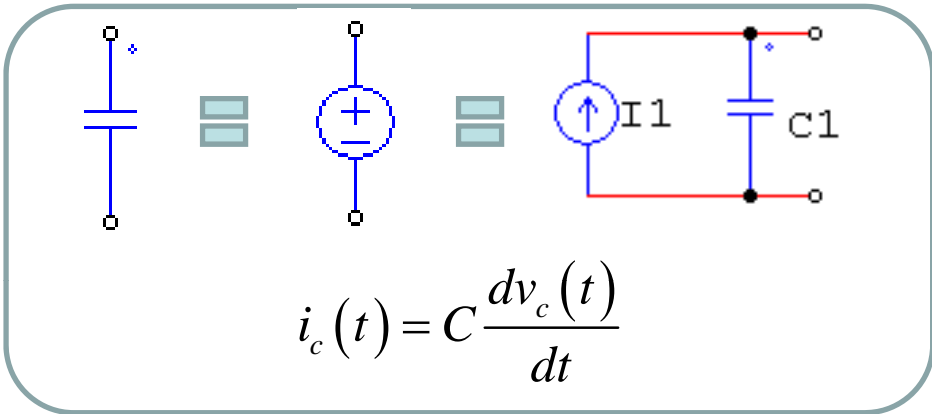
Fonte de corrente ideal



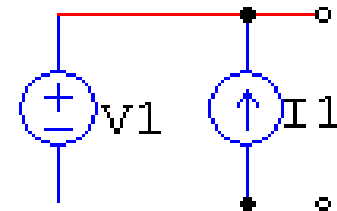
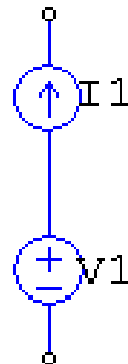
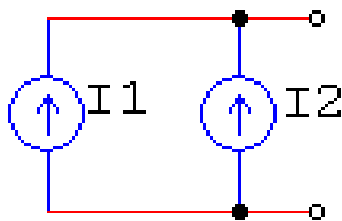
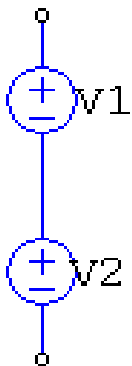
Fonte de corrente real

Revisão sobre fontes

Lembrando que:

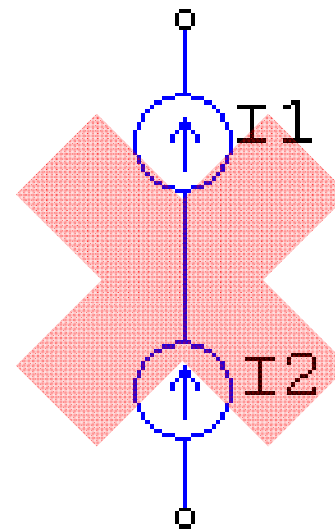
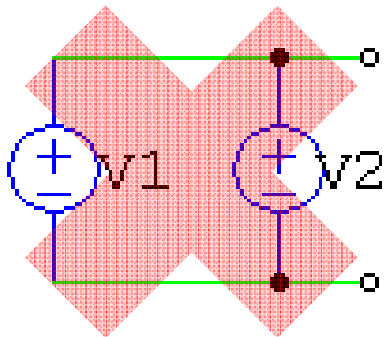


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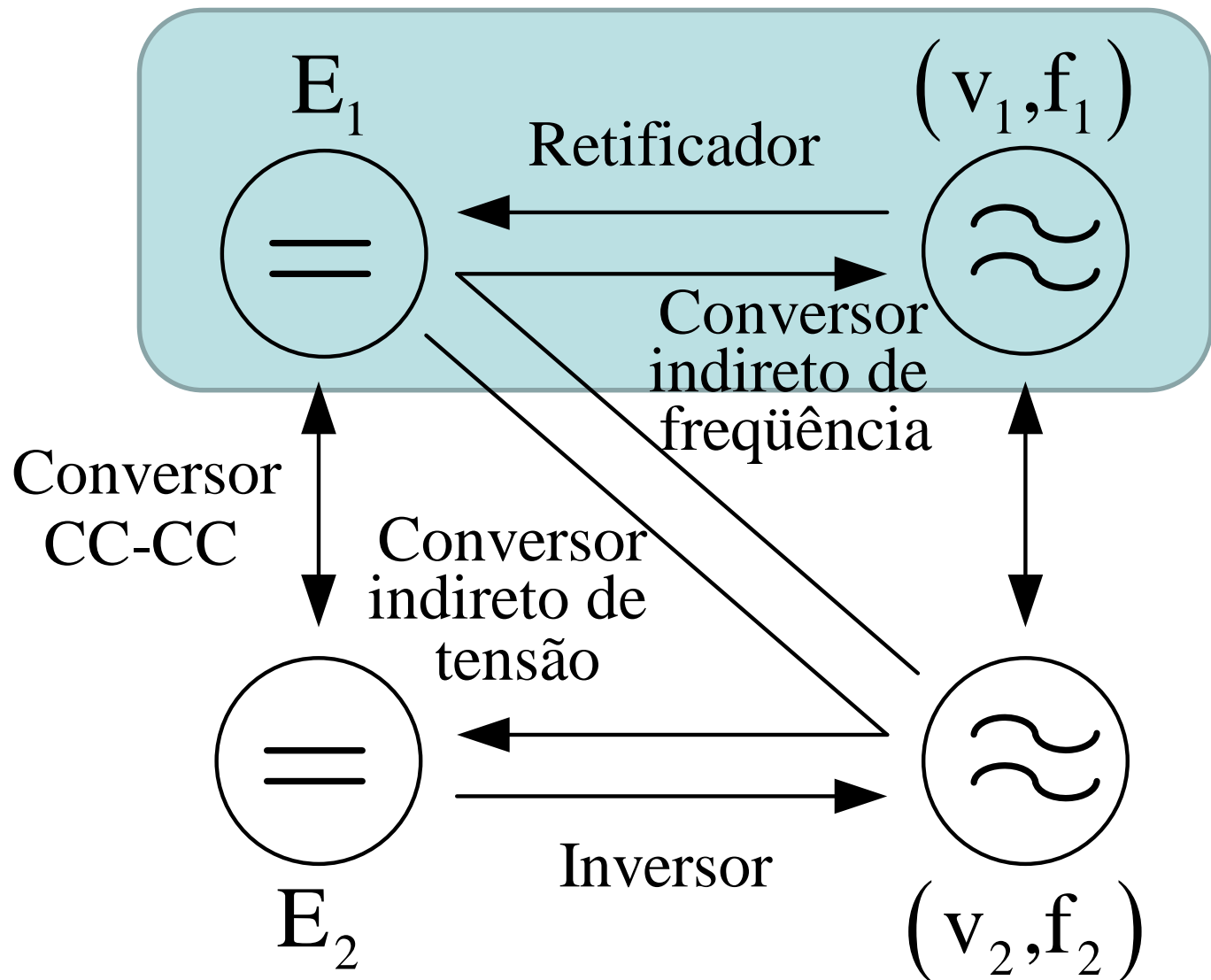


Revisão sobre fontes

O que não é permitido:



Divisão da eletrônica de potência

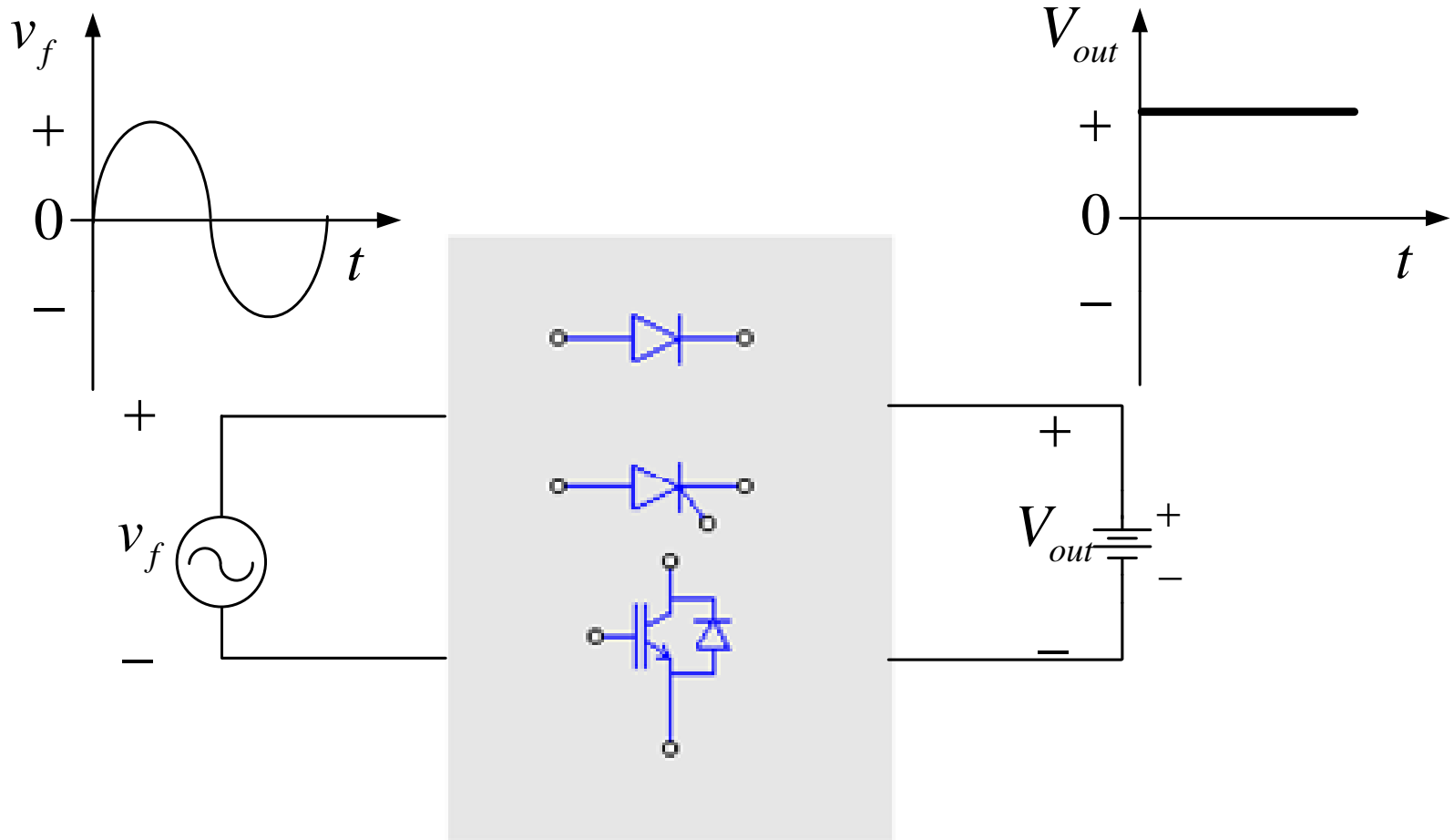


Conversores CA-CC

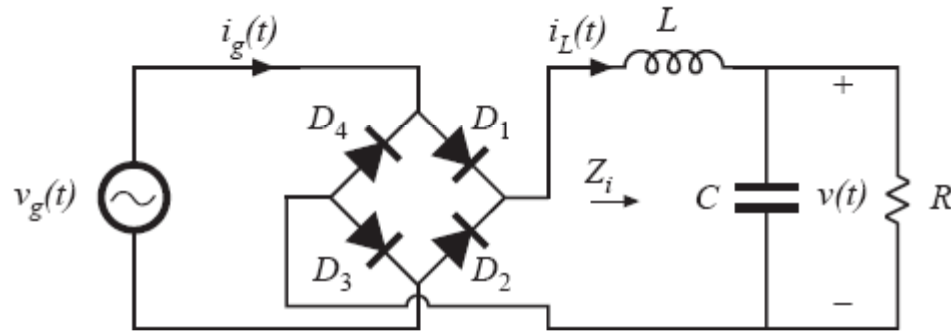
Conversores CA-CC:

- Denominados de retificadores: convertem a tensão alternada da rede de energia elétrica em uma tensão contínua;
- Podem ser monofásicos, trifásicos ou n-fásicos;
- Unidirecionais ou bidirecionais;
- Controlados ou não-controlados;
- Com ou sem correção de fator de potência;
- Podem ser isolados ou não-isolados;
- Um pulso ou múltiplos pulsos.

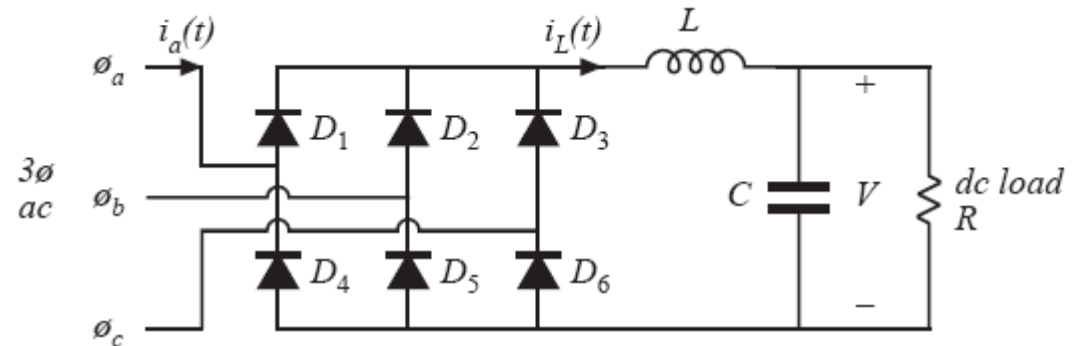
Conversores CA-CC – Princípio geral



Conversores CA-CC – Número de fases

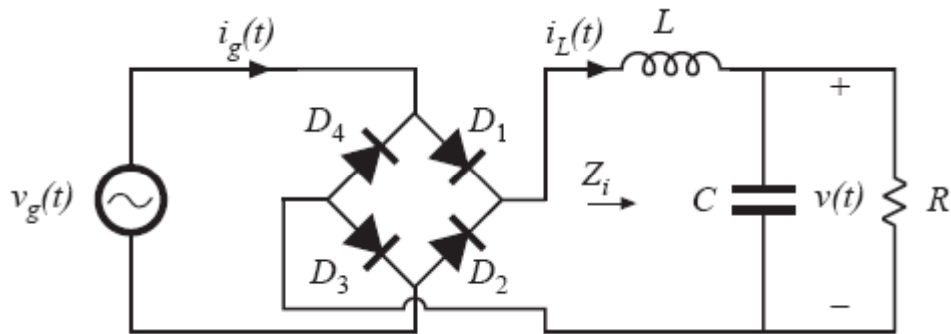


Monofásico



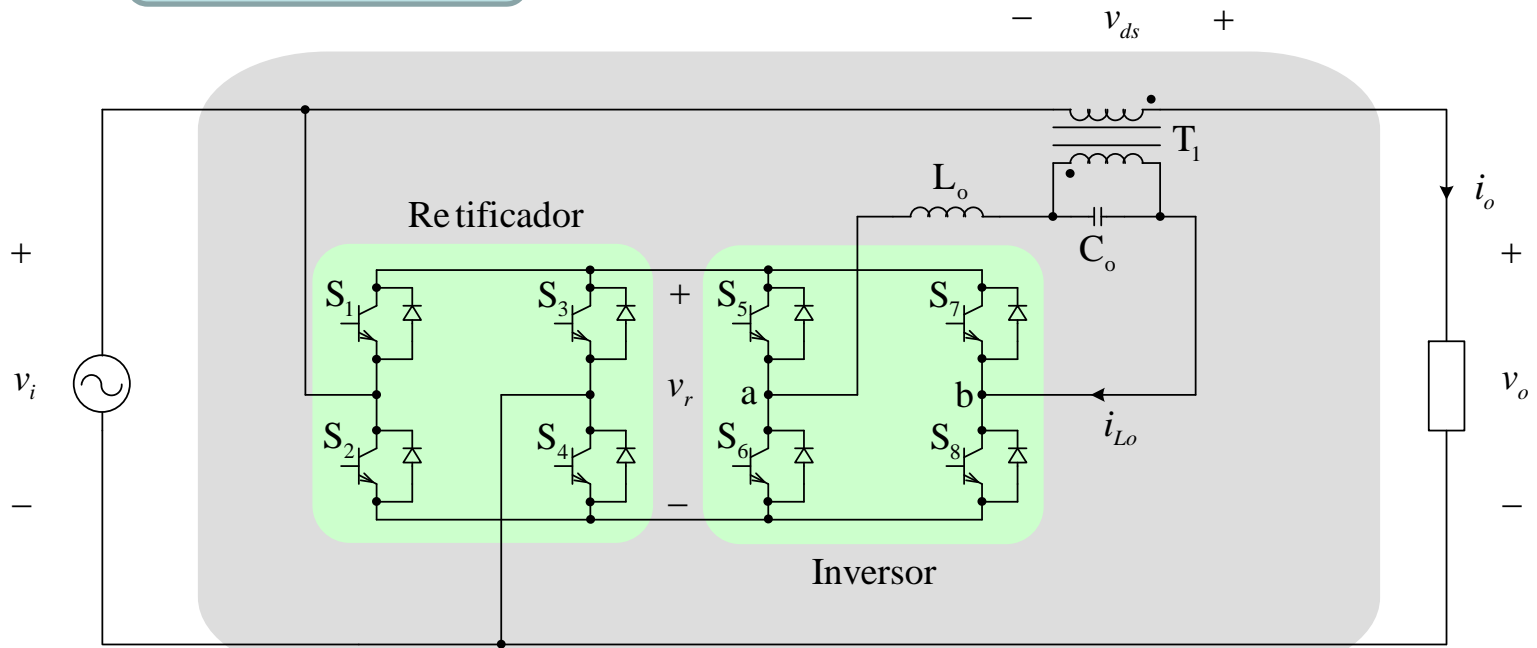
Trifásico

Conversores CA-CC – Direcionalidade

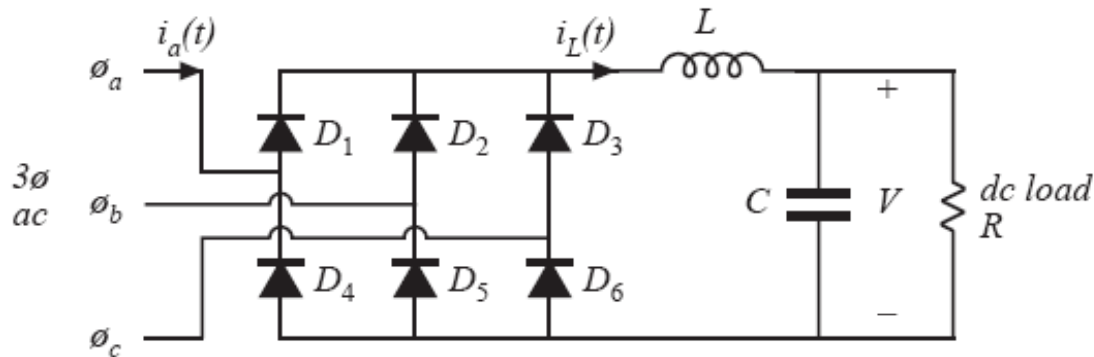


Unidirecional

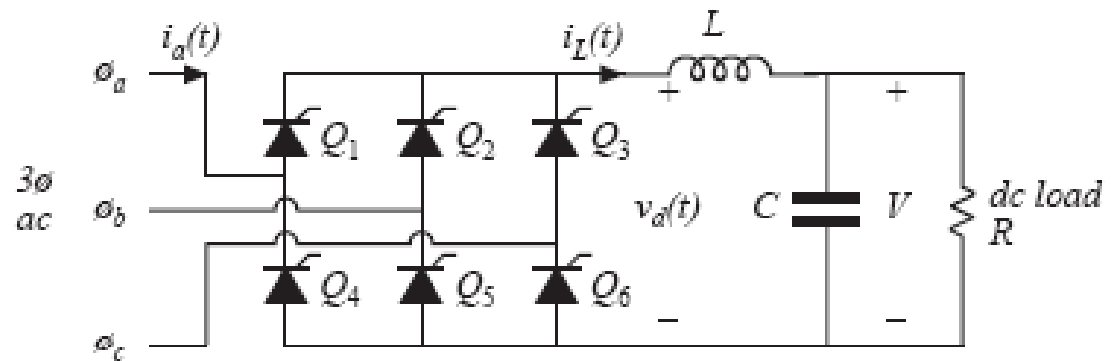
Bidirecional



Conversores CA-CC – Controle



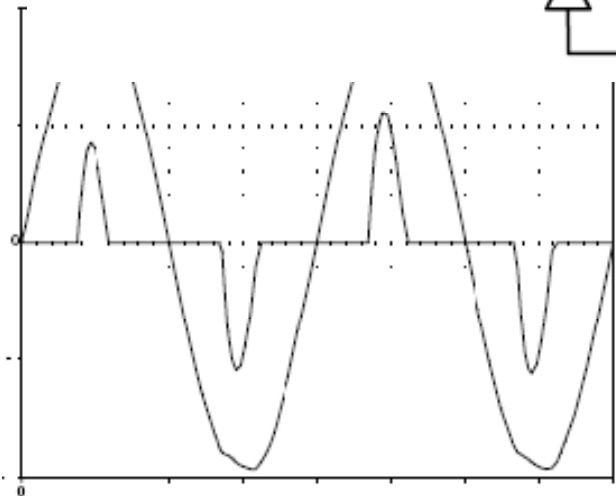
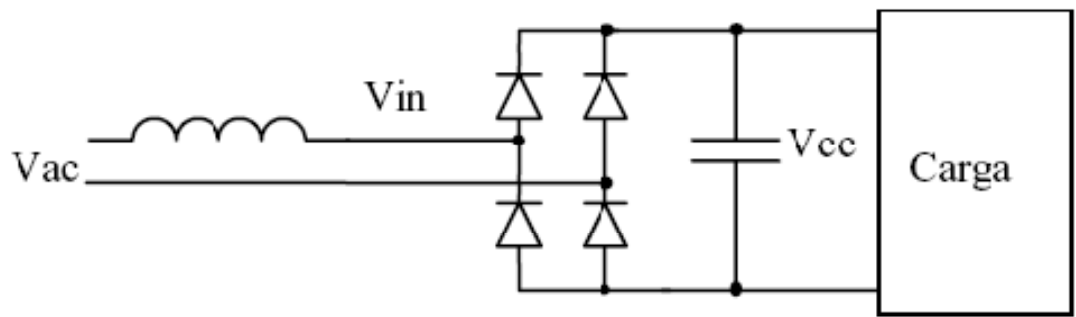
Não-controlado



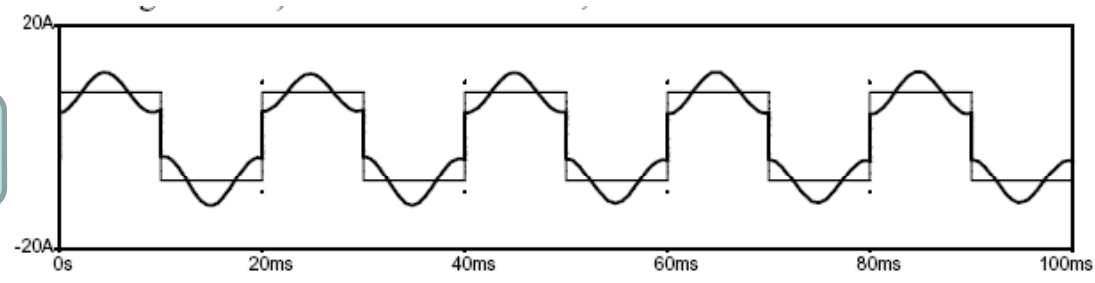
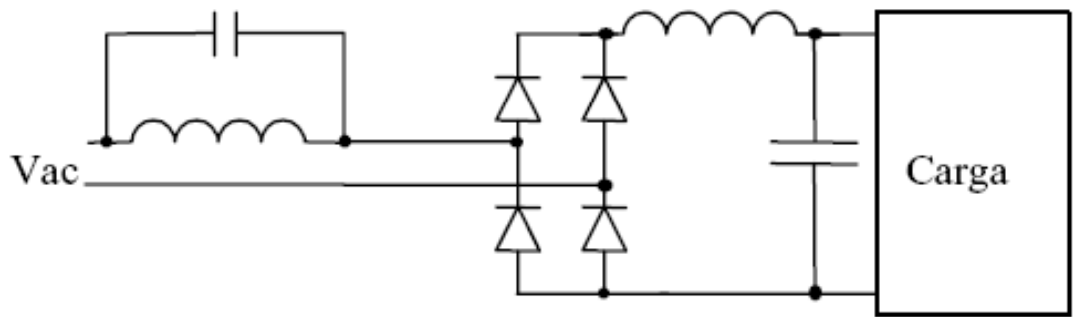
Controlado

Conversores CA-CC – Fator de potência

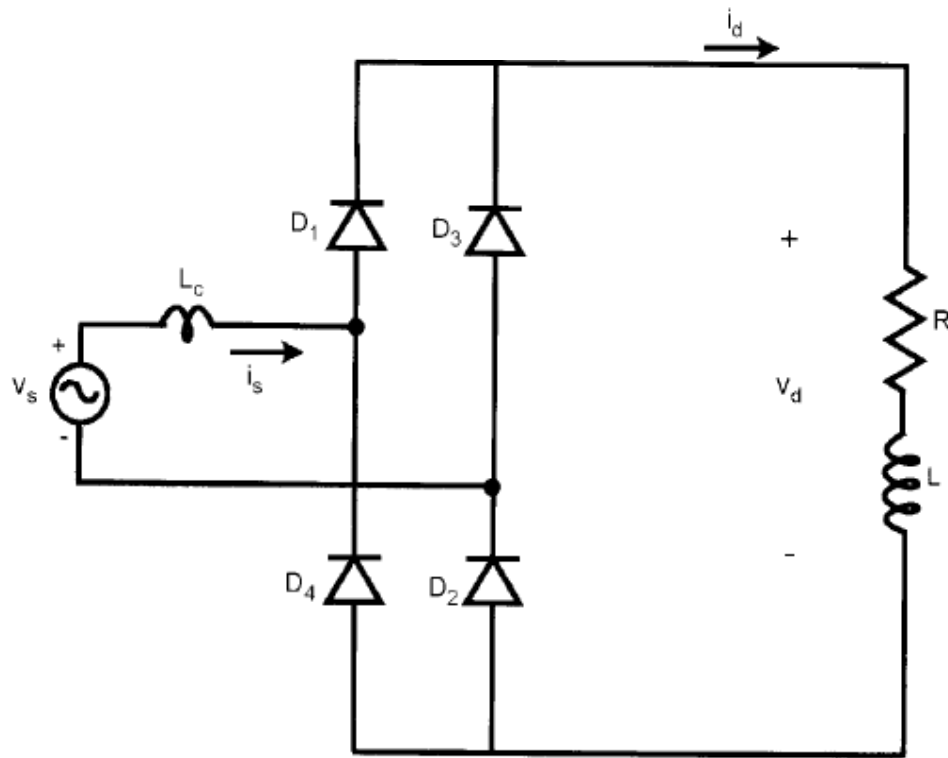
Sem correção



Com correção

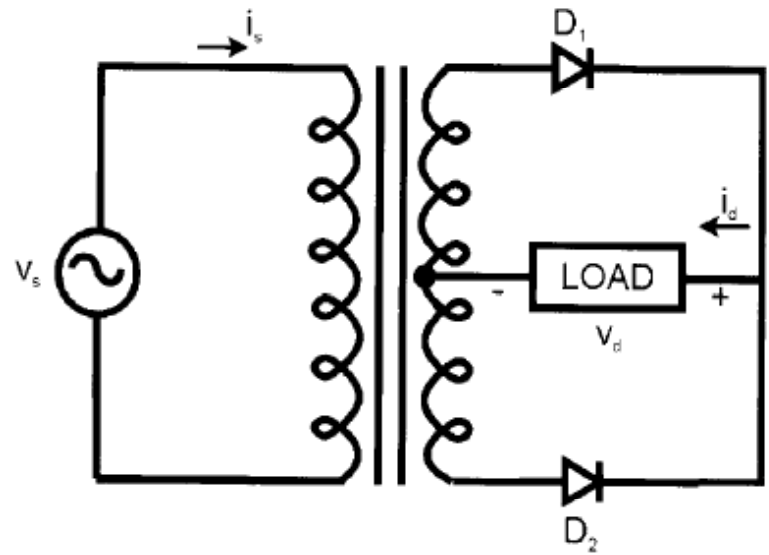


Conversores CA-CC – Isolamento

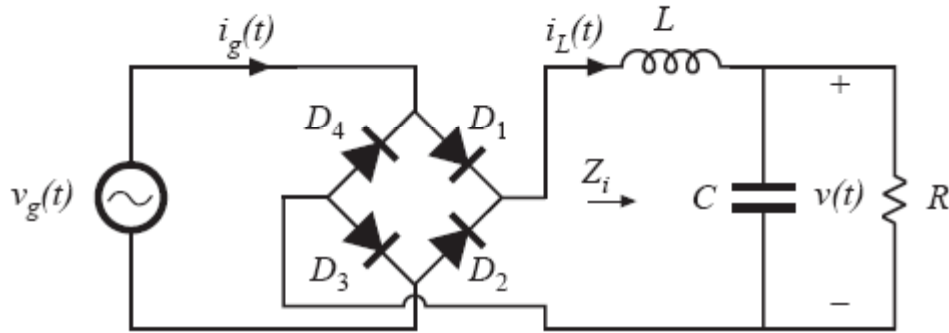


Não-isolado

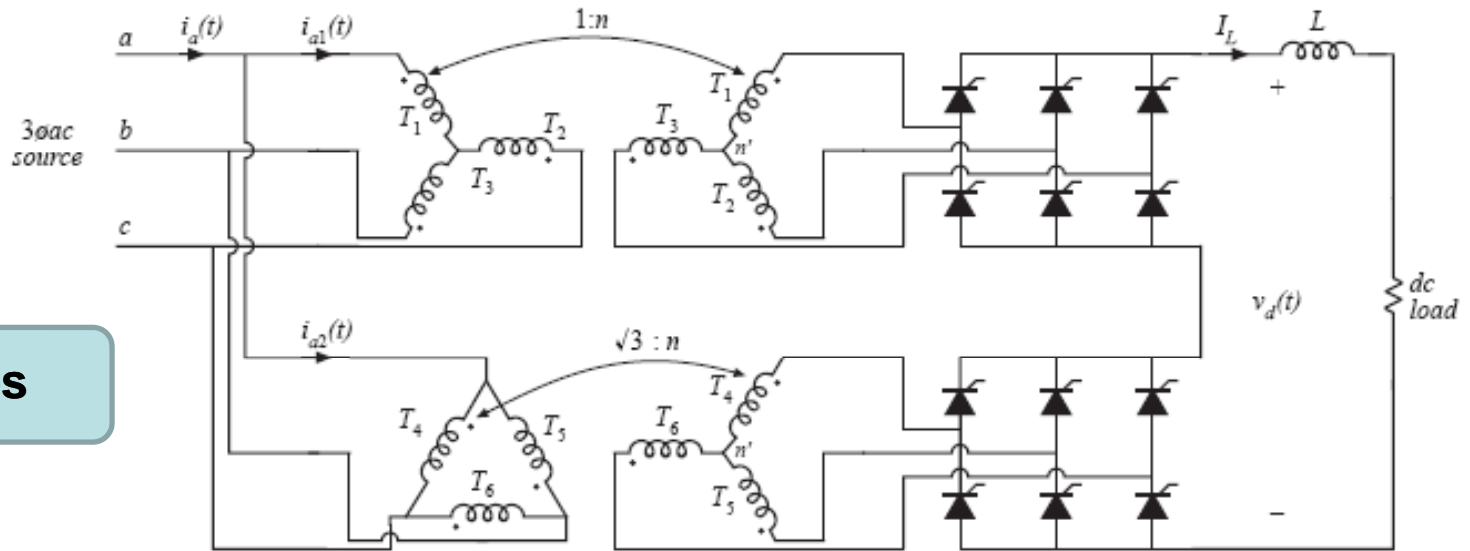
Isolado



Conversores CA-CC – Número de pulsos



2 pulsos

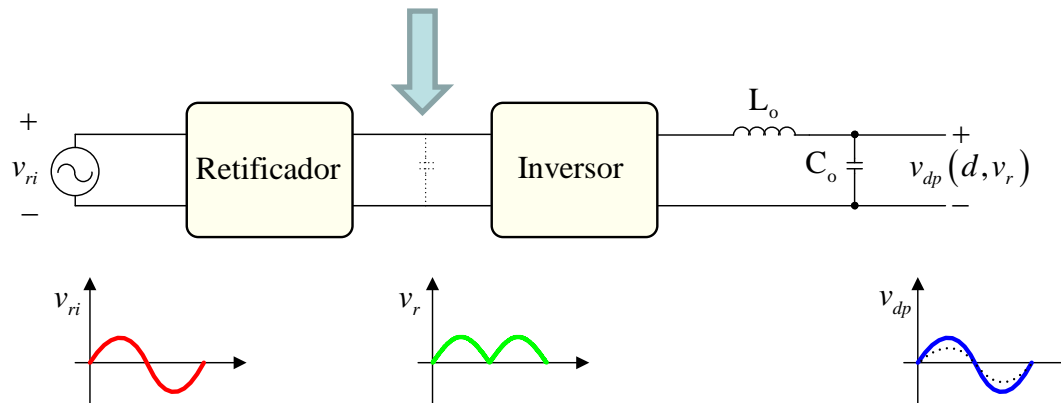


12 pulsos

Aplicações dos retificadores

Algumas aplicações:

- Processos eletroquímicos, tais como: anodização, produção de gases, refinamento de metais, eletrodeposição, etc.;
- Soldagem elétrica;
- Acionamentos a velocidade ajustável;
- Sistemas HVDC;
- Fontes de uso geral e ininterruptas;
- Interfaceamento de sistemas de energia alternativa com a rede de energia elétrica;
- Reatores eletrônicos e todos os outros circuitos que utilizam processamento indireto de energia.



Simuladores para eletrônica de potência

Psim:

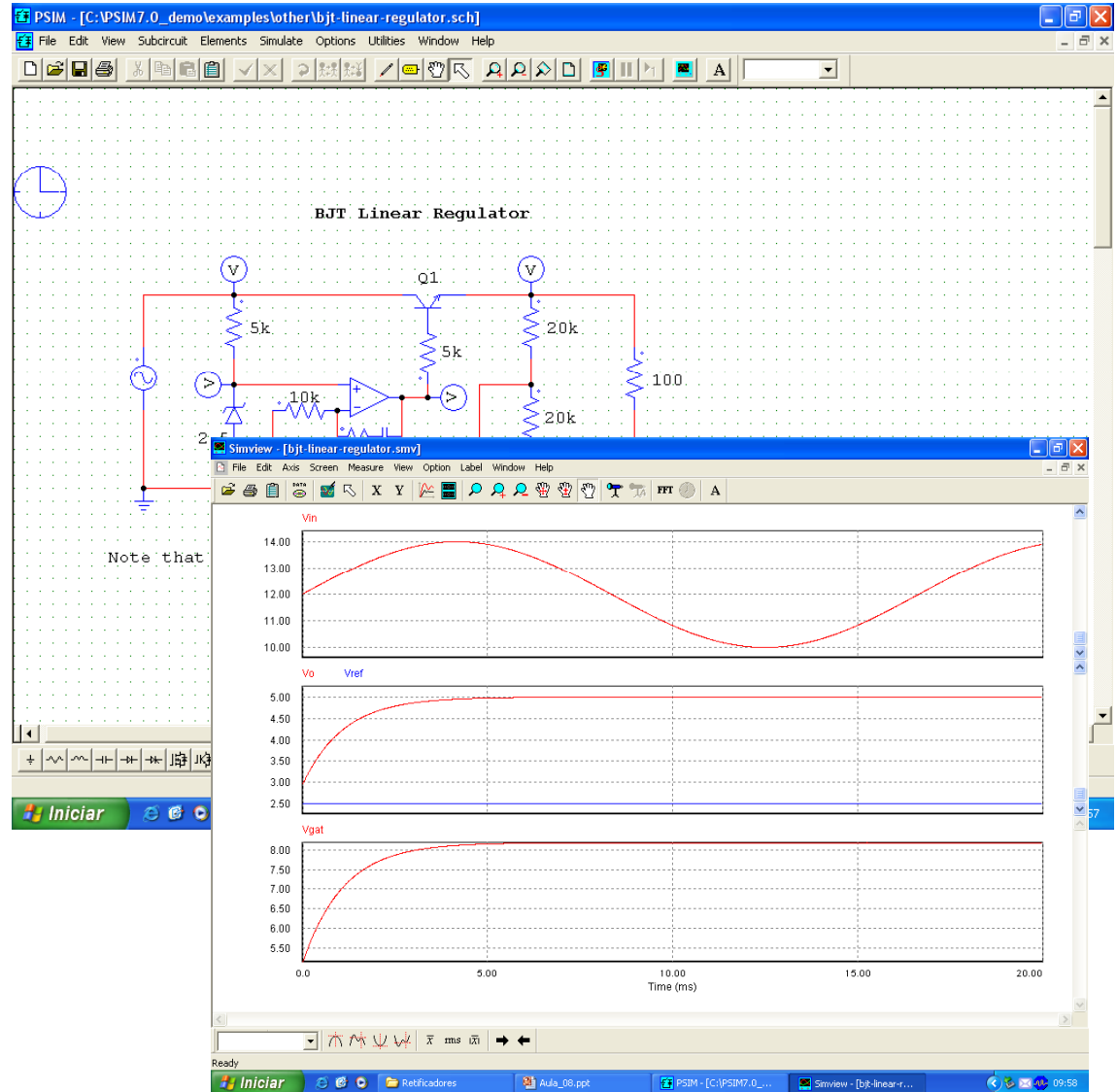


POWERSIM

www.powersimtech.com

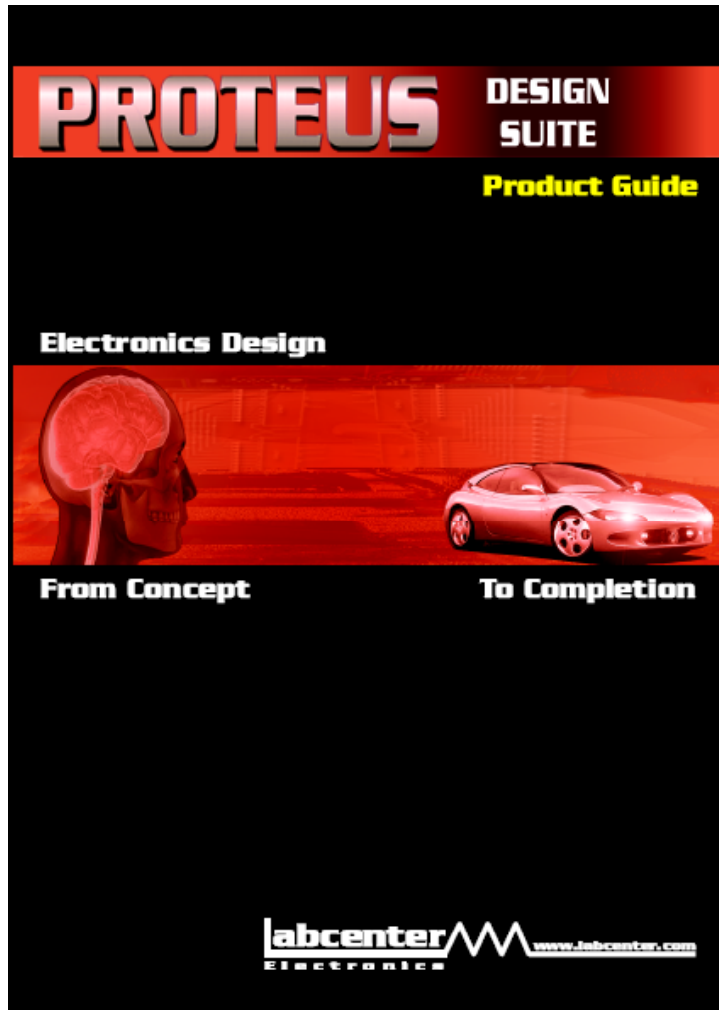


Baixar versão Demo



Simuladores para eletrônica de potência

Proteus:



PROTEUS DESIGN SUITE
Product Guide

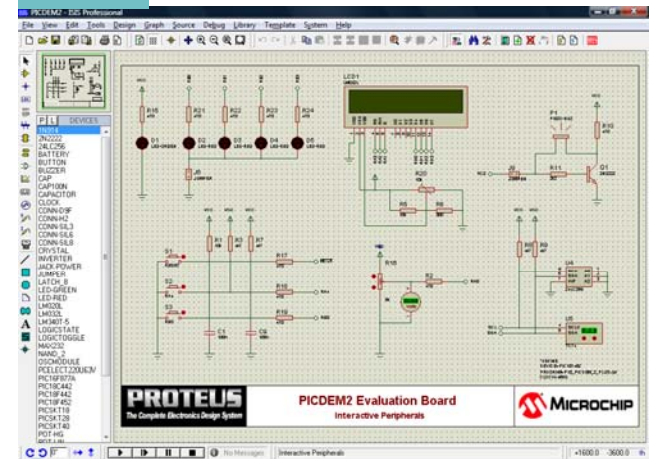
Electronics Design

From Concept To Completion

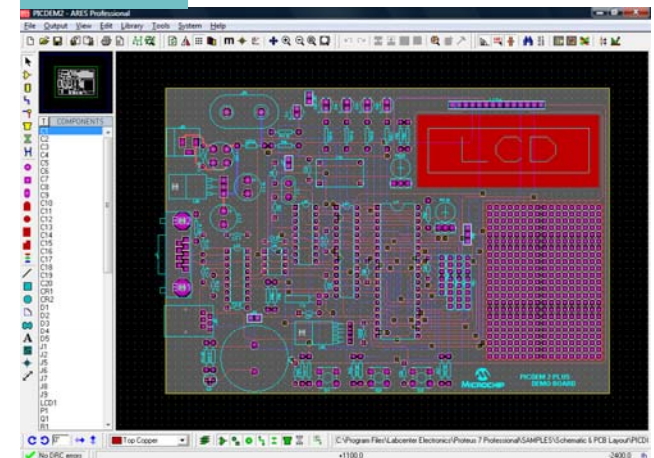
labcenter Electronics www.labcenter.co.uk

<http://www.labcenter.co.uk/>

ISIS

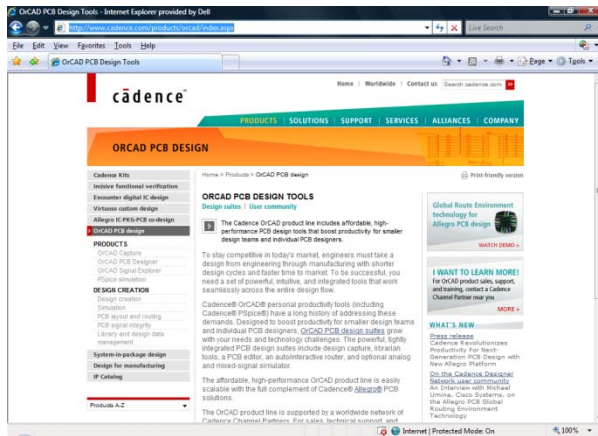


ARES

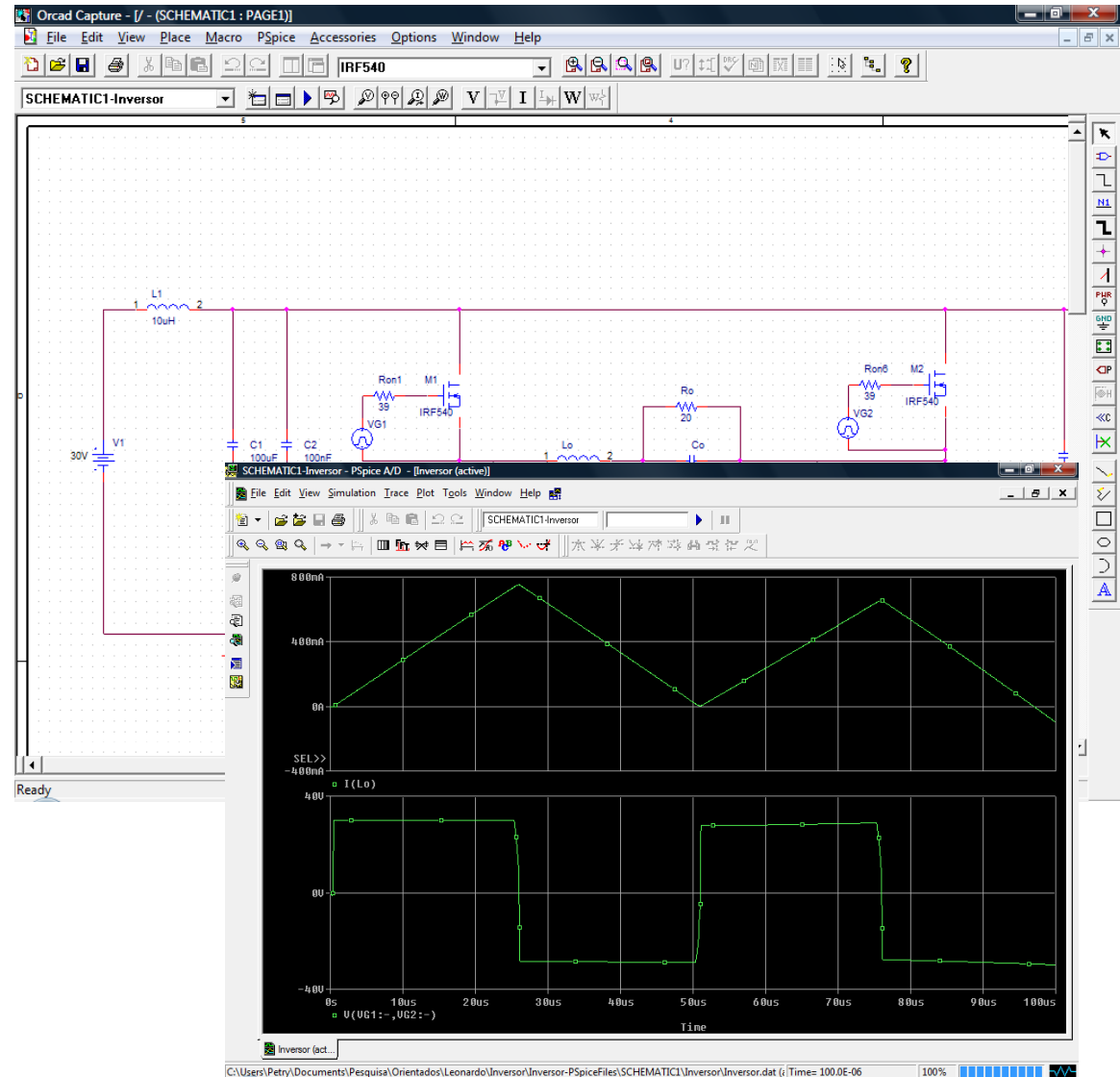


Simuladores para eletrônica de potência

Orcad (pspice):

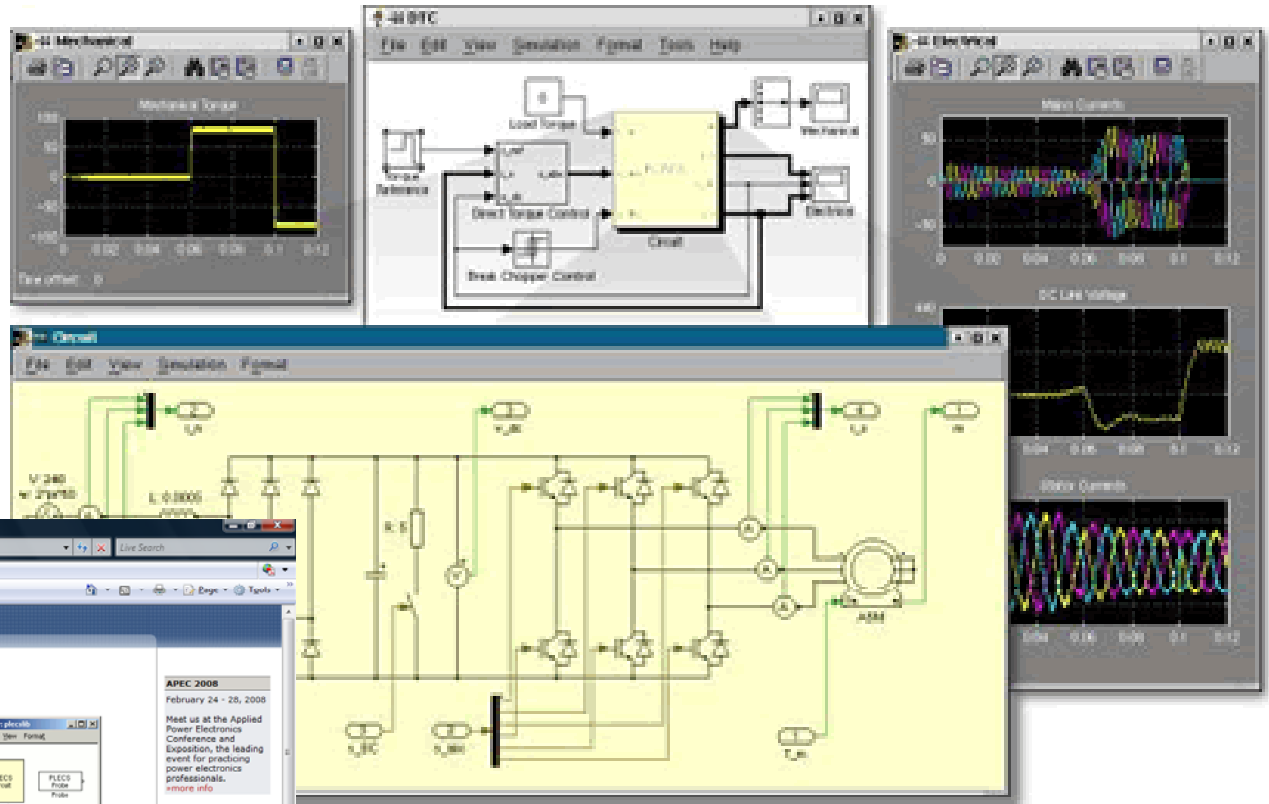


<http://www.cadence.com>



Simuladores para eletrônica de potência

Plexim:



The screenshot shows the PLEX website in Internet Explorer. The main content area features the following text:

Electrical systems and power electronics in Simulink

New: Simulation software PLECS version 1.6

The toolbox PLECS for high-speed simulations of electrical and power electronic circuits under MATLAB/Simulink is now available in version 1.6. Have a look at the new exciting features offered by the updated software:

- Analysis Tools**
The new analysis tools enable you to quickly determine the periodic steady state of a power electronic system and to perform ac analyses. Analyses can be performed both interactively via a graphical user interface and in batch mode.
- Access to State-Space Matrices**
The enhanced command line interface gives you access to the state-space matrices of a circuit model for a given combination of switch positions. This enables you to use advanced analysis methods such as state-space averaging.
- New Behavioral Semiconductor Models**
The semiconductor library has been complemented with advanced behavioral models: a thyristor with reverse-recovery, an IGBT with limited di/dt and a MOSFET with limited dV/dt.

On the right side of the page, there are several event announcements:

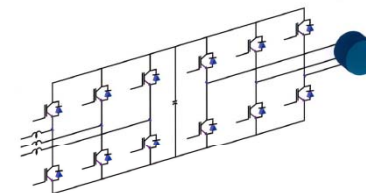
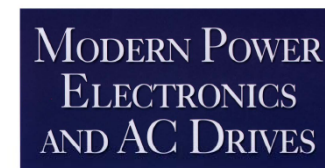
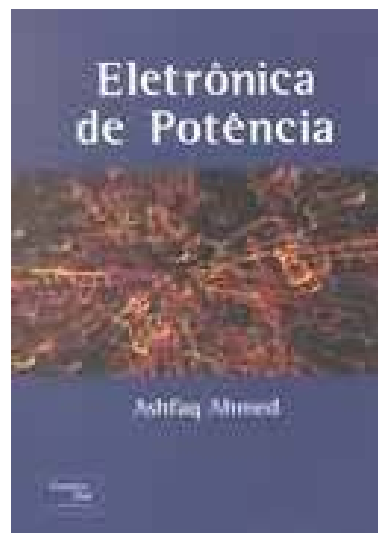
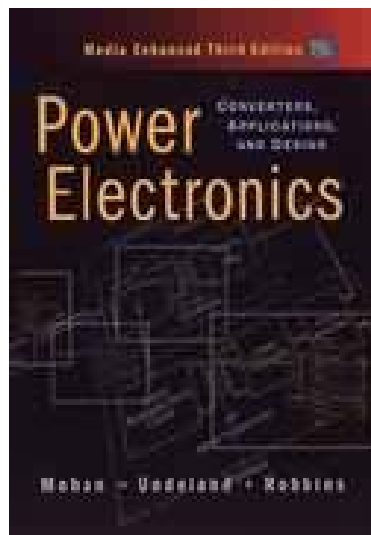
- APEC 2008**
February 24 - 26, 2008
Meet us at the Applied Power Electronics Conference and Exposition, the leading event for practicing power electronics professionals. [more info](#)
- Seminar in York (UK)**
April 1, 2008
Rapid development of power electronic systems with modern simulation and prototyping tools. Register now and reserve your place. [more info](#)
- PCIM Europe 2008**
May 27 - 29, 2007
Visit us at the PCIM, Europe's leading exhibition and conference on power electronics. [intelligent](#)

<http://www.plexim.com>

Próxima aula

Conversores CA-CC:

1. Semicondutores aplicados a conversores CA-CC (diodos).



www.cefetsc.edu.br/~petry