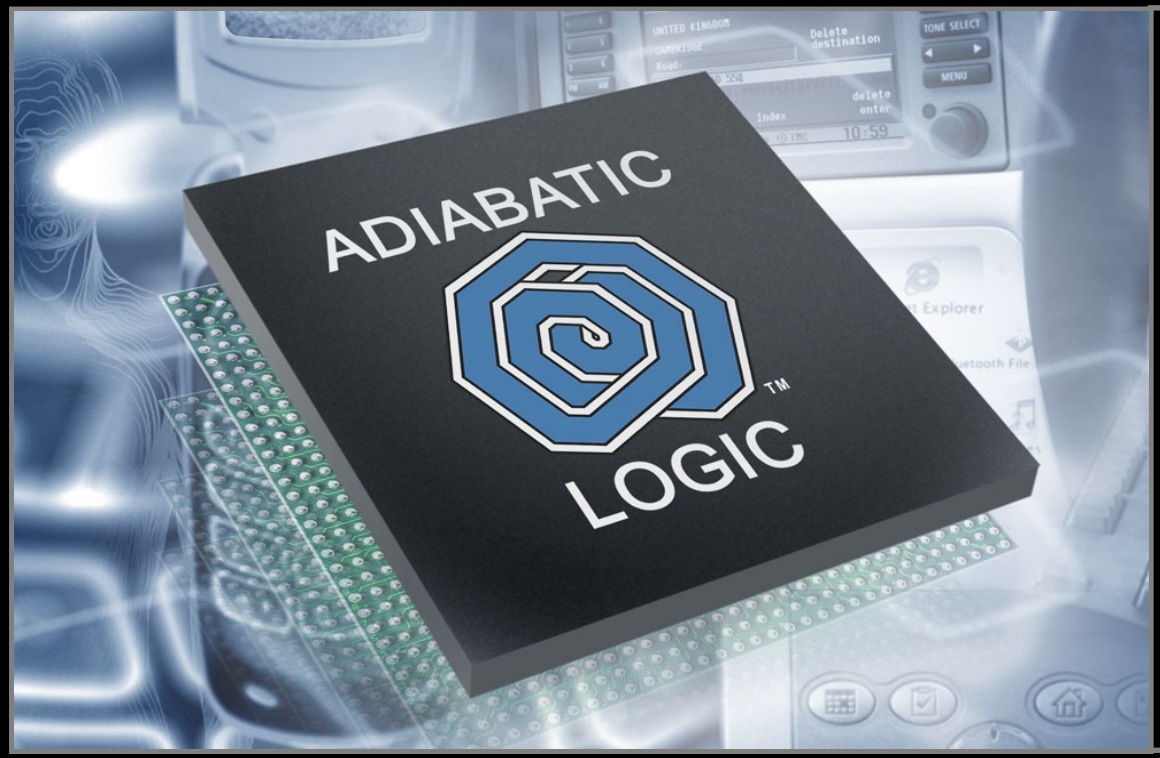
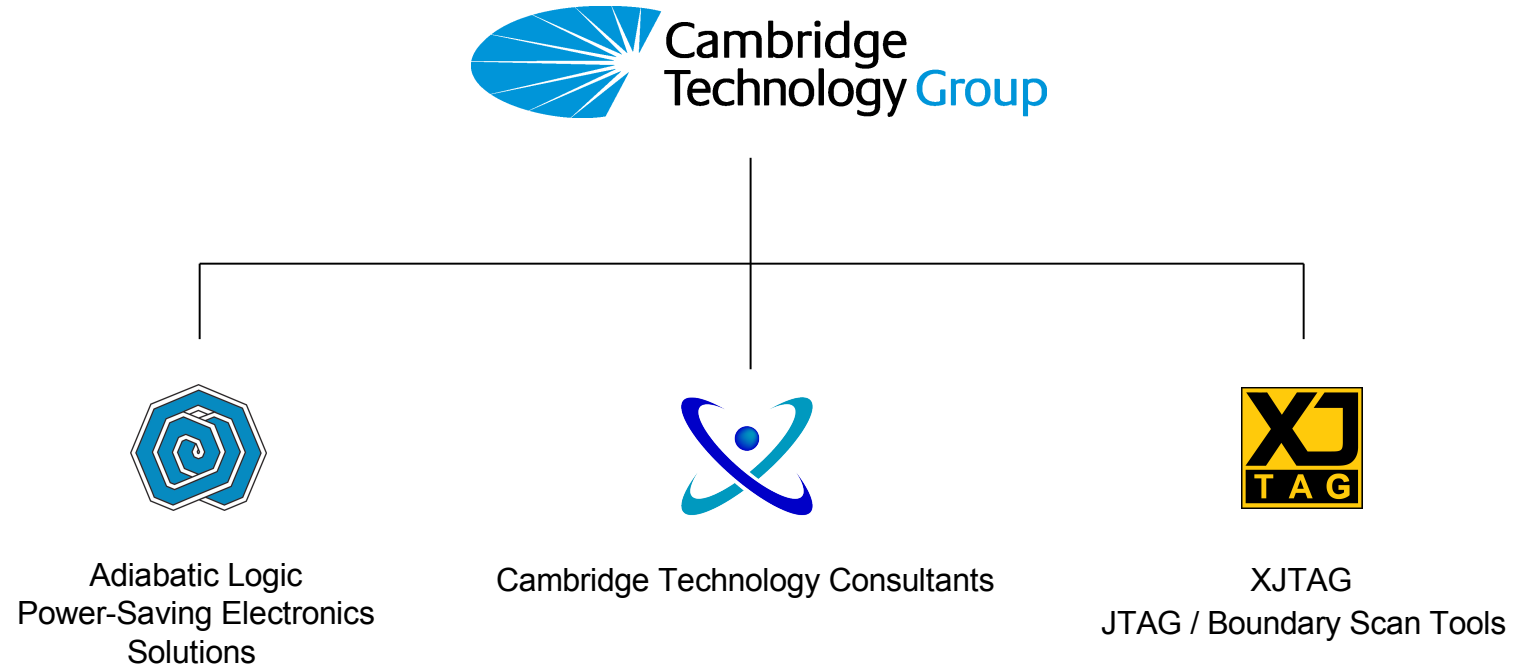


Adiabatic Logic

Geoff Harvey
CTO

Adiabatic Logic



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Adiabatic Logic

Adiabatic Logic's mission is to become

a Leader

in the application of micro and nano scale energy re-cycling techniques to electronic system design and integration.

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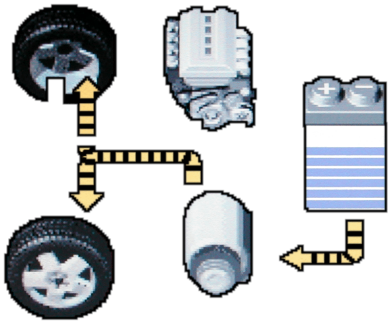
Adiabatic (recycling) principle

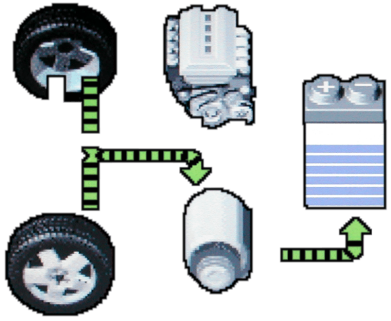
PRIUS

HYBRID ELECTRIC



Battery Drive

All thrust is provided by the electric motor and all power is provided by the battery-pack.



Regeneration Charge

As you approach a stop or just slow down, the excess kinetic energy is used to turn the generator. This creates electricity, which is used to charge the battery-pack.

There will be some losses since no system is perfect

Adiabatic = "pertaining to a condition where no heat enters or leaves a system" (OED).

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Electronic Equipment

POWER

is

the next frontier in design

that needs to be conquered

Note:

Source: CIBC World Markets with changes

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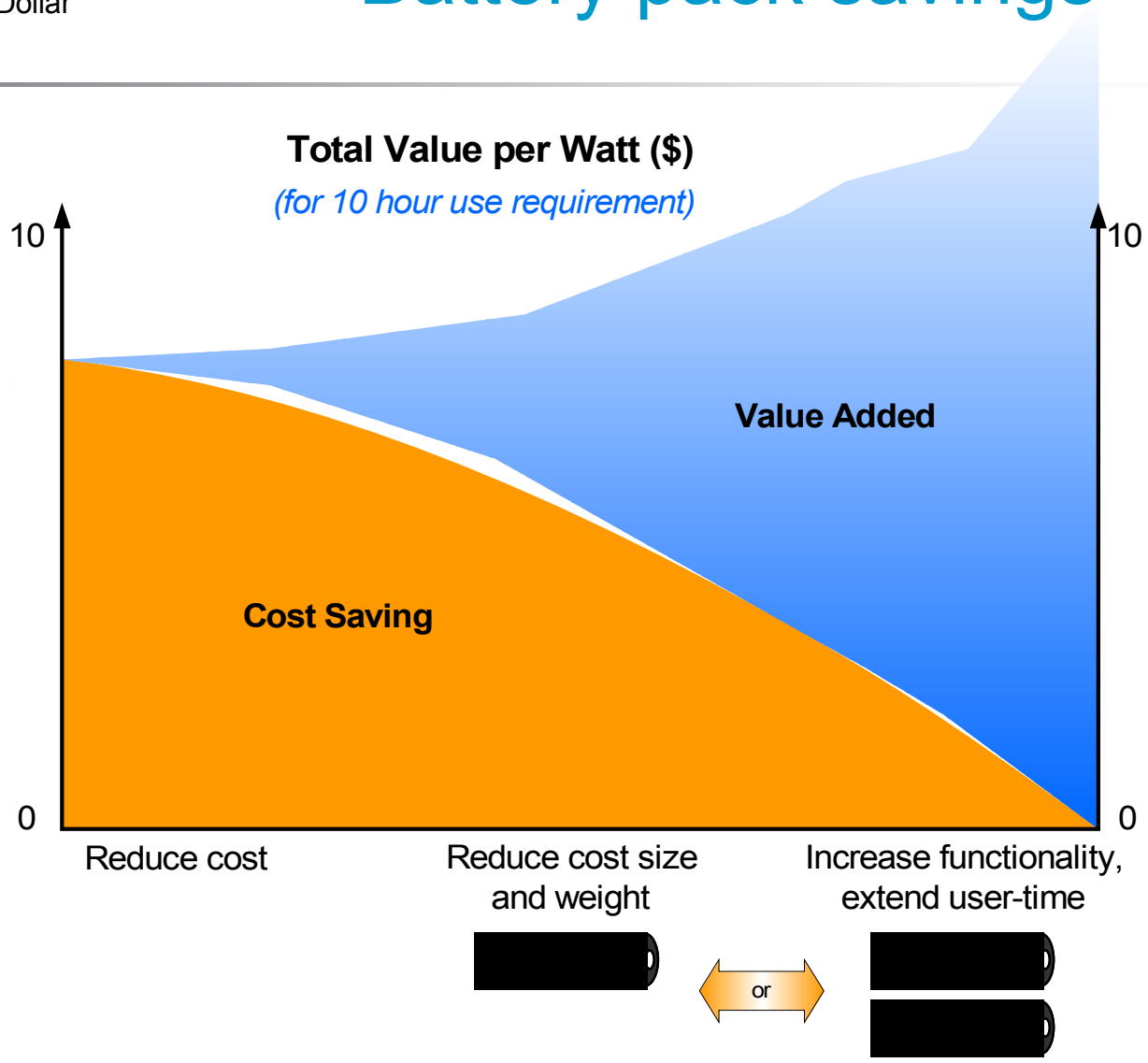
Battery pack savings



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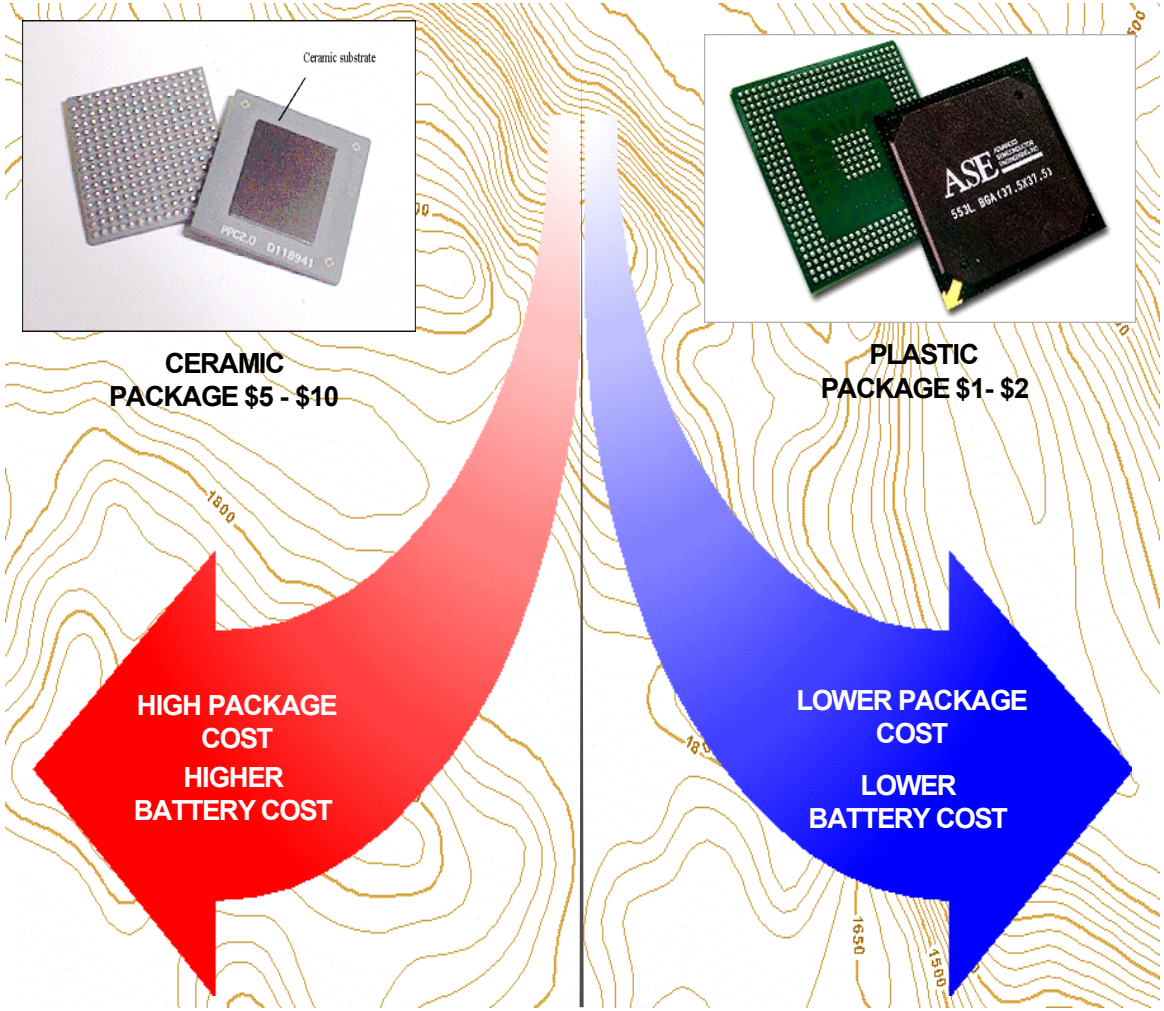
Electronic packaging savings



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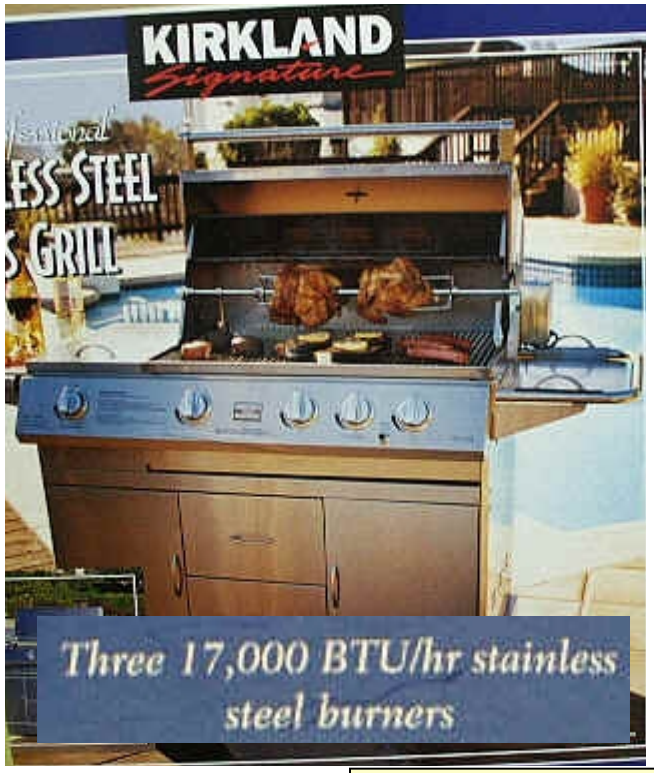
Air conditioning savings

46,405 BTU/Hr



51,000 BTU/Hr

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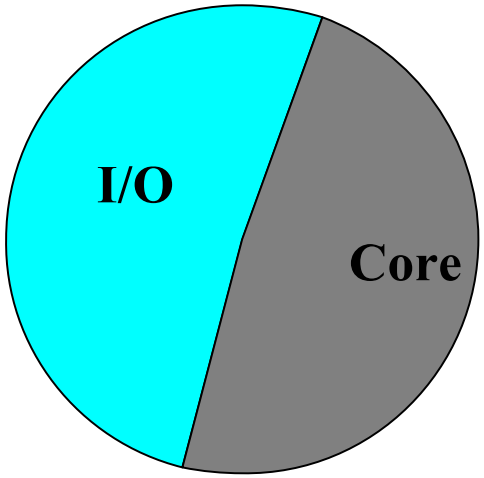
Chip to chip communication



"**A huge part of power consumption is lost in bus connections in and out of the chips**"
Arnaud Duclap, DSP business development manager at Texas Instruments

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Overview

- What is an Intelligent Output Driver?
  - IOD is a patented technology which actively matches the output buffer's operating characteristics to the electrical environment
  - IOD cell simply replaces a conventional IO Buffer cell

- What does the IOD achieve?
  - Reduces power losses in driven load by up to 75%
    - Reduces the number of components in a system
  - Optimises the output signal integrity
    - Increases signal switching speed
    - Simplifies design and simulation of complex systems

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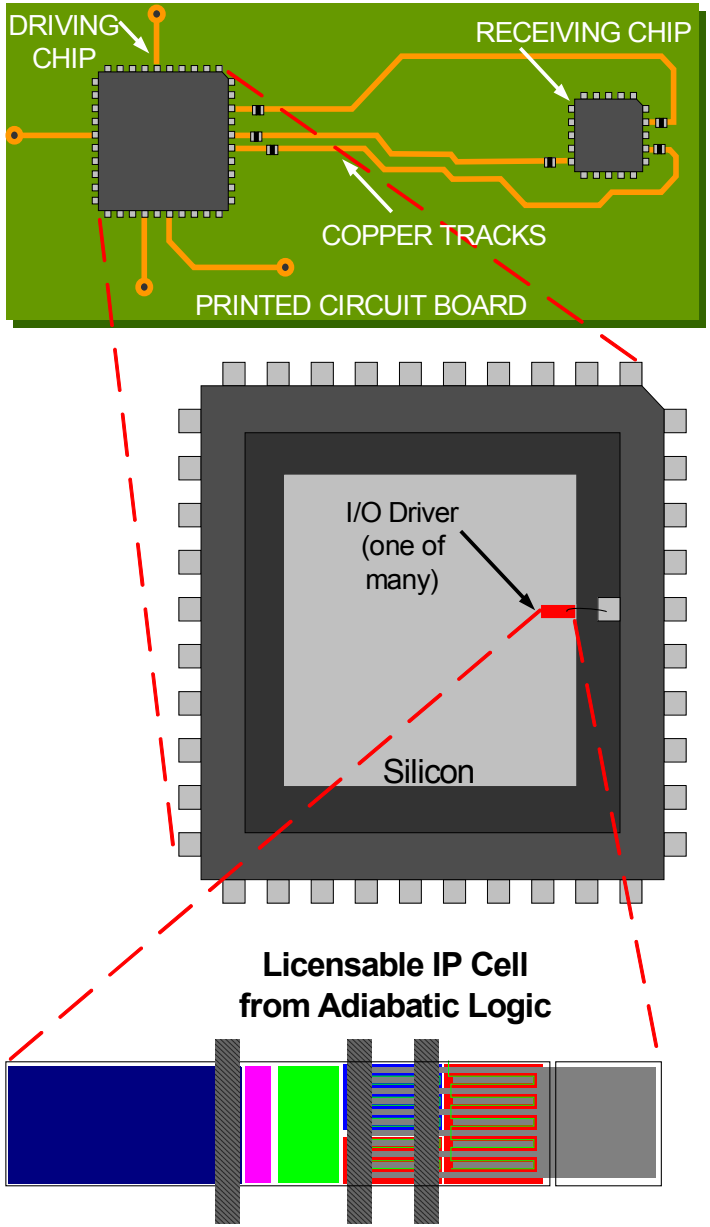

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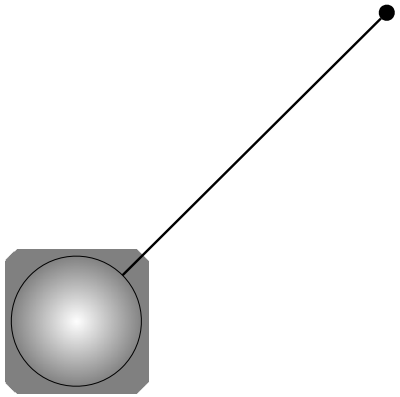
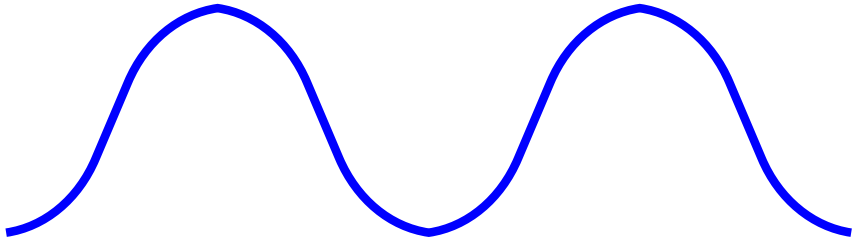
Pendulum – energy recycling





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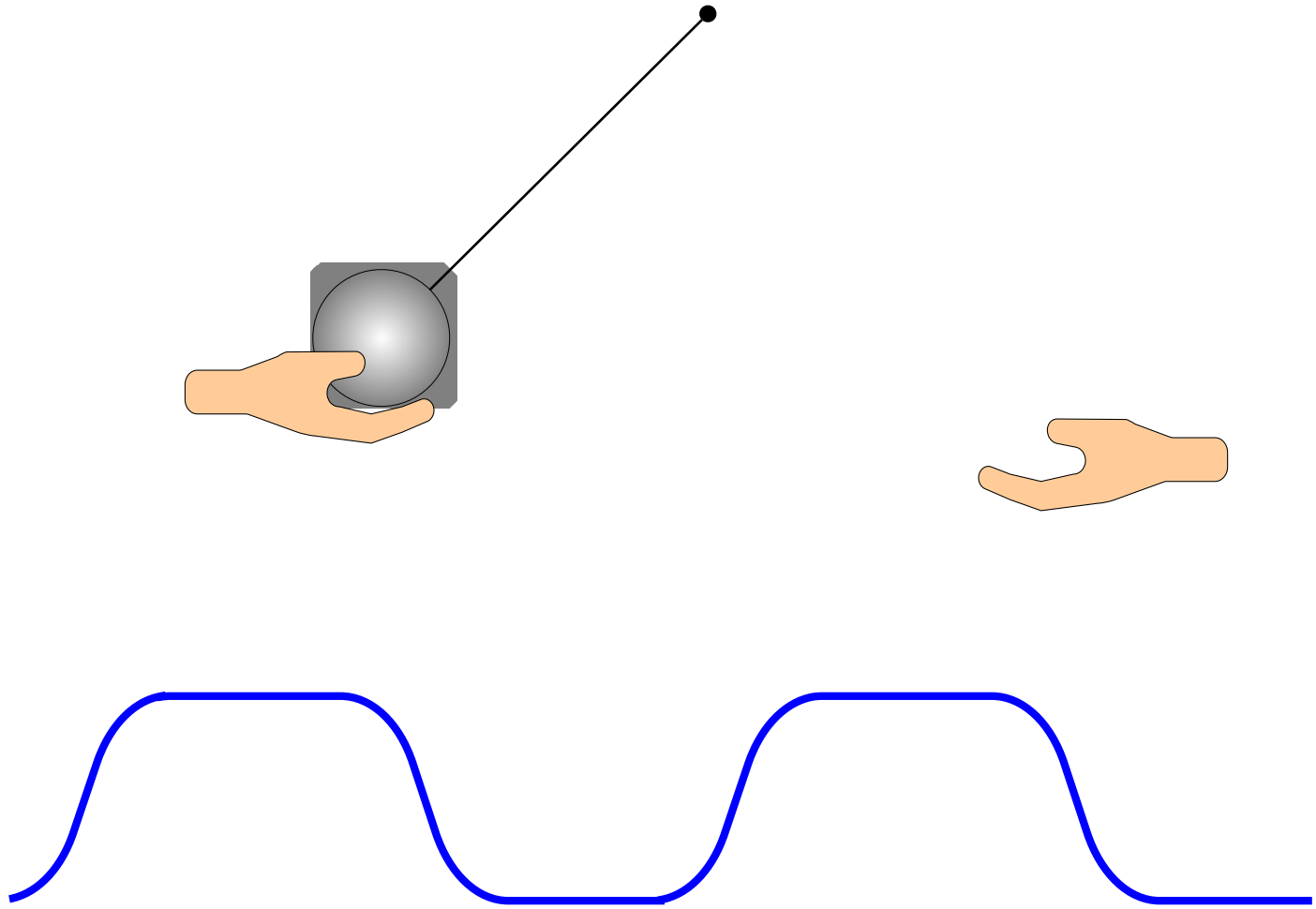
IOD - controllable recycling



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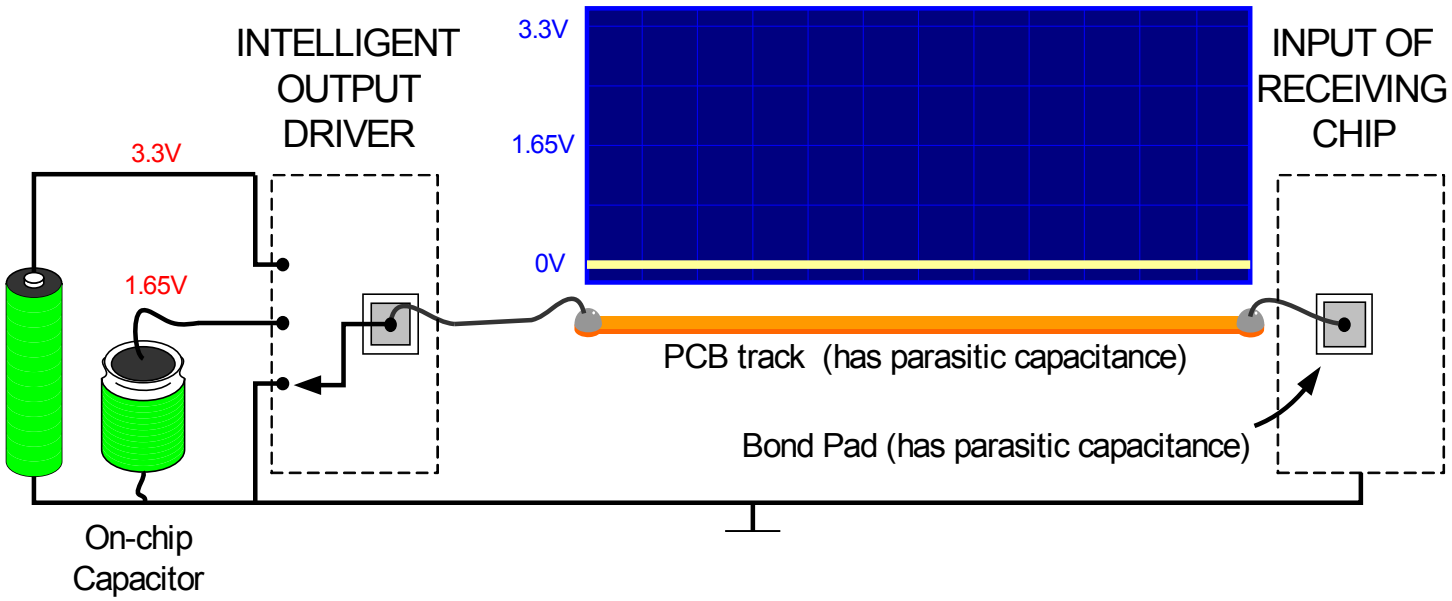

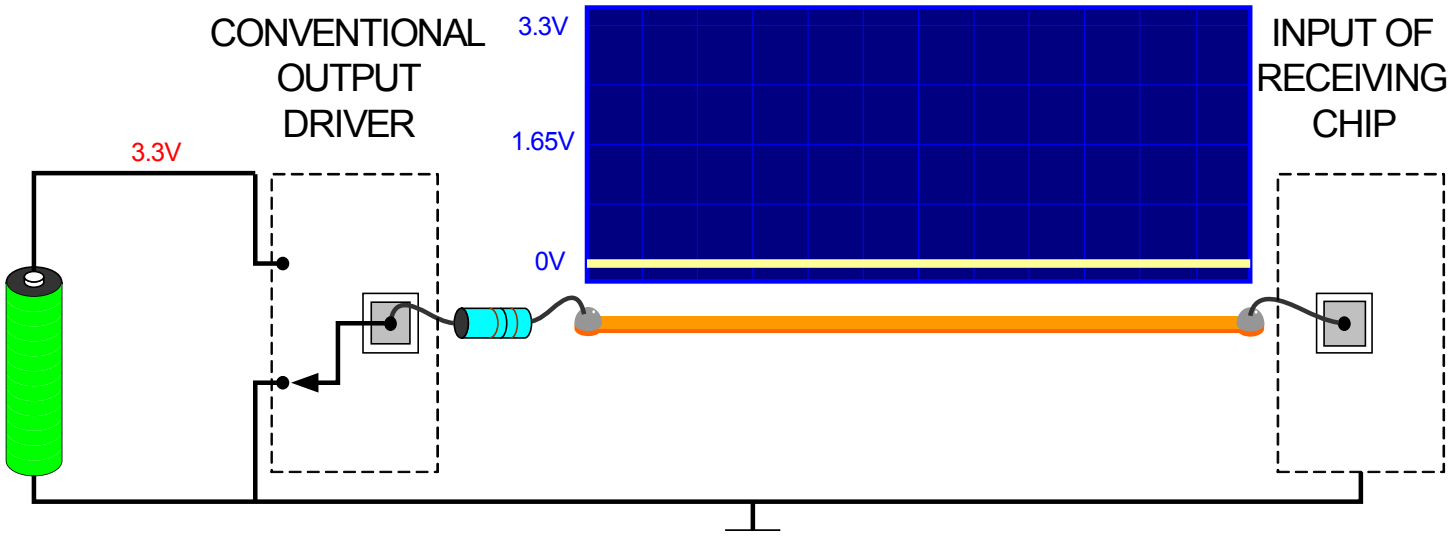

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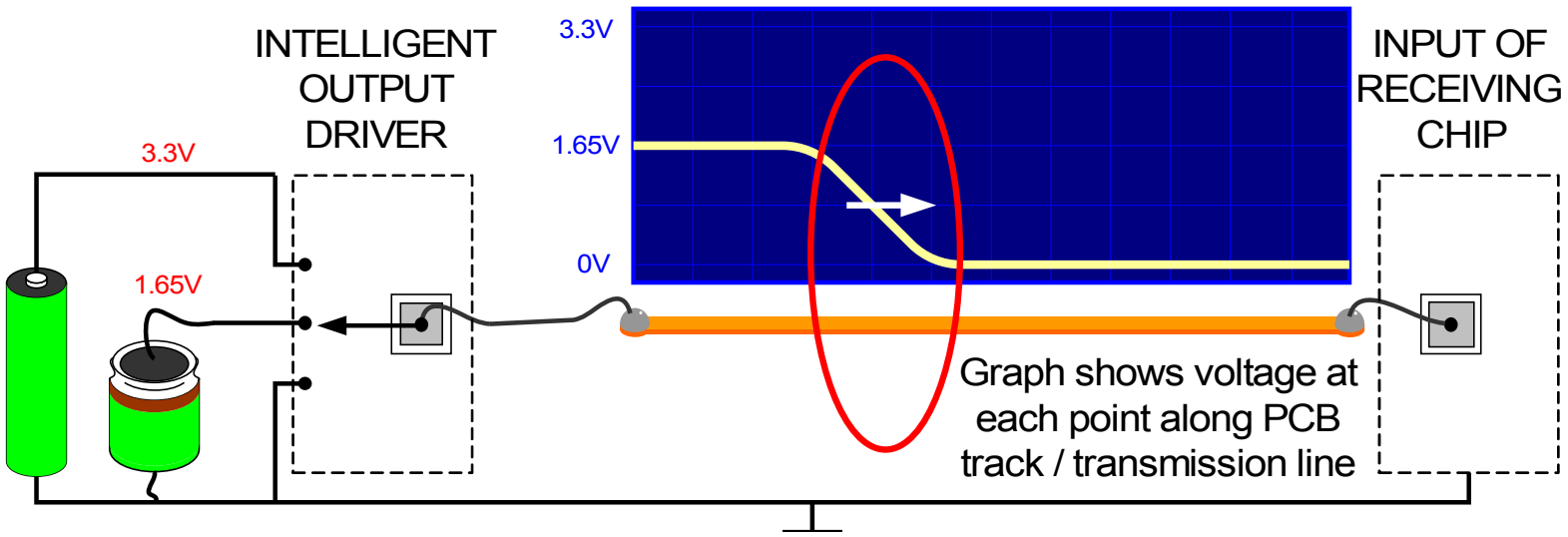

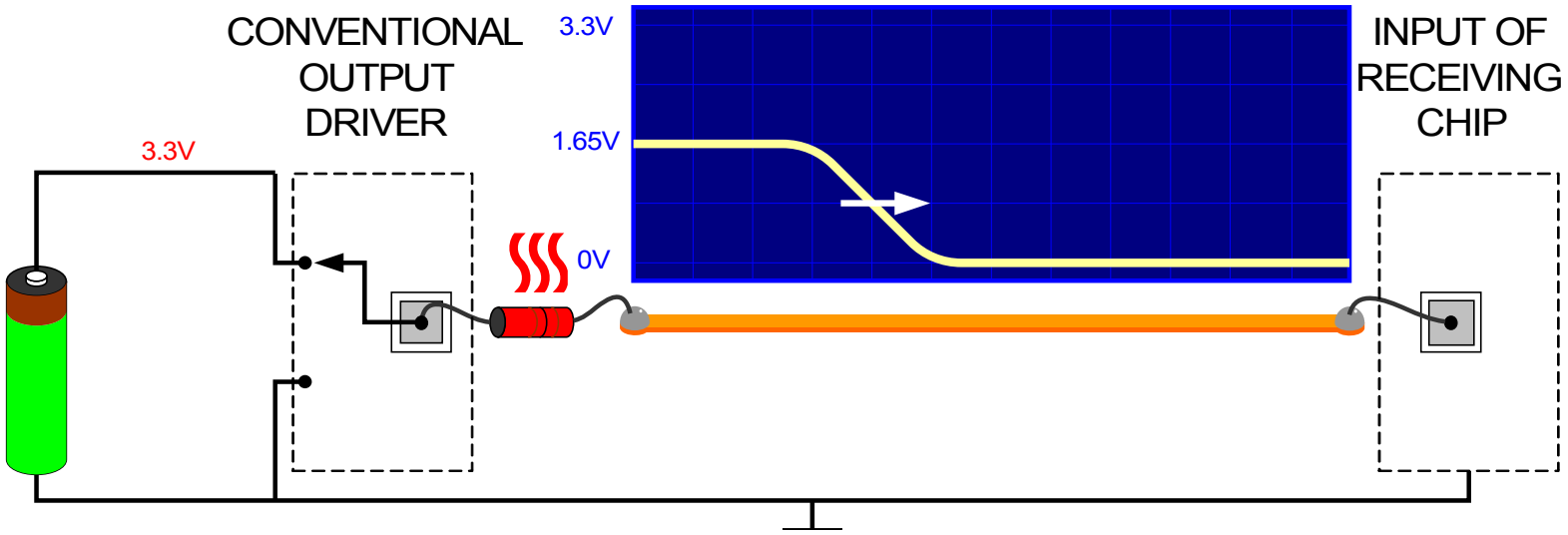

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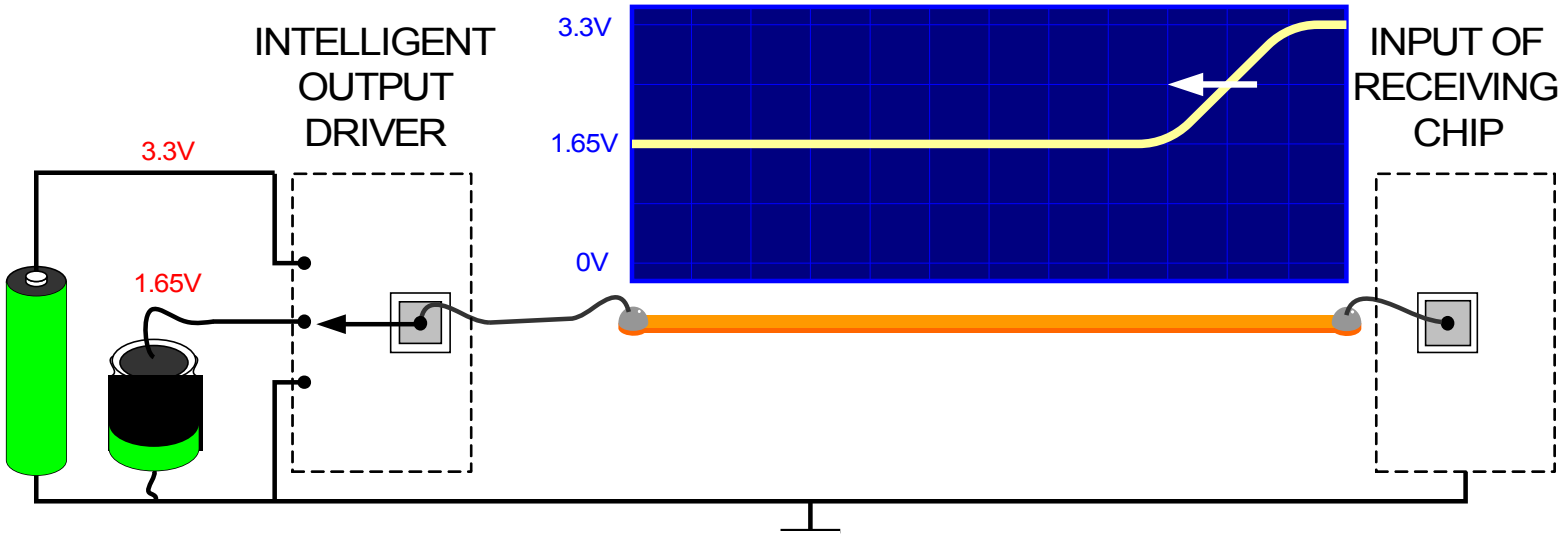

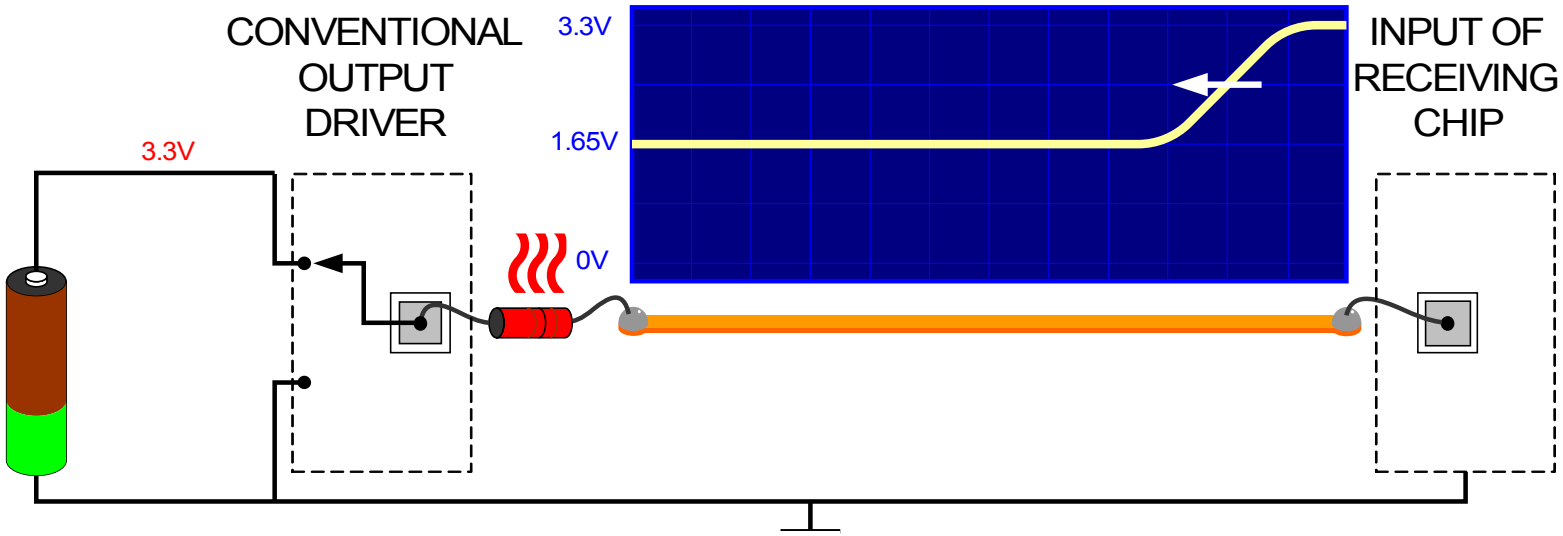

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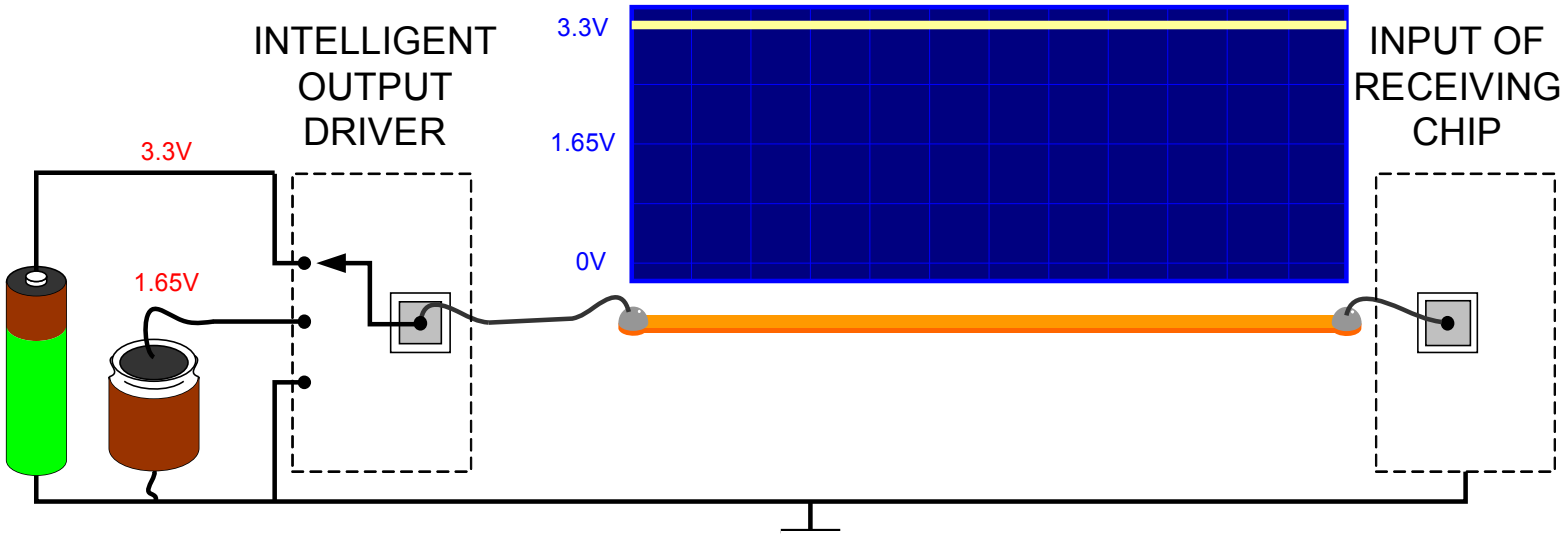

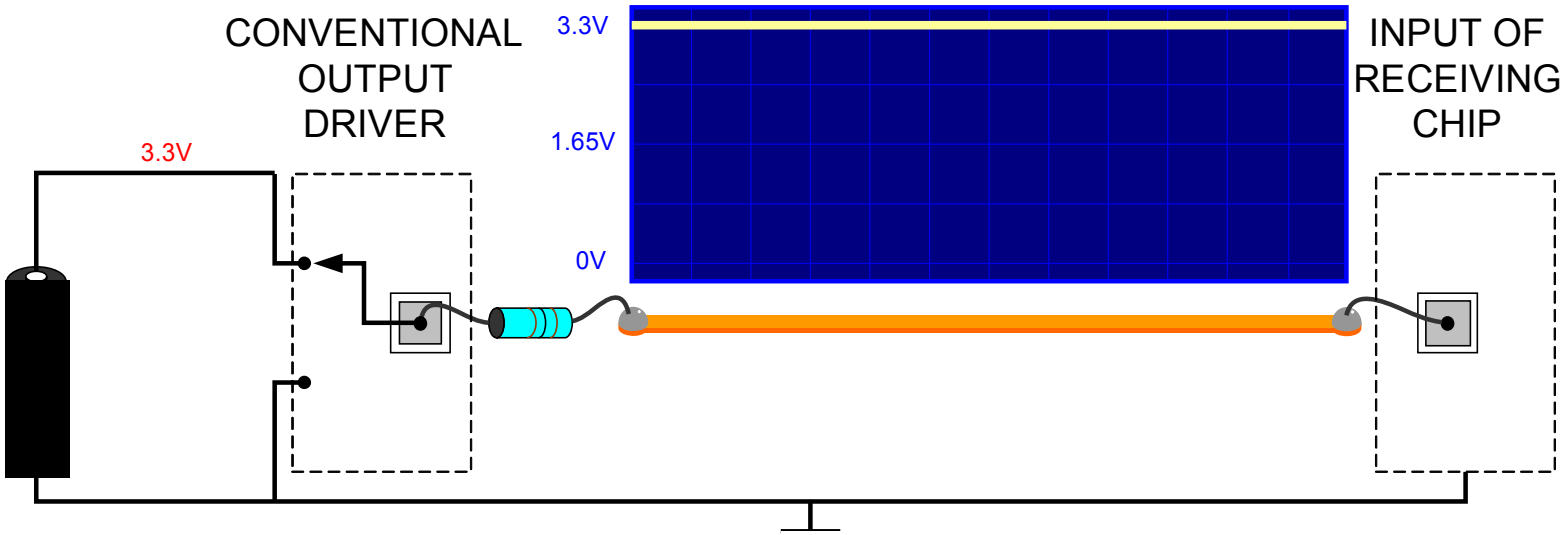

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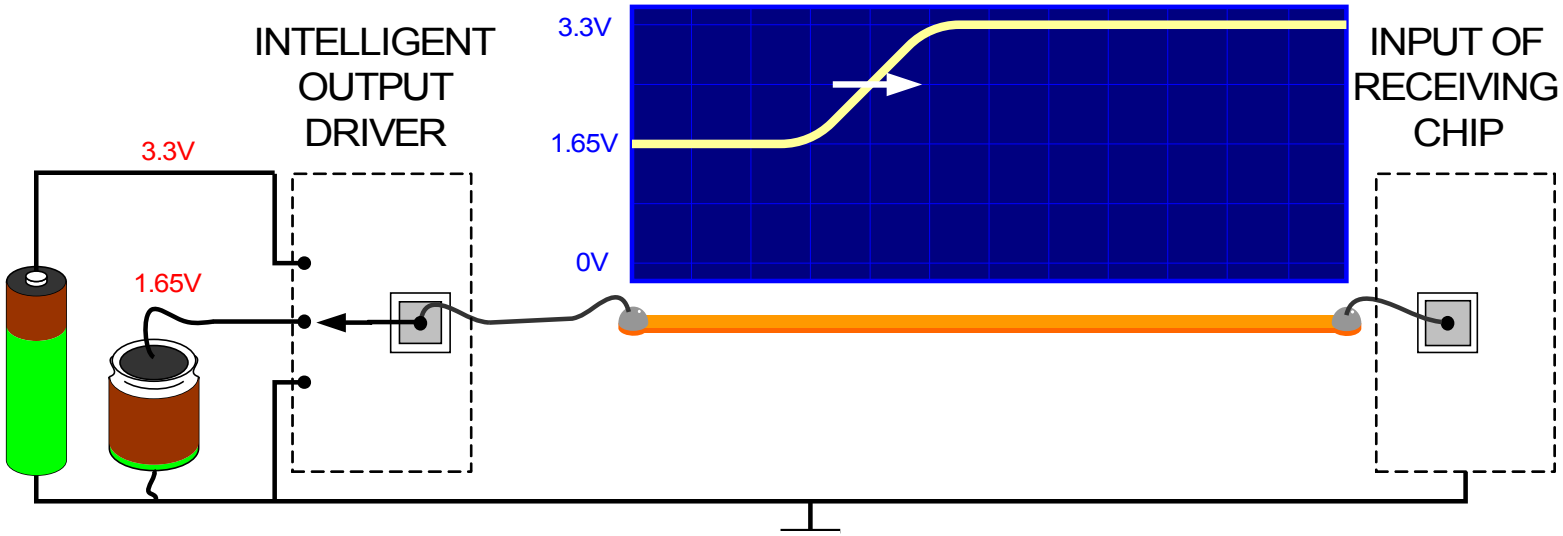

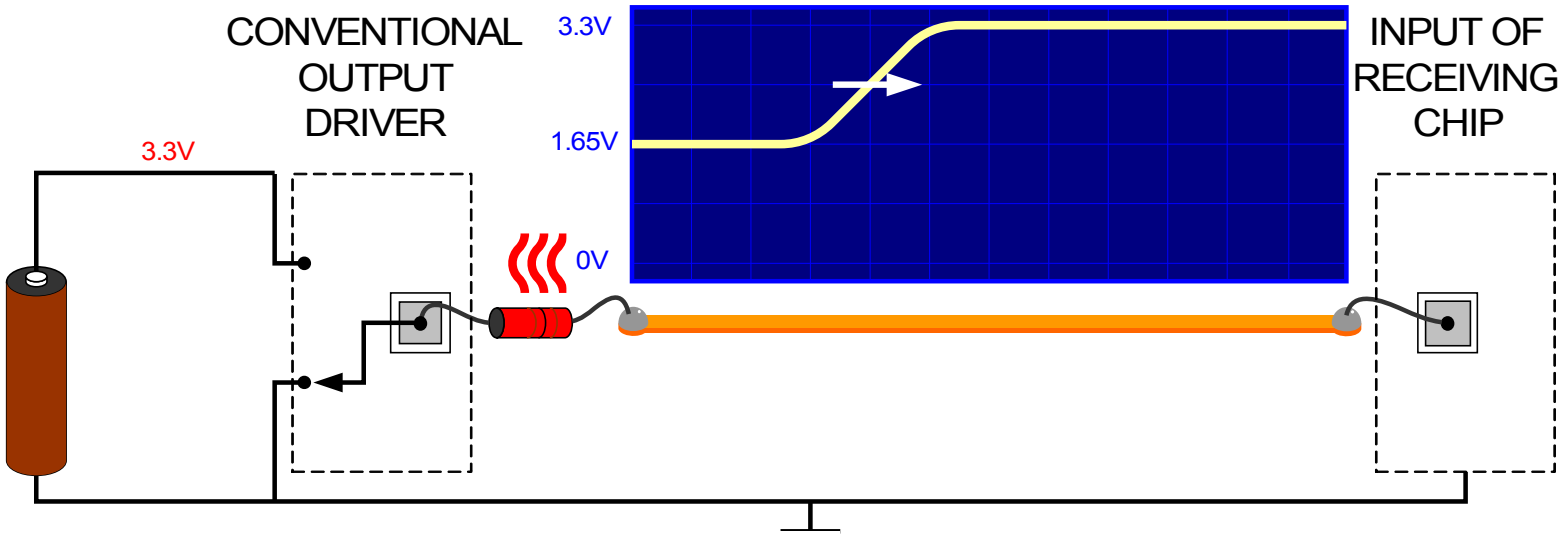

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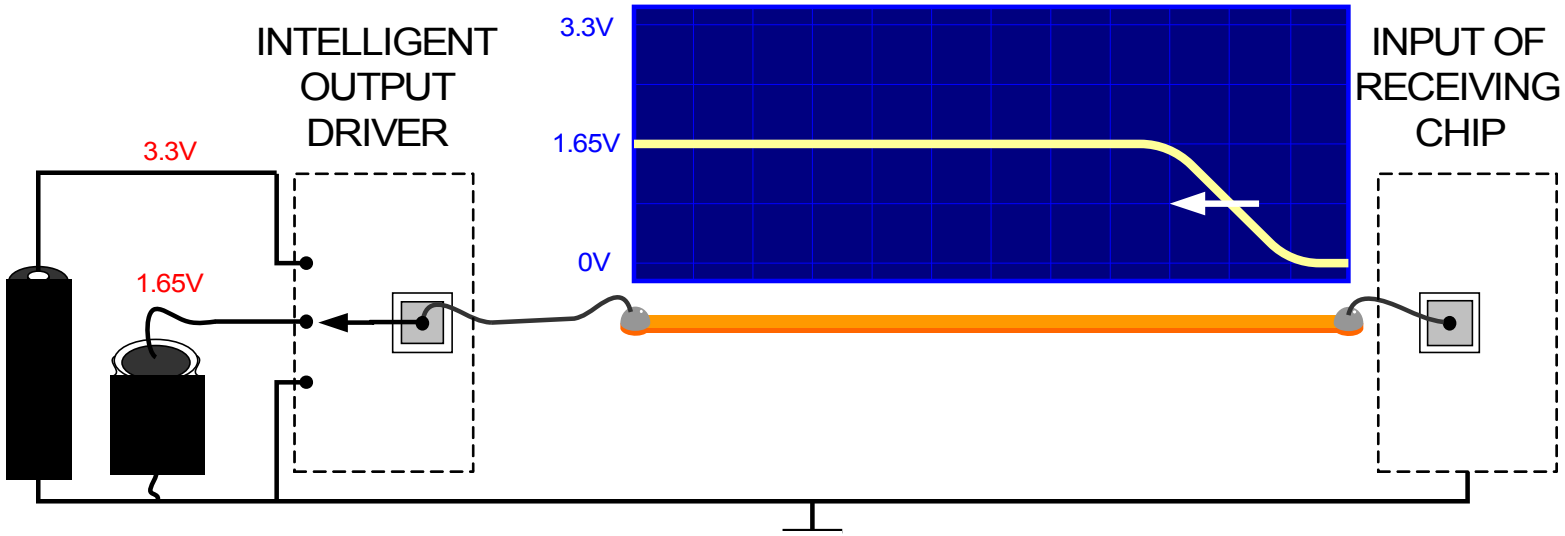

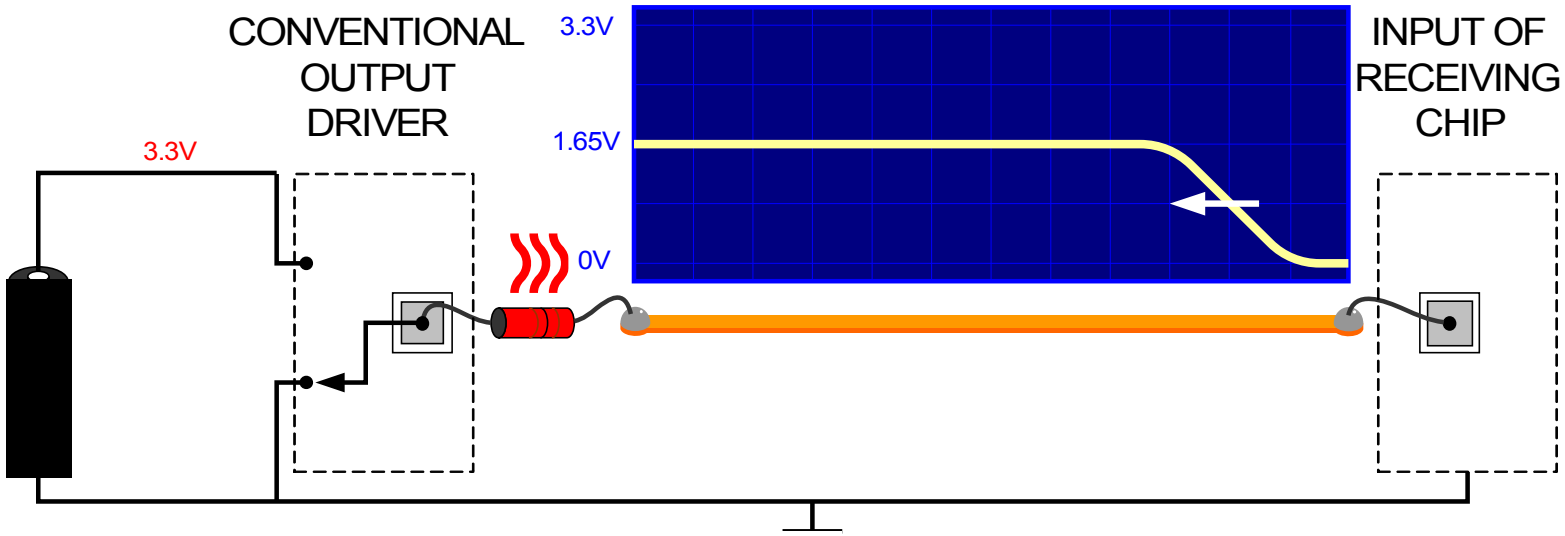

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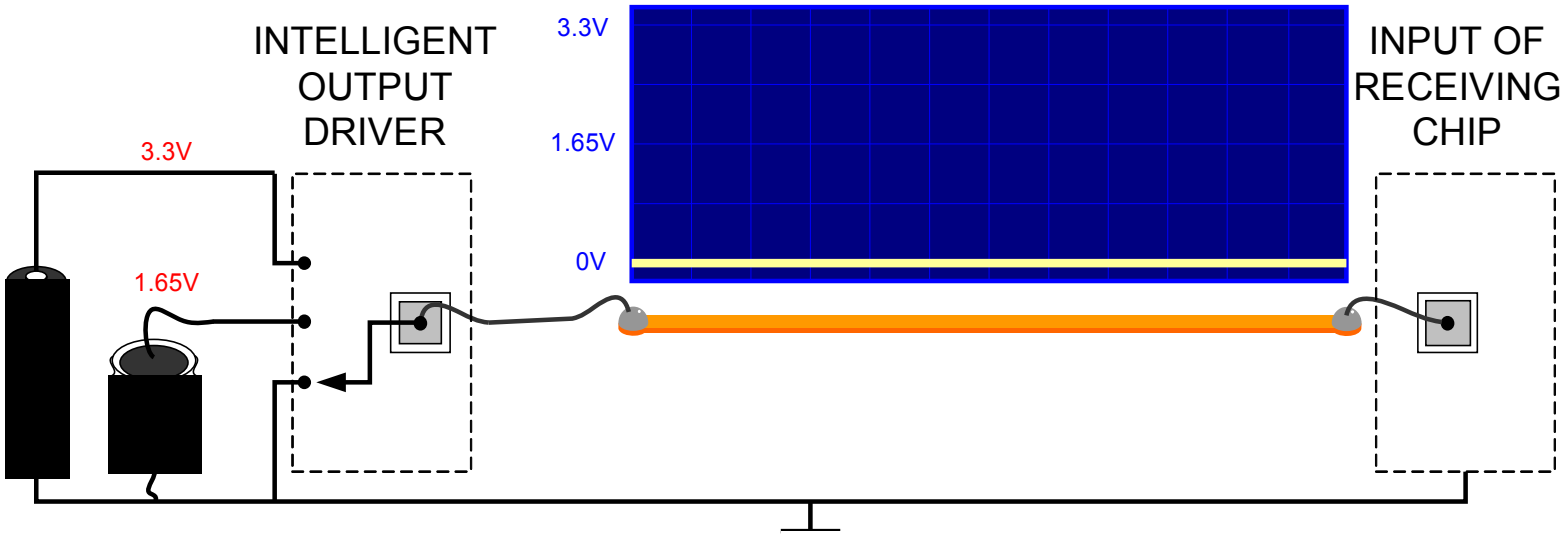

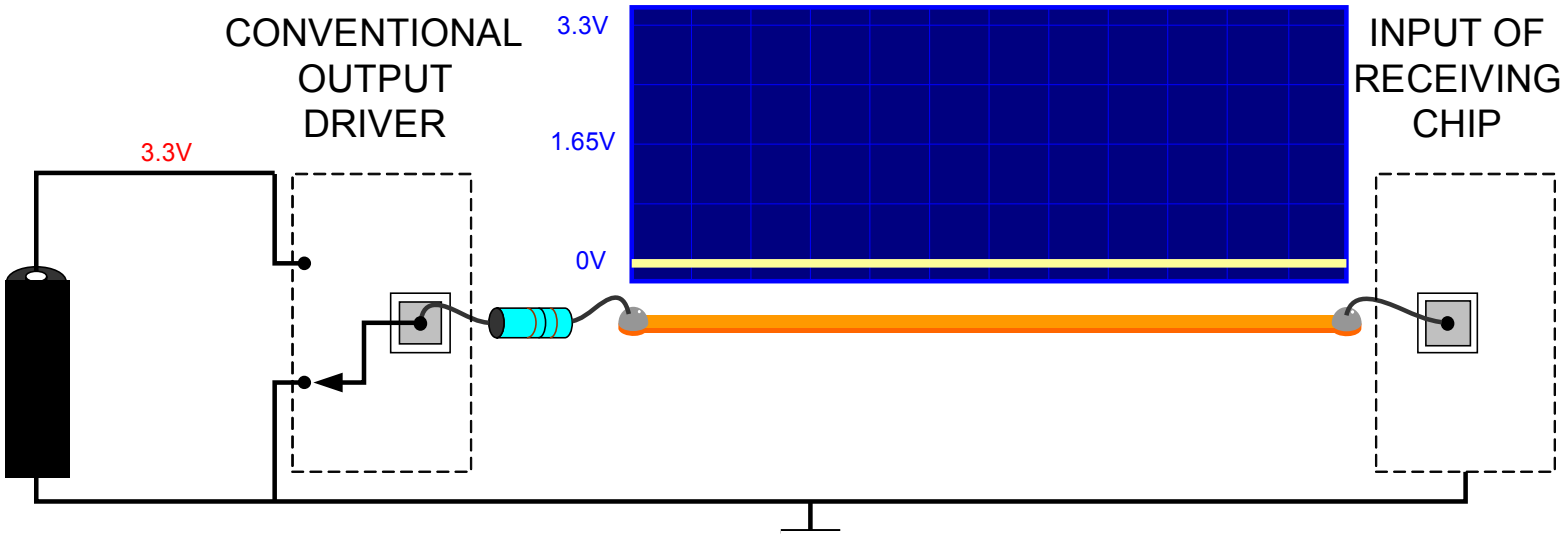

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Up to 75% of I/O power can be saved

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THE FUTURE

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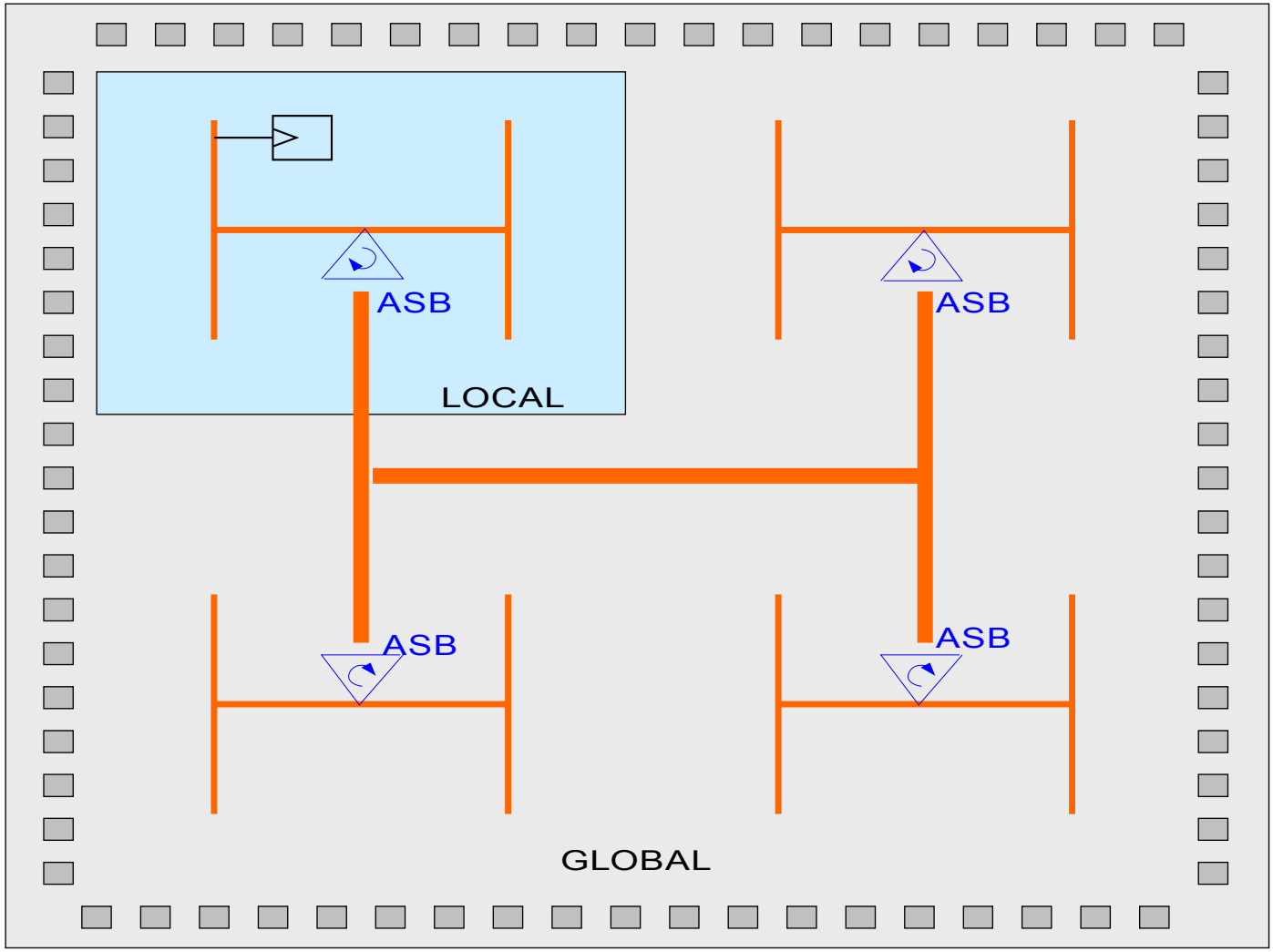
Recycle energy *inside* chips



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SAVE A WATT – SAVE A DOLLAR

Adiabatic Logic

Geoff Harvey CTO

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