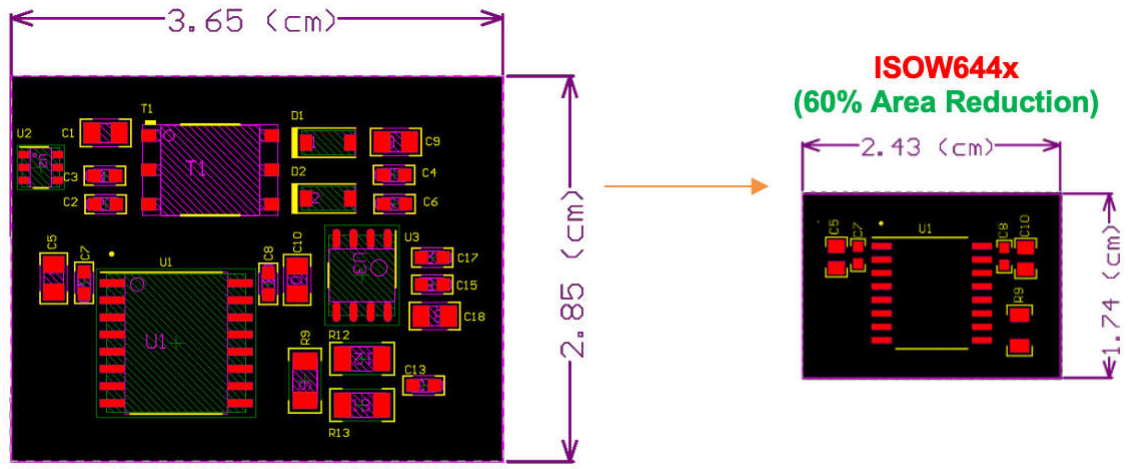
Product Overview

Optimize Board Design by Using an Isolator With Integrated Power

Overview

Designing across an isolation barrier often starts as a straightforward requirement, but rarely stays that way. A traditional discrete approach typically combines a digital isolator with a separate isolated power stage and the supporting passive network needed to generate the isolated supply. The number of available topology choices can provide flexibility, but also adds complexity to component selection, layout, design and more.

TI's ISOW device family simplifies that challenge by integrating both the digital isolation channels and the isolated DC/DC converter into one device. For applications where there is not an easily accessible power supply, the ISOW6441 is positioned to provide isolated power to the data channels while reducing board space, lowering BOM complexity, simplifying implementation and reducing the engineering time and effort required to get to production-ready design.



Digital Isolator with Discrete Power Supply **Digital Isolator with Integrated DC/DC Power**

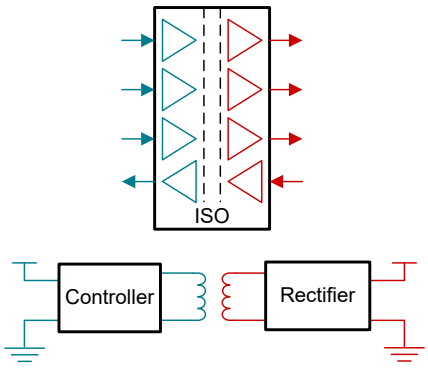
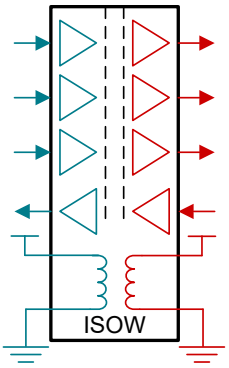
Figure 1. Digital Isolator With Discrete Power Supply and Digital Isolator With Integrated DC/DC Power

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Design Resources and Considerations:

- Reduce board space and BOM complexity
- Simplify design and layout decisions with ISOW versus multi-discrete components
- Reduce engineering time and effort
- Texas Instruments™ integrated circuits, *Enhance Design Performance using Integrated Power and Digital Isolation Design* application brief
- Texas Instruments, *Passing CISPR 32 Class-B Radiated Emissions With Ease Using ISOW6441* application note
- Texas Instruments, *EMC Compliance Report: ISOW64xx, ISOW308x, and ISOW1050* application note
- Texas Instruments, *TI's Latest Signal Isolators with Integrated Power Achieves Lowest Radiated Emissions* application brief

Table 1. Discrete Versus Integrated Power Implementations for Digital Isolators

	Discrete	Integrated Isolated DC/DC
Power Supply Requirements	Requires separate isolated power supply	No external isolated power supply required
Ease of Design	Complex – with multiple discrete components	Simplest - with full integration
EMC Optimized	More complex, EMC design flexibility	Yes, best EMC for size optimized design
Voltage Configuration	Flexible input/output voltages	Fixed Output: [5V to 5V], [5V to 3.3V], and [3.3V to 3.3V]
Power Output	Flexible	Up to 500mW
Time to Market	Normal - requires evaluation of multiple components	Faster – single component
Block diagram	 **Figure 2. Digital Isolator With Discrete Isolated Power (ISO + Power)**	 **Figure 3. Digital Isolator With Integrated Isolated DC/DC (ISOW)**

ISOW Device Family

ISOW is designed for engineers that need isolated data communication with isolated power, but don't want the overhead of building multiple discrete blocks, don't have enough PCB space, or limited design resources and time. By integrating isolation, communication and power functions into one device, ISOW6441 reduces board space, simplifies design and layout decisions, lowers BOM count, and improves the starting point for EMC performance. Applications in data centers, energy infrastructure, automotive, factory automation, test and measurement requires more compact PCB designs as space is becoming limited and ISOW provides a practical way to reduce board space, while providing the same design as a discrete implementation.

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There are three main devices in the ISOW trilogy. ISOW64xx, a digital isolator with integrated DC/DC, ISOW308x, an Isolated RS-485 with integrated DC/DC, and ISOW1050, an Isolated CAN with integrated DC/DC. The 'x' denotes different channel configurations or feature options for the respective family, see detailed list in Table 2. The ISOW64xx comes in a -Q1 variant, this indicates the device is AEC-Q100 qualified to help speed up the design, evaluation, and qualification of automotive boards.

Table 2. Recommended Parts: Isolated Interface With Integrated DC/DC

Device Family	Part Numbers	Protocol	Key Features
ISOW64xx(-Q1)	ISOW6421 ISOW6441 ISOW6442	GPIO, PWM, SPI, UART	Up to 150Mbps data rate Up to 550mW output power Up to 22.9MHz SPI High CMTI: 200kV/µs (typ) Independent logic supply (ISOW64xxV)
ISOW308x	ISOW3080 ISOW3080P ISOW3086 ISOW3086P	Full-Duplex RS-485 / PROFIBUS	Flexible data rate options: • ISOW3080: 500kbps • ISOW3086: 12Mbps Profibus capability (ISOW308xP)
ISOW1050	ISOW1050 ISOW1050V	CAN / CAN FD	Up to 5Mbps CAN FD High CMTI: 200kV/µs (typ) Independent logic supply (ISOW1050V)

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