

# Digital Isolator Standards and Certifications

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# Agenda

- Digital isolators – Standards & certifications
- Standards that apply to isolation products
- Certification agencies for each standard
- Test coverage
  - Component standards
  - Equipment standards
- VDE digital isolator standard
- TI.com resources
- Q&A

# Digital isolators – Standards & certifications

- Due to high voltage withstand and safety implications of digital isolators, they must pass several international safety standards.
- Designers look for digital isolators that have passed either isolator component standards or insulation-related clauses of specific equipment standards.
- Additionally, designers may request the version of the standard specific to each market such as US, Canada, Europe, China, etc.

# Standards that apply to isolation products

## Component level standards

- IEC 60747-5-5 (VDE 0884-5-5) – **Optocouplers only**
- DIN V VDE V 0884-10 & DIN VDE V 0884-11 – **Digital isolators only** • Isolators must pass
- IEC 60747-17 – **Digital isolators only** (Expected release in 2020)
- UL 1577 – **Optocouplers & digital isolators**

## System level / end equipment standards

- IEC 60950-1 & IEC 62368-1 – **IT equipment standard**
  - IEC 60601-1 - **Medical equipment standard**
  - IEC 61010-1 - **Safety standard for measurement, control and laboratory use equipment**
  - IEC 60079-0 & IEC 60079-11 – **Equipment for use in explosive atmospheres**
  - GB4943.1-2011 – **Chinese version of IT equipment standard (IEC 60950-1)**
- Equipment / system must pass
  - Isolators must pass insulation-related specs

# Certification agencies for each standard

- **VDE: Verband der Elektrotechnik, Elektronik und Informationstechnik, VDE Association for Electrical, Electronic & Information Technologies (Based in Germany)**
  - DIN V VDE V 0884-10 (Active since December 2006, expires January 2020)
  - DIN VDE V 0884-11 (Active since January 2017)
  - IEC / EN 60747-17 (Expected release in 2020) \*Note: EN is the European version of IEC standard
  - IEC / EN 62368-1 (Reinforced Insulation Certificate)
  - IEC / EN 61010-1 (Basic Insulation Certificate)
- **UL: Underwriters Laboratories (Based in the US)**
  - UL 1577



# Certification agencies for each standard

- **CSA: Canadian Standards Association (Based in Canada)**
  - IEC / CSA 60950-1 & IEC / CSA 62368-1 \*Note: CSA is the Canadian version of IEC standard
  - IEC / CSA 60601-1
  - IEC / CSA 61010-1
  - IEC / EN 60079-0 & IEC / EN 60079-11
- **CQC: China Quality Certification Centre (Based in China)**
  - GB4943.1-2011
- **TUV: Technischer Überwachungsverein, Technical Inspection Association (Based in Germany)**
  - EN / UL / CSA 60950-1 & EN / UL / CSA 62368-1
  - EN / UL / CSA 61010-1



# Test coverage – Component standards

## DIN VDE V 0884-11

- Preconditioning
- Rapid change of temp
- Vibration
- Shock
- Dry heat
- Damp heat (cyclic & steady state)
- Temp storage
- Apparent charge
- Isolation resistance
- Surge voltage
- Safety limiting
- Power/current
- Clearance
- Creepage
- Flammability
- Insulation lifetime (working voltage)
- Transient voltage

## UL 1577 - Single Protection

- Dielectric strength
- Overload
- Limited thermal aging

# Test coverage – Equipment standards

## IEC 61010-1

Measurement, Control, and  
Laboratory Use Equipment

- Creepage
- Clearance
- DTI
- Thermal cycling
- Humidity
- Dielectric strength
- Temperature/dissipation
- Material classification

## IEC 60079-0 & -11

Equipment for use in Explosive  
Atmospheres

- Thermal ignition compliance  
(service temp, power)
- Spark ignition compliance  
[capacitive, inductive, resistive  
(voltage & current)]
- Clearance
- Creepage
- DTI
- Dielectric strength
- Encapsulation
- Casting compound

## IEC 60601-1

Medical Equipment

- Creepage
- Clearance
- DTI
- Thermal cycling
- Humidity
- Dielectric strength
- Temperature/dissipation
- Material classification
- Defibrillation

# Test coverage – Equipment standards

## IEC 62368-1

Information Technology & Audio/Video  
Equipment

(Replacing IEC 60950-1, IEC 60065)

- Creepage
- Clearance
- DTI
- Thermal cycling
- Humidity
- Dielectric strength
- Temperature/dissipation
- Material classification

## GB 4943.1-2011

Information Technology Equipment  
(Chinese version of IEC 60950-1)

- Creepage
- Clearance
- DTI
- Thermal cycling
- Humidity
- Dielectric strength
- Temperature/dissipation
- Material classification

# VDE digital isolator standard – 2 versions

## DIN V VDE V 0884-10 & DIN VDE V 0884-11

- Currently both VDE standards are active.
- DIN V VDE V 0884-10 became an active standard in December 2006 whereas DIN VDE V 0884-11 became an active standard in January 2017.
- VDE gave 3 years time to suppliers to transition their product certifications from DIN V VDE V 0884-10 to the newer standard.
- **DIN V VDE V 0884-10 is expiring in January 2020.**
  - After January 2020, DIN VDE V 0884-11 will be the only active VDE digital isolator standard.
- Equipment suppliers should ensure that their digital isolator components remain VDE certified after January 2020.

# DIN V VDE V 0884-10 vs. DIN VDE V 0884-11

Criteria / Parameter	DIN V VDE V 0884-10	DIN VDE V 0884-11
Max surge isolation voltage, $V_{IOSM}$ (reinforced)	Test voltage = $1.6 \times V_{IOSM}$ Minimum 10 kV, 50 surge strikes (unipolar)	Test voltage = $1.6 \times V_{IOSM}$ Minimum 10 kV, 50 surge strikes (bipolar, 25 each polarity)
Max working/repetitive isolation voltage determination, $V_{IOWM}$ , $V_{IORM}$	Insulation lifetime data is not required	Based on insulation lifetime data analysis
Partial discharge test voltage, $V_{PD(M)}$ (reinforced)	$1.875 \times V_{IORM}$	$1.875 \times V_{IORM}$
Minimum rated lifetime (reinforced)	Not defined	20 years x 1.875 (safety margin)
Failure rate over lifetime	Not defined	< 1 ppm
Standard / certification expiration	January 2020	No set expiration date

# Where can I find more certification information?

Overview | Design & development | Technical documents | Support & training | Capacitive isolation

## Isolation solutions

High-voltage isolation for robust and reliable system operation

### Digital isolators & digital isolators with power

Basic and reinforced isolators, including isolators with integrated power, to transmit bit streams up to 100 Mbps over the isolation barrier

Search products:

Digital isolators

### Isolated interface

Basic and reinforced devices used to isolate the digital interface between the microcontroller and the communication bus

Search products:

Isolated RS-485  
Isolated CAN  
Isolated I2C  
Isolated LVDS

### Isolated gate drivers

Basic and reinforced isolated gate drivers that accept a low-power input from a controller IC and produce the appropriate high-current gate drive for a power switch (MOSFET, IGBT, SiC, GaN)

Search products:

Isolated gate drivers

### Isolated ADCs & amplifiers

Isolated modulators and isolated amplifiers used to isolate and monitor I/V parameters on high-voltage nodes for control and metrology applications

Search products:

Isolated ADCs  
Isolated amplifiers

Build your expertise with TI Precision Labs - Isolation

Check out this comprehensive curriculum of training videos covering everything from essential isolation parameters and certifications, to understanding how to design and troubleshoot with each type of isolation device.

Watch the video series >

What is TI's capacitive isolation advantage?

TI's capacitive isolation technology enables the industry's highest isolation ratings and longest lifetime reliability. Discover the high performance advantages of capacitive isolation from one of our high-voltage technology experts.

Watch the video series >

### Technical resources

Check product certifications

Isolation certifications make sure that your applications meet worldwide industry standards. Find isolators that meet each certification requirement.

Check certifications >

Isolation reference designs

Browse our complete board-level and system-level reference design circuits to help you quickly evaluate and customize your system.

Search designs >

Online support

Visit our TI E2E™ community to ask questions, share knowledge and help solve problems with fellow engineers.

Visit TI's E2E™ community >

## TI.com/isolation

Overview | Products | Featured products | Reference designs | Design & development | Technical documents | **Certifications**

## Isolate digital signals with our digital isolators

Highest working voltage, lowest emissions, lowest power and highest efficiency with integrated-power

Explore our portfolio of basic and reinforced digital isolators based on a proprietary silicon dioxide (SiO<sub>2</sub>) insulation barrier for industry-leading performance. We offer high-voltage, high-speed, low-power, small-size, integrated-power and low-cost solutions for every application including industrial and automotive.

### Quick search

Integrated isolated power:

Number of channels (#):  to

Forward/revers channels:

Isolation rating (Vrms):  to

Data rate (Max) (Mbps):  to

Default output:

### One-click search

Find specific parts with one click:

- Reinforced isolation (39)
- Low power (21)
- Automotive (33)

# Where can I find more certification information?

## Digital isolators – Certifications

We make sure that our devices meet worldwide industry standards for automotive and industrial designs. Multiple independent certification laboratories test and certify our isolated devices for electrical insulation strength. For more information, read the technical article, "Our isolators are certified. Are yours?".

Use the table to quickly see the certifications for each digital isolator. To learn more about the specific product certifications, click on the links below or scroll down the table. To find our certification documents, go to our [isolation technical documents](#) and search under "More literature".

### View certifications by device type

Digital isolators      Isolated RS-485      Isolated CAN      Isolated I2C

Isolated LVDS      Isolated gate drivers      Isolated ADCs      Isolated amplifiers

[Find digital isolation certification documents >](#)

### Digital isolators certification tables

[Expand all](#)

#### Single Channel Digital Isolators

Part number	UL 1577 (Vrms)				VDE 0884		CSA 60950-1		CSA 61010-1		CSA 60601-1	TUV EN 60950-1		TUV EN 61010-1		CQC GB4943.1-2011		
	2500	3000	5000	5700	Basic	Reinforced	Basic	Reinforced	Basic	Reinforced	Reinforced	Basic	Reinforced	Basic	Reinforced	Basic	Reinforced	
ISO721	☑				☑		☑	☑										
ISO721M	☑				☑		☑	☑										
ISO722	☑				☑		☑	☑										
ISO722M	☑				☑		☑	☑										
ISO7310C		☑			☑		☑	☑	☑	☑								☑
ISO7710		☑	☑			☑	☑	☑			☑	☑	☑	☑	☑	☑	☑	☑
ISO7810				☑		☑	☑	☑			☑	☑	☑	☑	☑			☑


#### Dual Channel Digital Isolators

# Where can I find more certification information?

## TI.com product folders

ISO7741 ACTIVE  
High-speed, low-power, robust EMC quad-channel digital isolator

In English  Alert me

 DATASHEET  
ISO774x High-Speed, Robust-EMC Reinforced Quad-Channel Digital Isolators datasheet (Rev. F)  
[View now](#) [Download](#)

**Top purchased products for ISO7741**

Part number	Buy from TI store	TI store inventory	Price   QTY	Package   Pins
ISO7741DBQ	<a href="#">Add to cart</a>	4798	1.69   1ku	SSOP (DBQ)   16
ISO7741DW	<a href="#">Add to cart</a>	5550	1.85   1ku	SOIC (DW)   16
ISO7741FDBQR	<a href="#">Add to cart</a>	4897	1.41   1ku	SSOP (DBQ)   16

[View all \(8\) >](#)

Description & parameters **Technical documents** Design & development [Order now](#) Quality & packaging Support & training

[Datasheet](#) | [Errata](#) | [Application notes](#) | [Technical articles](#) | [User guides](#) | [Selection & solution guides](#) | [White papers](#) | [Design files](#) | [Radiation & Reliability reports](#) | [More literature](#) | [Third party documents](#)

**Datasheet (1)**

Title	Type	Size (KB)	Date
<a href="#">ISO774x High-Speed, Robust-EMC Reinforced Quad-Channel Digital Isolators datasheet (Rev. F)</a>	PDF	2661	26 Feb 2019

**More literature (5)**

Title	Type	Size (KB)	Date
<a href="#">VDE certificate for reinforced isolation for DIN VDE V 0884-11:2017-01 (Rev. M)</a>	PDF	9617	27 Sep 2019
<a href="#">TUV certificate for isolation devices (Rev. H)</a>	PDF	3391	13 Sep 2019
<a href="#">CQC Certification (Rev. F)</a>	PDF	5433	13 Sep 2019
<a href="#">UL Certification (Rev. N)</a>	PDF	830	30 Jul 2019
<a href="#">CSA Certification (Rev. O)</a>	PDF	1294	28 Aug 2018

# Where can I find more certification information?

## 7.7 Safety-Related Certifications

VDE	CSA	UL	CQC	TUV
Certified according to DIN VDE V 0884-11:2017-01	Certified according to IEC 60950-1, IEC 62368-1 and IEC 60601-1	Certified according to UL 1577 Component Recognition Program	Certified according to GB 4943.1-2011	Certified according to EN 61010-1:2010 (3rd Ed) and EN 60950-1:2006/A2:2013
Maximum transient isolation voltage, 8000 V <sub>PK</sub> (DW-16) and 4242 V <sub>PK</sub> (DBQ-16); Maximum repetitive peak isolation voltage, 2121 V <sub>PK</sub> (DW-16, Reinforced) and 566 V <sub>PK</sub> (DBQ-16); Maximum surge isolation voltage, 8000 V <sub>PK</sub> (DW-16) and 4000 V <sub>PK</sub> (DBQ-16)	Reinforced insulation per CSA 60950-1-07+A1+A2 and IEC 60950-1 2nd Ed., 800 V <sub>RMS</sub> (DW-16) and 370 V <sub>RMS</sub> (DBQ-16) max working voltage (pollution degree 2, material group I); 2 MOPP (Means of Patient Protection) per CSA 60601-1:14 and IEC 60601-1 Ed. 3.1, 250 V <sub>RMS</sub> (DW-16) max working voltage	<b>DW-16:</b> Single protection, 5000 V <sub>RMS</sub> ; <b>DBQ-16:</b> Single protection, 3000 V <sub>RMS</sub>	<b>DW-16:</b> Reinforced Insulation, Altitude ≤ 5000 m, Tropical Climate, 700 V <sub>RMS</sub> maximum working voltage; <b>DBQ-16:</b> Basic Insulation, Altitude ≤ 5000 m, Tropical Climate, 400 V <sub>RMS</sub> maximum working voltage	5000 V <sub>RMS</sub> (DW-16) and 3000 V <sub>RMS</sub> (DBQ-16) Reinforced insulation per EN 61010-1:2010 (3rd Ed) up to working voltage of 600 V <sub>RMS</sub> (DW-16) and 300 V <sub>RMS</sub> (DBQ-16)  5000 V <sub>RMS</sub> (DW-16) and 3000 V <sub>RMS</sub> (DBQ-16) Reinforced insulation per EN 60950-1:2006/A2:2013 up to working voltage of 800 V <sub>RMS</sub> (DW-16) and 370 V <sub>RMS</sub> (DBQ-16)
Certificate number: 40040142	Master contract number: 220991	File number: E181974	Certificate numbers: CQC15001121716 (DW-16) CQC18001199097 (DBQ-16)	Client ID number: 77311

## TI data sheets

# Where can I find more certification information?

TI  
data sheets

7.6 Insulation Specifications					
PARAMETER		TEST CONDITIONS	VALUE		UNIT
			DW-16	DBQ-16	
CLR	External clearance <sup>(1)</sup>	Shortest terminal-to-terminal distance through air	>8	>3.7	mm
CPG	External creepage <sup>(1)</sup>	Shortest terminal-to-terminal distance across the package surface	>8	>3.7	mm
DTI	Distance through the insulation	Minimum internal gap (internal clearance)	>21	>21	µm
CTI	Comparative tracking index	DIN EN 60112 (VDE 0303-11); IEC 60112	>600	>600	V
	Material group	According to IEC 60664-1	I	I	
	Overvoltage category per IEC 60664-1	Rated mains voltage ≤ 300 V <sub>RMS</sub>	I-IV	I-III	
		Rated mains voltage ≤ 600 V <sub>RMS</sub>	I-IV	n/a	
		Rated mains voltage ≤ 1000 V <sub>RMS</sub>	I-III	n/a	
<b>DIN VDE V 0884-11:2017-01<sup>(2)</sup></b>					
V <sub>IORM</sub>	Maximum repetitive peak isolation voltage	AC voltage (bipolar)	2121	566	V <sub>PK</sub>
V <sub>IOWM</sub>	Maximum working isolation voltage	AC voltage; Time dependent dielectric breakdown (TDDB) Test, see <a href="#">Figure 28</a>	1500	400	V <sub>RMS</sub>
		DC voltage	2121	566	V <sub>DC</sub>
V <sub>IOTM</sub>	Maximum transient isolation voltage	V <sub>TEST</sub> = V <sub>IOTM</sub> , t = 60 s (qualification); V <sub>TEST</sub> = 1.2 × V <sub>IOTM</sub> , t = 1 s (100% production)	8000	4242	V <sub>PK</sub>
V <sub>IOSM</sub>	Maximum surge isolation voltage <sup>(3)</sup>	Test method per IEC 62368-1, 1.2/50 µs waveform, V <sub>TEST</sub> = 1.6 × V <sub>IOSM</sub> (qualification)	8000	4000	V <sub>PK</sub>
q <sub>pd</sub>	Apparent charge <sup>(4)</sup>	Method a, After Input/Output safety test subgroup 2/3, V <sub>swi</sub> = V <sub>IOTM</sub> , t <sub>swi</sub> = 60 s; V <sub>pd(m)</sub> = 1.2 × V <sub>IORM</sub> , t <sub>m</sub> = 10 s	≤5	≤5	pC
		Method a, After environmental tests subgroup 1, V <sub>swi</sub> = V <sub>IOTM</sub> , t <sub>swi</sub> = 60 s; V <sub>pd(m)</sub> = 1.6 × V <sub>IORM</sub> , t <sub>m</sub> = 10 s	≤5	≤5	
		Method b1: At routine test (100% production) and preconditioning (type test) V <sub>swi</sub> = 1.2 × V <sub>IOTM</sub> , t <sub>swi</sub> = 1 s; V <sub>pd(m)</sub> = 1.875 × V <sub>IORM</sub> , t <sub>m</sub> = 1 s	≤5	≤5	
C <sub>IO</sub>	Barrier capacitance, input to output <sup>(5)</sup>	V <sub>IO</sub> = 0.4 × sin (2πft), f = 1 MHz	~1	~1	pF
R <sub>IO</sub>	Isolation resistance <sup>(5)</sup>	V <sub>IO</sub> = 500 V, T <sub>A</sub> = 25°C	>10 <sup>12</sup>	>10 <sup>12</sup>	Ω
		V <sub>IO</sub> = 500 V, 100°C ≤ T <sub>A</sub> ≤ 125°C	>10 <sup>11</sup>	>10 <sup>11</sup>	
		V <sub>IO</sub> = 500 V at T <sub>S</sub> = 150°C	>10 <sup>9</sup>	>10 <sup>9</sup>	
	Pollution degree		2	2	
	Climatic category		55/125/21	55/125/21	
<b>UL 1577</b>					
V <sub>ISO</sub>	Maximum withstanding isolation voltage	V <sub>TEST</sub> = V <sub>ISO</sub> , t = 60 s (qualification), V <sub>TEST</sub> = 1.2 × V <sub>ISO</sub> , t = 1 s (100% production)	5000	3000	V <sub>RMS</sub>

## TI Precision Labs

TI Precision Labs - ADCs (45)

TI Precision Labs - Amplifiers (63)

TI Precision Labs - Isolation (11)

**Introduction to Isolation (5)**

Isolated Amplifiers and Modulators (2)

Isolated Gate Drivers (4)

TI Precision Labs - Motor Drivers (8)

TI Precision Labs - Interface (14)

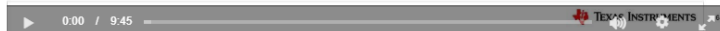
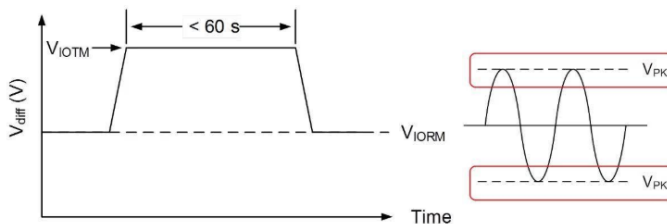
TI Precision Labs - Multiplexers (4)

TI Precision Labs - Sensors (22)

## 1.2 Isolation Parameters Overview

### $V_{IOTM}$ : Maximum Transient Isolation Voltage

Description: The peak transient voltage that can be handled without breaking down for up to 60 seconds



### Description

November 28, 2017

This section of the TI Precision Labs - Isolation series builds on the previous lesson by introducing the most common isolation parameters that are important to system designs and selecting the correct isolator product. These parameters describe the maximum voltage stresses that the isolator is designed to handle, and even the differences between a basic and reinforced isolator.

### PDFs for download

[QuestionsPL102.pdf](#)

### Additional information

[Learn more about TI's isolation portfolio and find the right isolation product for your design.](#)

Email

Select a topic (3)

### 1 Introduction to Isolation (5)

This section of training videos will discuss what isolation is, the three types of isolators, and how they achieve isolation. This course teaches the



1.1 Introduction to Isolation



1.2 Isolation Parameters Overview



1.3 How Digital Isolators Work



1.4 Digital Isolation: Creepage and Clearance



1.5 What is Reinforced Isolation?

# Additional resources available on TI.com

**Enabling high voltage signal isolation quality and reliability**

Tom Duffield  
High Voltage Development  
Tech Architect

TEXAS INSTRUMENTS

[Enabling high voltage signal isolation quality and reliability](#)

## Understanding isolation terminology and relevance

TEXAS INSTRUMENTS

This document serves as a quick guide to isolation terminology. The content compiled below can be a helpful reference for experienced designers or a starting point for engineers who are new to understanding isolation technologies. Learn more about isolation and explore TI's isolation portfolio and additional resources at [www.ti.com/iso](http://www.ti.com/iso).

Parameter	Definition	Relevance
Basic isolation	Isolation that can provide protection against high voltage as long as the barrier is intact.	Basic isolation needs to be coupled with another isolation barrier if human access is possible.
Reinforced isolation	Isolation that is equivalent to two basic isolation barriers in series.	Reinforced isolation by itself is sufficient as a safety barrier against high voltage.
$V_{max}$	The sinusoidal voltage isolator can tolerate for 60sec (defined in ms)	Tolerance to temporary overvoltage on supplies due to load changes, surging, etc.
$V_{UL}$	The unimodal voltage isolator can tolerate for 60sec (defined in ms)	
$V_{max}$	Maximum periodic voltage that the isolator has to handle on a continuous basis throughout its operating life (defined in ps)	The voltage that the isolator has to handle as part of normal operation (for eg. an isolator gate driver sees a $\mu$ k voltage equal to the DC bus voltage)
$V_{max}$	Maximum continuous working voltage that the isolator has to go continuous basis throughout its operating life (defined in ms)	
$V_{max}$	Maximum peak voltage of the 1.2us/50ns standard surge waveform that the isolator can handle.	Represents direct and indirect lightning strikes. Min 10kV required for reinforced isolation.
Coverage	Minimum distance from pins on side 1 to side 2 along the surface of the package	Limits working voltage or continuous voltage due to degradation along package surface (called tracking)
Clearance	Minimum distance from pins on side 1 to side 2 through the air	Limits peak voltages and surge voltages in system environment due to breakdown
CMTI	The maximum rate of change of ground potential difference (dV/dt) that the isolator can withstand without bit errors	Indicates robustness of isolator to ground noise, very important in gate driver applications

Learn more at [TI.com/ISO](http://TI.com/ISO)

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[Understanding isolation terminology and relevance](#)

## E2E™ support forums

Technical articles

### Our isolators are certified. Are yours?

Use electrical gadgets every day, and there are applicable [high-voltage safety standards](#) for designers to follow to help confirm that the gadgets that they design operate as expected from a safety perspective. Texas Instruments Inc. (TI) takes great care to produce components that meet component-level safety requirements of these standards.

Today, electrical equipment manufacturers use [digital isolators](#) for a variety of reasons, including safety and data integrity. If functional (non-safety) isolation is necessary, then the manufacturer's main concern is proper functioning of the equipment. On the other hand, if protecting against potential electric shock hazard is a requirement, many end equipment OEMs use third-party, independent regulatory compliance certification approvals including consideration for basic, double or reinforced isolation. Today, many end equipment designers frequently use digital isolators or semiconductor components with integrated isolation to provide the required level of isolation.

Basic isolation helps to provide a minimum level of protection against electric shock. For safety purposes, a supplementary isolation in addition to basic isolation may be required. Isolation comprising both basic and supplementary isolation is called double isolation. Reinforced isolation is a single isolation system which provides a degree of protection against electric shock equivalent to double isolation. Reinforced isolation may comprise several layers that cannot be tested individually as basic, insulation or supplementary isolation. Test & Measurement (T&M) equipment and Adjustable Speed Motor Drives are examples of end equipment that may require reinforced isolation.

TI's isolation integrated circuits (ICs) are tested and certified for electrical isolation strength by multiple independent certification laboratories around the world. A typical TI isolation product might have electrical safety approval bearing investigation and certification from the following five agencies:

- Underwriters Laboratories (UL)
- Canadian Standards Association (CSA)
- Association for Electrical, Electronic and Information Technologies (IEC)
- Technical Inspection Association (TUV)
- China Quality Certification Center (CQC)

UL is headquartered in the United States, while CSA is a Canadian organization. VDE and TÜV are based in Europe and CQC is a Chinese agency. UL, CSA, IEC and TÜV all are international entities with worldwide presence.

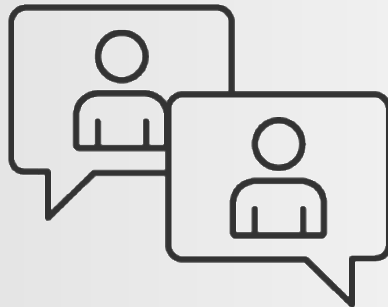
Once an isolation product manufacturer like TI obtains electrical safety certifications from each of the desired independent test agencies, equipment manufacturers can confidently use the devices in their products worldwide, provided the certified design ratings and other conditions of acceptance are effectively covered in the end product. Certification agencies not only test and evaluate digital isolators during qualification, but they also perform frequent audits of production facilities to help confirm that isolator manufacturers maintain the minimum electrical functional safety standard performance as initially qualified by the certification agencies. By using certified digital isolators, OEM and equipment manufacturers greatly benefit in terms of cost and time by avoiding extensive high-voltage isolation testing of the TI isolator during the end equipment certification by these agencies.

TI's isolation ICs are third party certified for multiple component and end-equipment electrical safety standards. Component standards such as German Institute for Standardization (DIN) VDE V0884-1:1998 V0884-1:2007-02 and UL 1877 evaluate the intrinsic insulation characteristics and high-voltage capabilities of TI isolators. End equipment electrical safety standards such as International Electrotechnical Commission (IEC) 60950-1, IEC 62310-1, IEC 60950-2 and IEC 60950-3 and IEC 60950-2:2011 assess the insulation capabilities of isolators in the context of specific end-equipment requirements. Table 1 shows various electrical safety certification standards providing the safety requirements for digital isolators.

[Our isolators are certified. Are yours?](#)

# Q & A

Visit our TI E2E™ support forums to receive direct support from our engineers throughout every step of your design.



<http://e2e.ti.com/>