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**.

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 insulation 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_{IOTM}	The sinusoidal voltage isolator can tolerate for 60sec (defined in pk)	Tolerance to temporary overvoltage on supplies due to load changes, arcing etc.
V_{ISO}	The sinusoidal voltage isolator can tolerate for 60sec (defined in rms)	
V_{IORM}	Maximum periodic voltage that the isolator has to handle on a continuous basis throughout its operating life (defined in pk)	The voltage that the isolator has to handle as part of normal operation (for eg. an isolated gate driver sees a pk voltage equal to the DC bus voltage).
V_{IOWM}	Maximum continuous working voltage that the isolator has to on a continuous basis throughout its operating life (defined in rms)	
V_{SURGE}	Maximum peak voltage of the 1.2us/50us standard surge waveform that the isolator can handle.	Represents direct and indirect lightning strikes. Min 10kV required for reinforced isolation.
Creepage	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 air breakdown
CMTI	The maximum rate of change of ground potential difference (GND1-GND2) that the isolator can withstand without bit errors	Indicates robustness of isolator to ground noise. Very important in gate-drive applications

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