

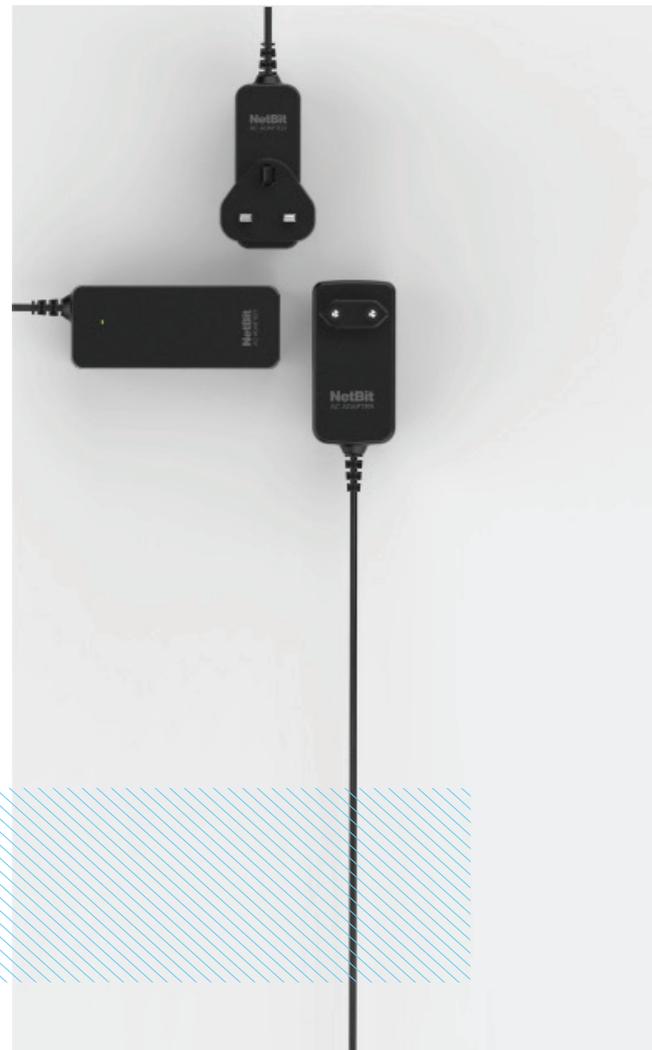


CONSEQUENCES OF OPEN NEUTRAL FAULT IN THE HOME & UL 1449

22nd March 2019

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BRIEF

This white paper will highlight why it is important that operators and companies supplying CPE power supplies voluntarily adopt the application of the UL1449 limited current abnormal over-voltage requirements to those power supplies, in addition to surge protective devices, if they wish to eliminate the possibility of fire during open neutral fault conditions.

BACKGROUND

Since the initial creation of the Underwriters Laboratory (UL) in 1985, UL1449 has provided the safety standards for Surge Sup-pression. This was originally titled, "The Standard for Safety for transient Voltage Surge Suppressor," which was formerly created to provide a framework for an industry that was developing rapid-ly. As time has elapsed, new developments and advanced tech-nologies have become available, resulting in the need for more precise standards. In September 29th 2009, the UL acted upon this transition by creating the UL1449 3rd Edition which has now become the primary safety standard for surge protective devices (SPDs).



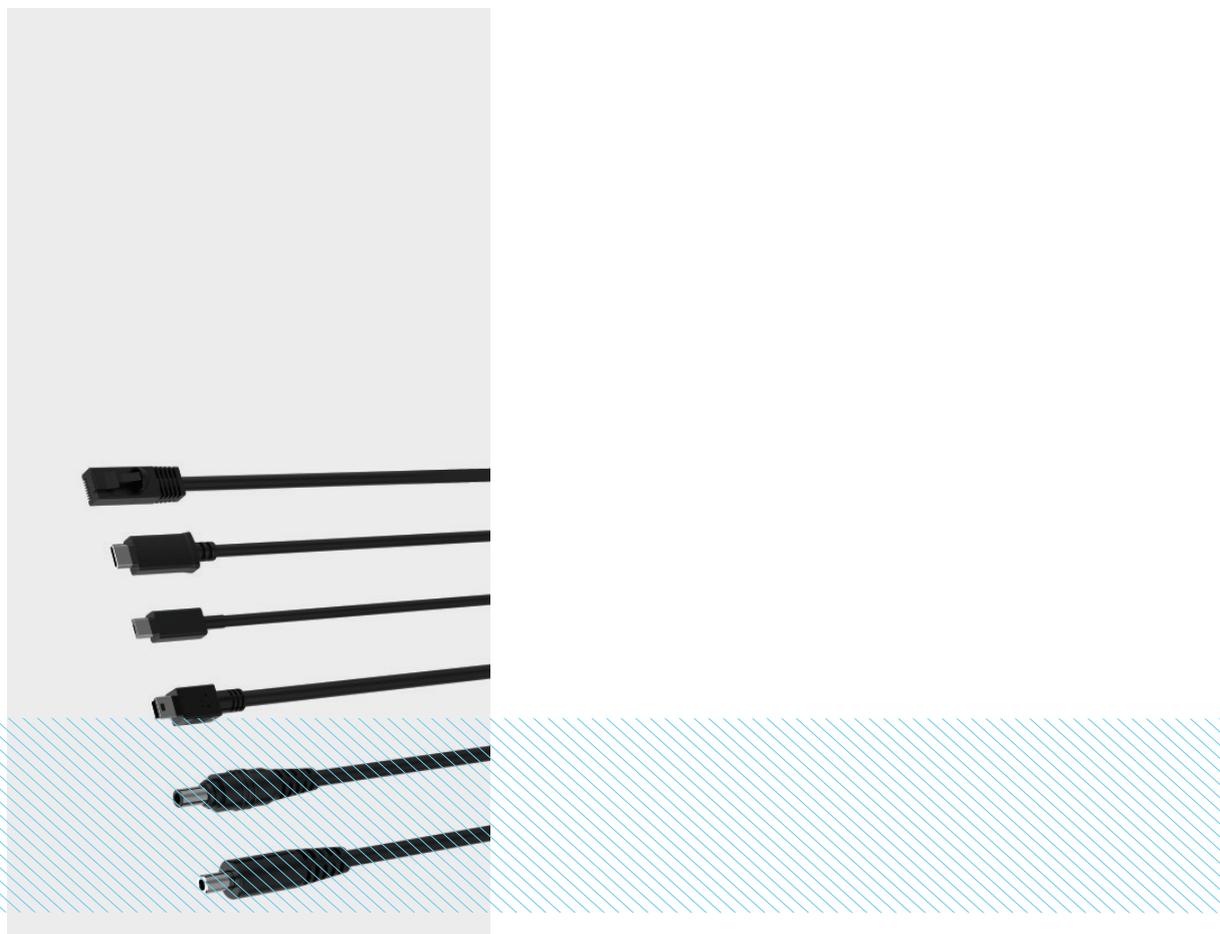
HOW UL 1449 CAN PREVENT HOUSE FIRES

Electronic equipment that contains transistors and integrated circuits such as: TV's, set-top boxes, modems, gateways and other customer premises equipment (CPE), are extremely vulnerable/susceptible to damage that can be caused by transient over-volt-ages (aka "surges") on the AC supply mains.

A MOV (Metal Oxide Varistor) is a voltage-dependent, nonlinear device that administers superior transient voltage suppression. The MOV has been specifically designed to protect electronic devices and semiconductor elements from switching and induced lightning surges.

Metal-oxide varistors (MOVs) used in CPE have been designed to clamp fast over-voltage transients in milliseconds. However, as a consequence of such speedy duration transients, MOVs inside SPD modules are open to experiencing temporary over-voltage conditions caused by the loss of neutral or by incorrect internal wiring during the installation period. Such conditions can cause stress to an MOV which results in thermal runaway and in turn, this can cause overheating, smoke and the danger of a potential fire.

UL 1449 safety standards for SPDs, define specific abnormal conditions under which devices must be tested to ensure absolute SPD safety. Robust SPD module designs will include thermal disconnects in order to protect the MOVs from thermal runaway.



HOW DOES UL 1449 RELATE TO CPE POWER SUPPLIES

Power Supplies for CPE (Customer Premises Equipment) applications are covered by different UL safety standards, primarily UL60590 and/or UL60065 which are now being combined into a common standard – UL62368. Whilst the vast majority of power supplies used in CPE applications will contain SPDs (MOVs) for lightning strike protection, the applicable safety standards as referenced above do not include tests to check behaviour under the same abnormal over-voltage limited current test conditions as the UL1449 standard. In practice, this can mean that even when a power supply uses an SPD (MOV) which is approved to the UL1449 standard there is still a possibility of fire, smoke and/or case deformation when the power supply is exposed to an open-neutral fault. In particular, the problem manifests itself when the current sourced into the power supply is drawn through a limited impedance which in turn prohibits the power supply's fuse from blowing in order to protect the device.

Some operators and CPE manufacturers are starting to recognise the potential for fires to occur in the home as result of this “loophole” and are now mandating that the power supplies deployed in customer premises are tested to the UL1449 standard in addition to the mandatory UL specifications. When testing in this manner the power supply itself is considered as an SPD and has to meet the “limited current abnormal overvoltage” requirements of the standard. Whilst this approach adds a small cost per unit to the power itself it can and will protect homes from fire and smoke damage and potentially save the loss of human life.

NETBIT AND THE USE OF UL 1449

NetBit is utilizing its extensive expertise in the field of CPE power to work directly with customers and operators to voluntarily adopt the application of the UL 1449 limited current abnormal over-voltage requirements. As a result, this will help to protect the end users from the risk of potentially catastrophic and life-threatening hazards. NetBit power solutions for CPE applications are now offered with the optional ability to comply with UL1449 limited current abnormal overvoltage requirements and give customers and end-users the peace of mind that their system is protected against these types of risks.