

UL TECHNICAL GUIDANCE DOCUMENTS

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Section / Paragraph Reference: Not Applicable
Subject: Type TL LED Driver Substitution

GUIDANCE:

1. Alternative Type TL drivers can be permitted without the need to conduct additional temperature tests when all the following conditions are met.

- a. The alternate Type TL driver input current and input power ratings are equal or lower than that of the original Type TL driver ratings,
- b. When the original Type TL LED driver is a constant current output type, the alternate Type TL driver output current setting (if adjustable) or rating (if not adjustable) should be equal or lower than that of the original TL driver;
- c. When the original Type TL driver is a constant voltage output type, the alternate Type TL driver output voltage rating should be equal to or lower than that of the original TL driver;
- d. The alternate TL driver output power setting (if adjustable) or rating (if not adjustable) should be equal or higher than that of the original TL driver;
- e. The alternate Type TL driver should have a $T_{ref\ max}$ equal to or higher than the temperature observed at T_c point on the original Type TL driver,
- f. The alternate Type TL driver should have a Measured T_{ref} equal to or lower than the Measured T_{ref} on the original Type TL driver,

In addition the following characteristics should be considered as part of the substitution decision.

- g. The alternate Type TL driver has the same supply connection method as the original Type TL driver,
- h. The alternate Type TL driver should have the same input type as the original Type TL driver,
- i. The alternate Type TL driver should have the same output type as the original Type TL driver- see notes below and
- j. The alternate Type TL driver should have the same environmental condition rating as the original Type TL driver- see notes below.

Notes:

- a. LED drivers with isolated, Class 2 or LVLE output types are also acceptable as alternate for a LED driver with non-isolated output. LED drivers with Class 2 or LVLE output types are also acceptable as alternate for a LED driver with isolated output. LED drivers with Class 2 output types are also acceptable as alternate for a LED driver with LVLE output.
 - b. LED drivers rated "wet" are also acceptable for use in damp and dry locations. LED drivers rated "damp" are also acceptable for use in dry locations.
2. Alternate Type TL drivers not meeting all item 1 conditions above should be evaluated by test or construction evaluation.
 3. Manufacturers can implement a 'no test' substitution in production. UL Follow UP Representatives may request any documentation related to the substitution choice during regular visits.

RATIONALE FOR GUIDANCE:

A Type TL LED Driver has been evaluated per applicable requirements of UL 8750 Certification Requirement Decision (CRD) dated 2014-04-28, as a thermally limited driver having the following characteristics:

- (a) The maximum case temperature at any point on the exterior surface of the driver is limited to 90 °C maximum under normal rated load conditions while tested in a uniform and standardized ambient environment.
- (b) The maximum case temperature at any point on the exterior surface of the driver is limited to 110 °C maximum under any condition of single component fault or under any overload condition including a shorted output, while tested in a uniform and standardized ambient environment.
- (c) Includes a manufacturer identified T_c point location on the exterior surface of the driver. There are 2 temperature values associated with T_c point.
 - I. $T_{ref\ max}$ is the maximum permitted temperature at the T_c point at which all components and materials in the LED driver are expected to operate below their thermal safety limits. As part of the Type TL LED driver program, the $T_{ref\ max}$ value specified by the manufacturer is verified (and adjusted as necessary).
 - II. The Measured T_{ref} value is the temperature observed at the T_c point during temperature testing.

Since Type TL drivers are tested using uniform loads and uniform environmental (including test chamber and specified ambient) conditions, the thermal ratings- Measured T_{ref} and $T_{ref\ max}$ - can be used to compare the thermal performance of one driver to another, so that substitution of drivers- with certain characteristics- can be allowed without the need for repeat testing.

UL 8750 CRD for Type TL LED Driver dated 2014-04-28.

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