

SpikeSafe Tj Measurement System

Thermal Resistance, Tj, K-factor Measurements

- Supports 1 or multiple DUTs
- Production in-situ Vf, R θ , and solutions available
- Industry Standard
JESD51-1 Electrical Test Method
- Supports Static or Dynamic Methods
- Data Logging to .csv file



One device Thermal Resistance System components include SpikeSafe current source, low current module, high speed sampling voltmeter, cabling and software application.

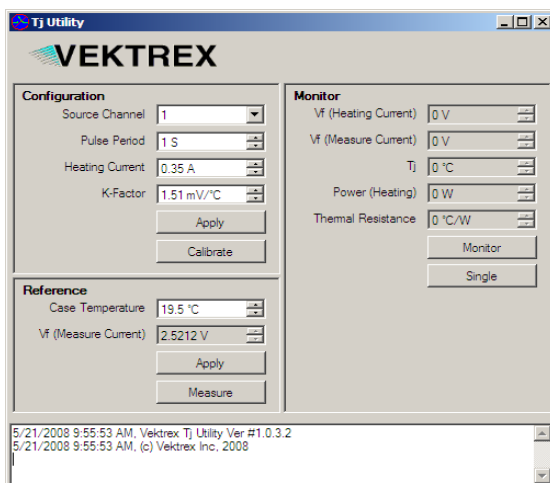
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Overview

The Thermal Resistance System provides an easy and accurate solution for determining K-Factor and measuring diode thermal resistance (R θ) and junction temperature (Tj) using the industry standard JESD51-1 Electrical Test Method. System configurations are available to support automated test of 1 device, 80 devices or more. Using the SpikeSafe 200 and the Tj Measurement System, Tj and R θ can easily be measured under high common mode voltage conditions, such as those found in series lighting circuits.

Tj Utility Application

The Tj Utility Application automates various Tj measurement steps. It features easy to use wizards that support automatic K-factor calibration and reference temperature measurement. The Tj Utility can take single Tj and R θ measurements, or it can be set to continuously monitor these parameters. Voltage measurement samples and the calculated Tj and R θ values are continuously logged to a file. The Tj Utility works with external in-place thermal management systems, such as ovens or thermal control platforms.



Windows based Tj Utility Application

Low Current Module

The Low Current module provides an adjustable DC current level from 0-6mA (0-24mA with high bias option). This module is factory installed in the 2U SpikeSafe 200 Chassis. A lockable potentiometer on the rear panel is provided for adjustment. This source is integrated into the SpikeSafe 200 and controlled with the SpikeSafe 200 Control Panel Application.

Applications

- ❑ LED Testing
- ❑ Lighting fixture design
- ❑ Thermal Modeling

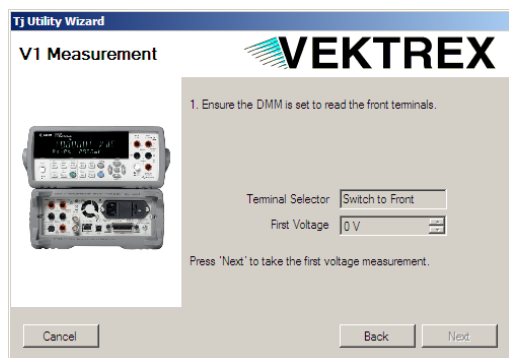
SpikeSafe 200 Tj Measurement System

Industry Standard Electrical Test Method

The industry standard JESD1-1 Electrical Test Method measures Tj using the diode junction's inherent voltage/temperature dependency. The diode is driven with a two-level pulsed current and voltage measurements are taken at both levels. These measurements are used to calculate Tj and Rθ.

K-Factor Calibration

A diode's voltage/temperature dependency is first characterized by a technique called K-factor calibration which uses a small measurement current level to bias the junction above the cut-in voltage. Vektrex's K-Factor wizard is an easy to use application that simplifies retrieving these necessary measurements.



K-Factor Wizard

High Speed 6 ½ Digit Sampling Voltmeter

Voltage and temperature measurements are made using a best-of-class 6 ½ digit sampling voltmeter. This voltmeter has excellent common mode rejection which allows it to make sensitive millivolt measurements after the current transitions from the high to low levels. The meter is activated by a trigger signal from the SpikeSafe 200. The meter also provides precise temperature measurement capability for K-factor calibration using a thermistor temperature sensor.

Specifications

| Overall | |
|--|---|
| Measurements: | Vf heating, Vf measurement, Tj, Rθ |
| Tj Resolution: | 0.1 degrees C |
| Tj Accuracy: | Dependant upon K-Factor calibration +/- 0.25C typical |
| Data Logging: | 1 set of log entries/SpikeSafe pulse |
| Measurement Position: | Adjustable in 20uS increments |
| Measurement Period: | 1 second typical |
| File Format: | Comma separated values (.csv) |
| Current Source | |
| Current Source, Heating: | SpikeSafe 200 precision pulsed current |
| Current Source, Measurement: | Low current DC Source |
| Low Current Source Range Normal: | 100uA - 6mA |
| Low Current Source Range High Bias Option: | 400uA - 24mA |
| Current Adjustment: | multi-turn potentiometer |
| Channel to channel current variation: | +/- 200uA |
| Current stability: | +/- 100uA |
| Meter | |
| Measurement aperture: | 20uS |
| Measurement ranges: | 10V, 100V |
| Meter Resolution: | 16 bit |
| Measurements taken: | 53/data point typical |
| Resolution: | 6 ½ digits |
| Thermistor: | 5K type |
| Applications | |
| Tj Utility, K-Factor Wizard: | Windows XP |



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