Two-Resistor Thermal Model Report

4.5V to 28V Input, 8.0A Integrated MOSFET Single Synchronous Buck DC/DC Converter BD9F800MUX-Z

In this report, thermal characteristics that can be confirmed by the thermal simulation using the Two-Resistor Thermal Model of a synchronous buck DC/DC Converter IC BD9F800MUX-Z is described. This document conforms to the definitions of terms in JESD51-13 Glossary of Thermal Measurement Terms and Definitions.

Components of BD9F800MUX-Z Two-Resistor Thermal Model

BD9F800MUX-Z Two-Resistor Thermal Model is shown in Table 1.

Table 1. The Value of Two-Resistor Thermal Model

Item	Unit	Value
θ_{JC_TOP}	°C/W	53.9
θ_{JB}	°C/W	7.2

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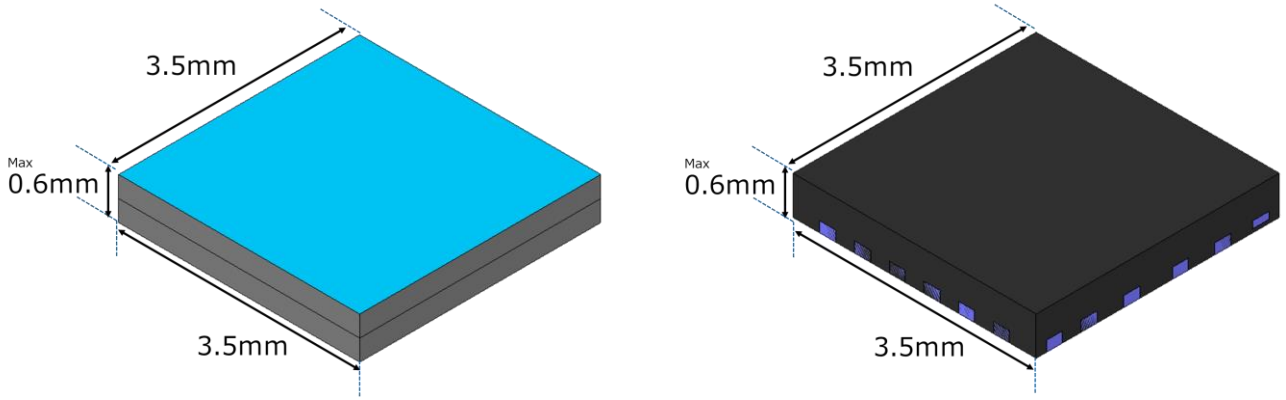

Figure 1. BD9F800MUX-Z Two-Resistor Thermal Model

In the CAE software environment, Two-Resistor Thermal Model is represented as the same size as the size of LSI package, as shown in Figure 1.

The physical arrangement of the Two-Resistor Thermal model consists of three nodes, as shown in Figure 2. The package contains a single integrated circuit and the temperature is represented by a single node. The thermal flow paths are represented using a thermal resistance network. Junction Node represents the heat source of the chip, Case Node represents the top surface of the package, and Board Node represents the board temperature at 1 mm from the edge of the device, respectively. Between the junction and the case and between the junction and the board are connected by two thermal resistances.

These thermal resistance values are derived from measurements based on the JEDEC Standard. If measured values are not available, they are extracted from a validated, detailed simulation model that simulates the measurement environment.

Extraction from the detailed model is done using a 3D thermal fluid analysis tool such as Simcenter Flotherm™*1.

For more detail about Two-Resistor Thermal Model, please refer to application note*2.

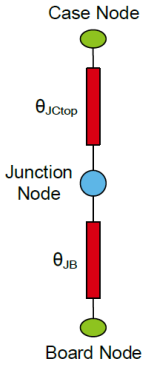

Figure 2. Physical arrangement of Two-Resistor Thermal Model

*1: Simcenter Flotherm™ is a trademark of Siemens Industry Software Inc.

*2: https://www.rohm.com/search/application-notes Document title: “Two-Resistor Model for Thermal Simulation”

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