R-C Thermal Model Parameters

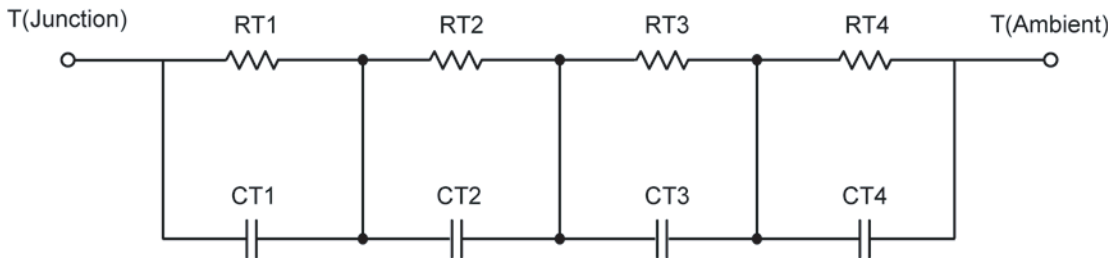
DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "A Simple Method of Generating Thermal Models for a Power MOSFET"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse Transient Thermal Impedance curves for the MOSFET.

R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included.

Note:
For a detailed explanation of implementing these values in P-SPICE, refer to Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform.

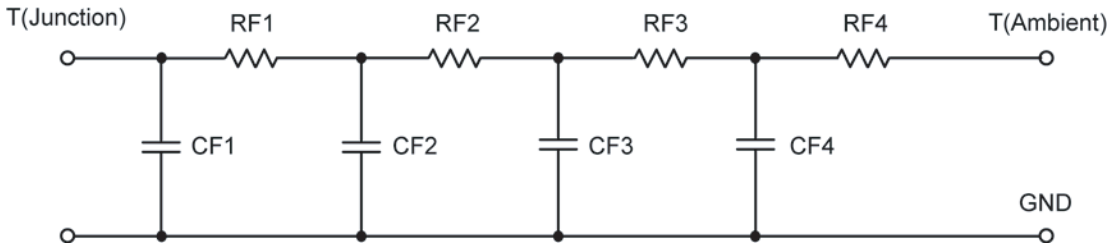
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
RT1	958.6109 m	2.6158 m	185.6655 µ
RT2	7.7501	381.2663 m	71.7125 m
RT3	11.4717	1.7221	950.3954 m
RT4	47.6099	1.3104	177.2356 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
CT1	386.8027 µ	67.2036 µ	559.6050 µ
CT2	356.7597 m	1.0300 m	5.1184 m
CT3	33.6036 m	34.7285 m	19.4889 m
CT4	1.3814	29.3605 m	4.5448 m

This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION

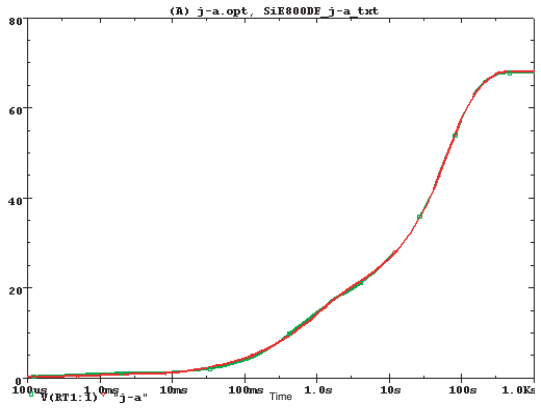


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
RF1	7.4187	2.6490 m	2.3337 m
RF2	7.0989	399.1700 m	302.9896 m
RF3	7.2919	1.8800	555.8412 m
RF4	46.0266	1.1338	337.9321 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
CF1	13.3779 m	110.1303 µ	616.1092 µ
CF2	77.0586 m	753.0523 µ	1.6215 m
CF3	9.7954 m	14.8148 m	1.6159 m
CF4	1.3066	5.6227 m	5.5801 m

Note: NA indicates not applicable

Reference:

[1] "A Simple Method of Generating Thermal Models for a Power MOSFET" by Wharton McDaniel and Kandarp Pandya, IEEE / SEMITHERM 2002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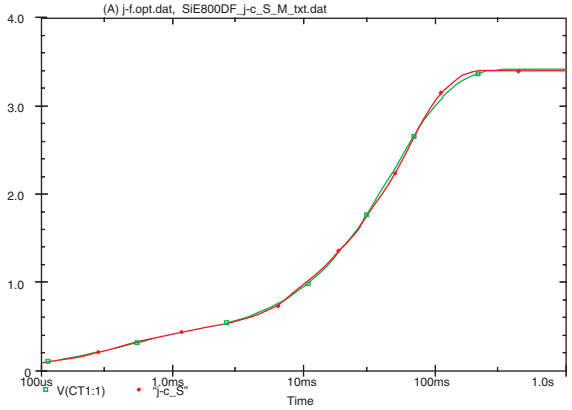
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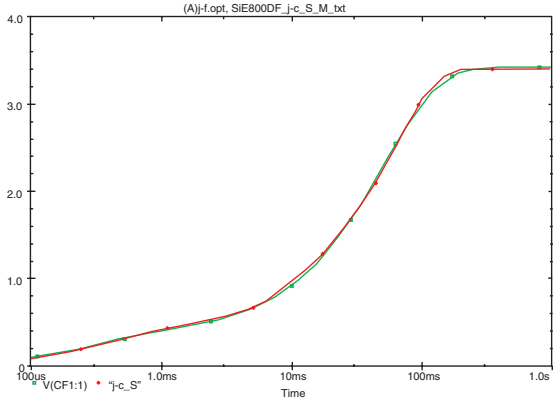
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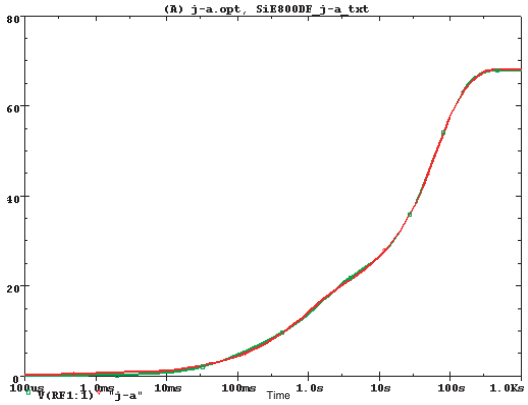
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"j-a"