R-C Thermal Model Parameters

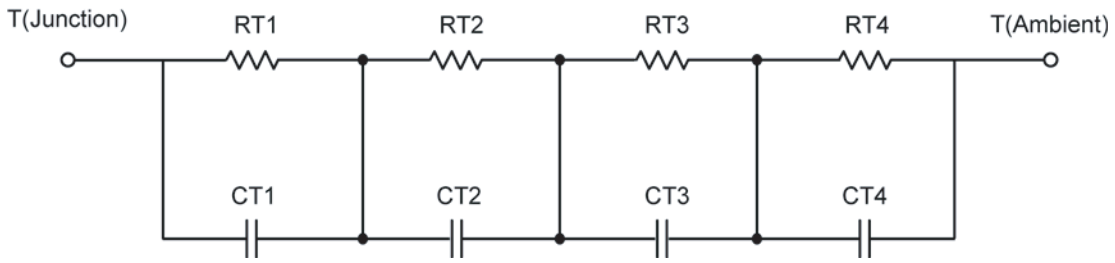
DESCRIPTION

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.

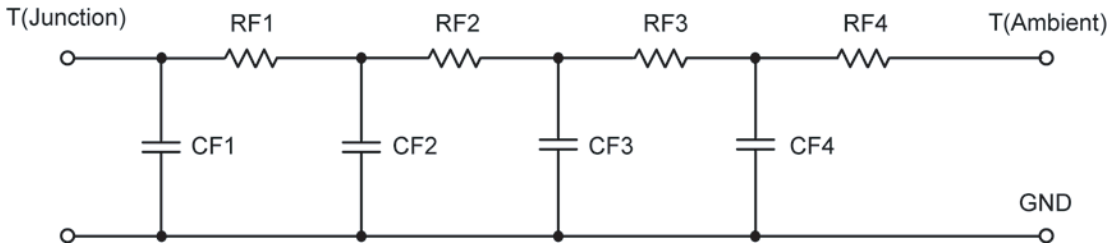
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
RT1	800.8191 m	1.8836 m	13.9369 m
RT2	7.3171	225.2602 m	563.7347 m
RT3	10.5922	1.3129	258.5365 m
RT4	49.1350	1.1755	167.1992 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
CT1	10.0497 m	49.6434 µ	347.5463 µ
CT2	588.1963 m	1.6560 m	30.1854 m
CT3	47.1217 m	48.9720 m	65.7388 m
CT4	1.4789	54.9761 m	3.0297 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

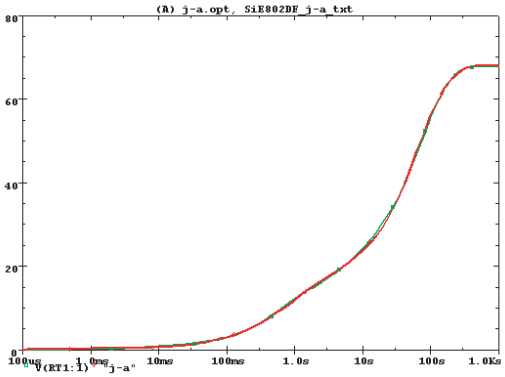


R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
RF1	8.6804	2.7253 m	3.2505 m
RF2	5.8765	244.8002 m	262.0894 m
RF3	5.9897	1.7199	498.7416 m
RF4	47.2176	757.7684 m	240.9187 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case Source**	**Case Drain Top**
CF1	25.1275 m	441.7276 µ	236.4508 µ
CF2	145.2098 m	1.4085 m	2.5538 m
CF3	17.5646 m	22.4924 m	20.2395 m
CF4	1.2744	24.3718 m	8.9116 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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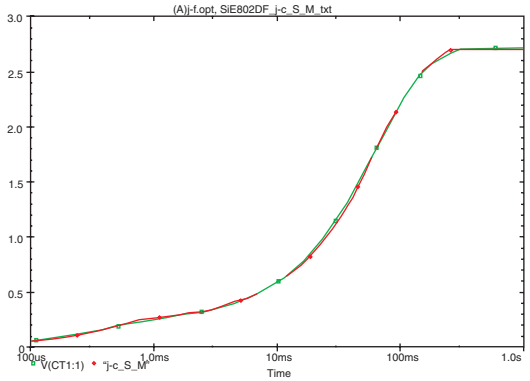
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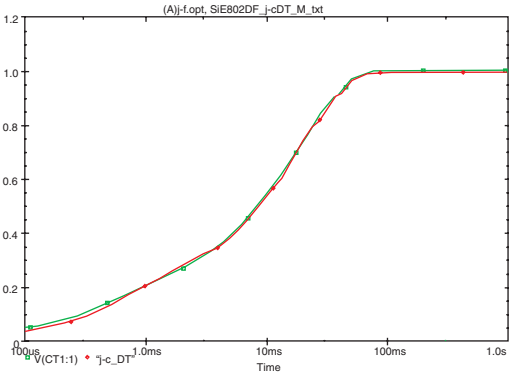
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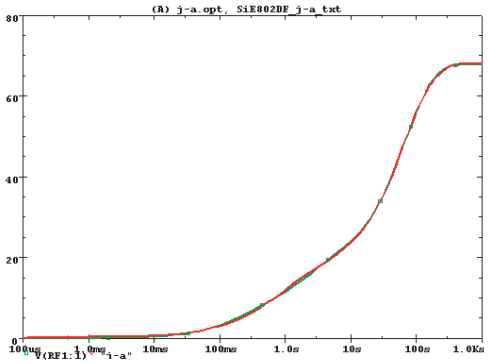
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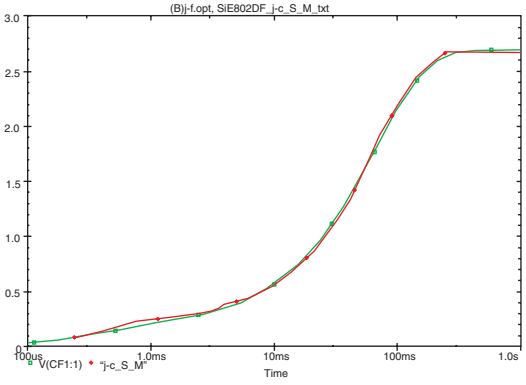
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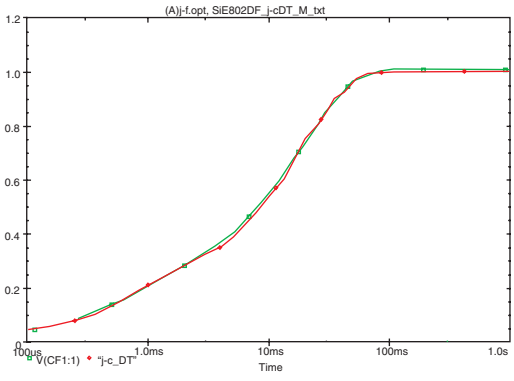
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