

R-C Thermal Model Parameters

DESCRIPTION

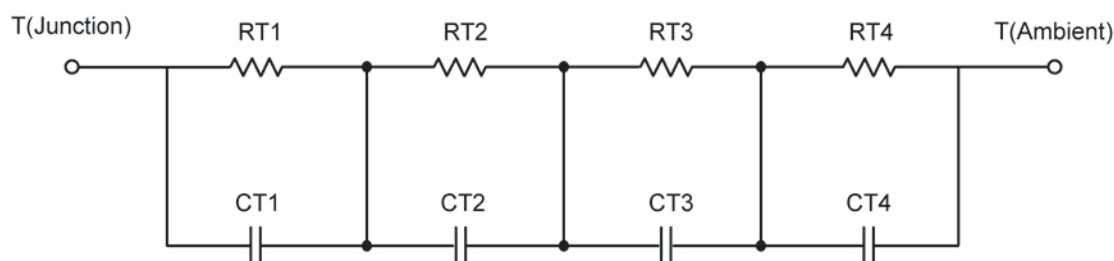
The parametric values in the R-C thermal model have been derived using curve-fitting techniques. These techniques are described in "[A Simple Method of Generating Thermal Models for a Power MOSFET](#)"[1]. When implemented in P-Spice, these values have matching characteristic curves to the Single Pulse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

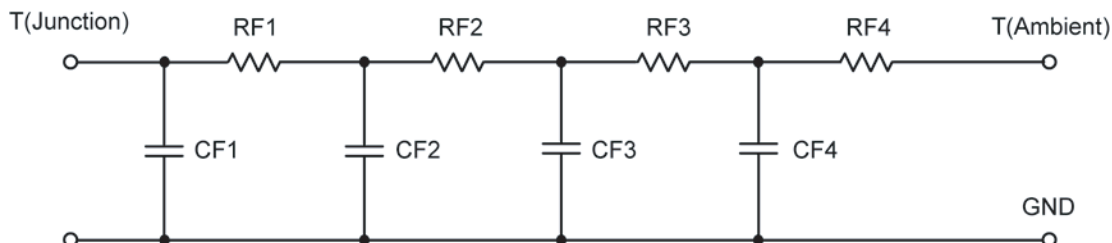
For a detailed explanation of implementing these values in P-SPICE, refer to [Application Note AN609 Thermal Simulations Of Power MOSFETs on P-SPICE Platform](#).

R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION					
Thermal Resistance (°C/W)					
Junction to	Ambient Nch	Ambient Pch	Case	Foot Nch	Foot Pch
RT1	25.5513	23.6015	N/A	12.2928	2.5189
RT2	4.1533	4.3225	N/A	9.1305	12.0402
RT3	29.6530	26.7280	N/A	14.1543	12.6614
RT4	59.6314	54.8533	N/A	4.2648	10.0004
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Nch	Ambient Pch	Case	Foot Nch	Foot Pch
CT1	5.5852 m	7.7151 m	N/A	5.6809 m	967.4206 u
CT2	555.9020 u	1.1699 m	N/A	12.5231 m	6.1953 m
CT3	64.4479 m	61.3101 m	N/A	76.7548 m	111.0801 m
CT4	1.1921	1.1764	N/A	2.2281 m	18.5315 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 Nch	Ambient Pch	Case	Foot Nch	Foot Pch
RF1	9.8595	7.8811	N/A	13.9521	2.2129
RF2	26.8209	27.1261	N/A	10.4036	22.1022
RF3	27.8104	25.2687	N/A	6.2315	12.4186
RF4	54.8011	49.4587	N/A	9.1727	7.8241
Thermal Capacitance (Joules/°C)					
Junction to	Ambient Nch	Ambient Pch	Case	Foot Nch	Foot Pch
CF1	1.0498 m	1.6964 m	N/A	1.5703 m	351.3387 u
CF2	6.4044 m	5.9649 m	N/A	4.6827 m	3.8561 m
CF3	71.7559 m	77.2045 m	N/A	10.7933 m	81.2761 m
CF4	1.2681	1.3219	N/A	110.5240 m	289.5496 m

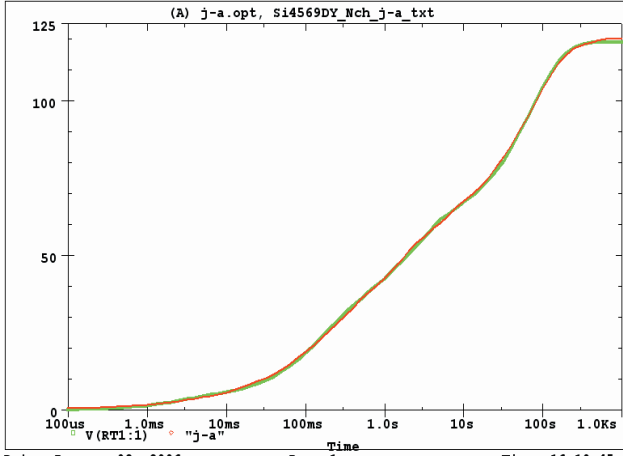
Note: NA indicates not applicable

Reference:

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

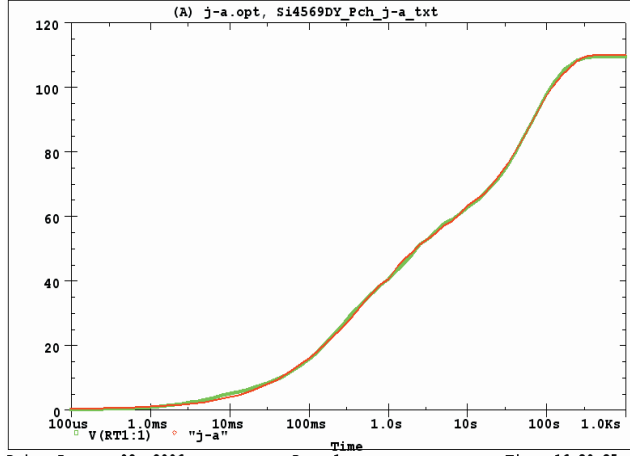


Si4569DY Nch Tank j-a Temperature: 27.0



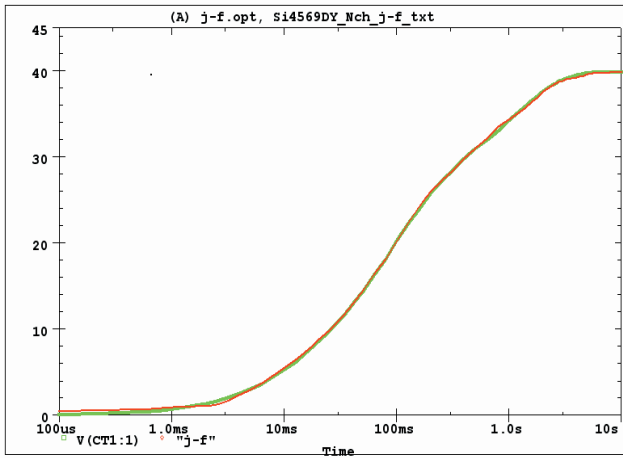
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Si4569DY Pch Tank j-a Temperature: 27.0



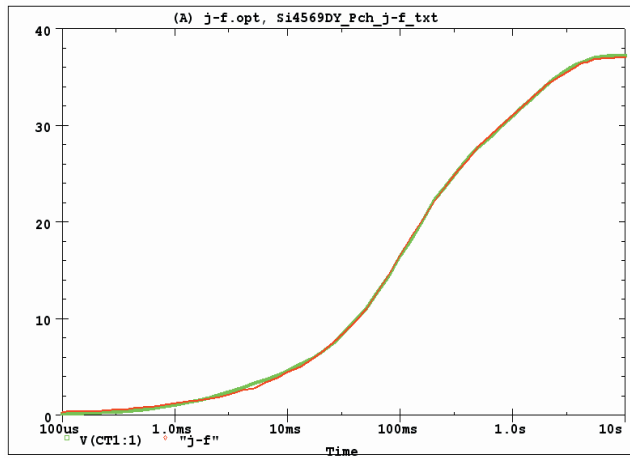
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Si4569DY Nch Tank j-f Temperature: 27.0



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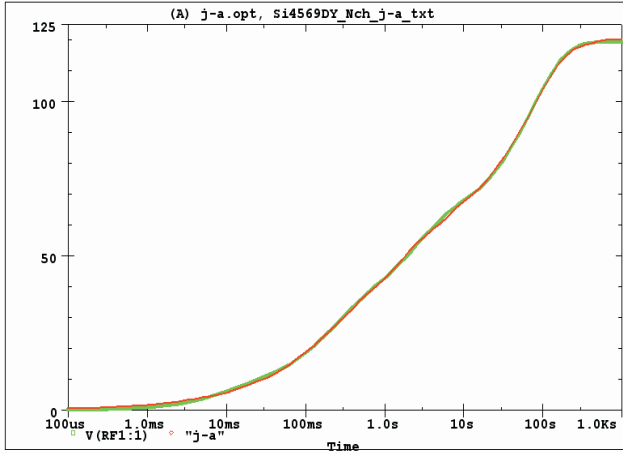
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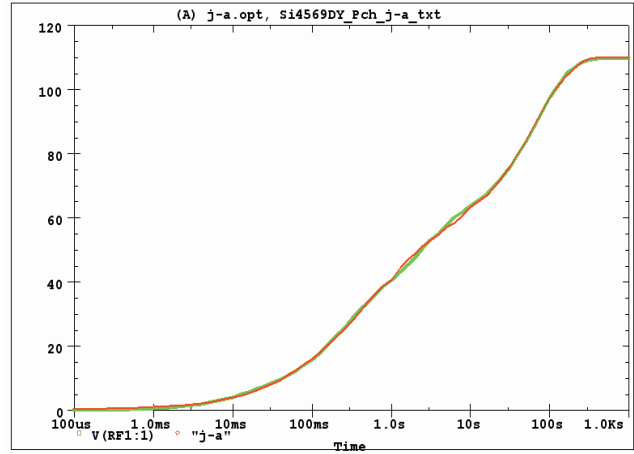


Si4569DY Nch Filter j-a Temperature: 27.0



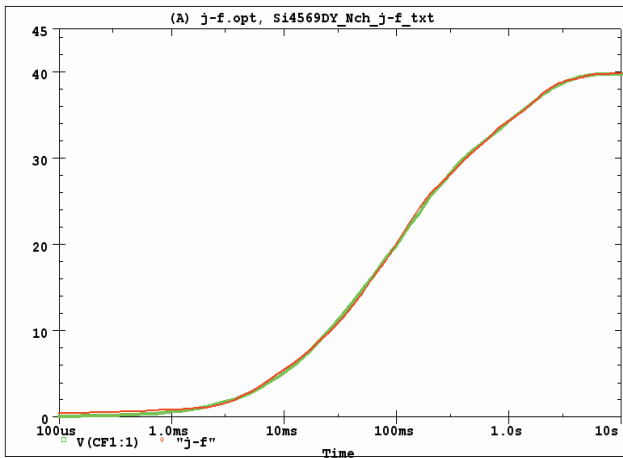
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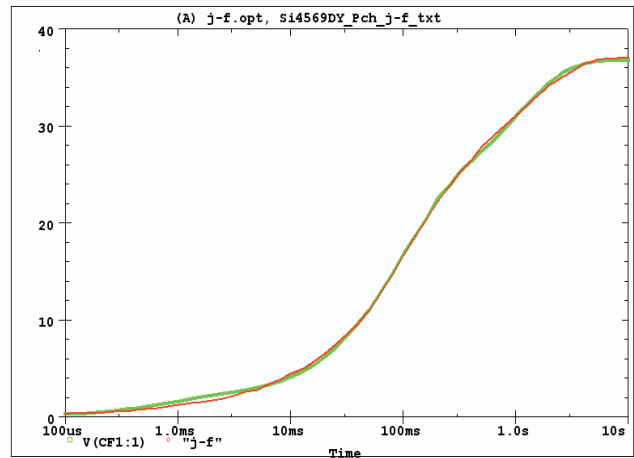
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Si4569DY Nch Filter j-f Temperature: 27.0



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Si4569DY Pch Filter j-f Temperature: 27.0



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