R-C Thermal Model Parameters

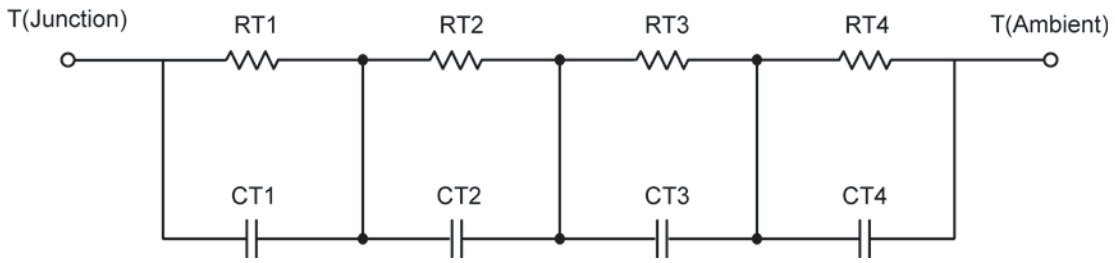
DESCRIPTION

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.

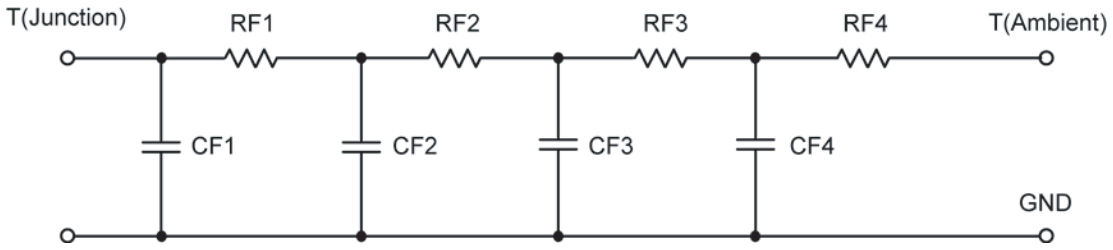
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	10.9251	N/A	10.1749
RT2	19.6096	N/A	4.9487
RT3	25.1784	N/A	4.2670
RT4	52.8429	N/A	16.1490
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	515.9460 u	N/A	3.9143 m
CT2	62.3604 m	N/A	404.9797 u
CT3	5.6981 m	N/A	175.3498 m
CT4	1.4434	N/A	7.4697 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



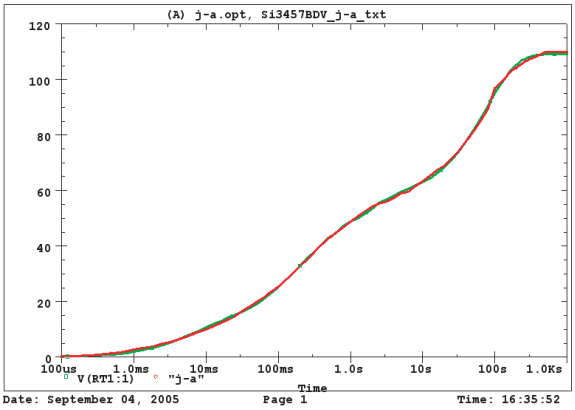
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	12.3929	N/A	3.4229
RF2	27.7596	N/A	12.1799
RF3	17.7652	N/A	15.9261
RF4	51.2598	N/A	4.0743
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	440.9928 u	N/A	203.2923 u
CF2	4.5773 m	N/A	1.1883 m
CF3	57.4890 m	N/A	4.1001 m
CF4	1.4299	N/A	151.5674 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

Si3457BDV Tank j-a Temperature: 27.0



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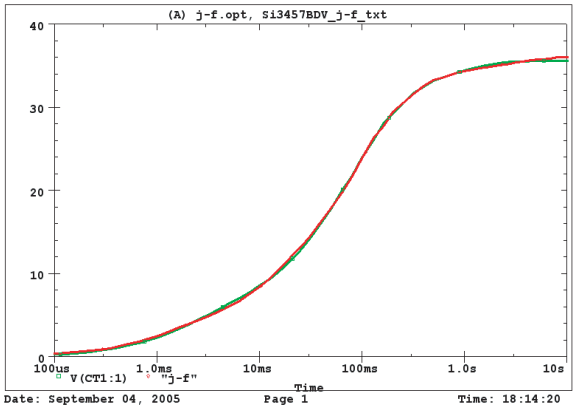
Si3457BDV Tank j-f Temperature: 27.0



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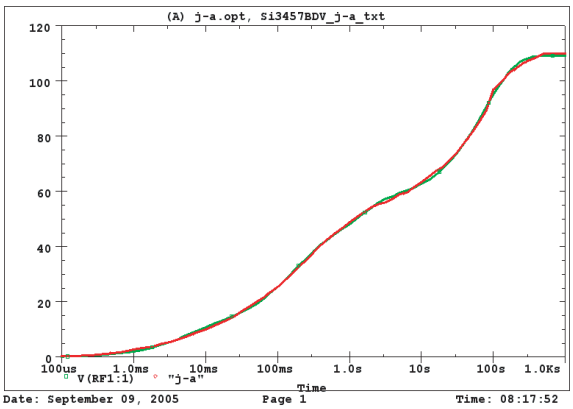
Si3457BDV Filter j-a Temperature: 27.0



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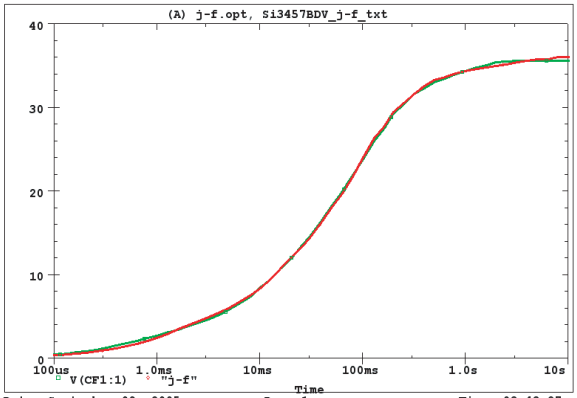
Si3457BDV Filter j-f Temperature: 27.0



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