R-C Thermal Model Parameters

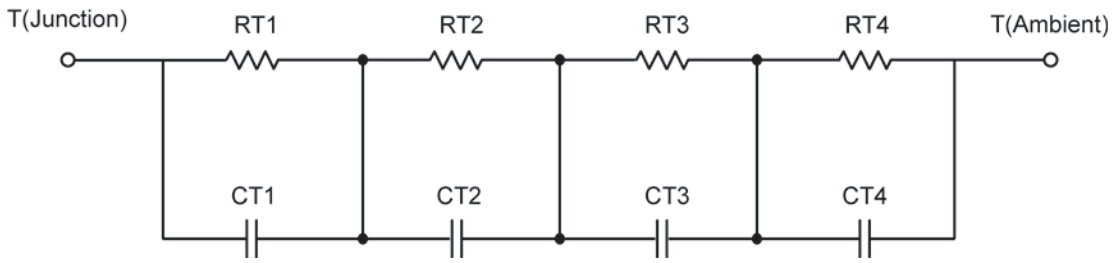
DESCRIPTION

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.

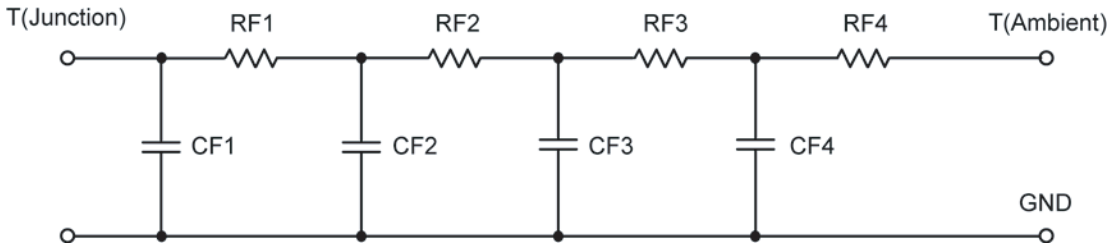
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.1646	N/A	253.8192 m
RT2	22.7237	N/A	4.1485
RT3	31.7971	N/A	6.6629
RT4	23.2083	N/A	4.9847
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	20.8422 m	N/A	18.9670
CT2	47.2729 m	N/A	155.1850 m
CT3	2.0384	N/A	257.9792 m
CT4	3.7242	N/A	13.8749 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



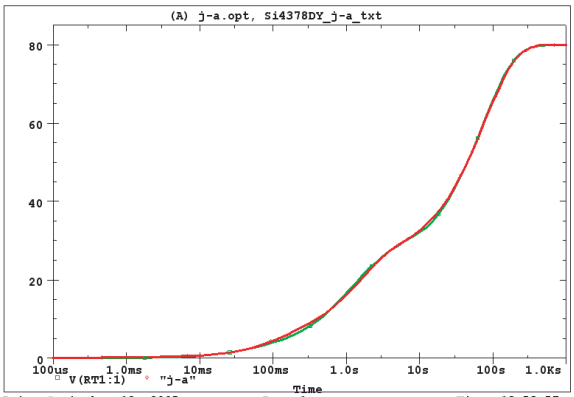
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.7489	N/A	4.7871
RF2	22.2239	N/A	3.9192
RF3	32.9041	N/A	6.5521
RF4	21.1242	N/A	755.2501 m
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	12.2646 m	N/A	10.3395 m
CF2	32.9132 m	N/A	32.2002 m
CF3	1.1221	N/A	127.3779 m
CF4	1.2290	N/A	3.8073

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

Si4378DY Tank j-a Temperature: 27.0



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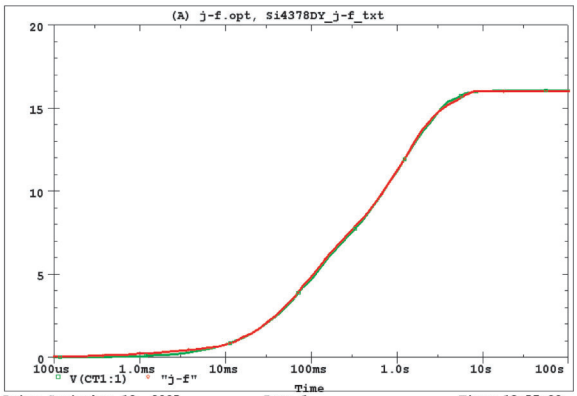
Si4378DY Tank j-f Temperature: 27.0



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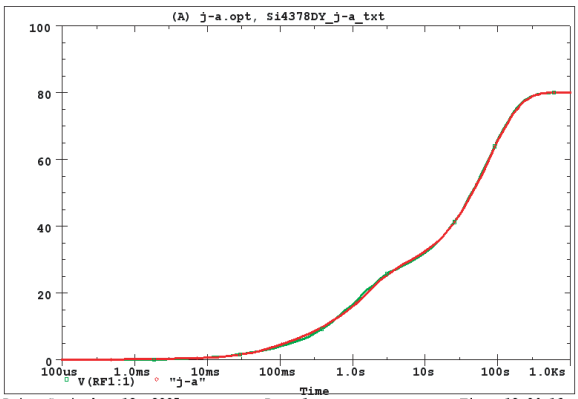
Si4378DY Filter j-a Temperature: 27.0



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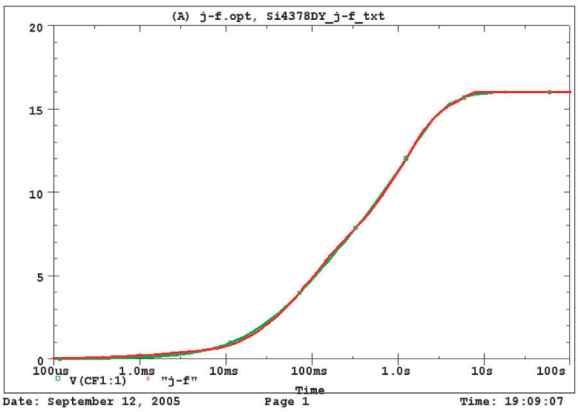
Si4378DY Filter j-f Temperature: 27.0



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