R-C Thermal Model Parameters

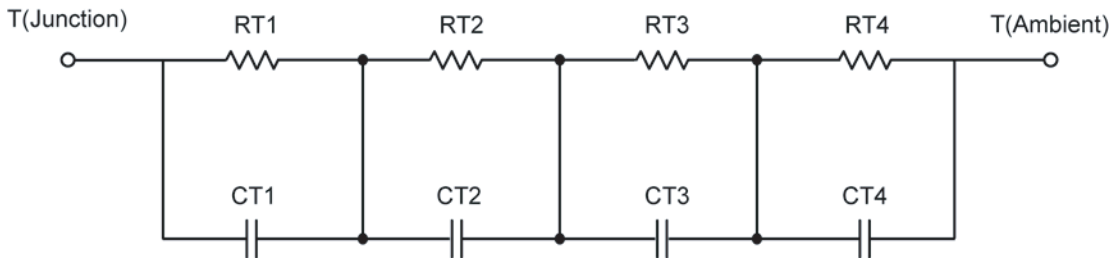
DESCRIPTION

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.

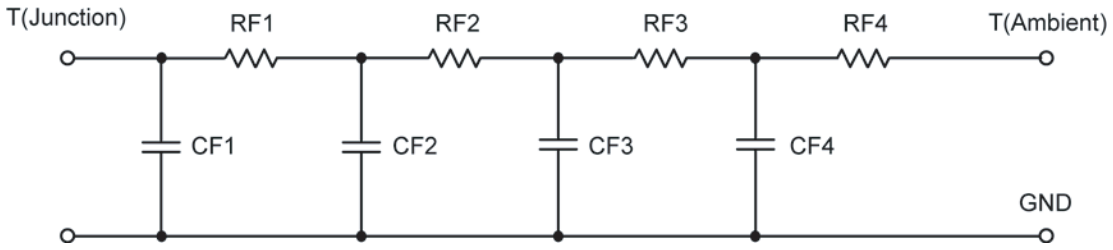
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	53.8273	N/A	48.1248
RT2	15.7691	N/A	12.9565
RT3	71.3851	N/A	8.6500
RT4	77.6408	N/A	30.4849
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.2390	N/A	592.9211 u
CT2	44.6763 u	N/A	49.6255 u
CT3	8.7732 m	N/A	265.2869 m
CT4	609.7718 u	N/A	2.9450 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

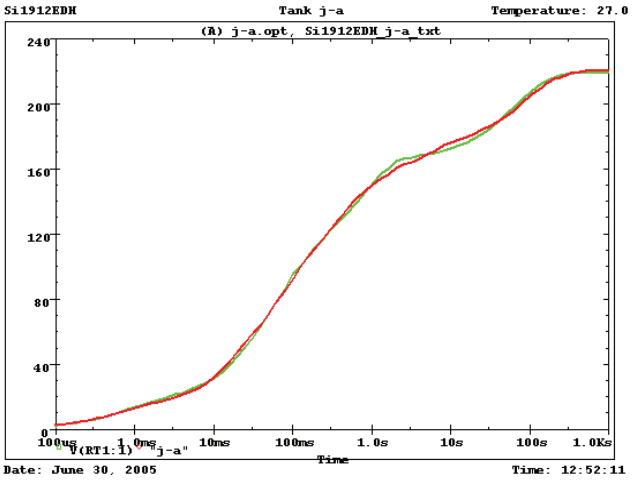


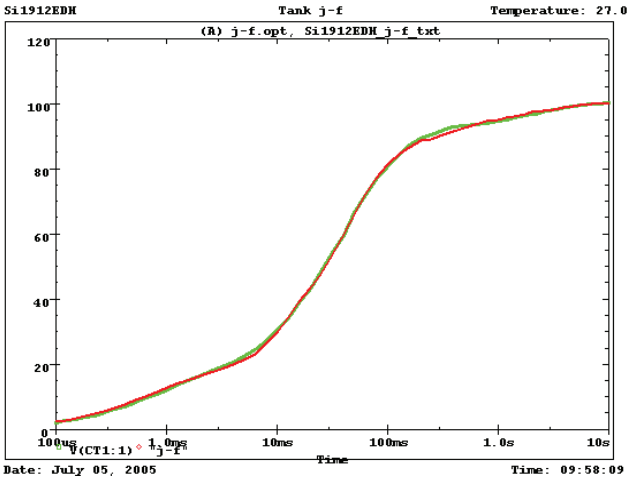
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	19.1328	N/A	15.0381
RF2	84.2059	N/A	69.9275
RF3	61.9466	N/A	108.4745 m
RF4	53.2796	N/A	14.2637
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	46.5958 u	N/A	39.2131 u
CF2	535.2194 u	N/A	486.6221 u
CF3	8.8692 m	N/A	22.8263 m
CF4	1.2326	N/A	25.3598 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


Si1912EDH
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si1912EDH_j-a_txt
240
200
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1) "j-a"
Time
Date: June 30, 2005
Time: 12:52:11


Si1912EDH
Tank j-f
Temperature: 27.0
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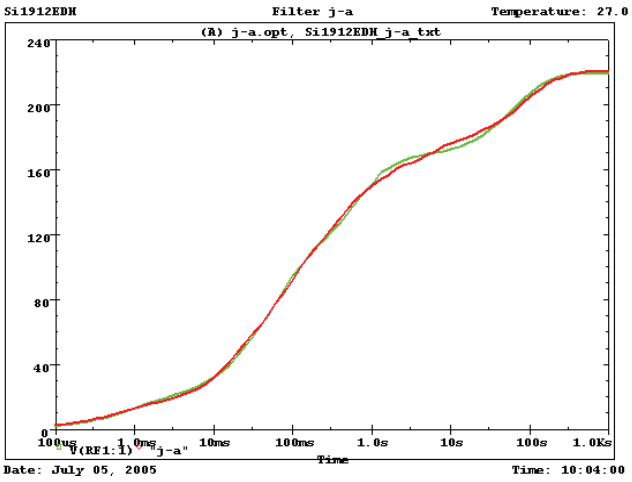
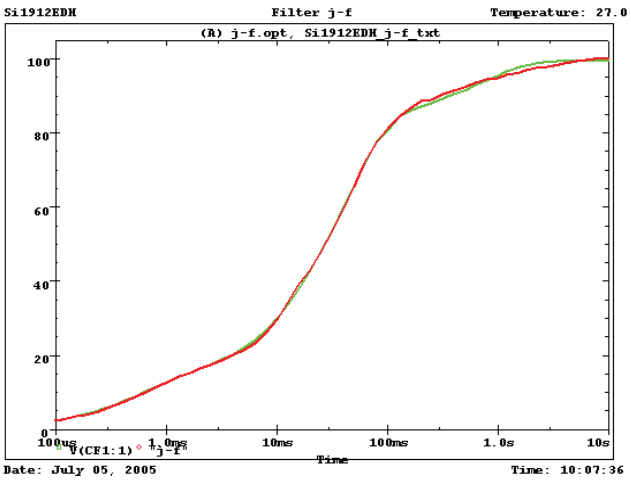
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) "j-f"
Time
Date: July 05, 2005
Time: 09:58:09


Si1912EDH
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si1912EDH_j-a_txt
240
200
160
120
80
40
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1) "j-a"
Time
Date: July 05, 2005
Time: 10:04:00


Si1912EDH
Filter j-f
Temperature: 27.0
(A) j-f.opt, Si1912EDH_j-f_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) "j-f"
Time
Date: July 05, 2005
Time: 10:07:36