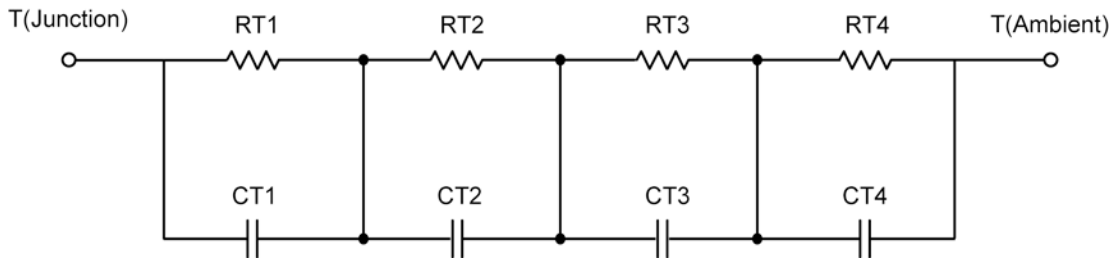
R-C Thermal Model Parameters

DESCRIPTION

The parametric values in the R-C thermal model have been derived using curve-fitting techniques. R-C values for the electrical circuit in the Foster/Tank and Cauer/Filter configurations are included. When implemented in P-Spice, these values have matching characteristic curves to the single-pulse transient thermal impedance curves for the MOSFET.

These RC values can be used in the P-SPICE simulation to evaluate the thermal behavior of the MOSFET junction temperature under a defined power profile. These techniques are described in Application Note AN609, "Thermal Simulation of Power MOSFETs on the P-Spice Platform."

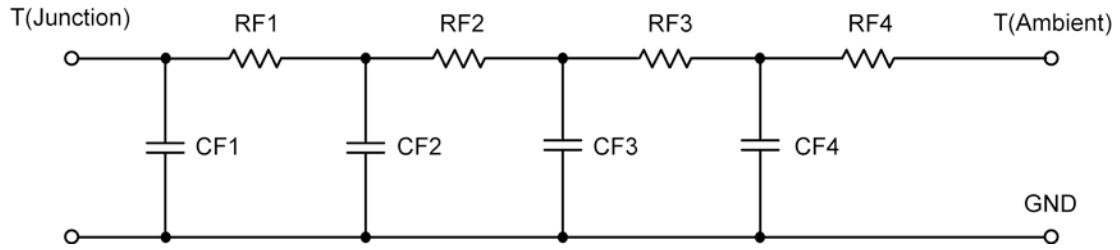
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.7181	520.4174 m	N/A
RT2	7.8179	204.6692 m	N/A
RT3	9.2726	671.4163 m	N/A
RT4	44.1914	103.4971 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	32.6883 m	33.0457 m	N/A
CT2	104.7284 m	1.2949 m	N/A
CT3	1.1804	23.7693 m	N/A
CT4	1.6137	15.3478 m	N/A

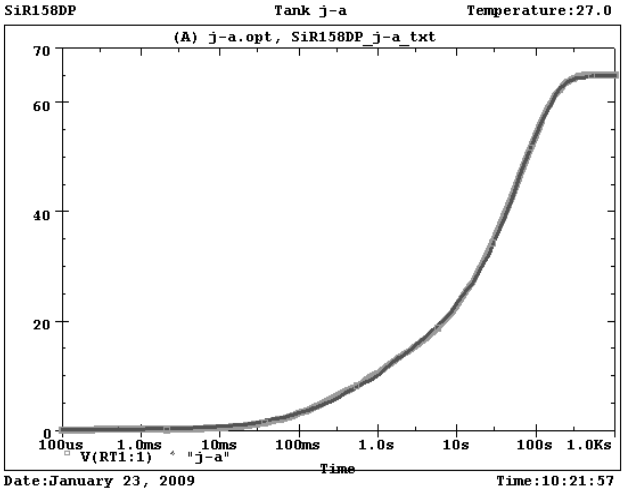
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

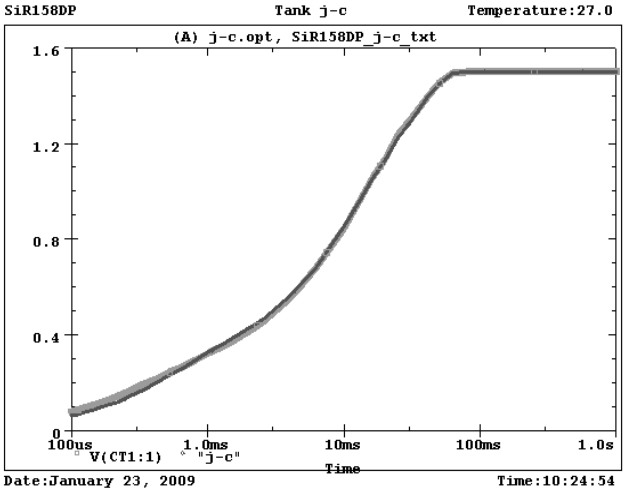
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.3381	96.9521 m	N/A
RF2	9.0265	369.0229 m	N/A
RF3	8.0464	463.8063 m	N/A
RF4	42.5890	570.2187 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	21.1671 m	723.1322 u	N/A
CF2	86.9363 m	2.1560 m	N/A
CF3	419.7924 m	12.5889 m	N/A
CF4	925.1198 m	1.5335 m	N/A

Note
NA indicates not applicable


SiR158DP
Tank j-a
Temperature:27.0
(A) j-a.opt, SiR158DP_j-a_txt
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:January 23, 2009
Time:10:21:57


SiR158DP
Tank j-c
Temperature:27.0
(A) j-c.opt, SiR158DP_j-c_txt
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
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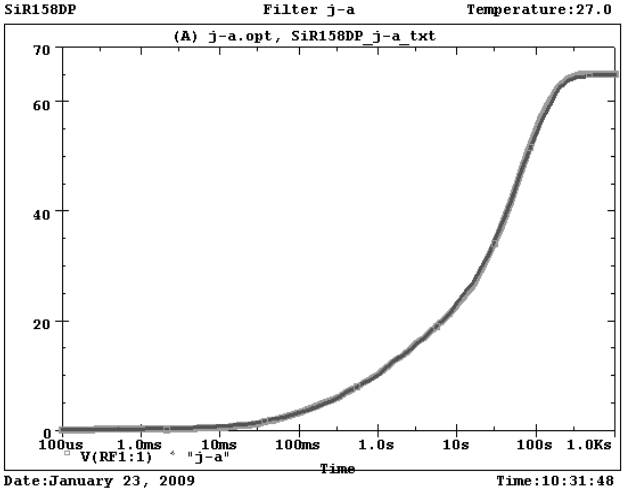
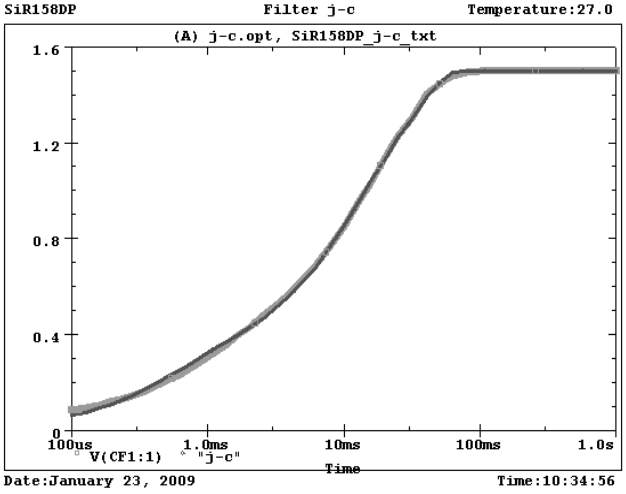
Time
Date:January 23, 2009
Time:10:24:54


SiR158DP
Filter j-a
Temperature:27.0
(A) j-a.opt, SiR158DP_j-a_txt
70
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:January 23, 2009
Time:10:31:48


SiR158DP
Filter j-c
Temperature:27.0
(A) j-c.opt, SiR158DP_j-c_txt
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date:January 23, 2009
Time:10:34:56