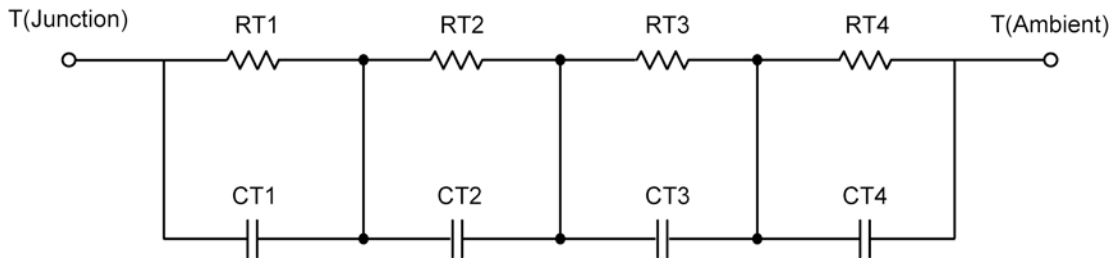
R-C Thermal Model Parameters

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."

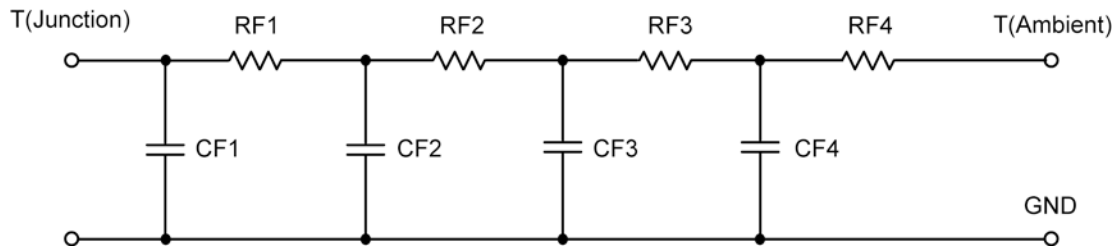
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	775.3000 m	434.9939 m	N/A
RT2	2.2923	163.1537 m	N/A
RT3	850.2000 m	269.4013 m	N/A
RT4	36.0822	382.4511 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	16.6116 m	2.3666 m	N/A
CT2	1.5618 m	1.9352 m	N/A
CT3	4.4794 m	9.2272 m	N/A
CT4	2.6501	17.7009 m	N/A

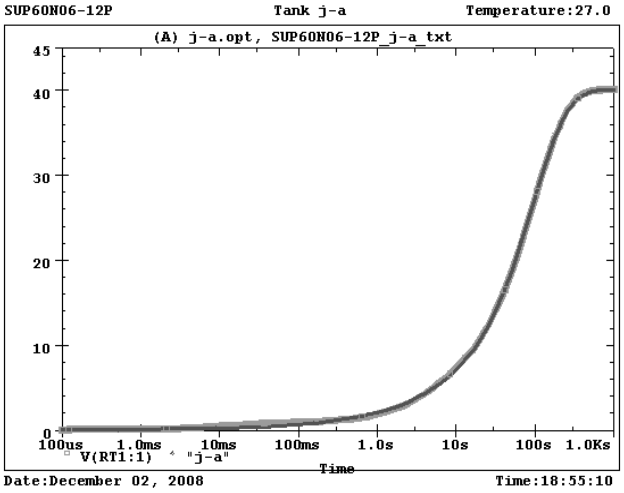
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

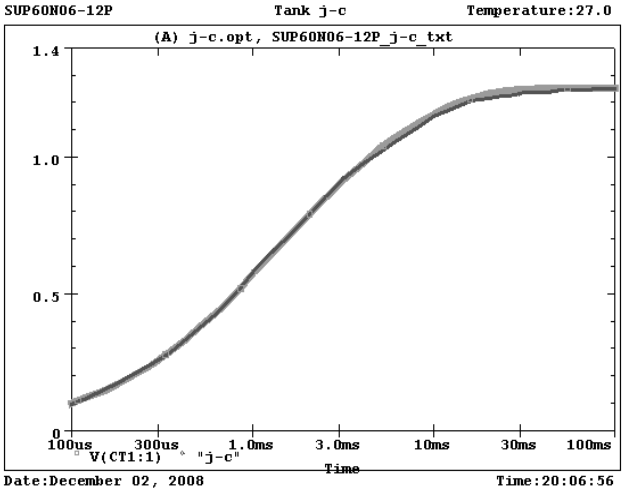
R-C THERMAL MODEL FOR FILTER CONFIGURATION

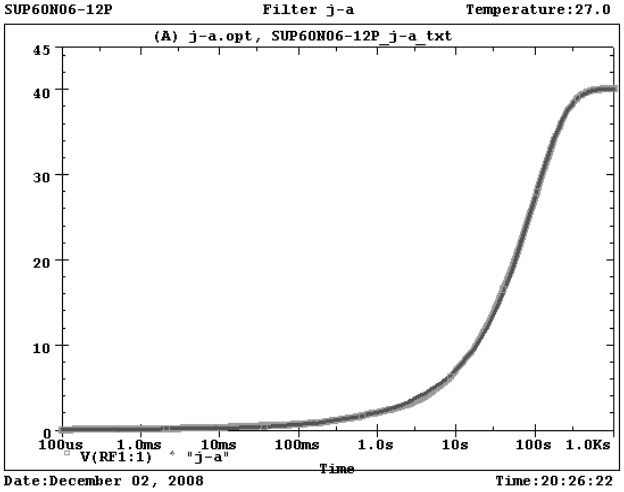


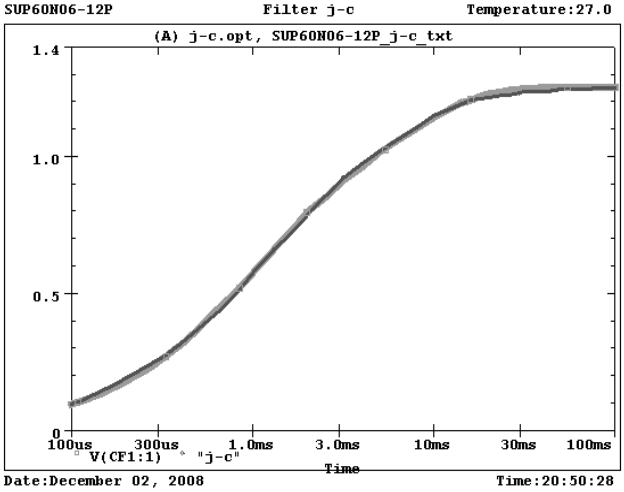
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	347.9000 m	193.2391 m	N/A
RF2	1.5435	614.2820 m	N/A
RF3	13.3075	229.6675 m	N/A
RF4	24.8011	212.8114 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	17.0211 m	879.1339 u	N/A
CF2	227.5601 m	237.9443 u	N/A
CF3	1.2410	8.0886 m	N/A
CF4	2.1120	16.5497 m	N/A

Note
NA indicates not applicable


SUP60N06-12P
Tank j-a
Temperature:27.0
(A) j-a.opt, SUP60N06-12P_j-a_txt
45
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:December 02, 2008
Time:18:55:10


SUP60N06-12P
Tank j-c
Temperature:27.0
(A) j-c.opt, SUP60N06-12P_j-c_txt
1.4
1.0
0.5
0
100us
300us
1.0ms
3.0ms
10ms
30ms
100ms
V(CT1:1)
"j-c"
Time
Date:December 02, 2008
Time:20:06:56


SUP60N06-12P
Filter j-a
Temperature:27.0
(A) j-a.opt, SUP60N06-12P_j-a_txt
45
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date:December 02, 2008
Time:20:26:22


SUP60N06-12P
Filter j-c
Temperature:27.0
(A) j-c.opt, SUP60N06-12P_j-c_txt
1.4
1.0
0.5
0
100us
300us
1.0ms
3.0ms
10ms
30ms
100ms
V(CF1:1)
"j-c"
Time
Date:December 02, 2008
Time:20:50:28