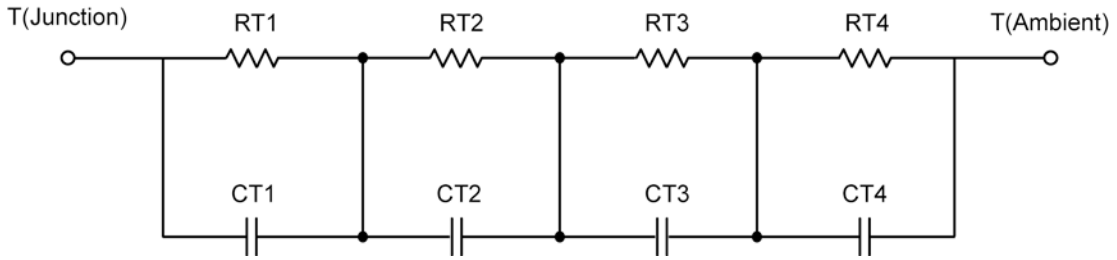
R-C Thermal Model Parameters

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."

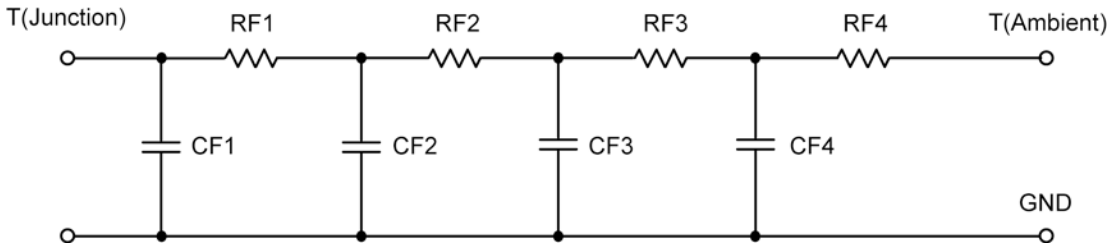
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	2.9542	164.7019 m	N/A
RT2	4.4145	631.6381 m	N/A
RT3	12.5279	1.0378	N/A
RT4	50.1034	865.8600 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	10.8832 m	123.4218 m	N/A
CT2	58.7694 m	1.4981 m	N/A
CT3	242.7547 m	11.6747 m	N/A
CT4	1.3408	20.1222 m	N/A

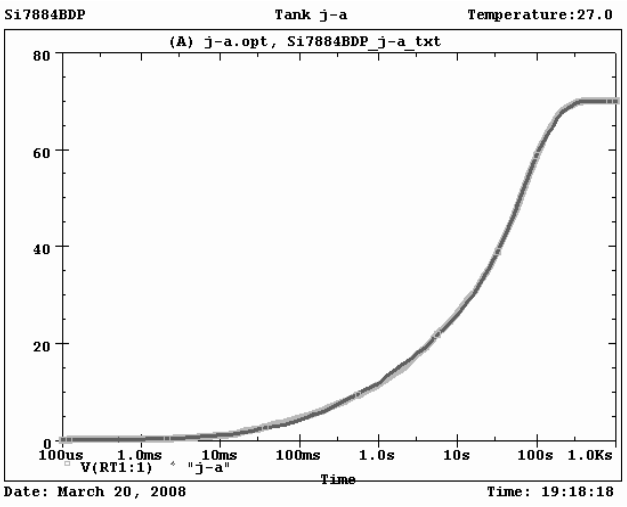
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

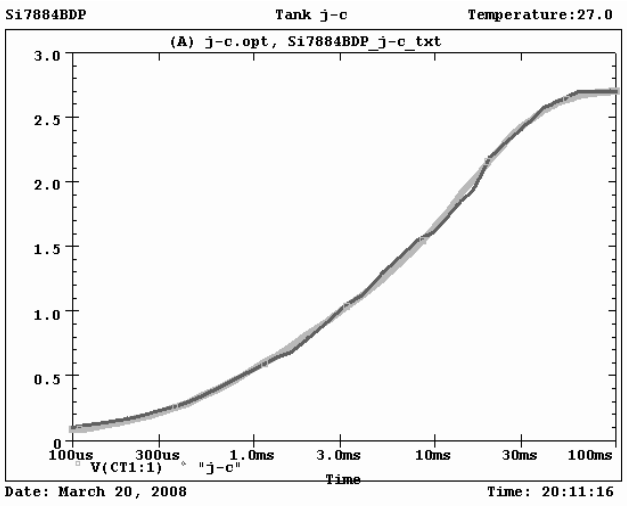
R-C THERMAL MODEL FOR FILTER CONFIGURATION

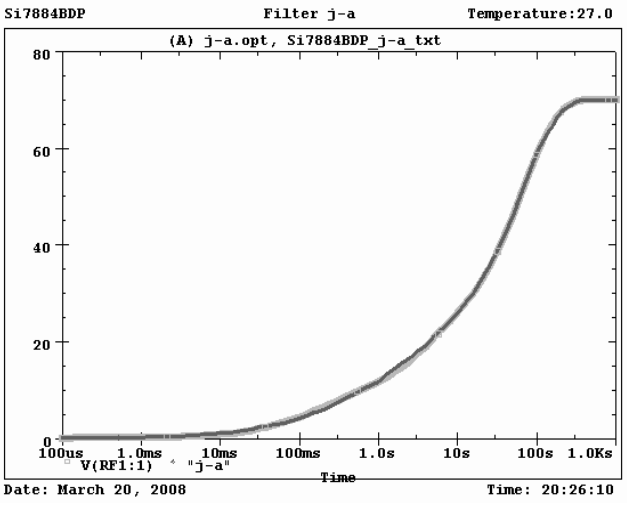


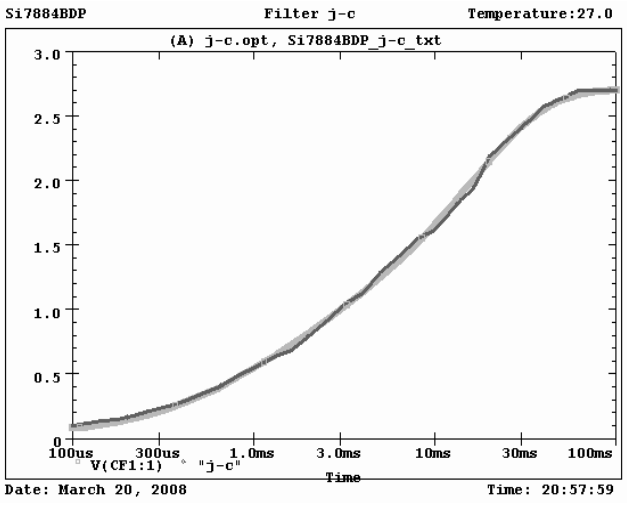
R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.0983	928.6304 m	N/A
RF2	5.5636	819.7281 m	N/A
RF3	15.2540	915.4472 m	N/A
RF4	45.0841	36.1943 m	N/A
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	11.3525 m	1.2629 m	N/A
CF2	22.3298 m	5.6199 m	N/A
CF3	213.9652 m	5.1084 m	N/A
CF4	1.2146	171.8545 m	N/A

Note: NA indicates not applicable


Si7884BDP
Tank j-a
Temperature:27.0
(A) j-a.opt, Si7884BDP_j-a_txt
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RT1:1) "j-a"
Time
Date: March 20, 2008
Time: 19:18:18


Si7884BDP
Tank j-c
Temperature:27.0
(A) j-c.opt, Si7884BDP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us 300us 1.0ms 3.0ms 10ms 30ms 100ms
V(CT1:1) "j-c"
Time
Date: March 20, 2008
Time: 20:11:16


Si7884BDP
Filter j-a
Temperature:27.0
(A) j-a.opt, Si7884BDP_j-a_txt
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
V(RF1:1) "j-a"
Time
Date: March 20, 2008
Time: 20:26:10


Si7884BDP
Filter j-c
Temperature:27.0
(A) j-c.opt, Si7884BDP_j-c_txt
3.0
2.5
2.0
1.5
1.0
0.5
0
100us 300us 1.0ms 3.0ms 10ms 30ms 100ms
V(CF1:1) "j-c"
Time
Date: March 20, 2008
Time: 20:57:59