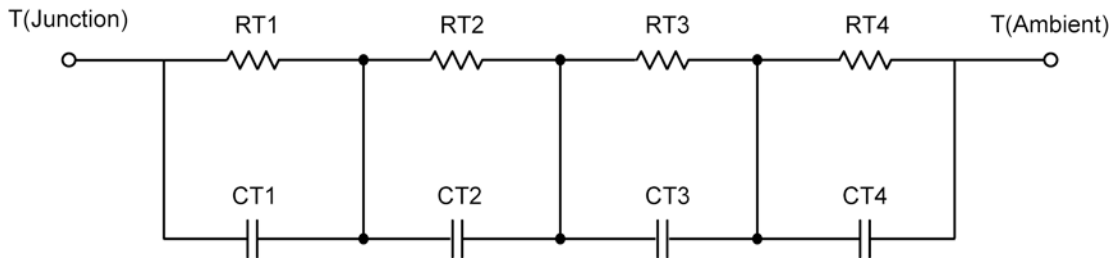
R-C Thermal Model Parameters

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."

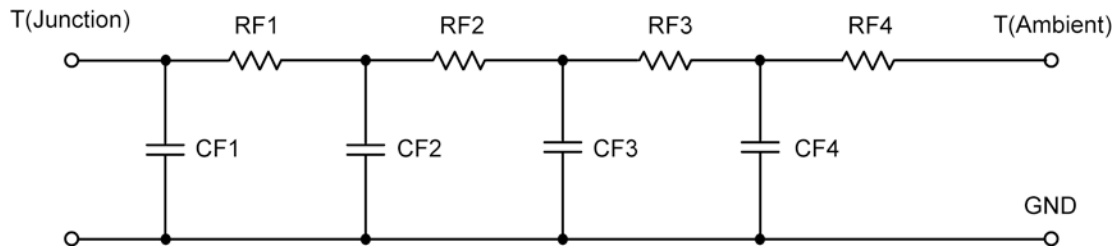
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.4510	N/A	7.9158
RT2	19.4095	N/A	6.0845
RT3	8.5636	N/A	5.7071
RT4	48.5756	N/A	1.2926
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	17.5842 m	N/A	197.1424 m
CT2	110.4623 m	N/A	123.7560 m
CT3	61.8139 m	N/A	12.4402 m
CT4	1.7269	N/A	7.8986 m

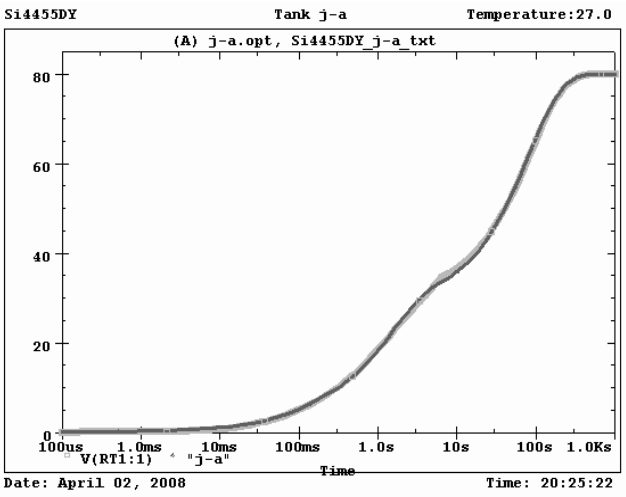
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

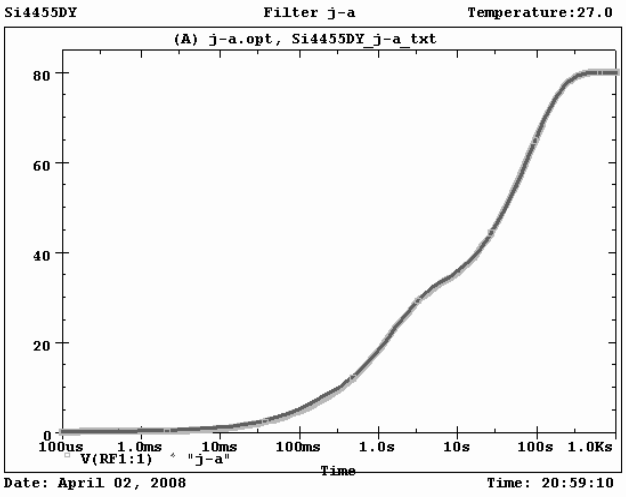
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.4319	N/A	3.4478
RF2	24.1666	N/A	5.3295
RF3	38.4578	N/A	5.6543
RF4	10.9437	N/A	6.5684
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	13.1137 m	N/A	5.0145 m
CF2	37.6108 m	N/A	6.3769 m
CF3	1.3748	N/A	74.8513 m
CF4	3.5180	N/A	31.0288 m

Note
NA indicates not applicable


Si4455DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4455DY_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: April 02, 2008
Time: 20:25:22


Si4455DY
Filter j-a
Temperature:27.0
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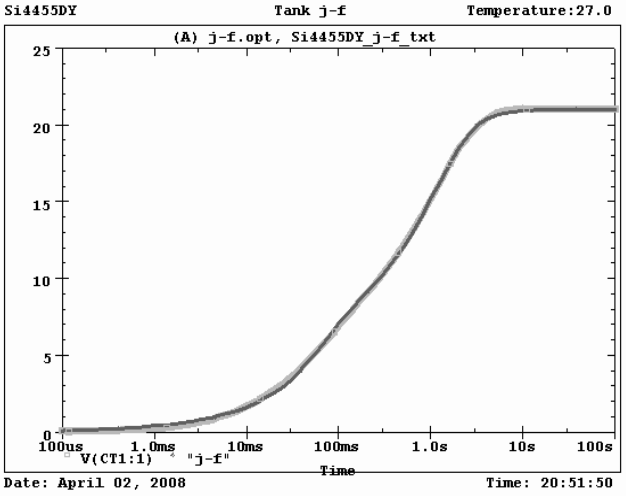
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: April 02, 2008
Time: 20:59:10


Si4455DY
Tank j-f
Temperature:27.0
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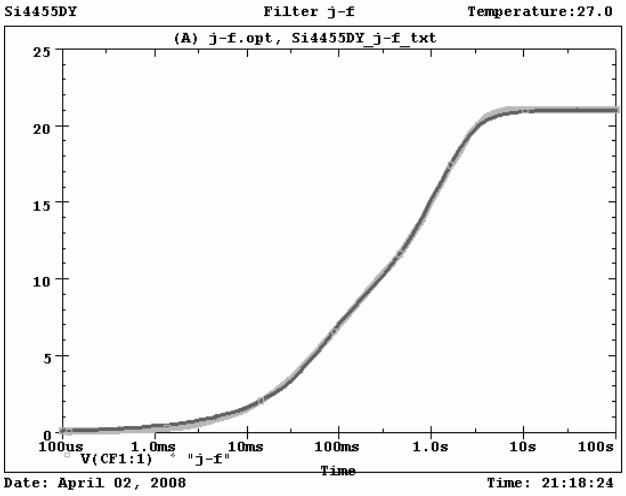
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CT1:1)
"j-f"
Time
Date: April 02, 2008
Time: 20:51:50


Si4455DY
Filter j-f
Temperature:27.0
(A) j-f.opt, Si4455DY_j-f_txt
25
20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date: April 02, 2008
Time: 21:18:24