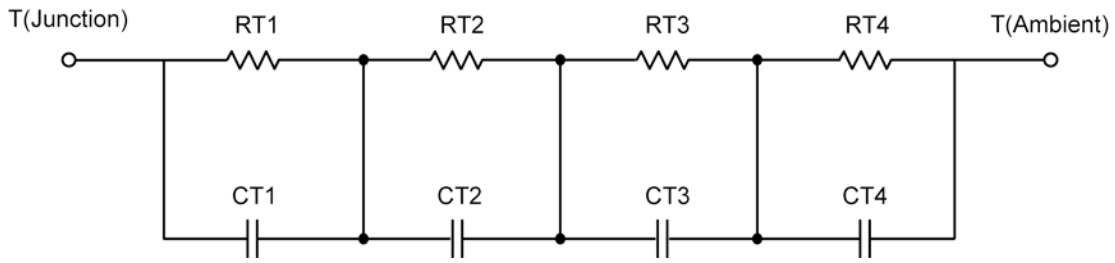
R-C Thermal Model Parameters

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."

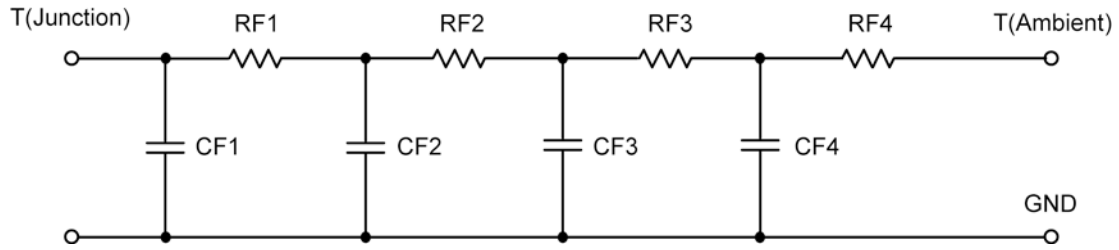
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	18.1759	N/A	1.8768
RT2	35.9657	N/A	14.9424
RT3	3.6305	N/A	403.8000 m
RT4	52.2279	N/A	20.7770
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	10.3284 m	N/A	386.4668 u
CT2	39.5853 m	N/A	4.9681 m
CT3	2.7278 m	N/A	6.4893 m
CT4	1.2815	N/A	35.2983 m

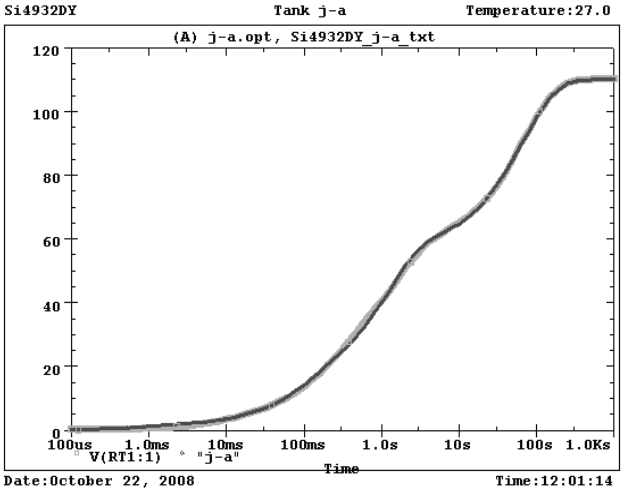
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	7.6599	N/A	2.4811
RF2	28.6685	N/A	14.3918
RF3	24.2707	N/A	11.8954
RF4	49.4009	N/A	9.2317
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.9836 m	N/A	727.4082 u
CF2	9.0199 m	N/A	2.9552 m
CF3	47.4211 m	N/A	13.9792 m
CF4	1.2946	N/A	65.4104 m

Note
NA indicates not applicable


Si4932DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4932DY_j-a_txt
120
100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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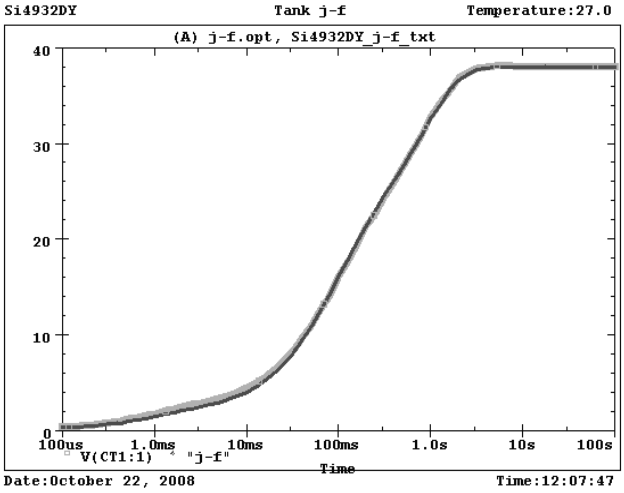
Time
Date:October 22, 2008
Time:12:01:14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Tank j-f
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30
20
10
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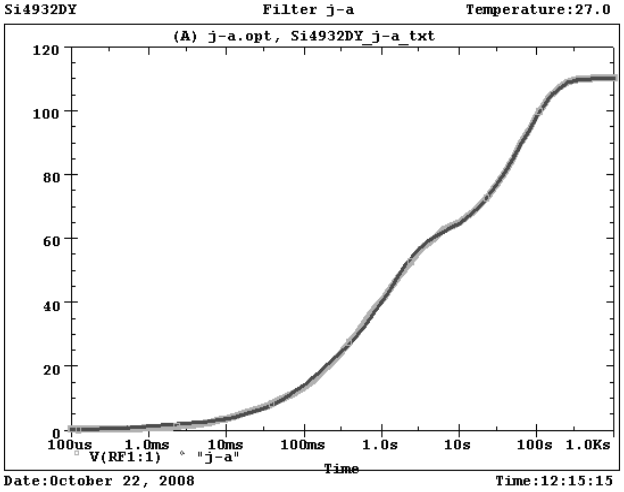
Si4932DY
Filter j-a
Temperature:27.0
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100
80
60
40
20
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s 1.0Ks
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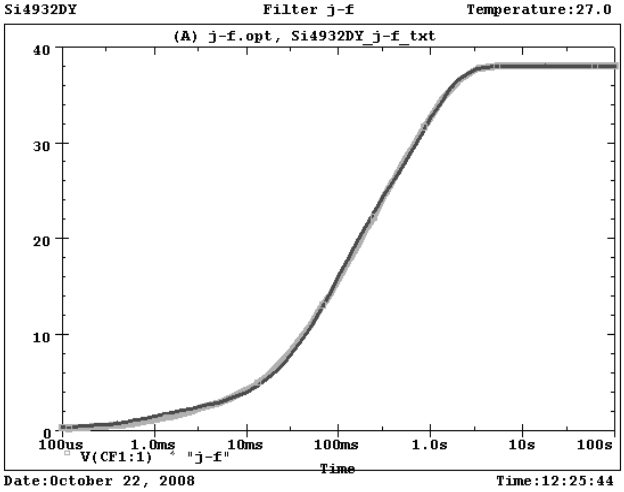
Date:October 22, 2008
Time:12:15:15


Si4932DY
Filter j-f
Temperature:27.0
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30
20
10
0
100us 1.0ms 10ms 100ms 1.0s 10s 100s
V(CF1:1) "j-f"
Time
Date:October 22, 2008
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