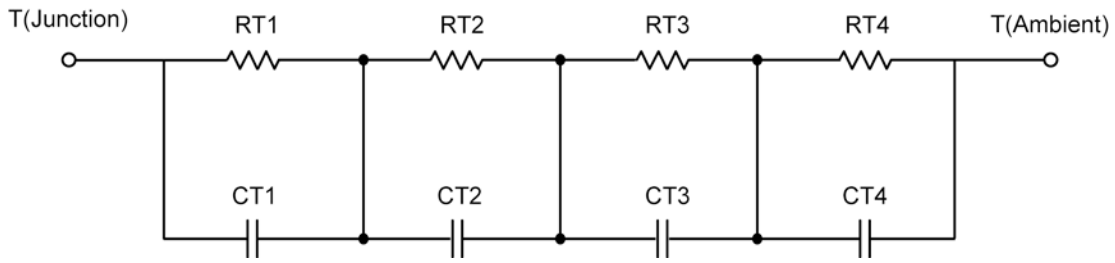
R-C Thermal Model Parameters

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."

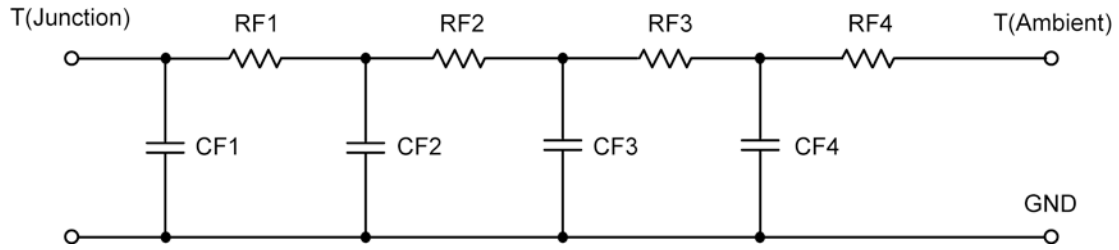
R-C THERMAL MODEL FOR TANK CONFIGURATION



R-C VALUES FOR TANK CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	23.7213	N/A	7.2633
RT2	2.3317	N/A	8.8509
RT3	13.4513	N/A	2.2201
RT4	50.2152	N/A	1.6657
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	73.1736 m	N/A	216.8868 m
CT2	759.0304 u	N/A	16.7509 m
CT3	16.4021 m	N/A	20.5193 m
CT4	1.1412	N/A	786.6962 u

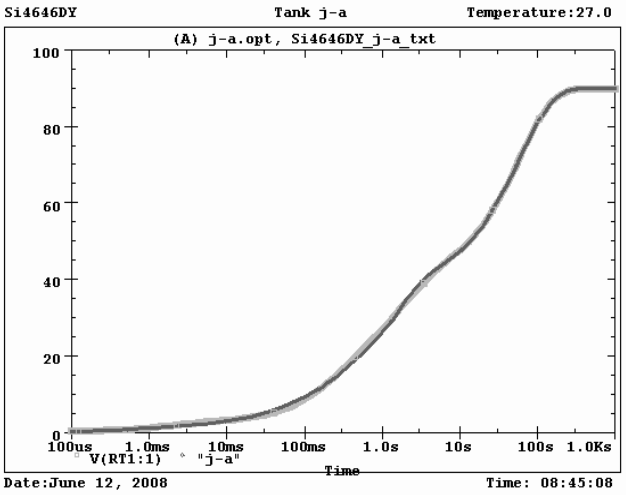
This document is intended as a SPICE modeling guideline and does not constitute a commercial product data sheet. Designers should refer to the appropriate data sheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
Thermal Resistance (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.2065	N/A	1.9031
RF2	18.9691	N/A	4.6896
RF3	20.9601	N/A	6.7557
RF4	47.8643	N/A	6.6516
Thermal Capacitance (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	541.0321 u	N/A	624.3071 u
CF2	12.2519 m	N/A	6.7082 m
CF3	60.1363 m	N/A	7.6860 m
CF4	1.1006	N/A	191.9934 m

Note
NA indicates not applicable


Si4646DY
Tank j-a
Temperature:27.0
(A) j-a.opt, Si4646DY_j-a_txt
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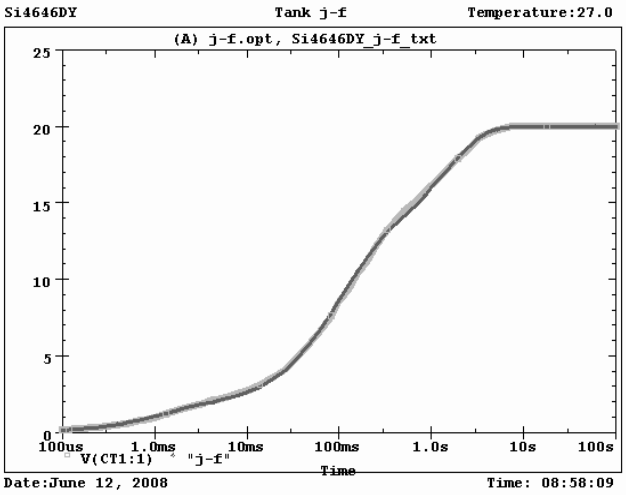
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date:June 12, 2008
Time: 08:45:08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15
10
5
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100us
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1.0s
10s
100s
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Time
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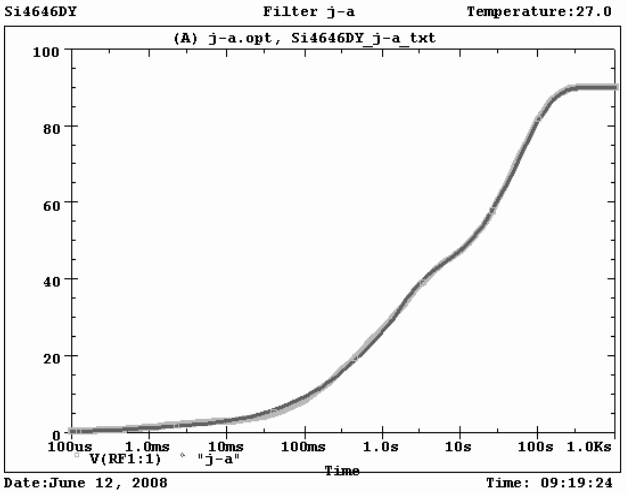
Si4646DY
Filter j-a
Temperature:27.0
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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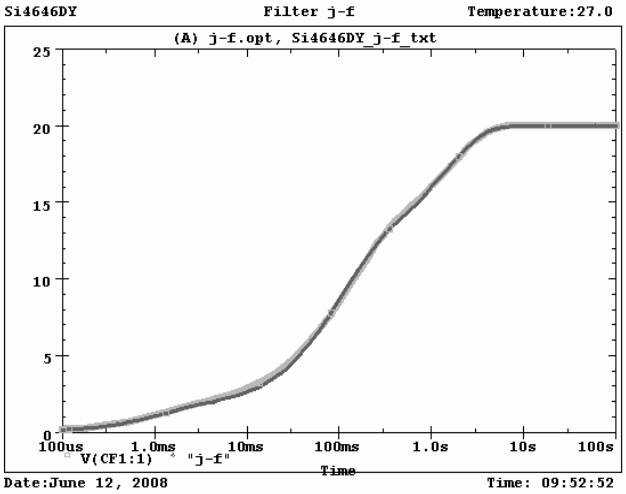
"j-a"
Time
Date:June 12, 2008
Time: 09:19:24


Si4646DY
Filter j-f
Temperature:27.0
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20
15
10
5
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
V(CF1:1)
"j-f"
Time
Date:June 12, 2008
Time: 09:52:52