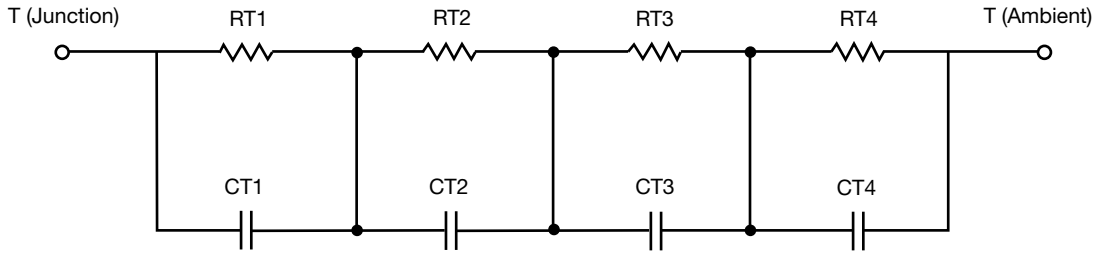
R-C Thermal Model Parameters

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

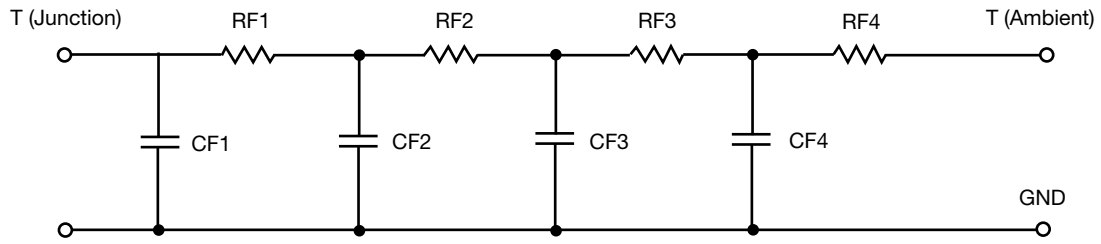


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	48.2196	N/A	N/A
RT2	48.2577	N/A	N/A
RT3	286.5016	N/A	N/A
RT4	116.3576	N/A	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	233.8311u	N/A	N/A
CT2	1.2185	N/A	N/A
CT3	5.6679m	N/A	N/A
CT4	2.0112m	N/A	N/A

Note
N/A indicates not applicable

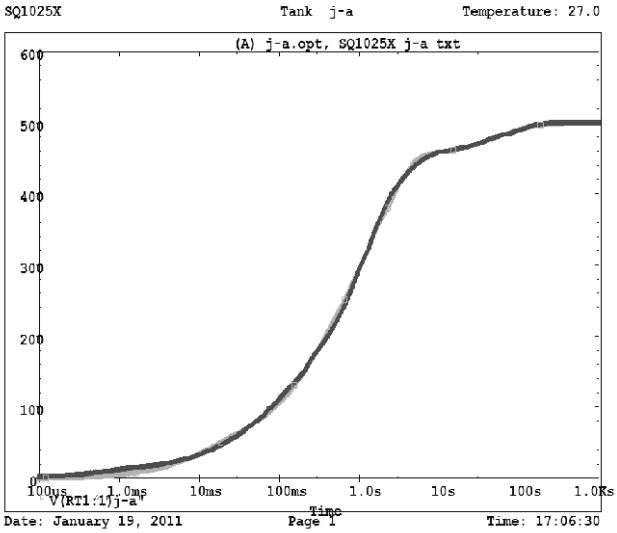
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	115.6872	N/A	N/A
RF2	316.9425	N/A	N/A
RF3	36.9790	N/A	N/A
RF4	30.8211	N/A	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	341.4813u	N/A	N/A
CF2	3.0964m	N/A	N/A
CF3	260.6286m	N/A	N/A
CF4	2.0475	N/A	N/A

Note
N/A indicates not applicable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Tank j-a
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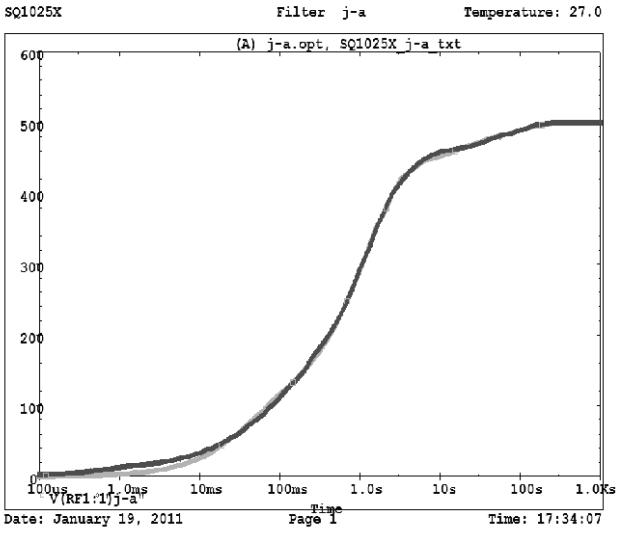
500
400
300
200
100
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: January 19, 2011
Page 1
Time: 17:06:30


SQ1025X
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQ1025X_j-a_txt
600
500
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200
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100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
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Time
Date: January 19, 2011
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