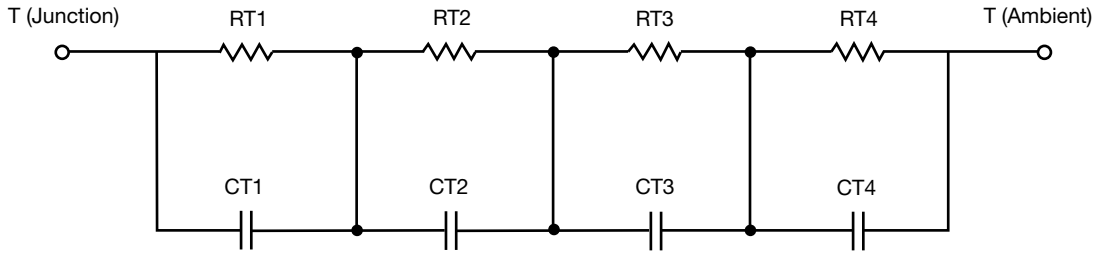
R-C Thermal Model Parameters

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

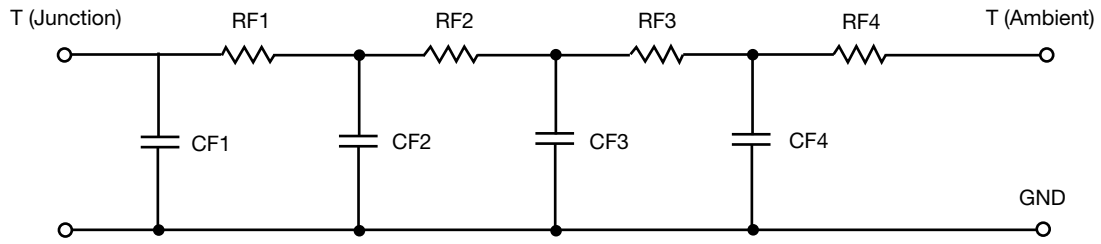


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	13.2078	113.0557m	N/A
RT2	6.0649	373.8497m	N/A
RT3	2.7995	542.5297m	N/A
RT4	31.9278	168.8730m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.0638	932.3844u	N/A
CT2	125.2382m	185.9394m	N/A
CT3	26.0917m	17.2344m	N/A
CT4	3.3100	664.3159m	N/A

Note
N/A indicates not applicable

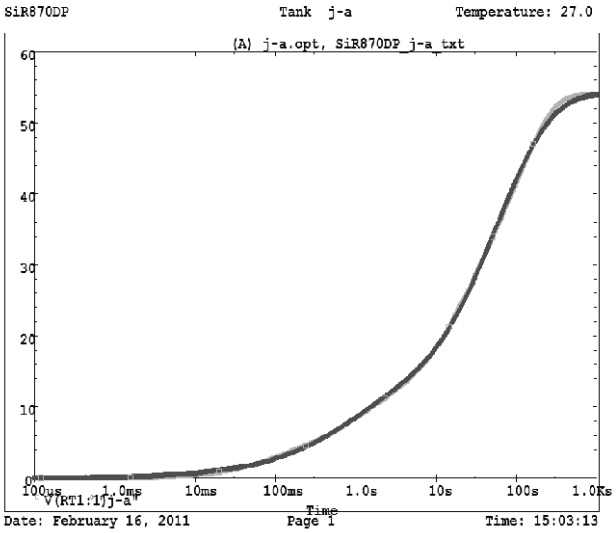
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

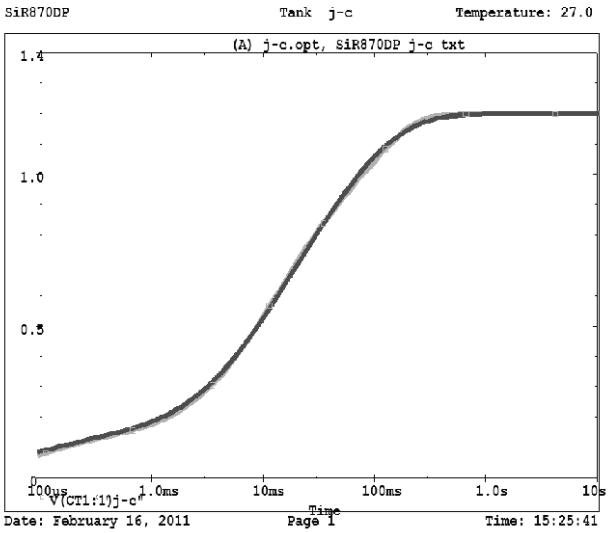
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.9102	148.7450m	N/A
RF2	9.2682	433.2167m	N/A
RF3	26.8208	202.0592m	N/A
RF4	11.7265	409.8945m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	23.6931m	1.1231m	N/A
CF2	233.8261m	13.5351m	N/A
CF3	1.1772	18.7512m	N/A
CF4	9.6436	122.9028m	N/A

Note
N/A indicates not applicable


SiR870DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, SiR870DP_j-a_txt
60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: February 16, 2011
Page 1
Time: 15:03:13


SiR870DP
Tank j-c
Temperature: 27.0
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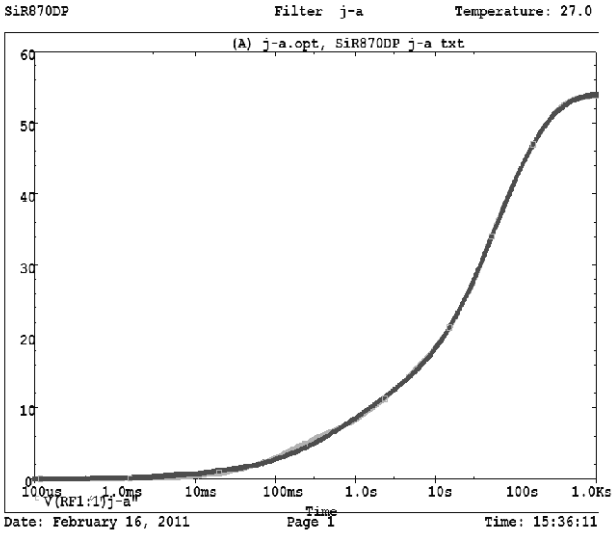
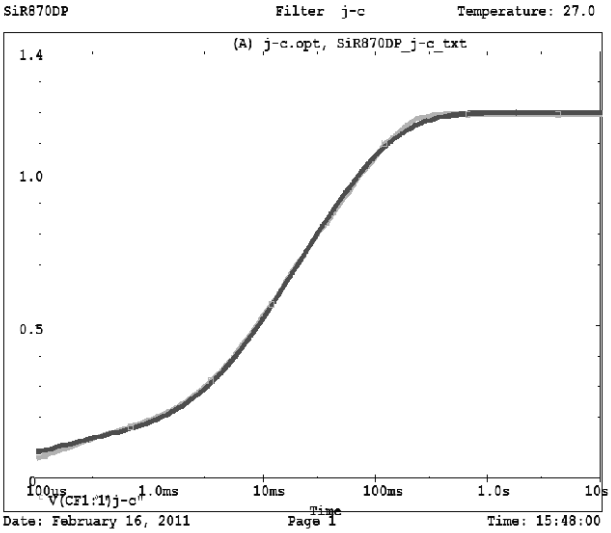
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: February 16, 2011
Page 1
Time: 15:25:41


SiR870DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, SiR870DP_j-a_txt
60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: February 16, 2011
Page 1
Time: 15:36:11


SiR870DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, SiR870DP_j-c_txt
1.4
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: February 16, 2011
Page 1
Time: 15:48:00