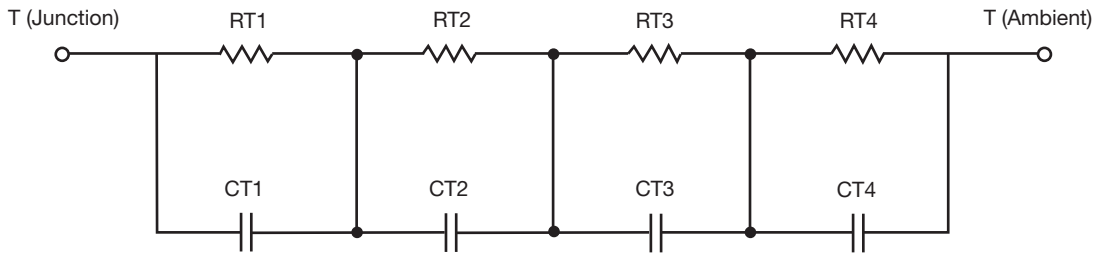
R-C Thermal Model Parameters

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

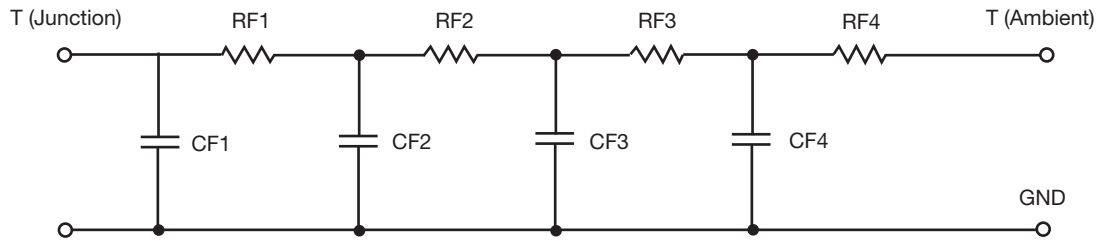


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	11.7277	67.8030m	N/A
RT2	24.8646	155.6271m	N/A
RT3	628.8086m	74.5007m	N/A
RT4	2.6399	101.9794m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	8.2542	108.2919m	N/A
CT2	3.6566	4.2854m	N/A
CT3	40.3749m	143.9962m	N/A
CT4	558.5953m	15.7064m	N/A

Note
N/A indicates not applicable

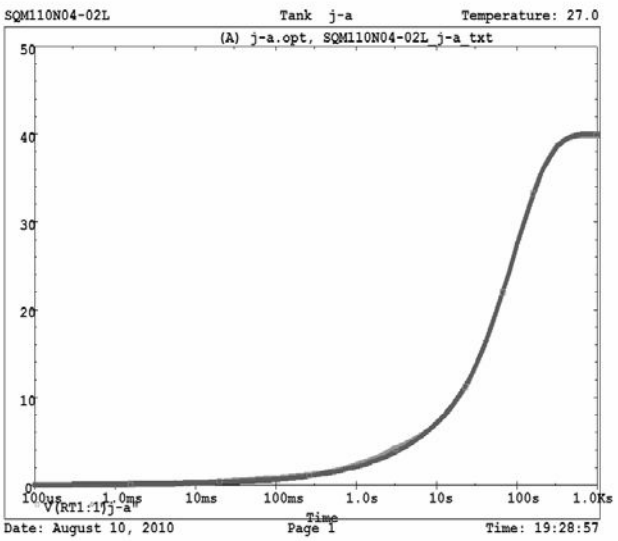
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

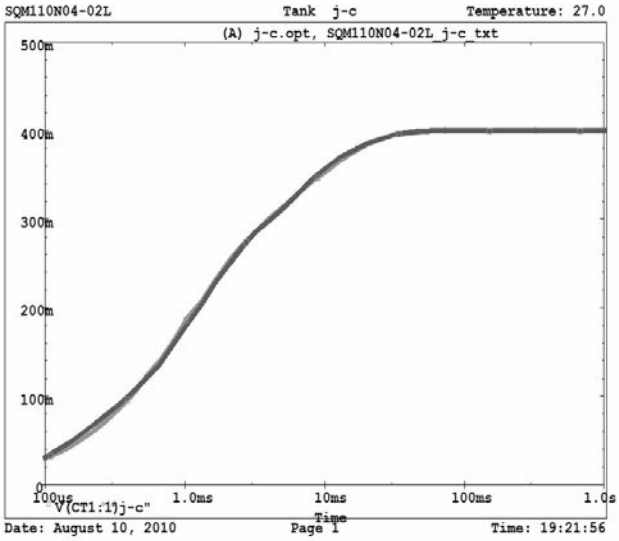
R-C THERMAL MODEL FOR FILTER CONFIGURATION

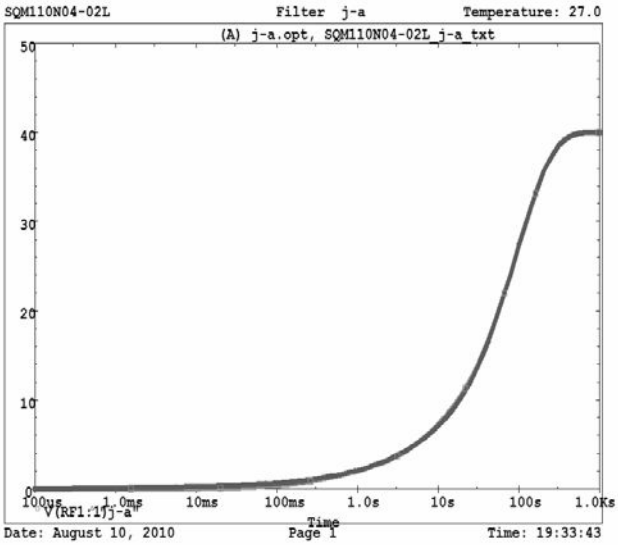


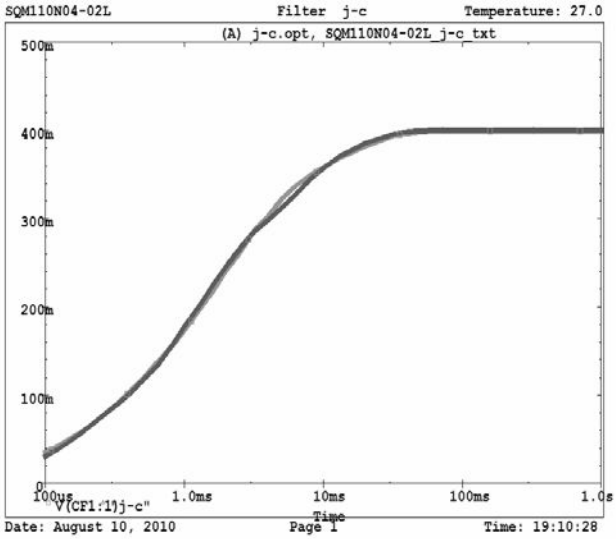
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	1.9086	148.2762m	N/A
RF2	7.1183	112.0625m	N/A
RF3	22.9377	74.5819m	N/A
RF4	8.0507	64.3827m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	231.9881m	2.4955m	N/A
CF2	885.9552m	7.1280m	N/A
CF3	1.7868	982.0209u	N/A
CF4	1.4745	165.5878m	N/A

Note
N/A indicates not applicable


SQM110N04-02L
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQM110N04-02L_j-a_txt
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a"
Time
Date: August 10, 2010
Page 1
Time: 19:28:57


SQM110N04-02L
Tank j-c
Temperature: 27.0
(A) j-c.opt, SQM110N04-02L_j-c_txt
500m
400m
300m
200m
100m
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: August 10, 2010
Page 1
Time: 19:21:56


SQM110N04-02L
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQM110N04-02L_j-a_txt
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: August 10, 2010
Page 1
Time: 19:33:43


SQM110N04-02L
Filter j-c
Temperature: 27.0
(A) j-c.opt, SQM110N04-02L_j-c_txt
500m
400m
300m
200m
100m
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: August 10, 2010
Page 1
Time: 19:10:28