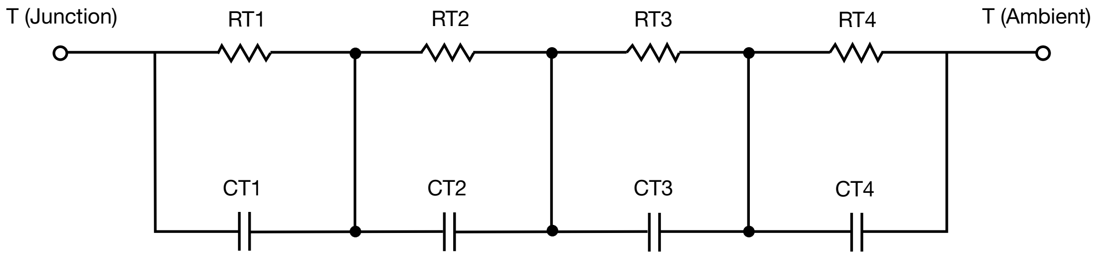
R-C Thermal Model Parameters

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

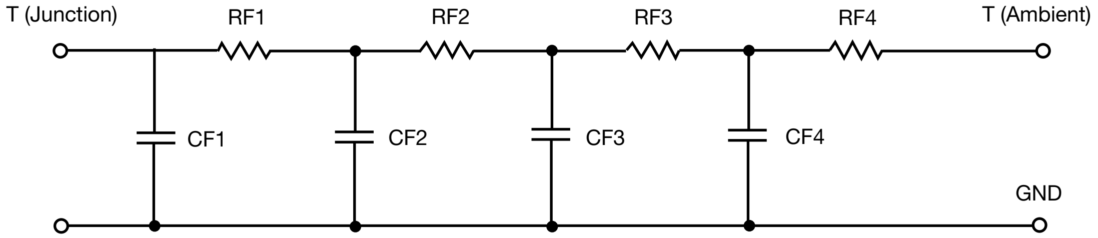
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	21.8851	112.4357m	N/A
RT2	3.3856	93.9415m	N/A
RT3	777.2462m	118.4911m	N/A
RT4	13.9006	75.8615m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	4.6123	168.2609m	N/A
CT2	1.0693	53.5222m	N/A
CT3	53.1968m	8.7304m	N/A
CT4	6.6023	889.3930m	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

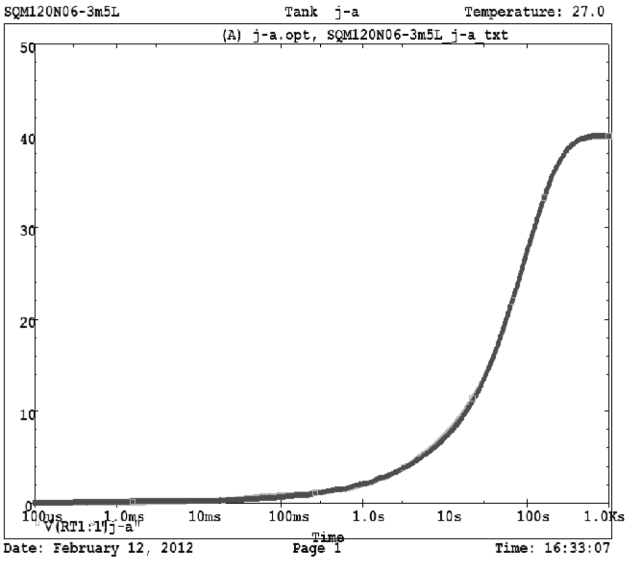


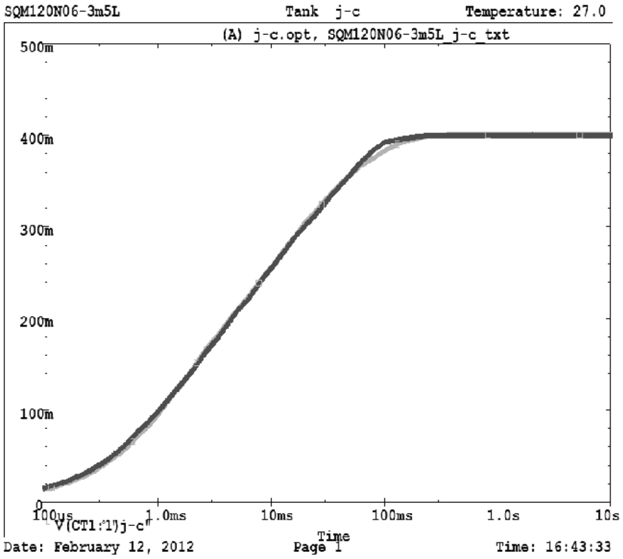
R-C VALUES FOR FILTER CONFIGURATION

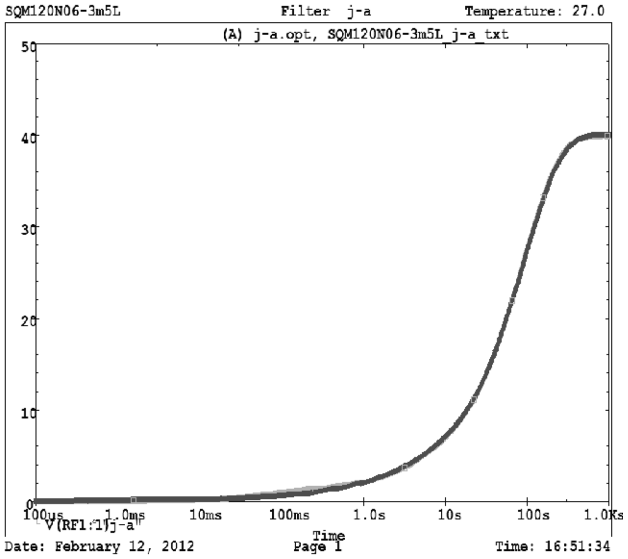
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	1.3207	143.7166m	N/A
RF2	5.4727	140.3574m	N/A
RF3	26.7163	111.3036m	N/A
RF4	6.3731	4.5934m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	56.3746m	6.9911m	N/A
CF2	945.5625m	28.3065m	N/A
CF3	1.7131	295.4169m	N/A
CF4	234.6497m	66.5661m	N/A

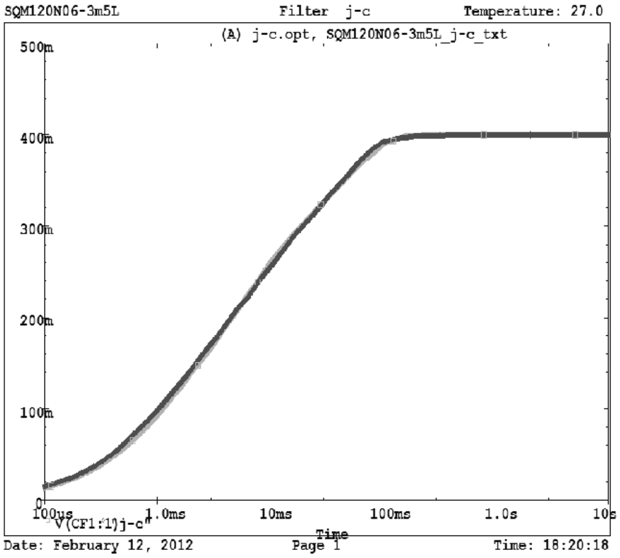
Note

- n/a indicates not applicable


SQM120N06-3m5L
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQM120N06-3m5L_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: February 12, 2012
Page 1
Time: 16:33:07


SQM120N06-3m5L
Tank j-c
Temperature: 27.0
(A) j-c.opt, SQM120N06-3m5L_j-c_txt
500m
400m
300m
200m
100m
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1) j-c
Time
Date: February 12, 2012
Page 1
Time: 16:43:33


SQM120N06-3m5L
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQM120N06-3m5L_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: February 12, 2012
Page 1
Time: 16:51:34


SQM120N06-3m5L
Filter j-c
Temperature: 27.0
(A) j-c.opt, SQM120N06-3m5L_j-c_txt
500m
400m
300m
200m
100m
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1) j-c
Time
Date: February 12, 2012
Page 1
Time: 18:20:18