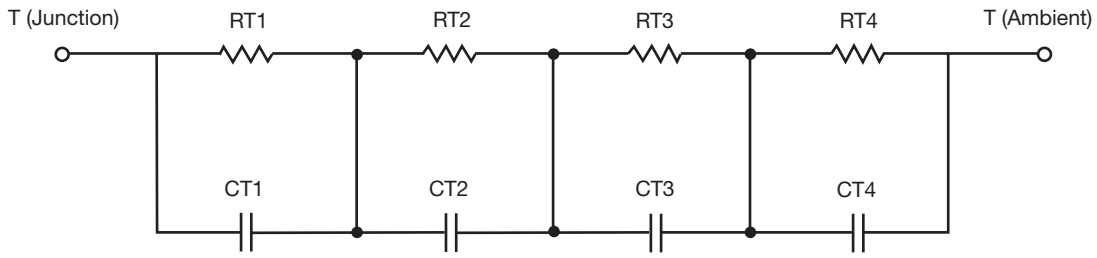
R-C Thermal Model Parameters

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

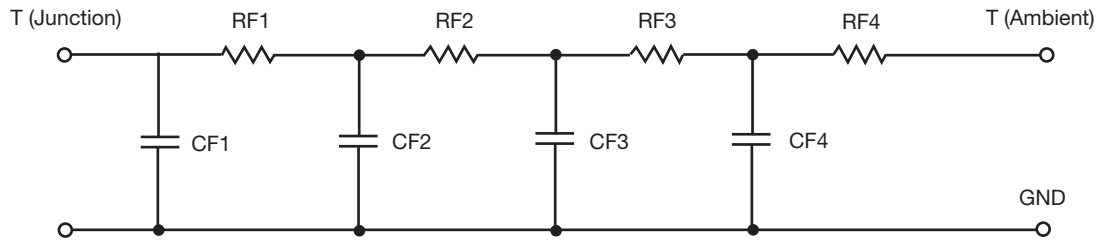


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	20.7613	253.1134m	N/A
RT2	16.1785	110.6522m	N/A
RT3	2.4641	101.2658m	N/A
RT4	624.0134m	35.5338m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	5.4947	213.3406m	N/A
CT2	4.3308	133.1919m	N/A
CT3	686.3164m	46.6453m	N/A
CT4	4.1719m	6.1623m	N/A

Note
N/A indicates not applicable

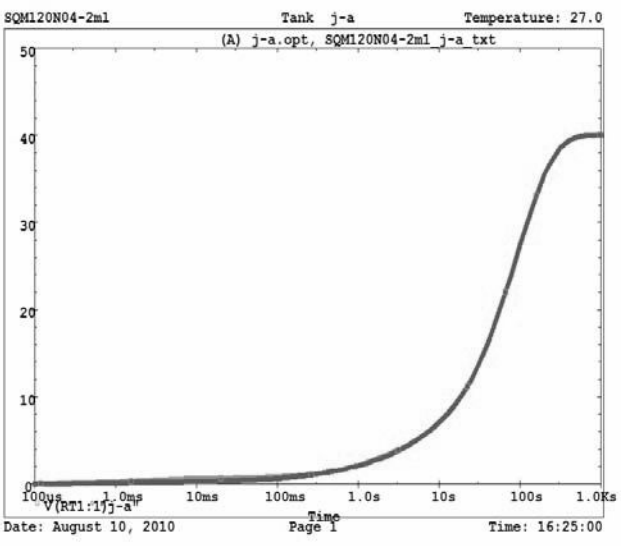
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

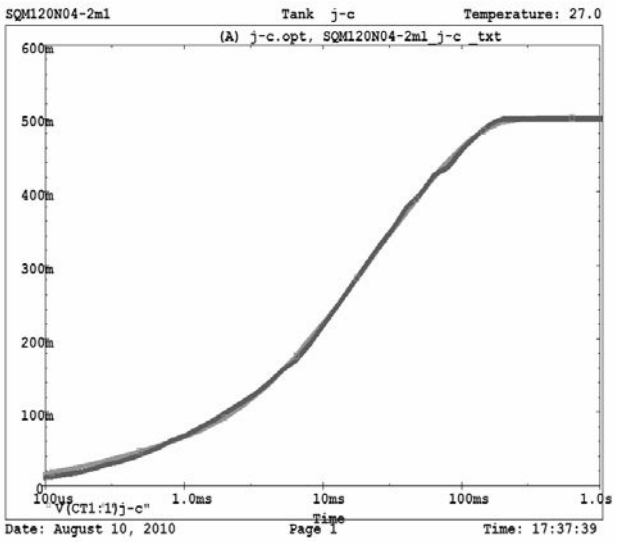
R-C THERMAL MODEL FOR FILTER CONFIGURATION

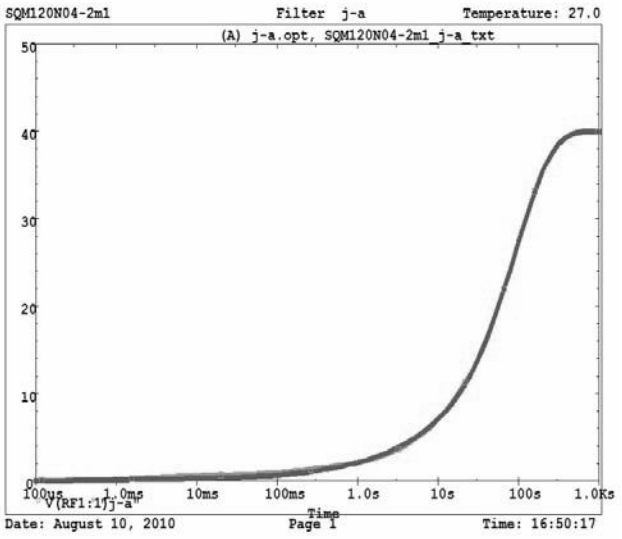


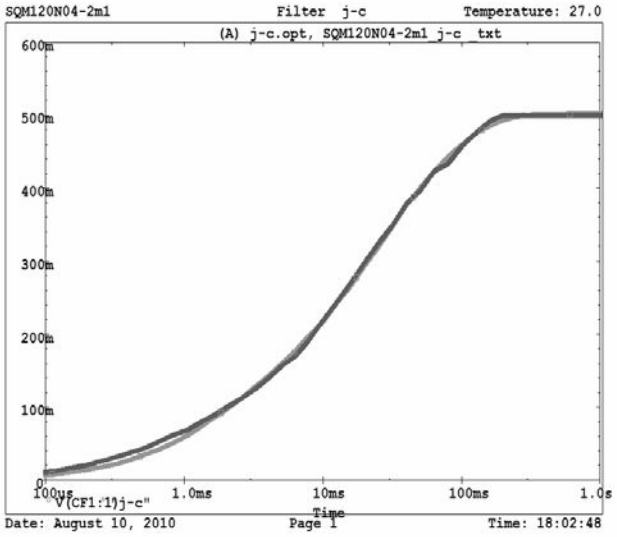
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	569.6034m	137.9230m	N/A
RF2	1.1588	155.8394m	N/A
RF3	9.7002	115.8873m	N/A
RF4	28.5202	91.5321m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	5.2517m	13.0446m	N/A
CF2	202.7145m	49.0813m	N/A
CF3	1.1307	49.9009m	N/A
CF4	1.8188	502.0781m	N/A

Note
N/A indicates not applicable


SQM120N04-2m1
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQM120N04-2m1_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: 16:25:00


SQM120N04-2m1
Tank j-c
Temperature: 27.0
(A) j-c.opt, SQM120N04-2m1_j-c _txt
600m
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: 17:37:39


SQM120N04-2m1
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQM120N04-2m1_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: 16:50:17


SQM120N04-2m1
Filter j-c
Temperature: 27.0
(A) j-c.opt, SQM120N04-2m1_j-c _txt
600m
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: 18:02:48