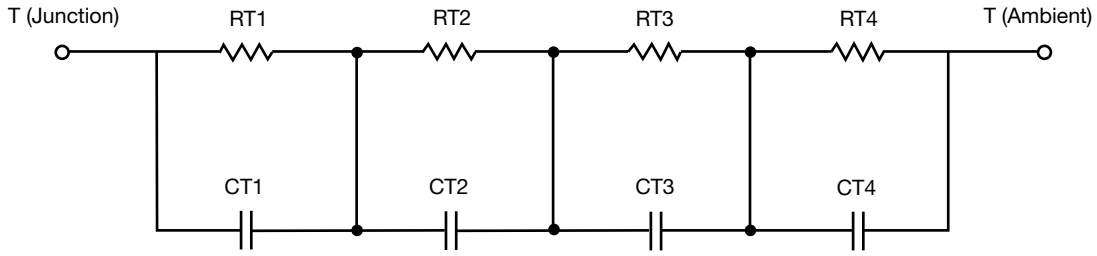
R-C Thermal Model Parameters

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

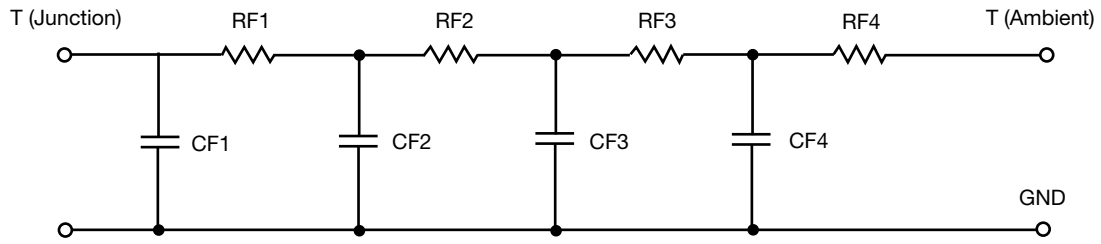


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.8343	487.9076m	N/A
RT2	3.8149	876.1777m	N/A
RT3	14.6906	603.8280m	N/A
RT4	49.5076	440.2974m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	538.7921m	1.0956m	N/A
CT2	3.3592m	5.5941m	N/A
CT3	26.6964m	21.4543m	N/A
CT4	1.3289	27.4802m	N/A

Note
N/A indicates not applicable

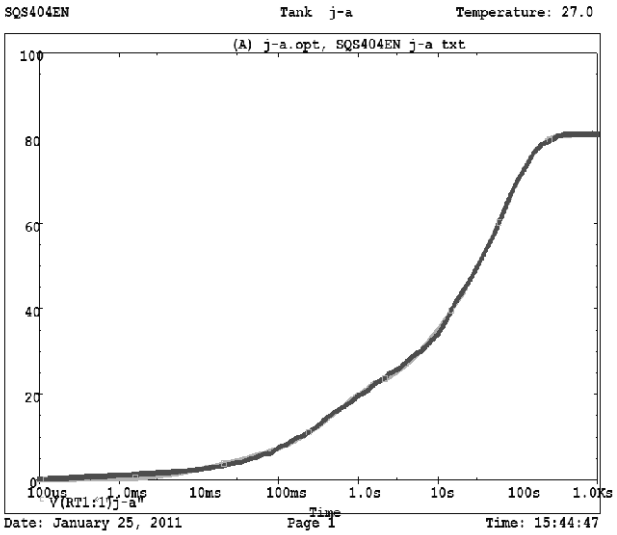
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

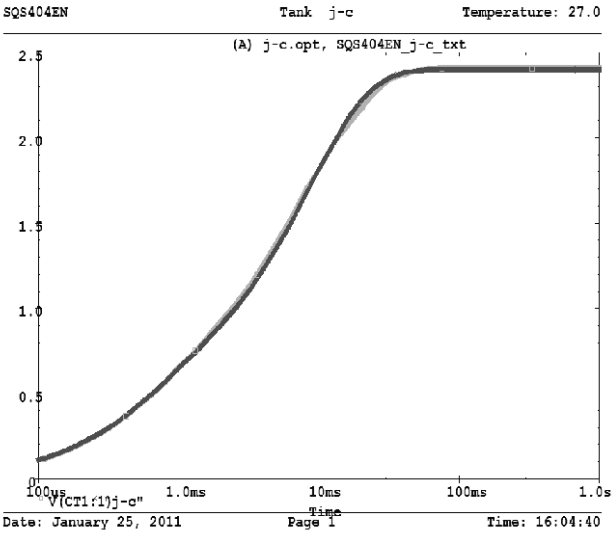
R-C THERMAL MODEL FOR FILTER CONFIGURATION

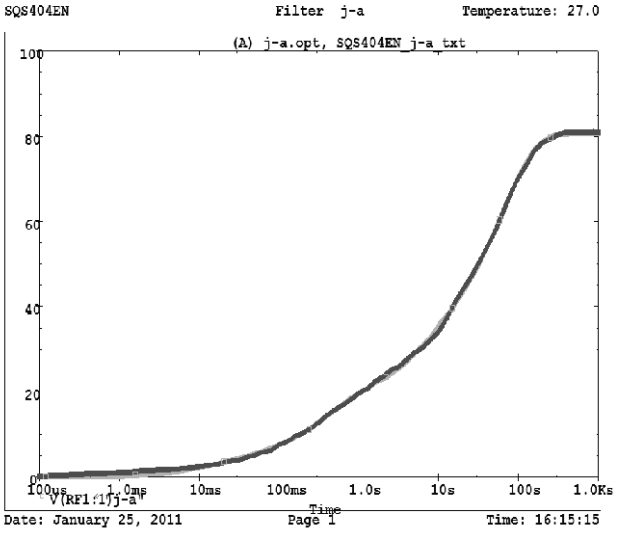


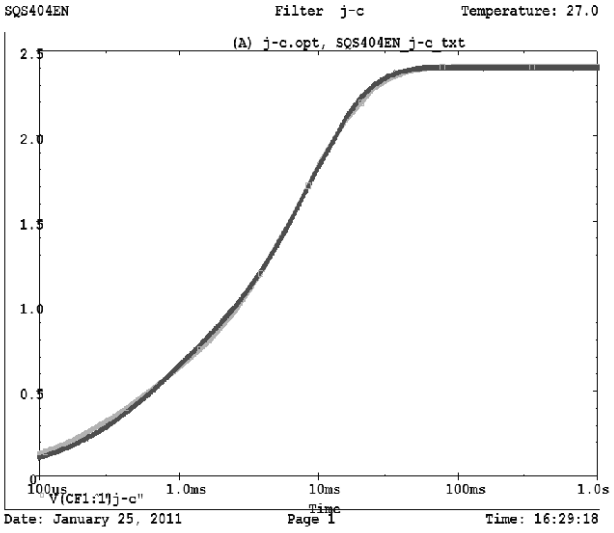
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.1060	592.6312m	N/A
RF2	14.6183	1.6096	N/A
RF3	19.5754	29.3820m	N/A
RF4	41.3817	175.7417m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	3.5655m	659.3581u	N/A
CF2	21.2076m	3.3937m	N/A
CF3	319.6156m	45.0560m	N/A
CF4	1.1262	18.2524m	N/A

Note
N/A indicates not applicable


SQS404EN
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQS404EN_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a"
Time
Date: January 25, 2011
Page 1
Time: 15:44:47


SQS404EN
Tank j-c
Temperature: 27.0
(A) j-c.opt, SQS404EN_j-c_txt
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: January 25, 2011
Page 1
Time: 16:04:40


SQS404EN
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQS404EN_j-a_txt
100
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: January 25, 2011
Page 1
Time: 16:15:15


SQS404EN
Filter j-c
Temperature: 27.0
(A) j-c.opt, SQS404EN_j-c_txt
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: January 25, 2011
Page 1
Time: 16:29:18