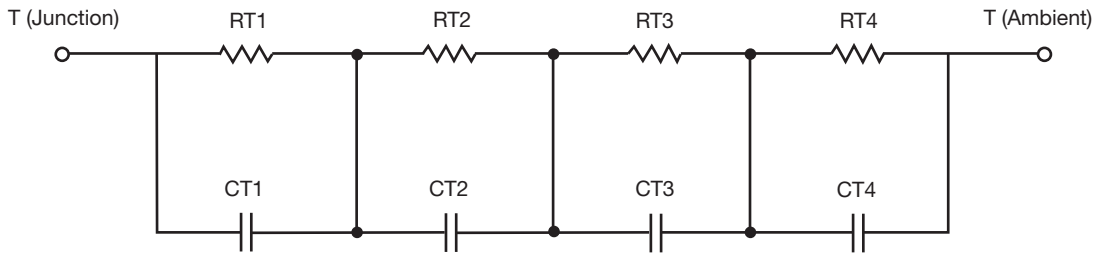
R-C Thermal Model Parameters

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

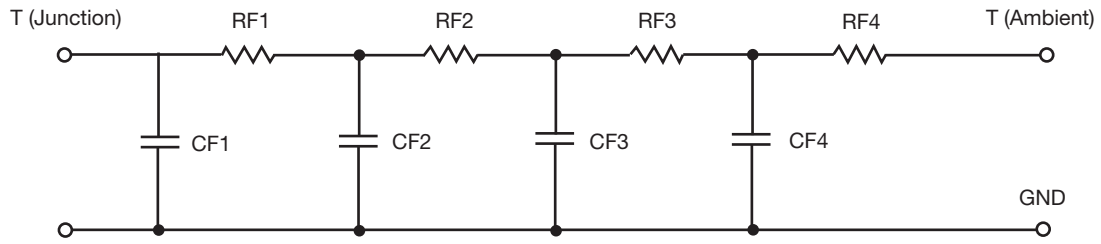


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	17.4960	625.7403m	N/A
RT2	28.8765	35.1142m	N/A
RT3	7.4701	650.3891m	N/A
RT4	6.1574	692.4277m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.3050	2.5085m	N/A
CT2	4.2567	125.4376u	N/A
CT3	75.0225m	69.7450m	N/A
CT4	349.8513u	63.3093m	N/A

Note
N/A indicates not applicable

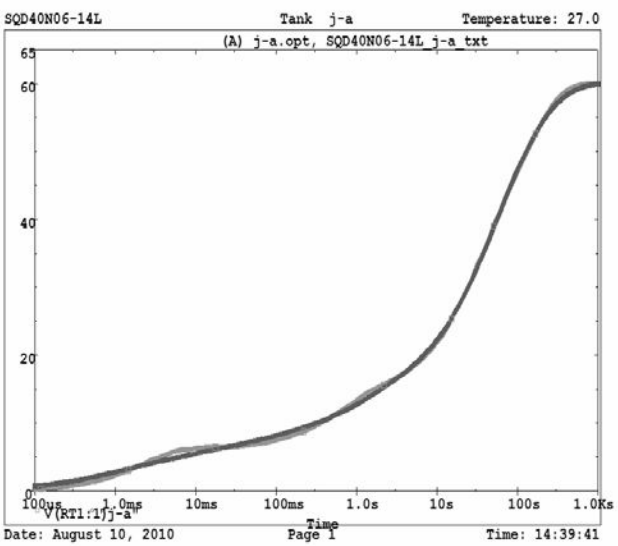
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

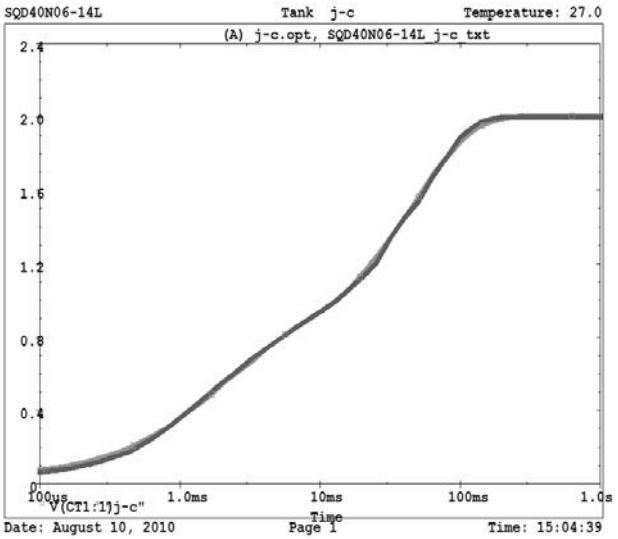
R-C THERMAL MODEL FOR FILTER CONFIGURATION

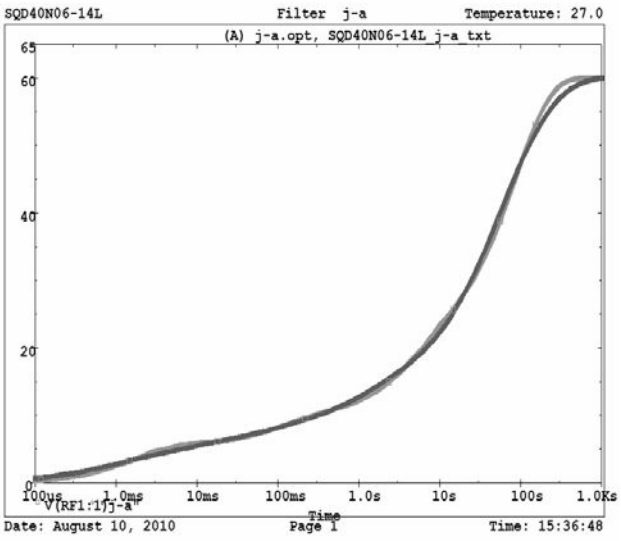


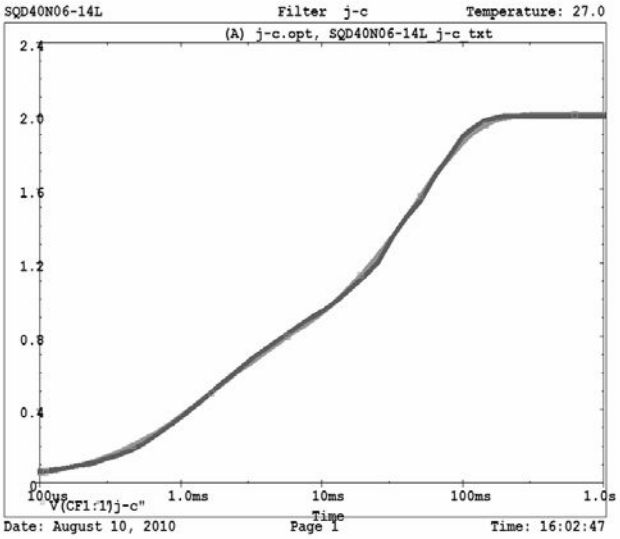
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	5.5453	64.8177m	N/A
RF2	4.6732	603.9346m	N/A
RF3	13.9508	503.9512m	N/A
RF4	35.8307	833.8745m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	295.9678u	1.4101m	N/A
CF2	24.4181m	596.9231u	N/A
CF3	341.6993m	19.5748m	N/A
CF4	2.0275	27.5099m	N/A

Note
N/A indicates not applicable


SQD40N06-14L
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQD40N06-14L j-a txt
65
60
40
20
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: 14:39:41


SQD40N06-14L
Tank j-c
Temperature: 27.0
(A) j-c.opt, SQD40N06-14L j-c txt
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: August 10, 2010
Page 1
Time: 15:04:39


SQD40N06-14L
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQD40N06-14L j-a txt
65
60
40
20
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: 15:36:48


SQD40N06-14L
Filter j-c
Temperature: 27.0
(A) j-c.opt, SQD40N06-14L j-c txt
2.4
2.0
1.6
1.2
0.8
0.4
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: August 10, 2010
Page 1
Time: 16:02:47