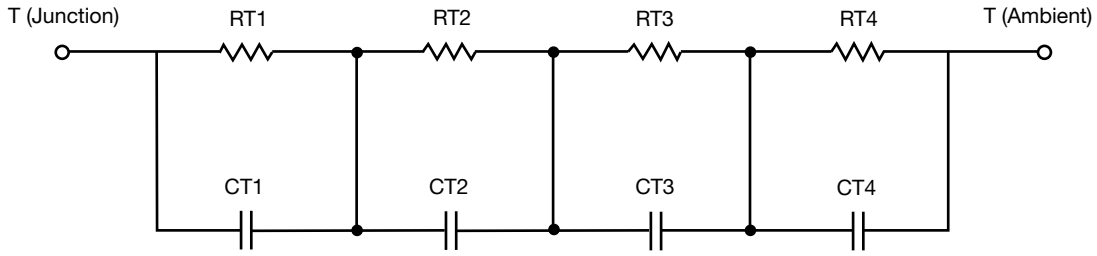
R-C Thermal Model Parameters

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

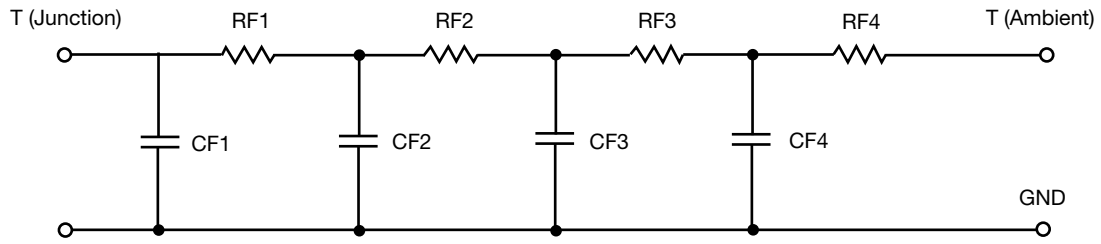


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	5.8010	506.9106m	N/A
RT2	4.6219	376.3685m	N/A
RT3	2.3692	472.4883m	N/A
RT4	37.1229	447.1708m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	786.5236m	41.8583m	N/A
CT2	111.7643m	293.6648m	N/A
CT3	11.1669m	9.2007m	N/A
CT4	1.8995	1.5132m	N/A

Note
N/A indicates not applicable

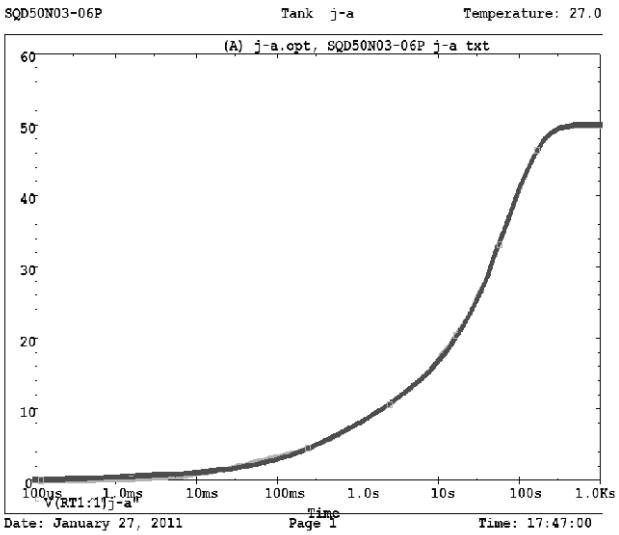
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

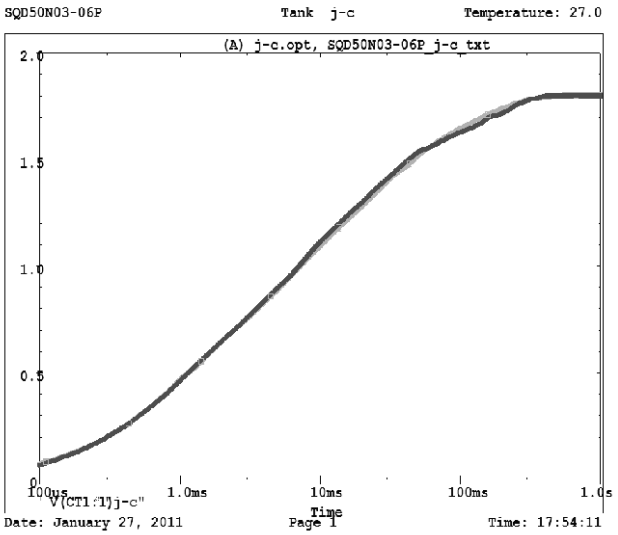
R-C THERMAL MODEL FOR FILTER CONFIGURATION

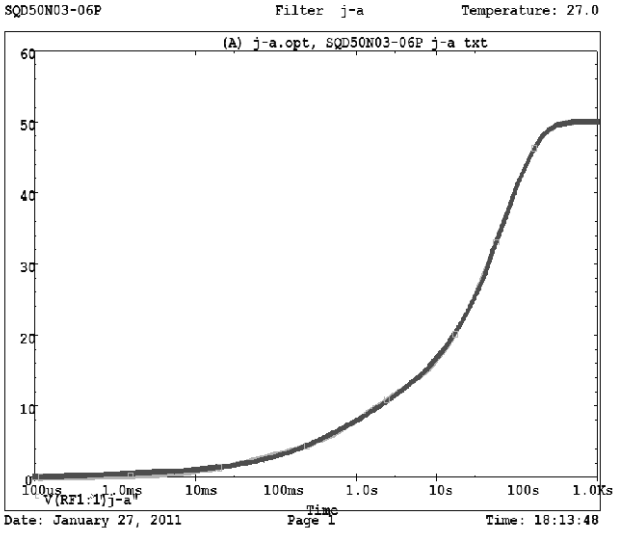


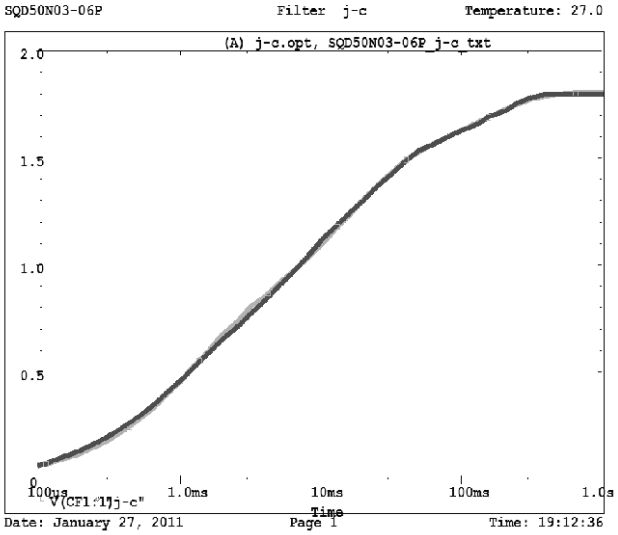
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	3.1690	798.4964m	N/A
RF2	8.0372	421.3376m	N/A
RF3	21.8948	285.4235m	N/A
RF4	16.8552	301.2312m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	11.4872m	1.4770m	N/A
CF2	113.8283m	17.8411m	N/A
CF3	1.1863	1.7450m	N/A
CF4	2.1127	404.1579m	N/A

Note
N/A indicates not applicable


SQD50N03-06P
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQD50N03-06P j-a txt
60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a"
Time
Date: January 27, 2011
Page 1
Time: 17:47:00


SQD50N03-06P
Tank j-c
Temperature: 27.0
(A) j-c.opt, SQD50N03-06P_j-c_txt
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c"
Time
Date: January 27, 2011
Page 1
Time: 17:54:11


SQD50N03-06P
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQD50N03-06P j-a txt
60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a"
Time
Date: January 27, 2011
Page 1
Time: 18:13:48


SQD50N03-06P
Filter j-c
Temperature: 27.0
(A) j-c.opt, SQD50N03-06P_j-c_txt
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c"
Time
Date: January 27, 2011
Page 1
Time: 19:12:36