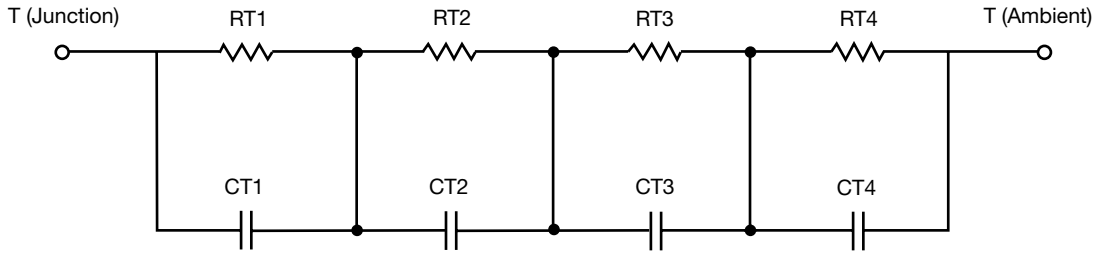
R-C Thermal Model Parameters

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

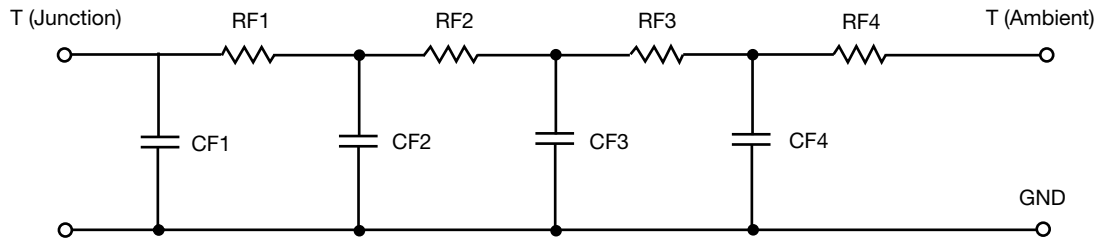


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	11.1430	7.4725 m	N/A
RT2	29.2059	596.1336 m	N/A
RT3	1.9707	189.4286 m	N/A
RT4	7.6804	311.1663 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.0008	107.9398 u	N/A
CT2	1.6022	61.5387 m	N/A
CT3	3.8779 m	4.1005 m	N/A
CT4	56.9743 m	256.9899 m	N/A

Note
N/A indicates not applicable

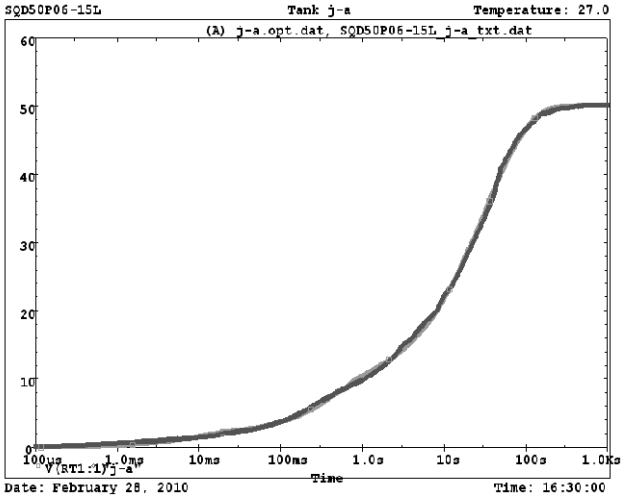
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

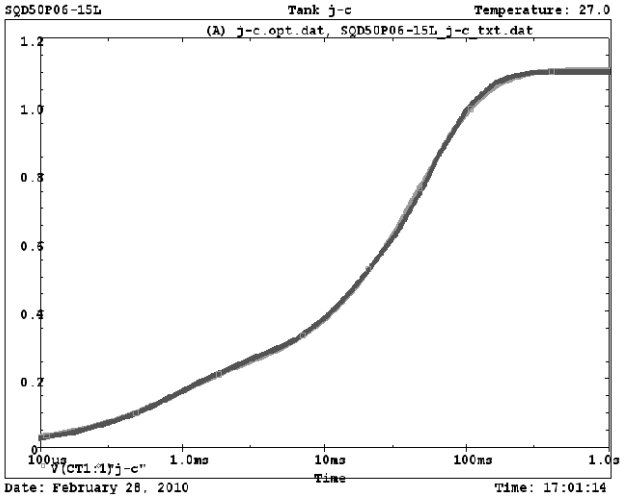
R-C THERMAL MODEL FOR FILTER CONFIGURATION

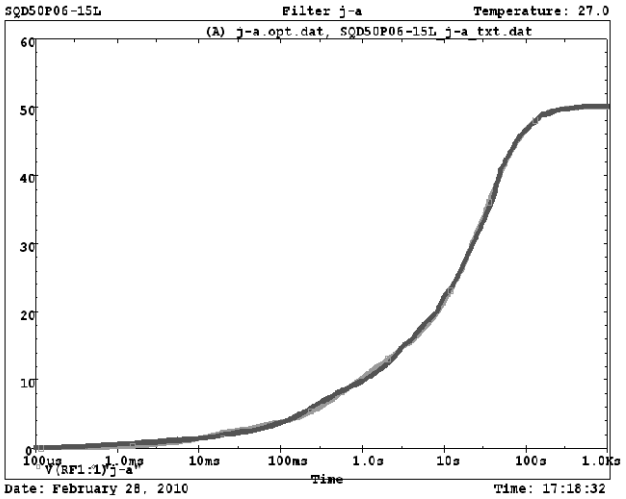


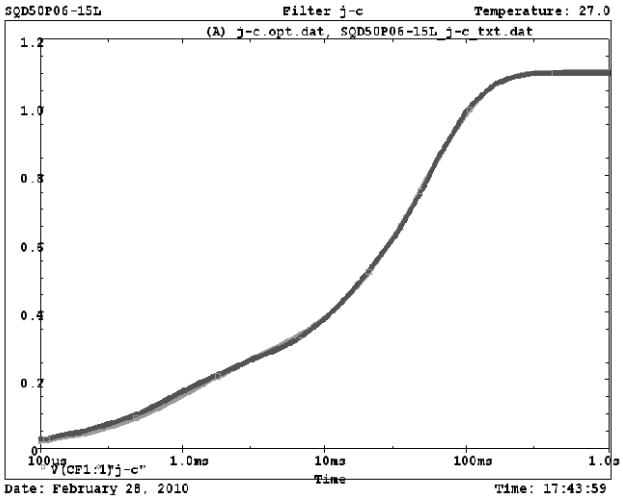
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.8325	20.2405 m	N/A
RF2	9.8480	235.6151 m	N/A
RF3	31.9434	499.0744 m	N/A
RF4	5.2613	346.1003 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	4.7772 m	4.2466 m	N/A
CF2	66.0102 m	43.3524 u	N/A
CF3	759.6471 m	51.2028 m	N/A
CF4	10.2208	19.9831 m	N/A

Note
N/A indicates not applicable


SQD50P06-15L
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SQD50P06-15L_j-a_txt.dat
60
50
40
30
20
10
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)/j-a
Time
Date: February 28, 2010
Time: 16:30:00


SQD50P06-15L
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SQD50P06-15L_j-c_txt.dat
1.2
1.0
0.8
0.6
0.4
0.2
0
100µs
1.0ms
10ms
100ms
1.0s
V(CT1:1)/j-c"
Time
Date: February 28, 2010
Time: 17:01:14


SQD50P06-15L
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SQD50P06-15L_j-a_txt.dat
60
50
40
30
20
10
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)/j-a"
Time
Date: February 28, 2010
Time: 17:18:32


SQD50P06-15L
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SQD50P06-15L_j-c_txt.dat
1.2
1.0
0.8
0.6
0.4
0.2
0
100µs
1.0ms
10ms
100ms
1.0s
V(CF1:1)/j-c"
Time
Date: February 28, 2010
Time: 17:43:59