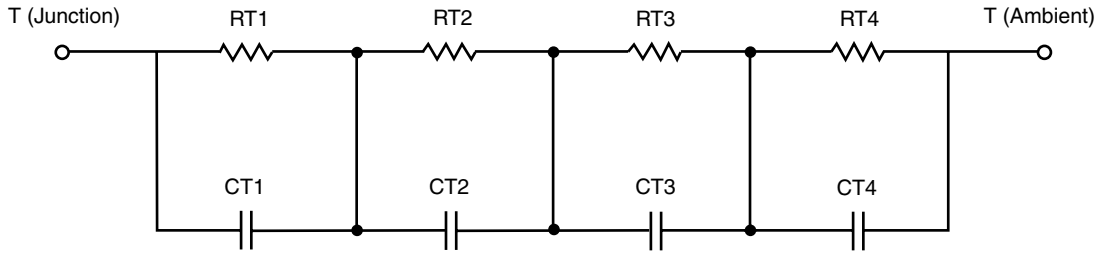
R-C Thermal Model Parameters

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

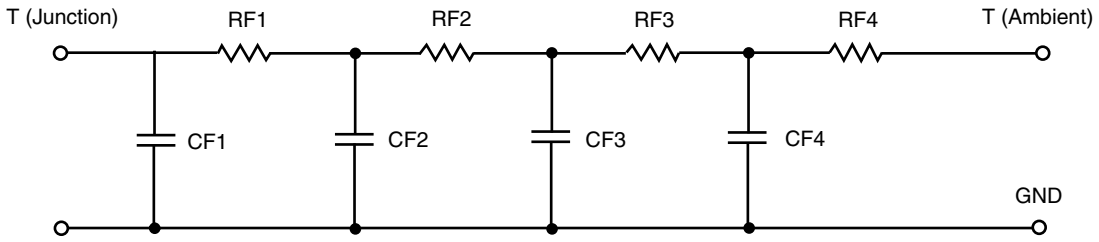


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	5.4237	1.1854	N/A
RT2	15.4890	3.2874	N/A
RT3	11.3444	1.0221	N/A
RT4	47.3968	1.0260	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	9.1756 m	207.2482 u	N/A
CT2	862.7791 m	565.5615 u	N/A
CT3	78.2393 m	5.4532 m	N/A
CT4	1.7922	4.9615 m	N/A

Note
N/A indicates not applicable

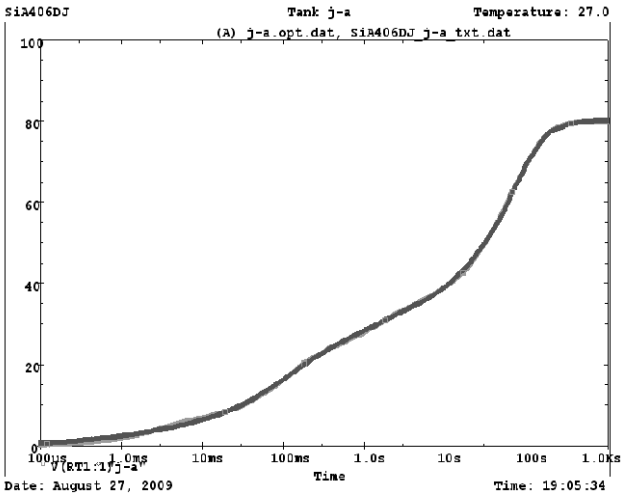
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

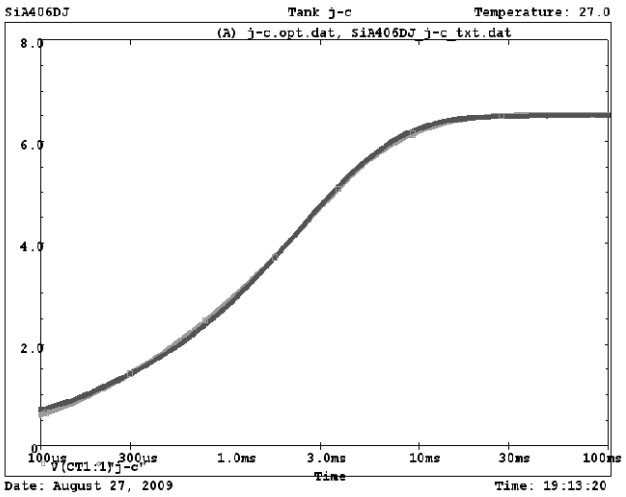
R-C THERMAL MODEL FOR FILTER CONFIGURATION

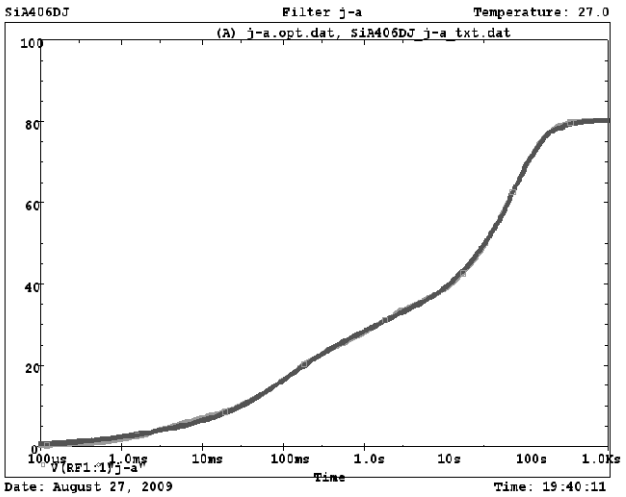


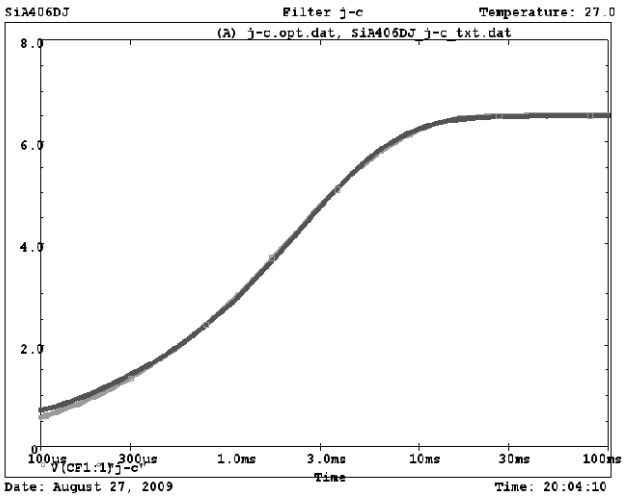
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	6.7252	2.0174	N/A
RF2	15.7322	3.2226	N/A
RF3	11.6591	315.5717 m	N/A
RF4	45.8835	959.7824 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	479.1047 u	149.5893 u	N/A
CF2	5.5974 m	302.3271 u	N/A
CF3	95.7505 m	1.7876 m	N/A
CF4	1.3544	1.1791 m	N/A

Note
N/A indicates not applicable


SiA406DJ
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SiA406DJ_j-a_txt.dat
100
80
60
40
20
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)j-a
Time
Date: August 27, 2009
Time: 19:05:34


SiA406DJ
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SiA406DJ_j-c_txt.dat
8.0
6.0
4.0
2.0
0
100µs
300µs
1.0ms
3.0ms
10ms
30ms
100ms
V(CT1:1)j-c
Time
Date: August 27, 2009
Time: 19:13:20


SiA406DJ
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SiA406DJ_j-a_txt.dat
100
80
60
40
20
0
100µs
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: August 27, 2009
Time: 19:40:11


SiA406DJ
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SiA406DJ_j-c_txt.dat
8.0
6.0
4.0
2.0
0
100µs
300µs
1.0ms
3.0ms
10ms
30ms
100ms
V(CF1:1)j-c
Time
Date: August 27, 2009
Time: 20:04:10