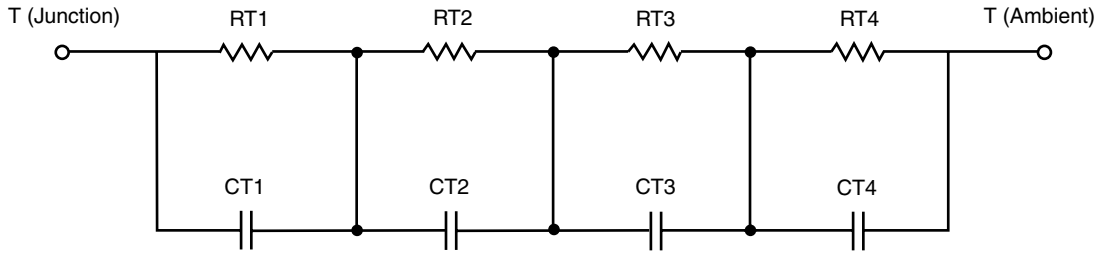
R-C Thermal Model Parameters

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

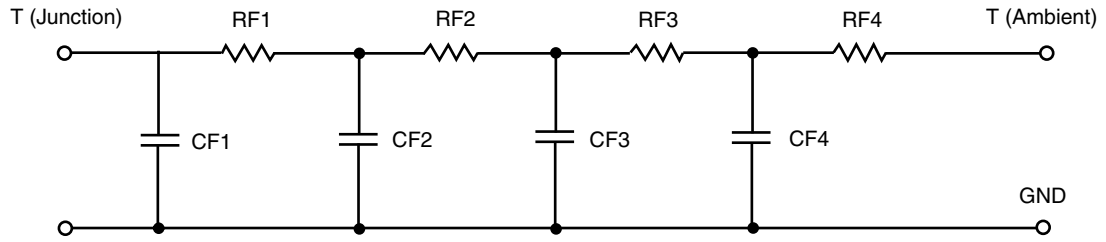


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	12.7963	965.0550 m	N/A
RT2	3.8181	495.9450 m	N/A
RT3	14.8332	1.4109	N/A
RT4	38.5524	1.3281	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	40.9642 m	1.5351 m	N/A
CT2	657.4686 u	242.6506 u	N/A
CT3	711.7633 m	11.3430 m	N/A
CT4	2.5749	7.5991 m	N/A

Note
N/A indicates not applicable

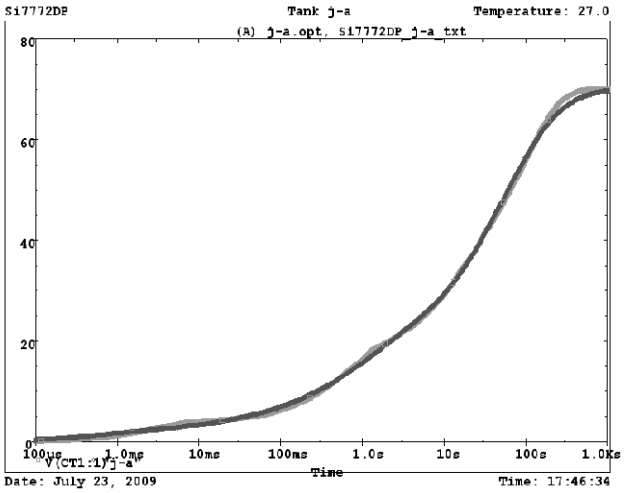
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

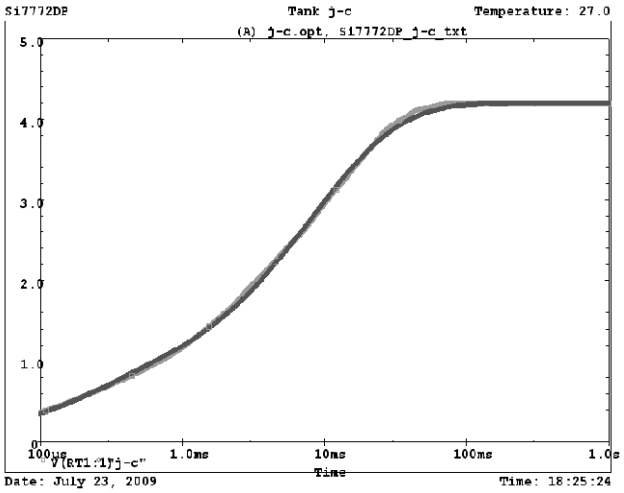
R-C THERMAL MODEL FOR FILTER CONFIGURATION

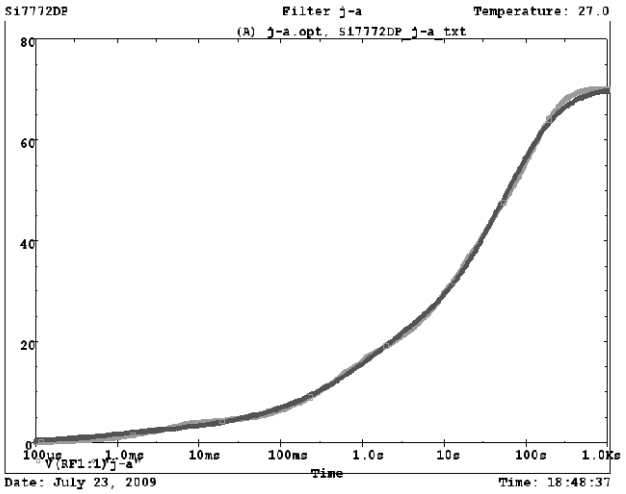


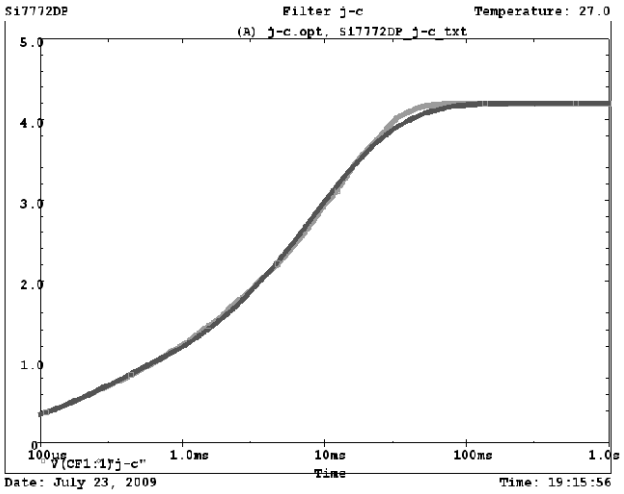
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	4.0018	748.2144 m	N/A
RF2	13.3091	565.9486 m	N/A
RF3	23.4612	715.2370 m	N/A
RF4	29.2279	2.1760	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	822.9711 u	215.8693 u	N/A
CF2	34.1276 m	789.4891 u	N/A
CF3	490.4307 m	678.5480 u	N/A
CF4	3.0552	3.5778 m	N/A

Note
N/A indicates not applicable


Si7772DP
Tank j-a
Temperature: 27.0
(A) j-a.opt, Si7772DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
Time
V(CT1:1)/j-a
Date: July 23, 2009
Time: 17:46:34


Si7772DP
Tank j-c
Temperature: 27.0
(A) j-c.opt, Si7772DP_j-c_txt
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
Time
V(RT1:1)/j-c"
Date: July 23, 2009
Time: 18:25:24


Si7772DP
Filter j-a
Temperature: 27.0
(A) j-a.opt, Si7772DP_j-a_txt
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
Time
V(RF1:1)/j-a
Date: July 23, 2009
Time: 18:48:37


Si7772DP
Filter j-c
Temperature: 27.0
(A) j-c.opt, Si7772DP_j-c_txt
5.0
4.0
3.0
2.0
1.0
0
100us
1.0ms
10ms
100ms
1.0s
Time
V(CF1:1)/j-c"
Date: July 23, 2009
Time: 19:15:56