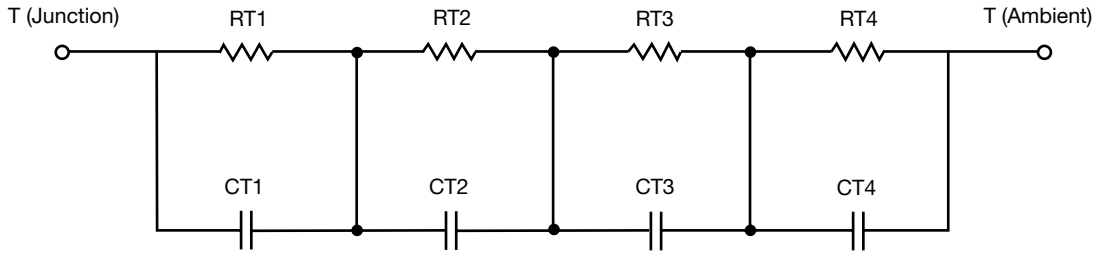
R-C Thermal Model Parameters

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



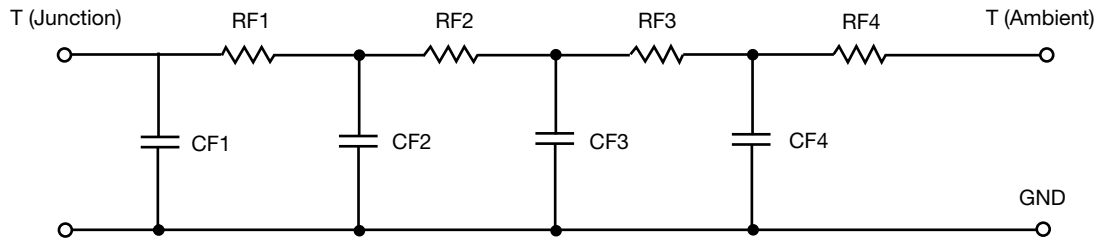
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	3.1560	581.8074 m	N/A
RT2	15.1883	536.3343 m	N/A
RT3	12.2929	48.3583 m	N/A
RT4	50.3628	1.2335	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	2.3497 m	966.5861 u	N/A
CT2	23.8775 m	16.6929 m	N/A
CT3	513.6192 m	123.6103 m	N/A
CT4	1.2896	7.0607 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.

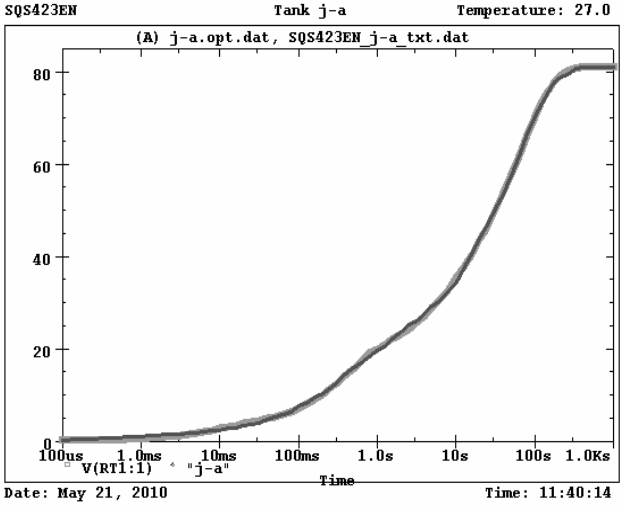
R-C THERMAL MODEL FOR FILTER CONFIGURATION

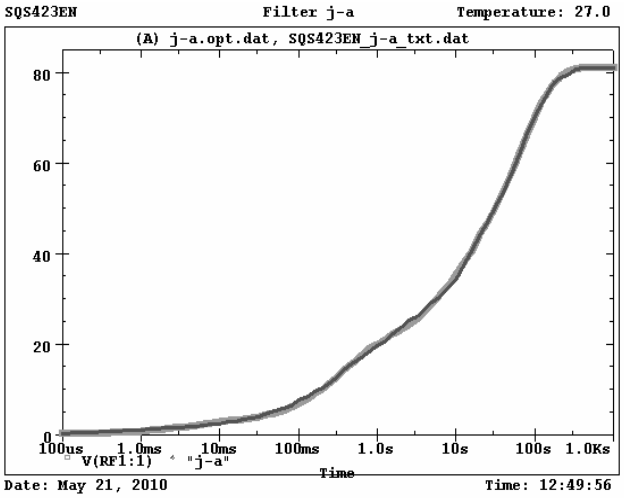


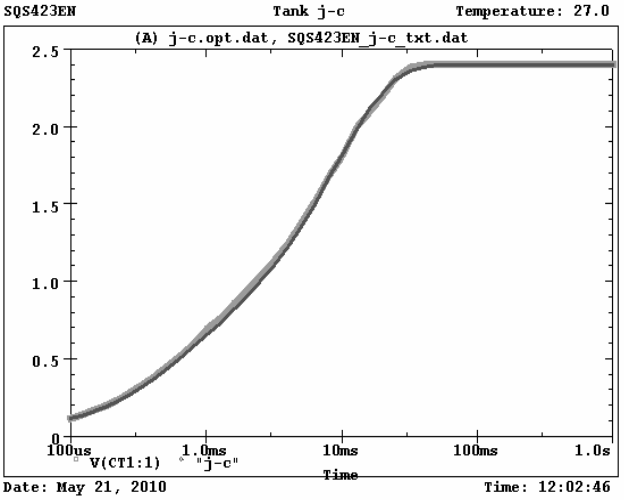
R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	2.7791	713.3791 m	N/A
RF2	17.1692	1.5932	N/A
RF3	22.1101	37.6622 m	N/A
RF4	38.9416	55.7587 m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	1.3190 m	828.9557 u	N/A
CF2	18.5717 m	3.9278 m	N/A
CF3	364.2352 m	58.5495 m	N/A
CF4	1.2344	1.3698	N/A

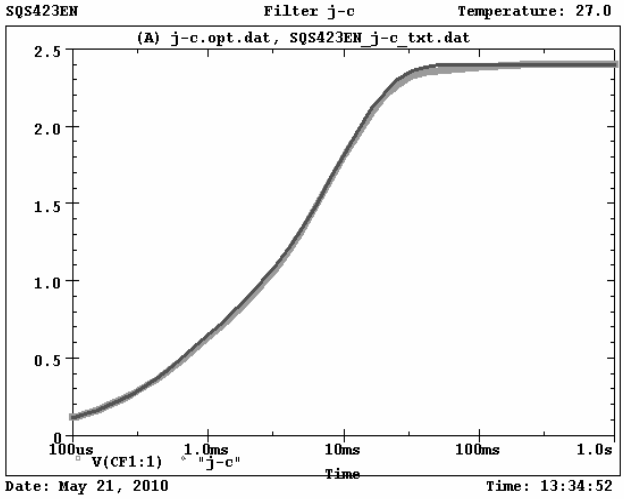
Note

- N/A indicates not applicable


SQS423EN
Tank j-a
Temperature: 27.0
(A) j-a.opt.dat, SQS423EN_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RT1:1)
"j-a"
Time
Date: May 21, 2010
Time: 11:40:14


SQS423EN
Filter j-a
Temperature: 27.0
(A) j-a.opt.dat, SQS423EN_j-a_txt.dat
80
60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)
"j-a"
Time
Date: May 21, 2010
Time: 12:49:56


SQS423EN
Tank j-c
Temperature: 27.0
(A) j-c.opt.dat, SQS423EN_j-c_txt.dat
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)
"j-c"
Time
Date: May 21, 2010
Time: 12:02:46


SQS423EN
Filter j-c
Temperature: 27.0
(A) j-c.opt.dat, SQS423EN_j-c_txt.dat
2.5
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
"j-c"
Time
Date: May 21, 2010
Time: 13:34:52