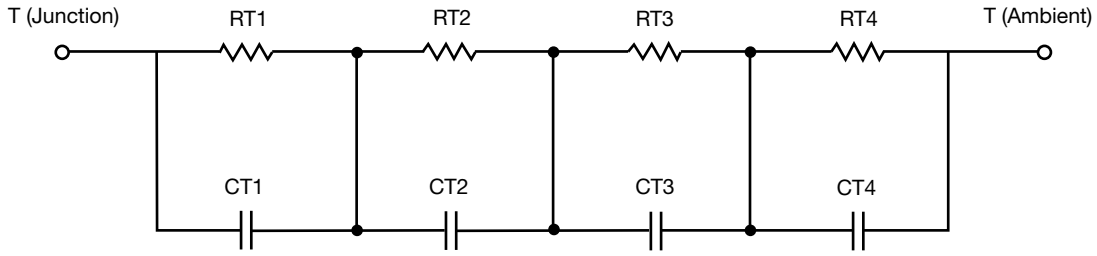
R-C Thermal Model Parameters

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

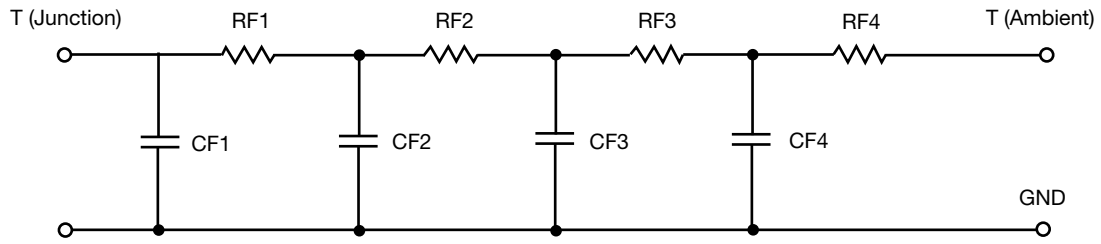


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	60.6226	N/A	9.0636
RT2	16.9468	N/A	2.7529
RT3	61.1716	N/A	7.5912
RT4	25.7992	N/A	30.5800
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.4484	N/A	4.1442m
CT2	270.6257m	N/A	279.3391u
CT3	6.2137m	N/A	235.0682m
CT4	1.1200m	N/A	12.3991m

Note
N/A indicates not applicable

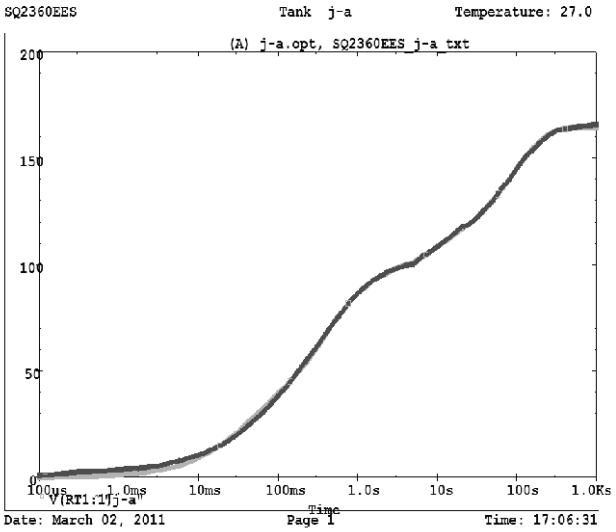
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

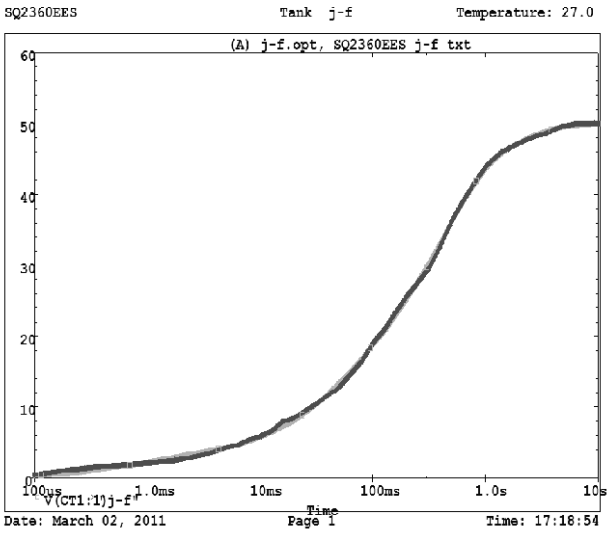
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.2458	N/A	4.4849
RF2	47.7806	N/A	19.2482
RF3	39.0015	N/A	23.1495
RF4	63.8436	N/A	3.4892
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	462.9800u	N/A	389.9940u
CF2	2.0270m	N/A	3.7588m
CF3	15.7873m	N/A	14.7082m
CF4	1.1631	N/A	861.0071m

Note
N/A indicates not applicable


SQ2360EES
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ2360EES_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: March 02, 2011
Page 1
Time: 17:06:31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Tank j-f
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50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
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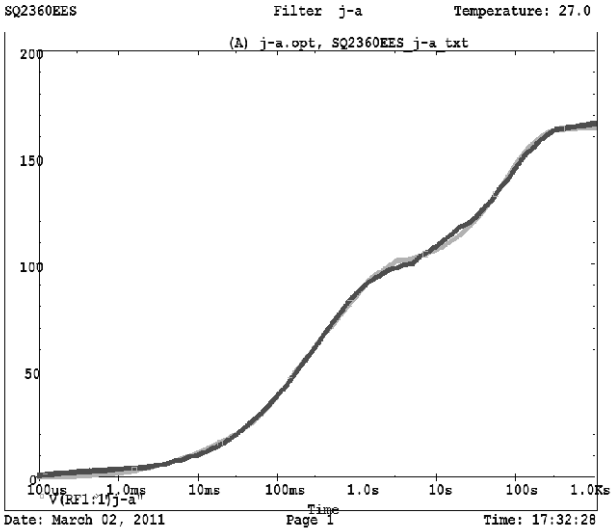
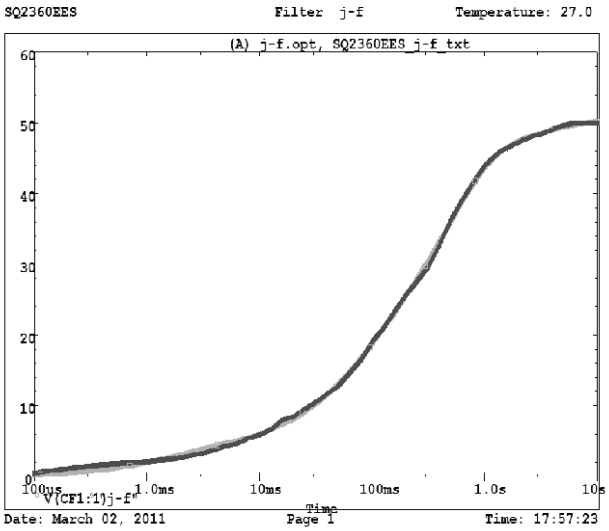
Time
Date: March 02, 2011
Page 1
Time: 17:18:54


SQ2360EES
Filter j-a
Temperature: 27.0
(A) j-a.opt, SQ2360EES_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: March 02, 2011
Page 1
Time: 17:32:28


SQ2360EES
Filter j-f
Temperature: 27.0
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60
50
40
30
20
10
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-f
Time
Date: March 02, 2011
Page 1
Time: 17:57:23