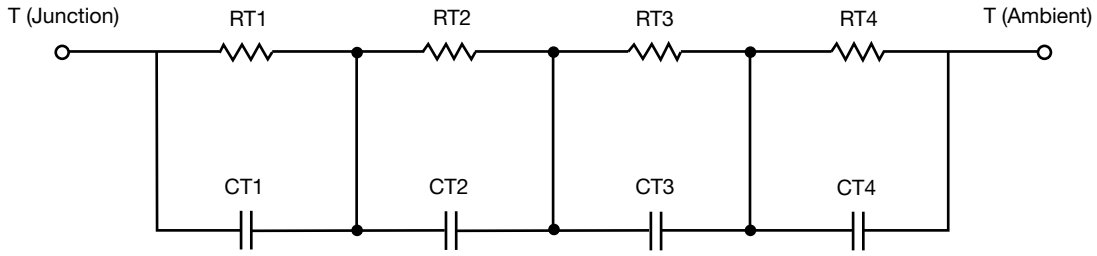
R-C Thermal Model Parameters

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

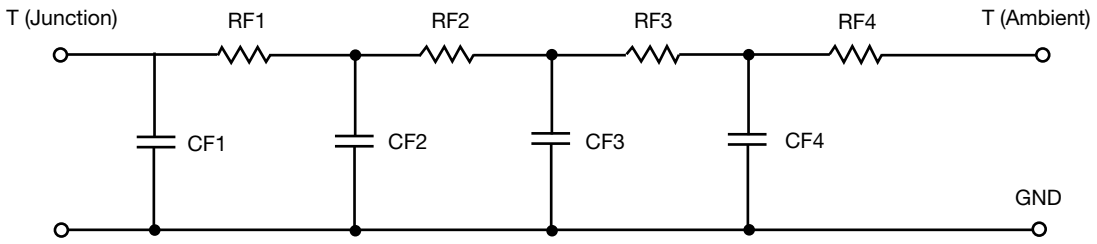


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	67.6300	N/A	12.3766
RT2	50.6734	N/A	11.3858
RT3	41.5195	N/A	13.6581
RT4	13.2481	N/A	37.3082
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	1.1674	N/A	9.4600m
CT2	3.3618m	N/A	82.5284u
CT3	26.2848m	N/A	14.7300m
CT4	690.3320u	N/A	697.5581u

Note
N/A indicates not applicable

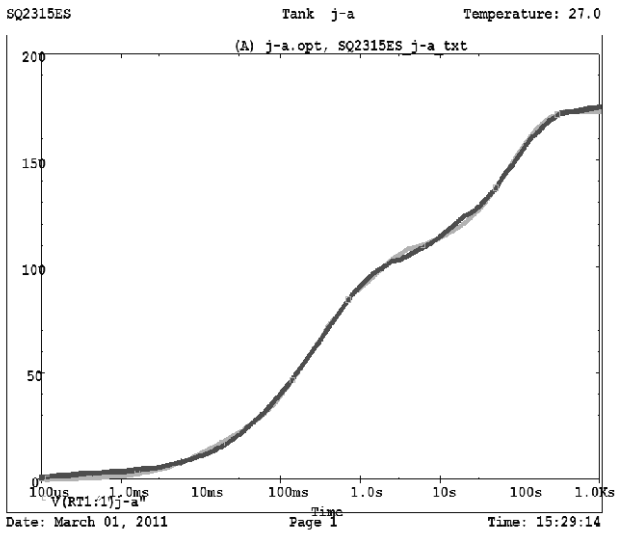
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	13.8337	N/A	12.6083
RF2	48.7411	N/A	29.2401
RF3	43.2360	N/A	21.0545
RF4	66.9351	N/A	12.1063
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	469.9776u	N/A	63.6258u
CF2	1.7793m	N/A	444.9459u
CF3	14.3070m	N/A	1.1178m
CF4	1.1209	N/A	15.4328m

Note
N/A indicates not applicable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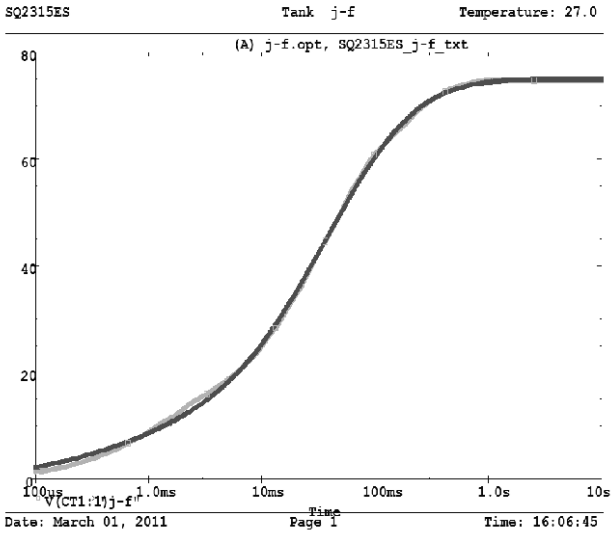
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ2315ES_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: March 01, 2011
Page 1
Time: 15:29:14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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
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Time
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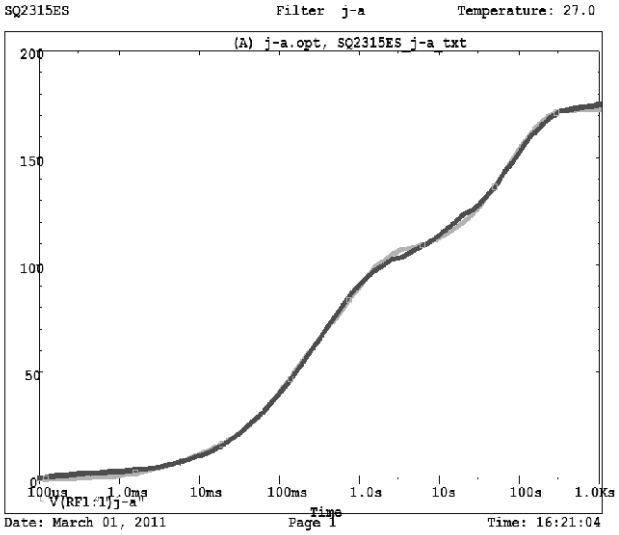
Page 1
Time: 16:06:45


SQ2315ES
Filter j-a
Temperature: 27.0
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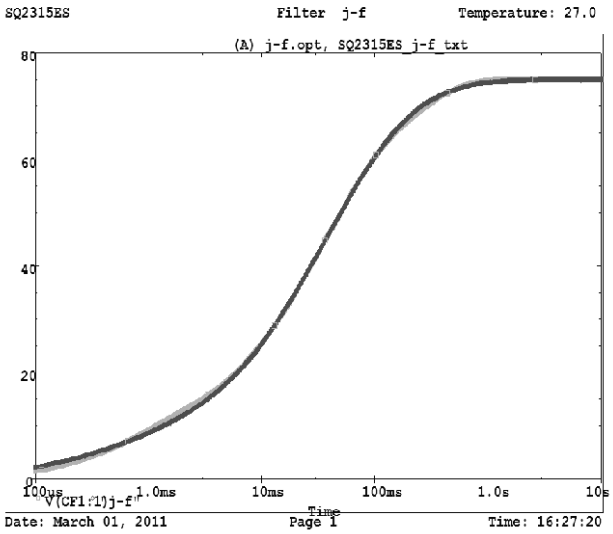
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(RF1:1)j-a
Time
Date: March 01, 2011
Page 1
Time: 16:21:04


SQ2315ES
Filter j-f
Temperature: 27.0
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-f
Time
Date: March 01, 2011
Page 1
Time: 16:27:20