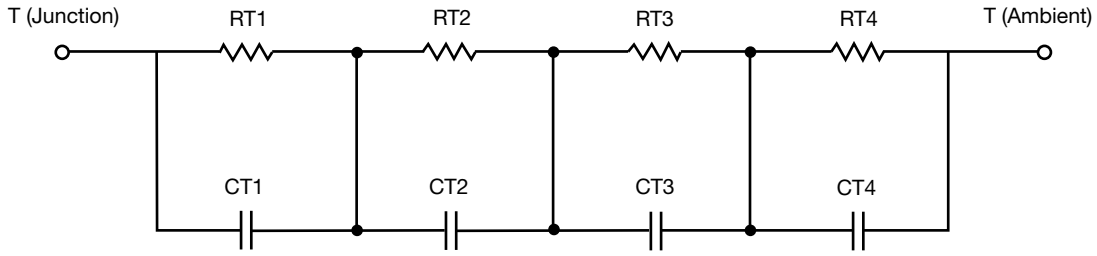
R-C Thermal Model Parameters

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

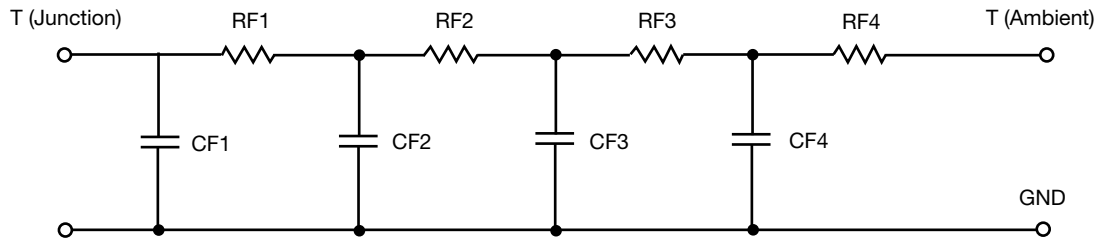


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	8.8453	N/A	13.1906
RT2	53.3848	N/A	29.2896
RT3	41.6952	N/A	22.3322
RT4	71.0747	N/A	10.1730
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	425.1745u	N/A	21.3444m
CT2	14.3761m	N/A	1.9559m
CT3	2.6958m	N/A	814.6812u
CT4	1.1300	N/A	73.7010u

Note
N/A indicates not applicable

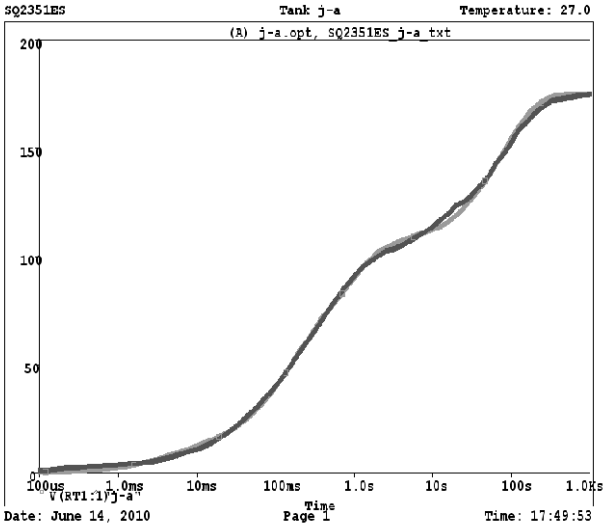
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

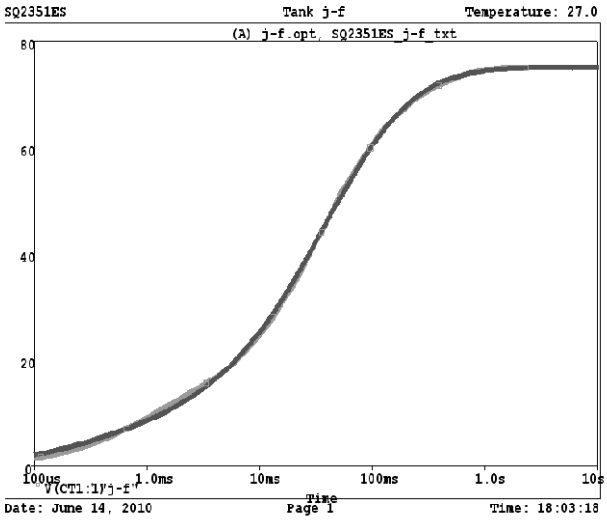
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	14.4878	N/A	13.2366
RF2	59.8705	N/A	40.3902
RF3	32.6249	N/A	20.0816
RF4	66.0838	N/A	1.2916
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	427.6062u	N/A	74.5941u
CF2	2.2626m	N/A	500.9684u
CF3	28.0582m	N/A	5.2481m
CF4	1.1500	N/A	1.0650

Note
N/A indicates not applicable


SQ2351ES
Tank j-a
Temperature: 27.0
(A) j-a.opt, SQ2351ES_j-a_txt
200
150
100
50
0
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0ks
V(RT1:1)"j-a"
Time
Date: June 14, 2010
Page 1
Time: 17:49:53


SQ2351ES
Tank j-f
Temperature: 27.0
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60
40
20
0
100us
1.0ms
10ms
100ms
1.0s
10s
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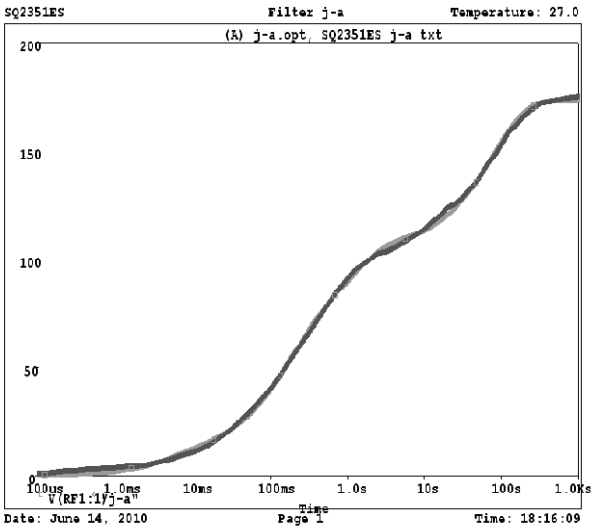
Time
Date: June 14, 2010
Page 1
Time: 18:03:18


SQ2351ES
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
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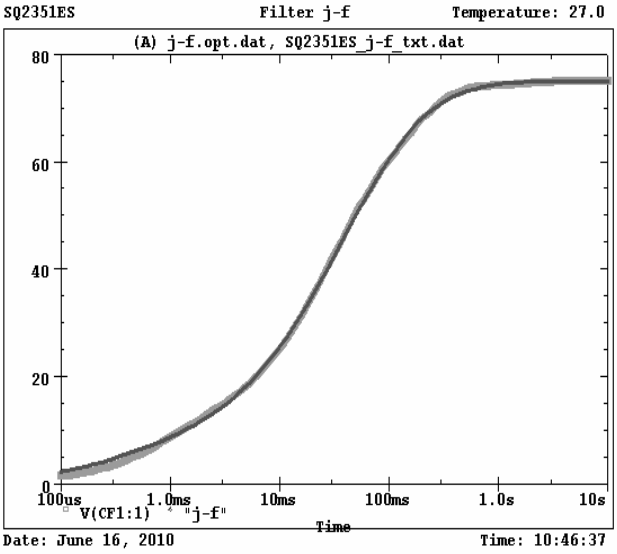
Time
Date: June 14, 2010
Page 1
Time: 18:16:09


SQ2351ES
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: June 16, 2010
Time: 10:46:37