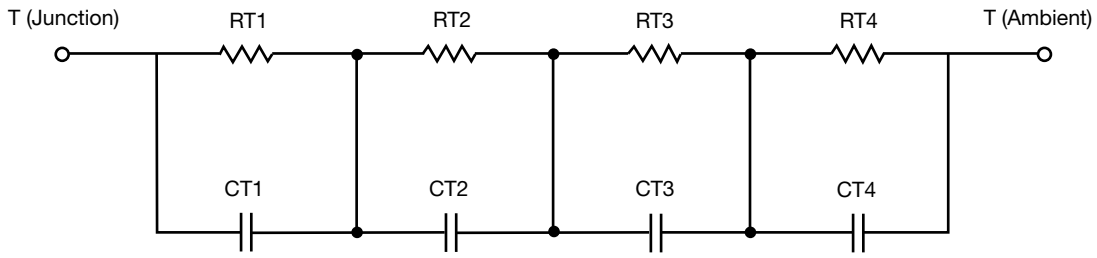
R-C Thermal Model Parameters

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

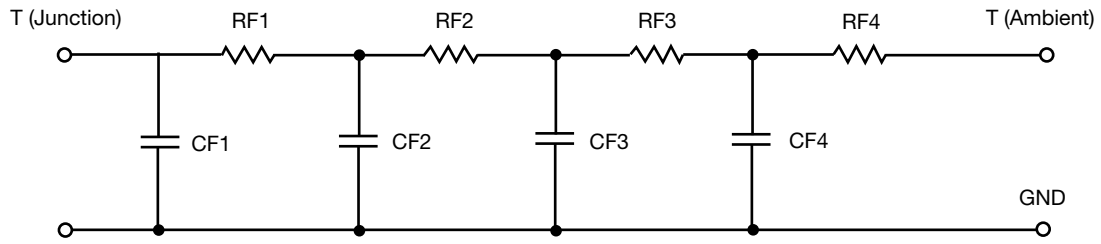


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	N/A	359.3698m	N/A
RT2	N/A	149.0506m	N/A
RT3	N/A	831.8828m	N/A
RT4	N/A	354.8372m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	N/A	934.0132m	N/A
CT2	N/A	1.7760m	N/A
CT3	N/A	49.7580m	N/A
CT4	N/A	15.7115m	N/A

Note
N/A indicates not applicable

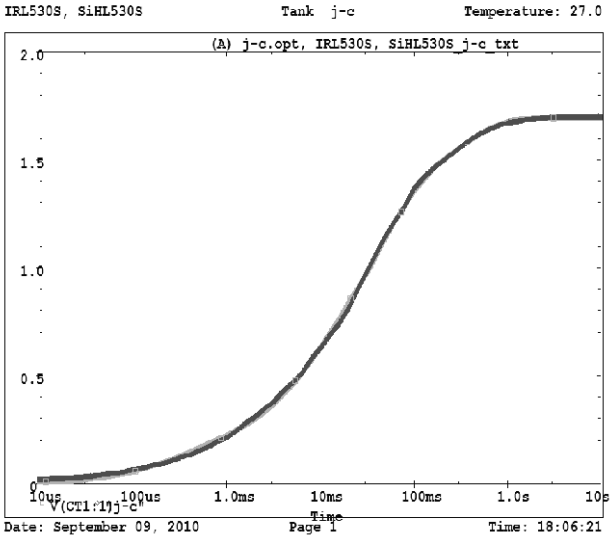
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

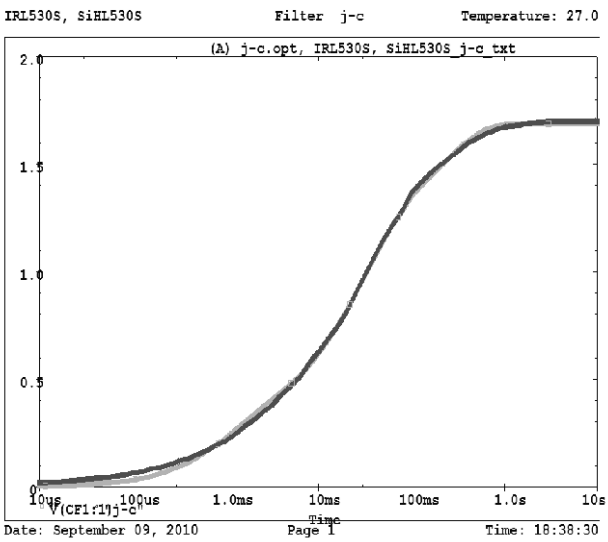
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	N/A	388.7554m	N/A
RF2	N/A	706.1954m	N/A
RF3	N/A	255.2375m	N/A
RF4	N/A	338.1812m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	N/A	2.9643m	N/A
CF2	N/A	25.1123m	N/A
CF3	N/A	60.3468m	N/A
CF4	N/A	538.7557m	N/A

Note
N/A indicates not applicable


IRL530S, SiHL530S
Tank j-c
Temperature: 27.0
(A) j-c.opt, IRL530S, SiHL530S_j-c_txt
2.0
1.5
1.0
0.5
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: September 09, 2010
Page 1
Time: 18:06:21


IRL530S, SiHL530S
Filter j-c
Temperature: 27.0
(A) j-c.opt, IRL530S, SiHL530S_j-c_txt
2.0
1.5
1.0
0.5
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: September 09, 2010
Page 1
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