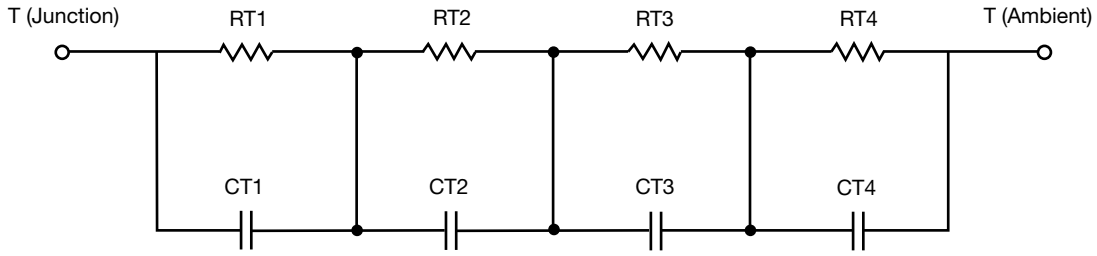
R-C Thermal Model Parameters

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

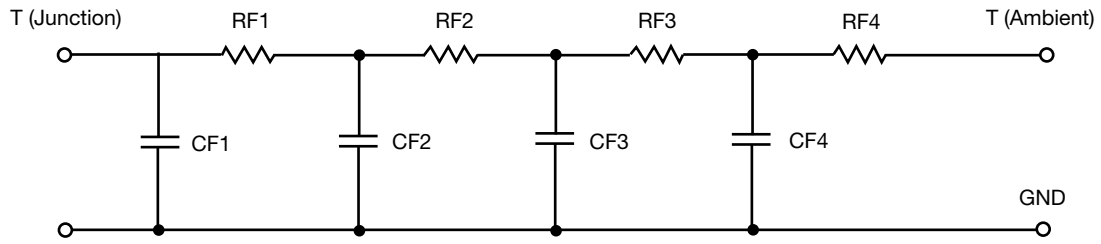


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	N/A	14.2126	N/A
RT2	N/A	8.8736	N/A
RT3	N/A	3.6050	N/A
RT4	N/A	13.3088	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	N/A	123.3103m	N/A
CT2	N/A	7.0034m	N/A
CT3	N/A	243.5086m	N/A
CT4	N/A	813.1741m	N/A

Note
N/A indicates not applicable

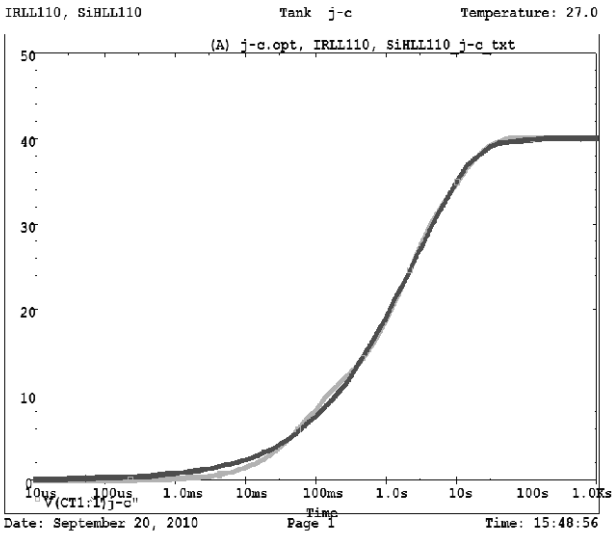
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

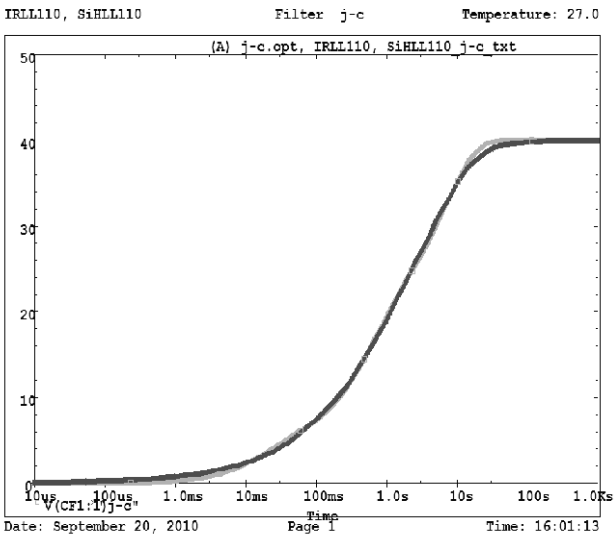
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	N/A	5.7044	N/A
RF2	N/A	16.4166	N/A
RF3	N/A	8.4326	N/A
RF4	N/A	9.4464	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	N/A	3.4971m	N/A
CF2	N/A	31.1860m	N/A
CF3	N/A	328.1506m	N/A
CF4	N/A	36.0064u	N/A

Note
N/A indicates not applicable


IRLL110, SiHLL110
Tank j-c
Temperature: 27.0
(A) j-c.opt, IRLL110, SiHLL110_j-c_txt
50
40
30
20
10
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(CT1:1)j-c"
Time
Date: September 20, 2010
Page 1
Time: 15:48:56


IRLL110, SiHLL110
Filter j-c
Temperature: 27.0
(A) j-c.opt, IRLL110, SiHLL110_j-c_txt
50
40
30
20
10
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
100s
1.0Ks
V(CT1:1)j-c"
Time
Date: September 20, 2010
Page 1
Time: 16:01:13