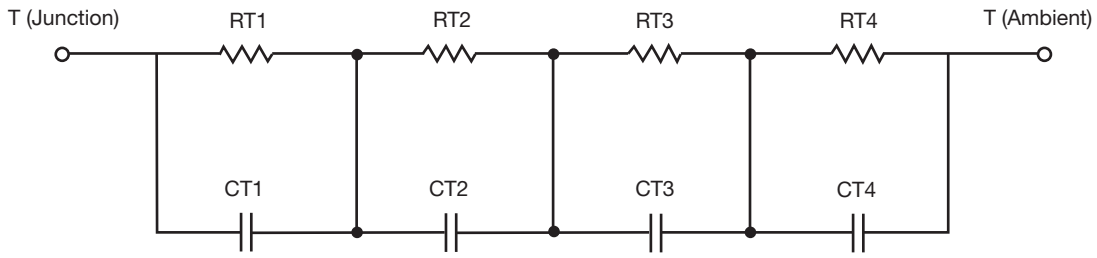
R-C Thermal Model Parameters

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

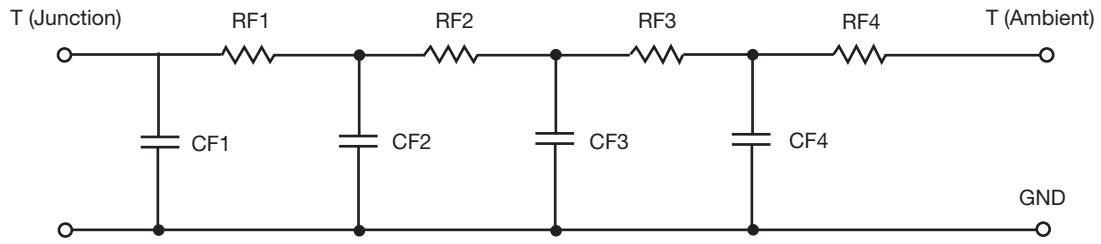


R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	N/A	1.5677	N/A
RT2	N/A	919.9134m	N/A
RT3	N/A	772.3523m	N/A
RT4	N/A	237.8901m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	N/A	13.3538m	N/A
CT2	N/A	112.5269m	N/A
CT3	N/A	3.4976m	N/A
CT4	N/A	740.9128u	N/A

Note
N/A indicates not applicable

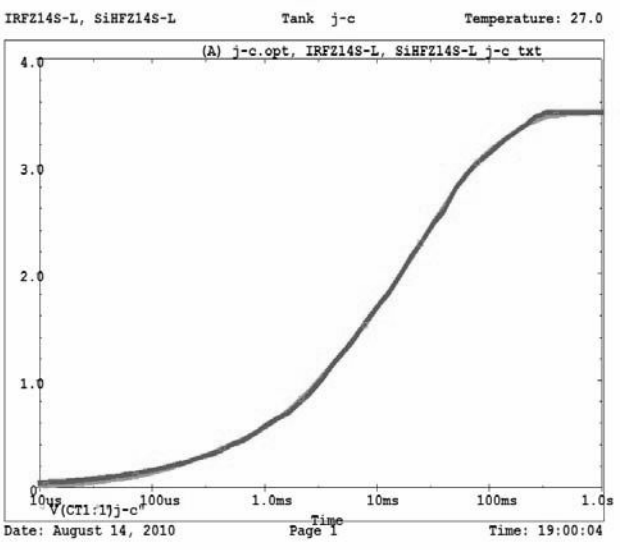
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

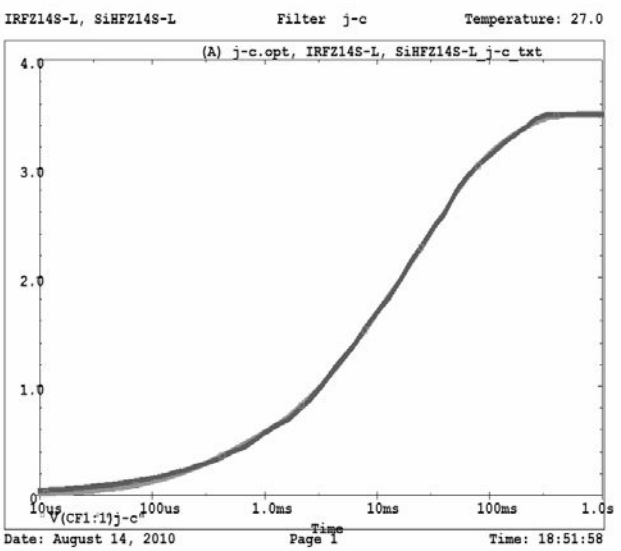
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	N/A	517.5914m	N/A
RF2	N/A	1.2719	N/A
RF3	N/A	1.2741	N/A
RF4	N/A	445.0559m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	N/A	708.6073u	N/A
CF2	N/A	3.3031m	N/A
CF3	N/A	17.5735m	N/A
CF4	N/A	219.6301m	N/A

Note
N/A indicates not applicable


IRFZ14S-L, SiHFZ14S-L
Tank j-c
Temperature: 27.0
(A) j-c.opt, IRFZ14S-L, SiHFZ14S-L j-c txt
4.0
3.0
2.0
1.0
0
10us
100us
1.0ms
10ms
100ms
1.0s
V(CT1:1)j-c
Time
Date: August 14, 2010
Page 1
Time: 19:00:04


IRFZ14S-L, SiHFZ14S-L
Filter j-c
Temperature: 27.0
(A) j-c.opt, IRFZ14S-L, SiHFZ14S-L j-c txt
4.0
3.0
2.0
1.0
0
10us
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)j-c
Time
Date: August 14, 2010
Page 1
Time: 18:51:58