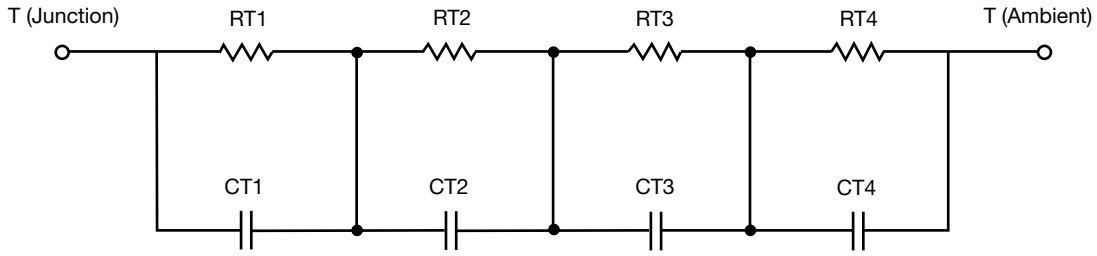
R-C Thermal Model Parameters

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



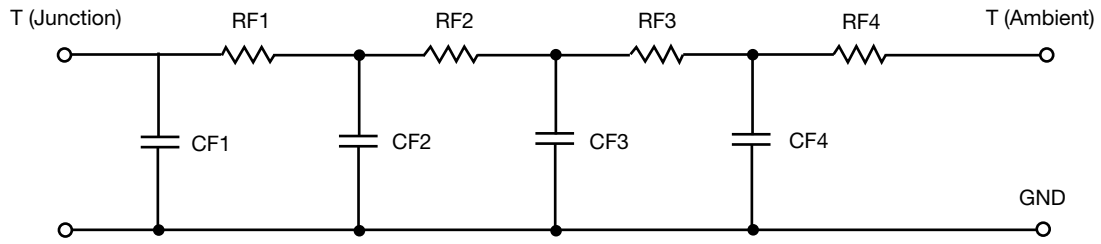
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	N/A	1.9602	N/A
RT2	N/A	320.8192m	N/A
RT3	N/A	961.3247m	N/A
RT4	N/A	854.7625m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	N/A	52.2976m	N/A
CT2	N/A	2.0621m	N/A
CT3	N/A	481.8519m	N/A
CT4	N/A	13.9904m	N/A

Note

N/A indicates not applicable

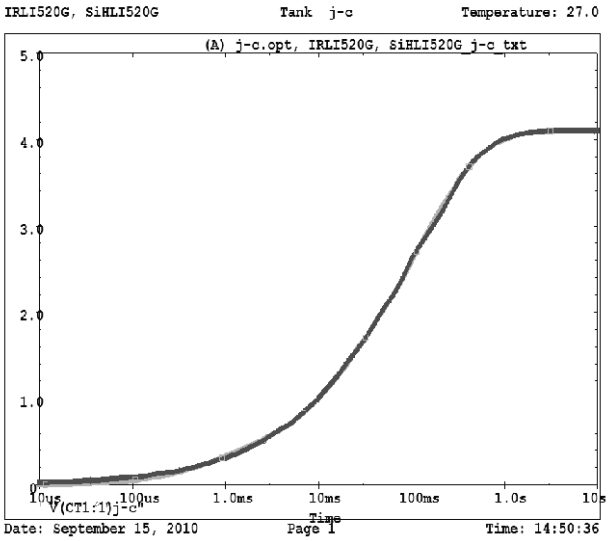
This document is intended as a SPICE modeling guideline and does not constitute a commercial product datasheet. Designers should refer to the appropriate datasheet of the same number for guaranteed specification limits.

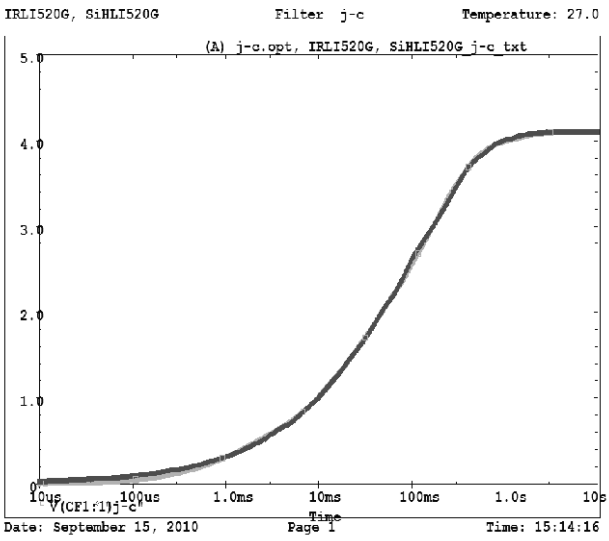
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	N/A	550.5423m	N/A
RF2	N/A	1.3783	N/A
RF3	N/A	1.9401	N/A
RF4	N/A	235.9224m	N/A
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	N/A	2.2308m	N/A
CF2	N/A	11.2194m	N/A
CF3	N/A	67.2146m	N/A
CF4	N/A	3.6146	N/A

Note
N/A indicates not applicable


IRLI520G, SiHLI520G
Tank j-c
Temperature: 27.0
(A) j-c.opt, IRLI520G, SiHLI520G_j-c_txt
5.0
4.0
3.0
2.0
1.0
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CT1:1)j-c
Time
Date: September 15, 2010
Page 1
Time: 14:50:36


IRLI520G, SiHLI520G
Filter j-c
Temperature: 27.0
(A) j-c.opt, IRLI520G, SiHLI520G_j-c_txt
5.0
4.0
3.0
2.0
1.0
0
10us
100us
1.0ms
10ms
100ms
1.0s
10s
V(CF1:1)j-c
Time
Date: September 15, 2010
Page 1
Time: 15:14:16

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.