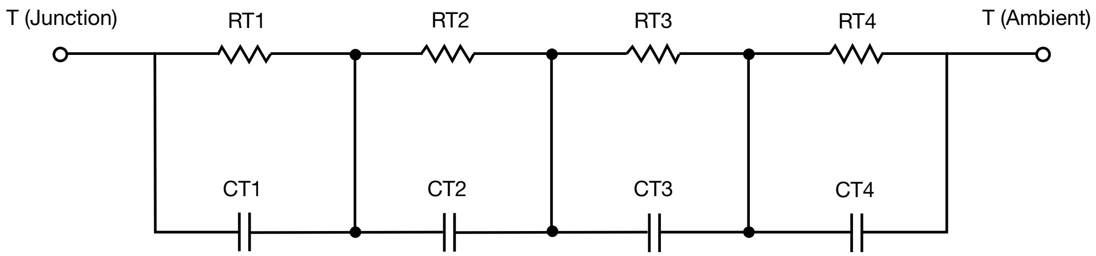
R-C Thermal Model Parameters

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 PSpice, 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 PSpice 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 PSpice Platform”.

R-C THERMAL MODEL FOR TANK CONFIGURATION



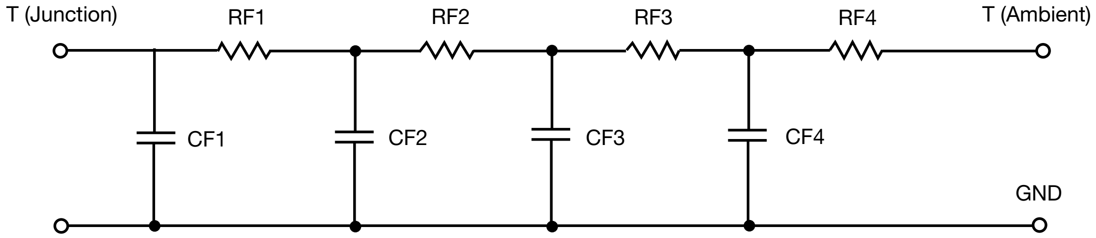
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RT1	n/a	131.6686m	n/a
RT2	n/a	32.8555m	n/a
RT3	n/a	136.8729m	n/a
RT4	n/a	148.9584m	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CT1	n/a	38.9421m	n/a
CT2	n/a	22.0277m	n/a
CT3	n/a	192.6946m	n/a
CT4	n/a	194.4802m	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

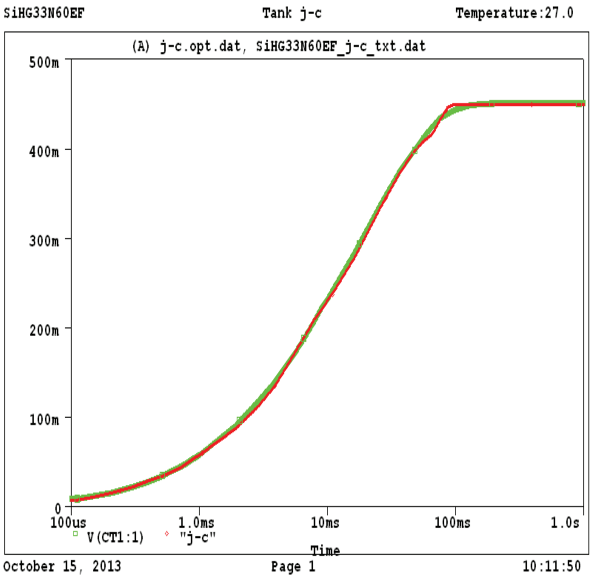


R-C VALUES FOR FILTER CONFIGURATION

THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	n/a	45.7669m	n/a
RF2	n/a	101.0708m	n/a
RF3	n/a	152.4947m	n/a
RF4	n/a	151.5912m	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	n/a	9.6079m	n/a
CF2	n/a	12.2386m	n/a
CF3	n/a	17.3612m	n/a
CF4	n/a	134.2145m	n/a

Note

- n/a indicates not applicable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Tank j-c
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400m
300m
200m
100m
0
100us
1.0ms
10ms
100ms
1.0s
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"j-c"
Time
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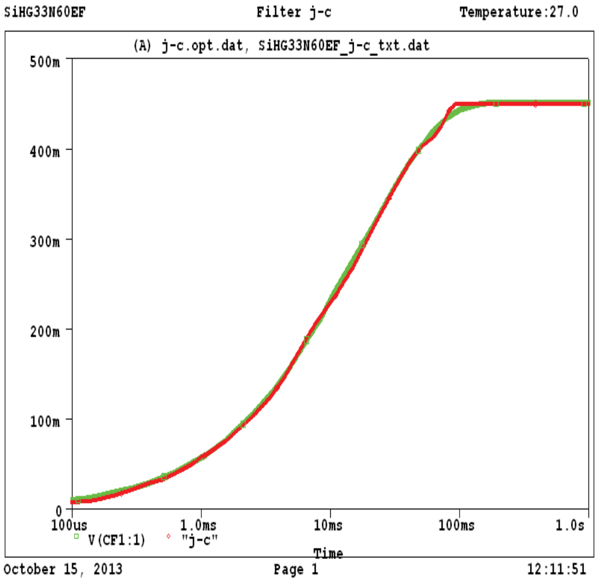
10:11:50


SiHG33N60EF
Filter j-c
Temperature:27.0
(A) j-c.opt.dat, SiHG33N60EF_j-c_txt.dat
500m
400m
300m
200m
100m
0
100us
1.0ms
10ms
100ms
1.0s
V(CF1:1)
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Time
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12:11:51