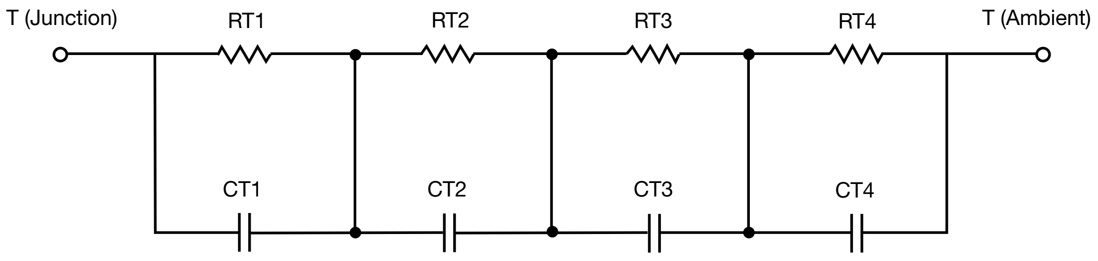
R-C Thermal Model Parameters

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



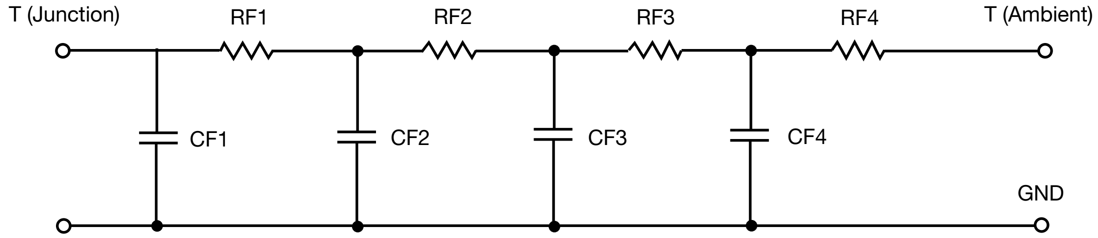
R-C VALUES FOR TANK CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	Ambient	Case	Foot
RT1	n/a	285.7408m	n/a
RT2	n/a	321.8487m	n/a
RT3	n/a	434.8111m	n/a
RT4	n/a	757.5994m	n/a
THERMAL CAPACITANCE (JOULES/°C)			
Junction to	Ambient	Case	Foot
CT1	n/a	84.9360m	n/a
CT2	n/a	5.1896m	n/a
CT3	n/a	3.3027m	n/a
CT4	n/a	284.7682m	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.

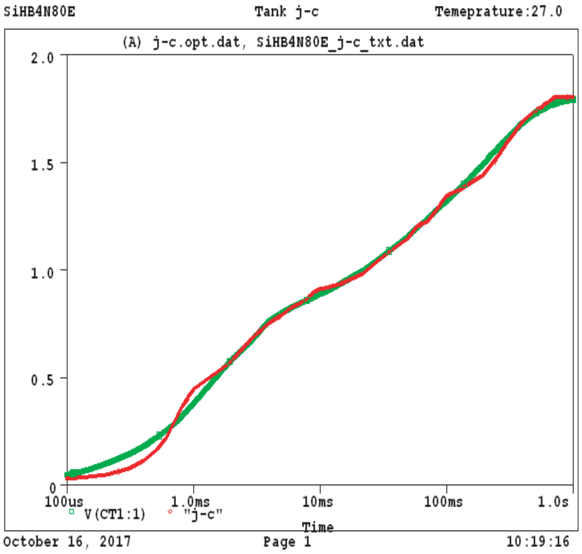
R-C THERMAL MODEL FOR FILTER CONFIGURATION



R-C VALUES FOR FILTER CONFIGURATION			
THERMAL RESISTANCE (°C/W)			
Junction to	**Ambient**	**Case**	**Foot**
RF1	n/a	813.6507m	n/a
RF2	n/a	503.7287m	n/a
RF3	n/a	469.2393m	n/a
RF4	n/a	13.3813m	n/a
THERMAL CAPACITANCE (Joules/°C)			
Junction to	**Ambient**	**Case**	**Foot**
CF1	n/a	1.9817m	n/a
CF2	n/a	83.0002m	n/a
CF3	n/a	345.1788m	n/a
CF4	n/a	2.0901	n/a

Note

- n/a indicates not applicable


SiHB4N80E
Tank j-c
Temeprature:27.0
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2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
□ V(CT1:1)
◇ "j-c"
Time
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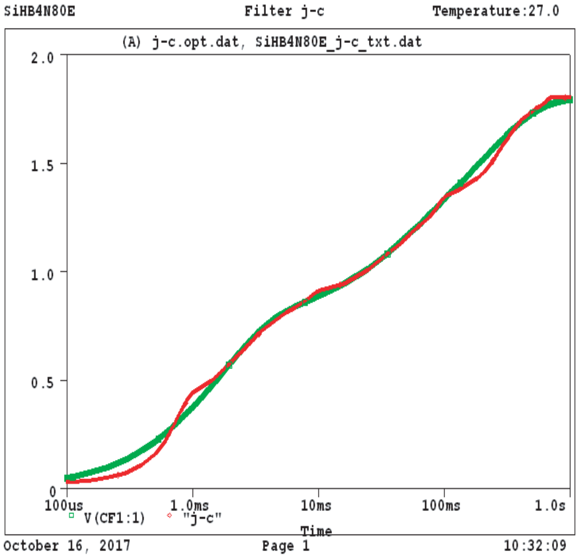
Page 1
10:19:16


SiHB4N80E
Filter j-c
Temperature:27.0
(A) j-c.opt.dat, SiHB4N80E_j-c_txt.dat
2.0
1.5
1.0
0.5
0
100us
1.0ms
10ms
100ms
1.0s
□ V(CF1:1)
◇ "j-c"
Time
October 16, 2017
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10:32:09