

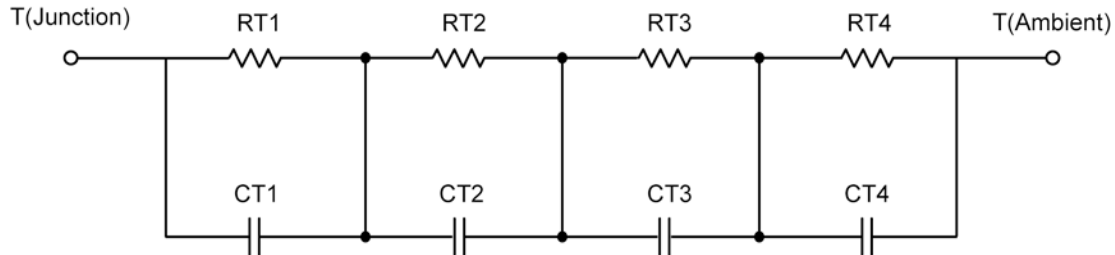
R-C Thermal Model Parameters

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-Mosfet	Foot-Mosfet	Ambient-Schtky	Foot-Schtky
RT1	12.6250	16.4681	21.0048	13.4802
RT2	29.7962	2.1657	35.1756	8.0825
RT3	35.5399	5.9413	37.6724	11.1569
RT4	52.0389	15.4249	31.1472	17.2804
Thermal Capacitance (Joules/°C)				
Junction to	Ambient-Mosfet	Foot-Mosfet	Ambient-Schtky	Foot-Schtky
CT1	91.2361 u	1.5280 m	41.3949 u	1.3689 m
CT2	27.7915 m	20.2105 m	734.0348 u	3.6143 m
CT3	1.3857 m	66.0406 u	11.0792 m	33.7753 u
CT4	1.6673	412.6608 u	923.3217 m	211.4587 u

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

R-C THERMAL MODEL FOR FILTER CONFIGURATION

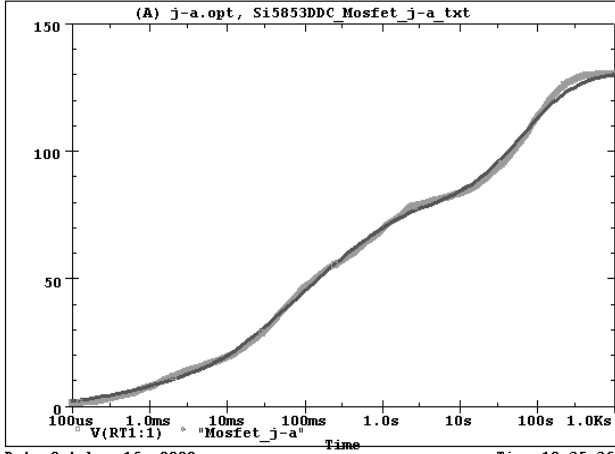
R-C VALUES FOR FILTER CONFIGURATION				
Thermal Resistance ($^{\circ}\text{C}/\text{W}$)				
Junction to	Ambient-Mosfet	Foot-Mosfet	Ambient-Schtky	Foot-Schtky
RF1	13.3993	9.8134	23.8969	12.8681
RF2	35.8098	24.4555	32.3853	21.6355
RF3	29.5435	5.5202	37.3432	15.3008
RF4	51.2474	210.9000 m	31.3746	195.6000 m
Thermal Capacitance (Joules/ $^{\circ}\text{C}$)				
Junction to	Ambient-Mosfet	Foot-Mosfet	Ambient-Schtky	Foot-Schtky
CF1	74.2741 u	60.6268 u	40.2733 u	24.0406 u
CF2	1.1351 m	388.3769 u	608.7231 u	128.7511 u
CF3	22.7507 m	7.2412 m	8.0253 m	1.1555 m
CF4	1.6570	35.4010 m	850.8547 m	20.9502 m

Note

NA indicates not applicable

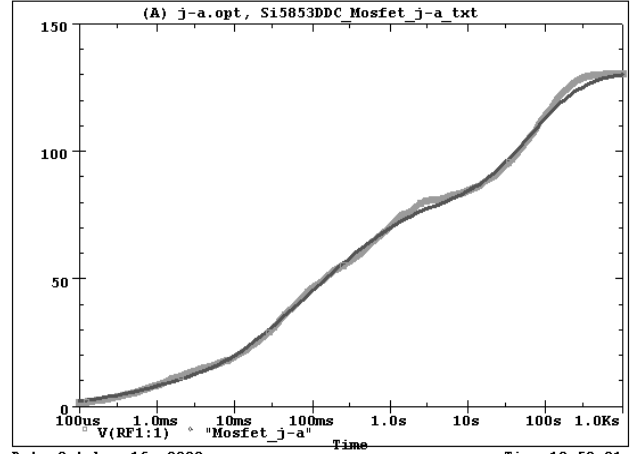


Si5853DDC Tank j-a Mosfet Temperature:27.0



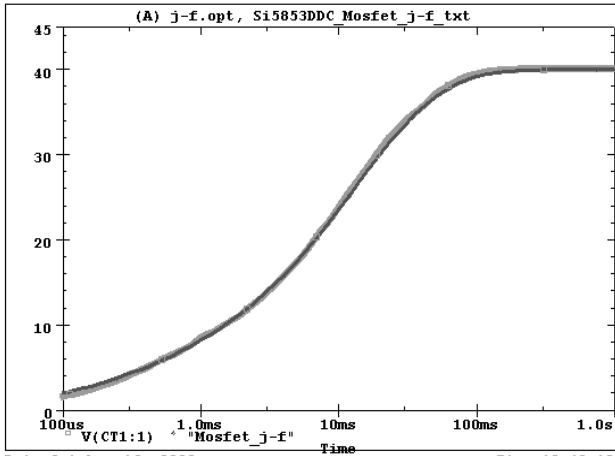
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Si5853DDC Filter j-a Mosfet Temperature:27.0



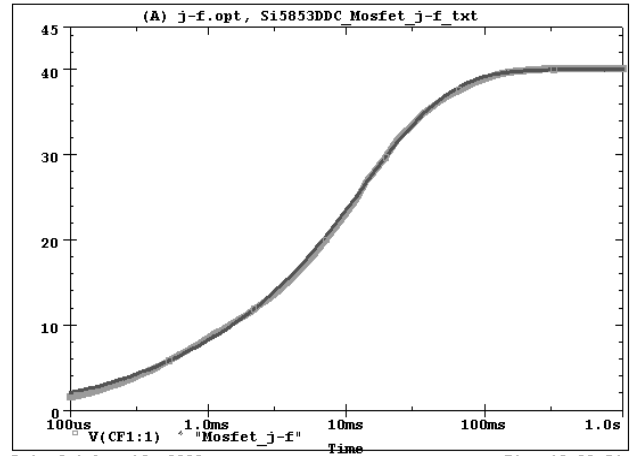
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Si5853DDC Tank j-f Mosfet Temperature:27.0



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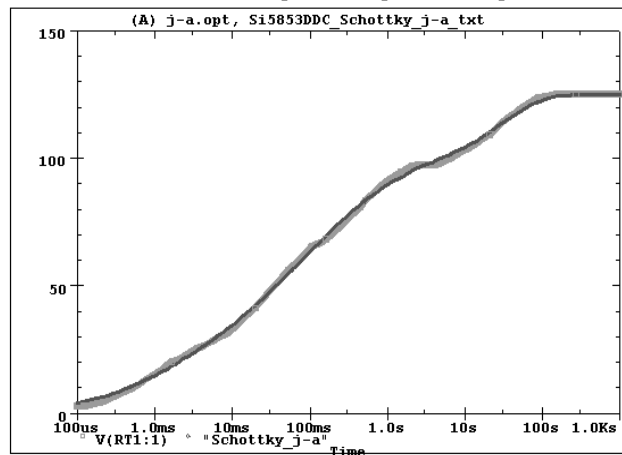
Si5853DDC Filter j-f Mosfet Temperature:27.0



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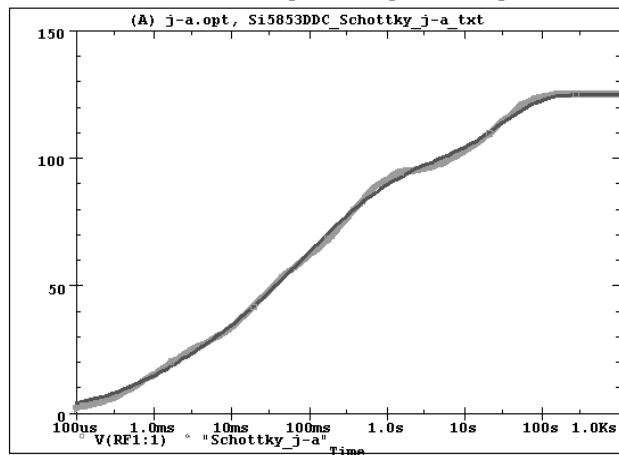


Si5853DDC Tank j-a Schottky Temperature:27.0



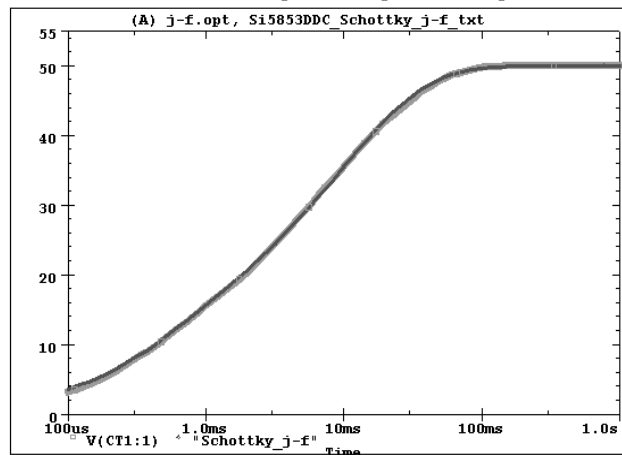
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Si5853DDC Filter j-a Schottky Temperature:27.0



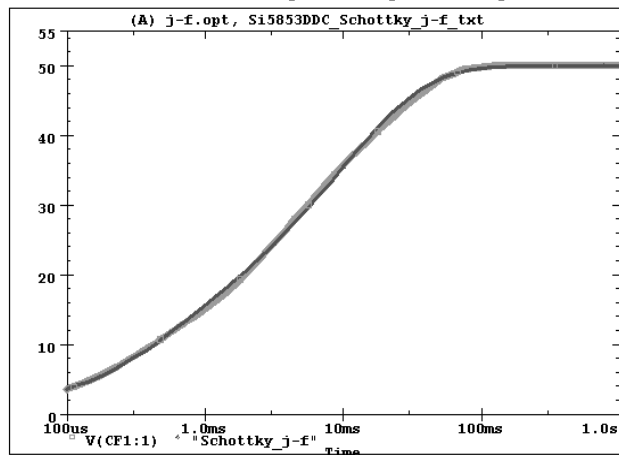
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Si5853DDC Tank j-f Schottky Temperature:27.0



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Si5853DDC Filter j-f Schottky Temperature:27.0



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