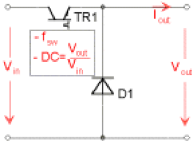


Semisel - Simulation Software

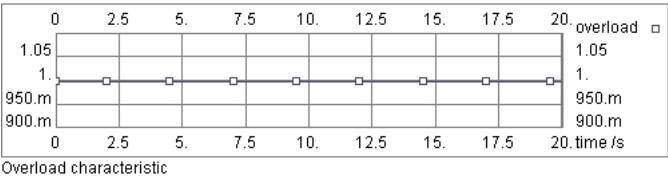
Project:
Topology
Circuit

DC/DC
Buck



Circuit:

V_{in} 600 V
I_{in} 22.70 A
f_{sw} 10 kHz
Duty Cycle 0.75(x100%)
V_{out} 450 V
I_{out} 30 A
t_{on fwd} 0.25
Overload factor 1
Overload duration 10 s



Device :
Product line
Device
Use maximum values
Max. junction temperature

SEMITRANS
SKM195GAL126D
No
150

Transistor

E_r = 40.5 mJ (@600V)
V_{CE0,125} = 0.9 V
r_{C,125} = 7.34 mOhm
V_{CE,sat} = 2.00 V
I_c = 150.00 A
R_{th(j-c)} = 0.16 K/W
R_{th(c-s)} = 0.05 K/W
Data set from 2005/08/23

Diode

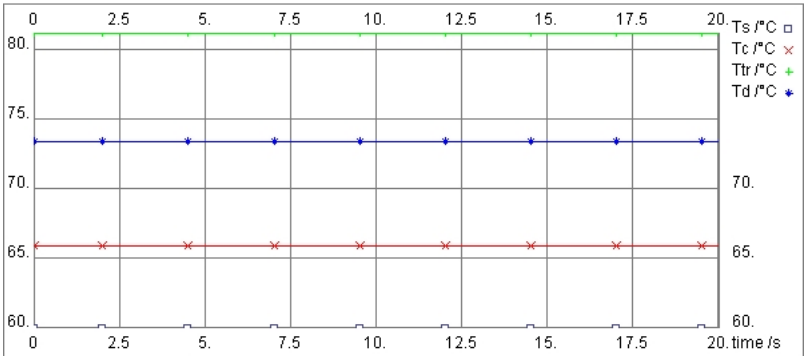
E_d = 5.8 mJ
V_{T0,125} = 0.9 V
r_{T,125} = 6 mOhm
V_f = 1.80 V
I_f = 150.00 A
R_{th(j-c)} = 0.32 K/W

Cooling:

Ambient temperature 40 °C
Number of sw itches per heat sink 1
Number of parallel devices on the same heat sink 1
Additional power source at this heat sink 0
Predefined SK-Heat Sink P3_120
Correction factor 1
Forced Air Cooling, Flow Rate: 80m³/h
R_{th(s-a)} 0.167K/W

Calculated losses and temperatures with rated current and at overload:

	Rated Current	Overload
P _{cond tr}	25 W	25 W
P _{sw tr}	70 W	70 W
P _{tr}	96 W	96 W
P _{cond d}	8.87 W	8.87 W
P _{sw d}	15 W	15 W
P _d	24 W	24 W
P _{tot}	119 W	119 W
T _s	60 °C	60 °C
T _c	66 °C	66 °C
T _{tr}	81 °C	81 °C
T _d	73 °C	73 °C



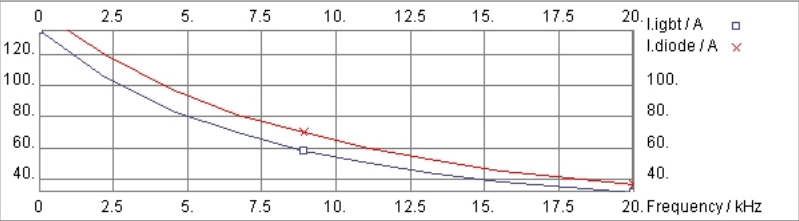
Evaluation:

This configuration seems to be too powerful.

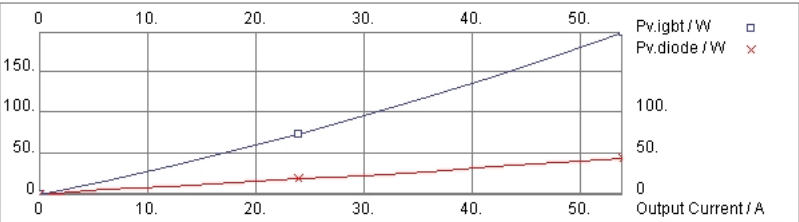
Device driver suggestion:

Name	I _{out(av)} /mA	I _{out} /A	V _{iso1} /kV	V _{ce max} /V	R _{gmin} / Ohm	Channels
1x SKHI24 R	80	15	4.0	1200	1.5	2
1x SKHI27W ⁽¹⁾	150	30	4.0	1200	1.1	2
1x SKYPER 32 R or SKYPER 32PRO R	50	15	4.0	1200	1.5	2

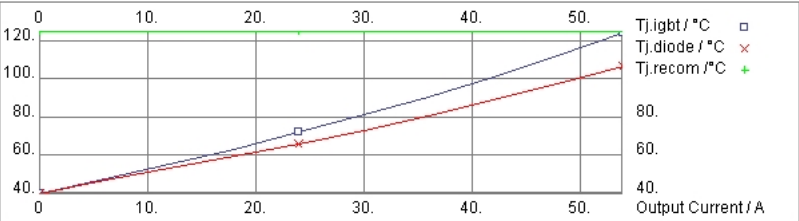
Additional Characteristics at given nominal operation conditions with one free parameter - X:



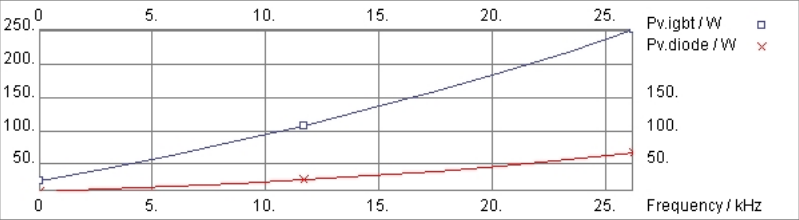
Current as function of switching frequency



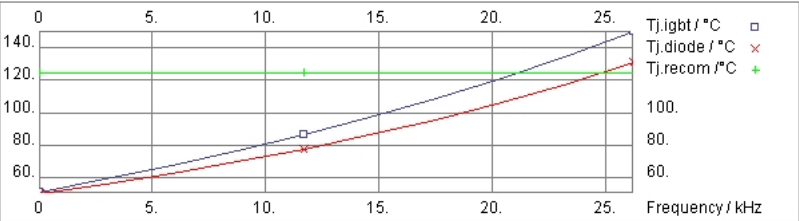
Losses vs. I_{out}



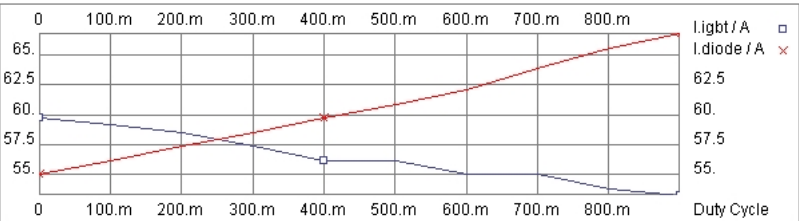
Junction Temperature vs. I_{out}



Losses vs. switching frequency



Temperature vs. switching frequency



Output current vs. Duty cycle





Note
1) * not for new design

Change Circuit	Circuit parameter	Device Parameter	Heat Sink Parameter
Printer friendly format	Load File	Save	Project information