

Hi, I have a question about LTC3872: The carrying load ability for the output of the LTC3872 circuit is not good, I do not know what is wrong with my LTC3872 circuit configuration? can ADI engineer help me? And I will be very grateful!!!

1、circuit configuration

Mosfet: Infineon BSZ018N04LS6 key performance parameters as follows:

Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	40	V
$R_{DS(on),max}$	1.8	$m\Omega$
I_D	158	A
Q_{oss}	34	nC
$Q_G(0V..10V)$	31	nC
$Q_G(0V..4.5V)$	15	nC

2、Test result

(1) no load model, the circuit of LTC3875 working normally, and the output voltage is 15.5V.

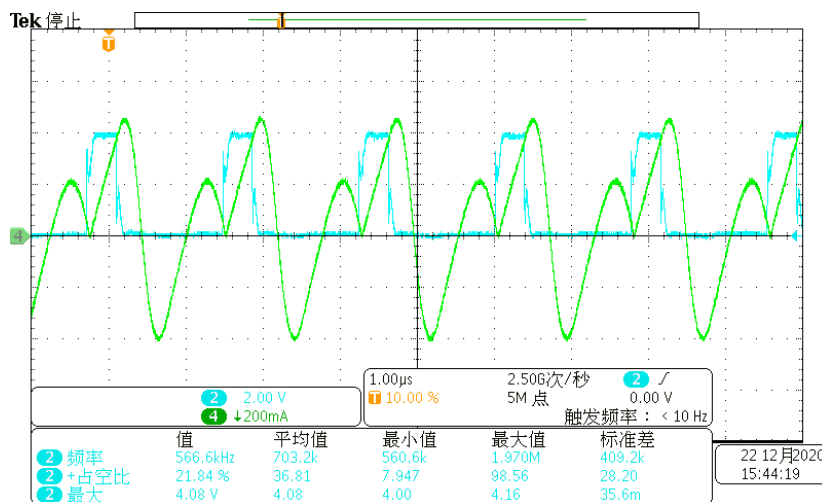


Figure1 gate waveform and inductor current waveform(the green is inductor current waveform, the blue is gate waveform)

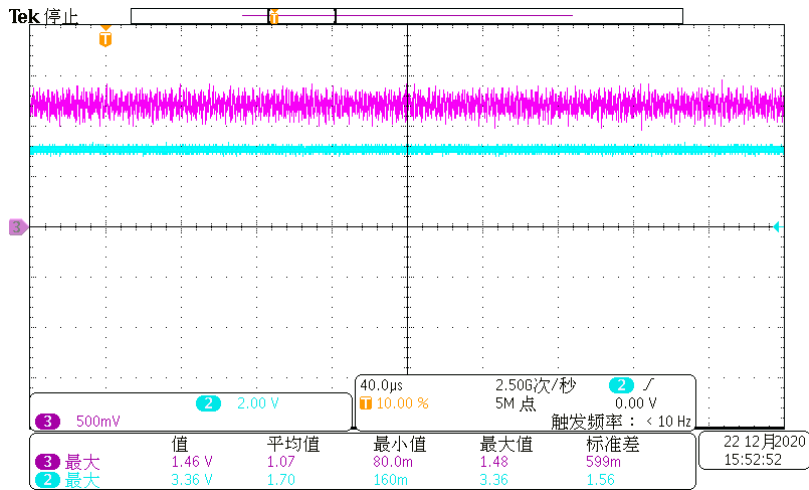


Figure2 run/ss waveform and FB waveform (the blue is run/ss waveform, the red is FB waveform)

(2) the circuit of LTC3785 carrying 100mA load and it is working normally, the output voltage is 14.5V.

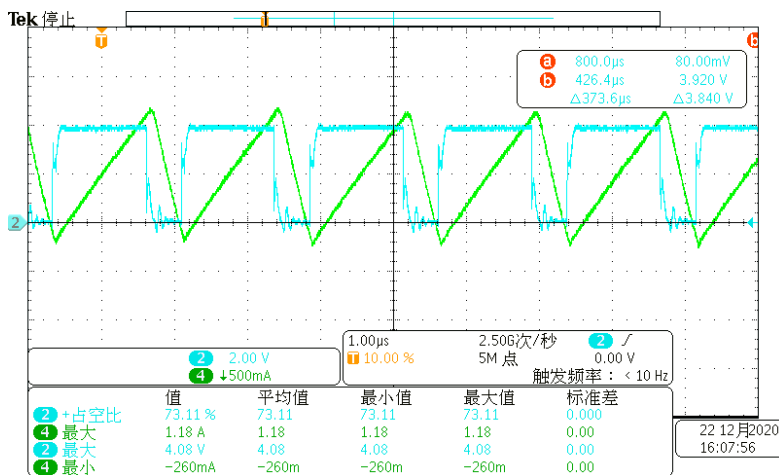


Figure3 gate waveform and inductor current waveform(the green is inductor current waveform, the blue is gate waveform)

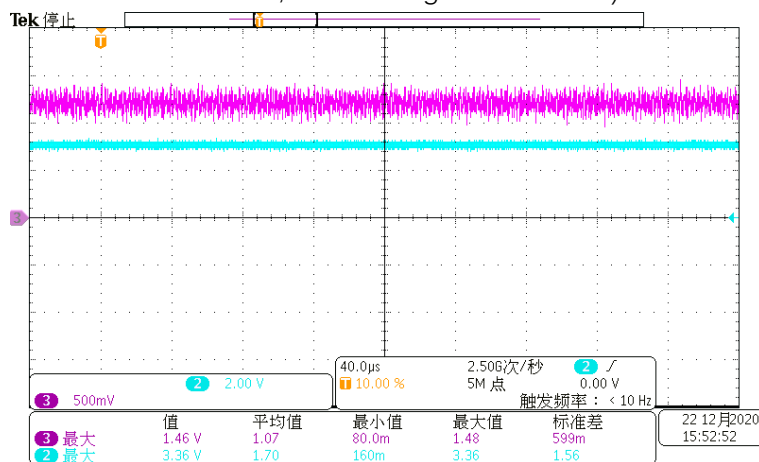


Figure4 run/ss waveform and FB waveform (the blue is run/ss waveform, the red is FB waveform)

(3) when the circuit of LTC3785 carrying 500mA load, it is operate abnormally. The output voltage is about 4.2V. the abnormal condition as follows:

(3.1)the voltage of run pin is about 880mv (oscilloscope measurement error, the voltage of run pin maybe below 0.85v) .according to LTC3782 datasheet, With the RUN/SS pin below 0.85V, the chip is off and the input supply current is typically only 8 μ A. But my gate pin still have drive waveform? What is wrong with the LTC3782 circuit?

(3.2) the voltage of run pin depends on the input voltage of LTC3782, the input voltage is still about 4V,but the voltage of run pin is about 880mv (oscilloscope measurement error, the voltage of run pin maybe below 0.85v) ? What is wrong with the LTC3782 circuit?

(3.3) according to LTC3782 datasheet, with the lprg pin is gnd, the PK limit current of input is 70mv@LTC3782!. the rds(on) of mosfet is 1.8m Ω . so the PK limit current is about 38A. therefore, the circuit of LTC3782 operated abnormally not because of current limit.

(3.4) according to LTC3782 datasheet, I configured the RCR network of lth PIN, but the circuit of LTC3782 still operated abnormally.

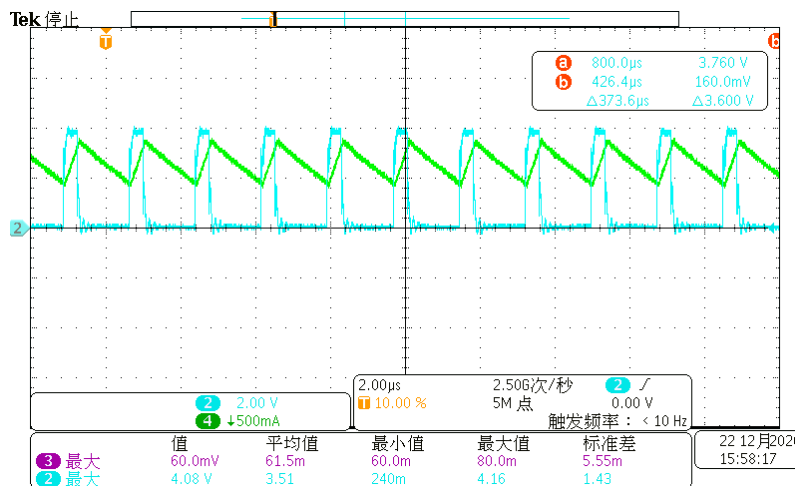


Figure5 gate waveform and inductor current waveform(the green is inductor current waveform, the blue is gate waveform)

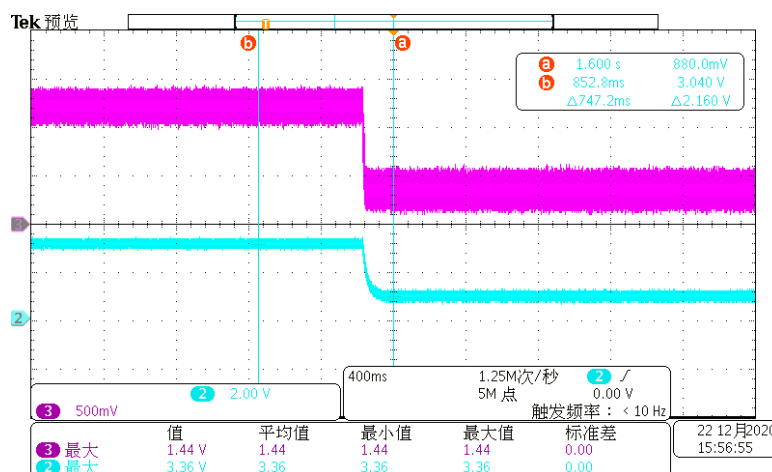


Figure6 run/ss waveform and FB waveform (the blue is run/ss waveform, the red is FB waveform, and the run/ss waveform is below 0.85V unexpected)