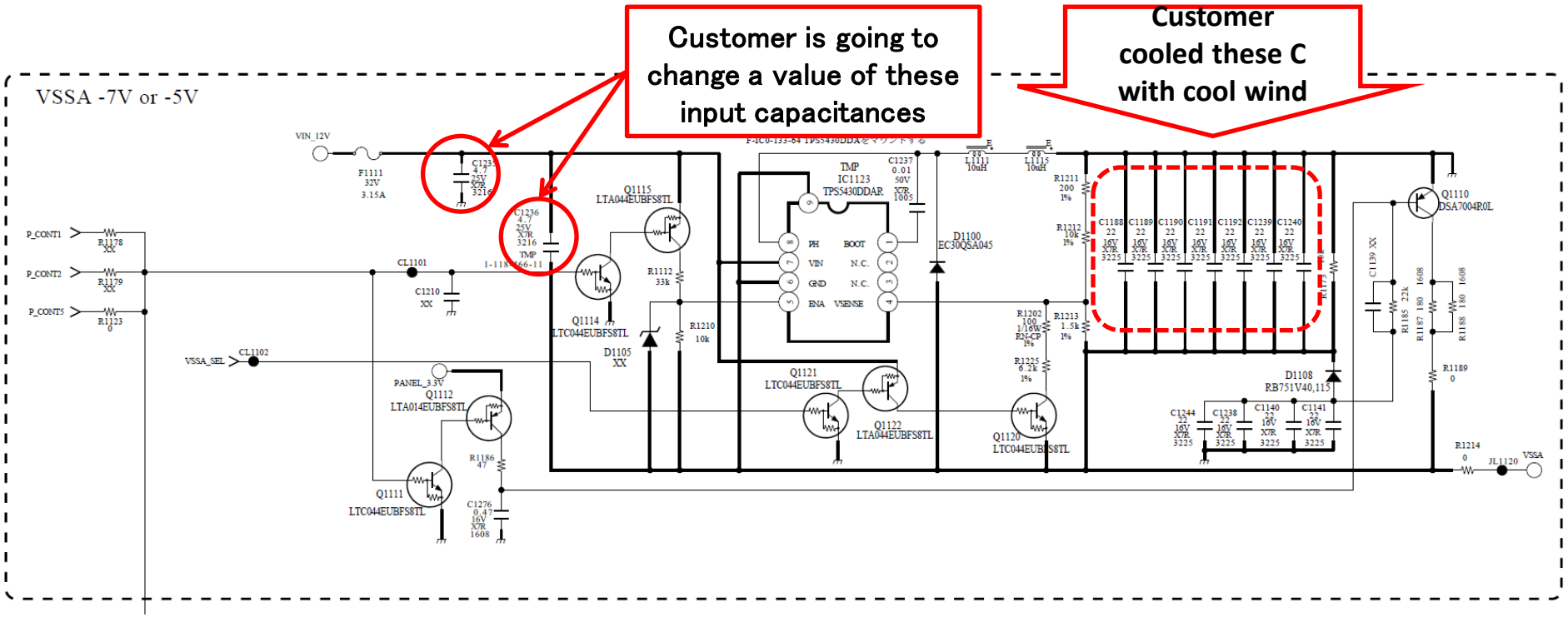
Customer board layout (TPS5430) and their problem



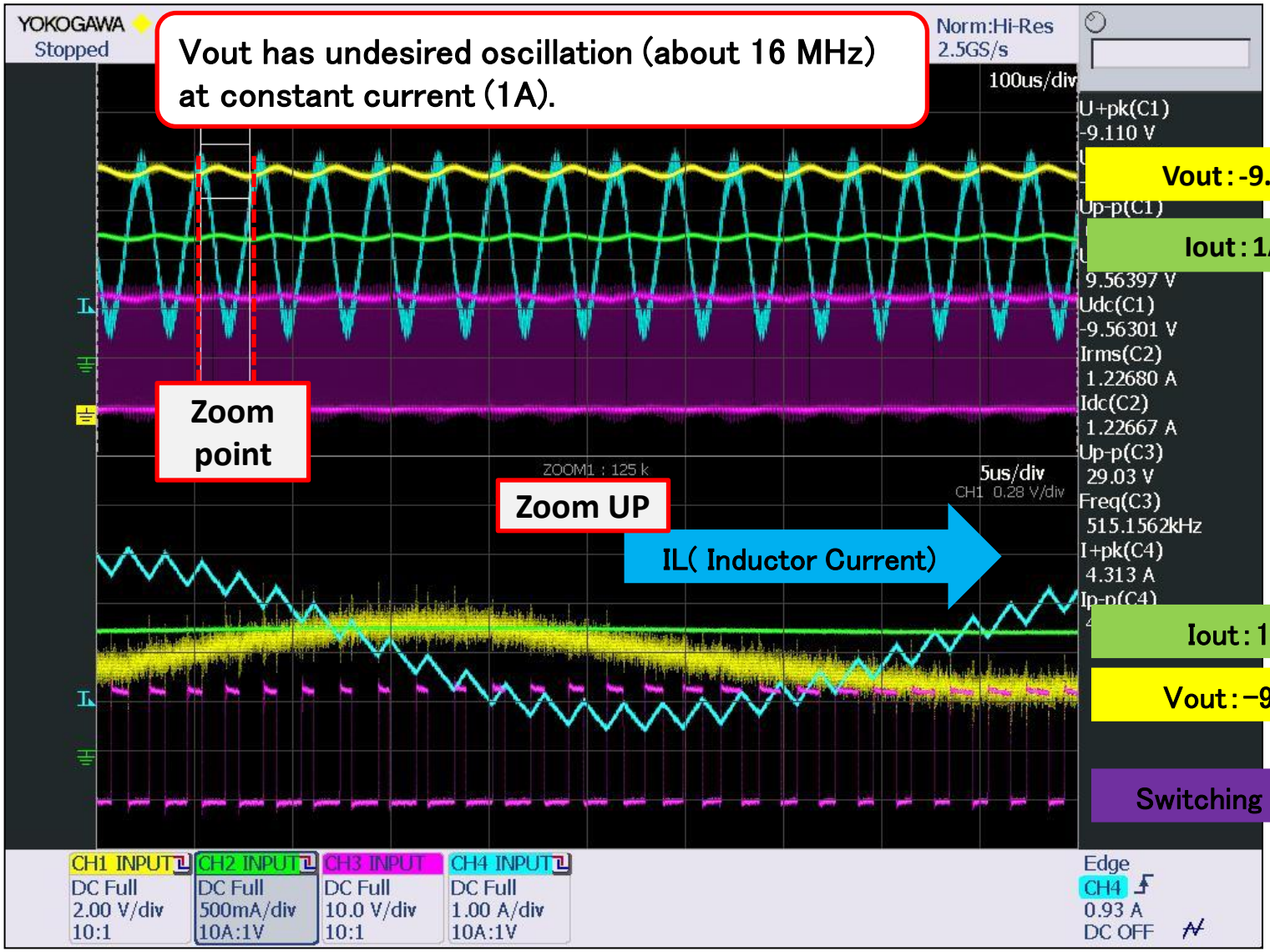
■Problem and its features

①An undesired oscillation of Vout was confirmed with a constant current.
(Especially, undesired oscillation is remarkable with the high load current.)

②In this case of ①, undesired oscillation might not happen.
Under the situation, this problem occurred when a customer cooled these parallel capacitances of the output side with a cold wind.

③Although the low load current, this problem occurred when its part was cooled.

Waveform at Iout:1A on customer board



(C1)黄色:-9.7V出力電圧
(C2)緑色:1A一定負荷電流
(C3)紫色:スイッチング波形
(C4)水色:コイル電流

Vout:-9.7V

Iout:1A

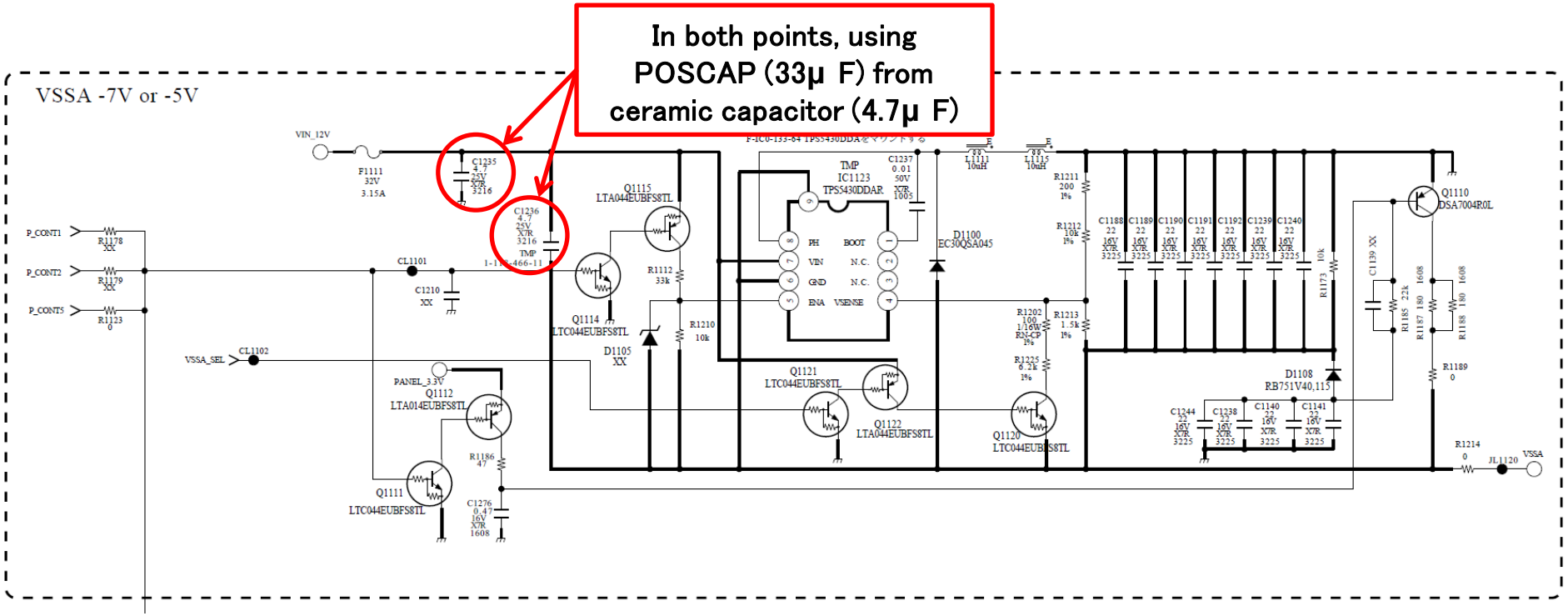
Iout:1A

Vout:−9.7V

Switching Pulse

考察:負荷が大きくなると発振することは分かっている。・・・・定常(一定)負荷で起きる。
コイルに流れる電流が通常の発振周波数では無い所で周期的(約16kHz)で変動しているのが分かる。

Customer’s countermeasure and result of teir board



■Their countermeasure

Customer tried a change of these input capacitances. (value/kind)

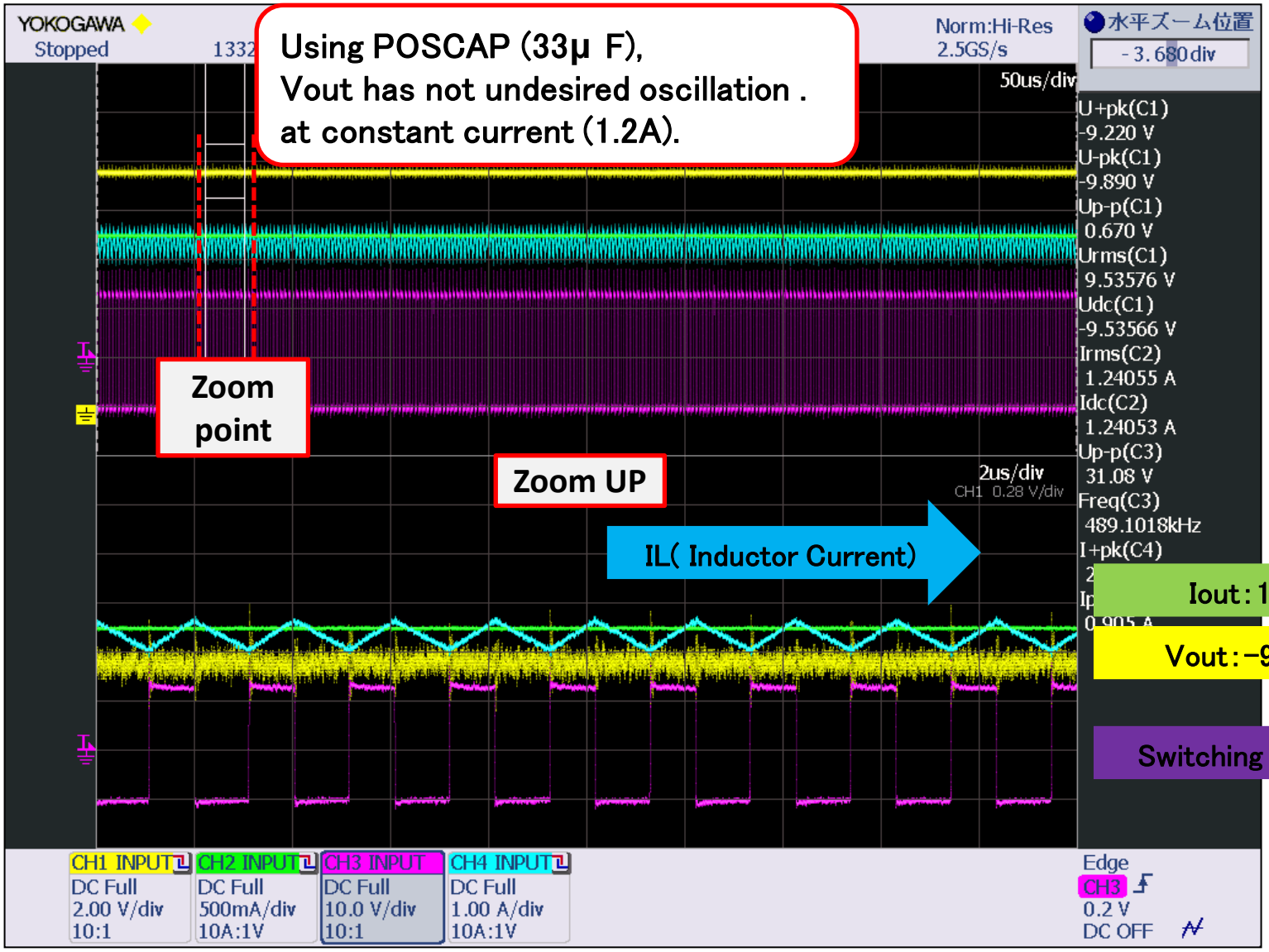
These points are C1235 and C1236 on customer’s block diagram.

Before	Ceramic capasitance	4.7μ F
After	POSCAP	33μ F

■Result of this countermeasure

Even if low temperature and high load current, this undesired oscillation did not occur.

Waveform at Iout:1A after their countermeasure



(C1)黄色:-9.7V出力電圧
(C2)緑色:1A一定負荷電流
(C3)紫色:スイッチング波形
(C4)水色:コイル電流

考察:出力波形、コイル電流、それにスイッチング波形に異常は見当たらない。