

hello dear forum

I designed an inverter for vibration tank ( photo below )  
 it is simply an H bridge with 500 V 20 A mosfets  
 the frequency and duty is variable with STM32F103  
 the vibrator worked for 5 minutes and one of the H-mosfet blow up  
 the L-mosfet also show 0 resistance so it is also fried

I added ( 100 nF 1 KOhm in series snubber ) paralel to DS of every mosfet

I suspect that there was a collision of CHN1 and CHN1N

please look at my code and comment if there is possibility of collision ( turn ON at the same time )

Or is there a snubber ( hardware design ) problem ? ( no software problem )

thank you

```
PWM_init(){
.....

    TIM_TimeBaseStructure.TIM_Prescaler = 99;
    TIM_TimeBaseStructure.TIM_CounterMode = TIM_CounterMode_Up;
    TIM_TimeBaseStructure.TIM_Period = 14400;
    TIM_TimeBaseStructure.TIM_ClockDivision = 0;
    TIM_TimeBaseStructure.TIM_RepetitionCounter = 0;

    TIM_TimeBaseInit(TIM8, &TIM_TimeBaseStructure);

    TIM_OCInitStructure.TIM_OCMode = TIM_OCMode_Timing;
    TIM_OCInitStructure.TIM_OutputState = TIM_OutputState_Enable;
    TIM_OCInitStructure.TIM_OutputNState = TIM_OutputNState_Enable;
    TIM_OCInitStructure.TIM_Pulse = 1000;
    TIM_OCInitStructure.TIM_OCPolarity = TIM_OCPolarity_High;
    TIM_OCInitStructure.TIM_OCNPolarity = TIM_OCNPolarity_High;
    TIM_OCInitStructure.TIM_OCIdleState = TIM_OCIdleState_Set;
    TIM_OCInitStructure.TIM_OCNIIdleState = TIM_OCNIIdleState_Set;

    TIM_OC1Init(TIM8, &TIM_OCInitStructure);
    TIM_OC2Init(TIM8, &TIM_OCInitStructure);

    /* Automatic Output enable, Break, dead time and lock configuration*/
    TIM_BDTRInitStructure.TIM_OSSRState = TIM_OSSRState_Enable;
    TIM_BDTRInitStructure.TIM_OSSIState = TIM_OSSIState_Enable;
    TIM_BDTRInitStructure.TIM_LOCKLevel = TIM_LOCKLevel_OFF;
    TIM_BDTRInitStructure.TIM_DeadTime = 120;
    TIM_BDTRInitStructure.TIM_Break = TIM_Break_Disable; //Enable;
    TIM_BDTRInitStructure.TIM_BreakPolarity = TIM_BreakPolarity_Low;
    TIM_BDTRInitStructure.TIM_AutomaticOutput = TIM_AutomaticOutput_Disable;

    TIM_BDTRConfig(TIM8, &TIM_BDTRInitStructure);

    TIM_CCPreloadControl(TIM8, DISABLE);
    TIM_ARRPreloadConfig(TIM8, ENABLE);
    TIM_ITConfig(TIM8, TIM_IT_Update , ENABLE);

    TIM_Cmd(TIM8, ENABLE);
    TIM_CtrlPWMOutputs(TIM8, ENABLE);
}
-----
main(){
.....
```

```

while(1){
    Delay(2000);
// freq varies between 25 and 106 Hz and puls varies between %10 and %90
//freqpot and pulspot are ADC channels connected to potentiometers

    freqdisp=freqpotantimeter/5+250;
    freq=2*freqdisp ;duty=90-pulspotantimeter/51;
    period=720000L/freq;puls=(period/100)*duty;

// I want you comment especially on below bit of code
// if the compare value is changed inbetween a PWM period
// is there a possibility of CHN1 and CHN1N being ON at the same time
// the ARR value is buffered but the compare registers are not as far as I know

    if ((freqold!=freq)|| (pulsold!=puls)){
        TIM_SetCompare1(TIM8, puls);
        TIM_SetCompare2(TIM8, puls);
        TIM_SetAutoreload(TIM8,period); }
    freqold=freq;pulsold=puls;
.....
}
-----
void TIM8_UP_IRQHandler(void){
    TIM_ClearFlag(TIM8, TIM_FLAG_Update);
    TIM_ClearITPendingBit(TIM8, TIM_IT_Update);
    tim8tog++;
    if (tim8tog&0x1) {
        TIM_SelectOCxM(TIM8, TIM_Channel_1, TIM_OCMode_PWM2);
        TIM_CCxCmd(TIM8, TIM_Channel_1, TIM_CCx_Enable);
        TIM_CCxNCmd(TIM8, TIM_Channel_1, TIM_CCxN_Disable);

        TIM_SelectOCxM(TIM8, TIM_Channel_2, TIM_OCMode_PWM2);
        TIM_CCxCmd(TIM8, TIM_Channel_2, TIM_CCx_Disable);
        TIM_CCxNCmd(TIM8, TIM_Channel_2, TIM_CCxN_Enable); }
    else {
        TIM_SelectOCxM(TIM8, TIM_Channel_2, TIM_OCMode_PWM2);
        TIM_CCxCmd(TIM8, TIM_Channel_2, TIM_CCx_Enable);
        TIM_CCxNCmd(TIM8, TIM_Channel_2, TIM_CCxN_Disable);

        TIM_SelectOCxM(TIM8, TIM_Channel_1, TIM_OCMode_PWM2);
        TIM_CCxCmd(TIM8, TIM_Channel_1, TIM_CCx_Disable);
        TIM_CCxNCmd(TIM8, TIM_Channel_1, TIM_CCxN_Enable); }
}

```



