Capacitive Touch IC Design Guide

1. Applied for:

PMS164 / PFC161

2. Instructions for Design:

Capacitive inductive touch MCU is the virtual ground effect capacitance for detecting touch keys. Its sensing signal is extremely small, so the sensitivity of touch is vulnerable to external noise/peripheral high frequency signals/external components/PCB layout/finished product assembly and other factors. Special attention must be paid to the design of the product. Only in accordance with the design of the special attention as far as possible, can the development speed of touch products be accelerated, the sensitivity adjustment time of touch buttons be shortened, and the wrong action or failure of touch buttons be avoided.

3. Precautions for Use of Chip CS Capacitor:

(1) The hardware adjusts the touch key sensitivity to change the CS capacitance.

(2) PMS164/PFC161 CS capacitor can be connected to VDD or GND. By default, it is recommended to connect to VDD for better touch stability due to power supply interference. If PCB space permits, it is recommended to reserve a set of CS capacitors to GND, so as to facilitate the adjustment of the actual board.

(3) NPO/C0G is recommended for CS capacitor material. Capacitive material has a great influence on the stability of touch keys.

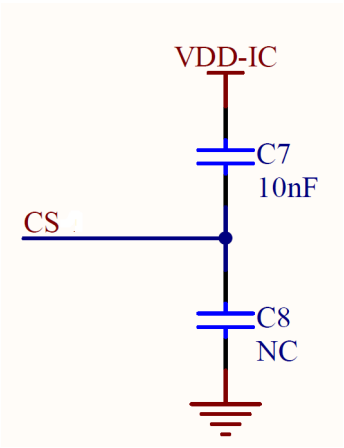

Fig. 1: Schematic diagram of sensitivity capacitor CS

4. Notes for Chip Power Supply:

(1) The chip power supply must be stable and free from high-frequency noise. It is recommended to use a voltage regulator and a suitable filter capacitor for power supply.

(2) When a power supply may have high-frequency noise and the voltage regulator cannot be used, it is recommended to add at least one set of RC filters to the power input end of the touch MCU.

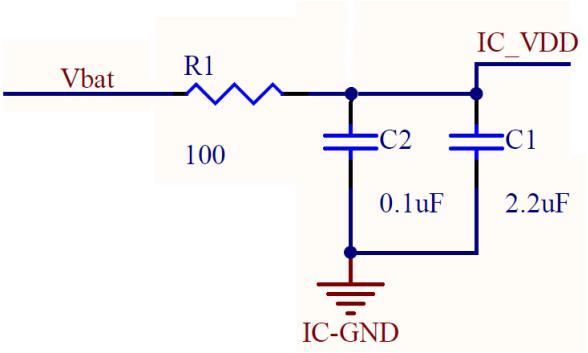

Fig. 2: Schematic diagram of chip power supply RC filter

5. Notes for Touch Program Development:

(1) It is recommended to use P-touch software to generate trigger button procedures, plus the required functions. For the use of P-Touch, please refer to the P-Touch software Manual or contact FAE.

(2) Touch clock frequency and touch VREF voltage settings will affect the touch sensitivity (touch count value).

(3) When the CS capacitor is increased, it is necessary to pay attention to whether the CS discharge time before touch conversion is enough. It is recommended to set it to the maximum, even to set the discharge by software in the program. Incomplete CS discharge will affect the stability of touch keys.

(4) The touch count value must be filtered by software after conversion.

(5) When using 5S-I-S02B for touch simulation, it is necessary to connect the touch simulation board. Refer to the operating instructions or contact FAE for the use of the touch emulation board.

(6) It is recommended that bit1-0 of TPS2 register be set as “Vref Capacitor Power On Hold” in some seriously disturbed or unstable environments, which will help improve the stability of touch conversion. Compiling with IDE versions later than 0.91 will automatically fill in the best default values for TPS2.

6. Precautions for PCB Layout：

(1) Touch PCB layout will directly affect the touch effect and stability. For PCB layout considerations, see Capacitive touch panel PCB Design Requirements.