Application Note for TEMP Pin

For CN3702/CN3703/CN3704/CN3705/CN3717/CN3722, the sixth pin is TEMP.   It is used to monitor the battery temperature.   When the battery temperature is too high or too low, charging will be terminated.   In the application circuit, a negative temperature coefficient thermistor (NTC) is connected between the TEMP pin and ground.   Also, the TEMP pin can be used for the enable function.

1.   Disable Battery Temperature Monitoring Function
If the battery temperature monitoring function is not required, a resistor (between 5k and 20k) is connected between the TEMP pin and ground as shown in Figure 1.   The TEMP pin cannot be left floating.
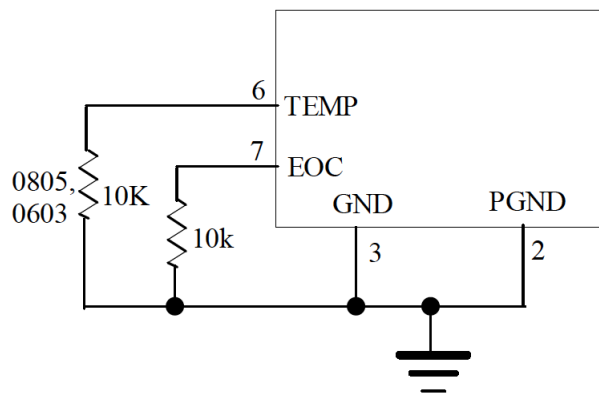

Figure 1 – Connection for Disable Battery Temperature Monitoring Function

2.   Enable Battery Temperature Monitor Function
If the battery temperature monitoring function is required, a negative temperature coefficient thermistor (NTC) is connected between the TEMP pin and ground.   A source current from the TEMP pin is 53uA (typically).   The resistance of NTC should be 10kΩ at 25°C.   It should be about 3.5kΩ at the upper temperature limit (50°C) and about 32kΩ at the lower temperature limit (0°C). TH11-3H103F, MF52 (10kΩ), QWX-103 and NCP18XH103F03RB can be used as NTC in the CN37XX application.   They have the negative temperature coefficients.   However, they are suggested for reference only.   Other NTC can be selected according to different requirements.

As NTC is tightly attached to the battery pack and it is connected to the circuit board by means of a connector, a zener as shown in Figure 2 is added in order to prevent from damage in the hot plug events.

3.   Use of TEMP Pin for Programming Charging Function
When the TEMP pin voltage is below 0.1V, the battery charging is suspended.   Therefore, a N-channel MOSFET can be used (drain to the TEMP pin, source to ground and gate to an $\overline{\text{enable}}$ control) for programming the charging function.   When the $\overline{\text{enable}}$ control is high, the TEMP pin voltage is pulled down and the charging function is disabled; and vice verse.
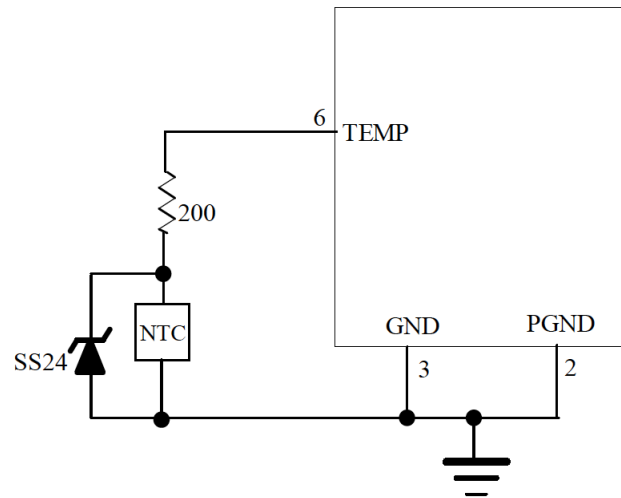
Figure 2 - Connection for Enable Battery Temperature Monitoring Function