

Product Document



Application Note

AN001016

TMD2755 Temperature Sensor Function

Register Description and Usage

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1 Introduction

The purpose of this document is to describe TMD2755 registers that are related to the temperature sensor functionality and how to use them correctly. These registers are not published in the TMD2755 datasheet.

2 Register Descriptions

2.1 Settings for the Temperature Sensor

2.1.1 CFG1 Register (0x91) Bit 7

enab_temp_sensor (Bit7)

Access RW

Description: Enable or disable the comparator for temp sensor

Default 0: Disable temp sensor comparator

Set to 1: Enable temp sensor comparator

2.1.2 ADCCFG Register (0xBF) Bit [1:0]

adc_sel (Bit [1:0])

Access RW

Description: ADC input selection

Default 0: ADC input path for normal prox operation

Set to 1: ADC input path for temp sensor

2.1.3 ADCCFG Register (0xBF) Bit [3:2]

adc_settling (Bit [3:2])

Access RW

Description: ADC settling time selection

Default 1: 2 μ s for normal prox operation

Set to 3: 8 μ s for temp sensor

2.1.4 CALIB Register (0xD7) Bit 1

start_adc (Bit 1)

Access WS_SC (Write to start – self clearing)

Description: Manually start ADC conversion

Default 0: No manual ADC start

Set to 1: Manually start ADC conversion for temp sensor (ADC conversion is automatic for prox when PEN is enabled)

3 Recommended Sequences in SW Driver

In some applications, there is a need to get the chip temperature information by reading out temp sensor ADCs periodically. At each time of setting up temp sensor and reading 10-bit temp ADCs from PDATA registers, the ongoing prox operation is affected. The sequences in the SW driver have to be optimized to reduce turnaround time, and avoid unwanted prox related interrupts if it operates in interrupt mode.

3.1 Sequences from Prox to Temp Sensor

Figure 1 below shows a recommended sequence from normal prox operation to temp sensor operation. The minimum lengths of the timers required are related to some of the prox configurations being used in an application.

Figure 1:
Sequences from Prox to Temp Sensor

Sequence Step	Actions/States	Notes
0	Ongoing prox operation	
1	Disable PEN	Enable Register (x80)
2	Start timer1	
3	Timer1 expires	
4	Disable prox-related INTs	INTENAB Register (0xDD)
5	Clear prox-related flags	STATUS Register (0x94)
6	Disable PWEN	Enable Register (x80)
7	Disable hw prox_avg	CALIBCFG Register (0xD9)
8	Set enab_temp_sensor bit to 1	CFG1 Register (0x91) Bit 7
9	Set adc_sel to 1	ADCCFG Register (0xBF) Bit [1:0]
10	Set adc_settling to 3 (8µs)	ADCCFG Register (0xBF) Bit [3:2]
11	Set start_adc bit to 1	CALIB Register (0xD7) Bit 1
12	Start timer2	
13	Timer2 expires	
14	Read 10-bit temp ADC from Pdata registers	Pdata Registers 0x99 and 0x9A

3.2 Sequences from Temp Sensor to Prox

Figure 2 below shows a recommended sequence from temp sensor operation to prox operation. The minimum lengths of the timer required are related to some of the prox configurations being used in an application.

Figure 2:
Sequences from Temp Sensor to Prox

Sequence Step	Actions/States	Notes
0	Temp sensor option just finished	
1	Set enab_temp_sensor bit to 0	CFG1 Register (0x91) Bit 7
2	Set adc_sel to 0	ADCCFG Register (0xBF) Bit [1:0]
3	Set adc_settling to 1 (2µs)	ADCCFG Register (0xBF) Bit [3:2]
4	Clear prox-related flags	STATUS Register (0x94)
5	Enable prox-related INTs	INTENAB Register (0xDD)
6	Set hw prox_avg to its original setting	CALIBCFG Register (0xD9)
7	Enable PWEN	Enable Register (x80)
8	Enable PEN	Enable Register (x80)
9	Start timer	
10	Timer expires	
11	First valid Pdata available. Prox now running	Pdata Registers 0x99 and 0x9A

4 Revision Information

Changes from previous version to current revision v1-00	Page
Initial version	

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

5 Legal Information

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