AVR533: Migrating from ATtiny2313 to ATtiny2313A

8-bit AVR® Microcontrollers

Application Note

1 Introduction

In order to optimize the manufacturing process and to further reduce current consumption, an optimized version of ATtiny2313 has been introduced.

The ATtiny2313A is a functionally identical, drop-in replacement for the ATtiny2313. All devices are subject to the same qualification process and same set of production tests, but as the manufacturing process is not the same some electrical characteristics differ.

ATtiny2313 and ATtiny2313A have separate datasheets. This application note outlines the differences between the two devices and the datasheets. There is also a detailed change log to assist the user at the end of the ATtiny2313A datasheet. Remember to always use the latest revision of the device datasheet.

Minor differences in typical characteristics are not discussed in this document as long as the low and high limits remain the same. For detailed information about the typical characteristics, see sections “Electrical Characteristics” and “Typical Characteristics” of the device datasheets.

Note: This application note serves as a guide to ease migration. For complete device details, always refer to the most recent version of the ATtiny2313A data sheet.

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2 Changes in Characteristics

This section outlines such differences in characteristics that may have an effect on the application in which the device is used. For detailed information, refer to the most recent version of the device data sheets.

2.1 Current Consumption

Active and Idle mode current consumption of the device have been reduced. The table below present typical current consumption figures at room temperature. All values are taken from device datasheets.

Table 2-1. Typical Current Consumption of Device at Room Temperature

Mode	Condition	ATtiny2313	ATtiny2313A	Change
Active	V_{CC} = 2V, f = 1 MHz	250 µA	200 µA	-20 %
	V_{CC} = 3V, f = 4 MHz	1.5 mA	1.2 mA	-20 %
	V_{CC} = 5V, f = 8 MHz	5 mA	3.6 mA	-28 %
Idle	V_{CC} = 2V, f = 1 MHz	80 µA	30 µA	-62 %
	V_{CC} = 3V, f = 4 MHz	410 µA	250 µA	-39 %
	V_{CC} = 5V, f = 8 MHz	1.6 mA	1.0 mA	-38 %

2.2 Reset

The table below summarizes the differences between the reset circuitry of ATtiny2313 and that of ATtiny2313A.

Table 2-2. Changes in Power-On Reset

Symbol	ATtiny2313			ATtiny2313A			Unit
	Min	Typ	Max	Min	Typ	Max	
V_{POR}		1.2		1.1	1.4	1.6	V
V_{POA}		1.1		0.6	1.3	1.6	V
SR_{ON}				0.01	-	-	V/ms

3 New or Updated Bits and Registers

In Table 3-1 are listed registers and bits that have been added or changed to the device as a result of functional enhancements. Some bits were marked as reserved in ATtiny2313 and some bits have another use in ATtiny2313A.

Table 3-1. New or Updated Bits and Registers in ATtiny2313A

Addr.	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0x07	BODCR							BODS	BODSE
0x06	PRR					PRTIM1	PRTIM0	PRUSI	PRUSART
0x05	PCMSK2		PCINT17	PCINT16	PCINT15	PCINT14	PCINT13	PCINT12	PCINT11
0x04	PCMSK1						PCINT10	PCINT9	PCINT8
0x03	UCSRC	UMSEL1	UMSEL0						
0x00	USIBR	USI Buffer Register							

Table 3-2 lists interrupt vectors that have been added to ATtiny2313A. Depending on how the firmware is constructed the below additions may have an effect on the start address of the program.

Table 3-2. New Interrupt Vectors in ATtiny2313A

Vector	Address	Source
20	0x013	Pin Change Interrupt Request A
21	0x014	Pin Change Interrupt Request D

For more details on the functional enhancements, see ATtiny2313A datasheet.

4 Datasheet Changes

For a summary of changes, see the revision history at the end of the ATtiny2313A data sheet.

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