



Product Change / EOL Notification

Product Change Notification Number: NC084202A (REVISED 11/20/08) Date: November 20, 2008
See Addition/Changes in Bold Blue Font Below

Title: Automotive ATMEGA164P, ATMEGA324P, ATMEGA644P ADC Upgrade

Product Identification:

Existing Part Number	ADC Upgrade Part Number
ATMEGA164P-15AZ	ATMEGA164P- A15AZ
ATMEGA164P-15MZ	ATMEGA164P- A15MZ
ATMEGA164P-15AT	ATMEGA164P- A15AZ
ATMEGA164P-15MT	ATMEGA164P- A15MZ
ATMEGA164P-15AT1	ATMEGA164P- A15AZ
ATMEGA164P-15MT1	ATMEGA164P- A15MZ
ATMEGA324P-15AZ	ATMEGA324P- A15AZ
ATMEGA324P-15MZ	ATMEGA324P- A15MZ
ATMEGA324P-15AT	ATMEGA324P- A15AZ
ATMEGA324P-15MT	ATMEGA324P- A15MZ
ATMEGA324P-15AT1	ATMEGA324P- A15AZ
ATMEGA324P-15MT1	ATMEGA324P- A15MZ
ATMEGA644P-15AZ	ATMEGA644P- A15AZ
ATMEGA644P-15MZ	ATMEGA644P- A15MZ
ATMEGA644P-15AT	ATMEGA644P- A15AZ
ATMEGA644P-15MT	ATMEGA644P- A15MZ
ATMEGA644P-15AT1	ATMEGA644P- A15AZ
ATMEGA644P-15MT1	ATMEGA644P- A15MZ

Reason for Change:

☒ Design

☐ Manufacturing Location

☐ Processing

☐ Quality/Reliability

☐ Logistics

☐ Material

Change Description:

Atmel will release an upgrade of the ADC block for the here mentioned microcontrollers. The change improves INL and DNL performances. The datasheet will be updated accordingly (revision D: 7674D-AVR-0808; page 334 table 26-10).

This fix was operated via interconnection layers (Metal 1 to Metal3).

Description:

- In order to improve the performances of the ADC in differential mode, bias conditions of some amplifiers have been changed.
- This modification is achieved by connecting spare transistors by metal wires.

On new 8-bit AVR, Atmel provides Grade1 AECQ100 temperature range. This applies to the Mega164P/324P/644P family with the introduction of revision A as shown in the product information table.

Identification Method to Distinguish Change:

An "A" designation has been added to the part number to distinguish changed product (immediately after the dash).

Qualification Data:	☒ available	☐ will be available	☐ not applicable
Samples:	☒ available (1)	☐ will be available	☐ not applicable

(1) ATMEGA164P samples available; ATMEGA324P and ATMEGA644P samples will be available in February 2009.

Quantifiable Impact on Quality & Reliability:

None

Estimated Availability Date*:	April 20, 2009
Last time buy date:	May 20, 2009
Last time ship date:	November 20, 2009

** All orders placed after the notification date are **non-cancellable** and **non-returnable (NCNR)**.*

Atmel Contact: pcnadm@atmel.com

Atmel will deem this change accepted unless specific conditions of acceptance are provided in writing within 30 days from the date of this notice. All correspondence must be sent to the Atmel Contact e-mail address listed above.

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Appendix 1

Previous specification

INL(5)	Integral Non-linearity	Gain = 1x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.5	6	LSB
		Gain = 10x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		1.0	6	
		Gain = 200x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽²⁾		0.5	3	
DNL(5)	Differential Non-linearity	Gain = 1x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.3	3	LSB
		Gain = 10x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.6	5	
		Gain = 200x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽²⁾		0.5	1.5	

New specification

Table 26-10. ADC Characteristics, Differential Channels⁽³⁾

Symbol	Parameter	Condition	Min ⁽¹⁾	Typ ⁽¹⁾	Max ⁽¹⁾	Units
INL	Integral Non-linearity	Gain = 1x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.2	1.5	LSB
		Gain = 10x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.2	1.5	
		Gain = 200x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽²⁾		0.25	1.5	
DNL	Differential Non-linearity	Gain = 1x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.2	1.0	LSB
		Gain = 10x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽¹⁾		0.2	1.0	
		Gain = 200x, $V_{CC} = 5V$, $V_{REF} = 4V$ ADC clock = 200 kHz ⁽²⁾		0.25	1.0	

Note: 1. 8-bit resolution
2. 7-bit resolution
3. -40°C to +125°C max