Product Change Notification

Product Change Notification Number: NC084202 **Date:** October 30, 2008

Title: Automotive ATMEGA164P, ATMEGA324P, ATMEGA644P ADC Upgrade

Product Identification:

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

Reason for Change:

☒ Design ☐ Processing ☐ Logistics
☐ Manufacturing Location ☐ Quality/Reliability ☐ 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.

Identification Method to Distinguish Change:
For the new revision, the dash (-) is no longer part of the offering number and on the topside mark. See below

ATMEGA164P 15AZ	ATMEGA164P 15AT	ATMEGA164P 15AT1
ATMEGA164P 15MZ	ATMEGA164P 15MT	ATMEGA164P 15MT1
ATMEGA324P 15AZ	ATMEGA324P 15AT	ATMEGA324P 15AT1
ATMEGA324P 15MZ	ATMEGA324P 15MT	ATMEGA324P 15MT1
ATMEGA644P 15AZ	ATMEGA644P 15AT	ATMEGA644P 15AT1
ATMEGA644P 15MZ	ATMEGA644P 15MT	ATMEGA644P 15MT1

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

(1) ATEMGA164P samples available; ATMEGA324P and ATMEGA644P samples will be available in February 2009.

Quantifiable Impact on Quality & Reliability:
None

Estimated Availability Date*: April 17, 2009

**The Estimated Availability Date is the forecasted date that a customer may expect to receive changed product. This is determined by the estimated date of inventory depletion on the PCN issue date. This may be affected by fluctuations in supply and demand. Consequently, although customers should be prepared to receive changed product on this date, Atmel will continue to ship pre-changed product until a time in which inventory has been depleted. This may result in pre-changed product being shipped to customers after this forecasted date.*

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.

Appendix 1

Previous specification

INL(5)	Integral Non-linearity	Gain = 1x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.5	6	LSB
		Gain = 10x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		1.0	6	
		Gain = 200x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(2)		0.5	3	
DNL(5)	Differential Non-linearity	Gain = 1x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.3	3	LSB
		Gain = 10x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.6	5	
		Gain = 200x, V_{CC} =5 V, 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} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.2	1.5	LSB
		Gain = 10x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.2	1.5	
		Gain = 200x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(2)		0.25	1.5	
DNL	Differential Non-linearity	Gain = 1x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.2	1.0	LSB
		Gain = 10x, V_{CC} =5 V, V_{REF} = 4V ADC clock = 200 kHz(1)		0.2	1.0	
		Gain = 200x, V_{CC} =5 V, 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