



PCN / EOL Notification

PCN Number: CC141705

Notification Date*: May 28, 2014

Title: AT24C04C to AT24C04D — 4-Kbit I²C-Compatible (Two Wire Interface) Industrial Temperature Grade (-40°C to 85°C) Serial EEPROM Process Optimization and Device Enhancement

Product Identification:

All package options of the Industrial Temperature Grade (-40°C to +85°C) version of the AT24C04C

Reason for Change:

- | | |
|--|---|
| ☒ Material / Composition | ☐ Manufacturing Location |
| ☐ Processing / Manufacturing | ☐ Quality / Reliability |
| ☒ Design / Firmware | ☐ Logistics |
| ☒ Datasheet | ☐ Other: |

Change Description:

Atmel has redesigned and improved its Industrial Temperature Grade (-40°C to +85°C) version of the 4-Kbit I²C-compatible Serial EEPROM and optimized the associated device's process. These changes have been made to enhance device performance and robustness. As a result, the Industrial Temperature Grade version of the AT24C04C is being replaced by the AT24C04D (please note the revision letter change from "C" to "D" in the base part number — see Table 2 for a list of full catalog part numbers). The AT24C04D is pin-to-pin and functionally backward compatible to the AT24C04C with the following exceptions and enhancements.

Supply Voltage (V_{CC}) Range

With a growing number of MCUs, SoCs, and ASICs migrating to lower supply voltages as a result of process lithography reductions, and as the electronics industry in general also moves to lower supply voltages to reduce power consumption, Atmel developed the next-generation AT24C04D to enhance performance for these lower voltage requirements. Unlike the AT24C04C devices that operate over a 1.7V to 5.5V voltage range, the AT24C04D devices have been designed to operate from a **1.7V to 3.6V** supply. As a result, the AT24C04D has significant improvements and advantages over the AT24C04C devices with respect to power consumption, endurance, and noise suppression (see Table 1 for all differences). *Please contact Atmel (MemoryPCN@atmel.com) for details regarding continued availability of AT24C04C devices for applications operating at voltage levels above 3.6V.*

Table 1

Parameter/Feature	AT24C04C	AT24C04D
Operating Voltage	1.7V to 5.5V	1.7V to 3.6V
Operating Temperature	-40°C to +85°C	-40°C to +85°C
Endurance	1,000,000 cycles (Page Mode, +25°C, 3.3V)	1,000,000 cycles (Byte or Page Mode, +25°C, 1.7V to 3.6V)
Data Retention	100 years	100 years
Supply Current, Read	0.4mA typ (5.0V, 100kHz) 1.0mA max (5.0V, 100kHz)	0.08mA typ (1.8V, 400kHz) 0.3mA max (1.8V, 400kHz) 0.15mA typ (3.6V, 1MHz) 0.5mA max (3.6V, 1MHz)
Supply Current, Write	2.0mA typ (5.0V, 100kHz) 3.0mA max (5.0V, 100kHz)	0.2mA typ (3.6V, 1MHz) 1.0mA max (3.6V, 1MHz)
Standby Current	1µA max (1.7V) 6µA max (5.5V)	0.08µA typ (1.8V) 0.4µA max (1.8V) 0.1µA typ (3.6V) 0.8µA max (3.6V)
Maximum Clock Frequency	1MHz (2.5V min.) 400kHz (1.7V min.)	1MHz (2.5V min.) 400kHz (1.7V min.)
Clock Pulse Width Low	1.2µs min ($f_{SCL} = 400\text{kHz}$) 0.4µs min ($f_{SCL} = 1\text{MHz}$)	1.3µs min ($f_{SCL} = 400\text{kHz}$) 0.5µs min ($f_{SCL} = 1\text{MHz}$)
Clock Pulse Width High	0.6µs min ($f_{SCL} = 400\text{kHz}$) 0.4µs min ($f_{SCL} = 1\text{MHz}$)	0.6µs min ($f_{SCL} = 400\text{kHz}$) 0.4µs min ($f_{SCL} = 1\text{MHz}$)
Input Filter Noise Suppression	100ns max ($f_{SCL} = 400\text{kHz}$) 50ns max ($f_{SCL} = 1\text{MHz}$)	100ns max ($f_{SCL} = 400\text{kHz}$) 100ns max ($f_{SCL} = 1\text{MHz}$)
Clock Low to Data Out Valid	900ns max ($f_{SCL} = 400\text{kHz}$) 550ns max ($f_{SCL} = 1\text{MHz}$)	900ns max ($f_{SCL} = 400\text{kHz}$) 450ns max ($f_{SCL} = 1\text{MHz}$)
Bus Free Time Between Start and Stop	1.2µs min ($f_{SCL} = 400\text{kHz}$) 0.5µs min ($f_{SCL} = 1\text{MHz}$)	1.3µs min ($f_{SCL} = 400\text{kHz}$) 0.5µs min ($f_{SCL} = 1\text{MHz}$)
Input Rise Time	300ns max ($f_{SCL} = 400\text{kHz}$) 300ns max ($f_{SCL} = 1\text{MHz}$)	300ns max ($f_{SCL} = 400\text{kHz}$) 100ns max ($f_{SCL} = 1\text{MHz}$)
Input Fall Time	300ns max ($f_{SCL} = 400\text{kHz}$) 100ns max ($f_{SCL} = 1\text{MHz}$)	300ns max ($f_{SCL} = 400\text{kHz}$) 100ns max ($f_{SCL} = 1\text{MHz}$)
Write Cycle Time	5ms max	5ms max
Page Write Size	16 bytes max	16 bytes max
Full Array Hardware Write Protect	Yes	Yes

Identification Method to Distinguish Change:

The revision letter in the base part number changes from "C" to "D". New devices use the catalog part number AT24C04D, and Table 2 lists the full catalog part number combinations for each package option. Please refer to datasheet for part marking schemes for each package type.

Table 2

Note: Standard datasheet offerings are listed in the table; however, this PCN also applies to all special CAN (customer specific) part numbers that are not listed in the table.

EOL Part Number	Replace Part Number	Package	Carrier Type
AT24C04C-PUM	AT24C04D-PUM	PDIP	Bulk
AT24C04C-SSHM-B	AT24C04D-SSHM-B	JEDEC SOIC	Bulk
AT24C04C-SSHM-T	AT24C04D-SSHM-T	JEDEC SOIC	T/R, 4K per reel
AT24C04C-XHM-B	AT24C04D-XHM-B	TSSOP	Bulk
AT24C04C-XHM-T	AT24C04D-XHM-T	TSSOP	T/R, 5K per reel
AT24C04C-MAHM-T	AT24C04D-MAHM-T	UDFN	T/R, 5K per reel
AT24C04C-STUM-T	AT24C04D-STUM-T	SOT23	T/R, 5K per reel
AT24C04C-CUM-T	AT24C04D-CUM-T	VFBGA	T/R, 5K per reel
AT24C04C-WWU11M	AT24C04D-WWU11M	Wafer Sales	
AT24C04C-WWU27M	AT24C04D-WWU27M	Wafer Sales	

Note: Contact Atmel regarding general PDIP availability

Qualification Data:	☐ Available	☒ Will be available: June 6, 2014	☐ N/A
Samples:	☒ Available now. Please contact Atmel Sales to submit Sample Request Form (samples in tape format only)	☒ Will be available online at Atmel Sample Center (www.atmel.com/samples): June 18, 2014 (tape format only) July 16, 2014 (bulk format)	☐ N/A

Quantifiable Impact on Quality & Reliability:

No impact. Form, fit, and function over the 1.7V to 3.6V range remains unchanged.

Forecasted Availability Date: June 11, 2014

Last Time Buy Date: November 26, 2014

Last Ship Date: May 26, 2015

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

Atmel Contact: Please contact your Atmel Sales Representative or Distributor for additional information (when replying via e-mail please include the PCN number in subject line).

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