PCN / EOL Notification

PCN Number: CC143005 **Notification Date*:** July 30, 2014

Title: AT24C16C to AT24C16**D** — 16-Kbit I^{2}C-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 AT24C16C

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 16-Kbit I^{2}C-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 AT24C16C is being replaced by the AT24C16**D** (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 AT24C16**D** is pin-to-pin and functionally backward compatible to the AT24C16C with the following exceptions and enhancements.

In addition to the historical packages offered, the new AT24C16**D** is now being offered in a 4-ball Wafer Level Chip Scale Package (WLCSP) which was not previously available on the AT24C16C.

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 AT24C16**D** to enhance performance for these lower voltage requirements. Unlike the AT24C16C devices that operate over a 1.7V to 5.5V voltage range, the AT24C16**D** devices have been designed to operate from a **1.7V to 3.6V** supply. As a result, the AT24C16**D** has significant improvements and advantages over the AT24C16C devices with respect to power consumption, endurance, and noise suppression (see Table 1 for all differences).

For applications operating at voltage levels above 3.6V, please contact Atmel (MemoryPCN@atmel.com) for details on continued availability of the AT24C16C and to request an exception to the Last Time Buy and Last Ship dates.

Table 1

Parameter/Feature	AT24C16C	AT24C16D
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	1.0µA max (1.7V) 6.0µA 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} = 400kHz) 0.4µs min (f_{SCL} = 1MHz)	1.3µs min (f_{SCL} = 400kHz) 0.5µs min (f_{SCL} = 1MHz)
Clock Pulse Width High	0.6µs min (f_{SCL} = 400kHz) 0.4µs min (f_{SCL} = 1MHz)	0.6µs min (f_{SCL} = 400kHz) 0.4µs min (f_{SCL} = 1MHz)
Input Filter Noise Suppression	100ns max (f_{SCL} = 400kHz) 50ns max (f_{SCL} = 1MHz)	100ns max (f_{SCL} = 400kHz) 100ns max (f_{SCL} = 1MHz)
Clock Low to Data Out Valid	900ns max (f_{SCL} = 400kHz) 550ns max (f_{SCL} = 1MHz)	900ns max (f_{SCL} = 400kHz) 450ns max (f_{SCL} = 1MHz)
Bus Free Time Between Start and Stop	1.2µs min (f_{SCL} = 400kHz) 0.5µs min (f_{SCL} = 1MHz)	1.3µs min (f_{SCL} = 400kHz) 0.5µs min (f_{SCL} = 1MHz)
Input Rise Time	300ns max (f_{SCL} = 400kHz) 300ns max (f_{SCL} = 1MHz)	300ns max (f_{SCL} = 400kHz) 100ns max (f_{SCL} = 1MHz)
Input Fall Time	300ns max (f_{SCL} = 400kHz) 100ns max (f_{SCL} = 1MHz)	300ns max (f_{SCL} = 400kHz) 100ns max (f_{SCL} = 1MHz)
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 AT24C16**D**, 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	Replacement Part Number	Package	Carrier Type
AT24C16C-PUM	AT24C16D-PUM(1)	PDIP	Bulk
AT24C16C-SSHM-B	AT24C16D-SSHM-B	SOIC	Bulk
AT24C16C-SSHM-T	AT24C16D-SSHM-T	SOIC	Tape & Reel (4K/reel)
AT24C16C-XHM-B	AT24C16D-XHM-B	TSSOP	Bulk
AT24C16C-XHM-T	AT24C16D-XHM-T	TSSOP	Tape & Reel (5K/reel)
AT24C16C-MAHM-T	AT24C16D-MAHM-T	UDFN	Tape & Reel (5K/reel)
AT24C16C-MEHM-T	none(2)	XDFN	Tape & Reel (5K/reel)
AT24C16C-STUM-T	AT24C16D-STUM-T	SOT23	Tape & Reel (5K/reel)
AT24C16C-CUM-T	AT24C16D-CUM-T	VFBGA	Tape & Reel (5K/reel)
AT24C16C-WWU11M	AT24C16D-WWU11M	Wafer Sales	
AT24C16C-WWU27M	AT24C16D-WWU27M	Wafer Sales	

Note 1: Contact Atmel regarding general PDIP availability.

Note 2: The 1.8x2.2mm XDFN package is no longer being offered on new products.

Qualification Data:	☒ Available	☐ Will be available:	☐ 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): August 13, 2014 (tape format only) August 13, 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: August 13, 2014

Last Time Buy Date: February 12, 2015

Last Ship Date: August 13, 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).

Attention Distributors: Product(s) identified in this notification will become obsolete and as such this EOL notification will act as the official written notification. All obsolete products will be listed in the next published quarterly distributor price book, following an PCN/EOL change, and listed on the obsolescence form which accompanies said price book. Within thirty (30) days from the published date of the price book, Distributor shall notify Atmel in writing of Distributor's then current inventory of the obsolete product

CUSTOMER ACKNOWLEDGEMENT OF RECEIPT: Atmel requests you acknowledge receipt of this PCN / EOL. Please complete and email to pcnadm@atmel.com and the Atmel Contact listed above. In your acknowledgement, you can grant approval or request additional information. **Atmel will deem this change accepted unless specific conditions of acceptance are provided in writing within 30 days from the date of this notice.**

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