

## ATmega4808/4809 Data Sheet

### Introduction

The ATmega4808/4809 microcontrollers are part of the megaAVR® 0-series, which uses the AVR® processor with hardware multiplier running at up to 20 MHz, and offers a wide range of Flash sizes up to 48 KB, up to 6 KB of SRAM, and 256 bytes of EEPROM in 28-, 32-, 40-, or 48-pin packages. The series uses the latest technologies from Microchip with a flexible and low-power architecture, including Event System and SleepWalking, accurate analog features, and advanced peripherals.

The devices described in this data sheet offer 48 KB in a 28/32/40/48-pin package.



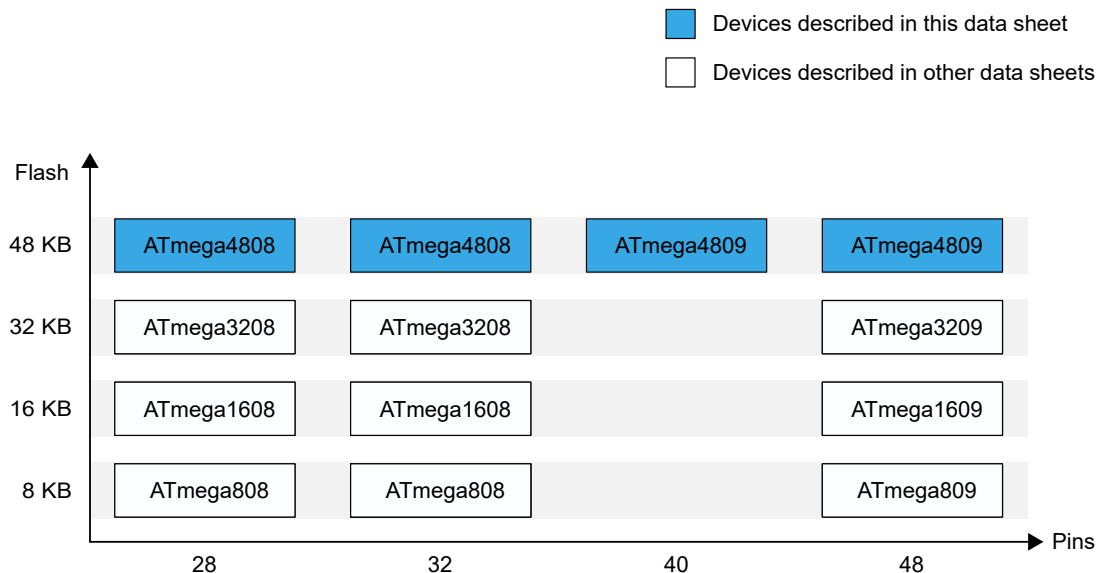
**Important:** The 40-pin version of the ATmega4809 is using the die of the 48-pin ATmega4809 but offers fewer connected pads. For this reason, the pins PB[5:0] and PC[7:6] must be disabled (INPUT\_DISABLE) or enable pull-ups (PULLUPEN).

### megaAVR® 0-series Overview

The figure below shows the megaAVR® 0-series devices, laying out pin count variants and memory sizes:

- Vertical migration is possible without code modification, as these devices are fully pin and feature compatible
- Horizontal migration to the left reduces the pin count and, therefore, the available features

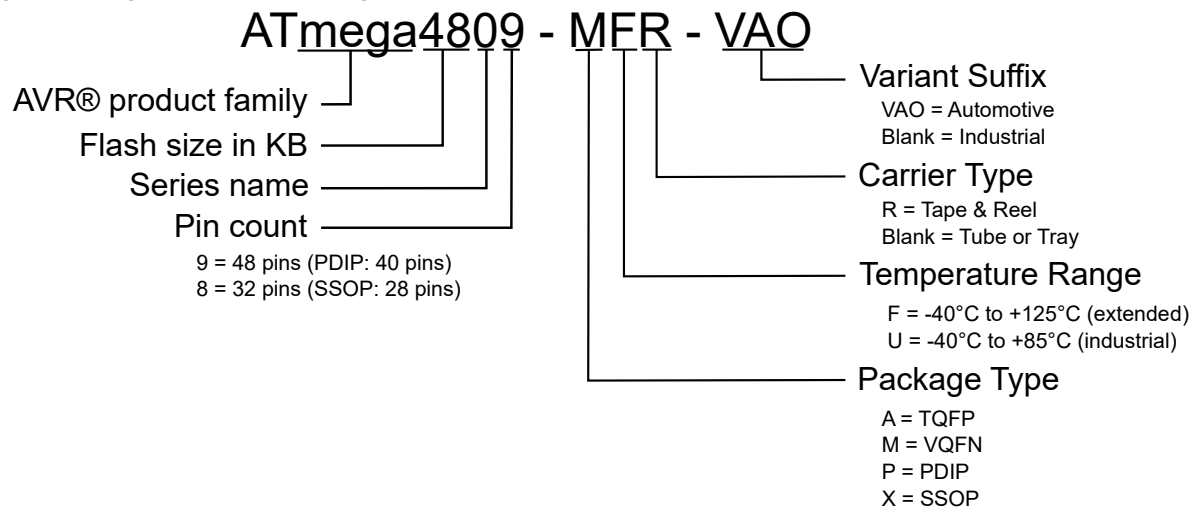
**Figure 1. megaAVR® 0-series Overview**



Devices with different Flash memory sizes typically also have different SRAM and EEPROM.

The name of a device in the megaAVR 0-series is decoded as follows:

**Figure 2. megaAVR® Device Designations**



## Memory Overview

**Table 1. Memory Overview**

Memory Type	ATmega808, ATmega809	ATmega1608, ATmega1609	ATmega3208, ATmega3209	ATmega4808, ATmega4809
Flash	8 KB	16 KB	32 KB	48 KB
SRAM	1 KB	2 KB	4 KB	6 KB
EEPROM	256B	256B	256B	256B
User row	32B	32B	64B	64B

## Peripheral Overview

**Table 2. Peripheral Overview**

Feature	ATmega808 ATmega1608 ATmega3208 ATmega4808	ATmega808 ATmega1608 ATmega3208 ATmega4808	ATmega4809	ATmega809 ATmega1609 ATmega3209 ATmega4809
<b>Pins</b>	<b>28</b>	<b>32</b>	<b>40</b>	<b>48</b>
Max. frequency (MHz)	20	20	20	20
16-bit Timer/Counter type A (TCA)	1	1	1	1
16-bit Timer/Counter type B (TCB)	3	3	4	4
12-bit Timer/Counter type D (TCD)	-	-	-	-
Real-Time Counter (RTC)	1	1	1	1

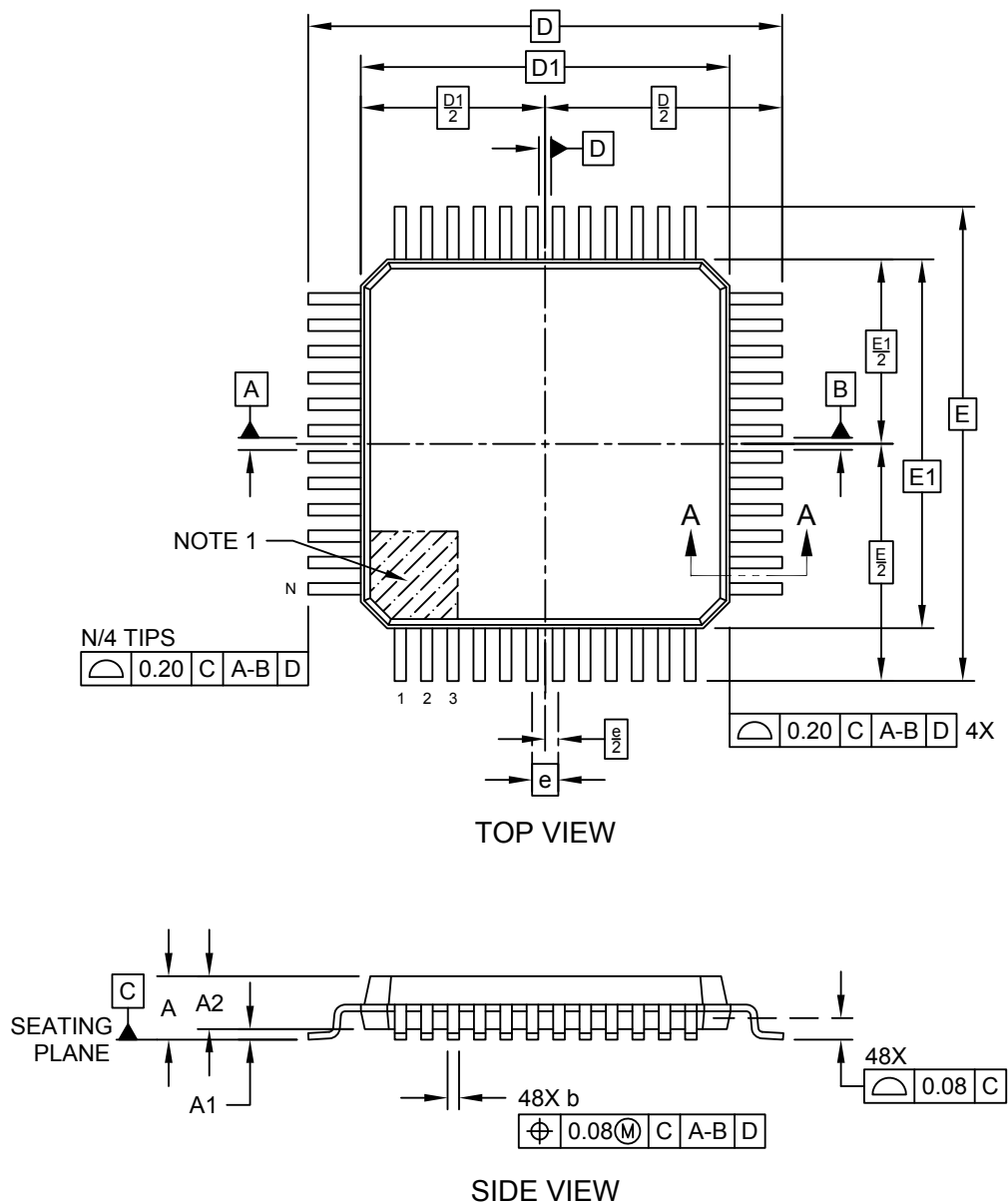
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Feature	ATmega808 ATmega1608 ATmega3208 ATmega4808	ATmega808 ATmega1608 ATmega3208 ATmega4808	ATmega4809	ATmega809 ATmega1609 ATmega3209 ATmega4809
Pins	28	32	40	48
USART	3	3	4	4
SPI	1	1	1	1
TWI (I <sup>2</sup> C)	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1 <sup>(1)</sup>	1 <sup>(1)</sup>
ADC (channels)	1 (8)	1 (12)	1 (16)	1 (16)
DAC (outputs)	-	-	-	-
AC (inputs)	1 (4p/3n)	1 (4p/3n)	1 (4p/3n)	1 (4p/3n)
Peripheral Touch Controller (PTC) (self-cap/mutual cap channels)	-	-	-	-
Custom Logic (LUTs)	1 (4)	1 (4)	1 (4)	1 (4)
Window Watchdog	1	1	1	1
Event System channels	6	6	8	8
General purpose I/O	23	27	33	41
PORT	PA[0:7], PC[0:3], PD[0:7], PF[0,1,6]	PA[0:7], PC[0:3], PD[0:7], PF[0:6]	PA[0:7], PC[0:5], PD[0:7], PE[0:3], PF[0:6]	PA[0:7], PB[0:5], PC[0:7], PD[0:7], PE[0:3], PF[0:6]
Asynchronous external interrupts	6	7	8	10
CRCSCAN	1	1	1	1
Unified Program and Debug Interface (UPDI) activated by dedicated pin	1	1	1	1

1. TWI can operate as host and client at the same time on different pins.

### 35.8 48-Pin TQFP

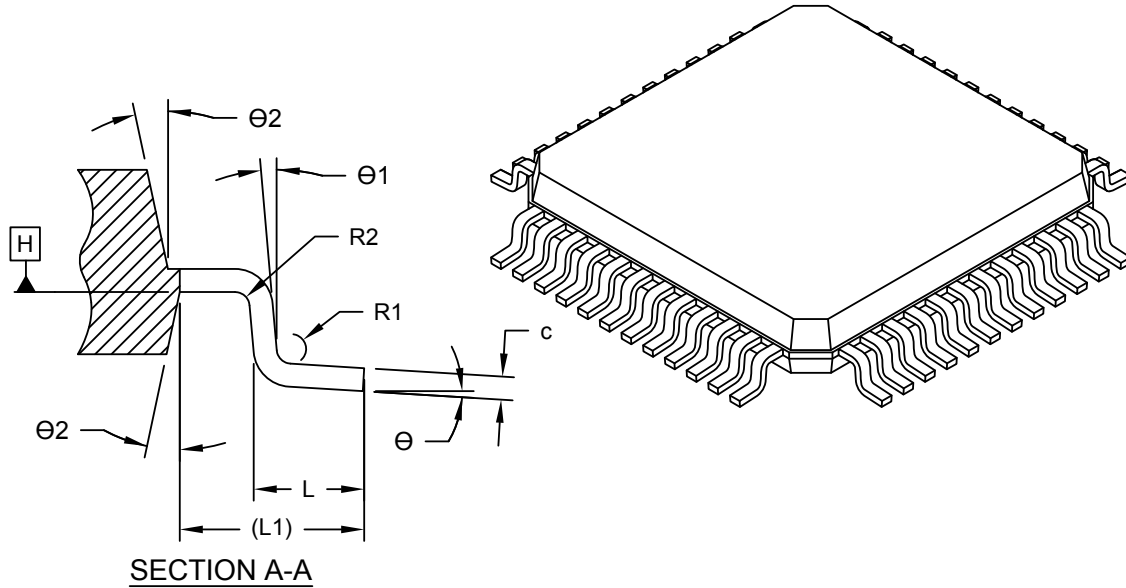
#### 48-Lead Plastic Thin Quad Flatpack (PT) - 7x7x1.0 mm Body [TQFP]

**Note:** For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



### 48-Lead Plastic Thin Quad Flatpack (PT) - 7x7x1.0 mm Body [TQFP]

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Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Number of Terminals	N	48		
Pitch	e	0.50 BSC		
Overall Height	A	-	-	1.20
Standoff	A1	0.05	-	0.15
Molded Package Thickness	A2	0.95	1.00	1.05
Overall Length	D	9.00 BSC		
Molded Package Length	D1	7.00 BSC		
Overall Width	E	9.00 BSC		
Molded Package Width	E1	7.00 BSC		
Terminal Width	b	0.17	0.22	0.27
Terminal Thickness	c	0.09	-	0.16
Terminal Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Lead Bend Radius	R1	0.08	-	-
Lead Bend Radius	R2	0.08	-	0.20
Foot Angle	Θ	0°	3.5°	7°
Lead Angle	Θ1	0°	-	-
Mold Draft Angle	Θ2	11°	12°	13°

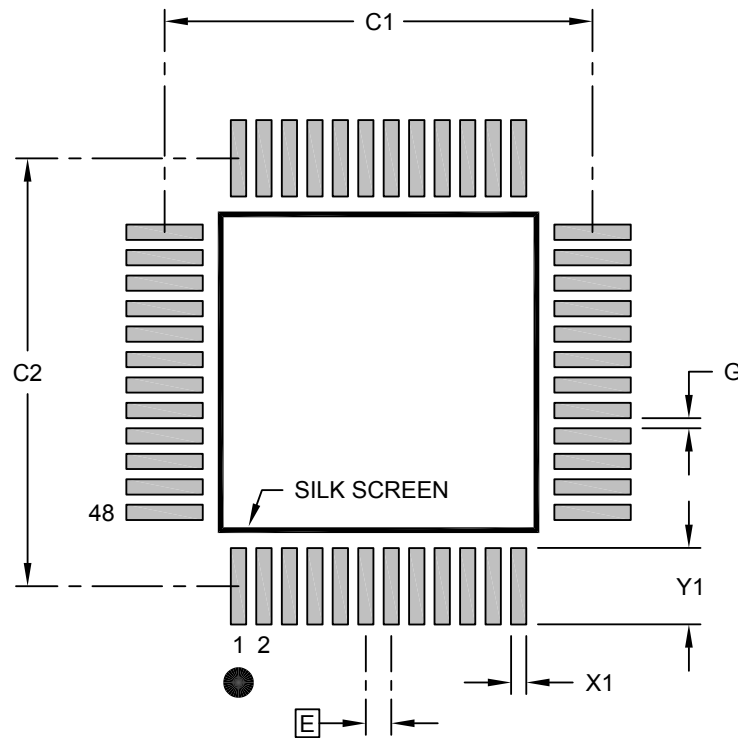
**Notes:**

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- Dimensioning and tolerancing per ASME Y14.5M  
BSC: Basic Dimension. Theoretically exact value shown without tolerances.  
REF: Reference Dimension, usually without tolerance, for information purposes only.

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### 48-Lead Plastic Thin Quad Flatpack (PT) - 7x7x1.0 mm Body [TQFP]

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### RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Contact Pad Spacing	C1		8.40	
Contact Pad Spacing	C2		8.40	
Contact Pad Width (X48)	X1			0.30
Contact Pad Length (X48)	Y1			1.50
Distance Between Pads	G	0.20		

#### Notes:

- Dimensioning and tolerancing per ASME Y14.5M  
BSC: Basic Dimension. Theoretically exact value shown without tolerances.
- For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

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