

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.



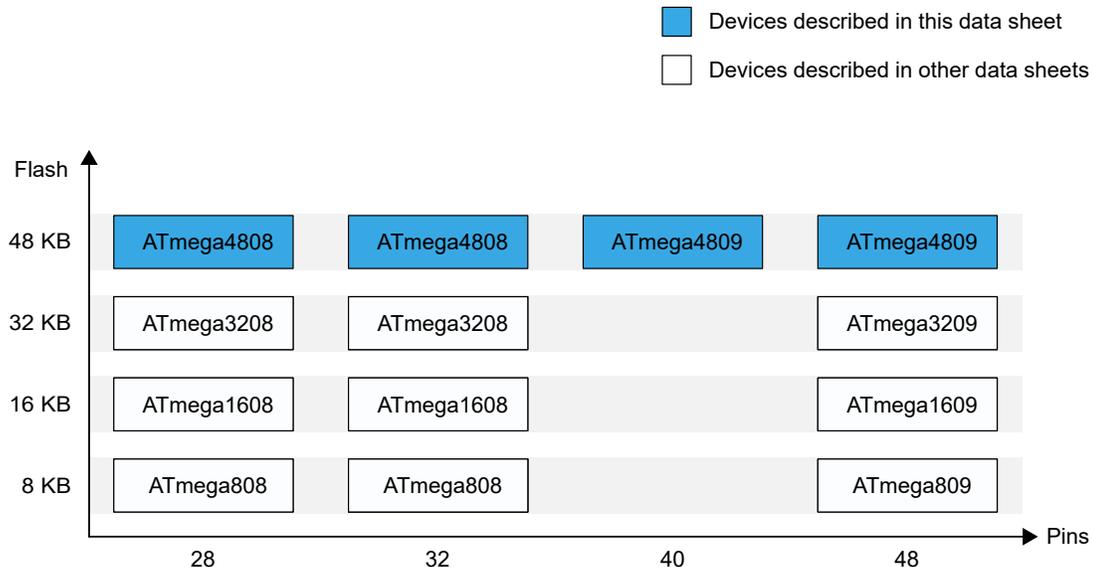
Important: The 40-pin version of the ATmega4809 is using the die of the 48-pin ATmega4809 but offers fewer connected pads. For this reason, the pins PB[5:0] and PC[7:6] must be disabled (INPUT_DISABLE) or enable pull-ups (PULLUPEN).

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

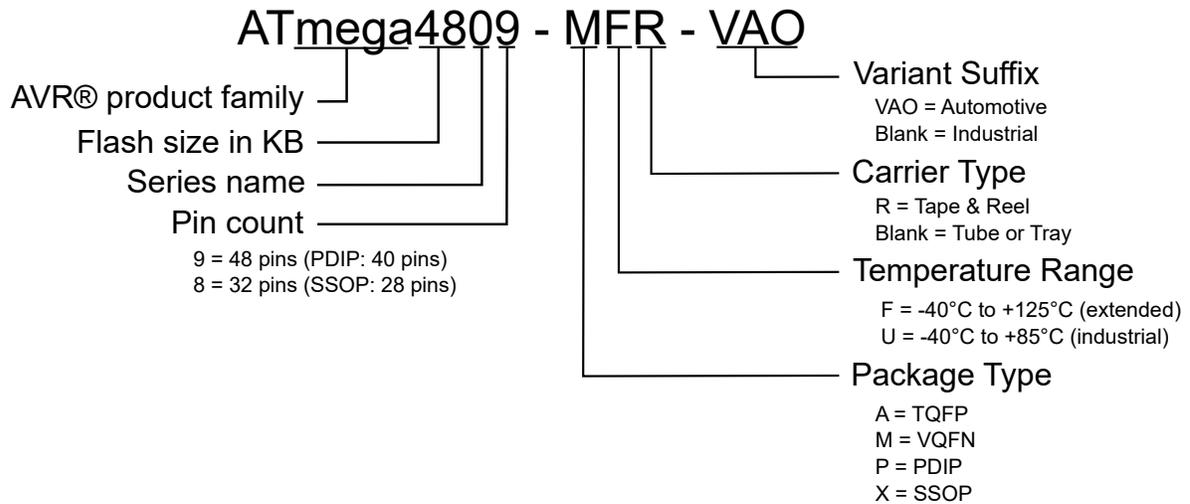
Figure 1. megaAVR® 0-series Overview



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
Pins	28	32	40	48
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

.....continued

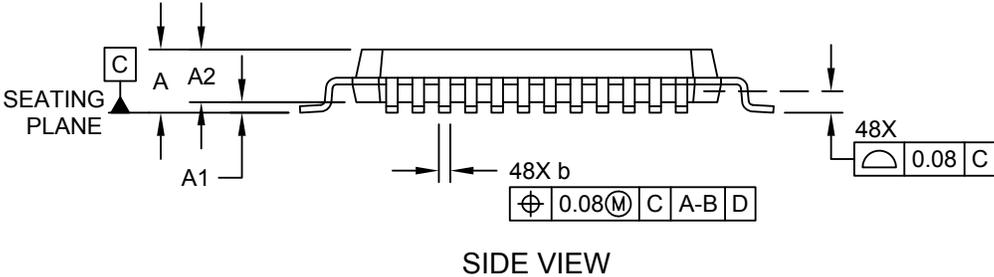
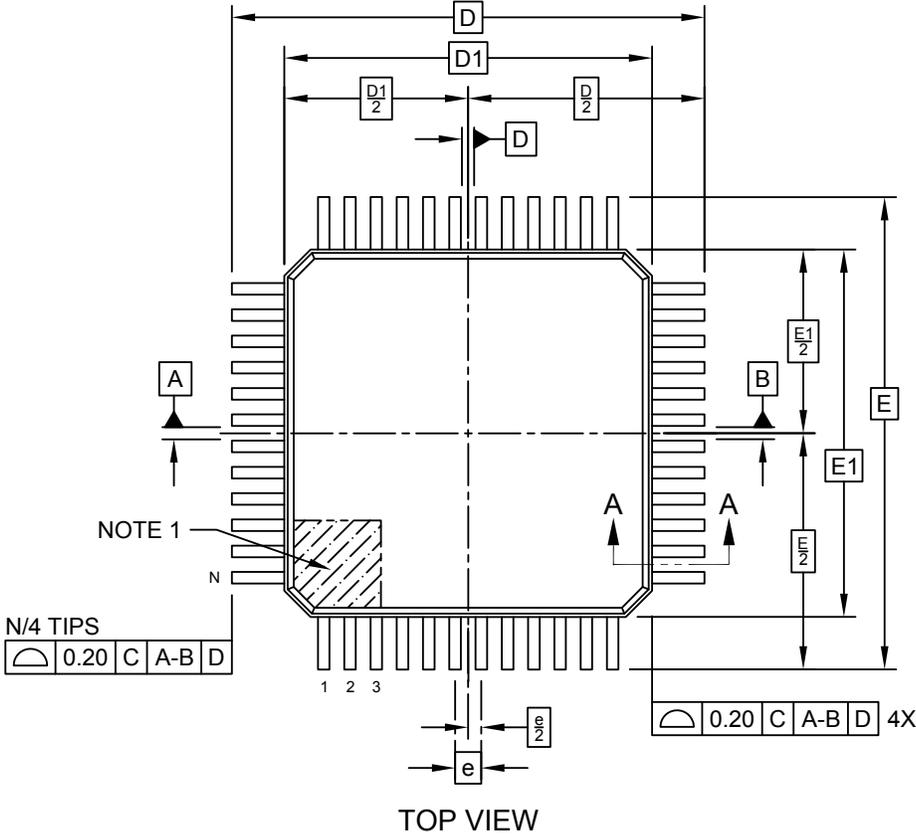
Feature	ATmega808 ATmega1608 ATmega3208 ATmega4808	ATmega808 ATmega1608 ATmega3208 ATmega4808	ATmega4809	ATmega809 ATmega1609 ATmega3209 ATmega4809
Pins	28	32	40	48
USART	3	3	4	4
SPI	1	1	1	1
TWI (I ² C)	1 ⁽¹⁾	1 ⁽¹⁾	1 ⁽¹⁾	1 ⁽¹⁾
ADC (channels)	1 (8)	1 (12)	1 (16)	1 (16)
DAC (outputs)	-	-	-	-
AC (inputs)	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

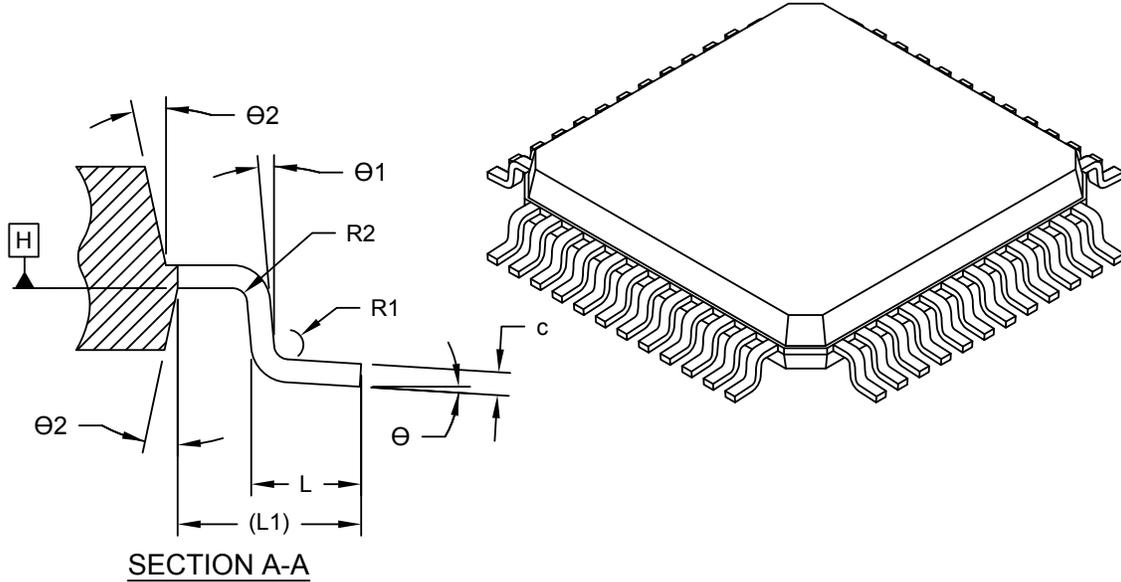
48-Lead Plastic Thin Quad Flatpack (PT) - 7x7x1.0 mm Body [TQFP]

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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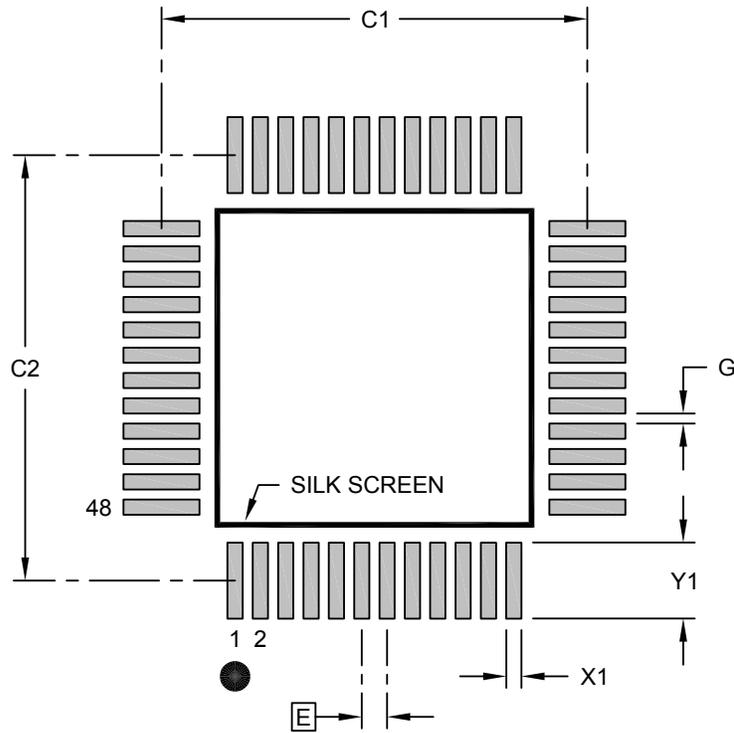
Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Number of Terminals	N	48		
Pitch	e	0.50 BSC		
Overall Height	A	-	-	1.20
Standoff	A1	0.05	-	0.15
Molded Package Thickness	A2	0.95	1.00	1.05
Overall Length	D	9.00 BSC		
Molded Package Length	D1	7.00 BSC		
Overall Width	E	9.00 BSC		
Molded Package Width	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:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. 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.

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

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RECOMMENDED LAND PATTERN

Dimension Limits	Units	MILLIMETERS		
		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

Microchip Technology Drawing C04-2300-PT Rev D