

ARDUINO PIN CURRENT LIMITATIONS:

A Few Definitions:

VOH - Voltage Output High (I/O Pin "HIGH")

VOL - Voltage Output Low (I/O Pin "LOW")

IOH - Current Output High (I/O Pin "HIGH")

IOL - Current Output Low (I/O Pin "LOW")

Atmel ATmega328P (UNO and Duemilanove) Current Specifications:

Absolute Maximum Ratings - the point where damage will start to happen

- DC Current per I/O Pin..... 40.0 mA
- DC Current VCC and GND Pins..... 200.0 mA
- VCC pin: Means these Arduinos can Source a total of 200 mA
- GND pins: Means these Arduinos can Sink a total of 400 mA
- Only the 32 pin surface mount packages (UNO Surface-Mount version) have 2 VCC pins.

Arduino (UNO and Duemilanove) Chip Pin #s vs. Ports:

Pin SOURCE Current Limitations:

NOTE: Although each I/O port can source more than the test conditions (20 mA at VCC = 5 V, 10 mA at VCC = 3 V) under steady state conditions (non-transient), the following must be observed.

- The sum of all IOH, for ports C0 - C5, D0 - D4, ADC7, RESET should not exceed 150 mA.
- The sum of all IOH, for ports B0 - B5, D5 - D7, ADC6, XTAL1, XTAL2 should not exceed 150 mA.
- If IOH exceeds the test condition, VOH may exceed the related specification. Pins are not guaranteed to source current greater than the listed test condition.

Pin SINK Current Limitations:

NOTE: Although each I/O port can sink more than the test conditions (20 mA at VCC = 5 V, 10 mA at VCC = 3 V) under steady state conditions (non-transient), the following must be observed:

- The sum of all IOL, for ports C0 - C5, ADC7, ADC6 should not exceed 100 mA.
- The sum of all IOL, for ports B0 - B5, D5 - D7, XTAL1, XTAL2 should not exceed 100 mA.
- The sum of all IOL, for ports D0 - D4, RESET should not exceed 100 mA.
- If IOL exceeds the test condition, VOL may exceed the related specification. Pins are not guaranteed to sink current greater than the listed test condition.

Atmel ATmega2560/1280/640 (MEGA) Current Specifications:

Absolute Maximum ratings:

DC Current per I/O Pin..... 40.0 mA

DC Current VCC and GND Pins..... 200.0 mA

This apparently is saying you get 800 mA to play with as there are 4 Vcc and 4 Gnd pins, further limited by subgroups of pins for Sink (IOL) and Source (IOH) current:

Pin SINK Current Limitations:

- The sum of all IOL, for ports J0-J7, A0-A7, G2 should not exceed 200 mA.
- The sum of all IOL, for ports C0-C7, G0-G1, D0-D7, L0-L7 should not exceed 200 mA.
- The sum of all IOL, for ports G3-G4, B0-B7, H0-B7 should not exceed 200 mA.
- The sum of all IOL, for ports E0-E7, G5 should not exceed 100 mA.
- The sum of all IOL, for ports F0-F7, K0-K7 should not exceed 100 mA.

[looks like 800 mA total!]

NOTE: If IOL exceeds the test condition [(20 mA at VCC = 5 V, 10 mA at VCC = 3 V) under steady state conditions (non-transient)], VOL may exceed the related specification. Pins are not guaranteed to sink current greater than the listed test condition.

Pin SOURCE Current Limitations:

- The sum of all IOH, for ports J0-J7, G2, A0-A7 should not exceed 200 mA.
- The sum of all IOH, for ports C0-C7, G0-G1, D0-D7, L0-L7 should not exceed 200 mA.
- The sum of all IOH, for ports G3-G4, B0-B7, H0-H7 should not exceed 200 mA.
- The sum of all IOH, for ports E0-E7, G5 should not exceed 100 mA.
- The sum of all IOH, for ports F0-F7, K0-K7 should not exceed 100 mA.

[looks like 800 mA Total!]

NOTE: If IOH exceeds the test condition [(20 mA at VCC = 5 V, 10 mA at VCC = 3 V) under steady state conditions (non-transient)], VOH may exceed the related specification. Pins are not guaranteed to source current greater than the listed test condition.

NOTE: Crossroads has confirmed with Atmel that total current is defined by the number of VCC pins per package. Here is a quote from their response:

"For 328P, the max current rating is 400mA for the TQFP package. For ATmega2560, the max current rating is 800 mA. Also, please note that this is absolute maximum rating and exposing the device to absolute maximum conditions for longer duration of time could possibly cause damage to the device."