

Teensy 3.5/3.6 Breakout

(Revision A, Standard)

This is a breakout for the Teensy 3.5 and Teensy 3.6 development boards by PJRC. Included are all the pin headers you need to assemble it, a switch to select between USB or external power, and a switch to set the USB host port's power mode (3.6 only). As an option during assembly, you can use the included jumpers (with pin headers) in place of the switches. This breakout can also optionally be assembled with the **Teensy 3.5/3.6 Socket Kit** (available separately).

This **Standard Edition** breaks out every signal along two rows of pins. It also has two mounting holes, pads for a full-size USB host port (3.6 only), and a proto area with power and ground rails. Installation of the USB-A host jack is only recommended in conjunction with the Socket Kit in order to maintain necessary height clearance. *The A2 revision adds scored carrier rails with mounting holes.*

Included Parts (visual part identification sheet attached)

	Count	Part Type	Pos.	Tech.	Rows	Pins	Mfr.	Part Number/Desc.
A	1	Bare PCB	80	TH	2	40	Tall Dog	Standard REV-A or A2
B	4	Male Header	40	TH	1	40	Generic	Standard
C	1	Male Header	10	SMD	2	5	Generic	Standard
D	1	Male Header	8	SMD	2	4	Generic	Standard
E	1	Male Header	6	SMD	2	3	Generic	Standard
F	4	Pogo Pin	1	TH	1	1	Mill-Max	0906-1-15-20-75-14-11-0
G	2	Slide Switch	3	TH	1	3	Generic	SS12D00G3
H	2	Jumper	2	N/A	1	2	Generic	Standard
I	1	USB-A Jack	4	TH	1	4	Generic	Standard
J	2	Machine Screw	N/A	N/A	N/A	N/A	Generic	#6-32 × 3/16" Pan Head
K	4	Machine Screw	N/A	N/A	N/A	N/A	Generic	#2-56 × 3/16" Pan Head

Detailed Specs (not including carrier rails)

- **Grid Spacing** — 0.1" / 2.54 mm
- **Board Dimensions** — 4.0" × 1.0" / 101.6 mm × 25.4 mm
- **Board Surface Area** — 4.0 in² / 25.81 cm²
- **Board Thickness** — 0.063" / 1.6 mm
- **Number of Breakout Pins** — 80 pins (2 rows × 40 pins)
- **Row Spacing** — 0.9" / 22.86 mm

Recommended Tools

- Soldering iron
- Solder and flux
- Breadboard
- Diagonal cutters
- Blue tape
- Razor blade

Contact Info

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Detailed Specs (*continued*, not including carrier rails)

- **Number of Mounting Holes** — 2 holes
- **Mounting Hole Distance** — 2.95" / 74.93 mm
- **Mounting Hole Diameter** — 0.15" / 3.81 mm
- **Mounting Hole Pad Diameter** — 0.27" / 6.86 mm

Assembly Instructions

1. Cut the trace to separate VIN from VUSB on the underside of the Teensy.
2. Cut the trace to separate the middle and left USB host power pads (marked H) on the underside of the Teensy. If you're using a Teensy 3.5, you can skip this step.
3. If the Teensy Breakout PCB (part A) has carrier rails (REV-A2 or later), decide whether you want to leave them in place or remove them. Otherwise, skip this step.
 - a. If you leave the carrier rails in place, you can jump whichever signals you want out onto the rails. You can also cut any of the exposed traces connecting the holes on the underside of the board. The mounting holes at either end of the rails are designed for #2 machine screws (part K) but M2 screws work too. The v-scoring is pretty strong, but you can further strengthen the perforated area with a thin line of epoxy.
 - b. If you remove the carrier rails (for typical breadboard use), apply pressure to one rail until you feel the material in the perforated area (v-score) begin to break. Using a pair of flat-head pliers makes this easier. Apply pressure in the opposite direction. Work the joint back and forth until it separates, then do the same for the other rail. You can sand or file down any rough edges. Put aside two 40-pin through-hole male header strips (part B) to use later (in step 17).
4. Choose one of the following:
 - a. Place and solder a slide switch (part G) into the three holes outlined with a rectangle and marked VIN-VUSB on the breakout board. If you're using a Teensy 3.6, you can also install the second slide switch into the similar location marked HOST-PWR.
 - b. You can use a 3-pin length of male header (from part B) and a jumper (part H) in place of either switch for a more permanent method of configuring these signals.
5. If you're using the **Teensy 3.5/3.6 Socket Kit**, stop here and switch to the instructions included with the Socket Kit. Keep parts from each kit separate since they both use similar part lettering schemes. When you're finished with the Socket Kit instructions, skip to step 16.

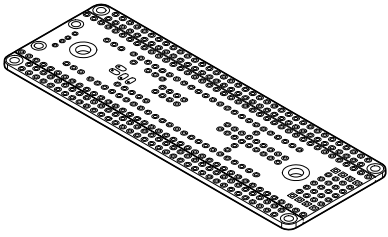
6. Apply some flux onto the four oblong outlined pads on the top side of the breakout board. Place and solder a gold pogo pin (part F) into each of these four holes. The elongated shape of each pad allows you to solder the pogo pins more easily from the top. The pogo pins must sit flush and be aligned perpendicularly to the board. You can secure the board to the edge of your work surface with tape, allowing the pads to hang over the edge. While soldering each pin, drag the tip of your soldering iron along the pin's base to rotate it slightly, which can help to improve alignment. After soldering, hold the board up and check that the pins are reasonably perpendicular to the board. Check from both the front and the side.
7. Cut a 5-pin length of through-hole male header (from part B). Place the header so that it interfaces with the RESET, PROGRAM, GND, 3.3V, and VBAT pins along the underside of the Teensy. Solder the header in place. You can use a breadboard to align the pins and an extra header strip turned sideways to keep the Teensy perpendicular.
8. Cut another 5-pin through-hole male header (from part B) and remove the metal pin from the 2nd position using your diagonal cutters as pliers. Solder the modified header (now a 4-pin header with one blank space) onto the underside of the Teensy so that it occupies the A11, A10, AREF, and VUSB positions. You can use a breadboard for alignment here also.
9. Place the Teensy so the bottom side is facing up. Apply flux onto the 2 rows of 5 rectangular pads (10 in total) marked 3.3V, 47, 48, 49, 50 on the first row and GND, 46, 45, 44, 43 on the second row. Place the 2x5 SMD male header (part C) onto the pads and solder it in place. You can secure the header using tape or a small drop of glue. The alignment doesn't have to be too perfect, just get it as close as you can.
10. Apply flux onto the 2 rows of 3 rectangular pads (6 in total) marked 51, 52, 53 on the first row and 42, 41, 40 on the second row. Place the 2x3 SMD male header (part E) onto the pads and solder it in place, as described above in step 9.
11. Apply flux onto the 2 rows of 4 rectangular pads (8 in total) marked 54, 55, 56, 57 on the first row and DD, DC, DE, G on the second row. Place the 2x4 SMD male header (part D) onto the pads and solder it in place, as described above in step 9.
12. Cut another 5-pin through-hole male header (from part B) and place it so it interfaces with the pins marked G, G, D+, D-, 5V on the underside of the Teensy. These holes aren't on the same 0.1 inch grid as the rest of the holes so you won't be able to use a breadboard for alignment here. Tack one pin and then solder them all.
13. Cut two 24-pin lengths of through-hole male header (from part B). Position them along the two longer edges on the underside of the Teensy. You won't be able to use a breadboard to align these headers, so tack them in place before fully soldering them.

14. Mate the Teensy and the breakout board assemblies together. You might need to apply some pressure depending on the alignment of the headers. If any pins are significantly misaligned, you may have to manually bend them so the two boards can mate. The distance between the boards will ultimately be determined by the surface-mount headers since they sit higher than the through-hole headers. As a result, there will be a small gap between the through-hole headers and the breakout board, which is normal.
15. Tack the four corner pins to provide some stability, then check for proper alignment. Using diagonal cutters, trim all the protruding pins so they're reasonably flush with the bottom surface of the breakout board. You can place your finger over the pin that you're trimming to prevent it from flying across the room when you snip it. Secure the assembly in place with the underside of the breakout facing up. You can use two pieces of tape, one placed over each end. Solder all the trimmed pins.
16. If you used the Socket Kit, or if you don't need clearance to the Teensy's onboard Micro USB port, you can install the optional USB-A host jack (part I). This only applies to the Teensy 3.6, so skip this step if you're using a Teensy 3.5. Place the USB-A jack into the corresponding holes along the short edge on the top side of the breakout board, tack it in place, then solder it.
17. If you didn't remove the carrier rails back in step 3, skip this step. Locate the two 40-pin headers (part B) that you put aside earlier. Place them along the two long edges on the underside of the breakout board. These exposed header pins will allow the entire assembly to interface with a standard breadboard, which you should use now to ensure proper alignment. Solder the headers in place. Counterintuitively, it's safer and easier to remove the assembly from a breadboard by rocking it forward and back instead of side to side. Be gentle and remove it carefully to prevent damage to any of the pins.
18. Inspect the finished assembly thoroughly. Connect it to power and make sure it functions correctly. I hope you enjoy using your new board, and best of luck with your project!

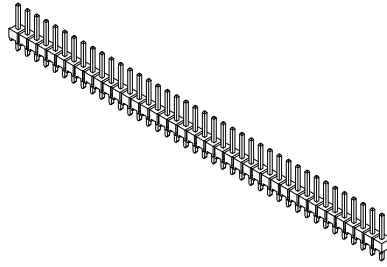
Congratulations, you're finished!

If you like using this product please consider leaving a positive review on Tindie!
If you have any concerns or problems please contact me at the email address above.

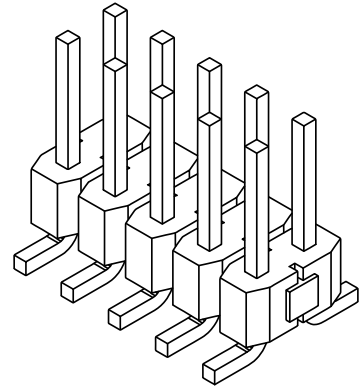
A
1x



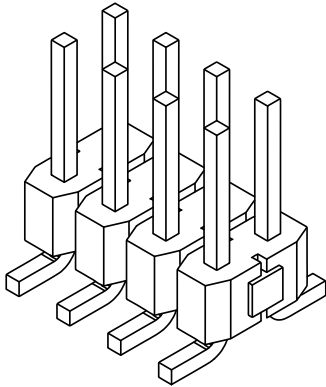
B
4x



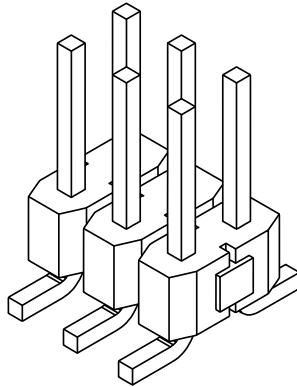
C
1x



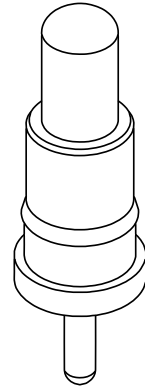
D
1x



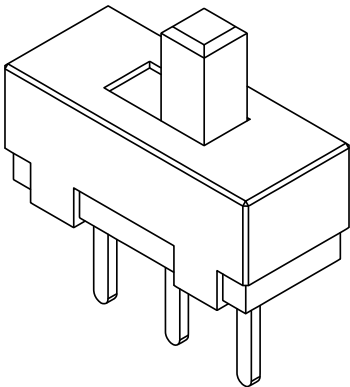
E
1x



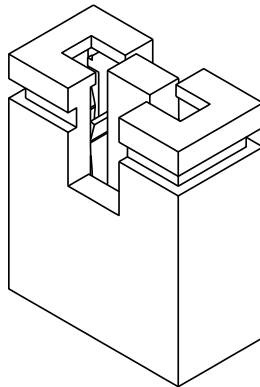
F
4x



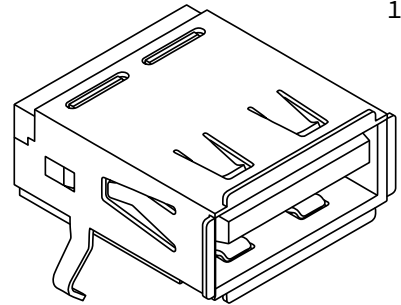
G
2x



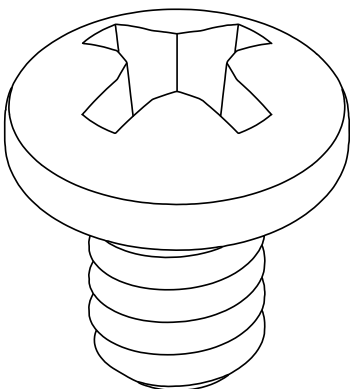
H
2x



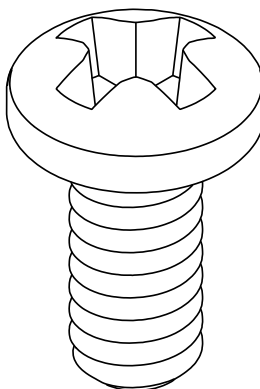
I
1x

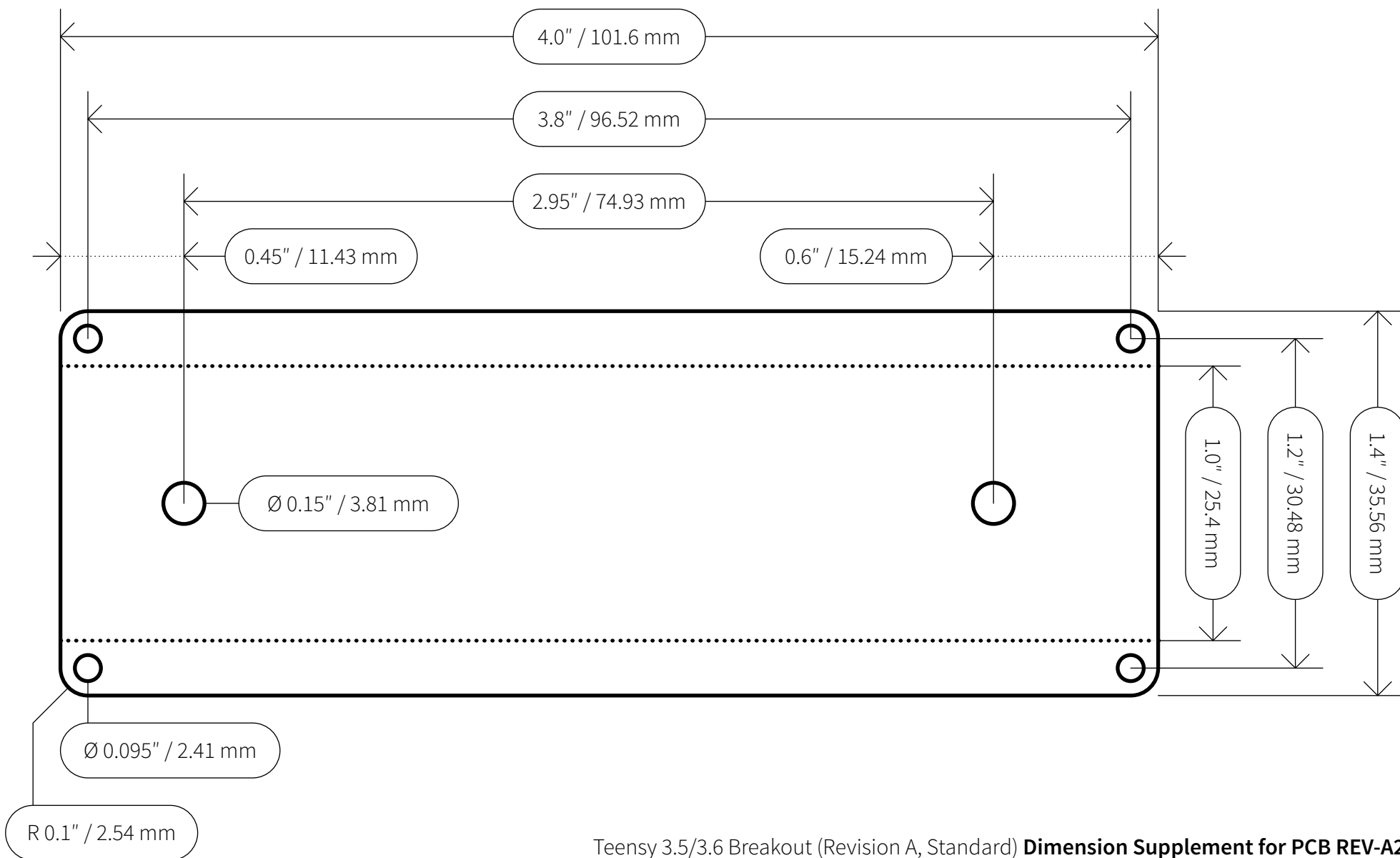


J
2x



K
4x





Teensy 3.5/3.6 Breakout (Revision A, Standard) **Dimension Supplement for PCB REV-A2**

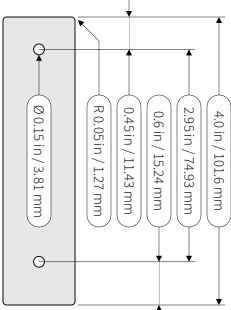
Teensy 3.5/3.6 Breakout

Standard Edition

Revision A

Legend

- Voltage Pins
- Ground Pins
- Digital Pins 58/58
- Analog Pins 27/25
- PWM Pins 20/22
- Touch Sense Pins 0/11
- Serial Ports 6/6
- I2C Ports 3/4
- SPI Ports 3/3
- CAN Bus Ports 1/2
- Alternate Functions
- Teensy 3.5 Only
- Teensy 3.6 Only



Teensy by PJRC
pjrc.com

Breakout by Tall Dog
tall-dog.com

