Subject: 3d printed case design for the MiniMax 8085
Posted by djmartins on Sat, 02 Feb 2019 21:33:06 GMT

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I have posted a case for the MiniMax 8085 on thingiverse for people to use. If there is a need I can print some at reasonable prices for people.

Here is where you can see it:
www.thingiverse.com/thing:3399973

quick print to test so the front cover is a bit thin on the surface, thought and changes open to discussion.

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by gkaufman on Sun, 03 Feb 2019 18:12:18 GMT

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Nicely done, printing now...

Any thoughts of adding small holes for the LED or Reset switches?

- Gary

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by djmartins on Sun, 03 Feb 2019 20:12:10 GMT

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Wellllllll

I have the parts for the reset switch and power LED on order. So NOW I am thinking of doing that and that will eliminate the text on the front. Might also model a simple block to form the leads so you can use a regular 3 or 5 mm LED...

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by gkaufman on Sun, 03 Feb 2019 21:21:57 GMT

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Have the top and bottom printed, and they look very nice.

You could put the text on the back panel.
Also the screw posts for mounting the board - the holes are a bit too large for a 4-40 to grab, but a 6-32 won't go thru the PC board easily. Might pay to make the holes a tiny bit smaller in the posts.

Thanks for making this available!

- Gary

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by djmartins on Sun, 03 Feb 2019 21:29:18 GMT
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The PCB mounting holes are for M3 screws.
If you really need 4-40 I can add another bottom with that but these days, in spite of hating metric, I have been forced to use a lot of M3 fasteners.
I can move the text to the back.

Give me a few hours and I can post updates to the enclosure.
Modeling parts right now. updated bottom part for 4-40 and 3mm board screws.
Test printing front again.
Forgive me, the box I am using is in OpenSCAD and I am a long term Pro/E user.

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by gkaufman on Mon, 04 Feb 2019 00:45:42 GMT
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Didn't think about trying metric, I do have some M3's.

If you're picky, looks like the power and and serial ports are slightly off (a bit too much to the left edge) but otherwise the case is really nicely done.

Ironically there is enough flex in the front panel to trigger the reset switch nicely.

- Gary
djmartins wrote on Sun, 03 February 2019 13:29The PCB mounting holes are for M3 screws.
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Subject: Re: 3d printed case design for the MiniMax 8085
Posted by djmartins on Mon, 04 Feb 2019 05:48:20 GMT
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Gary, I made a bunch of changes to the case!

You can just print a new front panel that will work with the old top and bottom.

I also made the case short so the front and back panels are closer to the PCB hoping it makes things go together easier but have not printed that yet, the one I made works ok but if anyone has a problem let me know.

Added 4-40 and 3mm pcb screw bottoms, fixed the front and that took a few tries since I don’t have the reset switch or the LED from the BOM. I used a rectangular green LED and bent the leads to fit and used a printed part made with the data sheet to make the hole for the one in the BOM. If there is interest I could add a 3mm or 5mm hole for a 3/5mm round LED and one can bend the leads to fit. The one in the BOM costs a bit more than a plain LED and bent leads work fine to make it 90 degree. THe pic I added shows my setup.

The back is plain, I know there is a double row of headers but haven’t seen it used by anyone yet and can make the case taller if anyone comes up with a board. I am working on a back panel with the letters cut through and contrasting piece glued behind it but have not uploaded the files yet until I get a good print.

I am in the process of putting together a few SBCs from here and will make cases for them all and share them on thingiverse.

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by tingo on Wed, 06 Feb 2019 16:04:47 GMT
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Nice case! Will you share your OpenSCAD model?
The OpenSCAD files would be fun to play with (and learn from). I've just started with OpenSCAD.

The updated case prints and works nicely. A standard 5mm LED at right angle projects thru the opening.

Thanks again for making this available.

- Gary

Ok, I have added the file but it is just a revision of the one linked at thingiverse. For the back panel with the lettering cutout I used Pro/Engineer and that file is of no use to anyone without Pro/Engineer.

There is a revision to the Ultimate Box Maker I should have used at thingiverse.com/thing:2938921

This one has more options to modify than the original and prefer it.
If there are other items you need modeled let me know in private messages, Gary.
Maybe I can do them.
Appreciate what I have seen you do for this community!

It's a shame that it is not yet cost effective to do low cost plastic injection molding.

It would be fabulous to be able to manufacture high quality custom cases and bring back classic designs.

I have seen someone reproduce apple and amiga case but they are very expensive.
... and 1 year later I've printed the MiniMax8085 case :)

First I've printed the case from provided STL files, but it had a few issues:
- The round hole for DC Jack didn't match the connector shape (rectangular)
- The PCB mounting holes seem to be a bit off. The actual distance between them is 90 x 70 mm, and the case had a slightly bigger distance. Maybe it was intentional to compensate for plastic shrinkage?
- I am using the "projected type" reset switch with a square key top, which didn't fit through a round hole in the case.

So I've redesigned it a bit. I've started with the SCAD code posted on Thingiverse, and tweaked it.

Here is the result:

If there are no objections I'll put the design (STLs and SCAD files) on the project's web site.

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Subject: Re: 3d printed case design for the MiniMax 8085
Posted by djmartins on Tue, 04 Feb 2020 00:01:57 GMT

Post it wherever you want!
I printed it in ABS but scaled it to make it the right size.
You'll have to do that with a lot of prints depending on the material you print it in.
All slicers allow you to scale things up or down as needed.
My reset button is round like on the BOM and recessed and the design didn't put the power jack through the front
of the case, the power plugs in fine through the hole.
I used one of the SCAD boxes found on Thingiverse and I like the design of this style of case due to ease of changing the front or back panels for issues or changes in the boards put in the case.

I just did a case for a raspberry pi zero (NON wifi) along with a place for a RS232 board and a composite
jack to use with that pigfx (or the modified one based on that) for a small terminal that can use a USB keyboard and have HDMI or composite video output.
If anyone is interested I can post it on Thingiverse too but again, you might need to scale the model
for PLA or PETG printing but the design is 1 to 1.
I use files to make things fit on 3D prints and will sometimes sand a surface smooth and use acetone to make
it look nice and shiny (ABS of course) and sometimes if I want a nice fit rely on a smaller hole that needed and file to fit like with the rectangular LED in this case front.

Let me know if there is any interest, I am waiting for a REAL max3232 SOIC chip to replace the cheap chinese copy on the $1.12 board that I am using.

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by scruss on Thu, 06 Feb 2020 02:42:16 GMT

b1ackmai1er wrote on Fri, 08 February 2019 22:52

It's a shame that it is not yet cost effective to do low cost plastic injection molding.

It never will be: the tooling starts in the tens of thousands of dollars. You need demand in the thousands to make it worthwhile, which there isn't for retro computers.

I work in 3d printing (developing/distributing low-cost open source assistive technology for Makers Making Change, a Canadian charity) and in many cases it's replacing injection moulding entirely.

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by b1ackmai1er on Thu, 06 Feb 2020 08:03:27 GMT

scruss wrote on Wed, 05 February 2020 18:42

It's a shame that it is not yet cost effective to do low cost plastic injection molding.

It never will be: the tooling starts in the tens of thousands of dollars. You need demand in the thousands to make it worthwhile, which there isn't for retro computers.

... but ... I never believed we would have tools like Kicad and that we could design and our own devices with, and that we could turn our designs into reality through China PCB shows for under $20.

I believe one day the technology will be available to build disposable, low life injection moulding for around $1000 where you could make short runs of say 100 units.

Anyway that's my dream :)

Edit: Thanks for the link to the site. Some very practical ways new technology can make peoples lives better. We take so much for granted.
b1ackmai1er wrote on Thu, 06 February 2020 03:03:1 believe one day the technology will be available to build disposable, low life injection moulding for around $1000 where you could make short runs of say 100 units.

Anyway thats my dream :)

Edit: Thanks for the link to the site. Some very practical ways new technology can make peoples lives better. We take so much for granted.

DIY injection molding has been done for decades. There is a book on making one machine by Vince Gingery: https://www.amazon.com/dp/B018RBEZKE/ref=dp-kindle-redirect?_encoding=UTF8&btkr=1 You can find copies out there for free.
Small items with simple molds but these days you can get a CNC mill cheaply and machine your own molds.
You can also file and sand 3D ABS prints and smooth it by wiping it with acetone to get a nice shiny and smooth surface
or run parts through an acetone vapor bath.
There are also the SLA 3D printers that use a resin bath and build up a part with an LCD or laser and they can make more detailed parts than a standard FDM printer but it is a whole different tech that now has become relatively cheap.
Consumer level SLA printers have much smaller work spaces that are less than ideal for enclosures like this though.
One can also get a cheap laser cutter and make enclosures that way.
There are also laser diode engravers that can cut some materials, engrave many, and you can also add a Z axis to them and a small motor and mill two sided PCBs.

Subject: Re: 3d printed case design for the MiniMax 8085
Posted by gkaufman on Sat, 08 Feb 2020 04:24:59 GMT

Please do post, very appreciated!

- Gary

"I just did a case for a raspberry pi zero (NON wifi) along with a place for a RS232 board and a composite jack to use with that pigfx (or the modified one based on that) for a small terminal that can use a USB keyboard and have HDMI or composite video output."
If anyone is interested I can post it on Thingiverse too but again, you might need to scale the model for PLA or PETG printing but the design is 1 to 1.

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Subject: Re: 3d printed case design for the MiniMax 8085  
Posted by etchedpixels on Sat, 08 Feb 2020 21:16:19 GMT  
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scruss wrote on Wed, 05 February 2020 18:42
b1ackmai1er wrote on Fri, 08 February 2019 22:52
It's a shame that it is not yet cost effective to do low cost plastic injection molding.

It never will be: the tooling starts in the tens of thousands of dollars. You need demand in the thousands to make it worthwhile, which there isn't for retro computers.

I work in 3d printing (developing/distributing low-cost open source assistive technology for Makers Making Change, a Canadian charity) and in many cases it's replacing injection moulding entirely. It is changing - but probably not sufficiently for really low volume. Some of the soft moulds (that wear out after a thousand or so runs) are much cheaper, and it is possible to 3D print some classes of plastic moulding tool although very limiting.

I'm not sure it matters unless you are worried about structural integrity issues. For the most part a high end up 3D printing setup can produce a case that is as good as a plastic one visually and cheaper than even the low volume moulding techniques - but still too expensive for most of us.

You can also vacuum form stuff at home surprisingly cheaply.

Alan

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Subject: Re: 3d printed case design for the MiniMax 8085  
Posted by scruss on Mon, 10 Feb 2020 02:37:21 GMT  
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Maybe so - but making the tooling is an extra delay, and you have to design for injection-mouldable parts. Jo Prusa has hundreds (possibly thousands) of his own 3D printers printing components for the printers he sells. It might take almost a day for a full set of parts to come off a printer, but he can (and does!) revise parts almost immediately. He can have his entire production line switch over to a new part within a day at no additional cost.
The updated case OpenSCAD and STL files along with a short README are posted here: https://github.com/skiselev/minimax8085/tree/master/printed_parts

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Subject: Re: 3d printed case design for the MiniMax 8085
Posted by djmartins on Tue, 11 Feb 2020 00:50:17 GMT
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Here are a few pictures of the case as designed.
I am not a photographer so go easy on me.....

Lid is not screwed on and the reset button requires something to go through the hole to press it.
I am not a photographer so go easy on me.....