Subject: Re: TMS7000 Series Devices (Manual section 2.1)
Posted by lynchaj on Thu, 04 Apr 2024 11:59:49 GMT
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Hi
I've got DAISY256 PCBs on the way and gathered up all the parts I have on hand for the project. Made some orders for the parts I am missing including 3 TMS7001NL-4 chips for initial testing. I think those are the most likely to work since they are the most closely similar to the PIC7041 that the CTS256 was derived from. The only difference being the lack of 4KB internal mask EPROM.

IF the TMS7001 works (that's a big IF), do you see anything preventing the TMS77C82 from working? I realize it has an 8KB internal EPROM but in microprocessor mode, that will be ignored so not really a difference. The TMS7xCx2 parts have some extra capabilities but if you don't use them, the CTS256 firmware should still work "as-is". Is that right? Or would the CTS256 firmware require modification?

I found some cheap TMS77C82 DIP40 chips on AliExpress so I ordered 3 to do some tests. Assuming I can get the TMS7001 parts to work, it should be just a simple swap with the TMS77C82 parts to test if they work. Probably could through a whole list of pin-compatible parts sorting out which ones work and which don't but only a couple of common chips (TMS7001 and TMS77C82) should be sufficient for the limited hobbyist demand for CTS256 replacements.

What do you think? Thanks

PS, I also ordered 5 TMS70C02 chips in DIP40 for about $13 from AliExpress. That's like $2.50 each shipped. I don't know if they will work but I think they have a reasonable chance. That's about 2% of the going rate on eBay where I routinely see CTS256s for >$100 each.

PPS, I think I've found another wrinkle in my plan. It turns out the divide by two or divide by 4 clock options are set in the mask at manufacturing. I am confident the CTS256 uses the /4 option since it requires a 10MHz crystal. However, other TMS7xxx use the /2 option and will need a 5MHz clock to get the same system performance. For a real time application like this, clock speed is super important so I recommend the crystal be socketed until we get this sorted out. I suspect the TMS7xCx2 parts will not work with a 10MHz crystal so make sure it is easy to replace. From the TMS7000 databook:

PPPS, this also clarifies the difference between TMS7001NL-2 and TMS7001NL-4. The -2 uses 5 MHz crystal and the -4 uses 10 MHz crystal. As long as the crystal is socketed, I am guessing either will work fine. This opens up more potentially suitable parts. I think the TMS7xCx2 parts all use /2 clocks (confirmed, paragraph 4.2.7 of TMS7000 databook, all TMS70Cxx use /2 only).

File Attachments

1) TMS7xxx interrupts and clock options.png, downloaded 817 times