alternative, pin-compatible MPUs, min 64k flash, 44-IO:
STM32G031C8Tx/Ux
STM32G041C8Tx/Ux
STM32G051C8Tx/Ux
STM32G061C8Tx/Ux
STM32G071C8Tx/Ux
STM32G071CBTx/Ux (128K)
STM32G081CBTx/Ux (128K)
STM32G0B1CBTx/Ux (128K)
STM32G0B1CCTx/Ux (256K)
STM32G0B1CETx/Ux (512K)

Socket Micro-USB B:
Amphenol 10103594-0001LF
Molex 105017-0001
GCT USB3076-30-A

ESD Protection:
NXP IP4220CZ6
AOZ8000CIL
ST USBLC6-4SC6

Note: the required crystal capacitance is combined capacitance of two capacitors

Seiko MS621FE-FL11E
supercapacitor ϕ10mm max

for Segger J-Link mini
use pins 3-12

reverse current protection

any P-CH SOT-223-3 Mosfet with Vgs(th)max<2V, Vds>30V, Id>5A, low Rds(on)
-ZXMP4A16GTA

High-voltage (>30V) SOT-223-3 LDO:
-MIC5239-3.3YS
-MIC5233-3.3YS (36V)
-LT1129CST-3.3
-LT1121CST-3.3
-SPX2954M3-L-3-3
-NCV4274AST33T3G (40V)
-NCV4264-2CST33T3G (45V)
-MCP1790-3302E
-MCP1799-3302H (45V)

use 3.9V Zener diode with low IR @3.3V

fixed terminal blocks:
CUI TB002-500-02BE
TE 1776244-2, 1776266-2, 1776504-2, 1776269-2
Degson DG301-5.0

Rohm:PTZTFTE253.9B

EEPROM
Note: 24CWxx EEPROM comes with preconfigured lower 3 bit address, '0' in p/n indicates address 1010_000X (0xA0)

Bourns PEC12R-4xxxF-Sxxxx
Bourns PEC12R-4xxxK-Sxxxx
Bourns PEC11R-4xxxF-Sxxxx
Bourns PEC11R-4xxxK-Sxxxx
or any popular single-channel Alps EC11E, G, M, N EC12E, EC111 encoder

Note: Bourns encoders are preffered. Unlike most ALPS encodes (besides EC12D), Bourns encoders have dent stability position between signal edges.

any P-CH SOT-223-3 Mosfet with Vgs(th)max<2V, Vds>30V, Id>5A, low Rds(on)
-ZXMP4A16GTA

any N-CH Mosfet with Vgs(th)max<2V

IR=30÷40nA @3.3V

instead of REF2030 a) internal MPU 2.5V VREFBUF can be used with divider and buffers (OpAmps), b) DACs can be used as Vref sources as well

3V, 1.5V, max 20mA

ref voltage source

consider driving EN from MPU

DAC buffers

low-offset (<0.1mV) OpAmp with low output swing headroom to negative supply (<10mV):
- OPA387 (SOT23-5, VSSOP-8 double, TSSOP-14 quad)
- OPA378 (SOT23-5, SC70-5, SOT23-8 double)
- OPA391, 396 (SC70-5 only)
- OPA320
- OPA392 (SOT23-5, SC70-5, higher swing headroom to negative supply (~20mV)

To drive light capacitive load use OPA388, NCS2005, OPA350EA/OP1177ARM (up to 1µF, MSOP-8 pkg) OPA2350EA/OP2177ARM (up to 1µF, MSOP-8 pkg, double) LM8261 (unlimited capacitive load, lower precision)

optoisolators: MAX12931, MAX22246, Si8422/26, ADuM1281/86, ISO7021, ISO6702?, ISO7720, ILE612-3E
ADuM1201AR

Vref buffer

reverse current protection

any low-offset (<0.1mV), high output current OpAmp
high CLoad drive
OPA388, NCS2005 (light capacitive load)
OPA350EA/OP1177ARM (up to 1µF, MSOP-8 pkg)
LM8261 (unlimited capacitive load, lower precision)

any P-CH Mosfet with Vgs(th)max<2V, low Rds(on)
-PMV100EPAR
-NXV90EPR
-SI2343CDS-T1-GE3
-SI2307CDS-T1-E3
-CPH3351-TL-W

22÷53Ω (21÷450°C)

for WSP80 use socket: Amphenol T 3437 000

Wheatstone Bridge Amplifier
R1÷R10 high grade 0.1% resistors

-32.51/+37.67mV
gain=1+(100k/Rg)=30.41

recommended: INA118, 317, 333, 823
optional: INA122, 126 (two op-amp architecture → limited common-mode voltage range)

Package_DFN_QFN:QFN-48-1EP_7x7mm_P0.5mm_EP5.6x5.6mm
Package_QFP:LQFP-48_7x7mm_P0.5mm

Sheet: /
File: APPMC.sch

Title: All-purpose Power Micro Controller, Copyright © 2022 Tomasz Jastrzębski

Size: A4	Date:	Rev: 3.1
KiCad E.D.A. kicad (5.1.6)-1	License: CC BY-NC-ND 4.0	Id: 1/1