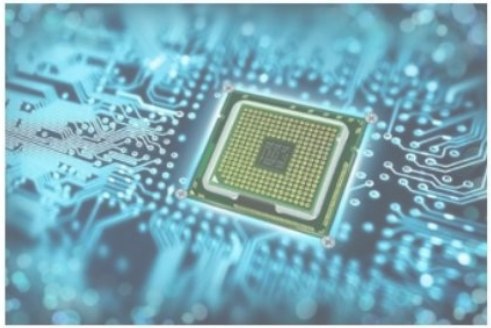
CARTE CURIOSITY

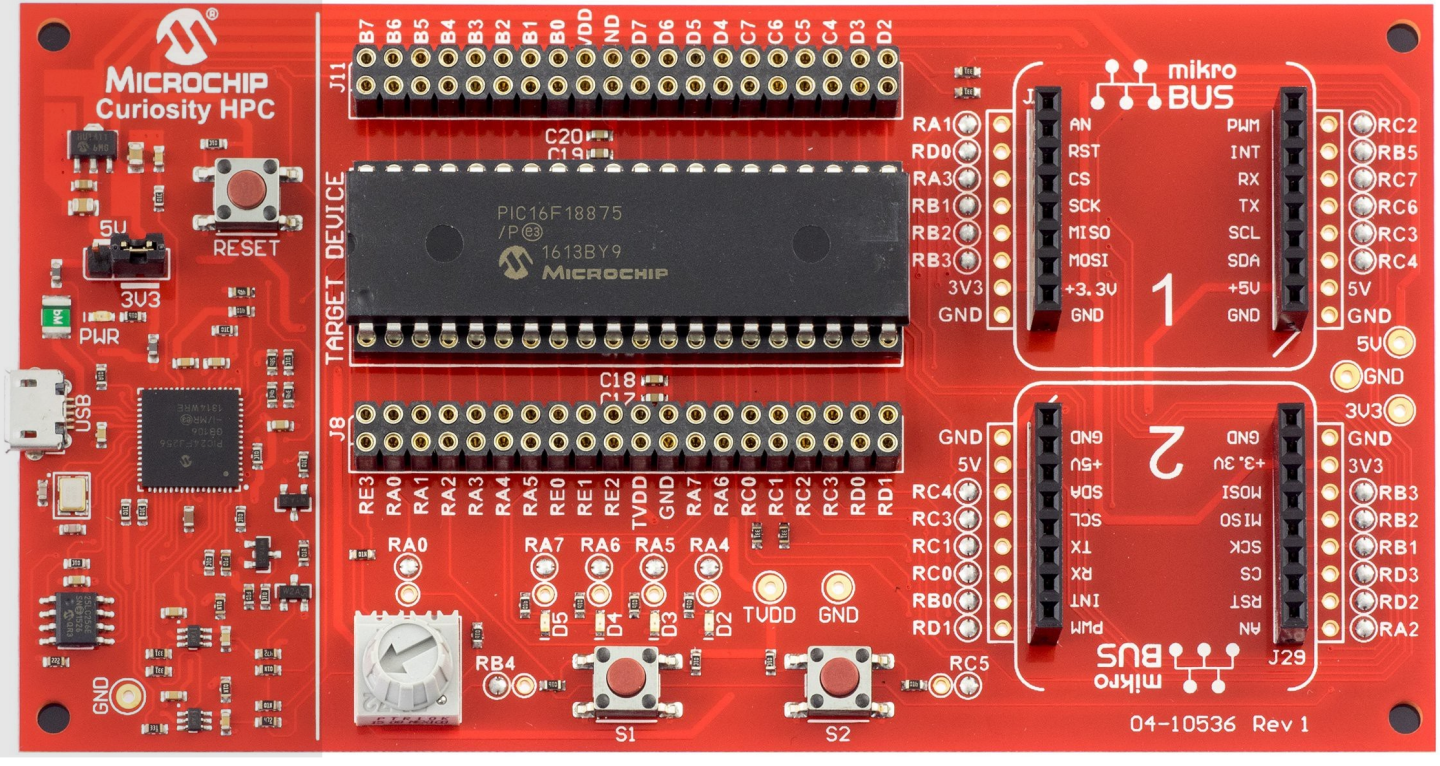





neku - hugo descoubes – enseignant Systèmes Embarqués – ENSICAEN - France
GNU\Linux Ubuntu 20.04 LTS – LibreOffice 6.4.6.2 – 2022

Programmer/Debugger

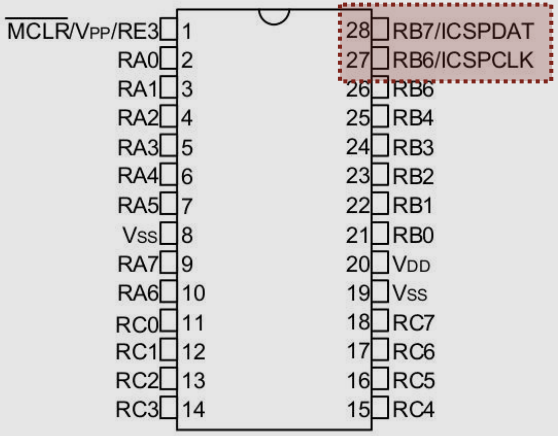
Application



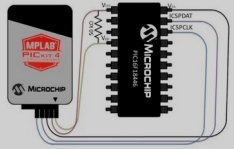
https://www.microchipdeveloper.com/boards:curiosityhpc

Sans bootloader déjà programmé dans le processeur, nous devons utiliser une sonde JTAG (Join Test Action Group) afin de charger voire debugger le programme depuis l'IDE sur ordinateur vers le MCU cible. Un StarterKit embarque déjà une sonde de programmation à côté du processeur cible de test. Sinon, nous pouvons utiliser des sondes externes plus polyvalentes (ICD4, PICKIT4, etc chez Microchip).

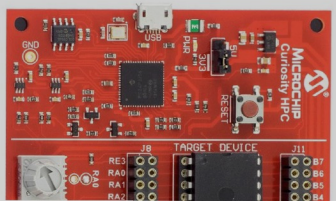
PIC18F27K40
SPDIP 28 pins package

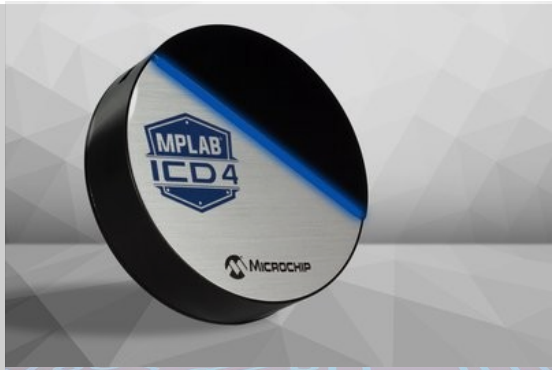


External PICKIT4
JTAG in-circuit programmer/Debugger



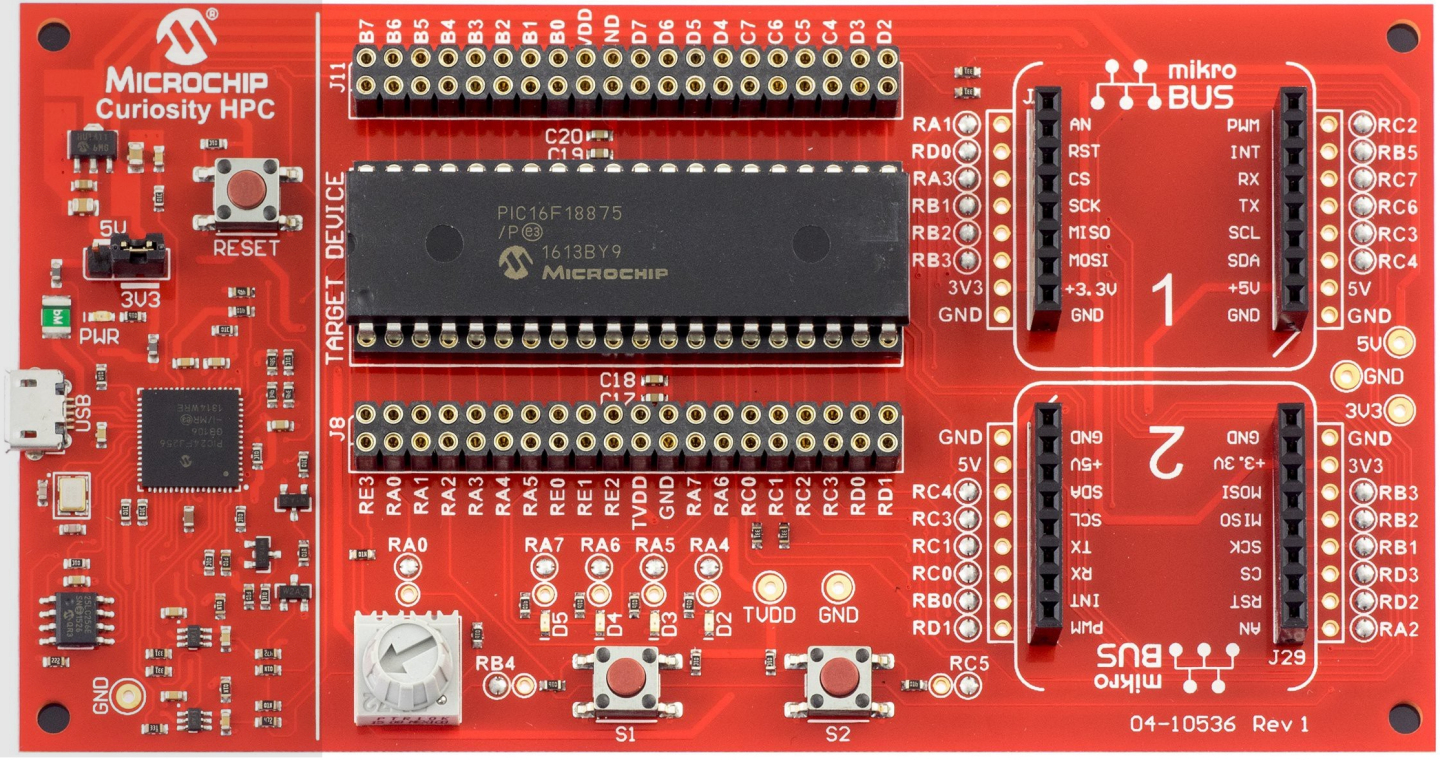
CURIOSITY HPC Starter Kit
with JTAG in-circuit programmer/Debugger



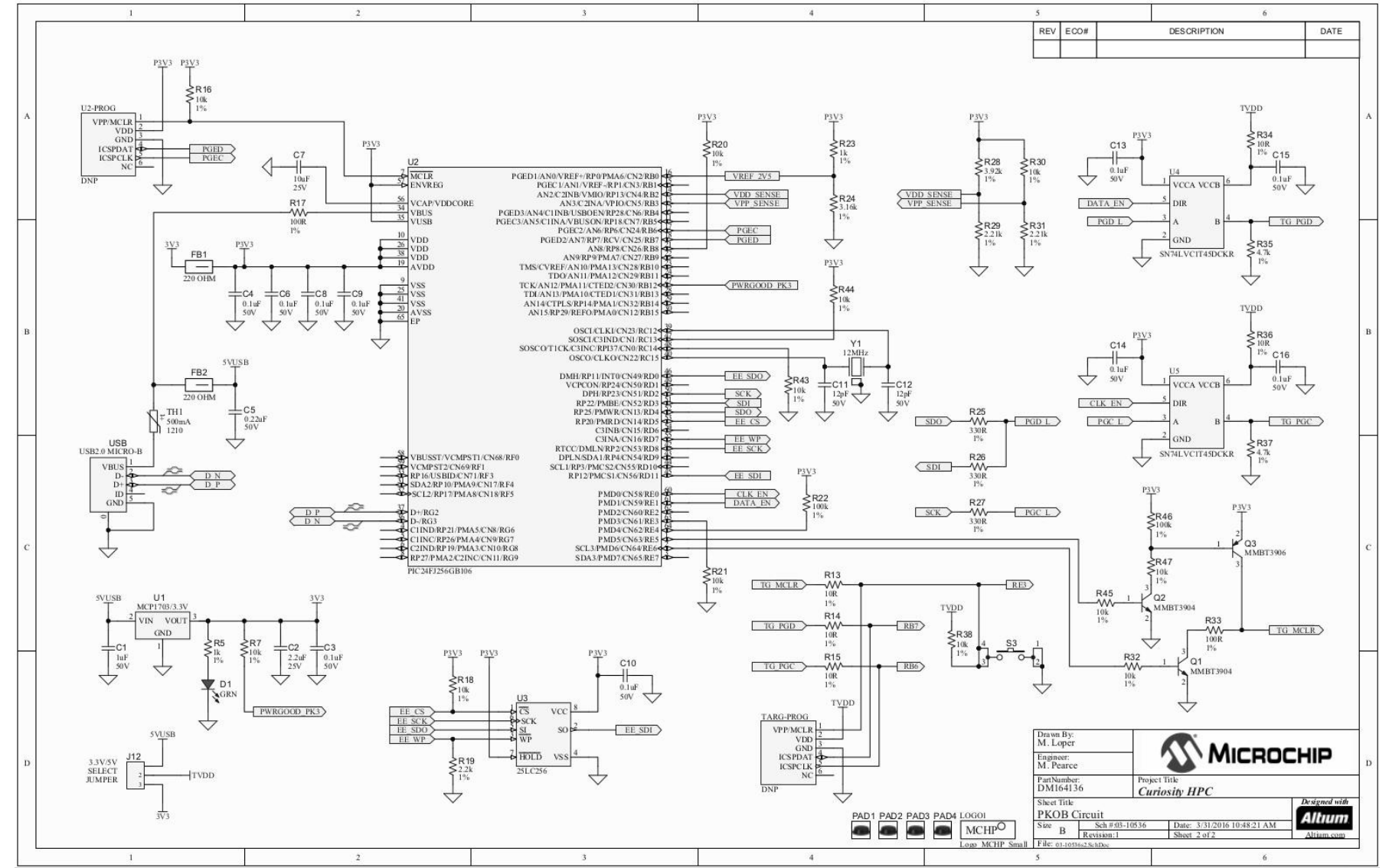


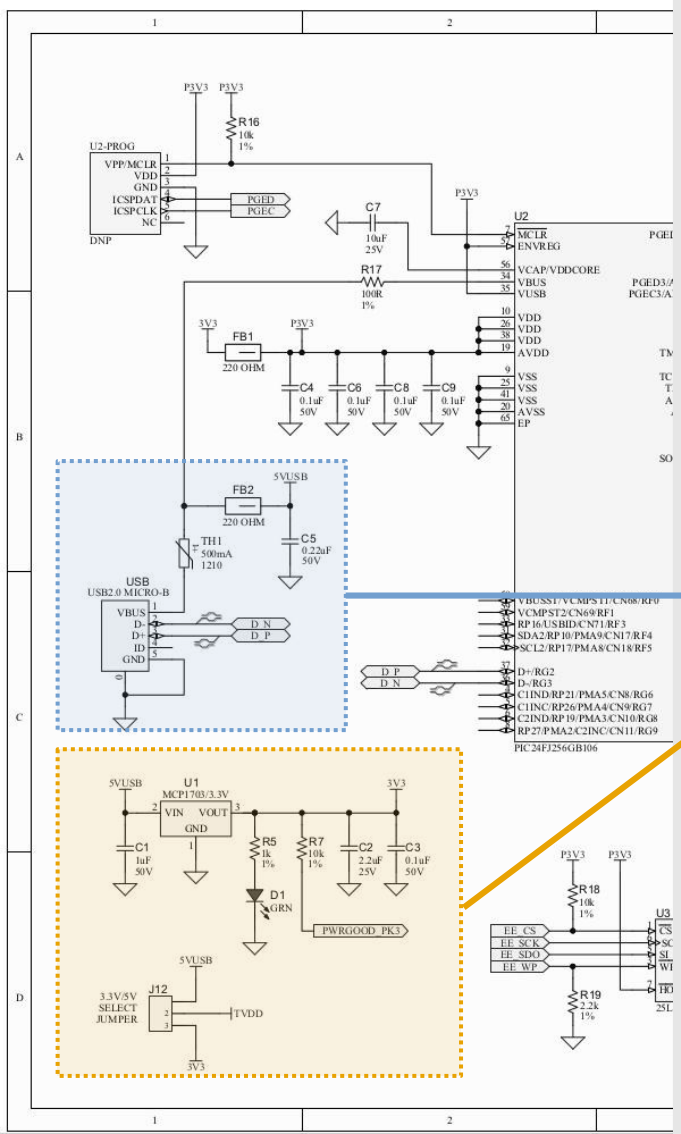
Programmer/Debugger

Application



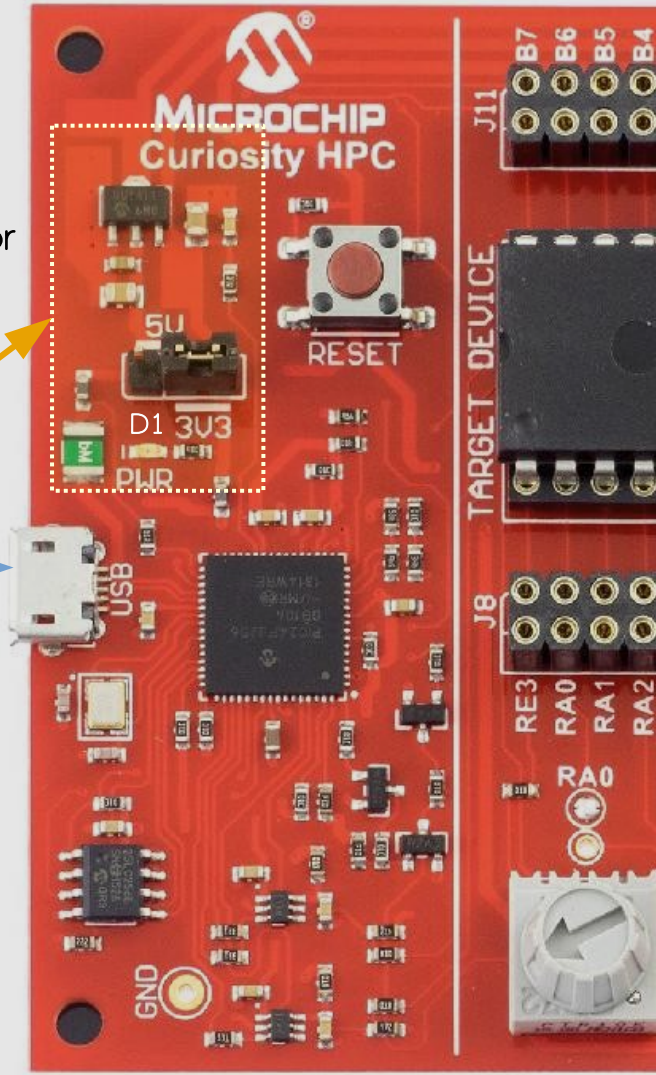
https://www.microchipdeveloper.com/boards:curiosityhpc


REV | ECO# | DESCRIPTION | DATE
U2-PROG
VPP/MCLR
VDD
GND
ICSPDAT
ICSPCLK
NC
DNP
PGED
PGEC
R16 10k 1%
C7 10uF 25V
R17 100R 1%
U2
MCLR
ENVREG
VCAP/VDDCORE
VBUS
VUSB
VDD
VDD
VDD
AVDD
VSS
VSS
VSS
AVSS
EP
PIC24FJ256GB106
FB1 220 OHM
FB2 220 OHM
C4 0.1uF 50V
C6 0.1uF 50V
C8 0.1uF 50V
C9 0.1uF 50V
C5 0.22uF 50V
TH1 500mA 1210
USB
USB2.0 MICRO-B
VBUS
D-
D+
ID
GND
D_N
D_P
R20 10k 1%
R23 1k 1%
R24 3.16k 1%
R44 10k 1%
R43 10k 1%
Y1 12MHz
C11 12pF 50V
C12 12pF 50V
R21 10k 1%
R22 100k 1%
VREF_2V5
VDD_SENSE
VPP_SENSE
PWRGOOD_PK3
EE_SDO
SCK
SDI
SDO
EE_CS
EE_WP
EE_SCK
EE_SDI
CLK_EN
DATA_EN
R28 1.92k 1%
R30 10k 1%
R29 2.21k 1%
R31 2.21k 1%
R25 330R 1%
R26 330R 1%
R27 330R 1%
PGD_L
PGC_L
U4
U5
VCCA VCCB
DIR
A
B
GND
SN74LVC1T45DCKR
DATA_EN
PGD_L
TG_PGD
CLK_EN
PGC_L
TG_PGC
C13 0.1uF 50V
C15 0.1uF 50V
C14 0.1uF 50V
C16 0.1uF 50V
R34 10R 1%
R35 4.7k 1%
R36 10R 1%
R37 4.7k 1%
TVDD
R46 100k 1%
R47 10k 1%
R45 10k 1%
R33 100R 1%
R32 10k 1%
R38 10k 1%
Q3 MMBT3906
Q2 MMBT3904
Q1 MMBT3904
S3
TG_MCLR
RE3
TG_PGD
RB7
TG_PGC
RB6
R13 10R 1%
R14 10R 1%
R15 10R 1%
TARG-PROG
VPP/MCLR
VDD
GND
ICSPDAT
ICSPCLK
NC
DNP
5VUSB
3V3
U1
MCP1703/3.3V
VIN
VOUT
GND
C1 1uF 50V
C2 2.2uF 25V
C3 0.1uF 50V
R5 1k 1%
R7 10k 1%
D1 GRN
PWRGOOD_PK3
U3
CS
SCK
SI
WP
HOLD
VCC
SO
VSS
25LC256
R18 10k 1%
R19 5.23k 1%
C10 0.1uF 50V
J12
3.3V/5V SELECT JUMPER
PAD1 PAD2 PAD3 PAD4 LOGO1
MCHP
Logo_MCHP_Small
Drawn By: M. Loper
Engineer: M. Pearce
PartNumber: DM164136
Project Title: Curiosity HPC
Sheet Title: PKOB Circuit
Size: B
Sch #:03-10536
Revision:1
Date: 3/31/2016 10:48:21 AM
Sheet 2 of 2
File: 03-10536r2.SchDoc
MICROCHIP
Designed with Altium
Altium.com

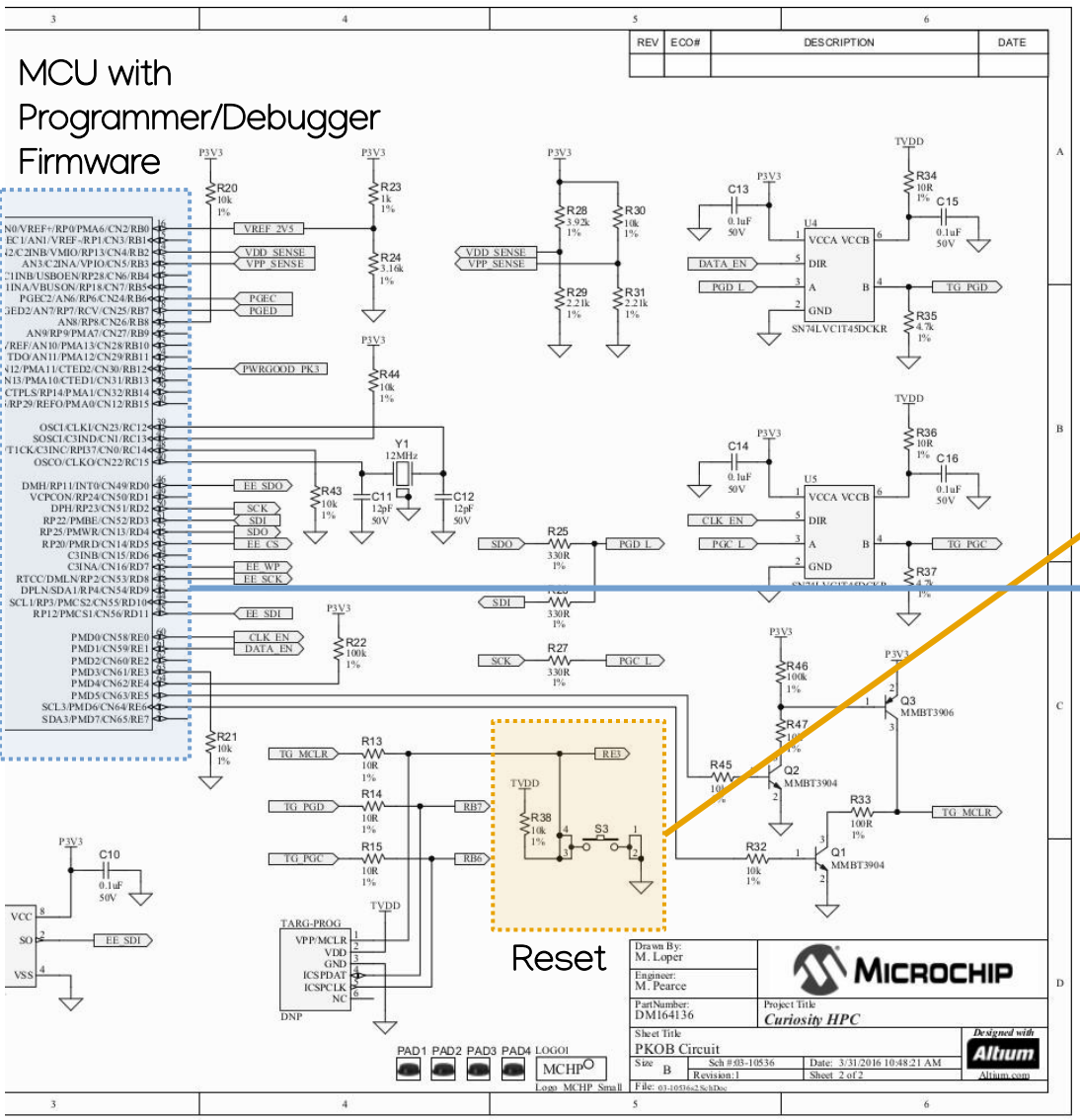


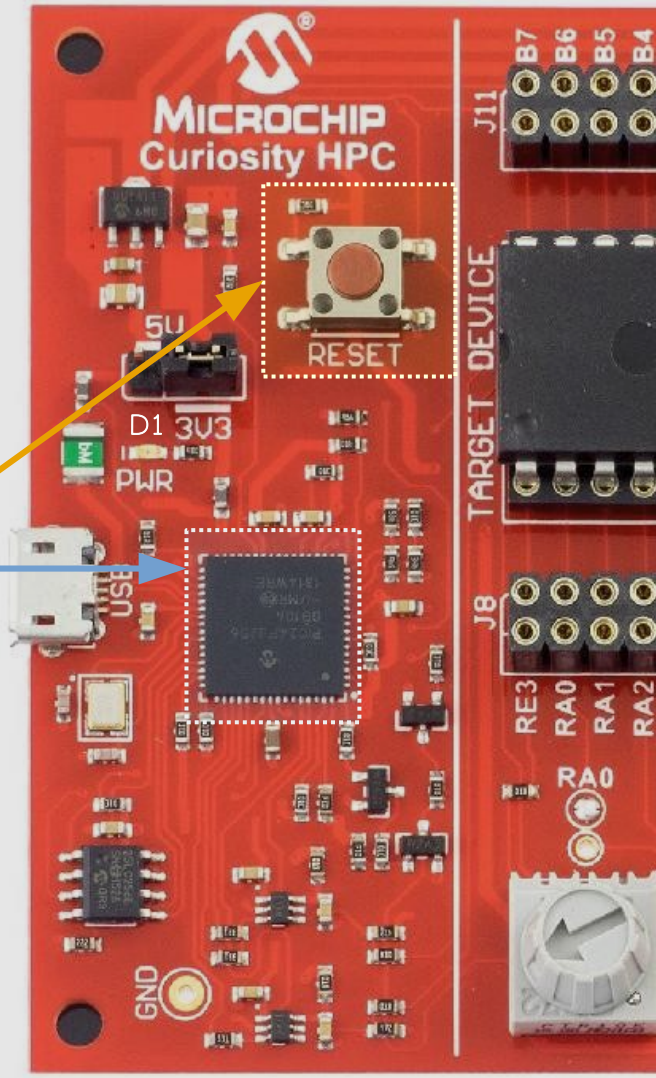
Power regulator
5V to 3,3V

Micro USB
Connector
5V Power



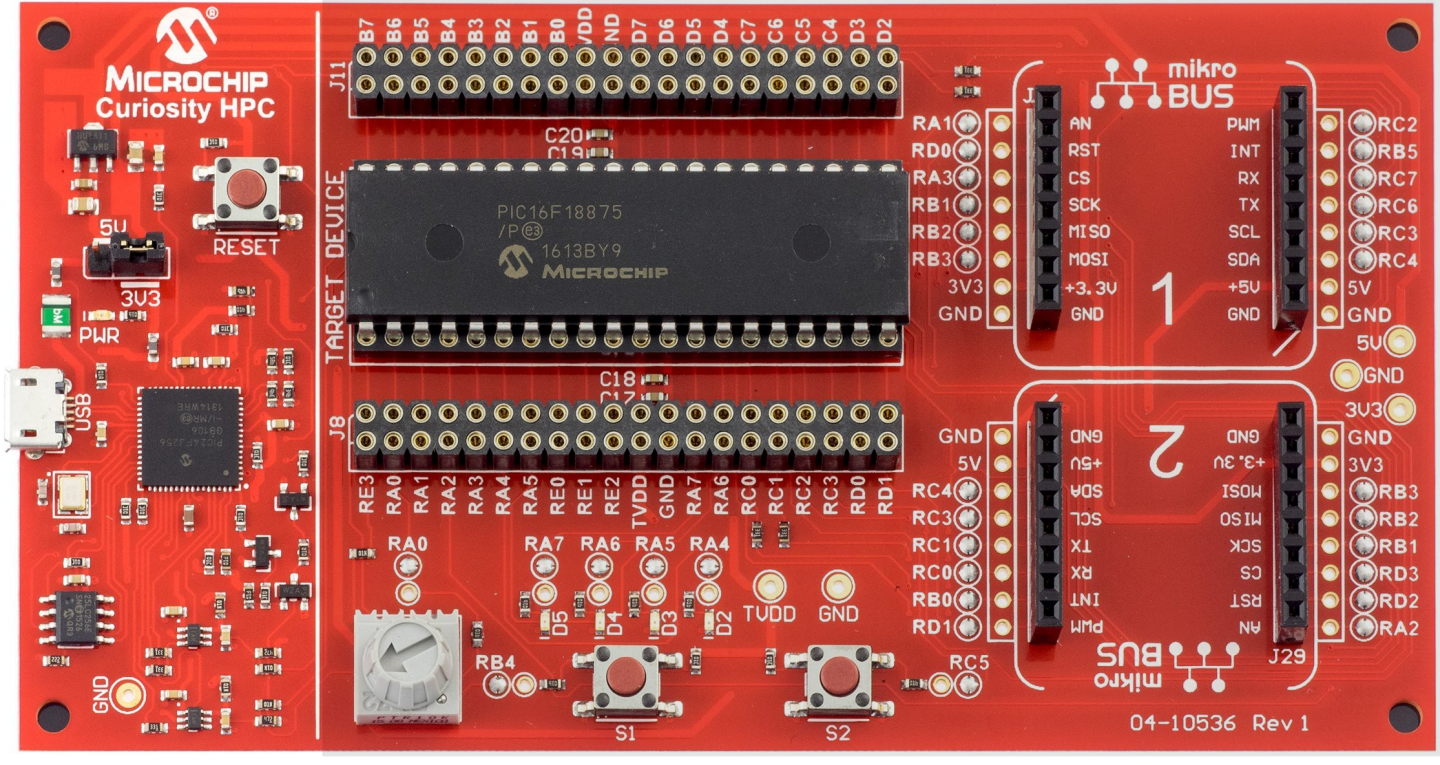
MCU with Programmer/Debugger Firmware



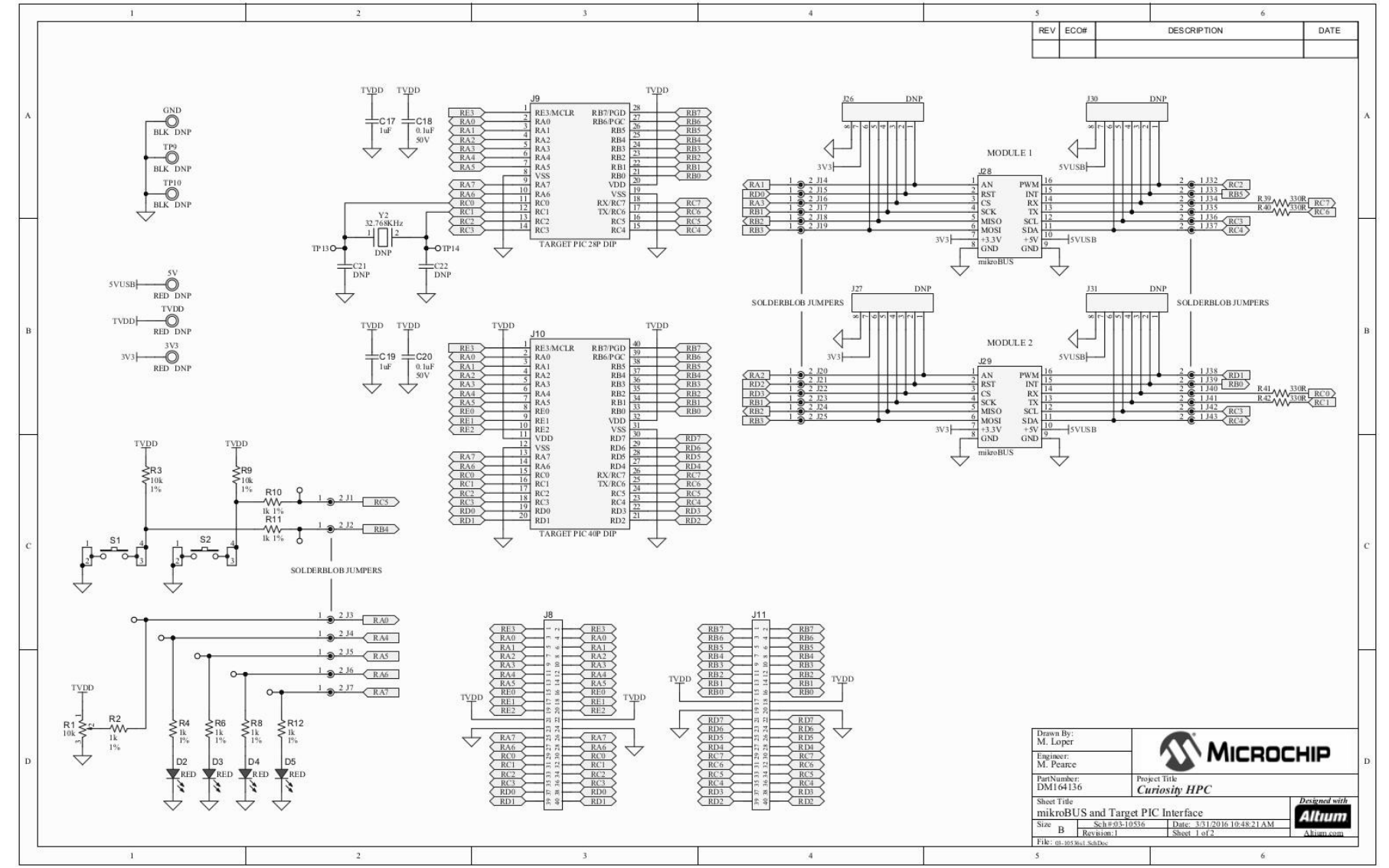


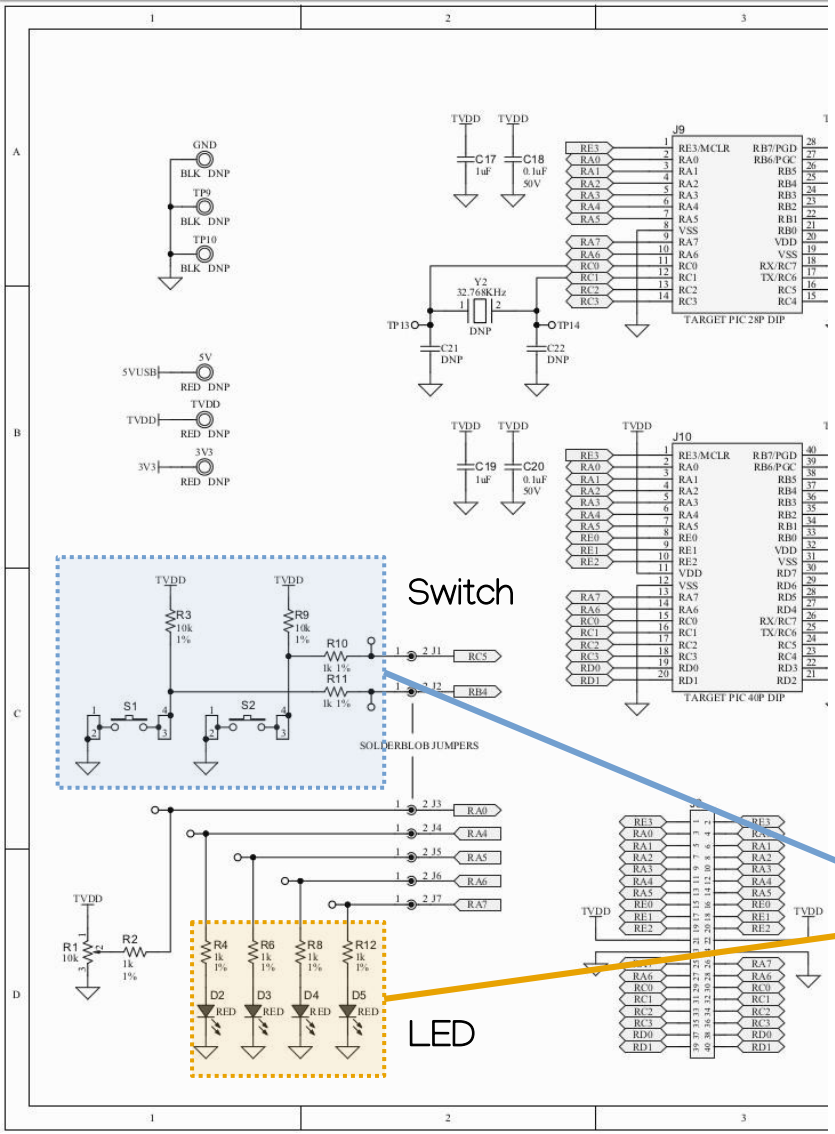
Programmer/Debugger

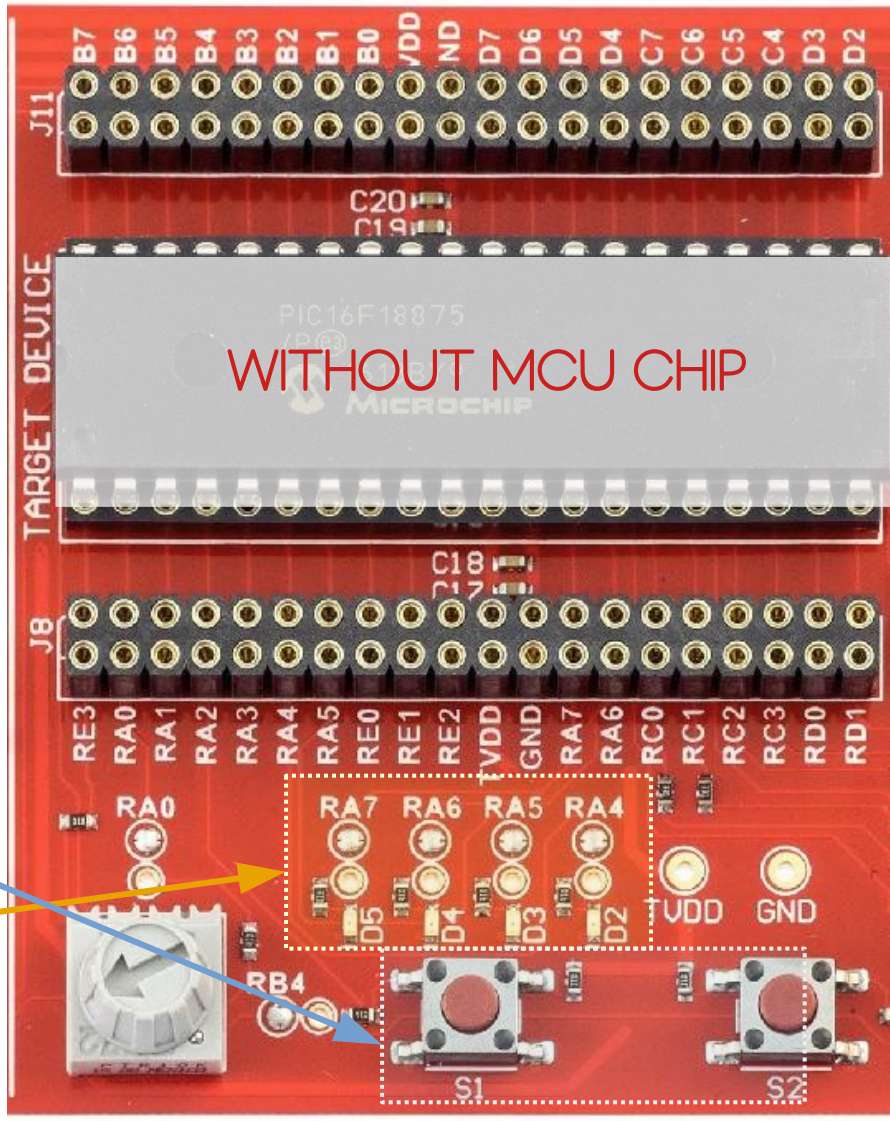
Application

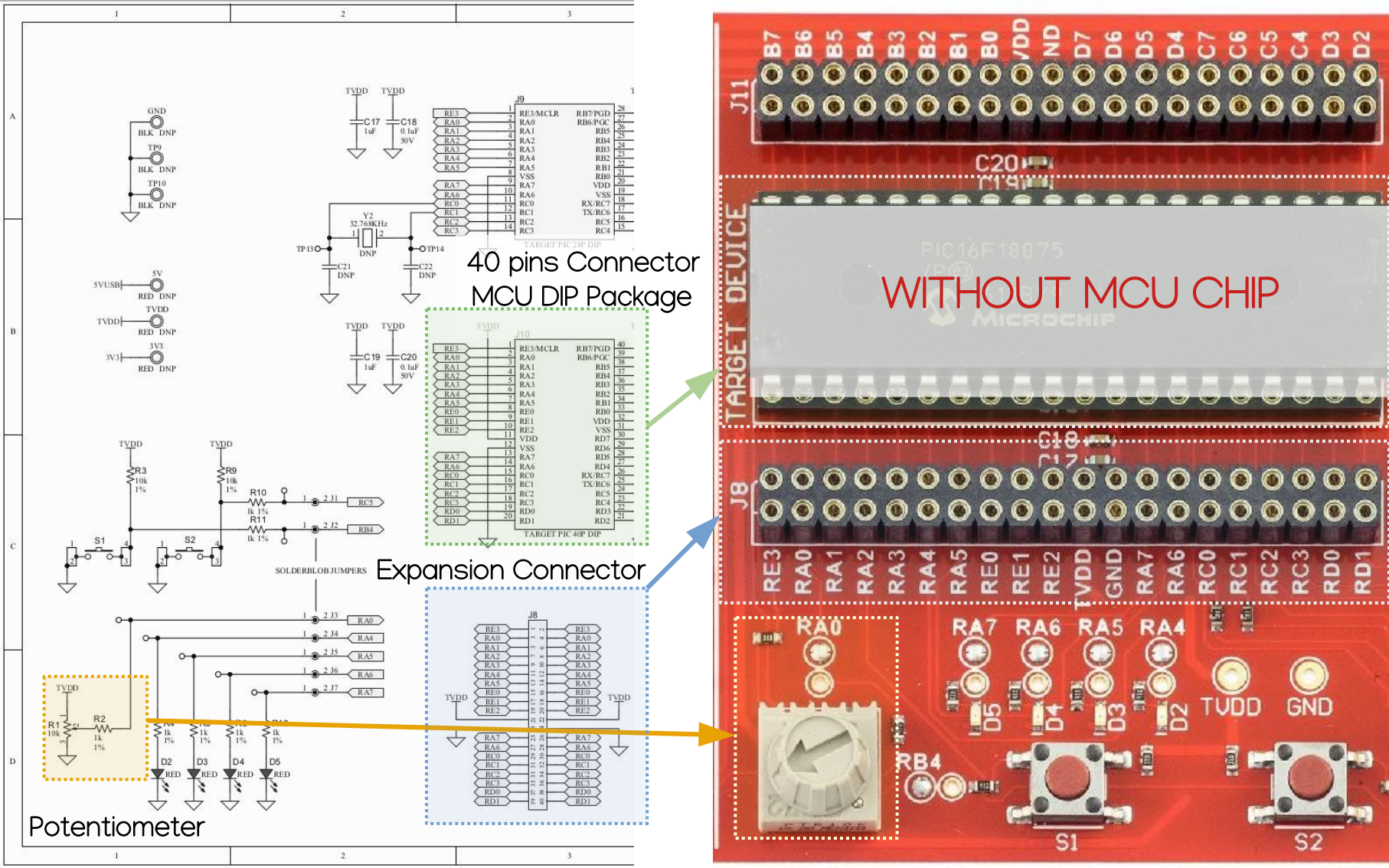


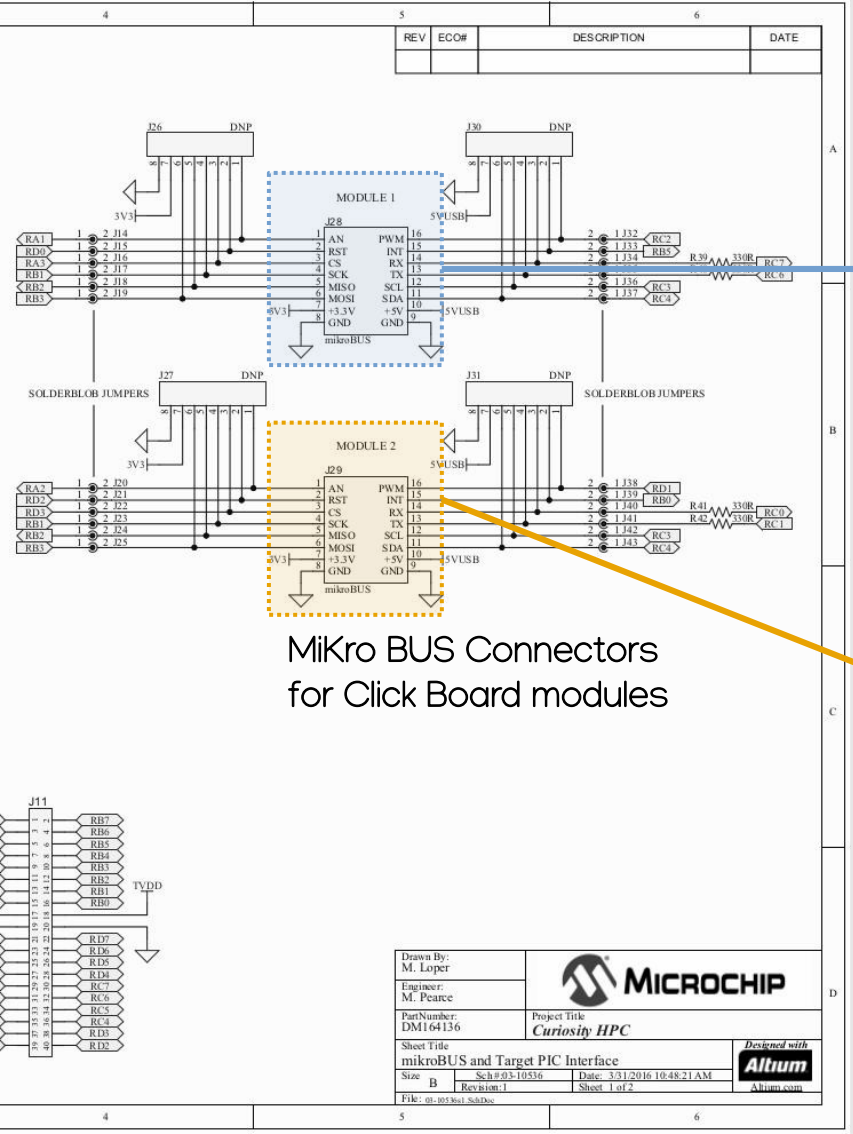
https://www.microchipdeveloper.com/boards:curiosityhpc

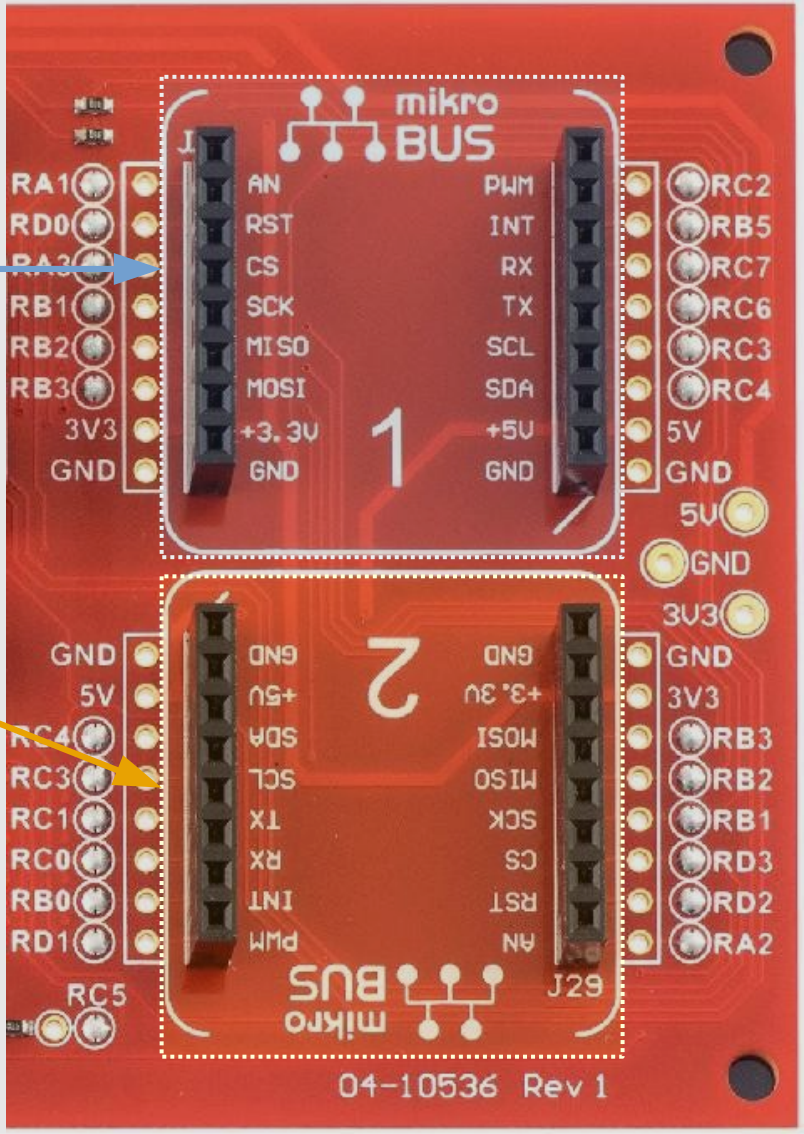

REV | ECO# | DESCRIPTION | DATE
GND
BLK DNP
TP9
BLK DNP
TP10
BLK DNP
5V
RED DNP
TVDD
RED DNP
3V3
RED DNP
TVDD
C17 1uF
C18 0.1uF 50V
J9
TARGET PIC 28P DIP
Y2 32.768KHz
DNP
TP13
TP14
C21 DNP
C22 DNP
C19 1uF
C20 0.1uF 50V
J10
TARGET PIC 40P DIP
R3 10k 1%
R9 10k 1%
R10 1k 1%
R11 1k 1%
S1
S2
SOLDERBLOB JUMPERS
R1 10k
R2 1k 1%
R4 1k 1%
R6 1k 1%
R8 1k 1%
R12 1k 1%
D2 RED
D3 RED
D4 RED
D5 RED
J8
J11
J26 DNP
J30 DNP
MODULE 1
J28
mikroBUS
J27 DNP
J31 DNP
SOLDERBLOB JUMPERS
MODULE 2
J29
mikroBUS
330R
Drawn By: M. Loper
Engineer: M. Pearce
PartNumber: DM164136
Project Title: Curiosity HPC
Sheet Title: mikroBUS and Target PIC Interface
Size: B
Sch#:03-10536
Revision: 1
Date: 3/31/2016 10:48:21 AM
Sheet 1 of 2
File: 03-10536s1.SchDoc
MICROCHIP
Designed with Altium
Altium.com


GND
BLK_DNP
TP9
BLK_DNP
TP10
BLK_DNP
5V
RED_DNP
TVDD
RED_DNP
3V3
RED_DNP
5VUSB
TVDD
C17
1uF
C18
0.1uF
50V
C19
1uF
C20
0.1uF
50V
Y2
32.768KHz
DNP
C21
DNP
C22
DNP
TP13
TP14
J9
J10
TARGET PIC 28P DIP
TARGET PIC 40P DIP
Switch
R3
10k
1%
R9
10k
1%
R10
1k 1%
R11
1k 1%
S1
S2
SOLDERBLOB JUMPERS
RC5
RB4
RA0
RA4
RA5
RA6
RA7
R1
10k
R2
1k
1%
R4
R6
R8
R12
D2
D3
D4
D5
RED
LED

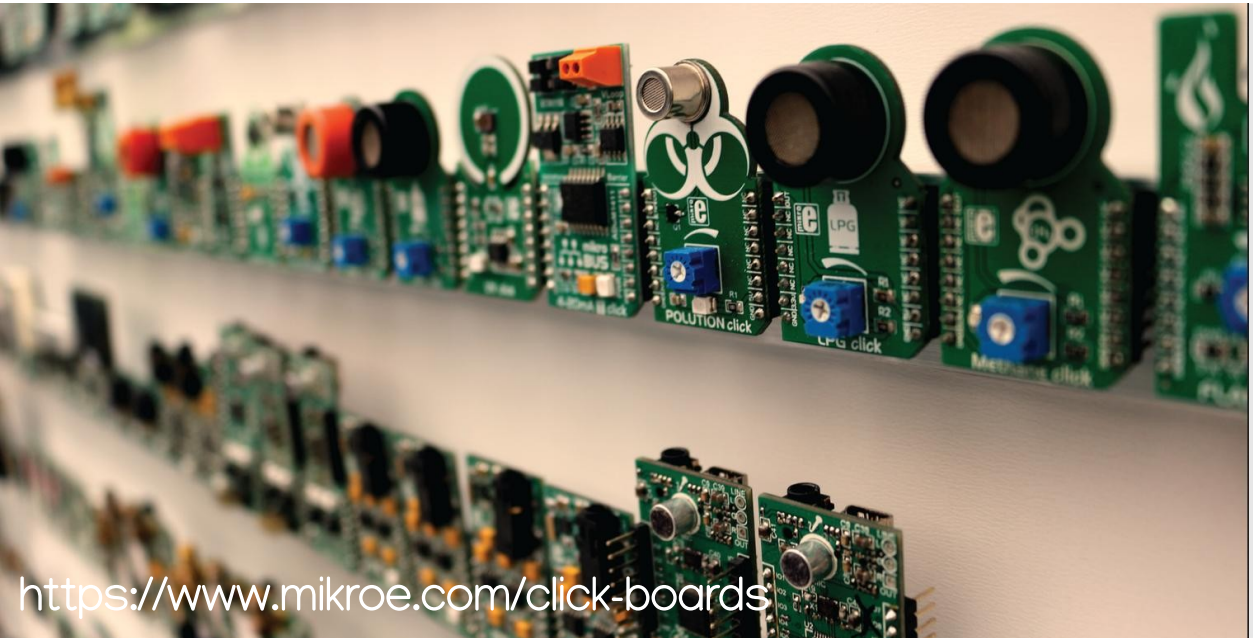

J11
J8
TARGET DEVICE
WITHOUT MCU CHIP
C20
C19
C18
C17
B7 B6 B5 B4 B3 B2 B1 B0 VDD GND D7 D6 D5 D4 C7 C6 C5 C4 D3 D2
RE3 RA0 RA1 RA2 RA3 RA4 RA5 RE0 RE1 RE2 VDD GND RA7 RA6 RC0 RC1 RC2 RC3 RD0 RD1
RA0
RA7 RA6 RA5 RA4
D5 D4 D3 D2
VDD
GND
RB4
S1
S2

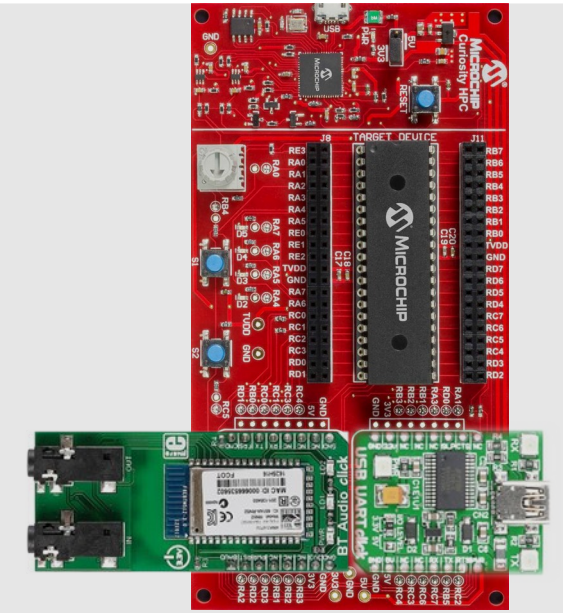

40 pins Connector
MCU DIP Package
Expansion Connector
Potentiometer
SOLDERBLOB JUMPERS
TARGET PIC 28P DIP
TARGET PIC 40P DIP
WITHOUT MCU CHIP
TARGET DEVICE
J11
J8
J9
J10
C20
C19
C18
C17
RA0
RA7
RA6
RA5
RA4
RB4
TVDD
GND
S1
S2
D2
D3
D4
D5
R1
R2
R3
R9
R10
R11
Y2
32.768KHz
C17
C18
C19
C20
C21
C22
TP9
TP10
TP13
TP14
5V
3V3
RED DNP
BLK DNP
DNP


REV
ECO#
DESCRIPTION
DATE
MODULE 1
MODULE 2
J28
J29
mikroBUS
SOLDERBLOB JUMPERS
SOLDERBLOB JUMPERS
MiKro BUS Connectors
for Click Board modules
J11
TVDD
Drawn By:
M. Loper
Engineer:
M. Pearce
PartNumber:
DM164136
MICROCHIP
Project Title
Curiosity HPC
Sheet Title
mikroBUS and Target PIC Interface
Size B
Sch#03-10536
Revision:1
Date: 3/31/2016 10:48:21 AM
Sheet 1 of 2
Designed with Altium
Altium.com


mikro BUS
1
2
J29
04-10536 Rev 1

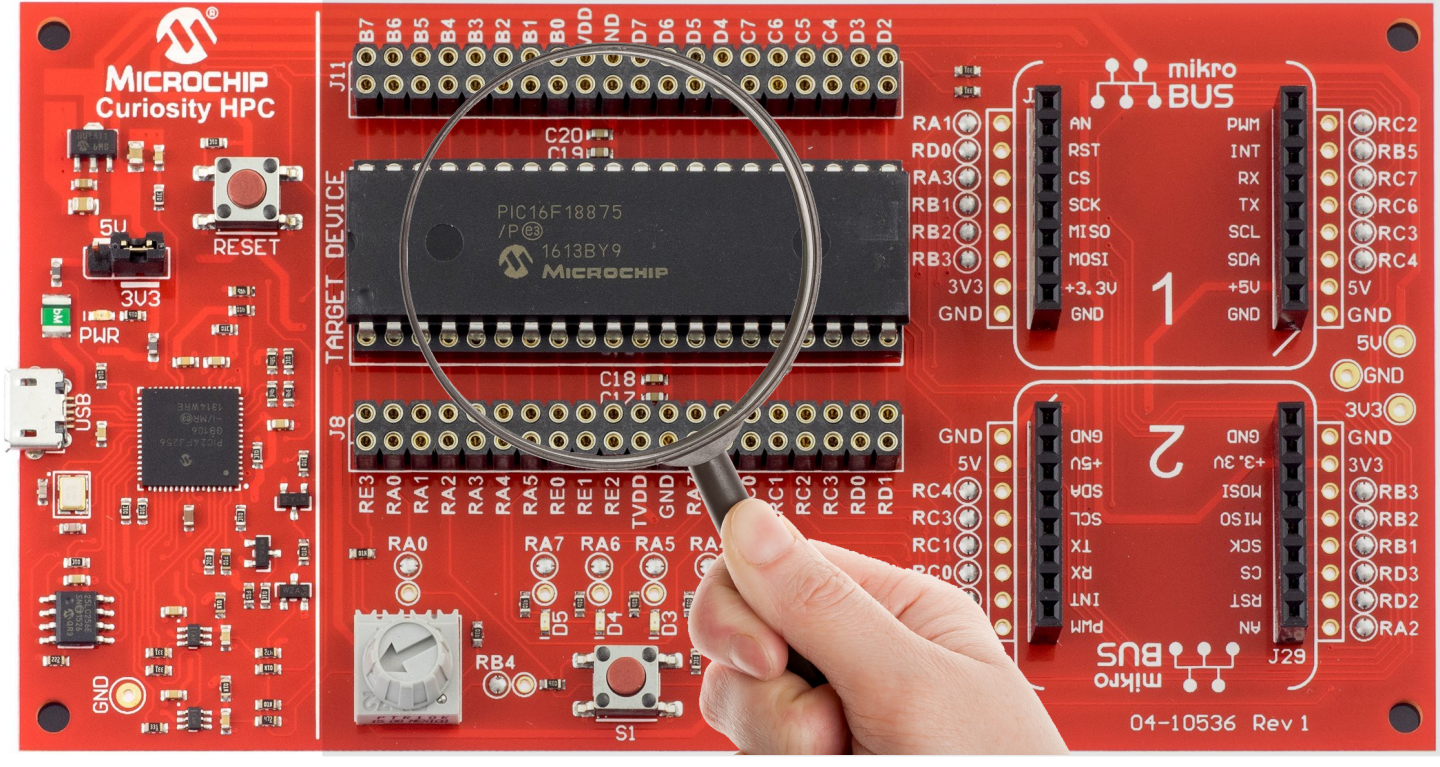
La carte Curiosity HPC possède deux connecteurs mikroBUS permettent également d'ajouter des modules externes Click Board proposés par la société Mikroelektronika. Des centaines de modules externes sont actuellement disponibles en catalogue (Bluetooth, audio, WIFI, contrôle de moteur, afficheurs LCD, capteurs divers, etc)





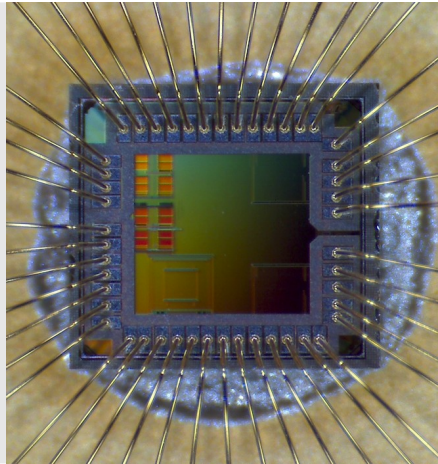
Programmer/Debugger

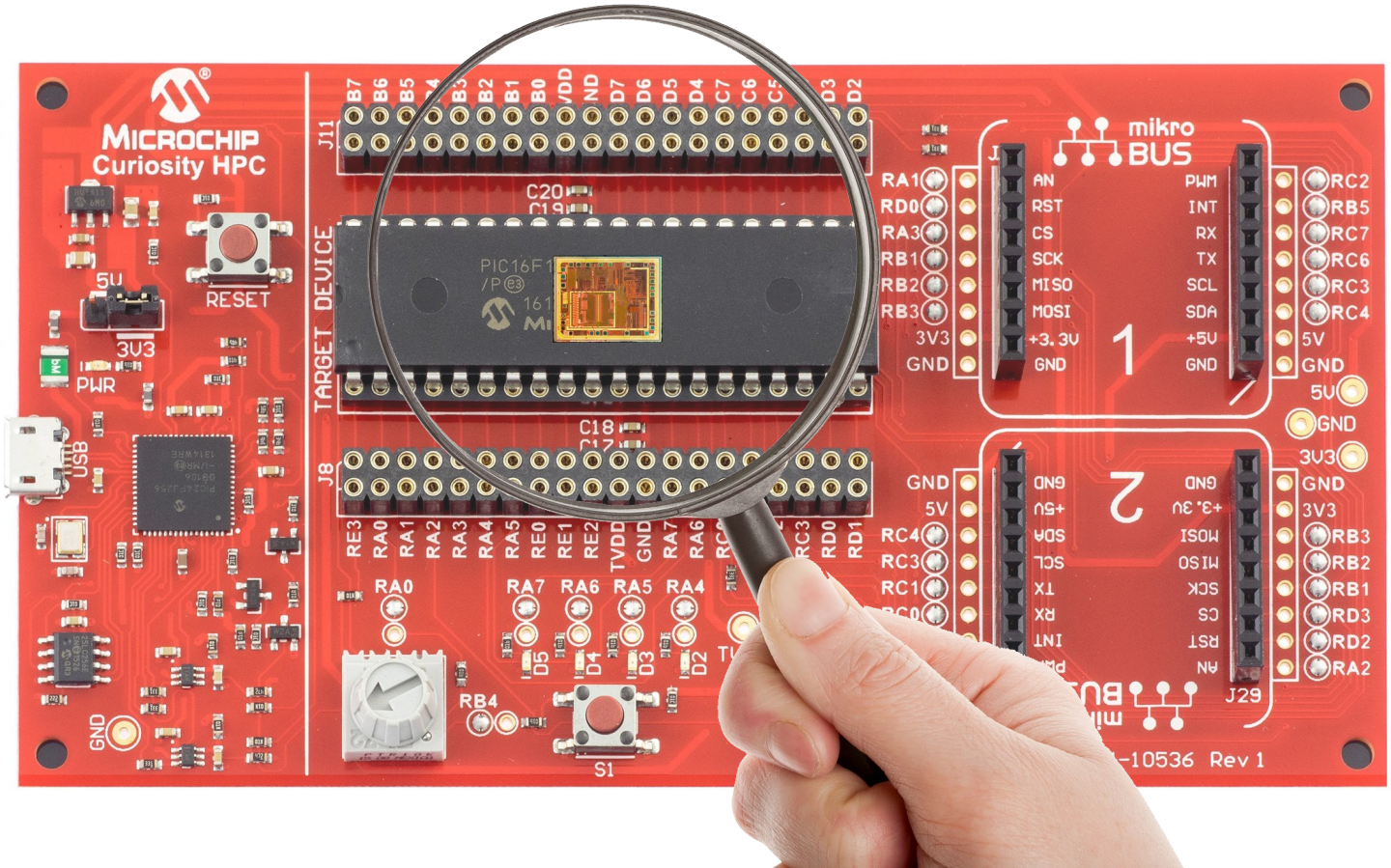
Application



https://www.microchipdeveloper.com/boards:curiosityhpc

Comme la plupart des composants électronique, un MCU peut être décliné en plusieurs boîtiers ou packages par le fabricant (DIP, BGA, QFN, SOP, etc). Chaque boîtier offrant en général un ensemble d'avantages et d'inconvénients. Il est à noter que seul le boîtier change (encombrement, accessibilité des broches, dissipation thermique, prototypage ou production, techniques de dépose, etc). La puce de silicium embarquée est la même. La curiosity HPC, en tant que matériel de prototypage, est elle dédiée aux boîtiers DIP 28 ou 40 broches.




MICROCHIP
Curiosity HPC
RESET
5V
3V3
PWR
USB
GND
TARGET DEVICE
J11
J8
C20
C18
PIC16F1
RA0
RA7
RA6
RA5
RA4
RB4
S1
D5
D4
D3
D2
mikro BUS
AN
RST
CS
SCK
MISO
MOSI
+3.3V
GND
PWM
INT
RX
TX
SCL
SDA
+5V
GND
1
2
J29
RA1
RD0
RA3
RB1
RB2
RB3
3V3
RC2
RB5
RC7
RC6
RC3
RC4
5V
GND
RC4
RC3
RC1
RB3
RB2
RB1
RD3
RD2
RA2
-10536 Rev 1