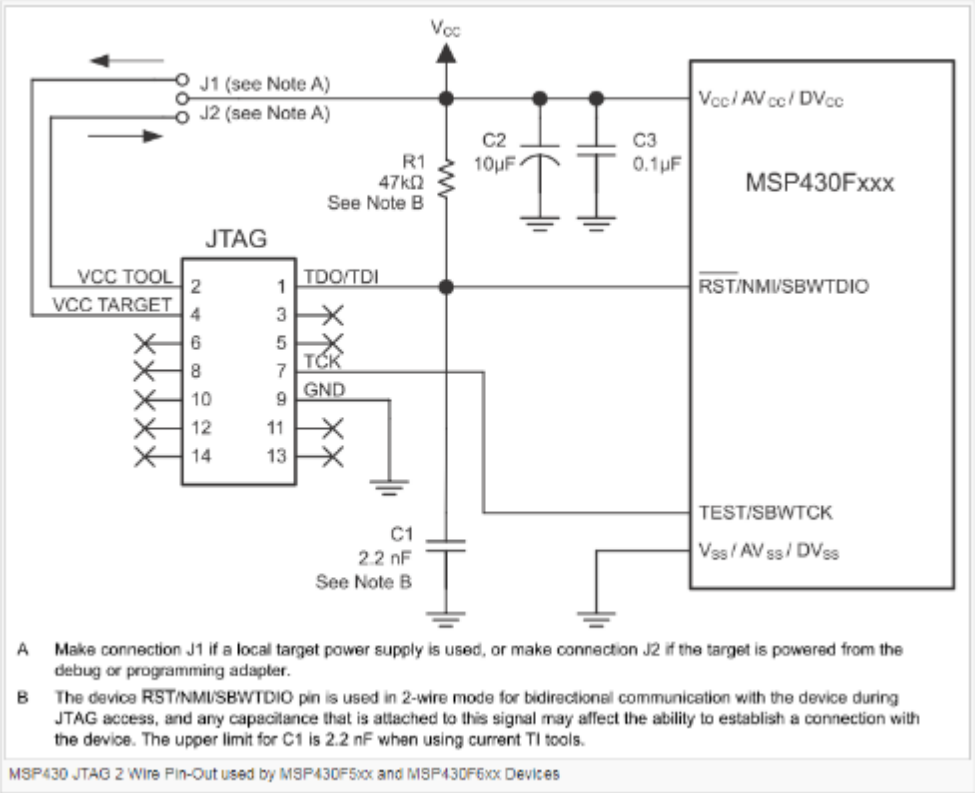
Assembly documentation - BUT SlotCar3, v2024

- The processor is programmed via Spy-Bi-Wire using TI debugger. Connection cable is as following (R1 and C1 are placed on the main board):

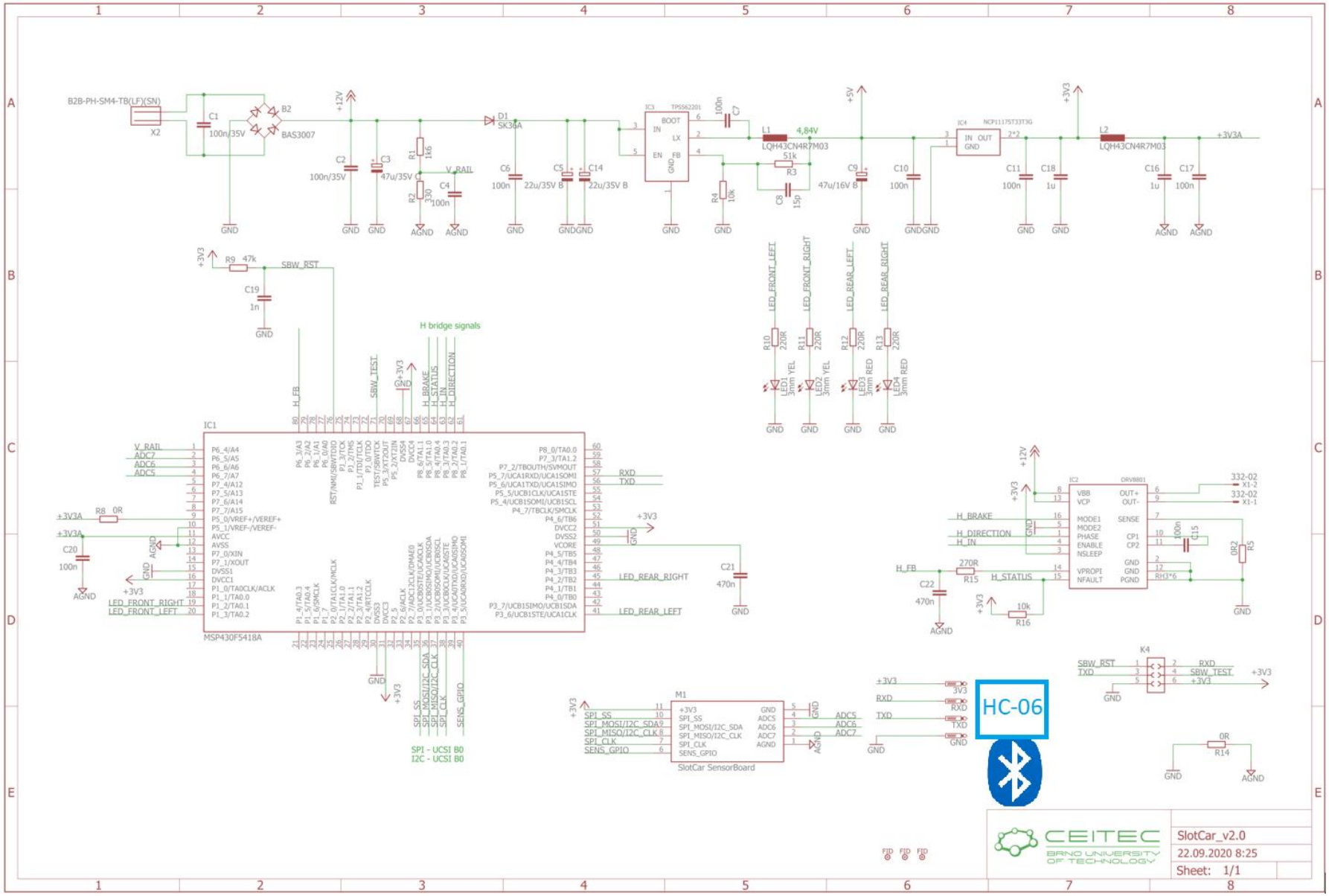
Spy Bi-Wire (2 Wire JTAG) for MSP430F5xx and MSP430F6xx



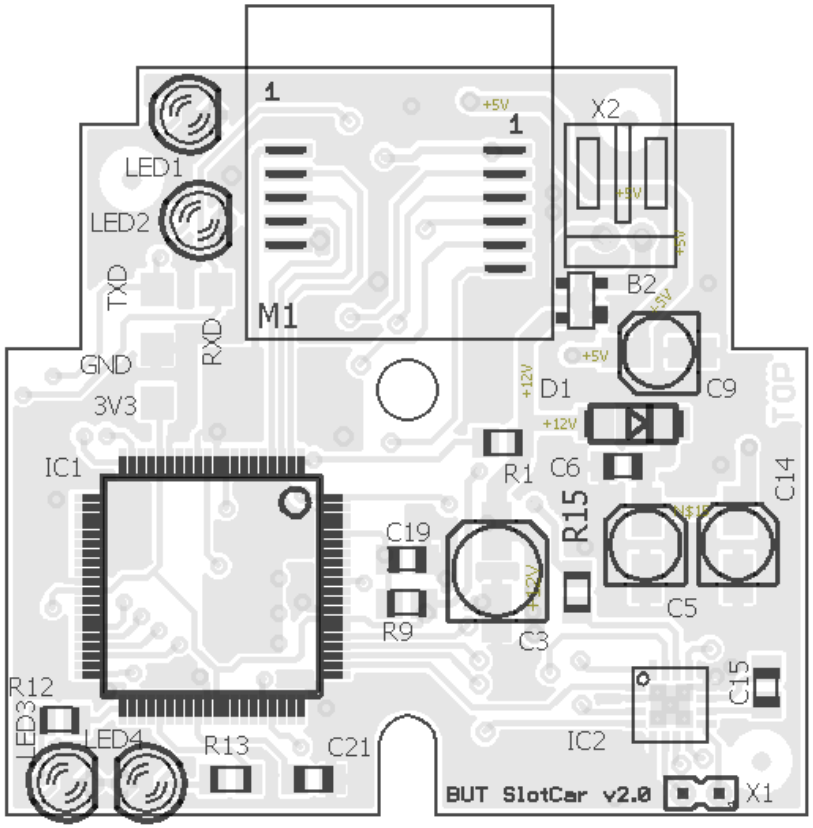
MSP430 JTAG 2 Wire Pin-Out used by MSP430F5xx and MSP430F6xx Devices

source http://processors.wiki.ti.com/index.php/JTAG_(MSP430)

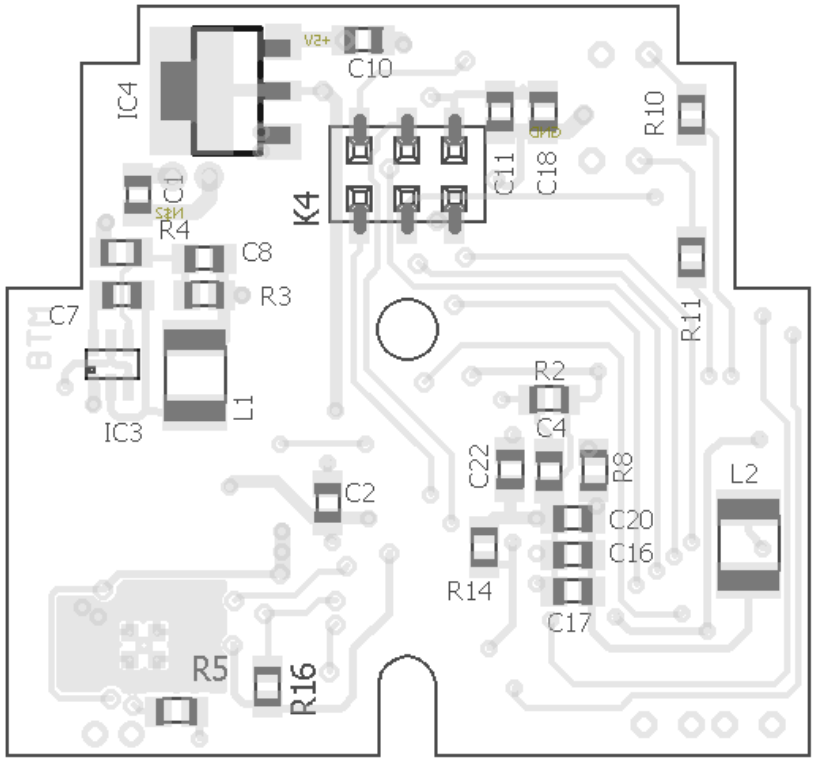
- Programming and system connector is K1 with 6 pins (1 – RST, 2 – RxD, 3 – TxD, 4 – TST, 5 – GND, 6 – +3V3) can be used for debugging purposes via serial interface as well.


B2B-PH-SM4-TB(LF)(SN)
X2
C1
100n/35V
BAS3007
B2
+12V
C2
100n/35V
C3
47u/35V
R1
1k6
V_RAIL
R2
330
C4
100n
D1
SK36A
C6
100n
C5
22u/35V B
C14
22u/35V B
IC3
TPS562201
BOOT
IN
LX
EN
FB
GND
C7
100n
L1
4,84V
LQH43CN4R7M03
R3
51k
C8
15p
R4
10k
+5V
C9
47u/16V B
IC4
NCP1117ST33T3G
IN
OUT
GND
C10
100n
C11
100n
C18
1u
+3V3
L2
LQH43CN4R7M03
+3V3A
C16
1u
C17
100n
GND
AGND
+3V3
R9 47k
SBW_RST
C19
1n
H bridge signals
H_FB
SBW_TEST
H_BRAKE
H_STATUS
H_IN
H_DIRECTION
LED_FRONT_LEFT
LED_FRONT_RIGHT
LED_REAR_LEFT
LED_REAR_RIGHT
R10 220R
R11 220R
R12 220R
R13 220R
LED1 3mm YEL
LED2 3mm YEL
LED3 3mm RED
LED4 3mm RED
IC1
MSP430F5418A
V_RAIL
ADC7
ADC6
ADC5
R8 0R
C20
100n
LED_FRONT_RIGHT
LED_FRONT_LEFT
RXD
TXD
C21
470n
LED_REAR_RIGHT
LED_REAR_LEFT
SPI_SS
SPI_MOSI/I2C_SDA
SPI_MISO/I2C_CLK
SPI_CLK
SENS_GPIO
SPI - UCSI B0
I2C - UCSI B0
M1
SlotCar SensorBoard
IC2
DRV8801
VBB
VCP
OUT+
OUT-
MODE1
MODE2
PHASE
ENABLE
NSLEEP
SENSE
CP1
CP2
GND
VPROPI
NFAULT
PGND
332-02
X1-2
X1-1
C15
100n
0R2
R5
RH3*6
H_BRAKE
H_DIRECTION
H_IN
H_FB
H_STATUS
270R
R15
C22
470n
10k
R16
K4
SBW_RST
TXD
RXD
SBW_TEST
HC-06
0R
R14
CEITEC
BRNO UNIVERSITY OF TECHNOLOGY
SlotCar_v2.0
22.09.2020 8:25
Sheet: 1/1

TOP side



BOTTOM side

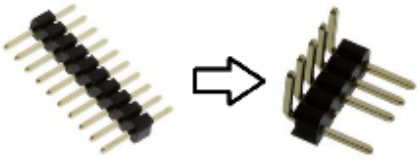


Bill Of Material

Qty	Value	Package	Parts
1		DUTINKY_2X3_RM2.54SMD	K4
2	0R	M0805	R8, R14
1	0R2	M0805	R5
8	100n	C0805K	C4, C6, C7, C10, C11, C15, C17, C20
2	100n/35V	C0805K	C1, C2
2	10k	M0805	R4, R16
1	15p	C0805K	C8
1	1k6	M0805	R1
1	1n	C0805K	C19
2	1u	C0805K	C16, C18
4	220R	M0805	R10, R11, R12, R13
2	22u/35V B	153CLV-0405	C5, C14
1	270R	M0805	R15
1	330	M0805	R2
1	DNP	332-02	X1
2	DNP	LED3MM	LED3, LED4
2	DNP	LED3MM	LED1, LED2
2	470n	C0805K	C21, C22
1	47k	M0805	R9
1	47u/16V B	153CLV-0405	C9
1	47u/35V C	153CLV-0505	C3
1	51k	M0805	R3
1	DNP	B2B-PH-SM4-TB(LF)(SN)	X2
1	BAS3007	SOT143-R	B2
1	DRV8801	PWQFN16	IC2
2	LQH43CN4R7M03	L1812	L1, L2
1	MSP430F5437A	PN_S-PQFP-G80	IC1
1	NCP1117ST33T3G	SOT223	IC4
1	SK36A	DO214AC	D1
1	DNP	SLOTCAR_SENSORBOAR	M1
1	TPS562201	SOT23-6	IC3

Notes:

1) LED diodes are not placed on the PCB, but they are glued into the car cabin (into the rear and front lights) and connected using a wire to the board.
2) K2 and K3 are standard 1,27 THT pins, bent into 90° shape and assembled as the SMT part:



3) Connector X1 – DNP. Cut the original violet/grey wires with the connector (length approx. 2cm) **from the original small PCB in the car** (the one with the switch and two inductors) and solder the wires to the PCB. Then plug the connector from the motor to the connector on the wires at the PCB.