

U_10 Receiver
10 Receiver.SchDoc

SPI_MOSI
SPI_MISO
SPI_CLK

BUSY
PUSH
CLKAM
EOB

U_20 Processor
20 Processor.SchDoc

SPI_MOSI
SPI_MISO
SPI_CLK

IO_BUSY
IO_PUSH
IO_CLKAM
IO_EOB

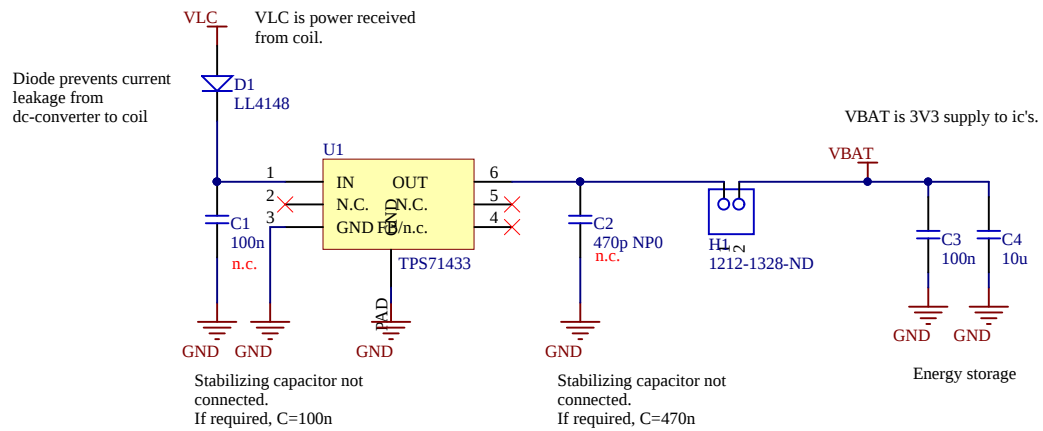
I2C_SDA
I2C_SCL

U_30 Sensor
30 Sensor.SchDoc

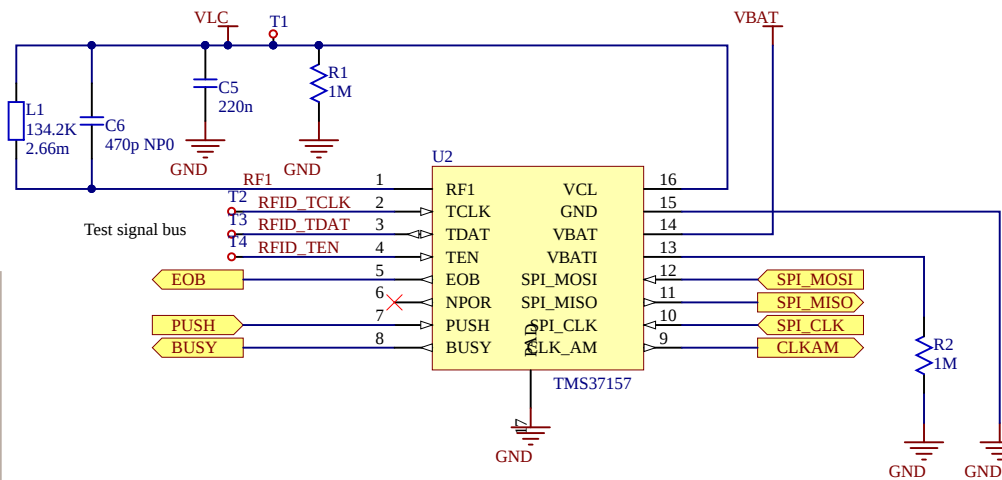
I2C_SDA
I2C_SCL

U_02 Power
02 Power.SchDoc

Title Overview			Delft University of Technology
Size: A4	Number: 1	Revision: P1	EEMCS
Date: 5-8-2017	Time: 10:25:03	Sheet 1 of 5	Embedded Software
File: F:\Dropbox\NIRICT\Prototype 1\Densor\01 Overview.SchDoc			L.P. Klaver MSc.



Title Power			Delft University of Technology
Size: A4			EEMCS
Number: 2			Embedded Software
Revision: P1			
Date: 5-8-2017	Time: 10:25:03	Sheet 2 of 5	L.P. Klaver MSc.
File: F:\Dropbox\NIRICT\Prototype 1\Densor\02 Power.SchDoc			



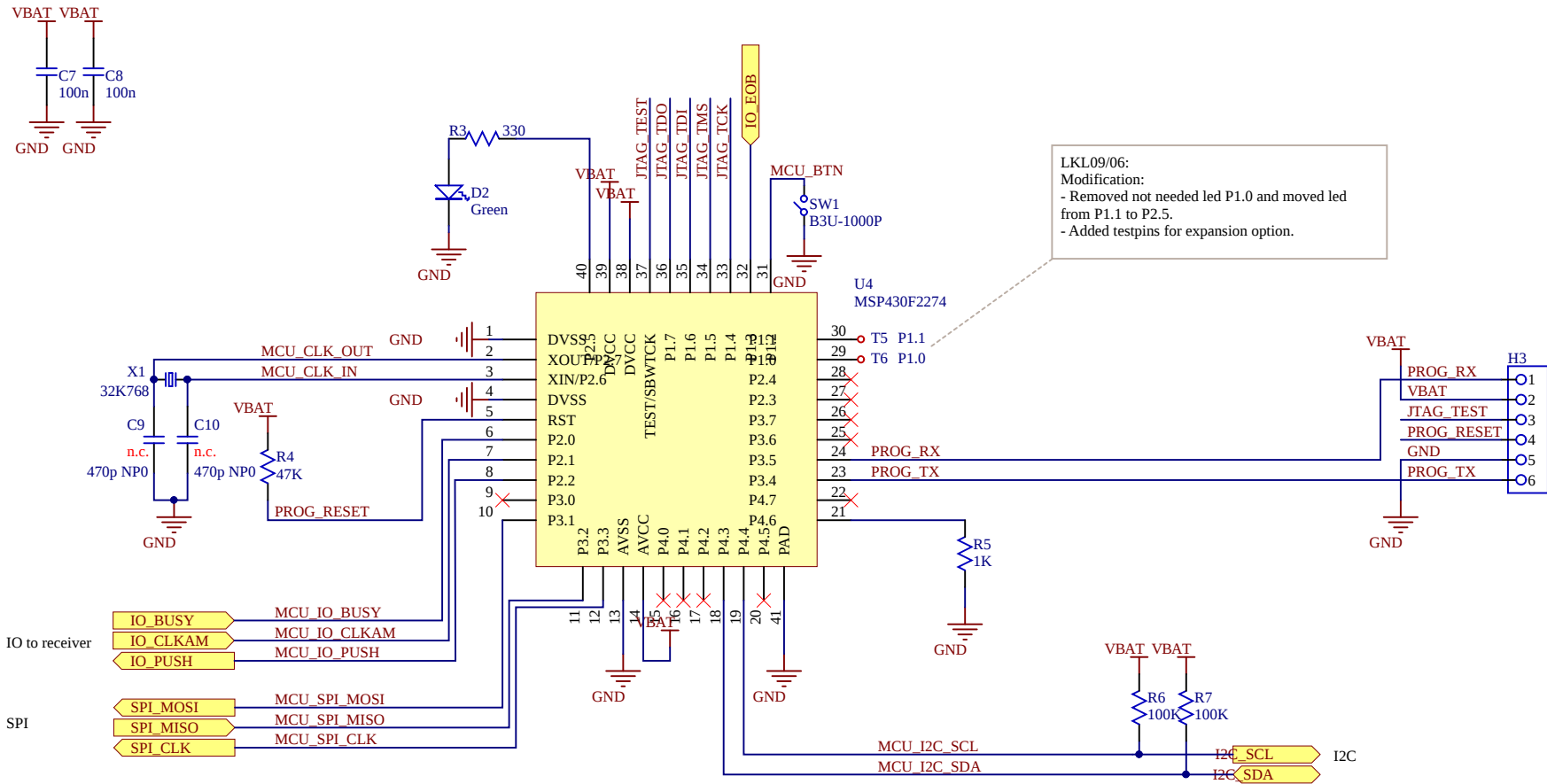
$L=2.66\text{mH}$
 $C_{\text{internal_TMS}} = 30\text{pF}$
 $C_{\text{res}} = 470\text{pF} + 30\text{pF} = 500\text{pF}$

$F_{\text{res}} = 1 / (2 * \pi * \sqrt{L * C_{\text{res}}})$
 $F_{\text{res}} = 138005 \text{ Hz}$

The TMS has internal capacitors to compensate max 74.4pF.

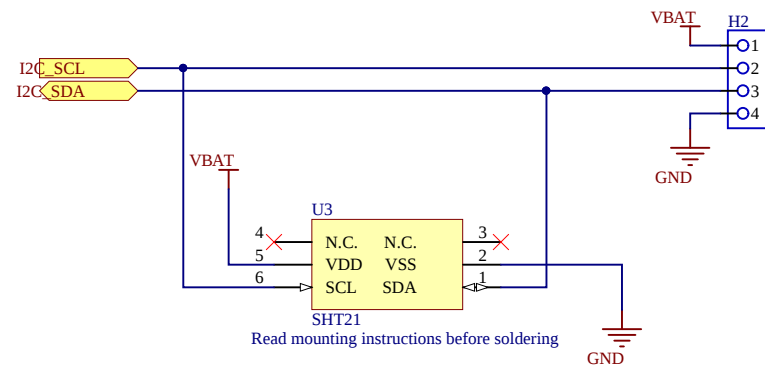
EOB: End of RF burst detector.
 BUSY: TMS is ready for next data byte.
 PUSH: Wakeup to TMS from sleep to access EEPROM.
 CLKAM: RF carrier clock output for calibration purposes.
 T...: Test interface.

Title Receiver			Delft University of Technology EEMCS Embedded Software L.P. Klaver MSc.
Size: A4	Number: 3	Revision: P1	
Date: 5-8-2017	Time: 10:25:04	Sheet 3 of 5	
File: F:\Dropbox\NIRICT\Prototype 1\Densor\10 Receiver.SchDoc			



LKL09/06:
Modification:
- Removed not needed led P1.0 and moved led from P1.1 to P2.5.
- Added testpins for expansion option.

Title Processor			Delft University of Technology
Size: A4	Number: 4	Revision: P1	EEMCS
Date: 5-8-2017	Time: 10:25:04	Sheet 4 of 5	Embedded Software
File: F:\Dropbox\NIRICT\Prototype 1\Densor\20 Processor.SchDoc			L.P. Klaver MSc.

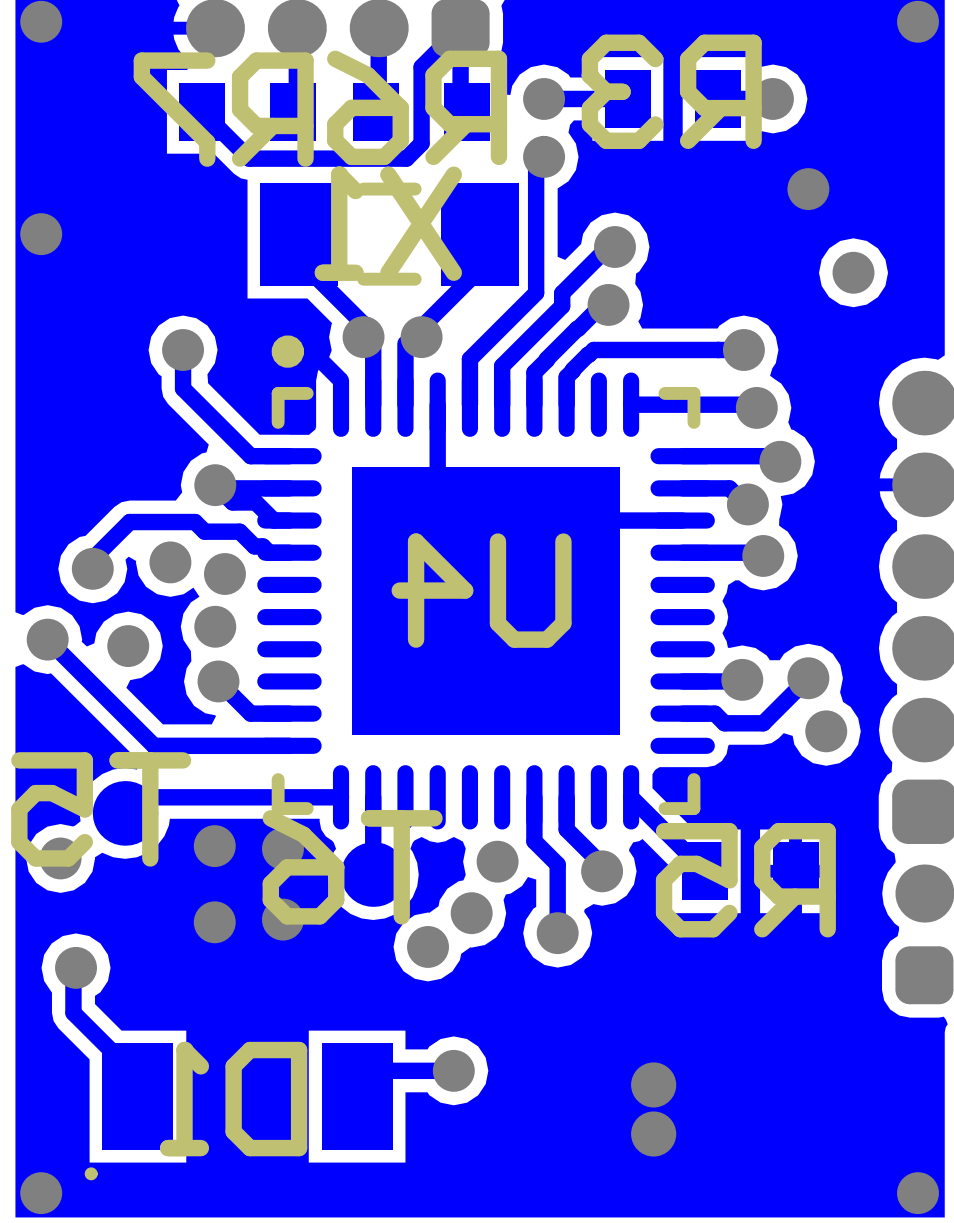


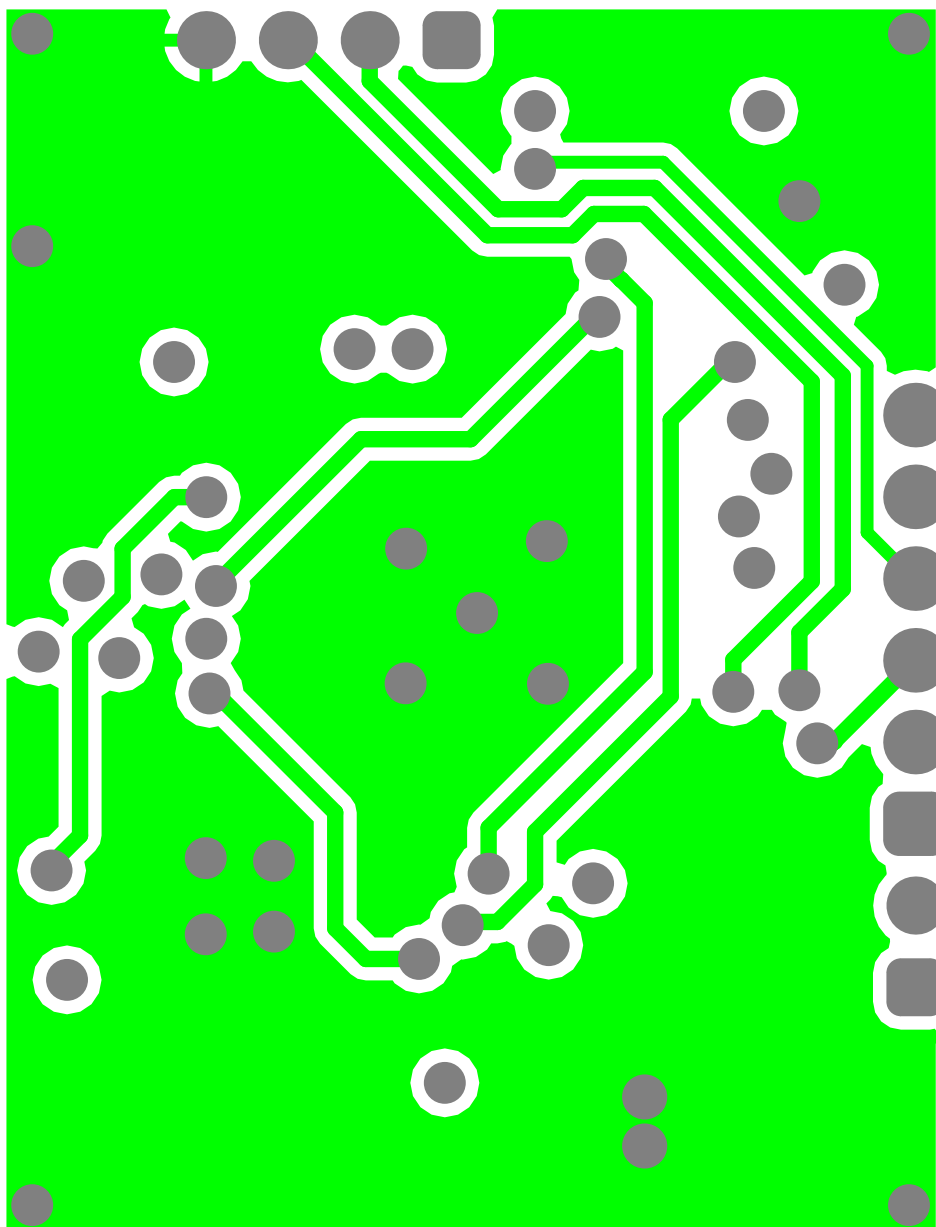
Temperature / humidity sensor
 I2C databus
 Max. resolution:
 12 bits / 0.04% RH +/- 2% RH
 14 bits / 0.01 Deg. C +/- 0.3 Deg. C

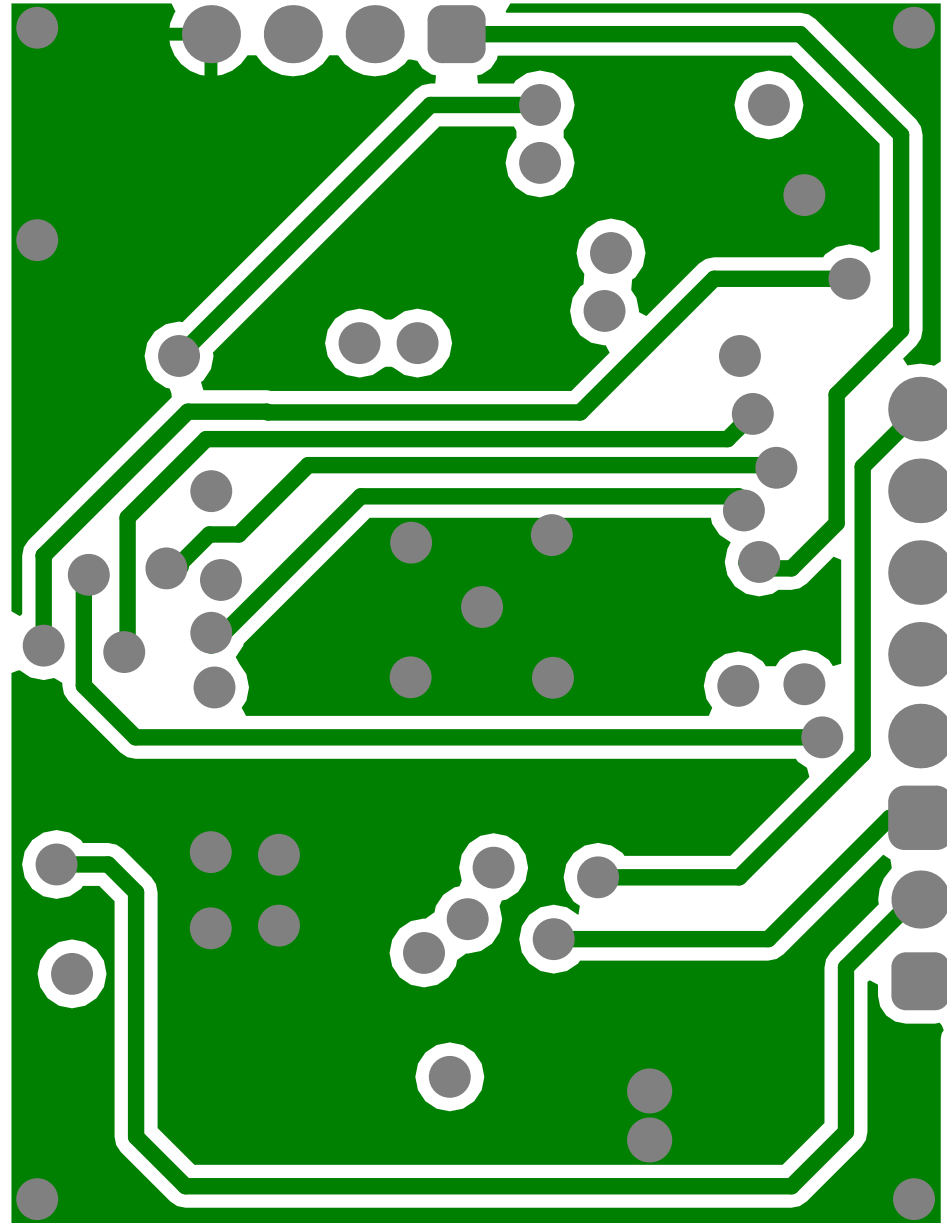
Note:
 Max. 2 measurements per second
 otherwise device heats itself.
 Add slit into PCB if possible.

Title Sensor			Delft University of Technology
Size: A4	Number: 5	Revision: P1	EEMCS
Date: 5-8-2017	Time: 10:25:04	Sheet 5 of 5	Embedded Software
File: F:\Dropbox\NIRICT\Prototype 1\Sensor\30 Sensor.SchDoc			L.P. Klaver MSc.

ITP E1702







GND

H2

3V3

VLC

T1

U3

D2

SD1

R1

N0

O5

U1

L1

C8

R4

CLKAM

SPICKL

C2

R2

U2

C4

E6

H3

H1

VBATI

VBAT

BUSY

RF

N3

M4

EOB

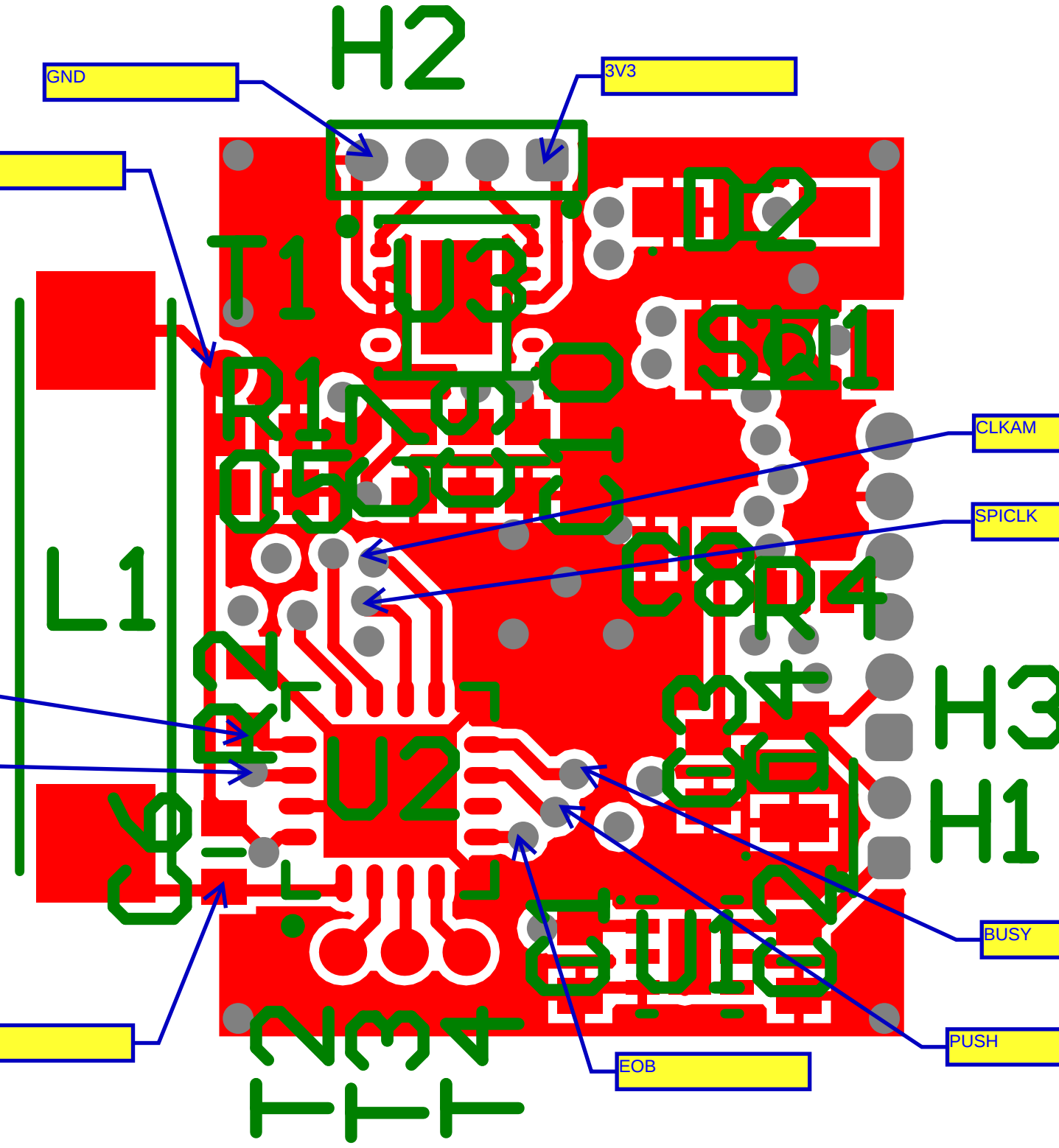
PUSH

E6

U1

T1

T2



Bill of Materials

Bill of Materials For Project [Densor.PrjPcb] (No PCB Document Selected)

Source Data From: Densor.PrjPcb
Project: Densor.PrjPcb
Variant: None

Creation Date: 5-8-2017 10:26:10
Print Date: 05-Aug-17 10:26:15 AM

Footprint	Comment	LibRef	Designator	Description	Quantity
C0603	100n	C1608X8R1E104K080AA	C1, C3, C7, C8	CAP CER 0.1UF 25V X8R 0603	4
C0603	470p NP0	C1608C0G2A471J080AA	C2, C6, C9, C10	CAP CER 470PF 100V C0G 0603	4
C2012	10u	C2012X5R1C106K085AC	C4	CAP CER 10UF 16V X5R 0805	1
C0603	220n	C1608X5R1E224K080AA	C5	CAP CER 0.22UF 25V X5R 0603	1
SOD80	LL4148	LL4148	D1	DIODE GEN PURP 100V 200MA SOD80	1
SML-LXR85GC-TR	SML-LXR85GC-TR	SML-LXR85GC-TR	D2	LED GREEN CLEAR 2SMD R/A	1
850-10-004-10-001101 - 2	TMM-102-01-F-S-SM	TMM-102-01-F-S-SM	H1	2MM TERMINAL STRIP 2 PINS 1 ROW	1
850-10-004-10-001101	I2C Expansion	850-10-004-10-001101	H2	CONN HDR 4POS 1.27MM T/H	1
851-87-006-20-001101	Programming port	851-87-006-20-001101	H3	SOCKET SOLDER TAIL SINGLE ROW	1
00617244	134.2K	00617244	L1	COIL RFID TRANSPONDER	1
R0603	1M	AC0603FR-071ML	R1, R2	RES SMD 1M OHM 1% 1/10W 0603	2
R0603	330	RC0603FR-07330RL	R3	RES SMD 330 OHM 1% 1/10W 0603	1
R0603	47K	RC0603FR-0747KL	R4	RES SMD 47K OHM 1% 1/10W 0603	1
R0603	1K	RC0603FR-071KL	R5	RES SMD 1K OHM 1% 1/10W 0603	1
R0603	100K	RC0603FR-07100KL	R6, R7	RES SMD 100K OHM 1% 1/10W 0603	2
B3U-1000P	B3U-1000P	B3U-1000P	SW1	SWITCH TACTILE SPST-NO 0.05A 12V	1
TESTPOINT		TESTPOINT	T1, T2, T3, T4	TESTPOINT	4
TESTPOINT	P1.1	TESTPOINT	T5	TESTPOINT	1
TESTPOINT	P1.0	TESTPOINT	T6	TESTPOINT	1
TPS71433DR VR	TPS71433	TPS71433DRVR	U1	IC REG LDO 3.3V 80MA 6SON	1
TMS37157IR SARG4	TMS37157	TMS37157IRSA RG4	U2	IC RFID TRNSP 134.2KHZ 16QFN	1
SHT21	SHT21	SHT21	U3	IC SENSOR HUMID/TEMP 3V I2C 2% SMD	1
MSP430F2274	MSP430F2274	MSP430F2274I RHAR	U4	IC MCU 16BIT 32KB FLASH 40VQFN	1
FC-135 32.7680KA-AC0	32K768	FC-135 32.7680KA-AC0	X1	CRYSTAL 32.7680KHZ 9PF SMD	1
					35

Approved	Notes