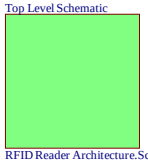
Top Level Schematic



RFID Reader Architecture.SchDoc

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CRITICAL QUALITY ATTRIBUTE

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SHALL BE COMPLIANT PER ES-1168 AND ES-1005 APPROVALS ARE FOUND IN PLM SYSTEM	SHEET: 1 OF 8	NUMBER: <SCH PN>	REV: <SCH REV>

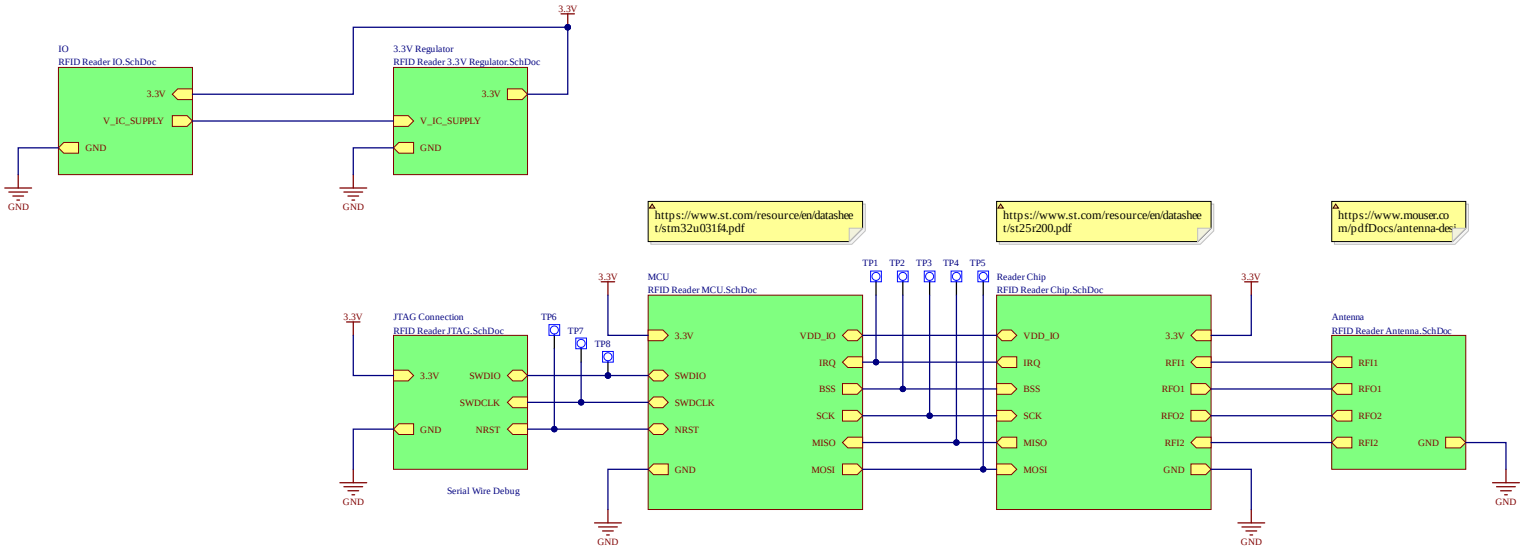
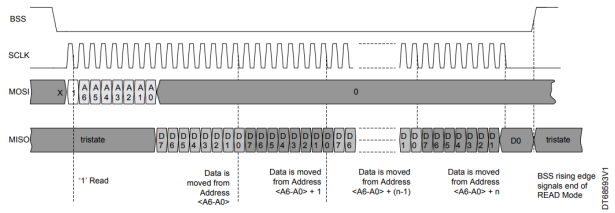


Figure 12. SPI communication: reading of multiple bytes



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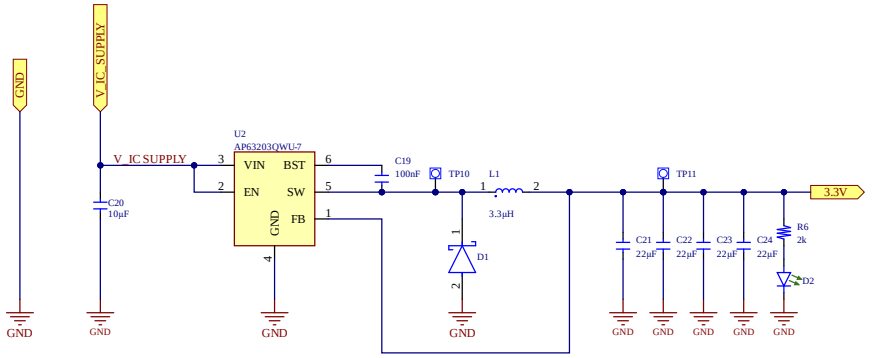

CRITICAL QUALITY ATTRIBUTE			stryker
LAYER NAME		TITLE NAME <SCH TITLE>	
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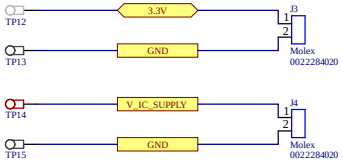

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CRITICAL QUALITY ATTRIBUTE

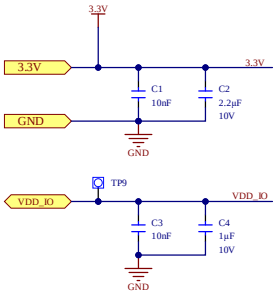
LAYER NAME

TITLE NAME <SCH TITLE>

SHALL BE COMPLIANT PER ES-1168 AND ES-1005

APPROVALS ARE FOUND IN PLM SYSTEM

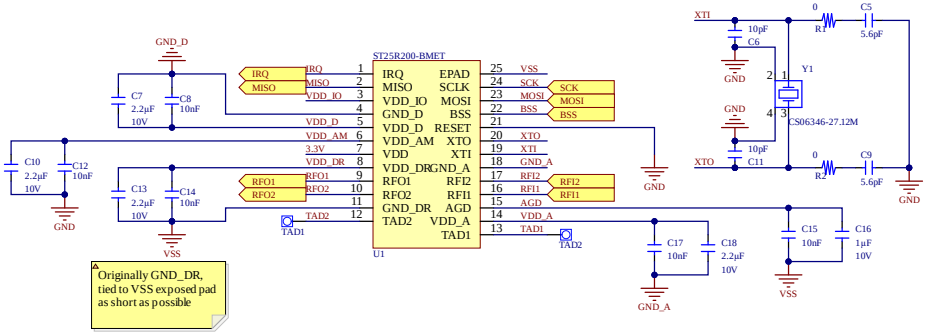
SHEET	NUMBER	REV
4 OF 8	<SCH PN>	<SCH REV>



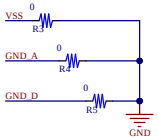
The ST25R200 communicates with a host via an SPI interface where it acts as a peripheral device, relying on the host to initiate all communication.

To notify the host of completed commands or external events that the ST25R200 signals an interrupt on the IRQ pin.

A RESET pin is also available to reset the device logic



Originally GND_DR, tied to VSS exposed pad as short as possible



consider current flowing into resistor, figure out trace size based on power

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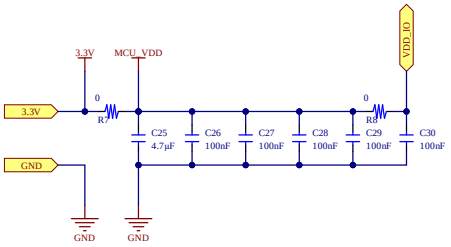
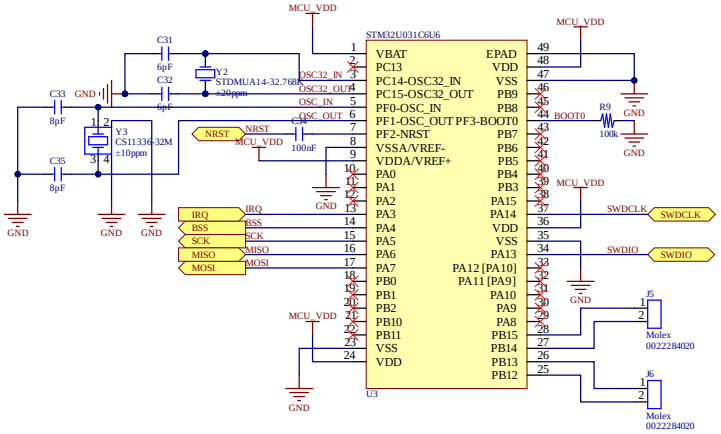
CRITICAL QUALITY ATTRIBUTE			
LAYER NAME	TITLE NAME <SCH TITLE>		
SHALL BE COMPLIANT PER ES-1168 AND ES-1005 APPROVALS ARE FOUND IN PLM SYSTEM	SHEET 5 OF 8	NUMBER <SCH PN>	REV <SCH REV>





SPI Facts:
ST25R200: up to 10 Mbit/s, tested up to 10 MHz
STM32U0: up to 32 Mbit/s, 27 MHz* (Page 99)
- A 3-bit prescaler gives eight master mode frequencies. The frame size is configurable from 4 bits to 16 bits

The ST25R200 communicates with a host via an SPI interface where it acts as a peripheral device, relying on the host to initiate all communication.

To notify the host of completed commands or external events that the ST25R200 signals an interrupt on the IRQ pin.

A RESET pin is also available to reset the device logic

USART on pins PA9/PA10, PC10/PC11, or PA2/PA3
I2C-bus on pins PB6/PB7 or PB10/PB11
SPI on pins PA4/PA5/PA6/PA7 or PB12/PB13/PB14/PB15

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CRITICAL QUALITY ATTRIBUTE

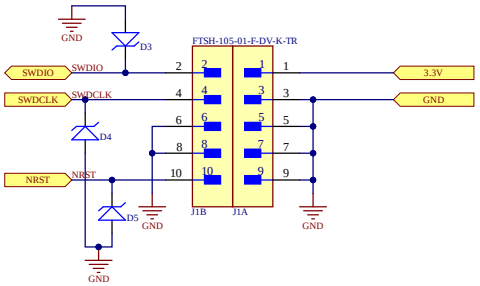
LAYER NAME

TITLE NAME: <SCH TITLE>

SHALL BE COMPLIANT PER ES-1168 AND ES-1005

APPROVALS ARE FOUND IN PLM SYSTEM

SHEET	NUMBER	REV
6 OF 8	<SCH PN>	<SCH REV>



CRITICAL QUALITY ATTRIBUTE			
LAYER NAME	TITLE NAME <SCH TITLE>		
SHALL BE COMPLIANT PER ES-1168 AND ES-1005 APPROVALS ARE FOUND IN PLM SYSTEM	SHEET 7 OF 8	NUMBER <SCH PN>	REV <SCH REV>

Target	ST25R200
Config	differential

Antenna parameters

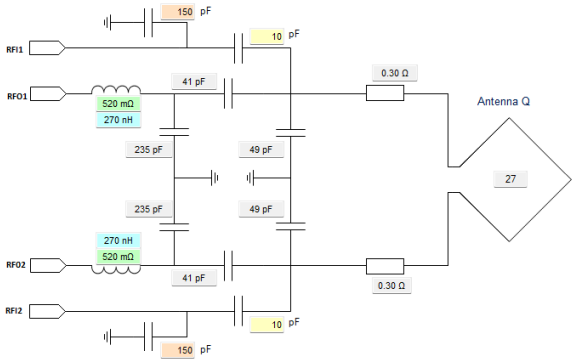
Antenna inductance	2400	[nH]
DC resistance	5100	[mOhm]
Parallel resistance	8800	[Ohm]
Self resonance	4.68e+7	[Hz]
Damping resistor	Serial / Parallel	

Matching inputs

Preset		
EMC Inductor	270	[nH]
DC Resistance	520	[mOhm]
EMC filter	20000	[kHz]
Target matching Z	17	[Ohm]
Target Q	25	factor

Cable parameters

Characteristic impedance Z0	50	[Ohm]
Cable length	0.5	[m]

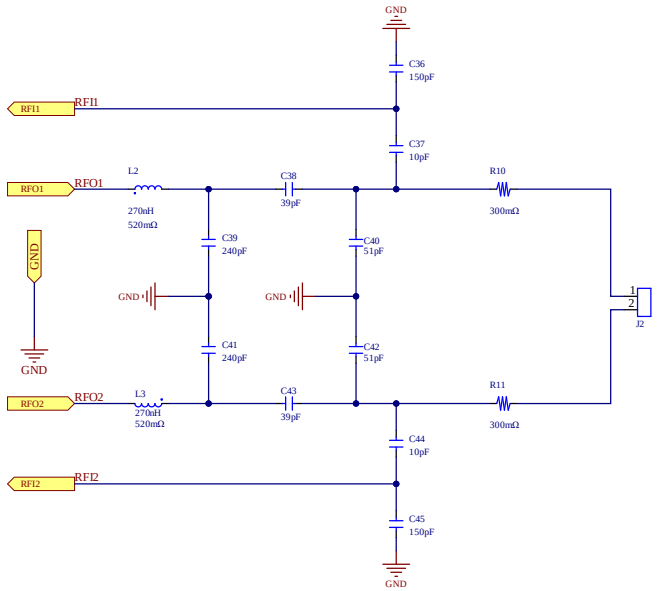


The calculation of the maximum allowable Q factor for Type-A with a data rate of 106 Kbit/s is based on the bandwidth - time product, and a on a definition of the Q factor resulting in the following equation:

$B * T \geq 1$; $Q = f_{work} / B \rightarrow Q \leq f_{work} * T \rightarrow Q \leq 13.56\ MHz * 3\ \mu s = 41$

B: 3 dB bandwidth; T: rise/fall time of RF modulation envelope; fwork: operating frequency

Some capacitance values differ from antenna program due to marketplace availability



Molex connection to antenna

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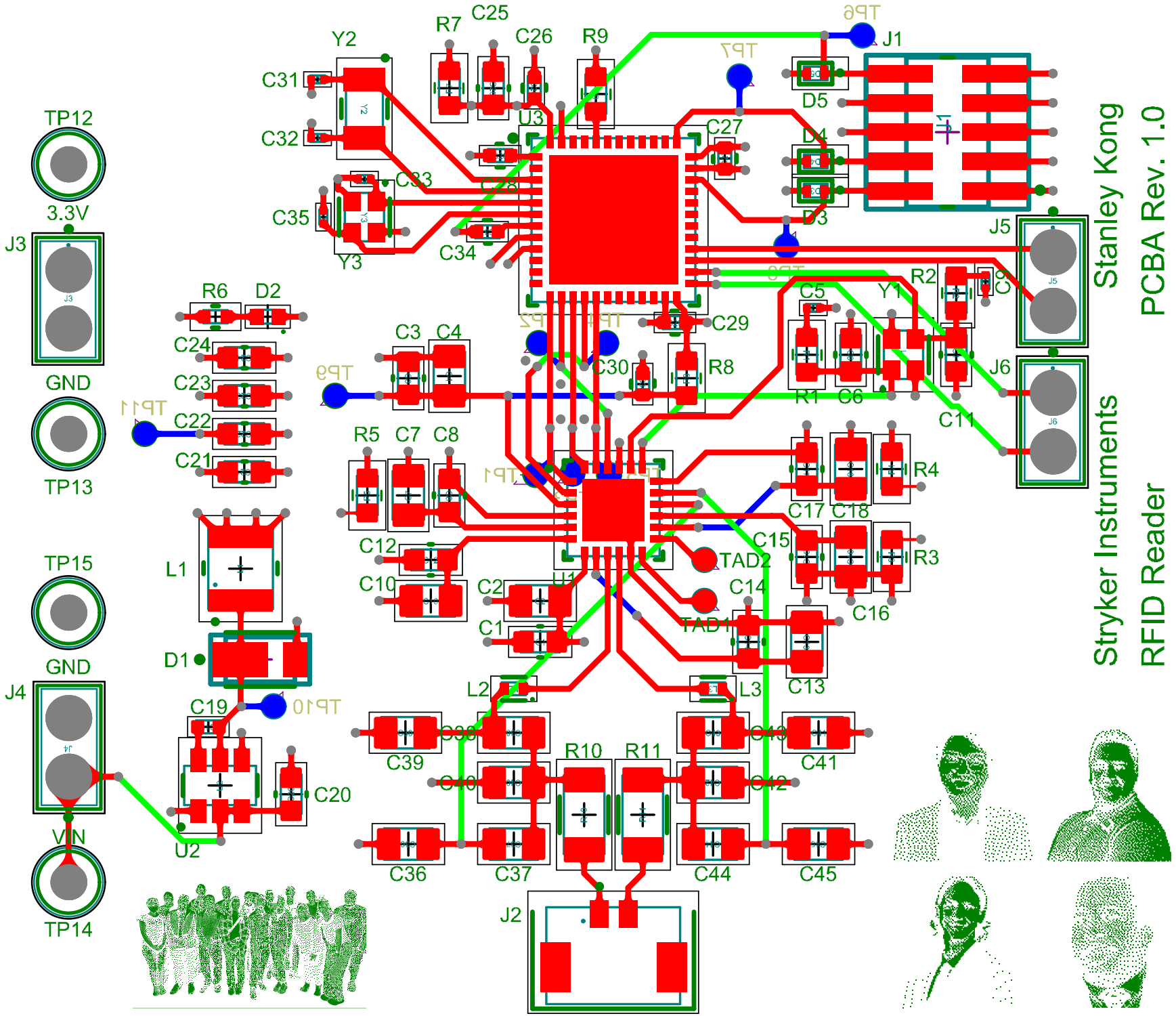
CRITICAL QUALITY ATTRIBUTE			
LAYER NAME	TITLE NAME <SCH TITLE>		
SHALL BE COMPLIANT PER ES-1168 AND ES-1005 APPROVALS ARE FOUND IN PLM SYSTEM	SHEET 8 OF 8	NUMBER <SCH PN>	REV <SCH REV>


Stanley Kong
Stryker Instruments
PCBA Rev. 1.0
RFID Reader
TP12
3.3V
J3
GND
TP13
TP15
GND
J4
VIN
TP14
Y2
R7
C25
C26
R9
C31
C32
C33
C35
Y3
U3
C34
C27
C28
D5
D4
D3
J1
J5
J6
C29
C30
R8
C3
C4
R6
D2
C24
C23
C22
C21
C5
Y1
R2
R1
C6
C11
R5
C7
C8
C12
C10
L1
D1
C19
C20
U2
C2
C1
U1
TAD2
TAD1
C14
C15
C16
C17
C18
R4
R3
C13
L2
L3
C39
C41
R10
R11
C40
C42
C36
C37
C44
C45
J2