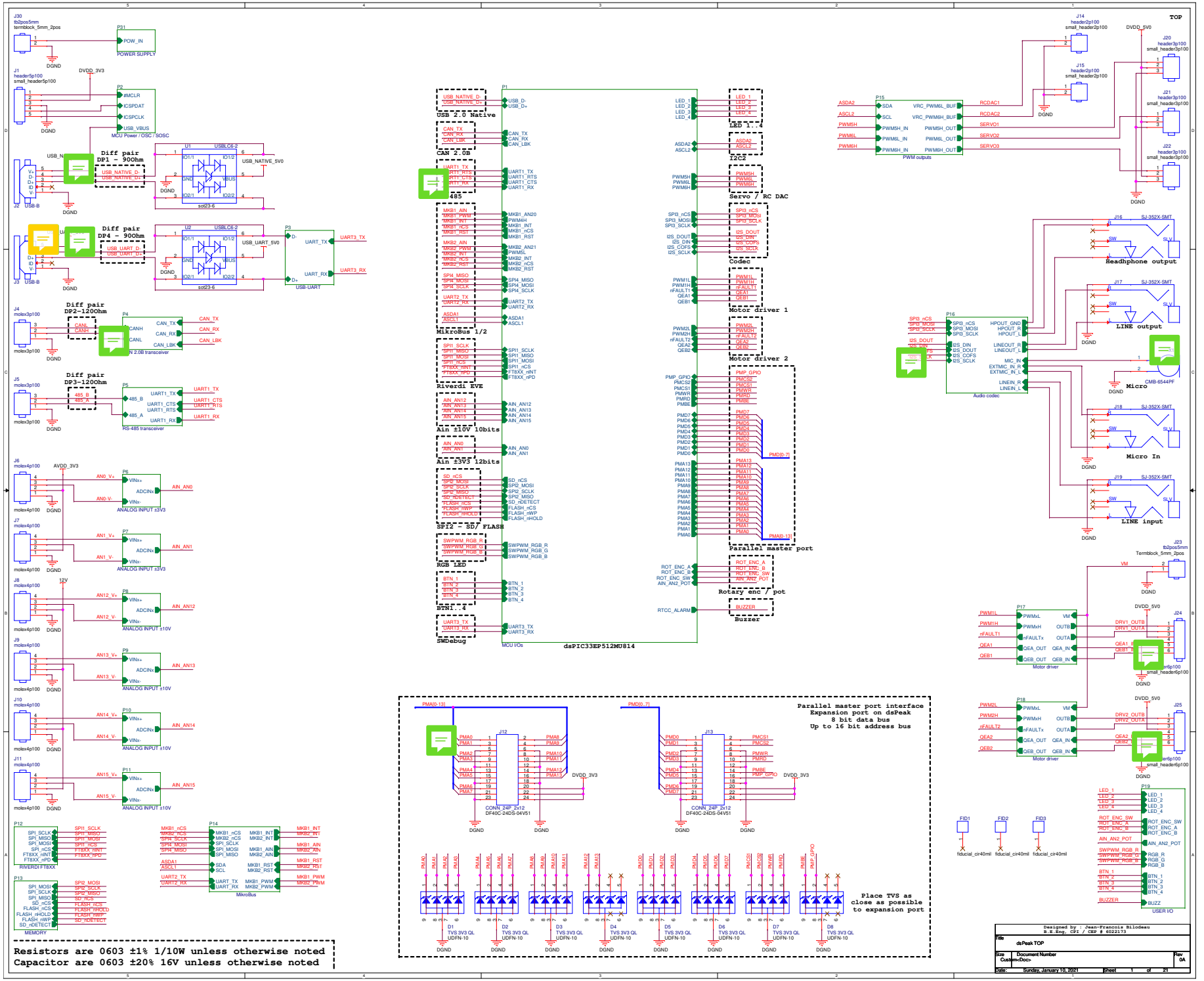
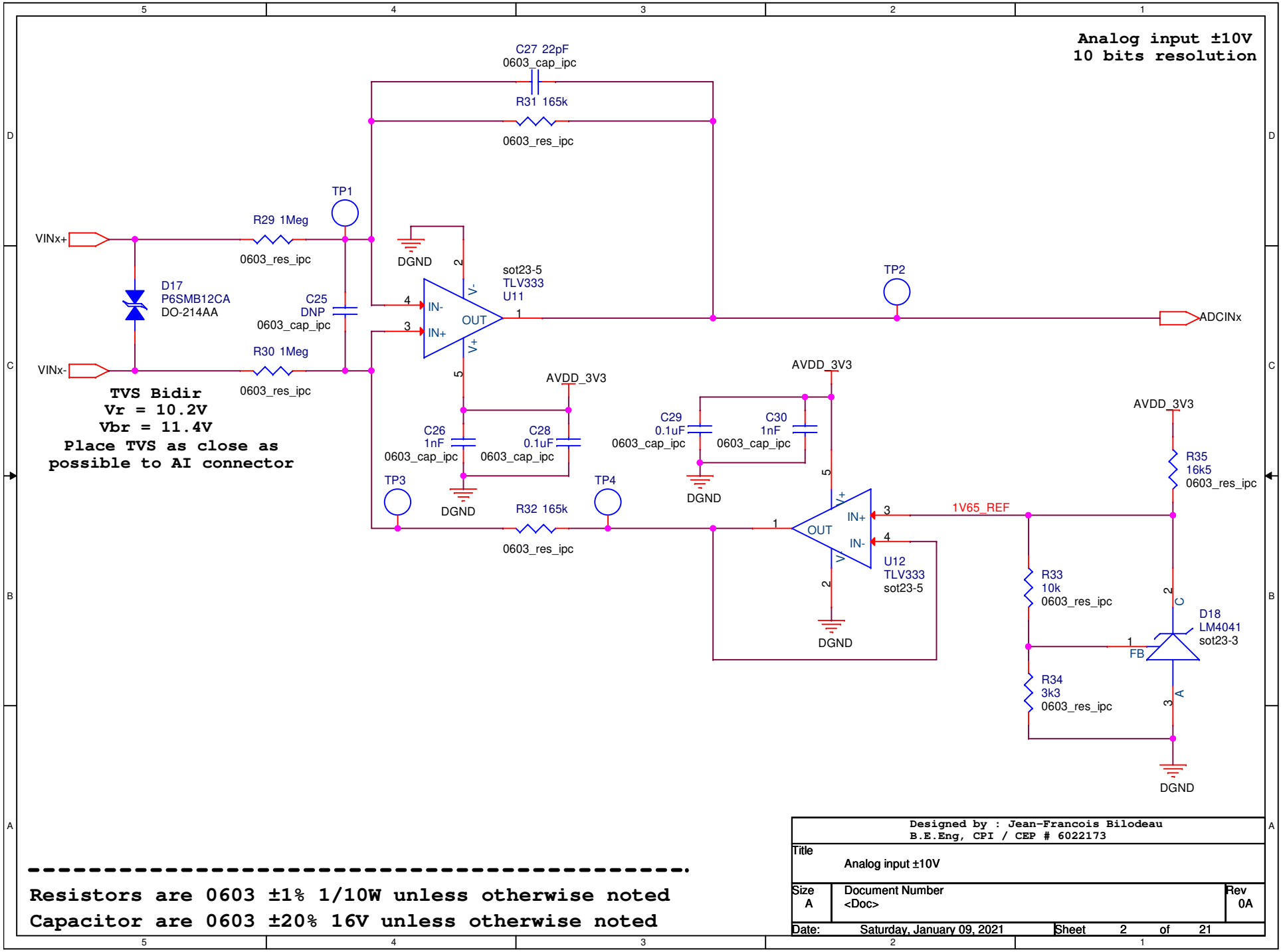

TOP
USB 2.0 Native
CAN 2.0B
I2C2
485
Servo / RC DAC
Codec
Motor driver 1
Motor driver 2
Parallel master port
Rotary enc / pot
Buzzer
LED 1..4
RIVERdi FT8XX
Ain ±10V 10bits
Ain ±3V3 12bits
SPI2 - SD/ FLASH
RGB LED
BTN1..4
SWDebug
MCU I/Os
dsPIC33EP512MU814
Diff pair DP1 - 90Ohm
Diff pair DP4 - 90Ohm
Diff pair DP2-120Ohm
Diff pair DP3-120Ohm
MCU Power / OSC / SOSC
RS-485 transceiver
ANALOG INPUT ±3V3
ANALOG INPUT ±10V
MikroBus
MEMORY
PWM outputs
Audio codec
Motor driver
Headphone output
LINE output
Micro
Micro In
LINE input
USER I/O
Parallel master port interface
Expansion port on dsPeak
8 bit data bus
Up to 16 bit address bus
Place TVS as close as possible to expansion port
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
dsPeak TOP
Sunday, January 10, 2021


Analog input ±10V
10 bits resolution
C27 22pF
0603_cap_ipc
R31 165k
0603_res_ipc
TP1
R29 1Meg
VINx+
0603_res_ipc
DGND
sot23-5
TLV333
U11
TP2
ADCINx
D17
P6SMB12CA
DO-214AA
C25
DNP
0603_cap_ipc
IN-
IN+
OUT
V-
V+
R30 1Meg
VINx-
0603_res_ipc
TVS Bidir
Vr = 10.2V
Vbr = 11.4V
Place TVS as close as
possible to AI connector
AVDD_3V3
C26
1nF
0603_cap_ipc
C28
0.1uF
0603_cap_ipc
TP3
TP4
R32 165k
0603_res_ipc
C29
0.1uF
0603_cap_ipc
C30
1nF
0603_cap_ipc
U12
TLV333
sot23-5
1V65_REF
R35
16k5
0603_res_ipc
R33
10k
0603_res_ipc
R34
3k3
0603_res_ipc
D18
LM4041
sot23-3
FB
C
A
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Analog input ±10V
Size
A
Document Number
<Doc>
Rev
0A
Date:
Saturday, January 09, 2021
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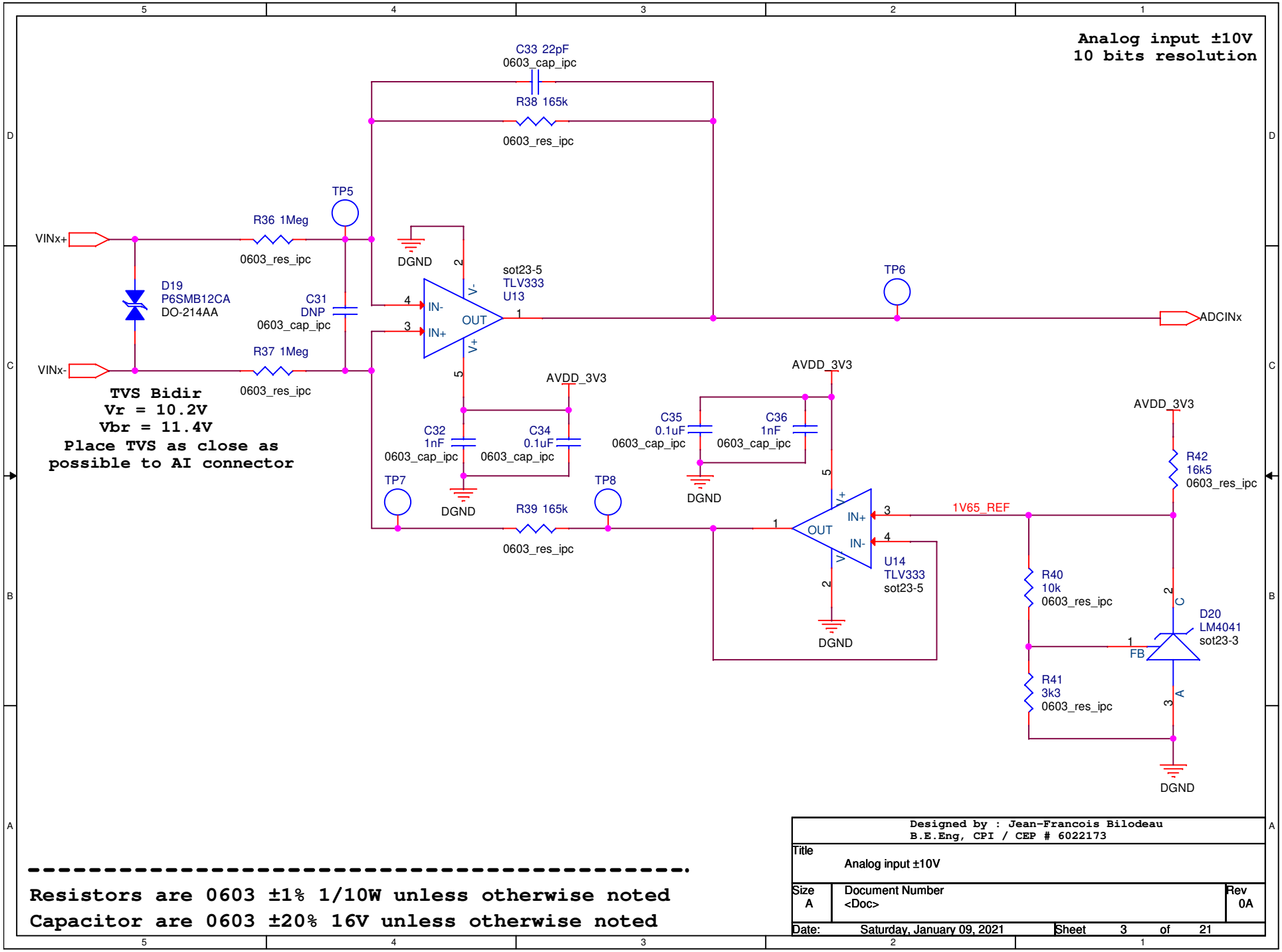
of
21
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted


Analog input ±10V
10 bits resolution
C33 22pF
0603_cap_ipc
R38 165k
0603_res_ipc
TP5
R36 1Meg
VINx+
0603_res_ipc
DGND
sot23-5
TLV333
U13
TP6
ADCINx
D19
P6SMB12CA
DO-214AA
C31
DNP
0603_cap_ipc
VINx-
R37 1Meg
0603_res_ipc
TVS Bidir
Vr = 10.2V
Vbr = 11.4V
Place TVS as close as
possible to AI connector
AVDD_3V3
C32
1nF
0603_cap_ipc
C34
0.1uF
0603_cap_ipc
C35
0.1uF
0603_cap_ipc
C36
1nF
0603_cap_ipc
TP7
TP8
R39 165k
0603_res_ipc
1V65_REF
U14
TLV333
sot23-5
R42
16k5
0603_res_ipc
R40
10k
0603_res_ipc
D20
LM4041
sot23-3
FB
R41
3k3
0603_res_ipc
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Analog input ±10V
Size
A
Document Number
<Doc>
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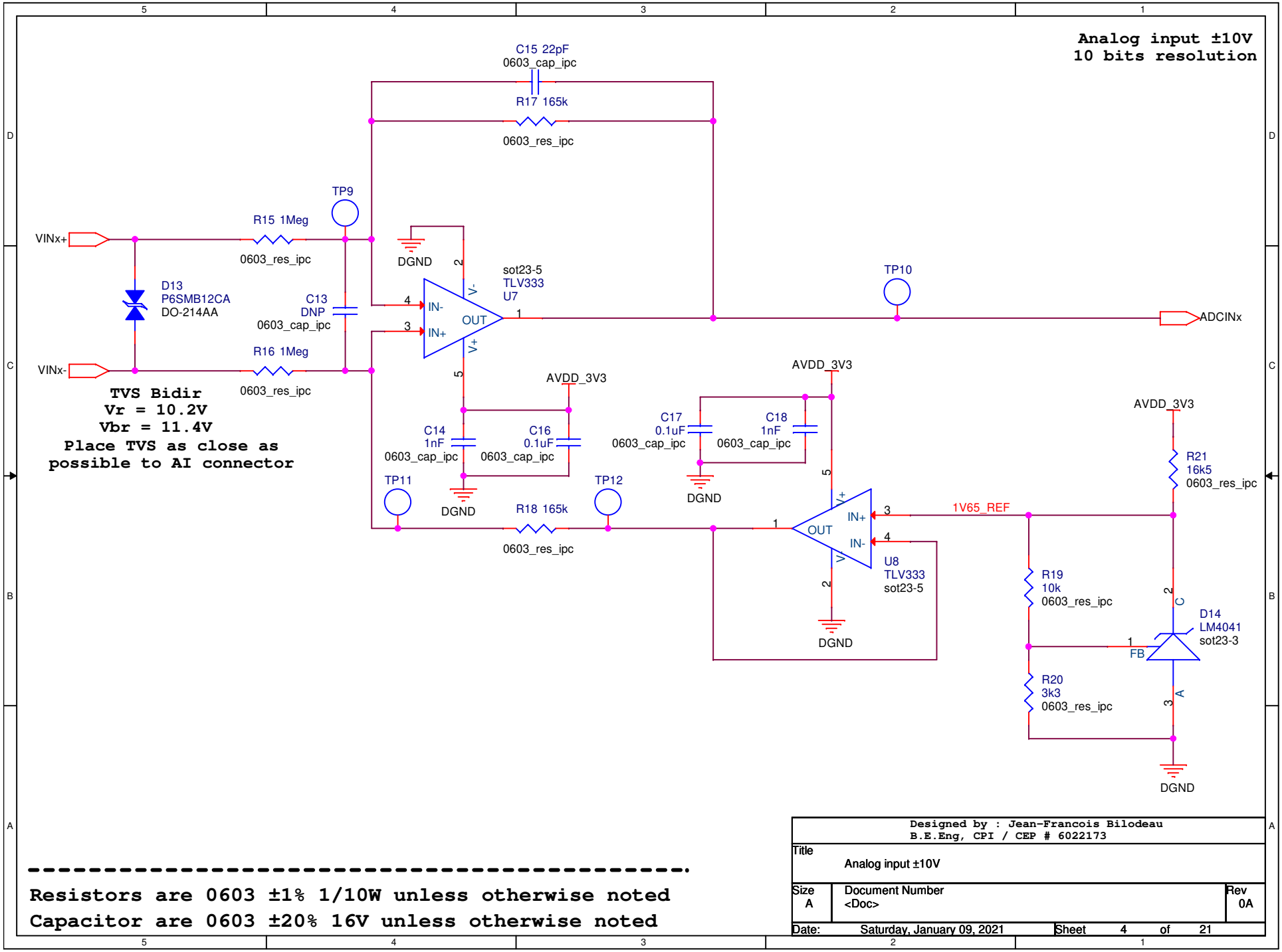
Date: Saturday, January 09, 2021
Sheet 3 of 21
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted


Analog input ±10V
10 bits resolution
C15 22pF
0603_cap_ipc
R17 165k
0603_res_ipc
TP9
R15 1Meg
VINx+
0603_res_ipc
DGND
sot23-5
TLV333
U7
TP10
ADCINx
D13
P6SMB12CA
DO-214AA
C13
DNP
0603_cap_ipc
R16 1Meg
VINx-
0603_res_ipc
TVS Bidir
Vr = 10.2V
Vbr = 11.4V
Place TVS as close as
possible to AI connector
AVDD_3V3
C14
1nF
0603_cap_ipc
C16
0.1uF
0603_cap_ipc
C17
0.1uF
0603_cap_ipc
C18
1nF
0603_cap_ipc
TP11
TP12
R18 165k
0603_res_ipc
1V65_REF
U8
TLV333
sot23-5
R19
10k
0603_res_ipc
R21
16k5
0603_res_ipc
D14
LM4041
sot23-3
FB
R20
3k3
0603_res_ipc
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Analog input ±10V
Size
A
Document Number
<Doc>
Rev
0A
Date:
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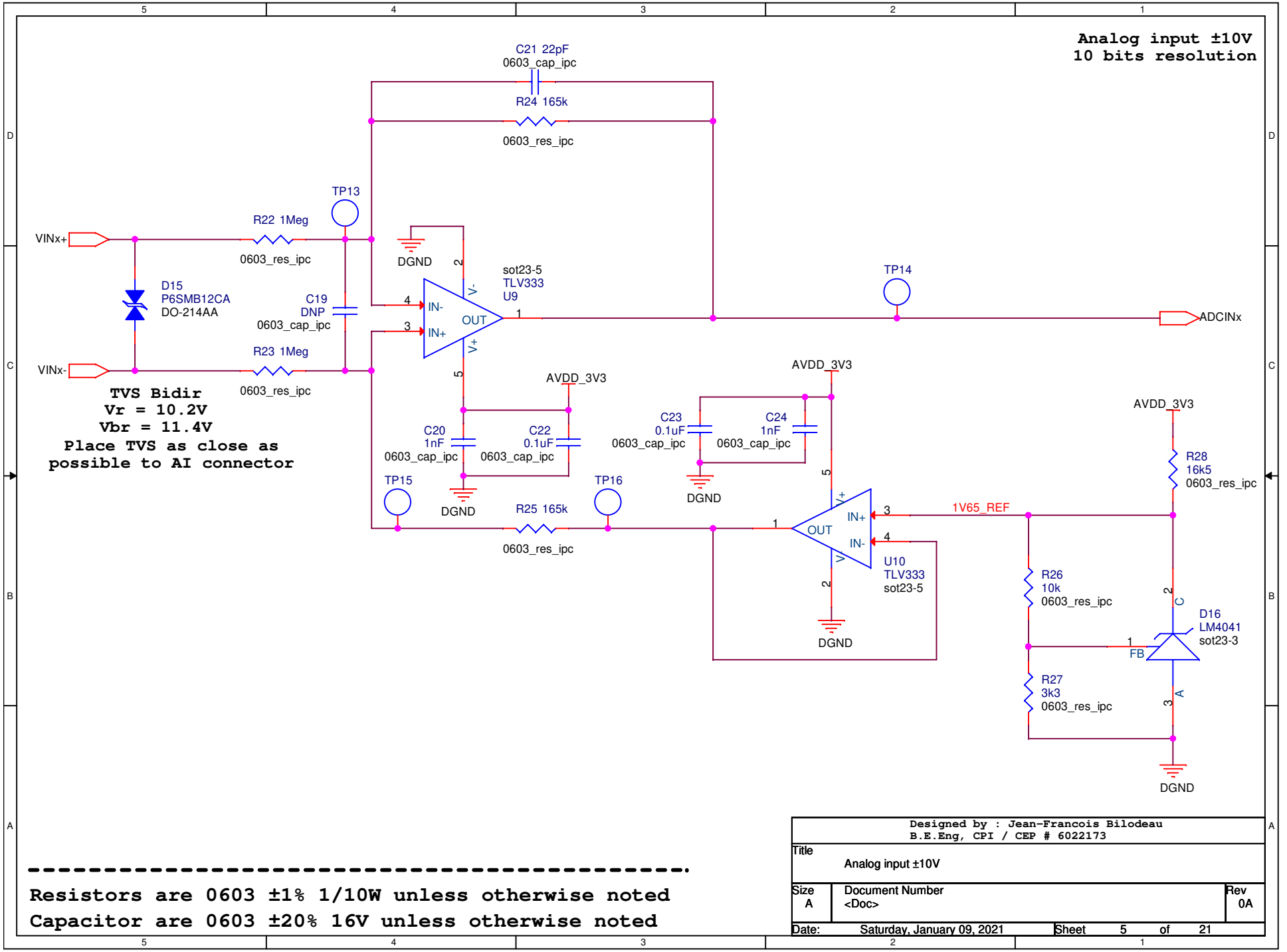
of
21
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted


Analog input ±10V
10 bits resolution
C21 22pF
0603_cap_ipc
R24 165k
0603_res_ipc
TP13
R22 1Meg
VINx+
0603_res_ipc
DGND
sot23-5
TLV333
U9
TP14
ADCINx
D15
P6SMB12CA
DO-214AA
C19
DNP
0603_cap_ipc
R23 1Meg
VINx-
0603_res_ipc
TVS Bidir
Vr = 10.2V
Vbr = 11.4V
Place TVS as close as
possible to AI connector
AVDD_3V3
C20
1nF
0603_cap_ipc
C22
0.1uF
0603_cap_ipc
C23
0.1uF
0603_cap_ipc
C24
1nF
0603_cap_ipc
TP15
TP16
R25 165k
0603_res_ipc
1V65_REF
U10
TLV333
sot23-5
R28
16k5
0603_res_ipc
R26
10k
0603_res_ipc
D16
LM4041
sot23-3
FB
R27
3k3
0603_res_ipc
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Analog input ±10V
Size
A
Document Number
<Doc>
Rev
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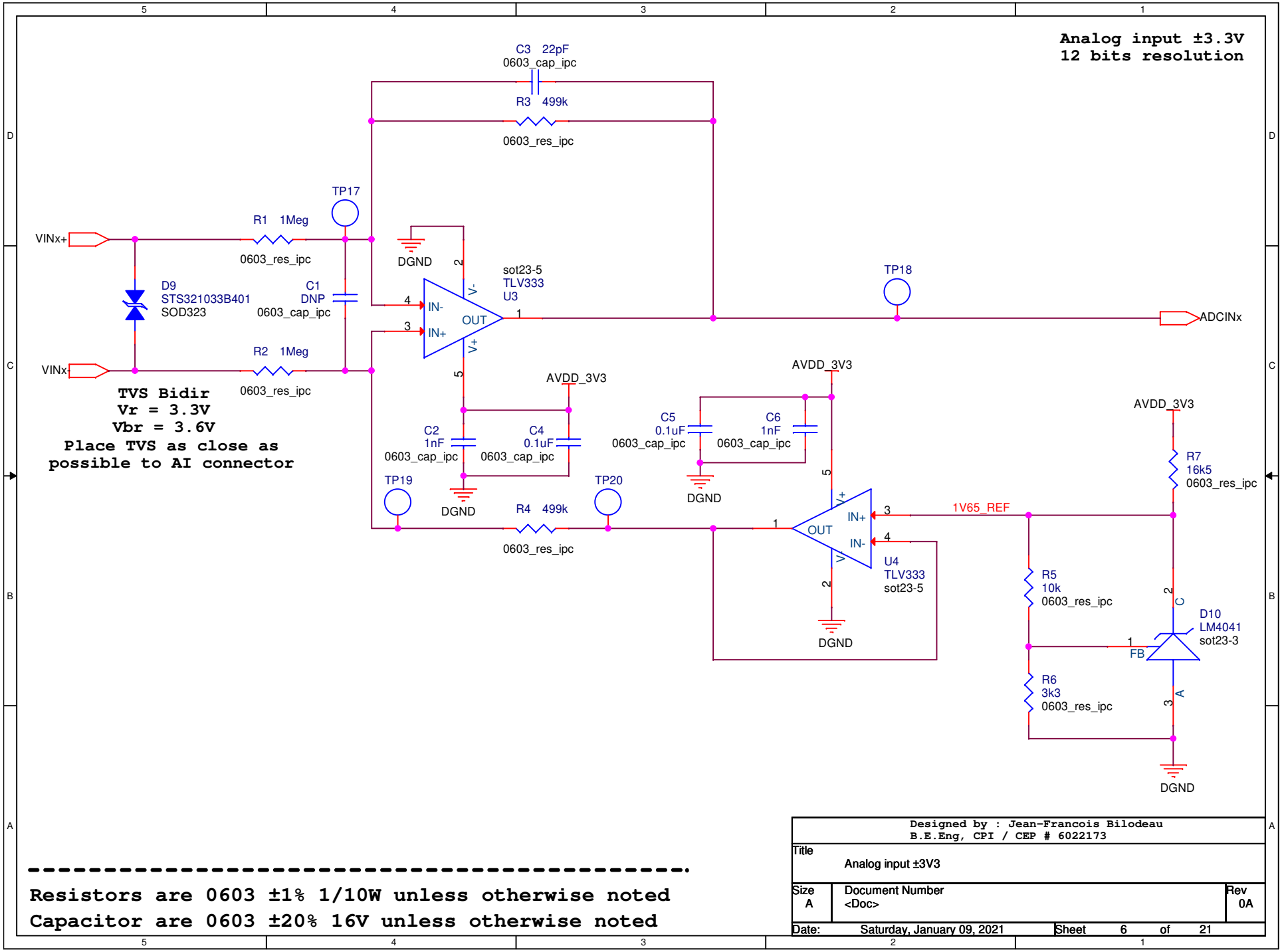
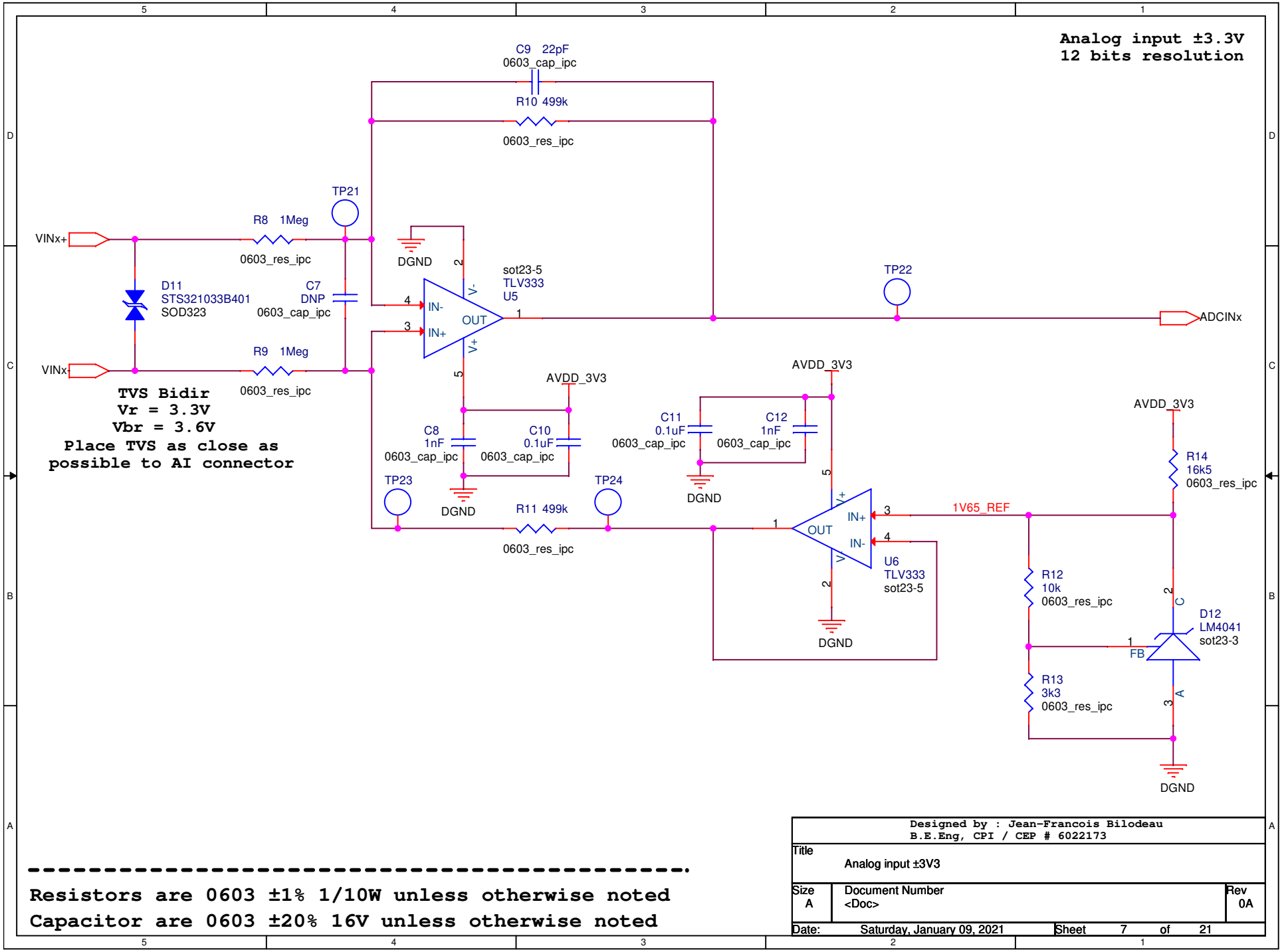
21


Analog input ±3.3V
12 bits resolution
C3 22pF
0603_cap_ipc
R3 499k
0603_res_ipc
TP17
R1 1Meg
VINx+
0603_res_ipc
DGND
sot23-5
TLV333
U3
TP18
ADCINx
D9
STS321033B401
SOD323
C1
DNP
0603_cap_ipc
IN-
IN+
OUT
V-
V+
VINx-
R2 1Meg
0603_res_ipc
TVS Bidir
Vr = 3.3V
Vbr = 3.6V
Place TVS as close as
possible to AI connector
AVDD_3V3
C2
1nF
0603_cap_ipc
C4
0.1uF
0603_cap_ipc
TP19
TP20
DGND
R4 499k
0603_res_ipc
C5
0.1uF
0603_cap_ipc
C6
1nF
0603_cap_ipc
U4
TLV333
sot23-5
1V65_REF
R7
16k5
0603_res_ipc
R5
10k
0603_res_ipc
R6
3k3
0603_res_ipc
D10
LM4041
sot23-3
FB
C
A
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Analog input ±3V3
Size
A
Document Number
<Doc>
Rev
0A
Date: Saturday, January 09, 2021
Sheet 6 of 21
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted


Analog input ±3.3V
12 bits resolution
C9 22pF
0603_cap_ipc
R10 499k
0603_res_ipc
TP21
R8 1Meg
VINx+
0603_res_ipc
DGND
sot23-5
TLV333
U5
TP22
ADCINx
D11
STS321033B401
SOD323
C7
DNP
0603_cap_ipc
IN-
IN+
OUT
V-
V+
VINx-
R9 1Meg
0603_res_ipc
TVS Bidir
Vr = 3.3V
Vbr = 3.6V
Place TVS as close as
possible to AI connector
AVDD_3V3
C8
1nF
0603_cap_ipc
C10
0.1uF
0603_cap_ipc
TP23
TP24
R11 499k
0603_res_ipc
C11
0.1uF
0603_cap_ipc
C12
1nF
0603_cap_ipc
U6
TLV333
sot23-5
1V65_REF
R14
16k5
0603_res_ipc
R12
10k
0603_res_ipc
D12
LM4041
sot23-3
FB
R13
3k3
0603_res_ipc
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Analog input ±3V3
Size
A
Document Number
<Doc>
Rev
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Date: Saturday, January 09, 2021
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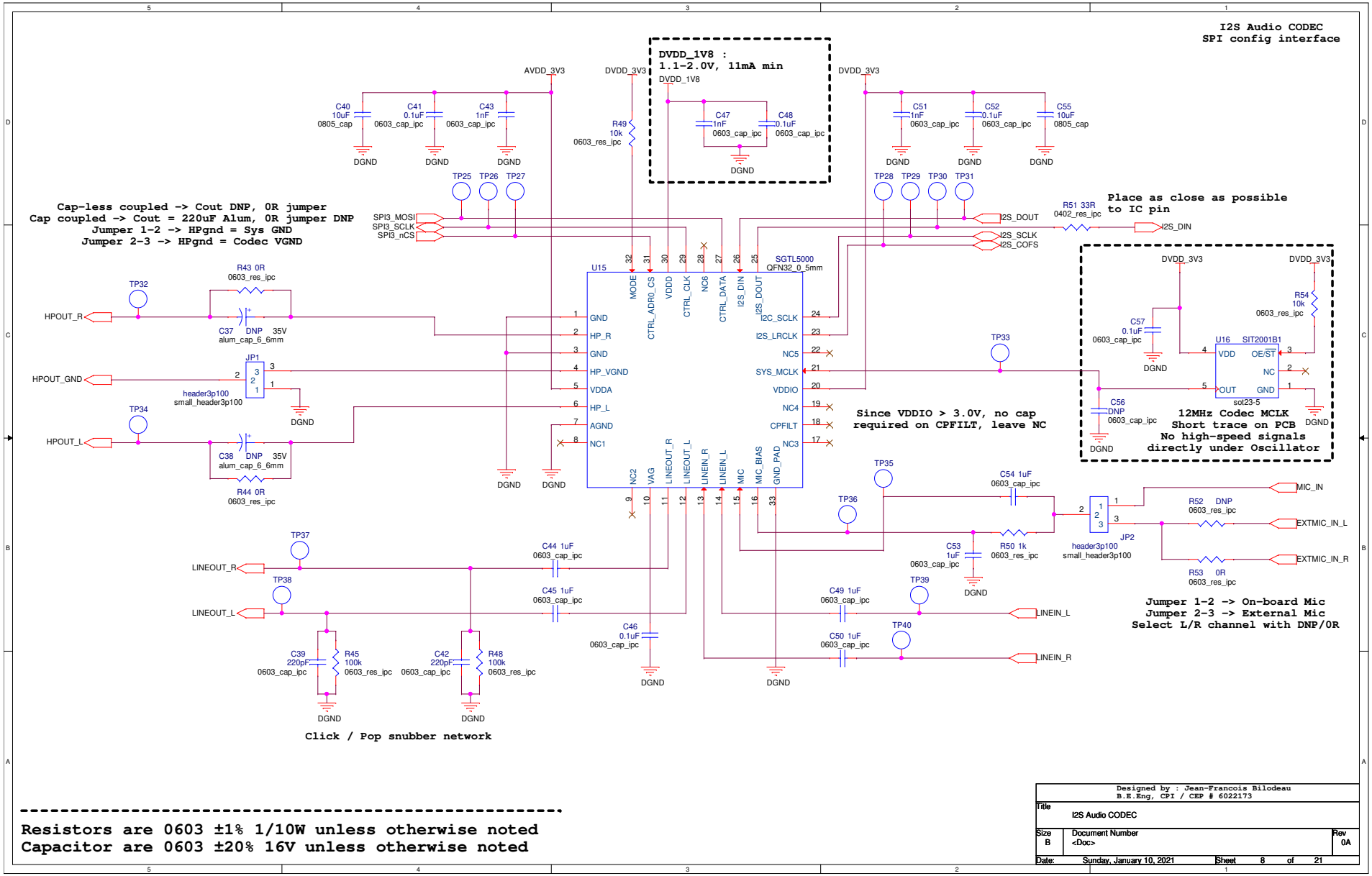
I2S Audio CODEC
SPI config interface
DVDD_1V8 :
1.1-2.0V, 11mA min
Cap-less coupled -> Cout DNP, 0R jumper
Cap coupled -> Cout = 220uF Alum, 0R jumper DNP
Jumper 1-2 -> HPgnd = Sys GND
Jumper 2-3 -> HPgnd = Codec VGND
Place as close as possible
to IC pin
SGTL5000
QFN32_0_5mm
Since VDDIO > 3.0V, no cap
required on CPFILT, leave NC
12MHz Codec MCLK
Short trace on PCB
No high-speed signals
directly under Oscillator
Jumper 1-2 -> On-board Mic
Jumper 2-3 -> External Mic
Select L/R channel with DNP/0R
Click / Pop snubber network
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
I2S Audio CODEC
Size
B
Document Number
<Doc>
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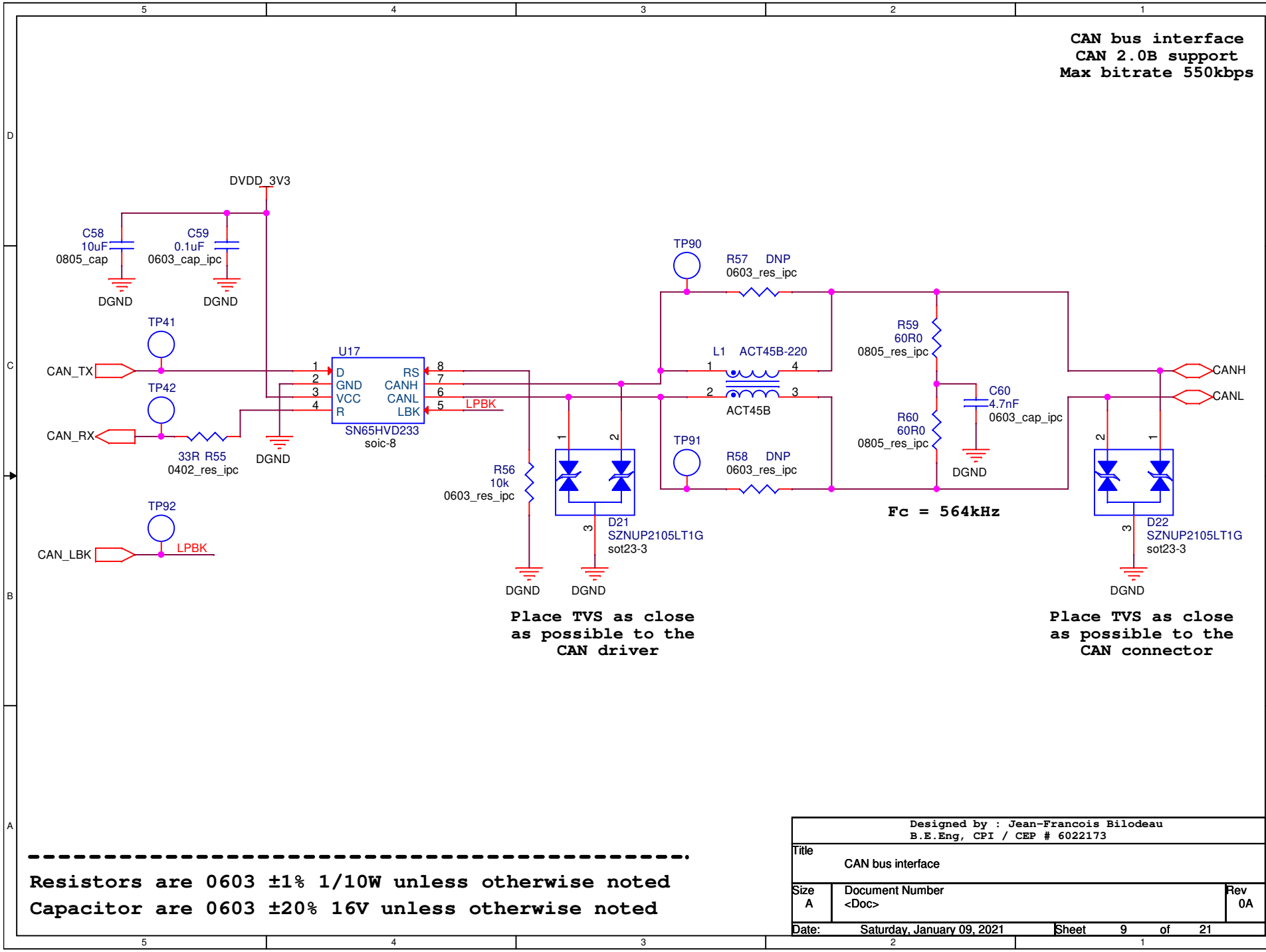
CAN bus interface
CAN 2.0B support
Max bitrate 550kbps
DVDD_3V3
C58
10uF
0805_cap
C59
0.1uF
0603_cap_ipc
DGND
DGND
TP41
CAN_TX
TP42
CAN_RX
33R R55
0402_res_ipc
DGND
U17
D
GND
VCC
R
RS
CANH
CANL
LBK
SN65HVD233
soic-8
LPBK
TP92
CAN_LBK
LPBK
R56
10k
0603_res_ipc
D21
SZNUP2105LT1G
sot23-3
DGND
DGND
TP90
R57 DNP
0603_res_ipc
L1 ACT45B-220
ACT45B
TP91
R58 DNP
0603_res_ipc
R59
60R0
0805_res_ipc
R60
60R0
0805_res_ipc
C60
4.7nF
0603_cap_ipc
DGND
Fc = 564kHz
D22
SZNUP2105LT1G
sot23-3
DGND
CANH
CANL
Place TVS as close as possible to the CAN driver
Place TVS as close as possible to the CAN connector
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
CAN bus interface
Size
A
Document Number
<Doc>
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0A
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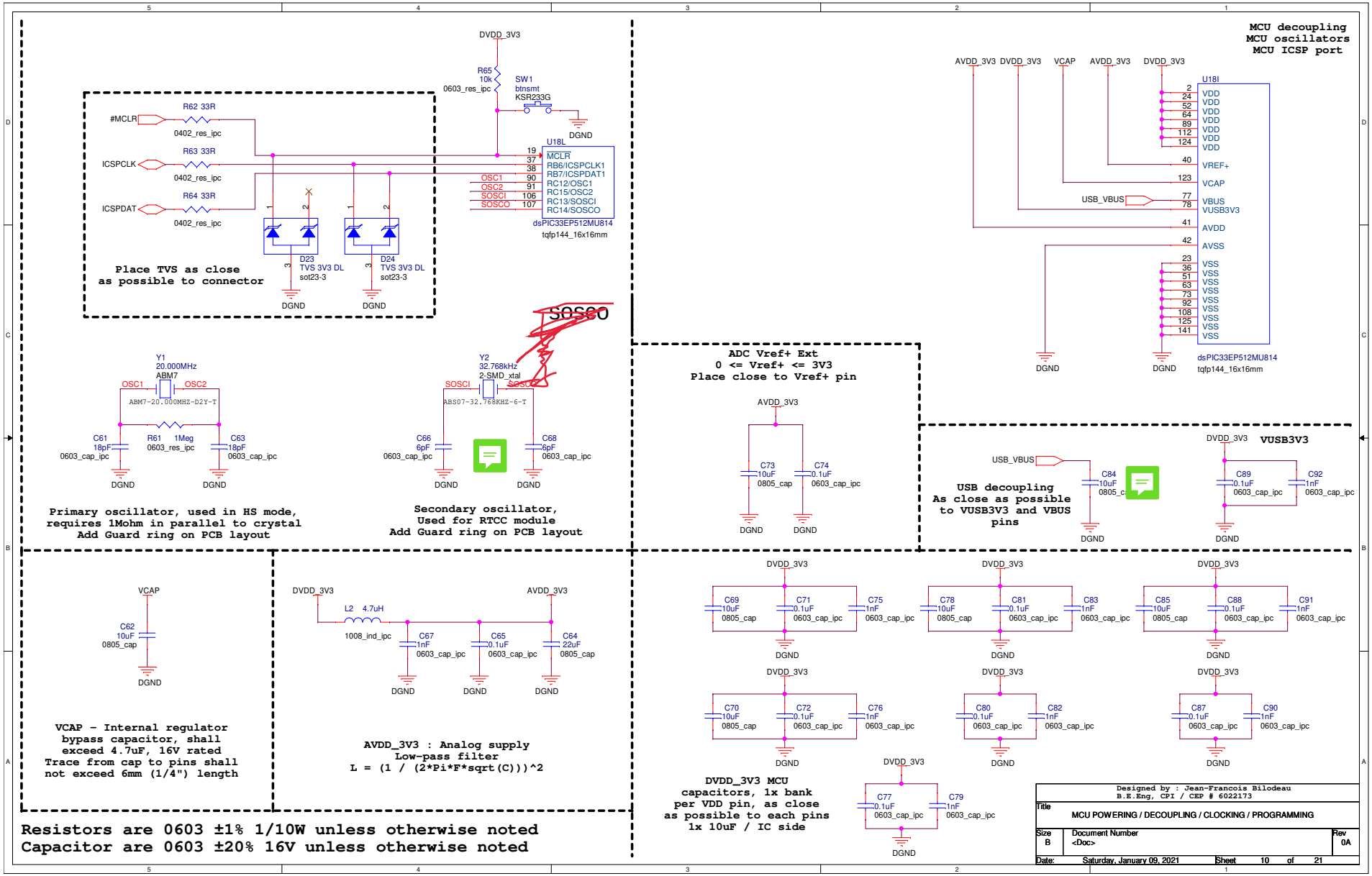
21


MCU decoupling
MCU oscillators
MCU ICSP port
DVDD_3V3
R65 10k 0603_res_ipc
SW1 btnsmt KSR233G
DGND
R62 33R
#MCLR
0402_res_ipc
R63 33R
ICSPCLK
0402_res_ipc
R64 33R
ICSPDAT
0402_res_ipc
U18L
MCLR
RB6/ICSPCLK1
RB7/ICSPDAT1
RC12/OSC1
RC15/OSC2
RC13/SOSCI
RC14/SOSCO
dsPIC33EP512MU814
tqfp144_16x16mm
D23 TVS 3V3 DL sot23-3
D24 TVS 3V3 DL sot23-3
Place TVS as close as possible to connector
SOSCO
Y1 20.000MHz ABM7
ABM7-20.000MHZ-D2Y-T
C61 18pF 0603_cap_ipc
R61 1Meg 0603_res_ipc
C63 18pF 0603_cap_ipc
Primary oscillator, used in HS mode, requires 1Mohm in parallel to crystal
Add Guard ring on PCB layout
Y2 32.768kHz 2-SMD_xtal
ABS07-32.768KHZ-6-T
C66 6pF 0603_cap_ipc
C68 6pF 0603_cap_ipc
Secondary oscillator, Used for RTCC module
Add Guard ring on PCB layout
ADC Vref+ Ext
0 <= Vref+ <= 3V3
Place close to Vref+ pin
AVDD_3V3
C73 10uF 0805_cap
C74 0.1uF 0603_cap_ipc
AVDD_3V3 DVDD_3V3 VCAP AVDD_3V3 DVDD_3V3
VDD
VREF+
VCAP
USB_VBUS
VBUS
VUSB3V3
AVDD
AVSS
VSS
dsPIC33EP512MU814
tqfp144_16x16mm
USB_VBUS
C84 10uF 0805_c
USB decoupling
As close as possible to VUSB3V3 and VBUS pins
DVDD_3V3 VUSB3V3
C89 0.1uF 0603_cap_ipc
C92 1nF 0603_cap_ipc
VCAP
C62 10uF 0805_cap
VCAP - Internal regulator bypass capacitor, shall exceed 4.7uF, 16V rated
Trace from cap to pins shall not exceed 6mm (1/4") length
DVDD_3V3
L2 4.7uH 1008_ind_ipc
AVDD_3V3
C67 1nF 0603_cap_ipc
C65 0.1uF 0603_cap_ipc
C64 22uF 0805_cap
AVDD_3V3 : Analog supply
Low-pass filter
L = (1 / (2*Pi*F*sqrt(C)))^2
C69 10uF 0805_cap
C71 0.1uF 0603_cap_ipc
C75 1nF 0603_cap_ipc
C78 10uF 0805_cap
C81 0.1uF 0603_cap_ipc
C83 1nF 0603_cap_ipc
C85 10uF 0805_cap
C88 0.1uF 0603_cap_ipc
C91 1nF 0603_cap_ipc
C70 10uF 0805_cap
C72 0.1uF 0603_cap_ipc
C76 1nF 0603_cap_ipc
C80 0.1uF 0603_cap_ipc
C82 1nF 0603_cap_ipc
C87 0.1uF 0603_cap_ipc
C90 1nF 0603_cap_ipc
C77 0.1uF 0603_cap_ipc
C79 1nF 0603_cap_ipc
DVDD_3V3 MCU capacitors, 1x bank per VDD pin, as close as possible to each pins
1x 10uF / IC side
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
MCU POWERING / DECOUPLING / CLOCKING / PROGRAMMING
Size B
Document Number
<Doc>
Rev 0A
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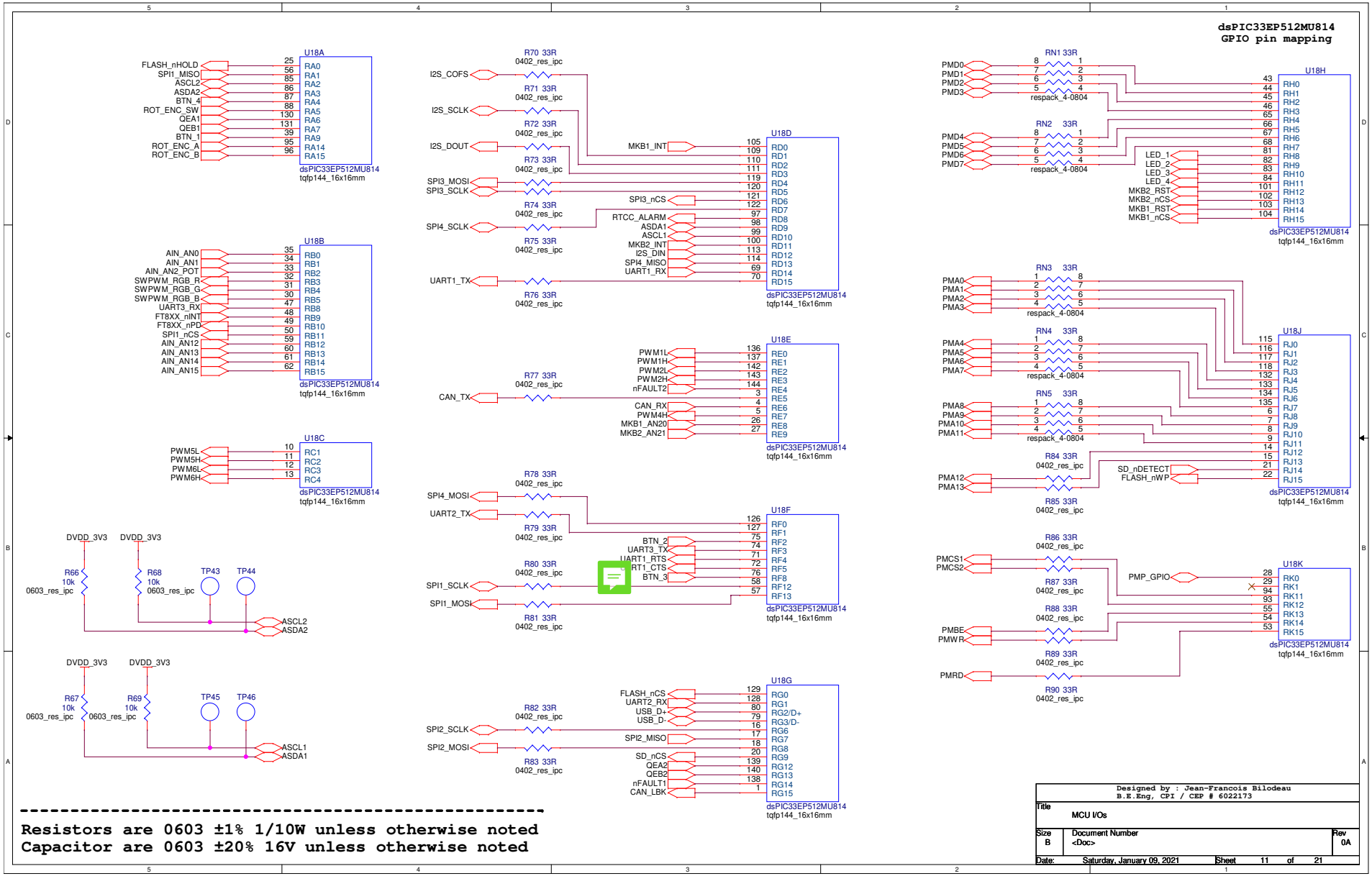
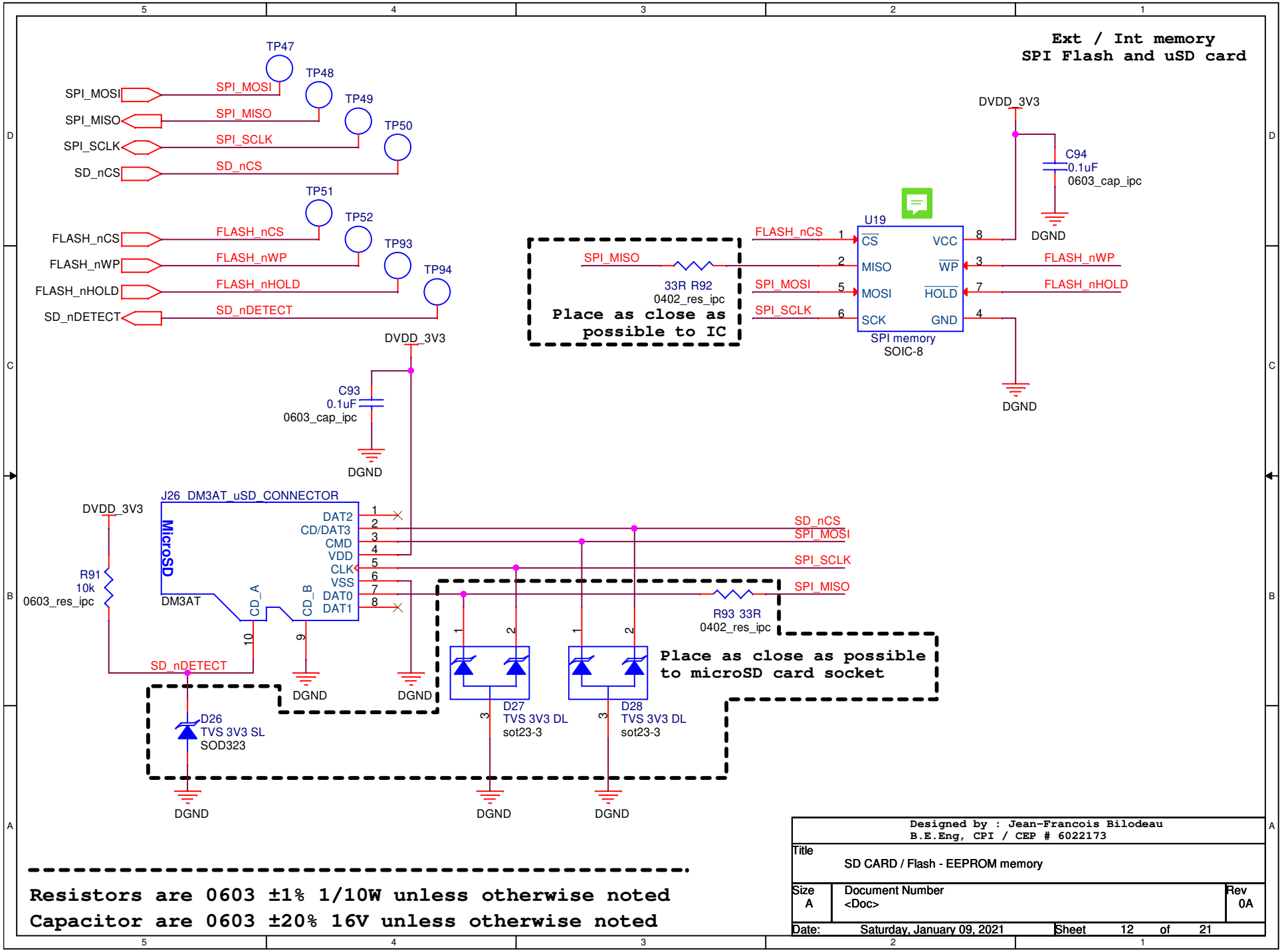

dsPIC33EP512MU814
GPIO pin mapping
U18A
FLASH_nHOLD 25 RA0
SPI1_MISO 56 RA1
ASCL2 85 RA2
ASDA2 86 RA3
BTN_4 87 RA4
ROT_ENC_SW 88 RA5
QEA1 130 RA6
QEB1 131 RA7
BTN_1 39 RA9
ROT_ENC_A 95 RA14
ROT_ENC_B 96 RA15
dsPIC33EP512MU814
tqfp144_16x16mm
U18B
AIN_AN0 35 RB0
AIN_AN1 34 RB1
AIN_AN2_POT 33 RB2
SWPWM_RGB_R 32 RB3
SWPWM_RGB_G 31 RB4
SWPWM_RGB_B 30 RB5
UART3_RX 47 RB8
FT8XX_nINT 48 RB9
FT8XX_nPD 49 RB10
SPI1_nCS 50 RB11
AIN_AN12 59 RB12
AIN_AN13 60 RB13
AIN_AN14 61 RB14
AIN_AN15 62 RB15
dsPIC33EP512MU814
tqfp144_16x16mm
U18C
PWM5L 10 RC1
PWM5H 11 RC2
PWM6L 12 RC3
PWM6H 13 RC4
dsPIC33EP512MU814
tqfp144_16x16mm
DVDD_3V3
DVDD_3V3
R66 10k 0603_res_ipc
R68 10k 0603_res_ipc
TP43
TP44
ASCL2
ASDA2
DVDD_3V3
DVDD_3V3
R67 10k 0603_res_ipc
R69 10k 0603_res_ipc
TP45
TP46
ASCL1
ASDA1
R70 33R 0402_res_ipc
I2S_COFS
R71 33R 0402_res_ipc
I2S_SCLK
R72 33R 0402_res_ipc
I2S_DOUT
R73 33R 0402_res_ipc
SPI3_MOSI
SPI3_SCLK
R74 33R 0402_res_ipc
SPI4_SCLK
R75 33R 0402_res_ipc
UART1_TX
R76 33R 0402_res_ipc
U18D
MKB1_INT 105 RD0
109 RD1
110 RD2
111 RD3
119 RD4
120 RD5
SPI3_nCS 121 RD6
RTCC_ALARM 122 RD7
ASDA1 97 RD8
ASCL1 98 RD9
MKB2_INT 99 RD10
I2S_DIN 100 RD11
SPI4_MISO 113 RD12
UART1_RX 114 RD13
69 RD14
70 RD15
dsPIC33EP512MU814
tqfp144_16x16mm
R77 33R 0402_res_ipc
CAN_TX
U18E
PWM1L 136 RE0
PWM1H 137 RE1
PWM2L 142 RE2
PWM2H 143 RE3
nFAULT2 144 RE4
3 RE5
CAN_RX 4 RE6
PWM4H 5 RE7
MKB1_AN20 26 RE8
MKB2_AN21 27 RE9
dsPIC33EP512MU814
tqfp144_16x16mm
R78 33R 0402_res_ipc
SPI4_MOSI
UART2_TX
R79 33R 0402_res_ipc
R80 33R 0402_res_ipc
SPI1_SCLK
SPI1_MOSI
R81 33R 0402_res_ipc
U18F
126 RF0
127 RF1
BTN_2 75 RF2
UART3_TX 74 RF3
UART1_RTS 71 RF4
UART1_CTS 72 RF5
BTN_3 76 RF8
58 RF12
57 RF13
dsPIC33EP512MU814
tqfp144_16x16mm
R82 33R 0402_res_ipc
SPI2_SCLK
SPI2_MOSI
R83 33R 0402_res_ipc
U18G
FLASH_nCS 129 RG0
UART2_RX 128 RG1
USB_D+ 80 RG2/D+
USB_D- 79 RG3/D-
16 RG6
17 RG7
SPI2_MISO 18 RG8
SD_nCS 20 RG9
QEA2 139 RG12
QEB2 140 RG13
nFAULT1 138 RG14
CAN_LBK 1 RG15
dsPIC33EP512MU814
tqfp144_16x16mm
RN1 33R
PMD0 8 1
PMD1 7 2
PMD2 6 3
PMD3 5 4
respack_4-0804
RN2 33R
PMD4 8 1
PMD5 7 2
PMD6 6 3
PMD7 5 4
respack_4-0804
U18H
43 RH0
44 RH1
45 RH2
46 RH3
65 RH4
66 RH5
67 RH6
68 RH7
81 RH8
82 RH9
83 RH10
84 RH11
LED_1 101 RH12
LED_2 102 RH13
LED_3 103 RH14
LED_4 104 RH15
MKB2_RST
MKB2_nCS
MKB1_RST
MKB1_nCS
dsPIC33EP512MU814
tqfp144_16x16mm
RN3 33R
PMA0 1 8
PMA1 2 7
PMA2 3 6
PMA3 4 5
respack_4-0804
RN4 33R
PMA4 1 8
PMA5 2 7
PMA6 3 6
PMA7 4 5
respack_4-0804
RN5 33R
PMA8 1 8
PMA9 2 7
PMA10 3 6
PMA11 4 5
respack_4-0804
R84 33R 0402_res_ipc
PMA12
PMA13
R85 33R 0402_res_ipc
U18J
115 RJ0
116 RJ1
117 RJ2
118 RJ3
132 RJ4
133 RJ5
134 RJ6
135 RJ7
6 RJ8
7 RJ9
8 RJ10
9 RJ11
14 RJ12
15 RJ13
SD_nDETECT 21 RJ14
FLASH_nWP 22 RJ15
dsPIC33EP512MU814
tqfp144_16x16mm
R86 33R 0402_res_ipc
PMCS1
PMCS2
R87 33R 0402_res_ipc
R88 33R 0402_res_ipc
PMBE
PMWR
R89 33R 0402_res_ipc
PMRD
R90 33R 0402_res_ipc
U18K
PMP_GPIO 28 RK0
29 RK1
94 RK11
93 RK12
55 RK13
54 RK14
53 RK15
dsPIC33EP512MU814
tqfp144_16x16mm
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
MCU I/Os
Size B
Document Number
<Doc>
Rev 0A
Date: Saturday, January 09, 2021
Sheet 11 of 21


Ext / Int memory
SPI Flash and uSD card
TP47
TP48
TP49
TP50
TP51
TP52
TP93
TP94
SPI_MOSI
SPI_MISO
SPI_SCLK
SD_nCS
FLASH_nCS
FLASH_nWP
FLASH_nHOLD
SD_nDETECT
DVDD_3V3
C94
0.1uF
0603_cap_ipc
DGND
U19
CS
MISO
MOSI
SCK
VCC
WP
HOLD
GND
SPI memory
SOIC-8
33R R92
0402_res_ipc
Place as close as possible to IC
C93
0.1uF
0603_cap_ipc
J26_DM3AT_uSD_CONNECTOR
MicroSD
DM3AT
DAT2
CD/DAT3
CMD
VDD
CLK
VSS
DAT0
DAT1
CD_A
CD_B
R91
10k
0603_res_ipc
R93 33R
0402_res_ipc
D26
TVS 3V3 SL
SOD323
D27
TVS 3V3 DL
sot23-3
D28
TVS 3V3 DL
sot23-3
Place as close as possible to microSD card socket
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
SD CARD / Flash - EEPROM memory
Size
A
Document Number
<Doc>
Rev
0A
Date: Saturday, January 09, 2021
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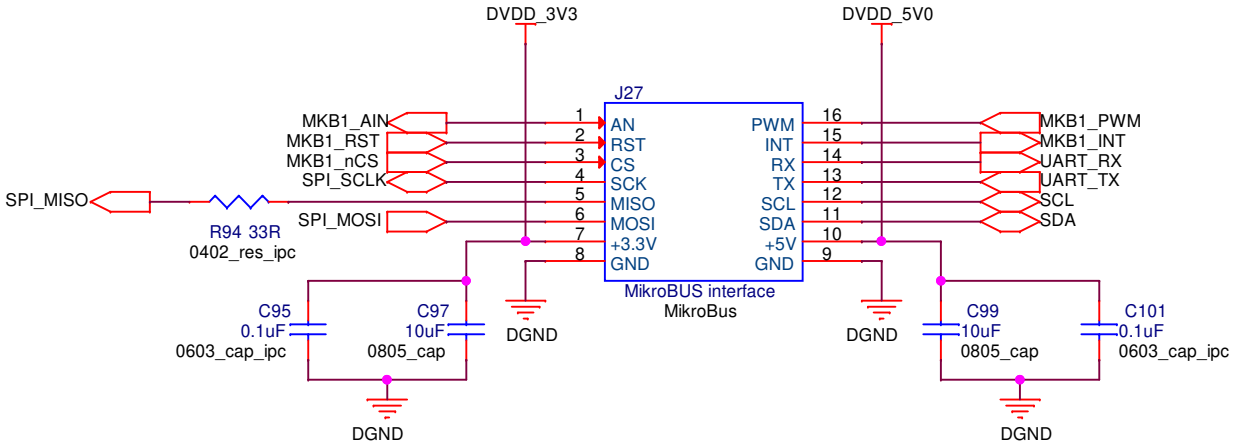
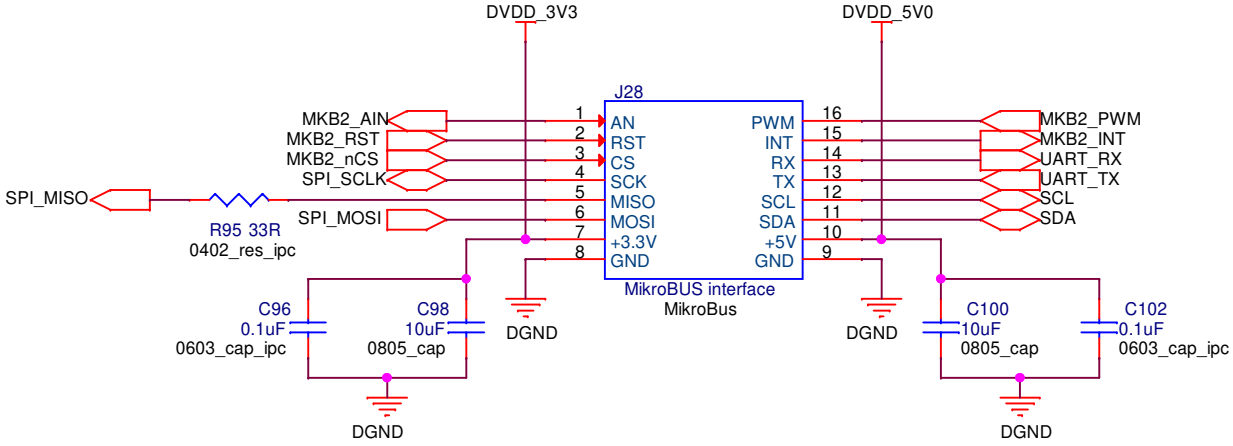
MikroBus port
Click Board compatible
General purpose I/Os

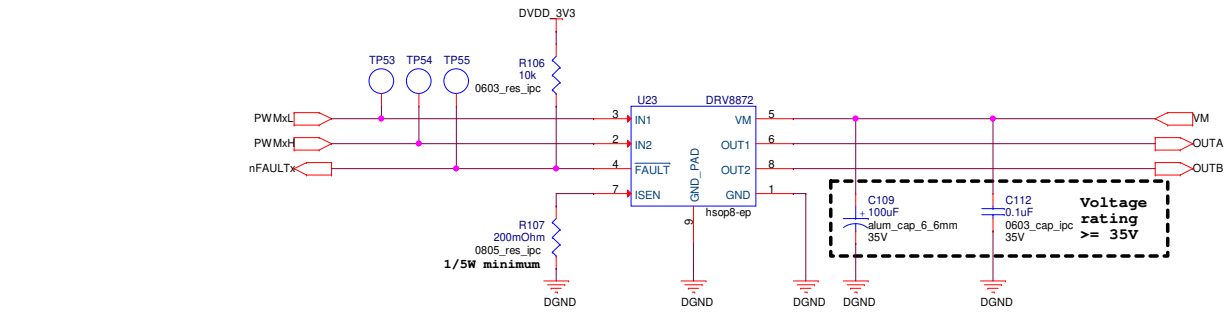




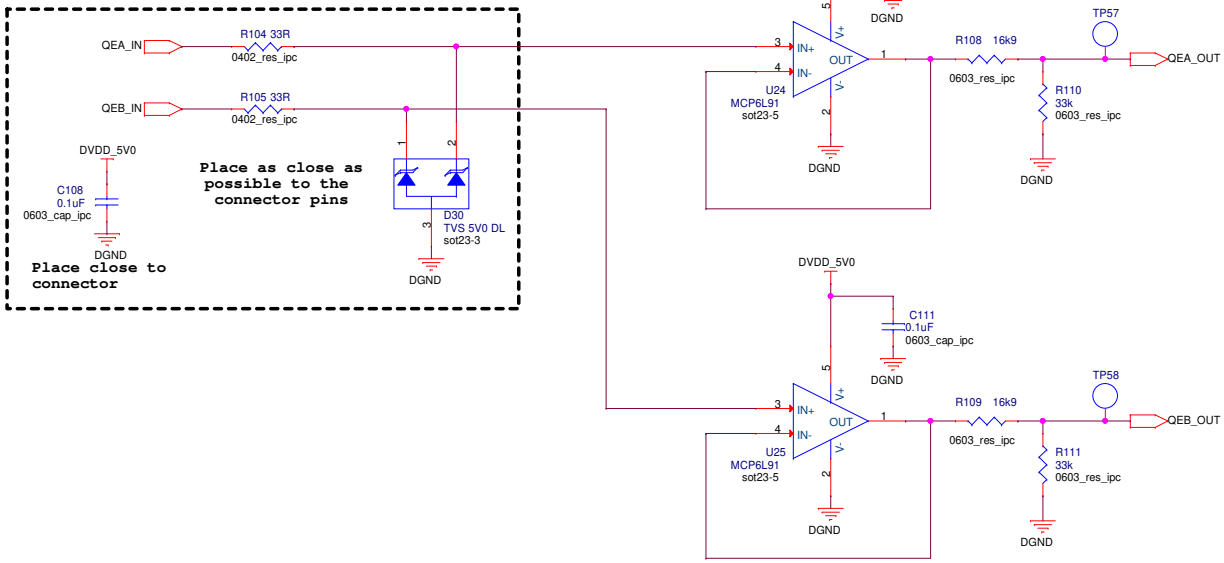
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau B.E.Eng, CPI / CEP # 6022173		
Title: MikroBUS interface		
Size: A	Document Number: <Doc>	Rev: 0A
Date: Saturday, January 09, 2021	Sheet 13 of 21	

Brushed DC motor driver
QEI encoder feedback



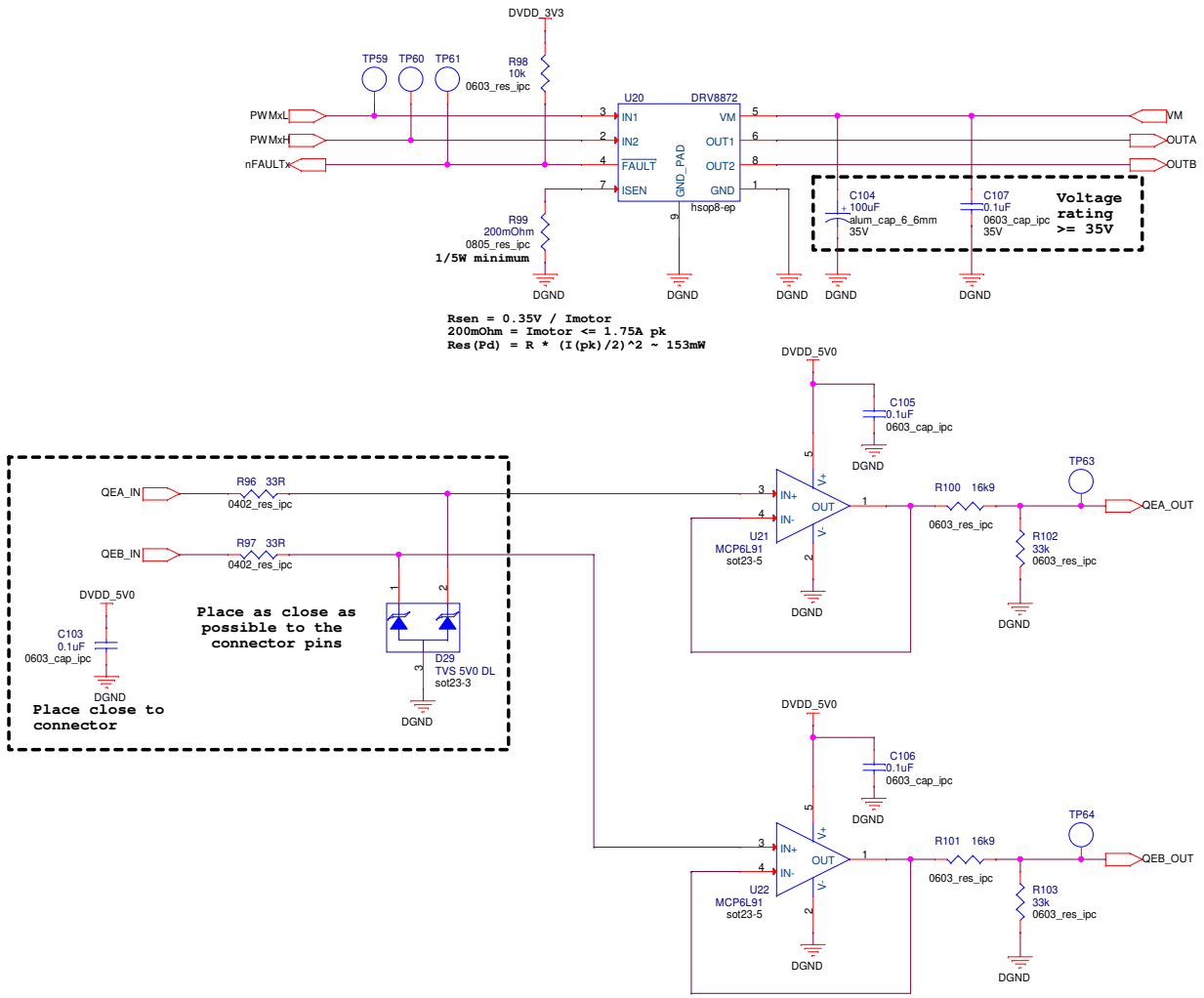
Rsen = 0.35V / Imotor
200mOhm = Imotor <= 1.75A pk
Res(Pd) = R * (I(pk)/2)^2 ~ 153mW



Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau B.E.Eng, CPI / CEP # 6022173		
Title: H-Bridge motor driver with encoder feedback		
Size: B	Document Number: <Doc>	Rev: 0A
Date: Saturday, January 09, 2021	Sheet 14 of 21	

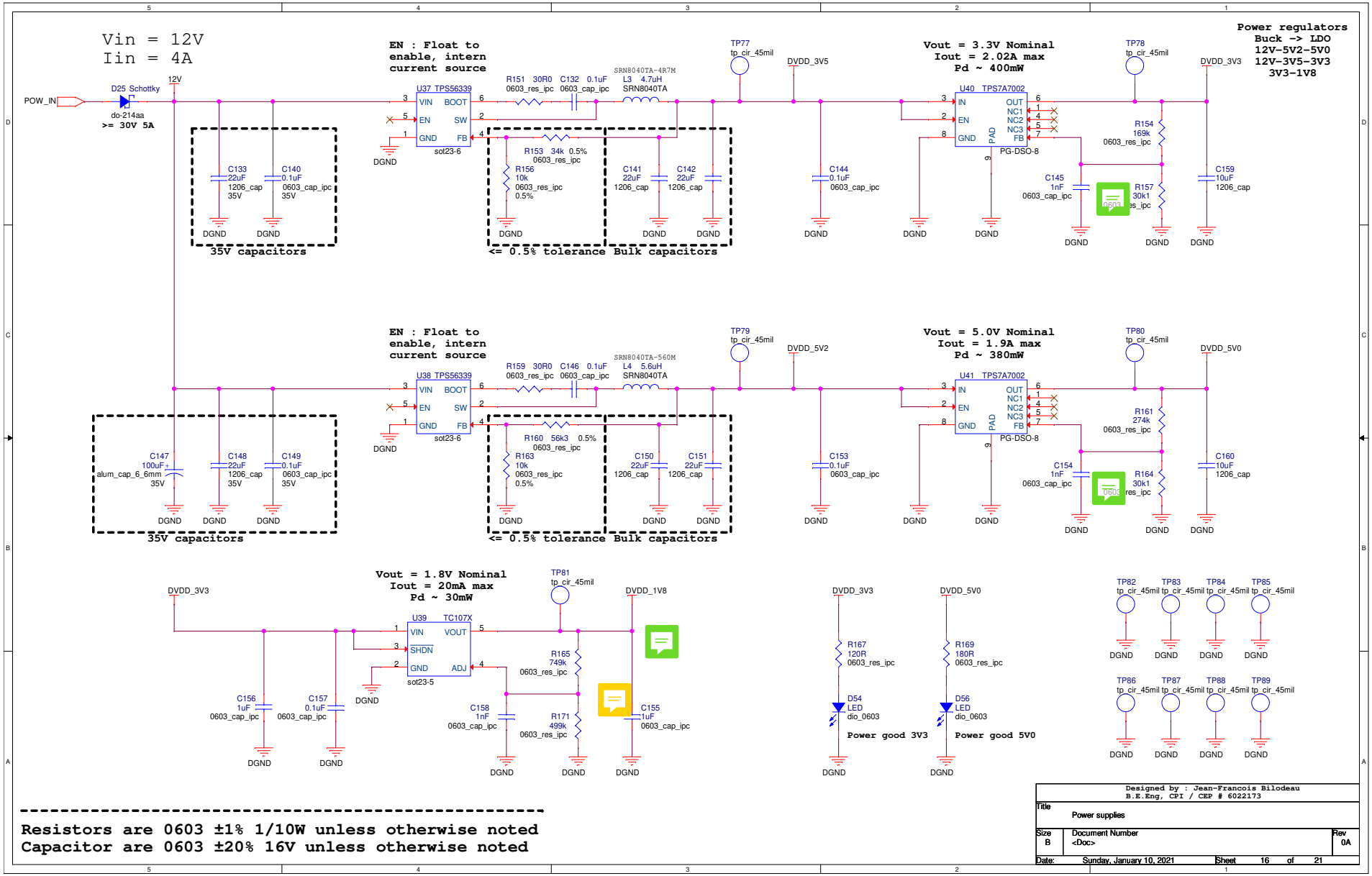
Brushed DC motor driver
QEI encoder feedback



Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173

Title	H-Bridge motor driver with encoder feedback	
Size B	Document Number <Doc>	Rev 0A
Date: Saturday, January 09, 2021	Sheet 15 of 21	


Power regulators
Buck -> LDO
12V-5V2-5V0
12V-3V5-3V3
3V3-1V8
Vin = 12V
Iin = 4A
POW_IN
12V
D25 Schottky
do-214aa
>= 30V 5A
EN : Float to enable, intern current source
U37 TPS56339
VIN BOOT EN SW GND FB
sot23-6
R151 30R0 0603_res_ipc
C132 0.1uF 0603_cap_ipc
L3 4.7uH SRN8040TA
SRN8040TA-4R7M
R153 34k 0.5% 0603_res_ipc
R156 10k 0603_res_ipc 0.5%
C141 22uF 1206_cap
C142 22uF 1206_cap
C133 22uF 1206_cap 35V
C140 0.1uF 0603_cap_ipc 35V
35V capacitors
<= 0.5% tolerance Bulk capacitors
TP77 tp_cir_45mil
DVDD_3V5
C144 0.1uF 0603_cap_ipc
Vout = 3.3V Nominal
Iout = 2.02A max
Pd ~ 400mW
U40 TPS7A7002
IN EN GND PAD OUT NC1 NC2 NC3 FB
PG-DSO-8
TP78 tp_cir_45mil
DVDD_3V3
R154 169k 0603_res_ipc
R157 30k1 0603_res_ipc
C145 1nF 0603_cap_ipc
C159 10uF 1206_cap
EN : Float to enable, intern current source
U38 TPS56339
VIN BOOT EN SW GND FB
sot23-6
R159 30R0 0603_res_ipc
C146 0.1uF 0603_cap_ipc
L4 5.6uH SRN8040TA
SRN8040TA-560M
R160 56k3 0.5% 0603_res_ipc
R163 10k 0603_res_ipc 0.5%
C150 22uF 1206_cap
C151 22uF 1206_cap
C147 100uF alum_cap_6_6mm 35V
C148 22uF 1206_cap 35V
C149 0.1uF 0603_cap_ipc 35V
35V capacitors
<= 0.5% tolerance Bulk capacitors
TP79 tp_cir_45mil
DVDD_5V2
C153 0.1uF 0603_cap_ipc
Vout = 5.0V Nominal
Iout = 1.9A max
Pd ~ 380mW
U41 TPS7A7002
IN EN GND PAD OUT NC1 NC2 NC3 FB
PG-DSO-8
TP80 tp_cir_45mil
DVDD_5V0
R161 274k 0603_res_ipc
R164 30k1 0603_res_ipc
C154 1nF 0603_cap_ipc
C160 10uF 1206_cap
Vout = 1.8V Nominal
Iout = 20mA max
Pd ~ 30mW
U39 TC107X
VIN VOUT SHDN GND ADJ
sot23-5
TP81 tp_cir_45mil
DVDD_1V8
DVDD_3V3
R165 749k 0603_res_ipc
R171 499k 0603_res_ipc
C156 1uF 0603_cap_ipc
C157 0.1uF 0603_cap_ipc
C158 1nF 0603_cap_ipc
C155 1uF 0603_cap_ipc
DVDD_3V3
R167 120R 0603_res_ipc
D54 LED dio_0603
Power good 3V3
DVDD_5V0
R169 180R 0603_res_ipc
D56 LED dio_0603
Power good 5V0
TP82 TP83 TP84 TP85 TP86 TP87 TP88 TP89 tp_cir_45mil
DGND
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
Power supplies
Size B
Document Number
<Doc>
Rev 0A
Date: Sunday, January 10, 2021
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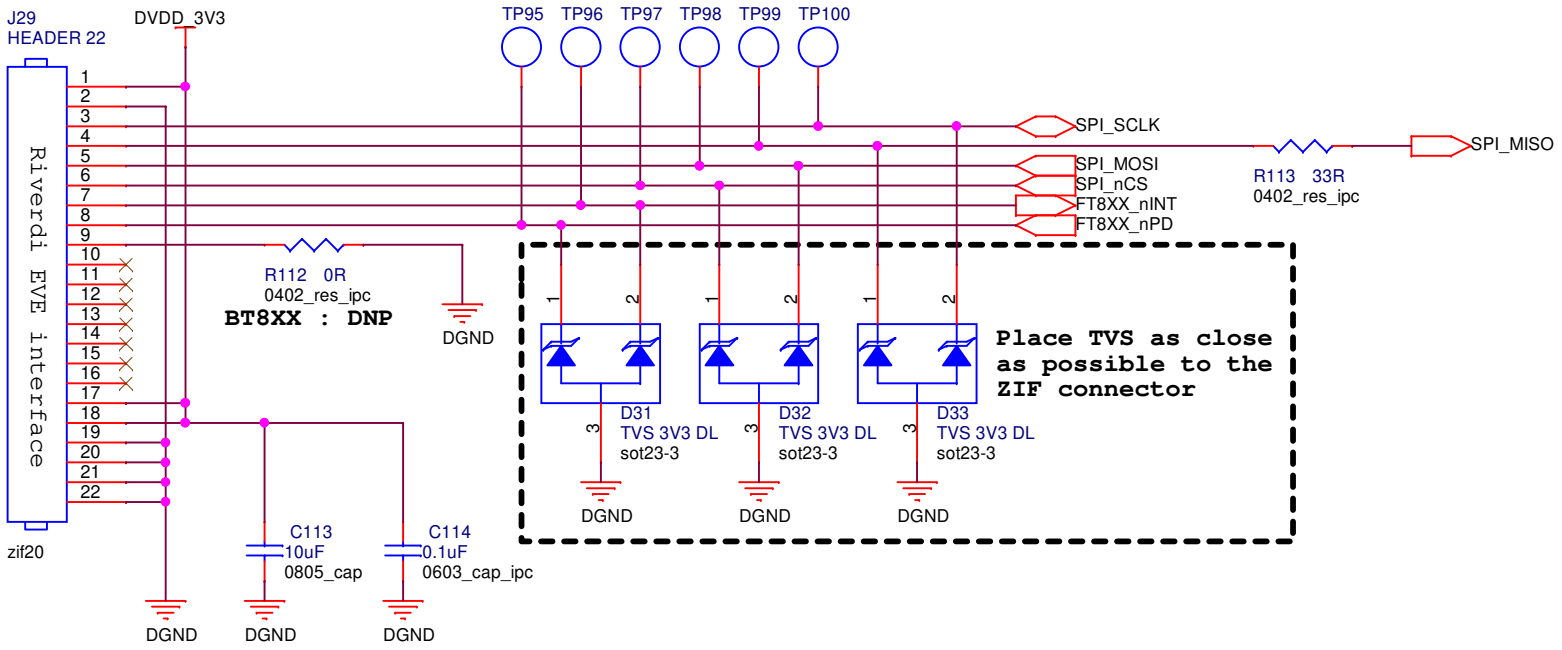
Riverdi EVE TFT Interface with FT/BT8xx



Resistors are 0603 ±1% 1/10W unless otherwise noted

Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau B.E.Eng, CPI / CEP # 6022173		
Title: Riverdi EVE LCD interface		
Size: A	Document Number: <Doc>	Rev: 0A
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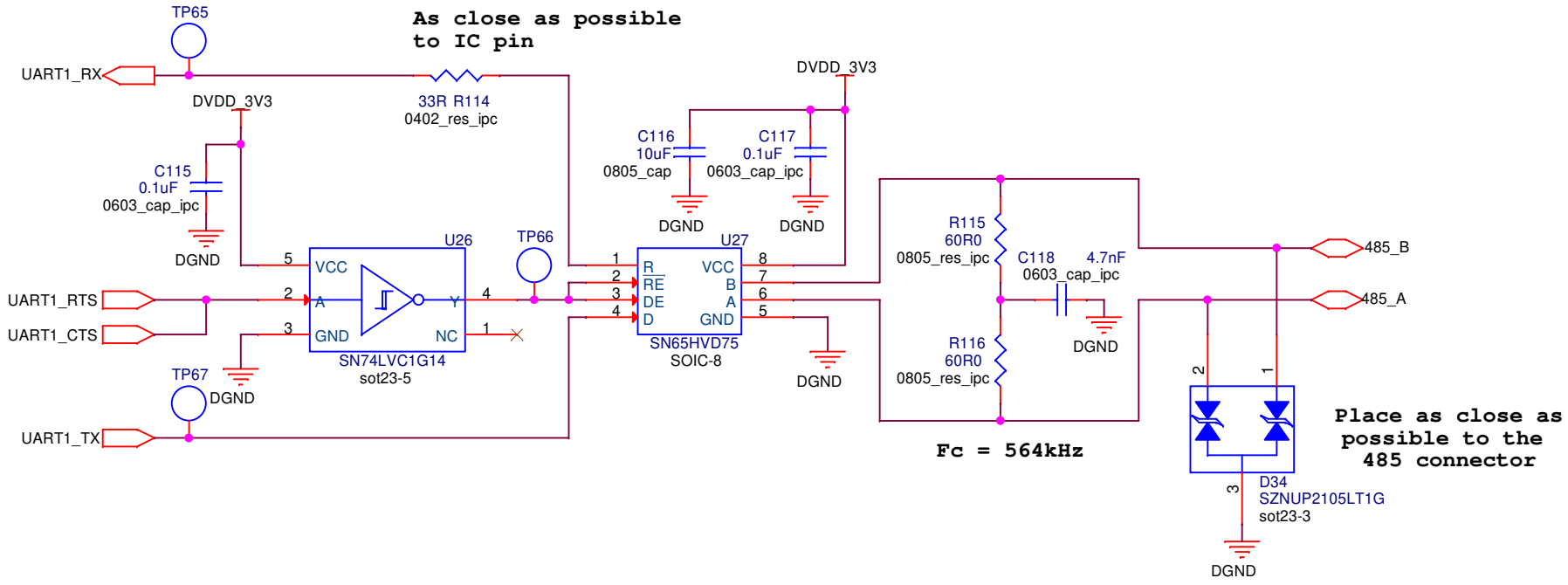
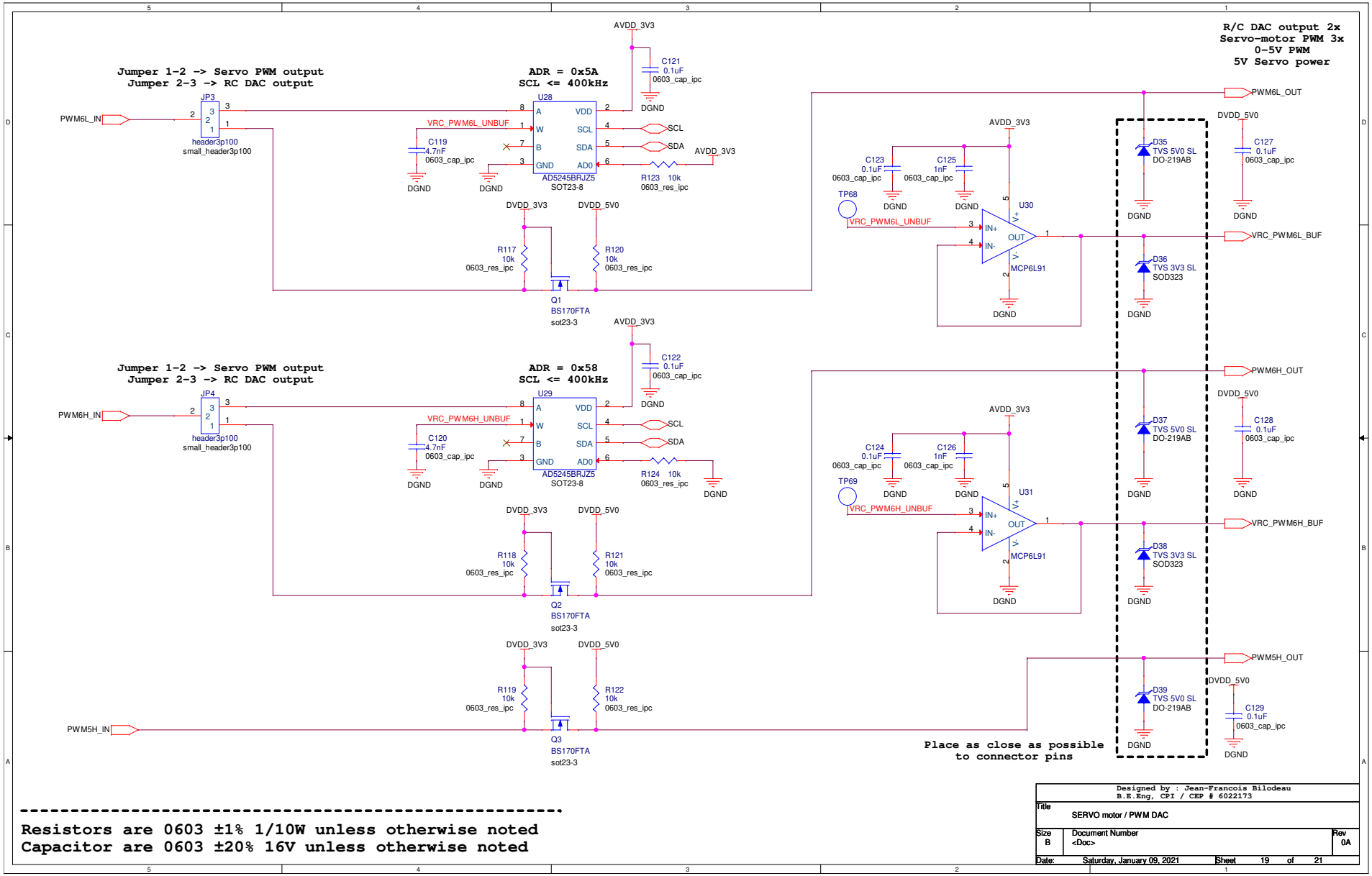
RS485 bus interface
Max bitrate 550kbps



Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau B.E.Eng, CPI / CEP # 6022173		
Title: RS485 bus interface		
Size: A	Document Number: <Doc>	Rev: 0A
Date: Saturday, January 09, 2021	Sheet 18 of 21	


R/C DAC output 2x
Servo-motor PWM 3x
0-5V PWM
5V Servo power
Jumper 1-2 -> Servo PWM output
Jumper 2-3 -> RC DAC output
ADR = 0x5A
SCL <= 400kHz
JP3
PWM6L_IN
header3p100
small_header3p100
U28
AD5245BRJZ5
SOT23-8
VRC_PWM6L_UNBUF
C119
4.7nF
0603_cap_ipc
C121
0.1uF
0603_cap_ipc
R123 10k
0603_res_ipc
R117
10k
0603_res_ipc
R120
10k
0603_res_ipc
Q1
BS170FTA
sot23-3
AVDD_3V3
DVDD_3V3
DVDD_5V0
DGND
SCL
SDA
TP68
U30
MCP6L91
C123
0.1uF
C125
1nF
PWM6L_OUT
VRC_PWM6L_BUF
D35
TVS 5V0 SL
DO-219AB
D36
TVS 3V3 SL
SOD323
C127
0.1uF
Jumper 1-2 -> Servo PWM output
Jumper 2-3 -> RC DAC output
ADR = 0x58
SCL <= 400kHz
JP4
PWM6H_IN
U29
VRC_PWM6H_UNBUF
C120
4.7nF
C122
0.1uF
R124 10k
R118
10k
R121
10k
Q2
BS170FTA
TP69
U31
C124
0.1uF
C126
1nF
PWM6H_OUT
VRC_PWM6H_BUF
D37
TVS 5V0 SL
DO-219AB
D38
TVS 3V3 SL
SOD323
C128
0.1uF
PWM5H_IN
R119
10k
R122
10k
Q3
BS170FTA
D39
TVS 5V0 SL
DO-219AB
C129
0.1uF
Place as close as possible
to connector pins
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
SERVO motor / PWM DAC
Size
B
Document Number
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Saturday, January 09, 2021
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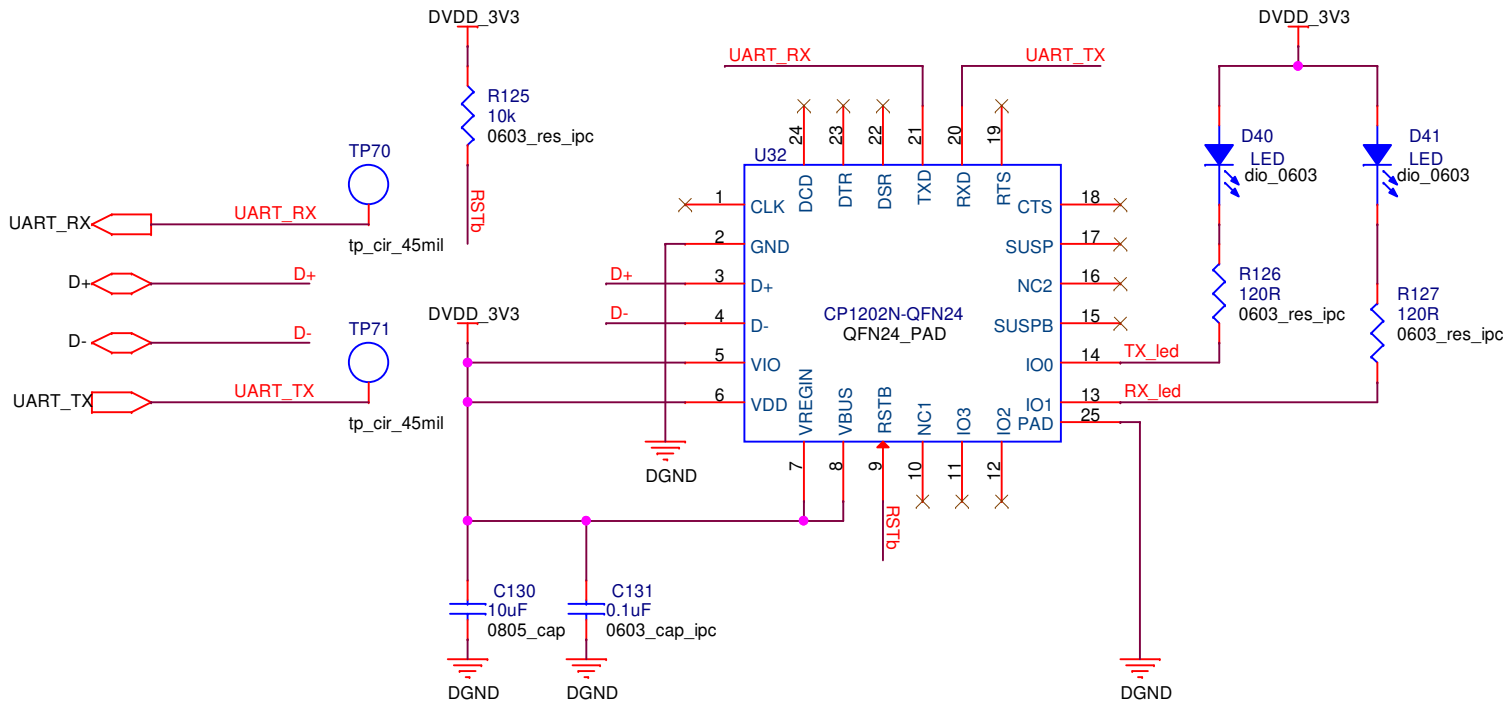
USB-UART Converter
SW debug interface

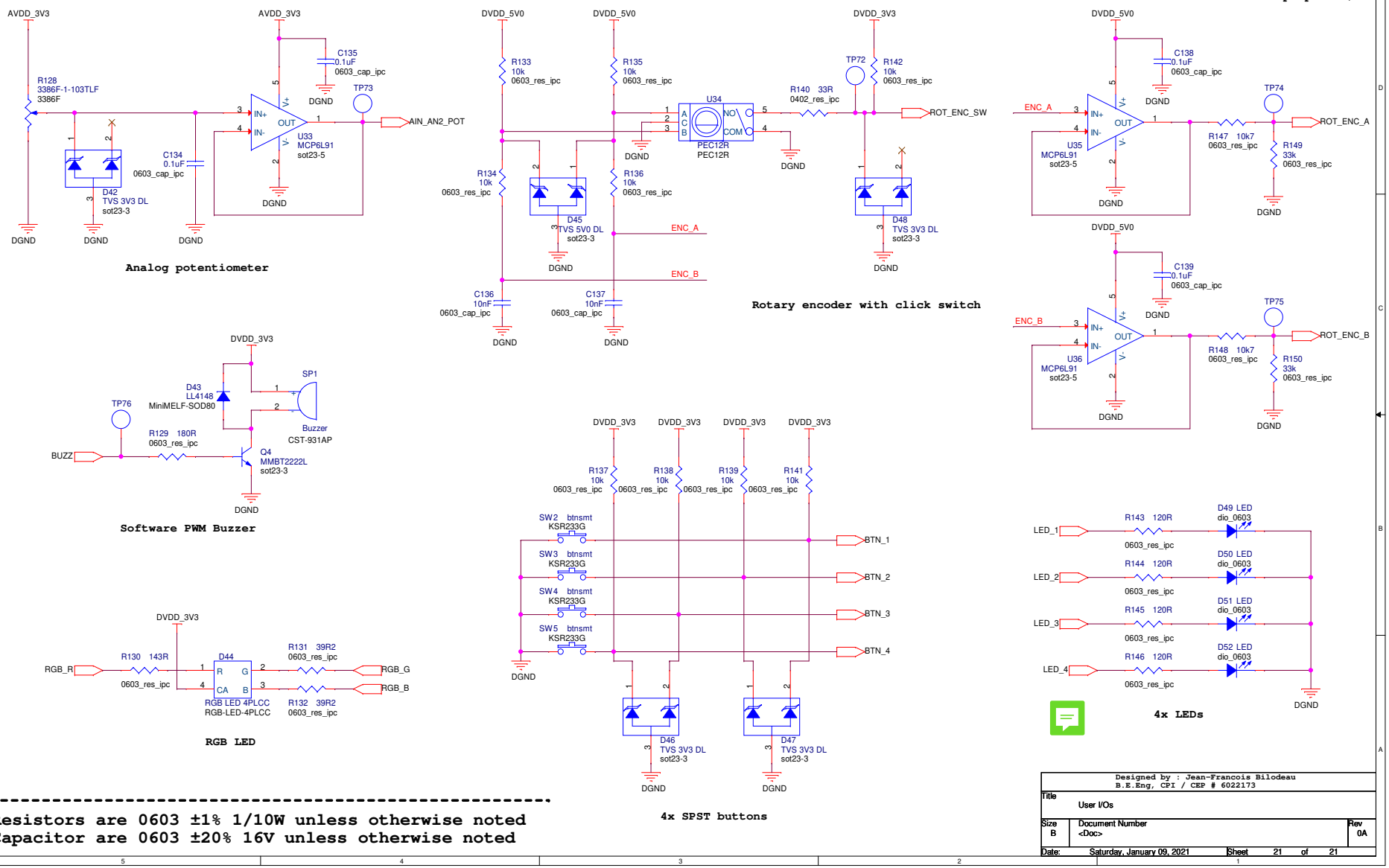


Resistors are 0603 ±1% 1/10W unless otherwise noted

Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173

Title: USB-UART debug interface		
Size: A	Document Number: <Doc>	Rev: 0A
Date: Saturday, January 09, 2021	Sheet 20 of 21	


General purpose I/O
AVDD_3V3
R128
3386F-1-103TLF
3386F
C134
0.1uF
0603_cap_ipc
D42
TVS 3V3 DL
sot23-3
C135
0.1uF
0603_cap_ipc
TP73
U33
MCP6L91
sot23-5
AIN_AN2_POT
DGND
Analog potentiometer
DVDD_5V0
DVDD_3V3
R133
10k
0603_res_ipc
R135
10k
0603_res_ipc
R134
10k
0603_res_ipc
R136
10k
0603_res_ipc
D45
TVS 5V0 DL
sot23-3
U34
PEC12R
PEC12R
TP72
R142
10k
0603_res_ipc
R140 33R
0402_res_ipc
ROT_ENC_SW
D48
TVS 3V3 DL
sot23-3
ENC_A
ENC_B
C136
10nF
0603_cap_ipc
C137
10nF
0603_cap_ipc
Rotary encoder with click switch
C138
0.1uF
0603_cap_ipc
TP74
U35
MCP6L91
sot23-5
R147 10k7
0603_res_ipc
R149
33k
0603_res_ipc
ROT_ENC_A
C139
0.1uF
0603_cap_ipc
TP75
U36
MCP6L91
sot23-5
R148 10k7
0603_res_ipc
R150
33k
0603_res_ipc
ROT_ENC_B
TP76
D43
LL4148
MiniMELF-SOD80
SP1
Buzzer
CST-931AP
R129 180R
0603_res_ipc
BUZZ
Q4
MMBT2222L
sot23-3
Software PWM Buzzer
R137
10k
0603_res_ipc
R138
10k
0603_res_ipc
R139
10k
0603_res_ipc
R141
10k
0603_res_ipc
SW2 btnsmt
KSR233G
SW3 btnsmt
KSR233G
SW4 btnsmt
KSR233G
SW5 btnsmt
KSR233G
BTN_1
BTN_2
BTN_3
BTN_4
D46
TVS 3V3 DL
sot23-3
D47
TVS 3V3 DL
sot23-3
4x SPST buttons
R130 143R
0603_res_ipc
D44
RGB LED 4PLCC
RGB-LED-4PLCC
R131 39R2
0603_res_ipc
R132 39R2
0603_res_ipc
RGB_R
RGB_G
RGB_B
RGB LED
R143 120R
R144 120R
R145 120R
R146 120R
0603_res_ipc
D49 LED
D50 LED
D51 LED
D52 LED
dio_0603
LED_1
LED_2
LED_3
LED_4
4x LEDs
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted
Designed by : Jean-Francois Bilodeau
B.E.Eng, CPI / CEP # 6022173
Title
User I/Os
Size
B
Document Number
<Doc>
Rev
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Date:
Saturday, January 09, 2021
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