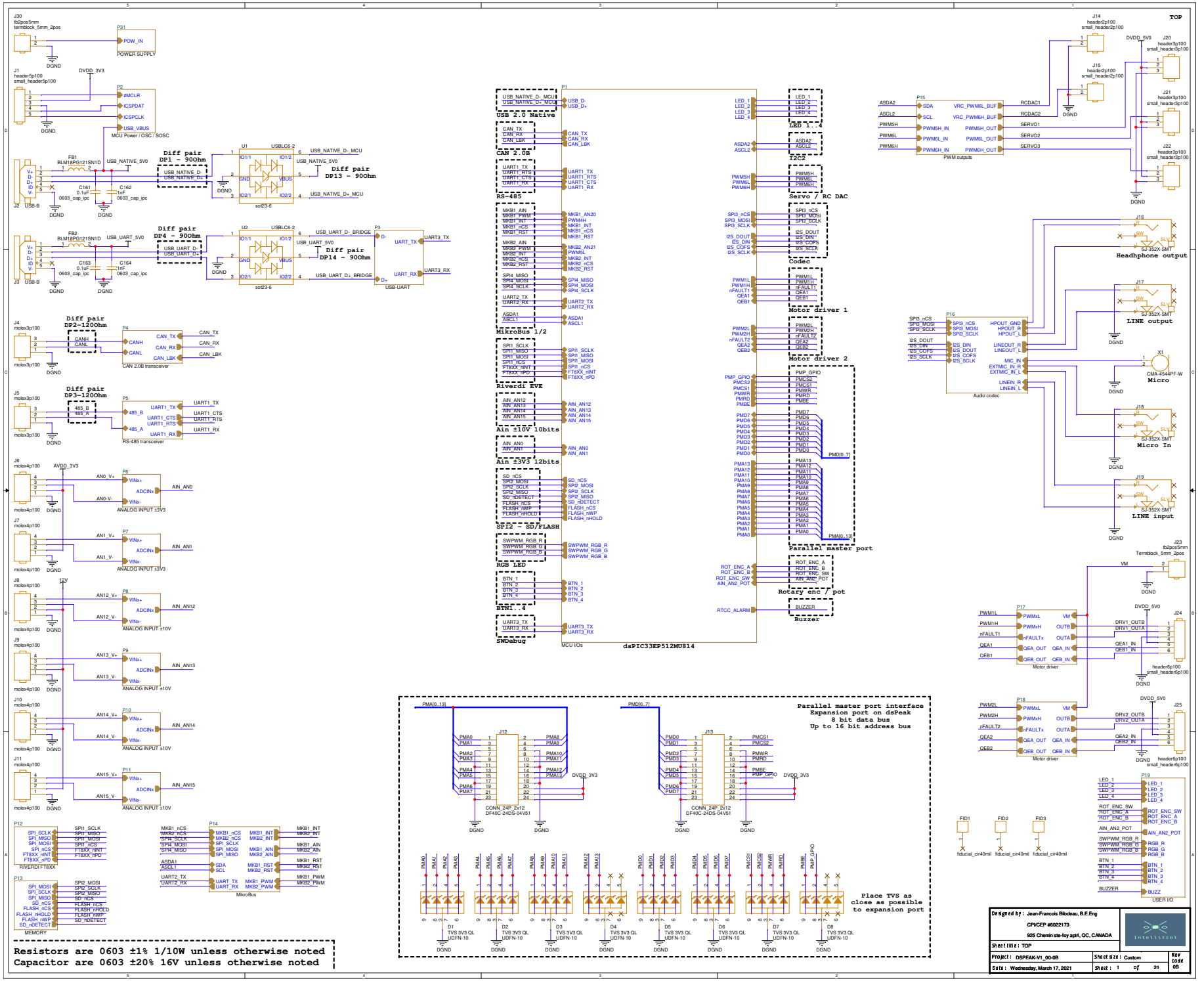
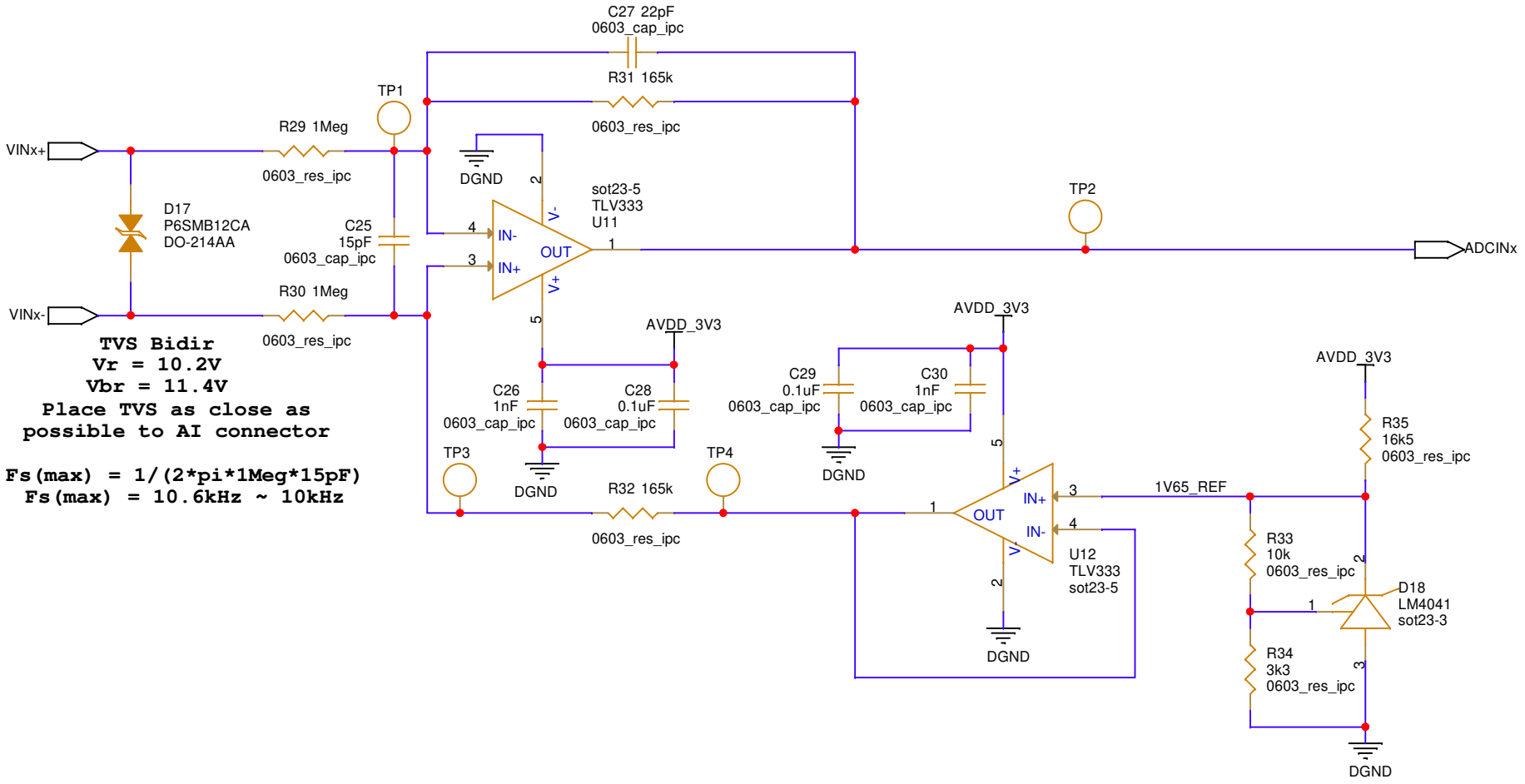

TOP
dsPIC33EP512MU814
MCU I/Os
USB 2.0 Native
CAN 2.0B
RS-485
MikroBus 1/2
Riverdi EVE
Ain ±10V 10bits
Ain ±3V3 12bits
SPI2 - SD/FLASH
RGB LED
BTN1
SWDebug
LED 1..4
I2C2
Servo / RC DAC
Codec
Motor driver 1
Motor driver 2
Parallel master port
Rotary enc / pot
Buzzer
Diff pair DP1 - 900hm
Diff pair DP13 - 90hm
Diff pair DP4 - 900hm
Diff pair DP14 - 90hm
Diff pair DP2-120Ohm
Diff pair DP3-120Ohm
POWER SUPPLY
MCU Power / OSC / SOSC
USB-B
CAN 2.0B transceiver
RS-485 transceiver
ANALOG INPUT ±3V3
ANALOG INPUT ±10V
RIVERDI FT8XX
MEMORY
MikroBus
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
925 Chemin ste-foy apt4, QC, CANADA
Sheet title : TOP
Project : DSPEAK-V1_00-0B
Sheet size : Custom
Rev code 0B
Date : Wednesday, March 17, 2021
Sheet : 1 of 21

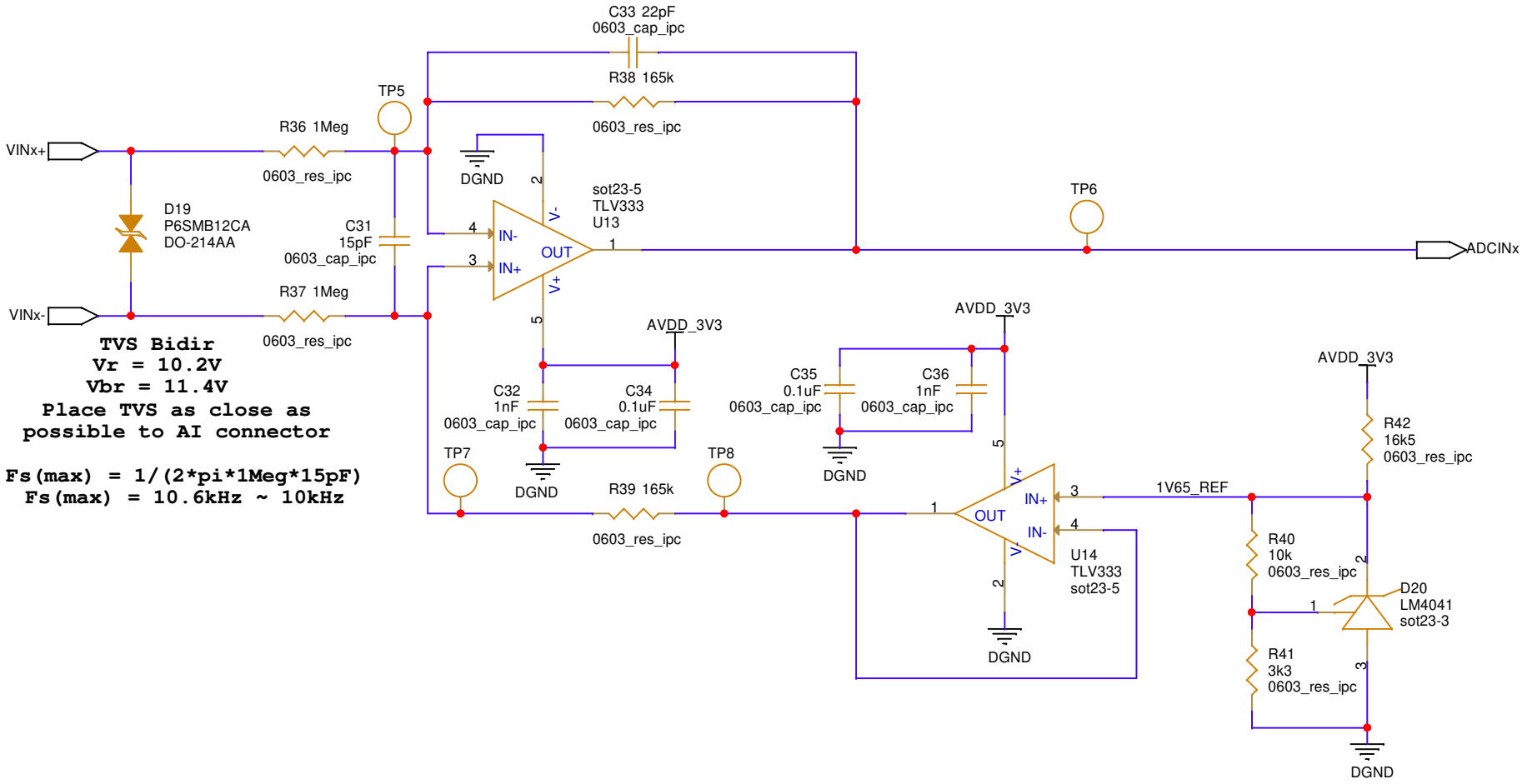
Analog input ±10V
10 bits resolution



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 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Analog input ±10V		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 2 *of* 21	

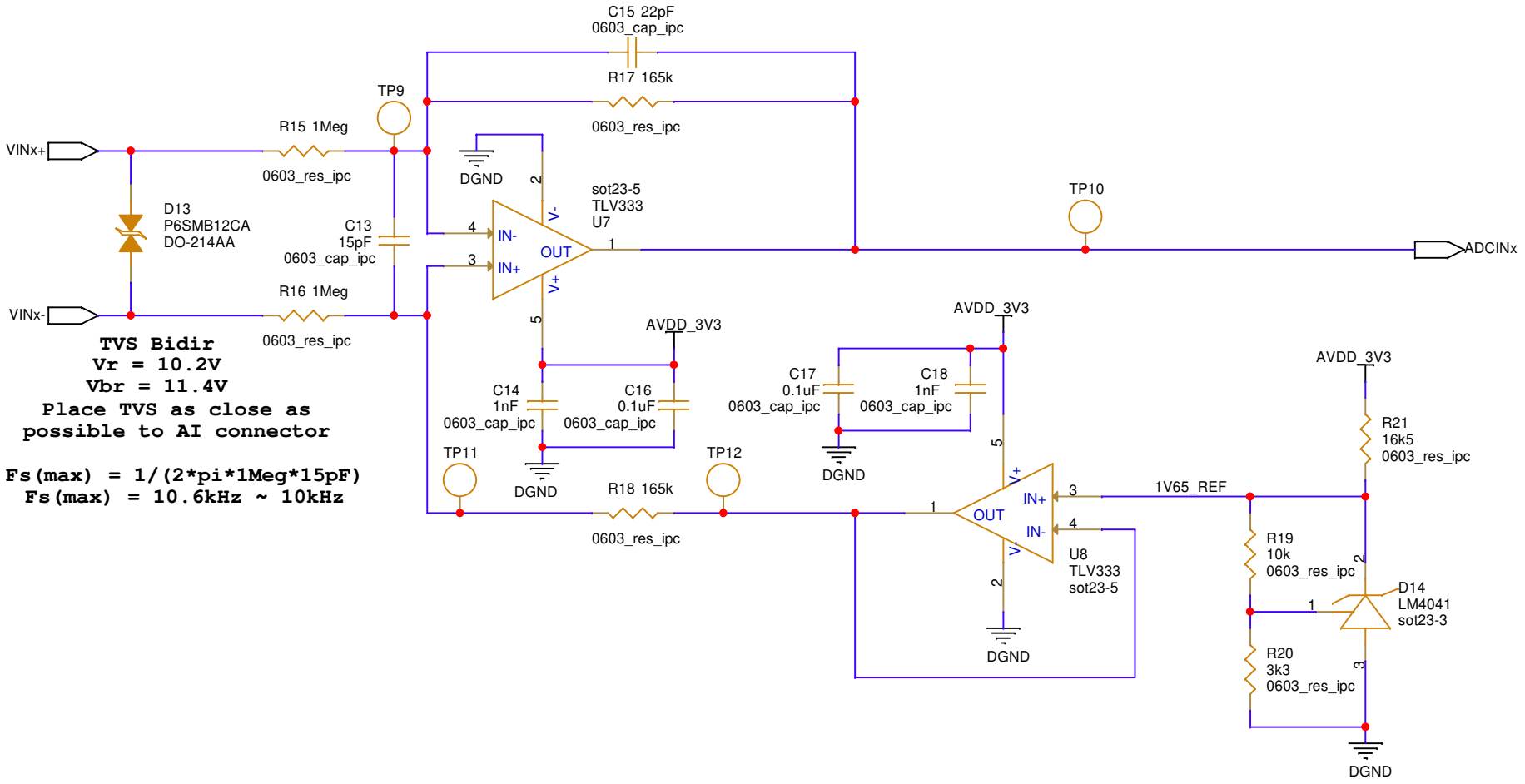
Analog input ±10V
10 bits resolution



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 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Analog input ±10V		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 3 *of* 21	

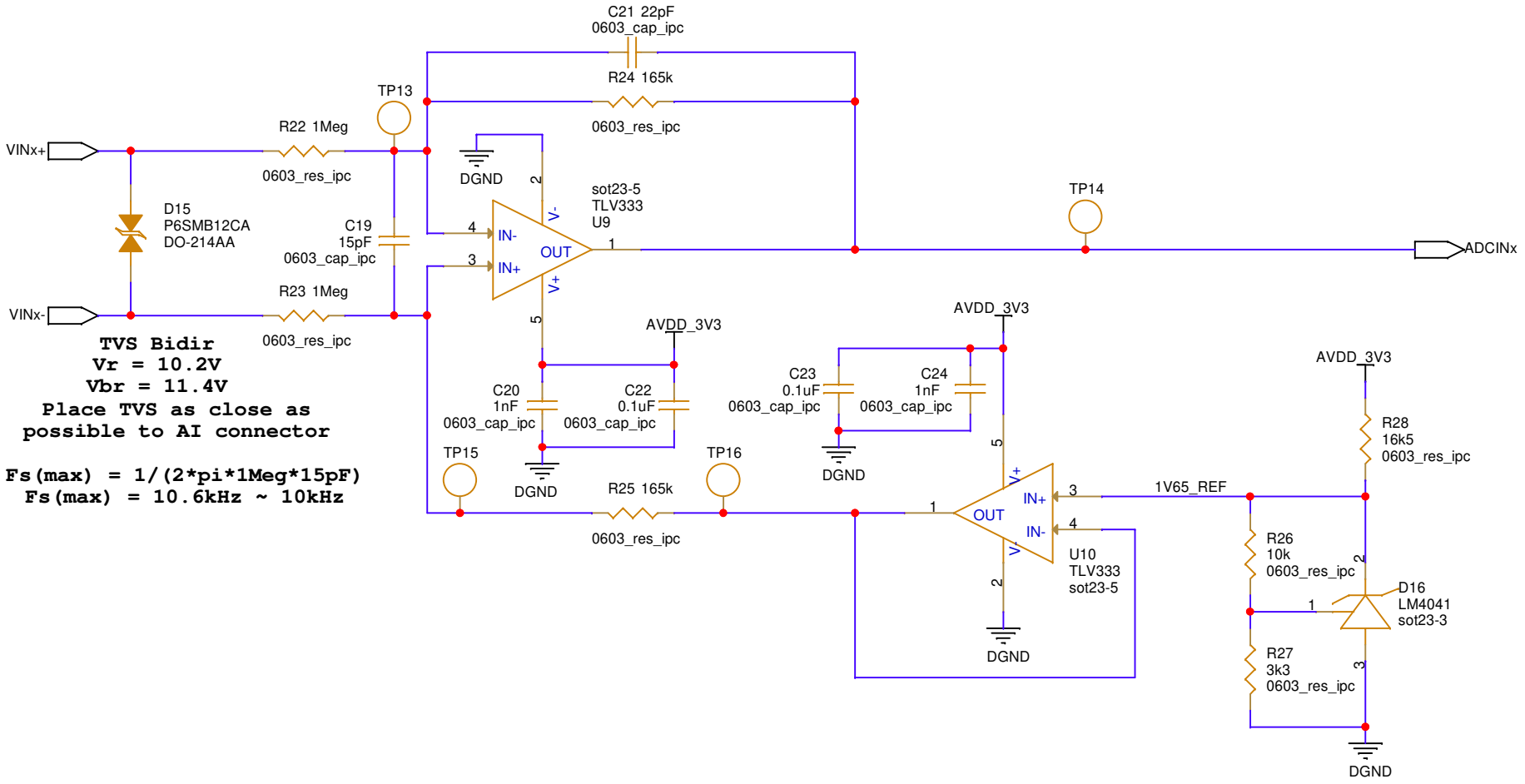
Analog input ±10V
10 bits resolution



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 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Analog input ±10V		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 4 *of* 21	

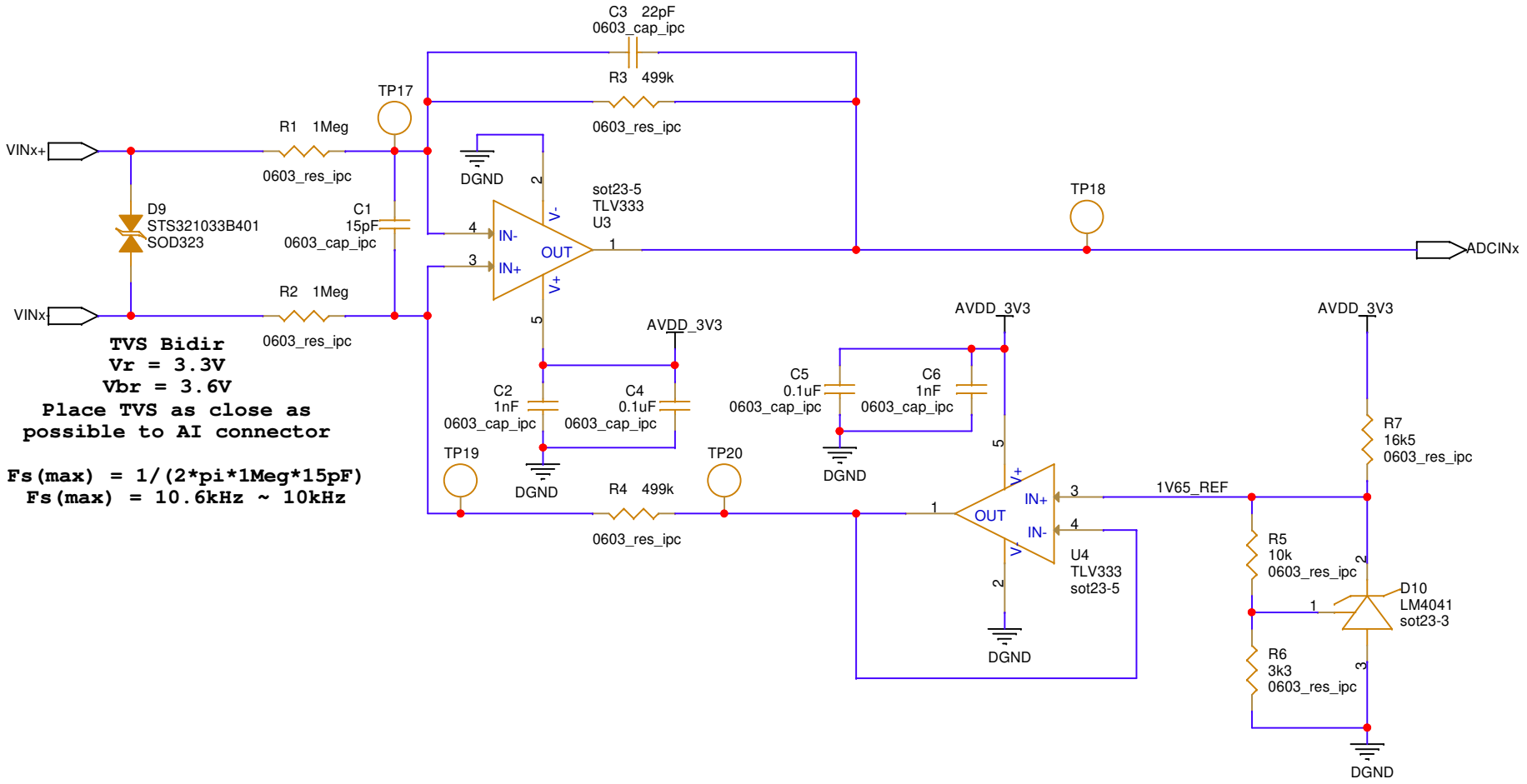
Analog input ±10V
10 bits resolution



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 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Analog input ±10V		
Project : DSPEAK-V1_00-0B	Sheet size : A	Rev code 0B
Date : Wednesday, March 17, 2021	Sheet : 5 of 21	

Analog input ±3.3V
12 bits resolution



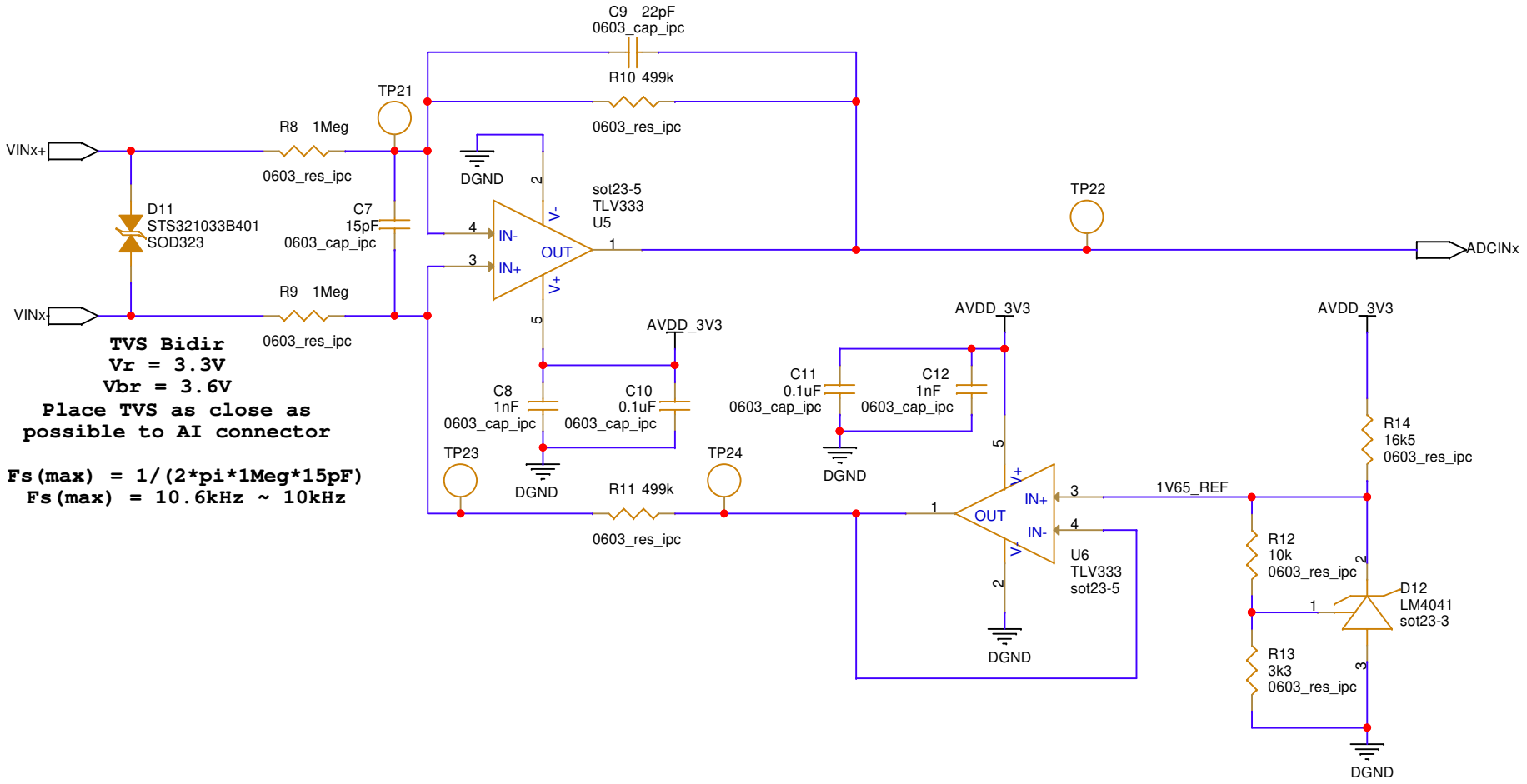
TVS Bidir
Vr = 3.3V
Vbr = 3.6V
Place TVS as close as possible to AI connector

Fs(max) = 1/(2*pi*1Meg*15pF)
Fs(max) = 10.6kHz ~ 10kHz

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 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Analog input ±3V3		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 6 *of* 21	

Analog input ±3.3V
12 bits resolution



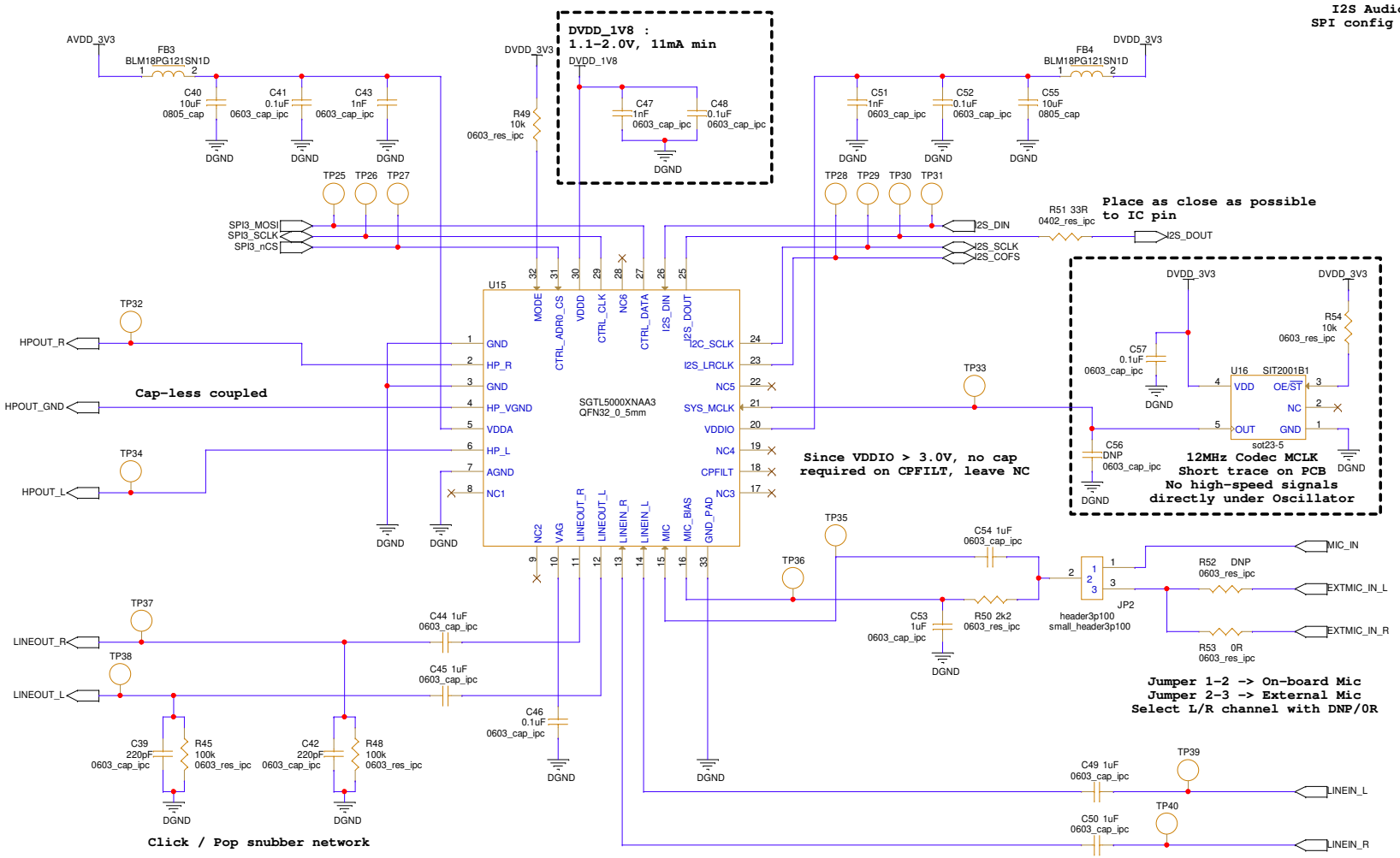
TVS Bidir
Vr = 3.3V
Vbr = 3.6V
Place TVS as close as possible to AI connector

Fs(max) = 1/(2*pi*1Meg*15pF)
Fs(max) = 10.6kHz ~ 10kHz

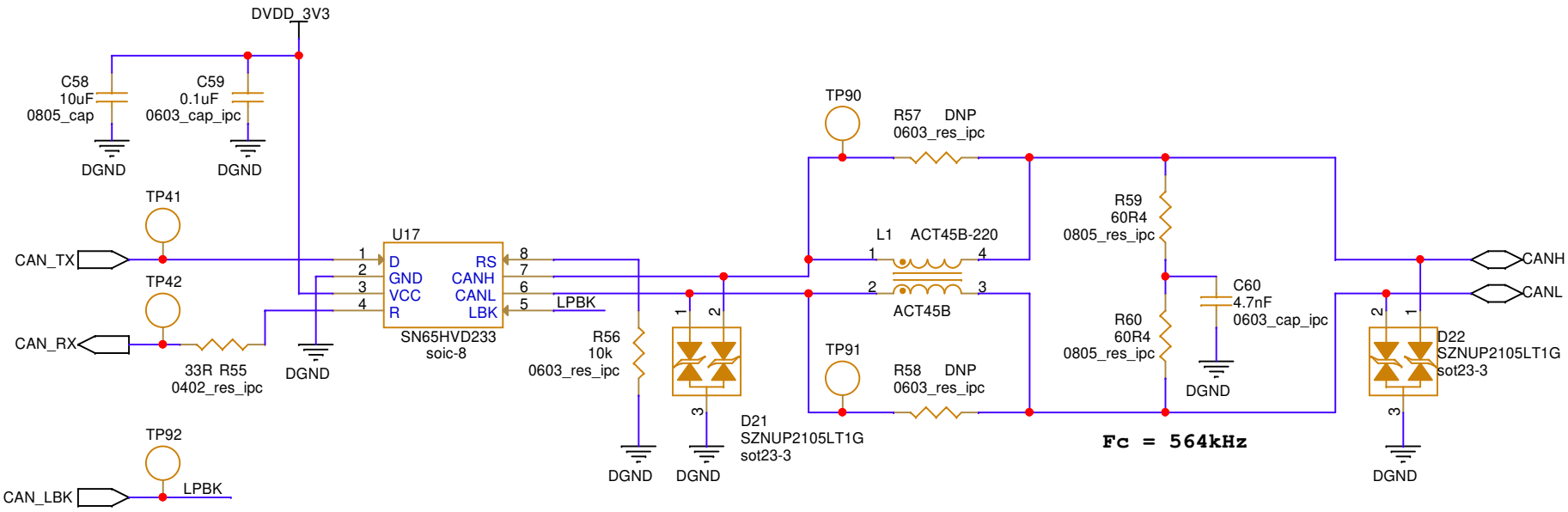
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		
Sheet title : Analog input ±3V3		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 7 *of* 21	

Intellitrol


I2S Audio CODEC
SPI config interface
DVDD_1V8 :
1.1-2.0V, 11mA min
Place as close as possible
to IC pin
Cap-less coupled
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
SGTL5000XNAA3
QFN32_0_5mm
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
925 Chemin ste-foy apt4, QC, CANADA
Sheet title : I2S audio CODEC
Project : DSPEAK-V1_00-0B
Sheet size : B
Date : Wednesday, March 17, 2021
Sheet : 8 of 21
Rev code 0B
Intellitrol

CAN bus interface
CAN 2.0B support
Max bitrate 550kbps

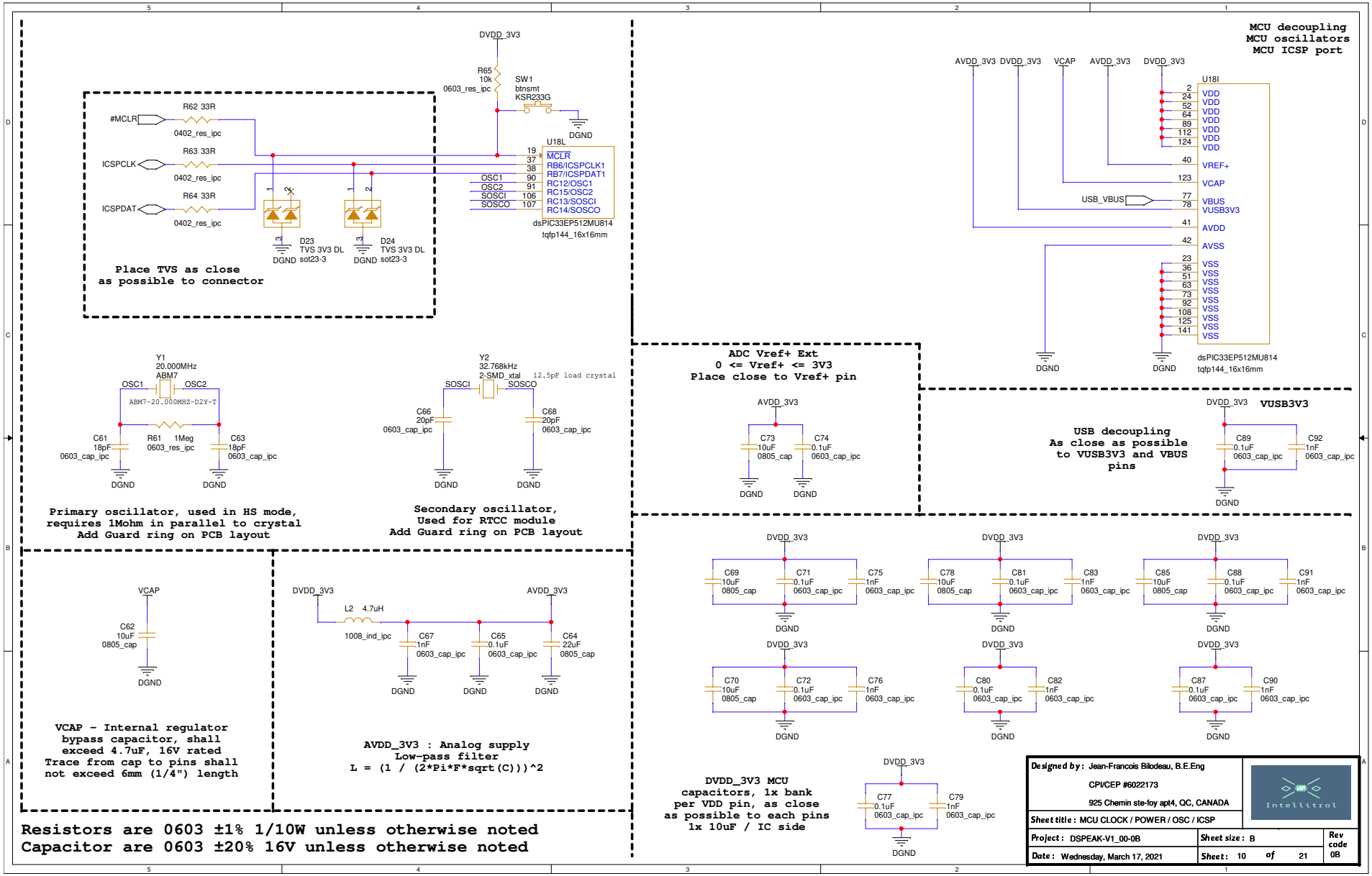


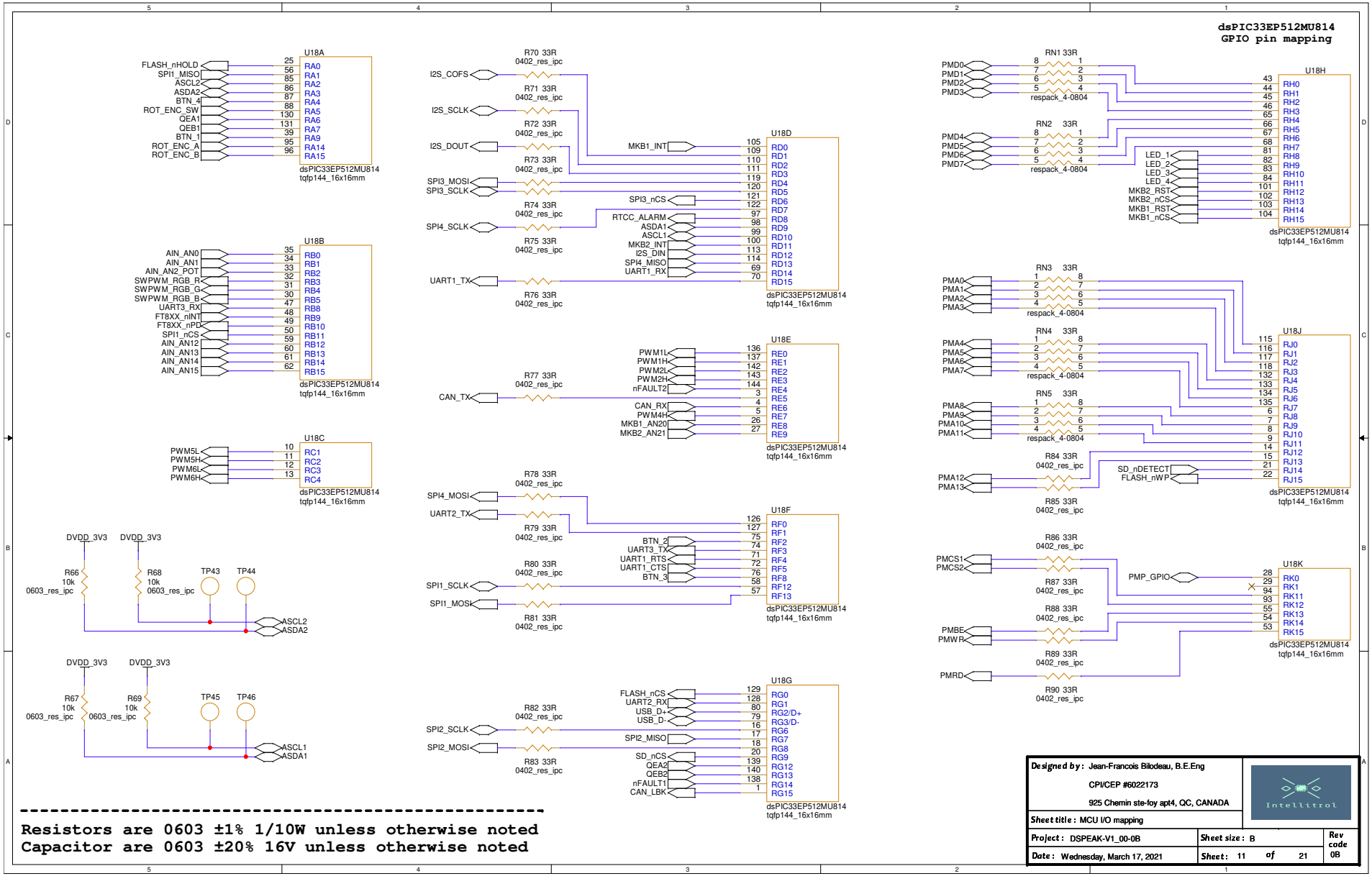
Place TVS as close as possible to the CAN driver

Place TVS as close as possible to the CAN connector

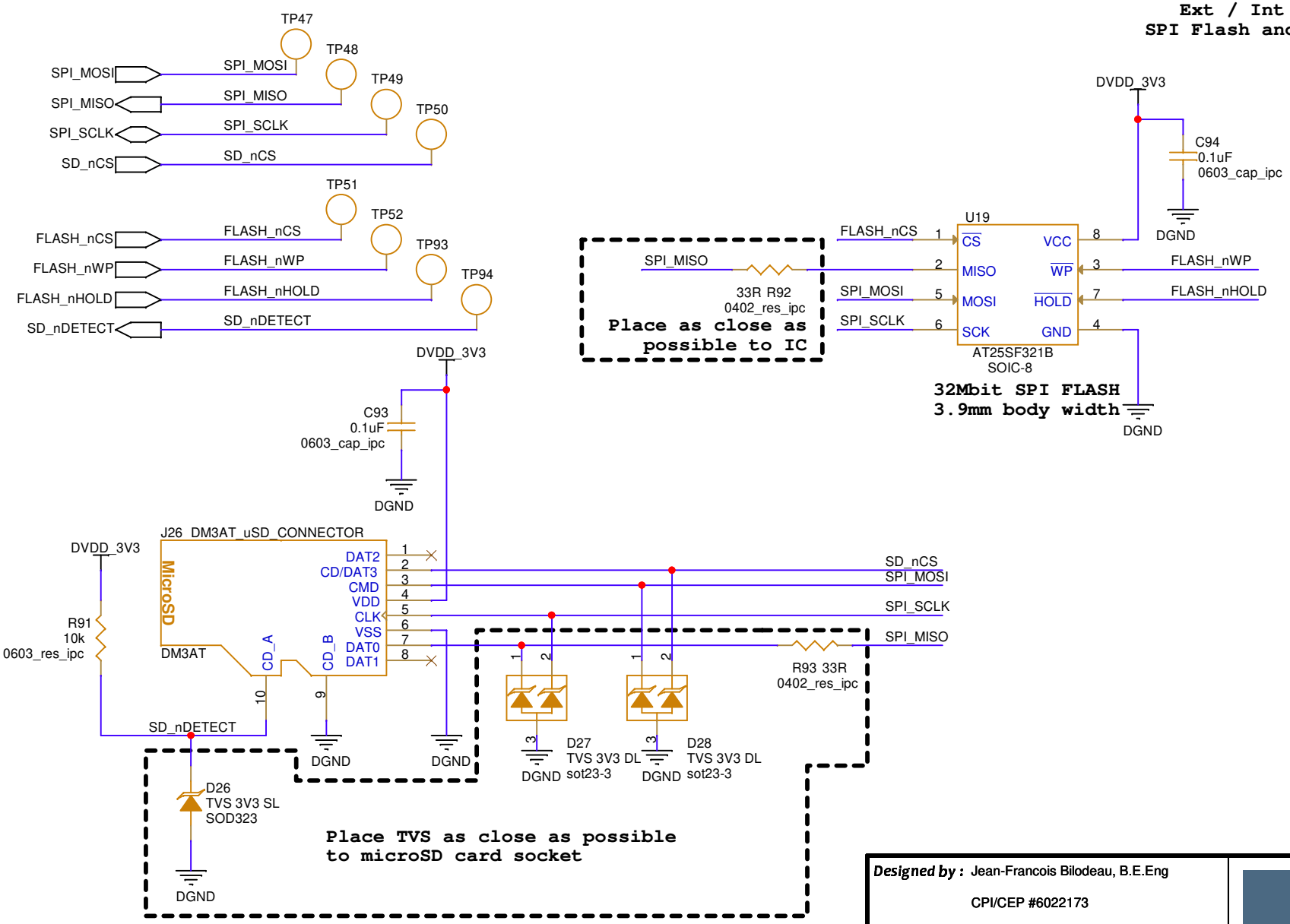
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : CAN 2.0B bus interface		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 9 of 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
OSC1
OSC2
SOSCI
SOSCO
dsPIC33EP512MU814
tqfp144_16x16mm
D23 TVS 3V3 DL sot23-3
D24 TVS 3V3 DL sot23-3
Place TVS as close as possible to connector
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 12.5pF load crystal
C66 20pF 0603_cap_ipc
C68 20pF 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
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
USB decoupling
As close as possible to VUSB3V3 and VBUS pins
VUSB3V3
C89 0.1uF 0603_cap_ipc
C92 1nF 0603_cap_ipc
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
L2 4.7uH 1008_ind_ipc
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
DVDD_3V3 MCU capacitors, 1x bank per VDD pin, as close as possible to each pins
1x 10uF / IC side
C77 0.1uF 0603_cap_ipc
C79 1nF 0603_cap_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
925 Chemin ste-foy apt4, QC, CANADA
Intellitrol
Sheet title: MCU CLOCK / POWER / OSC / ICSP
Project: DSPEAK-V1_00-0B
Sheet size: B
Rev code 0B
Date: Wednesday, March 17, 2021
Sheet: 10 of 21


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
SPI2_MISO 17 RG7
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
LED_1 43 RH0
LED_2 44 RH1
LED_3 45 RH2
LED_4 46 RH3
MKB2_RST 65 RH4
MKB2_nCS 66 RH5
MKB1_RST 67 RH6
MKB1_nCS 68 RH7
81 RH8
82 RH9
83 RH10
84 RH11
101 RH12
102 RH13
103 RH14
104 RH15
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
21 RJ14
22 RJ15
SD_nDETECT
FLASH_nWP
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
925 Chemin ste-foy apt4, QC, CANADA
Intellitrol
Sheet title: MCU I/O mapping
Project: DSPEAK-V1_00-0B
Sheet size: B
Rev code 0B
Date: Wednesday, March 17, 2021
Sheet: 11 of 21

Ext / Int memory
SPI Flash and uSD card



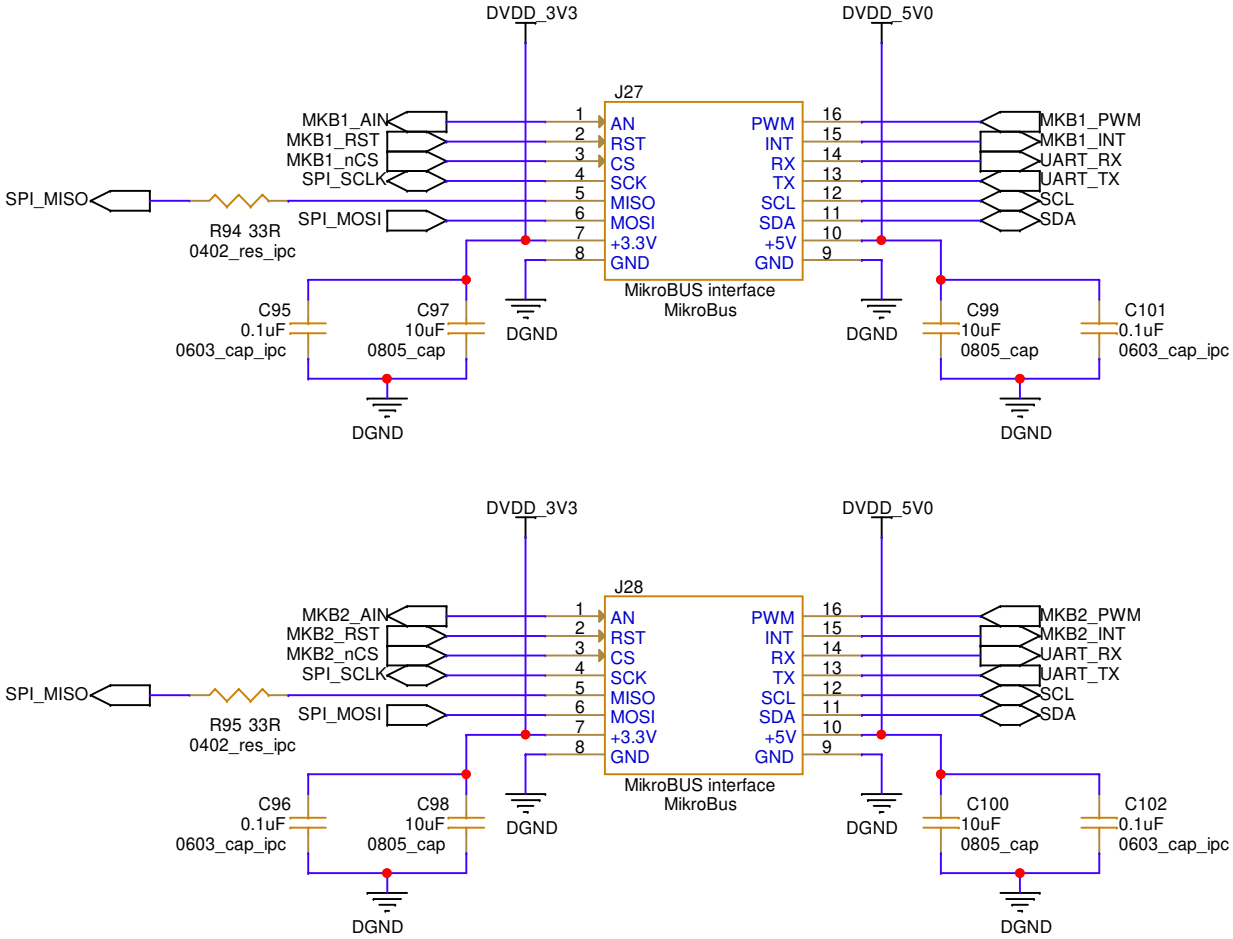
Resistors are 0603 ±1% 1/10W unless otherwise noted

Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		
Sheet title : Internal / External memory expansion		
Project : DSPEAK-V1_00-0B	**Sheet size :** A	**Rev code** 0B
Date : Wednesday, March 17, 2021	**Sheet :** 12 of 21	

Intellitrol

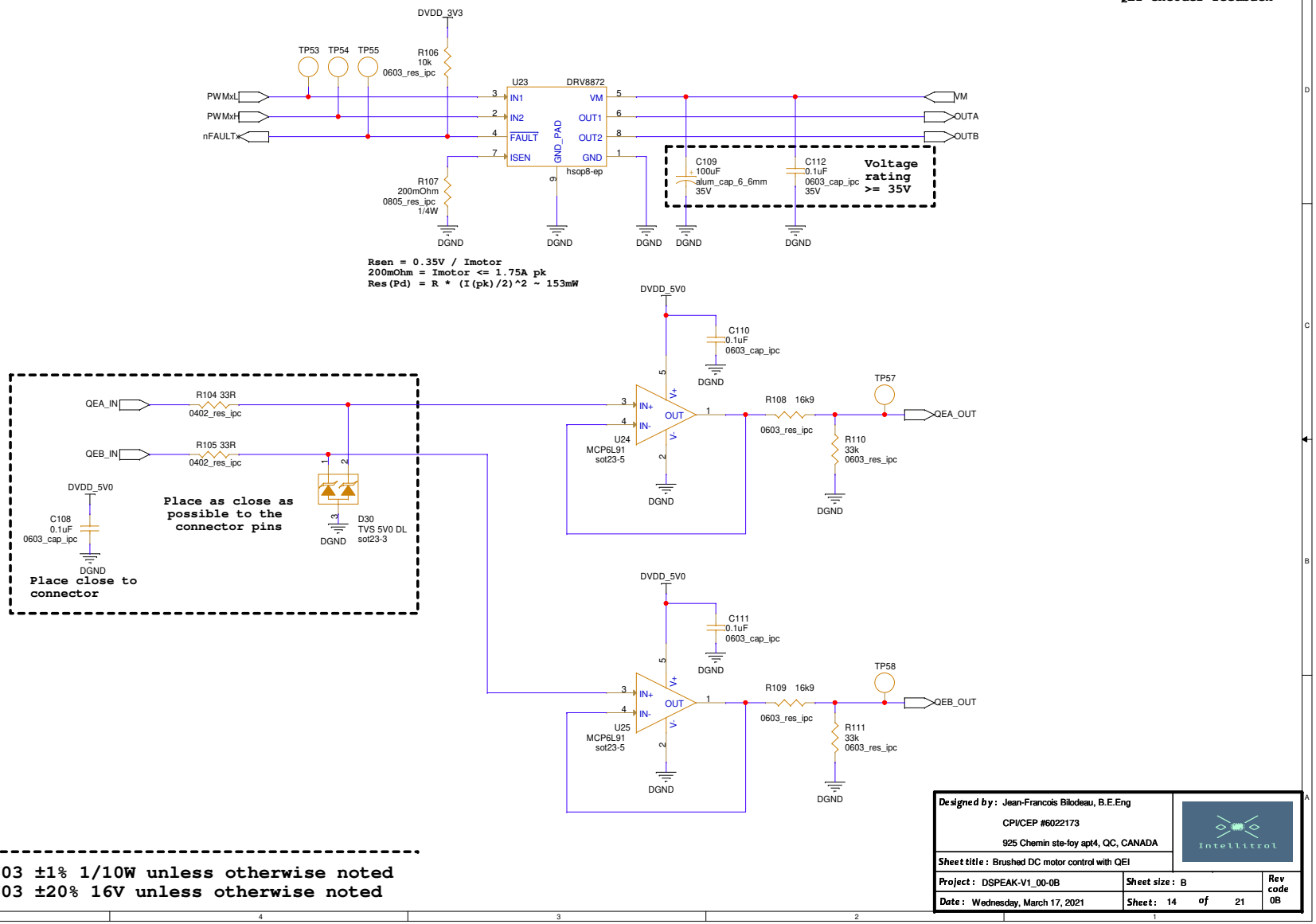
MikroBus port
Click Board compatible
General purpose I/Os



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 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : MikroBus expansion socket - dual		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 13 *of* 21	

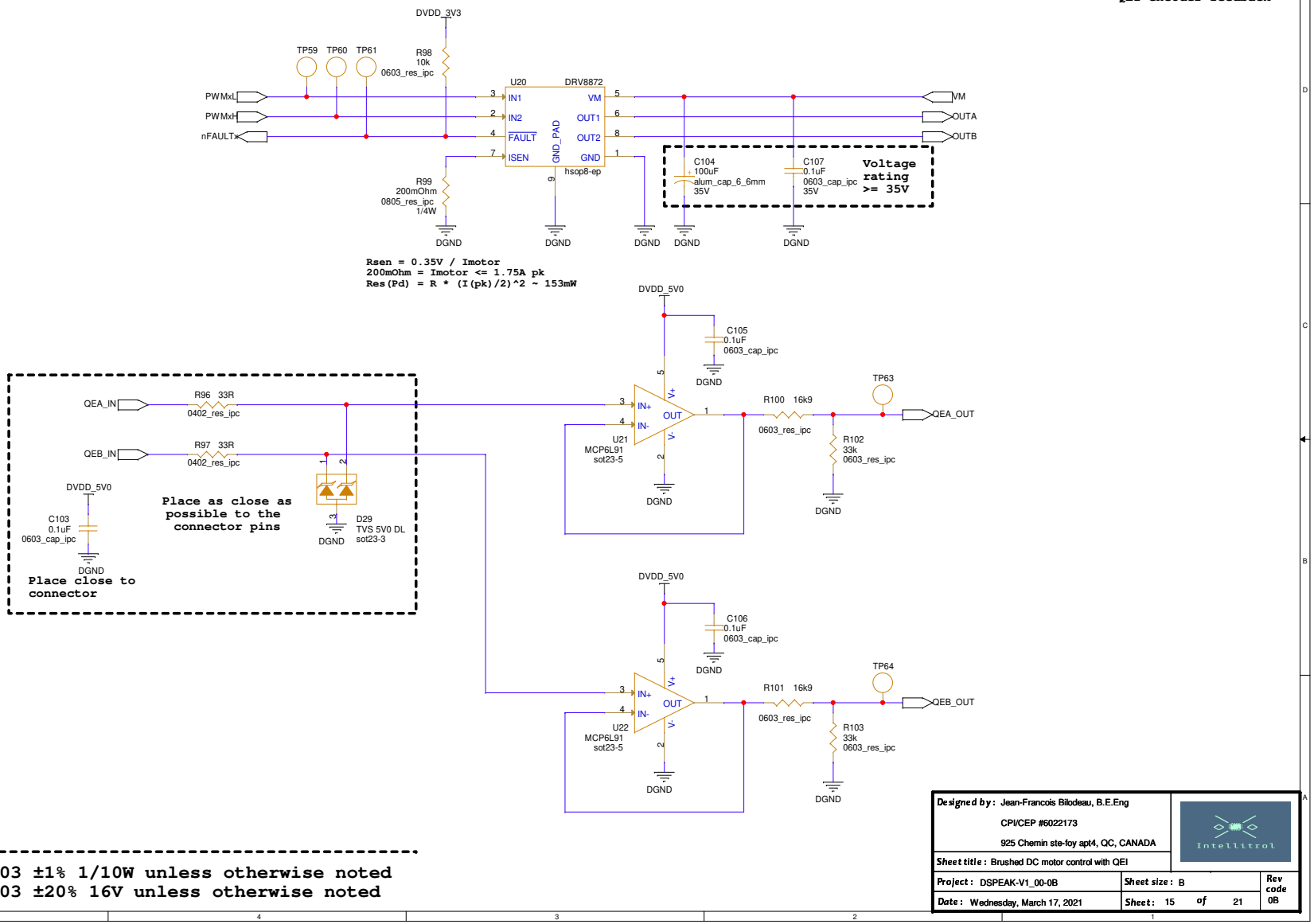
Brushed DC motor driver
QEI encoder feedback



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

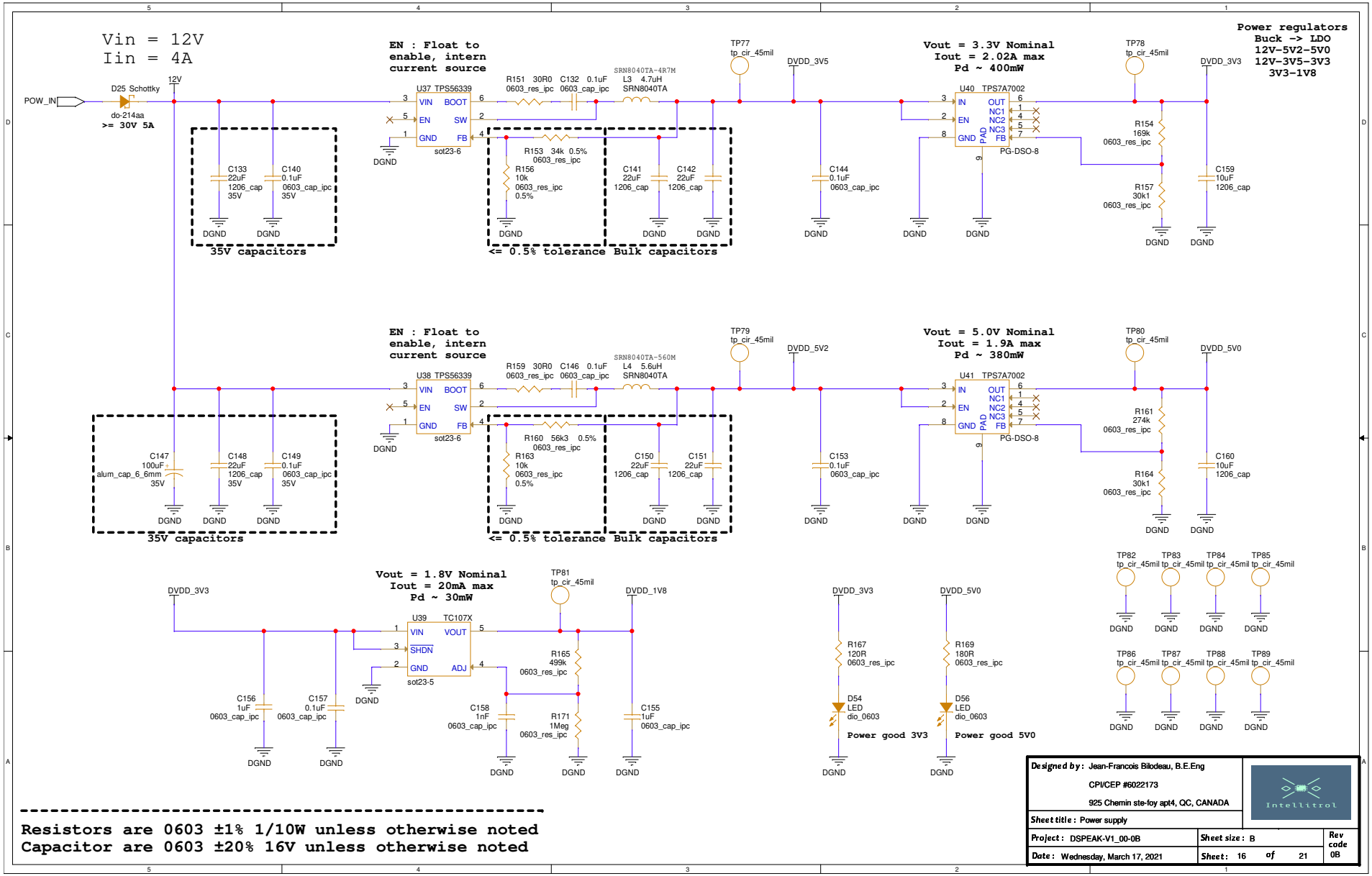
Designed by: Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title: Brushed DC motor control with QEI		
Project: DSPEAK-V1_00-0B	Sheet size: B	Rev code 0B
Date: Wednesday, March 17, 2021	Sheet: 14 of 21	

Brushed DC motor driver
QEI encoder feedback

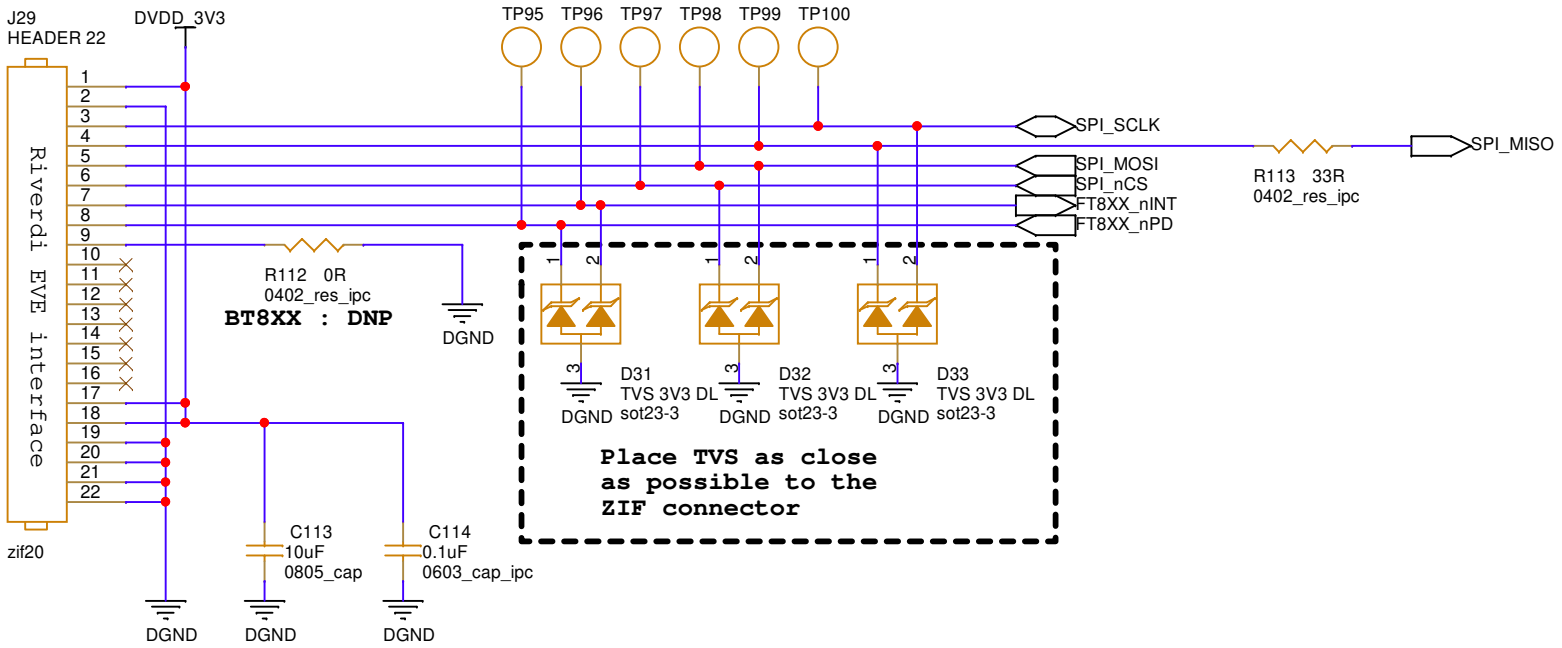


Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by: Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title: Brushed DC motor control with QEI		
Project: DSPEAK-V1_00-0B	Sheet size: B	Rev code 0B
Date: Wednesday, March 17, 2021	Sheet: 15 of 21	


Vin = 12V
Iin = 4A
Power regulators
Buck -> LDO
12V-5V2-5V0
12V-3V5-3V3
3V3-1V8
POW_IN
D25 Schottky
do-214aa
>= 30V 5A
12V
C133 22uF 1206_cap 35V
C140 0.1uF 0603_cap_ipc 35V
35V capacitors
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
SRN8040TA-4R7M
L3 4.7uH SRN8040TA
R153 34k 0.5% 0603_res_ipc
R156 10k 0603_res_ipc 0.5%
C141 22uF 1206_cap
C142 22uF 1206_cap
<= 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 OUT EN NC1 NC2 NC3 GND PAD FB
PG-DSO-8
TP78 tp_cir_45mil
DVDD_3V3
R154 169k 0603_res_ipc
R157 30k1 0603_res_ipc
C159 10uF 1206_cap
C147 100uF alum_cap_6_6mm 35V
C148 22uF 1206_cap 35V
C149 0.1uF 0603_cap_ipc 35V
35V capacitors
EN : Float to enable, intern current source
U38 TPS56339
R159 30R0 0603_res_ipc
C146 0.1uF 0603_cap_ipc
SRN8040TA-560M
L4 5.6uH SRN8040TA
R160 56k3 0.5% 0603_res_ipc
R163 10k 0603_res_ipc 0.5%
C150 22uF 1206_cap
C151 22uF 1206_cap
<= 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
TP80 tp_cir_45mil
DVDD_5V0
R161 274k 0603_res_ipc
R164 30k1 0603_res_ipc
C160 10uF 1206_cap
Vout = 1.8V Nominal
Iout = 20mA max
Pd ~ 30mW
DVDD_3V3
U39 TC107X
VIN VOUT SHDN GND ADJ
sot23-5
TP81 tp_cir_45mil
DVDD_1V8
C156 1uF 0603_cap_ipc
C157 0.1uF 0603_cap_ipc
R165 499k 0603_res_ipc
C158 1nF 0603_cap_ipc
R171 1Meg 0603_res_ipc
C155 1uF 0603_cap_ipc
R167 120R 0603_res_ipc
D54 LED dio_0603
Power good 3V3
R169 180R 0603_res_ipc
D56 LED dio_0603
Power good 5V0
TP82 tp_cir_45mil
TP83 tp_cir_45mil
TP84 tp_cir_45mil
TP85 tp_cir_45mil
TP86 tp_cir_45mil
TP87 tp_cir_45mil
TP88 tp_cir_45mil
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
925 Chemin ste-foy apt4, QC, CANADA
Intellitrol
Sheet title : Power supply
Project : DSPEAK-V1_00-0B
Sheet size : B
Rev code 0B
Date : Wednesday, March 17, 2021
Sheet : 16 of 21

Riverdi EVE TFT Interface with FT/BT8xx

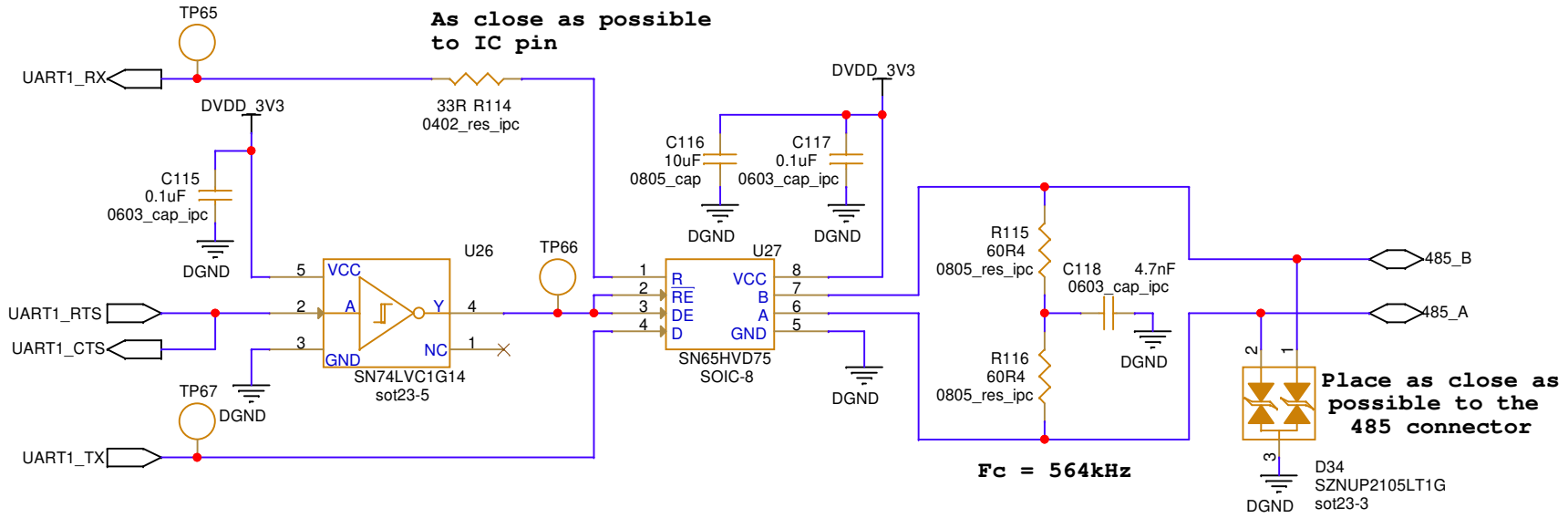


Resistors are 0603 ±1% 1/10W unless otherwise noted

Capacitor are 0603 ±20% 16V unless otherwise noted

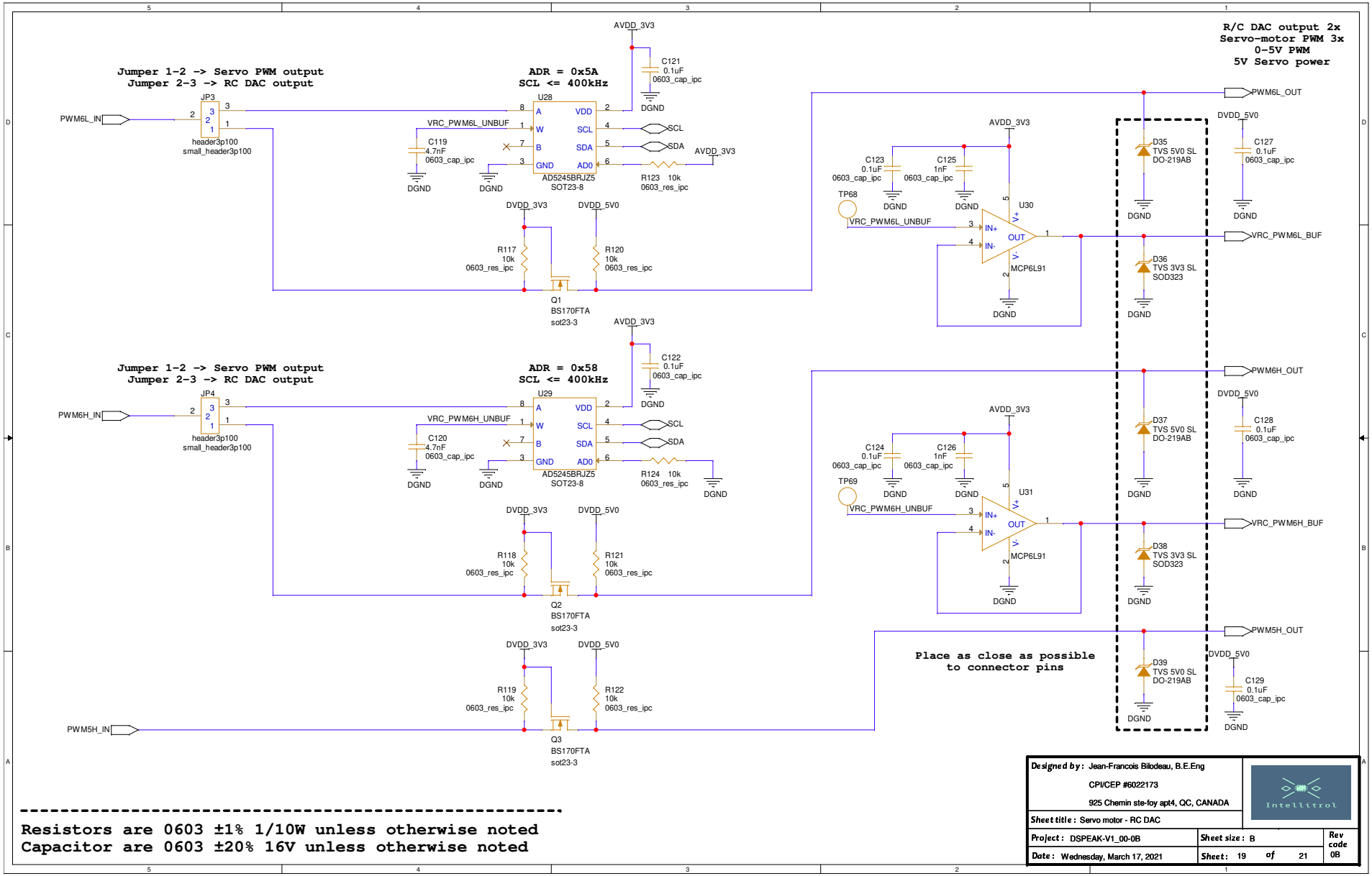
Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Riverdi TFT LCD EVE interface		
Project : DSPEAK-V1_00-0B	**Sheet size :** A	**Rev code** 0B
Date : Wednesday, March 17, 2021	**Sheet :** 17 of 21	

RS485 bus interface
Max bitrate 550kbps

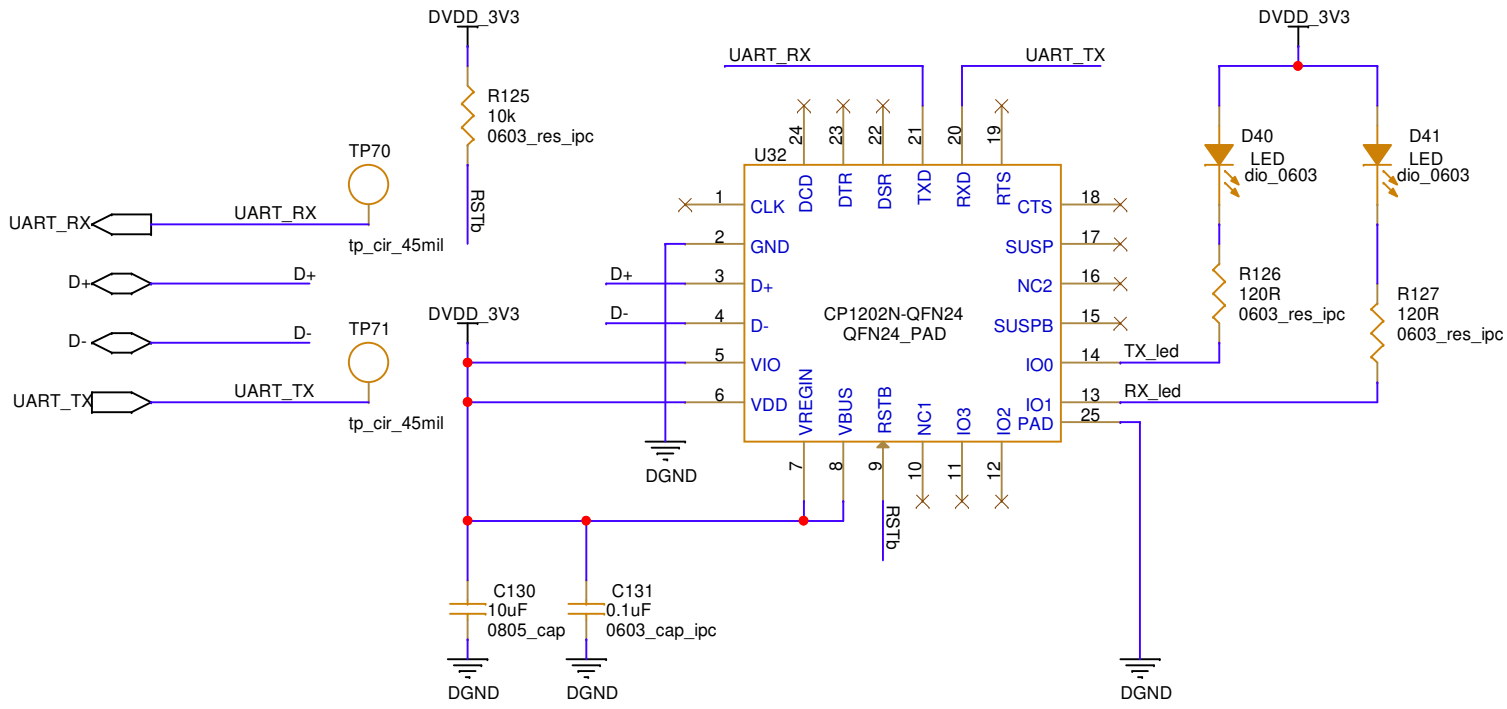


Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : RS-485 bus interface		
Project : DSPEAK-V1_00-0B	Sheet size : A	Rev code 0B
Date : Wednesday, March 17, 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
SCL
SDA
AVDD_3V3
DGND
DVDD_3V3
DVDD_5V0
R117
10k
0603_res_ipc
R120
10k
0603_res_ipc
Q1
BS170FTA
sot23-3
TP68
C123
0.1uF
C125
1nF
U30
MCP6L91
PWM6L_OUT
VRC_PWM6L_BUF
D35
TVS 5V0 SL
DO-219AB
D36
TVS 3V3 SL
SOD323
C127
0.1uF
DVDD_5V0
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
C124
C126
U31
PWM6H_OUT
VRC_PWM6H_BUF
D37
D38
C128
Place as close as possible
to connector pins
PWM5H_IN
R119
10k
R122
10k
Q3
PWM5H_OUT
D39
C129
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
925 Chemin ste-foy apt4, QC, CANADA
Intellitrol
Sheet title: Servo motor - RC DAC
Project: DSPEAK-V1_00-0B
Sheet size: B
Rev code 0B
Date: Wednesday, March 17, 2021
Sheet: 19 of 21

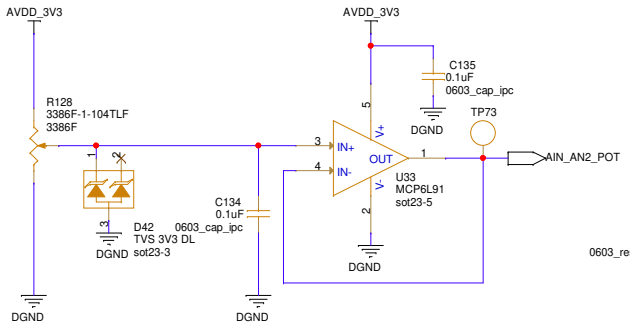
USB-UART Converter
SW debug interface



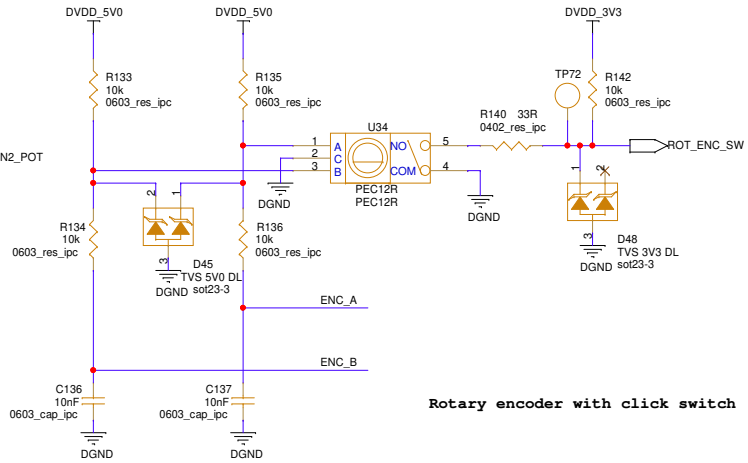
Resistors are 0603 ±1% 1/10W unless otherwise noted

Capacitor are 0603 ±20% 16V unless otherwise noted

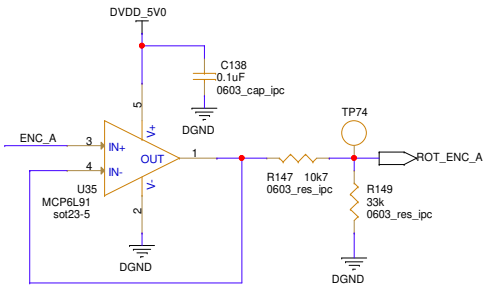
Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : USB - UART CP2102N bridge		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Wednesday, March 17, 2021	*Sheet :* 20 *of* 21	

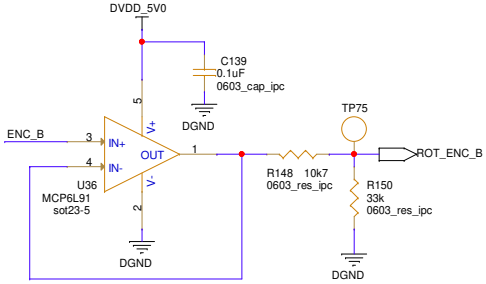


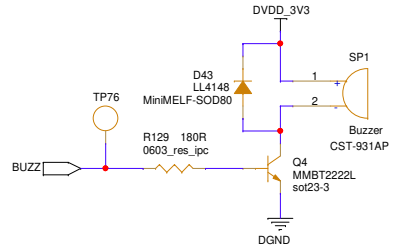
Analog potentiometer



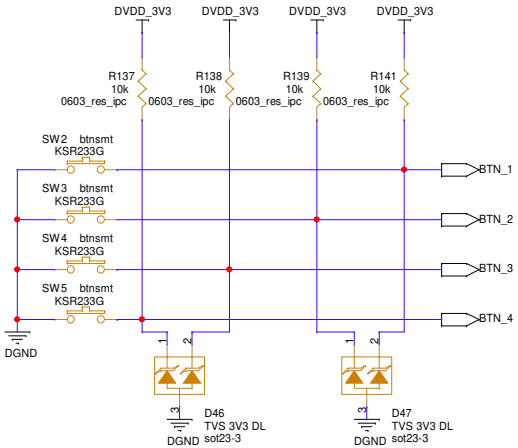
Rotary encoder with click switch



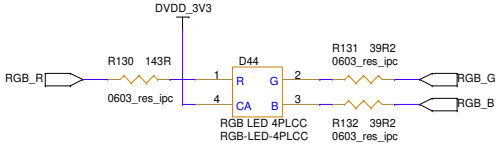




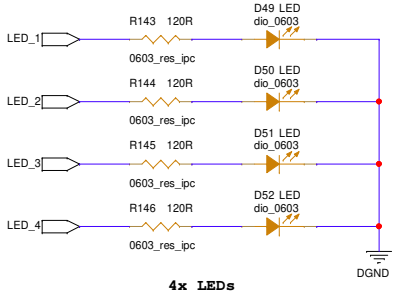
Software PWM Buzzer



4x SPST buttons



RGB LED



4x LEDs

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Capacitor are 0603 ±20% 16V unless otherwise noted

Designed by: Jean-Francois Bilodeau, B.E.Eng
CPI/CEP #6022173
925 Chemin ste-foy apt4, QC, CANADA

Intellitrol

Sheet title : User input / output		
Project : DSPEAK-V1_00-0B	Sheet size : B	Rev code 0B
Date : Wednesday, March 17, 2021	Sheet : 21 of 21	