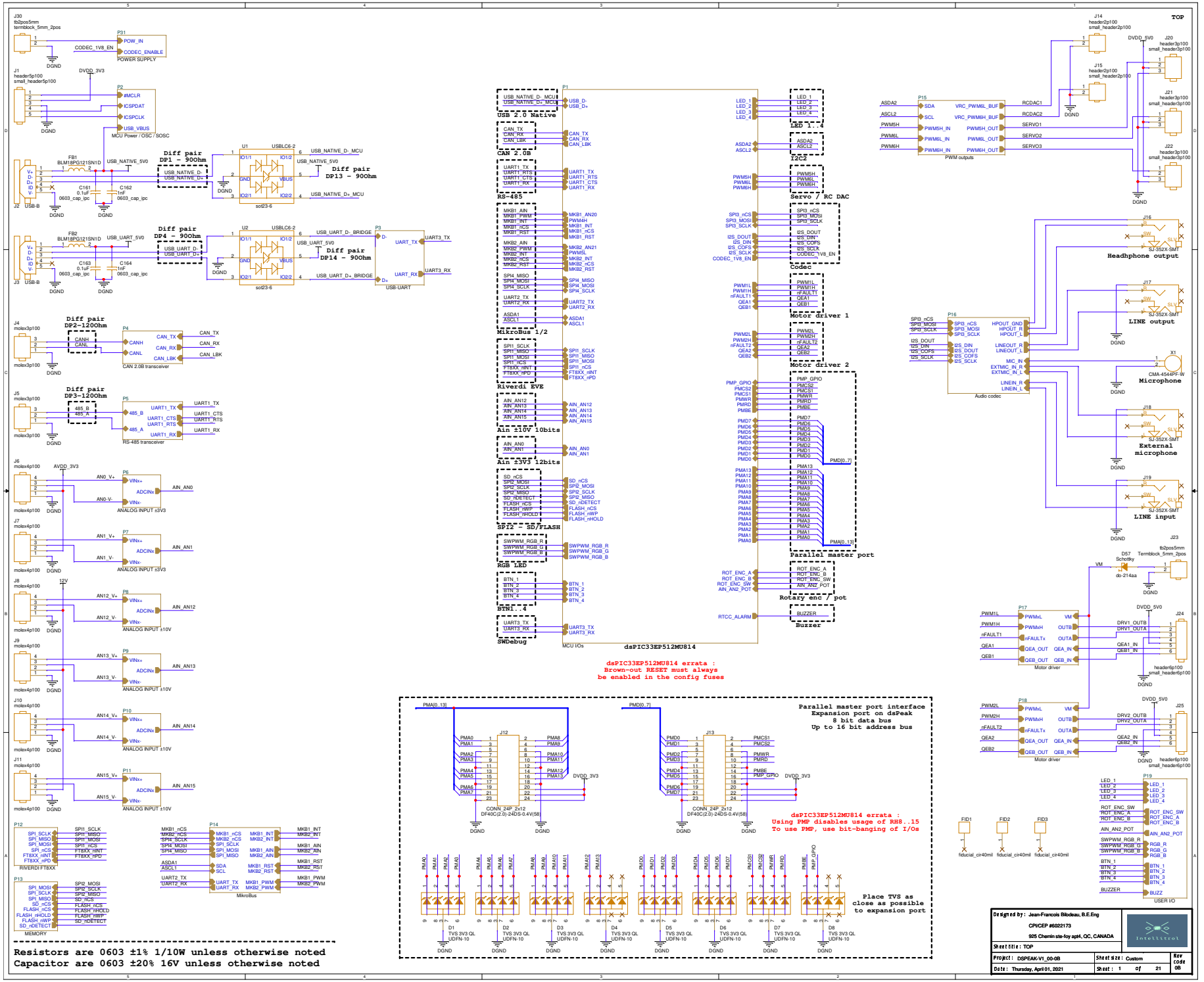
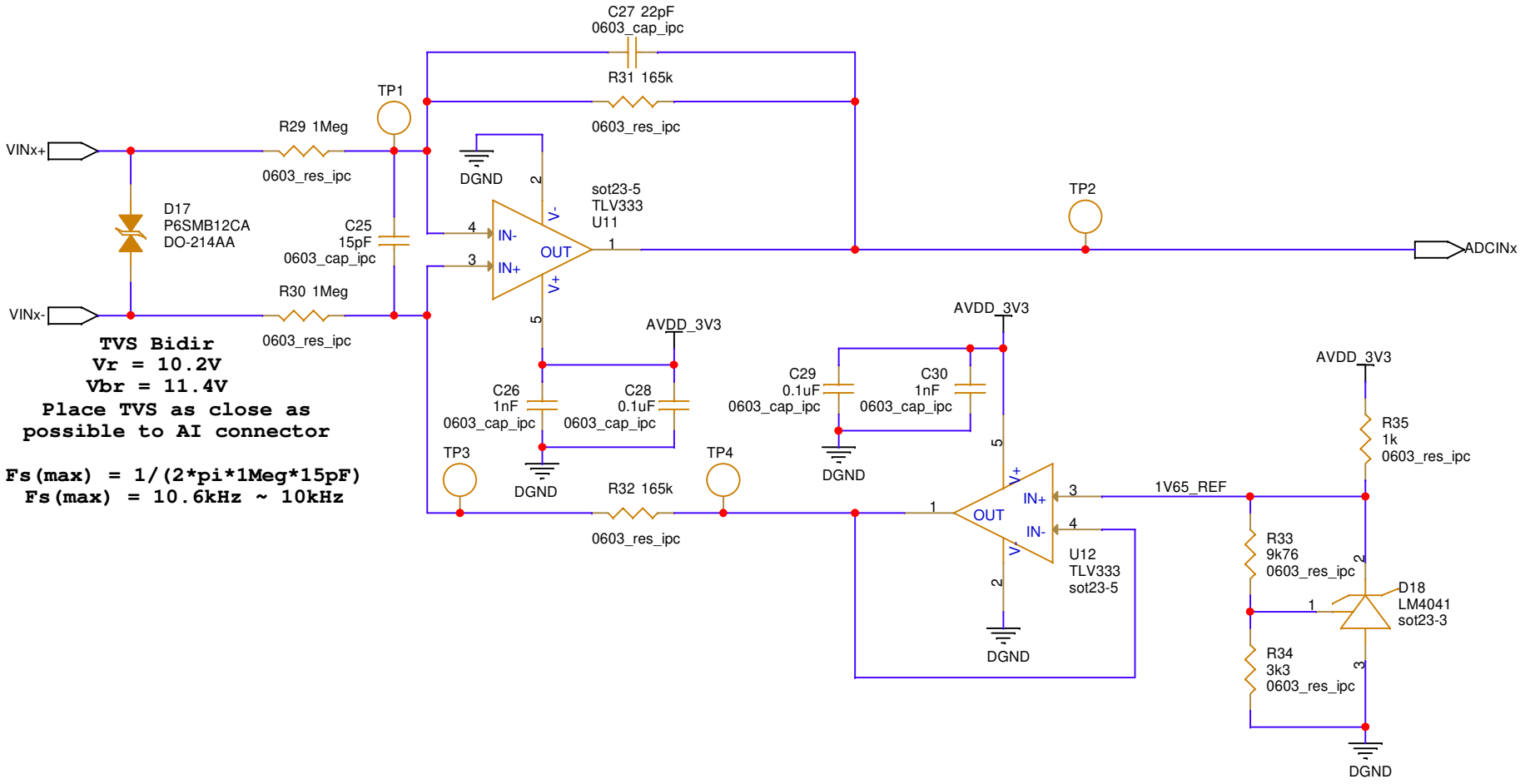

TOP
dsPIC33EP512MU814
USB 2.0 Native
CAN 2.0B
RS-485
MikroBus 1/2
Riverdi EVE
Ain ±10V 10bits
Ain ±3V3 12bits
SPI2 - SD/FLASH
RGB LED
BTN1
SWDebug
LED 1..4
I2C2
Servo / RC DAC
Codec
Motor driver 1
Motor driver 2
Parallel master port
Rotary enc / pot
Buzzer
USB-B
USB-UART
CAN 2.0B transceiver
RS-485 transceiver
ANALOG INPUT ±3V3
ANALOG INPUT ±10V
RIVERDI FT8XX
MEMORY
MikroBus
PWM outputs
Audio codec
Motor driver
Headphone output
LINE output
Microphone
External microphone
LINE input
USER I/O
Diff pair DP1 - 900hm
Diff pair DP13 - 900hm
Diff pair DP4 - 900hm
Diff pair DP14 - 900hm
Diff pair DP2-120Ohm
Diff pair DP3-120Ohm
dsPIC33EP512MU814 errata : Brown-out RESET must always be enabled in the config fuses
dsPIC33EP512MU814 errata : Using PMP disables usage of RH8..15 To use PMP, use bit-banging of I/Os
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 : Thursday, April 01, 2021
Sheet : 1 of 21

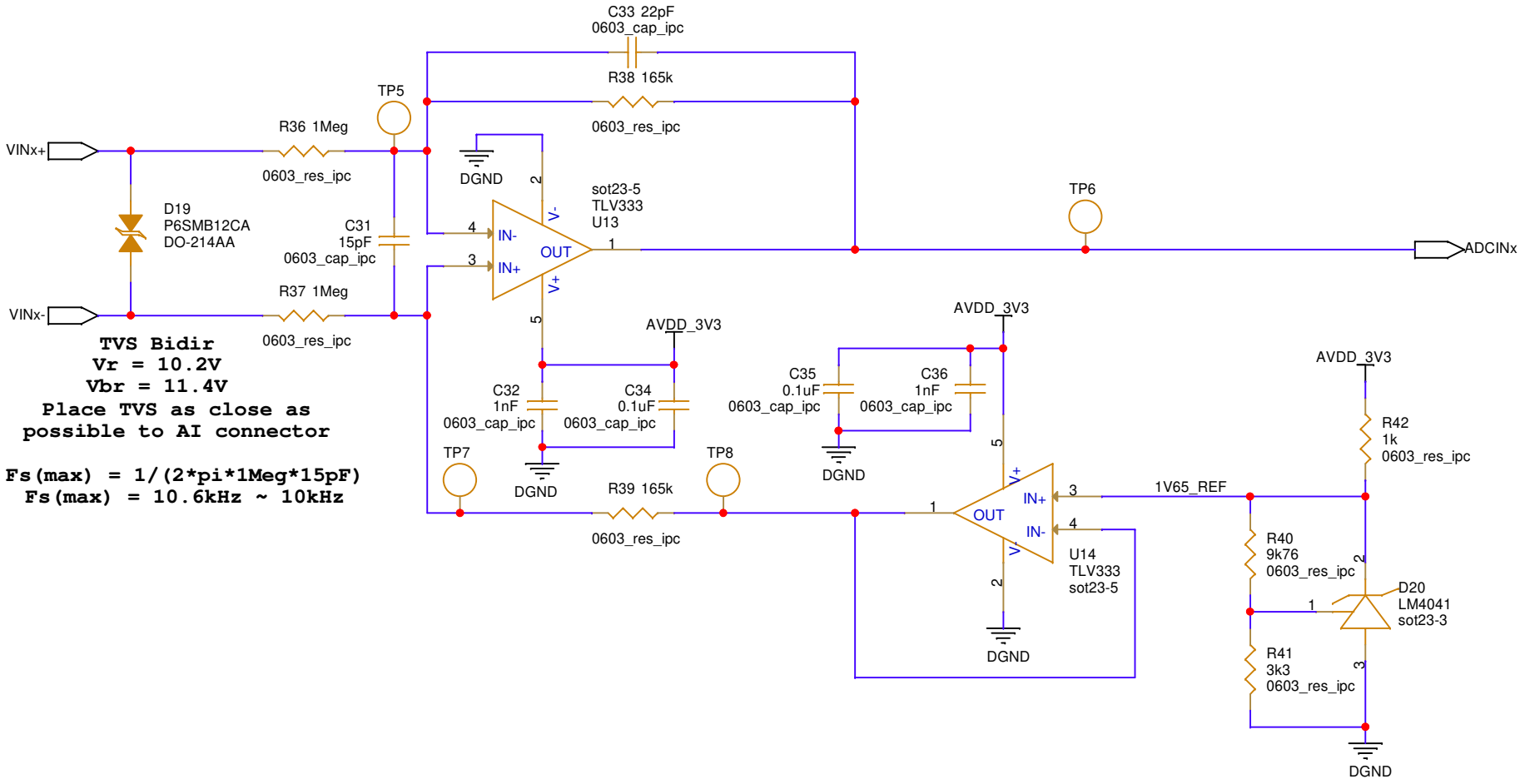
Analog input ±10V
12 bits resolution



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 : Thursday, April 01, 2021	Sheet : 2 of 21	

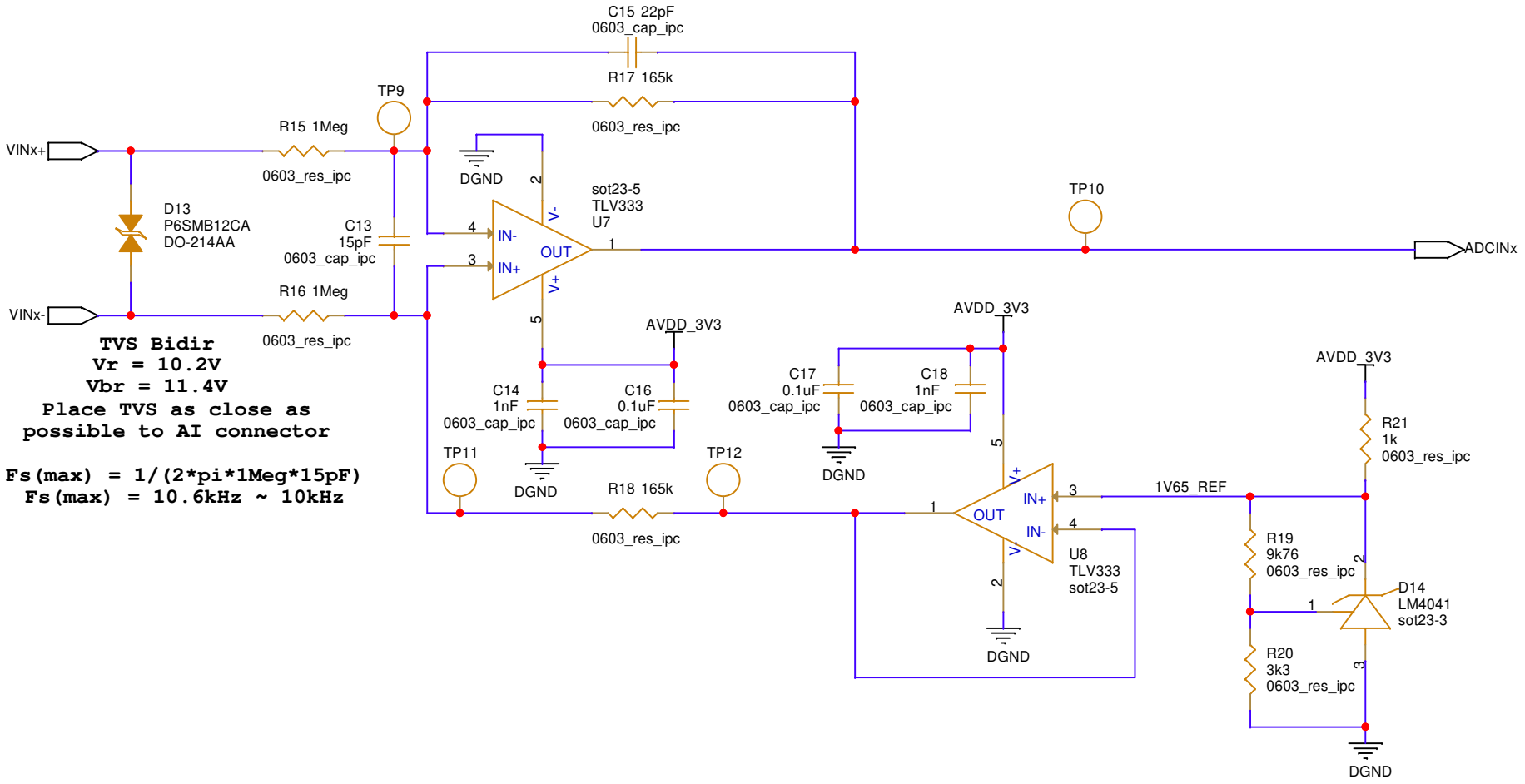
Analog input ±10V
12 bits resolution



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 : Thursday, April 01, 2021	*Sheet :* 3 *of* 21	

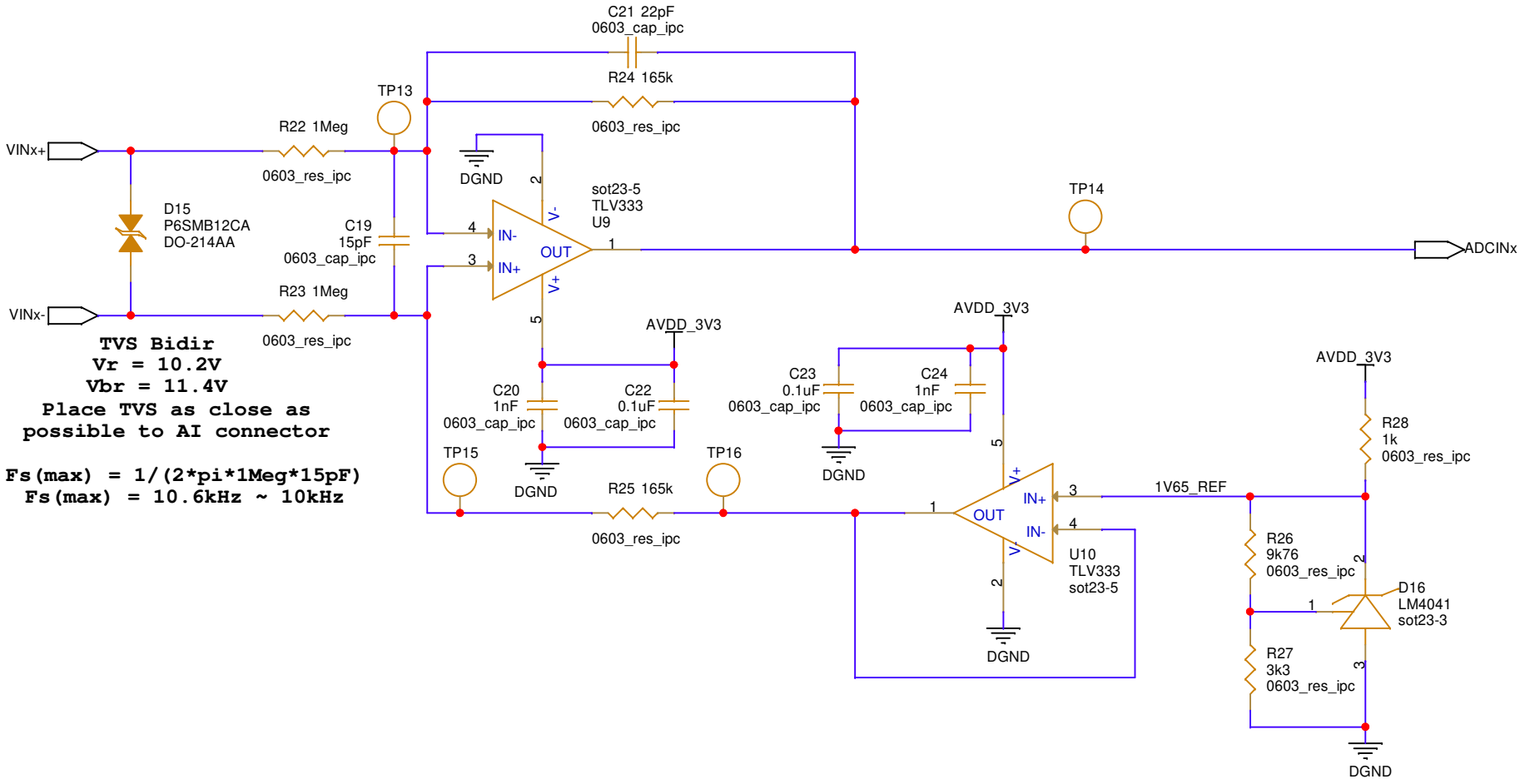
Analog input ±10V
12 bits resolution



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 : Thursday, April 01, 2021	*Sheet :* 4 *of* 21	

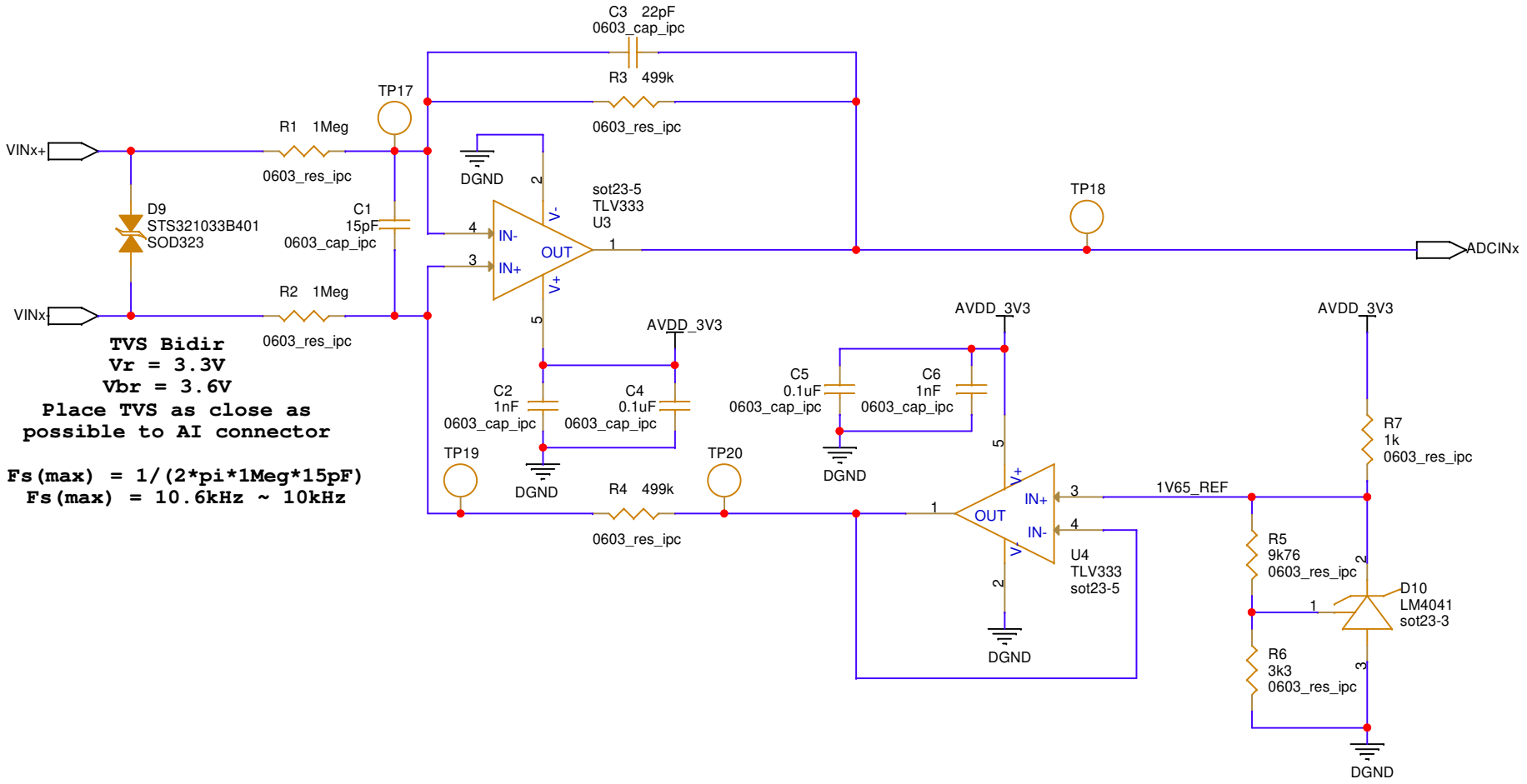
Analog input ±10V
12 bits resolution



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 : Thursday, April 01, 2021	*Sheet :* 5 *of* 21	

Analog input ±3.3V
10 bits resolution



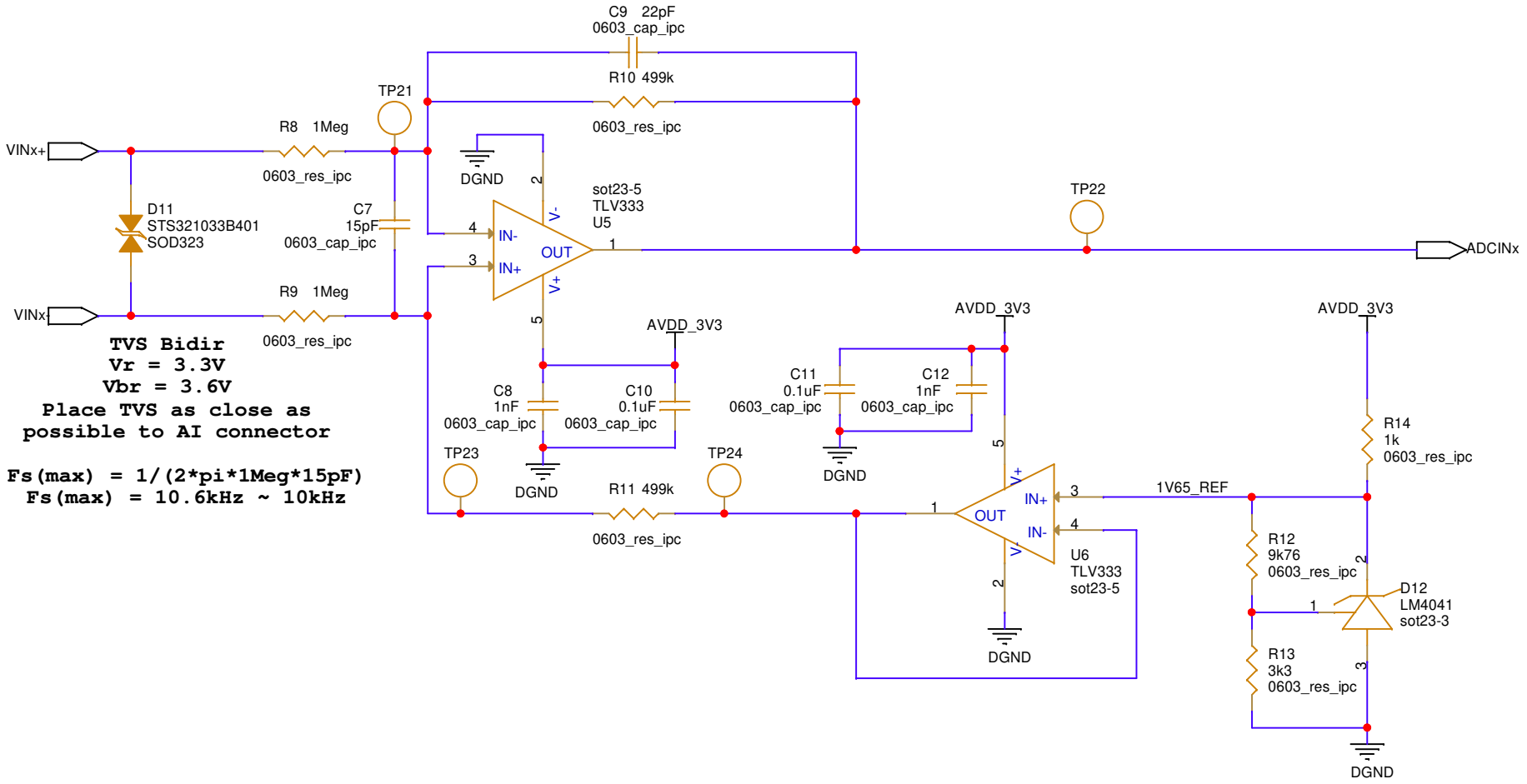
TVS Bidir
Vr = 3.3V
Vbr = 3.6V
Place TVS as close as possible to AI connector

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 : Thursday, April 01, 2021	*Sheet :* 6 *of* 21	

Analog input ±3.3V
10 bits resolution

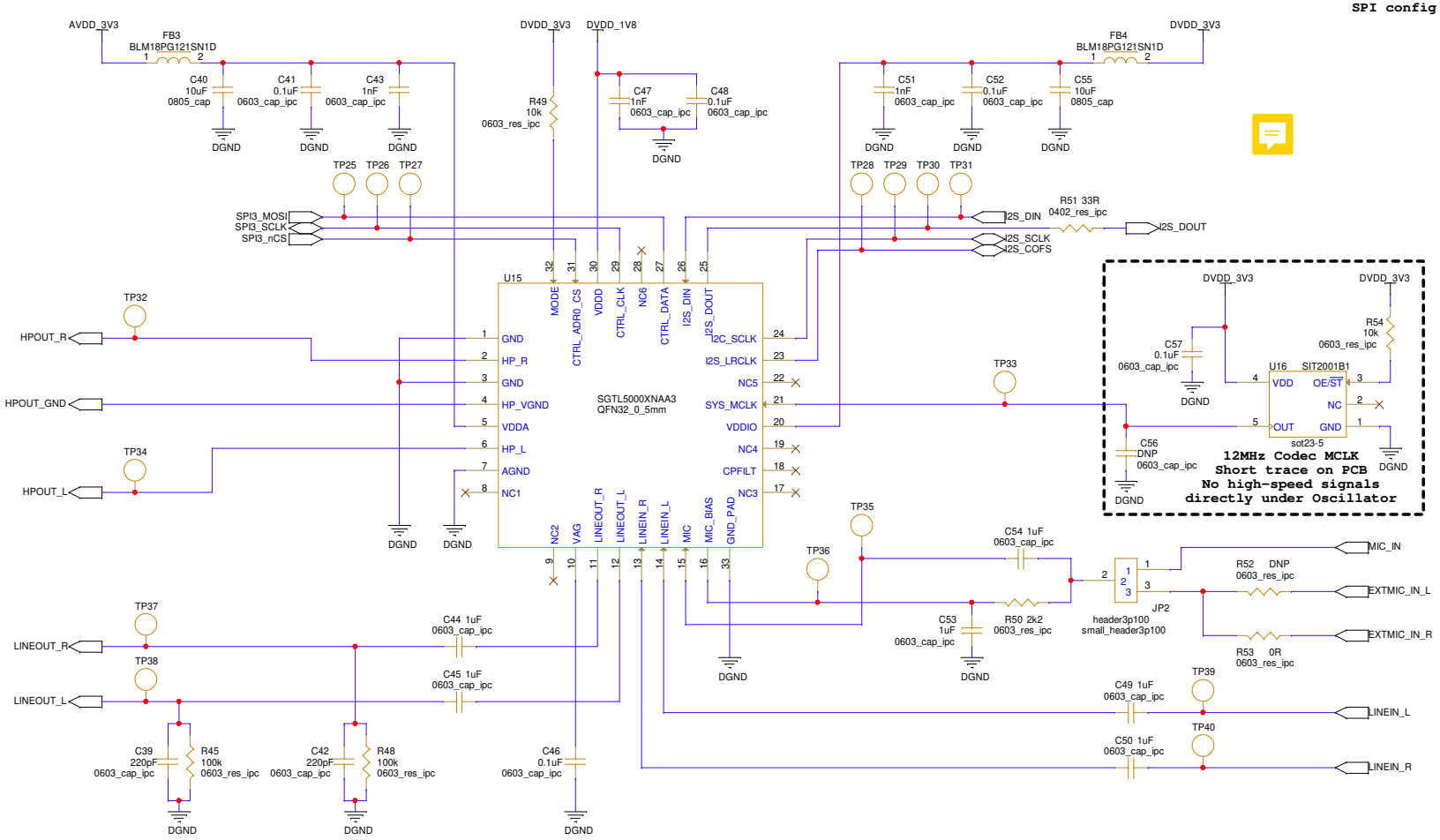


TVS Bidir
Vr = 3.3V
Vbr = 3.6V
Place TVS as close as possible to AI connector

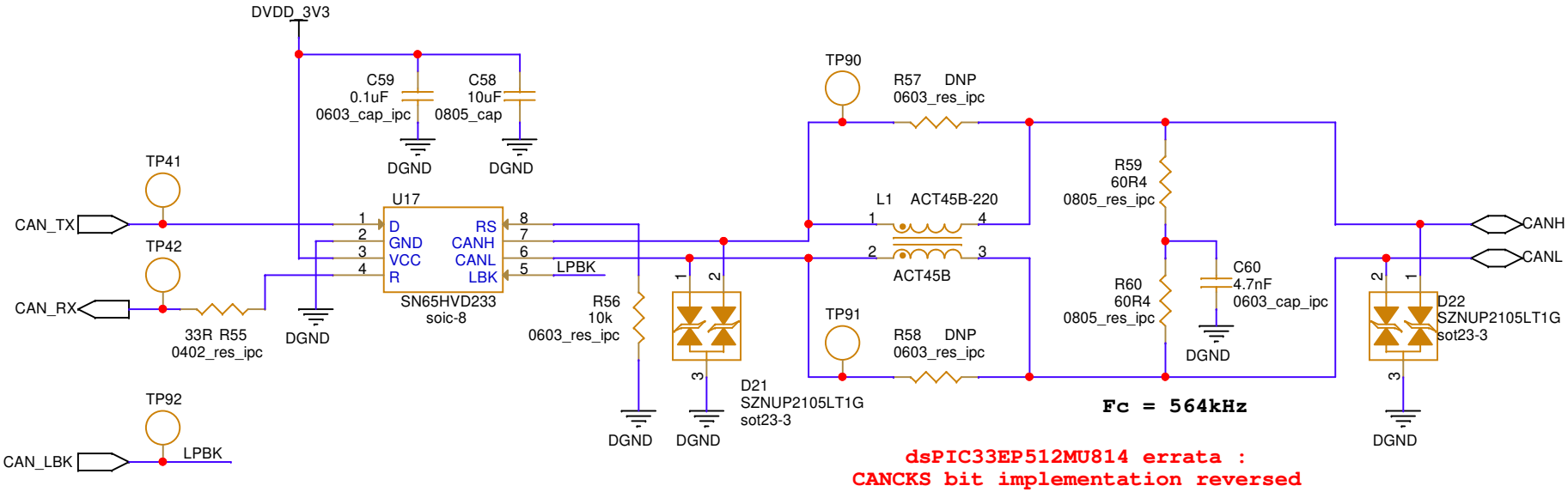
Fs(max) = 1/(2*pi*1Meg*15pF)
Fs(max) = 10.6kHz ~ 10kHz

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 : Thursday, April 01, 2021	*Sheet :* 7 *of* 21	


I2S Audio CODEC
SPI config interface
AVDD_3V3
FB3
BLM18PG121SN1D
C40 10uF 0805_cap
C41 0.1uF 0603_cap_ipc
C43 1nF 0603_cap_ipc
DGND
DVDD_3V3
DVDD_1V8
R49 10k 0603_res_ipc
C47 1nF 0603_cap_ipc
C48 0.1uF 0603_cap_ipc
FB4
BLM18PG121SN1D
C51 1nF 0603_cap_ipc
C52 0.1uF 0603_cap_ipc
C55 10uF 0805_cap
TP25 TP26 TP27
SPI3_MOSI
SPI3_SCLK
SPI3_nCS
TP28 TP29 TP30 TP31
I2S_DIN
I2S_DOUT
R51 33R 0402_res_ipc
I2S_SCLK
I2S_COFS
U15
SGTL5000XNAA3
QFN32_0_5mm
MODE
CTRL_ADR0_CS
VDDD
CTRL_CLK
NC6
CTRL_DATA
I2S_DIN
I2S_DOUT
I2C_SCLK
I2S_LRCLK
NC5
SYS_MCLK
VDDIO
NC4
CPFILT
NC3
GND
HP_R
HP_VGND
VDDA
HP_L
AGND
NC1
NC2
VAG
LINEOUT_R
LINEOUT_L
LINEIN_R
LINEIN_L
MIC
MIC_BIAS
GND_PAD
TP32
HPOUT_R
HPOUT_GND
TP34
HPOUT_L
TP33
TP35
TP36
TP37
LINEOUT_R
TP38
LINEOUT_L
C44 1uF 0603_cap_ipc
C45 1uF 0603_cap_ipc
C39 220pF 0603_cap_ipc
R45 100k 0603_res_ipc
C42 220pF 0603_cap_ipc
R48 100k 0603_res_ipc
C46 0.1uF 0603_cap_ipc
C54 1uF 0603_cap_ipc
C53 1uF 0603_cap_ipc
R50 2k2 0603_res_ipc
JP2
header3p100
small_header3p100
R52 DNP 0603_res_ipc
R53 0R 0603_res_ipc
MIC_IN
EXTMIC_IN_L
EXTMIC_IN_R
TP39
TP40
C49 1uF 0603_cap_ipc
C50 1uF 0603_cap_ipc
LINEIN_L
LINEIN_R
DVDD_3V3
R54 10k 0603_res_ipc
C57 0.1uF 0603_cap_ipc
U16 SIT2001B1
VDD
OE/ST
NC
OUT
GND
sot23-5
C56 DNP 0603_cap_ipc
12MHz Codec MCLK
Short trace on PCB
No high-speed signals
directly under Oscillator
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 : I2S audio CODEC
Project : DSPEAK-V1_00-0B
Sheet size : B
Date : Thursday, April 01, 2021
Sheet : 8 of 21
Rev code 0B

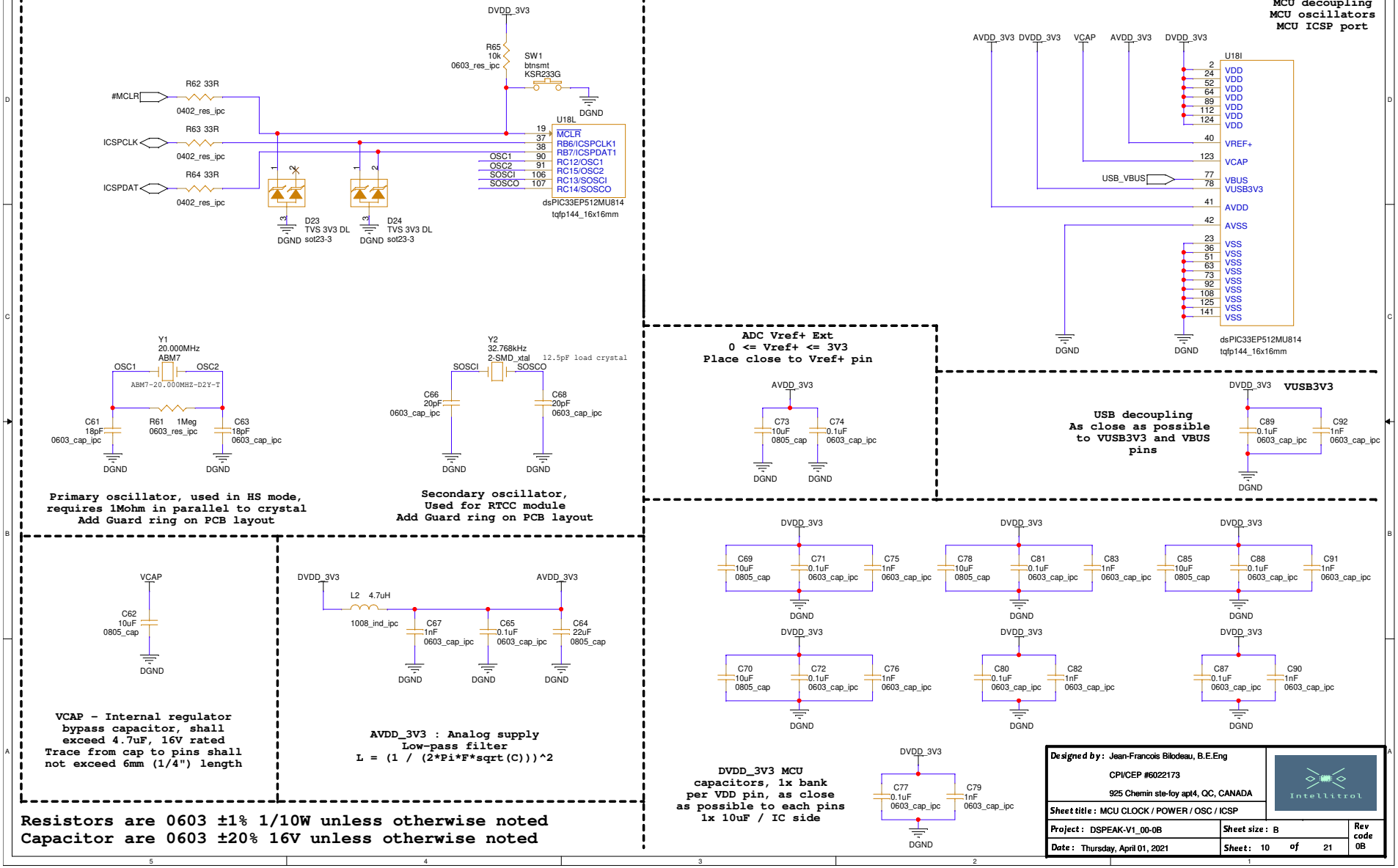
CAN bus interface
CAN 2.0B support
Max bitrate 550kbps

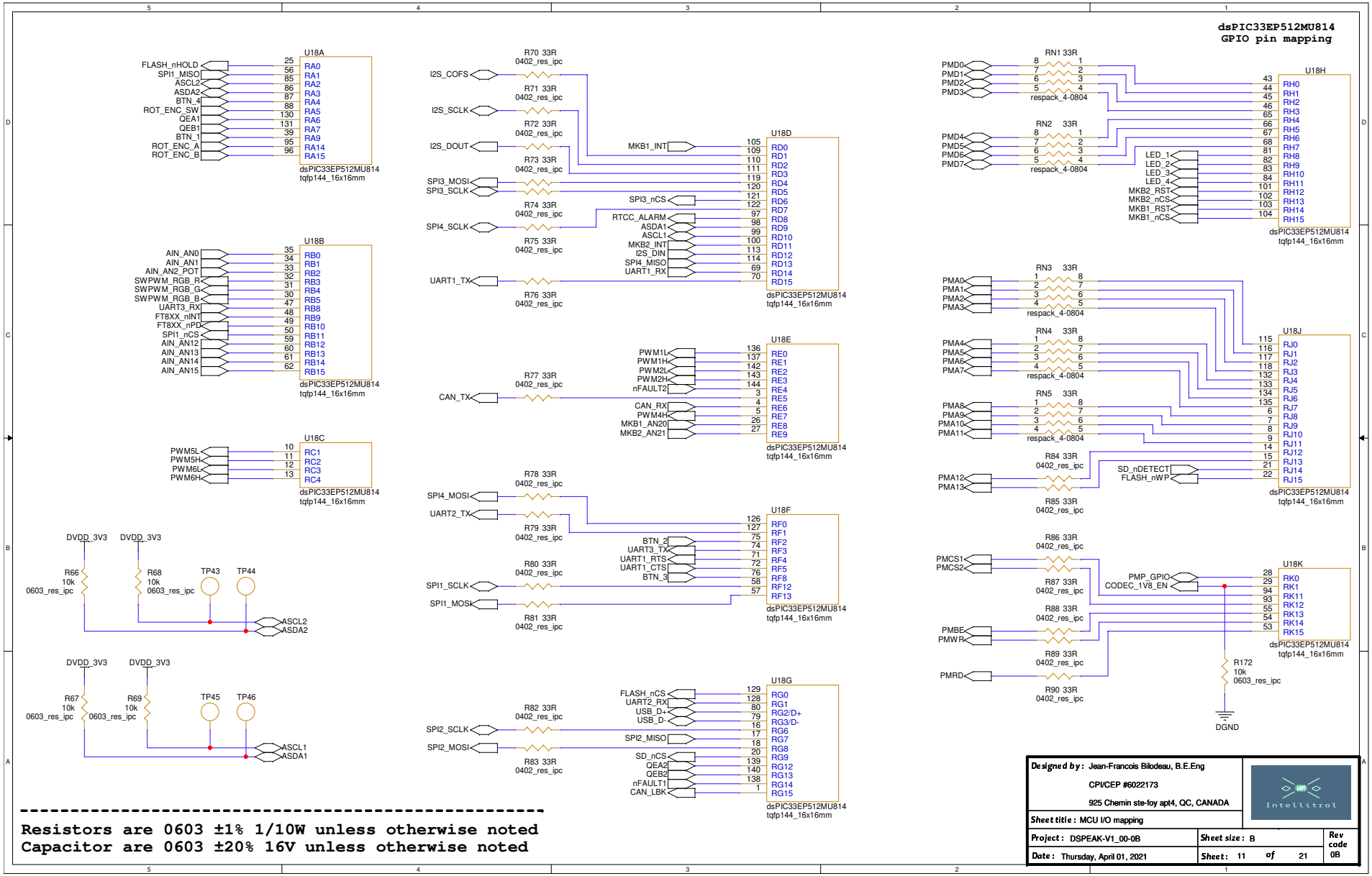


dsPIC33EP512MU814 errata :
CANCKS bit implementation reversed
I.E Fcan = Fcy if CANCKS = 1

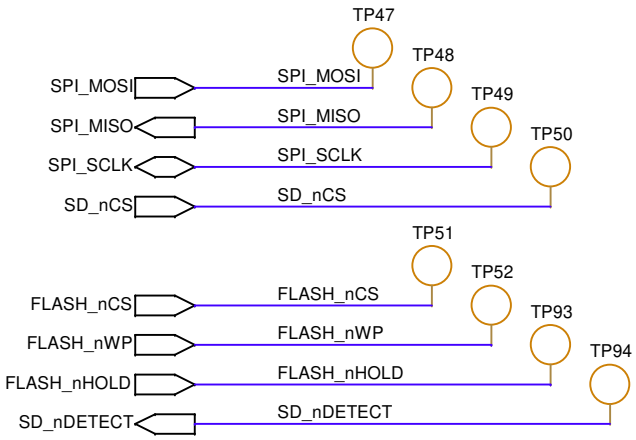
Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

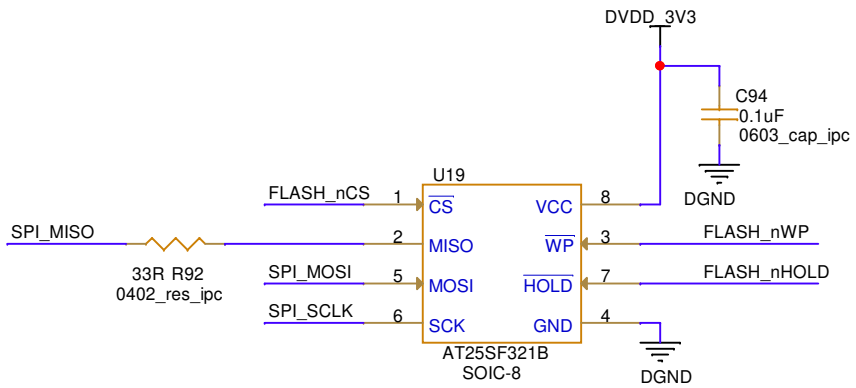
Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : CAN 2.0B bus interface		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Thursday, April 01, 2021	*Sheet :* 9 *of* 21	

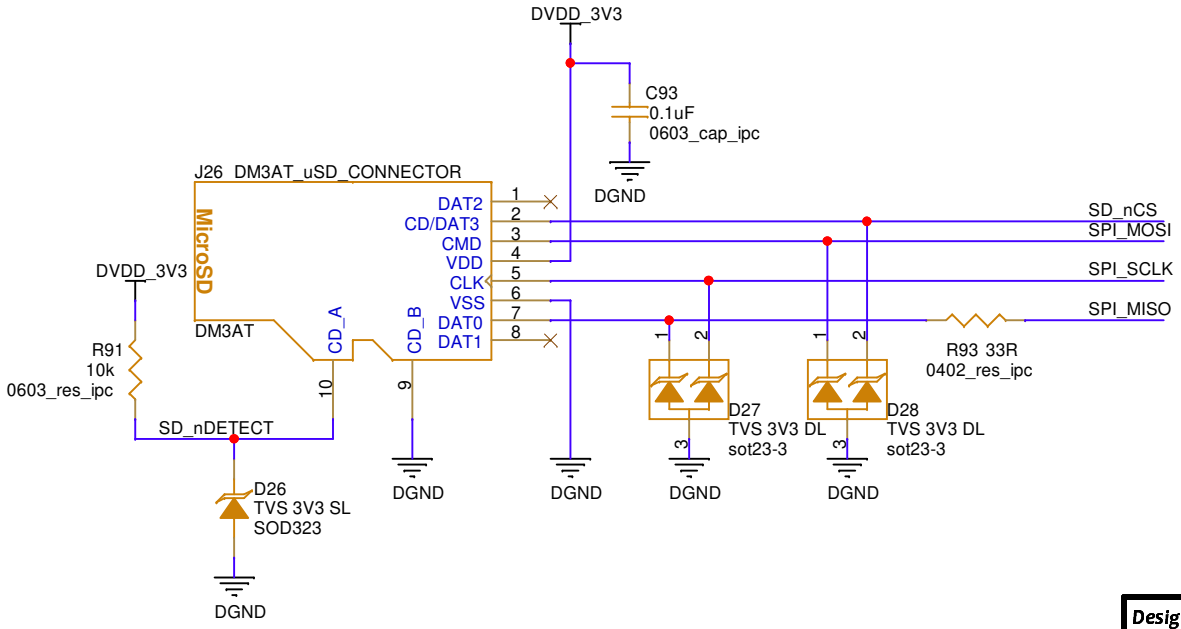

MCU decoupling
MCU oscillators
MCU ICSP port
DVDD_3V3
R65 10k 0603_res_ipc
SW1 btnsmt KSR233G
DGND
#MCLR
ICSPCLK
ICSPDAT
R62 33R
R63 33R
R64 33R
0402_res_ipc
U18L
MCLR
RB6/ICSPCLK1
RB7/ICSPDAT1
RC12/OSC1
RC15/OSC2
RC13/SOSCI
RC14/SOSCO
OSC1
OSC2
SOSCI
SOSCO
dsPIC33EP512MU814
tqfp144_16x16mm
D23 TVS 3V3 DL sot23-3
D24 TVS 3V3 DL sot23-3
AVDD_3V3
VCAP
USB_VBUS
U18I
VDD
VREF+
VCAP
VBUS
VUSB3V3
AVDD
AVSS
VSS
Y1 20.000MHz ABM7
ABM7-20.000MHZ-D2Y-T
C61 18pF 0603_cap_ipc
R61 1Meg 0603_res_ipc
C63 18pF 0603_cap_ipc
Y2 32.768kHz 2-SMD_xtal 12.5pF load crystal
C66 20pF 0603_cap_ipc
C68 20pF 0603_cap_ipc
Primary oscillator, used in HS mode,
requires 1Mohm in parallel to crystal
Add Guard ring on PCB layout
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
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: Thursday, April 01, 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
PMD1
PMD2
PMD3
respack_4-0804
RN2 33R
PMD4
PMD5
PMD6
PMD7
respack_4-0804
LED_1
LED_2
LED_3
LED_4
MKB2_RST
MKB2_nCS
MKB1_RST
MKB1_nCS
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
101 RH12
102 RH13
103 RH14
104 RH15
dsPIC33EP512MU814
tqfp144_16x16mm
RN3 33R
PMA0
PMA1
PMA2
PMA3
respack_4-0804
RN4 33R
PMA4
PMA5
PMA6
PMA7
respack_4-0804
RN5 33R
PMA8
PMA9
PMA10
PMA11
respack_4-0804
R84 33R 0402_res_ipc
PMA12
PMA13
R85 33R 0402_res_ipc
SD_nDETECT
FLASH_nWP
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
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
PMP_GPIO
CODEC_1V8_EN
U18K
28 RK0
29 RK1
94 RK11
93 RK12
55 RK13
54 RK14
53 RK15
dsPIC33EP512MU814
tqfp144_16x16mm
R172 10k 0603_res_ipc
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: MCU I/O mapping
Project: DSPEAK-V1_00-0B
Sheet size: B
Rev code 0B
Date: Thursday, April 01, 2021
Sheet: 11 of 21

Ext / Int memory
SPI Flash and uSD card





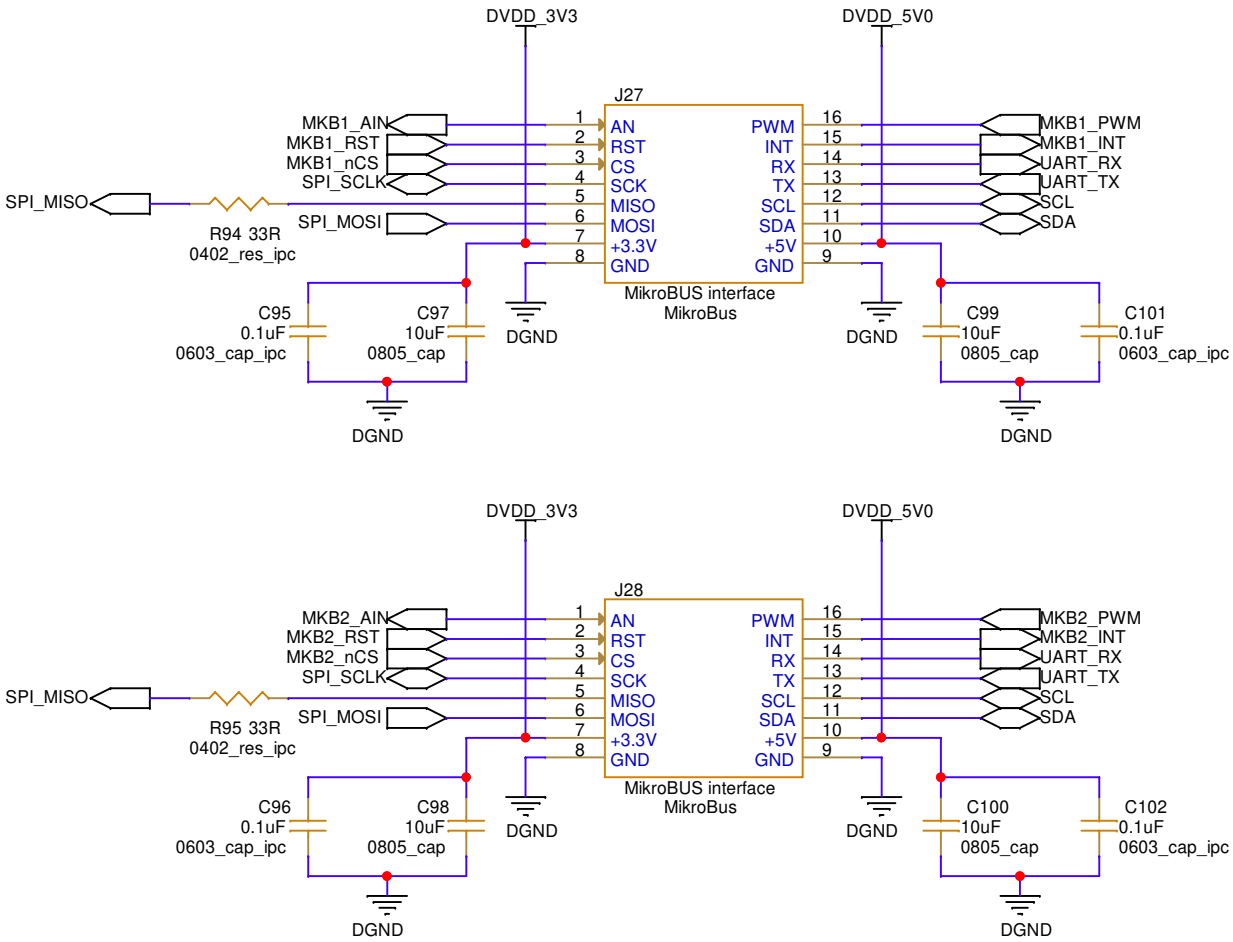


Resistors are 0603 ±1% 1/10W unless otherwise noted

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		Intellitrol
Sheet title : Internal / External memory expansion		
Project : DSPEAK-V1_00-0B	*Sheet size :* A	*Rev code* 0B
Date : Thursday, April 01, 2021	*Sheet :* 12 *of* 21	

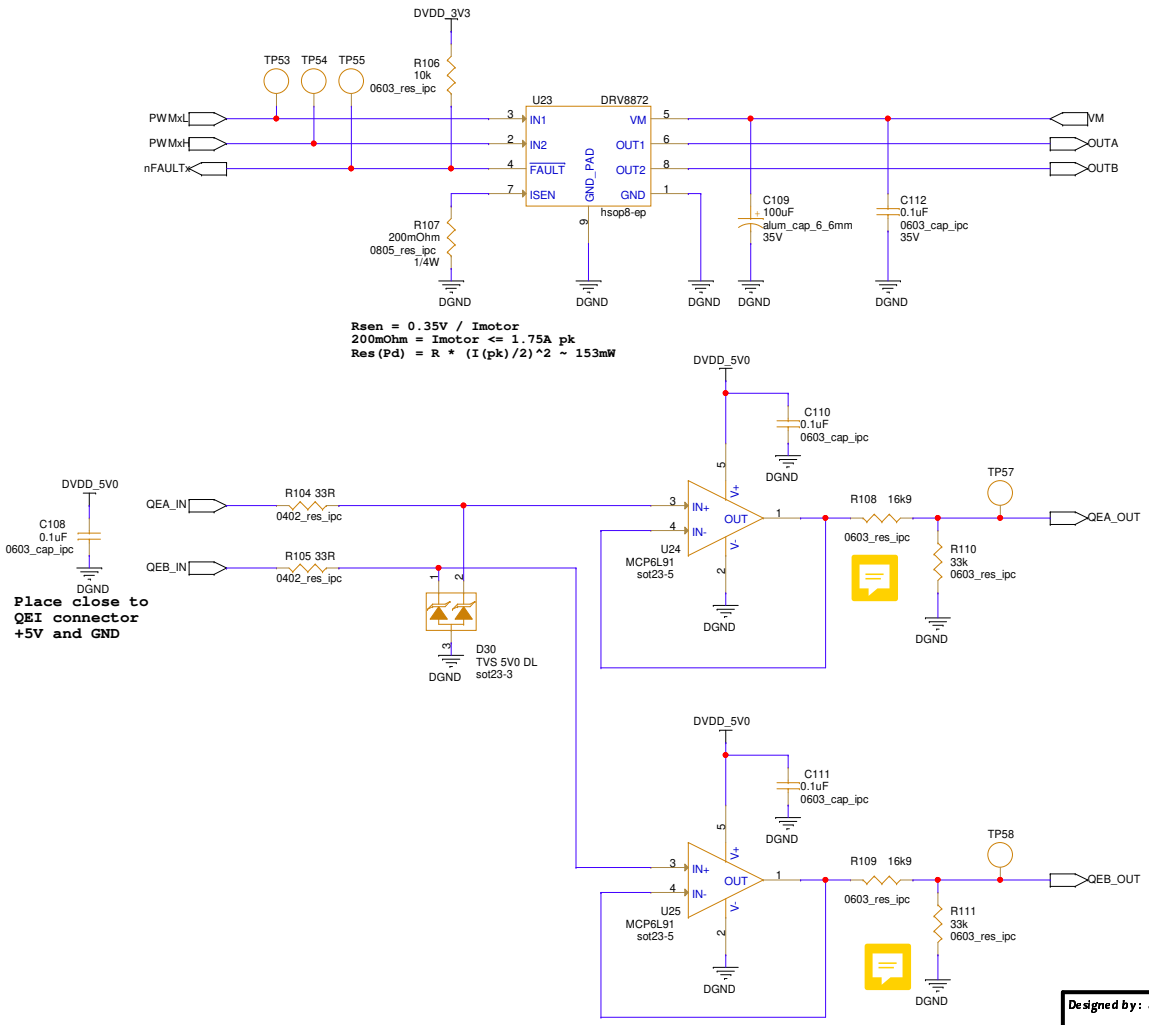
MikroBus port
Click Board compatible
General purpose I/Os



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 : Thursday, April 01, 2021	*Sheet :* 13 *of* 21	

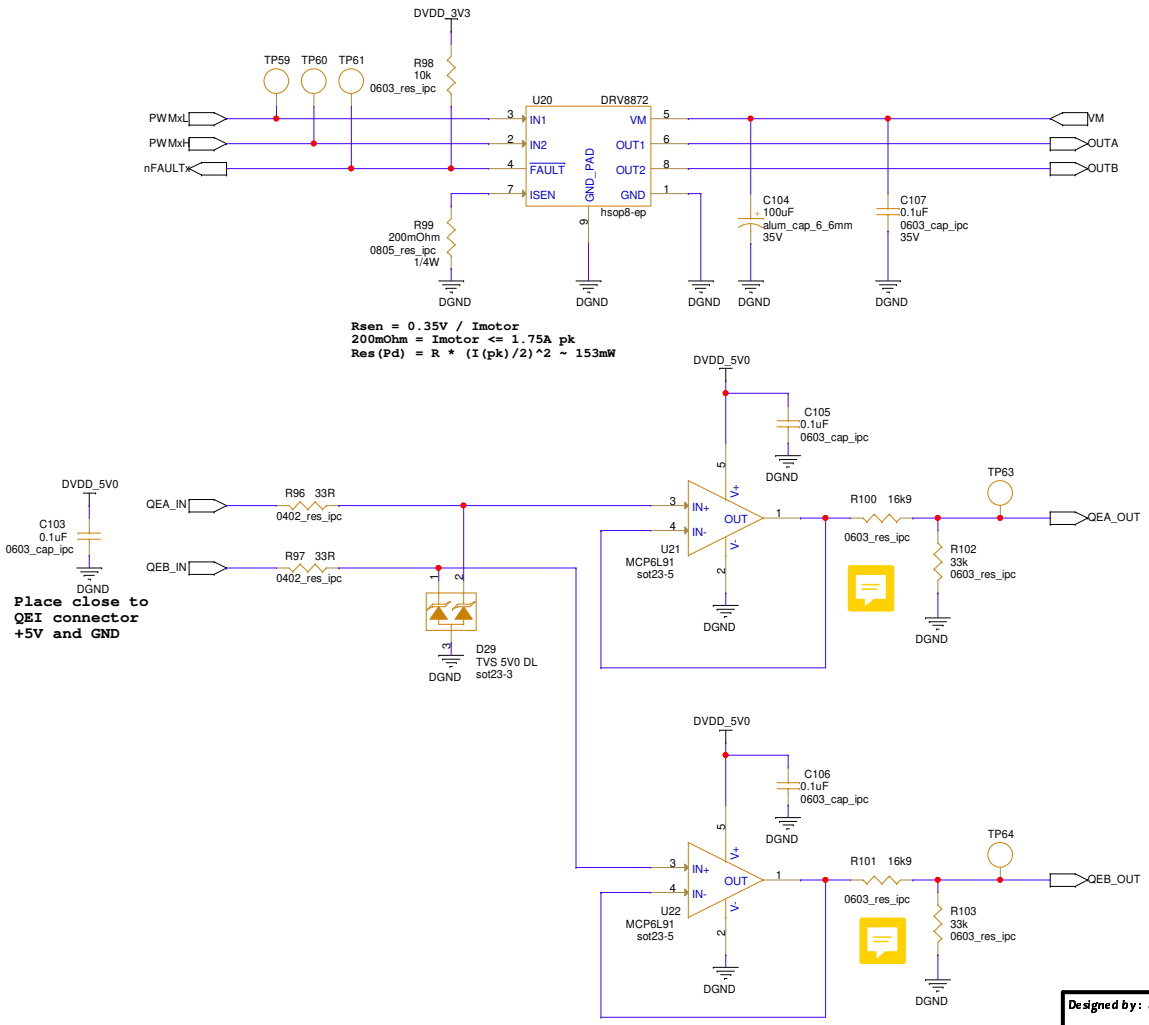
Brushed DC motor driver
QEI encoder feedback



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

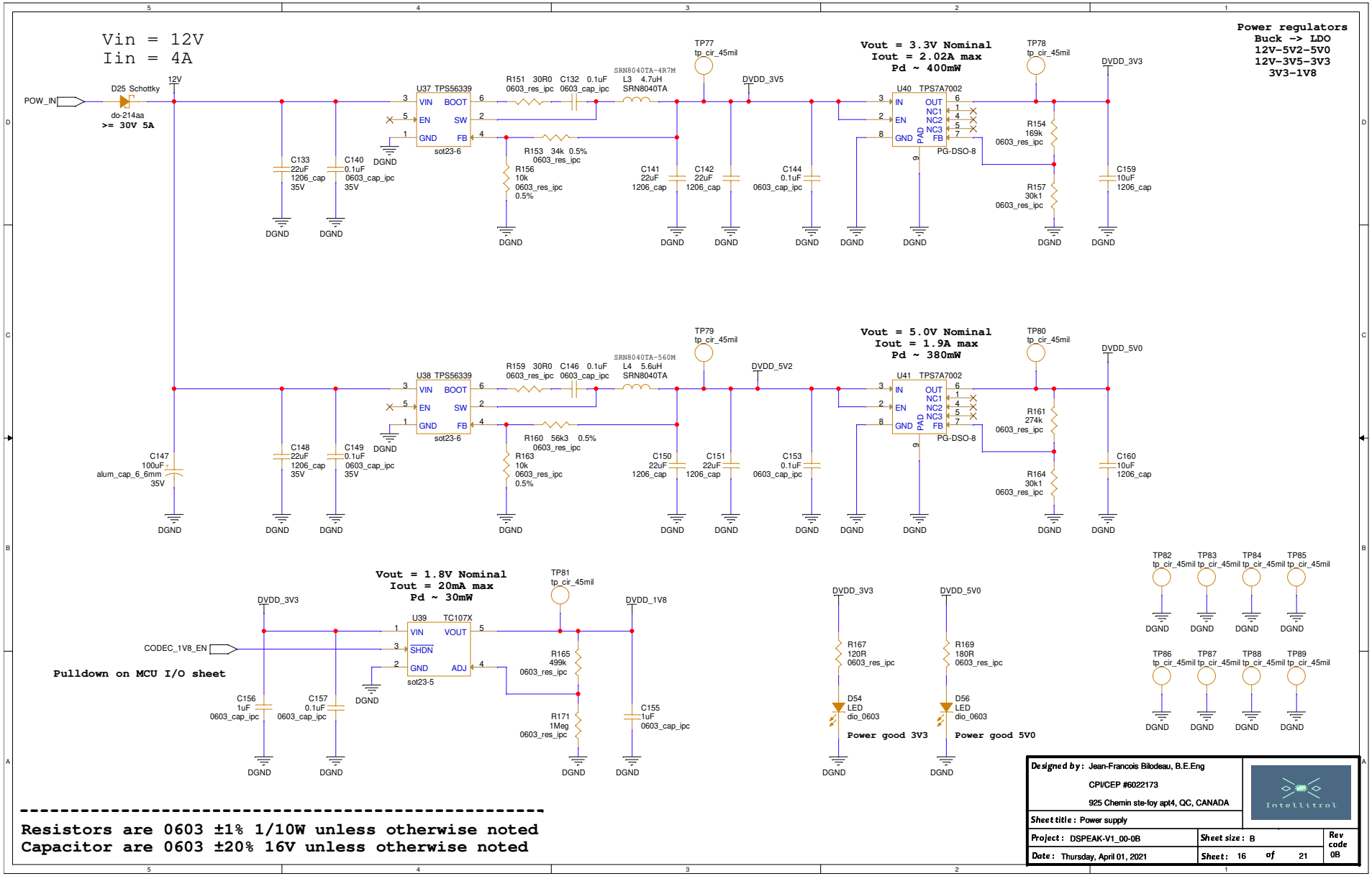
Designed by: Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title: Brushed DC motor control with QEI		
Project: DSPEAK-V1_00-0B	Sheet size: B	Rev code 0B
Date: Thursday, April 01, 2021	Sheet: 14 of 21	

Brushed DC motor driver
QEI encoder feedback

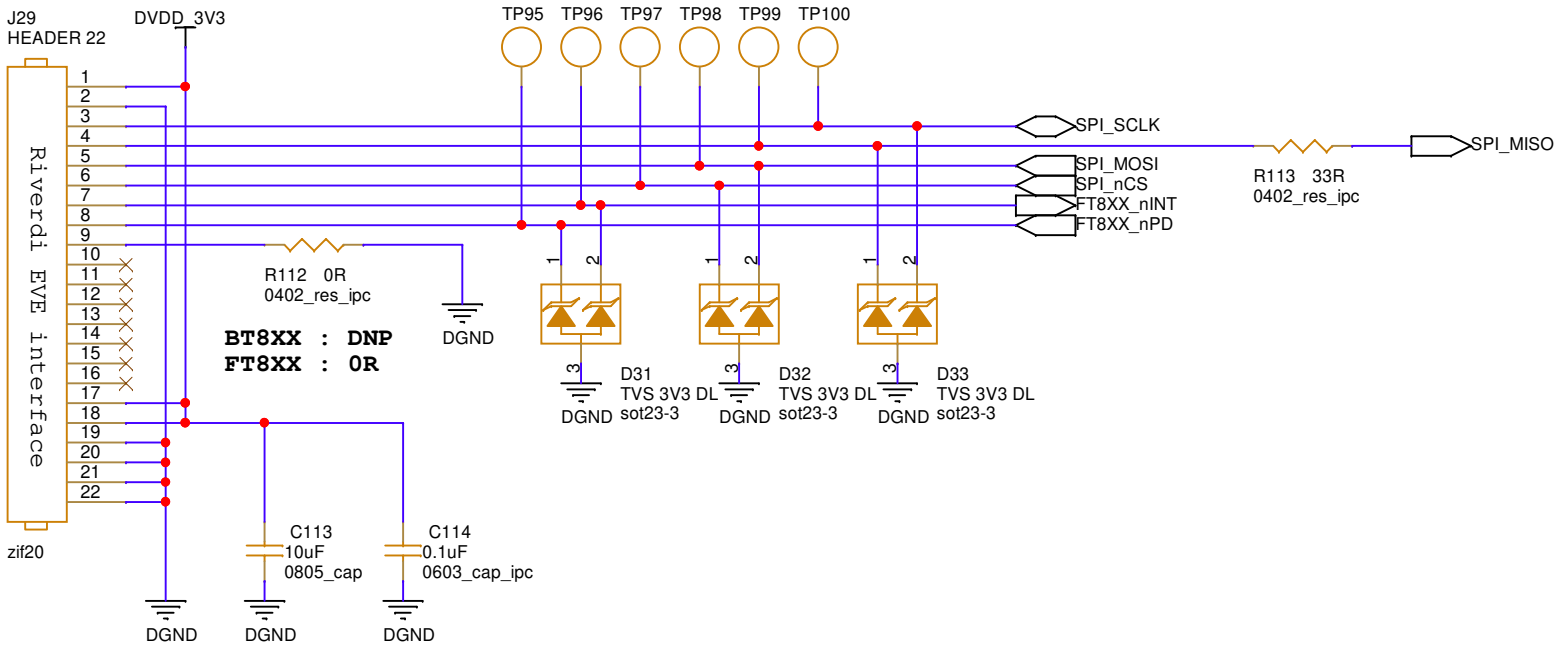


Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

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: Thursday, April 01, 2021	Sheet: 15 of 21	


Vin = 12V
Iin = 4A
Power regulators
Buck -> LDO
12V-5V2-5V0
12V-3V5-3V3
3V3-1V8
Vout = 3.3V Nominal
Iout = 2.02A max
Pd ~ 400mW
Vout = 5.0V Nominal
Iout = 1.9A max
Pd ~ 380mW
Vout = 1.8V Nominal
Iout = 20mA max
Pd ~ 30mW
POW_IN
D25 Schottky
do-214aa
>= 30V 5A
12V
U37 TPS56339
U38 TPS56339
U39 TC107X
U40 TPS7A7002
U41 TPS7A7002
sot23-6
sot23-5
PG-DSO-8
SRN8040TA-4R7M
SRN8040TA-560M
DVDD_3V3
DVDD_3V5
DVDD_5V0
DVDD_5V2
DVDD_1V8
DGND
CODEC_1V8_EN
Pulldown on MCU I/O sheet
Power good 3V3
Power good 5V0
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
Date: Thursday, April 01, 2021
Sheet: 16 of 21
Rev code 0B

Riverdi EVE TFT Interface with FT/BT8xx

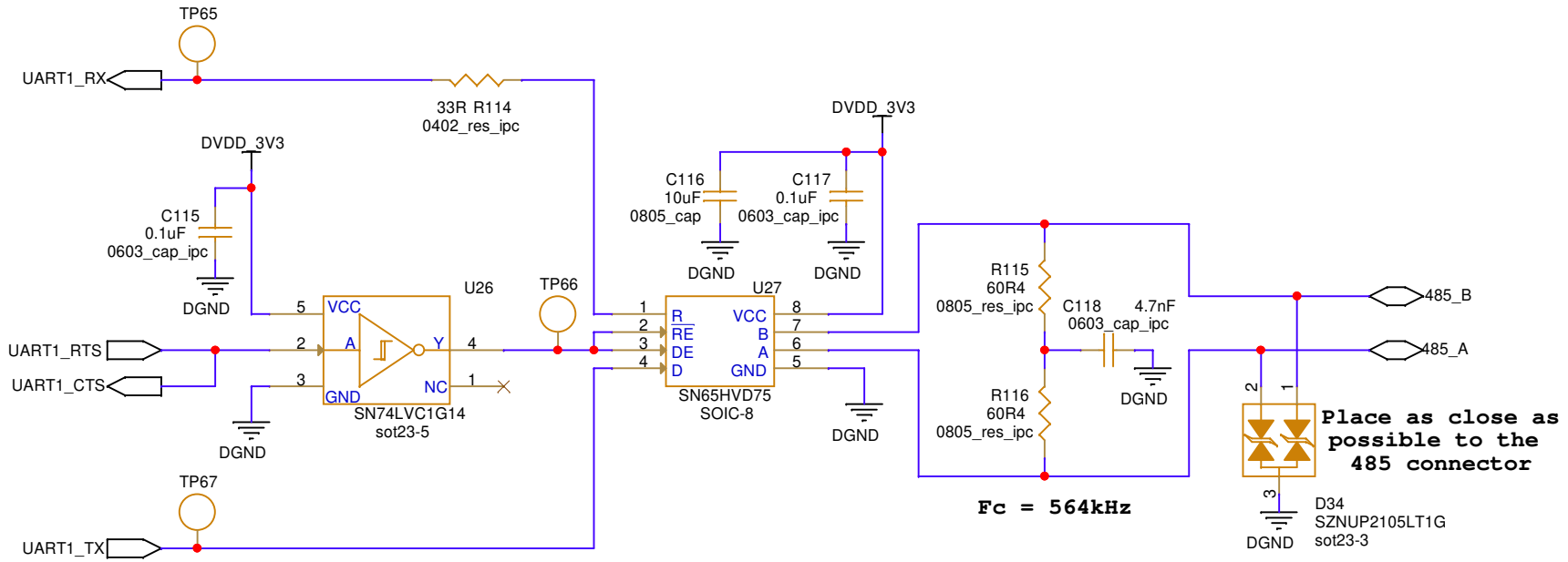


Resistors are 0603 ±1% 1/10W unless otherwise noted

Capacitor are 0603 ±20% 16V unless otherwise noted

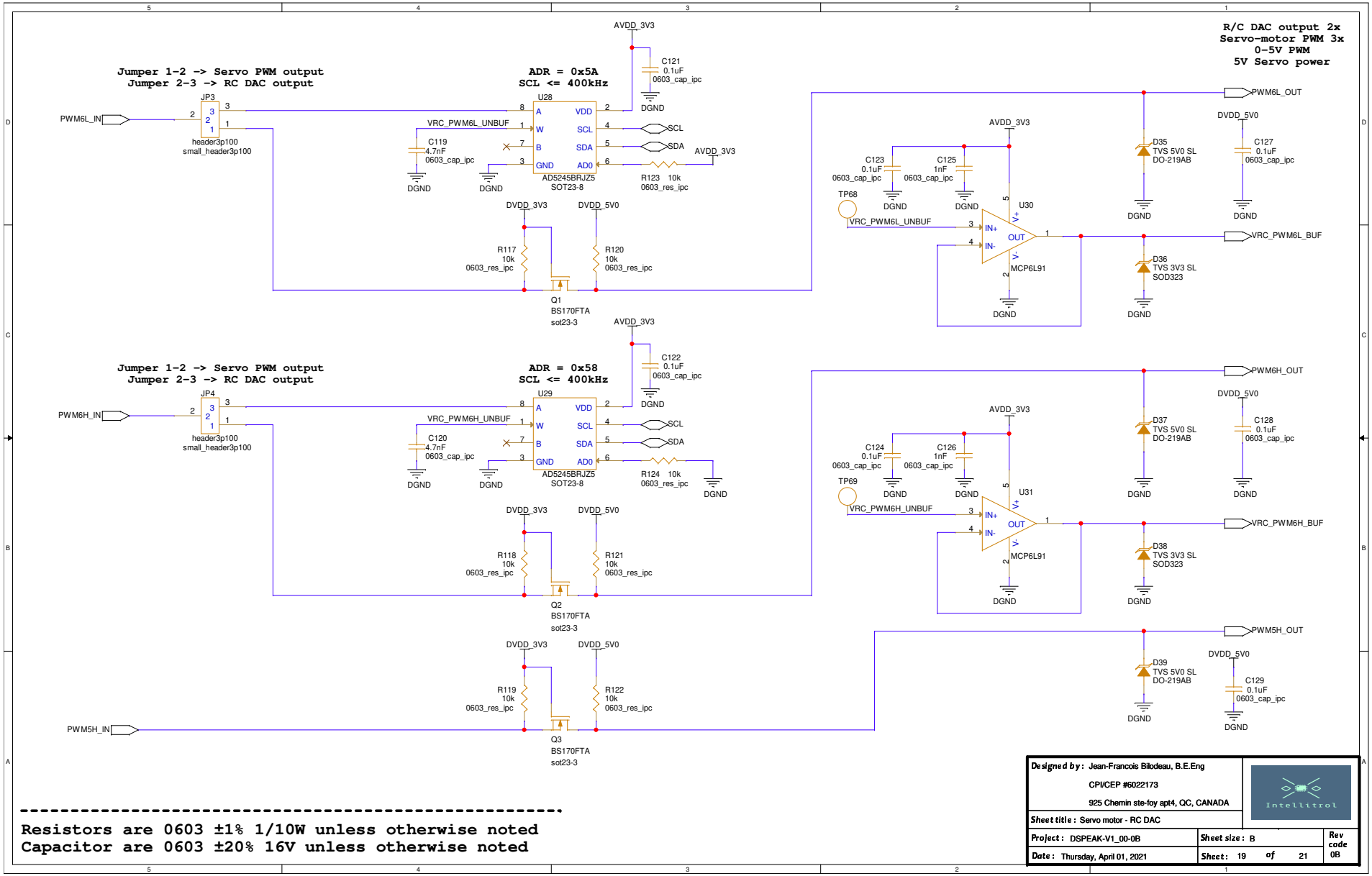
Designed by : Jean-Francois Bilodeau, B.E.Eng CPI/CEP #6022173 925 Chemin ste-foy apt4, QC, CANADA		Intellitrol
Sheet title : Riverdi TFT LCD EVE interface		
Project : DSPEAK-V1_00-0B	**Sheet size :** A	**Rev code** 0B
Date : Thursday, April 01, 2021	**Sheet :** 17 of 21	

RS485 bus interface
Max bitrate 550kbps

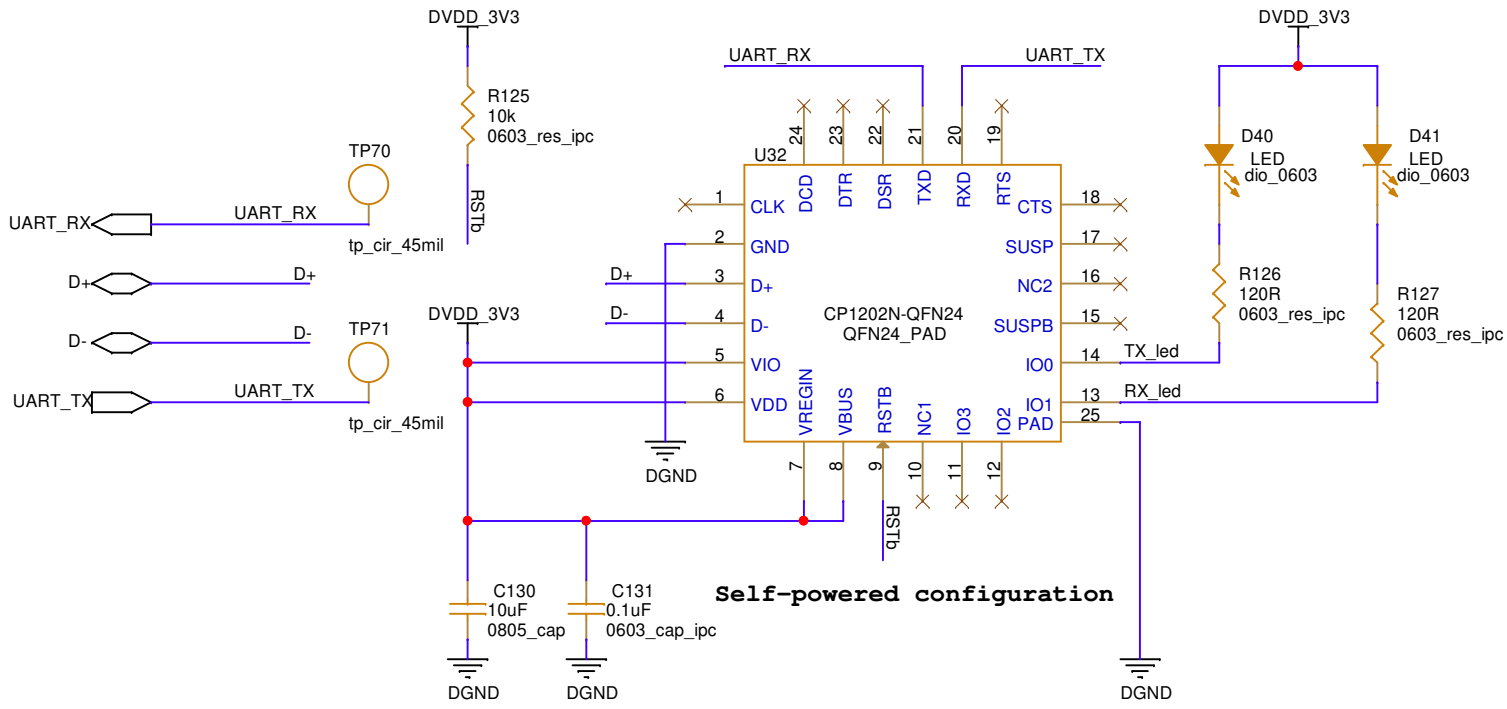


Resistors are 0603 ±1% 1/10W unless otherwise noted
Capacitor are 0603 ±20% 16V unless otherwise noted

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 : Thursday, April 01, 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
C123
0.1uF
C125
1nF
TP68
U30
MCP6L91
VRC_PWM6L_UNBUF
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
header3p100
small_header3p100
U29
AD5245BRJZ5
SOT23-8
VRC_PWM6H_UNBUF
C120
4.7nF
0603_cap_ipc
C122
0.1uF
0603_cap_ipc
R124 10k
0603_res_ipc
R118
10k
0603_res_ipc
R121
10k
0603_res_ipc
Q2
BS170FTA
sot23-3
C124
0.1uF
C126
1nF
TP69
U31
MCP6L91
VRC_PWM6H_UNBUF
PWM6H_OUT
VRC_PWM6H_BUF
D37
TVS 5V0 SL
DO-219AB
D38
TVS 3V3 SL
SOD323
C128
0.1uF
PWM5H_IN
R119
10k
0603_res_ipc
R122
10k
0603_res_ipc
Q3
BS170FTA
sot23-3
PWM5H_OUT
D39
TVS 5V0 SL
DO-219AB
C129
0.1uF
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: Thursday, April 01, 2021
Sheet: 19 of 21

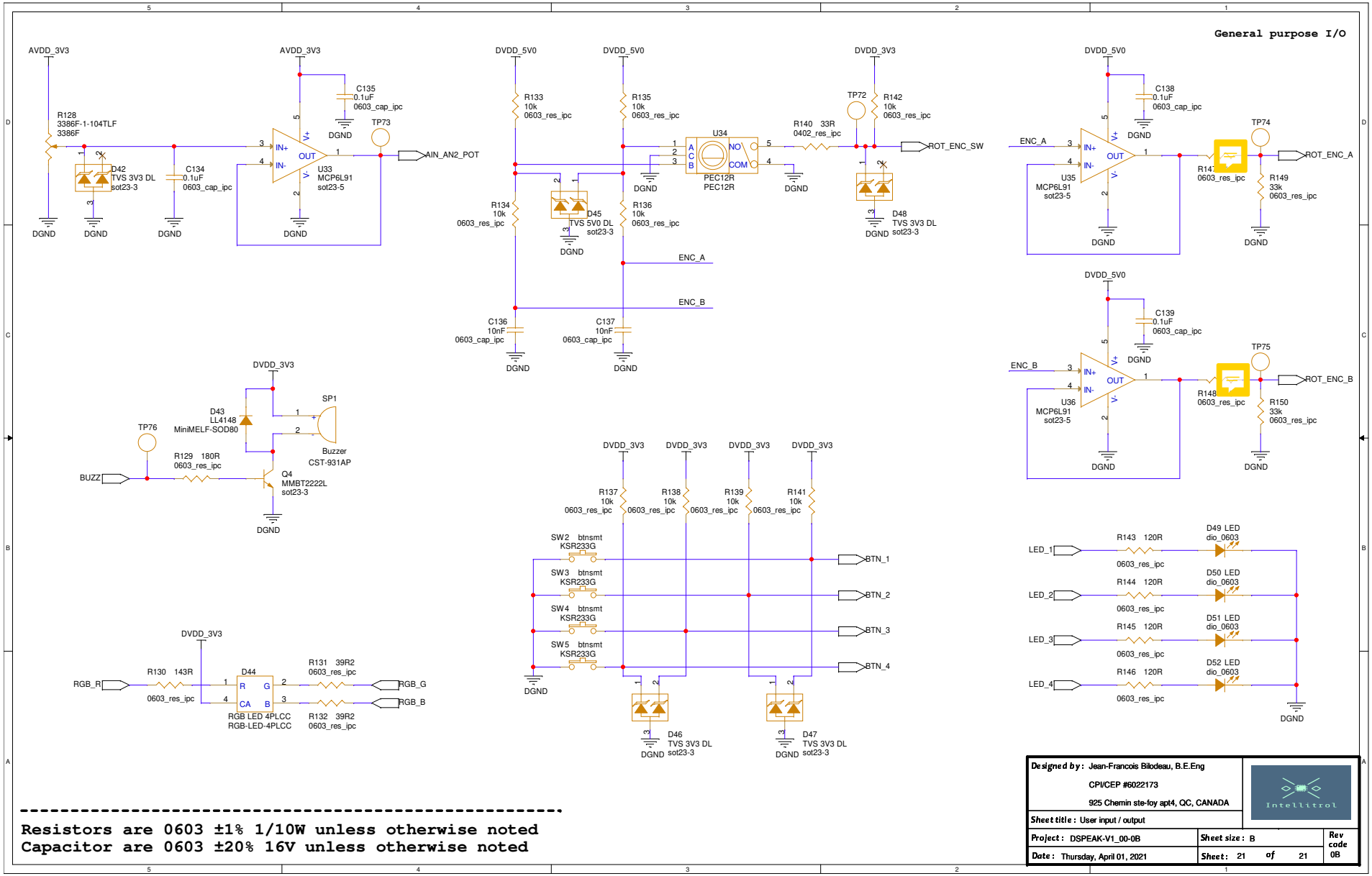
USB-UART Converter
SW debug interface



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 : Thursday, April 01, 2021	*Sheet :* 20 *of* 21	


General purpose I/O
AVDD_3V3
R128 3386F-1-104TLF 3386F
D42 TVS 3V3 DL sot23-3
C134 0.1uF 0603_cap_ipc
C135 0.1uF 0603_cap_ipc
TP73
U33 MCP6L91 sot23-5
AIN_AN2_POT
DGND
DVDD_5V0
DVDD_3V3
R133 10k 0603_res_ipc
R134 10k 0603_res_ipc
R135 10k 0603_res_ipc
R136 10k 0603_res_ipc
D45 TVS 5V0 DL sot23-3
U34 PEC12R PEC12R
R140 33R 0402_res_ipc
TP72
R142 10k 0603_res_ipc
D48 TVS 3V3 DL sot23-3
ROT_ENC_SW
ENC_A
ENC_B
C136 10nF 0603_cap_ipc
C137 10nF 0603_cap_ipc
C138 0.1uF 0603_cap_ipc
U35 MCP6L91 sot23-5
TP74
R149 33k 0603_res_ipc
ROT_ENC_A
C139 0.1uF 0603_cap_ipc
U36 MCP6L91 sot23-5
TP75
R150 33k 0603_res_ipc
ROT_ENC_B
SP1
Buzzer CST-931AP
D43 LL4148 MiniMELF-SOD80
TP76
R129 180R 0603_res_ipc
BUZZ
Q4 MMBT2222L sot23-3
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
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
R143 120R 0603_res_ipc
R144 120R 0603_res_ipc
R145 120R 0603_res_ipc
R146 120R 0603_res_ipc
D49 LED dio_0603
D50 LED dio_0603
D51 LED dio_0603
D52 LED dio_0603
LED_1
LED_2
LED_3
LED_4
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: User input / output
Project: DSPEAK-V1_00-0B
Sheet size: B
Date: Thursday, April 01, 2021
Sheet: 21 of 21
Rev code 0B