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Revisions

Rev	Description	Date	Approved
X1	Release to CAD	10 Oct 11	J.H.
A	Release to Production	21 Oct 11	J.H.
B	- Added 10uF cap (C50) to output of U10 - Replaced silicon/socket subassembly with silicon part	2 Feb 12	DK

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Microcontroller Solutions Group

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ICAP Classification: FCP: FIUO: PUBI: X

Designer: Jay Hartvigsen	Drawing Title: **TWR-K60D100M**	
Drawn by: Jay Hartvigsen	Page Title: **Table of Contents/Revisions**	
Approved: Lawrence Shellaby	Size: C	Document Number: SCH-27291 PDF: SPF-27291 — Rev: B
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1. Unless Otherwise Specified:
   All resistors are in ohms
   All capacitors are in uF
   All voltages are DC
   All polarized capacitors are aluminum electrolytic

2. Interrupted lines coded with the same letter or letter combinations are electrically connected.

3. Device type number is for reference only. The number varies with the manufacturer.

4. Special signal usage:
   _B Denotes - Active-Low Signal
   <> or [] Denotes - Vectored Signals

5. Interpret diagram in accordance with American National Standards Institute specifications, current revision, with the exception of logic block symbology.

Power & Ground Nets

NET	VOLTAGE	DESCRIPTION
P5V_USB	5V	Primary input power. Filtered from USB connector. Input to USB power switch.
P5V_TRG_USB	5V	Output of USB power switch controlled by the VTRG_EN signal from the JM60 MCU. Provides input to regulator.
P5V_SW	5V	Output of USB power switch controlled by the 5V_EN signal from the JM60 MCU. Used by OSBDM voltage translation circuits.
P5V_ELEV	5V	5V power on the Tower Elevator. This board provides power from P5V_TRG_USB to the elevator connectors through a diode.
P3V3	3.3V	Output of 3.3V regulator using USB power input (P5V_TRG_USB).
P1V8	1.8V	Output of 1.8V regulator using P3V3 power input.
V_BRD	1.8V/3.3V	Board power - selected from either the 1.8V or 3.3V supplies by a header and shunt.
MCU_PWR	1.8V/3.3V	MCU digital power. Filtered from V_BRD.
VDDA	3.3V	VDDA power for MCU and analog circuits. Filtered from 3V3_MCU.
VREFH	3.3V	Upper reference voltage for ADC on the MCU. Filtered from VDDA.
VREFL	0V	Lower reference voltage for ADC on the MCU. Filtered from VSSA.
VSSA	0V	VSSA power for MCU and analog circuits. Filtered from GND.
GND	0V	Digital Ground.

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Drawing Title: **TWR-K60D100M**

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Sheet 8

ELEVATOR CONNECTORS

Sheet 5

OSJTAG/USB Bridge Circuit

USB Mini B Connector

MC9S08JM60

Voltage Translation

OSJTAG/JTAG Header

SCI Source Selectors

Power Supply Circuits

Sheet 4

K60DN512VMD10 MCU

50 MHz XTAL

32.768 KHz XTAL

VSSA/VDDA filter

VREFH/VREFL filter

VREF_OUT

VREGIN, VOUT33

VBAT

Sheet 6

INFRARED PORT

Sheet 6

PUSH BUTTONS

Sheet 7

LEDs

Sheet 6

SD CARD SOCKET

Sheet 7

GENERAL PURPOSE
TOWER PLUG-IN (TWRPI)
JACK

Sheet 7

ANALOG INPUTS

MMA78451Q ACCELEROMETER

POTENTIOMETER

Sheet 7

TOUCH
TOWER PLUG-IN (TWRPI)
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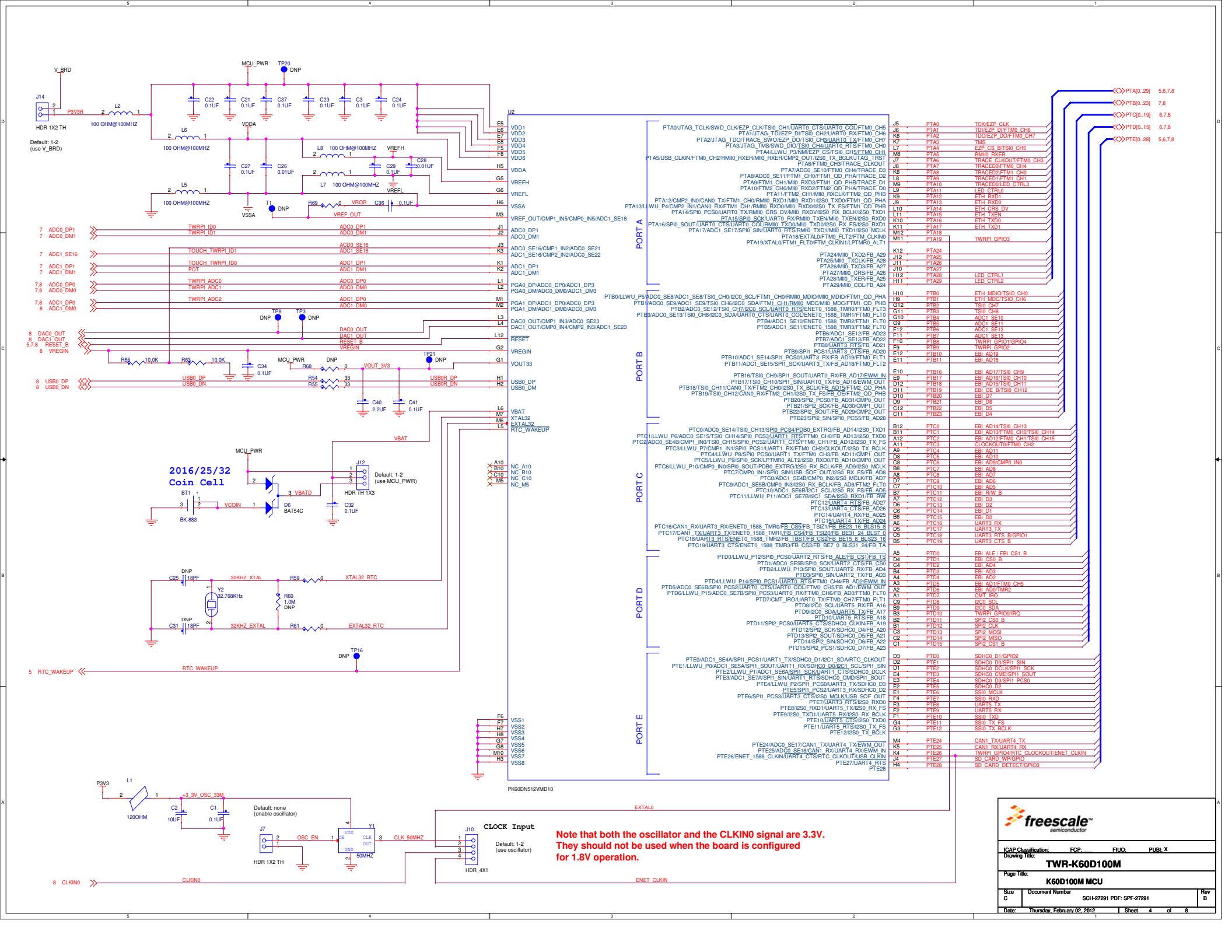
V_BRD
J14
HDR 1X2 TH
Default: 1-2
(use V_BRD)
P3V3R
L2
100 OHM@100MHZ
MCU_PWR
TP20
DNP
VDDA
L6
L8
VREFH
L7
VREFL
L5
VSSA
T1
R69
VROR
C36
0.1UF
VREF_OUT
C22 0.1UF
C21 0.1UF
C37 0.1UF
C23 0.1UF
C3 0.1UF
C24 0.1UF
C27 0.1UF
C26 0.01UF
C29 0.1UF
C28 0.01UF
U2
PK60DN512VMD10
PORT A
PORT B
PORT C
PORT D
PORT E
TWRPI_ID0
TWRPI_ID1
ADC0_DP1
ADC0_DM1
TOUCH_TWRPI_ID1
ADC0_SE16
ADC1_SE16
TOUCH_TWRPI_ID0
ADC1_DP1
ADC1_DM1
POT
TWRPI_ADC0
ADC0_DP0
ADC0_DM0
TWRPI_ADC1
TWRPI_ADC2
ADC1_DP0
ADC1_DM0
TP8
TP3
DAC0_OUT
DAC1_OUT
RESET_B
VREGIN
R65 10.0K
R63 10.0K
C34 0.1UF
R68
VOUT_3V3
TP21
R54 33
R55 33
USB0_DP
USB0_DN
C40 2.2UF
C41 0.1UF
VBAT
XTAL32
EXTAL32
RTC_WAKEUP
2016/25/32
Coin Cell
BT1
BK-883
VCOIN
D6
BAT54C
J12
HDR TH 1X3
Default: 1-2
(use MCU_PWR)
C32 0.1UF
C25 18PF
C31 18PF
Y2
32.768KHz
32KHZ_XTAL
32KHZ_EXTAL
R59
R60
1.0M
XTAL32_RTC
EXTAL32_RTC
TP16
RTC_WAKEUP
P3V3
L1
120OHM
+3_3V_OSC_33M
C2 10UF
C1 0.1UF
Default: none
(enable oscillator)
J7
HDR 1X2 TH
OSC_EN
Y1
50MHZ
CLK_50MHZ
J10
HDR_4X1
CLOCK Input
Default: 1-2
(use oscillator)
EXTAL0
ENET_CLKIN
CLKIN0
Note that both the oscillator and the CLKIN0 signal are 3.3V.
They should not be used when the board is configured
for 1.8V operation.
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TWR-K60D100M
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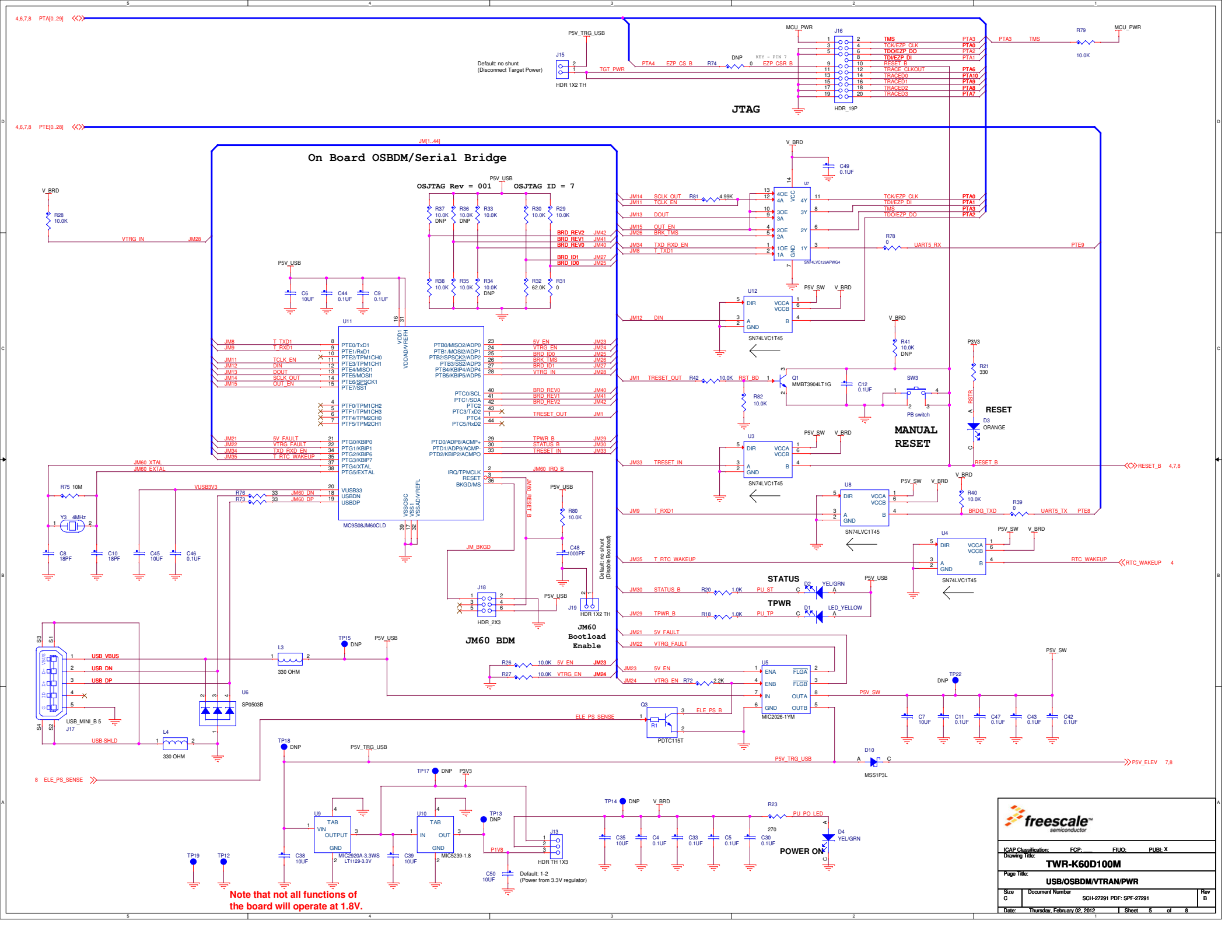
JTAG
On Board OSBDM/Serial Bridge
OSJTAG Rev = 001 OSJTAG ID = 7
JM60 BDM
JM60 Bootload Enable
STATUS
TPWR
RESET
MANUAL RESET
POWER ON
Note that not all functions of the board will operate at 1.8V.
MC9S08JM60CLD
SN74LVC1T45
SN74LVC126APWG4
MIC2026-1YM
MIC2920A-3.3WS
MIC5239-1.8
SP0503B
PDTC115T
MMBT3904LT1G
MSS1P3L
TWR-K60D100M
USB/OSBDM/VTRAN/PWR
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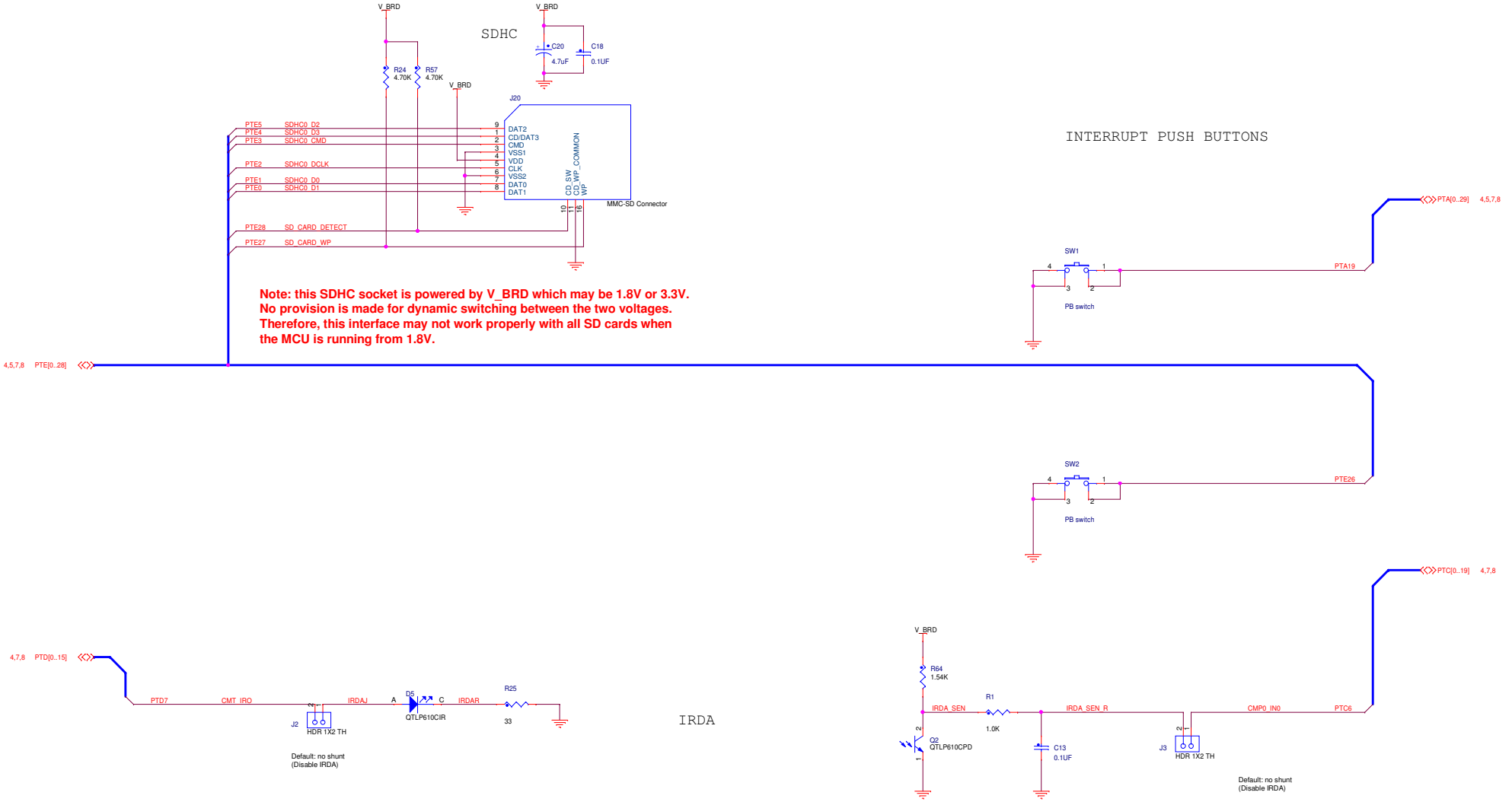

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Page Title: **Peripherals**

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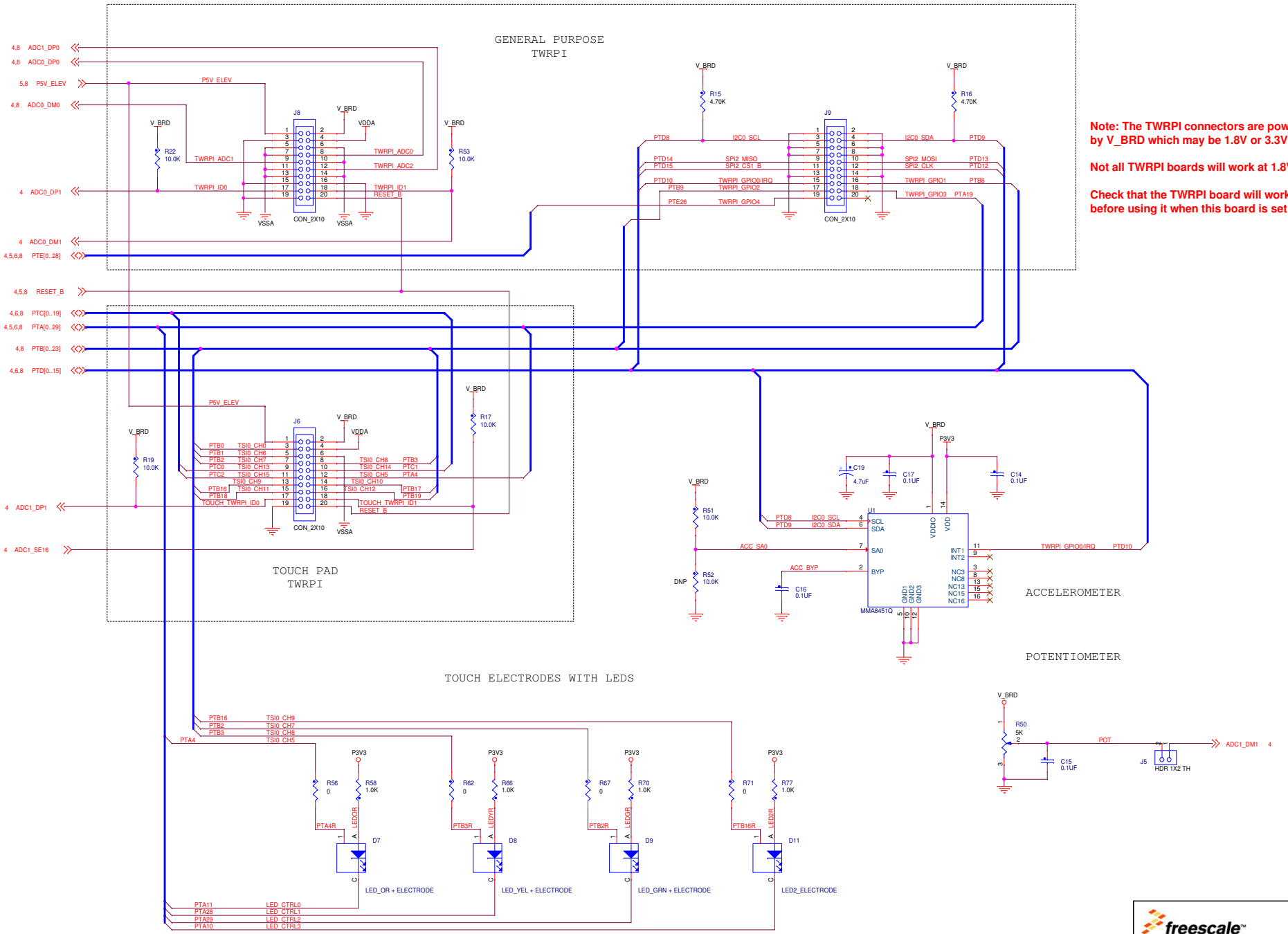

Note: The TWRPI connectors are powered by V_BRD which may be 1.8V or 3.3V.

Not all TWRPI boards will work at 1.8V.

Check that the TWRPI board will work at 1.8V before using it when this board is set for 1.8V.

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Drawing Title: **TWR-K60D100M**

Page Title: **Sensors**

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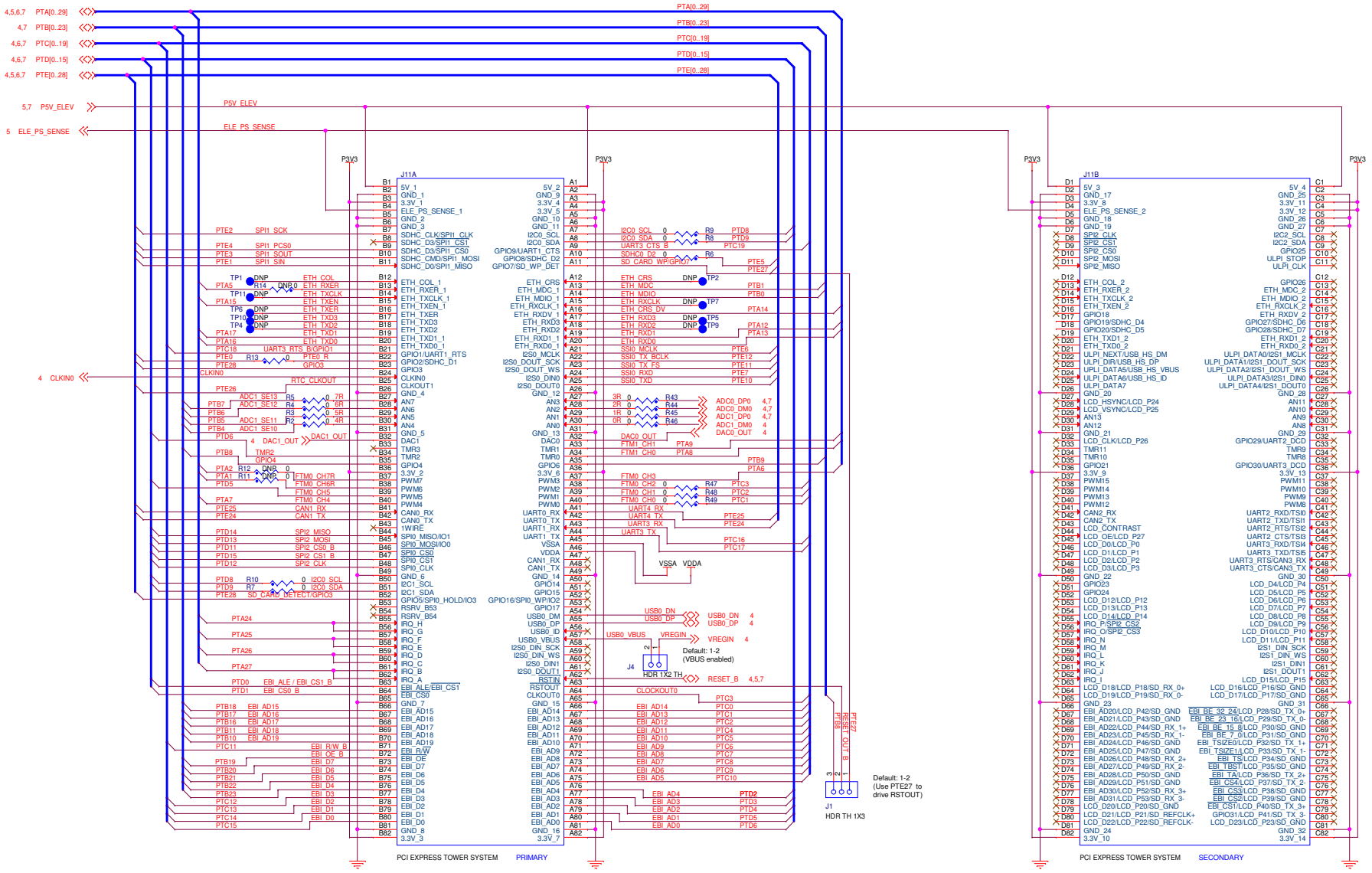

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Drawing Title: **TWR-K60D100M**

Page Title: **Elevator Connector**

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