


Contents	
	n
	IO MCU
	TRAN/PWR
6	Peripherals
7	Sensors
8	Elevator Connectors

Revisions			
Rev	Description	Date	Approved
X1	Release to A070	11-9-2011	LS
A	Release to A085	11-28-2011	LS

		Microcontroller Solutions Group 6501 William Cannon Drive West Austin, TX 78725-8598	
<small>This document contains information proprietary to Freescale Semiconductor and shall not be used for engineering design, procurement or manufacture in whole or in part without the express written permission of Freescale Semiconductor.</small>			
Design: J.Antony (L&T)	Drawing Title: TWR-K40D100M	ICAP Classification: FCP:	PUC: <input checked="" type="checkbox"/> X PUB:
Drawn by: J.Antony (L&T)	Page Title: Table of Contents/Revisions		
Approved: Shelby Lawrence	Size: C	Document Number: SCH-27292 PDF: SPF-27292	Rev: A
Date: Monday, November 28, 2011		Sheet: 1 of 8	




ified:
ms
JF

Power & Ground Nets

- 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.

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.



ICAP Classification: FCP: FREQ: X PURS:

Drawing Title: **TWR-K40D100M**

Page Title: **Notes**

Size	Document Number	Rev
C	SCH-27292 PDF: SPF-27292	A
Date:	Monday, November 28, 2011	Sheet 2 of 8



Sheet 8

ELEVATOR CONNECTORS

Sheet 6

OSJTAG/USB Bridge Circuit

USB Mini B Connector

MC9S08JM60

Voltage Translation

OSJTAG/JTAG Header

SCI Source Selectors

Power Supply Circuits

Sheet 4

PK40DX256VMD10 MCU

8 MHz XTAL

32.768 KHz XTAL

VSSA/VDDA filter

VREFH/VREFL filter

VREF_OUT

VREGIN, VOUT33

VBAT

Sheet 7

INFRARED PORT

Sheet 7

PUSH BUTTONS

Sheet 7

CAPACITIVE TOUCH PADS
WITH LEDs

Sheet 7

SD CARD SOCKET

Sheet 7

TOWER PLUG-IN (TWRPI)
SENSOR HEADERS

Sheet 7

ANALOG INPUTS

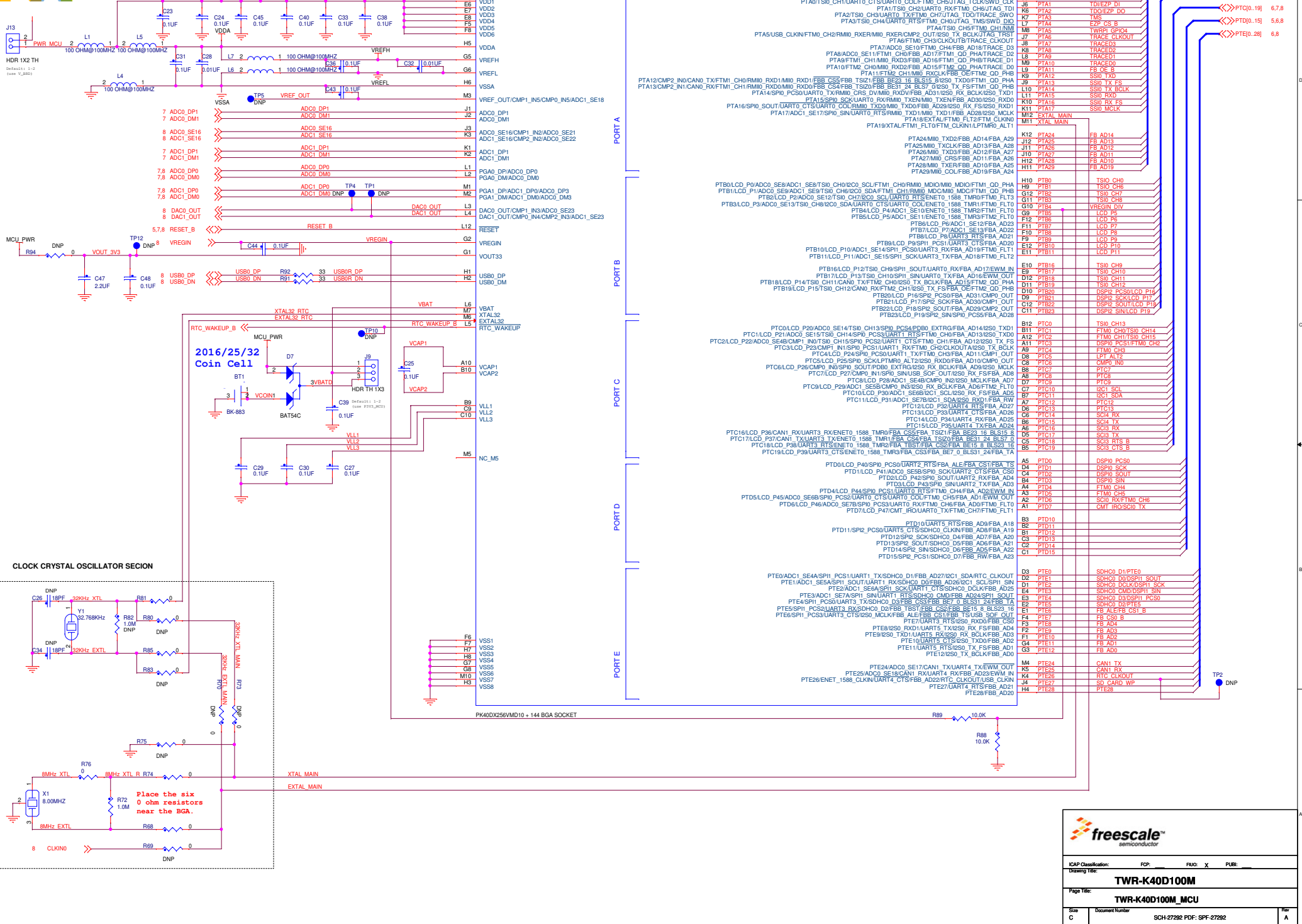
MMA8451Q ACCELEROMETER

POTENTIOMETER

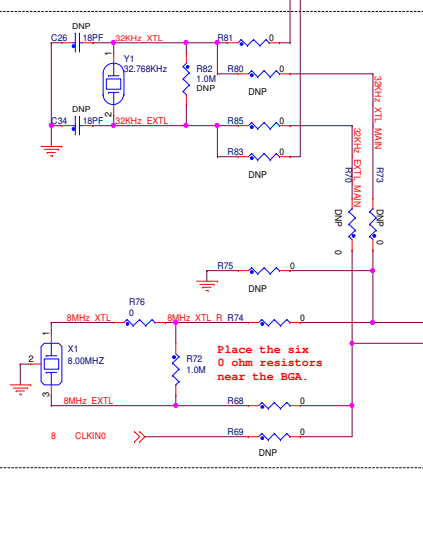
Sheet 7

TOWER PLUG-IN (TWRPI)
TOUCH HEADER

ICAP Classification: FCP: _____ FWD: X PURB: _____	
Drawing Title: TWR-K40D100M	
Page Title: Block Diagram	
Size: C	Document Number: SCH-27292 PDF: SPF-27292
Date: Monday, November 28, 2011	Sheet 3 of 8



CLOCK CRYSTAL OSCILLATOR SECTION



freescale
semiconductor

ICAP Classification: FCP FWD: X PURE:

Drawing Title: **TWR-K40D100M**

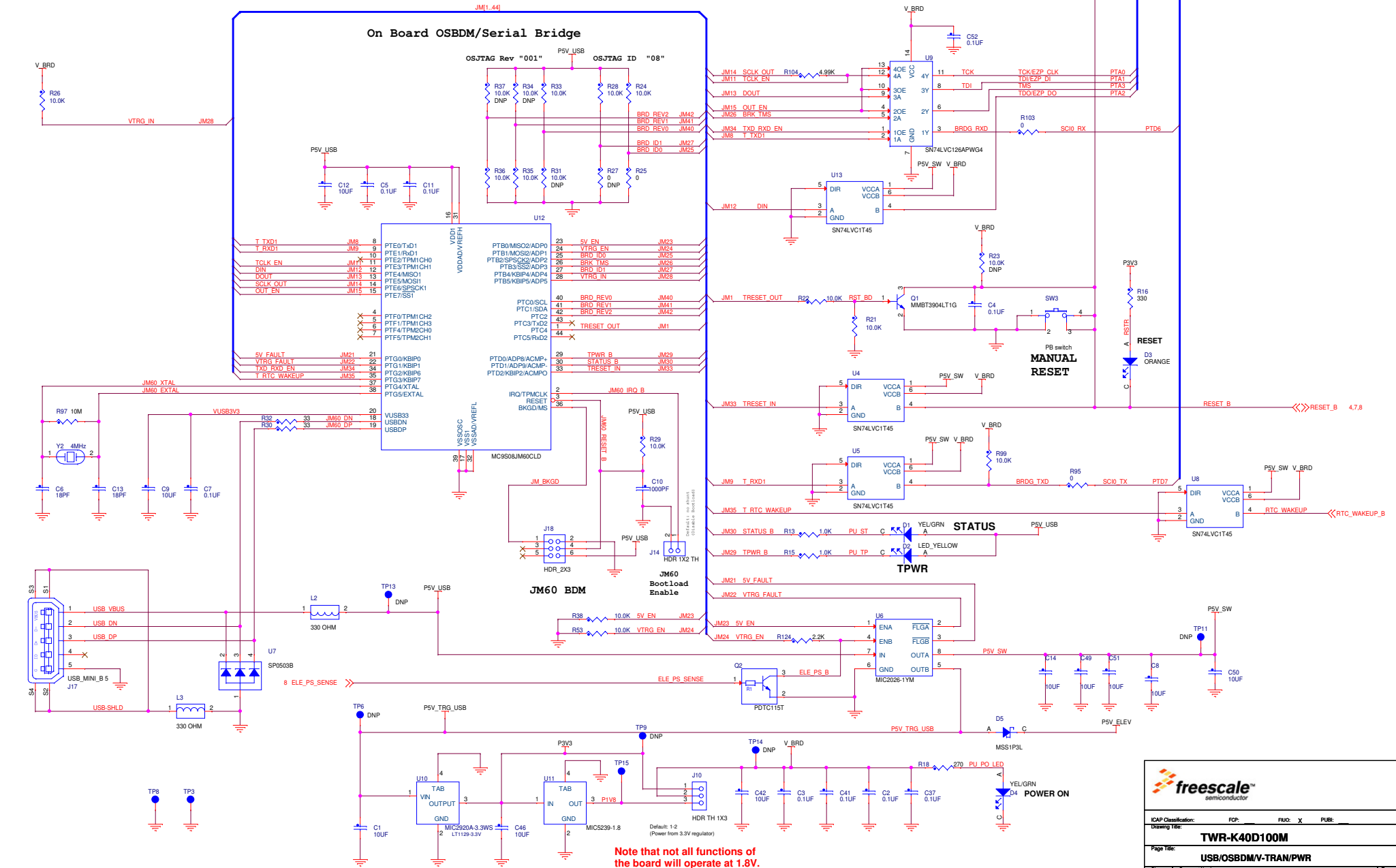
Page Title: **TWR-K40D100M_MCU**

Doc Number: SCH-27292 PDF: SPF-27292

Date: Monday, November 28, 2011 Sheet 4 of 8



4.6.8 PTD[0..15]



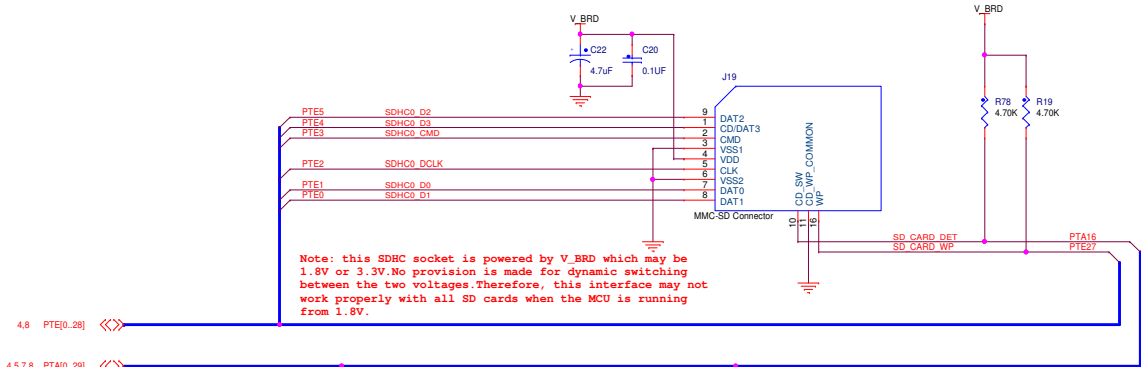
Note that not all functions of the board will operate at 1.8V.

freescale
semiconductor

ICAP Classification: FOP: FWD: X PUBE: _____
Drawing Title: **TWR-K40D100M**

Page Title: **USB/OSBDM/V-TRAN/PWR**

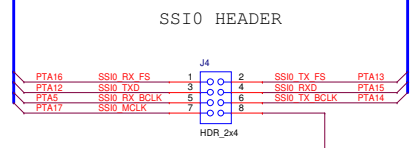
Size C	Document Number	SCH-27292 PDF: SPF-27292	Rev A
Date: Monday, November 28, 2011	Sheet 5 of 8		



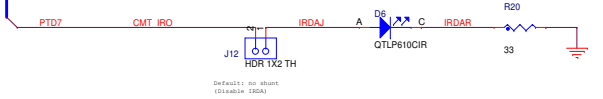
Note: this SDHC socket is powered by V_BRD which may be 1.8V or 3.3V. No provision is made for dynamic switching between the two voltages. Therefore, this interface may not work properly with all SD cards when the MCU is running from 1.8V.

4.8 PTE[0..28]

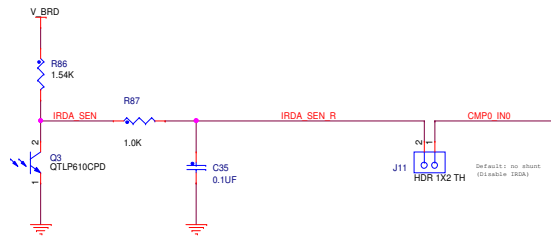
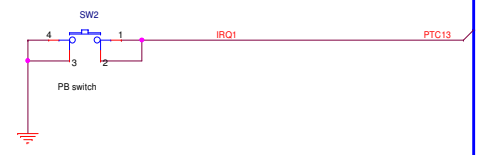
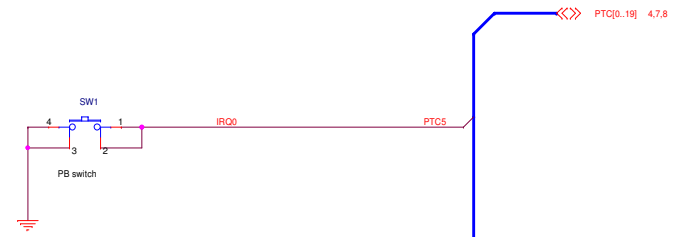
4.5,7.8 PTA[0..29]



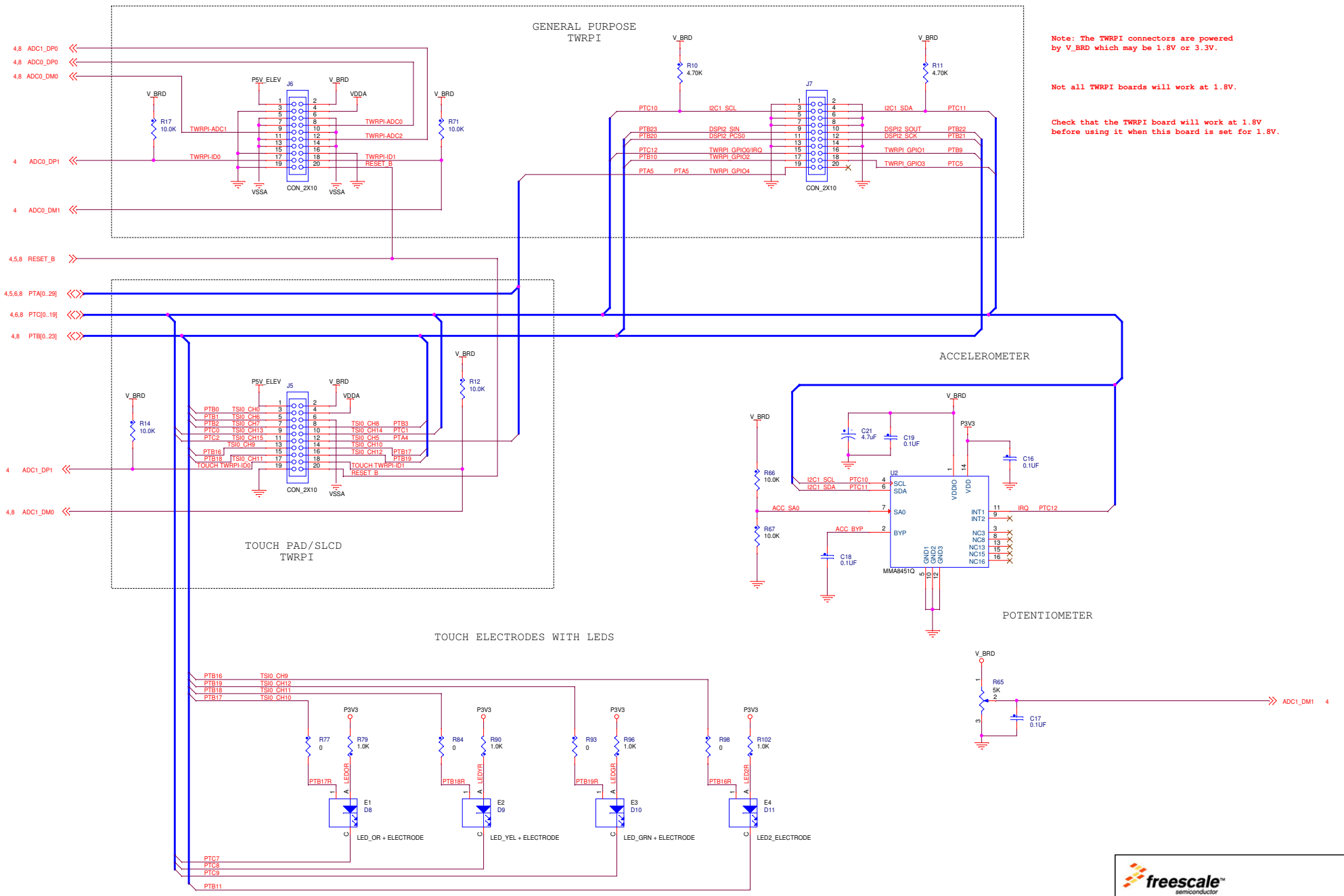
4.5,8 PTD[0..15]



IRDA



ICAP Classification: FCP: FUC: X PUC:	
Drawing Title: TWR-K40D100M	
Page Title: Peripherals	
Size: C	Document Number: SCH-27292 PDF: SPF-27292
Date: Monday, November 28, 2011	Sheet: 6 of 8



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.

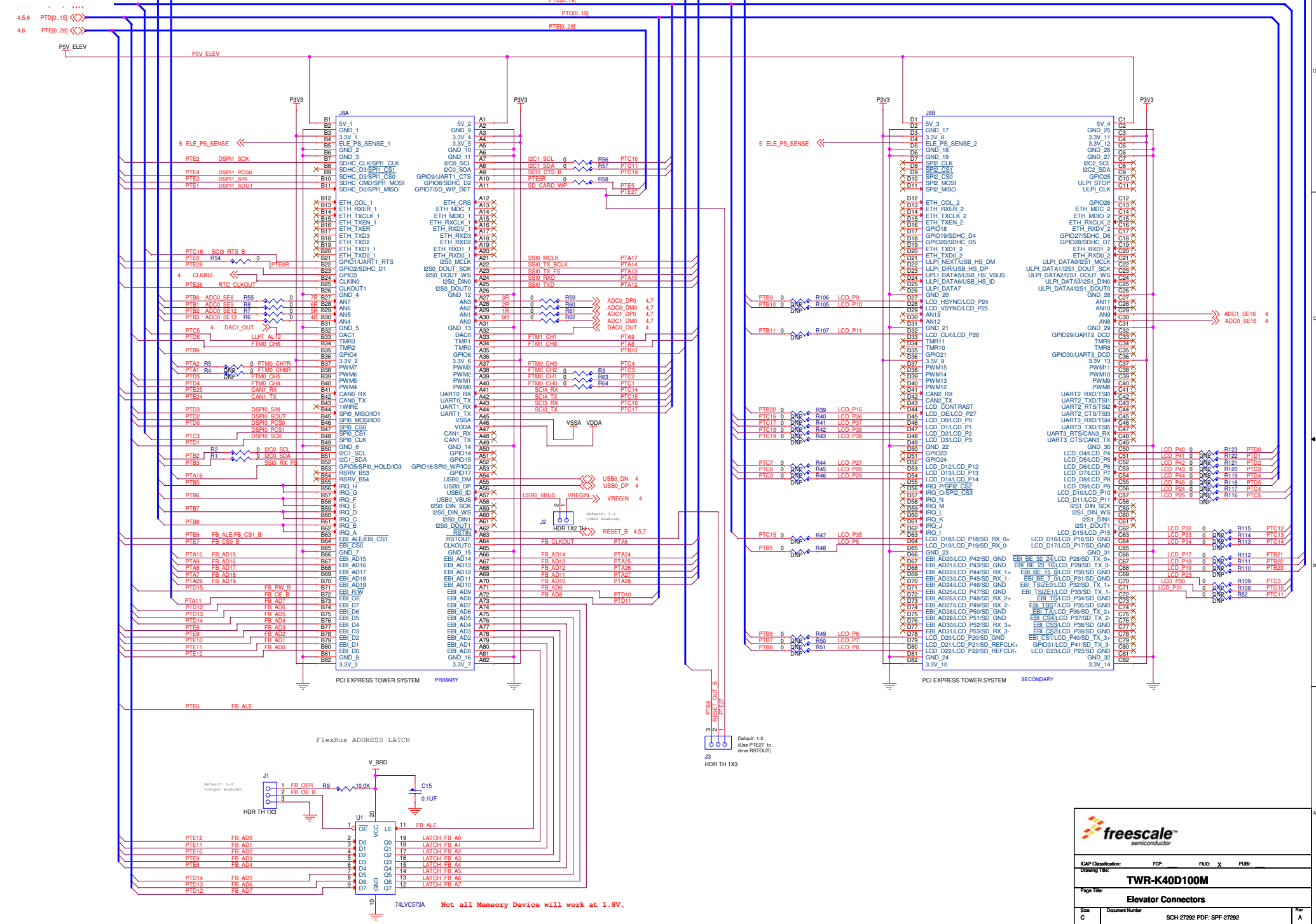
Check that the TWRPI board will work at 1.8V before using it when this board is set for 1.8V.

freescale
semiconductor

ICAP Classification: FCP: FUC: X PUR: _____
Drawing Title: **TWR-K40D100M**
Page Title: **Sensors**

Size	Document Number	Rev
C	SCH-27292 PDF: SPF-27292	A

Date: Monday, November 28, 2011 Sheet 7 of 8



freescale
semiconductor

ICAP Classification: FCP: FWD: X PWR: _____
 Drawing Title: **TWR-K40D100M**

Page Title: **Elevator Connectors**

Size C Document Number SCH-27292 PDF: SPF-27292
 Date: Monday, November 28, 2011 Sheet 8 of 8