
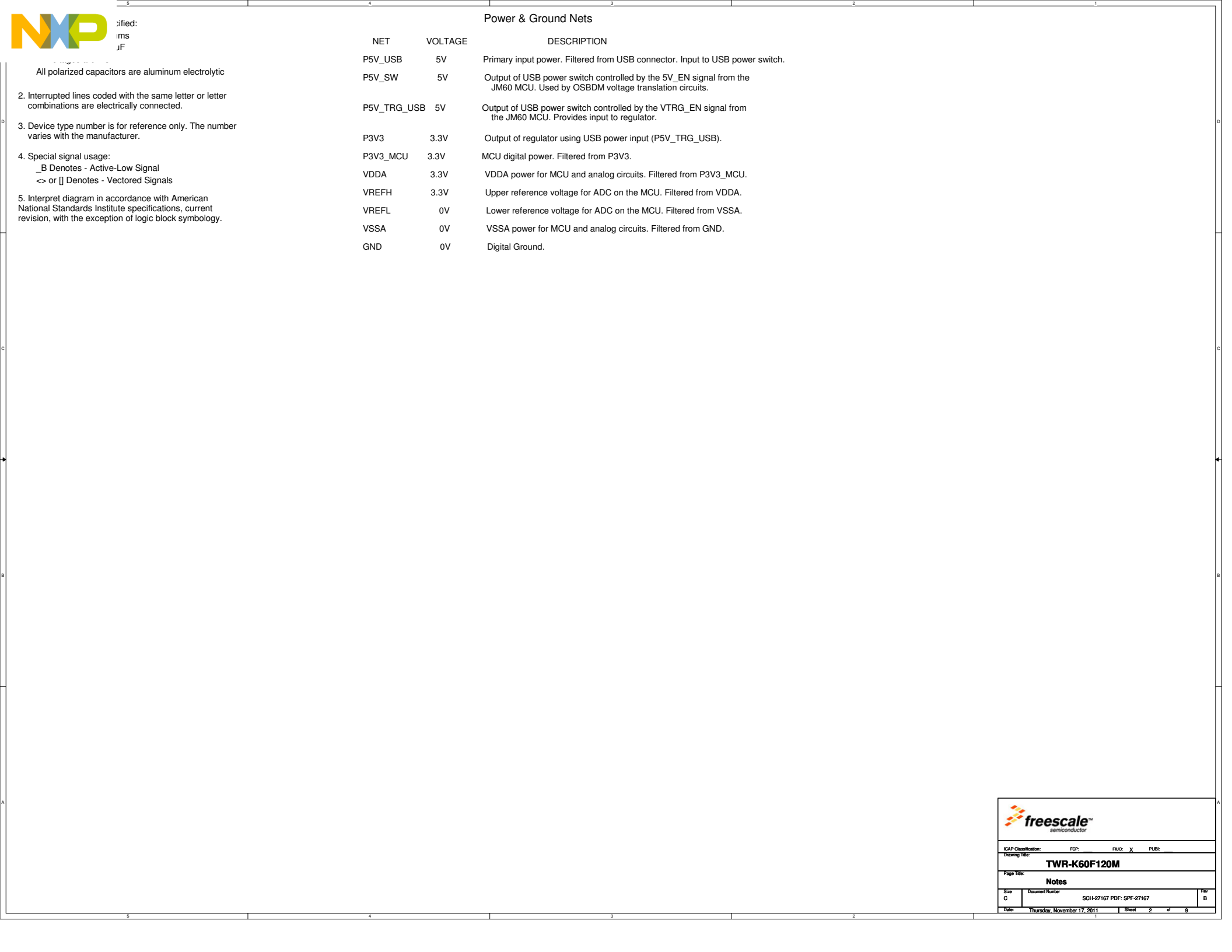


Contents	
6	Peripherals
7	Sensors
8	NAND Flash
9	Elevator Connectors

Revisions			
Rev	Description	Date	Approved
X1	Initial Release	02 Aug 11	M.H
X2	1. L9 replaced with DNP 0 ohm resistor. 2.Note updated for R172 & R173 Placement 3.C77, C78, R91, R92 & R93 removed 4.Jumper added on Y1 power 5.PTB4 to PTE7 used for Analog inputs on Primary elevator 6.IRQ signals removed from Secondary Elevator	03 Aug 11	M.H
X3	1. Jumper added between potentiometer and ADC1_DM1 2. I2S signals added on the elevator connector (A58-A61) 3.accelerometer part chnaged to MMA8451QT 4.0 ohms added to FTCL6 to isolate Nand Flash & R118 5.UART connections swapped on Elevator	08 Aug 11	M.H
X4	Net names changed for PID0 & PTD1 on OSBDM circuit	16 Aug 11	M.H
A	Proto Release	22 Aug 11	M.H
A1	Re-run ECO for A085 to correct BOM import.	16 Sept 11	E.T
AX1	1. PTE8 , PTE9 used instead of PTCL6 & PTCL7 on Primary elevator UART connections 2. Similarly RTS & CTS connections changed to PTE10 & PTE11 3. I2S signals extracted from PTA series through jumpers 4. Board ID pull down resistor changed to 1.3K	14 Nov 11	M.H
AX2	1. I2S0 Header connections sourced from either PTC or PTA through Jumper 2. 0 ohm resistor added for Trace clock out(PTA6) 3. 0 ohm resistor added between elevator and MCU for Ethernet signals on PTA pins 4. IRQ signals added to secondary elevator 5. 0 ohms resistor added between Nand flash and MCU on PTC signals which is shared with I2S0	15 Nov 11	M.H
B	Prototype Release	17 Nov 11	M.H

		<b>Microcontroller Solutions Group</b> 6501 Williams Canyon 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:	Marjulia	ICAP Classification:	FCP: PUC: X PUB:
Drawn by:	Marjulia	<b>TWR-K60F120M</b>	
Approved:	Melissa Hunter	<b>Table of Contents/Revisions</b>	
Size:	C	Document Number:	SCH-27167 PDF: SPF-27167
Date:	Thursday, November 17, 2011	Sheet:	1 of 9



ified:  
ms  
JF

### Power & Ground Nets

NET	VOLTAGE	DESCRIPTION
P5V_USB	5V	Primary input power. Filtered from USB connector. Input to USB power switch.
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_TRG_USB	5V	Output of USB power switch controlled by the VTRG_EN signal from the JM60 MCU. Provides input to regulator.
P3V3	3.3V	Output of regulator using USB power input (P5V_TRG_USB).
P3V3_MCU	3.3V	MCU digital power. Filtered from P3V3.
VDDA	3.3V	VDDA power for MCU and analog circuits. Filtered from P3V3_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.

- 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.

ICAP Classification:	FCP:      FWD: X      PUR:
Drawing Title: <b>TWR-K60F120M</b>	
<b>Notes</b>	
Size: C	Document Number: SCH-27167 PDF: SPF-27167
Date: Thursday, November 17, 2011	Sheet 2 of 9



ELEVATOR CONNECTORS

Sheet 9

Sheet 5

OSJTAG/USB Bridge Circuit

USB Mini B Connector

MC9S08JM60

Voltage Translation

OSJTAG/JTAG Header

SCI Source Selectors

Power Supply Circuits

Sheet 4

K60NF1M MCU

50 MHz XTAL

12 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 6

SD CARD SOCKET

Sheet 7

ANALOG INPUTS

MMA7660 ACCELEROMETER

POTENTIOMETER

Sheet 8

NAND Flash

Sheet 7

TOWER PLUG-IN (TWRPI)

SENSOR HEADERS

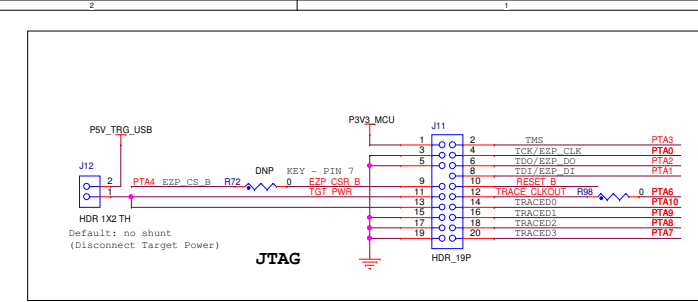
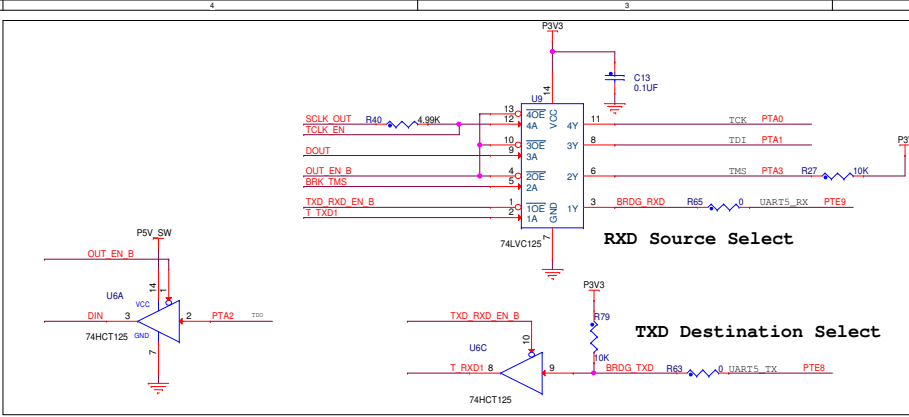
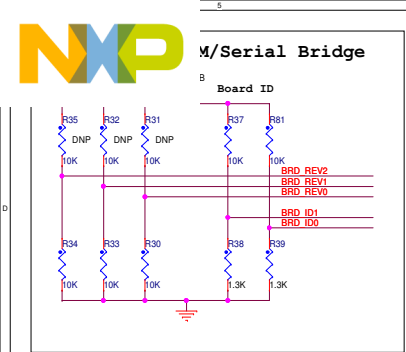
Sheet 7

TOWER PLUG-IN (TWRPI)

TOUCH HEADER

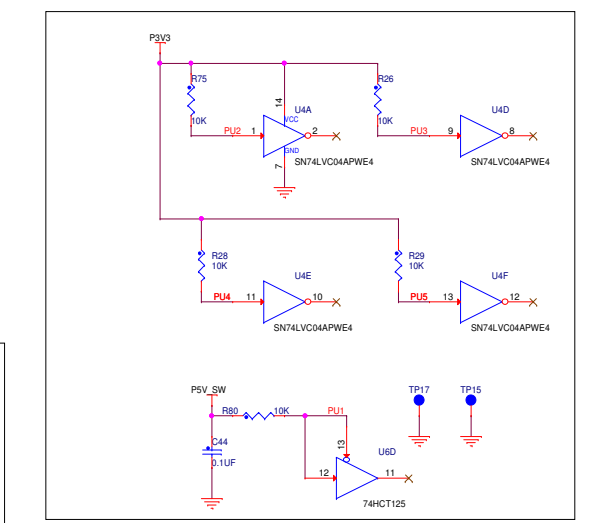
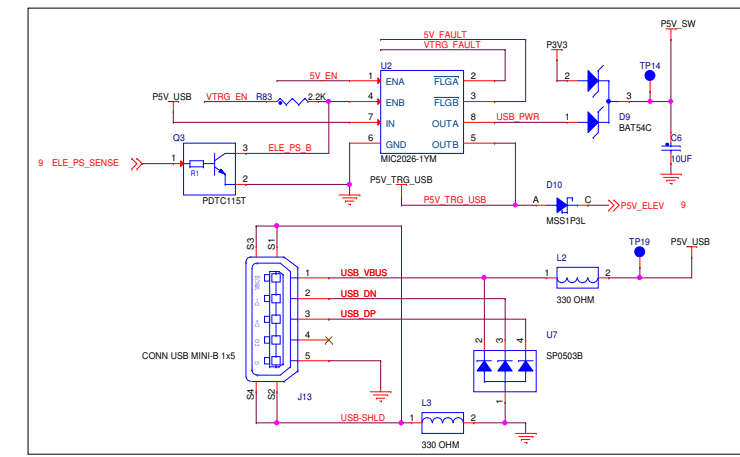
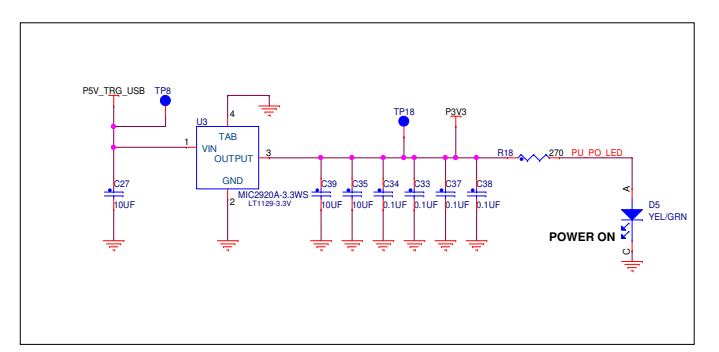
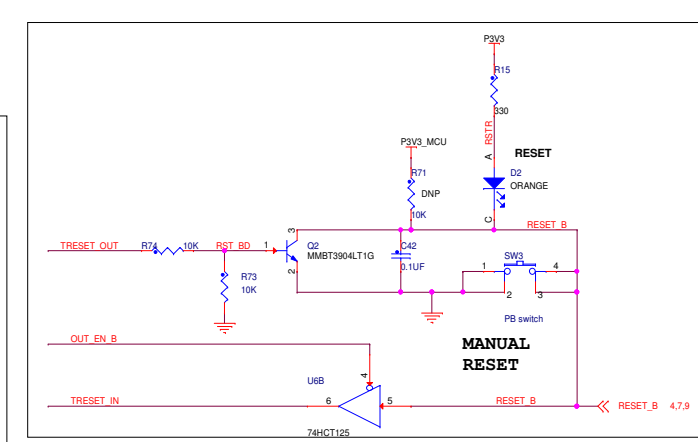
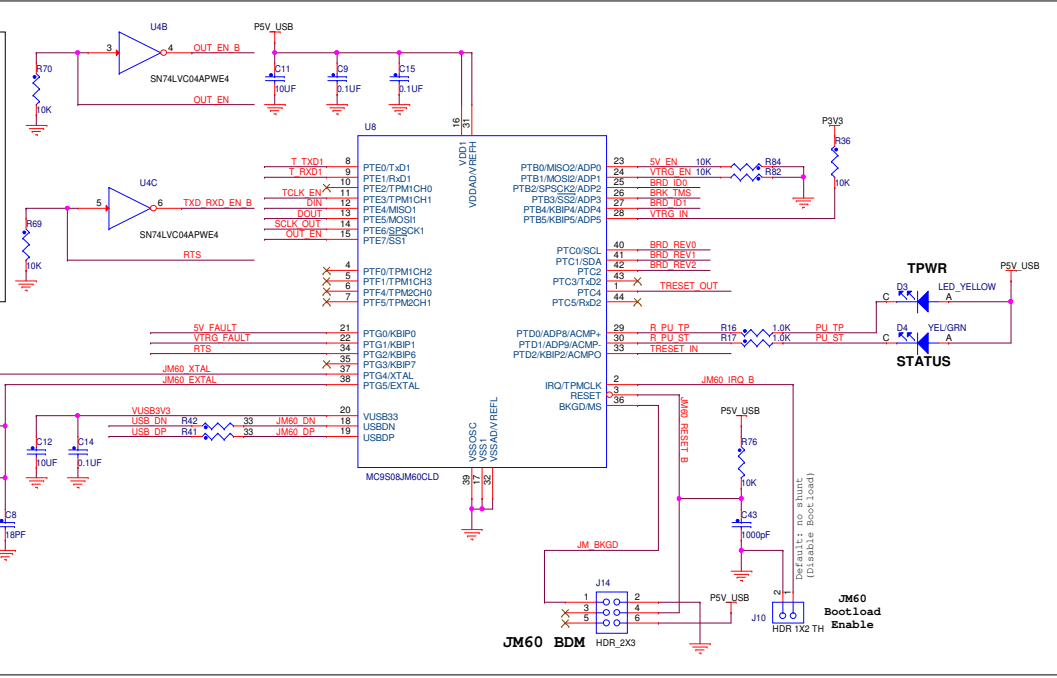
ICAP Classification: FCP: _____ FWD: X PURB: _____	
Drawing Title: <b>TWR-K60F120M</b>	
Page Title: <b>Block Diagram</b>	
Size: C	Document Number: SCH-27167 PDF: SPF-27167
Date: Thursday, November 17, 2011	Sheet 3 of 9





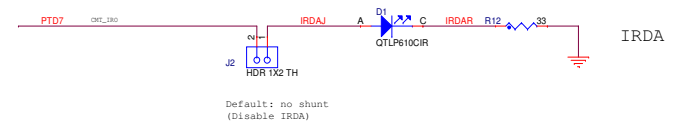
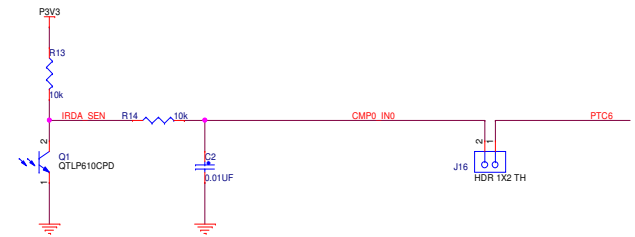
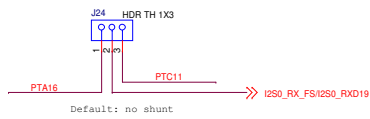
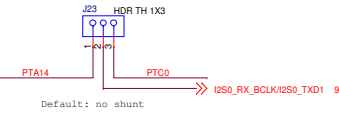
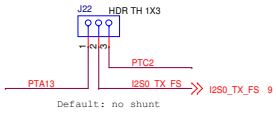
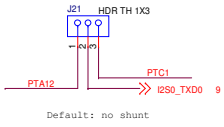
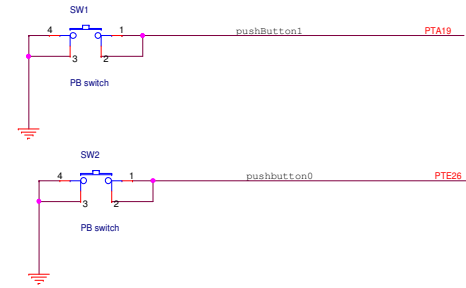
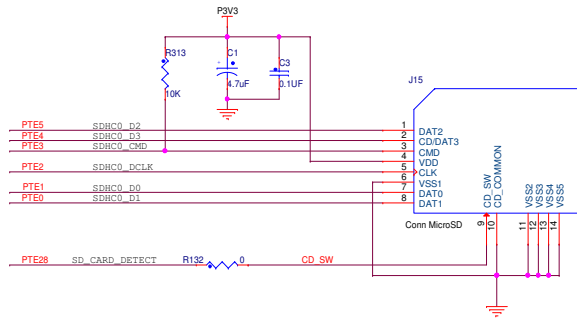
**Intersheet References**

PTA5	PTA1[7:0]	4,6,7,9
PTA11	PTA1[12:0]	4,6,9
PTA12	PTA1[15:0]	4,6,7,8,9
PTA13	PTA10	
PTA14	PTA11	
PTA15	PTA12	
PTA16	PTA13	
PTA17	PTA14	
PTA18	PTA15	
PTA19	PTA16	
PTA20	PTA17	
PTA21	PTA18	
PTA22	PTA19	
PTA23	PTA20	
PTA24	PTA21	
PTA25	PTA22	
PTA26	PTA23	
PTA27	PTA24	
PTA28	PTA25	
PTA29	PTA26	
PTA30	PTA27	
PTA31	PTA28	
PTA32	PTA29	
PTA33	PTA30	
PTA34	PTA31	
PTA35	PTA32	
PTA36	PTA33	
PTA37	PTA34	
PTA38	PTA35	
PTA39	PTA36	
PTA40	PTA37	
PTA41	PTA38	
PTA42	PTA39	
PTA43	PTA40	
PTA44	PTA41	
PTA45	PTA42	
PTA46	PTA43	
PTA47	PTA44	
PTA48	PTA45	
PTA49	PTA46	
PTA50	PTA47	
PTA51	PTA48	
PTA52	PTA49	
PTA53	PTA50	
PTA54	PTA51	
PTA55	PTA52	
PTA56	PTA53	
PTA57	PTA54	
PTA58	PTA55	
PTA59	PTA56	
PTA60	PTA57	
PTA61	PTA58	
PTA62	PTA59	
PTA63	PTA60	
PTA64	PTA61	
PTA65	PTA62	
PTA66	PTA63	
PTA67	PTA64	
PTA68	PTA65	
PTA69	PTA66	
PTA70	PTA67	
PTA71	PTA68	
PTA72	PTA69	
PTA73	PTA70	
PTA74	PTA71	
PTA75	PTA72	
PTA76	PTA73	
PTA77	PTA74	
PTA78	PTA75	
PTA79	PTA76	
PTA80	PTA77	
PTA81	PTA78	
PTA82	PTA79	
PTA83	PTA80	
PTA84	PTA81	
PTA85	PTA82	
PTA86	PTA83	
PTA87	PTA84	
PTA88	PTA85	
PTA89	PTA86	
PTA90	PTA87	
PTA91	PTA88	
PTA92	PTA89	
PTA93	PTA90	
PTA94	PTA91	
PTA95	PTA92	
PTA96	PTA93	
PTA97	PTA94	
PTA98	PTA95	
PTA99	PTA96	
PTA100	PTA97	

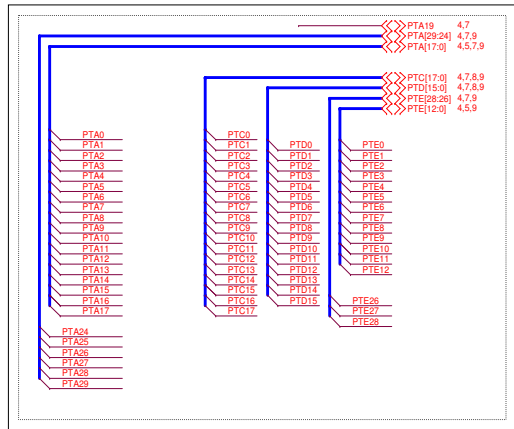




### MICRO SD INTERFACE



### Intersheet References

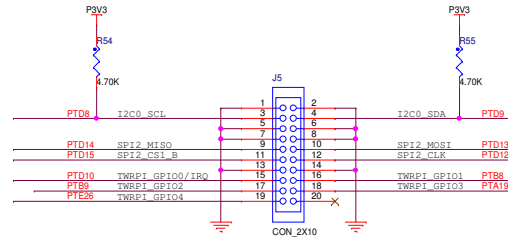
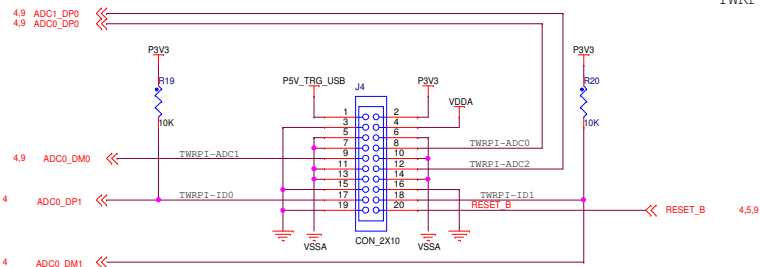


ICAP Classification: FCP: FUC: X PUR: \_\_\_\_\_  
 Drawing Title: **TWR-K60F120M**  
 Page Title: **Peripherals**

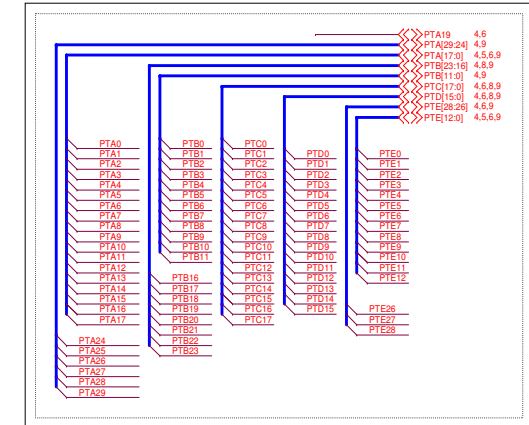
Size C	Document Number SCH-27167 PDF: SPF-27167	Rev B
Date: Thursday, November 17, 2011	Sheet 6 of 9	



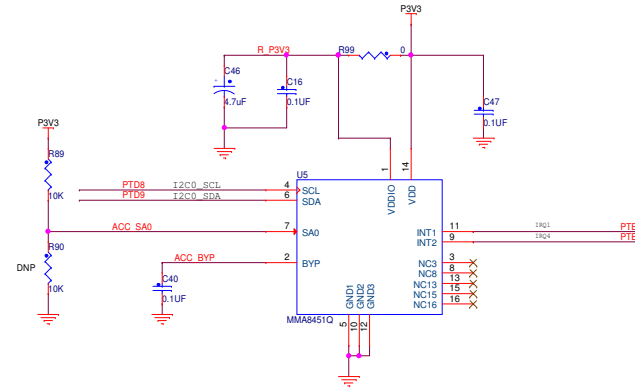
GENERAL PURPOSE  
TWRPI



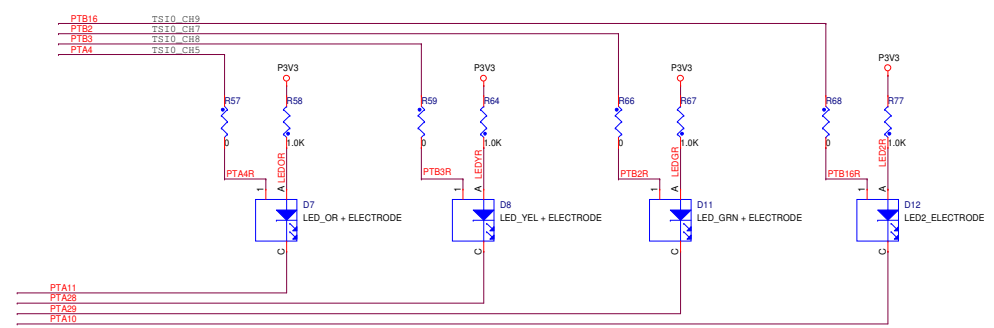
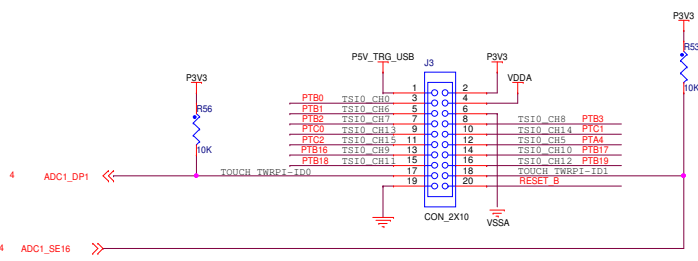
Intersheet References



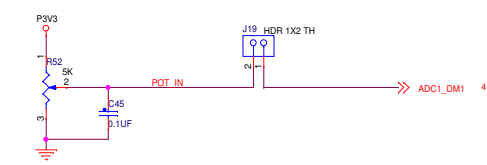
Accelerometer



TOUCH PAD  
TWRPI



POTENTIOMETER



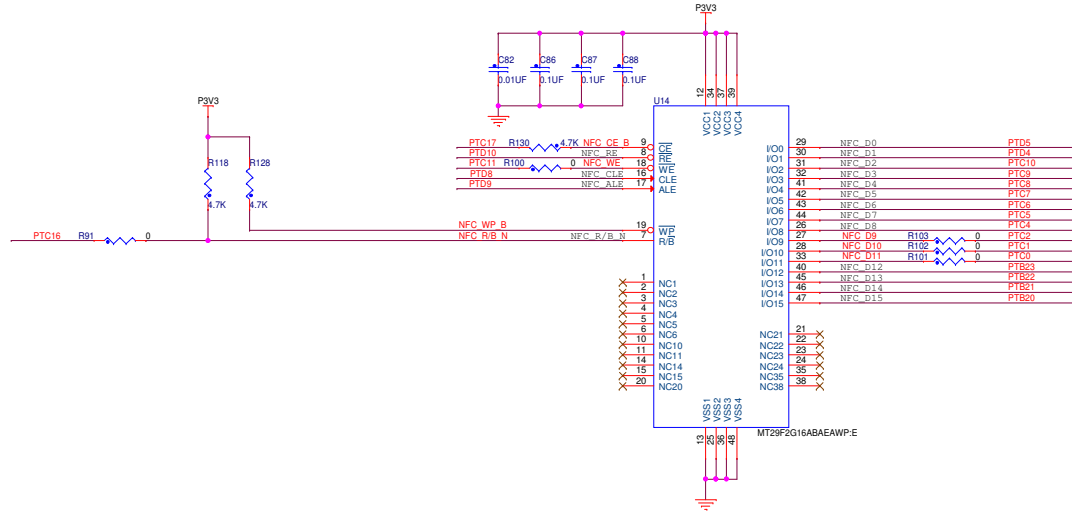
**freescale**  
semiconductor

ICAP Classification: FCP: FWD: X PUR: \_\_\_\_\_  
Drawing Title: **TWR-K60F120M**  
Page Title: **Sensors**

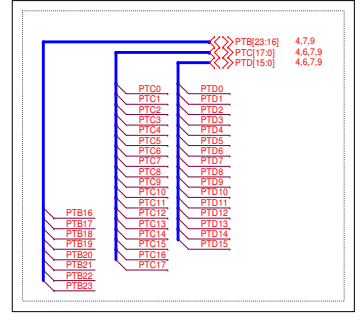
Size	Document Number	Rev
C	SCH-27167 PDF: SPF-27167	B
Date:	Thursday, November 17, 2011	Sheet 7 of 9



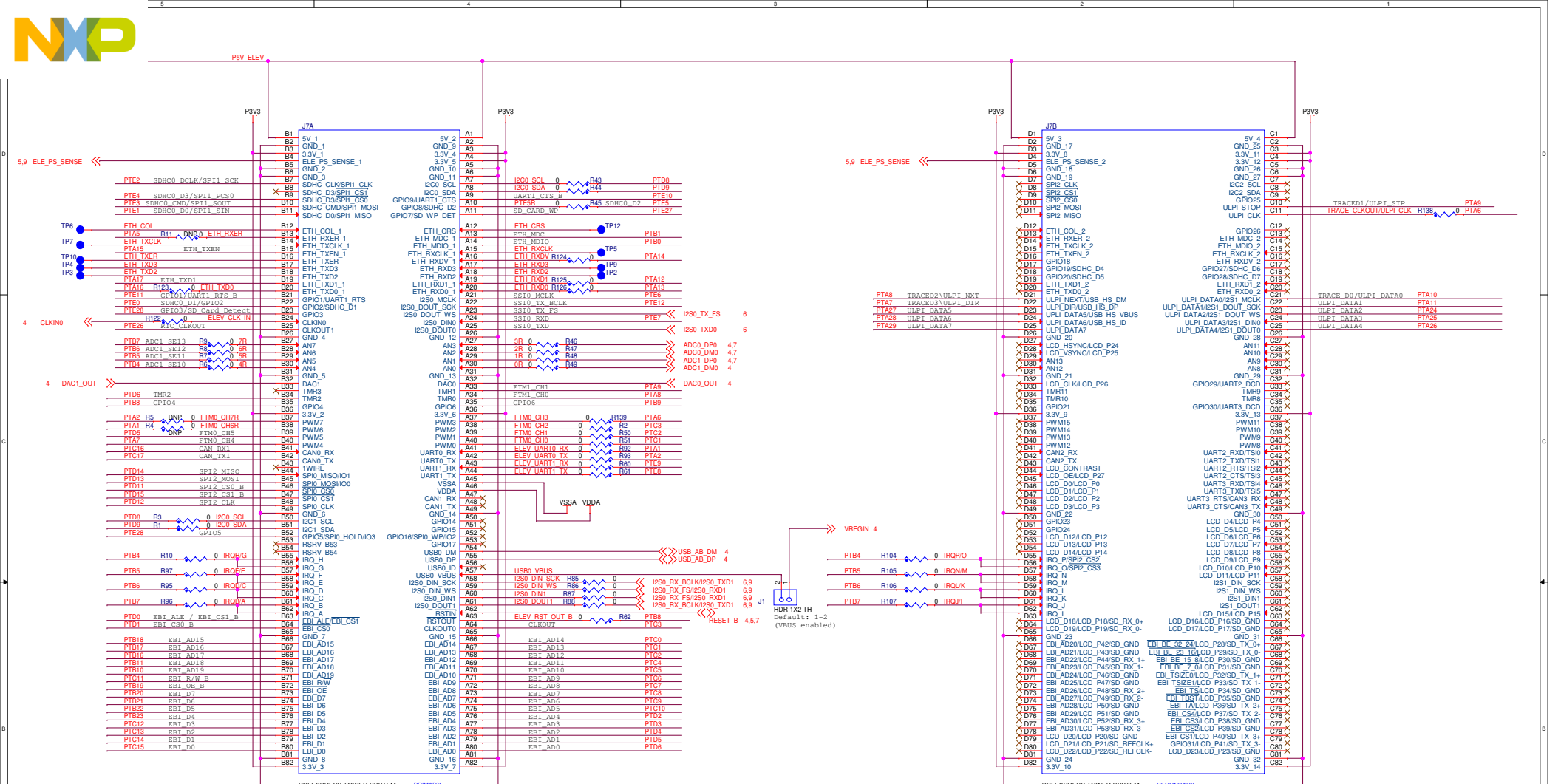
### NAND FLASH



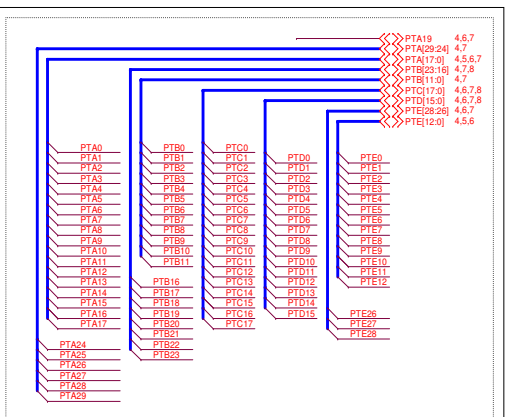
### Intersheet References







Intersheet References



**freescale**  
semiconductor

ICAP Classification: FCP: FWD: X PURE:  
Drawing Title: **TWR-K60F120M**

Page Title: **Elevator Connector**

Size C	Document Number SCH-27167 PDF: SPF-27167	Rev B
Date: Thursday, November 17, 2011	Sheet 9 of 9	