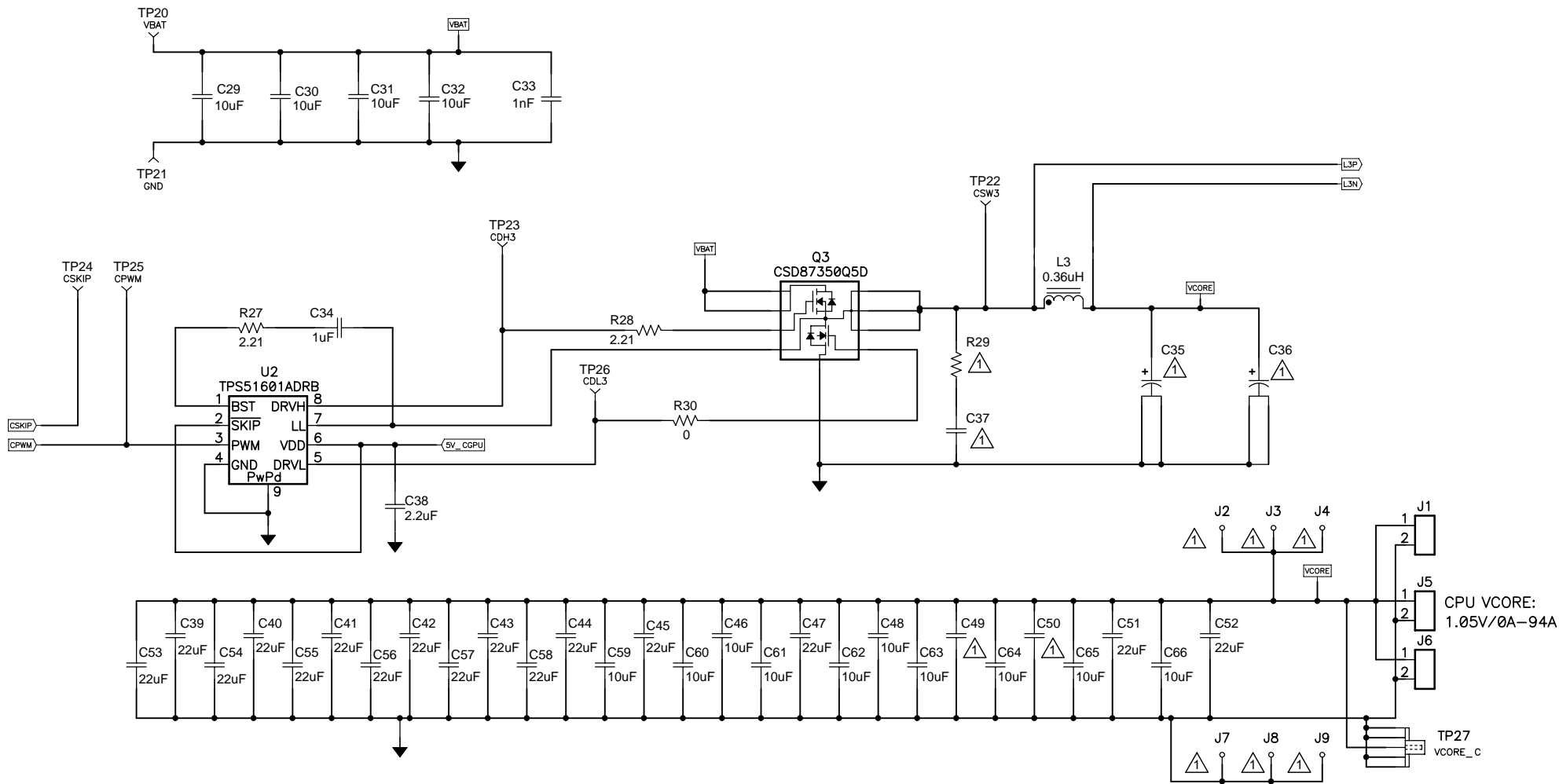



Note1:

- ① Not used
- ② CPU Switching frequency selection: See sheet 5
- ③ GPU Switching frequency selection: See sheet 5
- ④ CPU OCP selection: See sheet 5
- ⑤ GPU OCP selection: See sheet 5
- ⑥ CPU OSR/USR selection: See sheet 5
- ⑦ GPU OSR/USR selection: See sheet 5
- ⑧ CPU thrid phase: See sheet 2
- ⑨ GPU phase: See sheet 3

CPU and GPU Control, 1st and 2nd Phase CPU VCORE

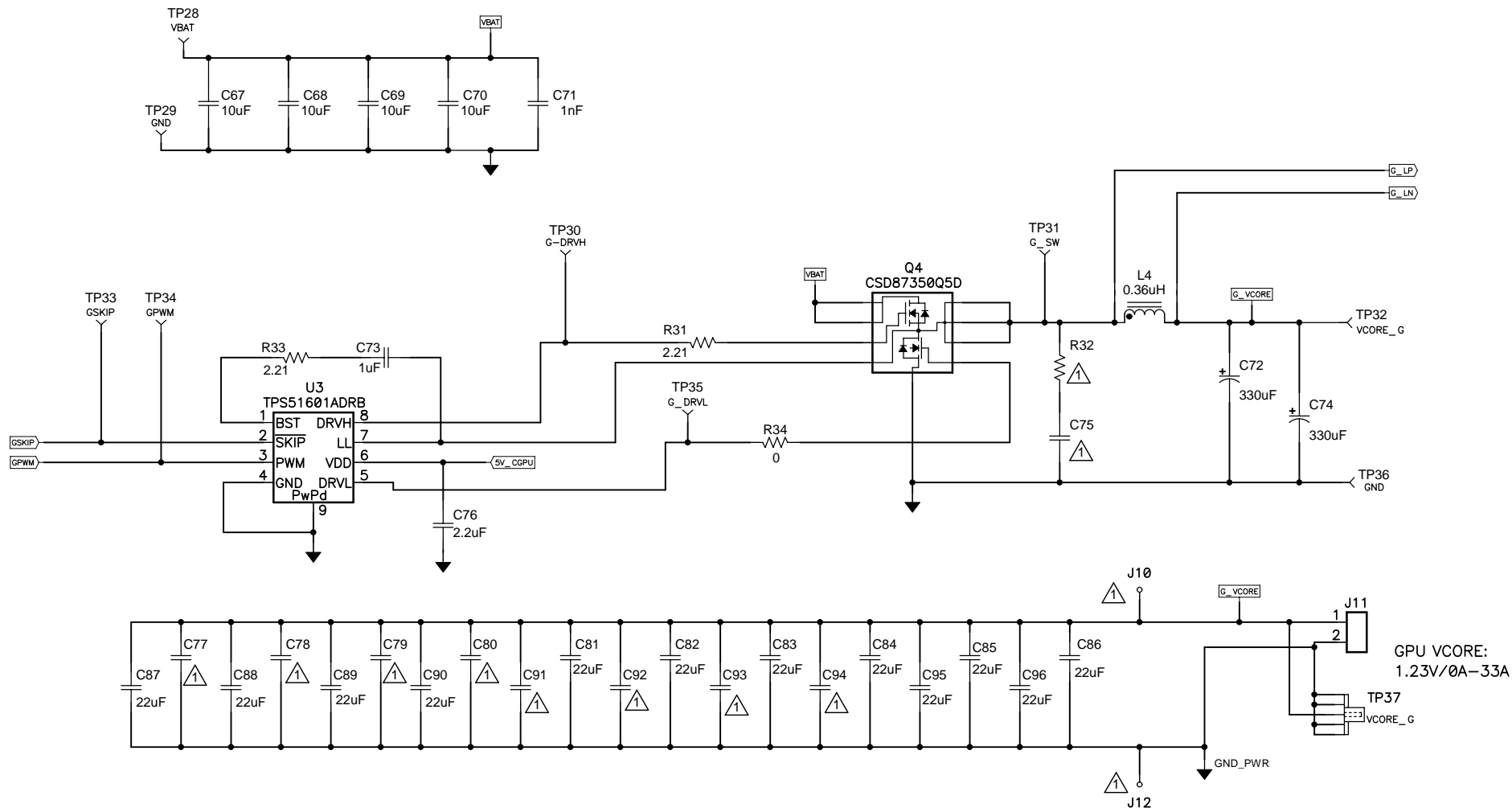
| | | | | | |
|----------|------------------|----------|-----------------|-----|----|
| Title | | | TPS59640EVm-751 | | |
| Size | Number | | | Rev | |
| | | | HPA751 | | A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang | | |
| Filename | HPA751A.sch | Sheet | 1 | of | 13 |



Note2:
 Not used

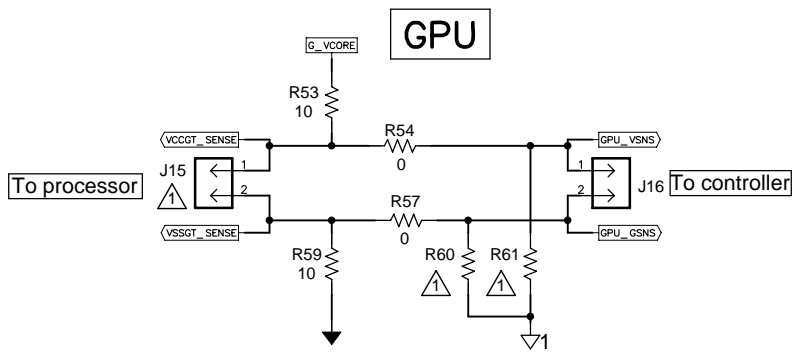
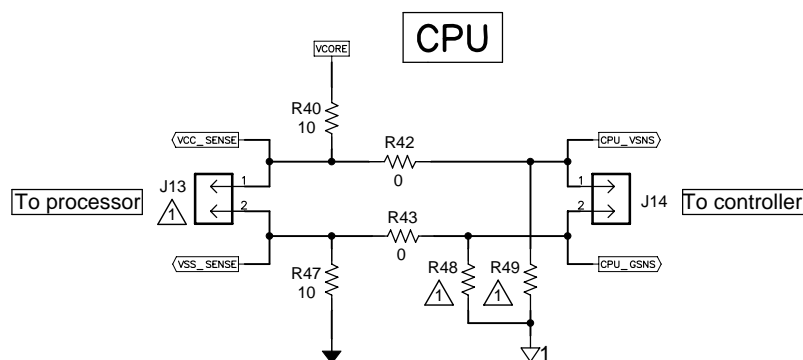
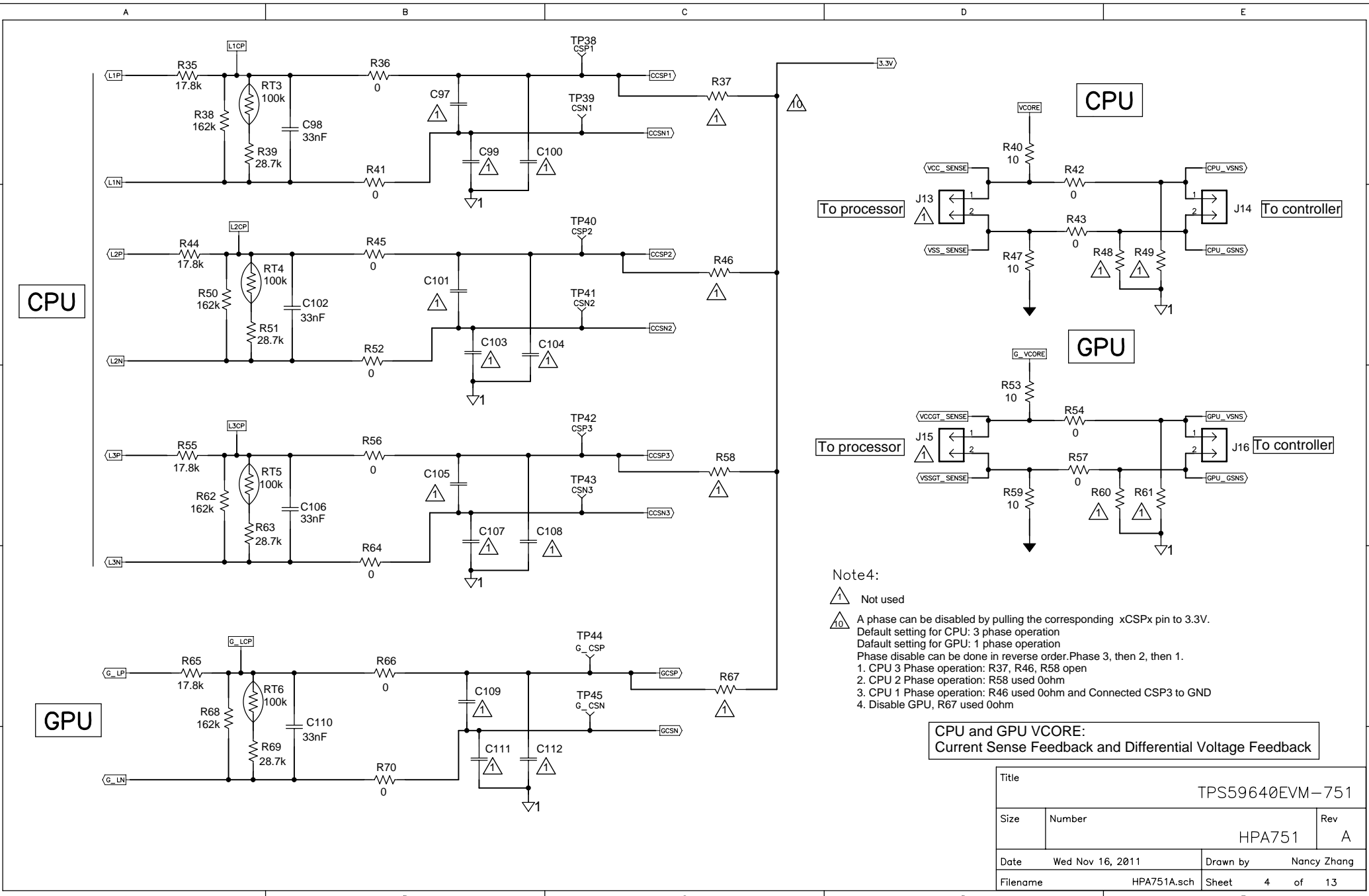
CPU 3rd Phase VCore

| | | | |
|----------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
| Filename | HPA751A.sch | Sheet | 2 of 13 |





Note3:
 Not used

| GPU Vcore | | |
|-----------|------------------|----------------------|
| Title | | TPS59640EVM-751 |
| Size | Number | Rev |
| | HPA751 | A |
| Date | Wed Nov 16, 2011 | Drawn by Nancy Zhang |
| Filename | HPA751A.sch | Sheet 3 of 13 |



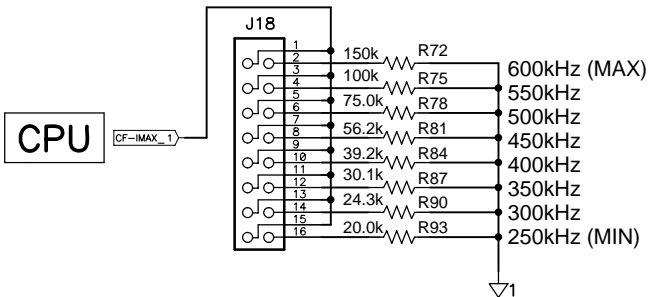
Note4:

-  Not used
-  A phase can be disabled by pulling the corresponding xCSPx pin to 3.3V.
Default setting for CPU: 3 phase operation
Default setting for GPU: 1 phase operation
Phase disable can be done in reverse order. Phase 3, then 2, then 1.
1. CPU 3 Phase operation: R37, R46, R58 open
2. CPU 2 Phase operation: R58 used 0ohm
3. CPU 1 Phase operation: R46 used 0ohm and Connected CSP3 to GND
4. Disable GPU, R67 used 0ohm

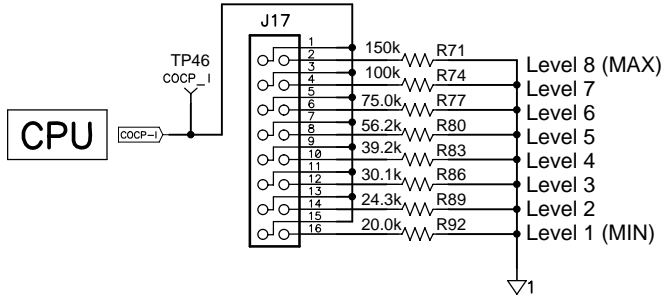
**CPU and GPU Vcore:
Current Sense Feedback and Differential Voltage Feedback**

| | | | |
|----------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
| Filename | HPA751A.sch | Sheet | 4 of 13 |

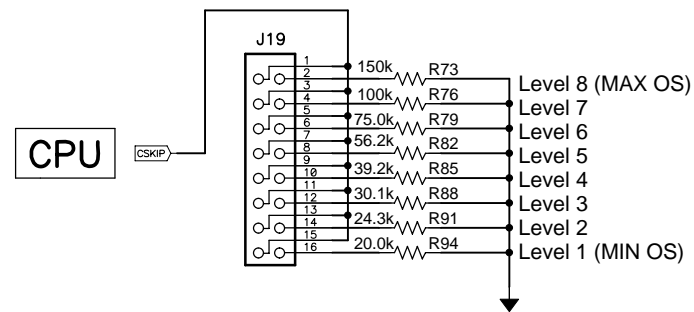
1. SWITCHING FREQUENCY SELECTION



2. OVER-CURRENT PROTECTION SELECTION

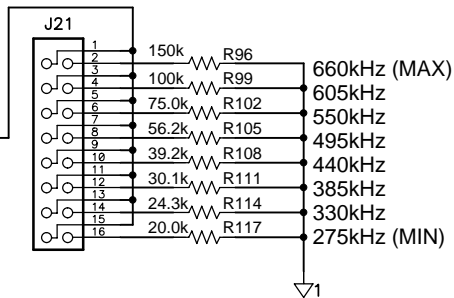


3. OVER-SHOOT/UNDER-SHOOT REDUCTION



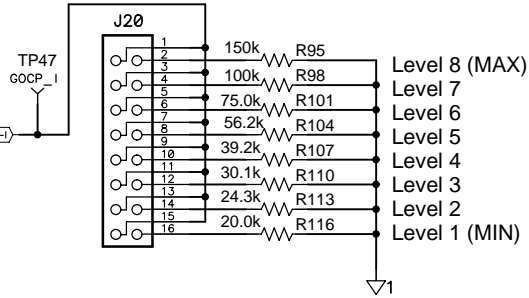
GPU

(GF-IMAX_1)



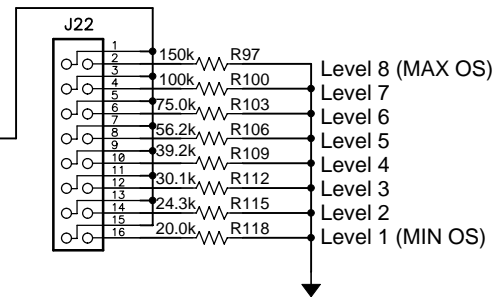
GPU

(GOCP-I)



GPU

(GSKIP)



Note5:



Switching Frequency Selection:

1. CPU Switching Frequency Default Setting: Jumper shorts on pin13 and pin14 to set 300kHz
2. GPU Switching Frequency Default Setting: Jumper shorts on pin 11 and pin12 to set 385kHz



Over Current Protection Selection:

1. CPU Over Current Protection Per Phase Default Setting: Jumper shorts on pin 7 and pin 8 to set 40A
2. GPU Over Current Protection Default Setting: Jumper shorts on pin7 and pin8 to set 40A

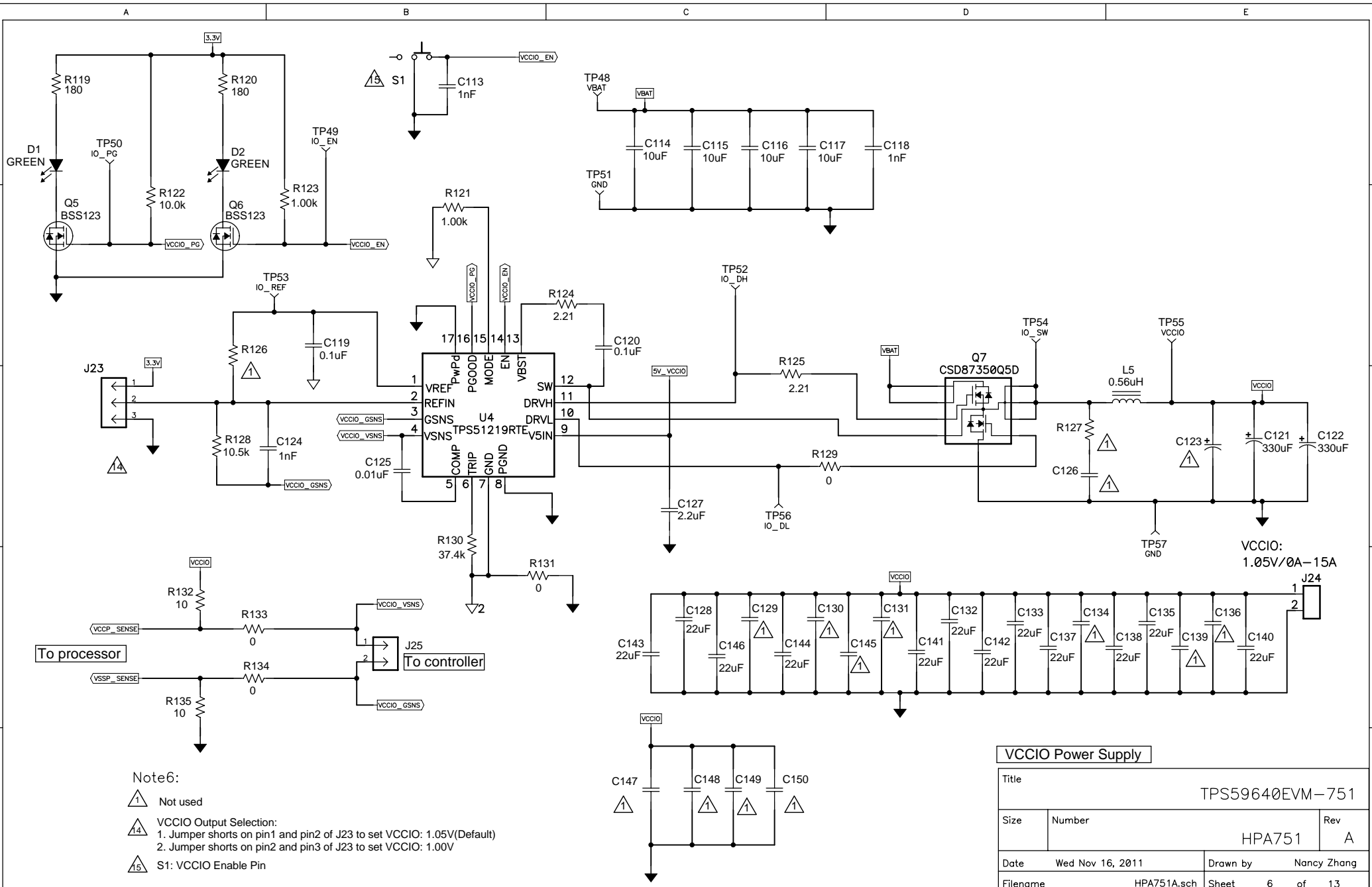


Over-Shoot /Under-Shoot Reduction Selection:

1. CPU OSR/USR Default Setting: Jumper shorts on pin1 and pin2 to set Max
2. GPU OSR/USR Default Setting: Jumper shorts on pin1 and pin2 to set Max

Frequency, OCP, OSR/USR SELECTIONS

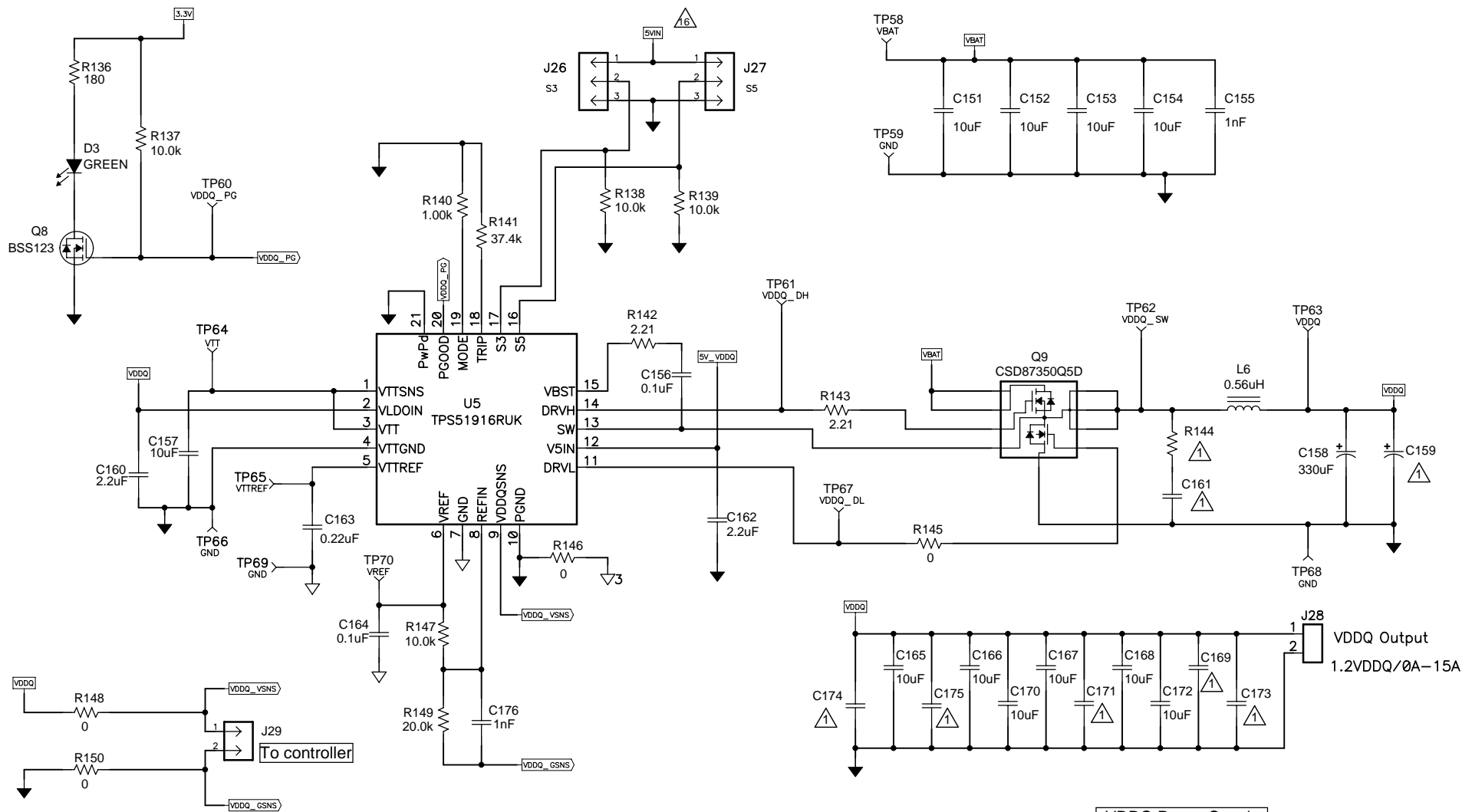
| | | | |
|----------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
| Filename | HPA751A.sch | Sheet | 5 of 13 |



Note6:

- Not used
- VCCIO Output Selection:
 1. Jumper shorts on pin1 and pin2 of J23 to set VCCIO: 1.05V(Default)
 2. Jumper shorts on pin2 and pin3 of J23 to set VCCIO: 1.00V
- S1: VCCIO Enable Pin

| VCCIO Power Supply | | | |
|--------------------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
| Filename | HPA751A.sch | Sheet | 6 of 13 |



Note7:

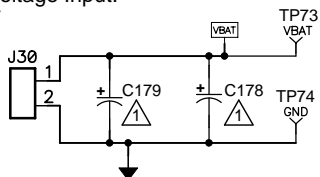
⚠ Not used

⚠ S3/S5 Enable Control, See datasheet for detail

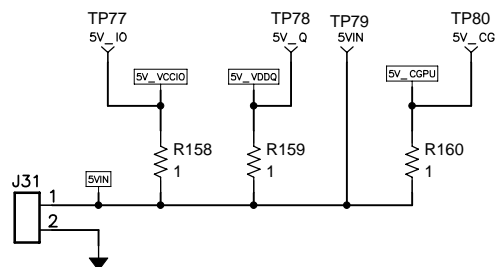
VDDQ Power Supply

| | | | |
|----------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | |
| | | Rev A | |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
| Filename | HPA751A.sch | Sheet | 7 of 13 |

VBAT Voltage Input:
9V- 20V



5V Bias Voltage Input



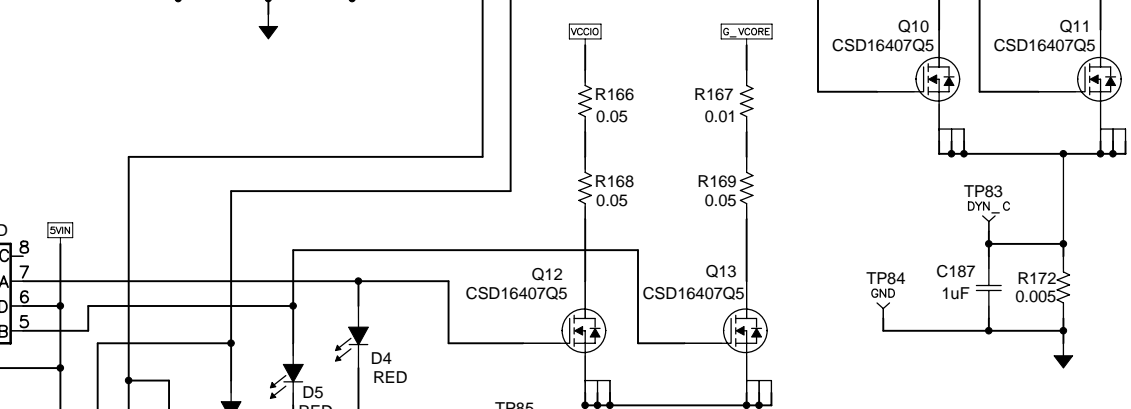
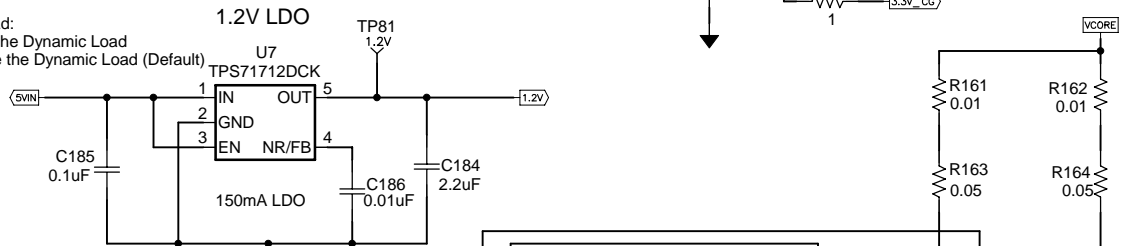
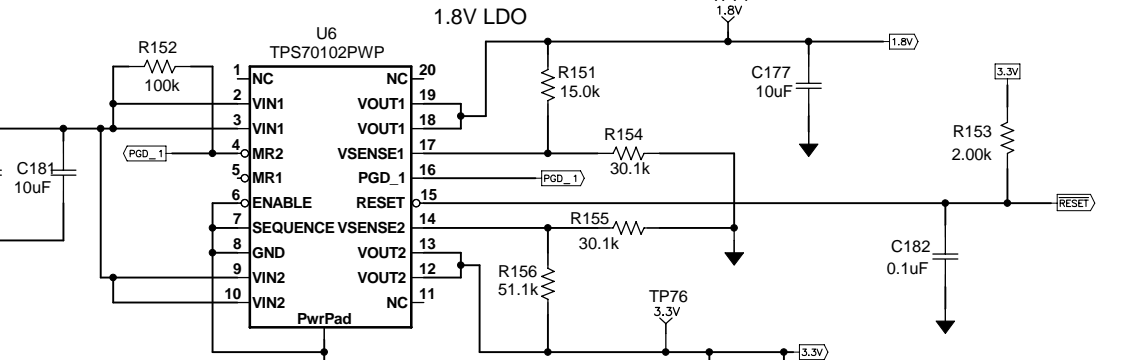
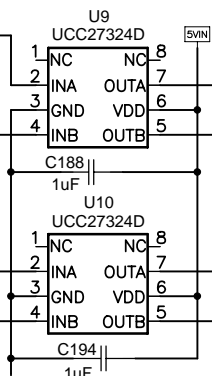
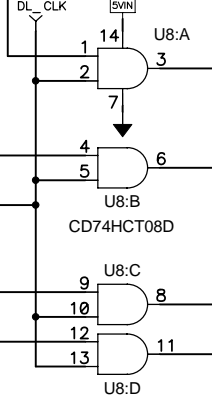
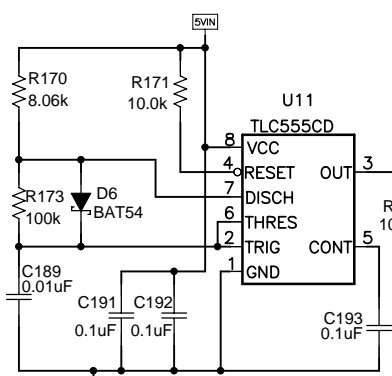
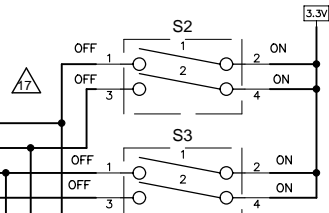
Note8:

⚠ Not used

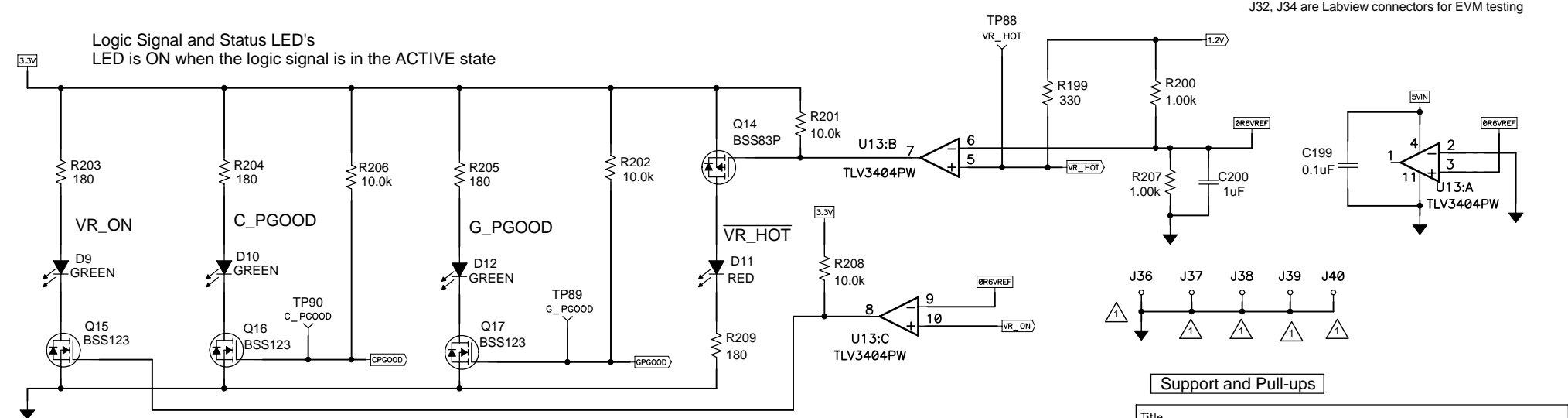
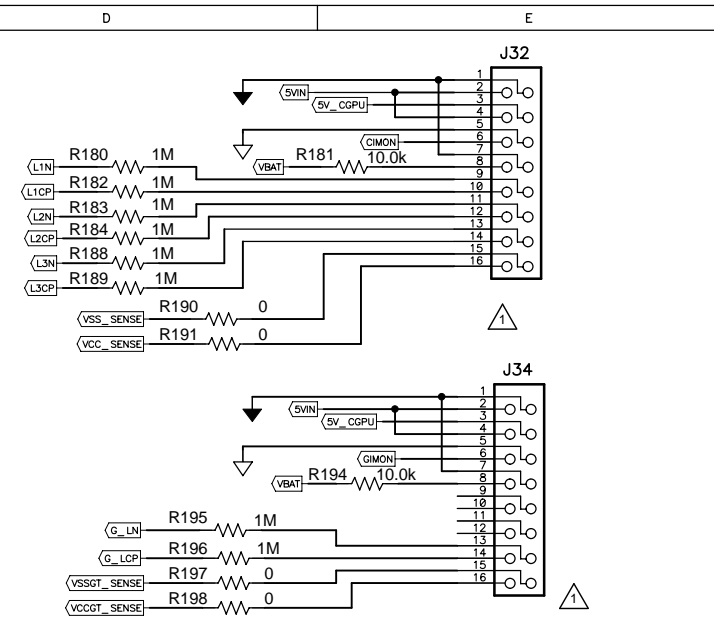
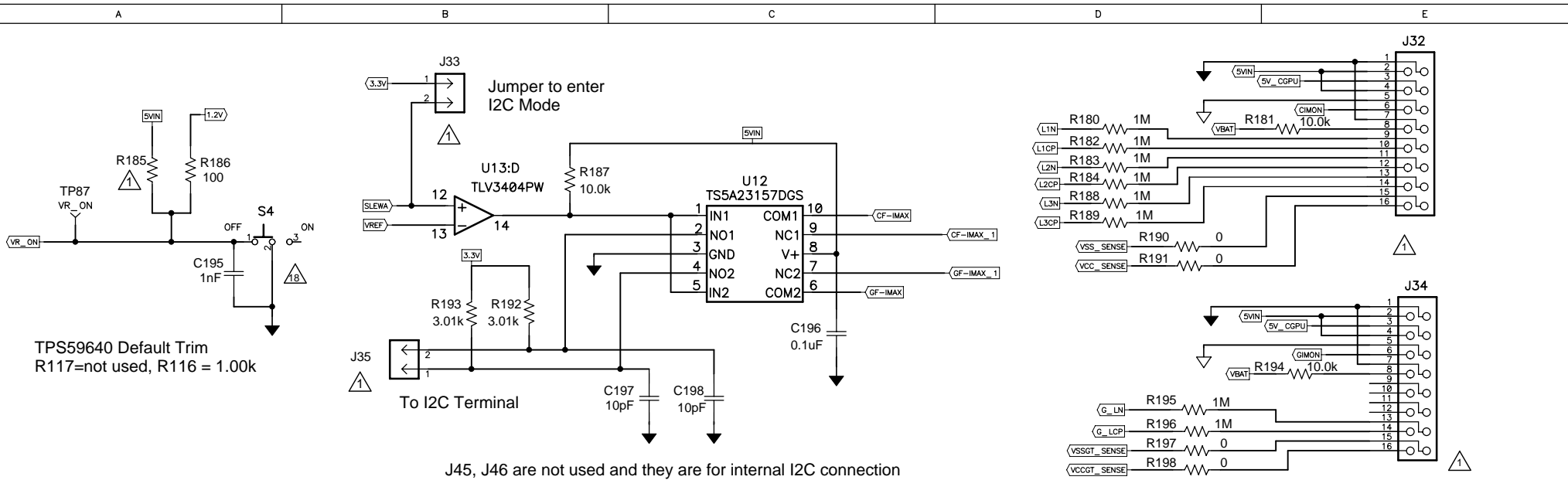
⚠ VCCIO, GPU and CPU Dynamic Load:

1. Switch to "ON" position to enable the Dynamic Load

2. Switch to "OFF" position to disable the Dynamic Load (Default)



| | | | | | |
|----------|------------------|----------|-----------------|---------|---|
| Title | | | TPS59640EVM-751 | | |
| Size | Number | HPA751 | | Rev | A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang | | |
| Filename | HPA751A.sch | | Sheet | 8 of 13 | |

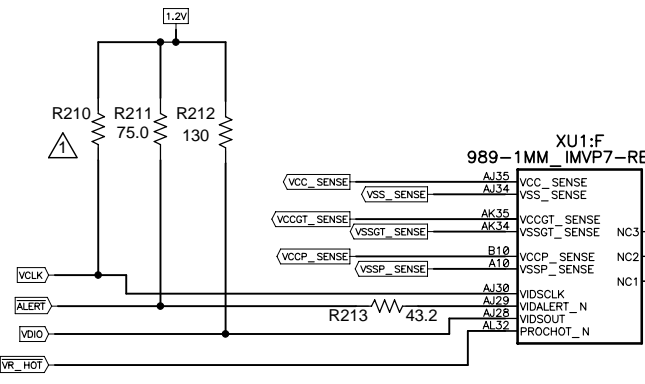
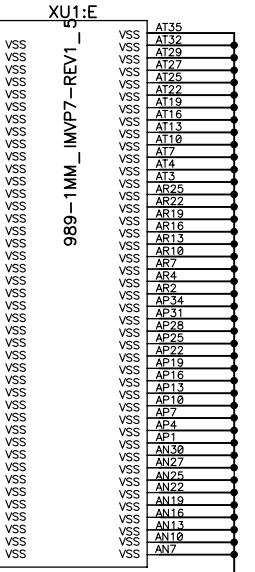
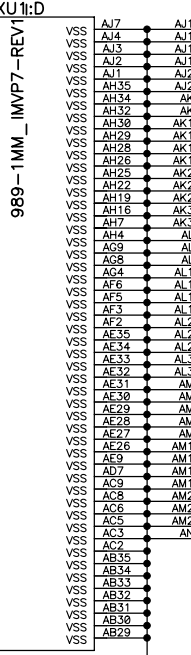
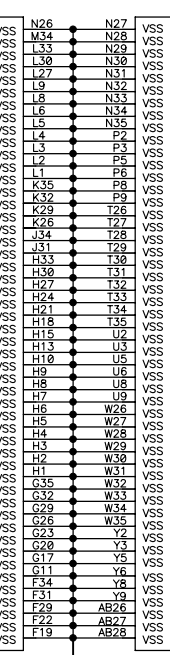
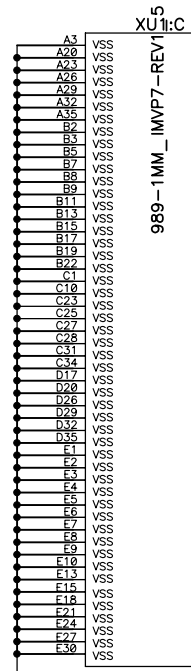
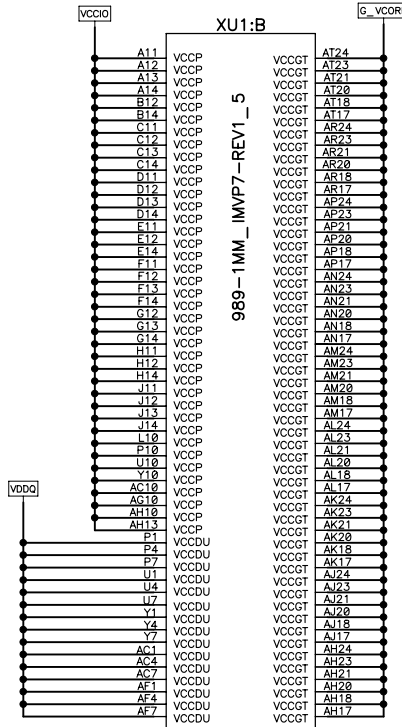
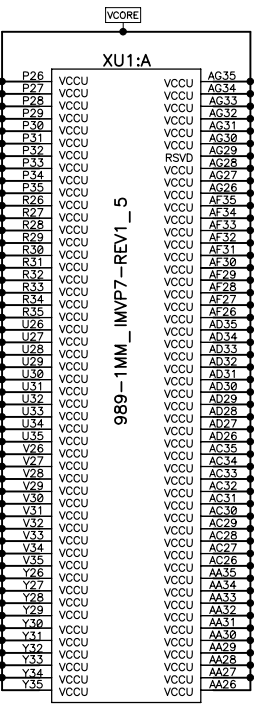


Note9:

⚠ Not used

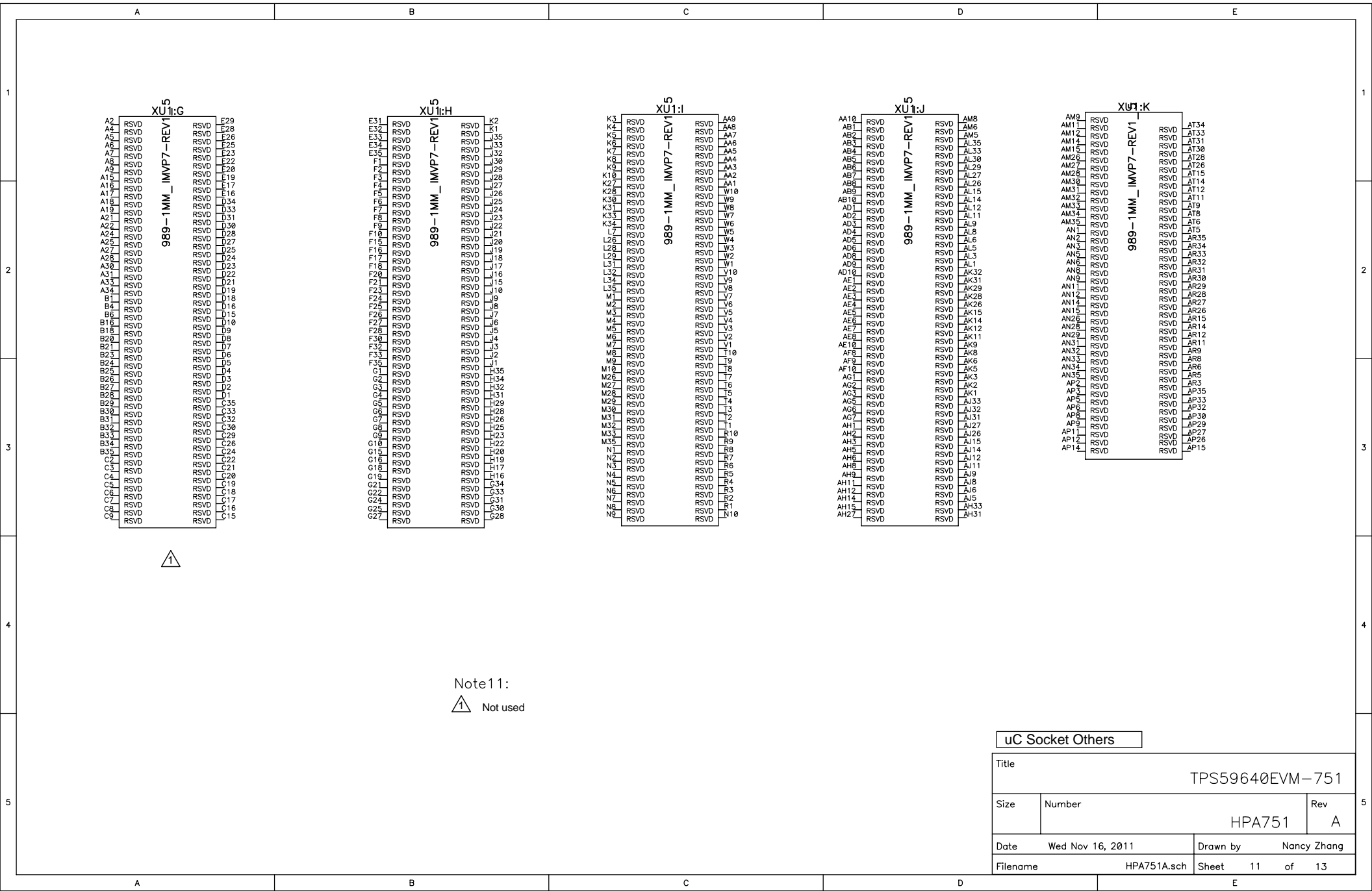
⚠ S4: IMVP-7 VR Enable:
1. Switch to "ON" position to Enable TPS59640 controller
2. Switch to "OFF" position to Disable TPS59640 controller(Default)

| | | | |
|----------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
| Filename | HPA751A.sch | Sheet | 9 of 13 |



Note10:
 Not used

| | | |
|-----------------|------------------|----------------------|
| uC Socket Main | | |
| Title | | |
| TPS59640EVM-751 | | |
| Size | Number | Rev |
| | HPA751 | A |
| Date | Wed Nov 16, 2011 | Drawn by Nancy Zhang |
| Filename | HPA751A.sch | Sheet 10 of 13 |



5
XU1:G
989 - 1MM - IMVP7 - REV1

| | | |
|-----|------|-----|
| A2 | RSVD | E29 |
| A4 | RSVD | E28 |
| A5 | RSVD | E26 |
| A6 | RSVD | E25 |
| A7 | RSVD | E23 |
| A8 | RSVD | E22 |
| A9 | RSVD | E20 |
| A15 | RSVD | E19 |
| A16 | RSVD | E17 |
| A17 | RSVD | E16 |
| A18 | RSVD | D34 |
| A19 | RSVD | D33 |
| A21 | RSVD | D31 |
| A22 | RSVD | D30 |
| A24 | RSVD | D28 |
| A25 | RSVD | D27 |
| A27 | RSVD | D25 |
| A28 | RSVD | D24 |
| A30 | RSVD | D23 |
| A31 | RSVD | D22 |
| A33 | RSVD | D21 |
| A34 | RSVD | D19 |
| B1 | RSVD | D18 |
| B4 | RSVD | D16 |
| B6 | RSVD | D15 |
| B16 | RSVD | D10 |
| B18 | RSVD | D9 |
| B20 | RSVD | D8 |
| B21 | RSVD | D7 |
| B23 | RSVD | D6 |
| B24 | RSVD | D5 |
| B25 | RSVD | D4 |
| B26 | RSVD | D3 |
| B27 | RSVD | D2 |
| B28 | RSVD | D1 |
| B29 | RSVD | C35 |
| B30 | RSVD | C33 |
| B31 | RSVD | C32 |
| B32 | RSVD | C30 |
| B33 | RSVD | C29 |
| B34 | RSVD | C28 |
| B35 | RSVD | C24 |
| C2 | RSVD | C22 |
| C3 | RSVD | C21 |
| C4 | RSVD | C20 |
| C5 | RSVD | C18 |
| C6 | RSVD | C17 |
| C7 | RSVD | C16 |
| C8 | RSVD | C15 |
| C9 | RSVD | C15 |

5
XU1:H
989 - 1MM - IMVP7 - REV1

| | | |
|-----|------|-----|
| E31 | RSVD | K2 |
| E32 | RSVD | K1 |
| E33 | RSVD | J35 |
| F1 | RSVD | J33 |
| F2 | RSVD | J30 |
| F3 | RSVD | J29 |
| F4 | RSVD | J27 |
| F5 | RSVD | J26 |
| F6 | RSVD | J25 |
| F7 | RSVD | J24 |
| F8 | RSVD | J23 |
| F9 | RSVD | J22 |
| F10 | RSVD | J21 |
| F15 | RSVD | J20 |
| F16 | RSVD | J19 |
| F17 | RSVD | J18 |
| F18 | RSVD | J17 |
| F20 | RSVD | J16 |
| F21 | RSVD | J15 |
| F22 | RSVD | J10 |
| F23 | RSVD | J9 |
| F24 | RSVD | J8 |
| F25 | RSVD | J7 |
| F26 | RSVD | J6 |
| F27 | RSVD | J5 |
| F28 | RSVD | J4 |
| F30 | RSVD | J3 |
| F32 | RSVD | J2 |
| F33 | RSVD | J1 |
| F35 | RSVD | H35 |
| G1 | RSVD | H34 |
| G2 | RSVD | H32 |
| G3 | RSVD | H31 |
| G4 | RSVD | H29 |
| G5 | RSVD | H28 |
| G6 | RSVD | H26 |
| G7 | RSVD | H25 |
| G8 | RSVD | H22 |
| G9 | RSVD | H23 |
| G10 | RSVD | H22 |
| G15 | RSVD | H20 |
| G16 | RSVD | H19 |
| G18 | RSVD | H17 |
| G19 | RSVD | H16 |
| G21 | RSVD | G34 |
| G22 | RSVD | G33 |
| G24 | RSVD | G31 |
| G25 | RSVD | G30 |
| G27 | RSVD | G28 |

5
XU1:I
989 - 1MM - IMVP7 - REV1

| | | |
|-----|------|-----|
| K3 | RSVD | AA9 |
| K4 | RSVD | AA8 |
| K5 | RSVD | AA6 |
| K6 | RSVD | AA5 |
| K7 | RSVD | AA4 |
| K8 | RSVD | AA3 |
| K9 | RSVD | AA2 |
| K19 | RSVD | AA1 |
| K27 | RSVD | W10 |
| K28 | RSVD | W9 |
| K30 | RSVD | W8 |
| K31 | RSVD | W7 |
| K34 | RSVD | W6 |
| L7 | RSVD | W5 |
| L26 | RSVD | W4 |
| L28 | RSVD | W3 |
| L29 | RSVD | W2 |
| L31 | RSVD | W1 |
| L32 | RSVD | V10 |
| L34 | RSVD | V9 |
| L35 | RSVD | V8 |
| M1 | RSVD | V7 |
| M2 | RSVD | V6 |
| M3 | RSVD | V5 |
| M4 | RSVD | V4 |
| M5 | RSVD | V3 |
| M6 | RSVD | V2 |
| M7 | RSVD | V1 |
| M8 | RSVD | T10 |
| M9 | RSVD | T9 |
| M10 | RSVD | T8 |
| M26 | RSVD | T7 |
| M27 | RSVD | T6 |
| M28 | RSVD | T5 |
| M29 | RSVD | T4 |
| M30 | RSVD | T3 |
| M31 | RSVD | T2 |
| M32 | RSVD | T1 |
| M33 | RSVD | R10 |
| M35 | RSVD | R9 |
| N1 | RSVD | R8 |
| N2 | RSVD | R7 |
| N3 | RSVD | R6 |
| N4 | RSVD | R5 |
| N5 | RSVD | R4 |
| N6 | RSVD | R3 |
| N7 | RSVD | R2 |
| N8 | RSVD | R1 |
| N9 | RSVD | N10 |

5
XU1:J
989 - 1MM - IMVP7 - REV1

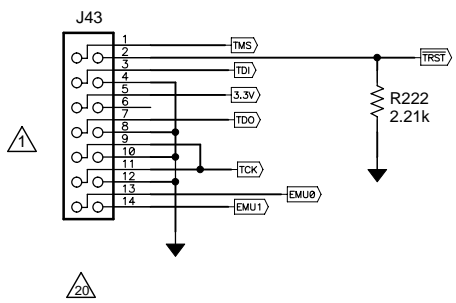
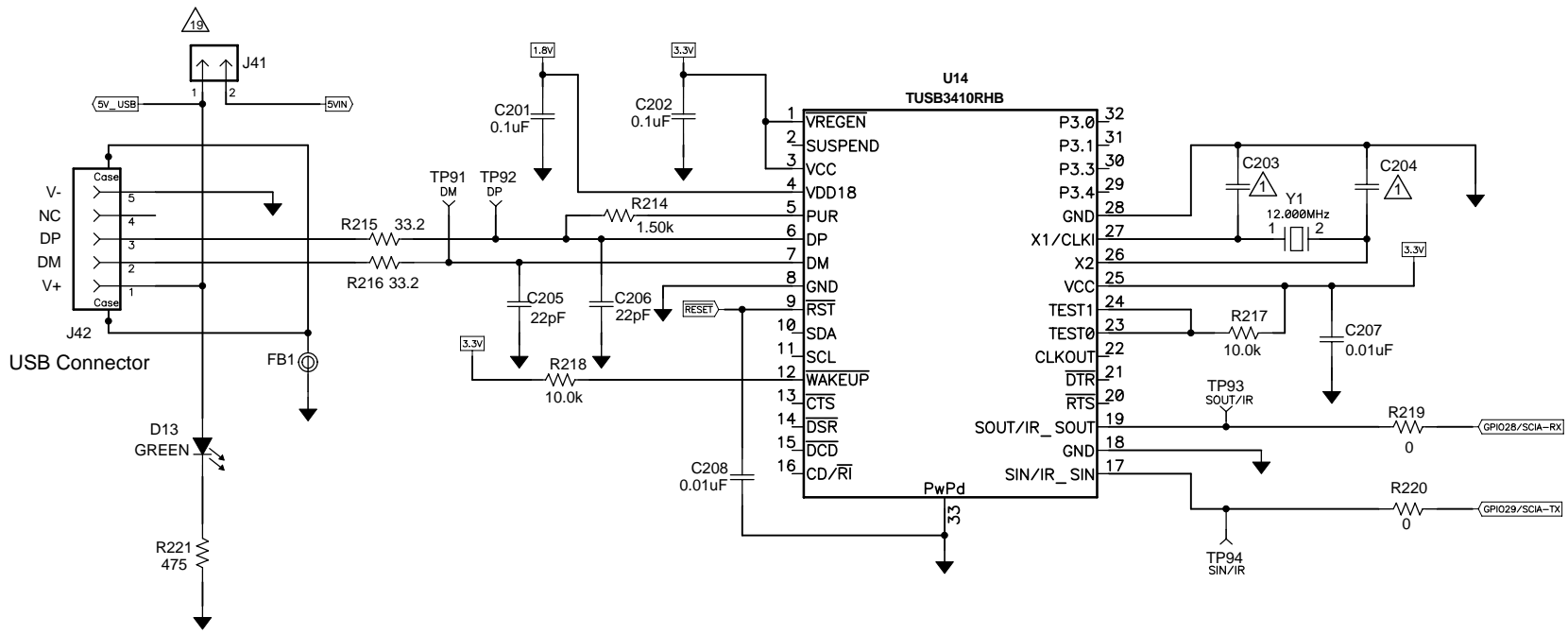
| | | |
|------|------|------|
| AA10 | RSVD | AM8 |
| AB1 | RSVD | AM6 |
| AB2 | RSVD | AM5 |
| AB3 | RSVD | AM4 |
| AB4 | RSVD | AM3 |
| AB5 | RSVD | AM2 |
| AB6 | RSVD | AM27 |
| AB7 | RSVD | AM26 |
| AB8 | RSVD | AM20 |
| AB9 | RSVD | AM15 |
| AB10 | RSVD | AM14 |
| AD2 | RSVD | AM12 |
| AD3 | RSVD | AM11 |
| AD4 | RSVD | AM9 |
| AD5 | RSVD | AM8 |
| AD6 | RSVD | AM6 |
| AD8 | RSVD | AM5 |
| AD9 | RSVD | AM4 |
| AD10 | RSVD | AK32 |
| AE1 | RSVD | AK31 |
| AE2 | RSVD | AK29 |
| AE3 | RSVD | AK28 |
| AE4 | RSVD | AK26 |
| AE5 | RSVD | AK15 |
| AE6 | RSVD | AK14 |
| AE7 | RSVD | AK12 |
| AE8 | RSVD | AK11 |
| AE10 | RSVD | AK9 |
| AF8 | RSVD | AK8 |
| AF9 | RSVD | AK6 |
| AF10 | RSVD | AK5 |
| AG1 | RSVD | AK3 |
| AG2 | RSVD | AK2 |
| AG3 | RSVD | AK1 |
| AG5 | RSVD | AJ33 |
| AG6 | RSVD | AJ32 |
| AG7 | RSVD | AJ31 |
| AH1 | RSVD | AJ27 |
| AH2 | RSVD | AJ26 |
| AH3 | RSVD | AJ15 |
| AH5 | RSVD | AJ14 |
| AH6 | RSVD | AJ12 |
| AH8 | RSVD | AJ11 |
| AH9 | RSVD | AJ9 |
| AH11 | RSVD | AJ8 |
| AH12 | RSVD | AJ6 |
| AH14 | RSVD | AJ5 |
| AH15 | RSVD | AH33 |
| AH2 | RSVD | AH31 |

5
XU1:K
989 - 1MM - IMVP7 - REV1

| | | |
|------|------|------|
| AM9 | RSVD | AT34 |
| AM11 | RSVD | AT33 |
| AM12 | RSVD | AT31 |
| AM14 | RSVD | AT30 |
| AM15 | RSVD | AT28 |
| AM26 | RSVD | AT26 |
| AM27 | RSVD | AT26 |
| AM28 | RSVD | AT15 |
| AM30 | RSVD | AT14 |
| AM31 | RSVD | AT12 |
| AM32 | RSVD | AT11 |
| AM33 | RSVD | AT9 |
| AM34 | RSVD | AT8 |
| AM35 | RSVD | AT6 |
| AN1 | RSVD | AT5 |
| AN2 | RSVD | AR35 |
| AN3 | RSVD | AR34 |
| AN5 | RSVD | AR33 |
| AN6 | RSVD | AR32 |
| AN8 | RSVD | AR31 |
| AN9 | RSVD | AR30 |
| AN11 | RSVD | AR29 |
| AN12 | RSVD | AR28 |
| AN14 | RSVD | AR27 |
| AN15 | RSVD | AR26 |
| AN26 | RSVD | AR15 |
| AN29 | RSVD | AR12 |
| AN31 | RSVD | AR11 |
| AN32 | RSVD | AR9 |
| AN33 | RSVD | AR8 |
| AN34 | RSVD | AR6 |
| AN35 | RSVD | AR5 |
| AP2 | RSVD | AR3 |
| AP3 | RSVD | AP35 |
| AP5 | RSVD | AP33 |
| AP6 | RSVD | AP32 |
| AP8 | RSVD | AP30 |
| AP9 | RSVD | AP29 |
| AP11 | RSVD | AP27 |
| AP12 | RSVD | AP26 |
| AP14 | RSVD | AP15 |

Note11:
⚠ Not used

| | | |
|-----------------------|----------------------------|----------------------|
| uC Socket Others | | |
| Title TPS59640EVM-751 | | |
| Size | Number HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by Nancy Zhang |
| Filename | HPA751A.sch Sheet 11 of 13 | |



Note 12:

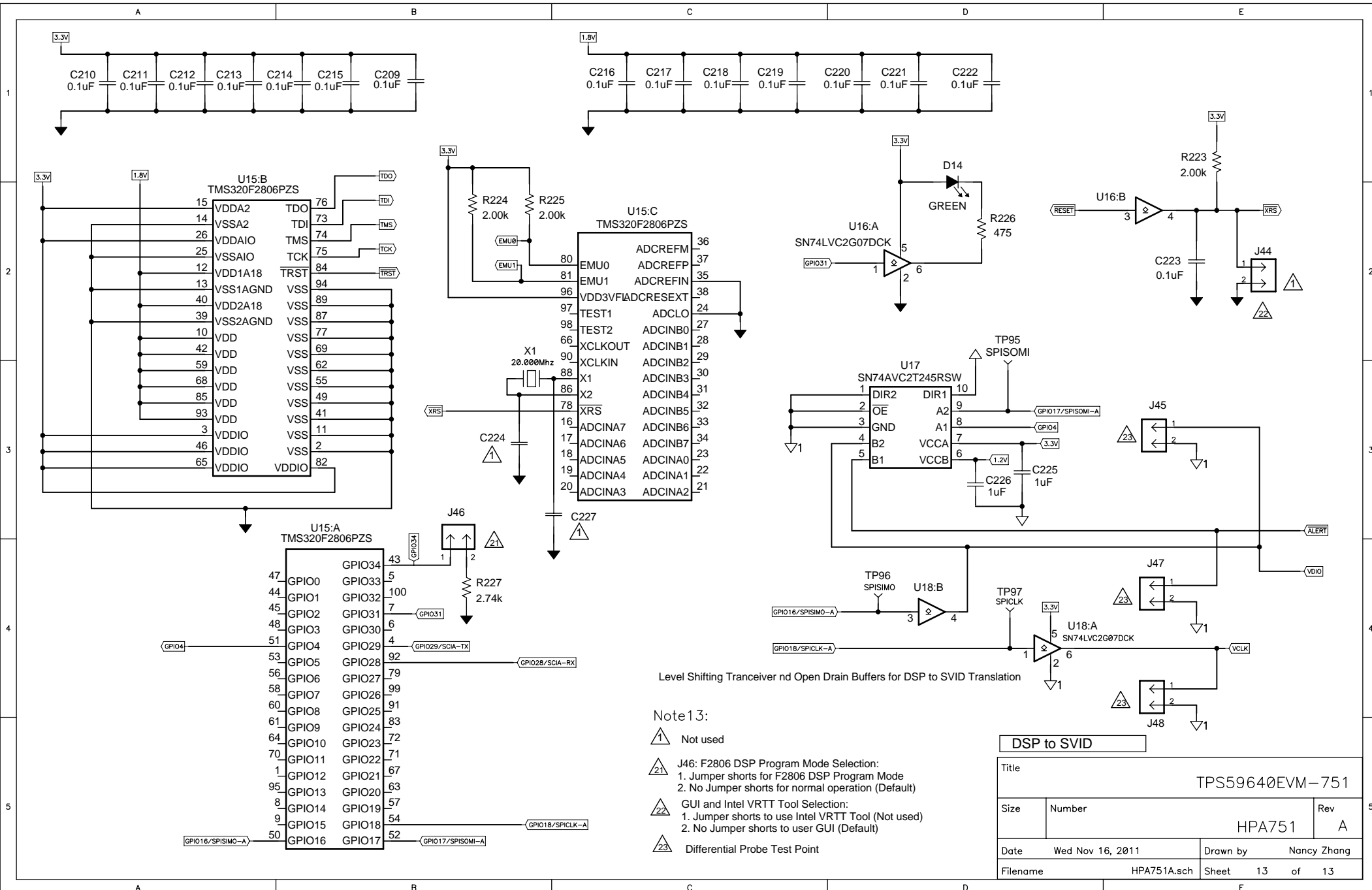
△1 Not used

△19 5V Bias option:
 1. Jumper shorts on J41, 5V Bias used from USB. If USB 5V is used, external 5V supply from J31 should not be used.
 2. No Jumper shorts on J41, 5V Bias used from external J31 (Default)

△20 For Internal software development

USB to DSP

| | | | |
|----------|------------------|-----------------|-------------|
| Title | | TPS59640EVM-751 | |
| Size | Number | HPA751 | Rev A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang |
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Level Shifting Transceiver and Open Drain Buffers for DSP to SVID Translation

Note 13:

- ⚠ Not used
- ⚠ J46: F2806 DSP Program Mode Selection:
 1. Jumper shorts for F2806 DSP Program Mode
 2. No Jumper shorts for normal operation (Default)
- ⚠ J45, J47, J48: GUI and Intel VRTT Tool Selection:
 1. Jumper shorts to use Intel VRTT Tool (Not used)
 2. No Jumper shorts to user GUI (Default)
- ⚠ Differential Probe Test Point

DSP to SVID

| | | | | | |
|----------|------------------|----------|-----------------|-----|----|
| Title | | | TPS59640EVM-751 | | |
| Size | Number | HPA751 | | Rev | A |
| Date | Wed Nov 16, 2011 | Drawn by | Nancy Zhang | | |
| Filename | HPA751A.sch | Sheet | 13 | of | 13 |

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