Revision Number	Date	Description of Changes	Implemented By
A	23/02/16	Import of AURduino Rev B2 Design. Change of name. P21.2 link to P15.4	A Davison
B	28/07/17	Updated as per change request ECR0001.	A Davison
B1	29/08/17	Added C522 and C404.	A Davison

Tool	Used?	Tool notes	Reviewed at Rev.
Partial N.ERC	Y	Used to stop swamping compilation reports.	A
Variant manager	Y	Safety and stanard variants.	

Checked By:		Title: **ShieldBuddy Revision History**			*Hitex (UK) Ltd.*
		Size: A3	Number: 4269.03.06200	Revision: B1	*Millburn Hill Road* *Coventry* *CV4 7HS*
Approved By:		Date:30/08/2017 (c) Hitex (UK) Ltd.		Sheet 1 of 6	
		File: ShieldBuddy Revision History.SchDoc			

hitex

Author: A.Davison

VDD

R201 10K
R202 0R_dnf
TP201

U201B

CLOCK & TESTMODE	
P20.2 / TESTMODE	P00.1 / XTAL3
XTAL1	P00.2 / XTAL4
XTAL2	VSS

P20_2 118
XTAL1 102
XTAL2 103
12
13
101 GND

C201 16pF
R203 0R
C202 16pF
GND
GND

Y201 20MHz

/TRST 114
TCK_DAP0 115
TMS_DAP1 112
TDI 111
R204 33R

JTAG / DAP / OCDS1	
TRST	P21.7 / TDO
TCK / DAP0	
TMS / DAP1	
P21.6 / TDI	

P20.1 / TIN60 / TGIN / TOUT60 / TGOIN 117

113 +3V3
R205 33R R206 10K

SAK-TC275Tx-64F200W

JTAG..

JTAG.. (to) JTAG..

P20_1

PORT[00..34]

(PIN29) (PIN27)
P00_2 P00_1

PORT[00..34]

Note: Pulling these down will effect power mode.
Default is Single 5V supply EVR13 SMPS topology.

Pulled up internally

P14_6 R207 680R (HWCFG0)
P14_5 R208 680R_dnf (HWCFG1)
P14_2 R209 680R_dnf (HWCFG2)

For +3V3 version, populate R208.

GND

P14_3 R210 680R_dnf (HWCFG3)
P10_5 R211 680R_dnf (HWCFG4)
P10_6 R212 680R_dnf (HWCFG5)
P14_4 R214 680R_dnf (HWCFG6)

JP201 1 2 Jumper
Default is open

GND

U201C

ASCLIN / CAN / QSPI / E-RAY / ETH	
P15.3 / ARX0B / ATX0 P15.2 / ATX0	
P15.5 / ARX1B / ATX1 P15.4 / ATX1	
P20.7 / RXDCAN0B P20.8 / TXDCAN0	
P14.1 / RXDCAN1B P14.0 / TXDCAN1	
P15.1 / RXDCAN2A P15.0 / TXDCAN2	
P20.9 / RXDCAN4A P20.10 / TXDCAN4	
P20.12 / MRST0A P20.14 / MTSR0	
P20.13 / SLSI0A P20.11 / SCLK0	
	P33.5 / SLSO07	
	P20.6 / SLSO08	
	P20.3 / SLSO09	
P00.5 / MRST4A P00.11 / MTSR4	
P00.4 / SLSI4A P00.12 / SCLK4	
	P00.0 / SLSO41	
	P00.3 / SLSO44	
P02.0 / TXDA P02.2 / TXDB	
P02.1 / RXDA2 P02.3 / RXDB2	
P02.4 / TXENA P02.5 / TXENB	
VFLEX P21.0 / MDC	
	P21.1 / MDIO	
P11.12 / REFCLK	
P11.9 / RXD1 P11.2 / TXD1	
P11.10 / RXD0 P11.3 / TXD0	
P11.11 / CRSDIV P11.6 / TXEN	

P15_3 (RX) 136
P15_5 (SDA0-3) 138
P20_7 (CANRX0) 125
P14_1 (PIN23) 143
P15_1 (RXD0) 134
P20_9 (J405.5) 127
P20_12 (MRST0) 130
P20_13 (SLSO2) 131
P00_5 (PIN35) 16
P00_4 (PIN33) 15
P02_0 (PWM2) 1
P02_1 (PWM3) 2
P02_4 (PWM6) 6
P11_12 (J406.33) 167
P11_9 (PIN41) 163
P11_10 (PIN42) 165
P11_11 (PIN43) 166

135 (TX) P15_2
137 (SCL0-3) P15_4
126 (CANTX0) P20_8
142 (PIN22) P14_0
133 (TXD0) P15_0
128 (CANTX/IO) P20_10
132 (MTSR0) P20_14
129 (SCLK0) P20_11
75 (AD14/RXD3) P33_5
124 (AD7) P20_6
19 (RXD2) P20_3
22 (PIN32) P00_11
23 (PIN34) P00_12
11 (PIN25) P00_0
14 (PIN31) P00_3
3 (J402.5) P02_2
4 (PWM5) P02_3
6 (PWM7) P02_5
105 (PIN49) P21_0
106 (PIN48) P21_1
160 (PIN45) P11_2
161 (PIN46) P11_3
162 (PIN47) P11_6

VDD R213 0R VDDFLX
VFLEX 164
C203 100nF
GND

SAK-TC275Tx-64F200W

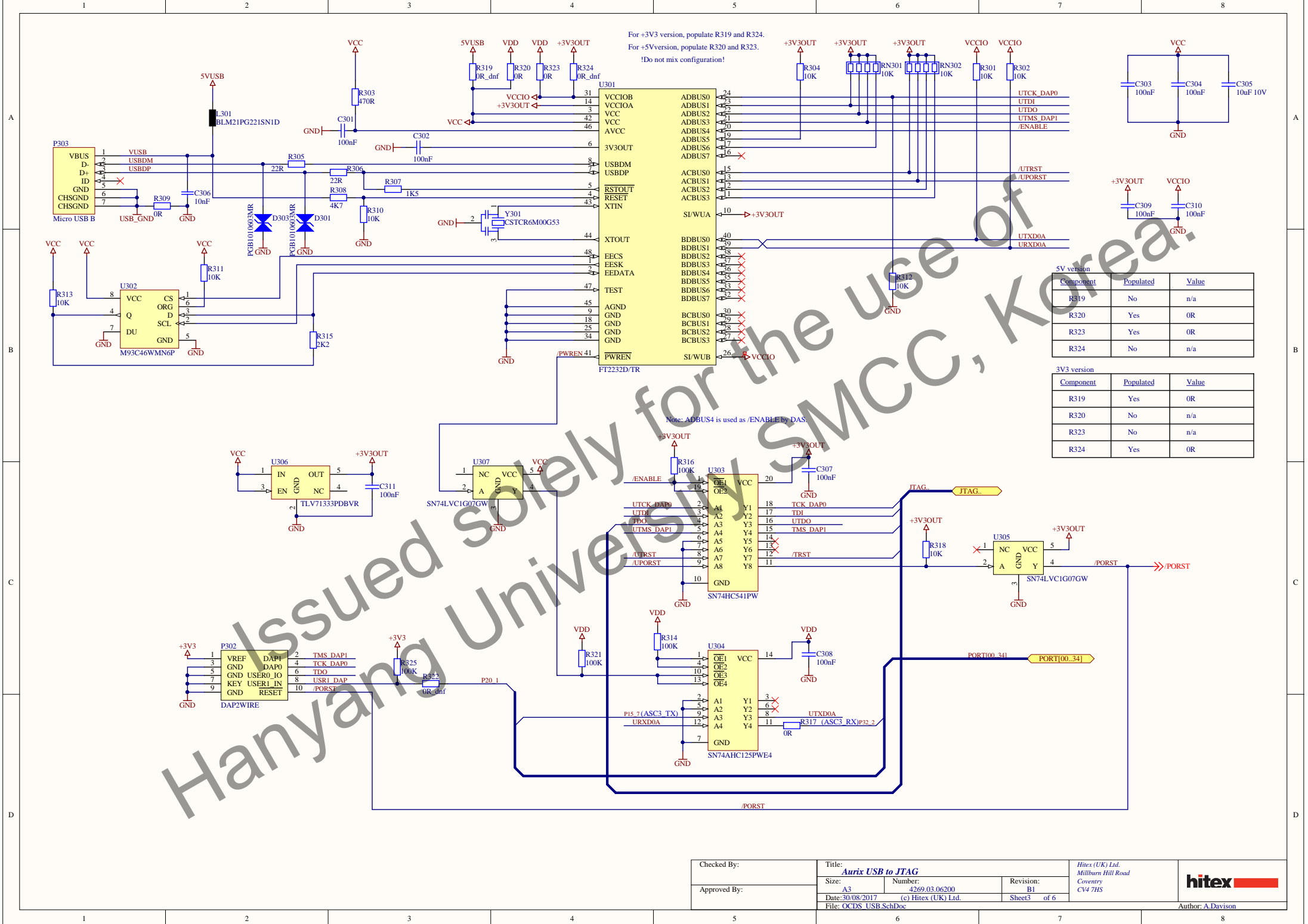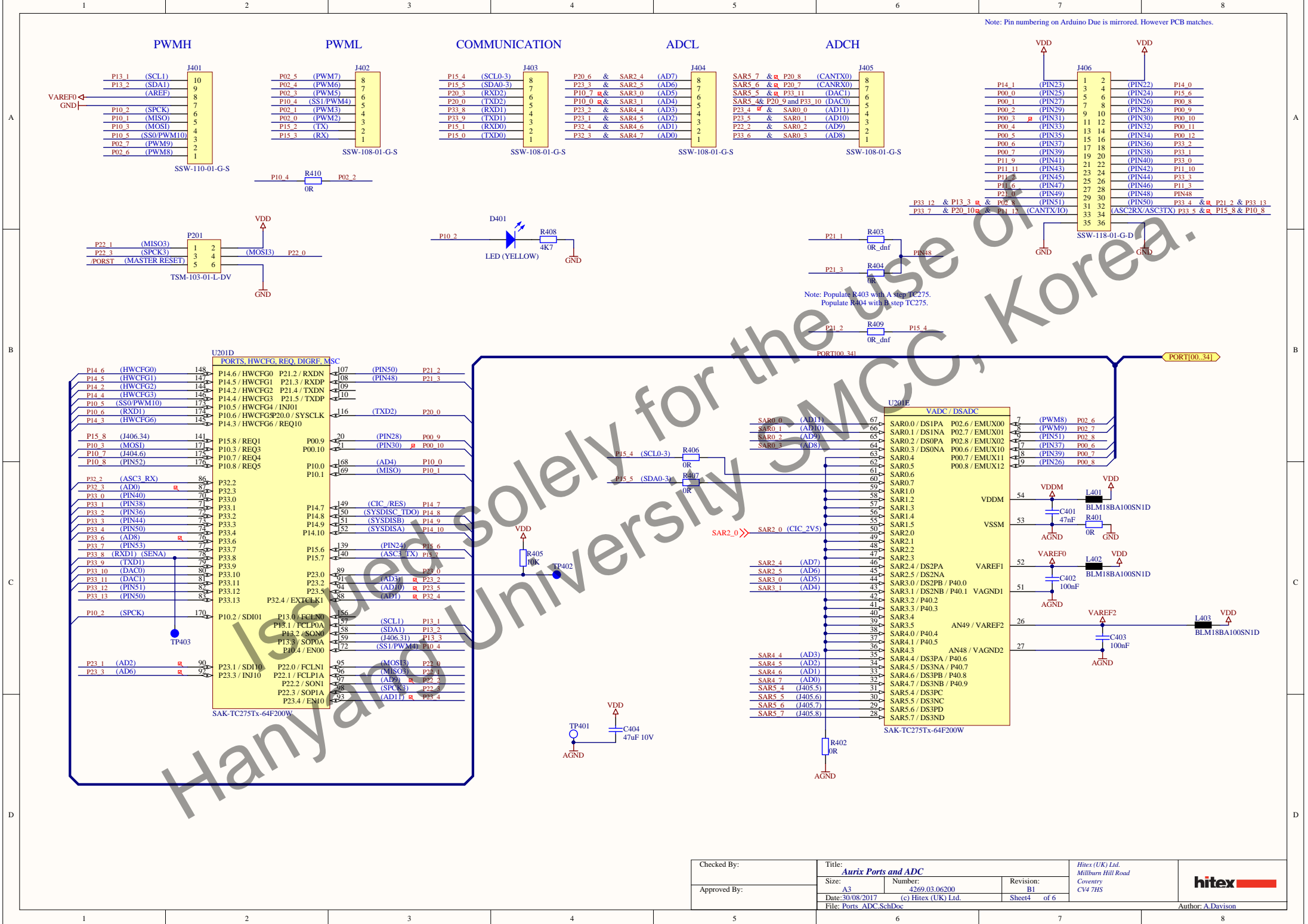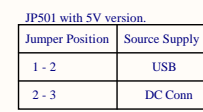**NOTE:** Boot and PLL configuration (about configuration see the TC275T manual).
Default is Internal Start From Flash

For +3V3 version, populate R319 and R324.
For +5V version, populate R320 and R323.
!Do not mix configuration!

Note: ADBUS4 is used as /ENABLE by DAS.

U301 — FT2232D/TR

U302 — M93C46WMN6P

P303 — Micro USB B

U306 — TLV71333PDBVR

U307 — SN74LVC1G07GW

U303 — SN74HC541PW

U305 — SN74LVC1G07GW

P302 — DAP2WIRE

U304 — SN74AHC125PWE4

Y301 — CSTCR6M00G53

5V version

Component	Populated	Value
R319	No	n/a
R320	Yes	0R
R323	Yes	0R
R324	No	n/a

3V3 version

Component	Populated	Value
R319	Yes	0R
R320	No	n/a
R323	No	n/a
R324	Yes	0R

Checked By:

Approved By:

Title: *Aurix USB to JTAG*

Size: A3
Number: 4269.03.06200
Revision: B1
Date: 30/08/2017 (c) Hitex (UK) Ltd.
Sheet3 of 6
File: OCDS_USB.SchDoc

Hitex (UK) Ltd.
Millburn Hill Road
Coventry
CV4 7HS

hitex

Author: A.Davison

Note: Pin numbering on Arduino Due is mirrored. However PCB matches.

PWMH

J401 — SSW-110-01-G-S

P13_1	(SCL1)	10
P13_2	(SDA1)	9
	(AREF)	8
P10_2	(SPCK)	7
P10_1	(MISO)	6
P10_3	(MOSI)	5
P10_5	(SS0/PWM10)	4
P02_7	(PWM9)	3
P02_6	(PWM8)	2

VAREF0
GND

PWML

J402 — SSW-108-01-G-S

P02_5	(PWM7)	8
P02_4	(PWM6)	7
P02_3	(PWM5)	6
P10_4	(SS1/PWM4)	5
P02_1	(PWM3)	4
P02_0	(PWM2)	3
P15_2	(TX)	2
P15_3	(RX)	1

P10_4 — R410 0R — P02_2

COMMUNICATION

J403 — SSW-108-01-G-S

P15_4	(SCL0-3)	8
P15_5	(SDA0-3)	7
P20_3	(RXD2)	6
P20_0	(TXD2)	5
P33_8	(RXD1)	4
P33_9	(TXD1)	3
P15_1	(RXD0)	2
P15_0	(TXD0)	1

D401 — R408 4K7 — GND
LED (YELLOW)
P10_2

ADCL

J404 — SSW-108-01-G-S

P20_6	&	SAR2_4	(AD7) 8
P23_3	&	SAR2_5	(AD6) 7
P10_7	&	SAR3_0	(AD5) 6
P10_0	&	SAR3_1	(AD4) 5
P23_2	&	SAR4_4	(AD3) 4
P23_1	&	SAR4_5	(AD2) 3
P32_4	&	SAR4_6	(AD1) 2
P32_3	&	SAR4_7	(AD0) 1

ADCH

J405 — SSW-108-01-G-S

SAR5_7	&	P20_8	(CANTX0) 8
SAR5_6	&	P20_7	(CANRX0) 7
SAR5_5	&	P33_11	(DAC1) 6
SAR5_4	&	P20_9 and P33_10	(DAC0) 5
P23_4	&	SAR0_0	(AD11) 4
P23_5	&	SAR0_1	(AD10) 3
P22_2	&	SAR0_2	(AD9) 2
P33_6	&	SAR0_3	(AD8) 1

P21_1 — R403 0R_dnf — PIN48
P21_3 — R404 0R

Note: Populate R403 with A step TC275.
Populate R404 with B step TC275.

P21_2 — R409 0R_dnf — P15_4

J406 — SSW-118-01-G-D

P14_1	(PIN23)	1	2	(PIN22) P14_0
P00_0	(PIN25)	3	4	(PIN24) P15_6
P00_1	(PIN27)	5	6	(PIN26) P00_8
P00_2	(PIN29)	7	8	(PIN28) P00_9
P00_3	(PIN31)	9	10	(PIN30) P00_10
P00_4	(PIN33)	11	12	(PIN32) P00_11
P00_5	(PIN35)	13	14	(PIN34) P00_12
P00_6	(PIN37)	15	16	(PIN36) P33_2
P00_7	(PIN39)	17	18	(PIN38) P33_1
P11_9	(PIN41)	19	20	(PIN40) P33_0
P11_11	(PIN43)	21	22	(PIN42) P11_10
P11_2	(PIN45)	23	24	(PIN44) P33_3
P11_6	(PIN47)	25	26	(PIN46) P11_3
P21_0	(PIN49)	27	28	PIN48
P33_12 & P13_3 & P02_8	(PIN51)	29	30	(PIN50) P33_4 & P21_2 & P33_13
P33_7 & P20_10 & P11_13	(CANTX/IO)	31	32	(ASC2RX/ASC3TX) P33_5 & P15_8 & P10_8
		33	34	
		35	36	

VDD GND

P201 — TSM-103-01-L-DV

P22_1	(MISO3)	1 — 2
P22_3	(SPCK3)	3 — 4 (MOSI3) P22_0
/PORST	(MASTER RESET)	5 — 6

VDD
GND

PORT[00..34]

U201D — PORTS, HWCFG, REQ, DIGRF, MSC — SAK-TC275Tx-64F200W

P14_6 (HWCFG0)	148	P14.6 / HWCFG0
P14_5 (HWCFG1)	147	P14.5 / HWCFG1
P14_2 (HWCFG2)	145	P14.4 / HWCFG2
P14_4 (HWCFG3)	146	P14.4 / HWCFG3
P10_5 (SS0/PWM10)	173	P10.5 / HWCFG4 / INJ01
P10_6 (RXD1)	174	P10.6 / HWCFG5
P14_3 (HWCFG6)	147	P14.3 / HWCFG6 / REQ10

P21.2 / RXDN	107	(PIN50) P21_2
P21.3 / RXDP	108	(PIN48) P21_3
P21.4 / TXDN	109	
P21.5 / TXDP	110	
P20.0 / SYSCLK	116	(TXD2) P20_0

P15_8 (J406.34)	141	P15.8 / REQ1	P00.9	20	(PIN28) P00_9
P10_3 (MOSI)	172	P10.3 / REQ3	P00.10	21	(PIN30) P00_10
P10_7 (J404.6)	175	P10.7 / REQ4			
P10_8 (PIN52)	176	P10.8 / REQ5	P10.0	168	(AD4) P10_0
			P10.1	169	(MISO) P10_1

P32_2 (ASC3_RX)	86	P32.2
P32_3 (AD0)	87	P32.3
P33_0 (PIN40)	70	P33.0
P33_1 (PIN38)	71	P33.1	P14.7	149	(CIC_/RES) P14_7
P33_2 (PIN36)	72	P33.2	P14.8	150	(SYSDISC_TDO) P14_8
P33_3 (PIN44)	73	P33.3	P14.9	151	(SYSDISB) P14_9
P33_4 (PIN50)	74	P33.4	P14.10	152	(SYSDISA) P14_10
P33_6 (AD8)	76	P33.6			
P33_7 (PIN53)	77	P33.7			
P33_8 (RXD1) (SENA)	78	P33.8	P15.6	138	(PIN24) P15_6
P33_9 (TXD1)	79	P33.9	P15.7	140	(ASC3_TX) P15_7
P33_10 (DAC0)	80	P33.10	P23.0	89	(J406.31) P23_0
P33_11 (DAC1)	81	P33.11	P23.2	91	(AD3) P23_2
P33_12 (PIN51)	82	P33.12	P23.5	94	(AD10) P23_5
P33_13 (PIN50)	83	P33.13	P32.4 / EXTCLK1	88	(AD1) P32_4

P10_2 (SPCK)	170	P10.2 / SDI01	P13.0 / FCLN0	156	
			P13.1 / FCLP0A	157	(SCL1) P13_1
			P13.2 / SON0	158	(SDA1) P13_2
			P13.3 / SOP0A	159	(J406.31) P13_3
			P10.4 / EN00	172	(SS1/PWM4) P10_4

P23_1 (AD2)	90	P23.1 / SDI10	P22.0 / FCLN1	95	(MOSI3) P22_0
P23_3 (AD6)	92	P23.3 / INJ10	P22.1 / FCLP1A	96	(MISO3) P22_1
			P22.2 / SON1	97	(AD9) P22_2
			P22.3 / SOP1A	98	(SPCK3) P22_3
			P23.4 / EN10	93	(AD11) P23_4

VDD — R405 10K — TP402
TP403

VDD — TP401 — C404 47uF 10V — AGND

U201E — VADC / DSADC — SAK-TC275Tx-64F200W

SAR0_0 (AD11)	67	SAR0.0 / DS1PA
SAR0_1 (AD10)	66	SAR0.1 / DS1NA
SAR0_2 (AD9)	65	SAR0.2 / DS0PA
SAR0_3 (AD8)	64	SAR0.3 / DS0NA
	63	SAR0.4
	62	SAR0.5
	61	SAR0.6
	60	SAR0.7
	59	SAR1.0
	58	SAR1.1
	57	SAR1.2
	56	SAR1.3
	55	SAR1.4
	50	SAR1.5
	49	SAR2.0
	48	SAR2.1
	47	SAR2.2
	46	SAR2.3
SAR2_4 (AD7)	45	SAR2.4 / DS2PA
SAR2_5 (AD6)	44	SAR2.5 / DS2NA
SAR3_0 (AD5)	43	SAR3.0 / DS2PB / P40.0
SAR3_1 (AD4)	42	SAR3.1 / DS2NB / P40.1
	41	SAR3.2 / P40.2
	40	SAR3.3 / P40.3
	39	SAR3.4
	38	SAR3.5
	37	SAR4.0 / P40.4
	36	SAR4.1 / P40.5
SAR4_4 (AD3)	35	SAR4.3
SAR4_5 (AD2)	34	SAR4.4 / DS3PA / P40.6
SAR4_6 (AD1)	33	SAR4.5 / DS3NA / P40.7
SAR4_7 (AD0)	32	SAR4.6 / DS3PB / P40.8
SAR5_4 (J405.5)	31	SAR4.7 / DS3NB / P40.9
SAR5_5 (J405.6)	30	SAR5.4 / DS3PC
SAR5_6 (J405.7)	29	SAR5.5 / DS3NC
SAR5_7 (J405.8)	28	SAR5.6 / DS3PD
		SAR5.7 / DS3ND

P02.6 / EMUX00	7	(PWM8) P02_6
P02.7 / EMUX01	8	(PWM9) P02_7
P02.8 / EMUX02	9	(PIN51) P02_8
P00.6 / EMUX10	17	(PIN37) P00_6
P00.7 / EMUX11	18	(PIN39) P00_7
P00.8 / EMUX12	19	(PIN26) P00_8

P15_4 (SCL0-3) — R406 0R
P15_5 (SDA0-3) — R407 0R

SAR2_0 — SAR2_0 (CIC_2V5)
(CIC_2V5)

VDDM 54 — L401 BLM18BA100SN1D — VDD / C401 47nF / R401 0R — AGND / GND
VSSM 53
VAREF1 52 — L402 BLM18BA100SN1D — VDD / VAREF0 / C402 100nF — AGND
VAGND1 51
AN49 / VAREF2 26 — L403 BLM18BA100SN1D — VDD / VAREF2 / C403 100nF — AGND
AN48 / VAGND2 27

R402 0R — AGND

Populate D507 only with 3V3 version.

Input 7V ...16V

5VUSB
D507
MBRA340T3G_dnf

J501
FCR681465

D501
MBRA340T3G

C501
330nF
GND

VIN

U501
VCC   OUT
CTL   GND   ADJ
NC
BA00BC0WFP-E2
GND

R522
33K
GND

Populate R520 with 100K for 5V. 54K9 for 3V3.

R520
100K

5VUSB
C521
10uF 10V
GND

5VUSB
JP501
3 way Jumper

VDD

C502
22uF 10V
GND

R519
0R_dnf

Populate R519 only with Safety version or 3V3 version.
Do not populate with JP501

JP501 with 5V version.

Jumper Position	Source Supply
1 - 2	USB
2 - 3	DC Conn

5V version

Component	Populated	Value
D507	No	n/a
R520	Yes	100K
R519	No	n/a
R521	Yes	0R
JP501	Yes	M20-9990345.
U502	Yes	MCP130T-475I/TT
R523	No	n/a

3V3 version

Component	Populated	Value
D507	Yes	MBRA340T3G
R520	Yes	54K9
R519	Yes	0R
R521	No	n/a
JP501	No	n/a
U502	Yes	MCP121T-315E/TT
R523	Yes	0R

POWER

J502
SSW-108-01-G-S
GND

+3V3
R523
0R_dnf
(IOREF)
(MASTER RESET)
R521
0R
VIN
VDD
/PORST

VDD
C503
100nF
GND

U502
VDD
RST
VSS
MCP130T-475I/TT
GND

Populate U502 with MCP121T-315E/TT for 3V3 version.

/PORST

VDD
D503
LED (BLUE)
R502
4K7

VDD
D504
LED (WHITE)
R503
10K
GND

+3V3
D505
LED (GREEN)
R504
470R
GND

+1V3
R507
12K
Q501
BC848C
GND

VDD
S502
FSM6JSMA
R508
4K7
R511
10K
GND
C518
4.7uF 10V
GND

Q502
BC848C

R509
0R
/PORST

R510
0R_dnf
GND

VDD
R512
1K
/PORST
PORST
/ESR0

VDD
R513
680R
/PORST
R514
4K7
/ESR0

R515
10K
Q504
BC858C
R516
47K
/ESR1
R517
330R
GND
D506
LED (RED)
GND

+3V3
R506
0R
C514
10uF 6.3V
GND

VDDP3
C512
100nF
GND

GND
C510
100nF
VDDFL3
R505
0R

C513
100nF
GND

VDD
C505
10uF 10V
GND
C506
100nF
C507
100nF
C508
100nF
C509
100nF
GND

C504
100nF
GND
VDDESB
D502
BAT54_dnf
R501
0R
+1V3

U201A
POWER
155   P13.4 / VDDFL3
       P02.9 / VDD / VDDSTBY
154   VDDP3
104   VDDP3
121   PORST
122   ESR0
120   ESR1
VEXT / VEXT / VEXT / VEXT   10
P24.0 / VDD   123
VDD   100
VDD   68
VDD   24
VSS
P32.0 / VGATEIP
VGATEIN
VGATEIP
GND
SAK-TC275Tx-64F200W

153 / 99 / 69 / 25

C511 100nF
C515 100nF
C516 100nF
C517 100nF
GND

+1V3

VDD
C522
47uF 10V
GND

Q503
BSL215C
P ch

L501
XAL4030-472MEC
4.7uH/20%

+1V3
C519
10uF 6.3V
GND

+1V3
R518
0R_dnf
N ch
GND

C520
100nF
GND

/PORST

/ESR0
/ESR1

Companion Processor

PORT0..18

P14_8   (SYSDISC_TDO)   R601 1K   SYSDISC_TDO
P14_9   (SYSDISB)   R602 1K   SYSDISB
P14_10 (SYSDISA)   R603 1K   SYSDISA
P20_13 (SLSO2)   R604 1K
P20_11 (SCLK0)   R606 1K
P20_14 (MTSR0)   R607 1K
P20_12 (MRST0)   R610 1K
P33_8   (SENA)

24.5mA under normal conditions.

U601

Pin	Signal		Signal	Pin
30	CS/P3.6	RESET		38
2	SCLK/P0.3		
3	MTSR/P0.4	(Hi-Z) SYSDISA/P3.1	SYSDISA	33
4	MRST/P0.5	(Hi-Z) SYSDISB/P3.0	SYSDISB	32
		(P-up) SYSDISC/TDO/P0.2	SYSDISC_TDO	13
15	SENA/AN0/P2.0		
16	SENB/AN1/P2.1		
17	SENC/AN2/P2.2	NC/P3.5		37
26	SEND/AN7/P2.7	NC/P3.4		36
25	SENREF	NC/P3.3		35
24	SENGND	NC/P3.2		34
1	VDDP/MBC	NC/P3.7		31
18	VDDP	NC/P1.5		29
11	VSSP/TMS	NC/P1.1/TXD	TMS_CIC	28
8	VDDC	NC/P1.0/RXD		27
7	VSSC	NC/TDI/P0.1	TDI_CIC	14
		NC/TCK/P0.0		12
		NC/P1.7		10
		NC/P1.6		9
		NC/XTAL1		6
		NC/XTAL2		5

VSSP/AN3/P2.3
VSSP/AN4/P2.4
VSSP/AN5/P2.5
VSSP/AN6/P2.6   19 20 21 22 23

CIC61508-XC866

+1V3 R611 0R
VDD   R612 6K8
+3V3 R613 2K2
R615 5K6_dnf   R616 5K6   R617 5K6
CIC_AGND

R618 1K

+5V_CIC
L601 BLM18BA100SN1D
R619 1K   VAREF_2V5_CIC
C605 100nF
U602 LM4040B25FTA NC
C606 100nF
CIC_AGND

C602 1nF   C603 1nF   C604 1nF
MBC_CIC
R621 0R_DNF

TMS_CIC
+2V5_CIC
R623 0R_DNF
C607 330nF
C608 220nF/25V
GND

R622 0R
GND   CIC_AGND

R624 0R_DNF
R625 0R_DNF
R626 0R_DNF
R627 0R_DNF
GND

+5V_CIC   Q601 1BC858C-7-F
D601 LED (RED)
R605 5K1
GND

+5V_CIC   R609 10K
GND

R608 12K

/PORST

R638 0R_DNF
Jumper option to join resets as one.

CIC61508 reset
C601 100nF
S601 FSM6JSMA
GND

R614 1K_dnf   (CIC_/RES) P14_7

P602
1
2
Header_dnf

+5V_CIC

P603
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
OCDS1_dnf
GND   GND   GND

TMS_CIC
SYSDISC_TDO
TDI_CIC
MBC_CIC   R620 1K
GND

Note: Small pitch header will require adaptor for OCDS1 connection.

VIN
U603
C609 100nF
IN   OUT   +5V_CIC
GND
TLE4284D V50
C610 22uF 10V
GND   GND   GND

+2V5_CIC
R628 1K
(CIC_2V5) SAR2_0
C611 10nF
AGND

SYSDIS signals are active high.
Red LED on when disabling.

+5V_CIC   +5V_CIC
R629 100K   R630 5K1
D602 LED (RED)
SYSDISA   R635 12K   Q602 BC848C-7-F
GND

+5V_CIC   +5V_CIC
R631 100K   R632 5K1
D603 LED (RED)
SYSDISB   R636 12K   Q603 BC848C-7-F
GND

+5V_CIC   +5V_CIC
R633 100K   R634 5K1
D604 LED (RED)
SYSDISC_TDO   R637 12K   Q604 BC848C-7-F
GND