REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	PRELIMINARY RELEASE	10OCT12	DML
B	GENERAL REVISED	10APR13	DML
C	REVISED PLANES	02DEC13	DML

AD9656 CUSTOMER EVAL BOARD

THOR-BASED 16 BIT 125 MSPS ADC

WITH JESD204B SERIAL OUTPUTS

ANALOG DEVICES

SCHEMATIC

CUSTOMER EVALUATION PCB
AD9656
:

DESIGN VIEW: -	DRAWING NO.: 02_035104	REV: C
PTD ENGINEER: S. GIBBS	SIZE: D / SCALE: 1:1	SHEET 1 OF 7

AD9656 POWER

WALWART 6V POWER SUPPLY INPUT

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

1.8V_DRVDD
C101 10UF, C102 0.1UF, C103 10UF, C104 0.1UF, C105 10UF, C106 0.1UF, C107 10UF, C108 0.1UF

1.8V_DVDD
C109 10UF, C110 0.1UF, C111 10UF, C112 0.1UF, C113 10UF, C114 0.1UF, C115 10UF, C116 0.1UF

1.8V_DUT_AVDD
C117 10UF, C118 0.1UF, C119 10UF, C120 0.1UF, C121 10UF, C122 0.1UF, C123 10UF, C124 0.1UF

3.3V_DIG
C125 10UF, C126 0.1UF, C127 10UF, C128 0.1UF, C129 10UF, C130 0.1UF, C131 10UF, C132 0.1UF

NUMBER OF DECOUPLING CAPS
CAN BE VARIED DEPENDING
ON LAYOUT IF NECESSARY

P101 C2M_12P0V
1-2 12V FMC
2-3 6V WALWART
P102 PJ-102AH

C138 10UF
F101 1.6A
S2A-TP CR101
FL101 BNX016-01
S2A-TP CR102

P103
1-2 12V FMC
2-3 6V WALWART

D106 D105 D104 D103 D102 D101 S2A-TP

CR104 S2A-TP
1-2 NORMAL
2-3 DISABLE REGS
P106 PG_C2M, REG_EN
SAMTECTSW10608GS3PIN

ADP1706ARDZ-3.3-R7
U102
EN, SENSE, IN, IN, SS, OUT, OUT, GND, PAD
C139 4.7UF, C140 0.01UF, C141 4.7UF

JP101 DNI
JPR0805

E104 39OHM
3.3V_DIG

ADP3339AKCZ-2.5-RL
APPROX 200 MW DISSIPATION
SOME HEATSPREADER COPPER NEEDED
A101
IN, OUT, GND, OUT
C142 4.7UF, C143 4.7UF
2.5V_AUX

LNJ308G8TRA (GREEN)
CR103
R101 619

CR105 S2A-TP
R61 10K

CR106 S2A-TP

ADP1706ARDZ-1.8-R7
U103
EN, SENSE, IN, IN, SS, OUT, OUT, GND, PAD
C144 4.7UF, C145 0.01UF, C146 4.7UF

JP102 DNI
JPR0805

E105 39OHM
1.8V_DVDD

J101
DNI
0734130050
1.8V_DVDD

E101 39OHM DNI

E114 39OHM, C163 10UF
E115 39OHM DNI

ADP1706ARDZ-1.8-R7
U101
EN, SENSE, IN, IN, SS, OUT, OUT, GND, PAD
C147 4.7UF, C148 0.01UF, C149 4.7UF

JP103 DNI
JPR0805

E106 39OHM
1.8V_DUT_AVDD

J102
DNI
0734130050
1.8V_DUT_AVDD

OPTIONAL SWITCHING POWER SUPPLY

C133 10UF, C134 10UF, C135 1UF
R102 100K
U105 VIN, EN, SW, FB, GND
L101 2.2UH, L102 2.2UH
C136 10UF, C137 10UF
R53 1K
ADP2108AUJZ-1.8-R7

E102 39OHM, C150 10UF
E107 39OHM DNI

ADP1706ARDZ-1.8-R7
U104
EN, SENSE, IN, IN, SS, OUT, OUT, GND, PAD
C151 4.7UF, C152 0.01UF, C153 4.7UF

JP104 DNI
JPR0805

E108 39OHM
1.8V_DRVDD

J103
DNI
0734130050
1.8V_DRVDD

E103 39OHM, C154 10UF
E109 39OHM DNI

EXTERNAL POWER SUPPLY INPUTS

DNI E110 39OHM, C155 10UF, C156 0.1UF → 1.8V_DRVDD
DNI P104 Z5.531.3425.0
DNI E111 39OHM, C157 10UF, C158 0.1UF → 1.8V_DVDD
DNI E112 39OHM, C159 10UF, C160 0.1UF → 1.8V_DUT_AVDD
DNI P105 Z5.531.3425.0
DNI E113 39OHM, C161 10UF, C162 0.1UF → 3.3V_DIG

SUPPLY MEASUREMENT POINTS
IN A ROW, IN OPEN SPACE NEAR DUT

DNI TP205 WHT — 1.8V_DVDD
DNI TP206 WHT — 1.8V_DUT_AVDD
DNI TP207 WHT — 1.8V_DRVDD
DNI TP208 WHT — 2.5V_AUX
DNI TP209 WHT — 3.3V_DIG

SUPPLY REGULATORS

ANALOG DEVICES

SCHEMATIC

CUSTOMER EVALUATION PCB
AD9656
:

DESIGN VIEW: -	DRAWING NO.: 02_035104		REV: C
PTD ENGINEER: S. GIBBS	SIZE: D	SCALE: 1:1	SHEET 2 OF 7

AD9656 DUT

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

DECOUPLING CAPACITORS

ALL SUPPLY PINS SHOULD BE INDEPENDENTLY DECOUPLED UNDER PINS ON THE BOTTOM OF PCB

1.8V_DUT_AVDD

PIN 1 C201 0.1UF
PIN 4 C202 0.1UF
PIN 5 C203 0.1UF
PIN 8 C204 0.1UF
PIN 11 C205 0.1UF
PIN 39 C206 0.1UF
PIN 42 C207 0.1UF
PIN 43 C208 0.1UF
PIN 46 C209 0.1UF
PIN 52 C210 0.1UF
PIN 53 C211 0.1UF
PIN 56 C212 0.1UF

1.8V_DRVDD

PIN 18 C213 0.1UF
PIN 23 C214 0.1UF
PIN 28 C215 0.1UF

1.8V_DVDD

PIN 12 C216 0.1UF
PIN 32 C217 0.1UF

VREF SELECT (WITHIN 1" OF DUT)

J206 (TSW-103-08-G-D)

1.8V_DVDD
DUT_SENSE
DUT_VREF
EXT_REF

1 1-2 EXTERNAL VREF
2
3 3-5 INTERNAL VREF (SPI PROGRAMMABLE)
4
5
6 4-6 EXTERNAL VREF

DUT_VREF
R220 0 DNI
DUT_SENSE
R221 0 DNI

RESISTOR PROGRAMMABLE INTERNAL VREF WITH OTHER JUMPERS OPEN

EXTERNAL DSYSREF

J201 DNI — R201 0 DNI — C218 0.1UF DNI

3.3V_DIG
JP201 DNI — JPR0402
C219 0.1UF

R203 10K
R202 49.9 DNI
R204 7.5K

U201 ADN4663BRZ
VCC
DIN1, DIN2
DOUT1_POS, DOUT1_NEG, DOUT2_POS, DOUT2_NEG
GND

EXT_SYSREF_TO_FPGA+
EXT_SYSREF_TO_FPGA-
100 OHM DIFF PAIR

SYSREF_TO_DUT+
SYSREF_TO_DUT-
100 OHM DIFF PAIR

SYNC_TO_DUT+
SYNC_TO_DUT-
100 OHM DIFF PAIR

SYNC INPUT
J202 — R206 0 — C220 0.1UF

R205 49.9

1.8V_DVDD
R207 2K
R208 2K

DUT_VREF
C222 0.1UF
C223 1UF
C221 1UF
VCM_DUT

DUT_RBIAS
TP201 1 WHT
R209 10K

EXPOSED PADDLE (BOTTOM OF PACKAGE)

SOCKET OR SOLDER DOWN
6.9 MM PADDLE

DNI
X201

1.8V_DUT_AVDD	1	42	1.8V_DUT_AVDD
AIND+	2	41	AINA+
AIND-	3	40	AINA-
1.8V_DUT_AVDD	4	39	1.8V_DUT_AVDD
1.8V_DUT_AVDD	5	38	
CLK-	6	37	CSB_DUT
CLK+	7	36	SDIO_DUT
1.8V_DUT_AVDD	8	35	SCLK_DUT
	9	34	SCANI
	10	33	
1.8V_DUT_AVDD	11	32	1.8V_DVDD
1.8V_DVDD	12	31	
	13	30	
R217 0	14	29	R218 0

SG-MLF56A-7007

** PLACE CLOSE TO PIN

J203
1 POWER DOWN
2
TSW-102-08-G-S
AWAY FROM DUT

R219 10K

P201 DNI
1 1-2 OUTPUTS DATA TO SDIO WHEN CHIP DESELECTED
2 OPEN = NORMAL SPI OPERATION
3 2-3 OUTPUTS DATA TO SDIO CONTINUALLY
SAMTECTSW10608GS3PIN

2.5V_AUX
C224 0.1UF

DISTRIBUTE AROUND BOARD
TP5 BLK, TP6 BLK, TP202 BLK, TP203 BLK, TP204 BLK

R210 0
R211 0
R212 0
R213 0 DNI
R214 100
R215 0 **
R216 0 **
KEEP ADJACENT IF POSSIBLE

R248 0 DNI
R249 0
R250 0
R251 0
R252 100
R253 0 **
R254 0 **
R255 0 DNI
KEEP ADJACENT IF POSSIBLE

EXTERNAL FPGA REFCLK

3.3V_DIG
JP202 DNI — JPR0402
R229 10K
R226 10K
C225 0.1UF

J204 — R222 0 — C226 0.1UF
R224 49.9
R227 7.5K

U202 ADN4663BRZ
VCC
DIN1, DIN2
DOUT1_POS, DOUT1_NEG, DOUT2_POS, DOUT2_NEG
GND

R241 0 — C231 0.1UF — EXT_REFCLK_TO_FPGA+
R243 0 — C232 0.1UF — EXT_REFCLK_TO_FPGA-
100 OHM DIFF PAIR

EXTERNAL DSYNC

J205 DNI — R223 0 DNI — C227 0.1UF
R225 49.9
R228 7.5K

OPTIONAL EXTERNAL VREF

3.3V_DIG
U204 AD822BRZ (V+, V-)
R246 2K — C233 0.1UF
U204 AD822BRZ — EXT_REF
R247 10K
CR202 DDZ9678-7
C234 0.1UF
U204 AD822BRZ

ANALOG DEVICES	SCHEMATIC		
	CUSTOMER EVALUATION PCB AD9656 :		
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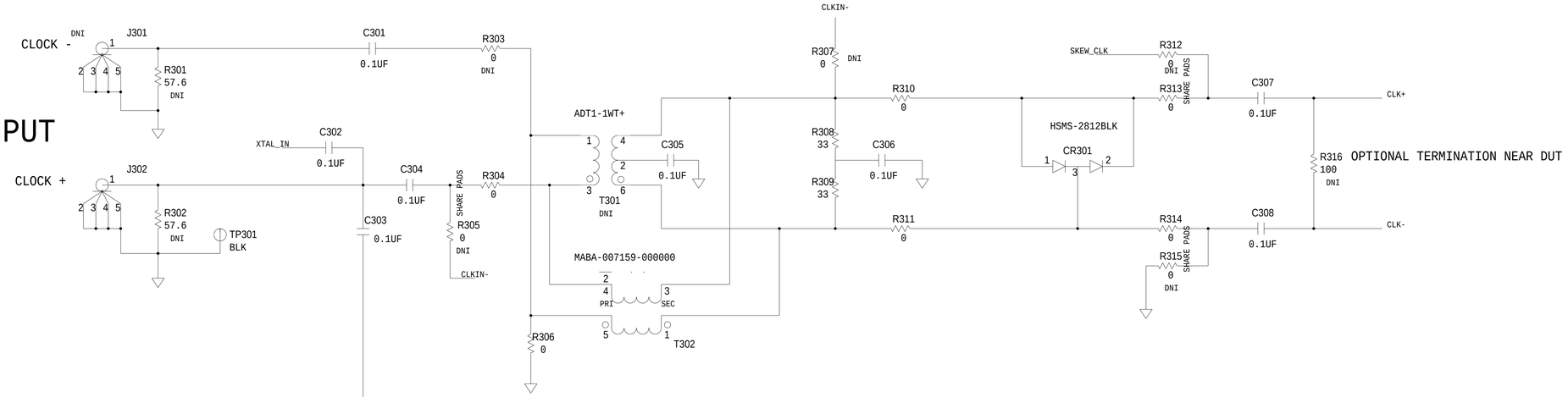
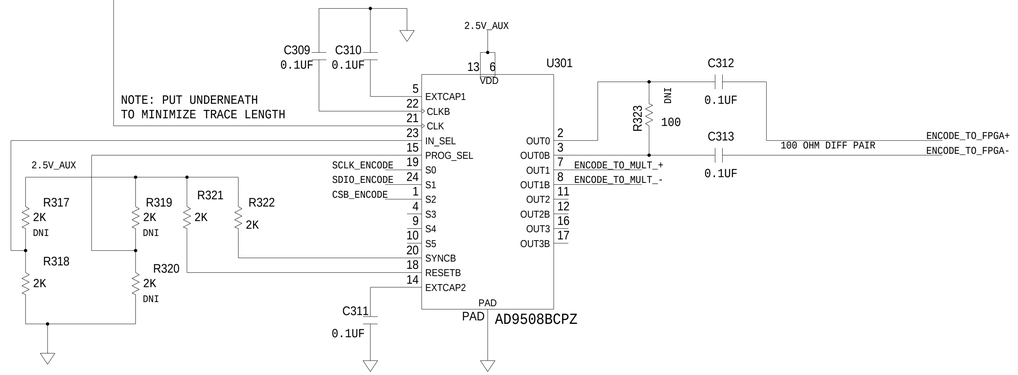
	PTD ENGINEER S. GIBBS	SIZE D	SCALE 1:1
		SHEET 3 OF 7	

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

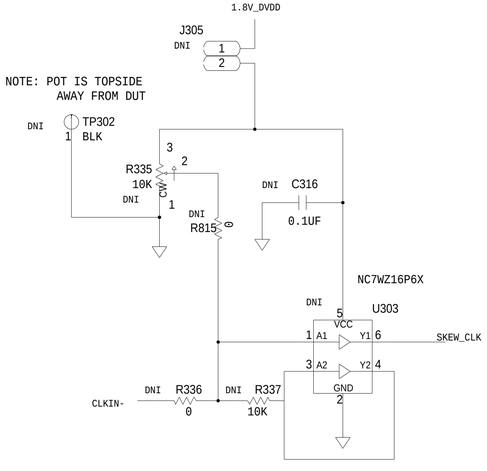
AD9656 ENCODE CLK CIRCUITRY

CLOCK INPUT

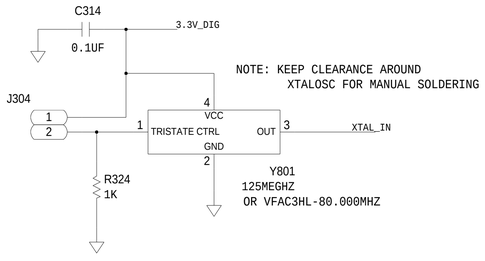




ENCODE CLK TO FPGA (DIVIDED)

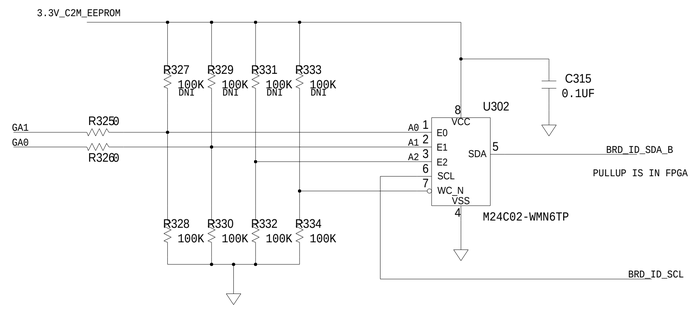


DUTY CYCLE SKEW CKT



OPTIONAL XTAL OSC CLOCK SOURCE

EEPROM - BOARD ID



EEPROM - BOARD ID

ANALOG DEVICES

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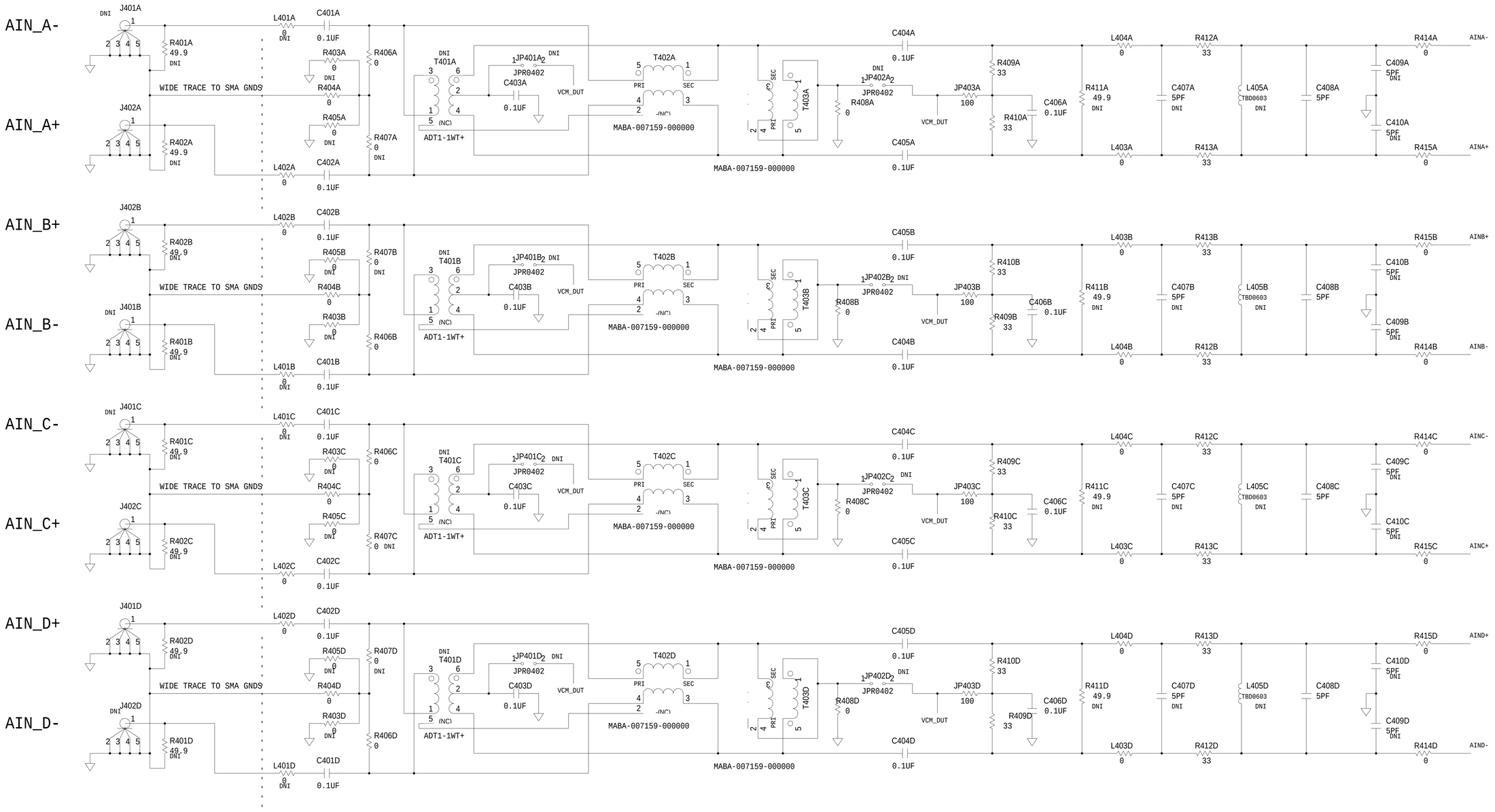
SCHEMATIC

CUSTOMER EVALUATION PCB
AD9656
:

DESIGN VIEW	DRAWING NO.	REV
-	02_035104	C
PTD ENGINEER	SIZE / SCALE	SHEET 4 OF 7
S. GIBBS	D / 1:1	

AD9656 ANALOG INPUT CIRCUITS

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



ANALOG DEVICES	SCHEMATIC		
	CUSTOMER EVALUATION PCB AD9656 :		
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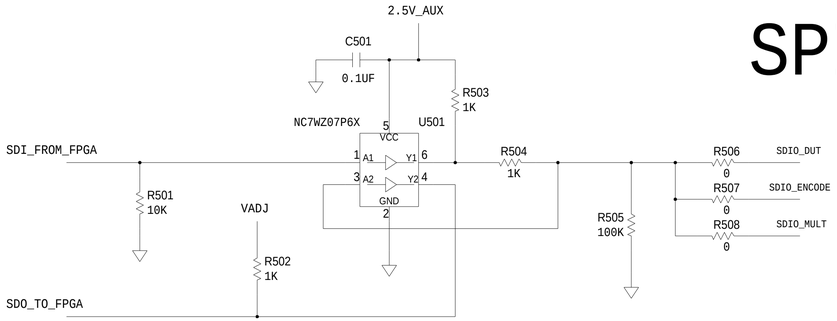
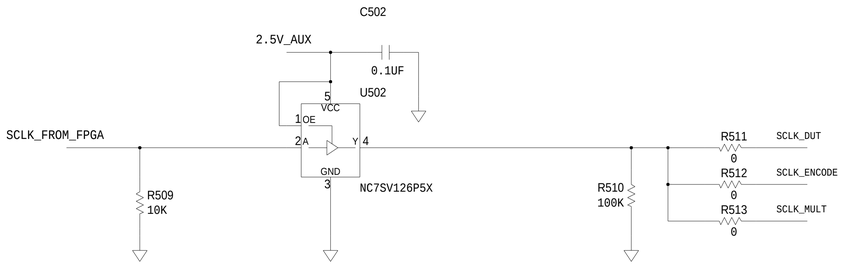
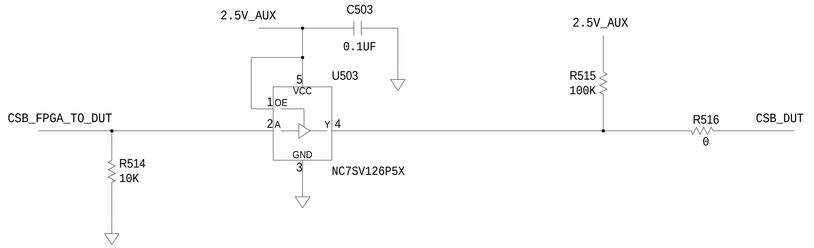
	PTD ENGINEER S. GIBBS	SIZE D / SCALE 1:1	SHEET 5 OF 7

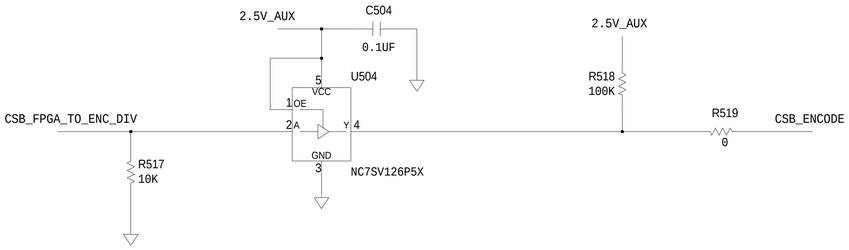
SPI AND MULTIPLIER

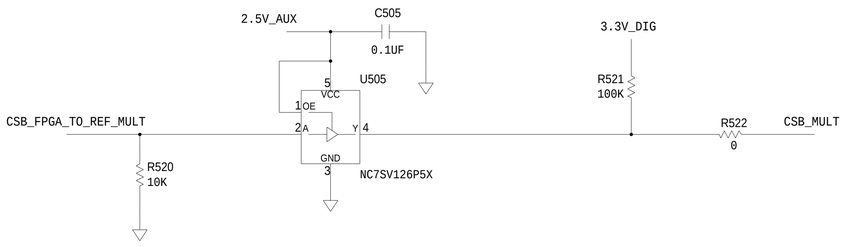
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

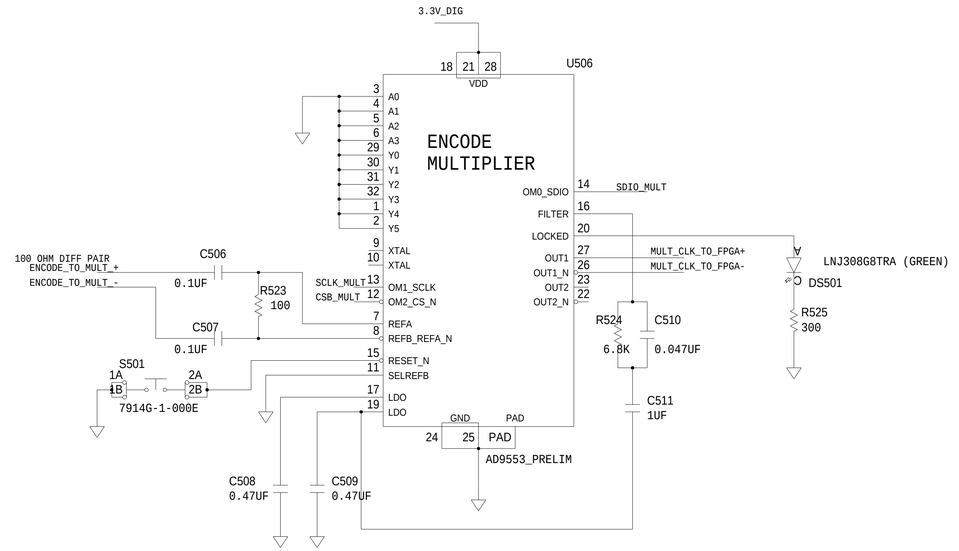








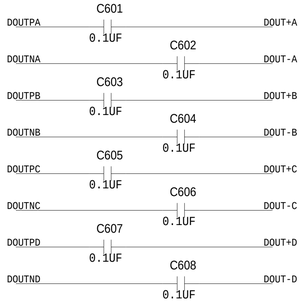


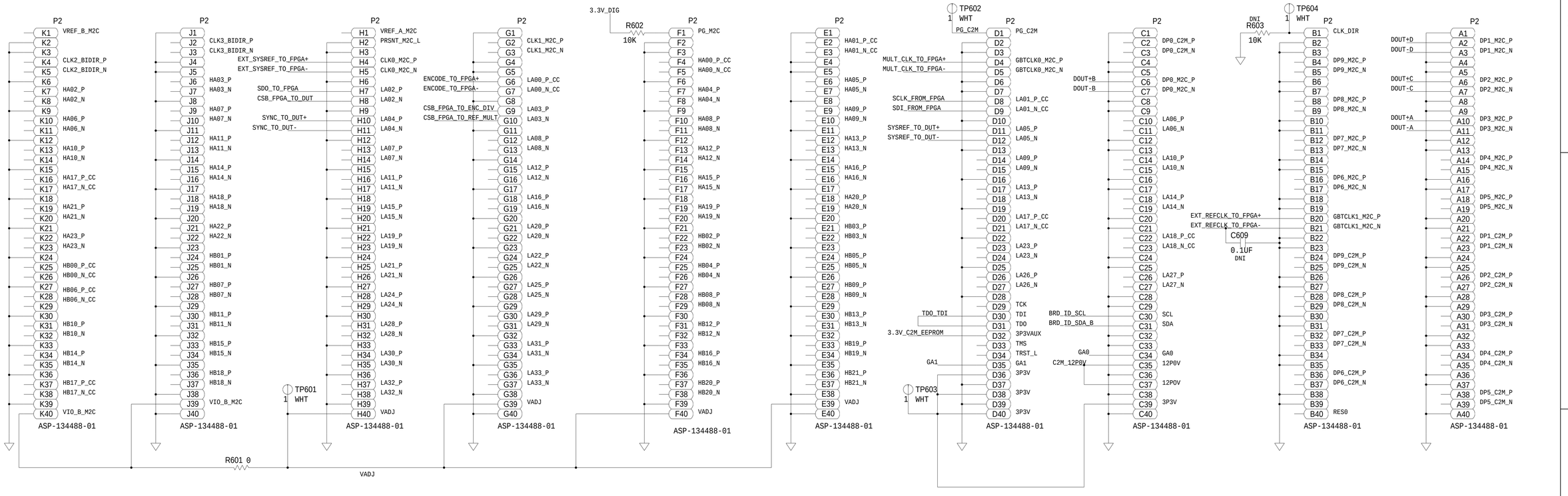


ANALOG DEVICES	SCHEMATIC			
	CUSTOMER EVALUATION PCB AD9656 :			
	DESIGN VIEW -	DRAWING NO. 02_035104		REV C
	PTD ENGINEER S. GIBBS	SIZE D	SCALE 1:1	SHEET 6 OF 7

AD9656 HADV6 FMC CONNECTIONS

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED





ANALOG DEVICES

SCHEMATIC

CUSTOMER EVALUATION PCB
AD9656
:

DESIGN VIEW: -	DRAWING NO.: 02_035104		REV: C
PTD ENGINEER: S. GIBBS	SIZE: D	SCALE: 1:1	SHEET 7 OF 7