Required power:
P1V8: 553mA + 40 = 600mA (1.1W)
P3V3: 50mW + 1100mW * 1.1 = 1.3W (400mA)
P5V: 1300mW*1.1 + 20mA*3.3 = 1500mW (300mA)

Main DC/DC, 12V -> 5V

U9 XCL226AOK1H2
DC/DC
Built-in inductor

R23 680k
C102 18pF
C103 10uF
C104 10uF
R24 120k

L1 4.7uH
C84 10uF
C85 120pF
C95 10uF
C97 0.10uF
FB17 600 Ohm @ 100MHz
FB18 600 Ohm @ 100MHz

3.3V DC/DC

U16 EMZ10501SILR
DC/DC
FB19 600 Ohm @ 100MHz
C105 10uF
C106 10uF
R25 11Bk
C107 470pF
R26 150k
C108 10uF

1.8V DC/DC

U17 EMZ10501SILR
DC/DC
FB20 600 Ohm @ 100MHz
C109 10uF
C110 10uF
R27 187k
C111 470pF
R28 82.5k
C112 10uF

Programming interface

C86 1.0uF C88 1.0uF C90 1.0uF C92 1.0uF
C87 1.0uF C89 1.0uF C91 1.0uF C93 1.0uF

Q3A PUMD13
Q3B PUMD13
Q2A PUMH13
R20 10k
R17 100k
R18 10k
R22 100k

J1 Header_2.54mm_10p
IUSB_MOSI_3V3
IUSB_SCLK_3V3
IUSB_SS_3V3
IUSB_RESET_N_3V3
IUSB_MISO_3V3

U12 74LVCH1T45GW
U13 74LVCH1T45GW
U14 74LVCH1T45GW
U15 74LVCH1T45GW
VccA VccB A B GND DIR

RESET_N
IUSB_MISO
IUSB_SS_N
IUSB_SCLK
IUSB_MOSI

Optical SPD/IF Interface

U5 TORX1355(V,F) RX
VCC GND OUTPUT
C94 1.0uF
U10 74LVCH1T45GW
C98 1.0uF
C100 1.0uF
SPDIF_IN_1V8
SPDIFIN

U6 TOTX1350(V,F) TX
A K
R19 120
R21 390
C96 47pF
U11 74LVCH1T45GW
C99 1.0uF
C101 1.0uF
SPDIF_OUT_1V8
SPDIFOUT

Sheet: DSP
File: dsp.sch

AUXADC0
AUXADC1
AUXADC2
AUXADC3
AUXADC4
AUXADC5
AUXADC6
AUXADC7
RESET_N
MISO_SDA
SS_ADDR0
SCLK_SCL
MOSI_ADDR1
SELFBOOT
BCLK_IN0
SDATA_IN0
LRCLK_IN0
SDATAIO0
SDATAIO1
SDATAIO2
SDATAIO3
SDATAIO4
SDATAIO5
SDATAIO6
SDATAIO7
MP6
MP15
BCLK_OUT2D
SDATA_OUT2D
LRCLK_OUT2D
BCLK_OUT3D
LRCLK_OUT3D
SDATA_OUT3D
BCLK_IN3
LRCLK_IN3
SDATA_IN3
BCLK_IN2
LRCLK_IN2
SDATA_IN2
BCLK_IN1
LRCLK_IN1
SDATA_IN1
THD_MD
THD_PD

DSP Consumes 553 mA on 1.8V (1W)
15 mA on 3.3V (50mW)

M1 MHNP_2.5mm
M2 MHNP_2.5mm
M3 MHNP_2.5mm
M4 MHNP_2.5mm
M5 MHNP_2.5mm

Amplifiers
Amplifiers consume 3 * 12.6 mA on 1.8V ~40mA (72mW)

R11 10k R12 1.5k R13 1.5k

Sheet: Amplifier 1
SDA SCL SD_N IRQ_N SBCLK SDIN FSYNC SDOUT PDMD PDMCK
AMP_OUT_P_FLTD
AMP_OUT_N_FLTD
I2C: 0x82 MODE
File: amplifier.sch

Sheet: Amplifier 2
SDA SCL SD_N IRQ_N SBCLK SDIN FSYNC SDOUT PDMD PDMCK
AMP_OUT_P_FLTD
AMP_OUT_N_FLTD
I2C: 0x84 MODE
File: amplifier.sch

Sheet: Amplifier 3
SDA SCL SD_N IRQ_N SBCLK SDIN FSYNC SDOUT PDMD PDMCK
AMP_OUT_P_FLTD
AMP_OUT_N_FLTD
I2C: 0x86 MODE
File: amplifier.sch

SDA2 SCL2 MP7 MP14
BCLK_OUT0D SDATA_OUT0D LRCLK_OUT0D
BCLK_OUT1D SDATA_OUT1D LRCLK_OUT1D

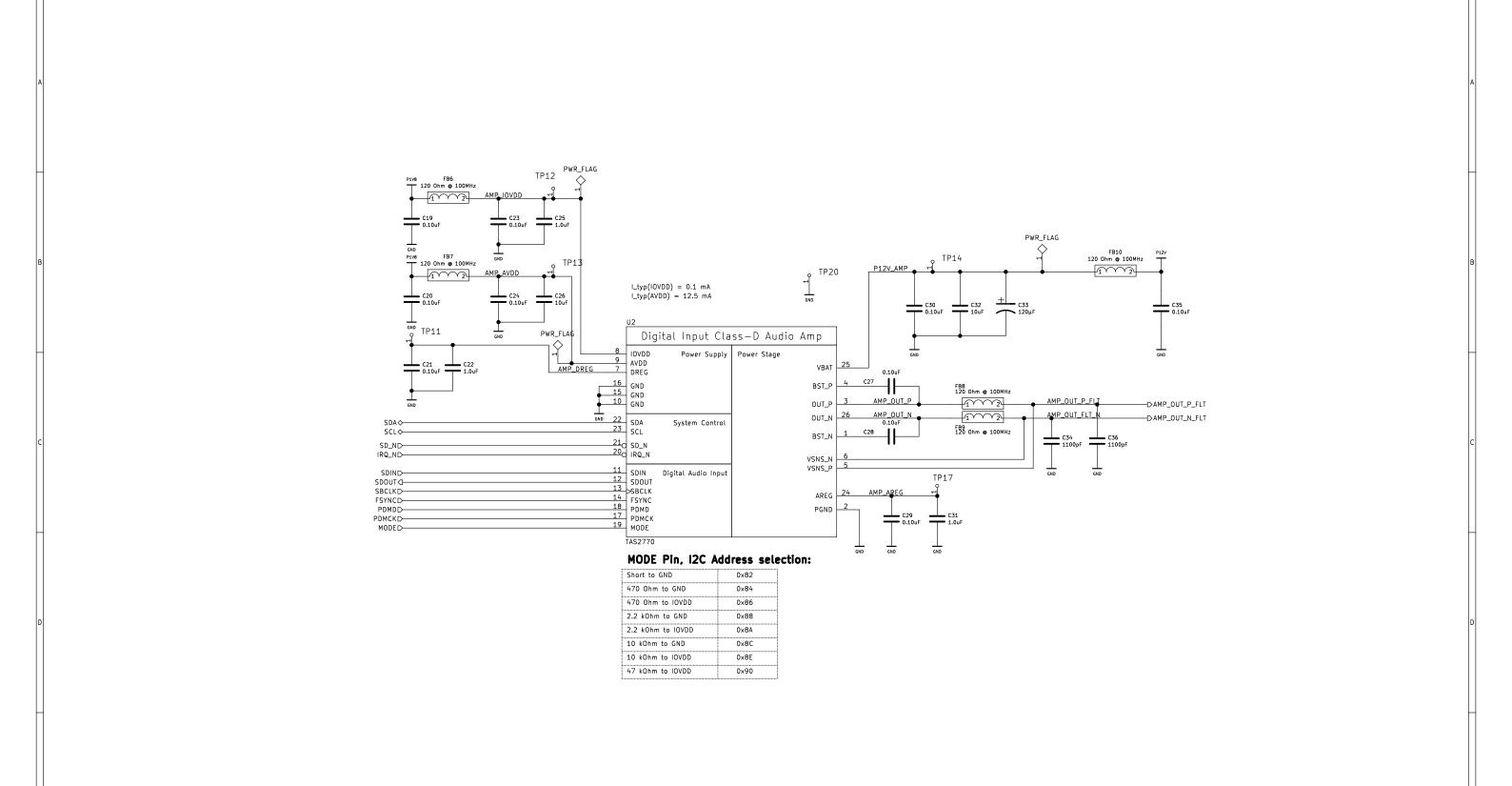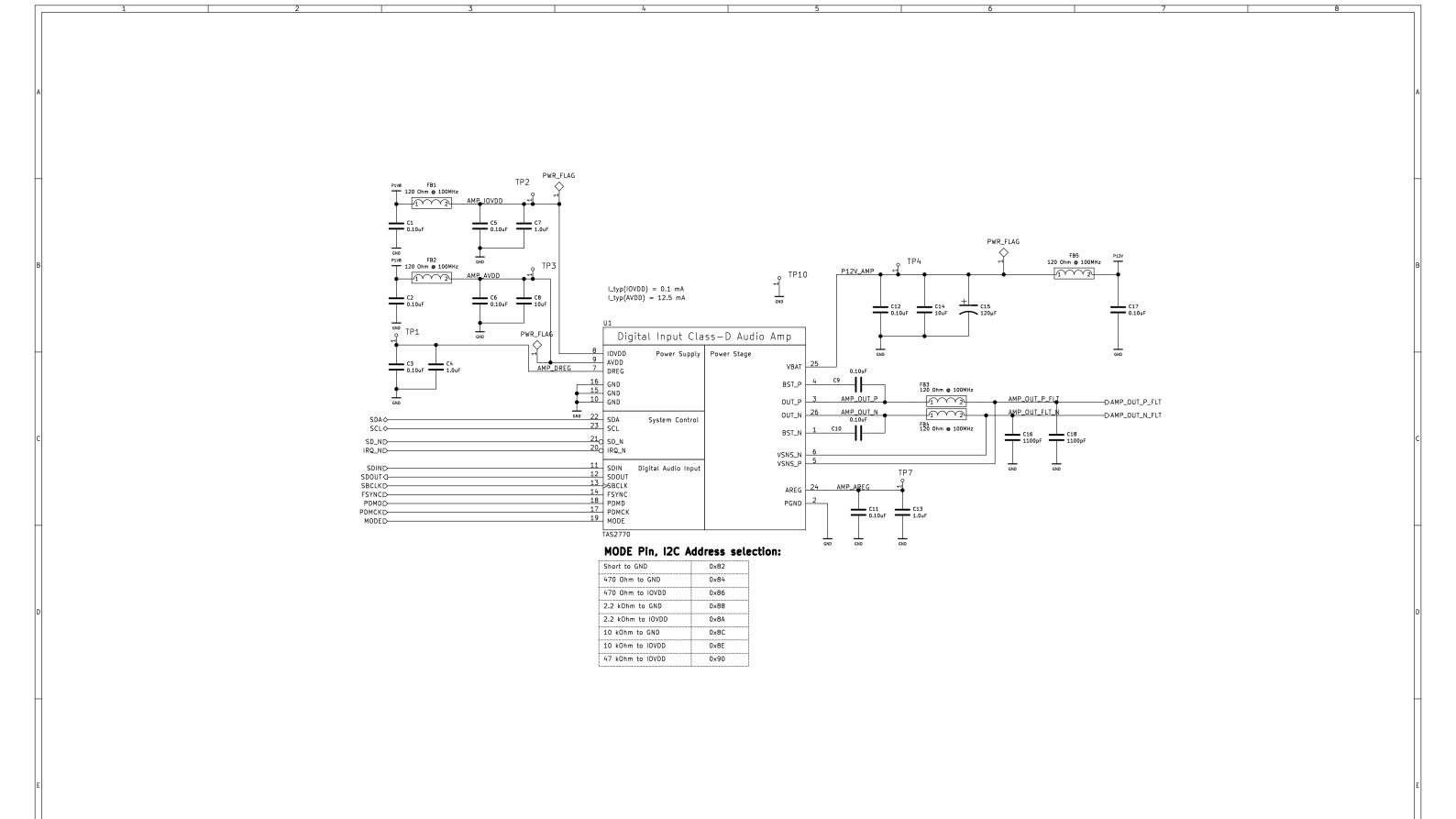F1 1206SFS200F_63-2
J2 0430450818
R14 470
R15 470
R1 10k
Q2B PUMH13

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Sheet: /
File: daydream.sch
Title: Vektor, Digital Speaker
Size: A3
Date: 2019-07-11
Rev: R1
KiCad E.D.A. kicad (5.1.0-0)
Id: 1/5

U4
ADAU1467
SigmaDSP Digital Audio Processor

U8
LP3470IM5X-3.08_NOPB

U7
25AA1024

System Control
- 28 RESET_N
- 42 SELFBOOT

SPI/I2C Slave
- 40 MOSI/ADDR1
- 38 MISO/SDA
- 39 SCLK/SCL
- 41 SS/ADDR0

I2C Master 2
- 31 SDA2_M
- 30 SCL2_M

SPI/I2C Master 1
- 35 SDA_M/MISO_M
- 34 SCL_M/SCLK_M
- 33 MOSI_M
- 32 SS_M

SPDIF In
- 4 SPDIFIN

I2S Inputs
- 75 SDATA_IN0
- 74 LRCLK_IN0
- 73 BCLK_IN0
- 78 SDATA_IN1
- 77 LRCLK_IN1
- 76 BCLK_IN1
- 83 SDATA_IN2
- 82 LRCLK_IN2
- 81 BCLK_IN2
- 86 SDATA_IN3
- 85 LRCLK_IN3
- 84 BCLK_IN3

Thermal Sensor
- 80 THD_P
- 79 THD_M

Serial TDM Outputs
- 72 SDATAIO0
- 71 SDATAIO1
- 70 SDATAIO2
- 69 SDATAIO3
- 64 SDATAIO4
- 63 SDATAIO5
- 62 SDATAIO6
- 61 SDATAIO7

SPDIF Out
- 5 SPDIFOUT

I2S Outputs
- 49 SDATA_OUT0
- 47 LRCLK_OUT0
- 48 BCLK_OUT0
- 52 SDATA_OUT1
- 50 LRCLK_OUT1
- 51 BCLK_OUT1
- 57 SDATA_OUT2
- 55 LRCLK_OUT2
- 56 BCLK_OUT2
- 60 SDATA_OUT3
- 58 LRCLK_OUT3
- 59 BCLK_OUT3

GPIO
- 53 MP6
- 54 MP7
- 6 MP14
- 7 MP15

Aux ADC Inputs
- 10 AUXADC0
- 11 AUXADC1
- 12 AUXADC2
- 13 AUXADC3
- 14 AUXADC4
- 15 AUXADC5
- 16 AUXADC6
- 17 AUXADC7

Internal Regulator
- 46 IOVDD
- 22 IOVDD
- 2 IOVDD
- 37 IOVDD
- 68 IOVDD
- 3 VDRIVE

DSP Core supply
- 87 DVDD
- 65 DVDD
- 43 DVDD
- 24 DVDD
- 19 PVDD

Oscillator & PLL
- 20 PLLFILT
- 26 XTALOUT
- 25 XTALIN
- 27 CLKOUT
- 18 PGND

- 9 AVDD
- 8 AGND

Ground
- 21 DGND
- 88 DGND
- 45 DGND
- 23 DGND
- 1 DGND
- 36 DGND
- 44 DGND
- 67 DGND
- 66 DGND
- 29 DGND
- 89 GND_EP

P1V8_IOVDD   I_max(IOVDD) = 53 mA

I_max(DVDD) = 500 mA   P1V2_DVDD

I_max(PVDD) = 13 mA

I_max(AVDD) = 2 mA

FB16
120 Ohm @ 100MHz

Q1 PHPT61002PYCLHX

R6 1k

X1 12.288MHz

R7 4.3k   R8 100

Capacitors / Resistors:
- C82 0.10uF
- C83 0.10uF
- R16 10k
- R9 10k
- R10 10k
- C80 0.10uF
- C56 10uF
- C58 0.10uF
- C60 0.10uF
- C62 0.10uF
- C64 0.10uF
- C67 0.10uF
- C70 0.10uF
- C57 0.10uF
- C59 10000pF
- C61 1.0uF
- C63 0.10uF
- C65 1.0uF
- C68 0.10uF
- C71 1.0uF
- C74 0.10uF
- C76 1.0uF
- C78 0.10uF
- C55 10uF
- R4 1
- R5 1
- C66 10uF
- C69 0.10uF
- C72 5600pF
- C75 150pF
- C73 22pF
- C77 22pF
- C79 10uF
- C81 1.0uF

Test points: TP83, TP36, TP38, TP35, TP37, TP32, TP33, TP31, TP34

Net labels: RESET_ND, DSP_RESET_N, EE_MISO, EE_SCLK, EE_MOSI, EE_SS, PWR_FLAG, PLLF_2, PLLF, P3V3, P1V8, GND

U7 pins: 1 CS_N, 2 SO, 3 WP_N, 4 VSS, 8 VCC, 7 HOLD_N, 6 SCK, 5 SI

U8 pins: 3 Vcc1, 4 Vcc, 5 RESET_N, 1 SRT, 2 GND

P1V8 FB11
120 Ohm @ 100MHz
AMP_IOVDD
TP22
PWR_FLAG

C37 0.10uF
GND
C41 0.10uF
GND
C43 1.0uF

P1V8 FB12
120 Ohm @ 100MHz
AMP_AVDD
TP23
PWR_FLAG

C38 0.10uF
GND
C42 0.10uF
GND
C44 10uF

TP21
C39 0.10uF
C40 1.0uF
GND
PWR_FLAG
AMP_DREG

I_typ(IOVDD) = 0.1 mA
I_typ(AVDD) = 12.5 mA

TP30
GND

P12V_AMP
TP24
PWR_FLAG
FB15
120 Ohm @ 100MHz
P12V

C48 0.10uF
C50 10uF
C51 120µF
GND
C53 0.10uF
GND

U3

Digital Input Class-D Audio Amp

	Power Supply	Power Stage	
8 IOVDD			VBAT 25
9 AVDD			
7 DREG			BST_P 4
16 GND			OUT_P 3
15 GND			OUT_N 26
10 GND			BST_N 1
22 SDA	System Control		
23 SCL			VSNS_N 6
21 SD_N			VSNS_P 5
20 IRQ_N			
11 SDIN	Digital Audio Input		AREG 24
12 SDOUT			PGND 2
13 SBCLK			
14 FSYNC			
18 PDMD			
17 PDMCK			
19 MODE			

TAS2770

SDA
SCL
SD_ND
IRQ_ND
SDIND
SDOUT
SBCLKD
FSYNCD
PDMDD
PDMCKD
MODED

GND

C45 0.10uF
AMP_OUT_P
FB13 120 Ohm @ 100MHz
AMP_OUT_P_FLT
AMP_OUT_P_FLT

AMP_OUT_N
FB14 120 Ohm @ 100MHz
AMP_OUT_FLT_N
AMP_OUT_FLT_N

C46 0.10uF

C52 1100pF
C54 1100pF
GND
GND

TP27
AMP_AREG
C47 0.10uF
C49 1.0uF
GND
GND
GND

MODE Pin, I2C Address selection:

Short to GND	0x82
470 Ohm to GND	0x84
470 Ohm to IOVDD	0x86
2.2 kOhm to GND	0x88
2.2 kOhm to IOVDD	0x8A
10 kOhm to GND	0x8C
10 kOhm to IOVDD	0x8E
47 kOhm to IOVDD	0x90

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Sheet: /Amplifier 3/
File: amplifier.sch
Title: Vektor, Digital Speaker
Size: A3 Date: 2019-07-11 **Rev: R1**
KiCad E.D.A. kicad (5.1.0-0) Id: 3/5

P1VB FB6
120 Ohm @ 100MHz
AMP_IOVDD
TP12
PWR_FLAG

C19 0.10uF
C23 0.10uF
C25 1.0uF
GND
GND

P1VB FB7
120 Ohm @ 100MHz
AMP_AVDD
TP13

C20 0.10uF
C24 0.10uF
C26 10uF
GND

TP11
PWR_FLAG
AMP_DREG

C21 0.10uF
C22 1.0uF
GND

I_typ(IOVDD) = 0.1 mA
I_typ(AVDD) = 12.5 mA

TP20
GND

P12V_AMP
TP14
PWR_FLAG
FB10
120 Ohm @ 100MHz
P12V

C30 0.10uF
C32 10uF
C33 120μF
GND

C35 0.10uF
GND

SDA
SCL
SD_ND
IRQ_ND

SDIND
SDOUTD
SBCLKD
FSYNCD
PDMDD
PDMCKD
MODED

U2
Digital Input Class−D Audio Amp

| Power Supply | Power Stage |

8 IOVDD
9 AVDD
7 DREG

16 GND
15 GND
10 GND
GND

22 SDA   System Control
23 SCL
21 SD_N
20 IRQ_N

11 SDIN   Digital Audio Input
12 SDOUT
13 SBCLK
14 FSYNC
18 PDMD
17 PDMCK
19 MODE

TAS2770

VBAT 25

BST_P 4
OUT_P 3
OUT_N 26
BST_N 1

VSNS_N 6
VSNS_P 5

AREG 24
PGND 2

C27 0.10uF
C28 0.10uF
AMP_OUT_P
AMP_OUT_N

FB8 120 Ohm @ 100MHz
FB9 120 Ohm @ 100MHz

AMP_OUT_P_FLT
AMP_OUT_FLT_N

AMP_OUT_P_FLT
AMP_OUT_N_FLT

C34 1100pF
C36 1100pF
GND GND

TP17
AMP_AREG
C29 0.10uF
C31 1.0uF
GND GND GND

MODE Pin, I2C Address selection:

Short to GND	0x82
470 Ohm to GND	0x84
470 Ohm to IOVDD	0x86
2.2 kOhm to GND	0x88
2.2 kOhm to IOVDD	0x8A
10 kOhm to GND	0x8C
10 kOhm to IOVDD	0x8E
47 kOhm to IOVDD	0x90

P1V8 FB1
120 Ohm @ 100MHz
AMP_IOVDD

TP2 PWR_FLAG

C1
0.10uF
GND

C5
0.10uF
GND

C7
1.0uF

P1V8 FB2
120 Ohm @ 100MHz
AMP_AVDD

TP3

C2
0.10uF
GND

C6
0.10uF
GND

C8
10uF

TP1

C3
0.10uF
GND

C4
1.0uF

PWR_FLAG
AMP_DREG

I_typ(IOVDD) = 0.1 mA
I_typ(AVDD) = 12.5 mA

TP10
GND

TP4
P12V_AMP

PWR_FLAG FB5
120 Ohm @ 100MHz
P12V

C12
0.10uF
GND

C14
10uF

C15
120µF

C17
0.10uF
GND

U1
Digital Input Class−D Audio Amp

Power Supply   Power Stage

8   IOVDD
9   AVDD
7   DREG

16 GND
15 GND
10 GND
GND

22 SDA   System Control
23 SCL
21 SD_N
20 IRQ_N

11 SDIN   Digital Audio Input
12 SDOUT
13 SBCLK
14 FSYNC
18 PDMD
17 PDMCK
19 MODE

TAS2770

VBAT 25

BST_P 4
C9 0.10uF

OUT_P 3
AMP_OUT_P   FB3
120 Ohm @ 100MHz
AMP_OUT_P_FLT   ▷ AMP_OUT_P_FLT

OUT_N 26
AMP_OUT_N
FB4
120 Ohm @ 100MHz
AMP_OUT_FLT_N   ▷ AMP_OUT_N_FLT

BST_N 1
C10 0.10uF

VSNS_N 6
VSNS_P 5

C16
1100pF
GND

C18
1100pF
GND

AREG 24
AMP_AREG

TP7

PGND 2

C11
0.10uF
GND

C13
1.0uF
GND

GND

SDA ◇
SCL ◇
SD_ND ○
IRQ_ND ○
SDIND ○
SDOUTD ◁
SBCLKD ○
FSYNCD ○
PDMDD ○
PDMCKD ◁
MODED ○

MODE Pin, I2C Address selection:

Short to GND	0x82
470 Ohm to GND	0x84
470 Ohm to IOVDD	0x86
2.2 kOhm to GND	0x88
2.2 kOhm to IOVDD	0x8A
10 kOhm to GND	0x8C
10 kOhm to IOVDD	0x8E
47 kOhm to IOVDD	0x90

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Sheet: /Amplifier 1/
File: amplifier.sch
Title: Vektor, Digital Speaker
Size: A3   Date: 2019−07−11   **Rev: R1**
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