# ModuMixer X16
# TRISOFT H.D/S.D

# PRE—RELEASE
# OPEN SOURCE

## U3 — TLV320AIC3100

Pins / labels:
- CODEC_NRST — RESET 31
- CODEC_SCL 10 — SCL
- CODEC_SDA 9 — SDA
- I2S_SD 5 — DIN
- I2S_EXT_SD 4 — DOUT
- I2S_CK 7 — BCLK
- I2S_WS 6 — WCLK
- I2S_MCK 8 — MCLK
- GPIO1 32
- SPKP 22 — OUT1_P
- SPKM 19 — OUT1_M
- HPL 27 — HPL
- HPR 30 — HPR
- VOL/MICDET
- MIC1LM 11 — MIC1LM
- MICBIAS 15
- MIC1LP 13 — MIC1LP
- MIC1RP 14 — MIC1RP
- Top: AVDD 17 / DSP_3V3, DVDD 3 / 1V8_DVDD, HPVDD 29 / DSP_3V3, IOVDD 28 / DSP_3V3, SPKVDD 20 / 5V_MAIN, SPKVDD 21 / 5V_MAIN
- Bottom: AVSS 16, DVSS 18, IOVSS 1, SPKVSS 20, EP 33, GND

## U4 — STM32F405RGTx

- NRST 7
- BOOT0 60
- PH0 5, PH1 6
- PD2 54
- PC0 8, PC1 9, PC2 10, PC3 11, PC4 24, PC5 25, PC6 37, PC7 38, PC8 39, PC9 40, PC10 51, PC11 52, PC12 53, PC13 2, PC14 3, PC15 4
- I2S_MCK 37
- CODEC_NRST 39
- VCAP_1 31, VCAP_2 47
- PA0 14 — READY1
- PA1 15 — READY2
- PA2 16 — USART_TX
- PA3 17 — USART_RX
- PA4 20 — USART_CK
- PA5 21 — FADER_MOTOR_IN1
- PA6 22 — FADER_MOTOR_IN2
- PA7 23 — FADER_W
- PA8 41
- PA9 42
- PA10 43
- PA11 44
- PA12 45
- PA13 46 — DSP_SWIO
- PA14 49 — DSP_SWCLK
- PA15 50
- PB0 26, PB1 27, PB2 28, PB3 55, PB4 56, PB5 57, PB6 58, PB7 59, PB8 61, PB9 62
- PB10 29 — CODEC_SCL
- PB11 30 — CODEC_SDA
- PB12 33 — I2S_WS
- PB13 34 — I2S_CK
- PB14 35 — I2S_EXT_SD
- PB15 36 — I2S_SD
- Top power: VBAT 1 / 3V3_MAIN, VDD 19/32/48/64 / 3V3_MAIN, VDDA 13 / 3V3_MAIN
- VSS 18, VSSA 12, GND

## Op-amps (U2 LM324)

- U2B LM324: R1 1k, OUT_L_PRE 6, R3 1k, R10 1k, MAIN_OUT_L_M 7
- R11 1k — OUT_L_PRE — MAIN_OUT_L_P
- R12 1k — OUT_R_PRE — MAIN_OUT_R_P
- U2A LM324: R2 1k, OUT_R_PRE 2, R4 1k, R9 1k, MAIN_OUT_R_M
- U2E LM324: C6 100n, 5V_MAIN, V+ 4, GND 11
- U2D LM324: R13 1k, CUE_R_PRE 12, R17 1k, R18 1k, CUE_RM 14; R19 1k CUE_R_PRE CUE_RP; R20 1k
- U2C LM324: R14 1k, CUE_L_PRE 9, R15 1k, R16 1k, CUE_LM 8; CUE_L_PRE CUE_LP

## Analog switches (4016)

- U5A 4016: OUT_L_PRE 1 — 2 CUE_L_PRE, CUE_SEL 13
- U5B 4016: OUT_R_PRE 3 — 4 CUE_R_PRE, CUE_SEL 5
- U5E 4016: VDD 14 / 5V_MAIN, VSS 7, GND
- C30 100nF, 5V_MAIN, GND

## Transistor

- Q1 MMBT2222A, 5V_MAIN
- R5 1k — CUE_CTRL — 1
- CUE_SEL
- R6 1k — GND

## Test points

- TP1 SWCLK — DSP_SWCLK
- TP2 SWIO — DSP_SWIO

## Left column (audio)

- C4 1mF, MIC1LM — IN_M
- MIC1LP — IN_P, 1mF C5
- C1 47uF, HPL — OUT_L_PRE
- C2 47uF, HPR — OUT_R_PRE

## Regulators / power

- JP1 SolderJumper_2_Bridged: 3V3_MAIN — DSP_3V3
- U1 AMS1117-1.8: DSP_3V3 3 — VI, VO — 1V8_DVDD 2
- C3 4.7uF, C7 4.7uF, GND
- C8 2.2uF — VCAP_1 (VCAP Decoupling)
- C9 2.2uF — VCAP_2

## Decoupling sections

- SPKVDD Decoupling: C10 GND, C14 22mF, C11 0.1mF, C15 0.1mF (5V_MAIN), GND
- HPVDD Decoupling: C18 10mF, C19 0.1mF (DSP_3V3), GND
- AVDD Decoupling: C21 10mF, C22 0.1mF (DSP_3V3), GND
- DVDD Decoupling: C25 10mF, C26 0.1mF (1V8_DVDD), GND
- IOVDD Decoupling: C28 10mF, C29 0.1mF (DSP_3V3), GND
- Audio MCU Decoupling: 3V3_MAIN, C12 10uF, GND
- VDD1-4 Decoupling: 3V3_MAIN, C13 100nF, C16 100nF, C17 100nF, GND
- VBAT Decoupling (is this necessary?): C20 100nF, 3V3_MAIN, C23 100nF, GND
- VDDA Decoupling: C24 1uF, C27 100nF, GND

D1
U6
LM317_TO-220
+12V_MAIN
C31
100n
C33
1u
GND GND
3 VI
VO 2
ADJ
1
D3
R7
720
C35
10u
GND GND
R21
240
C37
1u
GND
TP5
5V_MAIN
5V_MAIN
5V_MAIN_FB
GND
5V_MAIN_FB
TP3

D2
U7
LM317_TO-220
+12V_MAIN
C32
100n
C34
1u
GND GND
3 VI
VO 2
ADJ
1
D4
R8
390
C36
10u
GND GND
R22
240
C38
1u
GND
TP6
3V3_MAIN
3V3_MAIN
3V3_MAIN_FB
3V3_MAIN_FB
TP4

R24
10k
12V_MOD
R23
1k
READY_IN
IN_FET_GATE
Q2
IRF9540N
12V_MAIN
12V_MAIN
1
2
3
Q3
MMBT2222A
1
2
3
GND

12V_MAIN
C39
1000uF
GND
12V_MOD
C40
1000uF
GND

J1
Conn_01x03_Pin
1 IN_P
2 IN_M
3 GND

J2
Conn_02x07_Counter_Clockwise
12V_MOD  1    14  MAIN_LM
GND      2    13  MAIN_LP
READY_IN 3    12  MAIN_RM
M_USART_TX 4  11  MAIN_RP
M_USART_RX 5  10  CUE_LM
M_USART_CLK 6  9  CUE_LP
CUE_RP   7    8   CUE_RM

J3
Conn_02x07_Counter_Clockwise
12V_MOD  1    14  MAIN_LM
GND      2    13  MAIN_LP
READY_OUT 3   12  MAIN_RM
M_USART_TX 4  11  MAIN_RP
M_USART_RX 5  10  CUE_LM
M_USART_CLK 6  9  CUE_LP
CUE_RP   7    8   CUE_RM

J4
Conn_02x05_Counter_Clockwise
12V_MOD  1    10  OUT_L_PRE
GND      2    9   MAIN_OUT_L_M
READY_OUT 3   8   OUT_R_PRE
M_USART_TX 4  7   MAIN_OUT_R_M
M_USART_RX 5  6   M_USART_CLK

NSLEEP 1 SLEEP
VCP 11 VCP
GND 3 AISEN
GND 6 BISEN

VINT VM 14 12 VINT 5V_MAIN

AOUT1 2 FADER_MOTOR_OUT1
AOUT2 4 FADER_MOTOR_OUT2
BOUT1 7 FADER_MOTOR_OUT1
BOUT2 5 FADER_MOTOR_OUT2

FADER_MOTOR_IN1 16 AIN1
FADER_MOTOR_IN2 15 AIN2
FADER_MOTOR_IN1 9 BIN1
FADER_MOTOR_IN2 10 BIN2

FAULT 8

GND 13
U8
DRV8833PWP
GND

5V_MAIN R25 47k NSLEEP
C41 2.2u
VINT C42 2.2u GND
5V_MAIN VCP
C43 10u
5V_MAIN GND

FADER_MOTOR_OUT1 1 J5
FADER_MOTOR_OUT2 2 Screw_Terminal_01x02

FADER_A 1 J6
FADER_W 2 Screw_Terminal_01x03
FADER_B 3

JP2
SolderJumper_2_Bridged
3V3_MAIN FADER_A
JP3
SolderJumper_2_Bridged
GND FADER_B