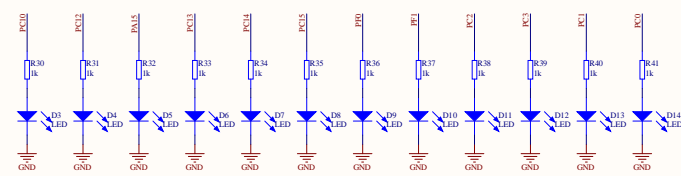
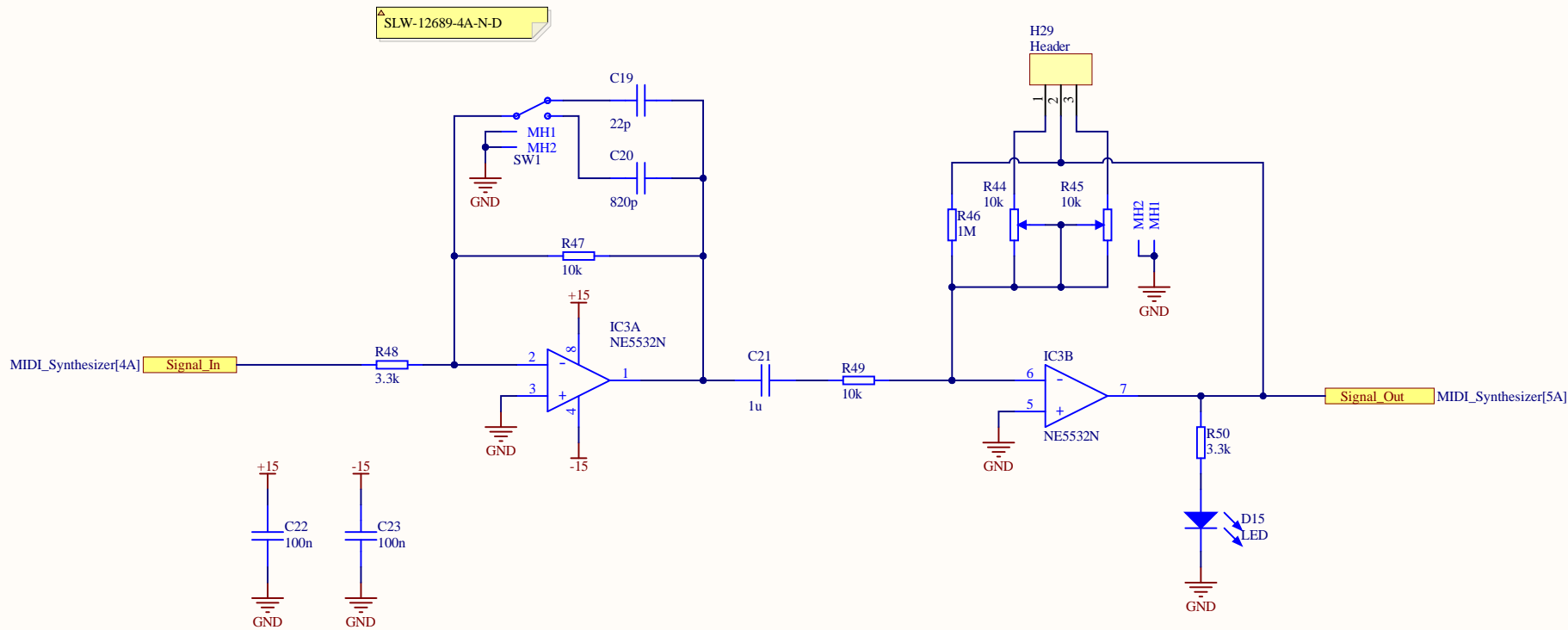


NUCLEO-H533RE Development Board



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Date:	4/03/2025	Sheet of
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Drawn By:		

MIDI SYNTHESIZER

MIDI IN MIDI OUT

UART FTDI

STM32H533-NUCLEO

MIDI DIGITAL SYNTHESIZER

FEATURES

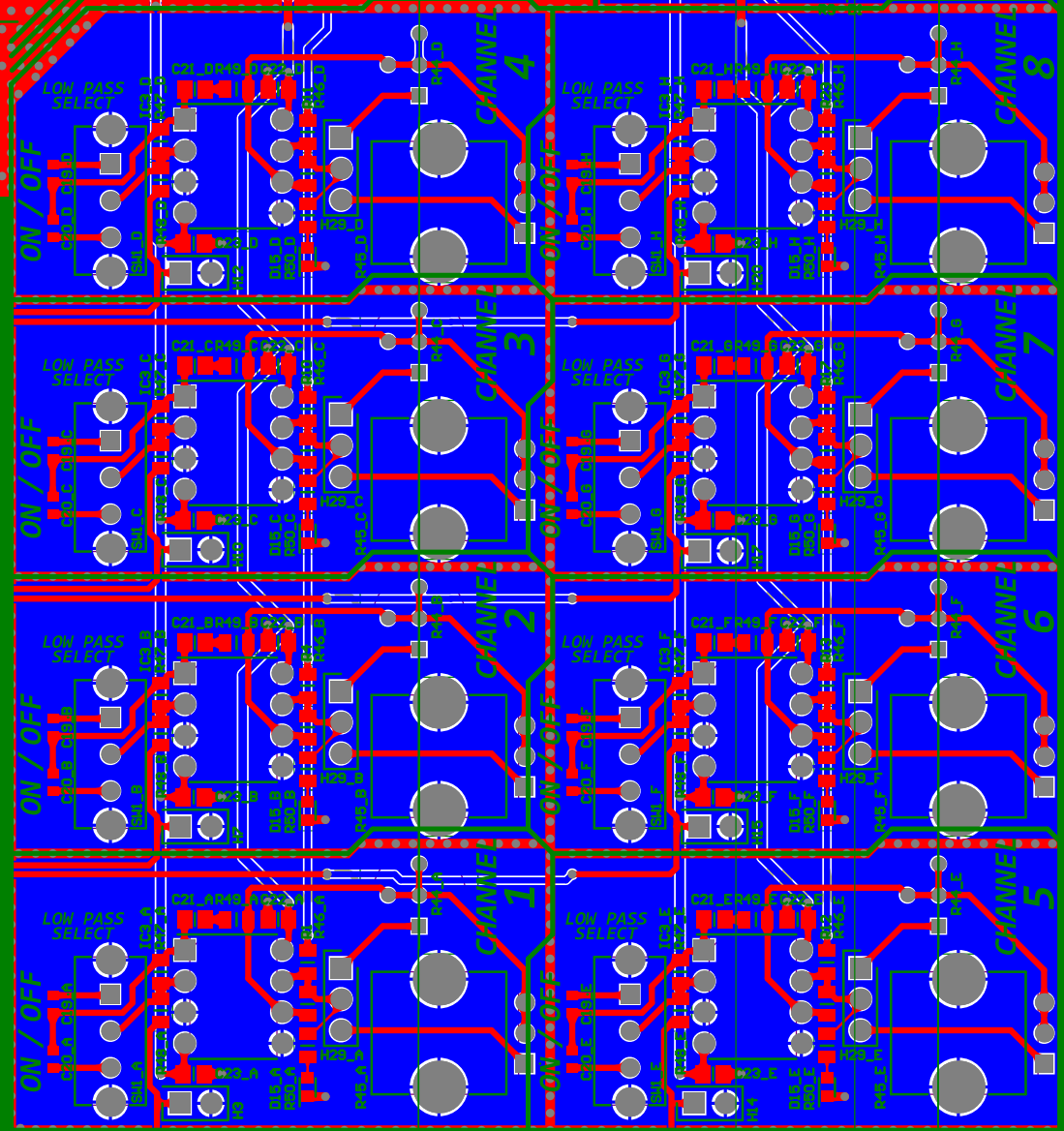
- MICROCONTROLLER
STM32H533RE (NUCLEO)
- MIDI
- MIDI IN
- MIDI OUT
- 8 CHANNEL WAVEFORM GENERATION
- 7 PWM
- 1 DAC
- ADJUSTABLE CHANNELS
- PER CHANNEL GAIN
- PER CHANNEL LOW PASS FILTER
- MASTER VOLUME CONTROL
- MASTER GAIN STAGE
- SPEAKER DRIVER
- LM1875 AMPLIFIER
- UP TO 20 WATTS

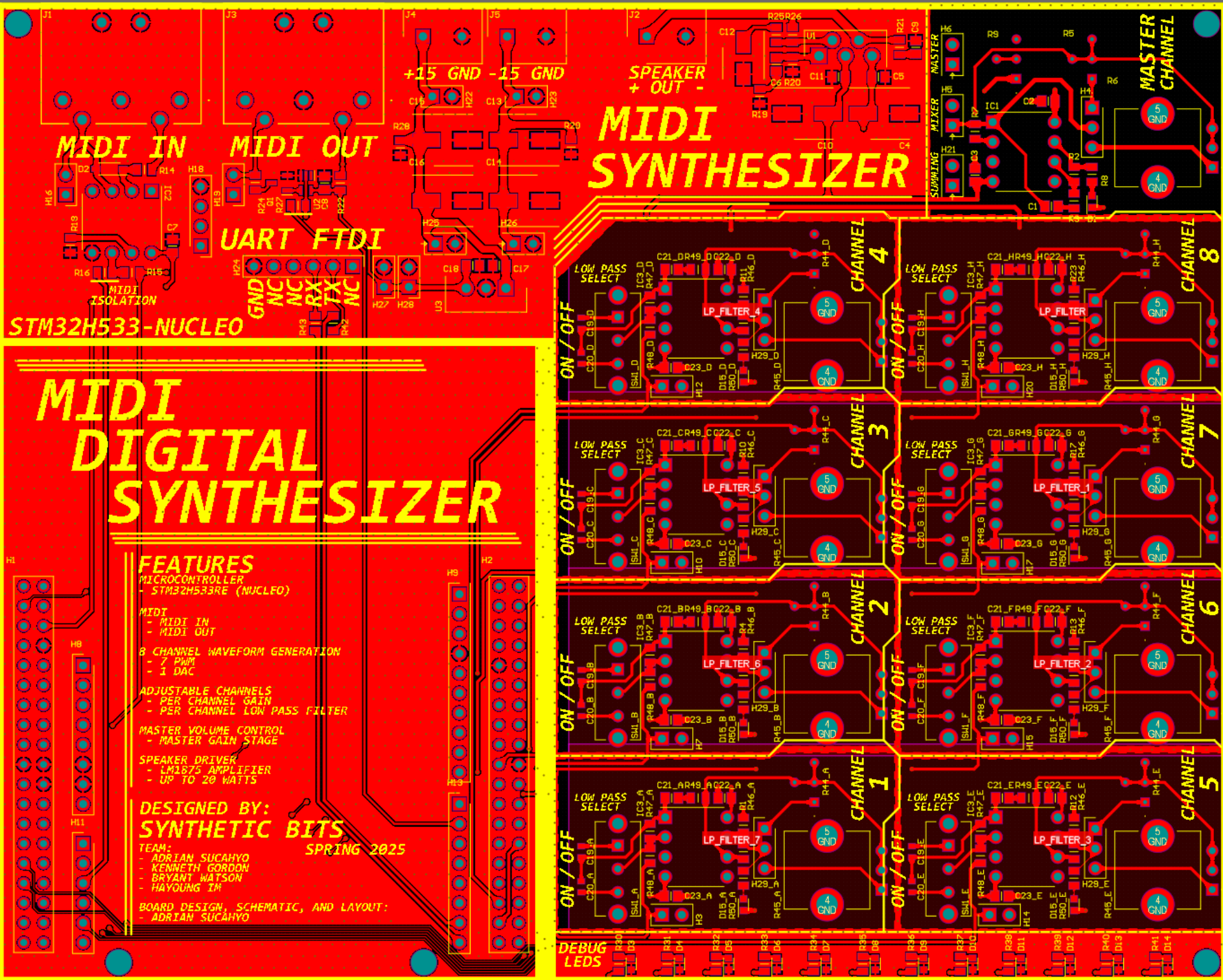
DESIGNED BY:
SYNTHETIC BITS

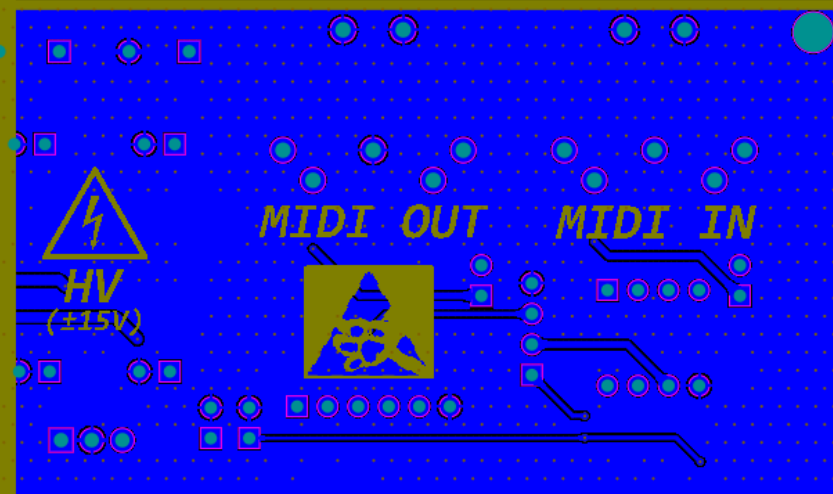
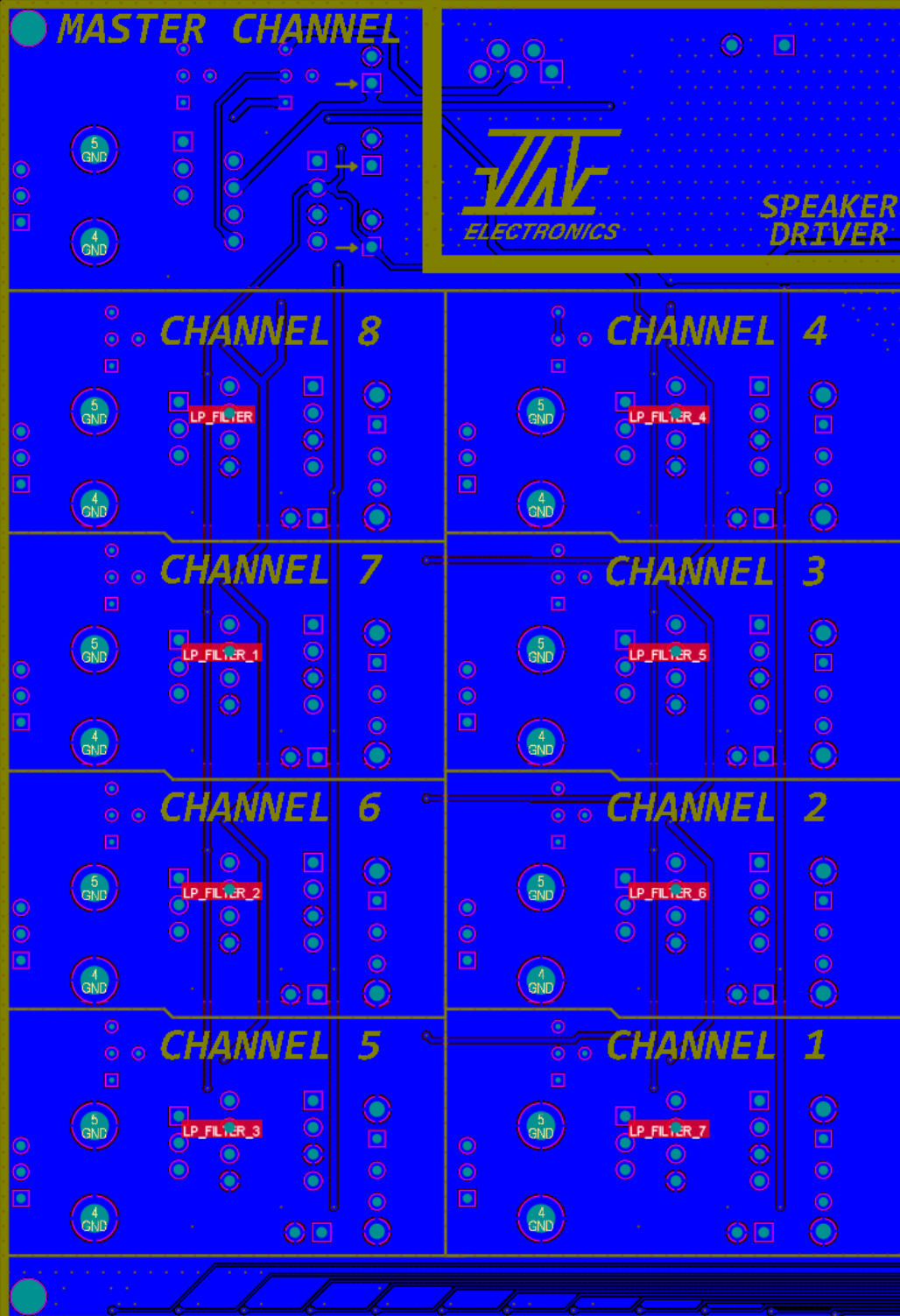
TEAM:
ADRIAN SUCARYO
KENNETH GORDON
BRYANT WATSON
HAYOUNG IM

BOARD DESIGN, SCHEMATIC, AND LAYOUT:
ADRIAN SUCARYO

SPRING 2025







MIDI DIGITAL SYNTHESIZER

FEATURES

MICROCONTROLLER
- STM32H533RE (NUCLEO)

MIDI
- MIDI IN
- MIDI OUT

8 CHANNEL WAVEFORM GENERATION
- 7 PWM
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ADJUSTABLE CHANNELS
- PER CHANNEL GAIN
- PER CHANNEL LOW PASS FILTER

MASTER VOLUME CONTROL
- MASTER GAIN STAGE

SPEAKER DRIVER
- LM3875 AMPLIFIER
- UP TO 20 WATTS

DESIGNED BY:
SYNTHETIC BITS

TEAM:
- ADRIAN SUCAHYO
- KENNETH GORDON
- BRYANT WATSON
- HAYOUNG IM

BOARD DESIGN, SCHEMATIC, AND LAYOUT:
- ADRIAN SUCAHYO

EMBEDDED SYSTEMS-SP25

Line #	Name	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Manufacturer Lifecycle 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Supplier Subtotal 1
	1u	Non Polarized Capacitor	C1, C7, C18, C21, A, C21, B, C21, C, C21, D, C21, E, C21, F, C21, G, C21, H	11							
	100n	Non Polarized Capacitor	C2, C3, C5, C7, G8, C11, C22, A, C22, B, C22, C, C22, D, C22, E, C22, F, C22, G, C22, H, C23, A, C23, B, C23, C, C23, D, C23, E, C23, F, C23, G, C23, H	22							
	100u	Polarized Capacitor	C9, C10, C13, C14, C15, C16	6							
	2.2u	Non Polarized Capacitor	C8	1							
	0.22u	Non Polarized Capacitor	C9	1							
	22u	Polarized Capacitor	C12	1							
	22p	Non Polarized Capacitor	C19, A, C19, B, C19, C, C19, D, C19, E, C19, F, C19, G, C19, H	8							
	820p	Non Polarized Capacitor	C20, A, C20, B, C20, C, C20, D, C20, E, C20, F, C20, G, C20, H	8							
	LED	General Purpose LED	D1, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, A, D15, B, D15, C, D15, D, D15, E, D15, F, D15, G, D15, H	21							
	1N4148	1N4148 General Purpose Switching Diode	D2	1							
	Header	38-Pin 2 Row Header	H1, H2	2							
	Header	2-Pin Header	H3, H6, H6, H7, H10, H12, H14, H15, H16, H17, H19, H20, H21, H22, H23, H25, H26, H27, H28	19							
	Header	3-Pin Header	H4, H29, A, H29, B, H29, C, H29, D, H29, E, H29, F, H29, G, H29, H	9							
	Header	8-Pin Header	H8, H13	2							
	Header	10-Pin Header	H9	1							
	Header	6-Pin Header	H11, H24	2							
	Header	4-Pin Header	H19	1							
	NE555N	Integrated Circuit	IC1, IC3, A, IC3, B, IC3, C, IC3, D, IC3, E, IC3, F, IC3, G, IC3, H	9							
	9N138	Integrated Circuit	IC2	1							
	RC20K-SS52	Connector	J1, J3	2							
	691137710002	Connector	J2, J4, J5	3							
	92302	General Purpose N-Channel MOSFET	Q1	1							
	10k	Resistor	R1, R4, R10, R11, R12, R13, R17, R23, R47, A, R47, B, R47, C, R47, D, R47, E, R47, F, R47, G, R47, H, R49, A, R49, B, R49, C, R49, D, R49, E, R49, F, R49, G, R49, H	24							
	100k	Resistor	R2, R3, R28, R29	4							
	10k	Potentiometer	R5, R2, R4, A, R4, B, R4, C, R4, D, R4, E, R4, F, R4, G, R4, H	10							
	10k	Potentiometer	R6, R45, A, R45, B, R45, C, R45, D, R45, E, R45, F, R45, G, R45, H	6							
	1M	Resistor	R7, R29, R46, A, R46, B, R46, C, R46, D, R46, E, R46, F, R46, G, R46, H	10							
	1k	Resistor	R8, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41	13							
	220	Resistor	R14, R22, R24	3							
	470	Resistor	R15	1							
	0	Resistor	R16, R27, R42, R43	4							
	4.7k	Resistor	R18	1							
	22k	Resistor	R20, R26	2							
	1	Resistor	R21	1							
	1k	Resistor	R25	1							
	3.3k	Resistor	R48, A, R48, B, R48, C, R48, D, R48, E, R48, F, R48, G, R48, H	8							
	3.3k	Resistor	R50, A, R50, B, R50, C, R50, D, R50, E, R50, F, R50, G, R50, H	8							
	Slide Switch 4	Slide Switch	SW1, A, SW1, B, SW1, C, SW1, D, SW1, E, SW1, F, SW1, G, SW1, H	8							
	UM1875T	Integrated Circuit	U1	1							
	SN754431G400R	Integrated Circuit	U2	1							
	UM7805CT	Integrated Circuit	U3	1							