

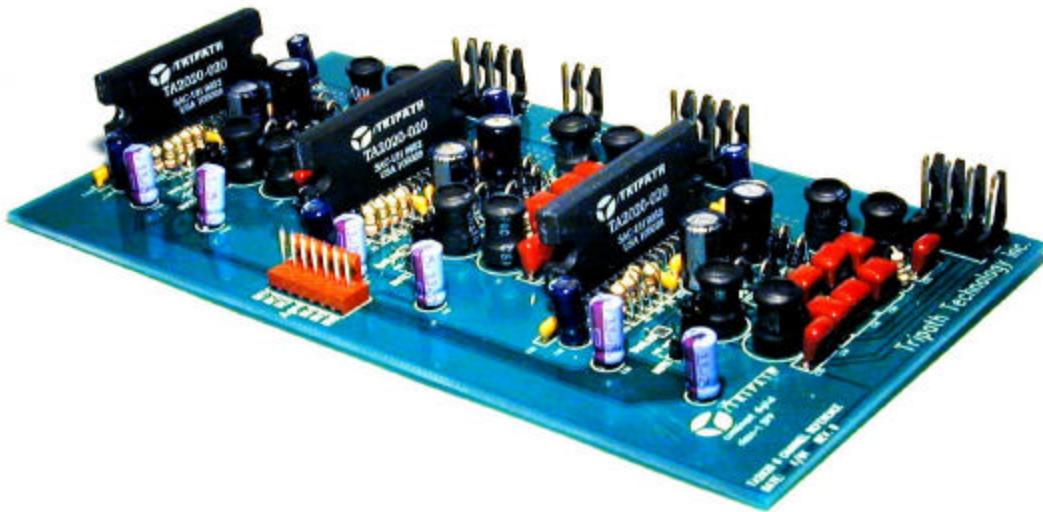
**RB-TA2020-1****6 CHANNEL TA2020 REFERENCE BOARD****CLASS-T DIGITAL AUDIO AMPLIFIER REFERENCE BOARD USING
DIGITAL POWER PROCESSING™ TECHNOLOGY**

Technical Information

Revision 1.0 – May 2001

GENERAL DESCRIPTION

The RB-TA2020-1 reference board is based on the TA2020 digital audio power amplifier from Tripath Technology. The board is designed to provide a simple and straightforward environment for the use of the Tripath TA2020. The RB-TA2020-1 reference board is a 6 x 20W (4Ω load) amplifier using three Tripath TA2020-020s. The TA2020-020 provides amplification for two channels of audio and drives a 4Ω (minimum) passive load (loudspeaker). For more information on the TA2020-020 power amplifier, see the TA2020-020 datasheet (www.tripath.com).



INPUT CONNECTION

Audio input to the board is provided via a 7-pin header (J1).

Connector Pin Out (J1)	Connector Designation	Description
Pin1	IN1	Channel 1 Input
Pin2	IN2	Channel 2 Input
Pin3	IN3	Channel 3 Input
Pin4	AGND	Analog Ground
Pin5	IN4	Channel 4 Input
Pin6	IN5	Channel 5 Input
Pin7	IN6	Channel 6 Input

OUTPUT CONNECTION

The TA2020 has differential outputs (bridged), therefore, it requires two wires per channel to connect to each speaker, neither of which is ground.

Connector	Connector Label	Description
J1	1P	Positive output of Channel 1
J1	1N	Negative output of Channel 1
J1	2N	Negative output of Channel 2
J1	2P	Positive output of Channel 2
J2	3P	Positive output of Channel 3
J2	3N	Negative output of Channel 3
J2	4N	Negative output of Channel 4
J2	4P	Positive output of Channel 4
J3	5P	Positive output of Channel 5
J3	5N	Negative output of Channel 5
J3	6N	Negative output of Channel 6
J3	6P	Positive output of Channel 6

POWER CONNECTION

The TA2020 requires a +13.5V power supply (14.6V max) to operate. Power to the board is provided via a 2 pin header connector.

Connector Label	Description
Vs	Positive of the 13.5V Power supply
GND	Negative (GND) of 13.5V Power Supply

Warning: Do not exceed Maximum Operating Supply Voltage of 14.6V

JUMPER SETTINGS

There is a 3 pin header for the MUTE control for each of the three TA2020 amplifiers to allow for evaluation of each TA2020 on the evaluation board. If the jumper is removed, the associated TA2020 and its two output channels will be muted. When the jumper is placed in the “gnd” position the associated part is un-muted. When the jumper is placed in the “fault” position the associated TA2020 and its two output channels will MUTE when the FAULT pin outputs a logic high indicating an over-current or over-temperature condition. It is recommended that the “fault” position be used during normal operation.

PERFORMING MEASUREMENTS ON THE RB-TA2020-1

The TA2020 operates by generating a high frequency switching signal based on the audio input. This signal is sent through a low-pass filter that recovers an amplified version of the audio input. The frequency of the switching pattern is spread spectrum in nature and typically varies between 100kHz and 1MHz, which is well above the 20Hz – 20kHz audio band. The pattern itself does not alter or distort the audio input signal, but it does introduce some inaudible components.

The measurements of certain performance parameters, particularly noise related specifications such as THD+N, are significantly affected by the design of the low-pass filter used on the output as well as the bandwidth setting of the measurement instrument used. Unless the filter has a very sharp roll-off just beyond the audio band or the bandwidth of the measurement instrument is limited, some of the inaudible noise components introduced by the TA2020 amplifier switching pattern will degrade the measurement by including out of band (audio) energy.

One feature of the TA2020 is that it does not require large multi-pole filters to achieve excellent performance in listening tests, usually a more critical factor than performance measurements. Though using a multi-pole filter may remove out-of-band noise and improve THD+N type measurements (when they are made with wide-bandwidth measuring equipment), these same filters degrade frequency response. The RB-TA2020-1 Reference Board has a simple two-pole output filter with excellent performance in listening tests.

(See Application Note 4 for more information on bench testing)

ADVANCED INFORMATION

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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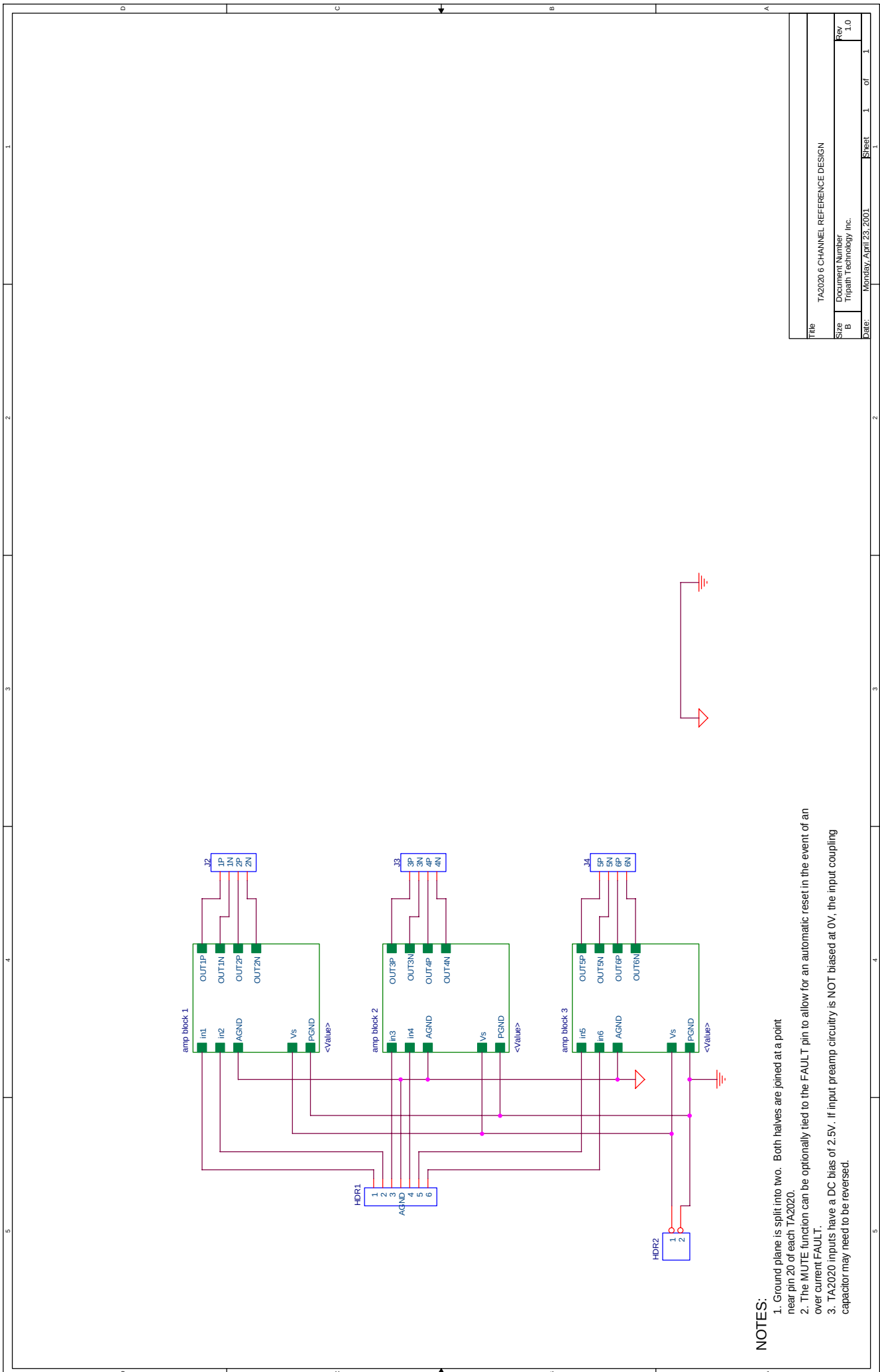
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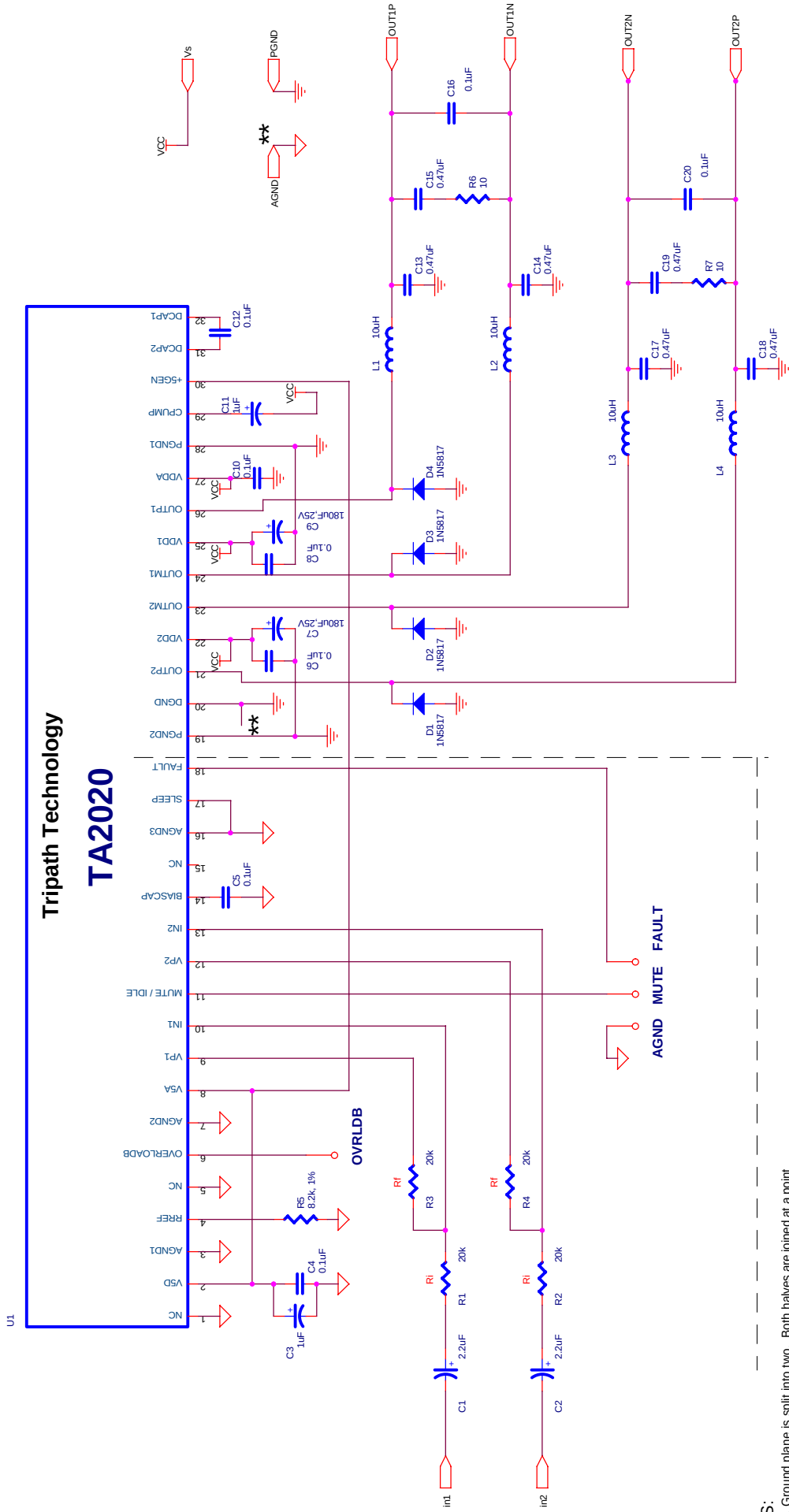
NOTES:

1. Ground plane is split into two. Both halves are joined at a point near pin 20 of each TA2020.
2. The MUTE function can be optionally tied to the FAULT pin to allow for an automatic reset in the event of an over current FAULT.
3. TA2020 inputs have a DC bias of 2.5V. If input preamp circuitry is NOT biased at 0V, the input coupling capacitor may need to be reversed.

Title				
TA2020 6 CHANNEL REFERENCE DESIGN				
Size	B	Document Number		Rev
		Tripath Technology Inc.		
Date:	Monday, April 23, 2001		Sheet	1 of 1

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TA2020



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**** Connect PGND to AGND from PIN 20 to PIN 3 with a single trace.**

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B Tripath Technology Inc.

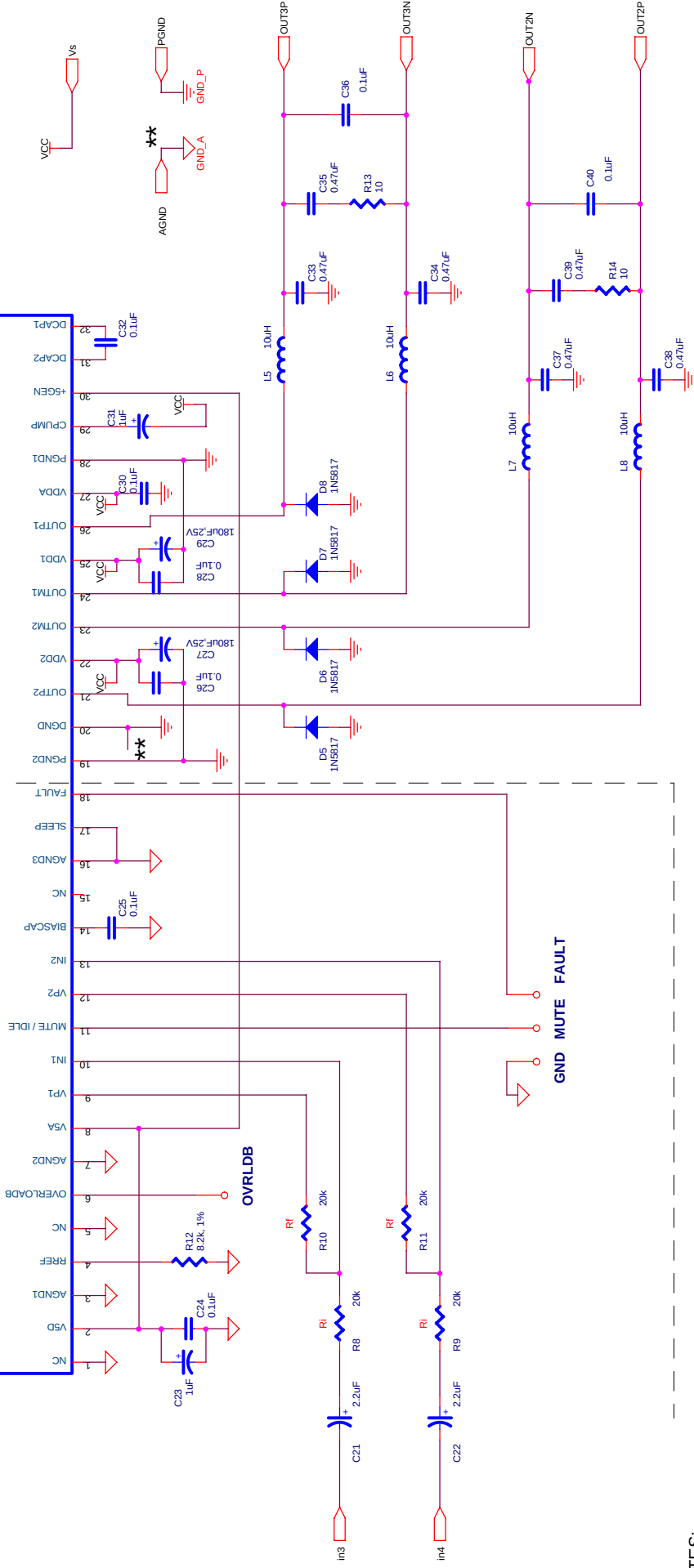
Rev 1.0

Date: Monday, April 23, 2001 Sheet 1 of 1

TripPath Technology

TA2020

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Title: TA2020 6 CHANNEL REFERENCE DESIGN

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Rev: TripPath Technology Inc. 1.0

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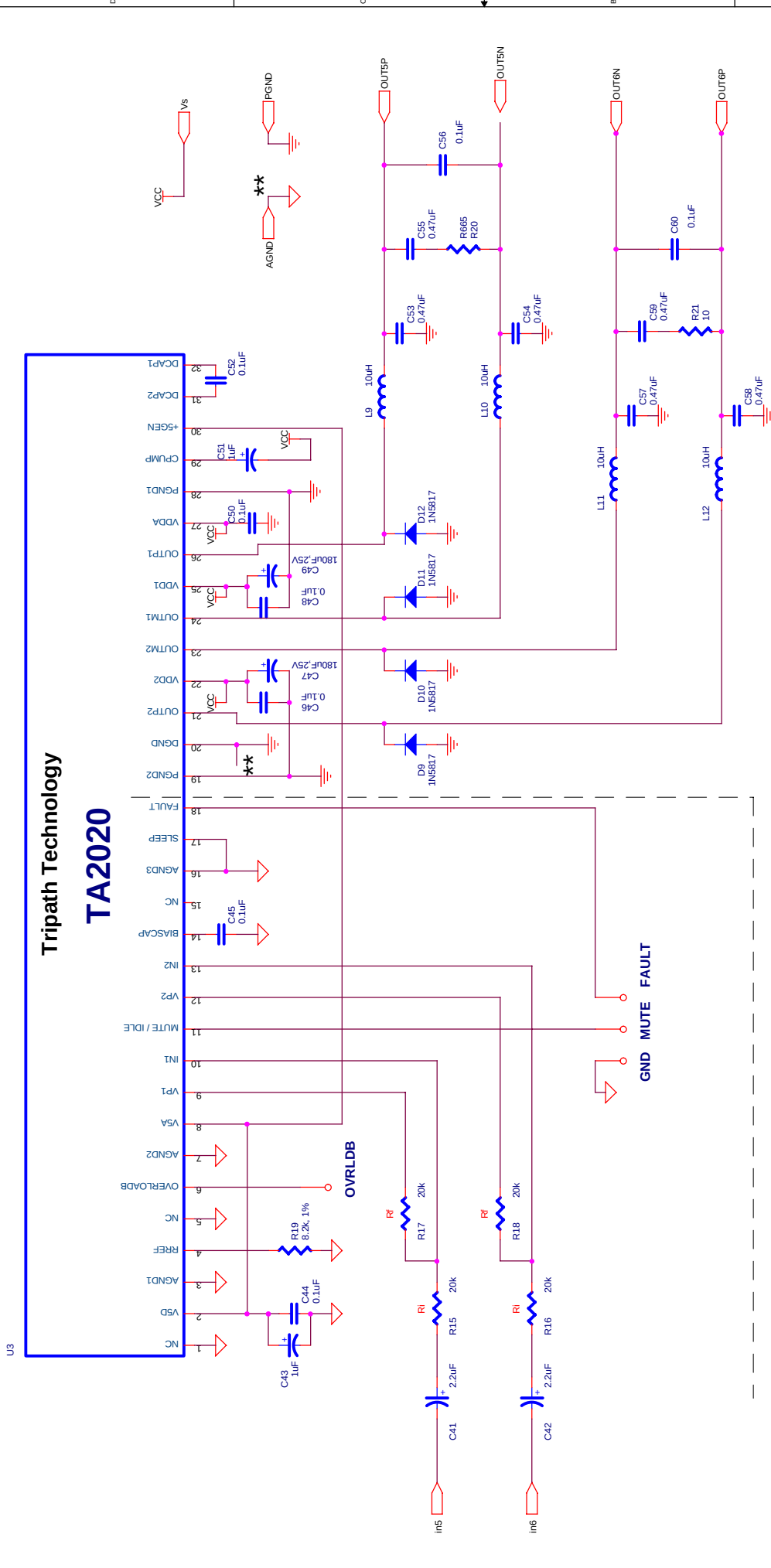
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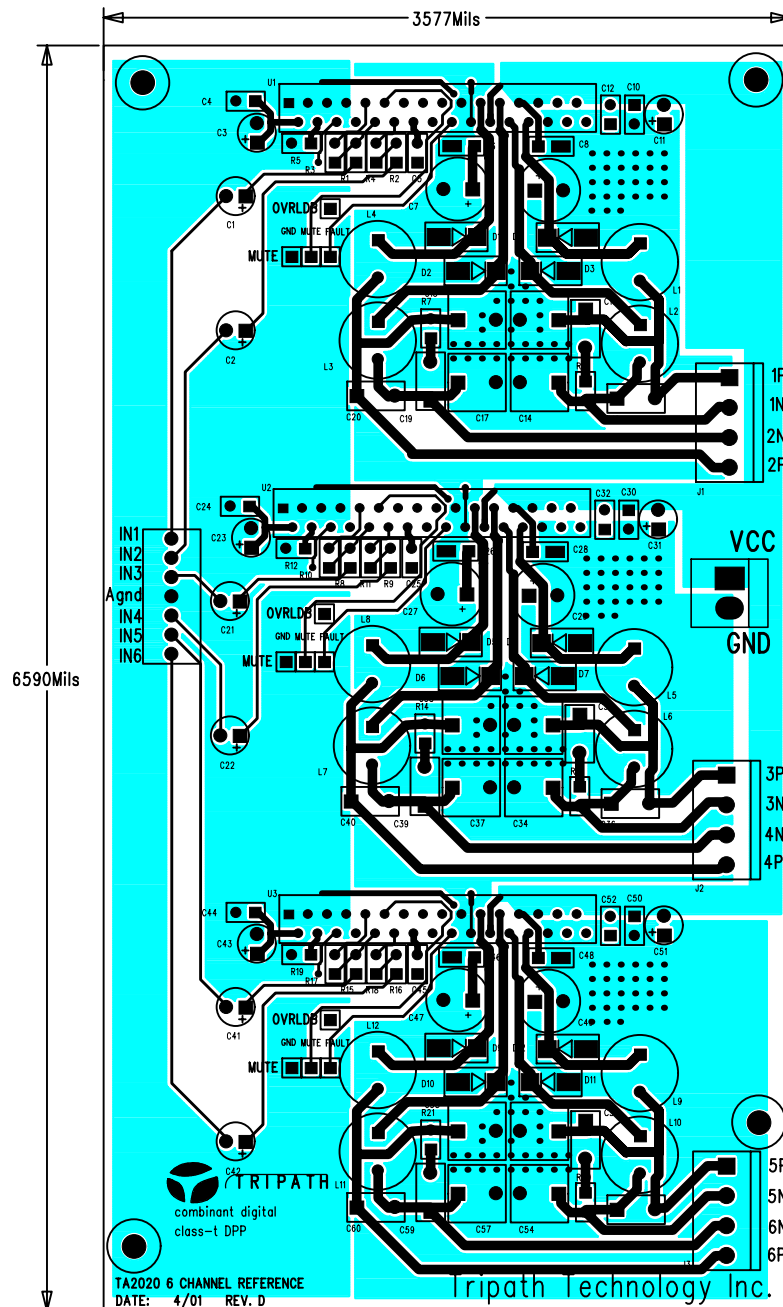
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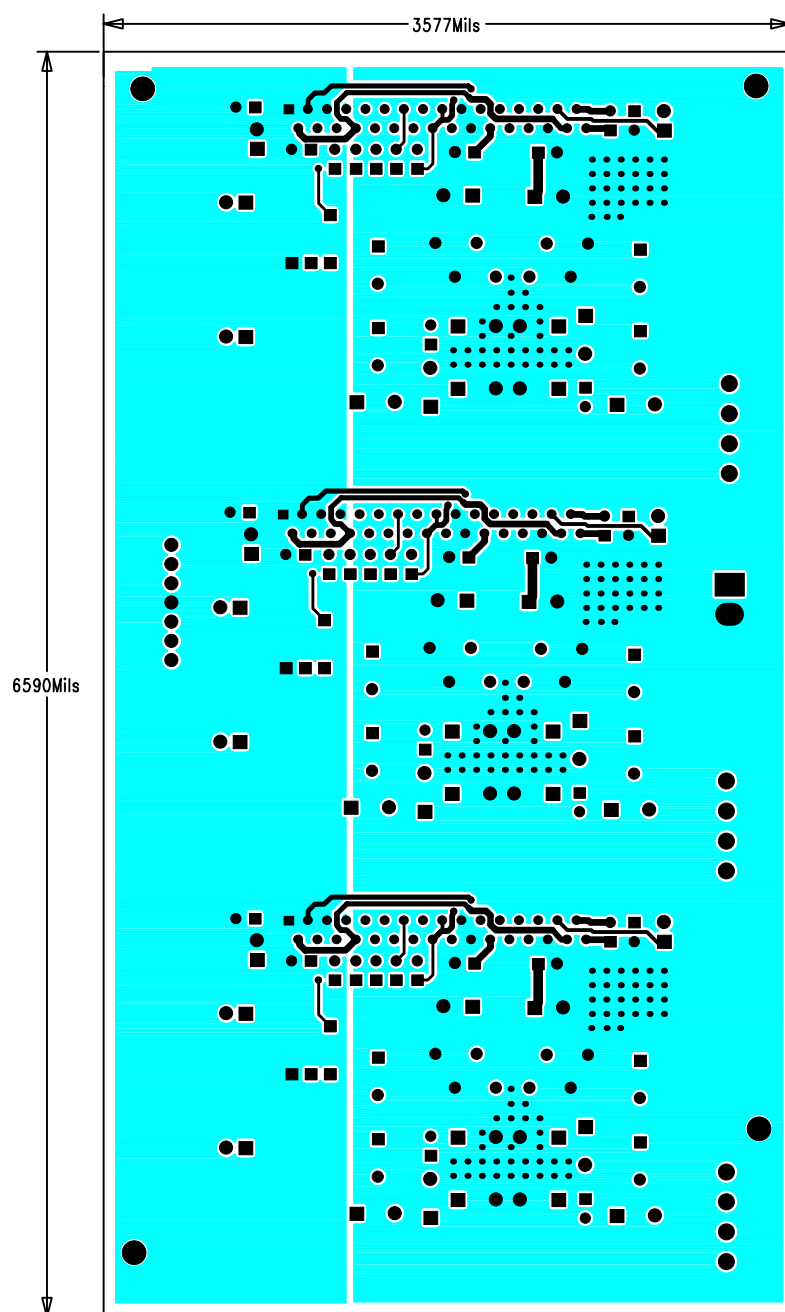
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TA2020 6 CHANNEL REFERENCE DESIGN
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<u>Qty.</u>	<u>designator</u>	<u>description</u>	<u>value</u>	<u>vendor</u>	<u>vendor #</u>
18	C4, C5, C6, C8, C10, C12, C24, C25, C26, C28, C30, C32, C44, C45, C46, C48, C50, C52	Ceramic Capacitor (100Mil)	.1uF		
18	C13, C14, C15, C17, C18, C19, C33, C34, C35, C37, C38, C39, C53, C54, C55, C57, C58, C59	Stack Metal Film Capacitor	.47uF, 50V	Digi-Key	P4671-ND
6	C16, C20, C36, C40, C56, C60	Stack Metal Film Capacitor	.1uF, 50V	Digi-Key	P4525-ND
6	C1, C2, C21, C22, C41, C42	Electrolytic Capacitor	2.2uF	Digi-Key	P6646-ND
6	C3, C11, C23, C31, C43, C51	Electrolytic Capacitor	1uF, 50V	Digi-Key	P5563-ND
6	C7, C9, C27, C29, C47, C49	Electrolytic Capacitor	180uF, 25V	Digi-Key	P5699-ND
12	R1, R2, R3, R4, R8, R9, R10 R11, R15, R16, R17, R18	1/4W, Thru-Hole Resistor	20K Ohm		
3	R5, R12, R19	1/4W, Thru-Hole Resistor	8.2K Ohm, 1%		
6	R6, R7, R13, R14, R20, R21	1/4W, Thru-Hole Resistor	10 Ohm		
12	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12	Schottky Rectifier Diode	1N5817	Digi-Key	1N5817DICT-ND
12	L1, L2, L3, L4, L5, L6, L7, L8 L8, L10, L11, L12	Fixed Inductor	10uH	Digi-Key	TK4467-ND
3	MUTE	3 Pin Header	100Mil Spacing		3-pin 0.1"
3	J1, J2, J3	4 Pin Header	156Mil Spacing	Digi-Key	WM4622-ND
1	HDR1	7 Pin Header	100Mil Spacing	Digi-Key	WM4205-ND
1	HDR2	2 Pin Header	156Mil Spacing	Digi-Key	WM4620-ND
3	U1, U2, U3	TA2020 IC			
4	NONE	STANDOFF & 4-40 NUT			



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