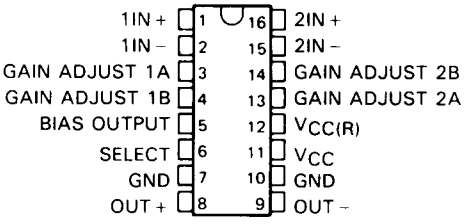
D3002, MARCH 1986—REVISED DECEMBER 1988

- **Designed for Use with the TL041 Magnetic Field Pulse Detector**
- **Wide Bandwidth . . . 20 MHz Typ**
- **Low Noise . . . Less than 8 μV Typ**
- **Independently Adjustable Channel Gains . . . Up to 450 Typ**
- **No Frequency Compensation Required**
- **Internal Voltage Source Eliminates External Components**
- **Input Channel Select Pin is Compatible with TTL and CMOS**
- **Low Power Dissipation . . . 150 mW Typ**

D OR N PACKAGE
(TOP VIEW)



CHANNEL SELECT TABLE

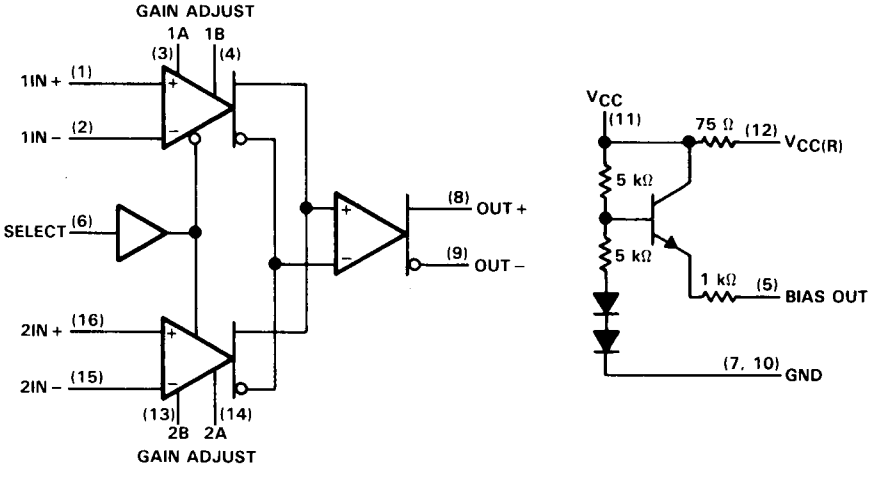
SELECT	CHANNEL
L	1
H	2

description

The TL040 is a two-channel multiplexed video amplifier designed for use with magnetic pulse detectors in streaming tape drives. The circuit design eliminates many external components, and the D package allows substantial reduction in circuit board area. The gain of each channel is a function of the resistance across its gain-adjust pins (A-B) with maximum gain occurring when the terminals are shorted.

The $V_{CC(R)}$ pin provides supply voltage decoupling required by some designs. The BIAS OUT pin provides a voltage source for other circuits that is approximately equal to 1/2 V_{CC}.

functional block diagram



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, VCC (see Note 1) . . . . . 14 V
Input voltage range . . . . . −0.2 V to V_{CC} + 0.2 V
Continuous total power dissipation . . . . . 600 mW
Operating free-air temperature range . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C

NOTE 1: All voltages except differential voltages are with respect to the ground terminals.

recommended operating conditions

	MIN	TYP	MAX	UNIT
Supply voltage, V_{CC}	10.8	12	13.2	V
Common-mode input voltage (diff inputs), V_{IC}	5	6	7	V
High-level input voltage, SELECT input, V_{IH}	2			V
Low-level input voltage, SELECT input, V_{IL}			0.8	V
Output sink current (diff outputs), I_{sink}			1.5	mA
Operating free-air temperature, T_A	0		70	°C

electrical characteristics of selected channel at T_A = 25°C, V_{CC} = 12 V, R_{AB} = 0, R_L = 2 kΩ (unless otherwise noted)

	PARAMETER	TEST FIGURE	TEST CONDITIONS	MIN	TYP	MAX	UNIT
A_{VD}	Large-signal differential voltage amplification	1		300	530	600	V/V
	Channel amplification mismatch	1			1%		
	Large-signal differential voltage attenuation	1	Δ V_I = 50 mV on unselected input		60		dB
V_{OC}	Common-mode output voltage	1	R_L = ∞		8.5		V
V_{OPP}	Maximum peak-to-peak output voltage swing	1			4		V
BW	Bandwidth (−3 dB)	2			20		MHz
I_{IO}	Input offset current	1			0.1	3	μA
I_{IB}	Input bias current	1			6	17	μA
V_{OD}	Differential output voltage	1	R_L = ∞, V_{ID} = 0		0.2		V
r_i	Input resistance (differential inputs)				4		kΩ
CMRR	Common-mode rejection ratio	3	V_{IC} = 5 V to 7 V	60	100		dB
k_{SVR}	Supply-voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$)	4	V_{CC} = 10.8 V to 13.2 V	50	70		dB
V_n	Broadband equivalent input noise voltage	4			<5		μV
I_{IH}	High-level input current, Select input		V_{IH} = 2.7 V			−0.4	mA
I_{IL}	Low-level input current, Select input		V_{IL} = 0.4 V			20	μA
t_{pd}	Propagation delay time (differential inputs)	2	ΔV_O = 1 V		15		ns
t_r	Output rise time	2	ΔV_O = 1 V		20		ns
I_{CC}	Supply current	1			12	15	mA
	Bias output voltage	1		5	6	7	V

PARAMETER MEASUREMENT INFORMATION

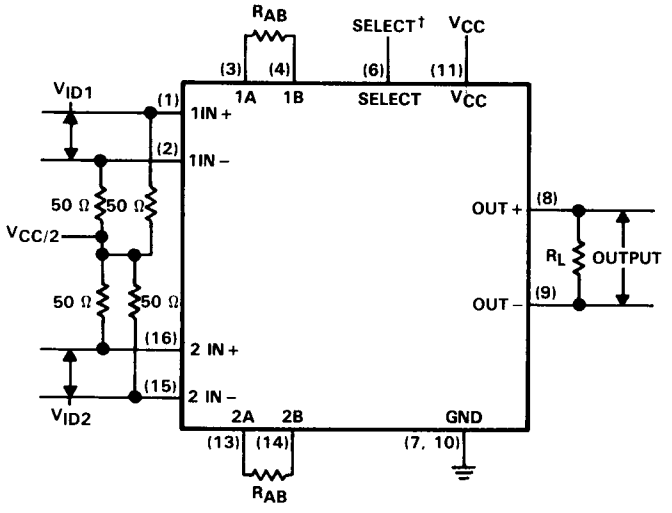


FIGURE 1

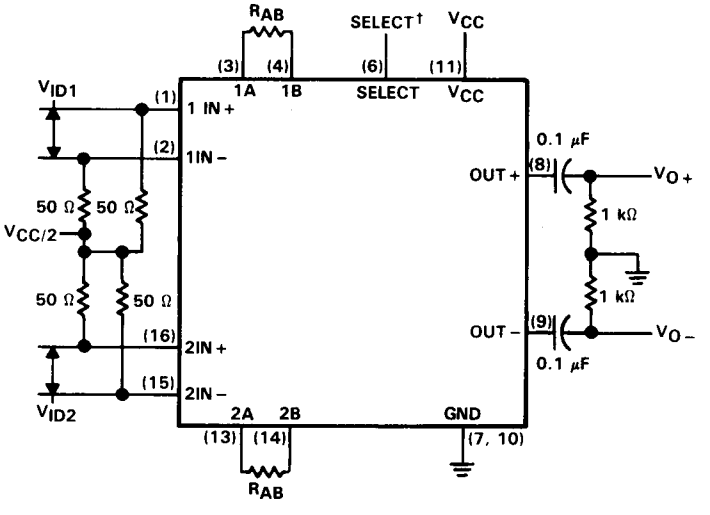


FIGURE 2

†Select input must be at proper logic level to select desired input channel.

PARAMETER MEASUREMENT INFORMATION (continued)

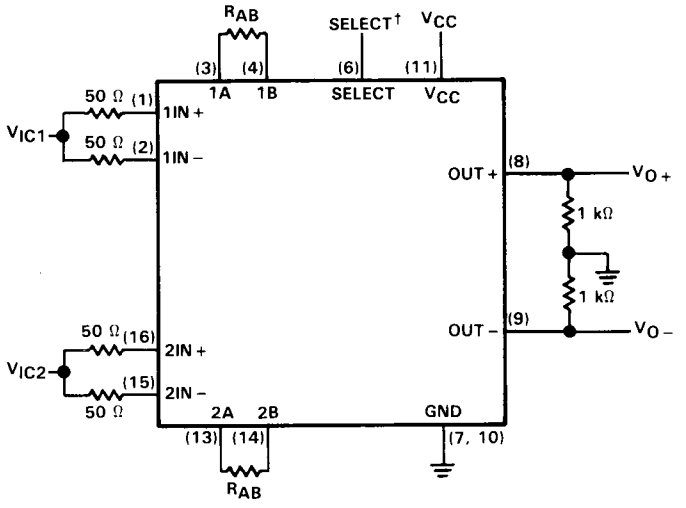


FIGURE 3

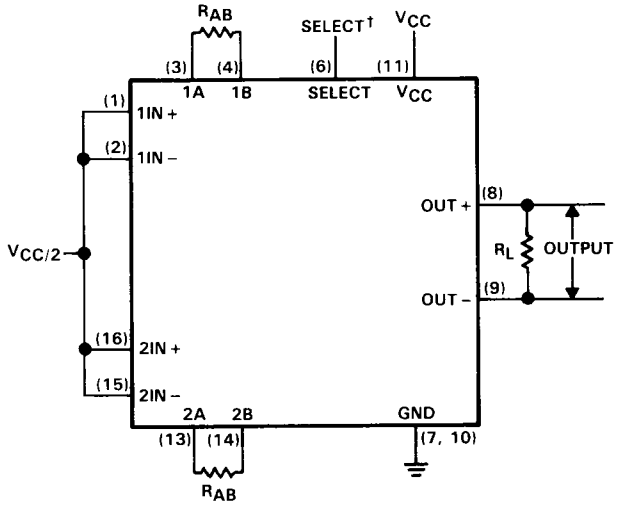


FIGURE 4

†Select input must be at proper logic level to select desired input channel.

TYPICAL CHARACTERISTICS

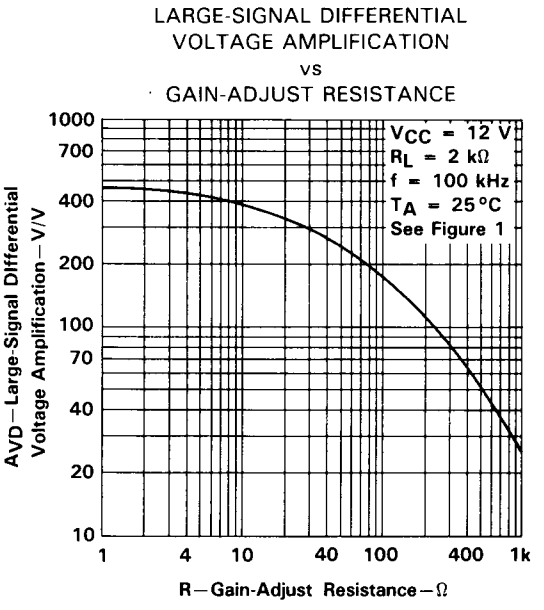


FIGURE 5

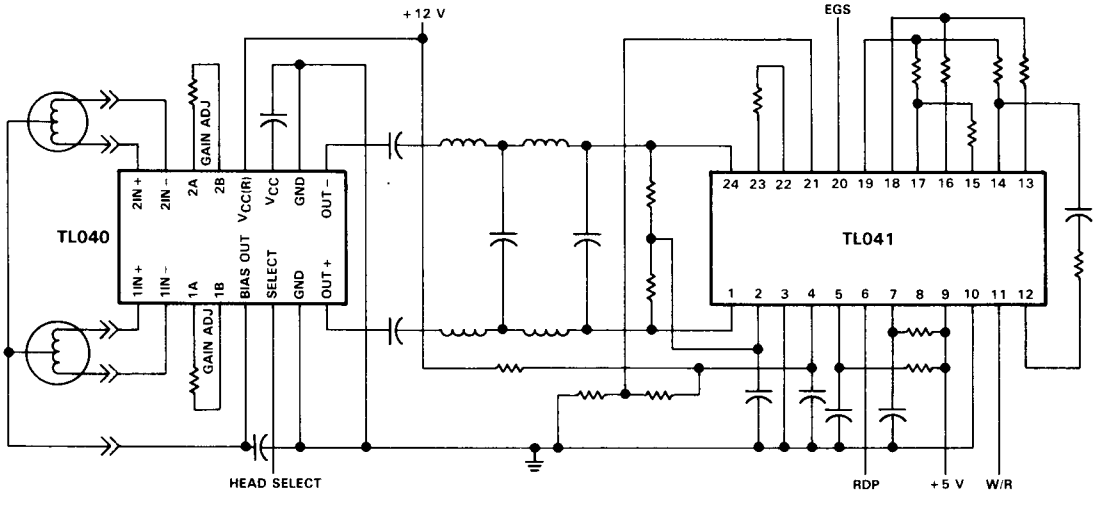


FIGURE 6. READ SIGNAL CIRCUIT FOR A STREAMING TAPE DRIVE