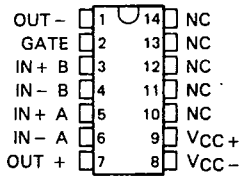
LINEAR INTEGRATED CIRCUITS

TYPES MC1545, MC1445
GATE-CONTROLLED 2-CHANNEL-INPUT VIDEO AMPLIFIER

D2572, JANUARY 1980—REVISED NOVEMBER 1983

- Differential Inputs and Outputs
- Channel Select Time . . . 20 ns Typ
- Bandwidth Typically 50 MHz
- 16-dB Minimum Gain
- Common-Mode Rejection Typically 85 dB
- Broadband Noise Typically 25 μV

MC1545 . . . J DUAL-IN-LINE OR W FLAT PACKAGE
MC1445 . . . J OR N DUAL-IN-LINE PACKAGE
(TOP VIEW)



NC—No internal connection

description

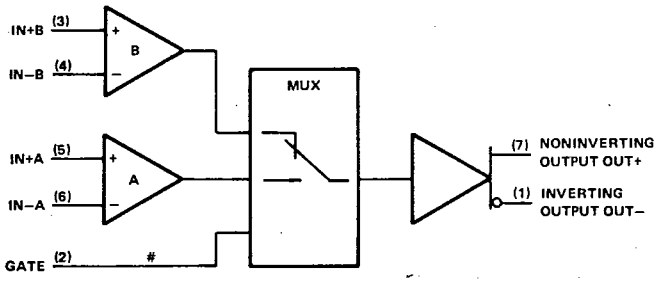
The MC1545 and MC1445 are general-purpose, gated, dual-channel wideband amplifiers designed for use in video-signal mixing and switching. Channel selection is accomplished by control of the voltage level at the gate. A high logic level selects channel A; a low logic level selects channel B. The unselected channel will have a gain of one or less.

The MC1545 is characterized for operation over the full military operating temperature range of −55°C to 125°C. The MC1445 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

GATE INPUT	SELECT
H	Channel A
L	Channel B

block diagram



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

		MC1545	MC1445	UNIT
Supply voltage V_{CC+} (see Note 1)		+12	+12	V
Supply voltage V_{CC-} (see Note 1)		−12	−12	V
Differential input voltage (see Note 2)		±5	±5	V
Output current		±25	±25	mA
Continuous total dissipation at (or below) 25°C free-air temperature (see Note 3)		675	675	mW
Operating free-air temperature range		−55 to 125	0 to 75	°C
Storage temperature range		−65 to 150	−65 to 150	°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds	J or W package	300	300	°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	N package	260	260	°C

NOTES: 1. Voltage values, except differential input voltage, are with respect to the midpoint of V_{CC+} and V_{CC-}.
2. Differential input voltages are measured at a noninverting input terminal with respect to the appropriate inverting input terminal.
3. For operation above 25°C free-air temperature, refer to the Dissipation Derating Curves, Section 2. In the J package, MC1545 chips are alloy mounted; MC1445 chips are glass mounted.

TEXAS INSTRUMENTS
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GATE-CONTROLLED 2-CHANNEL-INPUT VIDEO AMPLIFIER

electrical characteristics at V_{CC+} = 5 V, V_{CC-} = −5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	MC1545			MC1445			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
A_{VS}	Large-signal single-ended voltage amplification	f = 125 kHz, V_I = 20 mV	16	19	21	16	19.5	23	dB
BW	Bandwidth	V_I = 20 mV	40	60			50		MHz
V_{IO}	Input offset voltage			1	5			7.5	mV
I_{IO}	Input offset current			2			2		μA
I_{IB}	Input bias current			15	25		15	30	μA
V_{ICR}	Common-mode voltage range			±2.5			±2.5		V
V_{OQ}	Quiescent output voltage			0.1			0.1		V
ΔV_{OQ}	Change in quiescent output voltage	Gate input change from 5 V to 0 V		±15			±15		mV
V_{OPP}	Maximum peak-to-peak output voltage swing	f = 50 kHz, R_L = 1 kΩ	1.5	2.5		1.5	2.5		V
z_i	Input impedance	f = 50 kHz	4	10		3	10		kΩ
z_o	Output impedance	f = 50 kHz		25			25		Ω
CMRR	Common-mode rejection ratio	f = 50 kHz		85			85		dB
V_n	Broadband equivalent input noise voltage	BW = 5 Hz to 10 MHz, R_S = 50 Ω		25			25		μV
V_{TH}	High-level gate threshold voltage	$A_{VS(A)}$ ≥ 16 dB, $A_{VS(B)}$ ≤ 0 dB		1.5	2.2		1.3	3	V
V_{TL}	Low-level gate threshold voltage	$A_{VS(B)}$ ≥ 16 dB, $A_{VS(A)}$ ≤ 0 dB	0.4	0.7		0.2	0.4		V
I_{IH}	High-level gate current	V_I = 5 V			2			4	μA
I_{IL}	Low-level gate current	V_I = 0			2.5			4	mA
t_{PLH}	Propagation delay time, low-to-high-level output	ΔV_I = 20 mV, 50% to 50%		6.5	10		6.5		ns
t_{PHL}	Propagation delay time, high-to-low-level output	ΔV_I = 20 mV, 50% to 50%		6.3	10		6.3		ns
t_{TLH}	Transition time, low-to-high-level output	ΔV_I = 20 mV, 10% to 90%		6.5	15		6.5		ns
t_{THL}	Transition time, high-to-low-level output	ΔV_I = 20 mV, 10% to 90%		7	15		7		ns
I_{CC+}	Supply current from V_{CC+}	No load, No signal		7	11		7	15	mA
I_{CC-}	Supply current from V_{CC-}	No load, No signal		−7	−11		−7	−15	mA
P_D	Power dissipation	No load, No signal		70	110		70	150	mW

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