

TV Chroma Demodulator

SYSTEM FEATURES:

- Synchronous detector with color-difference matrix
- Emitter-follower output amplifier with short-circuit protection
- Typical R-Y output ratio of 0.95 and 89°, G-Y output ratio of 0.33 and 244°, and B-Y output ratio of 1.0 and 0°

The RCA-CA3172E is a monolithic silicon integrated circuit intended for use as a chroma demodulator in TV applications. It is operated from a 24-volt supply.

The device has synchronous detectors with matrix circuits to achieve the R-Y, G-Y, and B-Y color-difference output signals. The chroma input signal is applied to terminal Nos. 3 and 4, while the oscillator injection signal is applied to terminal Nos. 6 and 7. The color-difference signals, after

matrix, have a fixed relationship of amplitude and phase.

The outputs of the CA3172E are suitable for driving high-level color-difference or R, G, and B output amplifiers. The emitter-follower stages used to drive the high-level color amplifiers have short-circuit protection.

The CA3172E is supplied in a 14-lead dual-in-line plastic package.

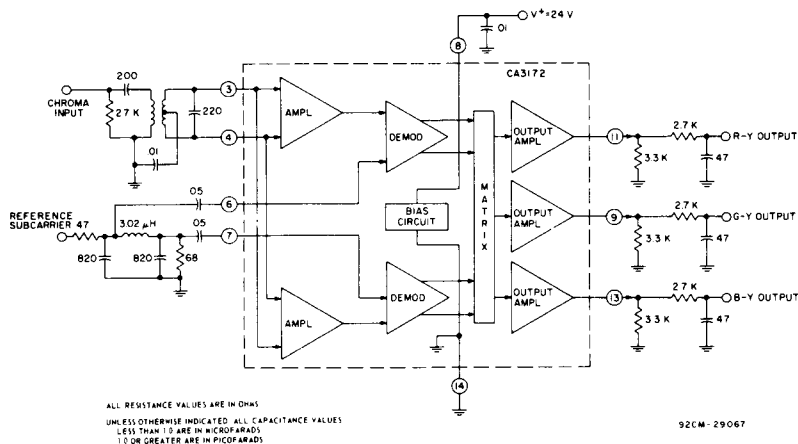


Fig. 1 — Functional diagram of RCA-CA3172E.

CA3172

MAXIMUM RATINGS, Absolute Maximum-Values at $T_A = 25^\circ\text{C}$

DC SUPPLY VOLTAGE (Terminal 8 to Terminal 14)	27	V
REFERENCE INPUT VOLTAGE	5	V_{p-p}
CHROMA INPUT VOLTAGE	5	V_{p-p}
DEVICE DISSIPATION:		
Up to $T_A = +70^\circ\text{C}$	530	mW
Above $T_A = +70^\circ\text{C}$	Derate Linearly at 6.7 mW/ $^\circ\text{C}$	
AMBIENT TEMPERATURE RANGE:		
Operating	-40 to +85	$^\circ\text{C}$
Storage	-65 to +150	$^\circ\text{C}$
LEAD TEMPERATURE (During Soldering):		
At distance 1/32 in. (3.17 mm) from seating plane for 10 s max.	+265	$^\circ\text{C}$

**Maximum Voltage and Current Ratings
at $T_A = +25^\circ\text{C}$**

Terminal No.	Voltage*		Terminal No.	Current	
	MIN VOLTS	MAX VOLTS		I_I mA	I_O mA
3	0	+5	3	—	—
4	0	+5	4	—	—
6	0	+12	6	—	—
7	0	+12	7	—	—
8	0	+27	8	—	—
9	0	+20	9	1.0	20
11	0	+20	11	1.0	20
13	0	+20	13	1.0	20

* With reference to terminal No. 14 and with the voltage between terminal No. 8 and terminal No. 14 at +24 V except as given in rating for terminal No. 8

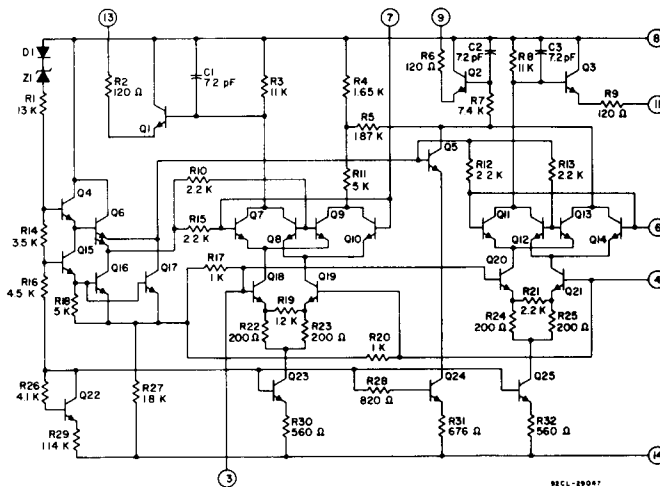


Fig. 2 — Schematic diagram for CA3172E.

ELECTRICAL CHARACTERISTICS, at $T_A = 25^\circ\text{C}$ and $V^+ = +24\text{ V}$ unless otherwise specified

CHARACTERISTICS	SYMBOLS	SPECIAL TEST CONDITIONS	LIMITS CA3172			UNITS
			MIN.	TYP.	MAX.	

Static Characteristics^a

Supply Current With Output Loads	I_T	S_1 Closed	16.5	—	28.5	mA
With No Output Loads		S_1 Open	—	9	—	
G-Y, R-Y, B-Y Outputs	V_9, V_{11}, V_{13}	S_1 Closed	13	14.5	15.5	V
Chroma Inputs	V_3, V_4	S_1 Open	—	3.6	—	
Reference Subcarrier	V_6, V_7	S_1 Open	—	6.4	—	

Dynamic Characteristics^b

Demodulator Unbalance	V_9, V_{11}, V_{13}	$V_3 = V_4 = 0$	—	—	0.6	V_{p-p}
Maximum Color Difference Output Voltage	V_{13}	$V_3 = V_4 = 0.35 V_{p-p}$	5	—	—	V_{p-p}
Chroma Input Sensitivity	V_3	Adjust e_c for 5.0 V_{p-p} @ term No. 13 (B-Y)	—	0.2	0.35	
R-Y Output Ratio	V_{11}		—	0.95	—	
G-Y Output Ratio	V_9		—	0.32	—	
V_{DC} Difference Between any two Output Terminals	$ V_9 - V_{11} $ $ V_9 - V_{13} $ $ V_{11} - V_{13} $		$e_c = 0$	—	—	0.6
Input Impedance Reference Subcarrier	$R_{i6,7}$ $C_{i6,7}$		—	1.7	—	k Ω
			—	6	—	pF
Input Impedance at Chroma Inputs	$R_{i3,4}$ $C_{i3,4}$		—	0.95	—	k Ω
			—	6	—	pF
Output Resistance	R_{o9}, R_{o11}, R_{o13}		—	180	—	Ω

a Test circuit Fig. 3

b Test circuit Fig. 4

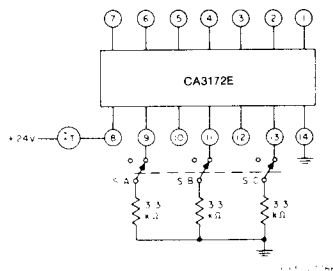


Fig. 3 — Static characteristics test circuit.

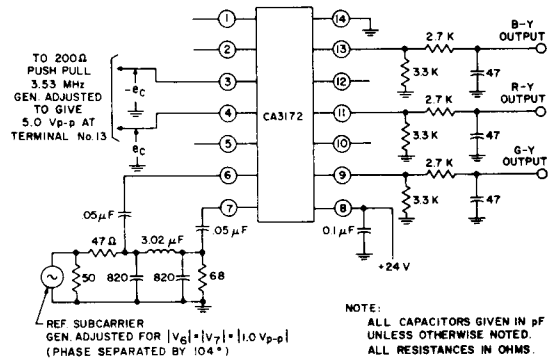


Fig. 4 — Dynamic characteristics test circuit.