

CA1398E

Television Chroma Processor

RCA-CA1398E is a monolithic silicon integrated-circuit chroma processor containing chroma-amplifier and gain-control, color-killer, color subcarrier oscillator, hue control, and ACC circuitry. It has been designed for interchangeability with other "1398"-type chroma-processor devices. It functions compatibly with the RCA-CA3125E Chroma Demodulator as well as other commercially available chroma demodulators in color-TV receivers. Fig. 2 shows a functional block diagram of a 2-package TV chroma system incorporating the CA1398E and CA3125E. The CA1398E is supplied in a 14-lead dual-in-line plastic package.

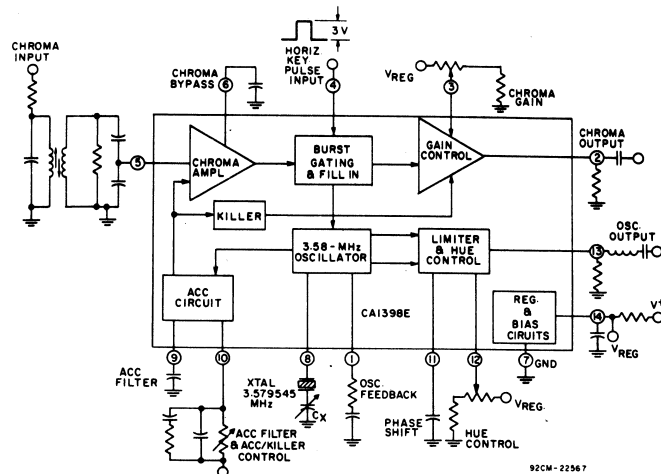


Fig. 1 - Functional block diagram of the CA1398E.

Features

- Minimum number of external components required
- Injection-lock oscillator with internal feedback
- DC chroma gain control and hue control circuits
- Low-impedance internal voltage regulation

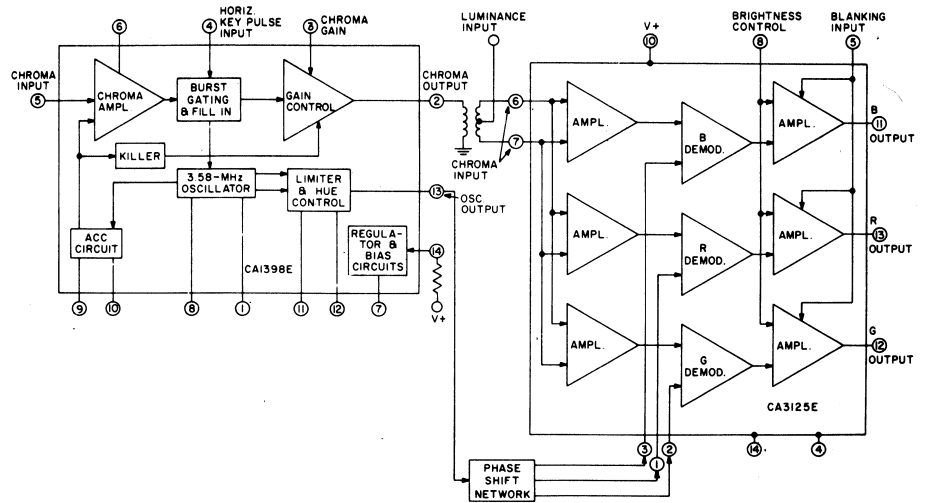


Fig. 2 - TV chroma system functional block diagram.

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

Peak Horizontal-Pulse Input Current	250 μA
Supply Current (Terminal 14)	35 mA
Ambient Temperature Range:	
Operating	-40 to +85 $^\circ\text{C}$
Storage	-65 to +150 $^\circ\text{C}$
Lead Temperature (During Soldering):	
At distance 1/16" \pm 1/32" (1.59 \pm 0.79 mm)	
from case for 10 s max.	265 $^\circ\text{C}$

ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$ and Referenced to Test Circuit (Fig. 4)

CHARACTERISTIC	TERMINAL MEASURED AND SYMBOL	TEST CONDITIONS				LIMITS			UNITS
		SWITCH POSITION (S1)	CHROMA	HUE	KILLER	V_{BURST} mV p-p	V_{CHROMA} mV p-p	MIN. TYP. MAX.	
<i>Static Characteristics</i>									
Regulated Supply Voltage	V ₁₄	2	max.	max.	max.	0	0	8.9 9.5 11.5	V
Chroma Output Bias	V ₁₄ to V ₂	2	max.	max.	max.	6	0	1.2 2.4 3.6	V
Regulator Impedance	See Note 1	2	max.	max.	max.	0	0	- 12 25	Ω
<i>Dynamic Characteristics (Refer to Test Set-Up Procedure for Oscillator)</i>									
Max. Chroma Gain	V ₂	1	max.	max.	See Note 2	6	5	310 425 -	mV p-p
Min. Chroma Gain	V ₂	1	min.	max.	See Note 2	6	5	- - 7	mV p-p
ACC Action	V ₂ (dB up from gain test)	1	max.	max.		50	50	2 7 11	dB
Killer Function:					See Note 2				
Kill	V ₂	2	max.	max.		0	5	- - 7	mV p-p
Unkill	V ₂	1	max.	max.	~15	5	100 - -	mV p-p	
Oscillator Lock-Up:					See Note 2				
Voltage	V ₁₃	1	max.	max.		6	0	250 340 390	mV p-p
Phase (Referenced to burst)	ϕ_{13}	1	max.	max.	6	0	-20 0 +20	degrees	
Hue Control Range:					See Note 2				
Voltage	V ₁₃	1	max.	min.		6	0	250 340 390	mV p-p
Phase (Referenced to burst)	ϕ_{13}	1	max.	min.	6	0	95 110 140	degrees	

Note 1 - Measure V₁₄ at I_{SUPPLY} = 38 mA and 18 mA. Calculate the regulator impedance: $Z_{\text{reg}} = (V_{14} \text{ at } 38 \text{ mA}) - V_{14} \text{ at } 18 \text{ mA}) / 0.02$

Note 2 - Increase the killer potentiometer resistance from minimum until the circuit unkills. This condition is evidenced by a shift in bias voltage at Term. 2. Maintain this potentiometer setting for all the dynamic tests.

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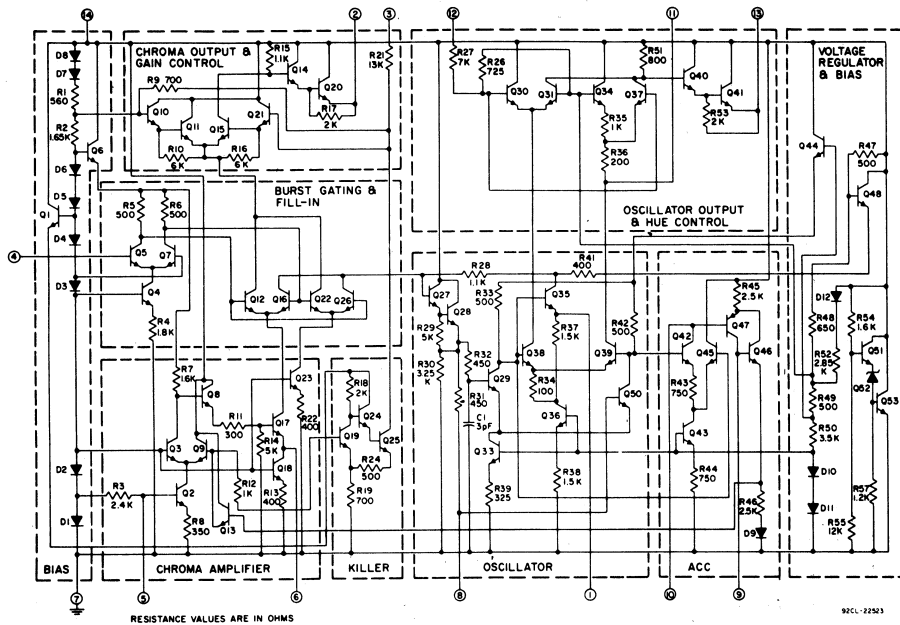


Fig. 3 - Schematic diagram of the CA1398E.

TEST SET-UP PROCEDURE FOR OSCILLATOR

Remove the horizontal keying and chroma inputs and adjust C_X to obtain a free-running oscillator frequency of 3.579545

MHz ± 10 Hz. Under the same Test Conditions described in the Electrical Characteristics Chart for Oscillator Lock-Up, vary L1 (approx. 20 μ H) and/or C1 (approx. 1000 pF) to obtain the initial conditions for amplitude and phase oscillator lock-up.

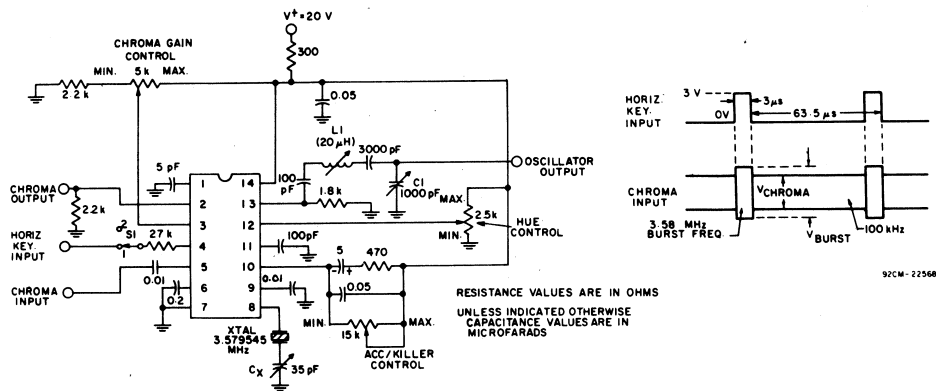


Fig. 4 - Typical static and dynamic characteristics test circuit for the CA1398E.