

Overview

The STK190-020 is a video output bias adjustment hybrid IC for high-definition CRT displays. It incorporates video output stage RGB cutoff and brightness adjustment circuits into a single package. All functions can be controlled by 0 to 5V DC voltage inputs, making it ideal for multi-scan CRT displays with built-in microcontrollers.

Features

- DC voltage-controlled RGB cutoff and brightness adjustment circuits
- 0 to 5V DC voltage control inputs for simple drive from an external microcontroller
- IMST (insulated metal substrate technology) excellent heat dissipation characteristic make a heatsink unnecessary.
- V_{CC} max = 200V and high withstand voltage design
- Compact, light weight package
- Wide 70V cutoff adjustment range and 20V brightness adjustment range (using an external variable resistor)
- Wide bias variable range so that a fixed voltage can be applied to the G1 grid. Furthermore, the bias circuit high-voltage design means that G1 can be connected to ground, eliminating the need for a negative supply.

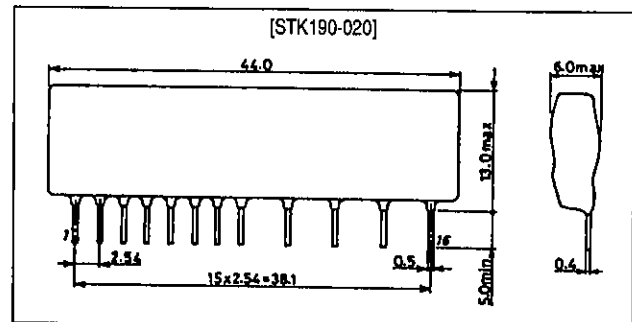
Internal Functions

- RGB cutoff adjustment (DC control for each channel)
- Brightness adjustment (DC control)

Package Dimensions

unit: mm

4157



Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC1} max	Pin 1	15	V
	V_{CC2} max	Pin 16	200	V
Maximum emitter current	I_e	Tr2, 4, 6 (1s DC)	100	mA
Allowable power dissipation	P_d max	$T_{opr} \leq +75^\circ\text{C}$	450	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-30 to +100	$^\circ\text{C}$

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

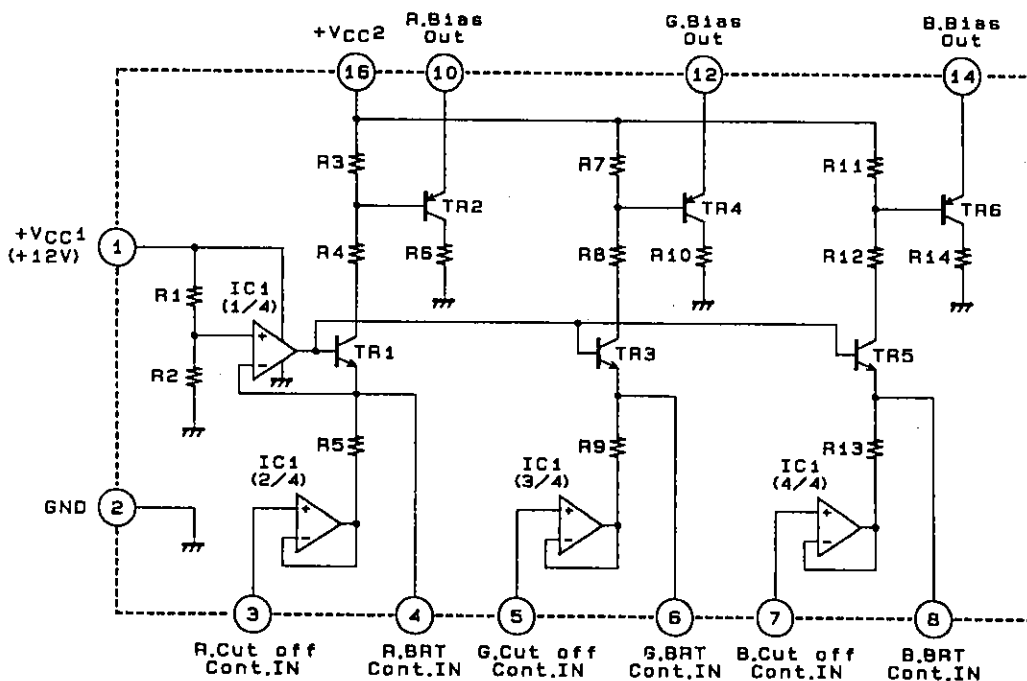
Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC1}		12	V
	V_{CC2}		120 to 160	V

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC1} = 12\text{V}$, $V_{CC2} = 160\text{V}$, specified test circuit

Parameter	Symbol	Conditions	min	typ	max	Unit
Supply current	$I_{CCO(1)}$	V_{CC1} (pin 1), $V_3 = V_5 = V_7 = 2.5\text{V}$	-	1.2	1.6	mA
	$I_{CCO(2)}$	V_{CC2} (pin 16), $V_3 = V_5 = V_7 = 2.5\text{V}$	-	0.9	1.3	mA
Output voltage	V_N	Per channel output, $V_3 = V_5 = V_7 = 2.5\text{V}$	114	-	124	V
	ΔV_N	Per channel output, $V_3 = V_5 = V_7 = 0.6$ to 4.5V	65	70	-	V
BRT control pin voltage	V_{BRT}	Pins 4, 6, and 8 $V_3 = V_5 = V_7 = 2.5\text{V}$	4.6	4.8	5.0	V

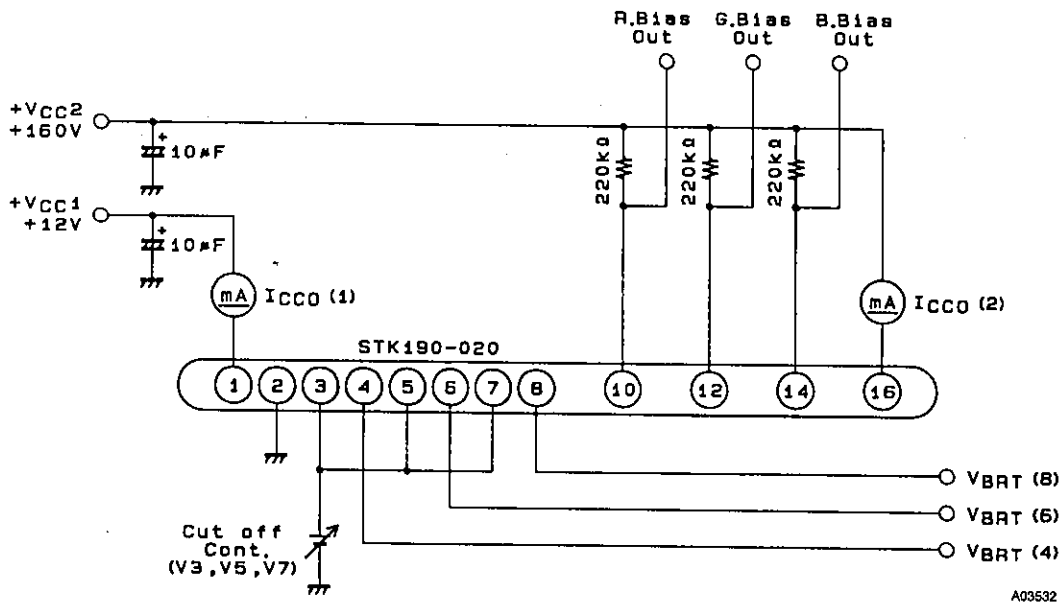
Note. All tests are measured using a fixed-voltage supply unless otherwise specified.

Equivalent Circuit



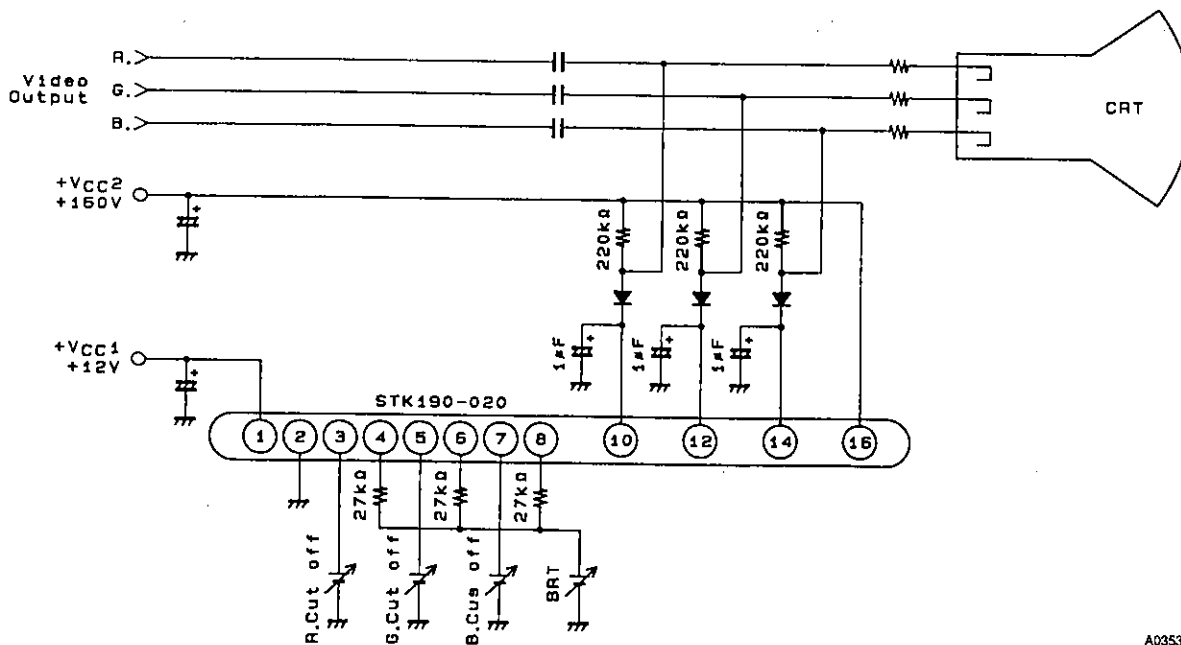
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Test Circuit



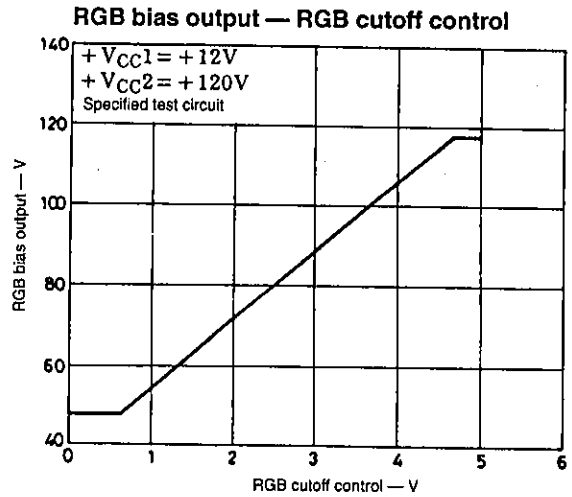
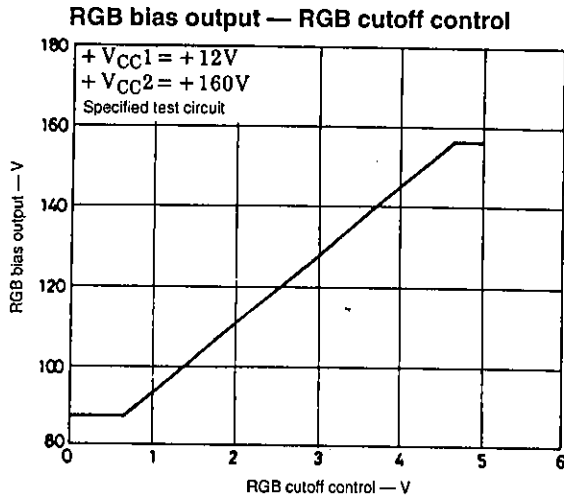
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Sample Application Circuit



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Characteristics Data



Series Organization

Type No.	Maximum ratings		Recommended supply voltage [V]	Electrical characteristics		
	V _{CC} max [V]	Pd max [mW]		V _{CC} [V]	Output voltage ¹ typ. [V]	Output voltage ² typ. [V]
STK190-010	+150	450	90 to 120	+120	80	45
STK190-020	+200	450	120 to 160	+160	119	85

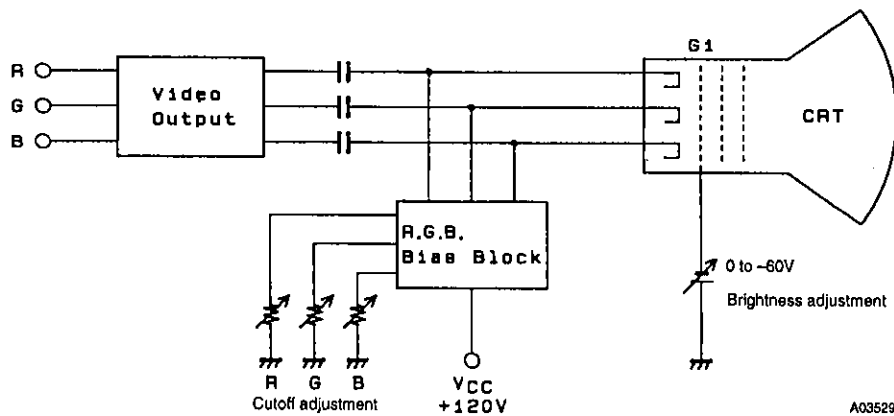
1. V₃ = V₅ = V₇ = 2.5V

2. V₃ = V₅ = V₇ = 0V

Design Rationalization

Existing Method

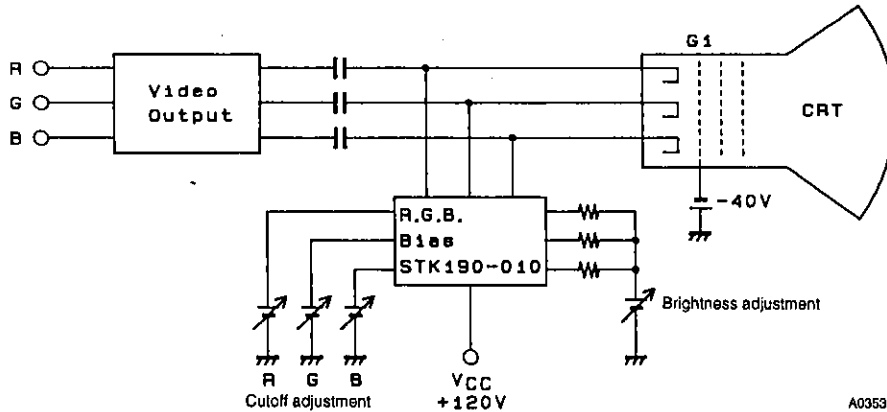
Bias adjustment on both the CRT cathode and G1 grid.
(A variable negative supply is applied to G1.)



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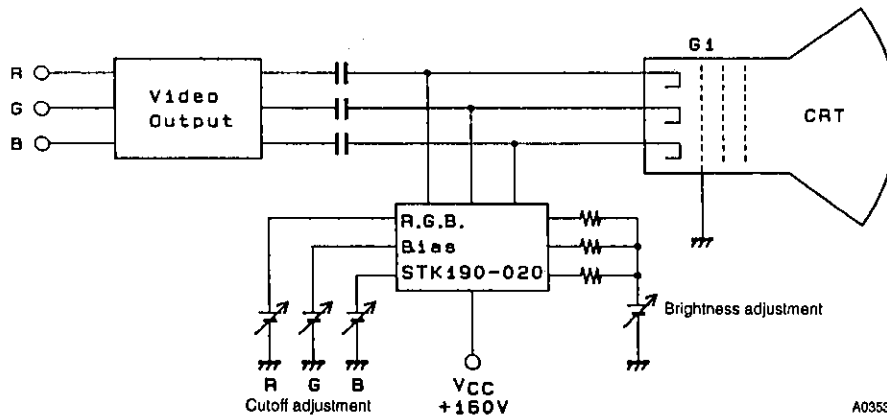
STK190-010 Method

Bias adjustment on the CRT cathode only.
(A fixed negative supply voltage is applied to G1.)



STK190-020 Method

Bias adjustment on the CRT cathode only.
(G1 is connected to ground, and therefore a negative supply is not required.)



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