

## 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.

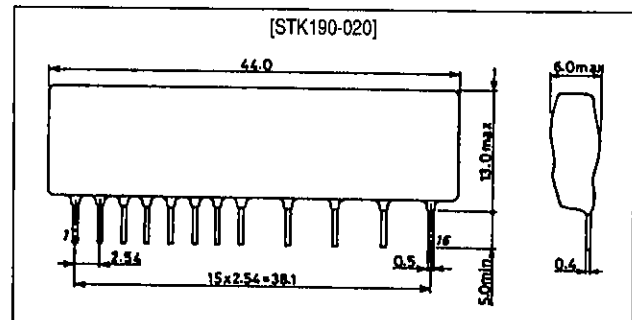
## Internal Functions

- 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 $T_a = 25^\circ\text{C}$

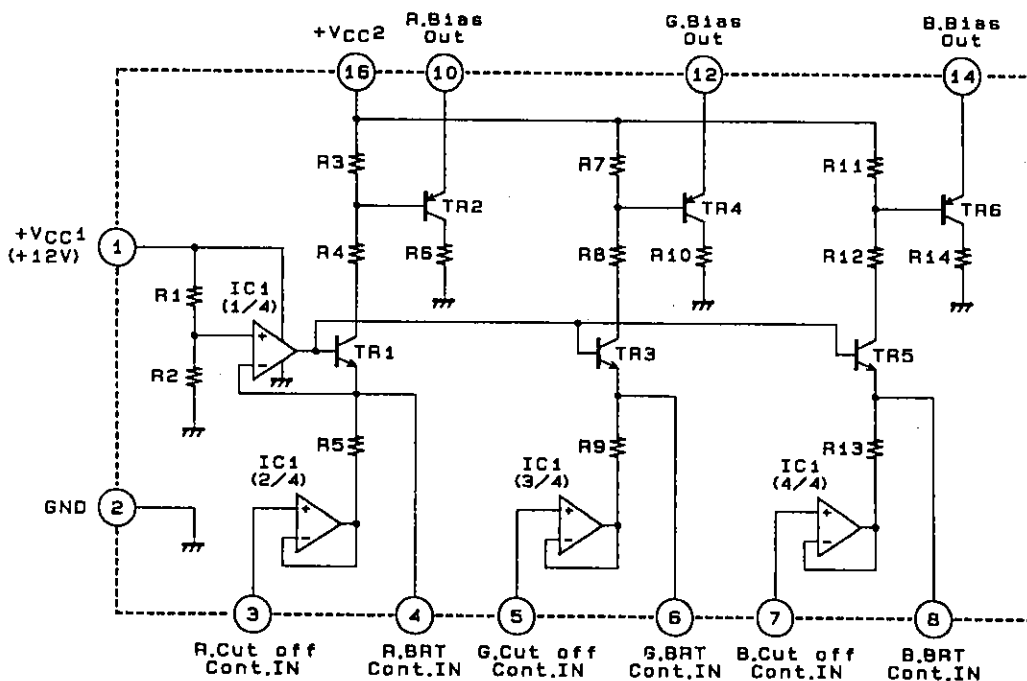
Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC1}$		12	V
	$V_{CC2}$		120 to 160	V

### 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
	$\Delta V_N$	Per channel output, $V_3 = V_5 = V_7 = 0.6$ to $4.5\text{V}$	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

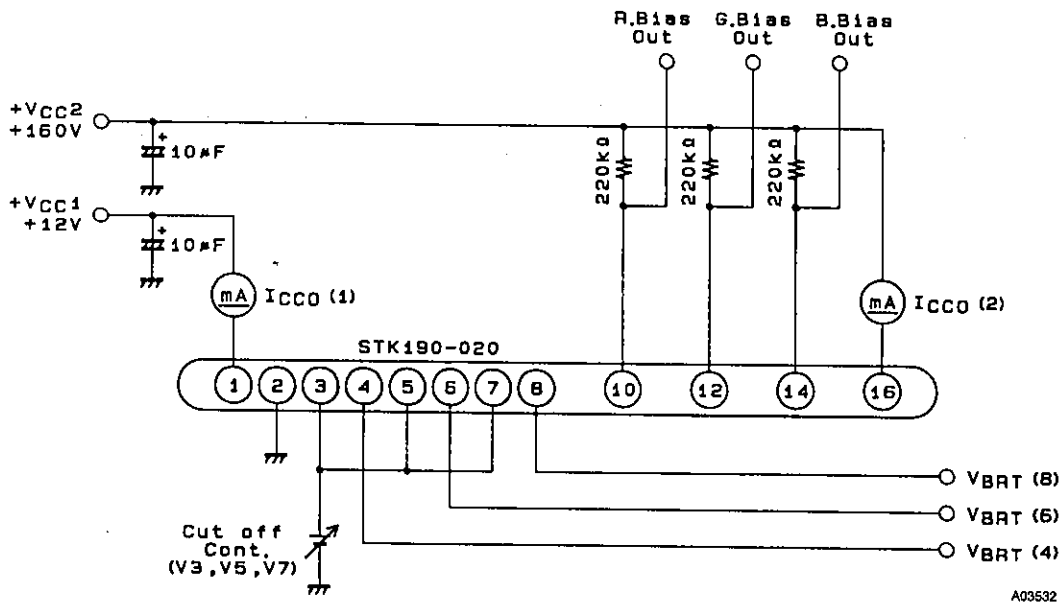
Note. All tests are measured using a fixed-voltage supply unless otherwise specified.

## Equivalent Circuit

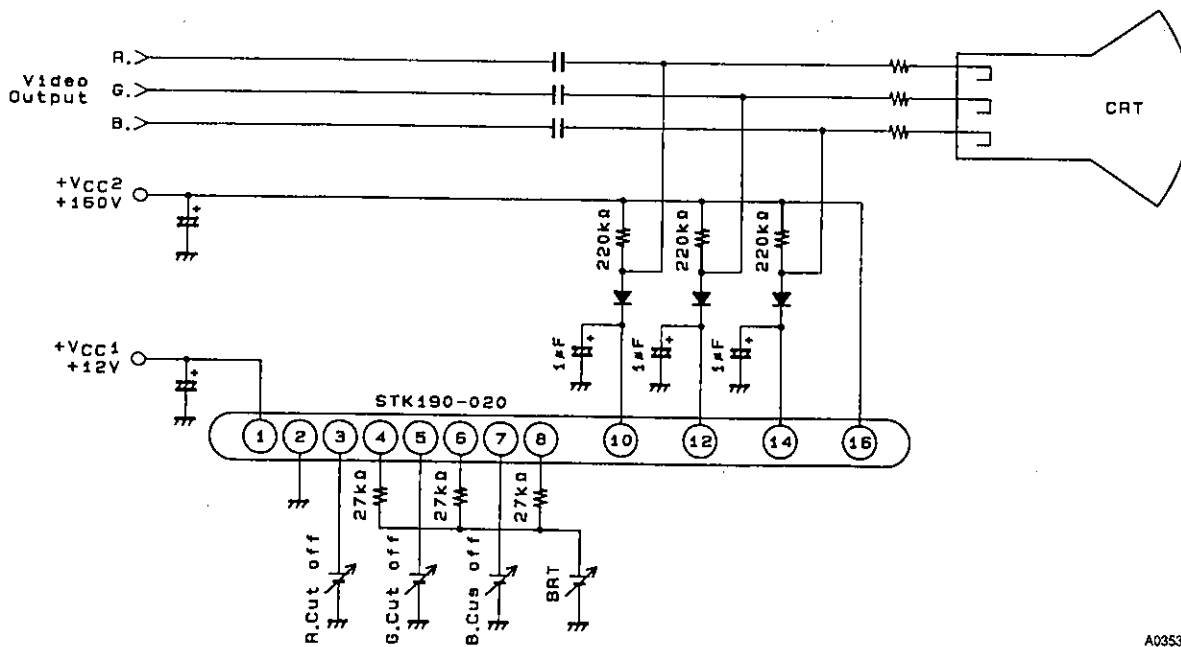


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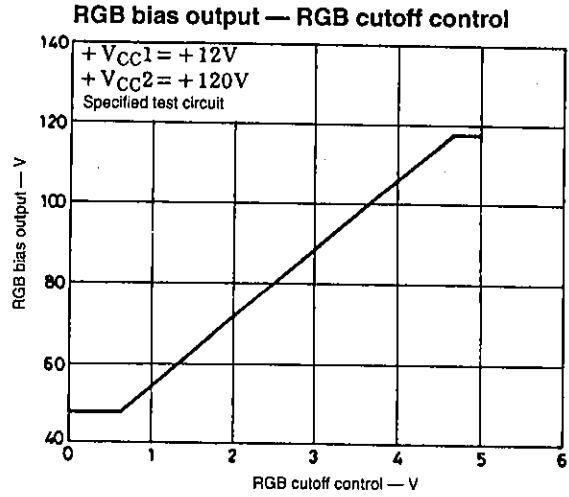
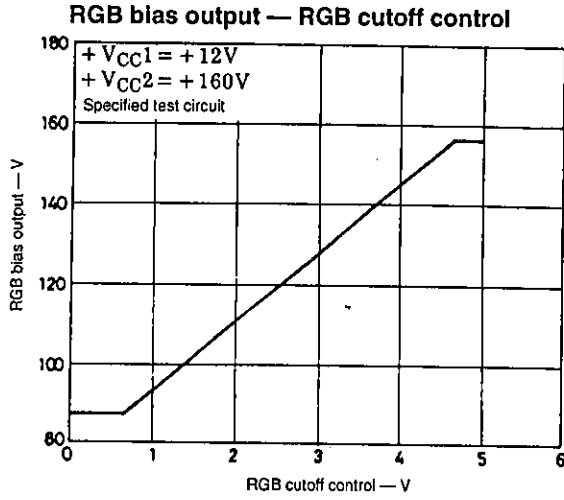
Test Circuit



Sample Application Circuit



### Characteristics Data



### Series Organization

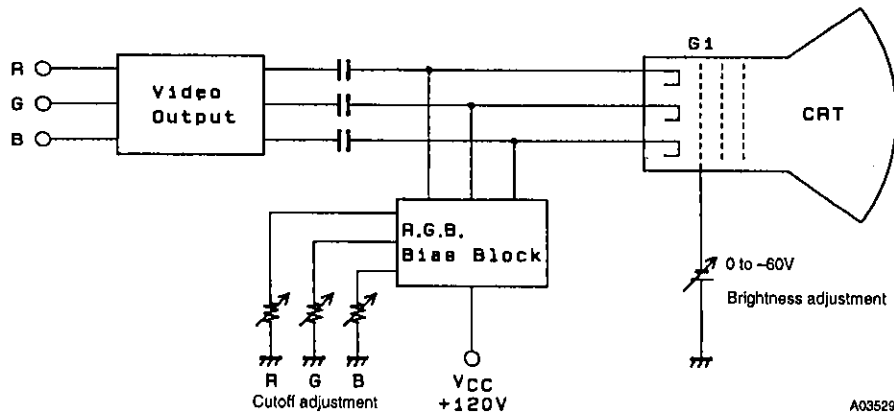
Type No.	Maximum ratings		Recommended supply voltage [V]	Electrical characteristics		
	V <sub>CC</sub> max [V]	Pd max [mW]		V <sub>CC</sub> [V]	Output voltage <sup>1</sup> typ. [V]	Output voltage <sup>2</sup> typ. [V]
STK190-010	+150	450	90 to 120	+120	80	45
STK190-020	+200	450	120 to 160	+160	119	85

- 1. V<sub>3</sub> = V<sub>5</sub> = V<sub>7</sub> = 2.5V
- 2. V<sub>3</sub> = V<sub>5</sub> = V<sub>7</sub> = 0V

### Design Rationalization

#### Existing Method

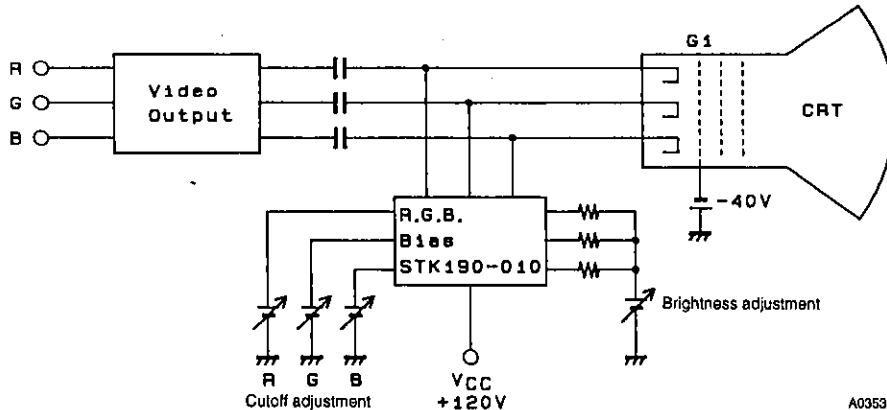
Bias adjustment on both the CRT cathode and G1 grid.  
 (A variable negative supply is applied to G1.)



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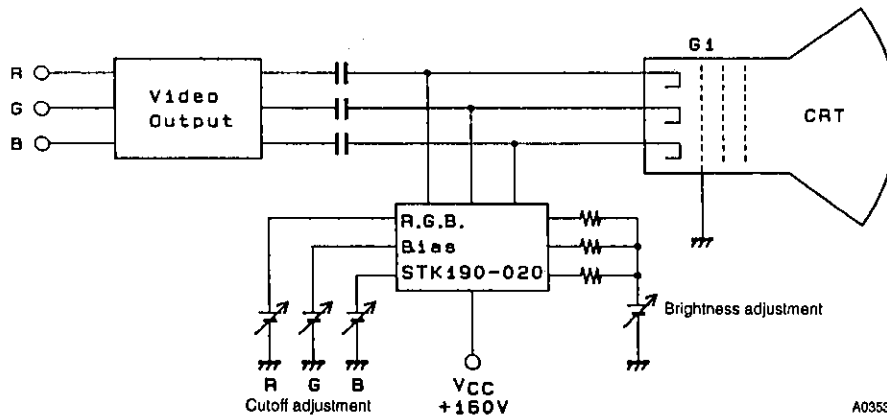
**STK190-010 Method**

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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