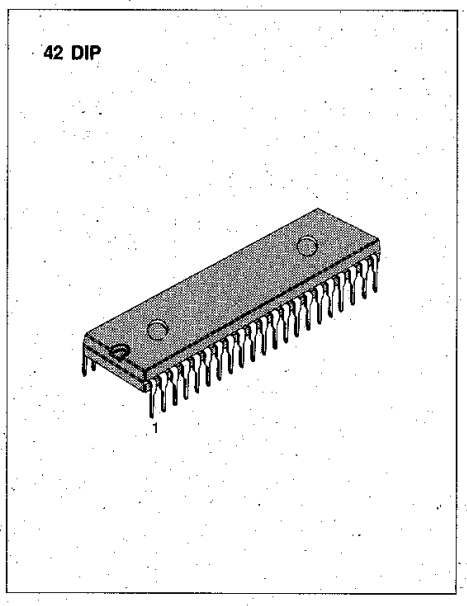
VIDEO-CHROMA DEFLECTION SYSTEM FOR A COLOR TV (NTSC)



The KA2153 combines the video-chroma sub-system and the deflection combination on a single monolithic integrated circuit to provide a color television video-chroma deflection system.

This device includes a video amplifier, color demodulator that is designed to provide color differential output, and improved sync separator, horizontal oscillator with saw tooth wave type AFC, horizontal pre-driver with X-ray protection circuit, and vertical oscillator, vertical pre-driver in a 42 leads dual in-line type plastic package.

FUNCTIONS

- Inverter-amplifier
- Contrast control
- Pedestal clamp
- Brightness control
- ACC-amplifier
- Tint control
- Uni-color control
- 3.58MHz V_{CO}
- APC
- Color-Killer
- Color demodulator
- Matrix circuit
- Sync-separator (H.V.sync in)
- $2f_H$ horizontal oscillator
- Flip-flop
- Stabilized horizontal V_{CC} by zener diode
- Horizontal pre driver
- Gate pulse generator
- Vertical sync input
- Vertical oscillator
- Ramp generator

FEATURES

Video-Chroma Section

- **Minimum numbers of external parts required.**
- **Stabilized with respect to variation of temperature and supply voltage.**
- **A few initial adjustment required.**

Deflection Section

- **Excellent temperature stability of horizontal oscillator.**
- **Exact 50% duty cycle output due to the 2-f_H oscillator and flip-flop circuit.**
- **Excellent inter-race.**
- **Stable Sync separator with V/H input terminals.**

BLOCK DIAGRAM

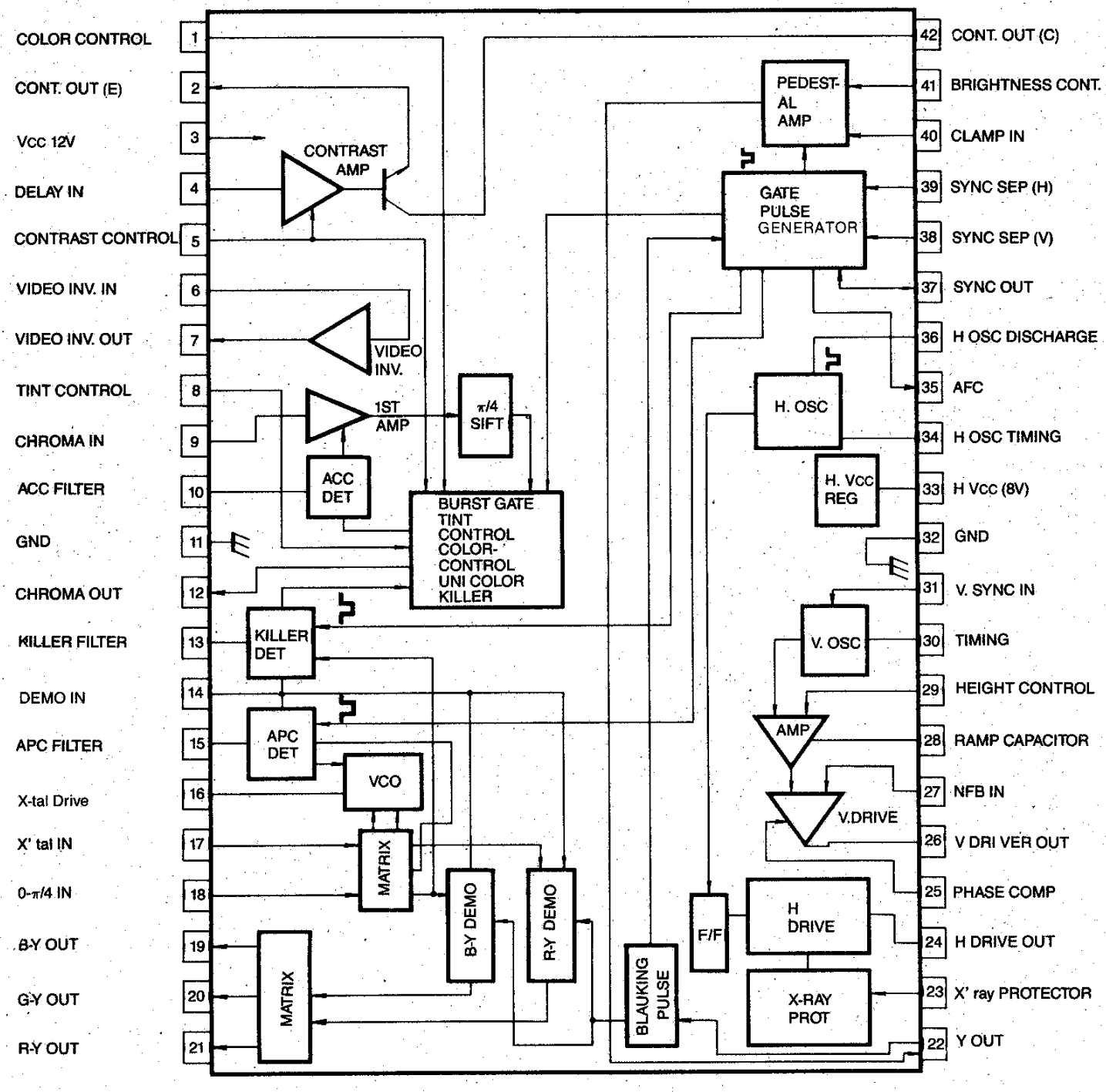


Fig. 1

MAXIMUM RATINGS (T_a = 25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_3 Max	15	V
Supply Current	I_{33} Max	40	mA
Input Signal Level	V_{in}	5	V_{p-p}
Demo. Min. Load Resistance	R_{LD}	1.8	KΩ
Horiz. Drive Peak Current	$-I_{24}$ Max	30	mA
Horiz. Drive Operating Current	$-I_{24}$	15	mA
Vert. Output Current	I_{26} Max	−5	mA
Sync separator Input Level	V_{38} Max V_{39} Max	8	V_{p-p}
Term. 7 Max. Operating Current	I_7	5	mA
Term. 2 Max. Operating Current	I_2	4	mA
Power Dissipation (Note)	P_d	2.2	W
Operating Temperature	Topr	−20 ~ 65	°C
Storage Temperature	Tstg	−55 ~ 150	°C

Note: Derated above T_a = 25°C in the proportion of 17.6mW/°C.

ELECTRICAL CHARACTERISTICS
VIDEO SECTION (Unless otherwise specified, V_3 = 12V, T_a = 25°C)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	Test Fig
12V Supply Current	I_{CC3}	Measure term. 3 current	60	82	100	mA	1
Video Gain	υ_{22}/υ_6	V_6 = 4.25V, υ_6: 4.0MHz, 1.0V_{p-p}, V_5 = 10V, V_B = 8.0V	2.0	3.5	5.0	dB	2
Contrast Gain Control Range	ΔG_V	V_6 = 4.25V, υ_6: 500KHz, 1.0V_{p-p}, V_5: 5 ~ 10V 20 log (V_{22} (max)/V_{22} (min))	11.2	12.3	13.4	dB	2
Video Frequency Characteristics	ΔG_{vf}	V_6 = 4.25V, V_5 = 10V, V_B = 8.0V υ_6 = 4.0MHz, 0.5MHz 1.0V_{P-P} 20 log (V_{22} (4MHz)/V_{22} (0.5MHz))	−3.5	−1.5	0.5	dB	2
DC Restoration Ratio	K	V_{41} = 4.1V Change APL 10% to 90% Measure pedestal level change of term. 22	63	70	77	%	2
Maximum Video Output	υ_V MAX.	Term. 5 open. change V_{40} DC voltage, measure 90% of voltage change at term. 22	5.0	7.5	—	V_{p-p}	2

ELECTRICAL CHARACTERISTICS
VIDEO SECTION (Unless otherwise specified, V_3=12V, T_a=25°C)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	Test Fig
Video DC Output Therm. Co-effic.	$\partial V_{22}/\partial T$	V_6=3.25V, V_{41}=4.1V T_a=−20~+65°C	−2.5	0	2.5	mV/°C	2
Inverter Amplifier Gain	υ_7/υ_6	V_6=4.25V, υ_6: 4.0MHz, 1.0V_{p-p}, V_5=10V, V_B=8.0V	2.2	3.5	4.6	dB	2
Inverter Amplifier Differential Gain	DG_R	V_6: 3.3~5.2V υ_6: 3.58MHz, 100mV_{P-P}	—	2.5	10	%	2
Inverter Amplifier Differential Phase	DP_R	The same condition as above	—	3	5	deg	2
Inverter Amplifier Frequency Characteristics	ΔG_{Rf}	V_6=4.25V, V_5=10V, V_B=8.0V, υ_6: 4.0MHz, 500KHz, 1.0V_{p-p} 20 log υ_7 (4MHz)/υ_7 (0.5MHz)	−3.5	−0.1	0.5	dB	2
Inverter Amplifier 3.58MHz Linearity	L_7	V_6=4.0V, υ_6=3.58MHz	1.6	—	—	V_{p-p}	2

CHROMA SECTION
(Unless otherwise specified. Gate Pulse and Blanking Pulse of TEST CIRCUIT 2 is Applied)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	Test Fig
Maximum Chroma Output	V_{CM}	V_1=12V, V_5=10V, V_8: open υ_9: 120mV_{P-P} (B:C=1:1) V_G=8V, V_B=15V, measure term. 12	0.5	0.75	1.05	V_{p-p}	3
Burst Output	V_B	The same condition as above	0.45	0.70	0.95	V_{p-p}	3
ACC Characteristics (1)	V_a	V_1=12V, V_5=10V, V_8: open υ_9=15mV_{p-p} (B:C=1:1) Measure chroma amplitude term. 12	0.16	0.34	—	V_{p-p}	3
ACC Characteristics (2)	A	V_9=100mV_{p-p}, 300mV_{p-p} (B:C=1:1) Chroma amplitude ratio at term. 12 $A=\frac{V_{12}\,(V_9=300mV_{p-p})}{V_{12}\,(V_9=100mV_{p-p})}$	—	1.0	1.3	—	3
Color Control Residual Signal	V_{CS}	V_1=0V, V_5=10V, V_8: open S_1: 1, S_2: 1, V_G=8V, V_B=15V, υ_9=120mV_{P-P} (B:C=1:1)	—	—	3	mV_{p-p}	3