μA787
CHROMA PROCESSOR
FAIRCHILD LINEAR INTEGRATED CIRCUIT

GENERAL DESCRIPTION — The μA787 is a monolithic color TV Chroma Processor circuit. It is constructed using the Fairchild Planar* epitaxial process. The device performs the entire chroma processing function in a color TV receiver. The μA787 interfaces with a variety of chroma demodulator circuits, e.g., μA746, 3067, and μA788. However, when teamed with the μA788 (chroma demodulator and dc tint control), it offers the most complete 2-chip chroma system, featuring reduced component count and minimum adjustments.

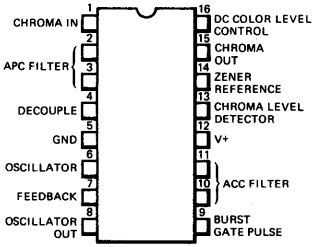
Automatic color level control, an additional feature of the μA787 controls the gain of the chroma bandpass amplifier by detection of the chroma level. ACC and ACL work in conjunction to give superior chroma performance under varying signal conditions.

- **GAIN CONTROLLED CHROMA BANDPASS AMPLIFICATION**
- **DC COLOR LEVEL CONTROL**
- **SYNCHRONOUS BURST LEVEL DETECTION (ACC)**
- **COLOR KILLER**
- **PHASE LOCKED CHROMA SUBCARRIER REGENERATION (APC)**
- **PEAK CHROMA LEVEL DETECTION (ACL)**
- **ACC AND COLOR KILLER ADJUSTMENTS NOT REQUIRED**

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	14 V
Power Dissipation	730 mW
Current into Zener Reference Terminal	20 mA
Operating Temperature Range	0°C to +70°C
Storage Temperature Range	−55°C to +125°C
Lead Temperature (soldering, 10 s)	260°C

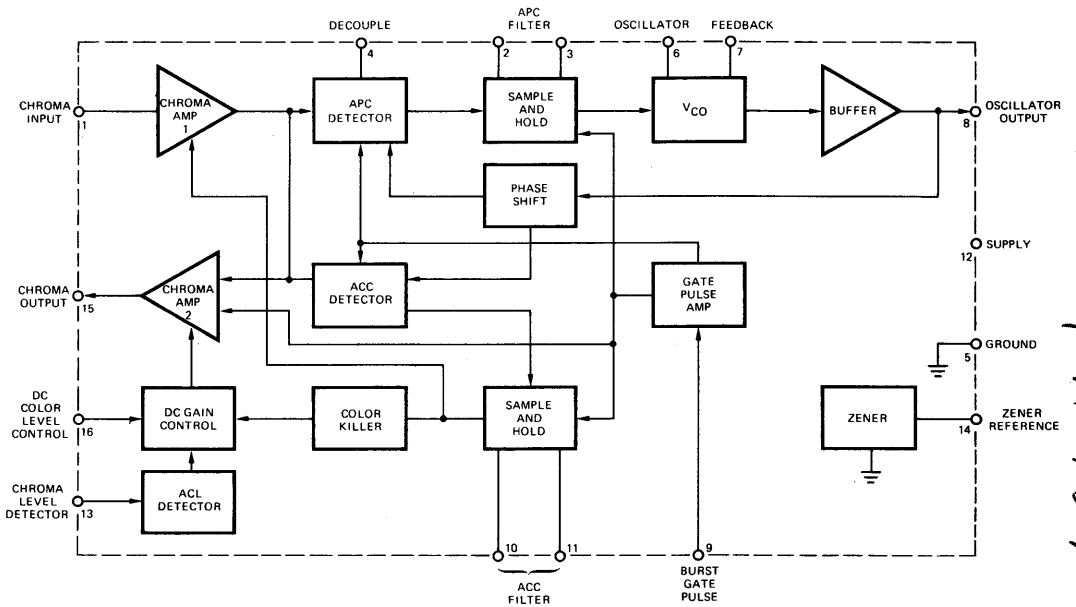
CONNECTION DIAGRAM
16-LEAD DIP
(TOP VIEW)
PACKAGE OUTLINE 9B
PACAKGE CODE P



ORDER INFORMATION

TYPE	PART NO.
μA787	μA787PC

BLOCK DIAGRAM



μA787

*Planar is a patented Fairchild process

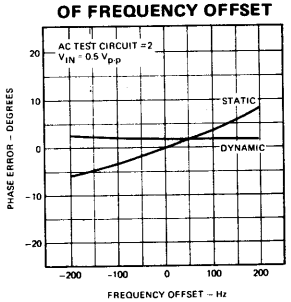
DC ELECTRICAL CHARACTERISTICS (T_A = 25°C, S1 and S2 normally open, Test Circuit 1, unless otherwise specified.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Current			26	36	mA
Zener Reference		11.1	11.9	12.7	V
Chroma Input			2.1		V
APC Filter			8.0		V
Decouple Bypass			7.5		V
Oscillator			8.0		V
Oscillator Feedback			2.0		V
Oscillator Output			7.6		V
Burst Gate Input	S2 Closed		1.7		V
ACC Filter			8.0		V
Chroma Level Detector			0.54		V
Chroma Output	S1, S2 Closed		6.2		V

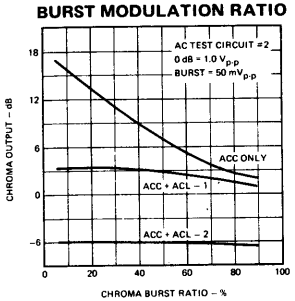
AC CHARACTERISTICS (V_{12} = 11.2 V, S3 normally open, Test Circuit 2, unless otherwise specified.)

Oscillator Output	V_{IN} = 0	0.6	1.1	1.8	V_{p-p}
Chroma Output	V_{IN} = 0.5 V_{p-p}	1.5	2.5	4.0	V_{p-p}
Oscillator Pull In Range	V_{IN} = 0.5 V_{p-p}	200	400		Hz
Chroma Output	S3 Closed		450		mV_{p-p}
Chroma Input Level for Color Killer Threshold		5.0	20	50	mV_{p-p}

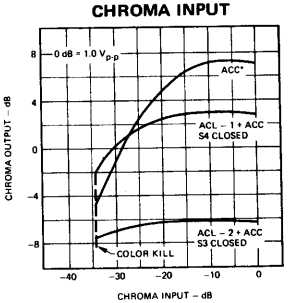
DYNAMIC AND STATIC PHASE ERROR AS A FUNCTION OF FREQUENCY OFFSET



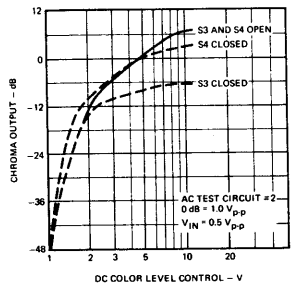
CHROMA OUTPUT AS A FUNCTION OF CHROMA BURST MODULATION RATIO



CHROMA OUTPUT AS A FUNCTION OF CHROMA INPUT

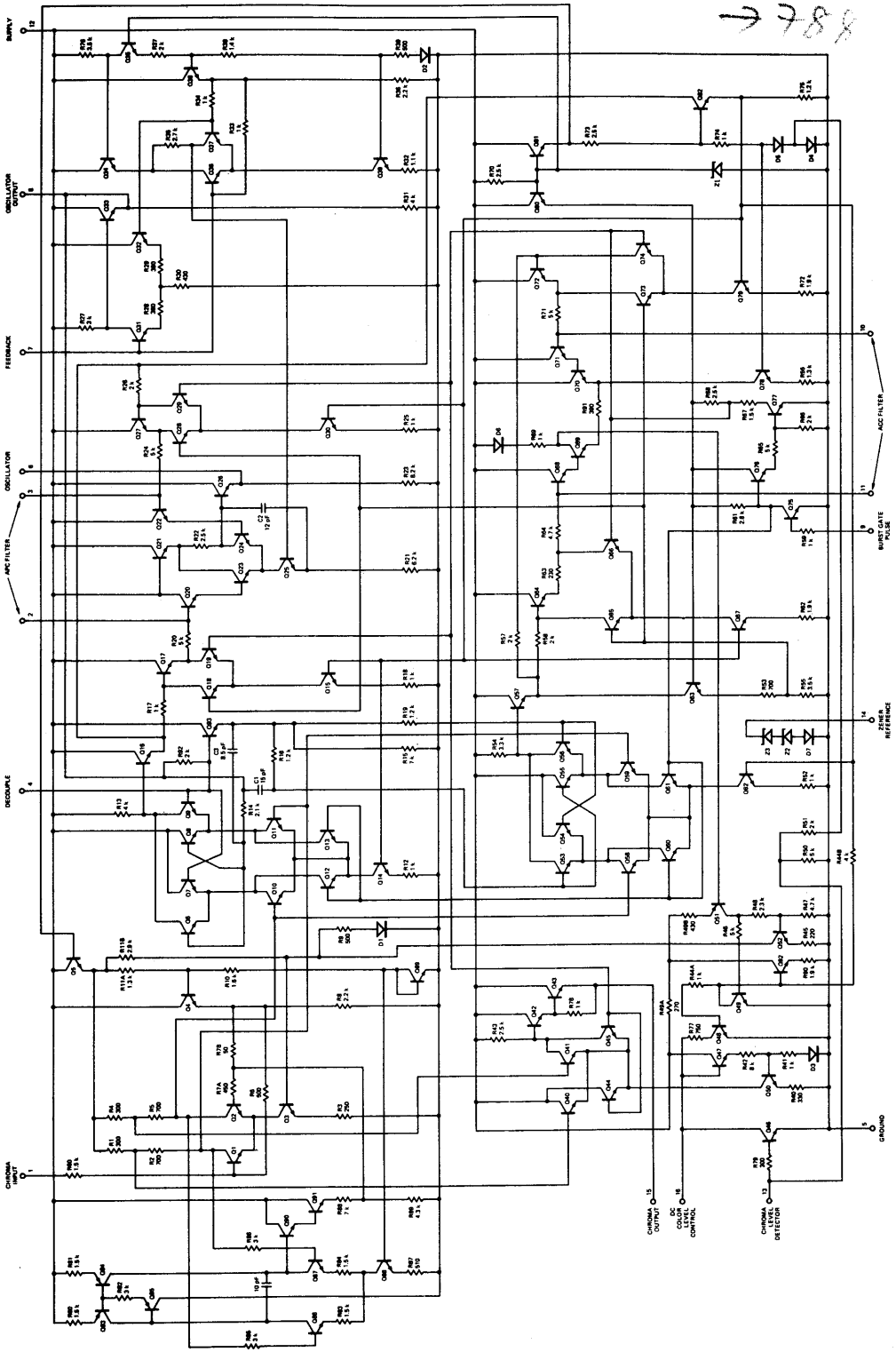


CHROMA OUTPUT AS A FUNCTION OF DC COLOR LEVEL CONTROL VOLTAGE

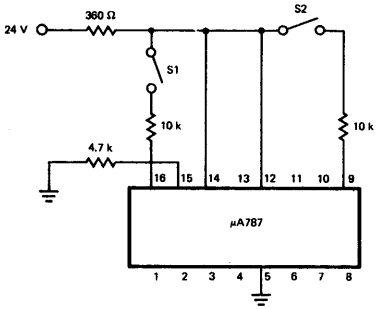


ACC — Output controlled by ACC only
ACL – 1 — Output partially controlled by ACL
ACL – 2 — Output fully controlled by ACL

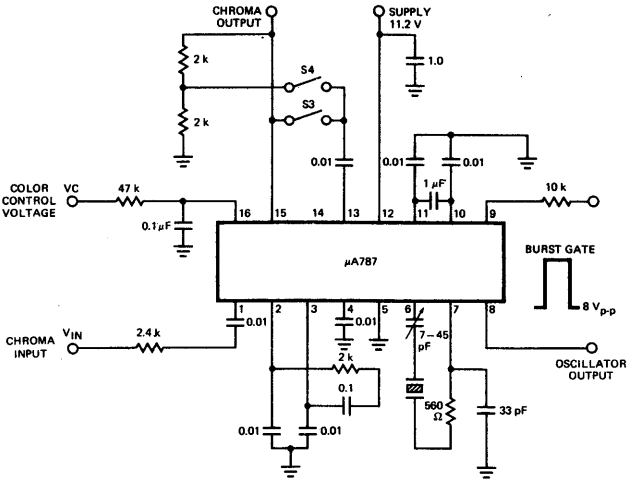
EQUIVALENT CIRCUIT



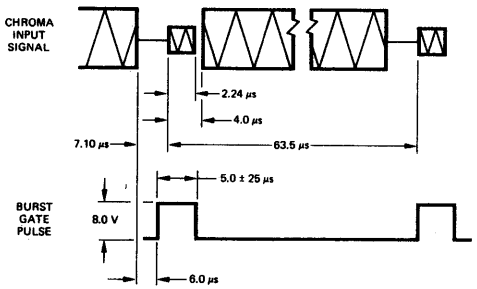
DC TEST CIRCUIT 1



AC TEST CIRCUIT 2



AC TEST SIGNAL (V_{IN})

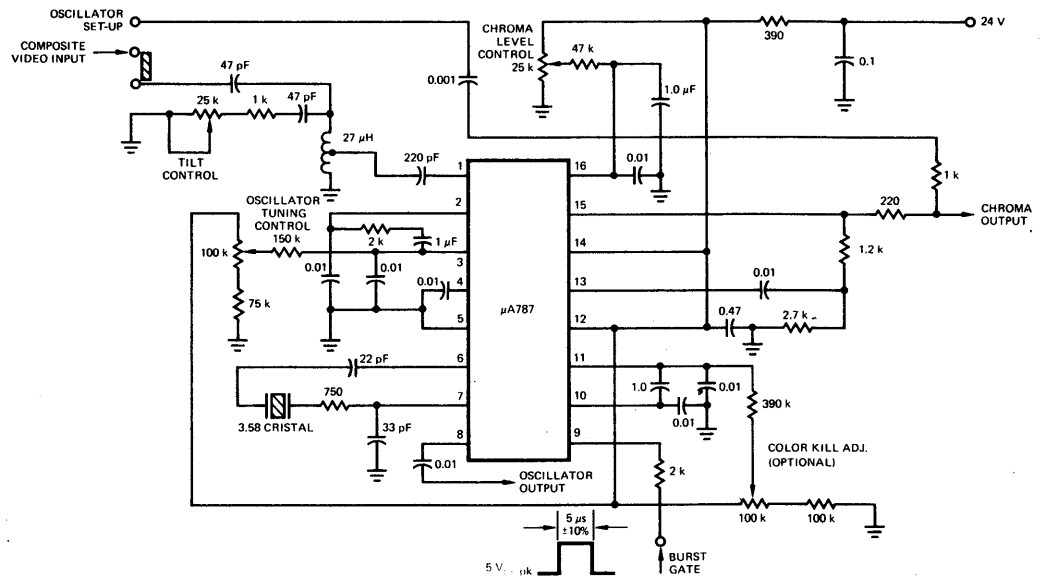


Burst® 8 Cycles –3.58 MHz amplitude is 46.5% of chrominance with first and last cycle being at least 85% full amplitude. Amplitude of remaining cycles shall be within 5% of specification value. Chroma amplitude is 0.5 V Peak-to-Peak.

NOTES

1. Burst position during blanking interval may be altered if necessary.
2. Chrominance duration is 52 μs.
3. Burst gate pulse applied to test circuit is timed to coincide with burst.

TYPICAL APPLICATION



μA788

TV CHROMA DEMODULATOR AND DC TINT CONTROL

FAIRCHILD LINEAR INTEGRATED CIRCUIT

GENERAL DESCRIPTION – The μA788 is a monolithic chroma demodulator with a dc tint control. It is constructed using the Fairchild Planar* epitaxial process. The device adds the luminance and color difference signals and provides direct coupled color signals to the video output drivers. The tint control section of the IC has a constant amplitude output with dc phase control.

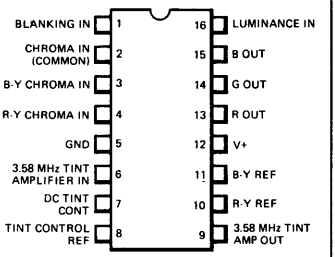
The μA788 will interface with several chroma processing systems, e.g., 3066 or μA780/μA781, but is intended to complement the μA787 chroma processing IC to form a 2-chip chroma system with optimum performance.

- **10 V PEAK-TO-PEAK BLUE OUTPUT**
- **INTERNAL SUBCARRIER FILTERING**
- **COLOR DIFFERENCE OR RGB SIGNALS AT THE OUTPUT**
- **LUMINANCE SIGNAL INPUT**
- **HORIZONTAL RETRACE BLANKING PULSE INPUT**
- **DC TINT CONTROL**
- **TINT RANGE ADJUSTABLE TO 150**

ABSOLUTE MAXIMUM RATINGS

Supply Voltage (V+)	28 V
Power Dissipation	730 mW
Operating Temperature Range	0°C to 70°C
Storage Temperature Range	−55°C to +125°C
Lead Temperature Molded DIP (soldering, 10 s)	260°C
Luminance Input Voltage	Supply Voltage (V+)
Minimum Tint Control Reference Load Resistance (Pin 8)	8.0 kΩ
Minimum Output Load Resistance (Pins 9, 13, 14, 15)	3.0 kΩ
Peak-to-Peak Reference Voltage (Pins 10, 11)	5.0 V
Peak-to-Peak Chroma Voltage (Pins 2, 3, 4)	5.0 V
Blanking Input Voltage	−3.0 V to +7.0 V

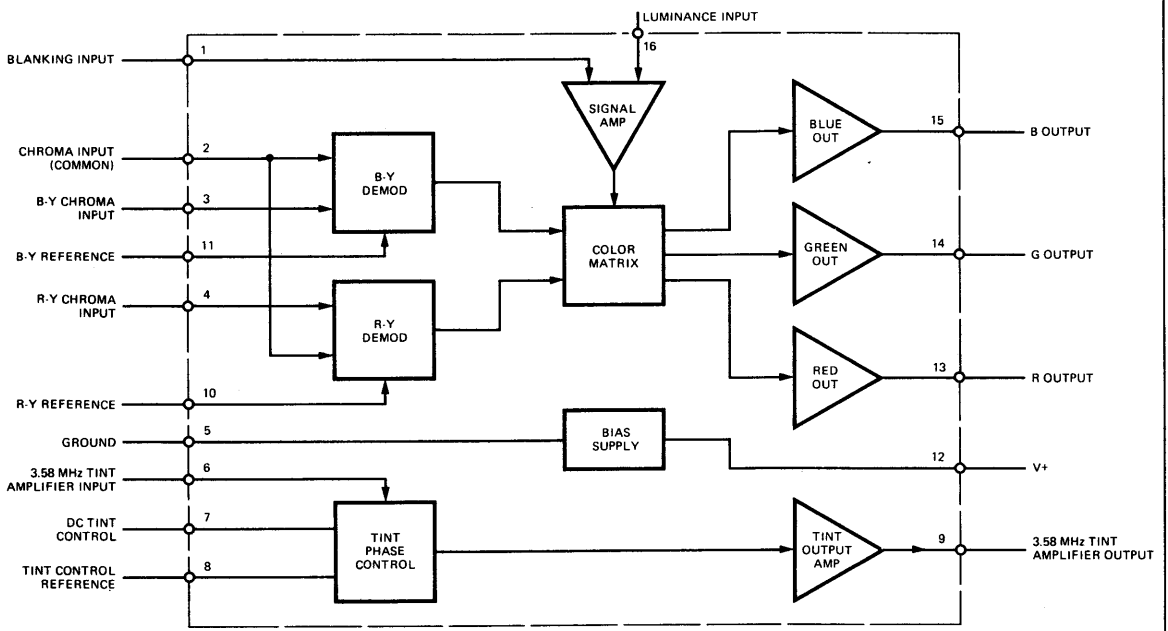
CONNECTION DIAGRAM
16-LEAD DIP
(TOP VIEW)
PACKAGE OUTLINE 9B
PACKAGE CODE P



ORDER INFORMATION

TYPE	PART NO.
788	μA788PC

BLOCK DIAGRAM



DC CHARACTERISTICS (T_A = 25°C, V+ = 24 V, Test Circuit 1, unless otherwise specified.)

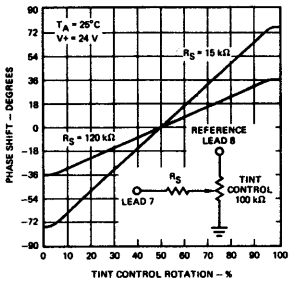
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
DC Bias Voltages					
Blanking Input (V1)	S1 Closed		1.2		V
Common Chroma Input (V2)			3.0		V
B-Y, R-Y Chroma Input (V3, V4)			3.0		V
3.58 MHz Tint Input (V6)			3.0		V
DC Tint Phase Control Input (V7)			5.6		V
Tint Phase Control Reference (V8)			11.2		V
3.58 MHz Tint Output (V9)			16		V
R-Y, B-Y Reference Input (V10, V11)			5.6		V
Demodulator Output (V13, V14, V15)		13	14.5	16	V
Luminance Input (V16)			23.8		V
Supply Current			25	33	mA
Blanking Input Current (I1)	V1 = 5.0 V		4.5		mA
Luminance Input Resistance (Pin 16)			100		kΩ
Chroma Input Resistance (Pins 2, 3, 4)			2.0		kΩ
Chroma Input Capacitance (Pins 2, 3, 4)			5.0		pF
Reference Input Resistance (Pins 10, 11)			2.0		kΩ
Reference Input Capacitance (Pins 10, 11)			6.0		pF
3.58 MHz Tint Amp Input Resistance (Pin 6)			2.0		kΩ
3.58 MHz Tint Amp Input Capacitance (Pin 6)			3.0		pF
3.58 MHz Tint Amp Output Resistance (Pin 9)			200		Ω
Demodulator Output Temperature Coefficient (V13, V14, V15)			−3.0		mV/°C

AC CHARACTERISTICS (T_A = 25°C, V+ = 24 V, Test Circuit 2, unless otherwise specified.)

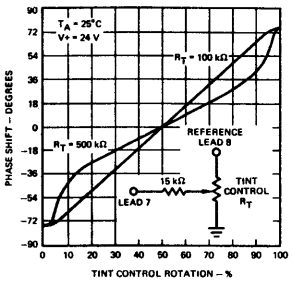
Tint Amp Output Voltage (V9)		1.0	2.0		V_{p-p}
Maximum Available Tint Range			150		Degrees
Blue Output Voltage	Chroma Input V3 = V4 = 0.7 V_{p-p}	6.0	8.0		V_{p-p}
B-Y Demodulator Conversion Gain	Blue Output V15 = 5.0 V_{p-p}	10	16		V/V
Demodulator Output Gain Relative to B-Y Output (V15)	B-Y Output (V15) Normalized to 1.0				
R-Y Output (V13)		0.65	0.76	0.84	
G-Y Output (V14)		0.15	0.20	0.25	
Demodulator Output Phase Angle Relative to B-Y Output	B-Y Output Phase Normalized to 0°				
R-Y Output (V13)		101	106	111	Degrees
G-Y Output (V14)		248	256	264	Degrees
Differential Voltage Between Any Two Demodulator Outputs (V13, V14, V15)	Chroma Input = 0		0.3		V
Demodulator ac Unbalance Voltage (V13, V14, V15)	Chroma Input = 0		0.2		V_{p-p}
Gain From Luminance Input	S2 Closed				
(Lead 16) to Demodulator Outputs	f = 1.0 kHz		0.95		V/V
	f = 5.0 MHz		0.5		V/V

TYPICAL PERFORMANCE CURVES

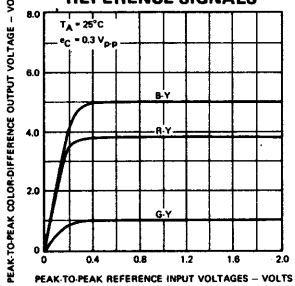
TINT CONTROL – RANGE



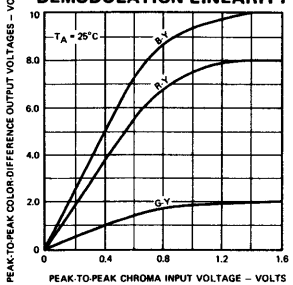
TINT CONTROL – LINEARITY



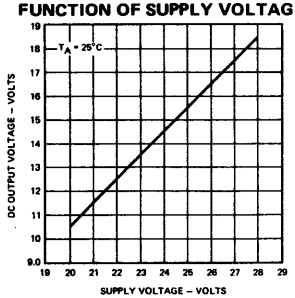
DEMODULATION SENSITIVITY TO AMPLITUDE OF REFERENCE SIGNALS



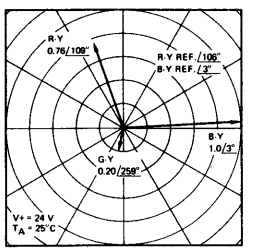
DEMODULATION LINEARITY



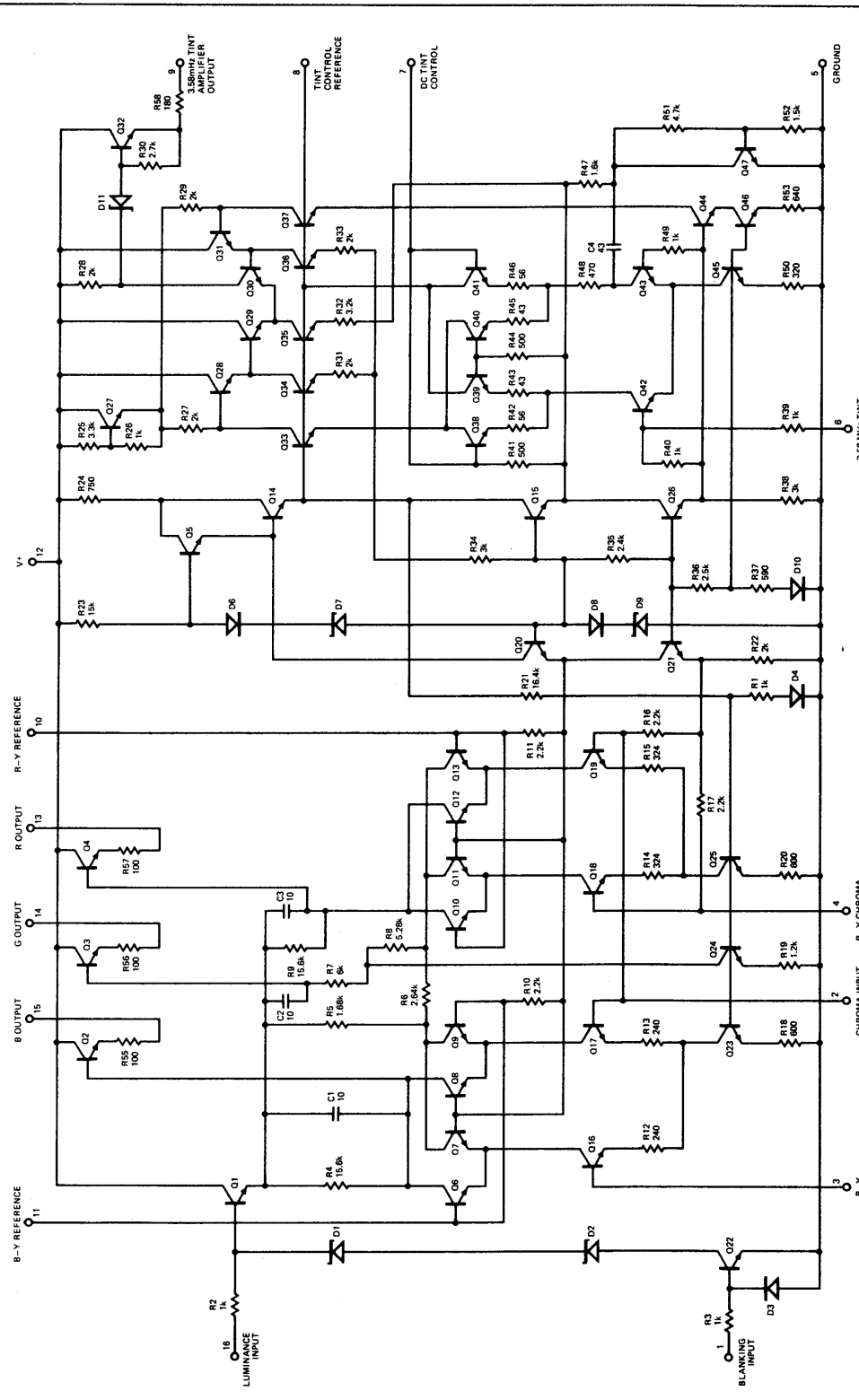
DC VOLTAGE AT ANY DEMODULATOR OUTPUT AS A FUNCTION OF SUPPLY VOLTAGE



DEMODULATION ANGLES AND RELATIVE GAINS



EQUIVALENT CIRCUIT



ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPACITOR VALUES ARE IN PICO FARADS.

TYPICAL APPLICATION