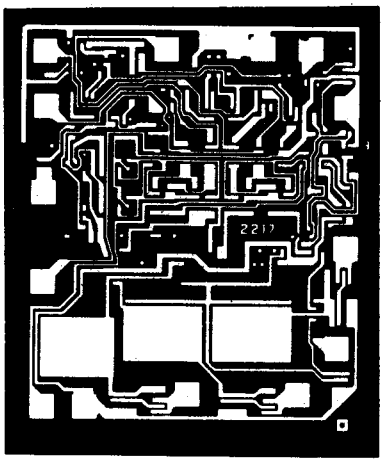
ULN-2217A/TDA1327 CHROMA DEMODULATOR FOR USE IN PAL SYSTEM COLOR TV RECEIVERS

FEATURES

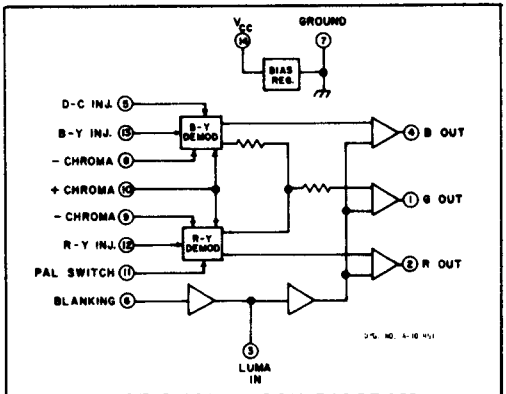
- Luminance and Blanking Inputs
- Good Chroma Sensitivity
- Excellent Temperature Stability
- Balanced PAL Switch
- Low Output Offset Voltage
- High-Level Outputs
- Pin-for-Pin Replacement for MC1327/TBA327

FEATURING improved demodulator temperature stability, the ULN-2217A/TDA1327 chroma demodulator is specifically intended for use in TV receivers utilizing the PAL color system. When used in conjunction with the ULN-2216A luminance processor and the ULN-2218A chroma processor, these three devices constitute a complete PAL color system.

The ULN-2217A/TDA1327 silicon monolithic integrated circuit consists of two double-balanced color demodulators, a resistor matrix to derive the green signal, luminance and blanking amplifiers, balanced PAL switch, three high-level emitter-follower output amplifiers, and a very stable bias voltage supply.



These integrated circuits will be marked ULN-2217A unless other marking is specified for production orders.



FUNCTIONAL BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{CC}	30 V
Chroma Input Voltage, V_8, V_9, V_{10}	5.0 V_P
Reference Input Voltage, V_5, V_{12}, V_{13}	5.0 V_P
Luminance Input Voltage, V_3	12 V_{PP}
Blanking Input Voltage, V_6	7.0 V_{PP}
Minimum Output Load Resistance, R_L	3.0 kΩ
Operating Temperature Range, T_A	−40°C to +85°C
Storage Temperature Range, T_S	−65°C to +150°C

STATIC ELECTRICAL CHARACTERISTICS at T_A = 25°C, V_{CC} = +24 V, R_L = 3.3 kΩ, Figure 1 (unless otherwise noted)

Characteristic	Test Pin	Test Conditions	Limits Min.	Typ.	Max.	Units	Notes
Quiescent Output Voltage	1, 2, 4		13.2	14.5	15.8	V	—
Quiescent Input Current		$R_L = \infty$	—	7.5	—	mA	—
		R_L = 3.3 kΩ	16	19	26	mA	—
Reference Input Voltage	5, 12, 13		—	6.2	—	V	—
Chroma Input Voltage	8, 9, 10		—	3.4	—	V	—
Differential Output Voltage	1, 2, 4	Figure 2	—	300	600	mV	1
Differential Output Voltage Temperature Coefficient	1, 2, 4	Figure 2, T_A = +25°C to +65°C	—	+0.7	—	mV/°C	1
Output Voltage Temperature Coefficient	1, 2, 4	Figure 2, T_A = +25°C to +65°C	—	+0.5	+5.0	mV/°C	1

DYNAMIC ELECTRICAL CHARACTERISTICS at T_A = 25°C, V_{CC} = +24 V, Reference Input Voltage = 1.0 V_{pp}, Figure 3 (unless otherwise noted)

Characteristic	Test Pin	Test Conditions	Limits Min.	Typ.	Max.	Units	Notes
Detector Output Voltage (B)	4		8.0	10	—	V_{PP}	2
Chroma Input Voltage	8		—	280	550	mV_{PP}	3
Detector Output Voltage (G)	1		1.4	1.8	2.2	V_{PP}	3, 4
Detector Output Voltage (R)	2		2.5	2.9	3.3	V_{PP}	3, 4
Demodulator Unbalance Voltage	1, 2, 4	Chroma input = 0	—	200	300	mV_{PP}	—
Residual Carrier and Harmonics	1, 2, 4		—	0.6	1.0	V_{PP}	5
Luminance Gain	1, 2, 4	f_{in} = 0	—	−0.4	—	dB	—
		Reference at 100 kHz, f_{in} = 5 MHz	—	−1.8	—	dB	—
Differential Luma Gain	1, 2, 4	f_{in} = 5 MHz	—	0.3	—	dB	—
PAL Switch Operating Range	11	f_{in} = 7.8 kHz square wave	0.3	—	3.0	V_{PP}	—
PAL Output Offset	2, 11	f_{in} = 7.8 kHz square wave	—	—	100	mV_{DC}	—
Reference Input Resistance	12, 13	Chroma input = 0	—	2.0	—	kΩ	—
Reference Input Capacitance	12, 13	Chroma input = 0	—	6.0	—	pF	—
Chroma Input Resistance	8, 9, 10		—	2.0	—	kΩ	—
Chroma Input Capacitance	8, 9, 10		—	2.0	—	pF	—
Luminance Input Resistance	3		100	—	—	kΩ	—
Blanking Input Resistance	6	V_{IN} = 1.0 V_{DC}	—	1.1	—	kΩ	—
		V_{IN} = 0 V_{DC}	—	75	—	kΩ	—

NOTES:
1. Reference input signal voltage = 1.0 V_{PP}
2. Chroma input signal voltage = 1.2 V_{PP}
3. Adjust chroma input signal voltage for B output = 5.0 V_{PP}
4. Luminance input signal voltage = 23 V
5. Tested with input signal voltage and B output = 5.0 V_{PP}

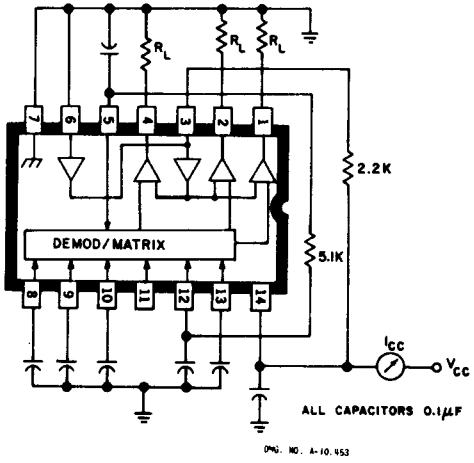


Figure 1

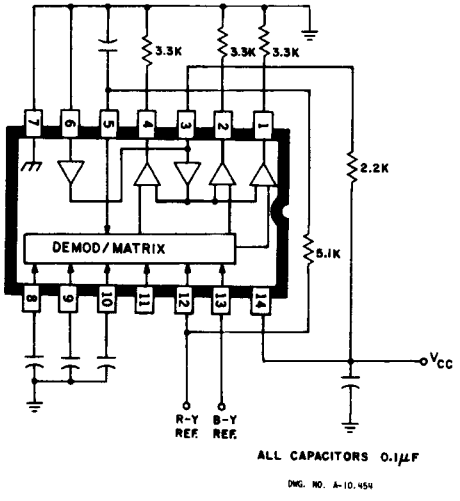


Figure 2

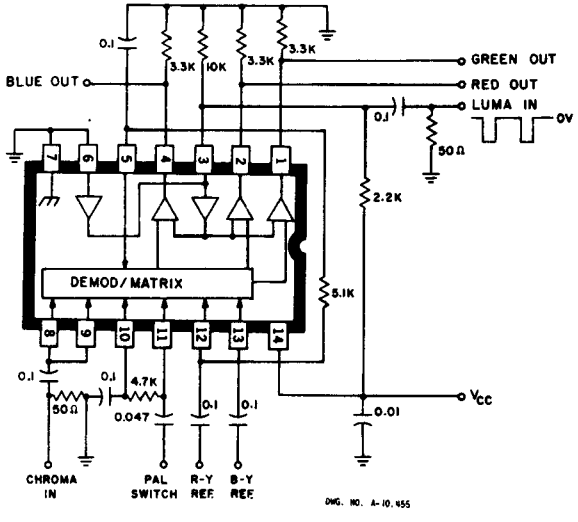
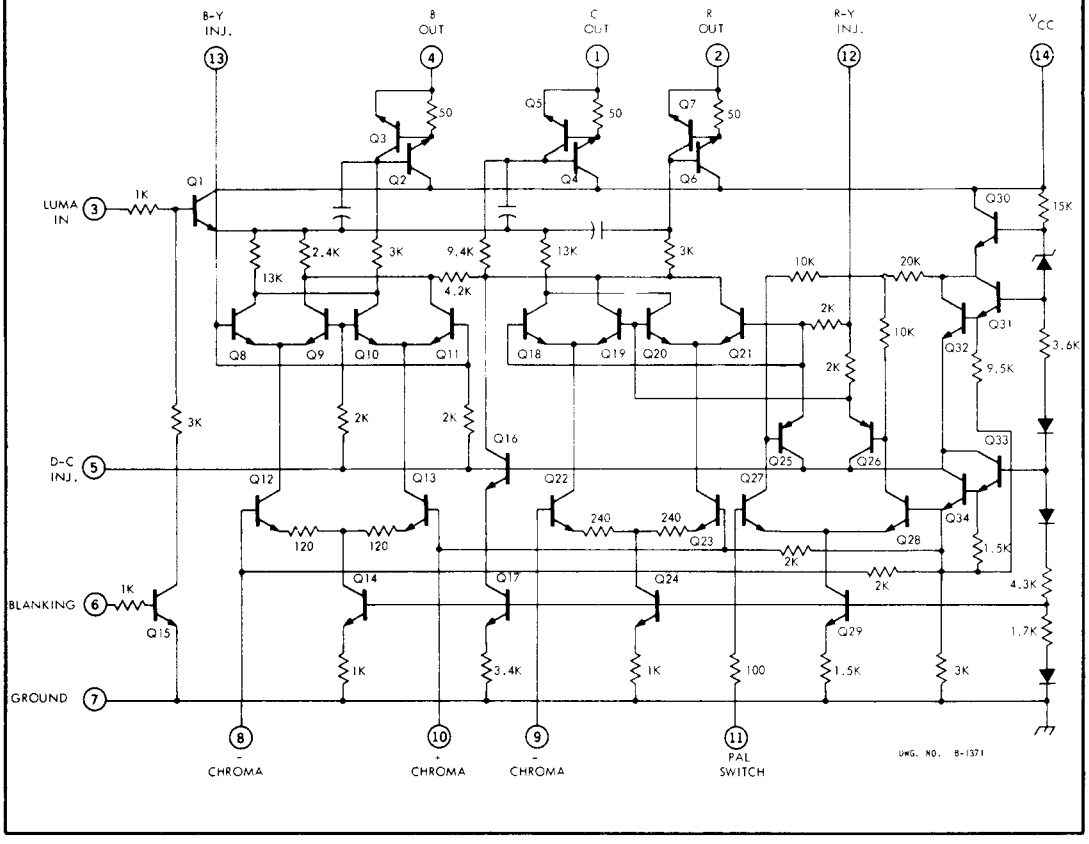
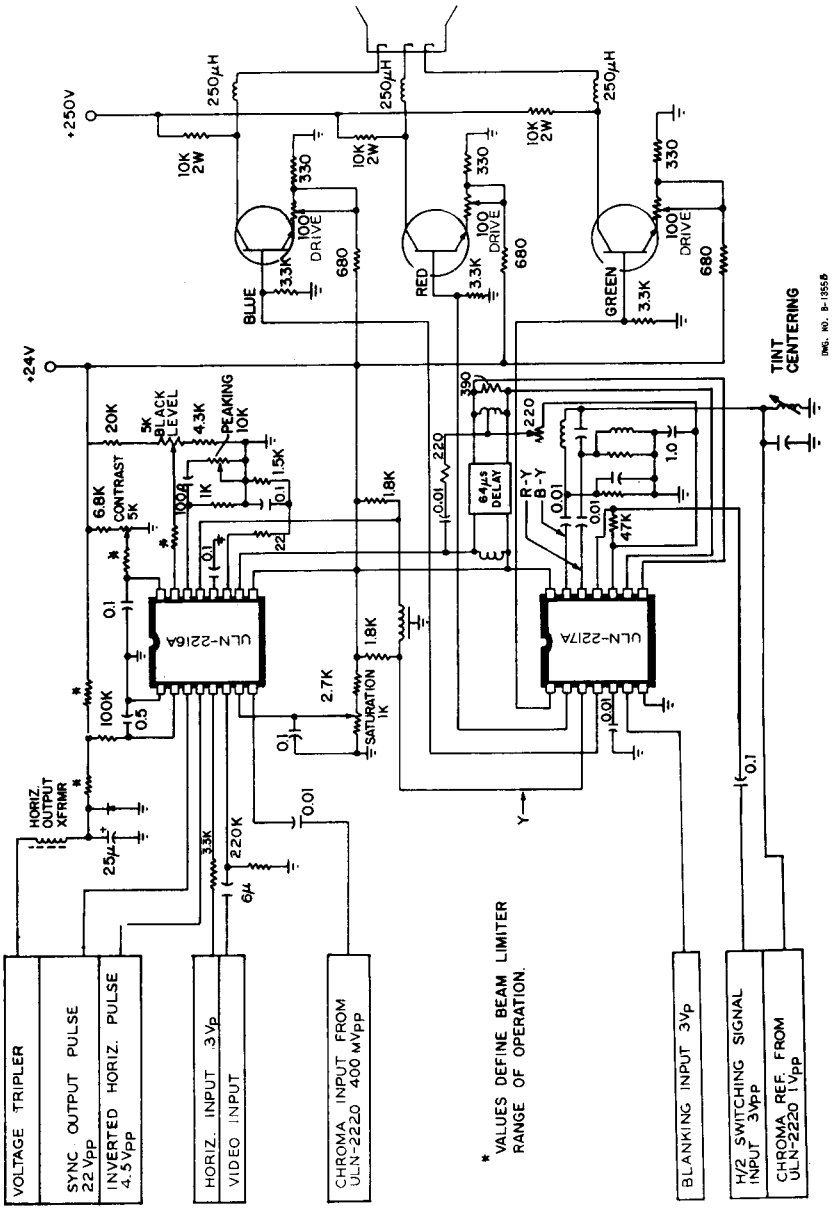


Figure 3

CIRCUIT SCHEMATIC





PAL LUMINANCE-CHROMA SYSTEM

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