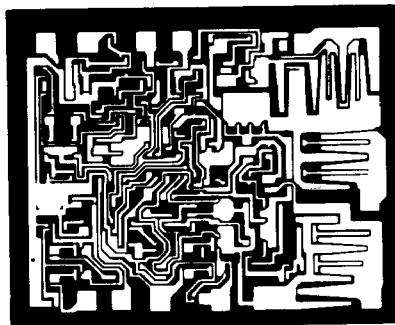


ULN-2270B AND ULN-2270Q/TDA1170 VERTICAL DEFLECTION SYSTEMS

FEATURES

- Internal Reference
- Positive or Negative Sync Input
- Vertical Ramp Generator
- Vertical Driver
- Flyback Generator
- Single-Supply Operation



AS A SINGLE DEVICE containing a vertical oscillator, a flyback generator and a power amplifier, this vertical deflection system can greatly simplify design of black-and-white and small-screen color television receivers.

The oscillator of Types ULN-2270B and ULN-2270Q is directly synchronized by positive or negative sync pulses. A current feedback loop makes yoke current independent of yoke resistance changes caused by operating temperature variations. The flyback generator develops the high voltage required by the yoke for short flyback time and high efficiency.

Type ULN-2270B is supplied in a 16-pin dual in-line plastic package with heat sink contact tabs. Its copper alloy lead frame gives enhanced power dissipation ratings with standard cooling methods. Greater package power dissipation is available with attachment of an external heat sink to the webbed center leads of the device. The lead configuration makes possible easy attachment of a heat sink and

use of a standard integrated circuit socket or printed wiring board layout.

Type ULN-2270Q/TDA1170 is supplied in a 16-pin quad in-line plastic package. It uses the printed wiring board on which it is mounted as a heat sink. Small heat sinks can also be attached to the center tabs of the device. The device carries the Sprague Electric Company part number (ULN-2270Q) unless the Pro-Electron marking (TDA1170) is requested.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{CC}	27 V
Peak Flyback Voltage, V_6-V_7	58 V
Sync Input Voltage, V_{I0}	± 12 V
Amp. Input Voltage Range, V_{I4}	-0.5 V to +10 V
Peak Output Current, I_6 (50 Hz, $\approx 10 \mu s$)	2.5 A
(50 Hz, $> 10 \mu s$)	1.5 A
(non-repetitive, 2 ms)	2.0 A
Package Power Dissipation, P_D	See Graph
Junction Temperature Range, T_J	-40°C to +150°C

For increased power-handling capability, these devices can be ordered in a 12-lead single in-line power-tab package by changing the part-number suffix from 'B' or 'Q' to 'W'.

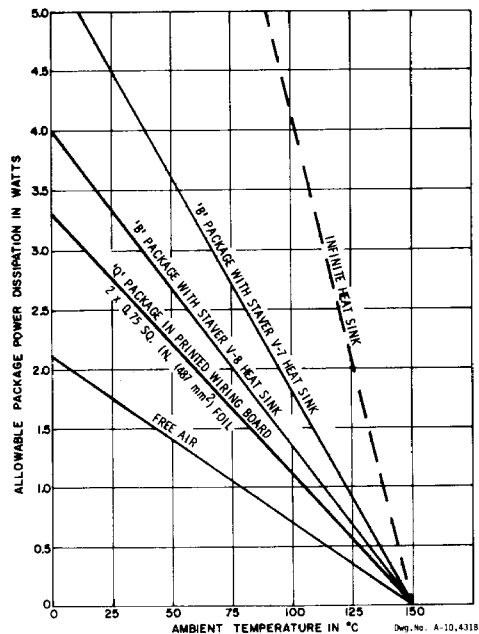
ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$, $V_{CC} = 25\text{ V}$, $f = 50\text{ Hz}$ (unless otherwise specified)

Characteristic	Test Pin	Test Fig.	Test Conditions	Limits			Units
				Min.	Typ.	Max.	
Operating Supply Voltage Range	2			10	—	27	V
Sync Input Voltage	10	3	Positive or negative	1.0	—	—	V_p
Sync Input Resistance	10	3	$V_{i0} = 1.0\text{ V}$	—	3.5	—	$k\Omega$
Oscillator Bias Current	11	1		—	0.2	1.0	μA
Oscillator Voltage	11	3		—	2.4	—	V_{pp}
Oscillator Pull-In Range	10-11	3	Below 50 Hz	—	7.0	—	Hz
Oscillator Frequency Drift	11	3	$V_{CC} = 10\text{ V to }27\text{ V}$	—	0.01	—	Hz/V
			$T_{TAB} = 40^\circ\text{C to }120^\circ\text{C}$	—	0.015	—	Hz/ $^\circ\text{C}$
Ramp Generator Bias Current	16	1		—	50	500	nA
Amplifier Input Current	14	2		—	0.15	1.0	μA
Quiescent Output Voltage	6	1	$V_{CC} = 10\text{ V}, R_2 = 10\text{ k}\Omega$	4.0	4.4	4.8	V
			$V_{CC} = 25\text{ V}, R_2 = 30\text{ k}\Omega$	8.0	8.8	9.6	V
Flyback Voltage		3	$i_{YOKE} = 1.0\text{ A}$	—	51	—	V
Flyback Time		3	$i_{YOKE} = 1.0\text{ A}$	—	0.6	0.8	ms
Yoke Current		3		—	—	1.6	A_{pp}
Regulator Voltage	8 or 9	2		6.0	6.5	7.0	V
Line Regulation	8 or 9	2	$V_{CC} = 10\text{ V to }27\text{ V}$	—	1.5	—	mV/V
Supply Current			$i_{YOKE} = 1.0\text{ A}$	—	140	—	mA

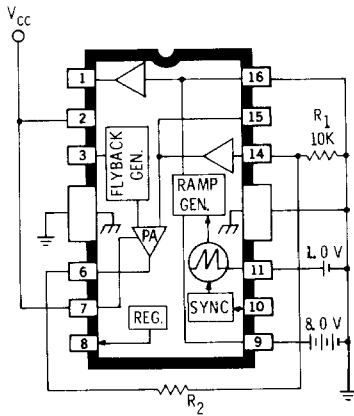
NOTE: Pin numbering shown is in accordance with U.S. (JEDEC) practice where all positions are numbered (1 thru 16). European (Pro-Electron) practice is to skip the tab positions.

JEDEC 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Pro-Electron 1 2 3 TAB TAB 4 5 6 7 8 9 TAB TAB 10 11 12

**ALLOWABLE POWER DISSIPATION
AS A FUNCTION OF
AMBIENT TEMPERATURE**

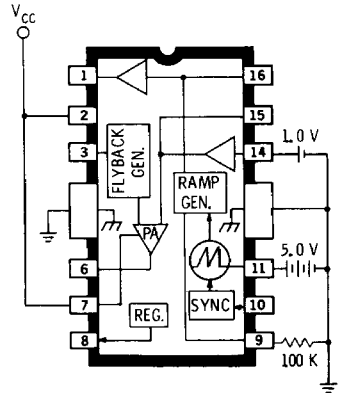


TEST FIGURES



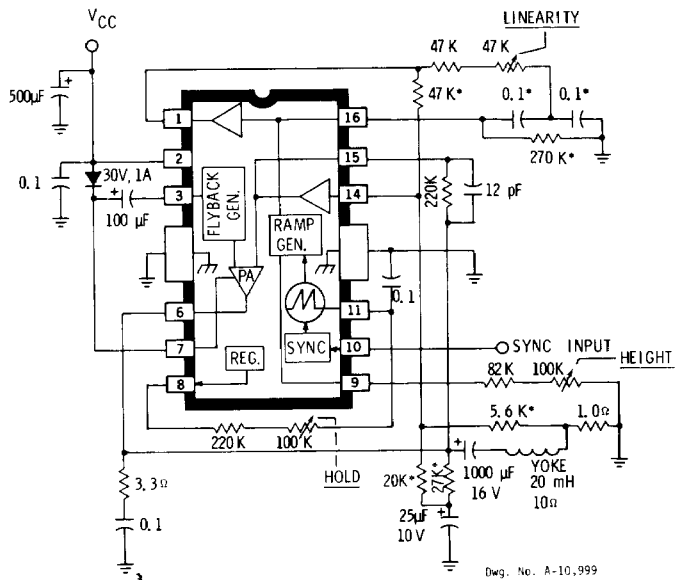
Dwg. No. A-10,992

Figure 1



Dwg. No. A-10,993

Figure 2

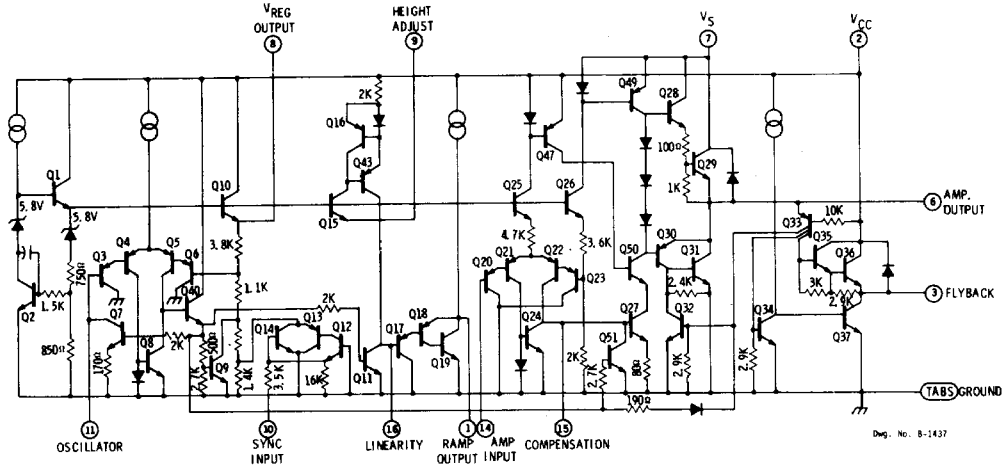


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*TOLERANCE $\pm 2\%$

Figure 3

CIRCUIT SCHEMATIC



FUNCTIONAL BLOCK DIAGRAM

