

1965

SEMICONDUCTOR and COMPONENTS CATALOG

CAM GARD SUPPLY LIMITED



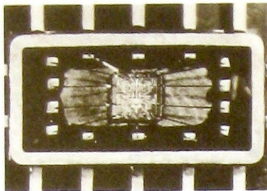
TEXAS INSTRUMENTS
INCORPORATED
SEMICONDUCTOR-COMPONENTS DIVISION
POST OFFICE BOX 5012 • DALLAS 22, TEXAS

Table of Contents not included.

Pages 1 :: 5 not included.



NEW SERIES 54 TTL — DIGITAL



- High speed, low power dissipation
- High noise margin, high fan-out
- Excellent capacitance-driving capability
- Multiple circuit functions per package
- Standard welded flat package

High speed/low power operation is obtained by using very small transistor geometries ($\frac{1}{4}$ -mil emitters). Speed-limiting parasitic capacitances are minimized — both by high-resolution photo-masking techniques which permit reduced resistor areas, and by the double-epitaxial structure which provides low saturation resistance, $r_{CE(sat)}$, and thus smaller element geometries.

TTL logic fully exploits the inherent capabilities of integrated semiconductor structures. The use of additional transistors and multiple-emitter structures provides performance parameters that are virtually independent of temperature and loading.

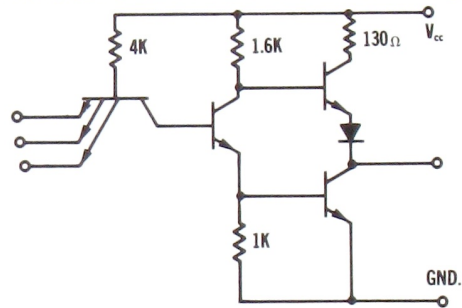
SERIES 54 TTL

- SN5400 — Quadruple 2-input Positive NAND Gate
- SN5410 — Triple 3-input Positive NAND Gate
- SN5420 — Dual 4-input Positive NAND Gate
- SN5430 — 8-input Positive NAND Gate
- SN5440 — Dual 4-input Positive NAND "Power" Gate
- SN5450 — Dual EXCLUSIVE-OR Gate with Expander inputs
- SN5460 — Dual 4-input Expander for SN5450
- SN5470 — Single-phase J-K Flip-flop

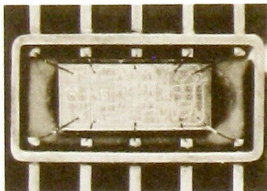
TYPICAL CHARACTERISTICS

Parameter	Basic Gate	Flip-flop
Propagation delay	15 nsec	40 nsec
Power dissipation	10 mw/gate	60 mw
Fan-out	10	10
D-c noise margin	1 v	1 v
Supply voltage	4.5 to 5.5 v	4.5 to 5.5 v
Temperature range	-55 to +125°C	-55 to +125°C

Typical circuit diagram for Series 54 Positive NAND gate



SERIES 53 MODIFIED-DTL — DIGITAL



- Multiple circuit functions per package
- Highly flexible AND/OR/INVERT logic
- High fan-out
- Medium speed, medium power dissipation
- Standard welded flat package
- For general-purpose digital applications

Multi-function networks. Each Series 53 bar contains between 50 and 85 elements — making it possible to provide quadruple gate and inverter networks, dual EXCLUSIVE-OR networks, or two complete J-K flip-flops in a single network package. This reduces the number of networks required per system — reducing cost and improving reliability. Each flip-flop can be used either as a counter or shift register.

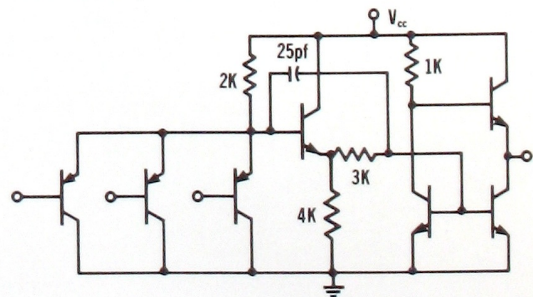
SERIES 53 MODIFIED-DTL

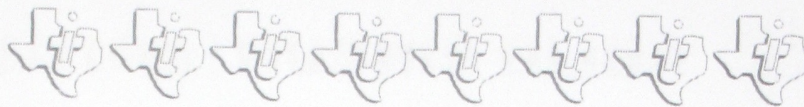
- SN530 — Single-phase J-K Flip-flop
- SN5302 — Dual J-K Flip-flop
- SN5304 — Dual J-K Flip-flop with dual presets
- SN531 — 5-input expandable NAND/NOR Gate
- SN5311 — Dual 5-input NAND/NOR Gate
- SN532 — 5-input AND/OR Gate or Expander
- SN533 — Dual 3-input NAND/NOR Gate
- SN5331 — Triple 3-input NAND/NOR Gate
- SN534 — Dual AND/OR Gate (2 and 3 Inputs)
- SN535 — Quadruple Inverter/Driver
- SN5360 — Quadruple 2-input NAND/NOR Gate
- SN5370 — Dual EXCLUSIVE-OR Gate
- SN1005 — "One Shot" Monostable Multivibrator

TYPICAL CHARACTERISTICS

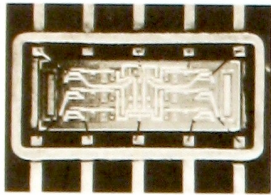
Parameter	Basic AND Gate	Basic NAND Gate	Flip-flop
Propagation delay	5 nsec	25 nsec	45 nsec
Power dissipation	10 mw	10 mw	27 mw
D-c noise margin	200 mv	200 mv	200 mv
Fan-out	4	10	10
Supply voltage	3 to 4 v	3 to 4 v	3 to 4 v
Temperature range	-55 to +125°C	-55 to +125°C	-55 to +125°C

Circuit diagram for basic Series 53 NAND gate





SERIES 51 RCTL — DIGITAL



- Exceptionally low power dissipation, high fan-out
- Thoroughly proven reliability
- Master Slice capability
- Multiple circuit functions per package
- Familiar RCTL logic design
- Standard welded flat package

This compatible line of monolithic semiconductor integrated circuits features the lowest power drain in the industry . . . typically 2 to 4 mw at 3 v. For this reason Series 51 networks are ideal for missile and space applications where size, weight, reliability, or power dissipation requirements are critical.

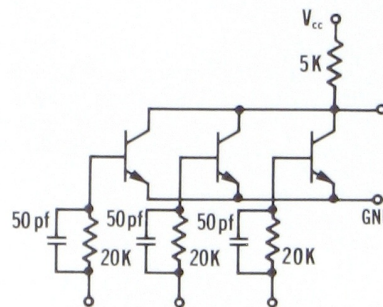
- SN510A — R-S Flip-flop/Counter
- SN5101 — R-S Flip-flop with Dual Presets
- SN511A — R-S Flip-flop/Counter with Emitter-follower Output
- SN5111 — R-S Flip-flop with Emitter-follower Output and Dual Presets
- SN5112 — Ripple-counter Flip-flop ($V_{cc} = 3$ to $6v$)
- SN5113 — Ripple-counter Flip-flop ($V_{cc} = 4$ to $6v$)
- SN512A — 6-input NAND/NOR Gate
- SN513A — 6-input NAND/NOR Gate with Emitter-follower Output
- SN514A — Dual 3-input NAND/NOR Gate
- SN515A — EXCLUSIVE-OR Gate
- SN516A — Dual 2-input NAND/NOR Gate and Inverter/Buffer
- SN5161 — Triple 2-input NAND/NOR Gate
- SN5162 — Triple 2-input NAND/NOR Gate with Emitter-follower Output
- SN517A — Clock Driver
- SN518A — "One Shot" Monostable Multivibrator
- SN5191 — Pulse EXCLUSIVE-OR Gate

TYPICAL CHARACTERISTICS

Parameter	Basic Gate	Flip-flop
Propagation delay	130 nsec/gate @ 3 v 65 nsec/gate @ 6 v	300 nsec
Power dissipation	2 mw @ 3 v	2 mw @ 3 v
Fan-out	5, 25*	4, 20*
D-c noise margin	200 mv	200 mv
Supply voltage	3 to 6 v	3 to 6 v
Temperature range	-55 to +125°C	-55 to +125°C

*with emitter-follower outputs

Typical circuit for basic Series 51 NAND/NOR gate



SERIES 51R — FOR SEVERE-ENVIRONMENT APPLICATIONS

For severe-environment military and aerospace applications, you can now specify a standard line of Series 51R semiconductor networks. This family of fifteen networks parallels TI's standard low-power Series 51 digital line.

Nearly four years' experience has thoroughly proved the reliability of Series 51 networks. Now you can get extra assurance of

reliability through extra testing and processing. Each Series 51R network is subjected to:

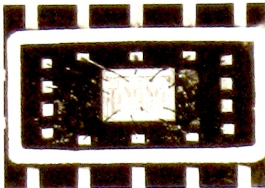
- Centrifugal acceleration at 20,000G in the Y_1 plane.
- Dynamic operation, burning-in each unit at 125°C for 168 hours.
- Radiographic inspection.

The complete list of networks available in the Series 51R family follows:

- | | | | |
|---------|---|---------|---|
| SNR510 | R-S Flip-flop/Counter | SNR514 | Dual 3-input NAND/NOR Gate |
| SNR5101 | R-S Flip-flop with Dual Presets | SNR515 | EXCLUSIVE-OR Gate |
| SNR511 | R-S Flip-flop/Counter with Emitter-follower Output | SNR516 | Dual 2-input NAND/NOR Gate and Inverter/Buffer |
| SNR5111 | R-S Flip-flop with Emitter-follower Output and Dual Presets | SNR5161 | Triple 2-input NAND/NOR Gate |
| SNR5112 | Ripple-counter Flip flop | SNR5162 | Triple 2-input NAND/NOR Gate with Emitter-follower Output |
| SNR5113 | Ripple-counter Flip-flop ($V_{cc} = 4$ to $6v$) | SNR517 | Clock Driver |
| SNR512 | 6-input NAND/NOR Gate | SNR518 | "One Shot" Monostable Multivibrator |
| SNR513 | 6-input NAND/NOR Gate with Emitter-follower Output | SNR5191 | Pulse EXCLUSIVE-OR Gate |



MINUTEMAN SERIES DTL — DIGITAL



- Proven reliability in Minuteman II guidance and control-system applications
- Multiple circuit functions per package
- High noise immunity
- Linear and memory networks also available in Minuteman Series
- Standard welded flat package

This compatible series of semiconductor integrated circuits was designed by Autonetics division of North American Aviation and TI. These digital units, along with linear units in the same series, perform more than 93 percent of the electronic functions in the guidance computer section of the Minuteman II missile.

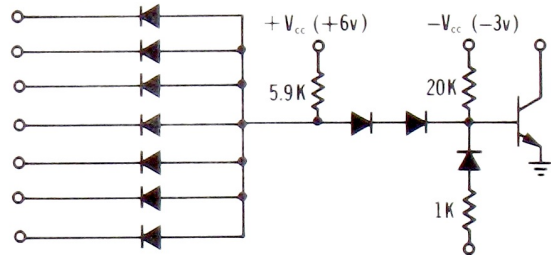
MINUTEMAN SERIES DTL

- SN337A — Flip-flop
- SN341A — 7-input NAND/NOR Gate (Clocked)
- SN344A — Triple High-level NAND/NOR Gate
- SN347A — Dual 4-input, Low-level NAND Gate (Clocked)
- SN359A — Dual 4-input, Low-level NAND/NOR Gate (Unclocked)
- SN343A — Dual Input Network
- SN346A — Dual Output Driver

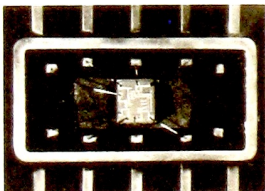
TYPICAL CHARACTERISTICS

Parameters	Basic Gate	Flip-flop
Propagation delay	100 nsec	250 nsec
Power dissipation	20-40 mw	90 mw
Fan-out	12	12
D-c noise margin	500 mv	500 mv
Supply voltage	+6 v, -3 v	+6 v, -3 v
Temperature range	0° to +65°C	0° to +65°C

Circuit diagram for basic Minuteman Series NAND gate



LOW-POWER RTL — DIGITAL



- Low power dissipation with moderate speed capability
- Choice of standard welded flat package or modified TO-5
- Gold-to-gold contact system
- Simple RTL logic configuration

This line of seven monolithic semiconductor integrated circuits combines low power dissipation with medium speed capabilities. The line is engineered and manufactured to the full-performance specifications of a sponsoring government agency. Compatibility is guaranteed through the full military temperature range of -55° to +125°C.

RTL

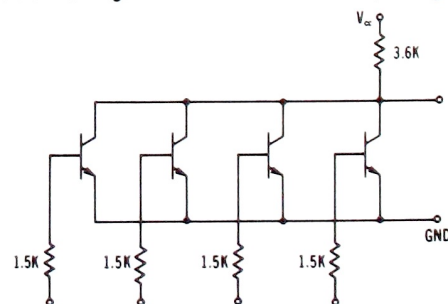
- SN729/SN729A — Adder
- SN730/SN730A — Buffer
- SN731/SN731A — Dual 2-input Gate
- SN732/SN732A — Dual 2-input Expander Gate
- SN733/SN733A — 4-input Gate
- SN734/SN734A — Half-adder
- SN735/SN735A — Register

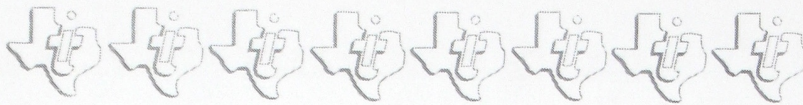
("A" suffix indicates 1/4" x 1/8" flat pack; absence of suffix indicates modified TO-5 package)

TYPICAL CHARACTERISTICS

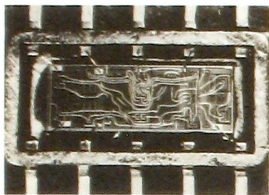
Parameter	Basic Gate	Register
Propagation delay	35 nsec	70 nsec
Power dissipation	4 mw	15 mw
Fan-out	4	3
Supply voltage	3 v	3 v
Temperature range	-55 to +125°C	-55 to +125°C

Typical circuit diagram for RTL Series NAND/NOR gate





SERIES 52 — OPERATIONAL/DIFFERENTIAL AMPLIFIERS



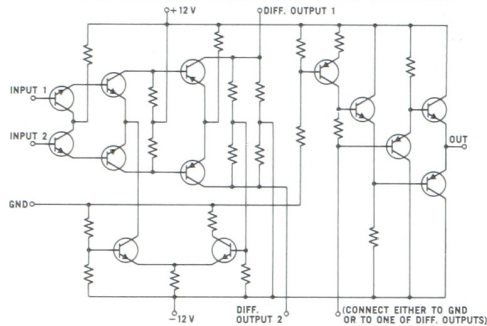
- Low input offset voltage
- High-gain, low-current transistors
- Master Slice capability
- NPN and PNP transistors for flexible circuit designs
- Standard welded flat package
- Demonstrated reliability

SERIES 52 — TYPICAL CHARACTERISTICS

Characteristic	SN521A	SN522A	SN523A	SN524A	NEW	
					SN525A	SN526A
Voltage Gain	62 db	62 db	73 db	62 db	80 db	60 db
Input Impedance	12 K Ohms	12 K Ohms	20 K Ohms	1 megohm	70 K Ohms	1 megohm
Input Offset Voltage	5 mv	5 mv	2 mv	12 mv	2 mv	7 mv
D-c Drift Referred to Input	8 $\mu\text{V}/^\circ\text{C}$	8 $\mu\text{V}/^\circ\text{C}$	5 $\mu\text{V}/^\circ\text{C}$	20 $\mu\text{V}/^\circ\text{C}$	3 $\mu\text{V}/^\circ\text{C}$	6 $\mu\text{V}/^\circ\text{C}$
Output Signal Swing, Single-ended	± 4.7 v	± 3.7 v	± 6.5 v	± 7.5 v	± 9 v	± 5 v*
Common-mode Rejection	60 db	60 db	90 db	55 db	90 db	80 db
Supply Voltages	+10, +6, -9 v	+10, +6, -9 v	± 12 v	± 12 v	± 12 v	± 12 v
Temperature Range	-55° to +125°C	-55° to +125°C	-55° to +125°C	-55° to +125°C	-55° to +125°C	-55° to +125°C

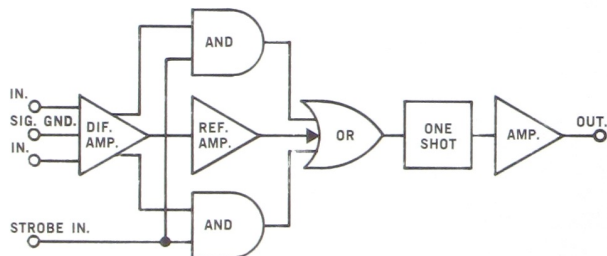
* $R_L = 500 \Omega$

CIRCUIT DIAGRAM FOR SN526A



NEW SERIES 55 — HIGH-FREQUENCY AMPLIFIERS

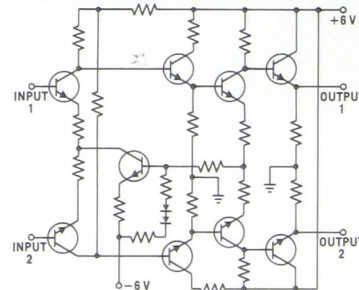
LOGIC DIAGRAM FOR SN5500



SN5500 — MAGNETIC-CORE SENSE AMPLIFIER

- Complete sense amplifier, including strobe gate and pulse-shaping output circuits
- Extremely sharp threshold — 20 mv sensitivity
- 150-nsec overload recovery
- 75-nsec output propagation delay
- -55° to +125°C operation
- Standard 1/4" x 1/8" welded flat package

CIRCUIT DIAGRAM FOR SN5510



SN5510 — VIDEO DIFFERENTIAL AMPLIFIER

- Flat frequency Response — DC to 40 mc
- 40-db single-ended gain
- Common-mode rejection — 60 db @ 1 mc
- Transistor $f_T > 1$ Gc @ 0.5 mw
- -55 to +125°C operation
- Standard 1/4" x 1/8" welded flat package

Pages 10 :: 36 not included.

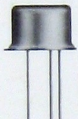
Pages 37 :: 39 not included.

NEW TI PRODUCTS to Help You Improve

VHF PLANAR EPITAXIAL SILICON POWER TRANSISTORS



2N2876
Isolated
7/16" Stud



2N2631
TO-5

- Power output: 2N2876: 10w @ 50 mc, 3 w @ 150 mc; 2N2631: 7.5w @ 50 mc, 3 w @ 150 mc
- High speed switching: Typical $t_{ON} = 95$ nsec, $t_{OFF} = 80$ nsec @ $I_C = 1$ amp
- High current gain: Typical $h_{FE} = 40$ @ $V_{CE} = 5$ v, $I_C = 500$ ma
- Current, voltage: $I_C = 2.5$ amps (2N2876), 1.5 amps (2N2631) $BV_{CBO} = 80$ volts, $BV_{CEO} = 60$ volts

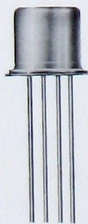
ULTRA-FAST, 30-AMP SILICON RECTIFIER



IN3909-IN3913
DO-5

- Exceptionally fast recovery time: 200 nsec max
- High-frequency, high rectification efficiency up to 200 kc
- High-voltage capability: 50-400 volts
- High surge current capability: 300 amps

PLANAR TETRODE SILICON CONTROLLED RECTIFIER

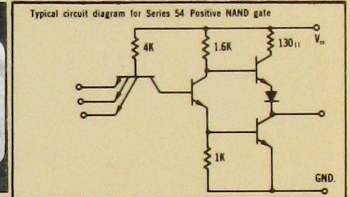
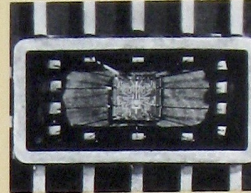


3N83-3N85
4-Lead
TO-18

- Simplify circuitry, reduce cost: Replaces two high-voltage transistors
- High sensitivity: $I_{GTC} = 10$ μ amps max (3N84, 3N85), 150 μ amps max (3N83)
- High voltage: 40-100 volts
- Continuous anode forward current: 50 ma d-c (3N83), 175 ma d-c (3N84, 3N85)
- For: Simplified low-speed flip-flop, logic applications, Nixie® driver, lamp driver

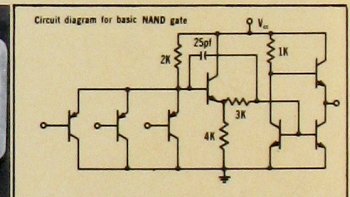
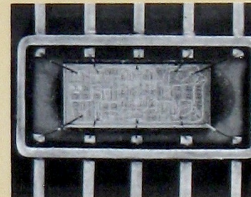
SOLID CIRCUIT® semiconductors

SERIES 54 TTL DIGITAL INTEGRATED CIRCUITS



- High speed, 15-nsec propagation delay
- D-c noise margin: 1 volt
- Power dissipation: 10 mw
- Fan-out: 10
- High capacitance-driving capability
- Family of eight multi-function networks
- -55° to $+125^\circ$ C temperature range

SERIES 73 INDUSTRIAL MULTI-FUNCTION INTEGRATED CIRCUITS



LOW SYSTEM COST

- Multi-function approach reduces system cost
- Economical triple-diffused structure

ADVANCED PERFORMANCE

- Wide industrial temperature range
- Guaranteed d-c margin
- High a-c noise rejection from 50-ohm output impedance
- Standard hermetically sealed flat pack
- Optimum speed/power trade-off for industrial applications

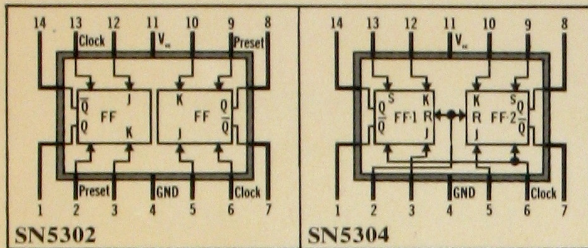
EASE OF DESIGN

- Most complete industrial family of circuits available: 13 networks
- Simple system design with modified DTL
- Fan-out of 10 from each network
- Double-ended output maintains waveshape integrity under all temperature and loading conditions

prove Circuit Performance and Reliability

ctor networks*

SERIES 53 MULTI-FUNCTION FLIP-FLOPS



- Multi-function economy now applied to flip-flops.
- Fully compatible with other Series 53 networks
- Monolithic structures
- Fan-out of 10; single-phase

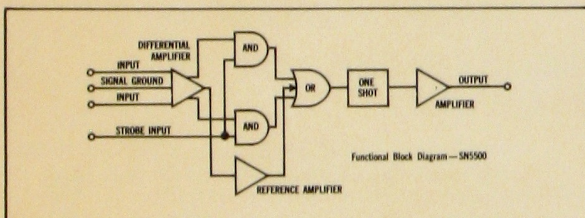
SN5302 — DUAL J-K FLIP-FLOP

- For ripple-counter and control flip-flop applications
- Independent clocks
- Independent inputs and outputs
- Independent presets

SN5304 — DUAL J-K FLIP-FLOP WITH DUAL PRESETS

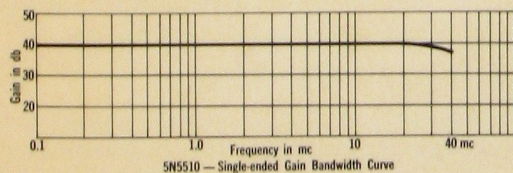
- Independent inputs and outputs
- Common clock

SERIES 55 HIGH-FREQUENCY AMPLIFIERS



SN5500 MAGNETIC-CORE SENSE AMPLIFIER

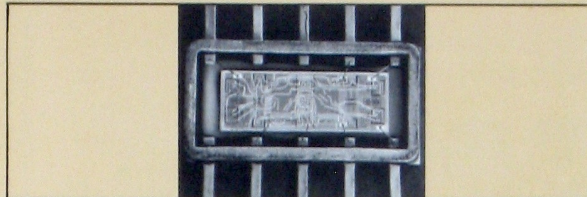
- Complete sense amplifier, including strobe gate and pulse-shaping output circuits
- Extremely sharp threshold: 20-mv sensitivity
- 150-nsec overload recovery
- 75-nsec output propagation delay



SN5510 — VIDEO DIFFERENTIAL AMPLIFIER

- Flat frequency response: Dc to 40 mc
- 40-db single-ended gain
- Common-mode rejection: 60 db at 1 mc
- Transistor $f_T > 1 \text{ Gc}$ @ 0.5 mw

OPERATIONAL/DIFFERENTIAL AMPLIFIERS Additions to Series 52



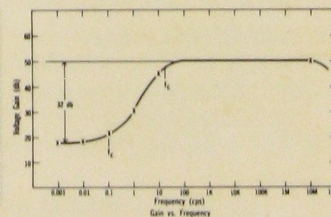
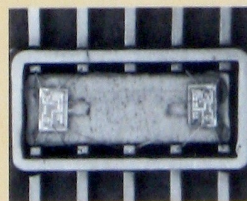
SN525A — GENERAL-PURPOSE DIFFERENTIAL AMPLIFIER

- Low offset voltage: 1 mv
- High common-mode rejection: 90 db
- High voltage gain: 10,000
- Power supplies up to $\pm 12 \text{ v}$
- -55° to $+125^\circ \text{C}$ operation

SN526A — GENERAL-PURPOSE OPERATIONAL AMPLIFIER

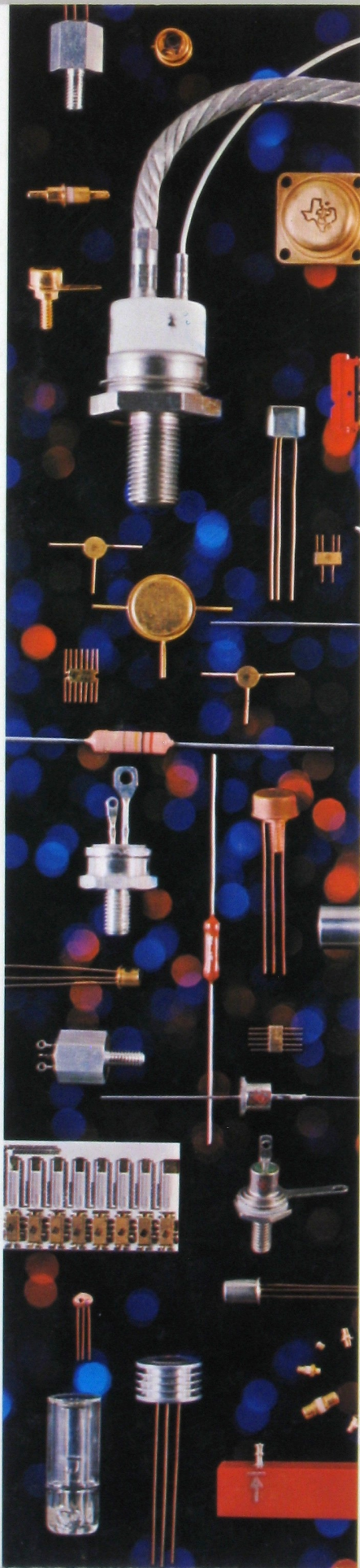
- High input impedance: 2 megohms
- High output current: 5 ma
- High output voltage swing: 18 v p-p
- Power supplies up to $\pm 12 \text{ v}$
- Class B output
- -55° to $+125^\circ \text{C}$ operation

SNX1303 THERMAL-FEEDBACK VIDEO AMPLIFIER



- Direct-coupled HF network amplifier
- Low-pass thermal feedback suppresses low-frequency response by 32 db
- Frequency response: 50 cps to 10 mc
- No external capacitors
- SNX1303 contained in two standard $\frac{1}{4}$ " by $\frac{1}{8}$ " flat packs

*PATENTED BY TI



CAM GARD
industrial
electronics ltd.

HEAD OFFICE: 397 WILLIAM AVE., WINNIPEG 2, MAN.
TELEX. 03-5285

SASKATOON: 1501 ONTARIO AVE.

Texas Instruments Catalog
1965
Digital/IC Extracts

This Digitised Version
2023 Nov

Digitised via manual photography with Canon A590 camera in Manual mode.
Post processing and PDF'd using Apple Preview 5.5.3.

Photographs originally 2448 • 3264.

Auto-Leveled. Some White-level decrease to brighten and clean white
background. Minor Sharpness increment on some.

/bhilpert