

CONDENSED CATALOG – FALL 1966



SIGNETICS
INTEGRATED CIRCUITS

811 EAST ARQUES AVENUE, SUNNYVALE, CALIFORNIA

SIGNETICS PRODUCT LINES

MILITARY PRODUCT LINES

APPLICATION DESCRIPTION	DTL	UTILOGIC	LOW POWER TTL	LINEAR	HIGH SPEED TTL	HIGH SPEED LOW POWER TTL	ARRAYS
ULTRA HIGH RELIABILITY AEROSPACE -55° C to +125° C	RE100K RE100G RE100J		RE400J	RE500K RE500G	RE800J	R8000J	
MILITARY AIRBORNE -55° C to +125° C	SE100K SE100G SE100J		SE400J	SE500K SE500G	SE800J	S8000J	
MILITARY PROTOTYPE, GSE -0° C to +70° C	NE100K NE100G NE100J	SU300K* SU300G*	NE400J	NE500K NE500G	NE800J		
GSE, DUAL-IN-LINE PACKAGE 0° C to +70° C	NE100A		NE400A		NE800A		S1200A
FEATURES	LONGEST ESTABLISHED RELIABILITY BEST SPEED/NOISE MARGIN/POWER TRADE-OFF	BEST DC NOISE MARGINS HIGH CAPACITANCE DRIVE	LESS THAN 5 mW/GATE, DUAL BINARY, ACTIVE PULL-UP AND PULL-DOWN	WIDE SELECTION OF GAIN-BANDWIDTH PRODUCT	DUAL 30 MHz BINARY, 10ns GATE DELAYS, ACTIVE PULL-UP AND PULL-DOWN	HIGH AC NOISE IMMUNITY, DUAL BINARY	MULTI-FUNCTION SUBSYSTEMS
SEE PAGE REFERENCED FOR FURTHER INFORMATION	PAGES 4 AND 5	PAGE 8 *-20° C to +85° C	PAGE 5	PAGE 12	PAGE 7	PAGE 8	PAGE 12

COMMERCIAL / INDUSTRIAL PRODUCT LINES

APPLICATION DESCRIPTION	DTL	UTILOGIC	LOW POWER TTL	LINEAR	PLUG-IN DTL	HIGH SPEED TTL	ARRAYS
INDUSTRIAL 0° C to +70° C TO-5 and FLAT PACK	NE100K NE100G NE100J	SU300K* SU300G*	NE400J	NE500K		NE800J	
INDUSTRIAL 0° C to +70° C DUAL-IN-LINE PACKAGE	NE100A		NE400A			NE800A	
INDUSTRIAL DUAL-IN-LINE PACKAGE 0° C to +70° C			ST400A		ST600A	ST800A	S1200A
COMMERCIAL +15° C to +55° C		LU300K	SP400A		SP600A	SP800A	
FEATURES	BEST SPEED/NOISE MARGIN/POWER TRADE-OFF PROVEN RELIABILITY	BEST DC NOISE MARGINS HIGH CAPACITANCE DRIVE	LOWEST POWER HIGH CAPACITANCE DRIVE	WIDE SELECTION OF GAIN-BANDWIDTH PRODUCT	LOW COST	HIGHEST SPEED HIGH CAPACITANCE DRIVE	MULTI-FUNCTION SUBSYSTEMS
SEE PAGE REFERENCED FOR FURTHER INFORMATION	PAGE 5	PAGE 8 *-20° C to +85° C	PAGE 6	PAGE 12	PAGE 5	PAGE 7	PAGE 12

HOW TO USE THIS CATALOG

This catalog is designed as a quick reference source on Signetics digital and linear product lines. Its primary purpose is to provide the integrated circuit user with no more than the salient features of each element, including a few typical performance characteristics, schematics, power supply requirements, packaging, operating temperature range, and primary area of application. Once the reader has found the circuit family or families most likely to meet his needs, he may obtain detailed design data sheets and supporting application data for his selection through his nearest Signetics representative or distributor listed on the back cover.

The catalog is organized first by logic type, DTL, TTL, UTILOGIC, and is broken down within each type to reflect operating temperature range and application. There are no hard and fast rules that distinguish the so-called military types from industrial or commercial types, but operating temperature is generally used as a benchmark. Circuits operating from -55°C to $+125^{\circ}\text{C}$ are classified as military and are backed by worst-case specifications on their data sheets. There are circuits in the 0°C to $+70^{\circ}\text{C}$ range that are suitable for either military or industrial applications. Circuit types in the 0°C to $+70^{\circ}\text{C}$ range with NE prefixes are specified more tightly than those with ST prefixes, which operate in the same range. This may not

be apparent from a review of the typical characteristics tabulated in this catalog. However, for the thoughtful systems designer a comparison of the data sheets for NE and ST types will show the differences in performance guarantees on which a proper choice can be made. It should be noted that the performance guarantees for ST types are identical to those for SP types except for the operating temperature range. Elements bearing an SP prefix operate in the $+15^{\circ}\text{C}$ to $+55^{\circ}\text{C}$ range and are designated as "commercial."

CONTENTS

<hr/>	
DTL CIRCUITS	
100-Series	4
600-Series	5
<hr/>	
TTL CIRCUITS	
400-Series	5
800-Series	7
8000-Series	8
<hr/>	
UTILOGIC	
300-Series	8
<hr/>	
SIGNETICS PACKAGES	9
<hr/>	
REFERENCE DIGITAL SCHEMATICS	10
<hr/>	
MONOLITHIC SUBSYSTEMS	
1200-Series	12
<hr/>	
LINEAR CIRCUITS	
500-Series	12
<hr/>	
SIGNETICS SURE PROGRAM	13

DTL**MILITARY**
-55° C to +125° C**RECOMMENDED**
POWER SUPPLY
+4.0 V, -2.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
SE101	4-INPUT NAND GATE	5	35	10	1.0	G, K	1, 3, 6	1
SE102	3-INPUT NAND GATE	5	35	10	1.0	G, K	1, 3, 6	1
SE105	6-INPUT GATE EXPANDER	—	—	—	—	G, K	3, 6	
SE110	3-INPUT HIGH FAN-OUT NAND GATE	15	20	34	1.0	G, K	1, 6	
SE113	DUAL 3-INPUT HIGH FAN-OUT NAND GATE	15	20	34	1.0	G, K	2, 6	
SE115	DUAL 2-INPUT NAND GATE	5	35	10	1.0	G, K	3, 6	
SE124	RST BINARY ELEMENT	8	18 MHz	28	1.0	G, J, K	5, 6	2
SE150	2-INPUT CLOCK/CAPACITIVE LINE DRIVER	20	35	36	1.0	G, K	4, 6	
SE157	DUAL 3-INPUT CLOCK/CAPACITIVE LINE DRIVER	15	20	34	1.0	K	4, 6	
SE160	ONE-SHOT MULTIVIBRATOR	4	—	32	1.0	G, K	1, 6	
SE161	ONE-SHOT MULTIVIBRATOR	5	—	40	1.0	J, K		6
SE181	QUADRUPLE INVERTER	5	25	15	1.0	K	2, 6	
CS700	DUAL 3-2-INPUT NAND GATE	5	35	10	1.0	G, K	6	
CS701	DUAL 3-2-INPUT NAND GATE	5	35	10	1.0	G, K	2, 6	
CS704	RST BINARY ELEMENT	8	18 MHz	16	1.0	G, K	5	
CS705	DUAL 3-INPUT AND GATE	—	3	5	1.0	G, K	3	
CS709	DUAL 3-INPUT GATE EXPANDER	—	—	—	—	G, K		
CS715	DUAL 2-INPUT CLOCK/CAPACITIVE LINE DRIVER	15	35	35	1.0	K	1	
CS716	DUAL 2-INPUT HIGH FAN-OUT NAND GATE	15	35	35	1.0	K	1	

DTL**MILITARY**
-55° C to +125° C**RECOMMENDED**
POWER SUPPLY
4.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
SE106	DUAL 5-INPUT GATE EXPANDER	—	—	—	—	J		
SE111	DUAL 4-INPUT HIGH FAN-OUT NAND GATE	19	20	34	1.0	J	2	
SE112	DUAL 3-INPUT HIGH FAN-OUT NAND GATE	19	20	34	1.0	J	1	
SE116	DUAL 4-INPUT NAND GATE	6	25	15	1.0	J	1	3
SE124	RST BINARY ELEMENT	7	18 MHz	28	1.0	J	5	2
SE125	J-K BINARY ELEMENT	8	12 MHz	40	1.0	J	5	4
SE155	DUAL 4-INPUT CLOCK/CAPACITIVE LINE DRIVER	19	20	34	1.0	J	4	
SE156	DUAL 4-INPUT CLOCK/CAPACITIVE LINE DRIVER	19	20	34	1.0	J	1, 4	
SE161	ONE-SHOT MULTIVIBRATOR	4	—	51	1.0	J		6
SE170	TRIPLE 3-INPUT NAND GATE	6	25	15	1.0	J	2	3
SE180	QUADRUPLE 2-INPUT NAND GATE	6	25	15	1.0	J	2	3
CS720	QUADRUPLE 2-INPUT NAND GATE	6	25	14	1.0	J		3
CS721	TRIPLE 3-INPUT NAND GATE	6	25	14	1.0	J		3
CS727	TRIPLE 2-INPUT NAND GATE	6	25	15	1.0	J	1, 2	3
CS729	RST BINARY ELEMENT	7	18 MHz	28	1.0	J	5	8
CS730	DUAL 5-INPUT NAND GATE	6	25	15	1.0	J	2	3
CS731	QUADRUPLE 2-INPUT GATE EXPANDER	—	—	—	—	J		
CS732	12-INPUT GATE EXPANDER	—	—	—	—	J		

DTL**MILITARY**
0° C to +70° C**RECOMMENDED**
POWER SUPPLY
4.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function 50% Duty (mW)	DC NOISE MARGIN (V)			
NE106	DUAL 5-INPUT GATE EXPANDER	—	—	—	—	A, J		
NE112	DUAL 3-INPUT HIGH FAN-OUT NAND GATE	19	20	34	1.0	A, J	1	
NE116	DUAL 4-INPUT NAND GATE	6	25	15	1.0	A, J	1	3
NE124	RST BINARY ELEMENT	7	18 MHz	28	1.0	A, J	5	2
NE125	J-K BINARY ELEMENT	8	12 MHz	40	1.0	A, J	5	4
NE156	DUAL 4-INPUT CLOCK/CAPACITIVE LINE DRIVER	19	20	34	1.0	A, J	1, 4	5
NE161	ONE-SHOT MULTIVIBRATOR	4	—	51	1.0	A, J		6
NE170	TRIPLE 3-INPUT NAND GATE	6	25	15	1.0	A, J	2	3
NE180	QUADRUPLE 2-INPUT NAND GATE	6	25	15	1.0	A, J	2	3

DTL**COMMERCIAL/INDUSTRIAL**
+15° C to +55° C**RECOMMENDED**
POWER SUPPLY
4.5 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function 50% Duty (mW)	DC NOISE MARGIN (V)			
SP616	DUAL 4-INPUT NAND GATE	5	30	34	1.0	A	7	3
SP620	J-K BINARY ELEMENT	5	5 MHz	28	1.0	A	7	7
SP629	RST BINARY ELEMENT	5	10 MHz	40	1.0	A	7	8
SP631	QUADRUPLE 2-INPUT GATE EXPANDER	—	—	—	—	A	7	
SP659	DUAL 3-INPUT BUFFER/DRIVER	12	25	34	1.0	A	7	
SP670	TRIPLE 3-INPUT NAND GATE	5	30	15	1.0	A	7	3
SP680	QUADRUPLE 2-INPUT NAND GATE	5	30	15	1.0	A	7	3

TTL**LOW POWER MILITARY**
−55° C to +125° C**RECOMMENDED**
POWER SUPPLY
4.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function 50% Duty (mW)	DC NOISE MARGIN (V)			
SE416	DUAL 4-INPUT NAND GATE	7	30	4.5	1.0	J	1, 4	9
SE417	DUAL 3-INPUT NAND GATE	7	32	4.5	1.0	J	1, 3	10
SE424	DUAL AC BINARY ELEMENT	7	9 MHz	9.0	1.0	J	4, 5	11
SE440	DUAL AND/OR/INVERT GATE	7	23	4.5	1.0	J	4	
SE455	DUAL 4-INPUT BUFFER/DRIVER	20	25	7.0	1.0	J	4	
SE480	QUADRUPLE 2-INPUT NAND GATE	7	23	3.5	1.0	J	4	12

TTL**LOW POWER MILITARY**
0° C to +70° CRECOMMENDED
POWER SUPPLY
4.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
NE416	DUAL 4-INPUT NAND GATE	7	32	5.0	1.0	J	1, 4	9
NE417	DUAL 3-INPUT NAND GATE	7	35	4.5	1.0	J	1, 3	10
NE424	DUAL AC BINARY ELEMENT	7	9 MHz	9.0	1.0	J	4, 5	11
NE440	DUAL AND/OR/INVERT GATE	7	25	4.5	1.0	J	4	
NE455	DUAL 4-INPUT BUFFER/DRIVER	20	29	7.0	1.0	J	4	
NE480	QUADRUPLE 2-INPUT NAND GATE	7	25	3.5	1.0	J	4	12

TTL**LOW POWER MILITARY**
0° C to +70° CRECOMMENDED
POWER SUPPLY
5.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
NE416	DUAL 4-INPUT NAND GATE	7	32	9.0	1.0	A	1, 4	9
NE417	DUAL 3-INPUT NAND GATE	7	35	8.0	1.0	A	1, 3	10
NE424	DUAL AC BINARY ELEMENT	7	9 MHz	14	1.0	A	4, 5	11
NE440	DUAL AND/OR/INVERT GATE	7	25	10	1.0	A	4	
NE455	DUAL 4-INPUT BUFFER/DRIVER	24	29	12	1.0	A	4	
NE480	QUADRUPLE 2-INPUT NAND GATE	7	25	9.0	1.0	A	4	12

TTL**LOW POWER COMMERCIAL/
INDUSTRIAL, +15° C to +55° C**RECOMMENDED
POWER SUPPLY
5.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
SP416	DUAL 4-INPUT NAND GATE	7	40	12	1.0	A	1, 4, 7	9
SP417	DUAL 3-INPUT NAND GATE	7	40	12	1.0	A	1, 3, 7	10
SP424	DUAL AC BINARY ELEMENT	7	9 MHz	22	1.0	A	4, 5, 7	11
SP440	DUAL AND/OR/INVERT GATE	7	45	18	1.0	A	4, 7	
SP455	DUAL 4-INPUT BUFFER/DRIVER	24	45	16	1.0	A	4, 7	
SP480	QUADRUPLE 2-INPUT NAND GATE	7	40	9.0	1.0	A	4, 7	12

TTL**HIGH SPEED MILITARY**
-55° C to +125° CRECOMMENDED
POWER SUPPLY
5.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
SE806	DUAL 4-INPUT EXPANDER	—	—	—	—	J		
SE808	8-INPUT NAND GATE	10	10	20	1.0	J	4	
SE816	DUAL 4-INPUT NAND GATE	10	10	20	1.0	J	4	13
SE825	DC CLOCKED J-K BINARY ELEMENT	10	20 MHz	70	1.0	J	5	14
SE826	DUAL J-K BINARY ELEMENT	5	30 MHz	35	1.0	J	5	15
SE840	DUAL 4-INPUT EXCLUSIVE-OR GATE	10	10	25	1.0	J	1, 4	
SE855	DUAL 4-INPUT POWER GATE	30	10	25	1.0	J	4	
SE870	TRIPLE 3-INPUT POWER GATE	10	10	20	1.0	J	4	
SE880	QUADRUPLE 2-INPUT NAND GATE	10	10	20	1.0	J	4	

TTL**HIGH SPEED MILITARY**
0° C to +70° CRECOMMENDED
POWER SUPPLY
5.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
NE806	DUAL 4-INPUT EXPANDER	—	—	—	—	A, J		
NE808	8-INPUT NAND GATE	10	13	20	1.0	A, J	4	
NE816	DUAL 4-INPUT NAND GATE	10	13	20	1.0	A, J	4	13
NE825	DC CLOCKED J-K BINARY ELEMENT	10	20 MHz	70	1.0	A, J	5	14
NE826	DUAL J-K BINARY ELEMENT	5	30 MHz	35	1.0	A, J	5	15
NE840	DUAL 4-INPUT EXCLUSIVE-OR GATE	10	13	25	1.0	A, J	1, 4	
NE855	DUAL 4-INPUT POWER GATE	30	13	25	1.0	A, J	4	
NE870	TRIPLE 3-INPUT POWER GATE	10	13	20	1.0	A, J	4	
NE880	QUADRUPLE 2-INPUT NAND GATE	10	13	20	1.0	A, J	4	

TTL**HIGH SPEED COMMERCIAL/
INDUSTRIAL, +15° C to +55° C**RECOMMENDED
POWER SUPPLY
5.0 V

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
SP806	DUAL 4-INPUT EXPANDER	—	—	—	—	A	7	
SP808	8-INPUT NAND GATE	8	20	25	1.0	A	4, 7	
SP816	DUAL 4-INPUT NAND GATE	8	20	25	1.0	A	4, 7	13
SP825	DC CLOCKED J-K BINARY ELEMENT	8	20 MHz	135	1.0	A	5, 7	14
SP826	DUAL J-K BINARY ELEMENT	4	30 MHz	40	1.0	A	5, 7	15
SP840	DUAL 4-INPUT EXCLUSIVE-OR GATE	8	20	30	1.0	A	1, 4, 7	
SP855	DUAL 4-INPUT POWER GATE	24	20	45	1.0	A	4, 7	
SP870	TRIPLE 3-INPUT POWER GATE	8	20	25	1.0	A	4, 7	
SP880	QUADRUPLE 2-INPUT NAND GATE	8	20	25	1.0	A	4, 7	

TTL**MILITARY HIGH SPEED AND
LOW POWER, -55° C to +125° C****RECOMMENDED
POWER SUPPLY
5.0 V**

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function (mW) 50% Duty	DC NOISE MARGIN (V)			
S8416	DUAL 4-INPUT NAND GATE	7	35	4.5	1.0	J	1, 4	9
S8417	DUAL 3-INPUT NAND GATE	7	50	4.5	1.0	J	1, 3	10
S8424	DUAL AC BINARY ELEMENT	7	9 MHz	9.0	1.0	J	4, 5	11
S8440	DUAL EXCLUSIVE-OR GATE	7	25	4.5	1.0	J	4	
S8455	DUAL 4-INPUT BUFFER/DRIVER	20	28	7.0	1.0	J	4	
S8480	QUADRUPLE 4-INPUT NAND GATE	7	25	3.5	1.0	J	4	12
S8806	DUAL 4-INPUT EXPANDER	-	-	-	-	J	-	
S8808	8-INPUT NAND GATE	10	12	20	1.0	J	4	
S8816	DUAL 4-INPUT NAND GATE	10	12	20	1.0	J	4	13
S8825	DC CLOCKED J-K BINARY ELEMENT	10	20 MHz	70	1.0	J	5	14
S8826	DUAL J-K BINARY ELEMENT	10	30 MHz	35	1.0	J	5	15
S8840	DUAL 4-INPUT EXCLUSIVE-OR GATE	10	12	25	1.0	J	1, 4	
S8855	DUAL 4-INPUT POWER GATE	26	12	25	1.0	J	4	
S8870	TRIPLE 3-INPUT NAND GATE	10	12	20	1.0	J	4	
S8880	QUADRUPLE 2-INPUT NAND GATE	10	12	20	1.0	J	4	

UTILOGIC®**MILITARY GSE AND INDUSTRIAL, -20° C to +85° C****RECOMMENDED
POWER SUPPLY
4.5 V**

TYPE NUMBER	DESCRIPTION	FAN-OUT Function	TYPICAL CHARACTERISTICS			PACKAGE TYPE	NOTES SEE PAGE 8	SCHEMATIC REFERENCE
			Tpd (ns)	AVG. PWR. Function 50% Duty (mW)	DC NOISE MARGIN (V)			
SU300	DUAL 3-INPUT GATE EXPANDER	-	-	-	-	G, K	8	
SU305	6-INPUT AND GATE	10	25	5	-	G, K	8	
SU306	DUAL 3-INPUT AND GATE	10	25	5	-	G, K	8	16
SU314	7-INPUT NOR GATE	17	30	18	1.2	G, K	8	
SU315	DUAL 3-INPUT NOR GATE	17	30	18	1.2	G, K	8	
SU316	DUAL 2-INPUT NOR GATE	17	30	18	1.2	G, K	1, 8	17
SU320	J-K BINARY ELEMENT	17	4 MHz	90	1.2	G, K	5, 8	7
SU331	DUAL 2-INPUT OR GATE	17	30	36	1.2	G, K	1, 8	
SU332	DUAL 3-INPUT OR GATE	17	30	36	1.2	G, K	8	18

NOTES

- (1) Fan-in expansion provision.
- (2) Has internally connected pull-up resistor. Collector logic permissible.
- (3) Has internal pull-up resistor that may be connected at user's option. For collector logic, at least one pull-up per array must be connected.
- (4) Active pull-up. Do not use collector logic.

- (5) Figure in Tpd column is toggle rate.
- (6) Also available for 0°C to 70°C operation. Specify prefix NE instead of SE.
- (7) Also available for 0°C to 70°C operation. Specify prefix ST instead of SP.
- (8) Also available for +10°C to +55°C operation in K package only. Specify prefix LU instead of SU.

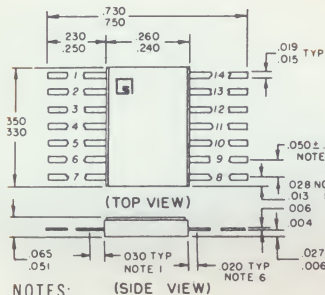
PACKAGES

Outline drawings of the packages used for Signetics products are provided below. For each of these packages, Signetics has designed a protective carrier that may be used in testing, handling, shipping, and storage. The mechanical and envi-

ronmental requirements imposed on these packages are covered in the discussion of the Signetics SURE Program at the back of this catalog. The carriers and their relationship to various test heads or test contactors is illustrated below.

OUTLINE DRAWINGS

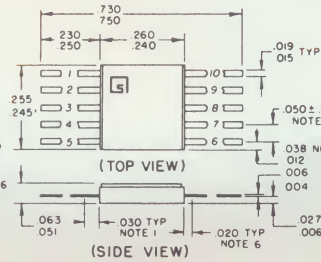
J-PACKAGE—(TO-88)
(MODULAR GLASS - KOVAR)



NOTES:

- (1) Recommended minimum offset before lead bend.
- (2) All leads weldable and solderable.
- (3) Pin 1 internally connected to case.

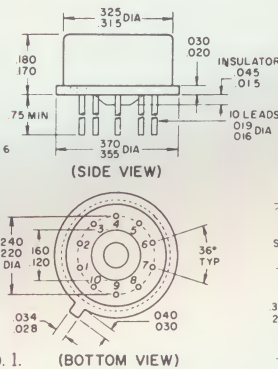
G-PACKAGE—(TO-91)
(MODULAR GLASS - KOVAR)



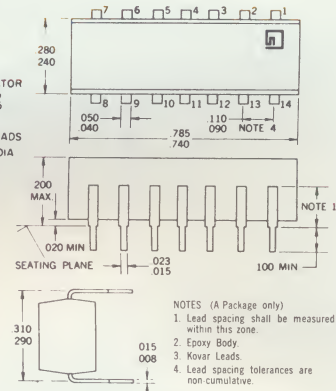
(4) All dimensions in inches.

- (5) Tolerances are non-cumulative.
- (6) Lead spacing dimensions apply to this area only.
- (7) Signetics symbol on flat package locates lead No. 1.

K-PACKAGE—(TO-100)
(MODIFIED JEDEC TO - 5)



A-PACKAGE



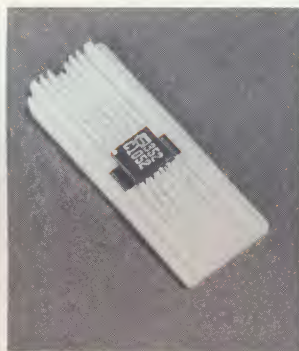
NOTES (A Package only)

1. Lead spacing shall be measured within this zone.
2. Epoxy Body
3. Kovar Leads
4. Lead spacing tolerances are non-cumulative.

PACKAGE CARRIERS



K-PACKAGE



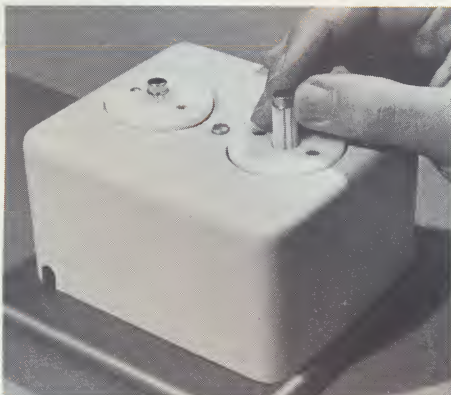
G-PACKAGE



J-PACKAGE



A-PACKAGE



K PACKAGE TEST HEAD



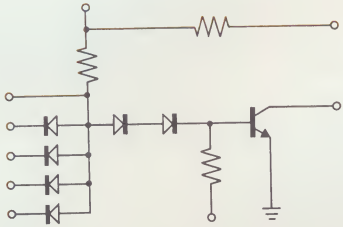
G AND J PACKAGE TEST HEAD



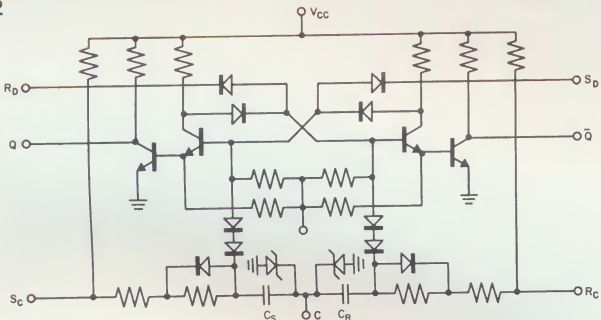
A PACKAGE TEST HEAD

SCHEMATICS

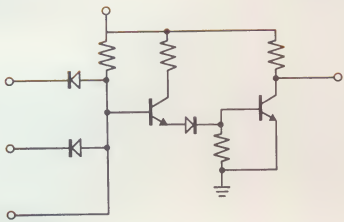
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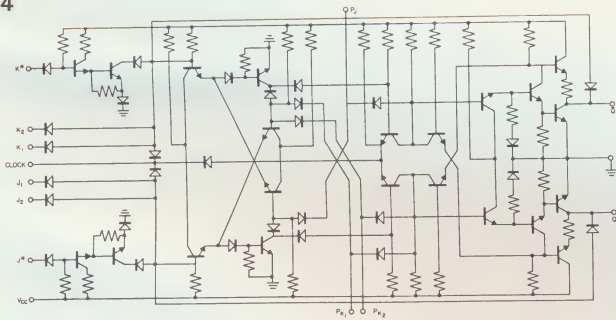
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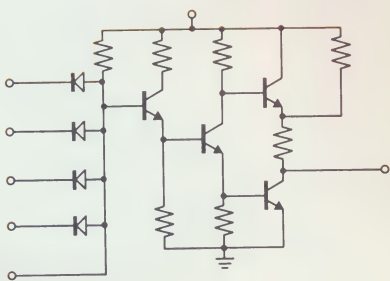
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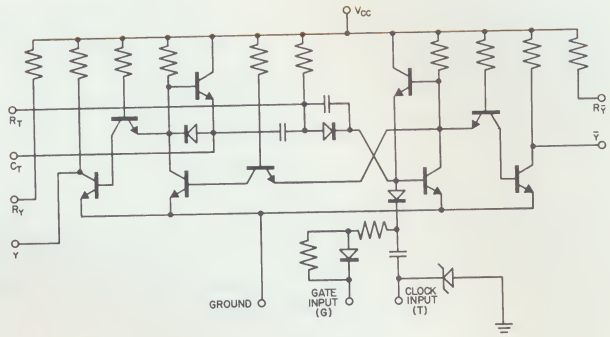
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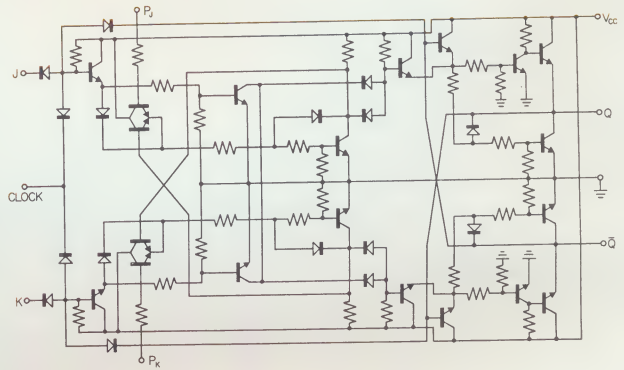
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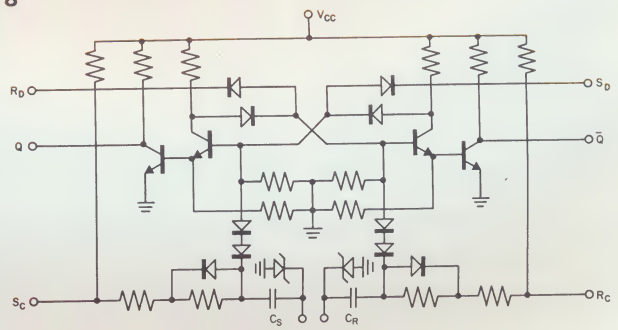
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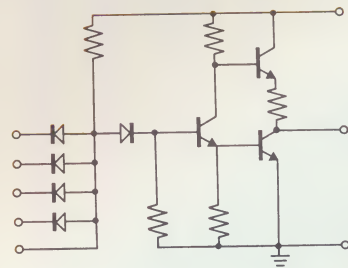
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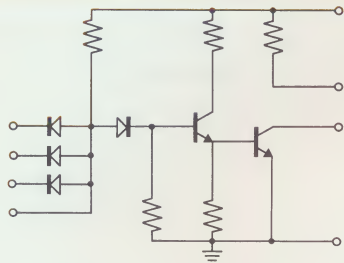
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NOTE: 1/2 circuit shown.

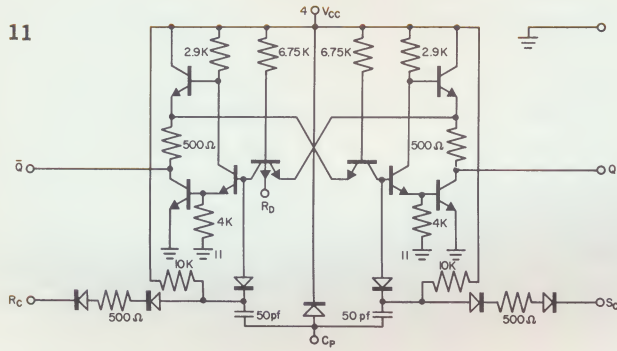
SCHEMATICS

10



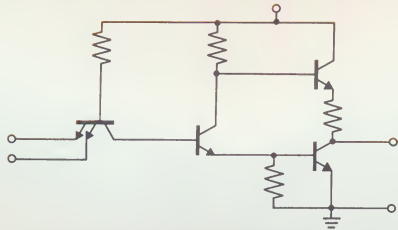
NOTE: 1/2 circuit shown.

11



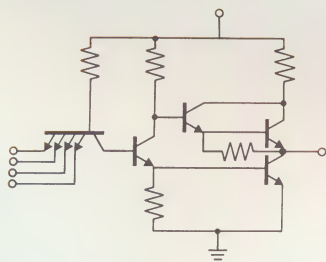
NOTE: 1/2 circuit shown.

12



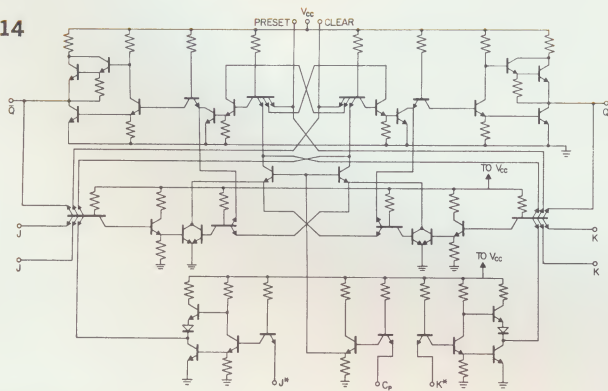
NOTE: 1/4 circuit shown.

13

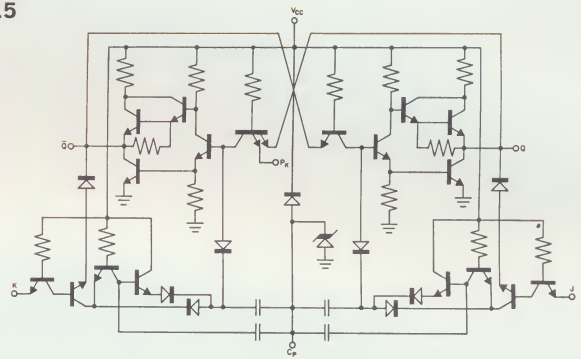


NOTE: 1/2 circuit shown.

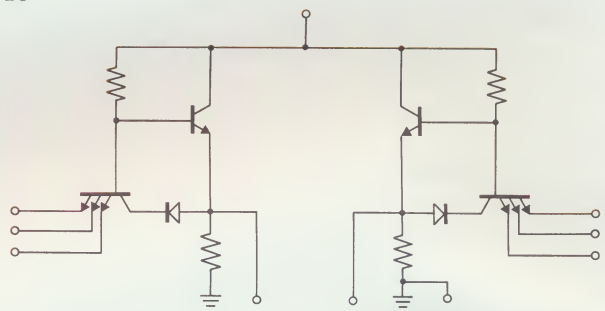
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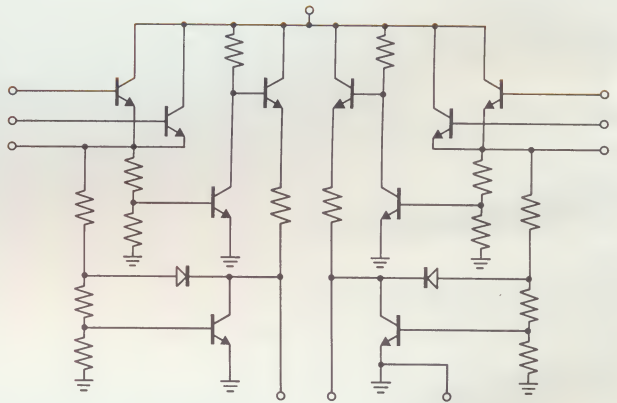
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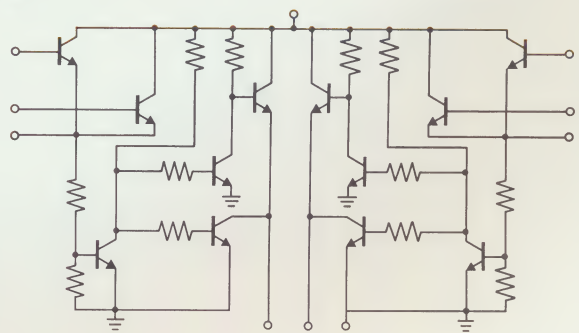
16



17



18



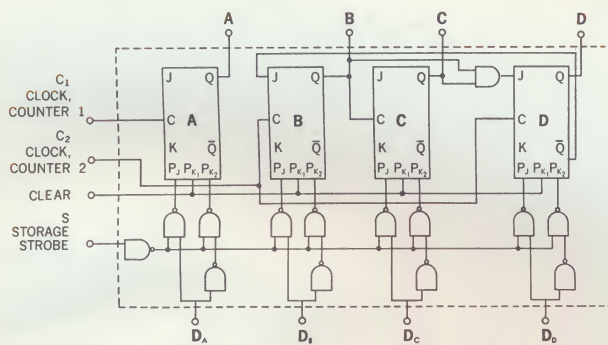
MONOLITHIC SUBSYSTEMS

The Signetics 1280 and 1281 are four-bit monolithic subsystems in convenient dual in-line packages. Both can be used as either counting or storage elements. The 1280 Decade Counter will divide by 2, 5, or 10 and provides either BCD or square wave outputs. The 1281 Binary Counter will divide by 2, 4, 8, or 16. Both counters have provisions for full decoding. Either of the counters

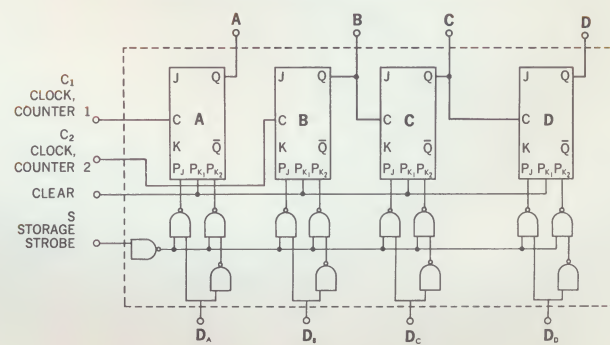
may be used in cascade, and both offer the following features for greatest versatility.

- Counting Rate 20 MHz
- Power Consumption 100 mW
- Operating Temperature 0°C to 70°C
- Optional BCD or Biquinary Outputs
- TTL and DTL Logic Compatibility
- Strobed Single-Ended Inputs
- Common Clear Line

1280 DECADE COUNTER/STORAGE REGISTER



1281 BINARY COUNTER/STORAGE REGISTER

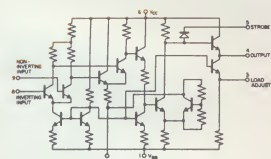


LINEAR FUNCTION SET

Signetics linear amplifiers provide all of the most frequently required circuit functions over a broad spectrum of gain and bandwidth combinations.

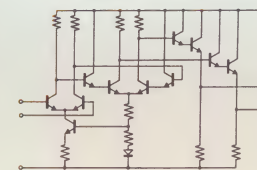
Available in two operating ranges: -55°C to +125°C and 0°C to +70°C.

518 ANALOG COMPARATOR



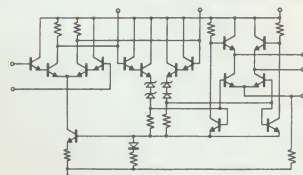
- Strobe Control
- Response time 55ns
- 10 msec overdrive
- Output Voltage Swing +5.1 V
- -1.4 V
- Differential Input Impedance 3000Ω

505 SMALL SIGNAL DIFFERENTIAL AMPLIFIER



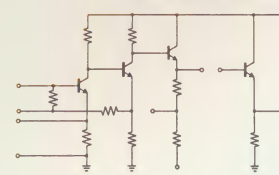
- Differential Input and Output
- Gain Bandwidth Product 2.5 GHz
- Common Mode Rejection 95 db min
- Input Common Mode Range ±1.0 V
- Power Dissipation 100 mW

506 DIFFERENTIAL AMPLIFIER



- Open Loop Voltage Gain 18,000
- Differential Input Impedance 200,000Ω
- Output Voltage Swing ±11 Volts
- Common Mode Rejection Ratio 90 db

501 RF/VIDEO/PULSE AMPLIFIER



- Externally Variable Gain-Bandwidth Characteristics
- Noise Figure 5.5 db typ @ 100 KHz
- Gain Stability vs Temperature ±1.0 db max
- Low Power Drain 25 mw max

SIGNETICS SURE PROGRAM

SIGNETICS SURE PROGRAM

The Signetics SURE* Program consists of a combination of 100% and statistical sample tests designed to assure specified performance, continuing uniformity, and long term reliability in Signetics products. These tests are made regularly at no extra cost to the user and are performed in addition to the 17 quality assurance inspections and tests to which every circuit is subjected before final seal. The tests, tabulated below for the specifier's convenience, are performed in accordance with the following conditions, sequence, and schedules on equipment calibrated to meet all requirements of MIL-Q-9858A and MIL-C-45662A.

One hundred per cent Production Screening (Table I) includes Thermal Shock, Centrifuge, and Hermeticity preceding Final Electrical Tests. Every circuit in every lot submitted for Quality Assurance Acceptance Testing must pass this screening series.

Every production lot of every circuit type is subject to the Group A tests outlined in Table II. All details of the sampling plans used for lot acceptance conform with MIL-STD-105D.

Group B Inspection shown in Table III is a complete environmental series in accordance with MIL-S-19500 and MIL-STD-750. These tests are performed once in every 28-day manufacturing period on a production lot of a representative circuit type. The circuit type selected each period is changed routinely and is representative of all structurally similar devices produced on the same line by the same processes during that period. A summary of these test results is available on request at the time of order placement.

Group C tests (Table IV) are intended to verify design parameters that are not specifically measured in Group A or B but are guaranteed by consideration of related measurements in those two series. These tests are performed every 90 days on at least one lot of every circuit type produced during that period.

For those with ultra-high reliability requirements, an additional preconditioning series, including operating burn-in and X-Ray, applicable to every circuit to be shipped, is available at extra cost. Details are given under Optional Preconditioning Series (Table V).

*Systematic Uniformity and Reliability Evaluation

TABLE I — 100% PRODUCTION SCREEN TESTS

Thermal Shock: 5 cycles; 60 sec. at 0°C, 60 sec. at 100°C. Centrifuge: y_1 axis; 30,000 g. min. Hermeticity: Gross leak test Above series performed prior to FINAL ELECTRICAL TESTS
--

TABLE II — GROUP A, PRODUCT ACCEPTANCE TESTS

SUB-GROUP	TEST	CONDITIONS	LIMITS	AQL	INSPECTION LEVEL
A-1	Visual and Mechanical Inspection	Per MIL-STD-750, Method 2071		1.0%	II
A-2	DC Parameters	$T = +25^\circ\text{C}$; Note 1	Note 2	1.0%	II
A-3	DC Parameters	$T = +25^\circ\text{C}$; Notes 1, 3	Note 2	1.0%	II
A-4	DC Parameters	$T = +125^\circ\text{C}$; Note 1	Note 2	1.0%	II
A-5	DC Parameters	$T = -55^\circ\text{C}$; Note 1	Note 2	1.0%	II
A-6	AC Parameters	$T = +25^\circ\text{C}$; Note 1	Note 2	1.0%	II

TABLE III — GROUP B, ENVIRONMENTAL TESTS PER MIL-S-19500D AND MIL-STD-750A

SUB-GROUP	TEST	CONDITIONS	MIL-STD-750 METHOD	LIMITS	LTPD	MAX. ACCEPTANCE NUMBER
B-1	Physical Dimensions		2066		15	1
B-2	DC Parameters Solderability Temperature Cycling Thermal Shock Moisture Resistance Electrical End Points FAILURE CRITERIA	Per GROUP A, SUB-GROUP 3 All terminals 10 cycles, $T_{\text{max}} = +175^\circ\text{C}$ $T_{\text{min}} = -70^\circ\text{C}$ $T_{\text{max}} = +100^\circ\text{C}$ 5 cycles, 1 minute at each extreme Transfer time = 5 sec. max. Omit initial conditioning Per GROUP A, SUB-GROUP 3 "I" Input Current "I" Output Voltage "O" Input Current "O" Output Voltage Expansion Node Current (as applicable)	2026 1052 1056 1021	Notes 2, 3 Notes 2, 3 10X Initial Value $\pm 20\%$ Initial Value $\pm 20\%$ Initial Value ± 0.1 V $\pm 20\%$ Initial Value	15	1
B-3	DC Parameters Shock Vibration Fatigue Vibration, Var. Freq. Acceleration Electrical End Points FAILURE CRITERIA	Per GROUP A, SUB-GROUP 3 1500 g; 5 blows ea. x_1, y_1, z_1 ; 0.5 msec. 30 g; non-operating 30 g; 30,000 g; 1 min. ea. x_1, y_1, z_1 , Per GROUP A, SUB-GROUP 3 Same as B-2	2016 2046 2056 2006	Notes 2, 3 Notes 2, 3	15	1

SIGNETICS SURE PROGRAM

SUB-GROUP	TEST	CONDITIONS	MIL-STD-750 METHOD	LIMITS	LTPD	MAX. ACCEPTANCE NUMBER
B-4	Terminal Strength Hermeticity Small Leak Large Leak	Test Condition E; weight = 4 oz. Per MIL-STD-202, Method 112C Condition C; Procedure III a Condition A; Ethylene Glycol	2036	25 x 10 ⁻⁶ cc/sec. max.	15	1
B-5	Salt Atmosphere		1041		15	1
B-6	DC Parameters Storage Life Electrical End Points FAILURE CRITERIA	Per GROUP A, SUB-GROUP 3 1000 hours at T _{min} = +175°C Per GROUP A, SUB-GROUP 3 Same as B-2	1031	Notes 2, 3 Notes 2, 3	λ=15	
B-7	DC Parameters Operating Life Electrical End Points FAILURE CRITERIA	Per GROUP A, SUB-GROUP 3 1000 hours at T _{min} = +125°C; Dynamic operation at 100 Kc. Per GROUP A, SUB-GROUP 3 Same as B-2	1026	Notes 2, 3 Notes 2, 3	λ=10	

TABLE IV — GROUP C, DESIGN TESTS

SUB-GROUP	TEST	CONDITIONS	LIMITS	AQL	INSPECTION LEVEL
C-1	DC Parameters	Note 1	Note 2	1.0%	II
C-2	AC Parameters	Note 1	Note 2	1.0%	II

OPTIONAL PRECONDITIONING SERIES

The following PRECONDITIONING SERIES is recommended for special applications in which the need for very high reliability outweighs consideration of incremental costs and delivery time. This series is applied after the normal GROUP A acceptance tests. Circuits subjected to this PRECONDITIONING SERIES are clearly distinguishable from standard products in the following ways:

- 1) Individual serial number on each circuit.
- 2) Lids are painted red.

- 3) Prefix to part number is RE rather than SE.
- 4) Individual device variable parameter test data supplied with each shipment.

A minimum order of 100 pieces (mixed types if desired) is required for the OPTIONAL PRECONDITIONING SERIES. Consult your local representative for price information. Delivery may require 2 to 3 weeks longer than for standard product. Device types should be specified with RE prefixes.

TABLE V — OPTIONAL PRECONDITIONING SERIES

TEST	CONDITIONS	MIL-STD-750 METHOD	LIMITS	AQL
Visual Inspection		2071		100%
DC Parameters	Per GROUP A, SUB-GROUP 3; Record Data		Notes 2, 3	100%
Thermal Shock	T _{min} = -70°C T _{max} = +100°C 5 cycles; 1 minute at each extreme Transfer time = 5 sec. max.	1056		100%
Mechanical Shock	1500 g; 5 blows y ₁ ; 0.5 msec.	2016		100%
Visual Inspection		2071		100%
Capacitor Stress	24 hours; T _{min} = +125°C; DC Condition		Note 4	100%
Operating Burn-In	36 hours; T _{min} = +125°C; Dynamic operation at 100 Kc.	1026		100%
Centrifuge	30,000 g, y ₁	2006		100%
Hermeticity	Per MIL-STD-202, Method 112C			100%
Small Leak	Condition C, Procedure III a		25 x 10 ⁻⁶ cc/sec.	
Large Leak	Condition A, Ethylene Glycol			
DC Parameters	Per GROUP A, SUB-GROUP 3; Record Data Apply failure criteria from TABLE III, SUB-GROUP B-2		Notes 2, 3	100%
X-Ray	Per MIL-STD-202, Method 209			100%
Visual Inspection		2071		100%

1. All test equipment calibrated to meet requirements of MIL-Q-9858A and MIL-C-45662A.
2. Detailed tests, conditions, and limits applicable to each sub-group are given in data sheet ELECTRICAL CHARACTERISTICS table.
3. These specific tests are used to determine Electrical End Points as required in GROUP B and in OPTIONAL PRECONDITIONING SERIES.
4. Applicable only to device types incorporating MOS capacitors.

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