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REVISIONS

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UNIT LOGIC DEVICE TYPES 322, 323, AND 324, DISCRETE INPUT (DIB), DESIGN AND PERFORMANCE FOR

1. SCOPE

1.1 PURPOSE - This specification defines the design and performance characteristics of the Discrete Input (DIB), Unit Logic Device (ULD) Types 322, 323, and 324.

2. APPLICABLE DOCUMENTS

2.1 The following documents shall form a part of this specification to the extent specified herein. In case of conflict between this specification and the referenced documents, this specification shall have precedence.

2.2 IBM SPECIFICATIONS

6701130	Electronic Measurement Standards

2.3 IBM DRAWINGS

6000043	Transistor-Silicon NPN
6000047	Diode-Silicon
6000322	Unit Logic Device, Type 322
6000323	Unit Logic Device, Type 323
6000324	Unit Logic Device, Type 324

3. REQUIREMENTS

3.1 DISCRETE INPUT - The Discrete Input (DIB) provides an output signal compatible with LVDA logic circuitry. The input signal is characterized by a switch which is either closed to ground or open. The circuit provides a logical inversion of the input signal.

3.2 LOGIC BLOCK DIAGRAM

3.2.1 System Block Diagram - Refer to Figure 1.

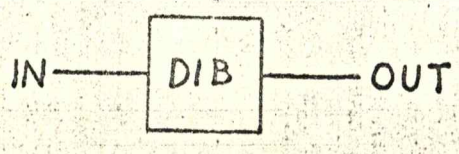

FIGURE 1

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3.2.1 ULD Interconnection Block Diagram - Refer to Figure 2.

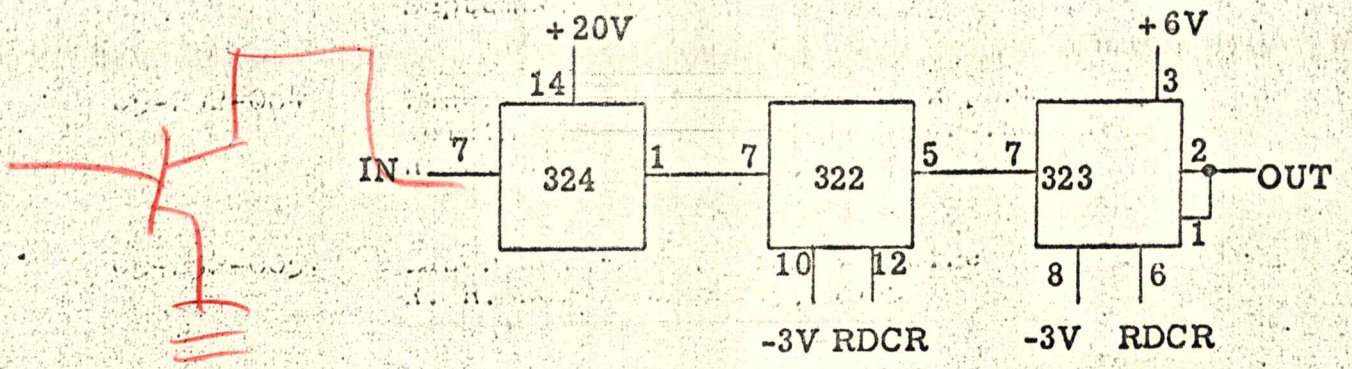

FIGURE 2

3.3 SCHEMATIC - Refer to Figure 3.

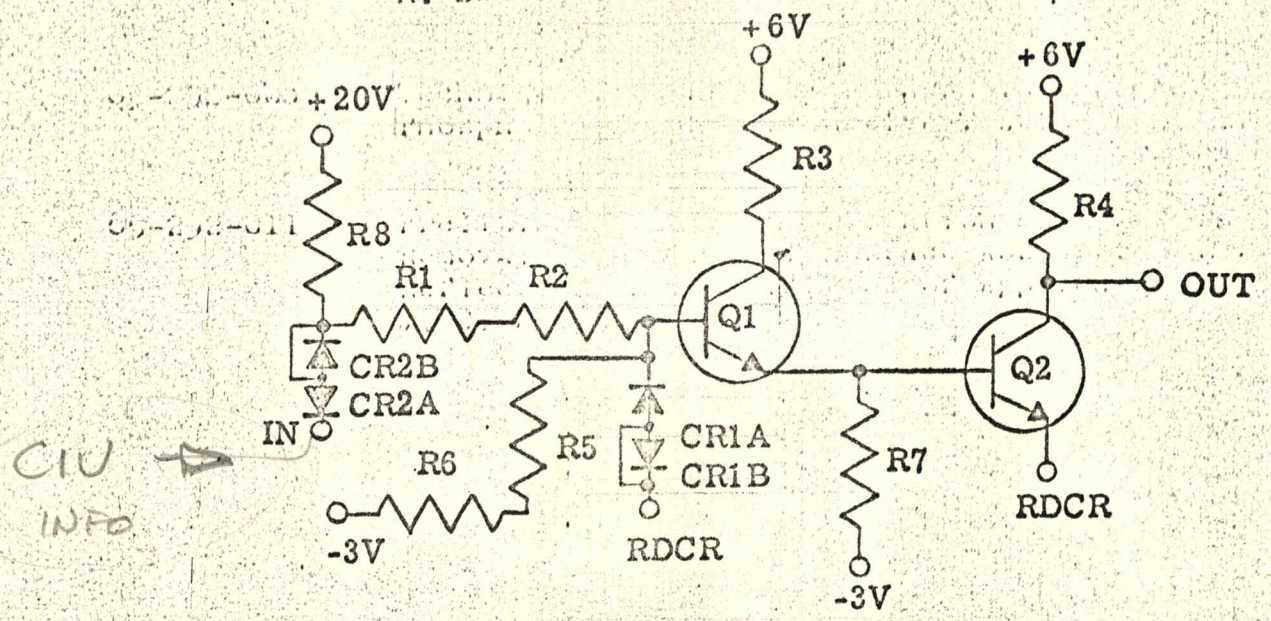

FIGURE 3

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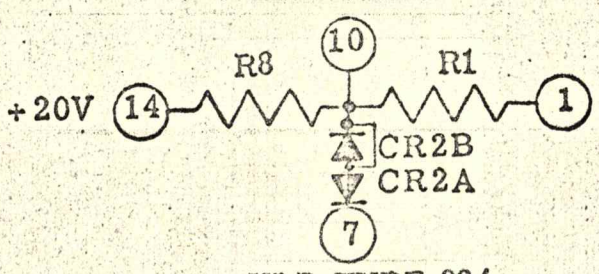
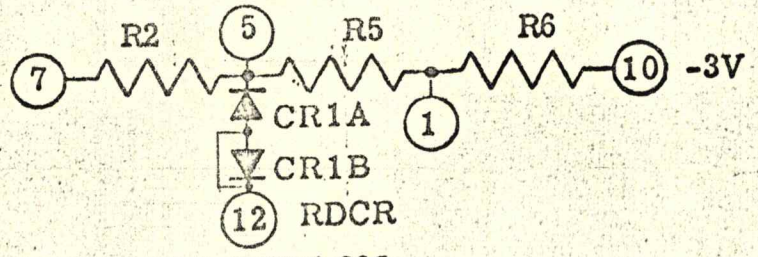
3.3.1 ULD Schematic - Refer to Figures 4, 5 and 6.



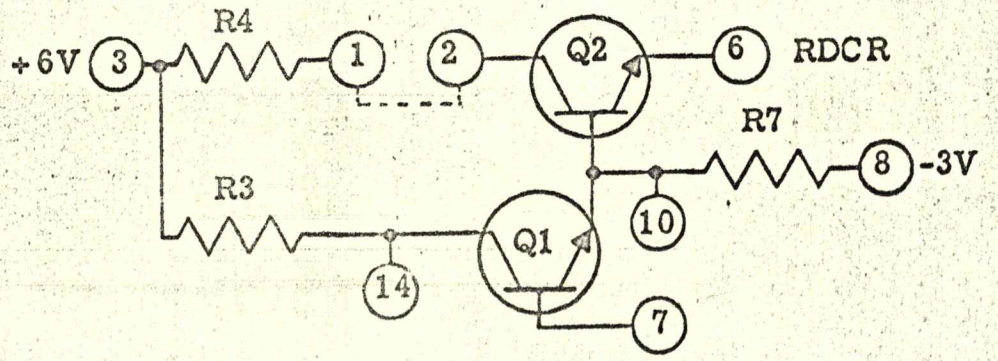
ULD TYPE 324

FIGURE 4



ULD TYPE 322

FIGURE 5



ULD TYPE 323

FIGURE 6

3.4 OPERATING TEMPERATURE LIMITS - Maximum junction temperature of any semiconductor device is 100°C. Minimum junction temperature of any semiconductor device is 10°C.

3.5 COMPONENTS

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3.5.1 Discrete Components - Refer to Table I.

TABLE I

UNIT LOGIC DEVICE

Type Number	IBM Part Number
322	6000322
323	6000323
324	6000324

3.5.2 Deposited Components in ULD Types 322, 323, and 324. Refer to Tables II through IV.

TABLE II

TRANSISTORS

REF DES	IBM Drawing
Q1	6000043
Q2	6000043

TABLE III

RESISTORS

REF DES	Resistive Value	Wattage Rating	EOL Tolerance
R8	8K	51MW	±5%
R1	10K	18MW	±5%
R2	8K	20MW	±5%
R3	5.2K	55MW	±5%
R4	6K	17MW	±5%
R5	8.25K	20MW	±5%
R6	8.25K	20MW	±5%
R7	10K	21MW	±5%

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TABLE IV

DIODE SETS

REF DES	IBM Drawing
CR1A	6000047
CR1B	6000047
CR2A	6000047
CR2B	6000047

3.6 COMPONENT OPERATING CONDITIONS

3.6.1 ULD Dissipation - Refer to Table V.

TABLE V

UNIT LOGIC DEVICE

Type Number	Average Power Dissipation During Worst Case Steady State Conditions
322	6.3MW
323	17MW
324	72MW

3.6.2 Deposited Components in ULD Types 322, 323 and 324. Refer to Tables VI through VIII.

TABLE VI

TRANSISTORS

REF DES	Parameter	Peak	Average During Worst Case Steady State Conditions
Q1	Collector to Emitter Voltage	6.4V	6.4V
	Inverse Base to Emitter Voltage	0V	0V
	Collector Current	1.15MA	1.15MA
	Power Dissipation	1.15MW	1.15MW
Q2	Collector to Emitter Voltage	6.12V	6.12V
	Inverse Base to Emitter Voltage	1.7V	1.7V
	Collector Current	8.45MA	8.45MA
	Power Dissipation	1.7MW	1.7MW

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TABLE VII

DIODE SETS

REF DES	Peak Forward Current	Peak Reverse Voltage	Maximum Switching Rate
CR2B	NA		
CR2A	3.02MA	21.7V	1KC
CR1A	.0.243MA	2V	1KC
CR1B	NA		

TABLE VIII

RESISTORS

REF DES	Peak Voltage	Average Power Dissipation During Worst Case Steady State Conditions
R8	23V	52MW
R1	8.0V	6.7MW
R2	6.5V	5.3MW
R3	5.5V	6.2MW
R4	5.9V	6.2MW
R5	2.6V	0.8MW
R6	2.6V	0.8MW
R7	3.96V	1.7MW

3.7 POWER SUPPLY REQUIREMENTS - Refer to Table IX.

TABLE IX

CURRENT LOAD PER SUPPLY

DC Voltage	Tolerance	Maximum Current Output Up	Output Down
+20V	±2%	3.02MA	1.58MA
+6V	±2%	Negligible	2.32MA
-3V	±2%	+.07MA	.67MA

3.7.1 Duty Cycle -100 percent.

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3.7.2 Voltage Application Sequence - None.

3.8 SIGNAL INPUT REQUIREMENTS

3.8.1 Signal Input Levels

	Minimum	Maximum
Up Level	+8V OR Open Circuit	+35V Or Open Circuit
Down Level	-3V	+3V

3.8.2 Input Currents

	Minimum	Maximum
Input at +0V	-2.60MA	-2.16MA
Input at +23V	0MA	0MA

3.8.3 Input Switching Requirements

	Minimum	Maximum
Rise Time	10NSEC	500USEC
Fall Time	10NSEC	500USEC

3.9 OUTPUT SPECIFICATIONS - Output specifications are predicated upon worst-case signal and power inputs and worst case end-of-life component characteristics. End-of-life resistor tolerance is ± 5%.

3.9.1 Maximum Resistive Load - The output may drive a minimum resistance of 790 ohms returned to +6V.

	Load Current	
	Minimum	Maximum
Output Up	0	-100UA
Output Down	NA	-7.75MA

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3.9.2 Output Signals Levels - Steady State

	Minimum	Maximum
Output Up	5.25V	6.12V
Output Down	0V	0.37V

3.9.3 Maximum Capacitive Load - Maximum load capacitance including stray capacitance is 100 PF.

3.9.4 Output Delay

3.9.4.1 Output Rise Delay

	Minimum	Maximum
Rise Delay	20USEC	300USEC

3.9.4.2 Output Fall Delay

	Minimum	Maximum
Fall Delay	5USEC	200USEC

3.9.5 Output Response Times

3.9.5.1 Fall Time

	Minimum	Maximum
Fall Time	1USEC	25USEC

3.9.5.2 Rise Time

	Minimum	Maximum
Rise Time	1USEC	30USEC

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3.10 INSTALLATION REQUIREMENTS

3.10.1 Grounding - Not applicable.

3.10.2 Packaging - The three ULD types 322, 323, and 324 forming DIB are to be adjacent.

4. QUALITY ASSURANCE PROVISIONS - Not applicable.

5. PREPARATION FOR DELIVERY - Not applicable.

6. NOTES

6.1 ABBREVIATIONS

NSEC	Nanosecond
PF	Picofarad
NA	Not Applicable.
EOL	End-of-Life
RDCR	Regulated DC Return

6.1.2 All voltages are DC unless otherwise specified.

6.2 MEASUREMENTS - Refer to Electronics Measurement Standards, IBM Specification 6701130.