

MIL-M-38510/2E  
AMENDMENT 7  
19 November 1984  
SUPERSEDING  
AMENDMENT 6  
19 December 1983

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL  
TTL, FLIP-FLOPS  
MONOLITHIC SILICON

This amendment forms a part of Military Specification MIL-M-38510/2E, dated 24 December 1974, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 2

- \* 1.2.5 Recommended operating conditions: Delete "Ambient operating temperature range" and substitute "Case operating temperature range".
- 3.3: Add the reference "(see 6.5)".
- \* 3.4, line 2: Delete "ambient" and substitute "case".
- \* 3.5, delete in its entirety.

PAGE 3

- \* TABLE I, input clamp voltage test, Conditions column: Delete " $T_A$ " and substitute " $T_C$ ".
- \* TABLE I, High-level input current tests, minimum limits column: Delete "0".  
TABLE I, Maximum clock frequency test column, add footnote reference "10/"; Minimum limits column, delete "5" and "7.5" and substitute "10" and "15".  
TABLE I, Symbol  $I_{IH3}$ , Device type column, add footnote reference "11/".

TABLE I, add new footnotes 10 and 11 as follows:

10/ Minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

11/ For device types 02 and 03, limits are 0 to 120  $\mu A$ .

PAGE 4

- \* 3.6, delete and substitute:

"3.6 Electrical test requirements. The electrical test requirements for each device class shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table III. Subgroups 7 and 8 testing requires only a summary of attributes data."

TABLE II, first column: Delete "Group C end point electrical parameters (Method 5005)" and substitute "Groups C and D end point electrical parameters (Method 5005)." .

Note\*, delete and substitute: "PDA applies to subgroup 1 (see 4.3(d))."

4.2, delete and substitute:

"Qualification inspection. Qualification inspection shall be in accordance with ~~MIL-M-38510~~. Inspections to be performed shall be those specified herein for groups A, B, C, and D inspections (see 4.4.1, 4.4.2, and 4.4.3)."

PAGE 5

4.3: Delete "(a)", "(b)", "(c)", and "(g)" in their entirety.

4.4.1, delete and substitute:

"Group A inspection. Group A inspection shall be in accordance with table I of ~~method 5005 of MIL-STD-883~~ and as follows:

(a) Tests shall be as specified in table II.

(b) Subgroups 4, 5, and 6 shall be omitted."

4.4.2, delete and substitute:

"Group B inspection. Group B inspection shall be in accordance with table II of ~~method 5005 of MIL-STD-883~~."

4.4.3, delete and substitute:

"Groups C and D inspections. Groups C and D inspections shall be in accordance with tables III and IV of method 5005 of MIL-STD-883 and as follows:

(a) End point electrical parameters shall be as specified in table II.

(b) Subgroups 3 and 4 shall be added to the group C inspection requirements for class B devices and shall consist of the tests, conditions, and limits specified for subgroups 10 and 11 of group A.

(c) Operating life-test (method 1005 of MIL-STD-883) conditions, or equivalent:

(1) Test condition D or E, using the circuit shown on figure 4, or equivalent.

(2)  $T_A = 125^\circ\text{C}$ , minimum.

(3) Test duration: 1,000 hours, except as permitted by Appendix B of MIL-M-38510."

PAGE 12

FIGURE 3: Add new circuit C as printed on page 11 of this amendment. (Original circuit C was deleted by previous amendment).

FIGURE 3, note 1: Delete "A and B" and substitute "A, B, and C." (Reference to circuit C deleted by previous amendment).

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FIGURE 3, delete and substitute a new circuit B as printed below.

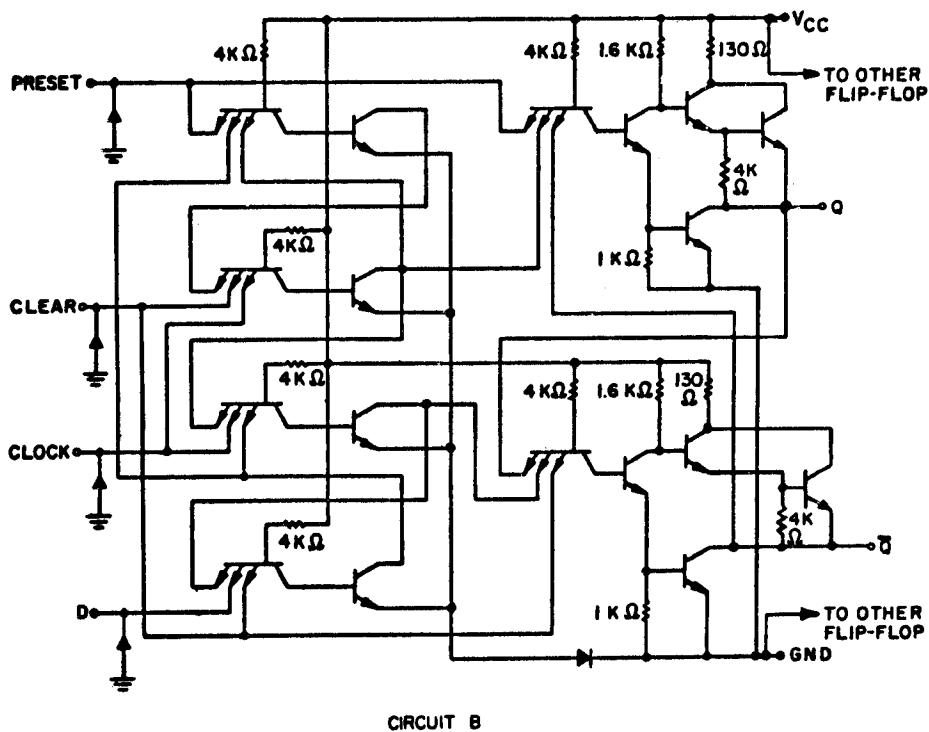


FIGURE 3, Add "circuit C" as printed on page 12 of this amendment.

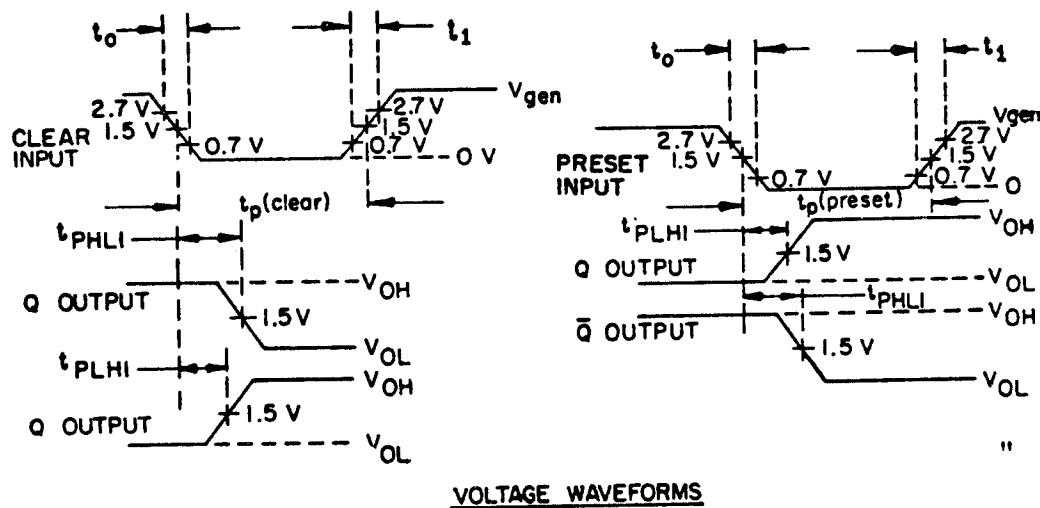
FIGURE 3, note 1: Delete "A and B" and substitute "A, B, and C".

PAGES 21, 22, AND 23

FIGURE 4, Device types 01 thru 07: Delete CP conditions in their entirety and substitute "CP = 100 kHz ±50% square wave; duty cycle = 50 ±15%; VI<sub>L</sub> = -0.5 V minimum to +0.8 V maximum; VI<sub>H</sub> = 2.0 V minimum to 5.5 V maximum".

PAGE 24

FIGURE 5, voltage waveforms, delete and substitute:

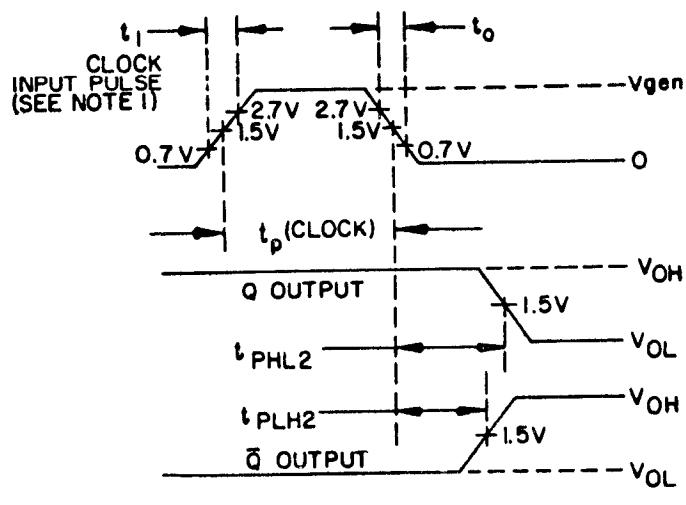


PAGE 27

FIGURE 8, Note 1, delete the last sentence and substitute: "When testing f<sub>MAX</sub> the clock input characteristics are V<sub>gen</sub> = 3 V, t<sub>1</sub> = t<sub>0</sub> ≤ 10 ns, t<sub>p</sub>(clock) = 20 ns, and PRR = 10 MHz for subgroups 9, 10, and 11."

PAGE 29

FIGURE 10, voltage waveforms, delete and substitute:



PAGES 37 THROUGH 61

TABLE III, all device types, Subgroup column, delete "T<sub>A</sub>" and substitute "T<sub>C</sub>", wherever it appears in the table.

PAGE 37

TABLE III, subgroup 1, I<sub>IL2</sub> and I<sub>IL3</sub>: Delete and substitute new tests as printed on page 13 of this amendment.

\* TABLE III, Tests 28 thru 45, Minimum limits column: Delete "0".

PAGE 38

TABLE III, subgroup 1, I<sub>IH5</sub>: Delete and substitute new tests as printed on page 13 of this amendment.

PAGE 39

TABLE III, tests 93, 94, 103, and 104, Symbol column: Add "6/"; Minimum limits column, delete "5" and substitute "10".

Add new footnote 6 as follows:

"6/ F<sub>MAX</sub>, minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency.

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TABLE III:

Tests 21 and 22, Clock 1 column: Delete "4.5 V" and substitute footnote "5/".

Test 21, Clear 1 column: Delete "B" and substitute "4.5 V".

Test 23, Clear 2 column: Delete "B" and substitute "4.5 V".

Tests 23 and 24, Clock 2 column: Delete "4.5 V" and substitute footnote "5/".

Test 27, CKT A, C, and B, K<sub>1</sub> column: Delete "4.5 V".

Test 28, CKT A, C, and B, K<sub>2</sub> column: Delete "4.5 V".

\* Tests 29 thru 42, Minimum limits column: Delete "0".

Tests 37 and 38, Symbol column: Add "7/".

Test 43, CKT A, and C, Clear 1 column: Delete "2.4 V" and substitute "E".

Test 44, CKT A and C, Clear 2 column: Delete "2.4 V" and substitute "E".

Tests 43 and 44, CKT A and C, Test limits: Delete "-500" Min and "-50" Max and substitute "-50" Min and "-700" Max.

Tests 43 and 44, CKT B, Test limits: Delete "-850" Min and "-200" Max and substitute "-200" Min and "-850" Max.

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TABLE III:

Test 46, Clock 1 column: Delete "GND" and substitute "A".

Test 46, Clear 1 column: Delete "2.4 V" and substitute "4.5 V".

Test 46, K<sub>1</sub> column: Delete "2.4 V" and substitute "0 V".

Test 46, J<sub>1</sub> column: Delete "2.4" and substitute "4.5 V".

Test 47, Clock 2 column: Delete "GND" and substitute "A".

Test 47, Clear 2 column: Delete "2.4 V" and substitute "4.5 V".

Test 47, J<sub>2</sub> column: Delete "2.4 V" and substitute "4.5 V".

Test 47, K<sub>2</sub> column: Delete "2.4 V" and substitute "0 V".

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TABLE III:

Test 89 through 92 and 105 through 108, Symbol column: Add "6/"; Minimum limits column, delete "5" and substitute "10".

Tests 89 and 90, Clear 1 column: Delete "5.0 V".

Tests 91 and 92, Clear 2 column: Delete "5.0 V".

Tests 97, 98, 101, 102, 113, and 114, Clear 1 column: Delete "J" and substitute "5.0 V".

Tests 99, 100, 103, 104, 115, and 116, Clear 2 column: Delete "J" and substitute "5.0 V".

Tests 105 and 106, Clear 1 column: Delete "5.0 V".

Tests 107 and 108, Clear 2 column: Delete "5.0 V".

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TABLE III:

Tests 117 and 118, Clear 1 column: Delete "J" and substitute "5.0 V".

Tests 119 and 120, Clear 2 column: Delete "J" and substitute "5.0 V".

Notes C and J: Delete in their entirety.

Add footnotes 5, 6, and 7 as follows:

"5/ Input shall be one normal clock pulse, then 4.5 V"

6/ F<sub>MAX</sub>, minimum limit specified is the frequency of the input pulse.  
The output frequency shall be one-half of the input frequency".

7/ For CKT A, I<sub>IH3</sub> limits are 0 to 120 μA."

PAGE 44

TABLE III:

Tests 21 and 22, Clock 1 column: Delete "4.5 V" and substitute footnote "5/".

Test 21, clear 1 column: Delete "B" and substitute "4.5 V".

Tests 23 and 24, Clock 2 column: Delete "4.5 V" and substitute footnote "5/".

Test 23, Clear 2 column: Delete "B" and substitute "4.5 V".

Tests 25 and 26, Test limits, Minimum column: Delete "-1.4" and substitute "-1.25".

\* Tests 29 thru 42, Minimum limits column: Delete "0".

Tests 37 and 38, Symbol column: Add "7/".

Test 39, Clear 1 column: Delete "5.5 V" and substitute "GND".  
Test 41, Clear 2 column: Delete "5.5 V" and substitute "GND".  
Test 43 CKT A, C, and B, Clear 1 column: Delete "2.4 V" and substitute "GND".  
Test 43 CKT A and C, Test limits: Delete "-500" Min and "-50" Max and substitute "-50" Min and "-700" Max.  
Test 43 CKT B, Test limits: Delete "-500" Min and "-200" Max and substitute "-200" Min and "-850" Max.  
Test 44 CKT A, C, and B, Clear 2 column: Delete "2.4 V" and substitute "GND".  
Test 44 A and C, Test limits: Delete "-500" Min and "-50" Max and substitute "-50" Min and "-700" Max.  
Test 44 CKT B, Test limits: Delete "-850" Min and "80" Max and substitute "80" Min and "-850" Max.

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TABLE III:

Test 46, Clock 1 column: Delete "GND" and substitute "A".  
Test 46, Clear 1 column: Delete "2.4 V" and substitute "4.5 V".  
Test 46, K<sub>1</sub> column: Delete "2.4 V" and substitute "0 V".  
Test 46, J<sub>1</sub> column: Delete "2.4" and substitute "4.5 V".  
Test 47, Clock 2 column: Delete "GND" and substitute "A".  
Test 47, Clear 2 column: Delete "2.4 V" and substitute "4.5 V".  
Test 47, J<sub>2</sub> column: Delete "2.4 V" and substitute "4.5 V".  
Test 47, K<sub>2</sub> column: Delete "2.4 V" and substitute "0 V".

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TABLE III:

Tests 89 through 92 and 105 through 108, Symbol column: Add "6/"; Minimum limits column, delete "5" and substitute "10".

Tests 93, 95, 109, and 111, K<sub>1</sub> column: Delete "2.4 V" and substitute "GND".  
Tests 94, 96, 110, and 112, K<sub>2</sub> column: Delete "2.4 V" and substitute "GND".

Note C: Delete in its entirety.

Add footnotes 5, 6, and 7 as follows:

- "5/ One normal clock pulse, then 4.5 V.  
6/ F<sub>MAX</sub>, minimum limit specified is the frequency of the input pulse.  
The output frequency shall be one-half of the input frequency.  
7/ For CKT A, I<sub>IH3</sub> limits are 0 to 120  $\mu$ A."

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TABLE III:

Test number column: Delete "35 A, D" through "38 A, D" and substitute "35 A, C" through "38 A, C"; delete "35 B, C" through "38 B, C" and substitute "35 B" through "38 B".

Tests 31, 32, 33, 34, Test limits, Minimum column: Delete "-1.4" and substitute "-1.25".

Tests 39 and 43, Preset 1 column: Delete "B".

\* Tests 39 thru 46, Minimum limits column: Delete "0".

Tests 40 and 44, Clear 1 column: Delete "B".

Tests 41 and 45, Preset 2 column: Delete "B".

Tests 42 and 46, Clear 2 column: Delete "B".

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TABLE III:

\* Tests 47 thru 56, Minimum limits column: Delete "0".

Test 55, Preset 1 column: Delete "GND".

Test 55, Clear 1 column: Add "GND".

Test 56, Preset 2 column: Delete "GND".

Test 56, Clear 2 column: Add "GND".

Tests 57 and 59 CKT A, C, and 57 and 59 CKT 3: Delete in their entirety.

Tests 58 and 60 CKT A and C, Test limits: Delete "-500" Min and "-50" Max and substitute "-50" Min and "-700" Max.

Tests 58 and 60 CKT B, Test limits: Delete "850" Min and "-200" Max and substitute "-200" Min and "-850" Max.

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TABLE III:

Test 94, K<sub>1</sub> column: Delete "B" and substitute "A".

Tests 107 and 108, Clear 1 column: Delete "5.0 V".

Test 107 through 110, Symbol column: Add "5/"; Minimum limits column, delete "5" and substitute "10".

Tests 109 and 110, Clear 2 column: Delete "5.0 V".

Test 111, Preset 1 column: Delete "J" and substitute "5.0 V".

Test 112, Clear 1 column: Delete "J" and substitute "5.0 V".

Test 113, Preset 2 column: Delete "J" and substitute "5.0 V".

Test 114, Clear 2 column: Delete "J" and substitute "5.0 V".

Test 115, Preset 1 column: Delete "J" and substitute "5.0 V".

Test 116, Clear 1 column: Delete "J" and substitute "5.0 V".

Test 117, Preset 2 column: Delete "J" and substitute "5.0 V".

Test 118, Clear 2 column: Delete "J" and substitute "5.0 V".

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TABLE III:

Tests 127 and 128, Clear 1 column: Delete "5.0 V".  
Test 127, Q1 column: Add "OUT".  
Tests 129 and 130, Clear 2 column: Delete "5.0 V".  
Tests 127 through 130, Symbol column: Add "5/"; Minimum limits column, delete "5" and substitute "10".  
Test 131, Preset 1 column: Delete "J" and substitute "5.0 V".  
Test 132, Clear 1 column: Delete "J" and substitute "5.0 V".  
Test 133, Preset 2 column: Delete "J" and substitute "5.0 V".  
Test 134, Clear 2 column: Delete "J" and substitute "5.0 V".  
Test 135, Preset 1 column: Delete "J" and substitute "5.0 V".  
Test 136, Clear 1 column: Delete "J" and substitute "5.0 V".  
Test 137, Preset 2 column: Delete "J" and substitute "5.0 V".  
Test 138, Clear 2 column: Delete "J" and substitute "5.0 V".

Notes: Delete "C" and "J" in their entirety.

Add footnote 5 as follows:

"5/  $F_{MAX}$ , minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency".

PAGE 51

TABLE III, tests 30 and 32, Test no. column: Add "7/".

PAGE 52

TABLE III: Delete and substitute new table III as printed on page 14 of this amendment.

PAGE 53

TABLE III: Delete and substitute new table III as printed on page 15 of this amendment.

PAGE 54

TABLE III and notes, delete and substitute new table III and notes as printed on page 16 of this amendment.

PAGE 55

\* TABLE III, tests 27 thru 44, Minimum limits column: Delete "0".

PAGE 57

TABLE III, tests 93, 94, 103, and 104, Symbol column: Add "5/".

TABLE III, tests 93 and 94, Minimum limits column: Delete "10" and substitute "20".

TABLE III, tests 103 and 104, Minimum limits column: Delete "7.5" and substitute "15".

Add footnote 5 as follows:

"5/  $F_{MAX}$ , minimum limit specified is the frequency of the input pulse. The output frequency shall be one-half of the input frequency."

PAGE 58

\* TABLE III, tests 33 thru 48, Minimum limits column: Delete "0".

PAGE 59

TABLE III, tests 49 through 54,  $V_{CC}$  column: Delete "4.5 V" and substitute "5.5 V".

TABLE III, tests 66, 67, and 68, Clear 1 column: Delete "B" and substitute "A".

PAGE 60

TABLE III, subgroup 9, tests 94 through 101: Delete and substitute new subgroup 9 as printed on page 16 of this amendment.

PAGE 61

TABLE III, subgroup 10, tests 114 through 121: Delete and substitute new subgroup 10 as printed on page 17 of this amendment.

NOTE: The margins of this amendment are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

Custodians:

Army - ER  
Navy - EC  
Air Force - 17

Preparing activity:  
Air Force - 17

(Project 5962-0701)

Review activities:

Army - AR, MI  
Air Force - 11, 99  
DLA - ES  
NASA - NA

User activities:

Army - SM  
Navy - AS, CG, MC, OS, SH  
Air Force - 19

Agent:

DLA - ES

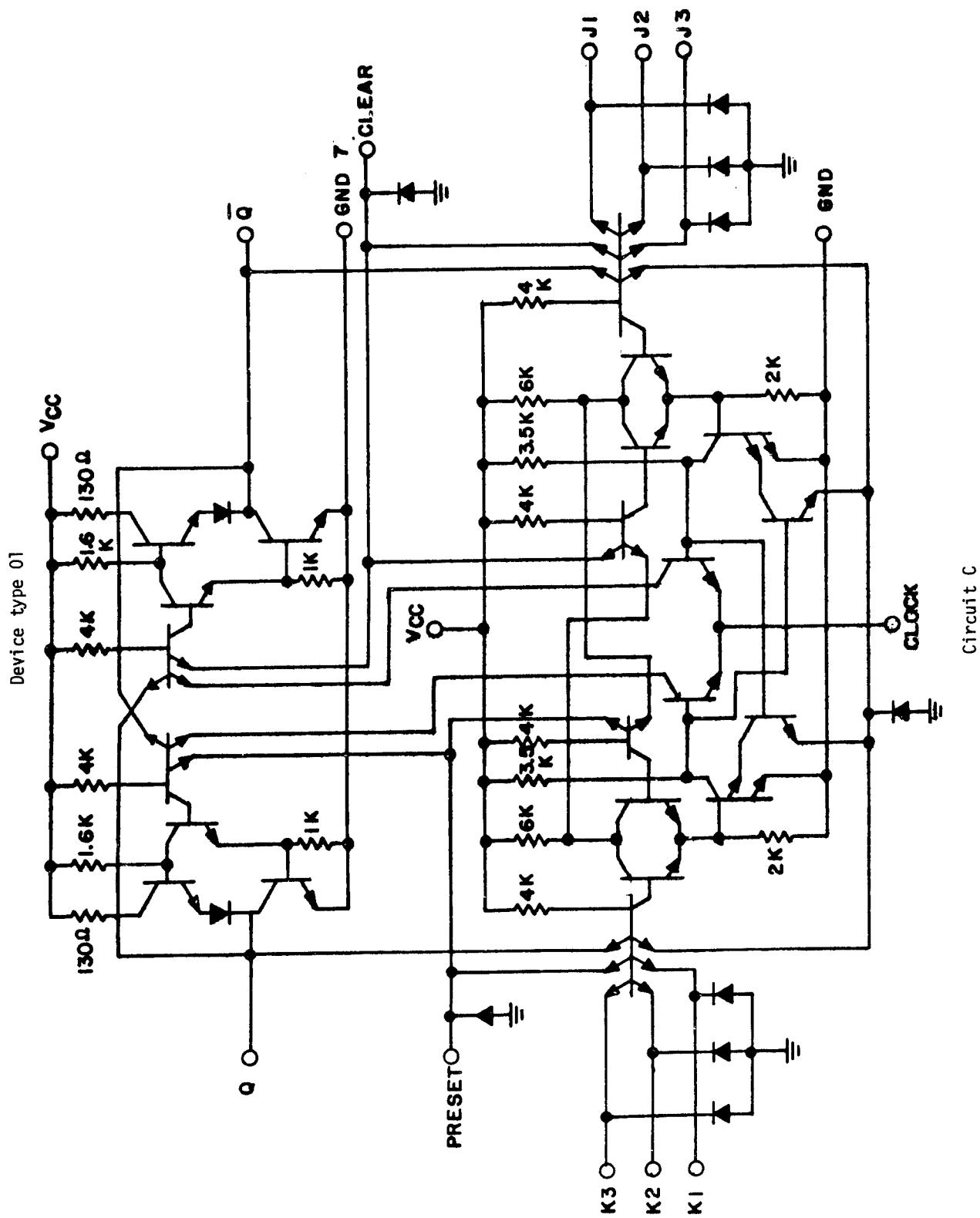


FIGURE 3. Schematic circuits - Continued.

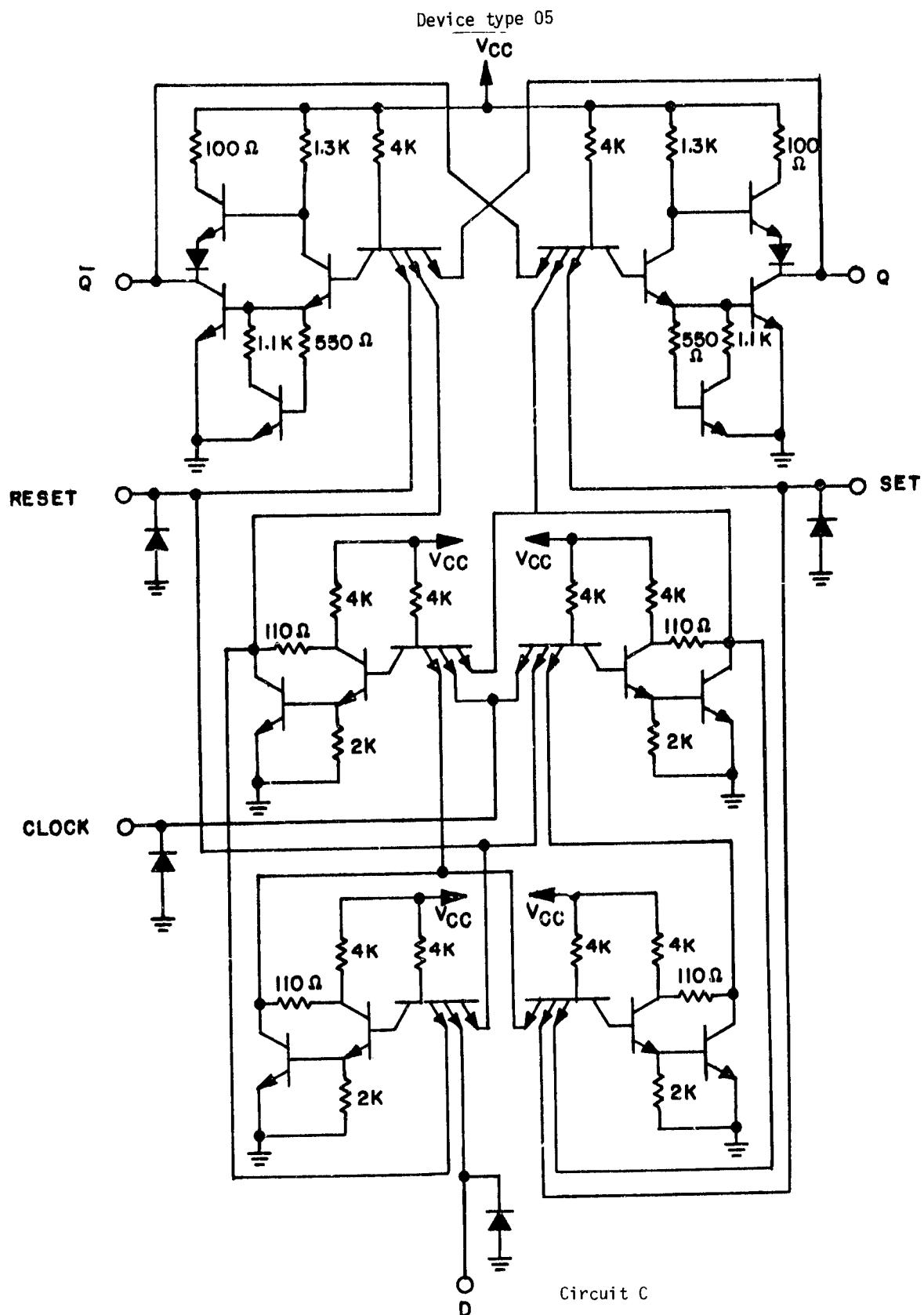


FIGURE 3. Schematic circuits - Continued.

TABLE III. Group A inspection for device type 01. 1/

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Test limits
			Case C	Case C	9	12	13	14	2	1	3	4	5	6	7	8	10	11	
1 $T_C = 25^\circ C$	I <sub>IL2</sub> I <sub>IL2</sub>	3009	24	4.5 V	0.4 V	B	5.5 V	B											mA
			25		0.4 V														
	I <sub>IL3</sub>		26 CKT A		4.5 V	0.4 V													
			26 CKT B			0.4 V													
			27 CKT A				0.4 V												
			27 CKT B					0.4 V											
	I <sub>TH5</sub>	3010	46 CKT A	GND	2.4 V					GND									$\mu A$
			46 CKT B						GND										
			46 CKT C						GND										
			47 CKT A							GND									
			47 CKT B							GND									
			47 CKT C								GND								

TABLE III. Group A inspection for device type 05 1/<sup>1</sup> -continued.

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Test limits
		Case C	3	2	1	14	13	12	11	Clock Preset	2	Q2	Q1	Q1	Q1	5	Preset terminal	
1			3011	49												GND	Q1 Q2 Q2 Q2	-20 -57 mA
$T_C = 25^\circ\text{C}$	I <sub>OS</sub>		3005	50	51	52										GND	V <sub>CC</sub> V <sub>CC</sub>	30 30
	I <sub>CC</sub>		3005	53	54		GND	GND	GND							GND	V <sub>CC</sub>	
2			Same tests, terminal conditions and limits as subgroup 1, except $T_C = 125^\circ\text{C}$ and $V_{IC}$ tests are omitted.															
3			Same tests, terminal conditions and limits as subgroup 1, except $T_C = -55^\circ\text{C}$ and $V_{IC}$ tests are omitted.															
$T_C = 25^\circ\text{C}$		7.2/4/ $T_C = 25^\circ\text{C}$																
			55	B	B	B	B	B	4.5 V	B	B	B	B	B	H 3/Y	GND	H 3/Y	H or L as shown 3/
			56	B	B	B	A	A		A	B	B	B	B	L	L	L	L
			57	B	B	B	A	A		A	B	B	B	B	L	H H H H	L	B
			58	B	B	B	B	B		B	A	B	B	B	L	H H H H	L	A
			59	A	B	B	B	B		B	A	B	B	B	L	H H H H	L	B
			60	A	A	B	B	B		B	A	B	B	B	L	H H H H	L	A
			61	A	A	A	B	B		B	A	A	A	A	L	H H H H	L	B
			62	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	A
			63	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	B
			64	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	A
			65	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	B
			66	B	B	B	A	A		B	A	A	A	A	L	H H H H	L	A
			67	B	B	B	A	A		B	A	A	A	A	L	H H H H	L	B
			68	A	B	B	A	A		B	A	A	A	A	L	H H H H	L	A
			69	A	B	B	A	A		B	A	A	A	A	L	H H H H	L	B
			70	A	A	B	B	B		B	B	B	B	B	L	H H H H	L	A
			71	A	B	B	A	A		B	A	A	A	A	L	H H H H	L	B
			72	A	B	B	A	A		B	A	A	A	A	L	H H H H	L	A
			73	A	B	B	A	A		B	A	A	A	A	L	H H H H	L	B
			74	B	A	B	A	A		B	A	A	A	A	L	H H H H	L	A
			75	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	B
			76	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	A
			77	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	B
			78	A	A	A	A	A		B	A	A	A	A	L	H H H H	L	A
			79	A	B	A	A	A		B	A	A	A	A	L	H H H H	L	B
			80	A	B	A	B	A		B	A	A	A	A	L	H H H H	L	A
			81	A	B	A	B	B		B	B	B	B	B	L	H H H H	L	B
			82	A	B	A	B	B		B	A	A	A	A	L	H H H H	L	A
			83	A	B	A	B	B		B	A	A	A	A	L	H H H H	L	B
			84	A	B	A	B	B		B	A	A	A	A	L	H H H H	L	A
8			8 Z/4/ Same tests, terminal conditions and limits as for subgroup 7, except $T_C = 125$ and $-55^\circ\text{C}$ .															
9			$F_{MAX}$	85	E	E	E	E	5.0 V						E IN	5.0 V	OUT	OUT
				86	E	E	E	E							E IN	5.0 V	OUT	OUT
				87														
				88														

See notes at end of device type 05.

TABLE III. Group A inspection for device type 05 <sup>1/</sup> - Continued.

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D Case C	Test No.	Test limits										
					1	2	3	4	5	6	7	8	9	10	14
9 $T_C = 25^\circ C$	$t_{PLH1}$	3003 (Fig 11)	89		IN	5.0 V	J	IN	Clear 2	12	11	10	9	8	5
	$t_{PHL1}$		90		D1	1	V <sub>CC</sub>	1	Clear 2	D2	Clock 2	Preset 2	OUT	IN	Meas. terminal
			91				J						OUT	J	Clear 1
			92				IN						OUT	IN	Preset 1
			93				J						OUT	J	Clear 2
			94				IN						OUT	IN	Preset 2
			95				J						OUT	J	Clear 1
			96				IN						OUT	IN	Clear 2
			97				IN	IN(A)	B				OUT	5.0 V	ns
			98				IN	IN(A)	5.0 V	B	IN(A)	IN	OUT	B	Clock 1
			99							5.0 V	IN(A)	IN	5.0 V	5.0 V	ns
			100				IN	IN(B)	5.0 V	5.0 V	IN(A)	IN	OUT	B	Clock 2
			101				IN	IN(B)	B				OUT	5.0 V	ns
			102				IN	IN(B)					OUT	5.0 V	ns
			103										OUT	B	Clock 1
			104										OUT	5.0 V	ns
			105				IN	E	5.0 V	E	IN	5.0 V	OUT	5.0 V	ns
			106				IN	E		E	IN	5.0 V	OUT	5.0 V	ns
			107										OUT	J	Clear 1
			108										OUT	IN	Preset 1
			109										OUT	J	Clear 2
			110										OUT	IN	Preset 2
			111										OUT	J	Clear 1
			112										OUT	IN	Preset 1
			113										OUT	J	Clear 2
			114										OUT	IN	Preset 2
			115										OUT	J	Clear 1
			116										OUT	IN	Clear 2
10 $T_C = 125^\circ C$	$t_{PLH1}$	F MAX (Fig 12)	105										OUT	5.0 V	ns
	$t_{PLH1}$	3003 (Fig 11)	106										OUT	5.0 V	ns
			107										OUT	5.0 V	ns
			108										OUT	5.0 V	ns
			109										OUT	5.0 V	ns
			110										OUT	5.0 V	ns
			111										OUT	5.0 V	ns
			112										OUT	5.0 V	ns
			113										OUT	5.0 V	ns
			114										OUT	5.0 V	ns
			115										OUT	5.0 V	ns
			116										OUT	5.0 V	ns

See notes at end of device type 05.



TABLE III. Group A inspection for device type 07 1/ - Continued.

Subgroup	Symbol	MIL-STD-883 method	Case A,B,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Test limits
				Case C	3	2	1	14	13	12	11	10	9	8	7	6	5	
9			Clock	1				Clear	2	Clock	Preset	2	Q2	GND	Q1	Q1	Preset 1	
$T_C = 25^\circ\text{C}$			Case No.	1	D1	VCC			D2	2			GND	$\bar{Q}_1$				Max. Unit
			Test No.	82	IN	E	5.0 v	5.0 v		IN	5.0 v	OUT	OUT	OUT	OUT	5.0 v	Q1	10 MHz
				83	IN	E	5.0 v	5.0 v		IN	5.0 v	OUT	OUT	OUT	OUT	5.0 v	$\bar{Q}_1$	
				84													Q2	
				85														ns
	tPLH	3003 (Fig. 12)		86				IN										
				87				IN										
				88				IN										
				89				IN										
				90				IN										
				91				IN										
				92				IN										
				93				IN										
	tPLH	3003 5/ (Fig. 12) (Fig. 13)		94	IN	IN(A)	B											
				95	IN	IN(A)	5.0 v											
				96				B	IN(A)	IN	5.0 v	OUT	OUT	OUT	OUT	5.0 v	Clock 1	
				97					5.0 v	IN(A)	IN	B					Clock 1	
				98	IN	IN(B)	5.0 v										Clock 2	
				99	IN	IN(B)	B										Clock 2	
	tPHL	(Fig. 12)		100				5.0 v	IN(B)	IN	B	OUT	OUT	OUT	OUT	5.0 v	Clock 1	
				101				B	IN(B)	IN	5.0 v	OUT	OUT	OUT	OUT		Clock 2	

See notes at end of device type 07.

TABLE III. Group A inspection for device type 07 1/ -Continued.

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, D		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Test limits
			Case C	Case C	3	2	1	14	13	12	11	10	9	8	7	6	5	4	
10 $T_C = 125^\circ C$	F MAX	(Fig. 12)	102	IN	E	5.0 V	5.0 V	D1	Clear 1	V <sub>CC</sub>	Clear 2	Clock 2	Preset 2	Q2	GND	Q1	OUT	IN	Clear 1 to Q1 Preset 1 to Q2
	tPLH	(Fig. 11)	103	IN	E	5.0 V	5.0 V					5.0 V	5.0 V				5.0 V	5.0 V	10 MHz
	tPHL		105																
	tPLH	(Fig. 12)	106																
	tPHL		107																
	tPLH	(Fig. 13)	108																
	tPHL		109																
	tPLH	(Fig. 12)	110																
	tPHL		111																
	tPLH	(Fig. 13)	112																
	tPHL		113																
	tPLH	(Fig. 12)	114	IN	IN(A)	B													
	tPHL		115	IN	IN(A)	5.0 V													
	tPLH	(Fig. 12)	116																
	tPHL		117																
	tPLH	(Fig. 13)	118	IN	IN(B)	5.0 V													
	tPHL		119	IN	IN(B)	B													
	tPLH	(Fig. 12)	120																
	tPHL		121																

11 Same tests, terminal conditions and limits as subgroup 10, except  $T_C = -55^\circ C$ .

NOTES:

A = Normal clock pulse.  
B = Momentary GND, then 4.5 V.  
E = Input D connected to  $\bar{Q}$ .

1/ Terminal conditions (pins not designated) may be  $H > 2.0$  V, or  $L < 0.8$  V, or open.

2/ Input voltages shown are:  $A_{\text{min}} = 2.0$  volts minimum and  $B = 0.8$  volts maximum.

3/ Output voltages shall be either: (a)  $H = 2.4$  V, minimum and  $L = 0.4$  V, maximum when using a high speed checker double comparator; or (b)  $H \geq 1.5$  V and  $L \leq 1.5$  V when using a high speed checker single comparator.

4/ Tests shall be performed for both D input pulses (A and B).

5/ Tests shall be performed for the frequency of the input pulse. The output frequency shall be one-half of the input frequency.